

**DA03 | Differential Pressure Gauge /
Differential Pressure Gauge
and Switch**

**Models for Assignment in
Explosion-hazardous Areas
per Directive 94/9/EC (ATEX)**

Application

The DA03 serves as indicator of differential pressure.

Follow mounting instructions in accordance to application.

**Differential Pressure Gauge without
Switching Contacts (Non-electrical
Device)**

DA03#####0A

Explosion-hazardous areas zone 1 and 2, as well as 21 and 22, endangerment by gases and dry dusts.

Ex II 2 GD c 95°C IP65

**Differential Pressure Gauge with
Built-in Contacts**

DA03#####1B

Simple electrical equipment per EN50020 para. 5.4 for usage in explosion-hazardous areas zone 1 and 2.

Ex II 2 G c 95°C IP65

**Differential Pressure Gauge with
Built-in Inductive Proximity Switch**

DA03#####1C

Explosion-hazardous areas zone 1 and 2, as well as 21 and 22, endangerment by gases and dry dusts.

Ex II 2 GD c 95°C IP65

EC-type approval of inductive proximity switch

PTB 99 ATEX 2219X

Ex II 2 G EEx ia IIC T6

and

Zelm 03 ATEX 0128 X

Ex II 1 D Ex ia D 20T..°C



**Differential Pressure Gauge with Built-in Capacitive
Electrical Position Transducer (KINAX 3W2)**

DA03#####2D

Explosion-hazardous areas zone 1 and 2, endangerment by gases.

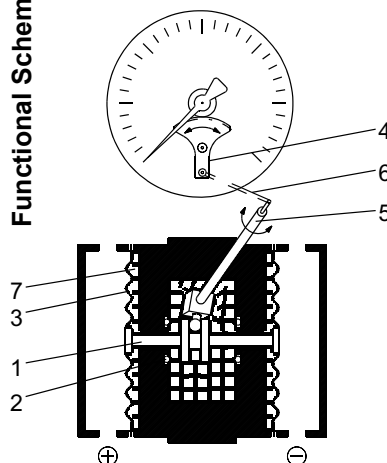
Ex II 2 G c 95°C IP65

EC-type approval of built-in capacitive electrical position transducer

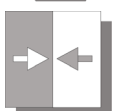
PTB 97 ATEX 2271 KINAX 3W2 708...

Ex II 2 G EEx ia IIC T6

Functional Scheme



1. Connecting rod
2. O-Ring, differential overpressure protection
3. Sensing diaphragm
4. Pointer mechanism
5. Lever
6. Link
7. Pressure transfer liquid



Specifications

General	Measuring ranges	0...40 mbar to 0...25 bar (see Ordering Code)
	Nominal pressure rating	40 bar or 100 bar (max. static pressure)
	Accuracy	± 1.6% of span
	Max. differential overpressure	Safe up to max. static pressure; in either direction
	Indicator	Circular dial type, 100 mm or 160 mm diameter
	Operating temperature	Ambient: -20°C to +60°C Media: see advice given in "Assignment in Explosion-hazardous Areas", resp. device
	Temperature coefficient	Approx. 0.3% / 10°C
	Zero adjustment	Screw through hole on top of dial housing. ±25% FS.
	Protection class	IP 65 per DIN EN 60529
	Pressure chambers	Smooth internal surfaces without recesses; flush sensing diaphragms
Pressure connections	DIN EN 61518 connecting flanges with 2x G½ (F) threaded sockets. Various bite type ferrule connectors (see Ordering Code)	
Purge ports	2x G 1/8 (F) threaded sockets, in flanged pressure chamber casing; screw plugs fitted	
Materials	<i>Type „R“</i>	
	Pressure chamber (wetted part)	Stainless steel 1.4404 (AISI 316L)
	Diaphragm (wetted part)	Ranges ≤ 400 mbar: stainless steel 1.4571 Ranges ≥ 0.6 bar: DURATHERM® (stainless steel)
	<i>Type „H“ (1)</i>	
	Pressure chamber (wetted part)	Hastelloy® C4
	Diaphragm (wetted part)	Ranges ≤ 2.5 bar: Hastelloy® C 276 Ranges ≥ 4 bar: Standard diaphragm with separating foil made from Hastelloy® C 276 Caution: Models with separating foil are unsuitable for vacuum application.
	Intermediate plate	Aluminium alloy (AlMgSiPb); HART-COAT®
	Dial mechanism, gauge housing	Stainless steel 1.4301
Dial window	Laminated safety glass	
Dial scale and pointer	Aluminium	
O-ring gasket	Viton® (FKM, fluorocarbon elastomere)	
Options and Accessories	Electrical accessories	Limit signalling contacts: magnet actuated switch type / non-contact proximity type limit detector. Pointer rotation transducer: capacitance type, with output signal proportional to the pointer position (uses deeper gauge housing: see Dimensions) For details of electrical accessories, see Data Sheet KE. For application in explosion-hazardous areas note version restrictions (see Ordering Code)!
	Liquid filling	For operating conditions involving vibration, pressure fluctuations, and/or moisture condensation inside, the gauge can be supplied with glycerine filling.
	Reference pointer	Adjustable pointer for visual marking of limit / reference value.
	Peak registering pointer	Separate pointer without spring, friction holding: dragged by the measuring pointer as the measured value increases. Stays put when the measuring pointer recedes, thereby registering peak value. Manual re-setting.
	Options (on special order)	Special materials: PTFE coated gaskets (compatibility of medium) Special dial scales; Housing of 1.4571 stainless steel
	Accessories	Direct fitting 3-spindle blocking/equalizing valves unit. Installs directly on the gauge flanges. Rating PN 100; size DN 5; stainless steel 1.4571 (Model DZ 36-00LV0300)
	Pressure connections	Process pipe connection to be erected by using bite type ferrule connectors or direct fitting of pipe into G½ F thread. Make sure that the connection is firmly sealed.
Mounting	Wall mounting (Type „W“)	With mounting plate on back of instrument
	Pipe mounting (Type „R“)	With mounting parts for vertical or horizontal mounting on 2"pipes
	Panel mounting (2)	Due to the instruments' heavy weight the small measuring cell only is suitable for direct panel mounting: measuring ranges ≥ 0.6 bar, dial NCS100 and NCS160, without contacts or transmitters. The instrument factory prepared for panel mounting and the necessary mounting parts may be ordered with code „T“.
	Panel mounting with front cover ring and support (3)	All models may be fitted with a customer made support construction and the front cover ring to be used for panel mounting (Ordering Code „G“).

**Differential Pressure Gauge
without Switching Contacts
(non-electrical device)**

**Ordering Code
DA03 # # # # # # # #0A**

**Range of Applications:
Explosion-hazardous areas
zone 1 and 2, as well as 21 and 22,
endangerment by gases
and dry dusts.**

Permissible temperatures:

Max. surface temperature of 95°C was calculated without settled dust and without safety factor.

Perm. ambient temperature -20°C up to +60°C.

Perm. medium temperature within differential pressure gauge < 85°C.

Caution! When used with gaseous media temperature of device might increase due to compression temperature. In such cases pressure variation speed resp. perm. media temperature must be reduced.

Note: During pressure variation between 10% and 90% of FS and a pulsation rate < 0.06 Hz temperature raises <10K.

To avoid additional heating of instrument they must not be used in direct sunshine!

Regarding explosion protection for non-electrical part of device applied standards EN13463-1, EN13463-5 and EN50281-1-2 are met.
Documents are deposited at TÜV-Nord-Cert.

Declaration CE  II 2 GD c 95°C IP65

Assignment in Explosion-hazardous Areas per Directive 94/9/EC (ATEX)

Differential Pressure Gauge with built-in contacts

Ordering Code
DA03 ##### #1B

with built-in contacts
KE# # M # # 0 D 4H2

Range of Applications:
Simple electrical equipment per EN50020 para. 5.4 for usage in explosion-hazardous areas zone 1 and 2

Permissible temperatures:
Max. surface temperature of 95°C was calculated without settled dust and without safety factor.
Perm. ambient temperature -20°C up to +60°C.
Perm. medium temperature within differential pressure gauge < 85°C.

Caution! When used with gaseous media temperature of device might increase due to compression temperature. In such cases pressure variation speed resp. perm. media temperature must be reduced.

Note: During pressure variation between 10% and 90% of FS and a pulsation rate < 0.06 Hz temperature raises <10K.
To avoid additional heating of instrument they must not be used in direct sunshine!

Regarding explosion protection for non-electrical part of device applied standards EN13463-1, EN13463-5 and EN50281-1-2 are met.

Simple electrical equipment must meet requirements of EN50020 para. 5.4 and applicable requisitions of EN50014. The devices are not marked regarding electrical parts.

For application in explosion-hazardous areas the devices need to be connected to certified intrinsically safe circuits:

- max. voltage $U_{max} = 30 \text{ V}$
- max. current $I_{max} = 200 \text{ mA}$
- max. power $P_{max} = 800 \text{ mW}$

Device specifications (per contact):

- max. internal capacity $C_i \text{ max} = 60 \text{ pF}$
- max. internal inductivity $L_i \text{ max} = 4 \text{ } \mu\text{H}$

Documents regarding mechanical parts are deposited at TÜV-Nord-Cert.

Declaration CE  II 2 G c 95°C IP65

Recommended isolating switches:

- MTL 5011B (1-channel, for contacts / inductive proximity switch, Operating voltage 20 - 35 V DC)
- MTL 5015 (2-channel, for contacts / inductive proximity switch, Operating voltage 20 - 35 V DC)
- KFA6-SR2-Ex1.W (1-channel, for contacts / inductive proximity switch, Operating voltage 230 V AC)
- KFA6-SR2-Ex2.W (2-channel, for contacts / inductive proximity switch, Operating voltage 230 V AC)

Differential Pressure Gauge with built-in inductive proximity switch

Ordering Code
DA03 ##### #1C

with built-in inductive proximity switch
KE# #H# # 0C 0 H 2

Range of Applications:
Explosion-hazardous areas zone 1 and 2, as well as 21 and 22, endangerment by gases and dry dusts

Permissible temperatures:

Max. surface temperature of 95°C was calculated without settled dust and without safety factor.

Perm. ambient temperature -20°C up to +60°C.

Perm. medium temperature within differential pressure gauge < 85°C.

Caution! When used with gaseous media temperature of device might increase due to compression temperature. In such cases pressure variation speed resp. perm. media temperature must be reduced.

Note: During pressure variation between 10% and 90% of FS and a pulsation rate < 0.06 Hz temperature raises <10K.

To avoid additional heating of instrument they must not be used in direct sunshine!

EC-type approval of inductive proximity switches:

PTB 99 ATEX 2219 X

and

Zelm 03 ATEX 0128 X

The type of inbuilt inductive proximity switch is declared on type plate / connection scheme. IP protection class of housing: IP65 acc. to EN60529.

For application in explosion-hazardous areas the devices need to be connected to certified intrinsically safe circuits:

- max. voltage $U_{max} = 16 \text{ V}$
- max. current $I_{max} = 25 \text{ mA}$
- max. power $P_{max} = 64 \text{ mW}$

Device specifications (per contact):

- max. internal capacity $C_i \text{ max} = 30 \text{ nF}$
- max. internal inductivity $L_i \text{ max} = 100 \mu\text{H}$

Permissible limit values of U_i , I_i and P_i of intrinsically safe circuits depend on type of inductive proximity switch. See respective EC-type approvals.

Regarding explosion protection for non-electrical part of device applied standards EN13463-1, EN13463-5 and EN50281-1-2 are met.

Documents regarding mechanical parts are deposited at TÜV-Nord-Cert.

Declaration CE Ex II 2 GD c 95°C IP65

Built-in inductive proximity switch

PTB 99 ATEX 2219X Ex II 2 G EEx ia IIC T6

Zelm 03 ATEX 0128 X Ex II 1 D Ex ia D 20T..°C

Recommended isolating switches:

- MTL 5011B (1-channel, for contacts / inductive proximity switch, Operating voltage 20 - 35 V DC)
- MTL 5015 (2-channel, for contacts / inductive proximity switch, Operating voltage 20 - 35 V DC)
- KFA6-SR2-Ex1.W (1-channel, for contacts / inductive proximity switch, Operating voltage 230 V AC)
- KFA6-SR2-Ex2.W (2-channel, for contacts / inductive proximity switch, Operating voltage 230 V AC)

**Differential Pressure Gauge
with built-in capacitive
electrical position transducer
(KINAX 3W2))**

**Ordering Code
DA03 ##### #2D**

**with built-in capacitive
electrical position transducer
KE0905#90000**

**Range of Applications:
Explosion-hazardous areas
zone 1 and 2
endangerment by gases**

Permissible temperatures:

Max. surface temperature of 95°C was calculated without settled dust and without safety factor.

Perm. ambient temperature -20°C up to +60°C.

Perm. medium temperature within differential pressure gauge < 85°C.

Caution! When used with gaseous media temperature of device might increase due to compression temperature. In such cases pressure variation speed resp. perm. media temperature must be reduced.

Note: During pressure variation between 10% and 90% of FS and a pulsation rate < 0.06 Hz temperature raises <10K.

To avoid additional heating of instrument they must not be used in direct sunshine!

EC-type approval of built-in capacitive electrical position transducer:

PTB 97 ATEX 2271 KINAX 3W2 708...

Type of built-in capacitive electrical position transducer is declared on type plate / connection scheme.

IP protection class of housing: IP65 acc. to EN60529.

For application in explosion-hazardous areas the devices need to be connected to certified intrinsically safe circuits:

- max. voltage $U_{max} = 30 \text{ V}$
- max. current $I_{max} = 160 \text{ mA}$
- max. power $P_{max} = 1 \text{ mW}$

Device specifications (per contact):

- max. internal capacity $C_i \text{ max} = 10 \text{ nF}$
- max. internal inductivity $L_i \text{ max} = 0 \text{ } \mu\text{H}$

Permissible limit values of U_i , I_i and P_i of intrinsically safe circuits depend on type of inductive proximity switch. See respective EC-type approvals.

Regarding explosion protection for non-electrical part of device applied standards EN13463-1 and EN13463-5 are met.

Documents regarding mechanical parts are deposited at TÜV-Nord-Cert.

Declaration CE $\text{\textcircled{Ex}}$ II 2 G c 95°C IP65

Built-in capacitive electrical position transducer

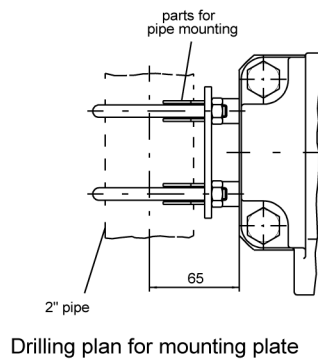
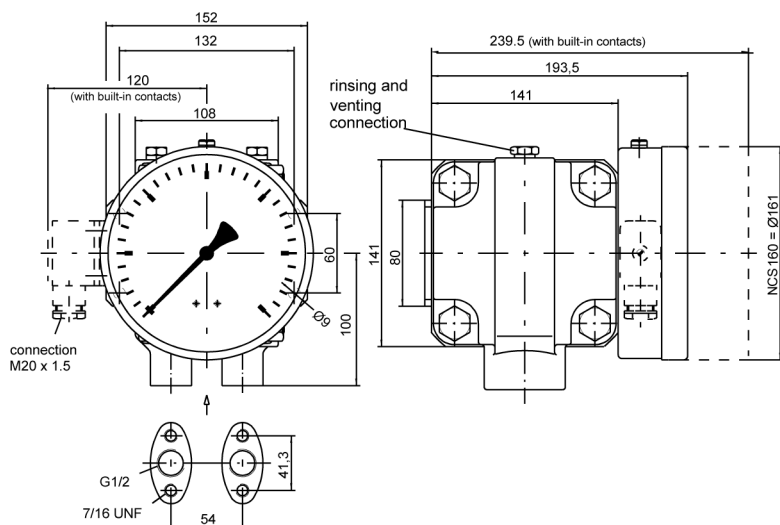
PTB 97 ATEX 2271 $\text{\textcircled{Ex}}$ II 2 G EEx ia IIC T6

Recommended supply device:

- MTL 5041 Operating voltage 20-35 V DC

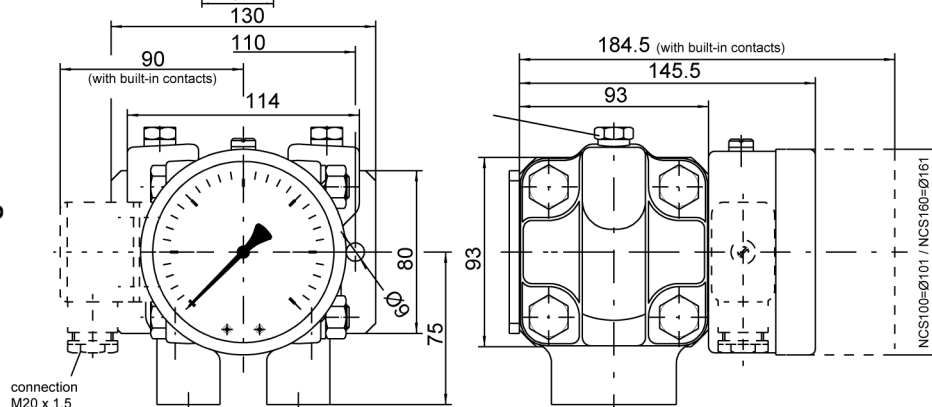
Dimensions (all units in mm unless stated otherwise)

for ranges 40...400 mbar

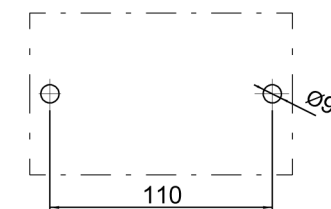


Drilling plan for mounting plate

for ranges 0.6...25 bar



Drilling plan for mounting plate

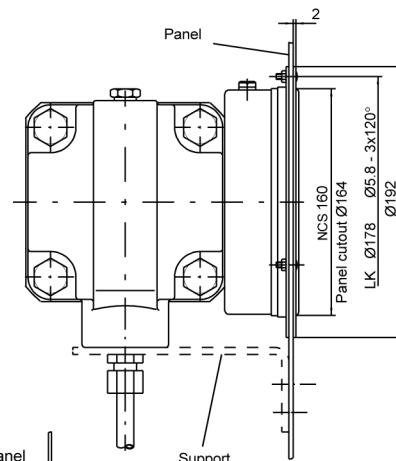
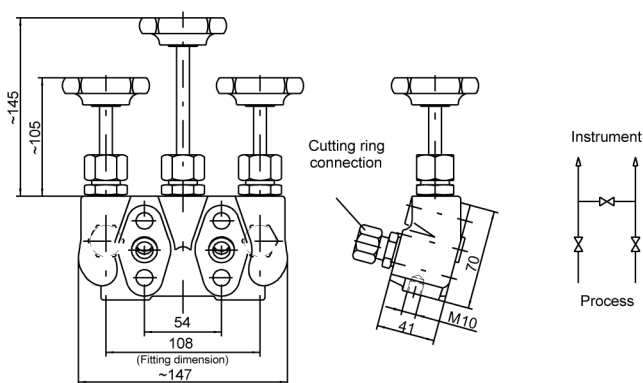


Three spindle blocking / equalising valves unit DZ 36-00 LV 0300

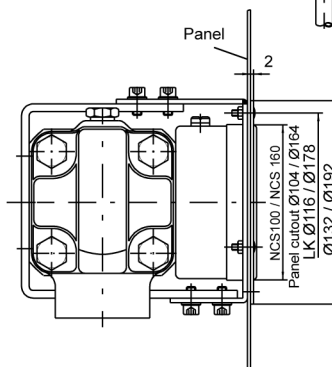
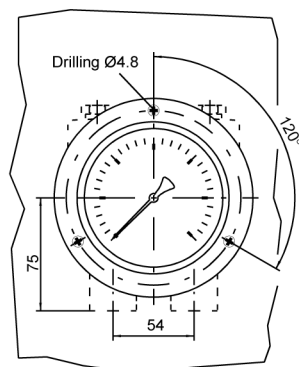
fits directly onto the DIN 19209 flanges

Panel mounting with customer prepared support

(Ordering Code „G“)



Panel mounting accessories only for bar ranges (Ordering code „T“)



Ordering Code

Differential Pressure Gauge

DA03

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Range																				
0 ... 40 mbar.....>	5	7																		
0 ... 60 mbar.....>	5	8																		
0 ... 100 mbar.....>	5	9																		
0 ... 160 mbar.....>	6	0																		
0 ... 250 mbar.....>	8	2																		
0 ... 400 mbar.....>	8	3																		
- 40 ... 60 mbar.....>	7	0																		
- 60 ... 100 mbar.....>	7	2																		
-100 ... 150 mbar.....>	7	4																		
-150 ... 250 mbar.....>	7	6																		
0 ... 0.6 bar.....>	0	1																		
0 ... 1 bar.....>	0	2																		
0 ... 1.6 bar.....>	0	3																		
0 ... 2.5 bar.....>	0	4																		
0 ... 4 bar.....>	0	5																		
0 ... 6 bar.....>	0	6																		
0 ... 10 bar.....>	0	7																		
0 ... 16 bar.....>	0	8																		
0 ... 25 bar.....>	0	9																		
- 1 ... 0.6 bar.....>	3	2																		
- 1 ... 1.5 bar.....>	3	3																		
- 1 ... 3 bar.....>	3	4																		
- 1 ... 5 bar.....>	3	5																		
Nominal Pressure Rating																				
40 bar.....>																				H
100 bar.....>																				L
Measuring System Material																				
Pressure chamber of Hastelloy® C4 / Sensing diaphragm of Hastelloy® C276 (1).....>																				H
Pressure chamber of chrome-nickel-Steel 1.4404 / AISI 316 L / Standard sensing diaphragm.....>																				R
Pressure Connections																				
DIN EN 61518 flanges with threaded sockets: 2x G1/2 (F).....>	0	3																		
Threaded connectors: 2x NPT 1/4-18 (F).....>	0	4																		
Threaded connectors: 2x NPT 1/2-14 (F).....>	0	5																		
Threaded connectors: 2x G1/2 (M) stainless steel.....>	1	3																		
Threaded connectors: 2x NPT 1/4-18 (M) stainless steel.....>	1	4																		
Threaded connectors: 2x NPT 1/2-14 (M) stainless steel.....>	1	5																		
Bite type ferrule connectors (1.4571) for 12 mm tube.....>	2	7																		
Dial Size																				
Bayonet ring case ø 100 mm (only for ranges ≥ 0.6 bar) 1.4301.....>																				L
Bayonet ring case ø 160 mm, 1.4301.....>																				M
Mounting																				
Wall mounting (Standard).....>																				W
Pipe mounting.....>																				R
Panel mounting (only for bar ranges) (2).....>																				T
Front cover ring for panel mounting (3).....>																				G
Dial Liquid Filling																				
Without liquid filling.....>																				0
Dial with liquid filling: glycerine (only for devices without contacts).....>																				1
Dial with liquid filling: compatible with built-in inductive contacts (Silicone oil).....>																				4
Dial with liquid filling (Silicone oil).....>																				5
Additional Pointer																				
Without additional pointer.....>																				0
Adjustable reference pointer.....>																				1
Peak registering pointer, resettable (only for ranges ≥ 60 mbar).....>																				2
Signalling Accessories: Contacts / Transmitters																				
Without contacts / transmitter.....>																				0
Built-in contacts per Data Sheet KE... (ranges ≥ 100 mbar).....>																				1
Built-in capacitive electrical position transducer per Data Sheet KE09 Ex type (ranges ≥ 100 mbar).....>																				2
Built-in contacts with plug connection (power plant model).....>																				5
Built-in resistance type remote sensors acc. to data sheet KE07 (ranges ≥ 100 mbar).....>																				6
Explosion Protection / Contacts																				
Standard.....>																				0
Non-electrical device (without switching contacts) II2 GD c 95°C IP65.....>																				A
Device with switching contacts (simple electrical equipment per EN50020 para. 5.4) Built-in contacts, per Data Sheet KE... (ranges ≥ 100 mbar) II2 G c 95°C IP65.....>																				B ⁽⁴⁾
Device with switching contacts (inductive proximity switch) Built-in contacts, per Data Sheet KE... (ranges ≥ 100 mbar) II2 GD c 95°C IP65.....>																				C ⁽⁴⁾
Device with built-in capacitive electrical position transducer KINAX 3W2 708-226D0 oder KINAX 3W2 708-226E0.... (ranges ≥ 100 mbar) II2 G c 95°C IP65.....>																				D ⁽⁴⁾

(1), (2), (3) see Specifications

(4) Version restrictions B: KE##M##0D4H2

C: KE###OC0H2

D: KE0905#90000

Technische Änderungen vorbehalten • Subject to change without notice • Changements techniques sous réserve