

# Chemical Injection Throttle Valve (CTV)

15K psi Low and Medium Flow

**Oceanengineering**<sup>®</sup> Rotator CTVs are installed on subsea trees and manifolds to provide continuous, controlled subsea injection of chemicals into the well stream. The valve is remotely operated and ROV retrievable.



## FEATURES

Field proven - more than 1,100 valves subsea

Self-cleaning design - no subsea filtration required

Accurate flow over a long service life

## Technical data

General		
Part number / name	CTV4-LF-15K	CTV4-MF-15K
Minimum flow rate*	0.001 l /min	0.1 l /min
Maximum flow rate*	1.8 l /min	15 l /min
Flow measurement type - primary	Differential pressure: Absolute pressure sensors at each end of fixed restriction.	
Turn down ratio (dependent on flow rates and viscosity)	100:1 or higher (typical)	
Flow measurement accuracy	Better than +/- 3% of full scale flow (FSC)	
Flow measurement type - secondary	Flow rate identified on look up chart	
Recommended differential pressure	Minimum 1.5 psi / 0.1 bar over fixed restriction	
Maximum differential pressure	15,000 psi, 1,035 bar	
Maximum differential pressure while operating the motor	2,900 psi, 200 bar (tested with safety margin of 25 %)	
Time of full travel (close to open)	11 min	
Chemical inhibitors typically used	Scale, wax, corrosion, defoamers, paraffin, asphaltene, demulsifier, MEG, methanol, etc.	
Valve failure mode	Fail as is, flow rate can be controlled with differential pressure	

Mechanical Design	
Design life	30 years
Pressure rating	15,000 psi, 1,035 bar
Maximum water depth	13,123 ft / 4,000 m
Outer diameter	Ø: 5.5 in / 141 mm
Length	Min: 34.8 in / 956.5 mm Max: 36.1 in / 1,005.5 mm
Weight - in air	~ 112 lb / 51 kg
Weight - in water	~ 95 lb / 43 kg
Temperature rating - design	14 to 158 ° F / -10 to 70° C
Temperature rating - electronic	-0.4 to 158 ° F / -18° to 70° C
Temperature rating - operating	23 to 104° F / -5° to 40° C
Temperature rating - storage	4 to 122 ° F / -20° to 50° C
Debris tolerance / fluid cleanliness	SAE AS4059 Class 12B-F
Maximum particle size through the valve	0.0196 in / 0.5 mm
Smallest restriction in the valve	0.031 in x 0.055 in 0.8 mm x 1.4 mm
Cleaning method	Mechanical scraper, flush through
Inlet screen / filter size	No filter required

Materials	
<b>External parts wetted by sea water</b>	
Valve body	Super duplex (UNS S32750)
Hydraulic couplings	Nitronic 50 (UNS S20910), ToughMet® (3 AT110)
Fasteners	Inconel® 625 (UNS N06625)
<b>Internal parts wetted by chemicals</b>	
Flow parts	Super duplex (UNS S32750), Nitronic 50 (UNS S20910)
Pressure sensor	Inconel® 625 (UNS N06625)
Hydraulic couplings	Nitronic 50 (UNS S20910), Monel® K500 (UNS N05500), ToughMet® (3 AT110)
<b>Other parts</b>	
Seals - chemical to sea water	PTFE, FFKM, PEEK (dual redundant seals)
Seals - chemical to internal	PTFE, FFKM, PEEK (dual redundant seals)
Seals - seawater to electronics	NBR (nitrile rubber), Silver-plated metal seal (dual redundant seals)
Hydraulic couplers	1/4 in metal/Chemraz® seal, PEEK, poppet seal/crown seal, bleeding poppets
Electronics housing	1 atmosphere nitrogen filled
Electrical connector	Tronic or ODI, jumper hose available as option



Electrical Design	
Motor type	Electric stepper
Gear type	Strain wave gear
Input voltage	24 +/- 4 VDC
Power consumption - operating, motor running	Typical 9 W (max 12 W)
Power consumption - idle	Typical 1.7 W (max 3 W)
Inrush current at power up	230-250 mA (for ~200 ms)
Position indicator	Stepper motor drive pulses
Redundant position indicator	Proximity switch detecting gear output movement
Communication protocol	RS485 Modbus, Canbus (CiA 443 S1S L2), Canbus (CiA 401), Profibus
Pressure transmitter accuracy	Absolute accuracy < +/- 0.25 bar (within all operating conditions)

\* Max/min flow can vary depending on viscosity.

- For more information, please contact us at [rotator@oceanengineering.com](mailto:rotator@oceanengineering.com)

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