User's Manual

Model VJX7 Universal Computing Unit (Multi-function)
(Isolated Single-output, Isolated Dual-output Type)

JUXTA

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

You can download the latest manuals from the following website:

http://www.yokogawa.com/ns/juxta/im/

YOKOGAWA ◆
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CAUTIONARY NOTES FOR SAFE USE OF THE PRODUCT

This User's Manual should be carefully read before installing and operating the product. Please keep this User's Manual for future reference.

For more information of the safety precautions, please refer to the "Precautions on the Use of the JUXTA Series (IM 77J01A00-91Z1)". The related manuals and general specifications are shown in the table below.

Doc. Name	Doc. Number
Precautions on the Use of the JUXTA Series (User's Manual)	IM 77J01A00-91Z1
Model VJX7 Universal Computing Unit (User's Manual)	IM 77J01X07-01E (This manual)
Model VJX7 Universal Computing Unit (General Specifications)	GS 77J01X07-01E

User's manuals in the above table are essential parts of the product; keep it in a safe place for future reference.

This manual is intended for the following personnel;
• Engineers responsible for installation, wiring, and maintenance of the equipment.
• Personnel responsible for normal daily operation of the equipment.

The following symbol is used on the product and in this manual to ensure safe usage.

⚠ **WARNING**

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

⚠ **CAUTION**

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

CHECKING THE PRODUCT SPECIFICATIONS AND THE CONTENTS OF PACKING

(1) Model Number and Specification Check
Check that the model number and specifications shown on the nameplate attached on the side of the product are as ordered.
(2) Contents of the Packing
Check that the packing contains the following items:
• VJX7: 1 unit
Standard Accessories:
• Tag number label: 1 sheet
• Range label: 1 sheet
• Shunt registor (for specification of current input): 1 piece
• User's manual (IM 77J01X07-01E, this manual): 1 copy
• User's manual (IM 77J01A00-91Z1): 1 copy

GENERAL

This Universal Computing Unit, which belongs to the JUXTA series of signal conditioners, receives DC current or voltage signals and converts them to pairs of isolated DC voltage or current signals.
• Output-2 signal is selectable from a DC voltage signal, DC current signal, communication function (RS-485), and two relay contacts. (Isolated Dual-output Type)
• Various parameters such as input range can be set and modified using a PC (VJ77(sold separately)) or Handy Terminal (JHT200(sold separately)) and the like).

MODEL AND SUFFIX CODES

Model	Suffix codes							Description
VJX7	-x	x	x	-x	x	x	0 /x	Universal Computing Unit (Multi-function)
Function	-A							Free program
	-B							Moving average computation
	-C							Dead time computation
	-D							First-order lag computation
	-E							First-order lead computation
	-F							Uniform-speed response (Velocity limiter)
	-G							Limiter
	-H							Velocity computation
	-J							Linearizer
	-K							Ratio setting
Output configuration		1						1 output
		2						2 outputs
Power supply			6					100-240 V AC/DC[*1]
			7					15-30 V DC[*2]
Input signal				-A				0 to 50 mA DC, span is 5 mA or more
				-1				–10 to +10 V DC, span is 0.1 V or more
Output-1 signal					A			4 to 20 mA DC
					6			1 to 5 V DC
					Z			(Custom order)[*3]
Output-2 signal						A		4 to 20 mA DC
						6		1 to 5 V DC
						P		Communication function (RS-485)
						T		Contact output (2 relay contacts)
						N		No output-2
Fixed code							0	Always 0
Option							/SN	No socket (with socket if not specified)
							/C0	HumiSeal coating[*4]
							/FB	Fuse bypass[*4]

*1: Operating range: 85 to 264V AC/DC
*2: Operating range: 12 to 36V DC
*3: DC voltage signal or DC current signal
*4: When option code /C0 or /FB is specified, the conformity to the safety and EMC standards is excluded. CE marking is not applicable.
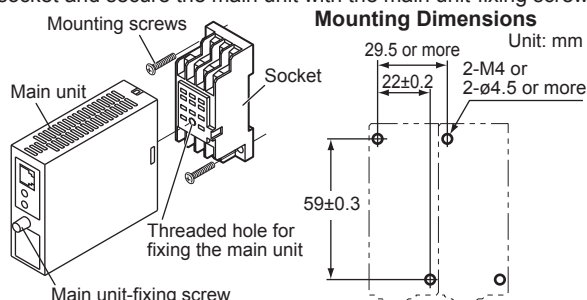
1. MOUNTING METHODS

⚠️ **CAUTION**

- **Plug/disconnect the main unit into/from the socket vertically to the socket face. Otherwise the terminals may bend and it may cause bad contact.**
- **The converter shall not tilt 5 degrees or more in either direction when installed.**
- **When the converter is not connected to the socket, it is necessary to protect the socket against ingress of dust to the connector part.**
- **Keep this product in a conductive bag when plugged out, during transport or storage.**

1.1 Wall Mounting

Loosen the main unit-fixing screw of the computing unit to disconnect the main unit from the socket. Next, anchor the socket onto the wall with screws. Then, plug the main unit into the socket and secure the main unit with the main unit-fixing screw.

Mounting screws
Main unit
Socket
Threaded hole for fixing the main unit
Main unit-fixing screw

Mounting Dimensions
Unit: mm
29.5 or more
22±0.2
2-M4 or 2-ø4.5 or more
59±0.3

1.2 DIN Rail Mounting

Locate the computing unit 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 at the lower part of the socket.

Fit into here
DIN rail
DIN rail
Push
(Rear of the socket)
DIN rail
Slide lock
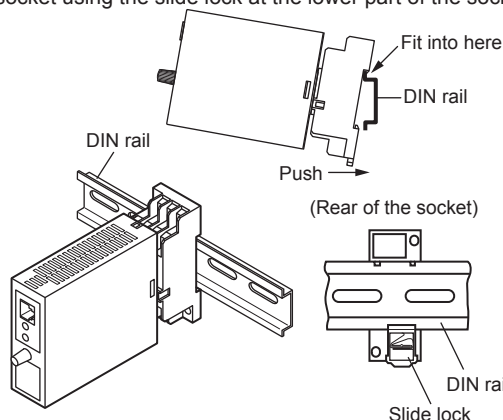
1.3 Mounting Using a Multi-mounting Base

For mounting using a multi-mounting base, see the Instruction Manual for VJCE (VJ Mounting Base).

1.4 Using Ducts

Wiring ducts should be installed at least 30 mm away from the top or bottom of the main unit.

2. INSTALLATION LOCATION

- Avoid the following environments for installation locations: Areas with vibrations, corrosive gases, dust, water, oil, solvents, direct sunlight, radiation, a strong electric field, and/or a strong magnetic field, direct radiant heat, wind, temperature fluctuation, 2,000 m or more 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 the product and a field-installed device.
- Operating temperature/humidity range: -10 to 55°C (-10 to 45°C for side-by-side mounting*)/5 to 90%RH (no condensation)
  * If the previous model (style S3.xx earlier) is installed together, the ambient temperature is 0 to 40°C.
- Continuous vibration: (at 5 to 9 Hz) Half amplitude of 3 mm or less (at 9 to 150 Hz) 9.8m/s² or less, 1 oct/min for 90 minutes each in the three axis directions
- Impact: 98 m/s2 or less, 11 ms, 3 axes, 6 directions, 3 times each
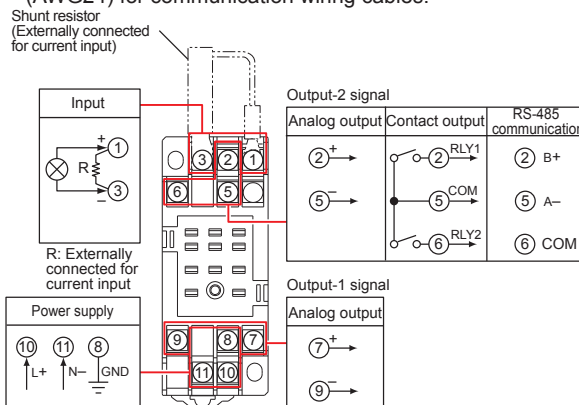
3. EXTERNAL WIRING

⚠️ **WARNING**

- **To avoid the risk of an electric shock, turn off the power supply and use a tester or similar device to ensure that no power is supplied to a cable to be connected, before carrying out wiring work.**
- **Do not operate the product in the presence of flammable or explosive gases or vapors. To do so is highly dangerous.**
- **Use of the product ignoring the specifications may cause overheating or damage. Before turning on the power, ensure the following:**
  - Power supply voltage and input signal value applied to the product should meet the required specifications.
  - The external wiring to the terminals and wiring to ground are as specifications.

Wires are connected to the terminals of the computing unit's socket. M3 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, and shielded twisted-pair cables (AWG24) for communication wiring cables.


Shunt resistor (Externally connected for current input)
Input
R: Externally connected for current input
Power supply
Output-2 signal
Analog output | Contact output | RS-485 communication
Output-1 signal
Analog output

⚠️ **CAUTION**

- **Do not use output-2 for the isolated single-output type.**
- **The power line and input/output signal lines should be installed away from noise-generating sources. Other wise accuracy cannot be guaranteed.**
- **Make sure to earth ground the ground terminal through minimum resistance. The length and thickness of the grounding cable should be as short and thick as possible. Directly connect the lead from the ground terminal (terminal no. 8) of the product to the ground. Do not carry out daisy-chained inter-ground terminal wiring.**
- **The product is sensitive to static electricity; exercise care in operating it. Before you operate the product, touch a nearby metal part to discharge static electricity.**
- **If an inductance (L) load such as auxiliary relays or solenoid valves is used, always insert a spark killer for diminishing sparks, such as a CR filter or a diode in parallel with the inductance load. Otherwise a malfunction or relay failure may occur. Refer to the following guidelines for a capacitor and resistor:**
  - C: 0.5 to 1 μF with respect to a contact current of 1 A
  - R: 0.5 to 1 W with respect to a contact voltage of 1 V
- **If the ambient temperature is 50 °C or more, please use the cable that the rated temperature is 70 °C or more.**

4. DESCRIPTION OF FRONT PANEL AND CONNECTION OF SETTING TOOLS

4.1 Front Panel

The communications connector in the front panel is used for setting up parameters through a PC (VJ77 PC-based Parameters Setting Tool) or the Handy Terminal. The RLY1 and RLY2 LEDs light up if a contact is ON (those LEDs are provided only when the output-2 is specified for contact output (the output-2 suffix code is T).)

Communication connector
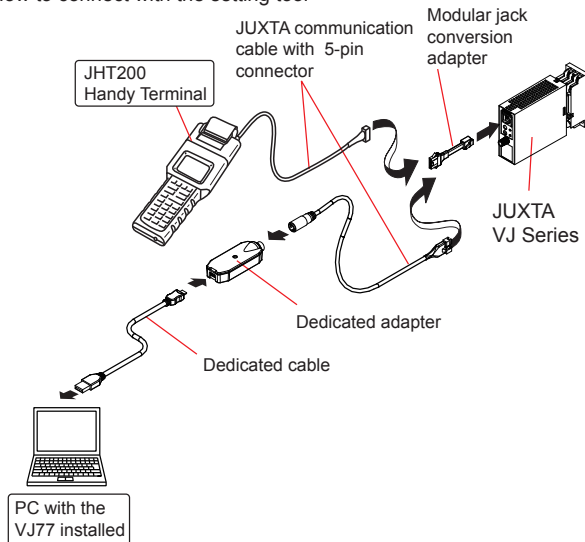Relay 1 indicator lamp
Relay 2 indicator lamp
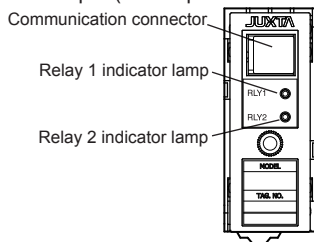
4.2 Connector for Communication

Use the connector for communication when setting the parameters using a PC (VJ77 Parameters Setting Tool) or the Handy Terminal.

< How to connect with the setting tool>

<How to connect with the setting tool>

JHT200 Handy Terminal
JUXTA communication cable with 5-pin connector
Modular jack conversion adapter
JUXTA VJ Series
Dedicated adapter
Dedicated cable
PC with the VJ77 installed

- Use the VJ77 of version R2.02,1 or later.
- The modular jack conversion adapter does not come with the JHT200 Handy Terminal. It is sold separately.

5. SETTING PARAMETERS

Set the parameters using a PC (VJ77 Parameter Setting Tool) or the Handy Terminal. Refer to **"7. 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 77J50H01-01EN).

5.1 Settings Related to Inputs and Outputs

5.1.1 Input Type
Set by selecting input type from among VOLTS (DC voltage) and CURRENT (DC current) in **[D12: INP TYPE]**.

5.1.2 Setting Input Resistance
When the input is DC current signal, set the external resistance in **[D13:IN RESIST]** (see Chapter 3, "EXTERNAL WIRING"). For example, enter "250" when the input is 4 to 20 mA DC.

5.1.3 Input Range
Set the 0% value of input range to **[D24: INPUT1 L_RNG]** and the 100% value of input range to **[D25: INPUT1 H_RNG]** within the numerically specified range.

⚠ **CAUTION**

In case the input range is changed after factory-ship, the instrument may not work within the rated accuracy range depending on the changed input range. Perform the adjustment following the maintenance of this instruction manual after changing the input range.

5.1.4 Selection of Program Function
Select the following communication functions in **[D45:PRGM SELECT]**.
(A) free program, (B) moving average, (C) dead time, (D) first-order lag, (E) first-order lead, (F) velocity limiter, (G) limiter, (H) velocity computation, (J) linearizer, and (K) ratio setter

5.1.5 Computation Cycle Time
Set the computation cycle time by selecting either 100 ms or 200 ms in **[D48:CYCLE TIME]**. Displayed only when D45 is "A".

5.1.6 Direction of Output Action
Analog output signals can be reversed. To reverse the signal from output-1, set **[D50: OUT1 DR]** to REVERSE. For output-2, set **[D51 OUT2 DR]** to REVERSE. To return the output-1 signal to normal, set **[D50: OUT1 DR]** to DIRECT. For output-2, set **[D51: OUT2 DR]** to DIRECT. Displayed only when D45 is other than "A".

5.1.7 External Input Resistance Correction
For current input, set the external resistance to **[D13: IN RESIST]**. There is a difference between this value and the actual external resistance. If this difference causes an error, the input can be corrected.
To perform correction, wire as shown in the figure below, apply a stable input equivalent to 100%, and set **[P40:RESISTOR ADJ]** to EXECUTE.
If you need perform correction again such as when the external resistance is changed, reset the correct value. To do so, set **[P40: RESISTOR ADJ]** to RESET.
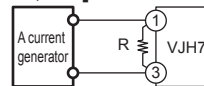
A current generator
R
VJH7
R：External resistor

5.2 Settings Related to Communication Function

Set the following parameters when output-2 is specified for communication function. For more information on the communication function, see the Instruction Manual for VJ Series Communication Function (IM 77J1J11-01E).

5.2.1 Communication Protocol
Set the communication protocol by selecting from among PC-LINK, PC-LINK WITH SUM, MODBUS ASCII, MODBUS RTU, and LADDER in **[F01: PROTOCOL]**.

5.2.2 Communication Address
Set the address number of the isolator numerically in a range of 1 to 99 in **[F02: ADDRESS]**.

5.2.3 Baud Rate
Set the baud rate by selecting from among 1200, 2400, 4800, 9600, 19200 and 384000 bps in **[F03: BAUD RATE]**.

5.2.4 Parity
Select and set NONE, EVEN, or ODD in **[F04: PARITY]**.

5.2.5 Data Length
Select and set 7 bits or 8 bits in **[F05: DATA LEN]**.

5.2.6 Stop Bit
Select and set 1 bit or 2 bits in **[F06: STOP BIT]**.

5.2.7 Decimal Point Position
Number of decimals of input value (setting of D register [D0003]) can be set. Select the number of decimals from among 0 to 5 in **[F07: INPUT DEC PT]**.

6. COMPUTING FUNCTION

6.1 VJX7-A (Free Program)

This computing unit is used to meet individual applications by programming the available commands using a PC (PC-based Parameters Setting Tool) or the Handy Terminal. Set the computing program in G01 to G59.

6.2 VJX7-B (Moving Average Computation)

This computing unit stores the input values sampled at intervals of one-fortieth of the moving-average time (L) into 40 buffers in order, and outputs the moving average of 40 input values (Output-1= Y1, Output-2= Y2). The output between samplings is smoothed out by interpolation. Minimum sampling time is the computing period (100 ms). Therefore, when the moving-average time is set shorter, the number of samplings is less than 40. When using a first-order lag filter for input (X), set the first-order lag time constant (T).
Set the moving-average time (L) at % value in **[H02: CONST]**. The value of 0.0 to 100.0% corresponds to that of 0 to 1000 seconds. For example, enter "6" to set in H02 when setting 60 seconds.
- Setting range of moving-average time:
  0 to 320,000 seconds (about 3.7 days) with 4 significant digits
  Minimum unit is 1 second (however, 0.1 second is possible for 4 seconds or shorter).
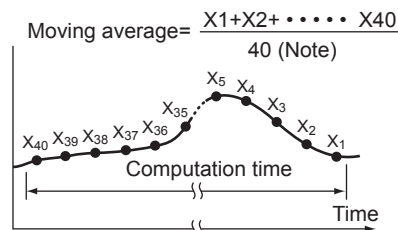 (e.g. 12345% is impossible, 12340% is possible.)

First-order lag time constant (T) is set at % value in **[H01: CONST]**. The value of 0 to 100% corresponds to that of 0 to 100 seconds.
- Setting range of time constant:
  0 to 799.0 seconds; minimum unit is 0.1 second.
- Accuracy of moving average and time constant setting:
  (±5.0% of set value) ± 1 second

e.g.

$$\text{Moving average} = \frac{X1 + X2 + \cdots\cdots X40}{40 \text{ (Note)}}$$

Note: For the moving average times at 1, 2 and 3 second, the number of samplings is 10, 20 and 30, respectively (when the computing period is 100 ms).

6.3 VJX7-C (Dead Time Computation)

This computing unit stores the input values (X) sampled at intervals of one-fortieth of the dead time (L) into 40 buffers in order and outputs data (output-1=Y1, Output-2= Y2) after the dead time has elapsed. Minimum sampling time is the set computing period. Therefore, when the dead time is set shorter, the number of samplings is less than 40. However, for the dead times of 3, 2 and 1 second, the number of samplings is 30, 20, and 10, respectively (when the computing period is 100ms). The output between samplings is smoothed out by interpolation.
When using a first-order lag filter for input (X), set the first-order lag time constant (T). Set the dead time (L) at % value in **[H02: CONST]**. The value of 0.0 to 100.0% corresponds to that of 0 to 1000 seconds. For example, enter "6" to set in H02 when setting 60 seconds.
- Setting range of dead time:
  0 to 320,000 seconds (about 3.7 days) with 4 significant digits
  Minimum unit is 1 second (however, 0.1 second is possible for 4 seconds or shorter).
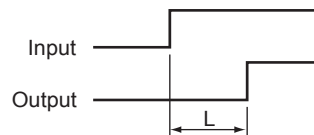 (e.g. 12345% is impossible, 12340% is possible.)

First-order lag time constant (T) is set at % value in **[H01: CONST]**. The value of 0 to 100% corresponds to that of 0 to 100 seconds.
- Setting range of time constant:
  0.0 to 799.0 seconds; minimum unit is 0.1 second.
- Accuracy of dead time and time constant setting:
  (±5.0% of set value) ± 1 second

$$Y1 = Y2 = \frac{e^{-LS}}{1 + TS} X$$

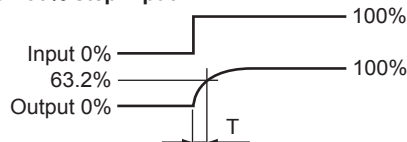**e.g. 0% → 100% step input**

6.4 VJX7-D (First-order Lag Computation)

This computing unit provides a first-order lag computation on input (X) with a time constant (T) and outputs the result (output-1=Y1, output-2=Y2). Set the time constant (T) at % value in **[H01: CONST]**. The value of 0 to 100% corresponds to that of 0 to 100 seconds.
- Setting range of time constant:
  0 to 799.0 seconds; minimum unit is 0.1 second.
- Accuracy of time constant setting:
  (±5.0% of set value) ± 1 second

$$Y1 = Y2 = \frac{1}{1 + TS} X$$

**e.g. 0% → 100% step input**

6.5 VJX7-E (First-order Lead Computation)

This computing unit provides a first-order lead computation on input (X) with a time constant (T) and outputs the result (output-1=Y1, output-2=Y2). Set the time constant (T) at % value in **[H01: CONST]**. The value of 0 to 100% corresponds to that of 0 to 100 seconds.
- Setting range of time constant:
  0 to 799.0 seconds; minimum unit is 0.1 second.
- Accuracy of time constant setting:
  (±5.0% of set value) ± 1 second

$$Y1 = Y2 = \left(1 + \frac{TS}{1 + TS}\right) X$$

e.g. 0% → 50% step input
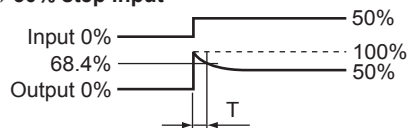
6.6 VJX7-F (Velocity Limiter)

This computing unit limit the input (X) velocity at the ascending velocity limit for a positive change and the descending velocity limit for a negative change, and outputs the limited value (output-1=Y1, output-2=Y2). When the input velocity (slope) is no more than the limit value, the unit outputs the input as is.
Set the ascending velocity limit at % value in **[H01:CONST]**, and the descending velocity limit at % value in **[H02:CONST]**. The value of 0.0 to 100.0% corresponds to that of 0.0 to 100.0%/minute.
- Setting range of velocity limit value:
  0.1% to 699.9%/minute; minimum unit is 0.1%/minute.
  Setting the limit at 700.0%/minute or above does not limit the input, so the unit simply outputs the input as is (i.e., works as an open limit function).
- Accuracy of velocity limit setting:
  (±5.0% of set value) ± 1 %/minute

e.g. 0% → 100% → 0% step input
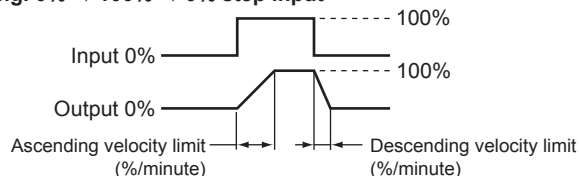
6.7 VJX7-G (Limiter)

This computing unit serves as an ordinary converter as long as the input (X) is within the upper and lower limits. When the input exceeds the limit, the unit outputs the signal that corresponds to the limit value (output-1=Y1, output-2=Y2).
Set the upper limit at % value in **[H01:CONST]**, and the lower limit at % value in **[H02:CONST]**.
- Setting range of upper and lower limit value:
  -6.00 to 106.00%; minimum unit is 0.01%.

However, if the setting is made so that the upper limit < lower limit, the unit outputs the upper limit value.

6.8 VJX7-H (Velocity Computation)

This computing unit calculates the input velocity by subtracting the input of the last velocity computation (XL) from the present input (X). The unit then adds a 50% bias to one-half of the obtained velocity and outputs the result (output-1=Y1, output-2=Y2). The output results is 50% when the input is not changed, 50% or more when the input increases (100% for X-XL 100%), and 50% or less when the input decreases (0% for X-XL −100%). When using a first-order lag filter for input (X), set the first-order lag time constant (T).

$$Y1=Y2= \frac{X-X_L}{2} +50\%$$

Set the velocity computation time (L) at % value in **[H02: CONST]**. The value of 0 to 100.0% corresponds to that of 0 to 1000 seconds. For example, enter "6" to set in H02 when setting 60 seconds.

- Setting range of velocity computation time:
  0 to 320,000 seconds (about 3.7 days) with 4 significant digits
  Minimum unit is 1 second (however, 0.1 second is possible for 4 seconds or shorter).
  (e.g. 12345% is impossible, 12340% is possible.)

First-order lag time constant (T) is set at % value in **[H01: CONST]**. The value of 0 to 100% corresponds to that of 0 to 100 seconds.

- Setting range of time constant:
  0 to 799.0 seconds; minimum unit is 0.1 second.
- Accuracy of moving average and time constant setting:
  (±5.0% of set value) ± 1 second

6.9 VJX7-J (Linearizer)

This computing unit gives an optional relationship between the input (X) and output (output-1=Y1, output-2=Y2) signals using an optional line-segment function. The line-segment function has 21 breakpoints, which each gives an input-output relationship as a percentage (%). Set the input (X) at % value in **[H01:CONST]** to **[H21:CONST]**, and the output (Y) at % value in **[H22:CONST]** to **[H42:CONST]**.

- Breakpoint (21 points) setting conditions:
  For input: $-6.0 \leq X_0$ (H01) to X_{20} (H21) $\leq 106.0\%$; minimum unit is 0.01%
  $X0 < X1 < X2 < \cdots < X20$
  For output: $-6.0 \leq Y_0$ (H22) to Y_{20} (H42) $\leq 106.0\%$; minimum unit is 0.01%
  When input $\leq X_0$ (H01), Y_0 (H21) is output.
  When input $\geq_{20}$ (H22), Y_{20} (H42) is output.
  Any number of line segments (1 to 20) can be set in H43.
  The number of line segments 1 to 20 corresponds 100 to 2000%.
- Computation accuracy:
  ±0.1 % (when line-segment gain is 1 or less)

6.10 VJX7-K (Ratio Setter)

This computing unit sets the ratio by the following expression.
$Y1=Y2=K1 \times (X+A1)+A2$
where Y1:   Output-1 signal (%)
        Y2:   Output-2 signal (%)
        X: Input signal (%)
        K1:   Ratio (no unit)
        A1, A2: Bias (%)
Set the ratio (K1) in **[H01:CONST]**, and the bias (A1) at % value in **[H02:CONST]**, and the bias (A2) at % value in **[H03:CONST]**.

- Setting range of ratio:
  -320 to 320 with 4 significant digits; minimum unit is 0.00001.
- Setting range of bias:
  -32,000% to 32,000% with 4 significant digits; minimum unit is 0.001%.
- Computation accuracy:
  ±0.1 % (when K1=1, A1=A2=0%)

7. LIST OF PARAMETERS [*3]

Parameter Display		Item	
	MODEL	Model	
	TAG NO	Tag no.	
	SELF CHK	Self-check result	
A	DISPLAY1	Display1	
A01	INPUT1	Input value 1	
A07	OUTPUT1	Output value 1	
A08	OUTPUT2	Output value 2	

A19	T1	Temporary memory 1	
A20	T2	Temporary memory 2	
A21	T3	Temporary memory 3	
A22	T4	Temporary memory 4	
A26	DO	Digital output	
A27	LOAD	Load factor	
A54	STATUS	Status	*1
A56	REV NO	Rev. no.	
A58	MENU REV	MENU REV	
A60	SELF CHK	Self-check result	
B	DISPLAY2	Display2	
B01	INPUT1	Input value 1	
B07	OUTPUT1	Output value 1	
B08	OUTPUT2	Output value 2	
B19	T1	Temporary memory 1	
B20	T2	Temporary memory 2	
B21	T3	Temporary memory 3	
B22	T4	Temporary memory 4	
B26	DO	Digital output	
B28	LOAD	Load factor	
B60	SELF CHK	Self-check result	
D	SET (I/O)	Setting (I/O)	*2
D01	TAG NO.1	Tag no. 1	
D02	TAG NO.2	Tag no. 2	
D03	COMMENT1	Comment 1	
D04	COMMENT2	Comment 2	
D12	INP TYPE	Input type	
D13	IN RESIST	Input resistor	
D32	INPUT1 L_RNG	Input low range	
D33	INPUT1 H_RNG	Input high range	
D32	OUT1 L_RNG	Output-1 low range	*4
D33	OUT1 H_RNG	Output-1 high range	*4
D34	OUT2 L_RNG	Output-2 low range	*4
D35	OUT2 H_RNG	Output-2 high range	*4
D45	PRGM SELECT	Selection of program	
D48	CYCLE TIME	Computing period	
D50	OUT1 DR	Direction of output-1 action	
D51	OUT2 DR	Direction of output-2 action	
D59	NMRR	Frequency setting	*4
D60	SELF CHK	Self-check result	
F	SET(COM)	Setting (communication)	*2
F01	PROTOCOL	Communication protocol	
F02	ADDRESS	Address	
F03	BAUD RATE	Baud rate	
F04	PARITY	Parity	
F05	DATA LEN	Data Length	
F06	STOP BIT	Stop bit	
F07	INPUT DEC PT	Decimal point position of input	
F60	SELF CHK	Self-check result	
G	PROGRAM	Program of computing unit	
G01	PROGRAM	Program	
⋮	⋮	⋮	
G59	PROGRAM	Program	
G60	SELF CHK	Self-check result	
H	CONST	Fixed constant of computing unit	
H01	CONST	Fixed constant	
⋮	⋮	⋮	
H59	CONST	Fixed constant	
H60	SELF CHK	Self-check result	
P	ADJUST	Adjustment	*2
P04	IN1 ZERO ADJ	Zero adjustment of input-1	
P05	IN1 SPAN ADJ	Span adjustment of input-1	
P30	OUT1ZERO ADJ	Zero adjustment of output-1	
P31	OUT1SPAN ADJ	Span adjustment of output-1	
P32	OUT2ZERO ADJ	Zero adjustment of output-2	
P33	OUT2SPAN ADJ	Span adjustment of output-2	
P40	RESISTOR ADJ	Adjustment of external input resistance	
P60	SELF CHK	Self-check result	
Q	TEST	Test	*2
Q04	OUT1 TEST	Forced output (output-1)	
Q05	OUT2 TEST	Forced output (output-2)	
Q14	RLY1 TEST	Forced output (relay-1)	
Q15	RLY2 TEST	Forced output (relay-2)	
Q60	SELF CHK	Self-check result	

*1 The Status is displayed for service personnel to see history records.
*2 There are items not displayed depending on what output-2 is specified.
*3 There are items not displayed depending on what the setting of program selection is specified.
*4 The parameters are the items to be set at the factory.

8. 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.

For cleaning the instrument, use a soft and dry cloth.

8.1 Calibration Apparatus

- A voltage and current generator (YOKOGAWA GS200 or the equivalent)
- Digital Multimeter (YOKOGAWA 7561 or equivalent): 1
- A precision resistor of 250 Ω ± 0.01%, 1 W (for current output)
- Setting tool for adjustment (Refer to "4.2 Connecting the Setting Tools" in this manual.)

8.2 Calibration Procedure

1. Connect the instruments as shown in figure below. First adjust the output-1 signal and then the output-2 signal.
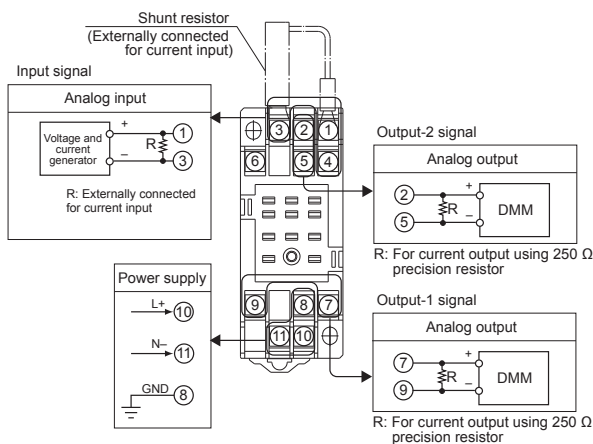
2. Produce input signals equivalent to 0, 25, 50, 75, and 100% of the input span from the voltage and current generator to the isolator.
3. Then, check that the isolator's output signal shows voltages corresponding to 0, 25, 50, 75, and 100% of the input span within the rated accuracy range.

For contact output, check the relay action by the relay indicator lamp or resistance of output terminals.

- If the output signal is out of the rated accuracy range, adjust the output signal level using PC (VJ77 PC-based Parameters Setting Tool) or the Handy Terminal (JHT200).

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

User's Manual for VJ77 [Document No.: IM 77J01J77-01E]
User's Manual for JHT200 [Document No.: IM 77J50H01-01EN]

# 9. SAFETY AND EMC STANDARDS

The following will be acquired.

Safety:

IEC/EN 61010-1 compliance (CE), IEC/EN 61010-2-030 compliance (CE)
CAN/CSA C22.2 No.61010-1 compliance (CSA)
UL61010-1 (CSA NRTL/C)

    Installation category II
    Pollution degree 2
    Measurement category O (other)
    Rated measurement input voltage: ±10 V DC max.
    Rated transient overvoltage: 1500 V [*]

  *   This is a reference safety standard value for Measurement Category I of CSA/UL61010-1 and Measurement Category O of EN 61010-2-030. This value is not necessarily a guarantee of instrument performance.

⚠ **CAUTION**

This instrument is for Measurement Category O (other). Do not use it for measurements in locations falling under Measurement Categories II, III, and IV.
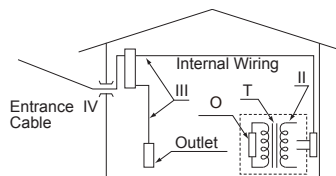
Measurement category		Description	Remarks
O	(other)	For measurements performed on circuits not directly connected to MAINS.	
II	CAT.II	For measurements performed on circuits directly connected to the low-voltage installation.	Appliances, portable equipments, etc.
III	CAT.III	For measurements performed in the building installation.	Distribution board, circuit breaker, etc.
IV	CAT.IV	For measurements performed at the source of the low-voltage installation.	Overhead wire, cable systems, etc.

EMC standards:

- CE marking:
  EN 61326-1 Class A, Table 2
  EN 61326-2-3

  *   The instrument continues to operate at a measurement accuracy of within ±20% of the range during testing.

  EN 55011 Class A Group 1
  EN 61000-3-2 Class A
  EN 61000-3-3
- EMC Regulatory Arrangement in Australia and New Zealand (RCM):
  EN 55011 Class A, Group 1
- KC marking:
  Electromagnetic wave interference prevention standard, electromagnetic wave protection standard compliance

⚠ **CAUTION**

Caution to comply with EMC standards: When operating this instrument by external power supply, use an independent power unit conforming to CE-marking. Be sure to use the lightning arrester to comply EMC standards.

However, if optional code /C0 or /FB is specified, the conformity to the safety and EMC standards is excluded.

10. ENVIRONMENT STANDARD

RoHS Directive: EN 50581
(However, when option code /C0 or /FB is specified, CE marking is not applicable because the product does not comply with the Safety and EMC standards.)

11. 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)

⚠ **CAUTION**

Keep this product in a conductive bag when plugged out, during transport or storage.

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