HK INSTRUMENTS

USER-FRIENDLY MEASURING DEVICES

MADE IN FINLAND

DESIGN FROM FINLAND®

PRODUCT CATALOGUE	2018	EN

HIGH-QUALITY MEASURING DEVICES FOR CLEAN INDOOR AIR

HK Instruments is a family-owned Finnish company that helps its customers to keep the quality of indoor air and the functionality of buildings high, resulting in wellbeing and energy savings. We design highly accurate and easy-to-use measuring devices for HVAC applications in ventilation and building automation systems.

Having lived in the clean Finnish climate, we know what it is like to breath in good-quality fresh air. This is why we have been leading the way, in Finland and abroad, for 30 years, allowing everyone to enjoy good-quality indoor air.

Our advanced measuring devices produce highly accurate real-time information about indoor air to the building management system. This leads to high functionality of the building, which supports the wellbeing of people while keeping energy costs down. Our products are known for their ease of use. Applications for our devices range from highly demanding laboratory conditions to regular residential buildings.

We understand that there are different needs in different parts of the world and in different applications. This is why we work with you to customise our solutions for your needs. Using the information our devices produce, we help you to make smart decisions to support the wellbeing of your people and the functionality of your building. Our decades of experience and our broad product range allow us to offer our services to market areas at highly different levels of development.

PEOPLE SPEND NEARLY 90% OF THEIR TIME INDOORS. THE QUALITY OF INDOOR AIR IS NOT INSIGNIFICANT. CLEAN INDOOR AIR THAT MAINTAINS WELLBEING IS ONE OF THE PRECONDITIONS FOR LIFE. THE CORRECT KIND OF INDOOR AIR MAINTAINS HEALTH, ENERGY LEVELS AND COMFORT. GOOD-QUALITY INDOOR AIR SAVES COSTS IN HEALTHCARE AND BUILDING MAINTENANCE.

VALUES

- Family
- Friendship
- Basic Needs of People

VISION

HK Instruments has a vision of being the best in the world in manufacturing user-friendly measuring devices for HVAC, and being a friendly partner.

MISSION

Our mission is to provide clean indoor air and energy savings by manufacturing user-friendly measuring devices for HVAC.

30 YEARS OF EXPERIENCE

MANAGEMENT SYSTEM CERTIFICATION DNV·GL ISO 9001 = ISO 14001

FRIENDSHIP AND BUSINESS IN BRAZIL

Our journey is based on respect and trust, and for us it is a great pleasure to know that these principles are also present in HK.

Pennse is a Brazilian company, founded by very close friends with a common goal and a very ambitious vision: we seek to inspire solutions. We want our customers to do more with the resources they have. We want our customers to innovate and innovation is something present in HK. Constant product development and the desire to do more and better are HK characteristics.

Brazilian HVAC market has a number of particularities, among them, the preference for short-term results. We are confident that the way we are cooperating as partners with HK will lead us to changes. Changes for better. What drives us is the challenge to change and we believe it is the key for success. With powerful, reliable and safe products, we know that HK is the perfect choice for our market. It is a valuable investment!

Although Pennse is a young company, the relationship created with HK is solid and dynamic and has already brought us rewarding results, reinforcing the certainty that we are creating something long-lasting.

People from HK family are our true friends – this is the most important element in our cooperation.

Renato R. dos Santos
Managing director, Pennse Controles Ltda

HK INSTRUMENTS EXPERTISE IN CERN

CERN, the European Laboratory for Particle Physics, is carrying out a large project to monitor and regulate the air conditioning inside the LHC (Large Hadron Collider), the particle accelerator that lead to the discovery of the Higgs Boson. For the differential pressure measurements, CERN has selected the DPT250-R8 sensor from HK Instruments to meet the Organization's stringent requirements in terms of precision, reliability and ease of integration. A total of 50 DPT transmitters have been installed in the underground areas such as experimental caverns, across galleries and pressurized modules. In addition, air quality transmitters of type CDT2000 are used for the control of air conditioning in control rooms of the LHC experiments.

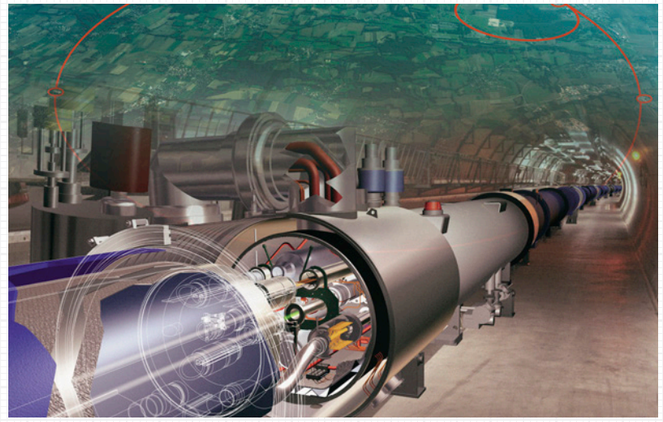


Image: CERN

PRODUCT PORTFOLIO

Solutions for measuring air pressure, air flow, air velocity, liquid pressure, temperature, CO_2 gas concentration and relative humidity within air handling and ventilation systems.

DIFFERENTIAL PRESSURE TRANSMITTERS

AIR FLOW AND VELOCITY TRANSMITTERS

PRESSURE AND FLOW CONTROLLERS

CARBON DIOXIDE TRANSMITTERS

HUMIDITY TRANSMITTERS

CARBON MONOXIDE TRANSMITTER

PRESSURE TRANSMITTERS FOR LIQUIDS

PASSIVE TEMPERATURE SENSORS

AIR PRESSURE GAUGES & MANOMETERS

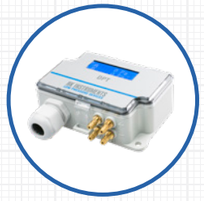
PRESSURE SWITCHES

FILTER ALERTS (DISPLAY + RELAY)

MICROMANOMETER

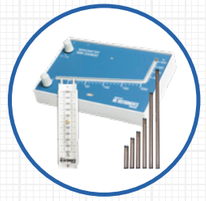

DPT-R8


DPT-MOD


DPT-DUAL


DPT-CTRL


DPG


MM/MMU/MMK


DPI


PS


DPT-FLOW


AVT

CDT2000


RHT DUCT


PTE-DUCT


PTE-ROOM

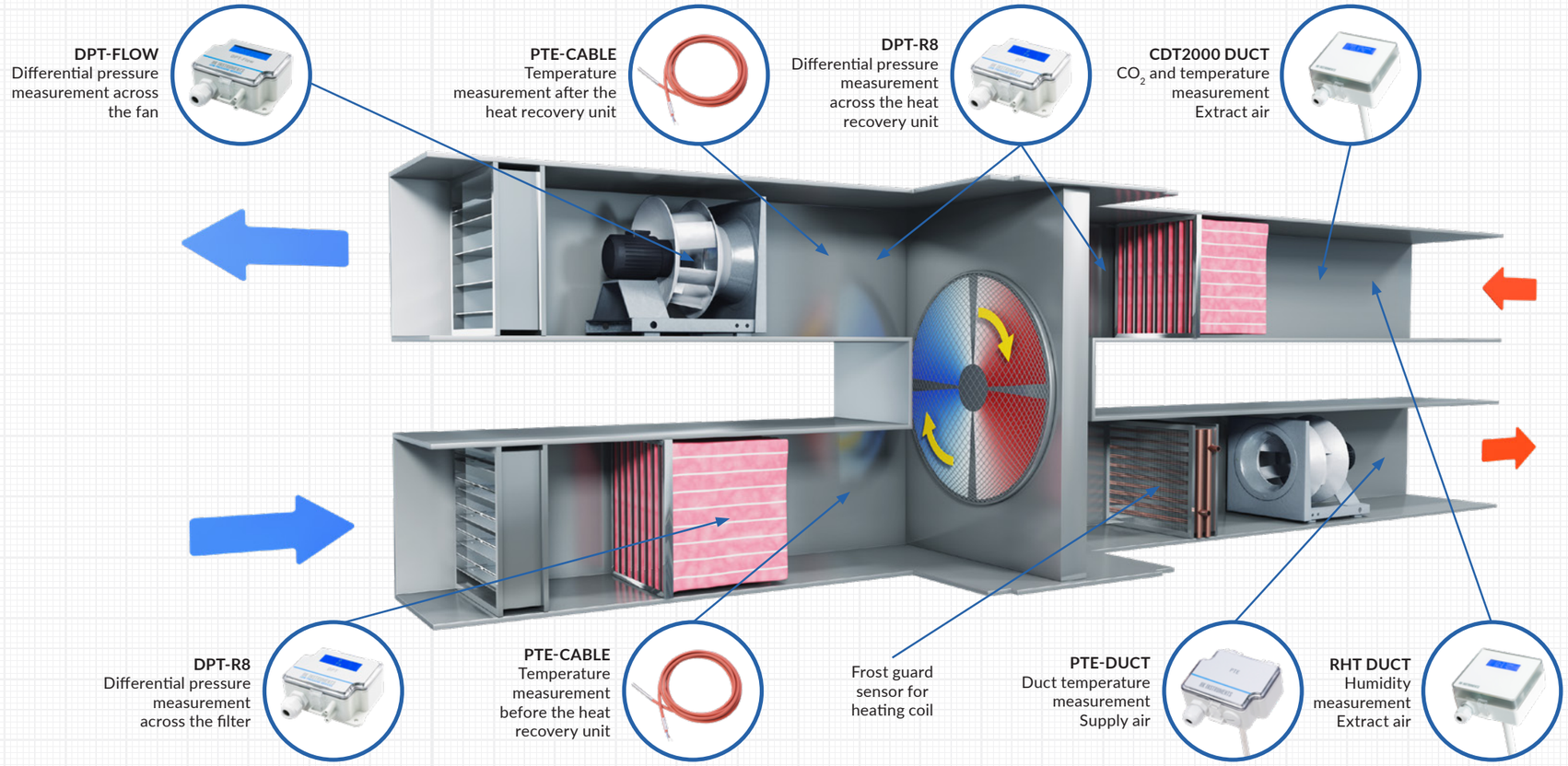

PTE-CABLE

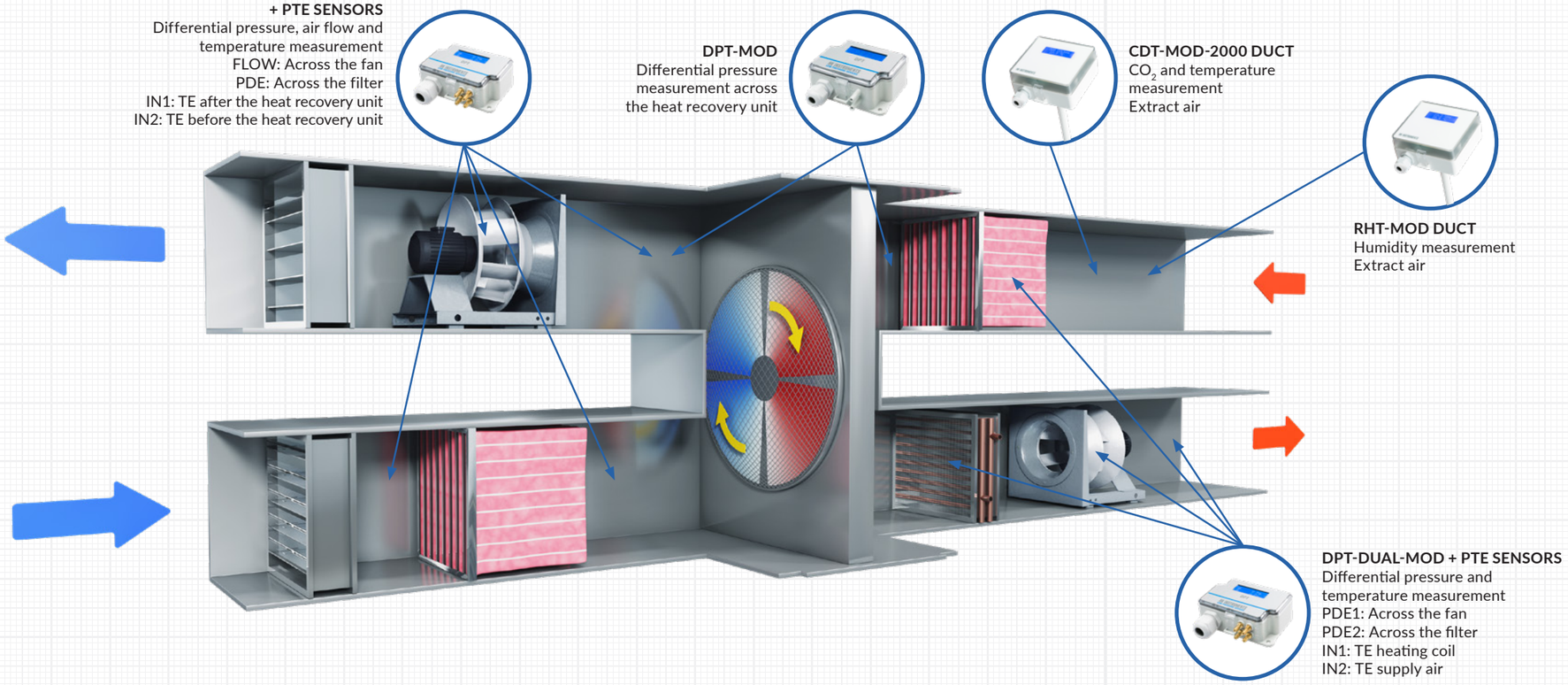

PTE-O

APPLICATIONS

DPT-Flow transmitters are used to actively control air flow and maintain pressure balance. Excellent results in indoor air quality and energy savings are reached when DPT-Flow is used with temperature and air quality sensors. Demand-controlled ventilation ensures good indoor air quality and comfortable conditions for everyone.

DPT-R8 transmitters are used to monitor filter and heat recovery systems. Monitoring is the key to maintaining clean filters and maximal efficiency of the heat recovery. This will reduce system load, which means energy and cost savings for the building owner.





MODBUS SOLUTION

Our main products are also available with Modbus communication. When using a bus solution, you need less wires in cables and fewer input points in the controller. As a result, you will save in costs of the devices and in the installation costs.

DPT-DUAL-MOD combines two differential pressure transmitters into one device. When using the Input terminal, temperature transmitters can be replaced with temperature sensors. This makes it possible to measure four different types of data.

With the Modbus solution you only need 4 wires as opposed to 23 wires when using the traditional solution.

Modbus

DIFFERENTIAL PRESSURE TRANSMITTERS

DPT series pressure transmitters are accurate and user-friendly devices with a stylish and modern design. Fully automated zero point calibration, AZ-calibration, offers reliability in the most sensitive of applications. In addition, the AZ-calibration provides cost savings over the lifetime of a building, as it makes the device completely maintenance-free.

The excellent usability of DPT-R8 series is widely known among electricians and installers all over the world. DPT-MOD and DPT-IO-MOD series Modbus transmitters can be connected on serial line and therefore require less wiring than traditional transmitters. Modbus communication is a modern and distortion-free way to transmit measurement data.

The DPT-DUAL-MOD with Modbus communication offers savings in the device and installation costs due to its two pressure sensors and Input terminal.

DPT-R8

DPT-MOD

DPT-IO-MOD

DPT-DUAL-MOD

DPT-2W

DIFFERENTIAL PRESSURE TRANSMITTERS

THREE-WIRE

USER-FRIENDLY DEVICES WITH AN EXCEPTIONAL DESIGN

DPT-R8	The DPT-R8 series includes electronic differential pressure transmitters that offer exceptional performance, high quality and economical pricing. Because of the high accuracy of the devices, it is usually not necessary to narrow down the range to get precise measurements. DPT-R8 devices are easily customizable, and also available for private labeling.
USAGE & APPLICATIONS	The differential pressure transmitter is used for measuring low pressures of air and non-combustible gases in order to monitor and control building automation, HVAC and cleanroom systems.
OPTIONS	**AZ:** autozero element **D:** display **S:** span point calibration for high accuracy applications **-40C:** cold-resistant model

TECHNICAL DETAILS

Accuracy (from applied pressure): (models 250 and 2500)	Pressure < 125 Pa = 1 % + ±2 Pa Pressure > 125 Pa = 1 % + ±1 Pa
Accuracy (from applied pressure): (model 7000)	Pressure < 125 Pa = 1.5 % + ±2 Pa Pressure > 125 Pa = 1.5 % + ±1 Pa
Zero point calibration:	automatic with autozero element (-AZ) or by pushbutton
Measuring units:	Pa, kPa, mbar, inchWC, mmWC, psi
Supply voltage:	24 VDC ±10 % / 24 VAC ±10 %
Power consumption:	< 1.0 W (< 1.2 W with output current 20 mA)
Output signals (3-wire):	0...10 VDC, Load R minimum 1 kΩ 4...20 mA, maximum load 500 Ω
Operating temperature:	-10...+50 °C (with autozero calibration -5...+50 °C) -40...+50 °C (-40C model)
Response time:	0.8 / 8 s
Protection standard:	IP54

DPT-R8

Example: DPT2500-R8-AZ-D	Product series		Model type	Zero point calibration	Display	Span point calibration
	DPT Differential pressure transmitter					
		Measuring ranges (Pa)				
		250 -150...+150 / -100...+100 / -50...+50 / -25...+25 / 0...25 / 0...50 / 0...100 / 0...250				
		2500 -100...+100 / 0...100 / 0...250 / 0...500 / 0...1000 / 0...1500 / 0...2000 / 0...2500				
		7000 0...1000 / 0...1500 / 0...2000 / 0...2500 / 0...3000 / 0...4000 / 0...5000 / 0...7000				
			Model type			
			-R8 Eight measuring ranges			
				Zero point calibration		
				-AZ With autozero calibration		
				Standard with pushbutton manual zero point calibration		
					Display	
					-D With display	
					Without display	
						Span point calibration
						-S Span point calibration
						Without span point calibration
Model	DPT	2500	-R8	-AZ	-D	

ACCESSORIES
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DIFFERENTIAL PRESSURE TRANSMITTERS

WITH AIR FLOW MEASUREMENT AND MODBUS COMMUNICATION

DPT-MOD	DPT-MOD is a multifunctional transmitter for measuring volume flow, velocity, and static and differential pressure. The measurements can be read and the configuration done via Modbus communication. DPT-MOD requires less wiring than the traditional 3-wire transmitters because multiple devices can be connected on serial line.
USAGE & APPLICATIONS	The DPT-MOD is used for measuring air flow or low pressures of air and non-combustible gases in order to monitor and control building automation, HVAC and cleanroom systems. It can also be used with several different measurement probes such as FLOXACT™ or pitot tube, and air dampers.

TECHNICAL DETAILS

Communication:	RS-485 Modbus (RTU)
Accuracy (from applied pressure): (model 2500)	Pressure < 125 Pa = 1 % + ±2 Pa Pressure > 125 Pa = 1 % + ±1 Pa
Accuracy (from applied pressure): (model 7000)	Pressure < 125 Pa = 1.5 % + ±2 Pa Pressure > 125 Pa = 1.5 % + ±1 Pa
Zero point calibration:	automatic with autozero element (-AZ), by pushbutton or via Modbus
Measuring units:	Pressure: Pa, kPa, mbar, inchWC, mmWC, psi Flow: m^3/s, m^3/h, cfm, l/s, m/s, ft/min
Supply voltage:	24 VAC ±10 % / 24 VDC ±10 %
Power consumption:	< 1.0 W
Output signal:	via Modbus
Response time:	1.0–20 s, selectable via menu or via Modbus
Operating temperature:	-10...+50 °C (with autozero calibration -5...+50 °C)
Protection standard:	IP54

ALL-IN-ONE TRANSMITTER: MEASURE VOLUME FLOW, VELOCITY AND DIFFERENTIAL PRESSURE

DPT-MOD

Example: DPT-MOD-2500-AZ-D	Product series		Model type		Measuring ranges (Pa)		Zero point calibration		Display	
	DPT	Differential pressure transmitter								
			-MOD	Modbus communication						
					-2500	-250...2500				
					-7000	-250...7000				
							-AZ	With autozero calibration		
								Standard with pushbutton manual zero point calibration		
									-D	With display
Model	DPT		-MOD		-2500		-AZ		-D	

Modbus

NOW AVAILABLE WITH AIR FLOW MEASUREMENT AND AUTOZERO CALIBRATION

ACCESSORIES
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DIFFERENTIAL PRESSURE TRANSMITTERS

WITH MODBUS COMMUNICATION AND INPUT TERMINAL

DPT-IO-MOD	DPT-IO-MOD differential pressure transmitter for air is designed for Modbus (RTU) communication network. The DPT-IO-MOD has an input terminal that turns it into a multifeatured transmitter. When using the input terminal, temperature transmitters can be replaced with temperature sensors. Very precise pressure sensor and easily operated interface make the device reliable and user-friendly.
USAGE & APPLICATIONS	The DPT-IO-MOD is used for measuring low pressures of air and non-combustible gases in order to monitor and control building automation, HVAC and cleanroom systems.

TECHNICAL DETAILS

Communication:	RS-485 Modbus (RTU)
Accuracy (from applied pressure): (model 2500)	Pressure < 125 Pa = 1 % + ±2 Pa Pressure > 125 Pa = 1 % + ±1 Pa
Accuracy (from applied pressure): (model 7000)	Pressure < 125 Pa = 1.5 % + ±2 Pa Pressure > 125 Pa = 1.5 % + ±1 Pa
Zero point calibration:	via Modbus or by pushbutton
Measuring units:	Pa, kPa, mbar, inchWC, mmWC, psi
Supply voltage:	24 VDC ±10 % / 24 VAC ±10 %
Power consumption:	< 1.3 W
Operating temperature:	-10...+50 °C
Response time:	1...20 s selectable via menu
Protection standard:	IP54

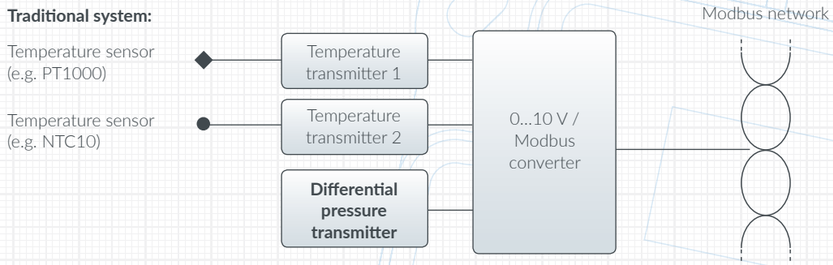
SAVE IN COSTS OF THE DEVICES AND IN THE INSTALLATION COSTS

DPT-IO-MOD

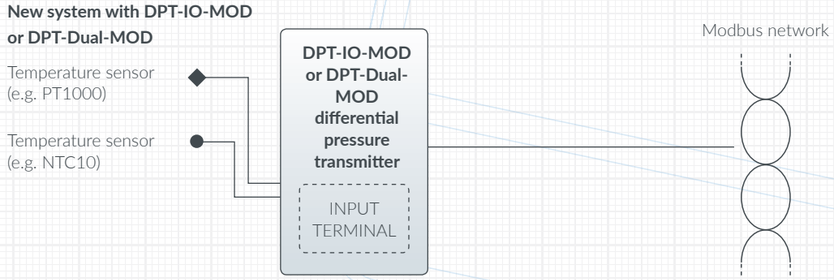
Example: DPT-IO-MOD-2500-D	Product series			
	DPT	Differential pressure transmitter		
		Model type		
		-IO-MOD	Input terminal and Modbus communication	
			Measuring ranges (Pa)	
			-2500	-250...2500
			-7000	-250...7000
				Display
				-D With display
Model	DPT	-IO-MOD	-2500	-D

Modbus

Traditional system:



New system with DPT-IO-MOD or DPT-Dual-MOD



ACCESSORIES
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DIFFERENTIAL PRESSURE TRANSMITTER

WITH TWO PRESSURE SENSORS

DPT-DUAL-MOD	DPT-DUAL-MOD combines two differential pressure transmitters into one device. It offers a possibility to measure pressure from two different points. One of the measurements can be set to show the air flow rate. DPT-DUAL-MOD has a Modbus interface and an Input terminal. When using the Input terminal, temperature transmitters can be replaced with temperature sensors. As a result, you will save in costs of the devices and in the installation costs. The AHU model that includes an air flow transmitter has been designed especially for ventilation units.
USAGE & APPLICATIONS	DPT-DUAL-MOD can be used in all applications where you need to measure two different pressures. With the AHU model one of the measurements can be air flow. The devices are suitable for air and non-combustible gases.

TECHNICAL DETAILS

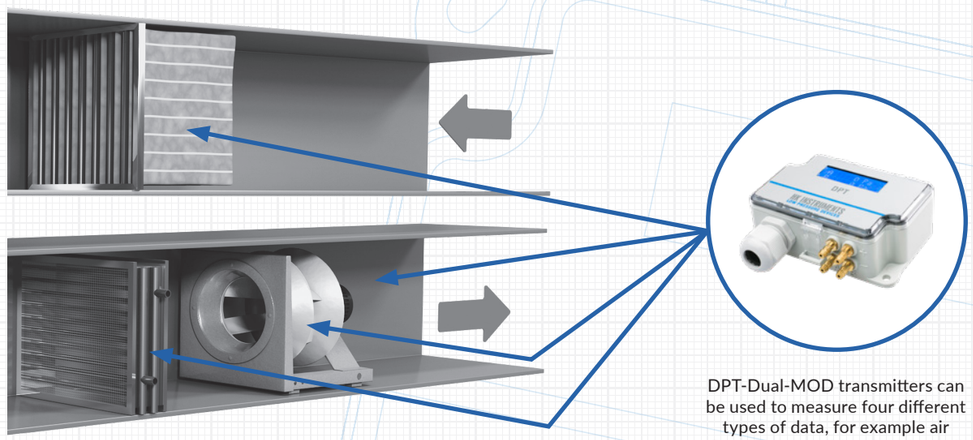
Communication:	RS-485 Modbus (RTU)
Accuracy (from applied pressure): (model 2500)	Pressure < 125 Pa = 1 % + ±2 Pa Pressure > 125 Pa = 1 % + ±1 Pa
Accuracy (from applied pressure): (model 7000)	Pressure < 125 Pa = 1.5 % + ±2 Pa Pressure > 125 Pa = 1.5 % + ±1 Pa
Zero point calibration:	via Modbus or by pushbutton
Measuring units:	Pressure: Pa, kPa, mbar, inchWC, mmWC, psi Flow: (AHU model) m^3/s, m^3/h, cfm, l/s, m/s, ft/min
Supply voltage:	24 VDC ±10 % / 24 VAC ±10 %
Power consumption:	< 1.3 W
Operating temperature:	-10...+50 °C
Response time:	1...20 s selectable via menu
Protection standard:	IP54

AHU MODEL INCLUDES AN AIR FLOW TRANSMITTER

DPT-DUAL-MOD

Example: DPT-Dual-MOD-2500-D	Product series			
	DPT	Differential pressure transmitter		
		Model type		
		-Dual-MOD	Two pressure sensors and Modbus communication	
			Measuring ranges (Pa)	
			-2500	-250...2500
			-7000	-250...7000
			-AHU	both 2500 and 7000 sensors, with flow measurement
				Display
				-D With display
Model	DPT	-Dual-MOD	-2500	-D

Modbus



DPT-Dual-MOD transmitters can be used to measure four different types of data, for example air flow, filter condition, heating coil and air temperature.

ACCESSORIES
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DIFFERENTIAL PRESSURE TRANSMITTERS

TWO-WIRE

DPT-2W	The DPT-2W is a differential pressure transmitter with two-wire connection.
USAGE & APPLICATIONS	The differential pressure transmitter is used for measuring low pressures of air and non-combustible gases in order to monitor and control building automation, HVAC and cleanroom systems.

TECHNICAL DETAILS

Accuracy (from FS):	±1.5 %
Long term stability, typical 1 year:	≤ ± 8 Pa; model 2500
Measuring unit:	Pa
Zero point calibration:	by pushbutton
Supply voltage:	10...35 VDC
Output signal:	4...20 mA
Operating temperature:	-10...+50 °C
Response time:	0.8 / 4 s
Protection standard:	IP54

DPT-2W

Example: **DPT-2W-2500-R8-D**	**Product series**				
	DPT-2W	Differential pressure transmitter with 2-wire configuration			
		Measuring ranges (Pa)			
		-2500	-100...+100 / 0...100 / 0...250 / 0...500 / 0...1000 / 0...1500 / 0...2000 / 0...2500		
			Model type		
			-R8	Eight measuring ranges	
				Display	
				-D	With display
					Without display
Model	DPT-2W	-2500	-R8	-D	

ACCESSORIES
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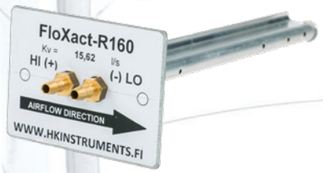
AIR FLOW AND VELOCITY TRANSMITTERS

DPT-FLOW transmitters are unique devices that make measuring air flow and air velocity easier than ever before. Together with FLOXACT™ measurement probes the same devices are the right option when measuring flow in a duct. Again, if you wish to measure air velocity, your selection would be AVT which offers multiple measuring ranges in a single device together with relay and temperature output signals.

DPT-FLOW



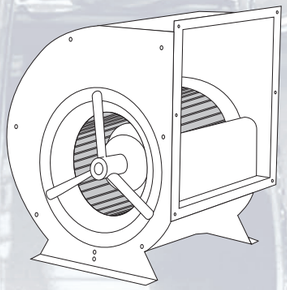
FLOXACT™

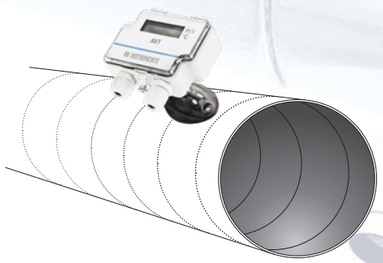
DPT-FLOW-BATT

AVT

FLOW MEASUREMENT

PRODUCT SELECTION GUIDE





Fan flow measurement
(Measuring inlets in the fan)

- **Electricity available**
  - **Note:** Check the K-value from the fan's technical sheet
  - **Fan manufacturers:** Fläkt Woods, Rosenberg, Comefri, Ziehl-Abegg, ebm-papst, Nicotra Gebhardt
  - **Other fan types with formula** $Q = K * \sqrt{\Delta P}$
  - → **DPT-FLOW** Fan flow transmitter → **Info:** Air flow display and output
- **Electricity not available**
  - **Fixed scale, specific type of fan** → **DPG+FLOW SCALE** Mechanical flow meter
  - **Flexible** → **DPT-FLOW-BATT** Fan flow meter with battery → **Supported fan manufacturers:** Fläkt Woods, Rosenberg, Comefri, Ziehl-Abegg, ebmpapst, Nicotra Gebhardt

Flow in duct

- **Electricity available**
  - **Customer's own probe** For example iris damper, pressure grid, pitot tube etc.
    - → **DPT-FLOW** Flow transmitter → **Info:** Air flow display and output
  - **Probe not available**
    - **Air volume measurement** → **DPT-FLOW +FLOXACT** Flow transmitter with probe → **Info:** Based on multipoint measurement, high accuracy
    - **Air velocity and temperature measurement with optional relay output** → **AVT** Air velocity transmitter → **Info:** Based on hot wire technique, no need for external probes or tubes
- **Electricity not available**
  - **Customer's own probe** For example iris damper, pressure grid, pitot tube etc.
    - → **DPG+FLOW SCALE** Mechanical flow meter
  - **Probe not available**
    - → **DPG+FLOW SCALE +FLOXACT** Mechanical flow meter with probe

FLOW TRANSMITTER FOR HVAC SYSTEMS

IDEAL PRODUCT FOR MEASURING THE FLOW RATE BOTH ON CENTRIFUGAL FANS AND IN A DUCT SYSTEM

DPT-FLOW	DPT-FLOW is a flow transmitter that provides an easy way to measure the flow rate on centrifugal fans or in a duct system. One device is suitable for a range of fan types. It can also be used with several different measurement probes such as FLOXACT™ or pitot tube, and air dampers.
USAGE	The DPT-FLOW can be used to measure the air flow on centrifugal fans or as a transmitter to regulate the air flow in a duct or on the selected fan or blower. It can also be used in a duct system or in air-handling units as an on-site display for flow.
APPLICATIONS	The DPT-FLOW is an ideal instrument for air flow monitoring and control, and fan and blower control.

TECHNICAL DETAILS

Accuracy (from applied pressure): (models 1000 and 2000)	Pressure < 125 Pa = 1 % + ±2 Pa Pressure > 125 Pa = 1 % + ±1 Pa
Accuracy (from applied pressure): (models 5000 and 7000)	Pressure < 125 Pa = 1.5 % + ±2 Pa Pressure > 125 Pa = 1.5 % + ±1 Pa
Zero point calibration:	automatic with autozero element (-AZ) or by pushbutton
Measuring units:	Pressure: Pa, kPa, mbar, inchWC, mmWC, psi Flow: m^3/s, m^3/h, cfm, l/s, m/s, ft/min
Supply voltage:	24 VAC ±10 % / 24 VDC ±10 %
Power consumption:	< 1.0 W
Output signals for pressure and air flow (selectable by jumper):	0...10 VDC, Load R minimum 1 kΩ or 4...20 mA, maximum load 500 Ω
Operating temperature:	-10...+50 °C (with autozero calibration -5...+50 °C)
Response time:	1...20 s
Protection standard:	IP54
Calculation formula:	$V = k * \sqrt{\Delta P(Pa)}$

ALSO USABLE WITH MEASUREMENT PROBES SUCH AS FLOXACT™, PITOT TUBES, AND AIR DAMPERS

DPT-FLOW

Example: DPT-Flow-2000-AZ-D	Product series				
	DPT-Flow	Flow transmitter for HVAC systems			
		Model type			
			Analog outputs		
			Measuring ranges (Pa)		
			-1000	0...1000	
			-2000	0...2000	
			-5000	0...5000	
			-7000	0...7000	
				Zero point calibration	
				-AZ	With autozero calibration
					Standard with pushbutton manual zero point calibration
					Display
					-D With display
Model	DPT-Flow		-2000	-AZ	-D

PRE-PROGRAMMED FAN MANUFACTURERS

Fläkt Woods, Rosenberg, Nicotra Gebhardt, Comefri, Ziehl-Abegg, ebm-papst

The fan only needs to have a pressure tap/port to which the DPT-Flow can be connected

ACCESSORIES
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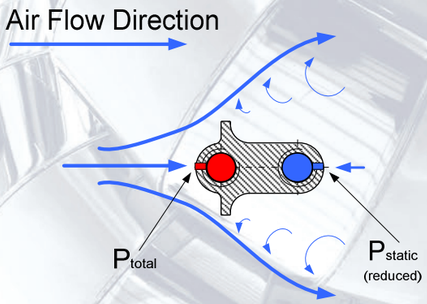
FLOXACT™



Operation of the FloXact™

APPLICATION	The FLOXACT™ probe is a differential air pressure device designed to measure air volume flow in a duct. It includes multiple sensing points to measure total and static pressures. The FLOXACT™ probe incorporates a unique design to amplify the differential pressure by 2.5 times for accurate measurement of lower air velocities down to 1.0 m/s (200 fpm). It is easy to install and cost-effective.
DESIGN FEATURES	• Multiple sensing points for greater accuracy • Easy installation • Chamfered sensing points for consistent readings • 2 % accuracy • 2.5 X signal amplification • Accepts 1/4” OD tubing

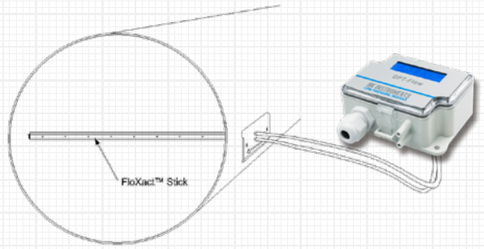


Figure 1. FloXact™ -R mounting.

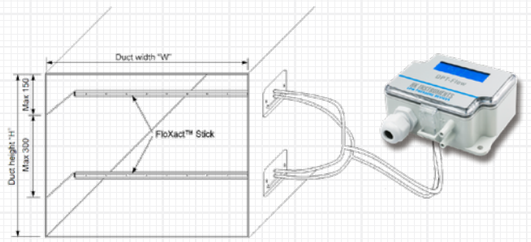
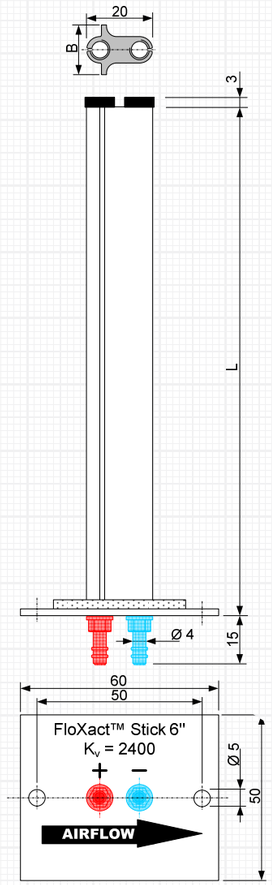


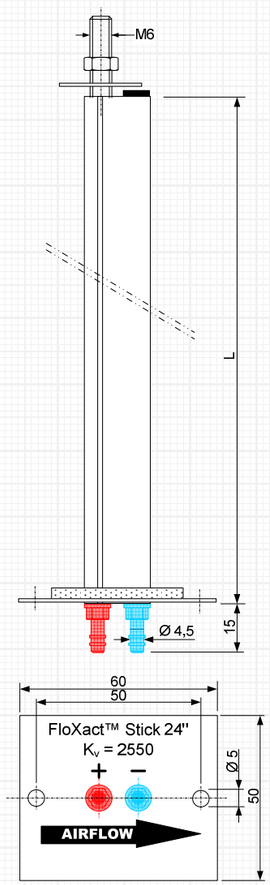
Figure 2. FloXact™ -L mounting.

Dimensions

FloXact™-R available models :
All standard round duct sizes up to 1200 m



FloXact™-L available models :
250, 300, … 1200 (50 mm steps)



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BATTERY POWERED AIR FLOW METER

DPT-FLOW-BATT	DPT-FLOW-BATT is a user-friendly on-site display for air flow designed for environments and applications where electricity is not available. One device is suitable for a range of different fan types. It also provides an easy way to measure flow rate in a duct system for example together with a FLOXACT™ averaging measurement probe.
USAGE & APPLICATIONS	The DPT-FLOW-BATT is an on-site display designed for air handling units to measure the air flow on centrifugal fans. The DPT-FLOW-BATT can also be used in the duct system as an on-site display for flow. The device can be used with several different measurement probes such as FLOXACT™ or pitot tube, and air dampers. The requirement is that the K-value of the measurement probe or damper is known.

TECHNICAL DETAILS

Accuracy (from FS):	±1.5 % (Including: general accuracy, temperature drift, linearity, hysteresis, long term stability, and repetition error)
Zero point calibration:	by pushbutton
Measuring units:	Pressure: Pa, kPa, mbar, inchWC, mmWC, psi Flow: m^3/s, m^3/h, cfm, l/s, m/s, ft/min
Supply voltage:	9 V battery
Current consumption:	~20 mA on active mode
Operating temperature:	-10...+50 °C
Response time:	1.0–10 s, selectable via menu
Protection standard:	IP54

DPT-FLOW-BATT

Example: DPT-Flow-Batt-7000-D	Product series		
	DPT-Flow-Batt	Battery powered air flow meter	
		Measuring ranges (Pa)	
		-7000	0...7000
			Display
			-D With display
Model	DPT-Flow-Batt	-7000	-D

MEASURE THE AIR FLOW IN ENVIRONMENTS WHERE ELECTRICITY IS NOT AVAILABLE

ACCESSORIES
SEE PAGE 78

AIR VELOCITY TRANSMITTER

AIR VELOCITY AND TEMPERATURE TRANSMITTER WITH RELAY OUTPUT

AVT	The AVT is an electronic air velocity and temperature transmitter for air and non-combustible gases with optional relay output.
USAGE	AVT is used in HVAC and building automation systems.
APPLICATIONS	Monitoring air velocity and temperature in ducts and laminar flow cabinets, and at ventilators and dampers.

TECHNICAL DETAILS

Accuracy (from reading):	< 0.2 m/s + 5 % (Range 0...2 m/s) < 0.5 m/s + 5 % (Range 0...10 m/s) < 1.0 m/s + 5 % (Range 0...20 m/s)
Measuring units:	m/s, °C
Supply voltage:	24 VDC ±10 % / 24 VAC ±10 %
Power consumption:	35 mA (50 mA with relay) + 40 mA with mA outputs
Output signal 1:	0...10 V (linear to °C), L min 1 kΩ or 4...20 mA (linear to °C), L max 400 Ω
Output signal 2:	0...10 V (linear to m/s), L min 1 kΩ or 4...20 mA (linear to m/s), L max 400 Ω
Optional relay output:	Potential free SPDT 250 VAC, 6 A / 30 VDC, 6 A with adjustable switching point and hysteresis
Operating temperature:	0...+50 °C
Probe:	Adjustable immersion length 50...190 mm, mounting flange included
Protection standard:	IP54

AVT

Example: AVT-D-R	Product series		
AVT	Air velocity transmitter, measuring ranges 0...2 / 0...10 / 0...20 m/s		
	Display		
	-D	With display	
		Without display	
		Relay	
		-R	With relay
			Without relay
Model	AVT	-D	-R

ACCESSORIES
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PRESSURE AND FLOW CONTROLLERS

The DPT-CTRL series PID controllers are engineered for stand-alone building automation in the HVAC/R industry. With the built-in controller it is possible to control the constant pressure or flow of fans, VAV systems or dampers. DPT-CTRL series offers various models for energy-efficient control of modern EC fans in all sizes of systems.

The DPT-CTRL-MOD can be used as a pressure or flow controller in modular building automation systems. Setpoints and other parameters can be adjusted remotely via bus. With the temperature compensation feature, the fan speed can be adjusted according to temperature. This saves energy by exhausting the right amount of air in cold environments.

DPT-CTRL-2SP is a perfect choice for small independent systems where the user can choose the desired air flow from two separate setpoints by using for example occupancy sensor or key card switch.

DPT-CTRL

DPT-CTRL-2SP

DPT-CTRL-MOD

PID CONTROLLERS

WITH DIFFERENTIAL PRESSURE OR AIR FLOW TRANSMITTER

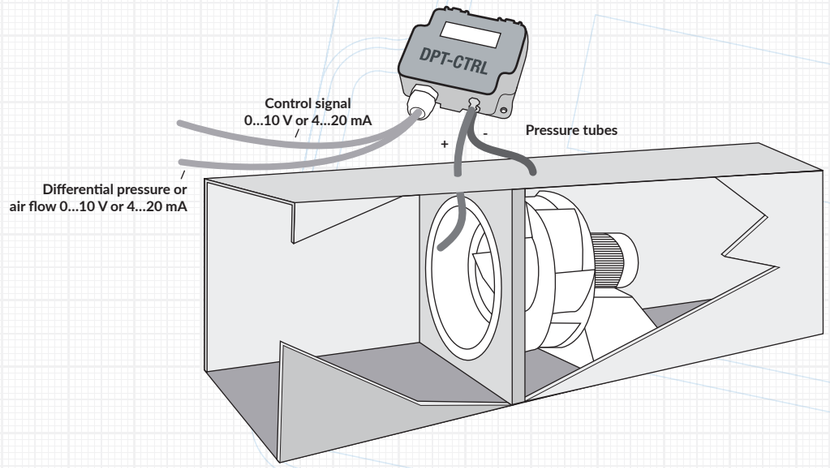
DPT-CTRL	DPT-CTRL is a multifunctional PID controller with differential pressure or air flow transmitter. It enables controlling constant pressure or flow of fans, VAV systems or dampers. When controlling flow, it is possible to select a fan manufacturer or a common measuring probe that has a K-value.
USAGE & APPLICATIONS	DPT-CTRL can be used to control air flow or constant pressure in applications where it is important to keep a constant vacuum or a steady air flow, such as vacuuming units in renovation sites that keep a constant negative pressure so that impurities do not spread to other spaces.

TECHNICAL DETAILS

Accuracy (from applied pressure): (model 2500)	Pressure < 125 Pa = 1 % + ±2 Pa Pressure > 125 Pa = 1 % + ±1 Pa
Accuracy (from applied pressure): (model 7000)	Pressure < 125 Pa = 1.5 % + ±2 Pa Pressure > 125 Pa = 1.5 % + ±1 Pa
Measuring units:	Pressure: Pa, kPa, mbar, inchWC, mmWC, psi Flow: m^3/s, m^3/h, cfm, l/s, m/s, ft/min
Control signal:	0...10 V or 4...20 mA (selectable by jumper)
Output signal for pressure or air flow (selectable via menu):	0...10 VDC, Load R minimum 1 kΩ or 4...20 mA, maximum load 500 Ω (selectable by jumper)
PID-parameters:	Adjustable via menu
Zero point calibration:	Automatic with autozero element (-AZ) or by pushbutton
Supply voltage:	24 VDC ±10 % / 24 VAC ±10 %
Power consumption:	< 1.0 W
Operating temperature:	-10...+50 °C (with autozero calibration -5...+50 °C)
Protection standard:	IP54

DPT-CTRL

Example: DPT-Ctrl-2500-AZ-D	Product series				
	DPT-Ctrl	Pressure and flow controller			
		Model type			
		Analog outputs			
		Measuring ranges (Pa)			
		-2500	0...2500		
		-7000	0...7000		
			Zero point calibration		
			-AZ	With autozero calibration	
				Standard with pushbutton manual zero point calibration	
				Display	
				-D	With display
Model	DPT-Ctrl		-2500	-AZ	-D



ACCESSORIES
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PID CONTROLLERS

WITH DIFFERENTIAL PRESSURE OR AIR FLOW TRANSMITTER AND MODBUS COMMUNICATION

DPT-CTRL-MOD	The DPT-CTRL-MOD controller is engineered for building automation in the HVAC industry. With the built-in controller of the DPT-CTRL-MOD it is possible to control the constant pressure or flow of fans, VAV systems or dampers. When controlling air flow, it is possible to select a fan manufacturer or a common measuring probe that has a K-value. Modbus communication enables remote adjustment of the setpoint and other parameters, so it can be used as a part of building management systems (BMS).
USAGE & APPLICATIONS	DPT-CTRL-MOD is designed to be used in buildings with a BMS to control air flow or constant pressure of an individual zone. A building operator can easily monitor and adjust the parameters via Modbus. The outdoor temperature compensation feature brings energy savings in cold areas automatically by decreasing extract air flow rates to preserve warm air.

TECHNICAL DETAILS

Communication:	RS-485 Modbus (RTU)
Accuracy (from applied pressure):	Pressure < 125 Pa = 1 % + ±2 Pa Pressure > 125 Pa = 1 % + ±1 Pa
Measuring units:	Pressure: Pa, kPa, mbar, inchWC, mmWC, psi Flow: m^3/s, m^3/h, cfm, l/s, m/s, ft/min
Control signal:	0...10 V
PID-parameters:	Selectable via menu and Modbus
Zero point calibration:	via Modbus or by pushbutton
Supply voltage:	24 VDC ±10 % / 24 VAC ±10 %
Power consumption:	< 1.0 W
Operating temperature:	-10...+50 °C
Protection standard:	IP54

DPT-CTRL-MOD

Example: DPT-Ctrl-MOD-2500-D	Product series			
	DPT-Ctrl	Pressure and flow controller		
		Model type		
		-MOD	Modbus communication	
			Measuring ranges (Pa)	
			-2500	-250...2500
				Display
				-D With display
Model	DPT-Ctrl	-MOD	-2500	-D

Modbus

ACCESSORIES
SEE PAGE 78

PID CONTROLLERS

WITH TWO SETPOINTS

DPT-CTRL-2SP MAY BE USED AS A MEANS OF SAVING ENERGY WHEN A ROOM IS NOT OCCUPIED

DPT-CTRL-2SP	DPT-CTRL-2SP is designed for simple systems to control constant pressure or air flow of fans, VAV systems or dampers. The device has a binary input to select between two user-adjustable setpoints. When controlling air flow, it is possible to select a fan manufacturer or a common measuring probe that has a K-value. The device also includes a temperature sensor input which enables compensation of flow or pressure according to for example outside temperature.
USAGE & APPLICATIONS	DPT-CTRL-2SP can be used to control air flow or constant pressure in applications where it is important to keep a constant vacuum or steady air flow. Energy savings and optimal indoor air quality can be achieved because of the two setpoints and the outdoor temperature compensation feature of the device. The desired setpoint can be selected, for example, with weekly clock, turn switch or key card switch.

TECHNICAL DETAILS

Accuracy (from applied pressure): (model 2500)	Pressure < 125 Pa = 1 % + ±2 Pa Pressure > 125 Pa = 1 % + ±1 Pa
Measuring units:	Pressure: Pa, kPa, mbar, inchWC, mmWC, psi Flow: m^3/s, m^3/h, cfm, l/s, m/s, ft/min
Control signal:	0...10 VDC
Output signal:	None
PID-parameters:	Adjustable via menu
Zero point calibration:	by pushbutton
Supply voltage:	24 VDC ±10 % / 24 VAC ±10 %
Power consumption:	< 1.0 W
Operating temperature:	-10...+50 °C
Protection standard:	IP54

DPT-CTRL-2SP

Example: DPT-Ctrl-2SP-2500-D	Product series			
	DPT-Ctrl	Pressure and flow controller		
		Model type		
		-2SP	Two setpoints (switchable via binary input), only control output	
			Measuring ranges (Pa)	
			-2500	-250...2500
				Display
				-D With display
Model	DPT-Ctrl	-2SP	-2500	-D

ACCESSORIES
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CARBON DIOXIDE TRANSMITTERS

CDT2000 series products are economical and versatile devices that measure CO_2 concentration and temperature (T). These devices are available for duct or wall mounting. CDT2000 is the first device measuring CO_2 with a large touchscreen display enabling easy configuration and adjustment. CDT2000 Duct is a cost-effective solution for measuring the total concentration of CO_2 in duct systems.

CDT2000

CDT2000 DUCT

CARBON DIOXIDE TRANSMITTERS

WALL MOUNTED

TOUCHSCREEN DISPLAY FOR EASY ADJUSTMENT

CDT2000	CDT2000 combines CO_2 concentration, temperature and optional relative humidity measurements into one easy-to-use device with a touchscreen display. It offers easy installation and adjustment, several different model options and various output signals that are configurable separately for each measurement parameter. CDT2000 utilizes the industry standard NDIR measurement principle with self-calibrating ABC logic™ for CO_2 measurement. CDT2000-DC is a dual channel model with a measuring channel and a reference channel that makes a continuous comparison and the necessary adjustment accordingly. CDT2000-DC is also suitable for buildings that are continuously occupied.
USAGE & APPLICATIONS	CDT2000 wall mount model is used to monitor and control CO_2 and humidity levels in offices, public spaces, meeting rooms and classrooms. CDT2000-DC series devices can also be used in applications where there is a constant source of carbon dioxide present (for example hospitals and greenhouses).

TECHNICAL DETAILS

Accuracy:	CO_2: ±40 ppm + 2 % of reading, DC model: 75 ppm or 10 % of reading (whichever is greater) Temperature: <0.5 °C Relative humidity: ±2...3 % rH at 0...50 °C and 10...90 % rH Total error band includes accuracy, hysteresis and temperature effect over 5...50 °C and 10–90 % rH
Measurement elements:	Pt1000 temperature sensor, Non Dispersive Infrared (NDIR) CO_2 sensor, thermoset polymer capacitive sensing element for humidity
Measuring units:	ppm, °C, % rH
Calibration:	Automatic self-calibration, ABC Logic™ or continuous comparison (DC)
Supply voltage:	24 VDC/VAC ±10 %
Current consumption:	max 90 mA (at 24 V) + 10 mA for each voltage output or 20 mA for each current output
Output signal 1:	0/2...10 V (linear to CO_2), L min 1 kΩ or 4...20 mA (linear to CO_2), L max 500 Ω
Output signal 2:	0/2...10 V (linear to rH), L min 1 kΩ or 4...20 mA (linear to rH), L max 500 Ω
Output signal 3:	0/2...10 V (linear to Temp), L min 1 kΩ or 4...20 mA (linear to Temp), L max 500 Ω
Optional relay output:	Potential free SPDT 250 VAC, 6 A / 30 VDC, 6 A with adjustable switching point and hysteresis
Operating temperature:	0...+50 °C
Protection standard:	IP20

CDT

Example: CDT2000-1R-D	Product series						
	CDT2000	Carbon dioxide transmitter, analog outputs					
	CDT-MOD-2000	Carbon dioxide transmitter, Modbus communication					
		Calibration					
			ABC logic™, Automatic Background Calibration				
		-DC	Dual channel, for continuously occupied space				
			Mounting				
				Wall mount			
				Relay			
				-1R	With relay		
					Without relay		
					Relative humidity sensor		
					-rH	With relative humidity sensor	
						Without relative humidity sensor	
						Display	
						-D	With display
							Without display
Model	CDT2000			-1R		-D	

CDT2000-DC IS ALSO SUITABLE FOR BUILDINGS THAT ARE CONTINUOUSLY OCCUPIED

ACCESSORIES
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CARBON DIOXIDE TRANSMITTERS

DUCT MOUNTED

CDT2000 DUCT	CDT2000 Duct combines CO_2 and temperature measurements into one device installed in a ventilation duct. Illuminated display ensures easy readability also from a distance. The CDT2000 Duct has a screwless lid and an easily adjustable mounting flange that make installing the device easy. CDT2000 utilizes the industry standard NDIR measurement principle with self-calibrating ABC logic™ for CO_2 measurement. CDT2000-DC is a dual channel model with a measuring channel and a reference channel that makes a continuous comparison and the necessary adjustment accordingly. CDT2000-DC is also suitable for buildings that are continuously occupied.
USAGE & APPLICATIONS	CDT2000 Duct is used to monitor and control CO_2 concentration of incoming and return air in a ventilation system. CDT2000-DC Duct series devices can also be used in applications where there is a constant source of carbon dioxide present (for example hospitals and greenhouses).

TECHNICAL DETAILS

Accuracy:	CO_2: ±40 ppm + 2 % of reading, DC model: 75 ppm or 10 % of reading (whichever is greater) Temperature: <0.5 °C
Measurement elements:	NTC10k temperature sensor, Non Dispersive Infrared (NDIR) CO_2 sensor
Measuring units:	ppm, °C
Calibration:	Automatic self-calibration, ABC Logic™ or continuous comparison (DC)
Supply voltage:	24 VDC/VAC ±10 %
Current consumption:	max 230 mA (at 24 V) + 10 mA for each voltage output
Output signal 1:	0/2...5/10 V (linear to CO_2), L min 1 kΩ
Output signal 2:	0/2...5/10 V (linear to T), L min 1 kΩ
Operating temperature:	0...+50 °C
Protection standard:	IP54

CDT DUCT

Example: CDT2000 Duct-D	Product series				
	CDT2000	Carbon dioxide transmitter, analog outputs			
	CDT-MOD-2000	Carbon dioxide transmitter, Modbus communication			
		Calibration			
			ABC logic™, Automatic Background Calibration		
		-DC	Dual channel, for continuously occupied space		
			Mounting		
			Duct	Duct mount	
				Display	
				-D	With display
					Without display
Model	CDT2000		Duct	-D	

Modbus

MEASURE THE TOTAL CONCENTRATION OF CO_2 WHERE ROOM MEASUREMENT IS NOT POSSIBLE

ACCESSORIES
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HUMIDITY TRANSMITTERS

RHT series devices measure relative humidity (rH) and temperature. They are available for duct or wall mounting. The configuration and adjustment of the RHT is quick and easy because of the large touchscreen display. RHT Duct is a user-friendly solution for measuring relative humidity in air ducts.

RHT

RHT DUCT

HUMIDITY TRANSMITTERS

WALL MOUNTED

TOUCHSCREEN DISPLAY FOR EASY ADJUSTMENT

RHT	RHT is a wall mounted relative humidity and temperature transmitter that offers several different model options for easy customizability.
USAGE & APPLICATIONS	RHT wall mount model is used to monitor and control relative humidity levels in offices, public spaces, hospitals, meeting rooms and classrooms.

TECHNICAL DETAILS

Accuracy:	Temperature: <0.5 °C Relative humidity: ±2...3 % rH at 0...50 °C and 10...90 % rH Total error band includes accuracy, hysteresis and temperature effect over 5...50 °C and 10–90 % rH
Measuring units:	°C, % rH
Measurement elements:	Pt1000 temperature sensor, thermoset polymer capacitive sensing element for humidity
Supply voltage:	24 VDC/VAC ±10 %
Current consumption:	max 90 mA (at 24 V) + 10 mA for each voltage output or 20 mA for each current output
Output signal 1:	0/2...10 V (linear to rH), L min 1 kΩ or 4...20 mA (linear to rH), L max 500 Ω
Output signal 2:	0/2...10 V (linear to Temp), L min 1 kΩ or 4...20 mA (linear to Temp), L max 500 Ω
Optional relay output:	Potential free SPDT 250 VAC, 6 A / 30 VDC, 6 A with adjustable switching point and hysteresis
Operating temperature:	0...+50 °C
Protection standard:	IP20

RHT

Example: RHT-1R-D	Product series			
	RHT	Relative humidity transmitter, analog outputs		
	RHT-MOD	Relative humidity transmitter, Modbus communication		
		Mounting		
		Wall mount		
			Relay	
			-1R	With relay
				Without relay
				Display
				-D With display
				Without display
Model	RHT		-1R	-D

Modbus

ACCESSORIES
SEE PAGE 78

HUMIDITY TRANSMITTERS

DUCT MOUNTED

RHT DUCT	RHT DUCT is a duct mounted humidity and temperature transmitter available also with an illuminated display.
USAGE & APPLICATIONS	RHT DUCT is used to monitor and control relative humidity of incoming and return air in ventilation system.

TECHNICAL DETAILS

Accuracy:	Temperature: <0.5 °C Relative humidity: ±2...3 % rH at 0...50 °C and 10...90 % rH Total error band includes accuracy, hysteresis and temperature effect over 5...50 °C and 10–90 % rH
Measuring units:	°C, % rH
Measurement elements:	NTC10k temperature sensor, thermoset polymer capacitive sensing element for humidity
Supply voltage:	24 VDC/VAC ±10 %
Current consumption:	max 90 mA (at 24 V) + 10 mA for each voltage output
Output signal 1:	0/2...5/10 V (linear to rH), L min 1 kΩ
Output signal 2:	0/2...5/10 V (linear to T), L min 1 kΩ
Operating temperature:	0...+50 °C
Protection standard:	IP54

RHT DUCT

Example: RHT Duct-D	**Product series**		
	RHT	Relative humidity transmitter, analog outputs	
	RHT-MOD	Relative humidity transmitter, Modbus communication	
		Mounting	
		Duct	Duct mount
			Display
			-D With display
			Without display
Model	RHT	Duct	-D

Modbus

ACCESSORIES
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CARBON MONOXIDE TRANSMITTER

CMT	The CMT is an easy-to-use, reliable transmitter for detecting CO gas. It is commonly used in places where air includes CO gas, such as parking garages.

TECHNICAL DETAILS

Measuring unit:	ppm
Measuring range:	0...300 ppm CO
Measuring element:	Electro-chemical
Linearity:	≤2 % on 300 ppm CO
Cross sensitivity:	≤2 % on 300 ppm CO
Response time t90:	<60 s
Supply voltage:	14...28 VDC
Output signal:	4–20 mA (2-wire)
Operating temperature:	-10...40 °C
Protection standard:	IP54

SCREW FIXING MAKES REPLACING THE SENSOR EASY. THIS IS PARTICULARLY USEFUL WHEN THE DEVICE NEEDS CALIBRATING.

ACCESSORIES
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PRESSURE TRANSMITTERS FOR LIQUIDS

PTL	The PTL is a pressure transmitter for pressure detection in liquids for air-conditioning, heating and water systems. Suitable for plants that use refrigerants.

DPTL	The DPTL is made for differential pressure detection in liquids for air-conditioning, heating and water systems. The equipment can withstand mildly corrosive substances and liquids.

TECHNICAL DETAILS

Accuracy (from FS):	±1.0 %
Power:	15...24 VDC/VAC
Output:	0...10 V or 4–20 mA
Protection standard:	IP65
Pressure connector:	G1/4” (G1/2” adaptor included)
Operating temperature:	-40...105 °C

PTL

Example: PTL-4-V	Product series		
	PTL	Pressure transmitter for liquids	
		Measuring range (bar)	
		-4	0...4
		-6	0...6
		-10	0...10
		-16	0...16
		-25	0...25
			Output
			-V Voltage
			-A Current
Model	PTL	-4	-V

TECHNICAL DETAILS

Accuracy (from FS):	±1 %
Power:	15...24 VDC/VAC
Output:	0...10 V or 4–20 mA
Protection standard:	IP65
Pressure connector:	inside thread G1/4”
Operating temperature:	-10...50 °C

DPTL

Example: DPTL-2,5-V	Product series		
	DPTL	Differential pressure transmitter for liquids	
		Measuring range (bar)	
		-1	0...1
		-2,5	0...2.5
		-4	0...4
		-6	0...6
			Output
			-V Voltage
			-A Current
Model	DPTL	-2,5	-V

ACCESSORIES
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PASSIVE TEMPERATURE SENSORS

PTE series passive temperature sensors are engineered for HVAC applications. The design approach has been to offer user-friendly and premium quality products with economical pricing.

PTE products are available with the following sensor types:

- NTC10k
- NTC20k
- Pt1000
- Ni1000
- Ni1000-LG

PTE-DUCT

PTE-CABLE

PTE-O

PTE-OI

PTE-ROOM

PASSIVE TEMPERATURE SENSORS

DUCT TEMPERATURE SENSOR FOR HVAC APPLICATIONS

PTE-DUCT	PTE-DUCT is a passive temperature sensor engineered for HVAC applications. PTE-DUCT is used to sense air temperature inside a ventilation duct. The temperature sensor is housed inside a stainless steel tube that protects it from the environment and condensation, ensuring long service life.
USAGE & APPLICATIONS	PTE-DUCT is commonly used in HVAC systems for measuring air temperature in ventilation ducts in offices, hospitals, schools etc.

TECHNICAL DETAILS

Accuracy:	NTC10k ± 0.25 °C @ 25 °C NTC20k ± 0.25 °C @ 25 °C Pt1000 ± 0.3 °C @ 0 °C Ni1000 ± 0.4 °C @ 0 °C Ni1000-LG ± 0.4 °C @ 0 °C
Operating temperature:	-50 ... +50 °C
Sensor tube length:	190 mm
Sensor tube outer diameter:	7 mm
Protection class:	IP54

PTE-DUCT

Example: PTE-Duct-NTC10	Product series		
	PTE	Passive temperature sensor for gas	
		Installation type	
		-Duct	Duct
			Sensor element
			-NTC10 10 KΩ @ 25 °C
			-NTC20 20 KΩ @ 25 °C
			-Pt1000 1000 Ω @ 0 °C
			-Ni1000 1000 Ω @ 0 °C
			-Ni1000-LG 1000 Ω @ 0 °C
Model	PTE	-Duct	-NTC10

ACCESSORIES
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PASSIVE TEMPERATURE SENSORS

ROOM TEMPERATURE SENSOR FOR HVAC APPLICATIONS

PTE-ROOM	PTE-ROOM is a passive temperature sensor engineered for HVAC applications. PTE-ROOM is used to sense air temperature indoors. The temperature sensor is housed in a modern white plastic housing. PTE-ROOM is particularly easy to install. The cover can be opened without tools and the cable can be routed from behind or above/below the installation surface. PTE-ROOM can be installed on top of a standard electrical switch box.
USAGE & APPLICATIONS	PTE-ROOM is commonly used in HVAC systems for measuring indoor air temperature in offices, hospitals, schools etc.

TECHNICAL DETAILS

Accuracy:	NTC10k ± 0.25 °C @ 25 °C NTC20k ± 0.25 °C @ 25 °C Pt1000 ± 0.3 °C @ 0 °C Ni1000 ± 0.4 °C @ 0 °C Ni1000-LG ± 0.4 °C @ 0 °C
Operating temperature:	-10 ... +50 °C
Housing material:	ABS
Housing dimensions:	80.0 x 75.0 x 27.5 mm
Protection class:	IP20

PTE-ROOM IS PARTICULARLY EASY TO INSTALL

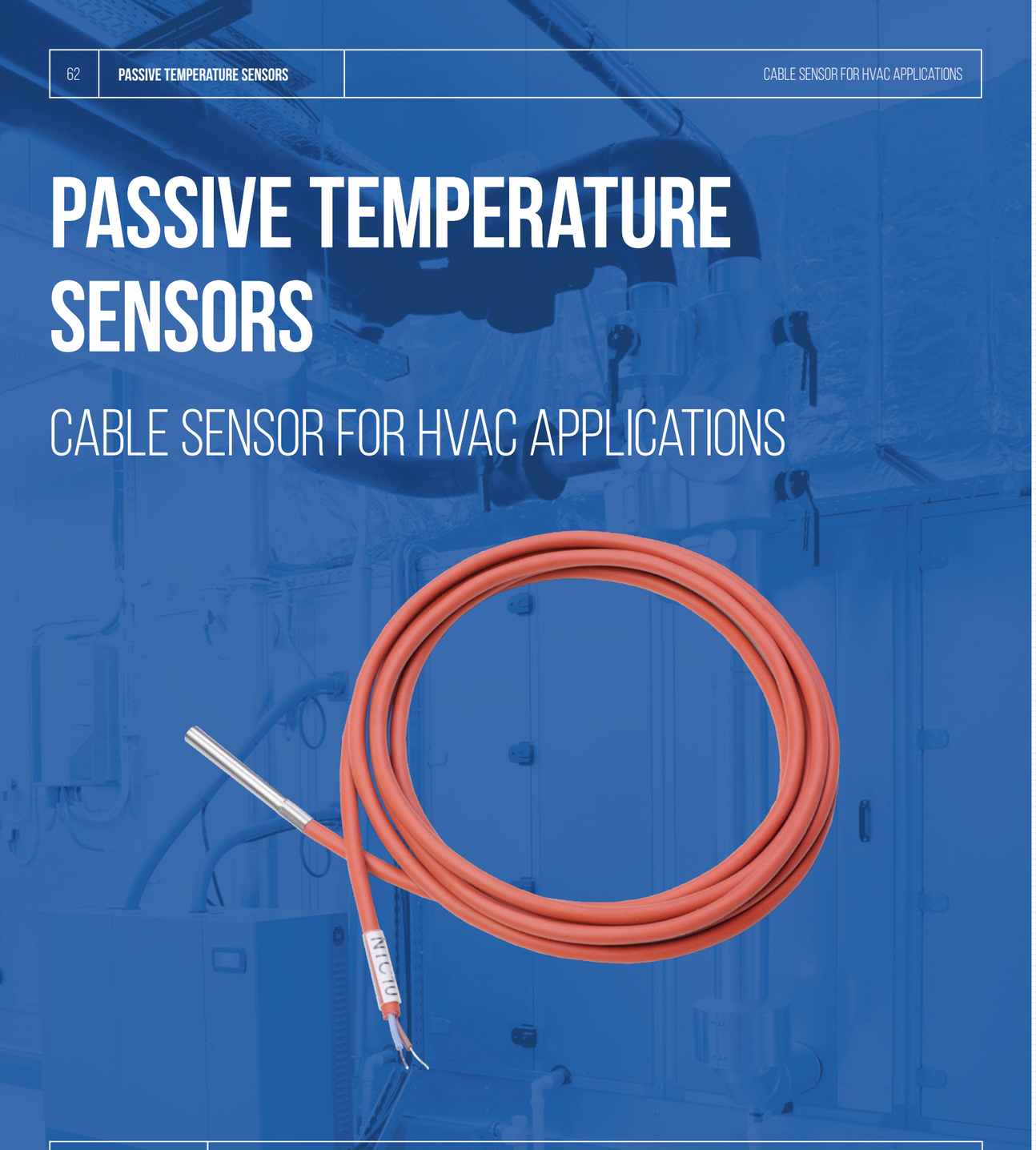
PTE-ROOM

Example: PTE-Room-NTC10	Product series		
	PTE	Passive temperature sensor for gas	
		Installation type	
		-Room	Room
			Sensor element
			-NTC10 10 KΩ @ 25 °C
			-NTC20 20 KΩ @ 25 °C
			-Pt1000 1000 Ω @ 0 °C
			-Ni1000 1000 Ω @ 0 °C
			-Ni1000-LG 1000 Ω @ 0 °C
Model	PTE	-Room	-NTC10

ACCESSORIES
SEE PAGE 78

PASSIVE TEMPERATURE SENSORS

CABLE SENSOR FOR HVAC APPLICATIONS



PTE-CABLE	PTE-CABLE is a passive temperature sensor engineered for HVAC applications. PTE-CABLE senses temperatures in a wide range. It is well protected from the environment by its stainless steel sleeve which is crimped on to premium quality silicone rubber cable. Inside the sleeve, the temperature sensor is protected against condensation, ensuring long service life. The cable is halogen-free and oil resistant. PTE-CABLE has a high protection rating of IP67.
USAGE & APPLICATIONS	PTE-CABLE is commonly used in HVAC systems for measuring temperature in ventilation units, hard-to-reach places or harsh environments.

TECHNICAL DETAILS

Accuracy:	NTC10k ± 0.25 °C @ 25 °C NTC20k ± 0.25 °C @ 25 °C Pt1000 ± 0.3 °C @ 0 °C Ni1000 ± 0.4 °C @ 0 °C Ni1000-LG ± 0.4 °C @ 0 °C
Operating temperature:	-60 … +180 °C
Short-term temperature:	up to +250 °C
Materials:	Sleeve: Stainless steel Cable: Silicone rubber
Sleeve dimensions:	Outer diameter: 6 mm Length: 50 mm
Cable length:	2.0 m (Custom lengths available upon request)
Protection class:	IP67

PTE-CABLE HAS A HIGH PROTECTION RATING OF IP67

PTE-CABLE

Example:	Product series		
PTE-Cable-NTC10	PTE	Passive temperature sensor for gas	
		Installation type	
		-Cable	Cable
			Sensor element
			-NTC10 10 KΩ @ 25 °C
			-NTC20 20 KΩ @ 25 °C
			-Pt1000 1000 Ω @ 0 °C
			-Ni1000 1000 Ω @ 0 °C
			-Ni1000-LG 1000 Ω @ 0 °C
Model	PTE	-Cable	-NTC10

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PASSIVE TEMPERATURE SENSORS

OUTSIDE AIR TEMPERATURE/ILLUMINANCE SENSOR FOR HVAC APPLICATIONS

PTE-O/OI	PTE-O is a passive temperature sensor engineered for HVAC applications. PTE-O is used to sense outside air temperature. The temperature sensor is housed inside a stainless steel sleeve that protects it from the environment and condensation, ensuring long service life. PTE-OI is a combination of a passive temperature and an illuminance sensor engineered for HVAC applications. It is used to sense outside air temperature and ambient lighting conditions. In addition to the outside air temperature, the PTE-OI includes an ambient illuminance sensor. The illuminance sensor is hermetically sealed for protection.
USAGE & APPLICATIONS	PTE-O is commonly used in HVAC systems for measuring outside air temperature and temperature in cold storages. PTE-OI is commonly used in HVAC systems for measuring outside air temperature and controlling the outside lighting of buildings.

TECHNICAL DETAILS

Accuracy:	NTC10k ± 0.25 °C @ 25 °C NTC20k ± 0.25 °C @ 25 °C Pt1000 ± 0.3 °C @ 0 °C Ni1000 ± 0.4 °C @ 0 °C Ni1000-LG ± 0.4 °C @ 0 °C
Operating temperature:	-50 ... +50 °C
Measuring range (OI only):	0...1000 lx
Protection class:	IP54

THE ILLUMINANCE SENSOR IS HERMETICALLY SEALED FOR PROTECTION

PTE-O/OI

Example: PTE-O-NTC10	Product series		
	PTE	Passive temperature sensor for gas	
		Installation type	
		-O	Outside
		-OI	Outside with illuminance
			Sensor element
			-NTC10 10 KΩ @ 25 °C
			-NTC20 20 KΩ @ 25 °C
			-Pt1000 1000 Ω @ 0 °C
			-Ni1000 1000 Ω @ 0 °C
			-Ni1000-LG 1000 Ω @ 0 °C
Model	PTE	-O	-NTC10

THE TEMPERATURE SENSOR IS HOUSED INSIDE A STAINLESS STEEL SLEEVE THAT PROTECTS IT FROM THE ENVIRONMENT AND CONDENSATION, ENSURING LONG SERVICE LIFE

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DIFFERENTIAL PRESSURE GAUGE

DPG

DPG WITH FLOW SCALE, A COST-EFFECTIVE SOLUTION FOR ON-SITE AIR FLOW MEASUREMENT

DPG	The DPG is a standard pressure gauge for measuring overpressure and differential pressure.
USAGE	The DPG is used to measure low pressures of air and non-combustible gases mainly in HVAC systems.
APPLICATIONS	• monitoring filters and ventilators • monitoring overpressure and pressure difference in air ducts, air handling units, cleanrooms and laminar flow cabinets • monitoring air flow on ventilators and in air ducts (special flow scales available separately)

TECHNICAL DETAILS

Accuracy (from FS):	< ±2 % (DPG60 < ±4 % ; DPG100 < ±3 %)
Operating temperature:	-5...+60 °C
Zero point adjustment screw:	external in the plastic cover
Mounting:	surface mounting or flush mounting
Mounting position:	vertical
Measuring air flow:	special flow scales available separately, easy to install on site

Product description	Measuring range
DPG60	0–60 Pa
DPG100	0–100 Pa
DPG120	0–120 Pa
DPG200	0–200 Pa
DPG250	0–250 Pa
DPG300	0–300 Pa
DPG400	0–400 Pa
DPG500	0–500 Pa
DPG600	0–600 Pa
DPG800	0–800 Pa
DPG1K	0–1 kPa
DPG1.5K	0–1.5 kPa
DPG2K	0–2 kPa
DPG3K	0–3 kPa
DPG5K	0–5 kPa

INTERCHANGEABLE FLOW SCALES

Snap!

Install!

Go!

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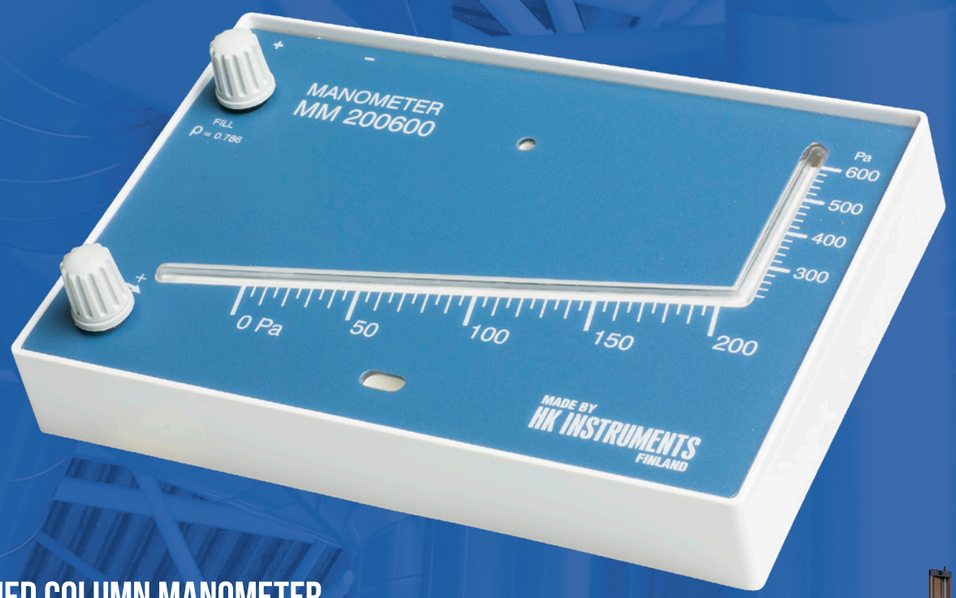
LIQUID COLUMN MANOMETERS

MM, MMU & MMK



RELIABLE INCLINED COLUMN MANOMETER WITH LEAKAGE PROTECTION SYSTEM

TRADITIONAL U-TUBE MANOMETER WITH EASY ZERO POINT CALIBRATION

EXTREMELY ROBUST MANOMETERS USED E.G. IN VESSELS

Liquid column manometers are reliable and inexpensive traditional pressure meters. The manometers are good for measuring and indicating small overpressure, vacuum and differential pressure of air and non-aggressive gases in low pressure ranges.

Liquid column manometers are ideal for general-purpose work in air-conditioning and ventilation, monitoring of air filters for contamination and monitoring of air flow and air velocity.

MM

Product	Measuring range	Accuracy
MM±50 *)	-50...0...+50 Pa	1 Pa
MM100 *)	-20...0...+100 Pa	1 Pa
MM±100500	-100...0...+500 Pa	5 Pa/25 Pa
MM200600	0...200...600 Pa	5 Pa/25 Pa

*) The types delivered with level bubble

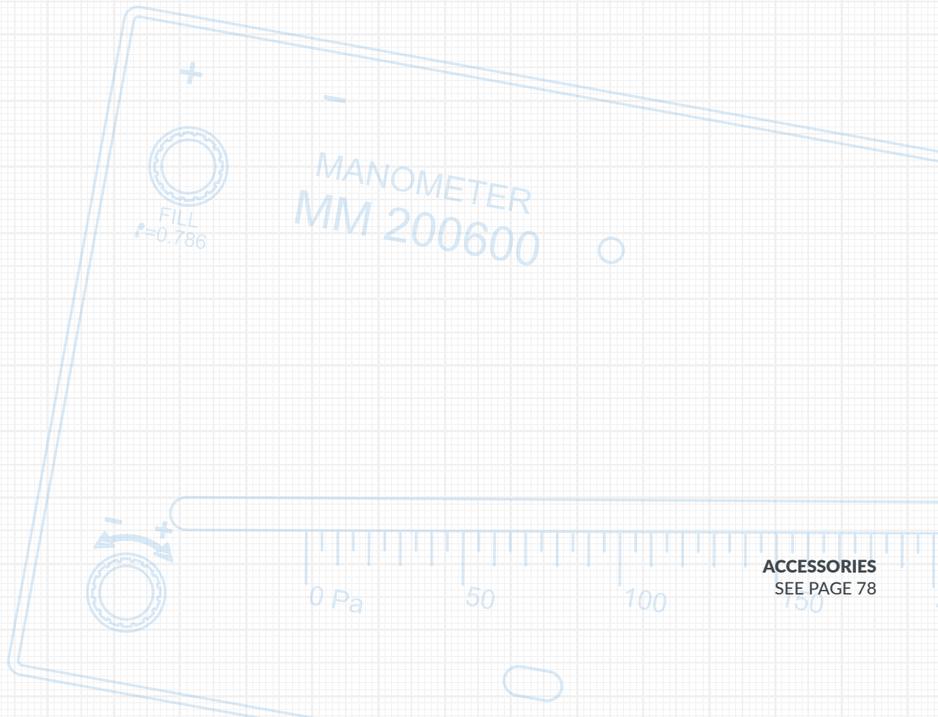
Optional level bubble is available to all models on request!

MMK

Product	Measuring range	Accuracy
MM1K	0...1 000 Pa	10 Pa
MM1,5K	0...1 500 Pa	10 Pa
MM2K	0...2 000 Pa	10 Pa
MM3K	0...3 000 Pa	10 Pa
MM5K	0...5 000 Pa	10 Pa
MM7K	0...7 000 Pa	10 Pa
MM10K	0...10 000 Pa	10 Pa

MMU

Product	Measuring range	Accuracy
MMU±500	±500 Pa	10 Pa



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DIFFERENTIAL PRESSURE INDICATOR

NEED AN ALARM? SELECT DPI - A TRANSMITTER WITH RELAY OUTPUT!

DPI	The DPI is an electronic differential pressure transmitter with up to two relay outputs.
USAGE & APPLICATIONS	The differential pressure indicator is used for measuring and indicating low pressures of air and non-combustible gases in order to monitor and control building automation, HVAC and cleanroom systems.

TECHNICAL DETAILS

Accuracy (from FS):	±1.5 % (±0.7 % with span point calibration) (including: general accuracy, temperature drift, linearity, hysteresis, and repetition error)
Long term stability, typical 1 year:	±1 Pa (±8 Pa without autozero element -AZ)
Zero point calibration:	automatic with autozero element (-AZ) or by using the buttons on the lid
Supply voltage:	21–35 VDC / 24 VAC ±10 % (without -AZ option) 24 VDC ±10 % / 24 VAC ±10 % (with -AZ option)
Current consumption:	35 mA + relays (7 mA each) + AZ (20 mA) + 0...10 V output (10 mA)
Output signals:	0...10 V, L min 1 kΩ Relay output 1 (250 VAC / 30 VDC / 6 A) Optional relay output 2 (250 VAC / 30 VDC / 6 A)
Operating temperature:	-10...+50 °C
Response time:	0.5...10 s
Protection standard:	IP54

DPI

Example: DPI±500-2R-D	Product series				
	DPI	Differential pressure indicator			
		Measuring ranges (Pa)			
		±500	±100 / ±250 / ±300 / ±500		
		2500	100 / 250 / 1000 / 2500		
			Number of relays		
			-1R	One relay	
			-2R	Two relays	
				Zero point calibration	
				-AZ	With autozero calibration
					Standard with manual zero point calibration
					Display
					-D With display
Model	DPI	±500	-1R		-D

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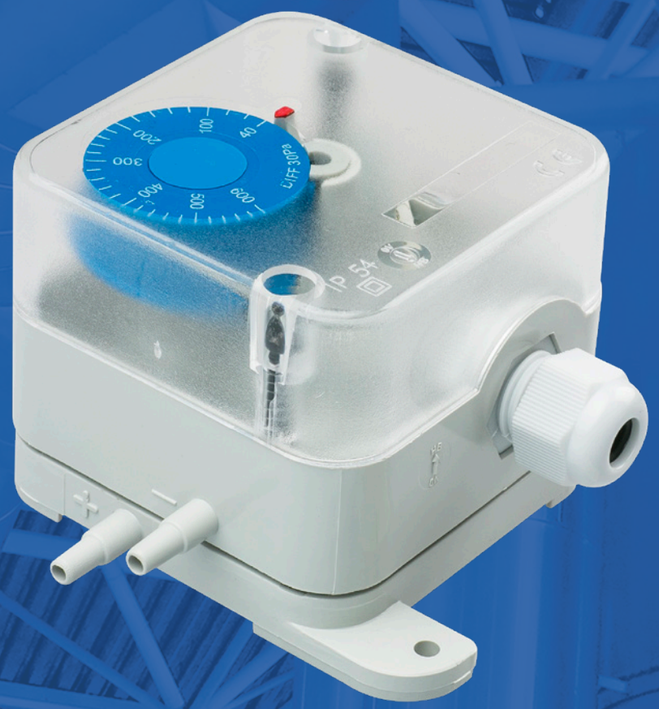
DIFFERENTIAL PRESSURE SWITCH



PS	The PS is a robust, easy-to-use differential pressure switch for air and non-combustible gases.
USAGE	The pressure switches are used in ventilation and air-conditioning systems to monitor changes in overpressure, vacuum and differential pressure.
APPLICATIONS	• monitoring filters and fans • monitoring vacuum and overpressure in air ducts • controlling defrosting functions

TECHNICAL DETAILS

Accuracy of switching point (low limit typ.):	±5 Pa (PS1500: ±20 Pa, PS4500: ±100 Pa)
Accuracy of switching point (high limit typ.):	PS200: ±20 Pa, PS300 & PS500: ±30 Pa, PS600 & PS1500: ±50 Pa, PS4500: ±200 Pa
Service life:	over 1 000 000 switching operations
Electrical rating (resistive load):	3 A / 250 VAC (PS200: 0.1 A / 250 VAC)
Electrical rating (inductive load):	2 A / 250 VAC (PS200: --)
Operating temperature:	-20...+60 °C
Protection standard:	IP54

Product	Measuring range
PS200	20...200 Pa
PS300	30...300 Pa
PS500	30...500 Pa
PS600	40...600 Pa
PS1500	100...1500 Pa
PS4500	500...4500 Pa

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FILTER ALERTS

The filter alerts are a solution for systems requiring visual indication of pressure on site, together with switching point signal. The filter alerts are ideal for general-purpose work in air-conditioning and ventilation, especially in monitoring of air filters for contamination.

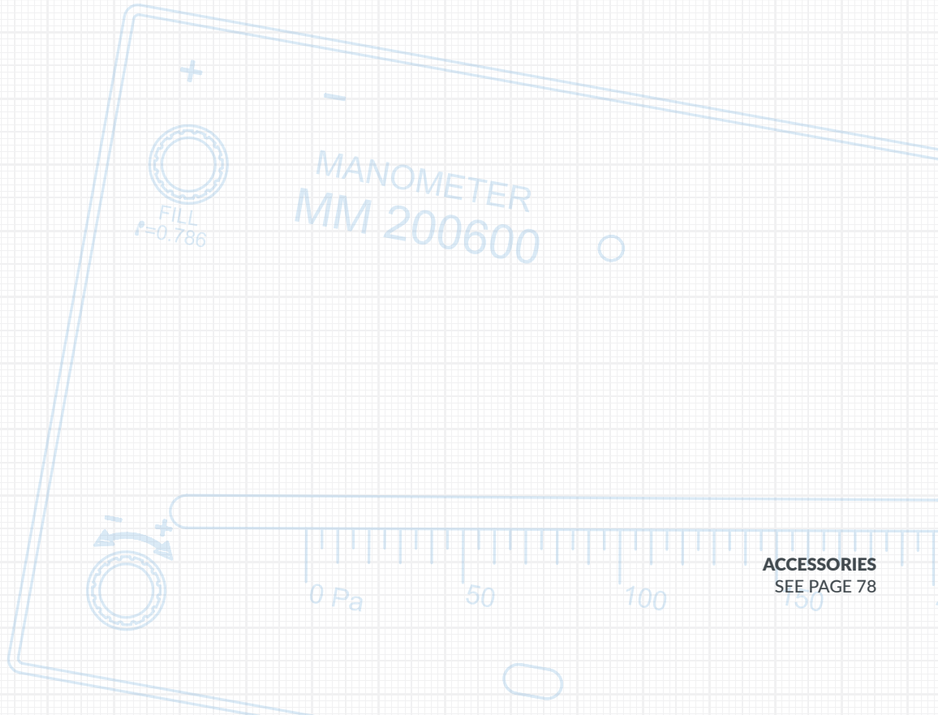
The available combinations include pressure gauge and pressure switch combination (DPG/PS), and inclined tube manometer and pressure switch combination (MM/PS).

MM/PS

Product	MM range	PS range
MM200600/PS600	0... 600 Pa	40...600 Pa

DPG/PS

Product	DPG range	PS range
DPG200/PS200	0... 200Pa	20...200 Pa
DPG600/PS600	0... 600 Pa	40...600 Pa
DPG1,5K/PS1500	0...1500 Pa	100...1500 Pa



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PHM-V1 MICROMANOMETER

COMPLETE FIELD INSTRUMENT FOR HVAC VENTILATION BALANCING AND DIAGNOSTICS

PHM-V1	PHM-V1 micromanometer is a handheld instrument for measuring air pressure and air flow. Its patented technology includes over 1000 preprogrammed ventilation valve and diffuser K-factor databases. This feature allows measuring without manual calculations or knowing the manufacturer's K-factors. Over 500 measuring results can be saved and then downloaded to PHM-V1 Manager computer software for documentations.
APPLICATIONS	• Air flow and pressure measurements from air diffusers, ventilation valves, dampers and grilles • Measuring room-to-room pressures or across the building envelope • In-duct measurements with pitot tube • Measuring pressure drop across the filter • Fan flow measurement • Cleanroom air flow measurements

TECHNICAL DETAILS

Range:	-250...2550 Pa
Maximum overpressure:	30 kPa
Accuracy:	+/- 1.4 % from applied pressure
USB:	Mini B
Units on display:	Pressure: Pa, mmH_2O, inchWC, mbar Volume flow: l/s, m^3/h, m^3/s
Operating temp. range:	-10 ... 50 °C
Can be used with pitot tube	

Preprogrammed valve manufacturers include for example:

- EH-Muovi
- Fläkt Woods
- Halton
- Lindab
- Climecon
- Swegon
- Uponor

SAVE TIME AND REDUCE HUMAN ERROR WITH A PREPROGRAMMED K-FACTOR DATABASE

PHM-V1 MANAGER SOFTWARE ALLOWS YOU TO UPLOAD MEASURING RESULTS, ADD NEW VENTILATION VALVE DATA AND CREATE DOCUMENTATIONS EFFICIENTLY ON YOUR COMPUTER

PHM-V1 IS DELIVERED IN A HANDY CASE CONTAINING A CALIBRATION CERTIFICATE, VENTILATION VALVE MEASUREMENT KIT, PHM-V1 MANAGER SOFTWARE ETC.

ACCESSORIES

STANDARD ACCESSORIES Product description	DPT (all models except 2W)	DPT-2W	DPT-FLOW	AVT	CDT / RHT	CDT / RHT DUCT	CMT	DPG	MM	MMU	MMK	DPI	PS	MM/PS	DPG/PS	DPTL	PTL	PTE-DUCT	PTE-ROOM	PTE-CABLE	PTE-O/OI
Mounting screw	x	x	x		x			x	x		x	x	x	x	x				x		x
PVC tube 2 m	x	x	x					x	x	x	x	x	x	x	x						
Duct connector, plastic for d=4 mm tube (80 mm)	x	x	x					x				x	x		x						
Gauge fluid 30 ml									x	x	x			x							
Attention stickers	x								x					x	x						
Adaptor G 1/4" to G1/2"																	x				
Mounting flange				x		x													x		
OPTIONAL ACCESSORIES **Product description**																					
Calibration certificate	x	x	x	x	x	x						x	x					x	x	x	x
Display 4-digit		x		x																	
Display 2-line backlit (blue)	x		x			x															
PVC tube 4/7 2 m	x	x	x					x	x	x	x	x	x	x	x						
PVC tube 4/7 matt (100 m)	x	x	x					x	x		x	x	x	x	x						
Accessory pack (tube, duct connectors)	x	x	x					x	x	x	x	x	x	x	x						
Accessory pack for DPG flush mounting								x													
Gauge fluid 0,786; 30 ml (red)									x	x	x			x							
Gauge fluid 0,786; 250 ml (red)									x	x	x			x							
Gauge fluid 1,870; 30 ml (blue)									x					x							
Duct connector, plastic for d=4 mm tube (80 mm)	x	x	x					x	x	x	x	x	x	x	x						
Duct connector, metallic for d=4 mm tube (40 mm)	x	x	x					x	x		x	x	x	x	x						
Duct connector, metallic for d=4 mm tube (100 mm)	x	x	x					x	x		x	x	x	x	x						
T-connector for d=4 mm tube	x	x	x					x	x	x	x	x	x								
Mounting screw for PS/DPG/DPT ZN M4x20 (1000 pcs)	x	x	x	x		x	x	x		x		x	x		x	x					
Flow scale								x							x						
Mounting plate																x					
Junction box (including wiring work)	x																				
Adhesive backed mounting base and cable tie																				x	

1. Applicability of the Terms and Conditions. These terms and conditions shall be applied to trade in devices, components and accessories between HK Instruments Oy and the customer, unless the parties have otherwise mutually agreed in writing. These conditions do not apply to trade by agents, to which the manufacturer's conditions of sale shall be applied.

2. Price. The prices in effect at the time the offer is made form the basis of pricing. All prices exclude VAT. If changes occur in customs, freight, VAT or other general payments related to the delivery before the date of delivery, the seller has the right to change the price of the goods in the same proportion that said changed prices or payments affected the price of the goods.

3. Offer. The seller's offer is binding and it is valid for 30 days unless otherwise agreed. Provided the seller's offer is tendered under intermediary terms and conditions of sale, an immediate in storage offer is denoted whereby the goods may be sold to a third party during the period the offer is valid and the seller does not guarantee the inventory is sufficient.

4. Contract. A contract between the seller and the buyer is deemed to have been established when

- the parties have signed a written contract (purchase agreement)
- the buyer has approved a binding offer in writing (order) or
- the seller has confirmed in writing as such an order other than one based on an offer or an order different from the offer (order confirmation)

5. Drawings and Descriptions. The information on prices, measurements, weights and performances given in descriptions, photos, memos, drawings, directories and price lists and other information containing technical and other details have been given without obligations, unless specifically referred to in the offer. All technical drawings and documents needed for the manufacture of the product or its component, which one party has provided to the other party prior to, or after the signing of the contract, shall remain the property of the provider. The receiving party may not, without the provider's consent, use, copy, surrender or divulge by other means information reagarding them to a third party.

6. Condition of Delivery. The condition of delivery is free seller's storage (re: Incoterms 2010 EXW) unless otherwise agreed.

7. Packaging. The prices stated in price lists and directories apply to unpacked products.

8. Time of Delivery. Unless the time of delivery is agreed, the seller shall stipulate the time of delivery. The goods are considered to have been delivered when handed over to a freight carrier for forwarding to the purchaser. When, according to the terms of the contract, the buyer has to collect the goods from the seller or from a place designated by the seller, the goods are deemed conveyed when the seller has notified the buyer that the goods are ready for delivery.

9. Conveyance and Examination of the Goods. On acceptance of the goods, the customer must make sure that the delivered goods correspond with the packing list and are externally undamaged. Before using, connecting, or installing the goods, the customer must again examine the goods to ensure their flawless condition. Complaints regarding errors or deficiencies must be made to the seller without delay, at the latest within 8 days of the conveyance of the goods.

10. Force Majeure. The seller is not liable to fulfill the contract if an obstacle the seller is unable to overcome exists regarding the contract, or if fulfilling the contract would require sacrifices that are unreasonable compared to the advantage for the buyer should the seller fulfill the contract. If said obstacle or disparity ceases to exist within a reasonable period of time, the buyer has the right to demand that the seller fulfill the contract. When the manufacturer or the party from which the seller obtains the goods has not fulfilled the terms of his contract thus causing the seller's delivery to be delayed or not completed, the seller is not obligated to compensate the buyer for any potential losses. The buyer does not have the right to request a new delivery to replace a flawed product if an obstacle as noted in this section exists for the seller. When completion of the contract within a reasonable period of time becomes impossible due to factors noted in this section, both parties are entitled to cancel the contract with no liability to compensate by notifying the other party of their intentions in writing.

11. Payment. The payment period starts from the invoice date. In case of a delay in payment, the buyer is liable for compensating the seller according to his/her rate of interest and paying the expenses arising from the collection of payment.

12. Warranty. The seller is obligated to provide a warranty of five (5) 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 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.

13. Returns. The sale made is binding and irrevocable and the seller is not liable to accept the return of a product. Products delivered according to contract are taken back and products reimbursed up to 70% provided the seller has, prior to the return of the product, agreed to it. Returned products may be taken back and credited provided they are in the original package and in original condition.

14. Notifications. The sender is responsible for ensuring the arrival of notifications sent to the other party.

15. Ownership. Ownership of the product is passed to the buyer when the price is paid in full.

16. Disagreements. Disagreements concerning contracts and related stipulations should be settled primarily by the parties to the contract. In case a settlement cannot be reached, the dispute shall be resolved in Finland in the lower court at the domicile of the seller.

HK INSTRUMENTS

– USER-FRIENDLY MEASURING DEVICES

HK Instruments is a Finnish company specialized in manufacturing and developing technologically advanced measuring devices for HVAC applications. Our devices are primarily used in air handling systems and building automation.

30 years of experience and exports to more than 45 countries prove our high-class product development and cost-effective manufacturing. We have invested in practical user interfaces and that is why the installation of our devices is extremely easy and fast.

HK INSTRUMENTS

Keihästie 7
FIN-40950 MUURAME
FINLAND

Phone. +358 14 337 2000
Fax. +358 14 337 2020

info@hkinstruments.fi
www.hkinstruments.fi