

Pressure transducers for hydraulic applications

Type HM20

RE 30272

Edition:2014-08

Replaces: 2013-11



H8002

► Component series 2X



Features

- Measuring pressures in hydraulic systems
- 8 measurement ranges up to 630 bar
- Sensor with thin film measuring cell
- Components that are in contact with the media are made of stainless steel
- Operational safety due to high bursting pressure, reversed polarity, overvoltage and short-circuit protection
- Accuracy class 0.5
- Excellent non-repeatability < 0.05 %
- Wide operating temperature range -40 ... +85 °C

Contents

| | |
|-----------------------|------|
| Features | 1 |
| Ordering code | 2 |
| Technical data | 3, 4 |
| Electrical connection | 5 |
| Unit dimensions | 5 |

Ordering code

| | | | | |
|-------------|----|-----------|----|------------|
| 01 | 02 | 03 | 04 | 05 |
| HM20 | - | 2X | / | - |
| | | | | K35 |

| | | |
|----|---|-------------|
| 01 | Pressure transducer | HM20 |
| 02 | Component series 20 to 29 (20 to 29: unchanged installation dimensions and pin assignments) | 2X |
| 03 | 10 bar | 10 |
| | 50 bar | 50 |
| | 100 bar | 100 |
| | 160 bar | 160 |
| | 250 bar | 250 |
| | 315 bar | 315 |
| | 400 bar | 400 |
| | 630 bar | 630 |
| 04 | Current output 4 to 20 mA | C |
| | Voltage output 0.1 to 10 V | H |
| 05 | Connector, 4-pole, M12 x 1 | K35 |

Replacement seal ring

| Designation | Material no. |
|---------------|-------------------|
| Seal ring NBR | R900012467 |

Cable sets or mating connectors are not included in the scope of delivery; please order separately

Cable sets and mating connectors

| Technical data | Unit dimensions (in mm) | Designation | Material no. |
|--|-------------------------|-----------------|-------------------|
| General Current carrying capacity 4 A Temperature range -25 ... +85 °C Protection class IP 67 according to EN 60529 | | 4PM12 (L = 2 m) | R900773031 |
| Cable sets, shielded Cable diameter 5.9 mm Jacket material PUR-OB Line cross-section 4 x 0.34 mm ² | | 4PM12 (L = 5 m) | R900779498 |
| Mating connectors Cable diameter 4 to 6 mm Line cross-section 4 x 0.75 mm ² Type of connection Screw connection | | 4PM12 (L = 2 m) | R900779504 |
| Connection diagram Socket contacts, Cable set View to the socket side | | 4PM12 (L = 5 m) | R900779503 |
| | | 4PE11508 | R900773042 |
| | | | 4PE11509 |

Technical data

| Input variables | | | | | | | | | |
|---|--|--|------------------------------|-----|-----|------|------|------|------|
| Operating voltage | U_S | 16 ... 36 VDC ¹⁾ | | | | | | | |
| Residual ripple | U_{PP} | 2.5 V (40 to 400 Hz) | | | | | | | |
| Current consumption | I_{max} | ≤ 12 mA (with voltage output) | | | | | | | |
| Protection class | | III | | | | | | | |
| Isolation resistance | R | >100 MΩ (500 VDC) | | | | | | | |
| Measurement range | p_N [bar] | 10 | 50 | 100 | 160 | 250 | 315 | 400 | 630 |
| Overload protection | p_{max} [bar] | 25 | 100 | 200 | 320 | 500 | 630 | 800 | 1000 |
| Bursting pressure | p [bar] | 200 | 200 | 400 | 640 | 1000 | 1260 | 1600 | 2520 |
| Output parameters | | | | | | | | | |
| Output signal and admissible load R_A | I_{Sig} | 4 ... 20 mA $R_A = (U_S - 8.5 \text{ V}) / 0.0215 \text{ A}$ with R_A in Ω and U_S in V | | | | | | | |
| | U_{Sig} | 0.1 ... 10 V, $R_A > 2 \text{ k}\Omega$ | | | | | | | |
| Setting time (10 to 90 %) | t | < 1 ms | | | | | | | |
| Accuracy (characteristic curve deviation) | | < related to the complete measurement range, including, 0,5 hysteresis, zero point and end value deviation % (corresponds to the measuring deviation according to IEC 61298-2) | | | | | | | |
| Temperature coefficient (TK) for zero point and range | | | | | | | | | |
| – in the nominal temperature range | | < 0.1 % / 10 K | | | | | | | |
| – outside the nominal temperature range | | < 0.2 % / 10 K | | | | | | | |
| Hysteresis | | < 0.15 % ²⁾ | | | | | | | |
| Non-repeatability | | < 0.05 % ²⁾ | | | | | | | |
| Long-term drift (1 year) under reference conditions | | < 0.1 % | | | | | | | |
| Environmental conditions | | | | | | | | | |
| Nominal temperature range | ϑ | –20 ... +80 °C | | | | | | | |
| Ambient temperature range | ϑ | –40 ... +85 °C | | | | | | | |
| Storage temperature range | ϑ | –40 ... +100 °C | | | | | | | |
| Hydraulic fluid temperature range | ϑ | –40 ... +90 °C | | | | | | | |
| Other characteristics | | | | | | | | | |
| Pressure connection | | G1/4 according to DIN 3852 form E Seal ring according to DIN 3869-14 | | | | | | | |
| Housing material | | V4A (1.4404), PEI, HNBR | | | | | | | |
| Materials in contact with medium | | 1.4542, NBR | | | | | | | |
| Pressure media | | HL, HLP, HFC, nitrogen ³⁾ , others upon request | | | | | | | |
| Tightening torque | Measurement ranges < 400 bar Measurement ranges ≥ 400 bar | M_A M_A | 20 ... 25 Nm 25 ... 30 Nm | | | | | | |
| Electrical connection | | 4-pole M12 connector at the housing ⁴⁾ | | | | | | | |
| Protection class according to EN 60529 | | IP65/IP67 with mating connector correctly mounted and locked | | | | | | | |
| Weight | m | 0.05 kg | | | | | | | |
| Life cycle | | 60 million load cycles or 60000 h | | | | | | | |
| Vibration load: | | | | | | | | | |
| – Transport shock according to DIN EN 60068-2-27 | | 15 g / 11 ms / 3 axes | | | | | | | |
| – Sine test according to DIN EN 60068-2-6 | | 10 ... 2000 Hz / maximum of 10 g / 10 cycles / 3 axes | | | | | | | |
| – Noise test according to DIN EN 60068-2-64 | | 20 ... 2000 Hz / 14 g RMS / 42 g peak / 24 h / 3 axes | | | | | | | |

1) With cULus: max. of 30 V DC is admissible

2) related to nominal temperature range

3) maximum of 300 bar is admissible

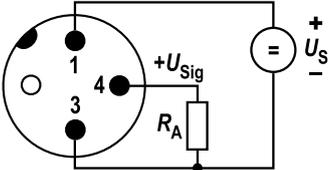
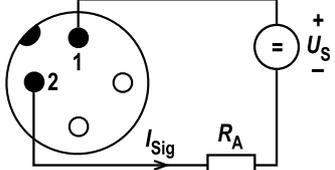
4) Recommendation: Use of shielded connection cable, see cable sets on page 2

Technical data

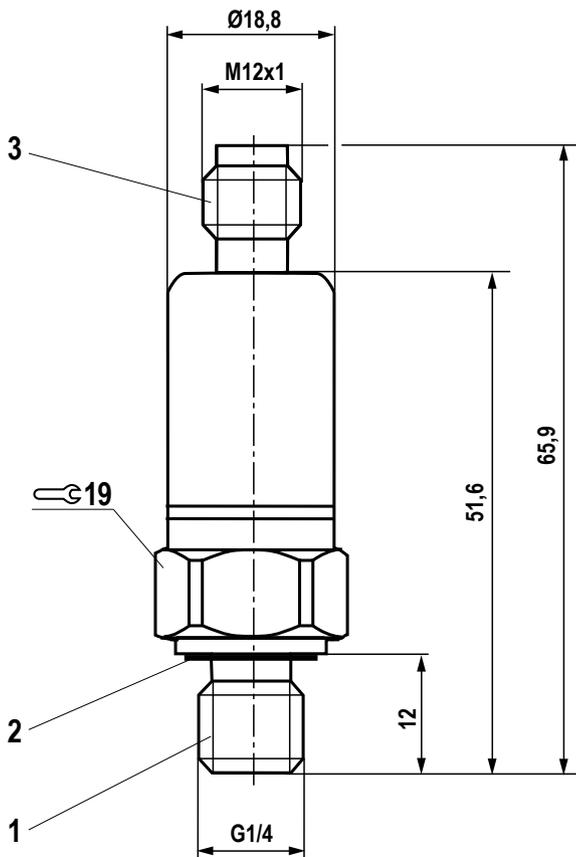
| | |
|---|---|
| Electro-magnetic compatibility (EMC): EN 61000-6:-2 / EN 61326-2-3 – EN 61000-4-2 ESD – EN 61000-4-3 HF radiated – EN 61000-4-4 burst – EN 61000-4-5 surge – EN 61000-4-6 HF cable-propagated – EN 61000-4-8 magnetic field 50/60Hz – EN 61000-4-9 magnetic field pulsed EN 61000-6:-3 / EN 61326-2-3 – EN 55016-2-1 interference voltage – EN 55016-2-3 radio interference field strength | 4 kV CD / 8 kV AD with evaluation criterion B 10 V/m (80 ... 2700 MHz) with evaluation criterion A 2 kV with evaluation criterion B 1 kV / 42 Ohm with evaluation criterion B 10 Veff (150 kHz ... 80 MHz) with evaluation criterion A 100 A/m with evaluation criterion A 1000 A/m with evaluation criterion A 0.15 ... 30 MHz, class A, EN 55022 30 ... 1000 MHz, class B, EN 55022 |
| Conformity | CE as per EMC directive |
| Further tests | cULus-listed |

Electrical connection

4-pole M12 connector, view to connection side

| Voltage | | Current (two-wire system) | |
|---|---|--|---|
|  | <p>Values for U_S, R_A and U_{Sig}, see page 3</p> |  | <p>Values for U_S, R_A and I_{Sig}, see page 3</p> |

Unit dimensions (dimensions in mm)



- 1** Pressure port G1/4 male thread
- 2** Seal ring
- 3** 4-pole M12 connector

Notes

Bosch Rexroth AG
Hydraulics
Zum Eisengießer 1
97816 Lohr am Main, Germany
Phone +49 (0) 93 52/18-0
documentation@boschrexroth.de
www.boschrexroth.de

© This document, as well as the data, specifications and other information set forth in it, are the exclusive property of Bosch Rexroth AG. It may not be reproduced or given to third parties without the consent of Bosch Rexroth AG. The data specified above only serve to describe the product. No statements concerning a certain condition or suitability for a certain application can be derived from our information. The information given does not release the user from the obligation of own judgment and verification. It must be remembered that our products are subject to a natural process of wear and aging.

Notes

Bosch Rexroth AG
Hydraulics
Zum Eisengießer 1
97816 Lohr am Main, Germany
Phone +49 (0) 93 52 / 18-0
documentation@boschrexroth.de
www.boschrexroth.de

© This document, as well as the data, specifications and other information set forth in it, are the exclusive property of Bosch Rexroth AG. It may not be reproduced or given to third parties without the consent of Bosch Rexroth AG. The data specified above only serve to describe the product. No statements concerning a certain condition or suitability for a certain application can be derived from our information. The information given does not release the user from the obligation of own judgment and verification. It must be remembered that our products are subject to a natural process of wear and aging.

Notes

Bosch Rexroth AG
Hydraulics
Zum Eisengießer 1
97816 Lohr am Main, Germany
Phone +49 (0) 93 52/18-0
documentation@boschrexroth.de
www.boschrexroth.de

© This document, as well as the data, specifications and other information set forth in it, are the exclusive property of Bosch Rexroth AG. It may not be reproduced or given to third parties without the consent of Bosch Rexroth AG. The data specified above only serve to describe the product. No statements concerning a certain condition or suitability for a certain application can be derived from our information. The information given does not release the user from the obligation of own judgment and verification. It must be remembered that our products are subject to a natural process of wear and aging.