

# Check valve type ER and EK

## Product documentation



Plug-in valve

Operating pressure  $p_{\max}$ : 700 bar

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



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Check valves are a type of non-return valve. They block the oil flow in one direction and open in the opposite direction. In the closed state they have zero leakage.

The check valve type ER can be plugged in. The spring-loaded ball check valve type ER is very robust and insensitive to soiling.

Type ER can be integrated directly in valves for manifold mounting. As such an additional intermediate plate is not necessary for the check valve function.

**Features and benefits:**

- Operating pressures up to 700 bar
- Easily machined mounting holes
- Sturdy

**Intended applications:**

- General hydraulic systems
- Hydraulic pre-loading



Figure 1: Insert check valve ER

## 2 Available versions, main data

Circuit symbol:



Order coding example:

ER 01  
 EK 01

Basic type and size Table 1 Basic type and size

**Table 1 Basic type and size**

Basic type and size	Volumetric flow Q (lpm)	Pressure $p_{\max}$ (bar)	Opening pressure (bar)	Section view	Circuit symbol
ER 01	6	700	0.4 ... 0.5		
ER 11 ER 12 ER 13	12	700	0.4 ... 0.5		
ER 21	30	700	0.4 ... 0.5		
ER 31	65	500	0.4 ... 0.5		
ER 41	120	400	0.4 ... 0.5		
EK 01	10	500	0.6		

## 3 Parameters

### 3.1 General

Designation	Check valves
Design	Ball seated valve
Model	Plug-in valve
Material	Steel; hardened, ground functional inner parts
Installation position	As desired
Hydraulic fluid	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.
Purity class	<b>ISO 4406</b> <u>21/18/15...19/17/13</u>
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

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

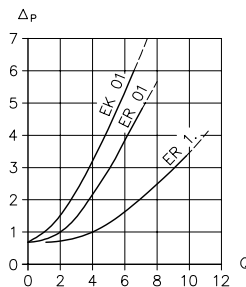


Figure 2: Q volumetric flow (lpm); Δp flow resistance (bar)

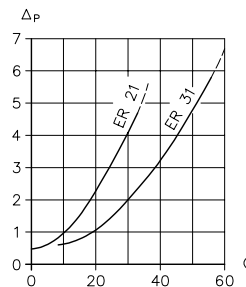


Figure 3: Q volumetric flow (lpm); Δp flow resistance (bar)

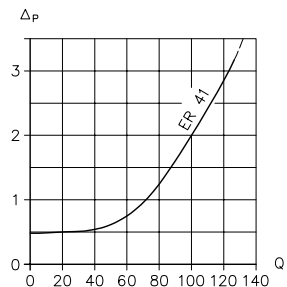


Figure 4: Q volumetric flow (lpm); Δp flow resistance (bar)

### Weight

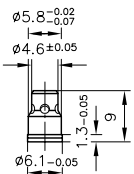
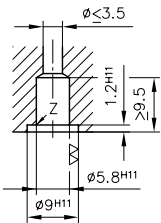
Type ER 01	= approx. 0.5 g
Type ER 11, ER 12, ER 13	= approx. 1 g
Type ER 21	= approx. 5 g
Type ER 31	= approx. 9 g
Type ER 41	= approx. 40 g
Type EK 01	= approx. 1 g

## 4 Dimensions

All dimensions in mm, subject to change!

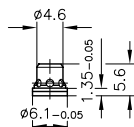
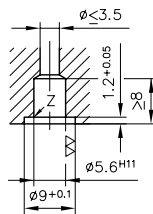
### Unit dimensions, mounting holes

**EK 01**



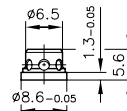
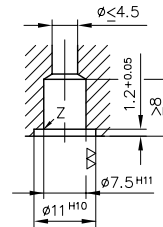
O-ring 6x1.5 NBR 90 Sh

**ER 01**



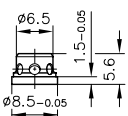
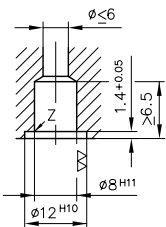
O-ring 6x1.5 NBR 90 Sh

**ER 11**



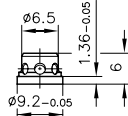
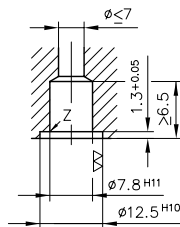
O-ring 8x1.5 NBR 90 Sh

**ER 12**



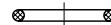
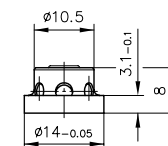
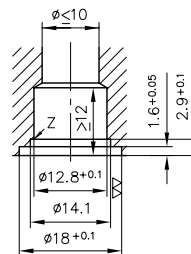
O-ring 8.73x1.78 NBR 90 Sh

**ER 13**



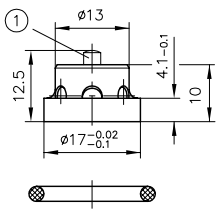
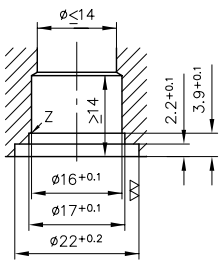
O-ring 9.25x1.78 NBR 90 Sh

**ER 21**



O-ring 14x2 NBR 90 Sh

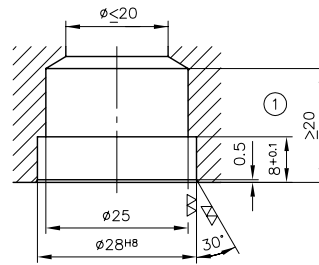
ER 31



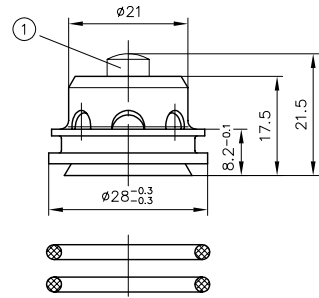
1 Valve guide pin, fully open

O-ring 17.12x2.62 NBR 90 Sh

ER 41



1 Reaming depth 7



1 Valve guide pin, fully open

O-rings 23.47x2.62 NBR 90 Sh



**Note**

O-rings must be ordered separately!



**5****Installation, operation and maintenance information****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 within oil-hydraulic systems.

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

**Note**

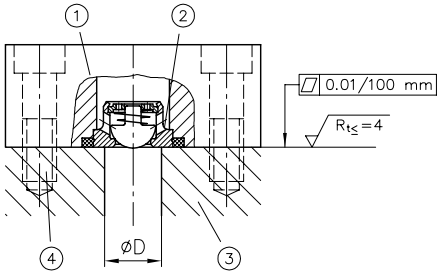
Non-compliance will void any warranty claims made against HAWE Hydraulik.

**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 dismantling; this applies in particular to systems with hydraulic accumulators.

### 5.2.1 Installation information

The insert check valve is precisely fixed in the holder by means of a deliberate slight plastic deformation on the marked contact edge when the fastening screws are tightened. This assembly requirement calls for the material of the holder to be fluid. All common hydraulic valve mounting materials may be used, with the exception of hardened or self-hardening materials.



- 1 Holder
- 2 Slight plastic deformation on the contact edge
- 3 Base plate
- 4 Tighten fastening screws equally until the joint between the holder and base plate is completely closed.

Type	Connection bore $\varnothing D$
EK 01	3.5
ER 01	3.5
ER 11	4.5
ER 12	6
ER 13	7
ER 21	10
ER 31	14
ER 41	20

### 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.

### 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.

## Additional versions and use

### Additional versions

- Check valves, type RC: D 6969 R
- Check valve type RK and RB: D 7445
- Check valve type CRK, CRB: D 7712
- Check valves, type B: D 1191
- Orifice type EB: D 6465

### For use in

- Directional seated valve type G, WG and others: D 7300
- Valve bank (directional seated valve) type VB: D 7302
- Directional seated valve type WN and WH: D 7470 A/1
- Valve bank (directional seated valve) type BWN and BWH:  
D 7470 B/1