

Driesen+Kern GmbH

User Manual DKP900

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1 Introduction

In this user manual you will find information about the installation and operation of the DKP 900 differential pressure transducer series.

If there are any problems with the instrument please try to solve them with the help of this manual first. If you don’t find help in this manual please contact your local distributor or Driesen+Kern:

Driesen + Kern GmbH
Am Hasselt 25
24576 Bad Bramstedt
☎ +49 (0)4192-8170-0
Fax: +49 (0)4192-8170-99
Email: info@driesen-kern.de

2 General Information

2.1 Product description



Fig.1
DKP900 Differential Pressure Transducer
equipped with LCD

The DKP900 is a transducer for differential pressure and can be ordered with two measurement ranges:

DKP900-A: Measurement range A = 0 … 1,000Pa
DKP900-B: Measurement range B = 0 ...10,000Pa

The device comes with a DIP switch enabling you to select more detailed measurement ranges and thus always provides the optimal resolution for regulators/controllers.

A: 0...100Pa, 0-250Pa, 0-500Pa, 0-750Pa, 0-1000Pa
+/-100Pa, +/-250Pa, +/-500Pa, +/-750Pa, +/-1000Pa

B: 0...1000Pa, 0-2500Pa, 0-5000Pa,
0-7500Pa, 0-10000Pa

+/-1000Pa, +/-2500Pa, +/-5000Pa,
+/-7500Pa, +/-10000Pa

Furthermore, the transducer is available in two versions:
Version 1: Electrical three-wire-connection (**0-10V, 0..20mA or 4..20mA)**
Version 2: Electrical two-wire-connection (**4..20mA current loop)**

Additional options are:

LCD display
Automated zero-module

3 Safety

Important safety instructions in this manual can be identified as follows:

WARNING: indicates a hazardous situation which, if instructions in this manual aren't followed carefully, will result in serious injury or even death.

CAUTION: indicates a hazardous situation which, if instructions in this manual aren't followed carefully, may result in property damage and data loss.

NOTE: indicates relevant information related to the use of the product.

Protection against electrostatic discharge (ESD)
Electrostatic discharge (ESD) can cause immediate or latent damage to the electronic circuit system. Products manufactured by Driesen+Kern GmbH are adequately protected against electrostatic discharge (ESD) when used appropriately. However, touching, removing or inserting parts within the housing may result in damage by electrostatic discharge.

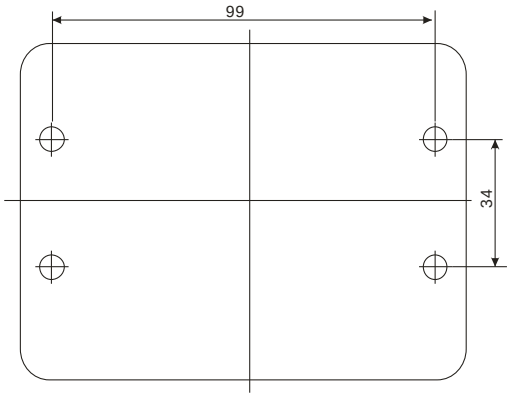
How to not cause electrostatic discharge:
Parts which are sensitive to electrostatic discharge (ESD) may be handled only in a work area which is earthed and protected against electrostatic discharge. If these conditions cannot be met, you should ground yourself at the instrument's frame before touching the circuit board.
Ground yourself with a wrist strap and an ohmic conductor. If neither is at your disposal, take hold of a conductive part of the instrument's frame before touching the circuit board.

Always hold the circuit board by the edges and please avoid touching the contacts.

4 Assembling the Transducer

4.1 Mechanical and Pneumatic Installation

The pressure transducer DKP900 is designed for the permanent use in HVAC and other industrial applications. The device features a piezo pressure sensor and can therefore be mounted in any position. Its installation on a vibration-free wall in a vertical mounting orientation is recommended (glands (+) and (-) facing downwards).
Avoid installation near heat or radiation sources.



Where required, this pattern can be used to drill holes for wall mounting.

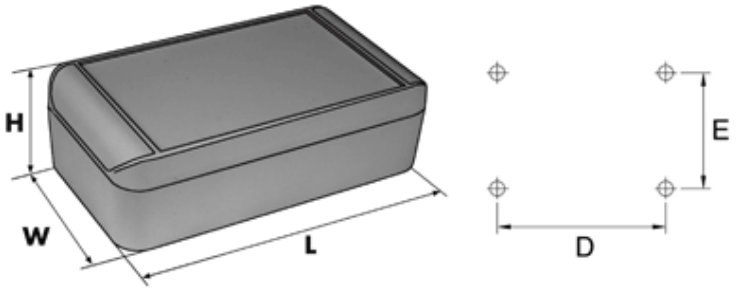


Fig.2 Hole pattern

L=120, W=90, H=50, D=99, E=34, G=155mm



Fig.3 Opening the housing

For the transducer's mechanical installation only the covers on either side need to be opened.
Identify the through bore-holes and mount the transducer with appropriate screws.

CAUTION: Undertake the pneumatic connection only **at zero pressure** or ensure that the peak pressure between both ports at no time exceeds the proof-pressure (see table 1).
Attention should also be paid to the correct pressure polarity (higher pressures at the (+) port).

Measurement Range	Proof Pressure	Burst Pressure
A	150 mbar	200 mbar
B	1 bar	1.5 bar

Table 1 Overrange limits

5 Electrical Installation



Fig.4 Layout of the DKP900

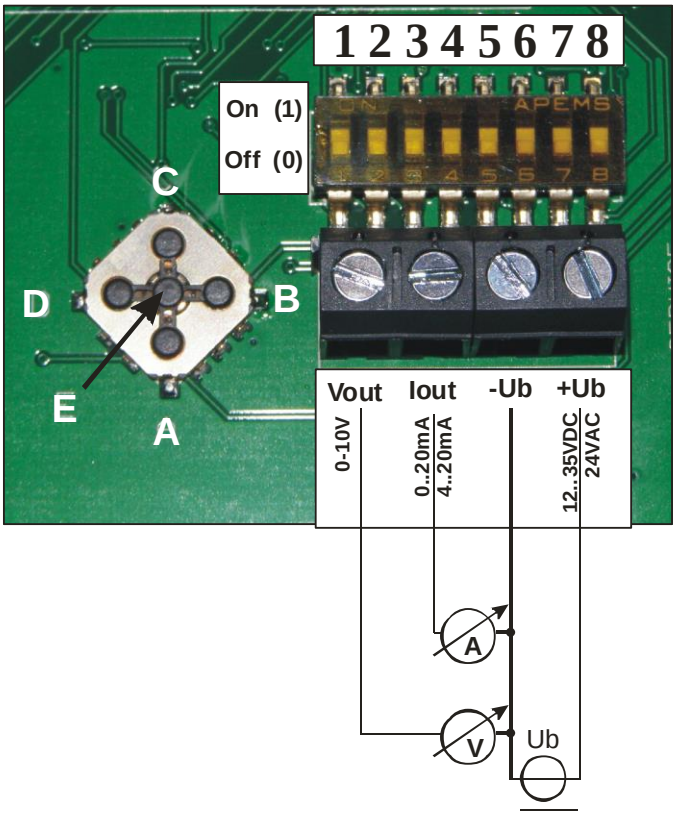
In order to conduct the electrical installation untighten the Phillips screw and feed the connection cable into the housing through the PG gland.

WARNING: Connect cables ONLY at zero potential.

NOTE: In case of strong electrical interference in the operating environment (e. g. with a close-by electric motor) we recommend the use of a shielded cable. Alternatively, you need to ensure that the signal cable is separated from other cables.

After connecting the transducer the blue LED starts flashing, thus indicating normal operating condition.

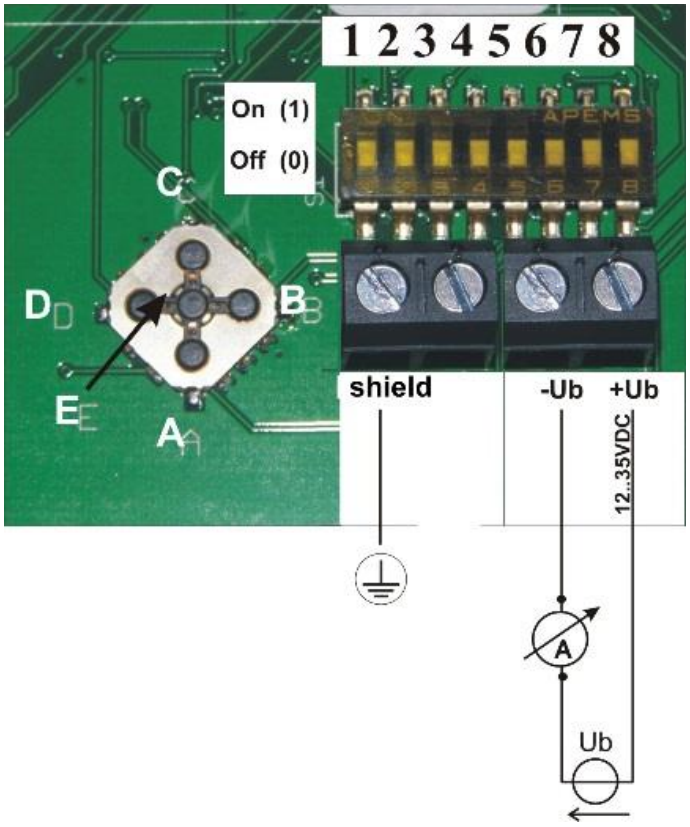
5.1 Version 1 Three-Wire-Connection (0...10V/0...20mA/4...20mA)



The transducer provides three different output signals which can be used for processing.
This illustration shows the DKP900's terminal clamp and its configuration options.

Fig.5 Electrical connection (Version 1 – Three-wire connection.

5.2 Version 2 Two-Wire-Current Loop (4...20mA)



This transducer provides a 4…20mA current loop output and can be connected as follows:

Fig.6 Electrical connection (Version 2 – Two-Wire-Current Loop)

6 DIP Switch Configuration

You can select the required measurement range as well as the output signal using the small DIP switch on the circuit board of the DKP900.

6.1 Three-Wire-Connection (0…10V/0...20mA/4...20mA)

Switches 1-4 are used to select the measurement range whereas switch 6 selects the required current signal (0...20mA/4...20mA) according to the following table.

Please note that switches 7 and 8 always have to be in position 0/off except when you are performing a calibration of the analogue signals as described in chapter 8.

DIP Switch Configuration (S1): 1 = ON, 0 = OFF								Modus		Notes
1	2	3	4	5	6	7	8	DKP900- A	DKP900- B	
1	1	1	1	1/0	1/0	0	0	0...100Pa	0...1000Pa	
1	1	1	0	1/0	1/0	0	0	0...250Pa	0...2500Pa	
1	1	0	1	1/0	1/0	0	0	0...500Pa	0...5000Pa	Every device is equipped
1	1	0	0	1/0	1/0	0	0	0...750Pa	0...7500Pa	with a 0-10V output.
1	0	0	0	1/0	1/0	0	0	0...1000Pa	0...10000Pa	DIP switch 6 selects either
0	1	1	1	1/0	1/0	0	0	+/- 100 Pa	+/- 1000 Pa	4...20mA (0) or 0...20mA (1)
0	1	1	0	1/0	1/0	0	0	+/- 250 Pa	+/- 2500 Pa	for the current output.
0	1	0	1	1/0	1/0	0	0	+/- 500 Pa	+/- 5000 Pa	
0	1	0	0	1/0	1/0	0	0	+/- 750 Pa	+/- 7500 Pa	
0	0	0	0	1/0	1/0	0	0	+/- 1000 Pa	+/- 10000 Pa	
				1						4 Seconds. averaging
				0						2 Seconds averaging
					1					0...20mA
					0					4...20mA
						1	0	Cal 1 point Vout		Change with buttons C and A
						0	1	Cal 1 point Iout		Change with buttons C and A

Table 2 DIP switch configuration DKP900 Three-wire Version 1
NOTE: Dip Switch 5 has a functionality only with special version DKP900-A-1-0-0-M. For all other versions DIP 5 remains in "off"-Position

6.2 Two-Wire-Current loop (4...20mA)

Switches 1-4 are used to select the measurement range.
Switch 6 remains in "Off" Position for 4..20mA loop-power.Please note that switches 7 and 8 always have to be in position 0/off except when you are performing a calibration of the analogue signals as described in chapter 8.

DIP-Switches (S1): 1= ON , 0=Off								Mode		Note
1	2	3	4	5	6	7	8	DKP900- A	DKP900- B	
1	1	1	1		0	0	0	0...100Pa	0...1000Pa	
1	1	1	0		0	0	0	0...250Pa	0...2500Pa	
1	1	0	1		0	0	0	0...500Pa	0...5000Pa	
1	1	0	0		0	0	0	0...750Pa	0...7500Pa	
1	0	0	0		0	0	0	0...1000Pa	0...10000Pa	
0	1	1	1		0	0	0	+/- 100 Pa	+/- 1000 Pa	
0	1	1	0		0	0	0	+/- 250 Pa	+/- 2500 Pa	
0	1	0	1		0	0	0	+/- 500 Pa	+/- 5000 Pa	
0	1	0	0		0	0	0	+/- 750 Pa	+/- 7500 Pa	
0	0	0	0		0	0	0	+/- 1000 Pa	+/- 10000 Pa	
					0					4...20mA current loop
						1	0	Kal 1 Punkt Iout		change with buttons C and A

7 Zero-point Calibration

After the installation of the transducer is completed you should perform a zero-point calibration.
Ensure that both **pressure ports are open** so that no differential pressure is applied.
Press and hold button E (see chapter 5) until the green LED lights up and starts flashing.

When releasing the button the LED first flashes green and blue alternately and then continues flashing blue every second.
This indicates normal operation and the completion of the zero-point calibration.

8 Calibrating the Analogue Outputs

The analogue outputs of the DKP900 have been calibrated precisely before delivery so that calibration at the initial installation is not required.
Due to deterioration of the electrical components the analogue outputs may become distorted and have to be adjusted in order for measurements to continue being most precise.

Zero-point calibration and the calibration of the analogue outputs cannot make up for an entire calibration of the transducer which is why we recommend the annual calibration at Driesen+Kern GmbH.

For the annual calibration please have the device delivered to our calibration laboratory:

Driesen+Kern GmbH
CalibrationLab
Am Hasselt 25
D-24576 Bad Bramstedt

8.1 Calibration 3-wire Current and Voltage Outputs

1. Position the DIP switches 7 and 8 according to the table in chapter 6 for the adjustment of the analogue outputs (voltage output and current output accordingly).
2. The DIP switch setting now produces a reference signal at the analogue output. The current output is 12.00 mA und and the voltage output is 5.00 V.
3. During the process the LED flashing red indicates a voltage calibration while the LED flashing green indicates current calibration.
4. Now measure the analogue output with a calibrated multimeter. If the reading deviates from the specified reference value adjust it with buttons A and C (see Fig. 5) until it meets the reference value. Pushing button A reduces the value, button C increases the value.
5. If the measured value meets the reference value set the DIP switches 7/8 to their original setting (0=Off).

8.2 Calibration 2-wire Current-loop (4...20mA)

1. Position the DIP switches 7 and 8 according to the table in chapter 6.2 for the adjustment of the analogue outputs (voltage output and current output accordingly).
2. The DIP switch setting now produces a reference signal of 4mA at the analogue output.
3. During the process the LED flashes green.
4. Now measure the analogue output with a calibrated multimeter. If the reading deviates from 4 mA adjust it with buttons A and C (see Fig. 5) until it meets the reference value. Pushing button A reduces the value, button C increases the value.
5. When the value meets the reference value push button E to finalize the reading.
6. Now the DKP900 produces an output of 20mA.
7. If the measured value does not meet the value, adjust it with buttons A and C (see Fig. 5) until it meets 20 mA.
8. Afterwards confirm by pushing the button E.
9. Finally set the DIP switches 7/8 back to the original setting (0=Off).

9 Certificate of Conformity

Driesen + Kern GmbH
Physikalisch-Technische-Messgeräte

Product:
Differential Transducer DKP900

This is to certify that above products are calibrated using dedicated equipment which is calibrated according to ISO 17025 and calibrated by comparison against natural standards, natural physical constants, consensus standards, or by ratio type measurements using self-calibrating techniques.

Bad Bramstedt, August 2014

Driesen+Kern GmbH
(Geschäftsführung)

Driesen+Kern GmbH
(Prüfmittelbeauftragter)

Driesen + Kern GmbH

Manufacturer´s Declaration of Conformity

Driesen+Kern GmbH does declare that, to the best of it knowledge and belief, the products referenced below meet the essential requirements and are in conformity with the relevant EC Directive(s) listed using the relevant section of the EC Standard.

The required performance and safety tests were sucessfully conducted according to the harmonized standards. The CE Marking has been affixed on the devices according to the EC Directives.

Equipment under Test (EuT): DKP900 Transducer Differential Pressure

Tests:	Standards:	Result
Emission		
Radiated emission	EN 61326-1:2006	**PASS**
Interference immunity		
Electrostatic discharge	EN 61326-1:2006	**PASS**
Electromangnetic field	EN 61326-1:2006	**PASS**
Magnetic field (power frequency)	EN 61326-1:2006	**PASS**
Explanation:		
PASS - The EuT meets the requirements	FAIL - The EuT does not meet the requirements	N/A - Test is not applicable

Evaluation:
The Equipment under Test (EuT) meets the requirements of the EN61326-1 first class B devices (emission) and industrial environment (immunity).

Manufacturer´s Contact

(Oliver Driesen, Managing Director)

Bad Bramstedt, 26.10.2011

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