Capacitance electromagnetic flow sensor

WFC Series

Type with IO-Link and fluid temperature measurement function

● Flow rate range: 0.5 to 15/2.0 to 60 L/min

Specifications

Port size			Rc3/8, G3/8, 3/8NPT	Rc1/2, G1/2, 1/2NPT	Rc3/4, G3/4, 3/4NPT
Applicable fluid			Fluids (conductive fluids) that do not corrode water/wetted part materials		
Available fluid conductivity			5 μS/cm or more		
Detection			Capacitance		
Rated flow range			0.5 to 15 ℓ/min	2.0 to 60 ℓ/min	
Low flow cut flow rate *1			Measured range max. flow rate of 3%		
Working fluid temperature *8			0 to 85°C (no freezing)		
Unit indicated			Instantaneous flow rate L/min Accumulated flow L, kL, ML Fluid temperature °C		
Flow rate	Repeatability *2		±2.0% F.S.		
	Ambient temperature characteristics *2		±5.0% F.S (base temperature 25 °C)		
	Fluid temperature characteristics *2		±5.0% F.S (base temperature 25 °C)		
Fluid temperature	Measurement range		0 to 85 °C (operational range is -10 to 110 °C)		
	Measurement accuracy		±2 °C (less than 50 °C) *The difference between the fluid temperature and the ambient temperature is within ±5 °C ±5 °C (50 °C and over) *The difference between the fluid temperature and the ambient temperature is within -35 °C		
Working pressure (according to the fluid temperature conditions) *8			0 to 1.0MPa (0 to 85°C), 0 to 2.0MPa (0 to 50°C)		
Proof pressure			3.0 MPa		
Response time *3			0.1 s/0.25 s/0.5 s/1 s/2 s/5 s (default 1 s)		
Accumulated flow range			0.0 to 99999999.9L		
			0.1 L increments		
Pressure loss *9			0.02 MPa or less (at max. rated flow)		
Switch output			NPN or PNP MOS-FET output (switchable with settings)		
	Max. load current		50mA		
	Max. applied voltage		30 VDC		
	Internal voltage drop		NPN: 2.0 V or less PNP: 2.4V or less		
	Output protection		Overcurrent abnormal alarm, overcurrent protection		
	Output mode		Select from hysteresis mode, window comparator mode, integrated output mode, integrated pulse output mode, and Select from alarm output mode and frequency pulse output mode		
Analog output		Voltage output	Voltage output: 1 to 5 V load impedance: 50 kΩ or more		
		Current output	Current output: 4 to 20 mA Load impedance: 500 Ω or less		
Switch input		Input time	20 ms or more		
		Short-circuit current	Approx. 2 mA		
Display			2-screen display (main screen: green/red 2-color display, sub-screen: white) Screen flip possible Instantaneous flow rate: 3 digits Liquid temperature: 2 digits Integrating flow: 4 digits Screen refresh cycle 5 times/sec		
Power supply voltage			When setting switch output: 24 VDC ±10% (ripple P-P ±10% or less)		
			When setting IO-Link: 20 to 30 VDC (ripple P-P ±10% or less)		
Current consumption			65 mA or less (with 24 VDC, 25 °C)		
Environmental resistance	Degree of protection		IP65 equiv. *5		
	Operating ambient temperature range		0 to 50°C (no condensation)		
	Ambient humidity range		35 to 85% RH (no condensation)		
Mounting orientation			Unrestricted in vertical/horizontal direction		
Compliant standards			EC Directives (EMC Directive, RoHS Directive)		
Material of wetted parts			PPS, FKM, CAC804, C6931		
Weight	Body *4		Approx. 460 g	Approx. 490 g	Approx. 520 g
	Cable	Cable	Approx. 170 g		
		L type cable			
		Two-sided connector cable	Approx. 180 g		
		L type two-sided connector cable	Approx. 100 g		
	Bracket		Approx. 30 g		

*1: Flow rate less than the low flow cut flow rate displays 0 ℓ/min.
*2: Characteristics when the response time is 1 s.
*3: The response time to reach 63% of the value in relation to the step input.
*4:When using options, add the weight of optional parts.
*5: Degree of protection is when the cable option is mounted.
*6: Contact CKD when installing in parallel at intervals of less than 50 mm.
*7: Piping port and body metal part are grounded to DC (-)/blue wire. This product cannot be used in (+) ground power supply. Contact CKD if using in (+) ground power supply.
*8: Fluid temperature for 0 to 1.0MPa working pressure. When working pressure is 0 to 2.0 MPa, use with a fluid temperature of 0 to 50 °C. (Refer to the graph on the following page for the usable range.)
*9: JIS B 8570 -1.
*10: Refer to the instruction manual for IO-Link Parameter specifications. IODD files can be downloaded from the CKD website. (https://www.ckd.co.jp/en/)

How to order

WFC - 150 - 10A - CT - C3

- Ⓐ Flow rate range
- Ⓑ Port size
- Ⓒ IO-Link/fluid temperature measurement
- Ⓓ Option (attachment)

Code	Description
Ⓐ Flow rate range	
150	0.5 to 15 L/min
600	2.0 to 60 L/min

Ⓑ Port size

	Flow rate range	150	600
10*	3/8	●	
15*	1/2		●
20*	3/4		●

*** Thread**	
A	Rc thread
G	G thread
N	NPT thread

Ⓒ IO-Link/fluid temperature measurement *1	
C	IO-Link compatible
CT	With IO-Link compatible, fluid temperature measurement function
T	With fluid temperature measuring function

Ⓓ Option (attachment) *2	
Blank	None
C3	Cable (M12/4-conductor/3 m) included
L3	L type cable (M12/4-conductor/3 m) included
B3	Two-sided connector cable (M12/4-conductor/3 m) included
G3	L type two-sided connector cable (M12/4-conductor/3 m) included
B	Bracket included

*1: Configuration to analog output/switch output is also possible. For details, refer to page 1580.

*2: Codes of attachments are not indicated in the product body model No. display section. For example, in the case of WFC-150-10A-CT-C3B
Product body (display): “WFC-150-10A-CT”
Cable (packaging display): “WFC-C3”
Bracket (packaging display): “WFC-B”
Of these three sets, "WFC-150-10A-CT-C3B" is displayed on the bag or box containing the entire package.

[Example of model No.]

WFC-150-10A-CT-C3B

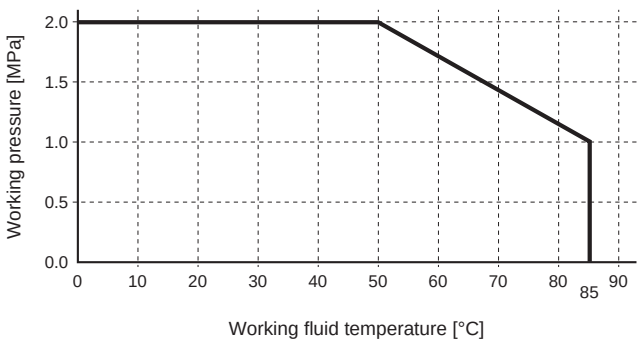
- Ⓐ Flow rate range : 0.5 to 15 L/min
- Ⓑ Port size : Rc3/8
- Ⓒ IO-Link/fluid temperature measurement : With IO-Link compatible, fluid temperature measurement function
- Ⓓ Option : Cable, bracket included

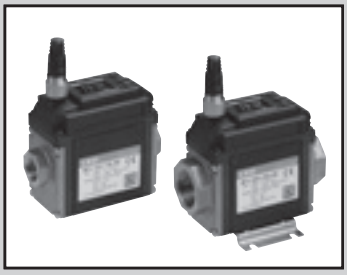
● Discrete option (cable, bracket) model No.

WFC - C3

Ⓓ Option

Operating ambient temperature range





Capacitance electromagnetic flow sensor

WFC Series

Standard

● Flow rate range: 0.5 to 15/2.0 to 60 L/min

Specifications

Port size			Rc3/8, G3/8, 3/8NPT	Rc1/2, G1/2, 1/2NPT	Rc3/4, G3/4, 3/4NPT
Applicable fluid			Fluids (conductive fluids) that do not corrode water/wetted part materials		
Available fluid conductivity			5 μS/cm or more		
Detection			Capacitance		
Rated flow range			0.5 to 15 ℓ/min	2.0 to 60 ℓ/min	
Low flow cut flow rate		*1	Measured range max. flow rate of 3%		
Working fluid temperature		*8	0 to 85°C (no freezing)		
Unit indicated			Instantaneous flow rate ℓ/min Accumulated flow L, kL, ML		
Repeatability		*2	±2.0% F.S.		
Temperature characteristics	Ambient temperature characteristics *2		±5.0%F.S (base temperature 25°C)		
	Liquid temperature characteristics *2		±5.0%F.S (base temperature 25°C)		
Working pressure (according to the fluid temperature conditions)		*8	0 to 1.0MPa (0 to 85°C), 0 to 2.0MPa (0 to 50°C)		
Proof pressure			3.0 MPa		
Response time		*3	0.25 s/0.5 s/1 s/2 s/5 s (default 1 s)		
Accumulated flow range			0.0 to 99999999.9L		
			0.1 L increments		
Pressure loss		*9	0.02 MPa or less (at max. rated flow)		
Switch output			NPN or PNP transistor output		
	Max. load current		50mA		
	Max. applied voltage		30 VDC		
	Internal voltage drop		NPN: 2.0 V or less PNP: 2.4V or less		
	Output protection		Overcurrent abnormal alarm, overcurrent protection		
	Output mode		Select from hysteresis mode, window comparator mode, integrated output mode, integrated pulse output mode, and alarm output mode.		
Analog output	Voltage output		Voltage output: 1 to 5 V load impedance: 50 kΩ or more		
	Current output		Current output: 4 to 20 mA Load impedance: 500 Ω or less		
Switch input	Input time		20 ms or more		
	Short-circuit current		Approx. 2 mA		
Display			2-screen display (main screen: green/red 2-color display, sub-screen: white) Screen flip possible Instantaneous flow rate: 3 digits Integrating flow: 4 digits Screen refresh cycle 5 times/sec		
Power supply voltage			24 VDC ±10% (ripple P-P ±10% or less)		
Current consumption			65 mA or less		
Environmental resistance	Degree of protection		IP65 equiv. *5		
	Operating ambient temperature range		0 to 50°C (no condensation)		
	Ambient humidity range		35 to 85% RH (no condensation)		
Mounting orientation			Unrestricted in vertical/horizontal direction		
Compliant standards			EC Directives (EMC Directive, RoHS Directive)		
Material of wetted parts			PPS, FKM, CAC804, C6931		
Weight	Body	*4	Approx. 460 g	Approx. 490 g	Approx. 520 g
	Cable	Cable	Approx. 170 g		
		L type cable			
	Bracket		Approx. 30 g		

*1: Flow rate less than the low flow cut flow rate displays 0 ℓ/min.
*2: Characteristics when the response time is 1 s.
*3: The response time to reach 63% of the value in relation to the step input.
*4: When using options, add the weight of optional parts.
*5: Degree of protection is when the cable option is mounted.
*6: Contact CKD when installing in parallel at intervals of less than 50 mm.
*7: Piping port and body metal part are grounded to DC (-)/blue wire. This product cannot be used in (+) ground power supply. Contact CKD if using in (+) ground power supply.
*8: Fluid temperature for 0 to 1.0MPa working pressure. When working pressure is 0 to 2.0 MPa, use with a fluid temperature of 0 to 50 °C. (Refer to the graph on the following page for the usable range.)
*9: JIS B 8570 -1.

How to order

WFC - 150 - 10A - N V - C3

- Ⓐ Flow rate range
- Ⓑ Port size
- Ⓒ Switch output
- Ⓓ Analog output
- Ⓔ Option (attachment)

Code	Description
Ⓐ Flow rate range	
150	0.5 to 15 L/min
600	2.0 to 60 L/min

Ⓑ Port size

	Flow rate range	150	600
10*	3/8	●	
15*	1/2		●
20*	3/4		●

*** Thread**	
A	Rc thread
G	G thread
N	NPT thread

Ⓒ Switch output	
N	NPN transistor output
P	PNP transistor output

Ⓓ Analog output	
V	Voltage output (1 to 5 V)
A	Current output (4 to 20 mA)

Ⓔ Option (attachment)	
Blank	None
C3	Cable (M12/4-conductor/3 m) included
L3	L type cable (M12/4-conductor/3 m) included
B	Bracket included

(Note) Codes of attachments are not indicated in the product body model No. display section. For example, in the case of WFC-150-10A-NV-C3B
Product body (display): "WFC-150-10A-NV"
Cable (packaging display): "WFC-C3"
Bracket (packaging display): "WFC-B"
Of these three sets, "WFC-150-10A-NV-C3B" is displayed on the bag or box containing the entire package.

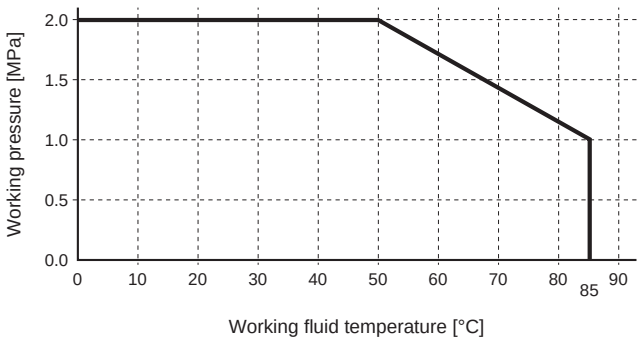
[Example of model No.]
WFC-150-10A-NV-C3B
Ⓐ Flow rate range : 0.5 to 15 L/min
Ⓑ Port size : Rc3/8
Ⓒ Switch output : NPN transistor output
Ⓓ Analog output : Voltage output (1 to 5 V)
Ⓔ Option : Cable, bracket included

● Discrete option (cable, bracket) model No.

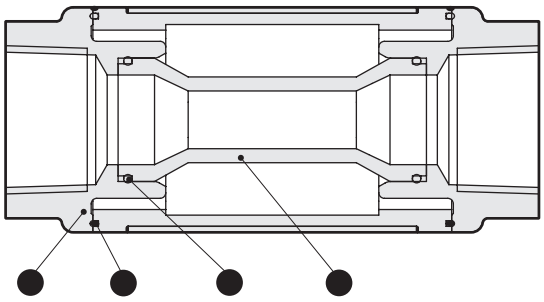
WFC - C3

Ⓔ Option

Operating ambient temperature range



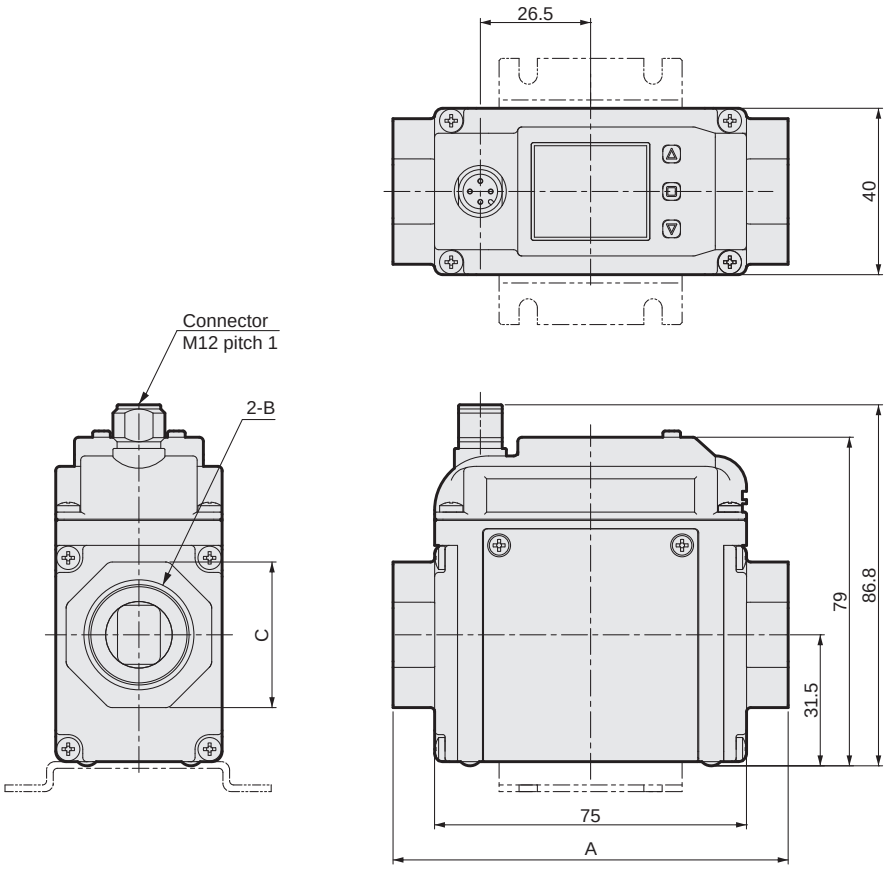
Internal structure diagram and parts list



* Shows the internal structure when the display screen is in front.

No.	Part name	Material		Quantity
1	Socket	CAC804 or C6931	Brass	2
2	Packing	FKM	Fluoro rubber	2
3	O-ring	FKM	Fluoro rubber	2
4	Measuring tube	PPS resin		1

Dimensions

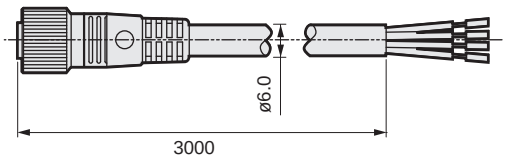


WFC-150-10A	90	Rc3/8	24
WFC-150-10G		G3/8	
WFC-150-10N		3/8NPT	
WFC-600-15A	95	Rc1/2	28
WFC-600-15G		G1/2	
WFC-600-15N		1/2NPT	
WFC-600-20A		Rc3/4	35
WFC-600-20G		G3/4	
WFC-600-20N		3/4NPT	

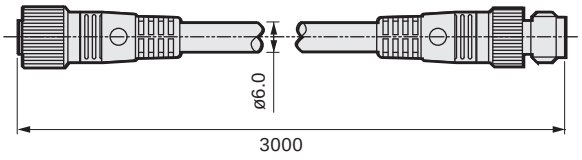
Optional dimensions

● Cable option

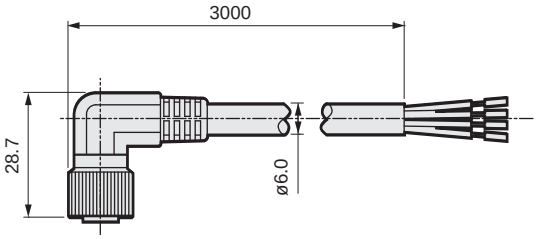
Discrete option model No: **WFC-C3**



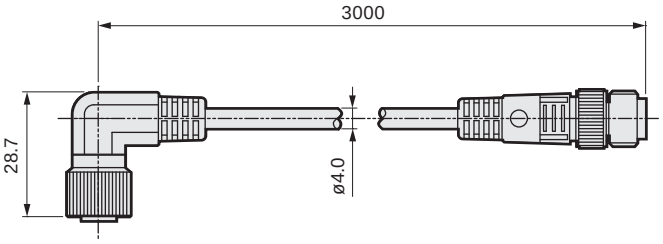
Discrete option model No: **WFC-B3**



Discrete option model No: **WFC-L3**



Discrete option model No: **WFC-G3**



● Bracket option

Discrete option model No: **WFC-B**