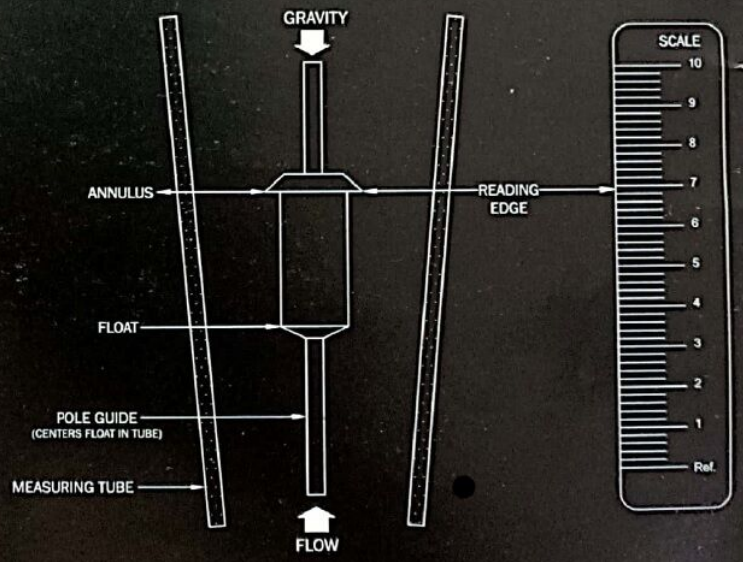
ROTAMETERS

ROTAMETERS

WHAT ARE ROTAMETERS

The variable area rotameter is used to measure a wide variety of industrial liquids and gases. This type of rotameter operates in a closed pipe system and utilizes a moveable float housed in vertically positioned tapered tube. A calibrated scale mounted in front of or next to the tube allows the float position to be translated into a meaningful value.



It's operation is based on the variable area principle, where a gas or liquid flow raises a float in a tapered tube increasing the area for passage of flow.

The float moves up or down in the tube in proportion to the fluid flow rate and the internal area between the float and the tube wall. The float reaches a point of balance when the upward force exerted by the flow of the liquid or gas equals the downward gravitional pull of the weight of the float. The variation in percentage of repeatable is the result of scale length. Long scale meters have better repeatability.

Significant aspect of excellent repeatability is one reason that variable area rotameters are so widely used in process industries and other application that require this important feature. Flowstar engineering pvt. Ltd. Manufactures some meters can be calibrated to an accuracy of ± 1% of full scale.

Flow & Control System Pvt. LTD.

ACRYLIC BODY ROTAMETERS

ROTAMETERS

- Easy Projection Mounting
- Neat Modular Appearance
- Direct Reading Scale
- Shatter Proof Acrylic Body
- Suitable For Gas & Liquid Flow
- Unique Flush Panel Mounting (Series FSB)
- Light Weight, Compact
- Built- In Flow Control Valve (Series FSA, FSB)
- Best Visibility

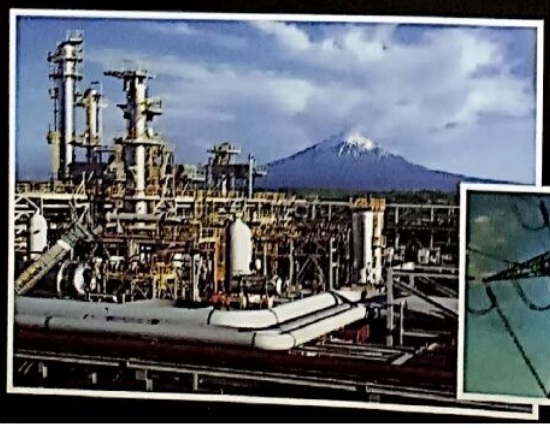
APPLICATIONS

These meters with all plastic fittings to eliminate corrosion completely. The meters are useful for measuring flow of air, common gases, water and many organic chemicals, excluding petrolelum products. Applications include purging of gas lines, anaesthesia, laboratory instruments, leak detection, cable pressurization, industrial furnaces and chromatography etc.

- Gas Lines
- Leak Detection
- Chromatography
- Cable Pressurization
- Anaesthesia
- Industrial Furnaces
- Laboratory Instruments

OPERATING PRINCIPLE

The essential working part is a tapered flow tube precision machined inside the acrylic body. When flow occurs, the position of a float within the tube indicates flowrate on a calibrated scale engraved on the acrylic body. With integral construction, a needle valve and flow parts (Model FSA & FSB) are built into the acrylic body, resulting in a very compact and ecnomical design. The unique "front plate" design (Model FSB) the beauty of any panel where the meter is installed.



Flow & Control System Pvt. LTD.

ROTAMETERS

FCA

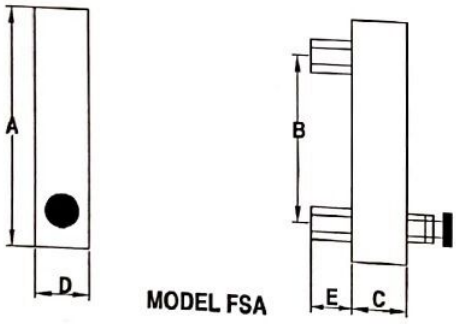
FCB

SPECIFICATIONS SERIES FSA,FSB

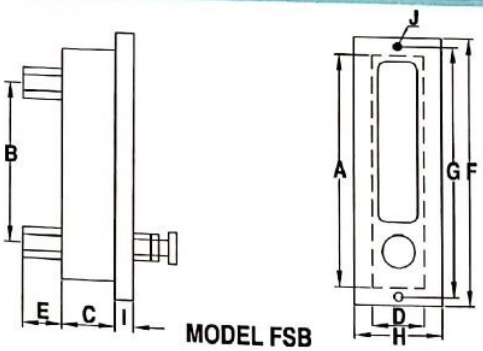
Meter Body	Acrylic
Float	SS 316, PTFE, PVC etc.
Wetted Parts	SS, PVC, P.P, PTFE etc.
O-Rings	Neoprene, PTFE Silicon etc.
Scale	Engraved on Body
Temp. Rating	160°F
Connection	Threaded BSP/NPT Female or Male
Accuracy of	Series 100 & 150 ±3%
Full Scale	Series 200, 300, & 350 ±2%
Repeatability	0.5%
Rangeability	10:1

Model	Air at Amb. Temp LPM	Air at Amb. Temp NM^3/HR	Pressure Rating Maximum
FCA & FCB	0.1-1		2 Kg/Cm^2
	0.2-2		
	0.4-5		
	1-10		
	2-20	0.1-1.2	
	3-30	0.15-1.8	
	4-50	0.3-3	
150	15-150	0.8-9	
200	10-100	0.6-6	
300	15-160	1-10	3 Kg/Cm^2
	20-250	1.5-15	
	40-500	3-30	
350	80-800	4-50	
	100-1000	6-60	

Model	Water at 20°C LPM	Water at 20°C LPH	Pressure Rating Maximum
FCA & FCB		0.4-5	2 Kg/Cm^2
		1-10	
		3-30	
	0.1-1	4-50	
100	0.15-1.5	10-100	
150	0.4-4	20-250	
200	0.2-2.5	15-150	
300	0.4-5	30-300	3 Kg/Cm^2
	0.8-8	40-500	
	1-10	60-600	
	1.5-16	100-1000	
350	2-25	150-1500	
	3-30	200-2000	
	4-40	200-2500	



MODEL FSA



MODEL FSB

OVERALL DIMENSIONS (MM) FSA, FSB

Series FCA&FCB	A	B	C	D	E	F	G	H	I	J HOLE ø	Connection BSP"F"
100	150	114	28	28	20	180	166	32	3	5	¼"
150	150	110	35	28	20	180	166	38	3	5	¼"
200	195	159	28	28	20	225	210	38	3	5	¼"
300	250	200	40	40	25	290	275	52	3	5	½"
350	250	194	48	42	25	290	275	52	3	5	¾"

F & C

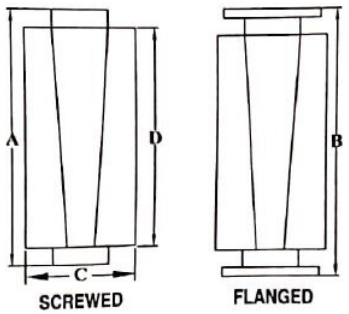
SPECIFICATIONS SERIESFCC

Meter Body	Acrylic
Float	SS 316, PTFE, PVC etc.
Wetted Parts	SS, PVC, P.P, PTFE etc.
O-Rings	Neoprene, PTFE Silicon etc.
Scale	Engraved on Body
Temp. Rating	160°F
Connection	Flanged Or Threaded
Accuracy of Full Scale	Series 100 & 150 ±3% Series 200, 300, 350 & 400 ±2% Series -450, 500, 600, 700 & 800 ±2%
Repeatibility	0.5%
Rangeability	10:1

Model	Air at Amb. Temp LPM	Air at Amb. Temp NM³/HR	Pressure Rating Maximum	Model	Water at 20°C LPM	Water at 20°C LPH	Pressure Rating Maximum
FCC	0.04-.5		2 Kg/Cm²	100		0.4-5	2 Kg/Cm²
	0.1-1					1-10	
	0.2-2					3-30	
	04-5				0.1-1	4-50	
100	1-10				0.15-1.5	10-100	
	2-20	0.1-1.2		150	0.4-4	20-250	
	3-30	0.15-1.8		200	0.2-2.5	15-150	
	4-50	0.3-3		300	0.4-5	30-300	5 Kg/Cm²
150	15-150	0.8-9			0.8-8	40-500	
200	8-75	0.4-4.5			1-10	60-600	
	10-100	0.6-6			1.5-16	100-1000	
300	15-160	1-10	5 Kg/Cm²	350	2-25	150-1500	
	20-250	1.5-15			3-30	200-2000	
	40-500	3-30			4-40	200-2500	
350	80-800	4-50		400	4-50	300-3000	
	100-1000	6-60			6-60	400-4000	
400	150-1500	10-100			8-80	400-5000	
	200-2000	10-120			10-100	600-6000	
	200-2500	15-150		450	10-100	600-6000	
450		20-200			10-130	600-8000	
500		25-250	15 Kg/Cm²	500	10-130	600-8000	15 Kg/Cm²
		30-300			10-160	1000-10000	
		40-400			20-200	1000-12000	
		50-500			20-250	1000-15000	
600		60-600		600	20-300	1000-18000	
		70-700			30-330	2000-20000	
650		80-800		650	40-400	2000-25000	
		100-1000			40-500	3000-30000	
		120-1200			60-600	3600-36000	
700		80-800		700	40-400	2000-25000	
		100-1000			40-500	3000-30000	
		130-1300			60-650	4000-40000	
		160-1600			80-800	5000-50000	
800		200-2000		800	100-1000	6000-60000	
		250-2500			150-1300	10000-80000	

SPECIAL SIZES & RANGES ON REQUEST

Series	A	B	C	D	Connection BSP'F' Flange
100	190	.....	28	150	¼"
150	190	.....	32	150	¼"& ½"
200	240	.....	28	195	¼"
300	250	275	35	180	½"
350	250	275	42	180	¾"
400	300	325	55	230	1"& 1½"
450	400	450	60	320	1"& 1½"
500/600	400	450	70	320	1½"& 2"
650	.....	450	85	320	2"& 2½
700	.....	450	100	320	2 ½"& 3"
800	.....	450	100	320	4"



ROTAMETERS

METAL TUBE ROTAMETERS

FCD SERIES

1) Dial type read out
2) Straight flow design
3) No bends, no seals, no threaded Joints
4) Direct reading scale
5) Compact, economical design
6) Perfect safety

OPERATING PRINCIPLE

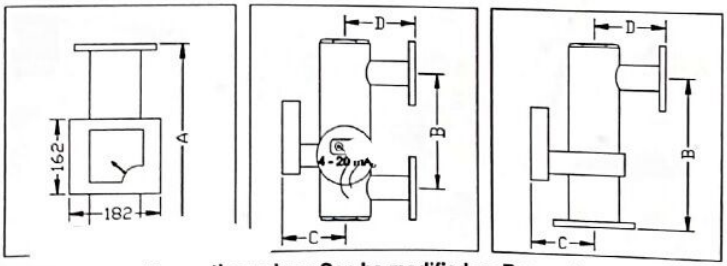
The essential working part is a tapered tube with an imbedded magnetic float. When flow occurs, the position of the float responds to flow driving a follower magnet outside the meter body, with no physical contact. The meter works well with liquids gases even at elevated pressures and temperatures.

SPECIFICATIONS SERIESFCD

Meter Body	SS 316L, SS 316, SS 304 etc.
Float	SS 316L, SS 316, PTFE etc.
Indicator Housing	ABS, Optional- Aluminium, SS-304
Temperature Rating	250°C
Pressure Rating	40 Bar
Accuracy	±2% of full scale
Accessories	1) Electronic transmitter with (Steam jacket) 4-20m A O/P
	2) Digital Flowrate indicator totaliser
	3) Hi - low flow switch

DIMENSIONS SERIESFCD

	Model & Ranges		Diamensions in mm			
Model No.	Range M³/HR Water	Connection Flange Type	'A'	'B'	'C'	'D'
FCD 100 S	0.1-1	½"	350	400	135	100
	0.2-2	¾"	350	400	135	100
100	0.3-3	1"	350	400	135	100
	0.5-5	1"	350	400	135	100
200	1-10	1½"	350	400	135	100
	1.5-15	1½"	350	400	135	100
300	2-20	2"	350	400	135	120
	2.5-25	2"	350	400	135	120
400	3-30	2½	350	400	135	120
	4-40	2½	350	400	135	120
500	4-40	3"	350	400	155	150
	5-50	3"	350	400	155	150
600	6-60	4"	350	400	155	150
	8-80	4"	500	500	175	170
	10-100	4"	500	500	175	170
700	13-130	5"	500	.....	175	.....
800	16-160	6"	500	.....	200	.....
900	20-200	8"	500	.....	200	.....



Note : Dimensions Can be modified on Request.

APPLICATIONS

Process treatment plant manufacturers use this meter due to its ease of installation, perfect safety and easy maintenance. It may be used for monitoring flow of De-mineralized Water, Gases, Acids, Salts, Organic Solvents and most petroleum products.

ROTAMETERS

GLASS TUBE ROATAMETERS

glass tube rotameters are unique design for industrial usage high precision tapered borosilicate glass tubes are utilized for best performances. Special design features eliminate stresses on glass tube even under industrial handling conditions. Glass tubes are field replacable without disturbing end connections.

glass tube rotameters are useful for measuring flow of Air, Comman Gases, Water, Alkelies, Oil & Organic Chemicals etc.

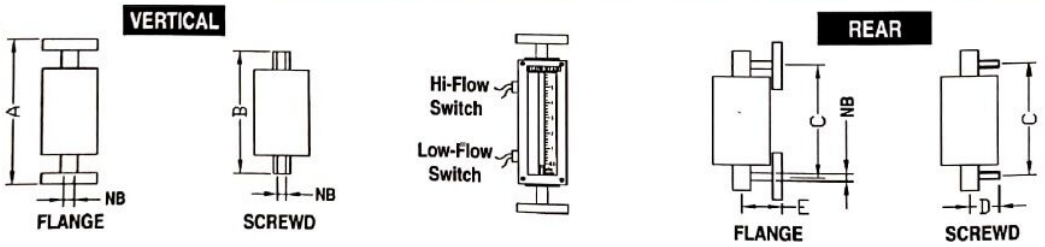
SPECIFICATIONS SERIESFCG

Meter Body	Powder coated M.S. optional SS 304, SS 316 etc.
Float	SS 316L, SS 316, PTFE, Monel, PVC etc.
Wetted Parts	SS 316L, SS 316, SS 304, MS PTFE, PVC, P.P., Monel etc.
Packings	Neoprene, PTFE , Silicon etc.
Tube	Borosillicate glass
Scale Length	175-225 mm
Temperature Max.	Upto 200°C depends on gland Packing material.
Connections	Flanged, threaded etc.
Accuracy	±2% of full scale.
Repeatibility	0.5%
Rangeability	10:1
Accessories	Hi- low flow switch, Steam jacketed

STANDARD RANGES

NB	Models	FLOW RATES. Water At 20°C LPH	FLOW RATES. Air At Amb. Temp. Nm^3/Hr	Pressure Rating KG/CM^2	Pressure Drop MM WG
15	FCG-1	10-100	0.3-3	20	250
	FCG-2	25-250	0.8-8		
20	FCG-3	50-500	1.5-15	20	360
	FCG-4	60-600	1.8-18		
25	FCG-5	100-1000	3-30	12	650
	FCG-6	200-2000	6-60		
	FCG-7	300-3000	8-80		
40	FCG-8	400-4000	12-120	9	650
	FCG-9	500-5000	15-150		
	FCG-10	600-6000	18-180		
50	FCG-11	80-8000	24-240	7	850
	FCG-12	1000-10000	30-300		
	FCG-13	1200-12000	.....		
65	FCG-14	1500-15000	.....	5	950
80	FCG-15	2000-20000	.....	5	950
	FCG-16	3000-30000	.....	5	1100
	FCG-17	8000-40000	.....	5	1100

OVERALL DIMENSIONS

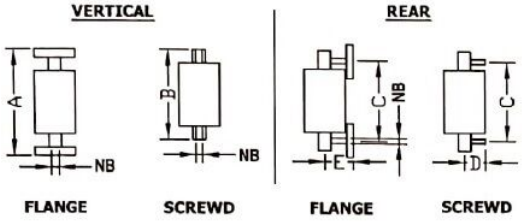


NB	A	B	C	D	E
15	500	425	440	55	90
20	500	425	440	60	90
25	500	425	440	65	115
40	500	425	500	85	140
50	500	450	500	85	155
65	500	N/A	500	N/A	190
80	500	N/A	500	N/A	190

SPECIFICATIONS SERIESFCGM

Meter Body	Powder coated M.S. optional SS 304, SS 316
Float	SS 316L, SS 316, PTFE, Monel, PVC etc.
Wetted Parts	SS 316L, SS 316, SS 304 MS PTFE, PVC, P.P., Monel etc.
Packings	Neoprene, PTFE, Silicon etc.
Tube	Borosillicate glass
Scale Length	100-125 mm
Temperature Max.	Upto 200°C depends on gland packing material.
Connections	Flanged, threaded etc.
Accuracy	±2% of full scale.
Repeatibility	0.5%
Rangeability	10:1
Accessories	Hi- low flow switch

OVERALL DIMENSIONS

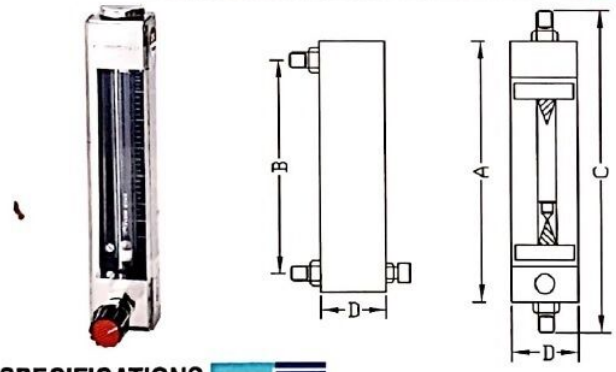


NB	A	B	C	D	E
15	350	300	325	55	90
20	350	300	325	60	90
25	350	300	325	65	115
40	350	300	325	85	140

STANDARD RANGES

NB	Models.	FLOW RATES. Water At 20°C LPH	FLOW RATES. Air At AMB. Temp. Nm^3/Hr	Pressure Rating KG/CM^2	Pressure Drop MM WG
15	FCGM-1 FCGM-2	10-100 25-250	0.3-3 0.8-8	20	250
20	FCGM-3 FCGM-4	50-500 60-600	1.5-15 1.8-18	20	360
25	FCGM-5 FCGM-6	100-1000 200-2000 300-3000	3-30 6-60 8-80	12	650
40	FCGM-7 FCGM-8	400-4000 500-5000	12-120 15-150	9	650

PURGE GLASS TUBE ROATAMETERS



SPECIFICATIONS

Meter	Powder coated M.S., SS 304, SS 316
Float	SS 316L, SS 316, PTFE etc.
Wetted Parts	SS 316L, SS 316, SS 304, PTFE etc.
Packings	Neoprene, PTFE etc.
Tube	Borosillicate glass
Scale Length	Model FSGT 1-3 =65 mm, FSGT 4-7 = 110 mm & FSGT 8-17 =140 mm
Temp. Max.	Upto 200°C depends on gland packing
Connections	threaded etc.
Accuracy	FSGT 1-3 ±5%, FSGT 4-7 ±3%, FSGT 8-17 ±2% of full scale.
Repeatibility	0.5%
Rangeability	10:1
Accessories	Hi- low flow switch

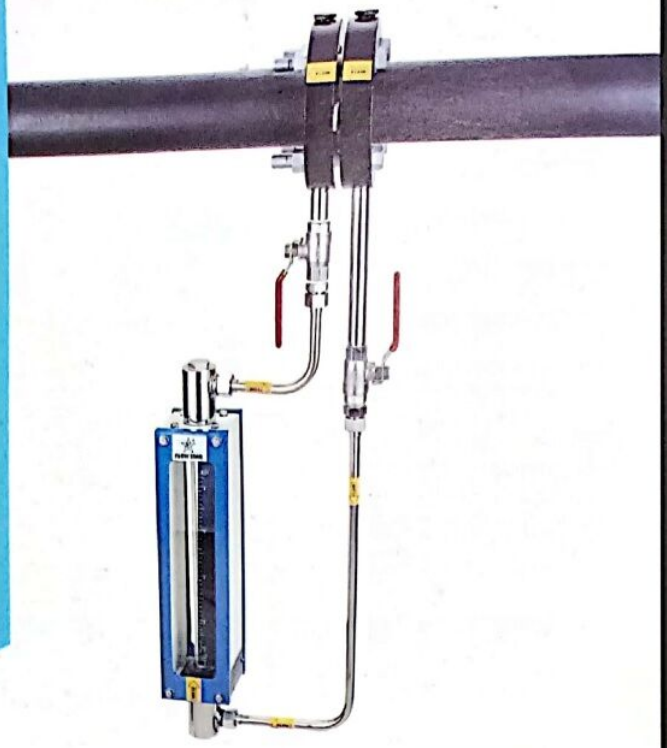
OVERALL DIMENSIONS

Model	A	B	C	D
FCGT-1-3	144	114	190	28
FCGT-4-7	193	163	240	36
FCGT-8-17	255	225	302	36

STANDARD RANGES SERIES FSGT

Models.	FLOW RATES Water At 20°C LPH	FLOW RATES Air At Amb. Temp. LPM	FLOW RATES Air At Amb. Temp. SCFH
FCGT-1	0.1-1	0.05-0.5	0.1-1
FCGT-2	0.2-2	0.1-1	0.2-2
FCGT-3	0.5-5	0.2-2	0.4-4
FCGT-4	0.6-6	0.4-4	0.8-8
FCGT-5	1.0-10	0.6-6	1.2-12
FCGT-6	1.5-15	1.0-10	2.20
FCGT-7	2.5-25	1.5-15	3-30
FCGT-8	1.2-12	0.7-7	1.5-15
FCGT-9	2-20	1.2-12	2.5-25
FCGT-10	3-30	1.6-16	3.2-32
FCGT-11	5-50	2.5-25	5-50
FCGT-12	6-60	3-30	6-60
FCGT-13	10-100	5-50	10-100
FCGT-14	12-120	6-60	12-120
FCGT-15	15-150	8-80	16-160
FCGT-16	18-180	10-100	20-200
FCGT-17	20-200	12-120	25-250

ROTAMETERS

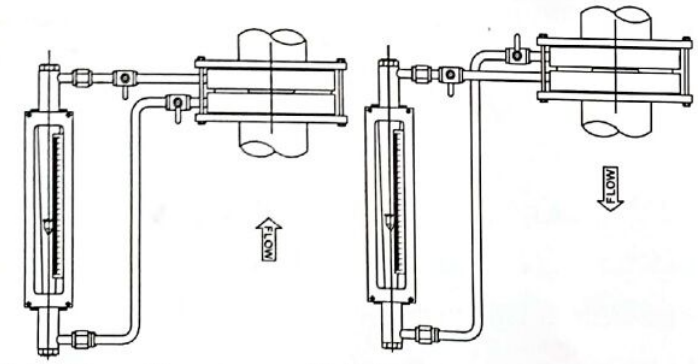


STANDARD RANGES FOR WATER AT 20°C

NB	Maximum Flowrate (M3/HR.)	NB	Maximum Flowrate (M3/HR.)
25	5	275	650
40	10	300	800
50	20	350	1000
80	36	400	1500
100	80	450	2000
125	125	500	2500
150	150	600	3000
200	320	700	4000
225	450	800	5000
250	550		Other sizes on request

METER ASSEMBLY

Glass Tube Rotameter	FCG-1
Metal Tube Rotameter	FCG-100



Vertical Upward Flow (Fig-B)

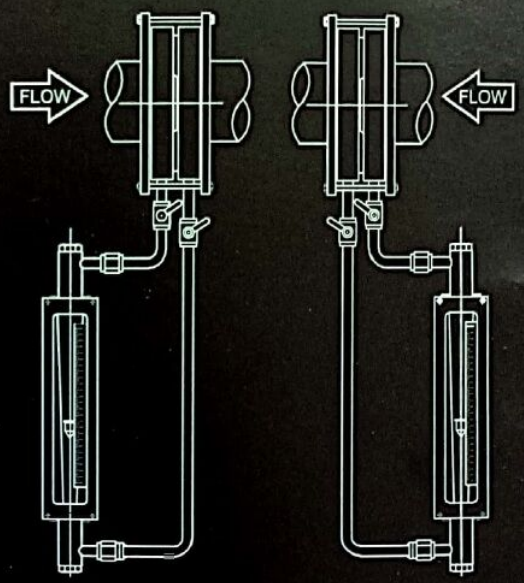
Vertical Downward Flow (Fig-C)

Bypass Rotameter Assembly Through Carrier Rings

BYPASS ROTAMETER

Bypass Rotameter systems are designed for the accurate measurement of fluid rate of flow in pipelines 25 NB in diameter or larger design Standard ISO 5167 or BS/1042. They accomplished this by providing a bypass flow that is directly proportional to the main flow. Since Rotameter measure bypass flow, not static differential, flow ranges up to 10 to I are possible with thease instruments. This provides a decided advantage over other types of flow measuring devices.

SYSTEM - A complete bypass Rotameter installation consists of the following : orifice flanges with orifice plate for insertion into the main pipeline; bypass piping with valves and fittings; a range orifice for insertion into the bypass pipeline; and what ever type Rotameter is considered best suited to a particular application

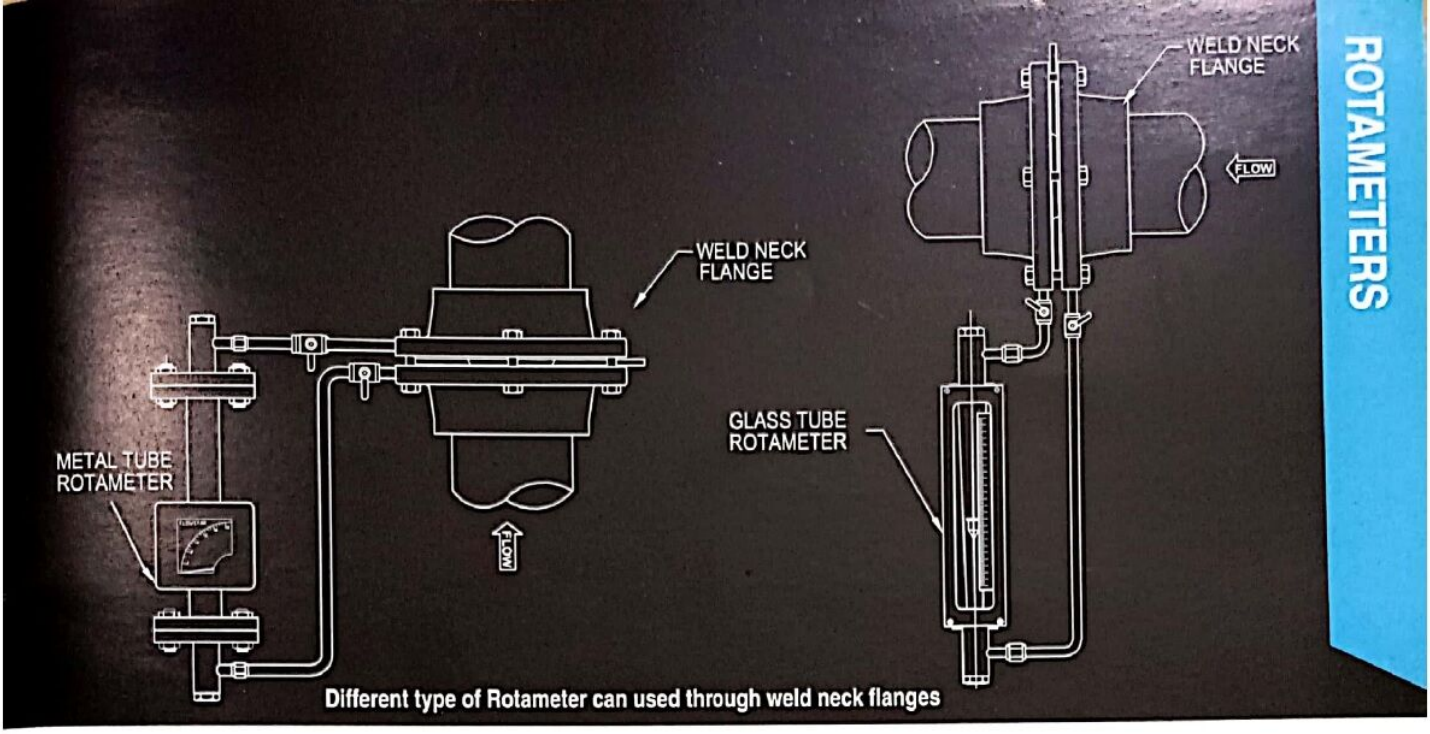


(Flow Right to Left) (Flow Left to Right)

Horizontal Flow (Fig -A)

INSTALLATION - BYPASS

Rotameters can be installed to measure horizontal flow (Fig. A) or vertical flow up (Fig. B) or down (Fig. C) for proper operation, a straight run of pipe is required on both sides of the orifice or, when space is limited, straightening vanes must be used as indicated in Table.



Different type of Rotameter can used through weld neck flanges

SPECIFICATION

Type of tapping	:	Flange, D and D/2, corner
Accuracy	:	±2% of full flow
Rangeability	:	7:1 or 5:1

ACCESSORIES

Hi-low flow switch
4-20 mA transmitter

STANDARD MATERIAL OF CONSTRUCTION

Orifice Flange	SS 316 L, SS 316, SS 304, CS etc.
Orifice Plate	SS 316, L, SS 316, SS 304, Hastelloy 'C', Monel, PVC etc.
Carrier Rings	SS 316 L, SS 316, Mild steel, PP etc.
By Pass Line	SS 316 L, SS 316, SS 304,Mild steel,PVC etc.
Wetted Parts of the Rotameter	SS 316 L, SS 316, SS 304, Mild steel, PP etc.

MINIMUM UPSTRAIGHT LENGTHS REQUIRED		DIAMETER RATIO (B)											
Fitting Before Straight Run	Piping Layout	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75
Single 90° bend or tee		10	10	10	12	14	14	14	16	18	22	28	36
Two or more 90° bends in the Same Planes		14	14	16	16	18	18	20	22	26	32	36	42
Two or more 90° bends in the Same Planes		34	34	34	36	36	38	40	44	48	54	62	70
Reducers or Expanders		16	16	16	16	16	18	20	20	22	24	26	28
Globe Valve Fully open		18	18	18	18	20	20	22	24	26	28	32	36
Gate Valve Fully open		12	12	12	12	12	12	12	14	16	16	20	24
Minimum Down Stream Straight Lengths Required		4	4	5	5	6	6	6	6	7	7	7	8

Valve of the Straight Length are of 'D' B=D/D D= Orifice Diameter D= Internal Diameter of Pipe

PLEASE PROVIDE US GENERAL ORDERING INFORMATIONS FOR BY-PASS ROTAMETER.

1) Name of fluid
2) Operating density of fluid / specific gravity
3) Operating viscosity of fluid
4) Clarity of fluid transparent or opaque
5) Operating pressure
6) Operating temperature
7) Line size
8) Type of connection
9) Minimum & maximum flow rate
10) Preferred material of construction for wetted parts and non wetted parts
11) Actual I. D. of pipe or schedule of pipe or class of pipe
12) Direction of flow i.e. vertical (upward or downward) or horizontal (left to right or right to left)