

**Operating Instructions  
for  
Digital Manometer**

**Model: MAN-SD**



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## 2. Note

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Please read these operating instructions before unpacking and putting the unit into operation. Follow the instructions precisely as described herein.

The devices are only to be used, maintained and serviced by persons familiar with these operating instructions and in accordance with local regulations applying to Health & Safety and prevention of accidents.

When used in machines, the measuring unit should be used only when the machines fulfil the EWG-machine guidelines.

## 3. Instrument Inspection

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Instruments are inspected before shipping and sent out in perfect condition.

Should damage to a device be visible, we recommend a thorough inspection of the delivery packaging. In case of damage, please inform your parcel service / forwarding agent immediately, since they are responsible for damages during transit.

### **Scope of delivery:**

The standard delivery includes:

- Transmitter with display
- Operating Instructions
- 9 Volt – block battery (IEC 6 LR 61)

## 4. Regulation Use

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Any use of the Digital Manometer, model: MAN-SD, which exceeds the manufacturers specification may invalidate its warranty. Therefore any resulting damage is not the responsibility of the manufacturer. The user assumes all risk for such usage.

The model MAN-SD serves to measure, monitor and transmit pressure-dependent operational processes in machines and systems.

These devices are equipped as follows:

- 4-digit LCD display
- Three Programming keys
- Process connection (St. Steel)
- Power Supply via 9V block battery
- Limit relays (option)
- Peak value memory (option)
- Analogue output (option)

## 5. Operating Principle

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A ceramic sensor detects system pressure and sends the signal to evaluation electronics. The sensor signal is conditioned and sent to the LCD display as a pressure reading. Parallel to this, an output is provided as analogue signal for the purpose of transmitting measured pressure.

A programmable relay-output is also available as an option.

## 6. Mechanical Connection

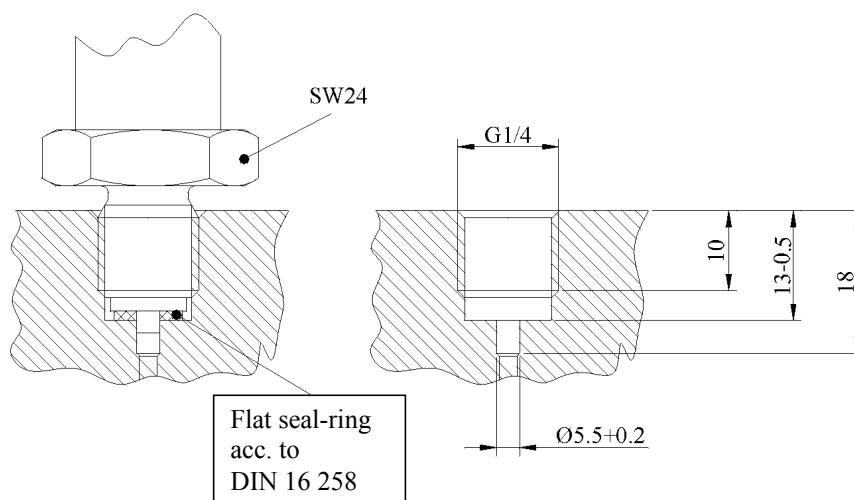
### Before installation:

- Ensure that the max. pressure in your system is within the prescribed range of the digital manometer. The measuring range can be read from the nameplate label of the device.
- Make sure that the permitted max. operational temperature of the device is not exceeded.
- Confirm that there are no fragments of packing material present inside the pressure sensing port.

### Installation:

- Ensure that the piping is fully depressurised..
- The digital manometer should be mounted just like a mechanical manometer.
- With standard thread connection, sealing is achieved by means of a suitable gasket (flat-seal or seal-ring DIN 16258).
- While threading in the device, install by using a wrench on the hexagonal screw (SW 24) and not the gauge housing.
- If possible, after the mechanical installation, pressure test the piping to determine whether the connection joint is adequately sealed.

**Attention! The MAN-SD digital manometer must be installed into a grounded system. This action is necessary in order to fulfil the EMV-guideline.**



## 7. Electrical Connection

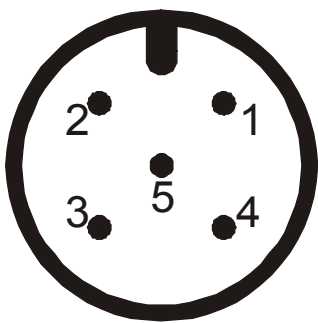
**Attention! Please ensure that you use a 9 V – alkali-manganese-block battery (IEC 6 LR 61).**

- Make sure that the power supply lines are not active. (Only with option limit-contacts or analogue output.)
- Open the battery enclosure on the back-side of the unit and connect the 9V block battery with the connection plug.
- Place the 9V block battery in the enclosure and close it with the lid.
- Terminate the connection wires on the plug (cable), as shown in the illustration below. (Only with option limit-contacts or analogue output.)
- Power supply conductor (area of cross-section): min.0.34 mm<sup>2</sup>.

**Attention! Incorrect wiring will lead to damage of the unit's electronics.**

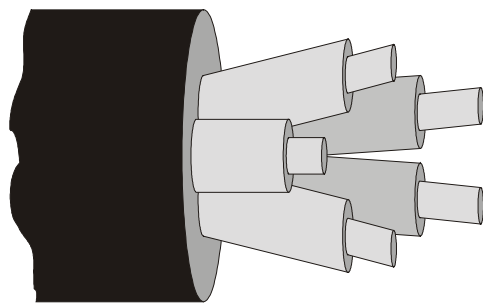
Cable No.	MAN-SD2...	MAN-SD3...	Cable colour
1			brown
2	Contact output (Relay in)		white
3		GND (0V Reference)	blue
4		Analogue output 0-2V <sub>DC</sub>	black
5	Contact output (Relay out)		grey

plug M12x1



View of plug contacts

5-core cable



Cable wires colour-coded

## **8. Function Keys**

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For the selection of menu options, the following functions keys are available:

- ↓      **Next Menu Option**
- ↑      **Previous Menu Option**
- P      **Press once to Switch-on**
- P      **Press twice to Switch-off**
- P & ↓ **Exit Menu**

Adjustment and Function:

- ↑              **Value-adjustment upwards**
- ↓              **Value-adjustment downwards**
- P              **Enter value and jump to next Menu Option**
- ↑&↓          **Reject input, Return to Menu Option**

## **9. Adjustments**

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**Possible adjustments of the device:**

1.      Zero point
2.      Password (factory pre-set: 0005)
3.      Peak value memory (option)
4.      Relay and hysteresis (option)  
(factory pre-set: switching point on 50% of measuring range)

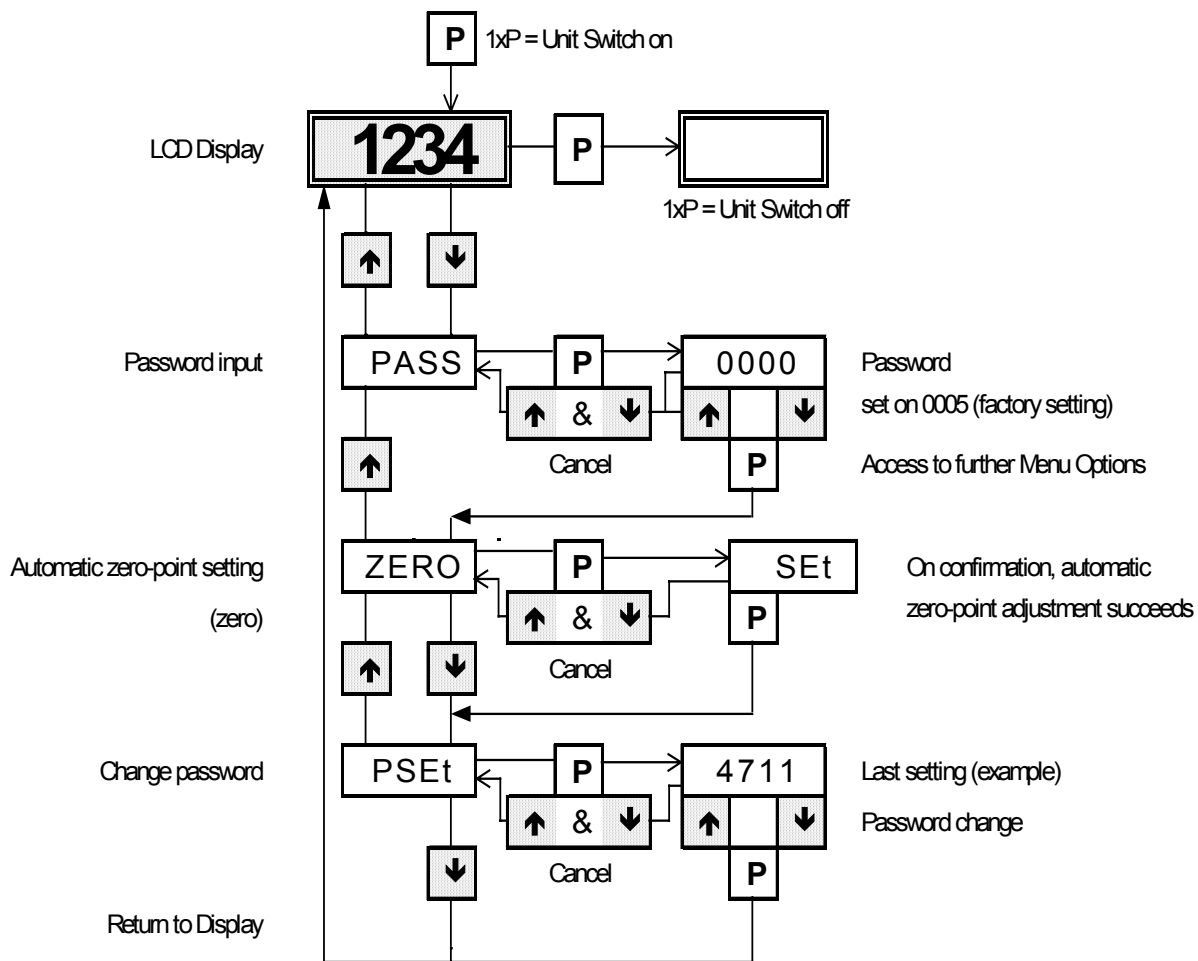
**Factory pre-sets:**

1.      Battery symbol on: voltage under 7 V
2.      Switch-off delay (default: 0 = inactive)
3.      Sampling rate/Dampening (default: 5 measurements per second)
4.      Analogue output (linear) within measuring range (option)

## 10. Control Functions

### 10.1. Standard version MAN-SD10...

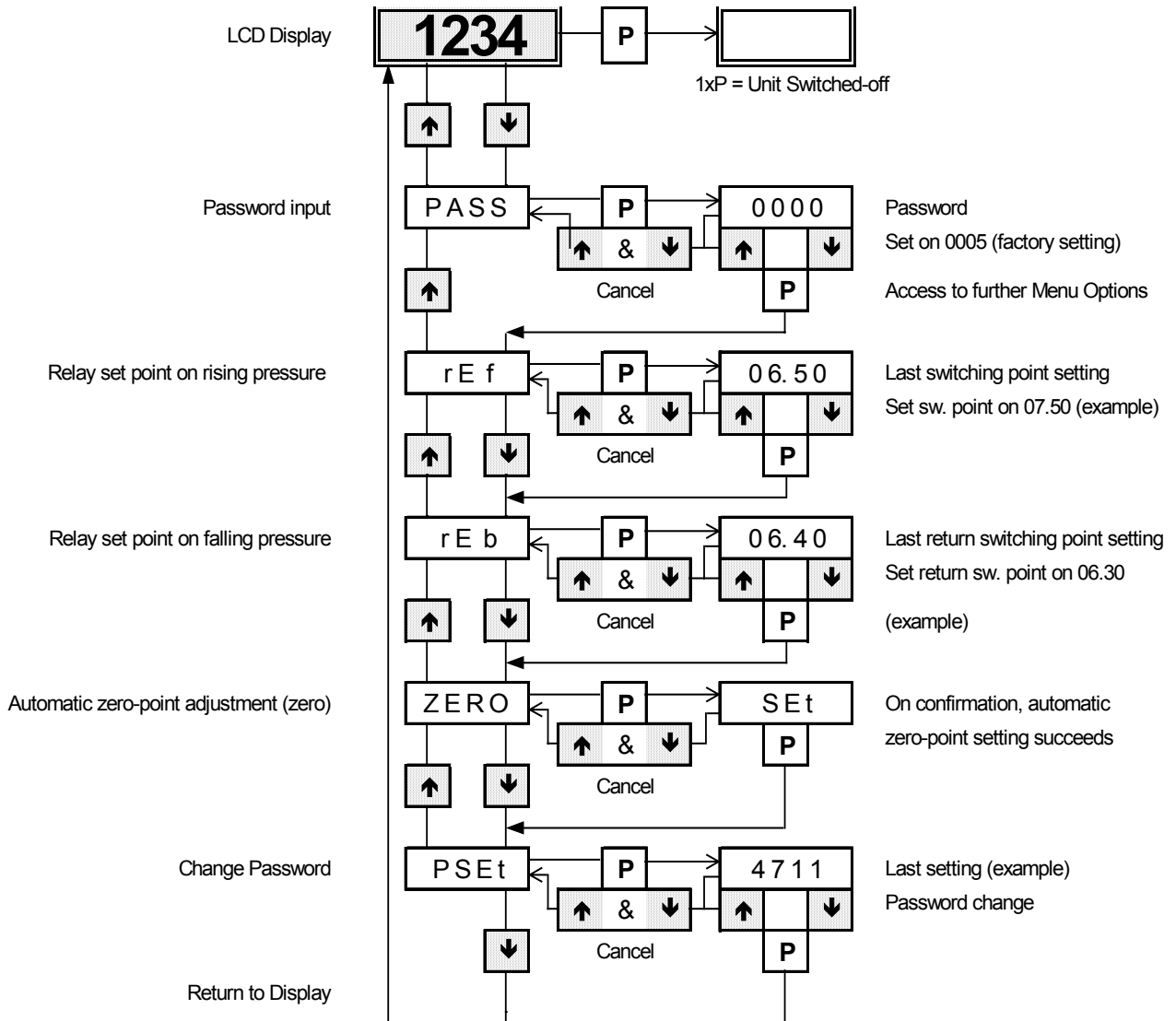
and unit with analogue output MAN-SD30...





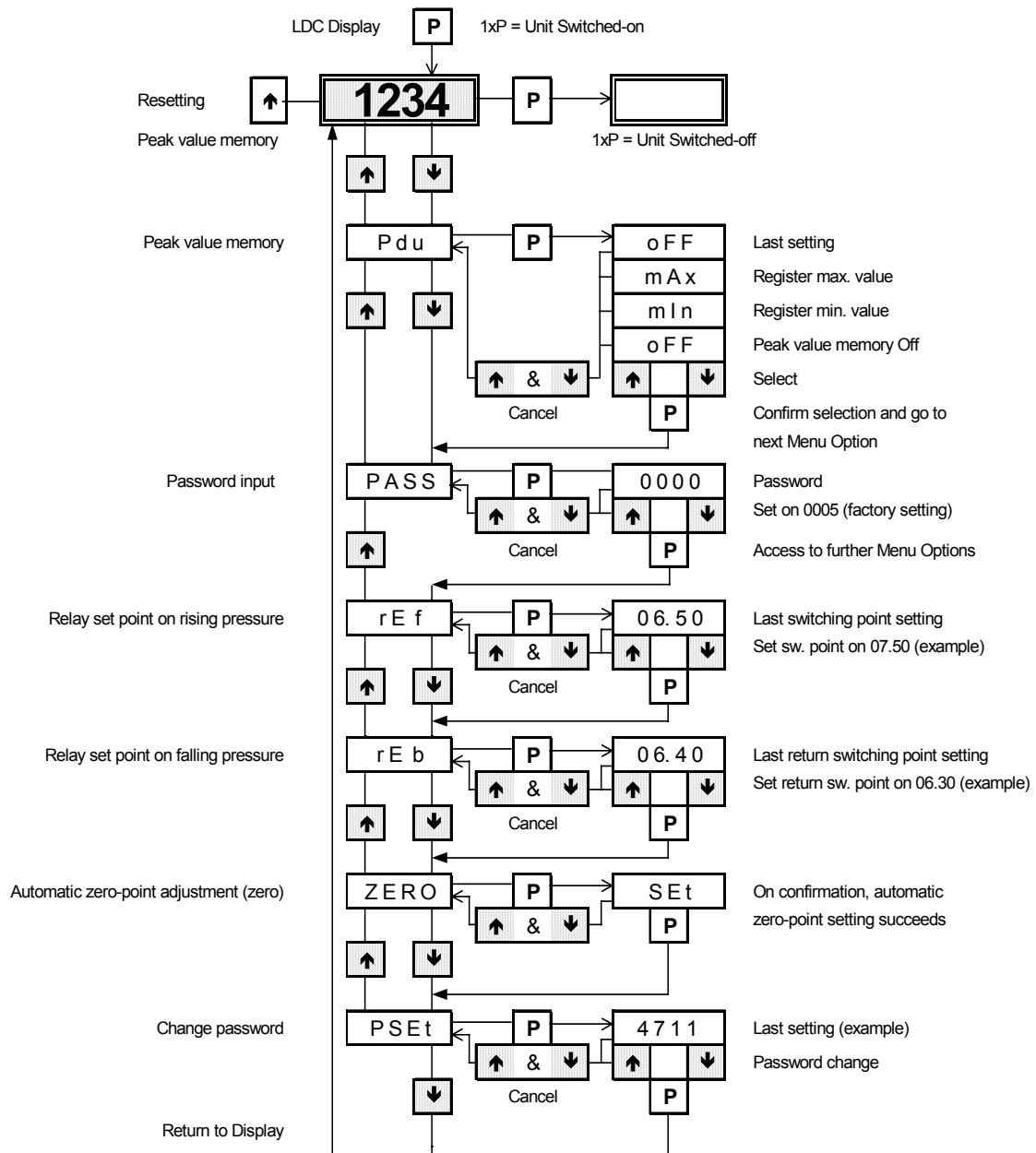


## 10.3. Unit with switching output MAN-SD20...



10.4. Unit with switching output + peak value memory

MAN-SD2S...



If the peak value memory is activated, the peak value can be reset by pressing the left arrow key.

**Note: with the switch-off of the device the peak value memory is reset.**

## 11. Maintenance

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In case, the medium to be measured is not polluted, the unit is maintenance-free.

## 12. Technical Information

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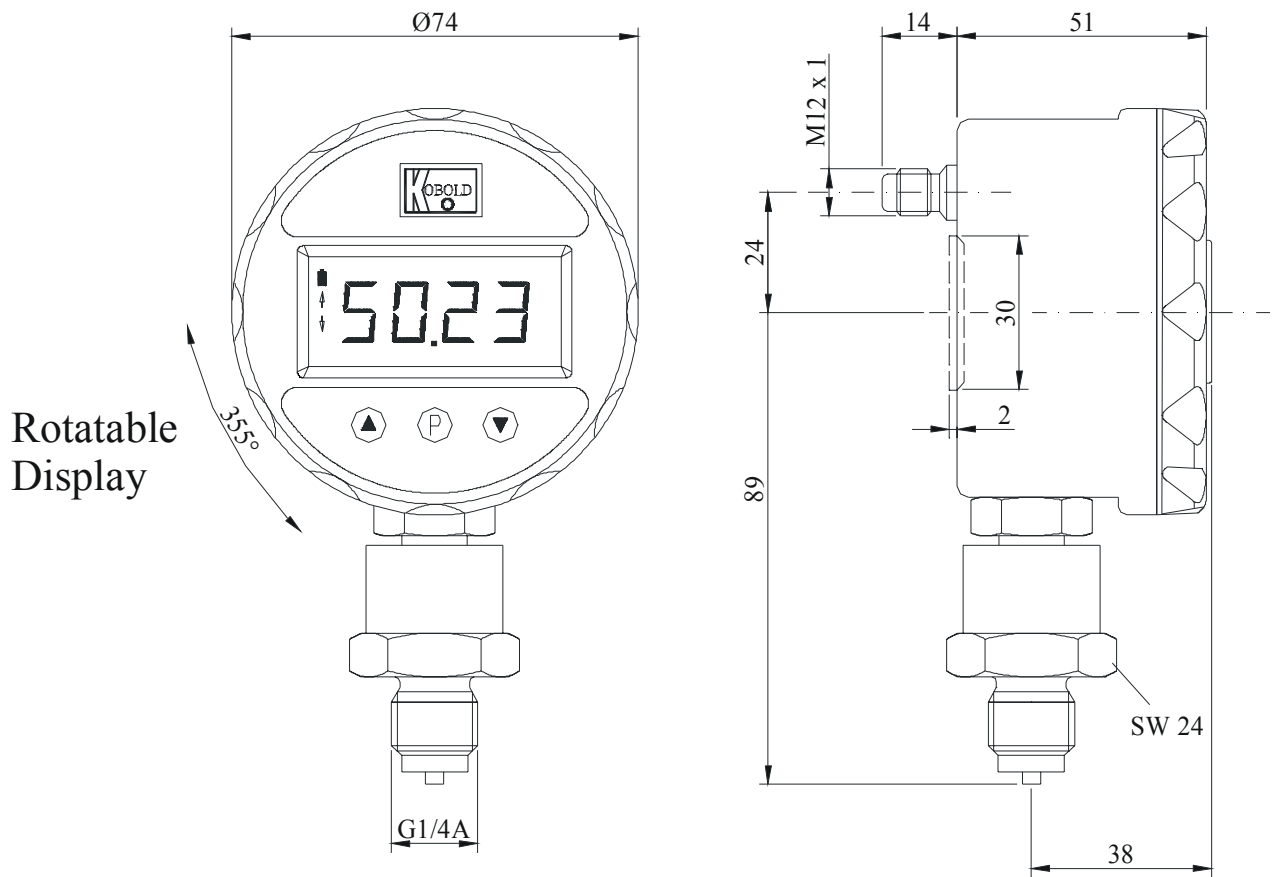
Nominal size:	74 mm
Accuracy class	0,5 %
Display:	4-digit LCD; digit height 12,7 mm
Measuring range:	-1...0, 0...1, 0...1.6, 0...2.5, 0...4, 0...6, 0...10, 0...16, 0...25, 0...40, 0...60, 0...100, 0...160, 0...250, 0...400 bar
Overload range:	3 x P <sub>N</sub> (up to 40 bar) 2 x P <sub>N</sub> (60 to 160 bar) 1,5 x P <sub>N</sub> (from 250 bar)
Power supply:	9 V <sub>DC</sub> (block battery, IEC 6 LR 01)
Service-life at conversion rate 5/s:	5000 h (block battery 600mAh), 10000 h (Lithium block battery 1200 mAh)
Conversion rate:	5 per sec. (standard) (1 to 10 per sec. factory-adjustable)
Automatic switch-off times: (auto off)	2 ..... 90 min, only factory-adjustable (not recommended with analogue or switching output), 0 = inactive
Zero point correction:	≤ ± 25 %
Parts in contact with medium:	st. steel 1.4571, ceramic, NBR (Buna-N)
Connection:	G ¼ A (other connection on request)
Medium temperature:	-30...+85 °C
Ambient temperature:	0...+60 °C
Storage temperature:	-30...+80 °C
Permissible relative humidity:	<90%, not condensing
Protection cat.:	IP 65
<b>Limit-value relay</b> (Option):	N/O, bistable adjustable setpoint and hysteresis
Max. switching power:	30 V <sub>AC/DC</sub> , 2 A (for relay output)
<b>Analogue output</b> (Option):	0 - 2 V <sub>DC</sub>
Load:	≥ 100 kΩ
Electrical connection	M 12 x 1 plug DIN (female connector as accessorie available)
Total cable length:	max. 3 metres
<b>Peak value memory</b> (option):	MIN or MAX value, resetting via keypad

### 13. Order Codes

MAN-SD	1	0	C315	0
<b>Output</b>				
without.....	1			
Relay/N/O contact.....	2			
Analogue output.....	3			
<b>Peak value memory</b>				
without.....		0		
with.....		S		
<b>Measuring range code</b>				
-1 to 0 bar .....			A315	
0 to 1 bar .....			B025	
0 to 2.5 bar .....			B045	
0 to 4 bar .....			B055	
0 to 6 bar .....			B065	
0 to 10 bar .....			B075	
0 to 16 bar .....			B085	
0 to 25 bar .....			B095	
0 to 40 bar .....			B105	
0 to 60 bar .....			A115	
0 to 100 bar .....			A125	
0 to 160 bar .....			A135	
0 to 250 bar .....			A145	
0 to 400 bar .....			A155	
<b>Electrical connection</b>				
Without.....				0
0.5 m cable .....				K
Plug M12 x 1 .....				S

## 14. Dimensions

Optional: PG7 (LCD)



## **15. Declaration of Conformance**

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We, Kobold-Messring GmbH, Hofheim-Ts., Federal Republic of Germany, declare, that the product

**Digital Manometer Model: MAN-SD...**

complies with the standards given below:

**EN 50081-1.2          1994.03**

Electromagnetic compatibility - Generic emission standard

**EN 61326-1          1998.01**

**EN 61010-1          1994.03**

Safety requirements for electrical measurement, control, and laboratory use

Also, following EWG guidelines are fulfilled:

**89/336/EWG**

**97/23/EG**

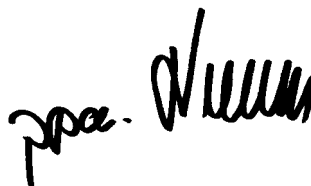
**PED**

Category I, Table 1, pipe, gas, group 1 dangerous fluids

Signature:



H. Peters



M. Wenzel

Date: 12.07.02