

General Specifications

GS 01B04J01-02E

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

YEW SERIES 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 ^(*)	RTD Input 3-wire ^(*) Current at 0.2 mA DC	Potentiometer Input 3-wire Voltage at 0.5 V DC
Minimum Span	3 mV	3 mV	10°C ^(*)	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 ^(*)	°C, K, °F ^(*)	Ω
Input Resistance	1 MΩ (Power on) 4 kΩ (Power off)	—	—	—
Source (leadwire) Resistance	Up to 500 Ω ^(*)	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. ^(*)	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 ^(*)	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 ^(*) –200 to 1200°C Type W3 ^(*) 0 to 2000°C Type W5 ^(*) 0 to 2000°C
RTD ^(*)	JPt100 –200 to 510°C Pt50 –200 to 649°C Pt100 (ITS-90) –200 to 850°C Pt100 (IPTS-68) ^(*) –200 to 660°C
Potentiometer ^(*)	100 to 2000 Ω ^(*)

- *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)

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

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

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/s² or less, 1 oct/min for 90 minutes each in the three axis directions
 Impact: 49 m/s² 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

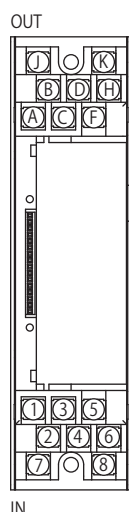
Temperature: -25 to 70°C
 Temperature change rate: 20°C per hour or less
 Humidity: 5 to 95%RH (no condensation)

■ 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	+ > Output 1 (1 to 5 V DC)
B	-
C	+ > Output 3 (4 to 20 mA DC)
D	-
F	+ > Output 2 (1 to 5 V DC)
H	-
J	
K	

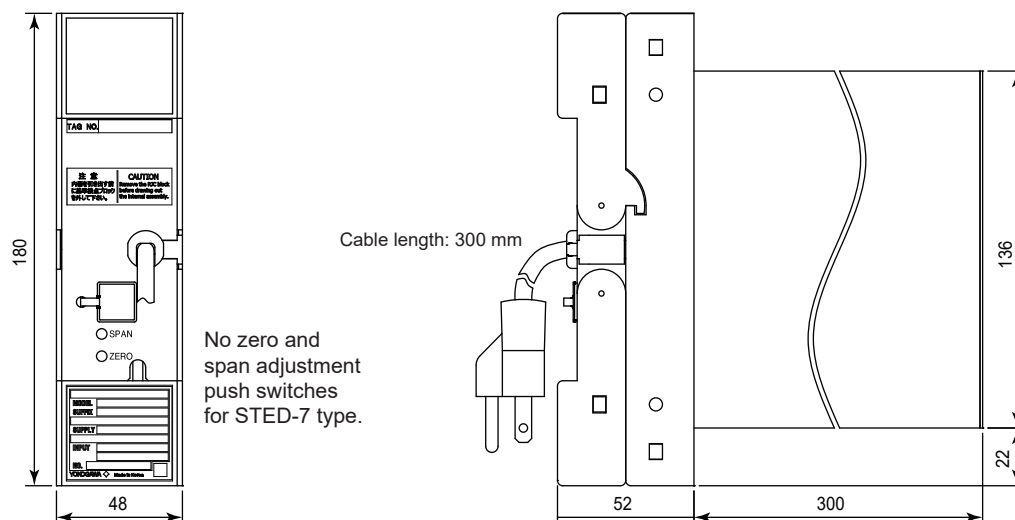
Do not connect to the output terminal when the terminal is not in use.

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

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

EXTERNAL DIMENSIONS

Power supply plug type



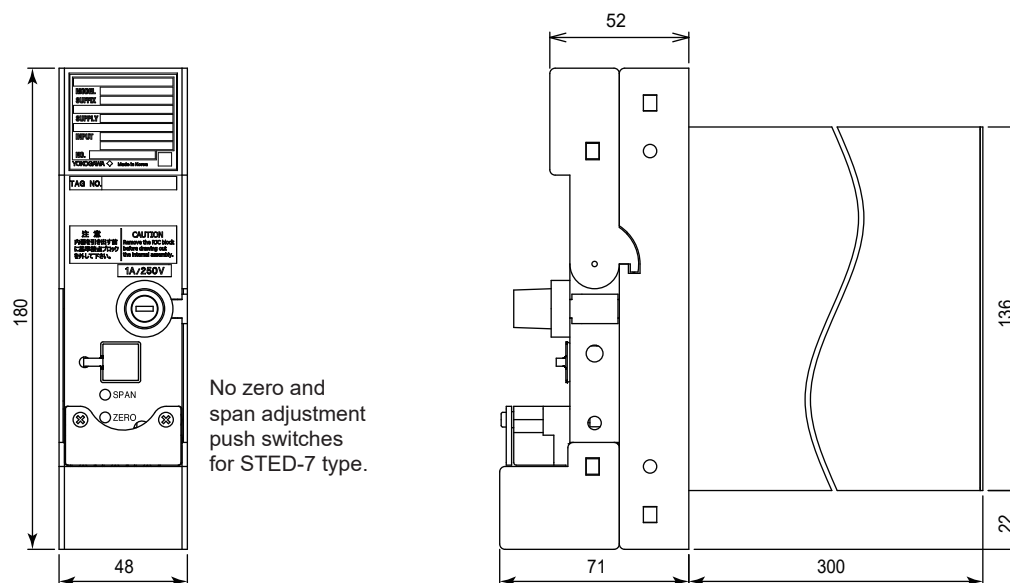
Trigonometry

Unit: mm

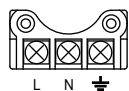
General tolerance = $\pm$ (value of tolerance class IT18 based on JIS B 0401-2016) / 2

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



Power supply terminal block



Power and Ground Terminal connection
(Connection screw: M4)

Symbol	Description
L	+ > Power supply
N	
G	Ground

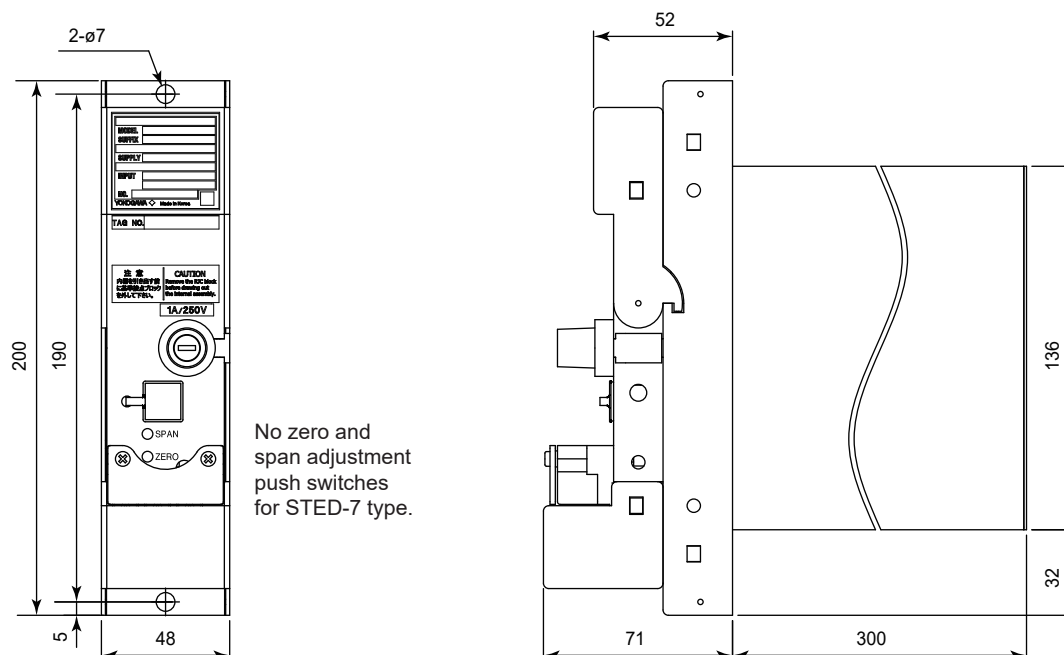
Trigonometry

Unit: mm

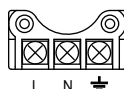
General tolerance = $\pm$ (value of tolerance class IT18 based on JIS B 0401-2016) / 2

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Power supply terminal type(option /REK)



Power supply terminal block



Power and Ground Terminal connection
(Connection screw: M4)

Symbol	Description
L	+ > Power supply
N	
⏏	Ground

Trigonometry
Unit: mm

General tolerance = $\pm(\text{value of tolerance class IT18 based on JIS B 0401-2016}) / 2$

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■ BASIC CONDITIONS AND INDIVIDUAL CONTRACTS AT THE TIME OF PURCHASE

The warranty for this product is defined in the basic conditions and individual contracts at the time of purchase. The individual conditions are as follows.

- **Warranty period of firmware**

The warranty conditions for the firmware installed in this products are same as that of the hardware.

■ MODEL AND SUFFIX CODES

Model	Suffix Codes	Option Codes	Descriptions
STED			mV, Temperature and Potentiometer/Voltage Converter
Input Signal	-1 -2 -3 -4 -7		mV DC input Thermocouple input RTD input Potentiometer input 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 -TK -TT -TJ -TE -TB -TR -TS -PA -PB -PD -RS -UN		mV DC Type K (ITS90, JIS C1602) Type T (ITS90, JIS C1602) Type J (ITS90, JIS C1602) Type E (ITS90, JIS C1602) Type B (ITS90, JIS C1602) Type R (ITS90, JIS C1602) Type S (ITS90, JIS C1602) JPT100 (JIS'89) Pt50 (JIS'81) Pt100 (ITS-90, JIS C1604) Potentiometer Universal input (mV, TC, RTD input)
Style Code	*S		Style S
Option Codes (*1)(*2)(*3)		/NHR /FBP /LOCK /WSW /REK /TB /A2TB /A2ER /FCAL	Without rack case Power supply fuse bypass Power supply plug with lock With spring washer Mount to same line with EK series rack With power supply terminal 220V version with power supply terminal 220V version with power supply plug 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 selected (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