Differential Pressure Gauge

With Integrated Working Pressure Gauge and Micro Switch

Pressure Gauges

DELTA-comb with Component Approval

Model 702.03.100

- **Working pressure gauge integrated as a standard feature enables the central monitoring of differential pressure and working pressure in one measuring instrument**
- **One or two adjustable microswitches respectively**
- **High repeatability of the switchpoints**
- **High working pressure (static pressure) 25 bar**
- **Overload value either side 25 bar**
- **Solid case construction for protection against external mechanical effects**
- **Three cast-on mounting brackets for wall mounting**
- **Long service life**
- **Component approval to ensure flow protection in accordance with DIN 32 727 Reg.-No.: 1B0162000, and also to safeguard flow in steam boilers in accordance with VdTÜV note of instructions "flow 100", component sign number TÜV.SW.00-030**

DELTA-comb with 2 micro switches, terminal box (optional extra) and compression fitting with ferrule (optional extra)

General features

These differential pressure gauges are particularly intended for flow safeguarding in heat transfer oil plants according to DIN 32 727 and in hot-water apparatus according to VdTÜV note of instructions "flow 100". This gauge has been designed for connection to standard throttling devices (e.g. orifice gauges, nozzles or similar) that operate according to the differential pressure principle and are interconnected via differential pressure lines and shut-off devices.

Apart from the display of the differential pressure, these applications require, as a rule, the display of the current working pressure. For this reason, a working pressure gauge is integrated in the differential pressure gauge DELTA-comb as a standard feature. An additional measuring point involving additional expenses for piping and mounting is thus no longer required.

The white dial of the working pressure gauge distinctly stands out against the blue background of the display of the differential pressure gauge, thus enabling a quick and safe reading of both quantities to be measured.

The ranges of 0 ... 250 mbar up to 0 ... 6 bar provide the measuring ranges required for the applications mentioned above. The sturdy and compact design of the differential pressure gauge makes it possible to use it even under tough industrial ambient conditions.

Supplementary data sheets

- Differential pressure gauge with integrated working pressure gauge Model 702.01.100 (see data sheet PM 07.15) — DELTA-plus
- Differential pressure gauge with integrated working pressure gauge and microswitch Model 702.02.100 (see data sheet PM 07.16) — DELTA-comb
- Differential pressure switch Model 851.02.100 (see data sheet PM 07.17) — DELTA-switch
- Differential pressure transmitter Model 891.34.2189 (see data sheet PM 07.18) — DELTA-trans

Design and operating principle

Pressure p_1 and p_2 are given in the ⊕ and ⊖ measuring medium chambers separated by an elastic diaphragm (1).

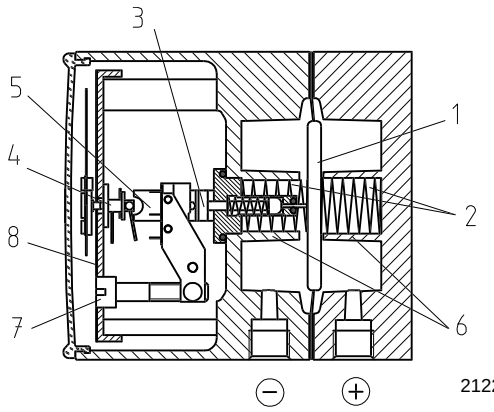
The differential pressure ($\Delta p = p_1 - p_2$) causes axial movement (measuring travel) of the diaphragm against the measuring range spring (2).

The transmission of the differential pressure proportional to the measuring travel to the movement (4) within the indicating case and to the plungers of the microswitches (5) and is carried out pressure sealed and with little friction by means of a connecting rod (3).

The overpressure protection is provided by contoured metal bolsters for the elastic diaphragm (6).

The adjustment of the switchpoint is made by setpoint screws accessible from the front (7). The assistant scales (8) enable a relatively accurate adjustment of the switchpoints over 270 ∢ ° and indicate the setpoint that is momentarily adjusted.

Illustration of operating principle



Technical data

Nominal size
Differential pressure gauge: Ø 100 mm
Working pressure gauge**:** Ø 23 mm

Accuracy class
Differential pressure gauge: 2.5
Working pressure gauge**:** 4

Scale ranges per EN 837
Differential pressure: 0 ... 0.25 to 0 ... 6 bar
Working pressure: 0 ... 25 bar

Working pressure max. (static pressure)
25 bar

Overpressure safety
Either side max. 25 bar

Operating temperature
Ambient: -10 ... +70 °C
Medium: +90 °C maximum

Ingress protection
IP 54 per EN 60 529 / IEC 529

Measuring media chamber (exposed to pressure medium)
GD-AlSi 12 (Cu) 3.2982, black painted

Pressure connections (exposed to pressure medium)
2 x G ¼ female, bottom, in-line,
axle base 26 mm

Pressure elements (exposed to pressure medium)
Differential pressure: Compression spring of stainless steel 1.4310 and separating diaphragm of FPM/Viton
Working pressure: Bourdon tube Cu-alloy

Links (exposed to pressure medium)
Stainless steel 1.4305, FPM/Viton

Sealing rings (exposed to pressure medium)
FPM/Viton

Movement
Cu-alloy, wear parts German silver

Dial
Differential pressure gauge: blue aluminium with white lettering
Working pressure gauge**:** white plastic with black lettering

Pointer
Differential pressure gauge: white aluminium adjustable pointer
Working pressure gauge**:** black plastic

Zero adjustment for differential pressure gauge
By means of adjustable pointer

Case
GD-AlSi 12 (Cu) 3.2982, black painted

Window
acrylic

Weight
approx. 1.4 kg

Gauge mounting
Pressure entries identified ⊕ and ⊖,
⊕ high pressure, ⊖ low pressure.
Mounting by means of rigid tailpipes or wall mounting with mounting brackets

Electrical contact

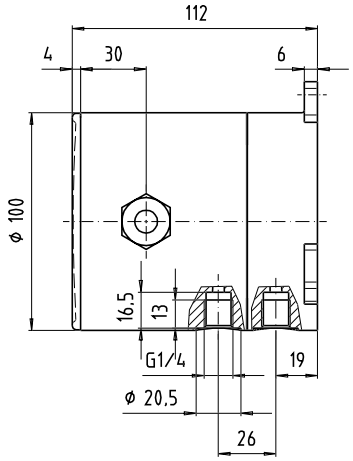
Contact type	Micro switch	
Contact functions	1 x SPDT	2 x SPDT
	850.3	850.3.3

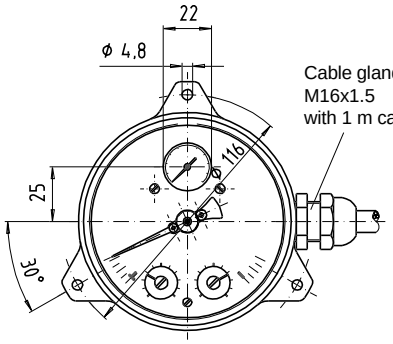
Load data		Voltage AC
	U max.	250 V
	I max.	1.4 A
	P max.	250 VA
Switching point adjustment		from the outside at assistant scale by means of setpoint screw(s)
Setting range		from 10 % to 100 % of span
Switching point repeatability accuracy		≤ 1.6 %
Contact hysteresis		max. 5 % of full scale value (optional 2.5 % max.)
Wiring		Cable gland M16x1.5 with 1 m connected cable

Optional extras

- Pressure media chamber GD-AlSi 12 (Cu) HART-COAT surface protection
- Pressure media chamber of stainless steel (without working pressure gauge)
- Accuracy class 1.6 for differential pressure gauge with factory-set switching points for ranges from 0 ... 1 bar to 0 ... 6 bar (swiching direction to be specified)
- 4-way valve manifold Cu-alloy or stainl. steel (1x pressure equalising valve, 2x pressure gauge valve, 1x valve for purging or air bleeding)
- Other threaded pressure connections female or male
- Compression fitting with ferrule for pipe Ø 6, 8 or 10 mm
- Front flange for panel mounting
- Wiring with terminal box, cable gland M20x1.5 or L-plug
- Approval German Lloyd, No. 40 146 - 01 HH

Dimensions in mm





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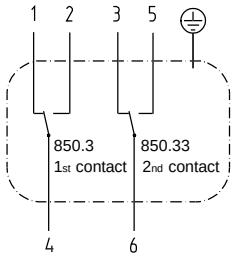
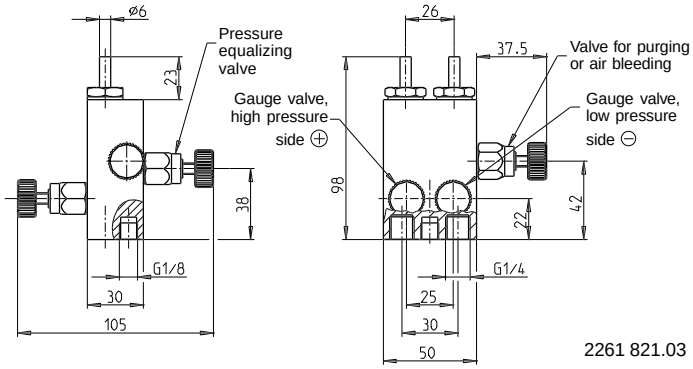
Electrical connection details



4-way valve manifold as optional extra



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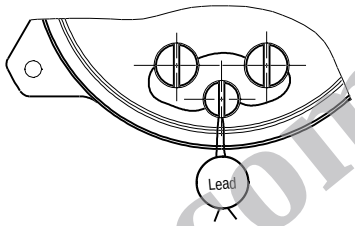
Lead sealing of the set switching points



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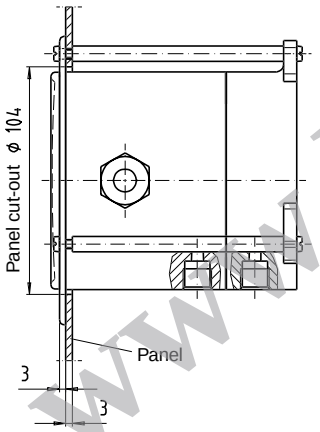
Panel mounting as optional extra



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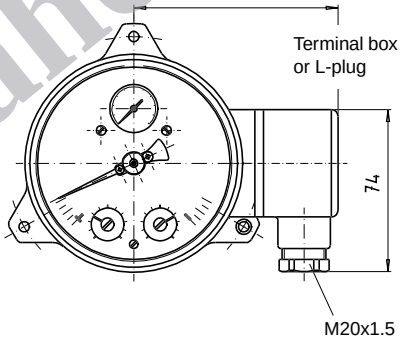
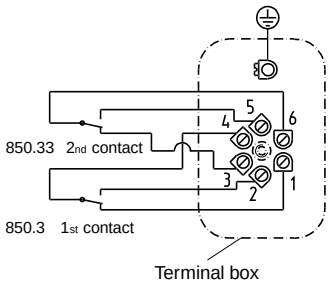
Wiring versions as optional extra



Electrical connection details



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Ordering information for Differential Pressure Gauge with integrated working pressure gauge and micro switch *DELTA-comb* with component approval Model 702.03.100

Field No.		Code	Instrument design
			Unit
		B	bar
1		**?**	other *Please state as additional text*
			Measuring range
		AN	0 ... 0.25 bar
		BB	0 ... 0.4 bar
		BC	0 ... 0.6 bar
		BD	0 ... 1 bar
		BE	0 ... 1.6 bar
		BF	0 ... 2.5 bar
		BG	0 ... 4 bar
		BH	0 ... 6 bar
2		**??**	other *Please state as additional text*

Field No.		Code	Instrument design	
			Process connection	
		AA	2 x G 1/4 female	*standard*
		AM	2 x G 1/4 B Cu-alloy	
		AN	2 x G 1/4 B stainless steel	
		DA	compression fitting with ferrule, steel for pipe Ø 6 mm	
		DB	compression fitting with ferrule, steel for pipe Ø 8 mm	
		DC	compression fitting with ferrule, steel for pipe Ø 10 mm	
		DE	compression fitting with ferrule, stainless steel for pipe Ø 6 mm	
		DF	compression fitting with ferrule, stainless steel for pipe Ø 8 mm	
		DG	compression fitting with ferrule, stainless steel for pipe Ø 10 mm	
		DK	compression fitting with ferrule, Cu-alloy for pipe Ø 6 mm	
		DL	compression fitting with ferrule, Cu-alloy for pipe Ø 8 mm	
		DM	compression fitting with ferrule, Cu-alloy for pipe Ø 10 mm	
3		**??**	other	*Please state as additional text*
			Pressure media chamber	
		A	aluminium, black painted	*standard*
		H	aluminium HART-COAT	
		C	stainless steel	*version without working pressure gauge*
4		**?**	other	*Please state as additional text*
			Separation diaphragm / Sealing rings	
5		**J**	FPM/Viton	
			Accuracy class for differential pressure gauge	
		4	class 2.5	*standard*
6		**3**	class 1.6	*scale ranges 0 ... 1 bar and up* 1)
			Mounting flange / bracket	
		Z	without	*standard*
		D	front flange, black steel	
7		**?**	other	*Please state as additional text*
			Ingress protection	
		F	IP 54	*standard*
8		**I**	IP 65	
			Alarm contacts	
		E	1 SPDT micro switch (850.3)	*standard*
9		**D**	2 SPDT micro switches (850.3.3)	
			Wiring	
		1	cable gland M16x1.5 with 1 m connected cable	*standard*
		P	terminal box M20x1.5	
		G	L-plug 3-pin + PE	*(with 1 contact)*
		N	L-plug 6-pin + PE	*(with 2 contacts)*
10		**?**	other	*Please state as additional text*
			Valve manifold / Pressure equalizing valve	
		Z	without	*standard*
		M	4-way valve manifold, Cu-alloy	
11		**V**	4-way valve manifold, stainless steel	
			Approvals	
		G	with GL-approval	
12		**V**	component-approved (flow protection DIN 32 727 and VdTÜV note of instructions "flow 100")	

		Additional order details			
		YES	**NO**		
13		**1**	**Z**	quality certificates	*Please state in clearly understandable text !*
14		**T**	**Z**	additional text	*Please state in clearly understandable text !*

1) with factory-set contacts, please specify switching points and swiching direction as additional text

Order code for *DELTA-comb* with component approval Model 702.03.100

	1	2		3		4	5	6	7	8	9	10	11	12		13	14
702.03-E –			–		–		**J**								–		

Additional text: _____

Specifications and dimensions given in this leaflet represent the state of engineering at the time of printing. Modifications may take place and materials specified may be replaced by others without prior notice.

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