Integrated unit for water control

WXU

■ Flow rate sensor

CONTENTS

Flow rate sensor

Compact flow sensor (gas)
Compact flow sensor (air)
Compact flow sensor (liquid)
Water Manifold Unit

Ending

Water Manifold Unit **WXU** Series

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

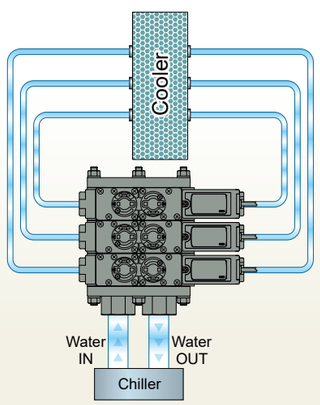
Piping-less footprint
80% reduced
Compact

- No more individual piping work
- Preventing pipe leakage
- Minimizing design and arrangement work

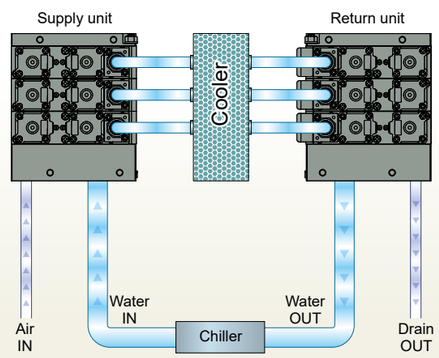
System image

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

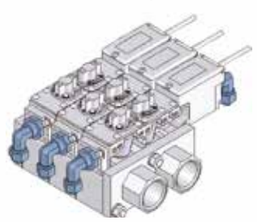
WXU-HC

Casting

WXU-P/J/H

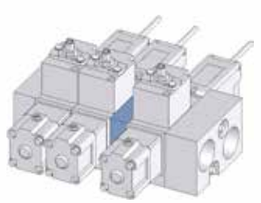
Customization example

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)

Integrated unit for water control One-fluid control

WXU-H/HC Series

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

RoHS

Model No. Notation Method

- Karman vortex flow rate sensor

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

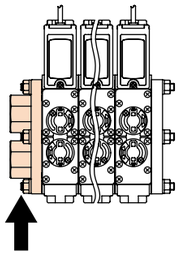
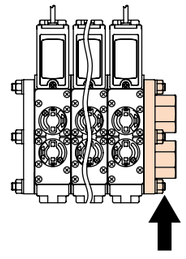
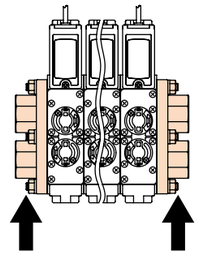
Model No. / ❶Station No. / ❷In-block position / ❸Port size (branching port) / ❹Flow rate range for flow sensor / ❺Flow rate sensor output (1) / ❻Flow rate sensor output (2)

When the configuration of all one-station assembly machines is identical, the entire unit can be displayed in the model number by selecting the codes. When assembling a unit from different configurations of one-station assembly components, specify the configuration in "Manifold specifications" (Page 509) for configuration.

❶Station No.

Code	Description
2	2 stations
to	to
10	10 stations

❷In-block position

Code	L	R	W
Description	Left	Right	Both sides
Layout			

❸Port size (branching port)

Code	Description
10	Rc3/8
15	Rc1/2

❹Flow rate range for flow sensor

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

❺Flow rate sensor output (1)

❻Flow rate sensor output (2)

Code	Description	Description				
		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

When the configuration of all one-station assembly machines is identical, the entire unit can be displayed in the model number by selecting the codes. When assembling a unit from different configurations of one-station assembly components, specify the configuration in "Manifold specifications" (Page 510) for configuration.

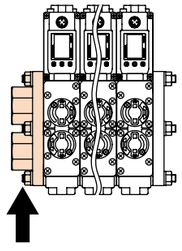
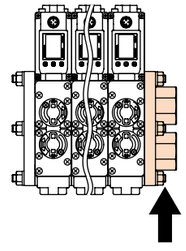
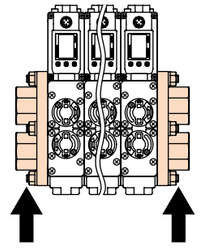
WXU-HC - 6 - L - 10 - 150 - N - V - C3

Model No. / ❶Station No. / ❷In-block position / ❸Port size (branching port) / ❹Flow rate range for flow sensor / ❺Switch Output / ❻Analog Output / ❼Cable

❶Station No.

Code	Description
2	2 stations
to	to
10	10 stations

❷In-block position

Code	L	R	W
Description	Left	Right	Both sides
Layout			

❸Port size (branching port)

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

❹Flow rate range for flow sensor

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

❺Switch Output

Code	Description
N	NPN transistor output
P	PNP transistor output

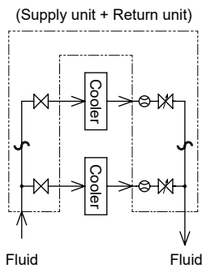
❻Analog Output

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

❼Cable

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

Application examples



A single unit serves as supply and return units of coolant piping. Each circuit can be controlled separately. Adjust flow rate by using the valve at return side.

Common specifications

Item		WXU-H/HC
Working fluid		Water/hot water
Working pressure MPa		0 to 0.7
Proof pressure (water pressure) 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 / explosive gas
Flow rate adjusting range %		0 to 100 (water) [with closing function]
Station No.		2 to 10 stations
Mounting orientation		Unrestricted
Sealant		Fluoro rubber
Port size	IN/OUT port	Rc1
	Branching ports	Rc3/8 or Rc1/2

Weight

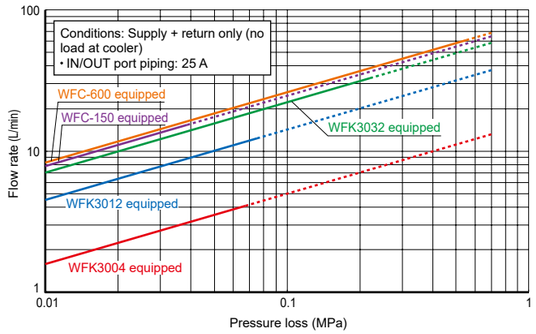
In-block (kg)	0.67
End block (kg)	0.63
One-station assembly (kg)	0.76
One-station assembly (WFC equipped)(kg)	1.00

Flow Characteristics

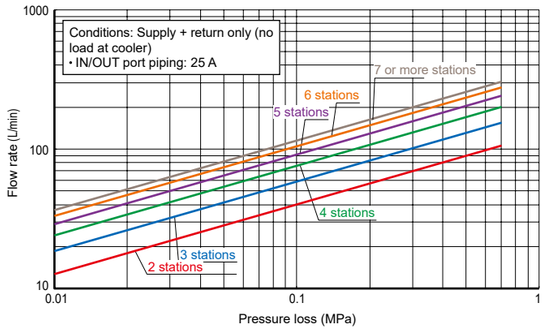
Supply/drain category	Configuration Flow rate sensor	Cv	Kv value *1
Supply side (one station)	-	3.00	2.60
Return side (one station)	WFK3004	0.35	0.30
	WFK3012	1.05	0.91
	WFK3032	1.80	1.56
	WFC-150	2.10	1.82
	WFC-600	2.30	2.00

*1: Refer to Kv values on Intro Page 11.
*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 513.)

●One station

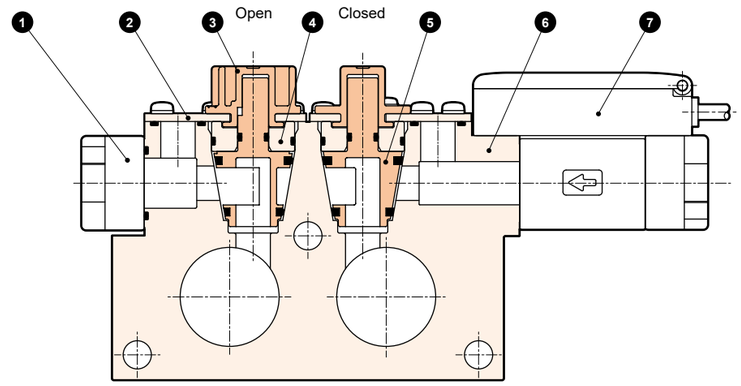


●Overall unit



Internal Structure Diagram / Material

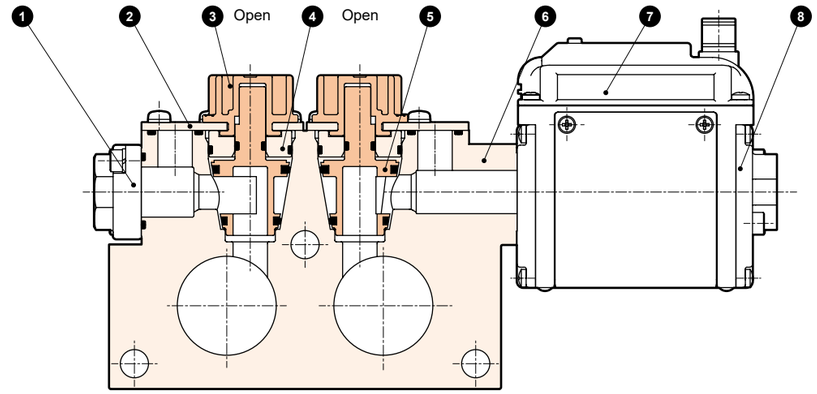
●Karman Vortex Flow Sensor WXU-H



[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 Fluoro rubber
6	Base	PPS	Polyphenylene sulfide
7	Flow rate sensor [WFK3000 Series]		

●Electromagnetic flow sensor WXU-HC

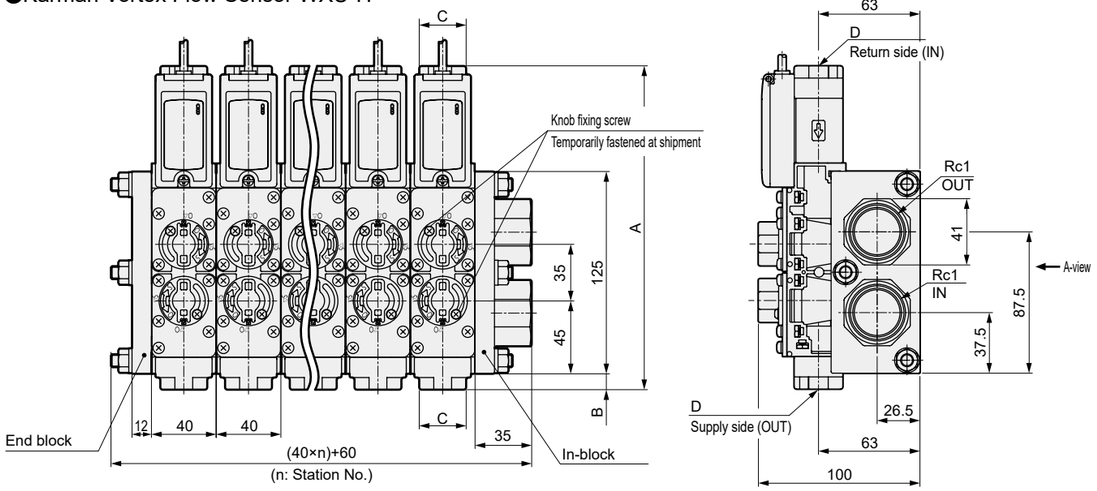


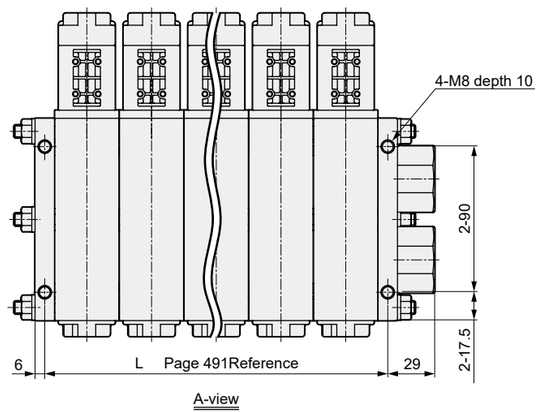
[Valve is fully opened at shipment.]

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 Fluoro rubber
6	Base	PPS	Polyphenylene sulfide
7	Flow rate sensor [WFC Series]		
8	Socket	CAC804 or C6931	Brass

Dimensions

●Karman Vortex Flow Sensor WXU-H



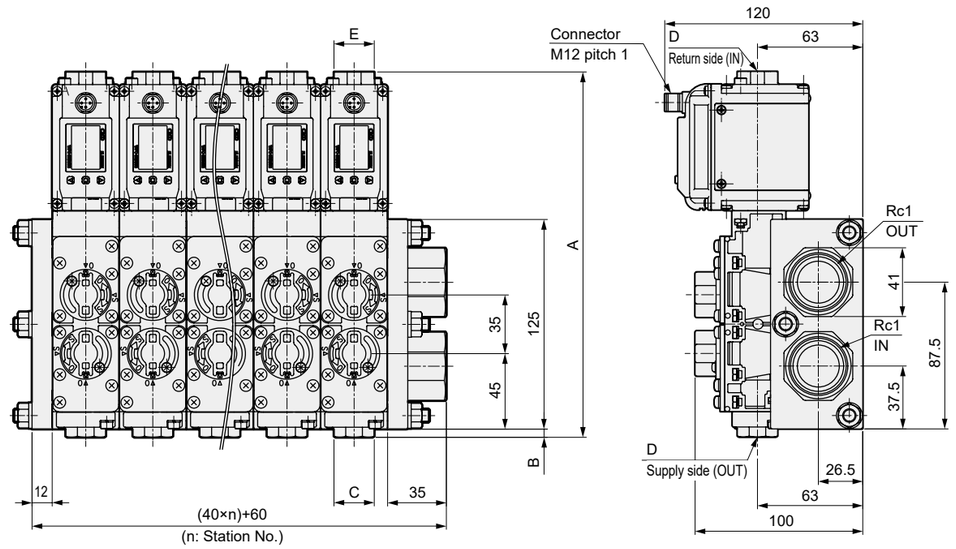


A-view

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

Dimensions

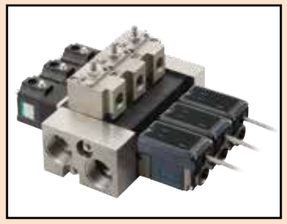
●Electromagnetic flow sensor WXU-HC



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

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

RoHS

Model No. Notation Method

When the configuration of all one-station assembly machines is identical, the entire unit can be displayed in the model number by selecting the codes. When assembling a unit from different configurations of one-station assembly components, specify the configuration in "Manifold specifications" (Page 511) for configuration.

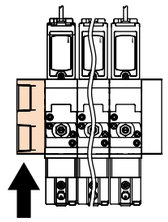
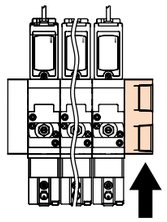
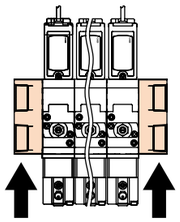
WXU-J - 6 - L - 25 - B1 - 15 - 12 - A0N0

- Model No.
- ❶Station No.
- ❷In-block position
- ❸Port size(IN/OUT port)
- ❹Valve actuation
- ❺Port size (branching port)
- ❻Flow rate range for flow sensor
- ❼Flow rate sensor output (1)
- ❽Flow rate sensor output (2)

❶Station No.

Code	Description
2	2 stations
to	to
10	10 stations

❷In-block position

Code	L	R	W
Description	Left	Right	Both sides
Layout			

❸Port size (IN/OUT port)

Code	Description
20	Rc3/4
25	Rc1

❹Valve actuation

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

❺Port size (branching port)

Code	Description
10	Rc3/8
15	Rc1/2

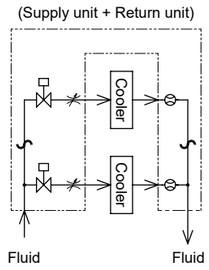
❻Flow rate range for flow sensor

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

❼Flow rate sensor output (1)

Code	Description	❽Flow rate sensor output (2)				
		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 DCto5V	●	●	●	●	●
A1	4 to 20 mA DC	●	●	●	●	●
A2	1 DCto5V	●	●	●	●	●
A3	0 DCto10V	●	●	●	●	●
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]



A single unit serves as supply and return units of coolant piping. Each circuit can be controlled separately.

Common specifications

Item		WXU-J
Working fluid		Water/hot water
Working 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 / explosive gas
Flow rate adjusting range %		0 to 100 (water) [with closing function]
Station No.		2 to 10 stations
Mounting orientation		Unrestricted
Sealant		Fluoro rubber
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

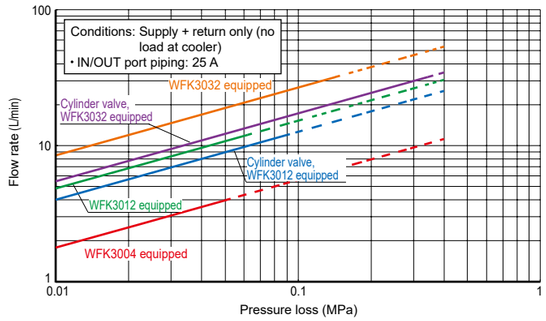
In-block (kg)	Port size	–
	20 A	1.30
	25 A	1.20
End block (kg)		1.05
One-station assembly (kg)	Supply side Cylinder valve	–
	Large flow rate specifications	1.29
	None	1.05

Flow Characteristics

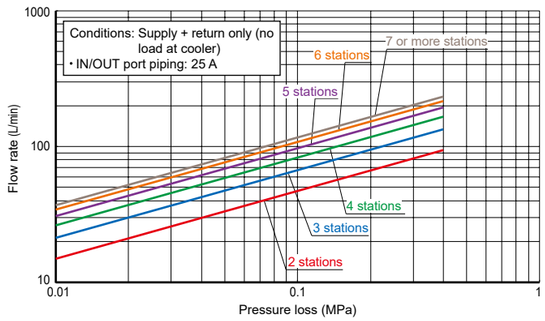
Supply/drain category	Configuration		Cv	Kv value *1
	Cylinder valve	Flow rate sensor		
Supply side (one station)	Large flow rate specifications	-	1.34	1.16
	None	-	2.51	2.18
Return side (one station)	-	WFK3004	0.41	0.36
		WFK3012	1.18	1.02
		WFK3032	2.82	2.45

*1: Refer to Kv values on Intro Page 11.
*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 513.)

●One station



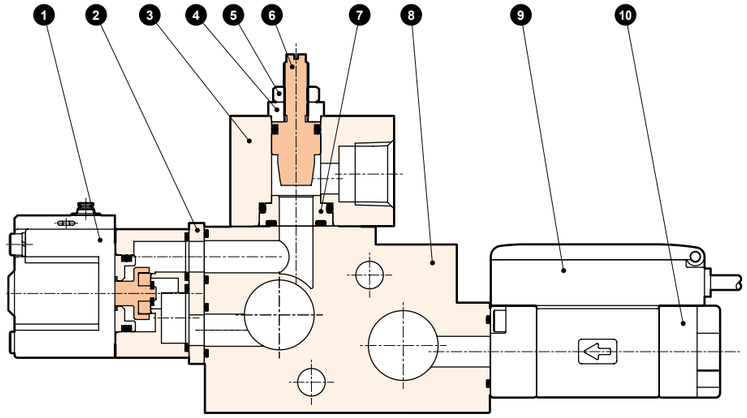
●Overall unit



Internal Structure Diagram / Material

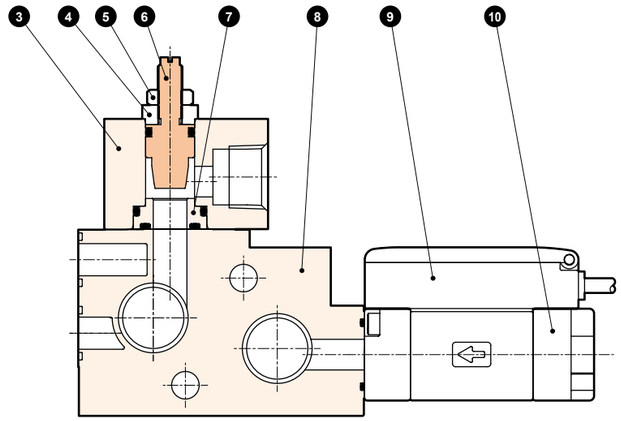
●One-station assembly

・With valve



[Needle is fully opened at shipment.]

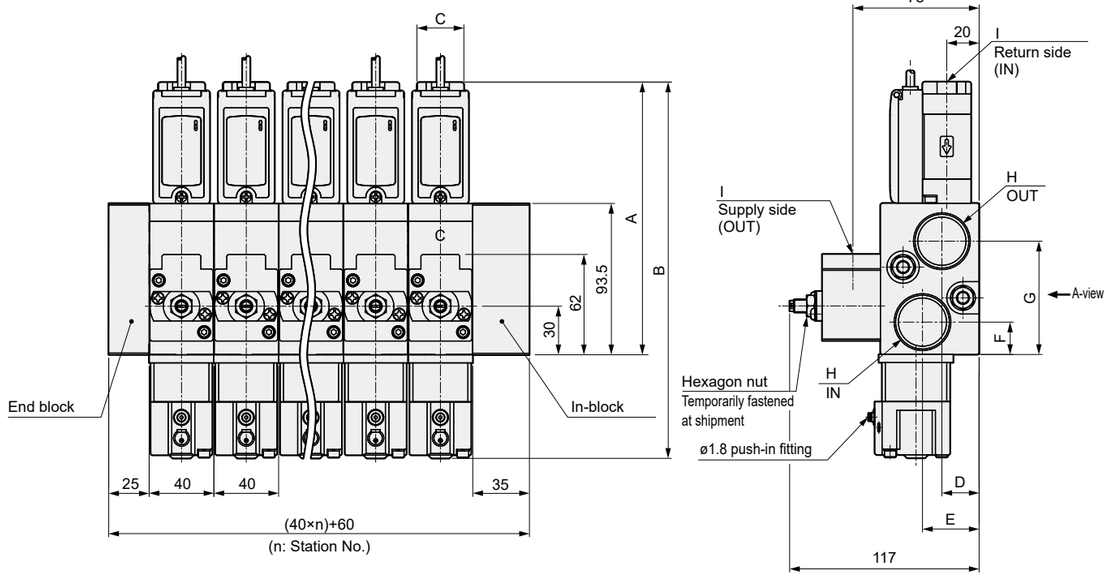
・Without valve

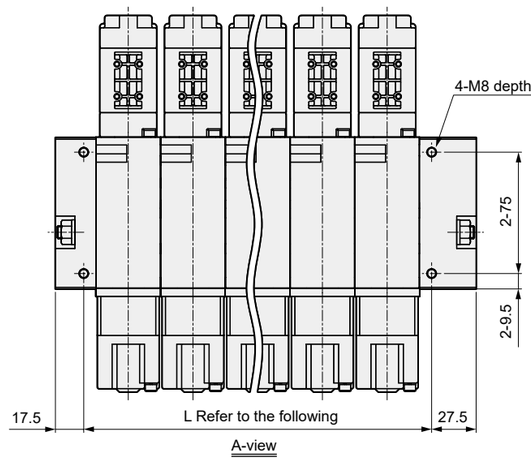


[Needle is fully opened at shipment.]

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 body	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	Hexagon nut	SWCH	Carbon steel for cold rolling	10	Attachment	SCS13	Stainless steel casting

Dimensions



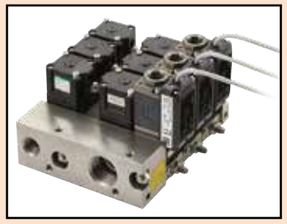


Model No.	A	B	C	D	E	F	G	H	I
WXU-J-□-□-20-□-10-□-□	164	228	24	22	33	24	65	Rc3/4	Rc3/8
WXU-J-□-□-25-□-10-□-□	164	228	24	23	35	20	70	Rc1	Rc3/8
WXU-J-□-□-20-□-15-□-□	169	233	29	22	33	24	65	Rc3/4	Rc1/2
WXU-J-□-□-25-□-15-□-□	169	233	29	23	35	20	70	Rc1	Rc1/2

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

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

RoHS

Model No. Notation Method

When the configuration of all one-station assembly machines is identical, the entire unit can be displayed in the model number by selecting the codes. When assembling a unit from different configurations of one-station assembly components, specify the configuration in "Manifold specifications" (Page 512) for configuration.

WXU-P - R - 6 - L - S - 1 - 1 - N - 15 - 12 - A0N0

- Model No.
- ❶ Supply/drain category
- ❷ Station No.
- ❸ In-block position
- ❹ Valve size for fluid 1
- ❺ Valve actuation for fluid 1
- ❻ Valve actuation for fluid 2
- ❼ Flow rate adjustment function
- ❽ Port size (branching port)
- ❾ Flow rate range for flow sensor
- ❿ Flow rate sensor output (1)
- ⓫ Flow rate sensor output (2)

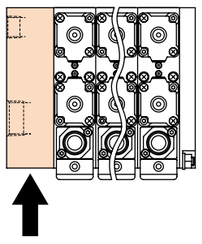
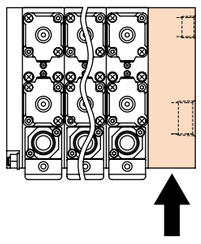
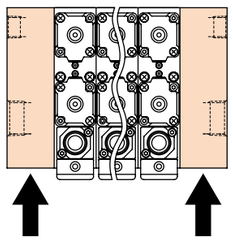
❶Supply/drain category

Code	Description
S	Supply side
R	Return side

❷Station No.

Code	Description
2	2 stations
to	to
6	6 stations

❸In-block position

Code	L	R	W
Description	Left	Right	Both sides
Layout			

❹Valve size for fluid 1

Code	Description
S	Standard specifications
B	Large flow rate specifications

❺Valve actuation for fluid 1

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

❻Valve actuation for fluid 2

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

❼Flow rate adjustment function

Code	Description	
N	With flow rate adjustment function	
0	None	

❽Port size (branching port)

Code	Description
10	Rc3/8
15	Rc1/2

❾Flow rate range for flow sensor

Code	Description
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 (❶ Supply/Drain category "S")

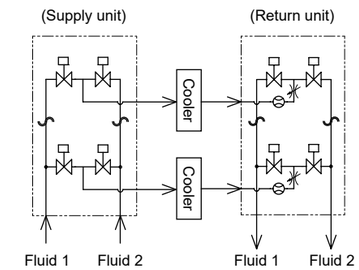
❿Flow rate sensor output (1)

⓫Flow rate sensor output (2)

Code	Description	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)	●				
000	Without flow rate sensor (❶Water supply category "S")	●				

Flow rate sensor
Compact flow sensor (gas)
Compact flow sensor (air)
Compact flow sensor (liquid)
Water Manifold Unit
Ending

Application examples



It enables flow of two kinds of fluid (e.g., water and air). Suitable for systems with both coolant and air purge. Each circuit can be controlled separately.
(2 units are used)

Common specifications

Item		WXU-P
Working fluid		Water, hot water, air
Working 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 / explosive gas
Flow rate adjusting range %		15 to 100 (water)
Station No.		2 to 6 stations
Mounting orientation		Unrestricted
Sealant		Fluoro rubber
Port size	Port for fluid 1	Rc1
	Port for fluid 2	Rc1/2
	Branching ports	Rc3/8 or Rc1/2

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

Weight

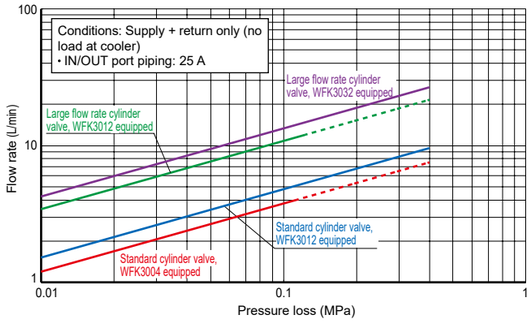
In-block (kg)				2.60
End block (kg)				0.70
One-station assembly (kg)	Supply/drain category	Cylinder valve for fluid 1	Cylinder valve for fluid 2	–
	Supply side	Standard specifications	Standard specifications	0.87
		Large flow rate specifications	Standard specifications	0.90
	Return side	Standard specifications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

Flow Characteristics

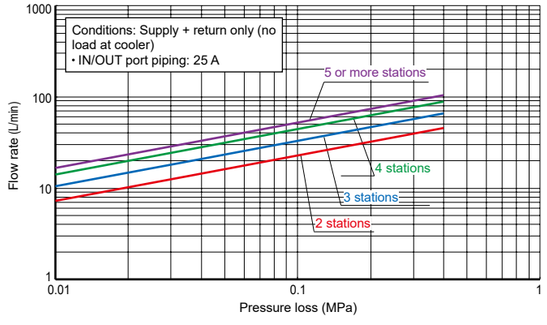
Supply/drain category	Configuration		Fluid 1 side		Fluid 2 side	
	Cylinder valve	Flow rate sensor	Cv	Kv value *1	C[dm3/(s·bar)]	b
Supply side (one station)	Standard specifications	-	0.44	0.38	1.4	0.2
	Large flow rate specifications	-	1.28	1.11	3.0	0.1
Return side (one station)	Standard specifications	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: Refer to Kv values on Intro Page 11.
*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 513.)

●One station

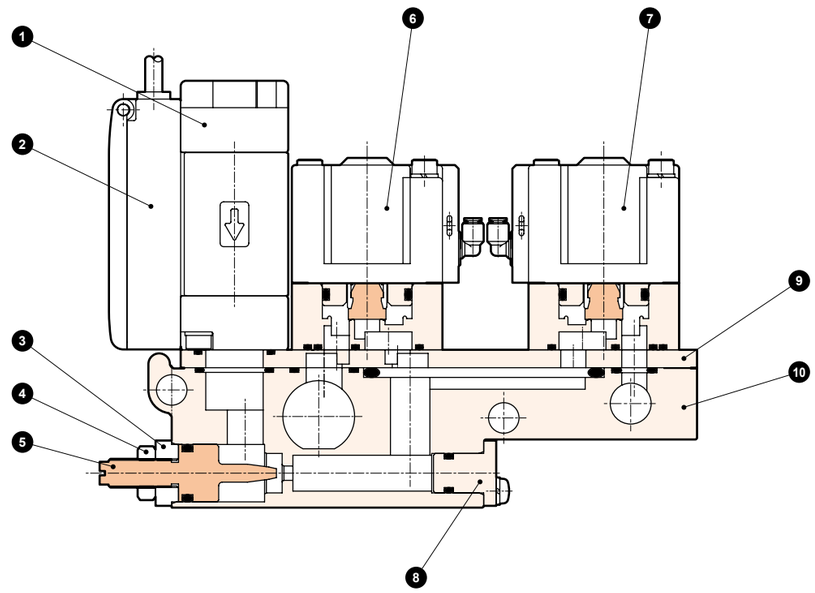


●Overall unit



Internal Structure Diagram / Material

●One-station assembly

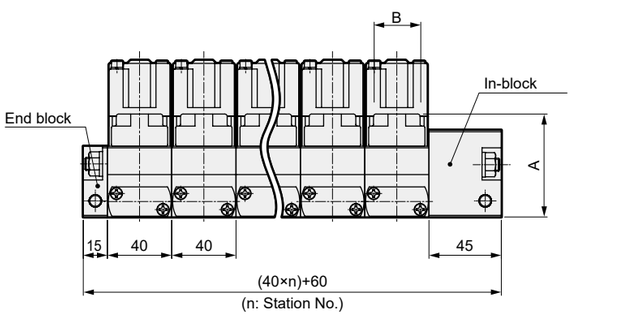


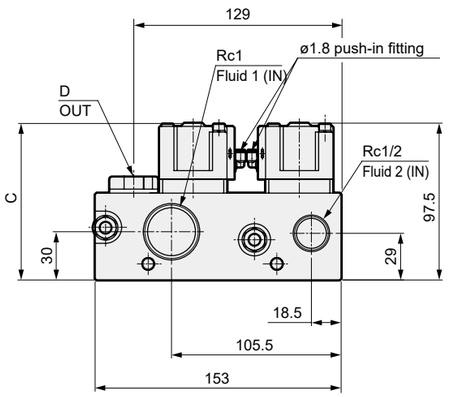
[Needle is fully opened at shipment.]

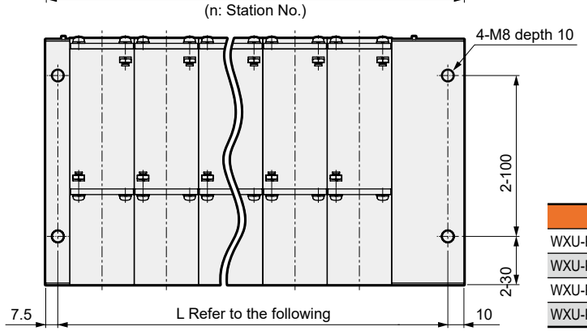
Part No.	Part name	Material	
1	Attachment	SCS13	Stainless steel casting
2	Flow rate sensor [WFK3000 Series]		
3	Needle stopper	SUS304	Stainless steel
4	Hexagon nut	SWCH	Carbon steel for cold rolling
5	Needle	SUS304	Stainless steel
6	Cylinder valve for fluid 1 [GNAB Series]		
7	Cylinder valve for fluid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

Dimensions

●WXU-P-S

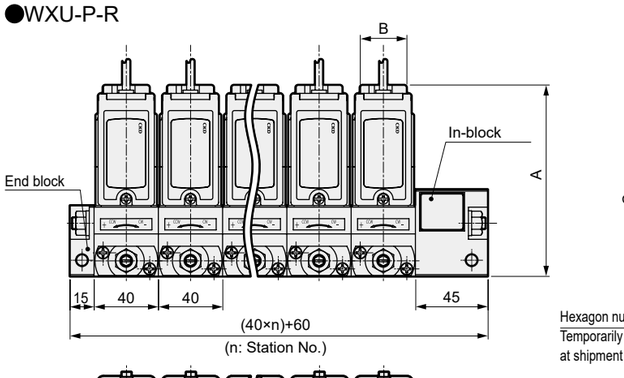


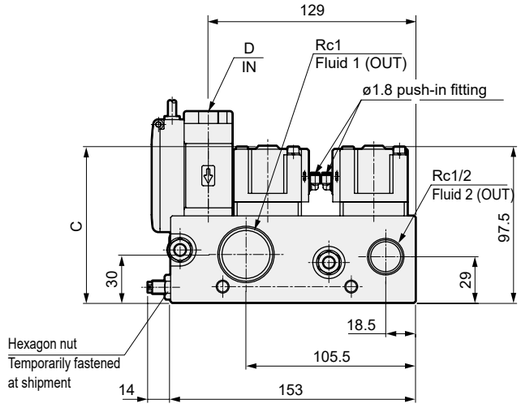


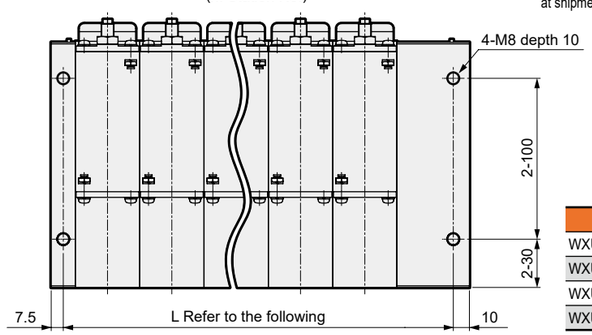


Model No.	A	B	C	D
WXU-P-S-□-□-S□□-□-10-□-□	59	24	97.5	Rc3/8
WXU-P-S-□-□-B□□-□-10-□-□	59	24	103	Rc3/8
WXU-P-S-□-□-S□□-□-15-□-□	64	29	97.5	Rc1/2
WXU-P-S-□-□-B□□-□-15-□-□	64	29	103	Rc1/2

●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

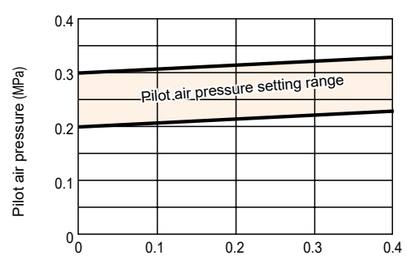
Specifications of mounted devices

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	ø1.8 push-in fitting for air fiber (Please inquire separately 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

■ WFK30□□S Flow sensor part specifications (sensor)
• Flow rate sensor output (1): -A0, -A1, -A2, -A3
• Flow rate sensor output : 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% (max. 80 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	Indicator	Instantaneous flow rate 2-digit LED display		
	Analog Output	-A0: 0 to 5 DC, -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 : -N0, -N1, -P0, -P1
• Flow rate sensor output : 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	Indicator	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)		

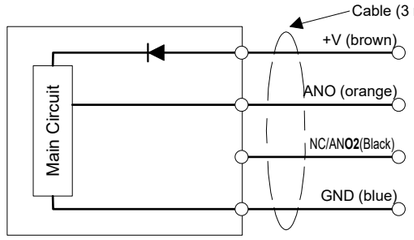
Flow rate sensor wiring method

- Always read the safety precautions before wiring.
- The cable is a 4-conductor cabtyre cable with a core wire of 0.2 m㎡ made by Correns Corporation.
- Option

Sensor (Analog output)	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)

*Sensor/switch alarm output is one point.

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

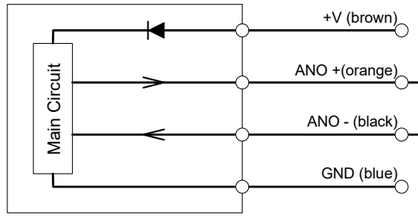


… DC power supply plus, connect to [+]: 12 to 24 VDC ±10%(Option A3: 15 to 24 VDC ±10%)

… Analog output: Output voltage proportional to flow rate

...Standard: NC

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



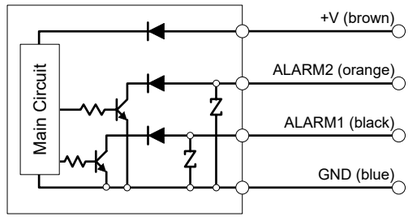
…DC power supply plus, connect to [+]: 12 to 24 VDC±10%

...Connect to 4-20 mA input device

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

Note: 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)



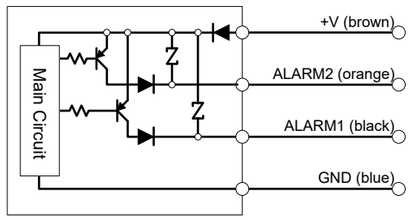
… Connect to [+] of DC power supply: 12 to 24 VDC±10%

...Switch 2 (OUT2) output: max. 30 VDC, 50 mA

...Switch 1 (OUT1) output: max. 30 VDC, 50 mA

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

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



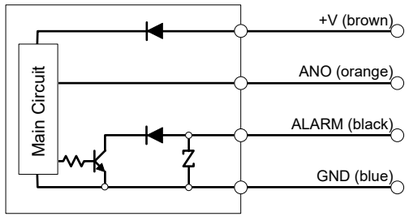
… Connect to [+] of DC power supply: 12 to 24 VDC±10%

… Switch 2 (OUT2) output : max. 50 mA

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

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

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



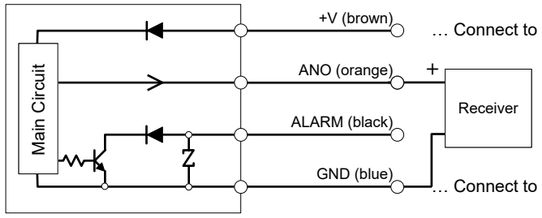
… Connect to DC power supply [+]: 12 to 24 VDC ±10% (Option A3 is 15 to 24 VDC±10%)

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

...Switch (OUT) output: max. 30 VDC, 50 mA

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

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



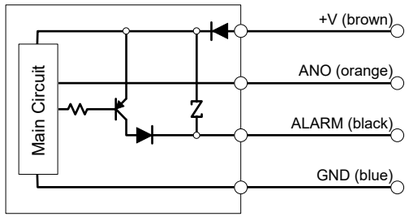
… Connect to [+] of DC power supply: 12 to 24 VDC±10%

...Connect to 4-20 mA input device

...Switch (OUT) output: max. 30 VDC, 50mA

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

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



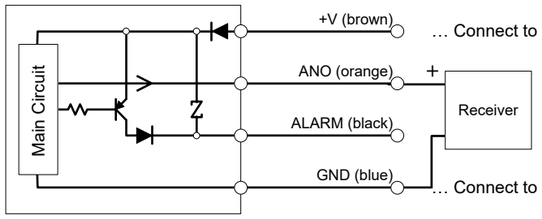
… Connect to DC power supply [+]: 12 to 24 VDC ±10% (Option A3 is 15 to 24 VDC±10%)

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

...Switch (OUT) output: max. 30 VDC, 50 mA

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

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



… Connect to [+] of DC power supply: 12 to 24 VDC±10%

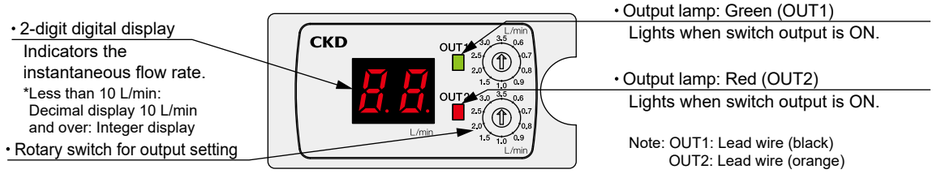
...Connect to 4-20 mA input device

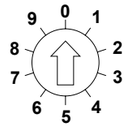
...Switch (OUT) output: max. 30 VDC, 50mA

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

Functions

●Switch (WFK30□□M)

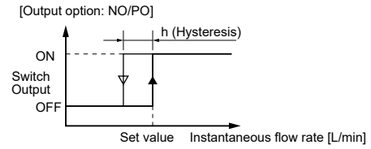


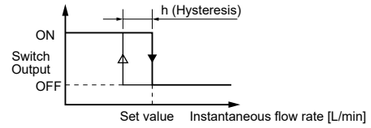


Allows you to set the switch output setting in 10 steps.
- Use a precision screwdriver, etc., to set the rotary switch. Be extremely careful, since applying excessive force to the rotating part may result in contact failure.
- Use the cylinder by making sure that the arrow aligns with the scale.

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

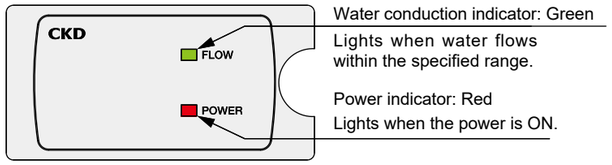




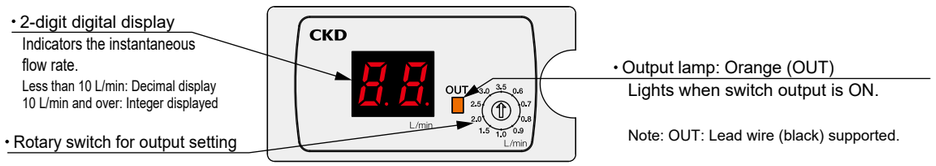
Switch output setting value [L/min]

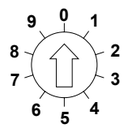
Rotary switch contact number	Model		
	WFK3004M	WFK3012M	WFK3032M
1	0.6	2.0	5.0
2	0.7	3.0	9.0
3	0.8	4.0	12
4	0.9	5.0	14
5	1.0	6.0	16
6	1.5	7.0	18
7	2.0	8.0	21
8	2.5	9.0	24
9	3.0	10	27
0	3.5	11	30
Hysteresis	0.1	0.5	1.0

●Sensor (WFK30□□S)



●Sensor / Switch (WFK30**C)

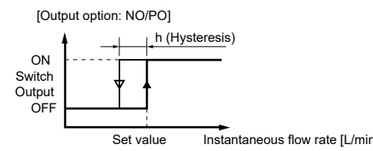


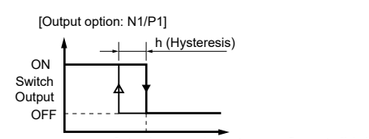


Allows you to set the switch output setting in 10 steps.
- Use a precision screwdriver, etc., to set the rotary switch. Be extremely careful, since applying excessive force to the rotating part may result in contact failure.
- Use the cylinder by making sure that the arrow aligns with the scale.

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





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

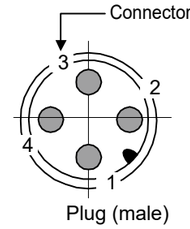
Item			150 (WFC-150)	600 (WFC-600)
Rated flow range			0.5 to 15 L/min	2.0 to 60 L/min
Available fluid conductivity			5 μs/cm or more	
Repeatability *1			±6.0% F.S	
Response time *2			0.25 s, 0.5 s, 1 s, 2 s, 5 s (default 1 s)	
Switch Output			NPN or PNP transistor output	
	Max. load current		50 mA	
	Max. applied voltage		30 VDC	
	Internal voltage drop		NPN: 2.0 V or less PNP: 2.4 V or less	
Analog Output		Output voltage	Voltage output: 1 to 5 V Load impedance: 50 kΩ or more	
		Output current	Current output: 4 to 20 mA, 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

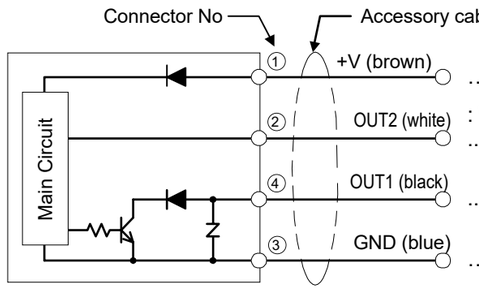
- Always read the safety precautions before wiring.

Connectors used are VA connectors (model No.: TM-4DSX3HG4) made by Correns Corporation. Specifications: For DC, 4 conductor 0.5 mm²
Cable model No.: TM-4DSX3HG4
L-type cable model No.: VA-4DLX3HG4



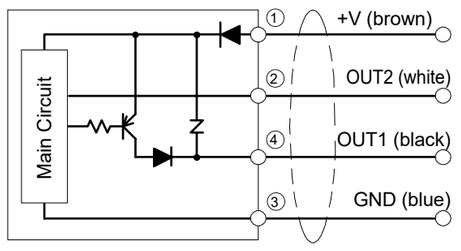
	Switch output	Analog Output
-NV	NPN transistor output	1 to 5 [V]
-NA		4 to 20 [mA]
-PV	PNP transistor output	1 to 5 [V]
-PA		4 to 20 [mA]

1) -NV,-NA



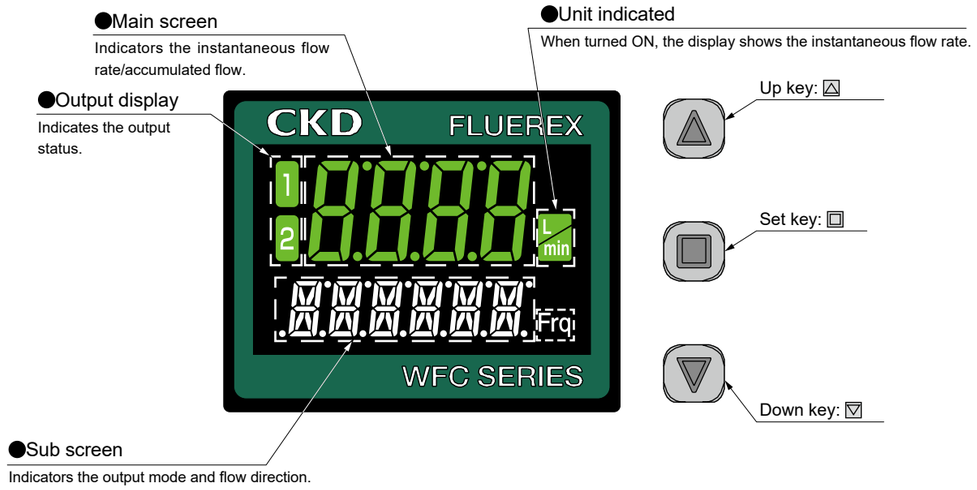
… DC power supply plus [+]: 24 VDC±10%
: Voltage outputs current in proportion to flow rate
...Analog output/switch input/Remote zero adjustment or accumulation reset
...Switch output (NPN): max. 30 VDC 50 mA
… Connect to [-] of DC power supply: 0 VDC

2) -PV, -PA



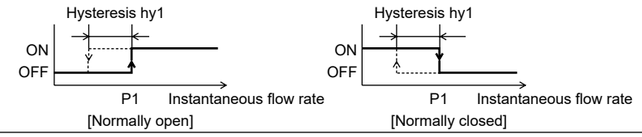
… DC power supply plus [+]: 24 VDC±10%
: Voltage outputs current in proportion to flow rate
...Analog output/switch input/Remote zero adjustment or accumulation reset
...Switch output (PNP): max. 50 mA
… Connect to [-] of DC power supply: 0 VDC

Functions

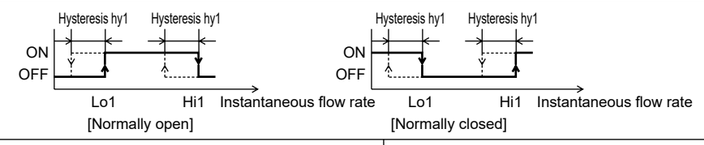


Output mode and output operation

(1) Hysteresis mode

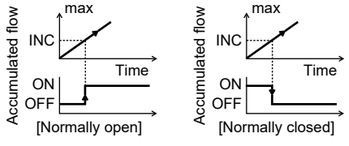


(2) Window comparator mode

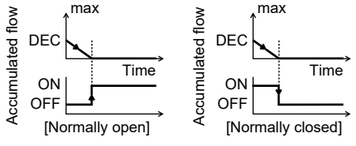


(3) Accumulated output mode

●Increment mode

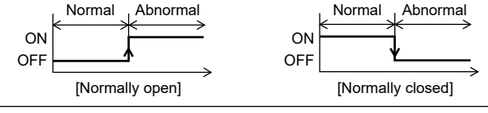


●Decrement mode

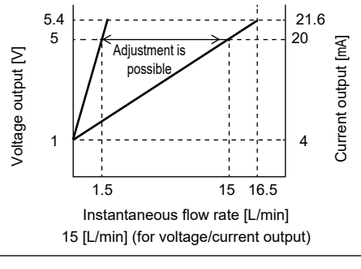


(4) Integrated pulse output

(5) Alarm output mode



(6) Analog 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	Accumulated units can be switched to "L", "kL", "ML" with up key: ▲ and down key: ▼.			

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, □ is confirmed.
Hysteresis mode	△ or ▽ ⇄ □: △ or ▽ set judgment value, □ and to confirm.
Accumulated output mode	□ + ▽ ⇄ □: Integrated value is reset with □.
Analog output mode	△ or ▽ ⇄ □: △ or ▽ change F.S. with, and to □ confirm.
Flow direction	△ or ▽ ⇄ □: △ or ▽ to change flow direction, and □ to confirm.
Total integrated value reset	□ + ▽ ⇄ Reset by □. △ or ▽ can be canceled.
Setting key lock	Normal screen ⇄ △ + ▽ (Hold down for 2 seconds or more) / 1 second after setting: △ or ▽ to change, and □ to confirm.

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.	Layout 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 product for integrated unit for water control]	NC	**GNAB-X2144-5**		○	○	○					3
	NO	**GNAB-X2190-5**					○	○			2
	Masking plate	-									
Cylinder valve at fluid 1 side [Dedicated product for integrated unit for water control]	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 rate sensor [Dedicated product for integrated unit for water control] (Return side only)	Select from the following and enter in the table at right. (Refer to the specifications of the on-board components on Page 501)										
		WFK30 04 15 - A0 Blank		○							1
	Flow rate range: 04/12/32	**WFK30** 32 15 - A3 Blank			○	○					2
	Port size: 10/15	**WFK30** 04 15 - N0 Blank					○				1
	Flow rate sensor output (1)(2): Refer to *1 (table below).	**WFK30** 32 15 - P0 N0						○			1
		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.)	-		○	○	○	○	○			5
Partition plug	Fluid 1 side	-					○				1
	Fluid 2 side	-					○				1
Remarks											

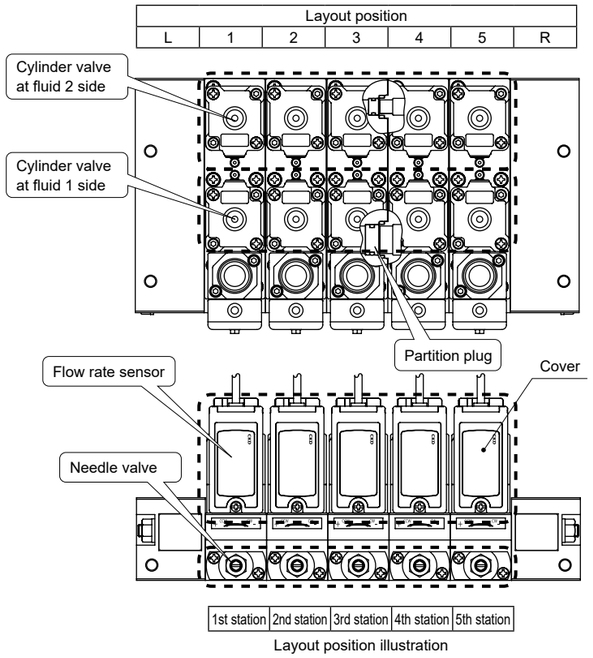
Flow rate sensor: Flow rate range, Port size, Flow rate sensor output (1), (2)

Fill in total quantity.

Specify device to be mounted for each station.

*1: Output variations of water flow rate sensor

Flow rate sensor output (1)		Flow rate sensor output (2) 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

WXU-H Manifold Specifications

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

Receipt No.	Order No.

Date issued / /

Company

Contact

Purchase order No.

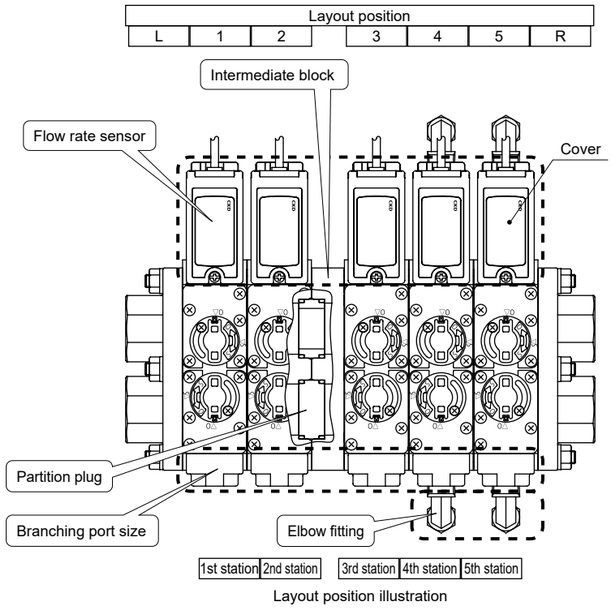
*Layout position is 1, 2... from the left with flow sensor cover facing the front. (Refer to the figure below)

Part name	Specifications		Model No.	Layout position L	1	2	3	4	5	6	7	8	9	10	R	Quantity
In-block	Rc1		-													
End block	-		-													
Flow rate sensor [Dedicated product for integrated unit for water control] (Return side only)	Select from the following and enter in the table at right. (Refer to the specifications of the on-board components on Page 501)		**WFK30** Flow rate range Port size - Flow rate sensor output (1) (2)													
	Flow rate range: 04/12/32		**WFK30**													
	Port size: 10/15		**WFK30**													
	Flow rate sensor output (1)(2): Refer to *1 (table below)		**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 x 6.99	L1N3/8-PT3/8-S												
		1/2	12.70 x 9.56	L1N1/2-PT1/2-S												
Remarks																

Flow rate sensor: Flow rate range, Port size, Flow rate sensor output (1), (2)

*1: Output variations of water flow rate sensor

Flow rate sensor output (1)		Flow rate sensor output (2) 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

WXU-HC Manifold Specifications

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

Receipt No.	Order No.

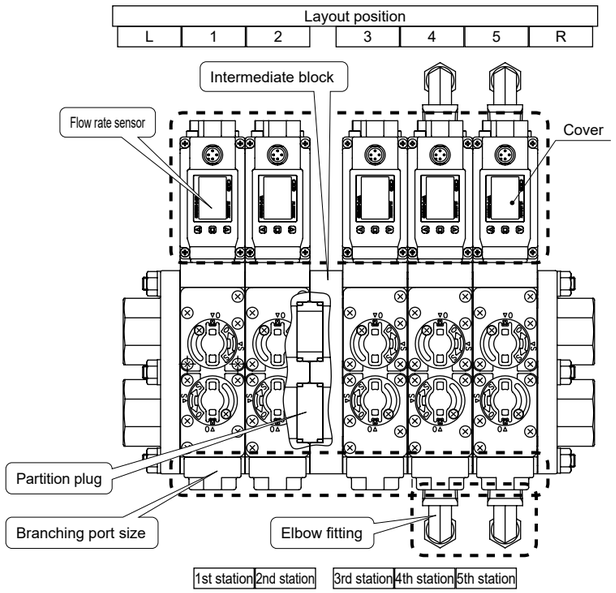
Date issued / /
Company
Contact
Purchase order No.

*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.				Layout position L	1	2	3	4	5	6	7	8	9	10	R	Quantity
In-block	Rc1		-																
End block	-		-																
Flow rate sensor [Dedicated product for integrated unit for water control]	Select from the following and enter in the table at right.			Flow rate range / Port size		Output													
	●Flow rate range / Port size: 150-10 W, 600-15 W ●Output: Refer to *1 (table below).		WFC-	-	-														
			WFC-	-	-														
			WFC-	-	-														
			WFC-	-	-														
			WFC-	-	-														
	Port only For	Rc3/8	-																
		Rc1/2	-																
	M12 connector cable		-																
	M12L-connector cable		-																
Branching port size (Supply side OUT port)	Rc3/8		-																
	Rc1/2		-																
Partition plug	Intermediate block (width 20 mm)	Supply side	-																
		Return side	-																
Stainless steel fitting (elbow) insert type	Tube, thread size (inch)	Compatible tube O.D. × I.D. (mm)	Quick seal fittings (NITTA)																
	3/8	9.53 x 6.99																	
	1/2	12.70 x 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 ● Quantity set(s) ● Delivery date: / /

Receipt No.	Order No.

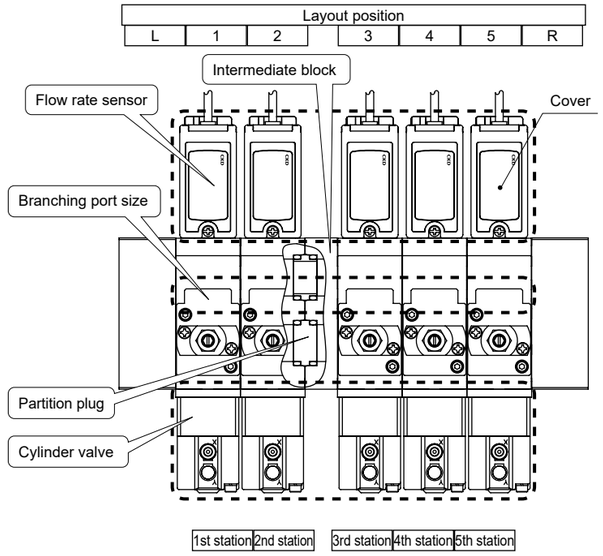
Date issued / /
Company
Contact
Purchase order No.

*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.						Layout position L	1	2	3	4	5	6	7	8	9	10	R	Quantity
In-block	Rc3/4		-																		
	Rc1		-																		
End block	-		-																		
Cylinder valve [Dedicated product for integrated unit for water control]	NC		GNAB-X2225-1																		
	NO		GNAB-X2226-1																		
	Masking plate		-																		
Flow rate sensor [Dedicated product for integrated unit for water control] (Return side only)	Select from the following and enter in the table at right. (Refer to the specifications of the on-board components on Page 501)			Flow rate range	Port size		Flow rate sensor output (1)	(2)													
			WFK30			-															
	Flow rate range: 04/12/32		WFK30			-															
	Port size: 10/15		WFK30			-															
	Flow rate sensor output (1)(2): Refer to *1 (table below).		WFK30			-															
			WFK30			-															
	Port only For	Rc3/8	-																		
		Rc1/2	-																		
Branching port size (Supply side OUT port)	Rc3/8		-																		
	Rc1/2		-																		
Partition plug	Intermediate block (width 20 mm)	Supply side	-																		
		Return side	-																		
Remarks																					

*1: Output variations of water flow rate sensor

	Flow rate sensor output (2)					
		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 to10 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

WXU-P Manifold Specifications

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

Receipt No.	Order No.

Date issued / /

Company

Contact

Purchase order No.

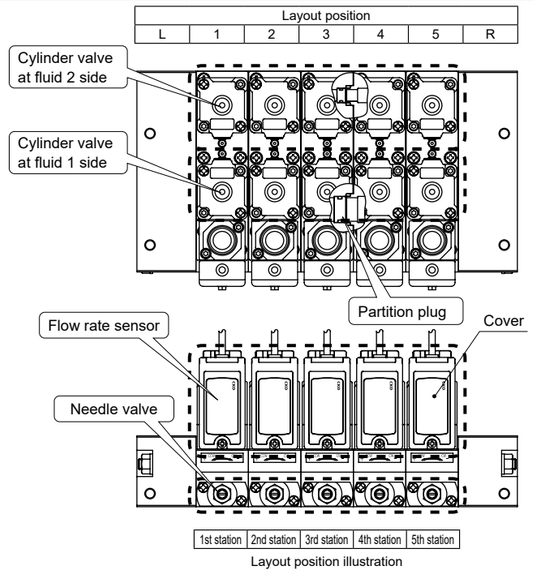
Supply side/Return side

*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.	Layout position L	1	2	3	4	5	6	R	Quantity
In-block	Rc1, Rc1/2	-									
End block	-	-									
Cylinder valve at fluid 2 side [Dedicated product for integrated unit for water control]	NC	**GNAB-X2144-5**									
	NO	**GNAB-X2190-5**									
	Masking plate	-									
Cylinder valve at fluid 1 side [Dedicated product for integrated unit for water control]	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 rate sensor [Dedicated product for integrated unit for water control] (Return side only)	Select from the following and enter in the table at right. (Refer to the specifications of the on-board components on Page 501)	Flow rate range / Port size / Flow rate sensor output (1) / (2)									
		WFK30 -									
	Flow rate range: 04/12/32	**WFK30** -									
	Port size: 10/15	**WFK30** -									
	Flow rate sensor output (1)(2): Refer to *1 (table below).	**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

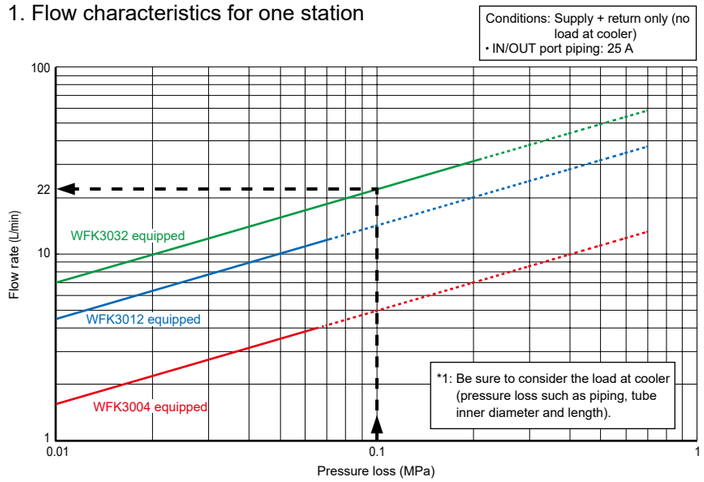
Flow rate sensor output (1)		Flow rate sensor output (2) Not required	Transistor output 1 point NPN a contact	NPN b contact	PNP a contact	PNP b contact
		Blank	N0	N1	P0	P1
A0	0 to 5 VDC	●	●	●	●	●
A1	4 to 20 mA DC	●	●	●	●	●
A2	1 to 5 VDC	●	●	●	●	●
A3	0 to 10 VDC	●	●	●	●	●
N0	NPN transistor output, 2 points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

Reading the Flow Properties Table

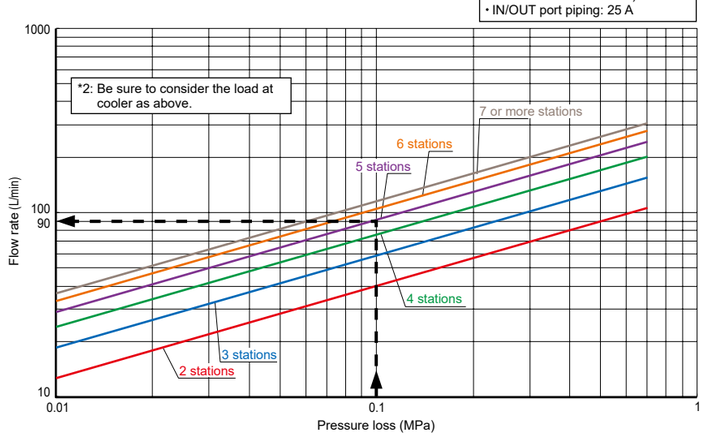
1. Flow characteristics for one station



Example 1:
What is the maximum flow rate when water (specific gravity = 1) flows at △P = 0.15 MPa (P_1-P_2) with WFK3032 mounted on WXU-H type (assume the load on the cooling section 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 (P_1-P_2Max. flow rate when flow is applied with parentheses (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 $\frac{\sqrt{P_1\text{-}P_2}}{\sqrt{G}}$

Q=45.16Cv

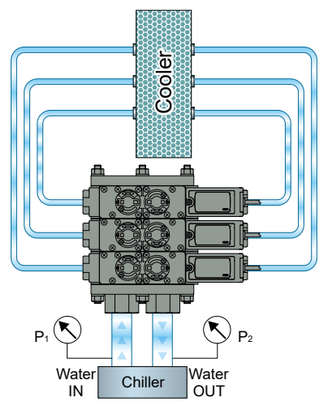
Q: Flow rate L/min

P_1: Primary pressure MPa

P_2: Secondary pressure MPa

G: Specific gravity (water = 1)

Cv: Flow coefficient



Pressure loss
△P
△P=P_1-P_2

Water-use components

Safety Precautions

Be sure to read this section before use.
Refer to Intro 17 for General Precautions.

Product-specific cautions: 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

■Working Fluids
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
Cannot be used outside the specified 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 of 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: Air operated 2-port components (cylinder valve)

Design / Selection

1. Working Fluid

⚠CAUTION

■External pilot air
(1) Draining: 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.
(2) Pre-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.
(3) Filter: Install a filter with a 5 μm or less filter element.

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

Design / Selection

1. Working environment

⚠CAUTION

■Vibration / Impact
For use with Vibration of 20 m/s^2 or more, Shock of 98m/s^2 or more, avoid using the parts above. This may cause malfunction and/or damage, as this product uses the Karman's vortex type detection principle.

× Vibration 20 m/s$_2$ or more × Shock 98 m/s$_2$ or more

■For approximately 2 seconds after power-ON, internal settings such as hardware checks are performed, so the display and output will not operate normally during this time. 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: Capacitance electromagnetic flow components 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). 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. If using at low temperatures, take 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.
■This product cannot be used as a billing meter. Do not use this product for commercial transactions as it is not compliant with the Measurement Act. 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 precautions during mounting, installation, adjustment, use and maintenance, refer to the CKD Components Product Site (https://www.ckd.co.jp/kiki/en/) → "Model No."→ Instruction Manual