Throttle valve and shut-off valve type AV

Product documentation

Operating pressure p_{max}:	500 bar
Flow rate Q_{max}:	100 lpm

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HAWE HYDRAULIK

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Contents

1 Throttle valve and shut-off valve type AV overview

Throttle and shut-off valves are a type of metering valve. With the aid of these valves a pressure drop can be established between the inlet and outlet side. In this way the velocity of cylinders in accumulator circuits and the flow rate in control circuits can be regulated or a consumer line completely shut-off (e.g. to protect a pressure gauge).
The throttle and shut-off valve type AV produces a throttle effect by means of an annular gap. It is available as a screw-in valve or valve for pipe connection.

Features and benefits:

- Various configurations
- Sensitive adjustment and complete shut off possible

Intended applications:

- General hydraulic systems

Valve for pipe connection

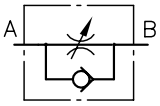
Screw-in valve

2 Available versions, main data

Circuit symbol:

AV 2(3)
AV 2(3) E

AV 2(3) R
AV 3 RE



Marking	Description		Ports	Flow rate Q_{max} (lpm)	Pressure range p_{max} (bar)
AV 2 E	Screw-in valve	Series	M28x1.5	40	500
AV 3 E			M40x1.5	100	400
AV 3 RE		with check valve			
AV 2	Valve for pipe connection	Series	G 1/2 (BSPP)	40	500
AV 3			G 3/4 (BSPP)	100	400
AV 2 R		with check valve	G 1/2 (BSPP)	40	500
AV 3 R			G 3/4 (BSPP)	100	400

3 Parameters

3.1 General

General information

Description	Throttle valve and shut-off valve
Design	Cone valve
Model	Screw-in valve, valve for pipe connection
Material	Steel parts electrogalvanised
Installation position	As desired
Flow direction	A → B
Hydraulic fluid	Hydraulic oil: according to Part 1 to 3; ISO VG 10 to 68 according to DIN ISO 3448 Viscosity limits: min. approx. 4, max. approx. 1500 mm^2/s opt. operation approx. 10... 500 mm^2/s. Also suitable for biologically degradable hydraulic fluids type HEPG (polyalkylene glycol) and HEES (synthetic ester) at operating temperatures up to approx. +70°C.
Cleanliness level	**ISO 4406** 21/18/15...19/17/13
Temperatures	Ambient: approx. -40 ... +80°C, Fluid: -25 ... +80°C, Note the viscosity range! Permissible temperature during start: -40°C (observe start-viscosity!), as long as the service temperature is at least 20K higher for the following operation. Biologically degradable pressure fluids: Observe manufacturer's specifications. By consideration of the compatibility with seal material not over +70°C.

Characteristic curves

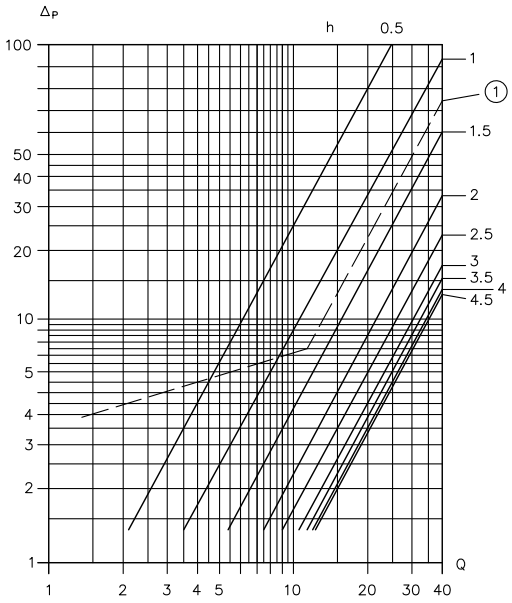
Oil viscosity approx. 50 mm²/s

Δp-Q characteristics (middles values of throttle resistances)

The diagrams show the correlation between the flow rate Q (lpm) and the expected pressure drop Δp (bar) at a viscosity of 50 mm²/s and at different valve strokes. With different viscosities, the families of straight lines move slightly to the left (thicker oil) or to the right (thinner oil). The diagrams therefore only provide indicative values and should be helpful when determining valve sizes.

AV 2, AV 2 E, AV 2 R

Flow direction A → B

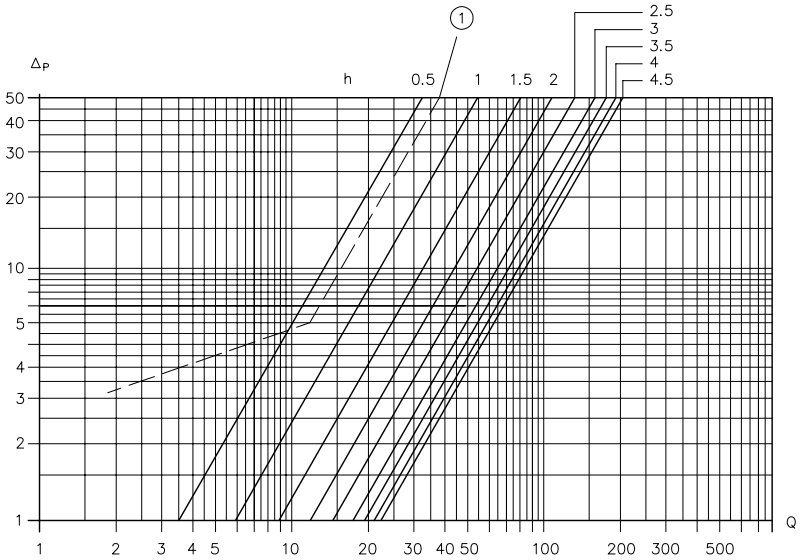


Q flow rate (lpm); Δp dynamic pressure (bar); h valve stroke (mm)

1 Flow direction B → A (Type AV 2 R)

AV 3, AV 3 E, AV 3 R, AV 3 RE

Flow direction A → B



Q flow rate (lpm); Δp dynamic pressure (bar); h valve stroke (mm)

1 Flow direction B → A (Type AV 3 R)

Weight

Type

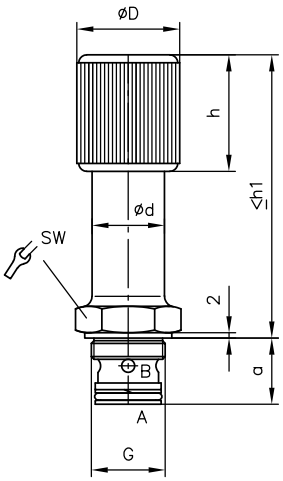
AV 2 E	= 0.6 kg
AV 3 E	= 1.0 kg
AV 3 RE	= 1.2 kg
AV 2	= 0.6 kg
AV 3	= 1.7 kg
AV 2 R	= 0.6 kg
AV 3 R	= 1.7 kg

4 Dimensions

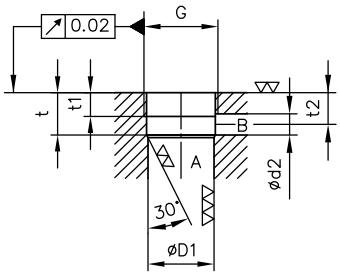
All dimensions in mm, subject to change.

Screw-in valve

AV 2 E, AV 3 E, AV 3 RE

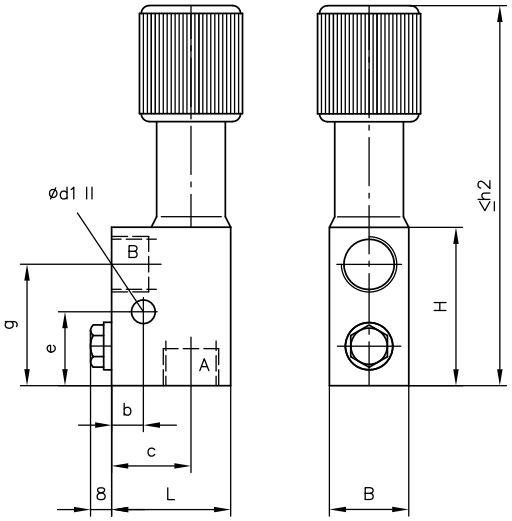


Mounting hole



Pipe connection

AV 2, AV 3, AV 2 R, AV 3 R



Type	Connections (ISO 228-1(BSPP)) A, B
AV 2	G 1/2
AV 3	G 3/4

Type	L	H	B	∅D	∅D1	a	b	c	∅d	∅d1	∅d2	e	g	h	h1	h2
AV 2 E	45	60	30	40	25^{H8}	25	12	30	26	9	8	28	46	45	115	145
AV 3 E AV 3 RE	60	70	40	50	36^{H8}	38	15	40	35	11	12	30	52	60	143	198
AV 2 AV 2 R	45	60	30	40	--	25	12	30	26	9	--	28	46	45	115	145
AV 3 AV 3 R	60	70	40	50	--	38	15	40	35	11	--	30	52	60	153	198

	t	t1	t2	G	SW
AV 2 E	16	9	12	M28x1.5	36
AV 3 E AV 3 RE	26	14	18	M40x1.5	46

5 Assembly, operation and maintenance recommendations

5.1 Intended use

This valve is exclusively intended for hydraulic applications (fluid engineering).

The user must observe the safety measures and warnings in this documentation.

Essential requirements for the product to function correctly and safely:

- All information in this documentation must be observed. This applies in particular to all safety measures and warnings.
- The product must only be assembled and put into operation by qualified personnel.
- The product must only be operated within the specified technical parameters. The technical parameters are described in detail in this documentation.
- All components must be suitable for the operating conditions in the event of application in an assembly.
- The operating and maintenance manual of the components, assemblies and the specific complete system must also always be observed.

If the product can no longer be operated safely:

1. Remove the product from operation and mark it accordingly.

✓ It is then not permitted to continue using or operating the product.

5.2 Assembly information

The product must only be installed in the complete system with standard and compliant connection components (screw fittings, hoses, pipes, fixtures etc.).

The product must be shut down correctly prior to dismounting (in particular in combination with hydraulic accumulators).

⚠ **DANGER**

Risk to life caused by sudden movement of the hydraulic drives when dismantled incorrectly!

Risk of serious injury or death.

- Depressurise the hydraulic system.
- Perform safety measures in preparation for maintenance.

5.3 Operating instructions

Note product configuration and pressure / flow rate

The statements and technical parameters in this documentation must be strictly observed.
The instructions for the complete technical system must also always be followed.

NOTE

- Read the documentation carefully before usage.
- The documentation must be accessible to the operating and maintenance staff at all times.
- Keep documentation up to date after every addition or update.

CAUTION

Risk of injury due to unexpected movement processes in the machine due to incorrect flow setting!
Risk of minor injury

- Be prepared for unexpected, fast movements. On changing the flow settings, consumers will move more slowly or more quickly.
- Always monitor the pressure gauge when setting or changing the flow.

Purity and filtering of the hydraulic fluid

Fine contamination can significantly impair the function of the hydraulic component. Contamination can cause irreparable damage.

Examples of fine contamination include:

- Metal chips
- Rubber particles from hoses and seals
- Dirt due to assembly and maintenance
- Mechanical debris
- Chemical ageing of the hydraulic fluid

NOTE

New hydraulic fluid from the manufacturer does not necessarily have the required level of purity.
The hydraulic fluid must be filtered during filling.

In order to maintain faultless operation, ensure that the cleanliness level of the hydraulic fluid is correct.
(See Cleanliness level in Chapter 3, "Parameters")

Additionally applicable document: D 5488/1 Oil recommendations

5.4 Maintenance information

Conduct a visual inspection at regular intervals, but at least once per year, to check if the hydraulic connections are damaged. If external leakages are found, shut down and repair the system.

Clean the device surface of dust deposits and dirt at regular intervals, but at least once per year.

Further information

Additional versions

- Shut-off valve type AVT and AVM: D 7690
- Throttle valve and shut-off valve CAV: D 7711

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