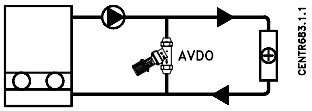
Data Sheet Automatic By-pass Valve AVDO

Application

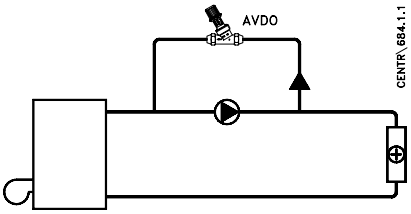
AVDO is a self-acting automatic by-pass control primarily used either to maintain minimum flow rates (e.g. through a low water content gas boiler) or to control the differential pressure in a central heating system.

AVDO:
- opens on rising differential pressure
- has a setting range of 0.725 - 7.25 psi (0.05 - 0.5 bar)
- designed for 145 psi (10 bar), max. 248 °F (120 °C)
- operates without impulse tubes
- can be supplied with NPT or solder tail pieces.

Application Examples



Low water content gas boiler where a min. flow is required through the boiler.



Heating systems where the differential pressure is controlled by constant flow control across the circulation pump.

Ordering

Type	Description	Size/Connections	Code Numbers
AVDO 15[1)]	Straight Valve Body	1/2" Union Solder 1/2" Union Male, NPT	**3L602001** **3L602002**
AVDO 15[1)]		3/4" Union Solder 3/4" Union Male, NPT	**3L602501** **3L602502**
AVDO 25[1)]		1" Union Male, NPT	**3L603002**

[1)] See AVD or IVD series for larger sizes/higher capacitics

Technical data

Setting range .. 0.725 - 7.25 psi (0.05 - 0.5 bar)
Max. differential pressure .... 7.25 psi (0.5 bar)
Operation pressure ..... 145 psi (10 bar)
Max. flow temperature ..... 248 °F (120 °C)
Max. leakage at closed valve ..... 0.22 gpm (0,05 m³/h)

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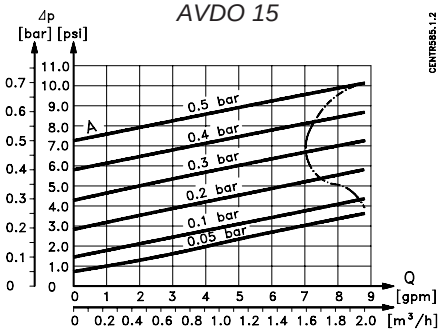
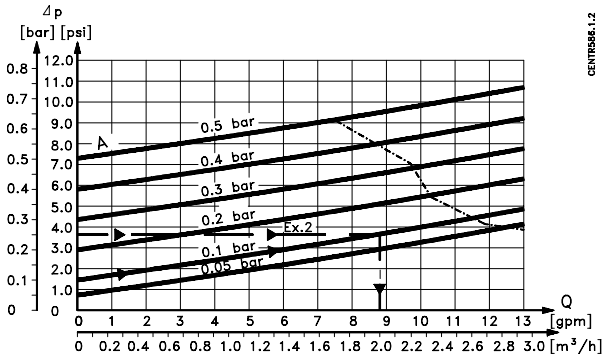
Capacity

A = set opening pressure
Δp = Δp for valve
–·– Upper limit graph for recommended application area with almost noiseless installation. Measurement conditions according to ISO 3743.

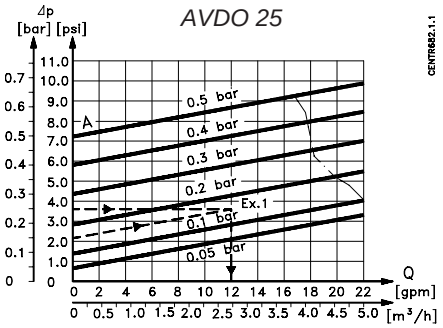
AVDO 15



AVDO 20



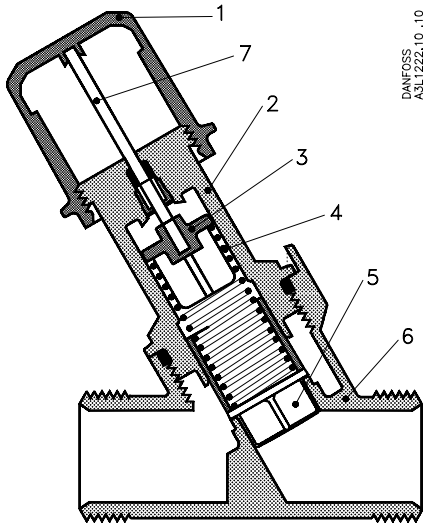
AVDO 25



Design

Materials of parts in contact with water

(1)	Setting handle	Pom-Plastic
(2)	Base	Ms 58
(3)	Spring guide	Polyphenylene sulphide (PPS-plastics)
(4)	Spring	Stainless steel
(5)	Valve cone	Polyphenylene sulphide (PPS-plastics)
(6)	Valve body	Ms 58, forged
(7)	Setting pin	Stainless steel
	O-rings	EPDM rubber



Installation

The valve body must be mounted with flow in the direction of the cast-in arrow.

Setting

The control is set by turning the adjustment knob. AVDO has a setting scale on which the opening pressure can be set according to the table to the right. The differential pressures stated for a given setting are indicative. The scale gives the differential pressure across the AVDO when it just begins to open.

0.1	-	1	=	1.45
0.2	-	2	=	2.90
0.3	-	3	=	4.35
0.4	-	4	=	5.8
0.5	-	5	=	7.25
bar		mH^2O		psi

Sizing

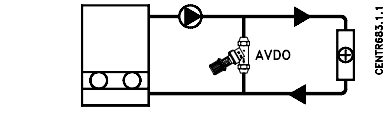


Fig. 1

Example 1
Bypass control across heating system

Given:
- System, see fig. 1
- Insignificant pressure loss in pipe from boiler to bypass
- Pump characteristic, see fig. 2
- 2.2 psi (0.15 bar) system differential pressure at max. system load

Required:
- Bypass circulation beginning at 2.2 psi (0.15 bar) pump pressure.
- Min. 8.8 gpm (2.0 m³/h) boiler circulation

Seek:
- A constant flow control that opens simultaneously with falling load across the system (closing radiator valves or zone valves)
- A constant flow control that ensures min. 8.8 gpm (2.0 m³/h) boiler circulation at min. system load

Solution:
An 8.8 gpm (2.0 m³/h) flow corresponds to a 3.6 psi (0.25 bar) pump pressure - see "Capacity".

On closing radiator valves or zone valves AVDO ensures a minimum of 8.8 gpm (2.0 m³/h) circulation at 3.6 psi (0,25 bar) differential pressure across AVDO.

Choose AVDO 25 that provides 12 gpm (2.7 m³/h) at 3.6 psi (0.25 bar) differential pressure across valve.

Set AVDO to #1.5 (2.2 psi, 0,15 bar) opening pressure.

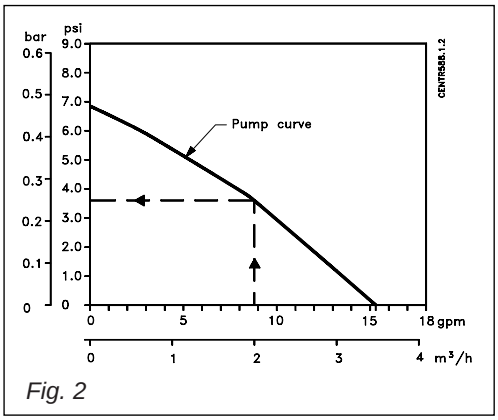


Fig. 2

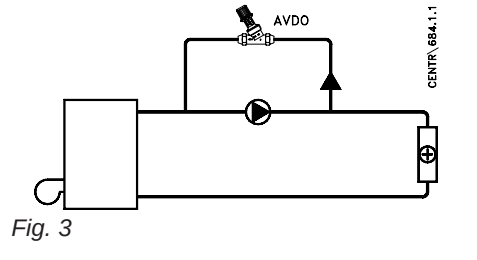


Fig. 3

Example 2
Bypass control across circulating pump

Given:
- System, see fig. 3
- Pump characteristic, see fig. 4

Required:
- Bypass circulation beginning at 1,5 psi (0.1 bar) pump pressure
- Max. system differential pressure with closed radiator valves or zone valves must be limited to 3.6 psi (0.25 bar)

Seek:
- A constant flow control that opens simultaneously with falling load across the system (closing radiator valves or zone valves)
- A constant flow control that ensures max. system differential pressure not to exceed 3.6 psi (0.25 bar) at min. system load

Solution:
The max. permissible differential pressure 3.6 psi (0,25 bar) across the system corresponds to a 8 gpm (1.8 m³/h) water volume (fig. 4). At min. load AVDO must ensure 8 gpm (1.8 m³/h) in circulation through the bypass. In this example AVDO 20 must be used - see "Capacity".

As circulation is not to begin before differential pressure across system has exceeded 1.5 psi (0.1 bar), AVDO is set to # 1.0 (1.5 psi, 0.1 bar) - see "Setting.

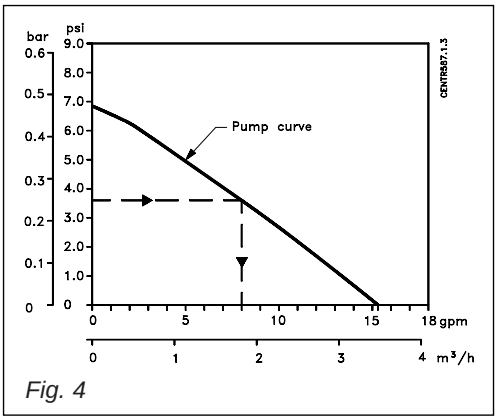
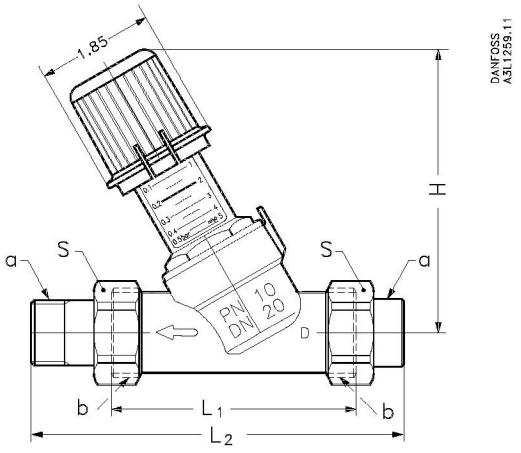


Fig. 4

Dimensions



DN	Type	Measure unit	L1	L2 Threaded	L2 Solder	H min	H max.	S	a	b ISO 228/1
15	AVDO 15	inch	3.44	5.94	4.76	3.50	4.45	1.18	1/2"	G 3/4 A
		mm	87	151	121	89	113	30		
20	AVDO 20	inch	3.66	6.49	5.39	3.55	4.49	1.46	3/4"	G 1 A
		mm	93	165	137	90	114	37		
25	AVDO 25	inch	4.17	7.00	-	3.74	4.69	4.69	1"	G 1 1/4 A
		mm	106	178	-	95	119	119		

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