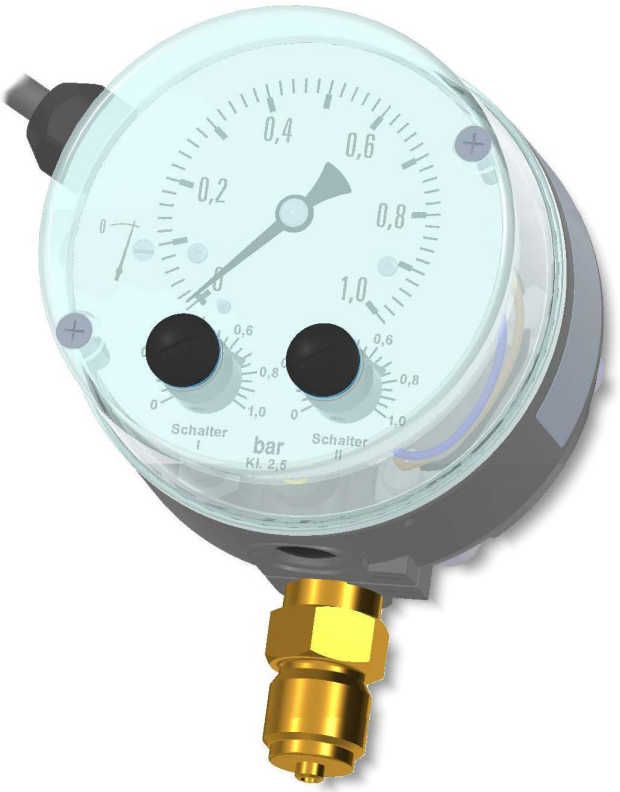
developing solutions

FISCHER
MESS- UND REGELTECHNIK

IEC 61508
SIL

CE
RoHS III
COMPLIANT
UK
CA




# Data sheet

## MS11

Contact manometer
for difficult measuring conditions

09005811 • DB_EN_MS11 • Rev. ST4-C • 03/23

# 1 Product and functional description

## 1.1 Delivery scope

- Contact manometer MS11
- Operating Manual

## 1.2 Performance characteristics

### Typical applications

- Pumping drinking water
- Procedural technology
- Plant engineering
- Water management
- Pneumatic transport systems

### Important features

- High repetition accuracy of the switch points
- Long life span
- High overload protection
- Vibration-proof
- Sturdy diaphragm measuring system
- All measuring ranges are overpressure-proof up to 25 bar

## 1.3 Intended use

The MS11 contact manometer is a combined measuring and switch device for pressure measurements under difficult conditions, such as pressure impacts, vibrations, frequent switch processes or high requirements on the switch performance.

The device is suitable for gaseous media and fluid media. Please contact the manufacturer before using this unit with dirty or aggressive media because the unit needs to be adapted in terms of the parts that come into contact with the media.

The device can be used as a functional safety components (SIL) as agreed with the manufacturer (see order code).

The device is to be exclusively used for the applications agreed between the manufacturer and the user.

## 1.4 Function diagram

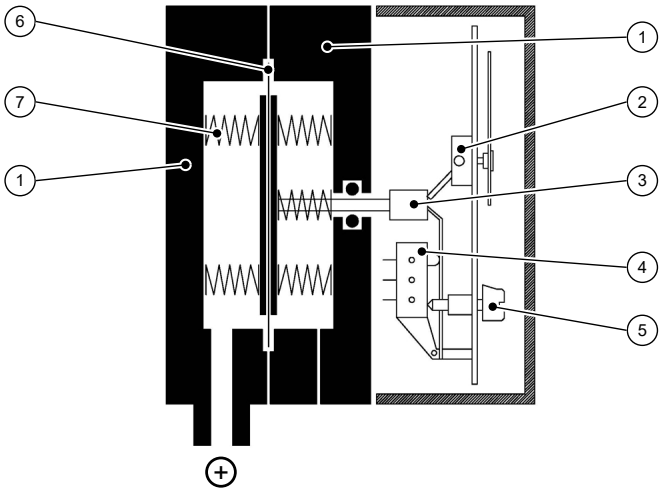



*Fig. 1:* Function diagram

| | |
|---|---|
| 1 Pressure chamber | 2 Motion train |
| 3 Tappet | 4 Micro-switch |
| 5 Switch point setting | 6 Measuring diaphragm |
| 7 Measuring springs | |

## 1.5 Design and mode of operation

The basis for this measurement and switch unit is a sturdy non-sensitive diaphragm measuring unit that is suitable for measuring over and under-pressure.

In the rest position, the spring forces on both sides of the membrane are balanced out. Due to the pressure or underpressure to be measured, a single-sided force is created on the membrane which shifts the membrane system against the measurement range springs up to compensation of the spring forces. In case of overload, the membrane supports against the metallic support surfaces.

A centrally positioned tappet transfers the movement of the membrane system on the motion train and operating elements of the micro-switches.

# 2 Technical data

## 2.1 General Information

| Reference conditions (acc. to IEC 61298-1) | | |
|---|---|---|
| Temperature | +15 … +25 °C | |
| Relative humidity | 45 … 75 % | |
| Air pressure | 86 … 106 kPa | 860 … 1060 mbar |
| Installation position | vertical | |

## 2.2 Input variables

| Measuring ranges | Measuring accuracy | Overpres-sure | Under-pres-sure |
|---|---|---|---|
| 0 … 250 mbar | ± 6.25 mbar | 25 bar | - 1 bar |
| 0 … 400 mbar | ± 10 mbar | | |
| 0 … 0.6 bar | ± 0.015 bar | | |
| 0 … 1 bar | ± 0.025 bar | | |
| 0 … 1.6 bar | ± 0.04 bar | | |
| 0 … 2.5 bar | ± 0.0625 bar | | |
| 0 … 4 bar | ± 0.1 bar | | |
| 0 … 6 bar | ± 0.15 bar | | |
| 0 … 10 bar | ± 0.25 bar | | |
| 0 … 16 bar | ± 0.4 bar | | |
| 0 … 25 bar | ± 0.625 bar | | |
| -0.6 … 0 bar | ± 0.015 bar | | |
| -1 … 0 bar | ± 0.025 bar | | |
| -1 … +0.6 bar | ± 0.04 bar | | |
| -1 … +1.5 bar | ± 0.0625 bar | | |
| -1 … +3 bar | ± 0.1 bar | | |
| -1 … +5 bar | ± 0.15 bar | | |
| -1 … +9 bar | ± 0.25 bar | | |
| -1 … +15 bar | ± 0.4 bar | | |
| -1 … +24 bar | ± 0.625 bar | | |

| | |
|---|---|
| Rated pressure of the measuring system | 25 bar |
| Test pressure | 1.5 times the rated pressure |
| Zero-point setting | Arranged in the front panel of the scale |
| Measuring accuracy | ± 2.5% of the measuring span |

## 2.3 Output parameters

| | |
|---|---|
| Switch contacts | 1 to 2 micro-switches |
| Switching function (per contact) | Changeover contact |
| Switch point setting | Can be set to reference scales from outside |
| Smallest settable value | 5% of the measuring span |
| Switch hysteresis | approx 2.5% of the measuring span |

| **Per contact** | **AC** | **DC** |
|---|---|---|
| Switching voltage | 250 V | 30 V |
| Switching current | 5 A | 0.4 A |
| Switching output | 250 VA | 10 W |

## 2.4 Operating conditions

| | |
|---|---|
| Increase ambient temperature | -10 … +70 °C |
| Media temperature | -10 … +70 °C |
| Storage temperature | -15 … +75 °C |
| Enclosure protection class | IP55 or IP65 acc. to EN 60529 depending on model |
| NSR | EN 61010-1:2010 +A1:2019+A12019/AC:2019 |
| RoHS | EN IEC 6300:2018 |
| SIL2 | EN 61508:2010 Parts 1-7 |

## 2.5 Construction design

| | | |
|---|---|---|
| Process connection | Connection shank G½ B DIN EN 837 | |
| Electrical connection | Permanently wired numbered cables | |
| | 7-pin plug connection | |
| | Cable socket | |
| Installation position | vertical | |
| Dimensions | See dimensional drawings | |
| Weight | Pressure chamber in aluminium | 1.2 kg |
| | Pressure chamber in stainless steel | 3.5 kg |

### 2.5.1 Materials

| Parts in contact with the medium | | |
|---|---|---|
| Pressure chamber | Aluminium GkAlSi10(mg); painted black | |
| | Aluminium GkALSi10(mg); HART-COAT© surface protection | |
| | Chromium nickel steel 1.4305 | |
| Measuring diaphragm | NBR | |
| | VITON® | |
| | Inconel 718 | |
| Seals | NBR | |
| | VITON® | |
| Other inner parts | Rustproof steel 1.4310, 1.4305 | |
| Process connection | Pressure chamber in aluminium | CuZn40 |
| | Pressure chamber in stainless steel | 1.4404 |

| Parts with no contact with the medium | | |
|---|---|---|
| Cover hood | IP55 | Makrolon |
| Bayonet ring housing | IP65 | Stainless steel 1.4301 |
| Dial face and needle | | Aluminium |
| Setting buttons | | AlCuMgPb 3.1645 |

### 2.5.2 Dimensional drawings

All dimensions in mm unless otherwise stated

The following are the dimensional diagrams for the different models of the pressure chambers in aluminium. The dimensional diagrams for the pressure chambers in stainless steel are similar. For this reason, there is no illustration.

#### 2.5.2.1 Standard version (aluminium)

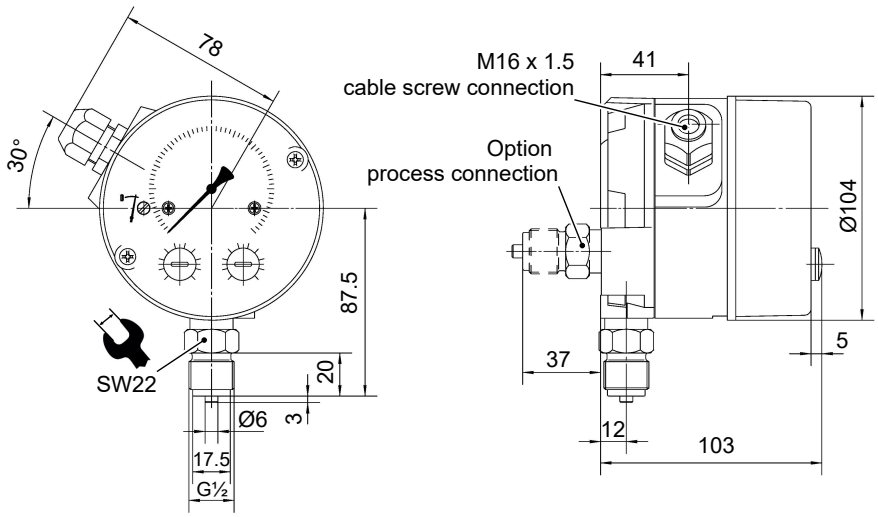



*Fig. 2:* Model IP55

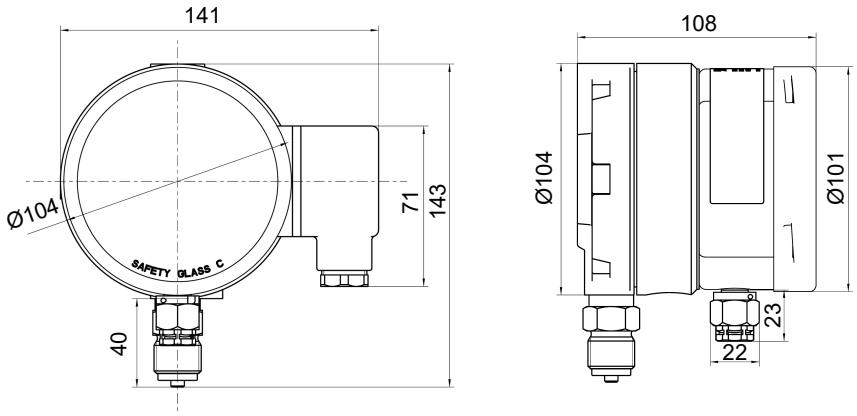



*Fig. 3:* Model IP65

### 2.5.2.2 Wall structure (aluminium)

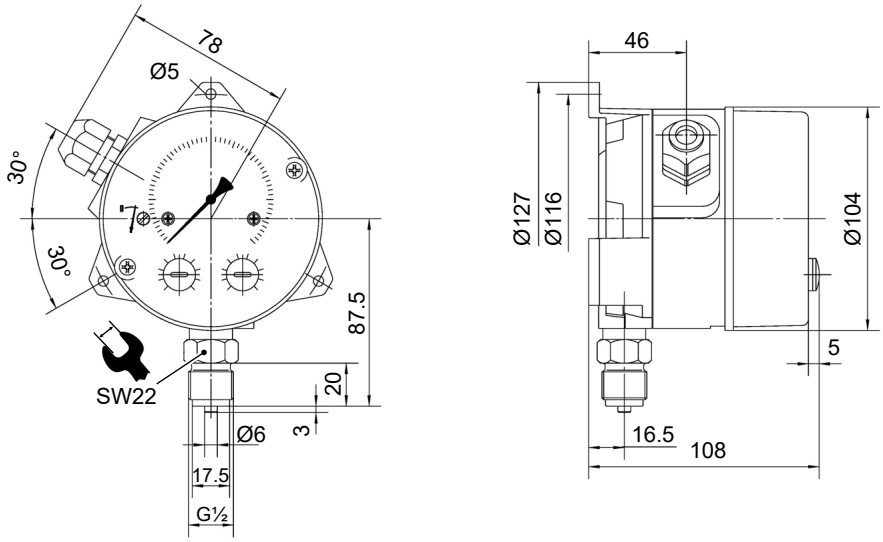



*Fig. 4:* Model IP55

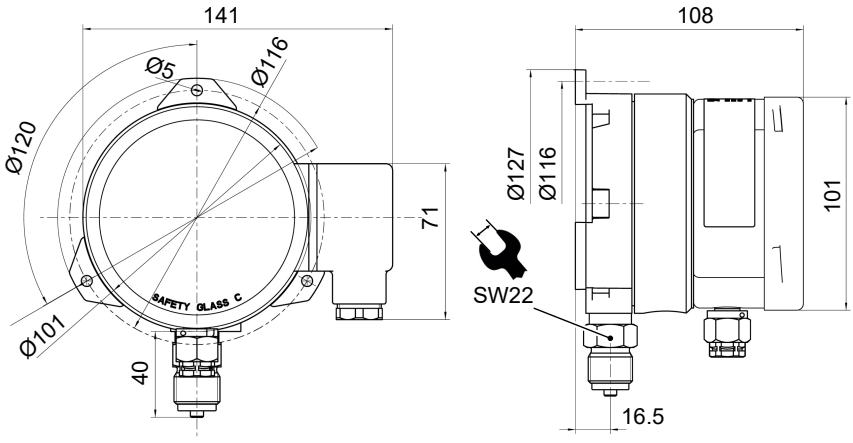



*Fig. 5:* Model IP65

### 2.5.2.3 Switch panel installation (aluminium)

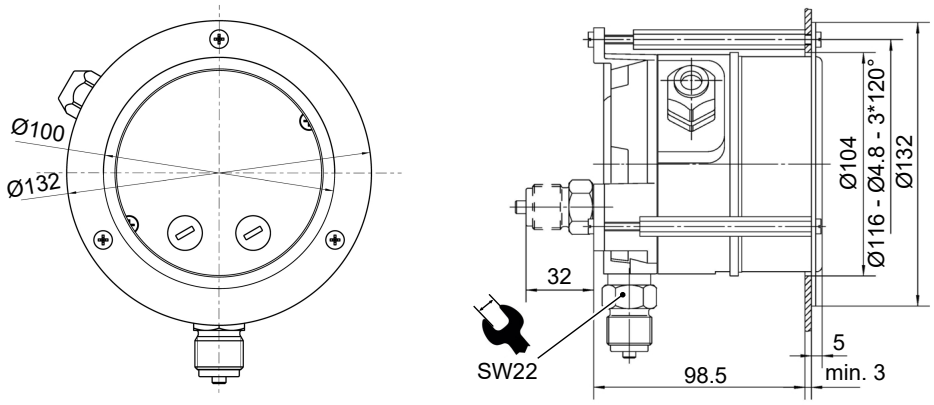



*Fig. 6:* Model IP55

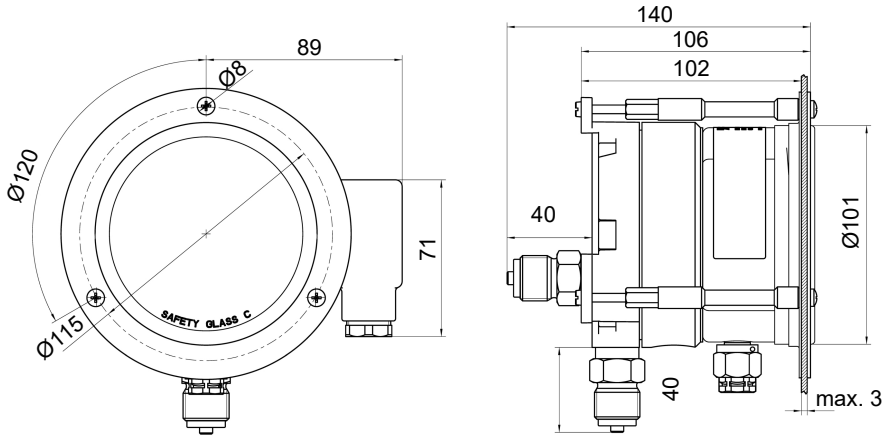
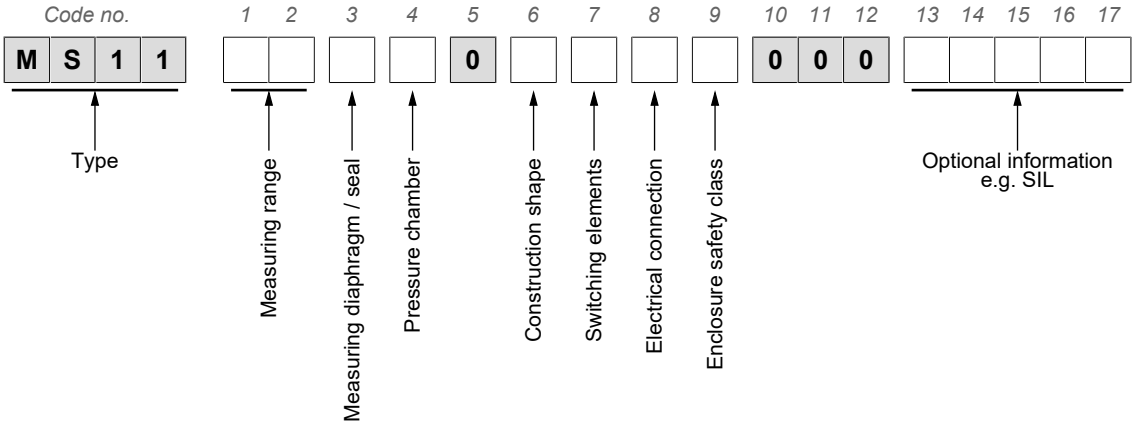



*Fig. 7:* Model IP65

# 3 Order codes




| | | Measuring diaphragm | |
|---|---|---|---|
| **[1.2]** | **Measuring range** | **NBR / VITON** | **Inconel 718** |
| **82** | 0 … 250 mbar | x | |
| **83** | 0 … 400 mbar | x | |
| **01** | 0 … 0.6 bar | x | |
| **02** | 0 … 1 bar | x | |
| **03** | 0 … 1.6 bar | x | |
| **04** | 0 … 2.5 bar | x | |
| **05** | 0 … 4 bar | x | |
| **06** | 0 … 6 bar | x | |
| **07** | 0 … 10 bar | x | |
| **08** | 0 … 16 bar | x | |
| **09** | 0 … 25 bar | | x |
| **30** | -0.6 … 0 bar | x | |
| **31** | -1 … 0 bar | x | |
| **32** | -1 … +0.6 bar | x | |
| **33** | -1 … +1.5 bar | x | |
| **31** | -1 … +3 bar | x | |
| **35** | -1 … +5 bar | x | |
| **36** | -1 … +9 bar | x | |
| **37** | -1 … +15 bar | x | |
| **38** | -1 … +24 bar | | x |

| **[3]** | **Measuring dia-phragm** | **Sealant** | **Comment** |
|---|---|---|---|
| **N** | NBR | NBR | |
| **V** | VITON® | VITON® | |
| **D** | Inconel 718 | NBR | Only measuring ranges 0 … 25 bar |
| **E** | Inconel 718 | VITON® | Only measuring ranges 0 … 25 bar |

| [4] | Pressure chamber | Comment |
|---|---|---|
| **A** | Aluminium | Only measuring range ≤ 0 ... 16 bar |
| **D** | Aluminium HART COAT® | |
| **W** | Stainless steel 1.4305 | |

| [6] | Version |
|---|---|
| **0** | Bottom pressure connection with outer thread G½ B |
| **H** | Back pressure connection with outer thread G½ B |
| **B** | Wall mounting; bottom pressure connection with outer thread G½ B |
| **G** | Switch panel installation; bottom pressure connection with outer thread G½ B |
| **L** | Switch panel installation; back pressure connection with outer thread G½ B |

| [7] | Switching Elements |
|---|---|
| **A** | 1 adjustable micro-switch |
| **B** | 2 adjustable microswitches |

| [8] | Electrical connection |
|---|---|
| **1** | 1 metre numbered cable, permanently wired |
| **2** | 2.50 metre numbered cable, permanently wired |
| **5** | 5 metre numbered cable, permanently wired |
| **K** | Cable connection socket |
| **W** | 7-pin plug connection |

| [9] | Casing protection class | Comment |
|---|---|---|
| **0** | IP55 | |
| **P** | IP65 | Only with a cable connection socket<br>or plug connection |

| *[13-17]* | Optional information |
|---|---|
| ##### | Code for special models e.g. SIL<br>The code is generated as agreed with our sales team. |

## Accessories

Please go to our website fischermesstechnik.de for the data sheet MZ for the measuring device accessories such as the shut-off valves, throttles etc.

## Notes

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