SANGAN

SANGAN SANAT CO.

METAL TUBE ROTAMETER

FL20

FEATURES

- Suitable for measuring gas and liquid flow
- Heavy duty design
- Maximum visibility
- Proven technology
- Easy to maintain and replace
- Suitable for high temperature
- Suitable for high pressure
- Limit switch option
- Optional 2-wire 4-20mA output
- Optional digital display
- Wide rangeability

Figure 1. FL20-P8: Standard design with local display

Figure 2. FL20-P10: Meter with local display and signal output

PRODUCT OVERVIEW

The Metal tube rotameter is one of the rotameter types, specifically designed for high pressure and high temperature application. Unlike the acrylic tube and glass tube rotameters, float is not visible because of the metal tube. Instead, a magnetic coupling is used to transfer float movement to a pointer installed outside the tube in the display unit. Our metal tube rotameters are manufactured in two versions as shown in figures 1 and 2. Figure 1 is the standard version without signal output and used as a local display. Design shown in figure 2 is generally applied where a signal output and higher IP is required.

TECHNICAL SPECIFICATION

Size*	½" to 4" (DN15 to DN100)		
Height	250mm (for flanged connection and inlet at bottom/outlet at top)		
Material	316 SS and 304 SS (PTFE coating, heating jacket and other special designs are possible. Please contact us for detailed information)		
Medium	Liquids, gases, vapors		
Flow range	Water: 20°C	(10-100000)L/h , Special order on request	
	Air: 1 atm, 20°C	(0.3-3000)Nm^3/h, Special order on request	
The turn-down ratio	10 : 1		
Accuracy class	1.0, 1.6, 2.0, 2.5 (VDI/VDE3513)		
Fluid temperature	Mechanical indicator		-40...+200°C (PTFE:0...80°C)
	Mechanical indicator with LCD		-40...+120°C (PTFE:0...80°C)
	Mechanical indicator with two-wire signal output (4-20)mA/Switch		-40...+120°C (PTFE:0...80°C)
Ambient temperature	Mechanical indicator		-20...+60°C
	Mechanical indicator with LCD		-20...+60°C
	Mechanical indicator with two-wire signal output (4-20)mA/Switch		-20...+60°C
Viscosity of fluid	DN15: η<10 mPa.S	DN25: η<250 mPa.S	DN50~100: η<300 mPa.S
Nominal pressure	DN15~DN50	4.0MPa	
	DN80~DN100	1.6MPa	
Process connection	Flange connection, Standard: ANSI, DIN2501, JIS		
Threaded connection	Hygiene clamp		

* Optional connection types, either different class of flanges or threaded connection are possible based on request.

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TECHNICAL SPECIFICATION

Electrical connection	M20×1.5 / ½"G / ½" NPT / ¾"G / ¾" NPT
Installation	Vertical mounting (bottom in-top out), Horizontal mounting(left in-right out and right in-left out), bottom in-side out, side in-side out (Please specify when ordering)
Straight unimpeded inlet run	Preferred to be ≥ 5D
Straight unimpeded outlet run	Preferred to be ≥ 250 mm
Degree of protection	IP67(Others need to be specified in the order)

DESIGN STANDARD

Metal tube rotameters are designed according to VDI/VDE 3513 Blatt 1. Maximum permissible error is defined according to VDI/VDE 3513 Blatt 2. Other applicable standards are ISA RP16.5, ISA RP16.6 and VDI/VDE 3513 Blatt 3.

FLOW RANGES FOR WATER

Range Code	Conn Size and Type	Range for Water at 20°C
L57	DN15, FL/Thread	1.6-16 l/h
L59	DN15, FL/Thread	2.5-25 l/h
L61	DN15, FL/Thread	4-40 l/h
L63	DN15, FL/Thread	6-60 l/h
L65	DN15, FL/Thread	10-100 l/h
L67	DN15, FL/Thread	16-160 l/h
L68	DN15, FL/Thread	25-250 l/h
L70	DN15, FL/Thread	40-400 l/h
L72	DN15, FL/Thread	60-600 l/h
L75	DN25, FL/Thread	100-1000 l/h
L77	DN25, FL/Thread	160-1600 l/h
L79	DN25, FL/Thread	250-2500 l/h
L81	DN25, FL/Thread	400-4000 l/h
L83	DN50, FL/Thread	600-6000 l/h
L85	DN50, FL/Thread	1000-10000 l/h
L86	DN50, FL/Thread	1600-16000 l/h
L87	DN80, FL/Thread	2500-25000 l/h
L88	DN80, FL/Thread	4000-40000 l/h
L89	DN100, FL/Thread	6000-60000 l/h
L91	DN100, FL/Thread	10000-100000 l/h
L00	Please specify	Please specify

FLOW RANGES FOR AIR

Range Code	Conn Size and Type	Range for Air at 20°C, 1 atm
A75	DN15, FL/Thread	0.05-0.5 Nm^3/h
A77	DN15, FL/Thread	0.1-1 Nm^3/h
A79	DN15, FL/Thread	0.16-1.6 Nm^3/h
A82	DN15, FL/Thread	0.3-3 Nm^3/h
A83	DN15, FL/Thread	0.4-4 Nm^3/h
A85	DN15, FL/Thread	0.6-6 Nm^3/h
A89	DN15, FL/Thread	1-10 Nm^3/h
A91	DN25, FL/Thread	1.6-16 Nm^3/h
A94	DN25, FL/Thread	3-30 Nm^3/h
A96	DN25, FL/Thread	5-50 Nm^3/h
A99	DN25, FL/Thread	7-70 Nm^3/h
A101	DN25, FL/Thread	10-100 Nm^3/h
A103	DN50, FL/Thread	16-160 Nm^3/h
A106	DN50, FL/Thread	25-250 Nm^3/h
A114	DN50, FL/Thread	40-400 Nm^3/h
A118	DN80, FL/Thread	100-1000 Nm^3/h
A120	DN100, FL/Thread	180-1800 Nm^3/h
A00	Please specify	Please specify

SELECTION GUIDE FOR WATER/AIR

To select the right flowmeter for your application, please specify the following when ordering a rotameter for water or air flow measurement:

1) Fluid name (water or air):
2) Flow range (minimum and maximum):
3) Operating pressure:
4) Operating temperature:
5) Maximum pressure:
6) Maximum temperature:

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SELECTION GUIDE FOR OTHER FLUIDS

The flow ranges specified in flow ranges tables are for air and water, only. If the fluid is other than air and water, specify the below information. Our sales engineers will help you choose the right rotameter.

1) Fluid name:
2) Flow range (minimum and maximum):
3) Operating pressure:
4) Operating temperature:
5) Maximum pressure:
6) Maximum temperature:
7) Fluid density:
8) Fluid viscosity (only for liquids):

ORDERING CODES

1. INSTALLATION FORM

PI	Vertical	**PI**
HI	Horizontal (Please specify flow direction, also: Left to right or right to left)	
BO	Bottom-in side-out (Please specify if you have any preferred side; left or right)	
SO	Side-in side-out (Please specify if you have any preferred side; left or right, for both ends)	

2. PROCESS CONNECTION

F	Flange connection	**F**
W	Screw thread connection	
H	Clamp connection / Hygienic	

3. MATERIALS (specify if other materials are requested)

S4	304SS	**S4**
S6	316SS	
S4L,S6L	304LSS, 316LSS	

4. MEASURING MEDIUM

L	Liquid	**L**
G	Gas	

5. INDICATOR

P8	Indicator with stainless steel housing/ No output	**P8**
P10A	Indicator with Aluminum housing/ No Output	
P10B	Indicator with Aluminum housing/ with two-wire signal output (4-20)mA	
P10C	Indicator with Aluminum housing/ with switch	
P10D	Indicator with Aluminum housing/ with LCD display and two-wire signal output (4-20)mA	
P10E	Indicator with Aluminum housing/ with LCD display and two-wire signal output (4-20)mA and switch	

6. JACKET-TYPE

0	None	**0**
T	With Heating / cooling jacket	

7. LIMIT SWITCHES

K1	Low limit	**K1**
K2	High limit	
K3	Low limit and high limit	

Ordering Example : FL20-PI-F-S4-L-P8-0-K1

NOTES

1. Each meter is calibrated individually in our flow calibration site. As a standard rule, meters intended for liquid measurement are calibrated by water and those intended for gas measurement are calibrated by air. We also provide correction factors to convert meter reading to operating condition if requested.
2. Rangeability of rotameters is generally 10:1. This means that if the desired maximum flow rate is 10m^3/h, the minimum measurable flow rate is 1m^3/h. The meter cannot measure from zero!
3. The scale on the meter is correct ONLY for the specified fluid at pressure and temperature shown on the meter. If the fluid, operating temperature or operating pressure are different from what is written on the meter scale, correction factors need to be applied. In this case, contact us to provide you with the necessary correction coefficients.

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Rev. 01