

# General Specifications

GS 77J09X03-01E

## WX3 Series Computing Units (mV Input/Variable Software Type)

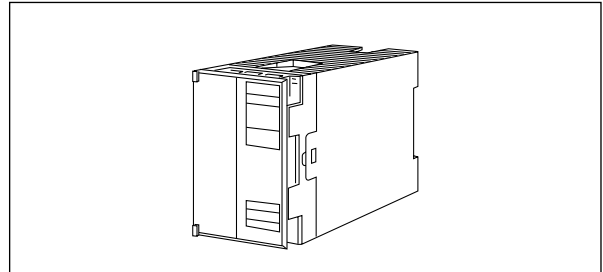
**JUXTA**

Moving Average Unit, Dead Time Unit, Velocity Unit, First Order Lug Unit, First Order Lead Unit, Velocity Limiter, Peak Holder, Bottom Holder, Analog Memory, Program Setter, Limiter, Linearizer, Temperature Compensator, Pressure Compensator, Adder/Subtractor, Multiplier, Divider, High Selector, Low Selector, Programmable Unit

### General

The JUXTA WX3 Series, Computing unit (mV Input/Variable Software Type) receives mV input signals, applies various computing functions to them, and outputs isolated DC current or DC voltage signals to controllers or recorders.

The computation parameters, zero points, and spans can be set and modified using a Handy Terminal (JHT200).

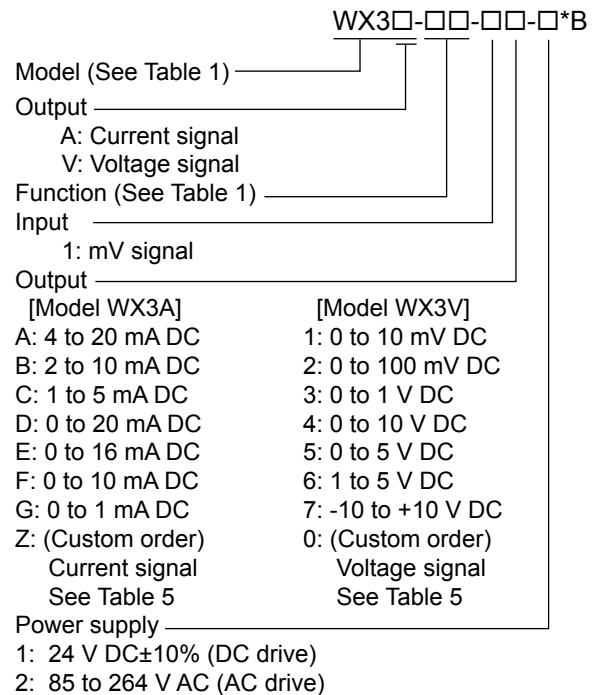


### List of Computing Units

Table 1. List of WX3 Series

Descriptions	Models □: V or A
Moving Average Unit	WX3□-MA
Dead Time Unit	WX3□-DT
Velocity Unit	WX3□-VC
First Order Lug Unit	WX3□-LG
First Order Lead Unit	WX3□-LE
Velocity Limiter	WX3□-VL
Peak Holder (with second input for holding)	WX3□-PH
Bottom Holder (with second input for holding)	WX3□-BH
Analog Memory (with second input for holding)	WX3□-AM
Program Setter	WX3□-PS
Limiter	WX3□-LM
Linearizer	WX3□-FX
Temperature Compensator	WX3□-TR
Pressure Compensator	WX3□-PR
Adder/Subtractor	WX3□-AS
Multiplier	WX3□-ML
Divider	WX3□-DV
High Selector	WX3□-HS
Low Selector	WX3□-LS
Programmable Unit (with contact input)	WX3□-FP

### Model and Suffix Codes



### Ordering Information

Specify the following when ordering.  
If the fixed constants for each computing function are specified with the order, the specified values will be assigned before shipment.  
If not specified, the products are shipped with factory default settings. (Refer to "Functions" for other items which need to be specified when ordering.)  
Model and suffix codes: e.g. WX3A-MA-1A-2\*B  
Input range: e.g. 0 to 100 mV DC  
Moving average time: e.g. 20 sec.

## Input Specifications

Input signal: Refer to Table 2

**Table 2. Input Signals**

Input signals	Model and Suffix codes
1 point of mV signal	WX3□-MA, WX3□-DT, WX3□-VC, WX3□-LG, WX3□-LE, WX3□-VL, WX3□-PS, WX3□-LM, WX3□-FX
2 points of mV signals	WX3□-PH, WX3□-BH, WX3□-AM, WX3□-TR, WX3□-PR, WX3□-AS, WX3□-ML, WX3□-DV, WX3□-HS, WX3□-LS, WX3□-FP

Measuring range: Refer to Table 3

**Table 3. Measuring Range**

Input signal	Measuring range
mV signal	Each measuring range and span is as follows: -100 to +1250 mV: span 250 mV or more -50 to +250 mV: span 50 mV or more -10 to +50 mV: span 10 mV or more -2 to +10 mV: span 3 mV or more

Input resistance: 1 MΩ (3 kΩ or more during power off)

Maximum allowable input: -0.5 to +4.0 V DC

Input adjustment function: ±1% of span (Zero/Span)

## Output Specifications

Output signal: DC current signal or DC voltage signal

Allowable load resistance: Refer to Table 4

**Table 4. Output signals**

Output range	Output range
4 to 20 mA DC: 750 Ω or less	0 to 10 mV DC: 250 kΩ or more
2 to 10 mA DC: 1500 Ω or less	0 to 100 mV DC: 250 kΩ or more
1 to 5 mA DC: 3000 Ω or less	0 to 1 V DC: 2 kΩ or more
0 to 20 mA DC: 750 Ω or less	0 to 10 V DC: 10 kΩ or more
0 to 16 mA DC: 900 Ω or less	0 to 5 V DC: 2 kΩ or more
0 to 10 mA DC: 1500 Ω or less	1 to 5 V DC: 2 kΩ or more
0 to 1 mA DC: 15 kΩ or less	-10 to +10 V DC: 10 kΩ or more

Output adjustment function: ±1% of span (Zero/Span)

## Standard Performance

Accuracy rating: ±0.2% of span

However, the accuracy is not guaranteed for output levels less than 0.5% of the span of 0 to X mA output range type.

The ranges corresponding to the input span less than 10 mV:

$$\text{Accuracy} = 0.2 \times \frac{10 \text{ (mV)}}{\text{Input span (mV)}} \text{ (%)}$$

WX3□-FX: ±0.2% of span  
(when piecewise-linear-gain is 1 or less)

WX3□-TR, WX1□-PR: ±0.5% of span  
(when K1=K2=1, A2=0%, and X2=100%)

WX3□-AS: ±0.3% of span  
(when K1=K2=1, K3=0.5, A1=A2=A3=0%)

WX3□-ML: ±0.5% of span  
(when K1=K2=K3=1, A1=A2=A3=0%)

WX3□-DV: ±0.5% of span  
(when K1=K2=K3=1, A1=A2=A3=0%)

WX3□-FP: ±0.2% of span  
(when Input; %=Output; %)

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

Computation cycle: 100 ms

Insulation resistance: 100 MΩ or more at 500 V DC between input and output, output and power supply, and input and power supply.

Withstand voltage:

DC drive; 1500 V AC/min. between (input and output) and power supply. 500 V AC/min. between output and power supply.

AC drive; 1500 V AC/min. between input and output, input and power supply, input and ground, output and power supply, output and ground, and power supply and ground.

## Environmental Conditions

Operating temperature range: 0 to 50°C

Operating humidity range: 5 to 90% RH (no condensation)

Power supply voltage: 85 to 264 V AC, 47 to 63 Hz or 24 V DC±10%

Effect of power supply voltage fluctuations: ±0.1% of span or less for fluctuation within the operating range of power supply voltage specification.

Effect of ambient temperature change: ±0.2% of span or less for a temperature change of 10°C.

Current consumption: 24 V DC 60 mA (WX3V), 82 mA (WX3A)

Power consumption: 100 V AC 7.0 V A (WX3V), 8.5 V A (WX3A)

## Mounting and Dimensions

Material: ABS resin (Case body)

Mounting method: Rack, Wall, or DIN rail mounting

Connection: M4 screw terminal

External dimensions: 72 x 48 x 127 mm (H x W x D)

Weight: DC drive; Approx.130 g,  
AC drive; Approx.280 g

## Standard Accessories

Tag number label: 1

Range label: 1

Mounting block: 2

Mounting screw: M4 screw x 4

## Custom Order Specifications

Output signal: Refer to Table 5

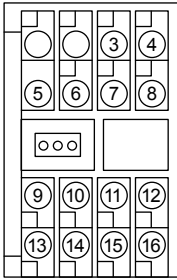
**Table 5. Acceptable range for custom order**

	Current signal	Voltage signal
Output range	0 to 24 mA DC	-10 to +10 V DC
Span	1 to 24 mA DC	10 mV to 20 V DC
Zero elevation	0 to 200%	-100 to +200%

Dual output: If dual output is necessary, specify /D0 at the end of the model code.

Note that the second output is fixed within the range of 1 to 5 V DC. Each first and second signal is output through an independent buffer amplifier. Relative error is within ±0.2%.

## Terminal Assignments



WX3□-MA, -DT, -VC, -LG, -LE, -VL, -LM, -FX	
7	Input (+)
8	Input (-)
9	Output 2 (+)
10	Output 2 (-)
11	Output 1 (+)
12	Output 1 (-)
13	Do not use this terminal
14	Power supply (L+)
15	Power supply (N-)
16	Ground (G)

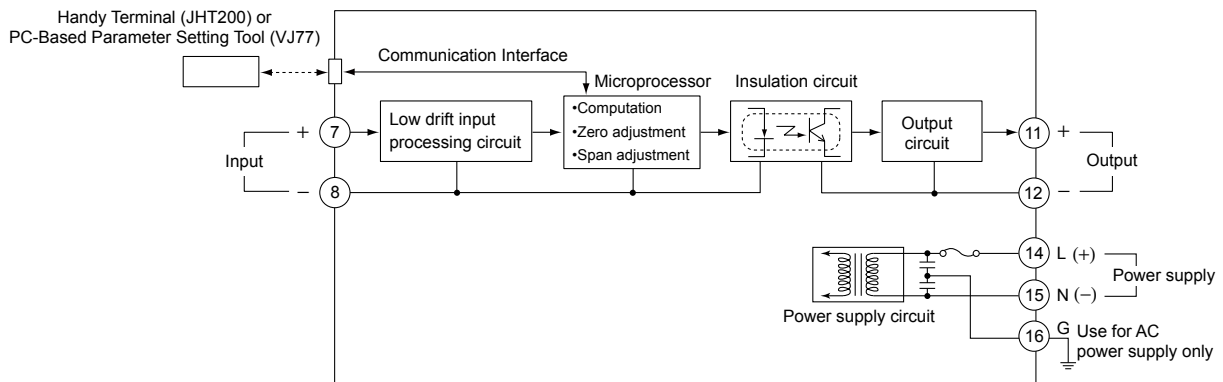
WX3□-PS	
3	Start/Reset (+)
4	Start/Reset (-)
5	Do not use this terminal
6	Do not use this terminal
7	Do not use this terminal
8	Do not use this terminal
9	Output 2 (+)
10	Output 2 (-)
11	Output 1 (+)
12	Output 1 (-)
13	Do not use this terminal
14	Power supply (L+)
15	Power supply (N-)
16	Ground (G)

WX3□-PH, -BH, -AM, -TR, -PR, -AS, -ML, -DV, -HS, -LS, -FP	
3	Input 2/Hold (+)
4	Input 2/Hold (-)
5	Do not use this terminal
6	Do not use this terminal
7	Input (+)
8	Input (-)
9	Output 2 (+)
10	Output 2 (-)
11	Output 1 (+)
12	Output 1 (-)
13	Do not use this terminal
14	Power supply (L+)
15	Power supply (N-)
16	Ground (G)

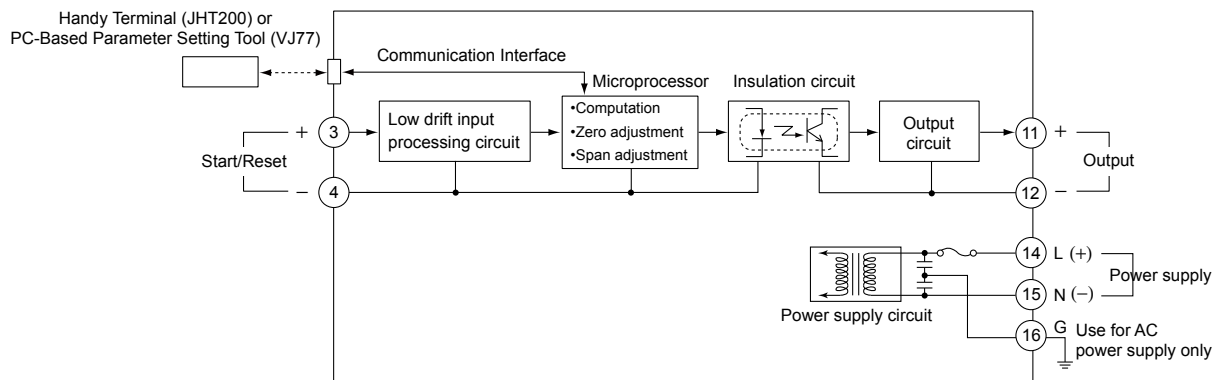
Terminals ⑨-⑩ are used for Output 2 only when the dual output is specified.

## Block Diagrams

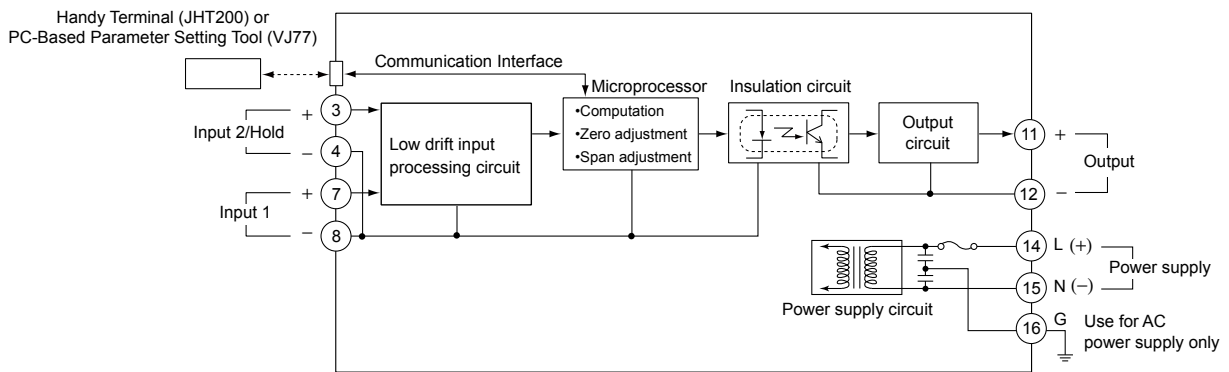
- WX3□ -MA, -DT, -VC, -LG, -LE, -VL, -LM, -FX



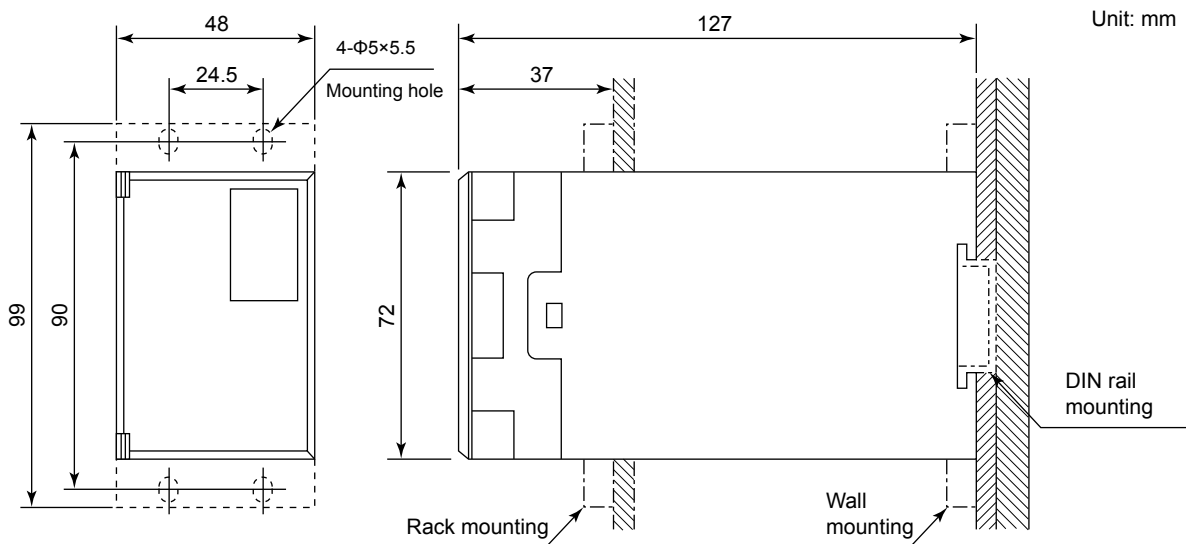
- WX3□ -PS



● WX3□ -PH, -BH, -AM, -TR, -PR, -AS, -ML, -DV, -HS, -LS, -FP



■ External Dimensions

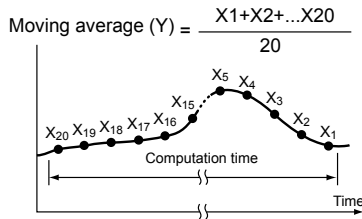


**■ Functions**

**• WX3□-MA Moving Average Unit**

This computing unit outputs the average of 20 input data (X) sampled at intervals of one-twentieth of the moving-average time (L). At the next sampling, the unit discards the oldest data and outputs the average of the 20 data, repeating the same operation. The output between samplings is smoothed out by interpolation.

**<Example>**



- Setting range of moving average time: 0 to 7990 sec. with 4 significant digits, the minimum unit is 1 sec.
- To use a first order lag filter for input (X), set the first-order lag time constant (T).
- Setting range of time constant: 0.0 to 799.0 sec.; the minimum unit is 0.1 sec.
- Accuracy of moving average and time constant setting: (±5.0% of set value) ± 1.0 sec.

**Ordering information and factory default setting**

- Moving average time: factory default; 10 sec.
- First order lag time constant: factory default; 0 sec.

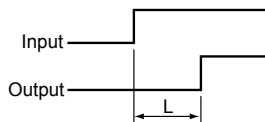
**• WX3□-DT Dead Time Unit**

This computing unit stores the input values (X) sampled at intervals of one-twentieth of the dead time (L) into 20 buffers and outputs data (Y) by orderly shifting them after the dead time has elapsed. The output between samplings is smoothed by interpolation.

$$Y = \frac{e^{-L/S}}{1+T/S} X$$

X: Input, L: Dead time  
Y: Output, T: Time constant

**<Example: 0% → 100% step input>**



- Setting range of dead time: 0 to 7990 sec. with 4 significant digits. Minimum unit is 1 sec.
- To use a first order lag filter for input (X), set the first order lag time constant (T).
- Setting range of time constant: 0.0 to 799.0 sec.; the minimum unit is 0.1 sec.
- Accuracy of dead time and time constant setting: (±5.0% of set value) ±1 sec.

**Ordering information and factory default setting**

- Dead time: factory default; 10 sec.
- First-order lag time constant: factory default; 0 sec.

**• WX3□-VC Velocity Unit**

This computing unit calculates the input velocity by subtracting the input of the last velocity computation (X<sub>L</sub>) from the present input (X). The unit then adds a 50% bias to one-half of the obtained velocity and outputs the result (Y).

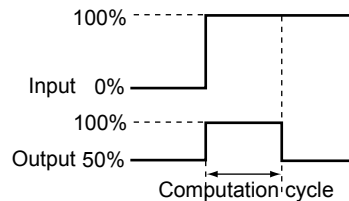
The output obtained is as follows:

- When there is no change in input: 50%
- When the input has increased: 50% or more (100% when X-X<sub>L</sub>= 100%)
- When the input has decreased: 50% or less (0% when X-X<sub>L</sub>= -100%)

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

X: Present Input  
X<sub>L</sub>: Input of the last velocity computation  
Y: Output

**<Example>**



- Setting range of velocity computation time: 0 to 7990 sec. 4 significant digits, the minimum unit is 1 sec.
- To use a first order lag filter for input (X), set the first order lag time constant (T).
- Setting range of time constant: 0.0 to 799.0 sec.; the minimum unit is 0.1 sec.
- Accuracy of velocity computation and time constant setting: (±5.0% of set value) ± 1 sec.

**Ordering information and factory default setting**

- Velocity computation time (L): factory default; 20 sec.
- First order lag time constant (T): factory default; 0 sec.

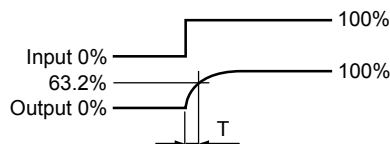
**• WX3□-LG First Order Lag Unit**

This computing unit provides a first order lag computation on input (X) with a time constant (T) and outputs the result (Y).

$$Y = \frac{1}{1+T/S} X$$

X: Input, T<sub>S</sub>: Time constant, Y: Output

**<Example: 0% → 100% step input>**



- Setting range of time constant: 1.0 to 799.0 sec.; minimum unit is 0.1 sec.
- Accuracy of time constant setting: (±5.0% of set value) ±1 sec.

**Ordering information and factory default setting**

- First order lag time constant: factory default; 10 sec.

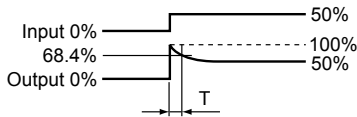
• **WX3□-LE First Order Lead Unit**

This computing unit provides a first order lead computation on input (X) with a time constant (T) and outputs the result (Y).

$$Y = \left(1 + \frac{T_s}{1 + T_s}\right) X$$

X: Input, T<sub>s</sub>: Time constant, Y: Output

<Example: 0% → 50% step input>



Setting range of time constant: 1.0 to 799.0 sec., the minimum unit is 0.1 sec.  
Accuracy of time constant setting: (±5.0% of set value) ± 1 sec.

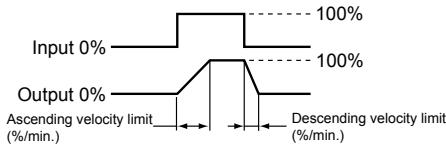
**Ordering information and factory default setting**

•First order lead time constant: factory default; 10 sec.

• **WX3□-VL Velocity Limiter**

This computing unit limits the input (X) velocity at the ascending velocity limit for a positive change at the descending velocity limit for a negative change, and outputs the limited value (Y). When the input velocity (slope) is not more than the limit, the unit outputs the input as it is.

<Example: 0% → 100% → 0% step input>



Setting range of velocity limit: 0.1 to 600.0%/min.; minimum unit is 0.1 %/min.  
Setting the limit at 700.0%/min. or above does not limit the input, the unit simply outputs the input as is. (Open limit function)

Setting accuracy of velocity limit: (±5.0% of set value) ± 0.1%/min.

**Ordering information and factory default setting**

•Ascending velocity limit: factory default; 100%/min.  
•Descending velocity limit: factory default; 100%/min.

• **WX3□-PH Peak Holder**

This computing unit outputs the current signal or voltage signal (Y) corresponding to the peak value when receiving hold-command input of more than 75%.

• **WX3□-BH Bottom Holder**

This computing unit outputs the current signal or voltage signal (Y) corresponding to the bottom value when receiving hold-command input of more than 75%.

• **WX3□-AM Analog Memory**

This computing unit holds the output signal (Y) at the moment when receiving hold-command input of more than 75%.

• **WX3□-PS Program Setter**

This computing unit starts the program when a start/reset input of more than 75% is accepted, and outputs the isolated current or voltage signal internally generated. The output signal changes with the time lapse corresponding to the 11 time table breakpoints.

Setting conditions of time table:

0.0 sec. ≤ (t<sub>0</sub> to t<sub>10</sub>) ≤ 7984 sec.,

-10.0% ≤ (Y<sub>0</sub> to Y<sub>20</sub>) ≤ 110.0%

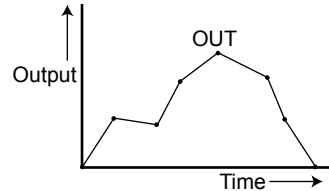
t<sub>0</sub> < t<sub>1</sub> < t<sub>2</sub> < t<sub>3</sub> < t<sub>4</sub> < t<sub>5</sub> < t<sub>6</sub> < t<sub>7</sub> < t<sub>8</sub> < t<sub>9</sub> < t<sub>10</sub>

Time breakpoints: t<sub>0</sub> to t<sub>10</sub>

Output breakpoints: Y<sub>0</sub> to Y<sub>10</sub>

Setting resolution: Time; 8 sec., Outputs; 0.1%

<Example>



**Ordering information and factory default setting**

•Time table: Write and specify all data of t<sub>0</sub> to t<sub>10</sub> and Y<sub>0</sub> to Y<sub>10</sub> on the work sheet below.

<Work Sheet>

Model and suffix code: \_\_\_\_\_

Time (sec.)		Output (%)	
t0		Y0	
t1		Y1	
t2		Y2	
t3		Y3	
t4		Y4	
t5		Y5	
t6		Y6	
t7		Y7	
t8		Y8	
t9		Y9	
t10		Y10	

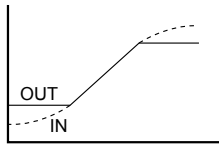
• **WX3□-LM Limiter**

This computing unit serves as an ordinary computing unit 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 (Y).

Setting range of limit: within 0.0 to 100.0%; minimum unit is 0.1% (both upper and lower)

However, if the upper limit is set less than the lower limit, the unit outputs the upper limit.

<Example>



**Ordering information and factory default setting**

- Upper limit: factory default; 100%
- Lower limit: factory default; 0%

• **WX3□-FX Linearizer**

This computing unit gives an arbitrary relationship between the input (X) and output (Y) signals using an arbitrary piecewise linear function. This piecewise linear function has 11 breakpoints, which each give an input-output relationship as a percentage (%).

Breakpoint setting conditions:

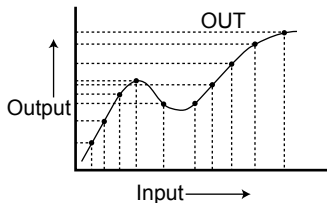
- 10.0% ≤ (X<sub>0</sub> to X<sub>10</sub>) ≤ 110.0%,
- 10.0% ≤ (Y<sub>0</sub> to Y<sub>10</sub>) ≤ 110.0%

X<sub>0</sub> < X<sub>1</sub> < X<sub>2</sub> < X<sub>3</sub> < X<sub>4</sub> < X<sub>5</sub> < X<sub>6</sub> < X<sub>7</sub> < X<sub>8</sub> < X<sub>9</sub> < X<sub>10</sub>

Input breakpoints: X<sub>0</sub> to X<sub>10</sub>

Output breakpoints: Y<sub>0</sub> to Y<sub>10</sub>

<Example>



**Ordering information and factory default setting**

- Breakpoint data: factory default; Input=Output
- Note: When specifying the data, write all data of X<sub>0</sub> to X<sub>10</sub> and Y<sub>0</sub> to Y<sub>10</sub> on the work sheet below.

<Work Sheet>

Model and suffix code: \_\_\_\_\_

Input (%)		Output (%)	
X0		Y0	
X1		Y1	
X2		Y2	
X3		Y3	
X4		Y4	
X5		Y5	
X6		Y6	
X7		Y7	
X8		Y8	
X9		Y9	
X10		Y10	

• **WX3□-TR Temperature Compensator**

This computing unit performs temperature compensation to gas flow signals (X1) and temperature signals (X2) measured by pressure flowmeters (Orifice, Bentley, Flow nozzle, etc.), and outputs the compensated gas flow signal (Y).

Computing parameters can be set using Handy Terminals.

$$\text{Formula } Y = \frac{K1 \cdot \sqrt{X1}}{\sqrt{K2 \cdot X2 + A2}}$$

- Y: Compensated flow output (%) K1: Gain (no unit)
- X1: Uncompensated flow input (%) K2: Gain (no unit)
- X2: Temperature input (%) A2: Bias (%)

If square root extraction is necessary for uncompensated flow input signal, set store address for the fixed constant (value of C14).

With square root extraction: C14=100.0%

Without square root extraction: C14=0.0%

Setting range of gain/bias:

gain ±7.990, bias ±799.0% = ±799.0%

If the ranges exceed ±800.0%, a correct computation cannot be obtained.

minimum unit; gain 0.001, bias 0.1%.

**Ordering information and factory default setting**

- Gain: factory default; K1=K2=1.000
- Bias: factory default; A2=0.0%
- Square root extraction for flow input: factory default; no setting

**How to obtain the gain (K1, K2) and bias (A2):**

$$K1 = \frac{\text{Uncompensated flow input span}}{\text{Compensated flow input span}}$$

$$K2 = \frac{\text{Temperature input span (K)}}{\text{Reference temperature (K)}}$$

$$= \frac{\text{Max. value (°C) - Min. value(°C)} \\ \text{(of temperature range)}}{\text{Reference temperature (°C) + 273.15 (°C)}}$$

$$A2 = \frac{\text{Min. value (K) (of temperature range)}}{\text{Reference temperature (K)}} \times 100 (\%)$$

$$= \frac{\text{Min. value (°C) (of temperature range) + 273.15 (°C)}}{\text{Reference temperature (°C) + 273.15 (°C)}} \times 100 (\%)$$

Note: Use Divider in cases where the temperature compensation for gas flow is measured by vortex flowmeter.



• **WX3□-PR Pressure Compensator**

This computing unit performs temperature compensation to gas flow signal (X1) and pressure signal (X2) measured by pressure flowmeters (Orifice, Bentley, Flow nozzle, etc.), and outputs the compensated gas flow signal (Y).

Computing parameters can be set using Handy Terminals.

$$\text{Formula } Y = K1 \cdot \sqrt{X1} \sqrt{K2 \cdot X2 + A2}$$

Y: Compensated flow output (%)    K1: Gain (no unit)  
 X1: Uncompensated flow input (%)    K2: Gain (no unit)  
 X2: Pressure input (%)    A2: Bias (%)

If square root extraction is necessary for uncompensated flow input signal, set store address for the fixed constant (value of C14).

With square root extraction: C14=100.0%  
 Without square root extraction: C14=0.0%  
 Setting range of gain/bias:  
 gain ±7.990, bias ±799.0% = ±799.0%  
 If the ranges exceed ±800.0%, a correct computation cannot be obtained.  
 minimum unit; gain 0.001, bias 0.1%.

**Ordering information and factory default setting**

- Gain: factory default; K1=K2=1.000
- Bias: factory default; A2=0.0%
- Square root extraction for flow input: factory default; no setting

**How to obtain the gain (K1, K2) and bias (A2):**

$$K1 = \frac{\text{Uncompensated flow input span}}{\text{Compensated flow input span}}$$

$$K2 = \frac{\frac{\text{Max. value (kPa) - Min. value (kPa)}}{\text{(of pressure transmitter range)}}}{\text{Reference pressure (kPa) + 101.32 (kPa)}}$$

$$A2 = \frac{\frac{\text{Min. value (kPa)}}{\text{(of pressure transmitter range)}} + 101.32 \text{ (kPa)}}{\text{Reference pressure (kPa) + 101.32 (kPa)}} \times 100 \text{ (\%)}$$

Note: Use Divider in cases where the temperature compensation for gas flow is measured by vortex flowmeter.

• **WX3□-AS Adder/Subtractor**

This computing unit accepts two voltage signal inputs (X1, X2) from various converters, and outputs the isolated current or voltage signal (Y) after addition and subtraction.

$$\text{Formula: } Y = K3\{K1(X1+A1)+K2(X2+A2)\}+A3$$

Y: Output (%)    K1 to K3: Gain (no unit)  
 X1, X2: Input (%)    A1 to A3: Bias (%)

Setting range of gain/bias:  
 gain ±7.990, bias ±799.0% = ±799.0%  
 If the ranges exceed ±800.0%, a correct computation cannot be obtained.

**Ordering information and factory default setting**

- Gain: factory default; K1=K2=K3=1.000

- Bias: factory default; A1=A2=A3=0.0%

• **WX3□-ML Multiplier**

This computing unit accepts two voltage signal inputs (X1, X2) from various converters, and outputs the isolated current or voltage signal (Y) after multiplication.

The unit can perform pressure compensation by inputting gas flow signals measured by vortex flowmeter etc. and pressure signal as two input signals.

$$\text{Formula: } Y = K3(K1 \cdot X1 + A1) \cdot (K2 \cdot X2 + A2) + A3$$

Y: Output (%)    K1 to K3: Gain (no unit)  
 X1, X2: Input (%)    A1 to A3: Bias (%)

Setting range of gain/bias:  
 gain ±7.990, bias ±799.0% = ±799.0%  
 If the ranges exceed ±800.0%, a correct computation cannot be obtained.

**Ordering information and factory default setting**

- Gain: factory default; K1=K2=K3=1.000
- Bias: factory default; A1=A2=A3=0.0%

**How to obtain the gain (K1, K2, K3) and bias (A1, A2, A3) for pressure compensation:**

- K1=1 since the output value of flow transmitter is used as it is.
- A1=0% since the output value of flow transmitter is used as it is.

$$K2 = \frac{\frac{\text{Max. value (kPa) - Min. value (kPa)}}{\text{(of pressure transmitter range)}}}{\text{Reference pressure (kPa) + 101.32 (kPa)}}$$

$$A2 = \frac{\frac{\text{Min. value (kPa)}}{\text{(of pressure transmitter range)}} + 101.32 \text{ (kPa)}}{\text{Reference pressure (kPa) + 101.32 (kPa)}} \times 100 \text{ (\%)}$$

$$K3 = \frac{\text{Uncompensated flow input span}}{\text{Compensated flow input span}}$$

- A3=0% since the compensated flow value is normally used as it is.
- Note: Use Pressure compensator in cases where the pressure compensation for gas flow is measured by pressure flowmeter.



### • WX3□-DV Divider

This computing unit accepts two voltage signal inputs (X1, X2) from various converters, and outputs the isolated current or voltage signal (Y) after division.

The unit can perform temperature compensation by inputting gas flow signal measured by vortex flowmeter etc. and temperature signal as two input signals.

Formula:

$$Y = \frac{K3 (K1 \cdot X1 + A1)}{K2 \cdot X2 + A2} + A3$$

Y: Output (%)                      K1 to K3: Gain (no unit)  
X1, X2: Input (%)                A1 to A3: Bias (%)

Setting range of gain/bias:

gain  $\pm 7.990$ , bias  $\pm 799.0\% = \pm 799.0\%$   
If the ranges exceed  $\pm 800.0\%$ , a correct computation cannot be obtained.

### Ordering information and factory default setting

- Gain: factory default; K1=K2=K3=1.000
- Bias: factory default; A1=A2=A3=0.0%

### How to obtain the gain (K1, K2, K3) and bias (A1, A2, A3) for temperature compensation:

- K1=1 since the output value of flow transmitter is used as it is.
- A1=0% since the output value of flow transmitter is used as it is.

$$K2 = \frac{\text{Temperature input span (K)}}{\text{Reference temperature (K)}}$$

$$= \frac{\text{Max. value (}^\circ\text{C)} - \text{Min. value (}^\circ\text{C)} \text{ (of temperature range)}}{\text{Reference temperature }^\circ\text{C} + 273.15 (^\circ\text{C)}}$$

$$A2 = \frac{\text{Min. value (K) (of temperature range)}}{\text{Reference temperature (K)}} \times 100 (\%)$$

$$= \frac{\text{Min. value (}^\circ\text{C)} \text{ (of temperature range)} + 273.15 (^\circ\text{C)}}{\text{Reference temperature (}^\circ\text{C)} + 273.15 (^\circ\text{C)}} \times 100 (\%)$$

$$K3 = \frac{\text{Uncompensated flow input span}}{\text{Compensated flow input span}}$$

- A3=0% since the compensated flow value is normally used as it is.

Note: Use Temperature compensator in cases where the temperature compensation for gas flow is measured by pressure flowmeter.

### • WX3□-HS High Selector

This computing unit accepts two voltage signal inputs (X1, X2) from various converters, selects the higher one (Y), and outputs a current signal or a voltage signal.

### • WX3□-LS Low Selector

This computing unit accepts two voltage signal inputs (X1, X2) from various converters, selects the lower one (Y), and outputs a current signal or a voltage signal.

### • WX3□-FP Programmable Unit

This computing unit accepts two voltage signal inputs (X1, X2) from various converters, performs various computations and outputs the isolated current or voltage signal as the result.