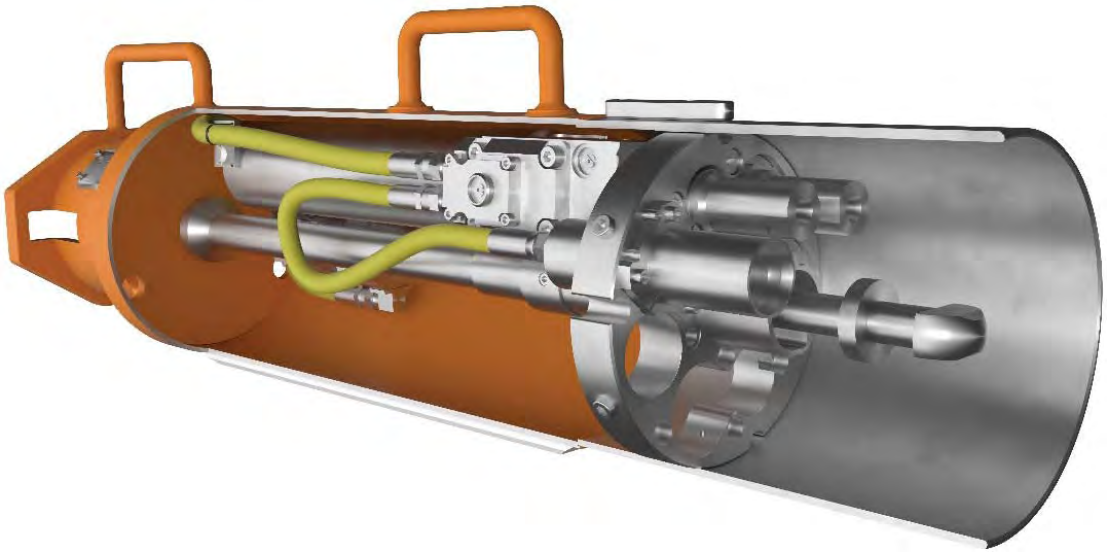


General Design Features

- Pressure-balanced piston: Pressure independence, which is unique to SkoFlo Chemical Injection Metering Valves, constantly delivers accurate and precise chemical injection.
- SkoFlo's Chemical Injection Metering Valve (CIMV) maintains set chemical injection flow rates regardless of upstream (platform to the valve) and downstream (valve to the well) pressure fluctuations. Upstream and downstream pressure fluctuations create a net force on the piston, which is countered by a spring force to maintain constant flow.
- SkoFlo's innovative pressure-balanced piston design allows chemicals to be distributed at different injection points from a common line. This reduces the number of umbilicals, and in turn, significantly reduces the cost to the operator. The spring balanced piston also provides a means of control that is more tolerant to debris and fluid filming than a throttling stem directly driven by a gear motor.
- Large particle debris produce a net force on the piston; pressure created on the piston surfaces by debris is pushed out through the outlet instantaneously. Response time occurs within milliseconds with no "hunting" or control iterations as opposed to a motor operated stem that needs to open and close, also known as dithering.
- Fail "as-is without drift" – During loss of power the valve will continue to regulate flow at the set flow rate, regardless of debris or system pressure fluctuations.
- The SkoFlo Positive Displacement Flow Meter (PDFM) provides accurate flow measurements of better than ±2% of reading and measures flow rates down to 1 GPD.

SkoFlo Benefits

- 30-years of experience, industry expert and solutions provider
- Pressure Independent Valve Technology (PIVT)
- Significant chemical **OPEX** cost savings
- Unmatched flow delivery accuracy and field proven reliability

Product Specification
Subsea Low Flow CIMV

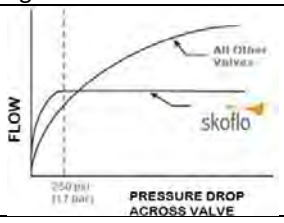
GENERAL

Product	Chemical Injection Metering Valve (CIMV)			
Design Standards	ISO 13628-6 (API 17F) ISO 13628-8 (API 17H), ASME B31.3, ASME BPVC Sec. VIIII			
Design Life	25 Years			
Temperature Rating Ops / Storage	23°F to 104°F (-5°C to 40°C) / 0°F to 158°F (-18°C to 70°C)			
Pressure Rating Working / Proof	10,000 psig (689 barg) / 15,000 psig (1034 barg)			
Depth Rating	10,000 ft (3,048 m)			
Injection Fluid Cleanliness Classification	SAE AS4059 Class 12B-F			
Seawater Wetted Materials	- 316/316L Stainless Steel - Aluminum Bronze - Alloy/Inconel 625, 718 - Alloy/Monel K500	- Silver (Plating over metal seals) - PVC NBR Blend (Proprietary) - SuperDuplex 2507 - Nitronic 50 HS	- Nitronic 60 - Acetal Resin - EPDM - PEEK	- Nylon - Elgiloy - Delrin - EPR
Chemically Wetted Materials	- 316/316L Stainless Steel - Alloy/Hastelloy C276 - Alloy/Inconel 600, 625, 718, X-750 - Gold (Plating over metal seals) - Silver (Plating over metal seals)	- Ceramic Coating (Proprietary) - Alloy/Monel K500 - Ceramic (Proprietary) - GTFE Teflon	- Monel R405 - Nitronic 50 HS - Chemraz 510 - PTFE - PEEK	- Nickel - Elgiloy

ELECTRICAL

Electrical Connector	4-Pin, Teledyne ODI or Siemens Tronic		
Electrical Connector Location	Electrical Connector located in the stab plate or ROV-deployed.		
Motor	High Efficiency Servo		
Voltage Supply[1]	24±4 VDC		
Power Consumption Max, steady state[1]	2W, idle	4W, stem/motor adjustment	6W, PDFM Measurement
Pressure Transducers (digital)	If pressure sensors are specified, four digital diagnostic sensors will monitor inlet and outlet pressures. Sensor accuracy is ± 0.05% of full scale (15,000 psi rated).		
Pressure Transducers (analog)	Alternate analog diagnostic sensors available upon request. Sensor accuracy ± 0.75% of full scale (18,000psi rated).		
Electronics Housing	2 atm nitrogen. Separated from chemical by welded Inconel bellows, from sea water by oil bathed penetrator and oil bathed double elastomeric seals.		
Communications Protocol	CANbus (SIIS Rev2 compliant for level 2 device) or Modbus		

LOW FLOW CIMV PERFORMANCE[2]

Flow Range	For project flow rates below 2 GPD (0.3 LPH) consult factory		
	Model L200	2 to 500 GPD (0.3 to 78.9 LPH)	
	Model L201	10 to 1200 GPD (1.6 to 189.3 LPH)	
Measurement Accuracy	PDFM integral to the valve.	±2% of reading	
Flow Delivery Accuracy[3]	Valve mechanically maintains set flow rate, with instantaneous mechanical response to system pressure fluctuations and debris, independent of feedback from flow measurement device.		
Secondary Measurement	Flow by Stem		
Loss of Power/Communications	Fail as is without drift. In event of loss of power or communication, valve will continue to control set flow rate.		
Minimum dP	250 psi (17 bar) required to regulate flow independent of pressure at max flow capacity. Min dP criteria decreases when flow decreases. (25% MEG in water at room temperature. For fluid viscosities 3-100cP, contact sales@skoflo.com)		

[1] *Information is for reference only, for the most updated information and additional details regarding valve power requirements, see the currently released revision of SkoFlo specification SPEC-10609. (per core, typical)*

[2] *Data is applicable to 25% monoethylene glycol in water injection fluid. Refer to project specific configuration sheet for requirements based on injected fluid properties.*

[3] *The accuracy that a CIMV delivers chemical in relation to the target/set flow rate regardless of any pressure fluctuations or debris.*