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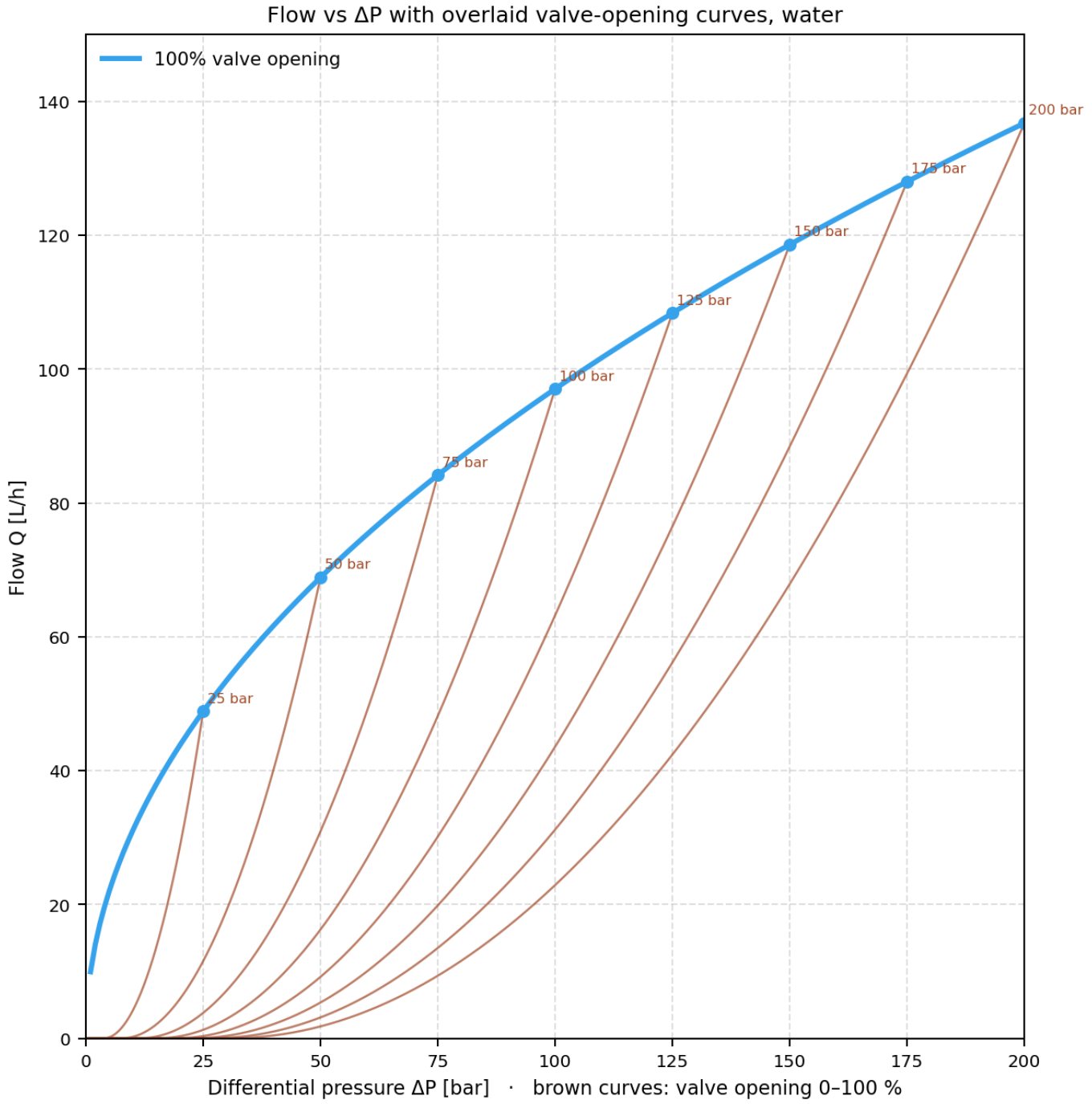
DT1-55 — Low Flow Configuration (smallest orifice) — Water Performance Datasheet

1. Flow rate vs differential pressure with overlaid valve-opening curves (water)



How to read. The blue envelope shows the maximum flow at 100 % valve opening over the full ΔP range, calibrated from in-house water testing. Each brown curve shows the valve characteristic at a fixed ΔP: 100 % open lands on the blue envelope at that ΔP; 0 % open sits at the origin. Closed-valve seat leakage at each ΔP is listed in the tables on page 2.
Naming. DT1-55, DT1-75 and DT1-90 designate the orifice/needle size — from the smallest (55) to the largest (90). This datasheet covers the **smallest** orifice; flow capacity scales with size.

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DT1-55 — Low Flow Configuration (smallest orifice) — Performance Tables (Water)

2. Flow rate [L/h] — water at listed ΔP, including closed-valve seat leakage

ΔP [bar]	Leakage (0% open)	25%	50%	75%	100%
5	1.74e-03	0.284	3.68	10.9	22.0
10	4.78e-03	0.400	5.19	15.4	31.0
25	0.018	0.630	8.17	24.2	48.9
50	0.050	0.887	11.5	34.2	68.9
75	0.090	1.08	14.1	41.8	84.2
100	0.137	1.25	16.2	48.2	97.0
150	0.248	1.53	19.8	58.9	118.6
200	0.377	1.76	22.9	67.9	136.8

3. Cv [US gpm per √psi] — water, turbulent flow

Valve opening	Leakage (0% open)	25%	50%	75%	100%
Cv	1.58e-05	0.00014	0.00188	0.00557	0.0112

All values on this page apply to water at ~20 °C (ρ ≈ 1.00 kg/L, μ ≈ 1.0 cP).
Cv definition. Cv (US) from Q[gpm] = Cv · √(ΔP[psi] / SG); SG = 1 for water. Listed Cv is for **turbulent flow**; for water the Cv is essentially constant with ΔP, so a single value per valve opening is given. For viscous fluids (e.g. hydraulic oil), partly laminar flow may occur at low ΔP and the effective Cv deviates from the tabulated values — contact us for fluid-specific dimensioning.
Leakage (Section 2) is at 0 % valve opening (closed seat). Values are predicted from a fitted internal seat-leakage model using representative DT1 manufacturing tolerances; actual seat leakage varies with build tolerances. The leakage prediction assumes identical seat geometry across DT1-55 / 75 / 90 configurations (the same plug-and-seat hardware is used; only the upstream needle/orifice differs).
Dosing context. At 200 bar the predicted water leakage is 0.38 L/h ≈ 9.0 L/day. For a customer dosing 1–5 L/h, that represents 5–38 % background flow even at full closure — worth accounting for in low-dose applications. **More viscous media give substantially lower seat leakage**: as a rule of thumb, internal leakage scales inversely with viscosity, so a μ ≈ 5 cP MEG/glycol mix at the same ΔP would leak roughly 5× less — about 0.075 L/h at 200 bar.
Worked example (Cv). At ΔP = 100 bar (≈ 1450 psi) and 75 % valve opening, Cv = 0.0056, so Q = 0.0056 × √1450 = 0.212 gpm ≈ 48 L/h (water).
Test range. Underlying water tests cover 5–150 bar; values above 150 bar are extrapolated from the fitted model.
For other configurations or fluid-specific predictions, please contact us at ems@droptech.no.

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