Type MA 12

General Description

The MA 12 pressure gauge can be used for monitoring under- and over-pressure under difficult operating conditions such as pressure surges and vibrations.
The instrument uses a spring-loaded diaphragm as the sensing element, and is inherently protected against overpressure conditions.
A choice of materials of construction for the pressure chamber and diaphragm allows the instrument to be configured to meet a wide variety of applicationns requirements.



Applications

- process instrumentation
- machine instrumentation
- water hydraulic systems
- pneumatic conveying systems

Important Features

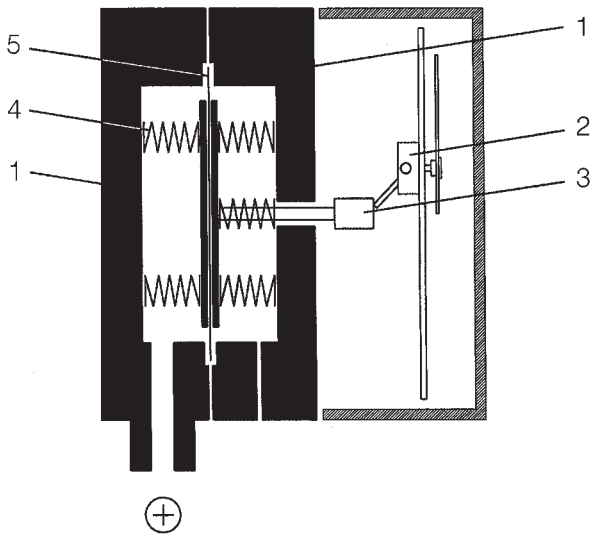
- vibration resistant
- long life expectancy
- rugged sensing diaphragm and springs
- overpressure rating 25 bar, for all ranges

Principles of Operation

The gauge uses a tough, flexible sensing diaphragm sandwiched between stiffening plates and balanced by springs on either side. For higher pressure ranges, a special stainless steel (Duratherm) diaphragm is used, which also acts a plate spring. The gauge can be used for monitoring under- or over-pressure. The diaphragm is at zero position when the forces exerted by the springs (or the plate spring) and the pressures on either side of the diaphragm are equal. When pressure is applied on the pressure chamber side of the diaphragm, it moves to a new equilibrium position, determined by a balance of forces of the springs and pressures on both sides. At overload limit, the diaphragm ist stopped by the end metal face on the side opposite the pressure chamber. The linear displacement of the diaphragm is translated to angular movement of the dial pointer, through a precision mechanism consisting of a push-rod, lever, linkages, and gears.

Schematic Diagram

1. Pressure chamber
2. Pointer mechanism
3. Push-rod
4. Sensing springs
5. Sensing diaphragm



Specifications

Measuring ranges	0…400 mbar to 0…25 bar (see Ordering Code)
Nominal pressure rating	25 bar
Max. overpressure	Safe up to nominal pressure rating (all ranges).
Operating temperature ambient	-10 ° to +70 °C (max. 5°C for SEV Approval)
Operating temperature media	max. 70 °C
Protection class	IP 54 per DIN 40 050
Mounting position	arbitrary
Accuracy	± 1.6 % of range full-scale
Zero adjustment	by screw, through dial window (front)
Pressure connections	threaded plug connector G 1/2 (M), per DIN 16 288

Sensing Elements

Range 10 bar	Sensing spring plus fabric-reinforced elastomer diaphragm
Range 16 bar	DURATHERM® (stainless steel) diaphragm, acting as a plate spring

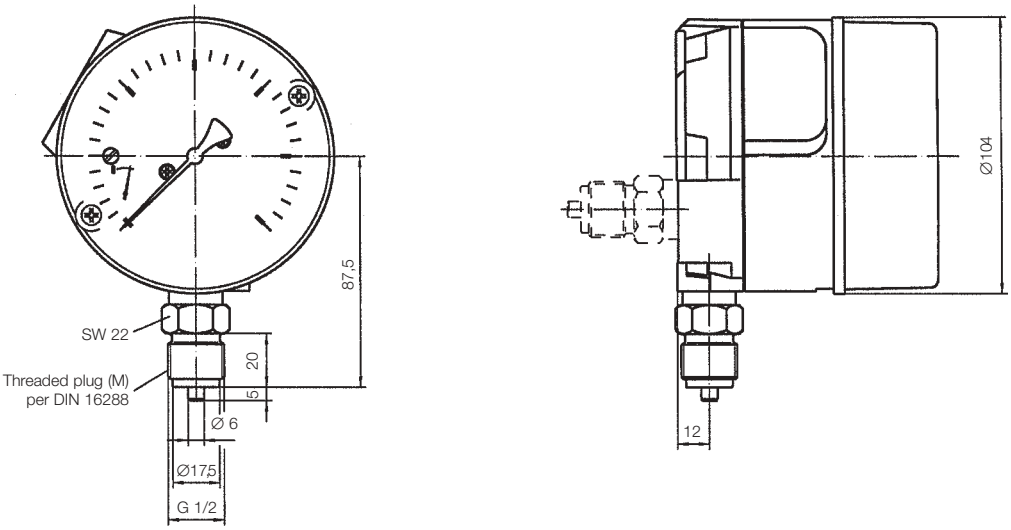
Materials

Pressure chamber	Aluminium Gk Al Si 12 (Cu) painted black Aluminium Gk Al Si 12 (Cu) with hard coat surface protection Stainless steel 1.4305
Diaphragm and seals Elastomer	Diaphragm and seals: NBR (nitrile) or Viton (fluorocarbon) Plate spring diaphragm: DURATHERM® (stainless steel)
Other parts in contact with media	Stainless steel 1.4310, 1.4305
Housing	Makrolon
Weight	With aluminium pressure chamber: 1.2 kg With stainless steel pressure chamber: 3.5 kg

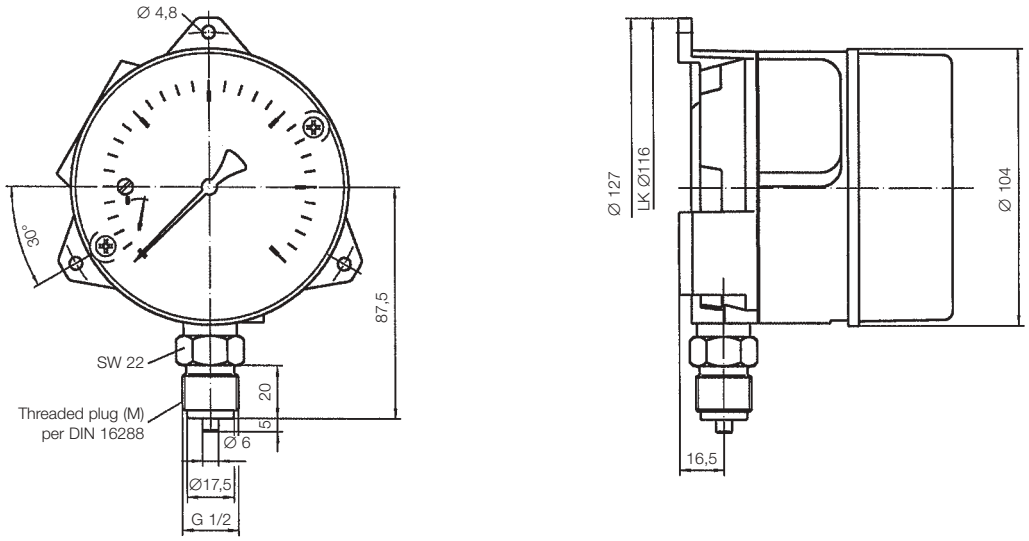
Mounting/Installation	Tube mounting:	Threaded connectors per DIN 16 288; (bottom or rear entry pressure connection)
	Wall mounting:	three integral mounting tabs (bottom entry pressure connection only)
	Front panel mounting:	front panel adaptor ring, 132 mm dia. (Adaptor kit DZ 11) (bottom or rear entry pressure connection)

Accessories	Pressure gauge acessories per Data Sheet MZ… e.g. gauge isolating valve, etc. Wall holder per DIN 16 281

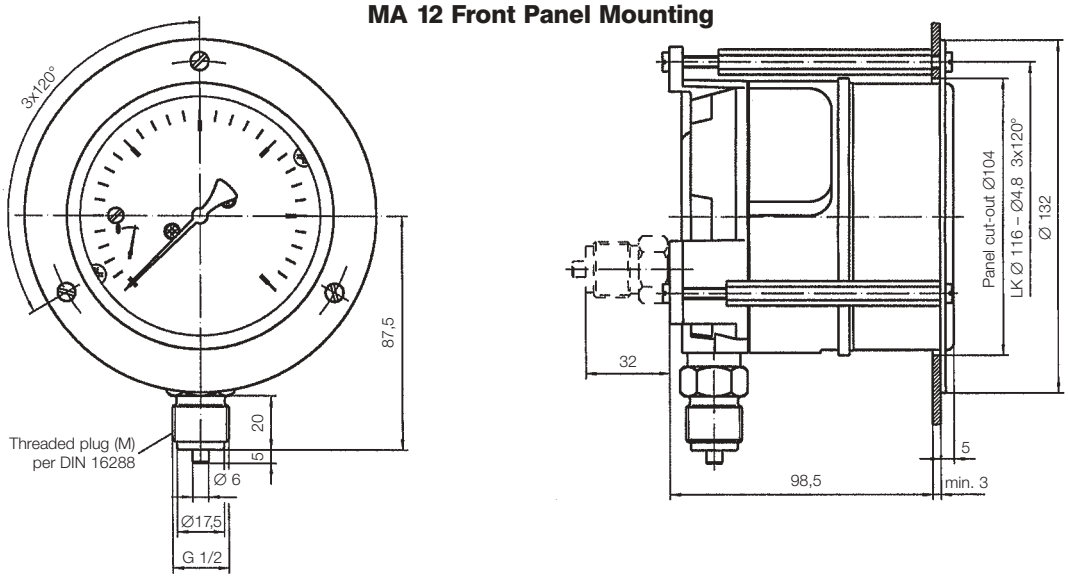
MA 12 Standard Configuration



MA 12 Wall Mounting



MA 12 Front Panel Mounting



Ordering Code

Pressure Gauge **Type MA 12** [ ][ ] [ ] [ ] **0** [ ] **0** **0**

Range

0 ... 400 mbar	▷ 8 3
0 ... 0.6 bar	▷ 0 1
0 ... 1 bar	▷ 0 2
0 ... 1.6 bar	▷ 0 3
0 ... 2.5 bar	▷ 0 4
0 ... 4 bar	▷ 0 5
0 ... 6 bar	▷ 0 6
0 ... 10 bar	▷ 0 7
0 ... 16 bar	▷ 0 8
0 ... 25 bar	▷ 0 9
-0,6 ... 0 bar	▷ 3 0
-1 ... 0 bar	▷ 3 1
-1 ... 0.6 bar	▷ 3 2
-1 ... 1.5 bar	▷ 3 3
-1 ... 3 bar	▷ 3 4
-1 ... 5 bar	▷ 3 5

Diaphragm / Seals

Diaphragm	Seals	
NBR	NBR (Range < 16 bar)	▷ N
Viton	Viton (Range < 16 bar)	▷ V
DURATHERM®	NBR (Range ≧ 16 bar)	▷ D
DURATHERM®	Viton (Range ≧ 16 bar)	▷ E

Pressure Chamber

Aluminium	▷ A
Aluminium, hard coated	▷ D
Stainless steel 1.4305	▷ W

Pressure Connections & Mounting

Bottom entry pressure connection, G 1/2 (M)	▷ O
Rear entry pressure connection, G 1/2 (M)	▷ H
Wall mounting, bottom entry pressure connection, G 1/2 (M)	▷ B
Front panel mounting, bottom entry pressure connection, G 1/2 (M)	▷ G
Front panel mounting, rear entry pressure connection, G 1/2 (M)	▷ L