

Droptech AS | 921 567 723 MVA
Harald Gilles Vei 7, 4633 Kristiansand S, Norway
+47 960 00 430 | ems@droptech.no

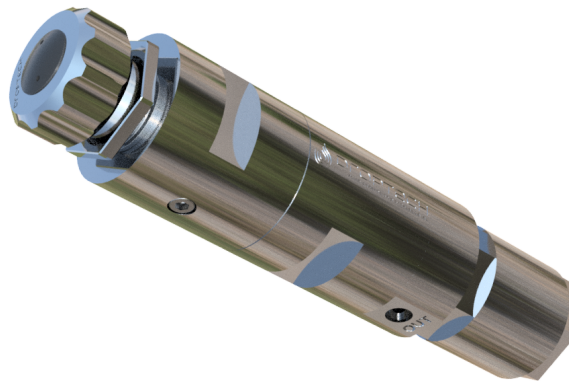
Amflow Norge AS | 996 524 051 MVA
Prinsens vei 12, 4315 Sandnes, Norway
+47 922 19 656 | lep@amflow.no

www.droptech.no


Technical Data Sheet

DT1 Flow Control Valve

The DT1 chemical injection valve is a flow control valve based on a unique and patented variable orifice design, featuring ultra low flow rate control below 0.01 l/h and turn down ratios up to 20000:1.

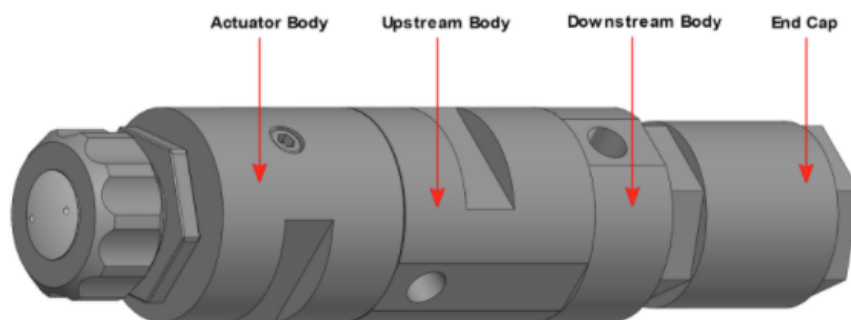
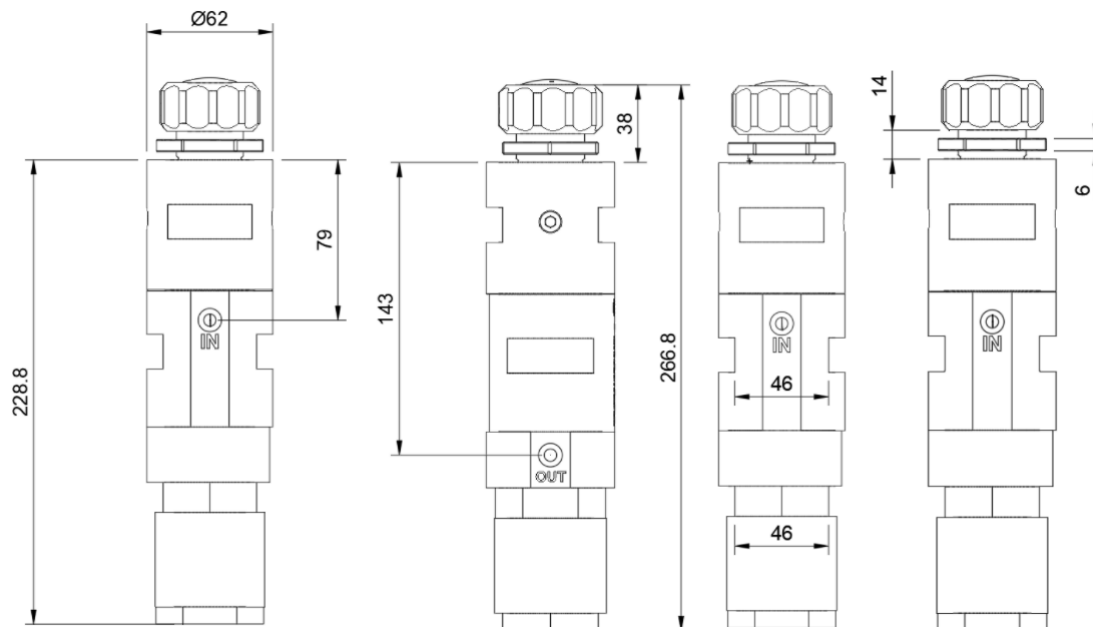


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CE  **II 2 G Ex h IIC T6 Gb**

Revision #	Revision date	Author	Status	Publication date
8	30.01.2024	Droptech AS	<u>Released</u>	30.01.2024

GA Drawing



DT1 - at a glance

The DT1 chemical injection valve is a flow control valve based on a unique and patented variable orifice design, featuring ultra low flow rate control and demonstrated turn down ratio up to 20000:1. An "equal percentage" flow rate gain offer low input response at low flow rates and high input response at high flow rates. Without any dynamic fluid response within the valve itself, it can be coupled with a valve actuator for industry leading flow rate accuracy and control. In stable pressure conditions the valve can be used as a manual valve. The unique orifice solution of the DT1 offers almost limitless options, however the standard orifice sizes fits most applications. For variable set-point applications, flow rate gain response can also be tuned for optimal system performance.

Key Specifications

- Operating pressure range: 0.1 - 690 barg / 1 - 10,000PSI(g).
- Min. flow rate: 0.005l/h or lower, depending on pressure drop and fluid parameters.*
- Max. flow rate: 200l/h or higher, depending on orifice, pressure drop and fluid parameters.
- Equal percentage flow gain.
- Operating temperature: -20°C - 85°C .
- Design temperature: -20°C - 120°C .
- Valve housing material in S316L (options available).
- Vetted seals in FKM (Viton A) or FFKM
- Weight 5.3kgs (with manual actuator).
- Pressure balanced valve stem for low torque requirement on valve handle.
- Screw type body connections for fast assembly and disassembly.
- Multi-orifice options are available for high maximum flow rates or high flow gain responses.

*The DT1 has a calibrated leakage rate that define minimum flow rate. The minimum flow rate is dependent on fluid parameters and pressure drop across the valve.

Filter recommendations

At very low flow rates, or at low flow rates coupled with high differential pressures, the internal orifice has a very small opening area. This will increase the filtering requirements of the fluid. The table below are general recommendations for selecting a suitable filter. Please refer to flow charts and tables for flow rate references. If the DT1 is used as a manual valve, a general recommendation is to use a high filtration grade (low micron classification). If actuated, the valve will have self-cleaning capabilities, and a lower filtration grade is possible.

Valve Identifier	Filter recommendation [microns]	5.0 μm	10 μm	50 μm
DT1-55	Valve opening in % (valve turns)	0-5% (0-2)	5-20% (2-8)	20-100% (8-38)
DT1-75	Valve opening in % (valve turns)	0-5% (0-2)	5-15% (2-6)	15-100% (6-38)
DT1-90	Valve opening in % (valve turns)	0-5% (0-2)	5-10% (2-4)	10-100% (4-38)

Flow Identifier and Flow Response Plots

The flow response of the DT1 is identified by the maximum depth of the orifice, in hundreds of millimeters. E.g. -55- identifies 1 orifice with 0.55mm maximum depth, and -3x90- identifies 3 orifices with 0.90mm maximum depth. Examples of flow response of the DT1-55 and the DT1-90 at various pressure drops is shown in the plots below. Additional flow response information can be found at droptech.no, or contact Droptech directly.

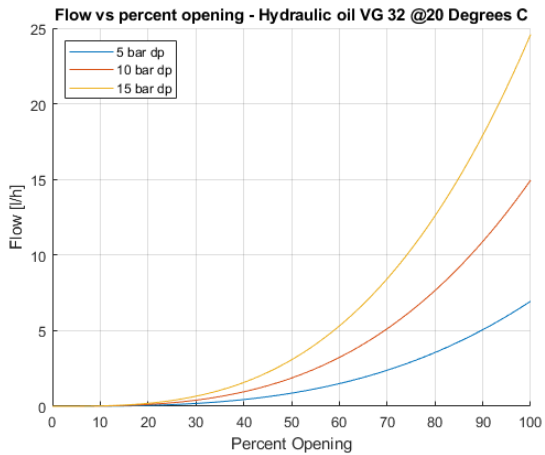


Figure 1: Percent opening flow DT1-55 [l/h]

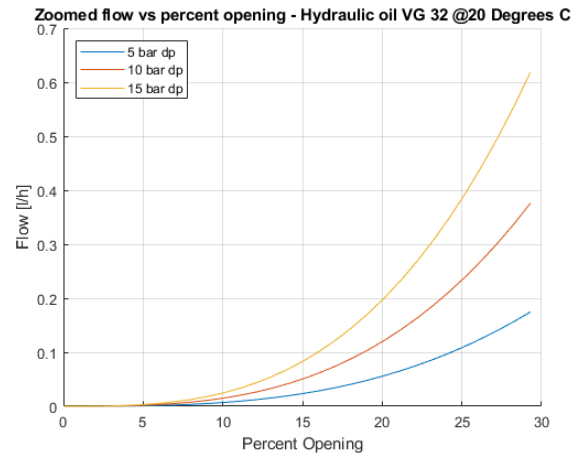


Figure 2: Zoomed flow DT1-55 [l/h]

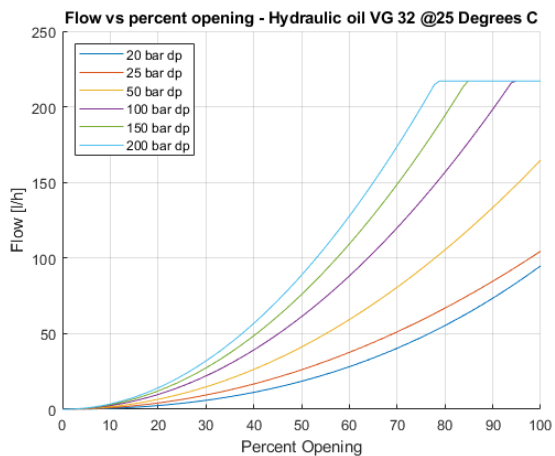


Figure 3: Percent opening flow DT1-90 [l/h]

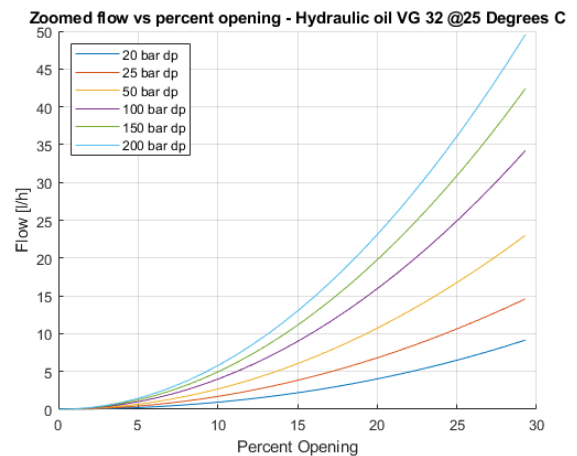
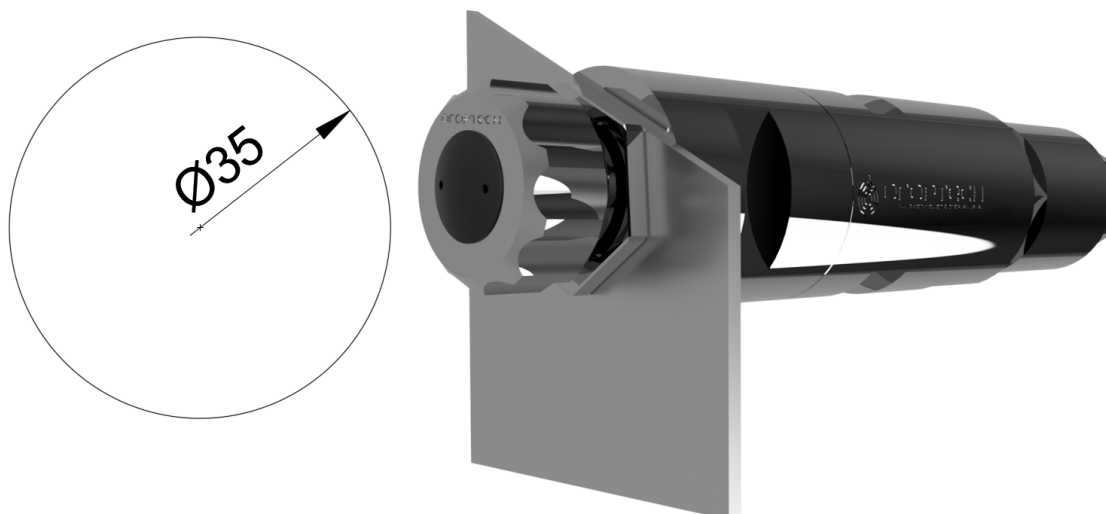


Figure 4: Zoomed flow DT1-90 [l/h]

Panel Mounting Dimensions - Manual



Maximum Panel Thickness - 7mm

ATEX Electric Actuator - Amflow A6



DT1 Technical Details

Name	Flow rate ID	Dp range	Pressure rating	Connections
DT1	55 / 75 / 90 / s*	1 - 150 barg**	690 barg	1/4" BSPP - 1/4" NPT - 1/4" Autoclave

*Special orders available, contact Droptech for additional information.

**Proven up to 600 barg dp, however restrictions due to cavitation.

DT1 Materials and Dimensions

Metallic components	Non-metallic components	Length	Diameter	Weight
316L/SS*, 304, CW307G, NKT40	PTFE, FKM and/or FFKM	275mm	62mm	5.3kg

*Options available.

DT1 Flow Performance - Orifice Size

Flow ID	Range @10barg dp	Range @50barg dp	Range @100barg dp	Test fluid data
-55-	0.005 - 15 l/h	0.01 - 63 l/h	0.01 - 97 l/h	29cSt 858kg/m ³
-75-	0.005 - 30 l/h	0.01 - 136 l/h	0.01 - 186 l/h	29cSt 858kg/m ³
-90-	0.005 - 59 l/h	0.01 - 164 l/h	0.01 - 214 l/h	29cSt 858kg/m ³

Contact Droptech for additional data, other differential pressures, or special orifice sizes.

Operational limits

Full range turns	Full range linear travel	Valve stem torque limit	Valve stem force limit
38 rotations	38mm / 1.5in	6.4Nm / 4.7ft-lb	1000N / 225lbf

Order Specification

Example: **DT1-55-VMB** for the DT1 with variable orifice size 0.55mm, Viton A o-rings, actuator body for manual handle or adaptor for rotary actuators, 1/4 female BSPP connection ports.

Order Specification - DT1-AA-B-C-D

AA - flow range	B - elastomers	C - actuation	D - ports
55	V = Viton	M = Manual or adaptor**	B = 1/4" BSPP
75	F = FFKM	A = Linearly actuated**	N = 1/4" NPT
90			A = 1/4 Autoclave
SS = Special*	S = Special*		S = Special*

*Special orders available, contact Droptech for additional options.

**Rotary and linear actuators available. Contact Droptech for details.