User's Manual

YEWSERIES 80

Model STED (Style S) mV,Temperature and Potentiometer /Voltage Converters

YOKOGAWA
Yokogawa Electric Corporation

IM 01B04J01-02E
12th Edition

Contents

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Introduction

This manual describes the functions and operations of the STED mV,Temperature, and Potentiometer/Voltage Converters.

● Intended Readers

This manual is intended for personnel in charge:

- Installation and wiring
- Instrumentation and setup of the function
- Operation and monitoring of the controller
- Maintenance of equipment

● Related Documents

The following documents all relate to the STED mV,Temperature, and Potentiometer/Voltage Converters. Read them as necessary.

Manual Title	Manual No.	Description
Rack-Mounted Instruments	IM 1B4F2-01E	Describes mounting and wiring for the YS80 rack-mounted instruments.
Model VJ77 PC-based Parameters Setting Tool	IM 77J01J77-01E	Describes operation for the VJ77 parameters setting tool..
Model JHT200 Handy Terminal	IM 77J50H01-01EN	Describes operation of JHT200.

1.1 Inspection

The STED converter is shipped only after stringent inspection at the factory. Visually inspect the product upon delivery to make sure it is not damaged in any way.
Store the box and inner packing material of the package in a safe place - they may be needed if there is a problem with the product and it needs to be sent back for repair.

Check of Model and Suffix Codes

The model and suffix codes are indicated on the Name plate attached to the front cover of the instrument. Crosscheck this information with the model and suffix codes of Section 2.2 to ensure that the product is as specified in the order.

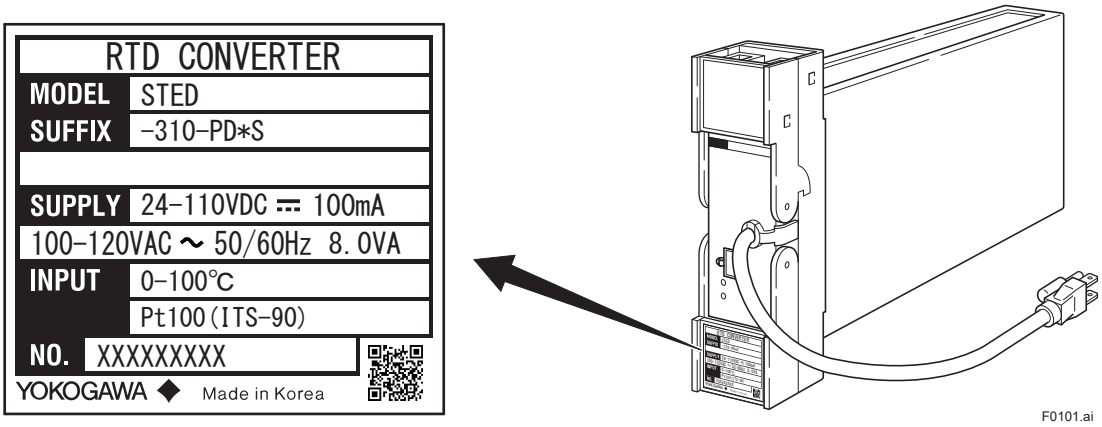

Figure 1-1 Name plate for Thermocouple Input (Description example)

Confirmation of the Package Contents

Check the package contents against the list below. If anything is missing or damaged, immediately contact the sales office from which you purchased the product or your nearest Yokogawa representative.

- STED mV, Temperature, and Potentiometer/Voltage Converters.....1
- Precautions on the Use of the YS80 Series 1

Downloadable Electronic Manuals

You can download the latest manuals from the following website:
To view the User's Manuals, use Adobe Acrobat Reader of Adobe Systems Incorporated.

http://www.yokogawa.com/ns/ys/

1.2 Documentation Conventions

This manual uses the following notational conventions

Symbols

The following symbols are used in this manual.

Markings	
 WARNING	Indicates that operating the hardware or software in a particular manner may damage it or result in a system failure.
 CAUTION	Draws attention to information that is essential for understanding the operation and/or features of the product.
Note	Gives additional information to complement the present topic and/or describe terms specific to this document.
▶	Gives reference locations for further information on the topic.

Description of Displays

Some of the representations of product displays shown in this manual may be exaggerated, simplified, or partially omitted for reasons of convenience when explaining them.

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/qr-code

QR Code is a registered trademark of DENSO WAVE INCORPORATED.

1.3 Notice

This Instruction Manual

- This manual should be passed on to the end user. Keep at least one extra copy of the manual in a safe place.
- Read this manual carefully to gain a thorough understanding of how to operate this product before you start using it.
- This manual is intended to describe the functions of this product. Yokogawa Electric Corporation (hereinafter simply referred to as Yokogawa) does not guarantee that these functions are suited to the particular purpose of the user.
- Under absolutely no circumstances may the contents of this manual, in part or in whole, be transcribed or copied without permission.
- The contents of this manual are subject to change without prior notice.
- 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 contact your nearest Yokogawa representative or sales office.

Protection, Safety, and Prohibition against Unauthorized Modification

- The following safety symbols are used on the product and in this manual.

Markings	
	If this symbol is indicated on the product, the operator should refer to the explanation given in the instruction manual in order to avoid personal injury or death to either themselves or other personnel, and/or damage to the instrument. The manual describes that the operator should exercise special care to avoid shock or other dangers that may result in injury or loss of life.
	Protective ground terminal: This symbol indicates that the terminal must be connected to ground prior to operating the equipment.
	Function ground terminal: This symbol indicates that the terminal must be connected to ground prior to operating the equipment.
	AC voltage: This symbol indicates that AC voltage is present.
	DC voltage: This symbol indicates that DC voltage is present.

- In order to protect the product and the system controlled by it against damage and ensure its safe use, make certain that all of the instructions and precautions relating to safety contained in this document are strictly adhered to. Yokogawa does not guarantee safety if products are not handled according to these instructions.
- If protection/safety circuits are to be used for the product or the system controlled by it, they should be externally installed on the product.
- Do not turn off the power of the product during adjustment and parameter setting.
- When you replace the parts or consumables of the product, only use those specified by Yokogawa.
- If the product is to be used in systems with special requirements for human safety, such in as nuclear power and radiation related equipment, railway facilities, aircraft facilities, and medical devices, please consult with your sales representative.
- Do not modify the product.

Force Majeure

- Yokogawa does not make any warranties regarding the product except those mentioned in the WARRANTY that is provided separately.
- Yokogawa assumes no liability to any party for any loss or damage, direct or indirect, caused by the use or any unpredictable defect of the product.

1.4 Compatibility with Previous Models

■ Compatibility with styles A and B

- Operation and settings differ from previous models (styles A and B). Please read this document carefully before operating the product.
- Before installing this product in a system or plant, you must check the jumper settings and parameters described in chapter 5, “Settings.” After checking settings and parameters, install the product in the system or plant, and then turn ON the power.

■ Compatibility with style R

- Operation and settings are the same as for the previous model (style R). Please read this document carefully before operating the product. However, if the temperature unit of the previous model (Style R) is set to “deg F”, the option code /FCAL is required for the new model (Style S).
- Before installing this product in a system or plant, you must check the jumper settings and parameters described in chapter 5, “Settings.” After checking settings and parameters, install the product in the system or plant, and then turn ON the power.

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General

The STED mV,Temperature and Potentiometer/Voltage Converters are used to convert mV DC, thermocouple, RTD (resistance temperature detector) or potentiometer input signals to isolated two 1 to 5 V DC signals and 4 to 20 mA DC signal.
Both thermocouple input type STED-210 and RTD input type STED-310 have built-in input linearizers as standard equipment.
Also, an upscale or downscale burnout function is provided in all types as a standard specification.
With the VJ77 Parameter Setting Tool you can do the following:

- Read/write all parameters at once
- Save read parameters to a file
- Copy parameters to other devices of the same model and suffix code (only with style code R or S).

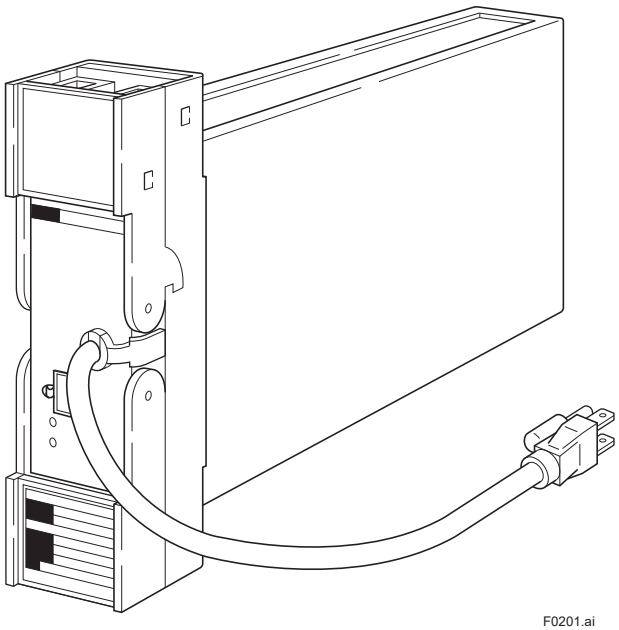

Figure 2-1 External View

2.1 Standard Specifications

Please see the General Specifications (GS 01B04J01-02E) at the end of this manual.

2.2 Model and Suffix Codes

Model	Suffix Codes	Option Codes	Description
STED			mV, Temperature and Potentiometer/Voltage Converters
Input signal	-1		mV DC input
	-2		Thermocouple input
	-3		RTD input
	-4		Potentiometer input
	-7		Universal input (mV, TC, RTD input)
Number of inputs	1		1 input
Suffix Code	0		Always 0
Suffix Codes	-MV		mV DC input
	-TK		Type K (ITS90, JIS C1602)
"-MV" for STED-110	-TT		Type T (ITS90, JIS C1602)
"-TK" to "-TS" for	-TJ		Type J (ITS90, JIS C1602)
STED-210	-TE		Type E (ITS90, JIS C1602)
"-PA" and "-PD" for	-TB		Type B (ITS90, JIS C1602)
STED-310	-TR		Type R (ITS90, JIS C1602)
"-RS" for STED-410	-TS		Type S (ITS90, JIS C1602)
"-UN" for STED-710	-PA		JPt100(JIS '89)
	-PB		Pt50 (JIS'81)
	-PD		Pt100(ITS-90, JIS C1604)
	-RS		Potentiometer
	-UN		Universal input (mV, TC, RTD input)
Style Code	*S		Style S
Option Codes (*1) (*2) (*3)		/NHR	Without rack case
		/FBP	Power supply fuse bypass
		/LOCK	Power supply plug with lock
		/WSW	With spring washer
		/REK	Mount to same line with EK series rack
		/TB	With power supply terminal
		/A2TB	220V version with power supply terminal
		/A2ER	220V version with power supply plug
		/FCAL	Fahrenheit range

*1: /LOCK, /REK, /TB, /A2TB, and /A2ER cannot be specified together.
*2: /FBP, /A2TB, and /A2ER cannot be specified together.
*3: When setting the temperature unit with "deg F", specify the option code /FCAL.

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Installation

For details of the installation procedure and wiring precautions, refer to the instruction manual “Installation of Rack-Mounted Instruments” (IM 1B4F2-01E).

3.1 External Wiring

(a) To prepare cables for connection to each terminal, install crimp-on solderless lugs for 4 mm screw on the end of each cable.
(b) Draw the internal unit out from the rack case.
(c) Connect the cables to the correct terminals by referring to Table 3-1.
(d) Replace the internal unit into the rack case after completing the wiring.
(e) The reference junction block (RJC) for STED-2 or STED-7 type should be securely installed to the screw on terminal 6.
(f) Always replace the terminal cover after completing the wiring.

CAUTION

The terminal cover cannot be replaced if the internal unit is not installed in the rack case. The terminal cover should be securely replaced because it has the function of locking the internal unit.

Terminal arrangement

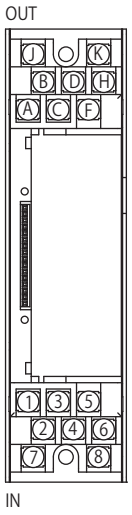


Figure 3-1 Terminal Layout

Table 3-1 Terminal Connections

Terminal Designation	Description
A B C D F H J K	+ / - > Output 1 (1 to 5 V DC) + / - > Output 3 (4 to 20 mA DC) + / - > Output 2 (1 to 5 V DC)

Do not connect to the output terminal when the terminal is not in use.

Terminal Designation	Description STED-1 and STED-2	Terminal Designation	Description STED-3	Terminal Designation	Description STED-4
1	+ / - > mV DC input or thermo-couple input	1	A, B	1	0%, CENTER
2		2		2	
3		3		3	
4		4		4	
5		5		5	
⑥	(RJC block installation terminal)	6		6	
7		7	B, RTD input	7	100%, Potentiometer input
8		8		8	

For STED-7 type, select one input from mV DC, thermocouple or RTD.

Applicable Cables

(1) Signal circuit wiring
● Cross-sectional area of the cable conductor: 0.5 to 0.75 mm^2
● Examples of applicable cables: Signal core PVC insulated flexible cable (VSF) stranded wires (JIS C 3306); heat-resistant vinyl-insulated cable (UL style 1007)
● Solderless lugs: All cable ends must be furnished with crimp-on solderless lugs for 4 mm screw.

(2) Power supply wiring
● Cross-sectional area of the cable conductor: 1.25 to 2.00 mm^2
● Examples of applicable cables: 600 V PVC insulated cable (1 V) stranded wires (JIS C 3307); PVC insulated cable for electrical apparatus (KIV) stranded wires (JIS C 3316)
● Solderless lugs: All cable ends must be furnished with crimp-on solderless lugs for 4 mm screw. The cable used should fulfill the amperage requirement of each instrument, and should also be small in voltage drop.

4.1 mV DC Input Type (STED-1 and STED-7 Types)

The mV DC input signals are converted into digital data in A/D conversion circuit. The digital data has signal processing (range conversion) in micro-processor to be Pulse Width Modulation (PWM). The Pulse Width Modulation (PWM) is converted into 1 to 5 V DC or 4 to 20 mA DC signals in output circuit after passing through optical insulation circuit.

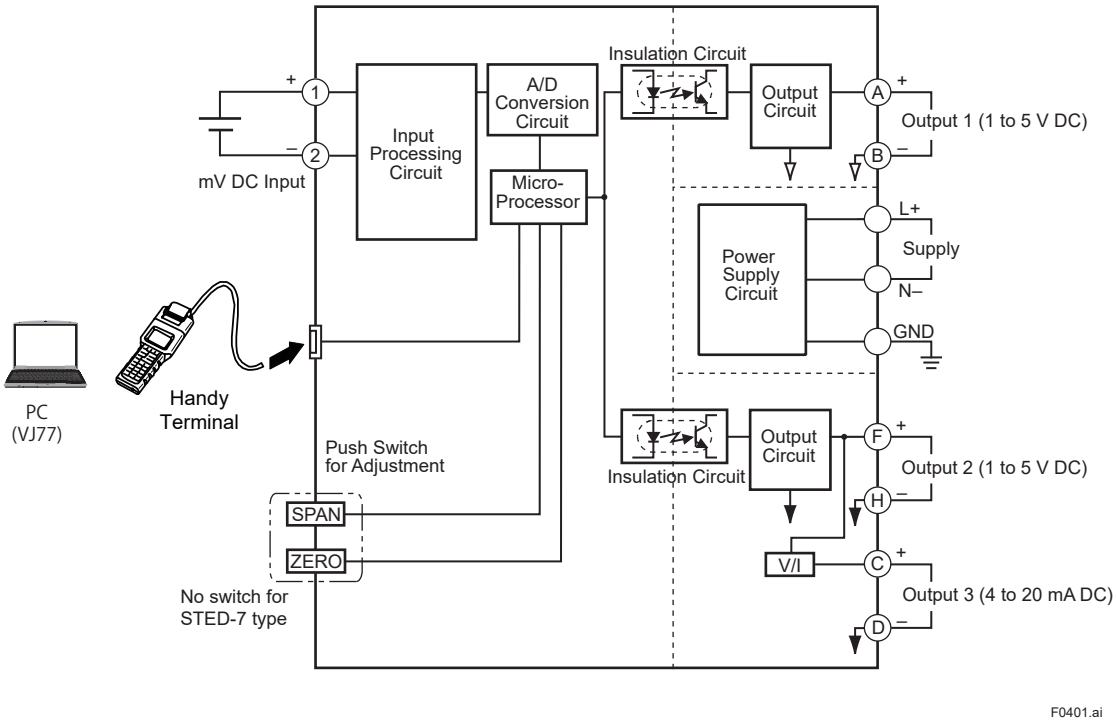


Figure 4-1 Functional Block Diagram for mV Input Type

4.2 Thermocouple Input Type (STED-2 and STED-7 Types)

The Thermocouple input signals are converted into digital data in A/D conversion circuit. The digital data has signal processing (linearizing computation, RJC computation, and range conversion) in micro-processor to be Pulse Width Modulation (PWM). The Pulse Width Modulation (PWM) is converted into 1 to 5 V DC or 4 to 20 mA DC signals in output circuit after passing through optical insulation circuit.

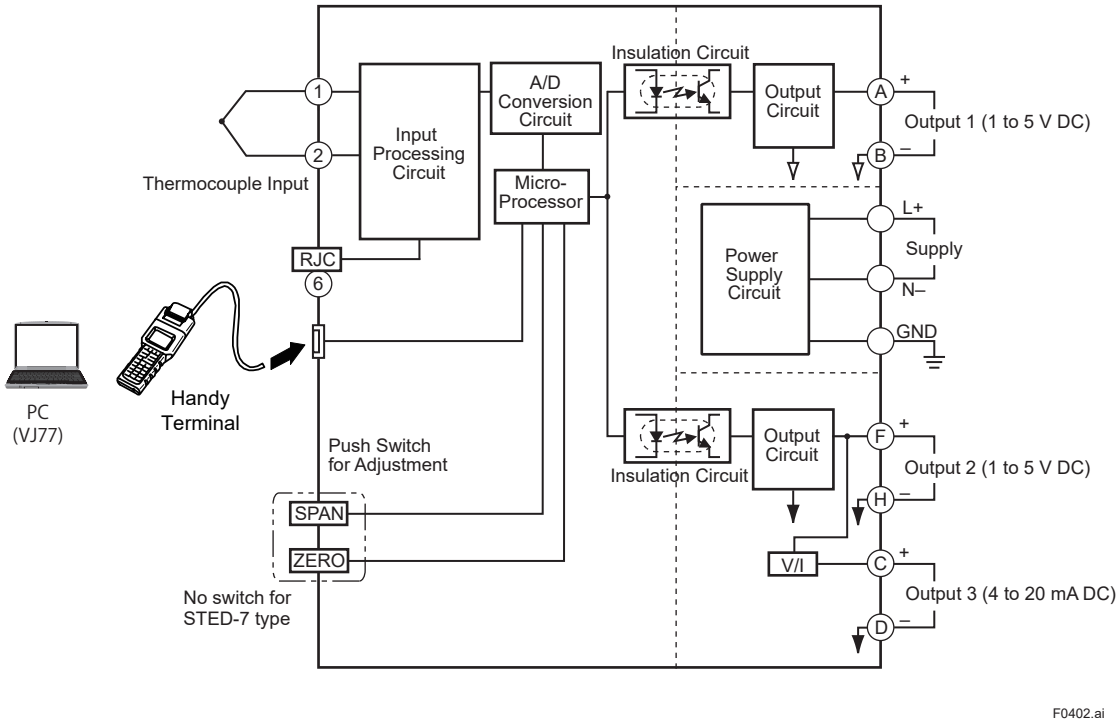


Figure 4-2 Functional Block Diagram for Thermocouple Input Type

4.3 RTD Input Type (STED-3 and STED-7 Types)

The RTD input signals are converted into digital data in A/D conversion circuit. The digital data has signal processing (linearizing computation and range conversion) in micro-processor to be Pulse Width Modulation (PWM). The Pulse Width Modulation (PWM) is converted into 1 to 5 V DC or 4 to 20 mA DC signals in output circuit after passing through optical insulation circuit.

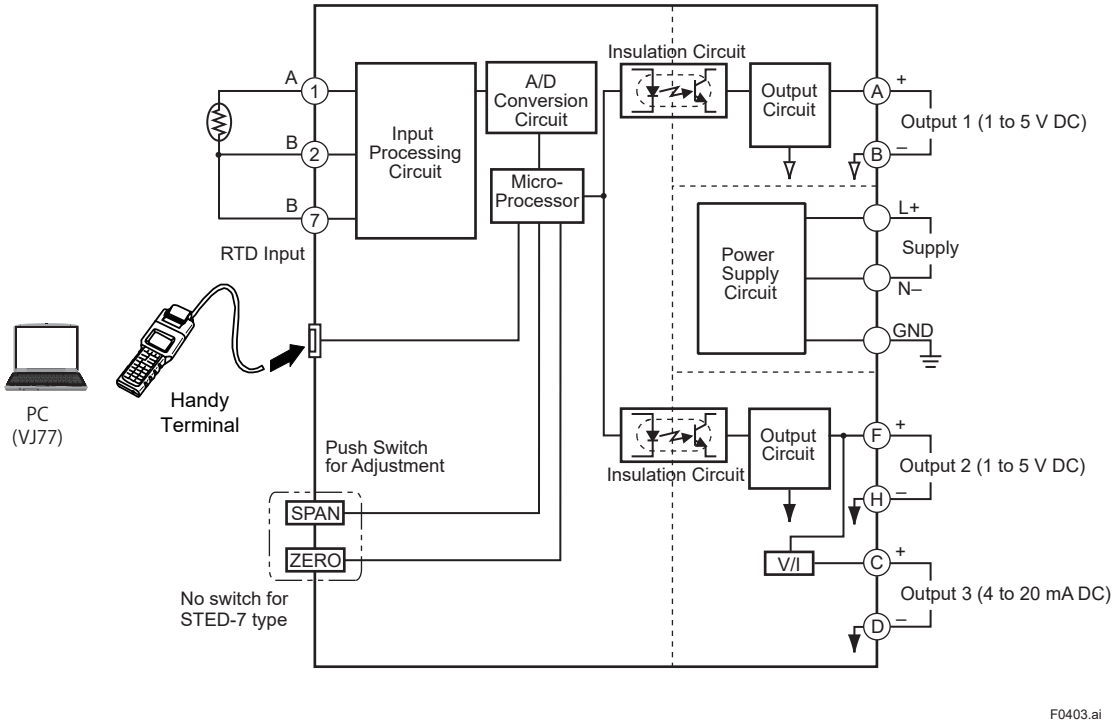


Figure 4-3 Functional Block Diagram for RTD Input Type

4.4 Potentiometer Input Type (STED-4 Type)

The Potentiometer input signals are converted into digital data in A/D conversion circuit. The digital data has signal processing (range conversion) in micro-processor to be Pulse Width Modulation (PWM). The Pulse Width Modulation (PWM) is converted into 1 to 5 V DC or 4 to 20 mA DC signals in output circuit after passing through optical insulation circuit.

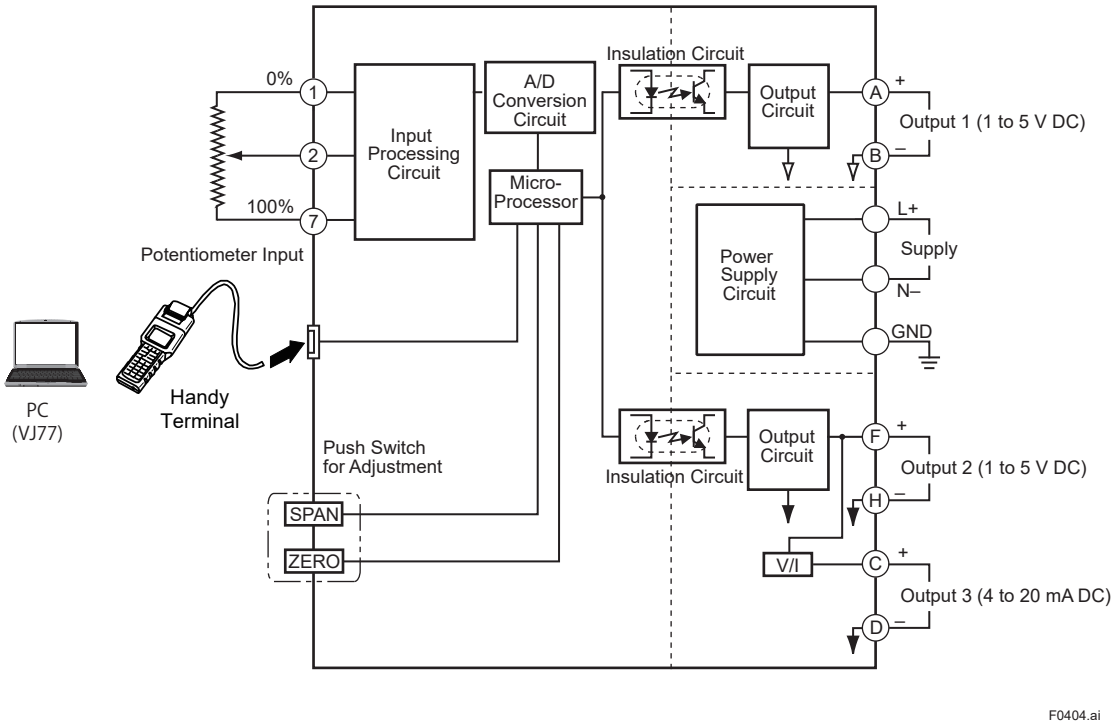


Figure 4-4 Functional Block Diagram for Potentiometer Input Type

Setting

■ Items to Confirm before Start of Operation

Before you start operation, inspect and confirm the following items:

(1)Draw out the internal unit from the rack case, and make sure that the specified fuses are properly mounted in the fuse holders at the rear of the internal unit.

(2)When inserting the internal unit into the rack case, firmly connect the multi-pin connectors for connecting the internal unit and the case.

(3)Make sure that power plugs are properly connected to the power outlet.

(4)Make sure that external wiring to the terminal block is properly connected.

The STED converters are made ready for operation by simply turning on the power once the installation and wiring are completed. The instrument does not require parameter settings and the like if there is no change in the specifications at order.

5.1 Names of Components

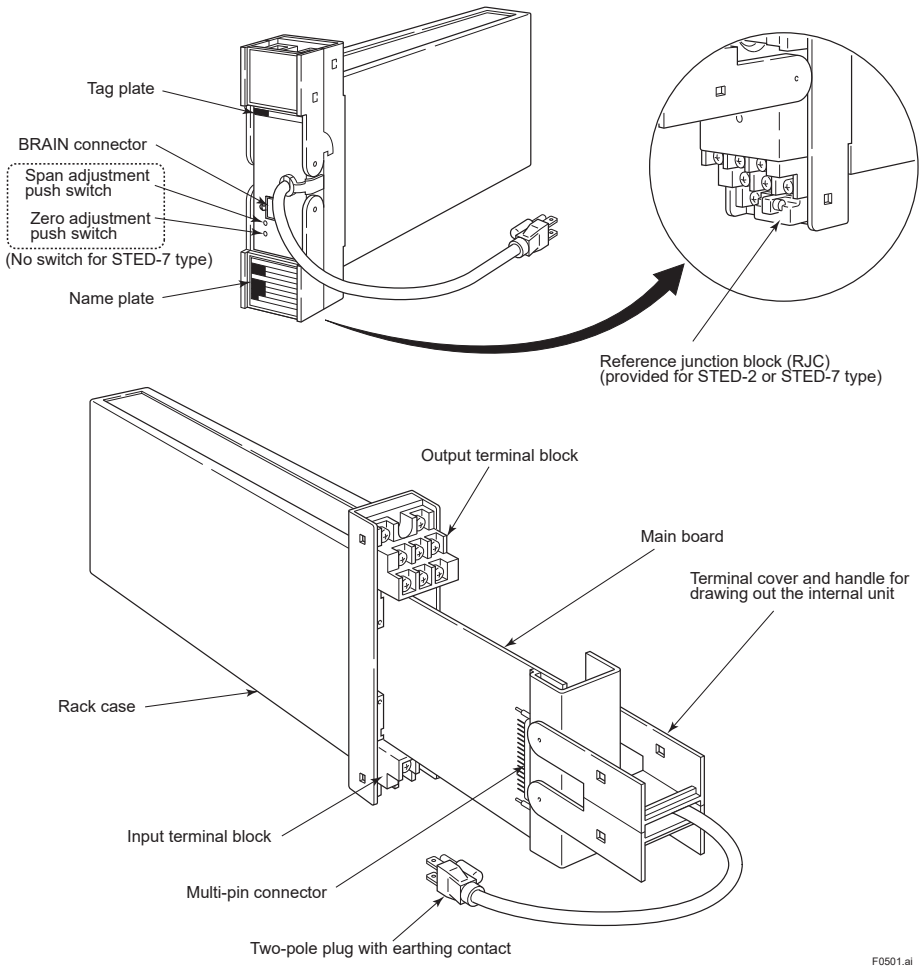


Figure 5-1 Names of Components

5.2 Setting Jumper

This instrument has the following setting jumpers:

- Reference junction compensation(JP1): ON/OFF (only for STED-2 type)
- Parameter Write Protect (JP2): ON/OFF
- Burnout (JP3, JP4): UP/DOWN/OFF (except for STED-7 type)

5.2.1 Check of Setting Jumper

CAUTION

- **For STED-2 and STED-7 types, first remove the reference junction block (RJC) from the terminal block, then draw the internal unit.**
- **For STED-2 and STED-7 types, attach the reference junction block (RJC) to the terminal block, then replace the terminal cover.**
- **Operation is not guaranteed if the jumper is not set.**

(a) Pull forward the terminal cover, and draw the internal unit out from the rack case.
(b) Check that the jumper on the main board of the internal unit is set to obtain the desired action.
(c) Use the tweezers to change the position of jumper.
(d) Put the internal unit back into the rack case.
(e) Replace the terminal cover.

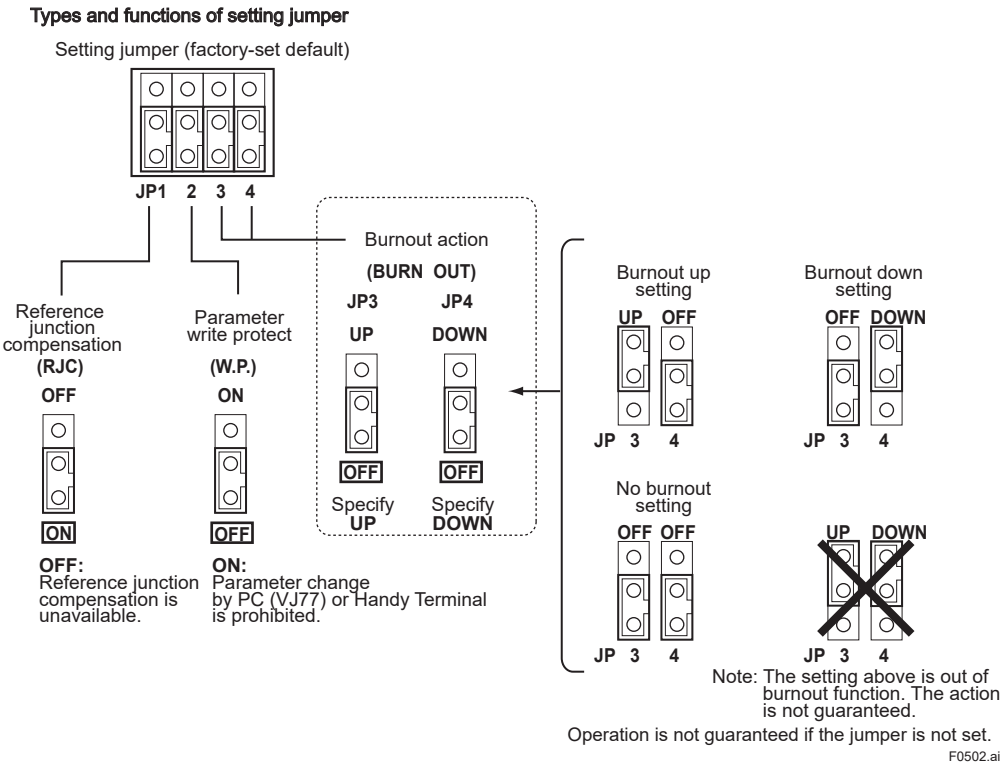


Figure 5-2 Types of Setting Jumper

5.2.2 Position of Setting Jumper

The setting jumper is on the main board of the internal unit.

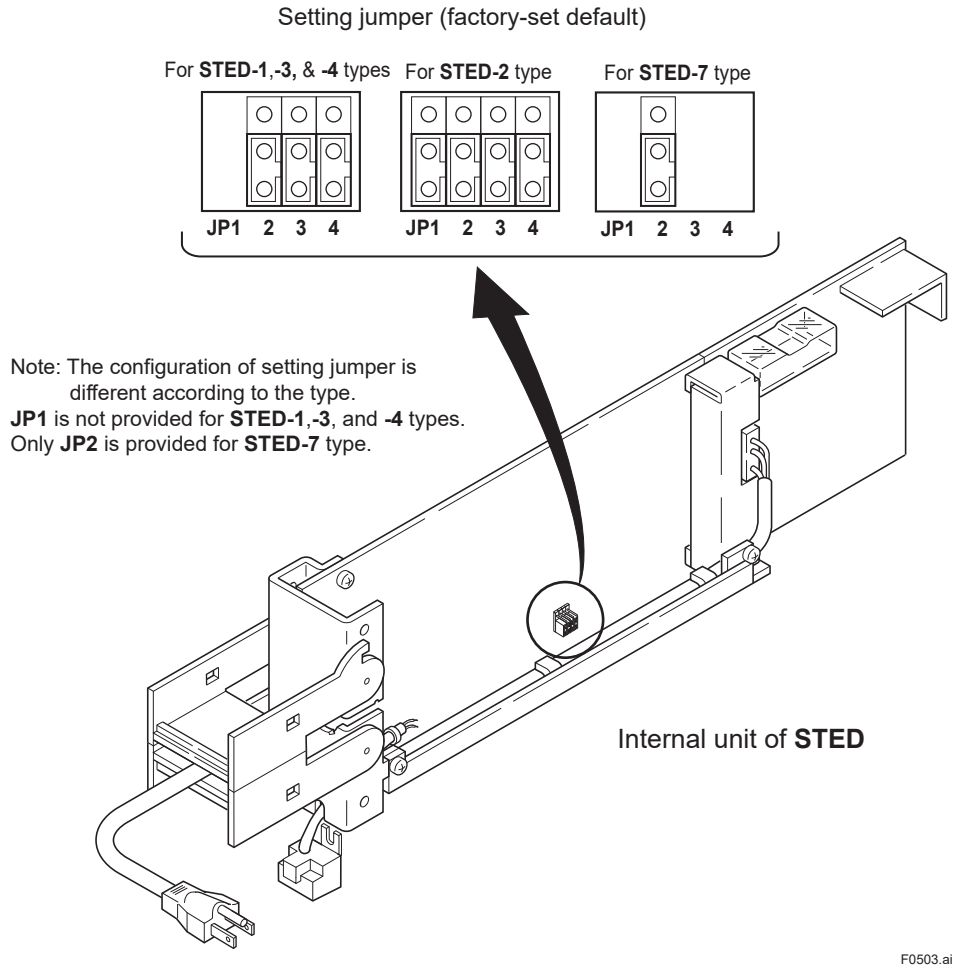


Figure 5-3 Configuration of Setting Jumper

5.3 Setting of Parameters

This instrument has BRAIN communication parameters for specifying functions and adjusting input/output. Connect a PC (VJ77) or JHT200 Handy Terminal (Note1) to the instrument to display or set parameters.

Note 1: BT200 BRAIN Terminal of Yokogawa Electric Corporation can also be used. When connecting a PC (VJ77) or the JHT200 Handy Terminal, the adapter for modular-jack (model E9786WH) is required. When using the BT200 BRAIN Terminal of YOKOGAWA Electric Corporation, the communication cable of 5-pin connector type (model F9182EE) and the adapter for modularjack (model E9786WH) are required.

CAUTION

- **For models STED-1 through STED-4, if no specifications are changed when ordering, you do not need to enter new parameters or other settings.**
- **For details of operation and adjusting procedures of VJ77 Parameters Setting Tool, refer to the instruction manual "Model VJ77 PC-based Parameters Setting Tool" (IM 77J01J77-01E).**
- **For details of operation and adjusting procedures of JHT200 Handy Terminal, refer to the instruction manual "JHT200 Handy Terminal" (IM 77J50H01-01EN).**
- **If the option code "/FCAL" is not specified, the temperature unit cannot be set with "deg F".**

<Connection>

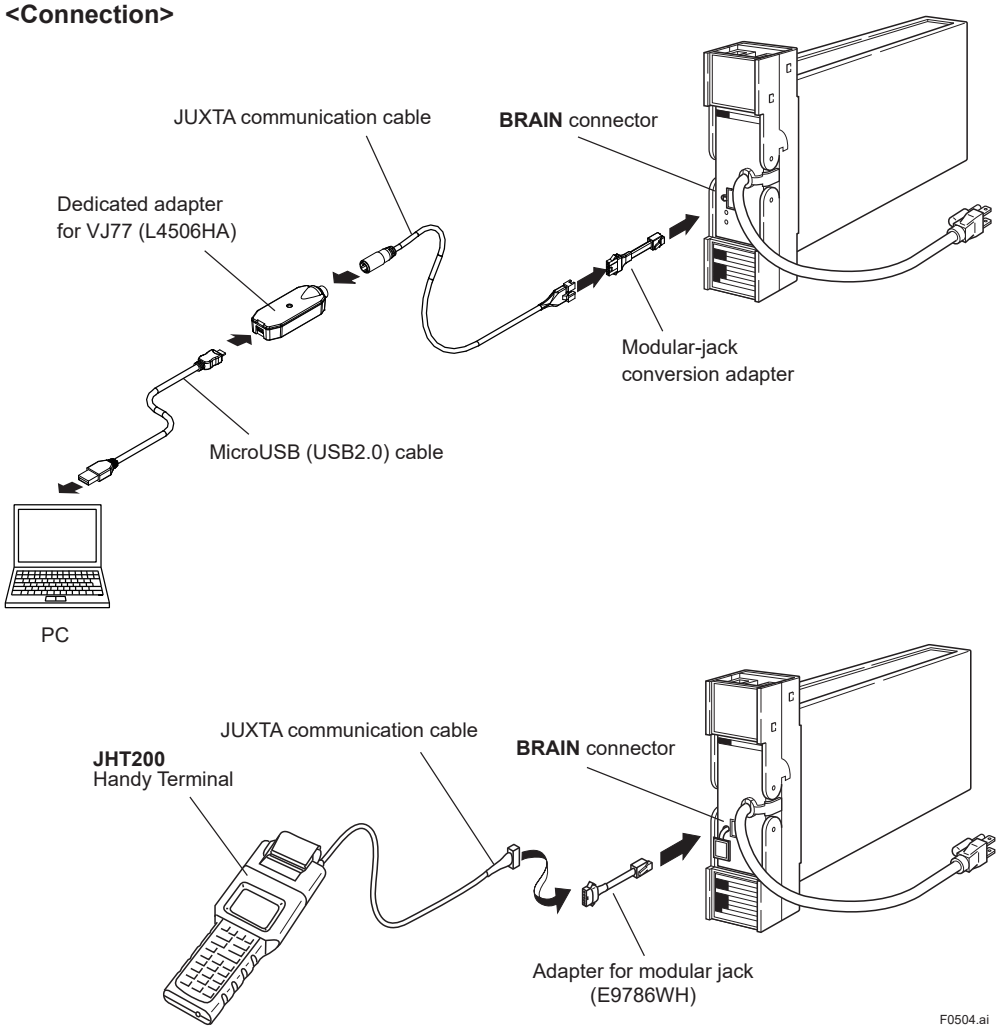


Figure 5-4 Connection

5.3.1 Configuration of Parameters

BRAIN communication parameters consist of the following parameters.

- Display (A & B parameters)
- Setting (D parameters)
- Adjustment (P parameters)
- Test (Q parameters)

5.3.2 Description of Parameters

The description of main parameters is as follows.

● Setting-related parameters

(1) D07: SENSOR TYPE1

Sets the input type for STED-7 type.
The following parameters are initialized if the SENSOR TYPE1 is changed.
D08: TC TYPE1
D09: RTD TYPE1
D27: INPUT1 L_RNG
D28: INPUT1 H_RNG
D37: RJC
D38: RJC CONST
P01: WIRING R1
P03: ZERO ADJ1
P04: SPAN ADJ1
P13: OUT1 0%
P14: OUT1 100%
P15: OUT2 0%
P16: OUT2 100%

(2) D08: TC TYPE1

Sets the thermocouple input type for STED-7 type.
The following parameters are initialized if the TC TYPE1 is changed.
D27: INPUT1 L_RNG
D28: INPUT1 H_RNG
P01: WIRING R1
P03: ZERO ADJ1
P04: SPAN ADJ1
P13: OUT1 0%
P14: OUT1 100%
P15: OUT2 0%
P16: OUT2 100%

(3) D09: RTD TYPE1

Sets the RTD input type for STED-7 type.
The following parameters are initialized if the RTD TYPE1 is changed.
D27: INPUT1 L_RNG
D28: INPUT1 H_RNG
P01: WIRING R1
P03: ZERO ADJ1
P04: SPAN ADJ1
P13: OUT1 0%
P14: OUT1 100%
P15: OUT2 0%
P16: OUT2 100%

(4) D13: RESIST1

Sets the total resistance for DC potentiometer input.

(5) D25: UNIT
Sets the unit for thermocouple input or RTD input.
The following parameters are initialized if the UNIT is changed.
D27: INPUT1 L_RNG
D28: INPUT1 H_RNG

(6) D27: INPUT1L_RNG
Sets 0% side of input range.

(7) D28: INPUT1H_RNG
Sets 100% side of input range.

(8) D31: BURN OUT1
Sets the burnout scale for STED-7 type.
The following parameter is initialized if the BURN OUT1 is changed.
P01: WIRING R 1

(9) D33: OUT1 DR and D34: OUT2 DR
Sets the action direction for output 1 and output 2.
If you set REVERSE, outputs 5 V (or 20 mA) for 0% and 1 V (or 4 mA) for 100%.

(10) D37: RJC
Sets available/unavailable of the reference junction temperature compensation-action for STED-7 type.

(11) D38: RJC CONST (The setting value is available when D37: RJC = OFF)
Can fix the reference junction temperature in the reference junction temperature compensation-action for STED-7 type.

● Adjustment-related parameters

(1) P01: WIRING R1
Corrects the wiring resistance of input.

(2) P03: ZERO ADJ1
Performs zero adjustment of input.

(3) P04: SPAN ADJ1
Performs span adjustment of input.

(4) P13: OUT1 0% (Note1)
Adjusts 0% of output 1.

(5) P14: OUT1 100% (Note1)
Adjusts 100% of output 1.

(6) P15: OUT2 0% (Note1)
Adjusts 0% of output 2.

(7) P16: OUT2 100% (Note1)
Adjusts 100% of output 2.

● Test-related parameters

(1) Q02: OUT1 TEST (Note1)
Outputs the set value forcibly regardless of input condition.
Q03 has the same function.

Note1: After completing adjustment and test, press the [F4] (OK) key of the Handy Terminal to return to normal condition (release of forced output).

5.4 Parameter List

BRAIN communication parameters for STED are as follows.

No.	Symbol	Parameter Name	Setting Range	Unit	Factory-set Value	Setting Type
01	MODEL	Model Name	Display	——		Display
02	TAG NO	Tag Number	Display	——		Display
03	SELF CHK	Self Check	GOOD/ERROR	——		Display
<Display Parameters>						
A	DISPLAY1	Menu Name				
A01	INPUT1	Input Display	Display	Note8		Display
A09	OUTPUT1	Output1 Display	Display	%		Display
A10	OUTPUT2	Output2 Display	Display	%		Display
A54	STATUS	Status Display (Note1)	0000 to FFFF	——		Display
A55	WRT PROTECT	Parameter Write Protect	ON/OFF	——	OFF	Display
A56	REV NO.	Revision number	Display	——		Display
A58	MENU REV	Menu Revision number	Display	——		Display
A60	SELF CHK	Self Check	GOOD/ERROR	——		Display
B	DISPLAY2	Menu Name				
B01	INPUT1	Input Display	Display	Note8		Display
B09	OUTPUT1	Output1 Display	Display	%		Display
B10	OUTPUT2	Output2 Display	Display	%		Display
B60	SELF CHK	Self Check	GOOD/ERROR	——		Display
<Setting Parameters>						
D	SET(I/O)	Menu Name				
D01	TAG NO.1	Tag Number1	Up to 8-single-byte	——		Alphanumeric
D02	TAG NO.2	Tag Number2	Up to 8-single-byte	——		Alphanumeric
D03	COMMENT1	Comment1	Up to 8-single-byte	——		Alphanumeric
D04	COMMENT2	Comment2	Up to 8-single-byte	——		Alphanumeric
D07	SENSOR TYPE1	Sensor Type (Note2)	TC/mV/RTD	——	(Note16)	Selection
D08	TC TYPE1	TC Type (Note10)	(Note6)	——	(Note16)	Selection
D09	RTD TYPE1	RTD Type (Note11)	(Note7)	——	(Note16)	Selection
D13	RESIST1	Resistance (Note3)	1 to 32000	OHM	(Note16)	Real number
D25	UNIT1	Unit (Note4)	degC/K/degF(when /FCAL is specified.)	——	(Note16)	Selection
D27	INPUT1 L_RNG	Input Low Range	Depends on the SENSOR TYPE	Note8	(Note16)	Real Number
D28	INPUT1 H_RNG	Input High Range	Depends on the SENSOR TYPE	Note8	(Note16)	Real Number
D31	BURN OUT1	Burn Out	OFF/UP/DOWN	——	(Note17)	Display(Note13)
D33	OUT1 DR	Output1 Direction	DIRECT/REVERSE	——	DIRECT	Selection
D34	OUT2 DR	Output2 Direction	DIRECT/REVERSE	——	DIRECT	Selection
D37	RJC	RJC On/Off (Note12)	ON/OFF	——	ON	Selection(Note14)
D38	RJC CONST	RJC Constant (Note10)	-20.0 to 80.0	Note15	000.0	Real Number
D60	SELF CHK	Self Check	GOOD/ERROR	——		Display
<Adjustment Parameters>						
P	ADJUST	Menu Name				
P01	WIRING R1	Wiring Resistance (Note5)	RESET/EXECUTE	——	RESET	Selecton
P03	ZERO ADJ1	Zero Adjustment (Note5)	Display	Note9		Selection
P04	SPAN ADJ1	Span Adjustment (Note5)	Display	Note9		Selection
P13	OUT1 0%	Output1 0%	-20.00 to 20.00	%	0.00	Real Number
P14	OUT1 100%	Output1 100%	-20.00 to 20.00	%	0.00	Real Number
P15	OUT2 0%	Output2 0%	-20.00 to 20.00	%	0.00	Real Number
P16	OUT2 100%	Output2 100%	-20.00 to 20.00	%	0.00	Real Number
P60	SELF CHK	Self Check	GOOD/ERROR	——		Display
<Test Parameters>						
Q	TEST	Menu Name				
Q02	OUT1 TEST	Output1 Test	-25.0 to 125.0	%	0.0	Real Number
Q03	OUT2 TEST	Output2 Test	-25.0 to 125.0	%	0.0	Real Number
Q60	SELF CHK	Self Check	GOOD/ERROR	——		Display

Note 1: The condition of the instrument is displayed.
Note 2: Displayed only for STED-7 type.
Note 3: Displayed only for STED-4 type.
Note 4: Not displayed for STED-1, -4 types, and mV input for STED-7 type.
Note 5: Not displayed only for STED-4 type.
Note 6: TYPE K/E/J/T/R/S/B/N/W3/W5 (N/W3/W5 are only for STED-7 type.)
Note 7: Pt100-90/Pt100-68/JPt100/Pt50
Note 8: “mV” is for mV input, “deg C, deg F or K” is for TC/RTD input, and “OHM” is for potentiometer input.
Note 9: ** RST/** INC/** HINC/** HDEC/** DEC(**;“mV” is for mV & TC inputs, and “OHM” is for RTD and potentiometer inputs.)
Note 10: Displayed only for TC input of STED-7 type.
Note 11: Displayed only for RTD input of STED-7 type.
Note 12: Displayed only for TC input of STED-2 and -7 type.
Note 13: STED-7 displays “Selection“.
Note 14: STED-2 displays “Display“.
Note 15: Specified in D25.
Note16: Items to Be Specified at the Time of Ordering (mandatory).
Note17: Items to Be Specified at the Time of Ordering (optional). If not specified, the burnout (B31) is set to OFF.

Blank

Maintenance

This chapter describes the calibration procedures that can be done in the instrument room or service shop.

6.1 Test Equipment

For efficient maintenance of this converter, it is recommended that the user have the following test equipment manufactured by Yokogawa or their equivalent.

- DC Voltage/Current Standard, Yokogawa GS200 or the equivalent……..... 1 set
  (Required for mV DC and thermocouple input type equipment)
- Decade Resistance Boxes, Yokogawa 279301 or the equivalent…..... 1 set
  (Required for RTD input type equipment)
- Digital Voltmeter, Yokogawa DM7560 or the equivalent…..... 1 set
- Cold Junction Bottle, Type T-MJ…….....1 set
  (To be made available only as required)
- PC, VJ77 Parameters Setting Tool…….....1 set
- Handy Terminal, JHT200 (BT200)…….....1 set

6.2 Reference Table of Thermocouple and RTD

This instrument has been adjusted in accordance with the JIS thermoelectromotive force table and the resistance ratio table.
For the input signals used to adjust the instruments, refer to JIS C1602, IEC 60584-1 (ITS-90) for the thermocouple input type and to JIS C 1604, IEC 60751 (ITS-90), DIN (IPTS-68) for the platinum resistance temperature detector (RTD) input type.

6.3 Adjustment

6.3.1 Adjustment for STED-1 to -4 Types (One Input-only Type)

The inputs of STED-1 to -4 types are different, but the way for adjustment is the same.

(a) Connect the test equipment corresponding to each input referring to Figure 6-1 through Figure 6-4.

(b) Turn on the power while the equipment is connected to the instrument, and allow a warm-up period of about 5 minutes.

(c) Press the Zero adjustment push-switch on the front panel for 3 seconds or more to enter the adjustment mode.

(d) Apply an input equivalent to 0 % of the input range and read the output on the digital voltmeter. It should be within the range 1 V ± 0.02 V. If the error is too large, apply an input equivalent to 0 % of the input range, then press the Zero adjustment push-switch for adjustment. When pressing the push-switch for 1 second or more, the output increases in the fixed ratio. When pressing the push-switch again for 1 second or more after releasing the push-switch, the output decreases in the fixed ratio. Perform the adjustment while checking the output.

(e) Apply an input equivalent to 100 % of the input range and read the output on the digital voltmeter. It should be within the range 5 V ± 0.02 V. If the error is too large, apply an input equivalent to 100 % of the input range, then press the Span adjustment push-switch for adjustment. When pressing the push-switch for 1 second or more, the output increases in the fixed ratio. When pressing the push-switch again for 1 second or more after releasing the push-switch, the output decreases in the fixed ratio. Perform the adjustment while checking the output.

(f) Adjustable range is ± 5 % of span for mV DC/RTD/Thermocouple input and ± 10 % of span for potentiometer input.

(g) Check that the output error for 25 %, 50 %, and 75 % of input range is within the accuracy. If necessary, apply inputs equivalent to 25 %, 50 %, and 75 % of input range, then press the Zero adjustment push-switch for adjustment.

(h) This instrument is provided with 3 outputs, but the adjustment for only one of the 3 outputs is enough.

- **Do not open the terminal cover while adjusting the thermocouple input in order to maintain all terminals at the same temperature.**
- **When the lead wire resistance is large (when using the safety barrier such as BARD in combination with the instrument, it is equivalent to the increase of the lead wire resistance), the error of zero point may occur. Perform zero adjustment in the condition close to mounting condition.**
- **When performing the adjustment by current output, connect the parallel resistance (250 Ω ± 0.05 %) and check voltage.**
- **When performing span adjustment immediately after the zero adjustment (shorter than 1 minute), pressing the Zero adjustment push-switch for 3 seconds or more is not required.**
- **The adjustment mode ends if the push-switch is not pressed for 1 minute or more, then the instrument enters the normal mode.**
- **Do not turn off the power to the instrument during adjustment.**

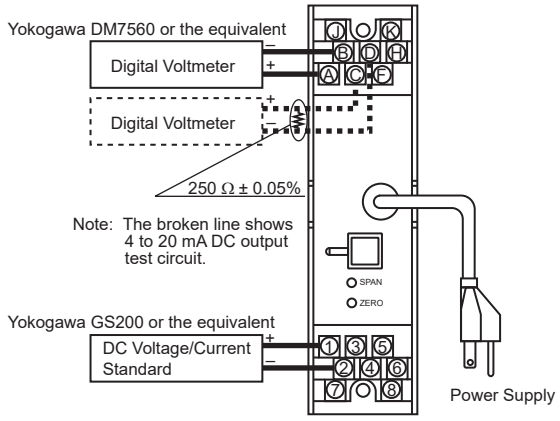


Figure 6-1 mV DC Input Converter Adjustment

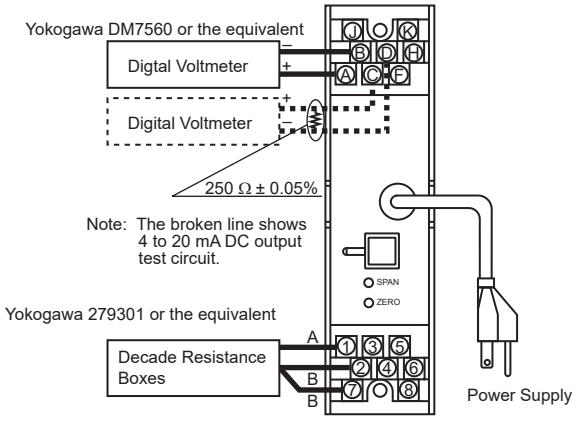


Figure 6-2 RTD Input Converter Adjustment

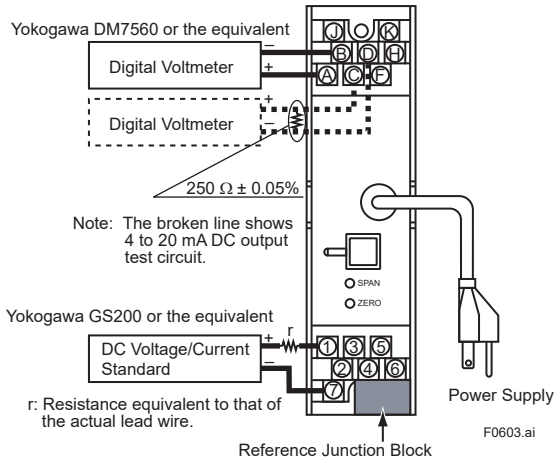


Figure 6-3 Thermocouple Input Converter Adjustment

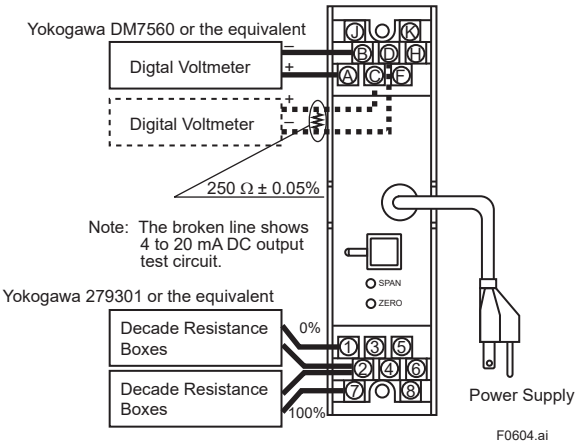


Figure 6-4 DC Potentiometer Input Converter Adjustment

6.3.2 Adjustment for STED-7 Type (Universal Type)

The adjustment for STED-7 type without Zero/Span adjustment push-switches on the front panel is to be performed using a PC (VJ77) or the JHT200 Handy Terminal.

(a) Connect the test equipment corresponding to each input referring to Figure 6-1 through Figure 6-3.
(b) Set the parameter write protect (W.P.) of setting jumper to OFF. (refer to “5.2 Setting Jumper”.)
(c) Turn on the power while the equipment is connected to the instrument, and allow a warm-up period of about 5 minutes.
(d) Connect a PC (VJ77) or JHT200 Handy Terminal.

<Connection>

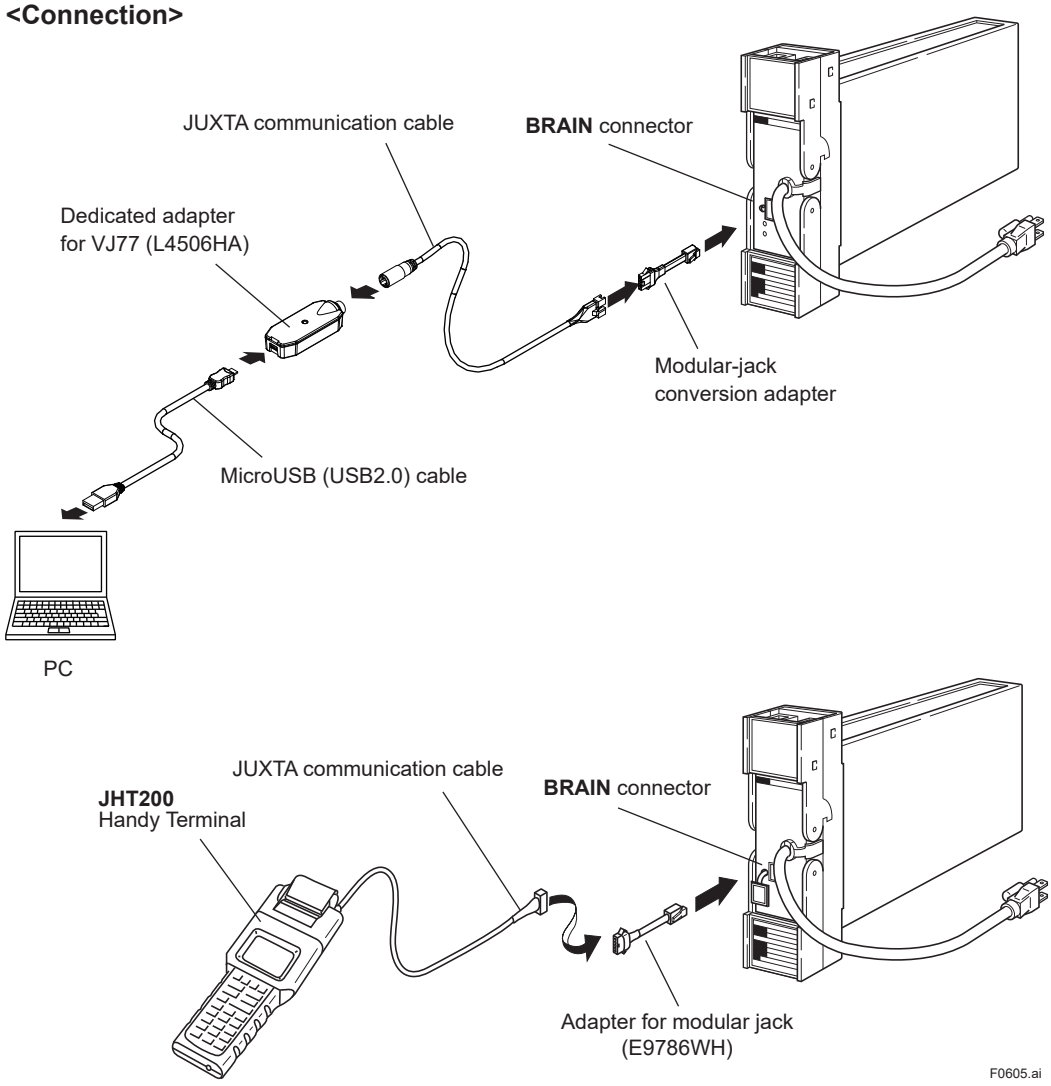


Figure 6-5 Connection

CAUTION

- **For details of operation and adjusting procedures of VJ77 Parameters Setting Tool, refer to the instruction manual “Model VJ77 PC-based Parameters Setting Tool” (IM 77J01J77-01E).**
- **For details of operation and adjusting procedures of JHT200 Handy Terminal, refer to the instruction manual “JHT200 Handy Terminal” (IM 77J50H01-01EN).**
- **Do not turn off the power of the instrument during adjustment.**

(e) Call the adjustment item (P:ADJUST).
(f) P03:ZERO ADJ1 is displayed.
(g) Apply an input equivalent to 0 % of the input range. Check the input value and the input display of P03:ZERO ADJ1. If the input value does not correspond to the display value, select P03:ZERO ADJ1 to enter the adjustment mode.
Mainly select INC (addition) or DEC (subtraction) for adjustment. (Selecting RST resets the adjusted value and retrieves the factory-set default.) Selecting HINC or HDEC performs adjustment using a value ten times as large as INC or DEC.
(h) Apply an input equivalent to 100 % of the input range. Check the input value and the input display of P04:SPAN ADJ1. If the input value does not correspond to the display value, select P04:SPAN ADJ1 to enter the adjustment mode.
Mainly select INC (addition) or DEC (subtraction) for adjustment. (Selecting RST resets the adjusted value and retrieves the factory-set default.) Selecting HINC or HDEC performs adjustment using a value ten times as large as INC or DEC.
(i) After completing the adjustment, set the parameter write protect (W.P.) of setting jumper to ON. (refer to “5.2 Setting Jumper”.)

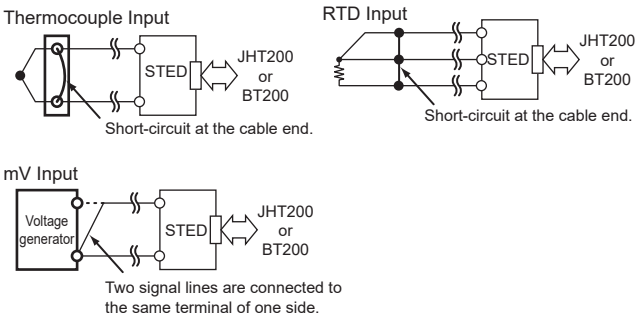
6.3.3 Calibrating the Input Wiring Resistance

When an error occurs due to the input wiring resistance in the input signal (DC potential differences (mV DC), thermocouple, or RTD), you can calibrate parameters by using a PC (VJ77) or the JHT200 Handy Terminal.

CAUTION

- **Calibrate the input wiring resistance after installation wiring at the site.**
- **Do not turn off the power to the instrument while calibrating the wiring resistance.**

(a) Turn the write-protect (W.P.) setting jumper to OFF.
(b) Short-circuit the unit's input wiring on the sensor side.
- Short-circuit the 2 wires for mV DC or thermocouple input.
- Short-circuit the 3 for RTD input.



(c) Connect a PC (VJ77) or the JHT200 Handy Terminal.
(d) P01: WIRING R1 of the adjustment item (P: ADJUST) appears.
(e) Select EXECUTE, and then press ENTER twice.
(f) When calibration is complete, turn the write protect (W.P.) setting jumper to ON if necessary.
(g) For details, see "10.4 Setting Wire Resistance Compensation" in the VJ77 Parameters Setting Tool user's manual (IM 77J50H01-01EN) or "Wiring Resistance Adjustment" in the JHT200 Handy Terminal user's manual (IM 77J50H01-01EN).

6.4 Check of Reference Junction Temperature Compensation Action

For thermocouple input, check the action of reference junction temperature compesation using the cold junction bottle. The figure of connection is shown in Figure 6-6.

CAUTION

When using the cold junction bottle, install the reference junction block (RJC), then replace the terminal cover and warm up the instrument for about 15 minutes.

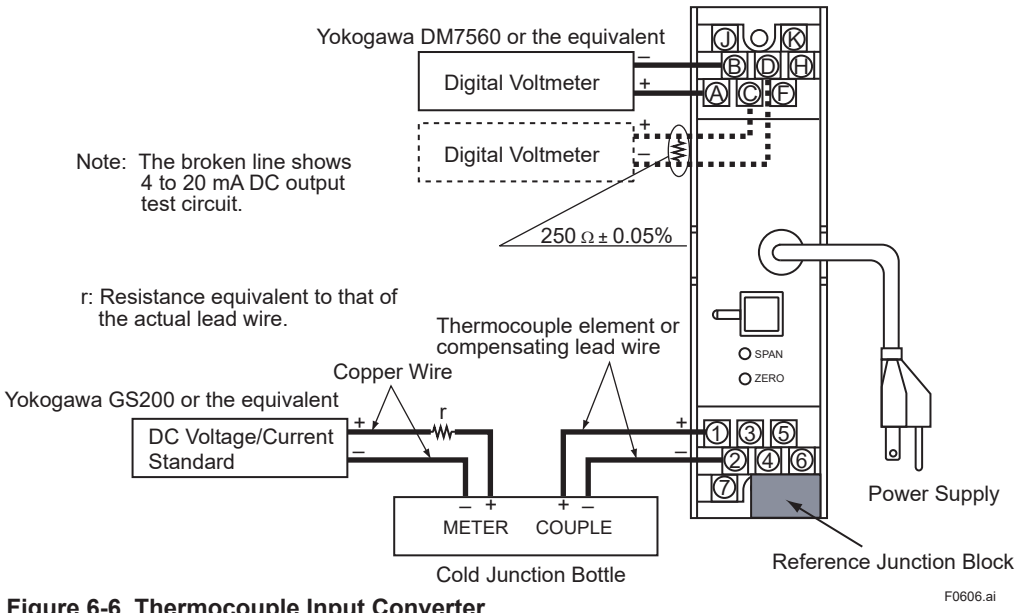


Figure 6-6 Thermocouple Input Converter (Using reference junction compensator)

6.5 List of Replaceble Parts

Contact YOKOGAWA's sales office or sales representative when replacing the spare parts.

Part Name	Part Number	Recommended replacement period	Reference
Fuse	S9510VK	Approx. 3 years	If the fuse breaks or if the replacement period elapses, please have the item replaced.
Power supply unit	L3510YA: Standard L3510YF: Option codes /TB, /FBP, or /REK L3510YT: Option code /A2TB L3510YR: Option code /A2ER	5-10 years	As the aluminum electrolytic capacitors used in the power supply unit are subject to deterioration from temperature and other operating conditions, we recommend the replacement period on the left.

Troubleshooting

If any fault occurs in the instrument, note the symptoms and follow Section 7.1.

7.1 Action in Fault Condition.

The output condition and error codes (BRAIN communication parameters) in fault condition are shown in the table below.

CAUTION

- **STATUS is displayed in A54 of A:DISPLAY (display), and SELF CHK is displayed in 60 of each item.**
- **STATUS error code is to be the addition display (hexadecimal number) when two errors or more occur.**

BRAIN Communication Parameter Display			Output Condition	Description of Error	Remedy
STATUS	SELF CHK	Error Information (*1)			
			Same state as power off Output: 0% or less Pushing button：Disable Communication： Undefined	Hardware failure Power supply failure, Fuse broken	Contact YOKOGAWA's sales office or sales representative.
0001	ERROR	EEPROM ERROR	Output: 0% or less Pushing button: Disable Communication： Undefined	EEPROM error	
0002	ERROR	EEPROM SUM ERROR	Output: 0% or less Pushing button: Disable Communication： Undefined	Parameter error	
1000	ERROR	AD ERROR	Output: 0% or less Pushing button: Disable Communication： Normal action	A/D conversion error	
0080	ERROR	RJC ERROR	Output: (*2) Pushing button: Enable Communication： Normal action	RJC sensor error	Replace RJC or check terminal (ambient) temperature.
0008	ERROR	INPUT OVER RANGE	Output: Normal action Pushing button: Enable Communication： Normal action	Excessive input, out of -25 to 125%	Set the input within the range. (*3)
0010	ERROR	RANGE SET ERROR	Output: Normal action Pushing button: Enable Communication： Normal action	INPUT1 L_RNG and INPUT1 H_RNG are same values.	Set INPUT1 L_RNG or INPUT1 H_RNG again.
0040	GOOD	None	Output: Normal action Pushing button: Enable Communication： Normal action	Check power failure during operation	Write "0000" at the STATUS display of BRAIN communication parameter.
0000	GOOD	None	Output: Normal action Pushing button: Enable Communication： Normal action	-	-

*1: Displayed when calling ■60: **SELF CHK**.

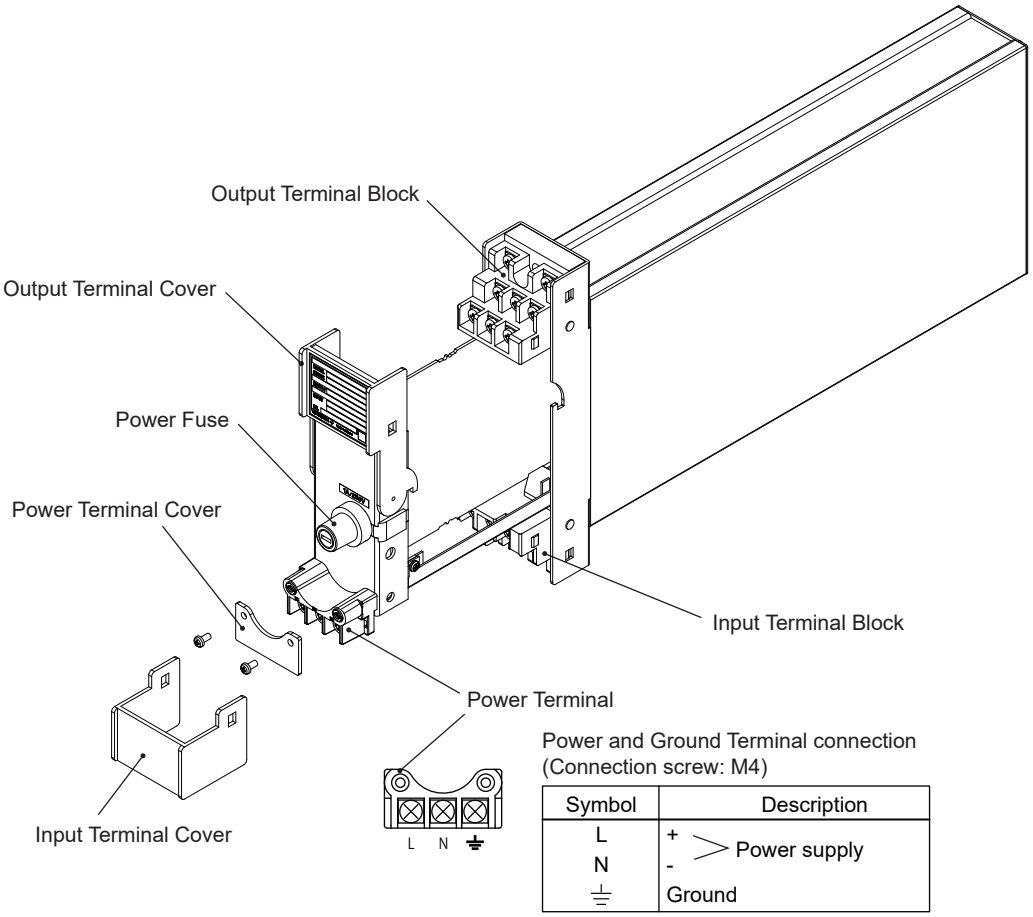
*2: Once you run the unit under a reference junction temperature of -20°C or 80°C, run it per the burnout settings.
If the burnout setting is UP or DOWN, run the unit such that the input value runs out in the set direction and outputs according to that input value.
Operation while the burnout setting is OFF results in undefined.

*3: If errors continue even when the input is within the range, the input circuit is broken.
Contact YOKOGAWA's sales office or sales representative.

Power Supply Terminal Connections (Options /TB, /A2TB, and /REK)

If you specify the terminal block to which the power source is directly connected (option codes: /TB, /A2TB, and /REK), the external wiring to the terminal block is necessary; therefore, drawing out the internal unit requires previous turning off of the power source and disconnection of the wiring from the terminal block.

8.1 External View and Names of Components



Power and Ground Terminal connection
(Connection screw: M4)

Symbol	Description
L	+
N	-
⏚	Ground

Power supply

Figure 8-1 External View and Names of Components

8.2 Power Supply and Ground Wiring

(1) All cable ends must be furnished with crimp-on type solderless lugs (for 4 mm screw).
(2) Examples of applicable cables:
Cross-sectional area of the cable conductor: 2.0 mm^2. *
Applicable cable: 600 V vinyle insulated cable (IV) stranded wires, conforming to JIS C3307.
Vinyle sheathed cables for electric appliances (KIV) stranded wires, conforming to JIS C3316.
Note *: Power supply cables should be determined from the instrument power consumption-they must have conductors with cross-sectional area of at least 1.25 mm^2.
(3) Wirings to power supply and ground terminals should be made after completion of signal terminal wirings. (To facilitate connecting input signal, pull the internal unit approximately half way out of the housing. Do not remove the power terminal block.)
(4) After completing the power supply and ground wiring, mount the power terminal cover.

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General Specifications

GS 01B04J01-02E

Model STED (Style S) mV, Temperature and Potentiometer/ Voltage Converter

YEWSERIES 80

■ GENERAL

The Model STED Converter accepts a mV DC, thermocouple, RTD or potentiometer signal, converts and normalizes it, provides isolation, and outputs 1 to 5 V DC and 4 to 20 mA DC signals. Two types are prepared for the STED converter: fixed input type that is fixed to mV DC, thermocouple, RTD or potentiometer, and universal input type that can select input type from mV DC, thermocouple or RTD. Burnout function is provided as standard for each type.

With the VJ77 Parameter Setting Tool you can do the following:

- *Read/write all parameters at once*
- *Save read parameters to a file*
- *Copy parameters to other devices of the same model and suffix code (only with style code R or S).*

■ STANDARD SPECIFICATIONS

Input Signals

Input Signal Type	mV DC Input	Thermocouple Input (*1)	RTD Input 3-wire (*2) Current at 0.2 mA DC	Potentiometer Input 3-wire Voltage at 0.5 V DC
Minimum Span	3 mV	3 mV	10°C (*3)	80 Ω
Maximum Span	100 mV	62 mV	650°C (PT50/Pt100) 500°C (JPt100)	2000 Ω
Max. Zero Elevation	Whichever is the smaller, within three times the span or ±50 mV	±25 mV	Within five times the span (temperature)	Up to 50 % of total resistance
Measuring Range	See table of Measuring Ranges shown on the right.			50 % or more of total resistance
Measurement unit	mV	°C, K, °F (*6)	°C, K, °F (*6)	Ω
Input Resistance	1 MΩ (Power on) 4 kΩ (Power off)		–	–
Source (leadwire) Resistance	Up to 500 Ω (*4)		No greater than input span (°C) X 0.4 Ω or 10 Ω per wire, whichever is the smaller. Each leadwire resistance must be equal. (*5)	Maximum 10 Ω per wire Each leadwire resistance must be equal.
Input Overload	Up to ± 4 V DC		–	–

*1: Thermocouple JIS C 1602, IEC 60584-1 (ITS-90)
TypeK, T, E, J, R, S, B, N, W3(Note 1), W5(Note 2)
Note 1: ASTM E988 Standard: W97Re3-W75Re25 (tungsten97% rhenium3%-tungsten75% rhenium25%)
Note 2: ASTM E988 Standard: W95Re5-W74Re26 (tungsten95% rhenium5%-tungsten74% rhenium26%)

*2: RTD JIS C 1604, IEC 60751 (ITS-90) Pt100
JIS C 1604: 1989, DIN (IPTS-68) Pt100
JIS C 1604: 1989, JPt100
JIS C 1604: 1981, Pt50 JIS C 1604

*3: When used with BARD-300 or BARD-700, the minimum span is 30°C (60°C for Pt50). The minimum span for Pt50 is 20°C. (BARD-300 and BARD-700 are safety barriers of YOKOGAWA.)

*4: When used with BARD-200 or BARD-600, the internal resistance of BARD (235 Ω ± 15 Ω) is not included. (BARD-200 and BARD-600 are safety barriers of YOKOGAWA.)

*5: When used with BARD-300 or BARD-700, the internal resistance of BARD (130 Ω ± 3 Ω) is not included. (BARD-300 and BARD-700 are safety barriers of YOKOGAWA.)

*6: When specify the option code "/FCAL".

For universal input type, select one input type from mV DC, thermocouple or RTD.
Measuring Ranges for Each Input

Type		Measuring Ranges
mV		–50 to 150 mV
TC (*1)	Type K	–200 to 1200°C
	Type T	–200 to 350°C
	Type J	0 to 750°C
	Type E	–200 to 800°C
	Type B	600 to 1700°C
	Type R	0 to 1600°C
	Type S	0 to 1600°C
	Type N (*7)	–200 to 1200°C
	Type W3 (*7)	0 to 2000°C
	Type W5 (*7)	0 to 2000°C
RTD (*2)	JPt100	–200 to 510°C
	Pt50	–200 to 649°C
	Pt100 (ITS-90)	–200 to 850°C
	Pt100 (IPTS-68) (*7)	–200 to 660°C
Potentiometer (*8)		100 to 2000 Ω (*9)

*7: For STED-7 type only
*8: For STED-4 type only
*9: Total resistance

Output Signals

Output: 1 to 5 V DC (two outputs)
4 to 20 mA DC (one output)
Load Resistance:
2 kΩ or more (1 to 5 V DC output)
750 Ω or less (4 to 20 mA DC output)

GS 01B04J01-02E

14th Edition Jan. 2021(YK)

BRAIN Communication Function

Sets each parameter, monitors input/output values, and adjusts input/output using a PC (VJ77) or the JHT200 Handy Terminal*.

Burnout Function (UP/DOWN/OFF)

Fixed input type: Selection by the jumper switch.
Universal input type: Selection by the parameter.

Calibration

mV DC Input:
Linearity for mV DC and output
Thermocouple Input/RTD Input:
Linearity for temperature and output
Potentiometer Input:
Linearity for resistance value and output

Adjustment Range for Zero and Span

mV DC Input/Thermocouple Input/RTD Input:
±5% of span
Potentiometer Input:
±10% of span
How to Adjust
Fixed input type:
Adjustment by push switch on the front.
Universal input type:
Adjustment using a PC (VJ77) or the JHT200 Handy Terminal*.

*: When connecting a PC (VJ77) or the JHT200 Handy Terminal, the adapter for modular-jack (model E9786WH) is required. When using the BT200 BRAIN Terminal of YOKOGAWA Electric Corporation, the communication cable of 5-pin connector type (model F9182EE) and the adapter for modular-jack (model E9786WH) are required.

■ MOUNTING AND APPEARANCE

Mounting: Indoor rack mounting
Wiring
Signal wiring: ISO M4 size (4mm) screws on terminal block
Power and Ground wiring
100 V version: JIS C 8303 two-pole plug with earthing contact (IEC A5-15, UL458)
Cable length: 300 mm
Power supply terminal type (option code /TB)
220 V version: CEE 7 VII (CENELEC standard) plug (option code /A2ER)
Cable length: 300 mm
Power supply terminal type (option code /A2TB)
External Dimensions:
(Height x Width x Depth from the mounting face)
180 x 48 x 300 (mm)
Weight: 1.7 kg (including rack-mounting case)

■ STANDARD PERFORMANCE

Accuracy: ±0.5% of span
However, there are the following conditions for TC and RTD inputs.
<For Thermocouple>
Note that for thermocouple input, add the reference junction compensation accuracy to the accuracy above.
Reference Junction Compensation Accuracy
For temperatures 0°C and over:
±0.5°C (except for Types R and S)
±1°C (for Types R and S)
For temperatures below 0°C:
Multiply accuracy for temperatures over 0°C by K, where

$$K = \frac{\text{(Thermocouple output change/°C near 0°C)}}{\text{(Thermocouple output change/°C at measurement temperature)}}$$

Reference junction compensation is not performed for type B.
<For Thermocouple>
±0.5% of span or ±0.1°C, whichever is greater

Burnout Time: 1 minute or less
Maximum Power Consumption
DC voltage: 24 V DC, 75 mA
AC voltage: 100 V AC, 5.5 VA
220 V AC, 7.0 VA

■ POWER SUPPLY AND ISOLATION

Power Supply Rated Voltage:
100 V version:
24-110 VDC ⎓, -10 %, +10 %, 100 mA
100-120 VAC ∼, -10 %, +10 %, 50/60 Hz, 8.0 VA
220 V version:
135-300 VDC ⎓, -10 %, +10 %, 20 mA
200-240 VAC ∼, -10 %, +10 %, 50/60 Hz, 10.0 VA
Power Supply Input Voltage: AC/DC both usage
100 V version: DC drive 20 to 130 V, no polarity
AC drive 80 to 138 V, 47 to 63 Hz
220 V version: DC drive 120 to 340 V, no polarity
AC drive 138 to 264 V, 47 to 63 Hz
Insulation Resistance
Between I/O terminals and Ground:
100 MΩ/ 500 V DC
Between Power and Ground:
100 MΩ/500 V DC
Dielectric Strength
Between I/O terminals and Ground:
500 V AC for 1 minute.
Between Power and Ground:
1000 V AC for 1 minute (100 V version)
1500 V AC for 1 minute (220 V version)

■ NORMAL OPERATING CONDITIONS

Ambient Temperature: 0 to 50°C
Ambient Humidity: 5 to 90% relative humidity (non-condensing)
Operating environment: Area free of hydrogen sulfide gas and other corrosive gases and dust and where the device is not exposed to sea breeze or direct sunlight.
Continuous vibration: (at 5 to 9 Hz) Half amplitude of 1.5 mm or less
(at 9 to 150 Hz) 4.9m/s^2 or less, 1 oct/min for 90 minutes each in the three axis directions
Impact: 49 m/s^2 or less, 11 ms, 3 axes, 6 directions, 3 times each
Installation altitude: 2,000 m or less above sea level
Warm-up time: 15 minutes or more after the power is turned on

■ TRANSPORT AND STORAGE CONDITIONS

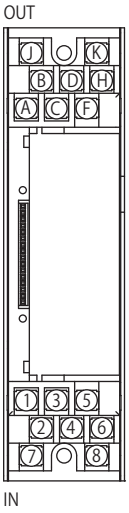
Temperature: -25 to 70°C
Temperature change rate: 20°C per hour or less
Humidity: 5 to 95%RH (no condensation)

■ OPTIONS

/NHR: Without rack case (internal unit only)
/FBP: Power supply fuse bypass
/LOCK: Power supply plug with lock
/WSW: With spring washer
/REK: Mount to same line with EK series rack
/TB: With power supply terminal
/A2TB: 220V version with power supply terminal
/A2ER: 220V version with power supply plug
/FCAL: Fahrenheit range

■ TERMINAL CONNECTIONS

Terminal arrangement



Terminal Designation	Description
A B	+ / - > Output 1 (1 to 5 V DC)
C D	+ / - > Output 3 (4 to 20 mA DC)
F H	+ / - > Output 2 (1 to 5 V DC)
J K	

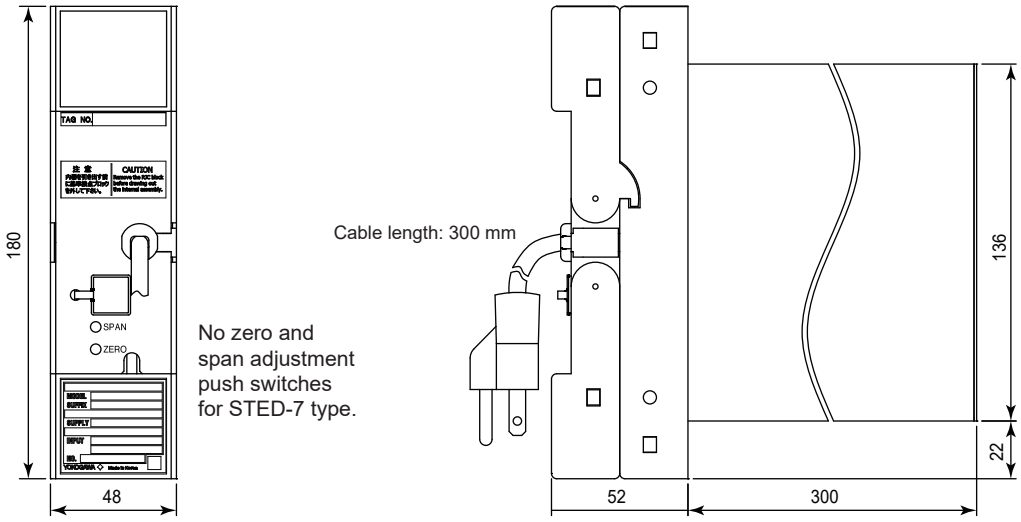
Do not connect to the output terminal when the terminal is not in use.

Terminal Designation	Description STED-1 and STED-2	Terminal Designation	Description STED-3	Terminal Designation	Description STED-4
1	+ / - > mV DC input or thermo-couple input	1	A — B —	1	0% — CENTER — 100% Potentiometer input
2		2		2	
3		3		3	
4		4		4	
5		5		5	
⑥	(RJC block installation terminal)	6		6	
7		7	B — RTD input	7	
8		8		8	

For STED-7 type, select one input from mV DC, thermocouple or RTD.

■ EXTERNAL DIMENSIONS

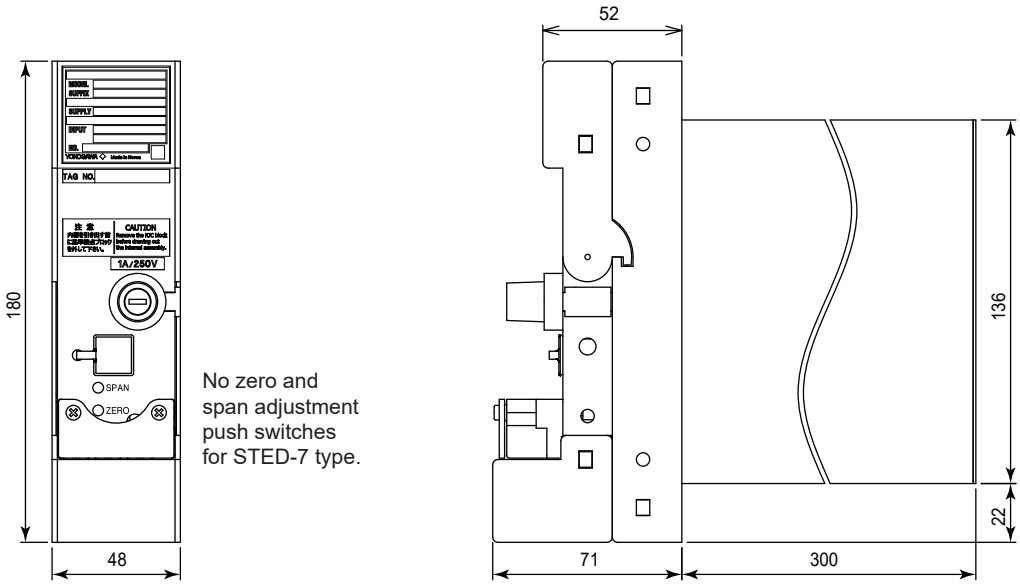
Power supply plug type



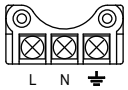
Trigonometry
Unit: mm
General tolerance = ±(value of tolerance class IT18 based on JIS B 0401-2016) / 2

F01.ai

Power supply terminal type(option /TB or /A2TB)



Power supply terminal block



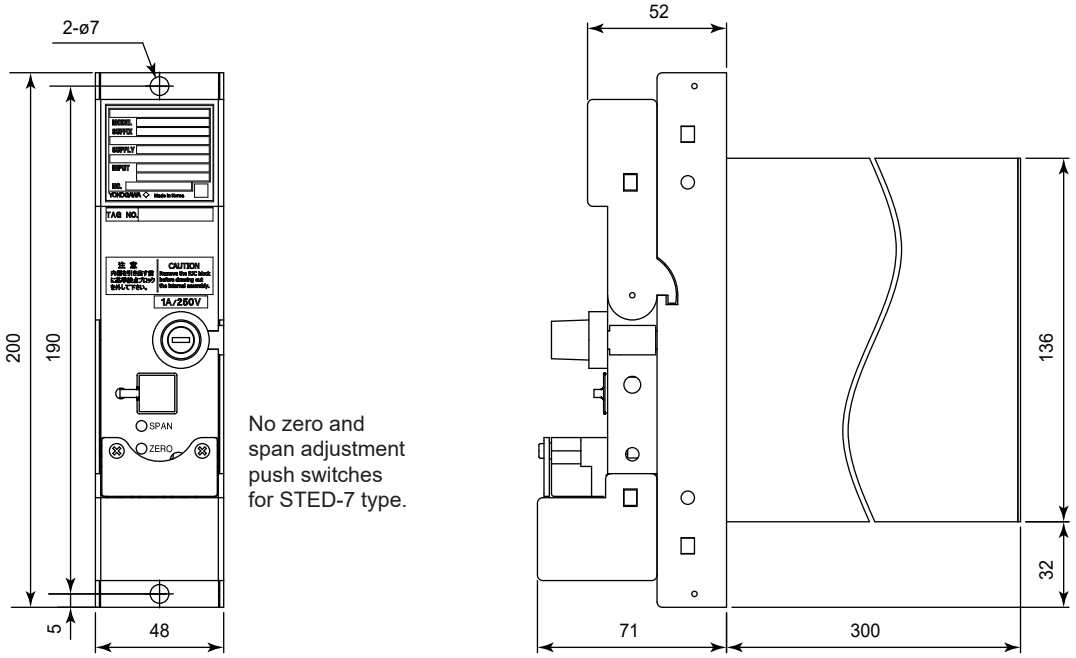
Power and Ground Terminal connection
(Connection screw: M4)

Symbol	Description
L	+
N	- > Power supply
⏚	Ground

Trigonometry
Unit: mm
General tolerance = ±(value of tolerance class IT18 based on JIS B 0401-2016) / 2

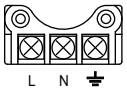
F02.ai

Power supply terminal type(option /REK)



No zero and span adjustment push switches for STED-7 type.

Power supply terminal block



Power and Ground Terminal connection
(Connection screw: M4)

Symbol	Description
L	+ > Power supply
N	-
⏚	Ground

Trigonometry
Unit: mm
General tolerance = ±(value of tolerance class IT18 based on JIS B 0401-2016) / 2

F03.ai

■ MODEL AND SUFFIX CODES

Model	Suffix Codes	Option Codes	Descriptions
STED			mV, Temperature and Potentiometer/Voltage Converter
Input Signal	-1		mV DC input
	-2		Thermocouple input
	-3		RTD input
	-4		Potentiometer input
	-7		Universal input (mV, TC, RTD input)
Number of Inputs	1		1 input
Suffix Code	0		Always 0
Auxiliary Codes STED-110: "-MV" STED-210: "-TK" to "-TS" STED-310: "-PA" to "-PD" STED-410: "-RS" STED-710: "-UN"	-MV		mV DC
	-TK		Type K (ITS90, JIS C1602)
	-TT		Type T (ITS90, JIS C1602)
	-TJ		Type J (ITS90, JIS C1602)
	-TE		Type E (ITS90, JIS C1602)
	-TB		Type B (ITS90, JIS C1602)
	-TR		Type R (ITS90, JIS C1602)
	-TS		Type S (ITS90, JIS C1602)
	-PA		JPt100 (JIS'89)
	-PB		Pt50 (JIS'81)
	-PD		Pt100 (ITS-90, JIS C1604)
	-RS		Potentiometer
	-UN		Universal input (mV, TC, RTD input)
Style Code	*S		Style S
Option Codes (*1) (*2) (*3)		/NHR	Without rack case
		/FBP	Power supply fuse bypass
		/LOCK	Power supply plug with lock
		/WSW	With spring washer
		/REK	Mount to same line with EK series rack
		/TB	With power supply terminal
		/A2TB	220V version with power supply terminal
		/A2ER	220V version with power supply plug
		/FCAL	Fahrenheit range

*1: /LOCK, /REK, /TB, /A2TB, and /A2ER cannot be specified together.
*2: /FBP, /A2TB, and /A2ER cannot be specified together.
*3: When setting the temperature unit with "deg F", specify the option code /FCAL.

■ ORDERING INSTRUCTIONS

Specify the following when ordering:
1. Model, suffix code and auxiliary code, and optional suffix code, if necessary.
2. Specification of input: Mandatory specification
   (1) Fixed-to-mV DC input type
   Measuring range and unit e.g. 0 to 10 mV DC
   (2) Fixed-to-Thermocouple input type (except for Types N, W3 and W5)
   Measuring range and unit e.g. 0 to 300 °C
   (3) Fixed-to-RTD input type
   Measuring range and unit e.g. 0 to 300 °C
   (4) Fixed-to-Potentiometer input type
   • Total resistance and unit (R_T Ω)
   • Resistance at 0% point and unit (R_0 Ω)
   • Resistance at 100% point and unit (R_{100} Ω)
   e.g. Resistance of Potentiometer R_T = 500 Ω, R_0 = 50 Ω, R_{100} = 450 Ω
   (5) Universal input type
   • Input type (Select input type from mV DC, thermocouple or RTD.)
   • When mV DC input is selected:
   Measuring range and unit e.g. 0 to 10 mV DC
   • When thermocouple input is selected (see table of Measuring Ranges on page 1):
   Thermocouple type e.g. Type K
   Measuring range and unit e.g. 0 to 300 °C
   • When RTD input is seleccted (see table of Measuring Ranges on page 1):
   RTD type e.g. Pt100
   Measuring range and unit e.g. 0 to 100 °C
3. Burnout selection: Optional specification
   Select from UP, DOWN or OFF.
   If not specified: OFF

Revision Information

- Title : Model STED (Style S) mV, Temperature and Potentiometer/Voltage Converters
- Manual No. : IM 01B04J01-02E

9th Edition/May 2004
Change of the company name.

10th Edition/Oct. 2019
Change of the style number.

11th Edition/Dec. 2019
Revision of the General Specifications.

12th Edition/Jan. 2021
VJ77 parameter setting tool (R3.01 or later) support

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