Catalogue 2021

Reliable measurements for building automation • 30+ years

PRODUAL

measure-be sure.

Embrace tomorrow's building automation, today

Produal is your reliable partner for building automation field devices. We share your goal of optimal building performance, comfort and health, and we want to make working together easy and convenient for you. With these needs in mind, we offer products and services that will yield excellent results for your building automation projects.

First up, we've been working hard to increase interoperability in building automation systems for better communication, connectivity and data sharing. Thanks to our wide variety of Modbus products, expanding range of BACnet devices, and further development in the field of communication protocols, we'll help you grasp the amazing opportunities of rapidly digitalising building automation.

Of course, interoperability also benefits from wireless functionality, a megatrend born from the need for greater efficiency and flexibility. Our Produal Proxima® MESH solution, which is becoming ever more popular in building automation projects, brings you the latest in wireless innovations. Reliable, scalable and energy efficient, this entirely battery-powered solution is both incredibly secure and multifunctional. What's more, it's easy to adapt for both renovations and new constructions.

We're keen to help you take advantage of the best building automation room controller solutions for whatever your needs are. Our portfolio caters for all budgets, design preferences and functionality requirements, including both mobile commissioning and cloud services. The choice is yours, but our experts are always at your service.

It's clear that building automation has a significant impact on buildings and their occupants, and we want to do our share in safeguarding its success. Our smart measurement products from transmitters to sensors, complete with actuators and other system components, support the growing need for reliable measurements and data collection about everything from CO_2 and humidity to differential pressure and ventilation solutions for indoor air quality.

In short, we have everything necessary to ensure the ideal outcome for your building automation projects – easily and effectively. Let's find the best way forward together.

Measure – be sure.

CONTENTS

PRODUAL – working with you for efficient building automation projects and services

As a high-quality partner for building automation measurement and control, we work with you for effective BA projects and services. Versatile, precise and reliable measurements lay the foundation for the evolving building automation. Our wide product offering includes over 1000 products, a complete range of measurement products for any need from room, duct and structure to exterior, and from temperature, pressure, air velocity and quality to humidity – wired or wirelessly. The range is complemented with multifunctional room controllers enabling intelligent control in all types of building automation applications and covers both analog and bus products.

We provide 5 years' warranty for the products we manufacture. Our products bear the CE marking, and our quality system is ISO 9001 certified. Our accurate, multifunctional and easy-to-install products, over 30 years of expertise and local service and passion for customer satisfaction provide you with reliable delivery, trust and advice. The ultimate result is cost efficiency and time savings during the whole lifecycle of the building automation system – and comfort, energy efficiency and return on investment for building owners and users.

Measure – be sure.

SOLID EXPERTISE IN BUILDING AUTOMATION MEASUREMENT AND CONTROL

30+ years **100** cross-border experts **4 000** customers **50 000** buildings

PASSION FOR CUSTOMER SATISFACTION

Working together • Looking to the future • Being flexible and attentive • Operating professionally with high standards

measure-be sure.

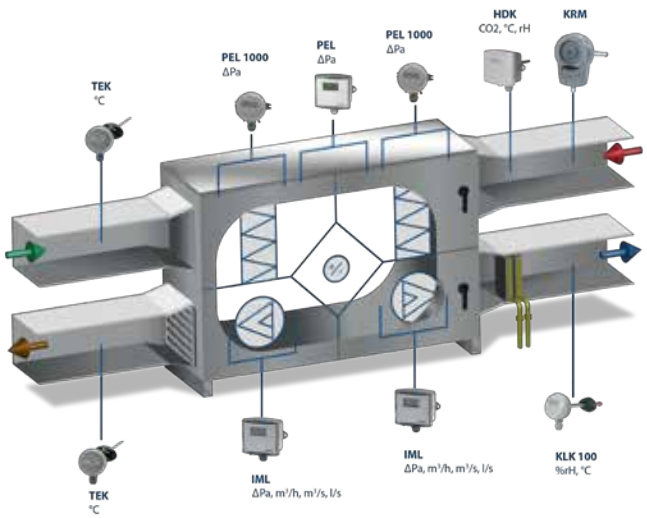
Sergelhuset, Hästskon 12, Stockholm – Produal room controller solution, with a couple of thousand Proxima CU controllers and Proxima RU room units for comfortable temperature, CO_2, and humidity circumstances, is implemented in Sergelhuset, as a part of the BMS system in one of the most centrally located office and commercial properties in the city. The biggest ever renovation project in Stockholm gave the iconic building complex a completely new functionality and appearance, representing part of the 1960s infrastructure transformation for the active and vibrant city centre at Sergels Torg. Here the people want to work, meet, eat, shop, and enjoy a total of 36,000 m^2 of state-of-the-art offices and 23,000 m^2 of stores and experience.

Reliable partner for measurement and control

We continuously develop our product portfolio to stay ahead of the evolving demands of building automation and to be a reliable partner for measurement and control for all our customers both today and in the future. We also want to support our customers in new opportunities enabled by digitalization, IoT and data analytics. Our aim is that the customer always finds a suitable set of products for its specific building automation application – whether it is new building or renovation, traditional HVAC application or something totally new. The current product range is illustrated in the picture below.

OEM and white-label solutions for device manufacturers

For air handling units



For room units

This product catalogue shows merely the foremost features of our products. We are engaged in constant development of our products and the current details may be viewed on our website: www.produal.com

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.

Building automation lifecycle

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:

- Customer logo printed on the product, 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

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

MESH

Based on the latest innovations, the **wireless Produal Proxima® solution** offers a reliable, fully battery-operated MESH network for energy renovation projects, inner air quality improvements, spatial adaptations of buildings, the efficiency of space utilisations or other smart office requirements, and more. *Page 68*

We have expanded our wireless Produal MESH network with **battery-powered Proxima WTR-CO2 transmitters** for ever-broader wireless monitoring, with extended battery life. A low-latency network allows using the wireless measurements also for demand-based controlling purposes through the BMS system. *Page 70*

Additionally, **wireless Proxima WTR-AK advanced setpoint knob** models are now available for implementing a wireless user interface in the room. *Page 70*

The new **Produal Proxima® CU-LH control unit family** suits perfectly for various building automation applications with its multifunctional inputs/outputs. DIN rail mounting is possible, and the design allows time savings in installation with plug-in terminals and fewer screws. The IP44 rating makes the unit suitable also for ventilated false ceilings. **Proxima CU-LH-MOD and BTL-certified Proxima CU-LH-BAC control unit models** allow flexible adaptation to various system demands. Together with our wide selection of room units, you can implement easy-to-use, premium class applications or simple yet stylish room solutions. *Page 30*

Our all-in-one **TRC touchscreen room controllers** are designed for both small stand-alone installations and to be connected to BMS systems via Modbus and BACnet, and they come now also with a **230 V power supply**. The new **TRC-P room controller model** includes a built-in real time clock and a 7-day schedule for switching the operating mode between Comfort, Economy, OFF (frost protection), and Boost modes. The TRC controller family is available in black, chrome, and white design. *Pages 16 and 18*

NEW PRODUCTS

NEW

Interoperability is playing an increasingly important role in building automation, as ever more intelligent devices and systems provide a wealth of useful and predictive data. We have an extensive portfolio of Modbus and BACnet products available and are continuously expanding our range of communicative products to help in creating an ever clearer total picture of the buildings' performance.

A full range of BACnet room transmitters is now available for building automation measurement. The multi-sensor **RTE-BAC, RRH-BAC, RCD-BAC, and RLL-BAC models** are designed for monitoring temperature, humidity, CO_2 with automatic calibration, light level, and occupancy, and can be used as stand-alone or as a part of the BMS system via BACnet MS/TP communication. The transmitters are available with a variety of options for functionality requirements in various projects. The transmitters can also operate as controllers modulating analogue outputs, for example. *Pages 53, 57, 104 and 116*

The BACnet multi-I/O-modules DIO4-BAC-DIN, IO10-BAC-DIN, and IO10-BAC-DIN-AI are ideal for reading digital, analogue (0...10 V) and resistive inputs and controlling digital and analogue 0...10 V outputs using BACnet communication. The input/output modules support standard BACnet objects and device discovery and are either wall or DIN rail mounted. *Page 134*

The RI-BAC room unit provides a room control interface for use with controllers and BMS systems. The units have a BACnet MS/TP bus connection, built-in temperature sensor, and backlit display showing the system status. The humidity or CO_2 measurement and number of push-button versions for user adjustments are available as an option. *Page 40*

Configuration backup and replication of Produal BACnet transmitters is carried out via Windows software, with **SW-DCT-USB configuration cable.** *Page 138*

PRODUAL CLASSICS

For more than 30 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 offering includes over 1000 products for controlling, measuring, actuating and commissioning, completed with system components. These traditional Produal products, as an example of our extensive portfolio, are helping in many ways in the customer projects, making the installation easy and saving costs.

RY1-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 126*

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 126*

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 123*

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. *Page 115*

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 110*

HDH-AL3 and HDH-N-AL3 transmitters provide information about the current indoor CO_2 level via the display and/or leds. Leds are a great way to get the user's attention when air quality needs improvement. *Page 56*

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 127*

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 124*

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 127*

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. *Page 132*

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 126*

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 134*

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 108*

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.

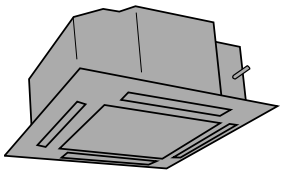
Please note that most of our transmitters are equipped with control output and can be used as single-sequence controllers for heating/cooling or ventilation.

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. Room controllers HLS 44-SE and TRC can both handle different output and input types, with simple touch buttons or with an intuitive full-screen touch display.

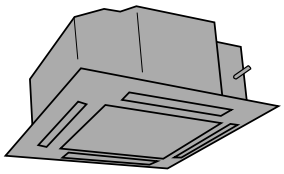
● Room controller HLS 44-SE *(Page 20)*

● Room controller TRC *(Page 16)*



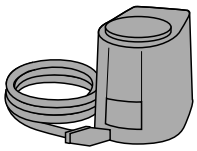
● ●

0...10 V EC fan control



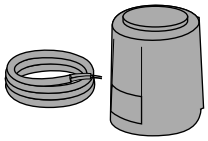
● ●

3-step fan control



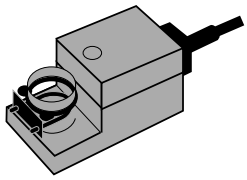
● ●

0...10 V actuators *(Page 119)*



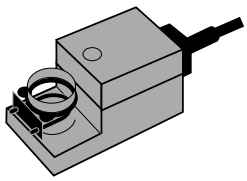
● ●

24 Vac actuators (on/off or PWM) *(Page 119)*



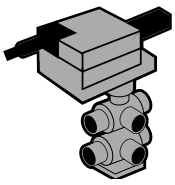
● ●

0...10 V damper motors



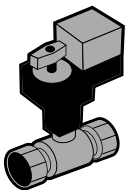
● ●

24 V damper motors



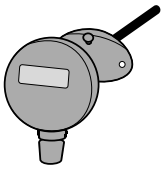
● ●

0...10 V 6-way valve control



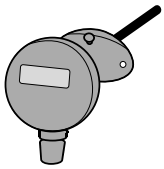
●

3-point actuators



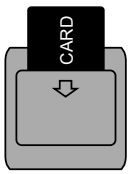
● ●

External passive sensors *(Page 80)*



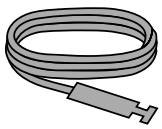
● ●

External 0...10 V active sensors *(Page 80)*



● ●

Key card input



● ●

Condensation input *(Page 110)*

ROOM CONTROLLER INPUTS AND OUTPUTS

Product	Page	Analogue inputs	Digital inputs	Analogue outputs	Digital outputs
TRC-A-3A	16	2[2)]	1	3	0
TRC(-P)-3A	16, 18	2[2)]	1	3	0
TRC(-P)-2A3R	16, 18	1[2)]	1	2	3[1)]
TRC(-P)-H-2A3R	16, 18	1[2)]	1	2	3[1)]
TRC(-P)-1A2T	16, 18	2[2)]	1	1	2
TRC(-P)-1A4R	16, 18	2[2)]	1	1	4[1)]
TRC(-P)-H-3R2T	16, 18	2[2)]	1	0	2 + 3[1)]
TRC(-P)-H-1A2R	16, 18	2[2)]	1	1	2[1)]
HLS 44-SE	20	1	2	4	2
HLS 44-V	20	1	2	2	4
HLS 44-CO2	20	1	2	4	2
HLS 44-3P	20	1	2	2	4
HLS 45	20	1	2	4	2
HLS 33	22	1 (HLS 33-EXT)	1	2	2
HLS 21	22	1 (HLS 21-EXT)	1	0	2
HLS 16	23	0	0	0	1

[1)] Relay outputs

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

In conference rooms, HLS 44-CO2 (page 20) can control chilled beams with cooling and a damper actuator for ventilation if the CO_2 values are too high, or if cooling is required. Heating is controlled with radiators.

HLS 45 (page 20) 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 126). HLS 45 can be connected to Modbus RTU.

ROOM CONTROLLER SELECTION GUIDE

NOTE: Check the product pages for more information.		Room controller families													
		HLS 16	HLS 21	HLS 33	HLS 44-SE	HLS 44-V	HLS 44-CO2	HLS 44-3P	HLS 45	TRC	TRC-P	TRC-A	TRT-1R	TRT-P-1R	TRT-H-2R2T
	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	1	2	2/3	2/3	2/3	2/3	2/3	1/2	2/2	2/2	2/2	1	1	2
	Control modes	P	P	P/PI	P/PI	P/PI	P/PI	P/PI	P/PI	P/PI	P/PI	P/PI	Stat	Stat	P
	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	o	o	•	•	•	•	•	•	•	•	•	•	•
	Touchscreen									•	•	•	•	•	•
	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	23	22	22	20	20	20	20	20	16	18	16	24	24	24

ROOM CONTROLLERS

1

room °C, %rH, CO_2

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

Range (temperature)	0...50 °C
Accuracy (temperature)	±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	Apartment controller, 2RI/DI, 1DI, 3AO	TRC-A-3A		B					
		Room controller, 2RI/DI, 1DI, 3AO	TRC-3A		C					
		Room controller, 1RI/DI, 1DI, 2AO, 3RO, 0.5 A	TRC-2A3R		D					
		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, 1AO, 3RO, 1RO	TRC-1A4R		G					
		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 RI input(s))	-AI						1	
		Control extension (not available for TRC-A-3A)	-CE						2	
		0...10 Vdc input(s) (replaces RI input(s)) + Control extension (not available for TRC-A-3A)	-AI-CE						3	
6	Body colour	Chrome								0
		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)*

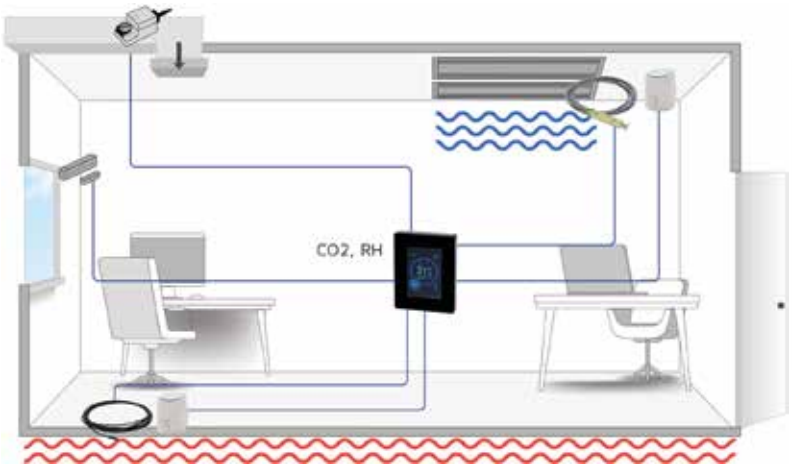
CE *Control extension. The extension provides control for lights and blinds and extension override function.*

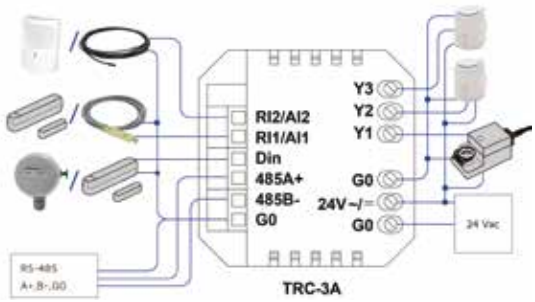
TRC-A-3A is designed for apartment control with pressure balancing of the supply and extract flows, interlinks to the kitchen extractor, heating/cooling control and simple Home/Away/Boost selection screens.

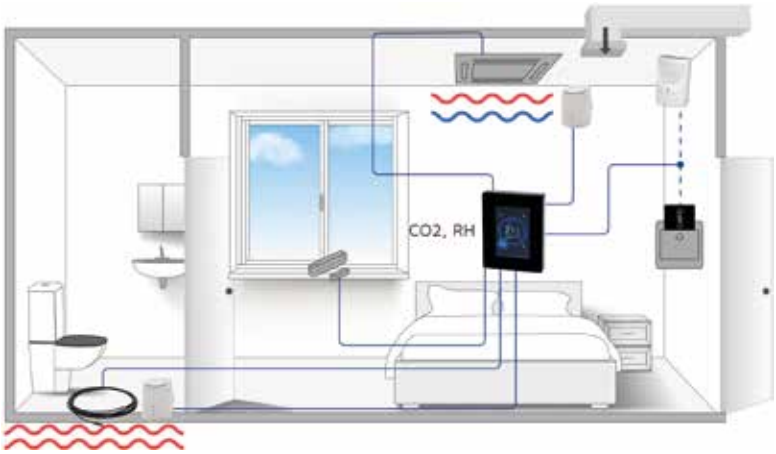
TRC-3A is an advanced room temperature and CO_2 controller where the analogue outputs can be configured for wide range of functions (e.g. heating, cooling, EC fan, maximum of CO_2 and cooling stages, humidity control, change-over control).

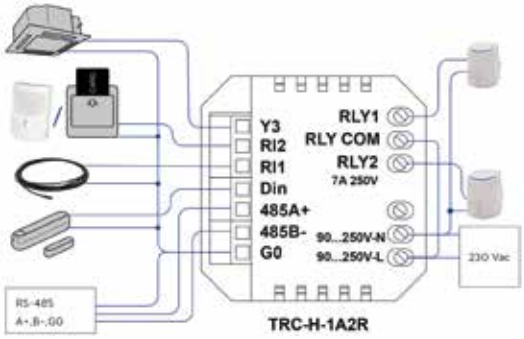
NOTE: *You can select also Fahrenheit for temperature unit during commissioning.*

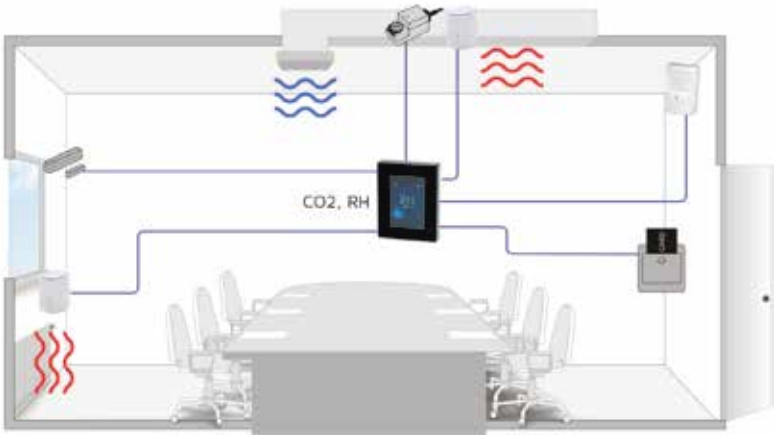
ROOM CONTROLLERS

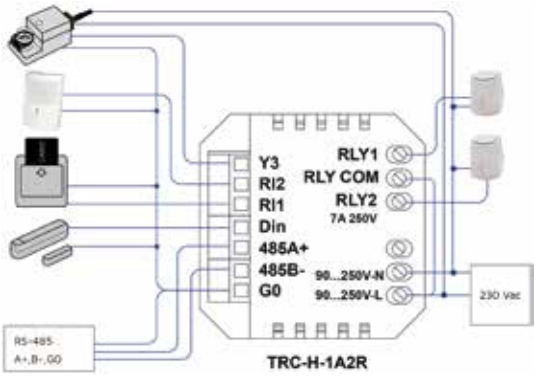


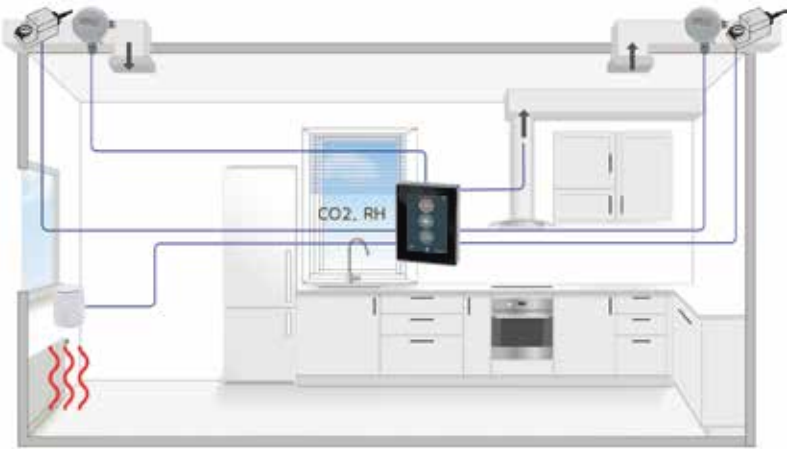


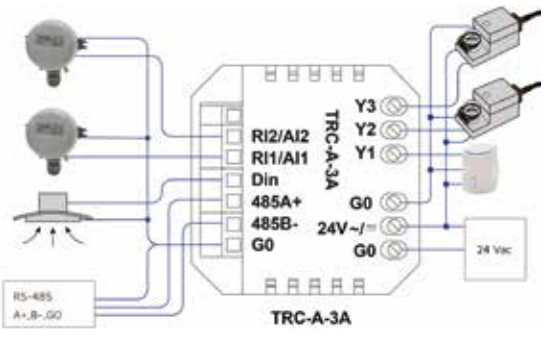












ROOM CONTROLLERS

NEW

1

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

room °C, %rH, CO_2

Range (temperature)	0...50 °C
Accuracy (temperature)	±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, 0.5 A, schedule	TRC-P-2A3R		P					
	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, 1AO, 3RO, 1RO, schedule	TRC-P-1A4R		S					
	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 RI input(s))	-AI						1	
6 Body colour	Chrome								0
	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)*

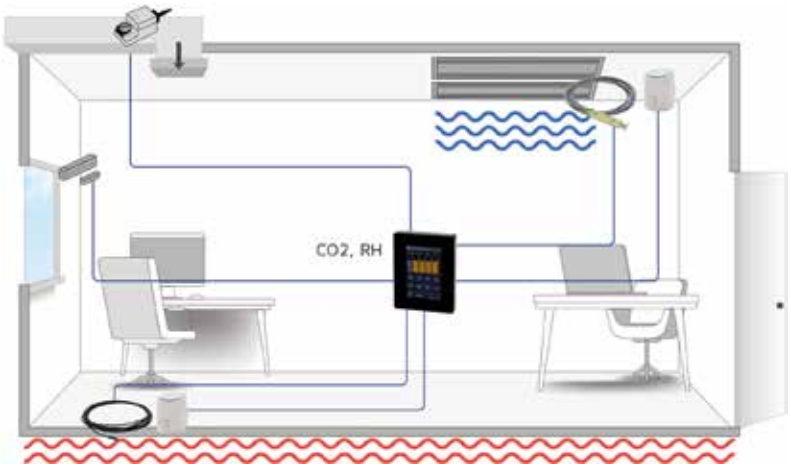
AO *0...10 Vdc analogue output (selectable function e.g heating, cooling, max VAV, EC fan, lights control, blinds control, humidity control, alarm output)*

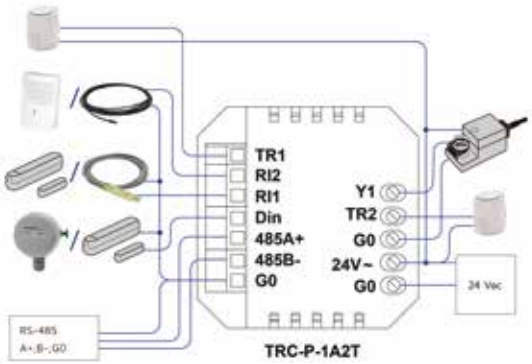
DO *24 Vac PWM output (thermal actuator heating/cooling control, requires 24 Vac supply)*

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).

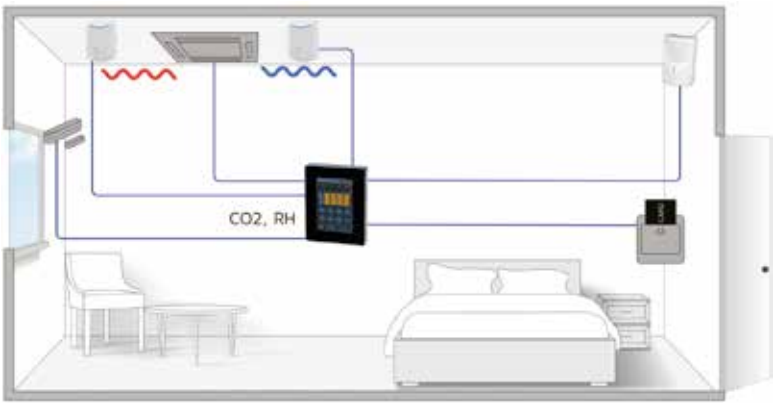
NOTE: *You can select also Fahrenheit for temperature unit during commissioning.*

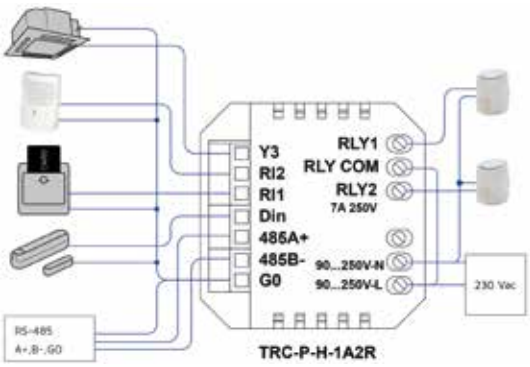
ROOM CONTROLLERS



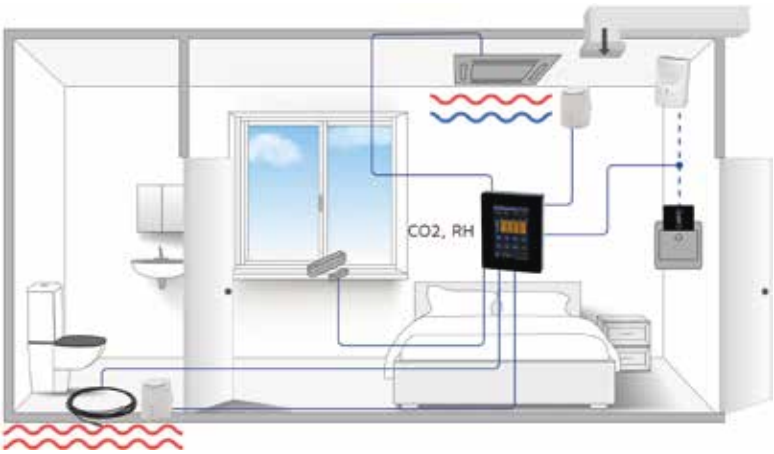


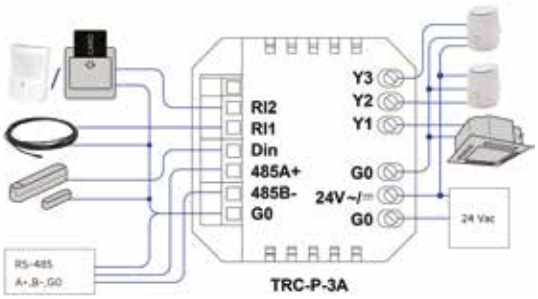
TRC-P-1A2T



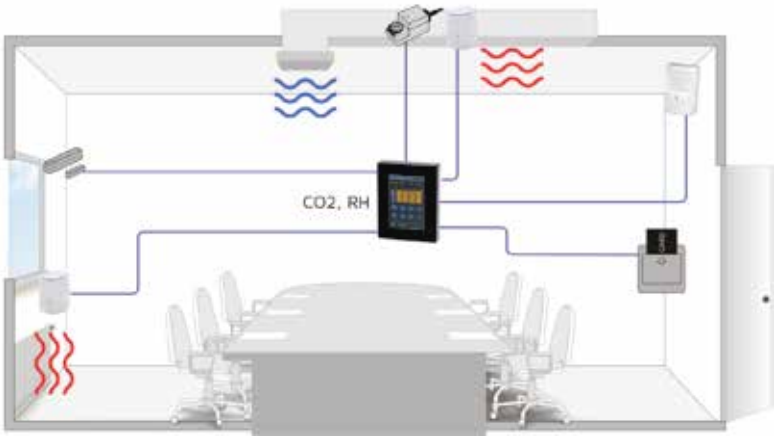


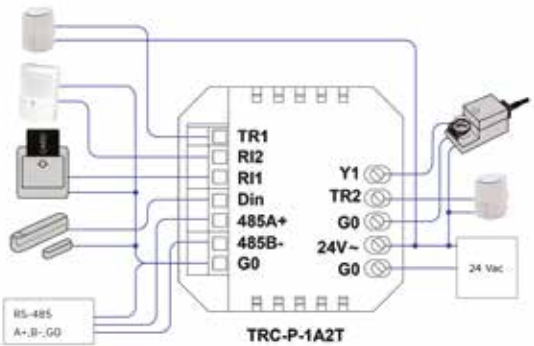
TRC-P-H-1A2R





TRC-P-3A





TRC-P-1A2T

ROOM CONTROLLERS

1

room °C

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 model, introduced in 2020 to grant long term availability and development possibility for our top seller room controller family, is the latest and most advanced release of HLS 44, which includes new functionalities previously available in different base models (HLS 44, HLS 44-EC, HLS 44-6W). 6-way valve control, adjustable 3-speed fan voltages, the possibility to dim the display with a timer and change the setpoint adjustment to a relative, with + and - steps, are examples of advanced functionalities now included in HLS 44-SE.

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.

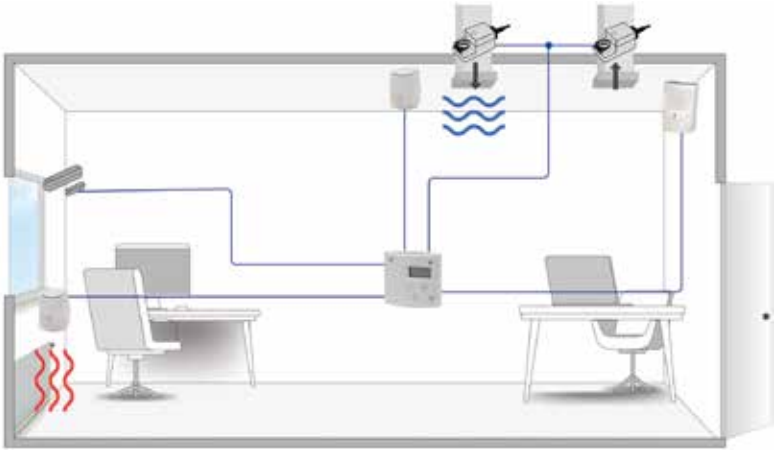
Supply	24 Vac/dc, < 1 VA NOTE: Only the 0...10 V outputs and Modbus work when using DC supply voltage.
Setpoint	18...26 °C, adjusted by push buttons or by bus communication
Accuracy (temperature)	±0,5 °C
IP protection class	IP20
Ambient temperature	0...50 °C
Ambient humidity	0...85 %rH
Mounting	on the wall surface or on a flush mounting box (60 mm hole distance)
Materials	ABS plastic
Dimensions	87 x 86 x 32 mm

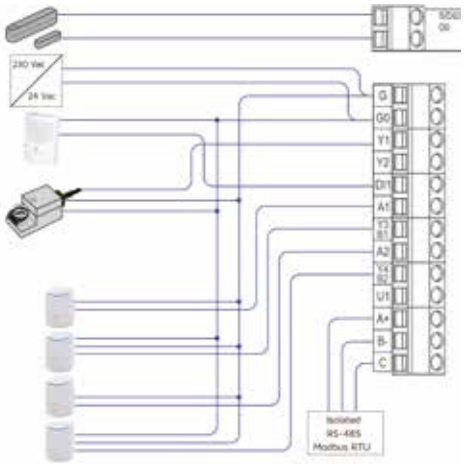
TYPE	ART NO.	
HLS 44-SE	1150400	room temperature controller, Modbus communication
HLS 44-3P	1150280	room temperature controller, Modbus communication, 3-point actuator control
HLS 44-CO2	1150370	room temperature controller, Modbus communication, built-in CO_2 sensor
HLS 44-V	1150260	room temperature controller, Modbus communication, lighting control
HLS 45	1150270	room temperature controller, Modbus communication, floor heating and cooling control

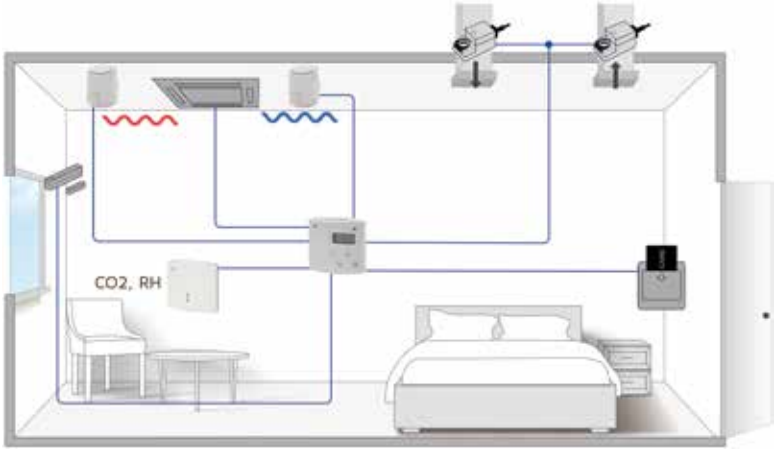
OPTIONS / ACCESSORIES		
TH 5	1183090	driver for thermal actuators, 5 outputs

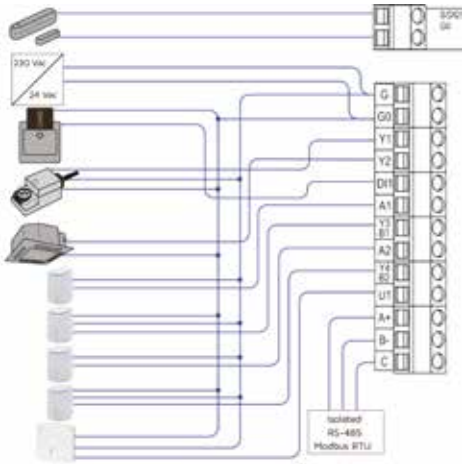
TOOLS		
HLS 44-SE-SER	1150401	configuration tool for HLS 44-SE
HLS 44-3P-SER	1150281	configuration tool for HLS 44-3P
HLS 44-CO2-SER	1150371	configuration tool for HLS 44-CO2
HLS 44-SER	1150251	configuration tool for HLS 44-V
HLS 45-SER	1150271	configuration tool for HLS 45

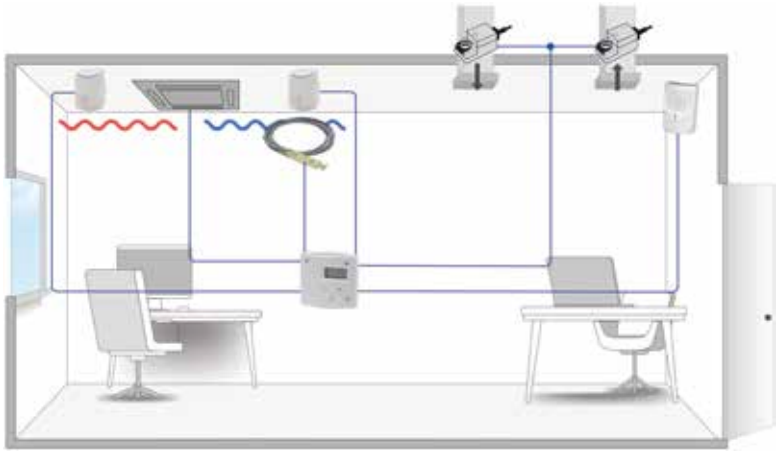
ROOM CONTROLLERS

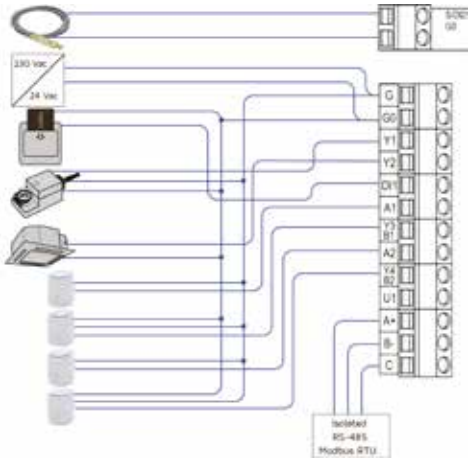


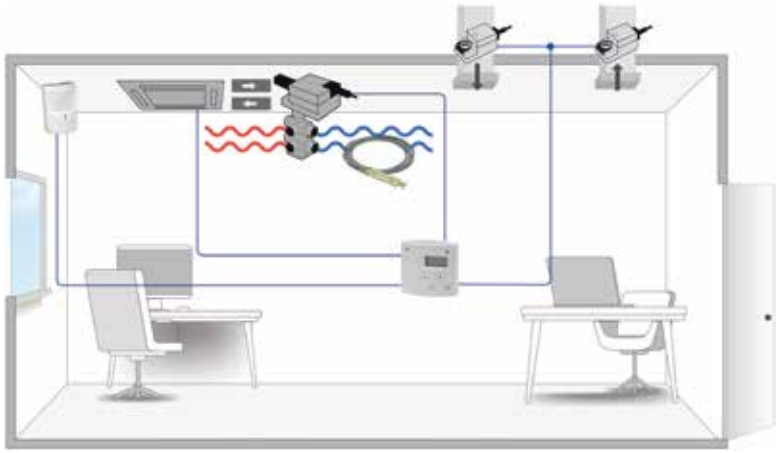


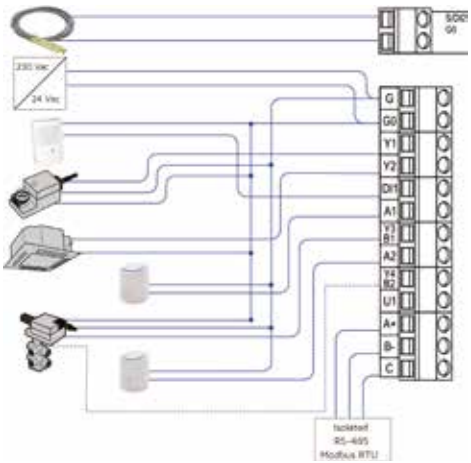












ROOM CONTROLLERS

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

Supply	24 Vac, < 2 VA
Setpoint	18...24 °C, ±3 °C
Range (temperature)	0...50 °C
Accuracy (temperature)	±0,5 °C
Output	2 x 0...10 Vdc, 2 mA, for heating and cooling
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
Dimensions	86 x 86 x 32 mm

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

OPTIONS / ACCESSORIES

TH 5	1183090	driver for thermal actuators, 5 outputs

ROOM CONTROLLERS

HLS 21 is a 2-stage controller for room temperature control. The controller has one thermal (PWM) actuator stage for both heating and cooling.

room °C

Supply	24 Vac, < 2 VA
Setpoint	18...24 °C, ±3 °C
Range (temperature)	0...50 °C
Accuracy (temperature)	±0,5 °C
Output (cooling)	24 Vac, 1 A, for thermal actuator
Output (heating)	24 Vac, 1 A, for thermal actuator
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
Dimensions	86 x 86 x 32 mm

TYPE	ART NO.	
HLS 21	1150100	room controller, internal temperature sensor
HLS 21-EXT	1150102	room controller, for an external NTC10 temperature sensor
HLS 21-N	1150101	room controller with display, internal temperature sensor
HLS 21-N-EXT	1150103	room controller with display, for an external NTC10 temperature sensor

OPTIONS / ACCESSORIES

TH 5	1183090	driver for thermal actuators, 5 outputs

ROOM CONTROLLERS

room °C

HLS 16 is a 1-stage controller for room temperature control. Both heating and cooling are controlled by using the same valve. The function of the valve can be changed by using external (summer / winter) switch connected to the Z1 terminal.

Supply	24 Vac, < 1 VA
Setpoint	18...24 °C, ±3 °C
Range (temperature)	0...50 °C
Accuracy (temperature)	±0,5 °C
Output	24 Vac, 1 A, for thermal actuator (NC or NO)
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
Dimensions	86 x 86 x 32 mm

TYPE	ART NO.	
HLS 16	1150160	room controller, for floor heating/cooling
HLS 16-N	1150161	room controller with display, for floor heating/cooling

OPTIONS / ACCESSORIES

TH 5	1183090	driver for thermal actuators, 5 outputs

SMART THERMOSTATS

room °C, %rH

The TRT smart thermostats offer a modern flush mounted slim design look for heating or cooling control. TRT-H range has multizone control (main space and bathroom) with 24 Vac PWM outputs. TRT series thermostats have 3.5" backlit colour touchscreen and have a wide range of power options. The MOD models have built-in Modbus RTU communications and the BAC models provide BACnet MS/TP communications. The thermostats can also be configured to be used as a lighting and/or air conditioning interface. The thermostats are also available with 7-day schedule with multiple setpoints.

Range (temperature)	0...50 °C
Accuracy (temperature)	±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
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					
	Multi-zone room thermostat, 1RI/DI, 1DI, 2RO, 2DO	TRT-H-2R2T		4					
2 Communication	No communication (only TRT-1R, TRT-P-1R)				A				
	Modbus RTU	-MOD			M				
	BACnet MS/TP	-BAC			B				
3 Power supply	24 Vac/dc	-24				2			
	12 Vdc (only TRT-1R, TRT-P-1R)	-12				1			
	90...250 Vac (only TRT-1R, TRT-P-1R)	-230				M			
4 Additional measurements	No additional measurement						0		
	Relative humidity	-RH					1		
5 Reserved								0	
6 Body colour	Chrome								0
	White (RAL 9010)	-W							W
	Black (RAL 8022)	-B							B

TOOLS

SW-DCT-USB	1139040	configuration cable

TRT ordering guide explanation:

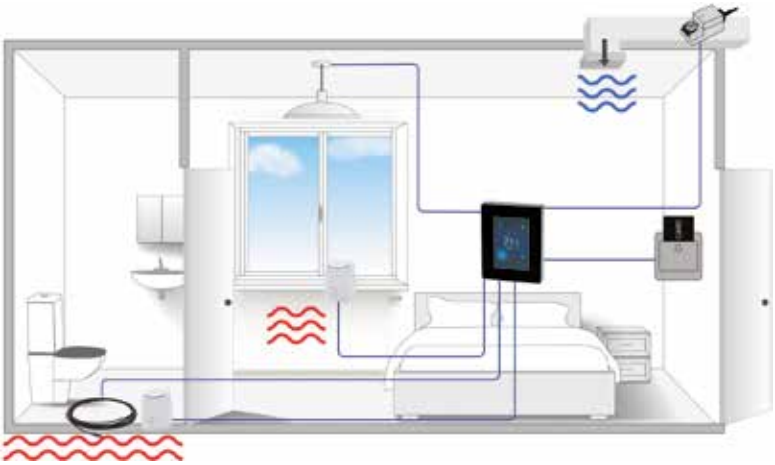
RI/DI External NTC 10 temperature input (selectable e.g. for control, high/low limit control)
These inputs can be configured also to work as digital inputs.

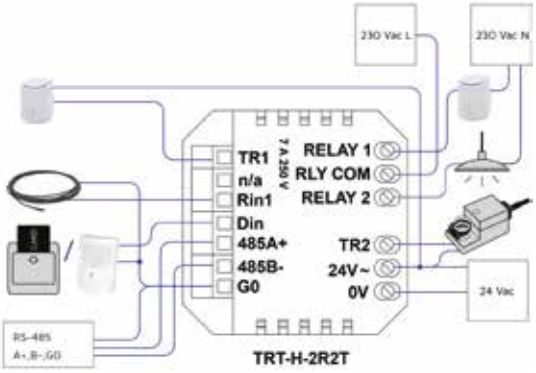
DI Voltage free digital input (selectable for e.g ECO override, OFF override, heating/cooling mode, alarm)

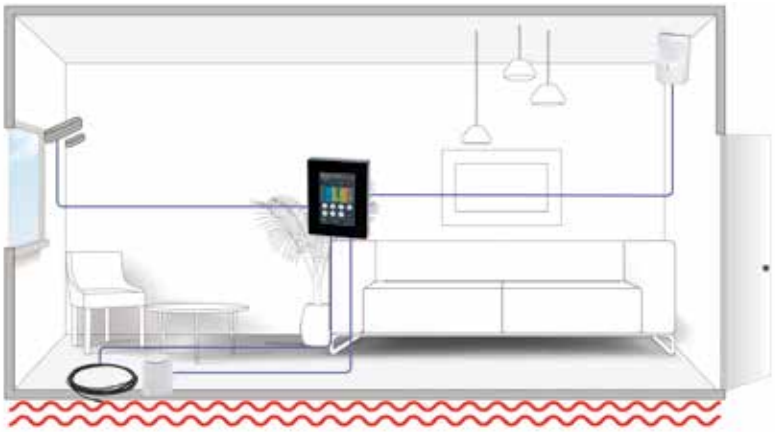
RO 230 Vac SPST relay, 7 A resistive (for heating/cooling control, zone 2 heating control)

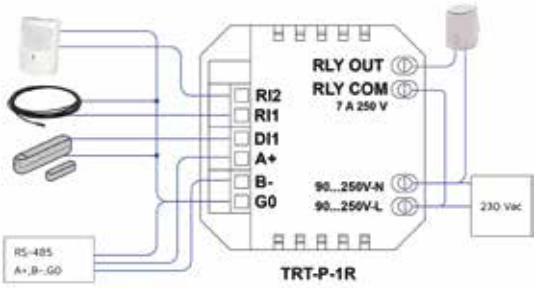
***NOTE:** You can select also Fahrenheit for temperature unit during commissioning.*

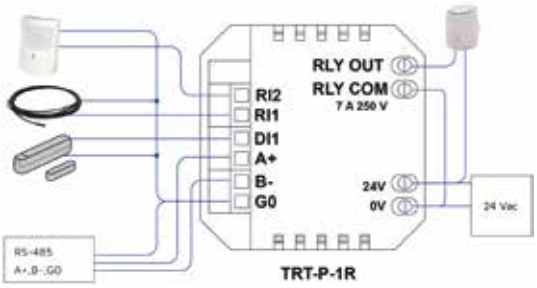
SMART THERMOSTATS





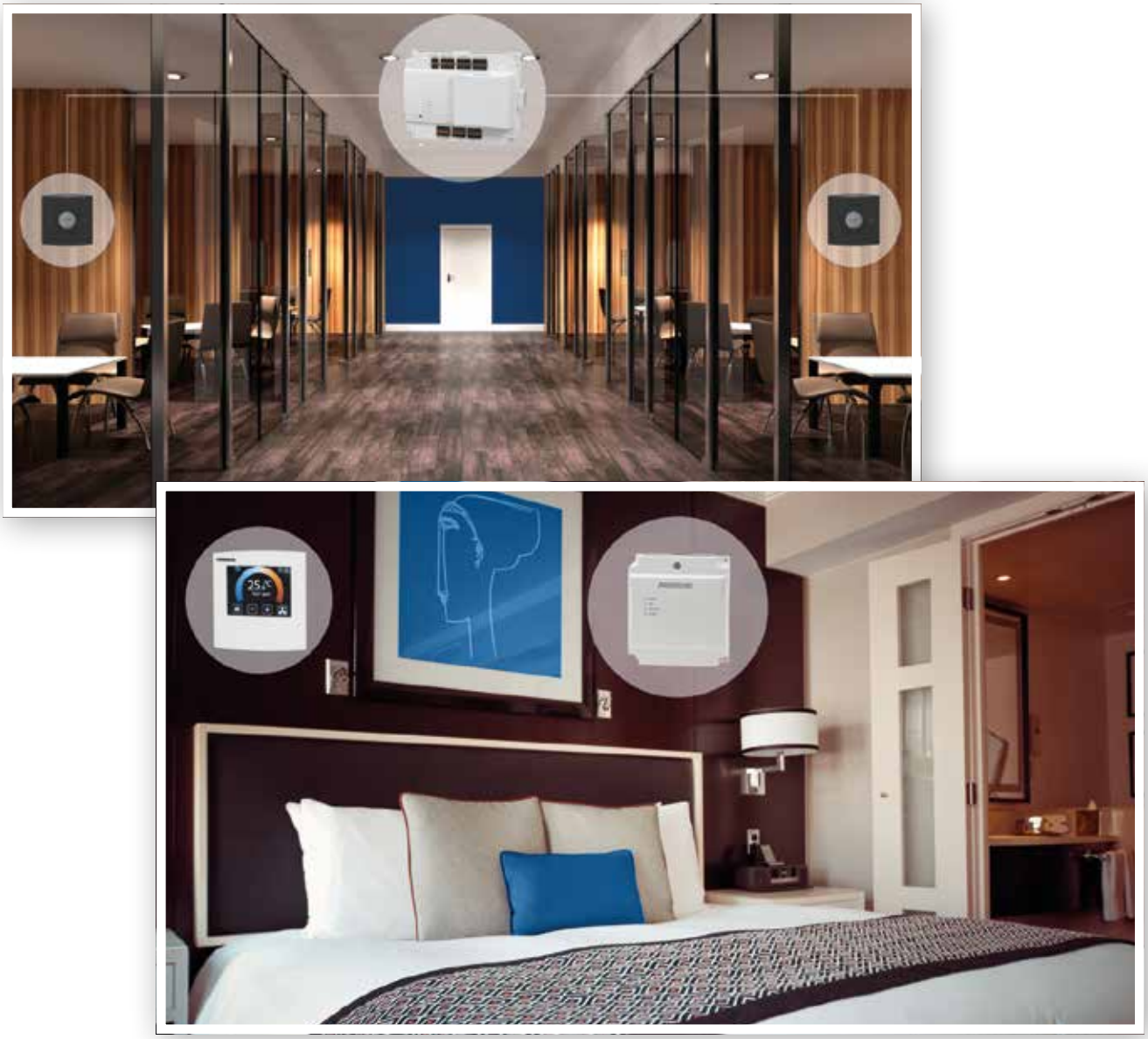






CONTROL UNITS

The 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 Produal MyTool® Android application. In this illustration, Proxima CU is controlling two conference rooms with our new room unit.



With Proxima CU-LH's inputs and outputs, it can control a wide range of system scenarios. In this case, CU-LH controls a hotel room with cooling, heating, and EC fan (0...10 V) in 3 steps. Even the bathroom floor heating is controlled by CU-LH with its integrated cascade controller. With Produal MyTool®, created configuration files can be stored in the cloud and on the local Android device. Configuration files can easily be sent by e-mail to Produal, to get fast support when configuring complex system and functions. Produal also provides ready-made configuration files for different applications. See the application files on our website www.produal.com and browse under Produal Proxima® CU-LH product.

CONTROL UNIT INPUTS AND OUTPUTS

Product	Page	Analogue inputs	Digital inputs	Analogue outputs	Digital outputs	Note
CU	28	6	6	6	4	Universal inputs (6 pcs) and outputs (6 pcs).
CU-LH	30	3	3	4	2	Multifunctional inputs (3 pcs) and outputs (4 pcs)
C230	32	4	4	2	2	Multifunctional inputs
PDS 2.2	33	2	0	2	2	
HS 2.2-M	33	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	C230	CU-LH	CU
	230 V supply voltage and output			•		
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	2/2
	Control modes	P/PI	P/PI	P/PI	P/PI	P/PI
	Cascade control			•	•	•
	230 V 3-speed fan control			•		
	3-speed fan control with FCRY 3			•	•	•
	EC fan control			•	•	•
	VAV control			•	•	•
	Summer/winter			•		
	Key card input			•	•	•
	CO_2 based ventilation control			•	•	•
	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	33	33	32	30	28

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.

Supply	24 Vac/dc, < 7 VA
Input	6 x multifunctional input (NTC 10 / Pt1000 / Resistive / Potential free contact / 0...10 Vdc)
Accuracy (temperature)	±0,5 °C
Output	4 x multifunctional output (0...10 Vdc, 2 mA / 24 Vac, 1 A (PWM))
Output	2 x multifunctional output (0...10 Vdc, 2 mA / 0...20 mA, 700 Ω)
Output	2 x 24 Vac supply output, 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
Dimensions	186 x 136 x 55 mm

TYPE	ART NO.	
CU	5201010000	multifunctional control unit, white
CUB	5201010003	multifunctional control unit, black

OPTIONS / ACCESSORIES		
CUCC	5201010400	cable covers for Proxima CU and WBU (includes two covers and four fixing screws)
TH 5	1183090	driver for thermal actuators, 5 outputs

TOOLS	
MyTool	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 36)

The versatile and customizable touchscreen room unit can be connected to the room unit port on the control unit.

ROU (page 39)

The advanced touchscreen room unit can be connected to the room unit port on the control unit.

RU (page 38)

The customizable room unit can be connected to the room unit port on the control unit.

TEHR NTC 10-P (page 102)

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.

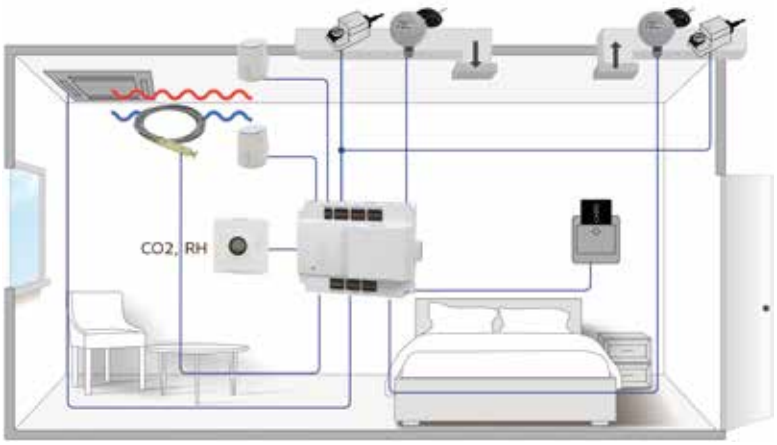
TEHR LU-PU (page 103)

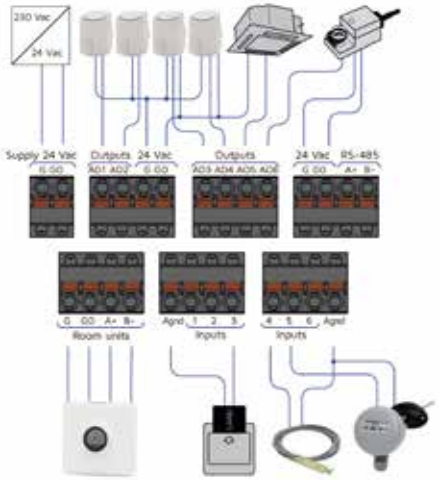
Room temperature transmitter with active potentiometer can be connected to input terminals on the control unit for setpoint and temperature.

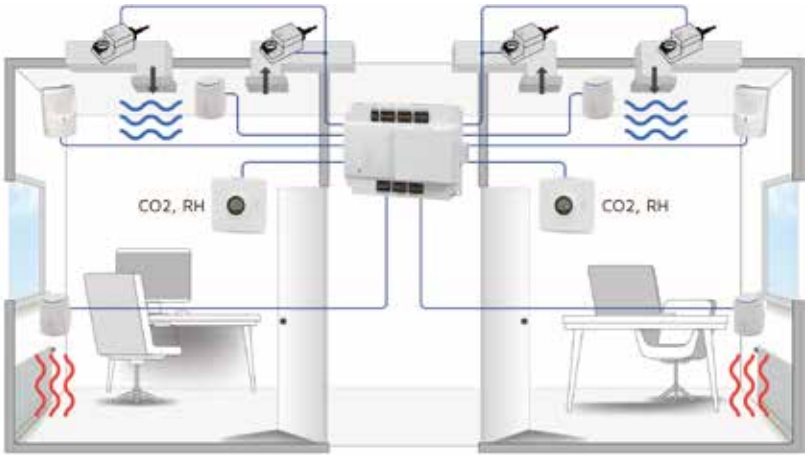
HDH-PU (page 56)

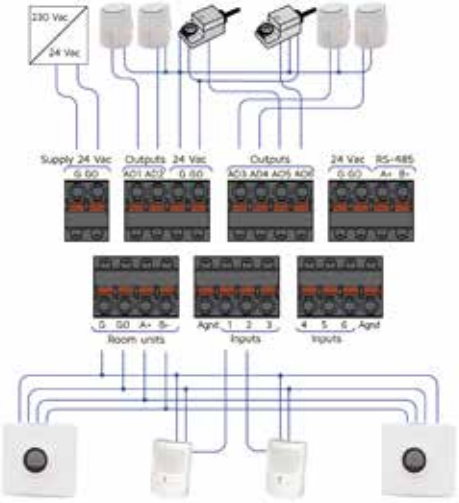
Room CO_2 transmitter with active potentiometer can be connected to input terminals on the control unit for setpoint, temperature and CO_2.

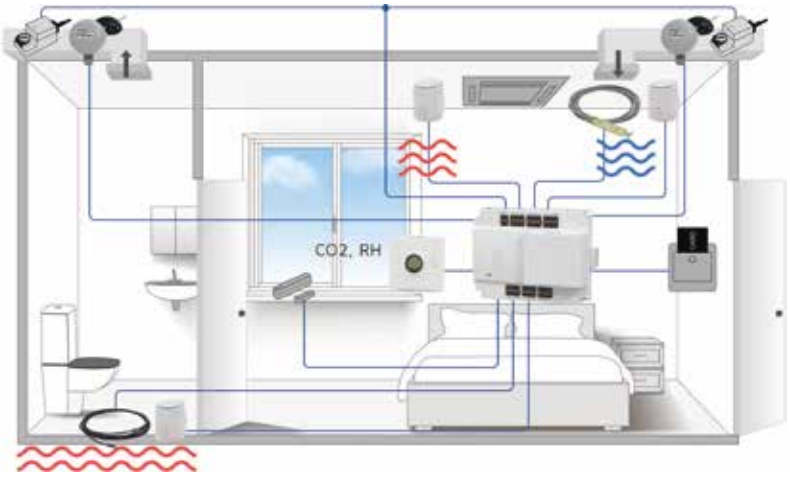
CONTROL UNITS

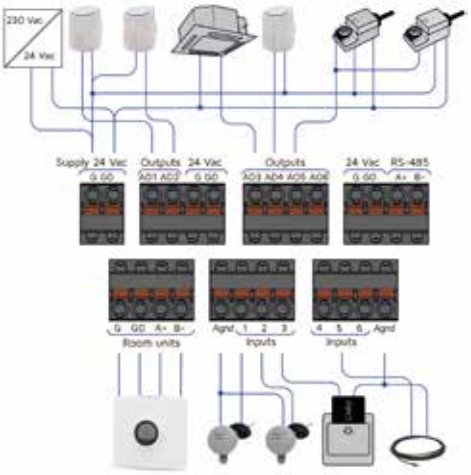












CONTROL UNITS

NEW

1

Produal Proxima® CU-LH control unit brings 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.

Supply	24 Vac/dc, < 2 VA
Input	3 x multifunctional input (NTC 10 / Resistive / Potential free contact / 0...10 Vdc)
Accuracy (temperature)	±0,5 °C
Output	2 x multifunctional output (0...10 Vdc, 2 mA / 24 Vac, 1 A (PWM))
Output	2 x multifunctional output (0...10 Vdc, 2 mA)
Output	2 x 24 Vac supply output, 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
Dimensions	116 x 128 x 47 mm

TYPE	ART NO.	
CU-LH-MOD	52011W1000	control unit, white, Modbus RTU
CU-LHB-MOD	52011B1000	control unit, black, Modbus RTU
CU-LHB-BAC	52011B2000	control unit, black, Modbus RTU/BACnet MS/TP
CU-LH-BAC	52011W2000	control unit, white, Modbus RTU/BACnet MS/TP

OPTIONS / ACCESSORIES		
CA-SR	5201A00S00	cable strain relief set
TH 5	1183090	driver for thermal actuators, 5 outputs

TOOLS		
MYT-CON	5100020000	MyTool Connect, a Bluetooth dongle for Produal MyTool® connection
MyTool		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 36)

The versatile and customizable touchscreen room unit can be connected to the room unit port on the control unit.

ROU (page 39)

The advanced touchscreen room unit can be connected to the room unit port on the control unit.

RU (page 38)

The customizable room unit can be connected to the room unit port on the control unit.

TEHR NTC 10-P (page 102)

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.

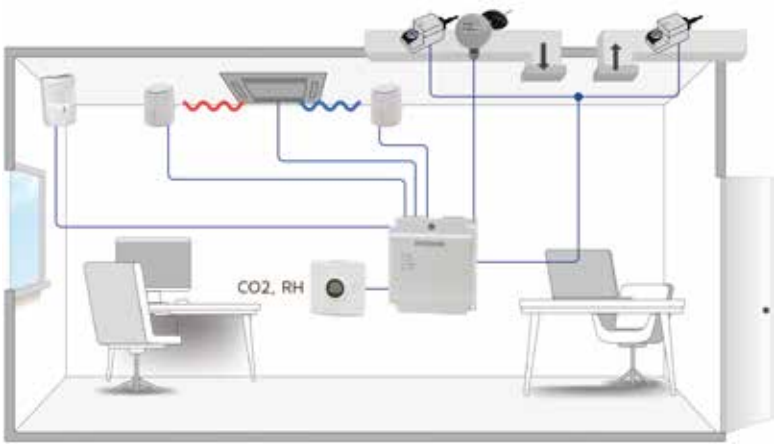
TEHR LU-PU (page 103)

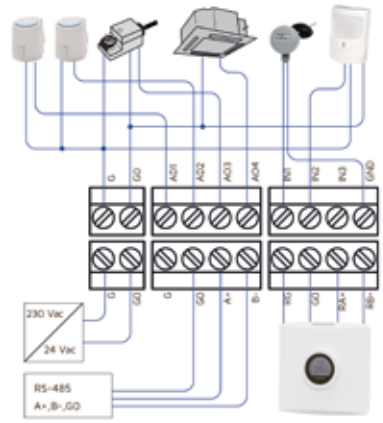
Room temperature transmitter with active potentiometer can be connected to input terminals on the control unit for setpoint and temperature.

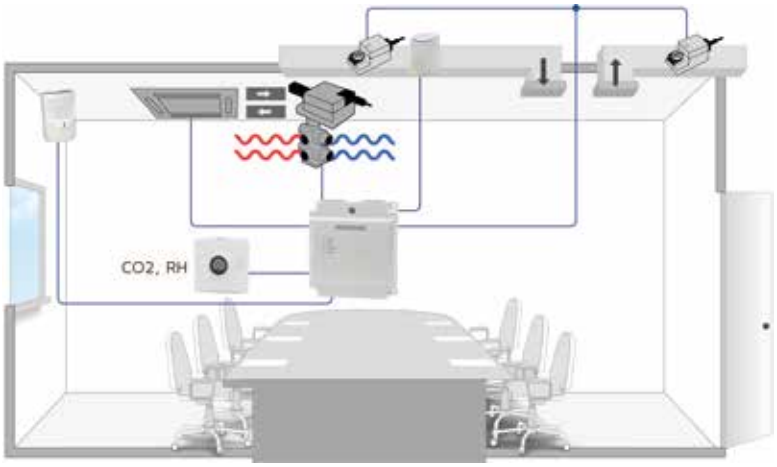
HDH-PU (page 56)

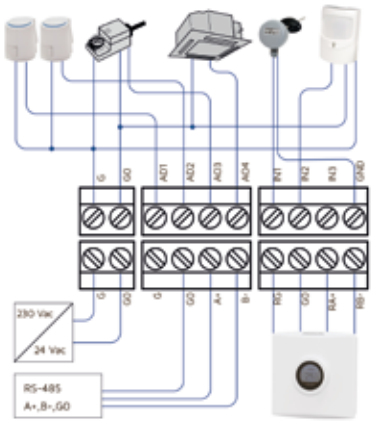
Room CO_2 transmitter with active potentiometer can be connected to input terminals on the control unit for setpoint, temperature and CO_2.

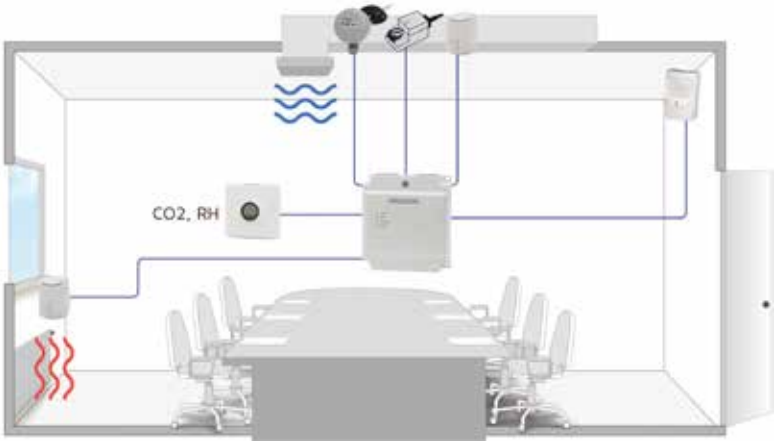
CONTROL UNITS

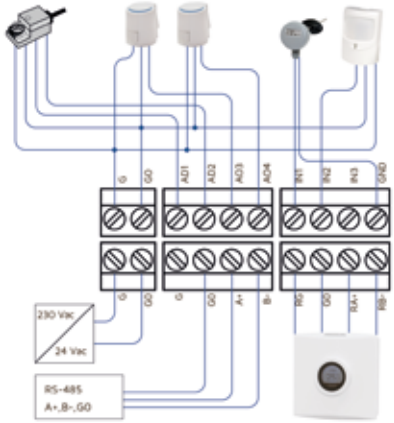


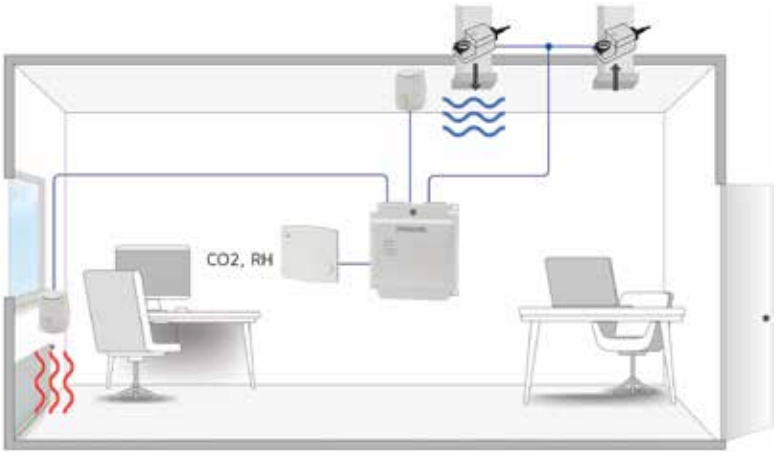


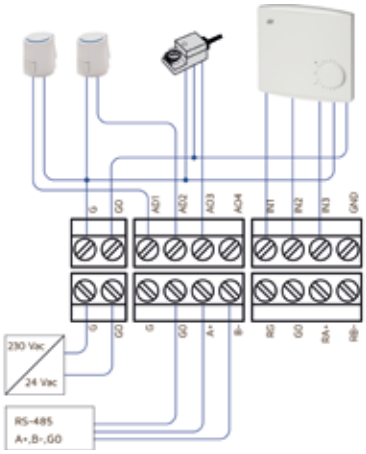












CONTROL UNITS

1

C230 is a multifunctional controller designed especially for individual room temperature and zone control applications. C230 is supplied with 230 V and it controls fan coil units and actuators. Controller has a galvanically isolated RS-485 connection for Modbus RTU communication. The controller has a terminal with 24 Vac (10 VA) supply voltage for external equipment.

Supply	230 Vac, < 10 VA
Input	3 x NTC 10, 0...10 Vdc or contact
Input	1 x contact for operation mode selection
Input	occupancy or 0...10 Vdc setpoint
Accuracy (temperature)	±0,5 °C
Output	2 x 0...230 Vac, 400 mA, heating / cooling
Output	2 x 0...10 Vdc, 10 mA, heating / cooling / VAV / EC fan control
Output	3 x 230 Vac, max motor load 2,4 A (570 W), max resistive load 4,0 A (960 W), relays for fan coil unit or damper control
IP protection class	IP20
Ambient temperature	5...50 °C
Ambient humidity	0...85 %rH
Mounting	on the wall surface or on 35 mm DIN rail
Dimensions	200 x 120 x 53 mm

TYPE	ART NO.	
C230	1155110	230V room temperature controller with Modbus communication
E121-01	1155080	room unit with setpoint potentiometer
E122-01	1155081	room unit with setpoint potentiometer and fan speed control switch
E123-01	1155082	room unit with setpoint potentiometer and timer
ROU-F	1150390	room unit with touch screen (flush mounting)
ROU-S	1150380	room unit with touch screen (surface mounting)
ROU-S-B	1150384	room unit with touch screen (surface mounting), black

OPTIONS / ACCESSORIES		
TH 5	1183090	driver for thermal actuators, 5 outputs

TOOLS		
H203	1155051	configuration tool

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:

ROU (page 39)

The advanced touchscreen room unit can be connected to the room unit port on the control unit.

E121 (page 41)

Room unit with passive potentiometer can be connected to the room unit port on the control unit.

E122 (page 41)

Room unit with passive potentiometer and fan speed control switch can be connected to the room unit port on the control unit.

E123 (page 41)

Room unit with passive potentiometer and timer can be connected to the room unit port on the control unit.

CONTROL UNITS

°C, %rH, Pa, bar, CO, CO_2, m/s, lx

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.

Supply	24 Vac/dc, < 2 VA NOTE: Only the 0...10 V outputs and Modbus work when using DC supply voltage.
Input	0...10 V, measurement
Input	0...10 V, external setpoint setting
Accuracy (temperature)	±0,5 °C
Output	0...10 Vdc, 2 mA
Output	2 x 24 Vac, 1 A, for thermal actuators or 3-point actuators
Output	10 Vdc, 2 mA, for 4,7...220 kΩ potentiometer
IP protection class	IP20
Ambient temperature	0...50 °C
Ambient humidity	0...85 %rH
Mounting	For 35 mm DIN rail
Dimensions	53 x 90 x 58 mm

TYPE	ART NO.	
PDS 2.2	1150150	universal controller

OPTIONS / ACCESSORIES

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.

Supply	24 Vac/dc, < 1 VA NOTE: Only the 0...10 V outputs and Modbus work when using DC supply voltage.
Input	0...10 V, 10 kΩ
Input	2 x DI, potential free contact
Accuracy (temperature)	±0,5 °C
Output	3 x 0...10 Vdc, 2 mA
Output	24 Vac, 1 A, for thermal actuator or 3-point actuator
Output	10 Vdc, error signal
IP protection class	IP20
Material	ABS plastic
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)
Dimensions	87 x 86 x 30 mm

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

OPTIONS / ACCESSORIES

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.

1

- *temperature, relative humidity, CO_2, 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

BACnet

The classic RI-BAC room unit provides a room control interface to the BMS system, offering BACnet MS/TP networking. Number of push button versions are available for user adjustments.

ROOM UNIT SELECTION GUIDE

NOTE: Check the product pages for more information.	Room unit families				
	TRI	RU	ROU	RI-BAC	E12X
Temperature measurement	•	•	•	•	•
External temperature sensor input	•				
Humidity measurement	o	o	o	o	
CO_2 measurement	o	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	**36**	**38**	**39**	**40**	**41**

• standard
o optional

[1)] a total of three outputs

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 UNITS

1

room °C, %rH, CO_2

The TRI series touchscreen room units provide attractive user interface and 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 TRI series have 320 x 480 pixel 255 colour touchscreen that displays the plant and control status information on the modern intuitive user interface. The users can use the unit to change the control settings such as the setpoint, fan speed and operation mode. They can switch lights and air conditioning units on/off, or activate the Party Mode for extended or boost period.
The TRI units have additional measurement inputs/outputs that can be used as inputs/outputs to the BMS system (controllable over the network).

Range (temperature)	0...50 °C
Accuracy (temperature)	±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
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	No communication (only TRI-3A)				A				
	Modbus RTU	-MOD			M				
	BACnet MS/TP	-BAC			B				
3 Power supply	24 Vac/dc	-24				2			
	12 Vdc (only TRI-1R)	-12				1			
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	Chrome								0
	White (RAL 9010)	-W							W
	Black (RAL 8022)	-B							B

TOOLS

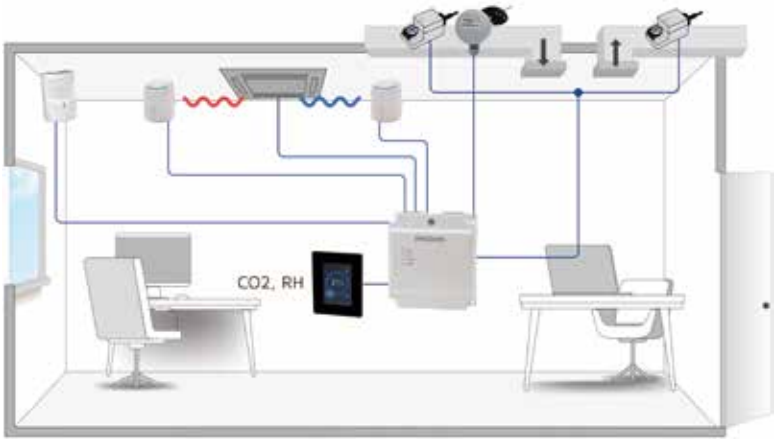
SW-DCT-USB	1139040	configuration cable

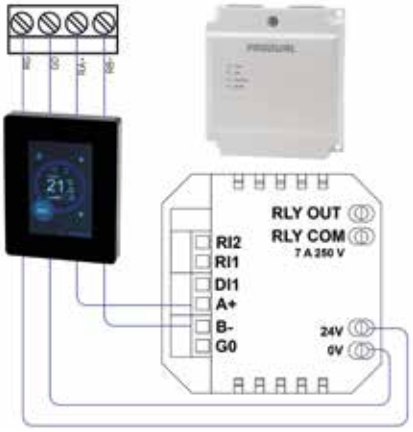
TRI ordering guide explanation:

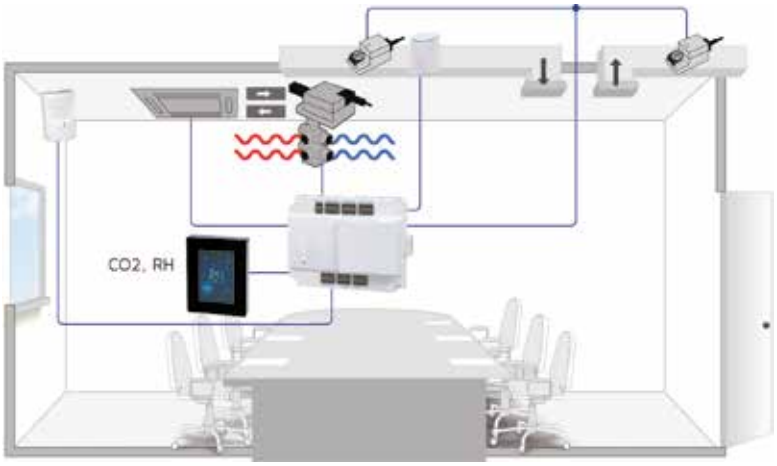
RI External NTC 10 temperature input
DI Voltage free digital input (for measurement and override)
RO 230 Vac SPST relay, 7 A resistive (for network/schedule switching)

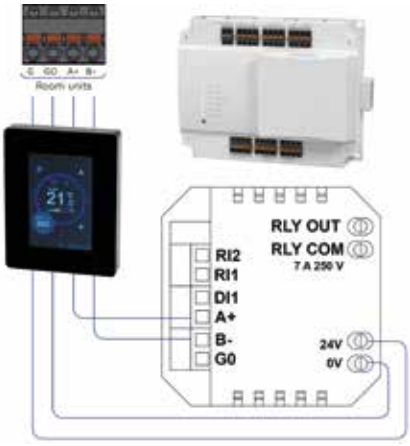
NOTE: *You can select also Fahrenheit for temperature unit during commissioning.*

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

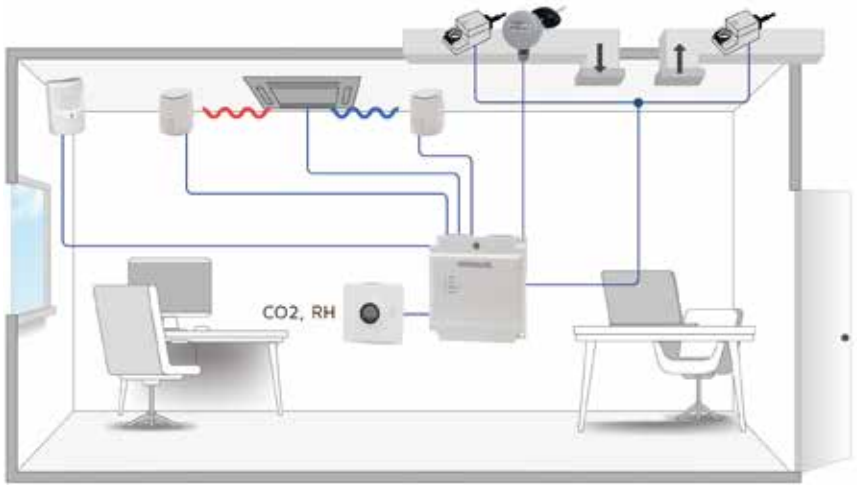
ROOM UNITS

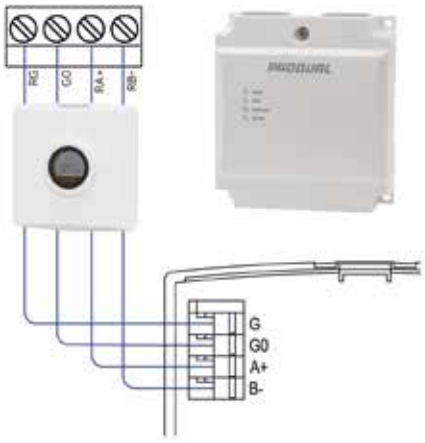
1

Produal Proxima® RU is a simple Modbus room unit designed to be used with the 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 man in house button. The indicator lights indicate the temperature setpoint and fan speed.

Supply	24 Vac/dc, < 1 VA
Range (temperature)	0...50 °C
Accuracy (temperature)	±0,5 °C (18...26 °C)
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	PC plastic
Dimensions	97 x 97 x 33 mm

Ordering guide		Type	0	1	2	3	4	5	6
0 Room unit type			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

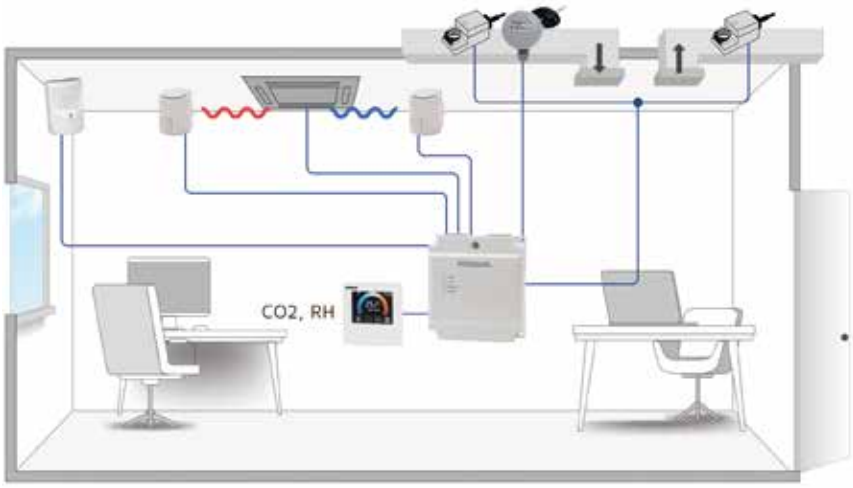
room °C, %rH, CO_2, PIR

ROU is an advanced room unit with easy-to-use touch screen functionality. It is designed to be used with above-the-ceiling control units. The basic room unit includes temperature measurement. Other measurements like CO_2 or occupancy are available as options. ROU can be used as a room unit for CU, CU-LH, C230 or as Modbus slave unit.

Supply	24 Vac/dc, < 2.5 VA
Setpoint	18...26 °C
Range (temperature)	0...50 °C
Accuracy (temperature)	±0,5 °C (25 °C)
IP protection class	IP20
Ambient temperature	5...40 °C
Ambient humidity	0...85 %rH

TYPE	ART NO.	
ROU-S	1150380	room unit with touch screen (surface mounting)
ROU-S-B	1150384	room unit with touch screen (surface mounting), black
ROU-F	1150390	room unit with touch screen (flush mounting)

OPTIONS / ACCESSORIES		
ROU-S-CO2-opt	1150382	CO_2 measurement option
ROU-PIR-opt	1150381	occupancy detection option
ROU-RH-opt	1150383	humidity option (for using with CU or for stand-alone room unit use)



BMS

ROOM UNITS

NEW

1

RI-BAC room units are designed to provide room interface for the building management systems. The units have BACnet MS/TP bus connection, built-in temperature sensor and backlit display that shows the system status. Depending on the model two, three or four push buttons can be used to change the setpoint, the operation mode and the fan speed. The humidity or CO_2 measurement is available as option.

room °C, %rH, CO_2

Supply	24 Vac/dc
Range (temperature)	0...50 °C
Accuracy (temperature)	±0,3 °C
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
Dimensions	86 x 120 x 29 mm

Ordering guide		Type	0	1	2	3	4	5	6
0 BACnet room units			6011			0	0	0	
1 Device type	Room unit, no buttons	RI-BAC		H					
	Room unit, setpoint buttons	RI-BAC-2B		J					
	Room unit, setpoint and fan buttons	RI-BAC-3B		K					
	Room unit, setpoint, fan and operation mode buttons	RI-BAC-4B		L					
2 Additional measurements	No additional measurement				0				
	Relative humidity	-RH			1				
	CO_2	-CO2			2				
3 Reserved						0			
4 Reserved							0		
5 Reserved								0	
6 Body colour	White (RAL 9010)								0
	Anthracite grey	-GR							B

TOOLS

SW-DCT-USB	1139040	configuration cable

BMS

ROOM UNITS

room °C

E12x room units are designed to be used with the C230 control units. All units have a built in temperature sensor and a setpoint knob. Units with timer and fan speed buttons also available. The indicator light indicates the current function (red (heating), blue (cooling), off (dead zone)).

Supply	12 Vdc, < 1 W (supplied from C2xx)
Setpoint	19...25 °C
Range (temperature)	0...50 °C
Accuracy (temperature)	±0,5 °C
IP protection class	IP20
Material	ABS plastic
Ambient temperature	5...40 °C
Mounting	on the wall surface or on a flush mounting box (60 mm hole distance)
Dimensions	87 x 86 x 30 mm

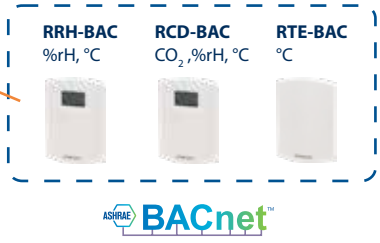
TYPE	ART NO.	
E121-01	1155080	room unit with setpoint potentiometer
E122-01	1155081	room unit with setpoint potentiometer and fan speed control switch
E123-01	1155082	room unit with setpoint potentiometer and timer
K43-3M	1155093	connector cable (3 m)
K43-5M	1155092	connector cable (5 m)

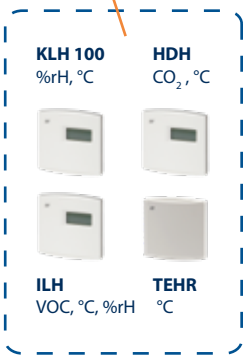
TRANSMITTERS

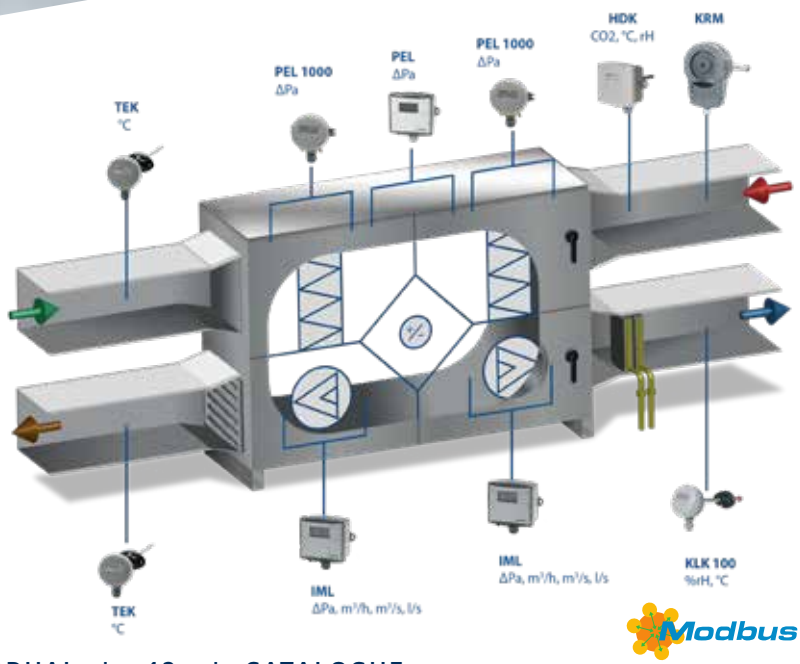
Versatile high-quality transmitters for measuring a wide range of parameters in different demanding HVAC applications: accurate measurement of differential pressure, air quality, temperature, humidity, water pressure, air velocity, illuminance or wind speed etc. Several measured properties are also possible 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 found under the Temperature measurement section (page 80)*

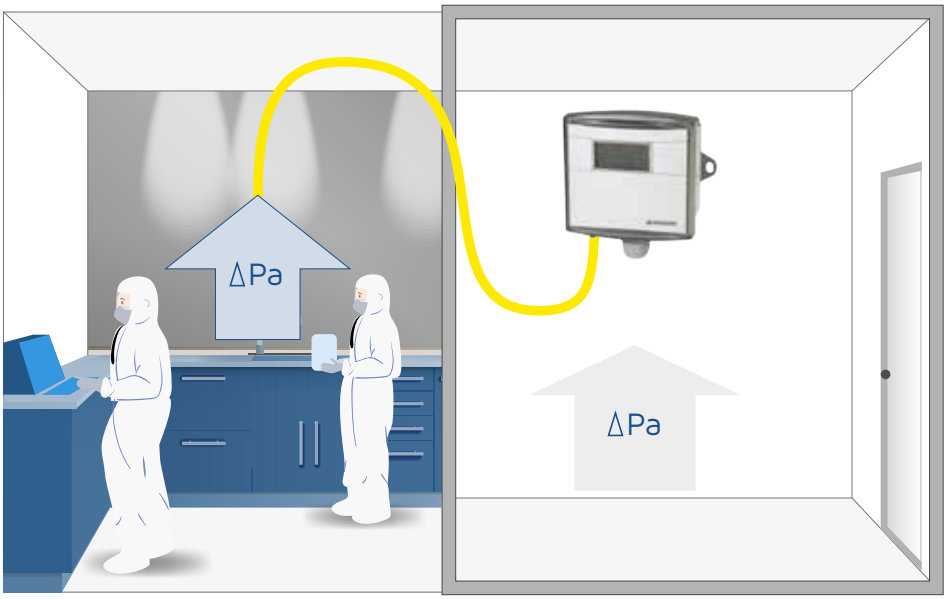


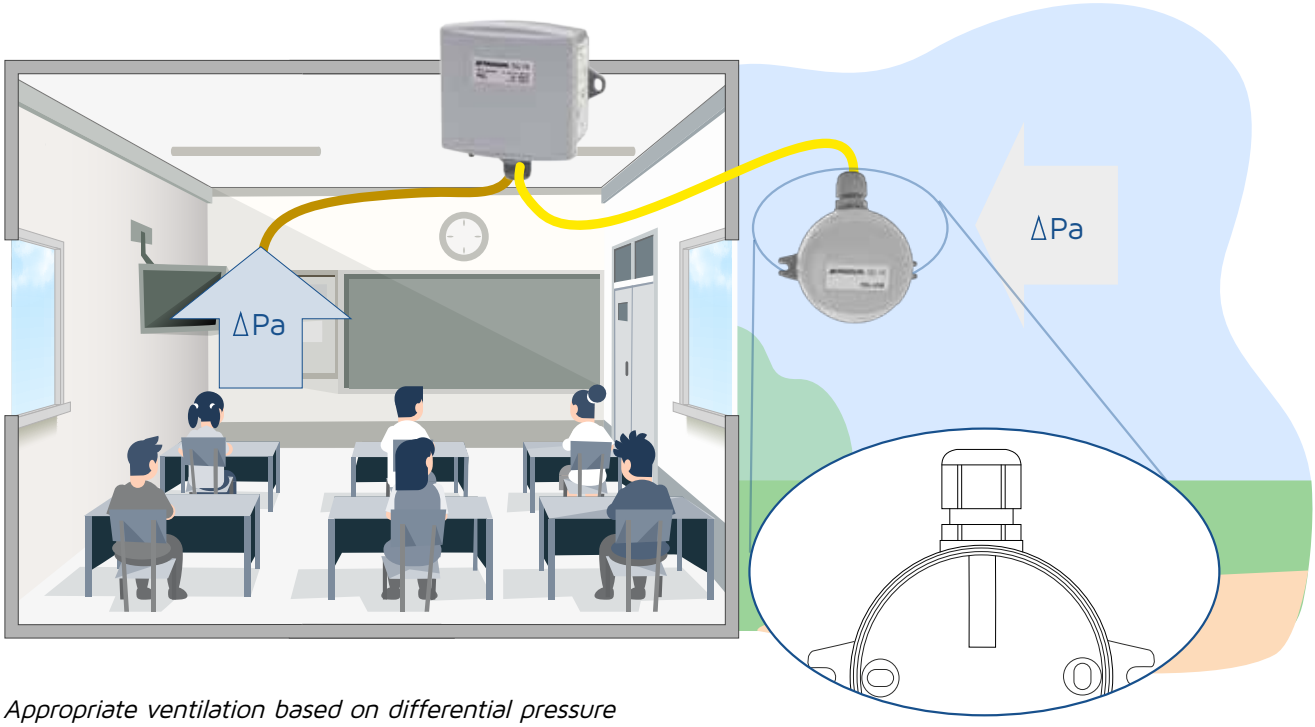




The high-accuracy air pressure transmitter PEL is an optimal solution for applications requiring high precision and reliability

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.*





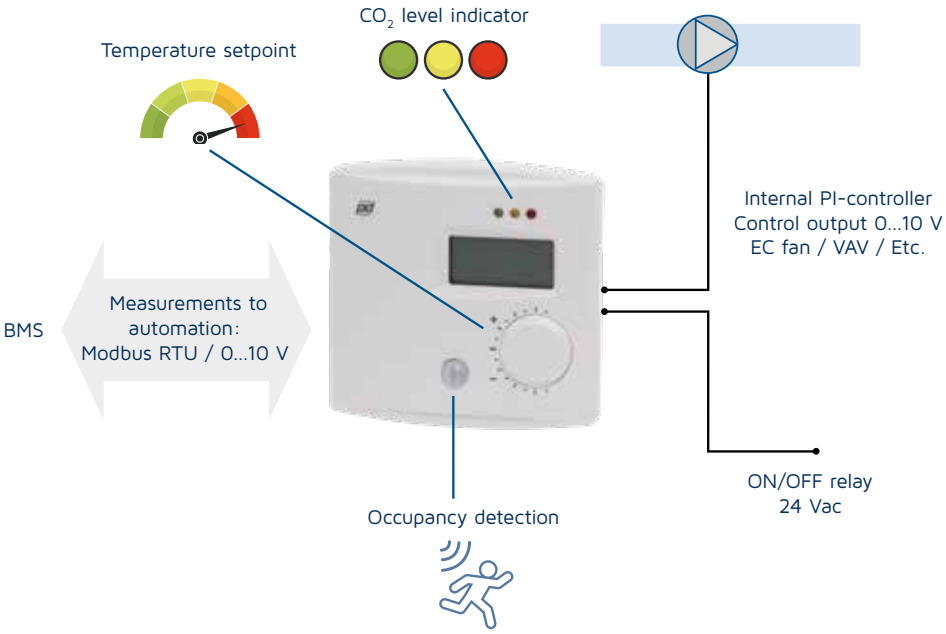
Appropriate ventilation based on differential pressure measurement through the building envelope ensures healthy indoor air quality. The ***protective cover PEL-USK****, installed in the outer measuring hose of* ***pressure transmitter PEL****, prevents the hose from pressure impacts or contamination.*

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

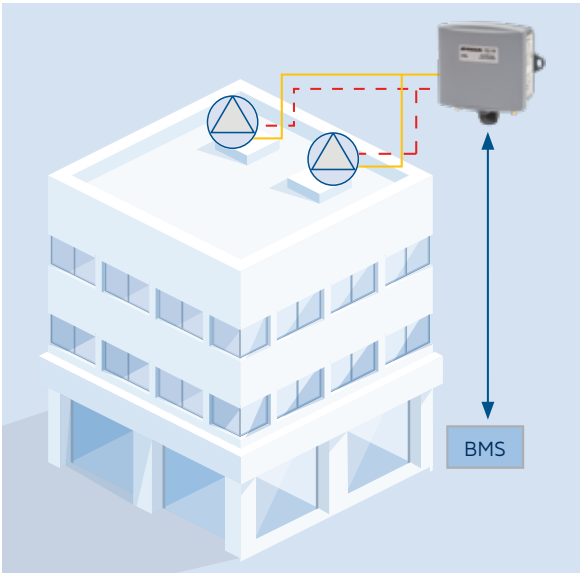
*By using the 0...10 V controller output, a built-in, stand-alone PI-controller in the **CO_2 transmitter HDH** can be used to control, for example, an EC FAN or VAV system. Measurements can be read to BMS by using Modbus RTU or an 0...10 V output.*

There are also various options available for our HDH transmitter:

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



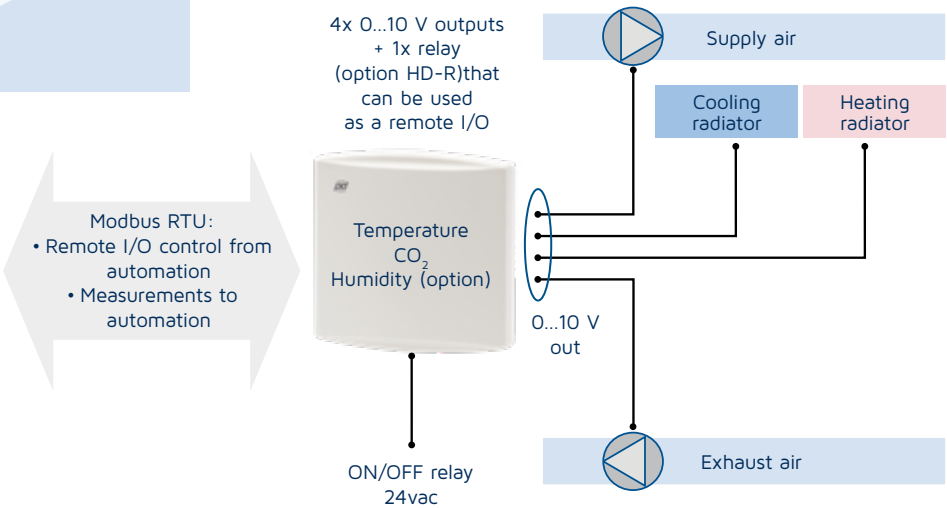
Several Produal transmitters can be used as an external I/O unit for flexibility and cost savings



*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.*



TRANSMITTER SELECTION GUIDE

Product family		Measured property													
Type	Page	°C	RH	CO_2	VOC	CO	Pa	bar	m/s		m^3/s	lux	W/m^2	H_2O	PIR
HDH	56	•	o	•											o
HDK	58	•	o	•											
HDU	59	•		•											
HML	61					•									
ILH	60	•	o		•										
ILK	61	•	o		•										
IML	49						•				•				
IVL	51	•							•						
KLH 100 / KLH-M	52	•	•												
KLH 420	52		•												
KLHJ	54	•	•												
KLK	55	•	•												
KLU	54	•	•												
KPEL	47						•								
LUX	62	•										•			
MMSP1	62												•		
PEL	47						•								
RCD-BAC	57	•	o	•								o			o
RRH-BAC	53	•	•									o			o
TUNA 20	65								•						
UV7+UV7-VV	64								•	•					
VPEL	63							•							
VPL	63							•							
VS 3000	65								•	•					

Product family		Outputs							Commissioning tool
Type	Page	V	mA	relay	Modbus	Modbus override	BACnet	controller	
HDH	56	•		o	o	o		•	ML-SER
HDK	58	•		o	o	o		•	ML-SER
HDU	59	•		o	o	o		•	ML-SER
HML	61	•	•						
ILH	60	•		o	o	o		•	ML-SER
ILK	61	•		o	o	o		•	ML-SER
IML	49	•			o	o			
IVL	51	•	•						
KLH 100 / KLH-M	52	•		o	o	o		•	ML-SER
KLH 420	52		•						
KLHJ	54	•	•						
KLK	55	•	•	o	o	o		•	ML-SER
KLU	54	•	•						
KPEL	47	•	•		o	o		•	ML-SER
LUX	62	•	•						
MMSP1	62	•	•						
PEL	47	•	•		o			•	ML-SER
RCD-BAC	57	•					•	•	SW-DCT-USB
RRH-BAC	53	•					•		SW-DCT-USB
TUNA 20	65	•	•						
UV7+UV7-VV	64	•			o				
VPEL	63	•	•						
VPL	63	•	•						
VS 3000	65	•							

• standard
o optional

Note: *Temperature transmitters are found under the Temperature measurement section (page 80).*

TRANSMITTERS WITH CONTROL OUTPUT

NOTE: Check the product pages for more information.		Transmitter product families									
		HDH	HDK, HDU	ILH, ILK	IML	KLH	KLK	KPEL, KPEL 9K	PEL 1000	RCD-BAC	RRH-BAC
Control output	4...20 mA						•	•			
	0...10 V	•	•	•	•	•	•	•	•	•	•
	Relay	•	•	•		•	•				
Function	Control stages	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
	Cooling control	•	•	•		•	•			•	•
	Heating control	•	•	•		•	•			•	•
	CO_2 control	•	•							•	
	VOC control			•							
	Humidity control	•	•	•		•	•			•	•
	Pressure control				•			•	•		
	Maximun selection control	•	•	•		•	•			•	
	Modbus RTU	•	•	•	•	•	•	•	•		
	Modbus override	•	•	•		•	•	•			
	BACnet MS/TP									•	•
	Page	**56**	**58**	**60**	**49**	**52**	**55**	**47**	**47**	**57**	**53**

AIR FLOW PRODUCT SELECTION GUIDE

Application		Air flow measurement products				
		IVL	PEL 2500 [3]	IML	PEL 2500 [3] + PP-PK/PP-SK	IML + 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	**51**	**47**	**49**	**47 and 50**	**49 and 50**

[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

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...6000 Pa	0...7000 Pa	0...8000 Pa	0...9000 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 8K	1								•	•	•	•	•	•	•			•		•	±10 Pa +1 %	•		•	•	○	•			○
PEL 1000	1							•	•											•	±3 Pa +1 %		•	•		○		•		○
KPEL	2		•			•	•	•	•	•	•	•								•	±3 Pa +1,25 %		•	•	•	○		•	○	○
KPEL 9K	2										•		•	•	•	•	•	•	•	•	±10 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 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 < 3 mA
Ambient temperature	0...+45 °C (PEL 1000: 0...50 °C)
Housing	IP54, cable gland downwards
Mounting	with screws, external lugs

KPEL, KPEL 9K

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 8K	1131350 (PEL 8K)	1131351 (PEL 8K-N)	1131400 (PEL 8K-M)	1131401 (PEL 8K-M-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)
KPEL 9K	1131330 (KPEL 9K)	1131331 (KPEL 9K-N)	1131340 (KPEL 9K-M)	1131341 (KPEL 9K-M-N)

PRESSURE TRANSMITTER ACCESSORIES

PEK-AS is an accessory kit that can be used for air pressure device 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. ML-SER is not compatible with IML or IML-M.

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

TYPE	ART NO.	
PEK-AS	1240300	differential pressure product accessory kit, includes 2 m hose and duct assemblies
PEL-USK	1131020	protective cover for pressure hose
ML-SER	1139010	transmitter commissioning tool
OPTIONS		
PEK-DCP	1240306	duct connector, plastic
PEK-KIT 90	1240390	accessory kit with 90° metal tubes
PVC-HOSE	1240305	PVC hose (4/7), 200 m
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

PEK-DCP

PEK-KIT 90

PVC-HOSE

T-CON

T-CON 100

Y-CON

Y-CON 100

AIR FLOW TRANSMITTERS

Modbus

m^3/s, m^3/h, l/s, Pa

IML is designed for measuring and controlling air flow in air handling units and rooms. IML-M has RS-485 connection for Modbus RTU communication.

Supply	24 Vac/dc, < 1.5 VA
Input	0...10 Vdc, < 2 mA (external setpoint)
Range	0...1000, 0...2000, 0...5000 or 0...7000 Pa
Time constant	1...20 s (factory setting is 8 s)
Accuracy (pressure)	±1 Pa ±1 % from reading
Output (air volume)	0...10 Vdc, 2 mA
Output (diff. pressure or control)	0...10 Vdc, 2 mA
Zeroing	automatic; regularly eliminates the possible zero point drifting
IP protection class	IP54, cable downwards
Ambient temperature	0...45 °C
Cable gland	M16
Mounting	with screws, external lugs

TYPE	ART NO.	
IML	1131600	air volume transmitter
IML-M	1131610	air volume transmitter, Modbus

OPTIONS / ACCESSORIES

PEK-AS	1240300	accessory kit for differential pressure products

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.

Supply	24 Vac/dc, < 2 VA
Range	0...100, 0...200, 0...500, 0...1000, 0...1500, 0...2000, 0...2500 or ±100 Pa
Output	3 x potential free contact (filter status)
Output	0...10 / 2...10 / 0...5 Vdc, < 2 mA (pressure)
Output	4...20 / 0...20 mA, 700 Ω (pressure)
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
Dimensions	105 x 102 x 46 mm

TYPE	ART NO.	
PEL 2500-SV	2240170	filter guard
PEK-AS	1240300	accessory kit for differential pressure products

AIR FLOW PROBES

l/s

PP air flow probes are designed for measuring air flow in the air handling systems. Different models with fixed Kv values are available for circular and rectangular ducts.

Accuracy	±2 % air speed > 1 m/s
Process connection	with Ø 7,5 mm hoses
Ambient temperature	5...95 °C

2

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 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 R1000	1250009	air flow volume probe for a circular 1000 mm duct
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

Other lengths up to 1500 mm also available on request.

AIR VELOCITY TRANSMITTERS

m/s, °C

IVL air velocity transmitters are designed for measuring air velocity and temperature inside the duct.

Supply	24 Vac/dc, < 1.5 VA
Range (temperature)	0...50 °C
Accuracy (temperature)	±0,5 °C
Probe	10 x 200 mm (probe depth 50...190 mm), versions with 100 mm and 400 mm probes are also available, e.g. IVL 10-400.
Output (velocity)	0...10 Vdc, 2 mA / 4...20 mA, 600 Ω
Output (temperature)	0...10 Vdc, 2 mA / 4...20 mA, 600 Ω
IP protection class	IP54, cable or probe downwards
Ambient temperature	0...50 °C
Mounting	with flange, adjustable probe depth

TYPE	ART NO.	
IVL 02	1130030	air velocity transmitter 0...2 m/s
IVL 02-N	1130032	air velocity transmitter with display, 0...2 m/s
IVL 10	1130010	air velocity transmitter 0...10 m/s
IVL 10-N	1130012	air velocity transmitter with display, 0...10 m/s
IVL 20	1130050	air velocity transmitter 0...20 m/s
IVL 20-N	1130053	air velocity transmitter with display, 0...20 m/s

AIR VELOCITY TRANSMITTERS

m/s, °C

IVLJ air velocity transmitters are designed for measuring air velocity and temperature inside the duct.

Supply	24 Vac/dc, < 1.5 VA
Range (temperature)	0...50 °C
Accuracy (temperature)	±0,5 °C
Probe	10 x 200 mm (probe depth 50...190 mm), versions with 100 mm and 400 mm probes are also available, e.g. IVLJ 10-400.
Output (velocity)	0...10 Vdc, 2 mA / 4...20 mA, 600 Ω
Output (temperature)	0...10 Vdc, 2 mA / 4...20 mA, 600 Ω
IP protection class	IP54, cable downwards (transmitter)
Ambient temperature	0...50 °C
Cable	2 m
Mounting	probe: by a flange, adjustable depth; transmitter: with screws, external lugs
Materials	PBT, PC, PA and stainless steel

TYPE	ART NO.	
IVLJ 02	1130040	air velocity transmitter 0...2 m/s
IVLJ 10	1130090	air velocity transmitter 0...10 m/s
IVLJ 20	1130100	air velocity transmitter 0...20 m/s

HUMIDITY TRANSMITTERS

room %rH, °C

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

Supply	24 Vac/dc, < 1 VA
Range (humidity)	0...100 %rH
Range (temperature)	0...50 °C
Accuracy (humidity)	±2 %rH
Accuracy (temperature)	±0,5 °C
Output	3 x 0...10 Vdc, 2 mA, control output included
IP protection class	IP20
Material	ABS plastic
Ambient temperature	0...50 °C
Mounting	on the wall surface or on a flush mounting box (60 mm hole distance)
Dimensions	87 x 86 x 30 mm

TYPE	ART NO.	
KLH 100	1132210	room humidity transmitter
KLH 100-N	1132211	room transmitter with display (humidity and/or temperature display)
KLH 100-NTC 10	1132230	room humidity transmitter, NTC 10 sensor
KLH 100-5V-PT 1000	1132620	room humidity transmitter, Pt1000 sensor, 0...5 V outputs
KLH-M	1132600	Modbus room humidity transmitter
KLH-M-N	1132601	Modbus room humidity transmitter with display (humidity and/or temperature display)

OPTIONS / ACCESSORIES

HD-P	1135001	passive potentiometer (not available for Modbus models)
HD-PU	1135002	0...10 V potentiometer
HD-R	1135003	relay, 24 Vac 1 A

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.

Supply	24 Vdc (12...35 Vdc)
Range	0...100 %rH
Accuracy (humidity)	±3 %rH (25 °C)
Output	4...20 mA, 500 Ω (24 Vdc)
IP protection class	IP20
Material	ABS plastic
Mounting	on the wall surface or on a flush mounting box (60 mm hole distance)

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

HUMIDITY TRANSMITTERS

NEW

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.

Supply	24 Vac/dc, < 1 VA
Range (humidity)	0...100 %rH
Range (temperature)	0...50 °C
Accuracy (humidity)	±2 %rH
Accuracy (temperature)	±0,3 °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)
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	
	Second digital input and passive temperature sensor (NTC 10)	-DI2-TE-NTC10						8	
6 Body colour	White (RAL 9010)								0
	Anthracite grey	-GR							B

TOOLS

SW-DCT-USB	1139040	configuration cable

HUMIDITY TRANSMITTERS

room/duct %rH, °C

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

Supply	24 Vac/dc, < 1 VA
Range (humidity)	0...100 %rH
Range (temperature)	-50...50 °C
Accuracy (humidity)	±2 %rH
Accuracy (temperature)	±0,5 °C
Output (humidity)	0...10 Vdc, 2 mA / 4...20 mA < 600 Ω
Output (temperature)	0...10 Vdc, 2 mA / 4...20 mA < 600 Ω
IP protection class	IP54, cable downwards
Ambient temperature	-50...50 °C
Cable	2 m, other lengths also available
Cable gland	M16
Mounting	transmitter with screws (external lugs), sensor with flange, adjustable probe depth < 150 mm

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

HUMIDITY TRANSMITTERS

outdoor %rH, °C

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

Supply	24 Vac/dc, < 1 VA
Range (humidity)	0...100 %rH
Range (temperature)	-50...50 °C
Accuracy (humidity)	±2 %rH
Accuracy (temperature)	±0,5 °C
Output (humidity)	0...10 Vdc, 2 mA / 4...20 mA < 600 Ω
Output (temperature)	0...10 Vdc, 2 mA / 4...20 mA < 600 Ω
IP protection class	IP54, cable downwards
Ambient temperature	-50...50 °C
Cable gland	M16
Mounting	with screws, external lugs

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.

Supply	24 Vac/dc, < 1 VA
Range (humidity)	0...100 %rH
Range (temperature)	-50...50 °C
Accuracy (humidity)	±2 %rH
Accuracy (temperature)	±0,5 °C
Output (humidity)	0...10 Vdc, 2 mA / 4...20 mA < 600 Ω
Output (temperature)	0...10 Vdc, 2 mA / 4...20 mA < 600 Ω
Output (control)	humidity or temperature output can be configured to control output
IP protection class	IP54, cable or probe downwards
Ambient temperature	-50...50 °C
Cable gland	M16
Mounting	with flange, probe depth adjustable < 150 mm

TYPE	ART NO.	
KLK 100	1132240	duct humidity transmitter
KLK 100-N	1132241	duct humidity transmitter with display
KLK-M	1132610	Modbus duct humidity transmitter
KLK-M-N	1132611	Modbus duct humidity transmitter with display

OPTIONS / ACCESSORIES

KL-R	1132001	relay, 24 Vac 1 A

TOOLS

ML-SER	1139010	transmitter commissioning tool

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.

Supply	24 Vac/dc, < 2 VA
Range (temperature)	0...50 °C
Time constant	< 2 min
Accuracy (temperature)	±0,5 °C
Output	3 x 0...10 Vdc, 2 mA, control output included
IP protection class	IP20
Material	ABS plastic
Ambient temperature	0...50 °C
Mounting	on the wall surface or on a flush mounting box (60 mm hole distance)
Dimensions	87 x 86 x 30 mm

TYPE	ART NO.	
HDH	1135040	room transmitter, CO_2 and °C measurement, range 0...2000 ppm
HDH-N	1135041	room transmitter with display, CO_2 and °C measurement, range 0...2000 ppm
HDH-RH	1135044	room transmitter, CO_2, °C and %rH measurement, range 0...2000 ppm
HDH-RH-N	1135045	room transmitter with display, CO_2, °C and %rH measurement, range 0...2000 ppm
HDH-PIR	1135240	room transmitter, CO_2 and °C measurement, PIR, range 0...2000 ppm
HDH-PIR-N	1135241	room transmitter with display, CO_2 and °C measurement, PIR, range 0...2000 ppm
HDH-RH-PIR	1135250	room transmitter, CO_2, °C and %rH measurement, PIR, range 0...2000 ppm
HDH-RH-PIR-N	1135251	room transmitter with display, CO_2, °C and %rH measurement, PIR, range 0...2000 ppm
HDH-M	1135100	Modbus room transmitter, CO_2 and °C measurement, range 0...2000 ppm
HDH-M-N	1135101	Modbus room transmitter with display, CO_2 and °C measurement, range 0...2000 ppm
HDH-M-RH	1135102	Modbus room transmitter, CO_2, °C and %rH measurement, range 0...2000 ppm
HDH-M-RH-N	1135103	Modbus room transmitter with display, CO_2, °C and %rH measurement, range 0...2000 ppm
HDH-M-PIR	1135260	Modbus room transmitter, CO_2 and °C measurement, PIR, range 0...2000 ppm
HDH-M-PIR-N	1135261	Modbus room transmitter with display, CO_2 and °C measurement, PIR, range 0...2000 ppm
HDH-M-RH-PIR	1135270	Modbus room transmitter, CO_2, °C and %rH measurement, PIR, range 0...2000 ppm
HDH-M-RH-PIR-N	1135271	Modbus room transmitter with display, CO_2, °C and %rH measurement, PIR, range 0...2000 ppm
HDH-PT 1000	1135280	room transmitter, 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 10	1135180	room transmitter, CO_2 and °C measurement, range 0...2000 ppm, NTC 10 sensor
HDH-5V	1135190	room transmitter, CO_2 and °C measurement, range 0...2000 ppm, 0...5 V outputs
HDH-5V-N	1135191	room transmitter with display, CO_2 and °C measurement, range 0...2000 ppm, 0...5 V outputs
HDH-5V-RH	1135192	room transmitter, CO_2, °C and %rH measurement, range 0...2000 ppm, 0...5 V outputs
HDH-5V-RH-N	1135193	room transmitter with display, CO_2, °C and %rH measurement, range 0...2000 ppm, 0...5 V output
HDH 10K	1135110	room transmitter, CO_2 and °C measurement, range 0...10000 ppm
HDH 10K-N	1135111	room transmitter with display, CO_2 and °C measurement, range 0...10000 ppm

OPTIONS / ACCESSORIES		
HD-AL3	1135048	3 leds indicating different concentration levels (not available for -PIR-N models)
HD-P	1135001	passive potentiometer (not available for Modbus models)
HD-PU	1135002	0...10 V potentiometer
HD-R	1135003	relay, 24 Vac 1 A

TOOLS		
ML-SER	1139010	transmitter commissioning tool

CO_2 TRANSMITTERS

NEW

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.

Supply	24 Vac/dc, < 1 VA
Range (CO_2)	0...5000 ppm
Range (temperature)	0...50 °C
Time constant	< 2 min
Accuracy (CO_2)	typ. ±50 ppm ±3 % of value
Accuracy (temperature)	±0,3 °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)
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	
	Second digital input and passive temperature sensor (NTC 10)	-DI2-TE-NTC10						8	
6 Body colour	White (RAL 9010)								0
	Anthracite grey	-GR							B

TOOLS

SW-DCT-USB	1139040	configuration cable

CO_2 TRANSMITTERS

duct ppm CO_2, °C, %rH

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

Supply	24 Vac/dc, < 2 VA
Range (temperature)	0...50 °C
Time constant	< 2 min
Accuracy (temperature)	±0,5 °C
Output	3 x 0...10 Vdc, 2 mA, control output included
IP protection class	IP54, cable downwards
Ambient temperature	0...50 °C
Cable gland	M16
Mounting	in a Ø 10 mm hole, with screws, external lugs
Dimensions	105 x 104 x 155 mm

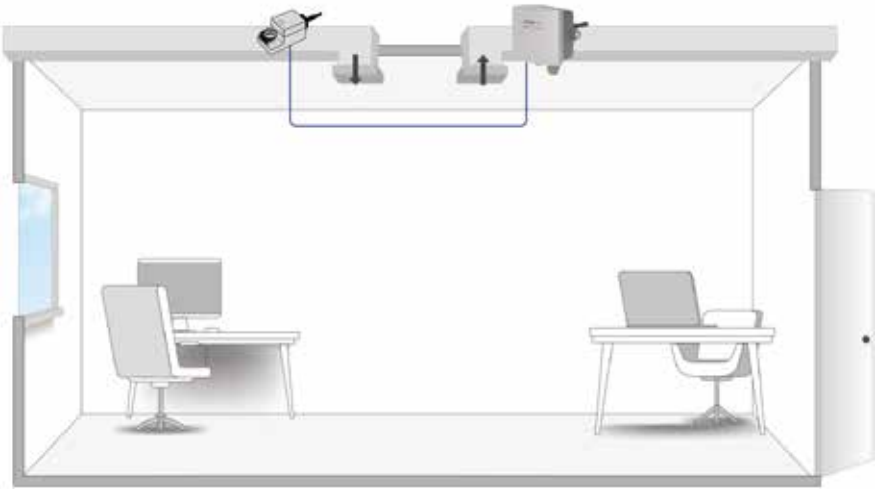
TYPE	ART NO.	
HDK	1135050	duct transmitter, CO_2 and °C measurement, range 0...2000 ppm
HDK-N	1135051	duct transmitter with display, CO_2 and °C measurement, range 0...2000 ppm
HDK-RH	1135054	duct transmitter, CO_2, °C and %rH measurement, range 0...2000 ppm
HDK-RH-N	1135055	duct transmitter with display, 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-NTC 10	1135210	duct transmitter, CO_2 and °C measurement, range 0...2000 ppm, NTC 10 sensor
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

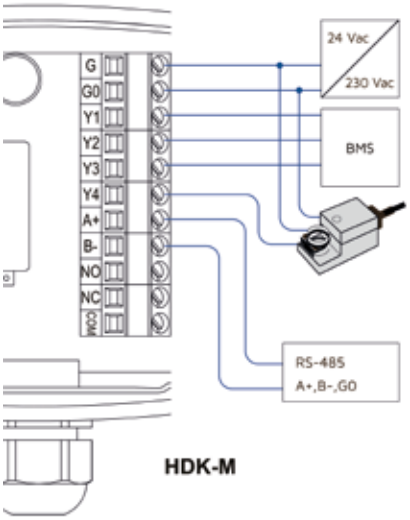
OPTIONS / ACCESSORIES

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). ABCLogic™ self-calibration method eliminates the possible long term drift.

Supply	24 Vac/dc, < 10 VA
Range (temperature)	-50...50 °C
Accuracy (temperature)	±0,5 °C
Output	3 x 0...10 Vdc, 2 mA, control output included
IP protection class	IP54, cable downwards
Ambient temperature	-30...50 °C
Ambient humidity	0...85 %rH
Cable gland	M16
Mounting	with screws, external lugs
Dimensions	105 x 110 x 46 mm

TYPE	ART NO.	
HDU	1135090	CO_2 transmitter for cold spaces, range 0...2000 ppm
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-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 / ACCESSORIES

HD-R	1135003	relay, 24 Vac 1 A

TOOLS

ML-SER	1139010	transmitter commissioning tool

AIR QUALITY TRANSMITTERS

room VOC, °C, %rH

ILH transmitters are designed for measuring and controlling VOC (Volatile Organic Compound) level, temperature and humidity in dry room spaces. MEMS sensing technology ensures accurate and durable VOC measurement that is related to the CO_2 level.

Supply	24 Vac/dc, < 2 VA
Range (VOC)	450...2000 ppm (CO_2 equivalent)
Range (temperature)	0...50 °C
Accuracy (temperature)	±0,5 °C
Output	3 x 0...10 Vdc, 2 mA, control output included
IP protection class	IP20
Material	ABS plastic
Ambient temperature	0...50 °C
Mounting	on the wall surface or on a flush mounting box (60 mm hole distance)
Dimensions	87 x 86 x 30 mm

TYPE	ART NO.	
ILH	1135610	room transmitter, VOC and temperature measurement
ILH-N	1135611	room transmitter with display
ILH-RH	1135612	room transmitter, VOC, temperature and humidity measurement
ILH-RH-N	1135613	room transmitter with display
ILH-M	1135620	Modbus room transmitter, VOC and temperature measurement
ILH-M-N	1135621	Modbus room transmitter with display
ILH-M-RH	1135622	Modbus room transmitter, VOC, temperature and humidity measurement
ILH-M-RH-N	1135623	Modbus room transmitter with display

OPTIONS / ACCESSORIES		
HD-AL3	1135048	3 leds indicating different concentration levels
HD-P	1135001	passive potentiometer (not available for Modbus models)
HD-PU	1135002	0...10 V potentiometer
HD-R	1135003	relay, 24 Vac 1 A

TOOLS		
ML-SER	1139010	transmitter commissioning tool

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.

Supply	24 Vac/dc, < 2 VA
Range (VOC)	450...2000 ppm (CO_2 equivalent)
Range (temperature)	0...50 °C
Accuracy (temperature)	±0,5 °C
Output	3 x 0...10 Vdc, 2 mA, control output included
IP protection class	IP54, cable downwards
Ambient temperature	0...50 °C
Ambient humidity	0...85 %rH
Cable gland	M16
Mounting	in a Ø 10 mm hole, with screws, external lugs
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 / ACCESSORIES

HD-R	1135003	relay, 24 Vac 1 A

TOOLS

ML-SER	1139010	transmitter commissioning tool

CARBON MONOXIDE TRANSMITTERS

outdoor ppm CO

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.

Supply	24 Vac/dc, < 2 VA
Range	0...100 ppm / 0...300 ppm
Time constant	1,5 min
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
Mounting	with screws, external lugs
Dimensions	100 x 113 x 46 mm

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

Supply	24 Vac/dc, < 0.1 VA
Range (temperature)	-50...50 °C
Output (illuminance)	0...10 Vdc, 1 mA
Output (temperature)	0...10 Vdc, 1 mA
IP protection class	IP54, cable downwards
Ambient temperature	-40...40 °C
Cable gland	M16
Mounting	with screws, external lugs
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

LIGHT INTENSITY TRANSMITTER

outdoor W/m²

MMSP1 is designed for measuring sun light intensity.

Supply	24 Vdc, < 0.03 W (5...30 Vdc)
Range (light intensity)	0...1500 W/m²
Accuracy	±5 % (annual mean)
Output	0...10 Vdc / 4...20 mA, the supply voltage must be at least 12 V
Output	0...3.125 Vdc / 0...150 mVdc
IP protection class	IP65
Cable gland	M16
Dimensions	80 x 150 x 60 mm

TYPE	ART NO.	
MMSP1	1133360	sun light intensity transmitter

DIFFERENTIAL PRESSURE TRANSMITTERS FOR WATER

bar

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

Supply	24 Vac/dc, < 1 VA
Accuracy	±2,5 % from the full scale
Output	0...10 Vdc, 5 mA / 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
Ambient temperature	-20...70 °C
Cable gland	M16
Mounting	with screws, external lugs, position allowed only process connectors downwards
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

bar

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

Supply	24 Vac/dc, < 1 VA
Accuracy (VPL 16)	±0,1 bar
Accuracy (VPL 60)	±0,5 bar
Output	0...10 Vdc, 2 mA / 4...20 mA, 800 Ω
IP protection class	IP54, cable or probe downwards
Ambient temperature	0...60 °C
Cable gland	M16
Mounting	R½"
Dimensions	70 x 95 x 81 mm

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

RAIN SENSOR

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

Supply	24 Vac/dc, < 2 VA
Output	relay, max. 230 Vac, 3 A
IP protection class	IP65
Ambient temperature	-35...50 °C
Cable gland	1 X M16
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.

Supply	24 Vac/dc, < 0.75 VA
Range (direction)	0...359 °
Range (speed)	0...15 m/s / 0...40 m/s
Time constant	1, 2, 4, 8, 16 s
Accuracy (direction)	±1°
Accuracy (speed)	±0.05 m/s
Output	3 x 0...10 Vdc
Output	RS232 NMEA0183®
IP protection class	IP65
Ambient temperature	-15...55 °C
Cable	25 m

m/s, °

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

WIND SENSORS

m/s, °

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

Supply	24 Vac/dc, < 2 VA
Range (direction)	0...359 °
Range (speed)	0...35 m/s
Accuracy (direction)	±1°
Accuracy (speed)	±1 m/s
Output (direction)	0...10 Vdc
Output (speed)	0...10 Vdc
IP protection class	IP65
Ambient temperature	-35...70 °C
Cable	10 m
Mounting	< Ø 50 mm

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.

Supply	24 Vac/dc, < 1.5 VA
Range (velocity)	0...20 m/s
Range (temperature)	-50...50 °C
Output	0...10 Vdc, 2 mA / 4...20 mA, 600 Ω
IP protection class	IP54 (transmitter)
Ambient temperature	-50...50 °C
Cable gland	M16
Mounting	with screws on wall
Materials	PBT, PC, PA, painted steel

TYPE	ART NO.	
TUNA 20	1136010	wind speed detector

SMOKE DETECTORS

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.

Supply	24 Vac/dc
Probe	160 mm
Sensor	Optical RM3.3-X (ALN-E)
Output (alarm)	250 Vac / 24 Vdc, 8 A, change-over contact
Output (alarm)	250 Vac / 24 Vdc, 8 A, NC contact
Output (contamination)	250 Vac / 24 Vdc, 6 A, NC contact
IP protection class	IP65
Ambient temperature	-20...50 °C
Cable gland	M16
Materials	ABS plastic, aluminium
Dimensions	172 x 271 x 85 mm

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

OPTIONS / ACCESSORIES

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

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.

Supply	230 Vac
Probe	160 mm
Sensor	Optical RM3.3-X (ALN-E)
Output (alarm)	250 Vac / 24 Vdc, 8 A, change-over contact
Output (alarm)	250 Vac / 24 Vdc, 8 A, NC contact
Output (contamination)	250 Vac / 24 Vdc, 6 A, NC contact
IP protection class	IP65
Ambient temperature	-20...50 °C
Cable gland	M16
Materials	ABS plastic, aluminium
Dimensions	172 x 271 x 85 mm

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

OPTIONS / ACCESSORIES

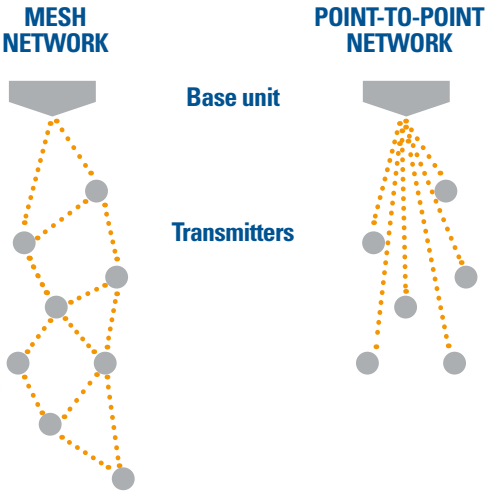
ASR-A10	1137096	test gas
KRM-RM3.3-X	1137097	smoke sensor (spare part)
KS-WDG-X	1137095	mounting plate for round or insulated ducts (with WDG-X)
KS-X	1137093	mounting plate for round or insulated ducts
WDG-X	1137094	protective insulating housing with alarm display for outdoor installation

WIRELESS TRANSMITTERS

Wireless functionality is one of the fastest-growing trends in the world – 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 new-generation, 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. Produal wireless 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.

The traditional 868 MHz wireless platform offers a wide range of products for outdoor and indoor applications, including a relay unit with an IP54 housing and occupancy detection. The 868 MHz platform is an optimal solution for smaller applications where only a few wireless transmitters are needed.

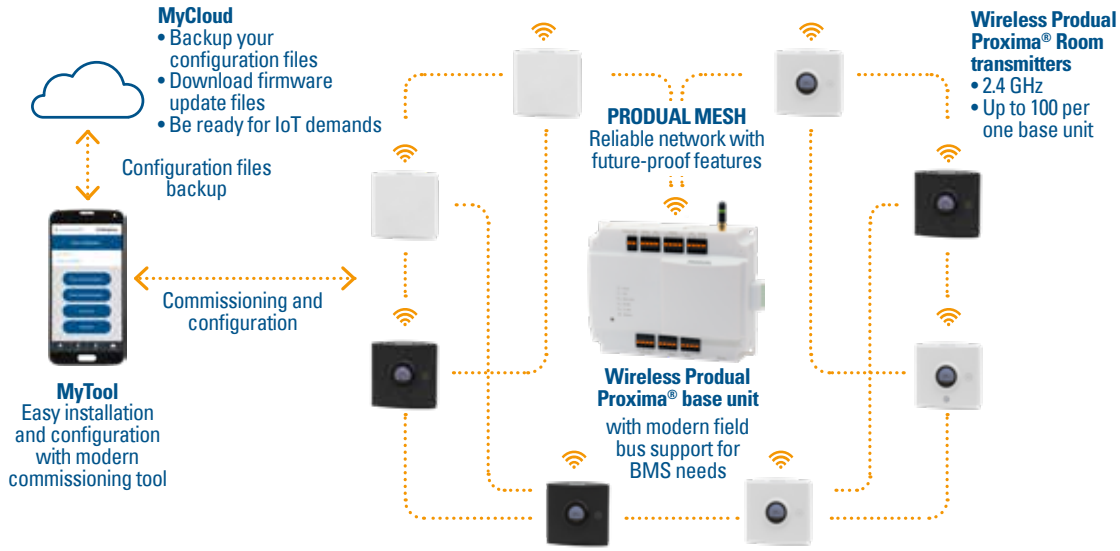


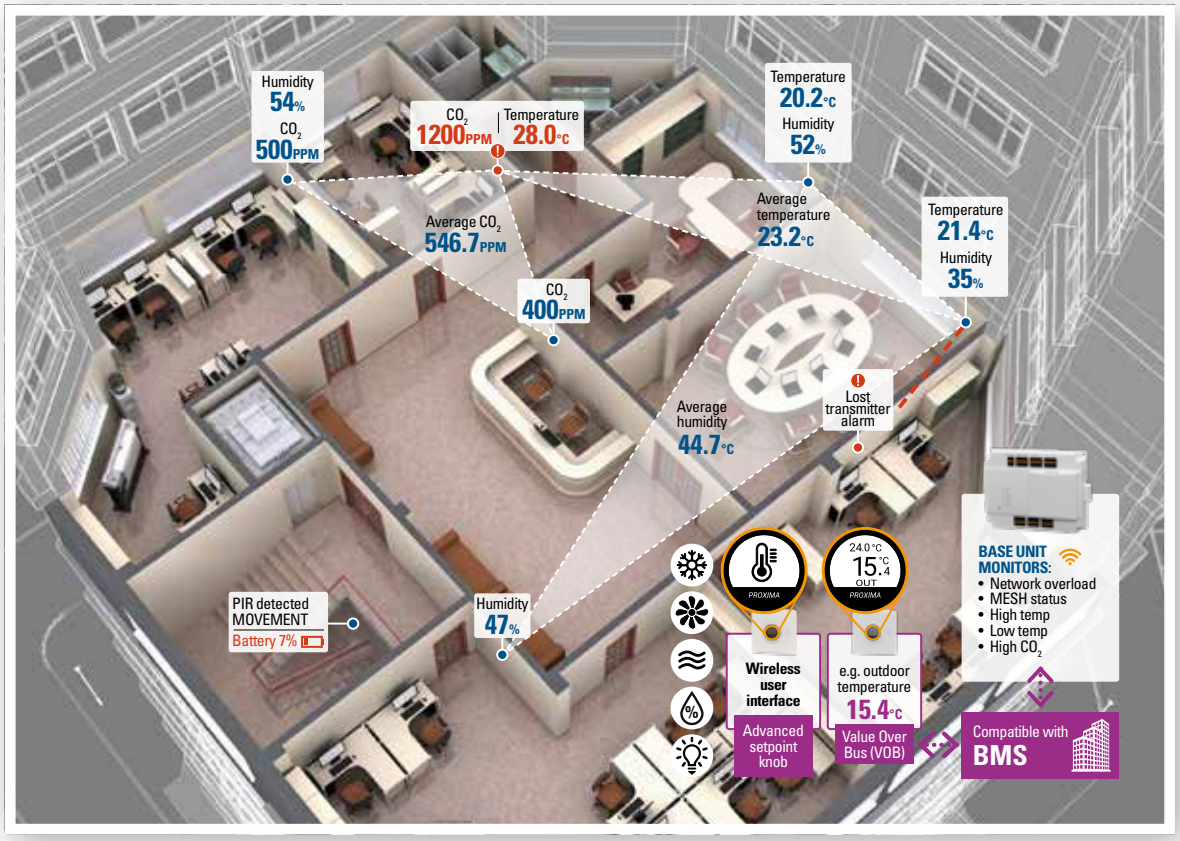
2.4 GHz Wireless MESH

868 MHz Wireless Point-To-Point

WIRELESS PRODUAL PROXIMA® MESH 2.4 GHz

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	•
CO_2 measurement	o	o	
Occupancy detection	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	**70**	**71**	**72**

• standard
o optional
[1] 3 inputs total

WIRELESS BASE UNIT

WBU is a base station for Produal Proxima® MESH wireless 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.

Supply	24 Vac/dc
Frequency	2,4 GHz
Input	100 wireless transmitters
Input	6 x analogue input
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
Dimensions	186 x 136 x 55 mm

TYPE	ART NO.	
WBU	54011W0000	wireless base unit

OPTIONS / ACCESSORIES		
CUCC	5201010400	cable covers for Proxima CU and WBU (includes two covers and four fixing screws)
WA-AS1	5401900010	extension cable and base for WBU antenna, 3 m cable

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

WIRELESS ROOM TRANSMITTERS

NEW

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

room °C, %rH

Supply	3,6 V lithium battery
Frequency	2,4 GHz
Range (temperature)	0...50 °C
Range (humidity)	0...100 %rH (RH models)
Range (CO_2)	0...2000 ppm (CO2 models)
Accuracy (temperature)	±0,5 °C (25 °C)
Accuracy (humidity)	±3 %rH (RH models)
Accuracy (CO_2)	typ. ±40 ppm ±3 % of value (CO2 models)
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	PC plastic
Dimensions	97 x 97 x 30 mm

3

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		

* Available in Q2/2021

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

NEW

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

room °C, %rH

Supply	24 Vac/dc
Frequency	2,4 GHz
Range (temperature)	0...50 °C
Range (humidity)	0...100 %rH (RH models)
Range (CO_2)	0...2000 ppm (CO2 models)
Accuracy (temperature)	±0,5 °C (25 °C) or ±1 °C (25 °C, CO2 models)
Accuracy (humidity)	±3 %rH (RH models)
Accuracy (CO_2)	typ. ±40 ppm ±3 % of value (CO2 models)
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	PC plastic
Dimensions	97 x 97 x 30 mm

3

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		

* Available in Q2/2021

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 Produal Proxima® MESH wireless network.

Supply	3,6 V lithium battery or 10...30 Vdc / 12...28 Vac
Frequency	2,4 GHz
Input	3 x 0...10 V or NTC 10 or resistance or digital
Range (temperature)	0...50 °C (internal measurement)
Range (humidity)	0...100 %rH (internal measurement)
Accuracy (temperature)	±0,5 °C (25 °C)
Accuracy (humidity)	±3 %rH (25 °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	PC plastic
Dimensions	97 x 97 x 26 mm

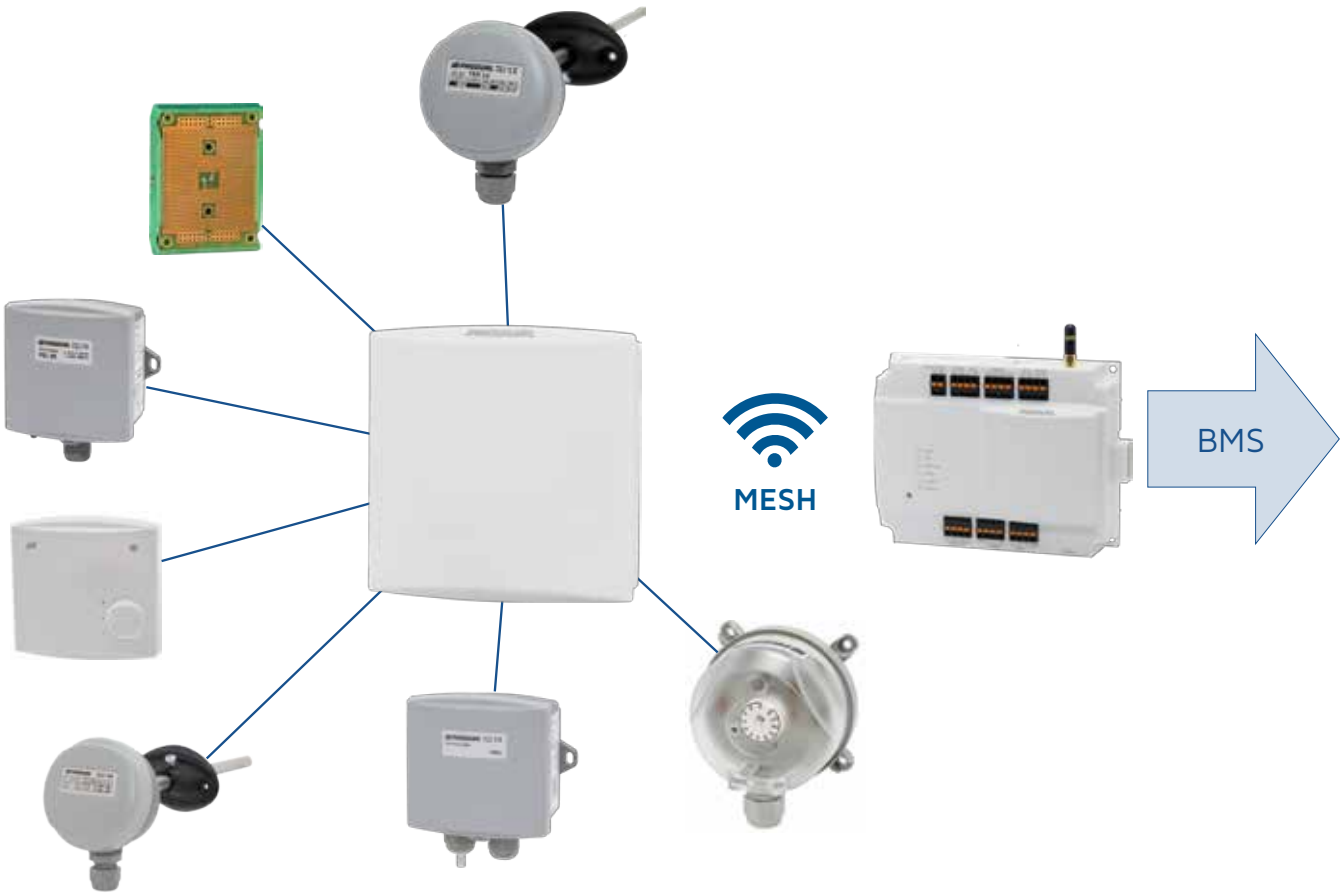
3

TYPE	ART NO.	
WTR-IM	54015W0000	wireless input module

OPTIONS / ACCESSORIES	
	lithium battery, 3.6 V / 3600 mAh

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

Convert the wired measurements to wireless messages for almost unlimited application possibilities.

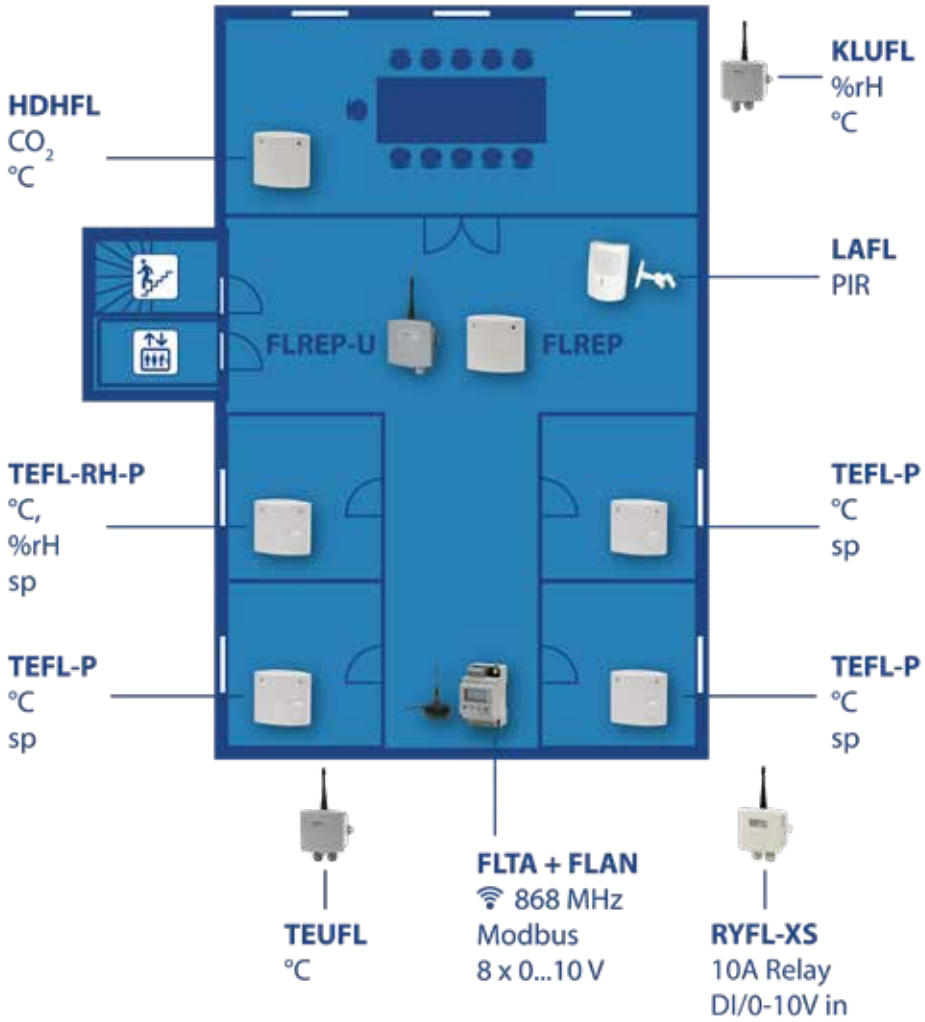


WIRELESS PLATFORM 868 MHz

Our wireless 868 MHz transmitters have a proven and field-tested coverage in various references around Europe. Effective bi-directional communication with good diagnostics through Modbus communication or analogue signal makes the network reliable and functional. The system includes transmitters for both indoor and outdoor use with repeaters, configuration tool and network functionality monitoring tool. Ideal for monitoring temperature, humidity, air quality, light level or occupancy.

- *Thousands of installed networks world wide*
- *A range of up to 500m in open spaces*
- *868 MHz frequenzy*
- *Modbus RTU*

THOUSANDS OF INSTALLED NETWORKS WORLD WIDE



WIRELESS PRODUCT SELECTION GUIDE

Wireless Platform 868 Mhz								
Property	**TEFL**	**TEUFL**	**TEUFL-24**	**TEUFL-DI**	**KLUFL**	**HDHFL**	**LAFL**	**RYFL-XS**
Battery	•	•		•	•		•	
24 Vac/dc power supply			•			•		•
Display	o					o		
Temperature measurement	•	•	•	•	•	•		
Humidity measurement	o				•	o		
CO_2 measurement						•		
Occupancy detection							•	
Light level measurement							o	
Digital input	o			•				•
0...10 V input		•	•					•
Temperature input (Pt1000)		•	•	•				
Pulse input								
0...10 V output						•		
0...10 V control output						•		
Relay output								•
5-position switch	o							
Protection class	IP20	IP54	IP54	IP54	IP54	IP20	IP20	IP54
Page	**76**	**77**	**77**	**77**	**77**	**78**	**78**	**79**

• standard
o optional

WIRELESS BASE STATION

FLTA is a base station for wireless network transmitters and I/O modules. From FLTA, the controls and measurements can be read via Modbus RTU and through the 8 analogue outputs. Respectively the control signals that come to base station via Modbus can be directed to I/O modules. FLTA base station needs a FLAN antenna.

Supply	24 Vac/dc, < 2 VA
Frequency	868.30 MHz Class 1
Range	up to 500 m in the line of sight, 20...100 m in buildings
Output	8 x 0...10 Vdc, Modbus RTU
IP protection class	IP20
Ambient temperature	-25...65 °C
Mounting	For 35 mm DIN rail
Dimensions	53 x 91 x 59 mm

TYPE	ART NO.	
FLTA	1191030	base station for wireless sensors
FLAN	1191040	antenna

TOOLS		
FLSER	1191070	configuration tool for wireless devices

WIRELESS CONFIGURATION TOOL

FLSER is a wireless configuration tool for setting the addresses of the sensors and the wireless repeaters. The tool can also be used for testing the communication signal strength.

Supply	3,6 V lithium battery
Frequency	868.30 MHz Class 1
IP protection class	IP20
Materials	ABS plastic
Dimensions	86 x 86 x 32 mm

TYPE	ART NO.	
FLSER	1191070	configuration tool for wireless devices

WIRELESS REPEATERS

FLREP repeaters can be used to extend the range of wireless sensors in difficult environments. It is possible to use up to 8 repeaters for one FLTA base station.

Supply	24 Vac/dc, < 0.1 VA / 12 Vac/dc
Frequency	868.30 MHz Class 1
Dimensions	86 x 86 x 32 mm

TYPE	ART NO.	
FLREP	1191080	wireless repeater with internal antenna, for indoor use (IP20)
FLREP-U	1191081	wireless repeater with external antenna, for outdoor use (IP54)
M230/12-4	1184080	230 Vac/12 Vdc 4 VA power supply

TOOLS		
FLSER	1191070	configuration tool for wireless devices

WIRELESS TRANSMITTERS

room °C, %rH

TEFL wireless room temperature sensors are designed for temperature measurement of indoor spaces. The communication between the TEFL room units and the FLTA base station is two-way. Commissioning is done by using the wireless FLSER configuration tool.

Supply	3,6 V lithium battery
Frequency	868.30 MHz Class 1
Range	0...50 °C
Accuracy	±0,5 °C (25 °C)
IP protection class	IP20
Material	ABS plastic
Ambient temperature	0...50 °C
Mounting	on the wall surface or on a flush mounting box (60 mm hole distance)
Dimensions	86 x 86 x 32 mm

3

TYPE	ART NO.	
TEFL	1191010	wireless room sensor
TEFL-P	1191011	wireless room sensor with setpoint knob
TEFL-RH	1191020	wireless room sensor with %rH
TEFL-RH-P	1191021	wireless room sensor with %rH and setpoint knob

OPTIONS / ACCESSORIES		
FL-DI	1191051	DI option for TEFL
FL-S5	1191050	5-position switch
FL-N	1191060	display option for TEFL

TOOLS		
FLSER	1191070	configuration tool for wireless devices

WIRELESS TRANSMITTERS

outdoors °C, 0...10 V

TEUFL is a wireless sensor for measuring outdoor temperatures. Communication between the sensors and the FLTA base station is two-way. In addition to temperature information, TEUFL sensor can send also one 0...10 V signal or one contact (DI) information (TEUFL-DI). Commissioning is done by using the wireless FLSER configuration tool.

Supply	3,6 V lithium battery
Frequency	868.30 MHz Class 1
Input	Pt 1000
Range (temperature)	-50...150 °C
Accuracy (temperature)	±0,5 °C (25 °C)
IP protection class	IP54, cable downwards
Material	PC plastic
Ambient temperature	-40...50 °C
Cable gland	M16
Mounting	with screws, external lugs
Dimensions	105 x 187 x 46 mm

TYPE	ART NO.	
TEUFL	1191100	wireless outdoor temperature sensor, 0...10 Vdc input
TEUFL-24	1191101	wireless outdoor temperature sensor, 0...10 Vdc input, 24 Vac/dc supply
TEUFL-DI	1191102	wireless outdoor temperature sensor, contact (DI) input

TOOLS		
FLSER	1191070	configuration tool for wireless devices

WIRELESS TRANSMITTERS

outdoors °C, %rH

KLUFL is a wireless transmitter for measuring outdoor temperatures and humidity. The communication between the sensors and the FLTA base station is two-way. Commissioning is done by using the wireless FLSER configuration tool.

Supply	3,6 V lithium battery
Frequency	868.30 MHz Class 1
Range (humidity)	0...100 %rH
Range (temperature)	-50...150 °C
Accuracy (humidity)	±3 %rH
Accuracy (temperature)	±0,5 °C (25 °C)
IP protection class	IP54, cable downwards
Material	PC plastic
Ambient temperature	-40...50 °C
Cable gland	M16
Mounting	with screws, external lugs
Dimensions	105 x 190 x 46 mm

TYPE	ART NO.	
KLUFL	1191110	wireless outdoor humidity and temperature transmitter

TOOLS		
FLSER	1191070	configuration tool for wireless devices

WIRELESS TRANSMITTERS

room ppm CO_2, °C, %rH

HDHFL transmitters are designed for measuring carbon dioxide concentration and temperature in the room spaces. HDHFL-RH transmitters have also a humidity output. Commissioning is done by using the wireless FLSER configuration tool.

Supply	24 Vac/dc, < 2 VA
Frequency	868.30 MHz Class 1
Range (CO_2)	0...2000 ppm
Range (temperature)	0...50 °C
Time constant	< 1,5 min
Accuracy (CO_2)	typ. ±40 ppm ±3 % of value
Accuracy (temperature)	±0,5 °C (25 °C)
Output	3 x 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
Dimensions	87 x 86 x 30 mm

TYPE	ART NO.	
HDHFL	1191150	CO_2 and °C transmitter with wireless communication
HDHFL-N	1191151	CO_2 and °C transmitter with wireless communication and with display
HDHFL-RH	1191160	CO_2, °C and %rH transmitter with wireless communication
HDHFL-RH-N	1191161	CO_2, °C and % rH transmitter with wireless communication and with display

TOOLS		
FLSER	1191070	configuration tool for wireless devices
ML-SER	1139010	transmitter commissioning tool

WIRELESS OCCUPANCY SENSOR

LAFL is a wireless detector for occupancy monitoring movement. The detector is passive infrared (PIR) which reacts to temperature changes. The communication between the sensors and the FLTA base station is two-way. Commissioning is done by using the wireless FLSER configuration tool. Mounting bracket and screws are included to the delivery.

Supply	3,6 V lithium battery
Frequency	868.30 MHz Class 1
Range	monitoring area 140°
IP protection class	IP40
Ambient temperature	0...50 °C

TYPE	ART NO.	
LAFL	1191120	wireless occupancy detector
LAFL-LX	1191121	wireless occupancy detector with illumination (0...2000 lx)

TOOLS		
FLSER	1191070	configuration tool for wireless devices

WIRELESS I/O MODULE

RYFL-XS is a wireless I/O module which can be used to transfer measurements and control information. Communication between the control system and I/O module is done through FLTA base station via Modbus protocol. Two input signals can be forwarded and one relay output with changeover contacts can be controlled.

Supply	24 Vac/dc
Frequency	868.30 MHz Class 1
Input	2 x 0...10 Vdc or potential free contact
Output	230 Vac relay, 10 A res.
IP protection class	IP54
Material	PC plastic
Ambient temperature	-40...50 °C
Cable gland	2 X M16
Mounting	with screws, external lugs
Dimensions	105 x 184 x 46 mm

TYPE	ART NO.	
RYFL-XS	1191200	wireless I/O module, 24 Vac

TOOLS		
FLSER	1191070	configuration tool for wireless devices

TOOL FOR MONITORING WIRELESS NETWORK

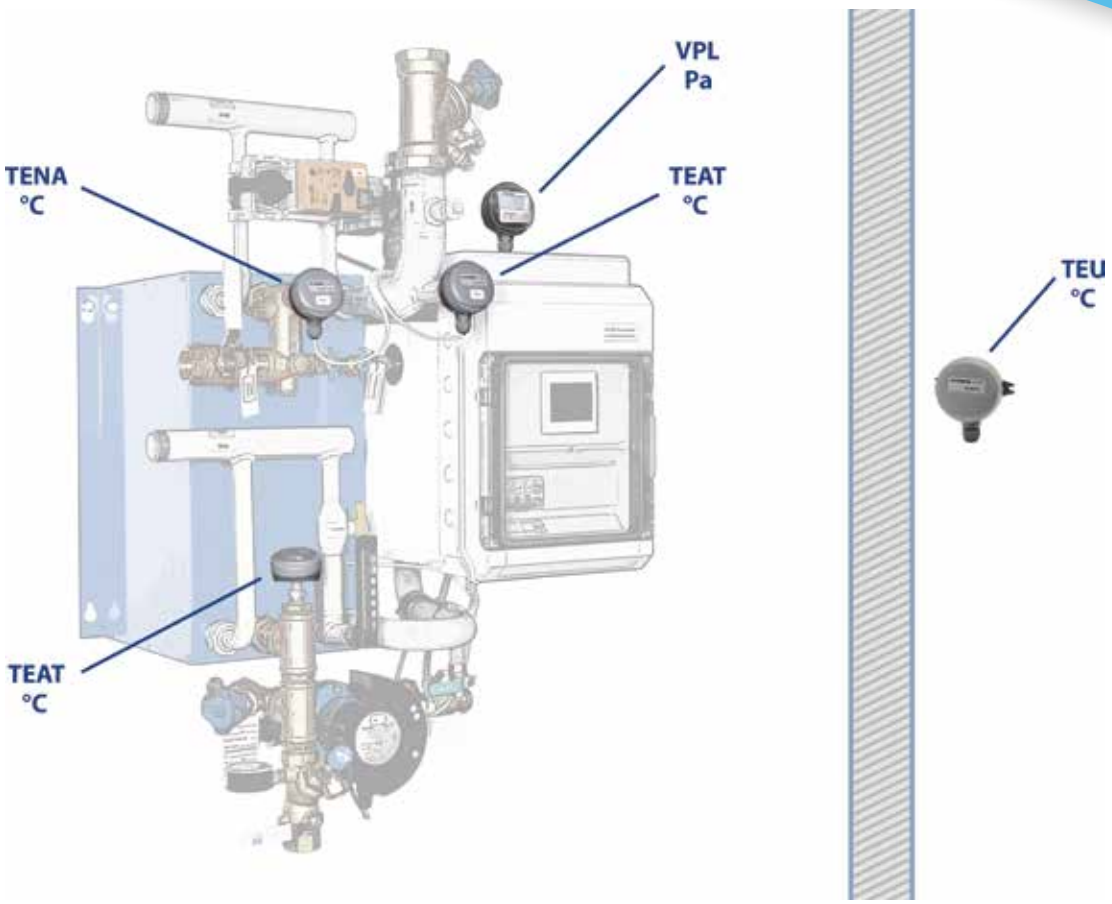
FLSNIF is a tool for monitoring the functionality of the wireless network. By using this tool you may follow one by one the signals between the wireless field equipment and the base station. Monitoring is possible only for signals which are available at the very moment. A PC with installed monitoring software is needed with the tool. The software is delivered with the tool.

TYPE	ART NO.	
FLSNIF	1191140	tool for monitoring the wireless network

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	83		• [1]			• [2]					IP54
TEHR	101...102	•									IP20
TEIK	101			•							IP20
TEK	91		•								IP54
TEKA	93		•								IP54
TEKHA	91		•								IP67
TEKV	86					•					IP54
TEKY	96...98				•						IP67
TEL	99				•				•		IP54
TEL-5M	100				•				•		IP68
TEM	100				•					•	IP54
TENA	85					•					IP54
TEP	88			•							IP54
TEPK	90			•							IP54
TES [3]	106	•					•				IP67
TESK	95							•			IP54
TEU	105						•				IP54
TEV	87					•					IP54

[1] Duct flange (MT4270) needed

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

[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	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
	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
	Cooling control	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	Heating control	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	Modbus RTU			•	•	•	•	•	•	•	•	•	•	•	•	
	Modbus override			•	•	•	•	•	•	•	•	•	•	•	•	
	BACnet MS/TP		•													
	Page	106	104	84	103	92	93	86	96	97	98	85	89	90	105	87

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	106	Depends on the connected external sensor.							IP54		•			•
LUK V2	106	Depends on the connected external sensor.							IP54	•				•
RTE-BAC	104	•							IP20	•			•	•
TEAT LU	84		• [1]			• [2]			IP54	•				•
TEAT LL	84		• [1]			• [2]			IP54		•			•
TEAT-M	84		• [1]			• [2]			IP54	•		•		•
TEHR LU	103	•							IP20	•				•
TEHR LL	103	•							IP20		•			•
TEHR-M	103	•							IP20	•		•		•
TEK LU	92		•						IP54	•				•
TEK LL	92		•						IP54		•			•
TEK-M	92		•						IP54	•		•		•
TEKA LU	93		•						IP54	•				•
TEKA LL	93		•						IP54		•			•
TEKA-M	93		•						IP54	•		•		•
TEKV LU	86					•			IP54	•				•
TEKV LL	86					•			IP54		•			•
TEKV-M	86					•			IP54	•		•		•
TEKYx LU	96				•				IP54/IP67	•				•
TEKYx LL	96				•				IP54/IP67		•			•
TEKYx-M	96				•				IP54/IP67	•		•		•
TENA LU	85					•			IP54	•				•
TENA LL	85					•			IP54		•			•
TENA-M	85					•			IP54	•		•		•
TEP LU	89			•					IP54	•				•
TEP LL	89			•					IP54		•			•
TEP-M	89			•					IP54	•		•		•
TEPK LU	90			•					IP54	•				•
TEPK LL	90			•					IP54		•			•
TEPK-M	90			•					IP54	•		•		•
TESK LU	95							•	IP54	•				
TESK LL	95							•	IP54		•			
TEU LU	105						•		IP54	•				•
TEU LL	105						•		IP54		•			•
TEU-M	105						•		IP54	•		•		•
TEV LU	87					•			IP54	•				•
TEV LL	87					•			IP54		•			•

[1] Duct flange (MT4270) needed

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

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.

Range	-50...120 °C
Time constant	5 s
Probe	Ø 6 x 85 mm
IP protection class	IP54, cable or probe downwards
Cable gland	M16
Mounting	water applications: with Produal pocket (R½"), air applications: with MT4270 flange
Materials	PBT, PC, PA, acid proof steel
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 PT 100-300)

TYPE	ART NO.	
TEAT PT 100	1173070	100 Ω / 0 °C, accuracy ±0,3 °C / 0 °C
TEAT PT 1000	1174070	1000 Ω / 0 °C, accuracy ±0,3 °C / 0 °C
TEAT NTC 1.8	117E070	1800 Ω / 25 °C, accuracy ±0,3 °C / 25 °C
TEAT NTC 10	1175070	10 kΩ / 25 °C, accuracy ±0,2 °C / 25 °C
TEAT NTC 10-C	117M070	10 kΩ / 25 °C, accuracy ±0,25 °C / 25 °C
TEAT NTC 20	1176070	20 kΩ / 25 °C, accuracy ±0,2 °C / 25 °C
TEAT NI 1000	117C070	1000 Ω / 0 °C, accuracy ±0,4 °C / 0 °C
TEAT NI 1000-LG	1178070	1000 Ω / 0 °C, accuracy ±0,5 °C / 0 °C
TEAT KP 10	117J070	LM235Z, 10 mV/K, 2,98 V / 25 °C

OPTIONS / ACCESSORIES

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
Acid proof steel AISI 316L		**ATH 80** 1170020	**ATH 100** 1170027	**ATH 150** 1170022	**ATH 200** 1170023	**ATH 250** 1170024	**ATH 300** 1170021	**ATH 350** 1170025	**ATH 450** 1170026

HEATING/COOLING WATER TRANSMITTERS

°C

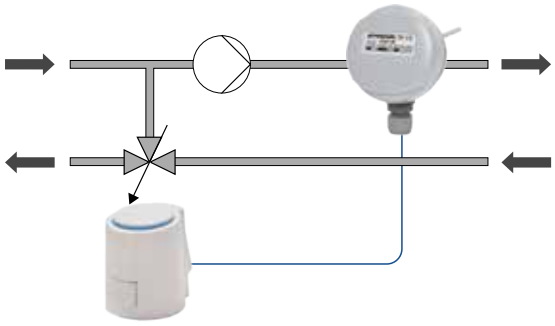
TEAT temperature transmitters are designed for measuring and controlling the temperature of heating and cooling water. The transmitters can also be used for air temperature measurements from ventilation ducts, for example.

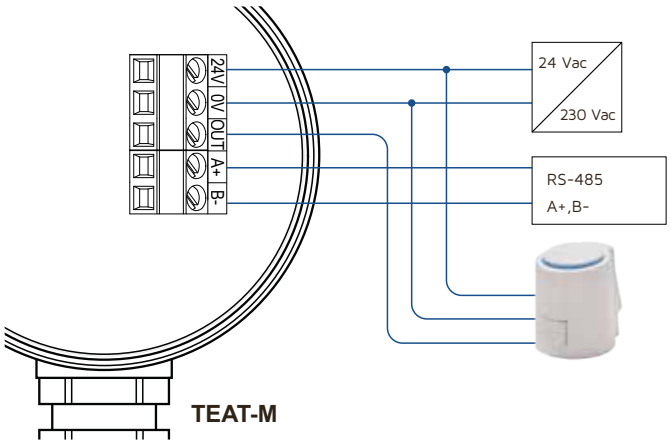
Range	-50...50, -50...150, 0...50, 0...100 °C
Accuracy	±0,5 °C (0 °C)
Probe	Ø 6 x 85 mm
Sensor	Pt1000 EN 60751/B
IP protection class	IP54, cable or probe downwards
Cable gland	M16
Mounting	water applications: with Produal pocket (R½"), air applications: with MT4270 flange
Materials	PBT, PC, PA, acid proof steel
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)

TYPE	ART NO.	
TEAT-M	117Z070	Modbus transmitter/controller, supply 24 Vac/dc, output 0...10 V < 2 mA
TEAT LL	1177070	2-wire transmitter/controller, supply 22...35 Vdc, output 4...20 mA
TEAT LU	1179070	3-wire transmitter/controller, supply 24 Vac/dc, output 0...10 V < 2 mA

OPTIONS / ACCESSORIES		
MT4270	MT4270	duct flange (6 mm)
TE-N V2	1170250	display option for the transmitters

TOOLS		
ML-SER	1139010	transmitter commissioning tool





HOT DOMESTIC WATER SENSORS

°C

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

Range	-50...120 °C
Time constant	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"
Materials	PBT, PC, PA, stainless steel
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

TYPE	ART NO.	
TENA PT 100	1173050	100 Ω / 0 °C, accuracy ±0,3 °C / 0 °C
TENA PT 1000	1174050	1000 Ω / 0 °C, accuracy ±0,3 °C / 0 °C
TENA NTC 1.8	117E050	1800 Ω / 25 °C, accuracy ±0,3 °C / 25 °C
TENA NTC 2.2	1172050	2252 Ω / 25 °C, accuracy ±0,25 °C / 25 °C
TENA NTC 10	1175050	10 kΩ / 25 °C, accuracy ±0,2 °C / 25 °C
TENA NTC 10-AN	117H050	10 kΩ / 25 °C, accuracy ±0,25 °C / 25 °C
TENA NTC 10-C	117M050	10 kΩ / 25 °C, accuracy ±0,25 °C / 25 °C
TENA NTC 10-KB	117B050	5025 Ω / 25 °C, accuracy ±0,5 °C / 25 °C
TENA NTC 20	1176050	20 kΩ / 25 °C, accuracy ±0,2 °C / 25 °C
TENA NI 1000	117C050	1000 Ω / 0 °C, accuracy ±0,4 °C / 0 °C
TENA NI 1000-LG	1178050	1000 Ω / 0 °C, accuracy ±0,5 °C / 0 °C
TENA T1	117V050	2226 Ω / 0 °C, accuracy ±0,4 °C / 0 °C

HOT DOMESTIC WATER TRANSMITTERS

Modbus

°C

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

Range	-50...50, -50...150, 0...50, 0...100 °C
Accuracy	±0,5 °C (0 °C)
Probe	Ø 4,1 x 80 / 50 / 210 mm
Sensor	Pt1000 EN 60751/B
IP protection class	IP54, cable or probe downwards
Cable gland	M16
Mounting	R ½"
Materials	PBT, PC, PA, acid proof steel
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-M-210).
Pressure rating	PN16

TYPE	ART NO.	
TENA-M	117Z050	Modbus transmitter/controller, supply 24 Vac/dc, output 0...10 V < 2 mA
TENA LL	1177050	2-wire transmitter/controller, supply 22...35 Vdc, output 4...20 mA
TENA LU	1179050	3-wire transmitter/controller, supply 24 Vac/dc, output 0...10 V < 2 mA

OPTIONS / ACCESSORIES		
TE-N V2	1170250	display option for the transmitters

TOOLS		
ML-SER	1139010	transmitter commissioning tool

FROST GUARD SENSORS

°C

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

Range	-50...120 °C
Time constant	2,5 s
Probe	Ø 4 x 200 / 400 mm
IP protection class	IP54, cable or probe downwards
Cable gland	M16
Mounting	R ¼"
Materials	PBT, PC, PA, stainless steel, brass
Mounting depth	< 200 mm (also available < 400 mm)
Pressure rating	PN16

TYPE	ART NO.	
TEKV PT 100	1173120	100 Ω / 0 °C, accuracy ±0,3 °C / 0 °C
TEKV PT 1000	1174120	1000 Ω / 0 °C, accuracy ±0,3 °C / 0 °C
TEKV NTC 1.8	117E120	1800 Ω / 25 °C, accuracy ±0,3 °C / 25 °C
TEKV NTC 2.2	1172120	2252 Ω / 25 °C, accuracy ±0,25 °C / 25 °C
TEKV NTC 10	1175120	10 kΩ / 25 °C, accuracy ±0,2 °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
TEKV NTC 10-KB	117B120	5025 Ω / 25 °C, accuracy ±0,5 °C / 25 °C
TEKV NTC 20	1176120	20 kΩ / 25 °C, accuracy ±0,2 °C / 25 °C
TEKV NI 1000	117C120	1000 Ω / 0 °C, accuracy ±0,4 °C / 0 °C
TEKV NI 1000-LG	1178120	1000 Ω / 0 °C, accuracy ±0,5 °C / 0 °C

FROST GUARD TRANSMITTERS

Modbus

°C

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

Range	-50...50, -50...150, 0...50, 0...100 °C
Accuracy	±0,5 °C (0 °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"
Materials	PBT, PC, PA, stainless steel, brass
Mounting depth	< 200 mm (also available < 400 mm)
Pressure rating	PN16

TYPE	ART NO.	
TEKV-M	117Z120	Modbus transmitter/controller, supply 24 Vac/dc, output 0...10 V < 2 mA
TEKV LL	1177120	2-wire transmitter/controller, supply 22...35 Vdc, output 4...20 mA
TEKV LU	1179120	3-wire transmitter/controller, supply 24 Vac/dc, output 0...10 V < 2 mA

OPTIONS / ACCESSORIES

TE-N V2	1170250	display option for the transmitters

TOOLS

ML-SER	1139010	transmitter commissioning tool

FROST GUARD SENSORS

°C

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

Range	-50...120 °C
Time constant	2,5 s
Probe	Ø 4 x 200 / 400 mm
Cable	Ø 3,2 mm x 2 m (LIYY 2 x 0,14 mm2)
Mounting	R ¼"
Materials	acid proof steel, brass
Mounting depth	< 200 mm (also available < 400 mm)
Pressure rating	PN16

TYPE	ART NO.	
TEV PT 100	1173020	100 Ω / 0 °C, accuracy ±0,3 °C / 0 °C
TEV PT 1000	1174020	1000 Ω / 0 °C, accuracy ±0,3 °C / 0 °C
TEV NTC 1.8	117E020	1800 Ω / 25 °C, accuracy ±0,3 °C / 25 °C
TEV NTC 2.2	1172020	2252 Ω / 25 °C, accuracy ±0,25 °C / 25 °C
TEV NTC 10	1175020	10 kΩ / 25 °C, accuracy ±0,2 °C / 25 °C
TEV NTC 10-AN	117H020	10 kΩ / 25 °C, accuracy ±0,25 °C / 25 °C
TEV NTC 10-C	117M020	10 kΩ / 25 °C, accuracy ±0,25 °C / 25 °C
TEV NTC 10-KB	117B020	5025 Ω / 25 °C, accuracy ±0,5 °C / 25 °C
TEV NTC 20	1176020	20 kΩ / 25 °C, accuracy ±0,2 °C / 25 °C
TEV NI 1000	117C020	1000 Ω / 0 °C, accuracy ±0,4 °C / 0 °C
TEV NI 1000-LG	1178020	1000 Ω / 0 °C, accuracy ±0,5 °C / 0 °C

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.

Range	-50...50, -50...150, 0...50, 0...100 °C
Accuracy	±0,5 °C (0 °C)
Probe	Ø 4 x 200 / 400 mm
Sensor	Pt1000 EN 60751/B
IP protection class	IP54, cable downwards
Cable	Ø 3,2 mm x 2 m (LIYY 2 x 0,14 mm2)
Cable gland	M16
Mounting	probe: R ¼", housing: with screws
Materials	acid proof steel, brass, PC plastic
Mounting depth	< 200 mm (also available < 400 mm)
Pressure rating	PN16

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 / ACCESSORIES		
TEU-N V2	1170270	display option for the transmitters

TOOLS		
ML-SER	1139010	transmitter commissioning tool

STRAP-ON SENSORS

°C

TEP sensors are designed for pipe strap-on installations in heating and cooling applications.

Range	-50...120 °C
Probe	41 x 15 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 PT 100	1173080	100 Ω / 0 °C, accuracy ±0,3 °C / 0 °C
TEP PT 1000	1174080	1000 Ω / 0 °C, accuracy ±0,3 °C / 0 °C
TEP NTC 1.8	117E080	1800 Ω / 25 °C, accuracy ±0,3 °C / 25 °C
TEP NTC 2.2	1172080	2252 Ω / 25 °C, accuracy ±0,25 °C / 25 °C
TEP NTC 10	1175080	10 kΩ / 25 °C, accuracy ±0,2 °C / 25 °C
TEP NTC 10-AN	117H080	10 kΩ / 25 °C, accuracy ±0,25 °C / 25 °C
TEP NTC 10-C	117M080	10 kΩ / 25 °C, accuracy ±0,25 °C / 25 °C
TEP NTC 10-KB	117B080	5025 Ω / 25 °C, accuracy ±0,5 °C / 25 °C
TEP NTC 20	1176080	20 kΩ / 25 °C, accuracy ±0,2 °C / 25 °C
TEP NI 1000	117C080	1000 Ω / 0 °C, accuracy ±0,4 °C / 0 °C
TEP NI 1000-LG	1178080	1000 Ω / 0 °C, accuracy ±0,5 °C / 0 °C
TEP KP 10	117J080	LM235Z, 10 mV/K, 2,98 V / 25 °C
TEP T1	117V080	2226 Ω / 0 °C, accuracy ±0,4 °C / 0 °C

STRAP-ON TRANSMITTERS

°C

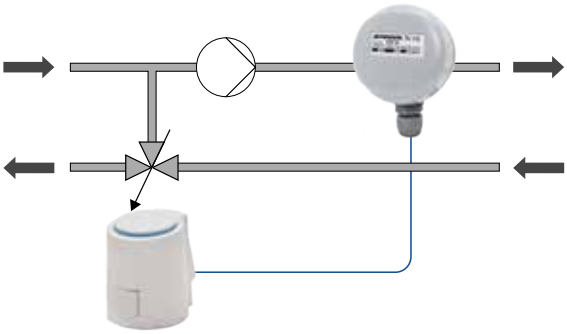
TEP temperature transmitters are designed for pipe strap-on installations. Transmitters can be used for measuring and controlling temperature in heating and cooling applications.

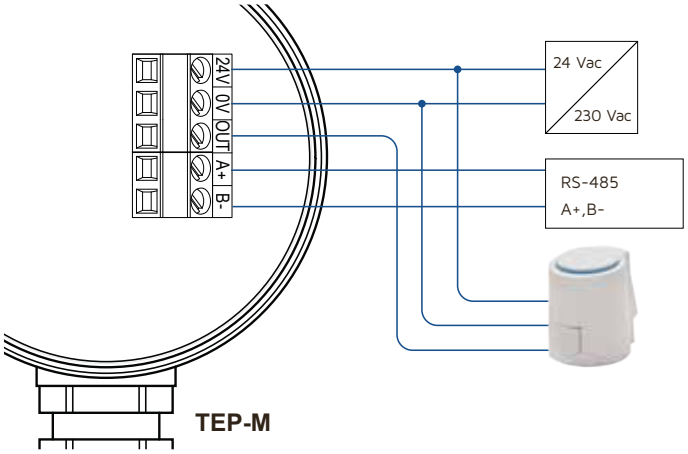
Range	-50...50, -50...150, 0...50, 0...100 °C
Accuracy	±0,5 °C (0 °C)
Probe	41 x 15 x 6 mm
Sensor	Pt1000 EN 60751/B
IP protection class	IP54, cable or probe downwards
Cable gland	M16
Mounting	by a band on the pipe (diam. 40...90 mm)
Materials	PBT, PC, PA, zink casting

TYPE	ART NO.	
TEP-M	117Z080	Modbus transmitter/controller, supply 24 Vac/dc, output 0...10 V < 2 mA
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

OPTIONS / ACCESSORIES		
TE-N V2	1170250	display option for the transmitters

TOOLS		
ML-SER	1139010	transmitter commissioning tool





STRAP-ON SENSORS

°C

TEPK sensors are designed for pipe strap-on installations in heating and cooling applications.

Range	-20...80 °C
Probe	41 x 15 x 6 mm
IP protection class	IP54
Cable	Ø 3,2 mm x 2 m (LIYY 2 x 0,14 mm2)
Mounting	by a plastic band on the pipe (Ø10...100 mm)
Materials	probe: zinc casting

TYPE	ART NO.	
TEPK PT 100	1173240	100 Ω / 0 °C, accuracy ±0,3 °C / 0 °C
TEPK PT 1000	1174240	1000 Ω / 0 °C, accuracy ±0,3 °C / 0 °C
TEPK NTC 1.8	117E240	1800 Ω / 25 °C, accuracy ±0,3 °C / 25 °C
TEPK NTC 2.2	1172240	2252 Ω / 25 °C, accuracy ±0,25 °C / 25 °C
TEPK NTC 10	1175240	10 kΩ / 25 °C, accuracy ±0,2 °C / 25 °C
TEPK NTC 10-AN	117H240	10 kΩ / 25 °C, accuracy ±0,25 °C / 25 °C
TEPK NTC 10-C	117M240	10 kΩ / 25 °C, accuracy ±0,25 °C / 25 °C
TEPK NTC 10-KB	117B240	5025 kΩ / 25 °C, accuracy ±0,5 °C / 25 °C
TEPK NTC 20	1176240	20 kΩ / 25 °C, accuracy ±0,2 °C / 25 °C
TEPK NI 1000	117C240	1000 Ω / 0 °C, accuracy ±0,4 °C / 0 °C
TEPK NI 1000-LG	1178240	1000 Ω / 0 °C, accuracy ±0,5 °C / 0 °C
TEPK T1	117V240	2226 Ω / 0 °C, accuracy ±0,4 °C / 0 °C

STRAP-ON TRANSMITTERS

Modbus

°C

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

Range	-50...50, -50...150, 0...50, 0...100 °C
Accuracy	±0,5 °C (0 °C)
Probe	41 x 15 x 6 mm
Sensor	Pt1000 EN 60751/B
IP protection class	IP54, cable downwards
Cable	Ø 3,2 mm x 2 m (LIYY 2 x 0,14 mm2)
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-M	117Z240	Modbus transmitter/controller, supply 24 Vac/dc, output 0...10 V < 2 mA
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

OPTIONS / ACCESSORIES		
TEU-N V2	1170270	display option for the transmitters

TOOLS		
ML-SER	1139010	transmitter commissioning tool

DUCT SENSORS

°C

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

Range	-50...70 °C
Probe	Ø 6 mm x 100 mm, acid proof steel
IP protection class	IP67
Cable	Ø 4,7 mm x 2 m (LIYY 2 x 0,5 mm2), other leghts also available
Mounting	with flange, adjustable < 90 mm
Materials	probe: acid proof steel
Mounting depth	< 90 mm

TYPE	ART NO.	
TEKHA PT 100	1173290	100 Ω / 0 °C, accuracy ±0,3 °C / 0 °C
TEKHA PT 1000	1174290	1000 Ω / 0 °C, accuracy ±0,3 °C / 0 °C
TEKHA NTC 1.8	117E290	1800 Ω / 25 °C, accuracy ±0,3 °C / 25 °C
TEKHA NTC 2.2	1172290	2252 Ω / 25 °C, accuracy ±0,25 °C / 25 °C
TEKHA NTC 10	1175290	10 kΩ / 25 °C, accuracy ±0,2 °C / 25 °C
TEKHA NTC 10-AN	117H290	10 kΩ / 25 °C, accuracy ±0,25 °C / 25 °C
TEKHA NTC 10-C	117M290	10 kΩ / 25 °C, accuracy ±0,25 °C / 25 °C
TEKHA NTC 20	1176290	20 kΩ / 25 °C, accuracy ±0,2 °C / 25 °C
TEKHA NI 1000	117C290	1000 Ω / 0 °C, accuracy ±0,4 °C / 0 °C
TEKHA NI 1000-LG	1178290	1000 Ω / 0 °C, accuracy ±0,5 °C / 0 °C
TEKHA KP 10	117J290	LM235Z, 10 mV/K, 2,98 V / 25 °C

DUCT SENSORS

°C

TEK sensors are designed for measuring temperatures inside ventilation ducts.

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

TYPE	ART NO.	
TEK PT 100	1173040	100 Ω / 0 °C, accuracy ±0,3 °C / 0 °C
TEK PT 1000	1174040	1000 Ω / 0 °C, accuracy ±0,3 °C / 0 °C
TEK PT 1000-500	1174041	1000 Ω / 0 °C, accuracy ±0,3 °C / 0 °C, probe length is 500 mm
TEK NTC 1.8	117E040	1800 Ω / 25 °C, accuracy ±0,3 °C / 25 °C
TEK NTC 2.2	1172040	2252 Ω / 25 °C, accuracy ±0,25 °C / 25 °C
TEK NTC 10	1175040	10 kΩ / 25 °C, accuracy ±0,2 °C / 25 °C
TEK NTC 10-500	1175041	10 kΩ / 25 °C, accuracy ±0,2 °C / 25 °C, probe length is 500 mm
TEK NTC 10-AN	117H040	10 kΩ / 25 °C, accuracy ±0,25 °C / 25 °C
TEK NTC 10-C	117M040	10 kΩ / 25 °C, accuracy ±0,25 °C / 25 °C
TEK NTC 10-KB	117B040	5025 Ω / 25 °C, accuracy ±0,5 °C / 25 °C
TEK NTC 20	1176040	20 kΩ / 25 °C, accuracy ±0,2 °C / 25 °C
TEK NI 1000	117C040	1000 Ω / 0 °C, accuracy ±0,4 °C / 0 °C
TEK NI 1000-LG	1178040	1000 Ω / 0 °C, accuracy ±0,5 °C / 0 °C
TEK KP 10	117J040	LM235Z, 10 mV/K, 2,98 V / 25 °C
TEK T1	117V040	2226 Ω / 0 °C, accuracy ±0,4 °C / 0 °C

DUCT TRANSMITTERS

°C

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

Range	-50...50, -50...150, 0...50, 0...100 °C
Accuracy	±0,5 °C (0 °C)
Probe	Ø 8 x 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
Mounting depth	adjustable < 200 mm, other mounting depths also available

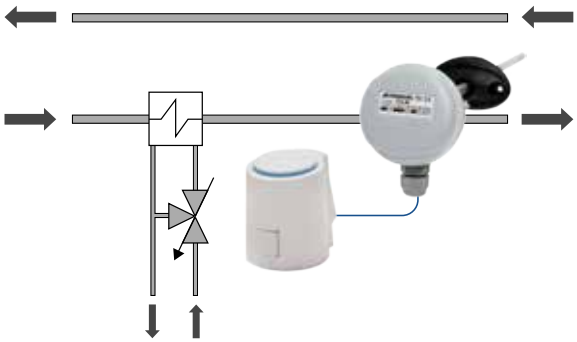
TYPE	ART NO.	
TEK-M	117Z040	Modbus transmitter/controller, supply 24 Vac/dc, output 0...10 V < 2 mA
TEK LL	1177040	2-wire transmitter/controller, supply 15...35 Vdc, output 4...20 mA
TEK LU	1179040	3-wire transmitter/controller, supply 24 Vac/dc, output 0...10 V < 2 mA

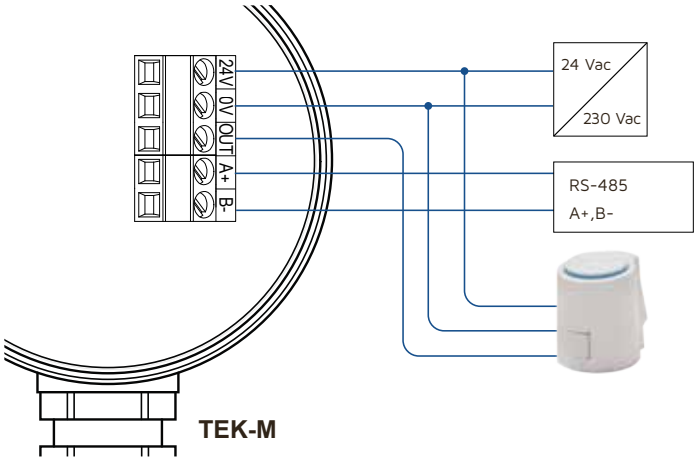
OPTIONS / ACCESSORIES

TE-N V2	1170250	display option for the transmitters

TOOLS

ML-SER	1139010	transmitter commissioning tool





DUCT SENSORS

°C

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

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

TYPE	ART NO.	
TEKA PT 100	1173130	100 Ω / 0 °C, accuracy ±0,3 °C / 0 °C
TEKA PT 1000	1174130	1000 Ω / 0 °C, accuracy ±0,3 °C / 0 °C
TEKA PT 1000-6m	1174131	1000 Ω / 0 °C, accuracy ±0,3 °C / 0 °C, length is 6 m
TEKA NTC 1.8	117E130	1800 Ω / 25 °C, accuracy ±0,3 °C / 25 °C
TEKA NTC 2.2	1172130	2252 Ω / 25 °C, accuracy ±0,25 °C / 25 °C
TEKA NTC 10	1175130	10 kΩ / 25 °C, accuracy ±0,2 °C / 25 °C
TEKA NTC 10-AN	117H130	10 kΩ / 25 °C, accuracy ±0,25 °C / 25 °C
TEKA NTC 10-C	117M130	10 kΩ / 25 °C, accuracy ±0,25 °C / 25 °C
TEKA NTC 10-KB	117B130	5025 Ω / 25 °C, accuracy ±0,5 °C / 25 °C
TEKA NTC 20	1176130	20 kΩ / 25 °C, accuracy ±0,2 °C / 25 °C
TEKA NI 1000	117C130	1000 Ω / 0 °C, accuracy ±0,4 °C / 0 °C
TEKA NI 1000-LG	1178130	1000 Ω / 0 °C, accuracy ±0,5 °C / 0 °C

DUCT TRANSMITTERS

Modbus

°C

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

Range	-50...50, -50...150, 0...50, 0...100 °C
Accuracy	±0,5 °C (0 °C)
Probe	Ø 10 x 3000 mm
Sensor	Pt1000 EN 60751/B
IP protection class	IP54, cable or probe downwards
Length	3 m
Cable gland	M16
Mounting	with flange and springs
Materials	PBT, PC, PA, stainless steel

TYPE	ART NO.	
TEKA-M	117Z130	Modbus transmitter/controller, supply 24 Vac/dc, output 0...10 V < 2 mA
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 LU-6m	1179131	3-wire transmitter/controller, supply 24 Vac/dc, output 0...10 V < 2 mA, length is 6 m

OPTIONS / ACCESSORIES		
TE-N V2	1170250	display option for the transmitters

TOOLS		
ML-SER	1139010	transmitter commissioning tool

DUCT SENSORS

°C

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

Range	-50...70 °C
Probe	Ø 8,2 x 497 mm
IP protection class	IP54, cable or probe downwards
Length	500 mm
Cable gland	M16
Mounting	with flange
Materials	PBT, PC, PA, stainless steel

TYPE	ART NO.	
TEKA PT 100-500	1173170	100 Ω / 0 °C, accuracy ±0,3 °C / 0 °C
TEKA PT 1000-500	1174170	1000 Ω / 0 °C, accuracy ±0,3 °C / 0 °C
TEKA NTC 1.8-500	117E170	1800 Ω / 25 °C, accuracy ±0,3 °C / 25 °C
TEKA NTC 2.2-500	1172170	2252 Ω / 25 °C, accuracy ±0,25 °C / 25 °C
TEKA NTC 10-500	1175170	10 kΩ / 25 °C, accuracy ±0,2 °C / 25 °C
TEKA NTC 10-AN-500	117H170	10 kΩ / 25 °C, accuracy ±0,25 °C / 25 °C
TEKA NTC 10-C-500	117M170	10 kΩ / 25 °C, accuracy ±0,25 °C / 25 °C
TEKA NTC 10-KB-500	117B170	5025 Ω / 25 °C, accuracy ±0,5 °C / 25 °C
TEKA NTC 20-500	1176170	20 kΩ / 25 °C, accuracy ±0,2 °C / 25 °C
TEKA NI 1000-500	117C170	1000 Ω / 0 °C, accuracy ±0,4 °C / 0 °C
TEKA NI 1000-LG-500	1178170	1000 Ω / 0 °C, accuracy ±0,5 °C / 0 °C

DUCT TRANSMITTERS

Modbus

°C

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

Range	-50...50, -50...150, 0...50, 0...100 °C
Accuracy	±0,5 °C (0 °C)
Probe	Ø 8,2 x 497 mm
Sensor	Pt1000 EN 60751/B
IP protection class	IP54, cable or probe downwards
Length	500 mm
Cable gland	M16
Mounting	with flange
Materials	PBT, PC, PA, stainless steel

TYPE	ART NO.	
TEKA-M-500	117Z170	Modbus transmitter/controller, supply 24 Vac/dc, output 0...10 V < 2 mA
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

OPTIONS / ACCESSORIES		
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.

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
Materials	silumin cast
Mounting depth	< 265 mm
Pressure rating	PN16

TYPE	ART NO.	
TESK PT 100	1173160	100 Ω / 0 °C, accuracy ±0,3 °C / 0 °C
TESK PT 1000	1174160	1000 Ω / 0 °C, accuracy ±0,3 °C / 0 °C

OPTIONS / ACCESSORIES

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.

Range	0...400 °C
Accuracy	±0,5 °C (0 °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
Materials	silumin cast
Mounting depth	< 265 mm
Pressure rating	PN16

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 / ACCESSORIES

MT4357	MT4357	duct flange, brass, 10 mm

CABLE TEMPERATURE SENSORS

°C

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

Range	-30...80 °C
Probe	Ø 4 x 30 mm
IP protection class	IP67
Cable	Ø 3,2 mm x 2,3 m (LIYY 2 x 0,14 mm²), other lengths also available
Mounting	housing: with screws on wall, external lugs
Materials	PVC, stainless steel

TYPE	ART NO.	
TEKY4 PT 100	1173330	100 Ω / 0 °C, accuracy ±0,3 °C / 0 °C
TEKY4 PT 1000	1174330	1000 Ω / 0 °C, accuracy ±0,3 °C / 0 °C
TEKY4 NTC 1.8	117E330	1800 Ω / 25 °C, accuracy ±0,3 °C / 25 °C
TEKY4 NTC 2.2	1172330	2252 Ω / 25 °C, accuracy ±0,25 °C / 25 °C
TEKY4 NTC 10	1175330	10 kΩ / 25 °C, accuracy ±0,2 °C / 25 °C
TEKY4 NTC 10-AN	117H330	10 kΩ / 25 °C, accuracy ±0,25 °C / 25 °C
TEKY4 NTC 10-C	117M330	10 kΩ / 25 °C, accuracy ±0,25 °C / 25 °C
TEKY4 NTC 10-KB	117B330	5025 Ω / 25 °C, accuracy ±0,5 °C / 25 °C
TEKY4 NTC 20	1176330	20 kΩ / 25 °C, accuracy ±0,2 °C / 25 °C
TEKY4 NI 1000	117C330	1000 Ω / 0 °C, accuracy ±0,4 °C / 0 °C
TEKY4 NI 1000-LG	1178330	1000 Ω / 0 °C, accuracy ±0,5 °C / 0 °C
TEKY4 T1	117V330	2226 Ω / 0 °C, accuracy ±0,4 °C / 0 °C

CABLE TEMPERATURE TRANSMITTERS

Modbus

°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.

Range	-50...50, -50...150, 0...50, 0...100 °C
Accuracy	±0,5 °C (0 °C)
Probe	Ø 4 x 30 mm
IP protection class	IP54, cable downwards
Cable	Ø 3,2 mm x 2,3 m (LIYY 2 x 0,14 mm2), other lengths also available
Cable gland	M16
Materials	PBT, PC, PA

TYPE	ART NO.	
TEKY4-M	117Z330	Modbus transmitter/controller, supply 24 Vac/dc, output 0...10 V < 2 mA
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

OPTIONS / ACCESSORIES		
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 measuring temperatures in automatic HVAC systems. The rolled stainless steel sleeve provides good protection against water and dust.

Range	-50...150 °C
Probe	Ø 6 x 45 mm
IP protection class	IP67
Cable	Ø 4,8 mm x 2,3 m (SIHF 2 x 0,25 mm²), other lengths also available
Mounting	housing: with screws on wall, external lugs
Materials	silicone, stainless steel

TYPE	ART NO.	
TEKY6S PT 100	1173340	100 Ω / 0 °C, accuracy ±0,3 °C / 0 °C
TEKY6S PT 1000	1174340	1000 Ω / 0 °C, accuracy ±0,3 °C / 0 °C
TEKY6S NTC 1.8	117E340	1800 Ω / 25 °C, accuracy ±0,3 °C / 25 °C
TEKY6S NTC 2.2	1172340	2252 Ω / 25 °C, accuracy ±0,25 °C / 25 °C
TEKY6S NTC 10	1175340	10 kΩ / 25 °C, accuracy ±0,2 °C / 25 °C
TEKY6S NTC 10-AN	117H340	10 kΩ / 25 °C, accuracy ±0,25 °C / 25 °C
TEKY6S NTC 10-C	117M340	10 kΩ / 25 °C, accuracy ±0,25 °C / 25 °C
TEKY6S NTC 10-KB	117B340	5025 Ω / 25 °C, accuracy ±0,5 °C / 25 °C
TEKY6S NTC 20	1176340	20 kΩ / 25 °C, accuracy ±0,2 °C / 25 °C
TEKY6S NI 1000	117C340	1000 Ω / 0 °C, accuracy ±0,4 °C / 0 °C
TEKY6S NI 1000-LG	1178340	1000 Ω / 0 °C, accuracy ±0,5 °C / 0 °C

CABLE TEMPERATURE TRANSMITTERS

Modbus

°C

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.

Range	-50...50, -50...150, 0...50, 0...100 °C
Accuracy	±0,5 °C (0 °C)
Probe	Ø 6 x 45 mm
Sensor	Pt1000 EN 60751/B
IP protection class	IP54, cable downwards
Cable	Ø 4,8 mm x 2,3 m (SIHF 2 x 0,25 mm2), other lengths also available
Cable gland	M16
Mounting	housing: with screws on wall, external lugs
Materials	PBT, PC, PA

TYPE	ART NO.	
TEKY6S-M	117Z340	Modbus transmitter/controller, supply 24 Vac/dc, output 0...10 V < 2 mA
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

OPTIONS / ACCESSORIES		
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 measuring temperatures in automatic HVAC systems. The rolled stainless steel sleeve provides good protection against water and dust.

Range	-30...80 °C
Probe	Ø 6 x 45 mm
IP protection class	IP67
Cable	Ø 4,7 mm x 2,3 m (LIYY 2 x 0,5 mm²), other lengths also available
Mounting	housing: with screws on wall, external lugs
Materials	PVC, stainless steel

TYPE	ART NO.	
TEKY6 PT 100	1173320	100 Ω / 0 °C, accuracy ±0,3 °C / 0 °C
TEKY6 PT 1000	1174320	1000 Ω / 0 °C, accuracy ±0,3 °C / 0 °C
TEKY6 NTC 1.8	117E320	1800 Ω / 25 °C, accuracy ±0,3 °C / 25 °C
TEKY6 NTC 2.2	1172320	2252 Ω / 25 °C, accuracy ±0,25 °C / 25 °C
TEKY6 NTC 10	1175320	10 kΩ / 25 °C, accuracy ±0,2 °C / 25 °C
TEKY6 NTC 10-AN	117H320	10 kΩ / 25 °C, accuracy ±0,25 °C / 25 °C
TEKY6 NTC 10-C	117M320	10 kΩ / 25 °C, accuracy ±0,25 °C / 25 °C
TEKY6 NTC 10-KB	117B320	5025 Ω / 25 °C, accuracy ±0,5 °C / 25 °C
TEKY6 NTC 20	1176320	20 kΩ / 25 °C, accuracy ±0,2 °C / 25 °C
TEKY6 NI 1000	117C320	1000 Ω / 0 °C, accuracy ±0,4 °C / 0 °C
TEKY6 NI 1000-LG	1178320	1000 Ω / 0 °C, accuracy ±0,5 °C / 0 °C
TEKY6 KP 10	117J320	LM335Z, 2,98 V / 25 °C, 10 mV/K, accuracy ±0,5 °C / 25 °C

CABLE TEMPERATURE TRANSMITTERS

Modbus

°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.

Range	-50...50, -50...150, 0...50, 0...100 °C
Accuracy	±0,5 °C (0 °C)
Probe	Ø 6 x 45 mm
Sensor	Pt1000 EN 60751/B
IP protection class	IP54, cable downwards
Cable	Ø 4,7 mm x 2,3 m (LIYY 2 x 0,5 mm2), other lengths also available
Cable gland	M16
Mounting	housing: with screws on wall, external lugs
Materials	PBT, PC, PA

TYPE	ART NO.	
TEKY6-M	117Z320	Modbus transmitter/controller, supply 24 Vac/dc, output 0...10 V < 2 mA
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

OPTIONS / ACCESSORIES		
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.

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, FLOOR

°C

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

Range	-30...80 °C
Probe	Ø 7 x 28 mm
IP protection class	IP54
Cable	Ø 4,7 mm x 2,3 m (LIYY 2 x 0,5 mm^2), other lengths also available

TYPE	ART NO.	
TEL PT 100	1173280	100 Ω / 0 °C, accuracy ±0,3 °C / 0 °C
TEL PT 1000	1174280	1000 Ω / 0 °C, accuracy ±0,3 °C / 0 °C
TEL NTC 1.8	117E280	1800 Ω / 25 °C, accuracy ±0,3 °C / 25 °C
TEL NTC 2.2	1172280	2252 Ω / 25 °C, accuracy ±0,25 °C / 25 °C
TEL NTC 10-AN	117H280	10 kΩ / 25 °C, accuracy ±0,25 °C / 25 °C
TEL NTC 10-C	117M280	10 kΩ / 25 °C, accuracy ±0,25 °C / 25 °C
TEL NI 1000	117C280	1000 Ω / 0 °C, accuracy ±0,4 °C / 0 °C
TEL NI 1000-LG	1178280	1000 Ω / 0 °C, accuracy ±0,5 °C / 0 °C

CABLE TEMPERATURE SENSORS, FLOOR

°C

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

Range	-50...105 °C
Probe	Ø 5 x 20 mm
IP protection class	IP68
Length	5 m
Cable	Ø 3 mm x 5 m, 2 x AWG24 (rigid, double insulation)

TYPE	ART NO.	
TEL NTC 10-5M	1175281	10 kΩ / 25 °C, accuracy ±0,2 °C / 25 °C
TEL NTC 20-5M	1176281	20 kΩ / 25 °C, accuracy ±0,2 °C / 25 °C

CABLE TEMPERATURE SENSORS, SOIL INSTALLATION

°C

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

Range	-30...80 °C
Probe	Ø 9 x 28 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 PT 100	1173310	100 Ω / 0 °C, accuracy ±0,3 °C / 0 °C
TEM PT 1000	1174310	1000 Ω / 0 °C, accuracy ±0,3 °C / 0 °C
TEM NTC 1.8	117E310	1800 Ω / 25 °C, accuracy ±0,3 °C / 25 °C
TEM NTC 2.2	1172310	2252 Ω / 25 °C, accuracy ±0,25 °C / 25 °C
TEM NTC 10	1175310	10 kΩ / 25 °C, accuracy ±0,2 °C / 25 °C
TEM NTC 10-AN	117H310	10 kΩ / 25 °C, accuracy ±0,25 °C / 25 °C
TEM NTC 10-C	117M310	10 kΩ / 25 °C, accuracy ±0,25 °C / 25 °C
TEM NTC 20	1176310	20 kΩ / 25 °C, accuracy ±0,2 °C / 25 °C
TEM NI 1000	117C310	1000 Ω / 0 °C, accuracy ±0,4 °C / 0 °C
TEM NI 1000-LG	1178310	1000 Ω / 0 °C, accuracy ±0,5 °C / 0 °C

WINDOW TEMPERATURE SENSORS

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

°C

Range	-20...60 °C
Probe	50 x 20 x 8 mm
IP protection class	IP20
Cable	Ø 3,2 mm x 2 m (LIYY 2 x 0,14 mm^2)
Mounting	by adhesive paste
Materials	probe: aluminum

TYPE	ART NO.	
TEIK PT 100	1173220	100 Ω / 0 °C, accuracy ±0,3 °C / 0 °C
TEIK PT 1000	1174220	1000 Ω / 0 °C, accuracy ±0,3 °C / 0 °C
TEIK NTC 1.8	117E220	1800 Ω / 25 °C, accuracy ±0,3 °C / 25 °C
TEIK NTC 10	1175220	10 kΩ / 25 °C, accuracy ±0,2 °C / 25 °C
TEIK NTC 20	1176220	20 kΩ / 25 °C, accuracy ±0,2 °C / 25 °C
TEIK NI 1000-LG	1178220	1000 Ω / 0 °C, accuracy ±0,5 °C / 0 °C

ROOM TEMPERATURE SENSORS

TEHR sensors are designed for measuring room temperatures.

°C

Range	0...50 °C
IP protection class	IP20
Material	ABS plastic
Mounting	on the wall surface or on a flush mounting box (60 mm hole distance)
Dimensions	86 x 86 x 32 mm

TYPE	ART NO.	
TEHR PT 100	1173190	100 Ω / 0 °C, accuracy ±0,3 °C / 0 °C
TEHR PT 1000	1174190	1000 Ω / 0 °C, accuracy ±0,3 °C / 0 °C
TEHR NTC 1.8	117E190	1800 Ω / 25 °C, accuracy ±0,3 °C / 25 °C
TEHR NTC 2.2	1172190	2252 Ω / 25 °C, accuracy ±0,25 °C / 25 °C
TEHR NTC 10	1175190	10 kΩ / 25 °C, accuracy ±0,2 °C / 25 °C
TEHR NTC 10-AN	117H190	10 kΩ / 25 °C, accuracy ±0,25 °C / 25 °C
TEHR NTC 10-C	117M190	10 kΩ / 25 °C, accuracy ±0,25 °C / 25 °C
TEHR NTC 10-KB	117B190	5025 Ω / 25 °C, accuracy ±0,5 °C / 25 °C
TEHR NTC 20	1176190	20 kΩ / 25 °C, accuracy ±0,2 °C / 25 °C
TEHR NI 1000	117C190	1000 Ω / 0 °C, accuracy ±0,4 °C / 0 °C
TEHR NI 1000-LG	1178190	1000 Ω / 0 °C, accuracy ±0,5 °C / 0 °C
TEHR KP 10	117J190	LM235Z, 10 mV/K, 2,98 V / 25 °C
TEHR T1	117V190	2226 Ω / 0 °C, accuracy ±0,4 °C / 0 °C

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

ROOM TEMPERATURE SENSORS

°C + setpoint adjustment

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.

Range	0...50 °C
IP protection class	IP20
Material	ABS plastic
Mounting	on the wall surface or on a flush mounting box (60 mm hole distance)
Dimensions	86 x 86 x 32 mm

TYPE	ART NO.	
TEHR PT 100-P	1173230	100 Ω / 0 °C, accuracy ±0,3 °C / 0 °C
TEHR PT 1000-P	1174230	1000 Ω / 0 °C, accuracy ±0,3 °C / 0 °C
TEHR NTC 1.8-P	117E230	1800 Ω / 25 °C, accuracy ±0,3 °C / 25 °C
TEHR NTC 2.2-P	1172230	2252 Ω / 25 °C, accuracy ±0,25 °C / 25 °C
TEHR NTC 10-AN-P	117H230	10 kΩ / 25 °C, accuracy ±0,25 °C / 25 °C
TEHR NTC 10-C-P	117M230	10 kΩ / 25 °C, accuracy ±0,25 °C / 25 °C
TEHR NTC 10-P	1175230	10 kΩ / 25 °C, accuracy ±0,2 °C / 25 °C
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
TEHR NI 1000-LG-P	1178230	1000 Ω / 0 °C, accuracy ±0,5 °C / 0 °C
TEHR NI 1000-P	117C230	1000 Ω / 0 °C, accuracy ±0,4 °C / 0 °C
TEHR KP 10-P	117J230	LM235Z, 10 mV/K, 2,98 V / 25 °C

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

ROOM TEMPERATURE TRANSMITTERS

°C

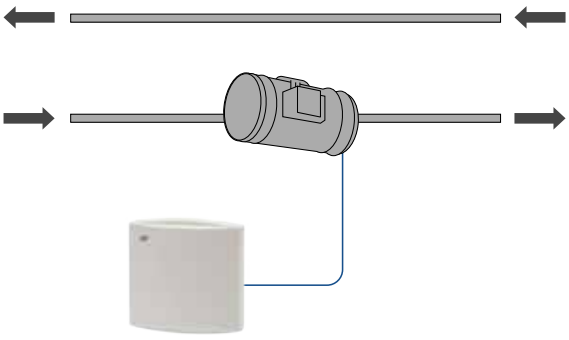
TEHR LL (2-wire, 4...20 mA) and TEHR LU (3-wire, 0...10 V) are temperature transmitters for dry room spaces. The output range is selectable. TEHR-M output is available via Modbus and as a 0...10 V signal.

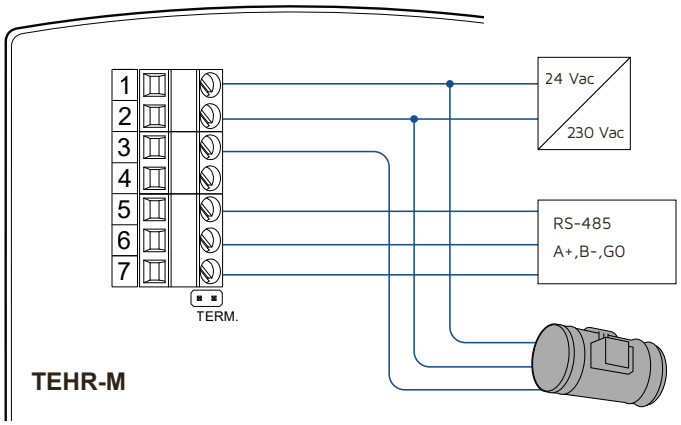
Range	-50...50, -50...150, 0...50, 0...100 °C
Accuracy	±0,5 °C (25 °C)
Sensor	Pt1000 EN 60751/B
IP protection class	IP20
Material	ABS plastic
Ambient temperature	0...50 °C
Mounting	on the wall surface or on a flush mounting box (60 mm hole distance)
Dimensions	86 x 86 x 32 mm

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 LU	1179190	3-wire transmitter/controller, supply 24 Vac/dc, output 0...10 V < 2 mA
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 LU-N	1179191	3-wire transmitter/controller with display, supply 24 Vac/dc, output 0...10 V < 2 mA
TEHR-M	117Z190	Modbus transmitter/controller, supply 24 Vac/dc, output 0...10 V < 2 mA
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
TEHR-M-N	117Z191	Modbus transmitter/controller with display, supply 24 Vac/dc, output 0...10 V < 2 mA

OPTIONS / ACCESSORIES		
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
TEHR-P	1170120	passive potentiometer (not available for M models)

TOOLS		
ML-SER	1139010	transmitter commissioning tool





ROOM TEMPERATURE TRANSMITTERS

NEW

°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.

Supply	24 Vac/dc, < 1 VA
Range (temperature)	0...50 °C
Accuracy (temperature)	±0,3 °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)
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	
		Second digital input and passive temperature sensor (NTC 10)	-DI2-TE-NTC10						8	
6	Body colour	White (RAL 9010)								0
		Anthracite grey	-GR							B

TOOLS

SW-DCT-USB	1139040	configuration cable

OUTDOOR TEMPERATURE SENSORS

TEU sensors are designed for measuring outdoor temperatures.

°C

Range	-50...50 °C
IP protection class	IP54, cable downwards
Cable gland	M16
Mounting	with screws on wall, external lugs
Materials	PBT, PC, PA
Dimensions	89 x 95 x 44 mm

TYPE	ART NO.	
TEU PT 100	1173090	100 Ω / 0 °C, accuracy ±0,3 °C / 0 °C
TEU PT 1000	1174090	1000 Ω / 0 °C, accuracy ±0,3 °C / 0 °C
TEU NTC 1.8	117E090	1800 Ω / 25 °C, accuracy ±0,3 °C / 25 °C
TEU NTC 2.2	1172090	2252 Ω / 25 °C, accuracy ±0,25 °C / 25 °C
TEU NTC 10	1175090	10 kΩ / 25 °C, accuracy ±0,2 °C / 25 °C
TEU NTC 10-AN	117H090	10 kΩ / 25 °C, accuracy ±0,25 °C / 25 °C
TEU NTC 10-C	117M090	10 kΩ / 25 °C, accuracy ±0,25 °C / 25 °C
TEU NTC 10-KB	117B090	5025 Ω / 25 °C, accuracy ±0,5 °C / 25 °C
TEU NTC 20	1176090	20 kΩ / 25 °C, accuracy ±0,2 °C / 25 °C
TEU NI 1000	117C090	1000 Ω / 0 °C, accuracy ±0,4 °C / 0 °C
TEU NI 1000-LG	1178090	1000 Ω / 0 °C, accuracy ±0,5 °C / 0 °C
TEU KP 10	117J090	LM235Z, 10 mV/K, 2,98 V / 25 °C
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

Range	-50...50, -50...150, 0...50, 0...100 °C
Accuracy	±0,5 °C (0 °C)
Sensor	Pt1000 EN 60751/B
IP protection class	IP54, cable downwards
Ambient temperature	-30...60 °C
Cable gland	M16
Mounting	with screws on wall, external lugs
Materials	PBT, PC, PA
Dimensions	115 x 115 x 45 mm

TYPE	ART NO.	
TEU LL	1177090	2-wire transmitter, supply 15..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 / ACCESSORIES		
TEU-N V2	1170270	display option for the transmitters

TOOLS		
ML-SER	1139010	transmitter commissioning tool

INDUSTRIAL TEMPERATURE SENSORS

IP67, °C

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

Range	-50...120 °C
IP protection class	IP67
Material	Silumin cast
Cable gland	PG11
Mounting	with screws on wall
Dimensions	98 x 90 x 36 mm

TYPE	ART NO.	
TES PT 100	1173100	100 Ω / 0 °C, accuracy ±0,3 °C / 0 °C
TES PT 1000	1174100	1000 Ω / 0 °C, accuracy ±0,3 °C / 0 °C
TES NTC 1.8	117E100	1800 Ω / 25 °C, accuracy ±0,3 °C / 25 °C
TES NTC 2.2	1172100	2252 Ω / 25 °C, accuracy ±0,25 °C / 25 °C
TES NTC 10	1175100	10 kΩ / 25 °C, accuracy ±0,2 °C / 25 °C
TES NTC 10-AN	117H100	10 kΩ / 25 °C, accuracy ±0,25 °C / 25 °C
TES NTC 10-C	117M100	10 kΩ / 25 °C, accuracy ±0,25 °C / 25 °C
TES NTC 10-KB	117B100	5025 Ω / 25 °C, accuracy ±0,5 °C / 25 °C
TES NTC 20	1176100	20 kΩ / 25 °C, accuracy ±0,2 °C / 25 °C
TES NI 1000	117C100	1000 Ω / 0 °C, accuracy ±0,4 °C / 0 °C
TES NI 1000-LG	1178100	1000 Ω / 0 °C, accuracy ±0,5 °C / 0 °C
TES KP 10	117J100	LM235Z, 10 mV/K, 2,98 V / 25 °C

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.

Range	-50...50, -50...150, 0...50, 0...100 °C
Accuracy	±0,5 °C (0 °C)
Sensor	PT 1000 EN60751/B (not included)
IP protection class	IP54, cable downwards
Ambient temperature	-30...60 °C
Cable gland	2 X M16
Dimensions	106 x 102 x 46 mm

TYPE	ART NO.	
LLK V2	1182230	2-wire transmitter/controller, supply 15...35 Vdc, output 4...20 mA
LLK-N V2	1182231	2-wire transmitter/controller with display, supply 15...35 Vdc, output 4...20 mA
LUK-N V2	1182241	3-wire transmitter/controller with display, supply 24 Vac/dc, output 0...10 V < 2 mA
LUK V2	1182240	3-wire transmitter/controller, 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.

Range	5 selectable temperature values (-50, -20, 0, 20, 50 °C)
Accuracy (PT 1000)	±0,15 °C (0 °C)
Accuracy (NTC 10)	±0,25 °C (25 °C)
IP protection class	IP54
Cable	0,9 m, banana jacks

TYPE	ART NO.	
TESIM PT 1000	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

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

DIN housing

Supply	24 Vac/dc, < 2 VA
Input	0...10 Vdc, 10 mA
Range	0...100 °C
Output (control)	230 Vac, 8 A, res.
Output (alarm)	60 Vdc, 1 A
Output (actuator)	0...10 Vdc, 10 mA
IP protection class	IP20
Mounting	For 35 mm DIN rail
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)

FROST PROTECTION THERMOSTATS

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

11-pole relay housing

Supply	24 Vac, < 2 VA
Input	0(2)...10 V, 10 mA
Range	0...100 °C
Output (control)	50 Vac, 6 A, res.
Output (alarm)	24 Vdc, 1 A
Output (actuator)	0...10 Vdc, 10 mA
IP protection class	IP20
Mounting	11-pole relay housing
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.

THERMOSTATS

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

Range	-10...10 °C
Accuracy	±1 °C
Output	24...250 Vac, 15 A
IP protection class	IP65
Ambient temperature	...55 °C
Ambient humidity	10...90 %rH
Dimensions	65 x 140 x 62 mm

TYPE	ART NO.	
TF 18	1240230	thermostat, capillary element length 1.8 m, automatic reset
TF 18R	1240231	thermostat, capillary element length 1.8 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 60	1240210	thermostat, capillary element length 6 m, automatic reset
TF 60R	1240211	thermostat, capillary element length 6 m, manual reset
DBZ-05	1240200	capillary element mounting bracket

CONDENSATION SWITCH

0...10 V output, relay output

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.

Supply	24 Vac/dc, < 1 VA
Output	0...10 Vdc, condensation information
Output	24 Vac/dc, 1 A, relay output
IP protection class	IP54, cable downwards
Ambient temperature	0...50 °C
Cable gland	M16
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.

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

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

Supply	24 Vac/dc, < 2 VA
Setpoint	< 10 kΩ or < 80 kΩ
Range	10...300 kΩ or 80...300 kΩ, selectable
Output	60 Vdc, 2 A, res. change-over contact
IP protection class	IP20
Mounting	For 35 mm DIN rail

TYPE	ART NO.	
VVK 2	1187024	water leakage relay

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.

Supply	24 Vac/dc, < 2 VA
Setpoint	approx. 10 kΩ
Output (alarm)	60 Vdc, 300 mA, res. change-over contact. Alarm is also indicated with an indicator light and buzzer.
IP protection class	IP20
Material	ABS plastic
Mounting	on the wall surface or on a flush mounting box (60 mm hole distance)
Dimensions	87 x 86 x 32 mm

TYPE	ART NO.	
LPH 10	1187010	water leakage relay

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, e.g. on floor and dip tray
VVA 3	1187026	sensor (25 x 200 mm) with 2 m cable and adhesive tape, e.g. on floor and dip tray
VVN 1	1187025	sensor, 1 m sensor band and 2 m cable
VVN 2	1187023	sensor, 2 m sensor band and 2 m cable

THERMOMETERS

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

Accuracy	±2 °C
Sensor	Ø 9 x 185 mm
IP protection class	IP40
Ambient temperature	-20...60 °C
Ambient humidity	35...85 %rH
Mounting	by a flange
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.

Accuracy	±2 °C
Sensor	Ø 9 x 200 mm
IP protection class	IP40
Ambient temperature	-20...60 °C
Ambient humidity	35...85 %rH
Mounting	by a flange
Dimensions	100 x 100 x 227 mm

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

DIFFERENTIAL PRESSURE SWITCHES

CPS switches are designed for monitoring over and under pressures and pressure differences in systems that handle air and other non-flammable gases.

Accuracy (switching)	±15 % from the set value
Output	24...250 Vac, 5 A, res. (1 A ind.)
IP protection class	IP54
Ambient temperature	-15...80 °C
Dimensions	86 x 108 x 48 mm

TYPE	ART NO.	
CPS 330	1240100	differential pressure switch 20...330 Pa
CPS 450	1240110	differential pressure switch 30...500 Pa
CPS 1100	1240120	differential pressure switch 100...1100 Pa
CPS 4000	1240130	differential pressure switch 500...4000 Pa

OPTIONS / ACCESSORIES		
PEK-AS	1240300	accessory kit for differential pressure products
PEK-DCP	1240306	duct connector, plastic
PEK-KIT 90	1240390	accessory kit with 90° metal tubes
PVC-HOSE	1240305	PVC hose (4/7), 200 m
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

See the images of the accessories from the page 48.

DIFFERENTIAL PRESSURE SWITCHES

PEK switches are designed for monitoring over and under pressures and pressure differences in systems that handle air and other non-flammable gases.

Accuracy (switching)	±15 % from the set value
Output	250 Vac, 1.5 A, res. (0,4 A ind.)
IP protection class	IP54
Ambient temperature	-20...85 °C
Ambient humidity	0...90 %rH
Dimensions	85 x 102 x 58 mm

TYPE	ART NO.	
PEK 300	1240310	differential pressure switch 20...300 Pa
PEK 400	1240320	differential pressure switch 30...400 Pa
PEK 500	1240330	differential pressure switch 50...500 Pa
PEK 1000	1240340	differential pressure switch 200...1000 Pa
PEK 2500	1240350	differential pressure switch 500...2500 Pa
PEK 5000	1240360	differential pressure switch 1000...5000 Pa

OPTIONS / ACCESSORIES		
PEK-AS	1240300	accessory kit for differential pressure products
PEK-DCP	1240306	duct connector, plastic
PEK-KIT 90	1240390	accessory kit with 90° metal tubes
PVC-HOSE	1240305	PVC hose (4/7), 200 m
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

See the images of the accessories from the page 48.

FILTER GUARDS

SV 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.

Accuracy (switching)	±15 % from the set value
Accuracy (gauge)	±15 % from the full scale
Output	250 Vac, 1.5 A, res. (0,4 A ind.)
IP protection class	IP54
Ambient temperature	-5...50 °C
Mounting	vertically (with screws)
Dimensions	170 x 150 x 68 mm

TYPE	ART NO.	
SV 250	1240370	filter guard, 250 Pa
SV 500	1240380	filter guard, 500 Pa

OPTIONS / ACCESSORIES		
PEK-AS	1240300	accessory kit for differential pressure products

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.

Supply	24 Vac/dc, < 0.5 VA
Output (signal)	60 Vdc, 100 mA, NC or NO. Delay 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
Dimensions	85 x 85 x 34 mm

TYPE	ART NO.	
LA 14E	1185130	occupancy sensor

OPTIONS / ACCESSORIES

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

OCCUPANCY SENSORS

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

Supply	24 Vac/dc
Output (signal)	60 Vdc, 100 mA, NC or NO. Delay 2 s.
Output (lighting)	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
Dimensions	85 x 85 x 34 mm

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

OPTIONS / ACCESSORIES

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

OCCUPANCY SENSORS

NEW

RLL-BAC transmitters are designed for detecting occupancy, light level, and temperature in dry room spaces. The transmitters have built-in single stage heating/cooling and light Level 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.

Supply	24 Vac/dc, < 1 VA
Range (illuminance)	0...3000 lx
Range (temperature)	0...50 °C
Accuracy (temperature)	±0,3 °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)
Dimensions	86 x 120 x 29 mm

Ordering guide		Type	0	1	2	3	4	5	6
0 BACnet room transmitter			6041			0			
1 Device type	Room occupancy detector and light level transmitter, 1DI, 3AO, 2DO	RLL-BAC		P					
2 Display	No display				0				
	Display	-LCD			1				
3 Reserved						0			
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	-RI2						2	
	Second digital input and second resistive input	-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	
	Second digital input and passive temperature sensor (NTC 10)	-DI2-TE-NTC10						8	
6 Body colour	White (RAL 9010)								0
	Anthracite grey	-GR							B

TOOLS

SW-DCT-USB	1139040	configuration cable

OCCUPANCY SENSORS

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

Supply	24 Vac/dc
Output (alarm)	60 Vdc, 100 mA, NC or NO. Delay is selectable (2 s, 2 min, 10 min or 20 min)
IP protection class	IP20
Ambient temperature	-10...45 °C
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.

Supply	12 Vdc
Output (alarm)	12 Vdc, 100 mA, NC
IP protection class	IP20
Ambient temperature	-10...40 °C
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*

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

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

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 (length 1 m) or removable. Different lengths of removable cables are available. An adapter between the valve and the actuator is always needed.

IP protection class	IP65
Ambient temperature	0...65 °C

TYPE	ART NO.	
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
A 40405-00N00-1S	1210011	thermal actuator 24 V NC, fixed cable 1 m
A 41405-10N00-1S	1210021	thermal actuator 24 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 NO, removable cable (sold separately)
APR 40405-01N00-0	1210052	thermal actuator 2...10 V NC, removable cable (sold separately)
VA 80	1220010	adapter for Produal NV valves

OPTIONS / ACCESSORIES		
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/MPV/M3P	1220031	1220032	1220033	1220035	1220036	1220037	1220038

MOTORIZED VALVE ACTUATORS

NEW

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.

Supply	24 Vac/dc, < 2.6 VA
IP protection class	IP54
Running time	30 s/mm
Ambient temperature	0...50 °C
Cable	1 m, 3 x 0,22 m^2 (PVC)
Dimensions	45 x 65 x 90 mm

TYPE	ART NO.	
MPV-46845-20N00-1S	1210110	motorized valve actuator, 0...10 V control
M3P-46845-20N00-1S	1210120	motorized valve actuator, 3-point control

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 (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	

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.

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

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

OPTIONS / ACCESSORIES		
MV-VK 24VAC-8W	1260280	changeable coil 24 Vac for the solenoid valves (sizes 1/2" - 1")
MV-VK 24VDC-8W	1260281	changeable coil 24 Vdc for the solenoid valves (sizes 1/2" - 1")
MV-VK 24VDC-14W	1260282	changeable coil 24 Vdc for the solenoid valves (sizes 1 1/4" - 1 1/2")

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.

Supply	24 Vac/dc, < 1 VA
Input	6 x potential free contact input
Output (1)	0...10 Vdc, 2 mA
Output (2)	4...20 mA, 500 Ω
IP protection class	IP20
Mounting	for 35 mm DIN rail
Dimensions	68 x 77 x 42 mm

TYPE	ART NO.	
DA 6	1182040	DI/AO converter

CONVERTERS

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.

Supply	24 Vac/dc, < 2 VA
Input	0...1 V, 0...10 V, 2...10 V, 0...20 mA or 4...20 mA
Output	0...10 Vdc, 2 mA, or 2...10 Vdc
Output	0...20 mA, 500 Ω, or 4...20 mA
IP protection class	IP20
Ambient temperature	0...50 °C
Mounting	For 35 mm DIN rail
Dimensions	12.5 x 90 x 112 mm

TYPE	ART NO.	
ISO 10	1182060	signal isolator

CONVERTERS

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

Supply	24 Vac, < 1 VA
Input	0...10 Vdc, 1 mA
Output	24 Vac, 2 A, for 3-point actuator
Output (actuator running time)	adjustable, 15...240 s
IP protection class	IP20
Mounting	11-pole relay housing
Dimensions	35 x 78 x 103 mm

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

CONVERTERS

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

Supply	24 Vac, < 1 VA
Input	10...40 Vac/dc
Output	0...10 Vdc, 1 mA
Output (change speed)	adjustable, 15...240 s
IP protection class	IP20
Mounting	11-pole relay housing
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.

Supply	24 Vac/dc, < 2 VA
Input	0(2)...10 Vdc, < 0,5 mA
Output	0(2)...10 V / 10...(2)0, max. 20 mA
IP protection class	IP20
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.

Supply	24 Vac/dc, < 0.5 VA
Input	0...10 Vdc, 0,2 mA
IP protection class	IP20
Mounting	For 35 mm DIN rail
Dimensions	23 x 77 x 41 mm

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

Supply	24 Vac, < 3 VA
Input	0...10 Vdc or 10...0 Vdc
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

TYPE	ART NO.	
BAK 64	1140010	binary step controller
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.

Supply	24 Vac, < 1 VA
Input	0...10 Vdc, 1 mA
Output	25 Vdc, 50 mA, for solid state relay, time proportional
Output	3 x 35 Vdc, 100 mA, for AR 1 and RY 1 relays
Number of steps	selectable, 1...4 pcs
IP protection class	IP20
Mounting	11-pole relay housing

TYPE	ART NO.	
STS 4	1140020	electric power controller
AR 1	1183010	relay with normally open (NO) contact, width 13 mm
PRMK	1140070	solid state relay control signal converter, Vac -> Vdc
PR 10/440	1140060	solid state relay 230...400 Vac, < 10 A, input 3...32 Vdc
PR 50/440	1140030	solid state relay 230...400 Vac, < 25 A, input 3...32 Vdc
RY 1	1183020	relay with change-over contact, width 23 mm

RELAY MODULES

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.

Input	24 Vac/dc, 0,5 VA
Output	250 Vac, 10 A, res.
IP protection class	IP20
Mounting	For 35 mm DIN rail

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

RELAY MODULES

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

Supply	24 Vac/dc, < 1 VA
Setpoint	adjustable, 0...10 V
Input	0...10 Vdc, 0,2 mA
Range	0...10 V
Output	250 Vac, 8 A, res., change-over contact
IP protection class	IP20
Mounting	For 35 mm DIN rail
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.

Supply	24 Vac/dc, < 1.5 VA
Setpoint	adjustable, factory settings 2,5 V, 5,0 V and 7,5 V
Input	0...10 Vdc, 0,2 mA
Output	3 x 230 Vac, 8 A, res. NO (interlocked)
IP protection class	IP20
Mounting	For 35 mm DIN rail
Dimensions	45 x 90 x 48 mm

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.

Supply	24 Vdc
Output	8 x 230 Vac, 4 A
Mounting	on 35 mm DIN rail
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, 0 V control

RELAY MODULES

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

Supply	24 Vac
Input	5...30 Vac/dc, 10 mA
Output	5 x 24 Vac, 0.6 A, total load max. 3 A
IP protection class	IP66
Material	PP plastic
Mounting	on the wall surface or on a flush mounting box (60 mm hole distance)
Dimensions	76 x 76 x 52 mm

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

KASPO 10 is a remote control unit with a 0...10 Vdc output for controlling e.g. temperature, humidity, lights or ventilation fans. Unit can be installed on the flush mounting box. Installation on the wall is possible by using the box sold as an accessory.

Supply	24 Vac/dc, < 0.5 VA
Output	0...10 Vdc, 2 mA
IP protection class	IP20
Dimensions	86 x 86 x 35 mm

TYPE	ART NO.	
KASPO 10.1	1182070	remote control unit, scale 0...100
KASPO 10.2	1182071	remote control unit, scale ±3
KO PRA	KO3602	casing for surface mounting

TRANSFORMERS

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

Supply	24 Vac/dc
Output	3.6...24 Vdc, 1 A (0...12 V); 0,5 A (12...24 V)
IP protection class	IP20
Mounting	For 35 mm DIN rail
Dimensions	45 x 90 x 58 mm

24 Vac/dc -> 3,6...24 Vdc

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.

Supply	230 Vac, < 15 VA
Output	24 Vac, 15 VA / 12 Vac, 7,5 VA
IP protection class	IP20
Ambient temperature	0...40 °C
Mounting	For 35 mm DIN rail
Dimensions	35 x 87 x 60 mm

TYPE	ART NO.	
M230/24-15	1184090	transformer

TRANSFORMERS

230 Vac -> 12/24 Vac, 30 VA

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

Supply	230 Vac, < 30 VA
Output	24 Vac, 30 VA / 12 Vac, 15 VA
IP protection class	IP20
Ambient temperature	0...40 °C
Mounting	For 35 mm DIN rail
Dimensions	54 x 87 x 60 mm

TYPE	ART NO.	
M230/24-30	1184050	transformer

TRANSFORMERS

230 Vac -> 12 Vdc, 4 VA

M230/12-4 transforms 230 Vac supply to 12 Vdc 4 VA supply.

Supply	230 Vac, < 4 VA
Output	12 Vdc, 250 mA
IP protection class	IP20
Cable	2 m

TYPE	ART NO.	
M230/12-4	1184080	230 Vac/12 Vdc 4 VA power supply

TRANSFORMERS

230 Vac -> 24 Vac, 20 VA

T20 transforms 230 Vac supply to 24 Vac supply.

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

TYPE	ART NO.	
T20	1184100	transformer

TRANSFORMERS

230 Vac -> 24 Vac, 35 VA

T35 transforms 230 Vac supply to 24 Vac supply.

Supply	230 Vac, < 35 VA
Output	24 Vac, 35 VA
IP protection class	IP44
Cable	300 mm on both sides
Mounting	with screws
Dimensions	63 x 103 x 55 mm

TYPE	ART NO.	
T35	1184111	transformer

TRANSFORMERS

230 Vac -> 24 Vac, 38 VA

T40 transforms 230 Vac supply to 24 Vac supply.

Supply	230 Vac, < 38 VA
Output	24 Vac, 38 VA
IP protection class	IP54
Ambient temperature	0...40 °C
Mounting	with screws
Dimensions	77 x 123 x 70 mm

TYPE	ART NO.	
T40	1184120	transformer

TRANSFORMERS

230 Vac -> 24 Vac, 60 VA

T60 transforms 230 Vac supply to 24 Vac supply.

Supply	230 Vac, < 60 VA
Output	24 Vac, 60 VA
IP protection class	IP54
Ambient temperature	0...40 °C
Mounting	with screws
Dimensions	77 x 123 x 70 mm

TYPE	ART NO.	
T60	1184130	transformer

TRANSFORMERS

230 Vac -> 24 Vac, 120 VA

T120 transforms 230 Vac supply to 24 Vac supply.

Supply	230 Vac, < 220 VA
Output	24 Vac, 120 VA
IP protection class	IP54
Ambient temperature	0...40 °C
Mounting	with screws
Dimensions	89 x 174 x 92 mm

TYPE	ART NO.	
T120	1184140	transformer

TRANSFORMERS

230 Vac -> 24 Vac, 220 VA

T220 transforms 230 Vac supply to 24 Vac supply.

Supply	230 Vac, < 220 VA
Output	24 Vac, 220 VA
IP protection class	IP54
Ambient temperature	0...40 °C
Mounting	with screws
Dimensions	104 x 168 x 105 mm

TYPE	ART NO.	
T220	1184150	transformer

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
Dimensions	136 x 136 x 40 mm

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

INDICATOR LIGHTS

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

24 Vac/dc

Supply	24 Vac/dc, < 0.5 VA
Input	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)
Dimensions	85 x 85 x 28 mm

TYPE	ART NO.	
LEKA 24E	1185150	indicator light

OPTIONS / ACCESSORIES		
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 office applications, if enhanced ventilation is needed outside the normal working hours.

Supply	24 Vac/dc (22...26 V) or 230 Vac (207...253 V)
Accuracy (time)	±10 s/h
Output	250 Vac, 10 A, change-over contact
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
Dimensions	97 x 97 x 27 mm

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

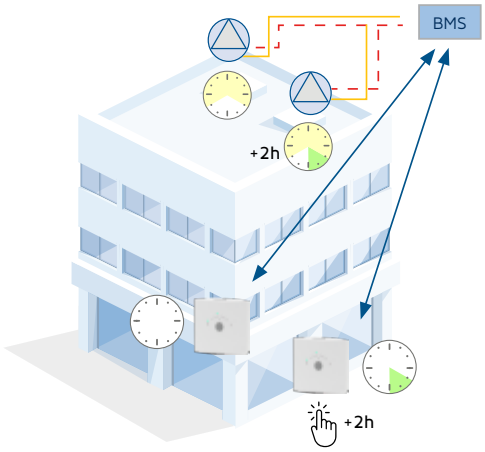
Supply	24 Vac/dc / 230 Vac, 2 VA
Accuracy (time)	±10 s/h
Output	250 Vac, 8 A, res., change-over contact
IP protection class	IP20
Ambient temperature	0...50 °C
Mounting	flush (surface mounting casing optional)
Dimensions	85 x 85 x 30 mm

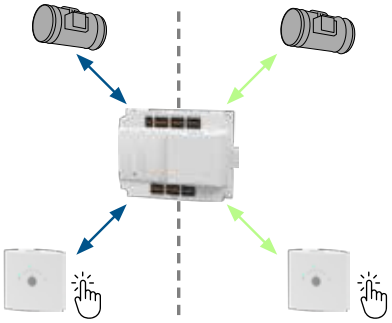
TYPE	ART NO.	
LAP 1E	1185110	12...60 minutes (max. time can be restricted to 12...36 minutes)
LAP 5E	1185111	1...5 hours (max. time can be restricted to 1...3 hours)
LAP 10E	1185112	2...10 hours (max. time can be restricted to 2...6 hours)

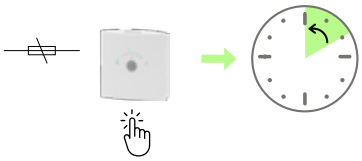
OPTIONS / ACCESSORIES		
SMB 1E	9000470	casing for surface mounting

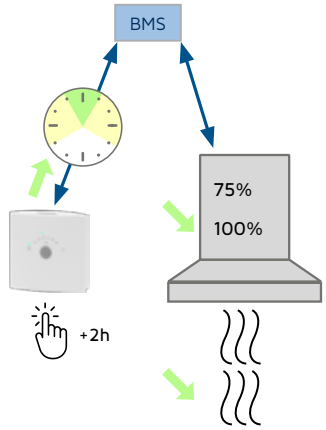
TIMERS

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. /





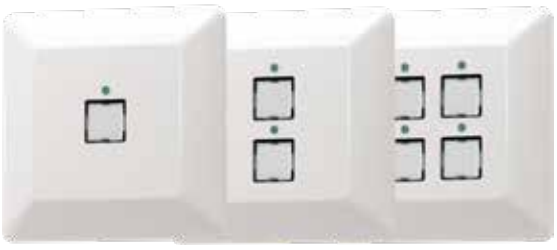




PUSH BUTTONS

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

Output	60 Vdc, 0.8 A
IP protection class	IP20
Ambient temperature	0...50 °C
Ambient humidity	0...85 %rH
Mounting	flush (surface mounting casing optional)
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 / ACCESSORIES		
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.

Supply	24 Vac, < 2 VA
Output (voltage)	4 x 0...10 Vdc, 2 mA
Output (triac)	4 x 24 Vac, 1 A, for thermal actuators or two 3-point actuators
IP protection class	IP20
Ambient temperature	5...40 °C
Mounting	For 35 mm DIN rail
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

NEW

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).

Supply	24 Vac, < 2 VA
Input	2 x potential free contact, impedance <1 kΩ. Pulse counting: max 25 Hz, min pulse length 20 ms (volatile).
Output (triac)	2 x 24 Vac, 1 A
IP protection class	IP20
Ambient temperature	0...50 °C
Ambient humidity	0...95 %rH
Mounting	For 35 mm DIN rail
Materials	ABS plastic, self extinguishing
Dimensions	106 x 97 x 38 mm

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

I/O MODULES

NEW

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.

Supply	24 Vac, < 2 VA
Input	2 x NTC10 / resistive / potential free contact and 2 x potential free contact
Output (triac)	2 x 0...24 Vac, 1 A
Output (voltage)	4 x 0...10 Vdc, 5 mA
IP protection class	IP20
Ambient temperature	0...50 °C
Ambient humidity	0...95 %rH
Mounting	For 35 mm DIN rail
Materials	ABS plastic, self extinguishing
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

NEW

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.

Supply	24 Vac, < 2 VA
Input	2 x 0...10 Vdc input and 2 x potential free contact
Output (triac)	2 x 24 Vac, 1 A
Output (voltage)	4 x 0...10 Vdc, 5 mA
IP protection class	IP20
Ambient temperature	0...50 °C
Ambient humidity	0...95 %rH
Mounting	For 35 mm DIN rail
Materials	ABS plastic, self extinguishing
Dimensions	106 x 97 x 38 mm

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

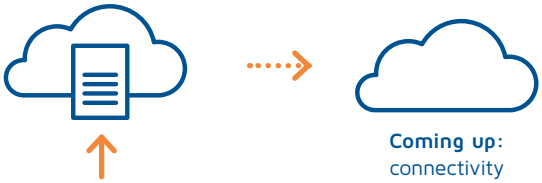
SENSOR CHARACTERISTICS

Sensor element	Pt 100	Pt 1000	Ni 1000	Ni 1000-LG	NTC 1.8	NTC 2.2	NTC 10	NTC 20	NTC 10-AN	NTC 10-C	NTC 10-KB	KP 10	T1
Tol.	±0,3°C / 0°C EN60751 B	±0,3°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		

PRODUAL MyTool® APPLICATION

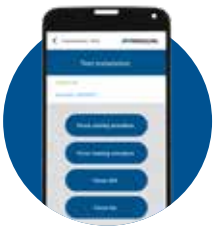
An ideal single commissioning tool on your mobile phone or tablet

- *Free Android application for commissioning and configuration of all the Produal PUMP® platform-based products*
- *Ease of use and a unified user experience on your mobile phone or tablet, with wireless connection via Bluetooth*
- *Produal MyCloud cloud service to help keep configuration and project information secured, and minimizing the risk of human error with parameters*

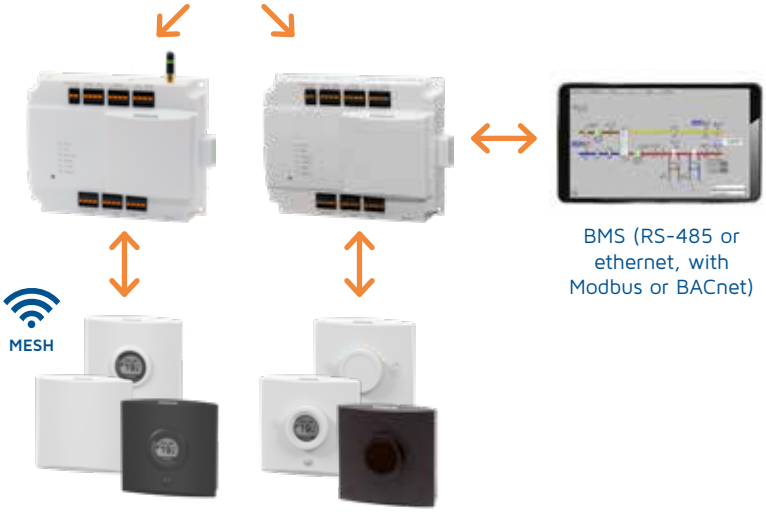


Coming up: connectivity to 3rd party cloud/system

- secured data connection
- configuration settings backup
- firmware updates



- wireless commissioning
- configuration modification
- firmware updates



BMS (RS-485 or ethernet, with Modbus or BACnet)

Firmware updates

With a couple of button presses, you can update the firmware in Produal PUMP® products. This enables you to update all devices with new options and features in the future.

Easy and fast configurations

Reach all parameters of a Produal PUMP® device from the configuration menu in Produal MyTool® application. Configuration menus are easy to navigate and simple to understand.

Test installations

With the test installation menu, you can read real-time measurement data and force outputs, when you want to test the system after installation.

Store configurations

You can store and reuse the configurations you create in Produal MyCloud, your personal storage space. Or you can store a configuration on the local file system on an Android device.

Wireless network installation

With the Produal MyTool® application you can set up the whole wireless network. Installation is done completely wirelessly, MyTool makes network building and monitoring easy and clear.

ML-SER

Easy and quick tool for commissioning on the field

- *Configuration tool for Produal 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 45)

OTHER USEFUL CONFIGURATION TOOLS

- *Configuration cable SW-DCT-USB for backup and replication of TRC room controllers (pages 16 and 18), TRT smart thermostats (page 24), TRI and RI-BAC room units (pages 36 and 40) , RRH-BAC (page 53), RCD-BAC (page 57) and RLL-BAC (page 116) transmitters, and RTE temperature transmitters (page 104).*
- *Configuration tools for HLS temperature controllers: HLS 44-SE-SER (page 20), HLS 44-SER (page 20), HLS 44-CO2-SER (page 20), HLS 44-3P-SER (page 20), HLS 45-SER (page 20).*
- *Configuration tool H203 for C230 control units (page 32).*
- *Wireless configuration tool FLSER for 868 MHz transmitters (page 75).*
- *Wireless monitoring tool FLSNIF for wireless 868 MHz network (page 79).*

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PRODUAL

measure - be sure.

5 year warranty

Reliable measurements for building automation

QUALITY SYSTEM CERTIFICATION

DNV·GL

ISO 9001

CONTACT INFORMATION

FINLAND

Kotka
Produal Oy
Keltakalliontie 18
48770 Kotka

tel. +358 10 219 9100
info@produal.fi
www.produal.com

Vantaa
Produal Oy
Teknobulevardi 3-5 A
01530 Vantaa

Jyväskylä
Produal Oy
Ohjelmakaari 10
40500 Jyväskylä

Sweden
Produal Sverige AB
Solkraftsvägen 16 A
13570 Stockholm
tel. +46 8 555 985 80
info@produal.se
www.produal.se

Denmark
Produal A/S
Generatorvej 8H
2860 Soeborg
tel. +45 70 26 03 04
info@produal.dk
www.produal.dk

France
Produal S.A.S.
2 allée des Sarments
Parc aux Vignes
77183 Croissy Beaubourg
tel. +33 1 71 40 50 49
info@produal.fr
www.produal.fr

Italy
Produal S.r.l. - sales office
Via Brennero 30
39042 Bressanone (BZ)
tel. +39 366 33 20 970
info@produal.it
www.produal.it

Spain
Produal Oy - sales office
Avda. Manoteras 38, Ofic. D415
28050 Madrid
tel. +34 910 562 431
info@produal.es
www.produal.es

Poland
Produal Oy - sales office
ul. Farbiarska 63 B
02-862 Warsaw
tel. +48 536 036 677
info@produal.pl
www.produal.pl

United Kingdom
SyxthSense Ltd
3 Topsham Units
Dart Business Park
Topsham, Exeter EX3 0QH
tel. +44 1392 875 414
info@syxthsense.com

Other countries
Produal Oy partner sales
tel. +358 10 219 9100
partnersales@produal.com

Produal office

Partner

Product information:

MADE IN FINLAND

CE