NITTOSEIKO
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SUPER ROTARY® FLOW METER

SPECIFICATIONS

SSV10852 21.07

1. Outline

Super Rotary Flow Meter, adopting the microcomputer counter unit on to the rotary piston flow meter which is the simplest construction in the positive displacement flow meter, realize multiple indication and gives wide flow range, high accuracy measuring and improving durability.

2. Features

- Realizing high measuring accuracy of ±0.2%.
- Low pressure loss and easily measuring of high viscosity liquid.
- Realization of long durability with ceramic bearing.
- Alteration of the setting is possible at field by the front switch operation.
- Due to simulated pulse function, easy maintenance at field.
- Total flow rate (total, reset) and instantaneous flow rate (/h, /min, %) are respectively shown on LCD display by MODE switching.
- Alarm for excessive flow rate, upper and lower limit, and battery (Field indication type only) are displayed.
- Output of analogue, pulse and alarm signals. (Output type only)
- Field indication type does not require external power source.
- Explosionproof Field counter type ExiaⅡBT4
  Output type ExdⅡBT4X

3. Specification

Specifications of measuring unit

Nominal size			025		040		050		080		100				
Volume symbol			A0	B0	A0	B0	A0	B0	A0	B0	A0				
Measured fluid			Chemical solutions, food liquids, petroleum, water, etc.												
Nominal size			25A		40A		50A		80A		100A				
Liquid viscosity			0.5～500 mPa·s (Special 0.3 ～30,000 mPa·s)												
Liquid temperature			0～200°C (special -10～200°C for Material symbol S2)												
Liquid pressure			2.0 MPa or under (By flange standards)												
Measuring accuracy			Within ±0.5% or within ±0.2%												
Standard connection	Flange		JIS5K,10K,16K,20K, ANSI class 150, 300 (For the details, see paragraph of "Process connection and face-to-face												
Material	Material symbol	FB	Main body : FC200, Measuring chamber : CAC406, Rotor : PPS, GC, AC												
		FF	Main body : FC200, Measuring chamber : FC200, Rotor : PPS, GC, AC												
		F2	Main body : FC200, Measuring chamber : SCS14A(※1), Rotor : PPS, GC, AC												
		DB	Main body : FCD450, Measuring chamber : CAC406, Rotor : PPS, GC, AC												
		DD	Main body : FCD450, Measuring chamber : FCD450, Rotor : PPS, GC, AC												
		D2	Main body : FCD450, Measuring chamber : SCS14A(※1), Rotor : PPS, GC, AC												
		S2	Main body : SCS14A(※1), Measuring chamber : SCS14A(※1), Rotor : PPS, GC, AC												
	(※1) But only 25A0 become SCS14 FC200: Cast iron; FCD450: Ductile cast iron; CAC406: Cast bronze; SCS14,SCS14A: Stainless steel casting PPS: Special plastic; GC: Carbon; AC: Corrosion-resistant aluminum														

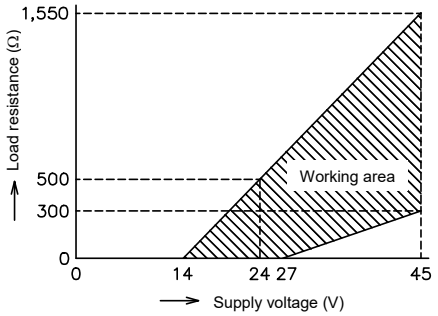
Material & Permissible Pressure	Nominal Pressure	Flange standard	Material symbol	Permissible Pressure (Liquid Temp.～200℃) MPa
	5K	JIS5K	FB/FF/F2 DB/DD/D2/S2	0.5
	10K	JIS10K, ANSI class150		1.0
	16K	JIS16K	DB/DD/D2	1.6
	20K	JIS20K, ANSI class300	DB/DD/D2/S2	2.5

Jacket specifications	Thermal liquid (Hot water, Steam) pressure is 0.5MPa or less. Permissible Temp. 200℃, Permissible Pressure 1.0MPa
Special specifications	Article approved for high-pressure gas service: Only material symbol S2 is manufacturable (up to nominal size 80A).Liquid temperature -10～75℃

Specification of counter unit

Nominal diameter & Volume symbol				025		040		050		080		100
				A0	B0	A0	B0	A0	B0	A0	B0	A0
Type				Field indication type : Without signal output , Output type : Pluse, Alarm, Analog								
Indication	Display unit			Numerical indication: 7-segment LCD 5W x 10H 8-digit, mode/alarm indication: LCD 2H								
	Indicated items	Total flow rate		Unresettable total flow rate: 8-digit (Mode 1), Resettable total flow rate: 8-digit (Mode 4)								
			Unit	×0.01L～×1m³		×0.1L～×1m³				×1L～×1m³		
		Instantaneous flow rate		Instantaneous flow rate (/h): 4-1/2 digit (Mode 2), Instantaneous flow rate (/min): 4-1/2 digit (Mode 3), Instantaneous flow rate (%): 4 digit (Mode 5)								
			Unit (/h)	×1L/h～×0.1m³/h				×0.01～×1m³/h				
			Unit (/min)	×0.01L/min～×1L/min		×0.1L/min～×0.01m³/min						
		Alarm		Alarm for excessive flow rate (OVER), Alarm for upper limit flow rate (HIGH), Alarm for lower limit flow rate (LOW), Battery alarm (BATT) (※1)								
	Switching of indication			Operate by bringing the operating magnet close to the respective switches on the glass face from outside the vessel. POWER: Switches lighting/extinction of the display. MODE: Switches the indicated items. RESET: Resets the resettable total flow rate.								
				(※1) Field indication type only (Note 1) Total flow rate and instantaneous flow rate cannot be displayed at same time. (Note 2) The indicated item (Mode) is switched from outside the case by means of an operating magnet.								
Output (output type only)	Pulse & alarm output	Number of outputs		2 (SIG1, SIG2)								
		Output assignment		To each of SIG1, SIG2, one is selected and assigned from among "Without output", "Unit pulse", "Alarm for excessive flow rate", "Alarm for upper limit flow rate", "Alarm for lower limit flow rate" , "Alarm for upper & lower limit flow", "Alarm for countercurrent" and " Alarm for error".								
		Type of signal		Voltage no-contact or open collector Voltage no-contact output: Signal level H : Approx. equal to voltage of external power source (at no load) L : 0.5V or less (at no load) Output resistance : Approx. 2.3kΩ (short-circuit protection resistance approx. 100Ω) Open collector output Voltage & current: 27VDC, 30 mA Voltage at ON: 0.5V or less								
		Signal logic		Positive or Negative logic Positive logic: Logic 1 at H (transistor: OFF) Negative logic: Logic 1 at L (transistor: ON)								
		Unit pulse	Unit	0.01L/P～1m³/P		0.1L/P～1m³/P				1L/P～1m³/P		
			Signal width	0.5～200.0ms（Standard 1ms）								
	Analogue output	Number of outputs		1								
		Output assignment		Instantaneous flow rate								
		Type of signal		4～20mADC								
		Conversion accuracy		±0.5% full scale								
		Resolution		1/1,000								
		Allowable load resistance		Refer to allowable load resistance.								
	(Note 3) An external power source is required for "Pulse & alarm output" and "Analogue output".											
Power source	Field integration type			Built-in lithium battery (3.6VDC Service life approx. 3 years)								
	Type of output	Pulse & alarm output		External power source required, voltage 12/24VDC, current consumption approx. 17～28 mA (with 12VDC power source), approx. 28～50 mA (with 24VDC power source)								
		Analogue output		External power source required, voltage 14～45VDC, current consumption approx. 22 mA. Refer to allowable load resistance characteristic.								
Ambient temperature				-10～60°C								
Explosionproof				Field counter type: Intrinsic safety type EXia II BT4 (under application) Output type: Flameproof enclosure type Exd II BT4X								
Radiating fin				Single-stage fin in the case where the liquid temperature exceeds 80°C, and double-stage fins in the case where the liquid temperature exceeds 150°C.								
Material				Aluminium alloy casting								

Drawing of allowable load resistance



4. Flow range

Accuracy ±0.5%

Unit(m^3/h)

Nominal diameter & Volume symbol	Operating conditions	0.5mPa·s～ Gasoline	1mPa·s～ Water (normal temperature)	Hot water (60.1~120℃)	2mPa·s～ Kerosene	4mPa·s～ Light oil	10mPa·s～ Heavy oil A	50～500mPa·s Heavy oil B / C
025A0	Continuous	0.3 ～ 1.2	0.3 ～ 1.2	0.3 ～ 1.2	0.16～ 1.2	0.13～ 1.2	0.1 ～ 1.2	0.04～ 1.2
	Intermittent	0.3 ～ 1.6	0.3 ～ 1.6	0.3 ～ 1.6	0.16～ 1.6	0.13～ 1.6	0.1 ～ 1.6	0.04～ 1.6
025B0	Continuous	0.46～ 3.0	0.35～ 2.5	0.35～ 2.5	0.35～ 3.0	0.25～ 3.5	0.14～ 3.5	0.12～ 3.5
040A0	Intermittent	0.46～ 4.0	0.35～ 3.5	0.35～ 3.5	0.35～ 5.0	0.25～ 5.0	0.14～ 5.0	0.12～ 5.0
040B0	Continuous	1.1 ～ 7.2	0.84～ 6.0	0.84～ 6.0	0.84～ 7.2	0.46～ 8.4	0.35～ 8.4	0.25～ 8.4
050A0	Intermittent	1.1 ～ 10.0	0.84～ 8.5	0.84～ 8.5	0.84～ 12.0	0.46～ 12.0	0.35～ 12.0	0.25～ 12.0
050B0	Continuous	2.1 ～ 15.0	1.7 ～ 12.0	1.7 ～ 12.0	1.7 ～ 15.0	0.84～ 17.0	0.7 ～ 17.0	0.53～ 17.0
080A0	Intermittent	2.1 ～ 20.0	1.7 ～ 17.0	1.7 ～ 17.0	1.7 ～ 24.0	0.84～ 24.0	0.7 ～ 24.0	0.53～ 24.0
080B0	Continuous	4.2 ～ 30.0	3.5 ～ 25.0	3.5 ～ 25.0	3.5 ～ 30.0	1.8 ～ 35.0	1.4 ～ 35.0	1.1 ～ 35.0
100A0	Intermittent	4.2 ～ 40.0	3.5 ～ 35.0	3.5 ～ 35.0	3.5 ～ 50.0	1.8 ～ 50.0	1.4 ～ 50.0	1.1 ～ 50.0

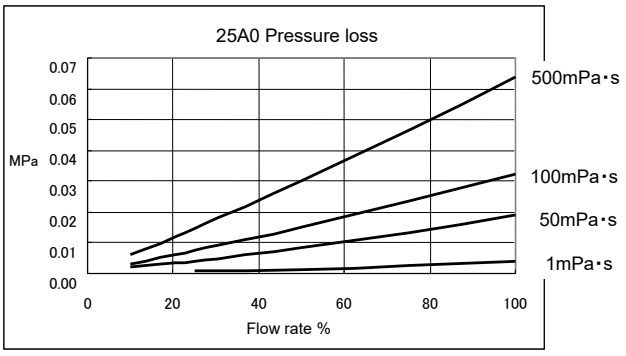
Accuracy ±0.2%

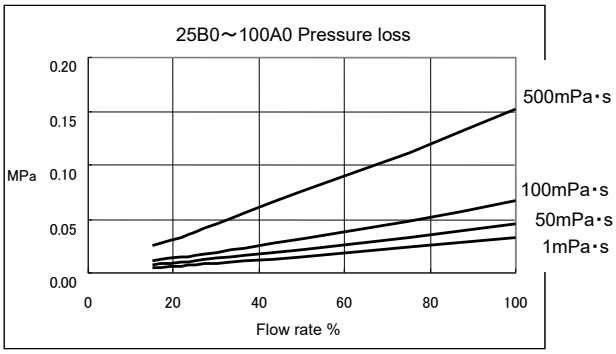
Unit(m^3/h)

Nominal diameter & Volume symbol	Operating conditions	0.5mPa·s～ Gasoline	1mPa·s～ Water (normal temperature)	2mPa·s～ Kerosene	4mPa·s～ Light oil	10mPa·s～ Heavy oil A	50～500mPa·s Heavy oil B / C
025A0	Continuous	0.7 ～ 0.84	0.65～ 0.77	0.6 ～ 0.84	0.4 ～ 0.98	0.3 ～ 0.98	0.2 ～ 0.98
	Intermittent	0.7 ～ 1.2	0.65～ 1.1	0.6 ～ 1.2	0.4 ～ 1.4	0.3 ～ 1.4	0.2 ～ 1.4
025B0	Continuous	1.1 ～ 2.5	0.84～ 2.5	0.8 ～ 2.8	0.42～ 3.5	0.25～ 3.5	0.21～ 3.5
040A0	Intermittent	1.1 ～ 3.5	0.84～ 3.5	0.8 ～ 4.0	0.42～ 5.0	0.25～ 5.0	0.21～ 5.0
040B0	Continuous	2.5 ～ 6.0	2.1 ～ 6.0	2.0 ～ 7.0	1.1 ～ 8.4	0.56～ 8.4	0.49～ 8.4
050A0	Intermittent	2.5 ～ 8.5	2.1 ～ 8.5	2.0 ～ 10.0	1.1 ～ 12.0	0.56～ 12.0	0.49～ 12.0
050B0	Continuous	4.9 ～ 12.0	4.2 ～ 12.0	4.0 ～ 14.0	2.1 ～ 17.0	1.1 ～ 17.0	0.98～ 17.0
080A0	Intermittent	4.9 ～ 17.0	4.2 ～ 17.0	4.0 ～ 20.0	2.1 ～ 24.0	1.1 ～ 24.0	0.98～ 24.0
080B0	Continuous	11.0 ～ 25.0	8.4 ～ 25.0	8.0 ～ 28.0	3.5 ～ 35.0	2.5 ～ 35.0	2.1 ～ 35.0
100A0	Intermittent	11.0 ～ 35.0	8.4 ～ 35.0	8.0 ～ 40.0	3.5 ～ 50.0	2.5 ～ 50.0	2.1 ～ 50.0

(note 1) "Continuous" means a continuous operation of exceeding 8 hour a day, while "Intermittent" means an operation within 8 hours a day.
(note 2) “Please select the nominai size of which 40～60% of Max flow is same as usual flow rate.

5. Pressure loss





Nominal size & volume symbol	Flow rate 100%
025A0	1.6m^3/h
025B0 040A0	5.0m^3/h
040B0 050A0	12.0m^3/h
050B0 080A0	24.0m^3/h
080B0 100A0	50.0m^3/h

6. Process connection and face-to-face dimensions

Unit(mm)

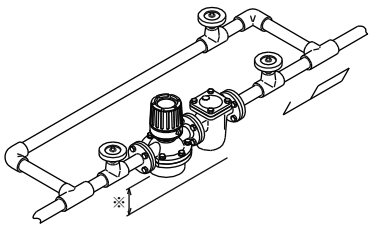
Nominal size&volume symbol	Material symbol	JIS				ANSI, JPI	
		5K	10K	16K	20K	class150	class300
025A0	FB/FF/F2	200	200	--	--	200	--
	DD/D2	200	200	--	204	200	208
	S2	--	200	--	204	200	208
025B0	FB/FF/F2	220	220	--	--	221	--
	DB/DD/D2	220	220	220	224	221	228
	S2	220	220	--	224	221	228
040A0 040B0	FB/FF/F2	300	300	--	--	304	--
	DB/DD/D2	300	300	300	304	304	310
	S2	300	300	--	304	304	310
050A0 050B0	FB/FF/F2	370	370	--	--	378	--
	DB/DD/D2	370	370	370	374	378	384
	S2	370	370	--	374	378	384
080A0 080B0	FB/FF/F2	400	400	--	--	412	--
	DB/DD/D2	400	400	400	408	412	422
	S2	400	400	--	408	412	422
100A0	FB/FF/F2	460	460	--	--	472	--
	DB/DD/D2	460	460	460	472	472	488
	S2	460	460	--	472	472	488

7. Piping method

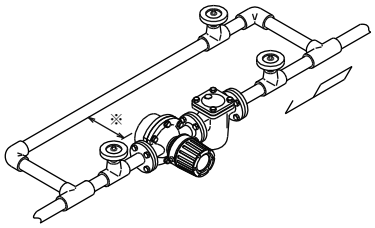
- Install a strainer on the inlet side of the flow meter without fail. To avoid outflow to the downstream side due to damage of internal component parts, install a strainer also on the outlet side of the flow meter.
  (Note) The standard mesh of the strainer element is 60 meshes.
- Install a bypass piping. In designing this bypass piping, take account of protection of the inner elements of the flow meter against the influences of flushing in the early period of operation or discharge of air in the piping as well as ease of maintenance and inspection work.
- Secure a space necessary for inspection, disassembling, etc. of the flow meter in the piping arrangement. Especially, secure a space for enabling disassembling of the measuring chamber of the flow meter.

Example of piping installation

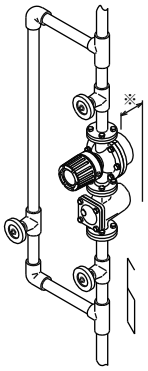
Horizontal piping
(Horizontal installation)



Horizontal piping
(Vertical installation)



Vertical piping

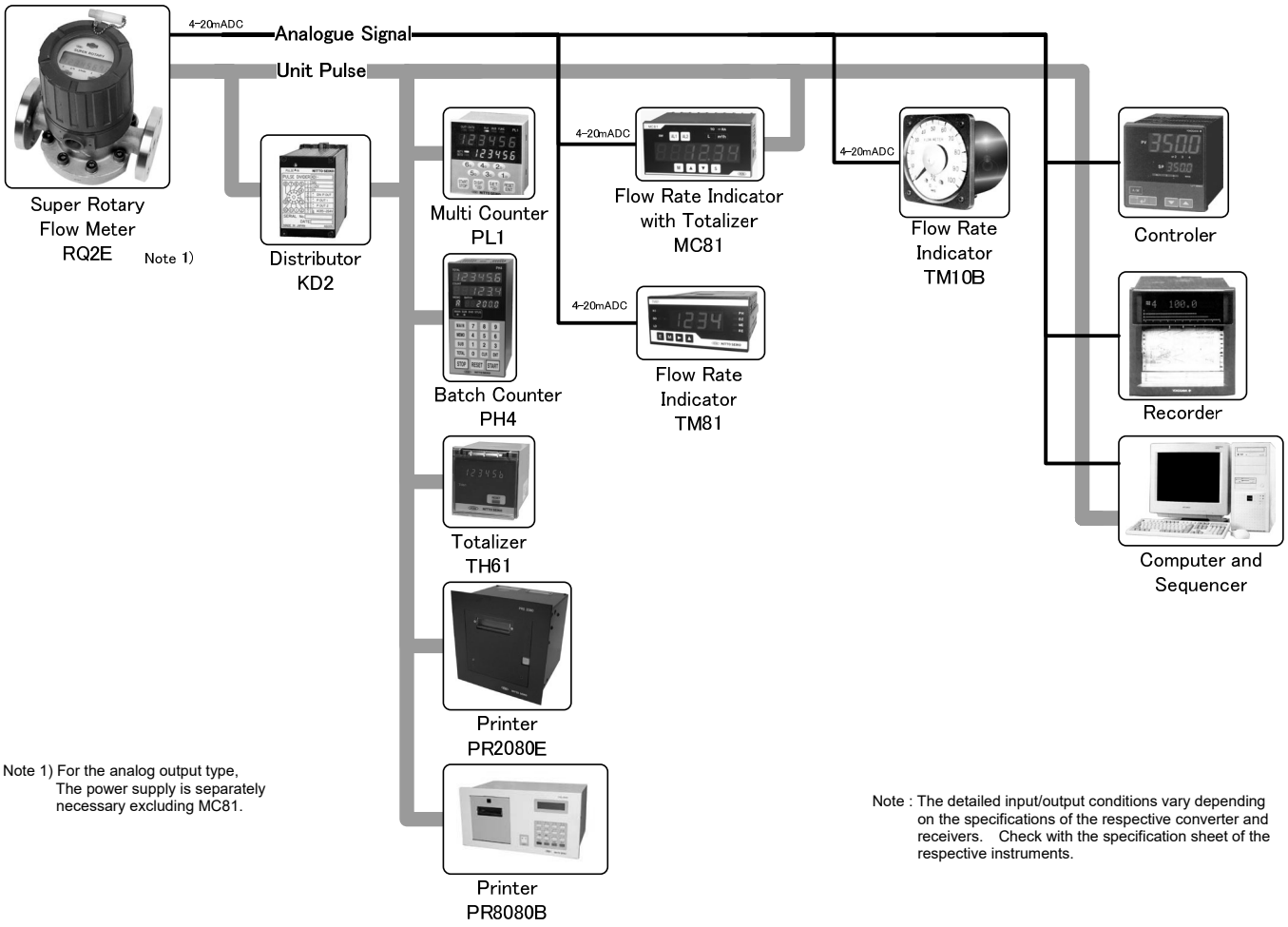


The mark ※ indicates a space necessary for disassembling and inspection.
Install the piping in a way to secure a dimension no small than the figures indicated on the table below.

Unit (mm)

Nominal size & volume symbol	025A0	025B0 040A0	040B0 050A0	050B0 080A0	080B0 100A0
※Dimension	154	192	246	312	444

8. Remote measurement system



Note 1) For the analog output type,
The power supply is separately
necessary excluding MC81.

Note : The detailed input/output conditions vary depending on the specifications of the respective converter and receivers. Check with the specification sheet of the respective instruments.

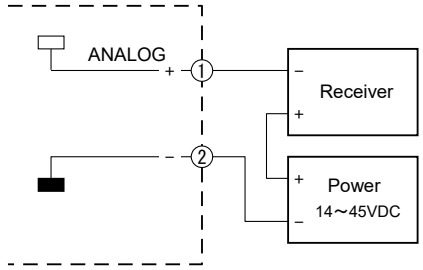
9. Terminal arrangment and wiring

9.1 Terminal arrangement

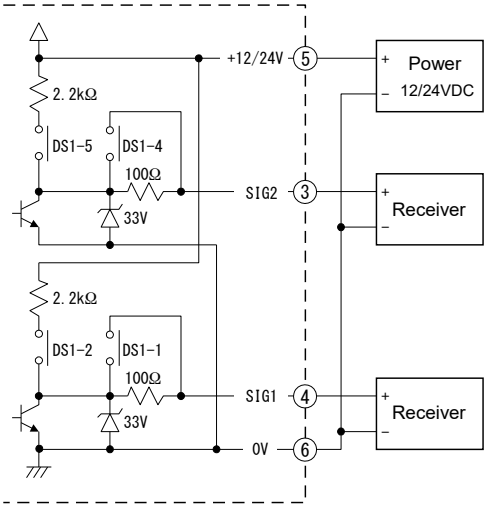
No.	Signal name	
1	＋ ＡＮＡＬＯＧ	Analogue output 4～20 mADC
2	－ ＯＵＴＰＵＴ	
3	ＳＩＧ２	Pulse output or alarm output
4	ＳＩＧ１	Pulse output or alarm output
5	＋１２／２４Ｖ	Power source for pulse & alarm output +12/24 V
6	０Ｖ	

9.2 Wiring

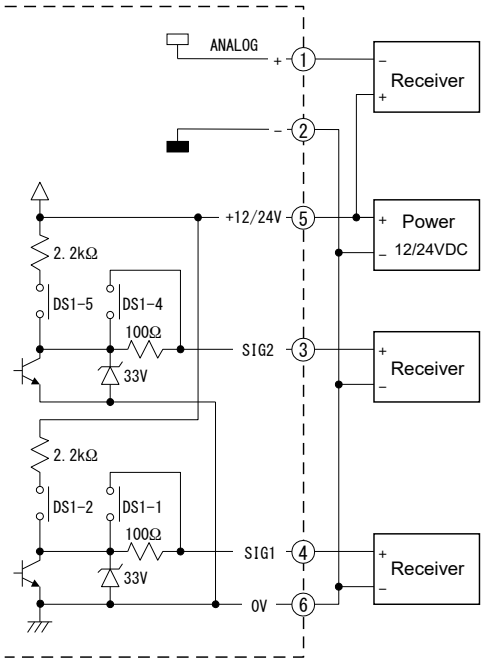
● Connection of analogue output



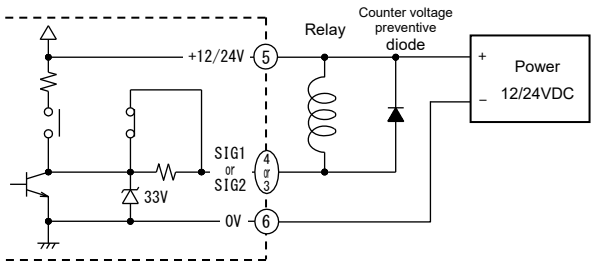
● Connection of pulse and alarm output



● Connection of analog, pulse and alarm output
(Case of power source common to analogue, pulse and alarm)



● Case of connection of relay to pulse and alarm output



※ Set open collector signal (negative logic or positive logic) as kind of output signal of the Super Rotary flow meter.

10. External dimension drawing

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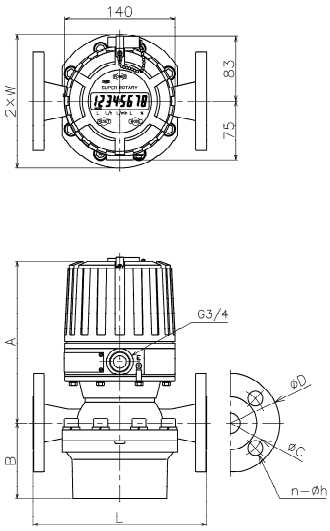
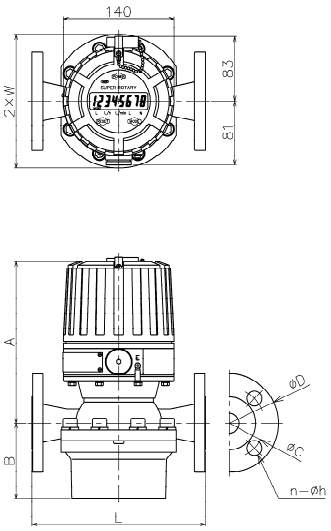
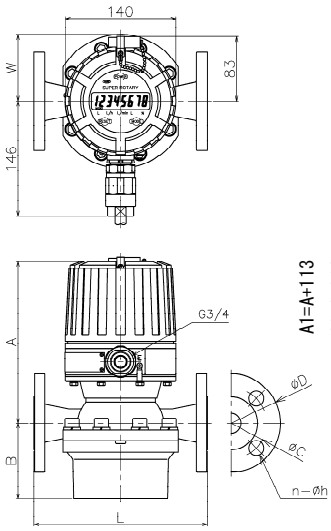
●Non explosionproof output type



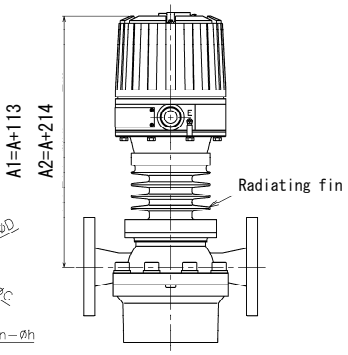
●Non explosionproof field counter type
●Explosionproof field counter type



●Explosionproof output type



●With Radiating fin

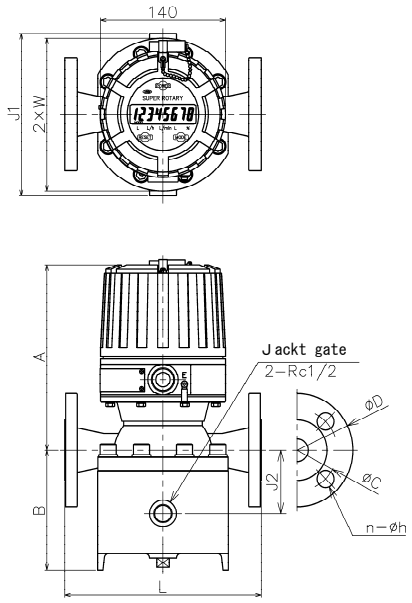


Unit (mm)

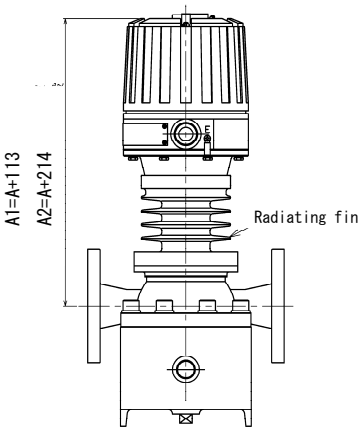
Nominal diameter & symbol	volume symbol	Flange standard	L	A	B	W	D	C	n	h	Approx. weight (kg)
025	A0	JIS10K	200	243	81	75	125	90	4	19	14
		JIS20K	204								15
	B0	JIS10K	220	206	96	85	125	90	4	19	16
		JIS20K	224								17
040	A0	JIS10K	300	206	96	85	140	105	4	19	18
		JIS20K	304								19
	B0	JIS10K	300	217	123	110	140	105	4	19	26
		JIS20K	304								27
050	A0	JIS10K	370	217	123	110	155	120	4	19	28
		JIS20K	374						8		29
	B0	JIS10K	370	203	156	143	155	120	4	19	42
		JIS20K	374						8		45
080	A0	JIS10K	400	203	156	143	185	150	8	19	44
		JIS20K	408				200	160		23	47
	B0	JIS10K	400	209	222	170	185	150	8	19	72
		JIS20K	408				200	160		23	75
100	A0	JIS10K	460	209	222	170	210	175	8	19	75
		JIS20K	472				225	185		23	78

Note) 1. In case of single radiating fin, size is A + 113mm. In case of double radiating fin, size is A + 214mm
2. Shown weight is for material code FF, DD

●Jacket type
Non explosionproof output type



●Jacket type With Radiating fin
Non explosionproof output type



Unit (mm)

Nominal diameter & symbol	volume symbol	Flange standard	L	A	B	W	D	J1	J2	C	n	h	Approx. weight (kg)
025	A0	JIS10K	200	243	116	75	125	158	55	90	4	19	19
	B0	JIS10K	220	206	133	85	125	180	75	90	4	19	20
040	A0	JIS10K	300	206	133	85	140	180	75	105	4	19	22
	B0	JIS10K	300	217	175	110	140	236	96	105	4	19	40
050	A0	JIS10K	370	217	175	110	155	236	96	120	4	19	43
	B0	JIS10K	370	203	209	143	155	300	108	120	4	19	57
080	A0	JIS10K	400	203	209	143	185	300	108	150	8	19	61
	B0	JIS10K	400	209	284	170	185	360	135	150	8	19	105
100	A0	JIS10K	460	209	284	170	210	360	135	175	8	19	108

Note) 1. In case of single radiating fin, size is A + 113mm. In case of double radiating fin, size is A + 214mm
2. Shown weight is for material code S2

11. Product code

RQ □ □ □ □ □ □ □ □ □ □ – □

- Super Rotary flow meter
- Counter symbol
- Nominal size symbol
- Volume symbol
- Material symbol
- Type of generator and pulse unit
- Explosionproof structure
- Additional specification
- Flange standard
- Flange shape
- Auxiliary symbol. (entered by the manufacturer)

●: Standard; ○: Manufacturable; ×: Non-manufacturable

Type	Specification code	Specification		25		40		50		80		100
				A0	B0	A0	B0	A0	B0	A0	B0	A0
RQ		Super Rotary flow meter		●	●	●	●	●	●	●	●	●
Counter symbol	2E	Electronic indication		●	●	●	●	●	●	●	●	●
Nominal size symbol ※1	025	Nominal diameter：25A	For the max. flow rate, refer to "Flow Rate Range Table"	●	●							
	040	Nominal diameter：40A				●	●					
	050	Nominal diameter：50A						●	●			
	080	Nominal diameter：80A								●	●	
	100	Nominal diameter：100A										●
Volume symbol	A0	Capacity: Small		●		●		●		●		●
	B0	Capacity: Large			●		●		●		●	
Material symbol ※1	FB	Body: FC200, Measuring chamber: CAC406, Rotor: PPS, GC, AC		●	●	●	●	●	●	●	●	●
	FF	Body: FC200, Measuring chamber: FC200, Rotor: PPS, GC, AC		●	●	●	●	●	●	●	●	●
	F2	Body: FC200, Measuring chamber: SCS14A, Rotor: PPS, GC, AC		●	●	●	●	●	●	●	●	●
	DB	Body: FCD450, Measuring chamber: CAC406, Rotor: PPS, GC, AC		×	●	●	●	●	●	●	●	●
	DD	Body: FCD450, Measuring chamber: FCD450, Rotor: PPS, GC, AC		●	●	●	●	●	●	●	●	●
	D2	Body: FCD450, Measuring chamber: SCS14A, Rotor: PPS, GC, AC		●	●	●	●	●	●	●	●	●
	S2	Body: SCS14A, Measuring chamber: SCS14A, Rotor: PPS, GC		●	●	●	●	●	●	●	●	●
	But only nominal diameter & capacity symbol 025A0 is not SCS14A but SCS14											
Type of generator and pulse unit	12	Field counter type: Without signal output		●	●	●	●	●	●	●	●	●
	PA	Type of output: With pulse, alarm and analogue output		○	○	○	○	○	○	○	○	○
Explosionproof structure	345	Non-explosion proof		●	●	●	●	●	●	●	●	●
	Y00	Intrinsic safety type Exia Ⅱ BT4 (Transmission symbol：12)		○	○	○	○	○	○	○	○	○
	X00	Flameproof enclosure type Exd Ⅱ BT4X (Transmission symbol：PA)		○	○	○	○	○	○	○	○	○
Additional specification Radiating fin Jacket ※1	0	Radiating fin: Not provided (liquid temperature: -10～80℃), Jacket: Not provided		●	●	●	●	●	●	●	●	●
	1	Radiating fin: 1 stage (liquid temperature: 81～150℃), Jacket: Not provided		○	○	○	○	○	○	○	○	○
	2	Radiating fin: 2 stage (liquid temperature: 151～200℃), Jacket: Not provided		○	○	○	○	○	○	○	○	○
	J	Radiating fin: Not provided (liquid temperature: -10～80℃), Jacket: Provided		○	○	○	○	○	○	○	○	○
	W	Radiating fin: 1 stage (liquid temperature: 81～150℃), Jacket: Provided		○	○	○	○	○	○	○	○	○
	1 stage fin when the liquid temperature exceeds 80 ℃. 2-stage fins if it exceeds 150 ℃											
Flange standard ※1	005	JIS 5K		○	○	○	○	○	○	○	○	○
	010	JIS 10K		●	●	●	●	●	●	●	●	●
	016	JIS 16K (Material symbol：DB,DD,D2,S2 only be selected)		○	○	○	○	○	○	○	○	○
	020	JIS 20K (Material symbol：DB,DD,D2,S2 only be selected)		○	○	○	○	○	○	○	○	○
	AS1	ANSI class 150		○	○	○	○	○	○	○	○	○
	AS3	ANSI class 300 (Material symbol：DB,DD,D2,S2 only be selected)		○	○	○	○	○	○	○	○	○
Flange shape	F	FF flange		×	●	○	○	○	○	○	○	○
	R	RF flange		●	○	●	●	●	●	●	●	●
Auxiliary symbol (entered by the manufacturer)	B	Non-explosion proof type (before June 2019), Explosion proof type		○	○	○	○	○	○	○	○	○
	C	Non-explosion proof type (after July 2019)		●	●	●	●	●	●	●	●	●

※1：Some combination of specification code is not manufacturable.

	specification code	Specification \ Nominal size symbol & Volume symbol / Material symbol	025A0～080A0							080B0, 100A0						
			FB	FF	F2	DB	DD	D2	S2	FB	FF	F2	DB	DD	D2	S2
Additional specification	J	With jacket	×	○	○	×	×	○	○	×	×	○	×	×	○	○
	W	With jacket + Radiating fin	×	○	○	×	×	○	○	×	×	○	×	×	○	○

12. Strainer

To prevent foreign matters mixed in the liquid from penetrating into the flow meter to cause troubles, it is necessary to install a strainer immediately before the flow meter or at a point as close as possible to the inflow side.(Element mesh:60 to 200 mesh)

◆◆◆ Matters to be specified at the time of ordering ◆◆◆

1. Type and specification code
2. Name of measured liquid, viscosity, temperature
3. Flow direction of fluid, mounting position

▼The contents given here are subject to change without notice.

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