

Differential pressure gauge with output signal With integrable working pressure indication (DELTA-trans) Model DPGT40

WIKA data sheet PV 17.19



for further approvals see
page 5

DELTA-trans

Applications

Monitoring and control of filters, compressors and pumps for:

- Boilers and pressure vessels
- Drinking and cooling-water treatment plants
- Pressure-boosting and pumping stations
- Heating technology
- Fire-extinguishing systems

Special features

- Transmission of process values to the control room (e.g. 4 ... 20 mA)
- Shatterproof window and robust aluminium or stainless steel measuring chamber for increased requirements
- Optionally with approvals for hazardous areas
- High ingress protection, IP65, for outdoor use and processes with high condensation
- Low measuring range from 0 ... 160 mbar



Fig. left: With aluminium measuring chamber
Fig. right: With stainless steel measuring chamber

Description

The differential pressure gauges of the DELTA-line product family are primarily used for the monitoring and control of low differential pressures where there are high requirements in terms of one-sided overload and static pressure.

Typical markets for these products are the process heating technology, the heating, ventilation and air-conditioning industries, the water/wastewater industry, and machine building and plant construction. For these, the main function of the measuring instruments is the monitoring and control of filters, compressors and pumps.

Wherever a signal transmission is needed and, at the same time, a differential pressure has to be indicated locally, the DELTA-trans finds its use. An electronic angle encoder, proven in safety-critical automotive applications, determines the position of the pointer shaft – it is a non-contact sensor and completely free from wear and friction.

From this, the electrical output signal proportional to the pressure, e.g. 4 ... 20 mA, is produced, which then acts to transmit the signal to the control room.

For instruments with aluminium measuring chamber, a version with integrated working pressure indication can be supplied in addition to the differential pressure display. The two easily readable, mechanical on-site displays need no power supply and enable the simultaneous reading of the working and the differential pressure. Furthermore, this saves on an additional measuring and sealing point, reducing additional expense for piping and mounting.

The measuring chamber, depending on the requirement and application, can be made from aluminium or stainless steel. Through the increased stability, the stainless steel measuring chamber is also suitable for gaseous media.

Functionality

The display case (1) is connected directly with the measuring chamber (2) and the process connections integrated in it.

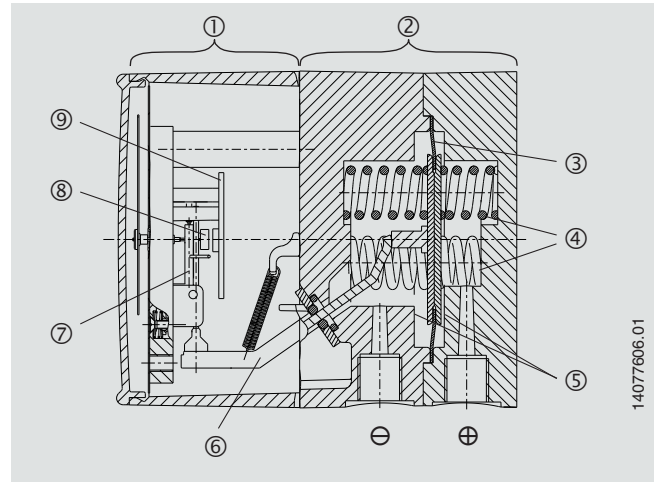
Pressures p_1 and p_2 act on the media chambers \oplus and \ominus , which are separated by an elastic diaphragm (3).

The differential pressure ($\Delta p = p_1 - p_2$) leads to an axial deflection of the diaphragm against the measuring range springs (4).

The deflection, which is proportional to the differential pressure, is transmitted to the movement (7) in the display case via a pressure-tight and low-friction rocker arm (6).

A magnet (8), fixed to the rear of the movement, affects the electromagnetic field of the HALL sensor. The signal that results from this is converted to a standardised output signal by the signal conditioning board (9).

Overload safety is provided by metal bolsters (5) resting against the elastic diaphragm.



Overview of versions

Measuring chamber material		Working pressure indication		Ex approval
Aluminium	Stainless steel	Without	Ø 22 mm	
x		x		Option
x			x	Option
	x	x		Option

→ For information on approvals, see page 6

Specifications

Basic information	
Nominal size	
Differential pressure display	Ø 100 mm
Working pressure indication	<input type="checkbox"/> Without <input type="checkbox"/> Ø 22 mm
Window	
Non-Ex version	Plastic, with plug screw for zero point setting
Ex version	Plastic (zero point setting can only be carried out at the factory)
Case version	
Display case, aluminium, EN AC-AI Si9Cu3(Fe); black painted	
→ Measuring chamber, see table "Measuring element"	

Measuring element	
Type of measuring element	
Differential pressure display	Measuring chamber with diaphragm and media chambers \oplus and \ominus
Working pressure indication	<ul style="list-style-type: none"> ■ Without ■ Bourdon tube
Material	
Measuring chamber	<ul style="list-style-type: none"> ■ Aluminium, EN AC-Al Si9Cu3(Fe), black painted ■ Stainless steel 1.4571
Diaphragm, sealings	<ul style="list-style-type: none"> ■ FPM/FKM ■ NBR
Bourdon tube (working pressure indication)	Copper alloy

Accuracy specifications	
Accuracy class	
Differential pressure display	<ul style="list-style-type: none"> ■ 2.5 ■ 1.6 (only selectable for scale ranges from 0 ... 1 bar to 0 ... 10 bar)
Working pressure indication	4
Accuracies of the output signal	<ul style="list-style-type: none"> ■ 2.5 % of measuring span ■ 1.6 % of measuring span (only selectable for scale ranges from 0 ... 1 bar to 0 ... 10 bar)
Zero point setting	
Differential pressure display	Via adjustment screw in the dial (only with non-Ex version)
Output signal	Through a jumper across terminals 5 and 6 (see operating instructions)
Linearisation error	<ul style="list-style-type: none"> ■ 2.5 % of measuring span ■ 1.6 % of measuring span (only selectable for scale ranges from 0 ... 1 bar to 0 ... 10 bar)
Temperature error	On deviation from the reference conditions at the measuring system: Max. ± 0.8 %/10 K of end value of measuring range
Influence of supply voltage	≤ 0.1 % of measuring span/10 V
Influence of the load	≤ 0.1 % of measuring span (for variant 1 - 3 of signal type)
Long-term stability DIN 16086	< 0.3 % of measuring span/year
Reference conditions	
Ambient temperature	+20 °C [+68 °F]

Differential pressure measuring ranges

Measuring range	
mbar	psi
0 ... 160	0 ... 5
0 ... 250	0 ... 15
0 ... 400	0 ... 25
0 ... 600	0 ... 40
0 ... 1,000	0 ... 60
bar	kg/cm ²
0 ... 0.16	0 ... 0.16
0 ... 0.25	0 ... 0.25
0 ... 0.4	0 ... 0.4
0 ... 0.6	0 ... 0.6
0 ... 1	0 ... 1
0 ... 1.6	0 ... 1.6
0 ... 2.5	0 ... 2.5
0 ... 4	0 ... 4
0 ... 6	0 ... 6
0 ... 10	0 ... 10

Measuring range	
kPa	MPa
-12.5 ... +12.5	0 ... 0.016
0 ... 16	0 ... 0.025
0 ... 25	0 ... 0.04
0 ... 40	0 ... 0.06
0 ... 60	0 ... 0.1
0 ... 100	0 ... 0.16
0 ... 160	0 ... 0.25
0 ... 250	0 ... 0.4
0 ... 400	0 ... 0.6
0 ... 600	0 ... 1
0 ... 1,000	

Scale ranges for working pressure

Scale range
bar
0 ... 10
0 ... 16
0 ... 25

Further details on: Measuring ranges

Type of pressure	Differential pressure
Special measuring ranges	Other measuring ranges on request
Unit	<ul style="list-style-type: none"> ■ bar ■ psi ■ mbar ■ kg/cm² ■ MPa ■ kPa

Process connection

Standard	<ul style="list-style-type: none"> ■ EN 837 ■ DIN EN ISO 8434-1
Size	
EN 837	<ul style="list-style-type: none"> ■ 2 x G ¼, female thread, centre distance 26 mm ■ 2 x G ¼ B, male thread, centre distance 26 mm
DIN EN ISO 8434-1	<ul style="list-style-type: none"> ■ 2 x bite-type fitting for pipe Ø 6 mm ■ 2 x bite-type fitting for pipe Ø 8 mm ■ 2 x bite-type fitting for pipe Ø 10 mm

Process connection	
Materials (wetted)	
Measuring chamber	<ul style="list-style-type: none"> ■ Aluminium, Al Si9Cu3(Fe), black painted ■ Stainless steel 1.4571
Process connection	<ul style="list-style-type: none"> ■ Identical to measuring chamber (only 2 x G ¼ female thread) ■ Copper alloy ■ Stainless steel ■ Steel (only bite-type fittings)
Diaphragm, sealings	<ul style="list-style-type: none"> ■ FPM/FKM ■ NBR


Output signal		
Signal type		
Variant 1: Per NAMUR NE 43	4 ... 20 mA, 2-wire, passive	
Variant 2: Ex version	4 ... 20 mA, 2-wire	
Variant 3: Current	0 ... 20 mA, 3-wire	
Variant 4: Voltage	0 ... 10 V, 3-wire	
Load in Ω		
Variant 1 - 3	$\leq (\text{supply voltage} - 12 \text{ V})/0.02 \text{ A}$, however max. 600 Ω	
Variant 4	100 k Ω	
Voltage supply		
Supply voltage	Variant 1	DC 12 ... 30 V
	Variant 2	DC 14 ... 30 V
	Variant 3	DC 12 ... 30 V
	Variant 4	DC 15 ... 30 V

Electrical connection	
Connection type	Angular connector
Pin assignment	→ See page 9










Operating conditions	
Medium temperature	-10 ... +90 °C [14 ... 194 °F]
Ambient temperature	
Non-Ex version	-10 ... +70 °C [14 ... 150 °F]
Ex version	-10 ... +60 °C [14 ... 140 °F]
Storage temperature	-20 ... +60 °C [-4 ... +140 °F]
Pressure limitation	
Steady	End value of measuring range
Fluctuating	0.9 x end value of measuring range
Overload safety	Max. 25 bar On one, both and alternatingly on the \oplus and \ominus sides
Ingress protection per IEC/EN 60529	IP65

Approvals

Approvals included in the scope of delivery

Logo	Description	Country
	EU declaration of conformity	European Union
	EMC directive	
	RoHS directive	
-	CRN Safety (e.g. electr. safety, overpressure, ...)	Canada

Optional approvals

Logo	Description	Country
	EU declaration of conformity	European Union
	ATEX directive	
	Hazardous areas	
	Gas II 2G Ex ia IIC T4/T5/T6 Gb Dust II 2D Ex ia IIIB T135°C Db	
	IECEx	International
	Hazardous areas	
	Gas Ex ia IIC T4/T5/T6 Gb	
	Dust Ex ia IIIB T135°C Db	
	EAC	Eurasian Economic Community
	EMC directive	
	Hazardous areas	
	UkrSEPRO Metrology, measurement technology	Ukraine
	Ex Ukraine Hazardous areas	Ukraine
	Uzstandard Metrology, measurement technology	Uzbekistan
	GOST Metrology, measurement technology	Russia
	KazInMetr Metrology, measurement technology	Kazakhstan
-	MTSCHS Permission for commissioning	Kazakhstan
	BelGIM Metrology, measurement technology	Belarus

Certificates (option)

Certificates	
Certificates	<ul style="list-style-type: none"> ■ 2.2 test report per EN 10204 (e.g. state-of-the-art manufacturing, indication accuracy) ■ 3.1 inspection certificate per EN 10204 (e.g. indication accuracy)
Recommended recalibration interval	1 year (dependent on conditions of use)

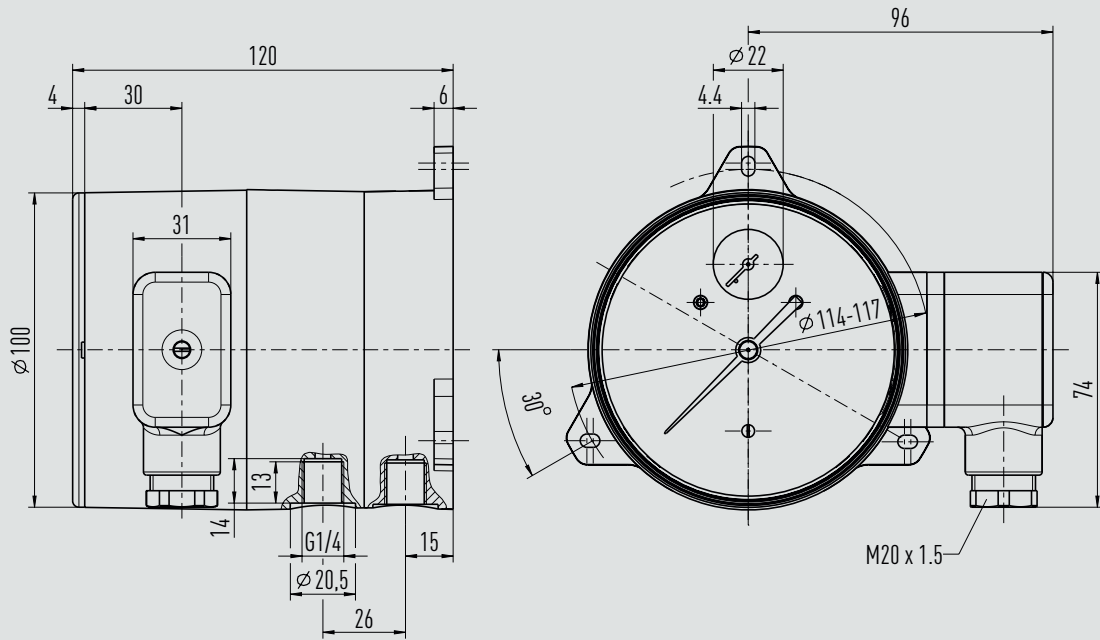
→ Approvals and certificates, see website

Safety-relevant characteristic values (explosion-protected version)

Safety-related characteristic values (Ex)	
Terminals	“I+” and “GND”
Maximum voltage U_i	DC 30 V
Maximum current I_i	100 mA
Maximum power P_i (gas)	1 W
Maximum power P_i (dust)	
$T_a \leq +40\text{ °C}$	$\leq 750\text{ mW}$
$T_a \leq +60\text{ °C}$	$\leq 650\text{ mW}$
Effective internal capacitance C_i	17.5 nF
Effective internal inductance L_i	Negligible

Dimensions in mm

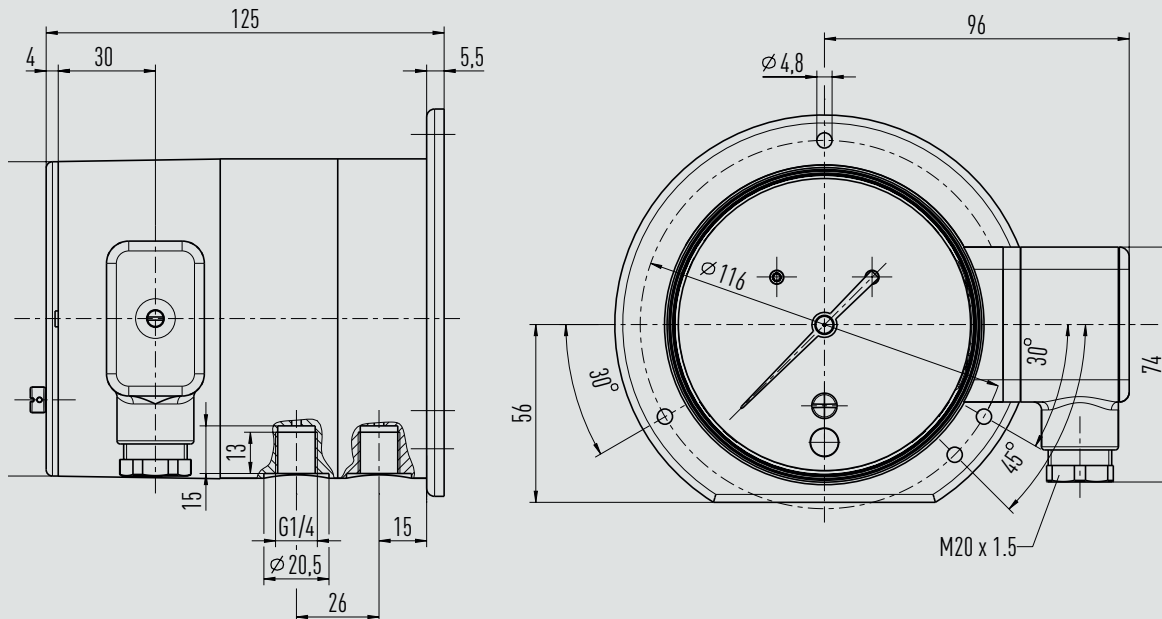
Model DPGT40 with aluminium measuring chamber, 2 x G 1/4 female thread, centre distance 26 mm



Weight
approx. 1.4 kg

14078303.01

Model DPGT40 with stainless steel measuring chamber, 2 x G 1/4 female thread, centre distance 26 mm

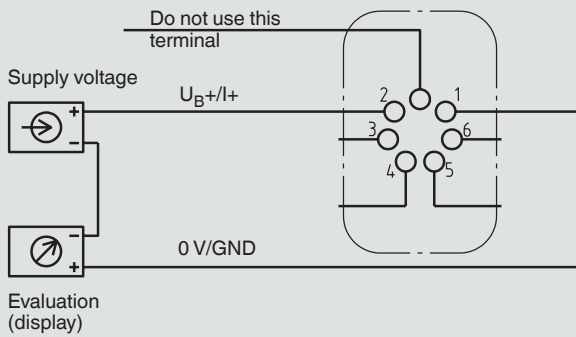


Weight
approx. 1.4 kg

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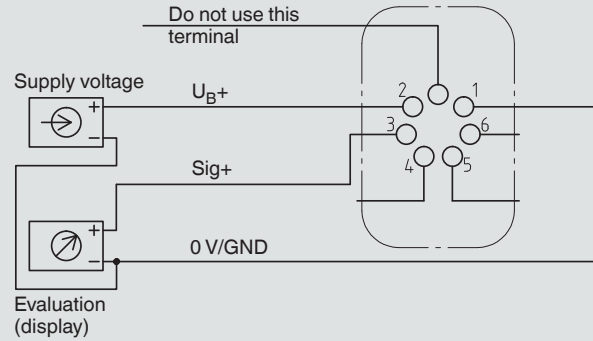
Pin assignment

2-wire system
4 ... 20 mA



Terminals 3 and 4: For internal use only

3-wire system
0 ... 20 mA and 0 ... 10 V








Terminal 4: For internal use only

Terminals 5 and 6: Reset zero point

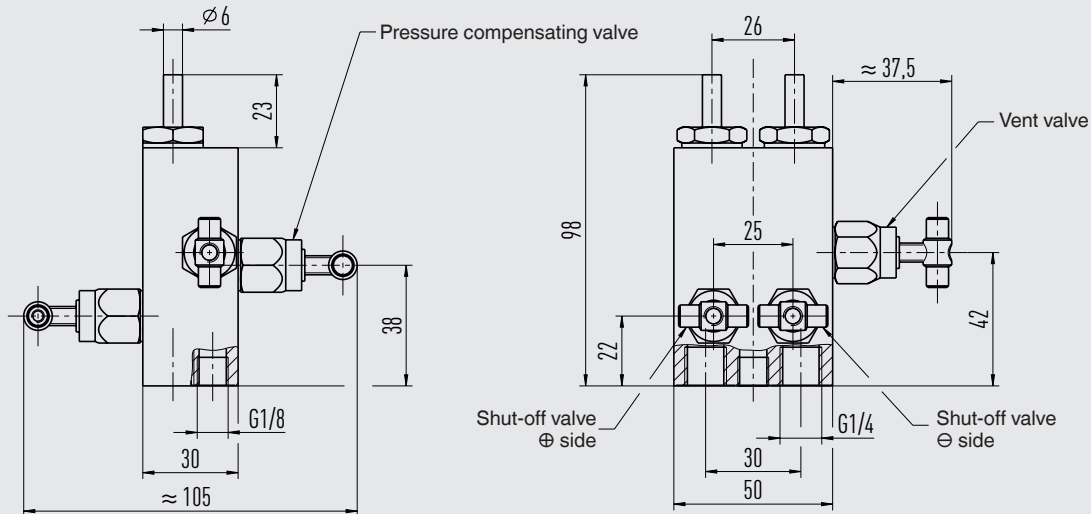
The instrument must be incorporated in the equipotential bonding via the process connection.

Accessories

Model	Description	Order number
	-	Panel mounting flange, aluminium
	-	Panel mounting flange, stainless steel
	910.17 Sealings → see data sheet AC 09.08	-
	910.15 Syphons → see data sheet AC 09.06	-
	IV3x	4-way valve block, stainless steel → For dimensions see page 10
	-	4-way valve block, brass → For dimensions see page 10
	-	Bite-type fittings for pipe diameters 6, 8 and 10 mm
		On request

Dimensions in mm

4-way valve block



2261821.01

Ordering information

Model / Measuring range / Process connection / Material of diaphragm, sealings / Output signal / Options / Accessories

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ICS Schneider Messtechnik GmbH
 Briesestrasse 59
 D-16562 Hohen Neuendorf / OT Bergfelde
 Tel.: +49 3303 5040-66
 Fax: +49 3303 5040-68
 E-Mail: info@ics-schneider.de



WIKAL Alexander Wiegand SE & Co. KG
 Alexander-Wiegand-Straße 30
 63911 Klingenberg/Germany
 Tel. +49 9372 132-0
 Fax +49 9372 132-406
 info@wika.de
 www.wika.de