Metal Tube Rotameter

บริษัท แฟ็คโต คอมโพเนนส์ จำกัด | FACTO COMPONENTS CO., LTD.

845/3-4 ชั้น 3 ถ.เทพารักษ์ ต.เทพารักษ์ อ.เมือง จ.สมุทรปราการ 10270

TEL. 02-384-5701, 02-753-3652 | LINE OA: @134ovdbx | Website : www.factocomponents.co.th | Email : info@factocomponents.co.th

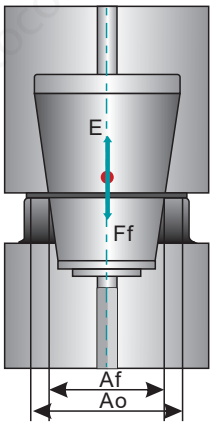
Metal Tube Rotameter

Introduction

Metal tube rotameter is a variable area flow meter which is based on the float position measurement. With full-metal structure, it has the features of small size, low pressure loss, large range ratio (10~20:1), optional transmitter with HART communication function, and convenient installation &maintenance etc. It is widely used in flow measurement and process control of small flow, low flow rate, and various industries under complex and harsh environments.

Working Principle

The flow meter consists of a measuring tube and a float inside it. The flow pushes the float to an equilibrium point. The area obtained between the float and the tube is proportional to the flow rate.



The point of equilibrium depends on:

E = Force of the fluid flow

Ff = Weight of the float

Al = Free area of flow

where:

Al= A0 (calibrated orifice area) - Af (float area)

Features

01 Robust all-metal structure design.

02 Suitable for gas and liquid measurement in various industries.

03 Cone-shape measuring tube design, which has wide measuring range and good linearity.

04 Wetted parts material are optional: SS304 SS316L,FEP, Hastelloy C,Titanium.

05 Adopt advanced magnetic coupling system design, improve the accuracy and stability

06 The upper row displays the instantaneous flow, the lower row displays the total flow

Instantaneous flow	0.000~99999
Total flow	0.00~99999999
Current range	3.80~21.00mA
Instantaneous flow percentage	0~100%
Pointer angle	0.00~90.00°
Ambient temperature	-40~+150℃
Total flow small signal cutoff	0~10%
Damping time setting range	0~10 seconds

Various flow units are optional, the range is automatically converted when unit is changed.

07 For the digital LCD display type, the flow range of the instantaneous flow can be corrected on-site based on the different measuring medium.

08 It adopts advanced six level data backup technology, data of total flow can be saved automatically when power-off, (the total flow sending period is 0.3S).

09 Besides AC/DC power supply, it supports battery power supply function.

10 No need to open the cover, it can be operated by a magnetic pen; the key operation function is also available.

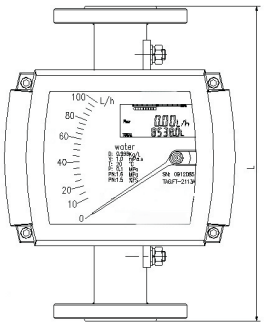
11 Through the HART protocol, you can use the handheld operator or host computer software to perform partial or full configuration operations on the flowmeter.

Technical Parameters

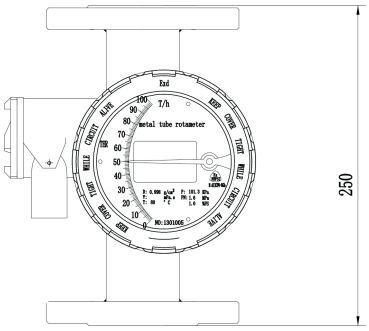
Measuring range	16~150000 l/h water (20℃) 0.5~4000 m^3/h gas (0.1013 MPa 20℃)
Turn down ration	10:1 (Special type 20:1)
Accuracy level	± 2.5% gas, ±1.5% liquid. (±1.5% gas or 1.0% liquid optional)
Working pressure	DN15～DN50 1.6 MPa DN80～DN150 1.0 MPa (Special type 1.6 MPa) Jacket pressure: 1.6 MPa
Medium temperature	Standard: -40℃～+220℃ (digital with 4~20 mA) High temperature: 300℃ (Mechanical with Indicator) . FEP liner type ≤90℃
Ambient temperature	-40℃～+120℃ (remote type without LCD display≤85℃) (remote type with LCD display ≤70℃)
Medium viscosity	DN15: ≤30 mPa.s DN25: ≤250 mPa.s DN50～DN150: ≤300 mPa.s
LCD display	Instantaneous flow numerical range: 0.000～99999 Total flow numerical range: 0.00～99999999
Signal output	Standard signal: Two-wire 4~20 mA (HART optional) Standard signal: Three-wire 0~10 mA Pulse
Communication	RS485 MODBUS, HART
Alarm signal	Two relay outputs (Limits 125VAC/0.25A) One or two proximity switches Pulse output:0~1KHz, Isolated output (Output Level Vpp >4.5V)
Power supply	Standard: 24 VDC±20% Customized: 220 VAC (85~265 VAC) Battery powered: 3.7@4.4~5.2 AH Lithium Battery, 12～36 months.
Connection	Flange (DIN, ANSI, JIS) Tri-clamp Thread (BSP, NPT)
Protection grade	IP65 / IP67
Ex-proof mark	Flame-proof : Exd IIC T4~T6 Gb Intrinsically Safe Explosion Proof: Ex ia IIC T3～T6
Wetted parts	SS304, SS316L, FEP, Hastelloy C, Titanium

Drawing

Standard Type: Dimensions and Weight



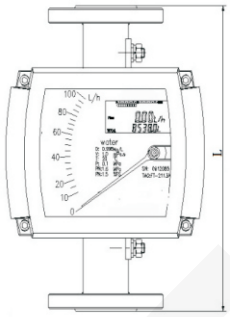
Square Convertor

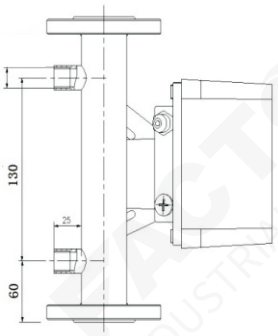


Round Convertor

Caliber	L (mm)	Weight (kg)
DN15	250	5.0
DN25	250	6.5
DN50	250	10
DN80	250	15.5
DN100	250	17
DN150	250	35

Jacket Type: Dimensions and Weight

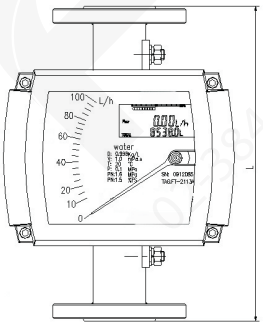




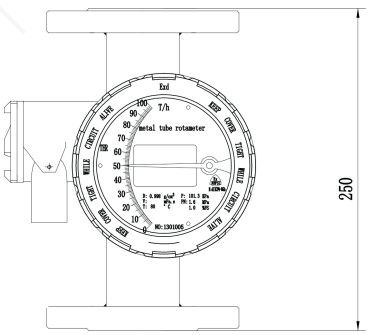
Insulation Jacket type

Caliber	L (mm)	Weight (kg)
DN15	250	7. 5
DN25	250	10
DN50	250	13
DN80	250	19
DN100	250	21
DN150	250	38

FEP Liner Type: Dimensions and Weight



Square Convertor

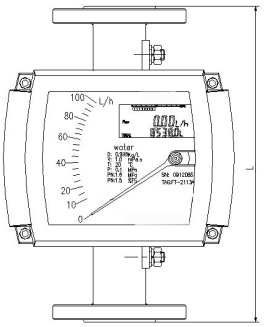


Round Convertor

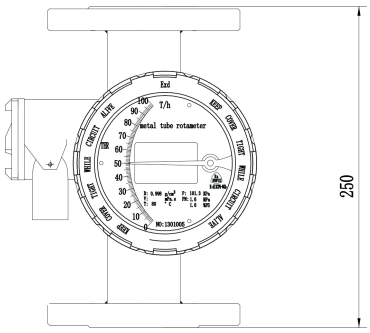
Caliber	L (mm)	Weight (kg)
DN15	250	5.0
DN25	250	6.5
DN50	250	10
DN80	250	15.5
DN100	250	16.5
DN150	250	32

Metal Tube Rotameter

Vertical Outlet Type: Dimensions and Weight



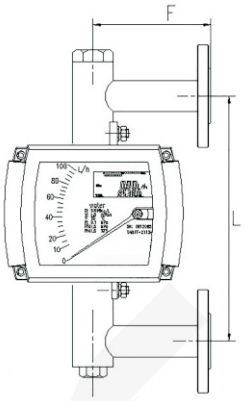
Square Convertor

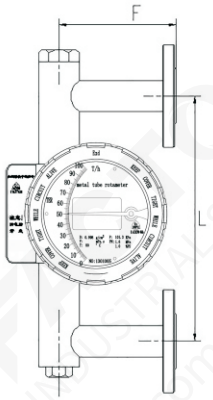


Round Convertor

Caliber	L (mm)	Weight (kg)
DN15	250	5.0
DN25	250	6.5
DN50	250	10
DN80	250	15.5
DN100	250	17
DN150	250	35

Side Outlet Type: Dimensions, Weight and Pressure Loss



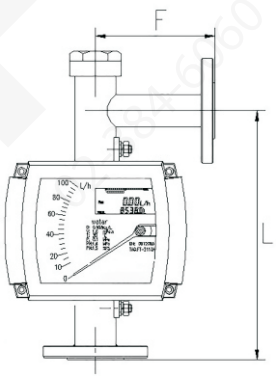


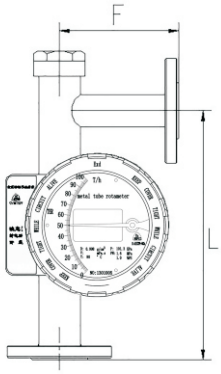
Caliber	DN15	DN25
F(mm)	120	120
L(mm)	250	250
Weight(kg)	6	7.2
Pressure loss(kpa)	21	30

(DN15~DN25)

DN32~DN150 drawing can be provided on request

Bottom Inlet and Side Outlet Type: Dimensions, Weight and Pressure Loss





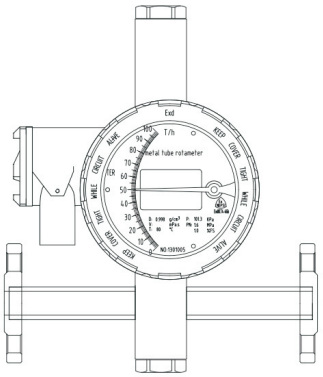
Caliber	DN15	DN25
F(mm)	120	120
L(mm)	250	250
H(mm)	350	350
Weight(kg)	4.5	7
Pressure loss(kpa)	18	22

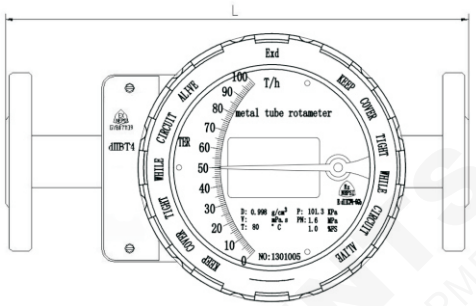
(DN15~DN25)

DN32~DN150 drawing can be provided on request

Metal Tube Rotameter

Horizontal Mounting Type: Dimensions, Weight and Pressure Loss





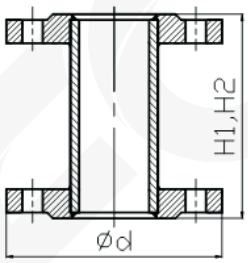
Caliber	L (mm)
DN15	250
DN20	250
DN25	250
DN40	300
DN50	300
DN65	400
DN80	400
DN100	400
DN125	500
DN150	500

(DN15～DN150 Gas)

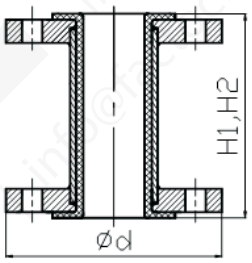
Caliber	L (mm)
DN15	250
DN20	250
DN25	250
DN40	250
DN50	250
DN65	250
DN80	250
DN100	250
DN125	250
DN150	250

(DN15～DN150 Liquid)

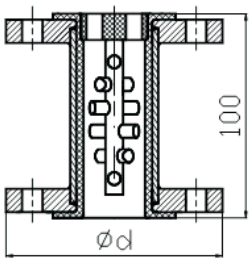
Additional Structure and Installation Instructions



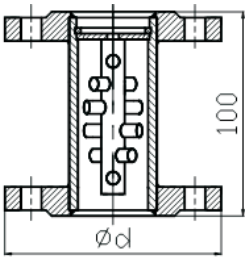
Straight pipe type



Liner FEP straight pipe type



Liner FEP with Filter

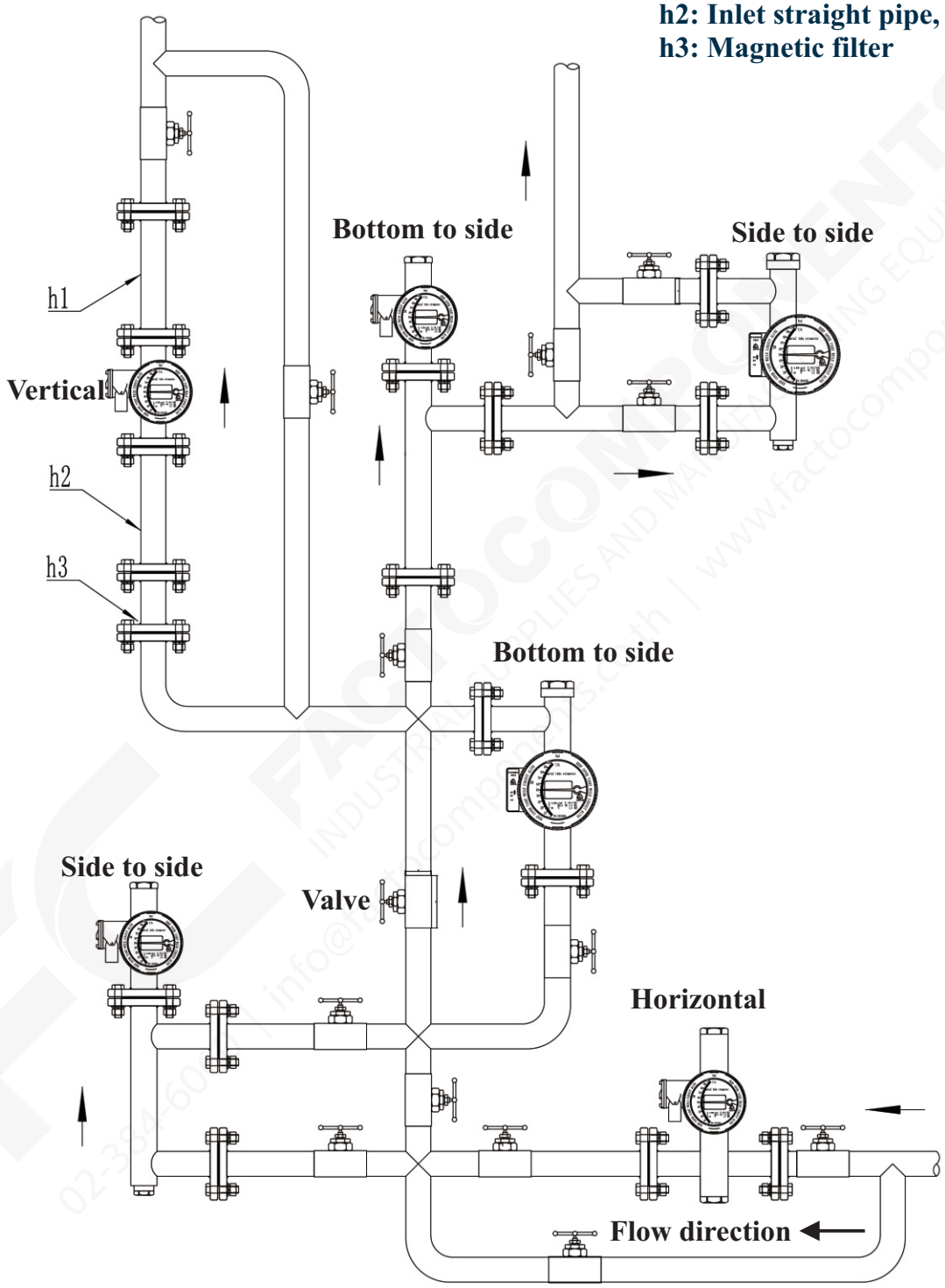


With Filter

Diameter	DN15	DN25	DN50	DN80	DN100	DN150
Front straight pipe H1≥(mm)	75	125	250	400	500	750
After straight pipe H2≥(mm)	250	250	250	250	250	250
ϕd (mm)	95	115	165	200	220	285

Intallation Drawing

h1: Outlet straight pipe
h2: Inlet straight pipe, 5D
h3: Magnetic filter



Installation drawing

Flow Range Table

Diameter DN	Water (20) L/h		Air 0.1013MPa 20 Nm^3/h	Standard type Max pressure loss Kpa	
	1 Standard	2 FEP	1	water	air
15	16	–	0.5	2.0	7.0
	25	16	0.7	2.3	7.2
	40	25	1.1	2.5	7.3
	63	40	1.8	2.5	7.5
	100	63	2.8	2.5	7.8
	160	100	4.8	2.6	8.0
	250	160	7.0	2.7	10.0
	400	250	10.0	2.9	10.8
	600	400	16.0	3.4	14
20	600	400	16	4.0	7.0
	1000	600	30	4.1	8.0
	1600	1000	45	4.4	12.0
	2500	1600	70	5.2	19.0
	4000	2500	110	7.0	25.0
	6000	4000	180	12.5	33.0
25	600	400	16	4.0	7.0
	1000	600	30	4.1	8.0
	1600	1000	45	4.4	12.0
	2500	1600	70	5.2	19.0
	4000	2500	110	7.0	25.0
	6000	4000	180	12.5	33.0

Flow Range Table

32	1000	600	30	4.1	8.0
	1600	1000	45	4.4	12.0
	2500	1600	70	5.2	19.0
	4000	2500	110	7.0	25.0
	6000	4000	180	12.5	33.0
	10000		250	12.5	33.0
40	2500	1600	70	5.2	19.0
	4000	2500	110	7.0	25.0
	6000	4000	180	12.5	33.0
	10000		250	12.5	33.0
50	6000	4000	180	4.7	8.0
	10000	6000	250	5.1	15.0
	16000	10000	400	6.2	22.0
	25000	16000	600	8.0	35.0
65	16000	10000	400	6.2	22.0
	25000	16000	600	8.0	35.0
80	25000	16000	1000	5.3	15.0
	40000	25000	1200	7.8	22.0
	60000	40000	1600	8.3	25.0
100	60000	40000	1800	11.4	35.0
	100000	60000	3000	16.7	45.0
125	100000	40000	3000	11.4	42.0
	125000	50000	3000	11.4	47.0
150	150000	100000	4000	17.0	47.0

Notes: It's standard flow rate in this table.
Special specifications can be customized according to customer's inquiry.

Selection Table

		x	x	x	x	x	x	x	x	x	x	x	x	x
Size	DN15-DN200 (1/2"～8")													
Indicator	Mechanical		M											
	Digital LCD display		D											
Installation	Vertical			V										
	Horizontal			H										
Structure	Bottom-top				BT									
	Top-Bottom				TB									
	Left-right (horizontal)				LR									
	Right-left (horizontal)				RL									
	Side-side				SS									
	Bottom-side				BS									
Accuracy	±2.5%					A25								
	±1.5%					A15								
Temperature	-20℃ ~ 200℃						T2							
	-20℃ ~ 300℃						T3							
Wetted parts	SS304							S4						
	SS304 lined FEP							S4F						
	SS316L							S6						
	Hastelloy C							HC						
	Titanium							Ti						
Power supply	24 VDC								DC					
	220 VAC								AC					
	3.6 V lithium battery								BA					
Signal output	No									SN				
	4~20 mA									C				
	RS485									R				
	HART									H				
	Pulse									P				
Process connection	Flange	D10: DIN PN10, D16: DIN PN16, D25: DIN PN25, D40: DIN PN40									DXX			
		A15: ANSI 150#, A30: ANSI 300#									AXX			
		J10: JIS 10K, J20: JIS 20K, J30: JIS 30K									JXX			
	Tri-clamp										TC			
	Thread										T			
Alarm	No											AN		
	High											H		
	Low											L		
	High + Low											HL		
Ex-proof	No												EN	
	Flame-proof (Ex d IIC T4~T6 Gb)												Exd	
	Intrinsic safe (Ex ia IIC T3~T6)												Exia	
Additional structure	No													ASN
	Damp													AD
	Jacket													AJ