PRODUAL

Manage the invisible

PRODUCTS
Produal &
HK Instruments

Seamless integration, attentive service

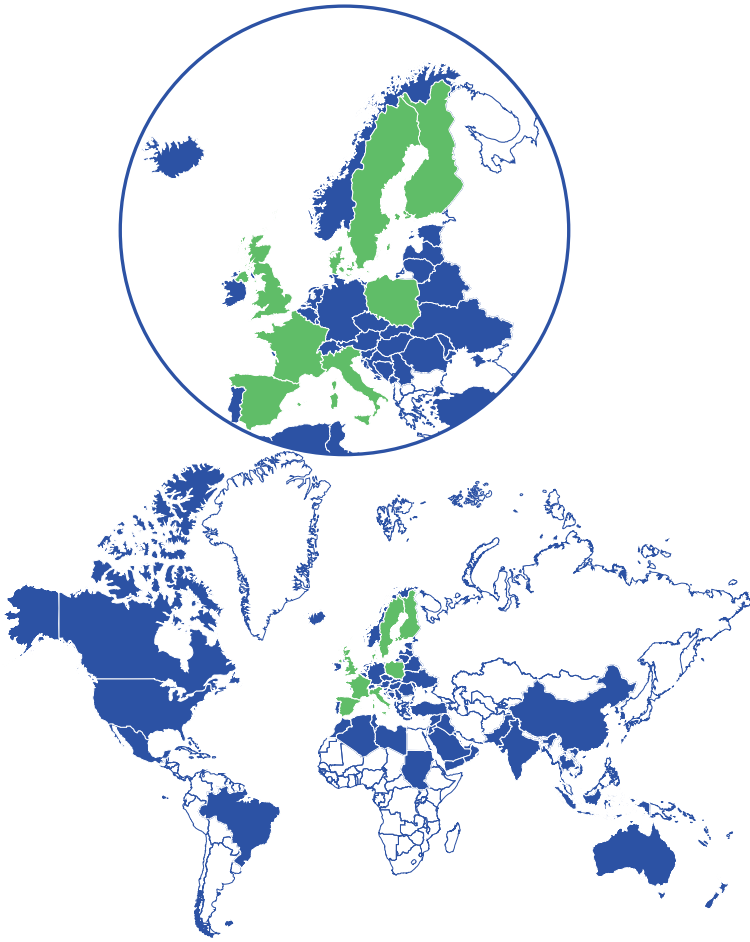
Produal is dedicated to providing you with top-tier building automation and HVAC solutions in collaboration with you. HK Instruments' innovative products now complement our portfolio, expanding and enhancing our capabilities. You benefit directly from our centralised and comprehensive range of products that paves the way for more efficient and effective solutions than ever before.

Even though our company evolves, Produal's core commitment to customer satisfaction and excellence stays intact. Your familiar, trustworthy team remains dedicated to prioritising your needs and adding value to your co-operation with us under one, unified Produal brand.

With our combined forces, we're better equipped to make the invisible changes in buildings visible and measurable. While most things stay the same, our customer service is set to reach new heights.

Let's make the changes in buildings visible and measurable - and manage the invisible together.

Pekka Keskiaho
Director, Sales and Marketing



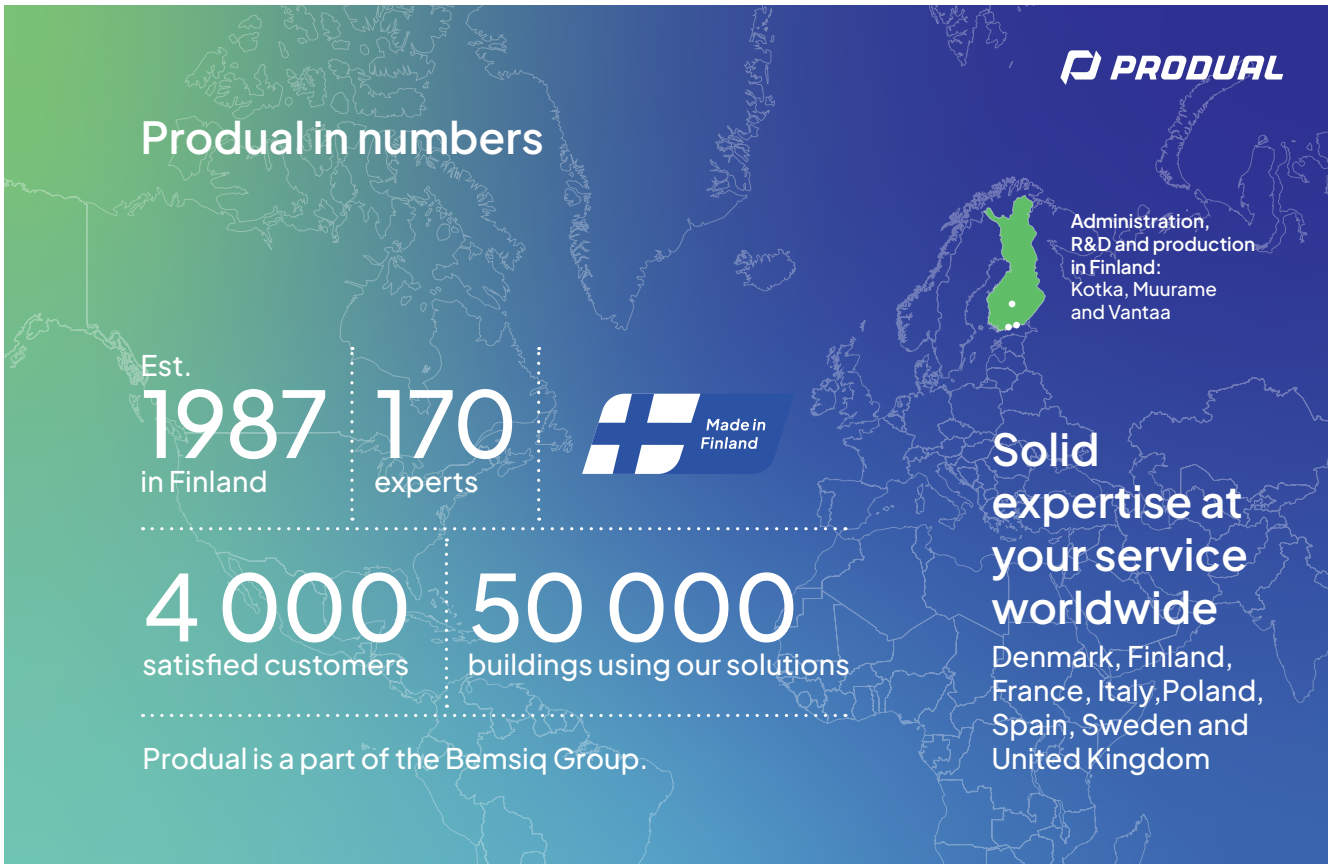
Contents

We manage the invisible. Together.

Produal makes invisible changes measurable and visible in all buildings. The accurate data our devices provide for building automation and HVAC professionals give buildings the ability to sense, and enable the development of intelligent and sustainable buildings together.

The demand to optimise the building ecosystem, and to minimize costs and environmental impact guides us. Therefore, our highly skilled professionals have developed accurate and reliable measurement and control devices to react to changing indoor conditions and to manage the premises with data.

In cooperation with our partners, we make the invisible visible to maximise indoor comfort, optimise performance, and extend the life cycle of buildings – doing our share for a sustainable world.



Pictures: Olla Architecture

London Design Award-winning learning center resembles a village community

Multipurpose center Akvarelli, Forssa, Finland

Over 200 Produal touchscreen TRC room controllers, along with a variety of transmitters and sensors, ensure an optimal indoor learning environment for small students. The new building merges two old schools and two kindergartens, creating a multifunctional, energy-efficient space of 10 000 m2. Instead of one large building, five different blocks resemble a modern yet traditional village. They provide more manageable facilities for the 800 daily users, including primary and early childhood education, and leisure time activities.

Class A energy efficiency

Demand-based ventilation and lighting control ensures sustainable building use. Cooling has been implemented only in the kindergarten, which is also used in summer, and in the gymnasium, where the highest-quality parquet flooring, meeting the requirements of the basketball city, requires precise humidity control.

A new, inspiring venue promotes life-cycle sustainability in the historic Kotka port area

Event Centre Satama, Kotka, Finland

As part of building automation, a wide range of Produal room controllers, transmitters, and HVAC measurement devices meet the needs of the owners and guests in this modern and versatile event centre. The adaptability of the flexible spaces and the demand-controlled building automation guarantee a successful and comfortable atmosphere for a variety of occasions, from small gatherings to large events with over 3 000 participants, paying attention to energy efficiency.

BREEAM certification

Event Center Satama pursues a "Very Good" rating from Europe's leading environmental certification system, BREEAM. Among other things, the optimization of energy and water consumption and a low-emission indoor climate are specifically taken into account, and it is a zero-emission building.

Photos: Aston Martin Residences

Luxury skyscraper with nearly 400 premium-level apartments

Aston Martin Residences, Miami, USA

Produal's TRC touchscreen room controllers provide design and functionality for the premium-level apartments in what may be the tallest all-residential skyscraper south of New York City. This one-of-a-kind building representing the pinnacle of elegant living also features a full-service marina that can accommodate superyachts.

Design and functionality

TRC touchscreen room controllers bring simplicity of touch to all 400 apartments, including HVAC, lighting and blind control.

Photo: Shutterstock:

Mecca pilgrims can now also enjoy better indoor conditions

The Great Mosque of Mecca, Saudi Arabia

Produal sensors and transmitters are part of the third and largest expansion project of the Sacred Mosque in its four-thousand-year history. The vast, multi-stage project on the northern side has taken years, covering the expansion of multiple zones and levels, including indoor and outdoor praying areas and the development of existing service facilities. The new BMS for the extensions and the existing system's modernization improved indoor circumstances and added new air conditioning to all closed spaces, taking into account air temperatures and air quality.

Photos: Pixabay

Architecture meets technology

The extension project was advanced in terms of architecture, technology, and sustainability. The best ventilation systems were installed, and the project used the most advanced systems available in terms of energy savings.

New kind of hospital architecture and cutting-edge hospital technology

Hospital Nova, Jyväskylä, Finland

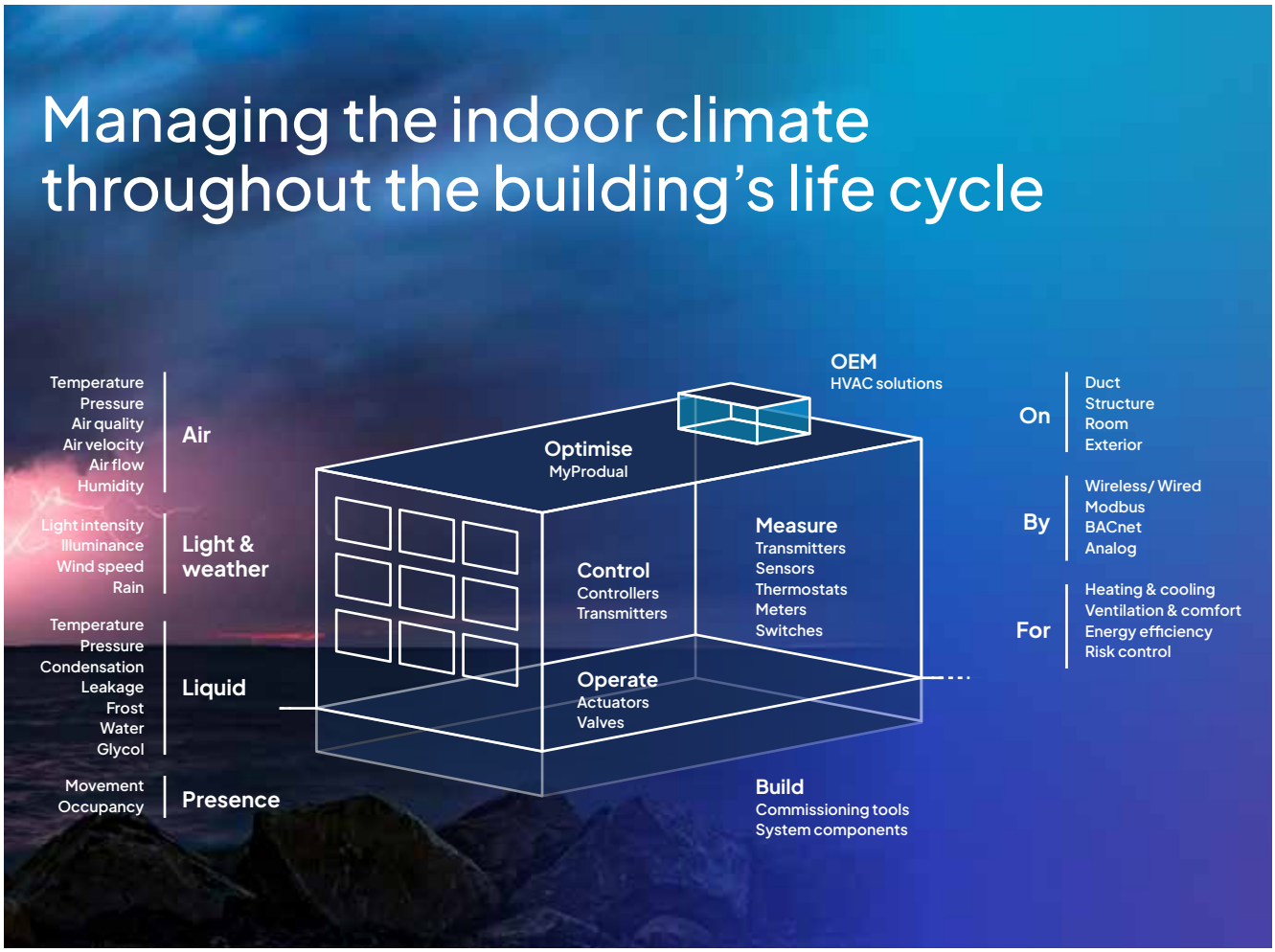
HK Instruments' measuring devices are a part of the impressive automation system that enables easy demand-controlled ventilation for the different functions of the Nova hospital complex. For example, the 24 operating theatres equipped with the latest state-of-the-art technology have high criteria for controlling the indoor climate conditions. As part of the system, HK Instruments' high-quality differential pressure and air flow transmitters ensure precise ventilation control, thus ensuring patient safety and energy efficiency.

One floor dedicated to AHUs

A whole floor of one building is almost completely dedicated to AHUs: there are about 200 air handling units in 13 different engine rooms, all equipped with HK Instruments' pressure and air flow measuring devices.

We give buildings the ability to sense

Produal develops and produces user-friendly measurement and control devices for building automation and the HVAC industry.



R&D

Our extensive R&D team focuses on innovative digital solutions and customized products.

Products

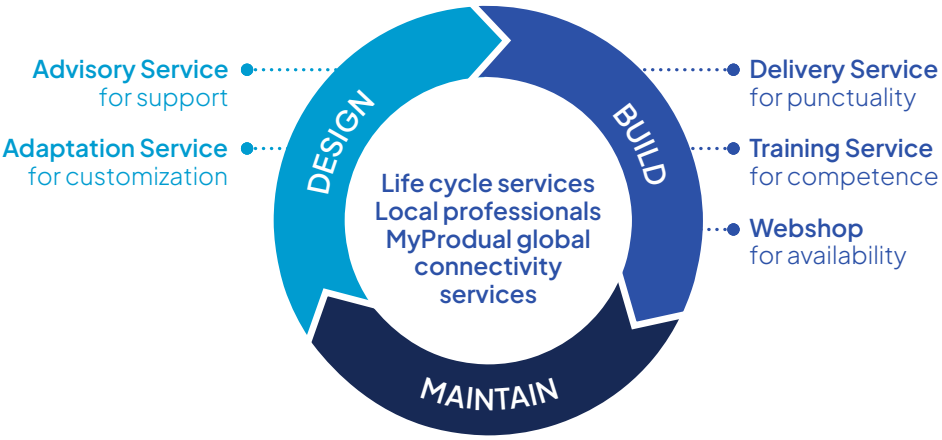
We design, manufacture and market measurement and room control devices to our partners, OEMs and system integrators.

Tailored solutions

Solution-oriented service ensures flexibility, efficiency, and fast delivery. Our experts support you from design to implementation.

Reliable local service for delivery, trust and advice

Our customers need more than products – they need reliable delivery, trust and advice. We have developed our service range to support and assist our customers during all phases of the building automation lifecycle. Our competent and reliable local service provides them with rapid and flexible delivery, advice for product selection, configuration and problem solving, and training for maximum product performance. Product adaptation and pre-configurations are offered for special needs and fast commissioning. Our online services with versatile search functions, filtering options, product comparison tools and application descriptions support our local operations. You can find the summary of the services in the picture below.



Adaptation Service

The Adaptation Service includes a wide range of services to speed up your building automation projects, to match the visual appearance of products to specific requirements, or to add additional logos or markings to products.

The following Adaptation Services are available:

- White labeling, additional stickers and markings (e.g. position marking)
- Pre-configuration of controllers and bus products, pre-setting of valves
- Adjustment of cable or probe length
- Calibration certificates
- Modification of the software functionality
- Special colouring of the products - see examples in the picture below.

Adaptation Services are implemented at Produal's factory with high quality and efficiency. A separate service-specific fee is charged, which is typically on a price-per-product basis and includes a minimum order quantity. In addition to standard classroom training dealing with applications, products, and technologies, our Training Services also offer an option for modified training modules to match your specific competence development needs. Training Services also offer certificates to support you in becoming a certified Produal distributor or solution provider.

New products

NEW

In Produal's **next-generation room transmitters**, improved accuracy, multifunctionality, extensive connectivity, and enhanced commissioning are combined with an updated design for indoor environment monitoring. New sensors allow measuring and managing the indoor climate as a whole, avoiding reacting to temporary changes. Minimised measurement errors translate directly into energy savings by avoiding unnecessary heating or cooling.

The **RTX room transmitter family** offers measurement combinations of all indoor air aspects, including temperature, humidity, CO_2, VOC, and PIR movement. Versatile features, such as built-in P/PI controller, freely configurable outputs, universal input, and relay option guarantee true multifunctionality. With improved sensor properties, RTX room transmitters comply with even the strictest measurement requirements of certification and rating systems for sustainable buildings.

BACnet Modbus

RT room transmitters are a streamlined solution for reliable temperature and CO_2 monitoring, including a humidity measurement option.

The enhanced **MyProdual mobile app**, available free of charge for Android and iOS, is a more powerful tool than ever for easy configuration and management of the next-generation room transmitters, even for a large number of devices.

Siro indoor air quality room transmitters bring PM2.5 (PM1, PM10) measurement to Produal's product range. The Siro series devices are available with or without a user interface that includes an LCD display and push-buttons, making use and configuration of the device quick and easy. Pages 80–81

Proxima RS room temperature sensor was our first wired room product to get a new look and feel. The black or white IP30 class housing provides an elegant solution for public spaces, for example, including an expanded temperature measurement range from -30...+70 °C and improved measurement accuracy via a 4-wire connection. Page 133

New products

NEW

Our wide selection of **TRC touchscreen room controllers** now includes an option to show consumption details. The new **TRC-A-3A-CD apartment controller** shows consumption meter data through the BMS system on the device display. The TRC controller family provides simplicity of touch for all types of room control and measurement applications and is available in both Modbus and BACnet models and in black and white designs. Pages 20–25

OEM

We have cooperated closely with OEM customers for decades, particularly with air handling unit manufacturers, and excel at unique, customer-focused implementations and functional solutions.

The new, enhanced **AVT air velocity transmitters** provide improved measurement accuracy and an extended temperature measurement range for in-duct monitoring and control. An internal controller for constant air velocity is included, and you can now implement, for example, alarms with a relay. With Modbus communication and three flexible commissioning methods for different needs, AVT transmitters are the perfect choice to ensure optimal ventilation in various air flow/velocity monitoring and control applications. Page 64

Are you looking for an accurate and reliable pressure switch for low pressure ranges? Let us introduce the **DPI-24 differential pressure switch and transmitter**. With 8 field selectable pressure ranges per model, one or two 24 V relays, span and zero point calibration, and easy commissioning with mobile phone application, this technologically advanced differential pressure switch is ideal for a wide range of applications. These include, for example, fan, blower and filter monitoring, staircase monitoring and alarm, pressure monitoring in cleanrooms, and boiler pressure monitoring and alarm. Page 57

DPT-2W differential pressure transmitters measure static and differential pressure. They are designed to simplify installation in applications where two-wire loop-powered measurements can be used. The current output enables accurate measurement results even when using long cables. DPT-2W transmitters are especially well suited for fan, blower and filter monitoring, as well as monitoring pressure in cleanrooms. Page 56

Produal classics

For more than 35 years, we have been active in technical development of building automation measurement and control, together with our customers. The goal has always been to support the customers in achieving excellent outcomes in the evolving business of building automation. Our wide product portfolio includes over 1000 products for controlling, measuring, actuating and commissioning, complemented with system components. These traditional Produal products, as an example of our extensive portfolio, are a great help in the customer projects, making the installation easy and saving costs.

RY 1-U is a voltage controlled relay with 0...10 V input, converting an analogue signal to digital. Useful for e.g. alarms and step-controls. Page 163

Relay units RYM 8-KK and RYM 8-KK-0 have eight relay outputs that can be controlled manually or by using 24 Vdc or 0 V input signal. The manual control helps, for example, in commissioning and in fault situations. Page 164

Isolator ISO 10 is a brilliant device for signal conversions and galvanic isolation. It is very useful for e.g solving ground loop problems. Page 159

LA 14E and LA 15E are occupancy sensors for controlling ventilation and lighting. Intelligent, processor based, logic prevents false detections being at the same time very responsive. Relay function is quiet and the release delay is adjustable. LA 15E is especially designed for lighting control because of extra output relay for lighting. Pages 150-151

Condensation switches KA 10 and KA 10-EXT are very powerful products for detecting water condensation in cooling systems, for example in cooling beams. With the condensation switch it is possible to control the cooling water supply when the water starts to condensate on the pipe. Page 145

The **YM-3 overpressure meter** is used to measure and monitor overpressure in civil defence and military shelters. It is designed and tested to withstand strong blast loadings exerted on the meter through its connection pipe. Page 206

Produal classics

TH 5 is a very useful product when controller's output for the load is not powerful enough. TH 5 is a **surface mounted driver** that can drive several parallel connected thermal actuators. The driver input signal can be any 5...30 V signal (time proportional) that is intended for thermal actuator control. Page 165

AO 2 / AO 3 signal dividers are used for splitting one signal in to 2 or 3 separate signals. It is used for example for adding controlled stages from 1 stage to 2 or 3 stages. Page 161

The switch mode power supply JY is a multifunction AC/DC to DC converter – it is basically all the DC power supply you need. Useful as a power supply for current loops. Page 166

Timers ETT6 and LAP 5E are designed for energy saving and boosting functions in ventilation applications. Because of exceptional working hours, the enhanced ventilation may also be necessary outside the normal working hours. Proxima ETT6 timer offers modern design for surface mounted applications and improved functionalities such as illustrative indicator lights, providing timer status information. For flush mounting purposes we offer LAP 5E timer. Pages 171–172

Control relay FCRY 3 for 3-speed motors has an input of 0...10 V and is especially useful for combining analogue control with digitally controlled motors. Page 164

The MIO 12 I/O module is the perfect product for reading multiple digital or analogue inputs and for controlling thermal or 3-point actuators and 0...10 V outputs using Modbus communication. Page 173

Frost protection thermostats JVA 24 and JVS 24 are an excellent way to prevent heating coils from freezing in the air handling units. Protection is based on proactive valve control by temperature measurement. Page 144

Controllers

A wide range of multifunctional and reliable controllers is available for all types of building automation applications, from chilled beams, radiators and fan coils to VAV and beyond. Our range covers single-room or zone control, integration with intelligent building automation systems and interoperability with overall smart building management in larger or smaller scale applications. Our selection and designs cater for all budgets, covering both bus and stand-alone products.

The room controllers include all the intelligence and connections in the same unit, covering various controller types for different requirements, with an add-on sensor, button capability and full-screen touch display. Touchscreen controllers have additional light and blinds control interface.

Our control units cover controllers for false ceiling mounting or other hidden installation, minimizing the need for cables through the walls, and universal controllers for a wide range of applications in heating, ventilation, pressure, or humidity control.

The user-friendly room units are available for various needs and budgets, from high-class applications to simple yet stylish solutions. Add-on capabilities for the desired functions in one housing remove the need for separate sensors in the room and make the system flexible and future-proof.

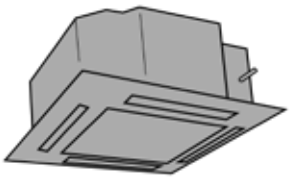
Please note that most of our transmitters are equipped with control output and can be used as single-sequence controllers for heating/cooling or ventilation.

Room controllers

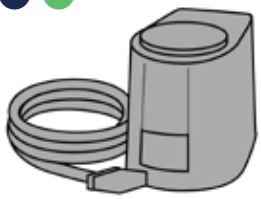
Produal offers complete solutions for different applications. Our room controllers are suitable for many various applications such as hotel rooms, office rooms, waiting areas, conference rooms, and more. HLS 44 and TRC room controller families can both handle different output and input types, with simple touch buttons or with an intuitive full-screen touch display.

HLS 44 room controller family

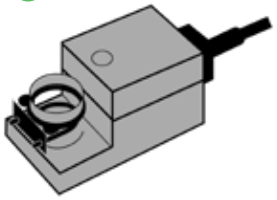
TRC room controller family



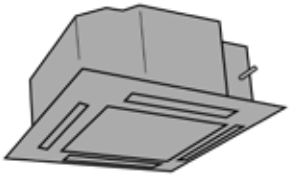
0...10 V EC fan control



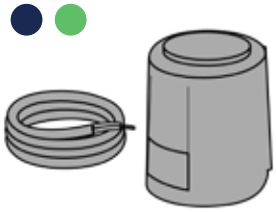
0...10 V actuators



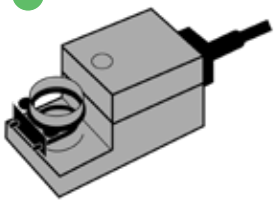
0...10 V damper motors



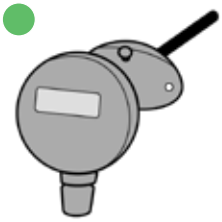
3-step fan control



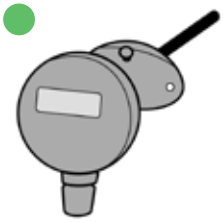
24 Vac actuators (on/off or PWM)



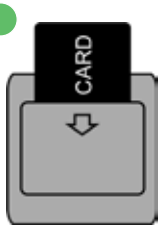
24 V damper motors



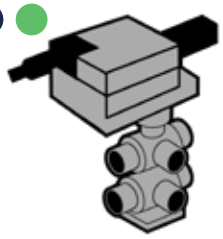
External passive sensors



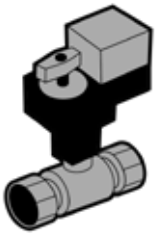
External 0...10 V active sensors



Key card input

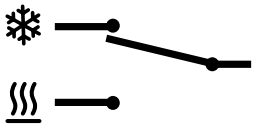


0...10 V 6-way valve control



3-point actuators

Condensation input



Change-over input

Room controller inputs and outputs

Product	Page	Supply voltage	Analogue inputs	Digital inputs	Analogue outputs	Digital outputs
TRC-A-3A	22	24 V	2[2)]	1	3	0
TRC(-P)-3A	20, 24	24 V	2[2)]	1	3	0
TRC(-P)-H-2A3R	20, 24	230 V	1[2)]	1	2	3[1)]
TRC(-P)-1A2T	20, 24	24 V	2[2)]	1	1	2
TRC(-P)-H-3R2T	20, 24	24 V	2[2)]	1	0	2 + 3[1)]
TRC(-P)-H-1A2R	20, 24	230 V	2[2)]	1	1	2[1)]
HLS 44-SE	26	24 V	1	2	4	2
HLS 44-V	26	24 V	1	2	2	4
HLS 44-CO2	26	24 V	1	2	4	2
HLS 44-3P	26	24 V	1	2	2	4
HLS 45	26	24 V	1	2	4	2
HLS 33	28	24 V	1 (HLS 33-EXT)	1	2	2

1) Relay outputs

2) These inputs can also be configured to work as digital inputs.

In conference rooms, HLS 44-CO2 (page 26) can control chilled beams with cooling and a damper actuator for ventilation if the CO2 values are too high, or if cooling is required. Heating is controlled with radiators.

HLS 45 (page 26) can be used to control fan coil units with 2-pipe systems with summer and winter change-over. It is also suitable for controlling heated floors with a return water temperature limit. HLS 45 controls EC fan speed directly via 0...10 V output. The 3-speed fan can be controlled by using FCRY 3 (page 164). HLS 45 can be connected to Modbus RTU.

Room controller selection guide

	Note: Check the product pages for more information.	Room controller families												
		HLS 33	HLS 44-SE	HLS 44-SE-P	HLS 44-V	HLS 44-CO2	HLS 44-3P	HLS 45	TRC	TRC-P	TRC-A	TRC-A-3Awith -CD option	TRT-1R	TRT-P-1R
	230 V supply voltage and output								•	•				
Application	4-pipe fan coil unit control	•	•	•	•	•	•		•	•		•		
	2-pipe fan coil unit control							•	•	•		•	•	•
	Heating or cooling	•	•	•	•	•	•	•	•	•	•	•	•	•
	Heating and cooling	•	•	•	•	•	•	•	•	•	•	•		
	Floor heating							•	•	•	•	•	•	•
	Floor heating/cooling							•	•	•	•	•	•	•
	Chilled beam	•	•	•	•	•	•	•	•	•	•	•		
	Heating radiator control	•	•	•	•	•	•	•	•	•	•	•	•	•
	6-way valve control		•	•					•	•				
	On/off thermostat mode		•	•	•	•	•	•	•	•			•	•
Actuator	Thermal	•	•	•	•	•	•	•	•	•	•	•		
	3-point	•					•	•						
	0...10 V	•	•	•	•	•	•	•	•	•	•	•		
	On/off		•	•	•	•	•	•	•	•			•	•
Function	Control stages	2/3	2/3	2/3	2/3	2/3	2/3	1/2	2/2	2/2	2/2	2/2	1	1
	Control modes	P/PI	P/PI	P/PI	P/PI	P/PI	P/PI	P/PI	P/PI	P/PI	P/PI	P/PI	Stat	Stat
	230 V 3-speed fan control								•	•				
	3-speed fan control with FCRY 3		•	•	•	•	•	•	•	•				
	EC fan control		•	•	•	•	•	•	•	•				
	VAV control	•	•	•	•	•	•	•	•	•	•	•		
	Changeover functionality							•	•	•	•	•	•	•
	CO_2 based ventilation control		•		•	•	•	•	•	•	•	•		
	Lighting control on/off				•				•	•	•	•	•	•
	Key card input		•	•	•	•	•	•	•	•	•	•	•	•
	Door / window switch input		•	•	•	•	•	•	•	•	•	•	•	•
	Condensation switch input	•	•	•	•	•	•	•	•	•	•	•	•	•
	Condensation sensor input								•		•			
	Display	o	•		•	•	•	•	•	•	•	•	•	•
	Touchscreen								•	•	•	•	•	•
	Consumption data screen											•		
	Setpoint potentiometer	•		•										
	Setpoint buttons		•		•	•	•	•						
	Occupancy input (PIR)		•	•	•	•	•	•	•	•	•	•	•	•
	Occupancy button (man in house)		•	•	•	•	•	•	•	•	•	•	•	•
	External temperature sensor input	•	•	•	•	•	•	•	•	•	•	•	•	•
	Temperature transmitter input		•		•	•	•	•	•	•				
	7-day time schedule									•				•
	Modbus RTU		•	•	•	•	•	•	•	•	•	•	•	•
	BACnet MS/TP								•	•	•	•	•	•
	Page	28	26	27	26	26	26	26	20	24	20	22	30	30

● standard o optional

Room controllers

1

TRC touchscreen room controllers have been designed for climate control in room spaces. The controllers have up to two heating and cooling temperature control stages, fan speed control, optional CO_2 level control and humidity control. The units can be used in various climate control applications, fan coil units, chilled ceilings and zone heating/cooling systems. Light and blinds control are also available. The devices provide accurate energy saving PI control and an intuitive, slim line 3.5" colour touchscreen interface.

room °C, %rH, CO_2

Temperature measurement range	0...50 °C
Temperature measurement accuracy	±0.5 °C (25 °C)
IP protection class	IP20
Ambient temperature	0...50 °C
Ambient humidity	0...95 %rH
Mounting	on a flush mounting box (60 mm hole distance)
Materials	PC plastic

Ordering guide		Type	0	1	2	3	4	5	6
0 Touchscreen room controllers			6001						
1 Device type	Room controller, 2RI/DI, 1DI, 3AO	TRC-3A		C					
	Room controller, 1RI/DI, 1DI, 2AO, 3RO, 7A	TRC-H-2A3R		E					
	Room controller, 2RI/DI, 1DI, 1AO, 2DO	TRC-1A2T		F					
	Room controller, 2RI/DI, 1DI, 3RO, 2DO, 7A	TRC-H-3R2T		H					
	Room controller, 2RI/DI, 1DI, 1AO, 2RO, 7A	TRC-H-1A2R		V					
2 Communication	Modbus RTU	-MOD			M				
	BACnet MS/TP	-BAC			B				
3 Power supply	24 Vac/dc (not available for TRC-H-1A2R)	-24				2			
	90...250 Vac (only TRC-H-1A2R)	-230				M			
4 Additional measurements	No additional measurement						0		
	Relative humidity	-RH					1		
	CO_2	-CO2					2		
	Relative humidity and CO_2	-RH-CO2					3		
5 Advanced options	No advanced options							0	
	0...10 Vdc input(s) (replaces existing RI input(s))	-AI						1	
	Control extension	-CE						2	
	0...10 Vdc input(s) (replaces existing RI input(s)) + Control extension	-AI-CE						3	
6 Body colour	White (RAL 9010)	-W							W
	Black (RAL 8022)	-B							B

TOOLS

SW-DCT-USB	1139040	configuration cable

Ordering guide explanation:

RI/DI External NTC 10 temperature input (optional, selectable function, control, limit control, measurement, heating/cooling changeover, high/low limit, aux control loop, 0...10 V external CO2 and temperature, 0...10 V pressure measurement). These inputs can be configured also to work as digital inputs.

DI Voltage free digital input (optional, selectable function e.g. occupancy, night mode, condensation, alarm, summer/winter)

RO 230 V relay output for 230 V actuators (typically 3-speed fan, optional heating/cooling stat)

AO 0...10 Vdc analogue output (selectable function e.g heating, cooling, max VAV, EC fan, lights control, blinds control, humidity control, alarm output)

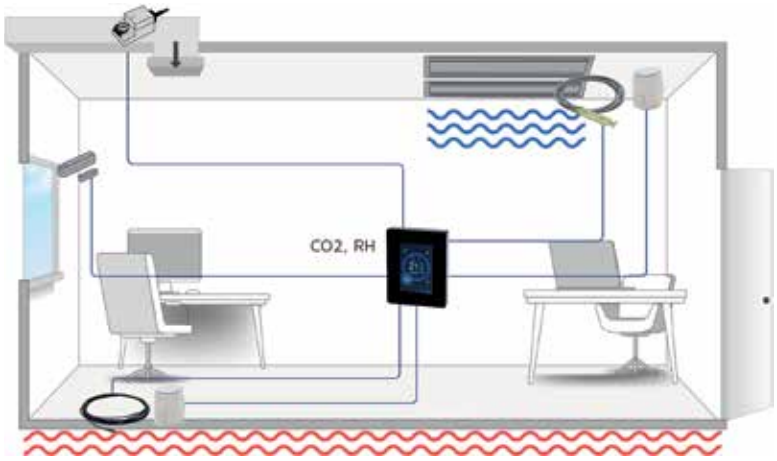
DO 24 Vac PWM output (thermal actuator heating/cooling control, requires 24 Vac supply)

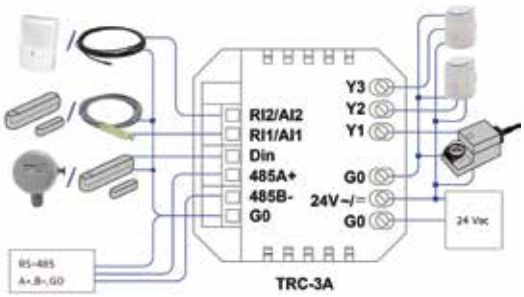
CE Control extension. The extension provides control for lights and blinds and extension override function.

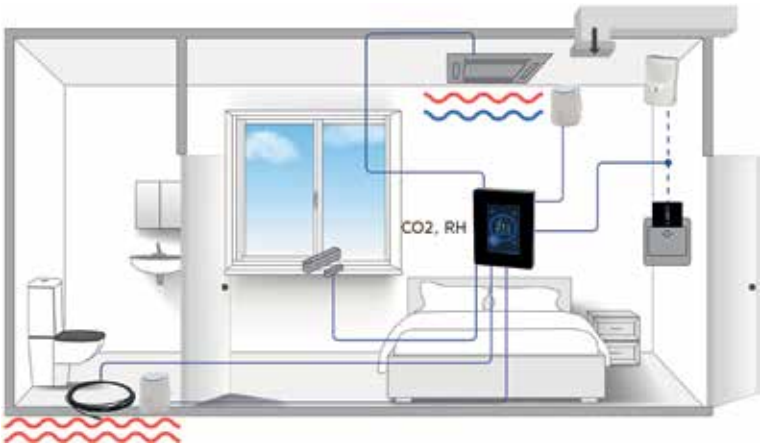
TRC-3A is an advanced room temperature and CO2 controller where the analogue outputs can be configured for wide range of functions (e.g. heating, cooling, EC fan, maximum of CO2 and cooling stages, humidity control, change-over control).

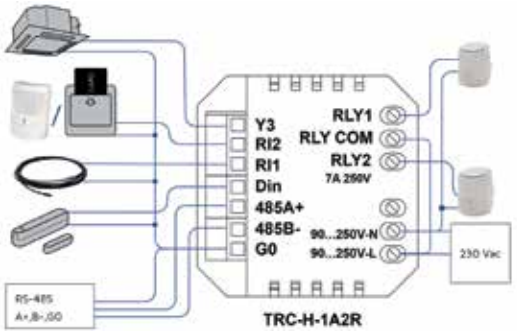
NOTE: You can select also Fahrenheit as the temperature unit during commissioning.

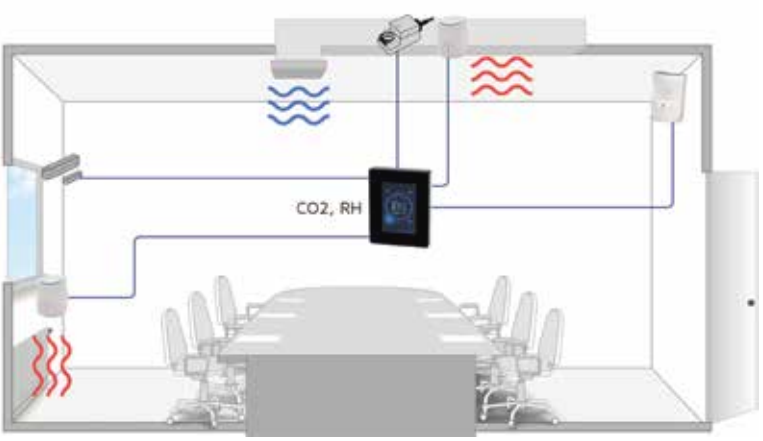
Room controllers

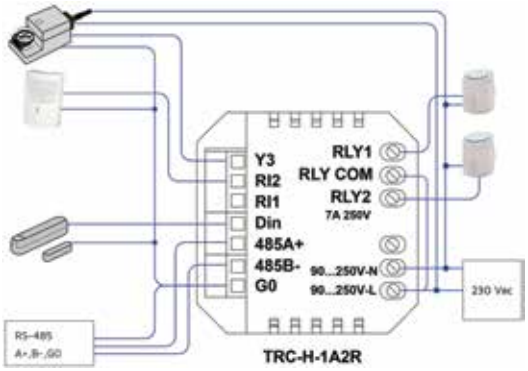












Room controllers

1

room °C, %rH, CO_2

The TRC-A-3A series room controllers have been designed for apartment climate control. They have a sharp, slim-line 3.5" colour touchscreen interface. The controllers have heating and/or cooling controls with summer/winter change-over. With the Home / Away / Boost operation button, the user can set the apartment conditions to the required state with a simple press of a button. Combined with extractor fans, the TRC-A-3A series controllers can control the supply and extract air flow in the apartment, maintaining comfortable and correctly pressurized climatic conditions in all operating conditions. Available with both Modbus RTU and BACnet MS/TP communication.

Consumption data view is a new feature available in -CD models. This view can display, for example, water, energy and heating consumption details to the user. The BMS system reads this data from the different sensors in the building and sends it to the TRC-A-3A controller via Modbus or BACnet.

Temperature measurement range	0...50 °C
Temperature measurement accuracy	±0.5 °C (25 °C)
IP protection class	IP20
Ambient temperature	0...50 °C
Ambient humidity	0...95 %rH
Mounting	on a flush mounting box (60 mm hole distance)
Materials	PC plastic

Ordering guide		Type	0	1	2	3	4	5	6
0 Touchscreen room controllers			6001						
1 Device type	Touchscreen apartment controller, 2RI, 1DI, 3AO	TRC-A-3A		B					
2 Communication	Modbus RTU	-MOD			M				
	BACnet MS/TP	-BAC			B				
3 Power supply	24 Vac/dc	-24				2			
4 Additional measurements	No additional measurement						0		
	Relative humidity	-RH					1		
	CO_2	-CO2					2		
	Relative humidity and CO_2	-RH-CO2					3		
5 Advanced options	No advanced options							0	
	0...10 Vdc inputs, replace existing RI inputs	-AI						1	
	Consumption data view	-CD						5	
6 Body colour	White (RAL 9010)	-W							W
	Black (RAL 8022)	-B							B

TOOLS

SW-DCT-USB	1139040	configuration cable

Ordering guide explanation:

RI External NTC 10 temperature input (optional, selectable function, control, limit control, measurement, heating/cooling changeover, high/low limit, aux control loop, 0...10 V external CO2 and temperature, 0...10 V pressure measurement).

DI Voltage free digital input (optional, selectable function e.g. occupancy, night mode, condensation, alarm, summer/winter)

AO 0...10 Vdc analogue output (selectable function e.g heating, cooling, max VAV, EC fan, lights control, blinds control, humidity control, alarm output)

DO 24 Vac PWM output (thermal actuator heating/cooling control, requires 24 Vac supply)

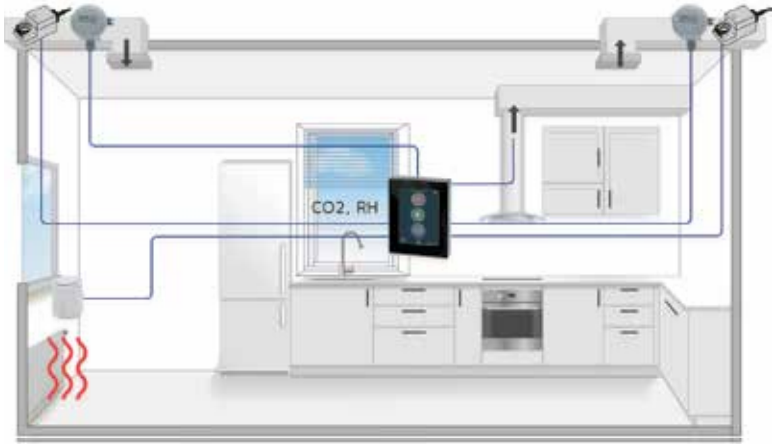
CE Control extension. The extension provides control for lights and blinds and extension override function.

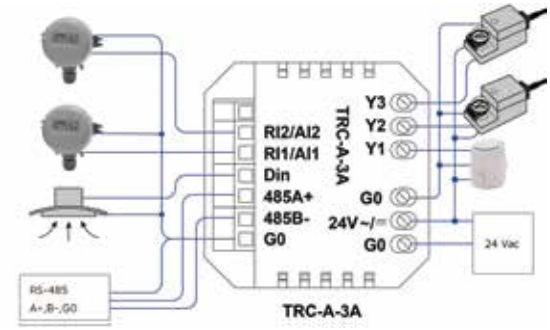
CD Consumption data. This option adds a consumption data view to the controller. This view shows the consumption data the BMS system has read from different sensors in the building and sent to the controller via bus.

TRC-A-3A is designed for apartment control with pressure balancing of the supply and extract flows, interlinks to the kitchen extractor, heating/cooling control and simple Home/Away/Boost selection screens.

NOTE: You can select also Fahrenheit as the temperature unit during commissioning.

Room controllers





Room controllers

1

TRC-P touchscreen room controllers have been designed for climate control in room spaces. The controllers have up to two heating and cooling temperature control stages, fan speed control, optional CO_2 level control and humidity control, and 7-day clock for scheduling operation modes. The units can be used in various climate control applications, fan coil units, chilled ceilings and zone heating/cooling systems. Light and blinds control are also available. The devices provide accurate energy saving PI control and an intuitive, slim line 3.5" colour touchscreen interface.

room °C, %rH, CO_2

Temperature measurement range	0...50 °C
Temperature measurement accuracy	±0.5 °C (25 °C)
IP protection class	IP20
Ambient temperature	0...50 °C
Ambient humidity	0...95 %rH
Mounting	on a flush mounting box (60 mm hole distance)
Materials	PC plastic

Ordering guide		Type	0	1	2	3	4	5	6
0 Touchscreen room controllers			6001						
1 Device type	Room controller, 2RI/DI, 1DI, 3AO, schedule	TRC-P-3A		N					
	Room controller, 1RI/DI, 1DI, 2AO, 3RO, 7A, schedule	TRC-P-H-2A3R		Q					
	Room controller, 2RI/DI, 1DI, 1AO, 2DO, schedule	TRC-P-1A2T		R					
	Room controller, 2RI/DI, 1DI, 3RO, 2DO, 7A, schedule	TRC-P-H-3R2T		T					
	Room controller, 2RI/DI, 1DI, 1AO, 2RO, 7A, schedule	TRC-P-H-1A2R		X					
2 Communication	Modbus RTU	-MOD			M				
	BACnet MS/TP	-BAC			B				
3 Power supply	24 Vac/dc (not available for TRC-P-H-1A2R)	-24				2			
	90...250 Vac (only TRC-P-H-1A2R)	-230				M			
4 Additional measurements	No additional measurement						0		
	Relative humidity	-RH					1		
	CO_2	-CO2					2		
	Relative humidity and CO_2	-RH-CO2					3		
5 Advanced options	No advanced options							0	
	0...10 Vdc input(s) (replaces existing RI input(s))	-AI						1	
6 Body colour	White (RAL 9010)	-W							W
	Black (RAL 8022)	-B							B

TOOLS

SW-DCT-USB	1139040	configuration cable

Ordering guide explanation:

RI/DI External NTC 10 temperature input (optional, selectable function, control, limit control, measurement, heating/cooling changeover, high/low limit, aux control loop, 0...10 V external CO_2 and temperature, 0...10 V pressure measurement). These inputs can be configured also to work as digital inputs.

DI Voltage free digital input (optional, selectable function e.g. occupancy, night mode, condensation, alarm, summer/winter)

RO 230 V relay output for 230 V actuators (typically 3-speed fan, optional heating/cooling stat)

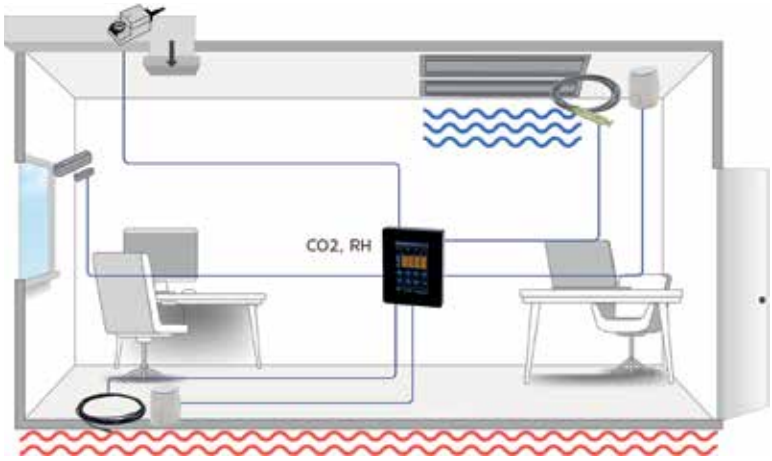
AO 0...10 Vdc analogue output (selectable function e.g heating, cooling, max VAV, EC fan, lights control, blinds control, humidity control, alarm output)

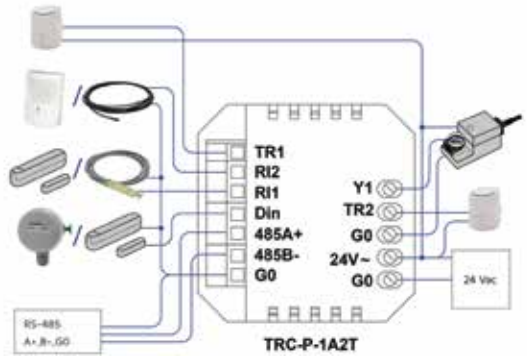
DO 24 Vac PWM output (thermal actuator heating/cooling control, requires 24 Vac supply)

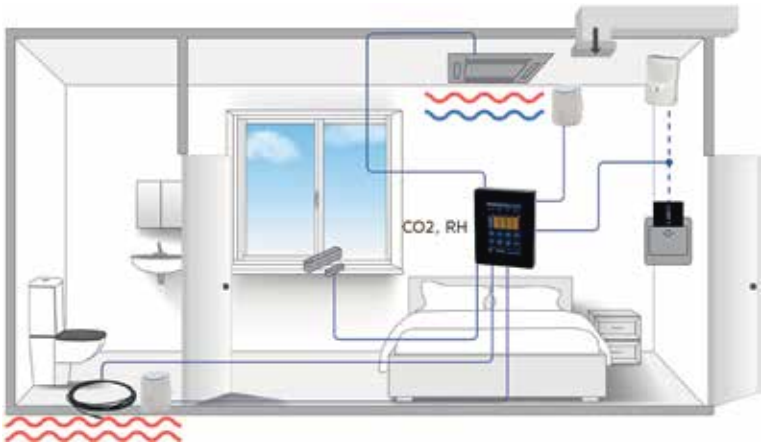
TRC-P-3A is an advanced room temperature and CO_2 controller where the analogue outputs can be configured for wide range of functions (e.g. heating cooling, EC fan, maximum of CO_2 and cooling stages, humidity control, change-over control).

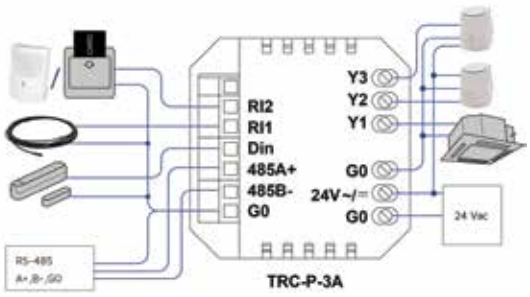
NOTE: You can also select Fahrenheit as the temperature unit during commissioning.

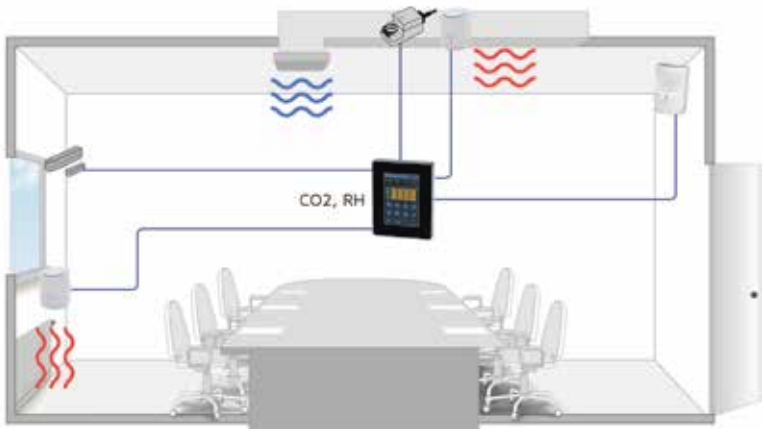
Room controllers

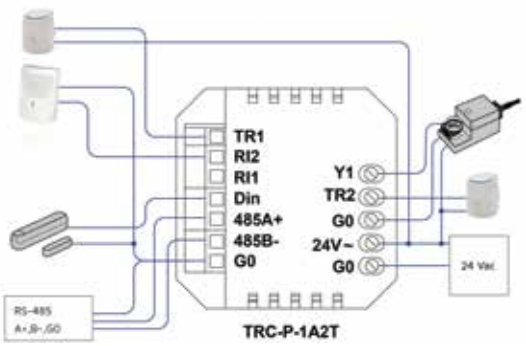


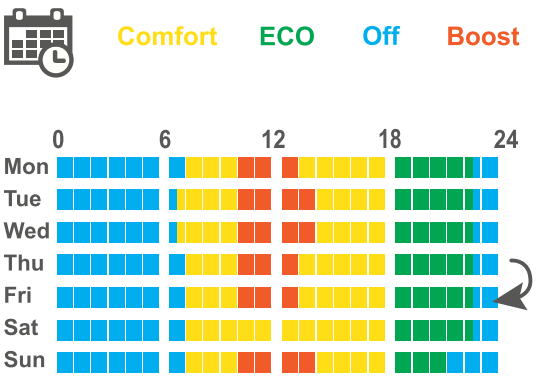












Room controllers

1

HLS 44 multifunctional controller family is specifically designed for individual room temperature and zone control applications. All controllers include the basic control functionalities, such as temperature, VAV, and fan control. The controllers have a built-in, galvanic isolated RS-485 channel for Modbus RTU communication.

HLS 44-SE includes advanced functionalities, e.g., 6-way valve control, adjustable 3-speed fan voltages, dimming the display with a timer, and changing the display to show + and - instead of the set temperature (relative setpoint adjustment).
All product variants can be ordered with our adaptation service. With the service you can order the product preconfigured with all the settings that are required by the application.

room °C

Power supply	24 Vac/dc, <1 VA
Temperature measurement accuracy	±0.5 °C
IP protection class	IP20
Ambient temperature	0...50 °C
Ambient humidity	0...85 %rH
Mounting	with screws on wall or on a junction box (hole distance 60 mm)
Materials	ABS plastic
Product dimensions	87 x 86 x 32 mm

TYPE	ART. NO.	
HLS 44-V	1150260	room temperature controller, Modbus communication, lighting control
HLS 45	1150270	room temperature controller, Modbus communication, floor heating and cooling control
HLS 44-3P	1150280	room temperature controller, Modbus communication, 3-point actuator control
HLS 44-CO2	1150370	room temperature controller, Modbus communication, built-in CO_2 sensor
HLS 44-SE	1150400	room temperature controller, Modbus communication
OPTIONS		
RYVA 16	1183060	relay for fluorescent lamps, 10 A (inrush current < 80 A, < 2,5 ms)
FCRY 3	1183070	fan coil relay, input 0...10 Vdc
TH 5	1183090	driver for thermal actuators, 5 outputs
TOOLS		
HLS 44-SER	1150251	configuration tool for HLS 44-V
HLS 45-SER	1150271	configuration tool for HLS 45
HLS 44-3P-SER	1150281	configuration tool for HLS 44-3P
HLS 44-CO2-SER	1150371	configuration tool for HLS 44-CO2
HLS 44-SE-SER	1150401	configuration tool for HLS 44-SE

Room controllers

room °C

1

HLS 44-SE-P is the latest arrival to the HLS 44 multifunctional controller family. As the other tried-and-true members of this family, it is designed for individual room temperature and zone control applications. Unlike the other models, HLS 44-SE-P has a potentiometer for easy setpoint adjustment. The controller includes the basic control functionalities, such as temperature, VAV and fan control. It supports 0...10 V controlled actuators and/or thermal actuators, and 0...10 V controlled dampers.

The controller also has day and night operating modes. These operating modes can be controlled by an external card switch, occupancy detector and via Modbus. The controller has a built-in, galvanic isolated RS-485 channel for Modbus RTU communication.

Power supply	24 Vac/dc, < 2 VA
Set point	18...26 °C, ±3 °C (day mode), 8...50 °C (night mode)
Temperature measurement range	0...50 °C
Temperature measurement accuracy	±0.5 °C
Voltage input	1 x 0...10 Vdc
Resistive input	1 x NTC 10 / DI
Voltage output	4 x 0...10 Vdc, 2 mA
Triac output	2 x 24 Vac, 1 A
IP protection class	IP20
Ambient temperature	0...50 °C
Ambient humidity	0...85 %rH
Mounting	with screws on wall or on a junction box (hole distance 60 mm)
Materials	ABS plastic
Product dimensions	87 x 86 x 33 mm

TYPE	ART. NO.	
HLS 44-SE-P	1150440	room temperature controller, Modbus communication
OPTIONS		
FCRY 3	1183070	fan coil relay, input 0...10 Vdc
TH 5	1183090	driver for thermal actuators, 5 outputs
TOOLS		
HLS 44-SE-SER	1150401	configuration tool for HLS 44-SE

Room controllers

1

HLS 33 is a room temperature controller with 2 or 3 stages. One stage is for heating and up to two stages for cooling. The controllers can be used with 0...10 V, 3-point or thermal (PWM) actuators.

room °C

Power supply	24 Vac, < 2 VA
Temperature measurement range	0...50 °C
Temperature measurement accuracy	±0.5 °C
Voltage output	2 x 0...10 Vdc, 2 mA, for heating and cooling
Triac output	2 x 24 Vac, 1 A, 0,6 A cont. / 1 A max, for heating and cooling
IP protection class	IP20
Ambient temperature	0...50 °C
Ambient humidity	0...85 %rH
Mounting	on the wall surface or on a flush mounting box (60 mm hole distance)
Materials	ABS plastic
Product dimensions	86 x 86 x 32 mm

TYPE	ART. NO.	
HLS 33	1150090	room controller, internal temperature sensor
HLS 33-N	1150091	room controller with display, internal temperature sensor
HLS 33-EXT	1150092	room controller, for an external NTC10 temperature sensor
HLS 33-N-EXT	1150093	room controller with display, for an external NTC10 temperature sensor

OPTIONS

TH 5	1183090	driver for thermal actuators, 5 outputs

Manage the invisible

We make invisible changes measurable for Building Automation and HVAC industry

Smart thermostats

1

The slim design of the flush-mounted TRT smart thermostat gives a modern look and feel to heating or cooling control applications. TRT series thermostats have a 3.5" backlit colour touchscreen and provide a wide range of power options. The MOD models have built-in Modbus RTU communication. The BAC models provide BACnet MS/TP communication. TRT smart thermostats can also be used as lighting and/or air conditioning interfaces. The thermostats are also available with 7-day schedule with multiple setpoints.

room °C, %rH

Temperature measurement range	0...50 °C
Temperature measurement accuracy	±0.5 °C (25 °C)
Digital input	1 x potential free input
Resistive input	2 x NTC 10 or potential free digital input
Relay output	230 Vac, 7 A (res.) / 1.3 A (inductive) or 115 Vac, 7 A (res.) / 2.2 A (inductive)
IP protection class	IP20
Ambient temperature	0...50 °C
Ambient humidity	0...95 %rH
Mounting	on a flush mounting box (60 mm hole distance)
Materials	PC plastic
Product dimensions	88 x 112 x 43 mm

Ordering guide		Type	0	1	2	3	4	5	6
0 Touchscreen room thermostats			6001					0	
1 Device type	Room thermostat, 2RI/DI, 1DI, 1RO	TRT-1R		1					
	Room thermostat, 2RI/DI, 1DI, 1RO, 7-days schedule	TRT-P-1R		2					
2 Communication	Modbus RTU	-MOD			M				
	BACnet MS/TP	-BAC			B				
3 Power supply	24 Vac/dc	-24				2			
	90...250 Vac	-230				M			
4 Additional measurements	No additional measurement						0		
	Relative humidity	-RH					1		
5 Reserved								0	
6 Body colour	White (RAL 9010)	-W							W
	Black (RAL 8022)	-B							B

TOOLS

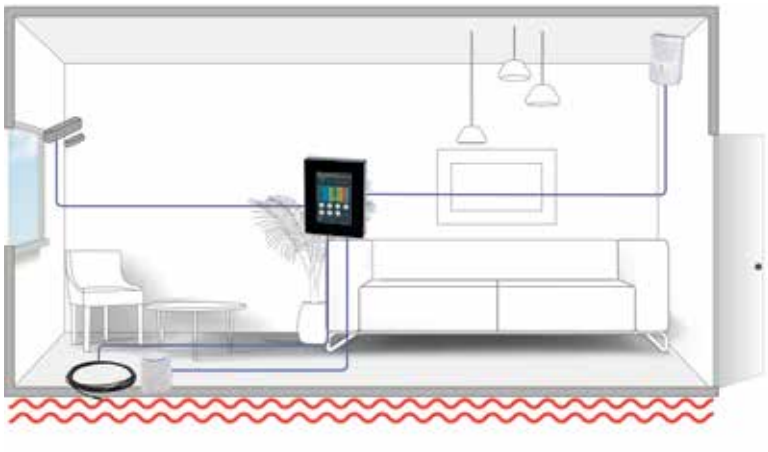
SW-DCT-USB	1139040	configuration cable

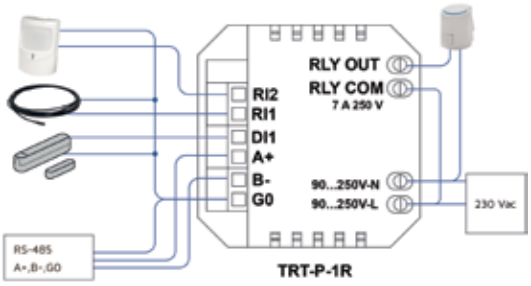
Ordering guide explanation:

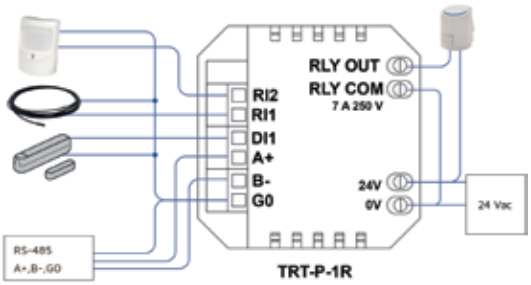
RI/DI External NTC 10 temperature input (selectable e.g. for control, high/low limit control)
These inputs can be configured also to work as digital inputs.
DI Voltage free digital input (selectable for e.g ECO override, OFF override, heating/cooling mode, alarm)
RO 230 Vac SPST relay, 7 A resistive (for heating/cooling control, zone 2 heating control)

NOTE: You can select also Fahrenheit for temperature unit during commissioning.

Smart thermostats







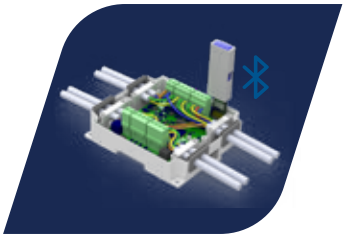
Control units

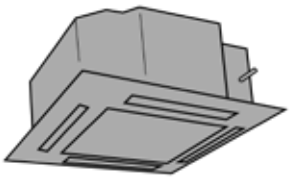
The multifunctionality of our control units offers plenty of possibilities for your larger or smaller scale room and zone control applications. Furthermore, configurable control parameters in the advanced controller models make them highly adaptable also for your future needs.

1

Proxima CU-LH control unit

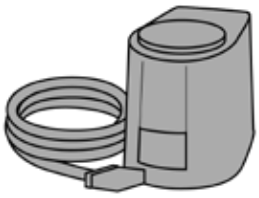
Wireless configuration via MyProdual



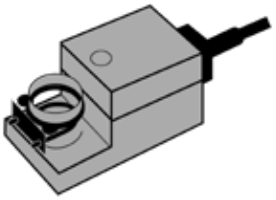


0...10 V EC fan control

3-step fan control

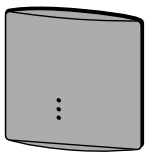


0...10 V actuators

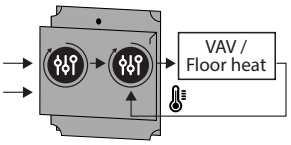


0...10 V damper motors

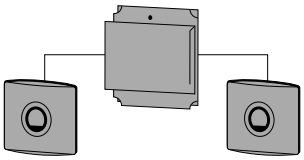
24 V damper motors



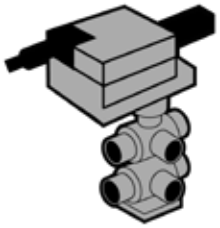
Support for external active transmitters (CO_2, %rH, temperature, setpoint)



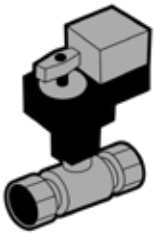
Cascade control



2-room control

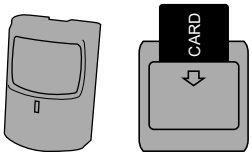


0...10 V 6-way valve control



3-point actuators

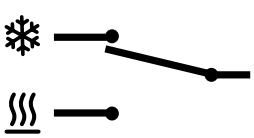
External passive NTC 10-K / 0...10 V active sensors



PIR sensor input

Key card input

Condensation input



Change-over input

Control unit inputs and outputs

Product	Page	Analogue inputs	Digital inputs	Analogue outputs	Digital outputs	Note
CU	34	6	6	6	4	Universal inputs (6 pcs) and outputs (6 pcs).
CU-LH	36	3	3	4	2	Multifunctional inputs (3 pcs) and outputs (4 pcs)
PDS 2.2	38	2	0	2	2	
HS 2.2-M	39	1	2	4	1	

Control unit selection guide

	Note: Check the product pages for more information.	Control unit			
		PDS 2.2	HS 2.2-M	CU-LH	CU
Application	4-pipe fan coil unit control			•	•
	2-pipe fan coil unit control			•	•
	Floor heating			•	•
	Floor heating/cooling			•	•
	Chilled beam			•	•
	Heating radiator control			•	•
	6-way valve control			•	•
	On/off thermostat mode			•	•
	Universal controller	•	•	•	•
	Middle roof installation			•	•
Actuator	Thermal	•	•	•	•
	3-point	•	•	•	•
	0...10 V	•	•	•	•
Function	Control stages	**1**	**1**	**2/2**	**2/2**
	Control modes	**P/PI**	**P/PI**	**P/PI**	**P/PI**
	Cascade control			•	•
	3-speed fan control with FCRY 3			•	•
	EC fan control			•	•
	VAV control			•	•
	2-pipe change-over / summer/winter			•	•
	Key card input			•	•
	CO_2 based ventilation control			•	•
	Thermostatic ON/OFF mode			•	•
	Dedicated room unit input			•	•
	CO_2 transmitter input			•	•
	Humidity transmitter input			•	•
	Temperature transmitter input			•	•
	Potentiometer input			•	•
	External temperature sensor input			•	•
	Condensation sensor input			•	•
	Modbus RTU	•	•	•	•
	Modbus TCP				•
	BACnet MS/TP			•	•
	BACnet IP				•
	Page	38	39	36	34

Control units

1

Produal Proxima® CU is a multifunctional control unit designed especially for room and zone control applications. The control unit supports the following communication protocols: Modbus RTU, Modbus TCP, BACnet MS/TP and BACnet IP. Two rooms can be controlled with one control unit by connecting two room units.

Power supply	24 Vac/dc (22...26 V), < 7 VA
Multifunctional input	6 x NTC 10 / Pt1000 / Resistive / Digital / 0...10 Vdc
Multifunctional output	4 x 0...10 Vdc, 2 mA / 24 Vac, 1 A (PWM) and 2 x 0...10 Vdc, 2 mA / 0...20 mA, 700 Ω
Supply output	2 x 24 Vac, total load < 8 A
IP protection class	IP22
Ambient temperature	0...50 °C
Ambient humidity	0...85 %rH
Mounting	on the wall surface or on 35 mm DIN rail
Materials	PC plastic
Product dimensions	186 x 136 x 55 mm

TYPE	ART. NO.	
CU	5201010000	multifunctional control unit, white
CUB	5201010003	multifunctional control unit, black
OPTIONS		
TH 5	1183090	driver for thermal actuators, 5 outputs
CUCC	5201010400	cable covers for Proxima CU and WBU (includes two covers and four fixing screws)
TOOLS		
MYT-Andr	5100010000	Free Android application for configuring and commissioning of Produal PUMP® devices.

The control unit can be used in many different room control applications with several Produal products. Here are some examples for connecting a room unit to the control unit:

TRI (PAGE 42)
The versatile and customizable touchscreen room unit can be connected to the room unit port on the control unit.

ROU (PAGE 45)
The advanced touchscreen room unit can be connected to the room unit port on the control unit.

RU (PAGE 44)
The customizable room unit can be connected to the room unit port on the control unit.

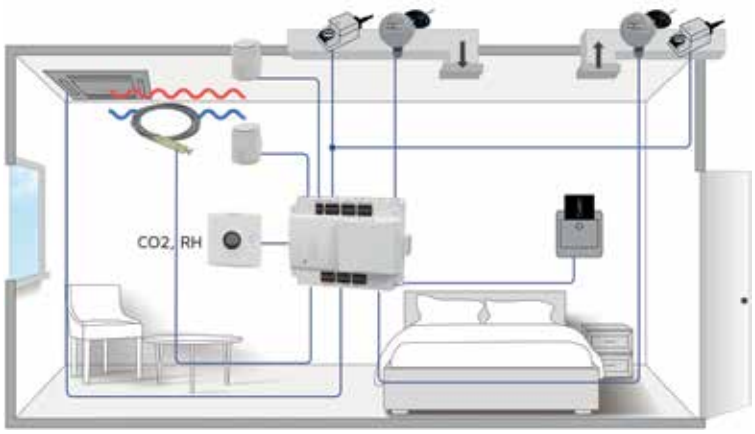
TEHR NTC 10-P (PAGE 135)
Room temperature sensor with passive potentiometer can be connected to input terminals on the control unit for setpoint and temperature.

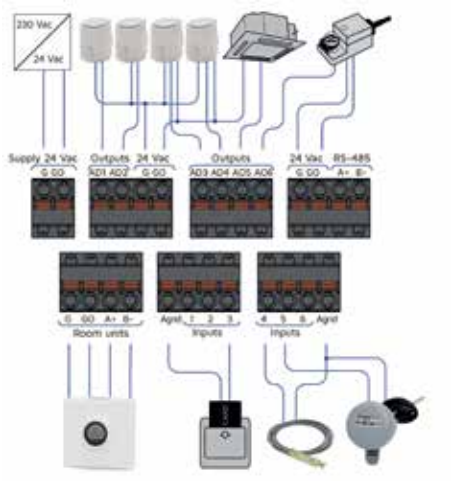
You may need to adjust the potentiometer resistance levels in the control unit.

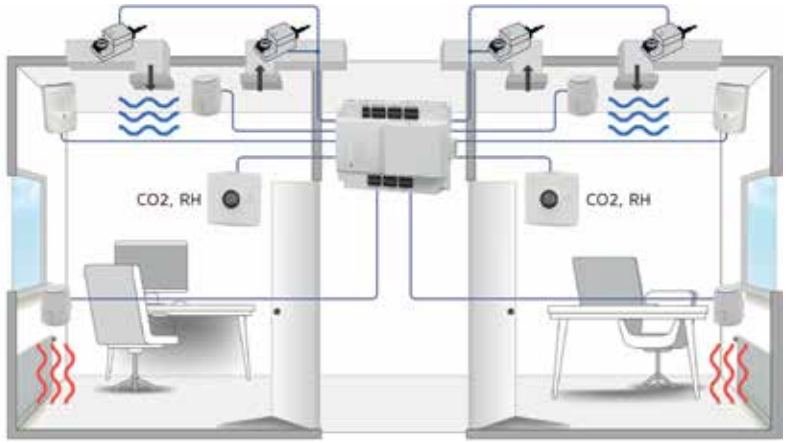
TEHR LU-PU (PAGE 136)
Room temperature transmitter with active potentiometer can be connected to input terminals on the control unit for setpoint and temperature.

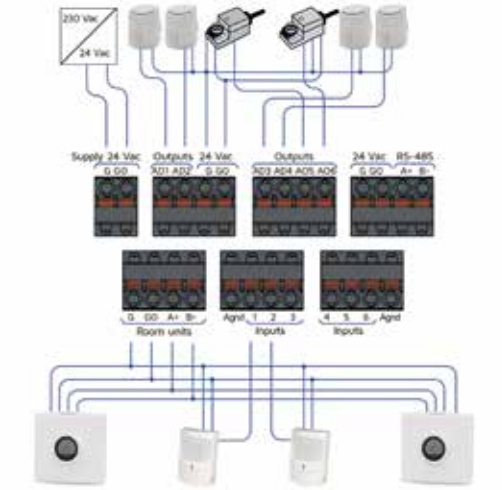
HDH-PU (PAGE 75)
Room CO2 transmitter with active potentiometer can be connected to input terminals on the control unit for setpoint, temperature and CO2.

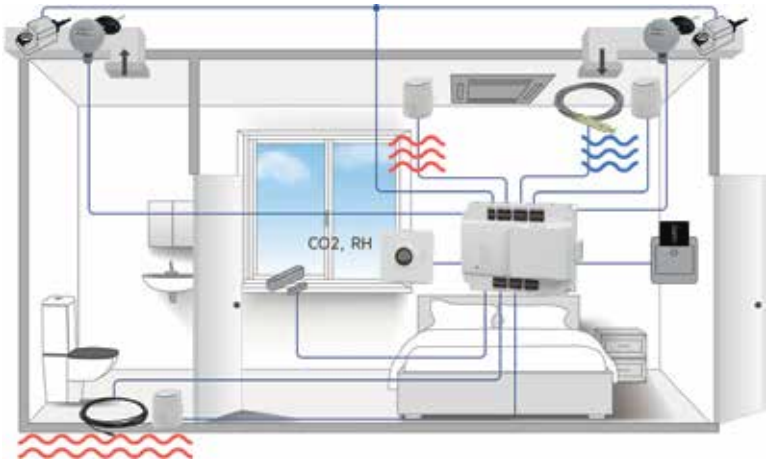
Control units

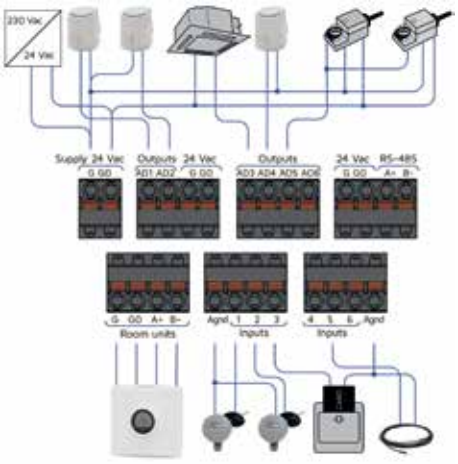












Control units

1

Produal Proxima® CU-LH control unit combines all the flexibility and power of Produal Proxima CU into a compact package, especially optimized for individual room temperature, VAV and zone control applications. The control unit supports the following communication protocols: Modbus RTU (MOD models) and BACnet MS/TP (BAC models). The BAC models also support Modbus RTU. The control unit is equipped with two separate control loops and a cascade controller loop. The unit has three operation modes for energy saving control functions. The outputs, setpoints and the controller dead zone can be configured separately for each operation mode.

Power supply	24 Vac/dc (22...26 V), < 2 VA
Multifunctional input	3 x NTC 10 / Resistive / Potential free contact / 0...10 Vdc
Multifunctional output	2 x 0...10 Vdc, 2 mA / 24 Vac, 1 A (PWM) and 2 x 0...10 Vdc, 2 mA
Supply output	2 x 24 Vac, total load < 6 A
IP protection class	IP44
Ambient temperature	0...50 °C
Ambient humidity	0...85 %rH
Mounting	on the wall surface or on 35 mm DIN rail
Materials	PC plastic
Product dimensions	116 x 128 x 47 mm

TYPE	ART. NO.	
CU-LHB-MOD	52011B1000	control unit, black, Modbus RTU
CU-LHB-BAC	52011B2000	control unit, black, Modbus RTU/BACnet MS/TP
CU-LH-MOD	52011W1000	control unit, white, Modbus RTU
CU-LH-BAC	52011W2000	control unit, white, Modbus RTU/BACnet MS/TP
OPTIONS		
TH 5	1183090	driver for thermal actuators, 5 outputs
CA-SR	5201A00S00	cable strain relief set
TOOLS		
MYT-Andr	5100010000	Free Android application for configuring and commissioning of Produal PUMP® devices.
MYT-CON	5100020000	MyTool Connect, a Bluetooth dongle for Produal MyTool® connection

The control unit can be used in many different room control applications with several Produal products. Here are some examples for connecting a room unit to the control unit:

TRI (PAGE 42)
The versatile and customizable touchscreen room unit can be connected to the room unit port on the control unit.

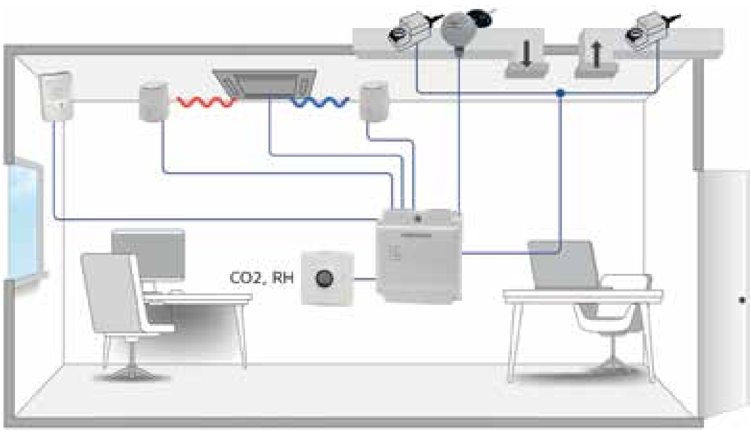
ROU (PAGE 45)
The advanced touchscreen room unit can be connected to the room unit port on the control unit.

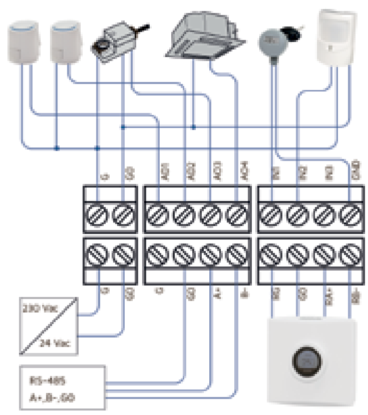
RU (PAGE 44)
The customizable room unit can be connected to the room unit port on the control unit.

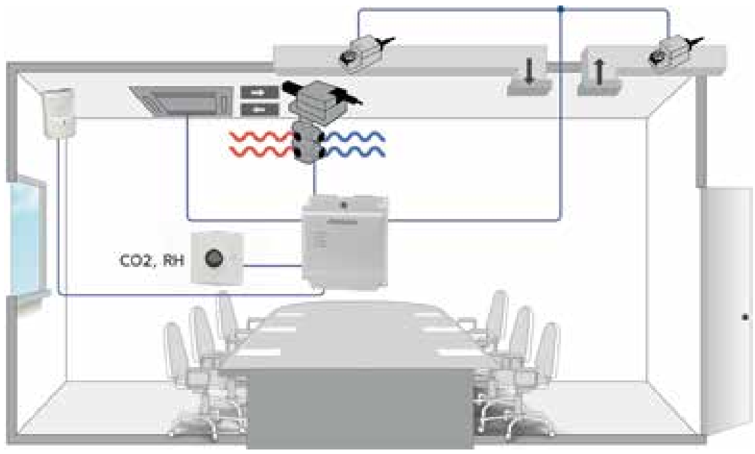
TEHR NTC 10-P (PAGE 135)
Room temperature sensor with passive potentiometer can be connected to input terminals on the control unit for setpoint and temperature. You may need to adjust the potentiometer resistance levels in the control unit.

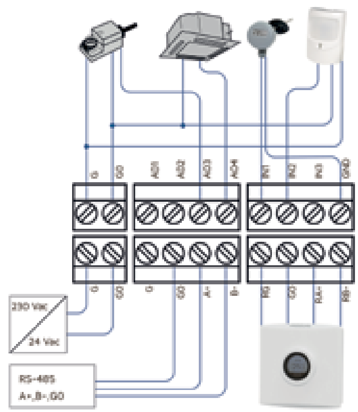
TEHR LU-PU (PAGE 136)
Room temperature transmitter with active potentiometer can be connected to input terminals on the control unit for setpoint and temperature.

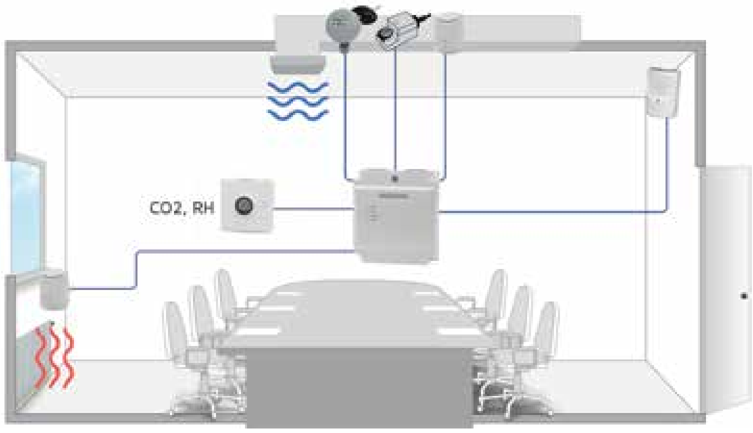
Control units

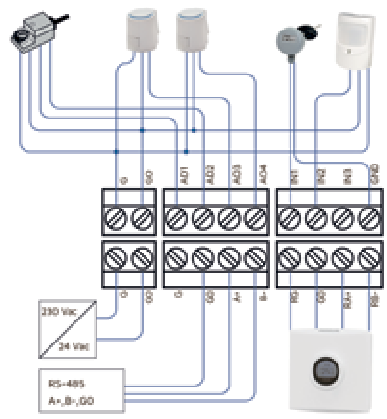


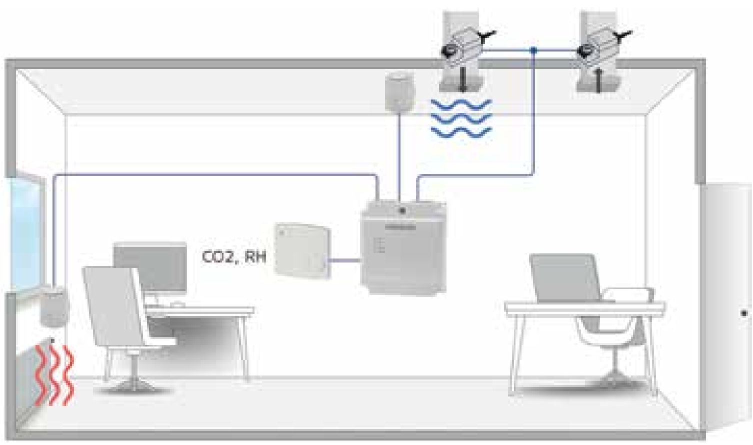


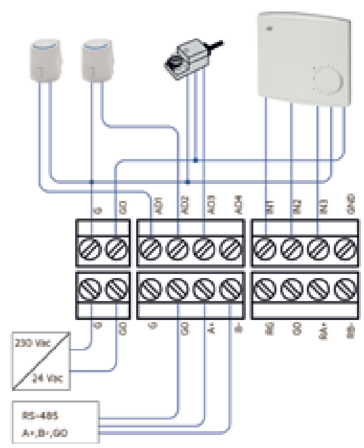












Control units

1

PDS 2.2 universal controller can be used for controlling e.g. pressure, humidity or temperature. The controller supports 0...10 V controlled, 3-point controlled or thermal actuators. The controller has RS-485 connection for Modbus RTU communication.

°C, %rH, Pa, bar, CO, CO_2, m/s, lx

Power supply	24 Vac/dc (20...28 V), <1 VA. NOTE: Only the 0...10 V outputs and Modbus work when using DC supply voltage.
Voltage input	2 x 0...10 Vdc
Voltage output	1 x 0...10 Vdc, 2 mA and 1 x 10 Vdc, for 4.7...220 kΩ potentiometer
Triac output	2 x 24 Vac, 1 A, for thermal actuators or 3-point actuators
IP protection class	IP20
Ambient temperature	0...50 °C
Ambient humidity	0...95 %rH
Mounting	on 35 mm DIN rail
Product dimensions	53 x 90 x 58 mm

TYPE	ART. NO.	
PDS 2.2	1150150	universal controller

OPTIONS

TH 5	1183090	driver for thermal actuators, 5 outputs

Control units

°C, %rH, Pa, bar, CO, CO_2, m/s, lx

HS 2.2–M is a universal controller designed for HVAC applications. It can be used for controlling e.g. pressure, differential pressure, temperature or illumination level. Display is possible to scale according to the measurement. Controller has a galvanically isolated RS-485 connection for Modbus RTU communication.

Power supply	24 Vac/dc, <1 A. NOTE: Only the 0...10 V outputs and Modbus work when using DC supply voltage.
Temperature measurement range	0...50 °C
Temperature measurement accuracy	±0.5 °C
Voltage input	0...10 Vdc, 10 kΩ
Digital input	2 x potential free contact
Voltage output	3 x 0...10 Vdc, 2 mA
Triac output	24 Vac, 1 A, for thermal actuator or 3-point actuator
Output	10 Vdc, error signal
IP protection class	IP20
Ambient temperature	0...50 °C
Ambient humidity	0...85 %rH
Mounting	on the wall surface or on a flush mounting box (60 mm hole distance)
Materials	ABS plastic
Product dimensions	86 x 86 x 32 mm

TYPE	ART. NO.	
HS 2.2–M	1150290	universal controller, room housing

OPTIONS

TH 5	1183090	driver for thermal actuators, 5 outputs

Room units

Our selection of room units allows the implementation of easy-to-use, premium class applications, or simple yet stylish room solutions in various commercial and public facilities. Versatile models with user-friendly touchscreens, graphical displays, or touch-button interfaces offer a wide range of functionalities – you can simply select the suitable product variant for your purposes.

- temperature, relative humidity, CO2, occupancy detection
- light and blinds control
- weekly time programme
- fan speed control, temporary day mode with man-in-house, continuously rotating setpoint knob enabling setpoint reset via Modbus
- RS-485 Modbus RTU communication
- BACnet MS/TP communication

Modbus

The Proxima RU, Proxima RU-D, and ROU room units can either be connected to the Proxima CU or Proxima CU-LH control unit or operate stand-alone as a general room interface option when connected via Modbus RTU directly to the BMS or PLC system. With an intuitive touchscreen interface, the ROU unit is a versatile and adaptaple room interface solutions.

The TRI room unit can be connected to Proxima CU or Proxima CU-LH control unit, or via Modbus and BACnet communications to most BMS and PLC systems, providing an attractive user interface to these systems. With a full-screen touch display, with a clear and visible layout and intuitive control, the TRI is a versatile and adaptable room interface solution.

Modbus BACnet

Modbus

A simple, local room solution can also be implemented with the help of TEHR NTC 10–P temperature sensor by reading analogue signals to PLC system. The temperature sensor TEHR-M is also directly connectable to BMS system.

Room unit selection guide

Note: Check the product pages for more information.	Room unit families		
	TRI	RU	ROU
Temperature measurement	•	•	•
External temperature sensor input	•		
Humidity measurement	o	o	o
CO_2 measurement	o	o	o
Display	•	o	•
Touchscreen	•		•
7–day schedule	o		
Timer	•		
Digital input	•		
Relay output	o		
0...10 Vdc setpoint output	o[1)]		
0...10 Vdc temperature output	o[1)]		
0...10 Vdc humidity output	o[1)]		
0...10 Vdc CO_2 output	o[1)]		
0...10 Vdc fan output	o[1)]		
0...10 Vdc network value	o[1)]		
Temperature setpoint	•	•	•
Temperature setpoint knob		•	
Continuously rotating setpoint knob		•	
Occupancy button	•	o	•
Occupancy sensor			o
Surface mounting		•	•
Flush mounting	•		o
Modbus RTU	o	•	•
BACnet MS/TP	o		
Page	42	44	45

• standard
o optional
[1)] a total of three outputs

The Produal Proxima® CU control unit can be used to control two rooms at the same time with its two built-in control loops. Two room units can be installed into CU's room unit port. This can greatly reduce the system cost. In this case, the installer can choose which inputs and outputs are available in Proxima CU, and easily assign them to each control loop. The configuration is carried out using the MyProdual® Android application. In this illustration, Proxima CU is controlling two conference rooms with the RU room unit.

Room units

1

room °C, %rH, CO_2

TRI touchscreen room units provide an intuitive user interface and a sensor for room control applications. The devices are connected to CU or CU-LH control units, or linked to BMS via Modbus or BACnet communication interfaces. The 320 x 480 pixel 255K colour touchscreen displays the control status information. Users can change the control settings, including the setpoint, fan speed, and operation mode. They can switch lights and air conditioning units on/off, or activate the Boost mode to improve ventilation.
All TRI units have additional measurement inputs/outputs that can be used as inputs/outputs in the BMS (can be controlled over the network).

Power supply	24 Vac/dc (22...28 V) < 80 mA
Temperature measurement range	0...50 °C
Temperature measurement accuracy	±0.5 °C (25 °C)
Digital input	1 x potential free input
Resistive input	2 x NTC 10
Relay output	230 Vac, 7 A (res.) / 1.3 A (inductive) or 115 Vac, 7 A (res.) / 2.2 A (inductive)
IP protection class	IP20
Ambient temperature	0...50 °C
Ambient humidity	0...95 %rH
Mounting	on a flush mounting box (60 mm hole distance)
Materials	PC plastic
Product dimensions	88 x 112 x 43 mm

Ordering guide		Type	0	1	2	3	4	5	6
0 Touchscreen room units			6001					0	
1 Device type	Room unit, 2RI, 1DI, 1RO	TRI-1R		6					
	Room unit, 2RI, 1DI, 1RO, 7-days schedule	TRI-P-1R		7					
	Room unit, 2RI, 1DI, 3AO	TRI-3A		8					
2 Communication	Modbus RTU	-MOD			M				
	BACnet MS/TP	-BAC			B				
3 Power supply	24 Vac/dc	-24				2			
4 Additional measurements	No additional measurement						0		
	Relative humidity	-RH					1		
	CO_2	-CO2					2		
	Relative humidity and CO_2	-RH-CO2					3		
5 Reserved								0	
6 Body colour	White (RAL 9010)	-W							W
	Black (RAL 8022)	-B							B

TOOLS

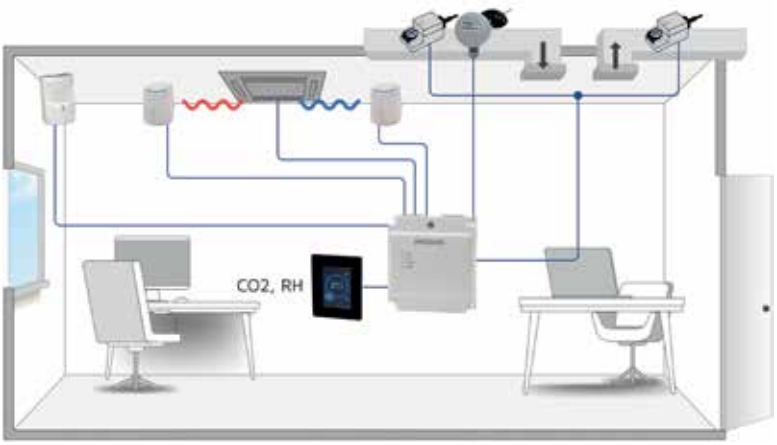
SW-DCT-USB	1139040	configuration cable

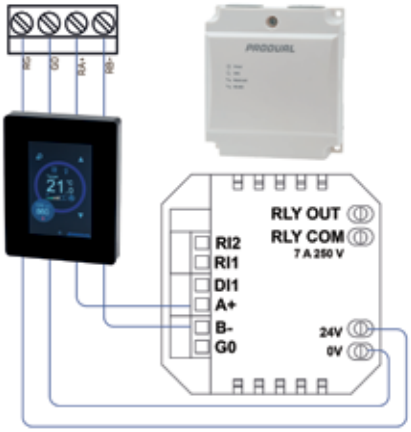
TRI ordering guide explanation:

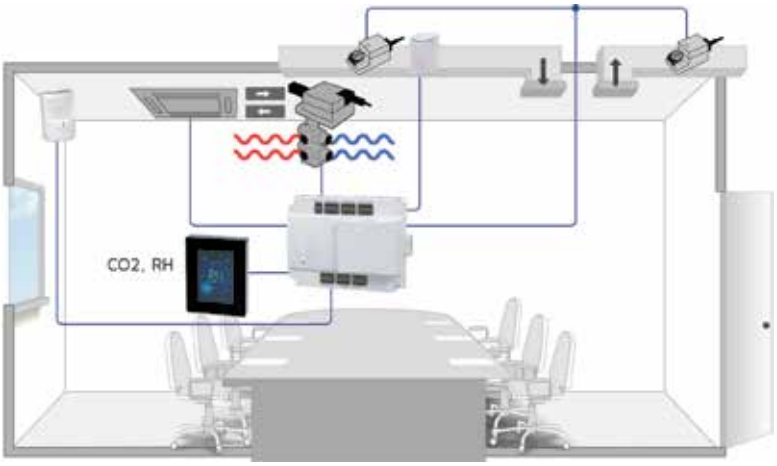
RI External NTC 10 temperature input
DI Voltage free digital input (for measurement and override)
RO 230 Vac SPST relay, 7 A resistive (for network/schedule switching)

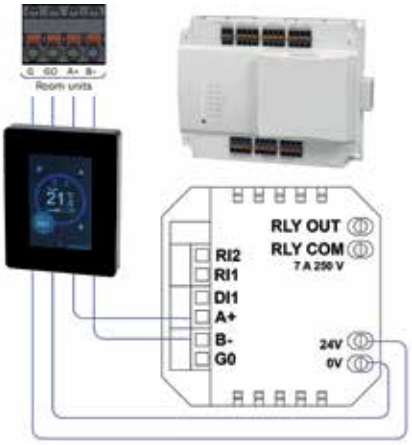
NOTE: You can also select Fahrenheit as the temperature unit during commissioning.

Room units


CO2, RH


RLY OUT
RLY COM
7 A 250 V
RI2
RI1
DI1
A+
B-
G0
24V
0V


CO2, RH


Room units
RLY OUT
RLY COM
7 A 250 V
RI2
RI1
DI1
A+
B-
G0
24V
0V


BMS
Modbus
BACnet

Room units

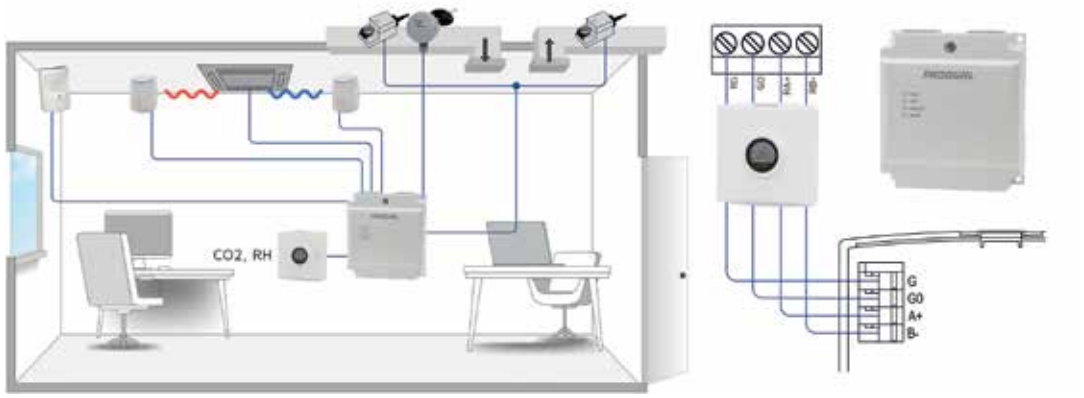
1

Produal Proxima® RU is a simple Modbus room unit designed to be used with Proxima control units or other control units. It has a built-in temperature sensor and a continuously rotating setpoint knob. The unit is also available with fan control and a man-in-house button. The indicator lights indicate the temperature setpoint and fan speed.

room °C, %rH, CO_2

Power supply	24 Vac/dc, < 1 VA (< 2 VA in CO2 models)
Set point	18…26 °C
Temperature meas. range	0...50 °C
Temperature meas. accuracy	±0.5 °C (18...26 °C)
IP protection class	IP30
Ambient temperature	0...50 °C
Ambient humidity	0...85 %rH
Mounting	on the wall surface or on a flush mounting box (60 mm hole distance)
Materials	PC plastic
Product dimensions	97 x 97 x 33 mm

Ordering guide		Type	0	1	2	3	4	5	6
0 Room unit			5202					0	0
1 Body colour	White	RU		W					
	Black	RUB		B					
2 Buttons	No buttons				0				
	1 button (fan speed)	1F			1				
	1 button (man in house)	1M			2				
	2 buttons (fan speed and man in house)	2FM			3				
3 Display	No display (indicator lights only)					0			
	Display (indicator lights are also included)	-D				D			
4 Additional measurements	No additional measurements						0		
	Relative humidity	-RH					1		
	CO_2	-CO2					3		
	Relative humidity and CO_2	-RH-CO2					5		



BMS

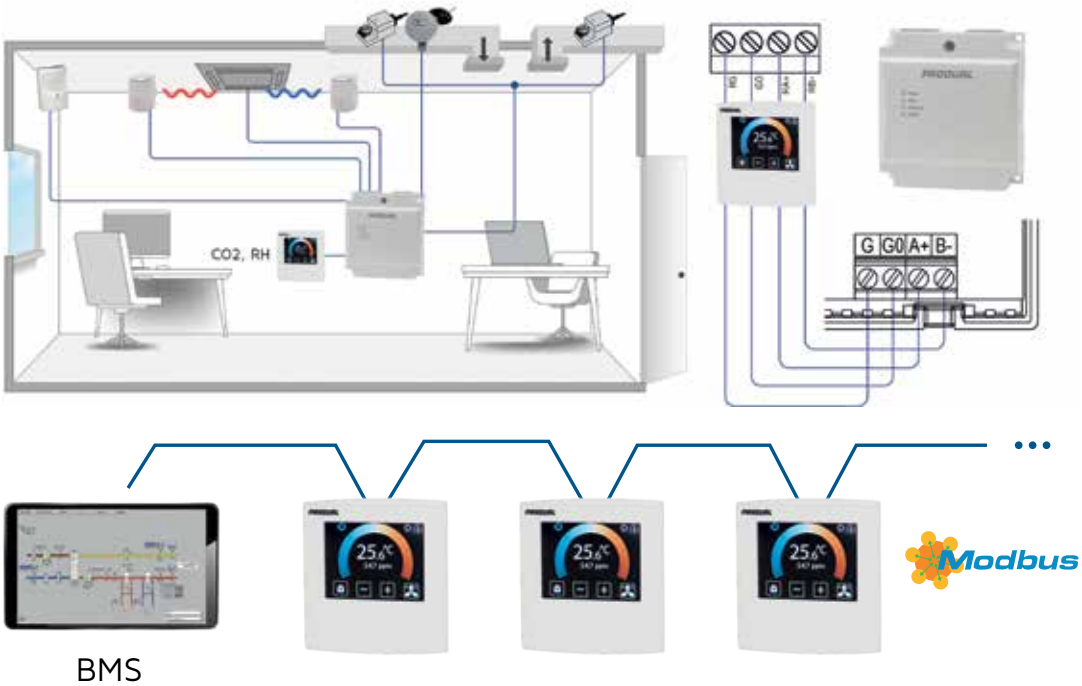
Room units

room °C, %rH, CO_2, PIR

ROU is an advanced room unit with an easy-to-use touchscreen. It is designed for above-the-ceiling control units. The basic model includes temperature measurement. Other measurements, including CO_2, RH and PIR, are available as options. ROU can be used as a room unit for CU and CU-LH, or as a Modbus slave unit.

Power supply	24 Vac/dc, < 2.5 VA
Set point	18...26 °C
Temperature measurement range	0...50 °C
Temperature measurement accuracy	±0.5 °C
IP protection class	IP20
Ambient temperature	5...40 °C
Ambient humidity	0...85 %rH
Mounting	on the wall surface or on a flush mounting box (60 mm hole distance)
Materials	ABS plastic
Product dimensions	100 x 105 x 20 mm

Ordering guide		Type	0	1	2	3	4
0 Room unit			115038			0	0
1 Body colour	White	ROU-S		0			
	Black	ROU-S-B		4			
2 Additional measurements	No additional measurements				0		
	Relative humidity	-RH			1		
	Occupancy detection	-PIR			2		
	CO2	-CO2			3		
	Relative humidity and occupancy detection	-RH-PIR			4		
	Relative humidity and CO2	-RH-CO2			5		
	Occupancy detection and CO2	-PIR-CO2			6		
	Relative humidity, occupancy detection and CO2	-RH-PIR-CO2			7		

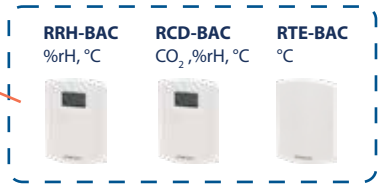


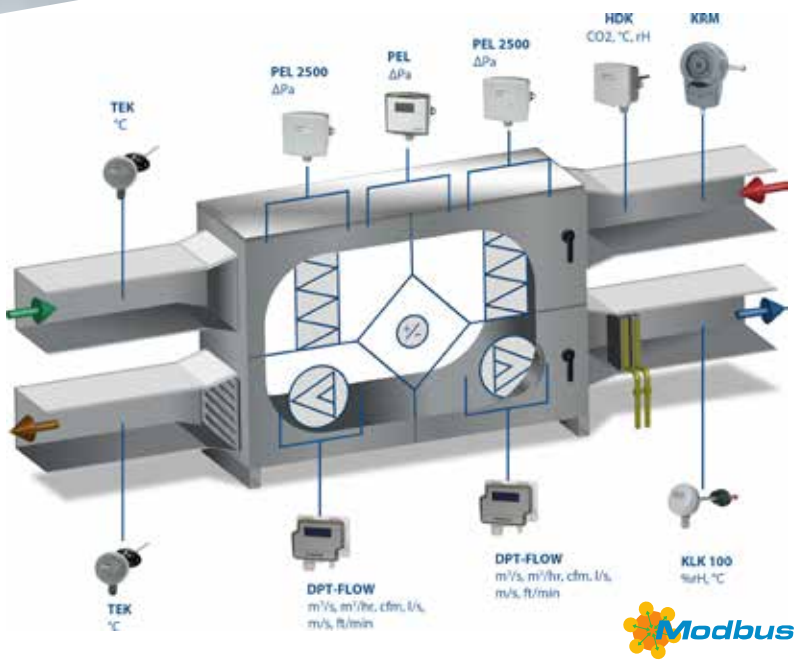
Transmitters

Versatile high-quality transmitters for measuring a wide range of parameters in different demanding HVAC applications: accurate measurement of differential pressure, air quality, temperature, humidity, water pressure, air velocity, illuminance or wind speed etc. Several measured properties are also possible with one device. The devices are available with different measurement ranges and with or without a display.

- Wide range of measured properties
- Several measurements with one device
- 0...10 V, 4...20 mA
- Wide range of Modbus and BACnet products for interoperability
- Control output on selected products

Note: Temperature transmitters are in the Temperature measurement section (page 102)

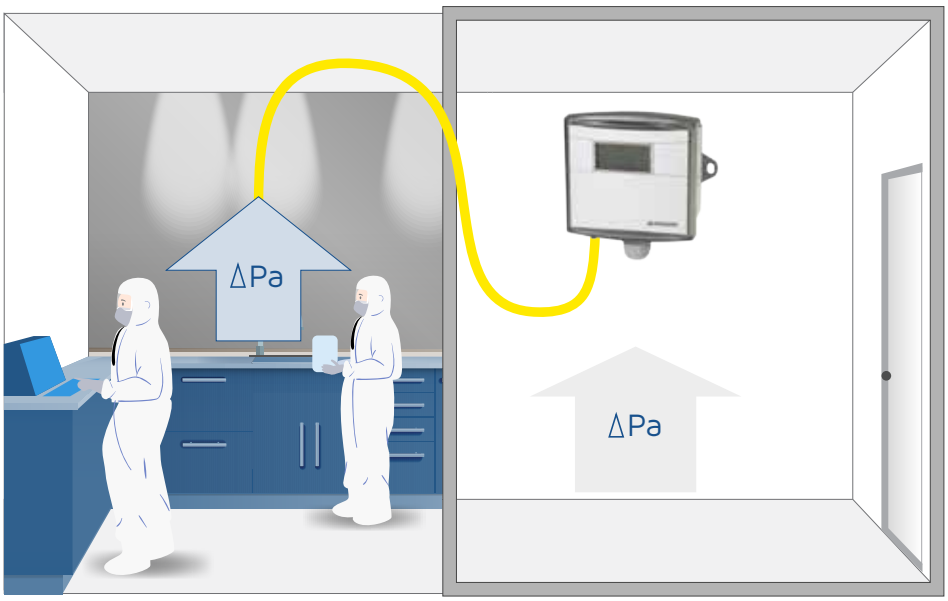


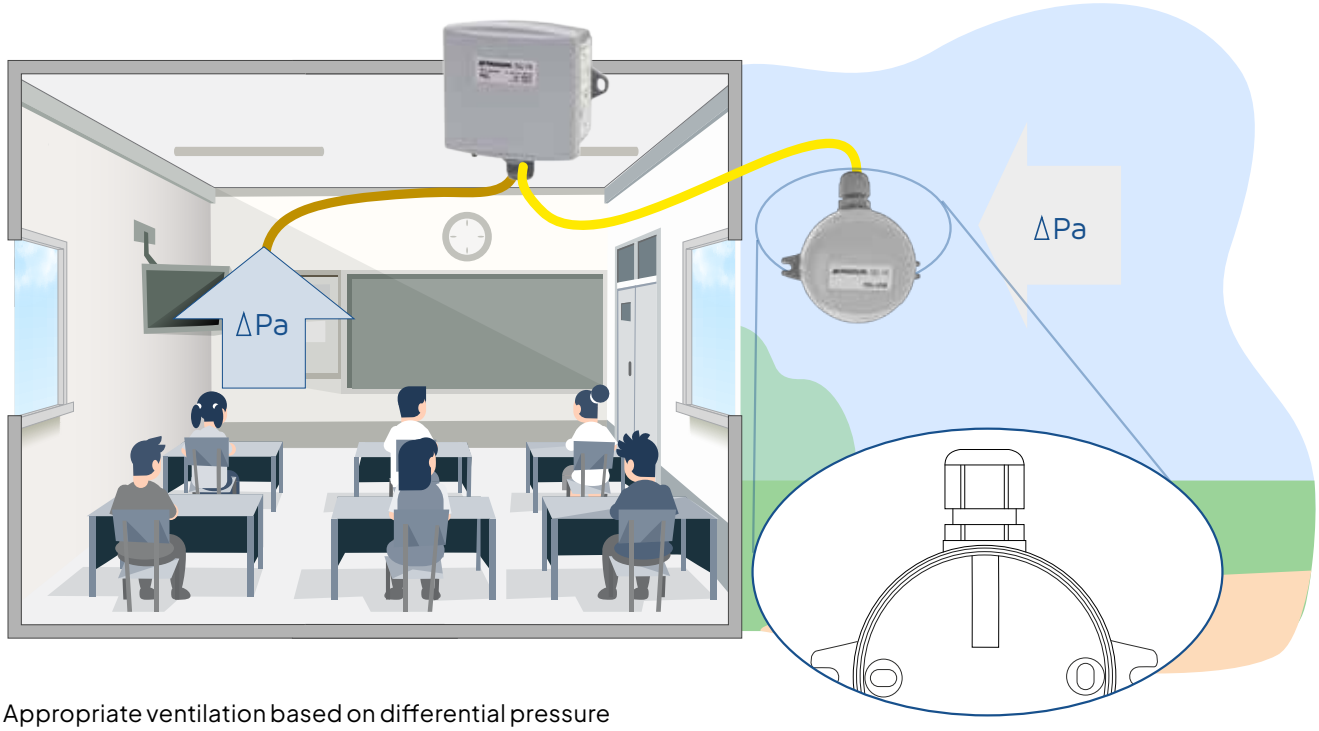


Transmitters

The high-accuracy air pressure transmitter PEL is an optimal solution for applications requiring high precision and reliability

The automatic zero-element regularly calibrates the 0-point, eliminating possible long-term and temperature drift of the sensor in differential pressure transmitter PEL-N. This also makes the transmitter temperature-compensated in the ambient temperature.





Appropriate ventilation based on differential pressure measurement through the building envelope ensures healthy indoor air quality. The **protective cover PEL-USK**, installed in the outer measuring hose of **pressure transmitter PEL**, prevents the hose from pressure impacts or contamination.

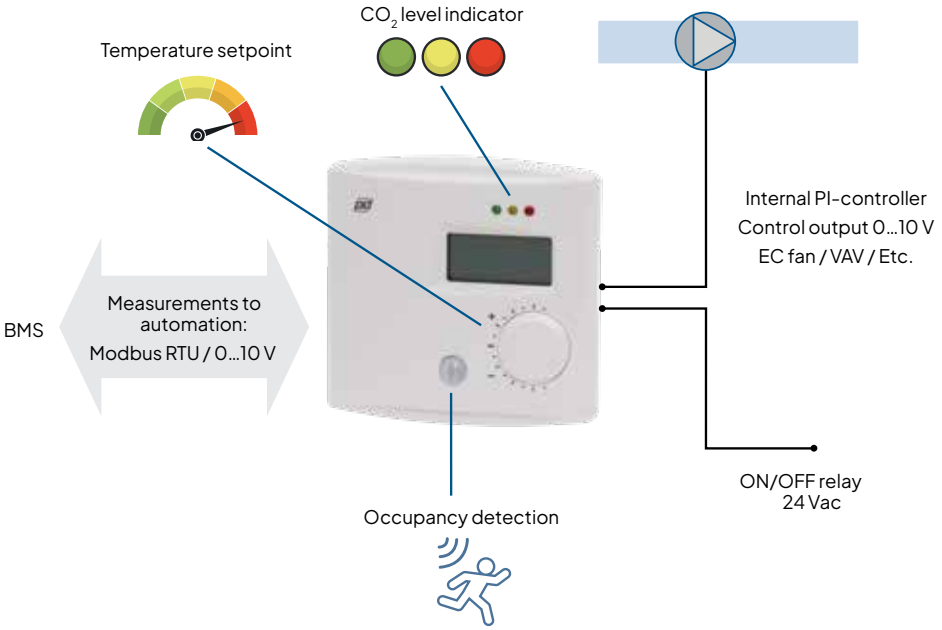
Transmitters

Many Produal transmitters are equipped with a control output and can be used as single-sequence controllers for heating/cooling or ventilation

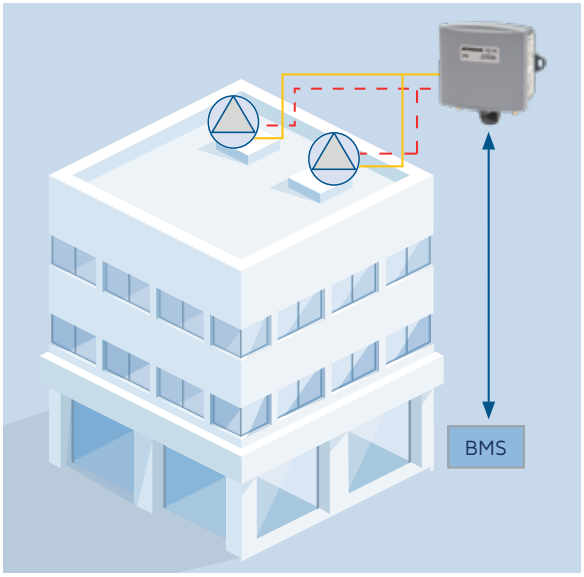
By using the 0…10 V controller output, a built-in, stand-alone PI-controller in the **CO_2 transmitter HDH** can be used to control, for example, an EC FAN or VAV system. Measurements can be read to BMS by using Modbus RTU or an 0…10 V output.

There are also various options available for our HDH transmitter:

- Humidity measurement
- Occupancy sensor
- CO_2 level indicator
- Temperature setpoint
- Relay output



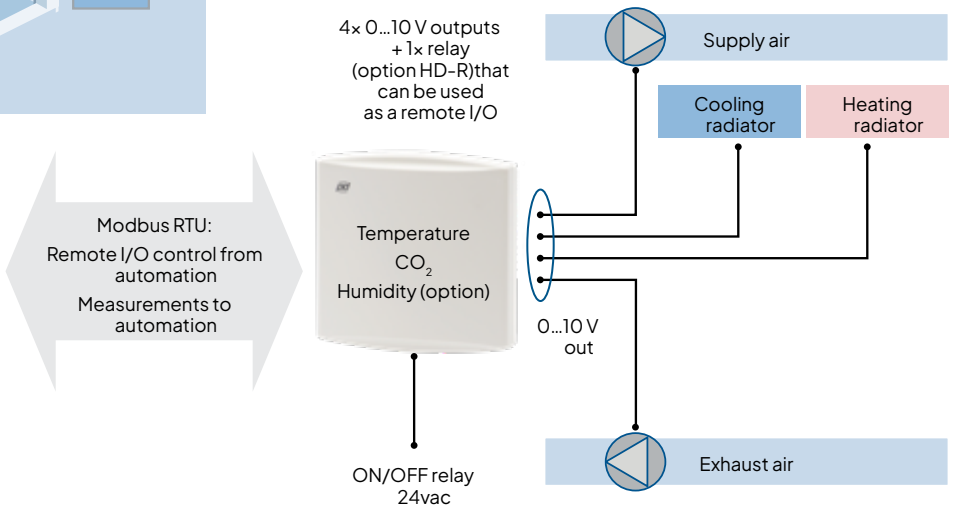
Several Produal transmitters can be used as an external I/O unit for flexibility and cost savings



The differential pressure transmitter KPEL-M works as an external I/O unit, for example, for controlling supply air fans, by overwriting 0…10 V outputs via the BMS system.

- 0…10 V control signal
- Pressure hose from duct to KPEL-M
- Modbus RTU bus from BMS to KPEL-M

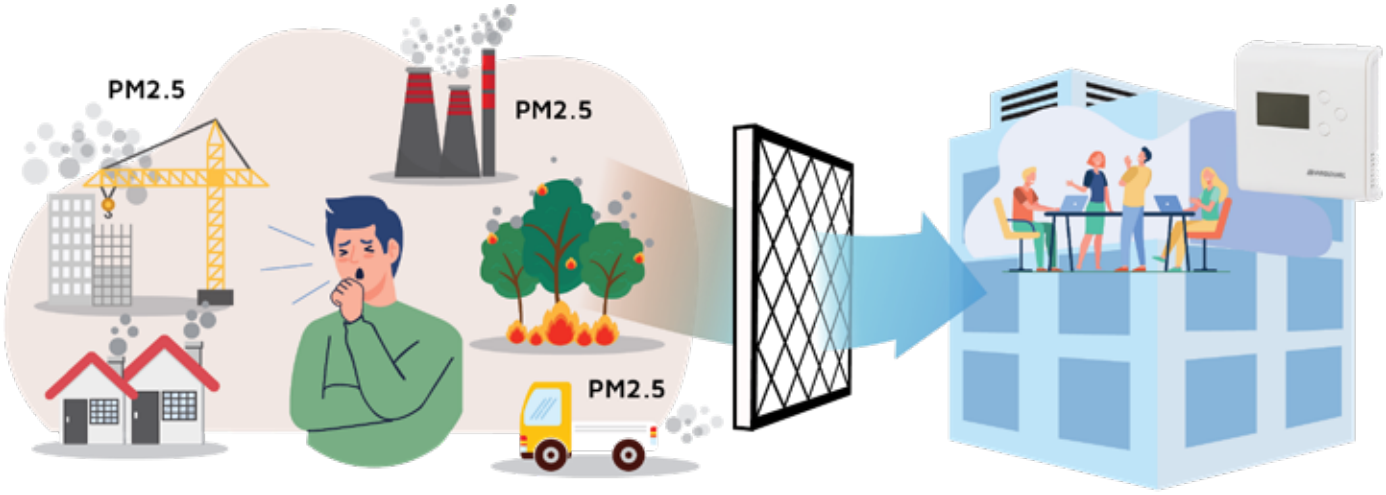
The **CO_2 transmitter HDH-M** operates as a remote I/O unit by controlling four 0…10 V outputs remotely from the BMS and reading the values to the system by using the Modbus RTU field bus.



Transmitters

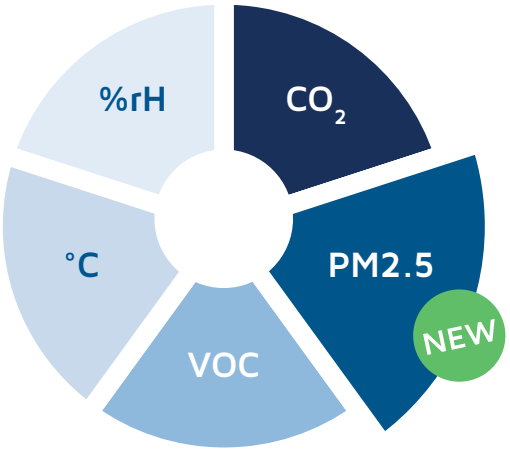
Fine dust measurement is an important addition to building indoor air monitoring and control to prevent hazardous health effects

Good indoor air quality is the sum of many different factors. Traditionally, temperature, humidity, CO_2, and VOC gases have been measured in indoor air. Standards, regulations and recommendations are focusing more and more on comprehensive IAQ, including particulate matter monitoring, for building occupier health and wellbeing. With the Siro indoor air quality transmitter, you can measure PM2.5 particles in addition to temperature and humidity to make sure that the filtration in your building is working at the required level and air handling can react to possible small particles in the air.



We help you to provide healthy and comfortable indoor air quality through measurements and to address indoor risk factors through on-demand ventilation control.

- Temperature to ensure comfortable and stable conditions, and to maintain an optimal balance with humidity
- Humidity to ensure comfort, to fight against airborne viruses and to prevent water damage and mould problems
- Carbon dioxide for fresh air to increase focus, productivity and learning skills
- Volatile organic compounds for detecting hazardous gas emissions, to prevent health hazards, and unpleasant smells
- PM2.5 fine particles to detect fine dust and reduce the risk of lung and heart diseases (PM1 and PM10 particles are calculated based on PM2.5 measurement using a default particle size distribution)



Transmitter selection guide

Product family		Measured property														
Type	Page	°C	RH	CO_2	VOC	PM	CO	Pa	bar	m/s	↖	m^3/s	lux	W/m^2	H_2O	PIR
AVT	64	•								•						
DPT-2W	56							•								
DPI-24	57							•		•		•				
DPT-Ctrl	55							•				•				
DPT-Ctrl-MOD	54							•				•				
DPT-Flow	59							•				•				
DPT-Flow-MOD	58							•				•				
HDH	74	•	o	•												o
HDK	78	•	o	•												
HDU	79	•		•												
HML	84						•									
ILK	83	•	o		•											
KLH 100 / KLH-M	67	•	•													
KLH 420	68		•													
KLHJ	70	•	•													
KLK	71	•	•													
KLU	70	•	•													
KPEL	53							•								
LUX	85	•											•			
MMSP1	85													•		
PEL	53							•								
RCD-BAC	77	•	o	•									o			o
RRH-BAC	69	•	•										o			o
RT	73	•	o	•												
RTX-CO2	72	•	o	•	o											o
RTX-RH	66	•	•		o											•
RTX-VOC	82	•			•											•
Siro	80	•	o	o	o	o										
TUNA 20	89									•						
UV7+UV7-VV	88									•	•					
VPEL	86								•							
VPL	87								•							
VS 3000	89									•	•					

• standard
o optional

Transmitter selection guide

Product family		Outputs							Commissioning tool
Type	Page	V	mA	Relay	Modbus	Modbus override	BACnet	Controller	
AVT	64	•	•	o	o			•	**MyTool**
DPT-2W	56		•						
DPI-24	57	•	•	•					**MyTool**
DPT-Ctrl	55	•	•					•	
DPT-Ctrl-MOD	54				•	•		•	
DPT-Flow	59	•	•						
DPT-Flow-MOD	58				•	•			
HDH	74	•		o	o	o		•	**ML-SER**
HDK	78	•		o	o	o		•	**ML-SER**
HDU	79	•		o	o	o		•	**ML-SER**
HML	84	•	•						
ILK	83	•		o	o	o		•	**ML-SER**
KLH 100 / KLH-M	67	•		o	o	o		•	**ML-SER**
KLH 420	68		•						
KLHJ	70	•	•						
KLK	71	•	•	o	o	o		•	**ML-SER**
KLU	70	•	•						
KPEL	53	•	•		o	o		•	**ML-SER**
LUX	85	•	•						
MMSP1	85	•	•						
PEL	53	•	•		o			•	**ML-SER**
RCD-BAC	77	•					•	•	**SW-DCT-USB**
RRH-BAC	69	•					•		**SW-DCT-USB**
RT	73	•			o		o		**MyProdual**
RTX-CO2	72	•		o	o		o	•	**MyProdual**
RTX-RH	66	•		o	o		o	•	**MyProdual**
RTX-VOC	82	•		o	o		o	•	**MyProdual**
Siro	80	•	o		o				**Siro-CT**
TUNA 20	89	•	•						
UV7+UV7-VV	88	•			o				
VPEL	86	•	•						
VPL	87	•	•						
VS 3000	89	•							

Transmitters with control output

	Note: See the product pages for more information.	Transmitter product families												
		AVT	DPT-Ctrl	DPT-Ctrl-MOD	HDH	HDK, HDU	ILK	KLH	KLK	KPEL, KPEL 9K	PEL 1000	RCD-BAC	RRH-BAC	RTX
Control output	4...20 mA	•	•						•	•				
	0...10 V	•	•	•	•	•	•	•	•	•	•	•	•	•
	Relay	•			•	•	•	•	•					•
Function	Control stages	1	1	1	1	1	1	1	1	1	1	1	1	1
	Control modes	PID	P/PI/ PID	P/PI/ PID	P/PI	P/PI	P/PI	P/PI	P/PI	P/PI	P/PI	P/PI	P/PI	P/PI
	Cooling control	•			•	•	•	•	•			•	•	•
	Heating control	•			•	•	•	•	•			•	•	•
	CO_2 control				•	•						•		o
	VOC control						•							o
	Humidity control				•	•	•	•	•			•	•	o
	Pressure control		•	•						•	•			
	Maximum selection control		•	•	•	•	•	•	•			•		•
	Modbus RTU	•		•	•	•	•	•	•	•	•			o
	Modbus override				•	•	•	•	•	•				•
	BACnet MS/TP											•	•	o
	Page	64	55	54	74	78	83	67	71	53	53	77	69	72

Air flow product selection guide

	Application	Air flow measurement products				
		IVL	PEL 2500 [3]	DPT-Flow	PEL 2500 [3] + PP-PK/PP-SK	DPT-Flow + PP-PK/PP-SK
Fan flow (fan with measuring inlets)	The fan K-value is known			• [1]		
	The fan K-value is unknown		•			
Flow in duct	Customer's probe for which the K-value is known			•		
	Customer's probe for which the K-value is unknown		•			
	Probe not available (air velocity and temperature measurement)	•				
	Probe not available (air volume measurement)	• [2]			• [4]	•
	Page	65	53	59	53 and 62–63	59 and 62–63

[1] Supported fan manufacturers: Fläkt Woods, Rosenberg, Comefri, Ziehl-Abegg, ebm-papst, Nicotra and Gebhardt. Universal formula available for other manufacturer's fans.

[2] Air volume = air velocity x duct cross section area.

[3] PEL 2500 with flow linear output (Q).

[4] Flow linear output can be used for air volume calculation in BMS.

Differential pressure transmitters for air

Modbus

Produal offers wide selection of differential pressure transmitters for air. The possible applications include clean/ isolation room control, air handling unit control and filter monitoring, for example. Controller output available in selected transmitters

Product family	Measuring inlets	Measuring ranges																Accuracy / zeroing			Outputs / inputs						Display
		±50 Pa	±100 Pa	±250 Pa	±500 Pa	0...100 Pa	0...200 Pa	0...500 Pa	0...1000 Pa	0...1500 Pa	0...2000 Pa	0...2500 Pa	0...3000 Pa	0...4000 Pa	0...5000 Pa	0...8000 Pa	Custom [1]	Accuracy	Automatic	Manual	0...10 V	4...20 mA	Modbus	Flow linear	Controller output	Analogue inputs	
PEL	1	•	•	•	•	•	•	•	•								•	±0,5 Pa +1 %	•		•	•	○				○
PEL 2500	1		•			•	•	•	•	•	•	•					•	±3 Pa +1 %	•		•	•	○	•			○
PEL 2500-MZ	1		•			•	•	•	•	•	•	•					•	±3 Pa +1 %		•	•	•	○	•			○
PEL 8K	1								•	•	•	•	•	•	•	•	•	±10 Pa +1 %	•		•	•		•			○
PEL 1000	1							•	•								•	±3 Pa +1 %		•	•		○		•		○
KPEL	2		•			•	•	•	•	•	•	•					•	±3 Pa +1,25 %		•	•	•	○		•	○	○

• Standard ○ Optional

1) The custom pressure range can be adjusted with ML-SER tool (or via Modbus) within the transmitter's normal pressure ranges.

PEL, PEL 2500, PEL 2500-MZ, PEL 8K, PEL 1000

Supply	24 Vac/dc, < 2 VA (PEL 1000: 1 VA)
Outputs	0...10 Vdc / 2...10 Vdc / 0...5 Vdc < 2 mA or 0...20 mA / 4...20 mA < 700 Ω PEL 1000: 0...10 Vdc / 2...10 Vdc / 0...5 Vdc < 2 mA
Ambient temperature	0...+45 °C (PEL 1000: 0...50 °C)
Housing	IP54, cable gland downwards
Mounting	with screws, external lugs

KPEL

Supply	24 Vac/dc, < 2.5 VA
Outputs*	2 x 0...10 Vdc < 2 mA or 2 x 4...20 mA < 700 Ω
Inputs (M models)*	2 x 0...10 Vdc / DI / temperature
Ambient temperature	0...+50 °C
Housing	IP54, cable downwards
Mounting	with screws, external lugs
	* = Two terminals for outputs/inputs

ORDERING INFORMATION

Options	Basic version	Display	Modbus	Modbus & Display
PEL	1131110 (PEL)	1131111 (PEL-N)	1131360 (PEL-M)	1131361 (PEL-M-N)
PEL 2500	1131210 (PEL 2500)	1131211 (PEL 2500-N)	1131370 (PEL 2500-M)	1131371 (PEL 2500-M-N)
PEL 2500-MZ	1131460 (PEL 2500-MZ)	1131461 (PEL 2500-MZ-N)	1131470 (PEL 2500-M-MZ)	1131471 (PEL 2500-M-MZ-N)
PEL 8K	1131350 (PEL 8K)	1131351 (PEL 8K-N)	-	-
PEL 1000	1131140 (PEL 1000)	1131141 (PEL 1000-N)	1131380 (PEL 1000-M)	1131381 (PEL 1000-M-N)
KPEL	1131310 (KPEL)	1131311 (KPEL-N)	1131260 (KPEL-M)	1131261 (KPEL-M-N)

Differential pressure transmitters for air

m³/s, m³/h, l/s, Pa

2

DPT-Ctrl-MOD Modbus differential pressure or airflow controllers are designed for building automation systems. Controller can control 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.

DPT-Ctrl-MOD includes an Input terminal that enables the reading of multiple signals, such as temperature or control relays over Modbus. The Input terminal has one input channel designed to accept 0–10 V, NTC10k, Pt1000, Ni1000/(-LG), and BIN IN (potential free contact) signals.

Power supply	24 Vac/dc (22…26 V), < 1 VA
Time constant	1…20 s
Control output	0...10 Vdc
IP protection class	IP54
Cable gland	M16
Ambient temperature	-20...50 °C
Ambient humidity	0...95 %rH
Mounting	with screws, external lugs
Materials	ABS, PC
Product dimensions	102 x 72 x 36 mm

TYPE	ART. NO.	
DPT-Ctrl-MOD-2500-D	114.003.020	differential pressure or airflow transmitter/controller, Modbus, range 0...2500 Pa, manual zeroing
DPT-Ctrl-MOD-7000-D	114.009.010	differential pressure or airflow transmitter/controller, Modbus, range 0…7000 Pa, manual zeroing

Differential pressure transmitters for air

DPT-Ctrl differential pressure or airflow controllers are designed for building automation systems. Controller can control 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.

Pa

Power supply	24 Vac/dc (22…26 V), < 1 VA
Time constant	1…20 s
Voltage output	0...10 V / 2...10 V, R > 1 kΩ
Current output	4...20 mA, 20 Ω < R < 500 Ω
IP protection class	IP54
Cable gland	M16
Ambient temperature	-20...50 °C
Mounting	with screws, external lugs
Materials	ABS, PC
Product dimensions	90 x 95 x 36 mm

TYPE	ART. NO.	
DPT-Ctrl-2500-D	103.007.232	differential pressure or airflow transmitter/controller, range 0...2500 Pa, manual zeroing
DPT-Ctrl-2500-AZ-D	103.007.233	differential pressure or airflow transmitter/controller, range 0...2500 Pa, automatic zeroing
DPT-Ctrl-2500-D-40C	103.007.234	differential pressure or airflow transmitter/controller, range 0...2500 Pa, manual zeroing, extended ambient temperature range (-40...50 °C)
DPT-Ctrl-7000-D	103.016.108	differential pressure or airflow transmitter/controller, range 0...7000 Pa, manual zeroing
DPT-Ctrl-7000-AZ-D	103.016.109	differential pressure or airflow transmitter/controller, range 0...7000 Pa, automatic zeroing
DPT-Ctrl-7000-D-40C	103.016.110	differential pressure or airflow transmitter/controller, range 0...7000 Pa, manual zeroing, extended ambient temperature range (-40...50 °C)

Differential pressure transmitters for air

NEW

Pa

DPT-2W differential pressure transmitters are 2–wire transmitters for measuring differential pressure in ventilation ducts. These most technologically advanced transmitters on the market measure static and differential pressure, and have a field selectable measurement range.

Power supply	10...35 Vdc
Differential air pressure measurement ranges	0...100 Pa[2,1]2, ±50 Pa
Current output	4...20 mA, > 20 Ω
Zeroing	Manually by push button
IP protection class	IP54
Cable gland	M16
Ambient temperature	-10...50 °C
Ambient humidity	0...95 %rH
Mounting	with screws, external lugs
Materials	ABS, PC
Product dimensions	90 x 95 x 36 mm

TYPE	ART. NO.	
DPT-2W-250-R8	104.004.011	2–wire differential pressure transmitter, 0...250 Pa
DPT-2W-250-R8-D	104.004.012	2–wire differential pressure transmitter with display, 0...250 Pa
DPT-2W-2500-R8	104.004.041	2–wire differential pressure transmitter, 0...2500 Pa
DPT-2W-2500-R8-D	104.004.042	2–wire differential pressure transmitter with display, 0...2500 Pa
DPT-2W-7000-R8	104.015.007	2–wire differential pressure transmitter, 0...7000 Pa
DPT-2W-7000-R8-D	104.015.008	2–wire differential pressure transmitter with display, 0...7000 Pa

Differential pressure transmitters for air

NEW

Technologically advanced and versatile DPI-24 differential pressure switches and transmitters are typically used in HVAC/R systems for fan, blower and filter monitoring, staircase pressure monitoring and alarm, pressure monitoring in cleanrooms, and boiler pressure monitoring and alarm. 8 measurement ranges per model. Options include display, three different pressure measurement ranges, one or two relays and manual or automatic zero point calibration. DPI-24 can control the relays based on differential pressure or air flow. The -BT models are easy to commission with a MyTool Connect Bluetooth dongle and mobile application.

Power supply	21...35 Vdc / 24 Vac ±10 %
Relay output	2 x 30 Vac/dc, 1A
Output	1 x 0...10 V, R > 1 kΩ / 1 x 4...20mA, 20...500 Ω
IP protection class	IP54, cable downwards
Ambient temperature	-10...50 °C, -5...50 °C (-AZ)
Ambient humidity	0...95 %rH
Mounting	with screws, external lugs
Materials	ABS and PC plastic, tubing PVC
Product dimensions	102 x 71.5 x 36 mm

Ordering guide		Type	0	1	2	3	4	5	6
0 Differential pressure transmitters for air			113A						0
1 Device type	Differential pressure switch	DPI-24		1					
	Differential pressure switch with Bluetooth connector	DPI-24-BT		2					
2 Range	±500 Pa	-±500			0				
	0...2500 Pa	-2500			1				
	0...7000 Pa	-7000			2				
3 Relay	1 relay	-R				0			
	2 relays	-2R				1			
4 Autozero	No autozero function						0		
	Autozero function	-AZ					1		
5 Display	No display							0	
	Display	-D						1	
6 Reserved									0

TOOLS

MYT-CON	5100020000	MyTool Connect, a Bluetooth dongle for Produal MyTool® and MyProdual connection

Air flow transmitters

m³/s, m³/h, l/s, Pa

DPT-Flow-MOD air flow transmitters are designed for building automation systems. These technologically advanced transmitters can measure volume flow, velocity, and static and differential pressure. The transmitters can be connected directly to the pressure measurement points of a centrifugal fan, providing accurate flow measurement. The user interface enables easy selection of settings according to the selected fan or measurement probe. The transmitters have an RS-485 channel for Modbus RTU communication.

Power supply	24 Vac/dc (22…26 V), < 1 VA
Time constant	1…20 s
IP protection class	IP54
Cable gland	M16
Ambient temperature	-20...50 °C
Mounting	with screws, external lugs
Materials	ABS, PC
Product dimensions	90 x 95 x 36 mm

TYPE	ART. NO.	
DPT-Flow-MOD-7000-D	102.006.072	air flow transmitter, Modbus, range 0...7000 Pa, manual zeroing
DPT-Flow-MOD-7000-AZ-D	102.006.073	air flow transmitter, Modbus, range 0...7000 Pa, automatic zeroing
DPT-Flow-MOD-7000-D-40C	102.006.074	air flow transmitter, Modbus, range 0...7000 Pa, manual zeroing, extended ambient temperature range (-40...50 °C)
DPT-Flow-MOD-2500-D	102.011.033	air flow transmitter, Modbus, range 0...2500 Pa, manual zeroing
DPT-Flow-MOD-2500-AZ-D	102.011.034	air flow transmitter, Modbus, range 0...2500 Pa, automatic zeroing
DPT-Flow-MOD-2500-D-40C	102.011.035	air flow transmitter, Modbus, range 0...2500 Pa, manual zeroing, extended ambient temperature range (-40...50 °C)

Air flow transmitters

m³/s, m³/h, l/s, Pa

DPT-Flow air flow transmitters are designed for building automation systems. These technologically advanced transmitters can measure volume flow, velocity, and static and differential pressure. The transmitters can be connected directly to the pressure measurement points of a centrifugal fan, providing accurate flow measurement. The user interface enables easy selection of settings according to the selected fan or measurement probe.

Power supply	24 Vac/dc (22…26 V), <1 VA
Differential air pressure measurement ranges	0...1000 Pa, Custom
Time constant	1…20 s
Voltage output	0...10 V / 2...10 V, R > 1 kΩ
Current output	4...20 mA, 20 Ω < R < 500 Ω
IP protection class	IP54
Cable gland	M16
Ambient temperature	-20...50 °C
Mounting	with screws, external lugs
Materials	ABS, PC
Product dimensions	90 x 95 x 36 mm

TYPE	ART. NO.	
DPT-Flow-1000-D	102.001.067	air flow transmitter, range 0...1000 Pa, manual zeroing
DPT-Flow-1000-AZ-D	102.001.068	air flow transmitter, range 0...1000 Pa, automatic zeroing
DPT-Flow-1000-D-40C	102.001.069	air flow transmitter, range 0...1000 Pa, manual zeroing, extended ambient temperature range (-40...50 °C)
DPT-Flow-2000-D	102.002.056	air flow transmitter, range 0...2000 Pa, manual zeroing
DPT-Flow-2000-AZ-D	102.002.057	air flow transmitter, range 0...2000 Pa, automatic zeroing
DPT-Flow-2000-D-40C	102.002.058	air flow transmitter, range 0...2000 Pa, manual zeroing, extended ambient temperature range (-40...50 °C)
DPT-Flow-5000-D	102.004.061	air flow transmitter, range 0...5000 Pa, manual zeroing
DPT-Flow-5000-AZ-D	102.004.062	air flow transmitter, range 0...5000 Pa, automatic zeroing
DPT-Flow-5000-D-40C	102.004.063	air flow transmitter, range 0...5000 Pa, manual zeroing, extended ambient temperature range (-40...50 °C)
DPT-Flow-7000-D	102.006.067	air flow transmitter, range 0...7000 Pa, manual zeroing
DPT-Flow-7000-AZ-D	102.006.068	air flow transmitter, range 0...7000 Pa, automatic zeroing
DPT-Flow-7000-D-40C	102.006.069	air flow transmitter, range 0...7000 Pa, manual zeroing, extended ambient temperature range (-40...50 °C)

Filter guard

PEL 2500–SV filter guard is designed for filter monitoring in systems that handle air and other non-flammable gases. The device has three indicator lights that indicate the filter status.

Power supply	24 Vac/dc, < 2 VA
Differential air pressure measurement ranges	0...100 Pa[2,1]2, ±100 Pa
Time constant	2 s or *8 s
Voltage output	0...10 / 2...10 / 0...5 Vdc, < 2 mA (pressure)
Current output	4...20 / 0...20 mA, 700 Ω (pressure)
Output	3 x potential free contact (filter status)
Zeroing	automatic; regularly eliminates the possible zero point drifting
IP protection class	IP54, cable downwards
Ambient temperature	0...45 °C
Mounting	with screws, external lugs
Materials	polycarbonate
Product dimensions	105 x 102 x 46 mm

TYPE	ART. NO.	
PEL 2500–SV	2240170	filter guard

OPTIONS

PEK-AS	1240300	accessory kit for differential pressure products

Pressure transmitter accessories

PEK-AS is an accessory kit that can be used for transmitter process connections.

ML-SER commissioning tool is designed for easy commission and configuration of the Produal transmitter products. The ML-SER shows device-specific configuration menus when the connector is plugged in the master device.

PEL-USK is designed to protect pressure measurement hose from pressure shocks caused by wind and other outdoor environmental influences.

TYPE	ART. NO.	
PEL-USK	1131020	protective cover for pressure hose
ML-SER	1139010	transmitter commissioning tool
PEK-AS	1240300	accessory kit for differential pressure products

OPTIONS

PEL	1131110	differential pressure transmitter
PEL-N	1131111	differential pressure transmitter
PEK-AS	1240300	accessory kit for differential pressure products
T-CON	1240301	T connector
T-CON 100	1240302	T connector, 100 pcs
Y-CON	1240303	Y connector
Y-CON 100	1240304	Y connector, 100 pcs
PVC-HOSE	1240305	PVC hose (4/7), 200 m
PEK-DCP	1240306	duct connector, plastic
PEK-KIT 90	1240390	accessory kit with 90° metal tubes

PEK-DCP

PEK-KIT 90

PVC-HOSE

T-CON

T-CON 100

Y-CON

Y-CON 100

Air flow probes

l/s

PP-PK air flow probes measure air flow in air handling systems. They are designed for circular air ducts. Different models with fixed Kv values are available for a wide range of duct sizes.

Air flow measurement accuracy	±2 %, air speed > 1 m/s
Process connection	with Ø 7.5 mm hoses
Ambient temperature	5...95 °C

TYPE	ART. NO.	
PP-PK R100	1250010	air flow volume probe for a circular 100 mm duct
PP-PK R125	1250020	air flow volume probe for a circular 125 mm duct
PP-PK R160	1250030	air flow volume probe for a circular 160 mm duct
PP-PK R200	1250040	air flow volume probe for a circular 200 mm duct
PP-PK R250	1250050	air flow volume probe for a circular 250 mm duct
PP-PK R300	1250059	air flow volume probe for a circular 300 mm duct
PP-PK R315	1250060	air flow volume probe for a circular 315 mm duct
PP-PK R355	1250065	air flow volume probe for a circular 355 mm duct
PP-PK R400	1250070	air flow volume probe for a circular 400 mm duct
PP-PK R450	1250073	air flow volume probe for a circular 450 mm duct
PP-PK R500	1250075	air flow volume probe for a circular 500 mm duct
PP-PK R550	1250076	air flow volume probe for a circular 550 mm duct
PP-PK R600	1250008	air flow volume probe for a circular 600 mm duct
PP-PK R630	1250078	air flow volume probe for a circular 630 mm duct
PP-PK R650	1250074	air flow volume probe for a circular 650 mm duct
PP-PK R700	1250077	air flow volume probe for a circular 700 mm duct
PP-PK R800	1250079	air flow volume probe for a circular 800 mm duct
PP-PK R900	1250001	air flow volume probe for a circular 900 mm duct
PP-PK R1000	1250009	air flow volume probe for a circular 1000 mm duct
PP-PK R1100	1250003	air flow volume probe for a circular 1100 mm duct
PP-PK R1200	1250007	air flow volume probe for a circular 1200 mm duct
PP-PK R1250	1250310	air flow volume probe for a circular 1250 mm duct
PP-PK R1300	1250002	air flow volume probe for a circular 1300 mm duct
PP-PK R1500	1250311	air flow volume probe for a circular 1500 mm duct

LONGER THAN 1500 MM PROBES ARE AVAILABLE WITH CENTRE BRACKET ON REQUEST.

Air flow probes

PP-SK air flow probes measure air flow in air handling systems. They are designed for rectangular air ducts. Different models with fixed Kv values are available for a wide range of duct sizes.

Air flow measurement accuracy	±2 %, air speed > 1 m/s
Process connection	with Ø 7.5 mm hoses
Ambient temperature	5...95 °C

l/s

TYPE	ART. NO.	
PP-SK L200	1250080	air flow volume probe for a 200 mm rectangular duct
PP-SK L250	1250090	air flow volume probe for a 250 mm rectangular duct
PP-SK L300	1250100	air flow volume probe for a 300 mm rectangular duct
PP-SK L350	1250110	air flow volume probe for a 350 mm rectangular duct
PP-SK L400	1250120	air flow volume probe for a 400 mm rectangular duct
PP-SK L450	1250130	air flow volume probe for a 450 mm rectangular duct
PP-SK L500	1250140	air flow volume probe for a 500 mm rectangular duct
PP-SK L550	1250150	air flow volume probe for a 550 mm rectangular duct
PP-SK L600	1250160	air flow volume probe for a 600 mm rectangular duct
PP-SK L650	1250170	air flow volume probe for a 650 mm rectangular duct
PP-SK L700	1250180	air flow volume probe for a 700 mm rectangular duct
PP-SK L750	1250190	air flow volume probe for a 750 mm rectangular duct
PP-SK L800	1250200	air flow volume probe for a 800 mm rectangular duct
PP-SK L850	1250210	air flow volume probe for a 850 mm rectangular duct
PP-SK L900	1250220	air flow volume probe for a 900 mm rectangular duct
PP-SK L950	1250230	air flow volume probe for a 950 mm rectangular duct
PP-SK L1000	1250240	air flow volume probe for a 1000 mm rectangular duct
PP-SK L1050	1250250	air flow volume probe for a 1050 mm rectangular duct
PP-SK L1100	1250260	air flow volume probe for a 1100 mm rectangular duct
PP-SK L1150	1250270	air flow volume probe for a 1150 mm rectangular duct
PP-SK L1200	1250280	air flow volume probe for a 1200 mm rectangular duct
PP-SK L1250	1250283	air flow volume probe for a 1250 mm rectangular duct
PP-SK L1300	1250288	air flow volume probe for a 1300 mm rectangular duct
PP-SK L1350	1250290	air flow volume probe for a 1350 mm rectangular duct
PP-SK L1400	1250295	air flow volume probe for a 1400 mm rectangular duct
PP-SK L1450	1250298	air flow volume probe for a 1450 mm rectangular duct
PP-SK L1500	1250300	air flow volume probe for a 1500 mm rectangular duct

LONGER THAN 1500 MM PROBES ARE AVAILABLE WITH CENTRE BRACKET ON REQUEST.

Air velocity transmitters

NEW

m/s, ft/min, °C

2

AVT air velocity transmitters measure air velocity and temperature in ventilation ducts. They have separate readings and outputs for air velocity and temperature. The -BT models are easy to commission with a MyTool Connect Bluetooth dongle and mobile application. The -MOD models have Modbus communication instead of analogue outputs.

Power supply	24 Vac/dc ± 10 %
Temperature measurement range	-25...50 °C (probe)
Air velocity measurement range	0...2 m/s, 0...10 m/s, 0...20 m/s, freely selectable
Temperature measurement accuracy	±0.5 °C (25 °C, air velocity > 0.5 m/s)
Air velocity measurement accuracy	0.5 m/s + 3 % from reading (velocity > 2 m/s and ≤ 10 m/s at 25 °C)
Probe	Ø 10 x 100 / 200 / 400 mm
Temperature output	0...10 Vdc, load > 1 kΩ / 4...20 mA, load 20...400 Ω
Air velocity output	0...10 Vdc, load > 1 kΩ / 4...20 mA, load 20...400 Ω
IP protection class	IP54, cable downwards / -R and -MOD models: cables downwards and a cable in each cable gland
Cable gland	M16 / 2 x M16 (-R, -MOD)
Ambient temperature	-25...50 °C (probe), 0...50 °C (housing)
Ambient humidity	0...95 %rH
Mounting	with flange, adjustable probe depth
Materials	ABS, PC, LLPDP and stainless steel
Product dimensions	86 x 95 x 268 mm

Ordering guide		Type	0	1	2	3	4	5	6
0 Air velocity transmitter			1138				0	0	0
1 Device type	Air velocity and temperature transmitter	AVT		1					
	Air velocity and temperature transmitter with display	AVT-D		2					
	Air velocity and temperature transmitter with display and relay	AVT-D-R		3					
	Air velocity and temperature transmitter with display and Modbus communication	AVT-MOD-D		4					
	Air velocity and temperature transmitter with Bluetooth connector	AVT-BT		5					
	Air velocity and temperature transmitter with Bluetooth connector and display	AVT-BT-D		6					
	Air velocity and temperature transmitter with Bluetooth connector and relay	AVT-BT-R		7					
	Air velocity and temperature transmitter with display, Bluetooth connector and relay	AVT-BT-D-R		8					
	Air velocity and temperature transmitter with Bluetooth connector and Modbus communication	AVT-BT-MOD		9					
	Air velocity and temperature transmitter with display, Bluetooth connector and Modbus communication	AVT-BT-MOD-D		A					
2 Reserved					0				
3 Probe length	200 mm					0			
	100 mm	-100				1			
	400 mm	-400				2			

TOOLS

MYT-CON	5100020000	MyTool Connect, a Bluetooth dongle for Produal MyTool® and MyProdual connection

Air velocity transmitters

m/s, °C

IVLJ air velocity transmitters are designed for measuring air velocity and temperature inside air ducts. The probe is attached to a cable for more flexible positioning on the duct.

The minimum installation depth in the duct is 50 mm for all probe lengths. The maximum installation depth is 10 mm less than the probe length. For example, if the probe length is 200 mm, the installation depth is 50...190 mm.

Power supply	24 Vac/dc, < 1.5 VA
Temperature measurement range	0...50 °C
Temperature measurement accuracy	±0.5 °C
Temperature output	0...10 Vdc, 2 mA / 4...20 mA < 600 Ω
Air velocity output	0...10 Vdc, 2 mA / 4...20 mA, 600 Ω
IP protection class	IP54, cable downwards (transmitter)
Cable gland	2 X M16
Ambient temperature	0...50 °C
Mounting	probe: by a flange, adjustable depth; transmitter: with screws, external lugs
Materials	PBT, PC, PA and stainless steel
Cable length	2,0 m

TYPE	ART. NO.	
IVLJ 02	1130040	air velocity transmitter 0...2 m/s, probe Ø 10 x 200 mm
IVLJ 02-400	1130042	air velocity transmitter, 0...20 m/s, probe Ø 10 x 400 mm
IVLJ 02-400-N	1130043	air velocity transmitter with display, 0...20 m/s, probe Ø 10 x 400 mm
IVLJ 02-N	1130044	air velocity transmitter with display, 0...2 m/s, probe Ø 10 x 200 mm
IVLJ 10	1130090	air velocity transmitter 0...10 m/s, probe Ø 10 x 200 mm
IVLJ 10-400-N	1130093	air velocity transmitter with display, 0...10 m/s, probe Ø 10 x 400 mm
IVLJ 10-400	1130095	air velocity transmitter, 0...10 m/s, probe Ø 10 x 400 mm
IVLJ 10-N	1130096	air velocity transmitter with display, 0...10 m/s, probe Ø 10 x 200 mm
IVLJ 20	1130100	air velocity transmitter 0...20 m/s, probe Ø 10 x 200 mm
IVLJ 20-N	1130101	air velocity transmitter with display, 0...20 m/s, probe Ø 10 x 200 mm
IVLJ 20-400	1130103	air velocity transmitter, 0...20 m/s, probe Ø 10 x 400 mm
IVLJ 20-400-N	1130104	air velocity transmitter with display, 0...20 m/s, probe Ø 10 x 400 mm

Humidity transmitters

NEW

2

Proxima® RTX-RH room transmitters provide improved temperature, humidity and VOC measurement as well as motion detection (PIR). Standard features include temperature and relative humidity measurement, built-in P/PI controller, condensation guard feature, seamless integration with existing devices and systems, and easy commissioning and configuration with MyProdual®mobile application.

°C, % rH, VOC

Power supply	24 Vac (22…26 V) / 24 Vdc (22…39 V), < 3.2 VA
Temperature measurement range	0…50 °C
Humidity measurement range	0…100 %rH
Temperature measurement accuracy	±0.3 °C (20…25 °C)
Humidity measurement accuracy	typ. ±2 %rH (30…75 %rH, 20…25 °C), max. ±3 %rH
Multifunctional input	1 x NTC 10 / Pt1000 / Resistive / Digital / 0…10 Vdc
Multifunctional output	4 x 0…10 Vdc, 2 mA
IP protection class	IP30
Ambient temperature	0…50 °C
Ambient humidity	0…95 %rH
Mounting	on the wall surface or on a flush mounting box (60 mm hole distance)
Materials	ABS plastic
Product dimensions	97 x 97 x 27 mm

Ordering guide		Type	0	1	2	3	4	5	6
0 Room transmitters			5301						0
1 Device type	Room transmitter with temperature measurement	RTX		1					
2 Body colour	White				W				
	Black	B			B				
3 Display	No display					0			
	LED indicator	-L				L			
	LED indicator with custom text	-LT				2			
4 Additional measurements	Relative humidity	-RH					H		
	Relative humidity and PIR	-RH-PIR					6		
	Relative humidity, VOC and PIR	-RH-VOC-PIR					7		
	Relative humidity and VOC	-RH-VOC					8		
5 Advanced options	No advanced options							0	
	Modbus	-MOD						M	
	BACnet	-BAC						B	
	Relay	-R						R	
	Modbus and relay	-MOD-R						1	
	BACnet and relay	-BAC-R						2	
6 Reserved									0

TOOLS

MYT-CON	5100020000	MyTool Connect, a Bluetooth dongle for Produal MyTool® and MyProdual connection

Humidity transmitters

KLH room humidity transmitters are designed for measuring and controlling indoor relative humidity and temperature.

room %rH, °C

Power supply	24 Vac/dc, < 1 VA
Temperature measurement range	0...50 °C
Humidity measurement range	0...100 %rH
Temperature measurement accuracy	±0.5 °C
Humidity measurement accuracy	±2 %rH
Control output	0...10 Vdc, 2 mA
Temperature output	0...10 Vdc, 2 mA
Humidity output	0...10 Vdc, 2 mA
IP protection class	IP20
Ambient temperature	0...50 °C
Mounting	on the wall surface or on a flush mounting box (60 mm hole distance)
Materials	ABS plastic
Product dimensions	87 x 86 x 30 mm

TYPE	ART. NO.	
KLH 100	1132210	room humidity transmitter
KLH 100-R	1132210010	room humidity transmitter, relay output (24 Vac 1 A)
KLH 100-N	1132211	room transmitter with display
KLH 100-N-R	1132211010	room transmitter with display, relay output (24 Vac 1 A)
KLH 100-N-PU	1132211A00	room transmitter with display, 0...10 V potentiometer
KLH 100-N-PU-R	1132211A10	room transmitter with display, 0...10 V potentiometer, relay output (24 Vac 1 A)
KLH 100-NTC 10	1132230	room humidity transmitter, NTC 10 sensor
KLH 100-NTC 20	1132310	room humidity transmitter, NTC 20 sensor
KLH-M	1132600	Modbus room humidity transmitter
KLH-M-R	1132600010	Modbus room humidity transmitter, relay output (24 Vac 1 A)
KLH-M-N	1132601	Modbus room humidity transmitter with display (humidity and/or temperature display)
KLH 100-5V-PT 1000	1132620	room humidity transmitter, Pt1000 sensor, 0...5 V outputs
OPTIONS		
HD-P	1135001	passive potentiometer (not available for Modbus models)
KO IVS	KO5239	protective casing for room products
TOOLS		
ML-SER	1139010	transmitter commissioning tool

Humidity transmitters

room %rH

KLH 420 is a 2–wire humidity transmitter designed for measuring indoor relative humidity.

2

Power supply	24 Vdc (12...35 Vdc)
Humidity measurement range	0...100 %rH
Humidity measurement accuracy	±3 %rH
Humidity output	4...20 mA < 500 Ω (24 Vdc)
IP protection class	IP20
Ambient temperature	0...50 °C
Mounting	on the wall surface or on a flush mounting box (60 mm hole distance)
Materials	ABS plastic
Product dimensions	87 x 86 x 30 mm

TYPE	ART. NO.	
KLH 420	1132280	room humidity transmitter
KLH 420–N	1132281	room humidity transmitter with display

Humidity transmitters

BACnet

room °C, %rH

RRH-BAC transmitters are designed for measuring and controlling temperature and humidity in dry room spaces. The transmitters have built-in single stage heating/cooling and humidity control loops. The transmitters have a RS-485 channel for BACnet MS/TP communication. The transmitter inputs and outputs can also be controlled from the BACnet network making the device an effective I/O module.

Power supply	24 Vac/dc, <1 VA
Temperature meas. range	0...50 °C
Humidity measurement range	0...100 %rH
Temperature meas. accuracy	±0.5 °C (25 °C)
Humidity meas. accuracy	±2 %rH
Output	3 x 0...10 Vdc, 5 mA, incl. control output
IP protection class	IP20
Ambient temperature	0...50 °C
Ambient humidity	0...95 %rH
Mounting	on the wall surface or on a flush mounting box (60 mm hole distance)
Materials	ABS plastic, self-extinguishing
Product dimensions	86 x 120 x 29 mm

Ordering guide		Type	0	1	2	3	4	5	6
0 BACnet room transmitter			6041						
1 Device type	Room humidity transmitter, 1RI, 1DI, 3AO, 2DO	RRH-BAC		H					
2 Display	No display				0				
	Display	-LCD			1				
	Red, yellow and green indicator lights	-AL			2				
3 Setpoint knob / occupancy detection	No setpoint knob or occupancy detection					0			
	Active setpoint knob	-SP				1			
	Passive setpoint knob	-SPR				2			
	Occupancy detection and light level sensor (replaces RI1)	-LL				3			
4 Push buttons	No push buttons						0		
	One push button	-PB					1		
	Two push buttons	-PB2					2		
	Three push buttons	-PB3					3		
	Four push buttons	-PB4					4		
	Push buttons for setpoint	-SPB					5		
	Push buttons for setpoint and one push button	-SPB-PB					6		
	Push buttons for setpoint and two push buttons	-SPB-PB2					7		
5 Inputs / outputs	No inputs / outputs							0	
	Second digital input	-DI2						1	
	Second resistive input (not available with SP/SPR options)	-RI2						2	
	Second digital input and second resistive input (not available with SP/SPR options)	-DI2-RI2						3	
	Two 0...10 Vdc inputs (replaces resistive input)	-AI						5	
	Second digital input and two 0...10 Vdc inputs (replaces resistive input)	-DI2-AI						6	
	Passive temperature sensor (NTC 10)	-TE-NTC10						7	
6 Body colour	White (RAL 9010)								0
	Anthracite grey (RAL 7015)	-GR							B

TOOLS

SW-DCT-USB	1139040	configuration cable

Humidity transmitters

KLHJ 100 transmitters are designed for measuring relative humidity and temperature. The probe cable length is 2 m.

room/duct %rH, °C

Power supply	24 Vac/dc, < 1 VA
Temperature meas. range	-50...50 °C
Humidity measurement range	0...100 %rH
Temperature meas. accuracy	±0.5 °C
Humidity meas. accuracy	±2 %rH
Temperature output	0...10 Vdc, 2 mA / 4...20 mA < 600 Ω
Humidity output	0...10 Vdc, 2 mA / 4...20 mA < 600 Ω
IP protection class	IP54, cable downwards
Cable gland	M16
Ambient temperature	-50...50 °C
Mounting	transmitter with screws (external lugs), sensor with flange, adjustable probe depth < 150 mm
Materials	PBT, PC, PA and stainless steel
Cable length	2,0 m

TYPE	ART. NO.	
KLHJ 100	1132260	humidity and temperature transmitter
KLHJ 100-N	1132261	humidity and temperature transmitter with display

Humidity transmitters

KLU 100 humidity and temperature transmitters are designed for outdoor applications.

outdoor %rH, °C

Power supply	24 Vac/dc, < 1 VA
Temperature meas. range	-50...50 °C
Humidity measurement range	0...100 %rH
Temperature meas. accuracy	±0.5 °C
Humidity meas. accuracy	±2 %rH
Temperature output	0...10 Vdc, 2 mA / 4...20 mA < 600 Ω
Humidity output	0...10 Vdc, 2 mA / 4...20 mA < 600 Ω
IP protection class	IP54, cable downwards
Cable gland	M16
Ambient temperature	-50...50 °C
Mounting	with screws, external lugs
Materials	PC plastic

TYPE	ART. NO.	
KLU 100	1132250	outdoor humidity transmitter
KLU 100-N	1132251	outdoor humidity transmitter with display

Humidity transmitters

duct %rH, °C

KLK duct humidity transmitters are designed for measuring relative humidity and temperature inside ventilation ducts.

Power supply	24 Vac/dc, < 1 VA
Temperature measurement range	-50...50 °C
Humidity measurement range	0...100 %rH
Temperature measurement accuracy	±0.5 °C
Humidity measurement accuracy	typ. ±2 %rH (20...80 %rH), max. ±3 %rH
Control output	humidity or temperature output can be configured to control output
Temperature output	0...10 Vdc, 2 mA / 4...20 mA < 600 Ω
Humidity output	0...10 Vdc, 2 mA / 4...20 mA < 600 Ω
IP protection class	IP54, cable or probe downwards
Cable gland	M16
Ambient temperature	-50...50 °C
Mounting	with flange, probe depth adjustable < 150 mm
Materials	PBT and stainless steel

TYPE	ART. NO.	
KLK100	1132240	duct humidity transmitter
KLK100-R	1132240A00	duct humidity transmitter, relay (24 Vac 1 A)
KLK100-N	1132241	duct humidity transmitter with display
KLK-M	1132610	Modbus duct humidity transmitter
KLK-M-N	1132611	Modbus duct humidity transmitter with display

TOOLS

ML-SER	1139010	transmitter commissioning tool

CO_2 transmitters

NEW

Modbus

BACnet

room ppm CO_2, °C, %rH

Proxima® RTX-CO2 room transmitters provide improved temperature, CO_2, humidity and VOC measurement as well as motion detection (PIR). Standard features include temperature and CO_2 measurement, built-in P/PI controller, seamless integration with existing devices and systems, and easy commissioning and configuration with MyProdual® mobile application.

Power supply	24 Vac (22…26 V) / 24 Vdc (22…39 V), < 3.2 VA
Temperature meas. range	0…50 °C
Humidity measurement range	0…100 %rH
CO_2 measurement range	0…5000 ppm
Time constant	adjustable (> 1 min)
Temperature meas. accuracy	±0.3 °C (20…25 °C)
Temperature meas. accuracy	±0.3 °C (20…25 °C) / R models: ±0.5 °C (25 °C)
Humidity meas. accuracy	RH models: typ. ±2 %rH (20…25 °C, 30…75 %rH), max. ±3 %rH
CO_2 measurement accuracy	typ. ±40 ppm +2 % from reading, max. ±50 ppm +2 % from reading (15…35 °C / 0…80 %rH)
Multifunctional input	1 x NTC 10 / Pt1000 / Resistive / Digital / 0…10 Vdc
Multifunctional output	4 x 0…10 Vdc, 2 mA
IP protection class	IP30
Ambient temperature	0…50 °C
Ambient humidity	0…95 %rH
Mounting	on the wall surface or on a flush mounting box (60 mm hole distance)
Materials	ABS plastic
Product dimensions	97 x 97 x 27 mm

Ordering guide		Type	0	1	2	3	4	5	6
0 Room transmitters			5301						0
1 Device type	Room transmitter with temperature and CO_2 measurement	RTX-CO2		2					
2 Body colour	White				W				
	Black	B			B				
3 Display	No display					0			
	LED indicator	-L				L			
	LED indicator with custom text	-LT				2			
4 Additional measurements	No additional measurement						0		
	Relative humidity	-RH					H		
	Volatile organic compounds (VOC)	-VOC					V		
	Occupancy detection (PIR)	-PIR					P		
	Relative humidity and PIR	-RH-PIR					6		
	Relative humidity, VOC and PIR	-RH-VOC-PIR					7		
	Relative humidity and VOC	-RH-VOC					8		
	VOC and PIR	-VOC-PIR					9		
5 Advanced options	No advanced options							0	
	Modbus	-MOD						M	
	BACnet	-BAC						B	
	Relay	-R						R	
	Modbus and relay	-MOD-R						1	
	BACnet and relay	-BAC-R						2	
6 Reserved									0

CO_2 transmitters

NEW

room ppm CO_2, °C, %rH

RT transmitters are versatile room temperature and CO_2 transmitters best suited for simple measuring applications in building automation. Their outputs can be configured separately for each measurement. Easy to install to a wall or on a flush mounting box, RT transmitters are also quick to commission with MyProdual mobile phone application and MyTool Connect commissioning tool.

Power supply	24 Vac (22…26 V) / 24 Vdc (22…39 V), < 2 VA
Temperature measurement range	0…50 °C
CO_2 measurement range	0…2000 ppm
Time constant	adjustable (> 1 min)
Temperature measurement accuracy	±0.5 °C (25 °C)
Humidity measurement accuracy	RH models: typ. ±2 %rH (22 °C, 30…75 %rH), max. ±4.5 %rH
CO_2 measurement accuracy	typ. ±50 ppm +5 % of value (25 °C / 50 %rH)
Output	3 x 0…10 Vdc, 2 mA (Note: -MOD models do not have analogue outputs)
IP protection class	IP30
Ambient temperature	0…50 °C
Ambient humidity	0…95 %rH
Mounting	on the wall surface or on a flush mounting box (60 mm hole distance)
Materials	ABS plastic
Product dimensions	97 x 97 x 27 mm

Ordering guide		Type	0	1	2	3	4	5	6
0 Room transmitters			5302			0			0
1 Device type	Room transmitter with temperature and CO_2 measurement	RT-CO2		2					
2 Body colour	White				W				
	Black	B			B				
3 Display	No display					0			
4 Additional measurements	No additional measurement						0		
	Relative humidity	-RH					H		
5 Advanced options	No advanced options							0	
	Modbus	-MOD						M	
	BACnet	-BAC						B	
6 Reserved									0

TOOLS

MYT-CON	5100020000	MyTool Connect, a Bluetooth dongle for Produal MyTool® and MyProdual connection

CO_2 transmitters

room ppm CO_2, °C, %rH

HDH transmitters are designed for measuring and controlling CO_2, temperature and humidity in dry room spaces. ABCLogic™ self-calibration method eliminates the possible long term drift.

Power supply	24 Vac/dc (22...28 V), < 2 VA
Temperature measurement range	0...50 °C
Time constant	< 2 min
Temperature measurement accuracy	±0.5 °C
CO_2 measurement accuracy	typ. ±40 ppm +3 % of value
Control output	0...10 Vdc, 2 mA
Temperature output	0...10 Vdc, 2 mA
CO_2 output	0...10 Vdc, 2 mA
IP protection class	IP20
Ambient temperature	0...50 °C
Ambient humidity	0...85 %rH
Mounting	on the wall surface or on a flush mounting box (60 mm hole distance)
Materials	ABS plastic
Product dimensions	87 x 86 x 30 mm

Ordering guide		Type	0	1	2	3	4	5	6
0 Room transmitter			1135						
1 Device type	Room transmitter, CO2 and °C, range 0...2000 ppm	HDH		0	4	0			
	Room transmitter, display, CO2 and °C, 0...2000 ppm	HDH-N		0	4	1			
	Room transmitter, CO2, °C and %rH, 0...2000 ppm	HDH-RH		0	4	4			
	Room transmitter, display, CO2, °C and %rH, 0...2000 ppm	HDH-RH-N		0	4	5			
	Modbus room transmitter, CO2 and °C, 0...2000 ppm	HDH-M		1	0	0			
	Modbus room transmitter, display, CO2 and °C, 0...2000 ppm	HDH-M-N		1	0	1			
	Modbus room transmitter, CO2, °C and %rH, 0...2000 ppm	HDH-M-RH		1	0	2			
	Modbus room transmitter, display, CO2, °C,%rH, 0...2000 ppm	HDH-M-RH-N		1	0	3			
	Room transmitter, CO_2 and °C, 0...10000 ppm	HDH 10K		1	1	0			
	Room transmitter, display, CO_2 and °C, 0...10000 ppm	HDH 10K-N		1	1	1			
	Room transmitter, CO2, °C and %rH, 0...10000 ppm	HDH 10K-RH		1	1	2			
	Room transmitter, display, CO2, °C, %rH, 0...10000 ppm	HDH 10K-RH-N		1	1	3			
	Room transmitter, CO2 and °C, 0...5 V outputs, 0...2000 ppm	HDH-5V		1	9	0			
	Room transmitter, display, CO2,°C, 0...5 V outputs, 0...2000 ppm	HDH-5V-N		1	9	1			
	Room transmitter, CO2, °C, %rH, 0...5 V outputs, 0...2000 ppm	HDH-5V-RH		1	9	2			
	Room transmitter, display, CO2, °C, %rH, 0...5 V outputs	HDH-5V-RH-N		1	9	3			
	Room transmitter, CO2 and °C, PIR, range 0...2000 ppm	HDH-PIR		2	4	0			
	Room transmitter, display, CO2 and °C, PIR, 0...2000 ppm	HDH-PIR-N		2	4	1			
	Room transmitter, CO2,°C and %rH, PIR, 0...2000 ppm	HDH-RH-PIR		2	5	0			
	Room transmitter, display, CO2,°C and %rH, PIR, 0...2000 ppm	HDH-RH-PIR-N		2	5	1			
	Modbus room transmitter, CO2,°C and PIR, 0...2000 ppm	HDH-M-PIR		2	6	0			
	Modbus room transmitter, display, CO2,°C and PIR, 0...2000 ppm	HDH-M-PIR-N		2	6	1			
	Modbus room transmitter, CO2,°C and %rH, PIR, 0...2000 ppm	HDH-M-RH-PIR		2	7	0			
	Modbus room transmitter, display, CO2,°C and %rH, PIR, 0...2000 ppm	HDH-M-RH-PIR-N		2	7	1			
2 Potentiometer options	No potentiometer						0		
	Active potentiometer (0...10 V)	-PU					A		
	Potentiometer 10 kΩ (not on -M models)	-P10K					B		
	Potentiometer 10 kΩ with resistors (not on -M models)	-P10KR					C		
	Potentiometer 1 kΩ (not on -M models)	-P1K					D		
	Potentiometer 1 kΩ with resistors (not on -M models)	-P1KR					E		
	Potentiometer 4.7 kΩ (not on -M models)	-P4K7					F		
	Potentiometer 4.7 kΩ with resistors (not on -M models)	-P4K7R					G		
	Potentiometer 22 kΩ (not on -M models)	-P22K					H		
	Potentiometer 22 kΩ with resistors (not on -M models)	-P22KR					J		
	Custom potentiometer with resistors (not on -M models)	-PC					K		
3 Additional options	No additional options							0	
	Relay 24 Vac 1 A	-R						1	
	Indicator light, 3 pcs	-AL3						2	
	Relay 24 Vac 1 A + Indicator light, 3 pcs	-R-AL3						3	
4 Body colour	White (RAL 9010)								0
	Grey Light (RAL 7004)								1
	Grey Dark (RAL 7012)								2
	Black (RAL 9005) painted								B
	Custom painted color								C

TOOLS

ML-SER	1139010	transmitter commissioning tool

CO_2 transmitters

HDH-Passive transmitters are designed for measuring and controlling CO_2, temperature and humidity in dry room spaces. ABCLogic™ self-calibration method eliminates the possible long term drift.

room ppm CO_2, °C, %rH

Power supply	24 Vac/dc (22...28 V), < 2 VA
Temperature measurement range	0...50 °C
Time constant	< 2 min
Temperature measurement accuracy	±0.5 °C (25 °C)
CO_2 measurement accuracy	typ. ±40 ppm +3 % of value
Control output	0...10 Vdc, 2 mA
Temperature output	0...10 Vdc, 2 mA
CO_2 output	0...10 Vdc, 2 mA
IP protection class	IP20
Ambient temperature	0...50 °C
Ambient humidity	0...85 %rH
Mounting	on the wall surface or on a flush mounting box (60 mm hole distance)
Materials	ABS plastic
Product dimensions	87 x 86 x 30 mm

TYPE	ART. NO.	
HDH-NTC 10	1135180	room transmitter, CO_2 and °C measurement, range 0...2000 ppm, NTC 10 sensor
HDH-NTC 10-RH	1135182	room transmitter with display, CO_2, °C and humidity measurement, range 0...2000 ppm, NTC 10 sensor
HDH-PT1000	1135280	room transmitter, CO_2 and °C measurement, range 0...2000 ppm, PT 1000 sensor
HDH-PT1000-N	1135281	room transmitter with display, CO_2 and °C measurement, range 0...2000 ppm, PT 1000 sensor
HDH-NTC 1.8	1135650	room transmitter, CO_2 and °C measurement, range 0...2000 ppm, NTC 1.8 sensor
HDH-NTC 1.8-N	1135651	room transmitter with display, CO_2 and °C measurement, range 0...2000 ppm, NTC 1.8 sensor
HDH-NTC 20	2200041	room transmitter, CO_2 and °C measurement, range 0...2000 ppm, NTC 20 sensor
HDH-NTC 20-RH	2200043	room transmitter with display, CO_2, °C and humidity measurement, range 0...2000 ppm, NTC 20 sensor
HDH-NTC 20-N	2200041	room transmitter with display, CO_2 and °C measurement, range 0...2000 ppm, NTC 20 sensor
TOOLS		
ML-SER	1139010	transmitter commissioning tool

CO_2 transmitters

room ppm CO_2, °C, %rH

RCD-BAC transmitters are designed for measuring and controlling CO_2, temperature and humidity in dry room spaces. Automatic self-calibration method eliminates the possible long-term drift. The transmitters have built-in single stage heating/cooling, humidity, CO_2 and maximum VAV control loops. The transmitters have a RS-485 channel for BACnet MS/TP communication. The transmitter inputs and outputs can also be controlled from the BACnet network making the device an effective I/O module.

Power supply	24 Vac/dc, < 1 VA
Temperature meas. range	0...50 °C
CO_2 measurement range	0...5000 ppm
Temperature meas. accuracy	±0.5 °C (25 °C)
CO_2 measurement accuracy	typ. ±50 ppm +3 % of value (25 °C)
Output	3 x 0...10 Vdc, 5 mA, incl. control output
IP protection class	IP20
Ambient temperature	0...50 °C
Ambient humidity	0...95 %rH
Mounting	on the wall surface or on a flush mounting box (60 mm hole distance)
Materials	ABS plastic, self-extinguishing
Product dimensions	86 x 120 x 29 mm

Ordering guide		Type	0	1	2	3	4	5	6
0 BACnet room transmitter			6041						
1 Device type	Room CO_2 transmitter, 1RI, 1DI, 3AO, 2DO	RCD-BAC		9					
	Room CO_2 and humidity transmitter, 1RI, 1DI, 3AO, 2DO	RCD-BAC-RH		B					
2 Display	No display				0				
	Display	-LCD			1				
	Red, yellow and green indicator lights	-AL			2				
3 Setpoint knob / occupancy detection	No setpoint knob or occupancy detection					0			
	Active setpoint knob	-SP				1			
	Passive setpoint knob	-SPR				2			
	Occupancy detection and light level sensor (replaces RI1)	-LL				3			
4 Push buttons	No push buttons						0		
	One push button	-PB					1		
	Two push buttons	-PB2					2		
	Three push buttons	-PB3					3		
	Four push buttons	-PB4					4		
	Push buttons for setpoint	-SPB					5		
	Push buttons for setpoint and one push button	-SPB-PB					6		
	Push buttons for setpoint and two push buttons	-SPB-PB2					7		
5 Inputs / outputs	No inputs / outputs							0	
	Second digital input	-DI2						1	
	Second resistive input (not available with SP/SPR options)	-RI2						2	
	Second digital input and second resistive input (not available with SP/SPR options)	DI2-RI2						3	
	Two 0...10 Vdc inputs (replaces resistive input)	-AI						5	
	Second digital input and two 0...10 Vdc inputs (replaces resistive input)	DI2-AI						6	
	Passive temperature sensor (NTC 10)	-TE-NTC10						7	
6 Body colour	White (RAL 9010)								0
	Anthracite grey (RAL 7015)	-GR							B

TOOLS

SW-DCT-USB	1139040	configuration cable

CO_2 transmitters

HDK transmitters are designed for measuring and controlling CO_2, temperature and humidity inside ventilation ducts. Automatic self-calibration method eliminates the possible long term drift.

duct ppm CO_2, °C, %rH

Power supply	24 Vac/dc, < 2 VA
Temperature meas. range	0...50 °C
Time constant	< 2 min
Temperature meas. accuracy	±0.5 °C
CO_2 measurement accuracy	typ. ±40 ppm +3 % of value
Control output	0...10 Vdc, 2 mA
Temperature output	0...10 Vdc, 2 mA
CO_2 output	0...10 Vdc, 2 mA
IP protection class	IP54
Cable gland	M16
Ambient temperature	0...50 °C
Ambient humidity	0...85 %rH
Mounting	in a Ø 10 mm hole, with screws, external lugs
Materials	PC plastic
Product dimensions	105 x 104 x 155 mm

TYPE	ART. NO.	
HDK	1135050	duct transmitter, CO_2 and °C measurement, range 0...2000 ppm
HDK-R	1135050A00	duct transmitter, CO_2 and °C measurement, range 0...2000 ppm, relay (24 Vac 1 A)
HDK-N	1135051	duct transmitter with display, CO_2 and °C measurement, range 0...2000 ppm
HDK-RH	1135054	duct transmitter, CO_2, °C and %rH measurement, range 0...2000 ppm
HDK-RH-N	1135055	duct transmitter with display, CO_2, °C and %rH measurement, range 0...2000 ppm
HDK-M	1135120	Modbus duct transmitter, CO_2 and °C measurement, range 0...2000 ppm
HDK-M-N	1135121	Modbus duct transmitter with display, CO_2 and °C measurement, range 0...2000 ppm
HDK-M-RH	1135122	Modbus duct transmitter, CO_2, °C and %rH measurement, range 0...2000 ppm
HDK-M-RH-N	1135123	Modbus duct transmitter with display, CO_2, °C and %rH measurement, range 0...2000 ppm
HDK 10K	1135130	duct transmitter, CO_2 and °C measurement, range 0...10000 ppm
HDK 10K-N	1135131	duct transmitter with display, CO_2 and °C measurement, range 0...10000 ppm
HDK 10K-RH	1135132	duct transmitter, CO_2, °C and %rH measurement, range 0...10000 ppm
HDK 10K-RH-N	1135133	duct transmitter with display, CO_2, °C and %rH measurement, range 0...10000 ppm
HDK 10K-M	1135140	Modbus duct transmitter, CO_2 and °C measurement, range 0...10000 ppm
HDK 10K-M-N	1135141	Modbus duct transmitter with display, CO_2 and °C measurement, range 0...10000 ppm
HDK 10K-M-RH	1135142	Modbus duct transmitter, CO_2, °C and %rH measurement, range 0...10000 ppm
HDK 10K-M-RH-N	1135143	Modbus duct transmitter with display, CO_2, °C and %rH measurement, range 0...10000 ppm

OPTIONS

HD-R	1135003	relay, 24 Vac 1 A

TOOLS

ML-SER	1139010	transmitter commissioning tool

CO_2 transmitters

outdoor ppm CO_2, °C, %rH

HDU transmitters are designed for measuring and controlling CO_2 concentration and temperature in underground parking garages and parking halls (NOTE: limited UV resistance in outdoor environment). Automatic self-calibration method eliminates the possible long term drift.

Power supply	24 Vac/dc, < 10 VA
Temperature measurement range	-50...50 °C
Temperature measurement accuracy	±0.5 °C
CO_2 measurement accuracy	typ. ±40 ppm +3 % of value
Temperature output	0...10 Vdc, 2 mA
CO_2 output	0...10 Vdc, 2 mA
IP protection class	IP54, cable downwards
Cable gland	M16
Ambient temperature	-30...50 °C
Ambient humidity	0...85 %rH
Mounting	with screws, external lugs
Materials	PC plastic
Product dimensions	105 x 110 x 46 mm

TYPE	ART. NO.	
HDU	1135090	CO_2 transmitter for cold spaces, range 0...2000 ppm
HDU-R	1135090A00	CO_2 transmitter for cold spaces, range 0...2000 ppm, relay (24 Vac 1 A)
HDU-N	1135091	CO_2 transmitter with display, range 0...2000 ppm
HDU-M	1135150	Modbus CO_2 transmitter for cold spaces, range 0...2000 ppm
HDU-M-N	1135151	Modbus CO_2 transmitter with display, range 0...2000 ppm
HDU 5K	1135160	CO_2 transmitter for cold spaces, range 0...5000 ppm
HDU 5K-R	1135160A00	CO_2 transmitter for cold spaces, range 0...2000 ppm, relay (24 Vac 1 A)
HDU 5K-N	1135161	CO_2 transmitter with display, range 0...5000 ppm
HDU 5K-M	1135170	Modbus CO_2 transmitter for cold spaces, range 0...5000 ppm
HDU 5K-M-N	1135171	Modbus CO_2 transmitter with display, range 0...5000 ppm
HDU 10K	1135220	CO_2 transmitter for cold spaces, range 0...10000 ppm
HDU 10K-N	1135221	CO_2 transmitter with display, range 0...10000 ppm
HDU 10K-M	1135290	Modbus CO_2 transmitter for cold spaces, range 0...10000 ppm
HDU 10K-M-N	1135291	Modbus CO_2 transmitter with display, range 0...10000 ppm
OPTIONS		
HD-R	1135003	relay, 24 Vac 1 A
TOOLS		
ML-SER	1139010	transmitter commissioning tool

Air quality transmitters

2

room CO_2, °C, %rH, VOC, PM

Siro is an indoor air quality transmitter with a modern design. The modular device can be equipped with CO_2 concentration and VOC (Volatile Organic Compounds) measurements or alternatively PM (Particulate Matter, PM2.5 (PM1, PM10) measurement and in addition temperature and humidity measurements. It offers easy installation and adjustment, several different model options and various output signals that are configurable separately for each measurement. The devices are available with user interface that includes a display and buttons making the configuration of the device quick and easy. A configuration tool is available for devices without user interface.

Power supply	24 Vac/dc (22…26 V)
Temperature measurement range	0...50 °C
Humidity measurement range	0...100 %rH
PM measurement range	0...50 µg/m3 / 0...500 µg/m³
Temperature measurement accuracy	±0.5 °C (20 °C) / MOD models: ±0.4 °C (20 °C)
Humidity measurement accuracy	RH models: typ. ±2.4 %rH / MOD-models: typ. ±2.2 %rH (20 °C, 30 %rH)
CO_2 measurement accuracy	typ. ±43 ppm +3 % of value
PM measurement accuracy	0...100 µg/m³: PM2.5: ±15 µg/m3 (at 20...30 °C), PM1/PM10: ±25 µg/m3 (at 20...30 °C), 100...1000 µg/m³: PM2.5: ±15 % (at 20...30 °C), PM1/PM10: ±25 % (at 20...30 °C)
Voltage output	4 x 0...10 V / 2...10 V / 0...5 V
IP protection class	IP20
Ambient temperature	0...50 °C
Ambient humidity	0...95 %rH
Mounting	on the wall surface or on a flush mounting box (60 mm hole distance)
Materials	ABS plastic
Product dimensions	95 x 103 x 30 mm

TYPE	ART NO.	TYPE	ART NO.	TYPE	ART NO.
Siro-CO2	304.001.017	Siro-PM-T-A	304.003.022	Siro-MOD-CO2-VOC-rH-T-D-B	304.005.040
Siro-CO2-A	304.001.018	Siro-PM-T-D	304.003.023	Siro-MOD-CO2-VOC-rH-T-A-D-B	304.005.041
Siro-CO2-D	304.001.019	Siro-PM-T-A-D	304.003.024	Siro-MOD-VOC-rH-T	304.006.005
Siro-CO2-A-D	304.001.020	Siro-PM-B	304.003.025	Siro-MOD-VOC-rH-T-A	304.006.006
Siro-CO2-VOC-rH-T	304.001.021	Siro-PM-A-B	304.003.026	Siro-MOD-VOC-rH-T-D	304.006.007
Siro-CO2-VOC-rH-T-A	304.001.022	Siro-PM-D-B	304.003.027	Siro-MOD-VOC-rH-T-A-D	304.006.008
Siro-CO2-VOC-rH-T-D	304.001.023	Siro-PM-A-D-B	304.003.028	Siro-MOD-VOC-rH-T-B	304.006.009
Siro-CO2-VOC-rH-T-A-D	304.001.024	Siro-PM-rH-T-B	304.003.029	Siro-MOD-VOC-rH-T-A-B	304.006.010
Siro-CO2-rH-T	304.001.025	Siro-PM-rH-T-A-B	304.003.030	Siro-MOD-VOC-rH-T-D-B	304.006.011
Siro-CO2-rH-T-A	304.001.026	Siro-PM-rH-T-D-B	304.003.031	Siro-MOD-VOC-rH-T-A-D-B	304.006.012
Siro-CO2-rH-T-D	304.001.027	Siro-PM-rH-T-A-D-B	304.003.032	Siro-MOD-PM	304.007.013
Siro-CO2-rH-T-A-D	304.001.028	Siro-PM-T-B	304.003.033	Siro-MOD-PM-A	304.007.014
Siro-CO2-T	304.001.029	Siro-PM-T-A-B	304.003.034	Siro-MOD-PM-D	304.007.015
Siro-CO2-T-A	304.001.030	Siro-PM-T-D-B	304.003.035	Siro-MOD-PM-A-D	304.007.016
Siro-CO2-T-D	304.001.031	Siro-PM-T-A-D-B	304.003.036	Siro-MOD-PM-rH-T	304.007.017
Siro-CO2-T-A-D	304.001.032	Siro-rH-T	304.004.009	Siro-MOD-PM-rH-T-A	304.007.018
Siro-CO2-B	304.001.033	Siro-rH-T-A	304.004.010	Siro-MOD-PM-rH-T-D	304.007.019
Siro-CO2-A-B	304.001.034	Siro-rH-T-D	304.004.011	Siro-MOD-PM-rH-T-A-D	304.007.020
Siro-CO2-D-B	304.001.035	Siro-rH-T-A-D	304.004.012	Siro-MOD-PM-T	304.007.021
Siro-CO2-A-D-B	304.001.036	Siro-T	304.004.013	Siro-MOD-PM-T-A	304.007.022
Siro-CO2-VOC-rH-T-B	304.001.037	Siro-T-A	304.004.014	Siro-MOD-PM-T-D	304.007.023
Siro-CO2-VOC-rH-T-A-B	304.001.038	Siro-T-D	304.004.015	Siro-MOD-PM-T-A-D	304.007.024
Siro-CO2-VOC-rH-T-D-B	304.001.039	Siro-T-A-D	304.004.016	Siro-MOD-PM-B	304.007.025
Siro-CO2-VOC-rH-T-A-D-B	304.001.040	Siro-MOD-CO2	304.005.018	Siro-MOD-PM-A-B	304.007.026
Siro-VOC-rH-T	304.002.005	Siro-MOD-CO2-A	304.005.019	Siro-MOD-PM-D-B	304.007.027
Siro-VOC-rH-T-A	304.002.006	Siro-MOD-CO2-D	304.005.020	Siro-MOD-PM-rH-T-B	304.007.029
Siro-VOC-rH-T-D	304.002.007	Siro-MOD-CO2-A-D	304.005.021	Siro-MOD-PM-rH-T-A-B	304.007.030
Siro-VOC-rH-T-A-D	304.002.008	Siro-MOD-CO2-VOC-rH-T	304.005.022	Siro-MOD-PM-rH-T-D-B	304.007.031
Siro-VOC-rH-T-B	304.002.009	Siro-MOD-CO2-VOC-rH-T-A	304.005.023	Siro-MOD-PM-rH-T-A-D-B	304.007.032
Siro-VOC-rH-T-A-B	304.002.010	Siro-MOD-CO2-VOC-rH-T-D	304.005.024	Siro-MOD-PM-T-B	304.007.033
Siro-VOC-rH-T-D-B	304.002.011	Siro-MOD-CO2-VOC-rH-T-A-D	304.005.025	Siro-MOD-PM-T-A-B	304.007.034
Siro-VOC-rH-T-A-D-B	304.002.012	Siro-MOD-CO2-rH-T	304.005.026	Siro-MOD-PM-T-D-B	304.007.035
Siro-PM	304.003.013	Siro-MOD-CO2-rH-T-A	304.005.027	Siro-MOD-PM-T-A-D-B	304.007.036
Siro-PM-A	304.003.014	Siro-MOD-CO2-rH-T-D	304.005.028	Siro-MOD-rH-T	304.008.009
Siro-PM-D	304.003.015	Siro-MOD-CO2-rH-T-A-D	304.005.029	Siro-MOD-rH-T-A	304.008.010
Siro-PM-A-D	304.003.016	Siro-MOD-CO2-T	304.005.030	Siro-MOD-rH-T-D	304.008.011
Siro-PM-rH-T	304.003.017	Siro-MOD-CO2-T-A	304.005.031	Siro-MOD-rH-T-A-D	304.008.012
Siro-PM-rH-T-A	304.003.018	Siro-MOD-CO2-T-D	304.005.032	Siro-MOD-T	304.008.013
Siro-PM-rH-T-D	304.003.019	Siro-MOD-CO2-T-A-D	304.005.033	Siro-MOD-T-A	304.008.014
Siro-PM-rH-T-A-D	304.003.020	Siro-MOD-CO2-VOC-rH-T-B	304.005.038	Siro-MOD-T-D	304.008.015
Siro-PM-T	304.003.021	Siro-MOD-CO2-VOC-rH-T-A-B	304.005.039	Siro-MOD-T-A-D	304.008.016

MOD Modbus RTU
CO2 Carbon dioxide sensor
VOC Volatile Organic Compounds sensor
PM Particulate Matter sensor
rH Humidity sensor
T Temperature sensor
A mA output
D Display
B Black body color

TOOLS

Siro-CT	304.009.002	commissioning tool for Siro transmitters

Air quality transmitters

NEW

room VOC, °C

Proxima® RTX-VOC room transmitters provide improved temperature and VOC measurement as well as motion detection (PIR). Standard features include temperature and VOC measurement, built-in P/PI controller, seamless integration with existing devices and systems, and easy commissioning and configuration with MyProdual® mobile application.

Power supply	24 Vac (22...26 V) / 24 Vdc (22...39 V), < 3.2 VA
VOC measurement range	400...2000 ppm (CO_2 equivalent)
Temperature measurement range	0...50 °C
Time constant	adjustable (> 1 min)
Temperature measurement accuracy	±0.5 °C (25 °C)
Temperature measurement accuracy	±0.5 °C (25 °C)
Multifunctional input	1 x NTC 10 / Pt1000 / Resistive / Digital / 0...10 Vdc
Multifunctional output	4 x 0...10 Vdc, 2 mA
IP protection class	IP30
Ambient temperature	0...50 °C
Ambient humidity	0...95 %rH
Mounting	on the wall surface or on a flush mounting box (60 mm hole distance)
Materials	ABS plastic
Product dimensions	97 x 97 x 27 mm

Ordering guide		Type	0	1	2	3	4	5	6
0 Room transmitters			5301						0
1 Device type	Room transmitter with temperature measurement	RTX		1					
2 Body colour	White				W				
	Black	B			B				
3 Display	No display					0			
	LED indicator	-L				L			
	LED indicator with custom text	-LT				2			
4 Additional measurements	Volatile organic compounds (VOC)	-VOC					V		
	VOC and PIR	-VOC-PIR					9		
5 Advanced options	No advanced options							0	
	Modbus	-MOD						M	
	BACnet	-BAC						B	
	Relay	-R						R	
	Modbus and relay	-MOD-R						1	
	BACnet and relay	-BAC-R						2	
6 Reserved									0

TOOLS

MYT-CON	5100020000	MyTool Connect, a Bluetooth dongle for Produal MyTool® and MyProdual connection

Air quality transmitters

duct VOC, °C, %rH

ILK transmitters are designed for measuring and controlling VOC (Volatile Organic Compound) level, temperature and humidity inside ventilation ducts. MEMS sensing technology ensures accurate and durable VOC measurement that is related to the CO_2 level.

Power supply	24 Vac/dc, < 2 VA
VOC measurement range	450...2000 ppm (CO_2 equivalent)
Temperature measurement range	0...50 °C
Temperature measurement accuracy	±0.5 °C
Control output	0...10 Vdc, 2 mA
Temperature output	0...10 Vdc, 2 mA
VOC output	0...10 Vdc, 2 mA
IP protection class	IP54, cable downwards
Cable gland	M16
Ambient temperature	0...50 °C
Ambient humidity	0...85 %rH
Mounting	in a Ø 10 mm hole, with screws, external lugs
Materials	PC plastic
Product dimensions	105 x 104 x 155 mm

TYPE	ART. NO.	
ILK	1135630	duct transmitter
ILK-N	1135631	duct transmitter with display
ILK-RH	1135632	duct transmitter with humidity measurement
ILK-RH-N	1135633	duct transmitter with humidity measurement and display
ILK-M	1135640	Modbus duct transmitter
ILK-M-N	1135641	Modbus duct transmitter with display
ILK-M-RH	1135642	Modbus duct transmitter with humidity measurement
ILK-M-RH-N	1135643	Modbus duct transmitter with humidity measurement and display
OPTIONS		
HD-R	1135003	relay, 24 Vac 1 A
TOOLS		
ML-SER	1139010	transmitter commissioning tool

Carbon monoxide transmitters

HML transmitters are designed for measuring carbon monoxide concentration in underground parking garages and parking halls. The measuring is based on electro-chemical cell. The transmitter measuring range is 0...100 or 0...300 ppm.

outdoor ppm CO

Power supply	24 Vac/dc, < 2 VA
CO measurement range	0...100 ppm / 0...300 ppm
Time constant	1.5 min
CO measurement accuracy	± 10 ppm for < 70 ppm value; ± 15 % of value for > 70 ppm value
Output	0...10 Vdc, 1 mA / 4...20 mA, < 500 Ω
IP protection class	IP54, cable downwards
Cable gland	M16
Ambient temperature	-30...40 °C
Mounting	with screws, external lugs
Materials	PC plastic
Product dimensions	100 x 113 x 46 mm

TYPE	ART. NO.	
HML	1135520	CO transmitter
HML-N	1135521	CO transmitter with display

OPTIONS

HMV	1135510	exchange kit for HML

Light level transmitters

outdoor lx, °C

LUX 34 is designed for measuring outdoor light level and temperature. Measured values can be used for controlling lighting and heating.

Power supply	24 Vac/dc, < 0.1 VA
Temperature measurement range	-50...50 °C
Temperature output	0...10 Vdc, 1 mA
Light level output	0...10 Vdc, 1 mA
IP protection class	IP54, cable downwards
Cable gland	M16
Ambient temperature	-40...40 °C
Mounting	with screws, external lugs
Materials	PBT, PC, PA
Product dimensions	90 x 94 x 44 mm

TYPE	ART. NO.	
LUX 34	1133310	light level transmitter, selectable range 0...1000 lx or 0...10000 lx
LUX 34-100	1133311	light level transmitter, selectable range 0...100 lx or 0...500 lx

OPTIONS

WS-1	9000520	weather shield

Light intensity transmitter

outdoor W/m²

MMSP1 is designed for measuring sun light intensity.

Power supply	24 Vdc, < 0.03 W (5...30 Vdc)
Light level range	0...1500 W/m²
Light level accuracy	±5 % (annual mean)
Voltage output	0...10 Vdc / 0...3.125 Vdc / 0...150 mVdc, the supply voltage must be at least 12 V
Current output	4...20 mA
IP protection class	IP65
Cable gland	M16
Product dimensions	80 x 150 x 60 mm

TYPE	ART. NO.	
MMSP1	1133360	sun light intensity transmitter

Differential pressure transmitters for water

VPEL differential pressure transmitter is designed for measuring water/glycol pressures in heating and cooling systems.

bar

Power supply	24 Vac/dc, < 1 VA
Differential water pressure measurement accuracy	±2.5 % from the full scale
Voltage output	0...10 Vdc, 5 mA
Current output	4...20 mA, < 500 Ω
Zeroing	manually by using the push button
Process connection	8 mm compression fittings for copper pipes
IP protection class	IP54
Cable gland	M16
Ambient temperature	-20...70 °C
Mounting	with screws, external lugs, position allowed only process connectors downwards
Materials	PC plastic
Product dimensions	118 x 113 x 46 mm

TYPE	ART. NO.	
VPEL 1.0/2.5	1134060	differential water pressure transmitter, range 0...1.0 or 0...2.5 bar
VPEL 1.0/2.5-N	1134061	differential water pressure transmitter with display, range 0...1.0 or 0...2.5 bar
VPEL 4.0/6.0	1134070	differential water pressure transmitter, range 0...4.0 or 0...6.0 bar
VPEL 4.0/6.0-N	1134071	differential water pressure transmitter with display, range 0...4.0 or 0...6.0 bar

Pressure transmitters for water

VPL pressure transmitter (3–wire) is designed for measuring fluid pressures in heating and cooling systems.

Power supply	24 Vac/dc, < 1 VA
Voltage output	0...10 Vdc, 2 mA
Current output	4...20 mA, 800 Ω
IP protection class	IP54, cable or probe downwards
Cable gland	M16
Ambient temperature	0...60 °C
Mounting	R½"
Materials	PBT, PC, PA and stainless steel
Product dimensions	70 x 95 x 81 mm

bar

TYPE	ART. NO.	
VPL 60	1134030	water pressure transmitter, range 0...16, 0...25, 0...40 or 0...60 bar
VPL 60–N	1134031	water pressure transmitter with display, range 0...16, 0...25, 0...40 or 0...60 bar
VPL 16	1134050	water pressure transmitter, range 0...2.5, 0...6, 0...10 or 0...16 bar
VPL 16–N	1134051	water pressure transmitter with display, range 0...2.5, 0...6, 0...10 or 0...16 bar

Rain sensor

RV2–24 is a rain sensor designed for HVAC and building automation systems to detect precipitation (rain/snow).

Power supply	24 Vac/dc, < 2 VA
Rain output	relay, max. 230 Vac, 3 A
IP protection class	IP65
Cable gland	1 X M16
Ambient temperature	-35...50 °C
Product dimensions	80 x 82 x 55 mm

TYPE	ART. NO.	
RV2–24	1136070	rain sensor

Wind sensors

UV7+UV7–VV ultrasonic wind transmitter is designed for measuring wind speed and direction in HVAC applications. The sensor is robust and stable.

m/s, °

Power supply	24 Vac/dc, < 0.75 A
Air direction measurement range	0...359 degrees
Air velocity measurement range	0...15 m/s / 0...40 m/s
Time constant	1, 2, 4, 8, 16 s
Air direction measurement accuracy	±1°
Voltage output	3 x 0...10 Vdc
Output	RS232 NMEA0183®
IP protection class	IP65
Ambient temperature	-15...55 °C
Cable	25 m

TYPE	ART. NO.	
UV7	1136030	wind sensor
UV7–VV	1136032	transmitter module for wind sensor
UV7+UV7–VV	1136033	wind sensor and transmitter module

Wind sensors

m/s, °

VS 3000 wind sensor is designed for measuring wind speed and direction in HVAC applications.

Power supply	24 Vac/dc, < 2 VA
Air direction measurement range	0...359 degrees
Air velocity measurement range	0...35 m/s
Air direction measurement accuracy	±1°
Air velocity measurement accuracy	±1 m/s
Air direction measurement output	0...10 Vdc
Air velocity output	0...10 Vdc
IP protection class	IP65
Ambient temperature	-35...70 °C
Mounting	< Ø 50 mm
Cable	10 m

TYPE	ART. NO.	
VS 3000	1136040	wind speed and direction sensor
VH 1000	1136050	wind speed sensor
VR 1000	1136060	wind direction sensor

Wind speed detector

m/s, °C

TUNA 20 is designed for measuring wind speed and outside air temperature.

Power supply	24 Vac/dc, < 1.5 VA
Temperature measurement range	-50...50 °C
Air velocity measurement range	0...20 m/s
Voltage output	0...10 Vdc, 2 mA
Current output	4...20 mA, 600 Ω
IP protection class	IP54
Cable gland	M16
Ambient temperature	-50...50 °C
Mounting	with screws on wall
Materials	PBT, PC, PA, painted steel

TYPE	ART. NO.	
TUNA 20	1136010	wind speed detector

Smoke detectors

2

KRM-X-2 duct smoke detector is designed for smoke detection in ventilation ducts. The detector is a combination of a smoke detector and an adapter system. The adapter system has been specially designed for optimal air flow through the smoke detector. KRM-X-2 detectors are for 24 Vac/dc supply voltage.

Power supply	24 Vac/dc
Probe	160 mm
Sensor	Optical RM3.3-X (ALN-E)
Alarm output	250 Vac / 24 Vdc, 8 A, change-over contact and 250 Vac / 24 Vdc, 8 A, NC contact
Contamination output	250 Vac / 24 Vdc, 6 A, NC contact
IP protection class	IP54
Cable gland	3 X M16
Ambient temperature	-20...50 °C
Materials	ABS plastic, aluminium
Product dimensions	172 x 271 x 85 mm

TYPE	ART. NO.	
KRM-X-2-0,16	1137060	duct smoke detector
KRM-X-2-MOD-0,16	1137070	Modbus duct smoke detector
KRM-X-2-BAC-0,16	1137080	BACnet duct smoke detector

OPTIONS

KS-X	1137093	mounting plate for round or insulated ducts
WDG-X	1137094	protective insulating housing with alarm display for outdoor installation
KS-WDG-X	1137095	mounting plate for round or insulated ducts (with WDG-X)
ASR-A10	1137096	test gas
KRM-RM3.3-X	1137097	smoke sensor (spare part)

Smoke detectors

KRM-X-1 duct smoke detector is designed for smoke detection in ventilation ducts. The detector is a combination of a smoke detector and an adapter system. The adapter system has been specially designed for optimal air flow through the smoke detector. KRM-X-1 detector is for 230 Vac supply voltage.

Power supply	230 Vac
Probe	160 mm
Sensor	Optical RM3.3–X (ALN-E)
Alarm output	250 Vac / 24 Vdc, 8 A, change-over contact and 250 Vac / 24 Vdc, 8 A, NC contact
Contamination output	250 Vac / 24 Vdc, 6 A, NC contact
IP protection class	IP65
Cable gland	M16
Ambient temperature	-20...50 °C
Materials	ABS plastic, aluminium
Product dimensions	172 x 271 x 85 mm

TYPE	ART. NO.	
KRM-X-1–0,16	1137050	duct smoke detector

OPTIONS

KS-X	1137093	mounting plate for round or insulated ducts
WDG-X	1137094	protective insulating housing with alarm display for outdoor installation
KS-WDG-X	1137095	mounting plate for round or insulated ducts (with WDG-X)
ASR-A10	1137096	test gas
KRM-RM3.3–X	1137097	smoke sensor (spare part)

Wireless transmitters

Wireless functionality is one of the fastest-growing trends globally – and this is also the case in building automation. Produal has been a pioneer in offering wireless solutions for this market ever since 2006.

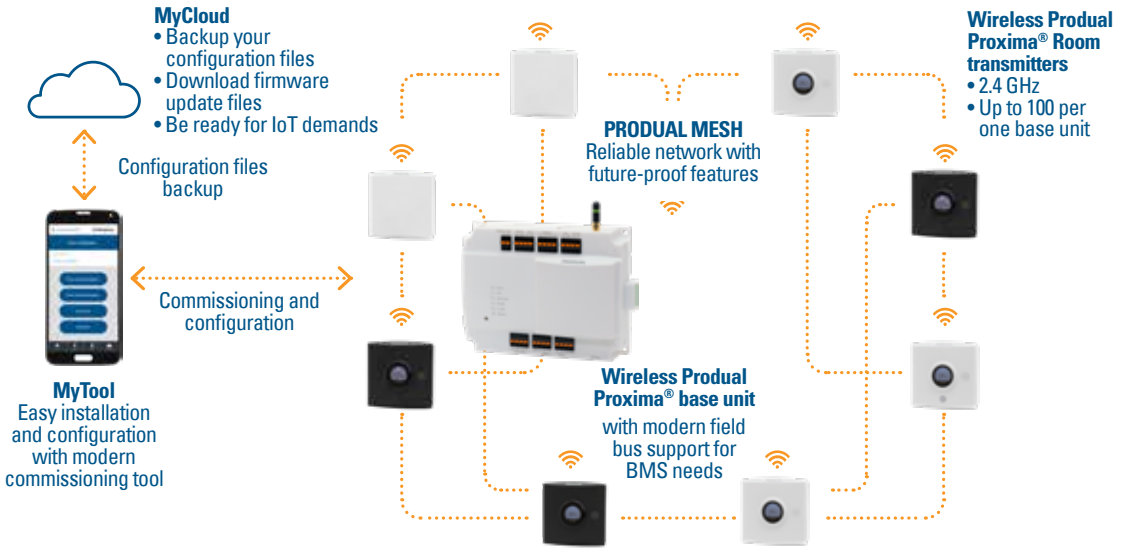
Our reliable, fully battery-operated Produal Proxima® MESH 2.4 GHz solution offers unparalleled reliability for wireless building automation. It is based on the intelligent and self-healing MESH network, using the best available communication frequencies dynamically in the building. The patented technology minimizes the likelihood of interference by or with other wireless systems. The wireless Produal MESH allows you to share the network connection across a wider area than ever before, and dedicated wireless applications can be built and commissioned easily.

Wireless Modbus MiraMesh technology allows the creation of a wireless Modbus RTU network that maintains the standardization of the protocol. As a result, you can reduce materials and workload by converting any Modbus RTU device to a wireless MiraMesh network and sending your Modbus measurement messages wirelessly with low latency.

We also offer transmitters for your long-range wireless LoRaWAN network. Our range makes it possible to convert Modbus RTU device communications to wireless LoRaWAN network communications, as well as to measure a wide range of properties and transmit the measurements as small-size payloads over long distances. LoRaWAN is a beneficial technology, especially in various IoT solutions.

Wireless Produal Proxima® MESH

Wireless Produal Proxima® is a fully battery-operated MESH platform, featuring an impressive battery life of up to 8 years on "always-on" wireless transmitters. The network utilizes the latest wireless technology innovations, ensuring extreme reliability even in the most challenging radio environments. We offer a wide range of measurements and options, including products for converting digital contacts, NTC 10 temperature measurement, and 0...10 V inputs to wireless messages. This allows for almost unlimited application possibilities from building automation to environment monitoring and IoT applications. Wireless Produal Proxima® is designed to be future-proof, aiming to offer one of the most comprehensive and multifunctional wireless portfolios on the market.



Operates on the globally accepted frequency of 2.4 GHz, which is acknowledged in various environments. Its stunning multifunctionality offers broad possibilities and options for system integrators. The mobile MyTool app allows easy network commissioning, monitoring, and updating. All the network messages are encrypted at the AES-128 level.

Wireless product selection guide

Wireless Produal Proxima® MESH 2,4 GHz			
Property	**WTR**	**WTR24**	**WTR-IM**
Battery	•		•
24 V power supply		•	•
Display	o	o	
Temperature measurement	•	•	•
Humidity measurement	o	o	•
CO2 measurement	o	o	
Occupancy detection / PIR	o	o	
Setpoint knob	o		
Advanced setpoint knob with display	o	o	
Digital input			3 1)
Temperature input (NTC 10)			3 1)
0...10 V input			3 1)
Protection class	**IP20**	**IP20**	**IP20**
Page	**95**	**96**	**97**

• standard
o optional
1) 3 inputs total

Wireless base unit

Modbus

WBU is a base station for wireless Produal Proxima® MESH network transmitters and input modules. The transmitter information can be read via Modbus or through the 6 analogue outputs. The base unit supports Modbus RTU and Modbus TCP.

Power supply	24 Vac/dc (22...26 V), < 7 VA
Frequency	2,4 GHz
Input	100 wireless transmitters and 6 analogue inputs
Supply output	2 x 24 Vac, total load < 8 A
Output	6 x analogue output
IP protection class	IP22
Ambient temperature	0...50 °C
Ambient humidity	0...85 %rH
Mounting	with screws on wall or on 35 mm DIN rail
Materials	PC plastic
Product dimensions	186 x 136 x 55 mm

TYPE	ART. NO.	
WBUB	54011B0000	wireless base unit, black
WBU	54011W0000	wireless base unit, white

OPTIONS

WA-AS1	5401900010	extension cable and base for WBU antenna, 3 m cable

TOOLS

MYT-Andr	5100010000	Free Android application for configuring and commissioning of Produal PUMP® devices.

Wireless room transmitters

room °C, %rH

WTR battery operated wireless transmitters are designed for measuring indoor temperature and humidity. Transmitters are compatible with the wireless Produal Proxima® MESH network.

Power supply	3.6 V lithium battery
Frequency	2,4 GHz
Temperature measurement range	0...50 °C
Temperature measurement accuracy	±0.5 °C
IP protection class	IP30
Ambient temperature	0...50 °C
Mounting	on the wall surface or on a flush mounting box (60 mm hole distance)
Materials	PC plastic
Product dimensions	97 x 97 x 30 mm

Ordering guide		Type	0	1	2	3	4	5	6
0 Wireless room transmitter			5401	3				0	0
1 Device type	Battery powered wireless transmitter	WTR		3					
2 Body colour	White				W				
	Black	B			B				
3 Display	No display					0			
	Advanced setpoint knob with display, menu button	-AK				1			
	Setpoint knob	-PK				2			
	Setpoint knob with custom print	-PKC				P			
	Display, menu button	-D				3			
4 Additional measurements	No additional measurement						0		
	CO_2 (not with -PK)	-CO2					C		
	Relative humidity	-RH					H		
	Occupancy detection (not with -PK)	-PIR					P		
	Relative humidity and occupancy detection (not with -PK)	-RH-PIR					1		
	CO_2 and relative humidity (not with -PK)	-CO2-RH					2		
	CO_2 and occupancy detection (not with -PK)	-CO2-PIR					3		
	CO_2, relative humidity and occupancy detection (not with -PK)	-CO2-RH-PIR					4		

OPTIONS / ACCESSORIES

		lithium battery, 3.6 V / 3600 mAh
VP-PROX	9000460	protective casing for Proxima room products
WA-STIC	5401900050	bottom housing with sticker mounting
WA-MAG	5401900060	bottom housing with magnet mounting

TOOLS

MyTool	Free Android application for configuring and commissioning of Produal PUMP® devices.

Wireless room transmitters

WTR24 wireless transmitters are designed for measuring indoor temperature and humidity. Transmitters are compatible with the wireless Produal Proxima® MESH network.

room °C, %rH

Power supply	24 Vac/dc
Frequency	2,4 GHz
Temperature measurement range	0...50 °C
Temperature measurement accuracy	±0,5 °C (25 °C) or ±1 °C (25 °C, CO_2 models)
IP protection class	IP30
Ambient temperature	0...50 °C
Mounting	on the wall surface or on a flush mounting box (60 mm hole distance)
Materials	PC plastic
Product dimensions	97 x 97 x 30 mm

Ordering guide		Type	0	1	2	3	4	5	6
0 Wireless room transmitter			5401					0	0
1 Device type	Wireless transmitter, 24 Vac supply	WTR24		4					
2 Body colour	White				W				
	Black	B			B				
3 Display	No display					0			
	Advanced setpoint knob with display, menu button	-AK				1			
	Display, menu button	-D				3			
4 Additional measurements	No additional measurement						0		
	Relative humidity	-RH					H		
	Occupancy detection	-PIR					P		
	CO_2	-CO2					C		
	Relative humidity and occupancy detection	-RH-PIR					1		
	CO_2 and relative humidity	-CO2-RH					2		
	CO_2 and occupancy detection	-CO2-PIR					3		
	CO_2, relative humidity and occupancy detection	-CO2-RH-PIR					4		

OPTIONS / ACCESSORIES

VP-PROX	9000460	protective casing for Proxima room products

TOOLS

MyTool	Free Android application for configuring and commissioning of Produal PUMP® devices.

Wireless input module

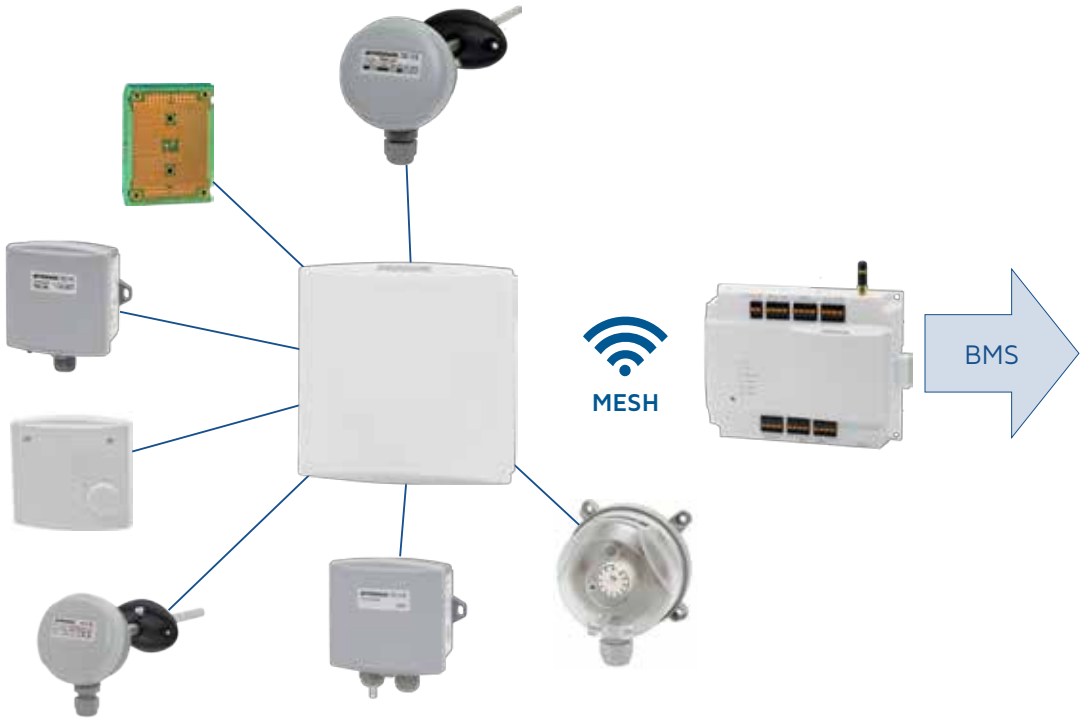
WTR-IM is a wireless input module that reads values from three inputs. The input module includes also temperature and humidity measurements. The module is compatible with the wireless Produal Proxima® MESH network.

Power supply	3.6 V lithium battery or 10...30 Vdc / 12...28 Vac
Frequency	2,4 GHz
Temperature measurement range	0...50 °C
Humidity measurement range	0...100 %rH
Temperature measurement accuracy	±0.5 °C (25 °C)
Humidity measurement accuracy	±3 %rH (25 °C)
Multifunctional input	3 x 0...10 V or NTC 10 or resistive or digital
IP protection class	IP30
Ambient temperature	0...50 °C
Mounting	on the wall surface or on a flush mounting box (60 mm hole distance)
Materials	PC plastic
Product dimensions	97 x 97 x 26 mm

TYPE	ART. NO.	
WTRB-IM	54015B0000	wireless input module, black
WTR-IM	54015W0000	wireless input module, white

TOOLS		
MYT-Andr	5100010000	Free Android application for configuring and commissioning of Produal PUMP® devices.

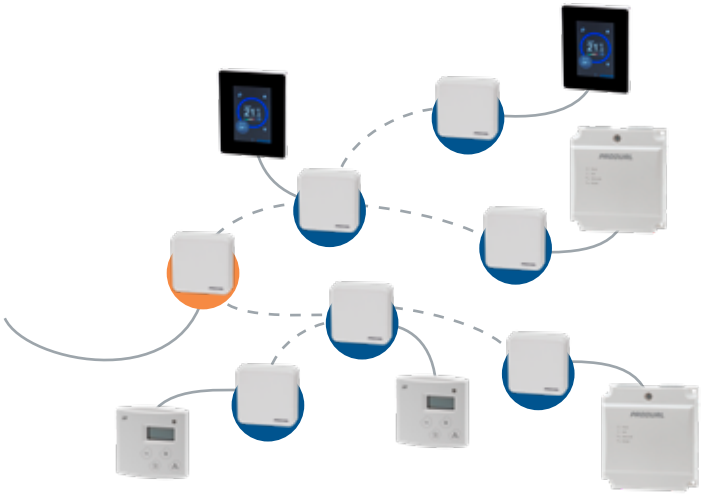
CONVERT THE WIRED MEASUREMENTS TO WIRELESS MESSAGES FOR ALMOST UNLIMITED APPLICATIONS.

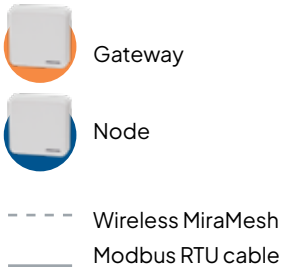


Wireless Modbus MiraMesh

Wireless Modbus technology allows the creation of a wireless Modbus RTU network that maintains the standardization of the protocol. By converting the Modbus signals to a wireless MiraMesh network, it is possible to send your range of Modbus measurement messages wirelessly with low latency. This option significantly reduces the need for control cables in your Modbus installations, saving valuable time and costs in installation planning, cabling work, daisy-chaining, and troubleshooting. A wireless Modbus system is also an excellent choice for Modbus projects where cables are not wanted or are impossible to use.

MiraMesh network utilizes the latest wireless technology innovations for extreme reliability even in the most challenging radio environments. The wireless Modbus bridge, used for conversion, can be configured either as a gateway connected to the Modbus client or as a node connected to the Modbus server with cables. The Wireless Modbus network can consist of up to 100 nodes, and it utilizes the international license-free ISM band at 2.4 GHz.





MiraMesh

Modbus

Wireless Modbus bridge

Modbus

W-Modbus is designed to convert the communication of Modbus RTU devices to wireless communication. The device supports up to 100 devices in one Modbus network.

Power supply	24 Vac/dc, < 2.5 VA
Frequency	2.45 GHz, ISM band (2400...2483 MHz)
Supply output	24 Vac/dc, < 10 VA
IP protection class	IP40
Ambient temperature	-20...55 °C
Ambient humidity	10...95 %rH
Product dimensions	86 x 86 x 26 mm

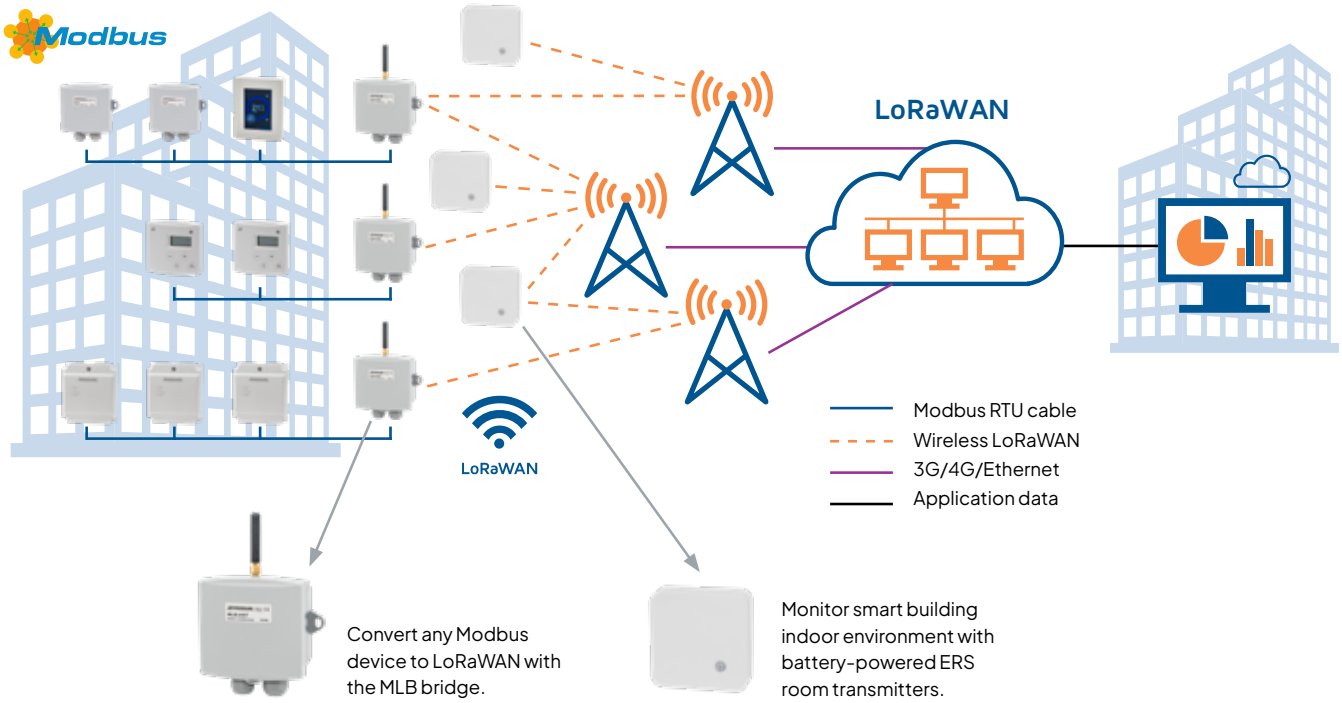
TYPE	ART. NO.	
W-Modbus	50201W0000	wireless Modbus bridge

Wireless LoRaWAN

Produal's wireless LoRaWAN selection offers transmitters for your long-range wireless network. LoRaWAN is a Low Power, Wide Area (LPWA) networking protocol designed to wirelessly connect all kinds of devices to the internet in regional, national, or global networks. It is one of the leading IoT (Internet of Things) technologies for wireless communication.

With our Modbus LoRaWAN bridge, it is easy to connect Produal or 3rd party Modbus measurement and control devices to the LoRaWAN network by converting Modbus RTU messages to wireless LoRaWAN communication, and vice versa. The MLB bridge acts as a Modbus master device and can read and write 32 freely configured Modbus registers via Modbus RTU bus, supporting two-direction communication. Commissioning is done conveniently with the Produal MyTool® mobile application, where you'll find ready description files of the most common Produal Modbus devices.

Additionally, the wireless LoRaWAN room transmitter selection fully covers your various battery-powered measurement needs for humidity, CO_2, light, and sound, as well as occupancy detection.



Wireless Modbus LoRaWAN bridge

LoRaWAN Modbus

MLB is a Class A LoRaWAN device that can operate in a public or private network. MLB is designed for converting Modbus RTU messages to wireless LoRaWAN messages and vice versa. The device functions as a Modbus master and it can read and write up to 32 registers via Modbus RTU bus. The slave device registers can be configured freely. Up to 16 Modbus slave devices can be connected to MLB and up to 32 registers can be read and written in total. MLB can be connected to any Modbus RTU slave device, and it supports two-way communication.

Power supply	10…30 Vac/dc, 30 mA
Frequency	863...870 MHz (868 MHz)
IP protection class	IP54, cable downwards
Cable gland	2 X M16
Ambient temperature	-5...50 °C
Ambient humidity	0...95 %rH
Product dimensions	106 x 102 x 46 mm

TYPE	ART. NO.	
MLB	5010100000	wireless Modbus LoRaWAN bridge, internal antenna
MLB-ANT	5010200000	wireless Modbus LoRaWAN bridge, external antenna

TOOLS

MYT-Andr	5100010000	Free Android application for configuring and commissioning of Produal PUMP® devices.

Wireless LoRaWAN room transmitters

LoRaWAN

Battery-operated wireless ERS2 LoRaWAN transmitters are designed for measuring indoor temperature, humidity, CO_2, light, sound and occupancy.

Power supply	2 x 3.6 V lithium battery
Frequency	863...870 MHz (868 MHz)
Temperature measurement range	0...50 °C
Humidity measurement range	0...100 %rH
CO_2 measurement range	400...10000 ppm
Light level range	0...65535 lx
Temperature measurement accuracy	±0.2 °C
Humidity measurement accuracy	±2 %rH (10...90 %rH, 25 °C)
CO_2 measurement accuracy	typ. ±30 ppm +3 % of value
Light level accuracy	±10 lx
IP protection class	IP20
Ambient temperature	0...50 °C
Ambient humidity	0...85 %rH
Mounting	with screws or double-sided adhesive tape on the wall surface
Materials	PC and ABS plastic
Product dimensions	76 x 76 x 23 mm

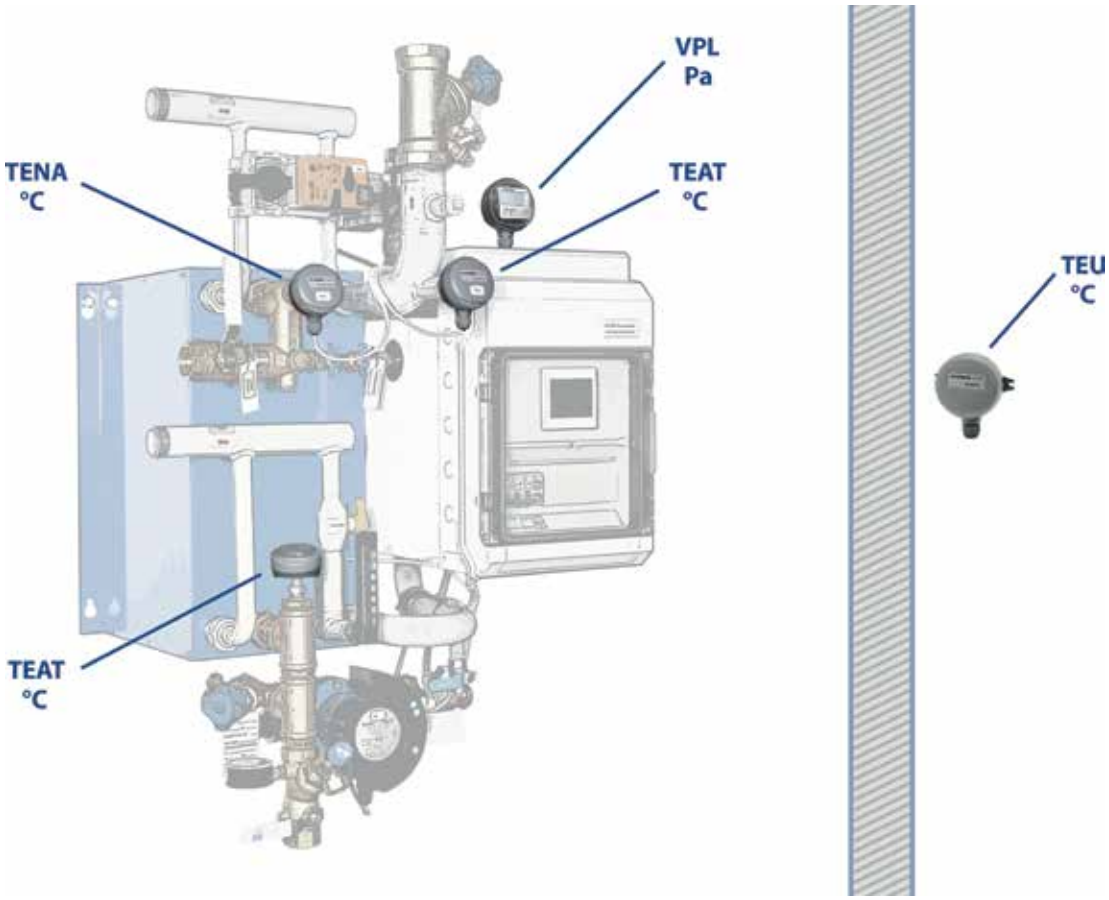
TYPE	ART. NO.	
ERS2 CO2	50301W0I00	wireless LoRaWAN transmitter, °C, %rH, CO_2 and light measurement, PIR
ERS2 Sound	50301W0J00	wireless LoRaWAN transmitter, °C, %rH, sound level and light measurement, PIR
ERS2 Eye	50301W0K00	wireless LoRaWAN transmitter, °C, %rH and light measurement, PIR and infrared
ERS2	50301W0L00	wireless LoRaWAN transmitter, °C, %rH and light measurement, PIR
ERS2 Lite	50301W0M00	wireless LoRaWAN transmitter, °C and %rH

CONTACT OUR SALES FOR OTHER LORAWAN PRODUCTS.

Temperature measurement

Comprehensive range of temperature sensors for different applications in buildings' control and heating, cooling and air-conditioning systems. Thanks to the unique housing design, the sensors are easy to install, which offers major advantages during commissioning. Our sensor range covers the most commonly used passive temperature sensor elements and transmitters. Versatile installation options covering ducts, pipes, construction, ground, room and exterior.

- Wide range of HVAC temperature measurements
- Sensor element options include PT, NTC and NI series
- On transmitters 0...10 V, 4...20 mA
- Heating / cooling control
- Modbus communication with override feature



Temperature sensor selection guide

Product family		Measurement point									
Type	Page	Room	Ventilation duct	Surface	Cable sensor	Water pipe	Outdoor	Combustion gases	Floor	Ground	IP class
TEAT	105		• [1]			• [2]					IP54
TEHR	135	•									IP20
TEIK	132			•							IP20
TEK	118		•								IP54
TEKA	120		•								IP54
TEKHA	117		•								IP67
TEKV	109					•					IP54
TEKY	125...129				•						IP67
TEL	131				•				•		IP54
TEL-5M	131				•				•		IP68
TEM	132				•					•	IP54
TENA	107					•					IP54
TEP	113			•		•					IP54
TEPK	115			•		•					IP54
TES [3]	141	•					•				IP67
TESK	123							•			IP54
TEU	139						•				IP54
TEV	111					•					IP54

[1] Duct flange (MT4270) is necessary

[2] Sensor pocket (e.g. AT 80) is necessary

[3] Rugged temperature sensor specifically designed for harsh environment, e.g. sauna, cold rooms and dirty or dusty industrial environment

Temperature transmitters with control output

	Note: Check the product pages for more information.	Product families															
		LLK, LUK	RTE-BAC	RTX	TEAT	TEHR	TEK	TEKA	TEKV	TEKY4	TEKY6S	TEKY6	TENA	TEP	TEPK	TEU	TEV
Control output	4...20 mA	•			•	•	•	•	•	•	•	•	•	•	•	•	•
	0...10 V	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Function	Control stages	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Control modes	P/PI	P/PI	P/PI	P/PI	P/PI	P/PI	P/PI	P/PI	P/PI	P/PI	P/PI	P/PI	P/PI	P/PI	P/PI	P/PI
	Cooling control	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	Heating control	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	Modbus RTU			•	•	•	•	•	•	•	•	•	•	•	•	•	
	Modbus override			•	•	•	•	•	•	•	•	•	•	•	•	•	
	BACnet MS/TP		•	•													
	Page	142	138	134	106	136	119	121	110	126	128	130	108	114	116	140	112

Temperature transmitter selection guide

Product		Measurement point								Outputs				
Type	Page	Room	Ventilation duct	Surface	Cable sensor	Water pipe	Outdoor	Combustion gases	IP class	V	mA	Modbus	BACnet	Controller
LLK V2	142	Depends on the connected external sensor.							IP54		•			•
LUK V2	142	Depends on the connected external sensor.							IP54	•				•
RTX	134	•							IP30	•		o	o	•
RTE-BAC	138	•							IP20	•			•	•
TEAT LU	106		• [1]			• [2]			IP54	•				•
TEAT LL	106		• [1]			• [2]			IP54		•			•
TEAT-M	106		• [1]			• [2]			IP54	•		•		•
TEHR LU	136	•							IP20	•				•
TEHR LL	136	•							IP20		•			•
TEHR-M	136	•							IP20	•		•		•
TEK LU	119		•						IP54	•				•
TEK LL	119		•						IP54		•			•
TEK-M	119		•						IP54	•		•		•
TEKA LU	121		•						IP54	•				•
TEKA LL	121		•						IP54		•			•
TEKA-M	121		•						IP54	•		•		•
TEKV LU	110					•			IP54	•				•
TEKV LL	110					•			IP54		•			•
TEKV-M	110					•			IP54	•		•		•
TEKYx LU	126				•				IP54/ IP67	•				•
TEKYx LL	126				•				IP54/ IP67		•			•
TEKYx-M	126				•				IP54/ IP67	•		•		•
TENA LU	108					•			IP54	•				•
TENA LL	108					•			IP54		•			•
TENA-M	108					•			IP54	•		•		•
TEP LU	114			•					IP54	•				•
TEP LL	114			•					IP54		•			•
TEP-M	114			•					IP54	•		•		•
TEPK LU	116			•					IP54	•				•
TEPK LL	116			•					IP54		•			•
TEPK-M	116			•					IP54	•		•		•
TESK LU	124							•	IP54	•				
TESK LL	124							•	IP54		•			
TEU LU	140						•		IP54	•				•
TEU LL	140						•		IP54		•			•
TEU-M	140						•		IP54	•		•		•
TEV LU	112					•			IP54	•				•
TEV LL	112					•			IP54		•			•

[1] Duct flange (MT4270) is necessary

[2] Sensor pocket (e.g. AT 80) is necessary

Heating/cooling water sensors

°C

TEAT temperature sensors are designed for measuring heating and cooling water temperatures in HVAC automation systems. The sensors can also be used for air temperature measurements from ventilation ducts, for example.

Temperature measurement response time	5.0 s
IP protection class	IP54, cable or probe downwards
Cable gland	M16
Ambient temperature	0...60 °C
Mounting	water applications: with Produal pocket (R½"), air applications: with MT4270 flange
Mounting depth	80 mm; 50, 100, 150, 200, 250, 300, 350 and 450 mm mounting depths also available. To order these sensors, add the depth to the product type (e.g. TEAT PT100–300).
Materials	PBT, PC, PA, acid proof steel

TYPE	ART. NO.	
TEAT PT100	1173070	100 Ω / 0 °C, accuracy ±0.3 °C / 0 °C, EN 60751/B
TEAT PT1000	1174070	1000 Ω / 0 °C, accuracy ±0.3 °C / 0 °C (Honeywell, Danfoss equivalent)
TEAT NTC10	1175070	10 kΩ / 25 °C, accuracy ±0.2 °C / 25 °C (Trend, Distech equivalent)
TEAT NTC20	1176070	20 kΩ / 25 °C, accuracy ±0.2 °C / 25 °C (Honeywell equivalent)
TEAT NI1000-LG	1178070	1000 Ω / 0 °C, accuracy ±0.4 °C / 0 °C (Siemens equivalent)
TEAT NI1000	117C070	1000 Ω / 0 °C, accuracy ±0.4 °C / 0 °C (Sauter equivalent)
TEAT NTC1.8	117E070	1800 Ω / 25 °C, accuracy ±0.3 °C / 25 °C (TAC/Schneider equivalent)
TEAT KP10	117J070	LM235Z, 10 mV/K, 2,98 V / 25 °C
TEAT NTC10-C	117M070	10 kΩ / 25 °C, accuracy ±0.25 °C / 25 °C (Carel equivalent)

OPTIONS

MT4270	MT4270	duct flange (6 mm)

POCKETS (PRESSURE RATING = PN16)

	TEAT mounting depth								
Pocket material	50	80	100	150	200	250	300	350	450
Stainless steel AISI 300	AT 50 1170011	AT 80 1170010							
Brass MS 362	ATM 50 1170031	ATM 80 1170030	ATM 100 1170037	ATM 150 1170032	ATM 200 1170033	ATM 250 1170034	ATM 300 1170038	ATM 350 1170035	ATM 450 1170036

Heating/cooling water transmitters

°C

TEAT temperature transmitters are designed for measuring and controlling the temperature of heating and cooling water. The transmitters can also be used for air temperature measurements from ventilation ducts, for example.

Power supply	15…35 Vdc
Temperature measurement range	-50...150 °C[2,1]2, 0...50 °C
Temperature measurement accuracy	±0.5 °C
Sensor	Pt1000 EN 60751/B
IP protection class	IP54, cable or probe downwards
Cable gland	M16
Ambient temperature	0...60 °C
Mounting	water applications: with Produal pocket (R½"), air applications: with MT4270 flange
Mounting depth	80 mm; 50, 100, 150, 200, 250, 300, 350 and 450 mm mounting depths also available. To order these sensors, add the depth to the product type (e.g. TEAT-M-300)
Materials	PBT, PC, PA, acid proof steel

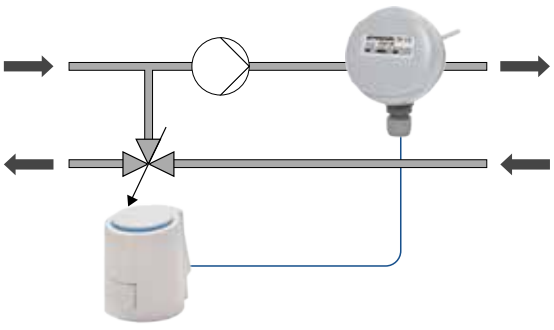
TYPE	ART. NO.	
TEAT LL	1177070	2-wire transmitter/controller, supply 15...35 Vdc, output 4...20 mA
TEAT LU	1179070	3-wire transmitter/controller, supply 24 Vac/dc, output 0...10 V < 2 mA
TEAT-M	117Z070	Modbus transmitter/controller, supply 24 Vac/dc, output 0...10 V < 2 mA

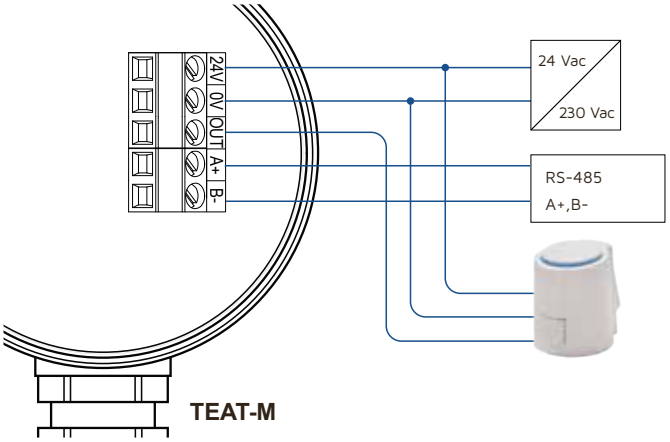
OPTIONS

AT 80	1170010	pocket
ATH 80	1170020	pocket
ATM 80	1170030	pocket
TE-N V2	1170250	display option for the transmitters
MT4270	MT4270	duct flange (6 mm)

TOOLS

ML-SER	1139010	transmitter commissioning tool





Hot domestic water sensors

TENA sensors are designed for measuring hot domestic water temperatures with fast response.

°C

Temperature measurement response time	2.5 s
Probe	Ø 4.1 x 80 / 50 / 210 mm
IP protection class	IP54, cable or probe downwards
Cable gland	M16
Mounting	R ½"
Mounting depth	80 mm. 50 and 210 mm mounting depths also available. To order these sensors, add the depth to the product type (e.g. TENA PT 100–210).
Pressure rating	PN16
Materials	PBT, PC, PA, stainless steel

TYPE	ART. NO.	
TENA NTC 2.2	1172050	2252 Ω / 25 °C, accuracy ±0.25 °C / 25 °C, probe 80 mm
TENA PT 100	1173050	100 Ω / 0 °C, accuracy ±0.3 °C / 0 °C, probe 80 mm
TENA PT 100–50	1173051	100 Ω / 0 °C, accuracy ±0.3 °C / 0 °C, probe 50 mm
TENA PT 100–210	1173052	100 Ω / 0 °C, accuracy ±0.3 °C / 0 °C, probe 210 mm
TENA PT 1000	1174050	1000 Ω / 0 °C, accuracy ±0.3 °C / 0 °C, probe 80 mm
TENA PT 1000–50	1174051	1000 Ω / 0 °C, accuracy ±0.3 °C / 0 °C, probe 50 mm
TENA PT 1000–210	1174052	1000 Ω / 0 °C, accuracy ±0.3 °C / 0 °C, probe 210 mm
TENA NTC 10	1175050	10 kΩ / 25 °C, accuracy ±0,2 °C / 25 °C, probe 80 mm
TENA NTC 10–50	1175051	10 kΩ / 25 °C, accuracy ±0,2 °C / 25 °C, probe 50 mm
TENA NTC 10–210	1175052	10 kΩ / 25 °C, accuracy ±0,2 °C / 25 °C, probe 210 mm
TENA NTC 20	1176050	20 kΩ / 25 °C, accuracy ±0.2 °C / 25 °C, probe 80 mm
TENA NTC 20–50	1176051	20 kΩ / 25 °C, accuracy ±0.2 °C / 25 °C, probe 50 mm
TENA NTC 20–210	1176052	20 kΩ / 25 °C, accuracy ±0.2 °C / 25 °C, probe 210 mm
TENA NI 1000–LG	1178050	1000 Ω / 0 °C, accuracy ±0.4 °C / 0 °C, probe 80 mm
TENA NI 1000–LG-50	1178051	1000 Ω / 0 °C, accuracy ±0.4 °C / 0 °C, probe 50 mm
TENA NI 1000–LG-210	1178052	1000 Ω / 0 °C, accuracy ±0.4 °C / 0 °C, probe 210 mm
TENA NTC 10–KB	117B050	5025 Ω / 25 °C, accuracy ±0.5 °C / 25 °C, probe 80 mm
TENA NI 1000	117C050	1000 Ω / 0 °C, accuracy ±0.4 °C / 0 °C, probe 80 mm
TENA NTC 1.8	117E050	1800 Ω / 25 °C, accuracy ±0.3 °C / 25 °C, probe 80 mm
TENA NTC 1.8–50	117E051	1800 Ω / 25 °C, accuracy ±0.3 °C / 25 °C, probe 50 mm
TENA NTC 1.8–210	117E052	1800 Ω / 25 °C, accuracy ±0.3 °C / 25 °C, probe 210 mm
TENA NTC 10–AN	117H050	10 kΩ / 25 °C, accuracy ±0.25 °C / 25 °C, probe 80 mm
TENA NTC 10–AN-50	117H051	10 kΩ / 25 °C, accuracy ±0.25 °C / 25 °C, probe 50 mm
TENA NTC 10–C	117M050	10 kΩ / 25 °C, accuracy ±0.25 °C / 25 °C, probe 80 mm
TENA T1	117V050	2226 Ω / 0 °C, accuracy ±0.4 °C / 0 °C, probe 80 mm
TENA T1–50	117V051	2226 Ω / 0 °C, accuracy ±0.4 °C / 0 °C, probe 50 mm

Hot domestic water transmitters

TENA temperature transmitters are designed for measuring and controlling hot domestic water temperature.

°C

Temperature measurement range	-50...150 °C[2,1]2, 0...50 °C
Temperature measurement accuracy	±0.5 °C
Probe	Ø 4.1 x 80 / 50 / 120 / 210 mm
IP protection class	IP54, cable or probe downwards
Cable gland	M16
Mounting	R ½"
Materials	PBT, PC, PA, acid proof steel

4

TYPE	ART. NO.	
TENA LL	1177050	2-wire transmitter/controller, supply 15...35 Vdc, output 4...20 mA, probe 80 mm
TENA LL-50	1177051	2-wire transmitter/controller, supply 15...35 Vdc, output 4...20 mA, probe 50 mm
TENA LL-50-N	1177051N00	2-wire transmitter/controller with display, supply 15...35 Vdc, output 4...20 mA, probe 50 mm
TENA LL-120	1177052	2-wire transmitter/controller, supply 15...35 Vdc, output 4...20 mA, probe 120 mm
TENA LL-210	1177053	2-wire transmitter/controller, supply 15...35 Vdc, output 4...20 mA, probe 210 mm
TENA LU	1179050	3-wire transmitter/controller, supply 24 Vac/dc, output 0...10 V < 2 mA
TENA LU-N	1179050N00	3-wire transmitter/controller with display, supply 24 Vac/dc, output 0...10 V < 2 mA
TENA LU-50	1179051	3-wire transmitter/controller, supply 24 Vac/dc, output 0...10 V < 2 mA, probe 50 mm
TENA LU-50-N	1179051N00	3-wire transmitter/controller with display, supply 24 Vac/dc, output 0...10 V < 2 mA
TENA LU-120	1179052	3-wire transmitter/controller, supply 24 Vac/dc, output 0...10 V < 2 mA, probe 120 mm
TENA LU-210	1179053	3-wire transmitter/controller, supply 24 Vac/dc, output 0...10 V < 2 mA, probe 210 mm
TENA-M	117Z050	Modbus transmitter/controller, supply 24 Vac/dc, output 0...10 V < 2 mA, probe 80 mm
TENA-M-50	117Z051	Modbus transmitter/controller, supply 24 Vac/dc, output 0...10 V < 2 mA, probe 50 mm
TENA-M-210	117Z052	Modbus transmitter/controller, supply 24 Vac/dc, output 0...10 V < 2 mA, probe 210 mm

TOOLS

ML-SER	1139010	transmitter commissioning tool

Frost guard sensors

TEKV sensors are designed for frost protection and for applications with fast response.

°C

Temperature measurement response time	2.5 s
Probe	Ø 4 x 200 / 400 mm
IP protection class	IP54, cable or probe downwards
Cable gland	M16
Mounting	R¼"
Mounting depth	< 200 mm (also available < 400 mm)
Pressure rating	PN16
Materials	PBT, PC, PA, stainless steel, brass

TYPE	ART. NO.	
TEKV NTC 2.2	1172120	2252 Ω / 25 °C, accuracy ±0.25 °C / 25 °C
TEKV PT100	1173120	100 Ω / 0 °C, accuracy ±0.3 °C / 0 °C
TEKV PT1000	1174120	1000 Ω / 0 °C, accuracy ±0.3 °C / 0 °C
TEKV PT1000-400	1174121	1000 Ω / 0 °C, accuracy ±0.3 °C / 0 °C, probe 400 mm
TEKV NTC 10	1175120	10 kΩ / 25 °C, accuracy ±0.2 °C / 25 °C
TEKV NTC 10-400	1175121	10 kΩ / 25 °C, accuracy ±0.2 °C / 25 °C, probe 400 mm
TEKV NTC 20	1176120	20 kΩ / 25 °C, accuracy ±0.2 °C / 25 °C
TEKV NI1000-LG	1178120	1000 Ω / 0 °C, accuracy ±0.4 °C / 0 °C
TEKV NTC 10-KB	117B120	5025 Ω / 25 °C, accuracy ±0.5 °C / 25 °C
TEKV NI1000	117C120	1000 Ω / 0 °C, accuracy ±0.4 °C / 0 °C
TEKV NTC 1.8	117E120	1800 Ω / 25 °C, accuracy ±0.3 °C / 25 °C
TEKV NTC 10-AN	117H120	10 kΩ / 25 °C, accuracy ±0.25 °C / 25 °C
TEKV NTC 10-C	117M120	10 kΩ / 25 °C, accuracy ±0.25 °C / 25 °C

Frost guard transmitters

°C

TEKV temperature transmitters are designed for measuring and controlling air heater radiator temperature in frost protection applications.

Temperature measurement range	-50...150 °C[2,1]2, 0...50 °C
Temperature measurement accuracy	±0.5 °C
Probe	Ø 4 x 200 / 400 mm
Sensor	Pt1000 EN 60751/B
IP protection class	IP54, cable downwards
Cable gland	M16
Mounting	R ¼"
Pressure rating	PN16
Materials	PBT, PC, PA, stainless steel, brass

TYPE	ART. NO.	
TEKV LL	1177120	2-wire transmitter/controller, supply 15...35 Vdc, output 4...20 mA
TEKV LU	1179120	3-wire transmitter/controller, supply 24 Vac/dc, output 0...10 V < 2 mA
TEKV LU-N	1179120N00	3-wire transmitter/controller with display, supply 24 Vac/dc, output 0...10 V < 2 mA
TEKV-M	117Z120	Modbus transmitter/controller, supply 24 Vac/dc, output 0...10 V < 2 mA
OPTIONS		
TE-N V2	1170250	display option for the transmitters
TOOLS		
ML-SER	1139010	transmitter commissioning tool

Frost guard sensors

TEV sensors are designed for frost protection and for applications with fast response.

°C

Temperature measurement response time	2.5 s
Probe	Ø 4 x 200 / 400 mm
Mounting	R ¼"
Mounting depth	< 200 mm (also available < 400 mm)
Pressure rating	PN16
Materials	acid proof steel, brass
Cable	Ø 3.2 mm x 2 m (LIYY 2 x 0.14 mm²)

TYPE	ART. NO.	
TEV NTC 2.2	1172020	2252 Ω / 25 °C, accuracy ±0.25 °C / 25 °C (Johnson equivalent)
TEV PT100	1173020	100 Ω / 0 °C, accuracy ±0.3 °C / 0 °C, EN 60751/B
TEV PT1000	1174020	1000 Ω / 0 °C, accuracy ±0.3 °C / 0 °C (Honeywell, Danfoss equivalent)
TEV PT1000-400	1174021	1000 Ω / 0 °C, accuracy ±0.3 °C / 0 °C, probe 400 mm, (Honeywell, Danfoss equivalent)
TEV NTC 10	1175020	10 kΩ / 25 °C, accuracy ±0.2 °C / 25 °C (Trend, Distech equivalent)
TEV NTC 10-400	1175021	10 kΩ / 25 °C, accuracy ±0.2 °C / 25 °C, probe 400 mm, (Trend, Distech equivalent)
TEV NTC 20	1176020	20 kΩ / 25 °C, accuracy ±0.2 °C / 25 °C (Honeywell equivalent)
TEV NTC 20-400	1176021	20 kΩ / 25 °C, accuracy ±0.2 °C / 25 °C, probe 400 mm, (Honeywell equivalent)
TEV NI1000-LG	1178020	1000 Ω / 0 °C, accuracy ±0.4 °C / 0 °C (Siemens equivalent)
TEV NI1000-LG-400	1178024	1000 Ω / 0 °C, accuracy ±0.4 °C / 0 °C, probe 400 mm, (Siemens equivalent)
TEV NTC 10-KB	117B020	5025 Ω / 25 °C, accuracy ±0.5 °C / 25 °C (Satchwell equivalent)
TEV NI1000	117C020	1000 Ω / 0 °C, accuracy ±0.4 °C / 0 °C (Sauter equivalent)
TEV NTC 1.8	117E020	1800 Ω / 25 °C, accuracy ±0.3 °C / 25 °C (TAC/Schneider equivalent)
TEV NTC 1.8-400	117E021	1800 Ω / 25 °C, accuracy ±0.3 °C / 25 °C, probe 400 mm, (TAC/Schneider equivalent)
TEV NTC 10-AN	117H020	10 kΩ / 25 °C, accuracy ±0.25 °C / 25 °C (Schneider/Andover equivalent)
TEV NTC 10-C	117M020	10 kΩ / 25 °C, accuracy ±0.25 °C / 25 °C (Carel equivalent)

Frost guard transmitters

°C

TEV temperature transmitters are designed for measuring and controlling air heater radiator temperature in frost protection applications. The transmitters are suitable also for domestic water applications due the short time constant.

Temperature measurement range	-50...150 °C[2,1]2, 0...50 °C
Temperature measurement accuracy	±0.5 °C
Probe	Ø 4 x 200 / 400 mm
Sensor	Pt1000 EN 60751/B
IP protection class	IP54, cable downwards
Cable gland	M16
Mounting	probe: R ¼", housing: with screws
Pressure rating	PN16
Materials	acid proof steel, brass, PC plastic

TYPE	ART. NO.	
TEV LL	1177020	2–wire transmitter/controller, supply 15...35 Vdc, output 4...20 mA
TEV LU	1179020	3–wire transmitter/controller, supply 24 Vac/dc, output 0...10 V < 2 mA
OPTIONS		
TEU-N V2	1170270	display option for the transmitters
TOOLS		
ML-SER	1139010	transmitter commissioning tool

Strap-on sensors

TEP sensors are designed for pipe strap-on installations.

°C

Temperature measurement range	-50...120 °C
Probe	41 x 16 x 6 mm
IP protection class	IP54, cable or probe downwards
Cable gland	M16
Mounting	by a band on the pipe (diam. 40...90 mm)
Materials	PBT, PC, PA, zink casting

TYPE	ART. NO.	
TEP NTC 2.2	1172080	2252 Ω / 25 °C, accuracy ±0.25 °C / 25 °C (Johnson equivalent)
TEP PT 100	1173080	100 Ω / 0 °C, accuracy ±0,3 °C / 0 °C, EN 60751/B
TEP PT 1000	1174080	1000 Ω / 0 °C, accuracy ±0.3 °C / 0 °C (Honeywell, Danfoss equivalent)
TEP NTC 10	1175080	10 kΩ / 25 °C, accuracy ±0.2 °C / 25 °C (Trend, Distech equivalent)
TEP NTC 20	1176080	20 kΩ / 25 °C, accuracy ±0.2 °C / 25 °C (Honeywell equivalent)
TEP NI1000-LG	1178080	1000 Ω / 0 °C, accuracy ±0.5 °C / 0 °C (Siemens equivalent)
TEP NTC 10-KB	117B080	5025 Ω / 25 °C, accuracy ±0.5 °C / 25 °C (Satchwell equivalent)
TEP NI 1000	117C080	1000 Ω / 0 °C, accuracy ±0.4 °C / 0 °C (Sauter equivalent)
TEP NTC 1.8	117E080	1800 Ω / 25 °C, accuracy ±0.3 °C / 25 °C (TAC/Schneider equivalent)
TEP NTC 10-AN	117H080	10 kΩ / 25 °C, accuracy ±0.25 °C / 25 °C (Schneider/Andover equivalent)
TEP KP 10	117J080	LM235Z, 10 mV/K, 2.98 V / 25 °C
TEP NTC 10-C	117M080	10 kΩ / 25 °C, accuracy ±0.25 °C / 25 °C
TEP T1	117V080	2226 Ω / 0 °C, accuracy ±0.4 °C / 0 °C

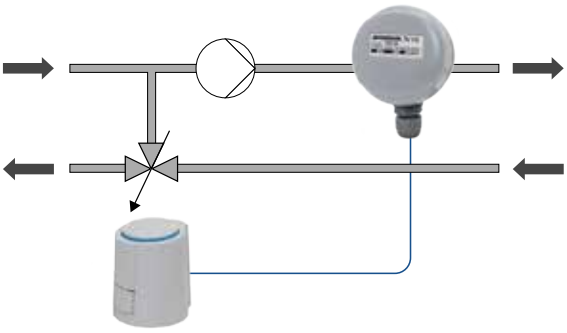
Strap-on transmitters

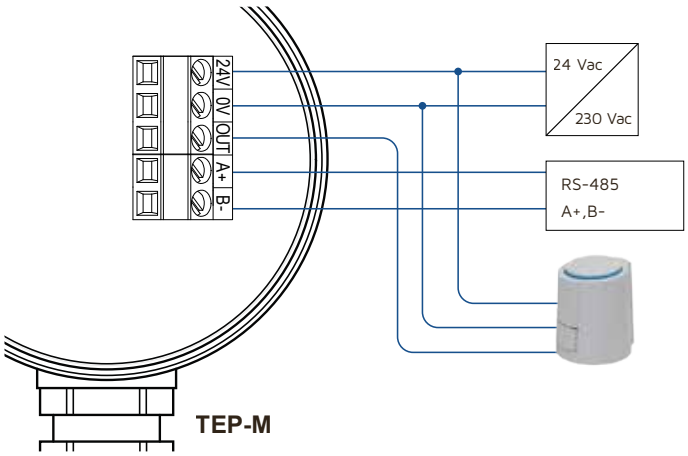
°C

TEP temperature transmitters are designed for pipe strap-on installations. Transmitters can be used for measuring and controlling temperature.

Temperature measurement range	-50...150 °C[2,1]2, 0...50 °C
Temperature measurement accuracy	±0.5 °C
Probe	41 x 15 x 6 mm
Sensor	Pt1000 EN 60751/B
IP protection class	IP54, cable or probe downwards
Cable gland	M16
Mounting	by a band on the pipe (diam. 40...90 mm)
Materials	PBT, PC, PA, zink casting

TYPE	ART. NO.	
TEP LL	1177080	2-wire transmitter/controller, supply 15...35 Vdc, output 4...20 mA
TEP LU	1179080	3-wire transmitter/controller, supply 24 Vac/dc, output 0...10 V < 2 mA
TEP-M	117Z080	Modbus transmitter/controller, supply 24 Vac/dc, output 0...10 V < 2 mA
OPTIONS		
TE-N V2	1170250	display option for the transmitters
TOOLS		
ML-SER	1139010	transmitter commissioning tool





Strap-on sensors

TEPK sensors are designed for pipe strap-on installations.

°C

Temperature measurement range	-20...80 °C
Probe	41 x 15 x 6 mm
IP protection class	IP54
Mounting	by a plastic band on the pipe (Ø10...100 mm)
Materials	probe: zinc casting
Cable	Ø 3.2 mm x 2 m (LIYY 2 x 0.14 mm²)

TYPE	ART. NO.	
TEPK NTC 2.2	1172240	2252 Ω / 25 °C, accuracy ±0.25 °C / 25 °C (Johnson equivalent)
TEPK PT 100	1173240	100 Ω / 0 °C, accuracy ±0.3 °C / 0 °C, EN 60751/B
TEPK PT 1000	1174240	1000 Ω / 0 °C, accuracy ±0.3 °C / 0 °C (Honeywell, Danfoss equivalent)
TEPK NTC 10	1175240	10 kΩ / 25 °C, accuracy ±0.2 °C / 25 °C (Trend, Distech equivalent)
TEPK NTC 20	1176240	20 kΩ / 25 °C, accuracy ±0.2 °C / 25 °C (Honeywell equivalent)
TEPK NI 1000-LG	1178240	1000 Ω / 0 °C, accuracy ±0.4 °C / 0 °C (Siemens equivalent)
TEPK NTC 10-KB	117B240	5025 Ω / 25 °C, accuracy ±0.5 °C / 25 °C (Satchwell equivalent)
TEPK NI 1000	117C240	1000 Ω / 0 °C, accuracy ±0.4 °C / 0 °C (Sauter equivalent)
TEPK NTC 1.8	117E240	1800 Ω / 25 °C, accuracy ±0.3 °C / 25 °C (TAC/Schneider equivalent)
TEPK NTC 10-AN	117H240	10 kΩ / 25 °C, accuracy ±0.25 °C / 25 °C (Schneider/Andover equivalent)
TEPK NTC 10-C	117M240	10 kΩ / 25 °C, accuracy ±0.25 °C / 25 °C (Carel equivalent)
TEPK T1	117V240	2226 Ω / 0 °C, accuracy ±0.4 °C / 0 °C

Strap-on transmitters

°C

TEPK temperature transmitters are designed for pipe strap-on installations. Transmitters can be used for measuring and controlling temperature.

Temperature measurement range	-50...150 °C[2,1]2, 0...50 °C
Temperature measurement accuracy	±0.5 °C
Probe	41 x 15 x 6 mm
Sensor	Pt1000 EN 60751/B
IP protection class	IP54, cable downwards
Cable gland	M16
Mounting	probe: by a plastic band on the pipe (Ø10...100 mm), housing: by screws
Materials	PBT, PC, PA, zink casting

TYPE	ART. NO.	
TEPK LL	1177240	2-wire transmitter/controller, supply 15...35 Vdc, output 4...20 mA
TEPK LU	1179240	3-wire transmitter/controller, supply 24 Vac/dc, output 0...10 V < 2 mA
TEPK-M	117Z240	Modbus transmitter/controller, supply 24 Vac/dc, output 0...10 V < 2 mA
OPTIONS		
TEU-N V2	1170270	display option for the transmitters
TOOLS		
ML-SER	1139010	transmitter commissioning tool

Duct sensors

TEKHA sensors are designed for measuring temperatures inside small ventilation ducts.

°C

Temperature measurement range	-50...70 °C
Probe	Ø 6 mm x 100 mm, acid proof steel
IP protection class	IP67
Mounting	with flange, adjustable < 90 mm
Mounting depth	< 90 mm
Materials	probe: acid proof steel
Cable	Ø 4.7 mm x 2 m (LIYY 2 x 0.5 mm²), other lengths also available

4

TYPE	ART. NO.	
TEKHA NTC 2.2	1172290	2252 Ω / 25 °C, accuracy ±0.25 °C / 25 °C (Johnson equivalent)
TEKHA PT 100	1173290	100 Ω / 0 °C, accuracy ±0,3 °C / 0 °C, EN 60751/B
TEKHA PT 1000	1174290	1000 Ω / 0 °C, accuracy ±0.3 °C / 0 °C (Honeywell, Danfoss equivalent)
TEKHA NTC 10	1175290	10 kΩ / 25 °C, accuracy ±0.2 °C / 25 °C (Trend, Distech equivalent)
TEKHA NTC 20	1176290	20 kΩ / 25 °C, accuracy ±0.2 °C / 25 °C (Honeywell equivalent)
TEKHA NI 1000-LG	1178290	1000 Ω / 0 °C, accuracy ±0.4 °C / 0 °C (Siemens equivalent)
TEKHA NI 1000	117C290	1000 Ω / 0 °C, accuracy ±0.4 °C / 0 °C (Sauter equivalent)
TEKHA NTC 1.8	117E290	1800 Ω / 25 °C, accuracy ±0.3 °C / 25 °C (TAC/Schneider equivalent)
TEKHA NTC 10-AN	117H290	10 kΩ / 25 °C, accuracy ±0.25 °C / 25 °C (Schneider/Andover equivalent)
TEKHA KP 10	117J290	LM235Z, 10 mV/K, 2,98 V / 25 °C
TEKHA NTC 10-C	117M290	10 kΩ / 25 °C, accuracy ±0.25 °C / 25 °C (Carel equivalent)

Duct sensors

TEK sensors are designed for measuring temperatures inside ventilation ducts.

°C

Temperature measurement range	-50...70 °C
Probe	Ø 8 x 200 / 500 mm
IP protection class	IP54, cable or probe downwards
Cable gland	M16
Mounting	with flange
Mounting depth	adjustable < 200 mm, other mounting depths also available
Materials	PBT, PC, PA, stainless steel

TYPE	ART. NO.	
TEK NTC 2.2	1172040	2252 Ω / 25 °C, accuracy ±0,25 °C / 25 °C (Johnson equivalent)
TEK PT 100	1173040	100 Ω / 0 °C, accuracy ±0.3 °C / 0 °C, EN 60751/B
TEK PT 1000	1174040	1000 Ω / 0 °C, accuracy ±0.3 °C / 0 °C (Honeywell, Danfoss equivalent)
TEK PT 1000-500	1174041	1000 Ω / 0 °C, accuracy ±0.3 °C / 0 °C, probe length is 500 mm
TEK NTC 10	1175040	10 kΩ / 25 °C, accuracy ±0.2 °C / 25 °C (Trend, Distech equivalent)
TEK NTC 10-500	1175041	10 kΩ / 25 °C, accuracy ±0.2 °C / 25 °C, probe length is 500 mm
TEK NTC 20	1176040	20 kΩ / 25 °C, accuracy ±0.2 °C / 25 °C (Honeywell equivalent)
TEK NI 1000-LG	1178040	1000 Ω / 0 °C, accuracy ±0.4 °C / 0 °C (Siemens equivalent)
TEK NTC 10-KB	117B040	5025 Ω / 25 °C, accuracy ±0,5 °C / 25 °C
TEK NI 1000	117C040	1000 Ω / 0 °C, accuracy ±0.4 °C / 0 °C (Sauter equivalent)
TEK NTC 1.8	117E040	1800 Ω / 25 °C, accuracy ±0.3 °C / 25 °C (TAC/Schneider equivalent)
TEK NTC 10-AN	117H040	10 kΩ / 25 °C, accuracy ±0.25 °C / 25 °C (Schneider/Andover equivalent)
TEK KP 10	117J040	LM235Z, 10 mV/K, 2,98 V / 25 °C
TEK NTC 10-C	117M040	10 kΩ / 25 °C, accuracy ±0.25 °C / 25 °C (Carel equivalent)
TEK T1	117V040	2226 Ω / 0 °C, accuracy ±0.4 °C / 0 °C

Duct transmitters

TEK temperature transmitters are designed for automatic ventilating systems to measure and control duct temperatures.

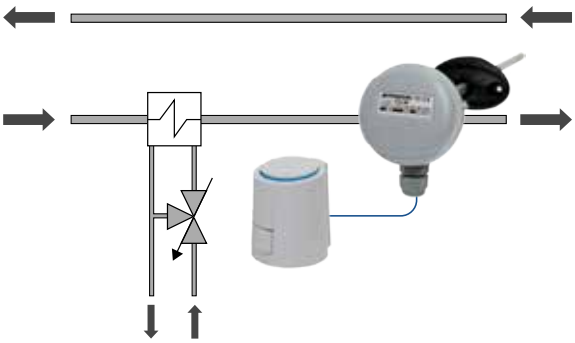
°C

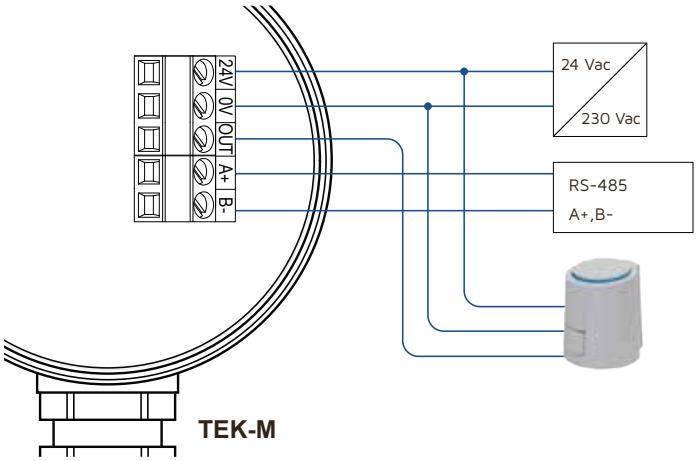
Temperature measurement range	-50...150 °C[2,1]2, 0...50 °C
Temperature measurement accuracy	±0.5 °C
Probe	Ø 8 x 200 mm
Probe length	200 mm
Sensor	Pt1000 EN 60751/B
IP protection class	IP54, cable or probe downwards
Cable gland	M16
Mounting	with flange
Materials	PBT, PC, PA, stainless steel

TYPE	ART. NO.	
TEK LL	1177040	2-wire transmitter/controller, supply 15...35 Vdc, output 4...20 mA
TEK LL-N	1177040N00	2-wire transmitter/controller with display, supply 15...35 Vdc, output 4...20 mA
TEK LU	1179040	3-wire transmitter/controller, supply 24 Vac/dc, output 0...10 V < 2 mA
TEK LU-N	1179040N00	3-wire transmitter/controller with display, supply 24 Vac/dc, output 0...10 V < 2 mA
TEK-M	117Z040	Modbus transmitter/controller, supply 24 Vac/dc, output 0...10 V < 2 mA
TEK-M-N	117Z040N00	Modbus transmitter/controller with display, supply 24 Vac/dc, output 0...10 V < 2 mA

TOOLS

ML-SER	1139010	transmitter commissioning tool





Duct sensors

°C

TEKA sensors are designed for detecting temperatures inside large ducts. Sensor's mechanical construction ensures accurate average temperature measurement.

Temperature measurement range	-50...70 °C
Probe	Ø 10 x 3000 mm
Probe length	3 m
IP protection class	IP54, cable or probe downwards
Cable gland	M16
Mounting	with flange and springs
Materials	PBT, PC, PA, stainless steel

4

TYPE	ART. NO.	
TEKA NTC 2.2	1172130	2252 Ω / 25 °C, accuracy ±0.25 °C / 25 °C (Johnson equivalent)
TEKA PT 100	1173130	100 Ω / 0 °C, accuracy ±0,3 °C / 0 °C, EN 60751/B
TEKA PT 1000	1174130	1000 Ω / 0 °C, accuracy ±0.3 °C / 0 °C (Honeywell, Danfoss equivalent)
TEKA NTC 10	1175130	10 kΩ / 25 °C, accuracy ±0.2 °C / 25 °C (Trend, Distech equivalent)
TEKA NTC 20	1176130	20 kΩ / 25 °C, accuracy ±0.2 °C / 25 °C (Honeywell equivalent)
TEKA NI 1000-LG	1178130	1000 Ω / 0 °C, accuracy ±0.4 °C / 0 °C (Siemens equivalent)
TEKA NTC 10-KB	117B130	5025 Ω / 25 °C, accuracy ±0.5 °C / 25 °C (Satchwell equivalent)
TEKA NI 1000	117C130	1000 Ω / 0 °C, accuracy ±0.4 °C / 0 °C (Sauter equivalent)
TEKA NTC 1.8	117E130	1800 Ω / 25 °C, accuracy ±0.3 °C / 25 °C (TAC/Schneider equivalent)
TEKA NTC 10-AN	117H130	10 kΩ / 25 °C, accuracy ±0.25 °C / 25 °C (Schneider/Andover equivalent)
TEKA NTC 10-C	117M130	10 kΩ / 25 °C, accuracy ±0.25 °C / 25 °C (Carel equivalent)

Duct transmitters

°C

TEKA averaging temperature transmitters are designed for measuring and controlling large air duct temperatures. Transmitter's mechanical construction ensures accurate average temperature measurement.

Temperature measurement range	-50...150 °C[2,1]2, 0...50 °C
Temperature measurement accuracy	±0.5 °C
Probe	Ø 10 x 3000 mm
Probe length	3 m
Sensor	Pt1000 EN 60751/B
Current output	4...20 mA (temperature or contoller)
IP protection class	IP54, cable or probe downwards
Cable gland	M16
Mounting	with flange and springs
Materials	PBT, PC, PA, stainless steel

TYPE	ART. NO.	
TEKA LL	1177130	2–wire transmitter/controller, supply 15...35 Vdc, output 4...20 mA
TEKA LU	1179130	3–wire transmitter/controller, supply 24 Vac/dc, output 0...10 V < 2 mA
TEKA-M	117Z130	Modbus transmitter/controller, supply 24 Vac/dc, output 0...10 V < 2 mA
OPTIONS		
TE-N V2	1170250	display option for the transmitters
TOOLS		
ML-SER	1139010	transmitter commissioning tool

Duct sensors

TEKA-500 sensors are designed for detecting temperatures inside ventilation ducts. Sensor detects the average temperature with 4 sensor elements.

°C

Temperature measurement range	-50...70 °C
Probe	Ø 8.2 x 497 mm
IP protection class	IP54, cable or probe downwards
Cable gland	M16
Mounting	with flange
Materials	PBT, PC, PA, stainless steel

4

TYPE	ART. NO.	
TEKA NTC 2.2–500	1172170	2252 Ω / 25 °C, accuracy ±0.25 °C / 25 °C (Johnson equivalent)
TEKA PT 100–500	1173170	100 Ω / 0 °C, accuracy ±0.3 °C / 0 °C, EN 60751/B
TEKA PT 1000–500	1174170	1000 Ω / 0 °C, accuracy ±0.3 °C / 0 °C (Honeywell, Danfoss equivalent)
TEKA NTC 10–500	1175170	10 kΩ / 25 °C, accuracy ±0.2 °C / 25 °C (Trend, Distech equivalent)
TEKA NTC 20–500	1176170	20 kΩ / 25 °C, accuracy ±0.2 °C / 25 °C (Honeywell equivalent)
TEKA NI 1000–LG-500	1178170	1000 Ω / 0 °C, accuracy ±0.4 °C / 0 °C (Siemens equivalent)
TEKA NTC 10–KB-500	117B170	5025 Ω / 25 °C, accuracy ±0.5 °C / 25 °C (Satchwell equivalent)
TEKA NI 1000–500	117C170	1000 Ω / 0 °C, accuracy ±0.4 °C / 0 °C (Sauter equivalent)
TEKA NTC 1.8–500	117E170	1800 Ω / 25 °C, accuracy ±0.3 °C / 25 °C (TAC/Schneider equivalent)
TEKA NTC 10–AN-500	117H170	10 kΩ / 25 °C, accuracy ±0.25 °C / 25 °C (Schneider/Andover equivalent)
TEKA NTC 10–C-500	117M170	10 kΩ / 25 °C, accuracy ±0.25 °C / 25 °C (Carel equivalent)

Duct transmitters

°C

TEKA-500 transmitters are designed for measuring and controlling temperatures inside ventilation ducts. The transmitter measures the average temperature with 4 sensor elements.

Temperature measurement range	-50...150 °C[2,1]2, 0...50 °C
Temperature measurement accuracy	±0.5 °C
Probe	Ø 8.2 x 497 mm
Sensor	Pt1000 EN 60751/B
IP protection class	IP54, cable or probe downwards
Cable gland	M16
Mounting	with flange
Materials	PBT, PC, PA, stainless steel

TYPE	ART. NO.	
TEKA LL-500	1177170	2-wire transmitter/controller, supply 15...35 Vdc, output 4...20 mA
TEKA LU-500	1179170	3-wire transmitter/controller, supply 24 Vac/dc, output 0...10 V < 2 mA
TEKA-M-500	117Z170	Modbus transmitter/controller, supply 24 Vac/dc, output 0...10 V < 2 mA

OPTIONS

TE-N V2	1170250	display option for the transmitters

TOOLS

ML-SER	1139010	transmitter commissioning tool

Combustion gas sensors

°C

TESK sensors are designed for measuring combustion gas temperatures.

Temperature measurement range	0...400 °C
Probe	Ø 10 x 265 mm
IP protection class	IP54, cable or probe downwards
Cable gland	PG16
Mounting	R ½" or with flange on order
Mounting depth	< 265 mm
Pressure rating	PN16
Materials	silumin cast

TYPE	ART. NO.	
TESK PT100	1173160	100 Ω / 0 °C, accuracy ±0.3 °C / 0 °C, EN 60751/B
TESK PT1000	1174160	1000 Ω / 0 °C, accuracy ±0.3 °C / 0 °C (Honeywell, Danfoss equivalent)

OPTIONS

MT4357	MT4357	duct flange, brass, 10 mm

Combustion gas transmitters

°C

TESK temperature transmitters are designed for temperature measurement in combustion gas from boilers and boiler plants.

Temperature measurement range	0...400 °C
Temperature measurement accuracy	±0.5 °C
Probe	Ø 10 x 265 mm
Sensor	Pt1000 EN 60751/B
IP protection class	IP54, cable or probe downwards
Cable gland	PG16
Mounting	R ½" or with flange on order
Pressure rating	PN16
Materials	silumin cast

4

TYPE	ART. NO.	
TESK LL 0/400	1177160	2–wire transmitter, supply 15...35 Vdc, output 4...20 mA
TESK LU 0/400	1179160	3–wire transmitter, supply 24 Vac/dc, output 0...10 V < 2 mA

OPTIONS

MT4357	MT4357	duct flange, brass, 10 mm

Cable temperature sensors

TEKY4 temperature sensors are designed for measuring temperatures in automatic HVAC systems. The rolled stainless steel sleeve provides good protection against water and dust.

°C

Temperature measurement range	-30...80 °C
Probe	Ø 4 mm x 30 mm, stainless steel
IP protection class	IP67
Materials	PVC, stainless steel
Cable	Ø 3.2 mm x 2.3 m (LIYY 2 x 0.14 mm²)
Cable length	2,3 m

TYPE	ART. NO.	
TEKY4 NTC 2.2	1172330	2252 Ω / 25 °C, accuracy ±0,25 °C / 25 °C (Johnson equivalent)
TEKY4 PT100	1173330	100 Ω / 0 °C, accuracy ±0.3 °C / 0 °C, EN 60751/B
TEKY4 PT1000	1174330	1000 Ω / 0 °C, accuracy ±0.3 °C / 0 °C (Honeywell, Danfoss equivalent)
TEKY4 NTC 10	1175330	10 kΩ / 25 °C, accuracy ±0.2 °C / 25 °C (Trend, Distech equivalent)
TEKY4 NTC 10-5m	1175331	10 kΩ / 25 °C, accuracy ±0.2 °C / 25 °C, cable 5 m (Trend, Distech equivalent)
TEKY4 NTC 20	1176330	20 kΩ / 25 °C, accuracy ±0.2 °C / 25 °C (Honeywell equivalent)
TEKY4 NI1000-LG	1178330	1000 Ω / 0 °C, accuracy ±0.4 °C / 0 °C (Siemens equivalent)
TEKY4 NTC 10-KB	117B330	5025 Ω / 25 °C, accuracy ±0.5 °C / 25 °C (Satchwell equivalent)
TEKY4 NI1000	117C330	1000 Ω / 0 °C, accuracy ±0.4 °C / 0 °C (Sauter equivalent)
TEKY4 NTC 1.8	117E330	1800 Ω / 25 °C, accuracy ±0.3 °C / 25 °C (TAC/Schneider equivalent)
TEKY4 NTC 10-AN	117H330	10 kΩ / 25 °C, accuracy ±0.25 °C / 25 °C (Schneider/Andover equivalent)
TEKY4 NTC 10-C	117M330	10 kΩ / 25 °C, accuracy ±0.25 °C / 25 °C (Carel equivalent)
TEKY4 T1	117V330	2226 Ω / 0 °C, accuracy ±0.4 °C / 0 °C

Cable temperature transmitters

°C

TEKY4 temperature transmitters are designed for measuring and controlling temperatures in automatic HVAC systems. The rolled stainless steel sleeve provides good protection against water and dust for the sensor.

Temperature measurement range	-50...150 °C[2,1]2, 0...50 °C
Temperature measurement accuracy	±0.5 °C (0 °C)
Probe	Ø 4 mm x 30 mm, stainless steel
Sensor	Pt1000 EN 60751/B
IP protection class	IP54, cable downwards
Cable gland	M16
Mounting	housing: with screws on wall, external lugs
Materials	PBT, PC, PA

TYPE	ART. NO.	
TEKY4 LL	1177330	2-wire transmitter/controller, supply 15...35 Vdc, output 4...20 mA
TEKY4 LU	1179330	3-wire transmitter/controller, supply 24 Vac/dc, output 0...10 V < 2 mA
TEKY4-M	117Z330	Modbus transmitter/controller, supply 24 Vac/dc, output 0...10 V < 2 mA
OPTIONS		
TEU-N V2	1170270	display option for the transmitters
TOOLS		
ML-SER	1139010	transmitter commissioning tool

Cable temperature sensors

°C

TEKY6S temperature sensors are designed for detecting temperatures in automatic HVAC systems. The rolled stainless steel sleeve provides good protection against water and dust.

Temperature measurement range	-50...150 °C
Probe	Ø 6 mm x 45 mm, stainless steel
IP protection class	IP67
Materials	silicone, stainless steel
Cable	Ø 4.8 mm x 2.3 m (SIHF 2 x 0.25 mm²)
Cable length	2,3 m

TYPE	ART. NO.	
TEKY6S NTC 2.2	1172340	2252 Ω / 25 °C, accuracy ±0.25 °C / 25 °C (Johnson equivalent)
TEKY6S PT 100	1173340	100 Ω / 0 °C, accuracy ±0.3 °C / 0 °C, EN 60751/B
TEKY6S PT 1000	1174340	1000 Ω / 0 °C, accuracy ±0.3 °C / 0 °C (Honeywell, Danfoss equivalent)
TEKY6S NTC 10	1175340	10 kΩ / 25 °C, accuracy ±0.2 °C / 25 °C (Trend, Distech equivalent)
TEKY6S NTC 20	1176340	20 kΩ / 25 °C, accuracy ±0.2 °C / 25 °C (Honeywell equivalent)
TEKY6S NI 1000-LG	1178340	1000 Ω / 0 °C, accuracy ±0.4 °C / 0 °C (Siemens equivalent)
TEKY6S NTC 10-KB	117B340	5025 Ω / 25 °C, accuracy ±0.5 °C / 25 °C (Satchwell equivalent)
TEKY6S NI 1000	117C340	1000 Ω / 0 °C, accuracy ±0.4 °C / 0 °C (Sauter equivalent)
TEKY6S NTC 1.8	117E340	1800 Ω / 25 °C, accuracy ±0.3 °C / 25 °C (TAC/Schneider equivalent)
TEKY6S NTC 10-AN	117H340	10 kΩ / 25 °C, accuracy ±0.25 °C / 25 °C (Schneider/Andover equivalent)
TEKY6S NTC 10-C	117M340	10 kΩ / 25 °C, accuracy ±0.25 °C / 25 °C (Carel equivalent)

Cable temperature transmitters

TEKY6S temperature transmitters are designed for measuring and controlling temperatures in automatic HVAC systems. The rolled stainless steel sleeve provides good protection against water and dust for the sensor.

°C

Temperature measurement range	-50...150 °C[2,1]2, 0...50 °C
Temperature measurement accuracy	±0.5 °C
Probe	Ø 6 mm x 45 mm, stainless steel
Sensor	Pt1000 EN 60751/B
IP protection class	IP54, cable downwards
Cable gland	M16
Mounting	housing: with screws on wall, external lugs
Materials	PBT, PC, PA

TYPE	ART. NO.	
TEKY6S LL	1177340	2-wire transmitter/controller, supply 15...35 Vdc, output 4...20 mA
TEKY6S LU	1179340	3-wire transmitter/controller, supply 24 Vac/dc, output 0...10 V < 2 mA
TEKY6S-M	117Z340	Modbus transmitter/controller, supply 24 Vac/dc, output 0...10 V < 2 mA
OPTIONS		
TEU-N V2	1170270	display option for the transmitters
TOOLS		
ML-SER	1139010	transmitter commissioning tool

Cable temperature sensors

°C

TEKY6 temperature sensors are designed for detecting temperatures in automatic HVAC systems. The rolled stainless steel sleeve provides good protection against water and dust. Cable length is 2.3 m, some models also available with 5 m cable.

Temperature measurement range	-30...80 °C
Probe	Ø 6 mm x 45 mm, stainless steel
IP protection class	IP67
Materials	PVC, stainless steel

TYPE	ART. NO.	
TEKY6 NTC 2.2	1172320	2252 Ω / 25 °C, accuracy ±0.25 °C / 25 °C (Johnson equivalent)
TEKY6 PT100	1173320	100 Ω / 0 °C, accuracy ±0,3 °C / 0 °C, EN 60751/B
TEKY6 PT100	1173320-5M	100 Ω / 0 °C, accuracy ±0.3 °C / 0 °C, EN 60751/B, cable 5 m
TEKY6 PT1000	1174320	1000 Ω / 0 °C, accuracy ±0.3 °C / 0 °C (Honeywell, Danfoss equivalent)
TEKY6 NTC 10	1175320	10 kΩ / 25 °C, accuracy ±0.2 °C / 25 °C (Trend, Distech equivalent)
TEKY6 NTC 10-5m	1175321	10 kΩ / 25 °C, accuracy ±0.2 °C / 25 °C, cable 5 m (Trend, Distech equivalent)
TEKY6 NTC 20	1176320	20 kΩ / 25 °C, accuracy ±0.2 °C / 25 °C (Honeywell equivalent)
TEKY6 NI1000-LG	1178320	1000 Ω / 0 °C, accuracy ±0.4 °C / 0 °C (Siemens equivalent)
TEKY6 NTC 10-KB	117B320	5025 Ω / 25 °C, accuracy ±0.5 °C / 25 °C (Satchwell equivalent)
TEKY6 NI1000	117C320	1000 Ω / 0 °C, accuracy ±0.4 °C / 0 °C (Sauter equivalent)
TEKY6 NTC 1.8	117E320	1800 Ω / 25 °C, accuracy ±0.3 °C / 25 °C (TAC/Schneider equivalent)
TEKY6 NTC 10-AN	117H320	10 kΩ / 25 °C, accuracy ±0.25 °C / 25 °C (Schneider/Andover equivalent)
TEKY6 KP 10	117J320	LM335Z, 2,98 V / 25 °C, 10 mV/K, accuracy ±0.5 °C / 25 °C
TEKY6 NTC 10-C	117M320	10 kΩ / 25 °C, accuracy ±0.25 °C / 25 °C (Carel equivalent)
TEKY6 T1	117V320	2226 Ω / 0 °C, accuracy ±0.4 °C / 0 °C

Cable temperature transmitters

°C

TEKY6 temperature transmitters are designed for measuring and controlling temperatures in automatic HVAC systems. The rolled stainless steel sleeve provides good protection against water and dust for the sensor.

Temperature measurement range	-50...150 °C[2,1]2, 0...50 °C
Temperature measurement accuracy	±0.5 °C (0 °C)
Probe	Ø 6 mm x 45 mm, stainless steel
Sensor	Pt1000 EN 60751/B
IP protection class	IP54, cable downwards
Cable gland	M16
Mounting	housing: with screws on wall, external lugs
Materials	PBT, PC, PA

TYPE	ART. NO.	
TEKY6 LL	1177320	2-wire transmitter/controller, supply 15...35 Vdc, output 4...20 mA
TEKY6 LU	1179320	3-wire transmitter/controller, supply 24 Vac/dc, output 0...10 V < 2 mA
TEKY6-M	117Z320	Modbus transmitter/controller, supply 24 Vac/dc, output 0...10 V < 2 mA

OPTIONS

TEU-N V2	1170270	display option for the transmitters

TOOLS

ML-SER	1139010	transmitter commissioning tool

Cable temperature sensors

°C

TE cable temperature sensors are designed for measuring temperatures in automatic HVAC systems. The sensor can be used in dry, non-condensing surroundings.

Temperature measurement range	-30...80 °C
Ambient humidity	0...85 %rH
Cable	NTC: 0.05 mm² x 300 mm; PT: 0.08 mm² x 300 mm

TYPE	ART. NO.	
TE PT 100	1173000	100 Ω / 0 °C, accuracy ±0.3 °C / 0 °C
TE PT 1000	1174000	1000 Ω / 0 °C, accuracy ±0.3 °C / 0 °C
TE NTC 10	1175000	10 kΩ / 25 °C, accuracy ±0.2 °C / 25 °C
TE NTC 20	1176000	20 kΩ / 25 °C, accuracy ±0.2 °C / 25 °C

Cable temperature sensors

TEL sensors are designed for measuring floor temperatures. The sensor is installed in the cable duct inside the floor construction.

°C

Temperature measurement range	-30...80 °C
Probe	Ø 7 mm x 28 mm
IP protection class	IP54
Cable	Ø 4.7 mm x 2.3 m (LIYY 2 x 0,5 mm²)

TYPE	ART. NO.	
TEL NTC 2.2	1172280	2252 Ω / 25 °C, accuracy ±0.25 °C / 25 °C (Johnson equivalent)
TEL PT100	1173280	100 Ω / 0 °C, accuracy ±0.3 °C / 0 °C, EN 60751/B
TEL PT1000	1174280	1000 Ω / 0 °C, accuracy ±0.3 °C / 0 °C (Honeywell, Danfoss equivalent)
TEL NI1000-LG	11782800	1000 Ω / 0 °C, accuracy ±0.4 °C / 0 °C (Siemens equivalent)
TEL NI1000	117C280	1000 Ω / 0 °C, accuracy ±0.4 °C / 0 °C (Sauter equivalent)
TEL NTC 1.8	117E280	1800 Ω / 25 °C, accuracy ±0.3 °C / 25 °C (TAC/Schneider equivalent)
TEL NTC 10-AN	117H280	10 kΩ / 25 °C, accuracy ±0.25 °C / 25 °C (Schneider/Andover equivalent)
TEL NTC 10-C	117M280	10 kΩ / 25 °C, accuracy ±0.25 °C / 25 °C (Carel equivalent)

Cable temperature sensors

TEL 5M sensors are designed for measuring floor temperatures. The sensor is installed in the cable duct inside the floor construction.

°C

Temperature measurement range	-50...105 °C
Probe	Ø 5 mm x 20 mm
IP protection class	IP68, 1.5 m / 30 min
Cable	Ø 3 mm x 5 m, 2 x AWG24
Cable length	5,0 m

TYPE	ART. NO.	
TEL NTC 10-5M	1175281	10 kΩ / 25 °C, accuracy ±0.2 °C / 25 °C, cable 5 m (Trend, Distech equivalent)
TEL NTC 20-5M	1176281	20 kΩ / 25 °C, accuracy ±0.2 °C / 25 °C, cable 5 m (Honeywell equivalent)

Cable temperature sensors

°C

TEM sensors are designed for measuring temperatures in road ramps and street constructions. The sensor must be protected against mechanical stress.

Temperature measurement range	-30...80 °C
Probe	Ø 9 mm
IP protection class	IP54
Cable	Ø 6 mm x 5 m (PUR 2 x 0,75 mm²), other lengths also available

TYPE	ART. NO.	
TEM NTC 2.2	1172310	2252 Ω / 25 °C, accuracy ±0.25 °C / 25 °C (Johnson equivalent)
TEM PT100	1173310	100 Ω / 0 °C, accuracy ±0.3 °C / 0 °C, EN 60751/B
TEM PT1000	1174310	1000 Ω / 0 °C, accuracy ±0.3 °C / 0 °C (Honeywell, Danfoss equivalent)
TEM NTC 10	1175310	10 kΩ / 25 °C, accuracy ±0.2 °C / 25 °C (Trend, Distech equivalent)
TEM NTC 20	1176310	20 kΩ / 25 °C, accuracy ±0.2 °C / 25 °C (Honeywell equivalent)
TEM NI1000-LG	1178310	1000 Ω / 0 °C, accuracy ±0.4 °C / 0 °C (Siemens equivalent)
TEM NI1000	117C310	1000 Ω / 0 °C, accuracy ±0.4 °C / 0 °C (Sauter equivalent)
TEM NTC 1.8	117E310	1800 Ω / 25 °C, accuracy ±0.3 °C / 25 °C (TAC/Schneider equivalent)
TEM NTC 10-AN	117H310	10 kΩ / 25 °C, accuracy ±0.25 °C / 25 °C (Schneider/Andover equivalent)
TEM NTC 10-C	117M310	10 kΩ / 25 °C, accuracy ±0.25 °C / 25 °C (Carel equivalent)

Window temperature sensor

°C

TEIK temperature sensor are made for automatic HVAC systems to detect window surface temperatures.

Temperature measurement range	-20...80 °C
Probe	50 x 20 x 8 mm
IP protection class	IP20
Mounting	by adhesive paste
Materials	probe: aluminum
Cable	Ø 3.2 mm x 2 m (LIYY 2 x 0.14 mm²)

TYPE	ART. NO.	
TEIK PT100	1173220	100 Ω / 0 °C, accuracy ±0.3 °C / 0 °C, EN 60751/B
TEIK PT1000	1174220	1000 Ω / 0 °C, accuracy ±0.3 °C / 0 °C (Honeywell, Danfoss equivalent)
TEIK NTC 10	1175220	10 kΩ / 25 °C, accuracy ±0.2 °C / 25 °C (Trend, Distech equivalent)
TEIK NTC 20	1176220	20 kΩ / 25 °C, accuracy ±0.2 °C / 25 °C (Honeywell equivalent)
TEIK NI1000-LG	1178220	1000 Ω / 0 °C, accuracy ±0.4 °C / 0 °C (Siemens equivalent)
TEIK NTC 1.8	117E220	1800 Ω / 25 °C, accuracy ±0.3 °C / 25 °C (TAC/Schneider equivalent)

Room temperature sensors

RS room temperature sensor is designed for measuring room temperature in indoor conditions. The sensor is built in a modern design plastic housing with a smooth snap-on cover. The sensor is suitable for surface installation and on a flush mounting box.

room °C

Temperature measurement range	-30...70 °C
IP protection class	IP30
Ambient temperature	-30...70 °C
Ambient humidity	0...95 %rH
Mounting	on the wall surface or on a flush mounting box (60 mm hole distance)
Materials	PC plastic
Product dimensions	97 x 97 x 26 mm

TYPE	ART. NO.	
RSB-PT1000	5501B00000	1000 Ω / 0 °C, accuracy ±0.3 °C / 0 °C, black
RSB-NTC 10	5501B10000	10 kΩ / 25 °C, accuracy ±0.23 °C / 25 °C, black
RSB-NTC 20	5501B20000	20 kΩ / 25 °C, accuracy ±0.21 °C / 25 °C, black
RSB-PT1000F015	5501B30000	1000 Ω / 0 °C, accuracy ±0.15 °C / 0 °C, black
RSB-NI1000 LG	5501B40000	1000 Ω / 0 °C, accuracy ±0.4 °C / 0 °C (Siemens equivalent), black
RS-PT1000	5501W00000	1000 Ω / 0 °C, accuracy ±0.3 °C / 0 °C, white
RS-NTC 10	5501W10000	10 kΩ / 25 °C, accuracy ±0.23 °C / 25 °C, white
RS-NTC 20	5501W20000	20 kΩ / 25 °C, accuracy ±0.21 °C / 25 °C, white
RS-PT1000F015	5501W30000	1000 Ω / 0 °C, accuracy ±0.15 °C / 0 °C, white
RS-NI1000 LG	5501W40000	1000 Ω / 0 °C, accuracy ±0.4 °C / 0 °C (Siemens equivalent), white

Room temperature transmitters

NEW

°C

Proxima® RTX room transmitters provide improved temperature, humidity and VOC measurement as well as motion detection (PIR). Standard features include temperature measurement, built-in P/PI controller, seamless integration with existing devices and systems, and easy commissioning and configuration with MyProdual® mobile application.

4

Power supply	24 Vac (22…26 V) / 24 Vdc (22…39 V), < 3,.2 VA
Temperature measurement range	0…50 °C
Temperature measurement accuracy	±0.3 °C (20…25 °C)
Multifunctional input	1 x NTC 10 / Pt1000 / Resistive / Digital / 0…10 Vdc
Multifunctional output	4 x 0…10 Vdc, 2 mA
IP protection class	IP30
Ambient temperature	0…50 °C
Ambient humidity	0…95 %rH
Mounting	on the wall surface or on a flush mounting box (60 mm hole distance)
Materials	ABS plastic
Product dimensions	97 x 97 x 27 mm

Ordering guide		Type	0	1	2	3	4	5	6
0 Room transmitters			5301						0
1 Device type	Room transmitter with temperature measurement	RTX		1					
2 Body colour	White				W				
	Black	B			B				
3 Display	No display					0			
	LED indicator	-L				L			
	LED indicator with custom text	-LT				2			
4 Additional measurements	No additional measurement						0		
	Occupancy detection (PIR)	-PIR					P		
5 Advanced options	No advanced options							0	
	Modbus	-MOD						M	
	BACnet	-BAC						B	
	Relay	-R						R	
	Modbus and relay	-MOD-R						1	
	BACnet and relay	-BAC-R						2	
6 Reserved									0

TOOLS

MYT-CON	5100020000	MyTool Connect, a Bluetooth dongle for Produal MyTool® and MyProdual connection

Room temperature sensors

TEHR sensors are designed for measuring room temperatures.

°C

Temperature measurement range	0...50 °C
IP protection class	IP20
Ambient temperature	0...50 °C
Mounting	on the wall surface or on a flush mounting box (60 mm hole distance)
Materials	ABS plastic
Product dimensions	87 x 86 x 30 mm

TYPE	ART. NO.	
TEHR NTC 2.2	1172190	2252 Ω / 25 °C, accuracy ±0.25 °C / 25 °C (Johnson equivalent)
TEHR PT 100	1173190	100 Ω / 0 °C, accuracy ±0.3 °C / 0 °C, EN 60751/B
TEHR PT 1000	1174190	1000 Ω / 0 °C, accuracy ±0.3 °C / 0 °C (Honeywell, Danfoss equivalent)
TEHR NTC 10	1175190	10 kΩ / 25 °C, accuracy ±0.2 °C / 25 °C (Trend, Distech equivalent)
TEHR NTC 20	1176190	20 kΩ / 25 °C, accuracy ±0.2 °C / 25 °C (Honeywell equivalent)
TEHR NI 1000-LG	1178190	1000 Ω / 0 °C, accuracy ±0.4 °C / 0 °C (Siemens equivalent)
TEHR NTC 10-KB	117B190	5025 Ω / 25 °C, accuracy ±0.5 °C / 25 °C (Satchwell equivalent)
TEHR NI 1000	117C190	1000 Ω / 0 °C, accuracy ±0.4 °C / 0 °C (Sauter equivalent)
TEHR NTC 1.8	117E190	1800 Ω / 25 °C, accuracy ±0.3 °C / 25 °C (TAC/Schneider equivalent)
TEHR NTC 10-AN	117H190	10 kΩ / 25 °C, accuracy ±0.25 °C / 25 °C (Schneider/Andover equivalent)
TEHR KP 10	117J190	LM235Z, 10 mV/K, 2.98 V / 25 °C
TEHR NTC 10-C	117M190	10 kΩ / 25 °C, accuracy ±0.25 °C / 25 °C (Carel equivalent)
TEHR T1	117V190	2226 Ω / 0 °C, accuracy ±0.4 °C / 0 °C

OPTIONS

TEHR-S	1170080	push button (no / nc) 24 Vac/dc
TEHR-L	1170100	LED 24 V
TEHR-N	1170140	digital display, input 0...10 V = 0...50 °C
TEHR-K5	1170240	5-position rotary switch (1, 2 ,3, 0, A) 24 Vac/dc

Room temperature transmitters

°C

TEHR LL (2–wire, 4...20 mA) and TEHR LU (3–wire, 0...10 V) are temperature transmitters for dry room spaces. The output range is selectable. TEHR-M output is available via Modbus and as a 0...10 V signal.

Temperature measurement range	-50...150 °C[2,1]2, 0...50 °C
Temperature measurement accuracy	±0.5 °C
Sensor	Pt1000 EN 60751/B
Current output	4...20 mA (temperature or contoller)
IP protection class	IP20
Ambient temperature	0...50 °C
Mounting	on the wall surface or on a flush mounting box (60 mm hole distance)
Materials	ABS plastic
Product dimensions	87 x 86 x 30 mm

TYPE	ART. NO.	
TEHR LL	1177190	2–wire transmitter/controller, supply 15...35 Vdc, output 4...20 mA
TEHR LL-N	1177191	2–wire transmitter/controller with display, supply 15...35 Vdc, output 4...20 mA
TEHR LL-P	1177230	2–wire transmitter/controller, supply 15...35 Vdc, output 4...20 mA, passive potentiometer
TEHR LU	1179190	3–wire transmitter/controller, supply 24 Vac/dc, output 0...10 V < 2 mA
TEHR LU-N	1179191	3–wire transmitter/controller with display, supply 24 Vac/dc, output 0...10 V < 2 mA
TEHR LU-N-P	1179191B00	3–wire transmitter/controller with display, supply 24 Vac/dc, output 0...10 V < 2 mA, passive potentiometer
TEHR LU-P	1179230	3–wire transmitter/controller, supply 24 Vac/dc, output 0...10 V < 2 mA, passive potentiometer
TEHR LU-PU	1179350	3–wire transmitter/controller, supply 24 Vac/dc, output 0...10 V < 2 mA, 0...10 V potentiometer
TEHR LU-PU-N	1179351	3–wire transmitter/controller with display, supply 24 Vac/dc, output 0...10 V < 2 mA, 0...10 V potentiometer
TEHR-M	117Z190	Modbus transmitter/controller, supply 24 Vac/dc, output 0...10 V < 2 mA
TEHR-M-N	117Z191	Modbus transmitter/controller with display, supply 24 Vac/dc, output 0...10 V < 2 mA, 0...10 V potentiometer
TEHR-M-PU	117Z350	Modbus transmitter/controller, supply 24 Vac/dc, output 0...10 V < 2 mA, 0...10 V potentiometer
TEHR-M-PU-N	117Z351	Modbus transmitter/controller with display, supply 24 Vac/dc, output 0...10 V < 2 mA, 0...10 V potentiometer
OPTIONS		
TEHR-K5	1170240	5–position rotary switch (1, 2 ,3, 0, A) 24 Vac/dc
TEHR-K5R	1170241	5–position rotary switch with resistance output
TOOLS		
ML-SER	1139010	transmitter commissioning tool

Room temperature sensors

TEHR-P sensors are designed for measuring room temperatures and adjusting the temperature setpoint. The potentiometer value and the fitting resistor values can be defined in the order.

°C

Temperature measurement range	0...50 °C
IP protection class	IP20
Ambient temperature	0...50 °C
Mounting	on the wall surface or on a flush mounting box (60 mm hole distance)
Materials	ABS plastic
Product dimensions	87 x 86 x 32 mm

TYPE	ART. NO.	
TEHR NTC 2.2-P	1172230	2252 Ω / 25 °C, accuracy ±0.25 °C / 25 °C (Johnson equivalent)
TEHR PT 100-P	1173230	100 Ω / 0 °C, accuracy ±0.3 °C / 0 °C, EN 60751/B
TEHR PT 1000-P	1174230	1000 Ω / 0 °C, accuracy ±0.3 °C / 0 °C (Honeywell, Danfoss equivalent)
TEHR NTC 10-P	1175230	10 kΩ / 25 °C, accuracy ±0.2 °C / 25 °C (Trend, Distech equivalent)
TEHR NTC 10-PU	1175350	10 kΩ / 25 °C, accuracy ±0.2 °C / 25 °C, 0...10 V potentiometer
TEHR NTC 20-P	1176230	20 kΩ / 25 °C, accuracy ±0.2 °C / 25 °C (Honeywell equivalent)
TEHR NI 1000-LG-P	1178230	1000 Ω / 0 °C, accuracy ±0.4 °C / 0 °C (Siemens equivalent)
TEHR NI 1000-P	117C230	1000 Ω / 0 °C, accuracy ±0.4 °C / 0 °C (Sauter equivalent)
TEHR NTC 1.8-P	117E230	1800 Ω / 25 °C, accuracy ±0.3 °C / 25 °C (TAC/Schneider equivalent)
TEHR NTC 10-AN-P	117H230	10 kΩ / 25 °C, accuracy ±0.25 °C / 25 °C (Schneider/Andover equivalent)
TEHR KP 10-P	117J230	LM235Z, 10 mV/K, 2,98 V / 25 °C
TEHR NTC 10-C-P	117M230	10 kΩ / 25 °C, accuracy ±0.25 °C / 25 °C (Carel equivalent)

OPTIONS

TEHR-S	1170080	push button (no / nc) 24 Vac/dc
TEHR-L	1170100	LED 24 V
TEHR-N	1170140	digital display, input 0...10 V = 0...50 °C
TEHR-K5	1170240	5-position rotary switch (1, 2 ,3, 0, A) 24 Vac/dc

Room temperature transmitters

°C

RTE-BAC transmitters are designed for measuring and controlling temperature in dry room spaces. Transmitters have built-in single stage heating/cooling control loops. The transmitters have a RS-485 channel for BACnet MS/TP communication. The transmitter inputs and outputs can also be controlled from the BACnet network making the device an effective I/O module.

Power supply	24 Vac/dc, < 1 VA
Temperature measurement range	0...50 °C
Temperature measurement accuracy	±0.5 °C (25 °C)
Output	3 x 0...10 Vdc, 5 mA, control output included
IP protection class	IP20
Ambient temperature	0...50 °C
Ambient humidity	0...95 %rH
Mounting	on the wall surface or on a flush mounting box (60 mm hole distance)
Materials	ABS plastic, self-extinguishing
Product dimensions	86 x 120 x 29 mm

Ordering guide		Type	0	1	2	3	4	5	6
0 BACnet room transmitter			6041						
1 Device type	Room temperature transmitter, 1RI, 1DI, 3AO, 2DO	RTE-BAC		M					
2 Display	No display				0				
	Display	-LCD			1				
	Red, yellow and green indicator lights	-AL			2				
3 Setpoint knob / occupancy detection	No setpoint knob or occupancy detection					0			
	Active setpoint knob	-SP				1			
	Passive setpoint knob	-SPR				2			
	Occupancy detection and light level sensor (replaces RI1)	-LL				3			
4 Push buttons	No push buttons						0		
	One push button	-PB					1		
	Two push buttons	-PB2					2		
	Three push buttons	-PB3					3		
	Four push buttons	-PB4					4		
	Push buttons for setpoint	-SPB					5		
	Push buttons for setpoint and one push button	-SPB-PB					6		
	Push buttons for setpoint and two push buttons	-SPB-PB2					7		
5 Inputs / outputs	No inputs / outputs							0	
	Second digital input	-DI2						1	
	Second resistive input (not available with SP/SPR options)	-RI2						2	
	Second digital input and second resistive input (not available with SP/SPR options)	-DI2-RI2						3	
	Two 0...10 Vdc inputs (replaces resistive input)	-AI						5	
	Second digital input and two 0...10 Vdc inputs (replaces resistive input)	-DI2-AI						6	
	Passive temperature sensor (NTC 10)	-TE-NTC10						7	
6 Body colour	White (RAL 9010)								0
	Anthracite grey (RAL 7015)	-GR							B

TOOLS

SW-DCT-USB	1139040	configuration cable

Outdoor temperature sensors

TEU sensors are designed for measuring outdoor temperatures.

°C

Temperature measurement range	-50...50 °C
IP protection class	IP54, cable downwards
Cable gland	M16
Ambient temperature	-50...50 °C
Mounting	with screws on wall, external lugs
Materials	PBT, PC, PA
Product dimensions	89 x 95 x 44 mm

TYPE	ART. NO.	
TEU NTC 2.2	1172090	2252 Ω / 25 °C, accuracy ±0,25 °C / 25 °C (Johnson equivalent)
TEU PT 100	1173090	100 Ω / 0 °C, accuracy ±0.3 °C / 0 °C, EN 60751/B
TEU PT 1000	1174090	1000 Ω / 0 °C, accuracy ±0.3 °C / 0 °C (Honeywell, Danfoss equivalent)
TEU NTC 10	1175090	10 kΩ / 25 °C, accuracy ±0.2 °C / 25 °C (Trend, Distech equivalent)
TEU NTC 20	1176090	20 kΩ / 25 °C, accuracy ±0.2 °C / 25 °C (Honeywell equivalent)
TEU NI 1000-LG	1178090	1000 Ω / 0 °C, accuracy ±0.4 °C / 0 °C (Siemens equivalent)
TEU NTC 10-KB	117B090	5025 Ω / 25 °C, accuracy ±0.5 °C / 25 °C (Satchwell equivalent)
TEU NI 1000	117C090	1000 Ω / 0 °C, accuracy ±0.4 °C / 0 °C (Sauter equivalent)
TEU NTC 1.8	117E090	1800 Ω / 25 °C, accuracy ±0.3 °C / 25 °C (TAC/Schneider equivalent)
TEU NTC 10-AN	117H090	10 kΩ / 25 °C, accuracy ±0.25 °C / 25 °C (Schneider/Andover equivalent)
TEU KP 10	117J090	LM235Z, 10 mV/K, 2.98 V / 25 °C
TEU NTC 10-C	117M090	10 kΩ / 25 °C, accuracy ±0.25 °C / 25 °C (Carel equivalent)
TEU T1	117V090	2226 Ω / 0 °C, accuracy ±0.4 °C / 0 °C

Outdoor temperature transmitters

TEU transmitters are designed for measuring outdoor temperatures.

°C

Temperature measurement range	-50...150 °C[2,1]2, 0...50 °C
Temperature measurement accuracy	±0.5 °C
Sensor	Pt1000 EN 60751/B
IP protection class	IP54, cable downwards
Cable gland	M16
Ambient temperature	-30...60 °C
Mounting	with screws on wall, external lugs
Materials	PBT, PC, PA
Product dimensions	115 x 115 x 45 mm

TYPE	ART. NO.	
TEU LL	1177090	2-wire transmitter, supply 22...35 Vdc, output 4...20 mA, accuracy ±0,5 °C
TEU LU	1179090	3-wire transmitter/controller, supply 24 Vac/dc, output 0...10 V < 2 mA
TEU-M	117Z090	Modbus transmitter/controller, supply 24 Vac/dc, output 0...10 V < 2 mA

OPTIONS

TEU-N V2	1170270	display option for the transmitters

TOOLS

ML-SER	1139010	transmitter commissioning tool

Industrial temperature sensors

TES sensors are designed for measuring temperatures in dusty, hot and wet (industrial) spaces.

IP67, °C

Temperature measurement range	-50...120 °C
IP protection class	IP67
Cable gland	PG11
Ambient temperature	-50...120 °C
Mounting	with screws on wall
Materials	Silumin cast
Product dimensions	98 x 90 x 36 mm

TYPE	ART. NO.	
TES NTC 2.2	1172100	2252 Ω / 25 °C, accuracy ±0.25 °C / 25 °C (Johnson equivalent)
TES PT 100	1173100	100 Ω / 0 °C, accuracy ±0.3 °C / 0 °C, EN 60751/B
TES PT 1000	1174100	1000 Ω / 0 °C, accuracy ±0.3 °C / 0 °C (Honeywell, Danfoss equivalent)
TES NTC 10	1175100	10 kΩ / 25 °C, accuracy ±0.2 °C / 25 °C (Trend, Distech equivalent)
TES NTC 20	1176100	20 kΩ / 25 °C, accuracy ±0.2 °C / 25 °C (Honeywell equivalent)
TES NI 1000-LG	1178100	1000 Ω / 0 °C, accuracy ±0.4 °C / 0 °C (Siemens equivalent)
TES NTC 10-KB	117B100	5025 Ω / 25 °C, accuracy ±0.5 °C / 25 °C (Satchwell equivalent)
TES NI 1000	117C100	1000 Ω / 0 °C, accuracy ±0.4 °C / 0 °C (Sauter equivalent)
TES NTC 1.8	117E100	1800 Ω / 25 °C, accuracy ±0.3 °C / 25 °C (TAC/Schneider equivalent)
TES NTC 10-AN	117H100	10 kΩ / 25 °C, accuracy ±0.25 °C / 25 °C (Schneider/Andover equivalent)
TES KP 10	117J100	LM235Z, 10 mV/K, 2.98 V / 25 °C
TES NTC 10-C	117M100	10 kΩ / 25 °C, accuracy ±0.25 °C / 25 °C (Carel equivalent)

Temperature transmitters

°C

LLK V2 and LUK V2 are transmitters for temperature measuring. LLK V2 is a 2–wire transmitter converting the sensor resistance to the 4...20 mA signal. LUK V2 is a 3–wire transmitter converting the sensor signal to the 0...10 V signal. The transmitter needs a separate Pt1000 sensor.

Temperature measurement range	-50...150 °C[2,1]2, 0...50 °C
Temperature measurement accuracy	±0.5 °C
Sensor	PT1000 EN60751/B (not included)
IP protection class	IP54, cable downwards
Cable gland	2 X M16
Ambient temperature	-30...60 °C
Product dimensions	106 x 102 x 46 mm

TYPE	ART. NO.	
LLK V2	1182230	2–wire transmitter/controller, supply 22...35 Vdc, output 4...20 mA
LLK-N V2	1182231	2–wire transmitter/controller with display, supply 22...35 Vdc, output 4...20 mA
LUK V2	1182240	3–wire transmitter/controller, supply 24 Vac/dc, output 0...10 V < 2 mA
LUK-N V2	1182241	3–wire transmitter/controller with display, supply 24 Vac/dc, output 0...10 V < 2 mA

TOOLS

ML-SER	1139010	transmitter commissioning tool

Temperature sensor simulator

TESIM sensor simulators are designed for simulating temperature sensor when testing a control system.

Temperature measurement range	5 selectable temperature values (-50, -20, 0, 20, 50 °C)
Temperature measurement accuracy	±0.15 °C
IP protection class	IP54
Cable	0,9 m, banana jacks

TYPE	ART. NO.	
TESIM PT1000	1170220	Pt1000 simulator
TESIM NTC 10	1170230	NTC 10 simulator

Special measurement and detection

The special measurement and detection products cover protective thermostats for heating coils' freezing protection, safety components for water leakage monitoring, thermometers, differential pressure switches, filter guards and occupancy sensors. With these components, you can complete your installation to secure air conditioning heaters, avoid water leakage damage, save energy with occupancy sensors and schedule the replacement of filters.

- Protection units
- Adjustable limits
- Mechanical measurements

Frost protection thermostats

DIN housing

Frost protection thermostats are protective devices for preventing heating coils from freezing in the air handling units.

Power supply	24 Vac/dc, < 2 VA
Temperature measurement range	0...100 °C
Voltage input	1 x 0...10 Vdc
Control output	230 Vac, 8 A, res.
Alarm output	60 Vdc, 1 A
Actuator output	0...10 Vdc, 10 mA
IP protection class	IP20
Mounting	For 35 mm DIN rail
Product dimensions	53 x 90 x 59 mm

TYPE	ART. NO.	
JVA 24-en	1110111	forecasting, regulating; selectable sensor type (Pt1000, Ni1000-LG, PTC 1000/2000)
JVS 24-en	1110121	adjustable forecasting, regulating; selectable sensor type (Pt1000, Ni1000-LG, PTC 1000/2000)

OPTIONS

TEV PT 1000	1174020	1000 Ω / 0 °C, accuracy ±0.3 °C / 0 °C (Honeywell, Danfoss equivalent)
TEV NI 1000-LG	1178020	1000 Ω / 0 °C, accuracy ±0.4 °C / 0 °C (Siemens equivalent)

Frost protection thermostats

11-pole relay housing

Frost protection thermostats are protective devices for preventing heating coils from freezing in the air handling units.

Power supply	24 Vac, < 2 VA
Temperature measurement range	0...100 °C
Voltage input	0...10 V / 2...10 V, 10 mA
Control output	50 Vac, 6 A, res.
Alarm output	24 Vdc, 1 A
Actuator output	0...10 Vdc, 10 mA
IP protection class	IP20
Mounting	11-pole relay housing
Product dimensions	35 x 79 x 95 mm

TYPE	ART. NO.	
EJV 24-PT-en	1110081	for Pt1000 sensor (1000 Ω / 0 °C), AR 1 relay included
JV 24-PT-en	1110091	for Pt1000 sensor (1000 Ω / 0 °C), contact output 50 Vac 6 A res.

OPTIONS

TEV PT 1000	1174020	1000 Ω / 0 °C, accuracy ±0.3 °C / 0 °C (Honeywell, Danfoss equivalent)

Thermostats

TF capillary thermostats are protective devices for preventing heating coils from freezing in the air handling units.

Temperature measurement range	-10...10 °C
Temperature measurement accuracy	±1 °C
Alarm output	24...250 Vac, 15 A
IP protection class	IP65
Ambient temperature	max. 55 °C
Ambient humidity	10...90 %rH
Product dimensions	65 x 140 x 62 mm

TYPE	ART. NO.	
TF 60	1240210	thermostat, capillary element length 6 m, automatic reset
TF 60R	1240211	thermostat, capillary element length 6 m, manual reset
TF 30	1240220	thermostat, capillary element length 3 m, automatic reset
TF 30R	1240221	thermostat, capillary element length 3 m, manual reset
TF 18	1240230	thermostat, capillary element length 1.8 m, automatic reset
TF 18R	1240231	thermostat, capillary element length 1.8 m, manual reset

OPTIONS

DBZ-05	1240200	capillary element mounting bracket

Condensation switch

Condensation switch KA 10 is designed for detecting water condensation in cooling systems, for example in cooling beams. With the condensation switch it is possible to control the cooling water supply when the water starts to condensate on the pipe. The KA 10–EXT model has an external condensation sensor.

0...10 V output, relay output

Power supply	24 Vac/dc, < 1 VA
Relay output	24 Vac/dc, 1 A
Condensation output	0...10 Vdc
IP protection class	IP54, cable downwards
Cable gland	M16
Ambient temperature	0...50 °C
Mounting	with two cable ties on the side or under the pipe (Ø10...100 mm)

TYPE	ART. NO.	
KA 10	1187030	condensation switch
KA 10–EXT	1187031	condensation switch with external sensor, cable length 2 m

Condensation sensor

KEK 1 condensation sensor is designed for detecting water condensation in cooling systems, for example in cooling beams.

Probe	84 x 15 x 2 mm
Nominal resistance	approx. 100 kΩ at condensation point
Mounting	with two cable ties on the side or under the pipe (Ø10...100 mm)

TYPE	ART. NO.	
KEK 1	1187040	condensation sensor, 2 m cable
KEK 1–3m	1187041	condensation sensor, 3 m cable
KEK 1–5m	1187042	condensation sensor, 5 m cable
KEK 1–10m	1187043	condensation sensor, 10 m cable
KEK 1–1m	1187044	condensation sensor, 1 m cable

Water leakage relay

VVK 2 monitors the status of the water leakage sensors connected to the relay. When the sensor becomes wet the resistance decreases and the alarm relay will be activated. Also the sensor circuit is monitored (alarms if R > 330 kΩ).

Power supply	24 Vac/dc, < 2 VA
Relay output	60 Vdc, 2 A, res.|Changeover
IP protection class	IP20
Mounting	For 35 mm DIN rail
Product dimensions	53 x 90 x 61 mm

TYPE	ART. NO.	
VVK 2	1187024	water leakage relay

OPTIONS

VVA 1	1187020	sensor with connection box, e.g. on floor and dip tray
VVA 2	1187021	sensor with 2 m cable
VVA 3	1187026	sensor (25 x 200 mm) with 2 m cable and adhesive tape

Water leakage relay

LPH 10 monitors the resistance of the connected sensor. When the sensor becomes wet the resistance decreases. If the resistance decreases below the alarm limit, the alarm relay, indicator light and buzzer activate. The buzzer can be muted by pressing the button, but the relay and indicator light stay active until the sensor resistance increases over the alarm limit.

Power supply	24 Vac/dc, < 2 VA
Set point	approx. 10 kΩ
Relay output	Changeover
Alarm output	60 Vdc, 300 mA, res. change-over contact. Alarm is also indicated with an indicator light and buzzer.
IP protection class	IP20
Mounting	on the wall surface or on a flush mounting box (60 mm hole distance)
Materials	ABS plastic
Product dimensions	87 x 86 x 32 mm

TYPE	ART. NO.	
LPH 10	1187010	water leakage relay

OPTIONS

VVA 1	1187020	sensor with connection box, e.g. on floor and dip tray
VVA 2	1187021	sensor with 2 m cable
VVA 3	1187026	sensor (25 x 200 mm) with 2 m cable and adhesive tape

Water leakage sensors

VVA and VVN sensors will be used with VVK 2 and LPH 10. The sensors can be installed on the floor and VVN also e.g. on the side of the pipe monitoring possible condensation.

Nominal resistance	approx. 300 kΩ when dry

TYPE	ART. NO.	
VVA 1	1187020	sensor with connection box, e.g. on floor and dip tray
VVA 2	1187021	sensor with 2 m cable
VVN 2	1187023	sensor, 2 m sensor band and 2 m cable
VVN 1	1187025	sensor, 1 m sensor band and 2 m cable
VVA 3	1187026	sensor (25 x 200 mm) with 2 m cable and adhesive tape

Thermometers

DTM is a mechanical thermometer for duct installation. Two scales are available. The meters are factory-calibrated.

°C

Temperature measurement accuracy	±2 °C
Probe	Ø 9 x 200 mm
IP protection class	IP40
Ambient temperature	-20...60 °C
Ambient humidity	35...85 %rH
Mounting	by a flange
Product dimensions	100 x 100 x 230 mm

TYPE	ART. NO.	
DTM -40/40	1240050	duct thermometer -40...40 °C
DTM 0/60	1240060	duct thermometer 0...60 °C

Thermometers

DTM-S is a mechanical thermometer for a duct installation. The thermometer can be used for indoor applications. Two scales are available. The thermometers have an adjustment screw for tuning.

°C

Temperature measurement accuracy	±2 °C
Probe	Ø 9 x 200 mm
IP protection class	IP40
Ambient temperature	-20...60 °C
Ambient humidity	35...85 %rH
Mounting	by a flange
Product dimensions	100 x 100 x 230 mm

TYPE	ART. NO.	
DTM-S -40/40	1240070	duct thermometer -40...40 °C
DTM-S 0/60	1240080	duct thermometer 0...60 °C

Differential pressure switches

PS differential pressure switches are designed for monitoring over and under pressures and pressure differences in systems that handle air and other non-aggressive gases. PS switches offer a cost-effective solution for filter, fan and duct pressure monitoring for building automation systems. The switching point can be adjusted manually.

Switching accuracy	max. ±15 %
Relay output	250 Vac, 0.1 A, res.|Changeover
Output	250 Vac, 3 A, res. (0.1 A, res. in PS200)
IP protection class	IP54
Cable gland	M16
Ambient temperature	-20...60 °C
Ambient humidity	0...95 %rH
Product dimensions	90 x 105 x 63 mm

TYPE	ART. NO.	
PS200	105.001.061	differential pressure switch 20...200 Pa
PS300	105.002.065	differential pressure switch 30...300 Pa
PS500	105.003.070	differential pressure switch 30...500 Pa
PS600	105.004.063	differential pressure switch 40...600 Pa
PS1500	105.005.068	differential pressure switch 100...1500 Pa
PS4500	105.006.050	differential pressure switch 500...4500 Pa

Filter guards

DPG/PS filter guards are designed for filter monitoring in systems that handle air and other non-flammable gases. The guards include a pressure gauge and a differential pressure switch. The differential pressure switch switching point is adjustable.

Gauge accuracy	±2 % from the full scale
Switching accuracy	±5 Pa at low limit, ±20 Pa at high limit
Relay output	250 Vac, 0.1 A, res.|Changeover
IP protection class	IP54
Cable gland	M16
Ambient temperature	-5...60 °C
Ambient humidity	0...95 %rH
Mounting	vertically (with screws)
Product dimensions	219 x 136 x 68 mm

TYPE	ART. NO.	
DPG200/PS200	109.001.005	filter guard, 200 Pa
DPG600/PS600	109.002.010	filter guard, 600 Pa
DPG1,5K/PS1500	109.003.007	filter guard, 1500 Pa
DPG500/PS500	109.004.008	filter guard, 500 Pa
DPG300/PS300	109.005.005	filter guard, 300 Pa

Occupancy sensors

LA 14E is an occupancy sensor for controlling ventilation and lighting. Intelligent, processor based, logic prevents false functions being at the same time very sensible. Relay function is quiet and the release delay is adjustable.

Power supply	24 Vac/dc, < 0.5 VA
Relay output	60 Vdc, 100 mA, delay is selectable (2 s, 2 min, 10 min or 20 min)|NC or NO
IP protection class	IP20
Ambient temperature	0...50 °C
Ambient humidity	0...85 %rH
Mounting	flush (surface mounting casing optional)
Materials	white plastic
Product dimensions	85 x 85 x 34 mm

TYPE	ART. NO.	
LA 14E	1185130	occupancy sensor

Occupancy sensors

LA 15E is designed for controlling lighting. Up to 1.5 A continuous fluorescent lighting load is allowed.

Power supply	24 Vac/dc, < 0.5 VA
Relay output	60 Vdc, 100 mA, delay 2 s.|NC or NO
Lighting output	250 Vac, 1.5 VA, hold on time is selectable (2 s, 2 min, 10 min or 20 min)
IP protection class	IP20
Ambient temperature	0...50 °C
Ambient humidity	0...85 %rH
Mounting	flush (surface mounting casing optional)
Materials	white plastic
Product dimensions	85 x 85 x 34 mm

TYPE	ART. NO.	
LA 15E	1185140	movement / occupancy sensor for switching lighting on/off

OPTIONS

LA-RAJ	1185070	180° area guard for occupancy sensor
SMB 1E	9000470	casing for surface mounting

Occupancy sensors

PLT 24 is a detector for monitoring occupancy through body heat and movements. The passive infrared PIR detector reacts to temperature changes in the range of the detection beams. Mounting bracket and screws are included to the delivery.

Power supply	24 Vac/dc, 10 mA
Relay output	60 Vdc, 100 mA, delay is selectable (2 s, 2 min, 10 min or 20 min)|NC or NO
IP protection class	IP20
Ambient temperature	-10...45 °C
Product dimensions	64 x 95 x 50 mm

TYPE	ART. NO.	
PLT 24	1185040	occupancy detector
PLT 24-K	1185045	occupancy detector, ceiling mounting

Occupancy sensors

PLT 12 is a detector for monitoring occupancy through body heat and movements. The passive infrared PIR detector reacts to temperature changes in the range of the detection beams. Mounting bracket and screws are included to the delivery.

Power supply	12 Vdc
Relay output	12 Vdc, 100 mA|NC
IP protection class	IP20
Ambient temperature	-10...40 °C
Product dimensions	64 x 95 x 50 mm

TYPE	ART. NO.	
PLT 12	1185080	occupancy detector

Thermal actuators and control valves

Thermal actuators, control valves and solenoid valves designed for building automation needs complement our wide product offering for automated HVAC management systems.

- Complementary products for all HVAC systems
- Valves for heating and cooling applications
- Adapters for almost all manufacturers' valves

Thermal actuators

Valve actuators are available for 24 Vac/dc and for 230 Vac supply with a NC or NO function. Control signal may be a PWM or a 0...10 Vdc signal. Connection cables may be fixed or removable. Different lengths of removable cables are available. An adapter between the valve and the actuator is always needed.

IP protection class	IP54
Ambient temperature	0...65 °C

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TYPE	ART. NO.	
A 40405-00N00-1S	1210011	thermal actuator 24 V, NC, fixed cable (1 m)
A 40405-00N00-3S	1210012	thermal actuator 24 V, NC, fixed cable (3 m)
A 41405-10N00-1S	1210021	thermal actuator 24 V, NO, fixed cable (1 m)
A 41405-10N00-3S	1210022	thermal actuator 24 V, NO, fixed cable (3 m)
A 20405-00N00-1S	1210027	thermal actuator 230 V NC, fixed cable 1 m
A 21405-10N00-1S	1210028	thermal actuator 230 V NO, fixed cable 1 m
AST 20405-00N00-0	1210031	thermal actuator 230 V NC, removable cable (sold separately)
AST 21405-10N00-0	1210032	thermal actuator 230 V NO, removable cable (sold separately)
AST 40405-00N00-0	1210041	thermal actuator 24 V NC, removable cable (sold separately)
AST 41405-10N00-0	1210046	thermal actuator 24 V NC, removable cable (sold separately)
APR 40405-01N00-0	1210052	thermal actuator 2...10 Vdc, NC, removable cable (sold separately)
APR 42405-00N00-0	1210053	thermal actuator 0...10 Vdc, NC, removable cable (sold separately)
APR 40405-00N00-0	1210061	thermal actuator 0...10 Vdc, NC, removable cable (sold separately)
A 40505-00N00-1S	1210070	thermal actuator 24 V, NC, 5 mm stroke, fixed cable (1 m)
A 41505-10N00-1S	1210071	thermal actuator 24 V, NO, 5 mm stroke, fixed cable (1 m)
APR 40625-20N00-1S	1210081	thermal actuator 0...10 Vac, NC, 6.5 mm stroke, fixed cable (1 m)
APV 41405-10N00-0	1210090	thermal actuator 0...10 Vdc NO, valve stem travel detection, removable cable (sold separately)

OPTIONS

VA 80	1220010	adapter for Produal NV valves
AA.SK.1004.N	1220090	protection cover for thermal actuator

OTHER MODELS ALSO AVAILABLE ON REQUEST.

Actuator	Cable order numbers						
	1 m	2 m	3 m	5 m	10 m	15 m	20 m
AST	1220021	1220022	1220023	1220025	1220026	1220027	1220028
APR/APV/MPV/M3P	1220031	1220032	1220033	1220035	1220036	1220037	1220038

To connect a thermal actuator to control valve, a special adapter ring is needed. Thermal actuators can be mounted to the Produal NV2 control valves by using a VA 80 adapter ring.

The adapter rings are also available for other manufacturers' valves. See the following table for more information.

NOTE: If you can't find the needed valve from the table, you can fill in the form on our website (scan the QR code on the right to open the PDF or browse to Product selection guides / Valve measuring guide) and send the dimensions to Produal customer support. The customer support will determine the correct adapter ring.

Valve manufacturer	Valve type	Adapter	Product number	Adapter description	Notes
Produal		VA 80	1220010	M30x1,5, light grey	
Comap		VA 70H	1220006	M28x1,5, grey	
Danfoss	RTD-N	VA 76	1220007	M30x1,5, white	
	RTD-G	VA 79	1220008	M30x1,5, white	
	RA-N 10/15	VA 78	1220013	white	
	RA-C				
	RA-U 10				
	FHF-6				
	RAV	VA 72H	1220057	M30x1,5, light grey	
	TWA-K	VA 80	1220010	M30x1,5, light grey	
Flowcon	EVC	VA 41	1220016	M30x1,5, dark green	
Giacomini		VA 26	1220017	M30x1,5, grey	
Honeywell	V2020EVS10	VA 80	1220010	M30x1,5, light grey	
	V2020DSL				
	V2000VS				
Johnson Controls	VG5200CC	VA 53H	1220002	M28x1,5, grey	
	VG5400CC	VA 55H	1220003	M28x1,5, grey	
	VG5410EC				
	VG5800CC				
LK		VA 02	1220005	M30x1,5, grey	
MMA	FVXR 15	VA 55H	1220003	M28x1,5, grey	
	FVR 10	VA 54	1220014	M28x1,5, dark blue	
	EKV 15				
Oras		VA 35H	1220004	M26x1,5, grey	
Oventrop	Cocon	VA 10	1220012	M30x1,5, light grey	
	F series				
	AV6				
	before 1998	VA 39	1220019	M30x1, white	
Siemens	VXP	VA 10	1220012	M30x1,5, light grey	
	VD115	VA 80	1220010	M30x1,5, light grey	
Tour & Andersson	TRV-2	VA 80	1220010	M30x1,5, light grey	
	TBV-C				
	TBV-CM	VA 90	1220011	M30x1,5, crimson	With 4,5 mm stroke actuator.
		VA 10	1220012	M30x1,5, light grey	With 4 mm stroke actuator.
		VA 32	1220015	M28x1,5, light green	
	RVT 40	VA 31H	1220001	M28x1,5, grey	
	COMPACT-P	VA 10	1220012	M30x1,5, light grey	Select a thermal actuator with 5 mm stroke.
Universa	before 1999	VA 70H	1220006	M28x1,5, grey	
Uponor / Velta	proVario	VA 02	1220005	M30x1,5, grey	
Uponor	Magna				
	Pro 1"				Q&E plastic manifold
	WGF	VA 32	1220015	M28x1,5, light green	
Wehofloor	manifold	VA 80	1220010	M30x1,5, light grey	
Wirsbo	manifold	VA 17	1220009	M28x1,5, white	

Control valves

2-way valves with different sizes and with different Kvs values for HVAC applications are available. Valves can be used for controlling heating and cooling. A VA 80 adapter is needed for connecting a NV valve with a thermal actuator.

Ambient temperature	max. 120 °C
Mounting	inner thread ISO 7/1; outer thread ISO 228/1
Pressure rating	PN 10
Materials	CW617N (brass parts), peroxide-cured EPDM (seals)

TYPE	ART. NO.	
NV2D10	1230100	valve 3/8" (DN10) fixed Kvs 1.20
NV2D10V	1230101	valve 3/8" (DN10) adjustable Kvs 0,09...0,77
NV2D10F	1230102	valve 3/8" (DN10) adjustable Kvs 0,05...0,35
NV2D15	1230150	valve 1/2" (DN15) fixed Kvs 1,20
NV2D15V	1230151	valve 1/2" (DN15) adjustable Kvs 0,09...0,85
NV2D15F	1230152	valve 1/2" (DN15) adjustable Kvs 0,05...0,35
NV2D20	1230200	valve 3/4" (DN20) fixed Kvs 1,20
NV2D20V	1230201	valve 3/4" (DN20) adjustable Kvs 0,09...0,85

OPTIONS

VA 80	1220010	adapter for Produal NV valves

Motorized valve actuators

The motorized valve actuators are designed for applications that need short response time for the valve control. The actuators are equipped with removable cable (1 m) and they available for 3-point control and 0...10 V control. An adapter between the valve and the actuator is always needed.

Power supply	24 Vac/dc, < 2.6 VA
IP protection class	IP54
Running time	15 s/mm
Ambient temperature	0...50 °C
Cable	1 m, 3 x 0,22 m² (PVC)
Product dimensions	45 x 65 x 90 mm

TYPE	ART. NO.	
MPV-46845-30N00-1S	1210111	motorized valve actuator, 0...10 V control, running time 15 s/mm
M3P-46845-20N00-1S	1210120	motorized valve actuator, 3-point control, running time 30 s/mm

Solenoid valves

MV solenoid valves are designed for building automation needs of the water control, for example in heating and cooling systems with closed circuit (valves are not suitable for domestic water circuit). Solenoid valves work in zero pressure difference and the valves are either normally closed (NC) or normally open (NO). Standard coils are for 230 Vac supply and 24 Vac or 24 Vdc coils are available as options. The valve coils are not designed for continuously energized applications.

Power supply	230 Vac
IP protection class	IP65
Ambient temperature	-5...90 °C
Materials	brass

TYPE	ART. NO.	
MV 1/2 NC 230	1260220	1/2“ solenoid valve (NC, DN15)
MV 3/4 NC 230	1260230	3/4“ solenoid valve (NC, DN20)
MV 1 NC 230	1260240	1“ solenoid valve (NC, DN25)
MV 1/2 NO 230	1260250	1/2“ solenoid valve (NO, DN15)
MV 3/4 NO 230	1260260	3/4“ solenoid valve (NC, DN20)
MV 1 NO 230V	1260270	1“ solenoid valve (NC, DN25)
MV 1 1/4 NC 230	1260290	1 1/4” solenoid valve (NC, DN32)
MV 1 1/2 NC 230	1260300	1 1/2“ solenoid valve (NC, DN40)

OPTIONS

MV-VK 24 VAC-8W	1260280	changeable coil 24 Vac for the solenoid valves (sizes 1/2” - 1”)
MV-VK 24 VDC-8W	1260281	changeable coil 24 Vac for the solenoid valves (sizes 1/2” - 1”)
MV-VK 24 VDC-14W	1260282	changeable coil 24 Vac for the solenoid valves (sizes 1/2” - 1”)

Transducers and accessories

Our wide selection of transducers and accessories helps you finalize regulation and control solutions. For example, I/O modules, dividers and transducers allow various signal type changes between Modbus, digital, analogue and 3-point signals. Transformers and electric power regulators with relay modules and solid state relays are useful for voltage supply and control load power. Our wide range of input signals and adjustable setpoints on relay modules enable applications like control fan coils, heaters and actuators.

- Useful devices for finalizing building automation projects
- Galvanic isolation
- Inputs 0...10 V, 2...10 V, 0...20 mA, 4...20 mA
- Outputs 0...10 V, 2...10 V, 0...20 mA, 4...20 mA, relay

Converters

DA 6 converts 1...6 digital (contact) inputs into one analogue 0...10 V or 4...20 mA output. The state of each contact can be identified by the control system software.

Power supply	24 Vac/dc, < 1 VA
Digital input	6 x potential free input
Voltage output	0...10 Vdc, 2 mA
Current output	4...20 mA, 500 Ω
IP protection class	IP20
Mounting	for 35 mm DIN rail
Product dimensions	68 x 77 x 42 mm

TYPE	ART. NO.	
DA 6	1182040	DI/AO converter

Converters

signal isolator

ISO 10 provides galvanic isolation between input and output signals and supply. Signal can also be converted, e.g. a 0...10 V signal into a 4...20 mA signal.

Power supply	24 Vac/dc, < 2 VA
Voltage input	0...1 Vdc / 0...10 Vdc / 2...10 Vdc
Voltage output	0...10 Vdc, 2 mA / 2...10 Vdc, 2 mA
Current output	0...20 mA, 500 Ω / 4...20 mA, 500 Ω
IP protection class	IP20
Ambient temperature	0...50 °C
Mounting	for 35 mm DIN rail
Product dimensions	12.5 x 90 x 112 mm

TYPE	ART. NO.	
ISO 10	1182060	signal isolator

Converters

0...10 V -> 3-point control

PMU 3 converts a 0...10 Vdc signal into a 24 Vac 3-point control signal.

Power supply	24 Vac, < 1 VA
Voltage input	0...10 Vdc, 1 mA
Actuator output	24 Vac, 2 A, 3-speed actuator
IP protection class	IP20
Running time	adjustable, 15...240 s
Mounting	11-pole relay housing
Product dimensions	35 x 78 x 103 mm

TYPE	ART. NO.	
PMU 3	1182120	from 0...10 V to 3-point converter

Converters

3-point control -> 0...10 V

UMP 3 converts a 3-point control signal into a 0...10 Vdc signal.

Power supply	24 Vac, < 1 VA
Voltage input	10...40 Vac/dc
Voltage output	0...10 Vdc, 1 mA
Output change speed	adjustable, 15...240 s
IP protection class	IP20
Mounting	11-pole relay housing
Product dimensions	35 x 78 x 103 mm

TYPE	ART. NO.	
UMP 3	1182150	from 3-point to 0...10 V converter

Converters

0...10 V -> 0...10 V (10...0 V)

UV 10 is an amplifier and inverter for 0...10 V signals. UV 10 can also be used for controlling fluorescent lamps with electronic transformers.

Power supply	24 Vac/dc, < 2 VA
Voltage input	0...10 V / 2...10 V, 0.5 mA
Voltage output	0...10 V / 2...10 V / 10...0 V / 10...2 V, < 20 mA
IP protection class	IP20
Mounting	for 35 mm DIN rail
Product dimensions	23 x 77 x 42 mm

TYPE	ART. NO.	
UV 10	1182160	signal amplifier

Converters

0...10 V -> 2 x 0...10 V/3 x 0...10 V

AO 2 and AO 3 are signal converters designed for HVAC applications. The converters divide one 0...10 V signal to two (AO 2) or three (AO 3) 0...10 V signals.

Power supply	24 Vac/dc, < 0.5 VA
Voltage input	0...10 Vdc, 0.2 mA
IP protection class	IP20
Mounting	for 35 mm DIN rail
Product dimensions	23 x 77 x 41 mm

TYPE	ART. NO.	
AO 3	1182210	signal divider, 3 outputs
AO 2	1182220	signal divider, 2 outputs

Electric power regulation

BAK 64 binary step controller is designed for controlling electric heating power. It can be used with all systems with 0...10 V outputs. Relays like AR 1 or RY 1 are needed for contact outputs. Power steps must be in binary sequence e.g. 1, 2, 4, 8, 16, 32 kW.

Power supply	24 Vac, < 3 VA
Voltage input	0...10 Vdc or 10...0 Vdc
Voltage output	40 Vdc, 100 mA, for AR 1 and RY 1 relays
Step delay	adjustable, 0.7...60 s
IP protection class	IP20
Mounting	11-pole relay housing
Product dimensions	39 x 78 x 103 mm

TYPE	ART. NO.	
BAK 64	1140010	binary step controller

OPTIONS

AR 1	1183010	relay with normally open (NO) contact, width 13 mm
RY 1	1183020	relay with change-over contact, width 23 mm

Electric power regulation

STS 4 converts 0...10 V signal to one time proportional and up to 3 contact outputs. Each step must be identical in power.

Power supply	24 Vac/dc, < 1 VA
Voltage input	0...10 Vdc, 1 mA
Voltage output	3 x 35 Vdc, 100 mA, for AR 1 and RY 1 relays
Relay output	25 Vdc, 50 mA, for solid state relay, time proportional
Number of steps	selectable, 1...4 pcs
IP protection class	IP20
Mounting	11-pole relay housing
Product dimensions	39 x 78 x 103 mm

TYPE	ART. NO.	
STS 4	1140020	electric power controller

OPTIONS

PR 50/440	1140030	solid state relay 230...400 Vac, < 25 A, input 3...32 Vdc
PRMK	1140070	solid state relay control signal converter, Vac -> Vdc
AR 1	1183010	relay with normally open (NO) contact, width 13 mm
RY 1	1183020	relay with change-over contact, width 23 mm

Relay modules

coil 24 Vac/dc

RY 1 and AR 1 are relays with a 24 Vac/dc coil voltage. RYVA 16 can be used for lighting control because it withstands a short-term inrush current peak.

Control signal	24 Vac/dc, 0.5 VA
Relay output	250 Vac, 10 A, res.|NO
IP protection class	IP20
Mounting	on 35 mm DIN rail

TYPE	ART. NO.	
AR 1	1183010	relay with normally open (NO) contact, width 13 mm
RY 1	1183020	relay with change-over contact, width 23 mm
RY 1-K	1183021	relay with change-over contact, width 23 mm
RYVA 16	1183060	relay for fluorescent lamps, 10 A (inrush current < 80 A, < 2,5 ms)

Relay modules

input 0...10 Vdc

RY 1-U and RY 1-U-K are voltage controlled relays with 0...10 V input.

Power supply	24 Vac/dc, < 1 VA
Set point	adjustable, 0...10 V
Control signal	0...10 Vdc, 0.2 mA
Relay output	250 Vac, 8 A, res.|Changeover
IP protection class	IP20
Mounting	on 35 mm DIN rail
Product dimensions	23 x 77 x 41 mm

TYPE	ART. NO.	
RY 1-U	1183040	voltage controlled relay
RY 1-U-K	1183041	voltage controlled relay, socket connection at the output

Relay modules

FCRY 3 is a 3 speed fan coil control relay, with 0..10 Vdc control input.

for fan coil controls

Power supply	24 Vac/dc, <1.5 VA
Set point	adjustable, factory settings 2,5 V, 5,0 V and 7,5 V
Control signal	0...10 Vdc, 0.2 mA
Relay output	3 x 230 Vac, 8 A, res. NO (interlocked)
IP protection class	IP20
Mounting	on 35 mm DIN rail
Product dimensions	45 x 90 x 48 mm

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TYPE	ART. NO.	
FCRY 3	1183070	fan coil relay, input 0...10 Vdc

Relay modules

RYM 8-KK is a relay module with eight relay outputs that can be controlled manually (switch in OFF or ON position) or by using control signal (switch in A position). The manual control is useful for example in commissioning and in fault situations.

Power supply	24 Vdc
Input type	24 V
Control signal	8 x 24 Vdc
Relay output	8 x 230 Vac, 4 A res.|Changeover
IP protection class	IP20
Mounting	on 35 mm DIN rail
Product dimensions	136 x 90 x 65 mm

TYPE	ART. NO.	
RYM 8-KK	1181110	relay module, 8 outputs, 24 Vdc control
RYM 8-KK-0	1181111	relay module, 8 outputs, 24 Vdc control

Relay modules

TH 5 is a surface mounted driver that can drive several parallel connected thermal actuators.

driver for thermal actuators

Power supply	24 Vac
Control signal	5...30 Vac/dc, 10 mA
Output	5 x 24 Vac, 0.6 A, total load max. 3 A
IP protection class	IP66
Mounting	on the wall surface or on a flush mounting box (60 mm hole distance)
Materials	PP plastic
Product dimensions	76 x 76 x 52 mm

TYPE	ART. NO.	
TH 5	1183090	driver for thermal actuators, 5 outputs

Set point selectors

The setpoint selector is designed to control for example temperature, humidity, lights or ventilation. The device can be mounted in a splash water proof surface mounted housing or on a flush mounting box. The selector provides a proportional 0...10 Vdc output signal that can be adjusted with internal trimmers. The selector has also off position.

Power supply	24 Vac/dc, ≤20 mA
Setpoint scale	0...100 %
Voltage output	0...10 Vdc
IP protection class	IP44/IP54, Flush mounting IP44, surface mounting IP54
Ambient temperature	0...40 °C
Ambient humidity	0...95 %rH
Mounting	On a flush mounting box or surface mounting
Product dimensions	82 x 82 x 65 mm

TYPE	ART. NO.	
LC-P24-P	1182250	set point selector, scale 0...100 %

Transformers

24 Vac/dc -> 3.6...24 Vdc

JY is a switch mode power supply converting a 24 Vac/dc supply into a lower DC voltage supply. Electronic protection for overloading.

Voltage input	24 Vac/dc, < 30 VA
Voltage output	3.6...24 Vdc, 1 A (0...12 V); 0.5 A (12...24 V)
IP protection class	IP20
Mounting	on 35 mm DIN rail
Product dimensions	45 x 90 x 58 mm

TYPE	ART. NO.	
JY	1184020	AC/DC to DC transformer

Transformers

230 Vac -> 12/24 Vac, 15 VA

M230/24-15 transforms 230 Vac supply to 12/24 Vac supply.

Voltage input	230 Vac, < 15 VA
Voltage output	24 Vac, 15 VA, / 12 Vac, 7.5 VA
IP protection class	IP20
Ambient temperature	0...40 °C
Mounting	on 35 mm DIN rail
Product dimensions	35 x 87 x 60 mm

TYPE	ART. NO.	
M 230/24-15	1184090	transformer

Transformers

M230/24–30 transforms 230 Vac supply to 12/24 Vac supply.

230 Vac -> 12/24 Vac, 30 VA

Voltage input	230 Vac, < 30 VA
Voltage output	24 Vac, 30 VA, / 12 Vac, 15 VA
IP protection class	IP20
Ambient temperature	0...40 °C
Mounting	on 35 mm DIN rail
Product dimensions	54 x 87 x 60 mm

TYPE	ART. NO.	
M 230/24–30	1184050	transformer

Transformers

T20 transforms 230 Vac supply to 24 Vac supply.

230 Vac -> 24 Vac

Voltage input	230 Vac, < 20 VA
Voltage output	24 Vac, 20 VA
IP protection class	IP33
Ambient temperature	0...40 °C
Cable	3 m, AMP connector (cable delivered with the transformer)
Product dimensions	61 x 85 x 50 mm

TYPE	ART. NO.	
T20	1184100	transformer

Transformers

T35 transforms 230 Vac supply to 24 Vac supply.

230 Vac -> 24 Vac

Voltage input	230 Vac, < 35 VA
Voltage output	24 Vac, 35 VA
IP protection class	IP44
Ambient temperature	0...40 °C
Mounting	with screws
Cable	300 mm on both sides
Product dimensions	63 x 103 x 55 mm

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TYPE	ART. NO.	
T35	1184111	transformer

Transformers

T40 transforms 230 Vac supply to 24 Vac supply.

230 Vac -> 24 Vac

Voltage input	230 Vac, < 38 VA
Voltage output	24 Vac, 38 VA
IP protection class	IP54
Ambient temperature	0...40 °C
Mounting	with screws
Product dimensions	77 x 123 x 70 mm

TYPE	ART. NO.	
T40	1184120	transformer

Transformers

T60 transforms 230 Vac supply to 24 Vac supply.

230 Vac -> 24 Vac

Voltage input	230 Vac, < 60 VA
Voltage output	24 Vac, 60 VA
IP protection class	IP54
Ambient temperature	0...40 °C
Mounting	with screws
Product dimensions	77 x 123 x 70 mm

TYPE	ART. NO.	
T60	1184130	transformer

Transformers

T120 transforms 230 Vac supply to 24 Vac supply.

230 Vac -> 24 Vac

Voltage input	230 Vac, < 120 VA
Voltage output	24 Vac, 120 VA
IP protection class	IP54
Ambient temperature	0...40 °C
Mounting	with screws
Product dimensions	89 x 174 x 92 mm

TYPE	ART. NO.	
T120	1184140	transformer

Transformers

T220 transforms 230 Vac supply to 24 Vac supply.

230 Vac -> 24 Vac

Voltage input	230 Vac, < 220 VA
Voltage output	24 Vac, 220 VA
IP protection class	IP54
Ambient temperature	0...40 °C
Mounting	with screws
Product dimensions	104 x 168 x 105 mm

TYPE	ART. NO.	
T220	1184150	transformer

Indicator lights

LEKA 24E is an indicator light device with green and red light.

24 Vac/dc

Power supply	24 Vac/dc, < 0.5 VA
Control signal	2 x 24 Vac/dc
IP protection class	IP20
Ambient temperature	0...50 °C
Ambient humidity	0...85 %rH
Mounting	flush (surface mounting casing optional)
Product dimensions	85 x 85 x 28 mm

TYPE	ART. NO.	
LEKA 24E	1185150	indicator light

OPTIONS

SMB 1E	9000470	casing for surface mounting

Timers

ETT electronic timers are designed for energy saving and boosting functions in ventilation and lighting applications. The timer functions can be used for example in offices, if enhanced ventilation is needed outside the normal working hours.

Power supply	24 Vac/dc (22...26 V) or 230 Vac (207...253 V)
Timer accuracy	±10 s/h
Relay output	250 Vac, 10 A|Changeover
IP protection class	IP20
Ambient temperature	0...50 °C
Ambient humidity	5...95 %rH
Mounting	on the wall surface or on a flush mounting box (60 mm hole distance)
Materials	PC plastic
Product dimensions	97 × 97 × 27 mm

TYPE	ART. NO.	
ETT1B	560011B000	electronic timer, black, 10...60 min
ETT1	560011W000	electronic timer, white, 10...60 min
ETT6B	560012B000	electronic timer, black, 1...6 h
ETT6	560012W000	electronic timer, white, 1...6 h
ETT12B	560013B000	electronic timer, black, 2...12 h
ETT12	560013W000	electronic timer, white, 2...12 h

Timers

LAP timers are designed for extending plant operating hours by pushing a button. The selected time is indicated by an indicator light.

Power supply	24 Vac/dc or 230 Vac, 2 VA
Timer accuracy	±10 s/h
Relay output	250 Vac, 8 A, res.|Changeover
IP protection class	IP20
Ambient temperature	0...50 °C
Ambient humidity	0...85 %rH
Mounting	flush (surface mounting casing optional)
Product dimensions	85 x 85 x 30 mm

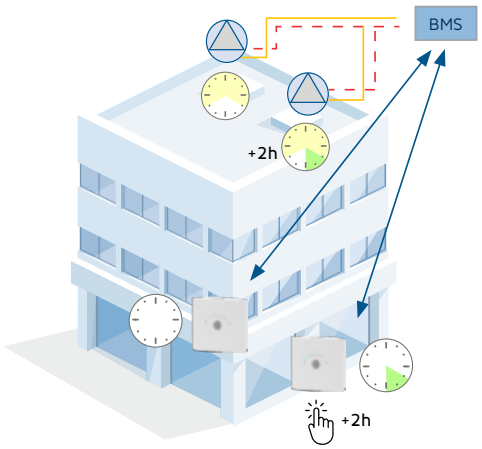
TYPE	ART. NO.	
LAP 1E	1185110	12...60 minutes (max. time can be restricted to 12...36 minutes)
LAP 5E	1185111	1...5 hours (max. time can be restricted to 1...3 hours)
LAP 10E	1185112	2...10 hours (max. time can be restricted to 2...6 hours)

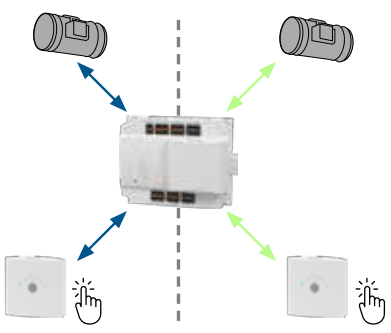
OPTIONS

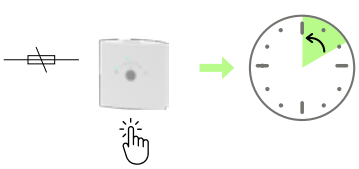
SMB 1E	9000470	casing for surface mounting

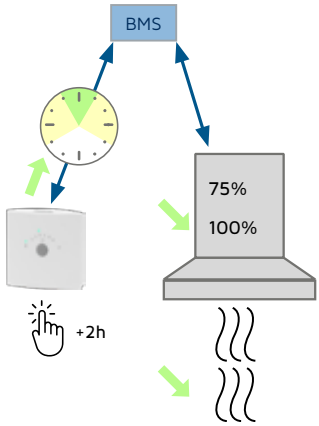
Timers

1 h (10, 20, 30, 40, 50, 60 min) 6 h (1, 2, 3, 4, 5, 6 h) 12h (2, 4, 6, 8, 10, 12 h)		60min (12, 24, 36, 48, 60 min) 5 h (1, 2, 3, 4, 5 h) 10 h (2, 4, 6, 8, 10 h)
230 Vac / 24 Vac/dc		230 Vac / 24 Vac/dc
10A res. / 230 Vac		8A res. / 230 Vac
max. /		max. /





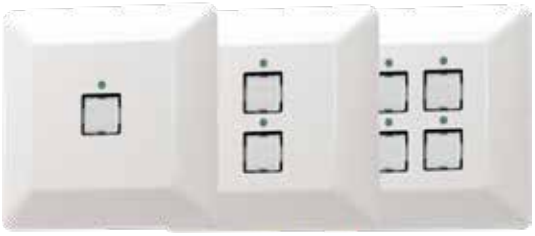




Push buttons

PJP is a low voltage push button device with 1, 2 or 4 buttons and indicator lights. The indicator lights are controlled externally.

IP protection class	IP20
Ambient temperature	0...50 °C
Ambient humidity	0...85 %rH
Mounting	flush (surface mounting casing optional)
Product dimensions	85 x 85 x 30 mm



TYPE	ART. NO.	
PJP 1E	1185120	1 push button and 1 indicator light
PJP 2E	1185121	2 push buttons and 2 indicator lights
PJP 4E	1185122	4 push buttons and 4 indicator lights

OPTIONS

SMB 1E	9000470	casing for surface mounting

I/O modules

MIO 12 I/O modules can read analogue and/or digital inputs, and control thermal or 3-point actuators and also 0...10 V analogue outputs. The module has RS-485 connection for Modbus RTU communication.

Power supply	24 Vac, < 2 VA
Voltage output	4 x 0...10 Vdc, 2 mA
Triac output	4 x 24 Vac, 1 A, for thermal actuators or two 3-point actuators
IP protection class	IP20
Ambient temperature	5...40 °C
Mounting	on 35 mm DIN rail
Product dimensions	53 x 90 x 58 mm

TYPE	ART. NO.	
MIO 12-PT	1181300	Modbus I/O, 4 analogue inputs (Pt1000) or potential free digital inputs
MIO 12-V	1181310	Modbus I/O, 4 analogue inputs (0...10 V) or potential free digital inputs
MIO 12-NILG	1181320	Modbus I/O, 4 analogue inputs (Ni1000-LG) or potential free digital inputs

I/O modules

DIO4-BAC-DIN is designed to be a compact DIN-rail mounted BACnet MS/TP input and output module. The module has two potential free contact inputs and two digital outputs (24 Vac triac).

Power supply	24 Vac, < 2 VA
Digital input	2 x potential free contact, impedance <1 kΩ. Pulse counting: max 25 Hz, min pulse length 20 ms (volatile)
Triac output	2 x 24 Vac, 1 A
IP protection class	IP20
Ambient temperature	0...50 °C
Ambient humidity	0...95 %rH
Mounting	on 35 mm DIN rail
Materials	ABS plastic, self extinguishing
Product dimensions	106 x 97 x 38 mm

TYPE	ART. NO.	
DIO4-BAC-DIN	6011A00000	BACnet I/O module, 2DI, 2DO

I/O modules

IO10-BAC-DIN is designed to be compact DIN-rail mounted BACnet MS/TP input and output module. The module has two potential free contact inputs, two resistive inputs, two digital outputs and four analogue outputs. The resistive inputs can also operate as potential free contact inputs.

Power supply	24 Vac, < 2 VA
Digital input	2 x potential free input
Resistive input	2 x NTC 10 / resistive / potential free digital input
Voltage output	4 x 0...10 Vdc, 5 mA
Triac output	2 x 24 Vac, 1 A
IP protection class	IP20
Ambient temperature	0...50 °C
Ambient humidity	0...95 %rH
Mounting	on 35 mm DIN rail
Materials	ABS plastic, self extinguishing
Product dimensions	106 x 97 x 38 mm

TYPE	ART. NO.	
IO10-BAC-DIN	6011B00000	BACnet I/O module, 2RI/DI, 2DI, 2DO, 4AO

I/O modules

IO10-BAC-DIN-AI is designed to be compact DIN-rail mounted BACnet MS/TP input and output module. The module has two analogue inputs, two potential free contact inputs, two digital outputs and four analogue outputs.

Power supply	24 Vac, < 2 VA
Voltage input	2 x 0...10 Vdc
Digital input	2 x potential free input
Voltage output	4 x 0...10 Vdc, 5 mA
Triac output	2 x 24 Vac, 1 A
IP protection class	IP20
Ambient temperature	0...50 °C
Ambient humidity	0...95 %rH
Mounting	on 35 mm DIN rail
Materials	ABS plastic, self extinguishing
Product dimensions	106 x 97 x 38 mm

TYPE	ART. NO.	
IO10-BAC-DIN-AI	6011C00000	BACnet I/O module, 2AI, 2DI, 2DO, 4AO

Casings

KO IVS and VP-PROX are protective casings for room products in spaces like sports halls. Casing is transparent and with a lock.

Ambient temperature	0...50 °C
Mounting	with screws (included)
Materials	PC plastic
Product dimensions	136 x 136 x 40 mm

TYPE	ART. NO.	
VP-PROX	9000460	protective casing for Proxima room products
KO IVS	KO5239	protective casing for room products

Casings

WS-1 weather shield is designed to protect Produal's outdoor products from sun, rain and snow.

Materials	stainless steel, AISI 304 (1.4301)
Product dimensions	171 x 170 x 80 mm

TYPE	ART. NO.	
WS-1	9000520	weather shield

Table stand

A table stand for Produal's room products. Fixing screws (2 pcs) are included in the delivery.

Materials	stainless steel
Product dimensions	78 x 90 x 52 mm

TYPE	ART. NO.	
TMS	9000480	table stand for room products

HK Instruments

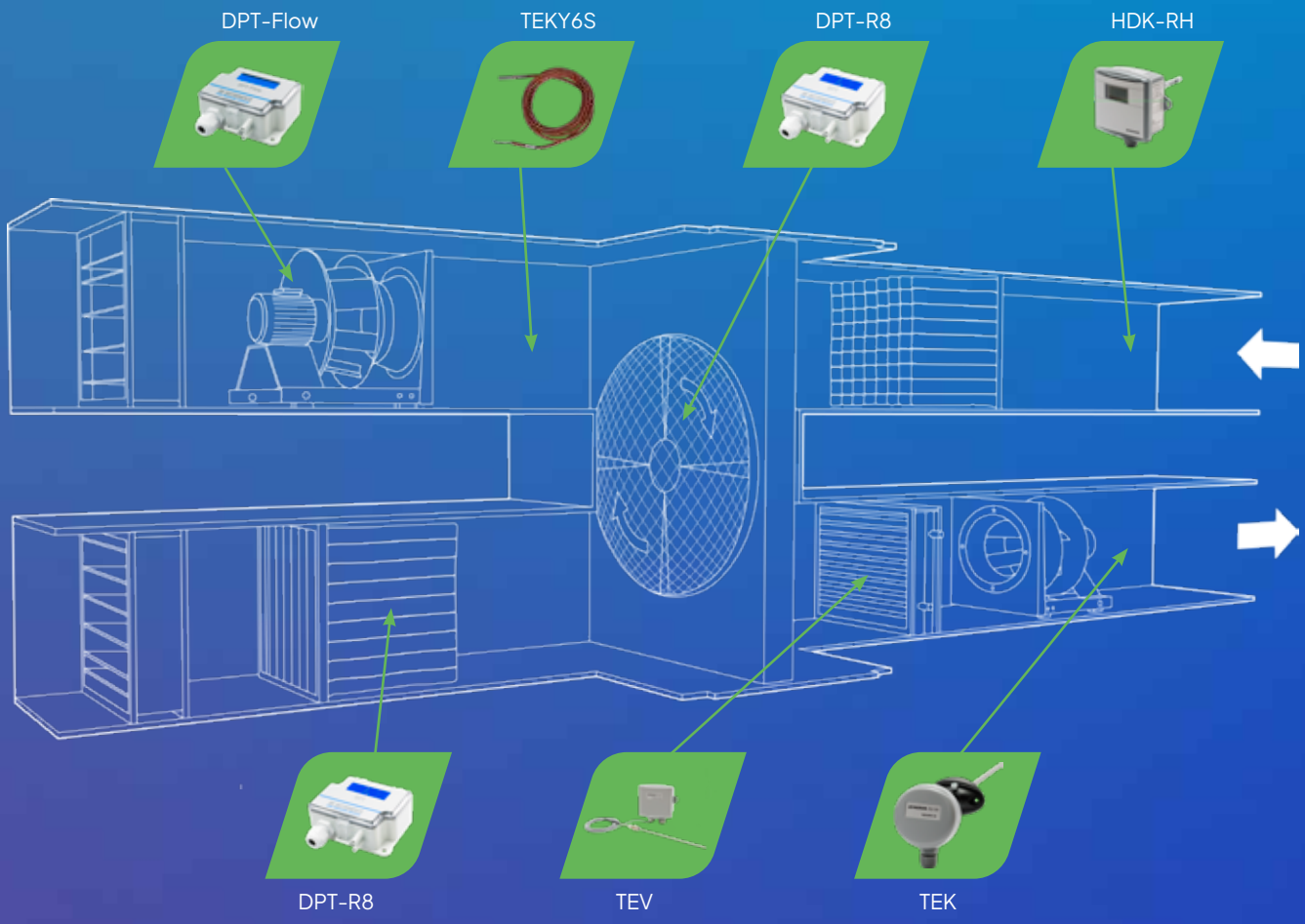
PRODUCTS

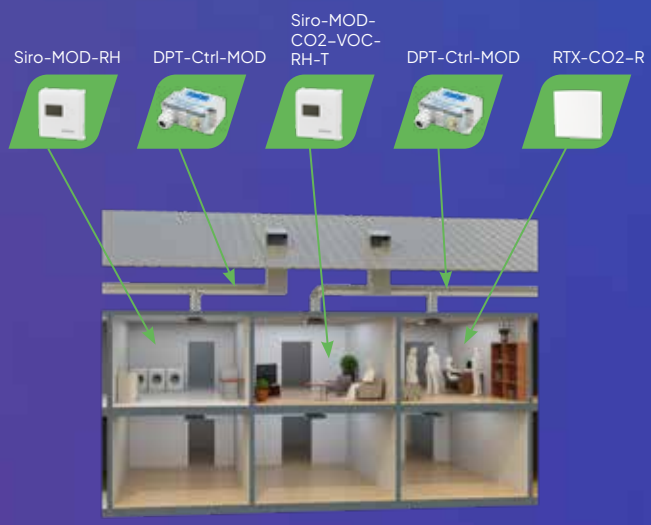
HK Instruments products

HK Instruments' highly accurate and easy-to-use measuring devices now complement Produal portfolio, primarily for HVAC applications in ventilation and building automation systems.

Air handling unit applications: traditional and Modbus

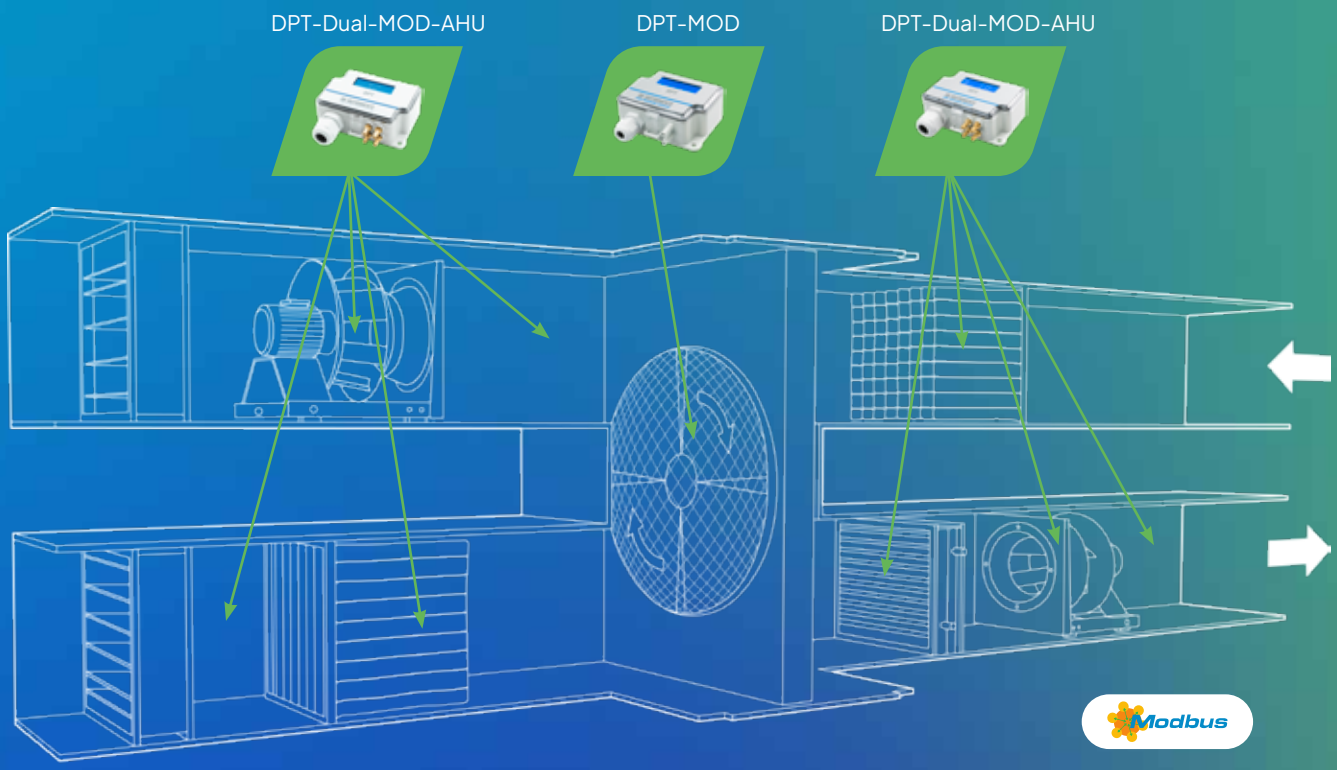
Air handling units are used in nearly all new and renovated buildings to ensure high-quality indoor air. In addition to providing clean indoor air, HK Instruments' easy-to-use devices enable cost-efficiency and effortless installation and monitoring of air handling units.





Roof extraction unit application

In apartment buildings, roof extraction units are often necessary to ensure clean, high-quality indoor air. Ventilation in apartment buildings is often set at a default level, even though the load varies. This results in a significant loss of energy. Ventilation applications in apartment buildings are easy to implement by using HK Instruments' measurement devices. ur cost-efficient solutions do not necessarily need to be supported by an expensive building automation system.



In comparison with analogue devices, modern Modbus devices require less wiring, which reduces the cost of cabling work. DPT-Dual-MOD-AHU is especially designed for air handling units, combining 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-AHU 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 save on equipment and installation costs.

Commercial building solutions

HK Instruments produces user-friendly measurement devices for indoor and outdoor facilities. Passive outdoor temperature and light sensors are reliable in use and reduce the need for cabling. These sensors predict the need for heating in a building and control outdoor lighting sensibly and energy-efficiently. Liquid pressure transmitters can be used to monitor district heating and cooling, as well as detecting any leaks and preventing water damage. Surveillance of differential pressure across the building envelope takes care of the health of the building and prevents serious structural problems.

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 AZcalibration 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-Priima is designed especially for high accuracy applications, and is also available as Modbus version, DPT-Priima-MOD, that includes air flow measurement. 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. DPTDual- MOD-AHU is designed especially for air handling units. It offers a possibility to measure pressure from two different points, and one of the measurements can be set to show the air flow rate.

Differential pressure transmitters

-40°C

three-wire

The DPT-R8 series includes electronic differential pressure transmitters that offer exceptional performance, high quality and competitive pricing. Because of the high accuracy of the devices, it is usually not necessary to narrow down the range to get accurate 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.

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) -40 °C model: <4.0 W when <0 °C
Output signals (3-wire)	0/2...10 VDC 4...20 mA
Operating temperature	-20...+50 °C (with autozero calibration -5...+50 °C) -40...+50 °C (-40C model)
Response time	0.8 / 8 s
Protection standard	IP54

Example: DPT2500 -R8-AZ-D	Product series						
	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
							Cold resistance
							-40C -40 °C cold resistant (not available with autozero calibration)
							Without -40 °C cold resistance
Model	**DPT**	**2500**	**-R8**	**-AZ**	**-D**		

Differential pressure transmitters

DPT-Priima is a high accuracy differential pressure transmitter designed for cleanrooms and other demanding applications. DPT-Priima has a new, extremely accurate sensor and automatic zero point calibration, and optional span point calibration and calibration certificate.

high accuracy

Usage & applications

DPT-Priima is used in applications where the required accuracy is higher than the regular building automation pressure transmitters can reach. The most common applications are pressure monitoring in cleanrooms and over the building envelope.

Accuracy, from applied pressure	0.4 % + ±0.4 Pa
Measuring ranges (Pa)	-25...+25 / -50...+50 / -100...+100 / -500...+500 / 0...25 / 0...50 / 0...250 / 0...1000
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)	0/2...10 VDC 4...20 mA
Operating temperature	-5...+50 °C
Response time	0.4 / 8 s
Protection standard	IP54

Example: DPT-Priima -AZ-D-S	**Product series**				
	DPT Differential pressure transmitter				
		Model type			
		-Priima High accuracy			
			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**	**-Priima**	**-AZ**	**-D**	

Differential pressure transmitters

high accuracy, Modbus

DPT-Priima-MOD is a multifunctional high accuracy differential pressure transmitter with Modbus communication and air flow measurement. It is designed for cleanrooms and other demanding applications. DPT-Priima-MOD has a new, extremely accurate sensor and automatic zero point calibration, and optional calibration certificate.

Usage & applications

The DPT-Priima-MOD is used for measuring differential pressure and air flow in 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.
The most common applications are pressure monitoring in cleanrooms and over the building envelope.

Communication	RS-485 Modbus (RTU)
Accuracy, from applied pressure	0.4 % + ±0.4 Pa
Measuring ranges (Pa)	-120...+120 / -240...+240 / -620...+620 / -1240...+1240 / -2490...+2490
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 VDC ±10 % / 24 VAC ±10 %
Power consumption	< 1.0 W
Output signal	via Modbus
Operating temperature	-5...+50 °C
Response time	0.4-20 s
Protection standard	IP54

Example: DPT-Priima -MOD -AZ-D-S	**Product series**			
	DPT Differential pressure transmitter			
		Model type		
		-Priima-MOD High accuracy, with Modbus communication		
			Zero point calibration	
			-AZ With autozero calibration	
				Display
				-D With display
Model	**DPT**	**-Priima-MOD**	**-AZ**	**-D**

Differential pressure transmitters

air flow measurement, Modbus

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.

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	< 1.3 W -40 °C model: <4.3 W when <0 °C
Output signal	via Modbus
Operating temperature	-20...+50 °C (with autozero calibration -5...+50 °C) -40...+50 °C (-40C model)
Response time	1.0-20 s, selectable via menu or via Modbus
Protection standard	IP54

Example: DPT-MOD-2500-AZ-D	Product series					
	DPT	Differential pressure transmitter				
		Model type				
		-MOD	Modbus communication			
			Measuring ranges (Pa)			
			-2500	-250...2500		
			-7000	-700...7000		
				Zero point calibration		
				-AZ	With autozero calibration	
					Standard with pushbutton manual zero point calibration	
					Display	
					-D	With display
						Cold resistance
						-40C -40 °C cold resistant (not available with autozero calibration)
						Without -40 °C cold resistance
Model	**DPT**	**-MOD**	**-2500**	**-AZ**	**-D**	

Differential pressure transmitters

input terminal, Modbus

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 andcontrol building automation, HVAC and cleanroom systems.

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	by pushbutton or via Modbus
Measuring units	Pa, kPa, mbar, inchWC, mmWC, psi
Supply voltage	24 VDC ±10 % / 24 VAC ±10 %
Power consumption	< 1.3 W
Output signal	via Modbus
Operating temperature	-20...+50 °C
Response time	1...20 s selectable via menu
Protection standard	IP54

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 -700...7000	
				Display
				-D With display
Model	**DPT**	**-IO-MOD**	**-2500**	**-D**

Differential pressure transmitters

for cleanroom monitoring

DPT-CR-MOD is a differential pressure transmitter designed specially for cleanroom monitoring. In addition to differential pressure, the device enables monitoring temperature and relative humidity. A 0...10 V voltage input of an external humidity and temperature transmitter (for example Siro-rH-T) can be connected to the input terminal of the device. In this case, all three measured values (differential pressure, relative humidity, temperature) can be shown simultaneously on the display. Alternatively, a passive temperature sensor can be connected to the input terminal. DPT-CR-MOD is compatible with Modbus serial communication protocol.

Usage & applications

DPT-CR-MOD is used for monitoring and controlling differential pressure, relative humidity and temperature in cleanrooms.

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

Example: DPT-CR-MOD-D	**Product series**		
	DPT Differential pressure transmitter		
		Model type	
		-CR-MOD For cleanroom monitoring, with Modbus communication	
			Display
			-D With display
Model	**DPT**	**-CR-MOD**	**-D**

Differential pressure transmitters

two pressure sensors, Modbus

DPT-Dual-MOD combines two differential pressure transmitters into one device. It offers a possibility to measure pressure from two different points. 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.

Usage & applications

DPT-Dual-MOD can be used in all applications where you need to measure two different pressures. The devices are suitable for air and non-combustible gases.

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	by pushbutton or via Modbus
Measuring units	Pa, kPa, mbar, inchWC, mmWC, psi
Supply voltage	24 VDC ±10 % / 24 VAC ±10 %
Power consumption	< 1.3 W
Output signal	via Modbus
Operating temperature	-20…+50 °C
Response time	1...20 s selectable via menu
Protection standard	IP54

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 -700...7000	
				Display
				-D With display
Model	**DPT**	**-Dual-MOD**	**-2500**	**-D**

Differential pressure transmitters

for air handling units

DPT-Dual-MOD-AHU is especially designed for air handling units, combining 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-AHU 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.

Usage & applications

DPT-Dual-MOD-AHU is designed for air handling units where one sensor monitors the air flow across the centrifugal fan while the other sensor monitors the filter cleanliness. The devices are suitable for air and non-combustible gases.

Communication	RS-485 Modbus (RTU)
Accuracy, from applied pressure	Sensor A (-700...7000 Pa): Pressure < 125 Pa = 1.5 % + ±2 Pa Pressure > 125 Pa = 1.5 % + ±1 Pa Sensor B (-250...2500 Pa): Pressure < 125 Pa = 1 % + ±2 Pa Pressure > 125 Pa = 1 % + ±1 Pa
Zero point calibration	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 VDC ±10 % / 24 VAC ±10 %
Power consumption	< 1.3 W
Output signal	via Modbus
Operating temperature	-20...+50 °C
Response time	1...20 s selectable via menu
Protection standard	IP54

Example: DPT-Dual-MOD-AHU-D	**Product series**		
	DPT	Differential pressure transmitter	
		Model type	
		-Dual-MOD-AHU	For air handling units, both 2500 and 7000 sensors, flow measurement and Modbus communication
			Display
			-D With display
Model	**DPT**	**-Dual-MOD-AHU**	**-D**

Differential pressure transmitters

DPT-Dual series differential pressure transmitters are engineered for building automation in the HVAC/R industry. DPT-Dual is a technologically advanced transmitter measuring static and differential pressure from two different points, with field selectable units, range and output, all in a single device.

two pressure sensors

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 and HVAC systems.

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	by pushbutton
Measuring units	Pa, kPa, mbar, inchWC, mmWC, psi
Supply voltage	24 VDC ±10 % / 24 VAC ±10 %
Power consumption	< 1.0 W
Output signals (3-wire)	2 x 0...10 VDC or 2 x 0...5 VDC (selectable by jumper)
Operating temperature	-20...+50 °C
Response time	0.8 / 4 s
Protection standard	IP54

Example: DPT-Dual-2500-D	**Product series**			
	DPT	Differential pressure transmitter		
		Model type		
		-Dual	Two pressure sensors	
			Measuring ranges (Pa)	
			-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
				Display
				-D With display
				Without display
Model	**DPT**	**-Dual**	**-2500**	**-D**

Differential pressure transmitters

two-wire

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.

Accuracy, from value	±1.5 % + 2 Pa
Long term stability (typical 1 year)	-250 and -2500 models: -8 Pa...8 Pa -7000 models: -22...22 Pa
Measuring units	Pa
Zero point calibration	by pushbutton
Supply voltage	10...35 VDC
Power consumption	< 1.0 W
Output signal	4...20 mA
Operating temperature	-10...+50 °C
Response time	0.8 / 4 s
Protection standard	IP54

Example: DPT-2W-2500-R8-D	**Product series**			
	DPT-2W	Differential pressure transmitter with 2-wire configuration		
		Measuring ranges (Pa)		
		-250	-25...25 / -50...50 / -100...100 / -150...150 / 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
				Display
				-D With display
				Without display
Model	**DPT-2W**	**-2500**	**-R8**	**-D**

Differential pressure transmitters

electronic switch

The DPI is an electronic differential pressure switch and transmitter with up to two relay outputs.

Usage & applications

The DPI 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.

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 Relay output 1 (250 VAC / 30 VDC / 6 A) Optional relay output 2 (250 VAC / 30 VDC / 6 A)
Operating temperature	-10...+50 °C (with autozero calibration -5...+50 °C)
Response time	0.5...10 s
Protection standard	IP54

Example: DPI±500-2R-D	Product series				
	DPI Differential pressure switch and transmitter				
		Measuring ranges (Pa)			
		±500 -100...100 / -250...250 / -300...300 / -500...500			
		2500 0...100 / 0...250 / 0...1000 / 0...2500			
			Number of relays		
			-1R One relay		
			-2R Two relays		
				Zero point calibration	
				-AZ With autozero calibration	
				Standard with pushbutton manual zero point calibration	
					Display
					-D With display
Model	**DPI**	**±500**	**-2R**		**-D**

Air flow and velocity transmitters

DPT-Flow transmitters are unique devices that make measuring air flow 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-Batt is an on-site display or air flow or differential pressure designed for environments where electricity is not available.

Air flow and velocity transmitters

air 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 & applications

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. The DPT-Flow is an ideal instrument for air flow monitoring and control, and fan and blower control.

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 -40C model: <4.0 W when <0 °C
Output signals for pressure and air flow (selectable by jumper)	0/2...10 VDC 4...20 mA
Operating temperature	-20...+50 °C (with autozero calibration -5...+50 °C) -40...+50 °C (-40C model)
Response time	1...20 s
Protection standard	IP54

Example: DPT-Flow-2000-AZ-D	Product series				
	DPT -Flow	Flow transmitter for HVAC systems			
		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
					Cold resistance
					-40C -40 °C cold resistant (not available with autozero calibration)
					Without -40 °C cold resistance
Model	**DPT-Flow**	**-2000**	**-AZ**	**-D**	

Air flow and velocity transmitters

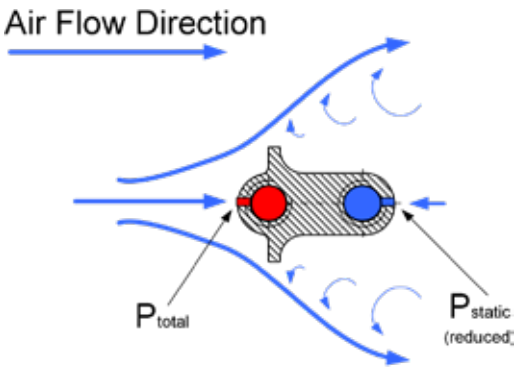
measuring probe

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
- 2 % accuracy greater accuracy
- 2.5 X signal amplification
- Easy installation
- Accepts 1/4" OD tubing
- Chamfered sensing points for consistent readings.

Operation



Operation of the FloXact™

Installation

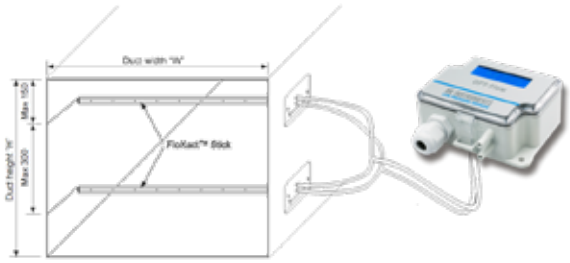


Figure 1. FloXact™-L mounting

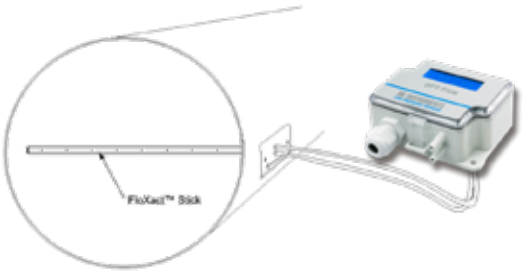


Figure 2. FloXact™-R mounting

Air flow and velocity transmitters

air flow, battery powered

DPT-Flow-Batt is a user-friendly on-site display for air flow or differential pressure 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 the flow rate in a duct system for example together with a FloXact™ averaging measurement probe.

Usage & applications

DPT-Flow-Batt is an on-site display designed for air handling units to measure the air flow on centrifugal fans. 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.

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
Power consumption	~20 mA on active mode
Operating temperature	-20...+50 °C
Response time	1.0–10 s, selectable via menu
Protection standard	IP54

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

Air flow and velocity transmitters

air velocity

AVT is a transmitter for monitoring air velocity and temperature in ducts. The built-in PID controller also enables the control of constant air velocity and there is an optional relay for external device control, for example alarms. Commissioning of the device is easy with jumpers or pushbuttons and display menu, and there are field selectable options for range and output settings. The measurements can be read via analog outputs or Modbus and are also shown on the clear backlit display.

Air velocity measurement range	0...2 m/s, 0...10 m/s, 0...20 m/s, freely selectable
Air velocity measurement accuracy (typ at 25 °C)	v ≥ 0.15 m/s and ≤ 2 m/s (0.2 m/s + 2 % from reading) v > 2 m/s and ≤ 10 m/s (0.5 m/s + 3 % from reading) v > 10 m/s (1.0 m/s + 3 % from reading)
Temp. measurement range	-25...50 °C (probe)
Temperature measurement accuracy (25 °C)	±0.5 °C (air velocity > 0.5 m/s)
Measuring units	Air velocity: m/s or ft/min Temperature: °C or °F
Supply voltage	24 VAC ±10 % / 24 VDC ±10 %
Current consumption	max. 80 mA + 40 mA with mA output + 10 mA with relay option (DC supply voltage)
Output signal 1 (T out [C])	0...10 Vdc, load > 1 kΩ 4...20 mA, load 20...400 Ω
Output signal 2 (v out [m/s])	0...10 Vdc, load > 1 kΩ 4...20 mA, load 20...400 Ω
Optional relay output	250 Vac, 6 A res., adjustable operating direction, switching point and hysteresis
Operating temperature	-25...50 °C (probe) 0...50 °C (transmitter housing)
Probe	Stainless steel, adjustable immersion length, mounting flange included
Protection standard	IP54

Example: AVT-D-R-400	Product series				
	AVT Air velocity transmitter				
		Modbus			
		-MOD With Modbus (not available for -R models)			
		Without Modbus			
			Display		
			-D With display		
			Without display (not available for -MOD and -R models)		
				Relay	
				-R With relay (not available for -MOD models)	
				Without relay	
					Probe length
					-200 200 mm
					-100 100 mm
					-400 400 mm
Model	**AVT**		**-D**	**-R**	

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.

Pressure and flow controllers

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.

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 VDC
Output signal for pressure or air flow (selectable via menu)	0...10 VDC 4...20 mA
PID-parameters	Adjustable via menu
Zero point calibration	automatic with autozero element (-AZ) or by pushbutton
Supply voltage	24 VAC ±10 % / 24 VDC ±10 %
Power consumption	< 1.0 W
Output signals for pressure and air flow (selectable by jumper)	0/2...10 VDC 4...20 mA
Operating temperature	-20...+50 °C (with autozero calibration -5...+50 °C) -40...+50 °C (-40C model)
Protection standard	IP54

Example: DPT-Ctrl-2500-AZ-D	**Product series**				
	DPT-Ctrl	Pressure and flow controller			
		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
					Cold resistance
					-40C -40 °C cold resistant (not available with autozero calibration)
					Without -40 °C cold resistance
Model	**DPT-Flow**	**-2500**	**-AZ**	**-D**	

Pressure and flow controllers

Modbus

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.

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
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
PID-parameters	Selectable via menu and Modbus
Zero point calibration	via Modbus or by pushbutton
Supply voltage	24 VAC ±10 % / 24 VDC ±10 %
Power consumption	< 1.0 W
Output signal	via Modbus
Operating temperature	-20...+50 °C
Protection standard	IP54

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	
			-7000 -700...7000	
				Display
				-D With display
Model	**DPT-CTrl**	**-MOD**	**-2500**	**-D**

Pressure transmitters for liquids

Pressure detection in liquids in heating and cooling systems.
Also suitable for refrigerants and non-aggressive gases.

Pressure transmitters for liquids

PTL-Heat is used for pressure detection in non-condensing applications such as district heating or heat recovery systems.

heating

Accuracy, from FS	±1.0 %
Supply voltage	15…24 VDC/VAC
Output signal	0…10 V or 4...20 mA (2-wire)
Protection standard	IP65, one-layer protection
Pressure connector	inside thread G1/4"
Ambient temperature	0...+105 °C, non-condensing
Temperature of medium	0...+125 °C

Pressure transmitters for liquids

PTL-Cool is designed for extreme conditions where condensation is a common problem. PTL-Cool has a two-layer protection for electronics. This is why the possible condensation does not harm the device. Suitable for plants that use refrigerants.

cooling

Accuracy, from FS	±1.0 %
Supply voltage	15…24 VDC/VAC
Output signal	0…10 V or 4...20 mA (2-wire)
Protection standard	IP65, two-layer protection against condensation
Pressure connector	inside thread G1/4"
Ambient temperature	-40...+60 °C
Temperature of medium	-40...+50 °C

Example: PTL-Heat-4-V	**Product series**			
	PTL Pressure transmitter for liquids			
		Application		
		-Heat For heating applications		
		-Cool For cooling applications		
			Measuring range (bar)	
			-4 0...4 (PTL-Cool only on request)	
			-6 0...6	
			-10 0...10	
			-16 0...16 (PTL-Cool only on request)	
			-25 0...25 (PTL-Cool only on request)	
				Output
				-V Voltage
				-A Current (2-wire)
Model	**PTL**	**-Heat**	**-4**	**-V**

Pressure transmitters for liquids

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.

differential

Accuracy, from FS	±1.0 %
Supply voltage	15…24 VDC/VAC
Output signal	0…10 V or 4…20 mA (3-wire)
Protection standard	IP65
Pressure connector	inside thread G1/4"
Operating temperature	-20…+80 °C

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 (3-wire)
Model	**PTL**	**-2,5**	**-V**

Air pressure gauges
Pressure switches
Filter alerts
Micromanometer

Air pressure gauges & manometers

DPG is a standard pressure gauge for measuring overpressure and differential pressure.

Usage

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

Accuracy (from FS)	< ±3 % (DPG60 < ±5 % ; DPG100 < ±4 %)
Operating temperature	-5…+60 °C
Supply voltage	24 VAC ±10 % / 24 VDC ±10 %
Zero point adjustment screw	external in the plastic cover
Mounting	surface mounting or flush mounting
Mounting position	vertical

Product	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

Liquid column manometers

Reliable inclined column manometer with leakage protection system

MM±100500 delivered with level bubble.

Optional level bubble is available to MM200600 on request.

Measuring range MM±100500	-100...100...500 Pa
Measuring range MM200600	0...200...600 Pa
Accuracy MM±100500	2 Pa/25 Pa
Accuracy MM200600	5 Pa/25 Pa

Liquid column manometers

Traditional U-tube manometer with easy zero point calibration

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

Air pressure gauges & manometers

YM-3 is an overpressure meter for civil defence and military shelters. It is designed and tested to withstand strong blast loadings exerted on the meter through its connection pipe. YM-3 is type-tested and approved by the Technical Research Centre of Finland / VTT that performs type inspecting mandated by the Finnish Ministry of the Interior.

Usage & applications

Measures and monitors overpressure in civil defence and military shelters.

Accuracy (MM±100500)	-100...100 Pa ±5 Pa 100...500 Pa ±25 Pa
Overpressure	Static pressure -20...300 kPa
Measurement ranges	-100...100...500 Pa
Safety	Withstands rapid change in velocity 2.5 m/s, 30 g Withstands vibration with acceleration of 2.5 m/s, 30 g Protected against blast shock and static pressure loads Certificate VTT-C-12329-18 granted by VTT / Technical Research Centre of Finland

Pressure switches

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

Accuracy of switching point (low limit typ.)	±8 Pa (PS1500: ±20 Pa, PS4500: ±100 Pa)
Accuracy of switching point (high limit typ.)	±15 %
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

Filter alerts

Pressure gauge and pressure switch combination (DPG/PS).

Range MM200600/PS600	MM range: 0...600 Pa PS range: 40...600 Pa

Filter alerts

Inclined tube manometer and pressure switch combination (MM/PS).

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

Micromanometer

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

Preprogrammed valve manufacturers include for example:

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

Can be used with pitot tube

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 Flow: l/s, m^3/h, m^3/s
Output signal	via Modbus
Operating temperature	-10 ... +50 °C

Accessories

Tubes and extensions

PVC tube 4/7 matt, 2 m

PVC tube 4/7 matt, 100 m coil

T-connector for d=4 mm tube
L-connector for d=4 mm tube
Connector extension for d=4 mm tube

Mounting

Accessory pack
(tube, duct connectors)

Accessory pack for
DPG flush mounting

PTL adapter G1/4"-G1/2"

Duct connector, plastic,
for d=4 mm tube (80 mm)

Duct connector, metallic,
for d=4 mm tube (40 mm)

Duct connector, metallic,
for d=4 mm tube (100 mm)

DPTL mounting plate

Mounting flange for duct
sensors

Manometer liquids

Gauge fluid 0,786; 30 ml (red)
Gauge fluid 0,786; 250 ml (red)

Thermometers

Thermometer
-40…60 °C

Other accessories

Display upgrade kit
(DPT, DPT-Flow)

Digital display, blue
(DPT, DPT-Flow, AVT)

4-digit, green/black
display (2W)

DPT cover with front label

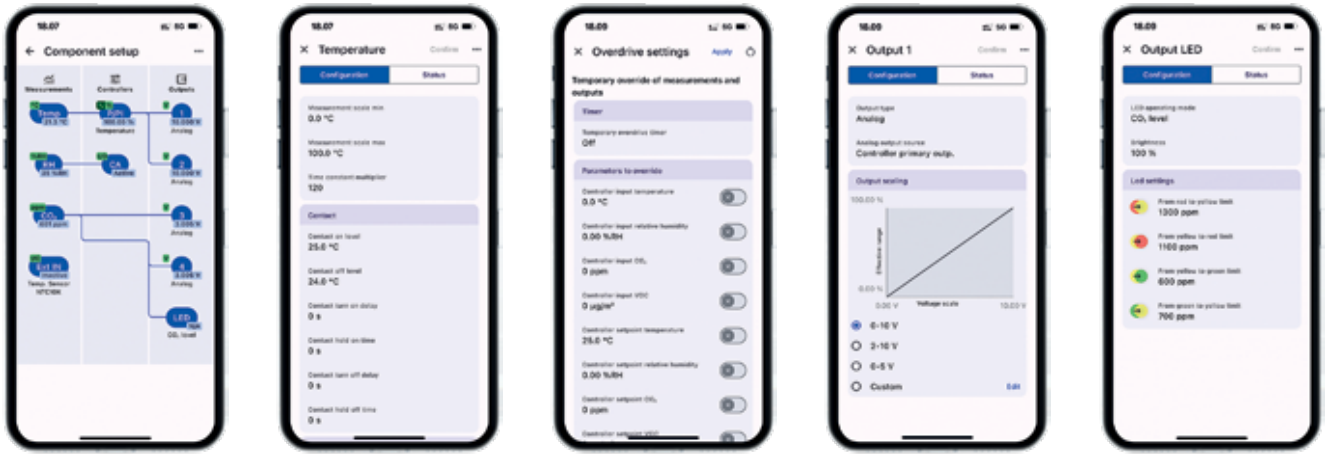
Static pressure port

Sealing insert

Commissioning tools for easy and quick configurations

MyProdual application

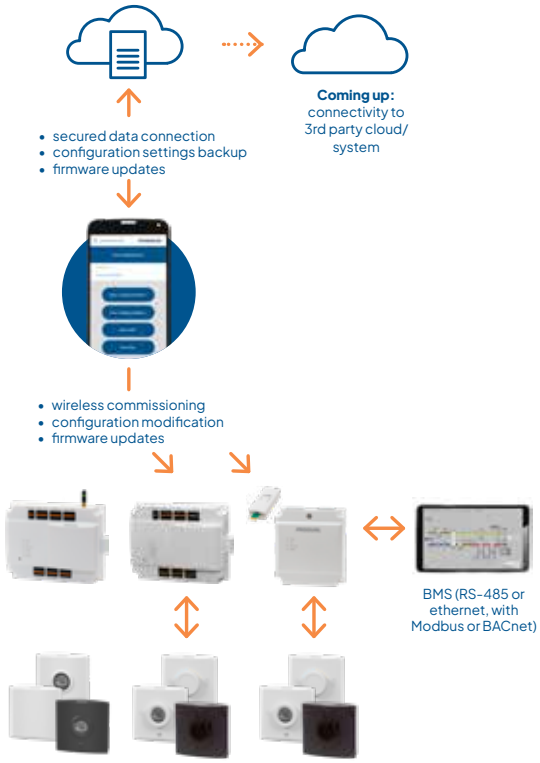
Available on Android and iOS, the completely redesigned MyProdual app provides even more possibilities to manage and control our next-generation RTX/RT room transmitters. Visualised device management gives a clear understanding and makes building even the most complex setups effortless.



MyTool application

Android application for commissioning and configuration of the Produal second generation products, providing ease of use and a unified user experience on your mobile phone or tablet

- Firmware updates
- Easy and fast configuration
- Test installations
- Save configurations
- Wireless network installation



ML-SER

Easy and quick tool for commissioning on the field

Configuration tool for Produal first-generation transmitters

- Easy to configure the settings or execute a one-point field calibration when required
- Configuration of one device at a time
  - Activation of built-in controller option
  - Modbus addressing
  - Factory settings restore

Examples:

1 Easy configuration of the controller functions for the CO_2 room transmitter

2 Easy tuning of the duct sensor's temperature measurement

3 Easy configuration of the differential pressure transmitter's user selectable measurement and output ranges

See the transmitter selection guide (page 50)

Other useful configuration tools

- Configuration cable SW-DCT-USB for backup and replication of TRC room controllers (pages 20–24), TRT smart thermostats (page 30), TRI room units (page 42) , RRH-BAC (page 69) and RCD-BAC (page 77) transmitters, and RTE temperature transmitters (page 138).
- Configuration tools for HLS temperature controllers: HLS 44–SE-SER (page 26), HLS 44–SER (page 26), HLS 44–CO2–SER (page 26), HLS 44–3P-SER (page 26), HLS 45–SER (page 26).
- Configuration tool Siro-CT for Siro transmitters (page 83).

Sensor characteristics

Sensor element	Pt100	Pt1000	Ni1000	Ni1000-LG	NTC 1.8 $\beta_{25/85}$= 3500	NTC 2.2 $\beta_{25/85}$= 3947	NTC 10 $\beta_{25/85}$= 3977	NTC 20 $\beta_{25/85}$= 4262	NTC10-AN $\beta_{25/70}$= 3670	NTC 10-C $\beta_{25/85}$= 3435	NTC10-KB	KP 10	T1
Tol.	±0.3°C / 0°C ±0.15 °C / 0 °C EN60751 B	±0.3°C / 0°C ±0.15 °C / 0 °C EN60751 B	±0.4°C / 0°C DIN43760	±0.4°C / 0°C tcr 5000ppm Siemens	±0.3°C / 25°C TAC / Schneider	±0.25°C / 25°C Johnson	±0.25°C / 25°C Trend / Distech	±0.25°C / 25°C Honeywell	±0.25°C / 25°C Schneider Andover	±0.25°C / 25°C Carel	±0.5°C / 25°C Satchwell	LM235Z 10 mV/K	±0.4°C / 0°C
Temp. °C	Ω	Ω	Ω	Ω	Ω	Ω	Ω	Ω	Ω	Ω	Ω	V	Ω
140	153.38	1533.8	1909	1737	66	53	235	351	298	381	324		
130	149.82	1498.2	1833	1675	82	68	301	459	377	474	385		3675
120	146.06	1460.6	1760	1615	103	90	389	609	483	597	467		3552
110	142.29	1422.9	1688	1557	131	115	511	818	624	758	576		3430
100	138.50	1385	1618	1500	168	153	679	1114	817	973	723	3.73	3311
95	136.60	1366	1583	1472	192	178	787	1307	940	1108	815	3.68	3252
90	134.70	1347	1549	1444	219	207	916	1541	1084	1266	923	3.63	3194
85	132.80	1328	1516	1417	252	241	1071	1823	1255	1451	1048	3.58	3136
80	130.89	1308.9	1483	1390	290	283	1256	2166	1458	1668	1194	3.53	3079
75	128.98	1289.8	1450	1364	335	334	1480	2585	1700	1924	1364	3.48	3022
70	127.07	1270.7	1417	1337	389	395	1751	3099	1990	2228	1562	3.43	2966
65	125.16	1251.6	1385	1311	453	469	2082	3732	2339	2588	1791	3.38	2910
60	123.24	1232.4	1353	1285	529	560	2488	4517	2760	3020	2056	3.33	2855
55	121.32	1213.2	1322	1260	622	673	2986	5494	3271	3536	2358	3.28	2800
50	119.40	1194	1291	1235	733	811	3600	6718	3893	4160	2702	3.23	2745
45	117.47	1174.7	1260	1210	869	984	4365	8259	4656	4911	3088	3.18	2692
40	115.54	1155.4	1230	1186	1034	1200	5323	10211	5594	5827	3517	3.13	2638
35	113.61	1136.1	1200	1162	1238	1471	6528	12698	6754	6940	3987	3.08	2585
30	111.67	1116.7	1171	1138	1489	1814	8054	15887	8197	8313	4492	3.03	2532
29	111.28	1112.8	1165	1132	1546	1893	8408	16628	8525	8622	4597	3.02	2522
28	110.90	1109	1159	1128	1605	1977	8777	17407	8869	8944	4703	3.01	2512
27	110.51	1105.1	1153	1123	1667	2064	9165	18228	9229	9281	4809	3.00	2501
26	110.12	1101.2	1147	1119	1732	2156	9572	19092	9606	9632	4917	2.99	2491
25	109.73	1097.3	1141	1114	1800	2252	10000	20000	10000	10000	5025	2.98	2480
24	109.35	1093.5	1136	1109	1871	2353	10452	20962	10413	10380	5134	2.97	2470
23	108.96	1089.6	1130	1105	1945	2458	10923	21973	10845	10780	5243	2.96	2460
22	108.57	1085.7	1124	1100	2023	2572	11417	23039	11297	11200	5353	2.95	2449
21	108.18	1081.8	1118	1095	2104	2689	11938	24164	11771	11630	5462	2.94	2439
20	107.79	1077.9	1112	1091	2189	2813	12490	25350	12268	12090	5573	2.93	2429
15	105.85	1058.5	1084	1068	2678	3538	15710	32346	15136	14690	6126	2.88	2377
10	103.90	1039	1056	1045	3296	4482	19900	41567	18787	17960	6667	2.83	2326
5	101.95	1019.5	1028	1022	4081	5718	25400	53812	23462	22050	7183	2.78	2276
0	100.00	1000	1000	1000	5087	7353	32660	70203	29490	27280	7661	2.73	2226
-5	98.04	980.4	973	978	6386	9533	42340	92322	37316	33900	8093	2.68	2176
-10	96.09	960.9	946	956	8076	12460	55340	122431	47549	42470	8472	2.63	2127
-15	94.12	941.2	919	935	10291	16428	72980	163777	61030	53410	8796	2.58	2078
-20	92.16	921.6	893	914	13218	21860	97120	221088	78930	67770	9067	2.53	2030
-25	90.19	901.9	867	893	17120	29398	130400	301297	102890	86430	9288	2,48	1982
-30	88.22	882.2	842	872	22357	39908	177000	414698	135233	111300	9466	2,43	1934
-35	86.25	862.5	816	851	29496	54751	243120	576763	179280		9605	2,38	
-40	84.27	842.7	791	831	39247	75953	337270	810861	239831		9712	2,33	
-45	82.29	822.9	767	811		106603	473370	1152992	323859		9793		
-50	80.31	803.1	743	791		151470	672600	1659082	441667		9854		

Videos

Produal Academy

Welcome to Produal Academy! Scan the QR codes to learn more about our wireless products, Produal Proxima Wireless MESH system and designing wireless networks.

Produal academy, Episode 1:

Introduction to Produal Proxima Wireless MESH system

Produal academy, Episode 2:

In-depth review of WTR and WBU

Produal academy, Episode 3:

Proxima MESH Wireless Network Features and Functions Part 1

Produal academy, Episode 4:

Using MLB, Modbus LoRaWAN Bridge

Produal Academy, episode 5:

How to design a wireless network

Product videos

Multifunctional Produal Room Controllers for Building Automation

Featuring HLS 44, HLS 44-CO2, HLS 44-SE and HLS 44-3P

Configuration of Produal PEL pressure transmitter user selectable ranges with ML SER tool

Configuration of HDH CO2 transmitter controller functions

Configuration of Produal DPT-Flow airflow transmitter

Tuning of HDH transmitter CO_2 measurement

Configuration of Produal DPT-Flow-MOD airflow transmitter

Videos

Produal product overviews

Produal Product Overview Episode 1

Introduction and basic functions of TRC

Produal Product Overview Episode 2:

Basic settings of TRC touchscreen room controller

Produal Product Overview Episode 3

Different variants of the TRC-3A touchscreen room controller

Produal Product Overview Episode 4

TRC-P-H-2A3R and TRC-H-3R2T touchscreen room controller models

Produal Product Overview Episode 5

Introduction/basic TRT touchscreen room thermostat functions

Produal Product Overview Episode 6

Introduction/basic TRI touchscreen room interface functions

Produal Product Overview Episode 7

PC configuration tool for the TRx touchscreen room controllers

Produal Product Overview Episode 8

Introduction of Siro CO_2 and VOC room transmitter

Produal Product Overview Episode 9

Introduction of Siro PM (Particulate Matter) room transmitter

Produal Product Overview Episode 10

Introduction of the Proxima RS room sensor

Produal Product Overview Episode 11

Tips for temperature transmitter intallation in the room

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