

T 9520 EN

Media 05 Differential Pressure and Flow Meter Indicator 100 Ø · PN 50



Application

Device for measuring and indicating the differential pressure or measured variables derived from it · Suitable for gases or liquids · Measuring spans between 0 to 40 and 0 to 3600 mbar · Static pressures up to 50 bar · Optionally with limit switch with max. two inductive alarm contacts

Measurement tasks

- **Liquid level measurement** in pressure tanks, especially for cryogenic gases
- **Differential pressure measurement** between flow and return pipe
- **Pressure drop measurement** across valves and filters
- **Flow rate measurement** according to the differential pressure method

Special features

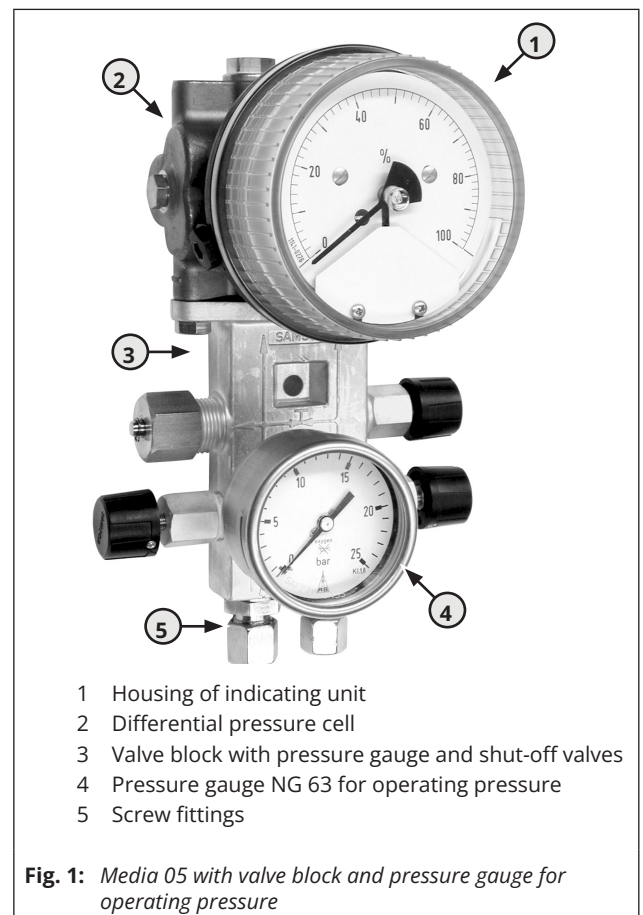
- Suitable for liquids, gases or vapors
- Limit switch (optional) with max. two alarm contacts can be subsequently installed
- Adjustment of measuring span 1:1.6
- Overloadable on one side up to the permissible static pressure
- Housing of indicating unit with burst protection
- Housing with degree of protection IP54
- Pressure rating PN 50
- Housing suitable for field and panel mounting
- Directly connectable (flange) valve block (optional) with connection to monitor the tank pressure and with connection for pressure switch

Versions (Fig. 1)

- **Media 05** · Indicator NG 100 with pointer mechanism · dp-cell made of CW617N (brass), PN 50 · Free of oil and grease for oxygen · Measuring ranges from 40 to 3600 mbar · ECO measuring diaphragm · Zero adjustment at the front · Process connections G 3/8 A

Options available:

- Dials · Scale 0 to 100 % linear or square root graduation, dial plates according to DIN EN 837-3, detachable dial plates for different media, special dial plates



- Inductive limit contact with max. two alarm contacts A1/A2 (proximity switches) · Version for hazardous locations
- Valve block which can be directly mounted onto Media 05 devices
- Screw fittings
- Pressure gauges

Special versions on request

Principle of operation (see Fig. 3)

The dp-cell works according to the deflection method and contains an ECO measuring diaphragm (1.5) which is designed to handle measuring spans from 40 to 3600 mbar. The diaphragm stem (1.7) is connected to a lever (1.8) and is supported and guided by the range springs. The lever leads the deflection of the measuring system out of the pressure chamber. The pressure chamber is sealed by a flexible disk (1.9). The range springs, which are connected to the housing and the diaphragm ensure that the position of the lever is independent of the static pressure. The dp-cell can be overloaded on one side as the measuring diaphragm flexes against the housing wall whenever the measured values are out of range.

The differential pressure $\Delta p = p_1 - p_2$ creates a force at the measuring diaphragm (1.5), which is opposed by the range springs (1.4). The movement of the measuring diaphragm and lever (1.8), which is proportional to the differential pressure, is transferred by the adjustable transmission element (2.1) and pointer mechanism equipped with jewel bearings (2.2) to the pointer (2.4). The range springs (1.4) installed in the dp-cell determine the upper and lower limit of each measuring span (measuring span limit) of the device. The span can be continuously adjusted within these limits in the ratio of 1:1.6 at the transmission element. This adjustment changes the transmission ratio between the lever (1.8) and the pointer mechanism (2.2).

Version with limit switch

Maximum two alarm contacts (A1, A2) can be installed. The gear segment (2.1) supports the metal tags (3.2) and activates the limit switch unit by moving the metal tags into the adjustable proximity switches (3.3).

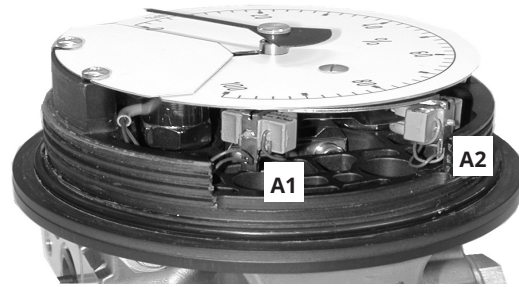
When the metal tag enters the inductive field of the associated proximity switch, it assumes a high resistance (contact open). When the metal tag leaves the inductive field, it assumes a low resistance (contact closed). The switching function is triggered when the metal tag leaves or enters the proximity switches, depending on the setting of the contacts.

Limit switch with alarm contacts A1/A2

– Media 05, version with limit switch –

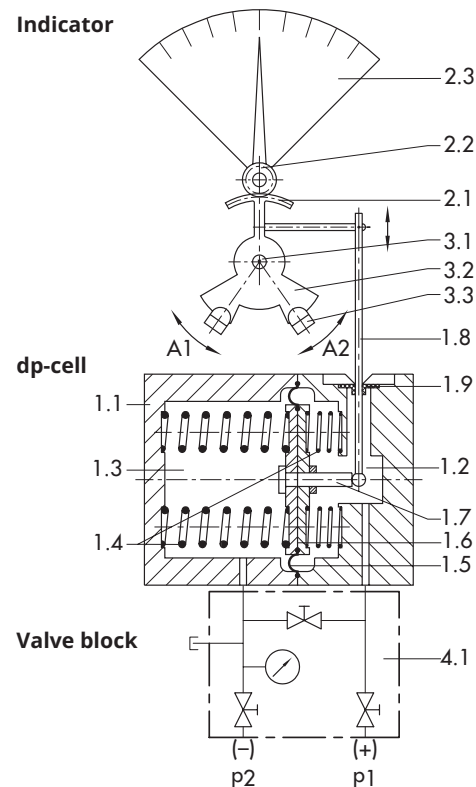
The inductive alarm contacts A1/A2 can be adjusted over the whole measuring range as required. They provide a signal when the differential pressure either increases or decreases and the metal tags enter or leave the inductive field of the switch.

The contacts can be pushed manually to the required switching position. Isolating switch amplifiers conforming to EN 60947-5-6 must be connected in the output circuit of the inductive alarm contacts to ensure they meet the operational requirements of any connected control and signaling equipment.



Location of alarm contacts A1/A2, dial plate cover removed

Fig. 2: Alarm contacts in the housing of the indicating unit



1 Differential pressure cell

- 1.1 dp-cell
- 1.2 High pressure chamber
- 1.3 Low pressure chamber
- 1.4 Range springs
- 1.5 Measuring diaphragm
- 1.6 Diaphragm plates
- 1.7 Diaphragm stem
- 1.8 Lever
- 1.9 Flexible disk

2 Housing of indicating unit

- 2.1 Gear segment
- 2.2 Pointer mechanism
- 2.3 Dial plate

3 Limit switch (optional)

- 3.1 Shaft of measuring unit
- 3.2 Metal tag
- 3.3 Proximity switches A1/A2

4 Valve block (accessories)

- 4.1 Valve block with pressure gauge, shut-off valves and screw fittings

Fig. 3: Functional diagram of version with limit switch

Table 1: *Technical data · All pressure stated as gauge pressure*

Media 05 Differential Pressure and Flow Meter											
Measuring range in mbar		0 to 60	0 to 100	0 to 160	0 to 250	0 to 400	0 to 600	0 to 1000	0 to 1600	0 to 2500	0 to 3600
Measuring span in mbar	min. max.	40 to 66	60 to 110	100 to 176	160 to 275	250 to 440	400 to 660	600 to 1100	1000 to 1760	1600 to 2750	2500 to 3960
Accuracy		±4 %	±2.5 %								
Pressure rating		PN 50, overloadable on one side up to 50 bar									
Indicator		Ø100 mm									
Characteristic		Output and reading linear to the differential pressure									
Deviation from terminal-based linearity		<±2.5 % including hysteresis ¹⁾									
Sensitivity		<±0.5 %	<0.25 %								
Effect of static pressure		<0.03 %/1 bar									
Use of Media 05 with gaseous oxygen											
Max. temperature max. oxygen pressure		+60 °C 50 bar									
Perm. ambient temperature range		-40 to +80 °C									
For oxygen		-40 to +60 °C									
Perm. storage temperature range		-40 to +100 °C									
Degree of protection according to DIN 40050		IP 54									
Weight											
Without SAMSON valve block with SAMSON valve block		Approx. 2.6 kg Approx. 4.6 kg									
Limit switch (option)											
Principle of operation		Max. 2 inductive alarm contacts A1 and A2 acc. to EN 60947-5-6 (limit contacts)									
Control circuit		Values corresponding to connected isolating switch amplifier e.g. KFA6-SR2-Ex2.W									
Proximity switch		SJ2-SN, for hazardous areas according to PTB 00 ATEX 2049 X									
Switching accuracy		<±2 %									
Dead band, approx.		<±0.6 %									

¹⁾ Based on upper measuring range value

Note

- All errors and deviations are specified in % of the adjusted measuring span.
- Refer to Data Sheet ► T 9520 for flow rate measurement.
- A correction of the measuring span is possible by changing the ratio in the limits of approx. 1:1.6.
- The Media 05 Differential Pressure and Flow Meter without limit switches may be used to measure flammable gases and liquids in which hazardous area conditions of Zone 0 are to be expected. The relevant regulations on the measurement of flammable gases and liquids of Zone 0 must be observed.
- Oxygen service: When the device is used for oxygen service, make sure that the dp-cell and any SAMSON accessories (e.g. valve block) only come into contact with gaseous oxygen.
- Refer to ► EB 9520 for more details.

Table 2: *Materials*

Media 05 Differential Pressure and Flow Meter	
dp-cell	CW617N (brass) or CrNi steel
Measuring diaphragm and seals	ECO ¹⁾
Springs, diaphragm plates and functional parts, lever	CrNi steel
Housing of indicating unit	Polycarbonate

¹⁾ Other on request

Terminal assignment

- Only for version with inductive limit switch -

Electrical connection

The device can be equipped with maximum two alarm contacts. The alarm contacts A1 and A2 of the indicator must be connected to an isolating switch amplifier for power supply connection. We recommend using isolating switch amplifiers from Pepperl + Fuchs. For two contacts, e.g. KFA6-SR2-Ex2.W and for one contact, KFA6-SR2-Ex1.W.

Switching characteristic of the proximity switches with normally closed function

Metal tag outside inductive field · Switching signal "ON" (L signal)

Function: Contact closed or output effectively conducting. Low resistance (undamped). Power draw ≥3 mA.

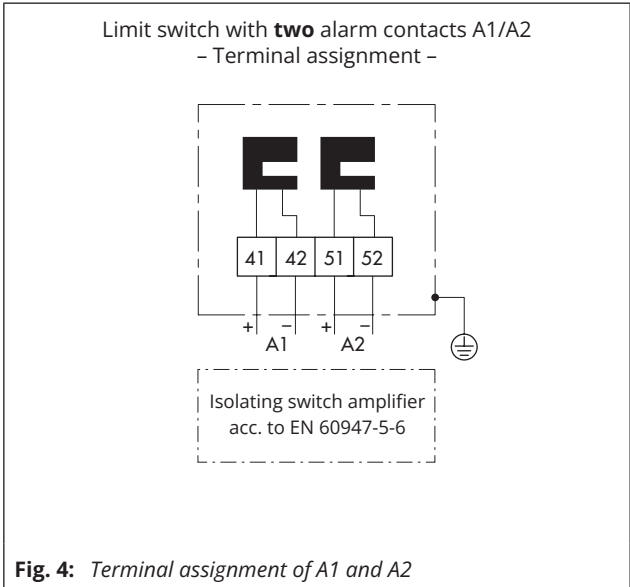
Metal tag inside inductive field · Switching signal "OFF" (0 signal)

Function: Contact opened or output effectively non-conducting. High resistance (damped). Power draw ≤1 mA.

The listed maximum values in the table apply concerning the connection of proximity switches to certified intrinsically safe circuits in the type of protection Ex ia IIC T6 (PTB 00 ATEX 2049 X):

Table 3: Connection values for intrinsically safe circuits

Electrical connection of alarm contacts



Installation

Wall/panel mounting · Using two M8 tapped holes located at the rear of the dp-cell or two Ø 8.3 mm holes in the valve block

Pipe mounting with mounting part and clamp for attachment to a vertical or horizontal 2" pipe.

Housing with burst protection in the rear wall of the indicator unit.

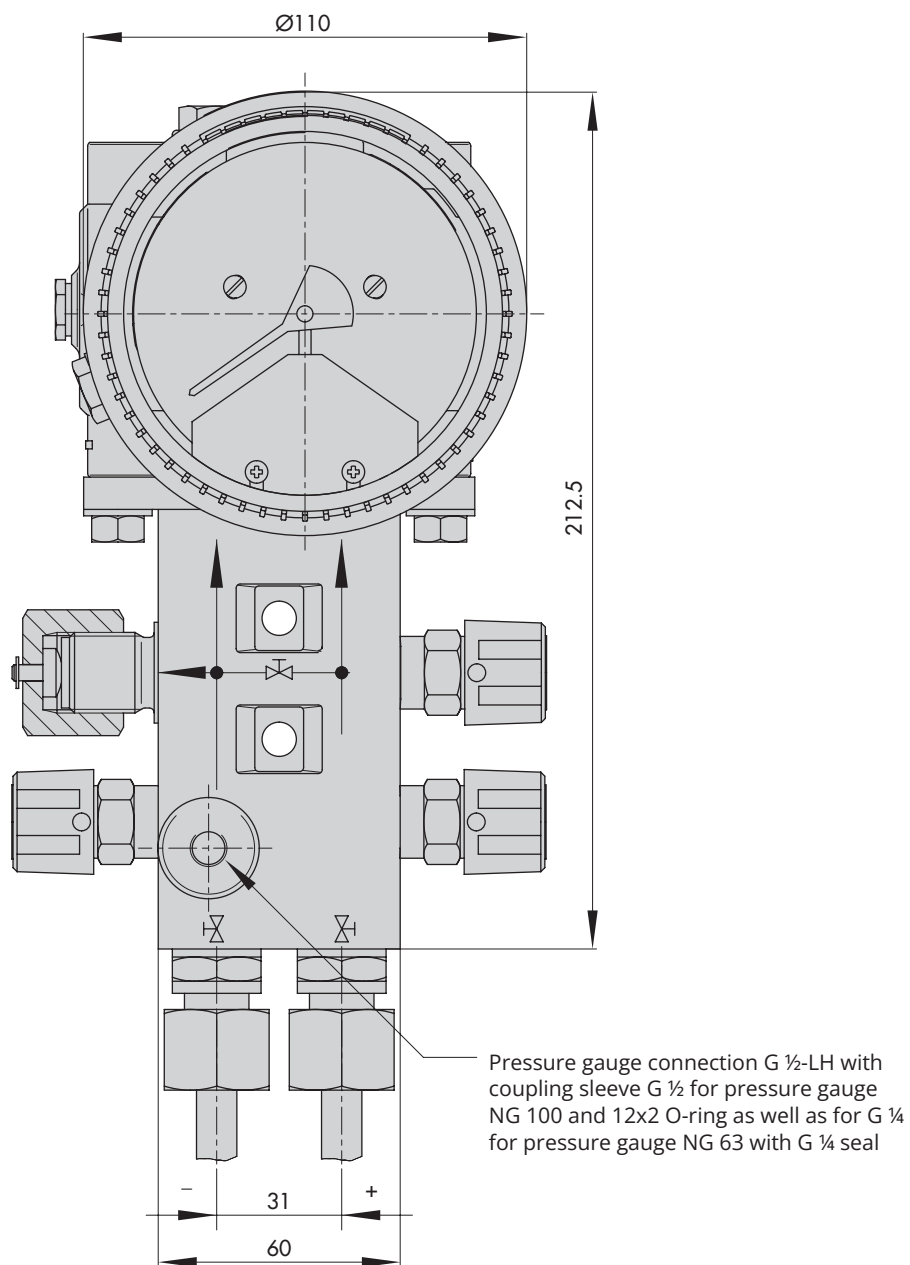
Process medium connection: Tapped hole ISO 228 G 3/8

Accessories

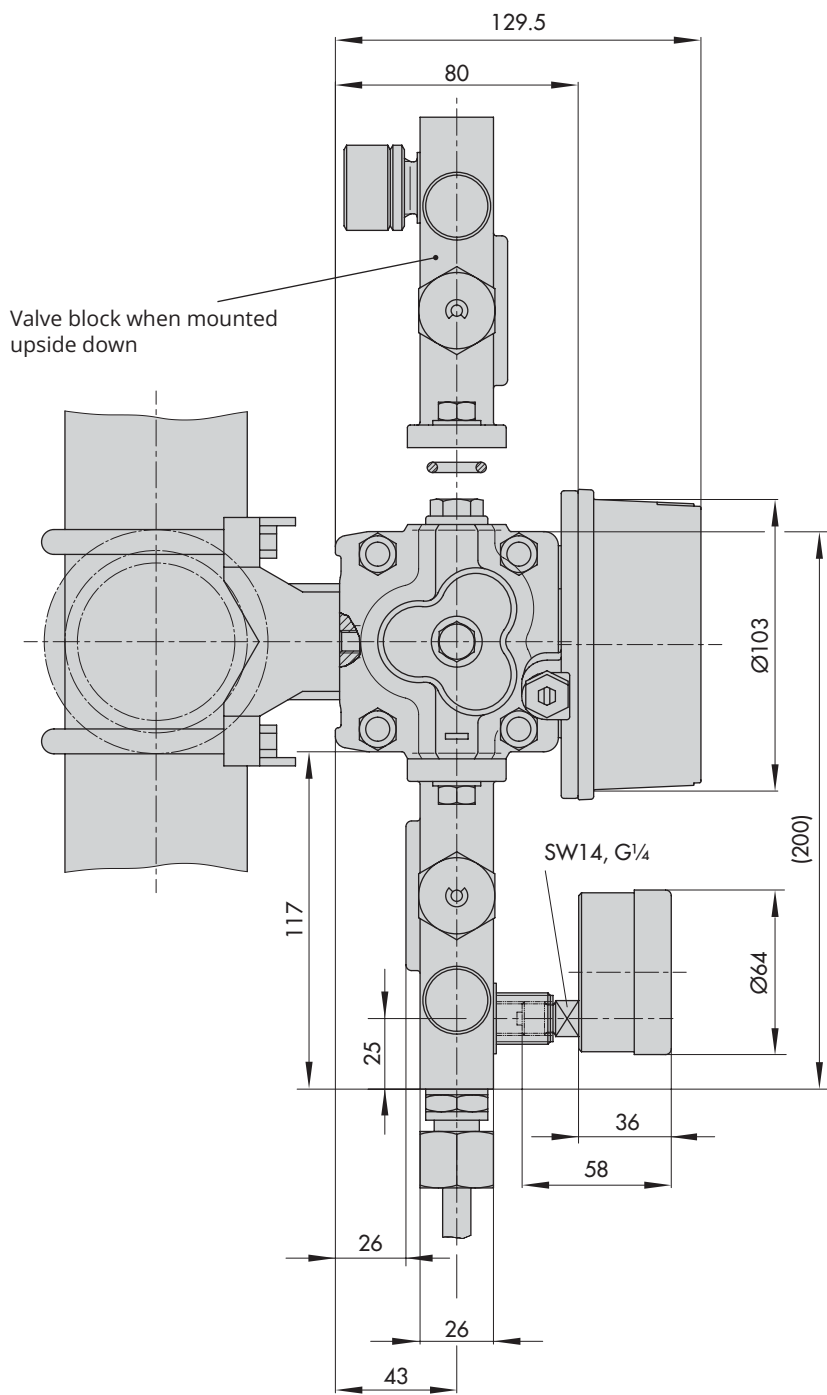
The SAMSON product range includes a wide assortment of accessories (e.g valve blocks, pressure gauges, high-pressure valves, condensation chambers, screw joints with restrictions, contact retrofit kits, range springs etc.) for the Media series.

Refer to Data Sheet ► T 9555 for further details.

Refer to Data Sheet ► T 9545 for a description of dial plates available at SAMSON.



Pipe mounting



Technical drawing of a circular part. The drawing shows a circular cross-section with a dashed line indicating a section line. The dimensions are as follows:

- Overall diameter: 30
- Distance from the center to the first hole: 8.6
- Distance from the center to the second hole: 15
- Distance from the center to the third hole: 6.4
- Distance from the center to the fourth hole: 35

Two Ø 8.5 mm holes for fastening at the back of the dp-cell (M8 screws)



Two Ø8.5 mm holes for fastening at the valve block (M8 screws)

Article code

Media 05 Differential Pressure and Flow Meter													x	x	x	x	x	x	x	x	x	x	x	x
Version																								
Indicator Ø100 mm													5											
Material																								
Brass														0										
Stainless steel														1										
Measuring range																								
60 mbar															0	2								
100 mbar															0	3								
160 mbar															0	4								
250 mbar															0	5								
400 mbar															0	6								
600 mbar															0	7								
1000 mbar															0	8								
1600 mbar															0	9								
2500 mbar															1	0								
3600 mbar															1	1								
Diaphragm ¹⁾																								
ECO: -40 to +80 °C																4								
Version																								
Standard																0	0							
Cryogenic gases according to DIN EN ISO 23208, free of oil and grease																1	1							
Oxygen according to DIN EN ISO 23208, free of oil and grease																1	2							
Zero adjustment screw																								
Standard (accessible from the outside)																	0							
Concealed (inside the housing)																	1							
Options																								
Without																	0							
1 min. limit contact (SJ2-SN) according to ATEX																	3							
1 min. and 1 max. limit contact (SJ2-SN) according to ATEX																	4							
2 min. limit contacts (SJ2-SN) according to ATEX																	5							
Special versions ²⁾																								
Without																		0	0	0				

¹⁾ Other diaphragms on request

²⁾ Special versions on request

Accessories

We recommend the following accessories (see Fig. 5) for use with the Media 05 device:

Item	Accessories	Ordering specifications
1	Valve block	Valve block: [yes/no]
2	Pressure gauges	Pressure gauge: [yes/no] + measuring range specifications (e.g. 25 bar)
3	Screw plugs	Screw plugs: [yes/no]
4	Screw fittings for process connections	Screw fittings for process connections: [yes/no] + pipe diameter specification [6/8/10/12 mm]

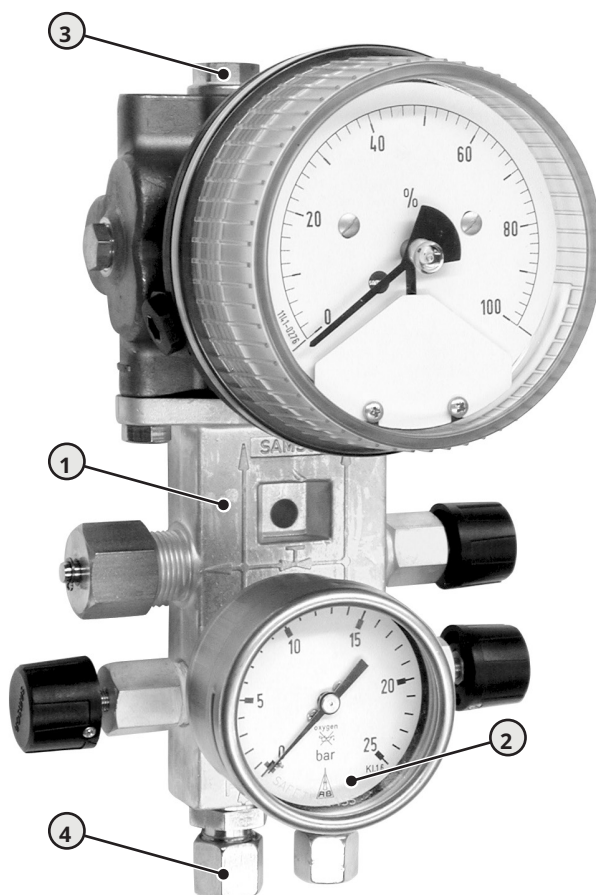


Fig. 5: Recommended accessories

Details and other accessories are listed in the Information Sheet ► T 9555.

See list of dial faces in ► T 9545.

Additionally required ordering specifications

- Measured value setting ¹⁾: alarm contact set to 0 to ...mbar
- ¹⁾ With default settings of measured value: 0 to upper measuring range value

Additionally required ordering specifications (only for limit switch)

			Contact A1	Standard
A1 Min. contact = Value decreases	Metal tag is ...	Inside/outside ³⁾	at ... mbar	22 ₋₂ %
			Contact A2	
A2 Min. contact = Value decreases	Metal tag is ...	Inside/outside ³⁾	at ... mbar	42 ₋₂ %
A2 Max. contact = Value increases	Metal tag is ...	Outside/inside ³⁾	at ... mbar	93 ⁺² %

- ¹⁾ When delivered with installed limit switch. Standard: without setting
- ²⁾ With default settings of measured value: 0 to max. measured value
- ³⁾ Delete specification that does not apply

Certificates and approvals

- CE compliance
- Registered by the metrological service of the federal agency for technical regulation and metrology for use in the Russian Federation
- Oxygen service, test report No. 2012/R249a based on DIN EN ISO 7291

Ordering text

- Media 05 Differential Pressure and Flow Meter
- Order no.: Type 5005-... (see article code)
- Special version ...