CKD

Various water control components fitted into a space-saving structure

Integrated Unit for Water Control WXU Series

CKD Corporation

CC-1116AA 6

Water Manifold Unit **WXU Series**

Next-gen water control
Various water control components fitted into a space-saving structure

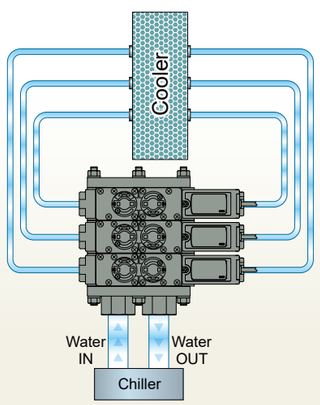
No piping! Footprint is 80% reduced Compact

- No more individual piping work
- Reduces pipe leakage
- Reduces design and arrangement work

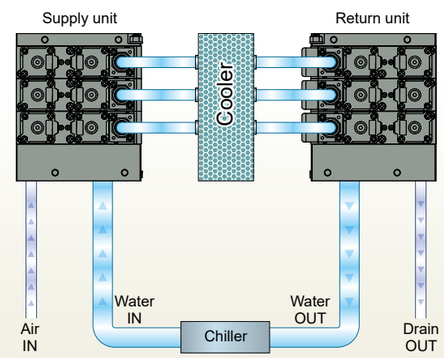
System image

The fluid is branched into individual pipes in the unit.

One-fluid control



Two-fluid control



WXU-H — One-fluid control

- A single unit serves as supply and return for the cooling piping.
- Valves can be mounted individually on the supply side and return side.
- Cock valve that opens and closes with a single operation allows easy visual inspections.
- Built-in structure and light valve housing make handling easier.

WXU-HC — One-fluid control

- A single-fluid cock valve that serves as both supply and return for the cooling piping in the same manner as WXU-H.
- Equipped with a capacitance electromagnetic flow sensor to reduce the risk of detection error due to water quality.

WXU-J — One-fluid control

- A single unit serves as supply and return for the cooling piping.
- Valves and needles mounted on the supply side can be controlled individually (ON/OFF) for each system.
- Mounted needle allows easy adjustment of the flow rate.

WXU-P — Two-fluid control

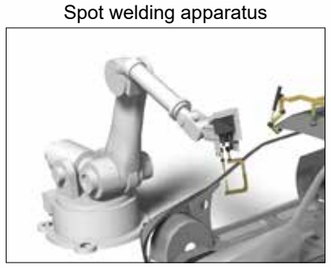
- Separate units for supply and return enable flow of two kinds of fluid (e.g., water and air).
- Suitable for a system with both coolant and air such as sputtering equipment.
- Individual control (water conduction/air purge control) by system is possible.

Application

LCD semiconductor Vacuum deposition apparatus

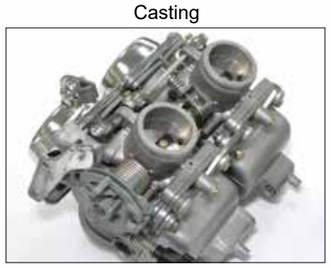
WXU-P/H

Spot welding apparatus



WXU-HC

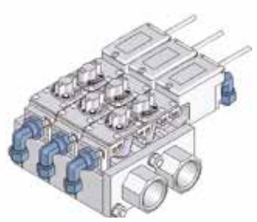
Casting



WXU-P/J/H

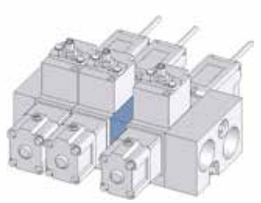
Customization example

Customization is possible according to your specific needs.



With fitting

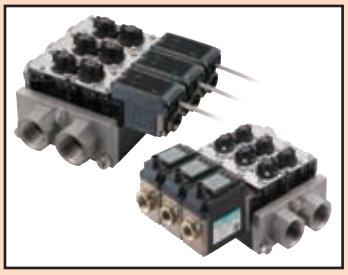
Masking



Intermediate Block

- Separately installed display [Sensor section]
- Analog + SW output [Sensor section]
- Branched (WXU-P)
- Without cylinder valve (WXU-J)

CKD



Integrated unit for water control One-fluid control

WXU-H/HC Series

- Connection Port Size: Rc3/8, Rc1/2, Rc1
- Flow rate range: 0.5 to 32 L/min

RoHS

Model No. Notation Method

● Karman Vortex Flow Sensor

WXU-H - 6 - L - 15 - 12 - A0N0

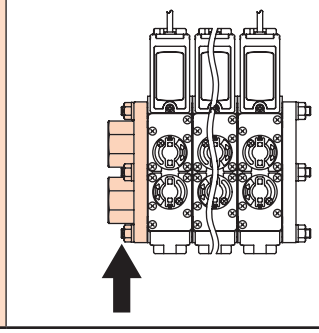
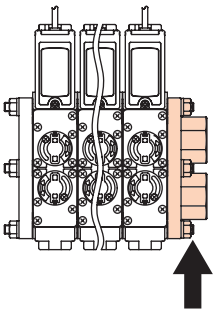
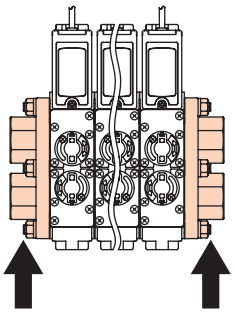
- Model No.
- 1 Station No.
- 2 In-block position
- 3 Port size (branching port)
- 4 Flow rate range for flow sensor
- 5 Flow rate sensor output (1)
- 6 Flow rate sensor output (2)

If all single-station assemblies have the same component configuration, the entire unit can be designated by a model No. through code selection. If combining stations with different component configurations into a single unit, please specify the configuration in the 'Manifold Specification Sheet' (P. 24).

1 Station No.

Code	Content
2	2 stations
to	to
10	10 stations

2 In-block position

Code	L	R	W
Content	Left	Right	Both Sides
Layout			

3 Port size (branching port)

Code	Content
10	Rc3/8
15	Rc1/2

4 Flow rate range for flow sensor

Code	Content
04	0.5 to 4.0 L/min
12	1.5 to 12 L/min
32	4.0 to 32 L/min

5 Flow rate sensor output (1)

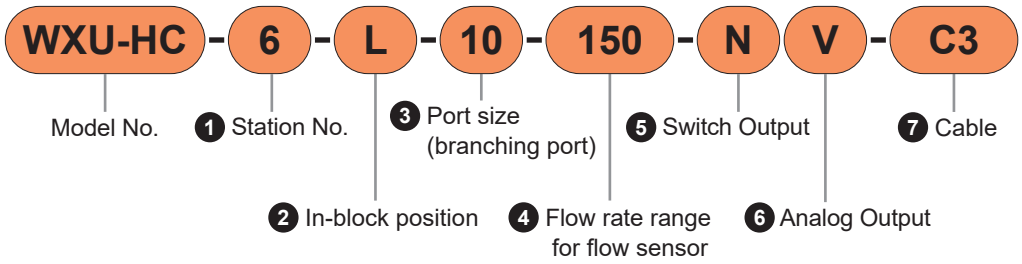
6 Flow rate sensor output (2)

Code	Content	Content				
		Not required	Transistor output 1 point			
			NPN a contact	NPN b contact	PNP a contact	PNP b contact
		Blank	N0	N1	P0	P1
A0	0 to 5 VDC	●	●	●	●	●
A1	4 to 20 mA DC	●	●	●	●	●
A2	1 to 5 VDC	●	●	●	●	●
A3	0 to 10 VDC	●	●	●	●	●
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)	●				

Model No. Notation Method

● Electromagnetic flow sensor

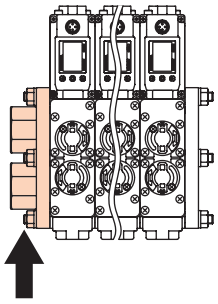
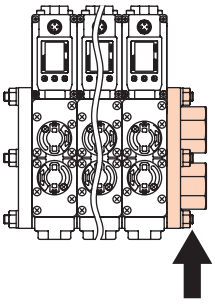
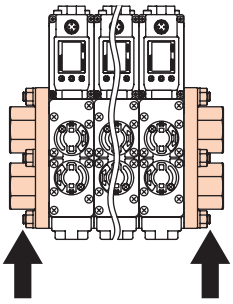
If all single-station assemblies have the same component configuration, the entire unit can be designated by a model No. through code selection. If combining stations with different component configurations into a single unit, please specify the configuration in the 'Manifold Specification Sheet' (P. 25).



1 Station No.

Code	Content
2	2 stations
to	to
10	10 stations

2 In-block position

Code	L	R	W
Content	Left	Right	Both Sides
Layout			

3 Port size (branching port)

Code	Content	4 Flow rate range for flow sensor	
		150	600
10	Rc3/8	●	
15	Rc1/2		●

4 Flow rate range for flow sensor

Code	Content
150	0.5 to 15 L/min
600	2.0 to 60 L/min

5 Switch Output

Code	Content
N	NPN transistor output
P	PNP transistor output

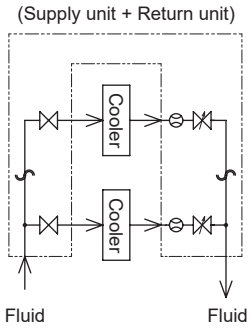
6 Analog Output

Code	Content
V	1 to 5 VDC
A	4 to 20 mA DC

7 Cable

Code	Content	
Blank	None	
C3	Cable (M12/4-conductor/3 m included)	
L3	L-type cable (M12/4-conductor/3 m included)	

[Application examples]



This single unit can manage both the supply and return for cooling piping. Each circuit can be controlled individually.
Note: Adjust the flow rate using the valve on the return side.

Common Specifications

Item		WXU-H/HC
Operating Fluid		Water/hot water
Operating Pressure MPa		0 to 0.7
Proof pressure (water) MPa		1.4
Fluid temperature °C		WXU-H: 1 to 70/WXU-HC: 1 to 85
Ambient Temperature °C		5 to 50
Atmosphere		Place free of corrosive gas and explosive gas
Flow rate adjusting range%		0 to 100 (water) [with closing function]
Station No.		2 to 10 stations
Mounting Orientation		Unrestricted
Sealant		Fluororubber
Connection Port Size	IN/OUT port	Rc1
	Branching ports	Rc3/8 or Rc1/2

Weight

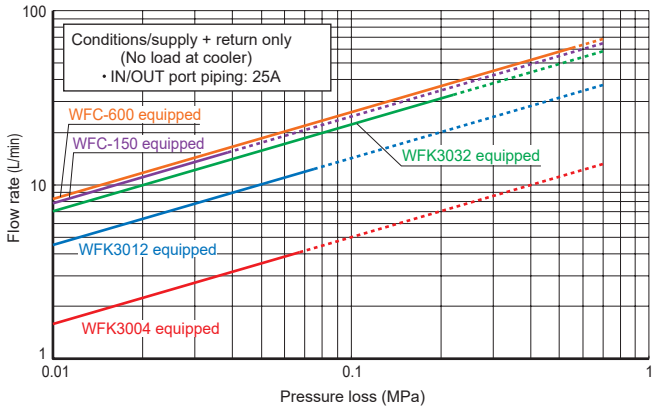
In-block (kg)	0.67
End block (kg)	0.63
One-station assembly (kg)	0.76
One-station assembly (WFC equipped) (kg)	1.00

Flow Characteristics

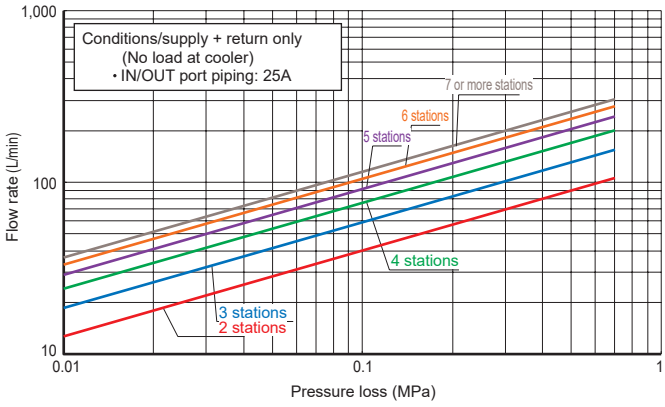
Supply/drain category	Configuration Flow Sensor	Cv	Kv value *1
Supply side (one station)	-	3.00	2.60
Return side (one station)	WFK3004	0.35	0.30
	WFK3012	1.05	0.91
	WFK3032	1.80	1.56
	WFC-150	2.10	1.82
	WFC-600	2.30	2.00

*1: For the Kv value refer to RJ-008AA "Sensors/Controllers".
*2: Make sure to check the flow rate of onestation (each system) and overall unit. (Refer to "Reading the Flow Properties Table" on page 28)

● One station

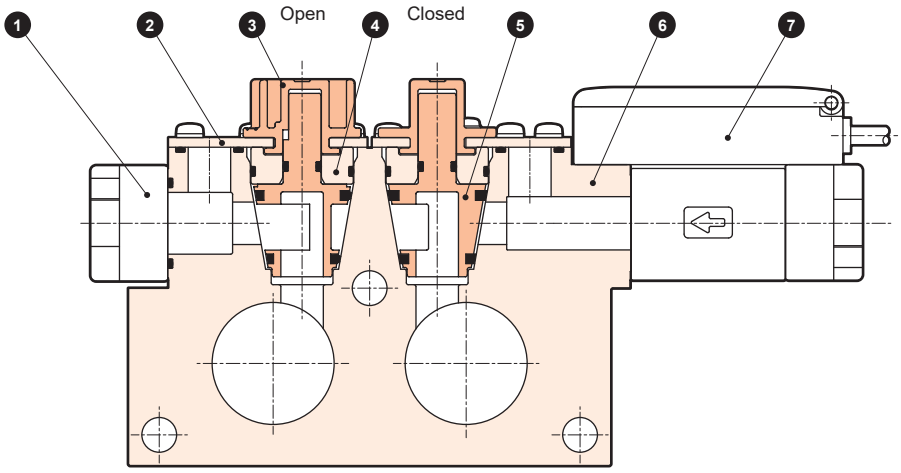


● Overall unit



Internal Structure Diagram/Materials

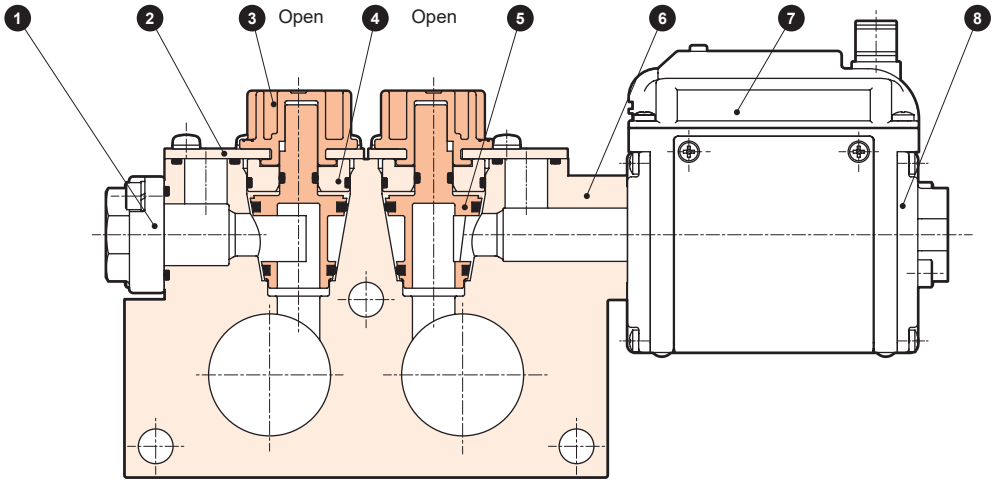
● Karman Vortex Flow Sensor WXU-H



[Valve is fully opened at shipment.]

Part No.	Part Name	Material	
1	Attachment	SCS13	Stainless steel casting
2	Plate	SUS304	Stainless Steel
3	Knob	PBT	Polybutylene terephthalate
4	Spacer	PPS	Polyphenylene sulfide
5	Cock	PPS FKM	Polyphenylene sulfide Fluororubber
6	Base	PPS	Polyphenylene sulfide
7	Flow rate sensor [WFK3000 Series]		

● Electromagnetic flow sensor WXU-HC

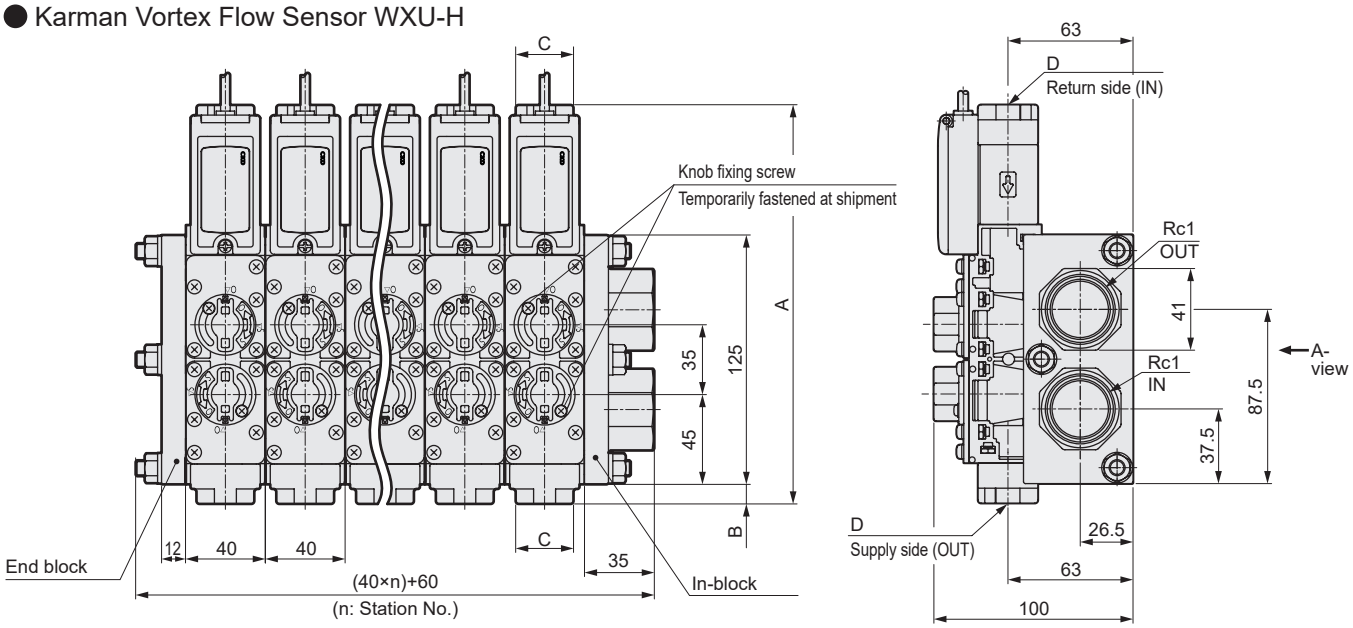


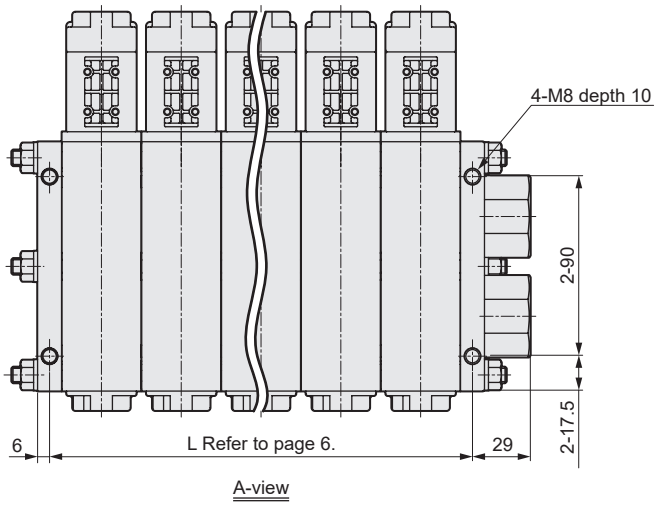
[Valve is fully opened at shipment.]

Part No.	Part Name	Material	
1	Attachment	SCS13	Stainless steel casting
2	Plate	SUS304	Stainless Steel
3	Knob	PBT	Polybutylene terephthalate
4	Spacer	PPS	Polyphenylene sulfide
5	Cock	PPS FFM	Polyphenylene sulfide Fluororubber
6	Base	PPS	Polyphenylene sulfide
7	Flow rate sensor [WFC Series]		
8	Socket	CAC804 or C6931	Brass

External Dimension Drawings

● Karman Vortex Flow Sensor WXU-H



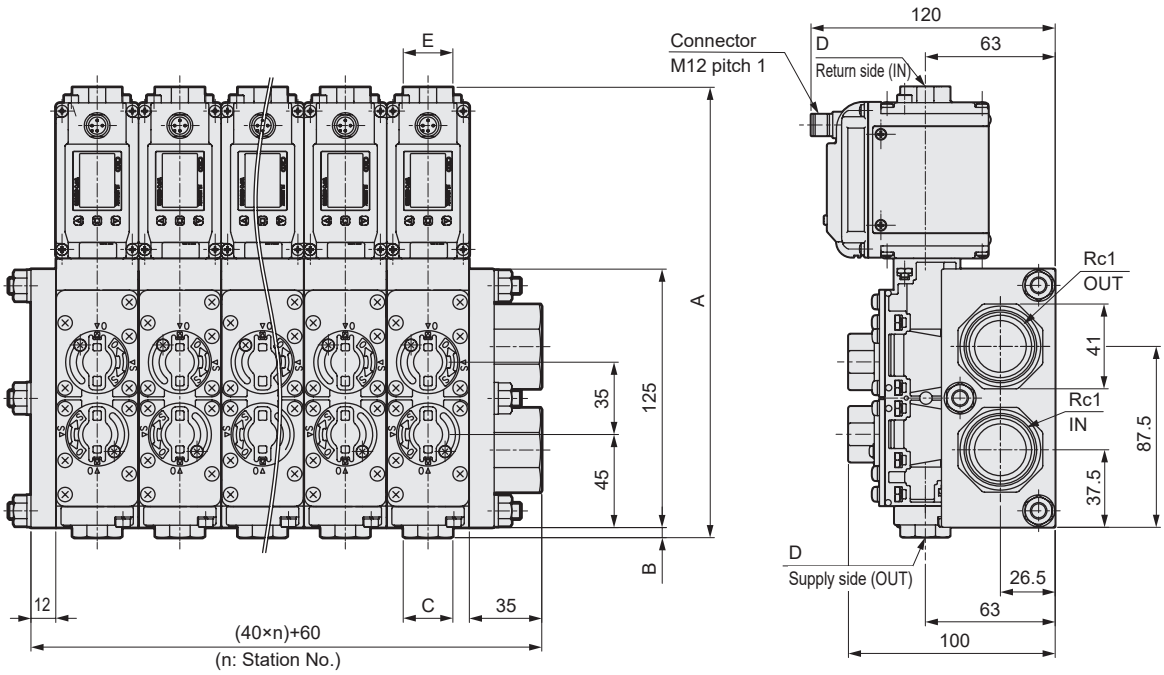


A-view

Model No.	A	B	C	D	E
WXU-H-□-□-10-□-□	190	5	24	Rc3/8	–
WXU-H-□-□-15-□-□	200	10	29	Rc1/2	–
WXU-HC-□-□-10-150-□□□	218	5	24	Rc3/8	24
WXU-HC-□-□-15-600-□□□	228	10	29	Rc1/2	28

External Dimension Drawings

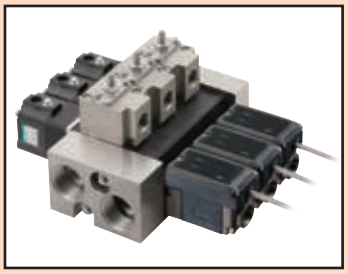
● Electromagnetic flow sensor WXU-HC



Pitch (L) for fixing main body

The screw pitch (L) is as follows.
Consider mounting holes by adopting a slotted hole at one side, etc.

Station No.	2	3	4	5	6	7	8	9	10
L: Screw pitch	92 $^{+1}_{-2}$	132 $^{+1.5}_{-2.5}$	172 $^{+1.5}_{-3}$	212 $^{+2}_{-3.5}$	252 $^{+2}_{-4}$	292 $^{+2}_{-4.5}$	332 $^{+2.5}_{-5}$	372 $^{+2.5}_{-5.5}$	412 $^{+3}_{-6}$



Integrated unit for water control One-fluid control

WXU-J Series

- Connection Port Size: Rc3/8, Rc1/2, Rc3/4, Rc1
- Flow rate range: 0.5 to 32 L/min

RoHS

Model No. Notation Method

If all single-station assemblies have the same component configuration, the entire unit can be designated by a model No. through code selection. If combining stations with different component configurations into a single unit, please specify the configuration in the 'Manifold Specification Sheet' (P. 26).

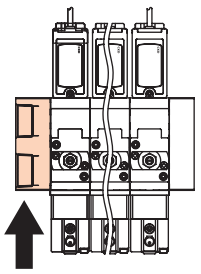
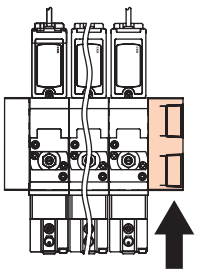
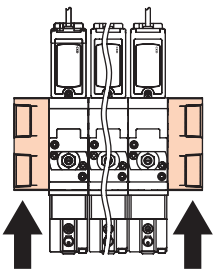
WXU-J - 6 - L - 25 - B1 - 15 - 12 - A0N0

- WXU-J: Model No.
- 6: ① Station No.
- L: ② In-block position
- 25: ③ Port size (IN/OUT port)
- B1: ④ Valve actuation
- 15: ⑤ Port size (branching port)
- 12: ⑥ Flow rate range for flow sensor
- A0N0: ⑦ Flow rate sensor output (1), ⑧ Flow rate sensor output (2)

① Station No.

Code	Content
2	2 stations
to	to
10	10 stations

② In-block position

Code	L	R	W
Content	Left	Right	Both Sides
Layout			

③ Port size (IN/OUT port)

Code	Content
20	Rc3/4
25	Rc1

④ Valve actuation

Code	Content
B1	NC (normally closed) (large flow rate specifications)
B2	NO (normally open) (large flow rate specifications)
00	None

⑤ Port size (branching port)

Code	Content
10	Rc3/8
15	Rc1/2

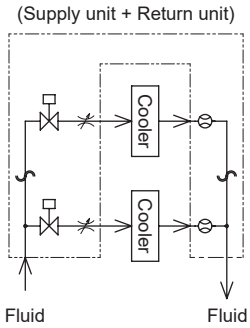
⑥ Flow rate range for flow sensor

Code	Content
04	0.5 to 4.0 L/min
12	1.5 to 12 L/min
32	4.0 to 32 L/min

⑦ Flow rate sensor output (1) / ⑧ Flow rate sensor output (2)

Code	Content	Content				
		Not required	Transistor output 1 point			
			NPN a contact	NPN b contact	PNP a contact	PNP b contact
		Blank	N0	N1	P0	P1
A0	0 to 5 VDC	●	●	●	●	●
A1	4 to 20 mADC	●	●	●	●	●
A2	1 to 5 VDC	●	●	●	●	●
A3	0 to 10 VDC	●	●	●	●	●
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)	●				

[Application examples]



This single unit can manage both the supply and return for cooling piping. Each circuit can be controlled individually.

Common Specifications

Item		WXU-J
Operating Fluid		Water/hot water
Operating Pressure MPa		0 to 0.4 (Note)
Proof pressure (water pressure)MPa		1.0
Fluid temperature °C		1 to 70
Ambient Temperature °C		5 to 50
Atmosphere		Place free of corrosive gas and explosive gas
Flow rate adjusting range%		0 to 100 (water) [with closing function]
Station No.		2 to 10 stations
Mounting Orientation		Unrestricted
Sealant		Fluororubber
Connection Port Size	IN/OUT port	Rc3/4 or Rc1
	Branching ports	Rc3/8 or Rc1/2

Note: Contact CKD about use at pressures higher than working pressure.

Weight

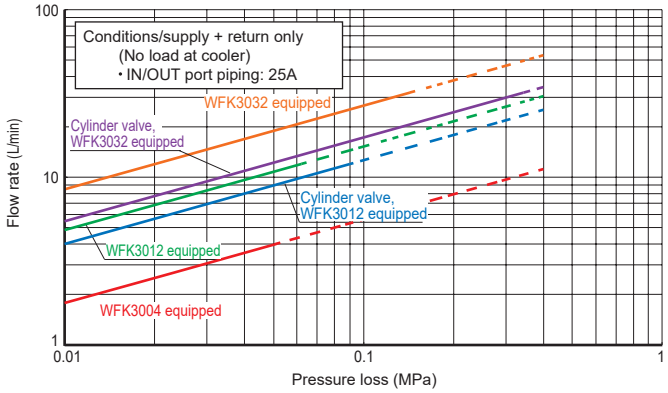
In-block (kg)	Connection Port Size	–
	20A	1.30
	25A	1.20
End block (kg)		1.05
One-station assembly (kg)	Supply side Cylinder Valve	–
	Large flow rate specifications	1.29
	None	1.05

Flow Characteristics

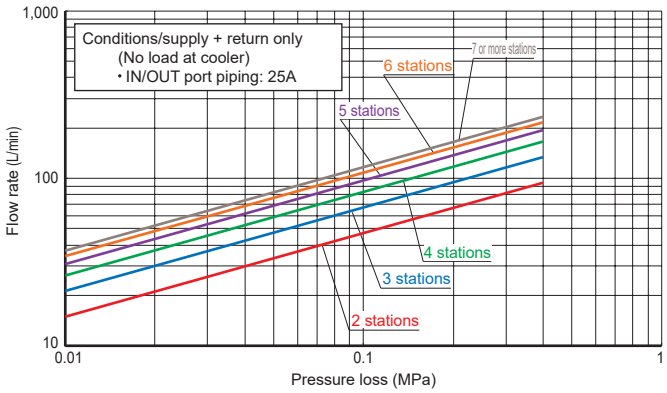
Supply/drain category	Configuration		Cv	Kv value *1
	Cylinder Valve	Flow Sensor		
Supply side (one station)	Large flow rate specifications	-	1.34	1.16
	None	-	2.51	2.18
Return side (one station)	-	WFK3004	0.41	0.36
		WFK3012	1.18	1.02
		WFK3032	2.82	2.45

*1: For the Kv value refer to RJ-008 "Sensors/Controllers".
*2: Make sure to check the flow rate of one station (each system) and overall unit.
(Refer to "Reading the Flow Properties Table" on page 28)

● One station



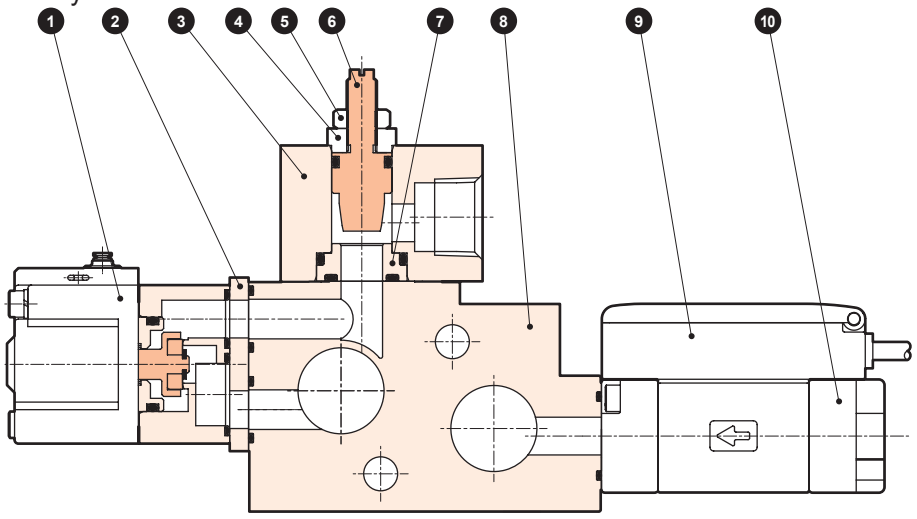
● Overall unit



Internal Structure Diagram/Materials

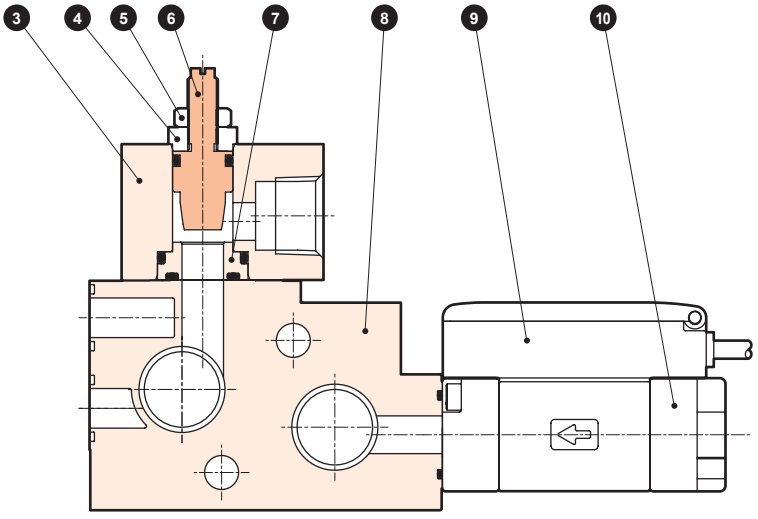
● One-station assembly

• With Valve



[Needle is fully opened at shipment.]

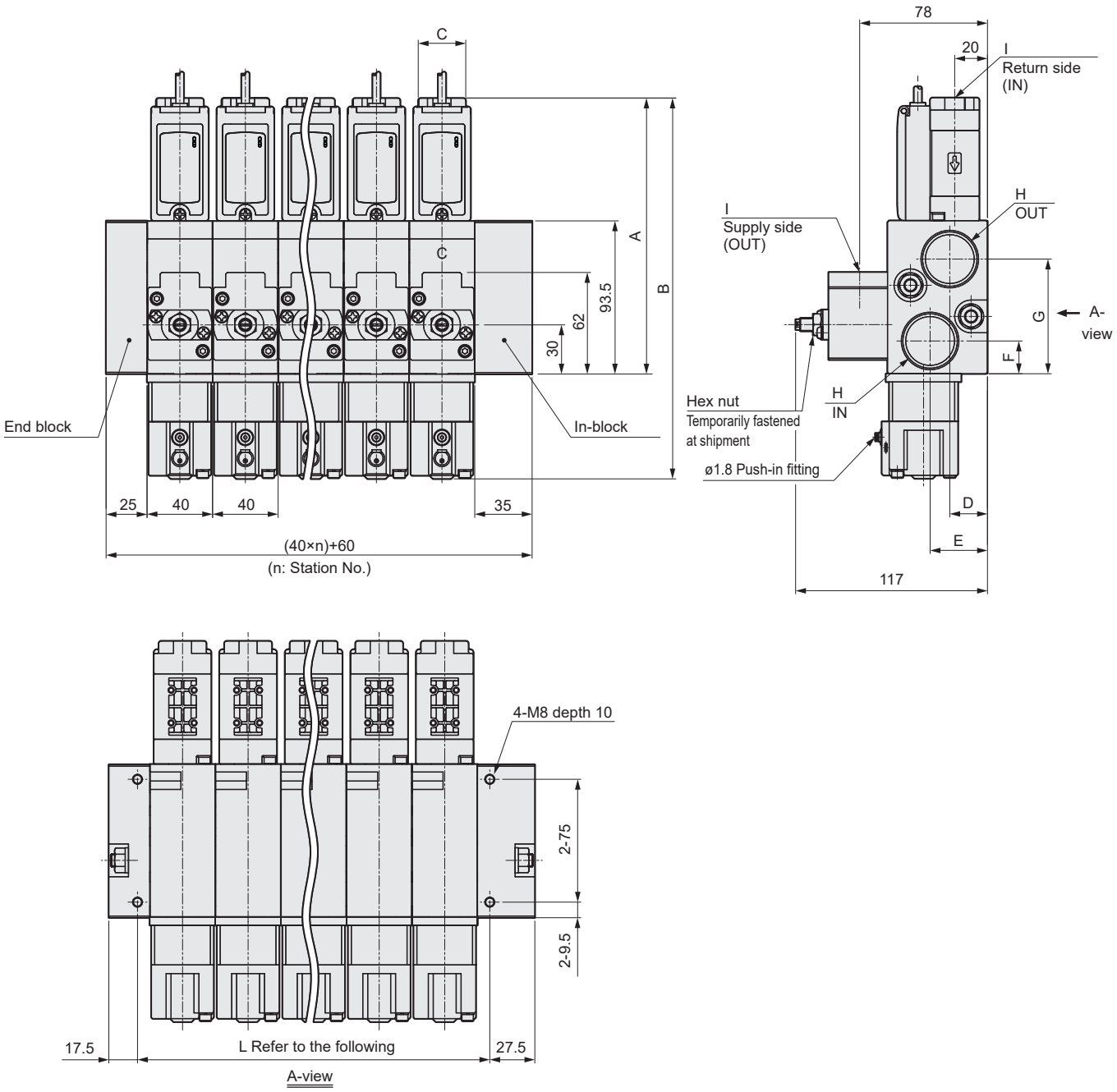
• Without Valve



[Needle is fully opened at shipment.]

Part No.	Part Name	Material		Part No.	Part Name	Material	
1	Cylinder valve [GNAB Series]			6	Needle	SUS304	Stainless Steel
2	Plate	SUS304	Stainless Steel	7	Valve Element	PP	Polypropylene
3	Needle block	SUS304	Stainless Steel	8	Base	PPS	Polyphenylene sulfide
4	Needle stopper	SUS304	Stainless Steel	9	Flow rate sensor [WFK3000 Series]		
5	Hex nut	SWCH	Carbon steel for cold rolling	10	Attachment	SCS13	Stainless steel casting

External Dimension Drawings

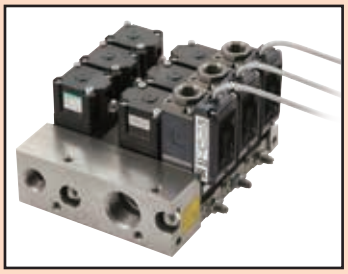


Model No.	A	B	C	D	E	F	G	H	I
WXU-J-□-□-20-□-10-□-□	164	228	24	22	33	24	65	Rc3/4	Rc3/8
WXU-J-□-□-25-□-10-□-□	164	228	24	23	35	20	70	Rc1	Rc3/8
WXU-J-□-□-20-□-15-□-□	169	233	29	22	33	24	65	Rc3/4	Rc1/2
WXU-J-□-□-25-□-15-□-□	169	233	29	23	35	20	70	Rc1	Rc1/2

Pitch (L) for fixing main body

The screw pitch (L) is as follows.
Consider mounting holes by adopting a slotted hole at one side, etc.

Station No.	2	3	4	5	6	7	8	9	10
L: Screw pitch	95±1	135±1.5	175±1.5	215±2	255±2	295±2	335±2.5	375±2.5	415±3



Integrated unit for water control　Two-fluid control

WXU-P Series

- Connection Port Size: Rc3/8, Rc1/2, Rc1
- Flow rate range: 0.5 to 32 L/min

RoHS

Model No. Notation Method

If all single-station assemblies have the same component configuration, the entire unit can be designated by a model No. through code selection. If combining stations with different component configurations into a single unit, please specify the configuration in the 'Manifold Specification Sheet' (P. 27).

WXU-P	-	R	-	6	-	L	-	S	1	1	-	N	-	15	-	12	-	A0N0
Model No.		① Supply/ drain category		② Station No.		③ In-block position		④ Valve size for fluid 1	⑤ Valve actuation for fluid 1	⑥ Valve actuation for fluid 2		⑦ Flow rate adjustment function		⑧ Port size (branching port)		⑨ Flow rate range for flow sensor		⑩ Flow rate sensor output① ⑪ Flow rate sensor output②

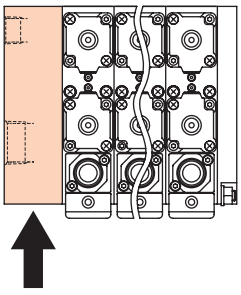
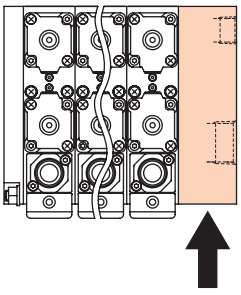
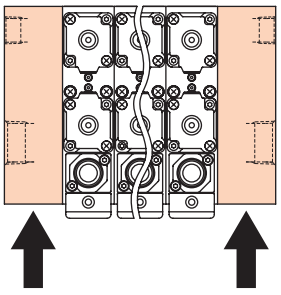
① Supply/drain category

Code	Content
S	Supply side
R	Return side

② Station No.

Code	Content
2	2 stations
to	to
6	6 stations

③ In-block position

Code	L	R	W
Content	Left	Right	Both Sides
Layout			

④ Valve size for fluid 1

Code	Content
S	Standard specifications
B	Large flow rate specifications

⑤ Valve actuation for fluid 1

Code	Content
1	NC (normally closed)
2	NO (normally open)

⑥ Valve actuation for fluid 2

Code	Content
1	NC (normally closed)
2	NO (normally open)

❼ Flow rate adjustment function

Code	Content	
N	With flow rate adjustment function	
0	None	

❽ Port size (branching port)

Code	Content
10	Rc3/8
15	Rc1/2

❾ Flow rate range for flow sensor

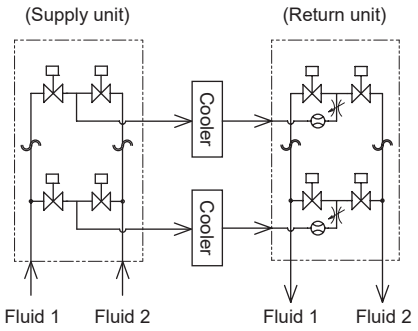
Code	Content
04	0.5 to 4.0 L/min
12	1.5 to 12 L/min
32	4.0 to 32 L/min
00	Without flow rate sensor (Supply/❶drain category "S")

❿ Flow rate sensor output①

⓫ Flow rate sensor output (2)

Code	Content	Content				
		Not required	Transistor output 1 point			
			NPN a contact	NPN b contact	PNP a contact	PNP b contact
		Blank	N0	N1	P0	P1
A0	0 to 5 VDC	●	●	●	●	●
A1	4 to 20 mADC	●	●	●	●	●
A2	1 to 5 VDC	●	●	●	●	●
A3	0 to 10 VDC	●	●	●	●	●
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)	●				
000	Without flow rate sensor (❶Water supply category "S")	●				

[Application examples]



Two different types of fluids (e.g., water and air) can be used. Ideal for circuits that require both cooling water and an air purge. Each circuit can be controlled individually. (Two units are used.)

Common Specifications

Item		WXU-P
Operating Fluid		Water, hot water, air
Operating Pressure MPa		0 to 0.4 (Note)
Proof pressure (water pressure)MPa		1.0
Fluid temperature °C		1 to 70
Ambient Temperature °C		5 to 50
Atmosphere		Place free of corrosive gas and explosive gas
Flow rate adjusting range%		15 to 100 (water)
Station No.		2 to 6 stations
Mounting Orientation		Unrestricted
Sealant		Fluororubber
Connection Port Size	Port for fluid 1	Rc1
	Port for fluid 2	Rc1/2
	Branching ports	Rc3/8 or Rc1/2

*: Contact CKD about use at pressures higher than working pressure.

Weight

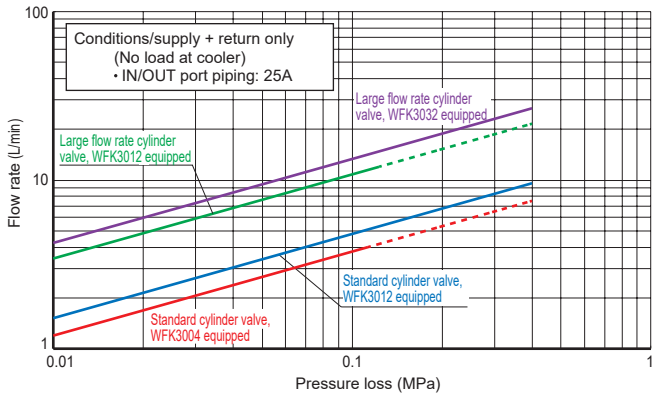
In-block (kg)				2.60
End block (kg)				0.70
One-station assembly (kg)	Supply/drain category	For fluid 1 Cylinder Valve	For fluid 2 Cylinder Valve	–
	Supply side	Standard specifications	Standard specifications	0.87
		Large flow rate specifications	Standard specifications	0.90
	Return side	Standard specifications	Standard specifications	1.14
		Large flow rate specifications	Standard specifications	1.17

Flow Characteristics

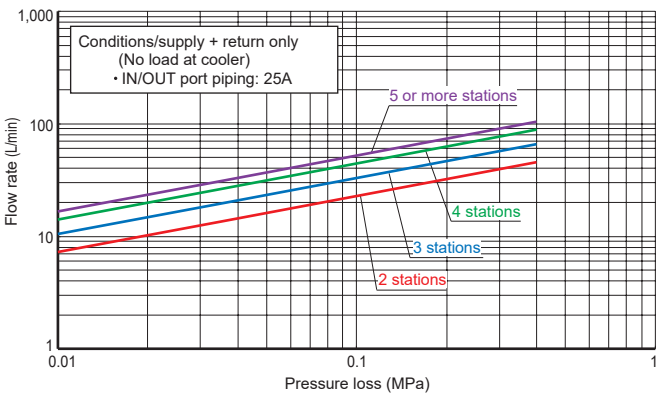
Supply/drain category	Configuration		Fluid 1 side		Fluid 2 side	
	Cylinder Valve	Flow Sensor	Cv	Kv value *1	C[dm3/(s·bar)]	b
Supply side (one station)	Standard specifications	-	0.44	0.38	1.4	0.2
	Large flow rate specifications	-	1.28	1.11	3.0	0.1
Return side (one station)	Standard specifications	WFK3004	0.33	0.29	1.4	0.2
		WFK3012	0.52	0.45		
	Large flow rate specifications	WFK3012	0.94	0.82	3.0	0.1
		WFK3032	1.37	1.19		

*1: Kv value refer to RJ-008 "Sensors/Controllers".
*2: Make sure to check the flow rate of one station (each system) and overall unit. (Refer to "Reading the Flow Properties Table" on page 28)

●One station

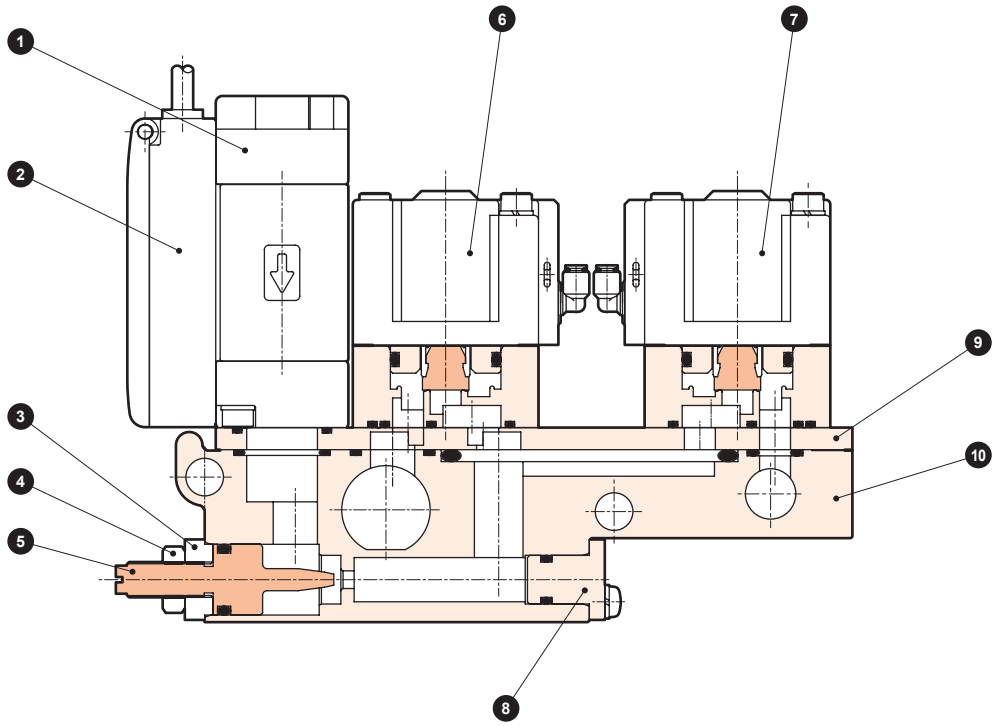


●Overall unit



Internal Structure Diagram/Materials

●One-station assembly

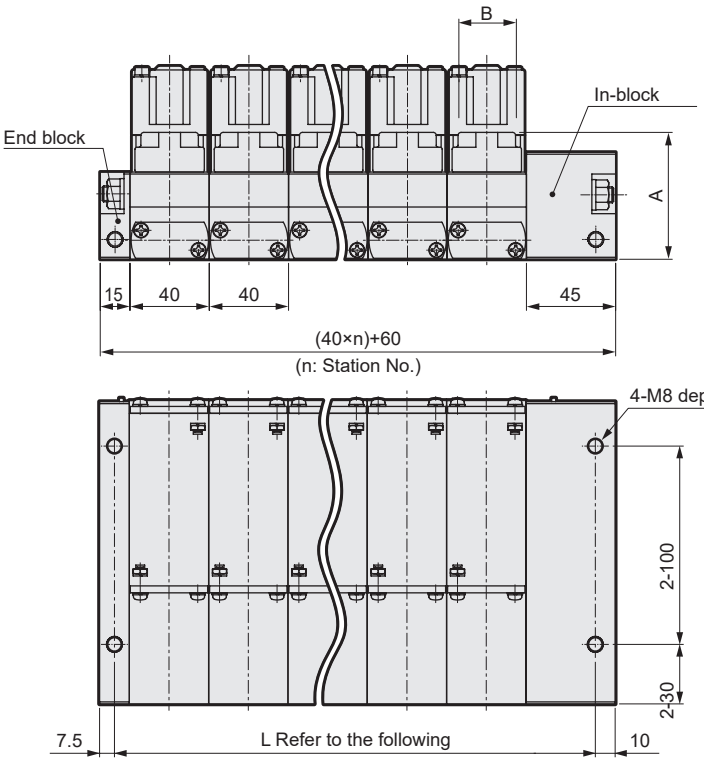


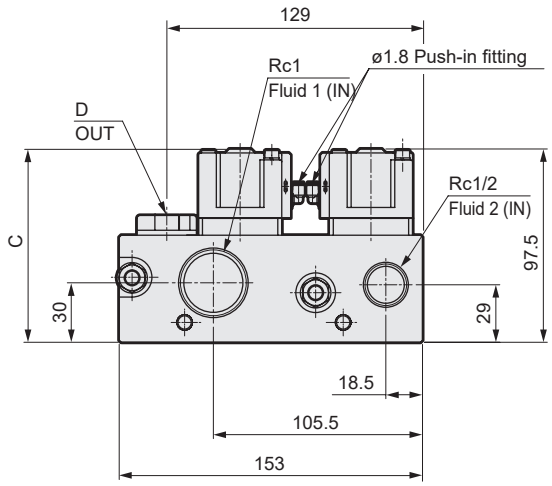
[Needle is fully opened at shipment.]

Part No.	Part Name	Material	
1	Attachment	SCS13	Stainless steel casting
2	Flow rate sensor [WFK3000 Series]		
3	Needle stopper	SUS304	Stainless Steel
4	Hex nut	SWCH	Carbon steel for cold rolling
5	Needle	SUS304	Stainless Steel
6	Cylinder valve for fluid 1 [GNAB Series]		
7	Cylinder valve for fluid 2 [GNAB Series]		
8	Plug	SUS304	Stainless Steel
9	Plate	SUS304	Stainless Steel
10	Base	PPS	Polyphenylene sulfide

External Dimension Drawings

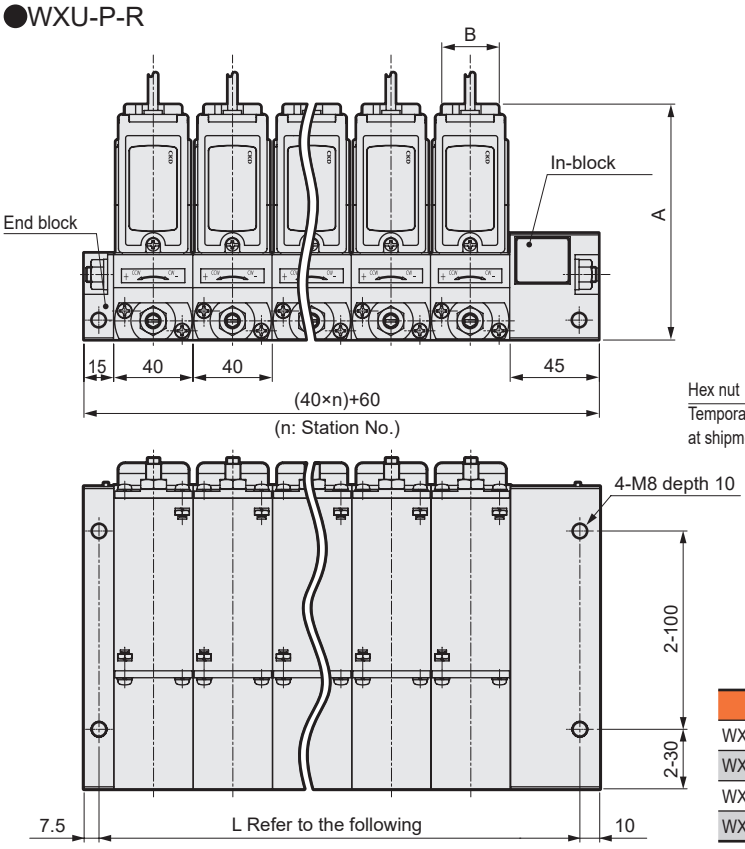
●WXU-P-S

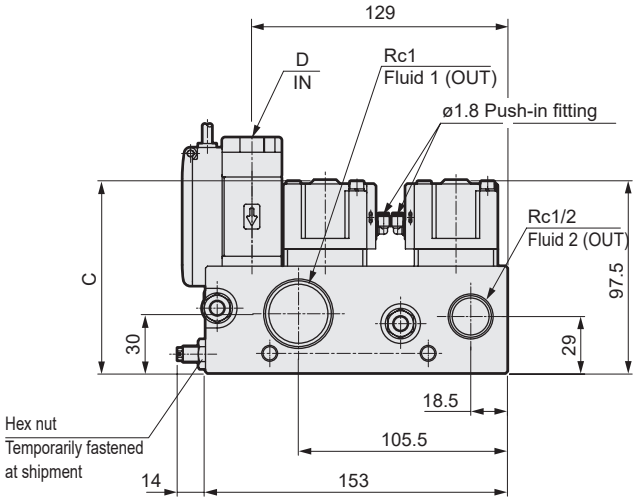




Model No.	A	B	C	D
WXU-P-S-□-□-S □□-□-10-□-□	59	24	97.5	Rc3/8
WXU-P-S-□-□-B □□-□-10-□-□	59	24	103	Rc3/8
WXU-P-S-□-□-S □□-□-15-□-□	64	29	97.5	Rc1/2
WXU-P-S-□-□-B □□-□-15-□-□	64	29	103	Rc1/2

●WXU-P-R





Model No.	A	B	C	D
WXU-P-R-□-□-S □□-□-10-□-□	114	24	97.5	Rc3/8
WXU-P-R-□-□-B □□-□-10-□-□	114	24	103	Rc3/8
WXU-P-R-□-□-S □□-□-15-□-□	119	29	97.5	Rc1/2
WXU-P-R-□-□-B □□-□-15-□-□	119	29	103	Rc1/2

Pitch (L) for fixing main body

The screw pitch (L) is shown on the right. Consider mounting holes by adopting a slotted hole at one side, etc.

Station No.	2	3	4	5	6
L: Screw pitch	122.5±2	162.5±2	202.5±2.5	242.5±2.5	282.5±2.5

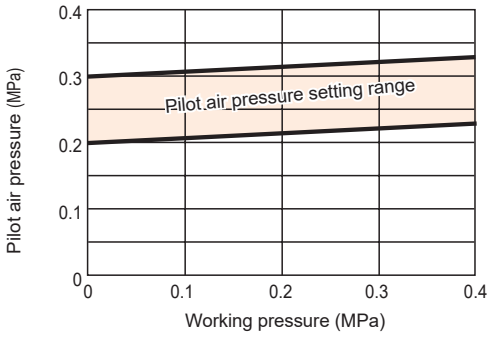
Specifications of mounted devices

Specifications of valve part

Item	GNAB-X□	
	Standard specifications	Large flow rate specifications
Valve seat leakage cm³/min	0.12 or less (pneumatic pressure)	
Orifice size mm	7	10
Cv	1.0	1.6
C [dm3/(s·bar)]	3.8 (*1)	–
b	0.3	–
Pilot air pressure MPa	NC (normally closed): 0.25 to 0.7 NO (normally open): (*2)	
Pilot connection	ø for fiber tube 1.8 push-in fitting (Contact CKD for other connections.)	

*1: Formula to calculate sonic conductance C from effective cross-sectional area S is S≈5.0×C.
*2: Refer to the graph below for NO pilot air pressure.

● GNAB Series NO type



Specifications of flow sensor part

■ Specifications of WFK30 □□ S flow sensor part (sensor)
• Flow rate sensor output (1) : -A0, -A1, -A2, -A3
• Flow rate sensor output (2): Blank

Item	04 (WFK3004S)	12 (WFK3012S)	32 (WFK3032S)
Flow rate range L/min	0.5 to 4.0	1.5 to 12	4.0 to 32
Accuracy	±2.5% F.S.		
Analog Output	-A0:0 to 5 VDC, -A1:4 to 20 mA DC, -A2:1 to 5 VDC, -A3:0 to 10 VDC		
Service voltage	12 to 24 VDC±10% (MAX80 mA) -A3 is 15 to 24 VDC		

■ Specifications of WFK30 □□ C flow sensor part (sensor/switch)
• Flow rate sensor output (1): -A0, -A1, -A2, -A3
• Flow rate sensor output (2): N0, N1, P0, P1

Item		04 (WFK3004C)	12 (WFK3012C)	32 (WFK3032C)
Flow rate range L/min		0.5 to 4.0	1.5 to 12	4.0 to 32
Accuracy		±2.5% F.S. ±1 digit		
Output	Display	Instantaneous flow rate 2-digit LED display		
	Analog Output	-A0:0 to 5 VDC, -A1:4 to 20 mA DC, -A2:1 to 5 VDC, -A3:0 to 10 VDC		
	Switch Output	1-point transistor output (select NPN/PNP) MAX.50 mA DC Internal Voltage Drop: (NPN) 2.0 V or less, (PNP) 2.5 V or less		
Service voltage		12 to 24 VDC±10% (MAX.80 mA)		

■ Specifications of WFK30 □□ M flow sensor part (switch)
• Flow rate sensor output (1): -N0, -N1, -P0, -P1
• Flow rate sensor output (2): Blank

Item		04 (WFK3004M)	12 (WFK3012M)	32 (WFK3032M)
Flow rate range L/min		0.5 to 4.0	1.5 to 12	4.0 to 32
Accuracy		±2.5% F.S. ±1 digit		
Output	Display	Instantaneous flow rate 2-digit LED display		
	Switch Output	2-point transistor output (select NPN/PNP) MAX. 50 mA DC Internal Voltage Drop: (NPN) 2.0 V or less, (PNP) 2.5 V or less		
Service voltage		12 to 24 VDC±10% (MAX. 80 mA)		

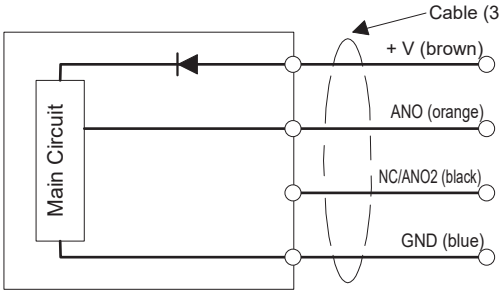
Flow rate sensor wiring method

- Always read the safety precautions before wiring.
- 4-conductor cabtyre cable 0.2 mm^2 is used.
- Option

Sensor (Analog output)	Switch (Switch output)
-A0; (0 to 5 [V])	-N0; (NPN a-contact, 2 points)
-A1; (4 to 20 [mA])	-N1; (NPN b-contact, 2 points)
-A2; (1 to 5 [V])	-P0; (PNP a-contact, 2 points)
-A3; (0 to 10 [V])	-P1; (PNP b-contact, 2 points)

*There is one alarm output point for the sensor/switch type.

● WFK3 □□□ S (sensor voltage output: -A0/-A2/-A3)

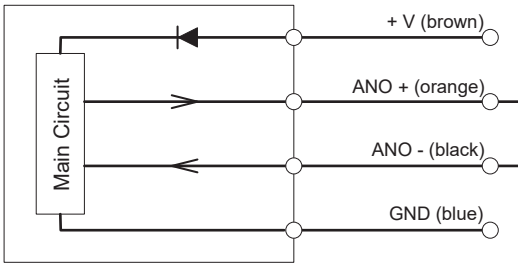


...Connect to DC power supply plus [+] : 12 to 24 VDC±10%
(15 to 24 VDC±10% for option A3)

...Analog output : Voltage in proportion to flow rate is output

...Standard: NC

... Connect to DC power supply minus (-) : 0 VDC



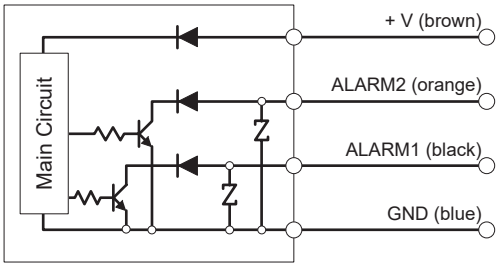
...Connect to DC power supply plus [+] : 12 to 24 VDC ±10%

...Connect to 4-20 mA input device

... Connect to DC power supply minus (-) : 0 VDC

* When connecting two or more flow rate sensors to the upper-level input circuit (receiver), carefully prevent signal interference.

● WFK3 □□□ M (Switch NPN output: -N0/-N1)



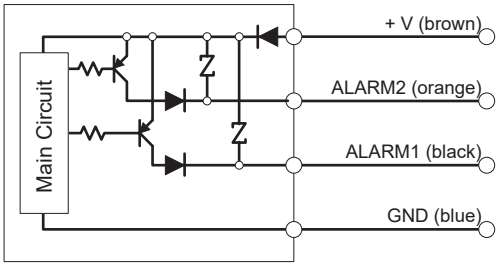
...Connect toDC power supply [+] : 12 to 24 VDC ±10%

...Switch 2 (OUT2) output : MAX. 30 VDC/50 mA

...Switch 1 (OUT1) output : MAX. 30 VDC/50 mA

...Connect to [-] of DC power supply : 0 VDC

● WFK3 □□□ M (Switch PNP output: -P0/-P1)



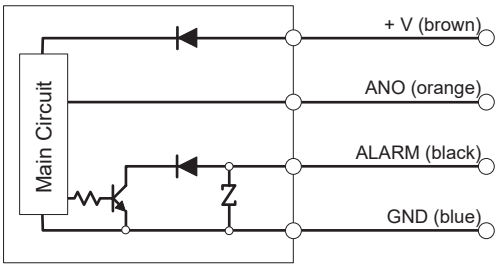
...Connect toDC power supply [+] : 12 to 24 VDC ±10%

...Switch 2 (OUT2) output : MAX. 50 mA

...Switch 1 (OUT1) output : MAX. 50 mA

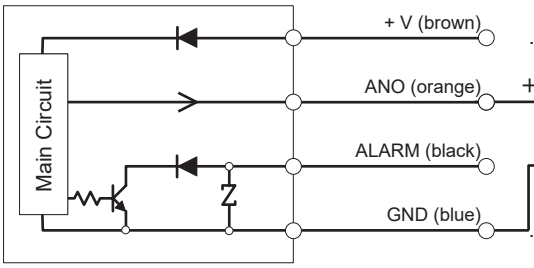
...Connect toDC power supply [-] : 0 VDC

● WFK3 □□□ C (sensor voltage output: -A0/-A2/-A3, Switch NPN output: N0/N1)



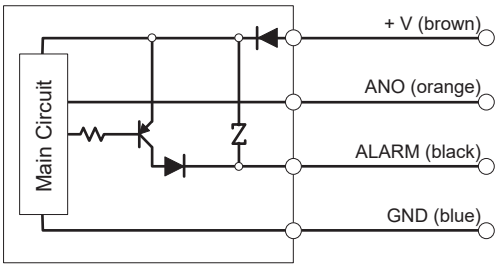
...Connect toDC power supply [+] : 12 to 24 VDC±10%
(15 to 24 VDC±10% for option A3)
...Analog output : Voltage in proportion to flow rate is output
...Switch (OUT) output : MAX. 30 VDC/50 mA
...Connect toDC power supply [-] : 0 VDC

● WFK3 □□□ C (sensor current output: -A1, Switch NPM output: N0,N1)



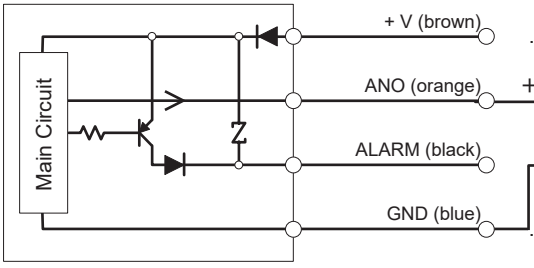
...Connect toDC power supply [+] : 12 to 24 VDC ±10%
...Connect to 4-20mA input device
...Switch (OUT) output
: MAX 30 VDC/50 mA
...Connect toDC power supply [-] : 0 VDC

● WFK3 □□□ C (sensor voltage output: -A0/-A2/-A3, Switch PNP output: P0,P1)



...Connect toDC power supply [+] : 12 to 24 VDC±10%
(15 to 24 VDC±10% for option A3)
...Analog output : Voltage in proportion to flow rate is output
...Switch (OUT) output : MAX 30 VDC/50 mA
...Connect toDC power supply [-] : 0 VDC

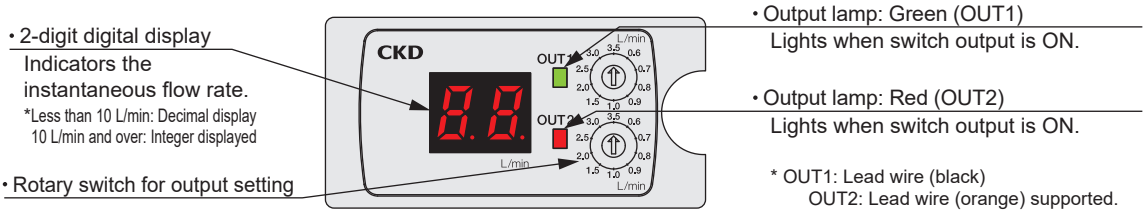
● WFK3 □□□ C (sensor current output: -A1, Switch PNP output: P0,P1)

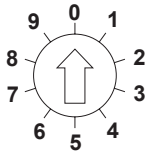


...Connect toDC power supply [+] : 12 to 24 VDC ±10%
...Connect to 4-20mA input device
...Switch (OUT) output
: MAX 30 VDC/50 mA
...Connect toDC power supply [-] : 0 VDC

Functions

●Switch (WFK30□ □M)

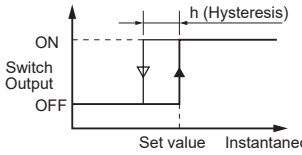




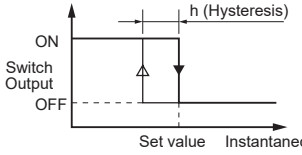
Allows you to set the switch output setting in 10 steps.
- Use a precision screwdriver, etc., to set the rotary switch. Be extremely careful, since applying excessive force to the rotating part may result in contact failure.
- Use the cylinder by making sure that the arrow aligns with the scale. If it is forcibly set at an intermediate point, the output may become unstable.
- Turn power OFF before setting switch outputs.
- After setting switch output, close the cover to display the set flow rate.

Switch output operation

[Output option: NO/PO]



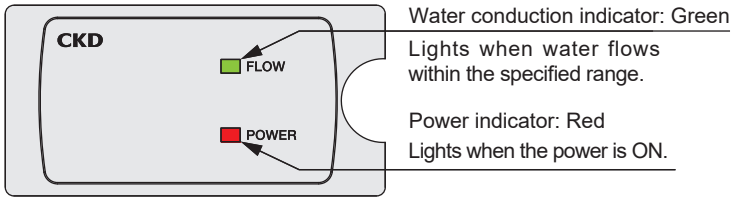
[Output option: N1/P1]



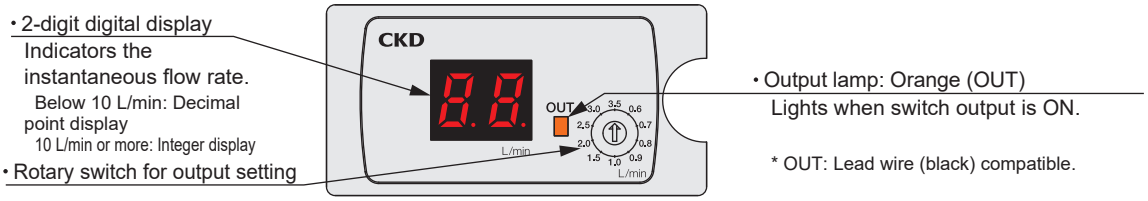
Switch output setting value [L/min]

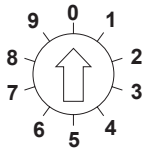
Rotary switch Contact number	Model		
	WFK3004M	WFK3012M	WFK3032M
1	0.6	2.0	5.0
2	0.7	3.0	9.0
3	0.8	4.0	12
4	0.9	5.0	14
5	1.0	6.0	16
6	1.5	7.0	18
7	2.0	8.0	21
8	2.5	9.0	24
9	3.0	10	27
0	3.5	11	30
Hysteresis	0.1	0.5	1.0

●Sensor (WFK30□ □S)



●Sensor/switch (WFK30□ □C)

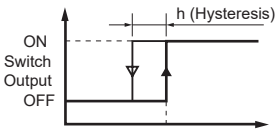




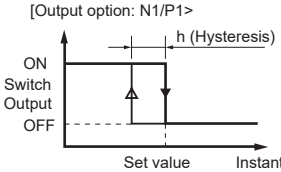
Allows you to set the switch output setting in 10 steps.
- Use a precision screwdriver, etc., to set the rotary switch. Be extremely careful, since applying excessive force to the rotating part may result in contact failure.
- Use the cylinder by making sure that the arrow aligns with the scale. If it is forcibly set at an intermediate point, the output may become unstable.
- Turn power OFF before setting switch outputs.
- After setting switch output, close the cover to display the set flow rate.

Switch output operation

[Output option: NO/PO>



[Output option: N1/P1>



Switch output set value [L/min]

Rotary switch Contact number	Model		
	WFK3004C	WFK3012C	WFK3032C
1	0.6	2.0	5.0
2	0.7	3.0	9.0
3	0.8	4.0	12
4	0.9	5.0	14
5	1.0	6.0	16
6	1.5	7.0	18
7	2.0	8.0	21
8	2.5	9.0	24
9	3.0	10	27
0	3.5	11	30
Hysteresis	0.1	0.5	1.0

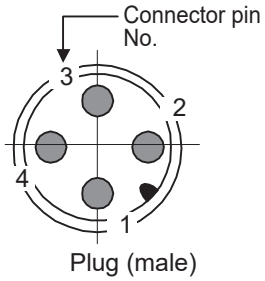
■ Specifications of WFC flow sensor part

Item			150 (WFC-150)	600 (WFC-600)
Rated flow range			0.5 to 15 L/min	2.0 to 60 L/min
Available fluid conductivity			5 μS/cm or more	
Repeatability *1			±6.0% F.S	
Response time *2			0.25 s/0.5 s/1 s/2 s/5 s (default 1 s)	
Switch Output			NPN or PNP transistor output	
	Max. load current		50 mA	
	Max. applied voltage		30 VDC	
	Internal Voltage Drop		NPN: 2.0V or less PNP: 2.4 V	
Analog Output		Voltage output	Voltage output: 1 to 5 V load impedance: 50 kΩ or more	
		Current output	Current output: 4 to 20mA, load impedance: 500 Ω or less	
Indicator			Dual screen display (top: 4-digit 7 segment green/red, bottom: 6-digit 11 segment white)	
Power Supply Voltage			24 VDC ±10% (ripple P-P ±10% or less)	
Current Consumption			65 mA or less	

*1: Characteristics when the response time is 5 s.
*2: The response time to reach 63% of the value in relation to the step input.
*3: Piping port and body metal part are grounded to DC (-)/blue wire. This product cannot be used in (+) ground power supply.

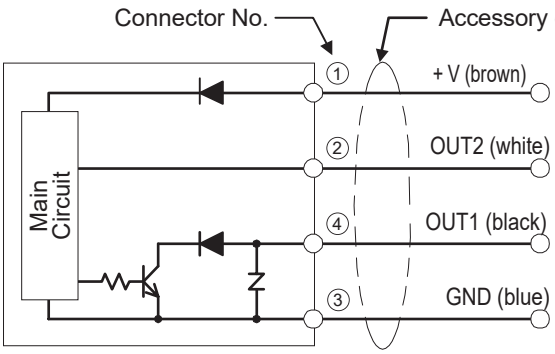
Wiring method

· Always read the safety precautions before wiring.
Connectors used are VA connectors (model No.: TM-4DSX3HG4) made by Correns Corporation. Specifications: For DC, 4-conductor 0.5 mm^2
Cable model No.: TM-4DSX3HG4
L-type cable model No.: VA-4DLX3HG4



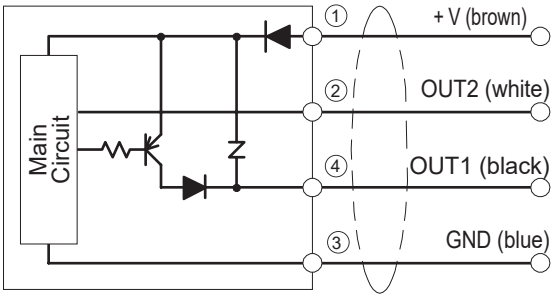
	Switch output	Analog Output
-NV	NPN transistor output	1 to 5 [V]
-NA		4 to 20 [mA]
-PV	PNP transistor output	1 to 5 [V]
-PA		4 to 20 [mA]

1) -NV, -NA



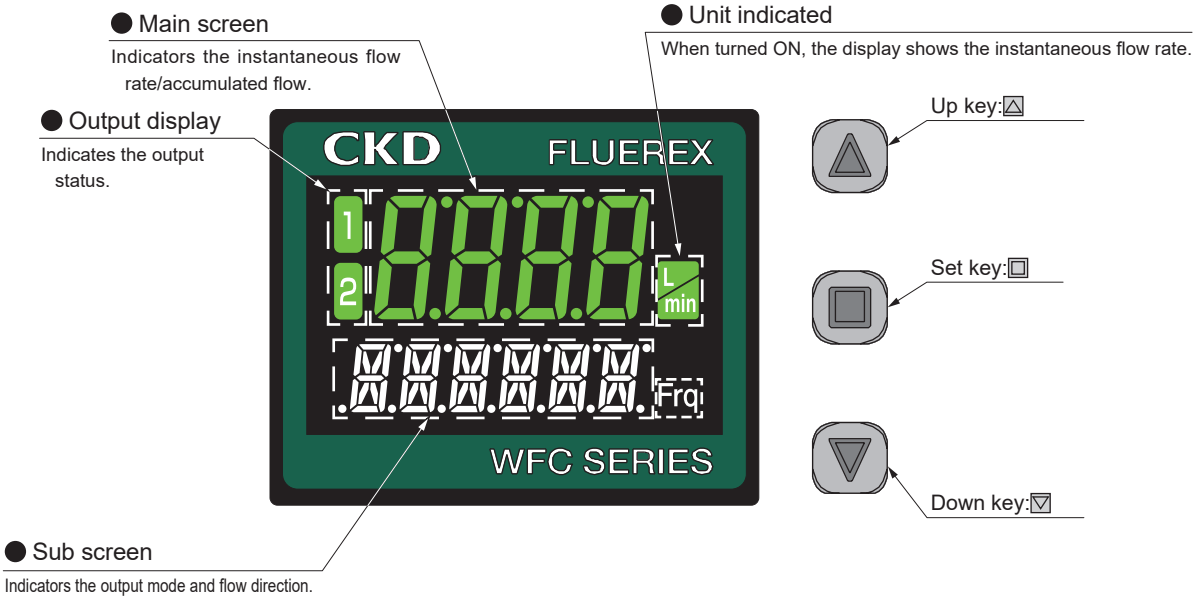
...Connectto DC power supply plus [+]: 24 VDC ±10%
: Analog output/switch input — : Voltage outputs current in proportion to flow rate /Remote zero adjustment or accumulation reset
...Switch output (NPN) — : MAX.30 VDC 50 mA
— Connect to [-] of DC power supply: 0 VDC

2) -PV, -PA

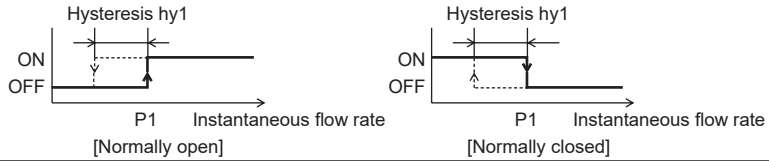
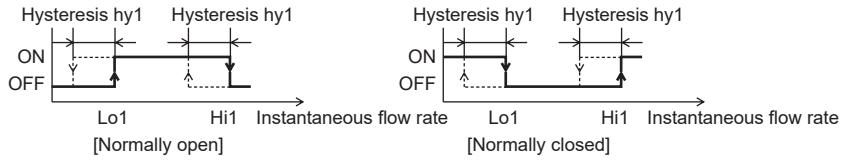
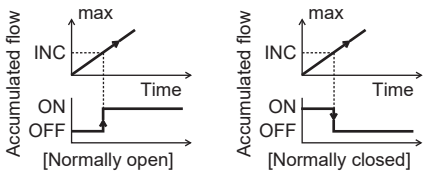
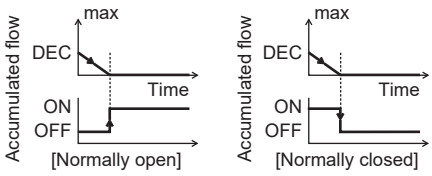
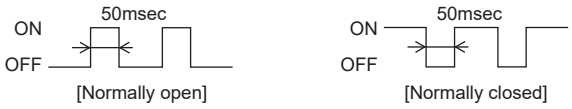
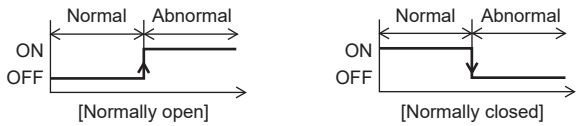
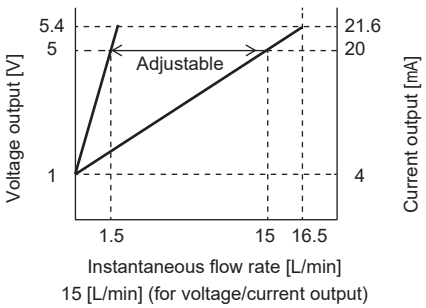


...Connect to DC power supply plus [+]: 24 VDC ±10%
: Analog output/switch input — : Voltage outputs current in proportion to flow rate /Remote zero adjustment or accumulation reset
...Switch output (PNP) — : MAX.50 mA
— Connect to [-] of DC power supply: 0 VDC

Functions

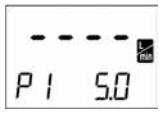


Output mode and output operation

①Hysteresis mode	
②Window comparator mode	
③Accumulated output mode	●Increment mode  ●Decrement mode 
④Integrated pulse output	
⑤Alarm output mode	
⑥Analog output mode	

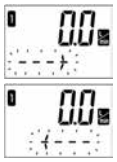
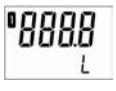
Measurement mode

[Normal screen]

Instantaneous Flow Rate Display	Hysteresis mode 	Window comparator mode 	Accumulated output mode 	Integrated pulse output mode 
	Analog Output 	Digital input: Remote zero adjustment 	Digital input: Accumulation reset 	Alarm output mode 
	Flow Direction  		Select any character 	No sub-screen display 
Total accumulated flow display		Up key: ▲, Down key: Accumulated units can be switched to "L", "kL", "ML" with ▼.		

Easy setting (shortcut mode)

By shortcut operation, settings with high frequency of use can be moved from the normal screen to the settable state.

Main screen	Normal screen ⇄ (□ Current screen blinks) ⇄ □  △ or ▽"Instantaneous value display", "total integrated value display" are selected and confirmed with □ .
Hysteresis mode	 △ or ▽ ⇄ □  △ Judgment value is set with △ or ▽ and confirmed with □ .
Accumulated output mode	 □ + ▽ ⇄ □  □ Integrated value is reset with .
Analog output mode	 △ or ▽ ⇄ □  △ F.S. is changed with △ or ▽ and confirmed with □ .
Flow Direction	 △ or ▽ ⇄ □  △ Flow direction is changed with △ or ▽ and confirmed with □ .
Total integrated value reset	 □ + ▽ ⇄  □ Reset by . △ can be canceled by △ or ▽.
Setting key lock	Normal screen ⇄ △ + ▽ (Hold down for 2 seconds or more) ⇄ 1 second after setting  △ changed in △ or ▽ and confirmed □ with .

How to fill out WXU-P manifold specifications sheet

Supply side/Return side

Create manifold specifications for both supply side and return side.

*Layout position is 1, 2... from the left with flow sensor cover facing the front. (Refer to the figure below)

Part name	Specifications	Model No.	Arrangement Position L	1	2	3	4	5	6	R	Quantity
In-block	Rc1, Rc1/2	-	○								1
End block	-	-								○	1
Cylinder valve at fluid 2 side [Dedicated for Water Collection Units]	NC	**GNAB-X2144-5**		○	○	○					3
	NO	**GNAB-X2190-5**					○	○			2
	Masking plate	-									
Cylinder valve at fluid 1 side [Dedicated for Water Collection Units]	NC (Standard specifications)	**GNAB-X2144-5**			○	○					2
	NO (Standard specifications)	**GNAB-X2190-5**					○				1
	NC (Large flow rate specifications)	**GNAB-X2145-5**		○							1
	NO (Large flow rate specifications)	**GNAB-X2224-5**						○			1
	Masking plate	-									
Branching port size (Supply side only)	Rc3/8	-									
	Rc1/2	-									
Flow Sensor [Dedicated for Water Collection Units] (Return side only)	Select from the following and enter in the table at right. (Refer to "Specification of mounted devices" on page 16)										
	Flow rate range: 04/12/32 Connection Port Size: 10/15 Flow rate sensor output①② : *1 Refer to (table below)	**WFK30** 04 15 - A0 Blank		○							1
		WFK30 32 15 - A3 Blank			○	○					2
		WFK30 04 15 - N0 Blank					○				1
		WFK30 32 15 - P0 N0						○			1
		WFK30 -									
	Port only For Rc3/8	-									
	Port only For Rc1/2	-									
Needle valve	For standard specifications / For large flow rate specs.	It depends on the model number of the cylinder valve at fluid 1 side. -		○	○	○	○	○			5
Partition plug	Fluid 1 side	-					○				1
	Fluid 2 side	-					○				1
Remarks											

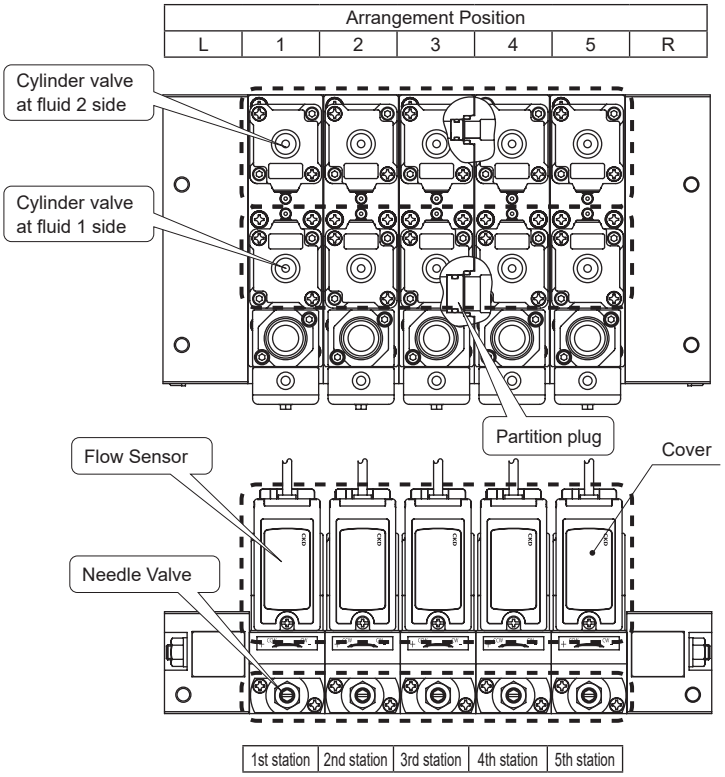
Fill in total quantity.

Specify device to be mounted for each station.

Flow Rate range	Connection Bore size		Flow rate sensor output ①	②
WFK30	04	15	- A0	Blank
WFK30	32	15	- A3	Blank
WFK30	04	15	- N0	Blank
WFK30	32	15	- P0	N0
WFK30			-	

*1: Output variations of water flow rate sensor

Flow rate sensor output①		Flow rate sensor output② Not required	Transistor output 1 point NPN a contact	NPN b contact	PNP a contact	PNP b contact
		Blank	**N0**	**N1**	**P0**	**P1**
A0	0 to 5 VDC	●	●	●	●	●
A1	4 to 20 mA DC	●	●	●	●	●
A2	1 to 5 VDC	●	●	●	●	●
A3	0 to 10 VDC	●	●	●	●	●
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)	●				



Layout position illustration

CKD

WXU-H Manifold Specifications

●Contact ●Quantity set(s) ●Delivery date / /

Receipt No.	Order Received No.

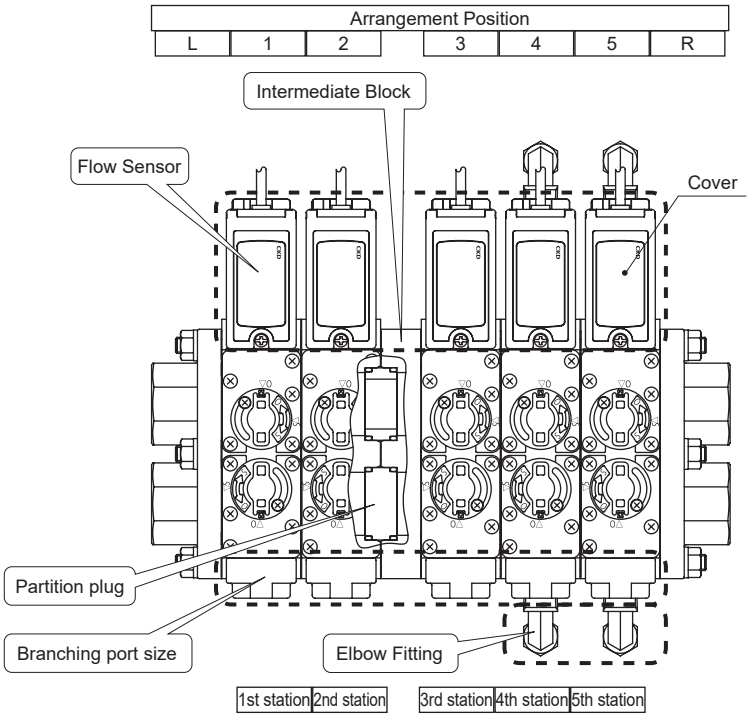
Date of Issue
Company
Attn:
P.O. No.

*Layout position is 1, 2... from the left with flow sensor cover facing the front. (Refer to the figure below)

Part name	Specifications		Model No.	Flow rate range	Connection Port Size		Flow rate sensor output ①	Flow rate sensor output ②	Arrangement Position L	1	2	3	4	5	6	7	8	9	10	R	Quantity
In-block	Rc1		-							■	■	■	■	■	■	■	■	■	■		
End block	-		-							■	■	■	■	■	■	■	■	■	■		
Flow Sensor [Dedicated for Water Collection Units] (Return side only)	Select from the following and enter in the table at right. (Refer to "Specification of mounted devices" on page 16)																				
			WFK30			-			■											■	
	Flow rate range: 04/12/32 Connection Port Size: 10/15 Flow rate sensor output①② : *1 Refer to (table below)		WFK30			-			■											■	
			WFK30			-			■											■	
			WFK30			-			■											■	
			WFK30			-			■											■	
	For port only	Rc3/8	-						■											■	
		Rc1/2	-						■											■	
Branching port size (Supply side OUT port)	Rc3/8		-						■											■	
	Rc1/2		-						■											■	
Partition plug	With intermediate block (Width 20 mm)	Supply side	-						■											■	
		Return side	-						■											■	
Elbow fitting (stainless steel) (Supply unit + Return unit Piped on both sides)	Tube, Thread Size (inch)	Compatible tube O.D. x I.D. (mm)	Manufactured by NITTA Co., Ltd. Quick seal fittings																		
	3/8	9.53 × 6.99	L1N3/8-PT3/8-S						■											■	
	1/2	12.70 × 9.56	L1N1/2-PT1/2-S						■											■	
Remarks																					

*1: Output variations of water flow rate sensor

Flow rate sensor output①		Flow rate sensor output② Not required	Transistor output 1 point NPN a contact	NPN b contact	PNP a contact	PNP b contact
		Blank	N0	N1	P0	P1
A0	0 to 5 VDC	●	●	●	●	●
A1	4 to 20 mA DC	●	●	●	●	●
A2	1 to 5 VDC	●	●	●	●	●
A3	0 to 10 VDC	●	●	●	●	●
N0	NPN transistor 2 output points (a contact)	●				
N1	NPN transistor 2 output points (b contact)	●				
P0	PNP transistor 2 output points (a contact)	●				
P1	PNP transistor 2 output points (b contact)	●				



Layout position illustration

WXU-HC Manifold Specifications

●Contact●Quantity set(s)●Delivery Date (Month/Day) /

Receipt No.	Order Received No.

Date of Issue

Company

Attn:

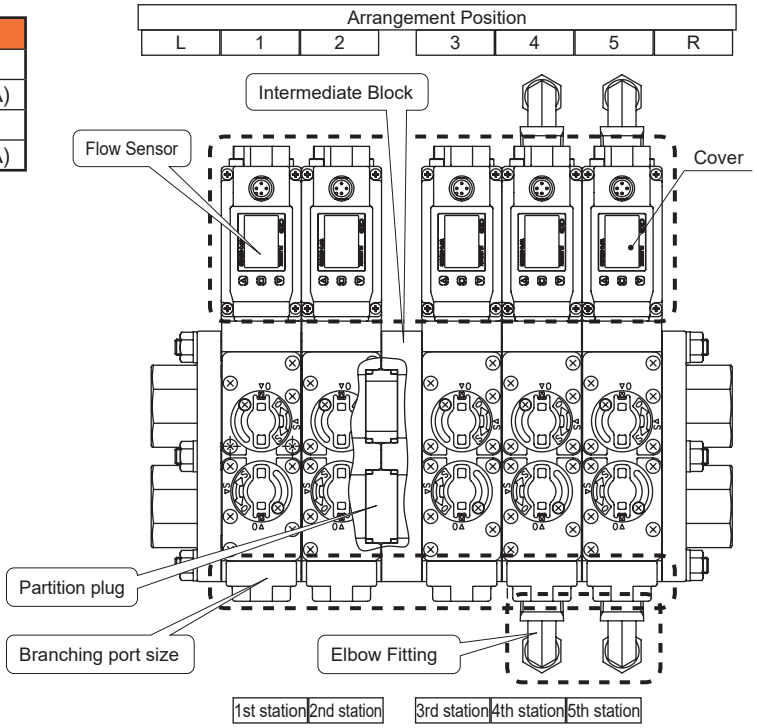
P.O. No.

*Layout position is 1, 2... from the left with the monitor of flow sensor facing the front. (Refer to the figure below)

Part name	Specifications		Model No.				Arrangement Position L	1	2	3	4	5	6	7	8	9	10	R	Quantity
In-block	Rc1		-																
End block	-		-																
Flow Sensor [Dedicated for Water Collection Units]	Select from the following and enter in the table at right.			Flow rate range / Port size		Output													
	● Flow rate range / Port size : 150-10W/600-15W ● Output: *1 Refer to (table below)		WFC-	-	-														
			WFC-	-	-														
			WFC-	-	-														
			WFC-	-	-														
			WFC-	-	-														
	For port only	Rc3/8	-																
		Rc1/2	-																
	M12 connector cable		-																
	M12L-connector cable		-																
Branching port size (Supply side OUT port)	Rc3/8		-																
	Rc1/2		-																
Partition plug	With intermediate block (Width 20 mm)	Supply side	-																
		Return side	-																
Fittings Stainless steel (Elbow) Insert type	Tube, thread size (inch)	Compatible tube O.D. x I.D. (mm)	Manufactured by NITTA Co., Ltd. Quick seal fittings																
	3/8	9.53 × 6.99																	
	1/2	12.70 × 9.56																	
Remarks																			

*1: Output variations of water flow rate sensor

Output	Switch Output	Analog Output
NV	NPN-Tr output	Voltage output (1 to 5 V)
NA	NPN-Tr output	Current output (4 to 20 mA)
PV	PNP-Tr output	Voltage output (1 to 5 V)
PA	PNP-Tr output	Current output (4 to 20 mA)



Layout position illustration

WXU-J Manifold Specifications

●Contact Person ●Quantity Set ●Delivery Date (Month/Day) /

Receipt No.	Order Received No.

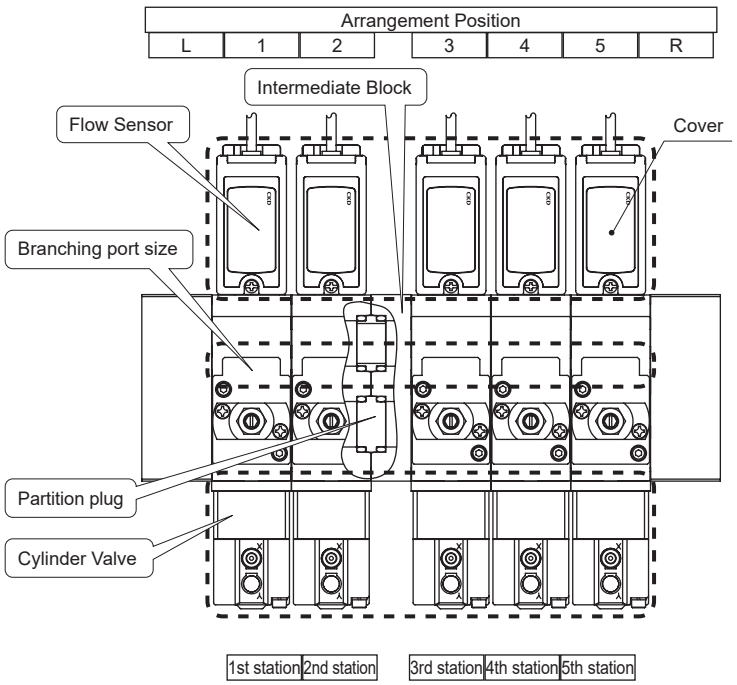
Date of Issue
Company
Attn:
P.O. No.

*Layout position is 1, 2... from the left with flow sensor cover facing the front. (Refer to the figure below)

Part name	Specifications		Model No.	Flow Rate range	Connection Bore size		Flow rate sensor output ①	Flow rate sensor output ②	Arrangement Position L	1	2	3	4	5	6	7	8	9	10	R	Quantity
In-block	Rc3/4		-																		
	Rc1		-																		
End block	-		-																		
Cylinder Valve [Dedicated for Water Collection Units]	NC		**GNAB-X2225-1**																		
	NO		**GNAB-X2226-1**																		
	Masking plate		-																		
Flow Sensor [Dedicated for Water Collection Units] (Return side only)	Select from the following and enter in the table at right. (Refer to "Specification of mounted devices" on page 16)																				
	Flow rate range: 04/12/32 Connection Port Size: 10/15 Flow rate sensor output : *1 Refer to (table below)		**WFK30**			-															
			WFK30			-															
			WFK30			-															
			WFK30			-															
			WFK30			-															
	Port only For	Rc3/8	-																		
		Rc1/2	-																		
Branching port size (Supply side OUT port)	Rc3/8		-																		
	Rc1/2		-																		
Partition plug	With intermediate block (Width 20 mm)	Supply side	-																		
		Return side	-																		
Remarks																					

*1: Output variations of water flow rate sensor

		Flow rate sensor output②				
		Not required	Transistor output 1 point			
			NPN a contact	NPN b contact	PNP a contact	PNP b contact
Flow rate sensor output (1)		Blank	N0	N1	P0	P1
A0	0 to 5 VDC	●	●	●	●	●
A1	4 to 20 mA DC	●	●	●	●	●
A2	1 to 5 VDC	●	●	●	●	●
A3	0 to 10 VDC	●	●	●	●	●
N0	NPN transistor 2 output points (a contact)	●				
N1	NPN transistor 2 output points (b contact)	●				
P0	PNP transistor 2 output points (a contact)	●				
P1	PNP transistor 2 output points (b contact)	●				



Layout position illustration

WXU-P Manifold Specifications

●Contact Person ●Quantity Set ●Delivery Date (Month/Day) /

Receipt No.	Order Received No.

Date of Issue

Company

Attn:

P.O. No.

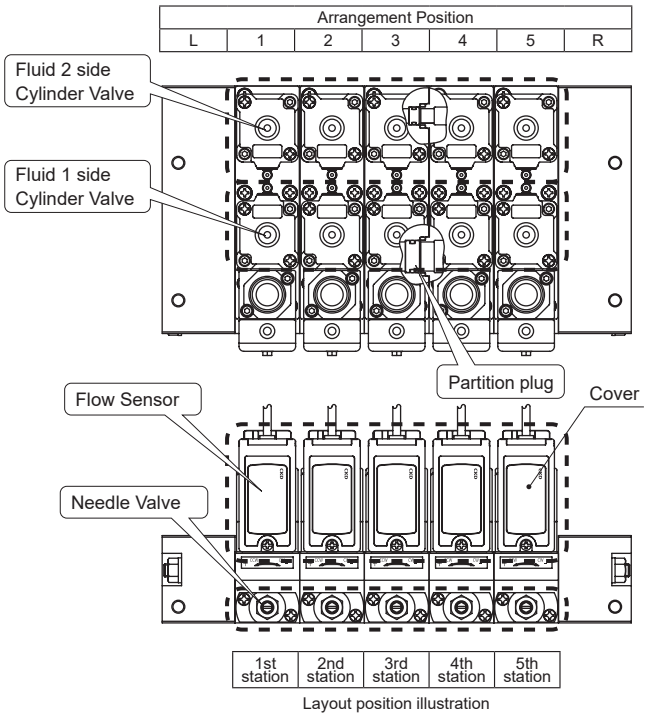
Supply side/Return side

*Layout position is 1, 2... from the left with flow sensor cover facing the front. (Refer to the figure below)

Part name	Specifications	Model No.	Arrangement Position L	1	2	3	4	5	6	R	Quantity
In-block	Rc1, Rc1/2	-									
End block	-	-									
Cylinder valve at fluid 2 side [Dedicated for Water Collection Units]	NC	**GNAB-X2144-5**									
	NO	**GNAB-X2190-5**									
	Masking plate	-									
Cylinder valve at fluid 1 side [Dedicated for Water Collection Units]	NC (Standard specifications)	**GNAB-X2144-5**									
	NO (Standard specifications)	**GNAB-X2190-5**									
	NC (Large flow rate specifications)	**GNAB-X2145-5**									
	NO (Large flow rate specifications)	**GNAB-X2224-5**									
	Masking plate	-									
Branching port size (Supply side only)	Rc3/8	-									
	Rc1/2	-									
Flow Sensor [Dedicated for Water Collection Units] (Return side only)	Select from the following and enter in the table at right. (Refer to "Specification of mounted devices" on page 16)	Flow Rate range / Connection Bore size / Flow rate sensor output ① ②									
		WFK30 -									
	Flow rate range: 04/12/32 Connection Port Size: 10/15 Flow rate sensor output①② : *1 Refer to (table below)	**WFK30** -									
		WFK30 -									
		WFK30 -									
		WFK30 -									
	For port only: Rc3/8	-									
	For port only: Rc1/2	-									
Needle valve	For standard specifications / For large flow rate specs.	It depends on the model number of the cylinder valve at fluid 1 side. -									
Partition plug	Fluid 1 side	-									
	Fluid 2 side	-									
Remarks											

*1: Output variations of water flow rate sensor

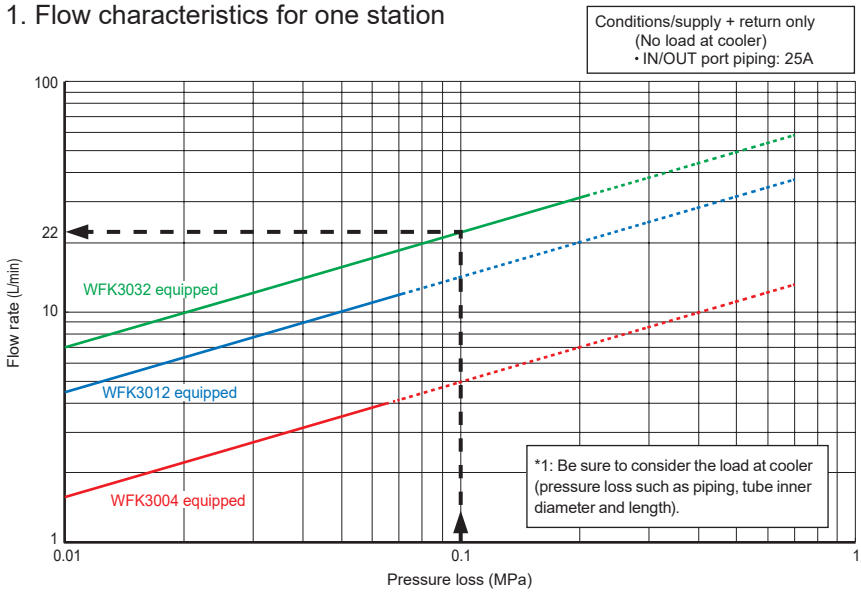
Flow rate sensor output (1)		Flow rate sensor output (2) Not required: Blank	Transistor output 1 point NPN a contact: N0	NPN b contact: N1	PNP a contact: P0	PNP b contact: P1
A0	0 to 5 VDC	●	●	●	●	●
A1	4 to 20 mA DC	●	●	●	●	●
A2	1 to 5 VDC	●	●	●	●	●
A3	0 to 10 VDC	●	●	●	●	●
N0	NPN transistor 2 output points (a contact)	●				
N1	NPN transistor 2 output points (b contact)	●				
P0	PNP transistor 2 output points (a contact)	●				
P1	PNP transistor 2 output points (b contact)	●				



Layout position illustration

Reading the Flow Properties Table

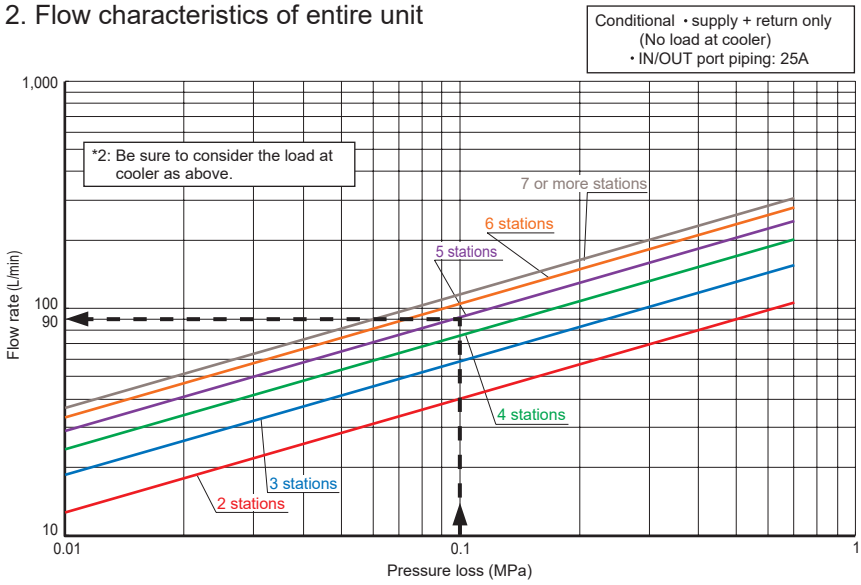
1. Flow characteristics for one station



Example 1:
What is the maximum flow rate when water (specific gravity =1) is passed through WXU-H with WFK3032 at △P=0.15 MPa (P_1-P_2)?
(Load at cooler is 0.05 MPa.)

Q=22 L/min
(pressure loss: 0.1 MPa (0.15 - 0.05))

2. Flow characteristics of entire unit



Example 2:
With WXU-H type, when using 5 stations, water (specific gravity = 1) will be △P=0.15 MPa
What is the maximum flow rate when flow is conducted at (P_1-P_2)
(Load at cooler is 0.05 MPa.)

Q=90 L/min
(pressure loss: 0.1 MPa (0.15 - 0.05))

Flow rate calculation method

SI units

$$Q=45.16Cv\frac{\sqrt{P_1-P_2}}{\sqrt{G}}$$

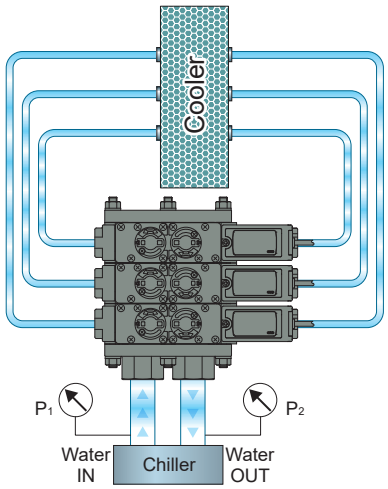
Q: Flow rate L/min

P_1: Primary side pressure MPa

P_2: Secondary pressure MPa

G: Specific gravity (water = 1)

Cv: Flow coefficient



Pressure Loss
△P
△P = P_1 - P_2

Safety Precautions

Be sure to read this section before use.

When designing and manufacturing a device using CKD products, the manufacturer is obligated to check that device safety mechanism, pneumatic control circuit, or water control circuit and the system operated by electrical control that controls the devices is secured.
It is important to select, use, handle and maintain the product appropriately to ensure that the CKD product is used safely.
Observe warnings and precautions to ensure device safety.
Check that device safety is ensured, and manufacture a safe device.

WARNING

1 This product is designed and manufactured as a general industrial machine part.
It must be handled by an operator having sufficient knowledge and experience.

2 Use this product in accordance with specifications.

This product must be used within its stated specifications. In addition, never modify or additionally machine this product.
This product is intended for use in general industrial machinery equipment or parts. It is not intended for use outdoors (except for products with outdoor specifications) or for use under the following conditions or environments.
(Note that this product can be used when CKD is consulted prior to its usage and the customer consents to CKD product specifications. The customer should provide safety measures to avoid danger in the event of problems.)

❶ Use for applications requiring safety, including nuclear energy, railways, aircraft, marine vessels, vehicles, medical devices, devices or applications in contact with beverages or foodstuffs, amusement devices, emergency cutoff circuits, press machines, brake circuits, or safety devices or applications.
❷ Use for applications where life or assets could be significantly affected, and special safety measures are required.

3 Observe organization standards and regulations, etc., related to the safety of device design and control, etc.

ISO4414, JIS B 8370 (Pneumatics fluid power - General rules and safety requirements for systems and their components)
JFPS2008 (Principles for pneumatic cylinder selection and use)
Including the High Pressure Gas Safety Act, Industrial Safety and Health Act, other safety rules, organization standards and regulations, etc.

4 Do not handle, pipe, or remove devices before confirming safety.

❶ Inspect and service the machine and devices after confirming safety of all systems related to this product.
❷ Note that there may be hot or charged sections even after operation is stopped.
❸ When inspecting or servicing the device, turn OFF the energy source (air supply or water supply), and turn OFF power to the facility.Discharge any compressed air from the system, and pay attention to possible water leakage and leakage of electricity.
❹ When starting or restarting a machine or device that incorporates pneumatic components, make sure that the system safety, such as pop-out prevention measures, is secured.

5 Observe warnings and cautions in the following pages to prevent accidents.

■ The precautions are ranked as "DANGER", "WARNING" and "CAUTION" in this section.

DANGER: When a dangerous situation may occur if handling is mistaken leading to fatal or serious injuries, and when there is a high degree of emergency to a warning.

WARNING: If handled incorrectly, a dangerous situation may occur, resulting in death or serious injury.

CAUTION: When a dangerous situation may occur if handling is mistaken leading to minor injuries or physical damage.

Note that some items described as "CAUTION" may lead to serious results depending on the situation.
Every item provides important information and must be observed.

Warranty

1 Warranty period

The product specified herein is warranted for one (1) year from the date of delivery to the location specified by the customer.

2 Warranty coverage

If the product specified herein fails for reasons attributable to CKD within the warranty period specified above, CKD will promptly provide a replacement for the faulty product or a part thereof or repair the faulty product at one of CKD's facilities free of charge.
However, following failures are excluded from this warranty:

1) Failure caused by handling or use of the product under conditions and in environments not conforming to those stated in the catalog, the Specifications, or the Instruction Manual.
2) Failure caused by use of the product exceeding its durability (cycles, distance, time, etc.) or caused by consumable parts.
3) Failure not caused by the product.
4) Failure caused by use not intended for the product.
5) Failure caused by modifications/alterations or repairs not carried out by CKD.
6) Failure caused by reasons unforeseen at the level of technology available at the time of delivery.
7) Failure caused by acts of nature and disasters beyond control of CKD.

The warranty stated herein covers only the delivered product itself. Any loss or damage induced by failure of the delivered product is excluded from this warranty.
Note: For details on the durability and consumable parts, contact your nearest CKD sales office.

3 Compatibility check

The customer is responsible for confirming the compatibility of CKD products with the customer's systems, machines and equipment.

Water-use components

To Use This Product Safely

Be sure to read before use.
Refer to "Sensors/Controllers (RJ-008AA)" for general precautions.

Individual Precautions: Integrated unit for water control WXU series

Design / Selection

1. Safety design

Warning

■This product cannot be used as an emergency shut-off valve.
The valves listed in this catalog are not designed as valves to ensure safety such as emergency cutoff valves. When using in such a system, always take separate measures that will ensure safety.

■Take measures to prevent physical harm or property damage in the event of breakdown of this product.

Caution

■Liquid ring
When liquid is to be passed, and a circuit of the liquid seal is formed, the pressure could rise due to changes in the temperature and operation may be disabled or some components may be damaged. Prevent a liquid seal circuit by providing a relief valve in the system.

■Vibration
Install this product in a place not subject to vibration.

2. Working fluid

Warning

■About Operating Fluid
Do not use any fluid other than the working fluids specified in the catalog.

■Fluid quality
Iron rust and debris in the fluid can cause operation faults or leaks and deteriorate product performance. Provide measures to remove foreign matter.

■Fluid temperature
Use the product within the fluid temperature range.

3. Working environment

Warning

■Only explosion-proof solenoid valves and air operated valves can be used in an explosive atmosphere.
Select either an explosion-proof solenoid valve or air operated valve for use within an explosive atmosphere.

■Do not use this product in a corrosive gas atmosphere or an atmosphere that could affect the component materials.

■Do not use this product near a heat generating source or in a location where it may be exposed to radiant heat.

■Use this product within the specified ambient temperature range.
Even if the ambient temperature is within the specified range, do not use this product in a location where rapid changes in temperature can occur.

■When you use the products in a cold climate, take necessary measures to prevent freezing.

4. Securing Space

Caution

■Securing maintenance space
Secure sufficient space for maintenance and inspection.

■Be sure to secure the product by using the mounting screws for in-block, end block and intermediate block.

■Make sure to secure the metal part of the port so that no force is applied to the resin parts when piping. The resin parts could be damaged.

Product-specific cautions for compatible components: Air operated 2-port valve (cylinder valve)

Design / Selection

1. Working fluid

Caution

■External pilot air
①Draining: Compressed air contains a large amount of drainage (water, oil oxides, tar, foreign matter). This is a factor that significantly reduces the reliability of the pneumatic components. For drainage measures, improve air quality by dehumidifying with an after cooler or dryer, removing foreign matter with a filter, and removing tar with a tar removal filter, etc.
②Pre-lubrication: This series is pre-lubricated, so no lubricator is required. However, once lubrication has been started, it must be continued so that the lubricant does not run out. Use turbine oil Class 1 ISO VG32 (#90) or equivalent for lubrication.
③Filter: Install a filter with a 5 μm or less filter element.

Product-specific cautions for compatible components: Karman vortex flow rate sensor for water WFK3000 Series

Design/Selection

1. Working environment

Caution

■ Vibration / Shock

Avoid use where the unit is subjected to vibration of 20 m/s² or more, or shock of 98 m/s² or more. Since the detection principle uses Karman vortices, this may cause malfunction or damage.

Vibration 20 m/s² or more ×

Shock 98 m/s² or more ×

■ Hardware check and other internal settings are performed during the first two seconds or so after turning ON the power. Display and output do not function normally during this period. Particularly, if a transistor output is used in the control of an interlock circuit, an abnormal stop may occur. Mask the output during this period.

Product-specific cautions for compatible components: Capacitance electromagnetic flow sensor WFC Series

Design / Selection

Caution

■ Do not exceed the specified range.

■ This product is for fluids that do not corrode water/wetted part materials with conductivity 5 μS/cm (0.5 mS/m) or more. Fluids with low conductivity cannot be detected normally.

■ Do not use with a positive ground.

■ Do not use for applications in direct contact with beverages/foodstuffs/chemical liquids, etc.

■ Do not use in flammable gas atmospheres.

■ Observe the working fluid temperature and use, When using at low temperaturesTake freeze prevention measures such as adding antifreeze.

■ If a fluid with temperature lower than the ambient temperature flows, condensation may form inside the product, which may adversely affect performance. Use the product so that there is no condensation.

■ Observe the working pressure range and use.

■ Observe the rated flow range and use.

■ Cannot be used as a meter for transactions. Does not comply with the Measurement Act, so do not use for commercial transactions. It cannot be calibrated, so use it as an industrial sensor.

■ After the power supply is turned ON, there is a 10-second warm-up period. Do not use display/output during this time.

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

Related Products

Multi-monitor MD Series

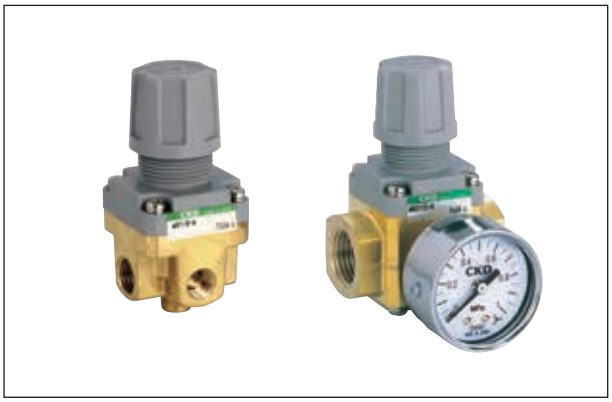
- Compatible with any flow rate and pressure regardless of the sensor
- Analog output proportional to display value is possible
- Easy-to-read 3-color display
- Lock function prevents misoperation
- Saves power with the energy saving mode function
- Indicator of sensor input can be converted to any value with the scaling function

Compact pilot operated solenoid valve for water FWD Series

- Low power consumption
  1/3 compared with conventional models.
- Compact and lightweight
  Materials optimized to realize weight reduction. Approximately one-third for both weight and volume.
- High Flow Rate
  Compared with conventional models, 1.3x or more.

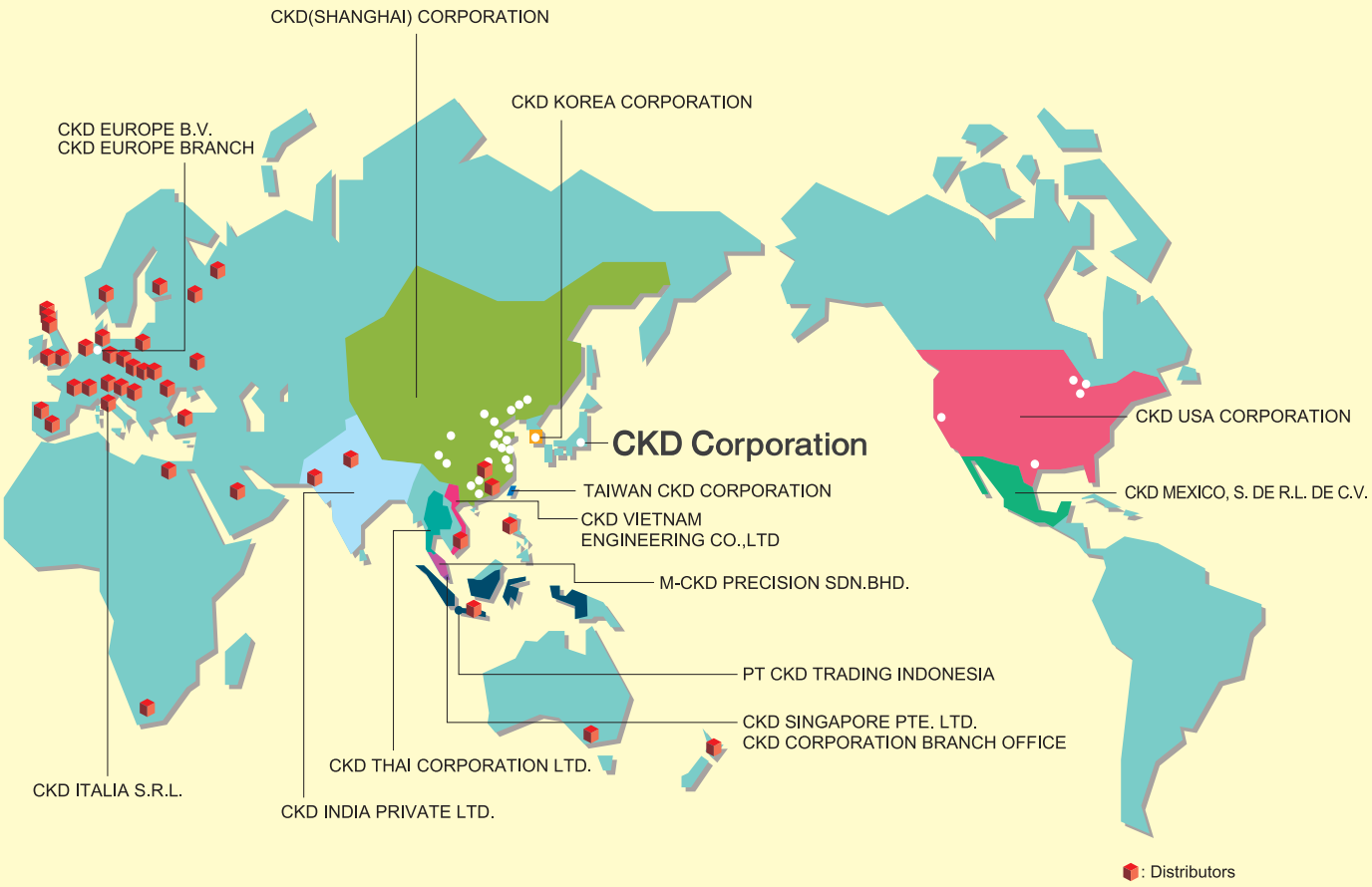
Regulator for water WR Series

- Specially designed knob shape for easy pressure adjustment
- A single push can lock the pressure adjustment knob
- Mesh filter equipped as standard



For details, refer to the CKD component product site (https://www.ckd.co.jp/kiki/en/) -> "Model No.".

WORLD-NETWORK



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2025.8