

# SKO FLO

## *MULTI-POINT CHEMICAL INJECTION SYSTEMS*

- ONLY ONE MOVING PART
- ADJUSTABLE FLOW RATES
- NO SCHEDULED MAINTENANCE
- CONSTANT FLOW REGARDLESS OF PRESSURE FLUCTUATIONS



# SKOFLO INDUSTRIES, INC.

## WHY PRESSURE INDEPENDENT CONTROL VALVES?

Control valves have been used for centuries. Until the new **SkoFlo** Valve, we have lived with the problem of changing flows as the pressure (DP) across the valve changes by the following flow equation:

$$Q = C_v \sqrt{\Delta P / S_g}$$

**Q = Flow** (gallons per minute)

**ΔP = Pressure Drop** across valve (PSID)

**Sg = Specific Gravity** (equals 1 for water at 60°F)

**Cv = Flow Rate** of the valve. The rating of a valve is a numerical value which corresponds to the flow rate occurring at a 1 PSID pressure differential across the valve.

eg: A valve with a Cv rating of 10 has a pressure drop of 1PSID when 10 GPM pass through it.

The **SkoFlo** Valve takes the DP out of the flow equation and holds it constant internally across orifices at each flow rate setting.

In the **SkoFlo** Valve, we internally set the DP across the control surfaces so it can't change. Therefore, the flow remains constant. Most all piping systems are dynamic (varying pressures and flows). The **SkoFlo** Valve solves the problem caused by pressure changes in the system.

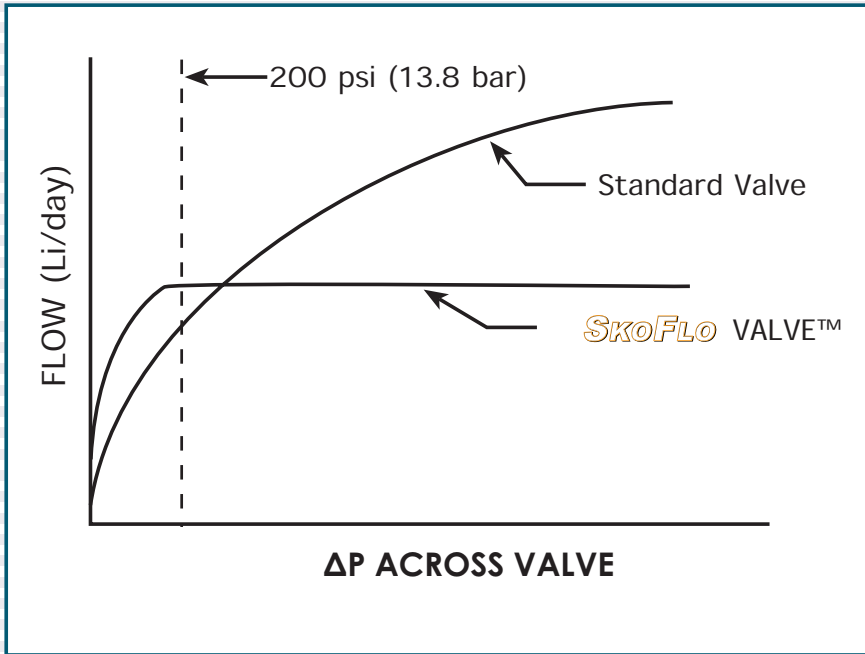
## QUESTIONS & ANSWERS

- Q. Why is this valve different from other flow control valves?
- A. This flow control valve maintains a constant flow through it regardless of pressure changes across it.
- Q. Does this valve has more than one setting?
- A. Yes, it operates within a pre-determined flow range. You just turn the rate adjustment handle to change the flow.
- Q. Can you supply valves to operate at less than 200 psi (13.8 bar) differential pressure?
- A. Yes, please contact the factory with your requirements.
- Q. What engineering principle does this valve use to give constant flow regardless of pressure fluctuations across it?
- A. This unit uses a unique spring system to maintain a constant differential pressure across a fixed orifice system.
- Q. What does the unit use for control power?
- A. The fluid passing through the unit provides the control power. The flow rate remains constant as long as the minimum differential pressure is maintained.
- Q. What is required to operate the unit?
- A. No hands-on operation and maintenance are required after initial start-up and calibration. No scheduled maintenance is required. You change the flow rate by turning the rate adjustment handle.
- Q. What can go wrong with the unit?
- A. It is possible to plug up the orifice system. The fluid passing through the unit must be filtered. We recommend that a filter be installed at the inlet to each unit.
- Q. How many moving parts are in the unit?
- A. This unit has one moving part.
- Q. Is this unit leak free?
- A. Yes, static O-rings and high pressure seals are used to seal the unit. The unit is bolted together.
- Q. What flow rates can be provided?
- A. A wide range of flow rate units can be provided .3 gpd to 2000 gpd (1 to 7600 l/d) at ratings to 15,000 psi (1034 bar). Higher flow rates are available (contact the factory).
- Q. How many units can be installed on a single pump or supply header system?
- A. You can connect as many units as the pump or supply source will satisfy.

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## THE VALVE

### Valve Performance Curve



**Notes:** (Assuming Cv remains constant for both valves)

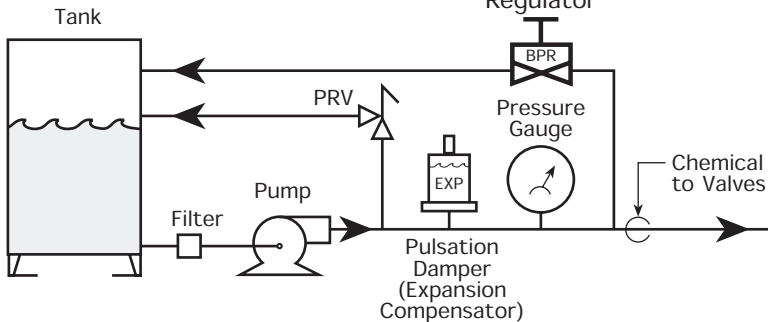
1. **Standard Valve:** the flow rate varies as the square root of the differential pressure across the standard control valve.
2. **SkoFlo Valve:** the flow rate remains constant once the minimum differential pressure is reached across the SkoFlo valve.

## THE SYSTEM

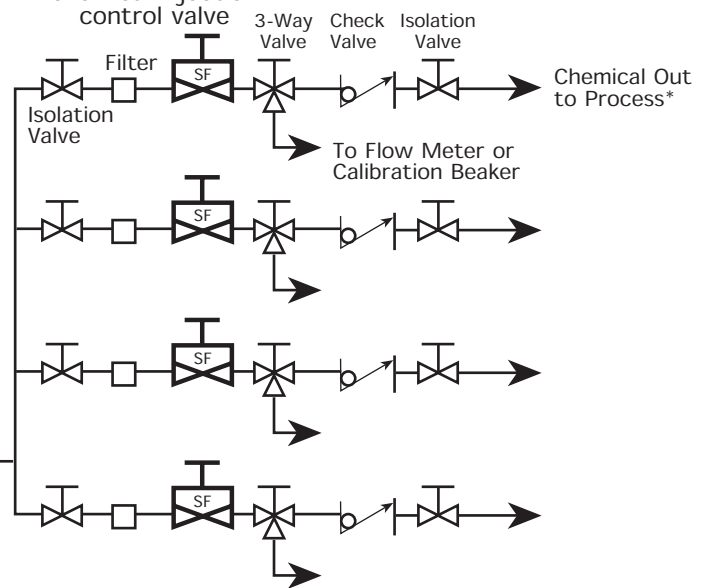
### SKOFLO Multi-Point System Utilizing a Positive Displacement Pump

- A single pump for multi-location injection program
- Local flow control chemical injection flow controllers for individual location rate control
- No pneumatic or electric power sources required for control
- Continuous flow

**SKOFLO**  
Back Pressure Regulator



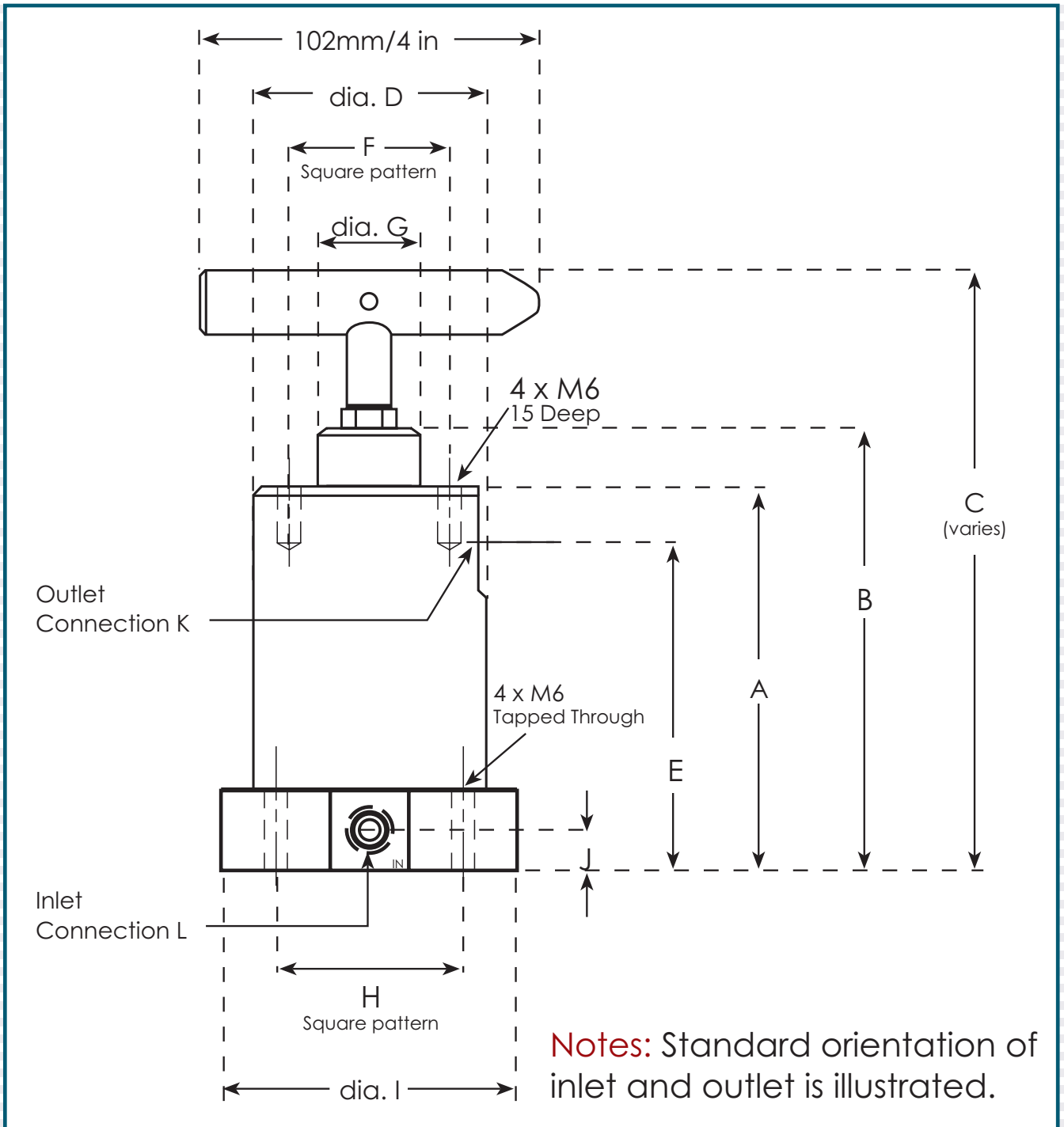
**SKOFLO**  
chemical injection  
control valve



\*Any number of injection points can be served.

**Notes:** For systems **not** using a positive displacement pump the pulsation damper and back pressure regulator are not required.

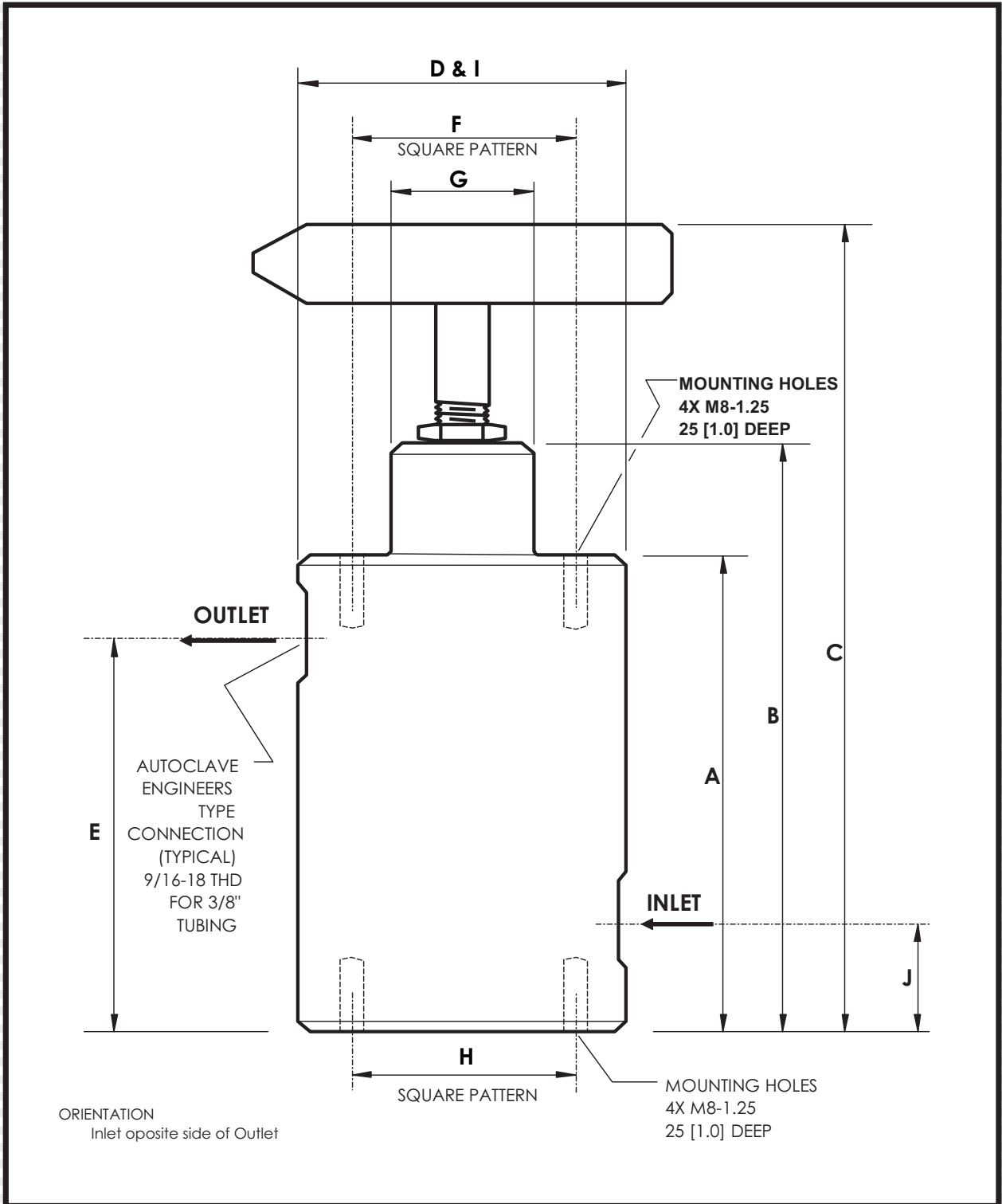
# SKOFLO Valve Model SF-5000C



MODEL	DIMENSIONS (mm/in)											
	"A"	"B"	"C"	"D"	"E"	"F"	"G"	"H"	"I"	"J"	"K"	"L"
SF-5000C	117 / 4.6	135 / 5.3	201 / 7.9	70 / 2.75	101 / 3.97	41 / 1.62	31 / 1.20	57 / 2.25	89 / 3.50	12.7 / 0.50	1/4 NPT	1/4 NPT

# SKOFLO Valve Model SF-10000D

## Valve Model SF-15000B



MODEL	DIMENSIONS (mm/in)											
	"A"	"B"	"C"	"D"	"E"	"F"	"G"	"H"	"I"	"J"	"K"	"L"
SF-10000D	170 / 6.69	194 / 7.64	290 / 11.4	87 / 3.43	144 / 5.66	51 / 2.00	30.5 / 1.20	51 / 2.00	87 / 3.43	57 / 2.26	3/8 AE	3/8 AE
SF-15000B	170 / 6.69	194 / 7.64	279 / 11.0	100 / 3.95	144 / 5.66	51 / 2.00	30.5 / 1.20	51 / 2.00	113 / 4.45	19 / 0.75	3/8 AE	3/8 AE

DASH #	FLOW RATE RANGE with 200 psi ΔP	
	Li / day	Gal / day
2	1 - 8	0.3 - 2
5	2 - 19	0.6 - 5
10	5 - 38	1.3 - 10
20	9 - 76	2.5 - 20
30	14 - 114	3.8 - 30
40	19 - 151	5 - 40
50	23 - 189	6 - 50
75	56 - 284	15 - 75
100	76 - 379	20 - 100
150	114 - 568	30 - 150
200	151 - 757	40 - 200
300	227 - 1136	60 - 300
400	303 - 1514	80 - 400
500	379 - 1893	100 - 500

DASH #	FLOW RATE RANGE with 200 psi ΔP	
	Li / day	Gal / day
750	720 - 2839	190 - 750
1000	947 - 3785	250 - 1000
1500	1439 - 5678	380 - 1500
2000	1893 - 7570	500 - 2000

SF-5000C NOT AVAILABLE WITH FLOW RATES ABOVE 500 Gal/day (1893 Li/day)

**Valve Selection:**

1. **Determine** maximum flow rate and system requirements. Minimum 200 psi (13.8 bar) ΔP across the valve is required for the flow rate ranges shown.
2. **Convert** to equivalent flow of water (using specific gravity and viscosity of fluid - see below).
3. **Select** the model and dash number from the flow tables.

**Notes:**

1. **Maximum working pressures:** SF5000C, 5000psi (345 bar)  
SF10000D, 10000psi (689 bar) SF15000A, 15000psi (1034 bar)
2. **Standard materials of construction:** 316 Stainless Steel, VITON seals.
3. **Models are available:** for under 200psi ΔP and for over 2000 gal/day flow rates. Please contact the factory.

**FLUIDS OTHER THAN WATER**

$$Q_{water} = \frac{Q_{fluid} \times \sqrt{Sg_{fluid}}}{V}$$

Where: **Q<sub>water</sub>** = equivalent water rate, Gal/day  
**Q<sub>fluid</sub>** = fluid flow rate required, Gal/day  
**Sg<sub>fluid</sub>** = specific gravity of fluid  
**V** = viscosity correction factor (from table)

Example: Maximum system pressure = 7400 psig  
 Fluid flow required = 10 gpd (38 l/d)  
 Fluid specific gravity = 0.9  
 Fluid viscosity = 250 cs  
 V = 0.58 (from table)

$$Q_{water} = \frac{10 \times \sqrt{0.9}}{0.58} = 16.36 \text{ Gal/day}$$

Viscosity CS	Factor V
1	1.00
10	1.00
20	0.97
30	0.92
40	0.89
50	0.86
60	0.83
70	0.81
80	0.79
90	0.77
100	0.74
200	0.63
300	0.53
400	0.44
500	0.39
600	0.34
700	0.30
800	0.26
900	0.24
1000	0.23

Therefore select a **SKOFLO VALVE™** model SF-10000D, Dash #20

**SKOFLO INDUSTRIES, INC.**

Patent #4893649