



HK INSTRUMENTS DPT-Priima-MOD Multifunctional High Accuracy Transmitter Instruction Manual

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HK INSTRUMENTS

USER-FRIENDLY MEASURING DEVICES
DIFFERENTIAL PRESSURE TRANSMITTERS
DPT-Priima-MOD Series
INSTALLATION INSTRUCTIONS

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INTRODUCTION

Thank you for choosing an HK Instruments DPT-Priima-MOD series transmitter. DPT-Priima-MOD is a multifunctional high accuracy transmitter for measuring volume flow, velocity, and static and differential pressure. It is designed for cleanrooms and other demanding applications. The measurements can be read and the configuration is done via Modbus communication. DPT-Priima-MOD can also be used with several different measurement probes such as FloXact™ or pitot tube, and air dampers. DPT-Priima-MOD models come with a local display and an automatic, zero-point calibration. A calibration certificate is available as an option.

APPLICATIONS

DPT-Priima-MOD is commonly used in applications requiring high measurement accuracy:

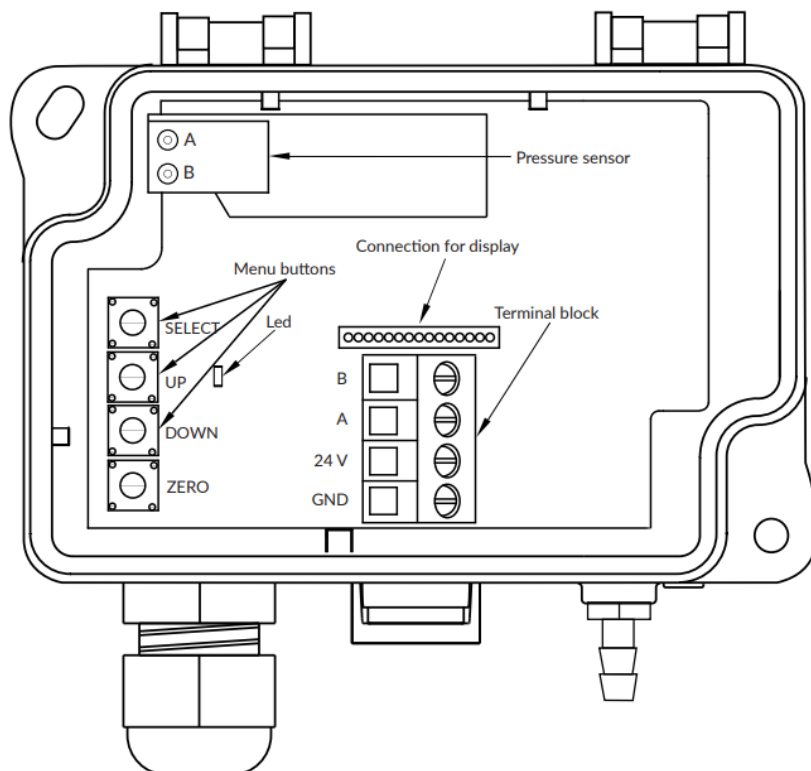
- monitoring pressure in cleanrooms

- monitoring pressure differences across the building envelope
- monitoring pressure and flow

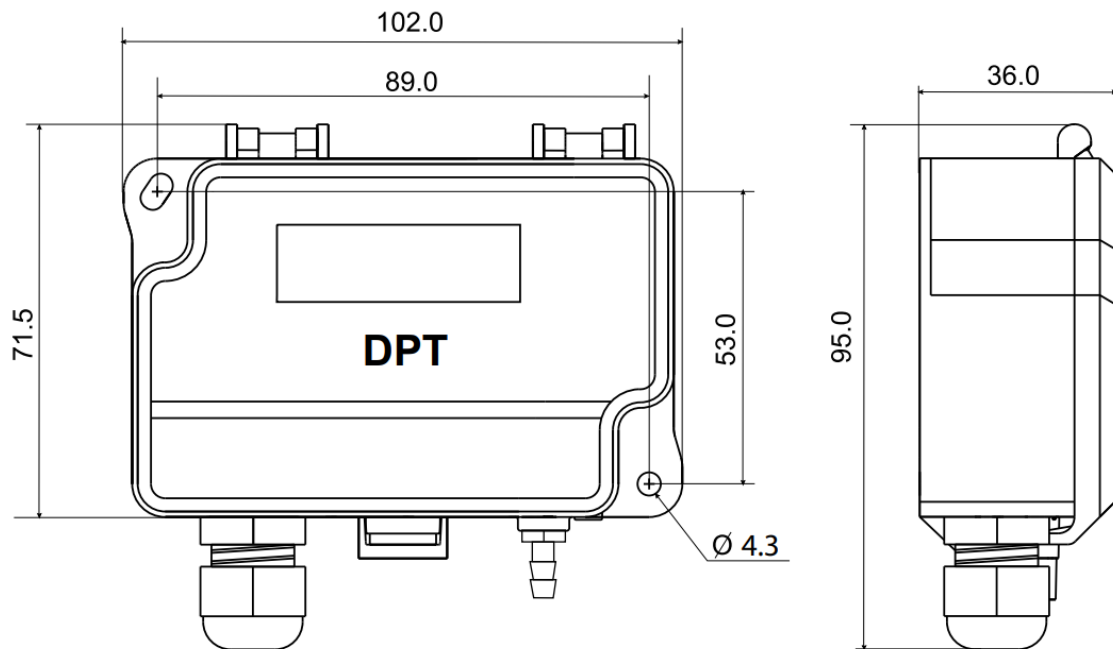
⚠ WARNING

- READ THESE INSTRUCTIONS CAREFULLY BEFORE ATTEMPTING TO INSTALL, OPERATE OR SERVICE THIS DEVICE.
- Failure to observe safety information and comply with instructions can result in PERSONAL INJURY, DEATH AND/OR PROPERTY DAMAGE.
- To avoid electrical shock or damage to equipment, disconnect power before installing or servicing and use only wiring with insulation rated for full device operating voltage.
- To avoid potential fire and/or explosion do not use in potentially flammable or explosive atmospheres.
- Retain these instructions for future reference.
- This product, when installed, will be part of an engineered system whose specifications and performance characteristics are not designed or controlled by HK Instruments. Review applications and national and local codes to assure that the installation will be functional and safe. Use only experienced and knowledgeable technicians to install this device.

SCHEMATICS



DIMENSIONAL DRAWINGS



INSTALLATION

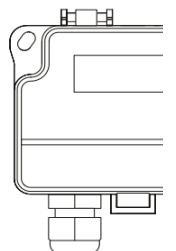
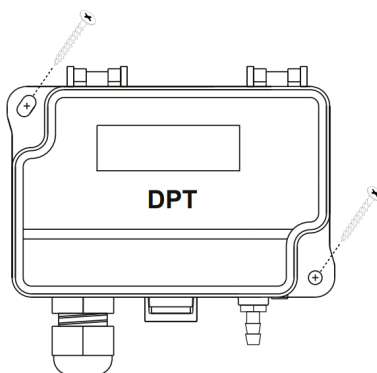
1. Mount the device in the desired location (see step 1).
2. Open the lid and route the cable through the strain relief and connect the wires to the terminal block(s) (see step 2).
3. The device is now ready for configuration.

⚠ WARNING! Apply power only after the device is properly wired.

STEP 1: MOUNTING THE DEVICE

1. Select the mounting location (duct, wall, panel).
2. Use the device as a template and mark the screw holes.
3. Mount with appropriate screws.

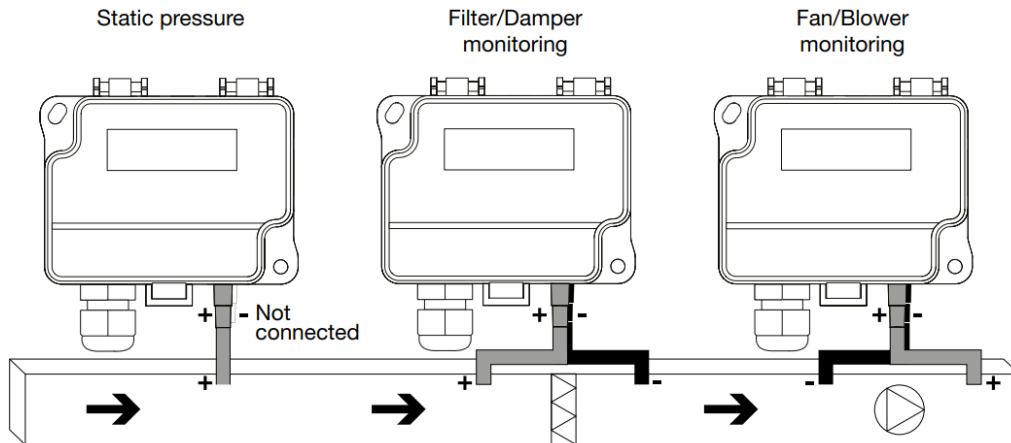
Figure 1a - Surface mounting



YES

Figure 1c - Application connections

Pressure



Flow

The pressure tubes are connected to a flow measurement probe (i.e. FloXact), or to the measurement ports specified by the fan manufacturer. Please see the FloXact installation guide or the fan manufacturer's technical specifications for more information.

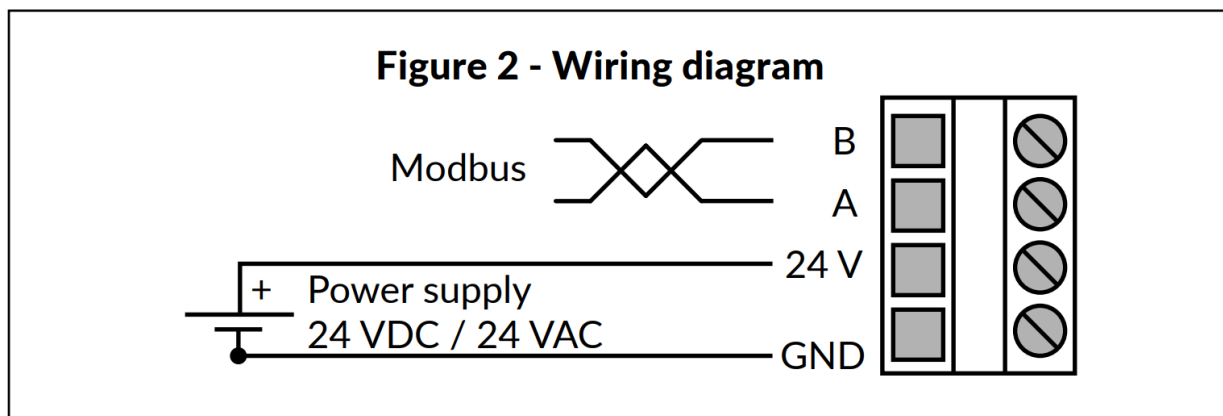
STEP 2: WIRING DIAGRAMS

For CE compliance, a properly grounded shielding cable is required.

1. Unscrew the strain relief and route the cable.
2. Connect the wires as shown in figure 2.
3. Tighten the strain relief.

It is recommended to use a shielded twisted pair cable for Modbus cabling.

The cable shield must be earthed only at one point, normally, at the end of the main cable.



STEP 3: CONFIGURATION

NOTE: The flow unit none is selected by default and the display shows only the pressure reading.

1. Activate the device Menu by pushing the select button for 2 seconds
2. Select the functioning mode of the flow meter:
 - Select Manufacturer when connecting DPT-Priima-MOD to a fan with pressure measurement points
 - Select Common probe when using DPT-Priima-MOD with a common measurement probe that follows the formula:

$$q = k \cdot \sqrt{\Delta P} \text{ (i.e. FloXact)}$$

MANUFACTURER
Common probe

☒ SELECT

☒ UP
☒ DOWN

Common probe

Fläkt Woods

☒ SELECT

☒ UP
☒ DOWN

3. If Common probe selected: select measurement units used in the formula (aka Formula unit) (i.e. l/s)

K-VALUE
9000.000

☒ SELECT

☒ UP
☒ DOWN

4. Select K-value

a. If manufacturer selected in step 2:

Each fan has a specific K-value. Select the K-value from fan manufacturer's specifications.

Manufacturer:..... K-value:

Fläktwoods.....k = 0.3...99

Rosenberg.....k = 37...800

Nicotra-Gebhardt.....k = 50...4700

Comefri.....k = 10...2000

Ziehl.....k = 10...1500

ebm-papst.....k = 10...1500

Gebhardt.....k = 50...4700

Nicotra.....k = 50...5300

b. If Common probe selected in step 1:

Each common probe has a specific K-value. Select the K-value from common probe manufacturer's specifications.

Available K-value range: 0.001...9999.000.

FORMULA UNIT
l/s

☒ SELECT

☒ UP
☒ DOWN

5. Select pressure unit for display: Pa, kPa, mbar, inWC, mmWC, psi or none.

PRESS.UNIT
Pa

☒ SELECT

☒ UP
☒ DOWN

6. Select desired pressure range:

±120 Pa, ±240 Pa, ±620 Pa, ±1240 Pa, ±2490 Pa

PRESS. RANGE
±120 Pa

☐ SELECT

☐ UP

☐ DOWN

7. Select flow unit for display:

Flow volume: m³/s, m³/h, cfm, l/s, none (default)

Velocity: m/s, f/min, none

FLOW UNIT
m³/s

☐ SELECT

☐ UP

☐ DOWN

8. Response time: Select response time between 0.4–20 s.

RESPONSE TIME
20 s

☐ SELECT

☐ UP

☐ DOWN

9. Select the address for Modbus: 1...247.

ADDRESS
99

☐ SELECT

☐ UP

☐ DOWN

10. Select the baud rate: 9600/19200/38400.

BAUD RATE
9600

☐ SELECT

☐ UP

☐ DOWN

11. Select the parity bit: None/Even/Odd.

PARITY BIT
NONE

☐ SELECT

☐ UP

☐ DOWN

12. Push select button to save changes and to exit menu.



STEP 4: ZEROING THE DEVICE

NOTE! Always zero the device before use.

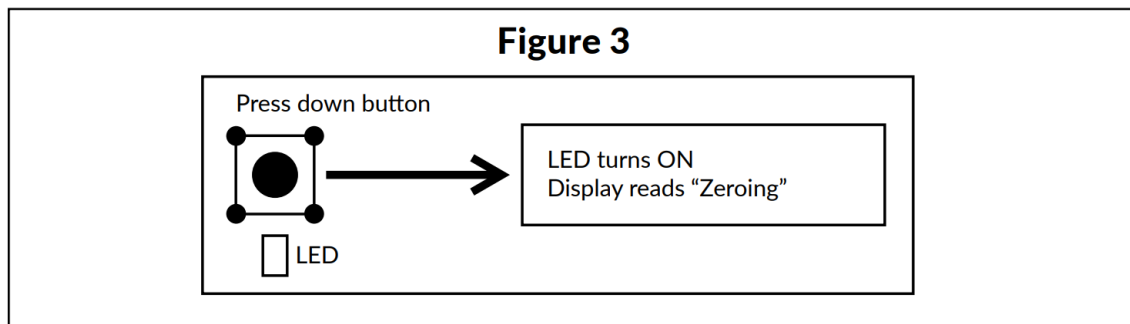
To zero the device three options are available:

1. Autozero calibration (manual zeroing not required)
2. Manual Pushbutton zero point calibration
3. Via Modbus register

1. Autozero calibration

Autozero calibration (-AZ) is an autozero function in the form of an automatic zeroing circuit built into the PCB board. The autozero calibration electronically adjusts the transmitter zero at predetermined time intervals (every 10 minutes). The function eliminates all output signal drift due to thermal, electronic or mechanical effects, as well as the need for technicians to remove high and low pressure tubes when performing initial or periodic transmitter zero point calibration. The autozero adjustment takes 4 seconds after which the device returns to its normal measuring mode. During the 4 second adjustment period, the output and display values will freeze to the latest measured value.

Transmitters equipped with the autozero calibration are virtually maintenance free and manual zeroing is not required.



2. Manual Pushbutton zero point calibration

NOTE: Supply voltage must be connected at least one hour prior to zero point adjustment.

- a) Disconnect both pressure tubes from the pressure ports labeled + and -.
- b) Push down the zero button until the LED light (red) turns on and the display reads "zeroing" (display option only). (see figure 3)

c) The zeroing of the device will proceed automatically in 4 seconds.

Zeroing is complete when the LED turns off, and the display reads 0 (display option only).

d) Reinstall the pressure tubes ensuring that the High pressure tube is connected to the port labeled +, and the Low pressure tube is connected to the port labeled -.

3. Via Modbus register

Make sure there is no pressure in the duct when the zeroing is done via Modbus register.

STEP 5: MODBUS REGISTERS

Function code 04 – Read input register

Register	Parameter description	Data Type	Value	Range
3×0001	Program version	16 bit	0...9900	0,00...99,00
3×0002	Pressure reading Pa	16 bit	-24900...24900 *	± 2490.0 Pa
3×0003	Pressure reading kPa	16 bit	-24900...24900 *	± 2.4900 kPa
3×0004	Pressure reading mbar	16 bit	-24900...24900 *	± 24.900 Pa
3×0005	Pressure reading mnnWC	16 bit	-25400...25400 *	± 253.91 mmWC
3×0006	Pressure reading inWC	16 bit	-10000...10000 *	± 10.000 inWC
3×0007	Pressure reading psi	16 bit	-3610...3610 *	± 0.3611 psi
3×0008	Flow m3/s	16 bit	0...10000	0...100 m3/s
3×0009	Flow m3/h	16 bit	0...30000	0...30000 m3/h
3×0010	Flow cfm	16 bit	0...30000	0...30000 cfm
3×0011	Flow l/s	16 bit	0...3000	0...3000 l/s
3×0012	Velocity m/s	16 bit	0...1000	0...100 m/s
3×0013	Velocity Unnin	16 bit	0...5000	0...5000 f/min

*) The value and range are determined by the selected pressure range ±120 Pa, ±240 Pa, ±620 Pa, ±1240 Pa, ±2490 Pa. The values shown in the table when the largest area is selected.

Function code 05 – Write single coil

Register	Parameter description	Data Type	Value	Range
0x0001	Zero point calibration	Bit 0	0...1	On – Off

Function code 03 – Read input holding register, Function code 06 – Write single register, Function code 16 – Write multiple registers

Register	Parameter description	Data Type	Value	Range
4×0001	Manufacturer	16 bit	0...8	0=F15kt Woods, 1=Rosenberg, 2=Nicotra-Gebhardt, 3=Comefri, 4=Ziehl, 5=ebm-papst, 6=Gebhardt, 7=Nicotra, 8=Common probe
4×0002	Formula unit (if manufacturer selection = common probe)	16 bit	0...5	0: m3/s, 1: m3/h, 2: cfm, 3: l/s, 4: m/s, 5: f/min
4×0003	K-factor integer	16 bit	0...9999	0...9999
4×0004	K-factor decimal	16 bit	0...999	0...999
4×0005	Response time	16 bit	0...20	0=0.4 s, 1=1 s, 2=2 s...20=20 s
4×0006	Pressure Range	16 bit	0...4	0=±120 Pa, 1=±240 Pa, 2=±620 Pa, 3=±1240 Pa, 4=±2490 Pa

RECYCLING/DISPOSAL



The parts left over from installation should be recycled according to your local instructions. Decommissioned devices should be taken to a recycling site that specializes in electronic waste.

WARRANTY POLICY

The seller is obligated to provide a warranty of five years for the delivered goods regarding material and manufacturing. The warranty period is considered to start on the delivery date of the product. If a defect in raw materials or a production flaw is found, the seller is obligated, when the product is sent to the seller without delay or before expiration of the warranty, to amend the mistake at his/her discretion either by repairing the defective product or by delivering free of charge to the buyer a new flawless product and sending it to the buyer. Delivery costs for the repair under warranty will be paid by the buyer and the return costs by the seller. The warranty does not comprise damages caused by accident, lightning, flood or other natural phenomenon, normal wear and tear, improper or careless handling, abnormal use, overloading, improper storage, incorrect care or reconstruction, or changes and installation work not done by the seller. The selection of materials for devices prone to corrosion is the buyer's responsibility, unless otherwise is legally agreed upon. Should the manufacturer alter the structure of the device, the seller is not obligated to make comparable changes to devices already purchased. Appealing for warranty requires that the buyer has correctly fulfilled his/her duties arisen from the delivery and stated in the contract. The seller will give a new warranty for goods that have been replaced or repaired within the warranty, however only to the expiration of the original product's warranty time. The warranty includes the repair of a defective part or device, or if needed, a new part or device, but not installation or exchange costs. Under no circumstance is the seller liable for damages compensation for indirect damage.

SPECIFICATIONS

Performance

Measurement ranges:

±120 Pa*, ±240 Pa, ±620 Pa, ±1240 Pa, ±2490 Pa (selectable via menu or Modbus)

*default range

Accuracy (at applied pressure):

0.4 % ±0.4 Pa

(Including general accuracy, linearity, hysteresis, long-term stability, and repetition error)

Overpressure:

Proof pressure: 10 kPa

Burst pressure: 30 kPa

Zero point calibration:

Automatic autozero, manual pushbutton, or via Modbus register

Response time:

0.4–20 s, selectable via menu or via Modbus register (63 % of the change)

Communication

Protocol: MODBUS over Serial Line

Transmission Mode: RTU

Interface: RS485

Byte format (11 bits) in RTU mode:

Coding System: 8-bit binary

Bits per Byte:

1 start bit

8 data bits, the least significant bit sent first 1 bit for parity 1 stop bit

Baud rate: selectable in configuration

Modbus address: 1–247 addresses selectable in the configuration menu

Technical Specifications**Media compatibility:**

Dry air or non-aggressive gases

Pressure units (select via menu):

Pa, kPa, mbar, inWC, mmWC, psi

Flow units (select via menu):

Volume: m³/s, m³/h, cfm, l/s

Velocity: m/s, ft/min

Measuring element:

MEMS, no flow-through

Environment:

Operating temperature: -5...50 °C

Temperature-compensated range 0...50 °C

Storage temperature: -40...70 °C

Humidity: 0 to 95 % RH, non-condensing

Physical**Dimensions:**

Case: 102.0 x 71.5 x 36.0 mm

Weight: 150 g

Mounting: 2 each 4.3 mm screw holes, one slotted

Materials: Case: ABS

Lid: PC

Pressure fittings: Brass

Tubing: Silicone

Protection standard: IP54

Display

2-line display (12 characters/line)

Line 1: Volume or velocity measurement

Line 2: Pressure measurement

Size: 46.0 x 14.5 mm

Electrical connections:

4-screw terminal block

Wire: 0.2–1.5 mm² (16–24 AWG)

Cable entry:

Strain relief: M16

Knockout : 16 mm

Pressure fittings

Male ø 5.2 mm

+ High pressure

– Low pressure

Electrical Supply voltage:

24 VAC or VDC ± 10 %

Power consumption:

< 1 W
< 2.2 W during AZ-calibration

Output signal:

via Modbus

Conformance

Meets requirements for:

	CE:	UKCA:
EMC:	2014/30/EU	S.I. 2016/1091
RoHS:	2011/65/EU	S.I. 2012/3032
WEEE:	2012/19/EU	S.I. 2013/3113

COMPANY WITH MANAGEMENT SYSTEM

CERTIFIED BY DNV

ISO 9001 • ISO 14001




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Installation version 1.0 2022

Documents / Resources

	<p>HK INSTRUMENTS DPT-Priima-MOD Multifunctional High Accuracy Transmitter [pdf] Instr uction Manual</p> <p>DPT-Priima-MOD, Multifunctional High Accuracy Transmitter, DPT-Priima-MOD Series</p>
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