

Multi-monitors

MD



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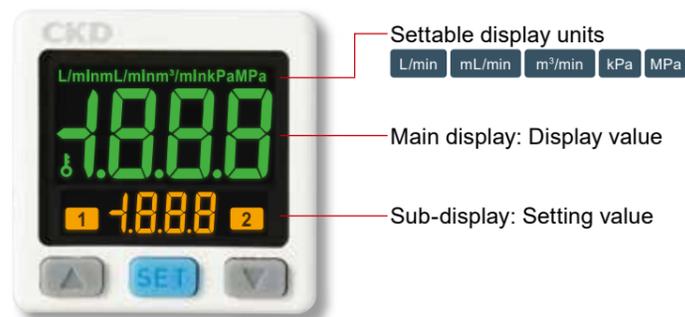
There is one way to manage both flow rate and pressure



Compatible with any flow rate and pressure regardless of the sensor

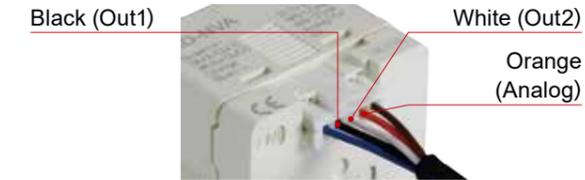
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Simultaneous confirmation of the display value and the set value is possible. Output of flow rate and pressure can be displayed regardless of the sensor.



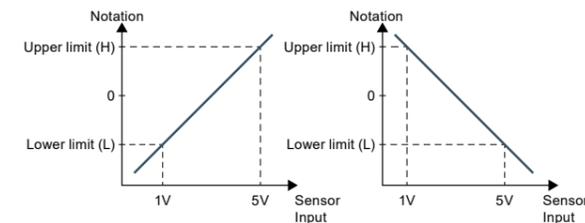
Analog output proportional to display value is possible

Switch output 2 points, analog output 1 point equipped
Transmits analog output signal proportional to input signal of the sensor to PLC, etc.



Set display value freely within range

Scaling function
Enables conversion display of sensor input to arbitrary values. The decimal point position can also be switched.



*Environment inspection is only available for "RoHS certificate" and "REACH certificate". Parts level detailed data is not supported.

Examples of applications

Ideal for remote monitoring of flow rate and pressure



Easy-to-read display

3-color display
The display value and set value are displayed in three colors.



Prevents misoperation

Lock function
Prevents misoperation such as touching the wrong key.



Saves power with display OFF when not setting

Energy saving mode function
In energy saving mode, the display will turn OFF after 30 seconds unless a button is pressed.



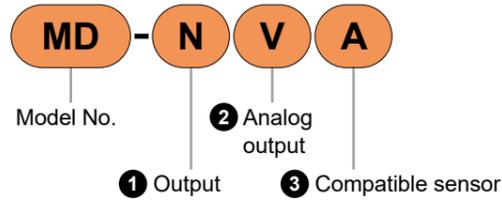
Multi-monitors MD Series



Refer to the CKD website for detailed compatible model Nos.

MD Series Specifications

Model No. Notation Method



1 Output

Code	Description
N	Switch output (NPN) 2 points
P	Switch output (PNP) 2 points

2 Analog output

Code	Description
V	Voltage output (1 to 5 V)
A	Current output (4 to 20 mA)

3 Compatible sensor

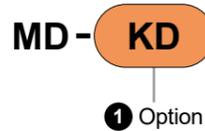
Code	Description	Sensor connection (CN1) connector		*Accessories	
		Sumitomo 3M model No.	Cover color	Applicable wire	
A	FSM-V, PPE, PPD3-A	37104-3122-000 FL	Yellow	24-26	ø1.0 - 1.2
B	WFK3000	37104-3163-000 FL	Orange		
C	WFC	37104-2206-000 FL	Gray	20-22	ø1.6 to 2.0

Note: The corresponding sensor is voltage output (1 to 5 V).

(Standard attachment)

- 5-conductor connector cable 2 m: 1
- Sensor connection connector (e-CON): 1

Discrete option model No.



1 Option

Code	Description
KD	Parallel mounting bracket (mounting screws included)
KL	L-shaped mounting bracket (mounting screws attached)
KHS	Panel adapter
KHSCB	Panel adapter + Front protective cover
C2	5-conductor connector cable 2 m

Specifications

Item		MD										
Indicator	Flow rate/pressure range *1	Upper limit (H)	-100.0 to 0	1.000 to 0	1.50 to 0	2.00 to 0	4.00 to 0	5.00 to 0	10.00 to 0	12.0 to 0	20.0 to 0	25.0 to 0
		Lower limit (L)	0	0	0	0	0	0	0	0	0	0
		Resolution	0.1	0.001	0.01	0.01	0.01	0.01	0.01	0.1	0.1	0.1
	Flow rate/pressure range *1	Upper limit (H)	32.0 to 0	50.0 to 0	60.0 to 0	100.0 to 0	1 to 200	300 to 0	500 to 0	1000 to 0	1.000 to -1.000	2.00 to -2.00
		Lower limit (L)	0	0	0	0	0	0	0	0	0	0
		Resolution	0.1	0.1	0.1	0.1	1	1	1	1	0.001	0.01
	Flow rate/pressure range *1	Upper limit (H)	5.00 to -5.00	10.00 to -10.00	20.0 to -20.0	50.0 to -50.0	100.0 to -100.0	200 to -200	500 to -500	1000 to -1000	300 to -100	980 to -100
		Lower limit (L)	0	0	0	0	0	0	0	0	0	0
		Resolution	0.01	0.01	0.1	0.1	0.1	1	1	1	1	1
Unit *2		With scaling function MPa, kPa, mL/min, L/min, m³/min										
Power supply voltage		12 to 24 VDC ±10% ripple (P-P) 10% or less										
Current consumption		40 mA or less (no load)										
Sensor input		1 to 5 V										
Sensor supply power current		max. 100 mA										
Switch output (NPN)		NPN: transistor, open collector 2 points Max. load current: 125 mA Max. power supply voltage: 30 VDC Internal voltage drop: 1.5 V or less										
Switch output (PNP)		PNP: transistor, open collector 2 points Max. load current: 125 mA Max. power supply voltage: 24 VDC Internal voltage drop: 1.5 V or less										
Repeatability (switch output)		±0.1% F.S. ±1 digit or less										
Hysteresis	One-point mode	Adjustable *3										
	Hysteresis mode											
	Window comparator mode											
Response time		2.5 ms or less (chattering prevention: 25 ms, 100 ms, 250 ms, 500 ms, 1000 ms, and 1500 ms can be selected)										
Switch output load short-circuit protection		Yes										
Indicator		Main/unit display: 2 colors (red, green) Sub-display: Orange (sampling rate: 5 times/sec)										
Indicator accuracy		±1%F.S.±1digit or less (reference temperature: 25±3°C)										
Indicator lamp		Orange (OUT1, OUT2)										
Analog output (voltage output)		Output voltage: 1 to 5 V±2%F.S. or less (rated pressure range) Linearity: ±1%F.S. Output impedance: 1 kΩ										
Analog output (current output)		Output current: 4 to 20 mA±2%F.S. or less (rated pressure range) Linearity: ±1%F.S. Max. load impedance: 250 Ω (12 V), 600 Ω (24 V) Min. load impedance: 50 Ω										
Degree of Protection		IP40										
Environment conditions	Ambient temperature	Usage: 0 to 50°C, Storage: -10 to 60°C (no condensation or freezing)										
	Ambient humidity	Usage/Storage: 35 to 85% RH (no condensation)										
	Withstand voltage	1000 VAC, 1 minute (between the case and lead wire)										
	Insulation resistance	50 MΩ or less (500 VDC, between the case and lead wire)										
	Vibration resistance	Compound amplitude 1.5 mm, 10 Hz - 55 Hz - 10 Hz per minute, 2 hours each in X, Y, Z directions										
	Shock resistance	100 m/s² (10 G), 3 times each in X, Y, Z directions										
Temperature characteristics		±0.5F.S. or less (25°C reference) temperature range 0 to 50°C										
Lead wire		Oil resistant cable (0.15 mm²)										
Weight		Approx. 67 g (Lead wire 2 m)										

*1: The flow rate/pressure range can be selected from 30 patterns. Arbitrary values can also be set with the scaling function.

*2: Units are "MPa" "kPa" "mL/min" "L/min" "m³/min" can be selected from five types.

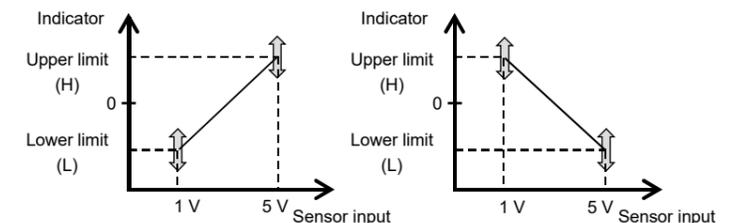
*3: Hysteresis of 1 to 8digit can be adjusted in one-point mode and window comparator mode.

Scaling function

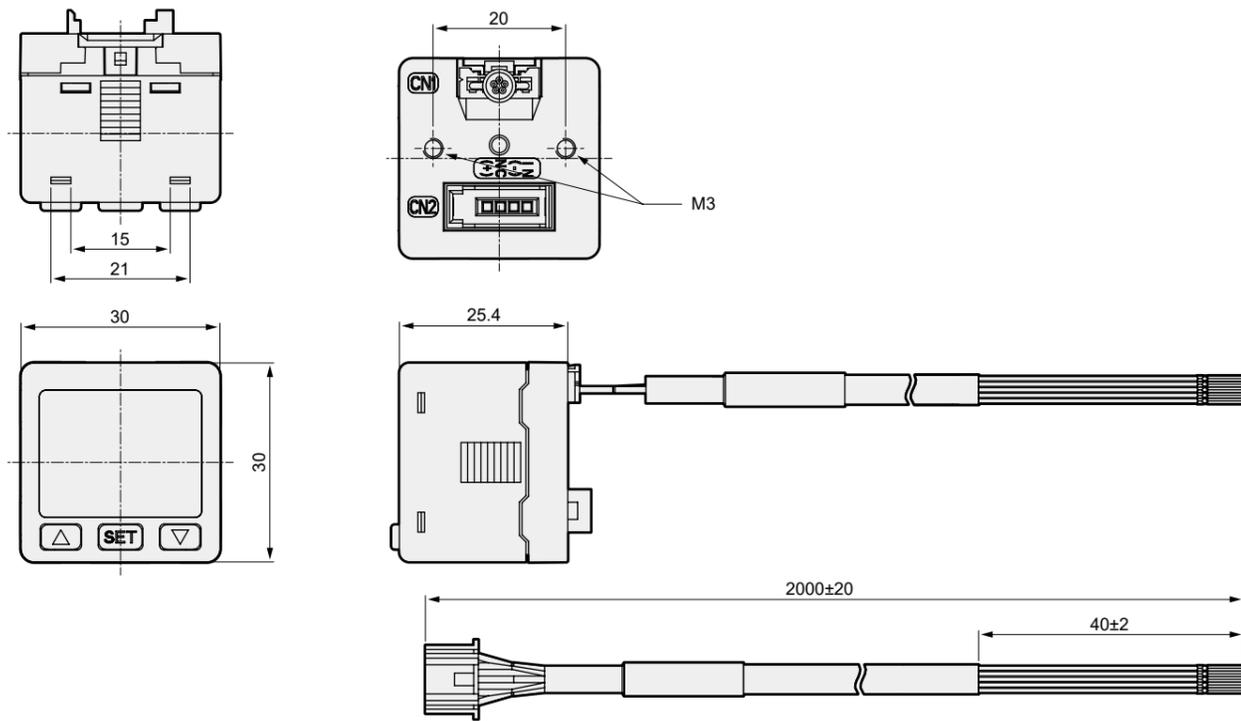
Arbitrary figures can also be set for the flow rate/pressure range with the scaling function.

The number of digits after the decimal point can also be changed.

Note: The upper (H) and lower (L) limits can be set within a range of ±1999. However, the upper (H) and lower (L) limits cannot be set with the same polarity (both positive or both negative).

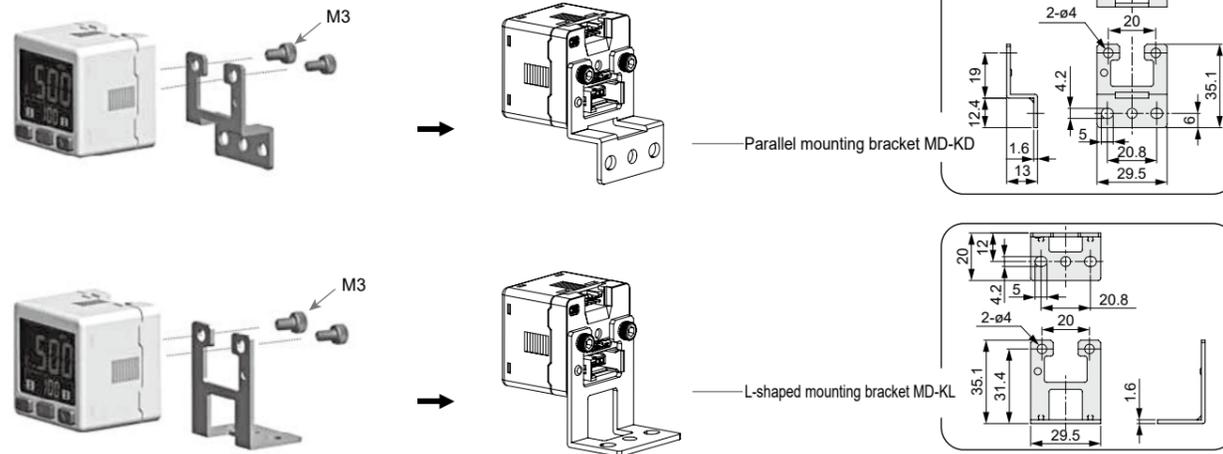


Dimensions

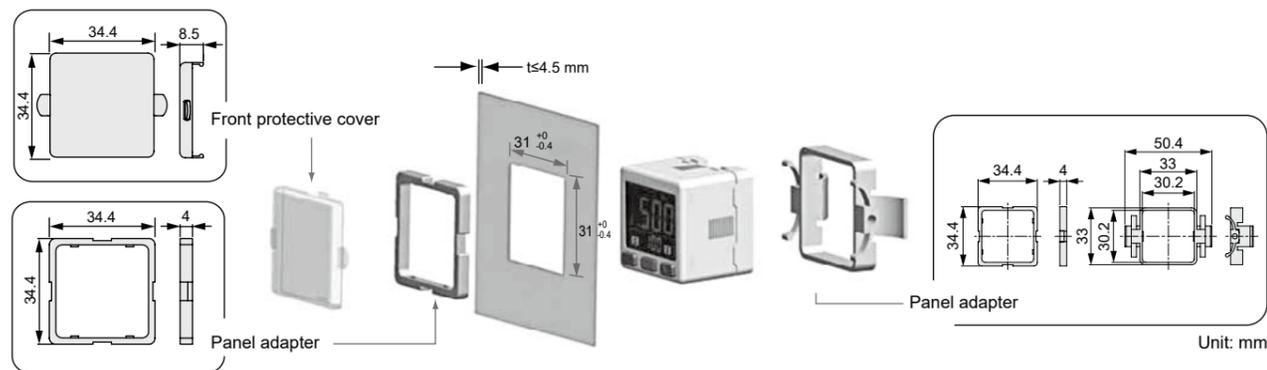


Optional dimensions

●Bracket mounting



●Panel mount



Display description, internal circuit and connection method

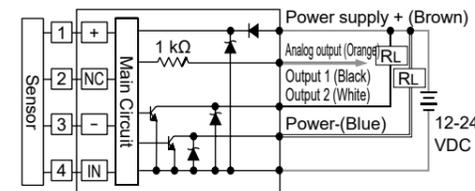
Indicator description



Internal circuit / connection method

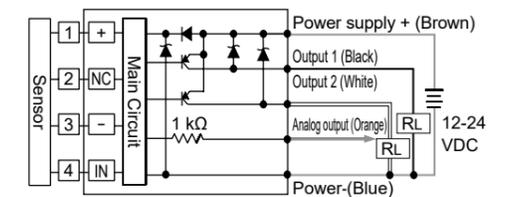
●MD-NV

2NPN + Analog output (1 to 5 V)



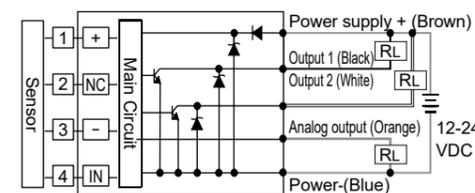
●MD-PV

2PNP + Analog output (1 to 5 V)



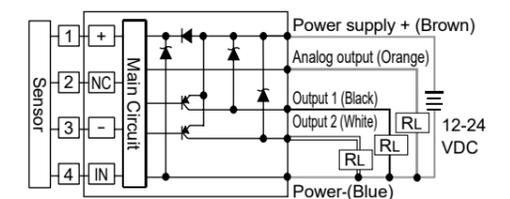
●MD-NA

2NPN + Analog output (4 to 20 mA)



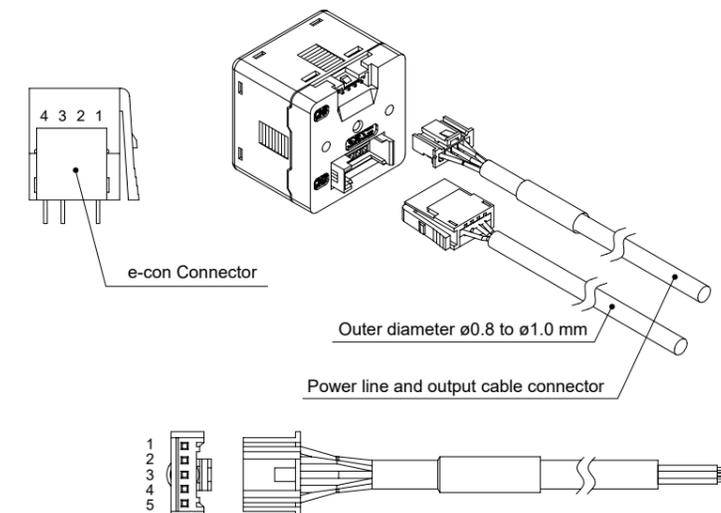
●MD-PA

2PNP + Analog output (4 to 20 mA)



PIN No.	Sensor wiring
1	Power supply +
2	N.C.
3	Power supply -
4	Sensor input (1 to 5 V)

PIN No.	Cable color
1	Brown (Power supply +)
2	Orange (analog output)
3	White (OUT2)
4	Black (OUT1)
5	Blue (Power supply -)





Pneumatic components (sensors) Safety Precautions

Be sure to read this section before use.
For general pneumatic components precautions, refer to Intro 17 for details.

Product-specific cautions: Multi-monitor MD Series

Design / Selection

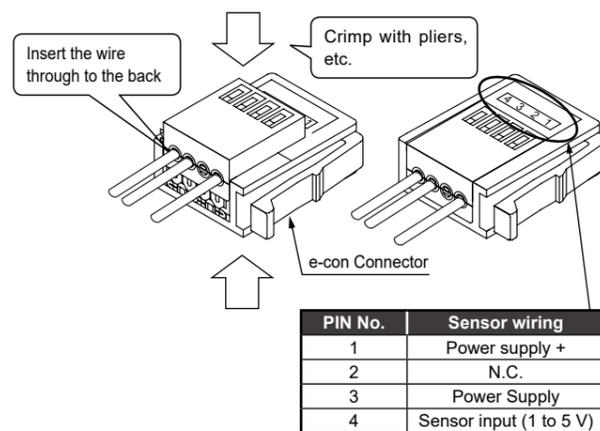
WARNING

- Use this product in accordance with specifications.
Use for applications, or at load currents, voltages, temperatures, impacts or sites excluded from the specifications could result in damage or malfunctions.
- Power supply voltage
Do not use this product at levels exceeding the power supply voltage. If voltage exceeding this range or AC power supply (100 VAC) is applied, the controller could rupture or burn.
- Load short-circuit
Do not short-circuit the load. Failure to observe this could result in rupture or burning.

CAUTION

- Working environment
 - Do not use the product in a location subject to vibration or shock of 100 m/s².
 - Do not use this product in areas containing water droplets, oil droplets, or dust.
- Determine the setting taking error caused by accuracy and temperature characteristics into consideration.
- Take care when using this product for an interlock circuit.
When using this product for an interlock signal requiring high reliability, provide a double interlock by installing a mechanical protection function or a switch (sensor) other than this product as a safeguard against breakdown.
- Corresponding sensor
 - The corresponding sensor is the voltage output (1-5 V) type. If the current output-type or other voltage output-type is connected, it will not operate properly.
 - The maximum supply current to the sensor is 100 mA. Check the specifications of the connected sensor before use.
 - As the compatible e-CON type varies depending on the sensor, select upon confirmation with Model No. Notation Method on page 580.
 - The FSM2 separated display sensor cannot be used as is, because the e-CON wiring pin array is different.

- CE-compliance working conditions
The standard for the immunity for industrial environments used for CE conforming products is EN61000-6-2, but the following requirements must be satisfied in order to conform to this standard.
Conditions
 - The evaluation of this product is performed by using a cable that has a power supply line and a signal line paired to assess the product's performance.
 - This product is not equipped with surge protection. Implement surge protection measures on the system side.
- Range setting
When using this product, be sure to set the range and units.
- Care must be taken for protection of body and lead wire.
 - Check that stress is not directly applied to cable leadouts or connectors.
 - Connect and wire bend-resistant material, such as robot wire material, for movable sections.
 - For e-CON connector wiring, cut the tip of the sensor lead wire for use. Insert the wire through to the back of the connector, and securely crimp with pliers, etc. The wire sheath does not need to be removed.
 - As the analog voltage output lead wire sheath color varies depending on the sensor, check the sensor specifications before e-CON wiring. Check that the pin No. and sensor wiring are correct before crimping. Incorrect wiring can result in malfunction, breakdown, or damage to the sensor or to this product.



For precautions during mounting, installation, adjustment, use and maintenance, refer to the CKD Components Product Site (<https://www.ckd.co.jp/kiki/en/>) → "Model No. → Instruction Manual"

MEMO

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