

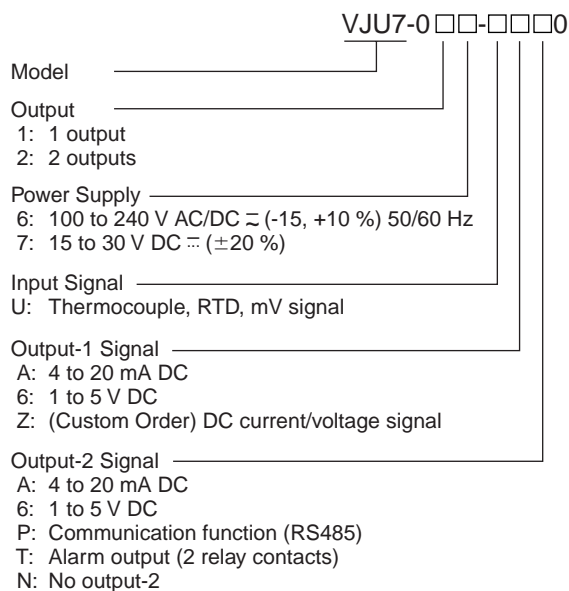
GS 77J1U07-01E

General

This plug-in type universal transmitter converts input signal (thermocouple, RTD or mV signal) into isolated DC voltage signal or DC current signal.

- Universal input enables selection of input type (thermocouple, RTD, mV signal) and of measuring ranges within specifications.
- DC voltage signal, DC current signal, communication output (RS485), or alarm output (2 relay contacts) is selectable as output-2.
- Change of input types / input ranges/burnout action, and I/O monitoring etc. can be done through Handy Terminal (JHT200 etc.).

Specifications



Input

Input Signal Type:

Thermocouple (ITS-90): Type K, T, E, J, R, S, B, N, W3 (see Note 1), W5 (see Note 2)

Note 1: W3 is the abbreviation of W97Re3-W75Re25 (tungsten97% rhenium 3% - tungsten75% rhenium25%) ASTM E988 Standard

Note 2: W5 is the abbreviation of W95Re5-W74Re26 (tungsten95% rhenium 5% - tungsten74% rhenium 26%) ASTM E988 Standard

RTD : Pt100 (ITS-90), JPt100 (JIS'89)
Pt50 Ω (JIS'81), Pt100 (IPTS-68)
Pt100 (ITS-90) : $R_0=100 \Omega$, $R_{100}/R_0=1.3851$
JPt100 (JIS'89) : $R_0=100 \Omega$, $R_{100}/R_0=1.3850$
Pt100 Ω (IPTS-68) : $R_0=100 \Omega$, $R_{100}/R_0=1.3916$
mV signal : Can be set within -10 to 100 mV

Table 1 Input Type and Range

Input Type	Range
TC sensor type	(°C)
Type K	-200 to 1200
Type E	-200 to 800
Type J	0 to 750
Type T	-200 to 350
Type R	0 to 1600
Type S	0 to 1600
Type B	600 to 1700
Type N	-200 to 1200
Type W3	0 to 2000
Type W5	0 to 2000
RTD sensor type	(°C)
Pt100(ITS-90)	-200 to 660
Pt100(IPTS-68)	-200 to 660
JPt100(JIS'89)	-200 to 510
Pt50(JIS'81)	-200 to 649
mV (DC voltage)	mV DC
	-10 to 100

Measuring Span: 3 mV or more (thermocouple, mV signal)
10 °C or more (RTD)

Input Resistance: 1 MΩ (when power on), 4 kΩ (when power off) when thermocouple, mV input

Input External Resistance:

Thermocouple, mV signal: 500 Ω or less

However, when combination with BARD200, it is the value connectable as external resistance besides internal resistance.

RTD: Input span (°C) × 0.4 Ω or less / wire or 10 Ω or less, whichever smaller

However, when combination with BARD 300, it is the value connectable as external resistance besides internal resistance.

RTD Detective Current: About 0.5 mA

Permissible Applicable Voltage: ±4 V DC or less

Output

1. Output-1

Output Signal	Output Resistance	Permissible Load Resistance
1 to 5 V DC	1 Ω or less	2 kΩ or more
4 to 20 mA DC	500 kΩ or more	750 Ω or less

● Custom Order Output Signal

2 to 10 mA DC, 1 to 5 mA DC, 0 to 20 mA DC,
0 to 16 mA DC, 0 to 10 mA DC, 0 to 1 mA DC
0 to 10 mV DC, 0 to 100 mV DC, 0 to 1 V DC,
0 to 10 V DC, 0 to 5 V DC, -10 to +10 V DC

2. Output -2

● Analog Output

Output Signal	Output Resistance	Permissible Load Resistance
1 to 5 V DC	1 Ω or less	2 kΩ or more
4 to 20 mA DC	500 kΩ or more	350 Ω or less

● Communication Function

This transmitter can be connected to a personal computer, graphic panel, YOKOGAWA programmable controller FA-M3, or programmable controllers of other manufacturers.

Standards: EIA RS485

Maximum number of connectable controllers:
31 controllers

Maximum communication distance: 1200 m

Communication method: 2-wire half duplex, start-stop synchronization, non-procedural

Communication rate: 1200, 2400, 4800, 9600 bps

Data length: 8, 7 bit

Stop bit: 1, 2 bit

Parity: Even parity, odd parity, or none

Communication protocol: PC-link, PC-link with SUM, MODBUS ASCII, MODBUS RTU, or LADDER

PC-link communication: Communication protocol with a personal computer, graphic panel, UT link module of FA-M3

MODBUS communication: Communication protocol with a personal computer (SCADA).

Ladder communication: Communication protocol with ladder communication module of FA-M3 and programmable controller of other manufacturers

Alarm Output

Signal Type: Relay contact

Output Signal: N. O. contact output (contact ON at excitation) 2 points, COM common

Contact Capacity: 30 V DC, 1 A

Alarm Operating Direction: High limit alarm or low limit alarm

Relay Operating Direction Setting: Excitation or non-excitation at normal status

Alarm Setting Ranges: 0 to 100 % of input range

Temperature input [°C], mV input [%]

Setting resolution: 0.1 °C or 0.1 %, 4 significant digits

Hysteresis: Set the value added to alarm setting point at alarm release

Setting range: 0 to 100 % of input range

Temperature input [°C], mV input [%]

Setting resolution: 0.1 °C or 0.1 %, 4 significant digits

Alarm On-Delay Setting: Delay time from alarm condition completion to output

(Ex. Outputted when alarm status continues for 1 second or more after input value is over alarm point in case of set value "1 second.")

Setting range: 0 to 999 seconds

Setting resolution: 1 second (however, add about 0.2 seconds to setting time to prevent wrong operation)

Alarm Off-Delay Setting: Delay time from alarm normal condition completion to output

(Ex. Released when normal status continues for 2 seconds or more after input value becomes normal status from alarm status in case of set value "2 seconds.")

Setting range: 0 to 999 seconds

Setting resolution: 1 second (however, add about 0.2 seconds to setting time to prevent wrong operation)

Alarm Operation Display: Front LED lights at excitation, 2 LEDs

Items Available to Be Set

The following items can be set through Handy Terminal:

Input type, input range, burnout, address number, communication rate, parity, data length, stop bit, protocol, alarm operating direction, relay operating direction, alarm setting, hysteresis, alarm on-delay, alarm off-delay

Standard Performance

Accuracy rating: ±0.1 % of span.

However, accuracy is limited in the following cases.

Thermocouple input:

Input range is -10 to 100 mV (M range), span is under 27.5 mV, in thermally generated emf conversion; accuracy (%) = ±0.1 % × 27.5 mV / input span [mV]

Input range is -2.5 to 25 mV (L range), span is under 10 mV, in thermally generated emf conversion; accuracy (%) = ±0.1 % × 10 mV / input span [mV]

RTD input:

Input range is 0 to 520 Ω (H range), span is under 130 Ω (refer to the reference resistance table); accuracy (%) = ±0.1 % × 130 Ω / input span [Ω]

Input range is 0 to 176 Ω (M range), span is under 38.6 Ω (refer to the reference resistance table); accuracy (%) = ±0.1 % × 38.6 Ω / input span [Ω]

Reference Junction Compensation Accuracy:

±1 °C (except for Type R, S); ±2 °C (Type R, S) for terminal temperature 25 °C ± 15 °C

Response Speed: 200 ms, 63 % response (10 to 90 %)
 Alarm output: 350 ms (input change 10 to 90 %, alarm setting point 50 %, time till alarm output, when alarm delay setting and hysteresis are min.)

Burnout: No up/down

Burnout time: within 60 seconds

Effect of Power Supply Voltage Fluctuation: ± 0.1 % or less of span for power supply voltage fluctuation of 15 to 30 V DC (± 20 %), 100 to 240 V AC/DC

Effect of Ambient Temperature Change: ± 0.2 % or less of span for change of 10 °C

■ Safety and EMC Standards

The following standards will be acquired.

Safety:

Conforms to IEC1010-1: 1990 and EN61010-11: 1993.

Certified for CSA1010

CSA1010 category: CAT II (IEC1010-1)

Certified for UL508

Non-Incendive Explosion-Proof:

CSA C22.2 No. 213 Class I, Division 2,

Groups A, B, C & D

FM No. 3611 Class I, Division 2, Groups A, B, C & D

The above certified/approved instrument is only for voltage of 15 to 30 V DC.

EMC Standards:

Conforms to the following EMC standards.

EN55011: 1991 Class A Group1 for EMI (emissions)

EN50082-2: 1995 for EMS (immunity)

The above conformed instrument is only for voltage of 15 to 30 V DC

■ Power Supply and Isolation

Power Supply Rated Voltage:

100 to 240 V AC/DC \approx 50/60 Hz

15 to 30 V DC \approx

Power Supply Input Voltage: 100 to 240 V AC/DC \approx (-15, +10 %) 50/60 Hz

15 to 30 V DC \approx (± 20 %)

Power Dissipation: 24 V DC 2.6 W, 110 V DC 2.6 W

100 V AC 5 VA, 200 V AC 6.7 VA

Insulation Resistance: 100 M Ω /500 V DC between input, output-1, output-2, power supply, and ground mutually

Withstand Voltage: 2000 V AC / minute between input, (output-1, output-2), power supply, and ground mutually

1000 V AC / minute between input and output-2, 1000 V AC / minute between output-1 and output-2 at alarm output

■ Environmental Conditions

Temperature: 0 to 50 °C

Humidity: 5 to 90 % RH (no condensation)

Ambient Condition: Avoid installation in such environments as corrosive gas like sulfide hydrogen, dust, sea breeze and direct sunlight

Installation altitude 2000m or less above sea level.

■ Mounting and Appearance

Construction: Compact plug-in type

Material: Modified Polyphenylene Oxide (Case body)

Mounting Method: Wall, DIN rail, or dedicated base (VJ mounting base: VJCE) mountings

Connection Method: M3 screw terminal

External Dimension: 29.5×76×124.5 mm (W×H×D)

Weight: Approx. 170 g

■ Accessories

Tag No. Label: 1 sheet

Range Label: 1 sheet

RJC Sensor: 1

■ Instruction Required When Ordering

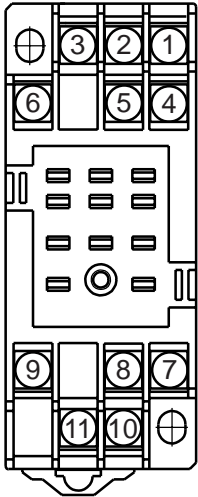
- Model and suffix code
- Shipped after setting the input type (selected from Table 1), input range (within available measuring range in Table 1), and burnout action as specified.

■ Factory Setting

Factory settings are as follows:

- Input type: RTD input Pt100 (ITS-90)
- Input range: 0 to 100 °C
- Burnout: Off
- **When output-2 is specified as communication output**
 - Address No.: 01
 - Communication rate: 9600 bps
 - Parity: Even
 - Data length: 8 bit
 - Stop bit: 1 bit
 - Protocol: PCLINK
- **When output-2 is specified as alarm output**
 - Alarm operating direction: High limit alarm (alarm-1), low limit alarm (alarm-2)
 - Relay operating direction: Excitation at alarm (alarm-1/2)
 - Alarm setting: The value equivalent to 100 % (alarm-1), The value equivalent to 0 % (alarm-2)
 - Hysteresis: The value equivalent to 3 % (alarm-1/2)
 - Alarm on-delay: 0 second (alarm-1/2)
 - Alarm off-delay: 0 second (alarm-1/2)

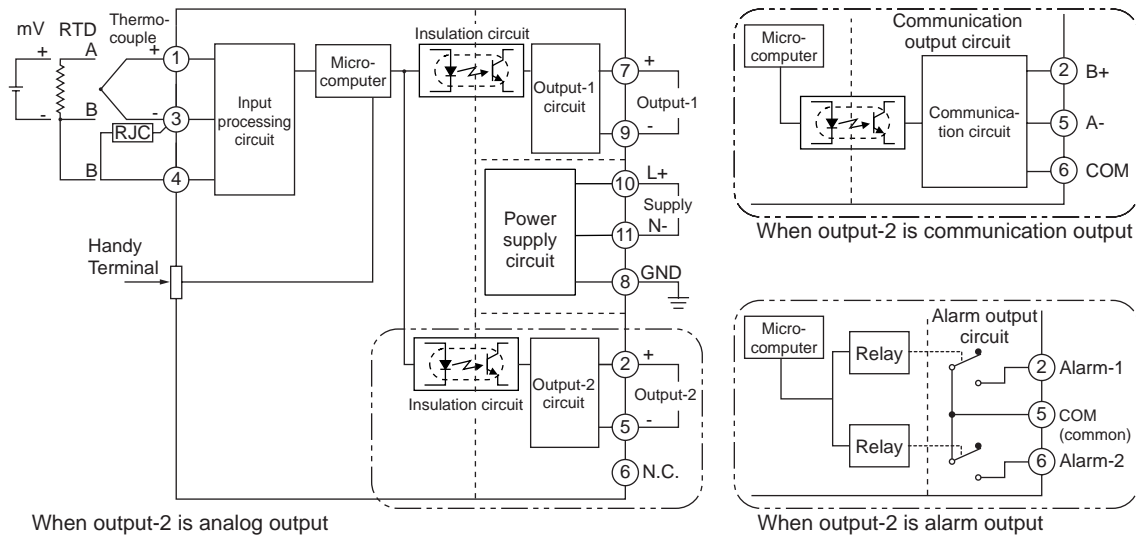
Terminal Arrangement & Terminal Connection



Terminal No.	Signal	Thermocouple	RTD	mV input	Output-2 Analog output	Output-2 Communication output	Output-2 Alarm output
1	Input	(+)	(A)	(+)	←	←	←
2	Output-2	→	→	→	(+)	B (+)	ALM1
3	Input	(-) [RJC]	(B)	(-)	←	←	←
4	Input		(B)	N.C.	←	←	←
5	Output-2	→	→	→	(-)	A (-)	COM
6	Output-2	→	→	→	N.C.	COM	ALM2
7	Output-1	(+) Output-1 circuit					
8	GND	GND					
9	Output-1	(-) Output-1 circuit					
10	Supply	(L+) Power supply circuit					
11	Supply	(N-) Power supply circuit					

Note 3: In case of one output type, output-2 is N.C.

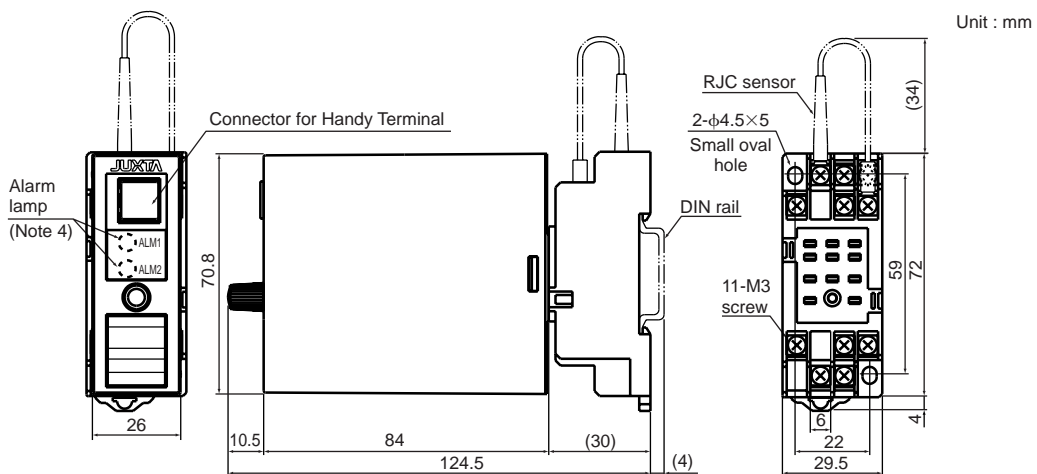
Block Diagram



When output-2 is analog output

When output-2 is alarm output

External Dimension



Note 4: Only when output-2 is alarm output