

# 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

### 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.



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

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.

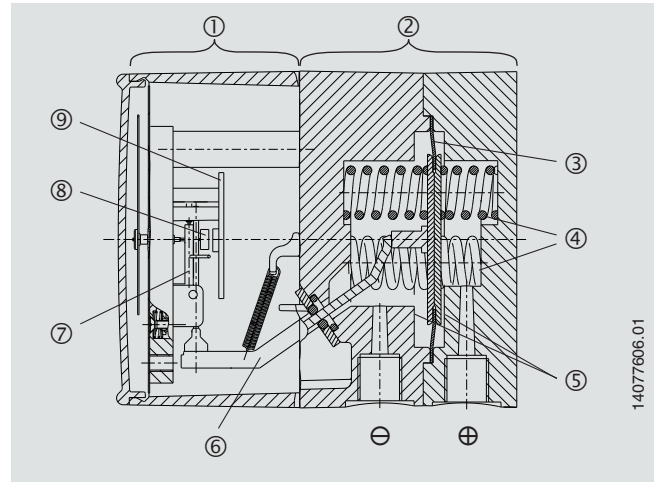
Pressures  $p_1$  and  $p_2$  act on the media chambers  $\oplus$  and  $\ominus$ , which are separated by an elastic diaphragm (3).

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	
<b>Nominal size</b>	
Differential pressure display	Ø 100 mm
Working pressure indication	<input type="checkbox"/> Without <input type="checkbox"/> Ø 22 mm
<b>Window</b>	
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)
<b>Case version</b>	
Display case, aluminium, EN AC-AI Si9Cu3(Fe); black painted	
→ Measuring chamber, see table "Measuring element"	

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

Accuracy specifications	
<b>Accuracy class</b>	
Differential pressure display	<ul style="list-style-type: none"> <li>■ 2.5</li> <li>■ 1.6 (only selectable for scale ranges from 0 ... 1 bar to 0 ... 10 bar)</li> </ul>
Working pressure indication	4
<b>Accuracies of the output signal</b>	<ul style="list-style-type: none"> <li>■ 2.5 % of measuring span</li> <li>■ 1.6 % of measuring span (only selectable for scale ranges from 0 ... 1 bar to 0 ... 10 bar)</li> </ul>
<b>Zero point setting</b>	
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)
<b>Linearisation error</b>	<ul style="list-style-type: none"> <li>■ 2.5 % of measuring span</li> <li>■ 1.6 % of measuring span (only selectable for scale ranges from 0 ... 1 bar to 0 ... 10 bar)</li> </ul>
<b>Temperature error</b>	On deviation from the reference conditions at the measuring system: Max. $\pm 0.8$ %/10 K of end value of measuring range
<b>Influence of supply voltage</b>	$\leq 0.1$ % of measuring span/10 V
<b>Influence of the load</b>	$\leq 0.1$ % of measuring span (for variant 1 - 3 of signal type)
<b>Long-term stability DIN 16086</b>	$< 0.3$ % of measuring span/year
<b>Reference conditions</b>	
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 <sup>2</sup>
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"> <li>■ bar</li> <li>■ psi</li> <li>■ mbar</li> <li>■ kg/cm<sup>2</sup></li> <li>■ MPa</li> <li>■ kPa</li> </ul>

## Process connection

Standard	<ul style="list-style-type: none"> <li>■ EN 837</li> <li>■ DIN EN ISO 8434-1</li> </ul>
Size	
EN 837	<ul style="list-style-type: none"> <li>■ 2 x G 1/4, female thread, centre distance 26 mm</li> <li>■ 2 x G 1/4 B, male thread, centre distance 26 mm</li> </ul>
DIN EN ISO 8434-1	<ul style="list-style-type: none"> <li>■ 2 x bite-type fitting for pipe Ø 6 mm</li> <li>■ 2 x bite-type fitting for pipe Ø 8 mm</li> <li>■ 2 x bite-type fitting for pipe Ø 10 mm</li> </ul>

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


Output signal		
<b>Signal type</b>		
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	
<b>Load in <math>\Omega</math></b>		
Variant 1 - 3	$\leq (\text{supply voltage} - 12 \text{ V})/0.02 \text{ A}$ , however max. 600 $\Omega$	
Variant 4	100 k $\Omega$	
<b>Voltage supply</b>		
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]
<b>Ambient temperature</b>	
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]
<b>Pressure limitation</b>	
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
	<b>EU declaration of conformity</b>	European Union
	EMC directive	
	RoHS directive	
-	<b>CRN</b> Safety (e.g. electr. safety, overpressure, ...)	Canada

### Optional approvals

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

## Certificates (option)

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

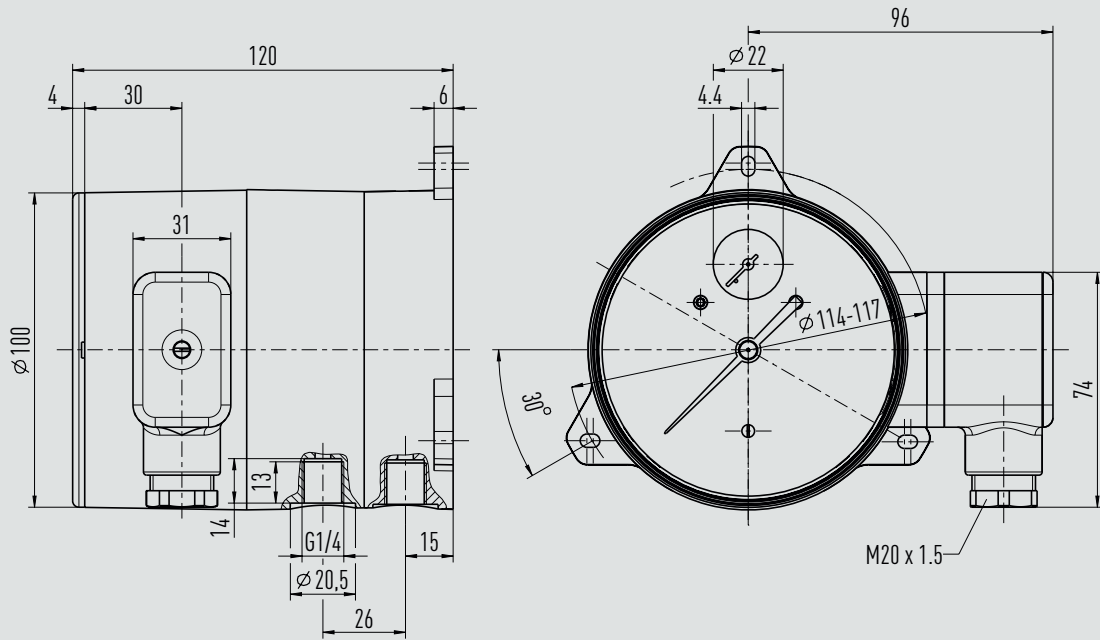
→ Approvals and certificates, see website

## 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

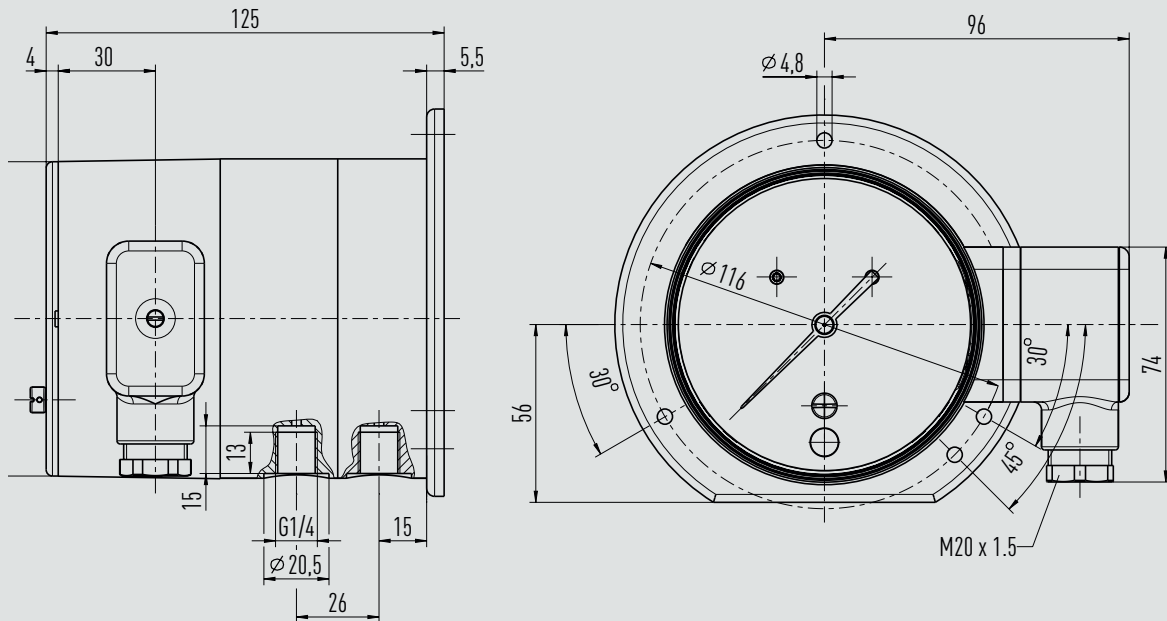
Model DPGT40 with aluminium measuring chamber, 2 x G 1/4 female thread, centre distance 26 mm



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



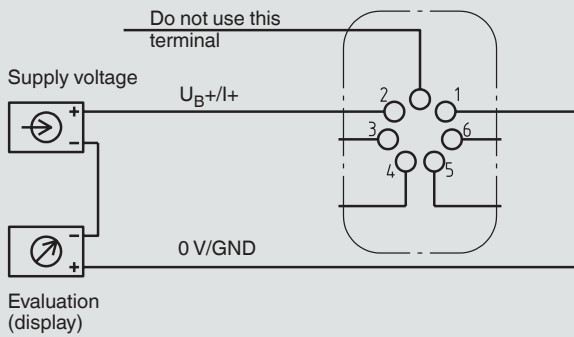
Weight  
approx. 1.4 kg

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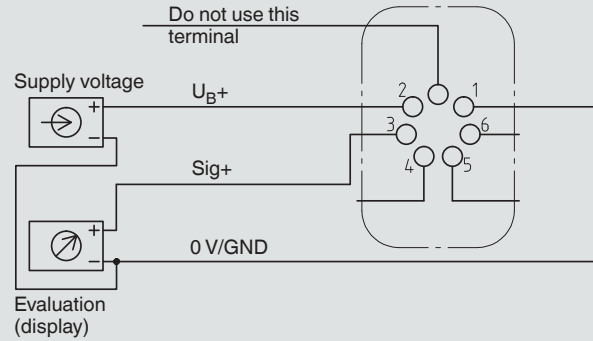
## Pin assignment

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	14074004
	-	Panel mounting flange, stainless steel	14075088
	910.17 Sealings → see data sheet AC 09.08	-	
	910.15 Syphons → see data sheet AC 09.06	-	
	IV3x, IV5x	4-way valve block, stainless steel	2043559
	-	4-way valve block, brass	2043567
	-	Bite-type fittings for pipe diameters 6, 8 and 10 mm	On request

## Ordering information

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

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**WIKA 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