

Yokogawa Electric Corporation

Network Solutions Business Division

2-9-32, Naka-cho Musashino-shi, Tokyo 180-8750 Japan
Phone: +81-422-52-7179 Facsimile: +81-422-52-6619

Thank you for purchasing the JUXTA Signal Conditioner.
Please read through this manual before use for correct handling.

CAUTIONARY NOTES FOR SAFE USE OF THE PRODUCT

This User's Manual should be carefully read before installing and operating the product. The following symbol is used on the product and in this manual to ensure safe usage.



This symbol is displayed on the product when it is necessary to refer to the User's Manual for information on personal and instrument safety. This symbol is displayed in the User's Manual to indicate precautions to avoid danger to the operator, such as an electric shock.

The following symbols are used only in this manual.



NOTE

Draws attention to essential information for understanding the operations and/or functions of the product.

CHECKING PRODUCT SPECIFICATIONS AND PACKAGE

(1) Checking the Model and Product Specifications

Check that the model and specifications indicated on the nameplate attached to the main unit are as ordered.

(2) Packaged Items

Check that the package contains the following items:

- FR5A or FR5V: 1
- Mounting block: 2
- Tag number and range label : 1 each
- Mounting screw (M4 x 0.7): 2
- User's Manual (this manual : IM 77J08R05-01E)

GENERAL

The FR5A/FR5V is a compact, front terminal connection and free range type RTD converter that is connected to an IEC/JIS-standard resistance temperature detector (RTD) to convert temperature signals into isolated DC current or DC voltage signals.

- Selection of input type, I/O range setting, burnout setting, output adjustment, I/O monitoring, and loop back test can be made using the optional Parameter Setting Tool (VJ77) or Handy Terminal (JHT200).

MODEL AND SUFFIX CODES

Model	Suffix codes			Description	
FR5A	-□	□	*C /□□	RTD Converter (Free Range Type)	
FR5V					
Input	-1			Pt100 (IPTS-68:JIS'89)	
	-2			JPt100 (JIS'89)	
	-3			Pt50 (JIS'81)	
	-4			Pt100 (ITS-90)	
	-0			Custom order	
Output	A			4 to 20 mA DC	FR5A
	B			2 to 10 mA DC	
	C			1 to 5 mA DC	
	D			0 to 20 mA DC	
	E			0 to 16 mA DC	
	F			0 to 10 mA DC	
	G			0 to 1mA DC	
	Z			(Custom order) Direct current signals	FR5V
	1			0 to 10 mV DC	
	2			0 to 100 mV DC	
	3			0 to 1 V DC	
4			0 to 10 V DC		
5			0 to 5 V DC		
6			1 to 5 V DC		
7			-10 to 10 V DC		
0			(Custom order) Direct voltage signals		
Style code		*C		Style C	
Burnout		/BU		Up	
		/BD		Down	
		/BN		None	
Temperature unit		/DF		Fahrenheit (°F) display function	

1. MOUNTING METHOD

1.1 Installing/Uninstalling the Mounting Block

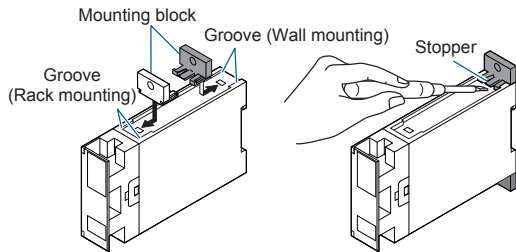
The mounting block is necessary for rack mounting or wall mounting.

Installing the mounting block

- Fit the mounting block into the grooves of the converter, and slide it in the direction of an arrow as shown below-left.

Uninstalling the mounting block

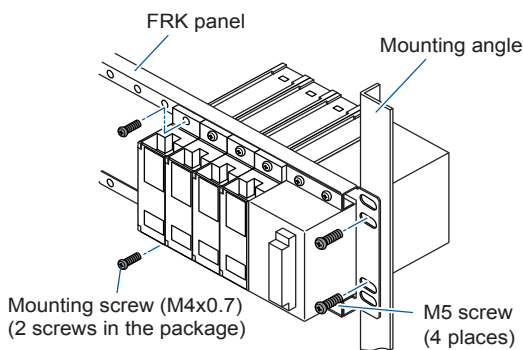
- Lift the stopper using a slotted screw-driver as shown below-right, and pull the mounting block to remove it.



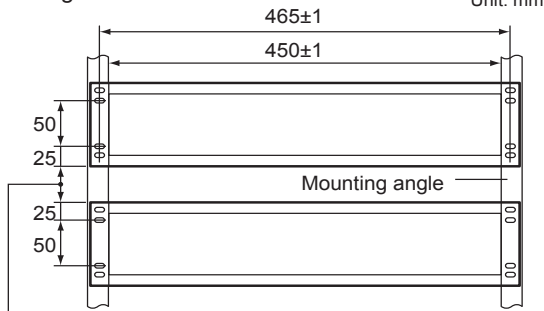
1.2 Rack Mounting

Take the FRK panel and install it on a mounting angle as shown below.

This method is suitable for high density mounting of the converters on a 19-inch rack panel.



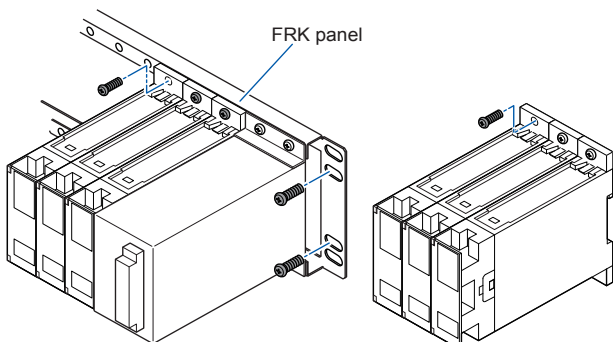
Mounting Dimensions



Supplied spacer(50) or Wiring space(30 to 60)

1.3 Wall Mounting

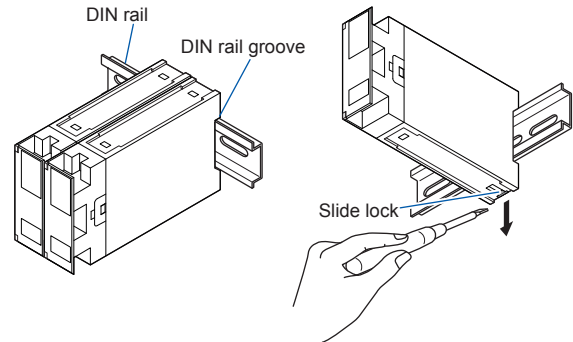
Mount the converter onto the FRK panel as shown below or mount it directly on the wall.



1.4 DIN Rail Mounting

Place the converter so that the DIN rail fits into the upper part of the DIN-rail groove at the rear of the socket, and fasten the socket using the slide lock located underneath the socket.

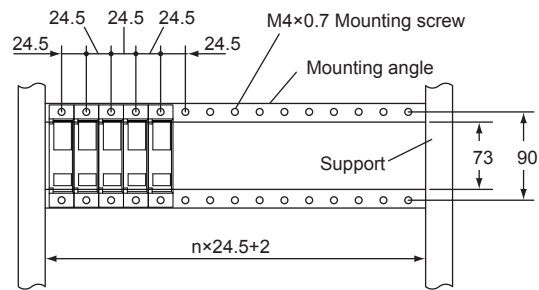
To remove the converter, pull down the slide lock using a slotted screw-driver.



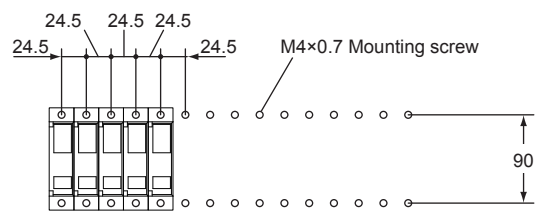
1.5 Mounting Dimensions

Unit: mm

Angle Mounting Dimensions



Wall Mounting Dimensions



2. INSTALLATION LOCATION

- Avoid the following environments for installation locations: Areas with vibration, corrosive gases, dust, water, oil, solvents, direct sunlight, radiation, a strong electric field, and/or a strong magnetic field, altitude of more than 2000m above sea level.
- If there is any risk of a surge being induced into the power line and/or signal lines due to lightning or other factors, a dedicated lightning arrester should be used as protection for both this converter and a field-installed device.
- Operating temperature/humidity range: 0 to 50C/5 to 90%RH (no condensation)

3. EXTERNAL WIRING



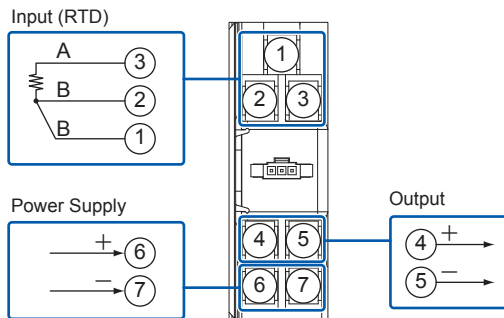
WARNING

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

M4 screw terminals are provided for the connection of external signals. Attach a crimp-on lug to each wire for connection to the terminals.

•Recommended cables: A nominal cross-sectional area of 0.5 mm² or thicker for signal cables, and that of 1.25 mm² or thicker for power cables.

Wiring Diagram



NOTE

- The power line and input/output signal lines should be installed away from noise-generating sources. Otherwise accuracy cannot be guaranteed.
- The wiring resistance of input terminals ① and ③ should be the same.
- Adhere strictly to the specifications to avoid overheating or damage. Before turning on the power, ensure the following:
 - (a) Power supply voltage and input signal value applied to the product should meet the required specifications.
 - (b) The external wiring to the terminals and wiring to ground are as specifications.
- Do not operate the product in the presence of flammable or explosive gases or vapors.
- The product is sensitive to static electricity; exercise care when in operation. Before you operate the product, touch a nearby metal part to discharge static electricity.

Power Supply and Isolation

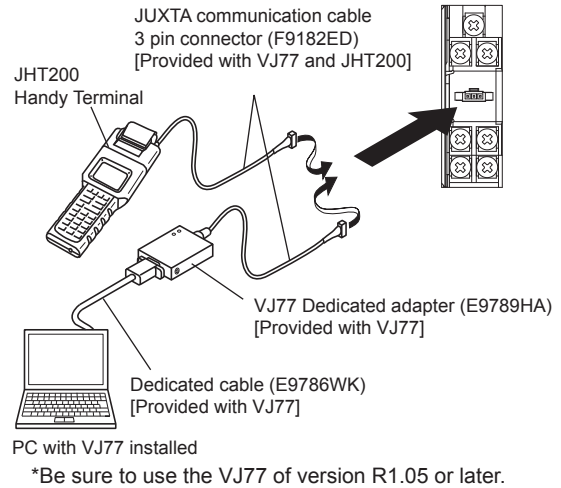
Power supply voltage: 24V DC ±10% (ripple: less than 5% p-p)
 Current consumption: FR5A 65mA, FR5V 50mA
 Insulation resistance: 100M Ω at 500V DC between input, output and power supply mutually.
 Withstand voltage: 1500V AC/minute between input-output, input-power supply
 500V AC/minute between output-power supply

4. SETTING PARAMETERS

The parameters are set as you specified in your order. Refer to the following to change the default settings.

Set the parameters using a PC (VJ77 Parameter Setting Tool) or the Handy Terminal. Refer to "5. List of Parameters" in this manual and the User's Manual for VJ77 PC-based Parameters Setting Tool (IM 77J01J77-01E) or the User's Manual for JHT200 Handy Terminal (IM JF81-02E). Parameters are shown in brackets "[]".

Connection of Setting Tools



Setting RTD Type

Set the RTD type to be connected to the input in [B05: TYPE].

Display	Type of input	Measuring range	Measuring span
PT	Pt100 (IPTS-68:JIS'89)	-200 to 660°C	10°C or more
JPT	JPt100 (JIS'89)	-200 to 10°C	
PT100-90	Pt100 (ITS-90:JIS'97)	-200 to 850°C	
PT50	Pt50 (JIS'81)	-200 to 649°C	

JPt100 (JIS'89): R₀=100Ω, R₁₀₀/R₀=1.3916
 Pt100 (IPTS-68): R₀=100Ω, R₁₀₀/R₀=1.3850
 Pt100 (ITS-90): R₀=100Ω, R₁₀₀/R₀=1.3851

Setting Temperature Unit

Set the temperature unit of the input range in [B09: UNIT]



NOTE

Do not set the "----" as the temperature unit, even if it is displayed during the setting. Otherwise it may cause the malfunction or damage.

Setting Input Range

Set the zero percent value of input range in [B10: ZERO], and the span of input range in [B11: SPAN].

Setting Burnout Action

Set the burnout action in [B12: BURN OUT]
 Set "OFF", "UP", or "DOWN."



NOTE

Input adjustment should be applied when the setting of input range, burnout action direction or input wiring has been changed.

5. LIST OF PARAMETERS

Parameter Display		Items
A	DISPLAY	Display
A01	INPUT	Input value
A02	OUTPUT	Output value
A03	STATUS	Status (*1)
A04	REV NO	Revision number
B	SET	Setting
B01	TAG NO.1	Tag number 1
B02	TAG NO.2	Tag number 2
B03	COMMENT1	Comment 1
B04	COMMENT2	Comment 2
B05	TYPE	Input type
B09	UNIT	Unit
B10	ZERO	Zero (0% of input range)
B11	SPAN	Span (Input span)
B12	BURN OUT	Burnout
C	ADJUST	Adjustment
C01	OUT 0%	Output 0% adjustment
C02	OUT 100%	Output 100% adjustment
C04	ZERO ADJ	Input zero adjustment
C05	SPAN ADJ	Input span adjustment

*1: This "STATUS" is for the customer's engineer to check the history.

6. MAINTENANCE

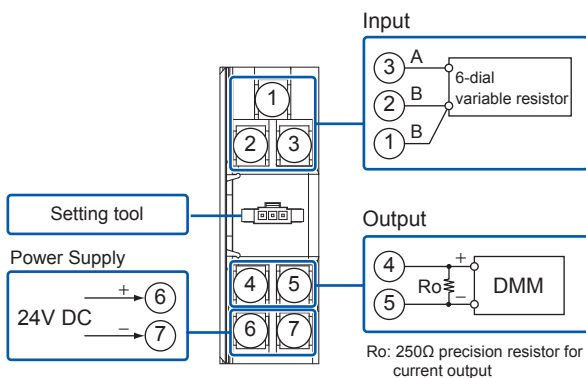
The product starts running immediately when the power is turned on; however, it needs 10 to 15 minutes of warm-up before it meets the specified performance.

6.1 Calibration Apparatus

- A 6-dial variable resistor (Yokogawa Meters & Instruments Corporation 279301 or equivalent)
- A digital multimeter (Yokogawa 7561 or equivalent)
- A precision resistor of $250\ \Omega \pm 0.01\%$, 1W
- A setting tool for adjustment (Refer to "4. Setting Parameters" in this manual.

6.2 Calibration Procedure

1. Connect the instruments as shown below.



- 2 Use the 6-dial variable resistor and apply the resistance equivalent to 0, 25, 50, 75, and 100% of the measuring range to the converter.
3. Verify that the corresponding output voltages are 0, 25, 50, 75, and 100% respectively and within the specified accuracy rating. (R_o is used for current output.)
- Use the setting tool (VJ77 Parameter Setting Tool or JHT200 Handy Terminal) to adjust the input/output signals.

Input Adjustment Procedure

- (1) Input the value equivalent to 0% value of the input range to the converter.
- (2) Read the parameter [**C04: ZERO ADJ**] and check the input value.
- (3) Select "INC" or "DEC" in the parameter [**C04: ZERO ADJ**] to adjust.
INC: Increase (Adjusts the increased value of the input [resistance] value)
DEC: Decrease (Adjusts the decreased value of the input [resistance] value)
RST: Reset of the adjustment value
- (4) Input the value equivalent to 100% value of the input range to the converter.
- (5) Read the parameter [**C05: SPAN ADJ**] and check the input value.
- (6) Adjust the span in the same way as (3).

Output Adjustment Procedure

When adjusting 0% value of output:

- (1) Set the adjustment value 0% in the parameter [**C01: OUT 0%**].
•The value equivalent to 0% of the output range will be output, irrespective of the input.
- (2) Check the output value via digital multimeter, and adjust it in the parameter [**C01: OUT 0%**].
•If it slips out to the (+) side, set (-) value equivalent to slipout; if it slips out to the (-) side, set (+) value equivalent to slipout for adjusting the output value to 0%.
*: The 100% value of output can be adjusted by the same operation as the above in [**C02:OUT100%**]

For adjustment using a setting tool, refer to the User's Manual for each setting tool and "5. List of Parameters" in this manual.

User's Manual for VJ77 [Document No.: IM 77J01J77-01E]; however, use the VJ77 of version R1.05 or later.

User's Manual for JHT200 [Document No.: IM JF81-02E]