

Output signal: 1 point of DC current or DC voltage signal; 1 point of contact output
 Analog output setting range:

Output signal suffix code	Setting range
A	0 to 20 mA DC Span is 2 mA or more
B	0 to 5 mA DC Span is 1 mA or more
1	0 to 10 V DC Span is 0.1 V or more
2	0 to 100 mV DC Span is 10 mV or more
3	±10 V DC Span is 0.2 V or more
4	±100 mV DC Span is 20 mV or more

Analog output permissible load resistance:

Output range	Permissible load resistance
0 to 20 mA DC	750 Ω or less
0 to 5 mA DC	3000 Ω or less
0 to 5 V DC	2 kΩ or more
0 to 10 V DC	10 kΩ or more (when 100% output exceeds 5 V)
0 to 100 mV DC	250 kΩ or more
-10 to +10 V DC	10 kΩ or more
-100 to +100 mV DC	250 kΩ or more

Contact output: Open collector
 Contact capacity: 30 V DC, 200 mA
 Input adjustment range:
 ±1% of span or more (zero/span adjustments)
 Output adjustment range:
 ±5% of span or more (zero/span adjustments)

Standard Performance

Accuracy rating: ±0.1% of span
 However, the accuracy is not guaranteed for output levels less than 0.5% of the span of a 0 to X mA output range type. The accuracy is limited according to the input/output range settings.

- Accuracy Calculation
Accuracy = Input accuracy + Output accuracy (%)
 Accuracy is obtained by totalizing the expression (1) for input accuracy and the expression (2) for output accuracy. However, ±0.05% is applied if a value obtained from the expression (1) or (2) is less than ±0.05%.
 For current input, add the error of receiving resistor ±0.1% to the input accuracy.

Input accuracy = ±0.05% × a/b ... expression (1)

Input signal suffix code	Input range (Range converted into voltage)	Accuracy calculation condition	
		a	b
A B ^{*1} 1	Outside of ±2.5 V DC and within ±10 V DC	4 (V)	Input span (Span converted into voltage)
	±2.5 V DC	1 (V)	
B ^{*2} 2	Outside of ±0.5 V DC and within ±2 V DC	0.8 (V)	
	Outside of ±100 mV DC and within ±0.5 V DC	0.2 (V)	
	Outside of ±20 mV DC and within ±100 mV DC	40 (mV)	
	±20 mV DC	10 (mV)	

Note: When input signal is current, the values converted into voltage by the receiving resistor are applied to the input range and input span.
 *1: For B (*250Ω).
 *2: For B (receiving resistor 100Ω).

Output accuracy = ±0.05% × a/b ... expression (2)

Output signal suffix code	Output range	Accuracy calculation condition	
		a	b
A	0 to 20 mA DC	10 (mA)	Output span
B	0 to 5 mA DC	2.5 (mA)	
1	0 to 2.5 V DC	1 (V)	
	Outside of 0 to 2.5 V DC and within 0 to 10 V DC	4 (V)	
2	0 to 25 mV DC	10 (mV)	
	Outside of 0 to 25 mV DC and within 0 to 100 mV DC	40 (mV)	
3	±2.5 V DC	1 (V)	
	Outside of ±2.5 V DC and within ±10 V DC	4 (V)	
4	±25 mV DC	20(mV)	
	Outside of ±25 mV DC and within ±100 mV DC	40 (mV)	

[Example of accuracy calculation]

Input range: 0 to 20 mA DC
 Receiving resistor: 250 Ω
 (0 to 5 V DC when converted into voltage)
 Output range: 20 to 40 mV DC
 Input accuracy =

$$\pm 0.05\% \times \frac{4}{5} = \pm 0.04\% \longrightarrow \pm 0.05\%$$
 (since it is less than ±0.05%)
 Add ±0.1% (error of receiving resistor) to the above.
 Then, Input accuracy = ±0.15%
 Output accuracy = ±0.05% × $\frac{40}{20}$ = ±0.1%
 Therefore, Accuracy = ±0.25%

Computation cycle: 100 ms (For the function suffix code "A", selectable from 50 ms, 100 ms and 200 ms.)

Response speed: 500 ms, 63% response (10 to 90%)

Effect of power supply voltage fluctuations:
 Equal to or less than whichever is greater, ±0.1% of span or accuracy for the fluctuation within the operating range of each power supply voltage specification.

Effect of ambient temperature change:
 ±0.15% of span or less for a temperature change of 10°C.

■ Power Supply and Isolation

Power supply rated voltage: 15-40 V DC \pm or 100-240 V AC \sim 50/60 Hz
 Power supply input voltage: 15-40 V DC \pm ($\pm 20\%$) or 100-240 V AC \sim ($-15, +10\%$) 50/60 Hz
 Power consumption: 24 V DC 2.3 W
 100 V AC 4.6 VA, 200 V AC 6.4 VA
 Insulation resistance: 100 M Ω or more at 500 V DC between input, analog output, contact output, power supply, and grounding terminals mutually. (Analog input and contact input terminals are not isolated.)
 Withstand voltage: 2000 V AC for 1 minute between input, (analog output, contact output), power supply and grounding terminals mutually. 1000 V AC for 1 minute between analog output and contact output terminals.

■ Environmental Conditions

Operating temperature range: 0 to 50°C
 Operating humidity range: 5 to 90% RH (no condensation)
 Operating conditions: Avoid installation in such environments as corrosive gas like sulfide hydrogen, dust, sea breeze and direct sunlight.
 Installation altitude: 2000 m or less above sea level.

■ Mounting and Dimensions

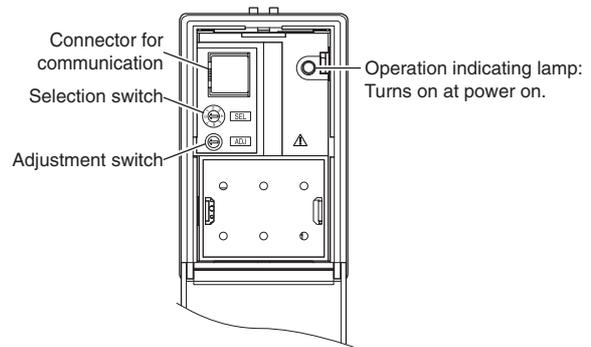
Material: Main unit : ABS resin (black), UL94 V-0
 ABS resin + polycarbonate resin (black), UL94 V-0
 PBT resin, including glass fiber (black), UL94 V-0
 Socket: Modified polyphenylene oxide resin, including glass fiber (black), UL94 V-1
 Mounting: Wall or DIN rail mounting (When mounting the units close together, leave a space of at least 5 mm between them.)
 Connection: M3.5 screw terminals
 External dimensions: 86.5 (H) \times 51 (W) \times 133 (D) mm (including a socket)
 Weight: Main unit: approx. 200 g
 Socket: approx. 80 g

■ Accessories

Spacer: One (for DIN rail mounting)
 Range label: One
 Receiving resistor: One (for current input)
 * When the optional specification "/R250" is specified, the 250 Ω receiving resistor is attached. When the optional specification "/R250" is not specified, the 100 Ω receiving resistor is attached.

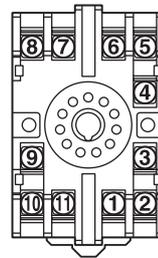
■ Front Panel

Output can be adjusted using the selection switch and adjustment switch.



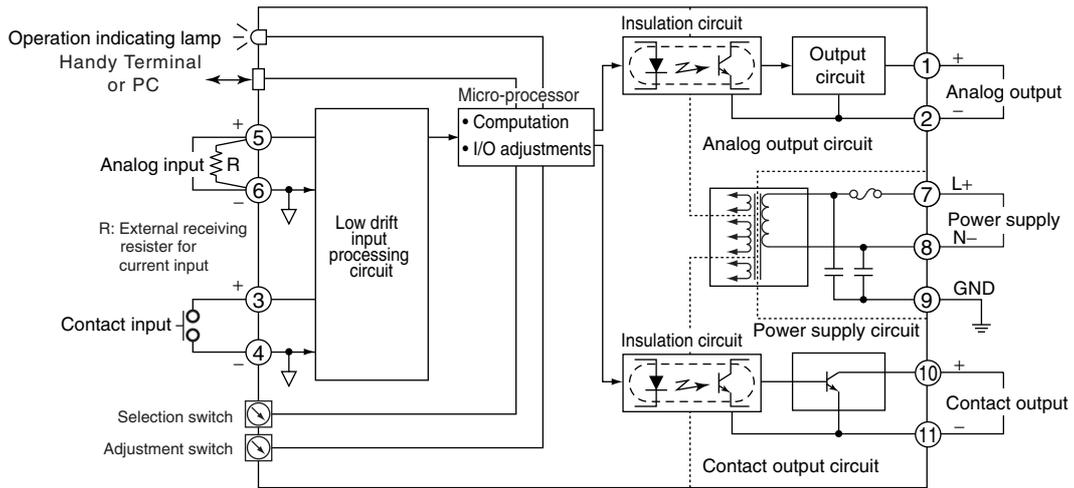
Position of selection switch	Item to be adjusted
0	No function
1	Output zero adjustment
2	Output span adjustment
3	No function
4	No function
5	No function
6	No function
7	Forced contact output ON/OFF

■ Terminal Assignments

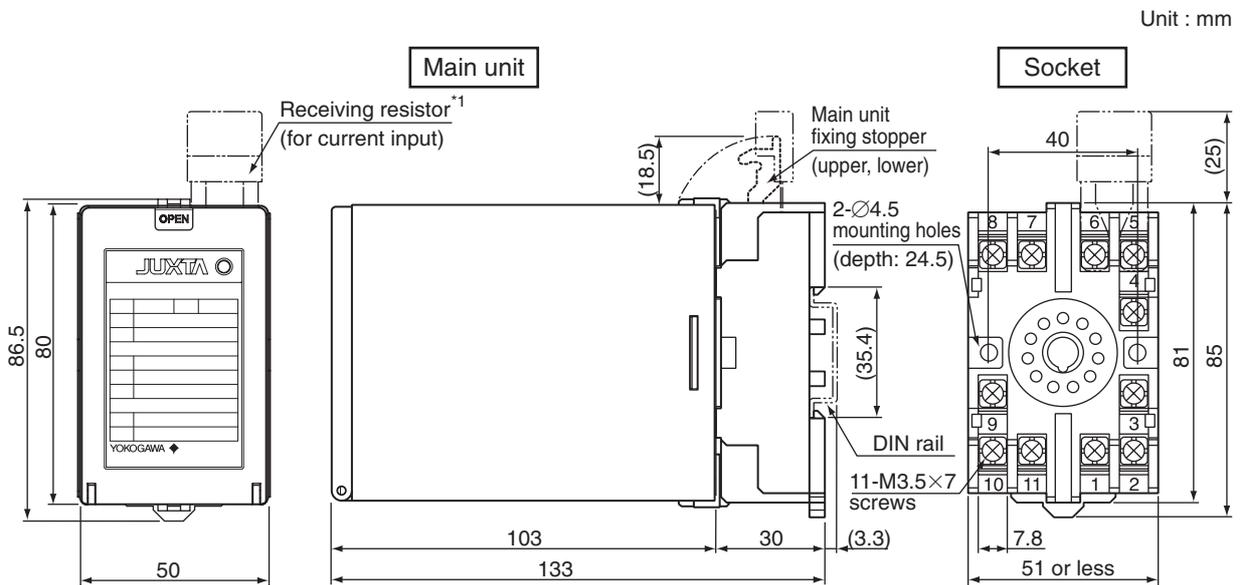


1	ANALOG OUTPUT (+)
2	ANALOG OUTPUT (-)
3	CONTACT INPUT (+)
4	CONTACT INPUT (-)
5	ANALOG INPUT (+)
6	ANALOG INPUT (-)
7	SUPPLY (L+)
8	SUPPLY (N-)
9	GND (GND)
10	CONTACT OUTPUT (+)
11	CONTACT OUTPUT (-)

Block Diagram

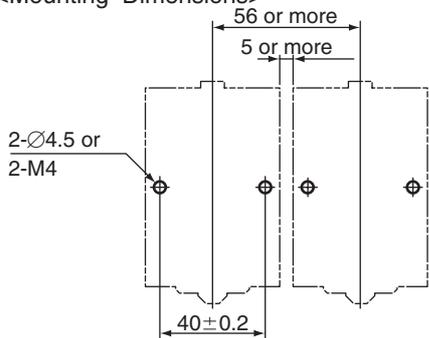


External Dimensions



*1: The receiving resistor is supplied for the input signal suffix code "A" or "B."

<Mounting Dimensions>



Note:

- When mounting the units close together, leave a space of at least 5 mm between them.
- Use the supplied spacer to keep a space of 5 mm for DIN rail mounting.

■ **Functions**

● **MXD-A Free Program**

This computing unit is used to meet individual applications by programming the available commands.

Initial Setting

- Program: Outputs the value that corresponds to the input.

● **MXD-L Analog Memory**

This computing unit carries out the analog output (Y) of the value that corresponds to the analog input (X) as an ordinary computing unit as long as the contact input (DI) is ON (SHORT).

When the contact input is OFF (OPEN), the unit holds the analog output at that time (Y) all the time.

● **MXD-M Peak Holder**

This computing unit carries out the analog output (Y) of the value that corresponds to the analog input (X) as an ordinary computing unit as long as the contact input (DI) is ON (SHORT).

When the contact input is OFF (OPEN), the unit outputs the analog signal (Y) that corresponds to the peak value of subsequent analog input (X).

● **MXD-P Program Setter**

This computing unit resets the program, outputs and holds the starting value of the time table when the contact input (DI) is ON (SHORT). When the contact input is OFF (OPEN), the unit starts the program and outputs the analog signal (Y) according to the time table. When the program ends, the unit outputs the end value of time table and holds it until the next reset command (contact input in ON (SHORT) status) enters.

Setting conditions of time table:

0.0 second (0.0%) ≤ (t₀ to t₂₀) ≤ 320000 seconds (32000%)

Number of significant digits: 4

Minimum unit: 1 second

t₀ < t₁ < t₂ < ... < t₂₀

-6% ≤ (Y₀ to Y₂₀) ≤ 106%

Minimum unit: 0.1%.

Ordering Information and Initial Settings

- Time table (21 breakpoints at maximum): Data that outputs 0 to 100% during 0 to 800 seconds.
Time: 0, 40, 80, 120, 160, 200, 240, 280, 320 ... 800 seconds
Output: 0, 5, 10, 15, 20, 25, 30, 35, 40 ... 100%
t₀ to t₂₀
Number of significant digits: 4 (e.g. 123456 seconds unacceptable, 1234 seconds acceptable)
Y₀ to Y₂₀
Minimum unit: 0.1% (e.g. 12.34% unacceptable, 12.3% acceptable)
- Number of line segments of time tables: 20

● **MXD-N Bottom Holder**

This computing unit carries out the analog output (Y) of the value that corresponds to the analog input (X) as an ordinary computing unit as long as the contact input (DI) is ON (SHORT).

When the contact input is OFF (OPEN), the unit outputs the analog signal (Y) that corresponds to the bottom value of subsequent analog input (X).

<Work Sheet>

Model and suffix code: MXD-P N- *B

Enter the time (t₀ to t₂₀) after converting it into % value. (1 second = 0.1 %)

Time (%)		Output (%)	
t ₀		Y ₀	
t ₁		Y ₁	
t ₂		Y ₂	
t ₃		Y ₃	
t ₄		Y ₄	
t ₅		Y ₅	
t ₆		Y ₆	
t ₇		Y ₇	
t ₈		Y ₈	
t ₉		Y ₉	
t ₁₀		Y ₁₀	
t ₁₁		Y ₁₁	
t ₁₂		Y ₁₂	
t ₁₃		Y ₁₃	
t ₁₄		Y ₁₄	
t ₁₅		Y ₁₅	
t ₁₆		Y ₁₆	
t ₁₇		Y ₁₇	
t ₁₈		Y ₁₈	
t ₁₉		Y ₁₉	
t ₂₀		Y ₂₀	

Number of line segments of time tables

● **MXD-Q Integrated Pulse Output**

This computing unit outputs the integrated pulse according to the following expression.

$$DO = K1 \cdot X \cdot 10$$

where DO: Integrated pulse output (pulse/hour)
X: Input signal (%)
K1: Integration factor (no unit)

Pulse output is ON pulse of 100 ms. However, the maximum number of output pulse is 5 pulses / second. Also, the analog signal is always output as monitor of input signal (X).

Setting range of integration factor:

0.01 to 18 (1% to 1800%)

Number of significant digits: 4

Minimum unit: 0.00001

Computation accuracy: 1000 ± 2 (pulse/hour) (However, when $K1 = 1$, $X = 100\%$.)

Ordering Information

- Integration factor: e.g. 1.0
- Number of significant digits: 4 (e.g. 1.23456 unacceptable; 12.34, 1.234, 0.01234 acceptable)