



ULTRA OVAL

Meter Sizes: 39, 41, 45, 50, 52, 53
w/Unfactored Pulse Generator (NPG60A)

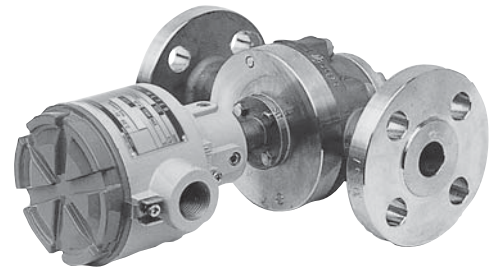
GENERAL SPECIFICATION
GS.No.GBU011E-6

■ GENERAL

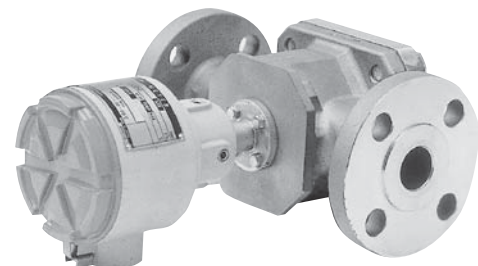
ULTRA OVAL MODEL 39, 41, and 45 provides extensive capability as a highly dependable OVAL flowmeter to be used for various application in process where accurate flow measurement of low flow rate is required.

■ FEATURES

1. Accurate (Linearity) to $\pm 0.15\%$ or better. Well suited for small flow measurements.
2. Pocketless design of measuring chamber construction makes the flowmeter ideal for fine chemicals, foods, pharmaceuticals, cosmetics and etc., furthermore, simplifies maintenance and inspection work.
3. Flowrate information is transmitted by the pulse generator in the form of a noncontact pulse signal compatible with highly sensitive and reliable remote instrumentation.
4. Absence of any mechanical transmission requires no loss in torque and ensures long service life.
5. Flow totalizing and instantaneous flowrate indication are monitored in a LCD counter independently mounted.



Meter size : 39, 41, 45, 50



Meter size : 52, 53

■ GENERAL SPECIFICATIONS

● Basic Meter

Item		Description					
Meter Size		39	41	45	50	52	53
Nominal Size		10mm			20mm	25mm	
Flange Rating	Group 1	JIS 10K RF, ASME 150 RF, JPI 150RF					
	Group 3	JIS16, 20, 30K RF, ASME 300 RF, JPI 300RF, DIN10, 16, 20, 25					
Flow range		See flow rang table (P2)					
Operating Temp. Range		-10 ~ +120°C					
Linearity		$\pm 0.35\%$	$\pm 0.35\%$ or $\pm 0.15\%$				
Repeatability		$\pm 0.35\%$	$\pm 0.05\%$ or $\pm 0.02\%$				
Material	Meter Body	SCS14 or *SCS16					
	Rear Lid	SUS316 or *SUS316L					
	Rotor	Special Carbon	SUS316 or *SUS316L				
	Bearings	Special Carbon	Special Carbon or Ceramics				
	Shaft	SUS316 or *SUS316L					
Flow direction		Right → Left (St'd) Left → Right Top → Bottom Bottom → To					
Finish		Not painted					

* : Special

● Flange Ratings and Max. Operating pressure : MPa

Flange Code	JIS 10K RF	ASME 150 RF	JIS 20K RF	JIS 30K RF	ASME 300 RF
1	1.18(12) at 120°C	1.50(15.3) at 120°C
3	1.96(20) at 120°C	2.94(30) at 120°C	2.94(30) at 120°C

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● Pulse Generator

Item			Description
Meter Size			39, 41, 45, 50, 52, 53
Generator			NPG60A
Output signal	Pulse	Current	Type Unscaled : 0/1=4/20mADC, See range opload resistance (P3)
		Type	Pulse with 1ms (Fixed)
	Pulse	Open collector	Type Unscaled : Max. 30VDC, allowable current : 50mADC
		Type	Pulse with 1ms (Fixed)
Pulse	Voltage	Type	Unscaled : 0/1=Max.1VDC/Power voltage Min.3VDC
		Type	Pulse width 1ms (Fixed)
Power supply			12 to 24VDC Current consumption Max.30mADC See range opload resistance (P3)
Cable			Cable w/outernal shield (CVVS 1.25mm ²) finished O.D. 8.5~11mm *
Transmission length			1km
Wiring mode		2 wires system	Currene pulse
		3 wires system	Open collector or voltage pulse
Ambient temperature			-20 to +70°C (explesion-proof : -20 to +55°C)
Ambient humidity			5 to 100%RH, Condensation not allowed
Construction			Explosion-proof construction : ExdII BT4X *
			Water-proof construction : JIS C0920 Splash proof type (IP65equivalent)
			Non-explosion-proof construction
Material for the housing			Alminum Alloy
Coting color			Baked melamine, Color : Muncell 10B8/4 (Cover) Muncell 2.5PB4/10

* : For wiring of explosionproof type, do not fail to use the ancillary pressure-resistant packing. Also, in case of TIIS explosionproof type used under the ambient temperature of 45°C or higher, use a cable resistant to the temperature of 70°C or higher.

■ NOMINZAL METER FACTOR

Meter size	P/r	Nominal Meter Factor
39	2	0.09838mL/P
41	2	0.4896 mL/P
45	4	1.2339 mL/P
50	4	4.968 mL/P
52	4	9.664 mL/P
53	4	17.513 mL/P

■ FLOW RANGE

Flow rate for water shall be selected from the following specification for temperature and viscosity.

Temperature range	Viscosity range
Max.30°C	0.8 to 2.0mPa·s
30 to 80°C	0.3 to 0.8mPa·s
80 to 120°C	Less than 0.3mPa·s

1 Linearity : ±0.35%,
Operating Temp. Range: -10 ~ +120°C Unit in L/h

Viscosity Range Meter size	less than 0.3mPa.s	0.3~ 0.8mPa.s	0.8~ 2mPa.s	2~ 5mPa.s	5~ 200mPa.s
39	2~ 12	1.4~12	0.7~12	0.35~12	* 0.2~12
41	18~ 60	12 ~60	4 ~60	2.5 ~60	* 1 ~60
45	50~420	35 ~420	15 ~420	10 ~420	5 ~420

Unit in m³/h

Viscosity Range Meter size	less than 0.3mPa.s	0.3~ 0.8mPa.s	0.8~ 2mPa.s	2~ 5mPa.s	5~ 1000mPa.s
50	0.3~1.6	0.15~1.6	0.1~1.6	0.05~2	0.03~2
52	0.7~3	0.4~ 3	0.3~3	0.15~3.8	0.08~3.8
53	1.1~5	0.7~ 5	0.55~5	0.28~6.4	0.15~6.4

2 Linearity : ±0.15% (Option)
Operating Temp. Range: -10 ~ +120°C Unit in L/h

Viscosity Range Meter size	less than 0.3mPa.s	0.3~ 0.8mPa.s	0.8~ 2mPa.s	2~ 5mPa.s	5~ 200mPa.s
39	3~12	2~12	1~12	0.5~12	* 0.3~12
41	27~60	18~60	6~60	3.7~60	* 1.5~60
45	75~420	52~420	22~420	15~420	7.5~420

Unit in m³/h

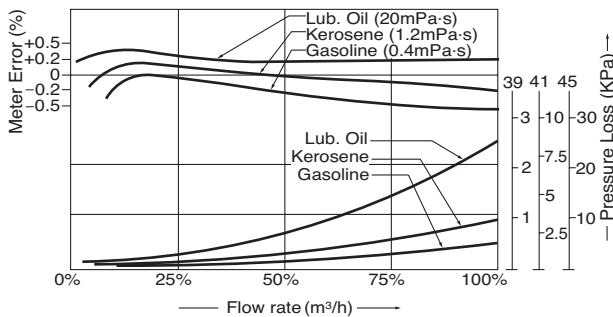
Viscosity Range Meter size	less than 0.3mPa.s	0.3~ 0.8mPa.s	0.8~ 2mPa.s	2~ 5mPa.s	5~ 1000mPa.s
50	0.5~1.6	0.3~1.6	0.15~1.6	0.08~2	0.05~2
52	1~3	0.7~3	0.53	0.25~3.8	0.15~3.8
53	1.6~5	1.1~5	0.75~5	0.4~6.4	0.22~6.4

Note: (1) * Only Model 45 is available up to 1000mPa.s.

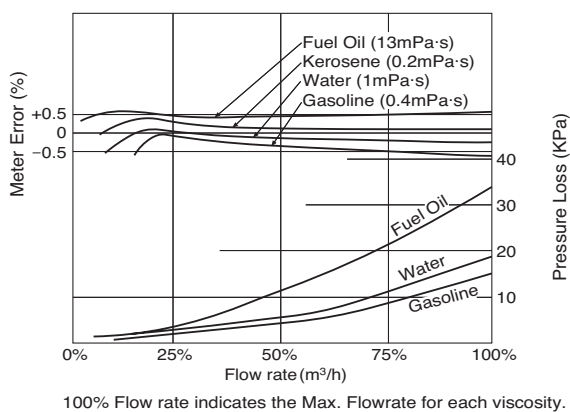
Note: (2) Consult Factory for High viscosity liquid more than 1000mPa.s.

■ METER ERROR and PRESSURE LOSS

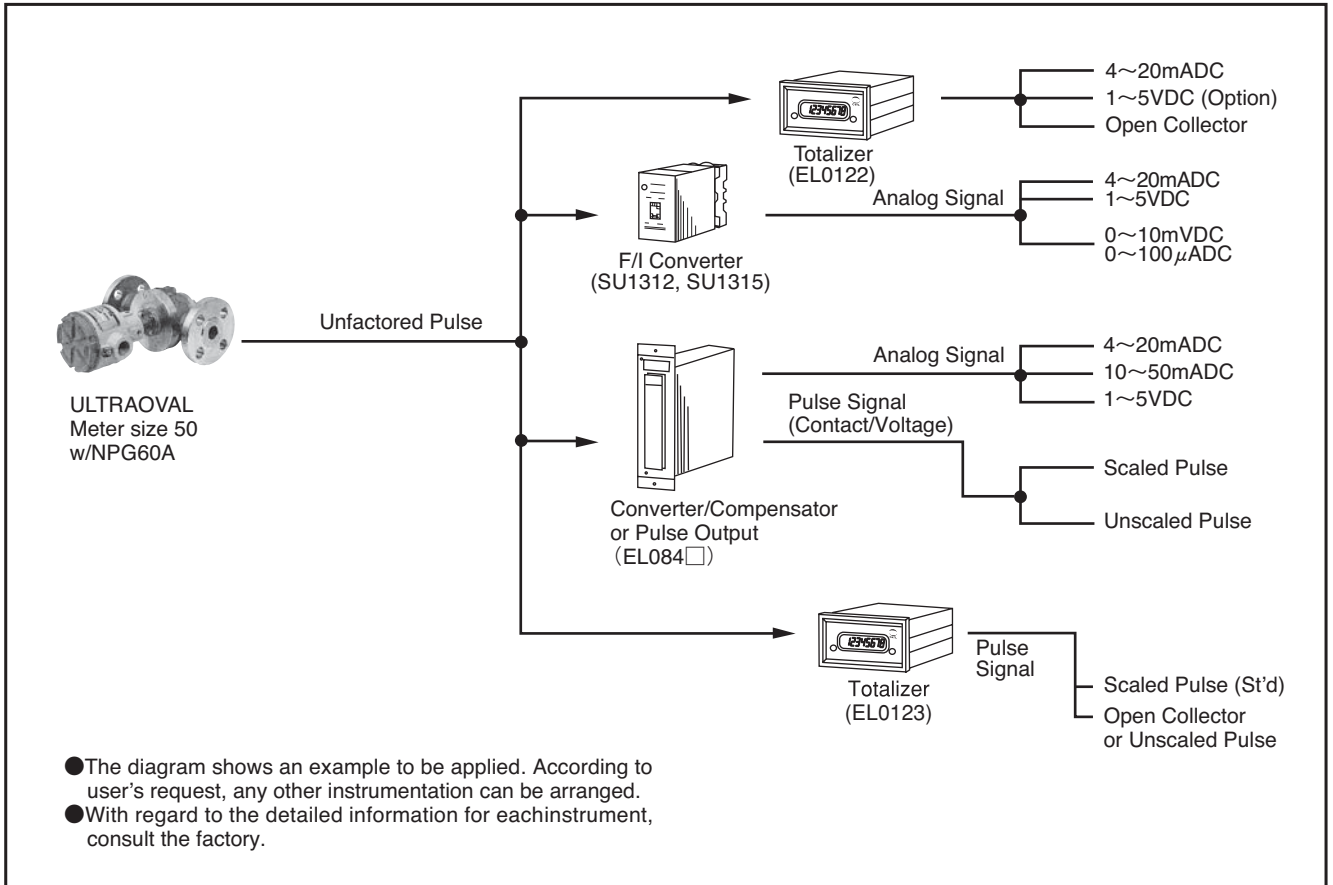
● Meter size : 39, 41, 45



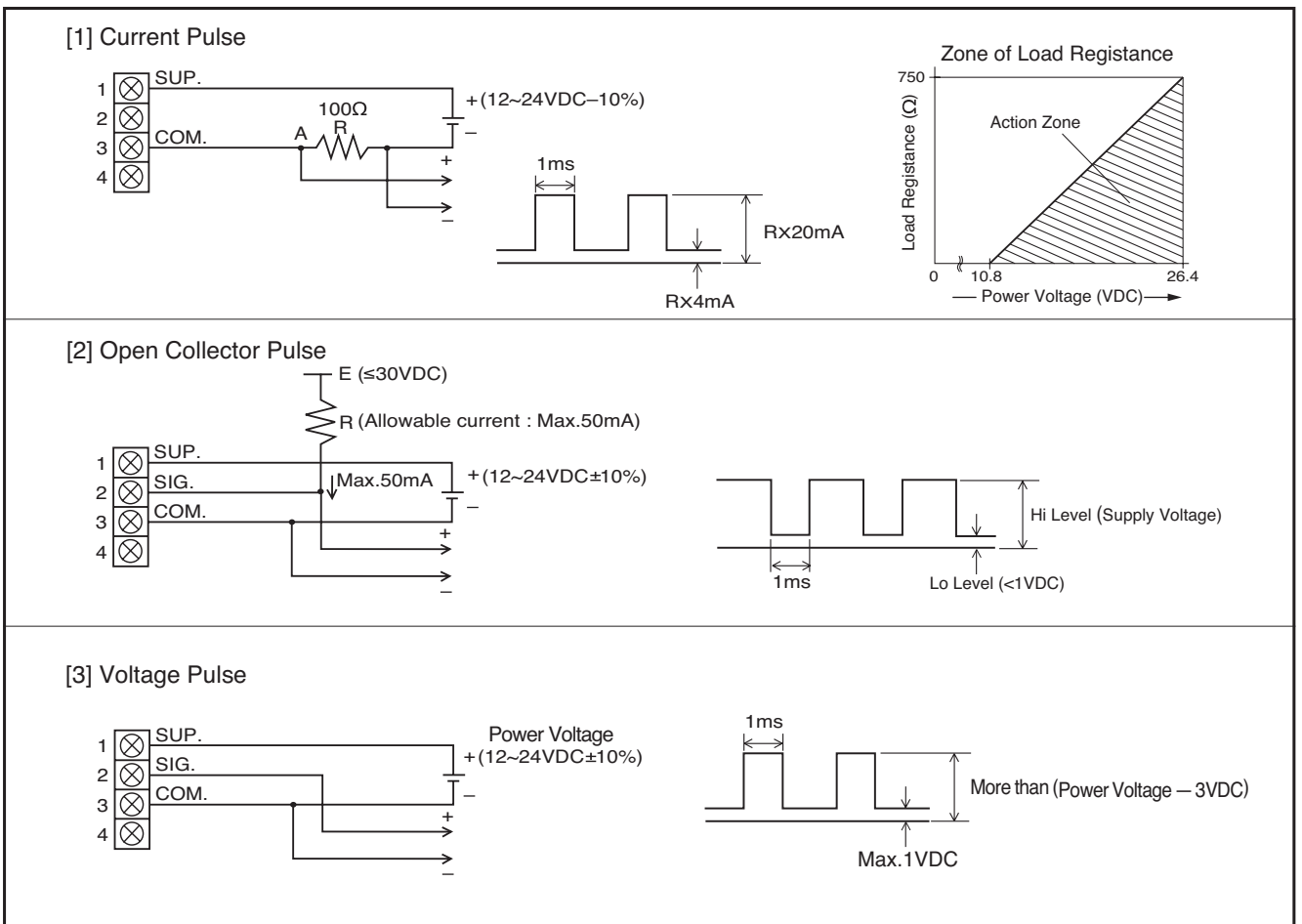
● Meter size : 50, 52, 53



SYSTEM OF RECEIVING INSTRUMENTS

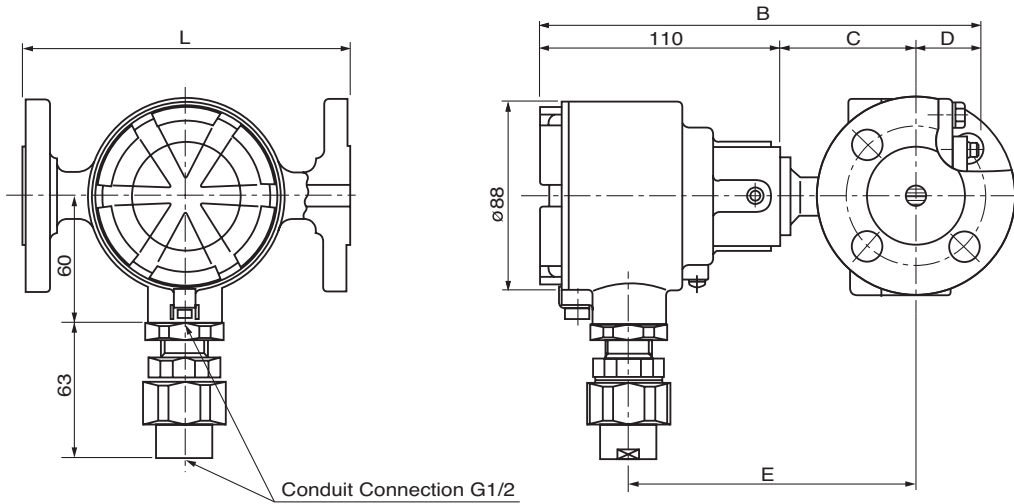


CONNECTING DIAGRAM



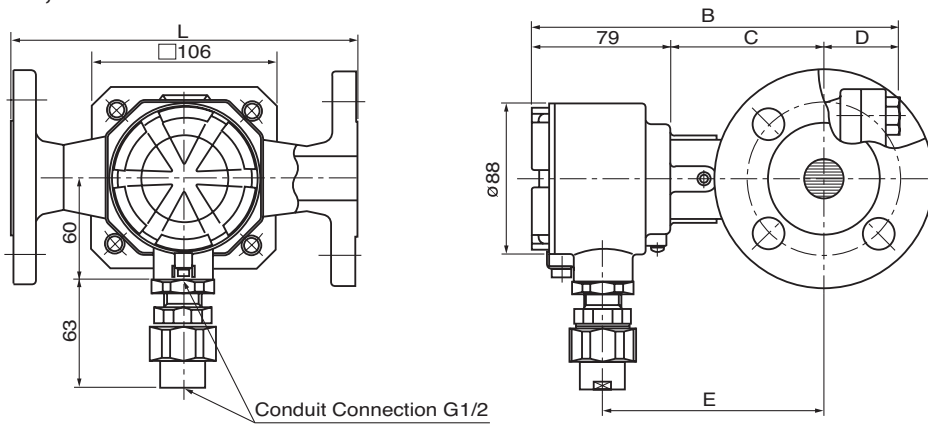
■ OUT DIMENSIONS (Unit in mm)

●Meter size : 39, 41, 45, 50



Meter size	Flange Rating	L(Face to Face)	B(Full Length)	C	D	E	Approx.Mass.
39 41 45	JIS 10K RF	150	201.8	62.5	29.3	131.5	6.5kg
	ASME/JPI 150 RF						
	JIS 20K RF						
	JIS 30K RF						
	ASME/JPI 300 RF						
50	JIS 10K RF	200	218	65	43	134	8kg
	ASME/JPI 150 RF	198					
	JIS 20K RF	204					
	JIS 30K RF	208					
	ASME/JPI 300 RF	204					11kg

●Meter size : 52, 53



Meter size	Flange Rating	L(Face to Face)	B(Full Length)	C	D	E	Approx.Mass.
52	JIS 10K RF	200	209.8	88	42.8	126	9kg
	ASME/JPI 150 RF						
	JIS 20K RF						204
	JIS 30K RF						212
	ASME/JPI 300 RF	207					12kg
53	JIS 10K RF	200	233.5	99	55.5	137	10kg
	ASME/JPI 150 RF						
	JIS 20K RF						204
	JIS 30K RF						212
	ASME/JPI 300 RF	207					13kg

■ PRODUCT CODE EXPLANATION

Item	Code No.												Description	
	①	②	③	④	⑤	⑥	⑦	⑧	—	⑨	⑩	⑪		⑫
Type	L	U	S											ULTRA OVAL (-10 to +120°C)
Meter size		3	9											Nominal Size : 10mm
		4	1											Nominal Size : 10mm
		4	5											Nominal Size : 10mm
		5	0											Nominal Size : 20mm
		5	2											Nominal Size : 25mm
Materials														Nominal Size : 25mm
		C												SUS316 Rotor + SCS14 Body (Meter size 39 is used only special carbon.)
		E												SUS316L Rotor + SCS16 Body [Special]
Flange rating *1														Other than above
		1												JIS 10K RF, ASME/JPI 150 RF
		3												JIS 16 to 30K RF, ASME/JPI 300 RF, DIN 10 to 25
Bearing type														1 - Carbon Bearing(OB414)
														5 - Ceramic Bearing(OB926)
														7 - Nonpolymeric Ceramics(OB926)
														8 - Nonpolymeric Carbon(OB414)
Generator												3	NPG60A	
Construction generator													1	Non-explosionproof (NPG60A)
													2	Flameproof (NPG60AEP) TIIS
													7	Flameproof (NPG60AEP) NEPSI
Type of output signal													0 1	Unscaled Pulse (4/20mA Current Pulse), 2Wire system
													0 5	Unscaled Pulse (Open collector), 3Wire system
													0 7	Unscaled Pulse (Voltage Pulse), 3Wire system

Notes: *1. Flange face provides RF only, FF is not supplied.

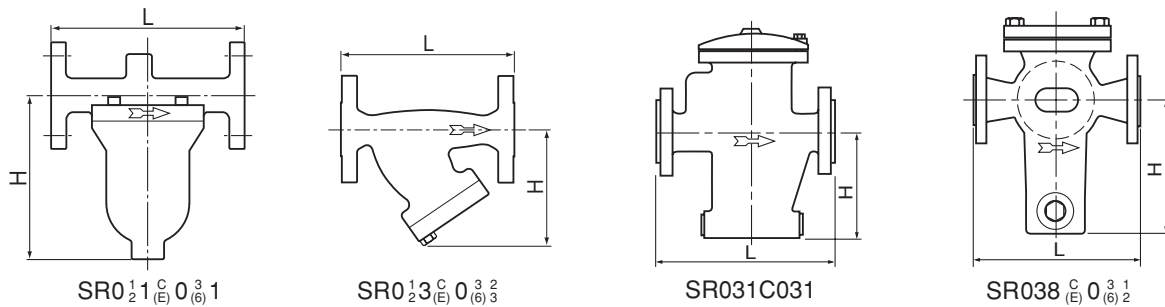
*2. Meter sizes 41 and 45 use the same body material SUS316 or 316L for rotors.

Meter size 39 uses special carbon rotors only.

■ STRAINER

It is necessary to install a strainer directly before the flow meter or as close as possible on the flow input side, so that solid particles mixed in the fluid do not enter the flow meter and causes problems.

※ The diagrams represent typical designs.



Model number	Nominal size	Flange rating	L (mm)	H (mm)	Body material	Net material	Net mesh	Applicable meter model
SR011 $\frac{C}{(E)} 0 \frac{3}{(6)} 1$	10mm (3/8")	JIS 10K RF/FF	180	152	SCS14A (SCS16A)	SUS316 (SUS316L)	200	39, 41, 45
SR013 $\frac{C}{(E)} 0 \frac{3}{(6)} 2$		ASME/JPI 150 RF	178					
SR013 $\frac{C}{(E)} 0 \frac{3}{(6)} 3$		JIS 20K RF	184	100				
		ASME/JPI 150 RF	178					
SR021 $\frac{C}{(E)} 0 \frac{3}{(6)} 1$		JIS 30K RF	188	126				
		ASME/JPI 300 RF	185					
SR021 $\frac{C}{(E)} 0 \frac{3}{(6)} 1$	20mm (3/4")	JIS 10K RF/FF	180	152	SCS14A (SCS16A)	SUS316 (SUS316L)	200	50
SR023 $\frac{C}{(E)} 0 \frac{3}{(6)} 2$		ASME/JPI 150 RF	177					
SR023 $\frac{C}{(E)} 0 \frac{3}{(6)} 3$		JIS 20K RF	184	100				
		ASME/JPI 150 RF	177					
SR031 C 0 3 1		JIS 30K RF	192	126				
		ASME/JPI 300 RF	188					
SR031 C 0 3 1	25mm (1")	JIS 10K RF/FF	230	165	SCS14A	SUS316	100	52, 53
SR038 $\frac{C}{(E)} 0 \frac{3}{(6)} 1$		ASME/JPI 150 RF	231					
		SR038 $\frac{C}{(E)} 0 \frac{3}{(6)} 2$	JIS 10K RF/FF	230	209	SCS14A (SCS16A)		
ASME/JPI 150 RF			231					
SR038 $\frac{C}{(E)} 0 \frac{3}{(6)} 2$		JIS 20K RF	234	209				
		ASME/JPI 150 RF	231					

■ POINTS OF CAUTION

These flowmeters used to measure minute flow rate are precisely adjusted in the factory, so it is necessary to take special care when unpacking, installing in the piping and testing. Never let foreign materials enter into the measuring chamber. Flush the piping well enough before installation.

It is essential that you always avoid violently spinning the rotor by flushing air or an excessive flow rate in a short period of time.

Only use Oval's strainer dedicatedly designed for these flowmeters.

■ PLEASE SUPPLY THE FOLLOWING INFORMATION WHEN YOU INQUIRE.

1. Model	L _____
2. Fluid to be measured	Name _____ Viscosity _____ mPa·s Specific gravity _____
3. Flow rate (L/h)	Maximum _____ Normal _____ Minimum _____
4. Fluid temperature (°C)	Maximum _____ Normal _____ Minimum _____
5. Ambient temperature (°C)	Maximum _____ Normal _____ Minimum _____
6. Pressure (MPa)	Maximum _____ Normal _____ Minimum _____
7. Flow direction	Right \leftarrow Left, Bottom \leftarrow Top
8. Flange connection	Nominal diameter _____ mm, Flange rating _____
9. Required accuracy (Linearity)	\pm _____ %
10. Explosion-proof construction	<input type="checkbox"/> Required class _____ <input type="checkbox"/> Not required
11. Accessories	<input type="checkbox"/> Strainer, <input type="checkbox"/> Air eliminator, <input type="checkbox"/> Companion flange
12. Quantity	Including accessories _____
13. Receiving device	Type, manufacturer, model, specifications (input, output, power supply, etc.)
14. Distance between the flow meter and the receiving device	_____ m

The specification as of May, 2015 is stated in this GS Sheet. Specifications and design are subject to change without notice.

Sales Representative:

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初版	改訂	印刷
01.05	15.05	06.05