TECHNICAL GUIDANCE

FLOW INDICATION WITH ALARM CONTACT

FA4000 Series
FLOW MONITOR

GENERAL

The **FA4000** series is a local indicating flowmeter with an alarm output for liquid measurement. It covers a wide range of applications from as small as 0.1 to 1 L/min to as large as 13 to 130 L/min in measuring range, from 10 mm to 40 mm in size.

FEATURES

❑ COMPACT AND LIGHT DESIGN
FA4000 Series is very much suitable for assembling onto equipment and devices due to its compact and light design.

❑ WATERPROOF CONSTRUCTION
Suitable for opaque liquids or hot pressurized water.

❑ WIDE APPLICATION
Opaque liquid or pressurization hot water is available.

❑ ALARM SET POINT
The alarm set point can be set at the front of the FA4000 Series using the alarm setting pointer in its housing.

❑ QUICK DELIVERY AND COMPETITIVE PRICE
The standardized specification allows reasonable quick delivery time.

STANDARD SPECIFICATION

• Measuring fluid	: Water or Low viscosity liquids
• Measuring range	: (Min.) 0.1 to 1 L/min
	: (Max.) 13 to 130 L/min
• Flow temp.	: 0 to 100°C
	*: It is general data, and the maximum temperature may change by terms of use and environment. (When fluid temperature exceeds 80°C, the material of O-ring is FPM.)
• Fluid press.	: Max. 1.0MPa
• Flow direction	: Bottom to Top, Left to Right, Right to Left,Top to Bottom
• Connection size	: 10mm (3/8") to 40mm (1 1/2")
• Process connection	: Rc, NPT, JIS10K FF, JIS10K RF, ANSI150Lb RF, JPI150Lb RF
• Indication accuracy	: ±5% F.S.
• Alarm setting accuracy	: ±2% F.S.(Against flow calibration)
• Alarm setting range	: 10 to 100% (F.S.)
• Alarm contact	: 1 point (High or Low)
• Alarm reset span	: Less than 15% F.S. (Against flow calibration)
• Alarm switch	: Self holding type
• Contact capacity	: 100 V DC/10W, 125 V AC / 10VA
• Insulation resistance	: 100MΩ or higher at 500 V DC megger
• Withstand voltage	: 1500 V AC (1 min.)
• Alarm setting	: Set by screw (Freely adjustable from housing front)
• Finishing painted	: Metallic silver (Except Stainless steel material)
• Cable entry	: G1/2 (Female thread)
• Wiring connection	: M3 screw terminal
• Housing construction	: Equivalent to IP65 Intrinsically safe (Supplied with safety barrier)
• Installation	: Piping support

RECOMMENDED APPLICATION

❑ Cooling water line
❑ Monitoring of leakage of sealing liquids
❑ Cooling fluids lines in injection moulding machines

BEFORE OPERATING

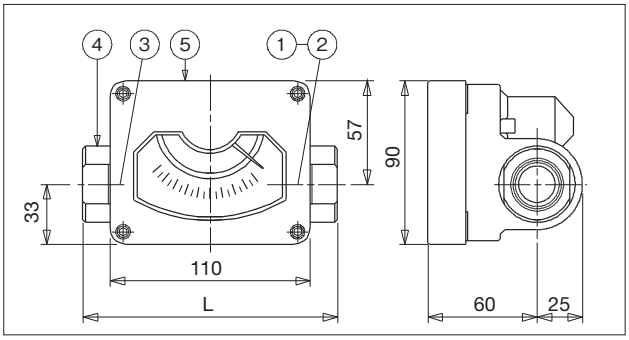
1) The FA4000 Series has a magnet coupling to indicate flow rate. Provide a magnet strainer which is supplied on request in the upstream of the piping to remove the ferrous materials like iron powders if they are contained in the fluid.
2) Add the relay driver to increase the contact capacity if more than the allowable contact capacity of the FA4000 Series is required.
3) Use an intrinsically safe relay if the FA4000 Series with the alarm output is used in the hazardous area.

The magnet strainer, relay driver and intrinsically safety relay mentioned above are available on request. See “OPTIONAL UNIT” at the last page for detail specifications.

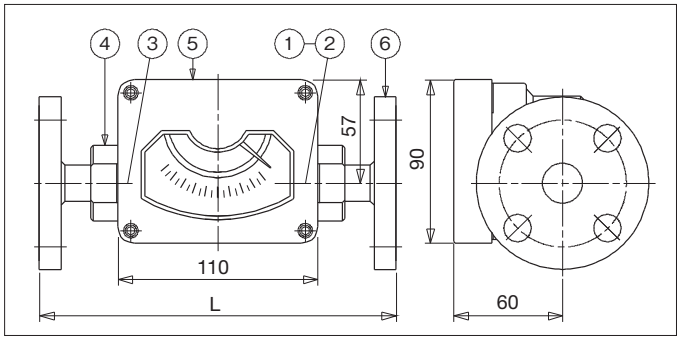
EXTERNAL DIMENSIONS AND MATERIAL

❑ DIMENSION

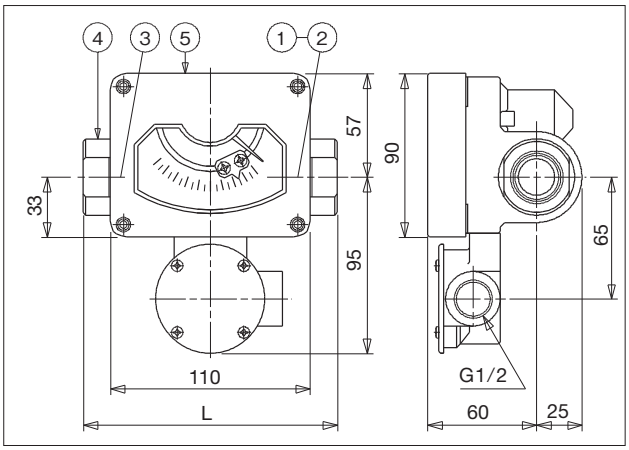
Screw connection without alarm FA4 □□ R(N) - □□□ 0 - A



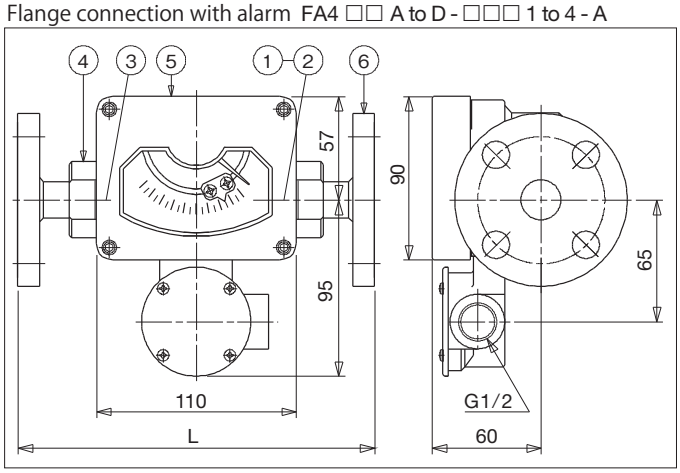
Flange connection without alarm FA4 □□ A to D - □□□ 0- A



Screw connection with alarm FA4 □□ R(N) - □□□ 1 to 4 - A



Flange connection with alarm FA4 □□ A to D - □□□ 1 to 4 - A



❑ Face to face dimension

Flow rate (L/min)	Connection size	Screw connection (L)	Flange connection (L)
Max. 1 to 70	10 mm (3/8") 15 mm (1/2") 20 mm (3/4")	150 mm	220 mm
	25 mm (1")		230 mm
Max. 80 to 130	20 mm (3/4")	200 mm	270 mm
	25 mm (1")		280 mm
	32 mm (1-1/4") 40 mm (1-1/2")		300 mm
Other than above	Consult us for details.		

❑ Approx. pressure loss

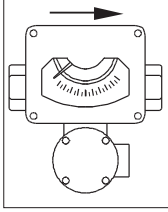
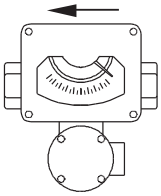
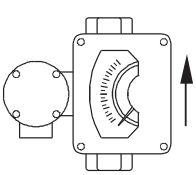
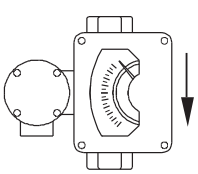
Flow rate (L/min)	Pressure loss (kPa)	Connection size
1	10	15 mm (1/2")
2	10	
5	25	
10	26	
15	19	20 mm (3/4")
20	25	
30	25	
50	39	25 mm (1")
60	46	
70	43	
80	32	40 mm (1-1/2")
100	42	
120	56	
130	68	

❑ MATERIAL

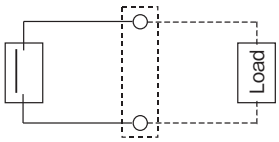
No.	Part name	Material		
		1	2	3
1	Tapered tube	SUS316	SUS316	SUS316
2	Float	SUS316	SUS316	SUS316
3	O-ring	NBR*1	NBR*1	NBR*1
4	Connecting fitting	SCS14A*2	SCS14A*2	SCS14A*2
5	Housing	ADC 12	ADC 12	ADC 12
6	Flange	SS 400	SUS304	SUS316

*1 When fluid temperature exceeds 80°C, the material of O-ring is FPM.
*2 The material of connecting fittings may be replaced by SUS316.

❑ INDICATION DISPLAY DIRECTION (FLOW DIRECTION)

Left to Right	Right to Left	Bottom to Top	Top to Bottom
			

❑ WIRING



Terminal

MODEL CODE

MODEL CODE												Description	
FA4	□	□	□	-	□□	□	□	-	A	/ □□□			
Measuring range	1					1						0.1 to 1 L/min (Applicable when flow direction is bottom to top)	
	2											0.2 to 2 L/min	
	3											0.5 to 5 L/min	
	4											1 to 10 L/min	
	5											1.5 to 15 L/min	
	6											2 to 20 L/min	
	7											3 to 30 L/min	
	8											5 to 50 L/min	
	9											6 to 60 L/min	
	A											7 to 70 L/min	
	B											8 to 80 L/min	
	C											10 to 100 L/min	
	D											12 to 120 L/min	
	E											13 to 130 L/min	
	Z											Consult us for other flow ranges	
Connection size		1										10 mm (3/8")	
		2										15 mm (1/2")	
		3										20 mm (3/4")	
		4										25 mm (1")	
		5										32 mm (1-1/4")	
		6										40 mm (1-1/2")	
Process connection			R									Rc	
			N									NPT (Female)	
			A									JIS 10K FF	
			B									JIS 10K RF	
			C									ANSI Class 150 RF	
			D									JPI Class 150 RF	
			Z									Others	
Material				-	1N							Material 1	Standard material O ring: NBR
				-	2N							Material 2	
				-	3N							Material 3	
				-	1F							Material 1	Standard material O ring: FPM
				-	2F							Material 2	
				-	3F							Material 3	
				-	ZZ							Consult factory for details.	
Flow direction						1						Bottom to Top	
						6						Left to Right	
						7						Right to Left	
						8						Top to Bottom	
Alarm function							0					No alarm contact	
							1					High alarm (High CLOSE)	
							2					High alarm (High OPEN)	
							3					Low alarm (Low CLOSE)	
							4					Low alarm (Low OPEN)	
Version								-	A			Version mark	
Option ✻										/DEG		Non oil treatment	
										/EXn		IS relay (Code "n" indicates the number of contacts) n=1 (for 1 contact), n=2 (for 2 contacts), n=3 (for 3 contacts)	
										/RED		Relay driver (RD-1000)	
										/MnR		Magnet strainer (Rc)	n=1: Size 10 mm (3/8") n=2: Size 15 mm (1/2") n=3: Size 20 mm (3/4") n=4: Size 25 mm (1") n=5: Size 32 mm (1-1/4") n=6: Size 40 mm (1-1/2")
										/MnA		Magnet strainer (JIS10K FF)	
Special											(Blank)	Not provided	
											/Z	Provided	

Note) Insert "/" between each code when the plural codes are selected.
Code example: Flow range 5 to 50 L/min, size 25 mm, Rating JIS 10K FF, Material 2 (O ring : NBR),
Flow direction : Left to Right, Low alarm CLOSE, Magnet strainer 25 mm, JIS 10K FF, IS relay for 2 contacts,
"FA484A-2N63-A/M4A/EX2"

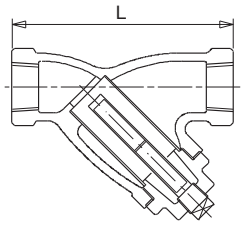
OPTIONAL UNIT

❑ MAGNET STRAINER

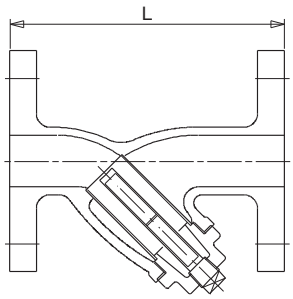
Fluid press. : Max. 1.5MPa
Fluid temp : Max. 200°C
Filter : 80 mesh
Material (Body) : SCS13 or SCS14, Others
(Filter) : SUS304 or SUS316
(Packing) : PTFE

Magnet strainer dimension (mm)

Nominal diameter	A	10 (3/8")	15 (1/2")	20 (3/4")	25 (1")	32 (11/4")	40 (11/2")
Screw	L	70	85	100	115	135	150
Flange	L	-	120	130	150	170	190



Connection rating : Rc



Connection rating : JIS10K FF

Notes on magnet strainer
Above figures and dimensions of magnet strainers are those of JIS 10K FF and Rc threads in connection and SCS13 or SCS14 in body material. The dimensions or appearance may differ if connection or material is different from above.

❑ Relay driver (RD-1000)

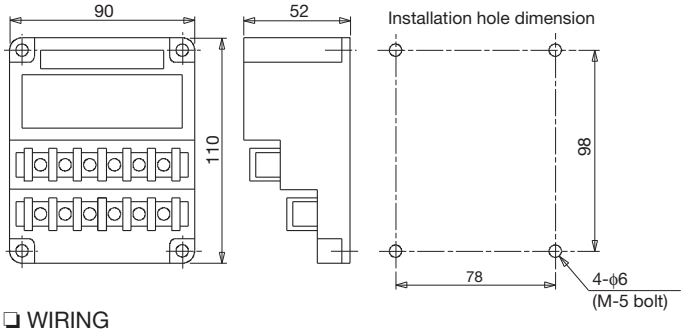
The contact output of FA4000 Series is reed switch contact. In case the contact capacity is not sufficient for the operation, use RD-1000 type RELAY DRIVER for capacity increment. (Separate TECDHNICAL GUIDANCE for RD-1000 RELAY DRIVER is available on request.
This is not intrinsically safety relay for intrinsically safe circuit.

SPECIFICATIONS (RD-1000)

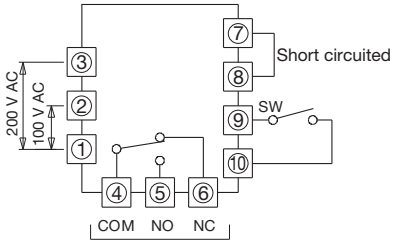
Power supply	100 V AC or 200 V AC ±10%, 50 / 60Hz
Ambient Temp.	-10 to 50°C
Max. supply voltage	12 V DC (Terminal 7-8 or 9-10)
Max. supply current	3 mA DC (Terminal 7-8 or 9-10)
Max. contact voltage	250 V AC, 125 V DC (Terminal 4-5 or 4-6)
Max. contact current	5 A (Terminal 4-5 or 4-6)
Max. value of switch capacity	• 1100 VA AC (Load resistance) • 120 W DC (Load resistance)
Insulation resistance	100MΩ at 500 V DC megger
Withstand voltage	1500 V AC (1 min.)
Power consumption	Less than 2 VA

Switch action (Terminal 9-10)	Relay action	
	NO (Terminal 4-5)	NC (Terminal 4-6)
ON	ON	OFF
OFF	OFF	ON

❑ RD-1000 Outline drawing



❑ WIRING



❑ INTRINSICALLY SAFE RELAY (EB3C)

Intrinsically safe relay is to be inserted into the contact loop of FA4000 Series.
We can supply IS relay on request.

General specification

General specification	100 V to 240 V AC	24 V DC
Acceptable variation rate	-15 to +10%	±10%
Rated frequency	50/60Hz (Allowable range: 47 to 63Hz)	—
Inrush current	10 A (100 V AC) 20 A (200 V AC)	10A
Insulation resistance	10MΩ or more (500 V DC megger, between the same poles as the dielectric strength)	

Flameproof specification

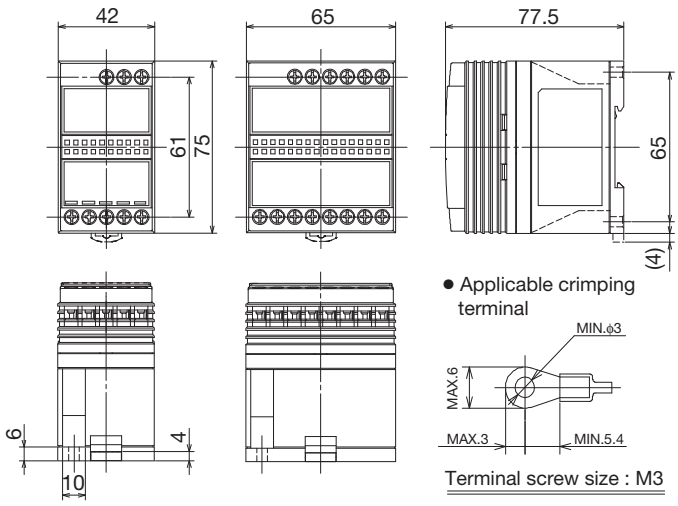
Type of protection	Intrinsically safe (Ex ia ⅡC)
Rated operation voltage	12 V DC±10%
Rated operation current	10 m A DC±20%
Protection class	IP20 (IEC60529)

Non-intrinsically circuit (Relay output)	
Contact configuration	1a contact
Rated insulation voltage	250 V AC / 125 V DC
Rated turning on electricity current	3A
Contact allowable power	750 VA AC / 72 W DC (Resistance load)
Rated load	250 V AC, 3A / 24 V DC, 3 A (Resistance load)

Model code				Description
EB3C-	R	□□	□	Model
Output type	R			Relay output
No. of contact		01		1 point use
		02		2 point use
		03		3 points use
Power supply			A	100 V to 240 V AC, 50/60Hz
			D	24 V DC

❑ EB3C Outline drawing

EB3C-R01□ EB3C-R02□, R03□



● Applicable crimping terminal

Terminal screw size : M3

* Specification is subject to change without notice.

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