Proportional pressure reducing valve, direct operated

Type MHDRE 04 K

Size 4
Component series 1X
Maximum control pressure 30 bar
Maximum flow 6 l/min

Table of contents

<table>
<thead>
<tr>
<th>Content</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Features</td>
<td>1</td>
</tr>
<tr>
<td>Ordering code</td>
<td>2</td>
</tr>
<tr>
<td>Standard types</td>
<td>2</td>
</tr>
<tr>
<td>Symbol</td>
<td>3</td>
</tr>
<tr>
<td>Function, section</td>
<td>4, 5</td>
</tr>
<tr>
<td>Technical data</td>
<td>5</td>
</tr>
<tr>
<td>Characteristic curves with tolerance band</td>
<td>6</td>
</tr>
<tr>
<td>Admissible working range</td>
<td>7</td>
</tr>
<tr>
<td>Unit dimensions, mounting cavity</td>
<td>8</td>
</tr>
<tr>
<td>Available individual components</td>
<td></td>
</tr>
</tbody>
</table>

Features

- Direct operated proportional pressure reducing valve for reducing a system pressure
- Cartridge valve
- Suitable for mobile and industrial applications
- Operation by means of proportional solenoid
- In case of power failure, the minimum pressure is set
- Recommended control electronics:
  - Mobile amplifier type RA and RC

Information on available spare parts:
www.boschrexroth.com/spc
Ordering code

MHDRE 04 K 1X/30 A V *

Proportional pressure reducing valve, direct operated
Size 4 = 04
Cartridge valve = K
Component series 10 to 19 = 1X
(10 to 19: Unchanged installation and connection dimensions)
Maximum control pressure 30 bar = 30
Proportional solenoid, wet-pin = A

Seal material
V = FKM seals
(other seals upon request)
Attention!
Observe compatibility of seals with hydraulic fluid used!

Electrical connection
K40 = without mating connector with connector DT 04-2P (Deutsch plug)

Nominal voltage
G12 = DC 12 V
G24 = DC 24 V

Standard types

<table>
<thead>
<tr>
<th>Type</th>
<th>Material number</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 V</td>
<td>24 V</td>
</tr>
<tr>
<td>MHDRE 04 K1X/30AG..K40V</td>
<td>R901059491 R901067641</td>
</tr>
</tbody>
</table>

Symbol

① = Main port 1 (A)
② = Main port 2 (P)
③ = Main port 3 (T)
Function, section

General
The proportional pressure reducing valve type MHDRE 04 K is a direct operated cartridge valve in 3-way design. It reduces the control pressure (main port ①) proportionally to the solenoid current and functions largely independently from the input pressure (main port ②).

With a command value of 0 or in case of power failure, the minimum pressure is set. Operation is effected by means of proportional solenoid. The solenoid's interior is connected to the main port ③ and filled with hydraulic fluid.

Depending on the electric command value, these valves can be used to reduce the system pressure continuously. The valve is suitable for controlling couplings, pumps and directional valves as well as for use in proportional pilot controls (particularly in the mobile area, however also for industrial applications).

Basic principle
The valve controls the pressure in the main port ① proportionally to the current at the solenoid.

The proportional solenoid (1) converts the electric current into mechanical force that acts on the spool (2) via the armature. The spool controls the connection between the main ports.

Note!
Occurring tank pressure (main port ③) is added up to the control pressure (main port ①).

Attention!
If the valve is not installed or installed in a system that is not completely bled, the valve must not be energized as otherwise, the entering air has a very negative effect on the valves' dynamic behavior.

① = Main port 1 (A)
② = Main port 2 (P)
③ = Main port 3 (T)
# Technical Data (For applications outside these parameters, please consult us!)

## General
- **Weight**: kg approx. 0.25
- **Installation position**: Any - if it is ensured that no air can collect upstream the valve. Otherwise, we recommend suspended installation of the valve (electric connection downwards).
- **Ambient temperature range**: °C
- **Storage temperature range**: °C ~30 to +80

## Environmental audits:
- **Salt spray test according to EN ISO 9227**: h 600 (NSS test)
- **Surface protection Solenoid**: Coating according to DIN 50962-Fe/ZnNi with thick layer passivation

## Hydraulic
- **Maximum control pressure**: Main port ① bar 30
- **Maximum input pressure**: Main port ② bar 100
- **Maximum backpressure**: Main port ③ bar at zero pressure (max. 30 bar, occurring tank pressures are added up to the control pressure (main port ①))
- **Maximum flow (Δp = 7 bar)**: l/min 6
- **Maximum leakage**: Main port ③ ml/min 100 (50 bar in ②; I = 0 mA, 46 cSt)
- **Maximum pilot oil**: ml/min 350 (50 bar in ②; I = I_max, 46 cSt)
- **Hydraulic fluid**: Mineral oil (HL, HLP) according to DIN 51524; other hydraulic fluids upon request
- **Hydraulic fluid temperature range**: °C ~30 to +110
- **Viscosity range**: mm²/s 5 to 400
- **Maximum permitted degree of contamination of the hydraulic fluid - cleanliness class according to ISO 4406 (c)**: Class 20/18/15 1)
- **Hysteresis (within tolerance band)**: bar ≤ 1.5
- **Step response (T_u + T_g)**: ms ≤ 60 (50 bar in ②; 46 cSt, q_V = 0 l/min, dead volume in ① 140 cm³)
- **Repeatability**: % < 2 % of the maximum control pressure
- **Load cycles**: 10⁷
- **Mesh size strainer element at the main port ②**: µm 160

1) The cleanliness classes specified for the components must be adhered to in hydraulic systems. Effective filtration prevents faults and at the same time increases the service life of the components.

For the selection of filters, see data sheets 50070, 50076, 50081, 50086, 50087 and 50088.

For more information refer to data sheets:
- 07008
- 07800
- 07900
- 64020
Technical Data (For applications outside these parameters, please consult us!)

**electrical**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>12 DC</th>
<th>24 DC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply voltage</td>
<td>V</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum control current</td>
<td>A</td>
<td>1.7</td>
<td>0.98</td>
</tr>
<tr>
<td>Coil resistance at 20 °C</td>
<td>Ω</td>
<td>3.5</td>
<td>11.1</td>
</tr>
<tr>
<td>Duty cycle (ED) 3)</td>
<td>%</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Maximum coil temperature 4)</td>
<td>°C</td>
<td>185</td>
<td></td>
</tr>
<tr>
<td>Protection class according to VDE 0470-1</td>
<td></td>
<td>(DIN EN 60529), DIN 40050-9</td>
<td>IP 69K (with mating connector mounted and locked)</td>
</tr>
<tr>
<td>Chopper frequency (recommended) 5)</td>
<td>Hz</td>
<td>200</td>
<td></td>
</tr>
<tr>
<td>Control electronics (separate order)</td>
<td></td>
<td>Control unit RA, see data sheet 95230</td>
<td>Control units RC, see data sheet 95200</td>
</tr>
</tbody>
</table>

Design according to VDE 0580

3) In case of use at an altitude of more than 2000 m a.s.l., we recommend consulting the manufacturer.

4) Due to the temperatures occurring at the surfaces of the solenoid coils, the standards ISO 13732-1 and EN 982 need to be adhered to!

5) The chopper frequency is to be optimized depending on the application. In this regard, observe the temperature range of the application.

**Characteristic curves with tolerance band** (measured with HLPD46, \( \theta_{oil} = 50 \pm 5 ^\circ C \))

**Measuring conditions:**

- Installation position: horizontal
- Amplifier: Analog amplifier RA (data sheet 95230)
- Chopper frequency: 200 Hz
- Input pressure: 50 bar
- Dead volume at the main port ①: 135 ml
Admissible working range:

Admissible working range against the ambient temperature
Version “G12” (DC 12 V)

Admissible working range against the ambient temperature
Version “G24” (DC 24 V)
Unit dimensions, mounting cavity (dimensions in mm)

1 Mating connector for connector “K40” (separate order, see data sheet 08006)
2 Strainer
3 Flat across widths SW30; $M_A = 12 \times 10^{-5}$ Nm

1) Depth of fit

Standards:

<table>
<thead>
<tr>
<th>Workpiece edges</th>
<th>DIN ISO 13715</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form and position tolerance</td>
<td>DIN EN ISO 1101</td>
</tr>
<tr>
<td>General tolerances for metal-cutting procedures</td>
<td>DIN ISO 2768-mK</td>
</tr>
<tr>
<td>Tolerance</td>
<td>DIN ISO 8015</td>
</tr>
<tr>
<td>Surface quality</td>
<td>DIN EN ISO 1302</td>
</tr>
</tbody>
</table>
Available individual components

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Material no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>999</td>
<td>Seal kit of the valve</td>
<td>R961004421</td>
</tr>
</tbody>
</table>