

# Chemical Injection Throttle Valve (CTV)

## Low Flow (CTV-LF)

The **Oceaneering**<sup>®</sup> Rotator CTVs provides continuous controlled subsea injection of chemicals into the well stream. The valve is remotely operated and ROV retrievable.



### FEATURES

Field proven - more than 1,000 valves subsea

Self cleaning design - no subsea filtration required

Accurate flow over a long service life

## Technical data:

General	
Part number / name	CTV-LF
Minimum flow rate*	0.005 l/min
Maximum flow rate*	1.2 l/min
Flow measurement type - primary	Differential Pressure: Absolute pressure sensors at each end of fixed restriction. Additional downstream pressure sensor fitted.
Turn down ratio (depending on flow rates and viscosity)	100:1 (from chosen maximum flow) Additional downstream pressure sensor
Measuring accuracy below 10 % of FSC flow**	+/- 2.5% of full scale flow (FSC)
Measuring accuracy above 10 % of FSC flow **	+/- 5% of full scale flow (FSC)
Flow measurement type - secondary	Look up chart
Recommended differential pressure***	870 psi, 60 bar (min 1.5 psi / 0.1 bar over fixed restriction)
Maximum differential pressure	10,000 psi / 690 bar
Maximum differential pressure while operating the motor	2,900 psi / 200 bar (safety margin of 25 %)
Time of full travel (close to open)	17 min
Chemical inhibitors typically used	Scale, wax, corrosion, defoamers, paraffin, asphaltene, demulsifier, etc.
Valve failure mode	Fail as is, flow rate can be controlled with differential pressure



Mechanical Design	
Design life	30 years
Pressure rating	10,000 psi / 690 bar
Water depth	3400 m
Size	Ø=149 mm, L= min 956,5 mm / max 1005,5 mm
Weight - in air	~ 51 kg
Weight - in water	~ 43 kg
Temperature rating - design	-10° to 70° C
Temperature rating - electronic	-18° to 70° C
Temperature rating - operating	-5° to 40° C
Temperature rating - storage	-20° to 50° C
Debris tolerance / fluid cleanliness	Operability up to SAE AS4059 class 12B-F
Maximum particle size through the valve	450 micron
Smallest restriction in the valve	800 x 1350 micron
Cleaning method	Mechanical scraper, flush through
Inlet screen / filter size	No filters required
Design standards	ISO 13628-6 (API 17F)

Materials	
<b>External parts wetted by seawater</b>	
Valve body	Super duplex (UNS S32750)
Hydraulic couplings	Nitronic 50 (UNS S20910), ToughMet® (3 at 110)
Fasteners	Inconel 625 (UNS N06625)
<b>Internal parts wetted by chemicals</b>	
Flow parts	Super Duplex (UNS S32750), Nitronic 50 (UNS S20910), ToughMet® (3 at 110)
Pressure sensor	Inconel 625 (UNS N06625)
Hydraulic couplings	Nitronic 50 (UNS S20910), Monel K500 (UNS N05500), ToughMet® (3 at 110)

Other parts	
Seals - chemical to sea water	PTFE, FFKM, PEEK
Seals - chemical to internal	PTFE, FFKM, PEEK
Seals - seawater to electronics	NBR, Silver plated metal seal
Hydraulic couplers	National 1/4" metal/Chemraz seal, PEEK poppet seal/ Crown seal, Bleeding poppets
Electronics housing	1 atmosphere nitrogen filled
Electrical connector	Tronic or ODI

Electrical Design	
Motor Type	Stepper
Gear Type	Harmonic gear
Input voltage	24 +/- 4 VDC
Power consumption - operating, motor running	Typical 9 W (max 12 W)
Power consumption - idle (watts)	Typical 1.7 W (max 3 W)
Inrush current at power up	230-250 mA (for ~200 ms)
Position indicator	Calculation of position based on 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. If a higher or lower flow is needed please contact Oceaneering Rotator at: [rotator@oceanengineering.com](mailto:rotator@oceanengineering.com)

\*\* The flow measurement accuracy is dependent of differential pressure and known viscosity. These numbers are conservative, and accuracy better than 2.5 % of FSC flow is typical.

\*\*\* Fluid with high viscosity may require less differential pressure.

■ For information please contact at [rotator@oceanengineering.com](mailto:rotator@oceanengineering.com)