

Models 1350 and 1355

Kynar® (PVDF) Sho-Rate™ Low Flow Indicators

- Corrosion resistant Kynar* (PVDF)
- Ten-to-one rangeability
- Heavy-wall, precision bore, borosilicate glass metering tubes
- A wide range of scales on the metering tube with contrasting background for easy readability
- Screwdriver slotted, non-rotating seal spindle eliminates tube turning
- Flush side plates
- No fitting adaptors - 1/4" female NPT machined in end fitting

*Kynar is resistant to most acids and bases. Fuming nitric, oleum, and other sulfonating agents have some effect at high temperatures. Good resistance to aliphatics, aromatics, alcohols, acids, and chlorinated solvents as well as oxidizing agents and the halogens. Strong reducing agents such as the primary amines have an effect depending upon temperature. Strongly polar solvents such as ketones and esters cause partial solvation, particularly at elevated temperatures.

DESCRIPTION

The Brooks® Kynar Sho-Rate series of low flow indicators provides a cost-effective means of accurate flow indication for difficult to handle, corrosive fluids. Available options include the Brooks-Line IV™ or NRS™ integral needle control valves.

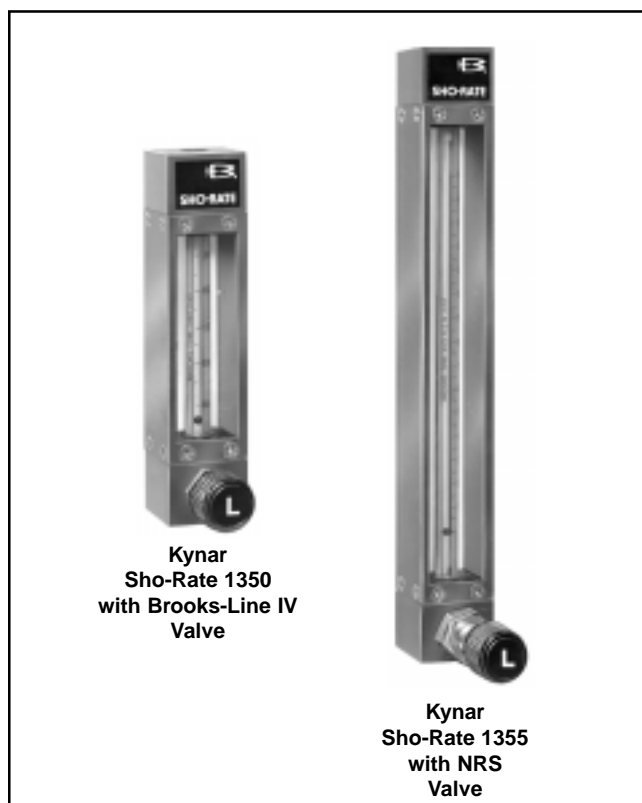
SPECIFICATIONS

⚠ WARNING

Do not operate this instrument in excess of the specifications listed below. Failure to heed this warning can result in serious personal injury and/or damage to the equipment.

Capacities

Refer to Tables 1 through 5



Standard Accuracy

Model 1350: $\pm 10\%$

Model 1355: $\pm 5\%$

Accuracy is % of full scale from 100% to 10% of scale reading.

Repeatability

1/2% full scale

Rangeability

10 to 1

Pressure

150 psig at temperatures up to 100°F, 25 psig at temperatures up to 150°F

Pressure Drop

Inquire at factory

Brooks Instrument

FISHER-ROSEMOUNT™ Managing The Process Better.™

Scales

Length - Model 1350: 65mm nominal; Model 1355: 150 mm nominal
 Graduations - Standard: 0-65mm, 0-150mm, or 0-100 linear reference scale with air or water calibration table.
 Optional: Direct read decal on tube - consult factory for available ranges; Direct read on metal scale plate mounted beside tube
 Type - Standard: Fused on meter tube with contrasting yellow background

Materials of Construction

Metering Tubes: Borosilicate glass
 Floats: Glass, 316 stainless steel, sapphire, Carboly, tantalum
 Structural Members: End fittings, seal spindle: Kynar (PVDF); Side Plates: Standard - Black anodized aluminum, Optional - 316 stainless steel; Window - Clear polycarbonate; Back Window - Milk white polycarbonate
 Float Stops: Teflon®
 Tube Packing: Standard: Viton; Optional: Buna-N, ethylene propylene
 O-rings: Standard: Viton-A; Optional: Kalrez®, Buna-N, ethylene propylene

Connections

Horizontal female 1/4" NPT threaded

Dimensions

Refer to Figure 1

COMPATIBLE BROOKS EQUIPMENT

Brooks-Line IV integral flow control valve with stainless steel valve stem, on inlet or outlet (See DS-BLIV)
 NRS integral flow control valve with stainless steel valve stem, on inlet or outlet (See DS-8503). These valves are particularly suitable for precise control requirements, and are recommended for flow rates below 500 sccm of air (@STP) or 10 cc/min water.

Screws for front of panel mounting

ORDERING INFORMATION, (Refer to Table 6)

1. Model
2. Size
3. Quantity Required
4. Fluid
5. Minimum, normal and maximum flow rate
6. Minimum, normal and maximum operating temperature
7. Minimum, normal and maximum operating pressure (inlet and outlet)
8. Fluid Specific Gravity
9. Fluid Viscosity
10. Scale Data
11. Materials of Construction
 - a. Side Plates
 - b. Packing
 - c. O-rings
12. Unusual System Conditions - for ranges and pressure drops other than those listed, consult factory.
13. Optional Equipment
 - a. Valve type & location
 - b. Front panel mounting screws

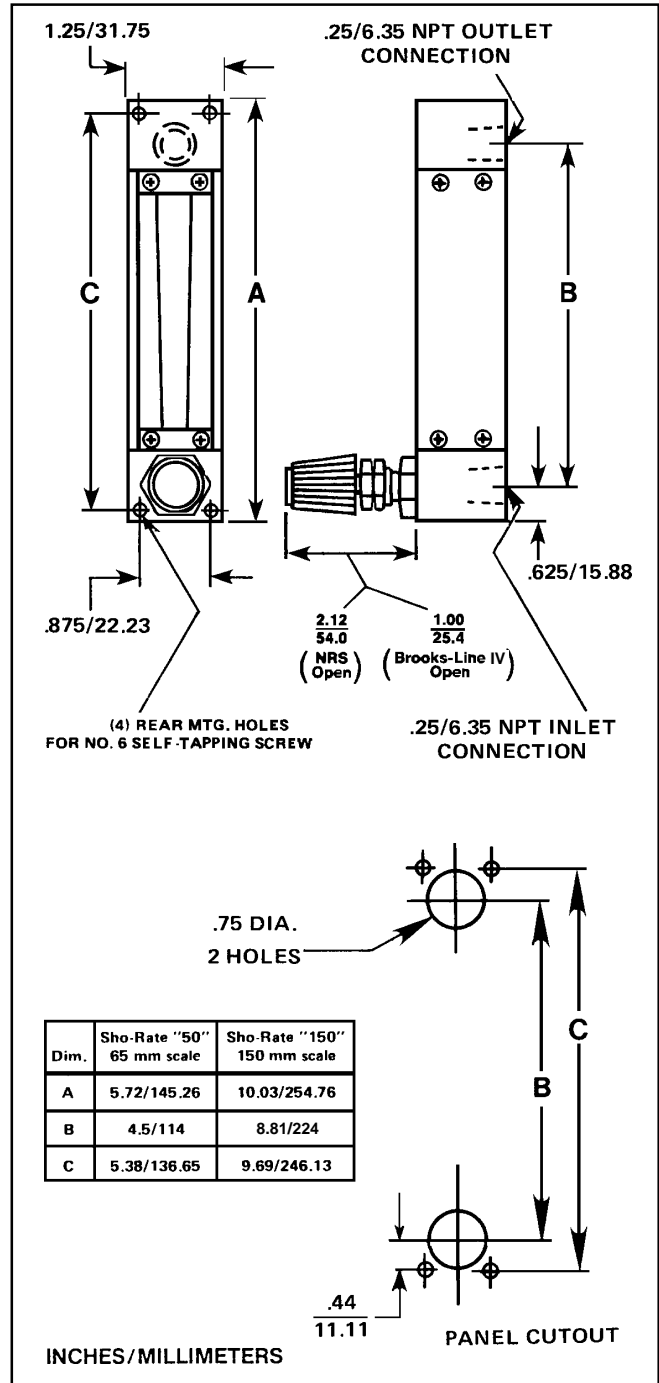


Figure 1 Dimensions

TRADEMARKS

Brooks Brooks Instrument Division, Emerson Electric Co.
 Brooks-Line IV Brooks Instrument Division, Emerson Electric Co.
 Fisher-Rosemount Fisher-Rosemount Grp. of Companies
 Kalrez E.I. DuPont de Nemours & Co.
 Kynar Penwalt Corp.
 Managing The Process Better Fisher-Rosemount Grp. of Companies
 NRS Brooks Instrument Division, Emerson Electric Co.
 Sho-Rate Brooks Instrument Division, Emerson Electric Co.
 Teflon E.I. DuPont de Nemours & Co.
 Viton E.I. DuPont de Nemours & Co.

Table 1 Capacities for Sho-Rate Model 1350 Rib Guided Tubes, Spherical Floats

RIBBED TUBES, SPHERICAL FLOATS											
METER SIZE	TUBE NO.	FLOAT MATERIAL	MAXIMUM FLOW RATE								
			WATER				AIR*				
			GPH	CODE	LPH	CODE	SCFH	CODE	NLPH	CODE	
2	R-2-65-A	GLASS	0.011	JB6	0.042	JB9	0.13	JB7	3.4	JB8	
		SAPPHIRE	0.022	JC4	0.085	JC2	0.18	JC3	5.0	JC1	
		STN. STL.	0.046	JC8	0.18	JC5	0.34	JC7	9.0	JC6	
		CARBOLOY	0.10	JB4	0.38	JB5	0.65	JB2	17.0	JB3	
		TANTALUM	0.11	JD2	0.42	JC9	0.70	JD1	19.0	JD3	
	R-2-65-B	GLASS	0.013	KB8	0.048	KB2	0.15	KB7	4.0	KB9	
		SAPPHIRE	0.026	KC1	0.10	KD3	0.22	KC2	5.5	KC3	
		STN. STL.	0.06	KC5	0.22	KC6	0.42	KC7	11.0	KC8	
		CARBOLOY	0.12	KB4	0.48	KB5	0.80	KB3	22.0	KB6	
	R-2-65-C	TANTALUM	0.13	KD2	0.50	KD5	0.85	KD4	22.0	KD1	
		GLASS	0.11	LB9	0.42	LB7	0.95	LB6	24.0	LB8	
		SAPPHIRE	0.15	LC1	0.6	LC2	1.3	LC3	34.0	LC4	
		STN. STL.	0.38	LC7	1.4	LC8	2.0	LC9	50.0	LC6	
		CARBOLOY	0.65	LB3	2.4	LB2	3.0	LB4	80.0	LB5	
	R-2-65-D	TANTALUM	0.65	LD1	2.6	LD2	3.2	LD3	85.0	LD4	
		GLASS	0.65	MB9	2.4	MB7	3.8	MB8	100	MC1	
		SAPPHIRE	0.95	MC2	3.6	MC3	5.0	MC4	130	MC5	
		STN. STL.	1.60	MC7	6.0	MD1	7.5	MC6	200	MC8	
		CARBOLOY	2.40	MB5	9.0	MB2	11.0	MB3	280	MB4	
		TANTALUM	2.60	MD5	10.0	MD6	12.0	MD2	300	MD4	
GLASS		2.40	NB8	8.5	NB7	13.0	NC1	340	NB9		
SAPPHIRE		3.40	NC4	13.0	NC3	17.0	NC6	460	NC5		
6	R-6-65-A	STN. STL.	5.50	ND1	20.0	ND3	26.0	NC9	650	ND2	
		CARBOLOY	8.50	NB2	32.0	NB3	36.0	NB5	950	NB6	
		TANTALUM	9.0	ND6	34.0	ND5	38.0	ND7	1000	ND4	
		GLASS	8.0	PB9	30.0	PB8	44.0	PC1	1100	PB7	
		SAPPHIRE	12.0	PC5	44.0	PC3	60.0	PC4	1500	PC2	
	R-6-65-B	STN. STL.	19.0	PD1	70.0	PC9	85.0	PC8	2200	PC6	
		CARBOLOY	28.0	PB3	100	PB2	130	PB6	3400	PB4	
		TANTALUM	30.0	PD7	110	PD6	140	PD5	3600	PD4	

* FLOW RATES GIVEN ARE MAXIMUM VALUES. AIR FLOWS ARE AT 14.7 PSIA AND 70 DEGREES F.

Table 2 Capacities for Sho-Rate Model 1350 Plain Tapered Tubes, Spherical Floats

PLAIN TAPER TUBES, SPHERICAL FLOATS							
TUBE AND FLOAT	SCFH AIR*	Press. Drop **		TUBE AND FLOAT	GPH WATER	Press. Drop **	
		Inches W.C.	CODE			Inches W.C.	CODE
1-65A GLASS	1.2	1.0	AB4	1-65C GLASS	0.14	1.8	AB5
2-65A GLASS	2.0	2.2	BA7	2-65C STN. STL.	0.5	4.0	DA5
2-65B STN. STL.	5.0	10.8	CA4	2-65D STN. STL.	1.0	19.5	CA8
3-65A GLASS	6.0	12.4	EB4	3-65C GLASS	0.7	22.3	EB9
3-65B STN. STL.	10	10.1	EB8	3-65D STN. STL.	1.6	18.3	EC1
4-65A GLASS	12	10.4	FC3	4-65C GLASS	2.0	18.7	FD3
4-65B STN. STL.	18	25	FC8	4-65D STN. STL.	4.0	45	FD6
5-65A GLASS	45	60	GB6	5-65C GLASS	9.0	109	GC4
5-65B STN. STL.	80	214	GC1	5-65D STN. STL.	17	385	GC5
6-65A GLASS	55	73	HB8	6-65C GLASS	11	132	HC7
6-65B STN. STL.	90	292	HC5	6-65D STN. STL.	20	525	HD1
6-65E CARBOLOY	120	400	HD3	6-65F CARBOLOY	30	890	HD4

* FLOW RATES ARE MAXIMUM VALUES. AIR FLOWS ARE AT 14.7 PSIA AND 70 DEGREES F

** PRESSURE DROPS ARE APPROXIMATE

Table 3 Tube and Float Code, Detachable Scale Option, 1st Digit

CODE	MODEL 1350 TUBE	MODEL 1355 TUBE
A	1-65	R-2-15-A
B	2-65A	R-2-15-AA
C	2-65B & D	R-2-15-AAA
D	2-65C	R-2-15-B
E	3-65	R-2-15-C
F	4-65	R-2-15-D
G	5-65	R-6-15-A
H	6-65	R-6-15-B
J	R-2-65-A	
K	R-2-65-B	
L	R-2-65-C	
M	R-2-65-D	
N	R-6-65-A	
P	R-6-65-B	
Y	NO TUBE	

Table 4 Tube and Float Code, Detachable Scale Option, 2nd & 3rd Digits

METER ACCURACY	FLOAT MATERIAL	DETACHABLE SCALE INSCRIPTION				
		MM	0-100 LINEAR	SPECIAL SINGLE SCALE	SPECIAL DUAL SCALE	BLANK SCALE
STANDARD (1350-10%) (1355- 5%)	GLASS	1A	1N	2A	2N	3A
	STN. STL.	1B	1P	2B	2P	3B
	SAPPHIRE	1C	1Q	2C	2Q	3C
	CARBOLOY	1D	1R	2D	2R	3D
	TANTALUM	1E	1S	2E	2S	3E
	*ALUMINUM	1F	1T	2F	2T	3F
CALIBRATED (1350-5%) (1355-2%)	GLASS	1G	1U	2G	2U	
	STN. STL.	1H	1V	2H	2V	
	SAPPHIRE	1J	1W	2J	2W	
	CARBOLOY	1K	1X	2K	2X	
	TANTALUM	1L	1Y	2L	2Y	
	*ALUMINUM	1M	1Z	2M	2Z	
N/A	NONE	9A	9B			9C

*ALUMINUM SPOOL FLOAT FOR 15 CC/MIN AIR AVAILABLE ONLY WITH R-2-15-AAA TUBE

Table 5 Capacities for Sho-Rate Model 1355 Rib Guided Tubes, Spherical Floats

CAPACITIES (RIB GUIDE TUBES, SPHERICAL FLOATS) - FOR USE WITH 1355 SERIES ONLY								
METER SIZE	TUBE NO.	FLOAT MATERIAL	MAXIMUM FLOW RATE *		MODEL CODE - SCALE ON TUBE			
			WATER (CC/MIN.)	AIR	0-150 MM	10-100%	0-100 LINEAR	
2	R-2-15-AAA	GLASS	0.524	47.1 SCC/M	CA6		CA1	
		SAPPHIRE	1.02	73.3 SCC/M	CA8		CA3	
		STN. STL.	2.42	140 SCC/M	CA7		CA2	
		CARBOLOY	4.77	238 SCC/M	CA9		CA4	
		TANTALUM	5.31	260 SCC/M	CB1		CA5	
	R-2-15-AA	GLASS	0.964	83.8 SCC/M	BA6		BA1	
		SAPPHIRE	1.86	128 SCC/M	BA8		BA3	
		STN. STL.	4.34	245 SCC/M	BA7		BA2	
		CARBOLOY	8.37	416 SCC/M	BA9		BA4	
		TANTALUM	9.30	454 SCC/M	BB1		BA5	
	R-2-15-D	GLASS	5.58	361 SCC/M	FA6		FA1	
		SAPPHIRE	10.2	491 SCC/M	FA8		FA3	
		STN. STL.	19.8	790 SCC/M	FA7		FA2	
		CARBOLOY	31.9	1170 SCC/M	FA9		FA4	
		TANTALUM	34.4	1250 SCC/M	FB1		LIQ. GAS	FA5
	R-2-15-A	GLASS	16.1	0.790 SLPM	AA6	AB7	AC3	AA1
		SAPPHIRE	25.2	1.04 SLPM	AA8	AB9	AC4	AA3
		STN. STL.	44.2	1.60 SLPM	AA7	AB8	AC6	AA2
		CARBOLOY	67.7	2.32 SLPM	AA9	AC1	AC5	AA4
		TANTALUM	72.5	2.46 SLPM	AB1	AC2	AC7	AA5
R-2-15-B	GLASS	50.6	2.25 SLPM	DA6	DB2		DA1	
	SAPPHIRE	76.2	2.92 SLPM	DA8	DB4		DA3	
	STN. STL.	127	4.42 SLPM	DA7	DB3		DA2	
	CARBOLOY	189	6.35 SLPM	DA9	DB5		DA4	
	TANTALUM	202	6.74 SLPM	DB1	DB6		DA5	
R-2-15-C	GLASS	81.1	3.69 SLPM	EA6	EB2		EA1	
	SAPPHIRE	123	4.81 SLPM	EA8	EB4		EA3	
	STN. STL.	208	7.23 SLPM	EA7	EB3		EA2	
	CARBOLOY	312	10.1 SLPM	EA9	EB5		EA4	
	TANTALUM	333	10.6 SLPM	EB1	EB6		EA5	
6	R-6-15-A	GLASS	191	8.26 SLPM	GA6	GB2		GA1
		SAPPHIRE	284	10.6 SLPM	GA8	GB4		GA3
		STN. STL.	468	15.7 SLPM	GA7	GB3		GA2
		CARBOLOY	690	22.0 SLPM	GA9	GB5		GA4
		TANTALUM	735	23.3 SLPM	GB1	GB6		GA5
	R-6-15-B	GLASS	548	22.6 SLPM	HA6	HB2		HA1
		SAPPHIRE	809	28.6 SLPM	HA8	HB4		HA3
		STN. STL.	1290	41.6 SLPM	HA7	HB3		HA2
		CARBOLOY	1850	58.1 SLPM	HA9	HB5		HA4
		TANTALUM	1960	61.4 SLPM	HB1	HB6		HA5

NOTE: ALL AIR FLOWS ARE AT 14.7 PSIA AND 70 DEGREES F.

*FLOW RATES SHOWN ARE MAXIMUM CAPACITIES. DIRECT READ SCALES MAY END AT SLIGHTLY DIFFERENT MAXIMUM FLOWS.

Table 6 Ordering Information and Model Code

MODEL	PURGE FLOWMETER		
1350E	65 MM TUBE, SIZES 1-6		
1355E	150 MM TUBE, SIZES 1-6		
CODE	TUBE, SCALE AND FLOAT		
---	MODEL 1350 OR 1355 DETACHABLE SCALE - SEE TABLES A1 & A2		
---	MODEL 1350 - SEE TABLE B OR C		
---	MODEL 1355 - SEE TABLE D		
CODE	TUBE PACKING	O-RING MATERIAL (METER/VALVE ASSEMBLY)	
A	BUNA -N	BUNA-N	
B	VITON	BUNA-N	
C	VITON	VITON (STD FOR KYNAR METERS)	
E	VITON	EPM	
F	VITON	KALREZ	
M	EPM	EPM	
P	NO PACKING	BUNA-N	
Q	NO PACKING	VITON	
S	NO PACKING	EPM	
T	NO PACKING	KALREZ	
CODE	FITTING AND ADAPTER MATERIAL/PROCESS CONNECTION SIZE AND TYPE		
K	KYNAR 1/4" NPT		
CODE	VALVE TYPE		
E	BROOKS-LINE IV VALVE - 316 STAINLESS STEEL - LOW FLOW		
F	BROOKS-LINE IV VALVE - 316 STAINLESS STEEL - MEDIUM FLOW		
G	BROOKS-LINE IV VALVE - 316 STAINLESS STEEL - HIGH FLOW		
P	NRS - 316 STAINLESS STEEL #1		
Q	NRS - 316 STAINLESS STEEL #2		
R	NRS - 316 STAINLESS STEEL #3		
S	NRS - 316 STAINLESS STEEL #4		
T	NRS - 316 STAINLESS STEEL #5		
U	NRS - 316 STAINLESS STEEL #6		
X	NO VALVE CAVITY (MUST USE CODE 9 BELOW FOR VALVE CAVITY LOCATION)		
CODE	VALVE CAVITY LOCATION	CONNECTION ORIENTATION	
1	INLET	IN-BACK,	OUT-BACK(STD)
2	INLET	IN-BACK,	OUT-FRONT
3	INLET	IN-FRONT,	OUT-BACK
4	INLET	IN-FRONT,	OUT-FRONT
5	OUTLET	IN-BACK,	OUT-BACK(STD)
6	OUTLET	IN-BACK,	OUT-FRONT
7	OUTLET	IN-FRONT,	OUT-BACK
8	OUTLET	IN-FRONT,	OUT-FRONT
9	NONE (INLET SIDE) USE WITH CODE X ABOVE	IN-BACK,	OUT-BACK
CODE	ACCESSORIES - 1,2, OR 3 DIGIT FIELD		
A	NONE		
C	FLUSH PANEL MOUNTING FOR KYNAR METERS		
J	DEGREASE FOR OXYGEN SERVICE		
L	STAINLESS STEEL SIDE PLATES		
M	STAINLESS STEEL SPRING FLOAT STOPS		
N	CALIBRATE FOR NIST TRACEABILITY (10%, 1350; 5%, 1355)		
Q	NO BROOKS IDENTIFICATION		

1350E LC7 C K X 9 A TYPICAL MODEL CODE

ISO 9001
QUALITY SYSTEM
Certificate of Conformity
The Quality System at Brooks Instrument
conforms to the quality standards set
forth in ISO 9001.

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Specifications Subject to Change Without Notice

Brooks Instrument

FISHER-ROSEMOUNT™ Managing The Process Better.™