

**YS1500 Indicating Controller  
YS1700 Programmable  
Indicating Controller  
Operation Guide**



IM 01B08B02-01EN

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The following are related manuals:

YS1500 Indicating Controller/YS1700 Programmable Indicating Controller

User's Manual (Electronic version)

- Chapter 1 Control Function
- Chapter 2 Auxiliary Control Function
- Chapter 3 Auxiliary Input and Output Functions
- Chapter 4 Display and Security Functions
- Chapter 5 Adjusting of Direct Inputs (Temperature/Resistance/Frequency)
- Chapter 6 Processing during Power Failures
- Chapter 7 Self-tuning Function
- Chapter 8 Maintenance
- Chapter 9 Specifications

YS1000 Series Communication Interface

User's Manual (Electronic version)

- Chapter 1 Overview
- Chapter 2 Setting Communication Functions
- Chapter 3 Description of RS-485 Communication (Optional Code: /A31)
- Chapter 4 Description of Ethernet Communication (Modbus/TCP) (Optional Code: /A34)
- Chapter 5 Description of DCS-LCS Communication (Optional Code: /A32)
- Chapter 6 Functions and Application of YS1500/YS1700 D-registers
- Chapter 7 Functions and Application of YS1310/YS1350/YS1360 D-registers
- Appendix ASCII Code Table

YSS1000 Setting Software for YS1000 Series/YS1700 Programmable Function

User's Manual (Electronic version)

- Chapter 1 Overview
- Chapter 2 YSS1000 Operation Guide
- Chapter 3 User Program Creation Guide
- Chapter 4 Operation of Computation and Control Programs
- Chapter 5 Basic Usage of Control Modules
- Chapter 6 Applied Usage of Control Modules
- Chapter 7 Operations and Application of Computing Module (Instructions)
- Chapter 8 Using Peer-to-peer Communication
- Chapter 9 Maintenance
- Chapter 10 Sample Program
- Chapter 11 Worksheets / Program Sheets / Parameter Sheets
- Chapter 12 List of Text Program Instructions

YS1000 Series Replacement Manual

(Electronic version)

- Chapter 1 Overview
- Chapter 2 Replacement with YS100-compatible Type
- Chapter 3 Replacement with YS80 Internal Unit-compatible Type and EBS, I, EK, or HOMAC-compatible Type
- Chapter 4 Replacement with YS80-compatible Type
- Chapter 5 Replacement with 100 Line-compatible Type

## Foreword

Thank you for purchasing the YS1000 series single-loop controller (hereinafter referred to as "YS1000").

This manual describes the basic functions and operation methods of the YS1500/YS1700. Please read though this user's manual carefully before using the product.

Note that the manuals for the YS1500/YS1700 comprise the following five documents:

- **Printed manual**

| Manual Name                                                             | Manual Number    |
|-------------------------------------------------------------------------|------------------|
| YS1500/YS1700 Operation Guide                                           | IM 01B08B02-01EN |
| This manual describes the basic operation methods.                      |                  |
| Precautions on the Use of the YS1000 Series                             | IM 01B08B02-91EN |
| This manual is always delivered even if 'without manuals' was selected. |                  |

- **Electronic manuals**

| Manual Name                                                                                                                                   | Manual Number    |
|-----------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| YS1500/YS1700 Operation Guide                                                                                                                 | IM 01B08B02-01EN |
| This is identical to the printed manual.                                                                                                      |                  |
| YS1500/YS1700 User's Manual                                                                                                                   | IM 01B08B02-02EN |
| This manual describes the detailed functions and setting items. It does not contain the user programs and communication functions.            |                  |
| YS1000 Series Communication Interface User's Manual                                                                                           | IM 01B08J02-01EN |
| This manual describes how to use YS1000 in Ethernet, serial, and DCS-LCS communications.                                                      |                  |
| YSS1000 Setting Software/YS1700 Programmable Function User's Manual                                                                           | IM 01B08K02-02EN |
| This manual describes how to use YSS1000 and YS1700's programmable function.                                                                  |                  |
| YS1000 Series Replacement Manual                                                                                                              | IM 01B08H02-01EN |
| This manual describes the compatibility of installation and wiring with YS100, YS80, EBS, I, EK, HOMAC, and 100 line.                         |                  |
| Precautions on the Use of the YS1000 Series                                                                                                   | IM 01B08B02-91EN |
| This manual is always delivered even if 'without manuals' was selected.                                                                       |                  |
| User's manuals for YS1000 are available on the following web site: <a href="http://www.yokogawa.com/ns/ys/im/">www.yokogawa.com/ns/ys/im/</a> |                  |
| You need Adobe Acrobat Reader (but the latest version is recommended) installed on the computer in order to open and read the manuals.        |                  |
| The printed versions of the electronic manuals are available for purchase. Contact your nearest YOKOGAWA dealer for details.                  |                  |

- **General Specifications**

| General Specification Name                | GS Number        |
|-------------------------------------------|------------------|
| YS1700 Programmable Indicating Controller | GS 01B08B02-01EN |
| YS1500 Indicating Controller              | GS 01B08C02-01EN |

\* The last two characters of the manual number and general specification number indicate the language in which the manual is written.

## Notice

- The contents of this manual are subject to change without notice as a result of continuing improvements to the instrument's performance and functions.
- Every effort has been made to ensure accuracy in the preparation of this manual. Should any errors or omissions come to your attention, however, please inform YOKOGAWA Electric's sales office or sales representative.
- Under no circumstances may the contents of this manual, in part or in whole, be transcribed or copied without our permission.

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## Authorised Representative in the EEA and the Importer into the EU/EEA Market

The Authorised Representative for this product in the EEA and the importer for this product into the EU/EEA market via Yokogawa sale channel is:

Yokogawa Europe B.V.

Euroweg 2, 3825 HD Amersfoort, The Netherlands

## Importer for This Product into the Great Britain Market

In relation to UKCA marking, the importer for this product into the Great Britain market via the YOKOGAWA sales channel is:

Yokogawa United Kingdom Limited

Stuart Road Manor Park Runcorn, WA7 1TR, United Kingdom

## Revisions

1st Edition: June 2014

6th Edition: Dec. 2022

2nd Edition: May 2015

3rd Edition: Mar. 2016

4th Edition: Mar. 2018

5th Edition: Aug. 2020

## Safety Precautions

The following contents are for the suffix codes "-□0□", "-□1□" and "-□2□"

This instrument is a product of Installation Category II of IEC/EN 61010-1, IEC/EN 61010-2-201 and IEC/EN 61010-2-030 Safety Standards and Class A (use in commercial and industrial areas) of EN 61326-1, EN 55011 (EMC Standards) (use a ferrite core and an arrester to comply with the standards).



### CAUTION

This instrument is a class A product (use in commercial and industrial areas). In a domestic environment this product may cause radio interference in which case the user needs to take adequate measures.

This instrument is designed to be used within the scope of Measurement Category O (other) and is dedicated for indoor use.

\* Measurement Category O (other)

For measurements performed on circuits not directly connected to MAINS.

To use the instrument properly and safely, observe the safety precautions described in this user's manual when operating it. Use of the instrument in a manner not prescribed herein may compromise protection features inherent in the device. We assume no liability for or warranty on a fault caused by users' failure to observe these instructions.

This instrument is an FM Non-incendive or CSA Non-incendive Standard certified product.

FM nonincendive: Class 3600:2011  
Class 3611:2004  
Class 3810:2005

Locations: Class I, Division 2, Groups A,B,C and D  
Temperature Code: T4

CSA nonincendive: C22. 2 No. 213-M1987  
CAN/CSA-C22.2 No. 0-10  
CAN/CSA-C22.2 No. 0.4-04

Locations: Class I, Division 2, Groups A,B,C and D  
Temperature Code: T4

#### ■ Notes on the User's Manual

- This user's manual should be readily accessible to the end users so it can be referred to easily. It should be kept in a safe place.
- Read the information contained in this manual thoroughly before operating the product.
- The purpose of this user's manual is not to warrant that the product is well suited to any particular purpose, but rather to describe the functional details of the product.

#### ■ Safety, Protection, and Modification of the Product

The following symbols are used in the product and user's manuals to indicate safety precautions:



**"Handle with Care" (This symbol is attached to the part(s) of the product to indicate that the user's manual should be referred to in order to protect the operator and the instrument from harm.)**



**Protective grounding terminal**



**Functional grounding terminal (Do not use this terminal as a protective grounding terminal.)**



**Alternating current**



**Direct current**

- In order to protect the system controlled by this product and the product itself, and to ensure safe operation, observe the safety precautions described in this user's manual. Use of the instrument in a manner not prescribed herein may compromise the product's functions and the protection features inherent in the device. We assume no liability for safety, or responsibility for the product's quality, performance or functionality should users fail to observe these instructions when operating the product.
- Installation of protection and/or safety circuits with respect to a lightning protector; protective equipment for the system controlled by the product and the product itself; foolproof or failsafe design of a process or line using the system controlled by the product or the product itself; and/or the design and installation of other protective and safety circuits are to be appropriately implemented as the customer deems necessary.
- Be sure to use the spare parts approved by YOKOGAWA when replacing parts or consumables.
- This product is not designed or manufactured to be used in critical applications that directly affect or threaten human lives. Such applications include nuclear power equipment, devices using radioactivity, railway facilities, aviation equipment, air navigation facilities, aviation facilities, and medical equipment. If so used, it is the user's responsibility to include in the system additional equipment and devices that ensure personnel safety.
- Modification of the product is strictly prohibited.

### WARNING

#### • Power Supply

Ensure that the instrument's supply voltage matches the voltage of the power supply before turning ON the power.

#### • Protective Grounding

To prevent electric shock, always confirm that protective grounding is connected before turning ON the instrument's power supply.

#### • Necessity of Protective Grounding

Do not cut off the internal or external protective grounding wire or disconnect the wiring of the protective grounding terminal. Doing so renders the protective functions of the instrument invalid and poses a potential shock hazard.

#### • Defects in Protective Functions

If protective functions such as grounding are suspected to be defective, do not operate the instrument. Ensure that all protective functions are in working order before operating the instrument.

#### • Do Not Use in an Explosive Atmosphere

Do not operate the instrument in locations with combustible or explosive gases or steam. Operation in such environments constitutes an extreme safety hazard. Use of the instrument in environments with high concentrations of corrosive gas (H<sub>2</sub>S, SO<sub>x</sub>, etc.) for extended periods of time may cause a failure.

#### • Do Not Remove Internal Unit

The internal unit should not be removed by anyone other than YOKOGAWA's service personnel. There are dangerous high voltage parts inside.

#### • External Connection

Ensure that protective grounding is connected before connecting the instrument to the device under measurement or to an external control circuit.

#### • Damage to the Protective Construction

Operation of the instrument in a manner not specified in this user's manual may damage its protective construction.

#### ■ Warning and Disclaimer

- YOKOGAWA makes no warranties regarding the product except those stated in the WARRANTY that is provided separately.
- The product is provided on an "as is" basis. YOKOGAWA assumes no liability to any person or entity for any loss or damage, direct or indirect, arising from the use of the product or from any unpredictable defect of the product.

#### ■ Notes on Software

- YOKOGAWA makes no warranties, either expressed or implied, with respect to the software's merchantability or suitability for any particular purpose, except as specified in the terms of the separately provided warranty.
- This software may be used on one specific machine only.
- To use the software on another machine, the software must be purchased again separately.
- It is strictly prohibited to reproduce the product except for backup purposes.
- Store the software CD-ROM (the original medium) in a safe place.
- All reverse-engineering operations, such as reverse compilation or the reverse assembly of the product are strictly prohibited.
- No part of the product's software may be transferred, converted, or sublet for use by any third party, without prior written consent from YOKOGAWA.

#### Handling Precautions for the Main Unit

- The instrument comprises many plastic components. To clean it, wipe it with a soft, dry cloth. Do not use organic solvents such as benzene or thinner for cleaning, as discoloration or deformation may result.
- Keep electrically charged objects away from the signal terminals. Not doing so may cause the instrument to fail.
- Do not apply volatile chemicals to the display area, operation keys, etc. Do not leave the instrument in contact with rubber or PVC products for extended periods. Doing so may result in failure.
- If the equipment emits smoke or abnormal smells or makes unusual noises, turn OFF the instrument's power switch immediately and unplug the device. In such an event, contact your sales representative.

#### Regarding the LCD

A small number of missing or steady-on LCD pixels and minor variations in brightness uniformity is a normal display characteristic and not a malfunction.

#### Protection of Environment

##### Waste Electrical and Electronic Equipment (WEEE)

Applicable models: YS1700-10x, -11x, -12x, -20x, -21x, -22x  
YS1500-10x, -12x, -20x, -22x  
However, except the option /A08.



(Only valid in the EEA for EU WEEE Directive and in the UK for UK WEEE Regulation)

This product complies with the WEEE marking requirement. This marking indicates that you must not discard this electrical/electronic product in domestic household waste. When disposing of products in the EEA or UK, contact your local Yokogawa office in the EEA or UK respectively.

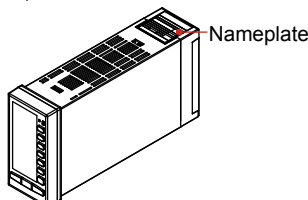
## Checking the Contents of the Package

Unpack the box and check the contents before using the product. If the product is different from that which you have ordered, if any parts or accessories are missing, or if the product appears to be damaged, contact your sales representative.

### YS1500/YS1700 Main Unit

The YS1000 series main units have nameplates affixed to the tops of the terminals.

Check the model and suffix codes inscribed on the nameplate to confirm that the product received is that which was ordered.



0001E.ai

### No. (Instrument number)

When contacting your sales representative, inform them of this number too.

### Model and Suffix Codes

| Model             | Suffix Code | Optional Code | Remarks                                                                                |
|-------------------|-------------|---------------|----------------------------------------------------------------------------------------|
| YS1700            |             |               | Programmable indicating controller                                                     |
| YS1500            |             |               | Indicating controller                                                                  |
| Use               | -1          |               | With hard manual unit                                                                  |
|                   | -2          |               | Without hard manual unit                                                               |
| Type              | 0           |               | Basic type                                                                             |
|                   | 1           |               | Basic type with expandable I/O (*1)                                                    |
|                   | 2           |               | Compatible type for YS100 (with YS100 case)                                            |
|                   | 3           |               | Compatible type for YS80 internal unit/ compatible type for EBS, I, EK, and HOMAC (*2) |
|                   | 4           |               | Compatible type for YS80 (compatible size for YS80 with YS100 terminal)                |
|                   | 5           |               | Compatible type for pneumatic 100 line (with YS100 terminal) (*3)                      |
| Power supply      | 0           |               | 100 V AC, 24 V DC common power                                                         |
|                   | 1           |               | 220 V AC power                                                                         |
| Direct input (*4) |             | /A01          | mV input                                                                               |
|                   |             | /A02          | Thermocouple input                                                                     |
|                   |             | /A03          | RTD input                                                                              |
|                   |             | /A04          | Potentiometer input                                                                    |
|                   |             | /A05          | Isolator                                                                               |
|                   |             | /A06          | Two-wire transmitter input (isolated)                                                  |
|                   |             | /A07          | Two-wire transmitter input (non-isolated)                                              |
|                   |             | /A08          | Frequency input (*10)                                                                  |
|                   |             | /DF           | Direct input with Fahrenheit temperature range function (*5)                           |
| Communication     |             | /A31          | RS-485 communication (PC-link, Modbus, YS protocol, and Peer-to-Peer) (*6)             |
|                   |             | /A32          | DCS-LCS communication (*7)                                                             |
|                   |             | /A34          | Ethernet communication (Modbus/TCP) (*8)                                               |
| Certification     |             | /FM           | FM nonincendive approved (FM Class I, Div 2) (*9)                                      |
|                   |             | /CSA          | CSA safety and nonincendive approved (Class I, DIV 2) (*9)                             |

\*1 Only YS1700 is compatible. The expandable I/O terminal (model YS010) and expandable I/O cable (model YS011) (cable length: 3 m) are provided.

- \*2 This type can be connected to the YS80 housing (model SHUP). (The EK/HOMAC-compatible housing (SHUP-420) and EBS/I series-compatible housing (SHUP-100) are sold separately.)
- \*3 The 100 line-compatible housing (model YS006) is sold separately.
- \*4 Direct input options can be combined only with suffix codes "-□2□," "-□4□," or "-□5□." Selection of multiple options is not possible.
- \*5 Optional code /DF can be combined only with optional code /A02 or /A03.
- \*6 A combination with suffix code "-□3□" is not possible. Optional codes /A31 and /A32 cannot be simultaneously specified. Please specify the communication options /A31 (RS-485 communication) to directly communicate with the CENTUM CS3000/VP.
- \*7 Optional codes /A31 and /A32 cannot be simultaneously specified. Please specify the communication options /A32 (DCS-LCS communication) to communicate with the CENTUM CS3000/VP through the SCIU.
- \*8 Optional code /A34 can be specified only for suffix codes "-□0□" or "-□1□."
- \*9 This option can be combined only with suffix codes "-□0□" or "-□1□."
- \*10 When option code /A08 is specified, the conformity to CE marking is excluded.

For the installation and wiring of YS1500/YS1700-□2□, -□3□, -□4□, or -□5□, see the YS1000 Series Replacement Manual.

## ■ Customized Product

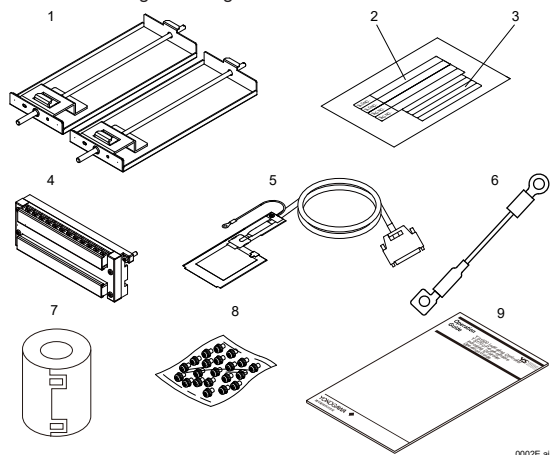
/S#, /Z: Customized product; details in FX1-XJYS1700.xxx\*

\* Contact your supplier in case your instrument has option /S# (where '#' is a number), and you are not in the possession of FX1-XJYS1700.xxx. (where "xxx" is a unique document number and option /S# or /Z is identified by the cover page of that document.)



## Accessories

The product is provided with the following accessories according to the model and suffix codes (see the table below). Check that none of them are missing or damaged.



| No. | Item Name                     | Part Number/ Model | Q'ty | Remarks                                                                     |
|-----|-------------------------------|--------------------|------|-----------------------------------------------------------------------------|
| 1   | Metal clamps                  | L4041RA            | 2    | For YS1□00-□0□, or YS1□00-□1□                                               |
|     |                               | E9760RJ            | 2    | For YS1□00-□2□                                                              |
|     |                               | E9760RN            | 2    |                                                                             |
|     |                               | E9760RJ            | 1    | For YS1□00-□4□                                                              |
|     |                               | E9760RP            | 1    |                                                                             |
| 2   | Tag plate seals               | —                  | 4    | 50 × 3.5 mm                                                                 |
| 3   | Range entry seals             | —                  | 4    | 34 × 2 mm                                                                   |
| 4   | Expandable I/O terminal       | YS010              | 1    | Supplied with YS1700-□1□.                                                   |
| 5   | Expandable I/O cable          | YS011-03           | 1    | Cable length: 3 m<br>Supplied with YS1700-□1□.                              |
| 6   | RJC sensor                    | L3501RA            | 1    | Supplied with products with optional code /A02. (*1)                        |
| 7   | Ferrite core                  | A1179MN            | 1    | For direct input cable<br>(Supplied with products with optional code /A0□.) |
| 8   | M4 screw with spring washer   | Y9408JH            | 42   | For YS1□00-□0□, or YS1□00-□1□                                               |
| 9   | YS1500/YS1700 Operation Guide | —                  | 1    | This user's manual, A4 size                                                 |

\*1: For the RJC mounting, see the chapter "Installation and Wiring" in this manual or the YS1000 Series Replacement Manual.

## Accessories (sold separately)

The following lists accessories that are sold separately. When ordered, check that none of them are missing or damaged. To inquire about the accessories or about how to place an order, contact your sales representative.

| No. | Item Name                       | Model | Sales Unit | Remarks                                      |
|-----|---------------------------------|-------|------------|----------------------------------------------|
| 1   | 120 Ω terminating resistor (*1) | YS020 | 1          | For RS-485 communication                     |
| 2   | 250 Ω shunt resistor            | YS021 | 1          | For a built-in 24 V transmitter power supply |

\*1 The instrument has a built-in terminating resistor, which can be selected for use by setting the relevant parameter. If a terminating resistor is used in another device at the termination of the same communication system, an external terminating resistor needs to be provided to match the terminating resistance of the YS1000's built-in terminating resistor.

## Symbols Used in This Manual



This symbol is used on the instrument. It indicates the possibility of injury to the user or damage to the instrument, and signifies that the user must refer to the user's manual for special instructions. The same symbol is used in the user's manual on pages that the user needs to refer to, together with the term "WARNING" or "CAUTION."

### WARNING

Calls attention to actions or conditions that could cause serious or fatal injury to the user, and indicates precautions that should be taken to prevent such occurrences.

### CAUTION

Calls attention to actions or conditions that could cause injury to the user or damage to the instrument or property and indicates precautions that should be taken to prevent such occurrences.

### Note

Identifies important information required to operate the instrument.



Indicates related operations or explanations for the user's reference.



Indicates a character string displayed on the display.

## Setting Display

Indicates a setting display and describes the keystrokes required to display the relevant setting display.  
Perform the operations in chronological order. This section describes the procedure under the assumption that these steps are being taken for the first time. There are cases where not all of the steps are required, depending on the required operation.

## Setting Details

Provides the descriptions of settings.

## Description

Describes restrictions, etc. regarding a relevant operation.

## About an Electronic Manual

User's manuals for YS1000 are available on the following web site:  
[www.yokogawa.com/ns/ys/im/](http://www.yokogawa.com/ns/ys/im/)

You need Adobe Acrobat Reader (but the latest version is recommended) installed on the computer in order to open and read the manuals.

## QR Code

The product has a QR Code pasted for efficient plant maintenance work and asset information management. It enables confirming the specifications of purchased products and user's manuals.

For more details, please refer to the following URL.

<https://www.yokogawa.com/qrcode>

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# Introduction to Functions

The YS1000 series is a series of single-loop controllers to meet the demands of users' consistently advancing and diversifying needs. It is capable of the flexible control computation required for process control.

## Features

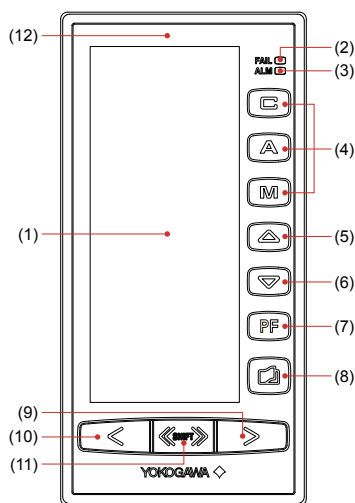
- **Color LCD display**  
The monitoring and operation display is provided in color, and input and output values, various constants, and incorporated control functions can be set freely using key switches on the front panel. The monitoring displays include LOOP Display, TREND Display, ALARM Display, and METER Display which provides information in much the same way as analog meters.
- **Failsafe function**  
Two CPUs are configured to provide manual operations and displays even if one of the CPUs becomes faulty. Moreover, because the instrument incorporates a hard manual circuit independent of the digital circuit, it can continue to generate manipulated output variables even if the digital circuit that includes the CPUs fails.
- **AC/DC-common power supply with wide operating voltage range.**  
The instrument can be powered by either AC (100 V AC) or DC (24 V DC).
- **The front panel is dust- and water-proof (conforming to IP54).**
- **Abundant communication functions**  
The instrument can incorporate Ethernet (Modbus/TCP) communication, serial communication (Modbus, PC-link, and YS protocol), and DCS-LCS communication.
- **Control functions and abundant computation functions**  
The instrument is capable of single-loop, cascade, selector, and programmable control functions.  
It can also perform computations such as the four arithmetic operations, logic computation, exponent, logarithm, temperature compensation, pressure correction, etc. and peer-to-peer communication. (Optional YSS1000 Setting Software is required.)
- **Number of I/O points**  
Use of YS1700's expandable I/O terminal allows the use of a maximum of eight analog inputs, a maximum of four analog outputs, and a maximum of 14 DI/Os.

## Definition of Terms

- **PV:** Process variable input from process
- **SV:** Setpoint regarded as a control target
- **MV:** Manipulated variable for operating control elements such as valves.
- **PID control:** Control system based on action which combined three elements: proportional (P) action, integral (I) action, and derivative (D) action.
- **M mode:** Mode in which manipulated output variables are operated manually.
- **A mode:** Mode in which MV is automatically controlled based on YS1000's setpoint
- **C mode:** Mode in which MV is controlled based on an external setpoint
- **Multi-function mode:** Modes of the three preinstalled functions (single-loop mode, cascade mode, and selector mode)
- **Programmable mode:** Mode in which input/output or control computation is programmed
- **User program:** A program created using the YSS1000 Setting Software (available as an option)

# Part Names

## Front Panel Part Names



- (1) Color LCD display: 120 × 320 dots
- (2) FAIL lamp (LED: red)
- (3) ALM lamp (LED: yellow)
- (4) C mode key, A mode key, M mode key, and LED indicators (C: green, A: green, M: yellow)
- (5) SV increase key
- (6) SV decrease key
- (7) PF key and LED indicator
- (8) Page key
- (9) MV increase key
- (10) MV decrease key
- (11) Fast-change key/SHIFT key
- (12) TAG label (recommended position to attach label)

► For the functions of each part: see “Monitoring and Control of Regular Operations (Operation Display)” in this manual.

Figure 2.1

## Swinging the Front Panel Up and Down

### Swinging up the front panel

1. Press upwards in the center of the bottom of the front panel. You can draw the front panel toward you until you feel a slight resistance and the movement of the front panel will stop.  
(You can swing up the front panel more smoothly if hold the top and bottom of the front panel.)
2. Swing the front panel up and out from that position.

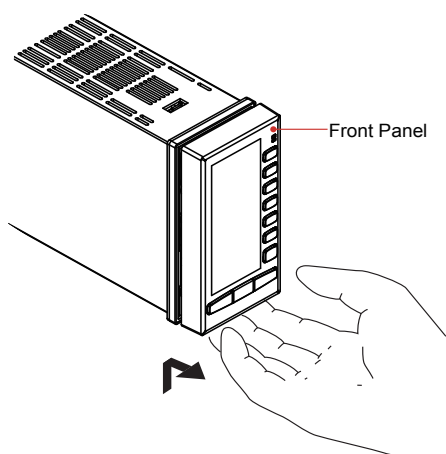


Figure 2.2

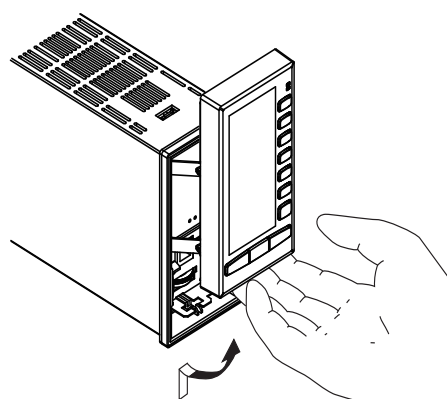


Figure 2.3

### Swinging down the front panel

Push down on the center of the top of the front panel. When you feel a slight sense of resistance, stop pushing. Slide it forward from that position. It will click into place, indicating that it is locked.

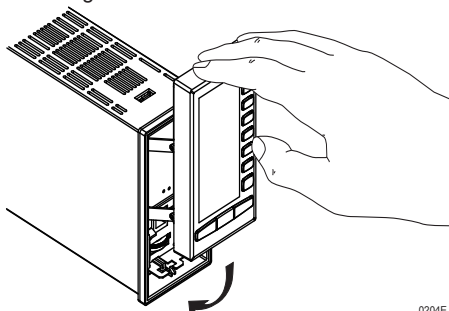


Figure 2.4

## Part Names of the Internal Panel Seen with the Front Panel Swung up

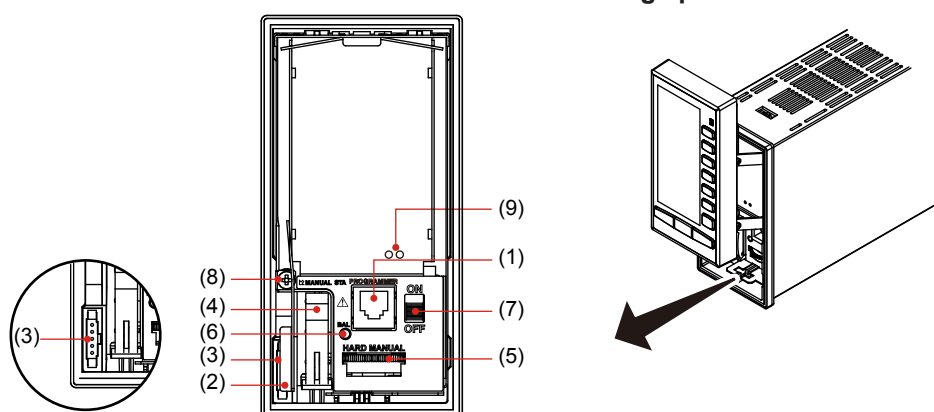


Figure 2.5

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- (1) Connector for connection to a PC (PROGRAMMER)  
This is a communication cable connector for downloading, uploading, or monitoring parameters or user programs set using the YSS1000 Setting Software.  
▶ [YSS1000: YSS1000 Setting Software/YS1700 Programmable Function User's Manual](#)
- (2) Metal lever  
Touch the metal lever to discharge static electricity. Before you connect the cable to the YS110 connector, touch the metal lever.
- (3) Connector for YS110 standby manual station (MANUAL STA)
- (4) Internal unit release lever
- (5) Hard manual operation wheel (HARD MANUAL)  
An operation wheel to manipulate an output
- (6) MV balance lamp (BAL) (Color: green)  
Lights up when a manipulated output variable and the hard manual unit's output value agree with each other.
- (7) Hard manual selector switch (ON/OFF)  
The switch used to switch to a manipulated variable (MV) set using the hard manual operation wheel.
- (8) An internal unit fixing screw
- (9) LED and switch for repair  
Contact us for repair.  
▶ Regarding items (2), (3), (5), (6), and (7) above: see "Backup Operation in the Event of Instrument Failure" in this manual.

### Note

For products with suffix code -2xx, there are no hard manual unit-related parts ((5), (6), and (7)).



### WARNING

Do not remove the internal unit from the instrument case. Contact YOKOGAWA's sales office or sales representative when removing the internal unit, as safety standard inspection is required.



### WARNING

**Explosion hazard.**  
Do not remove or insert the internal unit in explosive atmospheres.

### CAUTION

Products with optional code /FM or /CSA cannot satisfy the explosion protection standards if the internal unit is removed.

## YS1500/YS1700 Operating Procedure

When using the instrument for the first time, proceed according to the following sequence:

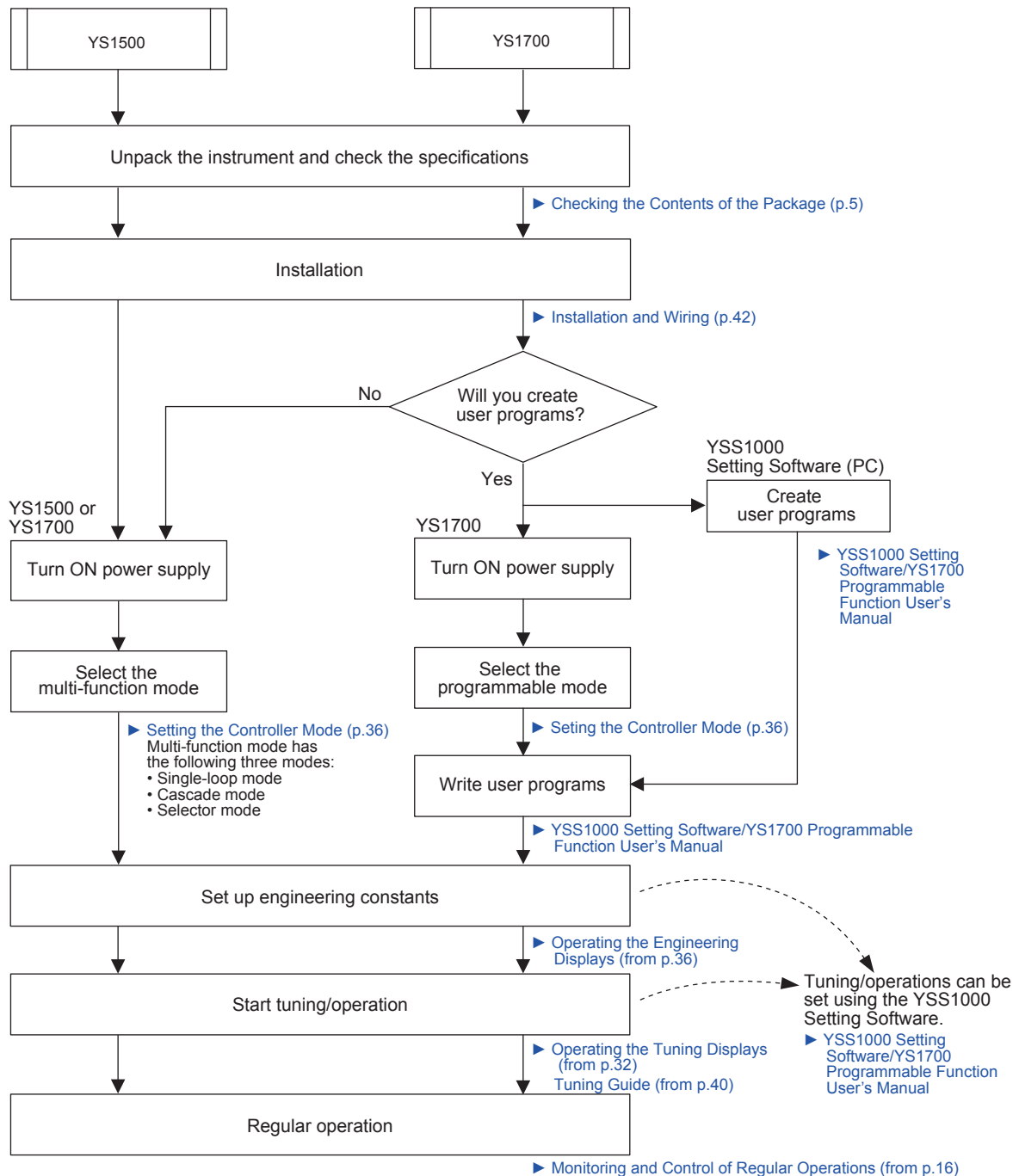


Figure 3.1

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# Basic Operation

## Overview of Display Switching and Operation Keys

The YS1000 has the following three display groups:

### (1) Operation Display Group

This group has a **LOOP Display** which allows operation mode switching during control operation, SV setting, and MV operation; a **TREND Display** which displays the trends of PV, SV, and MV; an **ALARM Display** which displays detailed alarm information; a **LOOP Display** which displays two loops simultaneously (operation is on a loop basis); and a **METER Display** which displays PV, SV, and MV on a meter scale using a pointer.

### (2) Tuning Display Group

This group has a display for setting and displaying control parameters such as PID, and a display for monitoring input/output signals.

### (3) Engineering Display Group

This group has a display for setting up functions as a controller, a display for setting and displaying various registers and various tables, a display for setting input specifications and a password setting display.

## Selecting a Display

The flow of display selecting operations is as follows:

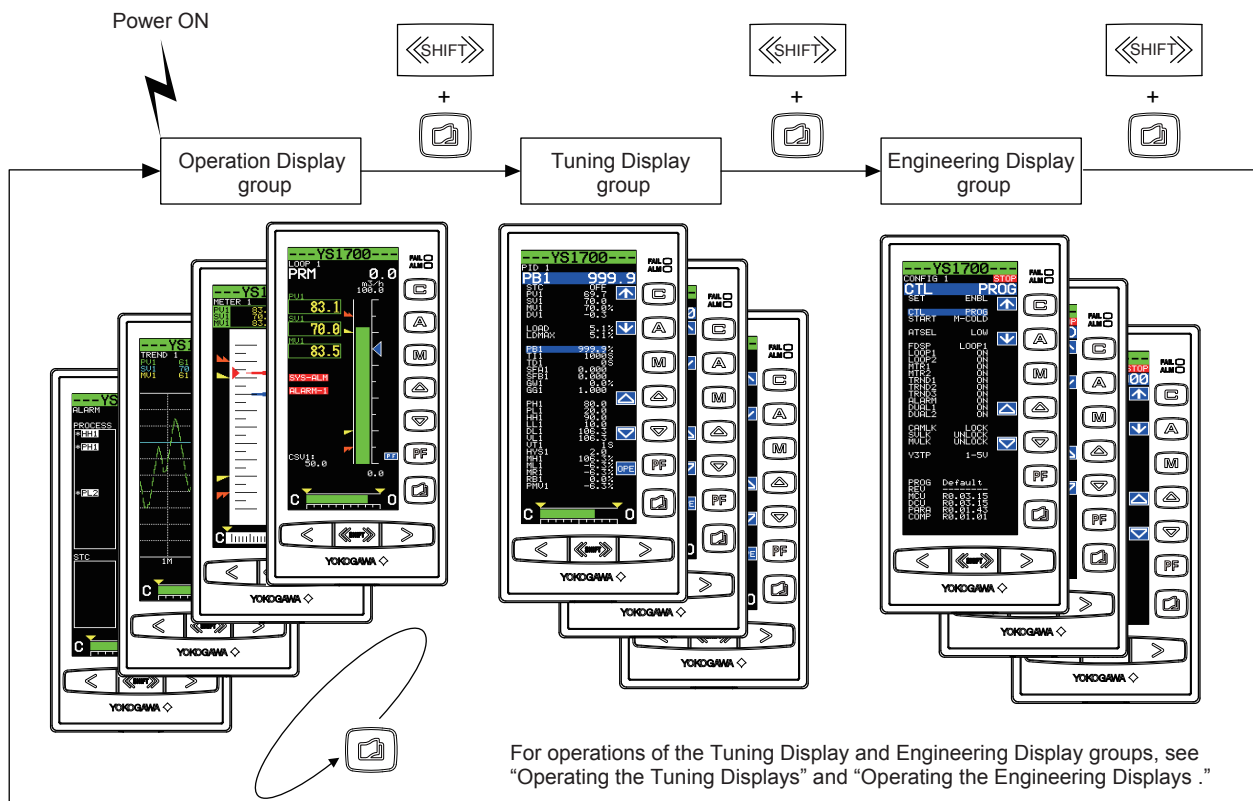


Figure 4.1

0401E.ai

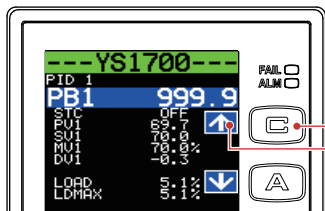
1. When the instrument's power is turned ON, the Operation Display appears.
2. Each time the Page key (□) is pressed with the SHIFT key (⇐⇐⇐) held down, the display is switched. The display changes in the order of Operation Display, Tuning Menu Display, and Engineering Menu Display, after which the Operation Display reappears.

### Note

Operation of the SHIFT key + Page key (a two key keystroke) implies that you should press the Page key with the SHIFT key held down. Doing so in the opposite order does not switch the display.

### Software keys

Software keys are keys displayed on the LCD. The functions of the software keys are assigned to the operation keys on the right of the display.



In the figure at the left, the  (UP) software key corresponds with the  mode key.

Figure 4.2

0402E.ai

## Display Switching in Single-loop Mode (YS1500's factory setting)

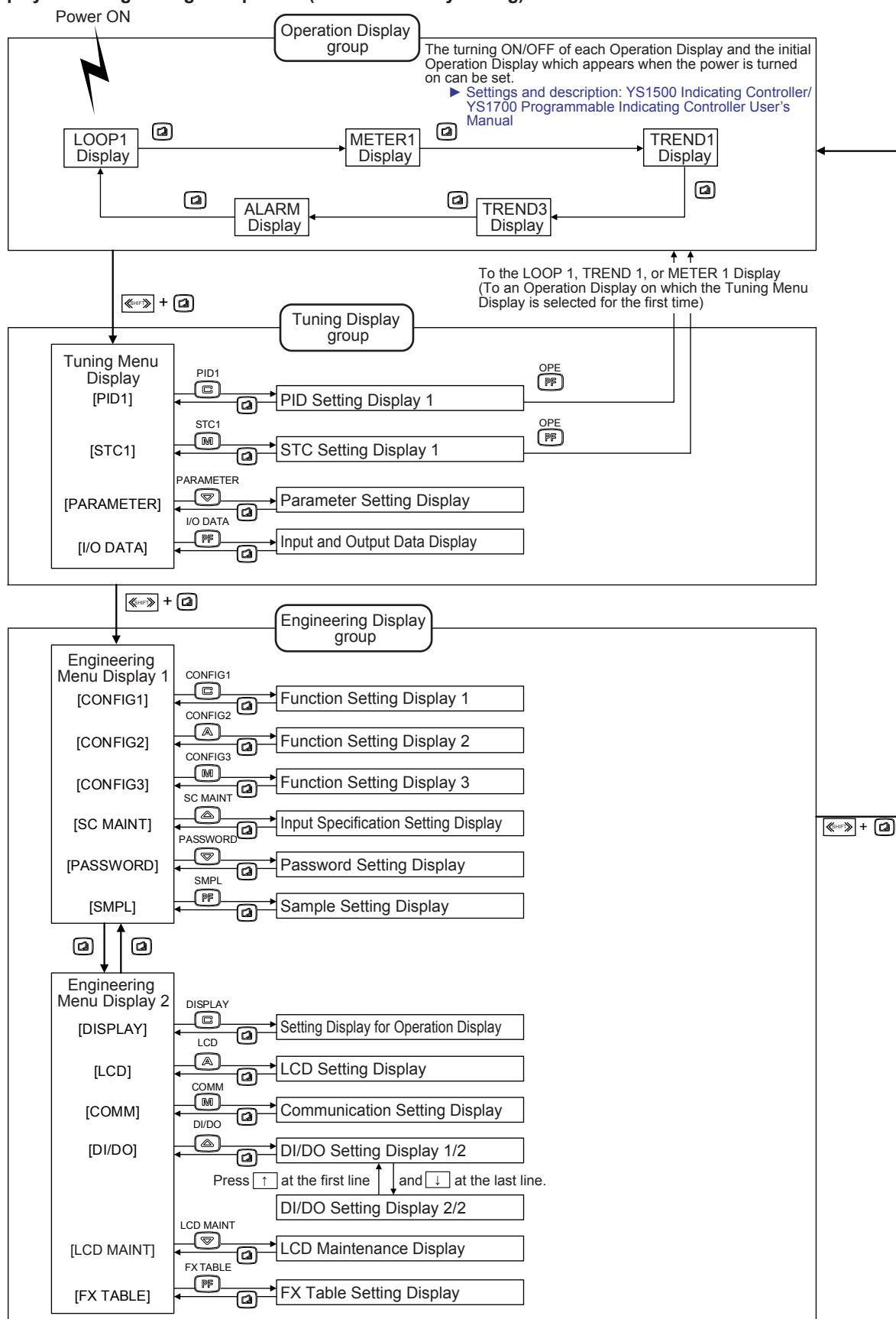


Figure 4.3

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## Display Switching in the Cascade or Selector Mode

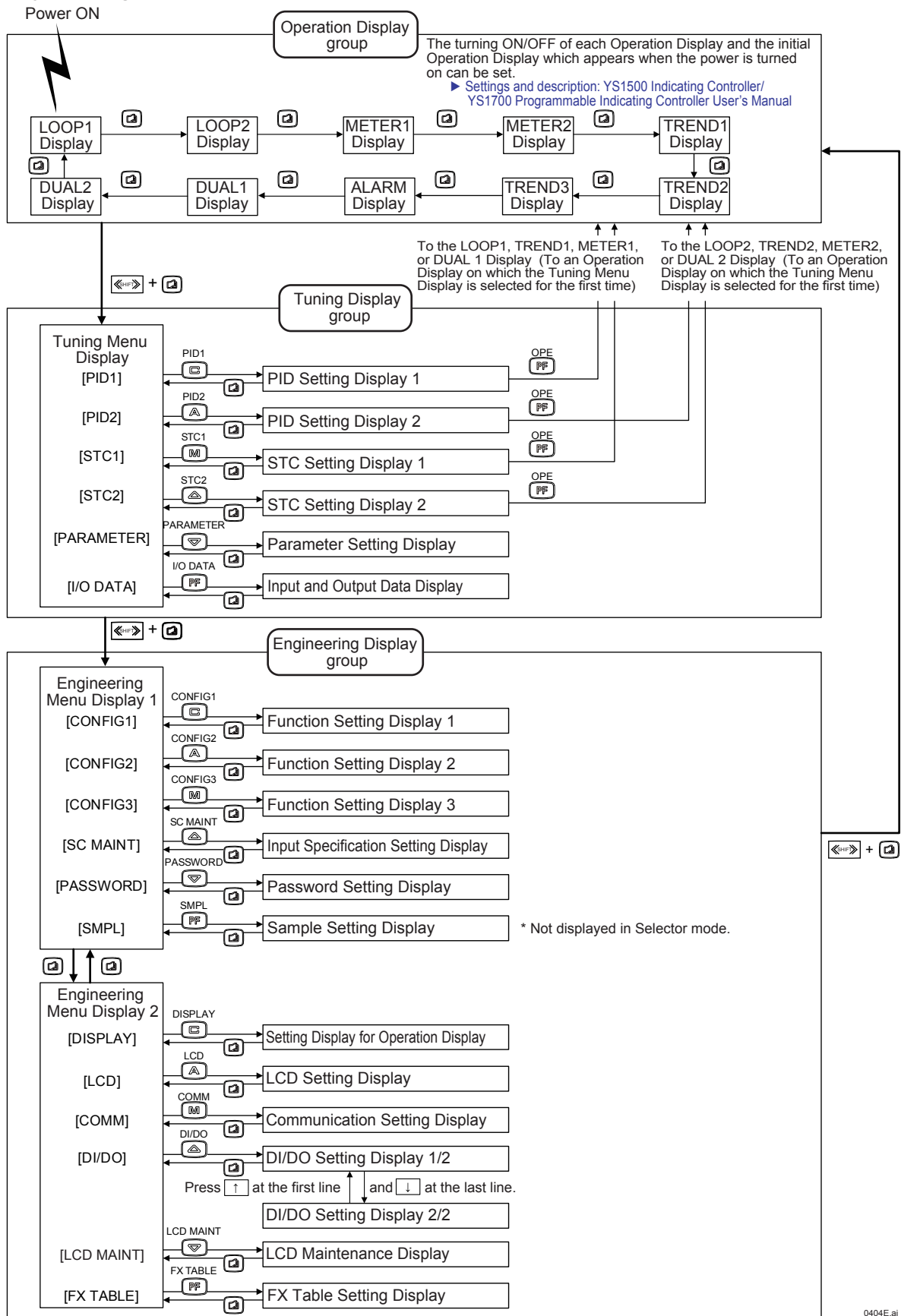


Figure 4.4

### Display Switching in the Programmable Mode (YS1700's factory setting)

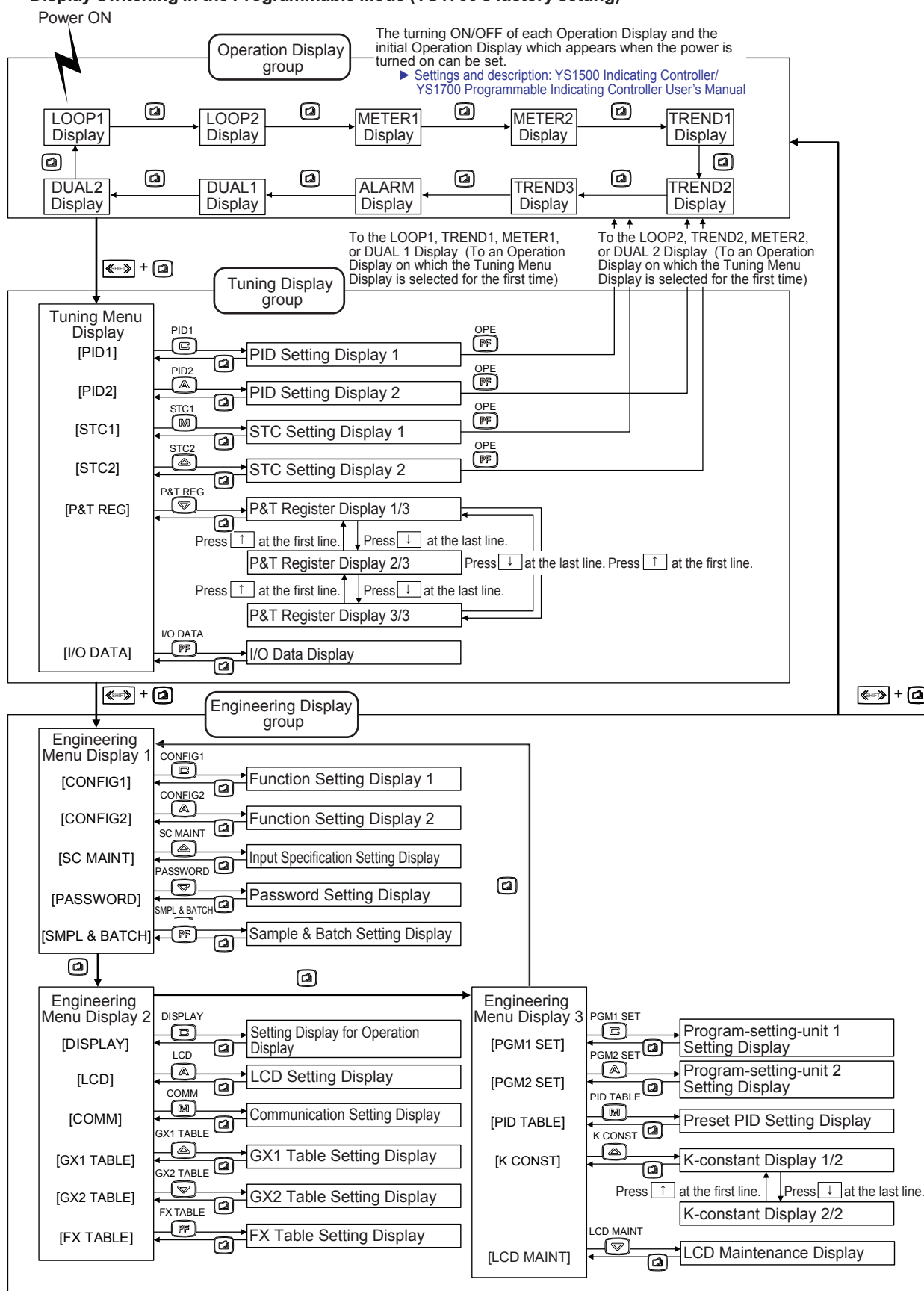


Figure 4.5

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# Monitoring and Control of Regular Operations (Operation Display)

## Monitoring and Operating the Operation Display

### Monitoring and Operating the LOOP Display

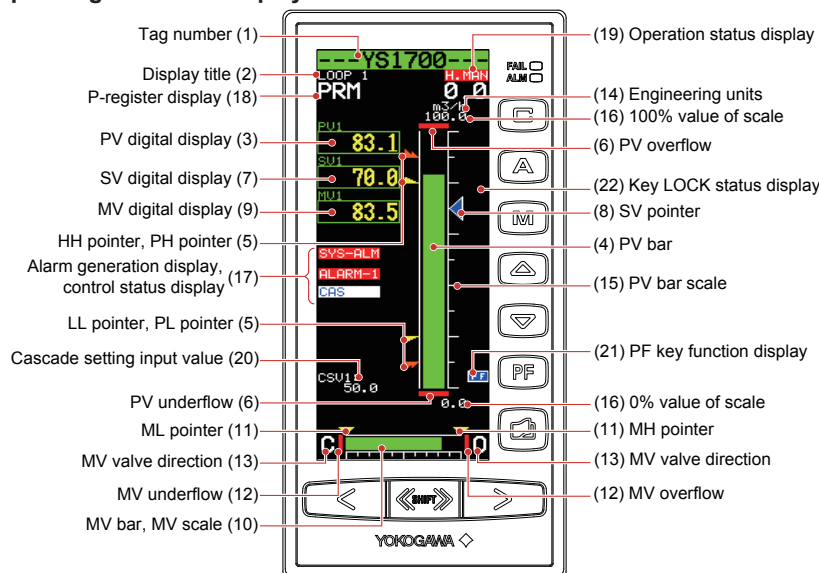


Figure 5.1

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Table 5.1

| No. in Figure | Name                         | Description                                                                                                                                                                                                                                                                                                                                                                                                                             |
|---------------|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (1)           | Tag number                   | A tag number combining alphanumeric characters and symbols having a maximum of 12 digits is displayed on a loop basis.                                                                                                                                                                                                                                                                                                                  |
| (2)           | Display title                | The title of the display being shown is indicated.                                                                                                                                                                                                                                                                                                                                                                                      |
| (3)           | PV digital display           | A PV value is displayed in engineering units in a digital value of five significant digits (seven digits including a sign and decimal point).                                                                                                                                                                                                                                                                                           |
| (4)           | PV bar                       | A PV value is displayed in a bar. The bar display is in 200 dots at full scale (100%) and increases/decreases on a dot (0.5%) basis.                                                                                                                                                                                                                                                                                                    |
| (5)           | PH, PL, HH, and LL pointers  | PH values (high limit alarm setpoints for PV) and PL values (low limit alarm setpoints for PV) are indicated with triangular pointers, while HH values (high-high limit alarm setpoints for PV) and LL values (low-low limit alarm setpoints for PV) are indicated with pointers which are overlapped pairs of triangles. Pointers are clipped and displayed at 0% if PV values are below 0%, or displayed at 100% if they exceed 100%. |
| (6)           | PV underflow and PV overflow | A PV underflow is displayed if a PV value is below 0%, while a PV overflow is displayed if it exceeds 100%.                                                                                                                                                                                                                                                                                                                             |
| (7)           | SV digital display           | An SV value is displayed in engineering units in a digital value of five significant digits (seven digits including a sign and decimal point).                                                                                                                                                                                                                                                                                          |
| (8)           | SV pointer                   | SV values are indicated with triangular pointers. The pointer display moves up and down with a resolution of 0.5%. Pointers are clipped and displayed at 0% if SV values are below 0%, or displayed at 100% if they exceed 100%.                                                                                                                                                                                                        |
| (9)           | MV digital display           | An MV value is displayed in a digital value of four significant digits (six digits including a sign and decimal point, with the number of decimal places fixed to one digit) in a % display.                                                                                                                                                                                                                                            |
| (10)          | MV bar<br>MV scale           | An MV value is displayed in a bar. The bar display is in 80 dots (100%) at full scale, divided into 20 blocks (5%) for display. It increases/decreases on a dot (1.25%) basis. A scale divided into 10 (10% segments) is also displayed.                                                                                                                                                                                                |
| (11)          | MH and ML pointers           | MH values (high limit setpoints of MV) and ML values (low limit setpoints of MV) are indicated with triangular pointers.                                                                                                                                                                                                                                                                                                                |
| (12)          | MV underflow and MV overflow | An MV underflow is displayed if an MV value is below 0%, while an MV overflow is displayed if it exceeds 100%.                                                                                                                                                                                                                                                                                                                          |
| (13)          | MV valve direction           | MV valve direction is displayed as [C] (closed) or [O] (open). The valve direction can be set.                                                                                                                                                                                                                                                                                                                                          |

Table 5.2

| Table 5.2     |                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |
|---------------|----------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|
| No. in Figure | Name                                                                                                     | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |  |
| (14)          | Engineering units                                                                                        | Engineering units (UNIT) are displayed in a maximum of seven digits.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |  |
| (15)          | PV bar scale                                                                                             | The PV bar scale is displayed divided into a maximum of 10 segments (10% segments).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |  |
| (16)          | 0% value of scale, 100% value of scale                                                                   | 0% value of scale (SCL) and 100% value of scale (SCH) are displayed in engineering units in a digital value of five significant digits (seven digits including a sign and decimal point).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |  |
| (17)          | Alarm generation display, Control status display                                                         | Alarm and control statuses are displayed in abbreviations. These vary according to controller mode in the multi-function mode; or according to the control module in the programmable mode. See Tables 5.3 to 5.5.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |  |
| (18)          | P-register display                                                                                       | When this display is enabled, P register is displayed on the LOOP 1 and LOOP 2 Displays individually. This display is available in the programmable mode.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |  |
| (19)          | Operation status display                                                                                 | The controller operation status is displayed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |  |
|               |                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |
|               |                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |
|               |                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |
|               |                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |
|               |                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |
|               |                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |
| (20)          | Cascade setting input value                                                                              | When the instrument is used in the cascade mode, a cascade setting input value is displayed in engineering units in a digital value of five significant digits (seven digits including a sign and decimal point). No value is displayed in the programmable mode.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |  |
| (21)          |  key function display | The  key function is displayed. The  key function display is different in the multi-function mode and the programmable mode.<br>1) Multi-function mode<br>The  key function is set using the PF key function selection parameter [PFKEY]. When the STC mode selection is “not OFF” and the “  key has been set to STC”, the function display becomes [STC]. In other cases, nothing is displayed.<br>2) Programmable mode<br>The  key function can be defined in user programs. The function display becomes [PF] in the programmable mode. |  |  |
| (22)          | Key LOCK status display                                                                                  | The key LOCK status is displayed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |  |
|               |                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |
|               |                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |
|               |                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |
|               |                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |

Table 5.3 Alarm Display and Control Status Display in the YS1500/YS1700 Multi-function Mode

| Controller Mode<br>Display Item   | Single Loop                          | Cascade                                  | Selector                                 |
|-----------------------------------|--------------------------------------|------------------------------------------|------------------------------------------|
| Alarm generation display (Note 1) | SYS-ALM<br>STC-ALM<br>ALARM-1        | SYS-ALM<br>STC-ALM<br>ALARM-1<br>ALARM-2 | SYS-ALM<br>STC-ALM<br>ALARM-1<br>ALARM-2 |
| Control status display (Note 2)   | CAS<br>SPC, DDC<br>BUA, BUM          | CAS<br>SPC, DDC<br>BUA, BUM              | CAS<br>SPC, DDC<br>BUA, BUM              |
| Control substatus display 1       | EXT-MAN, EXT-AUT<br>EXT-PMV, EXT-TRK | EXT-TRK, EXT-PMV                         | EXT-TRK, EXT-PMV                         |
| Control substatus display 2       | SV TRK, PV TRK                       | OPEN, CLOSE                              | SV2-RMT, SV2-LCL<br>SEL1, SEL2           |
| Control substatus display 3       | STC-ON, STC-DSP,<br>ATSTUP           | STC-ON, STC-DSP,<br>ATSTUP               | STC-ON, STC-DSP                          |

Note 1: This display appears only if an alarm occurs. If multiple alarms occur simultaneously, they are indicated in multiple lines.

Note 2: Only when the operation mode is in cascade setting automatic control (C mode) is a control status displayed, while nothing is indicated in automatic control (A mode) or manual control (M mode).

Table 5.4 Alarm Display and Control Status Display in the YS1700 Programmable Mode

| Control Module<br>Display Item    | Basic Control<br>(BSC1)       | Cascade Control<br>(CSC)                 | Selector Control<br>(SSC)                   | DUAL-loop<br>Control (BSC1,<br>BSC2)     |
|-----------------------------------|-------------------------------|------------------------------------------|---------------------------------------------|------------------------------------------|
| Alarm generation display (Note 1) | SYS-ALM<br>STC-ALM<br>ALARM-1 | SYS-ALM<br>STC-ALM<br>ALARM-1<br>ALARM-2 | SYS-ALM<br>STC-ALM<br>ALARM-1<br>ALARM-2    | SYS-ALM<br>STC-ALM<br>ALARM-1<br>ALARM-2 |
| Control status display (Note 2)   | CAS<br>SPC, DDC<br>BUA, BUM   | CAS<br>SPC, DDC<br>BUA, BUM              | CAS<br>SPC, DDC<br>BUA, BUM                 | CAS<br>SPC, DDC<br>BUA, BUM              |
| Control substatus display 1       | None                          | None                                     | None                                        | None                                     |
| Control substatus display 2       | None                          | OPEN, CLOSE                              | SV2-RMT<br>SV2-LCL<br>SEL1, SEL2<br>SEL-EXT | None                                     |
| Control substatus display 3       | STC-ON<br>STC-DSP<br>ATSTUP   | STC-ON<br>STC-DSP<br>ATSTUP              | STC-ON<br>STC-DSP                           | STC-ON<br>STC-DSP<br>ATSTUP              |

Note 1: This display appears only if an alarm occurs. If multiple alarms occur simultaneously, they are indicated in multiple lines.

Note 2: Only when the operation mode is in cascade setting automatic control (C mode) is a control status displayed, while nothing is indicated in automatic control (A mode) or manual control (M mode).

Table 5.5 Meaning of Display Abbreviations

| Symbol  | Meaning                                                                     | Symbol  | Meaning                                       |
|---------|-----------------------------------------------------------------------------|---------|-----------------------------------------------|
| SYS-ALM | A system alarm occurred.                                                    | SV TRK  | SV being tracked                              |
| STC-ALM | An STC alarm occurred.                                                      | PV TRK  | PV being tracked                              |
| ALARM-1 | A loop 1 process alarm occurred.                                            | OPEN    | (Internal) cascade open                       |
| ALARM-2 | A loop 2 process alarm occurred.                                            | CLOSE   | (Internal) cascade closed                     |
| CAS     | Remote operation being conducted in response to external setpoint input     | SV2-RMT | Loop 2's SV2 remote setting                   |
| SPC     | Remote operation being conducted in response to SV from a high-level device | SV2-LCL | Loop 2's SV2 local setting                    |
| DDC     | Remote operation being conducted in response to MV from a high-level device | SEL1    | Loop 1 side's selection status                |
| BUA     | Transition to backup auto status                                            | SEL2    | Loop 2 side's selection status                |
| BUM     | Transition to backup manual status                                          | SEL-EXT | External signal selection status              |
| EXT-MAN | Transition to manual control in response to external digital input          | STC-ON  | STC control operation being conducted         |
| EXT-AUT | Transition to automatic control in response to external digital input       | STC-DSP | PID setting target value is indicated by STC. |
| EXT-PMV | Preset MV being output in response to external digital input                | ATSTUP  | STC auto startup being conducted              |
| EXT-TRK | Output being tracked in response to external digital input                  |         |                                               |

► For causes of alarms that have occurred and actions to be taken: see "Troubleshooting" in this manual.

## Operating the LOOP Display

This section describes keystrokes for performing various settings and operations on the LOOP Display.

### (1) Switching the operation mode

-  M mode key: Switches the operation mode to manual control (M mode).
-  A mode key: Switches the operation mode to automatic control (A mode).
-  C mode key: Switches the operation mode to cascade setting automatic control (C mode).

Moreover, the LED inside the operation mode key corresponding to the current operation mode lights up.

### Note

If a cascade input signal is  $-6.3\%$  or less or  $106.3\%$  or more, the operation mode cannot be switched to C mode.

► For switching the operation mode: see "Switching of Operation Modes" in this manual.

### (2) SV setting operation

The SV setting key changes the setpoint (SV).

This key is enabled when the operation mode is in the A or M mode.

-  SV increase key: Increases an SV value.
-  SV decrease key: Decreases an SV value.

### (3) MV operation

The MV operation key is used to manually operate a manipulated output variable (MV). This key is enabled when the operation mode is in the M mode.

-  MV increase key: Increases an MV value.
-  MV decrease key: Decreases an MV value.

Moreover, pressing an MV operation key with the  (fast-change key/SHIFT key) held down accelerates the MV-value increase/decrease speed.

### (4) PF key functions

The PF key functions are different in the multi-function mode and the programmable mode.

#### Multi-function mode:

The PF key function is set on the Function Setting Display 3 (CONFIG 3). There are the following two parameter designations:

- (1) No function: The PF key does not function.
- (2) STC ON/OFF: The PF key switches STC operation ON/OFF.

If STC ON/OFF is specified, when STC is ON the LED inside the PF key lights up.

#### Programmable mode:

The PF key function is defined by user programs then used. The LED in the PF key can be turned ON/OFF by the user programs.

For cascade control, selector control, or dual-loop control, the loop 1 can be operated on the LOOP 1 Display, while the loop 2 can be operated on the LOOP 2 Display.

## Monitoring and Operating the METER Display

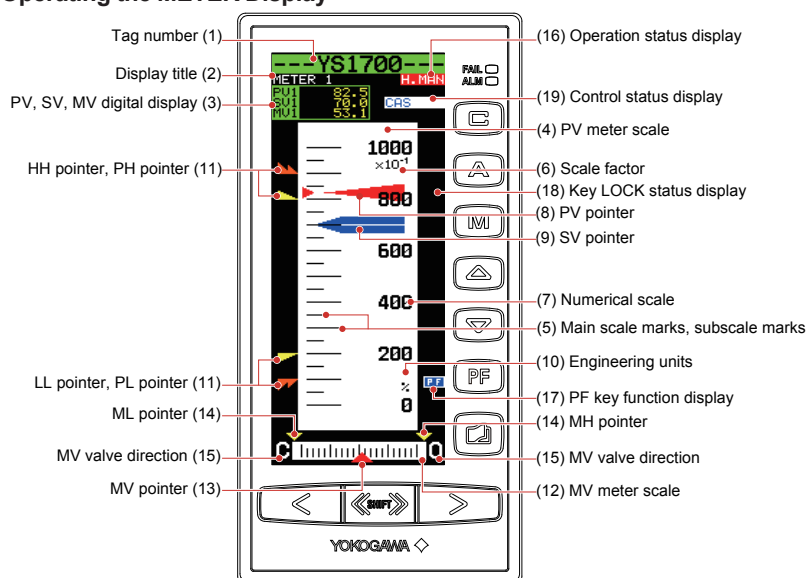


Figure 5.2

0502E.ai

Table 5.6

| No. in Figure | Name                             | Description                                                                                                                                                                                                                                                                                                               |
|---------------|----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (1)           | Tag number                       | As on the LOOP Display, a tag number appears here.                                                                                                                                                                                                                                                                        |
| (2)           | Display title                    | The title of the display being shown is indicated.                                                                                                                                                                                                                                                                        |
| (3)           | PV, SV, and MV digital display   | PV, SV, and MV digital values are displayed here.                                                                                                                                                                                                                                                                         |
| (4)           | PV meter scale                   | The PV meter scale displays main and subscale marks, a numerical scale, a scale factor, and engineering units.                                                                                                                                                                                                            |
| (5)           | Main scale marks, subscale marks | The main scale marks and subscale marks are determined by setting the variables to the 0% value of scale (SCL) and to the 100% value of scale (SCH), which causes the scale to be automatically divided into divisions based on those values.                                                                             |
| (6)           | Scale factor                     | The scale range is clearly represented in the range of the number of numerical scale digits using the power of 10 ( $\times 10^n$ ). It is possible to set the value of the power, however it can also be automatically determined from the 0% value of scale (SCL) and 100% value of scale (SCH).                        |
| (7)           | Numerical scale                  | The numerical scale is automatically determined from the 0% value of scale (SCL) and 100% value of scale (SCH), and is displayed centered and to the right of the main scale marks. The number of digits to be displayed is three (or four digits if there is no decimal point).                                          |
| (8)           | PV pointer                       | A PV value is indicated by two pointers (at the left and right sides of the scale). The pointer display moves up and down with a resolution of 0.5%.                                                                                                                                                                      |
| (9)           | SV pointer                       | An SV value is indicated with a pointer. The pointer display moves up and down with a resolution of 0.5%.                                                                                                                                                                                                                 |
| (10)          | Engineering units                | Engineering units (UNIT) are displayed in a maximum of seven digits.                                                                                                                                                                                                                                                      |
| (11)          | PH, PL, HH, and LL pointers      | PH values (high limit alarm setpoints for PV) and PL values (low limit alarm setpoints for PV) are indicated with triangular pointers, while HH values (high-high limit alarm setpoints for PV) and LL values (low-low limit alarm setpoints for PV) are indicated with pointers which are overlapped pairs of triangles. |
| (12)          | MV meter scale                   | Scale marks are displayed on the MV meter scale. The mark at the far left is the 0% position and the mark at the far right is the 100% position. Each scale division is 5%.                                                                                                                                               |
| (13)          | MV pointer                       | MV values are indicated with a pointer. Since the scale's full scale is 80 dots (100%), the MV pointer increases and decreases in a resolution of 1.25%.                                                                                                                                                                  |
| (14)          | MH and ML pointers               | MH values (high limit setpoints of MV) and ML values (low limit setpoints of MV) are indicated with triangular pointers.                                                                                                                                                                                                  |
| (15)          | MV valve direction               | The MV valve direction is displayed as [C] (closed) or [O] (open). The valve direction can be set.                                                                                                                                                                                                                        |



Table 5.7

| No. in Figure | Name                                 | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                        |
|---------------|--------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| (16)          | Operation status display             | The controller operation status is displayed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                        |
|               |                                      | Display                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Display Priority Order |
|               |                                      | [POWER DOWN]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Power down is being detected.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | (1)                    |
|               |                                      | [H.MAN]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Hard manual selector switch has been activated.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | (2)                    |
|               |                                      | (No indication)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | The instrument is operating.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | (3)                    |
|               |                                      | [STOP]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Operation stopped (such as while setting a function on the Engineering Display, etc.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                        |
|               |                                      | [TEST1]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Test run mode 1 (only in the programmable mode)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                        |
|               |                                      | [TEST2]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Test run mode 2 (only in the programmable mode)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                        |
|               | Simulation program is being executed |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                        |
| (17)          | PF key function display              | The  key function is displayed. The  key function display is different in the multi-function mode and the programmable mode.                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                        |
|               |                                      | 1) Multi-function mode<br>The  key function is set using the PF key function selection parameter [PFKEY]. When the STC mode selection is “not OFF” and the “  key has been set to STC”, the function display becomes [STC]. In other cases, nothing is displayed.<br>2) Programmable mode<br>The  key function can be defined in user programs. The function display becomes [PF] in the programmable mode. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                        |
| (18)          | Key LOCK status display              | The key LOCK status is displayed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                        |
|               |                                      | Display                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                        |
|               |                                      | [ALLK]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  ,  , and  keys, SV increase and decrease (  ,  ) keys, MV increase and decrease (  ,  ) keys, and  key are disabled. |                        |
|               |                                      | [MDLK]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  ,  , and  keys are disabled.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                        |
|               |                                      | [SVLK]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | SV increase and decrease (  ,  ) keys are disabled.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                        |
|               |                                      | [MVLK]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | MV increase and decrease (  ,  ) keys are disabled.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                        |
| (19)          | Control status display               | Control status is displayed in abbreviations. Control status display differs according to the controller mode in the multi-function mode; or according to the control module in the programmable mode. <a href="#">See Tables 5.8 to 5.10.</a>                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                        |

Table 5.8 Control Status Display in the YS1500/YS1700 Multi-function Mode

| Controller Mode                      | Single Loop                          | Cascade                     | Selector                       |
|--------------------------------------|--------------------------------------|-----------------------------|--------------------------------|
| Display Item                         |                                      |                             |                                |
| Control status display (Note 1)      | CAS<br>SPC, DDC<br>BUA, BUM          | CAS<br>SPC, DDC<br>BUA, BUM | CAS<br>SPC, DDC<br>BUA, BUM    |
| Control substatus display 1 (Note 2) | EXT-MAN, EXT-AUT<br>EXT-PMV, EXT-TRK | None                        | None                           |
| Control substatus display 2 (Note 3) | SV TRK, PV TRK                       | OPEN, CLOSE                 | SV2-RMT, SV2-LCL<br>SEL1, SEL2 |

Table 5.9 Control Status Display in the YS1700 Programmable Mode

| Control Module                       | Basic Control               | Cascade Control             | Selector Control                          | Dual-loop Control           |
|--------------------------------------|-----------------------------|-----------------------------|-------------------------------------------|-----------------------------|
| Display Item                         |                             |                             |                                           |                             |
| Control status display (Note 1)      | CAS<br>SPC, DDC<br>BUA, BUM | CAS<br>SPC, DDC<br>BUA, BUM | CAS<br>SPC, DDC<br>BUA, BUM               | CAS<br>SPC, DDC<br>BUA, BUM |
| Control substatus display 1 (Note 2) | None                        | None                        | None                                      | None                        |
| Control substatus display 2 (Note 3) | None                        | OPEN, CLOSE                 | SV2-RMT<br>SV2-LCL<br>SEL1, SEL2, SEL-EXT | None                        |

Note 1: Only when the operation mode is in cascade setting automatic control (C mode) is a control status displayed, while nothing is indicated in automatic control (A mode) or manual control (M mode).

Note 2: When each control substatus is generated, one item is displayed. Nothing is displayed when a status is not generated.

Note 3: One of the control substatus is always displayed.



Table 5.10 Meaning of Display Abbreviations

| Symbol  | Meaning                                                                     | Symbol  | Meaning                          |
|---------|-----------------------------------------------------------------------------|---------|----------------------------------|
| CAS     | Remote operation being conducted in response to external setpoint input     | SV TRK  | SV being tracked                 |
| SPC     | Remote operation being conducted in response to SV from a high-level device | PV TRK  | PV being tracked                 |
| DDC     | Remote operation being conducted in response to MV from a high-level device | OPEN    | (Internal) cascade open          |
| BUA     | Transition to backup auto status                                            | CLOSE   | (Internal) cascade closed        |
| BUM     | Transition to backup manual status                                          | SV2-RMT | Loop 2's SV2 remote setting      |
| EXT-MAN | Transition to manual control in response to external digital input          | SV2-LCL | Loop 2's SV2 local setting       |
| EXT-AUT | Transition to automatic control in response to external digital input       | SEL1    | Loop 1 side's selection status   |
| EXT-PMV | Preset MV being output in response to external digital input                | SEL2    | Loop 2 side's selection status   |
| EXT-TRK | Output being tracked in response to external digital input                  | SEL-EXT | External signal selection status |

► For causes of alarms that have occurred and actions to be taken: see "Troubleshooting" in this manual.

### Operating the METER Display

The following four operations can be conducted on the METER Display.

- (1) Operation mode switching operation
- (2) SV setting operation
- (3) MV operation
- (4)  key operation

The operations can be conducted in the loop 1 when the display title shows METER 1, and in the loop 2 when it shows METER 2. The operation methods are the same as those of the LOOP Display.

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### Monitoring and Operating the TREND Display

The TREND Display provides trend displays of PV, SV, MV, etc. in addition to the LOOP Display functions.

The TREND 1 Display can provide trend displays of PV1, SV1, and MV1; the TREND 2 Display can provide those of PV2, SV2, and MV2; and the TREND 3 Display can show those of any four data selected from PV1, PV2, SV1, SV2, MV1, MV2, X1, X2, X3, X4, X5, X6, X7, X8, Y1, Y2, Y3, and Y4. TREND Display also enables display data to be turned ON/OFF. It does not display control statuses and alarms that have occurred.

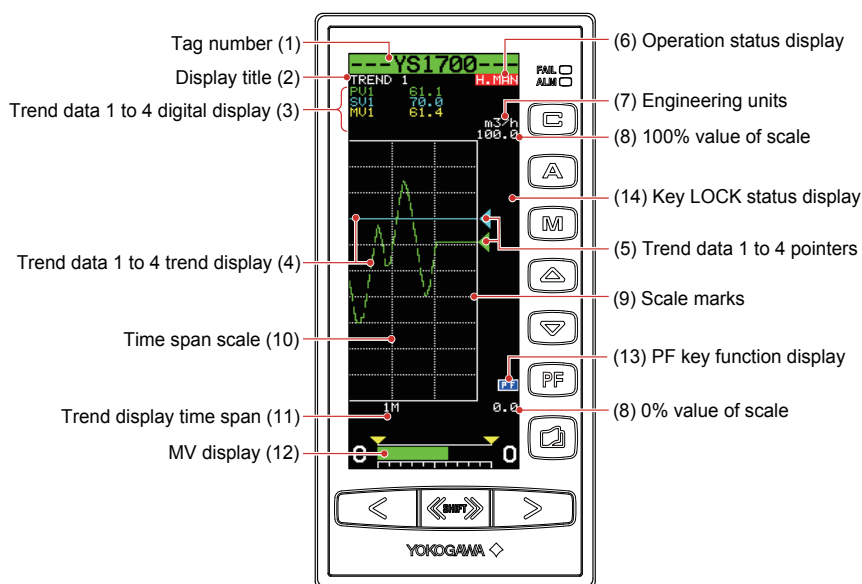


Figure 5.3

0503E.ai

Table 5.11

| No. in Figure   | Name                                                                                  | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |         |             |                        |              |                               |     |         |                                                 |     |                 |                              |     |        |                                                                                       |         |                                                 |         |                                                 |  |                                      |  |
|-----------------|---------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-------------|------------------------|--------------|-------------------------------|-----|---------|-------------------------------------------------|-----|-----------------|------------------------------|-----|--------|---------------------------------------------------------------------------------------|---------|-------------------------------------------------|---------|-------------------------------------------------|--|--------------------------------------|--|
| (1)             | Tag number                                                                            | A tag number combining alphanumeric characters and symbols having a maximum of 12 digits is displayed on a loop basis.<br>For TREND 3 Display, the tag number of the loop 1 is indicated.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |         |             |                        |              |                               |     |         |                                                 |     |                 |                              |     |        |                                                                                       |         |                                                 |         |                                                 |  |                                      |  |
| (2)             | Display title                                                                         | The title of the display being shown is indicated.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |         |             |                        |              |                               |     |         |                                                 |     |                 |                              |     |        |                                                                                       |         |                                                 |         |                                                 |  |                                      |  |
| (3)             | Digital display                                                                       | PV, SV, and MV digital values are displayed.<br>For TREND 3 Display, data selections 1 to 4 are indicated.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |         |             |                        |              |                               |     |         |                                                 |     |                 |                              |     |        |                                                                                       |         |                                                 |         |                                                 |  |                                      |  |
| (4)             | Trend display                                                                         | The time span of the set trend display is divided into 60 partitions, and PV, SV and MV values in the period of one time partition are displayed with the smallest and largest values of selected data in the vertical line of one element. Trend display is clipped and displayed at 0% if a relevant value is below 0% or at 100% if it exceeds 100%.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |         |             |                        |              |                               |     |         |                                                 |     |                 |                              |     |        |                                                                                       |         |                                                 |         |                                                 |  |                                      |  |
| (5)             | Trend data pointers                                                                   | PV, SV, and MV values and selected data are indicated with triangular pointers. The pointer display moves up and down with a resolution of 0.5%.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |         |             |                        |              |                               |     |         |                                                 |     |                 |                              |     |        |                                                                                       |         |                                                 |         |                                                 |  |                                      |  |
| (6)             | Operation status display                                                              | <p>The controller operation status is displayed.</p> <table border="1"> <thead> <tr> <th>Display</th><th>Description</th><th>Display Priority Order</th></tr> </thead> <tbody> <tr> <td>[POWER DOWN]</td><td>Power down is being detected.</td><td>(1)</td></tr> <tr> <td>[H.MAN]</td><td>Hard manual selector switch has been activated.</td><td>(2)</td></tr> <tr> <td>(No indication)</td><td>The instrument is operating.</td><td rowspan="4">(3)</td></tr> <tr> <td>[STOP]</td><td>Operation stopped (such as while setting a function on the Engineering Display, etc.)</td></tr> <tr> <td>[TEST1]</td><td>Test run mode 1 (only in the programmable mode)</td></tr> <tr> <td>[TEST2]</td><td>Test run mode 2 (only in the programmable mode)</td></tr> <tr> <td></td><td>Simulation program is being executed</td><td></td></tr> </tbody> </table> | Display | Description | Display Priority Order | [POWER DOWN] | Power down is being detected. | (1) | [H.MAN] | Hard manual selector switch has been activated. | (2) | (No indication) | The instrument is operating. | (3) | [STOP] | Operation stopped (such as while setting a function on the Engineering Display, etc.) | [TEST1] | Test run mode 1 (only in the programmable mode) | [TEST2] | Test run mode 2 (only in the programmable mode) |  | Simulation program is being executed |  |
| Display         | Description                                                                           | Display Priority Order                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |         |             |                        |              |                               |     |         |                                                 |     |                 |                              |     |        |                                                                                       |         |                                                 |         |                                                 |  |                                      |  |
| [POWER DOWN]    | Power down is being detected.                                                         | (1)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |         |             |                        |              |                               |     |         |                                                 |     |                 |                              |     |        |                                                                                       |         |                                                 |         |                                                 |  |                                      |  |
| [H.MAN]         | Hard manual selector switch has been activated.                                       | (2)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |         |             |                        |              |                               |     |         |                                                 |     |                 |                              |     |        |                                                                                       |         |                                                 |         |                                                 |  |                                      |  |
| (No indication) | The instrument is operating.                                                          | (3)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |         |             |                        |              |                               |     |         |                                                 |     |                 |                              |     |        |                                                                                       |         |                                                 |         |                                                 |  |                                      |  |
| [STOP]          | Operation stopped (such as while setting a function on the Engineering Display, etc.) |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |         |             |                        |              |                               |     |         |                                                 |     |                 |                              |     |        |                                                                                       |         |                                                 |         |                                                 |  |                                      |  |
| [TEST1]         | Test run mode 1 (only in the programmable mode)                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |         |             |                        |              |                               |     |         |                                                 |     |                 |                              |     |        |                                                                                       |         |                                                 |         |                                                 |  |                                      |  |
| [TEST2]         | Test run mode 2 (only in the programmable mode)                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |         |             |                        |              |                               |     |         |                                                 |     |                 |                              |     |        |                                                                                       |         |                                                 |         |                                                 |  |                                      |  |
|                 | Simulation program is being executed                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |         |             |                        |              |                               |     |         |                                                 |     |                 |                              |     |        |                                                                                       |         |                                                 |         |                                                 |  |                                      |  |
| (7)             | Engineering units                                                                     | Engineering units (UNIT) are displayed in a maximum of seven digits.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |         |             |                        |              |                               |     |         |                                                 |     |                 |                              |     |        |                                                                                       |         |                                                 |         |                                                 |  |                                      |  |
| (8)             | 0% value of scale, 100% value of scale                                                | The 0% value of scale (SCL) and the 100% value of scale (SCH) of PV and SV are displayed on a loop basis in digital values of five significant digits (seven digits including a sign and decimal point).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |         |             |                        |              |                               |     |         |                                                 |     |                 |                              |     |        |                                                                                       |         |                                                 |         |                                                 |  |                                      |  |
| (9)             | Scale marks                                                                           | A scale divided into a maximum of 10 divisions (10% segments) is displayed. Moreover, horizontal lines corresponding to the scale marks are indicated in dotted lines.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |         |             |                        |              |                               |     |         |                                                 |     |                 |                              |     |        |                                                                                       |         |                                                 |         |                                                 |  |                                      |  |

Table 5.12

Table 3-12

| No. in Figure | Name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |         |             |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |        |                                                                                                                                                                                                                                                                                  |        |                                                                                                                                                                                                                       |        |                                                                                                                                                                                                                         |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-------------|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (10)          | Time span scale                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | The time span scale (a vertical line) is displayed by a dotted line at the 60-line positions. If the scale marks are divided into 4 divisions or more, the time span scale is also displayed at the 30-line positions.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |         |             |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |        |                                                                                                                                                                                                                                                                                  |        |                                                                                                                                                                                                                       |        |                                                                                                                                                                                                                         |
| (11)          | Trend display time span                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | The trend display time span setpoint is displayed. The trend display span is 90 lines, but it represents the time span for 60 lines. Trend display is provided such that the 0-line position is the current time, while the 90-line position is the maximum past time. Changing the trend display time span causes data that has been displayed up to that time to be cleared.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |         |             |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |        |                                                                                                                                                                                                                                                                                  |        |                                                                                                                                                                                                                       |        |                                                                                                                                                                                                                         |
| (12)          | MV display                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | The MV bar, MV scale, MH pointer, ML pointer, MV underflow, MV overflow, and MV valve direction are displayed. The display contents are the same as those of the LOOP Display.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |         |             |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |        |                                                                                                                                                                                                                                                                                  |        |                                                                                                                                                                                                                       |        |                                                                                                                                                                                                                         |
| (13)          |  key function display                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <p>The  key function is displayed. The  key function display is different in the multi-function mode and the programmable mode.</p> <p>1) Multi-function mode</p> <p>The  key function is set using the PF key function selection parameter [PFKEY]. When the STC mode selection is “not OFF” and the “ key has been set to STC”, the function display becomes [STC]. In other cases, nothing is displayed.</p> <p>2) Programmable mode</p> <p>The  key function can be defined in user programs. The function display becomes [PF] in the programmable mode.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |         |             |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |        |                                                                                                                                                                                                                                                                                  |        |                                                                                                                                                                                                                       |        |                                                                                                                                                                                                                         |
| (14)          | Key LOCK status display                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <p>The key LOCK status is displayed.</p> <table><tr><th>Display</th><th>Description</th></tr><tr><td>[ALLK]</td><td>, , and  keys, SV increase and decrease (, ) keys, MV increase and decrease (, ) keys, and  key are disabled.</td></tr><tr><td>[MDLK]</td><td>, , and  keys are disabled.</td></tr><tr><td>[SVLK]</td><td>SV increase and decrease (, ) keys are disabled.</td></tr><tr><td>[MVLK]</td><td>MV increase and decrease (, ) keys are disabled.</td></tr></table> | Display | Description | [ALLK] |  ,  , and  keys, SV increase and decrease (  ,  ) keys, MV increase and decrease (  ,  ) keys, and  key are disabled. | [MDLK] |  ,  , and  keys are disabled. | [SVLK] | SV increase and decrease (  ,  ) keys are disabled. | [MVLK] | MV increase and decrease (  ,  ) keys are disabled. |
| Display       | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |         |             |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |        |                                                                                                                                                                                                                                                                                  |        |                                                                                                                                                                                                                       |        |                                                                                                                                                                                                                         |
| [ALLK]        |  ,  , and  keys, SV increase and decrease (  ,  ) keys, MV increase and decrease (  ,  ) keys, and  key are disabled. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |         |             |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |        |                                                                                                                                                                                                                                                                                  |        |                                                                                                                                                                                                                       |        |                                                                                                                                                                                                                         |
| [MDLK]        |  ,  , and  keys are disabled.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |         |             |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |        |                                                                                                                                                                                                                                                                                  |        |                                                                                                                                                                                                                       |        |                                                                                                                                                                                                                         |
| [SVLK]        | SV increase and decrease (  ,  ) keys are disabled.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |         |             |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |        |                                                                                                                                                                                                                                                                                  |        |                                                                                                                                                                                                                       |        |                                                                                                                                                                                                                         |
| [MVLK]        | MV increase and decrease (  ,  ) keys are disabled.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |         |             |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |        |                                                                                                                                                                                                                                                                                  |        |                                                                                                                                                                                                                       |        |                                                                                                                                                                                                                         |

## Operating the TREND Displays

The following operations can be conducted on the TREND 1 and TREND 2 Displays:

- (1) Operation mode switching of the loop displayed
- (2) SV setting operation of the loop displayed
- (3) MV operation of the loop displayed
- (4) PF key operation

The following operations can be conducted on the TREND 3 Display:

- (1) MV1 operation
- (2) PF key operation

The operation methods are the same as those of the LOOP Display.

The following table shows the contents displayed in trend data 1 to 4.

|              | TREND 1 Display | TREND 2 Display | TREND 3 Display               |
|--------------|-----------------|-----------------|-------------------------------|
| Trend data 1 | PV1             | PV2             | Set using the TRDS1 parameter |
| Trend data 2 | SV1             | SV2             | Set using the TRDS2 parameter |
| Trend data 3 | MV1 (Note)      | MV2 (Note)      | Set using the TRDS3 parameter |
| Trend data 4 | None            | None            | Set using the TRDS4 parameter |

Note: When the controller mode is set to the cascade/selector mode, MV will be displayed.

## Monitoring and Operating the ALARM Display

The ALARM Display collectively indicates detailed information when alarm(s) occurs. It allows the user to acknowledge unacknowledged alarms and events.

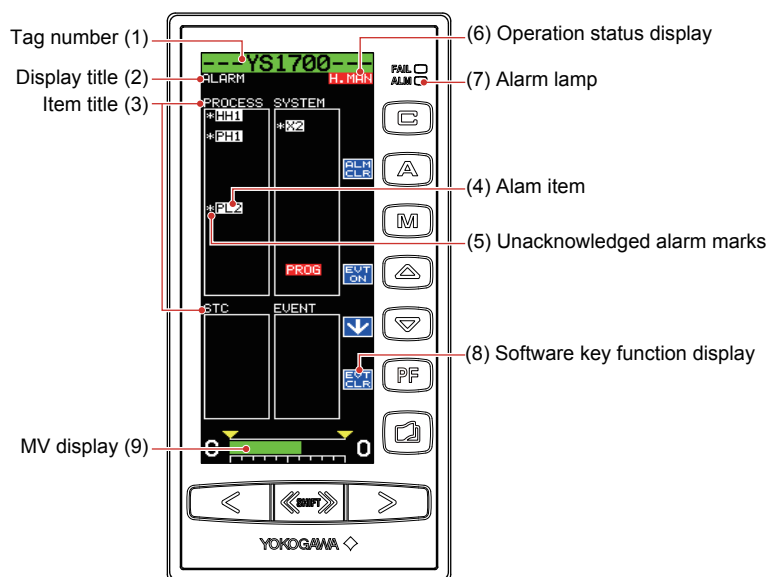


Figure 5.4

0504E.ai

Table 5.13

Table 6-10

| No. in Figure | Name                      | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                           |             |           |                |       |                      |          |                      |         |                     |       |                     |       |                           |       |                           |       |                         |       |                         |       |                   |       |                   |       |                    |       |                    |         |             |         |             |           |              |          |                      |         |          |         |          |         |          |         |          |         |                   |         |          |         |                           |         |          |
|---------------|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|-------------|-----------|----------------|-------|----------------------|----------|----------------------|---------|---------------------|-------|---------------------|-------|---------------------------|-------|---------------------------|-------|-------------------------|-------|-------------------------|-------|-------------------|-------|-------------------|-------|--------------------|-------|--------------------|---------|-------------|---------|-------------|-----------|--------------|----------|----------------------|---------|----------|---------|----------|---------|----------|---------|----------|---------|-------------------|---------|----------|---------|---------------------------|---------|----------|
| (1)           | Tag number                | The tag number of the loop 1 is displayed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                           |             |           |                |       |                      |          |                      |         |                     |       |                     |       |                           |       |                           |       |                         |       |                         |       |                   |       |                   |       |                    |       |                    |         |             |         |             |           |              |          |                      |         |          |         |          |         |          |         |          |         |                   |         |          |         |                           |         |          |
| (2)           | Display title             | The title of the display being shown is indicated.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                           |             |           |                |       |                      |          |                      |         |                     |       |                     |       |                           |       |                           |       |                         |       |                         |       |                   |       |                   |       |                    |       |                    |         |             |         |             |           |              |          |                      |         |          |         |          |         |          |         |          |         |                   |         |          |         |                           |         |          |
| (3)           | Item title                | <p>Alarms and events that have occurred or been generated are displayed on a type basis. They are classified into the following four types:</p> <table><tr><th>Display</th><th>Description</th></tr><tr><td>[PROCESS]</td><td>Process alarms</td></tr><tr><td>[STC]</td><td>STC alarms</td></tr><tr><td>[SYSTEM]</td><td>System alarms</td></tr><tr><td>[EVENT]</td><td>Event display</td></tr></table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Display                   | Description | [PROCESS] | Process alarms | [STC] | STC alarms           | [SYSTEM] | System alarms        | [EVENT] | Event display       |       |                     |       |                           |       |                           |       |                         |       |                         |       |                   |       |                   |       |                    |       |                    |         |             |         |             |           |              |          |                      |         |          |         |          |         |          |         |          |         |                   |         |          |         |                           |         |          |
| Display       | Description               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                           |             |           |                |       |                      |          |                      |         |                     |       |                     |       |                           |       |                           |       |                         |       |                         |       |                   |       |                   |       |                    |       |                    |         |             |         |             |           |              |          |                      |         |          |         |          |         |          |         |          |         |                   |         |          |         |                           |         |          |
| [PROCESS]     | Process alarms            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                           |             |           |                |       |                      |          |                      |         |                     |       |                     |       |                           |       |                           |       |                         |       |                         |       |                   |       |                   |       |                    |       |                    |         |             |         |             |           |              |          |                      |         |          |         |          |         |          |         |          |         |                   |         |          |         |                           |         |          |
| [STC]         | STC alarms                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                           |             |           |                |       |                      |          |                      |         |                     |       |                     |       |                           |       |                           |       |                         |       |                         |       |                   |       |                   |       |                    |       |                    |         |             |         |             |           |              |          |                      |         |          |         |          |         |          |         |          |         |                   |         |          |         |                           |         |          |
| [SYSTEM]      | System alarms             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                           |             |           |                |       |                      |          |                      |         |                     |       |                     |       |                           |       |                           |       |                         |       |                         |       |                   |       |                   |       |                    |       |                    |         |             |         |             |           |              |          |                      |         |          |         |          |         |          |         |          |         |                   |         |          |         |                           |         |          |
| [EVENT]       | Event display             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                           |             |           |                |       |                      |          |                      |         |                     |       |                     |       |                           |       |                           |       |                         |       |                         |       |                   |       |                   |       |                    |       |                    |         |             |         |             |           |              |          |                      |         |          |         |          |         |          |         |          |         |                   |         |          |         |                           |         |          |
| (4)           | Alarm item                | <p>There are two types of display formats for alarm items as follows:<br/>Red backlit display of items: An alarm(s) is currently being generated<br/>Normal display of items: Indicates that an alarm(s) was generated in the past, but the situation has now recovered<br/>▶ For causes of alarms that have occurred and actions to be taken: see “Troubleshooting” in this manual.</p> <p>The alarm items to be displayed are as follows:<br/>Process Alarms</p> <table><tr><th>Display</th><th>Description</th><th>Display</th><th>Description</th></tr><tr><td>[PH1]</td><td>PV1 high limit alarm</td><td>[PH2]</td><td>PV2 high limit alarm</td></tr><tr><td>[PL1]</td><td>PV1 low limit alarm</td><td>[PL2]</td><td>PV2 low limit alarm</td></tr><tr><td>[HH1]</td><td>PV1 high-high limit alarm</td><td>[HH2]</td><td>PV2 high-high limit alarm</td></tr><tr><td>[LL1]</td><td>PV1 low-low limit alarm</td><td>[LL2]</td><td>PV2 low-low limit alarm</td></tr><tr><td>[DL1]</td><td>Deviation 1 alarm</td><td>[DL2]</td><td>Deviation 2 alarm</td></tr><tr><td>[VL1]</td><td>PV1 velocity alarm</td><td>[VL2]</td><td>PV2 velocity alarm</td></tr></table> <p>STC Alarms</p> <table><tr><th>Display</th><th>Description</th><th>Display</th><th>Description</th></tr><tr><td>[SYS-ALM]</td><td>System alarm</td><td>[PWRDWN]</td><td>Power supply failure</td></tr><tr><td>[PVOVR]</td><td>PV alarm</td><td>[PBLMT]</td><td>PB alarm</td></tr><tr><td>[MVLMT]</td><td>MV alarm</td><td>[TILMT]</td><td>TI alarm</td></tr><tr><td>[OPERR]</td><td>Operation failure</td><td>[TDLMT]</td><td>TD alarm</td></tr><tr><td>[IDERR]</td><td>Identification impossible</td><td>[RTALM]</td><td>RT alarm</td></tr></table> | Display                   | Description | Display   | Description    | [PH1] | PV1 high limit alarm | [PH2]    | PV2 high limit alarm | [PL1]   | PV1 low limit alarm | [PL2] | PV2 low limit alarm | [HH1] | PV1 high-high limit alarm | [HH2] | PV2 high-high limit alarm | [LL1] | PV1 low-low limit alarm | [LL2] | PV2 low-low limit alarm | [DL1] | Deviation 1 alarm | [DL2] | Deviation 2 alarm | [VL1] | PV1 velocity alarm | [VL2] | PV2 velocity alarm | Display | Description | Display | Description | [SYS-ALM] | System alarm | [PWRDWN] | Power supply failure | [PVOVR] | PV alarm | [PBLMT] | PB alarm | [MVLMT] | MV alarm | [TILMT] | TI alarm | [OPERR] | Operation failure | [TDLMT] | TD alarm | [IDERR] | Identification impossible | [RTALM] | RT alarm |
| Display       | Description               | Display                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Description               |             |           |                |       |                      |          |                      |         |                     |       |                     |       |                           |       |                           |       |                         |       |                         |       |                   |       |                   |       |                    |       |                    |         |             |         |             |           |              |          |                      |         |          |         |          |         |          |         |          |         |                   |         |          |         |                           |         |          |
| [PH1]         | PV1 high limit alarm      | [PH2]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | PV2 high limit alarm      |             |           |                |       |                      |          |                      |         |                     |       |                     |       |                           |       |                           |       |                         |       |                         |       |                   |       |                   |       |                    |       |                    |         |             |         |             |           |              |          |                      |         |          |         |          |         |          |         |          |         |                   |         |          |         |                           |         |          |
| [PL1]         | PV1 low limit alarm       | [PL2]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | PV2 low limit alarm       |             |           |                |       |                      |          |                      |         |                     |       |                     |       |                           |       |                           |       |                         |       |                         |       |                   |       |                   |       |                    |       |                    |         |             |         |             |           |              |          |                      |         |          |         |          |         |          |         |          |         |                   |         |          |         |                           |         |          |
| [HH1]         | PV1 high-high limit alarm | [HH2]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | PV2 high-high limit alarm |             |           |                |       |                      |          |                      |         |                     |       |                     |       |                           |       |                           |       |                         |       |                         |       |                   |       |                   |       |                    |       |                    |         |             |         |             |           |              |          |                      |         |          |         |          |         |          |         |          |         |                   |         |          |         |                           |         |          |
| [LL1]         | PV1 low-low limit alarm   | [LL2]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | PV2 low-low limit alarm   |             |           |                |       |                      |          |                      |         |                     |       |                     |       |                           |       |                           |       |                         |       |                         |       |                   |       |                   |       |                    |       |                    |         |             |         |             |           |              |          |                      |         |          |         |          |         |          |         |          |         |                   |         |          |         |                           |         |          |
| [DL1]         | Deviation 1 alarm         | [DL2]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Deviation 2 alarm         |             |           |                |       |                      |          |                      |         |                     |       |                     |       |                           |       |                           |       |                         |       |                         |       |                   |       |                   |       |                    |       |                    |         |             |         |             |           |              |          |                      |         |          |         |          |         |          |         |          |         |                   |         |          |         |                           |         |          |
| [VL1]         | PV1 velocity alarm        | [VL2]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | PV2 velocity alarm        |             |           |                |       |                      |          |                      |         |                     |       |                     |       |                           |       |                           |       |                         |       |                         |       |                   |       |                   |       |                    |       |                    |         |             |         |             |           |              |          |                      |         |          |         |          |         |          |         |          |         |                   |         |          |         |                           |         |          |
| Display       | Description               | Display                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Description               |             |           |                |       |                      |          |                      |         |                     |       |                     |       |                           |       |                           |       |                         |       |                         |       |                   |       |                   |       |                    |       |                    |         |             |         |             |           |              |          |                      |         |          |         |          |         |          |         |          |         |                   |         |          |         |                           |         |          |
| [SYS-ALM]     | System alarm              | [PWRDWN]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Power supply failure      |             |           |                |       |                      |          |                      |         |                     |       |                     |       |                           |       |                           |       |                         |       |                         |       |                   |       |                   |       |                    |       |                    |         |             |         |             |           |              |          |                      |         |          |         |          |         |          |         |          |         |                   |         |          |         |                           |         |          |
| [PVOVR]       | PV alarm                  | [PBLMT]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | PB alarm                  |             |           |                |       |                      |          |                      |         |                     |       |                     |       |                           |       |                           |       |                         |       |                         |       |                   |       |                   |       |                    |       |                    |         |             |         |             |           |              |          |                      |         |          |         |          |         |          |         |          |         |                   |         |          |         |                           |         |          |
| [MVLMT]       | MV alarm                  | [TILMT]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | TI alarm                  |             |           |                |       |                      |          |                      |         |                     |       |                     |       |                           |       |                           |       |                         |       |                         |       |                   |       |                   |       |                    |       |                    |         |             |         |             |           |              |          |                      |         |          |         |          |         |          |         |          |         |                   |         |          |         |                           |         |          |
| [OPERR]       | Operation failure         | [TDLMT]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | TD alarm                  |             |           |                |       |                      |          |                      |         |                     |       |                     |       |                           |       |                           |       |                         |       |                         |       |                   |       |                   |       |                    |       |                    |         |             |         |             |           |              |          |                      |         |          |         |          |         |          |         |          |         |                   |         |          |         |                           |         |          |
| [IDERR]       | Identification impossible | [RTALM]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | RT alarm                  |             |           |                |       |                      |          |                      |         |                     |       |                     |       |                           |       |                           |       |                         |       |                         |       |                   |       |                   |       |                    |       |                    |         |             |         |             |           |              |          |                      |         |          |         |          |         |          |         |          |         |                   |         |          |         |                           |         |          |

Table 5.14

| No. in Figure | Name                          | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                        |                        |
|---------------|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|------------------------|
| (4)           | Alarm item                    | System Alarms                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                        |                        |
|               |                               | Display                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Description                                                                                            |                        |
|               |                               | [X1] to [X8]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Input overrange Register names X1 to X8 that have been allocated to each input terminal are displayed. |                        |
|               |                               | [Y1] and [Y3]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Output open (current output only) Register names Y1 and Y3 are displayed.                              |                        |
|               |                               | [CALC]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Computation overflow (only in the YS1700 programmable mode)                                            |                        |
|               |                               | [OVER]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Exceeding of control period (only in the YS1700 programmable mode)                                     |                        |
|               |                               | [COMM]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | RS-485 communication error, DCS-LCS communication error, or peer-to-peer communication error           |                        |
|               |                               | [ETHER]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Ethernet communication error                                                                           |                        |
|               |                               | [PTOP]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Peer-to-peer communication error                                                                       |                        |
|               |                               | [PROG]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | User program error                                                                                     |                        |
|               |                               | [DATA]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | YSS1000 writing incomplete                                                                             |                        |
|               |                               | [CALR]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Adjustment inspection error                                                                            |                        |
|               |                               | Event indication                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                        |                        |
|               |                               | Display                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Description                                                                                            |                        |
|               |                               | [EVENT1] to [EVENT5]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | User-set events 1 to 5                                                                                 |                        |
| (5)           | Unacknowledged alarm marks    | For unacknowledged alarms, [*] is indicated in front of alarm items.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                        |                        |
| (6)           | Operation status display      | The controller operation status is displayed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                        |                        |
|               |                               | Display                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Description                                                                                            | Display Priority Order |
|               |                               | [POWER DOWN]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Power down is being detected.                                                                          | (1)                    |
|               |                               | [H.MAN]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Hard manual selector switch has been activated.                                                        | (2)                    |
|               |                               | (No indication)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | The instrument is operating.                                                                           | (3)                    |
|               |                               | [STOP]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Operation stopped (such as while setting a function on the Engineering Display, etc.)                  |                        |
|               |                               | [TEST1]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Test run mode 1 (only in the programmable mode)                                                        |                        |
|               |                               | [TEST2]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Test run mode 2 (only in the programmable mode)                                                        |                        |
|               |                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Simulation program is being executed                                                                   |                        |
| (7)           | Alarm lamp                    | Lights up if a process alarm, STC alarm, or system alarm occurs.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                        |                        |
| (8)           | Software key function display | Indicates that the [ALM CLR] software key is allocated to the  key, the [EVT ON] software key to the  key, the [↓] software key to the  key, and the [EVT CLR] software key to the  key.<br>▶ For operation: see the following “Operating the ALARM Display.” |                                                                                                        |                        |
| (9)           | MV display                    | MV bar, MV scale, MH pointer, ML pointer, MV underflow, MV overflow, and MV valve direction are displayed. The display contents are the same as those of the LOOP Display.                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                        |                        |

### Operating the ALARM Display

The following operations can be conducted on the ALARM Display:

- (1) MV operation (the same as that of the LOOP Display)
- (2) Acknowledgement of unacknowledged alarms/events
- (3) Re-display of event indication

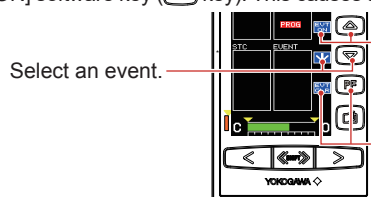
#### • Acknowledging unacknowledged alarms/events

The Alarm [ALM CLR] software key is used to acknowledge that an alarm has occurred. When this key is pressed, the "\*" mark that indicates that the alarm concerned has not yet been acknowledged, and that indicates currently not occurring alarms will be erased, implying that the alarm(s) has been acknowledged.

The Event [EVT CLR] software key is used to acknowledge an event. When this key is pressed, the "\*" mark that indicates that the event concerned has not yet been acknowledged, and that indicates events currently not generated will be erased, implying that the event(s) has been acknowledged.

#### • Re-displaying event indication

Browse through the event lines using the [↓] software key ( key) to select an event you wish to see and then press the [EVT ON] software key ( key). This causes the event to be re-displayed.



Select a generated event using the [↓] software key ( key) then press the [EVT ON] software key ( key). This causes the generated event status (\*) to be displayed.

Press the [EVT CLR] software key ( key), and then clears the selected generated event status (\*).

Figure 5.5

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## Monitoring and Operating the DUAL Display

The DUAL Display has two display titles: DUAL1 and DUAL2.

Information concerning PV, SV, and MV are displayed simultaneously for both loops. The loop 1 information is shown on the left, and the loop 2 information is displayed on the right.

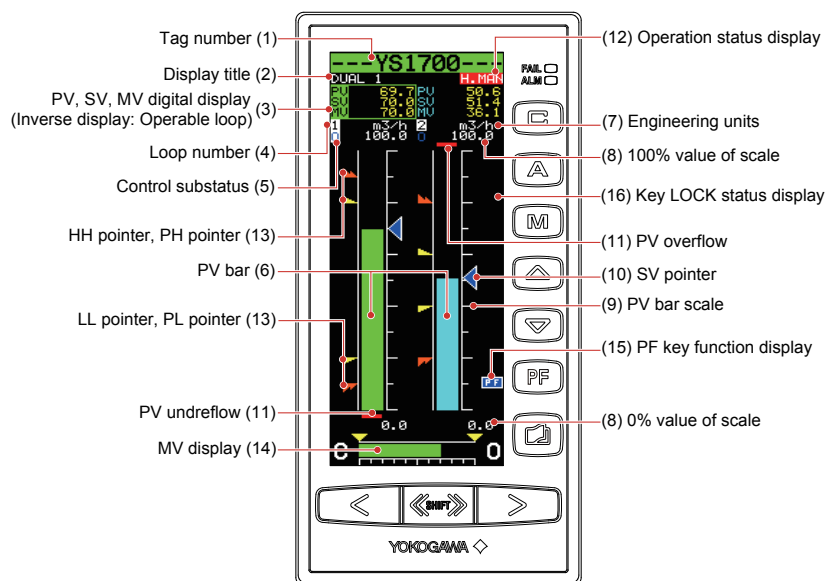


Figure 5.6

0506E.ai

Table 5.15

| No. in Figure | Name                                   | Description                                                                                                                                                                                                                                                                                |
|---------------|----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (1)           | Tag number                             | The tag number of the loop 1 appears for DUAL1 Display, while that of the loop 2 appears for DUAL2 Display.                                                                                                                                                                                |
| (2)           | Display title                          | The title of the display being shown is indicated.                                                                                                                                                                                                                                         |
| (3)           | PV, SV, and MV digital display         | PV, SV, and MV digital values of the loop 1 are displayed at the left and those of the loop 2 at the right. The loop that is inverse displayed can be operated.                                                                                                                            |
| (4)           | Loop number                            | Loop numbers "1" (left) and "2" (right) are displayed.                                                                                                                                                                                                                                     |
| (5)           | Control substatus                      | Control substatus is inverse displayed in one character below the loop number. The substatus display shown in Table 5.17 is indicated depending on controller mode in the multi-function mode or a control module in the programmable mode. Nothing is indicated in cases other than this. |
| (6)           | PV bar                                 | PV1 (left) and PV2 (right) are displayed in bars. The bar display is in 200 dots at full scale (100%) and increases or decreases on a dot (0.5%) basis.                                                                                                                                    |
| (7)           | Engineering units                      | Engineering unit 1 (left) and engineering unit 2 (right) are displayed in a maximum of seven digits.                                                                                                                                                                                       |
| (8)           | 0% value of scale, 100% value of scale | SCL1, SCH1 (left), SCL2, and SCH2 (right) are displayed in engineering units in digital values of five significant digits (seven digits including a sign and decimal point).                                                                                                               |
| (9)           | PV bar scale                           | The PV bar scale is displayed divided into a maximum of 10 divisions (10% segments).                                                                                                                                                                                                       |
| (10)          | SV pointer                             | SV1 (left) and SV2 (right) are indicated with triangular pointers. The pointer display moves up and down with a resolution of 0.5%.                                                                                                                                                        |
| (11)          | PV underflow, PV overflow              | PV underflow (PV1 at the left, PV2 at the right) is displayed if a PV value is below 0%, while PV overflow (PV1 at the left, PV2 at the right) is displayed if it exceeds 100%.                                                                                                            |
| (12)          | Operation status display               | The controller operation status is displayed.                                                                                                                                                                                                                                              |
|               |                                        |                                                                                                                                                                                                                                                                                            |
|               |                                        |                                                                                                                                                                                                                                                                                            |
|               |                                        |                                                                                                                                                                                                                                                                                            |
|               |                                        |                                                                                                                                                                                                                                                                                            |
|               |                                        |                                                                                                                                                                                                                                                                                            |
|               |                                        |                                                                                                                                                                                                                                                                                            |
| (13)          | PH, PL, HH, and LL pointers            |                                                                                                                                                                                                                                                                                            |
|               |                                        |                                                                                                                                                                                                                                                                                            |
|               |                                        |                                                                                                                                                                                                                                                                                            |
|               |                                        |                                                                                                                                                                                                                                                                                            |
|               |                                        |                                                                                                                                                                                                                                                                                            |
|               |                                        |                                                                                                                                                                                                                                                                                            |
|               |                                        |                                                                                                                                                                                                                                                                                            |

Table 5.16

Table 3-10

| No. in Figure | Name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |         |             |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |        |                                                                                                                                                                                                                                                                                  |        |                                                                                                                                                                                                                       |        |                                                                                                                                                                                                                       |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-------------|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (14)          | MV display                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | The MV bar, MV scale, MH pointer, ML pointer, MV underflow, MV overflow, and MV valve direction are displayed. The display contents are the same as those of the LOOP Display.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |         |             |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |        |                                                                                                                                                                                                                                                                                  |        |                                                                                                                                                                                                                       |        |                                                                                                                                                                                                                       |
| (15)          |  key function display                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <p>The  key function is displayed. The  key function display is different in the multi-function mode and the programmable mode.</p> <p>1) Multi-function mode<br/>The  key function is set using the PF key function selection parameter [PFKEY]. When the STC mode selection is “not OFF” and the “ key has been set to STC”, the function display becomes [STC]. In other cases, nothing is displayed.</p> <p>2) Programmable mode<br/>The  key function can be defined in user programs. The function display becomes [PF] in the programmable mode.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |         |             |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |        |                                                                                                                                                                                                                                                                                  |        |                                                                                                                                                                                                                       |        |                                                                                                                                                                                                                       |
| (16)          | Key LOCK status display                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <p>The key LOCK status is displayed.</p> <table><tr><th>Display</th><th>Description</th></tr><tr><td>[ALLK]</td><td>, , and  keys, SV increase and decrease (, ) keys, MV increase and decrease (, ) keys, and  key are disabled.</td></tr><tr><td>[MDLK]</td><td>, , and  keys are disabled.</td></tr><tr><td>[SVLK]</td><td>SV increase and decrease (, ) keys are disabled.</td></tr><tr><td>[MVLK]</td><td>MV increase and decrease (, ) keys are disabled.</td></tr></table> | Display | Description | [ALLK] |  ,  , and  keys, SV increase and decrease (  ,  ) keys, MV increase and decrease (  ,  ) keys, and  key are disabled. | [MDLK] |  ,  , and  keys are disabled. | [SVLK] | SV increase and decrease (  ,  ) keys are disabled. | [MVLK] | MV increase and decrease (  ,  ) keys are disabled. |
| Display       | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |         |             |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |        |                                                                                                                                                                                                                                                                                  |        |                                                                                                                                                                                                                       |        |                                                                                                                                                                                                                       |
| [ALLK]        |  ,  , and  keys, SV increase and decrease (  ,  ) keys, MV increase and decrease (  ,  ) keys, and  key are disabled. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |         |             |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |        |                                                                                                                                                                                                                                                                                  |        |                                                                                                                                                                                                                       |        |                                                                                                                                                                                                                       |
| [MDLK]        |  ,  , and  keys are disabled.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |         |             |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |        |                                                                                                                                                                                                                                                                                  |        |                                                                                                                                                                                                                       |        |                                                                                                                                                                                                                       |
| [SVLK]        | SV increase and decrease (  ,  ) keys are disabled.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |         |             |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |        |                                                                                                                                                                                                                                                                                  |        |                                                                                                                                                                                                                       |        |                                                                                                                                                                                                                       |
| [MVLK]        | MV increase and decrease (  ,  ) keys are disabled.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |         |             |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |        |                                                                                                                                                                                                                                                                                  |        |                                                                                                                                                                                                                       |        |                                                                                                                                                                                                                       |

Table 5.17

| Controller Mode or Control Module | Control Substatus Display in DUAL Display | Description                               | Control Substatus Display in LOOP Display                                                |
|-----------------------------------|-------------------------------------------|-------------------------------------------|------------------------------------------------------------------------------------------|
| Cascade or CSC control module     | O                                         | The cascade is open.                      | OPEN                                                                                     |
| Selector or SSC control module    | S                                         | The corresponding loop has been selected. | SEL1 (where “S” is displayed in the loop1) or SEL2 (where “S” is displayed in the loop2) |
|                                   | E                                         | An external signal has been selected.     | EXT (in the programmable mode)                                                           |

► Control module: YSS1000 Setting Software/YS1700 Programmable Function User's Manual

### Operating the DUAL Display

The following four operations can be conducted on the DUAL Display:

- (1) Operation mode switching operation
- (2) SV setting operation
- (3) MV operation
- (4)  key operation

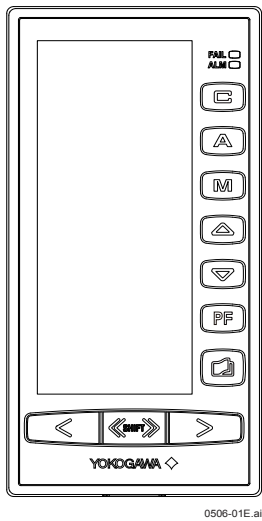
The operation methods are the same as those of the LOOP Display.

When the display title is DUAL1, the loop 1 can be operated; when it is DUAL2, the loop 2 can be operated. To make the operable loop easy to identify, the color of the backlit tag number, PV bar, and MV bar on the operable loop are displayed in the same color (selected loop color).



Switching of Operation Modes (Automatic Control (A), Manual Control (M), or Cascade Setting Automatic Control (C))

Switching by Keystroke



The operation mode can be switched by pressing the relevant key in the table below. This causes the light inside the key corresponding to the selected operation mode to light up. Note that on the ALARM Display, the operation mode cannot be switched.

| Key | Name       | Function                                                                                                                                                                                                             |
|-----|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     | M mode key | Press this key to change to manual operation.<br>It is not possible to change from manual control to cascade setting automatic control. To change to cascade setting automatic control, do so via automatic control. |
|     | A mode key | Press this key to change to automatic control.                                                                                                                                                                       |
|     | C mode key | Press this key to change to automatic control to set a value from an external analog signal or communication as a cascade setting.<br>(The C mode key is disabled when shipped from the factory.)                    |

Note

If the operation mode switching function is allocated to digital input, there may be cases where the operation mode cannot be switched by keystrokes. In such cases, check the allocation of the digital input function.

Operation mode transition in the figure below represents the single-loop mode with analog input-based cascade setting. If cascade setting is not used, it is only possible to switch between automatic control and manual control.

► For operation mode transition: see 1.1, Selecting the Controller Mode (CTL), in the YS1500 Indicating Controller/YS1700 Programmable Indicating Controller User's Manual.

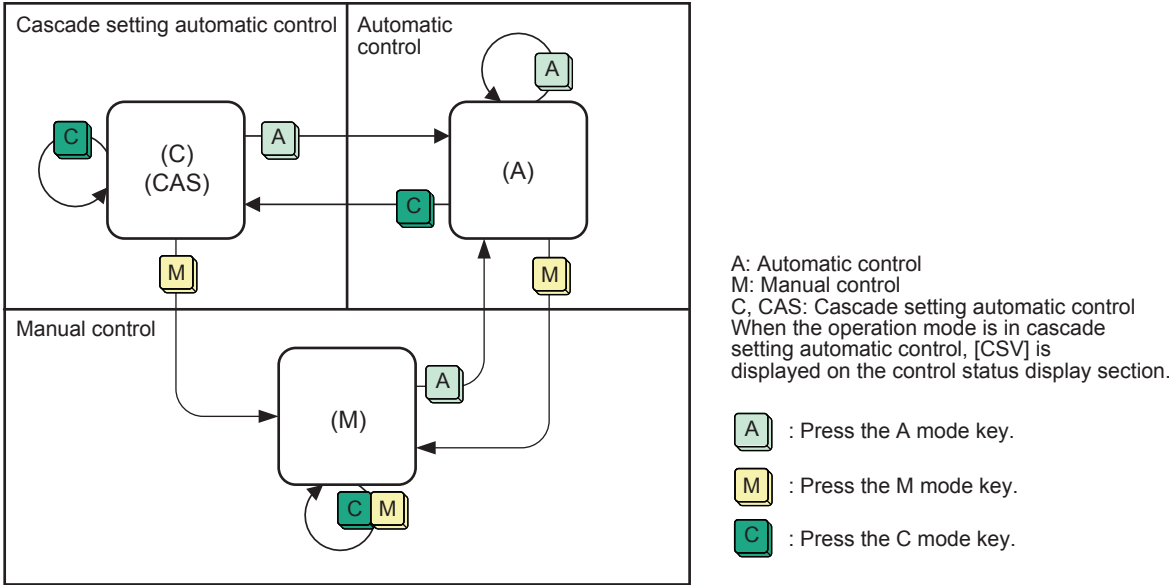


Figure 5.7

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### Switching in Response to Digital Input

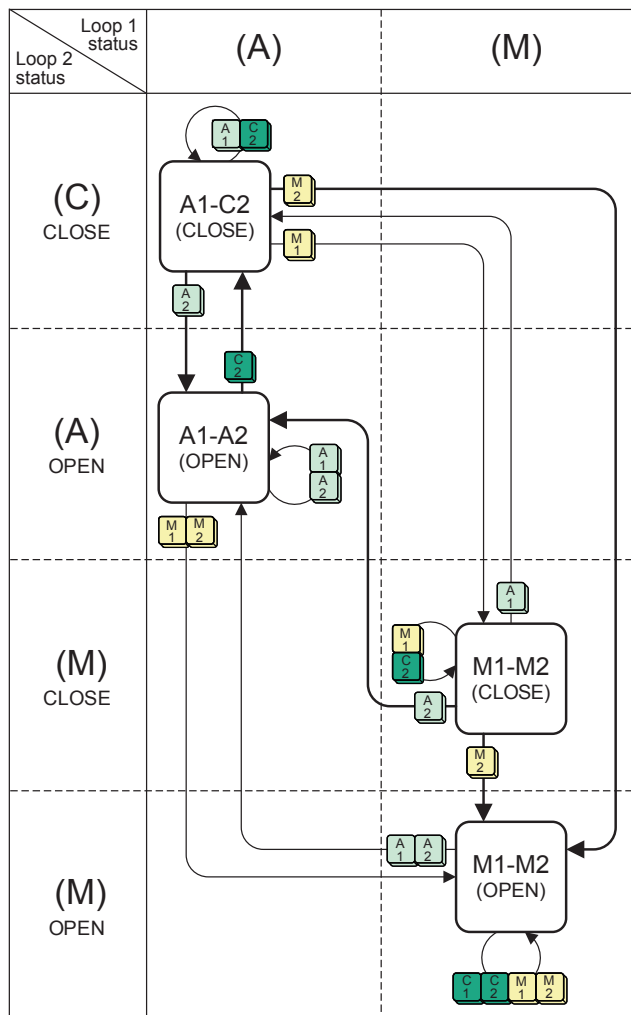
No function is allocated to digital input when shipped from the factory. To switch the operation mode in response to digital input, the operation mode switching function needs to be allocated to digital input.

► For digital input function assignment: see Chapter 3, Auxiliary Input and Output Functions, in the YS1500 Indicating Controller/YS1700 Programmable Indicating Controller User's Manual.

Operation mode transition in the figure below represents the cascade and selector modes. There is no cascade setting based on analog input.

► For operation mode transition: see 1.1, Selecting the Controller Mode (CTL), in the YS1500 Indicating Controller/YS1700 Programmable Indicating Controller User's Manual.

Cascade mode (no cascade setting based on analog input)



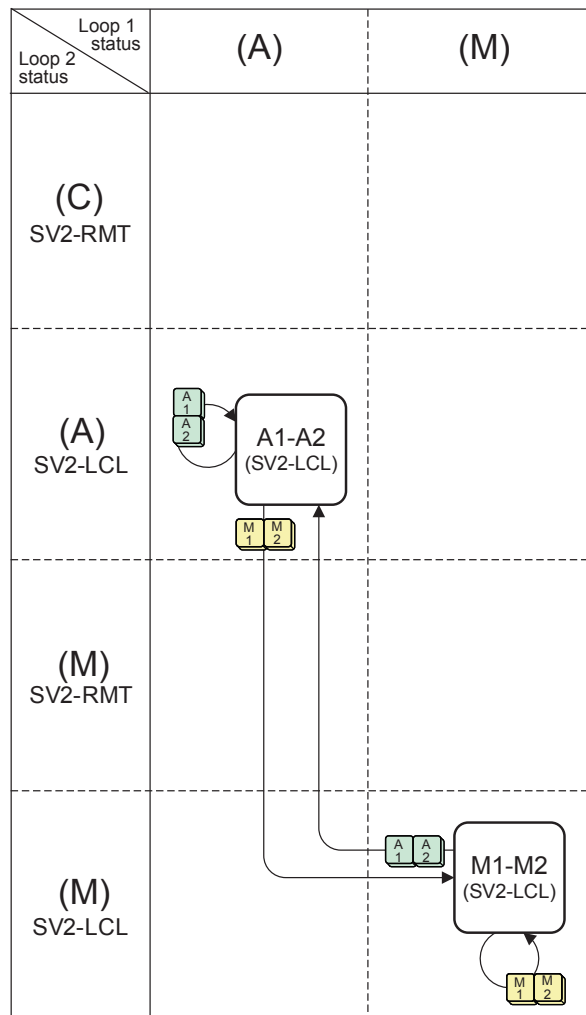
\* Pressing the C mode key in the loop 1 does not change the operation mode.

\* The heavy lines indicate that the open/closed status has changed.

A1-C2  
(CLOSE)

An: Automatic control, Mn: Manual control,  
Cn: (Internal) Cascade control (n: "1" stands for  
loop 1 and "2" indicates loop 2.)  
CLOSE/OPEN: Cascade closed/cascade open  
This is displayed on the control status display section.

Selector mode (no cascade setting based on analog input)



\* Pressing the C mode key in the loop 1 or loop 2 does not change the operation mode.

A1-A2  
(SV2-LCL)

An: Automatic control, Mn: Manual control  
(n: "1" stands for loop 1 and "2" indicates  
loop 2.)  
SV2-LCL: Loop2 is in local.  
This is displayed on the control  
status display section.



: Press the M mode key in the loop 1 (the number represents the relevant loop)



: Press the A mode key in the loop 2 (the number represents the relevant loop)

Figure 5.8

0508E.ai

# Operating the Tuning Displays

There are displays for setting and displaying control parameters such as PID, etc. and a display for monitoring input/output signals. To set tuning parameters proceed according to the setting examples below, and refer to “Overview of Display Switching and Operation Keys” and “List of Parameters”.

- ▶ For displaying and setting parameters: see “List of Parameters” in this manual.
- ▶ For a description of tuning parameter functions: see YS1500 Indicating Controller/YS1700 Programmable Indicating Controller User's Manual .

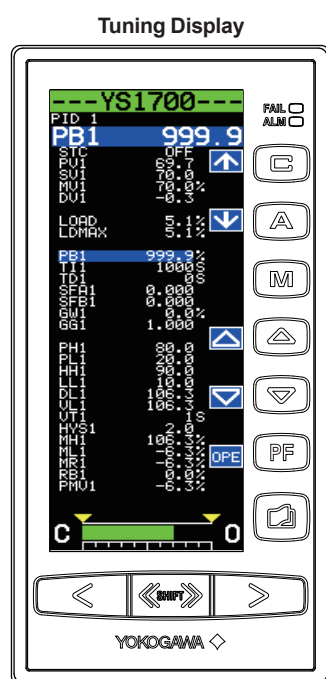
## Note

YS1000 has a password function as a security function. If the password has been set up, enter it and then change parameters.

- ▶ For setting and canceling passwords: see 4.2.2, Inhibiting/Enabling Parameter Change, in the YS1500 Indicating Controller/YS1700 Programmable Indicating Controller User's Manual.

## Setting PID

### Setting Display



Operation Display > [SHIFT] + [PAGE] keys (to the Tuning Menu Display) > [PID1] software key (PID Setting Display 1) or [PID2] software key (PID Setting Display 2)

**Setpoint changing procedure** (example of changing proportional band 1):

- (1) Press the [↓] software key to select and zoom in on proportional band 1 [PB1 999.9%].
- (2) Press the [△] or [▽] software key to change the setpoint. Holding it down accelerates the value increase/decrease speed.
- (3) Press the Page key to return to the Tuning Menu Display.
- (4) Press the SHIFT + Page keys twice to return to the Operation Display.

This completes the setting procedure.

### Setting Details

| Parameters | Names             | Setting Range            | Factory Default |
|------------|-------------------|--------------------------|-----------------|
| PB1, PB2   | Proportional band | 0.1 to 999.9 (%)         | 999.9           |
| TI1, TI2   | Integral time     | 1 to 9999 (s)            | 1000            |
| TD1, TD2   | Derivative time   | 0 to 9999 (0: no action) | 0               |

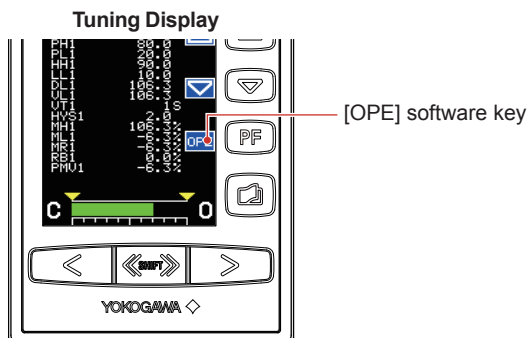
### Description

The PB2, TI2, and TD2 parameters are used in the loop 2 in the cascade mode, selector mode, and programmable mode.

- ▶ For proportional band, integral time, and derivative time: see “Tuning Guide” in this manual.

## Displaying the Operation Display While the Tuning Display is being Shown

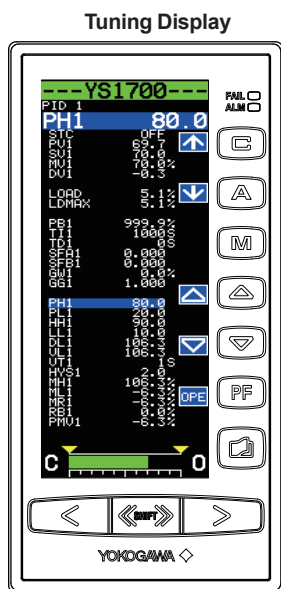
Pressing the [OPE] software key while setting a tuning parameter returns you to the Operation Display.



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## Setting Alarms

### Setting Display



0603E.ai

Operation Display > [SHIFT] + [PF] keys (to the Tuning Menu Display) > [PID1] software key (PID Setting Display 1) or [PID2] software key (PID Setting Display 2)

**Setpoint changing procedure** (example of changing high limit alarm setpoint for PV1)

- (1) Press the [↓] software key to select and zoom in on high limit alarm setpoint for PV1 [PH1 106.3].
- (2) Press the [△] or [▽] software key to change the setpoint. Holding it down accelerates the value increase/decrease speed.
- (3) Press the Page key to return to the Tuning Menu Display.
- (4) Press the SHIFT + Page keys twice to return to the Operation Display.

This completes the setting procedure.

### Setting Details

| Parameters | Names                                 | Setting Range                                       | Factory Default |
|------------|---------------------------------------|-----------------------------------------------------|-----------------|
| PH1, PH2   | High limit alarm setpoint for PV      | Engineering units equivalent to -6.3 to 106.3% (*1) | 106.3           |
| PL1, PL2   | Low limit alarm setpoint for PV       | Engineering units equivalent to -6.3 to 106.3% (*1) | -6.3            |
| HH1, HH2   | High-high limit alarm setpoint for PV | Engineering units equivalent to -6.3 to 106.3% (*1) | 106.3           |
| LL1, LL2   | Low-low limit alarm setpoint for PV   | Engineering units equivalent to -6.3 to 106.3% (*1) | -6.3            |
| DL1, DL2   | Deviation alarm setpoint              | Engineering units equivalent to 0.0 to 106.3% (*1)  | 0.0             |
| VL1, VL2   | PV velocity alarm setpoint            | Engineering units equivalent to 0.0 to 106.3% (*1)  | 0.0             |
| VT1, VT2   | PV velocity alarm time setpoint       | 1 to 9999                                           | 1               |
| HYS1, HYS2 | Alarm hysteresis                      | Engineering units equivalent to 0.0 to 20.0% (*1)   | 2.0             |

\*1 Engineering unit set using the engineering parameters SCH1, SCL1, and SCDP1 (or SCH2, SCL2, and SCDP2).

## Description

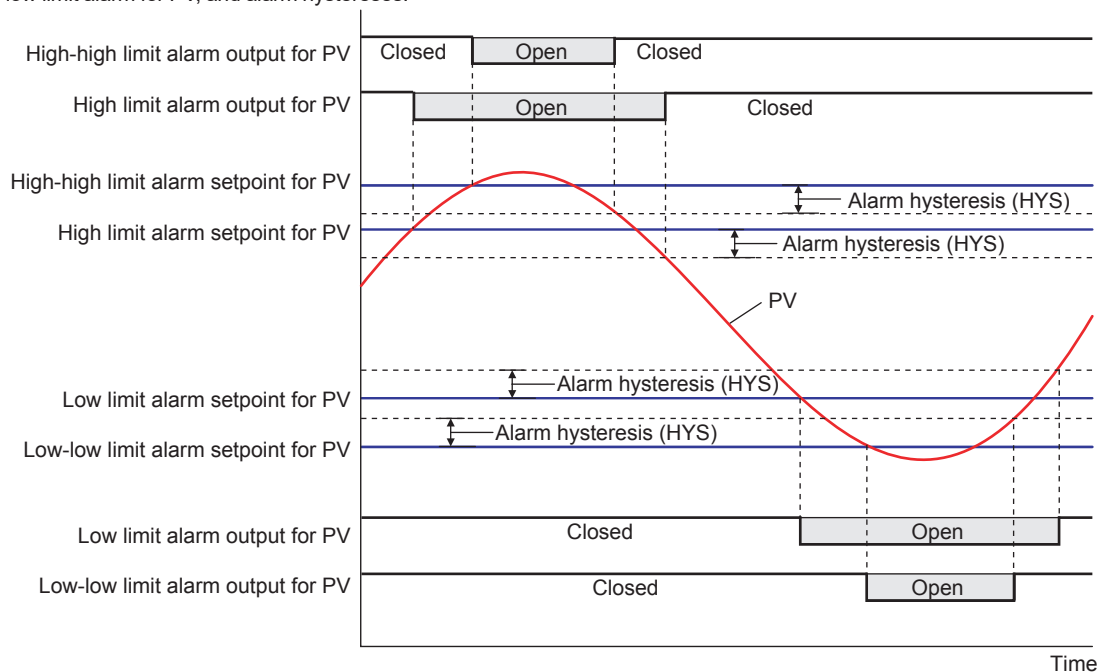
The PH2, PL2, HH2, LL2, DL2, VL2, and VT2 parameters are used in the loop 2 in the cascade mode, selector mode, and programmable mode.

If the high limit alarm setpoint for PV and the high-high limit alarm setpoint for PV are set to the maximum values, no alarm is generated.

If the low limit alarm setpoint for PV and the low-low limit alarm setpoint for PV are set to the minimum values, no alarm is generated.

Alarm hysteresis HYS1 acts on PH1, PL1, HH1, LL1, and DL1 collectively, while alarm hysteresis HYS2 acts on PH2, PL2, HH2, LL2, and DL2 collectively.

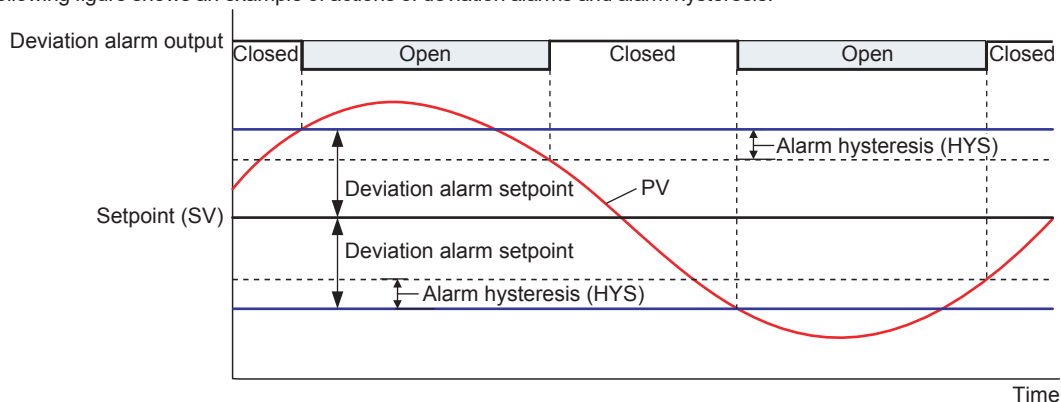
The following figure shows an example of actions of the high limit alarm for PV, high-high limit alarm for PV, low limit alarm for PV, low-low limit alarm for PV, and alarm hystereses.



For an example in the figure above, the contact type is such that the contact opens if an event occurs (factory default).

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The following figure shows an example of actions of deviation alarms and alarm hysteresis.

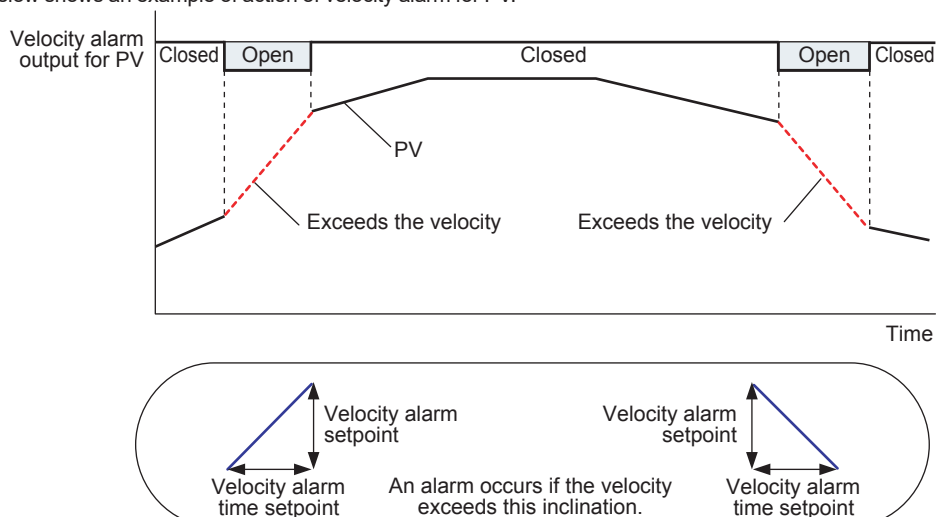


For an example in the figure above, the contact type is such that the contact opens if an event occurs (factory default).

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The value of alarm hysteresis is common to the high limit alarm for PV, high-high limit alarm for PV, low limit alarm for PV, low-low limit alarm for PV, and the deviation alarm.

The figure below shows an example of action of velocity alarm for PV.



For an example in the figure above, the contact type is such that the contact opens if an event occurs (factory default).

0606E.ai

The following table shows the sections to refer to for descriptions of the main functions. Consult them as they also describe functions other than those noted below.

These references are located in the [YS1500 Indicating Controller/YS1700 Programmable Indicating Controller User's Manual](#).

| Function                            | Reference Location                                                                               |
|-------------------------------------|--------------------------------------------------------------------------------------------------|
| Alarm function                      | 3.1.5, Changing Digital Output Functions                                                         |
| Output limiter                      | 1.2.3, Stopping Integral Action to Conduct Control with Less Overshoot (Output Limiter)          |
| Preset MV                           | 2.4, Using Preset MV                                                                             |
| Adjustable setpoint filter function | 1.2.6, Performing Stable Control for the Step Response of Setpoints (Adjustable Setpoint Filter) |
| Input filter                        | 2.1.1, Input Filter (First-order Lag Computation)                                                |
| Square root extraction              | 2.1.2, Square Root Extraction (Low Cutoff Adjustable)                                            |
| Line segment                        | 2.1.3, 10-segment Linearizer Function                                                            |
| Ratio                               | 2.1.4, Ratio Operation                                                                           |

# Operating the Engineering Displays

There is a display for setting up functions as a controller, a display for setting and displaying various registers and tables, the Input Specification Setting Display, and the Password Setting Display. To set engineering parameter settings, proceed according to the setting examples below, and refer to the "Overview of Display Switching and Operation Keys" and "List of Parameters."

- ▶ For displaying and setting parameters: see "List of Parameters" in this manual.
- ▶ For a description of engineering parameter functions: see YS1500 Indicating Controller/ YS1700 Programmable Indicating Controller User's Manual.

## CAUTION

There is a SET parameter in the engineering parameters to prevent accidental changes to settings. Unless this parameter setting is changed from INHB (setting inhibited) to ENBL (setting enabled), parameters on the same display cannot be changed. Be aware that changing the setting to ENBL causes YS1000's control action and input/output to be changed. The YS1000 enters manual operation and control stopped status, causing [STOP] to appear at the upper right of the display. The setpoints, manipulated output variables, analog output values, analog output registers, PF status, PF status registers, temporary storage registers, output registers, and digital output registers retain the values they had immediately prior to STOP. Dynamic computation (computation with a device number), such as first-order lag and dead time, will be initialized. For user program data, see the YSS1000 Setting Software/YS1700 Programmable Indicating Controller User's Manual.

## Note

YS1000 has a password function as a security function. If the password has been set up, enter it and then change parameters.

- ▶ For setting and canceling passwords: see 4.2.2, Inhibiting/Enabling Parameter Change, in the YS1500 Indicating Controller/YS1700 Programmable Indicating Controller User's Manual.

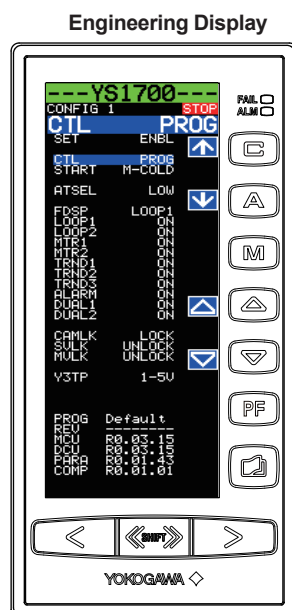
## Note

In the programmable mode, there are three displays for the engineering menu. The menu display is switched each time the Page key is pressed.

## Setting the Controller Mode

## Note

Changing the controller mode causes various parameters to be initialized. For more information, see List of Parameters (p.64). To change the controller mode, press and hold the [△] or [▽] software key for more than 5 seconds.



Operation Display > [SHIFT] + [C] keys (to the Tuning Menu Display) > [SHIFT] + [C] keys (to the Engineering Menu Display) > [CONFIG1] software key (Configuration Display 1)

## Setpoint changing procedure:

- (1) Press the [↓] software key to select and zoom in on [SET INHB].
- (2) Press the [△] software key to change to [SET ENBL].
- (3) Press the [↓] software key to select and zoom in on controller mode selection [CTL SINGLE].
- (4) Press and hold the [△] or [▽] software key for more than 5 seconds to change the setpoint.
- (5) Press the Page key to return to the Engineering Menu Display. (The SET parameter returns to setting inhibited [SET INHB] at the instant when you are brought to the menu display.)
- (6) Press the SHIFT + Page keys to return to the Operation Display.

This completes the setting procedure.

## Setting Details

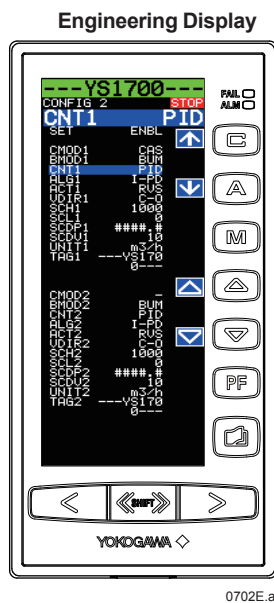
| Parameters | Names                     | Setting Range                                                          | Factory Default    |
|------------|---------------------------|------------------------------------------------------------------------|--------------------|
| CTL        | Controller mode selection | PROG: Programmable mode (*1)                                           | For YS1700: PROG   |
|            |                           | SINGLE: Single-loop mode<br>CAS: Cascade mode<br>SELECT: Selector mode | For YS1500: SINGLE |

\*1: Only selectable for YS1700

- ▶ For programmable mode: see YSS1000 Setting Software/YS1700 Programmable Function User's Manual.
- ▶ For single-loop mode, cascade mode, and selector mode: see 1.1, Selecting the Controller Mode, in the YS1500 Indicating Controller/YS1700 Programmable Indicating Controller User's Manual.

## Setting the Control Type and Control Operation Formula

## Setting Display



Operation Display >  +  keys (to the Tuning Menu Display) >  +  keys (to the Engineering Menu Display) > [**CONFIG2**] software key (Configuration Display 2)

**Setpoint changing procedure** (example of changing control type):

- (1) Press the  software key to select and zoom in on [SET INHB].
- (2) Press the  software key to change to [SET ENBL].
- (3) Press the  software key to select and zoom in on control type 1 [CNT1 PID].
- (4) Press the  or  software key to change the setpoint.
- (5) Press the Page key to return to the Engineering Menu Display.
- (6) Press the SHIFT + Page keys to return to the Operation Display.

A control operation formula can also be changed in the same way as above. This completes the setting procedure.

### Setting Details

| Parameters | Names                     | Setting Range                                                                                                                   | Factory Default |
|------------|---------------------------|---------------------------------------------------------------------------------------------------------------------------------|-----------------|
| CNT1, CNT2 | Control type              | PID: Standard PID control<br>S-PI: Sample-and-hold PI control<br>BATCH: Batch PID control (*1)<br>PD: Proportional (PD) control | PID             |
| ALG1, ALG2 | Control operation formula | I-PD: PV proportional type PID<br>PI-D: PV derivative type PID<br>SVF: Adjustable setpoint filter                               | I-PD            |

\*1: Only selectable for YS1700

### Description

The CNT2 and ALG2 parameters are used in the loop 2 in the cascade mode, selector mode, and programmable mode.

|                            | Single-loop Mode | Cascade Mode |        | Selector Mode |        |
|----------------------------|------------------|--------------|--------|---------------|--------|
|                            |                  | Loop 1       | Loop 2 | Loop 1        | Loop 2 |
| Standard PID control       | ✓                | ✓            | ✓      | ✓             | ✓      |
| Proportional(PD)control    | ✓                | —            | —      | —             | —      |
| Sample-and-hold PI control | ✓                | ✓            | ✓      | —             | —      |
| Batch PID control          | ✓                | —            | —      | —             | —      |

Legend      ✓: Available, —: Not available

- ▶ For standard PID control, proportional control, sample-and-hold PI control, and batch PID control: see 1.2, Selecting the Control Method (Selecting Control Type CNT and Control Operation Formula ALG, in the YS1500 Indicating Controller/YS1700 Programmable Indicating Controller User's Manual.



## Engineering Display



**Setpoint changing procedure** (example of changing scale):

- Change the loop 2 in the same way as above as necessary.  
This completes the setting procedure.

| Parameters   | Names                  | Setting Range                                  | Factory Default |
|--------------|------------------------|------------------------------------------------|-----------------|
| SCH1, SCH2   | 100% value of scale    | −80000 to 80000                                | 1000            |
| SCL1, SCL2   | 0% value of scale      | −80000 to 80000                                | 0               |
| SCDP1, SCDP2 | Decimal point position | #####, #####. #, #####. ##, ###. ###, #. ##### | #####. #        |

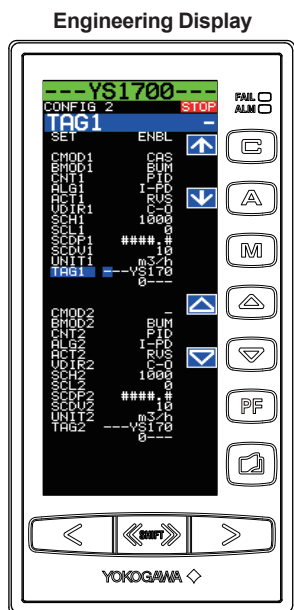
The SCH2, SCL2, and SCDP2 parameters are used in the loop 2 in the cascade mode, selector mode, and programmable mode. The figure below shows an example of setting the 100% value of scale to 1000, the 0% value of scale to 0, and the decimal point position to one decimal place (####.#). Process variables and setpoints are displayed on the scale that is set here.



Note: If a wide scale span (100% to 0% value of scale) is specified, the value less than 0.1% of PV may fluctuate.

## Registering a Tag and Units

### Setting Display



Operation Display > [SHIFT] + [F4] keys (to the Tuning Menu Display) > [SHIFT] + [F4] keys (to the Engineering Menu Display) > [CONFIG2] software key (Configuration Display 2)

**Setpoint changing procedure** (example of setting a tag):

- (1) Press the [↓] software key to select and zoom in on [SET INHB].
- (2) Press the [△] software key to change to [SET ENBL].
- (3) Press the [↓] software key to select and zoom in on tag number 1 [TAG1 ---YS1700---].
- (4) Press the [↓] or [↑] software key to move the cursor over the position where the tag is registered.
- (5) Press the [△] or [▽] software key to change the character (setting is made on a character basis).
- (6) Repeat steps (4) and (5) to register the tag.  
(To erase a character, enter a space.)
- (7) Press the Page key to return to the Engineering Menu Display.
- (8) Press the SHIFT + Page keys to return to the Operation Display.

This completes the setting procedure.

### Setting Details

| Parameters          | Names             | Setting Range                        | Factory Default                                      |
|---------------------|-------------------|--------------------------------------|------------------------------------------------------|
| <b>TAG1, TAG2</b>   | Tag number        | 12 digits of alphanumeric characters | For YS1700: ---YS1700---<br>For YS1500: ---YS1500--- |
| <b>UNIT1, UNIT2</b> | Engineering units | 7 digits of alphanumeric characters  | %                                                    |

### Description

The TAG2 and UNIT2 parameters are used in the loop 2 in the cascade mode, selector mode, and programmable mode.  
The tag is displayed in the top line of the LCD.  
The settable ASCII codes are as shown below:

|       |   |   |   |    |   |   |   |   |   |   |   |   |   |
|-------|---|---|---|----|---|---|---|---|---|---|---|---|---|
| Space | ! | " | # | \$ | % | & | ' | ( | ) | * | + | , | - |
| .     | / | 0 | 1 | 2  | 3 | 4 | 5 | 6 | 7 | 8 | 9 | : | = |
| >     | ? | @ | A | B  | C | D | E | F | G | H | I | J | K |
| M     | N | O | P | Q  | R | S | T | U | V | W | X | Y | Z |
| ¥     | ] | ^ | _ | `  | a | b | c | d | e | f | g | h | i |
| k     | l | m | n | o  | p | q | r | s | t | u | v | w | x |
| z     | { |   | } | ~  |   |   |   |   |   |   |   |   | y |

# Tuning Guide

This chapter describes how to activate the control functions and perform tuning for novice users.

## Starting Operations by Manual Operation

The following describes how to start operations, using an example of simple PID control.

### (1) Manual operation using the MV operation keys

1. Press the **[M]** mode key to switch the operation mode to the M mode. This causes the LED indicator inside the **[M]** mode key to light up.
2. Press the **[▲]** or **[▼]** key of an SV setting key, to set the SV value.
3. Press the **[<]** or **[>]** key of an MV operation key, to adjust the output signal.

Pressing an MV operation key with the **[SHIFT]** (fast-change key/SHIFT key) held down accelerates the MV-value increase/decrease speed.

While confirming that a smooth response is obtained by manual operation, balance the PV value with the SV value or a point in its vicinity.

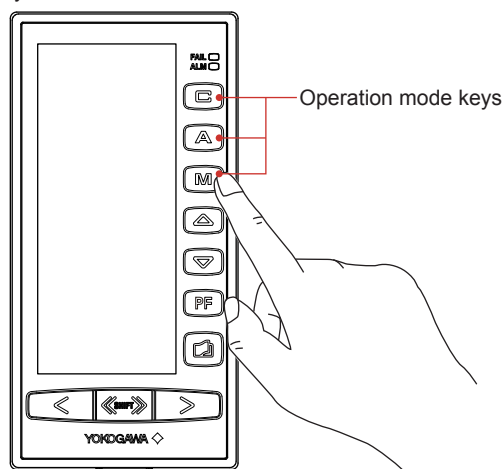


Figure 8.1 Switching the Operation Mode

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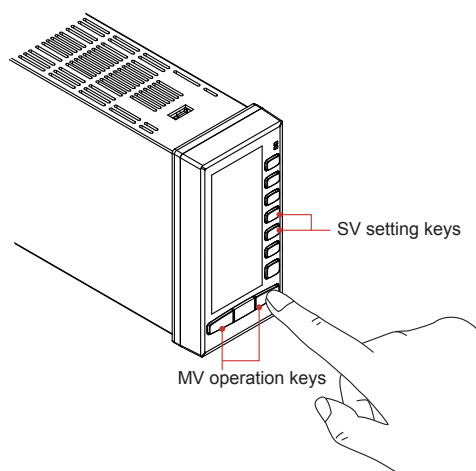


Figure 8.2 Manual Output Operation

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### (2) Switching from manual operation to automatic operation

Press the **[A]** mode key in condition 3. in item (1) to switch the operation mode to automatic control (A). This causes the LED indicator inside the **[A]** mode key to light up, activating automatic operation. Operation changes to automatic operation in a bumpless(\*) manner, not requiring balance operation at switching.

\* Bumpless: This feature has the effect of preventing rapid output changes when automatic operation is started from an output value obtained during manual operation.

### (3) Alarm check

If the ALM lamp on the front panel is lit, there is some kind of signal abnormality. In this case, check for an alarm item on the ALARM Display to determine the cause of the abnormality and take appropriate actions.

If the FAIL lamp is lit, an abnormality has occurred in the instrument.

► For causes of alarms that have occurred and actions to be taken: see "Troubleshooting" in this manual.

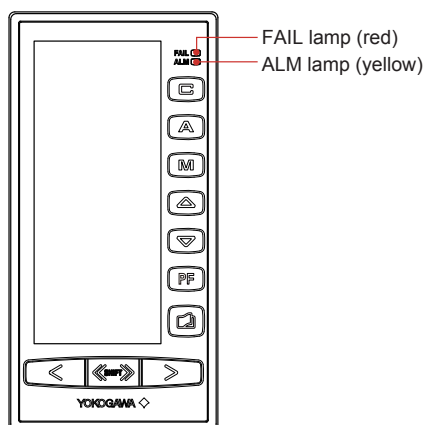


Figure 8.3 ALM Lamp and FAIL Lamp

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## PID Parameter Tuning Guide and Automatic Adjustment

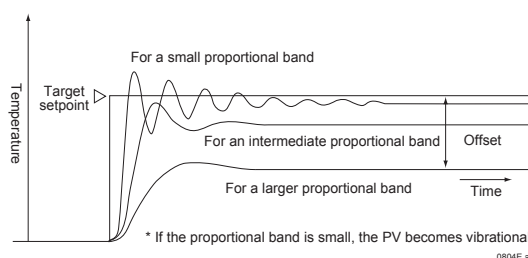
If the indicating controller is used for an unknown process, it is important to examine the conditions carefully in which the controller is operated by manual adjustment because they are useful in determining the proportional band (PBn), integral time (Tn), and derivative time (TDn) when entering automatic adjustment. ( $n = 1, 2$ )

For example, if the process variable (PV) changes significantly when the controller's manipulated output variable (MV) is simply changed slightly, the proportional band (PBn) needs to be widened as a safety provision. In a case where the opposite conditions prevail, the proportional band needs to be narrowed.

Moreover, for processes wherein the time required to follow a change in the controller's output is short, the integral time and derivative time must also be made short. For processes in which recovery time is long, these times need to be made longer.

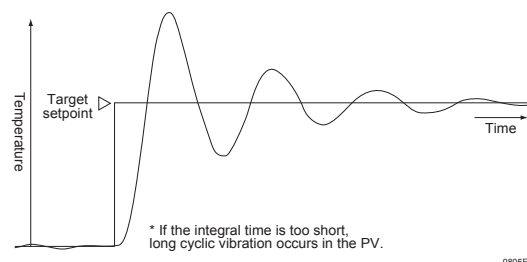
### (1) "Proportional + integral" controllers

1. Set the operation mode to manual control (M mode) and match the process variable with the setpoint by manual operation. Set the integral time to 9999 seconds, the proportional band to a sufficiently large value, and the derivative time to 0 seconds.
2. Change the operation mode to automatic control (A mode).
3. Conduct the following operations to obtain the optimum value for the proportional band.



- Lower the proportional band from a sufficiently large value to a smaller value (for example, from 100% to 50% to 20%). In this case, provide sufficient time to observe the control conditions at each stage. Continue this process until the control loop's continuation vibration (cycling) starts. Then measure the proportional band value (PBu) and cycling interval (Pu) at this point. (Cycling is a phenomenon caused because the proportional band has been made narrower than the process's maximum value. It can be identified by the fact that the process variable indication regularly vibrates centering around the point set.) A value approximately 2.2 times the proportional band at which cycling occurs is the maximum proportional band (2.2 PBu).

- Next, the cycling period is measured. A value about 0.83 times the vibration cycle is the integral time to be obtained (0.83 Pu). In general, even if the integral time is significantly reduced, the time taken to balance to the setpoint merely becomes shorter, not changing the operation conditions significantly. However, if it is lowered below a certain critical value determined by the process's delay characteristics, cycling occurs after all. This is due to the integral time having been lowered too excessively. In this case, increase the integral time gradually until cycling stops.



### (2) "Proportional + integral + derivative" controllers

1. Set the operation mode to manual control (M mode) and match a process variable with the setpoint by manual operation. Set the integral time to 9999 seconds, the proportional band to a sufficiently large value, and the derivative time to 0 seconds.
2. Change the operation mode to automatic control (A mode).
3. Change the proportional band as outlined in the case of the "proportional + integral" controllers in item (1) to look for the point at which cycling just starts to occur. Measure the proportional band (PBu) value and the cycling period (Pu) at this point.
4. The optimum setpoints are determined as follows:  
Proportional band = 1.7 PBu  
Integral time: 0.5 Pu  
Derivative time: 0.125 Pu

The method described above is known as the Ziegler Nichols limitation sensitivity method, which allows response characteristics to be obtained in which vibration attenuation is about 25%. Apart from this, various adjustment methods have been proposed, including the step response method. Refer to the technical books of automatic control as necessary.

# Installation and Wiring

For the following, see the YS1000 Series Replacement Manual.

- Installation and wiring for YS1500/YS1700-□2□, -□3□, -□4□, and -□5□
- Connection of the RJC sensor provided with the product with optional code /A02

## Installation Location



### WARNING

For products with optional code /FM or /CSA:

- 1) Devices must be installed by professionally trained personnel.
- 2) In case of option code /FM, install devices according to NEC (National Electrical Code: ANSI/NFPA-70).  
In case of option code /CSA, all wiring shall comply with Canadian Electrical Code Part I and local electrical codes.

The instrument should be installed in indoor locations meeting the following conditions:

- **Instrumented panel**  
This instrument is designed to be mounted in an instrumented panel. Mount the instrument in a location where its terminals will not inadvertently be touched.
- **Well ventilated locations**  
Mount the instrument in well ventilated locations to prevent the instrument's internal temperature from rising. To mount multiple indicating controllers, see the external dimensions/panel cutout dimensions which follow. If mounting other instruments adjacent to the instrument, comply with these panel cutout dimensions to provide sufficient clearance between the instruments.
- **Locations with little mechanical vibration**  
Install the instrument in a location subject to little mechanical vibration.
- **Horizontal location**  
Mount the instrument horizontally and ensure that it is level, with no inclination to the right or left.

### Note

If the instrument is moved from a location with low temperature and low humidity to a place with high temperature and high humidity, or if the temperature changes rapidly, condensation will result. Moreover, in the case of thermocouple inputs, measurement errors will result. To avoid such a situation, leave the instrument in the new environment under ambient conditions for more than 1 hour prior to using it.

Do not mount the instrument in the following locations:

- **Outdoors**
- **Locations subject to direct sunlight or close to a heater**  
Install the instrument in a location with stable temperatures that remain close to an average temperature of 23°C. Do not mount it in locations subject to direct sunlight or close to a heater. Doing so adversely affects the internal unit.
- **Locations with substantial amounts of oily fumes, steam, dust, or corrosive gases**  
The presence of oily fumes, steam, dust, or corrosive gases adversely affects the instrument. Do not mount the instrument in locations subject to any of these substances.
- **Areas near electromagnetic field generating sources**  
Do not place magnets or tools that generate magnetism near the instrument. If the instrument is used in locations close to a strong electromagnetic field generating source, the magnetic field may cause measurement errors.
- **Locations where the display is difficult to see**  
The instrument uses an LCD for the display unit, and this can be difficult to see from extremely oblique angles. Mount the instrument in a location where it can be seen as much as possible from the front.
- **Areas close to flammable articles**  
Absolutely do not place the instrument directly on flammable surfaces. If such a circumstance is unavoidable and the instrument must be placed close to a flammable item, provide a shield for it made of 1.43 mm thick plated steel or 1.6 mm thick unplated steel with a space of at least 150 mm between it and the instrument on the top, bottom and sides.
- **Areas subject to being splashed with water**

## Mounting Method

### Mounting the Instrument Main Unit

Provide an instrumented panel steel sheet of 2.3 to 25 mm thickness.

#### (1) For mounting single unit

1. Using a screwdriver, loosen the screws of the two provided metal clamps in advance.
2. Insert the main unit of the instrument from the front side of the instrumented panel.
3. Install one of the metal clamps on top of the main unit and tighten the screw into the rear face of the panel. Repeat the procedure with the second clamp at the bottom of the unit.

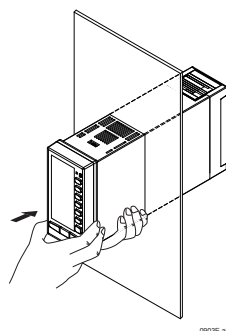


Figure 9.1

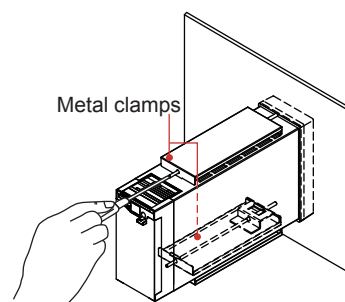


Figure 9.2

To remove the instrument from the panel, reverse the above procedure.

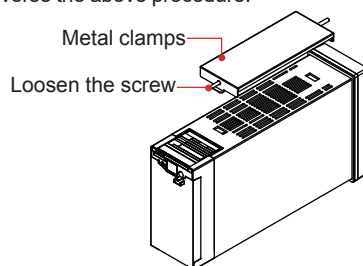


Figure 9.3

- Tighten the screws with appropriate tightening torque within 0.3 - 0.6N•m. Otherwise it may cause the case deformation or the bracket damage.
- Ensure that neither tools nor foreign matter enter the inside of the instrument through the holes for fitting the metal clamps.
- Mounting attitude: Up to 75 degrees above the horizontal. No downward tilting allowed.

#### (2) For mounting units side-by-side

1. According to the arrangement order, mount the other main units side by side in the panel, keeping them in close contact with each other.
2. Mount the individual controllers as above in item (1).

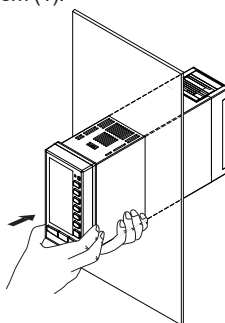


Figure 9.4

Installing an Expandable I/O Terminal

The expandable I/O terminal is of the wall-mounted or DIN rail mounted type.

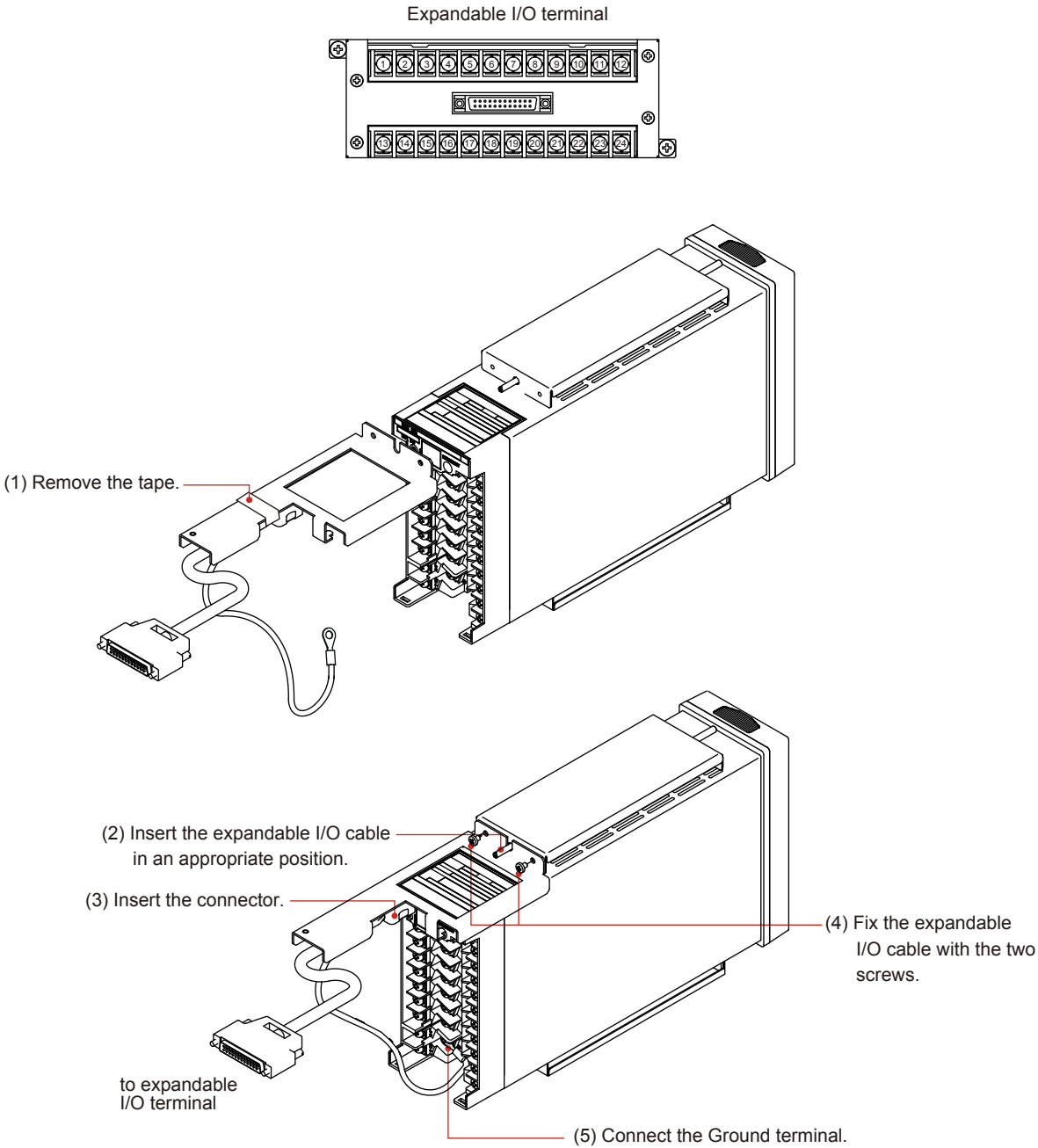
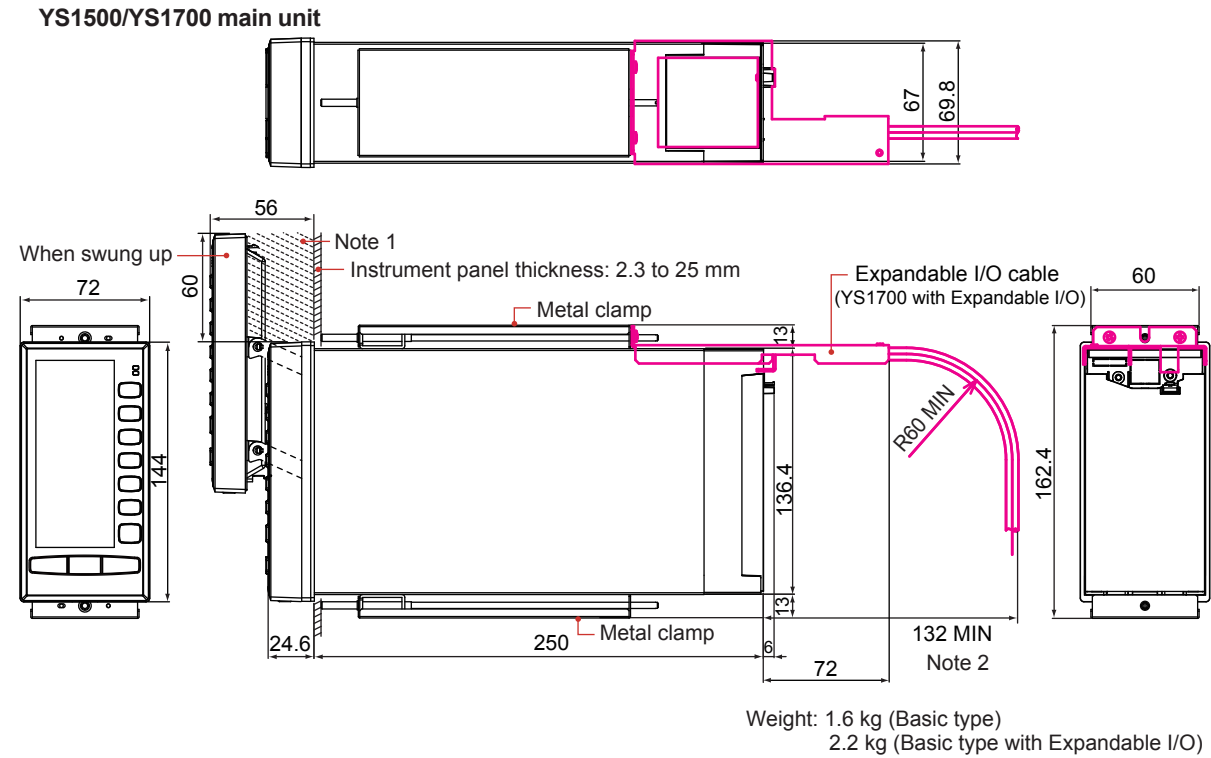


Figure 9.5

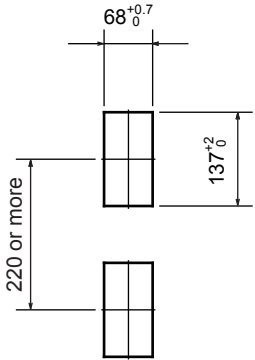
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External Dimensions/Panel Cutout Dimensions

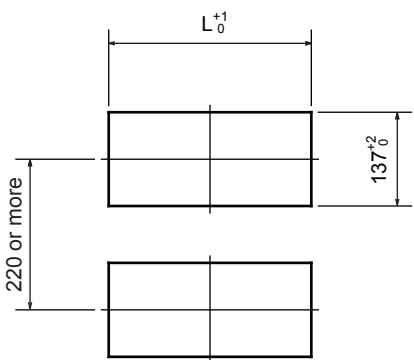


Panel Cutout Dimensions

For single mounting:



For side-by-side mounting:



Panel Cutout Width for Side-by-side Mounting

| Number of instruments to be mounted | L(mm) |
|-------------------------------------|-------|
| 2                                   | 140   |
| 3                                   | 212   |
| 4                                   | 284   |
| 5                                   | 356   |
| 6                                   | 428   |
| 7                                   | 500   |
| 8                                   | 572   |
| 9                                   | 644   |
| 10                                  | 716   |
| 11                                  | 788   |
| 12                                  | 860   |
| 13                                  | 932   |
| 14                                  | 1004  |

Trigonometry

Unit: mm

General tolerance =  $\pm(\text{value of tolerance class IT18 based on JIS B 0401-1998}) / 2$

Note 1: If a nameplate, etc. is installed within 60 mm above the instrument, the thickness of the nameplate, etc. must be 30 mm or less from the panel surface.

Note 2: When installing the expandable I/O cable, secure the wiring space of at least 60 mm for a minimum curvature radius of the cable in addition to the mounting bracket space of 72 mm from the terminal cover face of the main unit.

Note 3: To ensure good air ventilation, allow space of 100 mm or more at the top and bottom of the panel.

Figure 9.6

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Expandable I/O Terminal (YS010)

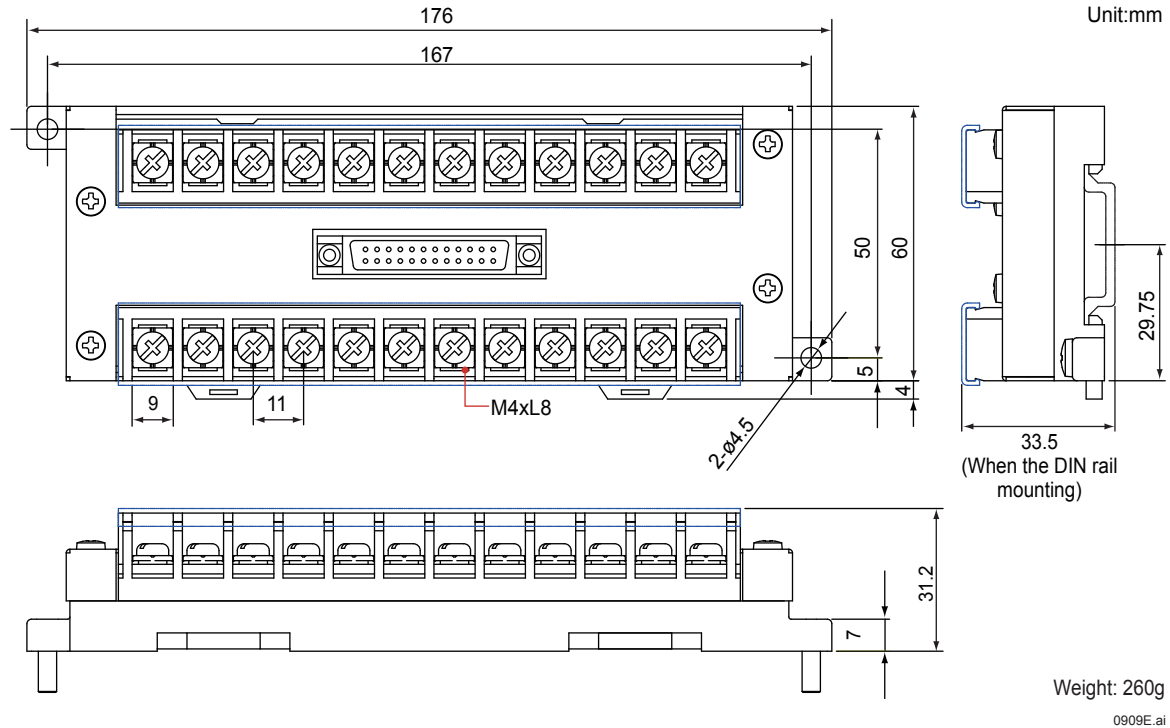


Figure 9.7

Expandable I/O Cable (YS011-03)

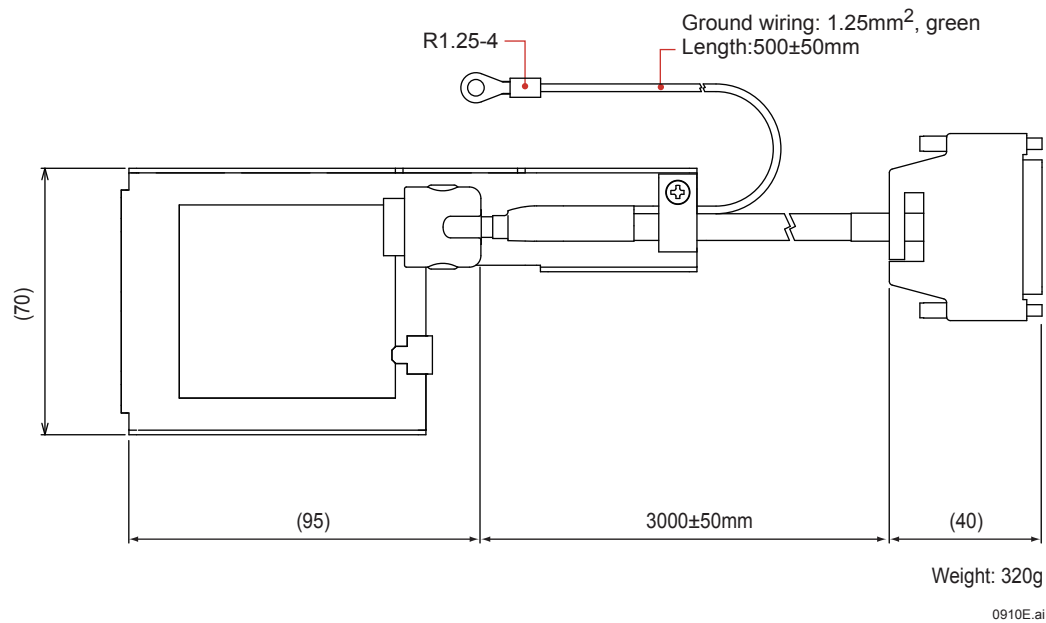


Figure 9.8

## Wiring

### Wiring Precautions



#### WARNING

- 1) Be sure to turn OFF the power supply before wiring to avoid an electric shock. Use a tester or similar device to ensure that no power is being supplied to a cable to be connected.
- 2) As a safety measure, always install a circuit breaker (an IEC 60947-compatible product, 5 A, 100 V or 220 V AC) in an easily accessible location near the instrument. Moreover, provide indication that the switch is a device for turning off the power to the instrument.
- 3) Wiring work must be carried out by a person with basic electrical knowledge and practical experience.
- 4) For the wiring cable, the temperature rating is 60 °C or more.



#### WARNING

For products with optional code /FM or /CSA:

- 1) Devices must be wired by professionally trained personnel.
- 2) For the field wiring parameters for YS1000 non-incendive instruments, see Hazardous location usage conditions of Safety Standards in 9.1 General Specifications, in the YS1500 Indicating Controller/YS1700 Programmable Indicating Controller User's Manual.
- 3) In case of option code /FM, install devices according to NEC (National Electrical Code: ANSI/NFPA-70).  
In case of option code /CSA, all wiring shall comply with Canadian Electrical Code Part I and local electrical codes.

#### CAUTION

- 1) Provide electricity from a single-phase power supply. If the power is noisy, install an isolation transformer on the primary side, and use a line filter (recommended product: ZAC2205-00U, TDK) on the secondary side. When measures against noise are taken, do not install the primary and secondary power cables close to each other.
- 2) For thermocouple inputs, wire the thermocouple using shielded compensating lead wire. Moreover, for RTD input, use shielded wires with low conducting resistance and no resistance difference between the three wires.
- 3) If there is a risk of external lightning surges, use a lightning arrester, etc.
- 4) Tightening condition for terminal screws for power supply terminals and signal terminals is tightening torque 1.2 N•m. When using an electric screwdriver, it is necessary to use it at a rotation speed of 200 rpm or less. Please do not use a high-speed electric driver such as 1000rpm. An excessive load will be applied to the terminal screws and terminal fittings, leading to a damage.

#### Note

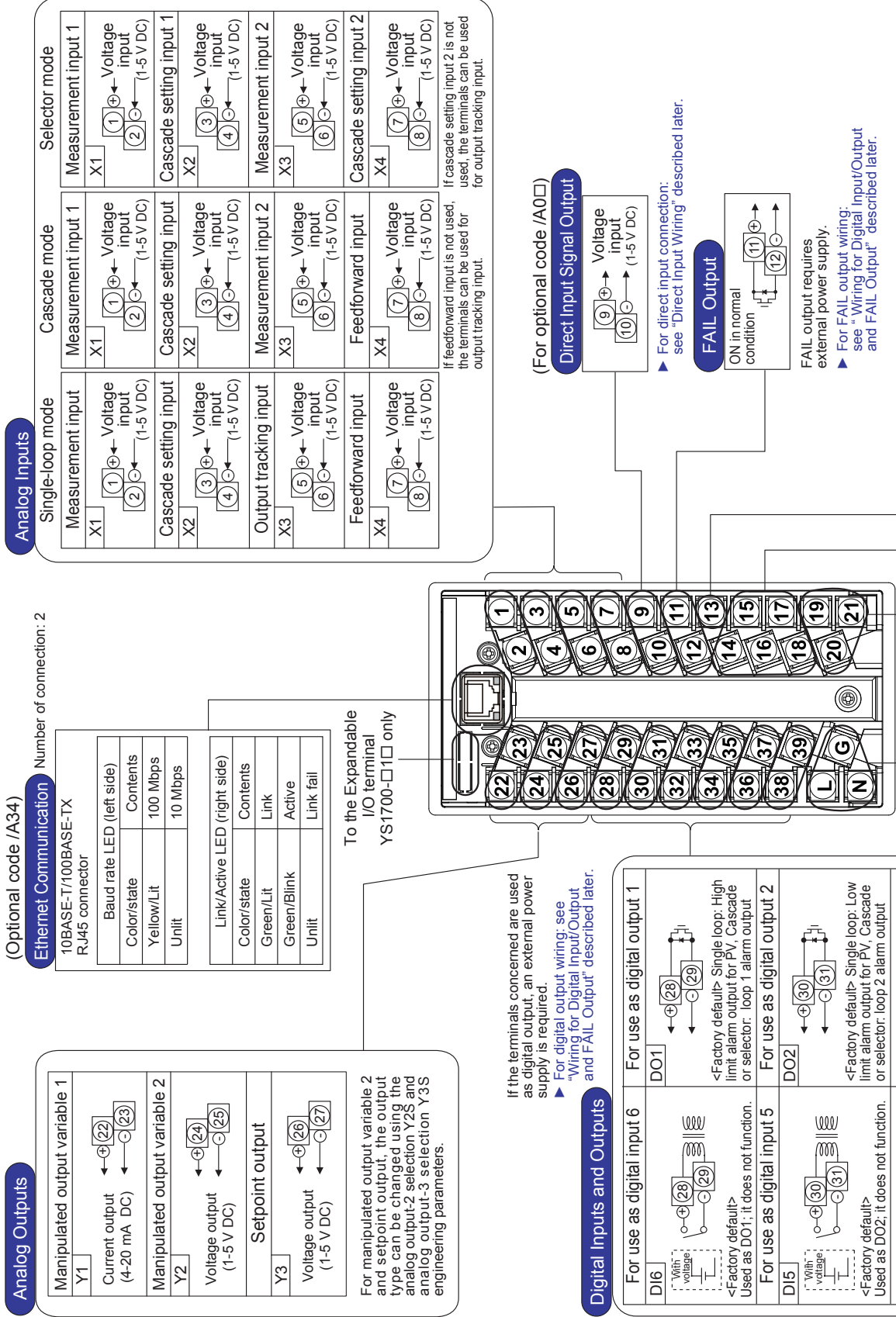
Please wire from the central terminals.

#### Note

When using the "M4 screw with washer", replace the terminal screws to "M4 screw with washer" included. For power supply, grounding and signal wiring cables, crimp terminals and fasten with "M4 screws with washers".

Terminal Diagrams of YS1500/YS1700 Single-loop, Cascade, and Selector Modes

Note: Do not use unassigned terminals as relay terminals.



| For use as digital input 4                                                                | For use as digital output 3                                                                                                         |
|-------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| <b>DI4</b><br><br>With voltage<br><Factory default><br>Used as DO3; it does not function. | <b>DO3</b><br><br><Factory default> Single loop: Velocity alarm output<br>Cascade: O/C status output<br>Selector: L/R status output |
| For use as digital input 3                                                                | For use as digital output 4                                                                                                         |
| <b>DI3</b><br><br>With voltage<br><Factory default><br>Used as DO4; it does not function. | <b>DO4</b><br><br><Factory default><br>C/A, M status output                                                                         |
| For use as digital input 2                                                                | For use as digital output 5                                                                                                         |
| <b>DI2</b><br><br>With voltage<br><Factory default><br>Used as DO5; it does not function. | <b>DO5</b><br><br><Factory default><br>C, A/M status output                                                                         |
| For use as digital input 1                                                                | For use as digital output 6                                                                                                         |
| <b>DI1</b><br><br>With voltage<br><Factory default><br>No function                        | <b>DO6</b><br><br><Factory default><br>Used as DI1; it does not function.                                                           |

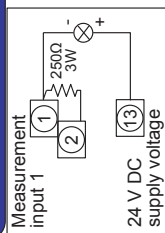
Digital input hardware specifications:  
 When voltage is present For no voltage  
 ON: -0.5 to 1 V DC ON: resistance of 200 Ω or less 200 mA or less (resistive load)  
 OFF: 4.5 to 30 V DC OFF: resistance of 100 kΩ or more  
 Input contact rating: 5 V DC, 20 mA or more

Digital inputs and digital outputs can be selected and used using the DI/DO specification DI016 to DI067 engineering parameters. A function can be set using DI1F to DI6F and DO1F to DO6F engineering parameters.

### Power Supply

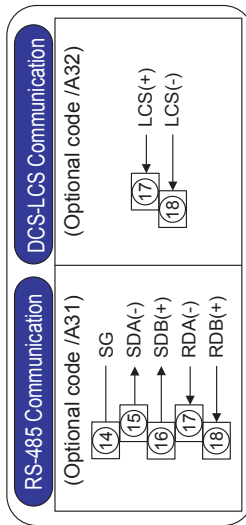
| Supply voltage (AC)                                                                                                                                                                                                                                                                               | Supply voltage (DC)                                |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|
|                                                                                                                                                                                                                                                                                                   |                                                    |
| Supply voltage<br>100 to 120 V AC (±10%), 50/60 Hz (±3 Hz) (100 V AC, 24 V DC common power)<br>(AC):<br>220 to 240 V AC (±10%), 50/60 Hz (±3 Hz) (220 V AC power)<br>Supply voltage<br>24 to 120 V DC (±10%) (100 V AC, 24 V DC common power)<br>(DC):<br>135 to 190 V DC (±10%) (220 V AC power) | DC power supply can be connected without polarity. |

### Connection of Transmitter Supply Power



The figure at the left shows an example of the wiring for measurement input 1. Measurement input 2 can also be connected in the same way.

► For connecting two transmitters: see "Transmitter Supply Power Wiring" described later.



### (Optional specifications)

► For direct input connection: see "Direct Input Wiring" described later.

### Direct Input Terminals

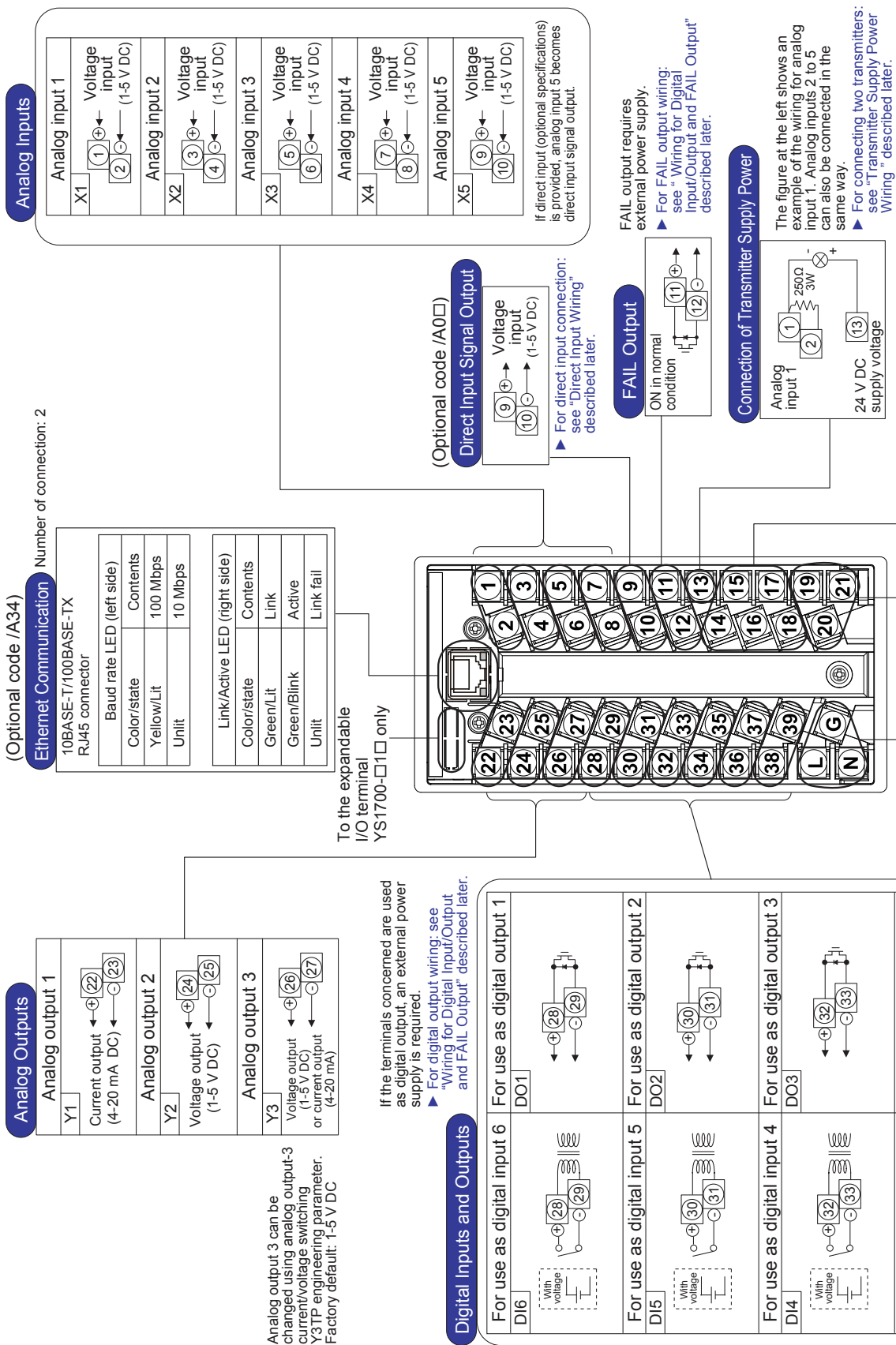
| mV input (optional code /A01)<br>Isolator (optional code /A05) | Thermocouple input (optional code /A02)                          | RTD input (optional code /A03)                                   |
|----------------------------------------------------------------|------------------------------------------------------------------|------------------------------------------------------------------|
|                                                                |                                                                  |                                                                  |
| <b>Potentiometer input (optional code /A04)</b><br>            | <b>Two-wire transmitter input (optional code /A06, /A07)</b><br> | <b>Two-wire transmitter input (optional code /A06, /A07)</b><br> |
| <b>Frequency input (optional code /A08)</b><br>                | <b>Frequency input (optional code /A08)</b><br>                  | <b>Frequency input (optional code /A08)</b><br>                  |

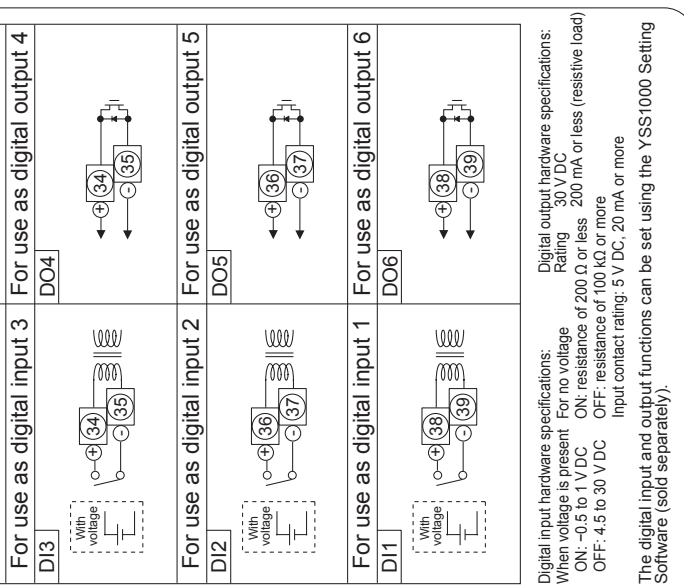
Figure 9.9

0911E.ai

# Terminal Diagrams of YS1700 Programmable Mode

Note: Do not use unassigned terminals as relay terminals.





### Power Supply

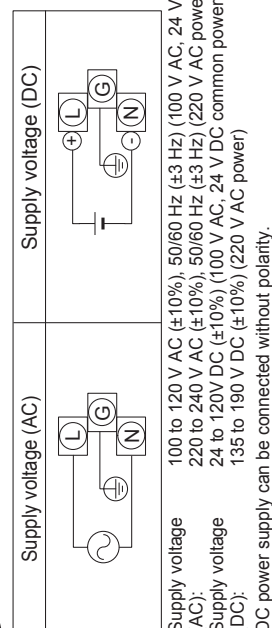
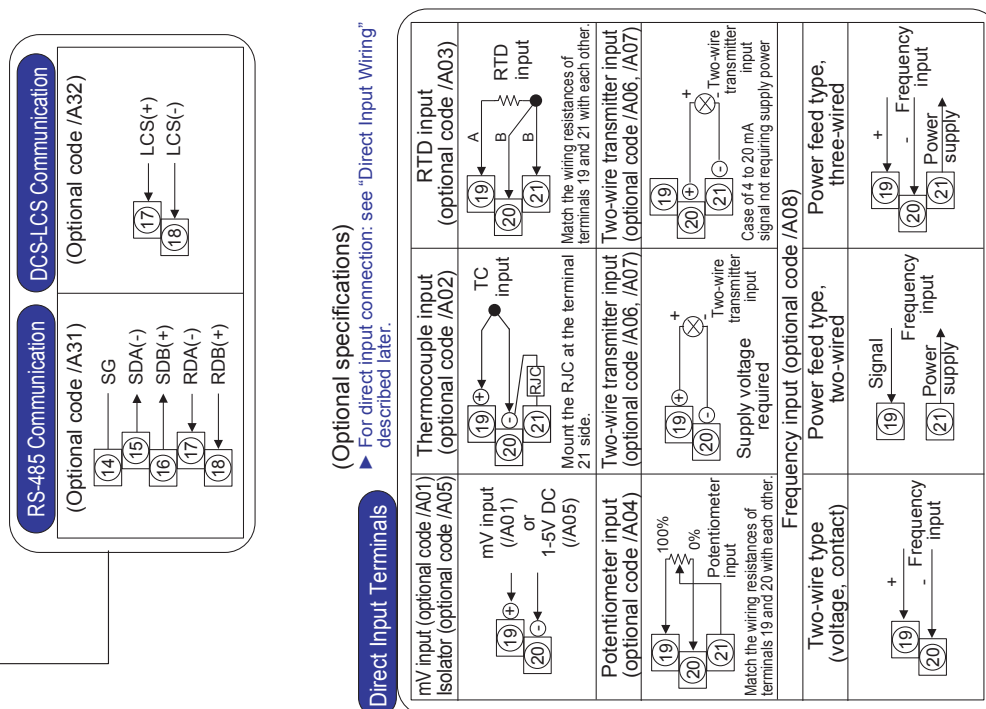


Figure 9.10

0912E.ai



## Expandable I/O Terminal Diagram (YS1700 Basic Type (with Expandable I/O))

Note: \*Do not use unassigned terminals as relay terminals.

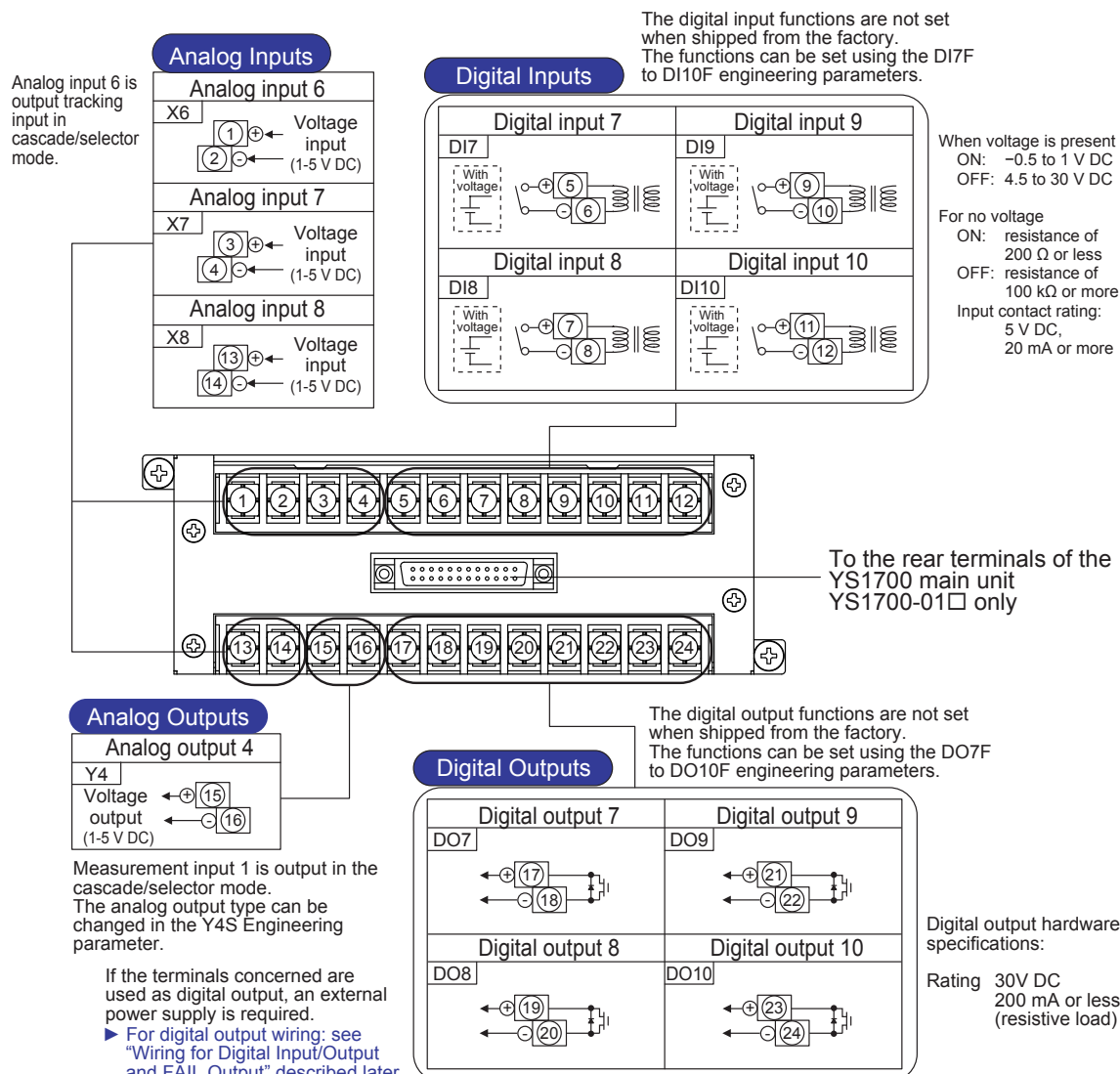


Figure 9.11

0913E.ai

## Transmitter Supply Power Wiring

If the YS1000 is connected to a two-wire transmitter, it is recommended that the field signal be isolated to limit the effects of short circuiting or ground fault incidents within a narrow range. (Use an external distributor.)

However, for economical connection to a two-wire transmitter, the YS1000 is equipped with non-isolated power terminals for transmitters (25 to 25.5 V DC).

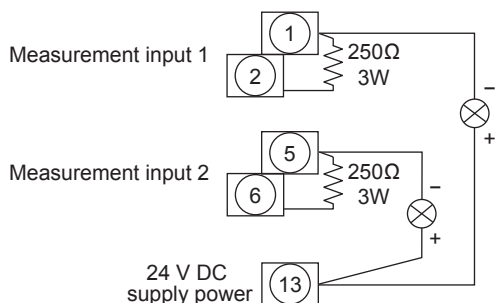


Figure 9.12

0914E.ai

## Supply current

When optional specification direct input (/A0□) is provided: 25 to 25.5 V DC, 30 mA

When no optional specification direct input (/A0□) is provided: 25 to 25.5 V DC, 60 mA (two two-wire transmitters can be connected)



## Wiring for Digital Input/Output and FAIL Output

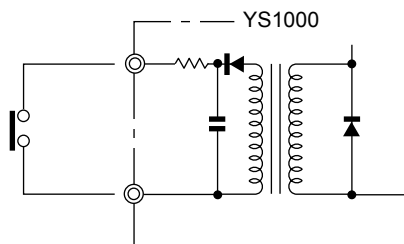
**WARNING**

For products with optional code /FM or /CSA:

Install explosion-proof wiring defined in the relevant country for the following signal wiring.

- The digital output cable must be wired from the non-hazardous area by using Class I, Division 2 wiring dedicated in potentially explosive atmospheres such as a threaded metal conduit. In addition, it is necessary to be wired not to apply stress at the end of the cable.

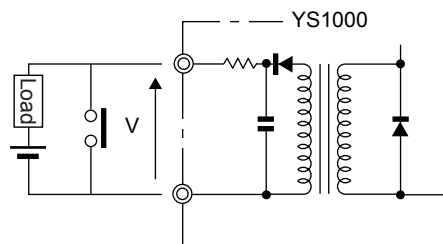
External no-voltage and voltage contacts for digital inputs should be provided so that the rated value is obtained. Attention must be paid to excessive conductor resistance and in-conductor voltage drop.



Rated value  
ON: 200  $\Omega$  or less  
OFF: 100 k $\Omega$  or more

0915E.ai

Figure 9.13 Connection of Digital Input (No-voltage Contact)



Rated value  
ON: V = -0.5 to +1 V  
OFF: V = 4.5 to 30 V

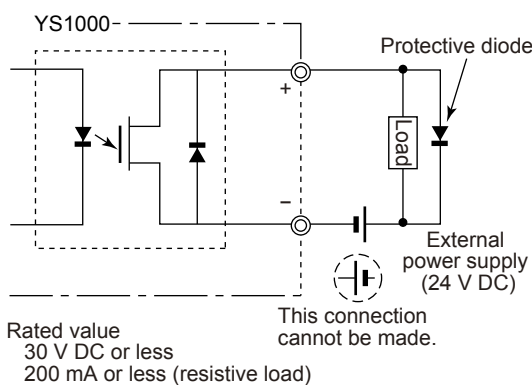
0916E.ai

Figure 9.14 Connection of Digital Input (Voltage Contact)

When driving an external device using contact outputs such as alarm output, status output, and FAIL output, install wiring paying attention to the following:

**CAUTION**

- Do not connect loads exceeding the contact rating.
- To drive equipment incorporating inductance components such as relays, always connect a protective diode (surge absorber) in parallel with the load.
- To connect a power supply for driving a load, the power supply's polarity must be matched with that of the contact output. Connecting it in reverse may result in failure.
- An AC load cannot be directly opened or closed using contact output. In this case, provide a repeating relay, etc.



Rated value  
30 V DC or less  
200 mA or less (resistive load)

This connection  
cannot be made.

0917E.ai

Figure 9.15 Connection Using Digital Output

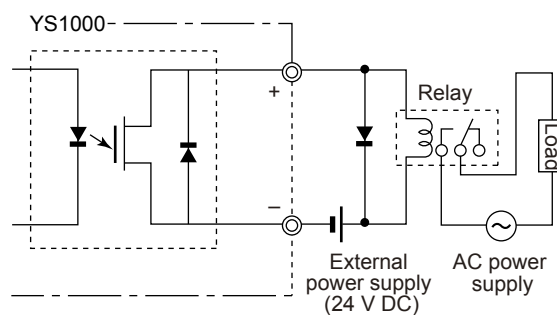


Figure 9.16 Connection of Digital Output to Drive a Load Including AC Power Supply

0918E.ai



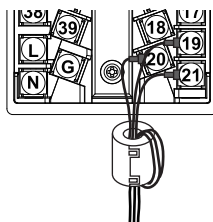
### Direct Input Wiring (Optional Code /A0□)

Direct input terminals allow the connection of one of the following: mV voltage, thermocouple, RTD, potentiometer, isolator, two-wire transmitter, or a pulse signal.

For YS1700, a sensor signal is connected to the direct input terminals, converted into a 1–5 V signal by a signal converter circuit, and then read as analog data (X5). Moreover, it is output as a 1–5 V DC signal from the analog input 5 terminals.

For YS1500, a sensor signal is connected to the direct input terminals, converted into a 1–5 V signal by a signal converter circuit, and then output to the direct input signal output terminals. Connect this signal to the terminals you wish to input to using external wiring. Connecting it to analog input 1 (X1) allows you to monitor measured signals using a standby manual station in the event of a control and display circuit failure.

A ferrite core is included when the optional code /A0□ is specified. Be sure to use the ferrite core when connecting to the wire to the direct input terminals.

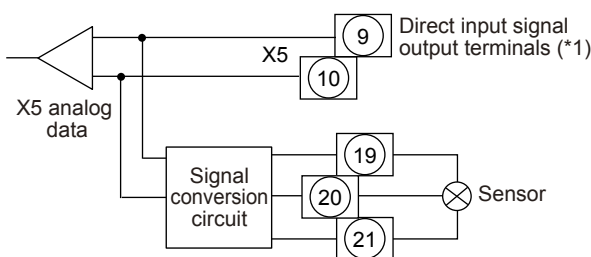


0918-01E.ai

### CAUTION

If there is any risk of a surge due to lightning discharge, an arrester should be connected to the direct input signal line. YOKOGAWAAR series is recommended for the arrester.

For YS1700



\*1: If the signal conversion circuit is not used, these terminals become analog input 5 (X5) terminals.

Figure 9.17

0919E.ai

For YS1500

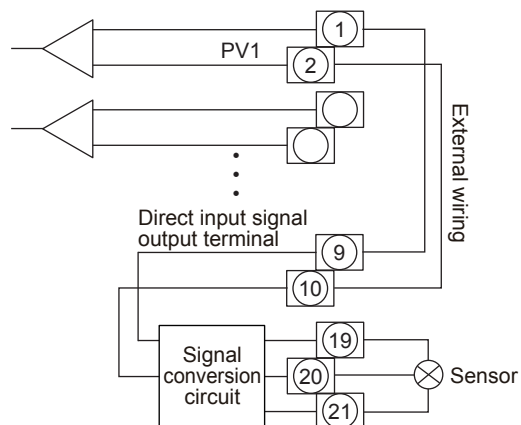


Figure 9.18

0920E.ai

### Wiring for the Serial Communication Interface (Optional Code /A31)

To perform Modbus communication, PC-link communication, or YS protocol communication connect the wires as shown below. To perform YS protocol communication with DCS, connect the wires as a four-wire type shown below. If the instrument is located at the end of the wiring, turn ON the terminating resistor. The terminating resistance (internal) can be set using the RS-485 communication terminating resistor ON/OFF (TRMR) engineering parameter.

#### Note

Even if the terminating resistor is being ON, it will be OFF when the power supply of the instrument is turned off.

► For details of communication parameter setting and communication functions: see YS1000 Series Communication Interface User's Manual

#### Four-wire connection

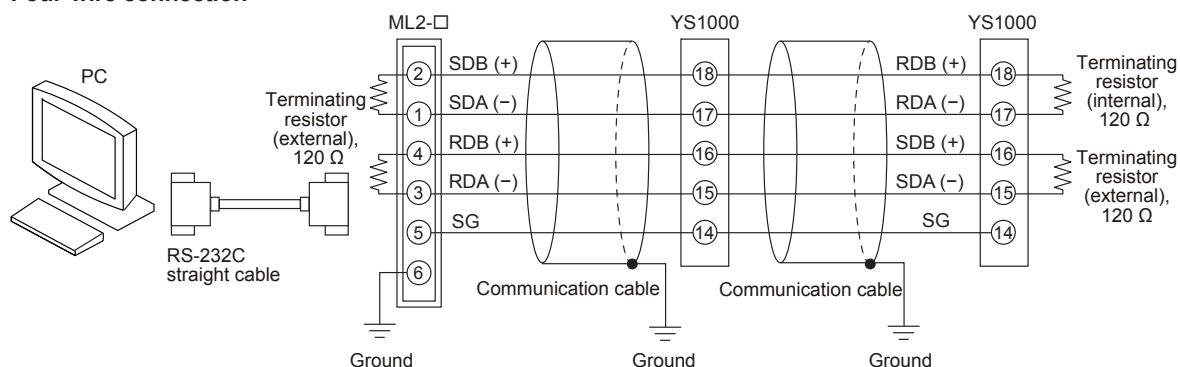


Figure 9.19

0921E.ai

#### Two-wire connection

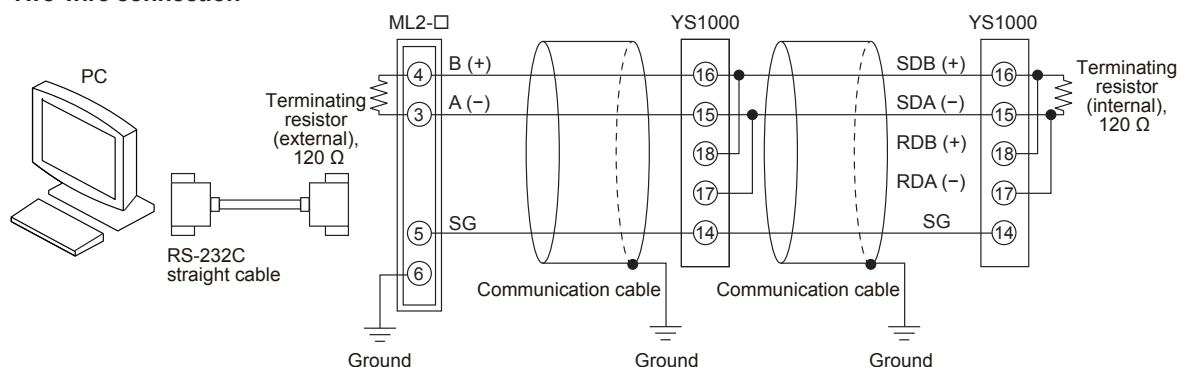


Figure 9.20

0922E.ai

#### Note

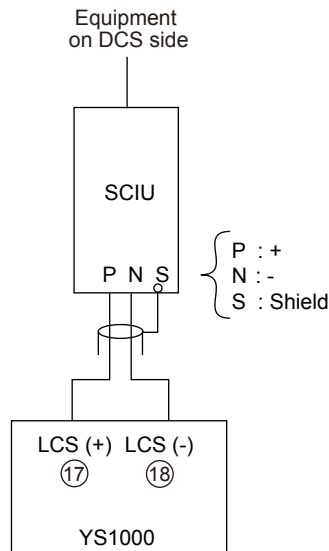
ML2-□ is a YOKOGAWA converter. RS-232C/RS-485 converters other than these devices can also be used. In such a case, check the electric specifications of each converter, etc. before using them.

### Wiring for Distributed Control System (DCS-LCS) Communication (Optional Code /A32)

The following shows a diagram of the wiring between YS1000 and an SCIU communication interface unit.

For the wiring between the DCS and an SCIU, and for the number of units to be connected, see the respective user's manuals.

► For details of communication parameter setting and communication functions: see [YS1000 Series Communication Interface User's Manual](#)



0923E.ai

Figure 9.21

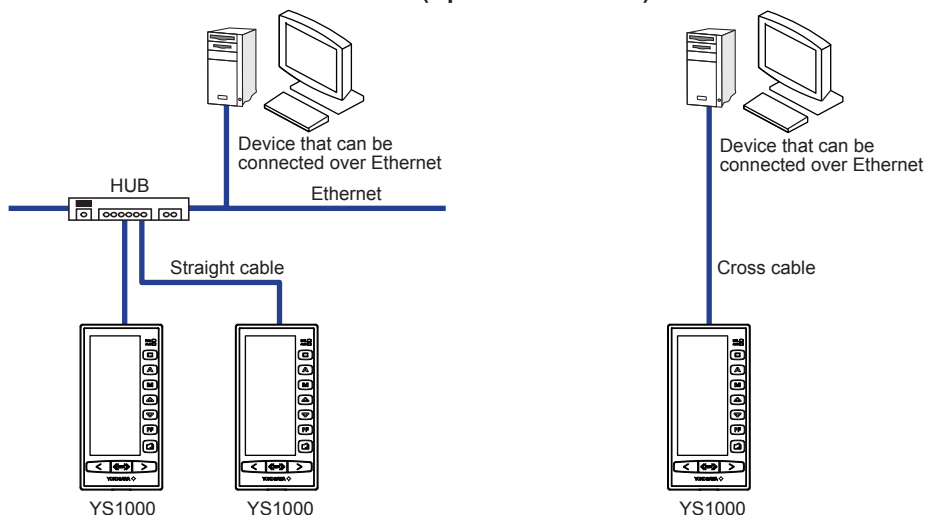
### Wiring for Peer-to-peer Communication (YS1700, Optional Code /A31)

Peer-to-peer communication can be used by user programs in the YS1700 programmable mode. To achieve peer-to-peer communication, the wiring is the same as for "two-wire connection" in Wiring for the Serial Communication Interface (Optional Code /A31) (p. 55). Communication cannot be accomplished with four-wire connections.

► For communication parameter setting: see [YS1000 Series Communication Interface User's Manual](#).

► For details of peer-to-peer communication: see Chapter 8, Using Peer-to-peer Communication, in the [YSS1000 Setting Software/YS1700 Programmable Function User's Manual](#).

### Wiring for the Ethernet Communication Interface (Optional Code /A34)



0923-01E.ai

#### CAUTION

If there is any risk of a surge due to lightning discharge, an arrester for Ethernet (100BASE-TX/10BASE-T) should be connected.

## Wiring for Power Supply and Grounding

### Power supply wiring



#### WARNING

Be sure to turn OFF the power supply before wiring. Use a tester or similar device to ensure that no power is being supplied to a cable to be connected.

Install the power cable keeping a distance of more than 1 cm from other signal wires.

The power cable is required to meet the IEC standards concerned or the requirements of the area in which the instrument is being installed.

For the power cable, the temperature rating is 60 °C or more.

For products with optional code /FM or /CSA:

- When devices are installed in a hazardous area in Class I, Division 2, wire a power supply cable from a non-hazardous area by explosion-proof wiring (including metal conduit wiring).
- In case of option code /FM, install devices according to NEC (National Electrical Code: ANSI/NFPA-70).
- In case of option code /CSA, all wiring shall comply with Canadian Electrical Code Part I and local electrical codes.

### Ground wiring



#### WARNING

The YS1000 should always be grounded to protect the operator and maintenance personnel from electric shock and to prevent the effects of external noise. Ground wiring should be grounded to Ground (minimum resistance).

For the ground cable, the temperature rating is 60 °C or more.



#### WARNING

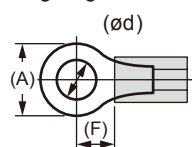
After completion of power cable wiring and ground wiring, always install the terminal cover to the instrument.

### Note

If there are multiple YS1000s on the same panel and individual grounding cannot be provided, determine the location of a grounding bus lead-in at one location and use and connect grounding cables of 2 mm<sup>2</sup> or more from each YS1000 to the grounding bus.

### Crimping terminal recommendations

Ring tongue terminal



| Applicable terminals | Applicable wire mm <sup>2</sup> (AWG#) | ød (mm)  | A (mm)   | F (mm)   | Applicable cable                   |
|----------------------|----------------------------------------|----------|----------|----------|------------------------------------|
| M4                   | 1.04-2.63 (16-14)                      | 4.4 max. | 7.0 max. | 7.8 max. | Grounding cable                    |
|                      | 0.25-1.65 (22-16)                      | 4.4 max. | 6.6 max. | 6.7 max. | Power supply cable<br>Signal cable |

Recommended tightening torque: 1.2 N•m

Applicable wire size: Grounding cable 2 mm<sup>2</sup> or more, Power supply cable 1.25 mm<sup>2</sup> or more

### Installing the Terminal Cover

After completing the wiring, be sure to install the terminal cover to the instrument for safety and dust proofing.

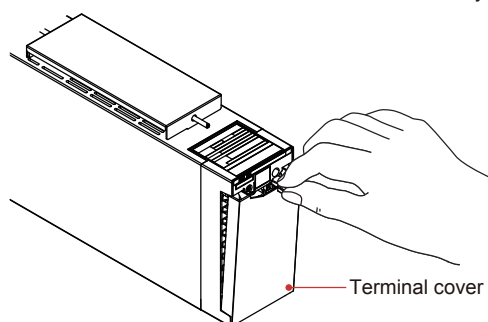


Figure 9.22

0924E.ai

# Troubleshooting

## How to Take Actions if the ALM Lamp or FAIL Lamp Lights up

In detecting an abnormality, YS1000 lights up the lamps (FAIL, ALM) at the upper part of the instrument's front panel.

- FAIL lamp (red): Lights up if a major failure occurs in which the controller cannot operate.
- ALM lamp (yellow): Lights up if a minor abnormality occurs in which the controller can still continue to operate.

### Actions to be Taken if the ALM Lamp Lights Up

- If the ALM lamp lights up, the alarm item can be checked on the ALARM Display.
- Alarm types include STC alarms, process alarms, and system alarms.
- An STC alarm or process alarm that has occurred prior to a power failure will be stored in the memory and will be re-displayed upon a HOT start. (Even if the power supply is turned off while in the condition that an alarm occurred in and the instrument is reused without a control module function, the ALM lamp lights up again at HOT start. In this case, set the instrument once to COLD start and turn ON the power supply. This will clear the alarm indication.)

Table 10.1 List of Causes of Alarm Occurrence

| Type         | Alarm Display                  | Description                                         | Cause of Alarm Occurrence and Diagnosis                                                                                                                                                                          | Actions and Others                                                                                                                                                      |
|--------------|--------------------------------|-----------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| System alarm | X1, X2, X3, X4, X5, X6, X7, X8 | Input overrange                                     | Input value is less than -6.3% or greater than +106.3%.                                                                                                                                                          | The operation mode (C, A, M) does not change in the event of alarm occurrence.<br>Check wiring and instruments connected.                                               |
|              | Y1, Y3                         | Current output wire open or output read-back error* | Output 1 (Y1) or output 3 (Y3) output wire is open or output read-back value error*.                                                                                                                             | Check wiring and instruments connected or Remove the noise of wiring.                                                                                                   |
|              | CALC                           | Computation overflow                                | The results become infinite or non-numerical in the midst of the execution of computation by user programs in the YS1700 programmable mode.                                                                      | Computation based on a limit value (positive or negative maximum value)<br>Correct user programs and then perform download again.                                       |
|              | OVER                           | Exceeding of control period                         | Control computation by user programs exceeds the control period in the YS1700 programmable mode.                                                                                                                 | During normal run: Computation stops at 2nd exceeding of the control period.<br>During test run: Computation stops.<br>Correct user programs and then re-download them. |
|              | PROG                           | User program error                                  | No END instruction<br>Out of a device number range<br>RTN instruction error                                                                                                                                      | User programs are suspended.<br>Correct user programs and then re-download them.                                                                                        |
|              | DATA                           | Writing from YSS1000 incomplete                     | Data write from YSS1000 has not been completed.                                                                                                                                                                  | Re-download data from YSS1000.                                                                                                                                          |
|              | COMM                           | RS-485 communication error                          | Framing parity error<br>Buffer overflow<br>Character-to-character timeout<br>Error detection (checksum, CRC, LRC)                                                                                                | Check communication connection (wiring and communication conditions).                                                                                                   |
|              |                                | DCS-LCS communication error                         | Framing parity error<br>Buffer overflow<br>Header receiving data error<br>Framing parity error<br>Error detection (BCC)<br>Communication undetected<br>Communication time exceeded<br>Communication status error | Check communication connection (wiring and communication conditions).<br>Check connection destination.                                                                  |
|              |                                | Peer-to-peer communication error                    | Framing parity error<br>Buffer overflow<br>Receiving data error<br>Error detection (checksum)                                                                                                                    | Check communication connection.                                                                                                                                         |
|              | ETHER                          | Ethernet communication error                        | No response from Ethernet communication device                                                                                                                                                                   | Press the [ALM CLR] software key to confirm the ETHER alarm. If the above operation is repeated many times, it is judged as a failure.                                  |
|              | PTOP                           | Peer-to-peer communication error                    | Peer-to-peer communication registers used by the user programs have not been updated.                                                                                                                            | Check communication connection.<br>Check connection destination.                                                                                                        |
|              | CALR                           | Adjustment inspection error                         |                                                                                                                                                                                                                  | Contact YOKOGAWA's sales office or sales representative.                                                                                                                |

\* An output read-back error is when SCOD is set to ALARM (1). (Please see P.62)

Table 10.2 List of Causes of Alarm Occurrence (Continued)

| Type          | Alarm Display | Description                  | Cause of Alarm Occurrence and Diagnosis                                                                                                    | Actions and Others                        |
|---------------|---------------|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|
| Process alarm | PH1, PH2      | High limit alarm for PV      | Process abnormality<br>PV1 or PV2 is at or above the high limit alarm setpoint.                                                            | Recover the process to normal conditions. |
|               | PL1, PL2      | Low limit alarm for PV       | Process abnormality<br>PV1 or PV2 is at or below the low limit alarm setpoint.                                                             |                                           |
|               | HH1, HH2      | High-high limit alarm for PV | Process abnormality<br>PV1 or PV2 is at or above the high-high limit alarm setpoint.                                                       |                                           |
|               | LL1, LL2      | Low-low limit alarm for PV   | Process abnormality<br>PV1 or PV2 is at or below the low-low limit alarm setpoint.                                                         |                                           |
|               | DL1, DL2      | Deviation alarm              | Abnormal process deviation<br>$ PV1 - SV1 $ or $ PV2 - SV2 $ is at or above the deviation alarm setpoint.                                  |                                           |
|               | VL1, VL2      | PV velocity alarm            | Abrupt change in process<br>PV1 or PV2 velocity is at or above the velocity alarm change setpoint or velocity alarm setting time setpoint. |                                           |

Table 10.3 List of Causes of Alarm Occurrence (Continued)

| Table 10.3 List of Causes of Alarm Occurrence (Continued) |               |                           |                                                                                                                                                                                 |                                                                        |                                                                 |
|-----------------------------------------------------------|---------------|---------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|-----------------------------------------------------------------|
| Type                                                      | Alarm Display | Description               | Cause of Alarm Occurrence and Diagnosis                                                                                                                                         | Actions and Others                                                     | How to Clear                                                    |
| STC alarm                                                 | SYS-ALM       | System abnormality        | Prohibited combination control element was executed.<br>Control function is not properly activated.<br>Current output is open.                                                  | STC stop (auto startup is impossible or stopped)                       | Continue STC (auto startup is impossible or stopped)            |
|                                                           | PVOVR         | PV alarm                  | PV value is below -6.3% or above 106.3%.                                                                                                                                        | STC continues (auto startup is impossible or stopped)                  |                                                                 |
|                                                           | MVLMT         | MV alarm                  | MV value is at the output limiter.<br>MV application signal span is inappropriate before starting auto startup.<br>MV value was changed or limited after starting auto startup. |                                                                        |                                                                 |
|                                                           | OPERR         | Operation abnormality     | Operation error during auto startup                                                                                                                                             |                                                                        |                                                                 |
|                                                           | IDERR         | Identification impossible | PV change was too small at auto startup.                                                                                                                                        |                                                                        |                                                                 |
|                                                           | PBLMT         | PB alarm                  | The proportional band has exceeded the high/low limit.                                                                                                                          | STC continues (No alarm is generated during execution of auto startup) | Eliminate the cause of alarm.<br>STC = OFF<br>Run auto startup. |
|                                                           | TILMT         | TI alarm                  | Integral time has exceeded the high/low limit.                                                                                                                                  |                                                                        |                                                                 |
|                                                           | TDLMT         | TD alarm                  | Derivative time has exceeded the high/low limit.                                                                                                                                |                                                                        |                                                                 |
|                                                           | RTALM         | RT alarm                  | Signal distribution ratio (RT) > 2 or RT < 0.5                                                                                                                                  |                                                                        |                                                                 |

### Actions to be Taken in the Event of the FAIL Lamp Lighting Up

If the FAIL lamp lights up, the FAIL Display appears. (If both the main processor (MCU) and display processor (DCU) fail or if the gate array (GA) is faulty, the FAIL lamp does not light up.)

Table 10.4 List of Causes of Failure

| FAIL Display | Description                                                                        | Processing (Action to be Taken in the Event of Abnormality) |                                                                                                                                                                                                                                                                                                                                                     |
|--------------|------------------------------------------------------------------------------------|-------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| None         | Main clock stopped or both the main processor and display processor are defective. | Control computation stopped                                 | <ul style="list-style-type: none"> <li>FAIL contact open</li> <li>M lamp lit</li> <li>Output HOLD (Y1 to Y4, DO1 to DO10)</li> <li>Y1 output can be operated using an MV operation key (&lt;, SHIFT, &gt;).</li> <li>Y1 output can be operated using the hard manual unit.</li> <li>Communication (RS-485, DCS-LCS, or Ethernet) stopped</li> </ul> |
| SCLK         | Sub-clock stopped                                                                  |                                                             |                                                                                                                                                                                                                                                                                                                                                     |
| MCU          | Main processor (MCU) faulty                                                        |                                                             |                                                                                                                                                                                                                                                                                                                                                     |
| DCU          | Display processor (DCU) faulty                                                     |                                                             |                                                                                                                                                                                                                                                                                                                                                     |
| A/D          | A/D converter faulty                                                               |                                                             |                                                                                                                                                                                                                                                                                                                                                     |
| D/A          | D/A converter faulty                                                               |                                                             |                                                                                                                                                                                                                                                                                                                                                     |
| RAM          | MCU-RAM faulty                                                                     |                                                             |                                                                                                                                                                                                                                                                                                                                                     |
| ROM          | MCU-ROM faulty                                                                     |                                                             |                                                                                                                                                                                                                                                                                                                                                     |
| FRAM         | FRAM faulty                                                                        |                                                             |                                                                                                                                                                                                                                                                                                                                                     |
| FLASH        | Flash memory faulty                                                                |                                                             |                                                                                                                                                                                                                                                                                                                                                     |
| OPT          | Communication/expandable I/O abnormal                                              |                                                             |                                                                                                                                                                                                                                                                                                                                                     |
| SYS          | System data abnormal                                                               |                                                             |                                                                                                                                                                                                                                                                                                                                                     |
| EMPFR        | FRAM data non-initialized, FRAM data lost                                          |                                                             |                                                                                                                                                                                                                                                                                                                                                     |
| EMPFL        | Flash data non-initialized, Flash data lost                                        |                                                             |                                                                                                                                                                                                                                                                                                                                                     |

### Displays and Operation in the Event of FAIL

YS1000 has an independent control computation circuit (main processor, MCU), a display operation circuit (display processor, DCU), and is also equipped with a current output backup circuit.

If the control computation circuit fails, control computation stops, and outputs (Y1 to Y4 and DO1 to DO10) are changed to held status. The communication function also stops. In this case, the FAIL Display is shown by the display operation circuit. This circuit measures and displays analog input data (X1), allowing a current output signal (Y1) to be manipulated using MV operation keys. The display cannot be switched.

If the display operation circuit fails, both normal display and operation are disabled, thereby causing control computation to be stopped and outputs (Y1 to Y4 and DO1 to DO10) to change to held status. The communication function also stops. In this case, the FAIL Display is shown by the control computation circuit. This circuit measures and displays analog input data (X1), allowing a current output signal (Y1) to be manipulated using MV operation keys. The display cannot be switched.

Regardless of the occurrence of a failure, the front panel of the instrument can be swung up to operate a current output signal (Y1) using the hard manual operation wheel (when the instrument is equipped with the hard manual unit (i.e. with the designation of suffix code -1□□)).

Moreover, use of the YS110 standby manual station facilitates the replacement of the controller's internal unit without interrupting outputs.

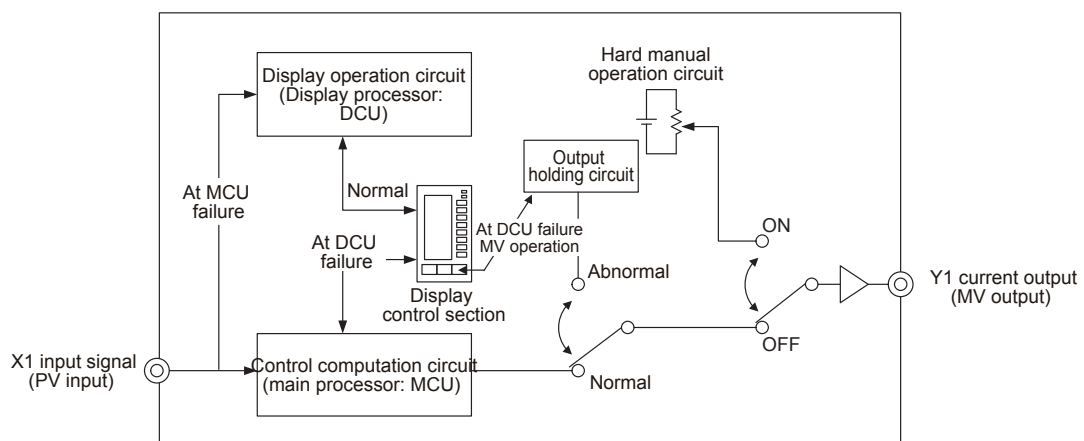


Figure 10.1 Output Backup System

1001E.ai

### Display Provided in the Event of FAIL

If both the main processor (MCU) and display processor (DCU) fail or if the gate array (GA) is faulty, no display is provided.

#### WARNING

If the FAIL lamp lights up and the LCD display does not function, the MV operation keys are available even if both the main processor (MCU) and display processor (DCU) are faulty. However, do not manipulate MV because MV display is invisible.

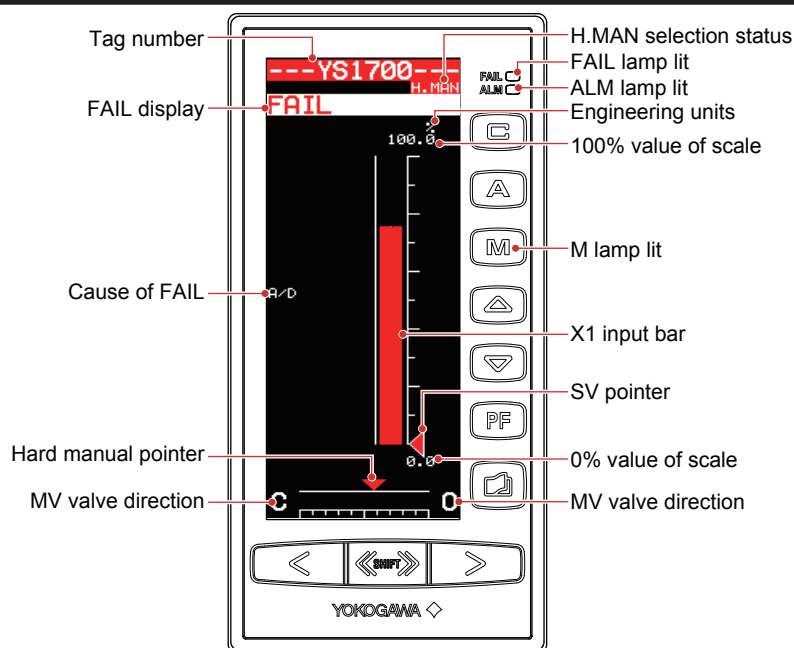


Figure 10.2

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Table 10.5

| Item Names in Figure           | Description                                                                                                                                                                  |
|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| X1 input bar                   | 1 to 5 V DC of analog input (X1) is displayed in a range of 0 to 100%.                                                                                                       |
| Y1 output bar                  | Y1 output value is displayed (if FAIL lights up, the value displayed is the manipulated output variable 1 produced immediately before the occurrence of the failure)         |
| Hard manual pointer            | Displayed being linked with the hard manual output value (this pointer is not displayed if suffix code -2□□ was specified.)                                                  |
| H.MAN selection status         | Displayed if the hard manual unit has been selected (this indication is not displayed if suffix code -2□□ was specified.)                                                    |
| FAIL cause                     | The cause of failure is displayed. If there are multiple failures, multiple causes of failures are displayed. No indication is displayed if the cause of failure is unknown. |
| FAIL and ALM lamps             | FAIL lamp lights up and the ALM lamp is off                                                                                                                                  |
| SV pointer                     | Undefined                                                                                                                                                                    |
| Tag number                     | The tag number shown immediately before FAIL was displayed.                                                                                                                  |
| MV value direction             | C-O or O-C indicated immediately before FAIL was displayed.                                                                                                                  |
| Scale                          | 0 to 100% unconditionally. Divisions are used that were indicated immediately before FAIL was displayed.                                                                     |
| C, A, M lamps                  | M lamp lights up.                                                                                                                                                            |
| MH and ML pointers             | Not displayed                                                                                                                                                                |
| PH, PL, HH, and LL pointers    | Not displayed                                                                                                                                                                |
| PV, SV, and MV digital display | Not displayed                                                                                                                                                                |
| Key entry                      | All invalid with the exception of the MV operation keys (<, SHIFT, >)                                                                                                        |



## Selecting the action to take in the event of an error in the circuit diagnosis of current output.

### Description

The SC OCD parameter is enabled when using Y1 terminal or Y3 terminal (Y3TP (analog output 3 current/voltage switching) is 4-20 mA (0)).

This parameter can be used to select D/A FAIL or OOP ALARM for displaying the diagnostic result in the event of an error with the D/A conversion section and read-back value. Note that selecting OFF (2) does not perform diagnosis.

When Y terminal is voltage output (Y2 terminal, Y4 terminal, or Y3 terminal (Y3TP (analog output 3 current/voltage switching) is 1-5V (1)), D/A FALL is displayed if an error occurs with the D/A conversion section, regardless of the setting of SC OCD.

Current output wire open is detected, regardless of the setting of SC OCD.

### Setting Display

| Parameters | Names                                         | Setting Range                                                                                             | Factory Default | Display                                                          |
|------------|-----------------------------------------------|-----------------------------------------------------------------------------------------------------------|-----------------|------------------------------------------------------------------|
| SC OCD     | Selection of Current Output Circuit Diagnosis | FAIL: D/A FALL in the event of an error<br>ALARM: OOP ALARM in the event of an error<br>OFF: No diagnosis | ALARM           | Engineering Menu Display 1 > [CONFIG1] (Configuration Display 1) |

### Note

- How to use the Selection of Current Output Circuit Diagnosis (SC OCD)
  - When SC OCD is in ALARM (1) (default value):
 

If an error is detected in the current output read-back value, OOP ALARM is issued and control is continued. In the event of a breakdown of the current output circuit, control is also continued. In this case, a breakdown of the current output circuit should be judged based on the fact that proper control can no longer be performed or another system alarm or process alarm has been issued.
  - When SC OCD is in FAIL (0):
 

If a breakdown of the current output circuit or an error in the current output read-back value is detected, D/A FAIL is set and control is stopped.
  - When SC OCD is in OFF (2):
 

Control continues, even if an output read-back value error occurs or the current output circuit breaks down. In this case, a breakdown of the current output circuit should be judged based on the fact that proper control can no longer be performed or another system alarm or process alarm is issued.
- Diagnosis of the current output circuit
 

In current output circuit diagnosis, the current output value of the Y1 or Y3 terminal is read back to within the YS1000 to detect an error from a difference between the output value and read-back value.

There are cases where the read-back value does not agree with the output value temporarily due to the characteristics of a positioner, etc. connected to the Y1 or Y3 terminal or noise superimposed by the wiring condition, which results in the judgment that there is an error in the D/A conversion section.

However, temporary noise of this kind or low-level noise may not affect control and control may be continued normally.

If an error occurs in the D/A conversion section, the cause may be one of the following three. Take action according to each cause.

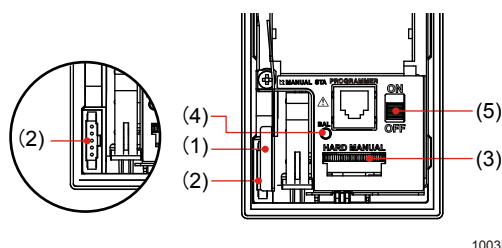
|     | Possible Cause                          | Actions                                                                                                                                                                |
|-----|-----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (1) | Breakdown of the current output circuit | In this case, control is disabled from being continued.<br>The current output circuit has failed; contact us for repair.                                               |
| (2) | A break in wire of Y1 or Y3 terminal    | A wire of the Y1 or Y3 terminal has broken; check the wiring.<br>This error may also occur if a terminal wire is disconnected during maintenance, transient work, etc. |
| (3) | Noise on Y1 or Y3 terminal              | If control is affected, eliminate noise.<br>If control is normal, control can be continued as is. This presents no problem.                                            |

## Backup Operation in the Event of Instrument Failure

### Hard manual unit operation (except in cases when suffix code -2□□ was specified)

Swinging up the front panel allows you to see the control section of the hard manual unit for backup (a manual operation output section consisting of analog circuits) on the internal panel.

If YS1000 is in FAIL status and there is an urgent demand situation, set the manipulated output variable (Y1 output) to the safe side using hard manual unit operation.



Note: Before you connect the cable to the YS110 connector, touch the metal lever to discharge static electricity.

- (1) Metal lever
- (2) YS110 standby manual station connection connector (MANUAL STA)
- (3) Hard manual operation wheel (HARD MANUAL)
- (4) MV balance lamp (BAL)
- (5) Hard manual selector switch (ON/OFF)

### Hard Manual Operation Section

Figure 10.3

- Adjust the value output by the hard manual circuit using the hard manual operation wheel to match it to the Y1 output value (the control computation circuit's manipulated output variable) produced immediately before FAIL was displayed. The output value increases when the operation wheel is turned clockwise, while it decreases when turned counterclockwise.
- When the hard manual circuit output value agrees with the Y1 output value, the MV balance lamp (BAL: green) lights up.
- When the hard manual selector switch is turned ON, the Y1 output value is shifted from the control computation circuit to the hard manual circuit while the Y1 output value continues to be generated. After that, output operation is available using the hard manual operation wheel.

### Note

The hard manual unit is only available for Y1 output operation.

## Online Controller Replacement



### WARNING

Do not remove the internal unit from the instrument case. Contact YOKOGAWA's sales office or sales representative when replacing the internal unit, as safety standard inspection is required.



### WARNING

#### Explosion hazard.

Do not remove or insert the internal unit or do not connect the YS110 in explosive atmospheres.

### CAUTION

Products with optional code /FM or /CSA cannot satisfy the explosion protection standards if the internal unit is removed.

Use of the standby manual station allows the controller to be replaced without interrupting Y1 output in the event of internal unit failure, etc.

► For YS110 standby manual station: see YS110 Standby Manual Station User's Manual.

## Recovery Operations after Power Failures

If a power failure occurs that exceeds the power holdup time, the instrument enters power failure status. Operation after a power failure differs depending on the power failure time and on the start mode (START) engineering parameters that have been set. The following action occurs with the factory default values.

► For operation after power failure: see Chapter 6, Processing during Power Failures, in the YS1500 Indicating Controller/YS1700 Programmable Indicating Controller User's Manual.

- Momentary power interruption of less than 2 seconds  
The instrument continues to operate the same as it had prior to the momentary power interruption.
- Power failure of 2 seconds or more  
The operation mode enters Manual, setpoints (SV) and parameters such as PID are maintained in the same condition as they were prior to the power failure, and the manipulated output variable becomes -6.3%.

If the self-tuning function is used, the PA1, IA1, and DA1 parameter values are initialized to the PB1, TI1, and TD1 values regardless of the start mode. This also holds true for the PA2, IA2, and DA2 parameters. Moreover, the parameters are initialized, so that CR1 and CR2 = 0, RT1 and RT2 = 1.0, LM1 and LM2 = 0, TM1 and TM2 = 0, and GM1 and GM2 = 0.

# List of Parameters

## Understanding the List of Parameters

|                                                     |                                                                                                                                                                                      |
|-----------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Parameter:                                          | Symbol displayed on YS1000's LCD                                                                                                                                                     |
| Name:                                               | Parameter name                                                                                                                                                                       |
| Setting and Display Range:                          | Range settable on YS1000                                                                                                                                                             |
| Unit:                                               | Parameter unit. An oblique line represents that there is no unit.                                                                                                                    |
| Factory Default Value:                              | Factory default values for YS1500 (single-loop mode) and YS1700 (programmable mode)<br>Values in parentheses indicate the initial value applied when the controller mode is changed. |
| Display and Setting Conditions for Controller Mode: | R: Display only, R/W: Display and setting available, N/A: No display                                                                                                                 |
| Description of symbols:                             |                                                                                                                                                                                      |
|                                                     | SINGLE: Single-loop mode                                                                                                                                                             |
|                                                     | CAS: Cascade mode                                                                                                                                                                    |
|                                                     | SELECT: Selector mode                                                                                                                                                                |
|                                                     | PROG: Programmable mode (YS1700 only)                                                                                                                                                |

For more information about each parameter, see the [YS1500 Indicating Controller/ YS1700 Programmable Indicating Controller User's Manual](#).

### Note

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Parameters are initialized if the controller mode selection (CTL) parameter is changed:  
All parameters will be initialized with the exception of setpoint 1 (SV1), setpoint 2 (SV2), user program name (PROG), system Rev. No. (REV), password, all parameters on the LCD Setting Display, and all parameters on the Communication Setting Display.

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## &lt;Tuning Parameters&gt;

## PID Setting Display 1 (PID1)

| Parameter | Name                                    | Setting and Display Range                                                                                                        | Unit             | Factory Default Value |               | Display and Setting Conditions for Controller Mode |     |        |      | User Set-tings |
|-----------|-----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|------------------|-----------------------|---------------|----------------------------------------------------|-----|--------|------|----------------|
|           |                                         |                                                                                                                                  |                  | YS1500 (SINGLE)       | YS1700 (PROG) | SINGLE                                             | CAS | SELECT | PROG |                |
| STC       | STC mode                                | OFF: STC is not operating <b>DISP</b> . STC values displayed only<br>ON: STC is operating <b>ATSTUP</b> . STC automatic start-up |                  |                       | OFF           | R                                                  | R   | R      | R    |                |
| PV1       | Process variable 1                      | Equivalent to -6.3 to 106.3% in the engineering unit (Note 1)                                                                    | Engineering unit |                       | Undefined     | R                                                  | R   | R      | R    |                |
| SV1       | Setpoint value 1                        | Equivalent to -6.3 to 106.3% in the engineering unit (Note 1)                                                                    | Engineering unit |                       | 0.0           | RW                                                 | RW  | RW     | RW   |                |
| MV1       | Manipulated output variable 1 (Note 2)  | -6.3 to 106.3                                                                                                                    | %                |                       | -6.3          | R                                                  | R   | R      | R    |                |
| DV1       | Deviation variable 1                    | PV1-SV1                                                                                                                          |                  |                       | Undefined     | R                                                  | R   | R      | R    |                |
| CSV1      | Cascade setting value 1                 | Equivalent to -6.3 to 106.3% in the engineering unit (Note 1)                                                                    | Engineering unit |                       | 0.0           | R                                                  | R   | R      | N/A  |                |
| FF1       | Feedforward input value 1               | -100.0 to 200.0                                                                                                                  | %                |                       | 0.0           | R                                                  | R   | N/A    | N/A  |                |
| LOAD      | Current load factor for user program    | 0.0 to 2000.0                                                                                                                    | %                |                       | 0.0           | N/A                                                | N/A | N/A    | R    |                |
| TRK1      | Output tracking input value 1           | -6.3 to 106.3                                                                                                                    | %                |                       | -6.3          | R                                                  | R   | R      | N/A  |                |
| LDMAX     | Maximum load factor for user program    | 0.0 to 2000.0                                                                                                                    | %                |                       | 0.0           | N/A                                                | N/A | N/A    | R    |                |
| PB1       | Proportional band 1                     | 0.1 to 999.9                                                                                                                     | %                |                       | 999.9         | RW                                                 | RW  | RW     | RW   |                |
| TI1       | Integral time 1                         | 1 to 9999                                                                                                                        | s (second)       |                       | 1000          | RW                                                 | RW  | RW     | RW   |                |
| TD1       | Derivative time 1                       | 0 to 9999 (0:OFF)                                                                                                                | s (second)       |                       | 0             | RW                                                 | RW  | RW     | RW   |                |
| SFA1      | Adjustable setpoint filter $\alpha$ 1   | 0.000 to 1.000                                                                                                                   |                  |                       | 0.000         | RW                                                 | RW  | RW     | RW   |                |
| SFB1      | Adjustable setpoint filter $\beta$ 1    | 0.000 to 1.000                                                                                                                   |                  |                       | 0.000         | RW                                                 | RW  | RW     | RW   |                |
| GW1       | Non-linear control gap width 1          | 0.0 to 100.0                                                                                                                     | %                |                       | 0.0           | RW                                                 | RW  | RW     | RW   |                |
| GG1       | Non-linear control gain 1               | 0.000 to 1.000                                                                                                                   |                  |                       | 1.000         | RW                                                 | RW  | RW     | RW   |                |
| PH1       | High limit alarm setpoint for PV1       | Equivalent to -6.3 to 106.3% in the engineering unit (Note 1) (Note 3)                                                           | Engineering unit |                       | 106.3         | RW                                                 | RW  | RW     | RW   |                |
| PL1       | Low limit alarm setpoint for PV1        | Equivalent to -6.3 to 106.3% in the engineering unit (Note 1) (Note 4)                                                           | Engineering unit |                       | -6.3          | RW                                                 | RW  | RW     | RW   |                |
| HH1       | High-high limit alarm setpoint for PV1  | Equivalent to -6.3 to 106.3% in the engineering unit (Note 1) (Note 3)                                                           | Engineering unit |                       | 106.3         | RW                                                 | RW  | RW     | RW   |                |
| LL1       | Low-low limit alarm setpoint for PV1    | Equivalent to -6.3 to 106.3% in the engineering unit (Note 1) (Note 4)                                                           | Engineering unit |                       | -6.3          | RW                                                 | RW  | RW     | RW   |                |
| DL1       | Alarm setpoint for deviation variable 1 | Equivalent to 0.0 to 106.3% in the engineering unit (Note 1) (Note 4)                                                            | Engineering unit |                       | 0.0           | RW                                                 | RW  | RW     | RW   |                |
| VL1       | Velocity alarm setpoint for PV1         | Equivalent to 0.0 to 106.3% in the engineering unit (Note 1) (Note 4)                                                            | Engineering unit |                       | 0.0           | RW                                                 | RW  | RW     | RW   |                |
| VT1       | Velocity alarm time setpoint for PV1    | 1 to 9999                                                                                                                        | s (second)       |                       | 1             | RW                                                 | RW  | RW     | RW   |                |
| HYS1      | Alarm hysteresis 1                      | Equivalent to 0.0 to 20.0% in the engineering unit (Note 1) (Note 6)                                                             | Engineering unit |                       | 2.0           | RW                                                 | RW  | RW     | RW   |                |
| MH1       | High limit setpoint of MV1              | -6.3 to 106.3 (Note 5)                                                                                                           | %                |                       | 106.3         | RW                                                 | RW  | RW     | RW   |                |
| ML1       | Low limit setpoint of MV1               | -6.3 to 106.3 (Note 5)                                                                                                           | %                |                       | -6.3          | RW                                                 | RW  | RW     | RW   |                |
| MR1       | Manual reset 1                          | -6.3 to 106.3                                                                                                                    | %                |                       | -6.3          | RW                                                 | N/A | N/A    | RW   |                |
| RB1       | Reset bias 1                            | 0.0 to 106.3                                                                                                                     | %                |                       | 0.0           | RW                                                 | RW  | RW     | RW   |                |
| PMV1      | Preset output 1 (Note 7)                | -6.3 to 106.3                                                                                                                    | %                |                       | -6.3          | RW                                                 | RW  | RW     | RW   |                |

Note 1: The engineering units set with the Engineering parameters, SCH1, SCL1, and SCDP1.

Note 2: MV (Manipulated output variable) can be set only with the MV operation key at the bottom of the front panel. MV will be displayed when the controller mode is set to cascade or selector.

Note 3: Alarm will not occur if set at a maximum value.

Note 4: Alarm will not occur if set at a minimum value.

Note 5: Be sure to set to MH1&gt;ML1. In the cascade mode, MH1 and ML1 will be used as the setpoint for the loop 2. In the selector mode, MH1 and ML1 will be the same as MH2 and ML2.

Note 6: The HYS1 setting is effective on all alarms of PH1, PL1, HH1, LL1, and DL1.

Note 7: When the controller mode is set to the cascade/selector mode, PMV will be displayed.

## PID Setting Display 2 (PID2)

| Parameter | Name                                    | Setting and Display Range                                                                                             | Unit             | Factory Default Value |               | Display and Setting Conditions for Controller Mode |     |        |      | User Set-tings |
|-----------|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------|------------------|-----------------------|---------------|----------------------------------------------------|-----|--------|------|----------------|
|           |                                         |                                                                                                                       |                  | YS1500 (SINGLE)       | YS1700 (PROG) | SINGLE                                             | CAS | SELECT | PROG |                |
| STC       | STC mode                                | OFF: STC is not operating<br>ON: STC is operating<br>Equivalent to -6.3 to 106.3% in the engineering unit (Note 1)    |                  |                       | OFF           | N/A                                                | R   | R      | R    |                |
| PV2       | Process variable 2                      | Equivalent to -6.3 to 106.3% in the engineering unit (Note 1)                                                         | Engineering unit |                       | Undefined     | N/A                                                | R   | R      | R    |                |
| SV2       | Setpoint value 2                        | Equivalent to -6.3 to 106.3% in the engineering unit (Note 1)                                                         | Engineering unit |                       | 0.0           | N/A                                                | R/W | R/W    | R/W  |                |
| MV2       | Manipulated output variable 2 (Note 2)  | -6.3 to 106.3                                                                                                         | %                |                       | -6.3          | N/A                                                | R   | R      | R    |                |
| DV2       | Deviation variable 2                    | PV2-SV2                                                                                                               | Engineering unit |                       | Undefined     | N/A                                                | R   | R      | R    |                |
| CSV2      | Cascade setting value 2                 | Equivalent to -6.3 to 106.3% in the engineering unit (Note 1)                                                         | Engineering unit |                       | Undefined     | N/A                                                | N/A | R      | N/A  |                |
| SSW       | Selector control switch                 | AUT: Automatic selection as in the setting of the engineering parameter "ATSEL"<br>1: Loop 1 output, 2: Loop 2 output |                  | (AUT)                 | (AUT)         | N/A                                                | N/A | R/W    | N/A  |                |
| PB2       | Proportional band 2                     | 0.1 to 999.9                                                                                                          | %                |                       | 999.9         | N/A                                                | R/W | R/W    | R/W  |                |
| TI2       | Integral time 2                         | 1 to 9999                                                                                                             | s (second)       |                       | 1000          | N/A                                                | R/W | R/W    | R/W  |                |
| TD2       | Derivative time 2                       | 0 to 9999(0: OFF)                                                                                                     | s (second)       |                       | 0             | N/A                                                | R/W | R/W    | R/W  |                |
| SFA2      | Adjustable setpoint filter α2           | 0.000 to 1.000                                                                                                        |                  |                       | 0.000         | N/A                                                | R/W | R/W    | R/W  |                |
| SFB2      | Adjustable setpoint filter β2           | 0.000 to 1.000                                                                                                        |                  |                       | 0.000         | N/A                                                | R/W | R/W    | R/W  |                |
| GW2       | Non-linear control gap width 2          | 0.0 to 100.0                                                                                                          | %                |                       | 0.0           | N/A                                                | R/W | R/W    | R/W  |                |
| GG2       | Non-linear control gain 2               | 0.000 to 1.000                                                                                                        |                  |                       | 1.000         | N/A                                                | R/W | R/W    | R/W  |                |
| PH2       | High limit alarm setpoint for PV2       | Equivalent to -6.3 to 106.3% in the engineering unit (Note 1) (Note 3)                                                | Engineering unit |                       | 106.3         | N/A                                                | R/W | R/W    | R/W  |                |
| PL2       | Low limit alarm setpoint for PV2        | Equivalent to -6.3 to 106.3% in the engineering unit (Note 1) (Note 4)                                                | Engineering unit |                       | -6.3          | N/A                                                | R/W | R/W    | R/W  |                |
| HH2       | High-high limit alarm setpoint for PV2  | Equivalent to -6.3 to 106.3% in the engineering unit (Note 1) (Note 3)                                                | Engineering unit |                       | 106.3         | N/A                                                | R/W | R/W    | R/W  |                |
| LL2       | Low-low limit alarm setpoint for PV2    | Equivalent to -6.3 to 106.3% in the engineering unit (Note 1) (Note 4)                                                | Engineering unit |                       | -6.3          | N/A                                                | R/W | R/W    | R/W  |                |
| DL2       | Alarm setpoint for deviation variable 2 | Equivalent to 0.0 to 106.3% in the engineering unit (Note 1) (Note 4)                                                 | Engineering unit |                       | 0.0           | N/A                                                | R/W | R/W    | R/W  |                |
| VL2       | Velocity alarm setpoint for PV2         | Equivalent to 0.0 to 106.3% in the engineering unit (Note 1) (Note 4)                                                 | Engineering unit |                       | 0.0           | N/A                                                | R/W | R/W    | R/W  |                |
| VT2       | Velocity alarm time setpoint for PV2    | 1 to 9999                                                                                                             | s (second)       |                       | 1             | N/A                                                | R/W | R/W    | R/W  |                |
| HYS2      | Alarm hysteresis 2                      | Equivalent to 0.0 to 20.0% in the engineering unit (Note 1) (Note 6)                                                  | Engineering unit |                       | 2.0           | N/A                                                | R/W | R/W    | R/W  |                |
| MH2       | High limit setpoint of MV2              | -6.3 to 106.3 (Note 5)                                                                                                | %                |                       | 106.3         | N/A                                                | R/W | R      | R/W  |                |
| ML2       | Low limit setpoint of MV2               | -6.3 to 106.3 (Note 5)                                                                                                | %                |                       | -6.3          | N/A                                                | R/W | R      | R/W  |                |
| MR2       | Manual reset 2                          | -6.3 to 106.3                                                                                                         | %                |                       | -6.3          | N/A                                                | N/A | N/A    | R/W  |                |
| RB2       | Reset bias 2                            | 0.0 to 106.3                                                                                                          | %                |                       | 0.0           | N/A                                                | R/W | R/W    | R/W  |                |
| PMV2      | Preset output 2                         | -6.3 to 106.3                                                                                                         | %                |                       | -6.3          | N/A                                                | N/A | N/A    | R/W  |                |

Note 1: The engineering units set with the Engineering parameters, SCH2, SCL2, and SCDP2.

Note 2: MV (Manipulated output variable) can be set only with the MV operation key at the bottom of the front panel. MV will be displayed when the controller mode is set to cascade or selector.

Note 3: Alarm will not occur if set at a maximum value.

Note 4: Alarm will not occur if set at a minimum value.

Note 5: Be sure to set to MH2>ML2. In the selector mode, MH2 and ML2 will be the same as MH1 and ML1.

Note 6: The HYS2 setting is effective on all alarms of PH2, PL2, HH2, LL2, and DL2.

\*The values in ( ) of YS1500/1700 factory default values mean the initial values when the controller mode is changed to the selector mode.

## STC Setting Display 1 (STC1)

| Parameter | Name                                       | Setting and Display Range                                                                                                                                                          | Unit             | Factory Default Value |               |  | Display and Setting Conditions for Controller Mode |     |        | User Set-tings |
|-----------|--------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-----------------------|---------------|--|----------------------------------------------------|-----|--------|----------------|
|           |                                            |                                                                                                                                                                                    |                  | YS1500 (SINGLE)       | YS1700 (PROG) |  | SINGLE                                             | CAS | SELECT | PROG           |
| PV1       | Process variable 1                         | Equivalent to -6.3 to 106.3% in the engineering unit (Note 1)                                                                                                                      | Engineering Unit | Undefined             |               |  | R                                                  | R   | R      | R              |
| SV1       | Setpoint value 1                           | Equivalent to -6.3 to 106.3% in the engineering unit (Note 1)                                                                                                                      | Engineering Unit | 0.0                   |               |  | RW                                                 | RW  | RW     | RW             |
| MV1       | Manipulated output variable 1 (Note 2)     | -6.3 to 106.3                                                                                                                                                                      | %                | -6.3                  |               |  | R                                                  | R   | R      | R              |
| STC       | STC mode selection                         | OFF: STC is not operating DISP: STC values displayed only<br>ON: STC is operating ATSTUP: STC automatic start-up (Note 3)                                                          |                  | OFF                   |               |  | RW                                                 | RW  | RW     | RW             |
| OD        | On-demand tuning start                     | OFF, ON                                                                                                                                                                            |                  | OFF                   |               |  | RW                                                 | RW  | RW     | RW             |
| PB1       | Proportional band 1                        | 0.1 to 999.9                                                                                                                                                                       | %                | 999.9                 |               |  | RW                                                 | RW  | RW     | RW             |
| TI1       | Integral time 1                            | 1 to 9999                                                                                                                                                                          | s (second)       | 1000                  |               |  | RW                                                 | RW  | RW     | RW             |
| TD1       | Derivative time 1                          | 0 to 9999(0: OFF)                                                                                                                                                                  | s (second)       | 0                     |               |  | RW                                                 | RW  | RW     | RW             |
| IP1       | Process type 1                             | STATIC: Static process<br>DYNAM: Astatic process (with integral characteristics)                                                                                                   |                  | STATIC                |               |  | RW                                                 | RW  | RW     | RW             |
| TR1       | Process response time 1                    | 4 to 9999                                                                                                                                                                          | s (second)       | 300                   |               |  | RW                                                 | RW  | RW     | RW             |
| NB1       | Noise band 1                               | Equivalent to 0.0 to 20.0% in the engineering unit (Note 1)                                                                                                                        | Engineering Unit | 0.0                   |               |  | RW                                                 | RW  | RW     | RW             |
| OS1       | Control target type 1                      | ZERO: Overshoot zero<br>MIN: Overshoot: Small (About 5%) Settling time: Short<br>MED: Overshoot: (About 10%) Rise time: Medium-fast<br>MAX: Overshoot: (About 15%) Rise time: Fast |                  | MED                   |               |  | RW                                                 | RW  | RW     | RW             |
| MI1       | MV applied signal span 1                   | 0.0 to 20.0                                                                                                                                                                        | %                | 5.0                   |               |  | RW                                                 | RW  | RW     | RW             |
| PMX1      | High limit setpoint of proportional band 1 | 2.0 to 999.9                                                                                                                                                                       | %                | 999.9                 |               |  | RW                                                 | RW  | RW     | RW             |
| PMN1      | Low limit setpoint of proportional band 1  | 2.0 to 999.9                                                                                                                                                                       | %                | 2.0                   |               |  | RW                                                 | RW  | RW     | RW             |
| IMX1      | High limit setpoint of integral time 1     | 1 to 9999                                                                                                                                                                          | s (second)       | 9999                  |               |  | RW                                                 | RW  | RW     | RW             |
| IMN1      | Low limit setpoint of integral time 1      | 1 to 9999                                                                                                                                                                          | s (second)       | 1                     |               |  | RW                                                 | RW  | RW     | RW             |
| DMX1      | High limit setpoint of derivative time 1   | 0 to 9999                                                                                                                                                                          | s (second)       | 2000                  |               |  | RW                                                 | RW  | RW     | RW             |
| PA1       | Calculated proportional band 1             | 2.0 to 999.9                                                                                                                                                                       | %                | 999.9                 |               |  | R                                                  | R   | R      | R              |
| IA1       | Calculated integral time 1                 | 1 to 9999                                                                                                                                                                          | s (second)       | 1000                  |               |  | R                                                  | R   | R      | R              |
| DA1       | Calculated derivative time 1               | 0 to 9999                                                                                                                                                                          | s (second)       | 0                     |               |  | R                                                  | R   | R      | R              |
| CR1       | Presumed accuracy error 1                  | 0.0 to 99.99                                                                                                                                                                       | %                | 0.00                  |               |  | R                                                  | R   | R      | R              |
| RT1       | Signal distribution ratio 1                | 0.000 to 9.999                                                                                                                                                                     |                  | 1.000                 |               |  | R                                                  | R   | R      | R              |
| LM1       | Equivalent dead time 1                     | 0 to 9999                                                                                                                                                                          | s (second)       | 0                     |               |  | R                                                  | R   | R      | R              |
| TM1       | Equivalent lag time 1                      | 0 to 9999                                                                                                                                                                          | s (second)       | 0                     |               |  | R                                                  | R   | R      | R              |
| GM1       | Equivalent process gain 1                  | 0.000 to 9.999                                                                                                                                                                     |                  | 0.000                 |               |  | R                                                  | R   | R      | R              |

Note 1: The engineering units set with the Engineering parameters, SCH1, SCL1, and SCDP1.

Note 2: MV (Manipulated output variable) can be set only with the MV operation key at the bottom of the front panel. MV will be displayed when the controller mode is set to cascade or selector.

Note 3: ATSTUP can not be set if the controller mode is set to the selector or the selector control module is being used in the programmable mode.

## STC Setting Display 2 (STC2)

| Parameter | Name                                       | Setting and Display Range                                                                                                       | Unit             | Factory Default Value |               | Display and Setting Conditions for Controller Mode |     |        |      | User Set-tings |
|-----------|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|------------------|-----------------------|---------------|----------------------------------------------------|-----|--------|------|----------------|
|           |                                            |                                                                                                                                 |                  | YS1500 (SINGLE)       | YS1700 (PROG) | SINGLE                                             | CAS | SELECT | PROG |                |
| PV2       | Process variable 2                         | Equivalent to -6.3 to 106.3% in the engineering unit (Note 1)                                                                   | Engineering Unit |                       | Undefined     | N/A                                                | R   | R      | R    |                |
| SV2       | Setpoint value 2                           | Equivalent to -6.3 to 106.3% in the engineering unit (Note 1)                                                                   | Engineering Unit |                       | 0.0           | N/A                                                | R/W | R/W    | R/W  |                |
| MV2       | Manipulated output variable 2 (Note 2)     | -6.3 to 106.3                                                                                                                   | %                |                       | -6.3          | N/A                                                | R   | R      | R    |                |
| STC       | STC mode selection                         | OFF: STC is not operating<br>ON: STC is operating<br>DISP: STC values displayed only<br>ATSTUP: STC automatic start-up (Note 3) |                  |                       | OFF           | N/A                                                | R/W | R/W    | R/W  |                |
| OD        | On-demand tuning start                     | OFF: ON                                                                                                                         |                  |                       | OFF           | N/A                                                | R/W | R/W    | R/W  |                |
| PB2       | Proportional band 2                        | 0.1 to 999.9                                                                                                                    | %                |                       | 999.9         | N/A                                                | R/W | R/W    | R/W  |                |
| TI2       | Integral time 2                            | 1 to 9999                                                                                                                       | s (second)       |                       | 1000          | N/A                                                | R/W | R/W    | R/W  |                |
| TD2       | Derivative time 2                          | 0 to 9999 (0: OFF)                                                                                                              | s (second)       |                       | 0             | N/A                                                | R/W | R/W    | R/W  |                |
| IP2       | Process type 2                             | STATIC: Static process<br>DYNAM: Astatic process (with integral characteristics)                                                |                  |                       | STATIC        | N/A                                                | R/W | R/W    | R/W  |                |
| TR2       | Process response time 2                    | 4 to 9999                                                                                                                       | s (second)       |                       | 300           | N/A                                                | R/W | R/W    | R/W  |                |
| NB2       | Noise band 2                               | Equivalent to 0.0 to 20.0% in the engineering unit (Note 1)                                                                     | Engineering Unit |                       | 0.0           | N/A                                                | R/W | R/W    | R/W  |                |
| OS2       | Control target type 2                      | ZERO: Overshoot zero<br>MIN: Overshoot: Small (About 5%)<br>MED: Overshoot: (About 10%)<br>MAX: Overshoot: (About 15%)          |                  |                       | MED           | N/A                                                | R/W | R/W    | R/W  |                |
| MI2       | MV applied signal span 2                   | 0.0 to 20.0                                                                                                                     | %                |                       | 5.0           | N/A                                                | R/W | R/W    | R/W  |                |
| PMX2      | High limit setpoint of proportional band 2 | 2.0 to 999.9                                                                                                                    | %                |                       | 999.9         | N/A                                                | R/W | R/W    | R/W  |                |
| PMN2      | Low limit setpoint of proportional band 2  | 2.0 to 999.9                                                                                                                    | %                |                       | 2.0           | N/A                                                | R/W | R/W    | R/W  |                |
| IMX2      | High limit setpoint of integral time 2     | 1 to 9999                                                                                                                       | s (second)       |                       | 9999          | N/A                                                | R/W | R/W    | R/W  |                |
| IMN2      | Low limit setpoint of integral time 2      | 1 to 9999                                                                                                                       | s (second)       |                       | 1             | N/A                                                | R/W | R/W    | R/W  |                |
| DMX2      | High limit setpoint of derivative time 2   | 0 to 9999                                                                                                                       | s (second)       |                       | 2000          | N/A                                                | R/W | R/W    | R/W  |                |
| PA2       | Calculated proportional band 2             | 2.0 to 999.9                                                                                                                    | %                |                       | 999.9         | N/A                                                | R   | R      | R    |                |
| IA2       | Calculated integral time 2                 | 1 to 9999                                                                                                                       | s (second)       |                       | 1000          | N/A                                                | R   | R      | R    |                |
| DA2       | Calculated derivative time 2               | 0 to 9999                                                                                                                       | s (second)       |                       | 0             | N/A                                                | R   | R      | R    |                |
| CR2       | Presumed accuracy error 2                  | 0.00 to 99.99                                                                                                                   | %                |                       | 0.00          | N/A                                                | R   | R      | R    |                |
| RT2       | Signal distribution ratio 2                | 0.000 to 9.999                                                                                                                  |                  |                       | 1.000         | N/A                                                | R   | R      | R    |                |
| LM2       | Equivalent dead time 2                     | 0 to 9999                                                                                                                       | s (second)       |                       | 0             | N/A                                                | R   | R      | R    |                |
| TM2       | Equivalent lag time 2                      | 0 to 9999                                                                                                                       | s (second)       |                       | 0             | N/A                                                | R   | R      | R    |                |
| GM2       | Equivalent process gain 2                  | 0.000 to 9.999                                                                                                                  |                  |                       | 0.000         | N/A                                                | R   | R      | R    |                |

Note 1: The engineering units set with the Engineering parameters, SCH2, SCL2, and SCDP2.

Note 2: MV (Manipulated output variable) can be set only with the MV operation key at the bottom of the front panel. MV will be displayed when the controller mode is set to cascade or selector.

Note 3: ATSTUP can not be set if the controller mode is set to the selector mode or the selector control module is being used in the programmable mode.

## P&amp;T Register Display (P&amp;T REG 1/3)

| Parameter | Name                  | Setting and Display Range                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Unit | Factory Default Value |               | Display and Setting Conditions for Controller Mode |     |        | User Set-tings |
|-----------|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------------------|---------------|----------------------------------------------------|-----|--------|----------------|
|           |                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |      | YS1500 (SINGLE)       | YS1700 (PROG) | SINGLE                                             | CAS | SELECT | PROG           |
| P01       | Variable parameter 1  | <p>Internal value (User program) = Maximum and Minimum value which can be expressed by floating point numbers.<br/> Setting and display range = <b>-99999</b> to <b>99999</b><br/> When this range is exceeded, '*' is displayed.</p> <p>The scale and decimal point position for each P register are set by YSS1000.</p> <p>Factory default settings for scale and decimal point position<br/> Scale high limit: 1000 (100.0 on the display)<br/> Scale low limit: 00 (0.0 on the display)<br/> Decimal point position: 1</p> |      |                       | 0.0           | N/A                                                | N/A | N/A    | R/W            |
| P02       | Variable parameter 2  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |                       | 0.0           | N/A                                                | N/A | N/A    | R/W            |
| P03       | Variable parameter 3  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |                       | 0.0           | N/A                                                | N/A | N/A    | R/W            |
| P04       | Variable parameter 4  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |                       | 0.0           | N/A                                                | N/A | N/A    | R/W            |
| P05       | Variable parameter 5  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |                       | 0.0           | N/A                                                | N/A | N/A    | R/W            |
| P06       | Variable parameter 6  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |                       | 0.0           | N/A                                                | N/A | N/A    | R/W            |
| P07       | Variable parameter 7  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |                       | 0.0           | N/A                                                | N/A | N/A    | R/W            |
| P08       | Variable parameter 8  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |                       | 0.0           | N/A                                                | N/A | N/A    | R/W            |
| P09       | Variable parameter 9  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |                       | 0.0           | N/A                                                | N/A | N/A    | R/W            |
| P10       | Variable parameter 10 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |                       | 0.0           | N/A                                                | N/A | N/A    | R/W            |
| P11       | Variable parameter 11 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |                       | 0.0           | N/A                                                | N/A | N/A    | R/W            |
| P12       | Variable parameter 12 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |                       | 0.0           | N/A                                                | N/A | N/A    | R/W            |
| P13       | Variable parameter 13 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |                       | 0.0           | N/A                                                | N/A | N/A    | R/W            |
| P14       | Variable parameter 14 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |                       | 0.0           | N/A                                                | N/A | N/A    | R/W            |
| P15       | Variable parameter 15 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |                       | 0.0           | N/A                                                | N/A | N/A    | R/W            |
| P16       | Variable parameter 16 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |                       | 0.0           | N/A                                                | N/A | N/A    | R/W            |
| P17       | Variable parameter 17 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |                       | 0.0           | N/A                                                | N/A | N/A    | R/W            |
| P18       | Variable parameter 18 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |                       | 0.0           | N/A                                                | N/A | N/A    | R/W            |
| P19       | Variable parameter 19 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |                       | 0.0           | N/A                                                | N/A | N/A    | R/W            |
| P20       | Variable parameter 20 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |                       | 0.0           | N/A                                                | N/A | N/A    | R/W            |
| P21       | Variable parameter 21 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |                       | 0.0           | N/A                                                | N/A | N/A    | R/W            |
| P22       | Variable parameter 22 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |                       | 0.0           | N/A                                                | N/A | N/A    | R/W            |
| P23       | Variable parameter 23 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |                       | 0.0           | N/A                                                | N/A | N/A    | R/W            |
| P24       | Variable parameter 24 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |                       | 0.0           | N/A                                                | N/A | N/A    | R/W            |
| P25       | Variable parameter 25 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |                       | 0.0           | N/A                                                | N/A | N/A    | R/W            |
| P26       | Variable parameter 26 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |                       | 0.0           | N/A                                                | N/A | N/A    | R/W            |
| P27       | Variable parameter 27 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |                       | 0.0           | N/A                                                | N/A | N/A    | R/W            |
| P28       | Variable parameter 28 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |                       | 0.0           | N/A                                                | N/A | N/A    | R/W            |
| P29       | Variable parameter 29 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |                       | 0.0           | N/A                                                | N/A | N/A    | R/W            |
| P30       | Variable parameter 30 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |                       | 0.0           | N/A                                                | N/A | N/A    | R/W            |



P&T Register Display (P&T REG 2/3)

| Parameter | Name                         | Setting and Display Range                                                                                                                                                                                                                                  | Unit | Factory Default Value |               | Display and Setting Conditions for Controller Mode |     |        | User Set-tings |
|-----------|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------------------|---------------|----------------------------------------------------|-----|--------|----------------|
|           |                              |                                                                                                                                                                                                                                                            |      | YS1500 (SINGLE)       | YS1700 (PROG) | SINGLE                                             | CAS | SELECT |                |
| T01       | Temporary memory register 1  | Internal value (User program) = Maximum and Minimum value which can be expressed by floating point numbers.<br>Setting and display range = -99999 to 99999<br>When this range is exceeded, '*' is displayed.<br><br>Each T register is set by user program |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R              |
| T02       | Temporary memory register 2  |                                                                                                                                                                                                                                                            |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R              |
| T03       | Temporary memory register 3  |                                                                                                                                                                                                                                                            |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R              |
| T04       | Temporary memory register 4  |                                                                                                                                                                                                                                                            |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R              |
| T05       | Temporary memory register 5  |                                                                                                                                                                                                                                                            |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R              |
| T06       | Temporary memory register 6  |                                                                                                                                                                                                                                                            |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R              |
| T07       | Temporary memory register 7  |                                                                                                                                                                                                                                                            |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R              |
| T08       | Temporary memory register 8  |                                                                                                                                                                                                                                                            |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R              |
| T09       | Temporary memory register 9  |                                                                                                                                                                                                                                                            |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R              |
| T10       | Temporary memory register 10 |                                                                                                                                                                                                                                                            |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R              |
| T11       | Temporary memory register 11 |                                                                                                                                                                                                                                                            |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R              |
| T12       | Temporary memory register 12 |                                                                                                                                                                                                                                                            |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R              |
| T13       | Temporary memory register 13 |                                                                                                                                                                                                                                                            |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R              |
| T14       | Temporary memory register 14 |                                                                                                                                                                                                                                                            |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R              |
| T15       | Temporary memory register 15 |                                                                                                                                                                                                                                                            |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R              |
| T16       | Temporary memory register 16 |                                                                                                                                                                                                                                                            |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R              |
| T17       | Temporary memory register 17 |                                                                                                                                                                                                                                                            |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R              |
| T18       | Temporary memory register 18 |                                                                                                                                                                                                                                                            |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R              |
| T19       | Temporary memory register 19 |                                                                                                                                                                                                                                                            |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R              |
| T20       | Temporary memory register 20 |                                                                                                                                                                                                                                                            |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R              |
| T21       | Temporary memory register 21 |                                                                                                                                                                                                                                                            |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R              |
| T22       | Temporary memory register 22 |                                                                                                                                                                                                                                                            |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R              |
| T23       | Temporary memory register 23 |                                                                                                                                                                                                                                                            |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R              |
| T24       | Temporary memory register 24 |                                                                                                                                                                                                                                                            |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R              |
| T25       | Temporary memory register 25 |                                                                                                                                                                                                                                                            |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R              |
| T26       | Temporary memory register 26 |                                                                                                                                                                                                                                                            |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R              |
| T27       | Temporary memory register 27 |                                                                                                                                                                                                                                                            |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R              |
| T28       | Temporary memory register 28 |                                                                                                                                                                                                                                                            |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R              |
| T29       | Temporary memory register 29 |                                                                                                                                                                                                                                                            |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R              |
| T30       | Temporary memory register 30 |                                                                                                                                                                                                                                                            |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R              |

## P&amp;T Register Display (P&amp;T REG 3/3)

| Parameter | Name                         | Setting and Display Range                                                                                                                                                                                                                                                 | Unit | Factory Default Value |               | Display and Setting Conditions for Controller Mode |     |        |      | User Set-tings |
|-----------|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------------------|---------------|----------------------------------------------------|-----|--------|------|----------------|
|           |                              |                                                                                                                                                                                                                                                                           |      | YS1500 (SINGLE)       | YS1700 (PROG) | SINGLE                                             | CAS | SELECT | PROG |                |
| T31       | Temporary memory register 31 | <p>Internal value (User program) = Maximum and Minimum value which can be expressed by floating point numbers.</p> <p>Setting and display range = -99999 to 99999</p> <p>When this range is exceeded, '*' is displayed.</p> <p>Each T register is set by user program</p> |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R    |                |
| T32       | Temporary memory register 32 |                                                                                                                                                                                                                                                                           |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R    |                |
| T33       | Temporary memory register 33 |                                                                                                                                                                                                                                                                           |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R    |                |
| T34       | Temporary memory register 34 |                                                                                                                                                                                                                                                                           |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R    |                |
| T35       | Temporary memory register 35 |                                                                                                                                                                                                                                                                           |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R    |                |
| T36       | Temporary memory register 36 |                                                                                                                                                                                                                                                                           |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R    |                |
| T37       | Temporary memory register 37 |                                                                                                                                                                                                                                                                           |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R    |                |
| T38       | Temporary memory register 38 |                                                                                                                                                                                                                                                                           |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R    |                |
| T39       | Temporary memory register 39 |                                                                                                                                                                                                                                                                           |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R    |                |
| T40       | Temporary memory register 40 |                                                                                                                                                                                                                                                                           |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R    |                |
| T41       | Temporary memory register 41 |                                                                                                                                                                                                                                                                           |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R    |                |
| T42       | Temporary memory register 42 |                                                                                                                                                                                                                                                                           |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R    |                |
| T43       | Temporary memory register 43 |                                                                                                                                                                                                                                                                           |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R    |                |
| T44       | Temporary memory register 44 |                                                                                                                                                                                                                                                                           |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R    |                |
| T45       | Temporary memory register 45 |                                                                                                                                                                                                                                                                           |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R    |                |
| T46       | Temporary memory register 46 |                                                                                                                                                                                                                                                                           |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R    |                |
| T47       | Temporary memory register 47 |                                                                                                                                                                                                                                                                           |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R    |                |
| T48       | Temporary memory register 48 |                                                                                                                                                                                                                                                                           |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R    |                |
| T49       | Temporary memory register 49 |                                                                                                                                                                                                                                                                           |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R    |                |
| T50       | Temporary memory register 50 |                                                                                                                                                                                                                                                                           |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R    |                |
| T51       | Temporary memory register 51 |                                                                                                                                                                                                                                                                           |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R    |                |
| T52       | Temporary memory register 52 |                                                                                                                                                                                                                                                                           |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R    |                |
| T53       | Temporary memory register 53 |                                                                                                                                                                                                                                                                           |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R    |                |
| T54       | Temporary memory register 54 |                                                                                                                                                                                                                                                                           |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R    |                |
| T55       | Temporary memory register 55 |                                                                                                                                                                                                                                                                           |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R    |                |
| T56       | Temporary memory register 56 |                                                                                                                                                                                                                                                                           |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R    |                |
| T57       | Temporary memory register 57 |                                                                                                                                                                                                                                                                           |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R    |                |
| T58       | Temporary memory register 58 |                                                                                                                                                                                                                                                                           |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R    |                |
| T59       | Temporary memory register 59 |                                                                                                                                                                                                                                                                           |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R    |                |
| T60       | Temporary memory register 60 |                                                                                                                                                                                                                                                                           |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R    |                |

## Parameter Setting Display (PARAMETER)

| Parameter | Name                                                | Setting and Display Range | Unit       | Factory Default Value |               | Display and Setting Conditions for Controller Mode |     |        |      | User Set-tings |
|-----------|-----------------------------------------------------|---------------------------|------------|-----------------------|---------------|----------------------------------------------------|-----|--------|------|----------------|
|           |                                                     |                           |            | YS1500 (SINGLE)       | YS1700 (PROG) | SINGLE                                             | CAS | SELECT | PROG |                |
| PLC1      | Square root extraction low cutoff setpoint for PV1  | 0.0 to 100.0              | %          | 1.0                   |               | RW                                                 | RW  | RW     | N/A  |                |
| PLG1      | First order lag time constant for PV1               | 0.0 to 800.0              | s (second) | 0.0                   |               | RW                                                 | RW  | RW     | N/A  |                |
| CLC1      | Square root extraction low cutoff setpoint for CSV1 | 0.0 to 100.0              | %          | 1.0                   |               | RW                                                 | RW  | RW     | N/A  |                |
| CLG1      | First order lag time constant for CSV1              | 0.0 to 800.0              | s (second) | 0.0                   |               | RW                                                 | RW  | RW     | N/A  |                |
| CGN1      | Ratio gain for CSV1                                 | -8.000 to 8.000           |            | 1.000                 |               | RW                                                 | RW  | RW     | N/A  |                |
| CB11      | Ratio input bias for CSV1                           | -106.3 to 106.3           | %          | 0.0                   |               | RW                                                 | RW  | RW     | N/A  |                |
| CBO1      | Ratio output bias for CSV1                          | -800.0 to 800.0           | %          | 0.0                   |               | RW                                                 | RW  | RW     | N/A  |                |
| FLG       | Feedforward lag time constant                       | 0.0 to 800.0              | s (second) | 0.0                   |               | RW                                                 | RW  | N/A    | N/A  |                |
| FGN       | Feedforward gain                                    | -8.000 to 8.000           |            | 0.000                 |               | RW                                                 | RW  | N/A    | N/A  |                |
| FBI       | Feedforward input bias                              | -106.3 to 106.3           | %          | 0.0                   |               | RW                                                 | RW  | N/A    | N/A  |                |
| FBO       | Feedforward output bias                             | -800.0 to 800.0           | %          | 0.0                   |               | RW                                                 | RW  | N/A    | N/A  |                |
| TLG       | Tracking input lag time constant                    | 0.0 to 800.0              | s (second) | 0.0                   |               | RW                                                 | RW  | RW     | N/A  |                |
| PLC2      | Square root extraction low cutoff setpoint for PV2  | 0.0 to 100.0              | %          | (1.0)                 |               | N/A                                                | RW  | RW     | N/A  |                |
| PLG2      | First order lag time constant of PV2                | 0.0 to 800.0              | s (second) | (0.0)                 |               | N/A                                                | RW  | RW     | N/A  |                |
| CLC2      | Square root extraction low cutoff setpoint for CSV2 | 0.0 to 100.0              | %          | (1.0)                 |               | N/A                                                | N/A | RW     | N/A  |                |
| CLG2      | First order lag time constant for CSV2              | 0.0 to 800.0              | s (second) | (0.0)                 |               | N/A                                                | N/A | RW     | N/A  |                |
| CGN2      | Ratio gain for CSV2                                 | -8.000 to 8.000           |            | (1.000)               |               | N/A                                                | N/A | RW     | N/A  |                |
| CB12      | Ratio input bias for CSV2                           | -106.3 to 106.3           | %          | (0.0)                 |               | N/A                                                | N/A | RW     | N/A  |                |
| CBO2      | Ratio output bias for CSV2                          | -800.0 to 800.0           | %          | (0.0)                 |               | N/A                                                | N/A | RW     | N/A  |                |

\*The values in ( ) of YS1500 factory default values mean the initial values when the Controller mode is changed to the Selector/Cascade mode.

## Input and Output Data Display (I/O Data)

| Parameter | Name                                        | Setting and Display Range | Unit | Factory Default Value |               | Display and Setting Conditions for Controller Mode |     |        |      | User Set-tings |
|-----------|---------------------------------------------|---------------------------|------|-----------------------|---------------|----------------------------------------------------|-----|--------|------|----------------|
|           |                                             |                           |      | YS1500 (SINGLE)       | YS1700 (PROG) | SINGLE                                             | CAS | SELECT | PROG |                |
| X1        | Analog input 1                              | -25.0 to 125.0            | %    | -25.0                 |               | R                                                  | R   | R      | R    |                |
| X2        | Analog input 2                              |                           | %    | -25.0                 |               | R                                                  | R   | R      | R    |                |
| X3        | Analog input 3                              |                           | %    | -25.0                 |               | R                                                  | R   | R      | R    |                |
| X4        | Analog input 4                              |                           | %    | -25.0                 |               | R                                                  | R   | R      | R    |                |
| X5        | Analog input 5/Direct input signal output   |                           | %    | -25.0                 |               | R                                                  | R   | R      | R    |                |
| X6        | Analog input 6 (Note 1)                     |                           | %    | -25.0                 |               | R                                                  | R   | R      | R    |                |
| X7        | Analog input 7 (Note 1)                     |                           | %    | -25.0                 |               | R                                                  | R   | R      | R    |                |
| X8        | Analog input 8 (Note 1)                     |                           | %    | -25.0                 |               | R                                                  | R   | R      | R    |                |
| Y1        | Analog output 1                             | -20.0 to 106.3            | %    | -20.0                 |               | R                                                  | R   | R      | R    |                |
| Y2        | Analog output 2                             |                           | %    | -6.3                  |               | R                                                  | R   | R      | R    |                |
| Y3        | Analog output 3                             |                           | %    | -6.3                  |               | R                                                  | R   | R      | R    |                |
| Y4        | Analog output 4 (Note 1)                    | -6.3 to 106.3             | %    | -6.3                  |               | R                                                  | R   | R      | R    |                |
| Y5        | Analog output 5 (Note 2)                    |                           | %    | -6.3                  |               | R                                                  | R   | R      | R    |                |
| Y6        | Analog output 6 (Note 2)                    |                           | %    | -6.3                  |               | R                                                  | R   | R      | R    |                |
| D101 DO01 | Digital input 1/Digital output 1            |                           | %    | -6.3                  |               | R                                                  | R   | R      | R    |                |
| D102 DO02 | Digital input 2/Digital output 2            | 0, 1                      | %    | -6.3                  |               | N/A                                                | N/A | N/A    | N/A  |                |
| D103 DO03 | Digital input 3/Digital output 3            |                           | %    | -6.3                  |               | N/A                                                | N/A | N/A    | N/A  |                |
| D104 DO04 | Digital input 4/Digital output 4            |                           | %    | -6.3                  |               | N/A                                                | N/A | N/A    | N/A  |                |
| D105 DO05 | Digital input 5/Digital output 5            |                           | %    | -6.3                  |               | N/A                                                | N/A | N/A    | N/A  |                |
| D106 DO06 | Digital input 6/Digital output 6            |                           | %    | -6.3                  |               | N/A                                                | N/A | N/A    | N/A  |                |
| D107 DO07 | Digital input 7/Digital output 7 (Note 1)   |                           | %    | -6.3                  |               | N/A                                                | N/A | N/A    | N/A  |                |
| D108 DO08 | Digital input 8/Digital output 8 (Note 1)   |                           | %    | -6.3                  |               | N/A                                                | N/A | N/A    | N/A  |                |
| D109 DO09 | Digital input 9/Digital output 9 (Note 1)   |                           | %    | -6.3                  |               | N/A                                                | N/A | N/A    | N/A  |                |
| D110 DO10 | Digital input 10/Digital output 10 (Note 1) |                           | %    | -6.3                  |               | N/A                                                | N/A | N/A    | N/A  |                |
| DO11      | Digital output 11                           |                           | %    | -6.3                  |               | N/A                                                | N/A | N/A    | N/A  |                |
| DO12      | Digital output 12                           |                           | %    | -6.3                  |               | N/A                                                | N/A | N/A    | N/A  |                |
| DO13      | Digital output 13                           |                           | %    | -6.3                  |               | N/A                                                | N/A | N/A    | N/A  |                |
| DO14      | Digital output 14                           |                           | %    | -6.3                  |               | N/A                                                | N/A | N/A    | N/A  |                |
| DO15      | Digital output 15                           |                           | %    | -6.3                  |               | N/A                                                | N/A | N/A    | N/A  |                |
| DO16      | Digital output 16                           |                           | %    | -6.3                  |               | N/A                                                | N/A | N/A    | N/A  |                |

Note 1: This value is displayed only on YS1700 Basic type with expandable I/O, and it is always displayed in the programmable mode.

Note 2: Y5 and Y6 are not actual terminals. They are used as the inside registers.

## &lt;Engineering Parameters&gt;

## Configuration Display 1 (CONFIG1)

If you change the controller mode (CTL), each parameter will be initialized.

| Parameter | Name                                          | Setting and Display Range                                                                                                                                                                                                                                                                                                                                                                                      | Unit | Factory Default Value |               | Display and Setting Conditions for Controller Mode |     |        |      | User Set-tings |
|-----------|-----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------------------|---------------|----------------------------------------------------|-----|--------|------|----------------|
|           |                                               |                                                                                                                                                                                                                                                                                                                                                                                                                |      | YS1500 (SINGLE)       | YS1700 (PROG) | SINGLE                                             | CAS | SELECT | PROG |                |
| SET       | Enable/Disable setting                        | INH: Setting impossible ENBL: Setting possible (Note 1)                                                                                                                                                                                                                                                                                                                                                        |      |                       | INH           |                                                    | RW  | RW     | RW   |                |
| CTL       | Controller mode selection                     | PROG: Programmable mode (Note 2)<br>SINGLE: Single-loop mode CAS: Cascade mode SELECT: Selector mode                                                                                                                                                                                                                                                                                                           |      |                       | SINGLE        |                                                    | RW  | RW     | RW   |                |
| START     | Start mode                                    | AUT: HOT start<br>M-COLD: Power failure duration<2 sec.; HOT Start, Power failure duration≥2 sec.; M-COLD start<br>A-COLD: Power failure duration<2 sec.; HOT Start, Power failure duration≥2 sec.; A-COLD start<br>C-COLD: Power failure duration<2 sec.; HOT Start, Power failure duration≥2 sec.; C-COLD start<br>COLD: Power failure duration<2 sec.; HOT Start, Power failure duration≥2 sec.; COLD start |      |                       | M-COLD        |                                                    | RW  | RW     | RW   |                |
| CYCL      | Control cycle                                 | 200 ms, 100 ms, 50 ms                                                                                                                                                                                                                                                                                                                                                                                          |      |                       | 200 ms        |                                                    | N/A | N/A    | R    |                |
| ATSEL     | Autoselector selection                        | LOW: Lower output value, HIGH: Higher output value                                                                                                                                                                                                                                                                                                                                                             |      |                       | (LOW)         |                                                    | N/A | N/A    | RW   |                |
| FDSP      | Power-on initial display                      | LOOP1: LOOP 1 Display, LOOP2: LOOP 2 Display, MTR1: METER 1 Display, MTR2: METER 2 Display, TRND1: TREND1 Display, TRND2: TREND2 Display, TRND3: TREND 3 Display, ALARM: ALARM Display, DUAL1: DUAL 1 Display, DUAL2: DUAL 2 Display                                                                                                                                                                           |      |                       | LOOP1         |                                                    | RW  | RW     | RW   |                |
| LOOP1     | LOOP 1 Display ON/OFF                         | OFF, ON (Note 3)                                                                                                                                                                                                                                                                                                                                                                                               |      | ON                    | ON            |                                                    | RW  | RW     | RW   |                |
| LOOP2     | LOOP 2 Display ON/OFF                         |                                                                                                                                                                                                                                                                                                                                                                                                                |      | ON                    | ON            |                                                    | N/A | RW     | RW   |                |
| MTR1      | METER 1 Display ON/OFF                        |                                                                                                                                                                                                                                                                                                                                                                                                                |      | ON                    | ON            |                                                    | RW  | RW     | RW   |                |
| MTR2      | METER 2 Display ON/OFF                        |                                                                                                                                                                                                                                                                                                                                                                                                                |      | ON                    | ON            |                                                    | N/A | RW     | RW   |                |
| TRND1     | TREND 1 Display ON/OFF                        |                                                                                                                                                                                                                                                                                                                                                                                                                |      | ON                    | ON            |                                                    | RW  | RW     | RW   |                |
| TRND2     | TREND 2 Display ON/OFF                        |                                                                                                                                                                                                                                                                                                                                                                                                                |      | ON                    | ON            |                                                    | N/A | RW     | RW   |                |
| TRND3     | TREND 3 Display ON/OFF                        |                                                                                                                                                                                                                                                                                                                                                                                                                |      | ON                    | ON            |                                                    | RW  | RW     | RW   |                |
| ALARM     | ALARM Display ON/OFF                          |                                                                                                                                                                                                                                                                                                                                                                                                                |      | ON                    | ON            |                                                    | RW  | RW     | RW   |                |
| DUAL1     | DUAL 1 Display ON/OFF                         |                                                                                                                                                                                                                                                                                                                                                                                                                |      | ON                    | ON            |                                                    | N/A | RW     | RW   |                |
| DUAL2     | DUAL 2 Display ON/OFF                         |                                                                                                                                                                                                                                                                                                                                                                                                                |      | ON                    | ON            |                                                    | N/A | RW     | RW   |                |
| CAMLK     | Keylock for C/A/M mode change                 | UNLOCK, LOCK                                                                                                                                                                                                                                                                                                                                                                                                   |      | UNLOCK                | UNLOCK        |                                                    | RW  | RW     | RW   |                |
| SVLK      | Keylock for SV change                         |                                                                                                                                                                                                                                                                                                                                                                                                                |      | UNLOCK                | UNLOCK        |                                                    | RW  | RW     | RW   |                |
| M/LK      | Keylock for MV change                         |                                                                                                                                                                                                                                                                                                                                                                                                                |      | UNLOCK                | UNLOCK        |                                                    | RW  | RW     | RW   |                |
| SCOOD     | Selection of Current Output Circuit Diagnosis |                                                                                                                                                                                                                                                                                                                                                                                                                |      | ALARM                 | ALARM         |                                                    | RW  | RW     | RW   |                |
| Y3TP      | Analog output 3 current/voltage switching     | FAIL: DIA FALL in the event of an error, ALARM: OOP ALARM in the event of an error, OFF: No diagnosis                                                                                                                                                                                                                                                                                                          |      |                       | 1-5V          |                                                    | N/A | N/A    | RW   |                |
| Y2S       | Analog output 2 selection                     | OFF: None, PV1: Process variable 1, SV1: Setpoint value 1, PV2: Process variable 2, SV2: Setpoint value 2, MV: Manipulated output variable, X1: Analog input 1, X2: Analog input 2, X3: Analog input 3, X4: Analog input 4, X5: Analog input 5, X6: Analog input 6 (Note 4), X7: Analog input 7 (Note 4), X8: Analog input 8 (Note 4)                                                                          |      | MV                    | SV1           |                                                    | RW  | RW     | N/A  |                |
| Y3S       | Analog output 3 selection                     |                                                                                                                                                                                                                                                                                                                                                                                                                |      |                       |               |                                                    | RW  | RW     | N/A  |                |
| Y4S       | Analog output 4 selection (Note 4)            |                                                                                                                                                                                                                                                                                                                                                                                                                |      |                       |               |                                                    | RW  | RW     | N/A  |                |
| PROG      | User program name                             | Alphanumeric character 8 digits (set by YSS1000)                                                                                                                                                                                                                                                                                                                                                               |      |                       | DEFAULT       |                                                    | N/A | N/A    | R    |                |
| REV       | System revision number                        | Style number and Revision number of the product                                                                                                                                                                                                                                                                                                                                                                |      |                       | Sx.xx         |                                                    | R   | R      | R    |                |
| MCU       | Main CPU version number                       | Main CPU version number                                                                                                                                                                                                                                                                                                                                                                                        |      |                       | Rx.xx.xx      |                                                    | R   | R      | R    |                |
| DCU       | Display CPU version number                    | Display CPU version number                                                                                                                                                                                                                                                                                                                                                                                     |      |                       | Rx.xx.xx      |                                                    | R   | R      | R    |                |
| PARA      | MCU parameter version number                  | MCU parameter version number                                                                                                                                                                                                                                                                                                                                                                                   |      |                       | Rx.xx.xx      |                                                    | R   | R      | R    |                |
| COMP      | Compile version number                        | Compile version number                                                                                                                                                                                                                                                                                                                                                                                         |      |                       | Rx.xx.xx      |                                                    | N/A | N/A    | R    |                |

Note 1: When the SET parameter is set to "ENBL", [STOP] will appear on the right of the display title, and the manipulated output and alarm output will be kept.

Note 2: "PROG" (User program name) is displayed only on YS1700.

Note 3: Loop1 is always displayed even if you set "OFF" for all lines. When you do not use TRND3, set it to "OFF".

Note 4: This value is displayed only on YS1700 Basic type with expandable I/O.

\*The values in ( ) of YS1500/1700 factory default values mean the initial values when the controller mode is changed to the selector/cascade mode

Configuration Display 2 (CONFIG2)

| Parameter | Name                          | Setting and Display Range                                                                                                                        | Unit | Factory Default Value |               |        |     | Display and Setting Conditions for Controller Mode |      |    |  | User Set-tings |
|-----------|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------------------|---------------|--------|-----|----------------------------------------------------|------|----|--|----------------|
|           |                               |                                                                                                                                                  |      | YS1500 (SINGLE)       | YS1700 (PROG) | SINGLE | CAS | SELECT                                             | PROG |    |  |                |
| SET       | Enable/Disable setting        | INHB: Setting impossible ENBL: Setting possible (Note1)                                                                                          |      |                       | INHB          | RW     | RW  | RW                                                 | RW   | RW |  |                |
| CMOD1     | C-mode 1                      | -: None, CAS: Analog cascade setting mode, CMP: Computer cascade setting mode                                                                    |      |                       | -             | RW     | RW  | RW                                                 | RW   | RW |  |                |
| BMOD1     | Backup mode 1                 | BUM: Manual operation backup mode, BUA: Automatic operation backup mode                                                                          |      |                       | BUM           | RW     | RW  | RW                                                 | RW   | RW |  |                |
| CNT1      | Control type 1                | PID: Standard PID (Note 2), S-PI: Sample-and-hold PI control (Note 2), BATCH: Batch PID control (Note 2), PD: Proportional (PD) control (Note 2) |      |                       | PID           | RW     | RW  | RW                                                 | RW   | RW |  |                |
| ALG1      | Control operation formula 1   | I-PD: PV proportional type PID, PH-D: PV derivative type PID, SVF: Adjustable setpoint filter                                                    |      |                       | I-PD          | RW     | RW  | RW                                                 | RW   | RW |  |                |
| ACT1      | Control operation direction 1 | RVS: Reverse action DIR: Direct action                                                                                                           |      |                       | RVS           | RW     | RW  | RW                                                 | RW   | RW |  |                |
| VDIR1     | Valve direction 1             | C-O: MV 0%=Close, 100%=Open, O-C: MV 0%=Open, 100%=Close                                                                                         |      |                       | C-O           | RW     | RW  | RW                                                 | RW   | RW |  |                |
| SCH1      | 100% value of scale 1         | -80000 to 80000                                                                                                                                  |      |                       | 1000          | RW     | RW  | RW                                                 | RW   | RW |  |                |
| SCL1      | 0% value of scale 1           | -80000 to 80000                                                                                                                                  |      |                       | 0             | RW     | RW  | RW                                                 | RW   | RW |  |                |
| SCDP1     | Decimal point position 1      | #####. ###. ##. ###. #. #####                                                                                                                    |      |                       | #####         | RW     | RW  | RW                                                 | RW   | RW |  |                |
| SCDV1     | Scale division 1              | 1, 2, 4, 5, 7, 10, 14, 20                                                                                                                        |      |                       | 10            | RW     | RW  | RW                                                 | RW   | RW |  |                |
| UNIT1     | Engineering unit 1            | Alphanumeric character 7 digits                                                                                                                  |      |                       | %             | RW     | RW  | RW                                                 | RW   | RW |  |                |
| TAG1      | Tag number 1                  | Alphanumeric character 12 digits                                                                                                                 |      |                       | --YS1500--    | RW     | RW  | RW                                                 | RW   | RW |  |                |
| CMOD2     | C-mode 2                      | -: None, CAS: Analog cascade setting mode, CMP: Computer cascade setting mode                                                                    |      |                       | -             | N/A    | N/A | RW                                                 | RW   | RW |  |                |
| BMOD2     | Backup mode 2                 | BUM: Manual operation backup, BUA: Automatic operation backup                                                                                    |      |                       | BUM           | N/A    | N/A | N/A                                                | RW   | RW |  |                |
| CNT2      | Control type 2                | PID: Standard PID (Note 2), S-PI: Sample-and-hold PI control (Note 2), BATCH: Batch PID control (Note 2), PD: Proportional (PD) control (Note 2) |      |                       | PID           | N/A    | RW  | RW                                                 | RW   | RW |  |                |
| ALG2      | Control operation formula 2   | I-PD: PV proportional type PID, PH-D: PV derivative type PID, SVF: Adjustable setpoint filter                                                    |      |                       | I-PD          | N/A    | RW  | RW                                                 | RW   | RW |  |                |
| ACT2      | Control operation direction 2 | RVS: Reverse action DIR: Direct action                                                                                                           |      |                       | RVS           | N/A    | RW  | RW                                                 | RW   | RW |  |                |
| VDIR2     | Valve direction 2             | C-O: MV 0%=Close, 100%=Open, O-C: MV 0%=Open, 100%=Close                                                                                         |      |                       | C-O           | N/A    | N/A | N/A                                                | RW   | RW |  |                |
| SCH2      | 100% value of scale 2         | -80000 to 80000                                                                                                                                  |      |                       | 1000          | N/A    | RW  | RW                                                 | RW   | RW |  |                |
| SCL2      | 0% value of scale 2           | -80000 to 80000                                                                                                                                  |      |                       | 0             | N/A    | RW  | RW                                                 | RW   | RW |  |                |
| SCDP2     | Decimal point position 2      | #####. ###. ##. ###. #. #####                                                                                                                    |      |                       | #####         | N/A    | RW  | RW                                                 | RW   | RW |  |                |
| SCDV2     | Scale division 2              | 1, 2, 4, 5, 7, 10, 14, 20                                                                                                                        |      |                       | 10            | N/A    | RW  | RW                                                 | RW   | RW |  |                |
| UNIT2     | Engineering unit 2            | Alphanumeric character 7 digits                                                                                                                  |      |                       | %             | N/A    | RW  | RW                                                 | RW   | RW |  |                |
| TAG2      | Tag number 2                  | Alphanumeric character 12 digits                                                                                                                 |      |                       | --YS1700--    | N/A    | RW  | RW                                                 | RW   | RW |  |                |

Note 1: When the SET parameter is set to "ENBL", [STOP] will appear on the right of the display title, and the manipulated output and alarm output will be kept.

Note 2: In the single-loop mode, "PID", "S-Pi" or "PD" is available for setting. In the cascade mode, "PID" or "S-Pi" is available for setting. "BATCH" is for programmable mode.

Be sure to set the ALG1 and ALG2 (Control operation formula 1, 2) to "PI-D". The same settings should be done to each control module (basic/cascade/selector control) used in the programmable mode.

## Configuration Display 3 (CONFIG3)

| Parameter | Name                                   | Setting and Display Range                               | Unit | Factory Default Value |               | Display and Setting Conditions for Controller Mode |     |        |      | User Set-tings |
|-----------|----------------------------------------|---------------------------------------------------------|------|-----------------------|---------------|----------------------------------------------------|-----|--------|------|----------------|
|           |                                        |                                                         |      | YS1500 (SINGLE)       | YS1700 (PROG) | SINGLE                                             | CAS | SELECT | PROG |                |
| SET       | Enable/Disable setting                 | INHB: Setting impossible ENBL: Setting possible (Note1) |      | INHB                  |               | RW                                                 | RW  | RW     | N/A  |                |
| PFKEY     | Selection of PF key function           | -: None, STC: Self tuning                               |      | -                     |               | RW                                                 | RW  | RW     | N/A  |                |
| TRKSW     | Selection of tracking function         | -: None SVTRK: SV tracking, PVTRK: PV tracking          |      | -                     |               | RW                                                 | N/A | N/A    | N/A  |                |
| PSR1      | Square root extraction for PV1         |                                                         |      | OFF                   |               | RW                                                 | RW  | RW     | N/A  |                |
| FX1       | 10-segment linearizer function for PV1 |                                                         |      | OFF                   |               | RW                                                 | RW  | RW     | N/A  |                |
| CSR1      | Square root extraction for CSV         |                                                         |      | OFF                   |               | RW                                                 | RW  | RW     | N/A  |                |
| CSW1      | Ratio operation for CSV1               | OFF, ON                                                 |      | OFF                   |               | RW                                                 | RW  | RW     | N/A  |                |
| FSW       | Feedforward gain operation             |                                                         |      | OFF                   |               | RW                                                 | RW  | N/A    | N/A  |                |
| FON       | Addition of feedforward output         |                                                         |      | OFF                   |               | RW                                                 | RW  | N/A    | N/A  |                |
| PSR2      | Square root extraction for PV2         |                                                         |      | (OFF)                 |               | N/A                                                | RW  | RW     | N/A  |                |
| FX2       | 10-segment linearizer function for PV2 | OFF, ON                                                 |      | (OFF)                 |               | N/A                                                | RW  | RW     | N/A  |                |
| CSR2      | Square root extraction for CSV2        |                                                         |      | (OFF)                 |               | N/A                                                | N/A | RW     | N/A  |                |
| CSW2      | Ratio operation for CSV2               |                                                         |      | (OFF)                 |               | N/A                                                | N/A | RW     | N/A  |                |

Note 1: When the SET parameter is set to "ENBL", [STOP] will appear on the right of the display title, and the manipulated output and alarm output will be kept.

\*The values in ( ) of YS1500 factory default values mean the initial values when the controller mode is changed to the selector/cascade mode

## Input Specification Setting Display (SC MAINT)

See Chapter 5, Adjustment of Direct Inputs (Temperature/Resistance/Frequency), in the YS1500 Indicating Controller/YS1700 Programmable Indicating Controller User's Manual.

## Password Setting Display (PASSWORD)

See 4.2.2, Inhibiting/Enabling Parameter Change, in the YS1500 Indicating Controller/YS1700 Programmable Indicating Controller User's Manual.

## Sample &amp; Batch Setting Display (SMPL &amp; BATCH)/Sample Setting Display (SMPL)

| Parameter | Name                                   | Setting and Display Range | Unit       | Factory Default Value |               | Display and Setting Conditions for Controller Mode |     |        |      | User Set-tings |
|-----------|----------------------------------------|---------------------------|------------|-----------------------|---------------|----------------------------------------------------|-----|--------|------|----------------|
|           |                                        |                           |            | YS1500 (SINGLE)       | YS1700 (PROG) | SINGLE                                             | CAS | SELECT | PROG |                |
| STM1      | Sample PI sampled time 1               | 0 to 9999                 | s (second) | 0                     | 0             | RW                                                 | RW  | N/A    | RW   |                |
| SWD1      | Sample-and-hold PI control time span 1 | 0 to 9999                 | s (second) | 0                     | 0             | RW                                                 | RW  | N/A    | RW   |                |
| BD1       | Batch PID deviation setting value 1    | 0.0 to 100.0              | %          |                       | 0.0           | N/A                                                | N/A | N/A    | RW   |                |
| BB1       | Batch PID bias 1                       | 0.0 to 100.0              | %          |                       | 0.0           | N/A                                                | N/A | N/A    | RW   |                |
| BL1       | Batch PID lock-up width 1              | 0.0 to 100.0              | %          |                       | 0.0           | N/A                                                | N/A | N/A    | RW   |                |
| STM2      | Sample PI sampled time 2               | 0 to 9999                 | s (second) |                       | 0             | N/A                                                | RW  | N/A    | RW   |                |
| SWD2      | Sample-and-hold PI control time span 2 | 0 to 9999                 | s (second) |                       | 0             | N/A                                                | RW  | N/A    | RW   |                |
| BD2       | Batch PID deviation setting value 2    | 0.0 to 100.0              | %          |                       | 0.0           | N/A                                                | N/A | N/A    | RW   |                |
| BB2       | Batch PID bias 2                       | 0.0 to 100.0              | %          |                       | 0.0           | N/A                                                | N/A | N/A    | RW   |                |
| BL2       | Batch PID lock-up width 2              | 0.0 to 100.0              | %          |                       | 0.0           | N/A                                                | N/A | N/A    | RW   |                |

## Setting Display for Operation Display (DISPLAY)

| Parameter | Name                                            | Setting and Display Range                                                                                                                                                                                                                                                                                                                                                    | Unit | Factory Default Value |               | Display and Setting Conditions for Controller Mode |     |        |      | User Set-tings |
|-----------|-------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------------------|---------------|----------------------------------------------------|-----|--------|------|----------------|
|           |                                                 |                                                                                                                                                                                                                                                                                                                                                                              |      | YS1500 (SINGLE)       | YS1700 (PROG) | SINGLE                                             | CAS | SELECT | PROG |                |
| SET       | Enable/Disable setting                          | INHB: Setting impossible ENBL: Setting possible (Note1)                                                                                                                                                                                                                                                                                                                      |      | INHB                  |               | RW                                                 | RW  | RW     | RW   |                |
| LP1C      | LOOP 1 color selection                          |                                                                                                                                                                                                                                                                                                                                                                              |      | GREEN                 |               | RW                                                 | RW  | RW     | RW   |                |
| LP2C      | LOOP 2 color selection                          | GREEN, AQUA, PINK, ORANGE                                                                                                                                                                                                                                                                                                                                                    |      |                       | AQUA          | N/A                                                | RW  | RW     | RW   |                |
| BKCL      | Background color selection                      | BLACK, WHITE, BLUE                                                                                                                                                                                                                                                                                                                                                           |      |                       | BLACK         | RW                                                 | RW  | RW     | RW   |                |
| MTMG1     | 10-exponential scale factor for METER 1 Display |                                                                                                                                                                                                                                                                                                                                                                              |      |                       | AUTO          | RW                                                 | RW  | RW     | RW   |                |
| MTMG2     | 10-exponential scale factor for METER 2 Display | AUTO, 10 <sup>-5</sup> , 10 <sup>-4</sup> , 10 <sup>-3</sup> , 10 <sup>-2</sup> , 10 <sup>-1</sup> , 10 <sup>0</sup> , 10 <sup>1</sup> , 10 <sup>2</sup> , 10 <sup>3</sup> , 10 <sup>4</sup> , 10 <sup>5</sup>                                                                                                                                                               |      |                       | AUTO          | N/A                                                | RW  | RW     | RW   |                |
| TR1PV     | PV1 trend ON/OFF for TREND 1 Display            |                                                                                                                                                                                                                                                                                                                                                                              |      | ON                    |               | RW                                                 | RW  | RW     | RW   |                |
| TR1SV     | SV1 trend ON/OFF for TREND 1 Display            |                                                                                                                                                                                                                                                                                                                                                                              |      | ON                    |               | RW                                                 | RW  | RW     | RW   |                |
| TR1MV     | MV1 trend ON/OFF for TREND 1 Display            |                                                                                                                                                                                                                                                                                                                                                                              |      | OFF                   |               | RW                                                 | RW  | RW     | RW   |                |
| TR2PV     | PV2 trend ON/OFF for TREND 2 Display            | OFF, ON                                                                                                                                                                                                                                                                                                                                                                      |      |                       | ON            | N/A                                                | RW  | RW     | RW   |                |
| TR2SV     | SV2 trend ON/OFF for TREND 2 Display            |                                                                                                                                                                                                                                                                                                                                                                              |      |                       | ON            | N/A                                                | RW  | RW     | RW   |                |
| TR2MV     | MV2 trend ON/OFF for TREND 2 Display            |                                                                                                                                                                                                                                                                                                                                                                              |      |                       | OFF           | N/A                                                | RW  | RW     | RW   |                |
| TRDS1     | Data selection 1 for TREND 3 Display            | OFF: None, PV1: Process variable 1, SV1: Setpoint value 1, MV1: Manipulated output variable 1, PV2: Process variable 2, SV2: Setpoint value 2, MV2: Manipulated output variable 2, X1: Analog input 1, X2: Analog input 2, X3: Analog input 3, X4: Analog input 4, X5: Analog input 5, X6: Analog input 6 (Note 2), X7: Analog input 7 (Note 2), X8: Analog input 8 (Note 2) |      |                       | PV1           | RW                                                 | RW  | RW     | RW   |                |
| TRDS2     | Data selection 2 for TREND 3 Display            |                                                                                                                                                                                                                                                                                                                                                                              |      |                       | SV1           | RW                                                 | RW  | RW     | RW   |                |
| TRDS3     | Data selection 3 for TREND 3 Display            |                                                                                                                                                                                                                                                                                                                                                                              |      |                       | MV1           | RW                                                 | RW  | RW     | RW   |                |
| TRDS4     | Data selection 4 for TREND 3 Display            | Y1: Analog output 1, Y2: Analog output 2, Y3: Analog output 3, Y4: Analog output 4 (Note 2)                                                                                                                                                                                                                                                                                  |      |                       | OFF           | RW                                                 | RW  | RW     | RW   |                |
| TRDT1     | TREND 1 Display time span                       | 1M: 1min., 5M: 5min., 10M: 10min., 30M: 30min., 1H: 1hour, 5H: 5hours, 10H: 10hours, 30H: 30hours                                                                                                                                                                                                                                                                            |      |                       | 1M            | RW                                                 | RW  | RW     | RW   |                |
| TRDT2     | TREND 2 Display time span                       |                                                                                                                                                                                                                                                                                                                                                                              |      |                       | 1M            | N/A                                                | RW  | RW     | RW   |                |
| TRDT3     | TREND 3 Display time span                       |                                                                                                                                                                                                                                                                                                                                                                              |      |                       | 1M            | RW                                                 | RW  | RW     | RW   |                |
| TR3DV     | Scale division for TREND3 Display               | 1, 2, 4, 5, 7, 10, 14, 20                                                                                                                                                                                                                                                                                                                                                    |      |                       | 10            | RW                                                 | RW  | RW     | RW   |                |
| ACTD1     | Active color display selection 1                | OFF: None, PH1: High limit alarm for PV1 PL1: Low limit alarm for PV1, HH1: High-high limit alarm for PV1, LL1: Low-low limit alarm for PV1, DL1: Alarm for deviation variable 1, VL1: Velocity alarm for PV1, DL1 VL1: Alarm for deviation variable 1/ Velocity alarm for PV1, 1-ALM: OR for all alarms of the loop 1                                                       |      |                       | OFF           | RW                                                 | RW  | RW     | RW   |                |
| ACTD2     | Active color display selection 2                | OFF: None, PH2: High limit alarm for PV2 PL2: Low limit alarm for PV2, HH2: High-high limit alarm for PV2, LL2: Low-low limit alarm for PV2, DL2: Alarm for deviation variable 2, VL2: Velocity alarm for PV2, DL2 VL2: Alarm for deviation variable 2/ Velocity alarm for PV2, 2-ALM: OR for all alarms of the loop 2                                                       |      |                       | OFF           | N/A                                                | RW  | RW     | RW   |                |
| TAGAL     | Color inversion of tag number                   | OFF, ON                                                                                                                                                                                                                                                                                                                                                                      |      |                       | OFF           | RW                                                 | RW  | RW     | RW   |                |
| DISP1     | Display register 1 selection                    | -, P01 to P30                                                                                                                                                                                                                                                                                                                                                                |      |                       | -             | N/A                                                | N/A | N/A    | N/A  |                |
| NAME1     | Name of display register 1                      | Alphanumeric character 3 digits                                                                                                                                                                                                                                                                                                                                              |      |                       | PRM           | N/A                                                | N/A | N/A    | N/A  |                |
| DISP2     | Display register 2 selection                    | -, P01 to P30                                                                                                                                                                                                                                                                                                                                                                |      |                       | -             | N/A                                                | N/A | N/A    | N/A  |                |
| NAME2     | Name of display register 2                      | Alpha numeric character 3 digits                                                                                                                                                                                                                                                                                                                                             |      |                       | PRM           | N/A                                                | N/A | N/A    | N/A  |                |

Note 1: When the SET parameter is set to "ENBL", [STOP] will appear on the right of the display title, and the manipulated output and alarm output will be kept.

Note 2: This value is displayed only on YS1700 Basic type with expandable I/O.



## LCD Setting Display (LCD)

| Parameter | Name                         | Setting and Display Range                                          | Unit | Factory Default Value |               | Display and Setting Conditions for Controller Mode |     |        |      | User Set-tings |
|-----------|------------------------------|--------------------------------------------------------------------|------|-----------------------|---------------|----------------------------------------------------|-----|--------|------|----------------|
|           |                              |                                                                    |      | YS1500 (SINGLE)       | YS1700 (PROG) | SINGLE                                             | CAS | SELECT | PROG |                |
| SET       | Enable/Disable setting       | INH: Setting impossible ENBL: Setting possible (Note1)             |      |                       | INH           |                                                    |     |        |      |                |
| ECO       | LCD backlight auto-off timer | OFF: Timer function OFF, ON: Timer function ON (Off timer: 30 min) |      |                       | OFF           |                                                    |     |        |      |                |
| CTRS      | LCD contrast adjustment      | 0 to 10                                                            |      |                       | 5             |                                                    |     |        |      |                |
| BRT       | LCD brightness adjustment    | 0 to 5                                                             |      |                       | 1             |                                                    |     |        |      |                |

Note 1: When the SET parameter is set to "ENBL", [STOP] will appear on the right of the display title, and the manipulated output and alarm output will be kept.

## Communication Setting Display (COMM)

| Parameter | Name                                                                  | Setting and Display Range                                                                                                                                                                                                     | Unit | Factory Default Value                      |               | Display and Setting Conditions for Controller Mode |     |        |      | User Set-tings |
|-----------|-----------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|--------------------------------------------|---------------|----------------------------------------------------|-----|--------|------|----------------|
|           |                                                                       |                                                                                                                                                                                                                               |      | YS1500 (SINGLE)                            | YS1700 (PROG) | SINGLE                                             | CAS | SELECT | PROG |                |
| SET       | Enable/Disable setting                                                | INHB: Setting impossible ENBL: Setting possible (Note1)                                                                                                                                                                       |      | INHB                                       |               | RW                                                 | RW  | RW     | RW   |                |
| COMM      | Communication selection                                               | -, RS-485, DCS-LCS                                                                                                                                                                                                            |      | No option:-<br>/A31/RS-485<br>/A32/DCS-LCS |               | R                                                  | R   | R      | R    |                |
| COMWR     | Enable/Disable writing via RS-485 communication (Note 2)              | INHB: Setting impossible ENBL: Setting possible (Note1)                                                                                                                                                                       |      | ENBL                                       |               | RW                                                 | RW  | RW     | RW   |                |
| DREG1     | RS-485 communication D register setting for High/Low level (Note 3)   | H-L: High-Low, L-H: Low-High                                                                                                                                                                                                  |      | H-L                                        |               | RW                                                 | RW  | RW     | RW   |                |
| PSL       | RS-485 Protocol selection (Note 3)                                    | PCL: PC-link communication,<br>PCLSUM: PC-link communication (with checksum),<br>MODASC: Modbus communication (ASCII),<br>MODRTU: Modbus communication (RTU),<br>YS: YS protocol, P-to-P: Peer-to-peer communication (Note 4) |      | MODRTU                                     |               | RW                                                 | RW  | RW     | RW   |                |
| ADRS      | RS-485 communication address (Note 3)                                 | 1 to 99                                                                                                                                                                                                                       |      | 1                                          |               | RW                                                 | RW  | RW     | RW   |                |
| STBIT     | RS-485 stop bit (Note 3)                                              | 1 bit, 2 bit                                                                                                                                                                                                                  |      | 1 bit                                      |               | RW                                                 | RW  | RW     | RW   |                |
| PAR       | RS-485 parity (Note 3)                                                | NONE, ODD, EVEN                                                                                                                                                                                                               |      | EVEN                                       |               | RW                                                 | RW  | RW     | RW   |                |
| DLEN      | RS-485 data length (Note 3)                                           | 7 bit, 8 bit                                                                                                                                                                                                                  |      | 8 bit                                      |               | RW                                                 | RW  | RW     | RW   |                |
| BPS       | RS-485 baud rate (Note 3)                                             | 1200, 2400, 4800, 9600, 19200, 38400 (bps)                                                                                                                                                                                    |      | 38400                                      |               | RW                                                 | RW  | RW     | RW   |                |
| TRMR      | RS-485 communication terminating resistor ON/OFF (Note 3)             | OFF, ON                                                                                                                                                                                                                       |      | OFF                                        |               | RW                                                 | RW  | RW     | RW   |                |
| ETRWR     | Enable/Disable writing via Ethernet communication (Note 5)            | INHB: Setting impossible ENBL: Setting possible (Note1)                                                                                                                                                                       |      | ENBL                                       |               | RW                                                 | RW  | RW     | RW   |                |
| DREG2     | Ethernet communication D register setting for High/Low level (Note 5) | H-L: High-Low, L-H: Low-High                                                                                                                                                                                                  |      | H-L                                        |               | RW                                                 | RW  | RW     | RW   |                |
| ECTO      | Ethernet communication timeout period                                 | 4 to 60                                                                                                                                                                                                                       | s    | 60                                         |               | RW                                                 | RW  | RW     | RW   |                |
| IPAD1     | IP address 1 (Note 5)                                                 |                                                                                                                                                                                                                               |      | 192                                        |               | RW                                                 | RW  | RW     | RW   |                |
| IPAD2     | IP address 2 (Note 5)                                                 |                                                                                                                                                                                                                               |      | 168                                        |               | RW                                                 | RW  | RW     | RW   |                |
| IPAD3     | IP address 3 (Note 5)                                                 | 0 to 255                                                                                                                                                                                                                      |      | 1                                          |               | RW                                                 | RW  | RW     | RW   |                |
| IPAD4     | IP address 4 (Note 5)                                                 |                                                                                                                                                                                                                               |      | 1                                          |               | RW                                                 | RW  | RW     | RW   |                |
| SM1       | Subnet mask 1 (Note 5)                                                |                                                                                                                                                                                                                               |      | 255                                        |               | RW                                                 | RW  | RW     | RW   |                |
| SM2       | Subnet mask 2 (Note 5)                                                |                                                                                                                                                                                                                               |      | 255                                        |               | RW                                                 | RW  | RW     | RW   |                |
| SM3       | Subnet mask 3 (Note 5)                                                | 0 to 255                                                                                                                                                                                                                      |      | 255                                        |               | RW                                                 | RW  | RW     | RW   |                |
| SM4       | Subnet mask 4 (Note 5)                                                |                                                                                                                                                                                                                               |      | 0                                          |               | RW                                                 | RW  | RW     | RW   |                |
| DG1       | Default gateway 1 (Note 5)                                            |                                                                                                                                                                                                                               |      | 0                                          |               | RW                                                 | RW  | RW     | RW   |                |
| DG2       | Default gateway 2 (Note 5)                                            |                                                                                                                                                                                                                               |      | 0                                          |               | RW                                                 | RW  | RW     | RW   |                |
| DG3       | Default gateway 3 (Note 5)                                            | 0 to 255                                                                                                                                                                                                                      |      | 0                                          |               | RW                                                 | RW  | RW     | RW   |                |
| DG4       | Default gateway 4 (Note 5)                                            |                                                                                                                                                                                                                               |      | 0                                          |               | RW                                                 | RW  | RW     | RW   |                |
| PORT      | Port number (Note 5)                                                  | 502, 1024 to 65535                                                                                                                                                                                                            |      | 502                                        |               | RW                                                 | RW  | RW     | RW   |                |
| ESW       | Ethernet setting switch (Note 5)                                      | -, ENTRY                                                                                                                                                                                                                      |      | -                                          |               | RW                                                 | RW  | RW     | RW   |                |

Note 1: When the SET parameter is set to "ENBL", [STOP] will appear on the right of the display title, and the manipulated output and alarm output will be kept.

Note 2: Available for the option /A31 or /A32.

Note 3: Available for the option /A31.

Note 4: "P-to-P" is available only for YS1700.

Note 5: Available for the option /A34.

## DI/DO Configuration Display 1/2 (DI/DO 1/2)

| Parameter | Name                            | Setting and Display Range                                                                                    | Unit                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Factory Default Value | Display and Setting Conditions for Controller Mode |      |        |      | User Set-tings |     |
|-----------|---------------------------------|--------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|----------------------------------------------------|------|--------|------|----------------|-----|
|           |                                 |                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | YS1500 (SINGLE)       | SINGLE                                             | CAS  | SELECT | PROG |                |     |
| SET       | Enable/Disable setting          | INHB: Setting impossible <a href="#">ENBL</a> : Setting possible (Note1)                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | INHB                  | R/W                                                | R/W  | R/W    | N/A  |                |     |
| DIO16     | D11/DO6 specification           |                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | DI                    | R/W                                                | R/W  | R/W    | N/A  |                |     |
| DIO25     | D2/DO5 specification            |                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | DO                    | R/W                                                | R/W  | R/W    | N/A  |                |     |
| DIO34     | D3/DO4 specification            |                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | DO                    | R/W                                                | R/W  | R/W    | N/A  |                |     |
| DIO43     | D4/DO3 specification            |                                                                                                              | DI: For digital input<br>DO: For digital output                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | DO                    | R/W                                                | R/W  | R/W    | N/A  |                |     |
| DIO52     | D5/DO2 specification            |                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | DO                    | R/W                                                | R/W  | R/W    | N/A  |                |     |
| DIO61     | D6/DO1 specification            |                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | DO                    | R/W                                                | R/W  | R/W    | N/A  |                |     |
| D11F      | D11 function selection          |                                                                                                              | NONE: No function<br>E-AUT: Switching to Automatic mode (status)<br>E-MAN: Switching to Manual mode (status)<br>E-O/C: Open/Close switching (Note 3),<br>E-L/R: Local/Remote switching (Note 4),<br>E-PMV: Preset MV switching<br>E-STC: Self tuning switching<br>E-SEL: Selector ON/OFF switching (Note 4)<br>TR-MPMV: Manual and Preset MV switching<br>TR-MAN: Switching to Manual mode (trigger)<br>TR-AUT: Switching to Automatic mode (trigger)<br>TR-CAS: Switching to Cascade mode (trigger)<br>LCD-OFF: Backlight OFF<br>E-TRK: Output tracking switching<br>E-LPSEL: Output loop selection (Selector control only)<br>TR-EVTC: All event elimination |                       | NONE                                               | R/W  | R/W    | R/W  | N/A            |     |
| D12F      | D12 function selection          |                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                       | NONE                                               | R/W  | R/W    | R/W  | N/A            |     |
| D13F      | D13 function selection          |                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                       |                                                    | NONE | R/W    | R/W  | R/W            | N/A |
| D14F      | D14 function selection          |                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                       | NONE                                               | R/W  | R/W    | R/W  | N/A            |     |
| D15F      | D15 function selection          |                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                       | NONE                                               | R/W  | R/W    | R/W  | N/A            |     |
| D16F      | D16 function selection          |                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                       | NONE                                               | R/W  | R/W    | R/W  | N/A            |     |
| D17F      | D17 function selection (Note 2) |                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                       | NONE                                               | R/W  | R/W    | R/W  | N/A            |     |
| D18F      | D18 function selection (Note 2) |                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                       |                                                    | R/W  | R/W    | R/W  | N/A            |     |
| D19F      | D19 function selection (Note 2) |                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                       |                                                    | R/W  | R/W    | R/W  | N/A            |     |
| D10F      | D10 function selection (Note 2) |                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                       |                                                    | R/W  | R/W    | R/W  | N/A            |     |
| D11D      | D11 contact type                | OPN: Function is available when the contact is open<br>CLS: Function is available when the contact is closed |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | OPN                   | R/W                                                | R/W  | R/W    | N/A  |                |     |
| D12D      | D12 contact type                |                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | OPN                   | R/W                                                | R/W  | R/W    | N/A  |                |     |
| D13D      | D13 contact type                |                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | OPN                   | R/W                                                | R/W  | R/W    | N/A  |                |     |
| D14D      | D14 contact type                |                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | OPN                   | R/W                                                | R/W  | R/W    | N/A  |                |     |
| D15D      | D15 contact type                |                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | OPN                   | R/W                                                | R/W  | R/W    | N/A  |                |     |
| D16D      | D16 contact type                |                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | OPN                   | R/W                                                | R/W  | R/W    | N/A  |                |     |
| D17D      | D17 contact type (Note 2)       |                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                       |                                                    | R/W  | R/W    | R/W  | N/A            |     |
| D18D      | D18 contact type (Note 2)       |                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                       |                                                    | R/W  | R/W    | R/W  | N/A            |     |
| D19D      | D19 contact type (Note 2)       |                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                       |                                                    | R/W  | R/W    | R/W  | N/A            |     |
| D10D      | D10 contact type (Note 2)       |                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                       |                                                    | R/W  | R/W    | R/W  | N/A            |     |

Note 1: When the SET parameter is set to "ENBL", [STOP] will appear on the right of the display title, and the manipulated output and alarm output will be kept.

Note 2: This value is displayed only on YS1700 Basic type with expandable I/O.

Note 3: This function can be selected when the controller mode is in the cascade mode. (Ex. DiND (n=1 to 10) = OPN: When the contact is closed, internal cascade is in open status. The status of the contact can be changed by the contact type parameters.)

Note 4: This function can be selected when the controller mode is in the selector mode. (Ex. DiND (n=1 to 10) = OPN: E-L/R; When the contact is closed, SV2 is the local setpoint value. When the contact is open, SV2 is cascade setpoint value. E-SEL; When the contact is closed, MV of the loop 1 is selected. When the contact is opened, MV is selected automatically by ATSEL parameter)

## DI/DO Configuration Display 2/2 (DI/DO 2/2)

| Parameter | Name                                      | Setting and Display Range                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Unit | Factory Default Value | Display and Setting Conditions for Controller Mode |     |        |      | User Set-tings |
|-----------|-------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------------------|----------------------------------------------------|-----|--------|------|----------------|
|           |                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |      | YS1500 (SINGLE)       | SINGLE                                             | CAS | SELECT | PROG |                |
| SET       | Enable/Disable setting                    | INHB: Setting impossible <b>ENBL</b> : Setting possible (Note1)<br><br><b>NONE</b> : OFF, <b>PH1</b> : High limit alarm for PV1, <b>PL1</b> : Low limit alarm for PV1, <b>HH1</b> : High-high limit alarm for PV1, <b>LL1</b> : Low-low limit alarm for PV1, <b>DL1</b> : Alarm for deviation variable 1, <b>VL1</b> : Velocity alarm for PV1, <b>PH2</b> : High limit alarm for PV2, <b>PL2</b> : Low limit alarm for PV2, <b>HH2</b> : High-high limit alarm for PV2, <b>LL2</b> : Low-low limit alarm for PV2, <b>DL2</b> : Alarm for deviation variable 2, <b>VL2</b> : Velocity alarm for PV2, <b>DL1 VL1</b> : Alarm for deviation variable 1/ Velocity alarm for PV1, <b>DL2 VL2</b> : Alarm for deviation variable 2/ Velocity alarm for PV2, <b>1-ALM</b> : OR for all alarms of the loop 1, <b>2-ALM</b> : OR for all alarms of the loop 2<br><b>CAS</b> : Cascade mode, <b>CASAUT</b> : Cascade or Automatic mode, <b>O/C</b> : Open/Close, <b>L/R</b> : Local/Remote, <b>OOP</b> : Current output open |      | INHB                  | R/W                                                | R/W | R/W    | N/A  |                |
| DO1F      | DO1 function selection (Note 2)           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |      | PH1                   | R/W                                                | R/W | R/W    | N/A  |                |
| DO2F      | DO2 function selection (Note 2)           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |      | PL1                   | R/W                                                | R/W | R/W    | N/A  |                |
| DO3F      | DO3 function selection (Note 2)           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |      | VL1                   | R/W                                                | R/W | R/W    | N/A  |                |
| DO4F      | DO4 function selection (Note 2)           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |      | CAS                   | R/W                                                | R/W | R/W    | N/A  |                |
| DO5F      | DO5 function selection (Note 2)           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |      | CASAUT                | R/W                                                | R/W | R/W    | N/A  |                |
| DO6F      | DO6 function selection (Note 2)           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |      | NONE                  | R/W                                                | R/W | R/W    | N/A  |                |
| DO7F      | DO7 function selection (Note 2) (Note 3)  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |      | NONE                  | R/W                                                | R/W | R/W    | N/A  |                |
| DO8F      | DO8 function selection (Note 2) (Note 3)  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |      | NONE                  | R/W                                                | R/W | R/W    | N/A  |                |
| DO9F      | DO9 function selection (Note 2) (Note 3)  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |      | NONE                  | R/W                                                | R/W | R/W    | N/A  |                |
| DO10F     | DO10 function selection (Note 2) (Note 3) |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | NONE | R/W                   | R/W                                                | R/W | N/A    |      |                |
| DO1D      | DO1 contact type                          | OPN: When the event occurs, the contact is opened<br>CLS: When the event occurs, the contact is closed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |      | OPN                   | R/W                                                | R/W | R/W    | N/A  |                |
| DO2D      | DO2 contact type                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |      | OPN                   | R/W                                                | R/W | R/W    | N/A  |                |
| DO3D      | DO3 contact type                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |      | OPN                   | R/W                                                | R/W | R/W    | N/A  |                |
| DO4D      | DO4 contact type                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |      | CLS                   | R/W                                                | R/W | R/W    | N/A  |                |
| DO5D      | DO5 contact type                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |      | CLS                   | R/W                                                | R/W | R/W    | N/A  |                |
| DO6D      | DO6 contact type                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |      | OPN                   | R/W                                                | R/W | R/W    | N/A  |                |
| DO7D      | DO7 contact type (Note 3)                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |      |                       | R/W                                                | R/W | R/W    | N/A  |                |
| DO8D      | DO8 contact type (Note 3)                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |      |                       | R/W                                                | R/W | R/W    | N/A  |                |
| DO9D      | DO9 contact type (Note 3)                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |      |                       | R/W                                                | R/W | R/W    | N/A  |                |
| DO10D     | DO10 contact type (Note 3)                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |      |                       |                                                    | R/W | R/W    | R/W  | N/A            |

Note 1: When the SET parameter is set to "ENBL", [STOP] will appear on the right of the display title, and the manipulated output and alarm output will be kept.

Note 2: Ex. When DInD (n=1 to 10) is OPN, and the DO function parameter is:

CASAUT: The contact is open when in the cascade or automatic mode

O/C: The contact is closed when the internal cascade is in close status, the contact is open when the internal cascade is in open status.

L/R: The contact is closed when SV2 is local setpoint value, the contact is open when SV2 is cascade setpoint value.

All alarm related parameters: the contact is open when the alarm occurs.

Note 3: This value is displayed only on YS1700 Basic type with expandable I/O.

FX Table Setting Display (FX TABLE)

| Parameter | Name                | Setting and Display Range | Unit | Factory Default Value |               | Display and Setting Conditions for Controller Mode |     |        |      | User Set-tings |
|-----------|---------------------|---------------------------|------|-----------------------|---------------|----------------------------------------------------|-----|--------|------|----------------|
|           |                     |                           |      | YS1500 (SINGLE)       | YS1700 (PROG) | SINGLE                                             | CAS | SELECT | PROG |                |
| 101       | 0% setting of FX1   | 0.000 to 1.000            | /    | 0.000                 |               | RW                                                 | RW  | RW     | RW   |                |
| 102       | 10% setting of FX1  |                           | /    | 0.100                 |               | RW                                                 | RW  | RW     | RW   |                |
| 103       | 20% setting of FX1  |                           | /    | 0.200                 |               | RW                                                 | RW  | RW     | RW   |                |
| 104       | 30% setting of FX1  |                           | /    | 0.300                 |               | RW                                                 | RW  | RW     | RW   |                |
| 105       | 40% setting of FX1  |                           | /    | 0.400                 |               | RW                                                 | RW  | RW     | RW   |                |
| 106       | 50% setting of FX1  |                           | /    | 0.500                 |               | RW                                                 | RW  | RW     | RW   |                |
| 107       | 60% setting of FX1  |                           | /    | 0.600                 |               | RW                                                 | RW  | RW     | RW   |                |
| 108       | 70% setting of FX1  |                           | /    | 0.700                 |               | RW                                                 | RW  | RW     | RW   |                |
| 109       | 80% setting of FX1  |                           | /    | 0.800                 |               | RW                                                 | RW  | RW     | RW   |                |
| 110       | 90% setting of FX1  |                           | /    | 0.900                 |               | RW                                                 | RW  | RW     | RW   |                |
| 111       | 100% setting of FX1 |                           | /    | 1.000                 |               | RW                                                 | RW  | RW     | RW   |                |
| 201       | 0% setting of FX2   | 0.000 to 1.000            | /    | 0.000                 |               | RW                                                 | RW  | RW     | RW   |                |
| 202       | 10% setting of FX2  |                           | /    | 0.100                 |               | RW                                                 | RW  | RW     | RW   |                |
| 203       | 20% setting of FX2  |                           | /    | 0.200                 |               | RW                                                 | RW  | RW     | RW   |                |
| 204       | 30% setting of FX2  |                           | /    | 0.300                 |               | RW                                                 | RW  | RW     | RW   |                |
| 205       | 40% setting of FX2  |                           | /    | 0.400                 |               | RW                                                 | RW  | RW     | RW   |                |
| 206       | 50% setting of FX2  |                           | /    | 0.500                 |               | RW                                                 | RW  | RW     | RW   |                |
| 207       | 60% setting of FX2  |                           | /    | 0.600                 |               | RW                                                 | RW  | RW     | RW   |                |
| 208       | 70% setting of FX2  |                           | /    | 0.700                 |               | RW                                                 | RW  | RW     | RW   |                |
| 209       | 80% setting of FX2  |                           | /    | 0.800                 |               | RW                                                 | RW  | RW     | RW   |                |
| 210       | 90% setting of FX2  |                           | /    | 0.900                 |               | RW                                                 | RW  | RW     | RW   |                |
| 211       | 100% setting of FX2 |                           | /    | 1.000                 |               | RW                                                 | RW  | RW     | RW   |                |

GX1 Table Setting Display (GX1 TABLE)

| Parameter | Name                     | Setting and Display Range | Unit | Factory Default Value |               | Display and Setting Conditions for Controller Mode |     |        |      | User Set-tings |
|-----------|--------------------------|---------------------------|------|-----------------------|---------------|----------------------------------------------------|-----|--------|------|----------------|
|           |                          |                           |      | YS1500 (SINGLE)       | YS1700 (PROG) | SINGLE                                             | CAS | SELECT | PROG |                |
| 101       | Input 1 setting of GX1   |                           |      |                       | 0.000         | N/A                                                | N/A | N/A    | R/W  |                |
| 102       | Input 2 setting of GX1   |                           |      |                       | 0.100         | N/A                                                | N/A | N/A    | R/W  |                |
| 103       | Input 3 setting of GX1   |                           |      |                       | 0.200         | N/A                                                | N/A | N/A    | R/W  |                |
| 104       | Input 4 setting of GX1   |                           |      |                       | 0.300         | N/A                                                | N/A | N/A    | R/W  |                |
| 105       | Input 5 setting of GX1   |                           |      |                       | 0.400         | N/A                                                | N/A | N/A    | R/W  |                |
| 106       | Input 6 setting of GX1   |                           |      |                       | 0.500         | N/A                                                | N/A | N/A    | R/W  |                |
| 107       | Input 7 setting of GX1   |                           |      |                       | 0.600         | N/A                                                | N/A | N/A    | R/W  |                |
| 108       | Input 8 setting of GX1   |                           |      |                       | 0.700         | N/A                                                | N/A | N/A    | R/W  |                |
| 109       | Input 9 setting of GX1   |                           |      |                       | 0.800         | N/A                                                | N/A | N/A    | R/W  |                |
| 110       | Input 10 setting of GX1  |                           |      |                       | 0.900         | N/A                                                | N/A | N/A    | R/W  |                |
| 111       | Input 11 setting of GX1  |                           |      |                       | 1.000         | N/A                                                | N/A | N/A    | R/W  |                |
| 101       | Output 1 setting of GX1  |                           |      |                       | 0.000         | N/A                                                | N/A | N/A    | R/W  |                |
| 102       | Output 2 setting of GX1  |                           |      |                       | 0.100         | N/A                                                | N/A | N/A    | R/W  |                |
| 103       | Output 3 setting of GX1  |                           |      |                       | 0.200         | N/A                                                | N/A | N/A    | R/W  |                |
| 104       | Output 4 setting of GX1  |                           |      |                       | 0.300         | N/A                                                | N/A | N/A    | R/W  |                |
| 105       | Output 5 setting of GX1  |                           |      |                       | 0.400         | N/A                                                | N/A | N/A    | R/W  |                |
| 106       | Output 6 setting of GX1  |                           |      |                       | 0.500         | N/A                                                | N/A | N/A    | R/W  |                |
| 107       | Output 7 setting of GX1  |                           |      |                       | 0.600         | N/A                                                | N/A | N/A    | R/W  |                |
| 108       | Output 8 setting of GX1  |                           |      |                       | 0.700         | N/A                                                | N/A | N/A    | R/W  |                |
| 109       | Output 9 setting of GX1  |                           |      |                       | 0.800         | N/A                                                | N/A | N/A    | R/W  |                |
| 110       | Output 10 setting of GX1 |                           |      |                       | 0.900         | N/A                                                | N/A | N/A    | R/W  |                |
| 111       | Output 11 setting of GX1 |                           |      |                       | 1.000         | N/A                                                | N/A | N/A    | R/W  |                |

GX2 Table Setting Display (GX2 TABLE)

| Parameter | Name                     | Setting and Display Range | Unit | Factory Default Value |               | Display and Setting Conditions for Controller Mode |     |        |      | User Set-tings |  |
|-----------|--------------------------|---------------------------|------|-----------------------|---------------|----------------------------------------------------|-----|--------|------|----------------|--|
|           |                          |                           |      | YS1500 (SINGLE)       | YS1700 (PROG) | SINGLE                                             | CAS | SELECT | PROG |                |  |
| 201       | Input 1 setting of GX2   | -0.250 to 1.250           |      |                       | 0.000         | N/A                                                | N/A | N/A    | R/W  |                |  |
| 202       | Input 2 setting of GX2   |                           |      |                       | 0.100         | N/A                                                | N/A | N/A    | R/W  |                |  |
| 203       | Input 3 setting of GX2   |                           |      |                       | 0.200         | N/A                                                | N/A | N/A    | R/W  |                |  |
| 204       | Input 4 setting of GX2   |                           |      |                       | 0.300         | N/A                                                | N/A | N/A    | R/W  |                |  |
| 205       | Input 5 setting of GX2   |                           |      |                       | 0.400         | N/A                                                | N/A | N/A    | R/W  |                |  |
| 206       | Input 6 setting of GX2   |                           |      |                       | 0.500         | N/A                                                | N/A | N/A    | R/W  |                |  |
| 207       | Input 7 setting of GX2   |                           |      |                       | 0.600         | N/A                                                | N/A | N/A    | R/W  |                |  |
| 208       | Input 8 setting of GX2   |                           |      |                       | 0.700         | N/A                                                | N/A | N/A    | R/W  |                |  |
| 209       | Input 9 setting of GX2   |                           |      |                       | 0.800         | N/A                                                | N/A | N/A    | R/W  |                |  |
| 210       | Input 10 setting of GX2  |                           |      |                       | 0.900         | N/A                                                | N/A | N/A    | R/W  |                |  |
| 211       | Input 11 setting of GX2  |                           |      |                       | 1.000         | N/A                                                | N/A | N/A    | R/W  |                |  |
| 201       | Output 1 setting of GX2  | -0.250 to 1.250           |      |                       | 0.000         | N/A                                                | N/A | N/A    | N/A  | R/W            |  |
| 202       | Output 2 setting of GX2  |                           |      |                       | 0.100         | N/A                                                | N/A | N/A    | R/W  |                |  |
| 203       | Output 3 setting of GX2  |                           |      |                       | 0.200         | N/A                                                | N/A | N/A    | R/W  |                |  |
| 204       | Output 4 setting of GX2  |                           |      |                       | 0.300         | N/A                                                | N/A | N/A    | R/W  |                |  |
| 205       | Output 5 setting of GX2  |                           |      |                       | 0.400         | N/A                                                | N/A | N/A    | R/W  |                |  |
| 206       | Output 6 setting of GX2  |                           |      |                       | 0.500         | N/A                                                | N/A | N/A    | R/W  |                |  |
| 207       | Output 7 setting of GX2  |                           |      |                       | 0.600         | N/A                                                | N/A | N/A    | R/W  |                |  |
| 208       | Output 8 setting of GX2  |                           |      |                       | 0.700         | N/A                                                | N/A | N/A    | R/W  |                |  |
| 209       | Output 9 setting of GX2  |                           |      |                       | 0.800         | N/A                                                | N/A | N/A    | R/W  |                |  |
| 210       | Output 10 setting of GX2 |                           |      |                       | 0.900         | N/A                                                | N/A | N/A    | R/W  |                |  |
| 211       | Output 11 setting of GX2 |                           |      |                       | 1.000         | N/A                                                | N/A | N/A    | R/W  |                |  |

## Program-Setting-Unit 1 Setting Display (PGM1 SET)

| Parameter | Name                       | Setting and Display Range | Unit | Factory Default Value |               | Display and Setting Conditions for Controller Mode |     |        | User Set-tings |
|-----------|----------------------------|---------------------------|------|-----------------------|---------------|----------------------------------------------------|-----|--------|----------------|
|           |                            |                           |      | YS1500 (SINGLE)       | YS1700 (PROG) | SINGLE                                             | CAS | SELECT | PROG           |
| 101       | Time 1 setting for PGM1    | 0 to 9999                 |      |                       | 0             | N/A                                                | N/A | N/A    | R/W            |
| 102       | Time 2 setting for PGM1    |                           |      |                       | 0             | N/A                                                | N/A | N/A    | R/W            |
| 103       | Time 3 setting for PGM1    |                           |      |                       | 0             | N/A                                                | N/A | N/A    | R/W            |
| 104       | Time 4 setting for PGM1    |                           |      |                       | 0             | N/A                                                | N/A | N/A    | R/W            |
| 105       | Time 5 setting for PGM1    |                           |      |                       | 0             | N/A                                                | N/A | N/A    | R/W            |
| 106       | Time 6 setting for PGM1    |                           |      |                       | 0             | N/A                                                | N/A | N/A    | R/W            |
| 107       | Time 7 setting for PGM1    |                           |      |                       | 0             | N/A                                                | N/A | N/A    | R/W            |
| 108       | Time 8 setting for PGM1    |                           |      |                       | 0             | N/A                                                | N/A | N/A    | R/W            |
| 109       | Time 9 setting for PGM1    |                           |      |                       | 0             | N/A                                                | N/A | N/A    | R/W            |
| 110       | Time 10 setting for PGM1   |                           |      |                       | 0             | N/A                                                | N/A | N/A    | R/W            |
| 101       | Output 1 setting for PGM1  | -0.250 to 1.250           |      |                       | 0.000         | N/A                                                | N/A | N/A    | R/W            |
| 102       | Output 2 setting for PGM1  |                           |      |                       | 0.000         | N/A                                                | N/A | N/A    | R/W            |
| 103       | Output 3 setting for PGM1  |                           |      |                       | 0.000         | N/A                                                | N/A | N/A    | R/W            |
| 104       | Output 4 setting for PGM1  |                           |      |                       | 0.000         | N/A                                                | N/A | N/A    | R/W            |
| 105       | Output 5 setting for PGM1  |                           |      |                       | 0.000         | N/A                                                | N/A | N/A    | R/W            |
| 106       | Output 6 setting for PGM1  |                           |      |                       | 0.000         | N/A                                                | N/A | N/A    | R/W            |
| 107       | Output 7 setting for PGM1  |                           |      |                       | 0.000         | N/A                                                | N/A | N/A    | R/W            |
| 108       | Output 8 setting for PGM1  |                           |      |                       | 0.000         | N/A                                                | N/A | N/A    | R/W            |
| 109       | Output 9 setting for PGM1  |                           |      |                       | 0.000         | N/A                                                | N/A | N/A    | R/W            |
| 110       | Output 10 setting for PGM1 |                           |      |                       | 0.000         | N/A                                                | N/A | N/A    | R/W            |



## Program-Setting-Unit 2 Setting Display (PGM2 SET)

| Parameter | Name                       | Setting and Display Range | Unit | Factory Default Value |               | Display and Setting Conditions for Controller Mode |     |        |      | User Set-tings |
|-----------|----------------------------|---------------------------|------|-----------------------|---------------|----------------------------------------------------|-----|--------|------|----------------|
|           |                            |                           |      | YS1500 (SINGLE)       | YS1700 (PROG) | SINGLE                                             | CAS | SELECT | PROG |                |
| 201       | Time 1 setting for PGM2    | 0 to 9999                 |      |                       | 0             | N/A                                                | N/A | N/A    | R/W  |                |
| 202       | Time 2 setting for PGM2    |                           |      |                       | 0             | N/A                                                | N/A | N/A    | R/W  |                |
| 203       | Time 3 setting for PGM2    |                           |      |                       | 0             | N/A                                                | N/A | N/A    | R/W  |                |
| 204       | Time 4 setting for PGM2    |                           |      |                       | 0             | N/A                                                | N/A | N/A    | R/W  |                |
| 205       | Time 5 setting for PGM2    |                           |      |                       | 0             | N/A                                                | N/A | N/A    | R/W  |                |
| 206       | Time 6 setting for PGM2    |                           |      |                       | 0             | N/A                                                | N/A | N/A    | R/W  |                |
| 207       | Time 7 setting for PGM2    |                           |      |                       | 0             | N/A                                                | N/A | N/A    | R/W  |                |
| 208       | Time 8 setting for PGM2    |                           |      |                       | 0             | N/A                                                | N/A | N/A    | R/W  |                |
| 209       | Time 9 setting for PGM2    |                           |      |                       | 0             | N/A                                                | N/A | N/A    | R/W  |                |
| 210       | Time 10 setting for PGM2   |                           |      |                       | 0             | N/A                                                | N/A | N/A    | R/W  |                |
| 201       | Output 1 setting for PGM2  | -0.250 to 1.250           |      |                       | 0.000         | N/A                                                | N/A | N/A    | R/W  |                |
| 202       | Output 2 setting for PGM2  |                           |      |                       | 0.000         | N/A                                                | N/A | N/A    | R/W  |                |
| 203       | Output 3 setting for PGM2  |                           |      |                       | 0.000         | N/A                                                | N/A | N/A    | R/W  |                |
| 204       | Output 4 setting for PGM2  |                           |      |                       | 0.000         | N/A                                                | N/A | N/A    | R/W  |                |
| 205       | Output 5 setting for PGM2  |                           |      |                       | 0.000         | N/A                                                | N/A | N/A    | R/W  |                |
| 206       | Output 6 setting for PGM2  |                           |      |                       | 0.000         | N/A                                                | N/A | N/A    | R/W  |                |
| 207       | Output 7 setting for PGM2  |                           |      |                       | 0.000         | N/A                                                | N/A | N/A    | R/W  |                |
| 208       | Output 8 setting for PGM2  |                           |      |                       | 0.000         | N/A                                                | N/A | N/A    | R/W  |                |
| 209       | Output 9 setting for PGM2  |                           |      |                       | 0.000         | N/A                                                | N/A | N/A    | R/W  |                |
| 210       | Output 10 setting for PGM2 |                           |      |                       | 0.000         | N/A                                                | N/A | N/A    | R/W  |                |

Preset PID Setting Display (PID TABLE)

| Parameter | Name                           | Setting and Display Range | Unit       | Factory Default Value |               | Display and Setting Conditions for Controller Mode |     |        |      | User Set-tings |
|-----------|--------------------------------|---------------------------|------------|-----------------------|---------------|----------------------------------------------------|-----|--------|------|----------------|
|           |                                |                           |            | YS1500 (SINGLE)       | YS1700 (PROG) | SINGLE                                             | CAS | SELECT | PROG |                |
| PPB1      | Preset PID proportional band 1 | 0.1 to 999.9              | %          |                       | 999.9         | N/A                                                | N/A | N/A    | R/W  |                |
| PTI1      | Preset PID integral time 1     | 1 to 9999                 | s (second) |                       | 1000          | N/A                                                | N/A | N/A    | R/W  |                |
| PTD1      | Preset PID derivative time 1   | 0 to 9999                 | s (second) |                       | 0             | N/A                                                | N/A | N/A    | R/W  |                |
| PPB2      | Preset PID proportional band 2 | 0.1 to 999.9              | %          |                       | 999.9         | N/A                                                | N/A | N/A    | R/W  |                |
| PTI2      | Preset PID integral time 2     | 1 to 9999                 | s (second) |                       | 1000          | N/A                                                | N/A | N/A    | R/W  |                |
| PTD2      | Preset PID derivative time 2   | 0 to 9999                 | s (second) |                       | 0             | N/A                                                | N/A | N/A    | R/W  |                |
| PPB3      | Preset PID proportional band 3 | 0.1 to 999.9              | %          |                       | 999.9         | N/A                                                | N/A | N/A    | R/W  |                |
| PTI3      | Preset PID integral time 3     | 1 to 9999                 | s (second) |                       | 1000          | N/A                                                | N/A | N/A    | R/W  |                |
| PTD3      | Preset PID derivative time 3   | 0 to 9999                 | s (second) |                       | 0             | N/A                                                | N/A | N/A    | R/W  |                |
| PPB4      | Preset PID proportional band 4 | 0.1 to 999.9              | %          |                       | 999.9         | N/A                                                | N/A | N/A    | R/W  |                |
| PTI4      | Preset PID integral time 4     | 1 to 9999                 | s (second) |                       | 1000          | N/A                                                | N/A | N/A    | R/W  |                |
| PTD4      | Preset PID derivative time 4   | 0 to 9999                 | s (second) |                       | 0             | N/A                                                | N/A | N/A    | R/W  |                |
| PPB5      | Preset PID proportional band 5 | 0.1 to 999.9              | %          |                       | 999.9         | N/A                                                | N/A | N/A    | R/W  |                |
| PTI5      | Preset PID integral time 5     | 1 to 9999                 | s (second) |                       | 1000          | N/A                                                | N/A | N/A    | R/W  |                |
| PTD5      | Preset PID derivative time 5   | 0 to 9999                 | s (second) |                       | 0             | N/A                                                | N/A | N/A    | R/W  |                |
| PPB6      | Preset PID proportional band 6 | 0.1 to 999.9              | %          |                       | 999.9         | N/A                                                | N/A | N/A    | R/W  |                |
| PTI6      | Preset PID integral time 6     | 1 to 9999                 | s (second) |                       | 1000          | N/A                                                | N/A | N/A    | R/W  |                |
| PTD6      | Preset PID derivative time 6   | 0 to 9999                 | s (second) |                       | 0             | N/A                                                | N/A | N/A    | R/W  |                |
| PPB7      | Preset PID proportional band 7 | 0.1 to 999.9              | %          |                       | 999.9         | N/A                                                | N/A | N/A    | R/W  |                |
| PTI7      | Preset PID integral time 7     | 1 to 9999                 | s (second) |                       | 1000          | N/A                                                | N/A | N/A    | R/W  |                |
| PTD7      | Preset PID derivative time 7   | 0 to 9999                 | s (second) |                       | 0             | N/A                                                | N/A | N/A    | R/W  |                |
| PPB8      | Preset PID proportional band 8 | 0.1 to 999.9              | %          |                       | 999.9         | N/A                                                | N/A | N/A    | R/W  |                |
| PTI8      | Preset PID integral time 8     | 1 to 9999                 | s (second) |                       | 1000          | N/A                                                | N/A | N/A    | R/W  |                |
| PTD8      | Preset PID derivative time 8   | 0 to 9999                 | s (second) |                       | 0             | N/A                                                | N/A | N/A    | R/W  |                |

K Constant Display 1/2 (K CONST 1/2)

| Parameter | Name                 | Setting and Display Range                                                           | Unit | Factory Default Value |               | Display and Setting Conditions for Controller Mode |     |        |      | User Set-tings |
|-----------|----------------------|-------------------------------------------------------------------------------------|------|-----------------------|---------------|----------------------------------------------------|-----|--------|------|----------------|
|           |                      |                                                                                     |      | YS1500 (SINGLE)       | YS1700 (PROG) | SINGLE                                             | CAS | SELECT | PROG |                |
| K01       | Constant register 1  | <div>-99999 to 99999<br/>5 digits display<br/>Set by YSS1000 Setting Software</div> |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R    |                |
| K02       | Constant register 2  |                                                                                     |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R    |                |
| K03       | Constant register 3  |                                                                                     |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R    |                |
| K04       | Constant register 4  |                                                                                     |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R    |                |
| K05       | Constant register 5  |                                                                                     |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R    |                |
| K06       | Constant register 6  |                                                                                     |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R    |                |
| K07       | Constant register 7  |                                                                                     |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R    |                |
| K08       | Constant register 8  |                                                                                     |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R    |                |
| K09       | Constant register 9  |                                                                                     |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R    |                |
| K10       | Constant register 10 |                                                                                     |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R    |                |
| K11       | Constant register 11 |                                                                                     |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R    |                |
| K12       | Constant register 12 |                                                                                     |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R    |                |
| K13       | Constant register 13 |                                                                                     |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R    |                |
| K14       | Constant register 14 |                                                                                     |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R    |                |
| K15       | Constant register 15 |                                                                                     |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R    |                |
| K16       | Constant register 16 |                                                                                     |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R    |                |
| K17       | Constant register 17 |                                                                                     |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R    |                |
| K18       | Constant register 18 |                                                                                     |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R    |                |
| K19       | Constant register 19 |                                                                                     |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R    |                |
| K20       | Constant register 20 |                                                                                     |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R    |                |
| K21       | Constant register 21 |                                                                                     |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R    |                |
| K22       | Constant register 22 |                                                                                     |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R    |                |
| K23       | Constant register 23 |                                                                                     |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R    |                |
| K24       | Constant register 24 |                                                                                     |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R    |                |
| K25       | Constant register 25 |                                                                                     |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R    |                |
| K26       | Constant register 26 |                                                                                     |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R    |                |
| K27       | Constant register 27 |                                                                                     |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R    |                |
| K28       | Constant register 28 |                                                                                     |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R    |                |
| K29       | Constant register 29 |                                                                                     |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R    |                |
| K30       | Constant register 30 |                                                                                     |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R    |                |

## K Constant Display 2/2 (K CONST 2/2)

| Parameter | Name                 | Setting and Display Range | Unit | Factory Default Value |               | Display and Setting Conditions for Controller Mode |     |        | User Set-tings |
|-----------|----------------------|---------------------------|------|-----------------------|---------------|----------------------------------------------------|-----|--------|----------------|
|           |                      |                           |      | YS1500 (SINGLE)       | YS1700 (PROG) | SINGLE                                             | CAS | SELECT | PROG           |
| K31       | Constant register 31 | Setting and Display Range |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R              |
| K32       | Constant register 32 |                           |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R              |
| K33       | Constant register 33 |                           |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R              |
| K34       | Constant register 34 |                           |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R              |
| K35       | Constant register 35 |                           |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R              |
| K36       | Constant register 36 |                           |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R              |
| K37       | Constant register 37 |                           |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R              |
| K38       | Constant register 38 |                           |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R              |
| K39       | Constant register 39 |                           |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R              |
| K40       | Constant register 40 |                           |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R              |
| K41       | Constant register 41 |                           |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R              |
| K42       | Constant register 42 |                           |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R              |
| K43       | Constant register 43 |                           |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R              |
| K44       | Constant register 44 |                           |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R              |
| K45       | Constant register 45 |                           |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R              |
| K46       | Constant register 46 |                           |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R              |
| K47       | Constant register 47 |                           |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R              |
| K48       | Constant register 48 |                           |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R              |
| K49       | Constant register 49 |                           |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R              |
| K50       | Constant register 50 |                           |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R              |
| K51       | Constant register 51 |                           |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R              |
| K52       | Constant register 52 |                           |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R              |
| K53       | Constant register 53 |                           |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R              |
| K54       | Constant register 54 |                           |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R              |
| K55       | Constant register 55 |                           |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R              |
| K56       | Constant register 56 |                           |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R              |
| K57       | Constant register 57 |                           |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R              |
| K58       | Constant register 58 |                           |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R              |
| K59       | Constant register 59 |                           |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R              |
| K60       | Constant register 60 |                           |      |                       | 0.0000        | N/A                                                | N/A | N/A    | R              |

-99999 to 99999  
5 digits display  
Set by YSS1000 Setting Software

## LCD Maintenance Setting Display (LCD MAINT)

| Parameter | Name                   | Setting and Display Range                               | Unit | Factory Default Value |               | Display and Setting Conditions for Controller Mode |     |        |      | User Set-tings |
|-----------|------------------------|---------------------------------------------------------|------|-----------------------|---------------|----------------------------------------------------|-----|--------|------|----------------|
|           |                        |                                                         |      | YS1500 (SINGLE)       | YS1700 (PROG) | SINGLE                                             | CAS | SELECT | PROG |                |
| SET       | Enable/Disable setting | INHB: Setting impossible ENBL: Setting possible (Note1) |      | INHB                  |               | R/W                                                | R/W | R/W    | R/W  |                |
| PWDOR     |                        |                                                         |      |                       |               |                                                    |     |        |      |                |
| KEYST     |                        |                                                         |      |                       |               |                                                    |     |        |      |                |

These parameters are for maintenance. If maintenance is required, contact your nearest YOKOGAWA dealer.

Note 1: When the SET parameter is set to "ENBL", [STOP] will appear on the right of the display title, and the manipulated output and alarm output will be kept.

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# Revision Information

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