

Sho-Rate Purgemeter

DESIGN FEATURES

- Simple but rugged construction for easy flow indication
- Integral needle valves for process control
- Integral flow controllers to compensate for varying inlet and/or outlet pressures
- Tubes can be changed in line minimizing process down time
- Kynar construction option for corrosive fluids
- Interchangeable tubes and floats

DESCRIPTION

The Sho-Rate series of flow indicators provide an economical means of flow rate indication and control for general plant use, laboratory and analytical applications. The instruments are ideal for common applications like purging services, cooling water flow indication, bearing lubrication, carrier gas flow rate indication, fuel flow indication in chromatography and atomic absorption and indication and control of doping gas in electronic crystal growing furnaces.



Model GT 1350/1355 with Needle Valve on Inlet

SPECIFICATIONS

Performance

Scale length	model 1350	65 mm
	model 1355	150 mm
	model 1357	250 mm
Accuracy	model 1350	± 10% F.S.
	Optional	± 5% F.S.
	model 1355	± 5% F.S.
	Optional	± 2% F.S.
	model 1357	± 3% F.S.
	Optional	± 2% F.S.
	or	± 1% F.S.
Repeatability	± 0.5%	
Rangeability	10:1	
Maximum operating pressure	1400 kPa (14 bar)	
Maximum operating temperature	120 °C	
Certified	Intrinsically safe according to ATEX (PTB 99ATEX2128 X) Pressure Equipment Directive (PED) 97/23/EC. Flow meter complies under Sound Engineering Practices (SEP).	

Construction data

Fitting material	Brass or 316 SS
Connection material	Brass or 316 SS
Connection types	• Standard 1/8" NPT • Optional: - 1/4" NPT - 1/8" tube compression - 1/4" tube compression - 1/4" I.D. Hose
Side plate material	Anodized aluminium
Metering tube material	Borosilicate glass
Float material	Pyrex, Sapphire, 316 SS, Carboly or Tantalum
Float stop material	Teflon
Tube packing material	Viton
O-Ring material	Viton

Capacity Table Model 1350

TUBE	FLOAT	MODEL CODE	l _n /h AIR	l/h H ₂ O	DECAL ** l _n /h AIR*	DECAL ** SCFH AIR*	DECAL ** l/h H ₂ O	DECAL ** GPH H ₂ O
R-2-65-5	Glass	A1	4.29	-	0.4-4.2	0.01-0.16	-	-
R-2-65-5	316 SS	A3	13.5	-	1.5-13.5	0.02-0.52	-	-
R-2-65-5	Carboloy	A4	22	-	2-22	0.04-0.85	-	-
1-65	Glass	B1	42	0.60	4-42	0.2-1.2	0.04-0.6	0.01-0.14
2-65A	Glass	C1	50	-	6-50	0.4-2.0	-	-
2-65B	316 SS	D3	165	4.68	15-165	0.5-5.0	0.4-4.6	0.1-1.0
2-65C	316 SS	E3	-	2.38	-	-	0.2-2.3	0.05-0.5
3-65	Glass	F1	180	3.6	15-180	0.5-6.0	0.3-3.6	0.05-0.7
3-65	316 SS	F3	319	7.9	30-310	1.0-10	0.6-7.8	0.1-1.6
4-65	Glass	G1	359	8.8	30-350	1.2-12	0.8-8.8	0.2-2.0
4-65	316 SS	G3	628	22.1	60-620	2.0-18	2-22	0.5-4.0
6-65	Glass	H1	1297	37.0	150-1300	5.0-50	3-37	1.0-11
6-65	316 SS	H3	2341	77.1	200-2300	10-90	6-76	2.0-20
6-65	Carboloy	H4	3500	109	300-3500	12-120	10-105	2.0-30

* Flow is given at normal conditions (0 °C & 1.013 bar absolute) when the meter is operated at 20 °C & 1.013 bar absolute

** In case the instruments are supplied with a direct reading decal fused on the tube, the flow range values stated in these columns must be used

Capacity Table Model 1355

TUBE	FLOAT	MODEL CODE	l _n /h AIR	l/h H ₂ O
R-2-15-AAA	Glass	A1	2.78	0.033
R-2-15-AAA	Sapphire	A2	4.32	0.064
R-2-15-AAA	316 SS	A3	8.28	0.15
R-2-15-AAA	Carboloy	A4	14	0.296
R-2-15-AAA	Tantalum	A5	15.3	0.33
R-2-15-AA	Glass	B1	5.4	0.033
R-2-15-AA	Sapphire	B2	8.2	0.125
R-2-15-AA	316 SS	B3	15.9	0.315
R-2-15-AA	Carboloy	B4	26.9	0.575
R-2-15-AA	Tantalum	B5	29.1	0.670
R-2-15-D	Glass	F1	21	0.34
R-2-15-D	Sapphire	F2	29	0.63
R-2-15-D	316 SS	F3	46	1.35
R-2-15-D	Carboloy	F4	69	2.09
R-2-15-D	Tantalum	F5	73	2.26
R-2-15-A	Glass	C1	46	1.00
R-2-15-A	Sapphire	C2	61	1.57
R-2-15-A	316 SS	C3	94	2.76
R-2-15-A	Carboloy	C4	136	4.24
R-2-15-A	Tantalum	C5	144	4.54
R-2-15-B	Glass	D1	133	3.2
R-2-15-B	Sapphire	D2	173	4.8
R-2-15-B	316 SS	D3	262	7.9
R-2-15-B	Carboloy	D4	376	12.1
R-2-15-B	Tantalum	D5	398	13.1
R-2-15-C	Glass	E1	221	5.2
R-2-15-C	Sapphire	E2	292	8.0
R-2-15-C	316 SS	E3	439	13.3
R-2-15-C	Carboloy	E4	629	20.3
R-2-15-C	Tantalum	E5	667	21.9
R-6-15-A	Glass	G1	510	12.3
R-6-15-A	Sapphire	G2	669	18.3
R-6-15-A	316 SS	G3	944	30.0
R-6-15-A	Carboloy	G4	1347	44.4
R-6-15-A	Tantalum	G5	1430	47.7
R-6-15-B	Glass	H1	1296	34
R-6-15-B	Sapphire	H2	1690	49
R-6-15-B	316 SS	H3	2500	80
R-6-15-B	Carboloy	H4	3549	117
R-6-15-B	Tantalum	H5	3644	125

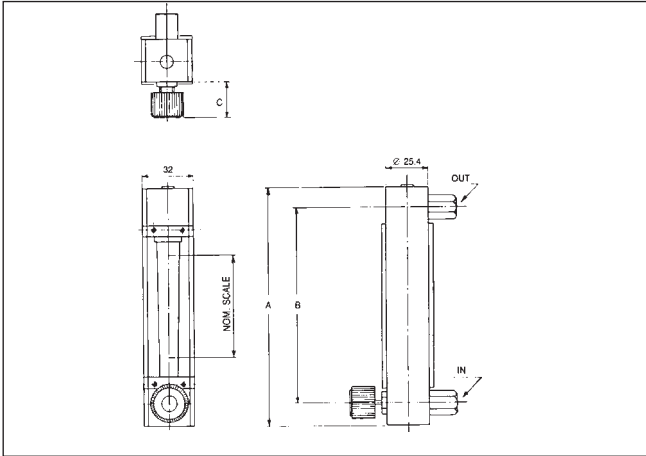
Capacity Table Model 1357

TUBE	FLOAT	MODEL CODE	ln/h AIR*	l/h H2O
R-2-25-D	Glass	D1	20	0.33
R-2-25-D	Sapphire	D2	28	0.61
R-2-25-D	316 SS	D3	45	1.21
R-2-25-D	Carboloy	D4	67	1.94
R-2-25-D	Tantalum	D5	71	2.10
R-2-25-A	Glass	A1	47	1.0
R-2-25-A	Sapphire	A2	62	1.6
R-2-25-A	316 SS	A3	96	2.8
R-2-25-A	Carboloy	A4	138	4.3
R-2-25-A	Tantalum	A5	147	4.6
R-2-25-B	Glass	B1	123	2.9
R-2-25-B	Sapphire	B2	160	4.5
R-2-25-B	316 SS	B3	242	7.4
R-2-25-B	Carboloy	B4	347	11.1
R-2-25-B	Tantalum	B5	370	11.9
R-2-25-C	Glass	C1	212	4.9
R-2-25-C	Sapphire	C2	277	7.5
R-2-25-C	316 SS	C3	416	12.8
R-2-25-C	Carboloy	C4	579	19.1
R-2-25-C	Tantalum	C5	611	20.5
R-6-25-A	Glass	E1	483	11.8
R-6-25-A	Sapphire	E2	619	17.6
R-6-25-A	316 SS	E3	910	29.2
R-6-25-A	Carboloy	E4	1280	43.0
R-6-25-A	Tantalum	E5	1356	45.8
R-6-25-B	Glass	F1	1273	33
R-6-25-B	Sapphire	F2	1621	49
R-6-25-B	316 SS	F3	2349	80
R-6-25-B	Carboloy	F4	3283	113
R-6-25-B	Tantalum	F5	3470	120

ALARM CONTACTS

• Inductive bistable ring initiators for high and/or low flow alarm may be mounted to the instrument to create a highly sensitive, stable and accurate device for signalling high or low flows or deviations from a controlled flow. The inductive alarm, (Ex) IICG EEx ia IIC T6) can only be used in combination with 316 SS or carbonyl ball floats and only with scales on tube. The alarm points may be adjusted over the entire flow meter range and be set so that any two contacts may be made to operate simultaneously. For hazardous area applications Brooks can supply an ATEX approved (Eex) ia IIC power supply/amplifier/relay unit to obtain an intrinsic safe current circuit.

DIMENSIONAL DRAWINGS



MODEL	CONNECTIONS	A	B	C
1350	1/8" NPT	140	114	26
1355	1/8" NPT	249	224	26
1357	1/8" NPT	376	351	26

OPTIONAL FEATURES/EQUIPMENT

• Kynar fitting material

The kynar (P.V.D.F.) fitting material provides an economical means of flow rate indication for difficult to handle, corrosive fluids encountered in chemical plants, research laboratories, semiconductor and film processing industries.

• Standard Valve or ELF Needle Valve

The Standard Valve is a multi-purpose valve. The ELF Needle Valve (Non Rising Stem design) provides a greater number of turns affording greater precision control with higher resolution. Both valves provide positive shut-off and both are directly interchangeable. Both valves can be installed at the inlet or the outlet fitting of the flowmeter.

• Panel Mounting Arrangements

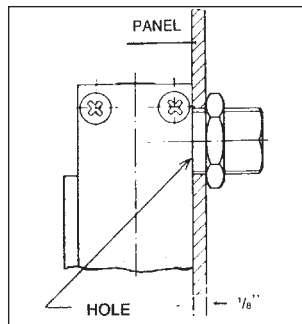
Flush mounting bezel

The instrument can be equipped with an aluminium (model 1350 and 1355) or plastic (model 1357) bezel for flush panel mounting.

Threaded adapters with mounting nuts for front panel mounting (See drawing below)

• Integrally mounted flow controllers

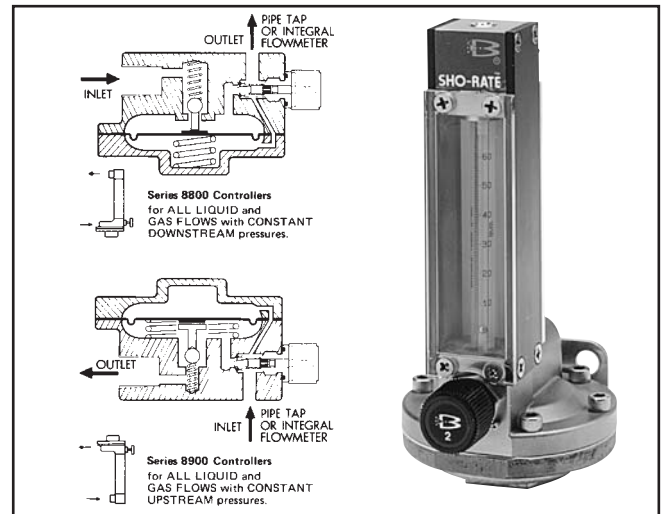
Brooks self-contained flow controllers are constant differential regulators with built-in flow control needle valve. The internal diaphragm-actuated control valve is positioned by the incoming fluid pressure on one side of the diaphragm, and outlet pressure + spring action on



the other side. Variations in the supply and/or discharge pressure, disturb the balance of forces on the diaphragm, causing the control valve to close or to open, thus maintaining a fixed differential across the manual flow regulating valve. The series 8800 controllers are designed for all liquid and gas flows with constant downstream pressure. Series 8900 controllers are designed for all liquids and gas flows with constant upstream pressure.

The 8800/8900 controllers are designed to offer an economical way of controlling all your liquid and gas flows.

The 8840/8940 controllers are designed to offer the most accurate way of controlling all your liquid and gas flows.



- Inductive switches for high and low flow alarm. One or more inductive sensing coils may be mounted to the instrument to create a highly sensitive, stable and accurate device for signalling high or low flows or deviations from a controlled flow (only for use with 316 SS or Carboly ball floats).
- In-line sintered metal filter.
- Circular or triangle base plates with screws and spirit level.
- Multi-tube construction with manifold or individual inlet/outlet.

Example Dimensional Drawing Multi-Tube Sho-Rate

No of Tube	A
2T	50.8
3T	76.2
4T	101.6
5T	127
6T	152.4

ORDERING INFORMATION

BASE MODEL NUMBER		DESCRIPTION
1350/D		SHO-RATE '65'
1355/D		SHO-RATE '150'
1357/D		SHO-RATE '250'
FITTING / O-RING MATERIAL		
1		BRASS FITTINGS/VITON O-RINGS
2		316 SS FITTINGS/VITON O-RINGS
TUBE TYPE		
X		TO BE SELECTED FROM CAPACITY TABLE
FLOAT MATERIAL		
X		TO BE SELECTED FROM CAPACITY TABLE
SCALE TYPE		
A		MM DECAL + CALIBRATION CURVE
D		DIRECT READING SCALE (NOT WITH ALARM)
E		DIRECT READING DECAL (ln/h AIR @ 20 °C & 1,013 BAR ABS)
F		DIRECT READING DECAL (l/h WATER)
G		DIRECT READING DECAL (SCFH AIR @ 70 °F & 14,7psig)
H		DIRECT READING DECAL (GPH WATER)
ACCURACY		
		MODEL 1350 MODEL 1355 MODEL 1357
1		± 10 % F.S. ± 5% F.S. ± 3% F.S.
2		± 5 % F.S. ± 2% F.S. ± 2% F.S.
3		± 1% F.S.
CONNECTIONS		
A		1/8" NPT FEMALE (NOT WITH FLOW CONTROLLER)
B		1/4" NPT FEMALE (ST'D WITH FLOW CONTROLLER)
C		1/8" TUBE COMPRESSION
D		1/4" TUBE COMPRESSION
E		1/4" I.D.HOSE
FLOW CONTROLLER/NEEDLE VALVE		
0		NONE
1		8800 FLOW CONTROLLER
2		8900 FLOW CONTROLLER
3		8840 FLOW CONTROLLER
4		8940 FLOW CONTROLLER
5		VALVE POSITIONED AT INLET SIDE
6		VALVE POSITIONED AT OUTLET SIDE
VALVE SIZE		
0		NONE
A		STANDARD VALVE # 1
B		STANDARD VALVE # 2
C		STANDARD VALVE # 3
D		NRS NEEDLE VALVE # 1
E		NRS NEEDLE VALVE # 2
F		NRS NEEDLE VALVE # 3
G		NRS NEEDLE VALVE # 4
H		NRS NEEDLE VALVE # 5
J		NRS NEEDLE VALVE # 6
K		NRS NEEDLE VALVE # 7
BISTABLE ALARM		
0		NONE
A		1 LIMIT SENSOR
B		2 LIMIT SENSORS
C		1 LIMIT SENSOR+ I.S. RELAY, 230/110VAC KFA6/KFA5-SR2-Ex1.W
D		2 LIMIT SENSORS+ I.S. DOUBLE RELAY, 230/110Vac KFA6/KFA5-SR2-Ex2.W
MOUNTING		
0		NONE
1		ALUMINIUM BEZEL
2		THREADED ADAPTERS (NPT ONLY) WITH PANEL MOUNTING NUTS
3		MOUNTING BRACKET FOR CONTROLLER
4		CIRCULAR BASEPLATE (ALUMINIUM)
9		SELECT "9" OR "Z" IF SPECIAL AND SPECIFY
1350 / D 2 A 1 A 1 A 5 D A 1 = TYPICAL MODEL NUMBER		



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