

# Pre-load check valve type VR

## Product documentation



Screw-in valve

Operating pressure  $p_{\max}$ : 315 bar

Flow rate  $Q_{\max}$ : 120 lpm



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## Contents

<b>1</b>	<b>Overview of Pre-load check valves type VR.....</b>	<b>4</b>
<b>2</b>	<b>Available versions, main data.....</b>	<b>5</b>
<b>3</b>	<b>Parameters.....</b>	<b>7</b>
3.1	General.....	7
<b>4</b>	<b>Dimensions.....</b>	<b>10</b>
4.1	Creating the mounting hole.....	11
<b>5</b>	<b>Installation, operation and maintenance information.....</b>	<b>12</b>
5.1	Designated use.....	12
5.2	Assembly information.....	12
5.2.1	Screwing in the basic version.....	12
5.2.2	Creating the mounting hole.....	12
5.3	Operating instructions.....	13
5.4	Maintenance information.....	13
<b>6</b>	<b>Accessories, spare parts and separate components.....</b>	<b>14</b>
6.1	Order coding for housing.....	14

## 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 gradient 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.

### Features and benefits:

- Compact screw-in valve

### Intended applications:

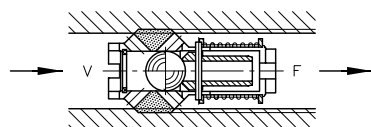
- Lifting equipment
- Lifting platforms
- Handling technology



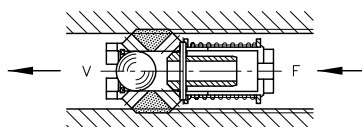
Figure 1: Screw-in cartridge

## 2 Available versions, main data

Volumetric flow pre-loaded in direction V → F



Free flow in direction V → F



Order coding example:

VR 33	C
VR 25	E
VR 47 27	C

Versions Table 2 Versions

Basic type and size Table 1 Basic type and size

**Table 1 Basic type and size**

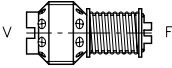

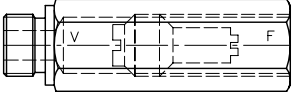

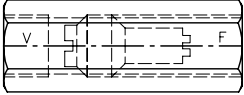
Basic type and size	Volumetric flow (reference value) $Q_{max}$ (lpm)	Thread	Pre-load pressure $\Delta p_{V \rightarrow F}$ (opening pressure) (bar)					
			3	5	7	9	12	15
VR 1.	15	G 1/4 (BSPP)	●	●	●	●	●	●
VR 1. 14	15	M 14x1.5	●	●	●	●	●	●
VR 2.	40	G 3/8 (BSPP)	●	●	●	●	●	●
VR 2. 18	40	M 18x1.5	●	●	●	●	●	●
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 in accordance with ISO 228/1 (BSPP) or DIN 13 T6 (metric)

**Table 2 Versions**

Model	Description	View	Circuit symbol
C	Screw-in cartridge		
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

### 3.1 General

<b>Designation</b>	Pre-load valve (sequence valve)
<b>Design</b>	Ball valve
<b>Model</b>	Screw-in cartridge, housing version
<b>Material</b>	Steel; nitrided valve housing, electrogalvanised sealing nuts and connection block, hardened and ground functional inner parts
<b>Mounting</b>	Screw in cartridge C up to end of the thread and tighten (wedging effect); for tightening torque see Section 4
<b>Installation position</b>	As desired
<b>Flow direction</b>	V → F (pre-loaded) F → V (free flow)
<b>Surface</b>	Single valves blank, housing version electrogalvanised
<b>Hydraulic fluid</b>	Hydraulic oil conforming DIN 51 524 part 1 to 3; ISO VG 10 to 68 conforming DIN 51 519 Viscosity limits: min. approx. 4, max. approx. 1500 mm <sup>2</sup> /s opt. operation approx. 10... 500 mm <sup>2</sup> /s. Also suitable are biologically degradable pressure fluids types HEPG (Poly-alkylenglycol) and HEES (Synth. Ester) at service temperatures up to approx. +70°C.
<b>Purity class</b>	<b>ISO 4406</b> <hr/> 21/18/15...19/17/13
<b>Temperatures</b>	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 capacity	3x p
Volumetric flow	15 ... 120 lpm, see " <a href="#">Available versions, main data</a> ", Table 1

**Characteristic curves**

Viscosity during measurements  
approx. 50 mm<sup>2</sup>/s

Flow direction V → F

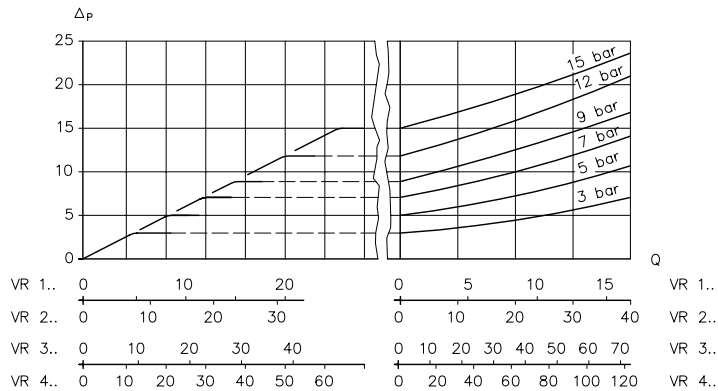


Figure 2: Q volumetric flow (lpm); Δp flow resistance (bar)

Leakage flow (cm<sup>3</sup>/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)

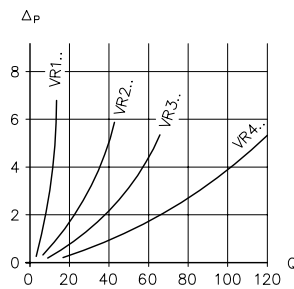


Figure 3: Q volumetric flow (lpm); Δp flow resistance (bar)



**Weight**

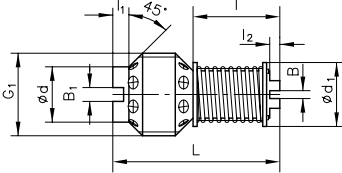
Type VR 1..C	= approx. 15 g
Type VR 1..G	= approx. 110 g
Type VR 1..E	= approx. 123 g
Type VR 2..C	= approx. 25 g
Type VR 2..G	= approx. 140 g
Type VR 2..E	= approx. 160 g
Type VR 3..C	= approx. 40 g
Type VR 3..G	= approx. 240 g
Type VR 3..E	= approx. 280 g
Type VR 4..C	= approx. 80 g
Type VR 4..G	=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

## 4 Dimensions

All dimensions in mm, subject to change!

### Screw-in cartridge

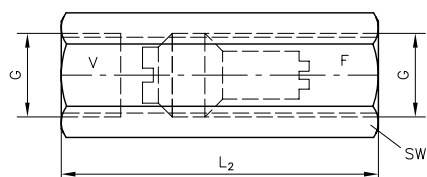
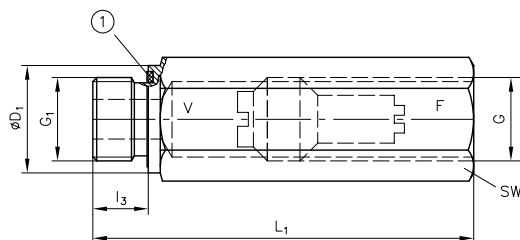
#### Type VR ... C



#### Note

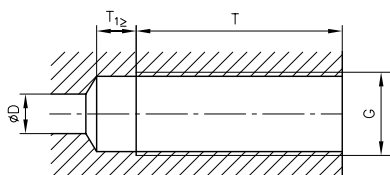
Screw in VR..C up to end of the thread and tighten (see tightening torque)

Type	$G_1$	B	$B_1$	L	l	$l_1$	$l_2$	$\varnothing d$	$\varnothing d_1$	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**
**Type VR ... G**

**Type VR ... E**


1 Special thread seal

Type	G (BSPP)	G <sub>1</sub> (BSPP)	ØD <sub>1</sub>	L <sub>1</sub>	L <sub>2</sub>	l <sub>3</sub>	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)	D	T	T <sub>1</sub>
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

### 5.1 Designated use

This fluid-power product has been designed, manufactured and tested acc. to standards and regulations generally applicable in the European Union and left the plant in a safe and fault-free condition.

To maintain this condition and ensure safe operation, operators must observe the information and warnings in this documentation.

This fluid-power product must be installed and integrated in a hydraulic system by a qualified staff who is familiar with and observes the general engineering principles and relevant applicable regulations and standards.

In addition, application-specific features of the system or installation location must be taken into account if relevant.

This product may only be used as a pressure-limiting valve within oil-hydraulic systems.

The product must be operated within the specified data. This documentation contains the technical parameters for various product versions.

**Note**

Non-compliance will void any warranty claims made against HAWE Hydraulik.

### 5.2 Assembly information

The hydraulic accumulator must be integrated in the system via state of the art connection components (screw fittings, hoses, pipes, etc.). The hydraulic system must be shut down as a precautionary measure prior to dismounting; this applies in particular to systems with hydraulic accumulators.

#### 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, pressure and/or flow settings

All statements in this documentation must be observed for all product, pressure and/or flow settings on or in the hydraulic system.



#### Caution

**Risk of injury on overloading components due to incorrect pressure settings!**

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

### Filtering and purity of the hydraulic fluid

Soiling in the fine range, e.g. abraded material and dust, or in the macro range, e.g. chips, rubber particles from hoses and seals, can cause significant malfunctions in a hydraulic system. It is also to be noted that new hydraulic fluid "from the drum" does not necessarily meet the highest purity requirements.

For trouble-free operation pay attention to the purity of the hydraulic fluid (see also purity class in [Chapter 3, "Parameters"](#)).

## 5.4 Maintenance information

This product is largely maintenance-free.

Conduct a visual inspection to check the hydraulic connections for damage at regular intervals, but at least once per year. If external leaks are found, shut down and remedy.

Check the device surfaces for dust deposits at regular intervals (but at least annually) and clean the device if required.

**6.1 Order coding for housing**

Type	Housing construction	
	E	G
VR 1..	6920 130/1	7340 050
VR 2..	7340 065	7340 060
VR 3..	6920 008/2	7340 070
VR 4..	7340 085	7340 080

Type	Special thread seal
VR 1..	DRV 100 116-NB 650
VR 2..	DRV 100 147-NB 650
VR 3..	DRV 100 185-NB 650
VR 4..	DRV 100 239-NB 650

## 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