Pre-load check valve type VR

Product documentation

Screw-in valve

Operating pressure p_{max}:	315 bar
Flow rate Q_{max}:	120 lpm

D 7340
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HAWE HYDRAULIK

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Contents

1 Overview of pre-load check valves type VR

Pre-load valves, also called sequence valves are a type of pressure control valve. They generate a largely constant pressure drop between the inlet and outlet on the valve. In the opposite direction the flow can pass freely. In the normal position the valve has minor leakage.
The sequence valve type VR is available as a screw-in valve and in a housing version for in-line installation.
The primary application area is in return lines for oscillation damping, mainly in lifting equipment, lifting platforms, handling systems and in lifting gantries as fall protection.

Screw-in valve

Housing version

Features and benefits:

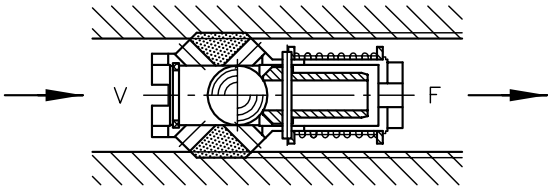
- Compact screw-in valve

Intended applications:

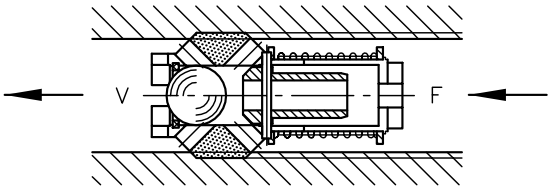
- Lifting equipment
- Lifting platforms
- Handling technology

2 Available versions, main data

Flow rate pre-loaded in direction V → F



Free flow in direction F → V



Order coding example:

VR 33 **VR 25** **VR 47 27**	**C** **E** **C**

Versions Table 2 Versions

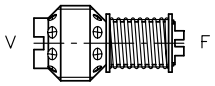
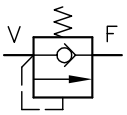
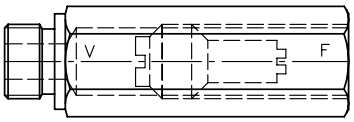
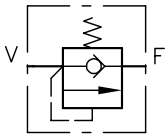
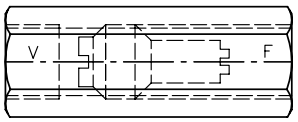
Basic type and size Table 1 Basic type and size

Table 1 Basic type and size

Basic type and size	Volumetric flow (reference value) Q_{max} (lpm)	Thread	Pre-load pressure $\Delta p_{V \rightarrow F}$ (opening pressure) (bar)					
			3	5	7	9	12	15
VR 1.	15	G 1/4 (BSPP)	●	●	●	●	●	●
VR 1. 14	15	M 14x1.5	●	●	●	●	●	●
VR 2.	40	G 3/8 (BSPP)	●	●	●	●	●	●
VR 2. 18	40	M 18x1.5	●	●	●	●	●	●
VR 3.	65	G 1/2 (BSPP)	●	●	●	●	●	
VR 3. 22	65	M 22x1.5	●	●	●	●	●	
VR 4.	120	G 3/4 (BSPP)	●	●	●	●	●	
VR 4. 27	120	M 27x2	●	●	●	●	●	

Note
Thread equivalent ISO 228-1 or DIN 13 T6 (metric).

Table 2 Versions

Model	Description	View	Circuit symbol
C	Screw-in valve		
E	Tapped journal on one side		
G	Pipe connection on both sides		

Note
No housing version for screw-in cartridge with metric thread.

3 Parameters

General

Designation	Pre-load valve (sequence valve)
Design	Ball valve
Model	Screw-in valve, housing version
Material	Steel; nitrided valve housing, electrogalvanised sealing nuts and connection block, hardened and ground functional inner parts Balls made of rolling bearing steel
Mounting	Screw in cartridge C up to end of the thread and tighten (wedging effect); for tightening torques see Chapter 4, "Dimensions"
Installation position	As desired
Flow direction	V → F (pre-loaded) F → V (free flow)
Surface	Single valves blank, housing version electrogalvanised
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.

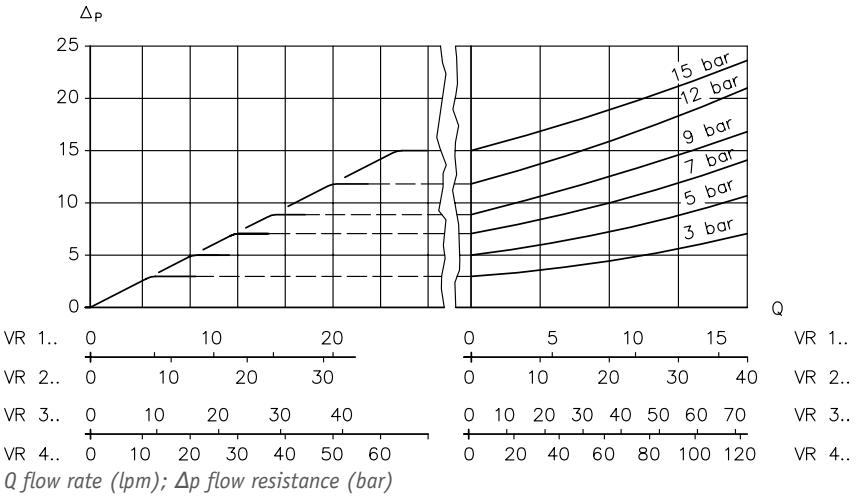
Pressure and volumetric flow

Operating pressure	315 bar
Static overload nominal volume	3x p
Volumetric flow	15 to 120 lpm, see Chapter 2, "Available versions, main data", Table 1

Characteristic curves

Oil viscosity approx. 50 mm²/s

Flow direction V → F

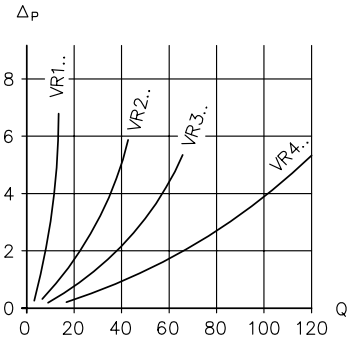


Q flow rate (lpm); Δp flow resistance (bar)

Leakage flow (cm³/min) below the opening pressure;
reference valve (thread section approx. 30%)

Volumetric flow Q (lpm) above the opening pressure (pre-loaded)

Flow direction F → V (free flow)



Q flow rate (lpm); Δp flow resistance (bar)

Weight

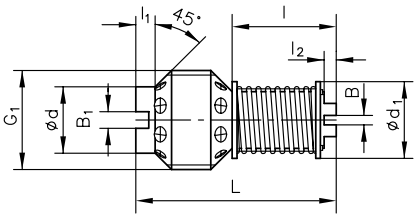
Type	
VR 1..C	= 15 g
VR 1..G	= 110 g
VR 1..E	= 123 g
VR 2..C	= 25 g
VR 2..G	= 140 g
VR 2..E	= 160 g
VR 3..C	= 40 g
VR 3..G	= 240 g
VR 3..E	= 280 g
VR 4..C	= 80 g
VR 4..G	= 370 g
VR 4..E	= 400 g

4 Dimensions

All dimensions in mm, subject to change.

Screw-in valve

VR ... C

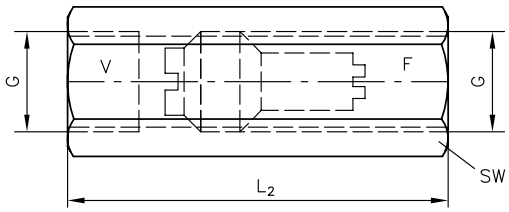


Note
Screw in VR..C up to end of the thread and tighten (see tightening torque).

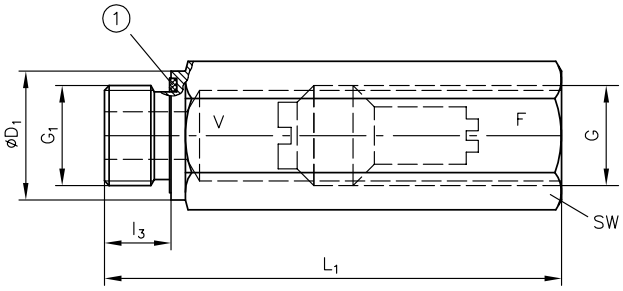
Type	G_1	B	B_1	L	l	l_1	l_2	∅d	$∅d_1$	Tightening torque max. (Nm)
VR 1..	G 1/4 A (BSPP)	1,2	2	31	18	4	2	8,5	10,5	5
VR 1. 14	M14x1.5									
VR 2..	G 3/8 A (BSPP)	1,2	2,5	36	19	4	2	11	13	6
VR 2. 18	M18x1.5									
VR 3..	G 1/2 A (BSPP)	2	3,5	42	23,5	4	2,5	14	16,2	10
VR 3. 22	M22x1.5									
VR 4..	G 3/4 A (BSPP)	2	4	54	28	7	3,5	17	20	15
VR 4. 27	M27x1.5									

Housing version

VR ... G



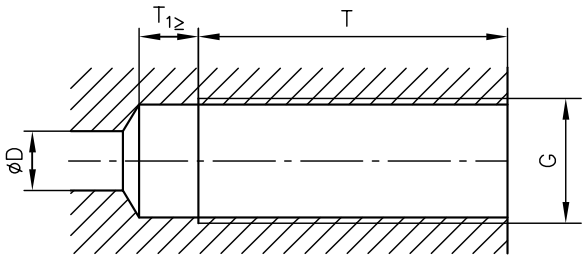
VR ... E



1 Special thread seal

Type	G (BSPP)	G_1 (BSPP)	ØD_1	L_1	L_2	l_3	SW
VR 1..	G 1/4	G 1/4 A	11	78	66	11,5	19
VR 2..	G 3/8	G 3/8 A	22	82	70	12	22
VR 3..	G 1/2	G 1/2 A	27	96	80	14	27
VR 4..	G 3/4	G 3/4 A	32	106	100	16	32

4.1 Creating the mounting hole



Type	G (BSPP)	ØD	T	T_1
VR 1..	G 1/4	5	40	7
VR 2..	G 3/8	8	46	8
VR 3..	G 1/2	12	53	10
VR 4..	G 3/4	16	66	12

5 Assembly, operation and maintenance recommendations

5.1 Intended use

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

The valve demands high technical safety standards and regulations for 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.
- The operating and maintenance manual of 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 permissible 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, etc.).

The hydraulic power pack must be shut down correctly prior to dismounting; this applies in particular to power packs 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.

5.2.1 Screwing in the basic version

Note
Screw in VR..C up to end of the thread and tighten (see tightening torque).

Type	Tightening torque (Nm)
VR 1	5
VR 2	6
VR 3	10
VR 4	15

5.2.2 Creating the mounting hole

See description in Chapter 4, "Dimensions".

5.3 Operating instructions

Product configuration and setting the pressure and 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 on overloading components due to incorrect pressure settings!

Risk of minor injury.

- Always monitor the pressure gauge when setting and changing the pressure.

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

Fresh hydraulic fluid from the drum does not always have the highest degree of purity. Under some circumstances the fresh hydraulic fluid must be filtered before use.

Pay attention to the cleanliness level of the hydraulic fluid in order to maintain faultless operation.
(Also see cleanliness level in Chapter 3, "Parameters").

5.4 Maintenance information

This product is largely maintenance-free.

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.

6 Accessories, spare parts and separate components

6.1 Order coding for housing

Type	Housing construction		Fitting seal
	E	G	
VR 1..	6920 130/1	7340 050	DRV 100 116-NB 650
VR 2..	7340 065	7340 060	DRV 100 147-NB 650
VR 3..	6920 008/2	7340 070	DRV 100 185-NB 650
VR 4..	7340 085	7340 080	DRV 100 239-NB 650

Further information

Additional versions

- Pressure-limiting valve type MV, SV and DMV: D 7000/1
- Pressure-limiting valve and pre-load valve type MVG, MVE, and MVP: D 3726
- Pressure valve type CMV, CMVZ, CSV and CSVZ: D 7710 MV

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