W.A. Kates® company

FC VALVE

the genius of simplicity

Automatic Flow Rate Controllers

The Kates FC Valve has been applied successfully throughout industry to a wide variety of liquid and gas applications. We take pride in providing a high quality and high performance instrument that will provide many years of maintenance free service. Our motto is "to serve our customers as we desire our suppliers to serve us", exemplifies our commitment to quality and service.

Materials of Construction

- All metal wetted parts: 316 stainless steel
- Other material available upon request: Hastelloy, PVC, Alloy 20, Monel, etc.

Specifications

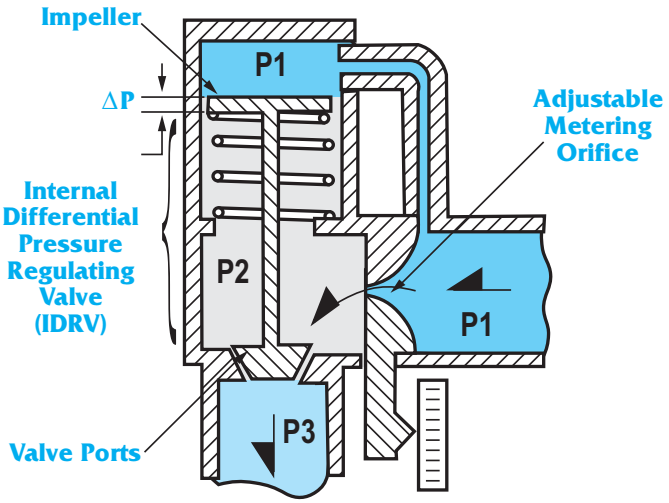
• Accuracy:	± 1-1/2% of setpoint
• Repeatability;	± 1/2% of setpoint
• Response time:	1-2 seconds
• Turndown ratio:	25 to 1 (average)
• Connections:	FNPT or ANSI flanged

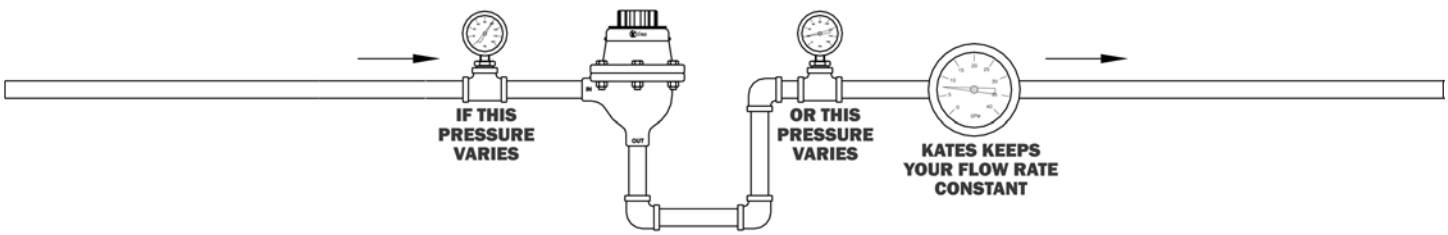
How It Works

Flow rate trough an orifice is proportional to the size of the restriction and the differential pressure across it. By combining an adjustable orifice with an internal regulating valve, the Kates FC Valve will maintain a constant pressure drop across the metering orifice.

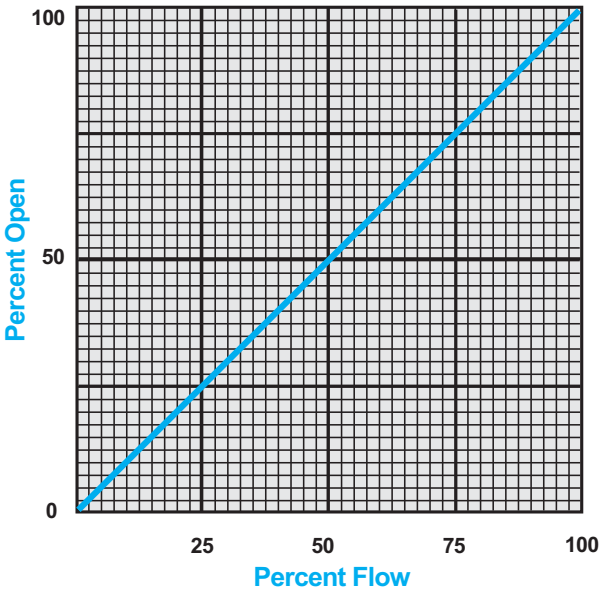
$$P1 = P2 + \text{Spring Force}$$

For example; if supply pressure (P1) increases, the resulting momentary pressure imbalance immediately moves the impeller downward. This action restricts the valve ports thus increasing orifice backpressure (P2),restoring differential pressure and the flow rate to the original settings. The unit will respond equally as well to an upset in outlet pressure (P3).

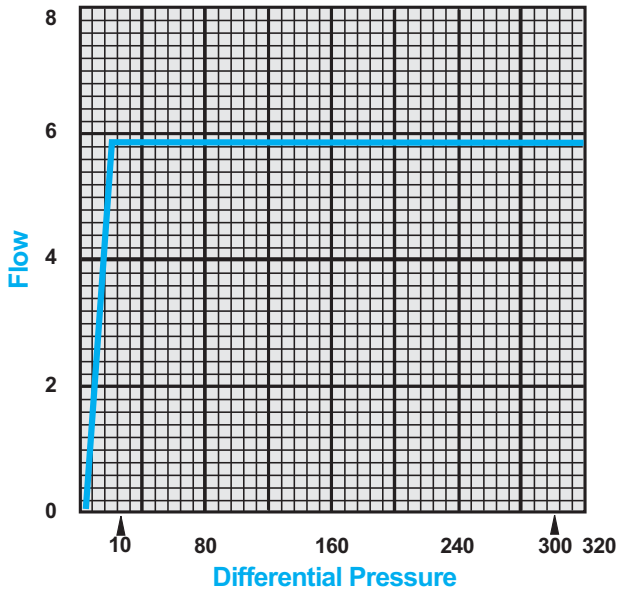




Linearity



Flow Characteristics



Flow Rate Control of Gases

Downstream pressure fluctuations are counterbalanced by the internal regulating valve to maintain the SCFM to within 1-1/2% of the flow setting. Variations in upstream pressure and temperature should be minimized due to the compressibility of gases and the corresponding changes in density. The ranges of Kates FC Valves are cataloged in gal/min for purposes of standardization. This equation is provided to estimate the gal/min flow equivalent to the desired flow setting in SCFM.

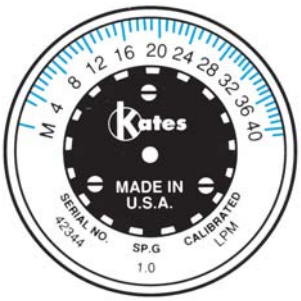
$$K = \frac{16.05\ \sqrt{2\ (PSIGin\ 14.7) - 4}}{\sqrt{(SP.\ GR.)\ (TEMP.,°F + 460)}}$$

GPM=SCFM/K

Dial Calibration

Kates FC Valves are supplied with a calibrated dial indicating actual gal/min, SCFM, or any other engineering unit.

Calibrated Dial

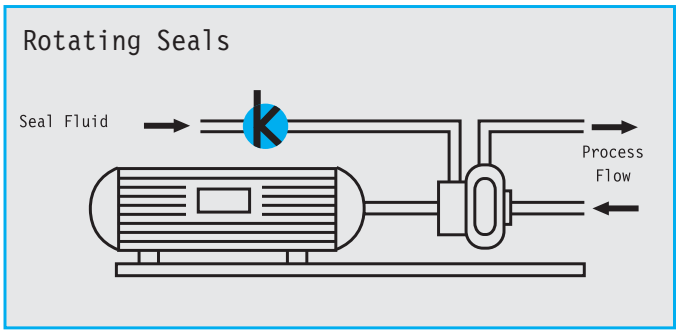


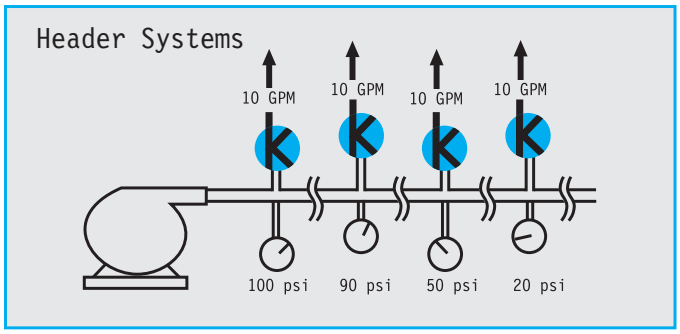
Pressure-Temperature Ratings Kates FC Valves: Maximum Working Pressure - PSIG

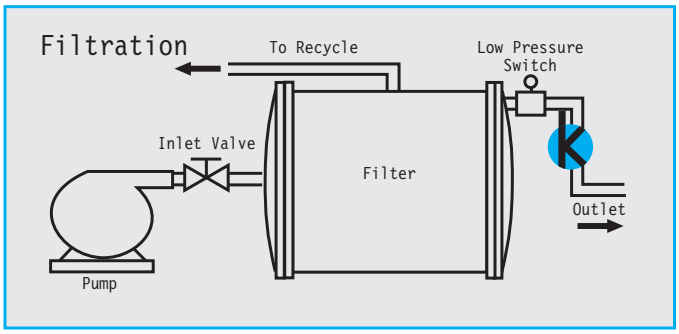
	Pressure Class					
Temperature (°F)	**150#**	**300#**	**600#**	**900#**	**1500#**	**2500#**
100	275	720	1440	2160	3600	6000
200	235	620	1240	1860	3095	5160
300	215	560	1120	1680	2795	4660
400	195	515	1025	1540	2570	4280
450	182	497	990	1487	2480	4130

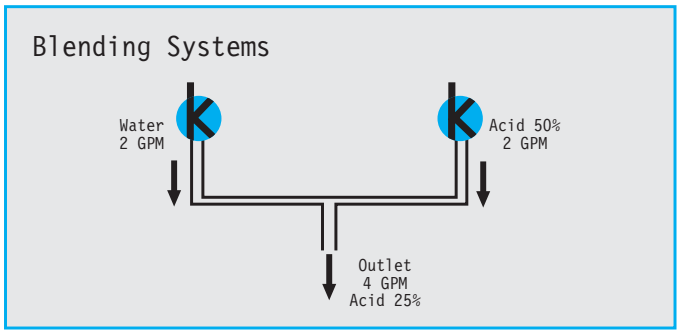
Hydrostatic testing of all castings is performed at the above test pressures for a period of not less than (3) minutes using water. This testing meets or exceeds all requirements of ANSI B16.5 or steel pipe flanges and flanged fittings

Typical Applications









Remote Positioning/ Modulating Control

The automated Kates FC Valve will improve the performance of almost any control loop. A change in input signal will cause a direct and linear change in flow rate regardless of inlet or outlet pressure variations. Turndown ratios for controllers can be ordered as high as 100:1. In addition to stabilizing the process loop, it inherently offers accurate cascade control.

More Applications

• Deionized Water • Rotating Seals • Additives/Blending • Nitrogen Blanketing • Natural Gas • Bleaching Systems • Reverse Osmosis • Dynamometers • Ratio Blending • Humidity Control • Heat Exchangers • Cooling Water • Dust Suppression • Aircraft De-icing • Test Cells • Caustics • Acids • Analytical Fast Loops...and hundreds more!

How To Order Guide

FCVALVE

Choose one alphanumeric character from each of the first five columns; multiple options may be selected from the sixth column. Then specify the needed information below. The sample Model Number, BB11T-BE, represents a 1/2" unit with 0.05 to 1.0 gpm flow range, 316 SS body, 150 pound body rating, 10 to 150 psi differential pressures, and threaded connections. The added options are Teflon® seals and a metal knob.

	Flow Range* (GPM)	Material	Pressure Class	ΔP Range (PSI)	Connections	Options
1/2"	A .02-.5	B 316 SS (STD)	1 150#	1 10-150	T THREADED	A BUNA O-RINGS
	B .05-1.0	C PVC**	3 300#	3 20-600	B RF FLG	B TEFLON O-RINGS® (STD)
	C .1-3.0	D Hastelloy C	6 600#	4 25-1200	S SPECIAL	C VITON O-RINGS
3/4"	E 1-5	E Alloy 20	9 900#	5 30-1800		E METAL KNOB
	F 1-12	F Monel	0 1500#	6 35-3000		F SS TAG
	G 1-25		A 2500#			H ELECTRIC ACTUATOR
1-1/2"	J 3-80					J GAS SERVICE
2"	K 10-150					L SPECIAL
3"	M 15-350					
4"	N 100-550					
	O SPECIAL					

Example

B	*B*	*1*	*1*	*T*	*- BE*

* Specified flow ranges are for water (SPG = 1.0). Actual flow may vary due to fluid conditions.

** Only available in 3/4" line size.

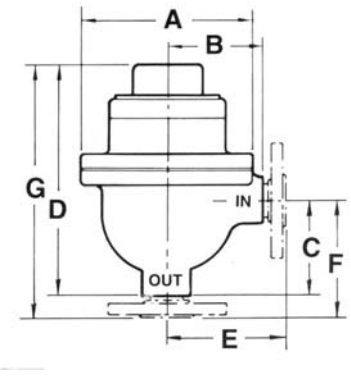
*** For long lasting maintenance free operation we recommend that a strainer or filter be installed just upstream of the controller. Refer to BLT 204–02.

Teflon® is a registered trademark of DuPont Corporation.

Dimensions: inches (cm)

PIPE SIZE	150/300# THREADED A	B	C	D	WT	150# FLANGED E	F	G	WT	300# FLANGED E	F	G	WT
1/2"	4.75 (12.07)	2.38 (6.03)	4.63 (11.76)	9.74 (24.74)	13 lb 5.9 kg	4.00 (10.16)	6.25 (15.88)	11.36 (28.85)	16 lb 7.3 kg	4.25 (10.80)	6.50 (16.51)	11.61 (29.49)	18 lb 8.2 kg
3/4"	5.69 (14.45)	3.36 (8.53)	3.38 (8.59)	8.17 (20.75)	17 lb 7.7 kg	4.62 (11.73)	4.62 (11.73)	9.40 (23.88)	21 lb 9.5 kg	5.00 (12.70)	5.00 (12.70)	9.78 (24.84)	23 lb 10.4 kg
1-1/2"	8.88 (22.56)	4.62 (11.73)	4.87 (12.37)	12.27 (31.17)	51 lb 23.1 kg	6.87 (17.45)	7.12 (18.08)	14.52 (36.88)	60 lb 27.2 kg	6.81 (17.30)	7.06 (17.93)	14.46 (36.73)	65 lb 29.5 kg
2"	9.25 (23.50)	-	-	-	N/A	7.46 (18.95)	6.78 (17.22)	18.93 (48.08)	110 lb 49.9 kg	7.77 (19.74)	7.09 (18.01)	19.25 (49.90)	115 lb 52.2 kg
3"	14.24 (36.20)	-	-	-	N/A	10.40 (26.42)	8.25 (20.96)	22.69 (57.63)	330 lb 150 kg	10.70 (27.18)	8.84 (22.45)	23.27 (59.11)	330 lb 150 kg
4"	Consult Factory												

600#
900#
1500#
2500#
Consult Factory



Name: _____

Title: _____

Company: _____

Address: _____

City: _____ State: _____ Zip Code: _____

Telephone: (_____) _____ Fax: (_____) _____ E-mail: _____

Please specify the following information when ordering:

Quantity: _____

Media: _____ Max Temperature: _____

Supply Pressure: _____ Specific Gravity: _____

Discharge Pressure: _____ Viscosity: _____

Max Pressure: _____ Nominal Flow: _____

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