

Flow sensor for water WFK3000 Series

FLOW SENSOR FOR WATER WFK3000 SERIES



Increased flow rate and functions all in the same size

New compact, lightweight medium flow (4 to 32 L/min) sensor for the WFK3000 Series water flow sensor is ideal for device assembly. Optional water temperature measurement is also available.



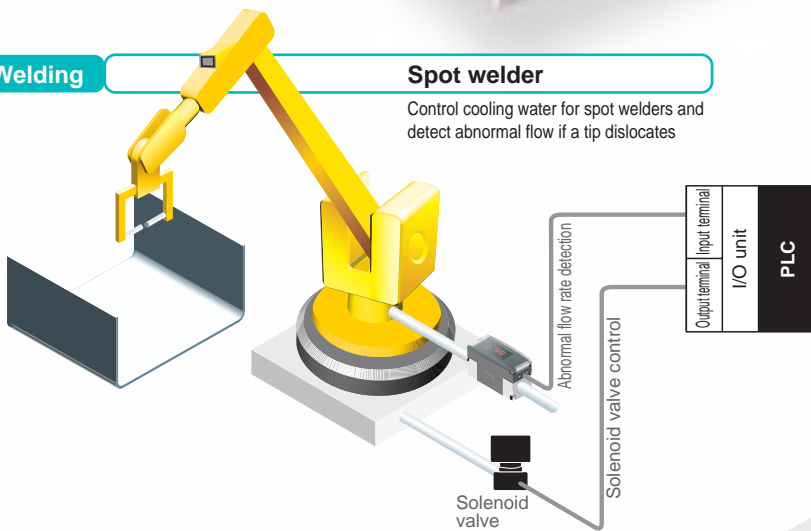
Examples of major control applications

- Cooling water for laser oscillators
- Flow rate in temperature controller
- Cooling water for dry vacuum pump
- Flow rate and temperature for mold cooling water

Welding

Spot welder

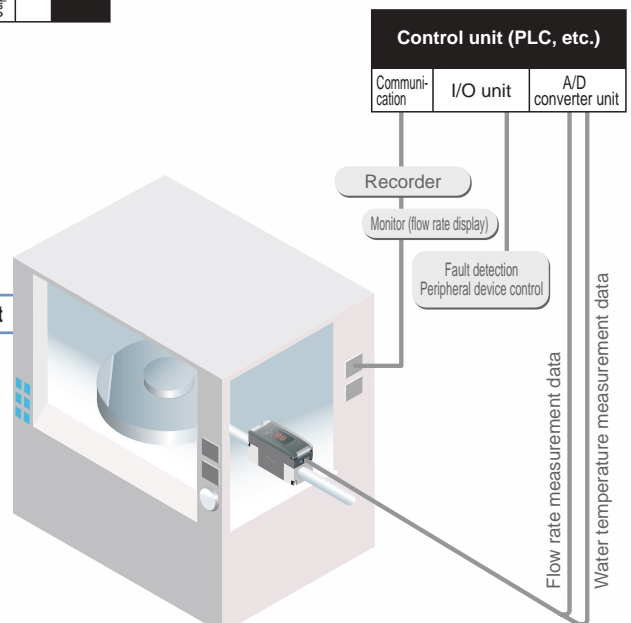
Control cooling water for spot welders and detect abnormal flow if a tip dislocates



Semiconductor

Control of cooling and temperature for semiconductor manufacturing equipment

Etching, grinder, dicer, CVD



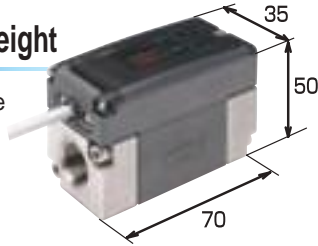
Highly reliable sensor using Karman's vortex

WFK3000 Series

Flow sensor for water

Compact and lightweight

Compact L70 x W35 x H50 size weighs just 380 g. Ideal size for incorporating into devices.

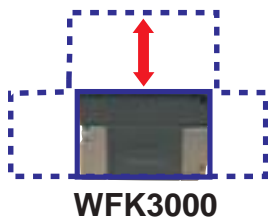


Built-in water temperature measurement

Water temperature measurement can be incorporated into the sensor. Water temperature is easily measured without preparing extra devices or ensuring space -- optional.

Medium flow rate even with the same size

Medium flow rate -- 4 to 32 L/min -- uses the same size. Space saving is equivalent to one-third of the conventional model.



CKD comparison: 1/3
32 L/min type

Protective structure equivalent to IP65

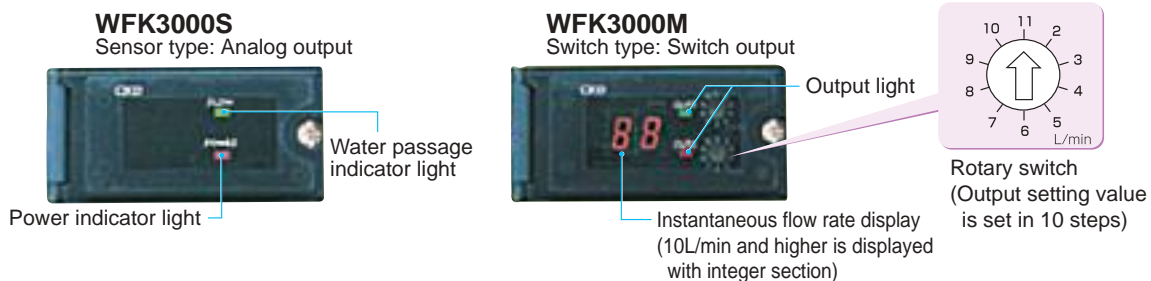
This sensor can be safely installed even where waterproofing is required, such as in food equipment.

Highly reliable Karman's vortex

Karman's vortex has no moving parts, unlike impellers, eliminating problems with dirt and rust in pipes. This sensor can be used safely even with poor water quality, such as industrial water.

Simple operation

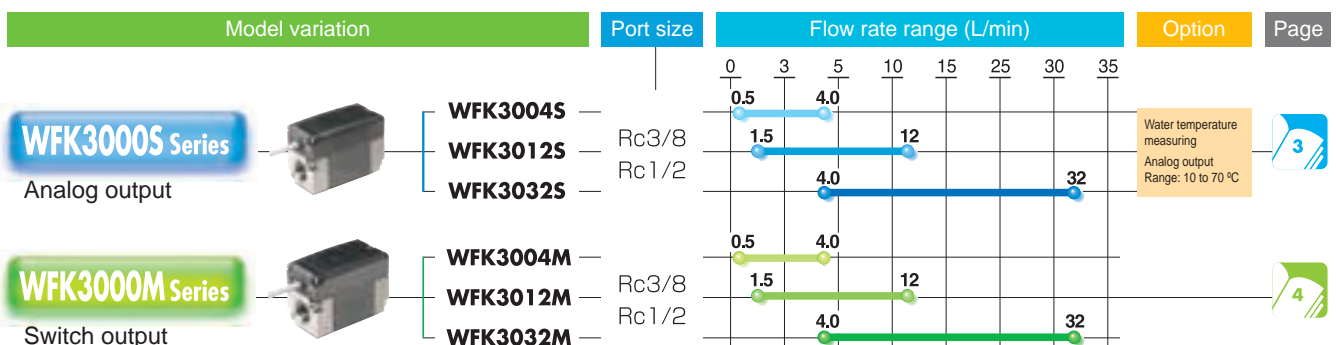
The sensor needs only to be wired for immediate use. Installation of the switch is completed by turning the rotary switch.



Many model variations

A model suitable for your application is available from two output types -- analog and switch -- and three flow rate -- 0.3 to 4.0 L/min, 1.5 to 12 L/min, and 4.0 to 32 L/min.

Diverse range of variations for the 3000 Series



Refer to safety precautions on "Pneumatic, Vacuum and Auxiliary Components" catalog (No. CB-024SA).



Flow sensor for water

WFK3000S Series

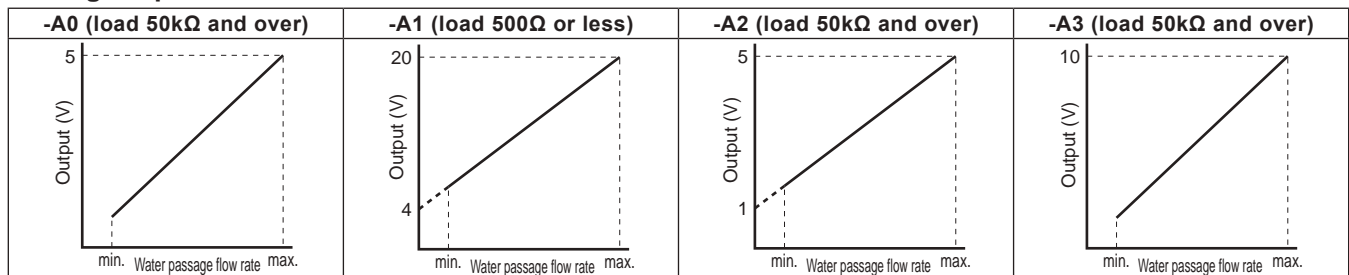
(Compact, device built-in sensor type)

Specifications

Model no.	WFK3004S-10	WFK3004S-15	WFK3012S-10	WFK3012S-15	WFK3032S-10	WFK3032S-15
Descriptions						
Flow rate range	0.5 to 4.0 L/min.		1.5 to 12 L/min.		4.0 to 32 L/min.	
Port size	Rc3/8	Rc1/2	Rc3/8	Rc1/2	Rc3/8	Rc1/2
Connection section material	Stainless steel: SCS13					
Working conditions	Working fluid					
	Clean water and industrial water					
	Max. working pressure					
	1.0MPa					
Withstanding pressure						
1.5MPa						
Ambient temperature						
0 to 50°C (85%RH or less)						
Fluid temperature						
1 to 70°C						
Precision	±2.5%F.S.					
Temperature characteristics	±5%F.S. (10 to 50°C, 20°C reference)					
Pressure loss	0.06MPa (at 4.0L/min.)		0.05MPa (at 12L/min.)		0.06MPa (at 32L/min.)	
Response time	1 sec. (Note)					
Output	Indicator					
	None					
Analog output						
Standard: 0 to 5 VDC / Option: 4 to 20 mA DC, 1 to 5 or 0 to 10 VDC						
Supply voltage	12 to 24 VDC ±10% (Max. 80mA) 15 to 24 VDC for option A3					
Cable	3m, 4-conductor, finish size 4.8mm, conductor 0.2mm ² , isolator O.D. 1.3mm					
Installation	Installation attitude					
	Horizontal or vertical					
	Strait piping section					
None						
Protective structure						
IP65 or equivalent (excluding optional water temperature measuring)						
Weight	380g	410g	380g	410g	380g	410g

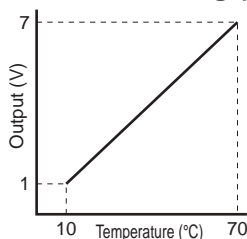
Note: Time to reach 70% of the original output when flow rate is instantly set to zero from the normal (usage) flow rate.

Analog output

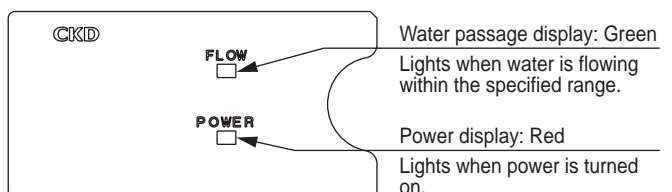


* min. refers to the minimum flow rate range and max. to the maximum flow rate range.

Water temperature measuring (option)



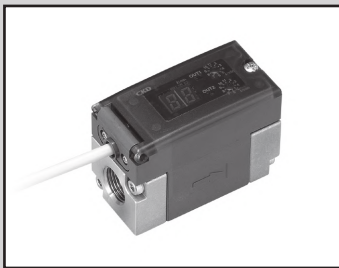
Functional explanation



Descriptions	Descriptions	
Specifications	Measured temperature range	10 to 70°C
	Port size	Rc3/8 (Note 1)
Output	Temperature output (analog)	1-7VDC (linear output)
	Precision	±2°C (less than 50°C) ±3°C (50°C and over) (Note2)

Note 1: Only the Rc3/8 port size is selectable.

Note 2: The difference between fluid and ambient temperature is within ±10°C. Note that if the fluid temperature is 50°C or more, the difference is within -20°C.



Flow sensor for water

WFK3000M Series

(Compact, device built-in switch type)

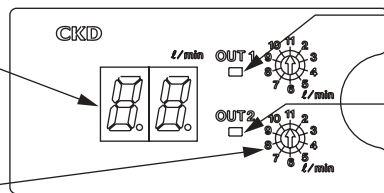
Specifications

Model no.	WFK3004M-10	WFK3004M-15	WFK3012M-10	WFK3012M-15	WFK3032M-10	WFK3032M-15
Descriptions						
Flow rate range	0.5 to 4.0 L/min.		1.5 to 12 L/min.		4.0 to 32 L/min.	
Port size	Rc3/8	Rc1/2	Rc3/8	Rc1/2	Rc3/8	Rc1/2
Connection section material	Stainless steel: SCS13					
Working conditions	Working fluid	Clean water and industrial water				
	Max. working pressure	1.0MPa				
	Withstanding pressure	1.5MPa				
	Ambient temperature	0 to 50°C (85%RH or less)				
	Fluid temperature	1 to 70°C				
Precision	±2.5% F.S. ±1 digit (1 digit = 0.1L/min. (less than 10L/min.), 1L/min (10L/min. or more))					
Temperature characteristics	±5%F.S. (10 to 50°C, 20°C reference)					
Pressure loss	0.06MPa (at 4.0L/min.)		0.05MPa (at 12L/min.)		0.06MPa (at 32L/min.)	
Response time	1 sec. (Note)					
Output	Indicator	Instantaneous flow 2 digit LED display				
	Switch output	Point	2 points transistor output (selection NPN/PNP)			
		Rated	MAX. DC50mA			
		Internal voltage drop	2.0V or less			
Supply voltage	12 to 24 VDC ±10% (Max. 80mA)					
Cable	3m, 4-conductor, finish size 4.8mm, conductor 0.2mm ² , isolator O.D. 1.3mm					
Installation	Installation attitude	Horizontal or vertical				
	Strait piping section	None				
	Protective structure	IP65 or equivalent				
Weight	380g	410g	380g	410g	380g	410g

Note: When switch output is set to normal flow rate 70%, the time for switch output to be output when the flow rate is instantly set to zero.

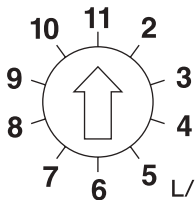
Functional explanation

- 2 digit digital display
Instantaneous flow is displayed.
* Less than 10L/min.: Decimal display
10L/min. or more: Integer display



- Rotary switch for output

- Output light: Green (OUT1)
Lights when switch output is turned on.
- Output light: Red (OUT2)
Lights when switch output is turned on.
- *OUT1: Lead wire (black)
OUT2: Corresponds to lead wire (orange)



Switch output is set in 10 steps.

(The drawing shows the WFK3012M.)

* Switch output is set with the rotary switch on the top of the sensor.

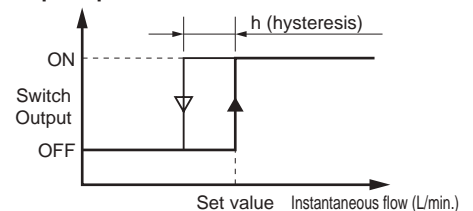
* Set the rotary switch with a precision driver, etc.
Do not apply excessive force to the rotating section or the contact could fail.

* Flow rate settings are shown below.

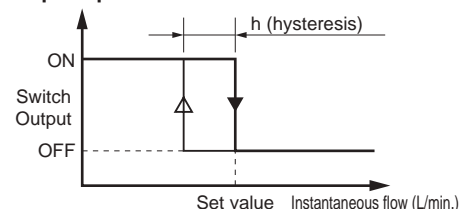
Model	WFK3004M	WFK3012M	WFK3032M
Switch output setting value (L/min.)	0.6	2.0	5.0
	0.7	3.0	9.0
	0.8	4.0	12
	0.9	5.0	14
	1.0	6.0	16
	1.5	7.0	18
	2.0	8.0	21
	2.5	9.0	24
	3.0	10	27
	3.5	11	30
Hysteresis	0.1	0.5	1.0

Switch output operation

<Output option: N0/P0>



<Output option: N1/P1>



WFK3000 Series

How to order

● Sensor type

WFK **3** **012** S - **10** - **A0** **T** **B**

<Example of model number>

WFK3004S-10-A0

- Ⓐ Shape : Compact device build-in
- Ⓑ Flow rate range : 0.5 to 4L/min.
- Ⓒ Port size : Rc3/8
- Ⓓ Analog output : 0 to 5 VDC
- Ⓔ Water temperature measuring : None
- Ⓕ Bracket : None

● Switch type

WFK **3** **012** M - **10** - **N0** **B**

<Example of model number>

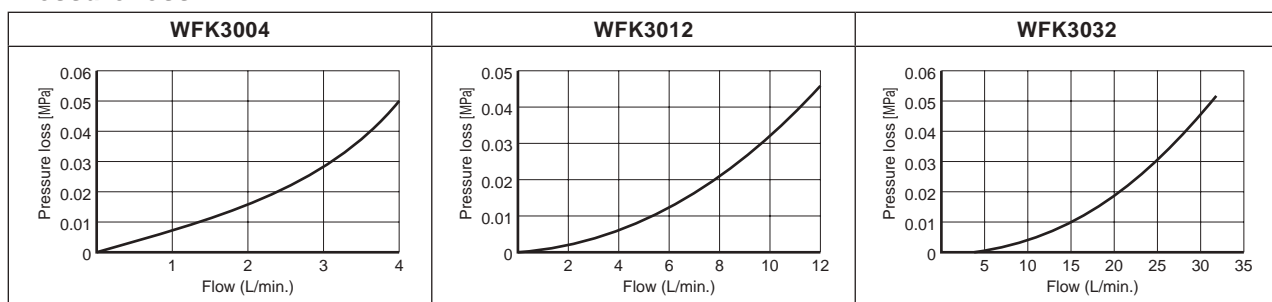
WFK3012M-15-N1B

- Ⓐ Shape : Compact device build-in
- Ⓑ Flow rate range : 1.5 to 12 L/min.
- Ⓒ Port size : Rc1/2
- Ⓓ Switch output : NPN 2 points (b contact)
- Ⓕ Bracket : Attached

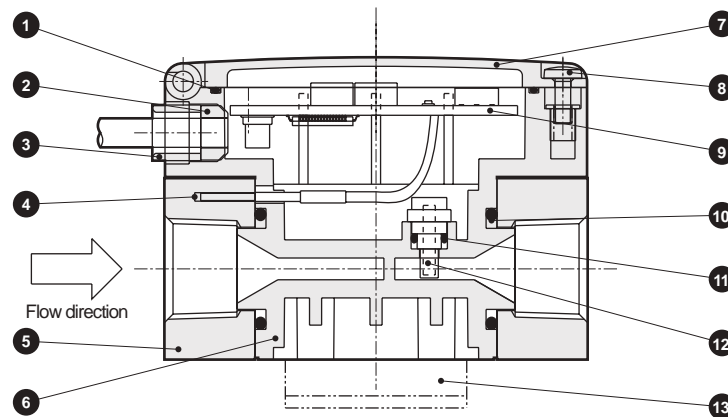
Symbol	Descriptions
Ⓐ Shape	
3	Compact device build-in
Ⓑ Flow rate range	
004	0.5 to 4.0 L/min.
012	1.5 to 12 L/min.
032	4.0 to 32 L/min.
Ⓒ Port size	
10	Rc3/8
15	Rc1/2 (Not available when "T" water temperature measuring is used.)
Ⓓ Analog output	
A0	0 to 5 VDC
A1	4 to 20 mA DC (Not available when "T" water temperature measuring is used.)
A2	1 to 5 VDC
A3	0 to 10 VDC
Ⓔ Water temperature measuring	
Blank	None
T	With water temperature measuring
Ⓕ Bracket	
Blank	None
B	Bracket attached

Symbol	Descriptions
Ⓐ Shape	
3	Compact device build-in
Ⓑ Flow rate range	
004	0.5 to 4.0 L/min.
012	1.5 to 12 L/min.
032	4.0 to 32 L/min.
Ⓒ Port size	
10	Rc3/8
15	Rc1/2
Ⓓ Switch output type	
N0	NPN transistor output 2 points (a contact)
N1	NPN transistor output 2 points (b contact)
P0	PNP transistor output 2 points (a contact)
P1	PNP transistor output 2 points (b contact)
Ⓕ Bracket	
Blank	None
B	Bracket attached

Pressure loss



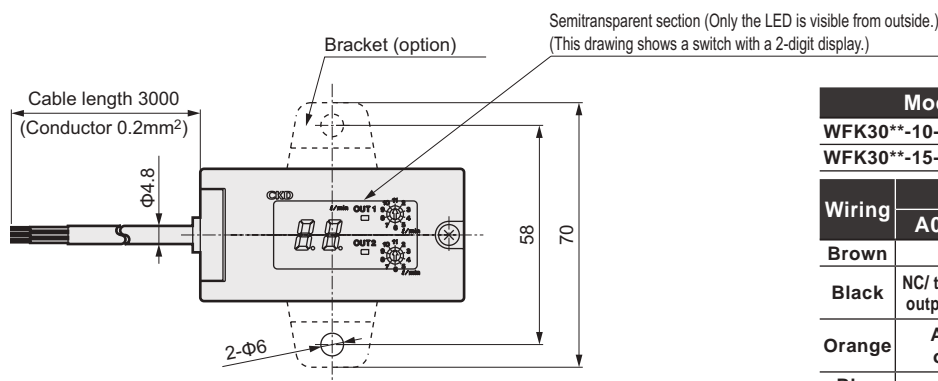
Internal structure drawing and parts list



No.	Parts name	Material	Quantity	No.	Parts name	Material	Quantity
1	Guard packing	NBR : Nitrile rubber	1	8	Screw for guard		1
2	Cable packing	NBR : Nitrile rubber	1	9	Electric component section		1
3	Cable gland	PPS resin GF40%	1	10	O ring	NBR : Nitrile rubber	2
4	Temperature measurement sensor (option)	Thermistor	(1)	11	O ring	NBR : Nitrile rubber	1
5	Attachment	SCS13 : Stainless steel casting	2	12	Karman's vortex detection sensor	PPS resin (internal: piezo-electric ceramic)	1
6	Body	PPS resin GF40%	1	13	Bracket (option)	SPCC	(1)
7	Guard	PC resin	1				

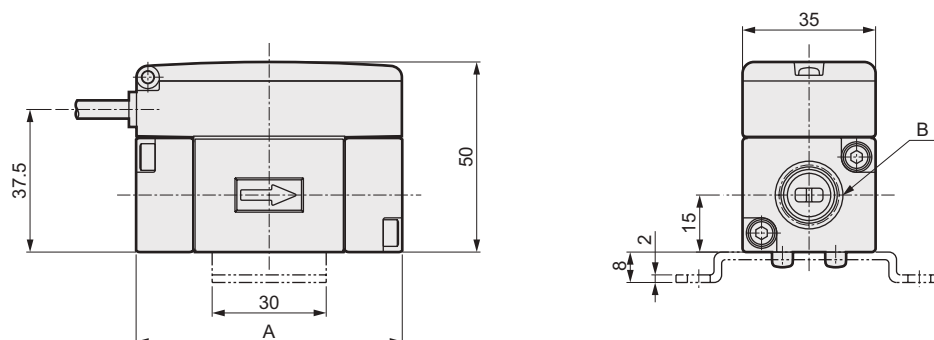
* The wetted parts are (5), (6), (10), (11) and (12).

Dimensions



Model no.	A	B
WFK30**-10-**-**	70	Rc3/8
WFK30**-15-**-**	80	Rc1/2



Wiring	Option		
	A0,A2,A3	A1	N0,N1,P0,P1
Brown	Power supply DC +		
Black	NC/ temperature output (Option)	Output-	Switch output (OUT1)
Orange	Analog output	Output+	Switch output (OUT2)
Blue	GND		



Related products

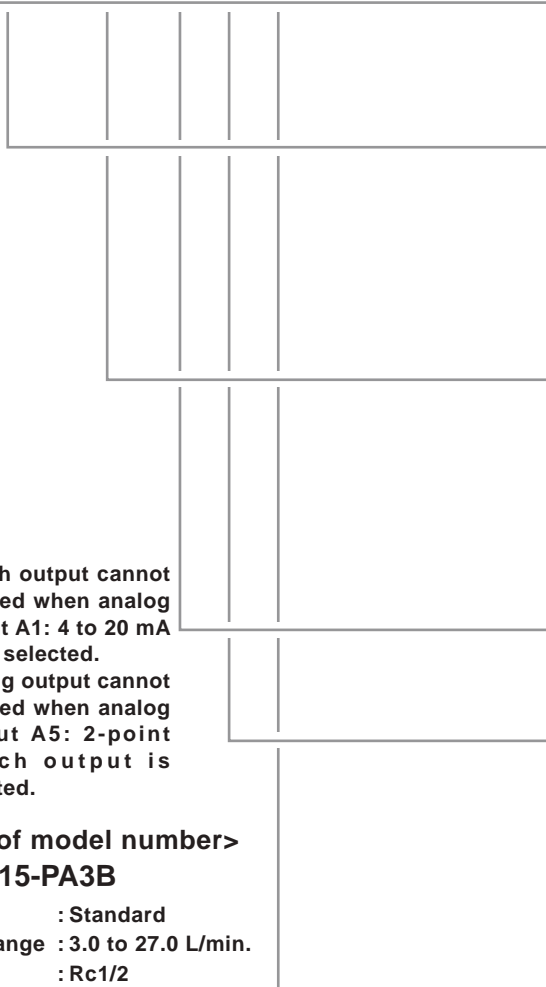
Karman's vortex type flow sensor for water WFK5000, 6000, 7000 Series

Catalog No. CC-519A

WFK series Flow variation	Model	Port size	Flow rate range (L/min.)													
			1	2	3	4	5	10	20	30	40	50	100	150	200	
	WFK5008 WFK6008	Rc3/8	1.0 to 8.0													
	WFK5027 WFK6027	Rc1/2 Rc3/4	3.0 to 27.0													
	WFK7050	Rc3/4 Rc1					10 to 50									
	WFK7100	Rc1 Rc1 1/4					20 to 100									
	WFK7200	Rc1 1/4 Rc1 1/2									40 to 200					

How to order

WFK **5** **027** - **15** - **P** **A3** **B**



Note 1: Switch output cannot be used when analog output A1: 4 to 20 mA DC is selected.

Note 2: Analog output cannot be used when analog output A5: 2-point switch output is selected.

<Example of model number>

WFK5027-15-PA3B

- A**Shape : Standard
- B**Flow rate range : 3.0 to 27.0 L/min.
- C**Port size : Rc1/2
- D**Switch output type : PNP
- E**Analog output : 0 to 10 VDC
- F**Bracket : Attached

Symbol	Descriptions						
A Shape							
5	Standard						
6	Modular design						
7	Large flow rate						
B Flow rate range							
Shape		5	6	7			
008	1.0 to 8.0 L/min.	●	●				
027	3.0 to 27.0 L/min.	●	●				
050	10 to 50 L/min.			●			
100	20 to 100 L/min.				●		
200	40 to 200 L/min.					●	
C Port size							
10	Rc3/8	●	●				
15	Rc1/2	●	●				
20	Rc3/4	●	●	●			
25	Rc1			●	●		
32	Rc1 1/4				●	●	
40	Rc1 1/2					●	
D Switch output type							
Blank	NPN transistor output						
P	PNP transistor output						
E Analog output							
Blank	0 to 5 VDC						
A1	4 to 20 mA DC (Note 1)						
A2	1 to 5 VDC						
A3	0 to 10 VDC						
A4	Without analog output						
A5	Switch output 2 points (Note 2)						
F Bracket							
Blank	None						
B	Bracket attached						

If the goods and their replicas, or the technology and software in this catalog are to be exported, laws require the exporter to make sure they will never be used for the development or the manufacture of weapons for mass destruction.

CKD Corporation

<Website>
<http://www.ckd.co.jp/>

Overseas Sales dept. 2-250 Uji Komaki, Aichi 485-8551, Japan

TEL(0568)74-1338 FAX(0568)77-3461