

# thermokon®

HOME OF SENSOR TECHNOLOGY



# PRODUCTS

VALID FROM 1<sup>ST</sup> APRIL 2026



SENSORS MADE IN GERMANY



# THERMOKON AT A GLANCE



USE



SR06 LCD



JOY



NOVOS Touch

## » 2026

- 2026 **Launch** of the new ceiling sensors **thevios®**
- 2024 **Investment** into injection moulding machines
- 2023 **Construction** of a new production and storage facility (11,000 m<sup>2</sup>)
- 2022 **Extension** of the product portfolio to sensors with LoRaWAN® interface
- 2020 **Establishing** a further SMD assembly line in Mittenaar-Bicken
- 2019 **Launch** of the new room sensors and operating units – **NOVOS®**
- 2017 **Company Anniversary** 30 Years Thermokon Sensortechnik GmbH
- 2016 **Premiere** of the new and innovative enclosure „USE“
- 2015 **Launch** of the new design room operating unit „JOY“
- 2015 **Launch** of the solar-powered room operating unit SR06 LCD
- 2015 **Investment** into a new SMD assembly line
- 2013 **New Company Headquarters** in Mittenaar-Offenbach
- 2013 **Establishing** Thermokon Sensortechnik Switzerland AG
- 2012 **A reason to celebrate:** 25 Years Thermokon Sensortechnik GmbH
- 2011 **Launch of the** high-end touch room operating unit thanos

## » 2010

- 2009 **Extension** of the product portfolio to sensors with BACnet interface
- 2007 **Further extension** of the company building by 600 m<sup>2</sup>
- 2005 **Extension** of the product portfolio to sensors with Modbus interface
- 2004 **Launch** of the innovative wireless sensor system EasySens®
- 2002 **Launch** of the surface mounted room operating unit WRF04
- 2002 **Establishing** Thermokon-Danelko Elektronik AB, Sweden
- 2002 **Anniversary** 15 Years Thermokon Sensortechnik GmbH
- 2000 **Further extension** of the company building to 2.000 m<sup>2</sup>

## » 2000

- 1998 **Establishing** Thermokon Components GmbH, Austria
- 1997 **Extension** of the company building in in Mittenaar-Bicken
- 1995 **First production** of humidity sensors
- 1995 **Extension** of the product portfolio to sensors with LON interface
- 1995 **First production** of mixed gas and brightness sensors
- 1995 **Launch** of a quality management system according to DIN EN ISO 9001
- 1994 **New company building** in Mittenaar-Bicken

## » 1990

- 1987 **Development and production** of temperature sensors for the heating industry
- 1987 **Company foundation** of Thermokon Sensortechnik GmbH by Harald Zygan



Headquarters (5.300 m<sup>2</sup>)  
in Mittenaar-Offenbach  
(Administration and Sales)



Production and Warehouse  
(11.000 m<sup>2</sup>) in Bischoffen



SMD Assembly Lines



## OUR WEBSITE – YOUR ADVANTAGE!

In addition to our new catalogue, we launch our new website with an extended range of functions. In order to give you an even better user experience, we have integrated the functionality of ThermokonDIRECT into our main page – you can now find all products and items directly on the main page. Use the convenient filter function and get the right item for your application in the blink of an eye.

The practical project management function allows you to quickly and conveniently select your required items at any time. Further you can order all items directly once you have registered and are eligible to order online\*. Registering different billing and delivery addresses offers you enormous flexibility in order placement and saves you time in daily business.

### » Your advantages:

- » Portfolio with more than 5000 online items
- » Project management for a flexible planning
- » Intelligent search via predefined filters or free text (e.g. item number or description)
- » Download of item-specific data sheets and media (BIM files, pictures, software, declarations of conformity, etc.)
- » Comparison function of multiple items or products

### Additional functions for existing corporate customers:

- » Online ordering possibility (24/7)\*
- » Online package tracking\*
- » View list and net prices\*

**REGISTER NOW:**



[www.thermokon.com](http://www.thermokon.com)

\* The additional functions will be activated after checking eligibility

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## EasySens®

### Room Operating Units

JOY SR Fancoil	Temperature, rel. humidity	<b>32</b>
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SR06 LCD	Temperature, rel. humidity	<b>40</b>
SR07 x	Temperature, rel. humidity	<b>44</b>
NOVOS 3 SR x	Temperature, rel. humidity	<b>46</b>

### Room Sensors

SR07	Temperature, rel. humidity	<b>48</b>
NOVOS 3 SR	Temperature, rel. humidity, CO2	<b>50</b>
MCS SR	Light, motion, temperature, rel. hum.	<b>52</b>
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## I/O Systems

STC-DO  
 STC-DO Light  
 STC-DO Blind  
 SRC-AO Climate  
 STC-DO8  
 SR65 DI

## LoRaWAN®

### Room Operating Units

NOVOS 3 x LRW Temperature, rel. humidity, CO2  
 NOVOS 3 INC LRW Temperature, rel. humidity, CO2

### Room Controller

JOY Fancoil LRW Temperature, rel. humidity, CO2  
 JOY HC LRW Light, motion, temperature, rel. hum.

### Room Sensors

NOVOS 3 LRW Temperature, rel. humidity, CO2  
 MCS LRW Light, motion, temperature, rel. hum.

### Actuators

SAB07 LRW Temperature, rel. humidity

### Outdoor Sensors

AGS55+ LRW Temperature  
 FTA54+ LRW Temperature, humidity  
 LA+ LRW CO2, VOC, temperature, humidity  
 Li65+ LRW Light, air pressure, temp., humidity

### Duct Sensors

AKF10+ LRW Temperature  
 FTK+ LRW Temperature, humidity  
 LK+ LRW CO2, VOC, temperature, humidity  
 MWF+ LRW Temperature

### Cable / Surface / Contact Sensors

TF25+ LRW Temperature  
 OF14+ LRW Temperature  
 VFG54+ LRW Temperature  
 AF25+ LRW Temperature

### Condensation Sensors

WK02+ LRW Condensation, temp., humidity

### Leakage Sensors

LS02+ ext. LRW Leakage  
 LS02+ flex LRW Leakage

### Pressure / Flow Sensors

DPA+ LRW Differential pressure, volume flow  
 CubicMeter Volume flow, leakage, temperature

### Gateways/Converters

Gateway LRW Indoor RAK 7268V2  
 Gateway LRW Outdoor LORIX One  
 Converter LRW NBnano

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## Room Application

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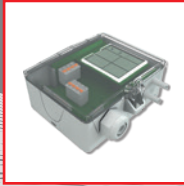
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## OUR EXPERTISE – YOUR SUCCESS

Since 1987, Thermokon is recognized worldwide for leveraging standards in intelligent buildings with engineering, innovation and quality "Made in Germany". Thanks to the development and production of sophisticated sensors and sensor systems we are creating an additional benefit for our customers all over the world. We focus on efficiency, sustainability and openness to new fields of technology as well as a close cooperation and thorough dialogue with our clients.

As a leader for innovation with a broad scope of applications we are continuously developing our portfolio further and offer decisive benefits with regards to product-related values, customised solutions and engineering. Our complete range of products is designed to energy-efficient buildings.

### FROM MITTENAAR ACROSS THE GLOBE

Trend-setting sensors and sensor systems are developed and produced at our headquarters in Mittenaar-Offenbach with currently 280 employees. Besides our core values – safety, openness to new technologies and sustainability as well as our daily motivation striving for excellence in sensors, we established an own R&D department, an in-house test laboratory, a climatic chamber as well as an own SMD assembly line for our PCBs.

In addition, our finished goods warehouse ensures our deliv-

ery ability at any time. The responsible handling of resources in all corporate sectors is self-evident.

### REPRESENTED IN MORE THAN 80 COUNTRIES

Our clients are manufacturers, system integrators, controller companies and strategic distributors in the HVAC industry and building automation. Our products and systems are exported all over the world.

A local support and presence is guaranteed by branches in Austria, Sweden, China, Switzerland, Finland and the the Netherlands. Due to a complementary cooperation with distributors in many parts of the world our product portfolio is available in more than 80 countries.



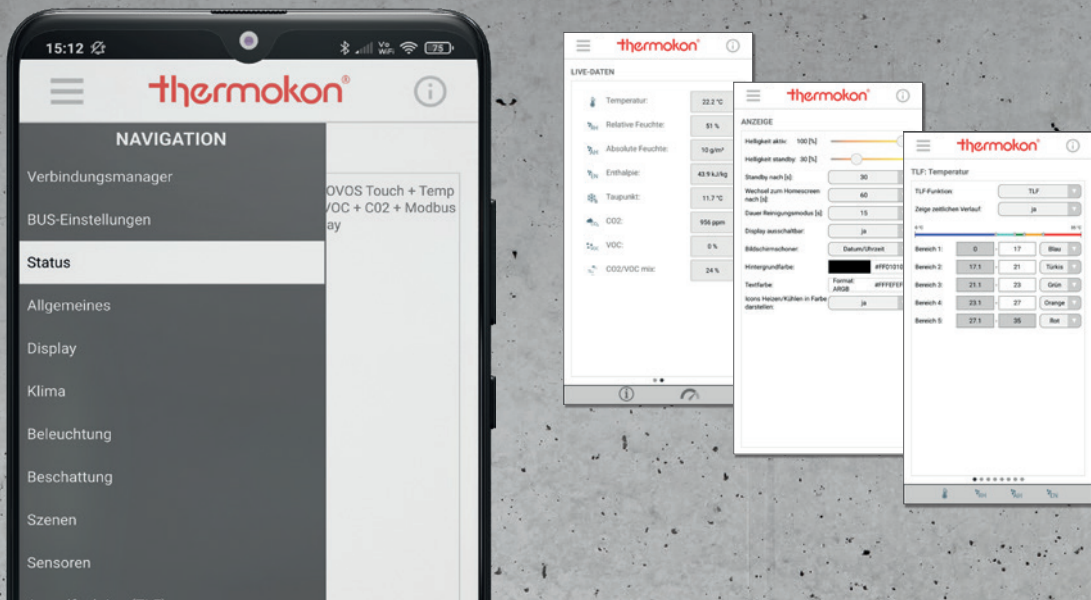


## FOR A SUSTAINABLE AND ECONOMICAL PARTNERSHIP



As the "Home of Sensor Technology" for building automation and HVAC Thermokon offers the essential knowledge to combine quality with efficiency to create customers' benefit by innovative solutions. Your success is guaranteed by our expertise. Thanks to well-engineered and high-grade products, a 5-year warranty with accommodating exceptions and pro-

active initiation of new innovations, you can rely on us at any time. Efficiency is an additional strength. We offer an excellent cost-performance ratio which pays off in terms of quality and service. Comprehensive sensor solutions are offered from a single source.



## THERMOKON® APPS – FOR INDIVIDUAL CONFIGURATION

All „USEapp“, „NOVOSapp“ and „LRWapp“ based products are supplied with a fully functional standard configuration for direct mounting/installation.

Via the app it is feasible to extend the range of use and to adapt the configuration individually to application requirements.

### » USEapp / NOVOSapp / LRWapp – HIGHLIGHTS AND FEATURES

- » Communication via Bluetooth® Low-Energy-Module (BLE)
- » For use on mobile terminals (Android and iOS)
- » Individual configuration of output signals
- » Setting of different measuring ranges
- » Additional adjustment of offset values
- » Parameterization of Live-Zero-Signal (1..10 V etc.)
- » Setting options for display indications
- » Customized parameterization of traffic-light function (TLF)
- » Setting of relay performance and thresholds
- » Modbus address offset (extension)
- » Possibility of firmware updates on-the-go (OTG)
- » Adjustment of maintenance intervals



Hardware			
Item description	Item No.	Group	€
BLE dongle with micro-USB for devices USE-M / USE-L / NOVOS / thanos EVO	668262		32,10



 **Bluetooth**<sup>®</sup>



*USEapp*



*NOVOSapp*



*LRWapp*





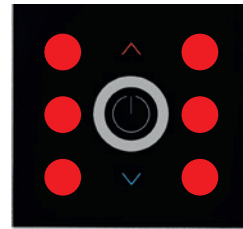
## JOY CUSTOM – FUNCTIONAL INDIVIDUALISM

With the **JOY Custom\*** you will get an individual room controller, that is optimally adapted to your requirements and desires. In addition to the classic functionality for controlling the setpoint temperature and adjusting fan speeds, our customized variants have four (JOY Fancoil) or six (JOY HC) additional, freely configurable buttons. Possible areas of application for the additional

buttons would be e.g. switching lighting or controlling blinds or shades – the choice is yours! Graphical and customizable icons for the respective buttons as well as the possibility of having your own logo lasered into the real glass surface make the JOY Custom a unique user experience.



JOY Fancoil Custom with four customizable touch buttons



JOY HC Custom with six customizable touch buttons

### » ADVANTAGES AND HIGHLIGHTS

- » Elegant, flat design – high-quality finishing
- » Flexibility due to different versions and master OFF button
- » Available with EasySens® EnOcean wireless interface transmitting instantaneous telegrams at the touch of a button
- » Demand-optimised control by setting up different user profiles
- » Bidirectional controls using BACnet or Modbus through a BMS system is possible
- » **Now available with an integrated relative humidity sensor**



## INSPIRATIONS



JOY Fancoil Custom



JOY HC Custom

\* Minimum order quantity 100 pieces



## LoRaWAN® – LONG RANGE WIDE AREA NETWORK

Long Range Wide Area Network – short LoRaWAN®\* – is a radio technology that is capable of transmitting data over a long distance and even from remote and hard-to-reach locations in an energy-efficient, cost-effective and secure manner. Due to the low energy consumption, the batteries of the sensors are extremely durable and can last for several years.

LoRaWAN® uses the so-called ISM frequency band around 868 MHz in Europe, for which no licence fees and no cellular costs are incurred. LoRaWAN® is heavily involved in the development of so-called „smart cities“. In Germany for example, cities and municipalities in particular are building a sustainable and process-optimised infrastructure for building security and monitoring or controlling street lighting.

In Switzerland, France and the Netherlands, telecommunications providers operate a nationwide network of gateways. In addition to the public networks, companies can also set up their own networks (private networks).

### » ADVANTAGES

- » Defined standard of the LoRa Alliance® with a broad ecosystem of members, products and world-wide references of active networks
- » Location-independent access to all measured values through the Cloud
- » Interference-resistant radio frequency range sub 1 GHz
- » Configuring the device from virtually everywhere (Remote Configuration)
- » Wide range of applications indoors and outdoors



Thermokon® is an official member of the LoRa Alliance®

## LoRa Alliance® Member



### » LONG DISTANCES

LoRa® provides long radio transmission ranges and a thorough signal penetration.



### » OPEN STANDARD

Guaranteed high security and interoperability due to LoRaWAN® network protocol.



### » HIGH ENERGY EFFICIENCY

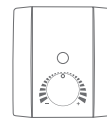
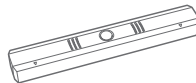
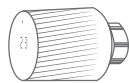
Intelligent LoRaWAN® sensors reach up to 10 years lifetime battery-operated.



### » BIDIRECTIONAL COMMUNICATION

LoRaWAN® enables bidirectional communication between sensors and network servers.

*\*LoRaWAN® is a registered trademark of the LoRa Alliance®*



Sensor value acquisition and bidirectional transmission



Receiving and forwarding data



SYSTEM ARCHITECTURE CLOUD

SYSTEM ARCHITECTURE BMS



Network management and data routing



Network server integrated in gateway

Integration into building management systems  
e.g. via BACnet IP, Modbus TCP/IP, ...



Data processing through IoT platforms,  
e.g. visualisation (Datacake, Widelix etc.)







# EasySens<sup>®</sup>



The Self-Powered, Intelligent Wireless System

## THE SELF-POWERED INTELLIGENT WIRELESS SYSTEM



The use of innovative technology makes it possible: The wireless EnOcean based system EasySens<sup>®</sup> enables a networked building automation – self-powered, intelligent and

maintenance-free. Thus, EasySens<sup>®</sup> offers best possible flexibility for realizing individual requirements in new buildings and refurbishments.

### » ADVANTAGES

- » Cost saving thanks to Energy Harvesting  
Energy generation through motion, light and temperature
- » Flexibility with sensor location – quick and easy mounting and commissioning
- » Reduction of fire load
- » Easy, wireless integration in existing buildings as well as retrofit adaptations to changed room layouts
- » Direct mounting to representative measuring points
- » Compatibility different manufacturers by using international standards (IEC 14543-3-10)
- » **airConfig:**  
Convenient parameterization of the devices using special remote commissioning commands
- » **airScan:**  
Field strength measuring system for evaluation and ideal placement of transmitters and receivers



## TRANSMITTERS

## RECEIVERS (TRANSCIEVER)



## TOOLBOX

## INTEROPERABLE SYSTEM INTEGRATION





## airConfig – COMMISSIONING MADE EASY!

The use of EnOcean RF telegrams and the airScan USB transceiver make it possible: airConfig enables comfortable parameterization of your EasySens® devices by means of special remote commissioning commands.

No more direct interaction and tiresome accessing of devices in buildings. Benefit by a significant time-saving. Thus, the communication of your devices is guaranteed.

### » ADVANTAGES

- » Simple seamlessly learning-in, configuration and deletion of devices via RF technology
- » Adjustment of configuration parameters – e.g. waking-up cycles or measuring ranges – in the device settings
- » Transparent and central availability of relevant system information
- » Uncomplicated handling of maintenance and support works
- » Configuration of measured values (EEP) and sensor parameters
- » Learning-in of sensors via Drag and Drop (Remote Management)
- » Saving time resources (configuration via Copy and Paste)
- » Remote access to product and project information
- » Structured product presentation thanks to device ID
- » Change of product configurations even at inaccessible mounting places
- » Change of specifications and parameterization on-site or via remote access
- » Password protected configuration of actuators
- » Identification via visual and acoustic feedback



## airScan – MEASURING AND MONITORING

You would like to plan and realize EasySens projects simply? Then airScan, the field strength measuring instrument of Thermokon, is the right tool for you: The traffic light indication (RSSI) displays the signal strengths received and shows reliably the

optimal mounting place for transmitters and receivers. Even in daily use the work with airScan cannot be easier. On the well-structured surface all telegrams received are clearly listed and allocated to the corresponding product.

### » ADVANTAGES

- » Find the best location for your device
- » Monitoring function for easy evaluation of radio frequency telegrams
- » Logging, repeater function and possibility of remote maintenance
- » Data export in CSV-, XML- or XLS data formats
- » Generation and transmission of EnOcean telegrams
- » Status detection of product ID, field strength and manufacturers of integrated products
- » Full support of EEP2.6.3. standards
- » Taking-over of desired EnOcean profile from a pre-defined EEP selection
- » Definition of telegram content via input fields
- » Easy and fast generation and transmission of telegrams
- » Translation of various available measuring values
- » Reliable information on signal quality or RSSI value of telegrams by colour indicator (traffic light system) or graphs
- » Detailed evaluation of telegrams (data bytes, RSSI value, sub-telegrams etc.)
- » Decoding of measuring values
- » Background saving of received telegrams
- » Possibility of data export as well as automated forwarding to a FTP server or an e-mail account



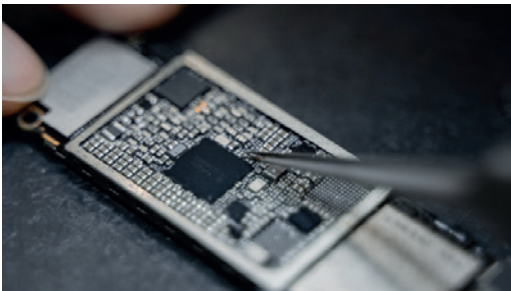
thermokon  
**INDIVIDUAL**

## INDIVIDUAL REQUIREMENTS

### DEMAND CUSTOMISED SOLUTIONS

With Thermokon INDIVIDUAL, we offer you specifically the uniqueness that you need. Whether we work together and create an innovative serial product or create added value for your project business.

Discover the different possibilities of Thermokon INDIVIDUAL!



#### » CUSTOMER-SPECIFIC PRODUCT SOLUTIONS

- » Hard-/Software Development
- » Construction, Engineering
- » Setting maintenance intervals



#### » PROJECT-SPECIFIC SERVICES

- » Configuration
- » Labelling
- » Packaging

MORE INFORMATION ON: [THERMOKON.DE/EN-GB/INDIVIDUAL](https://www.thermokon.de/en-gb/individual)

# INDIVIDUAL

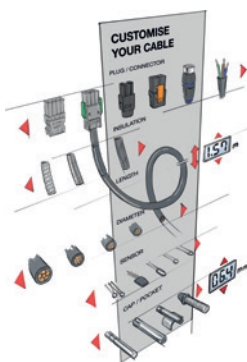
## CUSTOMISED PRODUCT SOLUTIONS:

### EXPERTISE FROM THE INITIAL CONTACT TO SERIES PRODUCTION

With customer-specific product solutions, we expand our comprehensive product range in order to match your requirements entirely. From conception to series delivery, our focus is your added value. Benefit from our expertise and knowledge as well

as our powerful and flexible partnership package. Starting with your ideas and design, we take you through the whole journey until series production. Additionally, we provide transparent processes and cost-optimized solutions along the way.

*WE STAND BY YOUR SIDE AS A POWERFUL AND EXPERIENCED PARTNER DURING THE COMPLETE PROJECT!*





thermokon  
INDIA

## PROJECT-SPECIFIC SERVICES: SIMPLE. PROFESSIONAL. INDIVIDUAL.

In order to be able to respond even better to your requirements, we offer customised products ex-works, suiting your project needs. Ever shorter project lead times and decreasing installation staff and skilled electricians are increasingly becoming a challenge in daily project business. In order to offer our customers a decisive added value in terms of saving time and costs, we deliver project-specific solutions for you – starting from

one piece. Whether it is project-specific configurations, norm-compliant labelling or pre-assembled connector solutions for a plug & play installation – Thermokon supports you with project-specific services in order to make your project implementation easier, safer and cost-saving. Our quality promise with a five-year warranty certainly remains.



# INDIVIDUAL

## » PARAMETERISATION / PRE-CONFIGURATION

For our customers, we can take over the configuration and parameterisation of room control units, thermostats as well as sensors. Typical applications are the parameterisation of BUS parameters or the pre-setting of measuring ranges. In addition, we further enable the address or pre-configuration of parameters for room control units, so that our customers receive a "ready-to-install" product. For a quick installation on project site, each device is given a unique identification according to your needs and wishes.

- » Pre-configuration of products
  - » Adjustment of parameters
  - » Teach-in / Integration of wireless products (plug & play solution)
- 

## » LABELLING / IDENTIFICATION

We gladly offer to take over part of your field device labelling / identification. Robust labels or innovative NFC tags are e.g. part of our offering. You provide us the content – we implement it during production process.

- » Labels, barcodes, QR, Datamatrix and NFC tags for field devices
  - » Cable tags / flags / identifiers
- 

## » WIRING / CONNECTORS

Thermokon products stand for fast and intuitive commissioning. In order to be able to reduce the installation time even further, we offer our customers pre-assembled devices with either open cable ends or even connector solutions. The focus here is on "plug & play".

- » Individual cable types, specifications and cable lengths
  - » Pre-assembly of connection cables with plugs/connectors
  - » Connector solutions or open cable ends
-



## LIGHTING CONTROL WITH HIGHEST DESIGN ASPIRATIONS

Expectations for full-featured professional lighting control solutions are high. Together with Casambi®, the thanos EVO provides all these features in just one device.

The room control units are already characterized by their outstanding performance for the detection of temperature, humidity and optional CO<sub>2</sub> and VOC. Further available is an ECO function for an increased energy-efficiency and convenient blind controls.

Classical lighting controls (on/off/dimming) are extended through setting light temperature and an RGB colour picker. Wireless communication between the Casambi® peripherals and the thanos EVO open up maximum flexibility in lighting control.

The BUS interface allows to display even external sensor values. Easy to install: All device parameters can be adjusted through a BUS interface or via mobile App.

## CASAMBI + thermokon®

- » Leading platform for lighting control systems in buildings
  - » Based on Bluetooth® Low Energy technology
  - » Self-organizing wireless mesh network
- » Ecosystems with more than 3 mio. active operating nodes

- » 35 years experience in building automation
- » First room operating unit using Casambi® technology
- » Highlight: Interface between Casambi® and BMS
- » Integrated sensors and multiple control functions



CO<sub>2</sub> | VOC | TEMP | RH



CLIMATE



SHADES/BLINDS



MONITORING



LIGHTING



SCENES



EUROPEAN CENTRAL BANK  
FRANKFURT, GERMANY  
MORE THAN 13.000 DEVICES



## REFERENCES



Star Arctic Hotel  
Saariselkä, Finland



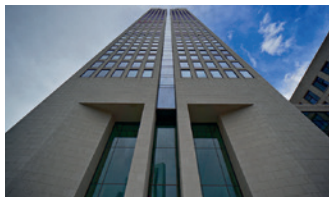
Shell Global Headquarters  
The Hague, Netherlands



Prime Tower  
Zurich, Switzerland



Fondation Louis Vuitton  
Paris, France



Opernturm  
Frankfurt, Germany



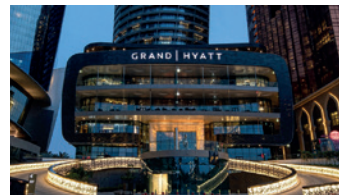
Tomson Riviera Apartment Towers  
Shanghai, China



KaDeWe  
Berlin, Germany



Semperoper  
Dresden, Germany



Grand Hyatt  
Dubai, UAE



Sheikh Abdullah Al Salem  
Cultural Center, Kuwait City



Fairmont Hotel Four Seasons  
Hamburg, Germany



University Oslo  
Oslo, Norway



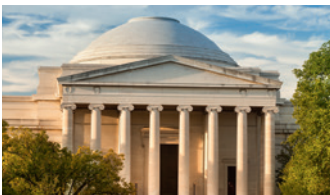
Generali Insurance, Headquarters  
Trieste, Italy



State Opera  
Vienna, Austria



Konica Minolta  
Milan, Italy



The National Gallery of Art  
Washington D.C., USA



Ascot Racecourse  
Ascot, England



European Patent Office  
Munich, Germany



## 5 YEARS WARRANTY

### » LASTING RELIABILITY

Due to high quality and durability of our products we offer a 5-year warranty from date of production for all products produced as of 01.01.2014.

You are interested in details? Please visit:

[www.thermokon.de/en-gb/highlights/5-years-warranty](http://www.thermokon.de/en-gb/highlights/5-years-warranty)



## SI-PROTECTION

### » FOR NON-CORRODING SENSORS

If the ambient temperature fluctuates around dew-point, condensatation might appear. For your sensors condensate can have unpleasant consequences: Humidity penetrates into the soldering point of the sensor, the sensor oxidizes and begins to corrode. Thus, the measuring result becomes unreliable. SI-Protection offers you a safe protection against corrosion damages, vibrations and measuring inaccuracies.



The contact points of the sensors are first coated with epoxy resin and with a casting compound afterwards. Due to the permanent connection with the insulation material of the wire a closed unit is established protecting the sensor reliably against vibration and humidity. This effect is additionally supported by the rolled pocket.



SI-Protection



16-point pressed  
(protection class IP65)



rolled  
(protection class IP67)

# EasySens®



Innovative self-powered wireless technology generates energy by means of harvesting ambient light or motion. Interoperable, cost-effective and energy-efficient solutions in building automation are available using our wireless sensor system EasySens®.

## Room Operating Units

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## JOY SR Fancoil

Fancoil thermostat with EnOcean radio interface in high-quality design for individual singleroom temperature- and fan control. A glass surface with intuitive touch control buttons and display combine design, feel and functionality in an outstanding way. The internal controller of the JOY calculates control values for fans and heating/cooling applications, which are provided via analog or digital outputs (depending on type). The integrated EnOcean interface also allows the control of a second heating circuit (e.g. using a radiator valve). The integration of various external sensors (e.g. window contacts, change-over, condensation sensors, etc.) is possible through a hard-wired connection or the EnOcean interface. These sensors enable temperature- and fan control tailored to the application. The device can be mounted in a standard flush-mounted box.



JOY SR Fancoil

JOY SR Fancoil Custom\*

**NEW:** With additional, customisable touch buttons (see page 12)

\* Minimum order quantity 100 pieces



Technical Data	
Measured values	temperature, relative humidity
Operating functions	setpoint adjustment temperature, fan stage adjustment, standby/presence detection
Operating elements	5 capacitive buttons
Configuration	uConfig, BUS
Inputs	see overview
Outputs	see overview
Network technology	RS485 Modbus
Radio technology	EnOcean (IEC 14543-3-10) 868 MHz
Output signal temperature	scaling according EEP: 0..+40 °C
Measuring range humidity	0..100% rH non-condensing
Power supply	<b>5DO/AO2DO:</b> 85..260 V ~ <b>3AO:</b> 24 V = (±10%) SELV, 24 V ~ (±10%) SELV
Power consumption	<b>5DO:</b> max. 2,5 VA (260 V ~) <b>AO2DO:</b> max. 3 VA (260 V ~) <b>3AO:</b> typ. 2,5 W (24 V =)
Display	LCD 60x44 mm, 240x160 px, backlight cold white
Enclosure	PC, cover glass
Colour	pure white, black
Operating range temperature	0..+50 °C
Protection (IP)	IP30, according to EN 60529
Connection	terminal block, max. 1,5 mm <sup>2</sup> , inputs max. 1,0 mm <sup>2</sup>
Mounting	in standard EU box (Ø=60 mm, depth min. 45 mm)

Outputs	5DO (230 V)	EC AO2DO (230 V)	EC 3AO (24 V)
Fan (Relay)	3x	–	–
EC Fan (0..10 V)	–	1x	1x
Heating/Cooling (Relay)	2x	2x	–
Heating/Cooling (0..10 V)	–	–	2x
6-Way-Valve (0..10 V)	–	–	(1x) <sup>1</sup>
Inputs	5DO (230 V)	EC AO2DO (230 V)	EC 3AO (24 V)
Input for NTC10k or floating contact	1x	1x	1x
Input for potential contact (230 V)	1x	1x	–
Input for potential contact (24 V)	–	–	–
Input for floating contact	–	–	1x

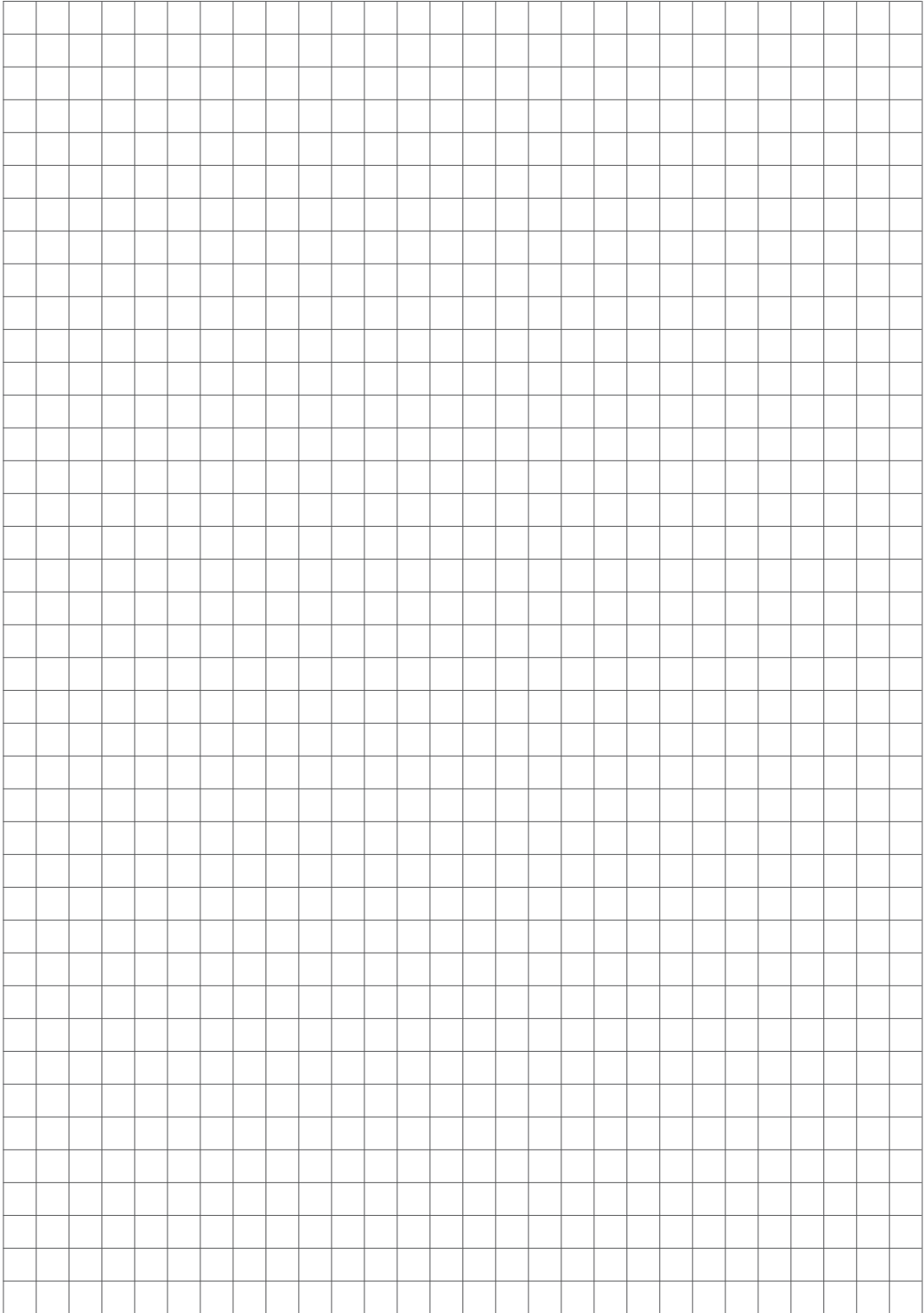
<sup>1</sup> Instead of 2x 0..10 V (heating/cooling)

Fan coil thermostat with radio interface temperature – RS485 Modbus – 85..260 V				
Item description	Contr.	Item No.	Group	€
JOY SR FC 5D0 temp RS485 Modbus white MVolt	✓	793117	E1	260,00
JOY SR FC 5D0 temp RS485 Modbus black MVolt	✓	799072	E1	273,00
JOY SR EC AO2D0 temp RS485 Modbus white MVolt	✓	763776	E1	260,00
JOY SR EC AO2D0 temp RS485 Modbus black MVolt	✓	793902	E1	273,00

Fan coil thermostat with radio interface temperature – RS485 Modbus – 24 V				
Item description	Contr.	Item No.	Group	€
JOY SR EC 3A0 temp RS485 Modbus white 24 V	✓	701020	E1	260,00
JOY SR EC 3A0 temp RS485 Modbus black 24 V	✓	701037	E1	273,00

Options	
Description	€
Add for additional humidity sensor	43,00
Add for additional CO2 sensor	148,50

Accessories				
Item description		Item No.	Group	€
microSD card 2 GB		500098	A1	13,80
USB Interface RS485 (incl. driver CD)		668293		63,50
Decorative frame JOY white		681452	A1	14,80
Decorative frame JOY black		740951	A1	14,80
Frame for surface mounting JOY white		760201	A1	29,30
Frame for surface mounting JOY black		760195	A1	29,30



## JOY SR HC

Room thermostat with EnOcean wireless interface in high-quality design for individual temperature control, e.g. in hotel rooms or offices. A glass surface with intuitive touch control buttons and display combine design, feel and functionality in an outstanding way. The internal controller of the JOY calculates control values for fans and heating/cooling applications, which are provided via analog or digital outputs (depending on type). The integrated EnOcean interface also allows the control of a second heating circuit (e.g. using a radiator valve). The integration of various external sensors (e.g. window contacts, change-over, condensation sensors, etc.) is possible through a hard-wired connection or the EnOcean interface. These sensors enable temperature control tailored to the application. The device can be mounted in a standard flush-mounted box.



**NEW:** With additional, customisable touch buttons (see page 12)

\* Minimum order quantity 100 pieces



Technical Data	
Measured values	temperature, relative humidity
Operating functions	setpoint adjustment temperature, standby/presence detection
Operating elements	3 capacitive buttons
Configuration	uConfig, BUS
Inputs	see overview
Outputs	see overview
Network technology	RS485 Modbus
Radio technology	EnOcean (IEC 14543-3-10) 868 MHz
Output signal temperature	scaling according EEP, 0..+40 °C
Measuring range humidity	0..100% rH non-condensing
Power supply	<b>AO2DO:</b> 85..260 V ~ <b>3AO:</b> 24 V = (±10%) SELV, 24 V ~ (±10%) SELV
Power consumption	<b>AO2DO:</b> max. 3 VA (260 V ~) <b>3AO:</b> typ. 2,5 W (24 V =)
Display	LCD 60x44 mm, 240x160 px, backlight cold white
Enclosure	PC, cover glass
Colour	pure white, black
Operating range temperature	0..50 °C
Connection	terminal block, max. 1,5 mm <sup>2</sup> , inputs max. 1,0 mm <sup>2</sup>
Mounting	in standard EU box (Ø=60 mm, depth min. 45 mm)

Outputs	EC AO2DO (230 V)	EC 3AO (24 V)
Fan (Relay)	–	–
EC Fan (0..10 V)	1x	1x
Heating/Cooling (Relay)	2x	–
Heating/Cooling (0..10 V)	–	2x
6-Way-Valve (0..10 V)	–	(1x) <sup>1</sup>
Inputs	EC AO2DO (230 V)	EC 3AO (24 V)
Input for NTC10k or floating contact	1x	1x
Input for potential contact (230 V)	1x	–
Input for potential contact (24 V)	–	–
Input for floating contact	–	1x

<sup>1</sup> Instead of 2x 0..10 V (heating/cooling)

**Room thermostat heating/cooling with radio interface temperature – RS485 Modbus – 85..260 V**

Item description	Contr.	Item No.	Group	€
JOY SR HC AO2DO temp RS485 Modbus white MVolt	✓	756914	E1	260,00
JOY SR HC AO2DO temp RS485 Modbus black MVolt	✓	756938	E1	273,00

**Room thermostat heating/cooling with radio interface temperature – RS485 Modbus – 24 V**

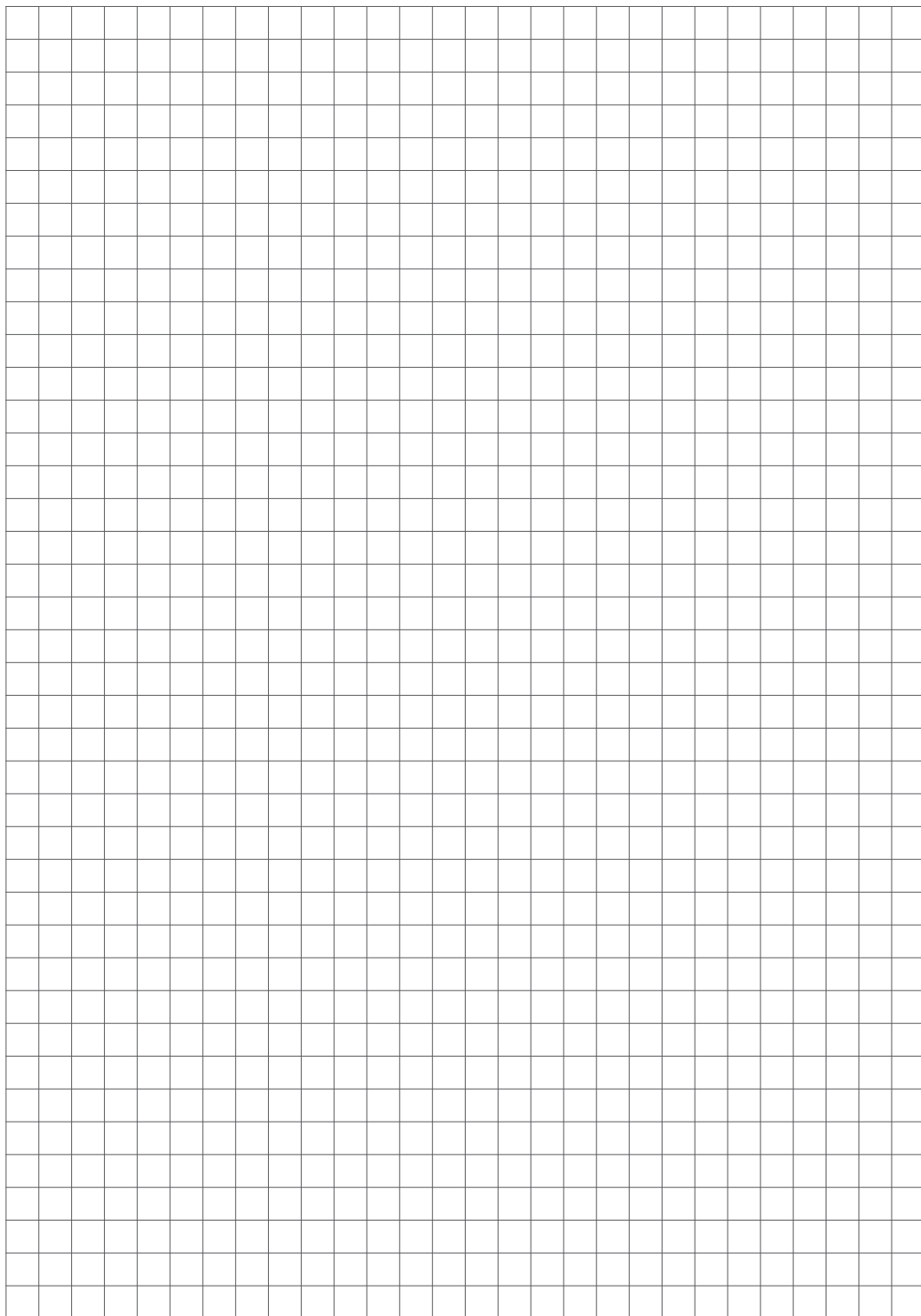
Item description	Contr.	Item No.	Group	€
JOY SR HC 3AO temp RS485 Modbus white 24 V	✓	700993	E1	260,00
JOY SR HC 3AO temp RS485 Modbus black 24 V	✓	701006	E1	273,00

**Options**

Description	€
Add for additional humidity sensor	43,00
Add for additional CO2 sensor	148,50

**Accessories**

Item description	Item No.	Group	€
microSD card 2 GB	500098	A1	13,80
USB Interface RS485 (incl. driver CD)	668293		63,50
Decorative frame JOY white	681452	A1	14,80
Decorative frame JOY black	740951	A1	14,80
Frame for surface mounting JOY white	760201	A1	29,30
Frame for surface mounting JOY black	760195	A1	29,30



## SR06 LCD

Energy-harvesting wireless room operating unit with an integrated LCD for the measurement of temperature and relative humidity (rH version). Depending on the type, temperature set point, fan stages, room occupancy, lighting or blinds can be controlled using the operating buttons on the device. The device transmits its measured values to corresponding receivers or gateways, which directly process the information or - depending on the application - forward it to a BMS controller. Using the SmartACK protocol, the bidirectional communication is capable of managing a local overwrite from BMS of e.g. set point, fan stages and room occupancy. The SR06 LCD can be wirelessly parameterized by using the airConfig software or alternatively through the optional USB programming interface. Although the SR06 LCD is a self-powered device, the energy capacitor of the device can also be charged via USB interface if required. It can be integrated into almost any 55x55 mm frames, allowing you to choose from many designs and frame manufacturers. The SR06 LCD is mounted by using the adhesive pad or screws.



SR06 LCD 2T  
pure white brilliant



SR06 LCD 2T+Light  
anthracite



SR06 LCD 2T+Blind  
anthracite



SR06 LCD 4T Itype1  
pure white brilliant



SR06 LCD 4T Itype2  
pure white brilliant



SR06 LCD 4T Itype3  
pure white brilliant



Technical Data	
Measured values	temperature, relative humidity
Operating functions	setpoint adjustment fan stage adjustment presence detection light ON/OFF blind UP/DOWN
Operating elements	2 buttons 4 buttons
Configuration	airConfig, Software/Plug-In for configuration
Radio technology	EnOcean (IEC 14543-3-10) 868 MHz, 902 MHz
Output signal temperature	scaling according EEP, 0..+40 °C
Measuring range humidity	0..100% rH non-condensing
Power supply	solar cell, maintenance-free LiPo-battery use of back-up battery possible for insufficiently lit environments, coin cell CR1632
Display	LCD 29x12 mm, monochrome
Enclosure	PC V0
Colour	pure white brilliant, anthracite
Operating range temperature	0..+40 °C
Protection (IP)	IP20, according to EN 60529
Switch ranges	Berker, Busch-Jaeger, Feller, Gira, Jung, Merten (please specify the desired frame when ordering)
Mounting	surface-mounted flat on base using adhesive foil or screws
Delivery content	incl. adhesive foil for mounting
Notes	minimum illuminance at standard setting: 200 lx for 8 hours, for configuration an optional programming interface is available energy storage can be recharged with a separate USB-cable, to use the free software airConfig (download) a USB stick, which is able to send and receive EnOcean telegrams, is necessary. The EnOcean USB stick (incl. license) is included in airScan (item No. 566704 for 868 MHz) (refer to accessories)

**Wireless room operating unit temperature 2T**

Item description	Item No.	Group	€
SR06 LCD 2T temp pure white brilliant	728843	E2	223,50
SR06 LCD 2T temp anthracite	728928	E2	223,50

**Wireless room operating unit temperature 2T+light**

Item description	Item No.	Group	€
SR06 LCD 2T+Light temp pure white brilliant	728850	E2	245,70
SR06 LCD 2T+Light temp anthracite	728935	E2	245,70

**Wireless room operating unit temperature 2T+blind**

Item description	Item No.	Group	€
SR06 LCD 2T+Blind temp pure white brilliant	731836	E2	245,70
SR06 LCD 2T+Blind temp anthracite	728942	E2	245,70

**Wireless room operating unit temperature 4T**

Item description	Item No.	Group	€
SR06 LCD 4T ltype1 temp pure white brilliant	728874	E2	240,90
SR06 LCD 4T ltype1 temp anthracite	728959	E2	240,90

**Wireless room operating unit humidity + temperature 2T**

Item description	Item No.	Group	€
SR06 LCD 2T temp_rH pure white brilliant	729031	E2	266,50
SR06 LCD 2T temp_rH anthracite	729147	E2	266,50

**Wireless room operating unit humidity + temperature 2T+light**

Item description	Item No.	Group	€
SR06 LCD 2T+Light temp_rH pure white brilliant	693035	E2	288,70
SR06 LCD 2T+Light temp_rH anthracite	729154	E2	288,70

**Wireless room operating unit humidity + temperature 2T+blind**

Item description	Item No.	Group	€
SR06 LCD 2T+Blind temp_rH pure white brilliant	729048	E2	288,70
SR06 LCD 2T+Blind temp_rH anthracite	729161	E2	288,70

**Wireless room operating unit humidity + temperature 4T**

Item description	Item No.	Group	€
SR06 LCD 4T ltype1 temp_rH pure white brilliant	729055	E2	283,90
SR06 LCD 4T ltype1 temp_rH anthracite	729178	E2	283,90

**Options**

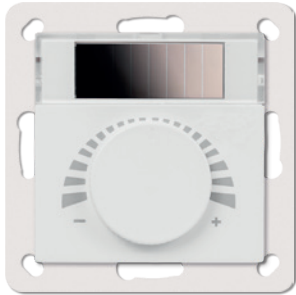
Description	€
Labelling type 2 (ltype2)	0,00
Labelling type 3 (ltype3)	0,00
Switch ranges (various manufacturers)	Page 256

**Accessories**

Item description	Item No.	Group	€
Coin cell CR1632	597814	A1	5,00
EnOcean USB transceiver for airConfig/airScan (incl. airScan license)	566704		113,90
USB extension 3 m	574044		16,30
USB interface for devices USE-M / USE-L / NOVOS / thanos EVO / SR06 LCD	597838	A1	39,50

## SR07 x

Energy-harvesting wireless room operating unit for the measurement of temperature and relative humidity (rH version) in living and office spaces. Also available with set point potentiometer, slide switch (for example ‚Day/Night‘) or occupancy button. The device transmits its values unidirectionally to receiving actuators or gateways, which process the information directly or – depending on the application – forward it to a BMS controller. It can be integrated into almost any 55x55 mm frames, allowing you to choose from many designs and frame manufacturers. The SR07 x is mounted by using the adhesive pad or screws.



SR07 P pure white brilliant



SR07 P anthracite



SR07 P BTyp6



### Technical Data

<b>Measured values</b>	temperature, relative humidity
<b>Operating functions</b>	setpoint adjustment temperature
<b>Radio technology</b>	EnOcean (IEC 14543-3-10) 868 MHz
<b>Output signal temperature</b>	scaling according EEP, 0..+40 °C
<b>Measuring range humidity</b>	0..100% rH non-condensing
<b>Power supply</b>	solar cell, maintenance-free internal super cap use of back-up battery possible for insufficiently lit environments, coin cell CR1632
<b>Enclosure</b>	PC
<b>Colour</b>	pure white brilliant, anthracite
<b>Operating range temperature</b>	0..+40 °C
<b>Protection (IP)</b>	IP20, according to EN 60529
<b>Switch ranges</b>	Berker, Busch-Jaeger, Feller, Gira, Jung, Merten (please specify the desired frame when ordering)
<b>Mounting</b>	surface-mounted flat on base using adhesive foil or screws
<b>Delivery content</b>	incl. adhesive foil for mounting

**Wireless room operating unit temperature**

Item description	Item No.	Group	€
SR07 P temp pure white brilliant	634113	E2	182,40
SR07 P temp anthracite	729376	E2	182,40

**Wireless room operating unit humidity + temperature**

Item description	Item No.	Group	€
SR07 P temp_rH pure white brilliant	729208	E2	225,40
SR07 P temp_rH anthracite	729406	E2	225,40

**Options**

Description	€
Labelling type 6 colour red+blue (ltype6)	7,00
Switch ranges (various manufacturers)	Page 256

**Accessories**

Item description	Item No.	Group	€
Coin cell CR1632	597814	A1	5,00

## NOVOS 3 SR x

Energy-harvesting wireless room operating unit in the NOVOS design for the integrated measurement of temperature and relative humidity (rH version) in living and office spaces as well as controls through operating elements such as set point and occupancy button. The device is mounted using the adhesive pad or screws included and transmits its values unidirectionally to EasySens® receiving actuators or gateways, which process the information directly or – depending on the application – forward it to a BMS controller.



NOVOS 3 SR P



NOVOS 3 SR T



NOVOS 3 SR PT



### Technical Data

<b>Measured values</b>	temperature, relative humidity
<b>Operating functions</b>	setpoint adjustment temperature presence detection
<b>Operating elements</b>	potentiometer (P) button (T)
<b>Configuration</b>	DIP switches
<b>Radio technology</b>	EnOcean (IEC 14543-3-10) 868 MHz
<b>Output signal temperature</b>	scaling according EEP, 0..+40 °C
<b>Measuring range humidity</b>	0..100% rH non-condensing
<b>Power supply</b>	solar cell, maintenance-free internal super cap use of back-up battery possible for insufficiently lit environments, battery LS14250 (3,6 V)
<b>Enclosure</b>	PC V0
<b>Colour</b>	pure white, black
<b>Protection (IP)</b>	IP20, according to EN 60529
<b>Mounting</b>	surface-mounted flat on base using adhesive foil or screws
<b>Delivery content</b>	incl. adhesive foil for mounting

**Wireless room operating unit temperature**

Item description	Item No.	Group	€
NOVOS 3 SR P white temp	754064	E2	158,60
NOVOS 3 SR T white temp	754071	E2	163,90
NOVOS 3 SR PT white temp	754095	E2	180,20

**Wireless room operating unit humidity + temperature**

Item description	Item No.	Group	€
NOVOS 3 SR P white temp_rH	754101	E2	201,60
NOVOS 3 SR T white temp_rH	754118	E2	206,90
NOVOS 3 SR PT white temp_rH	754125	E2	223,20

**Options**

Description	€
Enclosure in black	13,00

**Accessories**

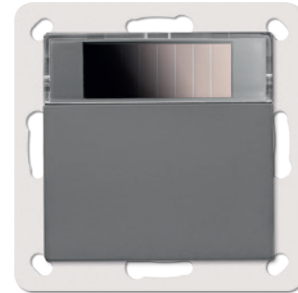
Item description	Item No.	Group	€
Fixing kit rawlplugs and screws (2x each)	660945	A1	1,10
Frame for surface mounting NOVOS 3 white	795050	A1	15,30
Frame for surface mounting NOVOS 3 black	795074	A1	55,30
Battery AA 3.6 V lithium ER14505	759182	A1	8,40
Adhesive foil for NOVOS 3 SR with inner cut-outs	773386	A1	2,40

## SR07

Energy-harvesting wireless room sensor for measuring temperature in residential and commercial buildings. The SR07 transmits its measured values unidirectionally to compatible EasySens® receiving actuators or gateways, which forward the information to a BMS controller. It can be integrated into a wide range of common switch ranges and frames, allowing you to choose from many designs and frame manufacturers.



SR07 pure white brilliant



SR07 anthracite



### Technical Data

<b>Measured values</b>	temperature, relative humidity
<b>Radio technology</b>	EnOcean (IEC 14543-3-10) 868 MHz
<b>Output signal temperature</b>	scaling according EEP, 0..+40 °C
<b>Measuring range humidity</b>	0..100% rH non-condensing
<b>Power supply</b>	solar cell, maintenance-free internal super cap use of back-up battery possible for insufficiently lit environments, coin cell CR1632
<b>Enclosure</b>	PC
<b>Colour</b>	pure white brilliant, anthracite
<b>Operating range temperature</b>	0..+40 °C
<b>Protection (IP)</b>	IP20, according to EN 60529
<b>Switch ranges</b>	Berker, Busch-Jaeger, Feller, Gira, Jung, Merten (please specify the desired frame when ordering)
<b>Mounting</b>	surface-mounted flat on base using adhesive foil or screws
<b>Delivery content</b>	incl. adhesive foil for mounting

**Wireless room sensor temperature**

Item description	Item No.	Group	€
SR07 temp pure white brilliant	729437	E2	162,70
SR07 temp anthracite	729468	E2	162,70

**Wireless room sensor humidity + temperature**

Item description	Item No.	Group	€
SR07 temp_rH pure white brilliant	729550	E2	205,70
SR07 temp_rH anthracite	729598	E2	205,70

**Options**

Description	€
Switch ranges (various manufacturers)	Page 256

**Accessories**

Item description	Item No.	Group	€
Coin cell CR1632	597814	A1	5,00

## NOVOS 3 SR

Energy-harvesting wireless room sensor in the NOVOS design for measuring temperature in residential and commercial buildings. Mounted directly on the wall using the adhesive pad or screws included, the NOVOS 3 SR Temp transmits its measured values to EasySens® receiving actuators or gateways, which process the information directly or – depending on the application – forward it to a BMS controller.




NOVOS 3 SR



NOVOS 3 SR CO2



Technical Data	
Measured values	temperature, relative humidity, CO2
Configuration	DIP switches
Radio technology	EnOcean (IEC 14543-3-10) 868 MHz
Output signal temperature	scaling according EEP: 0..+40 °C
Measuring range humidity	0..100% rH non-condensing
Measuring range CO2	0..2000 ppm, 0..5000 ppm, optionally configurable
Power supply	solar cell, maintenance-free internal super cap use of back-up battery possible for insufficiently lit environments, battery ER14505 (3,6 V)
Enclosure	PC V0
Colour	pure white, black
Operating range temperature	0..+40 °C
Protection (IP)	IP20, according to EN 60529
Mounting	surface-mounted flat on base using adhesive foil or screws
Delivery content	incl. adhesive foil for mounting

Wireless room sensor CO2 + temperature + humidity				
Item description	Item No.	In stock	Group	€
NOVOS 3 SR temp white	754040		E2	142,40
NOVOS 3 SR temp_rH white	754057		E2	185,40
NOVOS 3 SR CO2 temp white	789790		E2	290,90
NOVOS 3 SR CO2 temp_rH white	789820		E2	333,90

Options	
Description	€
Enclosure in black	13,00

Accessories			
Item description	Item No.	Group	€
Fixing kit rawlplugs and screws (2x each)	660945	A1	1,10
Frame for surface mounting NOVOS 3 white	795050	A1	15,30
Frame for surface mounting NOVOS 3 black	795074	A1	55,30
Battery AA 3.6 V lithium ER14505	759182	A1	8,40
Adhesive foil for NOVOS 3 SR with inner cut-outs	773386	A1	2,40

## MCS SR

Multi compact sensor with EnOcean interface for measuring temperature, humidity and motion.



MCS SR Temp\_rH



MCS SR Occ



MCS SR Occ Lum



### Technical Data

<b>Measured values</b>	<b>Temp_rH:</b> temperature, relative humidity <b>Lum:</b> luminosity <b>Occ:</b> motion, presence,
<b>Radio technology</b>	EnOcean (IEC 14543-3-10) 868 MHz
<b>Power supply</b>	battery type AAA
<b>Enclosure</b>	PC V0
<b>Colour</b>	pure white, anthracite
<b>Operating range temperature</b>	0..+40 °C
<b>Protection (IP)</b>	IP20, according to EN 60529
<b>Mounting</b>	surface-mounted flat on base using included adhesive pad or screws
<b>Delivery content</b>	incl. adhesive foil for mounting incl. battery type AAA

### Wireless room sensor motion EnOcean (868 MHz)

Item description	Item No.	Group	€
MCS SR Occ white	792424	E2	158,20
MCS SR Occ anthracite	792448	E2	164,70
MCS SR temp_rH white	799058	E2	147,20
MCS SR temp_rH anthracite	799065	E2	153,70
MCS SR Occ Lum white	814768	E2	172,90
MCS SR Occ Lum anthracite	814775	E2	179,40

### Accessories

Item description	Item No.	Group	€
Battery AAA 1,5 V lithium L92	2000202	A1	8,30
Battery AAA 1,5 V Alkaline VARTA 4003	739351	A1	5,00



## SR-MDS Solar

Energy-harvesting wireless radio multi-sensor to measure light levels and detect motion. The SR-MDS Solar can be integrated into compatible receiving actuators or gateways.



### Technical Data

<b>Measured values</b>	luminosity, motion
<b>Configuration</b>	airConfig
<b>Sensor</b>	PIR (passive infrared) detection range: 102 °x92 °, Ø=5 m at a sensor height of approx. 2,8 m
<b>Radio technology</b>	EnOcean (IEC 14543-3-10) 868 MHz, 902 MHz
<b>Measuring range light</b>	0..510 lux (default setting) 0..1000 lux (10 bit) 0..1020 lux optionally configurable
<b>Power supply</b>	solar cell, maintenance-free internal super cap use of back-up battery possible for insufficiently lit environments: battery LS14250 (3,6 V)
<b>Enclosure</b>	PC, ABS
<b>Colour</b>	pure white
<b>Operating range temperature</b>	0..50 °C
<b>Protection (IP)</b>	IP20, according to EN 60529
<b>Mounting</b>	surface-mounted flat on base using adhesive foil or screws
<b>Delivery content</b>	incl. fixing kit rawplugs and screws (2x each)
<b>Notes</b>	to use the free software airConfig (download) a USB stick, which is able to send and receive EnOcean telegrams, is necessary. The EnOcean USB stick (incl. license) is included in airScan (item No. 566704 for 868 MHz)

### Wireless ceiling sensor light + motion

Item description	Item No.	Group	€
SR-MDS Solar	591577	E2	259,10

### Accessories

Item description	Item No.	Group	€
Battery 1/2AA 3.6V Lithium LS14250	315098	A1	5,00
EnOcean USB transceiver for airConfig/airScan (incl. airScan license)	566704		113,90

## SR65

Energy-harvesting wireless sensor for measuring temperature in outdoor areas or industrial environments (for example in cold stores, production halls and warehouses). The airConfig software can be used to parameterize the SR65 to customized measurement ranges, transmission intervals and wake-up times. When used in dark places (e.g. server rooms), a backup battery can be inserted.



SR65 Temp



SR65 Temp\_rH



### Technical Data

<b>Measured values</b>	temperature, relative humidity
<b>Configuration</b>	airConfig
<b>Radio technology</b>	EnOcean (IEC 14543-3-10) 868 MHz, 902 MHz
<b>Output signal temperature</b>	scaling according EEP: -20..+60 °C, optionally configurable
<b>Measuring range humidity</b>	0..100% rH non-condensing
<b>Power supply</b>	solar cell, maintenance-free internal super cap, use of back-up battery possible for insufficiently lit environments, battery LS14250 (3,6 V)
<b>Material in touch with media</b>	<b>Temp:</b> Sensor probe: Ø=6 mm, stainless steel V4A (1.4571) <b>rH:</b> Pipe: Ø=19 mm, PC, length 50 mm, with filter stainless steel wire mesh
<b>Enclosure</b>	PA6.6, with quick lock screws
<b>Colour</b>	pure white, transparent cover
<b>Operating range temperature</b>	-25..+65 °C
<b>Protection (IP)</b>	IP65, according to EN 60529
<b>Notes</b>	to use the free software airConfig (download) a USB stick, which is able to send and receive EnOcean telegrams, is necessary. The EnOcean USB stick (incl. license) is included in airScan (item No. 566704 for 868 MHz) (refer to accessories)

**Wireless outdoor sensor**

Item description	Item No.	Group	€
SR65 temp	230001	E2	163,60
SR65 temp_rH	540391	E2	206,60

**Accessories**

Item description	Item No.	Group	€
Battery 1/2AA 3.6V Lithium LS14250	315098	A1	5,00
EnOcean USB transceiver for airConfig/airScan (incl. airScan license)	566704		113,90

## SR65 TF

Energy-harvesting wireless cable sensor for measuring temperature in gaseous media in heating, ventilation and air-conditioning systems. The SR65 TF can be configured via airConfig software to customized measurement ranges, transmission intervals and wake-up times. When used in dark places, a backup battery can be inserted.



## SR65 AKF

Energy-harvesting wireless duct sensor for the measurement of temperature in gaseous media of heating, ventilation and air-conditioning systems. The SR65 AKF can be configured via airConfig software to customized measurement ranges, transmission intervals and wake-up times. When used in dark places, a backup battery can be inserted.



## SR65 VFG

Energy-harvesting wireless contact sensor for measuring temperature on ducts/pipes. The SR65 VFG can be configured via airConfig software to customized measurement ranges, transmission intervals and wake-up times. When used in dark places, a backup battery can be inserted.



### Technical Data

<b>Measured values</b>	temperature
<b>Configuration</b>	airConfig
<b>Radio technology</b>	EnOcean (IEC 14543-3-10) 868 MHz
<b>Output signal temperature</b>	<b>SR65 TF:</b> scaling according EEP: -20..+60 °C, optionally configurable <b>SR65 AKF/VFG:</b> scaling according EEP: +10..+90 °C, optionally configurable
<b>Power supply</b>	solar cell, maintenance-free internal super cap use of back-up battery possible for insufficiently lit environments battery LS14250 (3,6 V)
<b>Material in touch with media</b>	<b>SR65 TF:</b> Sensor probe: Ø=6 mm, stainless steel V4A (1.4571), rolled (IP67) <b>SR65 AKF:</b> Sensor probe: Ø=6 mm, stainless steel V4A (1.4571) <b>SR65 VFG:</b> Sensor probe: brass, spring loaded sensor
<b>Enclosure</b>	PA6.6, with quick lock screws
<b>Colour</b>	pure white, transparent cover
<b>Operating range temperature</b>	-25..+65 °C
<b>Protection (IP)</b>	IP65, according to EN 60529
<b>Connection cable</b>	<b>SR65 TF:</b> silicone, 0,25 mm², 2-wire
<b>Notes</b>	to use the free software airConfig (download) a USB stick, which is able to send and receive EnOcean telegrams, is necessary. The EnOcean USB stick (incl. license) is included in airScan (item No. 566704 for 868 MHz) (refer to accessories)

## SR65 TF

Wireless cable sensor temperature					
Item description	Item No.	In stock	Group	€	
SR65 TF 050.06 L1000	245647	⊖	E2	165,90	

Options	
Description	€
Other connection types and lengths	on request

## SR65 AKF

Wireless duct/immersion sensor temperature			
Item description	Item No.	Group	€
SR65 AKF 100.06	630566	E2	173,70

## SR65 VFG

Wireless contact sensor temperature			
Item description	Item No.	Group	€
SR65 VFG	239615	E2	163,60

Thermowells brass for sensors with pocket Ø=6 mm						
Item description	Length	Inst. length	Item No.	In stock	Group	€
MS-thermowell 50 mm type THMSDS50	50 mm	36 mm	610995	⊖	A2	9,90
MS-thermowell 100 mm type THMSDS100	100 mm	86 mm	611008	⊖	A2	11,20

Thermowells stainless steel for sensors with pocket Ø=6 mm						
Item description	Length	Inst. length	Item No.	In stock	Group	€
VA-thermowell 50 mm type THVADS50	50 mm	36 mm	611152	⊖	A2	23,10
VA-thermowell 100 mm type THVADS100	100 mm	86 mm	611817	⊖	A2	25,30
Pressure screw with sealing PTFE (without silicone) for thermowell pocket THVADS			666473	⊖	A2	22,20

Accessories			
Item description	Item No.	Group	€
Battery 1/2AA 3.6V Lithium LS14250	315098	A1	5,00
Mounting flange MF6DS flexible (suitable for Ø=6 mm)	669016	A2	7,80
Mounting flange MF6 brass (suitable for Ø=6 mm)	3407	A1	7,80
Compression fittings KL6VA for Ø=6 mm with cutting ring, stainless steel	103213	A1	15,60
Tightening strap PA (max. 85 °C) for pipes Ø up to 100 mm with contact fluid	668071	A1	3,30
EnOcean USB transceiver for airConfig/airScan (incl. airScan license)	566704		113,90



## STC65+ RS485 Modbus

Bidirectional gateway with RS485 Modbus interface for integration of up to 32 EasySens® devices. Freely programmable 32 channels allow for a bidirectional communication with 32 addresses (registers) and SAB+/SAB05 wireless valve actuators for example. The STC65+ RS485 Modbus includes an ext. transmitting/receiving antenna (2.5 m).



Technical Data	
<b>Configuration</b>	Software/Plug-In for configuration, BUS, jumper, DIP switches
<b>Network technology</b>	RS485 Modbus
<b>Radio technology</b>	EnOcean (IEC 14543-3-10) 868 MHz, 902 MHz
<b>Data transmission</b>	bidirectional, transmitting/receiving channels: 32 (Rx) + 32 (Tx) + 32 (VA)
<b>Power supply</b>	15..24 V = (±10%) SELV, 24 V ~ (±10%) SELV
<b>Power consumption</b>	typ. 0,8 W (24 V =), 2 VA (24 V ~)
<b>Enclosure</b>	USE-M, impact- and shock-resistant enclosure with quick-release cover, PC
<b>Colour</b>	pure white, transparent cover
<b>Operating range temperature</b>	-20..+60 °C
<b>Protection (IP)</b>	IP65, according to EN 60529
<b>Connection</b>	removable cable entry M25 with fourfold cable entry for wire with max. Ø=7 mm, plug-in terminal, max. 1,5 mm²
<b>Mounting</b>	prepared for mounting on DIN rail TS35 (35x7,5 mm) according to EN 60715
<b>Delivery content</b>	incl. mounting base enclosure USE-M pure white incl. mounting set (screws and accessories) incl. external receiving/transmitting antenna (2,5 m) with magnetic base
<b>Notes</b>	to use the free software airConfig (download) a USB stick, which is able to send and receive EnOcean telegrams, is necessary. The EnOcean USB stick (incl. license) is included in airScan (item No. 566704 for 868 MHz), communication with up to 15 SmartACK devices, magnetic antenna plate for the external antenna recommended to improve radio coverage (see accessories)

Gateway EnOcean <-> BUS				
Item description	Item No.	In stock	Group	€
STC65+ RS485 Modbus	657372	⊖	E2	290,90

Accessories			
Item description	Item No.	Group	€
Antenna extension 10 m	257206	A1	67,70
Antenna extension 20 m	257213	A1	82,40
L-shaped magnetic antenna holder, 180x180 mm	255097	A1	17,50
Mounting base enclosure USE-M pure white	668354	A1	9,60
Mounting kit universal for enclosure USE	698511	A1	10,70



## STC65+ RS485 EVC

Bidirectional gateway with serial RS485 interface and IP65 enclosure for integrating up to 64 EasySens® sensors or wireless switches into a network. Transmission of field-programmable telegrams to max. 127 addresses. The gateway includes an ext. transmitting/receiving antenna (2.5 m).



### Technical Data

<b>Configuration</b>	Software/Plug-In for configuration, BUS, jumper, DIP switches
<b>Network technology</b>	RS485 EVC
<b>Radio technology</b>	EnOcean (IEC 14543-3-10) 868 MHz, 902 MHz
<b>Data transmission</b>	bidirectional, transmitting/receiving channels: in filter mode 64 (Rx) + 128 (Tx), in gateway mode ∞ (Rx) + 128 (Tx)
<b>Power supply</b>	15..24 V = (±10%) SELV, 24 V ~ (±10%) SELV
<b>Power consumption</b>	typ. 0,8 W (24 V =), 2 VA (24 V ~)
<b>Enclosure</b>	USE-M, impact- and shock-resistant enclosure with quick-release cover, PC
<b>Colour</b>	pure white, transparent cover
<b>Operating range temperature</b>	-20..+60 °C
<b>Protection (IP)</b>	IP65, according to EN 60529
<b>Connection</b>	removable cable entry M25 with fourfold cable entry for wire with max. Ø=7 mm, plug-in terminal, max. 1,5 mm²
<b>Mounting</b>	prepared for mounting on DIN rail TS35 (35x7,5 mm) according to EN 60715
<b>Delivery content</b>	incl. mounting base enclosure USE-M pure white incl. mounting set (screws and accessories) incl. external receiving/transmitting antenna (2,5 m) with magnetic base
<b>Notes</b>	to use the free software airConfig (download) a USB stick, which is able to send and receive EnOcean telegrams, is necessary. The EnOcean USB stick (incl. license) is included in airScan (item No. 566704 for 868 MHz), communication with up to 15 SmartACK devices, magnetic antenna plate for the external antenna recommended to improve radio coverage (see accessories)

### Gateway EnOcean <-> BUS

Item description	Item No.	In stock	Group	€
STC65+ RS485 EVC	657396	⊖	E2	290,90

### Accessories

Item description	Item No.	Group	€
Antenna extension 10 m	257206	A1	67,70
Antenna extension 20 m	257213	A1	82,40
L-shaped magnetic antenna holder, 180x180 mm	255097	A1	17,50
Mounting base enclosure USE-M pure white	668354	A1	9,60
Mounting kit universal for enclosure USE	698511	A1	10,70



## STC-BACnet IP

The STC-BACnet IP gateway is designed for bidirectional communication between EasySens® devices and building management systems with a BACnet IP interface. Configuration can be easily performed with the EasySens® airConfig software tool. Details of the communication protocol are described in the software documentation accordingly. The delivery content includes an external antenna for achieving best transmission ranges.



Technical Data	
Configuration	airConfig, BUS
Network technology	BACnet IP
Radio technology	EnOcean (IEC 14543-3-10) 868 MHz, 902 MHz
Data transmission	bidirectional, transmitting/receiving channels: ∞ (Rx) + 128 (Tx)
Power supply	24 V = (±10%) SELV, 24 V ~ (±10%) SELV
Power consumption	typ. 3 W (24 V =), 5 VA (24 V ~)
Enclosure	ABS
Colour	light grey
Operating range temperature	0..+50 °C
Protection (IP)	IP20, according to EN 60529
Connection	terminal block, max. 1,5 mm <sup>2</sup>
Mounting	prepared for mounting on DIN rail TS35 (35x7,5 mm) according to EN 60715
Delivery content	incl. external receiving/transmitting antenna (2,5 m) with magnetic base
Notes	to use the free software airConfig (download) a USB stick, which is able to send and receive EnOcean telegrams, is necessary. The EnOcean USB stick (incl. license) is included in airScan (item No. 566704 for 868 MHz) for network connection use a shielded standard Ethernet cable CAT 5 magnetic antenna plate for the external antenna recommended to improve radio coverage (see accessories)

Gateway EnOcean <-> BUS				
Item description	Item No.	In stock	Group	€
STC-BACnet IP V4 + microSD Card	817509		E1	612,40
STC-BACnet IP V4	804462	⊖	E1	552,00

Accessories			
Item description	Item No.	Group	€
Antenna extension 10 m	257206	A1	67,70
Antenna extension 20 m	257213	A1	82,40
L-shaped magnetic antenna holder, 180x180 mm	255097	A1	17,50
EnOcean USB transceiver for airConfig/airScan (incl. airScan license)	566704		113,90



## SRC65-BACnet MS/TP

The unidirectional SRC65-BACnet MS/TP gateway allows the reception of information from EasySens® sensors, switches, room units and other transmitters. Details of the communication protocol are described in the software documentation accordingly. The delivery content includes an external antenna for achieving best transmission ranges.



### Technical Data

<b>Configuration</b>	BUS, jumper, DIP switches
<b>Network technology</b>	RS485 BACnet (MS/TP)
<b>Radio technology</b>	EnOcean (IEC 14543-3-10) 868 MHz, 902 MHz
<b>Data transmission</b>	unidirectional, receiving channels: 32 (Rx)
<b>Power supply</b>	15..24 V = (±10%) SELV, 24 V ~ (±10%) SELV
<b>Power consumption</b>	typ. 1 W (24 V =), 1,3 VA (24 V ~)
<b>Enclosure</b>	PA6.6, with quick lock screws
<b>Colour</b>	pure white, transparent cover PC
<b>Operating range temperature</b>	-20..+60 °C
<b>Protection (IP)</b>	IP42, according to EN 60529
<b>Connection</b>	terminal block, max. 1,5 mm <sup>2</sup>
<b>Delivery content</b>	incl. external receiving/transmitting antenna (2,5 m) with magnetic base
<b>Notes</b>	magnetic antenna plate for the external antenna recommended to improve radio coverage (see accessories)

### Gateway EnOcean -> BUS

Item description	Item No.	Group	€
SRC65-BACnet MS/TP	396431	E1	316,10

### Accessories

Item description	Item No.	Group	€
Antenna extension 10 m	257206	A1	67,70
Antenna extension 20 m	257213	A1	82,40
L-shaped magnetic antenna holder, 180x180 mm	255097	A1	17,50



## STC-IoT

The STC-EnOcean IP gateway allows for an easy integration of EasySens® sensors and actuators into the Internet of Things (IoT). The new EnOcean-over-IP gateway communicates JSON streams or RestAPI command lines. The seamless commissioning and configuration can be done through any browser interface. The graphical dataflow-oriented processing of the EnOcean information can be performed by the integrated free Node-RED editor (<https://nodered.org/>) and enables simple, rule-based processing of information. It can further be used to send push notifications via SMS/e-Mail, if values exceed thresholds (additional required hardware not included). EasySens® devices can be integrated very easily into cloud-based applications. Compatible with IP-based controllers and display systems.



Technical Data	
Configuration	web interface
Network technology	TCP/IP
Radio technology	EnOcean (IEC 14543-3-10) 868 MHz, 902 MHz
Data transmission	unidirectional, receiving channels: ∞ (Rx)
Power supply	15..24 V = (±10%) SELV, 24 V ~ (±10%) SELV
Power consumption	typ. 3 W (24 V =), 5 VA (24 V ~)
Enclosure	ABS
Colour	light grey
Operating range temperature	0..+50 °C
Protection (IP)	IP20, according to EN 60529
Connection	removable plug-in terminal, max. 2,5 mm <sup>2</sup>
Mounting	prepared for mounting on DIN rail TS35 (35x7,5 mm) according to EN 60715
Delivery content	incl. external receiving/transmitting antenna (2,5 m) with magnetic base
Notes	magnetic antenna plate for the external antenna recommended to improve radio coverage (see accessories) local documentation via web browser interface

### Gateway EnOcean -> BUS

Item description	Item No.	Group	€
STC-IoT	669320	E1	474,80

### Accessories

Item description	Item No.	Group	€
Antenna extension 10 m	257206	A1	67,70
Antenna extension 20 m	257213	A1	82,40
L-shaped magnetic antenna holder, 180x180 mm	255097	A1	17,50



## STC-KNX

Bidirectional gateway for connecting up to 32 EasySens® sensors or wireless switches to a KNX network. The device offers additional logical control blocks, which can be configured for: switching and dimming lights, blinds up/down, presence, set point adjustment, fan stages, humidity sensor, window contact/handle, binary input, light and motion.



### Technical Data

<b>Configuration</b>	BUS, ETS (KNX)
<b>Network technology</b>	KNX (TP1)
<b>Radio technology</b>	EnOcean (IEC 14543-3-10) 868 MHz, 902 MHz
<b>Data transmission</b>	bidirectional, transmitting/receiving channels: 32 (Rx) + 32 (Tx)
<b>Power supply</b>	supply via BUS: 29 V = SELV
<b>Power consumption</b>	max. 12 mA
<b>Display</b>	graphic display monochrome (internal)
<b>Enclosure</b>	PC
<b>Colour</b>	white
<b>Operating range temperature</b>	-5..+45 °C
<b>Protection (IP)</b>	IP20, according to EN 60529
<b>Connection</b>	removable plug-in terminal, max. Ø=0,8 mm cable entry via rear opening
<b>Mounting</b>	flush-mounted on standard EU box (Ø=60 mm)
<b>Notes</b>	product database (freeware via download)

### Gateway EnOcean <-> BUS

Item description	Item No.	In stock	Group	€
STC-KNX	698948	●	E1	445,20



## SRE-Repeater

The SRE-Repeater is used for repeating radio telegrams between EnOcean transmitters and receivers/gateways. The repeater is typically used when transmission range problems occur between transmitter and receiver in an existing installation (e.g. due to walls being pulled in, furniture/cabinets being moved). Level 1, Level 2 and Smart Repeating (rule-based filters) can be set using the free airConfig software. Ideal for installation in suspended ceilings.



Technical Data	
Configuration	airConfig
Radio technology	EnOcean (IEC 14543-3-10) 868 MHz, 902 MHz
Power supply	flex. 15..240 V =/~
Power consumption	typ. 1 VA (15..240 V =/~)
Enclosure	PA6.6, with quick lock screws
Colour	pure white, transparent cover PC
Operating range temperature	-20..+60 °C
Protection (IP)	IP65, according to EN 60529
Connection	terminal block, max. 1,5 mm <sup>2</sup>
Delivery content	incl. external receiving/transmitting antenna (2,5 m) with magnetic base
Notes	to use the free software airConfig (download) a USB stick, which is able to send and receive EnOcean telegrams, is necessary. The EnOcean USB stick (incl. license) is included in airScan (item No. 566704 for 868 MHz) magnetic antenna plate for the external antenna recommended to improve radio coverage (see accessories)

Wireless repeater				
Item description	Item No.	In stock	Group	€
SRE-Repeater MultiLevel internal antenna	593809	●	E2	160,80
SRE-Repeater MultiLevel external antenna	593830	●	E2	184,40

Accessories			
Item description	Item No.	Group	€
EnOcean USB transceiver for airConfig/airScan (incl. airScan license)	566704		113,90

**SRG02**

Battery- and wireless window handle for status monitoring of windows (lock option available) with radio interface. When actuated, the handle transmits a radio signal with the handle position to a receiving actuator or gateway. The window handle is used to optimize energy consumption in the building, as heating/cooling or ventilation gets deactivated when windows are open. Equipped with a variable length square spindle for profile depths of 32..42 mm for most common window frames.



aluminium pure white

aluminium steel grey

stainless steel

**Technical Data**

<b>Radio technology</b>	EnOcean (IEC 14543-3-10) 868 MHz
<b>Power supply</b>	maintenance-free electrodynamic energy generator
<b>Enclosure</b>	aluminium (locking cylinder optional), stainless steel
<b>Colour</b>	pure white painted, steel grey painted
<b>Operating range temperature</b>	+5..+40 °C
<b>Mounting</b>	square spindle, variable lengths (for tread depth 32..42 mm)
<b>Notes</b>	lateral detent with precise detent position

**Wireless window handle**

Item description	Item No.	Group	€
SRG02 aluminium pure white	730747	E1	164,30
SRG02 aluminium steel grey	730730	E1	164,30
SRG02 stainless steel	730723	E1	275,70
SRG02 lockable aluminium pure white	730716	E1	235,70
SRG02 lockable aluminium steel grey	730709	E1	235,70

## SRW03

Energy-harvesting wireless window contact for the status monitoring of windows and doors. Ideal for retrofitting applications in hotel rooms or office spaces to increase energy savings.



SRW03 / SRW03 BAT



SRW03 Dual BAT



Technical Data	
Sensor	reed contact and magnet
Radio technology	EnOcean (IEC 14543-3-10) 868 MHz, 902 MHz
Power supply	<b>SRW03 BAT:</b> solar cell, maintenance-free internal super cap, coin cell CR1225 <b>SRW03 Dual BAT:</b> battery type AAA
Enclosure	PC V0
Colour	pure white, anthracite
Operating range temperature	-20..+60 °C
Protection (IP)	IP20, according to EN 60529
Mounting	surface-mounted flat on base using included adhesive pad or screws
Delivery content	incl. adhesive foil for mounting <b>SRW03 BAT:</b> incl. coin cell type CR1225 <b>SRW03 Dual BAT:</b> incl. battery type AAA
Notes	<b>SRW03 Dual BAT:</b> for 1 or 2-leaf windows

Wireless window/door contact			
Item description	Item No.	Group	€
SRW03 BAT white	793728	E1	87,50
SRW03 BAT anthracite	793735	E1	94,00
SRW03 Dual BAT white	778558	E1	90,60
SRW03 Dual BAT anthracite	778565	E1	97,10

Accessories			
Item description	Item No.	Group	€
<b>SRW03 BAT:</b> Coin cell CR1225	727310	A1	5,00
<b>SRW03 Dual BAT:</b> Battery AAA 1,5 V Alkaline VARTA 4003	739351	A1	5,00

## Hand-helds

The EasySens® hand-held switch works as a remote control for EasySens® receiving actuators or gateways, which can integrate the wireless signals into an existing network and application.



### Technical Data

<b>Operating elements</b>	4 buttons
<b>Radio technology</b>	EnOcean (IEC 14543-3-10) 868 MHz, 902 MHz
<b>Power supply</b>	maintenance-free electrodynamic energy generator
<b>Operating range temperature</b>	-25..+65 °C
<b>Notes</b>	actuation force 7 N, actuation range 2 mm, operating cycle quantity > 50.000

### Hand-held

Item description	Item No.	Group	€
Hand-held switch 4-channel	314602	E1	118,80

## Wireless Switches Mini

Energy-harvesting wireless switch for adjusting the (dimming) status of lights and blinds. The EasySens® radio technology offers flexible attachment to glass and plasterboard walls using the adhesive pad or screws.



4-channel blinds, pure white brilliant



2-channel blinds, anthracite



### Technical Data

<b>Operating functions</b>	light ON/OFF blind UP/DOWN
<b>Operating elements</b>	<b>2-channel:</b> 1 switch <b>4-channel:</b> 2 switches
<b>Radio technology</b>	EnOcean (IEC 14543-3-10) 868 MHz, 902 MHz
<b>Power supply</b>	maintenance-free electrodynamic energy generator
<b>Enclosure</b>	PC
<b>Colour</b>	pure white brilliant, anthracite
<b>Operating range temperature</b>	-25..+65 °C
<b>Switch ranges</b>	Thermokon mini
<b>Mounting</b>	surface-mounted flat on base using adhesive foil or screws
<b>Delivery content</b>	incl. adhesive foil for mounting
<b>Notes</b>	price including frame actuation force 7 N, actuation range 2 mm, operating cycle quantity > 50.000

**Wireless switch 2-channel light**

Item description	Item No.	Group	€
Switch Mini 2-channel light pure white brilliant	430647	E2	77,90
Switch Mini 2-channel light anthracite	430623	E2	77,90

**Wireless switch 4-channel light**

Item description	Item No.	Group	€
Switch Mini 4-channel light pure white brilliant	430838	E2	80,50
Switch Mini 4-channel light anthracite	430814	E2	80,50

**Wireless switch 2-channel blind**

Item description	Item No.	Group	€
Switch Mini 2-channel blind pure white brilliant	430630	E2	77,90
Switch Mini 2-channel blind anthracite	430302	E2	77,90

**Wireless switch 4-channel blind**

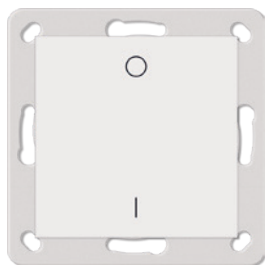
Item description	Item No.	Group	€
Switch Mini 4-channel blind pure white brilliant	430821	E2	80,50
Switch Mini 4-channel blind anthracite	430807	E2	80,50

**Options**

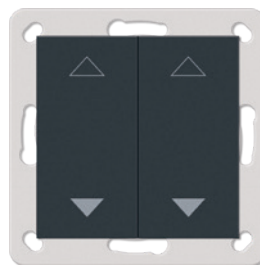
Description	€
Special printing	on request

## Wireless Switches 55x55

Energy-harvesting wireless switch for adjusting the (dimming) status of lights and blinds. The EasySens® radio technology offers flexible attachment to glass and plasterboard walls using the adhesive pad or screws.



2-channel light pure white



4-channel blinds anthracite



### Technical Data

<b>Operating functions</b>	light ON/OFF blind UP/DOWN
<b>Operating elements</b>	<b>2-channel:</b> 1 switch <b>4-channel:</b> 2 switches
<b>Radio technology</b>	EnOcean (IEC 14543-3-10) 868 MHz
<b>Power supply</b>	maintenance-free electrodynamic energy generator
<b>Enclosure</b>	PC
<b>Colour</b>	pure white brilliant, pure white matt, anthracite
<b>Operating range temperature</b>	-25..+65 °C
<b>Switch ranges</b>	Berker, Busch-Jaeger, Gira, Jung, Merten, Peha (please specify the desired frame when ordering)
<b>Mounting</b>	surface-mounted flat on base using adhesive foil or screws
<b>Delivery content</b>	incl. adhesive foil for mounting
<b>Notes</b>	actuation force 7 N, actuation range 2 mm, operating cycle quantity > 50.000

**Wireless switch 2-channel light**

Item description	Item No.	Group	€
Switch 2-channel light 55x55 pure white matt	839440	E1	84,50
Switch 2-channel light 55x55 pure white brilliant	839457	E1	84,50
Switch 2-channel light 55x55 anthracite	839471	E1	84,50

**Wireless switch 4-channel light**

Item description	Item No.	Group	€
Switch 4-channel light 55x55 pure white matt	839488	E1	87,10
Switch 4-channel light 55x55 pure white brilliant	839495	E1	87,10
Switch 4-channel light 55x55 anthracite	839525	E1	87,10

**Wireless switch 2-channel blind**

Item description	Item No.	Group	€
Switch 2-channel blind 55x55 pure white matt	839532	E1	84,50
Switch 2-channel blind 55x55 pure white brilliant	839549	E1	84,50
Switch 2-channel blind 55x55 anthracite	839570	E1	84,50

**Wireless switch 4-channel blind**

Item description	Item No.	Group	€
Switch 4-channel blind 55x55 pure white matt	839587	E1	87,10
Switch 4-channel blind 55x55 pure white brilliant	839594	E1	87,10
Switch 4-channel blind 55x55 anthracite	839617	E1	87,10

**Options**

Description	€
Special printing	on request
Switch ranges (various manufacturers)	Page 256

## Wireless Switches BJ 63x63

Energy-harvesting wireless switch for adjusting the (dimming) status of lights and blinds, especially for Busch-Jaeger (63x63mm) designs. The radio technology offers flexible attachment to glass and plasterboard walls using the adhesive pad or screws.



4-channel blinds,  
future® linear studio white



2-channel blinds,  
future® linear anthracite



### Technical Data

<b>Operating functions</b>	light ON/OFF blind UP/DOWN
<b>Operating elements</b>	<b>2-channel:</b> 1 switch <b>4-channel:</b> 2 switches
<b>Radio technology</b>	EnOcean (IEC 14543-3-10) 868 MHz
<b>Power supply</b>	maintenance-free electrodynamic energy generator
<b>Enclosure</b>	PC
<b>Colour</b>	studio white, ivory white, anthracite
<b>Operating range temperature</b>	-25..+65 °C
<b>Switch range Busch-Jaeger</b>	future® linear, solo®, Busch-axcent® (please specify the desired frame when ordering)
<b>Mounting</b>	surface-mounted flat on base using adhesive foil or screws
<b>Delivery content</b>	incl. adhesive foil for mounting
<b>Notes</b>	actuation force 7 N, actuation range 2 mm, operating cycle quantity > 50.000, frame designs Busch-Jaeger solo®, future® linear and Busch-axcent® at the same price, please ask for carat® Busch-balance® SI see Wireless Switches 55x55

**Wireless switch 2-channel light**

Item description	Item No.	Group	€
Switch 2-channel light BJ63x63 studio white	730532	E1	87,10
Switch 2-channel light BJ63x63 ivory white	730570	E1	87,10
Switch 2-channel light BJ63x63 anthracite	730754	E1	87,10

**Wireless switch 4-channel light**

Item description	Item No.	Group	€
Switch 4-channel light BJ63x63 studio white	730549	E1	89,90
Switch 4-channel light BJ63x63 ivory white	730587	E1	89,90
Switch 4-channel light BJ63x63 anthracite	730761	E1	89,90

**Wireless switch 2-channel blind**

Item description	Item No.	Group	€
Switch 2-channel blind BJ63x63 studio white	730556	E1	87,10
Switch 2-channel blind BJ63x63 ivory white	730594	E1	87,10
Switch 2-channel blind BJ63x63 anthracite	730778	E1	87,10

**Wireless switch 4-channel blind**

Item description	Item No.	Group	€
Switch 4-channel blind BJ63x63 studio white	730563	E1	89,90
Switch 4-channel blind BJ63x63 ivory white	730600	E1	89,90
Switch 4-channel blind BJ63x63 anthracite	730785	E1	89,90

**Options**

Description	€
Special printing	on request
Switch ranges Busch-Jaeger future® linear   solo®   Busch-axcent®	6,00

## Wireless Switches Jung LS 990

Energy-harvesting wireless switch for adjusting the (dimming) status of lights and blinds, especially for JUNG designs. The radio technology offers flexible attachment to glass and plasterboard walls using the adhesive pad or screws.



2-channel light,  
LS 990 light grey



4-channel light,  
LS 990 alpin white



4-channel blinds,  
LS 990 white



### Technical Data

<b>Operating functions</b>	light ON/OFF blind UP/DOWN
<b>Operating elements</b>	<b>2-channel:</b> 1 switch <b>4-channel:</b> 2 switches
<b>Radio technology</b>	EnOcean (IEC 14543-3-10) 868 MHz
<b>Power supply</b>	maintenance-free electrodynamic energy generator
<b>Enclosure</b>	PC
<b>Colour</b>	white, light grey, alpin white
<b>Operating range temperature</b>	-25..+65 °C
<b>Switch range Jung</b>	LS 990
<b>Delivery content</b>	incl. adhesive foil for mounting
<b>Notes</b>	price including frame actuation force 7 N, actuation range 2 mm, operating cycle quantity > 50.000

**Wireless switch 2-channel light**

Item description	Item No.	Group	€
Switch 2-channel light Jung LS 990 white	435390	E1	131,00
Switch 2-channel light Jung LS 990 alpin white	435376	E1	131,00
Switch 2-channel light Jung LS 990 light grey	435413	E1	131,00

**Wireless switch 4-channel light**

Item description	Item No.	Group	€
Switch 4-channel light Jung LS 990 white	435475	E1	135,80
Switch 4-channel light Jung LS 990 alpin white	435451	E1	135,80
Switch 4-channel light Jung LS 990 light grey	435499	E1	135,80

**Wireless switch 2-channel blind**

Item description	Item No.	Group	€
Switch 2-channel blind Jung LS 990 white	435406	E1	131,00
Switch 2-channel blind Jung LS 990 alpin white	435383	E1	131,00
Switch 2-channel blind Jung LS 990 light grey	435420	E1	131,00

**Wireless switch 4-channel blind**

Item description	Item No.	Group	€
Switch 4-channel blind Jung LS 990 white	435482	E1	135,80
Switch 4-channel blind Jung LS 990 alpin white	435468	E1	135,80
Switch 4-channel blind Jung LS 990 light grey	435505	E1	135,80

**Options**

Description	€
Special printing	on request

## SAB+

Self-powered wireless EasySens® valve actuator for individual room temperature control. The new electronic heating valve actuator uses the temperature difference between the radiator and ambient room temperature to generate electrical energy by means of a thermo-electric generator. Sufficient energy can be stored in the integrated high-performance capacitor to ensure reliable operation even during periods of insufficient energy management (summer months, transition period between seasons). Adapters are available for numerous valve manufacturers.



### Technical Data

Measured values	temperature
Configuration	airConfig
Sensor	integrated digital temperature transmitter
Radio technology	EnOcean (IEC 14543-3-10) 868 MHz
Power supply	maintenance-free thermal energy harvesting, maintenance-free LiPo-battery
Display	LED for status feedback, red
Enclosure	PC
Colour	pure white, aluminium
Operating range temperature	0..+50 °C
Protection (IP)	IP40, according to EN 60529
Connection	USB micro (power supply)
Mounting	screw mounting M30x1,5

### Notes

to use the free software airConfig (download) a USB stick, which is able to send and receive EnOcean telegrams, is necessary. The EnOcean USB stick (incl. license) is included in airScan (item No. 566704 for 868 MHz) operating noise <35 dB(A), nominal stroke 3,8 mm, automatically adjusting, regulation time 0,24 mm/s, pulling load >100 N the Micro-USB connection allows charging of the internal battery directly at the socket using a USB power supply

**Radio valve actuator**

Item description	Contr.	Item No.	Group	€
SAB+	✓	669108	E2	214,90

**Accessories**

Item description	Item No.	Group	€
EnOcean USB transceiver for airConfig/airScan (incl. airScan license)	566704		113,90
Safety lock dismounting protection SAB	706148	A1	12,70

**Accessories**

Item description	Item No.	Group	€
Valve adapter SAB for Giacomini Z810 (22,6 mm)	634724	A1	29,20
Valve adapter SAB for Oventrop Z809 (M30x1,0)	611978	A1	29,20
Valve adapter SAB for Herz Z807 (M28 X 1,5 mm)	595070	A1	29,20
Valve adapter SAB for Danfoss RA2000 Z802	589093	A1	29,20
Valve adapter SAB for Danfoss RAV Z803	589109	A1	29,20
Valve adapter SAB for Danfoss RAV-L Z804	589116	A1	29,20
Valve adapter SAB for Danfoss Z800	589079	A1	29,20
Valve adapter SAB for Danfoss Z801	589086	A1	29,20
Valve adapter SAB for Vaillant Z805	615181	A1	29,20

## SAB05

Battery-powered wireless EasySens® valve actuator for individual room temperature control. The SAB05 is compatible with the STC-MSG server (for stand-alone solutions) or EasySens® gateways to integrate into BUS networks. Parameterisation can be done through airConfig software. The SAB05 is completely wireless and powered by 3x AA batteries. Adapters are available for numerous valve manufacturers.



### Technical Data

Measured values	temperature
Configuration	airConfig
Sensor	integrated digital temperature transmitter
Radio technology	EnOcean (IEC 14543-3-10) 868 MHz
Power supply	battery type AA (3x)
Display	LED for status feedback, multicoloured
Enclosure	PC, latching battery compartment lid
Colour	pure white, light grey
Operating range temperature	0..+50 °C
Protection (IP)	IP40, according to EN 60529
Mounting	screw mounting M30x1,5
Delivery content	incl. battery type AA (3x)

### Notes

to use the free software airConfig (download) a USB stick, which is able to send and receive EnOcean telegrams, is necessary. The EnOcean USB stick (incl. license) is included in airScan (item No. 566704 for 868 MHz)  
 operating noise <35 dB(A), nominal stroke 3,8 mm, automatically adjusting, regulation time 0,24 mm/s, pulling load >100 N

**Radio valve actuator**

Item description	Contr.	Item No.	Group	€
SAB05	✓	513753	E2	172,30

**Accessories**

Item description	Item No.	Group	€
EnOcean USB transceiver for airConfig/airScan (incl. airScan license)	566704		113,90
Safety lock dismounting protection SAB	706148	A1	12,70

**Accessories**

Item description	Item No.	Group	€
Valve adapter SAB for Giacomini Z810 (22,6 mm)	634724	A1	29,20
Valve adapter SAB for Oventrop Z809 (M30x1,0)	611978	A1	29,20
Valve adapter SAB for Herz Z807 (M28 X 1,5 mm)	595070	A1	29,20
Valve adapter SAB for Danfoss RA2000 Z802	589093	A1	29,20
Valve adapter SAB for Danfoss RAV Z803	589109	A1	29,20
Valve adapter SAB for Danfoss RAV-L Z804	589116	A1	29,20
Valve adapter SAB for Danfoss Z800	589079	A1	29,20
Valve adapter SAB for Danfoss Z801	589086	A1	29,20
Valve adapter SAB for Vaillant Z805	615181	A1	29,20
Valve adapter SAB05/07 for Danfoss RA-02	836333	A1	9,20
Valve adapter SAB05/07 for Danfoss RAV-02	836326	A1	9,20
Valve adapter SAB05/07 for Danfoss RAVL-02	836319	A1	9,20
Valve adapter SAB05/07 for Herz (M28 X 1,5 mm)	836302	A1	9,20

## STC-DO

Bidirectional flush-mounted receiving actuator for EasySens® devices with one relay output. Functions/applications can be individually configured via airConfig software for e.g. heating with PWM, heating ON/OFF, signal contact, status feedback, hygrostat control, heating/cooling with PWM, light ON/OFF or fan speed control. The STC-DO is a universal relay actuator that can be configured through airConfig depending on the application.



### Technical Data

<b>Configuration</b>	airConfig
<b>Radio technology</b>	EnOcean (IEC 14543-3-10) 868 MHz
<b>Power supply</b>	15..24 V = (±10%) SELV, 24 V ~ (±10%) SELV, 100..240 V ~
<b>Power consumption</b>	typ. 1,5 W (24 V =), 3,4 VA (24 V ~), typ. 0,5 VA (230 V ~)
<b>Enclosure</b>	ABS
<b>Operating range temperature</b>	-20..+60 °C
<b>Protection (IP)</b>	IP20, according to EN 60529
<b>Connection</b>	terminal block, max. 1,5 mm <sup>2</sup>
<b>Mounting</b>	flush-mounted in standard EU box (Ø=60 mm, depth min. 45 mm)

### Radio multi-function actuator

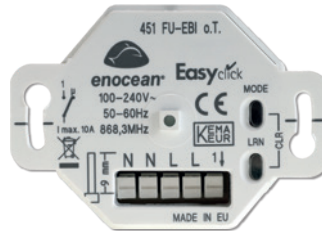
Item description	Contr.	Item No.	In stock	Group	€
STC-DO airConfig 24 V	✓	593731	⊖	E2	168,00
STC-DO airConfig 100..240 V	✓	593748		E2	168,00

### Accessories

Item description	Item No.	Group	€
EnOcean USB transceiver for airConfig/airScan (incl. airScan license)	566704		113,90

## STC-DO Light

Bidirectional flush-mounted receiving actuator using EnOcean switch telegrams for lighting applications (e.g. light on/off, staircase function, twilight switch, etc.). The functions can be parameterised via a programming button.



### Technical Data

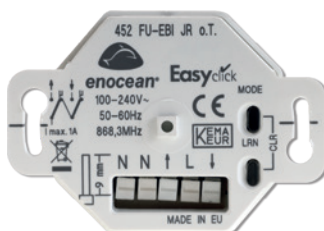
<b>Configuration</b>	buttons
<b>Radio technology</b>	EnOcean (IEC 14543-3-10) 868 MHz
<b>Power supply</b>	100..240 V ~
<b>Power consumption</b>	max. 0,5 mW (standby)
<b>Enclosure</b>	ABS
<b>Operating range temperature</b>	-20..+40 °C
<b>Protection (IP)</b>	IP20, according to EN 60529
<b>Connection</b>	terminal block, max. 1,5 mm <sup>2</sup>
<b>Mounting</b>	flush-mounted in standard EU box (Ø=60 mm, depth min. 45 mm)

### Radio lighting actuator

Item description	Contr.	Item No.	Group	€
STC-DO Light 230 V	✓	2000040	E2	175,60

## STC-DO Blind

Bidirectional flush-mounted receiving actuator for blind applications compatible with EasySens® wireless switches and room operating units. The functions can be parameterised via programming button.



### Technical Data

<b>Configuration</b>	buttons
<b>Radio technology</b>	EnOcean (IEC 14543-3-10) 868 MHz
<b>Power supply</b>	100..240 V ~
<b>Power consumption</b>	max. 0,5 mW (standby)
<b>Enclosure</b>	ABS
<b>Operating range temperature</b>	-20..+40 °C
<b>Protection (IP)</b>	IP20, according to EN 60529
<b>Connection</b>	terminal block, max. 1,5 mm <sup>2</sup>
<b>Mounting</b>	flush-mounted in standard EU box (Ø=60 mm, depth min. 45 mm)

### Radio shading actuator

Item description	Contr.	Item No.	Group	€
STC-DO Blind 230 V	✓	2000030	E2	175,60

## SRC-AO Multi

Unidirectional flush-mounted receiving actuator with two proportional 0..10 V outputs for converting EasySens® wireless sensors such as temperature, temperature setpoint, humidity, etc. into 0..10 V signals.



### Technical Data

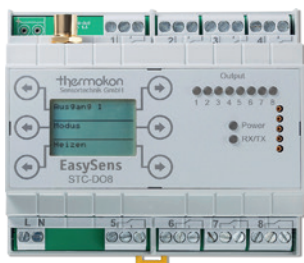
<b>Configuration</b>	buttons
<b>Radio technology</b>	EnOcean (IEC 14543-3-10) 868 MHz, 902 MHz
<b>Power supply</b>	15..24 V = ( $\pm 10\%$ ) SELV, 24 V ~ ( $\pm 10\%$ ) SELV
<b>Power consumption</b>	typ. 1 W (24 V =), 1,5 VA (24 V ~)
<b>Enclosure</b>	ABS
<b>Operating range temperature</b>	-20..+60 °C
<b>Protection (IP)</b>	IP20, according to EN 60529
<b>Connection</b>	terminal block, max. 1,5 mm <sup>2</sup>
<b>Mounting</b>	flush-mounted in standard EU box ( $\varnothing=60$ mm, depth min. 45 mm)
<b>Notes</b>	per channel 1 transmitter can be learned in

### Radio multi-function actuator

Item description	Contr.	Item No.	Group	€
SRC-AO Multi V	✓	508315	E2	168,00
SRC-AO Multi VV	✓	508322	E2	196,20

## STC-D08

Bidirectional receiving actuator for (DIN) rail mounting with 8 relay outputs (expandable up to 12 relay outputs using the ,STC-PLUS 4DO' expansion module) for the evaluation of EnOcean sensors, switches and room operating units. Suitable for heating/cooling control, fan coil control, light switching, shutter and blind control. The delivery content includes an external antenna for achieving best possible transmission range.



### Technical Data

Configuration	buttons
Radio technology	EnOcean (IEC 14543-3-10) 868 MHz
Power supply	18..24 V = SELV, 24 V ~ (±10%) SELV 100..240 V ~
Power consumption	typ. 2 W (24 V =), 3,5 VA (24 V ~) 3,5 VA
Display	LCD 37,5x31,6 mm
Enclosure	ABS
Colour	light grey
Operating range temperature	0..+60 °C
Protection (IP)	IP20, according to EN 60529
Connection	terminal block, max. 1,5 mm <sup>2</sup>
Mounting	prepared for mounting on DIN rail TS35 (35x7,5 mm) according to EN 60715
Delivery content	incl. external receiving/transmitting antenna (2,5 m) with magnetic base
Notes	magnetic antenna plate for the external antenna recommended to improve radio coverage (see accessories) for inductive and/or capacitive loads, a suitable protective circuit must be provided (varistor, RC element, inrush current limitation, ...)

**Radio multi-relay actuator 100..240 V**

Item description	Item No.	Group	€
STC-DO8 100..240 V type1 heating/cooling	490030	E2	389,70
STC-DO8 100..240 V type2 fancoil, heating/cooling	490047	E2	389,70
STC-DO8 100..240 V type3 switch actuator	490054	E2	389,70

**Radio multi-relay actuator 24 V**

Item description	Item No.	Group	€
STC-DO8 24 V type1 heating/cooling	564458	E2	389,70
STC-DO8 24 V type2 fancoil, heating/cooling	631495	E2	389,70
STC-DO8 24 V type3 switch actuator	561273	E2	389,70

**Extension module**

Item description	Item No.	Group	€
STC-PLUS 4DO	517690	E2	174,90

**Accessories**

Item description	Item No.	Group	€
Antenna extension 10 m	257206	A1	67,70
Antenna extension 20 m	257213	A1	82,40
L-shaped magnetic antenna holder, 180x180 mm	255097	A1	17,50



## SR65-DI

The SR65 DI is a wireless transmitter for the binary status of relay inputs. The status of the digital input is transmitted through radio to corresponding remote controllers in the EnOcean network or can be transferred through a gateway to any BUS network. It is often used as a push signal for night-time temperature reduction of heating controllers or ECO/comfort switching.



Technical Data	
<b>Configuration</b>	airConfig
<b>Input</b>	1x input for floating contact, contact resistance max. 1000 Ω
<b>Radio technology</b>	EnOcean (IEC 14543-3-10) 868 MHz, 902 MHz
<b>Power supply</b>	solar cell, maintenance-free internal super cap, battery LS14250 (3,6 V)
<b>Enclosure</b>	PA6.6, with quick lock screws
<b>Colour</b>	pure white, transparent cover
<b>Operating range temperature</b>	-25..+65 °C
<b>Protection (IP)</b>	IP65, according to EN 60529
<b>Connection</b>	cable entry M16 for wire Ø=8 mm, terminal block, max. 1,5 mm <sup>2</sup>
<b>Delivery content</b>	incl. battery LS14250 (3,6 V)
<b>Notes</b>	to use the free software airConfig (download) a USB stick, which is able to send and receive EnOcean telegrams, is necessary. The EnOcean USB stick (incl. license) is included in airScan (item No. 566704 for 868 MHz) (refer to accessories)

Wireless binary module			
Item description	Item No.	Group	€
SR65-DI	267731	E2	163,60

Accessories			
Item description	Item No.	Group	€
Battery 1/2AA 3.6V Lithium LS14250	315098	A1	5,00
EnOcean USB transceiver for airConfig/airScan (incl. airScan license)	566704		113,90

# LoRaWAN®



LoRaWAN® is a radio technology that is capable of transmitting data over a long distance and even from remote and hard-to-reach locations in an energy-efficient, cost-effective and secure manner. Due to the low energy consumption, the batteries of the sensors are extremely durable and can last for several years.



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## NOVOS 3 x LRW

Room operating unit with LoRaWAN® interface in NOVOS 3 design with temperature, humidity and CO2 sensor (depending on variant) as well as various control elements, e.g. for transmitting a setpoint. Different housing colors allow the room operating unit to be adapted to design-oriented interiors such as hotels, schools or office buildings.



NOVOS 3 P LRW



NOVOS 3 T LRW



NOVOS 3 PT LRW



NOVOS 3 P Occ LRW



### Technical Data

Measured values	temperature, relative humidity, CO2, motion
Operating functions	setpoint adjustment temperature, presence detection
Operating elements	potentiometer (P), button (T)
Configuration	App, uConfig, LoRaWAN® Downlink
Radio technology	LoRaWAN® (868 MHz)
Measuring range humidity	0..100% rH non-condensing
Measuring range CO2	0..5000 ppm
Detection range (Occ)	detection range, angle 110°/110°, 32 detection zones – at a distance of 2,5 m the detection area will be about 5x5 m max. range 5 m
Power supply	battery type AA (1x)
Enclosure	PC V0
Colour	pure white, black
Operating range temperature	-35..+70 °C
Protection (IP)	IP20, according to EN 60529
Mounting	flush-mounted on standard EU box (Ø=60 mm), surface-mounted flat on base using adhesive foil or screws
Delivery content	incl. adhesive foil for mounting

Wireless room operating unit humidity + temperature – LoRaWAN® (868 MHz)				
Item description	App	Item No.	Group	€
NOVOS 3 P white Temp_rH LRW	✓	811217	W1	94,80
NOVOS 3 T white CO2 Temp_rH LRW	✓	824255	W1	202,80
NOVOS 3 PT white CO2 Temp_rH LRW	✓	824248	W1	210,00
NOVOS 3 P white Occ Temp_rH LRW	✓	850790	W1	188,40

Options	
Description	€
Enclosure in black	13,00

Accessories			
Item description	Item No.	Group	€
Battery AA 3.6 V lithium ER14505	759182	A1	8,40
Battery AA 1,5 V lithium L91	819640	A1	8,10
Battery AA 1,5 V Alkaline VARTA 4906	459099	A1	5,00
Fixing kit rawlplugs and screws (2x each)	660945	A1	1,10
Frame for surface mounting NOVOS 3 white	795050	A1	15,30
Frame for surface mounting NOVOS 3 black	795074	A1	55,30
Adhesive foil for NOVOS 3 SR with inner cut-outs	773386	A1	2,40

## NOVOS 3 INC LRW

Room operating unit with LoRaWAN® interface in NOVOS 3 design with temperature, humidity and CO2 sensor (depending on variant) as well as various control elements, e.g. for transmitting a setpoint. Different housing colors allow the room operating unit to be adapted to design-oriented interiors such as hotels, schools or office buildings.



NOVOS 3 INC LRW



NOVOS 3 INC T LRW



Technical Data	
Measured values	temperature, relative humidity, CO2
Operating functions	setpoint adjustment temperature T: presence detection
Operating elements	rotary encoder/push button for setpoint adjustment/ECO function T: button (T)
Configuration	App, uConfig, LoRaWAN® Downlink
Radio technology	LoRaWAN® (868 MHz)
Measuring range humidity	0..100% rH non-condensing
Measuring range CO2	0..5000 ppm
Power supply	battery type AA (1x)
Display	ePaper Display 44x24 mm
Enclosure	PC V0
Colour	pure white, black
Operating range temperature	-20..+70 °C
Protection (IP)	IP20, according to EN 60529
Mounting	flush-mounted on standard EU box (Ø=60 mm), surface-mounted flat on base using adhesive foil or screws

**Room operating unit with up to 3 measured values – LoRaWAN® (868 MHz)**

Item description	App	Item No.	Group	€
NOVOS 3 INC EPD white Temp_rH LRW	✓	835657	W1	144,90
NOVOS 3 INC EPD white CO2 Temp_rH LRW	✓	835664	W1	250,20
NOVOS 3 INC EPD T white Temp_rH LRW	✓	835640	W1	150,10
NOVOS 3 INC EPD T white CO2 Temp_rH LRW	✓	835633	W1	255,40

**Options**

Description	€
Enclosure in black	13,00

**Accessories**

Item description	Item No.	Group	€
Battery AA 3.6 V lithium ER14505	759182	A1	8,40
Battery AA 1,5 V lithium L91	819640	A1	8,10
Battery AA 1,5 V Alkaline VARTA 4906	459099	A1	5,00
Fixing kit rawlplugs and screws (2x each)	660945	A1	1,10
Frame for surface mounting NOVOS 3 white	795050	A1	15,30
Frame for surface mounting NOVOS 3 black	795074	A1	55,30
Adhesive foil for NOVOS 3 SR with inner cut-outs	773386	A1	2,40

## JOY Fancoil LRW

Fancoil thermostat in high-quality design for individual single-room temperature- and fan control. A glass surface with intuitive touch control buttons and display combine design, feel and functionality in an outstanding way. The internal controller of the JOY calculates control values for fans and heating/cooling applications, which are provided via analog or digital outputs (depending on type). The possible integration of various external sensors (e.g. window contacts, change-over, condensation sensors, etc.) allows temperature and fan control tailored to the application. The device can be mounted in a standard flush-mounted box.



JOY Fancoil LRW

JOY Fancoil LRW Custom\*

NEW: With additional, customisable touch buttons (see page 12)

\* Minimum order quantity 100 pieces

Technical Data	
Measured values	temperature, relative humidity, CO2
Operating functions	setpoint adjustment temperature, fan stage adjustment, standby/presence detection
Operating elements	5 capacitive buttons
Configuration	uConfig, LoRaWAN® Downlink
Inputs	see overview
Outputs	see overview
Radio technology	LoRaWAN® (868 MHz)
Output signal temperature	0..+50 °C
Measuring range humidity	0..100% rH non-condensing
Measuring range CO2	0..2000 ppm
Power supply	<b>5DO/AO2DO (230 V):</b> 85..260 V ~ <b>5DO/AO2DO/3AO (24 V):</b> 24 V = (±10%) SELV, 24 V ~ (±10%) SELV
Power consumption	<b>5DO:</b> max. 2,5 VA (260 V ~) <b>AO2DO:</b> max. 3 VA (260 V ~) <b>5DO/AO2DO/3AO (24 V):</b> typ. 2,5 W (24 V =)
Display	LCD 60x44 mm, 240x160 px, backlight cold white
Enclosure	PC, cover glass
Colour	pure white, black
Operating range temperature	0..+50 °C
Protection (IP)	IP30, according to EN 60529
Connection	terminal block, max. 1,5 mm <sup>2</sup> inputs max. 1,0 mm <sup>2</sup>
Mounting	in standard EU box (Ø=60 mm, depth min. 45 mm)

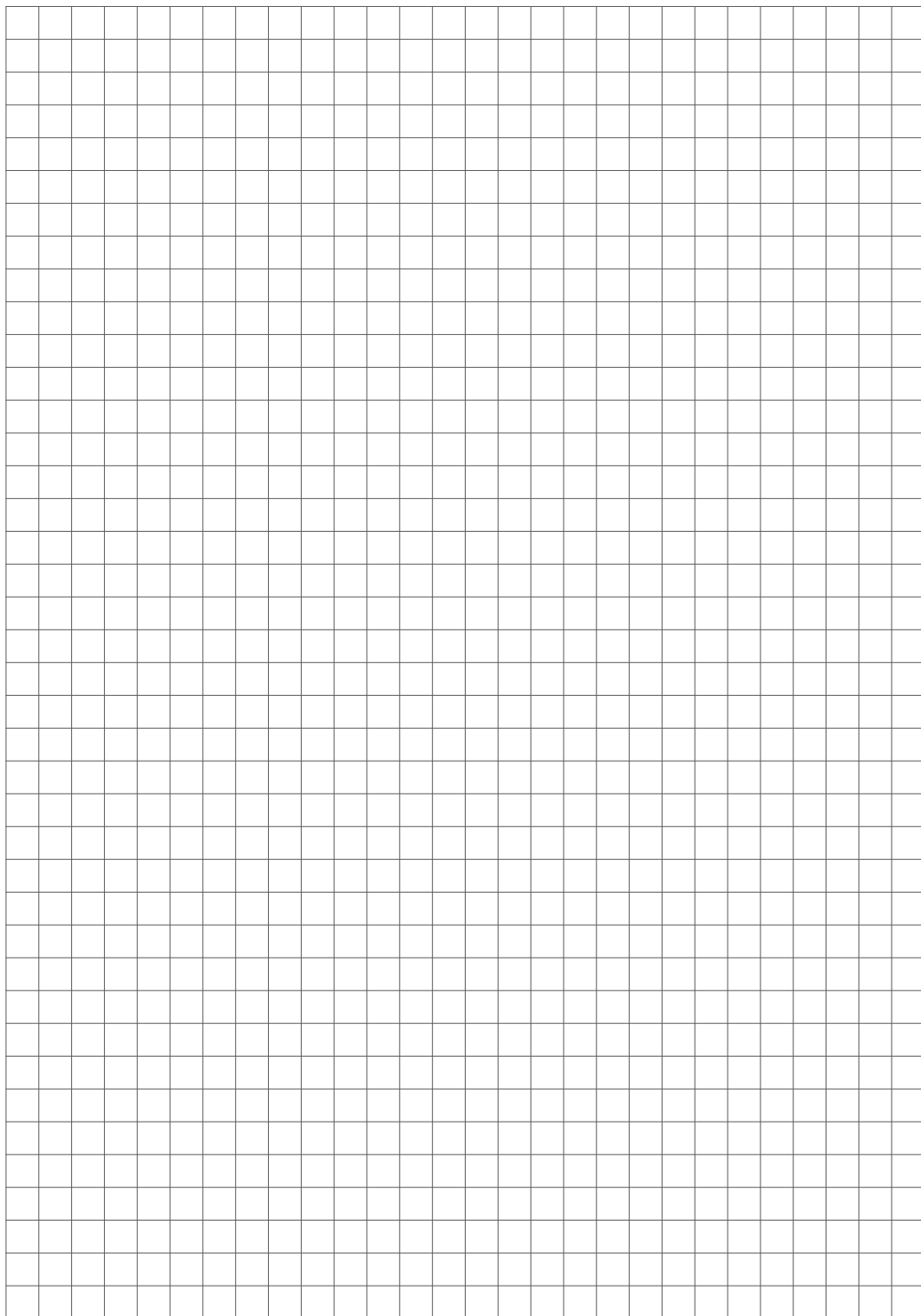
Outputs	5DO (230 V)	5DO (24 V)	EC AO2DO (230 V)	EC AO2DO (24 V)	EC 3AO (24 V)
Fan (Relay)	3x	3x	–	–	–
EC Fan (0..10 V)	–	–	1x	1x	1x
Heating/Cooling (Relay)	2x	2x	2x	2x	–
Heating/Cooling (0..10 V)	–	–	–	–	2x
6-Way-Valve (0..10 V)	–	–	–	–	(1x) <sup>1</sup>
Inputs	5DO (230 V)	5DO (24 V)	EC AO2DO (230 V)	EC AO2DO (24 V)	EC 3AO (24 V)
Input for NTC10k or floating contact	1x	1x	1x	1x	1x
Input for potential contact (230 V)	1x	–	1x	–	–
Input for potential contact (24 V)	–	1x	–	1x	–
Input for floating contact	–	–	–	–	1x

<sup>1</sup> Instead of 2x 0..10 V (heating/cooling)

Fan coil thermostat temperature – LoRaWAN® (868 MHz) – 230 V				
Item description	Contr.	Item No.	Group	€
JOY Fancoil 5DO temp_rH LRW white	✓	850922	W2	218,50
JOY Fancoil 5DO temp_rH LRW black	✓	850919	W2	231,50
JOY Fancoil 5DO CO2 temp_rH LRW white	✓	850918	W2	260,50
JOY Fancoil 5DO CO2 temp_rH LRW black	✓	850924	W2	273,50
JOY Fancoil EC A02DO temp_rH LRW white	✓	850897	W2	218,50
JOY Fancoil EC A02DO temp_rH LRW black	✓	850898	W2	231,50
JOY Fancoil EC A02DO CO2 temp_rH LRW white	✓	850909	W2	260,50
JOY Fancoil EC A02DO CO2 temp_rH LRW black	✓	850899	W2	273,50

Fan coil thermostat temperature – LoRaWAN® (868 MHz) – 24 V				
Item description	Contr.	Item No.	Group	€
JOY Fancoil 24V 5DO temp_rH LRW white	✓	851254	W2	218,50
JOY Fancoil 24V 5DO temp_rH LRW black	✓	851257	W2	231,50
JOY Fancoil 24V 5DO CO2 temp_rH LRW white	✓	851256	W2	260,50
JOY Fancoil 24V 5DO CO2 temp_rH LRW black	✓	851259	W2	273,50
JOY Fancoil 24V EC A02DO temp_rH LRW white	✓	851252	W2	218,50
JOY Fancoil 24V EC A02DO temp LRW black	✓	851253	W2	231,50
JOY Fancoil 24V EC A02DO CO2 temp_rH LRW white	✓	851244	W2	260,50
JOY Fancoil 24V EC A02DO CO2 temp_rH LRW black	✓	851245	W2	273,50
JOY Fancoil EC 3AO temp_rH LRW white	✓	850920	W2	218,50
JOY Fancoil EC 3AO temp_rH LRW black	✓	850913	W2	231,50
JOY Fancoil EC 3AO CO2 temp_rH LRW white	✓	850912	W2	260,50
JOY Fancoil EC 3AO CO2 temp_rH LRW black	✓	850915	W2	273,50

Accessories				
Item description		Item No.	Group	€
microSD card 2 GB		500098	A1	13,80
Decorative frame JOY white		681452	A1	14,80
Decorative frame JOY black		740951	A1	14,80
Frame for surface mounting JOY white		760201	A1	29,30
Frame for surface mounting JOY black		760195	A1	29,30



## JOY HC LRW

Room thermostat in high-quality design for individual temperature control, e.g. in hotel rooms or offices. A glass surface with intuitive touch control buttons and display combine design, feel and functionality in an outstanding way. The internal controller of the JOY calculates control values for heating/cooling applications, which are provided via analog or digital outputs (depending on type). The possible integration of various external sensors (e.g. window contacts, change-over, condensation sensors, etc.) allows temperature control tailored to the application. The device can be mounted in a standard flush-mounted box.



JOY HC LRW

JOY HC LRW Custom\*

NEW: With additional, customisable touch buttons (see page 12)

\* Minimum order quantity 100 pieces

Technical Data	
Measured values	temperature, relative humidity, CO2
Operating functions	setpoint adjustment temperature, standby/presence detection
Operating elements	3 capacitive buttons
Configuration	uConfig, LoRaWAN® Downlink
Inputs	see overview
Outputs	see overview
Radio technology	LoRaWAN® (868 MHz)
Output signal temperature	0..+50 °C
Measuring range humidity	0..100% rH non-condensing
Measuring range CO2	0..2000 ppm
Power supply	<b>A02DO (230 V):</b> 85..260 V ~ <b>A02DO/3AO (24 V):</b> 24 V = (±10%) SELV, 24 V ~ (±10%) SELV
Power consumption	<b>A02DO (230 V):</b> max. 3 VA (260 V ~) <b>A02DO/3AO (24 V):</b> typ. 2,5 W (24 V =)
Display	LCD 60x44 mm, 240x160 px, backlight cold white
Enclosure	PC, cover glass
Colour	pure white, black
Operating range temperature	0..50 °C
Protection (IP)	IP30, according to EN 60529
Connection	terminal block, max. 1,5 mm <sup>2</sup> inputs max. 1,0 mm <sup>2</sup>
Mounting	in standard EU box (Ø=60 mm, depth min. 45 mm)

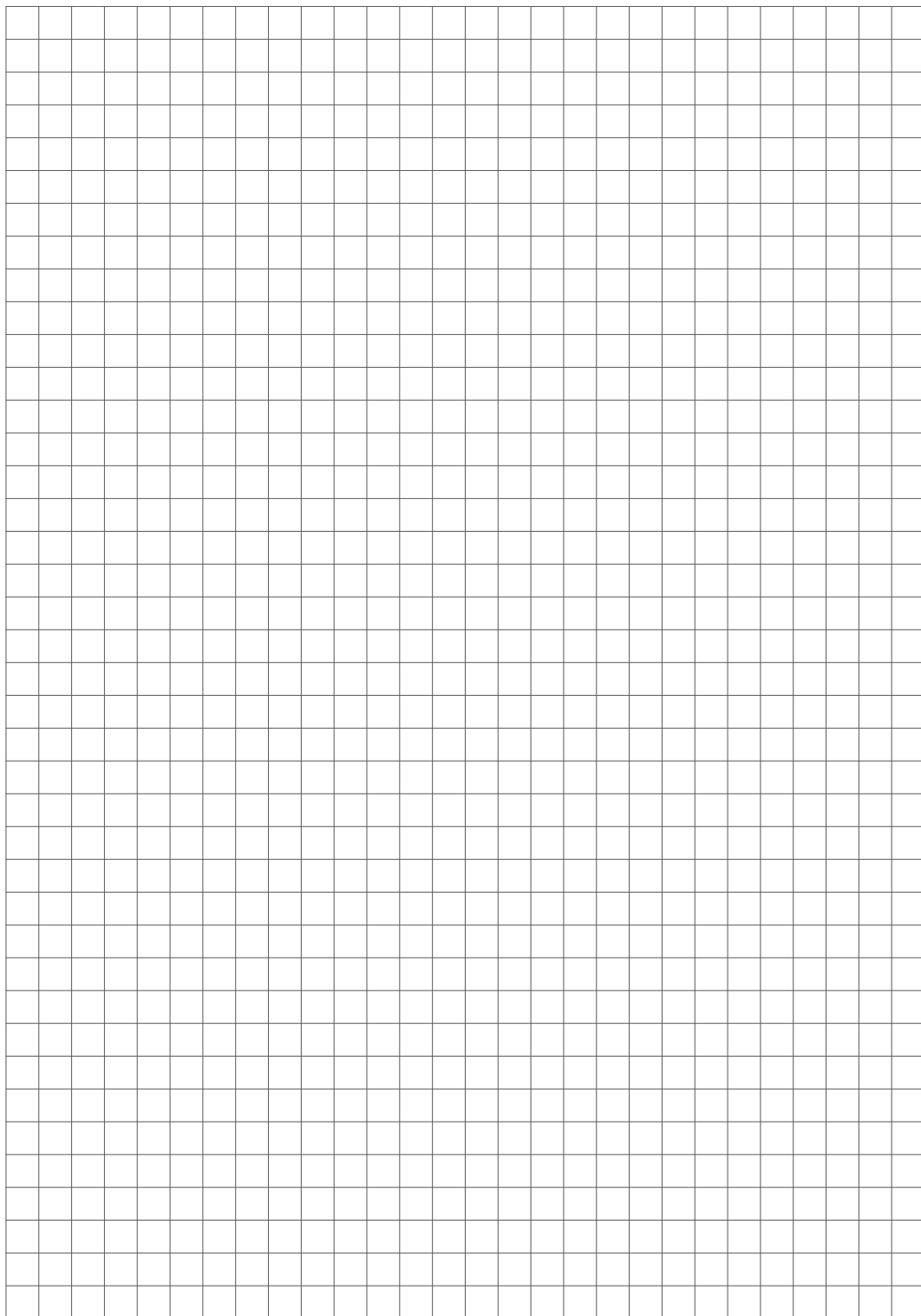
Outputs	EC A02DO (230 V)	EC A02DO (24 V)	EC 3AO (24 V)
Fan (Relay)	–	–	–
EC Fan (0..10 V)	1x	1x	1x
Heating/Cooling (Relay)	2x	2x	–
Heating/Cooling (0..10 V)	–	–	2x
6-Way-Valve (0..10 V)	–	–	(1x) <sup>1</sup>
Inputs	EC A02DO (230 V)	EC A02DO (24 V)	EC 3AO (24 V)
Input for NTC10k or floating contact	1x	1x	1x
Input for potential contact (230 V)	1x	–	–
Input for potential contact (24 V)	–	1x	–
Input for floating contact	–	–	1x

<sup>1</sup> Instead of 2x 0..10 V (heating/cooling)

Room thermostat heating/cooling – LoRaWAN® (868 MHz) – 230 V				
Item description	Contr.	Item No.	Group	€
JOY HC A02DO temp_rH LRW white	✓	850892	W2	218,50
JOY HC A02DO temp_rH LRW black	✓	850902	W2	231,50
JOY HC A02DO CO2 temp_rH LRW white	✓	850893	W2	260,50
JOY HC A02DO CO2 temp_rH LRW black	✓	850894	W2	273,50

Room thermostat heating/cooling – LoRaWAN® (868 MHz) – 24 V				
Item description	Contr.	Item No.	Group	€
JOY HC 24V A02DO temp_rH LRW white	✓	851241	W2	218,50
JOY HC 24V A02DO temp_rH LRW black	✓	851242	W2	231,50
JOY HC 24V A02DO CO2 temp_rH LRW white	✓	851251	W2	260,50
JOY HC 24V A02DO CO2 temp_rH LRW black	✓	851243	W2	273,50
JOY HC 3AO temp_rH LRW white	✓	850895	W2	218,50
JOY HC 3AO temp_rH LRW black	✓	850906	W2	231,50
JOY HC 3AO CO2 temp_rH LRW white	✓	850904	W2	260,50
JOY HC 3AO CO2 temp_rH LRW black	✓	850908	W2	273,50

Accessories				
Item description		Item No.	Group	€
microSD card 2 GB		500098	A1	13,80
Decorative frame JOY white		681452	A1	14,80
Decorative frame JOY black		740951	A1	14,80
Frame for surface mounting JOY white		760201	A1	29,30
Frame for surface mounting JOY black		760195	A1	29,30



## NOVOS 3 LRW

Room sensor with LoRaWAN® interface in NOVOS 3 design for measuring temperature, humidity and CO2 concentration (depending on variant). Different housing colors allow the sensor to be adapted to design-oriented interiors such as hotels, schools or office buildings.



NOVOS 3 LRW



NOVOS 3 LRW ePaper (EPD)



NOVOS 3 LRW Occ Lum



Technical Data	
Measured values	temperature, relative humidity, CO2, luminosity, motion / presence
Configuration	App, uConfig, LoRaWAN® Downlink
Sensor	<b>Occ:</b> PIR (passive infrared) <b>Lum:</b> ambient light sensor with precise optical filtering appropriate to the human eye
Radio technology	LoRaWAN® (868 MHz)
Measuring range humidity	0..100% rH non-condensing
Measuring range CO2	0..5000 ppm
Measuring range light	<b>Lum:</b> selectable from 6 ranges 0..200 lux   0..1000 lux   0..2 klux   0..10 klux   0..20 klux   0..50 klux
Detection range	<b>Occ:</b> detection range, angle 110°/110°, 32 detection zones – at a distance of 2,5 m the detection area will be about 5x5 m max. range 5 m
Power supply	battery type AA (1x)
Display	<b>EPD:</b> ePaper Display 44x24 mm
Enclosure	PC V0
Colour	pure white, black
Operating range temperature	0..+50 °C
Protection (IP)	IP20, according to EN 60529
Mounting	flush-mounted on standard EU box (Ø=60 mm), surface-mounted flat on base using adhesive foil or screws
Delivery content	incl. adhesive foil for mounting

## Room sensor with up to 5 measured values – LoRaWAN® (868 MHz)

Item description	App	Item No.	In stock	Group	€
NOVOS 3 Temp_rH white LRW	✓	811187	⊖	W1	68,90
NOVOS 3 Temp_rH white EPD LRW	✓	828918		W1	99,20
NOVOS 3 CO2 Temp_rH white LRW	✓	811170		W1	174,20
NOVOS 3 CO2 Temp_rH white EPD LRW	✓	828901		W1	204,50
NOVOS 3 Occ Temp_rH white LRW	✓	838931		W1	160,40
NOVOS 3 Occ Lum Temp_rH white LRW	✓	838955		W1	173,20
NOVOS 3 Occ Lum CO2 Temp_rH white LRW	✓	838948		W1	223,00

## Options

Description	€
Enclosure in black	13,00
ePaper Display 44x24 mm	30,30

## Accessories

Item description	Item No.	Group	€
Battery AA 3.6 V lithium ER14505	759182	A1	8,40
Battery AA 1,5 V lithium L91	819640	A1	8,10
Battery AA 1,5 V Alkaline VARTA 4906	459099	A1	5,00
Fixing kit rawlplugs and screws (2x each)	660945	A1	1,10
Frame for surface mounting NOVOS 3 white	795050	A1	15,30
Frame for surface mounting NOVOS 3 black	795074	A1	55,30
Adhesive foil for NOVOS 3 SR with inner cut-outs	773386	A1	2,40

## MCS LRW

LoRaWAN® multi compact sensor for condition monitoring of up to 2 windows or doors and measurement of temperature, humidity, motion and brightness.



MCS LRW State



MCS LRW Lum



MCS LRW Occ



MCS LRW Occ / Lum



### Technical Data

<b>Measured values</b>	<b>State:</b> status <b>Temp_rH:</b> temperature, relative humidity <b>Lum:</b> luminosity <b>Occ:</b> motion, presence
<b>Configuration</b>	App, uConfig, LoRaWAN® Downlink
<b>Radio technology</b>	LoRaWAN® (868 MHz)
<b>Power supply</b>	battery type AAA
<b>Enclosure</b>	PC V0
<b>Colour</b>	pure white, anthracite
<b>Operating range temperature</b>	0..+40 °C
<b>Protection (IP)</b>	IP20, according to EN 60529
<b>Mounting</b>	surface-mounted flat on base using included adhesive pad or screws
<b>Delivery content</b>	incl. adhesive foil for mounting

### Radio compact room sensor – LoRaWAN® (868 MHz)

Item description	App	Item No.	Group	€
MCS State white LRW	✓	798204	W1	64,00
MCS State temp_rH white LRW	✓	798792	W1	79,20
MCS temp_rH white LRW	✓	798211	W1	74,80
MCS Lum temp_rH white LRW	✓	798808	W1	86,90
MCS Occ temp_rH white LRW	✓	798228	W1	94,10
MCS LRW Occ Lum temp_rH white	✓	798815	W1	107,90
MCS LRW Occ Lum State temp_rH white	✓	817318	W1	114,50

### Accessories

Item description	Item No.	Group	€
Battery AAA 1,5 V lithium L92	2000202	A1	8,30
Battery AAA 1,5 V Alkaline VARTA 4003	739351	A1	5,00

## SAB07 LRW

Radio-controlled valve actuator with LoRaWAN® technology. The SAB07 has a manual setpoint adjustment as well as an additional override option via LoRaWAN®. Power is supplied via 2x AA batteries. Connection thread M30x1.5. Adapters are available for numerous valve manufacturers.



### Technical Data

Measured values	temperature, relative humidity
Operating functions	setpoint adjustment temperature
Operating elements	rotary button
Radio technology	LoRaWAN® (868 MHz)
Power supply	battery type AA (2x)
Display	graphic display monochrome (internal)
Enclosure	PC, ABS
Colour	pure white
Operating range temperature	0..+60 °C
Protection (IP)	IP30, according to EN 60529
Mounting	screw mounting M30x1,5
Delivery content	incl. battery type AA (2x)

### Radio valve actuator – LoRaWAN® (868 MHz)

Item description	Contr.	Item No.	Group	€
SAB07 LRW	✓	819619	W1	89,00

### Accessories

Item description	Item No.	Group	€
Battery AA 1,5 V lithium L91	819640	A1	8,10
Safety lock dismounting protection SAB	706148	A1	12,70
Reinforced mounting plate SAB07	2000144	W2	12,00
Vandalism protection SAB07	836104	W2	19,60

**AGS55+ LRW**

Outdoor temperature sensor with external stainless steel probe (fast response) for measuring temperature in outdoor areas, cold rooms, greenhouses, production plants and warehouses. In addition to LoRaWAN®, additional analog voltage outputs are available as interfaces. In radio-shielded mounting locations, an optional external antenna can be used to optimize the radio link between the device and the gateway. A hinged cover and tool-free wiring as well as removable cable entries ensure a quick and easy installation.

0..10 V 

Technical Data	
Measured values	temperature
Configuration	USEapp, uConfig, jumper, LoRaWAN® Downlink
Output voltage	0..10 V or 0..5 V, adjustable via jumper, live-zero configuration via app or uConfig, min. load 10 kΩ
Radio technology	LoRaWAN® (868 MHz)
Output signal temperature	scaling analogue output: -20..+80 °C (default setting) selectable from 4 temperature ranges -50..+50   -20..+80   -15..+35   -10..+120   0..+50   0..+100   0..+160   0..+250 °C, optionally configurable
Power supply	15..35 V = SELV, 19..29 V ~ SELV
Power consumption	max. 2,5 W (24 V =), 4,3 VA (24 V ~)
Material in touch with media	Sensor probe, Ø=6 mm, stainless steel V2A (1.4305)
Enclosure	USE-M, impact- and shock-resistant enclosure with quick-release cover, PC
Colour	pure white
Operating range temperature	-35..+70 °C
Protection (IP)	IP65, according to EN 60529
Connection	removable cable entry M25 with fourfold cable entry for wire with max. Ø=7 mm, removable plug-in terminal, max. 2,5 mm²
Delivery content	incl. mounting base enclosure USE-M pure white incl. mounting set (screws and accessories)

**Outdoor sensor temperature – LoRaWAN® (868 MHz)**

Item description	App	Item No.	Group	€
AGS55+ LRW	✓	797627	W2	156,80

**Accessories**

Item description	Item No.	Group	€
Mounting base enclosure USE-M pure white	668354	A1	9,60
Fixing kit rawlplugs and screws (2x each)	660945	A1	1,10
Housing protection BS150, transparent	730075	A1	27,50
BLE dongle with micro-USB for devices USE-M / USE-L / NOVOS / thanos EVO	668262		32,10
USB interface for devices USE-M / USE-L / NOVOS / thanos EVO / SR06 LCD	597838	A1	39,50
Cable entry M20 USE white, sealing insert Flextherm Ø=4,5..9 mm (4 pcs)	851077	A1	12,30
Sealing insert M20 USE white, Flextherm Ø=4,5..9 mm (10 pcs)	752206	A1	12,30
Sealing insert M20 USE white, 2x Ø=7 mm (10 pcs)	641333	A1	12,30
Cable entry M25 USE white, sealing insert 4x Ø=7 mm (4 pcs)	641364	A1	12,30

## FTA54+ LRW

Outdoor sensor for measuring relative humidity and temperature in HVAC applications, greenhouses, industrial halls and in meteorology. The accuracy of the humidity sensor is 2%. In addition to LoRaWAN®, additional analog voltage outputs are available as interfaces. In radio-shielded mounting locations, an optional external antenna can be used to optimize the radio link between the device and the gateway. A hinged cover and tool-free wiring as well as removable cable entries ensure a quick and easy installation.



FTA54+ LRW



FTA54+ BAT LRW

0..10 V 

Technical Data	
Measured values	temperature, relative humidity,
Configuration	App, uConfig, jumper, LoRaWAN® Downlink <b>BAT:</b> App, uConfig, LoRaWAN® Downlink
Output voltage	2x 0..10 V or 0..5 V, adjustable via jumper, live-zero configuration via app or uConfig, min. load 10 kΩ
Radio technology	LoRaWAN® (868 MHz)
Output signal temperature	scaling analogue output: -20..+80 °C (default setting) selectable from 4 temperature ranges -40..+60   0..+50   -20..+80   -15..+35 °C optionally configurable
Measuring range humidity	0..100% rH non-condensing
Power supply	15..35 V = SELV, 19..29 V ~ SELV <b>BAT:</b> battery type AA (2x)
Power consumption	max. 2,5 W (24 V ≈), 4,3 VA (24 V ~)
Material in touch with media	Pipe, PC, pure white, with filter stainless steel wire mesh
Enclosure	USE-M, impact- and shock-resistant enclosure with quick-release cover, PC
Colour	pure white
Operating range temperature	-20..+70 °C
Protection (IP)	IP65, according to EN 60529
Connection	removable cable entry M25 with fourfold cable entry for wire with max. Ø=7 mm, removable plug-in terminal, max. 2,5 mm²
Delivery content	incl. mounting base enclosure USE-M pure white incl. mounting set (screws and accessories) incl. sun/rain protection PC, white
Notes	external antenna available on request

## Outdoor sensor humidity + temperature – LoRaWAN® (868 MHz)

Item description	App	Item No.	Group	€
FTA54+ LRW	✓	797634	W2	239,40
FTA54+ BAT LRW	✓	816625	W2	214,40

## Accessories

Item description	Item No.	Group	€
Mounting base enclosure USE-M pure white	668354	A1	9,60
Mounting kit universal for enclosure USE	698511	A1	10,70
Filter stainless steel, wire mesh FTK+ / FTA54+ / FTP+ (spare part)	231169	A1	11,90
BLE dongle with micro-USB for devices USE-M / USE-L / NOVOS / thanos EVO	668262		32,10
USB interface for devices USE-M / USE-L / NOVOS / thanos EVO / SR06 LCD	597838	A1	39,50
Cable entry M20 USE white, sealing insert Flextherm Ø=4,5..9 mm (4 pcs)	851077	A1	12,30
Sealing insert M20 USE white, Flextherm Ø=4,5..9 mm (10 pcs)	752206	A1	12,30
Sealing insert M20 USE white, 2x Ø=7 mm (10 pcs)	641333	A1	12,30
Cable entry M25 USE white, sealing insert 4x Ø=7 mm (4 pcs)	641364	A1	12,30
<b>BAT:</b> Battery AA 3.6 V lithium ER14505	759182	A1	8,40
<b>BAT:</b> Battery AA 1,5 V lithium L91	819640	A1	8,10
<b>BAT:</b> Battery AA 1,5 V Alkaline VARTA 4906	459099	A1	5,00

## LA+ LRW

Air quality sensor for measuring CO<sub>2</sub>, mixed gas (VOC), optionally temperature and humidity outdoors and in areas requiring high IP protection class (e.g. underground stations, tunnels, exhibition halls, cold chains and greenhouses as well as in production halls and warehouses). In addition to LoRaWAN®, additional analog voltage outputs are available as interfaces. In radio-shielded mounting locations, an optional external antenna can be used to optimize the radio link between the device and the gateway.



LA+ (Temp)



LA+ (Temp\_rH)



LA+ BAT (Temp\_rH)

0..10 V 

### Technical Data

Measured values	temperature, relative humidity, CO <sub>2</sub> , VOC
Configuration	App, uConfig, jumper, LoRaWAN® Downlink <b>CO<sub>2</sub>+VOC:</b> each output can be set to get a variable mix of CO <sub>2</sub> and VOC by configuration via app or uConfig
Output voltage	2x 0..10 V or 0..5 V, adjustable via jumper, live-zero configuration via app or uConfig, min. load 10 kΩ
Radio technology	LoRaWAN® (868 MHz)
Output signal temperature	scaling analogue output: 0..+50 °C (default setting) selectable from 4 temperature ranges -40..+60   0..+50   -20..+80   -15..+35 °C, optionally configurable
Measuring range humidity	0..100% rH non-condensing, 0..85 KJ/kg enthalpy, 0..50   0..80 g/m <sup>3</sup> absolute humidity, 0..+50   -20..+80 °C dew point, optionally configurable
Measuring range CO <sub>2</sub>	0..2000 ppm, 0..5000 ppm, optionally configurable
Measuring VOC (mixed gas)	heated metal oxide semiconductor, self-calibration
Power supply	15..35 V = SELV, 19..29 V ~ SELV <b>BAT:</b> battery type AA (2x)
Power consumption	max. 2,5 W (24 V =), 4,3 VA (24 V ~)
Material in touch with media	<b>Temp:</b> Sensor probe, stainless steel V2A (1.4305) <b>Temp+rH:</b> Pipe, PC, with filter stainless steel wire mesh
Enclosure	USE-M, impact- and shock-resistant enclosure with quick-release cover, PC
Colour	pure white
Operating range temperature	0..+50 °C
Protection (IP)	IP65, according to EN 60529

Technical Data	
<b>Connection</b>	removable cable entry M25 with fourfold cable entry for wire with max. $\varnothing=7$ mm, removable plug-in terminal, max. 2,5 mm <sup>2</sup>
<b>Delivery content</b>	incl. mounting base enclosure USE-M pure white incl. mounting set (screws and accessories) <b>Temp+rH:</b> incl. sun/rain protection PC, white
<b>Notes</b>	Mixed-gas sensors detect volatile organic compounds (VOC) such as body odours, tobacco smoke and off-gassing from materials (furniture, carpets, paint, adhesives, etc.)

Outdoor sensor CO2 + VOC or mix + temperature + humidity – LoRaWAN® (868 MHz)				
Item description	App	Item No.	Group	€
LA+ CO2 temp LRW	✓	797641	W2	362,30
LA+ CO2 temp_rH LRW	✓	797658	W2	405,30
LA+ CO2 Temp_rH BAT LRW	✓	816601	W2	380,30
LA+ CO2+VOC LRW	✓	797764	W2	437,80
LA+ CO2+VOC temp LRW	✓	797771	W2	485,20
LA+ CO2+VOC temp_rH LRW	✓	797788	W2	528,20

Accessories				
Item description	Item No.	Group	€	
Mounting base enclosure USE-M pure white	668354	A1	9,60	
Mounting kit universal for enclosure USE	698511	A1	10,70	
BLE dongle with micro-USB for devices USE-M / USE-L / NOVOS / thanos EVO	668262		32,10	
USB interface for devices USE-M / USE-L / NOVOS / thanos EVO / SR06 LCD	597838	A1	39,50	
Cable entry M20 USE white, sealing insert Flextherm $\varnothing=4,5..9$ mm (4 pcs)	851077	A1	12,30	
Sealing insert M20 USE white, Flextherm $\varnothing=4,5..9$ mm (10 pcs)	752206	A1	12,30	
Sealing insert M20 USE white, 2x $\varnothing=7$ mm (10 pcs)	641333	A1	12,30	
Cable entry M25 USE white, sealing insert 4x $\varnothing=7$ mm (4 pcs)	641364	A1	12,30	
<b>BAT:</b> Battery AA 3.6 V lithium ER14505	759182	A1	8,40	
<b>BAT:</b> Battery AA 1,5 V lithium L91	819640	A1	8,10	
<b>BAT:</b> Battery AA 1,5 V Alkaline VARTA 4906	459099	A1	5,00	

## Li65+ LRW

Outdoor sensor for measuring light, temperature, humidity and atmospheric pressure in outdoor areas, greenhouses, warehouses or industrial halls. The device has an integrated ambient light sensor with a precise optical filter adapted to the spectral sensitivity of human eyes. A hinged cover and tool-free wiring as well as removable cable entries ensure a quick and easy installation. In addition to LoRaWAN®, additional analog voltage outputs are available as interfaces. In radio-shielded mounting locations, an optional external antenna can be used to optimize the radio link between the device and the gateway.



Li65+



Li65+ (Temp+rH)



Li65+ BAT (Temp\_rH)

0..10 V 

### Technical Data

<b>Measured values</b>	temperature, relative humidity, absolute humidity, enthalpy, dew point, luminosity, atmospheric pressure
<b>Configuration</b>	App, uConfig, jumper, LoRaWAN® Downlink <b>BAT:</b> App, uConfig, LoRaWAN® Downlink
<b>Output voltage</b>	0..10 V or 0..5 V, 2x 0..10 V or 0..5 V, 3x 0..10 V or 0..5 V, 4x 0..10 V or 0..5 V, adjustable via jumper
<b>Radio technology</b>	LoRaWAN® (868 MHz)
<b>Output signal temperature</b>	scaling analogue output: -20..+80 °C (default setting) selectable from 4 temperature ranges -40..+60   0..+50   -20..+80   -15..+35 °C, adjustable at the transducer, optionally configurable
<b>Measuring range humidity</b>	0..100% rH non-condensing
<b>Measuring range light</b>	0..1000 lux (default setting), selectable from 6 ranges 0..200 lux   0..1000 lux   0..2 klux   0..10 klux   0..20 klux   0..50 klux
<b>Measuring range atm. pressure</b>	500..1500 hPa
<b>Power supply</b>	15..35 V = SELV, 19..29 V ~ SELV   <b>BAT:</b> battery type AA (2x)
<b>Power consumption</b>	typ. 0,6 W (24 V =), 1,5 VA (24 V ~)
<b>Enclosure</b>	USE-M, impact- and shock-resistant enclosure with quick-release cover, PC
<b>Colour</b>	pure white, translucent cover PC
<b>Operating range temperature</b>	-30..+70 °C
<b>Protection (IP)</b>	IP65, according to EN 60529
<b>Connection</b>	removable cable entry M25 with fourfold cable entry for wire with max. Ø=7 mm, removable plug-in terminal, max. 2,5 mm²
<b>Delivery content</b>	incl. mounting base enclosure USE-M pure white incl. mounting set (screws and accessories)

Outdoor sensor light – LoRaWAN® (868 MHz)				
Item description	App	Item No.	Group	€
Li65+ LRW	✓	797795	W2	229,00
Li65+ temp_rH LRW	✓	800181	W2	272,00
Li65+ temp_rH_hPa LRW	✓	800198	W2	315,00
Li65+ Temp_rH BAT LRW	✓	816618	W2	247,00

Accessories				
Item description		Item No.	Group	€
Mounting base enclosure USE-M pure white		668354	A1	9,60
Mounting kit universal for enclosure USE		698511	A1	10,70
BLE dongle with micro-USB for devices USE-M / USE-L / NOVOS / thanos EVO		668262		32,10
USB interface for devices USE-M / USE-L / NOVOS / thanos EVO / SR06 LCD		597838	A1	39,50
Cable entry M20 USE white, sealing insert Flextherm Ø=4,5..9 mm (4 pcs)		851077	A1	12,30
Sealing insert M20 USE white, Flextherm Ø=4,5..9 mm (10 pcs)		752206	A1	12,30
Sealing insert M20 USE white, 2x Ø=7 mm (10 pcs)		641333	A1	12,30
Cable entry M25 USE white, sealing insert 4x Ø=7 mm (4 pcs)		641364	A1	12,30
<b>BAT:</b> Battery AA 3.6 V lithium ER14505		759182	A1	8,40
<b>BAT:</b> Battery AA 1,5 V lithium L91		819640	A1	8,10
<b>BAT:</b> Battery AA 1,5 V Alkaline VARTA 4906		459099	A1	5,00



## AKF10+ LRW

Duct sensor for measuring air temperature and other gaseous media (e.g. in ventilation and air conditioning systems). Combined with a thermowell pocket, it can be used as an immersion temperature sensor as well. A hinged cover and tool-free wiring as well as removable cable entries ensure a quick and easy installation. In addition to LoRaWAN®, additional analog voltage outputs are available as interfaces. In radio-shielded mounting locations, an optional external antenna can be used to optimize the radio link between the device and the gateway.

0..10 V 

Technical Data	
Measured values	temperature
Configuration	App, uConfig, jumper, LoRaWAN® Downlink <b>BAT:</b> App, uConfig, LoRaWAN® Downlink
Output voltage	0..10 V or 0..5 V, adjustable via jumper, live-zero configuration via app or uConfig, min. load 10 kΩ
Radio technology	LoRaWAN® (868 MHz)
Output signal temperature	scaling analogue output: -20..+80 °C (default setting) selectable from 4 temperature ranges -50..+50   -20..+80   -15..+35   -10..+120   0..+50   0..+100   0..+160   0..+250 °C, optionally configurable
Power supply	15..35 V = SELV, 19..29 V ~ SELV   <b>BAT:</b> battery type AA (2x)
Power consumption	max. 2,5 W (24 V ~), 4,3 VA (24 V ~)
Material in touch with media	Sensor probe, Ø=6 mm, stainless steel V4A (1.4571) suitable for usage in aggressive media
Installation length	50 mm, 100 mm, 150 mm, 200 mm, 250 mm, 300 mm, 450 mm
Enclosure	USE-M, impact- and shock-resistant enclosure with quick-release cover, PC
Colour	pure white
Operating range temperature	-50..+160 °C
Protection (IP)	IP65, according to EN 60529
Connection	removable cable entry M25 with fourfold cable entry for wire with max. Ø=7 mm, removable plug-in terminal, max. 2,5 mm²
Mounting	when used as duct sensors: please use mounting flange MF6DS flexible (+90..+120 °C) or MF6 (brass, +120..+260 °C) for use as immersion sensors please use immersion pocket THVADS / THMSDS
Delivery content	incl. mounting flange MF6DS flexible, incl. mounting set (screws and accessories)

Duct/immersion sensor -50..+160 °C – LoRaWAN® (868 MHz)				
Item description	USEapp	Item No.	Group	€
AKF10+ LRW 050.06	✓	797818	W2	164,10
AKF10+ LRW 100.06	✓	797825	W2	165,20
AKF10+ LRW 150.06	✓	797832	W2	166,40

Duct/immersion sensor -50..+160 °C – LoRaWAN® (868 MHz)				
Item description	USEapp	Item No.	Group	€
AKF10+ LRW 200.06	✓	797849	W2	166,80
AKF10+ LRW 250.06	✓	797856	W2	168,30
AKF10+ LRW 300.06	✓	797863	W2	169,40
AKF10+ LRW 450.06	✓	797870	W2	170,80
AKF10+ BAT LRW 100.06	✓	850318	W2	140,20

Accessories			
Item description	Item No.	Group	€
Mounting base enclosure USE-M pure white	668354	A1	9,60
Mounting kit universal for enclosure USE	698511	A1	10,70
BLE dongle with micro-USB for devices USE-M / USE-L / NOVOS / thanos EVO	668262		32,10
USB interface for devices USE-M / USE-L / NOVOS / thanos EVO / SR06 LCD	597838	A1	39,50
Mounting flange MF6DS flexible (suitable for Ø=6 mm)	669016	A2	7,80
Mounting flange MF6 brass (suitable for Ø=6 mm)	3407	A1	7,80
Syringe thermal contact fluid	102308	A1	1,80
Mounting bracket with cable gland for duct sensors Ø=6 mm	670593	A1	14,80

Thermowells brass for sensors with pocket Ø=6 mm						
Item description	Length	Inst. length	Item No.	In stock	Group	€
MS-thermowell 50 mm type THMSDS50	50 mm	36 mm	610995	⊕	A2	9,90
MS-thermowell 100 mm type THMSDS100	100 mm	86 mm	611008	⊕	A2	11,20
MS-thermowell 150 mm type THMSDS150	150 mm	136 mm	611015	⊕	A2	11,80
MS-thermowell 200 mm type THMSDS200	200 mm	186 mm	611022	⊕	A2	12,30
MS-thermowell 250 mm type THMSDS250	250 mm	236 mm	611985	⊕	A2	14,10
MS-thermowell 300 mm type THMSDS300	300 mm	286 mm	611039	⊕	A2	14,60
MS-thermowell 450 mm type THMSDS450	450 mm	436 mm	611046	⊕	A2	14,90

Thermowells stainless steel for sensors with pocket Ø=6 mm						
Item description	Length	Inst. length	Item No.	In stock	Group	€
VA-thermowell 50 mm type THVADS50	50 mm	36 mm	611152	⊕	A2	23,10
VA-thermowell 100 mm type THVADS100	100 mm	86 mm	611817	⊕	A2	25,30
VA-thermowell 150 mm type THVADS150	150 mm	136 mm	611824	⊕	A2	27,40
VA-thermowell 200 mm type THVADS200	200 mm	186 mm	611848	⊕	A2	28,70
VA-thermowell 250 mm type THVADS250	250 mm	236 mm	611862	⊕	A2	35,60
VA-thermowell 300 mm type THVADS300	300 mm	286 mm	611879	⊕	A2	37,30
VA-thermowell 450 mm type THVADS450	450 mm	436 mm	611893	⊕	A2	38,60
Pressure screw with sealing PTFE (without silicone) for thermowell pocket THVADS			666473	⊕	A2	22,20

## FTK+ LRW

Duct sensor for measuring relative humidity and temperature in gaseous media of heating, ventilation and air-conditioning systems as well as clean rooms. The accuracy of the humidity sensor is 2%. A hinged cover and tool-free wiring as well as removable cable entries ensure a quick and easy installation. In addition to LoRaWAN®, additional analog voltage outputs are available as interfaces. In radio-shielded mounting locations, an optional external antenna can be used to optimize the radio link between the device and the gateway.



FTK+ LRW



FTK+ LRW BAT

0..10 V 

Technical Data	
Measured values	temperature, relative humidity, absolute humidity, enthalpy, dew point
Configuration	App, uConfig, jumper, LoRaWAN® Downlink <b>BAT:</b> App, uConfig, LoRaWAN® Downlink
Output voltage	2x 0..10 V or 0..5 V, adjustable via jumper, live-zero configuration via app or uConfig, min. load 10 kΩ
Radio technology	LoRaWAN® (868 MHz)
Output signal temperature	scaling analogue output: -20..+80 °C (default setting) selectable from 4 temperature ranges -40..+60   0..+50   -20..+80   -15..+35 °C, optionally configurable
Measuring range humidity	0..100% rH non-condensing, 0..85 KJ/kg enthalpy, 0..50   0..80 g/m³ absolute humidity, 0..+50   -20..+80 °C dew point, optionally configurable
Power supply	15..35 V = SELV, 19..29 V ~ SELV   <b>BAT:</b> battery type AA (2x)
Power consumption	max. 2,5 W (24 V =), 4,3 VA (24 V ~)
Material in touch with media	Pipe, PA6, with filter stainless steel wire mesh, black, Ø=19,5 mm
Installation length	140 mm, 270 mm, 400 mm
Enclosure	USE-M, impact- and shock-resistant enclosure with quick-release cover, PC
Colour	pure white
Operating range temperature	-20..+70 °C
Protection (IP)	IP65, according to EN 60529
Connection	removable cable entry M25 with fourfold cable entry for wire with max. Ø=7 mm, removable plug-in terminal, max. 2,5 mm²
Delivery content	incl. mounting flange, incl. mounting set (screws and accessories)
Notes	air speed max. 12 m/s

**Duct sensor humidity + temperature – LoRaWAN® (868 MHz)**

Item description	App	Item No.	Group	€
FTK+ 140 LRW	✓	797924	W2	243,60
FTK+ 270 LRW	✓	797931	W2	252,30
FTK+ 400 LRW	✓	797948	W2	260,80
FTK+ 140 BAT LRW	✓	821827	W2	218,60

**Accessories**

Item description	Item No.	Group	€
BLE dongle with micro-USB for devices USE-M / USE-L / NOVOS / thanos EVO	668262		32,10
USB interface for devices USE-M / USE-L / NOVOS / thanos EVO / SR06 LCD	597838	A1	39,50
Filter stainless steel, wire mesh FTK+ / FTA54+ / FTP+ (spare part)	231169	A1	11,90
Mounting flange MF20	612562	A1	14,40
Cable entry M20 USE white, sealing insert Flextherm Ø=4,5..9 mm (4 pcs)	851077	A1	12,30
Sealing insert M20 USE white, Flextherm Ø=4,5..9 mm (10 pcs)	752206	A1	12,30
Sealing insert M20 USE white, 2x Ø=7 mm (10 pcs)	641333	A1	12,30
Cable entry M25 USE white, sealing insert 4x Ø=7 mm (4 pcs)	641364	A1	12,30
Battery AA 1,5 V lithium L91	819640	A1	8,10
Battery AA 1,5 V Alkaline VARTA 4906	459099	A1	5,00
Battery AA 3.6 V lithium ER14505	759182	A1	8,40

## LK+ LRW

The maintenance-free and multi-functional duct air quality sensor measures CO<sub>2</sub>, mixed gas (VOC), temperature and humidity. A hinged cover and tool-free wiring as well as removable cable entries ensure a quick and easy installation. In addition to LoRaWAN®, additional analog voltage outputs are available as interfaces. In radio-shielded mounting locations, an optional external antenna can be used to optimize the radio link between the device and the gateway.



LK+ LRW



LK+ LRW BAT

0..10 V 

Technical Data	
Measured values	temperature, relative humidity, CO <sub>2</sub> , VOC
Configuration	App, uConfig, jumper, LoRaWAN® Downlink <b>CO<sub>2</sub>+VOC:</b> each output can be set to get a variable mix of CO <sub>2</sub> and VOC by configuration via app or uConfig
Output voltage	2x 0..10 V or 0..5 V, adjustable via jumper, live-zero configuration via app or uConfig, min. load 10 kΩ
Radio technology	LoRaWAN® (868 MHz)
Output signal temperature	scaling analogue output: 0..+50 °C (default setting) selectable from 4 temperature ranges -40..+60   0..+50   -20..+80   -15..+35 °C, optionally configurable
Measuring range humidity	0..100% rH non-condensing, 0..85 KJ/kg enthalpy, 0..50   0..80 g/m <sup>3</sup> absolute humidity, 0..+50   -20..+80 °C dew point, optionally configurable
Measuring range CO <sub>2</sub>	0..2000 ppm, 0..5000 ppm, optionally configurable
Measuring VOC (mixed gas)	heated metal oxide semiconductor
Power supply	15..35 V = SELV, 19..29 V ~ SELV   <b>BAT:</b> battery type AA (2x)
Power consumption	max. 2,5 W (24 V =), 4,3 VA (24 V ~)
Material in touch with media	Pipe, Ø=19,5 mm, black, with filter stainless steel wire mesh
Installation length	180 mm, <b>models without temperature:</b> 150 mm
Enclosure	USE-M, impact- and shock-resistant enclosure with quick-release cover, PC
Colour	pure white
Operating range temperature	0..+50 °C
Protection (IP)	IP65, according to EN 60529

Technical Data	
<b>Connection</b>	removable cable entry M25 with fourfold cable entry for wire with max. $\varnothing=7$ mm, removable plug-in terminal, max. 2,5 mm <sup>2</sup>
<b>Delivery content</b>	incl. mounting flange incl. mounting set (screws and accessories)
<b>Notes</b>	Mixed-gas sensors detect volatile organic compounds (VOC) such as body odours, tobacco smoke and off-gassing from materials (furniture, carpets, paint, adhesives, etc.) air speed 0,3..12 m/s

Duct sensor CO2 – LoRaWAN® (868 MHz)				
Item description	App	Item No.	Group	€
LK+ CO2+VOC LRW	✓	797993	W2	429,20
LK+ CO2+VOC temp LRW	✓	798006	W2	476,60
LK+ CO2+VOC temp_rH LRW	✓	798013	W2	519,60
LK+ CO2 temp LRW	✓	797955	W2	353,70
LK+ CO2 temp_rH LRW	✓	797962	W2	396,70
LK+ CO2 Temp_rH BAT LRW	✓	821841	W2	371,70

Accessories				
Item description	Item No.	Group	€	
Mounting flange MF20	612562	A1	14,40	
Mounting kit universal for enclosure USE	698511	A1	10,70	
BLE dongle with micro-USB for devices USE-M / USE-L / NOVOS / thanos EVO	668262		32,10	
USB interface for devices USE-M / USE-L / NOVOS / thanos EVO / SR06 LCD	597838	A1	39,50	
Cable entry M20 USE white, sealing insert Flextherm $\varnothing=4,5..9$ mm (4 pcs)	851077	A1	12,30	
Sealing insert M20 USE white, Flextherm $\varnothing=4,5..9$ mm (10 pcs)	752206	A1	12,30	
Sealing insert M20 USE white, 2x $\varnothing=7$ mm (10 pcs)	641333	A1	12,30	
Cable entry M25 USE white, sealing insert 4x $\varnothing=7$ mm (4 pcs)	641364	A1	12,30	
Battery AA 3.6 V lithium ER14505	759182	A1	8,40	
Battery AA 1,5 V lithium L91	819640	A1	8,10	
Battery AA 1,5 V Alkaline VARTA 4906	459099	A1	5,00	

**MWF+ LRW**

Duct sensor for measuring the average temperature in air ducts. The sensor measures the mean temperature value throughout the entire length. A spring at the connection head reduces vibrations. Mounting angles are included in the delivery content. A hinged cover and tool-free wiring as well as removable cable entries ensure a quick and easy installation. In addition to LoRaWAN®, additional analog voltage outputs are available as interfaces. In radio-shielded mounting locations, an optional external antenna can be used to optimize the radio link between the device and the gateway.

0..10 V 

Technical Data	
Measured values	temperature
Configuration	USEapp, uConfig, jumper, LoRaWAN® Downlink
Output voltage	0..10 V or 0..5 V, adjustable via jumper live-zero configuration via app or uConfig, min. load 10 kΩ
Radio technology	LoRaWAN® (868 MHz)
Output signal temperature	scaling analogue output: -20..+80 °C (default setting) selectable from 4 temperature ranges -50..+50   -20..+80   -15..+35   -10..+120   0..+50   0..+100   0..+160   0..+250 °C, optionally configurable via app or uConfig
Power supply	15..35 V = SELV, 19..29 V ~ SELV
Power consumption	max. 2,5 W (24 V =), 4,3 VA (24 V ~)
Installation length	3000 mm, 6000 mm
Enclosure	USE-M, impact- and shock-resistant enclosure with quick-release cover, PC
Colour	pure white
Operating range temperature	-30..+70 °C
Protection (IP)	IP65, according to EN 60529
Connection	removable cable entry M25 with fourfold cable entry for wire with max. $\varnothing=7$ mm, removable plug-in terminal, max. 2,5 mm <sup>2</sup>
Delivery content	incl. mounting flange incl. mounting set (screws and accessories) incl. installation set

**Duct averaging sensor -50..+80 °C – LoRaWAN® (868 MHz)**

Item description	App	Item No.	Group	€
MWF+ LRW L3000	✓	798020	W2	220,90
MWF+ LRW L6000	✓	798037	W2	230,90

**Accessories**

Item description	Item No.	Group	€
Mounting base enclosure USE-M pure white	668354	A1	9,60
Mounting kit universal for enclosure USE	698511	A1	10,70
BLE dongle with micro-USB for devices USE-M / USE-L / NOVOS / thanos EVO	668262		32,10
USB interface for devices USE-M / USE-L / NOVOS / thanos EVO / SR06 LCD	597838	A1	39,50
Installation set TFR / MWF+	679466	A1	10,30
Cable entry M20 USE white, sealing insert Flextherm Ø=4,5..9 mm (4 pcs)	851077	A1	12,30
Sealing insert M20 USE white, Flextherm Ø=4,5..9 mm (10 pcs)	752206	A1	12,30
Sealing insert M20 USE white, 2x Ø=7 mm (10 pcs)	641333	A1	12,30
Cable entry M25 USE white, sealing insert 4x Ø=7 mm (4 pcs)	641364	A1	12,30

## TF25+ LRW

Cable sensor for temperature measurement in HVAC or refrigeration applications. In combination with a thermowell, the TF25 can also be used for temperature measurement in liquid media. Depending on the application requirements, different PVC, silicone, high-temperature silicone and fibreglass cables are available.



TF25+ BAT LRW



TF25+ Dual BAT LRW



Technical Data	
Measured values	temperature
Configuration	App, uConfig, LoRaWAN® Downlink
Radio technology	LoRaWAN® (868 MHz)
Power supply	battery type AA (2x)
Material in touch with media	Sensor probe, Ø=6 mm, stainless steel V4A (1.4571) 16-point pressed (IP65)
Installation length	50 mm
Enclosure	USE-M, impact- and shock-resistant enclosure with quick-release cover, PC
Colour	pure white
Operating range temperature	-50..+160 °C
Protection (IP)	IP65, according to EN 60529
Connection cable	silicone, 0,25 mm <sup>2</sup>
Length connection wire	1 m
Delivery content	incl. mounting base enclosure USE-M pure white incl. mounting set (screws and accessories)
Notes	PE connection wire available (please request) <b>Dual:</b> Variant with 2 independent sensor elements

Cable sensor -50..+160 °C				
Item description	App	Item No.	Group	€
TF25+ BAT LRW T160 050.06 L1000	✓	850314	W2	132,90
TF25+ Dual BAT LRW T160 050.06 L1000	✓	850315	W2	137,50

Options	
Description	€
Temperature -50..+250 °C (T250)	26,60
2-wire connection cable L2000 for T135 / T160 / T180 – (Dual x2)	4,60
2-wire connection cable L4000 for T135 / T160 / T180 – (Dual x2)	13,80
2-wire connection cable L6000 for T135 / T160 / T180 – (Dual x2)	23,00
2-wire connection cable L2000 for T250 – (Dual x2)	7,40
2-wire connection cable L4000 for T250 – (Dual x2)	22,20
2-wire connection cable L6000 for T250 – (Dual x2)	37,00
Other connection types and lengths	on request

Accessories				
Item description	Item No.	Group	€	
Mounting flange MF6DS flexible (suitable for Ø=6 mm)	669016	A2	7,80	
Mounting flange MF6 brass (suitable for Ø=6 mm)	3407	A1	7,80	
Compression fittings KL6VA for Ø=6 mm with cutting ring, stainless steel	103213	A1	15,60	
Tension clamp for pipes Ø up to 110 mm with contact fluid	658911	A1	3,30	
Tension clamp for pipes Ø up to 250 mm with contact fluid	648103	A1	5,20	
Tightening strap PA (max. 85 °C) for pipes Ø up to 100 mm with contact fluid	668071	A1	3,30	
Battery AA 1,5 V lithium L91	819640	A1	8,10	
Battery AA 1,5 V Alkaline VARTA 4906	459099	A1	5,00	
Battery AA 3.6 V lithium ER14505	759182	A1	8,40	

Thermowells brass for sensors with pocket Ø=6 mm							
Item description	Length	Inst. length	Item No.	In stock	Group	€	
MS-thermowell 50 mm type THMSDS50	50 mm	36 mm	610995	☉	A2	9,90	
MS-thermowell 100 mm type THMSDS100	100 mm	86 mm	611008	☉	A2	11,20	
MS-thermowell 150 mm type THMSDS150	150 mm	136 mm	611015	☉	A2	11,80	

Thermowells stainless steel for sensors with pocket Ø=6 mm							
Item description	Length	Inst. length	Item No.	In stock	Group	€	
VA-thermowell 50 mm type THVADS50	50 mm	36 mm	611152	☉	A2	23,10	
VA-thermowell 100 mm type THVADS100	100 mm	86 mm	611817	☉	A2	25,30	
VA-thermowell 150 mm type THVADS150	150 mm	136 mm	611824	☉	A2	27,40	
Pressure screw with sealing PTFE (without silicone) for thermowell pocket THVADS			666473	☉	A2	22,20	

## OF14+ LRW

Surface-mounted sensor for temperature measurement on glass or similar surfaces. Designed for connecting to controls and display systems.



OF14+ BAT LRW



OF14+ Dual BAT LRW



Technical Data	
Measured values	temperature
Configuration	App, uConfig, LoRaWAN® Downlink
Radio technology	LoRaWAN® (868 MHz)
Power supply	battery type AA (2x)
Material in touch with media	Sensor probe: aluminium, 35x10x6 mm
Installation length	35 mm
Enclosure	USE-M, impact- and shock-resistant enclosure with quick-release cover, PC
Colour	pure white
Operating range temperature	-35..+70 °C
Protection (IP)	IP65, according to EN 60529
Connection cable	PVC, 0,25 mm <sup>2</sup> , 2-wire, white
Length connection wire	1 m
Mounting	surface mounting due to self-adhesive sensor surface
Delivery content	incl. mounting base enclosure USE-M pure white incl. mounting set (screws and accessories)
Notes	<b>Dual:</b> Variant with 2 independent sensor elements

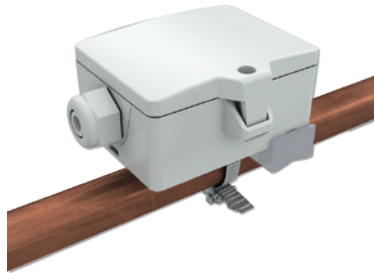
Contact Sensor -35..+70 °C				
Item description	App	Item No.	Group	€
OF14+ BAT LRW L1000	✓	850316	W2	136,90
OF14+ Dual BAT LRW L1000	✓	850304	W2	151,80

Options	
Description	€
2-wire connection cable L2000 for T100 – (Dual x2)	2,80
2-wire connection cable L4000 for T100 – (Dual x2)	8,40
2-wire connection cable L6000 for T100 – (Dual x2)	14,00
Other connection types and lengths	on request

Accessories			
Item description	Item No.	Group	€
Mounting base enclosure USE-M pure white	668354	A1	9,60
Mounting kit universal for enclosure USE	698511	A1	10,70
Battery AA 1,5 V lithium L91	819640	A1	8,10
Battery AA 3.6 V lithium ER14505	759182	A1	8,40
Battery AA 1,5 V Alkaline VARTA 4906	459099	A1	5,00

## VFG54+ LRW

Contact sensor for measuring the surface temperature on pipes (cold or hot water) and other curved contact surfaces. The measuring element is pressed onto the measuring surface via a spring mechanism in order to achieve direct contact and a fast response. Clamping tape and thermal paste are available as accessories. In addition to LoRaWAN®, additional analog voltage outputs are available as interfaces. An optional external antenna can be used to optimize the wireless connection between the device and gateway at radio-shielded installation sites. Tool-free opening, closing and cabling as well as removable cable entries ensure simple, quick and convenient installation.



0..10 V 

Technical Data	
Measured values	temperature
Configuration	App, uConfig, jumper, LoRaWAN® Downlink BAT: App, uConfig, LoRaWAN® Downlink
Output voltage	0..10 V or 0..5 V, adjustable via jumper live-zero configuration via app or uConfig, min. load 10 kΩ
Radio technology	LoRaWAN® (868 MHz)
Output signal temperature	scaling analogue output, -20..+80 °C (default setting) selectable from 4 temperature ranges -50..+50   -20..+80   -15..+35   -10..+120   0..+50   0..+100   0..+160   0..+250 °C, optionally configurable
Power supply	15..35 V = SELV, 19..29 V ~ SELV BAT: battery type AA (2x)
Power consumption	max. 2,5 W (24 V =), 4,3 VA (24 V ~)
Material in touch with media	Sensor probe, brass, spring loaded sensor
Enclosure	USE-M, impact- and shock-resistant enclosure with quick-release cover, PC
Colour	pure white
Operating range temperature	-35..+120 °C
Protection (IP)	IP65, according to EN 60529
Connection	removable cable entry M25 with fourfold cable entry for wire with max. Ø=7 mm, removable plug-in terminal, max. 2,5 mm <sup>2</sup>
Mounting	along the pipe or sideways

**Contact sensor temperature – LoRaWAN® (868 MHz)**

Item description	App	Item No.	Group	€
VFG54+ LRW	✓	813372	W2	163,30
VFG54+ BAT LRW	✓	850317	W2	138,30

**Accessories**

Item description	Item No.	Group	€
Tension clamp for pipes Ø up to 110 mm with contact fluid	658911	A1	3,30
Tension clamp for pipes Ø up to 250 mm with contact fluid	648103	A1	5,20
Tightening strap PA (max. 85 °C) for pipes Ø up to 100 mm with contact fluid	668071	A1	3,30
BLE dongle with micro-USB for devices USE-M / USE-L / NOVOS / thanos EVO	668262		32,10
USB interface for devices USE-M / USE-L / NOVOS / thanos EVO / SR06 LCD	597838	A1	39,50
Cable entry M20 USE white, sealing insert Flextherm Ø=4,5..9 mm (4 pcs)	851077	A1	12,30
Sealing insert M20 USE white, Flextherm Ø=4,5..9 mm (10 pcs)	752206	A1	12,30
Sealing insert M20 USE white, 2x Ø=7 mm (10 pcs)	641333	A1	12,30
Cable entry M25 USE white, sealing insert 4x Ø=7 mm (4 pcs)	641364	A1	12,30
Battery AA 1,5 V lithium L91	819640	A1	8,10
Battery AA 3.6 V lithium ER14505	759182	A1	8,40
Battery AA 1,5 V Alkaline VARTA 4906	459099	A1	5,00

## AF25+ LRW

Contact sensor in the USE enclosure with connection cable and brass lug for surface temperature measurement (cold or hot water) on pipes and other curved surfaces.



AF25+ BAT LRW



AF25+ Dual BAT LRW



### Technical Data

Measured values	temperature
Configuration	App, uConfig, LoRaWAN® Downlink
Radio technology	LoRaWAN® (868 MHz)
Power supply	battery type AA (2x)
Material in touch with media	Sensor probe: Ø=6 mm, brass, with contact tongue 16-point pressed (IP65)
Installation length	35 mm
Enclosure	USE-M, impact- and shock-resistant enclosure with quick-release cover, PC
Colour	pure white
Operating range temperature	-50..+135 °C
Protection (IP)	IP65, according to EN 60529
Connection cable	PVC, 0,25 mm <sup>2</sup>
Length connection wire	1 m
Delivery content	incl. mounting base enclosure USE-M pure white incl. mounting set (screws and accessories)
Notes	<b>Dual:</b> Variant with 2 independent sensor elements

### Contact sensor temperature

Item description	App	Item No.	Group	€
AF25+ BAT LRW T135 L1000	✓	850312	W2	135,40
AF25+ Dual BAT LRW T135 L1000	✓	850303	W2	156,40

Options	
Description	€
2-wire connection cable L2000 for T135 / T160 / T180 – (Dual x2)	4,60
2-wire connection cable L4000 for T135 / T160 / T180 – (Dual x2)	13,80
2-wire connection cable L6000 for T135 / T160 / T180 – (Dual x2)	23,00
Other connection types and lengths	on request

Accessories			
Item description	Item No.	Group	€
Tension clamp for pipes Ø up to 110 mm with contact fluid	658911	A1	3,30
Tension clamp for pipes Ø up to 250 mm with contact fluid	648103	A1	5,20
Tightening strap PA (max. 85 °C) for pipes Ø up to 100 mm with contact fluid	668071	A1	3,30
Mounting base enclosure USE-M pure white	668354	A1	9,60
Battery AA 1,5 V lithium L91	819640	A1	8,10
Battery AA 3.6 V lithium ER14505	759182	A1	8,40
Battery AA 1,5 V Alkaline VARTA 4906	459099	A1	5,00

**WK02+ LRW**

Condensation sensor with LoRaWAN® interface as well as LED signal and a relay output to prevent condensation on chilled surfaces. For control and monitoring applications or connection to cooling valves to stop the flow of chilled water flow upon condensation. The 'ext.' model uses a 2m remote sensor for a more flexible installation. In radio-shielded mounting locations, an optional external antenna can be used to optimize the radio link between the device and the gateway.



Technical Data	
Measured values	temperature, relative humidity, condensation
Configuration	USEapp, LoRaWAN® Downlink
Output switch contact	changeover contact floating, max. 250 V ~, 1 A resistive load
Radio technology	LoRaWAN® (868 MHz)
Measuring range humidity	0..100% rH non-condensing
Power supply	<b>24 V:</b> 15..24 V = (±10%) SELV, 24 V ~ (±10%) SELV <b>230 V:</b> 230 V ~ (±10%)
Power consumption	<b>24 V:</b> typ. 0,8 W (24 V =), 1,6 VA (24 V ~) <b>230 V:</b> typ. 3,5 W (230 V ~)
Display	LED green – power supply OK, LED red – condensation
Enclosure	USE-L, impact- and shock-resistant enclosure with quick-release cover, PC
Colour	pure white, transparent cover
Operating range temperature	0..+50 °C
Protection (IP)	IP65, according to EN 60529
Connection	removable cable entry M25 with fourfold cable entry for wire with max. Ø=7 mm, removable plug-in terminal, max. 2,5 mm²
Connection cable	PVC, 0,25 mm², white
Length connection wire	2 m
Delivery content	incl. mounting base enclosure USE-L pure white incl. mounting set (screws and accessories) incl. cable tie 140x3,6 mm incl. syringe thermal contact fluid 1 ml

Condensation sensor – LoRaWAN® (868 MHz)				
Item description	App	Item No.	Group	€
WK02+ ext LRW 24 V L2000	✓	798181	W2	242,80
WK02+ ext LRW 230 V L2000	✓	798198	W2	268,90

Options	
Description	€
Other connection types and lengths	on request

Accessories			
Item description	Item No.	Group	€
Mounting base enclosure USE-L pure white	668361	A1	13,40
Mounting kit universal for enclosure USE	698511	A1	10,70
BLE dongle with micro-USB for devices USE-M / USE-L / NOVOS / thanos EVO	668262		32,10
Cable entry M20 USE white, sealing insert Flextherm Ø=4,5..9 mm (4 pcs)	851077	A1	12,30
Sealing insert M20 USE white, Flextherm Ø=4,5..9 mm (10 pcs)	752206	A1	12,30
Sealing insert M20 USE white, 2x Ø=7 mm (10 pcs)	641333	A1	12,30
Cable entry M25 USE white, sealing insert 4x Ø=7 mm (4 pcs)	641364	A1	12,30

## LS02+ ext. LRW

Leakage detector with relay output and two signalling LEDs designed for alarm, control and monitoring applications of containers, false floors, suspended ceilings or rooms for preventing unintended ingress of water. The remote sensor element enables flexible mounting. This allows the leakage detector to be individually adapted to the existing installation situation or leakage height to be detected. A potential-free switching contact is used for communication with the higher-level control system.



Technical Data	
Measured values	leakage
Configuration	USEapp, LoRaWAN® Downlink
Output switch contact	changeover contact, 1 A resistive load, max. 24 V, floating
Radio technology	LoRaWAN® (868 MHz)
Power supply	15..24 V = (±10%) SELV, 24 V ~ (±10%) SELV
Power consumption	typ. 0,8 W (24 V =), 1,5 VA (24 V ~)
Material in touch with media	stainless steel V4A (1.4401)
Display	LED green – power supply OK, LED red – alarm, leakage detected
Enclosure	USE-L, impact- and shock-resistant enclosure with quick-release cover, PC
Colour	pure white, transparent cover
Operating range temperature	-20..+60 °C
Protection (IP)	IP65, according to EN 60529
Connection	removable cable entry flextherm M20 for wire Ø=4,5..9 mm removable plug-in terminal, max. 2,5 mm²
Connection cable	PVC, 0,25 mm²
Length connection wire	5 m
Mounting	level compensation through spring contacts
Delivery content	incl. mounting base enclosure USE-L pure white incl. mounting set (screws and accessories) incl. fixing kit rawlplugs and screws (2x each)

**Leakage detector – LoRaWAN® (868 MHz)**

Item description	App	Item No.	Group	€
LS02+ ext LRW L5000	✓	798136	W2	204,90

**Options**

Description	€
Other connection types and lengths	on request

**Accessories**

Item description	Item No.	Group	€
Mounting base enclosure USE-L pure white	668361	A1	13,40
Mounting kit universal for enclosure USE	698511	A1	10,70
BLE dongle with micro-USB for devices USE-M / USE-L / NOVOS / thanos EVO	668262		32,10
Fixing kit rawplugs and screws (2x each)	660945	A1	1,10
Cable entry M20 USE white, sealing insert Flextherm Ø=4,5..9 mm (4 pcs)	851077	A1	12,30
Sealing insert M20 USE white, Flextherm Ø=4,5..9 mm (10 pcs)	752206	A1	12,30
Sealing insert M20 USE white, 2x Ø=7 mm (10 pcs)	641333	A1	12,30
Cable entry M25 USE white, sealing insert 4x Ø=7 mm (4 pcs)	641364	A1	12,30

## LS02+ flex LRW

Leakage detector LS02+ flex with relay output and two signalling LEDs designed for alarm, control and monitoring applications of containers, false floors, suspended ceilings or rooms for preventing unintended ingress of water. The type flex detects water or liquid intrusion over the entire length of the sensor rod. A potential-free switching contact is used for communication with the higher-level control system. Thanks to the compact design of the sensor rod, the sensor can be mounted in a variety of places (floors, ceilings, etc.) to save space. The sophisticated and highly flexible insulation braiding also allows direct mounting on water-bearing pipe systems. The sensor rod can easily be shortened on site.



Technical Data	
Measured values	leakage
Configuration	USEapp, LoRaWAN® Downlink
Output switch contact	changeover contact, 1 A resistive load, max. 24 V, floating
Radio technology	LoRaWAN® (868 MHz)
Power supply	15..24 V = (±10%) SELV, 24 V ~ (±10%) SELV
Power consumption	typ. 0,6 W (24 V =), 1,6 VA (24 V ~)
Material in touch with media	Sensor rod, Twisted PVC cable
Installation length	2000 mm, 5000 mm, 20000 mm, 30000 mm
Display	LED green – power supply OK, LED red – alarm, leakage detected
Enclosure	USE-L, impact- and shock-resistant enclosure with quick-release cover, PC
Colour	pure white, transparent cover
Operating range temperature	-20..+60 °C
Protection (IP)	IP65, according to EN 60529
Connection	removable cable entry flextherm M20 for wire Ø=4,5..9 mm removable plug-in terminal, max. 2,5 mm <sup>2</sup>
Mounting	additional fixation of the sensor rod possible with adhesive pads (see accessories)
Delivery content	incl. mounting base enclosure USE-L pure white incl. mounting set (screws and accessories) incl. fixing kit rawplugs and screws (2x each)

Leakage detector – LoRaWAN® (868 MHz)				
Item description	App	Item No.	Group	€
LS02+ flex LRW L2000	✓	798143	W2	263,50
LS02+ flex LRW L5000	✓	798150	W2	292,90
LS02+ flex LRW L20m	✓	798167	W2	439,90
LS02+ flex LRW L30m	✓	798174	W2	537,90

Options	
Description	€
Other connection types and lengths	on request

Accessories			
Item description	Item No.	Group	€
Mounting base enclosure USE-L pure white	668361	A1	13,40
Mounting kit universal for enclosure USE	698511	A1	10,70
BLE dongle with micro-USB for devices USE-M / USE-L / NOVOS / thanos EVO	668262		32,10
Fixing kit rawplugs and screws (2x each)	660945	A1	1,10
C-clip adhesive pads (5 pieces) – mounting accessories for LS02+ flex	778596	A1	10,30
Cable entry M20 USE white, sealing insert Flextherm Ø=4,5..9 mm (4 pcs)	851077	A1	12,30
Sealing insert M20 USE white, Flextherm Ø=4,5..9 mm (10 pcs)	752206	A1	12,30
Sealing insert M20 USE white, 2x Ø=7 mm (10 pcs)	641333	A1	12,30
Cable entry M25 USE white, sealing insert 4x Ø=7 mm (4 pcs)	641364	A1	12,30

## **DPA+ LRW**

Differential pressure transmitter for measuring and monitoring overpressure, underpressure, differential pressure and flow volume of air and other non-aggressive gases in fan and filter systems in duct applications. 8 adjustable pressure and flow volume ranges permit use in HVAC applications of clean rooms, process measurement and controls systems. In addition to LoRaWAN®, additional analog voltage outputs are available as interfaces. In radio-shielded mounting locations, an optional external antenna can be used to optimize the radio link between the device and the gateway. A hinged cover and tool-free wiring as well as removable cable entries ensure a quick and easy installation. 'Dual' versions with 2 independent sensors for up to 2x differential pressures or 2x flow volume in a single enclosure are available. The mounting base (included in the delivery content) can be used to mount the DPA+ on a flat surface or on DIN rail TS35 (35x7,5 mm) in accordance with EN 60715.



DPA+



DPA+ Dual



DPA+  
with additional cable entry  
(refer to mounting accessories USE)



Technical Data	
Measured values	differential pressure, volume flow pressure in Pa or inchWC, volume flow in m <sup>3</sup> /h or cfm optionally configurable via app or uConfig
Configuration	USEapp, DIP switches, LoRaWAN® Downlink
Output voltage	2x 0..10 V or 0..5 V, adjustable via jumper, live-zero configuration via app or uConfig, min. load 10 kΩ
Radio technology	LoRaWAN® (868 MHz)
Measuring range pressure	<p><b>DPA250+</b>: 0..+25   0..+50   0..+100   0..+250   -25..+25   -50..+50   -100..+100   -150..+150 Pa, 0..+250 Pa (default setting),</p> <p><b>DPA2500+</b>: -100..+100   0..+100   0..+250   0..+500   0..+1000   0..+1500   0..+2000   0..+2500 Pa, 0..+2500 Pa (default setting)</p> <p><b>DPA7000+</b>: 0..+1000   0..+1500   0..+2000   0..+2500   0..+3000   0..+4000   0..+5000   0..+7000 Pa, 0..+7000 Pa (default setting)</p> <p>selectable at the device</p>
Measuring range velocity	0..750.000 m <sup>3</sup> /h, optionally configurable
Power supply	15..35 V = SELV, 19..29 V ~ SELV
Power consumption	max. 2,5 W (24 V ~), 4,3 VA (24 V ~)
Enclosure	USE-L, impact- and shock-resistant enclosure with quick-release cover, PC
Colour	pure white
Operating range temperature	-10..+50 °C
Protection (IP)	IP65, according to EN 60529
Connection	removable cable entry M25 with fourfold cable entry for wire with max. Ø=7 mm, removable plug-in terminal, max. 2,5 mm <sup>2</sup> , inputs max. 1,0 mm <sup>2</sup> pressure connection male Ø=5,0 mm / Ø=6,3 mm connection tube: PVC, soft
Mounting	surface-mounted flat on base using screws prepared for mounting on DIN rail TS35 (35x7,5 mm) according to EN 60715
Delivery content	incl. mounting base enclosure USE-L pure white incl. mounting set (screws and accessories) incl. pressure connection set and 2 m PVC connection hose
Notes	output protection circuit (reverse polarity protected)

Differential pressure and volume flow transducer – LoRaWAN® (868 MHz)					
Item description	App	Item No.	Group	€	
DPA250+ LRW MultiRange	✓	798099	W2	189,80	
DPA2500+ LRW MultiRange	✓	798105	W2	189,80	
DPA7000+ LRW MultiRange	✓	798112	W2	189,80	

Dual differential pressure and volume flow transducer – LoRaWAN® (868 MHz)					
Item description	App	Item No.	Group	€	
DPA2500+ Dual LRW	✓	798129	W2	287,30	

Options					
Description					€
Automatic zero-point calibration (AZ)					61,20
Automatic zero-point calibration dual (2x AZ)					122,20

Accessories					
Item description	Item No.	Group	€		
T-hose connector for pressure hoses Ø=4 mm (10 pcs)	668323	A1	36,60		
Metal duct connector MKS40 (Ø=4 mm, L=40 mm)	265138	A1	5,00		
Metal duct connector MKS100 (Ø=5 mm, L=100 mm)	302531	A1	5,90		
Mounting base enclosure USE-L pure white	668361	A1	13,40		
Mounting kit universal for enclosure USE	698511	A1	10,70		
BLE dongle with micro-USB for devices USE-M / USE-L / NOVOS / thanos EVO	668262		32,10		
USB interface for devices USE-M / USE-L / NOVOS / thanos EVO / SR06 LCD	597838	A1	39,50		
Cable entry M20 USE white, sealing insert Flextherm Ø=4,5..9 mm (4 pcs)	851077	A1	12,30		
Sealing insert M20 USE white, Flextherm Ø=4,5..9 mm (10 pcs)	752206	A1	12,30		
Sealing insert M20 USE white, 2x Ø=7 mm (10 pcs)	641333	A1	12,30		
Cable entry M25 USE white, sealing insert 4x Ø=7 mm (4 pcs)	641364	A1	12,30		
Protective enclosure TAP+	782739	A1	40,00		

## CubicMeter

CubicMeter is a non-invasive volume flow and leakage sensor for use on copper and plastic pipes. Using ultrasonic technology, the sensor measures the volume flow and indicates anomalies (e.g. leaks) without having to open existing pipework. It is mounted directly on water pipes using stainless steel clamps. The device transmits the detected data wirelessly via LoRaWAN®.



CubicMeter LTCM02-P / -C

### Technical Data

Measured values	temperature, volume flow, leakage
Configuration	LoRaWAN® Downlink
Radio technology	LoRaWAN® (868 MHz)
Power supply	Lithium battery (permanently installed)
Display	graphic display monochrome (internal)
Colour	white, black
Operating range temperature	5..55 °C
Protection (IP)	IP65
Mounting	C: Non-invasive fastening on copper pipes using clamps P: Non-invasive fastening on plastic pipes using clamps

### Volume flow sensor – LoRaWAN® (868 MHz)

Item description	Item No.	Group	€
CubicMeter LTCM02-C	833677	W1	304,70
CubicMeter LTCM02-P	833684	W1	304,70

## Gateway LRW Indoor RAK 7268

LoRaWAN® indoor gateway with external antenna and integrated network/application server. An MQTT interface (client) enables a direct connection to higher-level systems. Alternatively, the gateway can be connected to an external network server. Configuration is intuitive via an integrated web interface.



### Technical Data

Configuration	web interface
Network technology	TCP/IP, MQTT
Radio technology	<b>CV2:</b> LoRaWAN® (868 MHz), Cellular radio (LTE), WLAN <b>V2:</b> LoRaWAN® (868 MHz), WLAN
Power supply	12 V =, PoE
Display	LED for status feedback, multicoloured
Enclosure	PC, ABS
Colour	white
Operating range temperature	-10..55 °C
Protection (IP)	IP30
Delivery content	incl. external power supply

### Gateway LoRaWAN® -> IP

Item description	Item No.	Group	€
Gateway LRW Indoor RAK 7268CV2 (LTE)	827898	W1	359,50
Gateway LRW Indoor RAK 7268V2	832359	W1	274,50

## Gateway LRW Outdoor LORIX One

Professional and compact LoRaWAN® outdoor gateway with external antenna. Thanks to the passive PoE connection, the gateway requires only one line for power supply and connection to an external network server. The configuration is done intuitively via an integrated web interface. Various mounting options are available, e.g. for wall or pole mounting.



### Technical Data

<b>Configuration</b>	web interface
<b>Network technology</b>	TCP/IP
<b>Radio technology</b>	LoRaWAN® (868 MHz)
<b>Power supply</b>	24 V =, passive PoE
<b>Power consumption</b>	typ. 3 W (24 V =)
<b>Colour</b>	light grey
<b>Operating range temperature</b>	-30..+55 °C
<b>Protection (IP)</b>	IP65, according to EN 60529
<b>Connection</b>	RJ45 socket (8P8C) 10/100 MBit/s Ethernet
<b>Mounting</b>	mounting at the wall or at a pole
<b>Delivery content</b>	incl. external power supply incl. passive PoE splitter

### Gateway LoRaWAN® -> IP

Item description	Item No.	Group	€
Gateway LRW Outdoor LORIX One	806619	W1	1167,60

## Converter LRW NBnano

Converter for LoRaWAN® data to BACnet IP and Modbus TCP/IP. The NBnano contains a LoRaWAN® network/application server and allows conversion to BACnet IP or Modbus TCP/IP for direct connection to a building management system. External LoRaWAN® gateways (e.g. indoor RAK 7268), which are connected to the NBnano, serve as radio receivers.



Technical Data	
Configuration	web interface
Network technology	Modbus TCP/IP, BACnet IP, TCP/IP
Radio technology	LoRaWAN® (868 MHz), WLAN
Power supply	12 V =
Operating range temperature	-20..+60 °C
Connection	2x RJ45 socket
Delivery content	incl. external power supply
Notes	optional extension of the possible number of devices (50   200   1000   2000) available

Gateway LoRaWAN® -> IP			
Item description	Item No.	Group	€
Converter LRW NBnano	809160	W1	980,00

# Bluetooth®

Bluetooth® solutions gain more and more importance for modern lighting controls. Thanks to the wireless and batteryless switches of Thermokon 2,4 GHZ-BLE lighting systems can be controlled easily. The switches are ideal for switching and dimming of lights and for the call of lighting scenes.



Bluetooth®



## BLE Switches (Bluetooth® Low Energy)

Mini	BLE switch (battery-free)	142
55x55	BLE switch (battery-free)	144
Busch-Jaeger	BLE switch (battery-free)	146

## Wireless Switches Mini

Energy-harvesting wireless switch for adjusting the (dimming) status of lights and blinds. The EasySens® radio technology offers flexible attachment to glass and plasterboard walls using the adhesive pad or screws.



4-channel blinds, pure white brilliant



2-channel blinds, anthracite



Technical Data	
Operating functions	light ON/OFF, blind UP/DOWN
Operating elements	<b>2-channel:</b> 1 switch <b>4-channel:</b> 2 switches
Configuration	NFC-based / DMC
Radio technology	Bluetooth® Low Energy (BLE), Beacon
Power supply	maintenance-free electrodynamic energy generator
Enclosure	PC
Colour	pure white brilliant, anthracite
Operating range temperature	-25..+65 °C
Switch ranges	Thermokon mini
Mounting	surface-mounted flat on base using adhesive foil or screws
Notes	price including frame actuation force 7 N, actuation range 2 mm, operating cycle quantity > 50.000 configuration interface NFC forum type 2 tag (ISO/IEC 14443 parts 2 and 3) Data Matrix Code (DMC) on the back of the unit for commissioning

**Wireless switch 2-channel light**

Item description	Item No.	Group	€
Switch Mini 2-channel BLE light pure white brilliant	731065	E2	77,90
Switch Mini 2-channel BLE light anthracite	733953	E2	77,90

**Wireless switch 4-channel light**

Item description	Item No.	Group	€
Switch Mini 4-channel BLE light pure white brilliant	708425	E2	80,50
Switch Mini 4-channel BLE light anthracite	733977	E2	80,50

**Wireless switch 2-channel blind**

Item description	Item No.	Group	€
Switch Mini 2-channel BLE blind pure white brilliant	733984	E2	77,90
Switch Mini 2-channel BLE blind anthracite	734004	E2	77,90

**Wireless switch 4-channel blind**

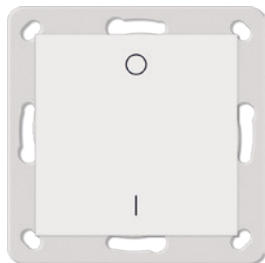
Item description	Item No.	Group	€
Switch Mini 4-channel BLE blind pure white brilliant	734011	E2	80,50
Switch Mini 4-channel BLE blind anthracite	734035	E2	80,50

**Options**

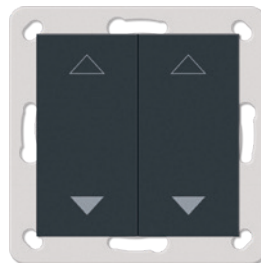
Description	€
Special printing	on request

## Wireless Switches 55x55

Energy-harvesting wireless switch for adjusting the (dimming) status of lights and blinds. The EasySens® radio technology offers flexible attachment to glass and plasterboard walls using the adhesive pad or screws.



2-channel light pure white



4-channel blinds anthracite



Technical Data	
Operating functions	light ON/OFF, blind UP/DOWN
Operating elements	<b>2-channel:</b> 1 switch <b>4-channel:</b> 2 switches
Configuration	NFC-based / DMC
Radio technology	Bluetooth® Low Energy (BLE), Beacon
Power supply	maintenance-free electrodynamic energy generator
Enclosure	PC
Colour	pure white brilliant, pure white matt, anthracite
Operating range temperature	-25..+65 °C
Switch ranges	Berker, Busch-Jaeger, Gira, Jung, Merten, Peha (please specify the desired frame when ordering)
Mounting	surface-mounted flat on base using adhesive foil or screws
Delivery content	incl. adhesive foil for mounting
Notes	actuation force 7 N, actuation range 2 mm, operating cycle quantity > 50.000, configuration interface NFC forum type 2 tag (ISO/IEC 14443 parts 2 and 3) Data Matrix Code (DMC) on the back of the unit for commissioning

**Wireless switch 2-channel light**

Item description	Item No.	Group	€
Switch 2-channel BLE light 55x55 pure white matt	839624	E1	84,50
Switch 2-channel BLE light 55x55 pure white brilliant	839631	E1	84,50
Switch 2-channel BLE light 55x55 anthracite	839662	E1	84,50

**Wireless switch 4-channel light**

Item description	Item No.	Group	€
Switch 4-channel BLE light 55x55 pure white matt	839679	E1	87,10
Switch 4-channel BLE light 55x55 pure white brilliant	839686	E1	87,10
Switch 4-channel BLE light 55x55 anthracite	839709	E1	87,10

**Wireless switch 2-channel blind**

Item description	Item No.	Group	€
Switch 2-channel BLE blind 55x55 pure white matt	839716	E1	84,50
Switch 2-channel BLE blind 55x55 pure white brilliant	839723	E1	84,50
Switch 2-channel BLE blind 55x55 anthracite	839747	E1	84,50

**Wireless switch 4-channel blind**

Item description	Item No.	Group	€
Switch 4-channel BLE blind 55x55 pure white matt	839761	E1	87,10
Switch 4-channel BLE blind 55x55 pure white brilliant	839778	E1	87,10
Switch 4-channel BLE blind 55x55 anthracite	839792	E1	87,10

**Options**

Description	€
Special printing	on request
Switch ranges (various manufacturers)	Page 256

## Wireless Switches BJ 63x63

Energy-harvesting wireless switch for adjusting the (dimming) status of lights and blinds, especially for Busch-Jaeger (63x63mm) designs. The radio technology offers flexible attachment to glass and plasterboard walls using the adhesive pad or screws.



4-channel blinds,  
future® linear studio white



2-channel blinds,  
future® linear anthracite



Technical Data	
Operating functions	light ON/OFF, blind UP/DOWN
Operating elements	<b>2-channel:</b> 1 switch <b>4-channel:</b> 2 switches
Configuration	NFC-based / DMC
Radio technology	Bluetooth® Low Energy (BLE), Beacon
Power supply	maintenance-free electrodynamic energy generator
Enclosure	PC
Colour	studio white, ivory white, anthracite
Operating range temperature	-25..+65 °C
Switch range Busch-Jaeger	Busch-axcent®, carat®, future® linear, solo® (please specify the desired frame when ordering)
Mounting	surface-mounted flat on base using adhesive foil or screws
Delivery content	incl. adhesive foil for mounting
Notes	actuation force 7 N, actuation range 2 mm, operating cycle quantity > 50.000 frame designs Busch-Jaeger solo®, future® linear and Busch-axcent® at the same price, please ask for carat® Busch-balance® SI see Wireless Switches 55x55 configuration interface NFC forum type 2 tag (ISO/IEC 14443 parts 2 and 3) Data Matrix Code (DMC) on the back of the unit for commissioning

**Wireless switch 2-channel light**

Item description	Item No.	Group	€
Switch 2-channel BLE light BJ63x63 studio white	734516	E1	87,10
Switch 2-channel BLE light BJ63x63 ivory white	734547	E1	87,10
Switch 2-channel BLE light BJ63x63 anthracite	734561	E1	87,10

**Wireless switch 4-channel light**

Item description	Item No.	Group	€
Switch 4-channel BLE light BJ63x63 studio white	734509	E1	89,90
Switch 4-channel BLE light BJ63x63 ivory white	734578	E1	89,90
Switch 4-channel BLE light BJ63x63 anthracite	734592	E1	89,90

**Wireless switch 2-channel blind**

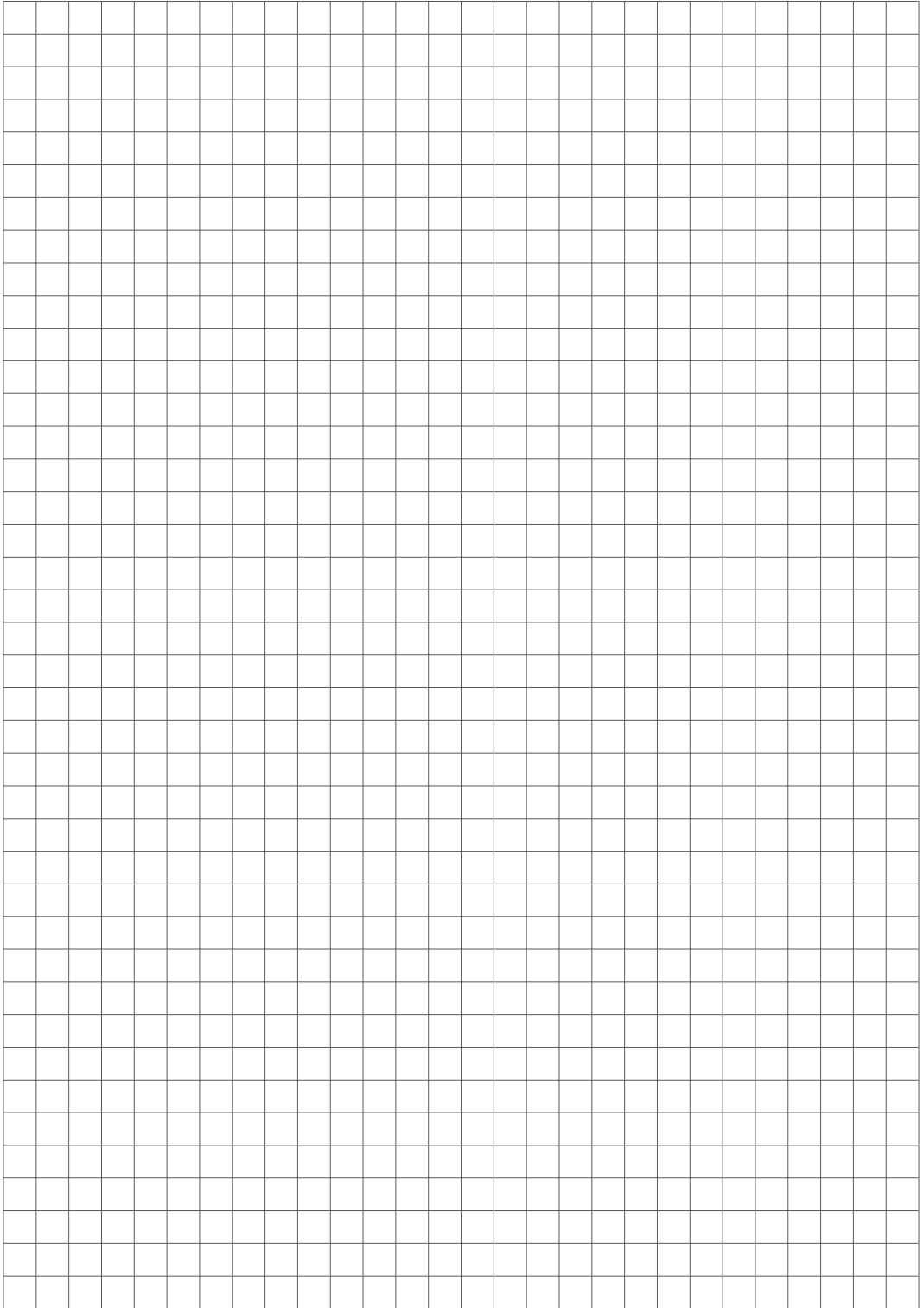
Item description	Item No.	Group	€
Switch 2-channel BLE blind BJ63x63 studio white	734615	E1	87,10
Switch 2-channel BLE blind BJ63x63 ivory white	734622	E1	87,10
Switch 2-channel BLE blind BJ63x63 anthracite	735056	E1	87,10

**Wireless switch 4-channel blind**

Item description	Item No.	Group	€
Switch 4-channel BLE blind BJ63x63 studio white	734608	E1	89,90
Switch 4-channel BLE blind BJ63x63 ivory white	735070	E1	89,90
Switch 4-channel BLE blind BJ63x63 anthracite	735100	E1	89,90

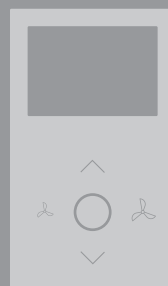
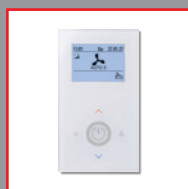
**Options**

Description	€
Special printing	on request
Switch ranges Busch-Jaeger future® linear   solo®   Busch-axcent®	6,00



# Room Application

Our room operating units and room sensors enable the measured value acquisition and/or integrated operation of HVAC, lighting and shading in individual room control. Due to the sophisticated appearance and a variety of design options, the devices are particularly suitable for design-oriented facilities.



## Room Operating Units

thanos EVO	Temperature, humidity, CO2, VOC	150
NOVOS Touch	Temperature, humidity, CO2, VOC	156
NOVOS 7	Temperature, humidity, CO2, VOC	160
NOVOS 5 x	Temperature, humidity, CO2, VOC	164
NOVOS 3 x	Temperature, humidity, CO2, VOC	168
NOVOS 3 INC	Temperature, humidity	173
NOVOS 3 Timer	Timer	176
WRF07 x	Temperature, rel. humidity, CO2, VOC	178
WRF07 INC	Temperature, rel. humidity	182
WRF06 LCD	Temperature, rel. humidity	184
WRF06 x	Temperature	186
LCR Touch	Temperature, humidity, VOC	187

## Room Controller

JOY Fancoil	Temperature, rel. humidity	188
JOY HC	Temperature, rel. humidity	194
LCF02 Touch	Temperature	198
LCF02 QTouch	Temperature, rel. humidity, CO2	200
LCF02	Temperature	202
LCF Touch	Temperature	204
LCF	Temperature	205
WRF07 RC x	Temperature, rel. humidity	206
WRF06 LCD RC	Temperature, rel. humidity	208
WRF04 RC x	Temperature	210
FSR01	Rel. humidity	212

## Room Sensors

NOVOS 3	Temperature, humidity, CO2, VOC	214
NOVOS 3 IR	Radiation temperature	218
WRF06	Temperature, rel. humidity, CO2, VOC	220
FTB+	Temperature, humidity	224
WRF06I	Motion	226
WRF04I	Motion	228

## Pendulum Sensors

RPF40/40+	Temperature, radiation temp.	229/230
RPF100/100+	Temperature	232/233
FTP+	Temperature, humidity	235
LP+	CO2, Temperature, humidity	237

## Ceiling Sensors

thevios HUB	Temp., rH, CO2, VOC, Hell., Bew., PM	240
thevios 5	Temp., rH, CO2, VOC, Hell., Bew., PM	242
thevios 3	Temp., rH, Helligkeit, Bewegung	244
RDF18+	Temperature, humidity	246
RDF18	Temperature	248
RDI	Motion	249
RDF-IR	Radiation temperature	250
LDF+	Light	252

## thanos EVO

The high-grade materials and sophisticated design of the thanos EVO make it an outstanding room unit for high-end residential or commercial buildings. With its 4.8" touchscreen and up to 4 integrated sensors (temperature, relative humidity, CO2 and VOC), users can individually adjust multiple HVAC and lighting/blinds features. 2D room graphics make operations even more intuitive. External sensors and inputs enhance the multi-functionality of the thanos EVO.

## thanosEVO



## thanosEVO design



Technical Data	
Measured values	temperature, relative humidity, absolute humidity, enthalpy, dew point, CO <sub>2</sub> , VOC
Operating functions	setpoint adjustment temperature, fan stage adjustment, presence detection, light ON/OFF/DIM, blind UP/DOWN/SET, setup scenarios, ECO function, showing measured value and history
Operating elements	capacitive touch screen
Configuration	NOVOSapp, uConfig, BUS, ETS (KNX) (depending on type)
Input	<b>BACnet/Modbus:</b> 1x input for floating contact <b>KNX:</b> 1x input for NTC10k or floating contact 2x input for floating contact
Network technology	RS485 Modbus, RS485 BACnet (MS/TP), KNX (TP1)
Radio technology	BlueRange Mesh
Output signal temperature	0..+50 °C (default setting), selectable from 4 temperature ranges -50..+50   0..+50   -20..+80   -15..+35 °C, optionally configurable
Measuring range humidity	0..100% rH non-condensing, 0..85 KJ/kg enthalpy, 0..50   0..80 g/m <sup>3</sup> absolute humidity, 0..+50   -20..+80 °C dew point, optionally configurable
Measuring range CO <sub>2</sub>	0..2000 ppm, 0..5000 ppm, optionally configurable
Measuring VOC (mixed gas)	heated metal oxide semiconductor
Power supply	24 V = (±10%) SELV, 24 V ~ (±10%) SELV <b>KNX:</b> 24 V = (±10%) SELV
Power consumption	typ. 3 W (24 V =), 6 VA (24 V ~) <b>KNX:</b> typ. 3 W (24 V =)
Display	TFT 4,8", 1120x480 px, capacitive touch technology
Enclosure	with thermal separation and sensor channel, PC V0
Colour	pure white, black, design frame anodised aluminium available
Operating range temperature	0..+50 °C
Protection (IP)	IP30, according to EN 60529
Connection	cable entry via rear opening <b>BACnet/Modbus/BlueRange:</b> tool-free mountable spring clamp, max. 1,5 mm <sup>2</sup> predetermined breaking point (bottom) or drilling mark (top) <b>KNX:</b> removable plug-in terminal, max. Ø=0,8 mm
Mounting	base part can be mounted and wired separately <b>BACnet/Modbus/BlueRange:</b> flush-mounted on standard EU box (Ø=60 mm), surface-mounted flat on base using adhesive foil or screws <b>KNX:</b> flush-mounted in standard EU box (Ø=60 mm, depth min. 45 mm)
Notes	<b>thanos EVO Design:</b> Surcharge for design frame (mandatory), please select colour Mixed-gas sensors detect volatile organic compounds (VOC) such as body odours, tobacco smoke and off-gassing from materials (furniture, carpets, paint, adhesives, etc.)



Touchscreen room operating unit with up to 4 measured values – RS485 BACnet (MS/TP) – thanos EVO white				
Item description	NOVOSapp	Item No.	Group	€
thanos EVO white temp RS485 BACnet (MS/TP)	✓	766630	R1	460,80
thanos EVO white temp_rH RS485 BACnet (MS/TP)	✓	780339	R1	503,80
thanos EVO white CO2 temp_rH RS485 BACnet (MS/TP)	✓	775434	R1	568,30
thanos EVO white CO2+VOC temp_rH RS485 BACnet (MS/TP)	✓	771368	R1	622,00

Touchscreen room operating unit with up to 4 measured values – RS485 BACnet (MS/TP) – thanos EVO black				
Item description	NOVOSapp	Item No.	Group	€
thanos EVO black temp RS485 BACnet (MS/TP)	✓	774352	R1	473,80
thanos EVO black temp_rH RS485 BACnet (MS/TP)	✓	780360	R1	516,80
thanos EVO black CO2 temp_rH RS485 BACnet (MS/TP)	✓	780377	R1	581,30
thanos EVO black CO2+VOC temp_rH RS485 BACnet (MS/TP)	✓	771351	R1	635,00

Touchscreen room operating unit with up to 4 measured values – RS485 BACnet (MS/TP) – thanos EVO Design				
Item description	NOVOSapp	Item No.	Group	€
thanos EVO design black temp RS485 BACnet (MS/TP)	✓	807418	R1	473,80 *
thanos EVO design black temp_rH RS485 BACnet (MS/TP)	✓	807401	R1	516,80 *
thanos EVO design black CO2 temp_rH RS485 BACnet (MS/TP)	✓	807395	R1	581,30 *
thanos EVO design black CO2+VOC temp_rH RS485 BACnet (MS/TP)	✓	807371	R1	635,00 *

\*

Surcharge for design frame (mandatory), please select colour	
Description	€
Design frame anodised aluminium (gold, graphite, black or silver)	65,00

Accessories			
Item description	Item No.	Group	€
Fixing kit rawlplugs and screws (2x each)	660945	A1	1,10
PSU-UP24 – flush-mounted power supply 24 V	645737	A1	50,60
BLE dongle with micro-USB for devices USE-M / USE-L / NOVOS / thanos EVO	668262		32,10
USB interface for devices USE-M / USE-L / NOVOS / thanos EVO / SR06 LCD	597838	A1	39,50


**Touchscreen room operating unit with up to 4 measured values – RS485 Modbus – thanos EVO white**

Item description	NOVOSapp	Item No.	Group	€
thanos EVO white temp RS485 Modbus	✓	753913	R1	460,80
thanos EVO white temp_rH RS485 Modbus	✓	753944	R1	503,80
thanos EVO white CO2 temp_rH RS485 Modbus	✓	753968	R1	568,30
thanos EVO white CO2+VOC temp_rH RS485 Modbus	✓	754002	R1	622,00

**Touchscreen room operating unit with up to 4 measured values – RS485 Modbus – thanos EVO black**

Item description	NOVOSapp	Item No.	Group	€
thanos EVO black temp RS485 Modbus	✓	753920	R1	473,80
thanos EVO black temp_rH RS485 Modbus	✓	753951	R1	516,80
thanos EVO black CO2 temp_rH RS485 Modbus	✓	753975	R1	581,30
thanos EVO black CO2+VOC temp_rH RS485 Modbus	✓	754019	R1	635,00

**Touchscreen room operating unit with up to 4 measured values – RS485 Modbus – thanos EVO Design**

Item description	NOVOSapp	Item No.	Group	€
thanos EVO design black temp RS485 Modbus	✓	792639	R1	473,80 *
thanos EVO design black temp_rH RS485 Modbus	✓	795814	R1	516,80 *
thanos EVO design black CO2 temp_rH RS485 Modbus	✓	807340	R1	581,30 *
thanos EVO design black CO2+VOC temp_rH RS485 Modbus	✓	801560	R1	635,00 *

\*

**Surcharge for design frame (mandatory), please select colour**

Description	€
Design frame anodised aluminium (gold, graphite, black or silver)	65,00

**Accessories**

Item description	Item No.	Group	€
Fixing kit rawlplugs and screws (2x each)	660945	A1	1,10
PSU-UP24 – flush-mounted power supply 24 V	645737	A1	50,60
BLE dongle with micro-USB for devices USE-M / USE-L / NOVOS / thanos EVO	668262		32,10
USB interface for devices USE-M / USE-L / NOVOS / thanos EVO / SR06 LCD	597838	A1	39,50



Touchscreen room operating unit with up to 4 measured values – KNX – thanos EVO white				
Item description	NOVOSapp	Item No.	Group	€
thanos EVO white temp KNX	✓	850285	R1	529,50
thanos EVO white temp_rH KNX	✓	850284	R1	572,50
thanos EVO white CO2 temp_rH KNX	✓	850282	R1	637,00
thanos EVO white CO2+VOC temp_rH KNX	✓	850290	R1	690,70

Touchscreen room operating unit with up to 4 measured values – KNX – thanos EVO black				
Item description	NOVOSapp	Item No.	Group	€
thanos EVO black temp KNX	✓	850277	R1	542,50
thanos EVO black temp_rH KNX	✓	850276	R1	585,50
thanos EVO black CO2 temp_rH KNX	✓	850280	R1	650,00
thanos EVO black CO2+VOC temp_rH KNX	✓	850275	R1	703,70

Touchscreen room operating unit with up to 4 measured values – KNX – thanos EVO Design				
Item description	NOVOSapp	Item No.	Group	€
thanos EVO design black temp KNX	✓	850293	R1	542,50 *
thanos EVO design black temp_rH KNX	✓	807449	R1	585,50 *
thanos EVO design black CO2 temp_rH KNX	✓	850287	R1	650,00 *
thanos EVO design black CO2+VOC temp_rH KNX	✓	850291	R1	703,70 *

\*

Surcharge for design frame (mandatory), please select colour	
Description	€
Design frame anodised aluminium (gold, graphite, black or silver)	65,00

Accessories			
Item description	Item No.	Group	€
Fixing kit rawplugs and screws (2x each)	660945	A1	1,10
PSU-UP24 – flush-mounted power supply 24 V	645737	A1	50,60
BLE dongle with micro-USB for devices USE-M / USE-L / NOVOS / thanos EVO	668262		32,10
USB interface for devices USE-M / USE-L / NOVOS / thanos EVO / SR06 LCD	597838	A1	39,50

 BlueRange

**Touchscreen room operating unit with up to 4 measured values – BlueRange**

Item description	NOVOSapp	Item No.	Group	€
thanos EVO white temp BlueRange	✓	836340	R1	490,00
thanos EVO white temp_rH BlueRange	✓	836357	R1	533,00
thanos EVO white CO2 temp_rH BlueRange	✓	836364	R1	597,50
thanos EVO white CO2+VOC temp_rH BlueRange	✓	836371	R1	651,20

**Touchscreen room operating unit with up to 4 measured values – BlueRange**

Item description	NOVOSapp	Item No.	Group	€
thanos EVO black temp BlueRange	✓	836388	R1	503,00
thanos EVO black temp_rH BlueRange	✓	836395	R1	546,00
thanos EVO black CO2 temp_rH BlueRange	✓	836401	R1	610,50
thanos EVO black CO2+VOC temp_rH BlueRange	✓	836418	R1	664,20

**Accessories**

Item description	Item No.	Group	€
Fixing kit rawlplugs and screws (2x each)	660945	A1	1,10
PSU-UP24 – flush-mounted power supply 24 V	645737	A1	50,60

## **NOVOS Touch**

Covering the 4.8" touchscreen below a real glass surface, the NOVOS Touch is the flagship model of the NOVOS family. With a maximum of up to 4 integrated sensors (temperature, relative humidity, CO2 and VOC) and the possibility of including external values as well, the NOVOS Touch brilliantly combines comfort and energy efficiency. Multiple design options and colors provide individualism for the most diverse applications.





Technical Data	
Measured values	temperature, relative humidity, absolute humidity, enthalpy, dew point, CO <sub>2</sub> , VOC
Operating functions	setpoint adjustment temperature, fan stage adjustment, presence detection, light ON/OFF/DIM, blind UP/DOWN/SET, setup scenarios, ECO function, showing measured value and history
Operating elements	capacitive touch screen
Configuration	App, uConfig, BUS, ETS (KNX) (depending on type)
Input	<p><b>BACnet/Modbus:</b> 1x input for floating contact</p> <p><b>KNX:</b> 1x input for NTC10k or floating contact 2x input for floating contact</p>
Network technology	RS485 Modbus, RS485 BACnet (MS/TP), KNX (TP1)
Output signal temperature	0..+50 °C (default setting), selectable from 4 temperature ranges -50..+50   0..+50   -20..+80   -15..+35 °C, optionally configurable
Measuring range humidity	0..100% rH non-condensing 0..85 KJ/kg enthalpy 0..50   0..80 g/m <sup>3</sup> absolute humidity 0..+50   -20..+80 °C dew point optionally configurable
Measuring range CO <sub>2</sub>	0..2000 ppm, 0..5000 ppm, optionally configurable
Measuring VOC (mixed gas)	heated metal oxide semiconductor
Power supply	24 V = (±10%) SELV, 24 V ~ (±10%) SELV <b>KNX:</b> 24 V = (±10%) SELV
Power consumption	typ. 3 W (24 V =), 6 VA (24 V ~) <b>KNX:</b> typ. 3 W (24 V =)
Display	TFT 4,8", 1120x480 px, capacitive touch technology
Enclosure	with thermal separation and sensor channel, PC V0
Colour	pure white, black
Operating range temperature	0..+50 °C
Protection (IP)	IP30, according to EN 60529
Connection	<p>cable entry via rear opening</p> <p><b>BACnet/Modbus:</b> tool-free mountable spring clamp, max. 1,5 mm<sup>2</sup> predetermined breaking point (bottom) or drilling mark (top)</p> <p><b>KNX:</b> removable plug-in terminal, max. Ø=0,8 mm</p>
Mounting	<p>base part can be mounted and wired separately</p> <p><b>BACnet/Modbus:</b> flush-mounted on standard EU box (Ø=60 mm), surface-mounted flat on base using adhesive foil or screws</p> <p><b>KNX:</b> flush-mounted in standard EU box (Ø=60 mm, depth min. 45 mm)</p>
Notes	Mixed-gas sensors detect volatile organic compounds (VOC) such as body odours, tobacco smoke and off-gassing from materials (furniture, carpets, paint, adhesives, etc.)

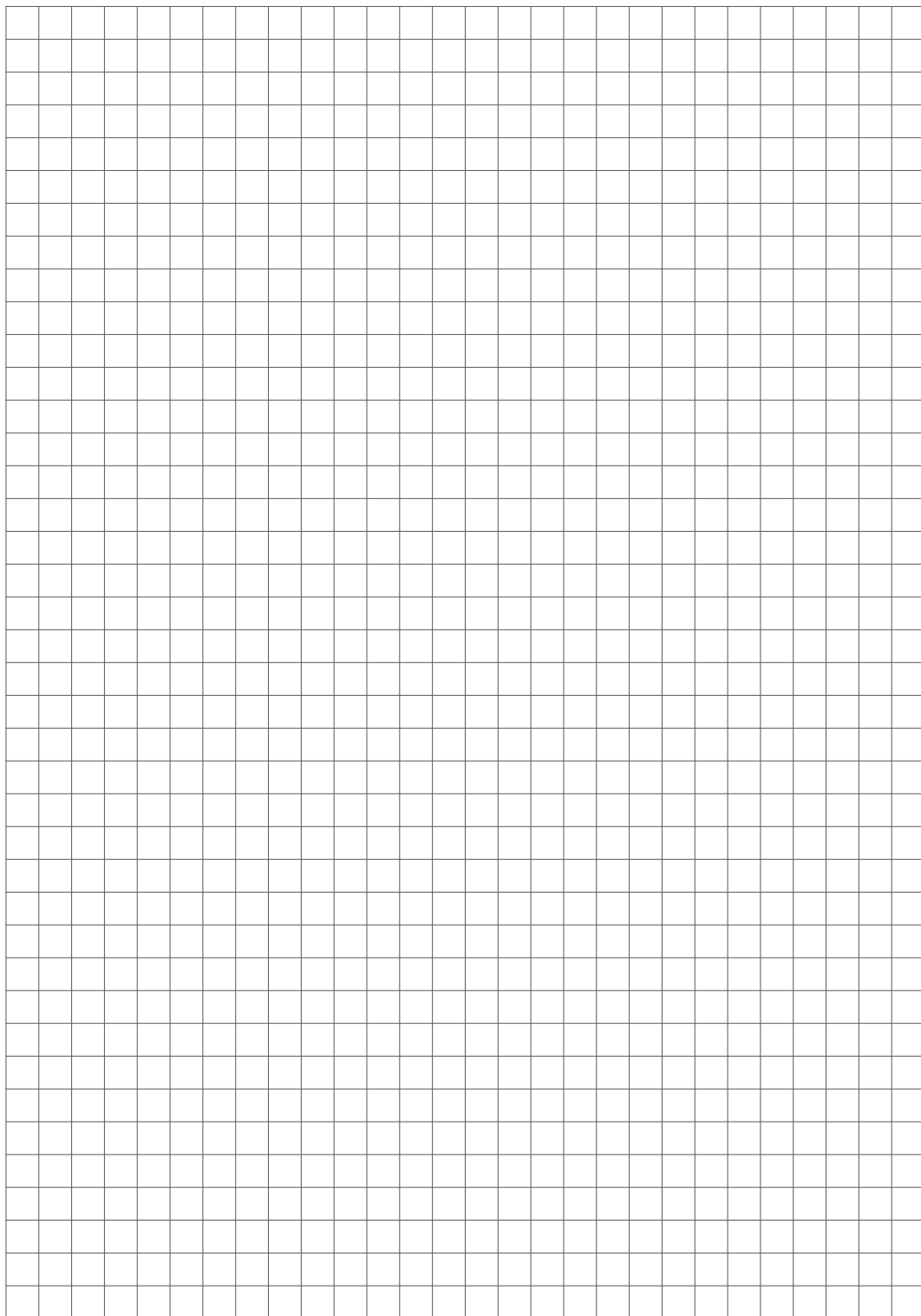
Touchscreen room operating unit with up to 4 measured values – RS485 BACnet (MS/TP)				
Item description	NOVOSapp	Item No.	Group	€
NOVOS Touch white temp RS485 BACnet (MS/TP)	✓	778312	R1	427,90
NOVOS Touch white temp_rH RS485 BACnet (MS/TP)	✓	780704	R1	470,90
NOVOS Touch white CO2 temp_rH RS485 BACnet (MS/TP)	✓	780735	R1	535,40
NOVOS Touch white CO2+VOC temp_rH RS485 BACnet (MS/TP)	✓	780797	R1	589,10

Touchscreen room operating unit with up to 4 measured values – RS485 Modbus				
Item description	NOVOSapp	Item No.	Group	€
NOVOS Touch white temp RS485 Modbus	✓	761802	R1	427,90
NOVOS Touch white temp_rH RS485 Modbus	✓	761819	R1	470,90
NOVOS Touch white CO2 temp_rH RS485 Modbus	✓	761826	R1	535,40
NOVOS Touch white CO2+VOC temp_rH RS485 Modbus	✓	761840	R1	589,10

Touchscreen room operating unit with up to 4 measured values – KNX				
Item description	NOVOSapp	Item No.	Group	€
NOVOS Touch white temp KNX	✓	850268	R1	496,60
NOVOS Touch white temp_rH KNX	✓	850266	R1	539,60
NOVOS Touch white CO2 temp_rH KNX	✓	850257	R1	604,10
NOVOS Touch white CO2+VOC temp_rH KNX	✓	850258	R1	657,80

Options	
Description	€
Enclosure in black	13,00

Accessories			
Item description	Item No.	Group	€
Fixing kit rawplugs and screws (2x each)	660945	A1	1,10
PSU-UP24 – flush-mounted power supply 24 V	645737	A1	50,60
BLE dongle with micro-USB for devices USE-M / USE-L / NOVOS / thanos EVO	668262		32,10
USB interface for devices USE-M / USE-L / NOVOS / thanos EVO / SR06 LCD	597838	A1	39,50



## NOVOS 7

The NOVOS 7 stands out for its well-known and intuitive user interface using a rotary push button and a 3.5" TFT display. Four favourite buttons allow quick access to frequently used functions such as temperature set point or light control. Blinds and lights can thus be configured accordingly. The NOVOS 7 can be equipped with up to 4 integrated sensors (temperature, relative humidity, CO2 and VOC) and contributes to a comfortable room ambience and energy savings.





Technical Data	
Measured values	temperature, relative humidity, absolute humidity, enthalpy, dew point, CO <sub>2</sub> , VOC
Operating functions	setpoint adjustment temperature, fan stage adjustment, presence detection, light ON/OFF/DIM, blind UP/DOWN/SET, setup scenarios, ECO function, showing measured value and history
Operating elements	rotary push button, 4 favourite buttons
Configuration	App, uConfig, BUS, ETS (KNX) (depending on type)
Input	<p><b>BACnet/Modbus:</b> 1x input for floating contact</p> <p><b>KNX:</b> 1x input for NTC10k or floating contact 2x input for floating contact</p>
Network technology	RS485 Modbus, RS485 BACnet (MS/TP), KNX (TP1)
Output signal temperature	0..+50 °C (default setting), selectable from 4 temperature ranges -50..+50   0..+50   -20..+80   -15..+35 °C, optionally configurable
Measuring range humidity	0..100% rH non-condensing 0..85 KJ/kg enthalpy 0..50   0..80 g/m <sup>3</sup> absolute humidity 0..+50   -20..+80 °C dew point optionally configurable
Measuring range CO <sub>2</sub>	0..2000 ppm, 0..5000 ppm, optionally configurable
Measuring VOC (mixed gas)	heated metal oxide semiconductor
Power supply	24 V = (±10%) SELV, 24 V ~ (±10%) SELV <b>KNX:</b> 24 V = (±10%) SELV
Power consumption	typ. 2 W (24 V =), 4 VA (24 V ~) <b>KNX:</b> typ. 2 W (24 V =)
Display	TFT 3,5", 320x480 px
Enclosure	PC V0
Colour	pure white, black
Operating range temperature	0..+50 °C
Protection (IP)	IP30, according to EN 60529
Connection	<p>cable entry via rear opening</p> <p><b>BACnet/Modbus:</b> tool-free mountable spring clamp, max. 1,5 mm<sup>2</sup> predetermined breaking point (bottom) or drilling mark (top)</p> <p><b>KNX:</b> removable plug-in terminal, max. Ø=0,8 mm</p>
Mounting	<p>base part can be mounted and wired separately</p> <p><b>BACnet/Modbus:</b> flush-mounted on standard EU box (Ø=60 mm), surface-mounted flat on base using adhesive foil or screws</p> <p><b>KNX:</b> flush-mounted in standard EU box (Ø=60 mm, depth min. 45 mm)</p>
Notes	Mixed-gas sensors detect volatile organic compounds (VOC) such as body odours, tobacco smoke and off-gassing from materials (furniture, carpets, paint, adhesives, etc.)

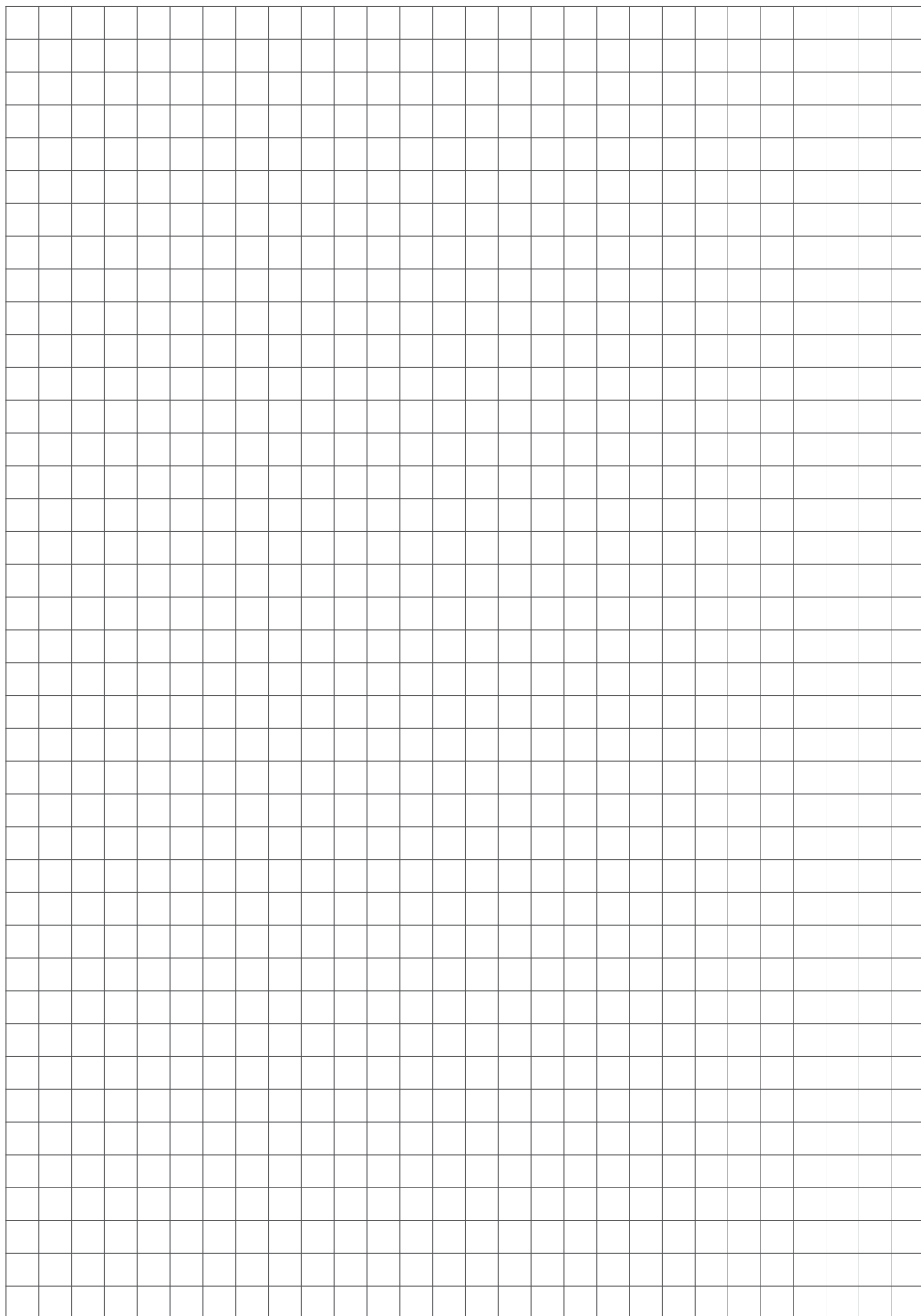
Room operating unit with up to 4 measured values – RS485 BACnet (MS/TP)				
Item description	NOVOSapp	Item No.	Group	€
NOVOS 7 white temp RS485 BACnet (MS/TP)	✓	778329	R1	304,90
NOVOS 7 white temp_rH RS485 BACnet (MS/TP)	✓	780841	R1	347,90
NOVOS 7 white CO2 temp_rH RS485 BACnet (MS/TP)	✓	769037	R1	412,40
NOVOS 7 white CO2+VOC temp_rH RS485 BACnet (MS/TP)	✓	780926	R1	466,10

Room operating unit with up to 4 measured values – RS485 Modbus				
Item description	NOVOSapp	Item No.	Group	€
NOVOS 7 white temp RS485 Modbus	✓	735018	R1	304,90
NOVOS 7 white temp_rH RS485 Modbus	✓	735025	R1	347,90
NOVOS 7 white CO2 temp_rH RS485 Modbus	✓	735032	R1	412,40
NOVOS 7 white CO2+VOC temp_rH RS485 Modbus	✓	735094	R1	466,10

Room operating unit with up to 4 measured values – KNX				
Item description	NOVOSapp	Item No.	Group	€
NOVOS 7 white temp KNX	✓	850261	R1	373,60
NOVOS 7 white temp_rH KNX	✓	850239	R1	416,60
NOVOS 7 white CO2 temp_rH KNX	✓	850235	R1	481,10
NOVOS 7 white CO2+VOC temp_rH KNX	✓	850251	R1	534,80

Options	
Description	€
Colour black	25,90

Accessories			
Item description	Item No.	Group	€
Fixing kit rawplugs and screws (2x each)	660945	A1	1,10
PSU-UP24 – flush-mounted power supply 24 V	645737	A1	50,60
BLE dongle with micro-USB for devices USE-M / USE-L / NOVOS / thanos EVO	668262		32,10
USB interface for devices USE-M / USE-L / NOVOS / thanos EVO / SR06 LCD	597838	A1	39,50



## NOVOS 5 x

The surface-mounted NOVOS 5 x comes in the NOVOS design with an integrated temperature sensor. Possible operating elements are set point potentiometer, status LED with up to 7 selectable colors, rotary switch for fan stage control and a presence button. The connection terminal in the back part allows for pre-wiring. The device is furthermore available with an LCD and integrated traffic light function for indicating the status of measured values. Threshold values and display settings can be individually configured using the Thermokon NOVOSapp.

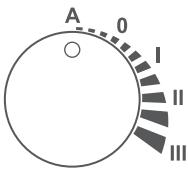


NOVOS 5 S

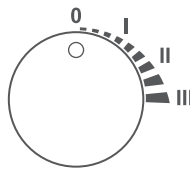


NOVOS 5 PSTD

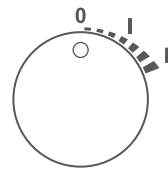
### Labelling fan stages (FSx)



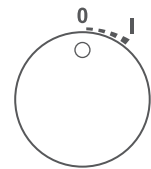
Auto – 0 – 1 – 2 – 3  
(FS5)



0 – 1 – 2 – 3  
(FS4)



0 – 1 – 2  
(FS3)



0 – 1  
(FS2)

passive / 0..10 V  

Technical Data	
Measured values	temperature, relative humidity, absolute humidity, enthalpy, dew point, CO <sub>2</sub> , VOC
Operating functions	<b>S:</b> fan stage adjustment, max. 5 stages <b>PSTD:</b> setpoint adjustment temperature, fan stage adjustment, max. 5 stages, presence detection
Operating elements	<b>S:</b> Rotary switch for fan stage adjustment with up to 5 stages <b>PSTD:</b> potentiometer (P), Rotary switch for fan stage adjustment with up to 5 stages, button (T)
Configuration	NOVOSapp, uConfig, BUS, jumper (depending on type)
Input	<b>BACnet/Modbus:</b> 1x input for floating contact
Network technology	RS485 Modbus, RS485 BACnet (MS/TP)
Output signal temperature	0..+50 °C (default setting) selectable from 4 temperature ranges -50..+50   0..+50   -20..+80   -15..+35 °C
Measuring range humidity	0..100% rH non-condensing 0..85 KJ/kg enthalpy 0..50   0..80 g/m <sup>3</sup> absolute humidity 0..+50   -20..+80 °C dew point optionally configurable
Measuring range CO <sub>2</sub>	0..2000 ppm, 0..5000 ppm, optionally configurable
Measuring VOC (mixed gas)	heated metal oxide semiconductor
Power supply	15..35 V = SELV, 19..29 V ~ SELV
Power consumption	typ. 0,4 W (24 V =), 0,8 VA (24 V ~)
Display	LCD 29x35 mm, RGB backlight with traffic light function, threshold values configurable, optionally configurable via app or uConfig
Enclosure	PC V0
Colour	pure white, black
Operating range temperature	-35..+70 °C
Protection (IP)	IP30, according to EN 60529
Connection	cable entry via rear opening tool-free mountable spring clamp, max. 1,5 mm <sup>2</sup> predetermined breaking point (bottom) or drilling mark (top)
Mounting	base part can be mounted and wired separately flush-mounted on standard EU box (Ø=60 mm), surface-mounted flat on base using adhesive foil or screws

## NOVOS 5 x – passive

Room operating unit temperature – passive – S			
Item description	Item No.	Group	€
NOVOS 5 S white without sensor, FS5	730082	R3	88,80
NOVOS 5 S white temp Pt100, FS5	730129	R3	97,60
NOVOS 5 S white temp Pt1000, FS5	730150	R3	100,10
NOVOS 5 S white temp Pt1000 1/3 DIN, FS5	730204	R3	104,10
NOVOS 5 S white temp NTC10k, FS5	730334	R3	96,00
NOVOS 5 S white temp Ni1000, FS5	730273	R3	99,80
NOVOS 5 S white temp Ni1000TK5000, FS5	730303	R3	104,10

Room operating unit temperature – passive – PSTD			
Item description	Item No.	Group	€
NOVOS 5 PSTD white without sensor, 10 kOhm, FS5	730112	R3	116,90
NOVOS 5 PSTD white temp Pt100, 10 kOhm, FS5	730143	R3	125,70
NOVOS 5 PSTD white temp Pt1000, 10 kOhm, FS5	730198	R3	128,20
NOVOS 5 PSTD white temp Pt1000 1/3 DIN, 10 kOhm, FS5	730228	R3	132,20
NOVOS 5 PSTD white temp NTC10k, 10 kOhm, FS5	730358	R3	124,10
NOVOS 5 PSTD white temp Ni1000, 10 kOhm, FS5	730297	R3	127,90
NOVOS 5 PSTD white temp Ni1000TK5000, 10 kOhm, FS5	730327	R3	132,20

Options	Labelling fan stages on page 164
Description	€
Passive potentiometer 1 kΩ (poti_1k), 2,5 kΩ (Poti_2,5k) or 5 kΩ (Poti_5k)	0,00
Other resistance values	on request
Rotary switch S with 2/3/4 fan stages (FS2/FS3/FS4)	13,90
Colour black	25,90
Add to price of NTC10k for sensor NTC10k Precon   NTC10k Carel   NTC1,8k   NTC5k   NTC20k   LM235Z	0,00
Other sensor elements	on request

Accessories			
Item description	Item No.	Group	€
Fixing kit rawlplugs and screws (2x each)	660945	A1	1,10

**NOVOS 5 x – active**

Room operating unit temperature – active – 0..10 (0..5) V				
Item description	NOVOSapp	Item No.	Group	€
NOVOS 5 S white temp TRV, FS5	✓	734936	R3	181,70
NOVOS 5 PSTD white temp TRV, pot_active, FS5	✓	734943	R3	209,80

**NOVOS 5 x – BUS**

Room operating unit temperature – RS485 BACnet (MS/TP)				
Item description	NOVOSapp	Item No.	Group	€
NOVOS 5 S white temp RS485 BACnet (MS/TP), FS5	✓	754217	R2	225,00
NOVOS 5 PSTD white temp RS485 BACnet (MS/TP), FS5	✓	754255	R2	253,10

Room operating unit temperature – RS485 Modbus				
Item description	NOVOSapp	Item No.	Group	€
NOVOS 5 S white temp RS485 Modbus, FS5	✓	734974	R2	225,00
NOVOS 5 PSTD white temp RS485 Modbus, FS5	✓	734981	R2	253,10

Options	Labelling fan stages on page 164
Description	€
Rotary switch S with 2/3/4 fan stages (FS2/FS3/FS4)	13,90
LCD 29x35 mm, RGB backlight	46,20
Colour black	25,90
Add for additional humidity sensor	43,00
Add for additional CO2+VOC sensor	199,70
Add for additional CO2 sensor	148,50

Accessories			
Item description	Item No.	Group	€
Fixing kit rawlplugs and screws (2x each)	660945	A1	1,10
PSU-UP24 – flush-mounted power supply 24 V	645737	A1	50,60
BLE dongle with micro-USB for devices USE-M / USE-L / NOVOS / thanos EVO	668262		32,10
USB interface for devices USE-M / USE-L / NOVOS / thanos EVO / SR06 LCD	597838	A1	39,50

## NOVOS 3 x

The surface-mounted NOVOS 3 x comes in the NOVOS design with an integrated temperature sensor. Possible operating elements are set point potentiometer, status LED with up to 7 selectable colors and a presence button. It furthermore provides passive outputs to superior control systems. The separate back part with its connection terminals allows pre-wiring. Threshold values and display settings can be individually configured using the Thermokon NOVOSapp.



NOVOS 3 P



NOVOS 3 TD



NOVOS 3 PTD

passive / 0..10 V  

Technical Data	
Measured values	temperature, relative humidity, absolute humidity, enthalpy, dew point, CO <sub>2</sub> , VOC
Operating functions	<b>P:</b> setpoint adjustment temperature <b>TD:</b> presence detection <b>PTD:</b> setpoint adjustment temperature, presence detection
Operating elements	<b>P:</b> potentiometer (P) <b>TD:</b> button (T) with LED 24 V = <b>PTD:</b> potentiometer (P), button (T) with LED 24 V =
Configuration	NOVOSapp, uConfig, BUS, jumper (depending on type)
Input	<b>BACnet/Modbus:</b> 1x input for floating contact
Network technology	RS485 Modbus, RS485 BACnet (MS/TP)
Output signal temperature	0..+50 °C (default setting) selectable from 4 temperature ranges -50..+50   0..+50   -20..+80   -15..+35 °C
Measuring range humidity	0..100% rH non-condensing 0..85 KJ/kg enthalpy 0..50   0..80 g/m <sup>3</sup> absolute humidity 0..+50   -20..+80 °C dew point optionally configurable
Measuring range CO <sub>2</sub>	0..2000 ppm, 0..5000 ppm, optionally configurable
Measuring VOC (mixed gas)	heated metal oxide semiconductor
Power supply	15..35 V = SELV, 19..29 V ~ SELV
Power consumption	typ. 0,4 W (24 V =), 0,8 VA (24 V ~)

Technical Data	
Display	TD / PTD: RGB LED
Enclosure	PC V0
Colour	pure white, black
Operating range temperature	-35..+70 °C
Protection (IP)	IP20, according to EN 60529
Connection	cable entry via rear opening tool-free mountable spring clamp, max. 1,5 mm <sup>2</sup> predetermined breaking point (bottom) or drilling mark (top)
Mounting	base part can be mounted and wired separately flush-mounted on standard EU box (Ø=60 mm), surface-mounted flat on base using adhesive foil or screws
Delivery content	incl. adhesive foil for mounting

## NOVOS 3 x – passive

### Room operating unit temperature – passive – without sensor

Item description	Item No.	Group	€
NOVOS 3 P white without sensor, 10 kOhm	729574	R3	40,10
NOVOS 3 TD white without sensor	729604	R3	45,90
NOVOS 3 PTD white without sensor, 10 kOhm	729611	R3	61,70

### Room operating unit temperature – passive – Pt100 DIN cl. B

Item description	Item No.	Group	€
NOVOS 3 P white temp Pt100, 10 kOhm	729659	R3	48,90
NOVOS 3 TD white temp Pt100	729666	R3	54,70
NOVOS 3 PTD white temp Pt100, 10 kOhm	729673	R3	70,50

### Room operating unit temperature – passive – Pt1000 DIN cl. B

Item description	Item No.	Group	€
NOVOS 3 P white temp Pt1000, 10 kOhm	729727	R3	51,40
NOVOS 3 TD white temp Pt1000	729734	R3	57,20
NOVOS 3 PTD white temp Pt1000, 10 kOhm	729741	R3	73,00

Room operating unit temperature – passive – Pt1000 1/3 DIN			
Item description	Item No.	Group	€
NOVOS 3 P white temp Pt1000 1/3 DIN, 10 kOhm	729789	R3	55,40
NOVOS 3 TD white temp Pt1000 1/3 DIN	729796	R3	61,20
NOVOS 3 PTD white temp Pt1000 1/3 DIN, 10 kOhm	729802	R3	77,00

Room operating unit temperature – passive – NTC10k			
Item description	Item No.	Group	€
NOVOS 3 P white temp NTC10k, 10 kOhm	729994	R3	47,30
NOVOS 3 TD white temp NTC10k	730013	R3	53,10
NOVOS 3 PTD white temp NTC10k, 10 kOhm	730020	R3	68,90

Room operating unit temperature – passive – Ni1000 DIN cl. B			
Item description	Item No.	Group	€
NOVOS 3 P white temp Ni1000, 10 kOhm	729864	R3	51,10
NOVOS 3 TD white temp Ni1000	729871	R3	56,90
NOVOS 3 PTD white temp Ni1000, 10 kOhm	729895	R3	72,70

Room operating unit temperature – passive – Ni1000TK5000			
Item description	Item No.	Group	€
NOVOS 3 P white temp Ni1000TK5000, 10 kOhm	729932	R3	55,40
NOVOS 3 TD white temp Ni1000TK5000	729949	R3	61,20
NOVOS 3 PTD white temp Ni1000TK5000, 10 kOhm	729956	R3	77,00

Options	
Description	€
Passive potentiometer 1 kΩ (poti_1k), 2,5 kΩ (Poti_2,5k) or 5 kΩ (Poti_5k)	0,00
Other resistance values	on request
Active potentiometer 0..10 V (poti_active)	42,00
Enclosure in black	13,00
Add to price of NTC10k for sensor NTC10k Precon   NTC10k Carel   NTC1,8k   NTC5k   NTC20k   LM235Z	0,00
Other sensor elements	on request

Accessories			
Item description	Item No.	Group	€
Fixing kit rawplugs and screws (2x each)	660945	A1	1,10
Frame for surface mounting NOVOS 3 white	795050	A1	15,30
Frame for surface mounting NOVOS 3 black	795074	A1	55,30

## NOVOS 3 x – active

Room operating unit temperature – active – 0..10 (0..5) V				
Item description	NOVOSapp	Item No.	Group	€
NOVOS 3 P white temp TRV, pot_active	✓	734691	R3	115,80
NOVOS 3 TD white temp TRV	✓	734714	R3	121,60
NOVOS 3 PTD white temp TRV, pot_active	✓	734776	R3	137,40

Options	
Description	€
Enclosure in black	13,00
Add for additional humidity sensor	43,00
Add for additional CO2+VOC sensor	199,70
Add for additional CO2 sensor	148,50

Accessories			
Item description	Item No.	Group	€
Fixing kit rawplugs and screws (2x each)	660945	A1	1,10
Frame for surface mounting NOVOS 3 white	795050	A1	15,30
Frame for surface mounting NOVOS 3 black	795074	A1	55,30
PSU-UP24 – flush-mounted power supply 24 V	645737	A1	50,60
BLE dongle with micro-USB for devices USE-M / USE-L / NOVOS / thanos EVO	668262		32,10
USB interface for devices USE-M / USE-L / NOVOS / thanos EVO / SR06 LCD	597838	A1	39,50

## NOVOS 3 x BUS

Room operating unit temperature – RS485 BACnet (MS/TP)				
Item description	NOVOSapp	Item No.	Group	€
NOVOS 3 P white temp RS485 BACnet (MS/TP)	✓	754453	R2	133,00
NOVOS 3 TD white temp RS485 BACnet (MS/TP)	✓	754460	R2	138,80
NOVOS 3 PTD white temp RS485 BACnet (MS/TP)	✓	754477	R2	154,60

Room operating unit temperature – RS485 Modbus				
Item description	NOVOSapp	Item No.	Group	€
NOVOS 3 P white temp RS485 Modbus	✓	734851	R2	133,00
NOVOS 3 TD white temp RS485 Modbus	✓	734882	R2	138,80
NOVOS 3 PTD white temp RS485 Modbus	✓	734899	R2	154,60

Options	
Description	€
Enclosure in black	13,00
Add for additional humidity sensor	43,00
Add for additional CO2+VOC sensor	199,70
Add for additional CO2 sensor	148,50

Accessories			
Item description	Item No.	Group	€
Fixing kit rawlplugs and screws (2x each)	660945	A1	1,10
Frame for surface mounting NOVOS 3 white	795050	A1	15,30
Frame for surface mounting NOVOS 3 black	795074	A1	55,30
PSU-UP24 – flush-mounted power supply 24 V	645737	A1	50,60
BLE dongle with micro-USB for devices USE-M / USE-L / NOVOS / thanos EVO	668262		32,10
USB interface for devices USE-M / USE-L / NOVOS / thanos EVO / SR06 LCD	597838	A1	39,50

## NOVOS 3 INC

Room operating unit in the Thermokon NOVOS 3 enclosure with integrated temperature sensor. The unit is operated via a push-and-rotary switch and, depending on the version, has an additional button for presence detection or for adjusting fan stages. Coloured LEDs provide feedback on the currently set setpoint status (heating/cooling) or the respective fan stage. The connection terminal in the lower part of the enclosure allows wiring in advance. The threshold values can be individually configured via the Thermokon NOVOSapp.



NOVOS 3 INC



NOVOS 3 INC TD



NOVOS 3 INC FS5



NOVOS 3 INC TD ePaper (EPD)



NOVOS 3 INC FS5 ECO ePaper (EPD)

Technical Data	
<b>Measured values</b>	temperature, relative humidity, absolute humidity, enthalpy, dew point, CO <sub>2</sub> , VOC
<b>Operating functions</b>	setpoint adjustment temperature, ECO function <b>TD:</b> presence detection <b>FSx:</b> fan stage adjustment, max. 5 stages
<b>Operating elements</b>	rotary encoder/push button for setpoint adjustment/ECO function <b>TD:</b> button (T), with LED 24 V =, colour configurable via jumpers (7 colours) <b>FSx:</b> button for fan stage adjustment with up to 5 stages
<b>Configuration</b>	NOVOSapp, BUS
<b>Input</b>	1x input for floating contact
<b>Network technology</b>	RS485 Modbus, RS485 BACnet (MS/TP)
<b>Output signal temperature</b>	0..+50 °C (default setting), selectable from 4 temperature ranges -50..+50   0..+50   -20..+80   -15..+35 °C
<b>Measuring range humidity</b>	0..100% rH non-condensing, 0..85 KJ/kg enthalpy, 0..50   0..80 g/m <sup>3</sup> absolute humidity, 0..+50   -20..+80 °C dew point, optionally configurable
<b>Measuring range CO<sub>2</sub></b>	0..2000 ppm, 0..5000 ppm, optionally configurable
<b>Measuring VOC (mixed gas)</b>	heated metal oxide semiconductor
<b>Power supply</b>	15..35 V = SELV, 19..29 V ~ SELV
<b>Power consumption</b>	typ. 0,4 W (24 V =), 0,8 VA (24 V ~)
<b>Display</b>	7 LEDs for displaying setpoint adjustment <b>TD:</b> LED for status feedback <b>FS5:</b> 4 LEDs showing fan stage <b>EPD:</b> ePaper Display 44x24 mm
<b>Enclosure</b>	PC V0
<b>Colour</b>	pure white, black
<b>Operating range temperature</b>	-20..+70 °C
<b>Protection (IP)</b>	IP20, according to EN 60529
<b>Connection</b>	tool-free mountable spring clamp, max. 1,5 mm <sup>2</sup> predetermined breaking point (bottom) or drilling mark (top)
<b>Mounting</b>	flush-mounted on standard EU box (Ø=60 mm), surface-mounted flat on base using adhesive foil or screws base part can be mounted and wired separately
<b>Notes</b>	Mixed-gas sensors detect volatile organic compounds (VOC) such as body odours, tobacco smoke and off-gassing from materials (furniture, carpets, paint, adhesives, etc.)



Room operating unit temperature – RS485 BACnet (MS/TP)				
Item description	NOVOSapp	Item No.	Group	€
NOVOS 3 INC white temp RS485 BACnet (MS/TP)	✓	840781	R2	153,40
NOVOS 3 INC ECO white temp RS485 BACnet (MS/TP)	✓	781657	R2	153,40
NOVOS 3 INC TD white temp RS485 BACnet (MS/TP)	✓	840798	R2	160,50
NOVOS 3 INC TD ECO white temp RS485 BACnet (MS/TP)	✓	781664	R2	160,50
NOVOS 3 INC FS5 white temp RS485 BACnet (MS/TP)	✓	840804	R2	175,00
NOVOS 3 INC FS5 ECO white temp RS485 BACnet (MS/TP)	✓	781671	R2	175,00



Room operating unit temperature – RS485 Modbus				
Item description	NOVOSapp	Item No.	Group	€
NOVOS 3 INC white temp RS485 Modbus	✓	795272	R2	153,40
NOVOS 3 INC ECO white temp RS485 Modbus	✓	781626	R2	153,40
NOVOS 3 INC TD white temp RS485 Modbus	✓	839235	R2	160,50
NOVOS 3 INC TD ECO white temp RS485 Modbus	✓	781633	R2	160,50
NOVOS 3 INC FS5 white temp RS485 Modbus	✓	790604	R2	175,00
NOVOS 3 INC FS5 ECO white temp RS485 Modbus	✓	781640	R2	175,00

### Options

Description	€
Enclosure in black	13,00
ePaper Display 44x24 mm	30,30
Add for additional humidity sensor	43,00
Add for additional CO2+VOC sensor	199,70
Add for additional CO2 sensor	148,50

### Accessories

Item description	Item No.	Group	€
Fixing kit rawplugs and screws (2x each)	660945	A1	1,10
Frame for surface mounting NOVOS 3 white	795050	A1	15,30
Frame for surface mounting NOVOS 3 black	795074	A1	55,30
PSU-UP24 – flush-mounted power supply 24 V	645737	A1	50,60
BLE dongle with micro-USB for devices USE-M / USE-L / NOVOS / thanos EVO	668262		32,10
USB interface for devices USE-M / USE-L / NOVOS / thanos EVO / SR06 LCD	597838	A1	39,50

## NOVOS 3 Timer

Timer for energy-saving and amplification functions in indoor ventilation and lighting applications. The user selects and starts a time interval using a push button on the device. The end of a time interval occurs automatically after the set time has elapsed or can be terminated manually ahead of time. The integrated display shows the available time intervals as well as the remaining time of a timer. In addition, the setting options on the circuit board allow different groups of time intervals and display settings to be configured according to individual requirements. During activation of the timer, the relay remains active, enabling reliable control of the devices. After the set time has elapsed, the relay automatically drops out, deactivating the connected components. The timer functions can be used, for example, in office applications when increased ventilation is required outside normal working hours. The timer can also be used, for example, to limit the running time of a supply voltage for certain electronic devices.



Technical Data	
Operating elements	button (T)
Configuration	DIP switches
Power supply	24 V = (±10%) SELV, 24 V ~ (±10%) SELV, 230 V ~ (±10%)
Power consumption	1,2 VA (24 V ~)
Display	ePaper Display 44x24 mm, RGB LED, green
Enclosure	PC V0
Colour	pure white, black
Operating ranges temperature	-20..+70
Protection (IP)	IP20, according to EN 60529
Connection	cable entry via rear opening tool-free mountable spring clamp, max. 1,5 mm <sup>2</sup> predetermined breaking point (bottom) or drilling mark (top)
Mounting	flush-mounted on standard EU box (Ø=60 mm), surface-mounted flat on base using adhesive foil or screws, base part can be mounted and wired separately

signal contact / switch actuator			
Item description	Item No.	Group	€
NOVOS 3 Timer white	850490	R3	152,00
NOVOS 3 Timer black	850492	R3	165,00

Accessories			
Item description	Item No.	Group	€
PSU-UP24 – flush-mounted power supply 24 V	645737	A1	50,60
Frame for surface mounting NOVOS 3 white	795050	A1	15,30
Frame for surface mounting NOVOS 3 black	795074	A1	55,30
Fixing kit rawlplugs and screws (2x each)	660945	A1	1,10

## WRF07 x

An optically appealing flush-mounted room unit in the design of various switch frame manufacturers. Available in different colors and with different labeling options. Possible operating elements are potentiometers, LEDs, buttons and rocker switches. An integrated temperature sensor is optional. The removable terminal allows for pre-wiring.



WRF07 P I type2



WRF07 PTD I type2



WRF07 P I type6

passive / 0..10 V 

Technical Data	
Measured values	temperature, relative humidity, CO <sub>2</sub> , VOC
Operating functions	setpoint adjustment temperature, fan stage adjustment, presence detection, status feedback via LED
Operating elements	potentiometer (P), button (T)
Configuration	BUS, DIP switches
Input	<b>Modbus:</b> 2x input digital for floating switch contact
Network technology	RS485 Modbus
Output signal temperature	0..+50 °C
Measuring range humidity	0..100% rH non-condensing
Measuring range CO <sub>2</sub>	0..2000 ppm
Power supply	<b>TRV3:</b> 24 V = (±10%) SELV, 24 V ~ (±10%) SELV <b>Modbus:</b> 15..35 V = SELV, 19..29 V ~ SELV
Power consumption	<b>TRV3:</b> typ. 0,4 W (24 V =), 0,8 VA (24 V ~) <b>Modbus:</b> max. 1,6 W (24 V =), 3,9 VA (24 V ~)
Display	LED for status feedback (D)
Operating range temperature	-35..+70 °C
Protection (IP)	IP20, according to EN 60529
Connection	terminal block, max. 1,5 mm <sup>2</sup>
Switch ranges	Berker, Busch-Jaeger, Gira, Jung, Merten (please specify the desired frame when ordering)
Mounting	flush-mounted in standard EU box (Ø=60 mm, depth min. 45 mm)
Notes	Mixed-gas sensors detect volatile organic compounds (VOC) such as body odours, tobacco smoke and off-gassing from materials (furniture, carpets, paint, adhesives, etc.)

**WRF07 x – passive**

Room operating unit temperature – passive – P			
Item description	Item No.	Group	€
WRF07 P without sensor ltype2 pure white, 10 kOhm	819107	R2	89,40
WRF07 P NTC10k ltype2 pure white, 10 kOhm	819206	R2	96,60
WRF07 P Pt100 ltype2 pure white, 10 kOhm	819138	R2	98,20
WRF07 P Pt1000 ltype2 pure white, 10 kOhm	819152	R2	100,70
WRF07 P Pt1000 1/3 DIN ltype2 pure white, 10 kOhm	819169	R2	104,70
WRF07 P Ni1000 ltype2 pure white, 10 kOhm	819183	R2	100,40
WRF07 P Ni1000TK5000 ltype2 pure white, 10 kOhm	819190	R2	104,70

Room operating unit temperature – passive – PTD			
Item description	Item No.	Group	€
WRF07 PTD without sensor ltype2 pure white, 10 kOhm, LED green	819312	R2	125,40
WRF07 PTD NTC10k ltype2 pure white, 10 kOhm, LED green	819381	R2	132,60
WRF07 PTD Pt100 ltype2 pure white, 10 kOhm, LED green	819329	R2	134,20
WRF07 PTD Pt1000 ltype2 pure white, 10 kOhm, LED green	819343	R2	136,70
WRF07 PTD Pt1000 1/3 DIN ltype2 pure white, 10 kOhm, LED green	819350	R2	140,70
WRF07 PTD Ni1000 ltype2 pure white, 10 kOhm, LED green	819367	R2	136,40
WRF07 PTD Ni1000TK5000 ltype2 pure white, 10 kOhm, LED green	819374	R2	140,70

Options	
Description	€
Passive potentiometer 1 kΩ (poti_1k), 2,5 kΩ (Poti_2,5k) or 5 kΩ (Poti_5k)	0,00
Other resistance values	on request
Active potentiometer 0..10 V (poti_active)	42,00
Additional operating and display elements	on request
Labelling type 6 colour red+blue (ltype6)	7,00
Switch ranges (various manufacturers)	Page 256
Add to price of NTC10k for sensor NTC10k Precon   NTC10k Carel   NTC1,8k   NTC5k   NTC20k   LM235Z	0,00
Other sensor elements	on request

## WRF07 x – active 0..10 V

Room operating unit temperature – active			
Item description	Item No.	Group	€
WRF07 P temp TRV3 ltype2 pure white, pot_active	819213	R2	227,50
WRF07 PTD temp TRV3 ltype2 pure white, pot_active, LED green	819398	R2	263,50

Options	
Description	€
Additional operating and display elements	on request
Labelling type 6 colour red+blue (ltype6)	7,00
Switch ranges (various manufacturers)	Page 256
<b>WRF07 P:</b> Add for additional humidity sensor	43,00
<b>WRF07 P:</b> Add for additional CO2 sensor	148,50

## WRF07 x BUS

Room operating unit with up to 4 measured values – RS485 Modbus – P			
Item description	Item No.	Group	€
WRF07 P temp RS485 Modbus ltype2 pure white	839204	R2	155,70
WRF07 P temp_rH RS485 Modbus ltype2 pure white	839211	R2	198,70
WRF07 P CO2 temp_rH RS485 Modbus ltype2 pure white	819220	R2	347,20
WRF07 P CO2+VOC temp_rH RS485 Modbus ltype2 pure white	819251	R2	398,40

Room operating unit with up to 4 measured values – RS485 Modbus – PTD			
Item description	Item No.	Group	€
WRF07 PTD temp RS485 Modbus ltype2 pure white, LED green	839228	R2	168,30
WRF07 PTD temp_rH RS485 Modbus ltype2 pure white, LED green	822343	R2	211,30
WRF07 PTD CO2 temp_rH RS485 Modbus ltype2 pure white, LED green	819435	R2	359,80
WRF07 PTD CO2+VOC temp_rH RS485 Modbus ltype2 pure white, LED green	819459	R2	411,00

Options	
Description	€
Add to price of RS485 Modbus for RS485 BACnet (MS/TP)	0,00
Additional operating and display elements	on request
Labelling type 6 colour red+blue (ltype6)	7,00
Switch ranges (various manufacturers)	Page 256

Accessories			
Item description	Item No.	Group	€
PSU-UP24 – flush-mounted power supply 24 V	645737	A1	50,60

## WRF07 INC

The flush-mounted room operating unit with an interface for RS485 Modbus or KNX is used for set point adjustment. An outstanding feature is the possibility to overwrite the status via Modbus RS485. It furthermore includes a push button for triggering an ECO mode to save energy. The central knob is used as a rotary push button. The set point can be changed as required by turning the button accordingly. The device status is visualized by LEDs i.e. heating/cooling.



WRF07 INC



WRF07 INC FS5



Technical Data	
Measured values	temperature, relative humidity, absolute humidity, enthalpy, dew point
Operating functions	setpoint adjustment temperature, fan stage adjustment, standby/presence detection, ECO function, status feedback via LED
Operating elements	rotary encoder/push button for setpoint adjustment/ECO function FS5: button for fan stage adjustment
Configuration	BUS, DIP switches, ETS (KNX)
Input	1x input for NTC10k or floating contact
Network technology	KNX (TP1)
Output signal temperature	0..+50 °C
Measuring range humidity	0..100% rH non-condensing
Measuring range CO2	0..2000 ppm
Measuring VOC (mixed gas)	heated metal oxide semiconductor
Power supply	supply via BUS, 29 V = SELV
Power consumption	typ. 0,3 W (24 V =), 0,9 VA (24 V ~)
Display	7 LEDs for displaying setpoint adjustment LED for displaying the ECO mode function FS5: 4 LEDs showing fan stage
Enclosure	PA6.6
Colour	pure white brilliant, pure white matt
Operating range temperature	-10..+50 °C
Protection (IP)	IP30, according to EN 60529
Connection	removable plug-in terminal, max. Ø=0,8 mm cable entry via rear opening
Switch ranges	Berker, Busch-Jaeger, Gira, Jung, Merten (please specify the desired frame when ordering)
Mounting	flush-mounted in standard EU box (Ø=60 mm, depth min. 45 mm)


**Room operating unit humidity + temperature – KNX**

Item description	Item No.	Group	€
WRF07 INC temp_rH KNX pure white matt	823838	R2	228,90
WRF07 INC temp_rH KNX pure white brilliant	823845	R2	228,90
WRF07 INC FS5 temp_rH KNX pure white matt	781527	R2	250,40
WRF07 INC FS5 temp_rH KNX pure white brilliant	781503	R2	250,40

**Options**

Description	€
Switch ranges (various manufacturers)	Page 256

**Accessories**

Item description	Item No.	Group	€
PSU-UP24 – flush-mounted power supply 24 V	645737	A1	50,60

## WRF06 LCD

The flush-mounted room operating unit with set point adjustment, fan stage control and occupancy button can be used for an individual temperature control in living spaces as well as hotel and office rooms. With 4 push buttons and an integrated LCD for visualizing temperature, fan stage and occupancy, the WRF06 LCD VV can also control proportional valves directly besides the models to integrate into a Modbus RS485 or LON network. Removable terminals allow for pre-wiring.



WRF06 LCD Itype1 pure white



WRF06 LCD Itype1 anthracite

0..10 V

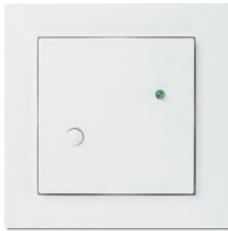
Technical Data	
Measured values	temperature, relative humidity
Operating functions	setpoint adjustment temperature setpoint adjustment OK/cancel presence detection
Operating elements	4 buttons
Configuration	buttons
Input	2x input digital for floating contact to activate messages on the LCD display
Output signal temperature	0..+50 °C
Measuring range humidity	0..95% rH non-condensing
Power supply	15..24 V = (±10%) SELV, 24 V ~ (±10%) SELV
Power consumption	typ. 0,8 W (24 V =), 2,5 VA (24 V ~)
Display	LCD 34x21 mm, monochrome
Enclosure	PC
Colour	pure white brilliant, pure white matt, anthracite
Operating range temperature	0..+50 °C
Protection (IP)	IP30, according to EN 60529
Connection	terminal block, max. 1,5 mm <sup>2</sup> , pluggable
Switch ranges	Berker, Busch-Jaeger, Gira, Jung, Merten, Peha (please specify the desired frame when ordering)
Mounting	flush-mounted in standard EU box (Ø=60 mm)

Room operating unit temperature – active			
Item description	Item No.	Group	€
WRF06 LCD temp VV ltype1 pure white matt	378062	R2	223,20
WRF06 LCD temp VV ltype1 pure white brilliant	748513	R2	223,20
WRF06 LCD temp VV ltype1 anthracite	748599	R2	223,20

Room operating unit temperature – active			
Item description	Item No.	Group	€
WRF06 LCD temp VV ltype3 pure white matt	731089	R2	223,20
WRF06 LCD temp VV ltype3 pure white brilliant	731102	R2	223,20
WRF06 LCD temp VV ltype3 anthracite	731133	R2	223,20

Options	
Description	€
Switch ranges (various manufacturers)	Page 256
Add for additional humidity sensor	43,00

Accessories			
Item description	Item No.	Group	€
PSU-UP24 – flush-mounted power supply 24 V	645737	A1	50,60



## WRF06 x

A visually appealing flush-mounted room operating unit in the design of various switch frame manufacturers. Available in different colors and with different labeling options. Possible operating elements are rotary switches (fan stage adjustment), LEDs (optical status feedback), buttons (presence) and buttons for operating other peripheral devices. A temperature sensor can be added. The removable terminal allows for pre-wiring. It can be connected to Modbus RS485 and LON networks.

WRF06 TD

Gira E2 pure white matt

passive

### Technical Data

<b>Measured values</b>	temperature
<b>Operating functions</b>	fan stage adjustment, presence detection, status feedback via LED
<b>Operating elements</b>	button (T)
<b>Display</b>	LED for status feedback
<b>Enclosure</b>	central disc in design of the manufacturer (varies depending on switch range)
<b>Operating range temperature</b>	-35..+70 °C
<b>Protection (IP)</b>	IP20, according to EN 60529
<b>Connection</b>	terminal block, max. 1,5 mm <sup>2</sup> , pluggable
<b>Switch ranges</b>	Berker, Busch-Jaeger, Feller, Gira, Jung, Merten
<b>Mounting</b>	flush-mounted in standard EU box (Ø=60 mm, depth min. 45 mm)
<b>Delivery content</b>	incl. frame

### Room operating unit temperature

Item description	Item No.	Group	€
WRF06 TD without sensor Gira E2 pure white matt, LED green	285964	R2	77,60
WRF06 TD Pt100 Gira E2 pure white matt, LED green	564441	R2	86,40
WRF06 TD Pt1000 Gira E2 pure white matt, LED green	629423	R2	88,90
WRF06 TD Pt1000 1/3 DIN Gira E2 pure white matt, LED green	629447	R2	92,90
WRF06 TD NTC10k Gira E2 pure white matt, LED green	629324	R2	84,80
WRF06 TD Ni1000 Gira E2 pure white matt, LED green	195379	R2	88,60
WRF06 TD Ni1000TK5000 Gira E2 pure white matt, LED green	629461	R2	92,90

### Options

Description	€
Additional operating and display elements	on request
Switch ranges (various manufacturers)	Page 255
Add to price of NTC10k for sensor NTC10k Precon   NTC10k Carel   NTC1,8k   NTC5k   NTC20k   LM235Z	0,00
Other sensor elements	on request



## LCR Touch

Room operating unit with an integrated temperature sensor (rH sensor optional) and touch surface for visualization of the measured values and room control. It provides connection to an RS485 Modbus network and additional three inputs. The LCR Touch forms the basis for a pleasant indoor climate and well-being. Typical applications are schools, office buildings, hotels or cinemas. The intuitive operation offers all relevant HVAC functions for an intelligent and energy-saving room automation.



Technical Data	
Measured values	temperature, relative humidity,
Operating functions	setpoint adjustment 0..+50 °C, fan stage adjustment, light ON/OFF/DIM, blind UP/DOWN, ECO function, status displays
Operating elements	5 capacitive buttons
Input	1x input for change-over sensor NTC10k 2x input digital for floating contact 1x ESI for window contact, dew point 1x OCC for presence detection, key card switch
Network technology	RS485 Modbus
Measuring range humidity	0..100% rH non-condensing
Power supply	24 V = (±20%) SELV, 24 V ~ (±20%) SELV
Power consumption	typ. 0,3 W (24 V =), 5 VA (24 V ~)
Display	LCD 64x41 mm, backlight white
Enclosure	ABS
Colour	pure white, frame silver
Operating range temperature	-10..+50 °C
Protection (IP)	IP20, according to EN 60529
Connection	terminal block, max. 1,5 mm <sup>2</sup> , cable entry via rear opening
Mounting	flush-mounted in standard EU box (Ø=60 mm)

Room operating unit temperature and optionally humidity – RS485 Modbus			
Item description	Item No.	Group	€
LCR Touch white temp RS485 Modbus	754323	R1	135,40
LCR Touch white temp_rH RS485 Modbus	754347	R1	169,70

Accessories			
Item description	Item No.	Group	€
PSU-UP24 – flush-mounted power supply 24 V	645737	A1	50,60
Fixing kit rawplugs and screws (2x each)	660945	A1	1,10

## **JOY Fancoil**

Fancoil thermostat in high-quality design for individual single-room temperature- and fan control. A glass surface with intuitive touch control buttons and display combine design, feel and functionality in an outstanding way. The internal controller of the JOY calculates control values for fans and heating/cooling applications, which are provided via analog or digital outputs (depending on type). The possible integration of various external sensors (e.g. window contacts, change-over, condensation sensors, etc.) allows temperature and fan control tailored to the application. The device can be mounted in a standard flush-mounted box.



JOY Fancoil

JOY Fancoil Custom\*

**NEW:** With additional, customisable touch buttons (see page 12)

\* Minimum order quantity 100 pieces



Technical Data	
Measured values	temperature, relative humidity, CO2
Operating functions	setpoint adjustment temperature fan stage adjustment standby/presence detection
Operating elements	5 capacitive buttons
Configuration	uConfig, BUS, ETS (KNX)
Inputs	see overview
Outputs	see overview
Network technology	RS485 Modbus, RS485 BACnet (MS/TP), KNX (TP1)
Output signal temperature	0..+50 °C
Measuring range humidity (BUS)	0..100% rH non-condensing
Power supply	<b>5DO/AO2DO (230 V):</b> 85..260 V ~ <b>5DO/AO2DO/3AO (24 V):</b> 24 V = (±10%) SELV, 24 V ~ (±10%) SELV
Power consumption	<b>5DO:</b> max. 2,5 VA (260 V ~) <b>AO2DO:</b> max. 3 VA (260 V ~) <b>5DO/AO2DO/3AO (24 V):</b> typ. 2,5 W (24 V =)
Display	LCD 60x44 mm, 240x160 px, backlight cold white
Enclosure	PC, cover glass
Colour	pure white, black
Operating range temperature	0..+50 °C
Protection (IP)	IP30, according to EN 60529
Connection	terminal block, max. 1,5 mm <sup>2</sup> inputs max. 1,0 mm <sup>2</sup>
Mounting	in standard EU box (Ø=60 mm, depth min. 45 mm)

Outputs	5DO (230 V)	5DO (24 V)	EC AO2DO (230 V)	EC AO2DO (24 V)	EC 3AO (24 V)
Fan (Relay)	3x	3x	–	–	–
EC Fan (0..10 V)	–	–	1x	1x	1x
Heating/Cooling (Relay)	2x	2x	2x	2x	–
Heating/Cooling (0..10 V)	–	–	–	–	2x
6-Way-Valve (0..10 V)	–	–	–	–	(1x) <sup>1</sup>
Inputs (BUS)	5DO (230 V)	5DO (24 V)	EC AO2DO (230 V)	EC AO2DO (24 V)	EC 3AO (24 V)
Input for NTC10k or floating contact	1x	1x	1x	1x	1x
Input for potential contact (230 V)	1x	–	1x	–	–
Input for potential contact (24 V)	–	1x	–	1x	–
Input for floating contact <sup>2</sup>	–	–	–	–	1x

<sup>1</sup> Instead of 2x 0..10 V (heating/cooling)

<sup>2</sup> Types without BUS have an additional input for a potential-free contact

Fan coil thermostat temperature – active				
Item description	Contr.	Item No.	Group	€
JOY Fancoil 5DO temp white	✓	751940	R1	201,80
JOY Fancoil 5DO temp black	✓	751957	R1	214,80
JOY Fancoil EC A02DO temp white	✓	751988	R1	201,80
JOY Fancoil EC A02DO temp black	✓	751995	R1	214,80
JOY Fancoil EC 3AO temp white	✓	724975	R1	201,80
JOY Fancoil EC 3AO temp black	✓	724982	R1	214,80



Fan coil thermostat temperature – RS485 BACnet (MS/TP) – 230 V				
Item description	Contr.	Item No.	Group	€
JOY Fancoil 5DO temp RS485 BACnet (MS/TP) white	✓	778749	R1	209,20
JOY Fancoil 5DO temp RS485 BACnet (MS/TP) black	✓	778732	R1	222,20
JOY Fancoil EC A02DO temp RS485 BACnet (MS/TP) white	✓	778725	R1	209,20
JOY Fancoil EC A02DO temp RS485 BACnet (MS/TP) black	✓	778718	R1	222,20

Fan coil thermostat temperature – RS485 BACnet (MS/TP) – 24 V				
Item description	Contr.	Item No.	Group	€
JOY Fancoil 24V 5DO temp RS485 BACnet (MS/TP) white	✓	851008	R1	209,20
JOY Fancoil 24V 5DO temp RS485 BACnet (MS/TP) black	✓	851017	R1	222,20
JOY Fancoil 24V EC A02DO temp RS485 BACnet (MS/TP) white	✓	851018	R1	209,20
JOY Fancoil 24V EC A02DO temp RS485 BACnet (MS/TP) black	✓	851019	R1	222,20
JOY Fancoil EC 3AO temp RS485 BACnet (MS/TP) white	✓	778817	R1	209,20
JOY Fancoil EC 3AO temp RS485 BACnet (MS/TP) black	✓	778800	R1	222,20



Fan coil thermostat temperature – RS485 Modbus – 230 V					
Item description	Contr.	Item No.	In stock	Group	€
JOY Fancoil 5DO temp RS485 Modbus white	✓	751933	⊖	R1	209,20
JOY Fancoil 5DO temp RS485 Modbus black	✓	751964		R1	222,20
JOY Fancoil EC A02DO temp RS485 Modbus white	✓	752015	⊖	R1	209,20
JOY Fancoil EC A02DO temp RS485 Modbus black	✓	752022		R1	222,20

Fan coil thermostat temperature – RS485 Modbus – 24 V					
Item description	Contr.	Item No.	In stock	Group	€
JOY Fancoil 24V 5DO temp RS485 Modbus white	✓	839921	⊕	R1	209,20
JOY Fancoil 24V 5DO temp RS485 Modbus black	✓	851005		R1	222,20
JOY Fancoil 24V EC AO2DO temp RS485 Modbus white	✓	851011	⊕	R1	209,20
JOY Fancoil 24V EC AO2DO temp RS485 Modbus black	✓	851012		R1	222,20
JOY Fancoil EC 3AO temp RS485 Modbus white	✓	723817	⊕	R1	209,20
JOY Fancoil EC 3AO temp RS485 Modbus black	✓	724999	⊕	R1	222,20

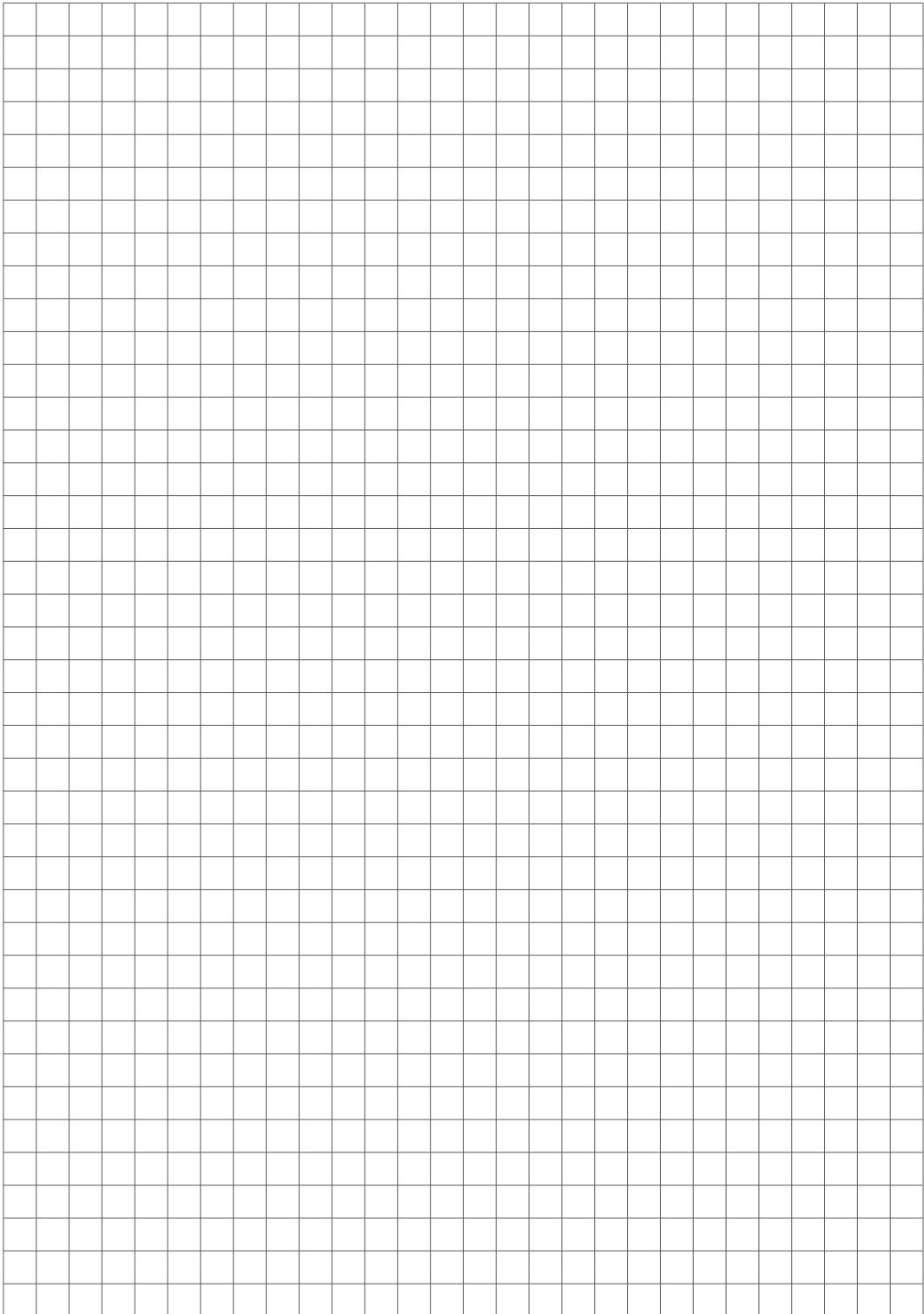
Options	
Description	€
Add for additional humidity sensor	43,00
Add for additional CO2 sensor	148,50



Fan coil thermostat temperature – KNX – 230 V					
Item description	Contr.	Item No.	Group	€	
JOY Fancoil 5DO Temp_rH KNX white	✓	831482	R1	270,60	
JOY Fancoil 5DO Temp_rH KNX black	✓	831543	R1	283,60	
JOY Fancoil 5DO CO2 Temp_rH KNX white	✓	831604	R1	352,50	
JOY Fancoil 5DO CO2 Temp_rH KNX black	✓	831659	R1	365,50	
JOY Fancoil EC AO2DO Temp_rH KNX white	✓	831499	R1	270,60	
JOY Fancoil EC AO2DO Temp_rH KNX black	✓	831550	R1	283,60	
JOY Fancoil EC AO2DO CO2 Temp_rH KNX white	✓	831611	R1	352,50	
JOY Fancoil EC AO2DO CO2 Temp_rH KNX black	✓	831666	R1	365,50	

Fan coil thermostat temperature – KNX – 24 V					
Item description	Contr.	Item No.	Group	€	
JOY Fancoil 24V 5DO Temp_rH KNX white	✓	851030	R1	270,60	
JOY Fancoil 24V 5DO Temp_rH KNX black	✓	851022	R1	283,60	
JOY Fancoil 24V EC AO2DO Temp_rH KNX white	✓	851031	R1	270,60	
JOY Fancoil 24V EC AO2DO Temp_rH KNX black	✓	851032	R1	283,60	
JOY Fancoil EC 3AO Temp_rH KNX white	✓	831505	R1	270,60	
JOY Fancoil EC 3AO Temp_rH KNX black	✓	831567	R1	283,60	
JOY Fancoil EC 3AO CO2 Temp_rH KNX white	✓	831628	R1	352,50	
JOY Fancoil EC 3AO CO2 Temp_rH KNX black	✓	831673	R1	365,50	

<b>Accessories</b>			
<b>Item description</b>	<b>Item No.</b>	<b>Group</b>	<b>€</b>
microSD card 2 GB	500098	A1	13,80
<b>BACnet / Modbus:</b> USB Interface RS485 (incl. driver CD)	668293		63,50
<b>KNX:</b> USB interface KNX	806190	A1	194,20
Decorative frame JOY white	681452	A1	14,80
Decorative frame JOY black	740951	A1	14,80
Frame for surface mounting JOY white	760201	A1	29,30
Frame for surface mounting JOY black	760195	A1	29,30



## JOY HC

Room thermostat in high-quality design for individual temperature control, e.g. in hotel rooms or offices. A glass surface with intuitive touch control buttons and display combine design, feel and functionality in an outstanding way. The internal controller of the JOY calculates control values for heating/cooling applications, which are provided via analog or digital outputs (depending on type). The possible integration of various external sensors (e.g. window contacts, change-over, condensation sensors, etc.) allows temperature control tailored to the application. The device can be mounted in a standard flush-mounted box.



**NEW:** With additional, customisable touch buttons (see page 12)

\* Minimum order quantity 100 pieces



Technical Data	
Measured values	temperature, relative humidity, CO2
Operating functions	setpoint adjustment temperature standby/presence detection
Configuration	uConfig, BUS, ETS (KNX)
Inputs	see overview
Outputs	see overview
Network technology	RS485 Modbus, RS485 BACnet (MS/TP), KNX (TP1)
Output signal temperature	0..+50 °C
Measuring range humidity (BUS)	0..100% rH non-condensing
Power supply	<b>A02DO:</b> 85..260 V ~ <b>3AO:</b> 24 V = (±10%) SELV, 24 V ~ (±10%) SELV
Power consumption	typ. 2,5 W (24 V =), max. 3 VA (260 V ~)
Display	LCD 60x44 mm, 240x160 px, backlight cold white
Enclosure	PC, cover glass
Colour	pure white, black
Operating range temperature	0..50 °C
Protection (IP)	IP30, according to EN 60529
Connection	terminal block, max. 1,5 mm <sup>2</sup> inputs max. 1,0 mm <sup>2</sup>
Mounting	in standard EU box (Ø=60 mm, depth min. 45 mm)

Outputs	EC A02DO (230 V)	EC A02DO (24 V)	EC 3AO (24 V)
Fan (Relay)	–	–	–
EC Fan (0..10 V)	1x	1x	1x
Heating/Cooling (Relay)	2x	2x	–
Heating/Cooling (0..10 V)	–	–	2x
6-Way-Valve (0..10 V)	–	–	(1x) <sup>1</sup>
Inputs (BUS)	EC A02DO (230 V)	EC A02DO (24 V)	EC 3AO (24 V)
Input for NTC10k or floating contact	1x	1x	1x
Input for potential contact (230 V)	1x	–	–
Input for potential contact (24 V)	–	1x	–
Input for floating contact <sup>2</sup>	–	–	1x

<sup>1</sup> Instead of 2x 0..10 V (heating/cooling)

<sup>2</sup> Types without BUS have an additional input for a potential-free contact

Room thermostat heating/cooling – active				
Item description	Contr.	Item No.	Group	€
JOY HC A02D0 temp white	✓	748995	R1	201,80
JOY HC A02D0 temp black	✓	752039	R1	214,80
JOY HC 3A0 temp white	✓	725002	R1	201,80
JOY HC 3A0 temp black	✓	725019	R1	214,80



Room thermostat heating/cooling – RS485 BACnet (MS/TP) – 230 V				
Item description	Contr.	Item No.	Group	€
JOY HC A02D0 temp RS485 BACnet (MS/TP) white	✓	778701	R1	209,20
JOY HC A02D0 temp RS485 BACnet (MS/TP) black	✓	778695	R1	222,20

Room thermostat heating/cooling – RS485 BACnet (MS/TP) – 24 V				
Item description	Contr.	Item No.	Group	€
JOY HC 24V A02D0 temp RS485 BACnet (MS/TP) white	✓	851020	R1	209,20
JOY HC 24V A02D0 temp RS485 BACnet (MS/TP) black	✓	851009	R1	222,20
JOY HC 3A0 temp RS485 BACnet (MS/TP) white	✓	778770	R1	209,20
JOY HC 3A0 temp RS485 BACnet (MS/TP) black	✓	778756	R1	222,20



Room thermostat heating/cooling – RS485 Modbus – 230 V				
Item description	Contr.	Item No.	Group	€
JOY HC A02D0 temp RS485 Modbus white	✓	752046	R1	209,20
JOY HC A02D0 temp RS485 Modbus black	✓	752053	R1	222,20

Room thermostat heating/cooling – RS485 Modbus – 24 V					
Item description	Contr.	Item No.	In stock	Group	€
JOY HC 24V A02D0 temp RS485 Modbus white	✓	851014		R1	209,20
JOY HC 24V A02D0 temp RS485 Modbus black	✓	851016		R1	222,20
JOY HC 3A0 temp RS485 Modbus white	✓	723732	⊕	R1	209,20
JOY HC 3A0 temp RS485 Modbus black	✓	725026		R1	222,20

Options	
Description	€
Add for additional humidity sensor	43,00
Add for additional CO2 sensor	148,50



Room thermostat heating/cooling – KNX – 230 V				
Item description	Contr.	Item No.	Group	€
JOY HC A02D0 Temp_rH KNX white	✓	831512	R1	270,60
JOY HC A02D0 Temp_rH KNX black	✓	831574	R1	283,60
JOY HC A02D0 CO2 Temp_rH KNX white	✓	831635	R1	352,50
JOY HC A02D0 CO2 Temp_rH KNX black	✓	831680	R1	365,50

Room thermostat heating/cooling – KNX – 24 V				
Item description	Contr.	Item No.	Group	€
JOY HC 24V A02D0 Temp_rH KNX white	✓	851023	R1	270,60
JOY HC 24V A02D0 Temp_rH KNX black	✓	851033	R1	283,60
JOY HC 3AO Temp_rH KNX white	✓	831529	R1	270,60
JOY HC 3AO Temp_rH KNX black	✓	831581	R1	283,60
JOY HC 3AO CO2 Temp_rH KNX white	✓	831642	R1	352,50
JOY HC 3AO CO2 Temp_rH KNX black	✓	831697	R1	365,50

Accessories				
Item description	Item No.	Group	€	
microSD card 2 GB	500098	A1	13,80	
<b>BACnet / Modbus:</b> USB Interface RS485 (incl. driver CD)	668293		63,50	
<b>KNX:</b> USB interface KNX	806190	A1	194,20	
Decorative frame JOY white	681452	A1	14,80	
Decorative frame JOY black	740951	A1	14,80	
Frame for surface mounting JOY white	760201	A1	29,30	
Frame for surface mounting JOY black	760195	A1	29,30	

## LCF02 Touch

Modern, touch-operated fan coil room thermostat designed for individual control of room temperature. It is tailored to be compatible with 2-pipe and 4-pipe fan coil units and modulating valves (PWM and 0..10 V). Furthermore, LCF02 Touch provides two configurable digital inputs for e.g. occupancy, window contacts, dew-point contact or change-over. Additionally, it is equipped with an input for external (remote) temperature sensors and an RS485 Modbus interface for overwriting controls parameters. With its flush-mounted design, the LCF02 Touch combines digital technology with a large touch screen (LCD), which makes up for an intuitive operation of the fan coil thermostat. It further provides an integrated scheduler with 7 days and 4 time periods.



Technical Data	
Measured values	temperature
Operating functions	setpoint adjustment temperature, fan stage adjustment, status displays
Operating elements	capacitive touch screen
Configuration	BUS
Input	1x input for additional external NTC10k 1x ESI for window contact, dew point 1x OCC for presence detection, key card switch
Network technology	RS485 Modbus
Power supply	24 V = (±10%) SELV, 24 V ~ (±20%) SELV
Power consumption	typ. 3 W (24 V =)
Display	LCD 64x64 mm, backlight white LCD 64x64 mm, backlight black touch technology
Enclosure	ABS, glass
Colour	pure white, black
Operating range temperature	-10..+50 °C
Protection (IP)	IP20, according to EN 60529
Connection	terminal block, max. 1,5 mm <sup>2</sup> , cable entry via rear opening
Mounting	flush-mounted in standard EU box (Ø=60 mm, depth min. 45 mm)

Outputs	5DO	2A03DO	3A02DO
Fan (Relay)	3	3	–
EC Fan (0..10 V)	–	–	1
Heating/Cooling (Relay)	2	–	2**
Heating/Cooling (0..10 V)	–	2	2
6-Way-Valve (0..10 V)	–	1*	1*
Inputs	5DO	2A03DO	3A02DO
Universal (configurable)	3	3	3

\* Instead of 2x 0..10 V (heating/cooling)

\*\* Additional heating register (3 stages)

#### Fan coil thermostat temperature – BUS

Item description	Contr.	Item No.	Group	€
LCF02 Touch 5DO RS485 Modbus 24 V white	✓	721035	R1	191,70
LCF02 Touch 5DO RS485 Modbus 24 V black	✓	721004	R1	191,70
LCF02 Touch 2A03DO RS485 Modbus 24 V white	✓	721011	R1	191,70
LCF02 Touch 2A03DO RS485 Modbus 24 V black	✓	720984	R1	191,70
LCF02 Touch 3A02DO RS485 Modbus 24 V white	✓	721028	R1	191,70
LCF02 Touch 3A02DO RS485 Modbus 24 V black	✓	720991	R1	191,70

#### Accessories

Item description	Item No.	Group	€
PSU-UP24 – flush-mounted power supply 24 V	645737	A1	50,60

## LCF02 QTouch

Modern, touch-operated fan coil room thermostat designed for individual control of room temperature. It is tailored to be compatible with 2-pipe and 4-pipe fan coil units and modulating valves (PWM and 0..10 V). Furthermore, LCF02 Touch provides two configurable digital inputs for e.g. occupancy, window contacts, dew-point contact or change-over. Additionally, it is equipped with an input for external (remote) temperature sensors and an RS485 Modbus interface for overwriting controls parameters. With its flush-mounted design, the LCF02 Touch combines digital technology with a large touch screen (LCD), which makes up for an intuitive operation of the fan coil thermostat. It further provides an integrated scheduler with 7 days and 4 time periods.



Technical Data	
Measured values	temperature, relative humidity, CO2
Operating functions	setpoint adjustment temperature: +16..+30 °C (default setting) optionally configurable, fan stage adjustment, status displays
Operating elements	6 capacitive buttons
Configuration	BUS
Input	1x input for additional external NTC10k 1x ESI for window contact, dew point 1x OCC for presence detection, key card switch
Network technology	RS485 Modbus
Measuring range CO2	0..5000 ppm
Power supply	100..240 V ~
Power consumption	max. 5 VA (230 V ~)
Display	LCD 102x56 mm, backlight black LCD 102x56 mm, backlight white
Enclosure	ABS, glass
Colour	pure white, black
Operating range temperature	-10..+50 °C
Protection (IP)	IP20, according to EN 60529
Connection	terminal block, max. 1,5 mm <sup>2</sup>
Mounting	<b>LCF02 QTouch:</b> flush-mounted in standard EU box (Ø=60 mm, depth min. 45 mm) <b>LCF02 QTouch AP:</b> on surface, surface-mounted flat on base using screws, base part can be mounted and wired separately

Fan coil thermostat temperature – BUS				
Item description	Contr.	Item No.	Group	€
LCF02 QTouch rH AO5DO RS485 Modbus white	✓	817691	R1	231,50
LCF02 QTouch rH AO5DO RS485 Modbus black	✓	817707	R1	231,50
LCF02 QTouch CO2 rH AO5DO RS485 Modbus white	✓	817714	R1	274,00
LCF02 QTouch CO2 rH AO5DO RS485 Modbus black	✓	817721	R1	274,00

Fan coil thermostat temperature – BUS				
Item description	Contr.	Item No.	Group	€
LCF02 QTouch AP rH AO5DO RS485 Modbus white	✓	2000170	R1	231,50
LCF02 QTouch AP rH AO5DO RS485 Modbus black	✓	2000180	R1	231,50
LCF02 QTouch AP CO2 rH AO5DO RS485 Modbus white	✓	2000171	R1	274,00
LCF02 QTouch AP CO2 rH AO5DO RS485 Modbus black	✓	2000181	R1	274,00

## LCF02

Modern and intuitive fan coil room thermostat designed for individual control of room temperature. It is tailored to be compatible with 2-pipe and 4-pipe fan coil units and modulating valves (PWM and 0..10 V). Furthermore, the LCF02 provides two configurable digital inputs for occupancy, window contact, dew-point contact or change-over, among other things. Additionally, it is equipped with an input for external (remote) temperature sensors and a RS485 Modbus interface for overwriting controls parameters. With its flush-mounted design, the LCF02 combines digital technology with a large display, making up for an intuitive room control.



Technical Data	
Measured values	temperature
Operating functions	setpoint adjustment temperature, fan stage adjustment, status displays
Operating elements	5 buttons
Configuration	BUS, buttons
Input	1x ESI for window contact, dew point 1x OCC for presence detection, key card switch <b>5DO/2A03DO/3A02DO:</b> 1x input for additional external NTC10k
Network technology	RS485 Modbus
Power supply	24 V = ( $\pm 10\%$ ) SELV, 24 V ~ ( $\pm 20\%$ ) SELV
Power consumption	typ. 0,3 W (24 V =)
Display	LCD 64x41 mm, backlight white
Enclosure	ABS
Colour	pure white
Operating range temperature	-10..+50 °C
Protection (IP)	IP20, according to EN 60529
Connection	terminal block, max. 1,5 mm <sup>2</sup> , cable entry via rear opening
Mounting	flush-mounted in standard EU box ( $\varnothing=60$ mm, depth min. 45 mm)

Outputs	C	6WV	5DO	2A03DO	3A02DO
Fan (Relay)	3	3	3	3	–
EC Fan (0..10 V)	–	–	–	–	1
Heating/Cooling (Relay)	1***	–	2	–	2**
Heating/Cooling (0..10 V)	1***	–	–	2	2
6-Way-Valve (0..10 V)	–	1	–	1*	1*
Inputs	C	6WV	5DO	2A03DO	3A02DO
Universal (configurable)	2	2	3	3	3

\* Instead of 2x 0..10 V (heating/cooling)

\*\* Additional heating register (3 stages)

\*\*\* Only cooling

#### Fan coil thermostat temperature – active

Item description	Contr.	Item No.	Group	€
LCF02 C fan coil	✓	684606	R1	73,50
LCF02 6WV fan coil	✓	684613	R1	73,50

#### Fan coil thermostat temperature – BUS

Item description	Contr.	Item No.	Group	€
LCF02 5DO RS485 Modbus 24 V	✓	703307	R1	109,60
LCF02 2A03DO RS485 Modbus 24 V	✓	703314	R1	121,60
LCF02 3A02DO RS485 Modbus 24 V	✓	703321	R1	133,60

#### Accessories

Item description	Item No.	Group	€
PSU-UP24 – flush-mounted power supply 24 V	645737	A1	50,60
Fixing kit rawplugs and screws (2x each)	660945	A1	1,10



## LCF Touch

Modern, touch-operated fan coil room thermostat used for individual control of room temperature. It is tailored to be compatible with both 2-pipe and 4-pipe fan coil units and modulating valves (PWM). The device combines digital technology with a large touch screen (LCD), which permits the single room controller to be used intuitively. It further provides an integrated scheduler with 7 days and 4 time periods. It is designed for mounting in a flush-mounted box.



Technical Data	
Measured values	temperature
Operating functions	setpoint adjustment temperature, fan stage adjustment, status displays
Operating elements	capacitive touch screen
Output switch contact	2x contact NO, 1x heating, 1x cooling 3x contact NO, fan stages
Configuration	BUS, buttons
Input	1x input for change-over sensor NTC10k
Network technology	RS485 Modbus
Power supply	90..265 V ~
Power consumption	0,9 VA (265 V ~)
Display	LCD 64x64 mm, backlight white, touch technology
Enclosure	ABS, glass
Colour	black
Operating range temperature	-10..+50 °C
Protection (IP)	IP20, according to EN 60529
Connection	terminal block, max. 1,5 mm <sup>2</sup>
Mounting	flush-mounted in standard EU box (Ø=60 mm, depth min. 45 mm)

### Fan coil thermostat temperature – active

Item description	Contr.	Item No.	Group	€
LCF Touch	✓	575768	R1	147,00

### Fan coil thermostat temperature – BUS

Item description	Contr.	Item No.	Group	€
LCF Touch RS485 Modbus	✓	575775	R1	164,00



## LCF

The fan coil room thermostat LCF has been designed for individual control of temperature in commercial, industrial and residential buildings. It is compatible with 2-pipe and 4-pipe applications and 3-stage fan coils. With its flush-mounted modern design, the device combines digital technology with a large LCD and operating buttons, which make up for an intuitive operation.

### Technical Data

Measured values	temperature
Operating functions	setpoint adjustment temperature, status displays
Operating elements	5 buttons
Output switch contact	2x contact NO, 1x heating, 1x cooling 3x contact NO, fan stages
Configuration	buttons
Input	1x input for NTC10k or floating contact (optionally)
Power supply	90..265 V ~
Power consumption	max. 0,9 W
Display	LCD 36x49 mm, backlight white
Enclosure	ABS, scratch-resistant acrylic glass
Colour	pure white
Operating range temperature	-10..+50 °C
Protection (IP)	IP20, according to EN 60529
Connection	terminal block, max. 1,5 mm <sup>2</sup> , cable entry via rear opening
Mounting	flush-mounted in standard EU box (Ø=60 mm, depth min. 45 mm)

### Fan coil thermostat temperature – active

Item description	Contr.	Item No.	Group	€
LCF	✓	575751	R1	48,40

## WRF07 RC x

An optically appealing flush-mounted room unit in the design of various switch frame manufacturers. Available in different colors and with different labeling options. Possible operating elements are potentiometers, LEDs, buttons and rocker switches. An integrated temperature sensor is optional. The removable terminal allows for pre-wiring.



WRF07 P I type2



WRF07 PTD I type2



WRF07 P I type6



Technical Data	
Measured values	temperature, relative humidity
Operating functions	setpoint adjustment temperature, presence detection, status feedback via LED
Operating elements	potentiometer (P), button (T)
Configuration	BUS, DIP switches
Input	<b>DI4:</b> 4x input digital for floating switch contact <b>AO2V:</b> 2x input digital for floating switch contact
Network technology	RS485 Modbus, RS485 BACnet (MS/TP)
Output signal temperature	0..+50 °C
Measuring range humidity	0..100% rH non-condensing
Power supply	24 V = (±10%) SELV, 24 V ~ (±10%) SELV
Power consumption	typ. 0,9 W (24 V =), 1 VA (24 V ~)
Display	LED for status feedback, green
Colour	white
Operating range temperature	0..+50 °C
Protection (IP)	IP20, according to EN 60529
Connection	terminal block, max. 1,5 mm <sup>2</sup>
Switch ranges	Berker, Busch-Jaeger, Gira, Jung, Merten (please specify the desired frame when ordering)
Mounting	flush-mounted in standard EU box (Ø=60 mm, depth min. 45 mm)

**WRF07 RC x DI4****Room thermostat temperature – RS485 BACnet (MS/TP) – DI4**

Item description	Contr.	Item No.	Group	€
WRF07 RC P DI4 temp RS485 BACnet (MS/TP) Itype2 pure white	✓	820523	R2	203,80
WRF07 RC PTD DI4 temp RS485 BACnet (MS/TP) Itype2 pure white, LED green	✓	820530	R2	216,50

**Room thermostat temperature – RS485 Modbus – DI4**

Item description	Contr.	Item No.	Group	€
WRF07 RC P DI4 temp RS485 Modbus Itype2 pure white	✓	820509	R2	203,80
WRF07 RC PTD DI4 temp RS485 Modbus Itype2 pure white, LED green	✓	820516	R2	216,50

**WRF07 RC x AO2V****Room thermostat heating/cooling – RS485 BACnet (MS/TP) – AO2V**

Item description	Contr.	Item No.	Group	€
WRF07 RC P AO2V temp RS485 BACnet (MS/TP) Itype2 pure white	✓	820462	R2	203,80
WRF07 RC PTD AO2V temp RS485 BACnet (MS/TP) Itype2 pure white, LED green	✓	820479	R2	216,50

**Room thermostat heating/cooling – RS485 Modbus – AO2V**

Item description	Contr.	Item No.	Group	€
WRF07 RC P AO2V temp RS485 Modbus Itype2 pure white	✓	820486	R2	203,80
WRF07 RC PTD AO2V temp RS485 Modbus Itype2 pure white, LED green	✓	820493	R2	216,50

**Options**

Description	€
Additional operating and display elements	on request
Labelling type 6 colour red+blue (Itype6)	7,00
Switch ranges (various manufacturers)	Page 256
Add for additional humidity sensor	43,00

**Accessories**

Item description	Item No.	Group	€
PSU-UP24 – flush-mounted power supply 24 V	645737	A1	50,60

## WRF06 LCD RC

The flush-mounted room operating unit with set point adjustment, fan stage control and occupancy button can be used for an individual temperature control in living spaces as well as hotel and office rooms. With 4 push buttons and an integrated LCD for visualizing temperature, fan stage and occupancy, the WRF06 LCD VV can also control proportional valves directly besides the models to integrate into a Modbus RS485 or LON network. Removable terminals allow for pre-wiring.



WRF06 LCD Itype1 pure white



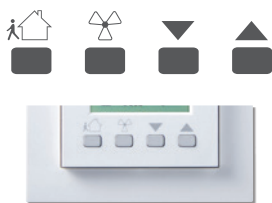
WRF06 LCD Itype1 anthracite



Technical Data	
Measured values	temperature, relative humidity
Operating functions	setpoint adjustment temperature, setpoint adjustment OK/cancel, fan stage adjustment, presence detection
Operating elements	4 buttons
Configuration	BUS, buttons, DIP switches
Input	<b>DI4:</b> 4x input digital for floating switch contact <b>AO2V:</b> 2x input digital for floating switch contact
Network technology	RS485 Modbus
Output signal temperature	0..+50 °C
Measuring range humidity	0..100% rH non-condensing
Power supply	15..24 V = (±10%) SELV, 24 V ~ (±10%) SELV
Power consumption	typ. 0,9 W (24 V =), 1 VA (24 V ~)
Display	LCD 34x21 mm, monochrome
Enclosure	PC
Colour	pure white brilliant, pure white matt, anthracite
Protection (IP)	IP30, according to EN 60529
Connection	terminal block, max. 1,5 mm <sup>2</sup> , pluggable
Switch ranges	Berker, Busch-Jaeger, Gira, Jung, Merten, Peha (please specify the desired frame when ordering)
Mounting	flush-mounted in standard EU box (Ø=60 mm, depth min. 45 mm)



labelling type 1 (ltype1)



labelling type 2 (ltype2)



labelling type 3 (ltype3)

<b>Outputs</b>	<b>A02V</b>	<b>DI4</b>
0..10 V	2	-
<b>Inputs</b>	<b>A02V</b>	<b>DI4</b>
Universal (configurable)	2	4

**Room thermostat temperature – RS485 Modbus – DI4**

Item description	Contr.	Item No.	Group	€
WRF06 LCD RC DI4 temp RS485 Modbus ltype1 pure white matt	✓	731140	R2	223,20
WRF06 LCD RC DI4 temp RS485 Modbus ltype1 pure white brilliant	✓	730068	R2	223,20
WRF06 LCD RC DI4 temp RS485 Modbus ltype1 anthracite	✓	731201	R2	223,20

**Room thermostat heating/cooling – RS485 Modbus – A02V**

Item description	Contr.	Item No.	Group	€
WRF06 LCD RC A02V temp RS485 Modbus ltype1 pure white matt	✓	415125	R2	223,20
WRF06 LCD RC A02V temp RS485 Modbus ltype1 pure white brilliant	✓	731379	R2	223,20
WRF06 LCD RC A02V temp RS485 Modbus ltype1 anthracite	✓	731409	R2	223,20

**Options**

Description	€
Labelling type 2 (ltype2)	0,00
Labelling type 3 (ltype3)	0,00
Switch ranges (various manufacturers)	Page 256
Add for additional humidity sensor	43,00

**Accessories**

Item description	Item No.	Group	€
USB Interface RS485 (incl. driver CD)	668293		63,50
PSU-UP24 – flush-mounted power supply 24 V	645737	A1	50,60

## WRF04 RC x

The surface-mounted room controller (with optional display) provides a comfortable and individual temperature control in living spaces, hotel and office rooms. Available operating elements are set point potentiometers, rotary switches for fan stage selection, buttons for occupancy and LEDs for status feedback. Depending on the type, proportional 0..10 V or 2-point valves can be controlled for heating and cooling. The terminal in the back part allows for pre-wiring.



WRF04 LCD P



WRF04 LCD PTD



WRF04 LCD PSD



WRF04 LCD PSTD



### Technical Data

Measured values	temperature
Operating functions	setpoint adjustment temperature, fan stage adjustment, max. 5 stages, presence detection, status feedback via LED
Operating elements	potentiometer (P), rotary switch (S), button (T)
Configuration	BUS, DIP switches
Input	2x input for floating contact
Network technology	RS485 Modbus
Power supply	15..24 V = ( $\pm 10\%$ ) SELV, 24 V ~ ( $\pm 10\%$ ) SELV
Power consumption	typ. 0,4 W (24 V =), 0,6 VA (24 V ~)
Display	LCD 29x12 mm, monochrome LED for status feedback
Enclosure	PC
Colour	pure white
Operating range temperature	-35..+70 °C
Protection (IP)	IP30, according to EN 60529
Connection	terminal block, max. 1,5 mm <sup>2</sup> cable entry via rear opening, predetermined breaking point (bottom und top)
Mounting	flush-mounted on standard EU box ( $\varnothing=60$ mm), surface-mounted flat on base using screws or with frame for surface mounting (see accessories) base part can be mounted and wired separately

Room thermostat heating/cooling – RS485 Modbus – AO2V				
Item description	Contr.	Item No.	Group	€
WRF04 RC P AO2V temp RS485 Modbus	✓	419956	R2	185,60
WRF04 RC PTD AO2V temp RS485 Modbus, LED green	✓	415613	R2	194,80
WRF04 RC PSD AO2V temp RS485 Modbus, FS5, LED green	✓	419949	R2	215,80
WRF04 RC PSTD AO2V temp RS485 Modbus, FS5, LED green	✓	480505	R2	235,10
WRF04 RC LCD P AO2V temp RS485 Modbus	✓	420020	R2	231,80
WRF04 RC LCD PTD AO2V temp RS485 Modbus, LED green	✓	415620	R2	241,00
WRF04 RC LCD PSD AO2V temp RS485 Modbus, FS5, LED green	✓	419987	R2	262,00
WRF04 RC LCD PSTD AO2V temp RS485 Modbus, FS5, LED green	✓	538442	R2	281,30

Options	
Description	€
Rotary switch S with 2/3/4 fan stages (FS2/FS3/FS4)	13,90
Labelling type 6 colour red+blue (ltype6)	7,00
Special printing	on request

Accessories			
Item description	Item No.	Group	€
Fixing kit rawlplugs and screws (2x each)	660945	A1	1,10
Frame for surface mounting WRF04 pure white	111584	A1	15,30
PSU-UP24 – flush-mounted power supply 24 V	645737	A1	50,60

## FSR01

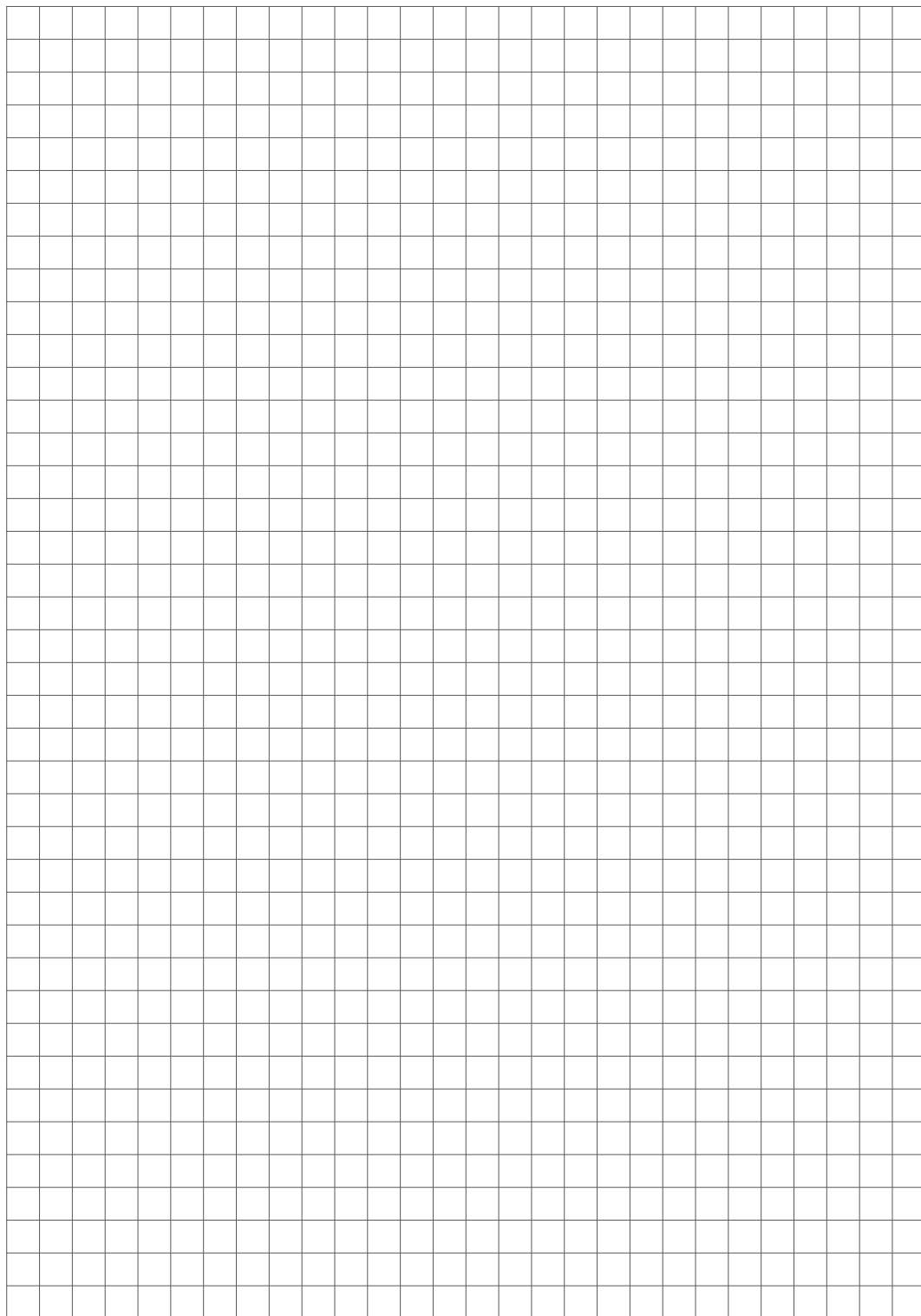
Hyrostat for ON/OFF control of ventilation and air conditioning, humidification and dehumidification equipment in rooms and office spaces, data centers, warehouses and similar applications.



Technical Data	
Measured values	relative humidity
Operating functions	threshold adjustment
Operating elements	rotary button
Measuring range humidity	30..100% rH non-condensing
Enclosure	PC
Colour	pure white
Operating range temperature	0..+60 °C
Protection (IP)	IP30, according to EN 60529
Connection	terminal block, max. 1,5 mm <sup>2</sup> cable entry via rear opening, predetermined breaking point (bottom und top)
Mounting	flush-mounted on standard EU box (Ø=60 mm), surface-mounted flat on base using screws or with frame for surface mounting (see accessories) base part can be mounted and wired separately

Room hygrostat on surface			
Item description	Item No.	Group	€
FSR01	835336	H1	103,20
FSR01 internal adjuster	836777	H1	103,20

Accessories			
Item description	Item No.	Group	€
Fixing kit rawlplugs and screws (2x each)	660945	A1	1,10



## NOVOS 3

Room sensor in the NOVOS 3 enclosure for measurement of temperature (also available with passive temperature output), humidity (relative and absolute humidity, enthalpy, dew point), CO<sub>2</sub> and mixed gas (VOC) depending on the variant. The maintenance-free sensor contributes to a pleasant room climate and well-being. Typical applications include schools, office buildings, hotels or cinemas. Different parameters can be individually configured via Thermokon NOVOSapp or uConfig. Optionally, operating elements for controlling HVAC systems can be added (see product NOVOS 3 x in the chapter ‚Room Operating Units‘).



passive / 0..10 V / 4..20 mA  

Technical Data	
Measured values	temperature, relative humidity, absolute humidity, enthalpy, dew point, CO <sub>2</sub> , VOC
Configuration	NOVOSapp, uConfig, BUS, jumper, ETS (KNX) (depending on type) <b>CO<sub>2</sub>+VOC</b> : each output can be set to get a variable mix of CO <sub>2</sub> and VOC by configuration via app or uConfig
Input	<b>BACnet/Modbus:</b> 1x input for floating contact
Network technology	RS485 Modbus, RS485 BACnet (MS/TP), KNX (TP1)
Output signal temperature	0..+50 °C (default setting), selectable from 4 temperature ranges -50..+50   0..+50   -20..+80   -15..+35 °C, optionally configurable
Measuring range humidity	0..100% rH non-condensing, 0..85 KJ/kg enthalpy, 0..50   0..80 g/m <sup>3</sup> absolute humidity, 0..+50   -20..+80 °C dew point, optionally configurable
Measuring range CO <sub>2</sub>	0..2000 ppm, 0..5000 ppm, optionally configurable
Measuring VOC (mixed gas)	heated metal oxide semiconductor
Power supply	15..35 V = SELV, 19..29 V ~ SELV
Power consumption	typ. 0,4 W (24 V =), 0,8 VA (24 V ~)
Display	ePaper Display 44x24 mm, RGB LED, with traffic light function, threshold values configurable optionally configurable via app or uConfig
Enclosure	PC V0
Colour	pure white, black
Operating range temperature	-35..+70 °C
Protection (IP)	IP20, according to EN 60529

Technical Data	
<b>Connection</b>	cable entry via rear opening tool-free mountable spring clamp, max. 1,5 mm <sup>2</sup> predetermined breaking point (bottom) or drilling mark (top)
<b>Mounting</b>	flush-mounted on standard EU box (Ø=60 mm), surface-mounted flat on base using adhesive foil or screws base part can be mounted and wired separately
<b>Notes</b>	Mixed-gas sensors detect volatile organic compounds (VOC) such as body odours, tobacco smoke and off-gassing from materials (furniture, carpets, paint, adhesives, etc.)

## NOVOS 3 – temperature – passive

Room sensor temperature – passive					
Item description	NOVOSapp	Item No.	In stock	Group	€
NOVOS 3 temp white Pt100	✓	728256		T3	24,30
NOVOS 3 temp white Pt1000	✓	728386	⊖	T3	26,80
NOVOS 3 temp white Pt1000 1/3 DIN	✓	728393		T3	30,80
NOVOS 3 temp white Ni1000	✓	728409	⊖	T3	26,50
NOVOS 3 temp white Ni1000TK5000	✓	728416		T3	30,80
NOVOS 3 temp white NTC10k	✓	728423	⊖	T3	22,70

Options	
Description	€
4-wire connection (4-wire)	13,40
Enclosure in black	13,00
Add to price of NTC10k for sensor NTC10k Precon   NTC10k Carel   NTC1,8k   NTC5k   NTC20k   LM235Z	0,00
Other sensor elements	on request

Accessories			
Item description	Item No.	Group	€
Fixing kit rawplugs and screws (2x each)	660945	A1	1,10
Frame for surface mounting NOVOS 3 white	795050	A1	15,30
Frame for surface mounting NOVOS 3 black	795074	A1	55,30

## NOVOS 3 – temperature + relative humidity

Room sensor humidity + temperature – active					
Item description	NOVOSapp	Item No.	In stock	Group	€
NOVOS 3 temp white TRV	✓	731614	●	T2	77,90
NOVOS 3 temp white TRA	✓	731621	●	T2	77,90
NOVOS 3 temp_rH white VV	✓	731904	●	H2	120,90
NOVOS 3 temp_rH white AA	✓	731911	●	H2	120,90

Room sensor humidity + temperature – BUS					
Item description	NOVOSapp	Item No.	In stock	Group	€
NOVOS 3 temp white RS485 BACnet (MS/TP)	✓	754736		T2	119,70
NOVOS 3 temp_rH white RS485 BACnet (MS/TP)	✓	754866		H2	162,70
NOVOS 3 temp white RS485 Modbus	✓	731652	●	T2	119,70
NOVOS 3 temp_rH white RS485 Modbus	✓	733496	●	H2	162,70

Options	
Description	€
Enclosure in black	13,00
EPD: ePaper Display 44x24 mm	30,30

## NOVOS 3 – CO2 + temperature + relative humidity

Room sensor CO2 with up to 3 measured values – active					
Item description	NOVOSapp	Item No.	In stock	Group	€
NOVOS 3 CO2 white V	✓	733663	●	Q2	210,90
NOVOS 3 CO2 white A	✓	733724		Q2	210,90
NOVOS 3 CO2 temp white VV	✓	733670	●	Q2	232,40
NOVOS 3 CO2 temp white AA	✓	733731		Q2	232,40
NOVOS 3 CO2 temp_rH white 3xV	✓	733687		Q2	275,40

Room sensor CO2 with up to 3 measured values – BUS					
Item description	NOVOSapp	Item No.	Group	€	
NOVOS 3 CO2 temp white RS485 BACnet (MS/TP)	✓	755856	Q2	272,10	
NOVOS 3 CO2 temp_rH white RS485 BACnet (MS/TP)	✓	755870	Q2	315,10	
NOVOS 3 CO2 temp white RS485 Modbus	✓	734165	Q2	272,10	
NOVOS 3 CO2 temp_rH white RS485 Modbus	✓	734172	Q2	315,10	

**NOVOS 3 – CO2 + VOC + temperature + relative humidity****Room sensor CO2 + VOC with up to 4 measured values – active**

Item description	NOVOSapp	Item No.	Group	€
NOVOS 3 CO2+VOC white VV	✓	735353	Q2	264,50
NOVOS 3 CO2+VOC white AA	✓	735421	Q2	264,50
NOVOS 3 CO2+VOC temp white 3xV	✓	735360	Q2	286,10
NOVOS 3 CO2+VOC temp_rH white 4xV	✓	735377	Q2	329,10

**Room sensor CO2 + VOC with up to 4 measured values – BUS**

Item description	NOVOSapp	Item No.	In stock	Group	€
NOVOS 3 CO2+VOC white RS485 BACnet (MS/TP)	✓	755771		Q2	304,30
NOVOS 3 CO2+VOC temp white RS485 BACnet (MS/TP)	✓	755795		Q2	325,90
NOVOS 3 CO2+VOC temp_rH white RS485 BACnet (MS/TP)	✓	755818		Q2	368,90
NOVOS 3 CO2+VOC white RS485 Modbus	✓	735483		Q2	304,30
NOVOS 3 CO2+VOC temp white RS485 Modbus	✓	735544		Q2	325,90
NOVOS 3 CO2+VOC temp_rH white RS485 Modbus	✓	735568	⊖	Q2	368,90

**Options**

Description	€
TLF – traffic light function, RGB-LED indicating air quality	24,30
Enclosure in black	13,00
<b>EPD:</b> ePaper Display 44x24 mm	30,30

**Accessories**

Item description	Item No.	Group	€
Fixing kit rawplugs and screws (2x each)	660945	A1	1,10
Frame for surface mounting NOVOS 3 white	795050	A1	15,30
Frame for surface mounting NOVOS 3 black	795074	A1	55,30
PSU-UP24 – flush-mounted power supply 24 V	645737	A1	50,60
BLE dongle with micro-USB for devices USE-M / USE-L / NOVOS / thanos EVO	668262		32,10
USB interface for devices USE-M / USE-L / NOVOS / thanos EVO / SR06 LCD	597838	A1	39,50



## NOVOS 3 IR

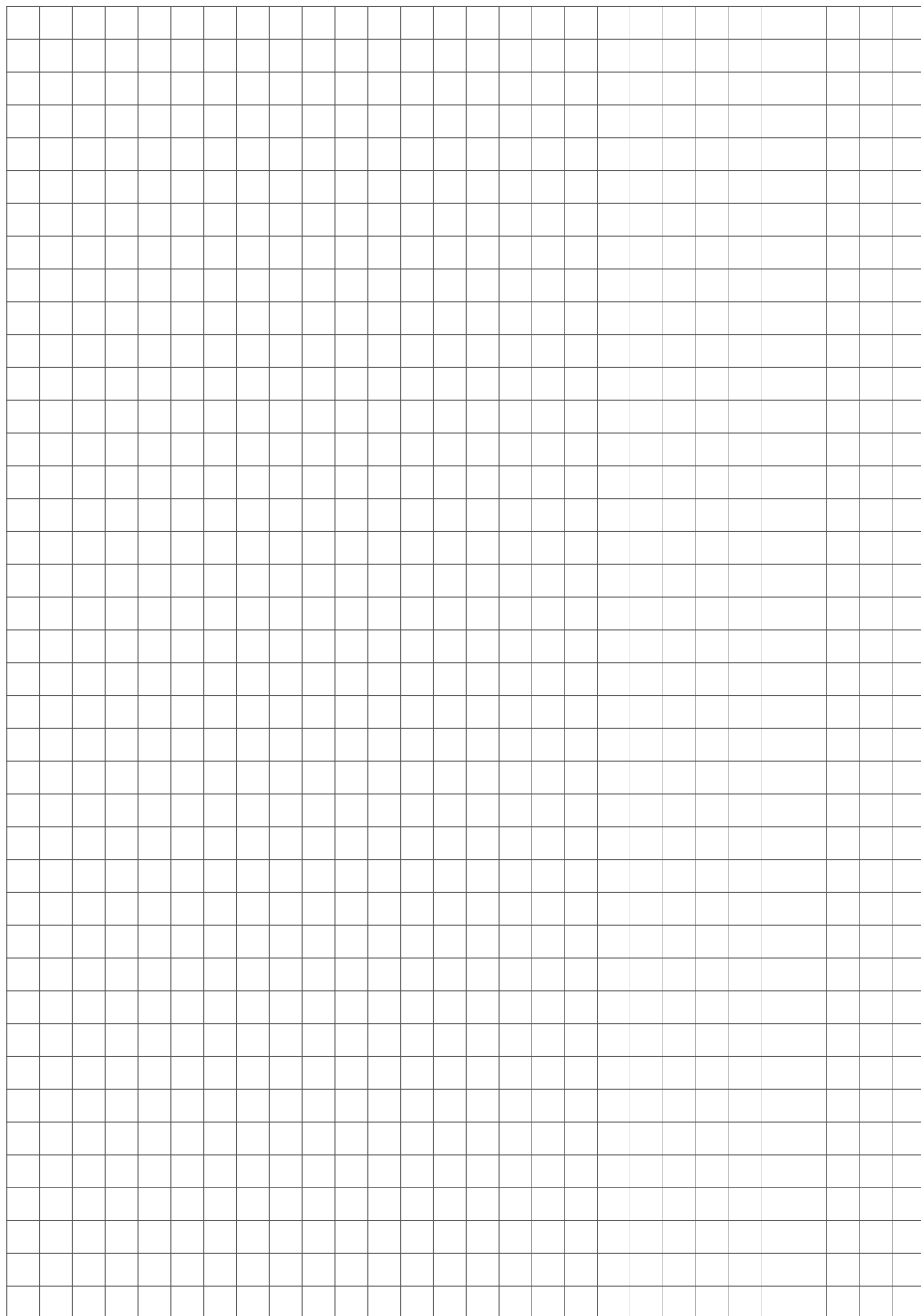
Surface-mounted room sensor for measuring the effective radiation in living rooms and offices. Designed for connection to control and display systems. For pre-wiring at the installation site, the back part with the connection terminals can be removed from the upper part of the housing.

Technical Data	
Measured values	radiation temperature
Material in touch with media	hemispherical ball, Ø=37 mm, aluminium, black
Enclosure	PC V0
Colour	pure white, black
Operating range temperature	-35..+70 °C
Protection (IP)	IP20, according to EN 60529
Connection	tool-free mountable spring clamp, max. 1,5 mm <sup>2</sup> cable entry via rear opening predetermined breaking point (bottom) or drilling mark (top)
Connection cable	2-wire
Mounting	flush-mounted on standard EU box (Ø=60 mm), surface-mounted flat on base using adhesive foil or screws base part can be mounted and wired separately

Room sensor radiation temperature – passive			
Item description	Item No.	Group	€
NOVOS 3 IR white Pt1000	799164	T2	90,60
NOVOS 3 IR white Ni1000	799171	T2	90,30
NOVOS 3 IR white NTC10k	799188	T2	86,50

Options	
Description	€
Enclosure in black	13,00

Accessories			
Item description	Item No.	Group	€
Fixing kit rawlplugs and screws (2x each)	660945	A1	1,10
Frame for surface mounting NOVOS 3 white	795050	A1	15,30
Frame for surface mounting NOVOS 3 black	795074	A1	55,30



## WRF06

Flush-mounted room sensor for temperature, humidity and air quality measurement in living rooms, offices etc. Designed for connection to controller and display systems. Due to the visual appearance and the matching design frames from various switch range manufacturers, the device is particularly suitable for design-oriented facilities. It can be mounted separately in a single frame or in a multiple frame. Optionally, it is possible to add operating elements for controlling HVAC systems from the device. Stainless steel versions are available on request.



WRF06 passive,  
frame Gira E2 pure white matt



WRF06 active/BUS anthracite



WRF06 CO2 TLF pure white

passive / 0..10 V  

Technical Data	
Measured values	temperature, relative humidity, CO2, VOC
Configuration	Software/Plug-In for configuration, BUS, jumper, DIP switches (depending on type)
Network technology	RS485 Modbus, RS485 BACnet (MS/TP)
Output signal temperature	0..+50 °C, scaling analogue output
Measuring range humidity	0..100% rH non-condensing
Measuring range CO2	0..2000 ppm
Measuring VOC (mixed gas)	heated metal oxide semiconductor, self-calibration
Power supply	15..24 V = (±10%) SELV, 24 V ~ (±10%) SELV <b>WRF06 rH BUS:</b> 15..35 V = SELV, 19..29 V ~ SELV
Power consumption	<b>WRF06 BUS:</b> typ. 0,9 W (24 V =), 0,5 VA (24 V ~) <b>WRF06 CO2/VOC:</b> max. 1,6 W (24 V =), 3,9 VA (24 V ~) <b>WRF06 VV:</b> typ. 0,3 W (24 V =), 0,8 VA (24 V ~) <b>WRF06 rH Modbus:</b> max. 1,6 W (24 V =), 3,9 VA (24 V ~)
Display	3 LEDs for displaying air quality (traffic light function – TLF)
Enclosure	PC, central disc in design of the manufacturer (varies depending on switch range)
Operating range temperature	-35..+70 °C
Protection (IP)	IP30, according to EN 60529
Connection	terminal block, max. 1,5 mm <sup>2</sup> , pluggable
Switch ranges	Berker, Busch-Jaeger, Gira, Jung, Merten, Peha (please specify the desired frame when ordering)
Mounting	flush-mounted in standard EU box (Ø=60 mm, depth min. 45 mm)
Delivery content	<b>passive:</b> incl. frame

**WRF06 temperature – passive**

Room sensor temperature – passive			
Item description	Item No.	Group	€
WRF06 without sensor Gira E2 pure white matt	626194	T1	44,10
WRF06 Pt100 Gira E2 pure white matt	128933	T1	52,90
WRF06 Pt1000 Gira E2 pure white matt	158299	T1	55,40
WRF06 Pt1000 1/3 DIN Gira E2 pure white matt	160773	T1	59,40
WRF06 Ni1000 Gira E2 pure white matt	138314	T1	55,10
WRF06 Ni1000TK5000 Gira E2 pure white matt	121866	T1	59,40
WRF06 NTC10k Gira E2 pure white matt	191050	T1	51,30

Options	
Description	€
Switch ranges (various manufacturers)	Page 255
Add to price of NTC10k for sensor NTC10k Precon   NTC10k Carel   NTC1,8k   NTC5k   NTC20k   LM235Z	0,00
Other sensor elements	on request

**WRF06 temperature + relative humidity – active 2x 0..10 V**

Room sensor humidity + temperature – active			
Item description	Item No.	Group	€
WRF06 temp_rH VV pure white matt	482721	H1	172,30
WRF06 temp_rH temp_rH VV pure white brilliant	732161	H1	172,30
WRF06 temp_rH VV anthracite	732192	H1	172,30

Options	
Description	€
Switch ranges (various manufacturers)	Page 256

**WRF06 CO2 + VOC – active 2x 0..10 V / 4x 0..10 V**

Room sensor CO2 + VOC – active			
Item description	Item No.	Group	€
WRF06 CO2+VOC VV pure white matt	732420	Q1	299,30
WRF06 CO2+VOC VV pure white brilliant	732437	Q1	299,30
WRF06 CO2+VOC VV anthracite	732468	Q1	299,30
WRF06 CO2+VOC temp_rH 4xV pure white matt	732475	Q1	363,70
WRF06 CO2+VOC temp_rH 4xV pure white brilliant	732482	Q1	363,70
WRF06 CO2+VOC temp_rH 4xV anthracite	732512	Q1	363,70

**WRF06 CO2 – active 2x 0..10 V / 3x 0..10 V**

Room sensor CO2 + temperature – active			
Item description	Item No.	Group	€
WRF06 CO2 temp VV pure white matt	728492	Q1	267,10
WRF06 CO2 temp VV pure white brilliant	724555	Q1	267,10
WRF06 CO2 temp VV anthracite	732123	Q1	267,10
WRF06 CO2 temp_rH 3xV pure white matt	732598	Q1	310,00
WRF06 CO2 temp_rH 3xV pure white brilliant	726641	Q1	310,00
WRF06 CO2 temp_rH 3xV anthracite	732628	Q1	310,00

**Options**

Description	€
TLF – traffic light function, 3 LEDs indicating air quality	24,30
Switch ranges (various manufacturers)	Page 256

**WRF06 temperature + relative humidity – BUS**

Room sensor temperature – BUS			
Item description	Item No.	Group	€
WRF06 temp RS485 Modbus pure white matt	726825	T1	169,10
WRF06 temp RS485 Modbus pure white brilliant	726801	T1	169,10
WRF06 temp RS485 Modbus anthracite	726818	T1	169,10
WRF06 temp_rH RS485 Modbus pure white matt	732208	H1	212,00
WRF06 temp_rH RS485 Modbus pure white brilliant	732215	H1	212,00
WRF06 temp_rH RS485 Modbus anthracite	732246	H1	212,00

**WRF06 CO2 + VOC – BUS**

Room sensor CO2 + VOC – BUS			
Item description	Item No.	Group	€
WRF06 CO2+VOC RS485 Modbus pure white matt	732680	Q1	339,00
WRF06 CO2+VOC RS485 Modbus pure white brilliant	732697	Q1	339,00
WRF06 CO2+VOC RS485 Modbus anthracite	732727	Q1	339,00
WRF06 CO2+VOC temp_rH RS485 Modbus pure white matt	732734	Q1	403,40
WRF06 CO2+VOC temp_rH RS485 Modbus pure white brilliant	732741	Q1	403,40
WRF06 CO2+VOC temp_rH RS485 Modbus anthracite	732772	Q1	403,40

**WRF06 CO2 – BUS**

Room sensor CO2 + temperature – BUS			
Item description	Item No.	Group	€
WRF06 CO2 temp RS485 Modbus pure white matt	732840	Q1	306,80
WRF06 CO2 temp RS485 Modbus pure white brilliant	732857	Q1	306,80
WRF06 CO2 temp RS485 Modbus anthracite	732321	Q1	306,80
WRF06 CO2 temp_rH RS485 Modbus pure white matt	732888	Q1	349,70
WRF06 CO2 temp_rH RS485 Modbus pure white brilliant	732895	Q1	349,70
WRF06 CO2 temp_rH RS485 Modbus anthracite	728676	Q1	349,70

**Options**

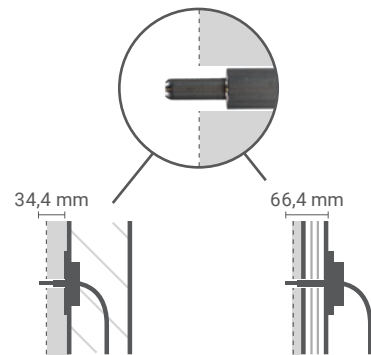
Description	€
Add to price of RS485 Modbus for RS485 BACnet (MS/TP)	0,00
TLF – traffic light function, 3 LEDs indicating air quality	24,30
Switch ranges (various manufacturers)	Page 256

**Accessories**

Item description	Item No.	Group	€
PSU-UP24 – flush-mounted power supply 24 V	645737	A1	50,60

## FTB+

Wall-mounted sensor for measuring relative humidity and temperature in a high quality and inconspicuous stainless steel design. For plastering into flush-mounted boxes or installations in hollow walls. Especially designed for museums and exhibitions, where measuring accuracy and almost invisible sensors have to be installed due to architectural design. The precise measurements provided to a BMS system contribute to a comfortable room climate and prevent mold formation.



0..10 V / 4..20 mA   

Technical Data	
Measured values	temperature, relative humidity, absolute humidity, enthalpy, dew point
Configuration	USEapp, uConfig, BUS, jumper, DIP switches (depending on type)
Network technology	RS485 Modbus, RS485 BACnet (MS/TP), LON FT (free topology)
Output signal temperature	scaling analogue output: -20..+80 °C (default setting), selectable from 4 temperature ranges -40..+60   0..+50   -20..+80   -15..+35 °C adjustable at the transducer, optionally configurable
Measuring range humidity	0..100% rH non-condensing, 0..85 KJ/kg enthalpy, 0..50   0..80 g/m <sup>3</sup> absolute humidity, 0..+50   -20..+80 °C dew point, adjustable at the transducer, optionally configurable
Power supply	<b>VV:</b> 15..24 V = (±10%) SELV, 24 V ~ (±10%) SELV <b>AA:</b> 15..24 V = (±10%) SELV <b>LCD/BUS:</b> 15..35 V = SELV, 19..29 V ~ SELV
Power consumption	<b>VV:</b> typ. 0,4 W (24 V ⇒), 0,8 VA (24 V ~) <b>AA:</b> max. 1 W (24 V ⇒) <b>LCD/BUS:</b> max. 2,5 W (24 V ⇒), 4,3 VA (24 V ~)
Material in touch with media	Sensor head Ø=13 mm, end of sensor Ø=7 mm, stainless steel V2A (1.4305)
Installation length	35, 67
Display	LCD 29x35 mm, RGB backlight
Enclosure	USE-M, impact- and shock-resistant enclosure with quick-release cover, PC
Colour	pure white, transparent cover
Operating range temperature	-40..+120 °C
Protection (IP)	enclosure IP65, according to EN 60529

Technical Data	
	removable plug-in terminal, max. 2,5 mm <sup>2</sup> , BUS max. 1,5 mm <sup>2</sup>
<b>Connection</b>	<b>VV/AA:</b> removable cable entry flextherm M20 for wire Ø=4,5..9 mm
	<b>BUS:</b> removable cable entry M25 with fourfold cable entry for wire with max. Ø=7 mm
<b>Connection cable</b>	PVC, 0,14 mm <sup>2</sup> , grey
<b>Length connection wire</b>	15 m
<b>Mounting</b>	plastering or installation in hollow wall
<b>Delivery content</b>	incl. mounting base enclosure USE-M pure white
	incl. mounting set (screws and accessories)

Wall-mounted sensor humidity + temperature – active				
Item description	USEapp	Item No.	Group	€
FTB+ VV 34.06 L15m	✓	689205	H1	332,70
FTB+ VV 66.06 L15m	✓	689083	H1	359,80
FTB+ AA 34.06 L15m	✓	700108	H1	351,90
FTB+ AA 66.06 L15m	✓	700115	H1	379,00

Options	
Description	€
RS485 Modbus	51,60
RS485 BACnet (MS/TP)	51,60
2x floating contact NO for 24 V ~ or 24 V = / 3 A	48,40
LCD 29x35 mm, RGB backlight	46,20

Accessories			
Item description	Item No.	Group	€
Mounting base enclosure USE-M pure white	668354	A1	9,60
Mounting kit universal for enclosure USE	698511	A1	10,70
BLE dongle with micro-USB for devices USE-M / USE-L / NOVOS / thanos EVO	668262		32,10
USB interface for devices USE-M / USE-L / NOVOS / thanos EVO / SR06 LCD	597838	A1	39,50

## WRF06I

Flush-mounted sensor for motion detection in rooms. The WRF06I provides a relay contact for efficient light control or temperature reduction in unoccupied rooms. Especially designed for applications in residential and commercial buildings, offices and corridors. Available in different designs and colors of various switch frame manufacturers. The device is mounted in a flush-mounted standard EU box.



WRF06I Gira E2 pure white matt



WRF06I Jung AS 500 alpine white

Technical Data	
Measured values	motion
Output switch contact	1x contact NO, load max. 1 A for 24 V =/~, floating with follow-up time 8 seconds
Detection range	cone-shaped, detection range, angle 110°/93°, 80 detection zones – at a distance of 2,8 m the detection area will be about 7x5 m
Power supply	15..24 V = (±10%) SELV, 24 V ~ (±10%) SELV
Power consumption	max. 0,5 W (24 V =), 1,1 VA (24 V ~)
Enclosure	central disc in design of the manufacturer (varies depending on switch range)
Operating range temperature	-20..+60 °C
Protection (IP)	IP20, according to EN 60529
Connection	plug-in terminal, max. 1,5 mm <sup>2</sup>
Switch ranges	Berker, Busch-Jaeger, Feller, Gira, Jung, Merten,
Mounting	flush-mounted in standard EU box (Ø=60 mm)
Delivery content	incl. frame

**Wall sensor motion**

Item description	Item No.	Group	€
WRF06I Gira E2 pure white matt	187183	L2	126,20
WRF06I Berker S.1 polar white	223997	L2	126,20
WRF06I Busch-Jaeger Busch-balance® SI alpin white	630405	L2	126,20
WRF06I Busch-Jaeger Reflex SI alpin white	413350	L2	126,20
WRF06I Jung A 500 alpin white	630412	L2	126,20
WRF06I Merten M-Smart polar white brilliant	630429	L2	126,20

**Options**

Description	€
Switch ranges (various manufacturers)	Page 255

**Accessories**

Item description	Item No.	Group	€
PSU-UP24 – flush-mounted power supply 24 V	645737	A1	50,60



## WRF04I

Wall-mounted sensor for motion detection in rooms. The WRF04I provides a relay contact for efficient light control or temperature reduction in unoccupied rooms. Especially designed for application in residential and commercial buildings, offices and corridors. The sensor can be directly mounted on the wall, in a flush-mounted standard EU box or a surface-mounted frame (see ‚Accessories‘).

Technical Data	
Measured values	motion
Output switch contact	1x contact NO, load max. 1 A for 24 V =/~, floating with follow-up time 8 seconds
Detection range	cone-shaped, detection range, angle 110°/93°, 80 detection zones – at a distance of 2,8 m the detection area will be about 7x5 m
Power supply	15..24 V = (±10%) SELV, 24 V ~ (±10%) SELV
Power consumption	max. 0,5 W (24 V =), 1,1 VA (24 V ~)
Enclosure	PC
Colour	pure white
Operating range temperature	-20..+50 °C
Protection (IP)	IP30, according to EN 60529
Connection	terminal block, max. 1,5 mm <sup>2</sup> , cable entry via rear opening, predetermined breaking point (bottom und top)
Mounting	flush-mounted on standard EU box (Ø=60 mm) surface-mounted flat on base using screws, or with frame for surface mounting (see accessories) base part can be mounted and wired separately

Wall sensor motion – relay			
Item description	Item No.	Group	€
WRF04I relay	195812	L1	110,40

Accessories			
Item description	Item No.	Group	€
Fixing kit rawlplugs and screws (2x each)	660945	A1	1,10
PSU-UP24 – flush-mounted power supply 24 V	645737	A1	50,60



## RPF40

Pendulum sensor for temperature measurement in large rooms like open space offices, arcades and production plants. Optionally available with black ball as a radiation sensor with long time constants for radiant heaters. Especially designed for control and display systems.

### Technical Data

Measured values	temperature, radiation temperature
Material in touch with media	Sensor head, PF31, white, black, Ø=40 mm
Operating range temperature	-35..+90 °C
Protection (IP)	IP30, according to EN 60529
Connection cable	PVC, 0,25 mm <sup>2</sup>

### Room pendulum sensor temperature – passive

Item description	Item No.	Group	€
RPF40 Pt100 white L1000	350006	T2	61,60
RPF40 Pt1000 white L1000	321068	T2	64,10
RPF40 Pt1000 1/3 DIN white L1000	329569	T2	68,10
RPF40 Ni1000 white L1000	329279	T2	63,80
RPF40 Ni1000TK5000 white L1000	144193	T2	68,10
RPF40 NTC10k white L1000	351980	T2	60,00

### Options

Description	€
2-wire connection cable L2000 for T100	2,80
2-wire connection cable L4000 for T100	8,40
2-wire connection cable L6000 for T100	14,00
4-wire connection cable L1000 for T100	13,40
4-wire connection cable L2000 for T100	17,20
4-wire connection cable L4000 for T100	24,80
4-wire connection cable L6000 for T100	32,40
Other connection types and lengths	on request
Connection enclosure USE-S incl. mounting base pure white	26,00
Add to price of NTC10k for sensor NTC10k Precon   NTC10k Carel   NTC1,8k   NTC5k   NTC20k   LM235Z	0,00
Other sensor elements	on request
Sensor head black (radiation sensor)	0,00



## RPF40+

Pendulum sensor for temperature measurement in large rooms like open space offices, arcades and production plants. Optionally available with black ball as a radiation sensor with long time constants for radiant heaters. Especially designed for control and display systems.

0..10 V / 4..20 mA  

Technical Data	
Measured values	temperature, radiation temperature
Configuration	USEapp, uConfig, BUS, jumper
Network technology	RS485 Modbus, RS485 BACnet (MS/TP)
Output signal temperature	scaling analogue output: selectable from 4 temperature ranges -50..+50   -20..+80   -15..+35   -10..+120   0..+50   0..+100   0..+160   0..+250 °C adjustable at the transducer, optionally configurable via app or uConfig <b>TRV/TRA:</b> 0..+160 °C (default setting) <b>LCD/BUS/Relay:</b> -20..+80 °C (default setting),
Power supply	<b>TRV:</b> 15..24 V = (±10%) SELV, 24 V ~ (±10%) SELV <b>TRA:</b> 24 V ~ (±10%) SELV <b>LCD/BUS/Relay:</b> 15..35 V = SELV, 19..29 V ~ SELV
Power consumption	<b>TRV:</b> typ. 0,4 W (24 V =), 0,8 VA (24 V ~), <b>TRA:</b> typ. 0,5 W (24 V =) <b>LCD/BUS/Relay:</b> typ. 2,5 W (24 V =), 4,3 VA (24 V ~)
Material in touch with media	Sensor head, PF31, white, Ø=40 mm
Display	LCD 29x35 mm, RGB backlight, with traffic light function, threshold values configurable, optionally configurable via app or uConfig
Enclosure	<b>TRV/TRA:</b> USE-S, impact- and shock-resistant enclosure with quick-release cover, PC <b>LCD/BUS/Relay:</b> USE-M, impact- and shock-resistant enclosure with quick-release cover, PC
Operating range temperature	-35..+70 °C
Protection (IP)	IP30, enclosure IP65, according to EN 60529
Connection	removable plug-in terminal, max. 2,5 mm <sup>2</sup> BUS max. 1,5 mm <sup>2</sup> , relay max. 1,5 mm <sup>2</sup> <b>TRV/TRA/Relay:</b> removable cable entry flextherm M20 for wire Ø=4,5..9 mm <b>LCD/BUS:</b> removable cable entry M25 with fourfold cable entry for wire with max. Ø=7 mm
Connection cable	PVC, 0,25 mm <sup>2</sup> , white
Delivery content	incl. mounting set (screws and accessories) <b>TRV/TRA:</b> incl. mounting base enclosure USE-S pure white, <b>LCD/BUS:</b> incl. mounting base enclosure USE-M pure white

## Room pendulum sensor temperature – active – 0..10 (0..5) V

Item description	Item No.	Group	€
RPF40+ TRV MultiRange white L1000	658409	T2	136,50
RPF40+ TRA MultiRange white L1000	658416	T2	136,50

## Options

Description	€
2-wire connection cable L2000 for T100	2,80
2-wire connection cable L4000 for T100	8,40
2-wire connection cable L6000 for T100	14,00
Other connection types and lengths	on request
RS485 Modbus in enclosure USE-M with option board	87,00
RS485 BACnet (MS/TP) in enclosure USE-M with option board	87,00
2x floating contact NO in enclosure USE-M with option board for 24 V ~ or 24 V = / 3 A	81,70
LCD 29x35 mm, RGB backlight in enclosure USE-M with option board	79,50
Sensor head black (radiation sensor)	0,00

## Accessories

Item description	Item No.	Group	€
Mounting kit universal for enclosure USE	698511	A1	10,70
<b>TRV/TRA:</b> Mounting base enclosure USE-S pure white	667722	A1	6,70
<b>LCD/BUS/Relay:</b> Mounting base enclosure USE-M pure white	668354	A1	9,60
<b>LCD/BUS/Relay:</b> BLE dongle with micro-USB for devices USE-M / USE-L / NOVOS / thanos EVO	668262		32,10
<b>LCD/BUS/Relay:</b> USB interface for devices USE-M / USE-L / NOVOS / thanos EVO / SR06 LCD	597838	A1	39,50



## RPF100

Pendulum sensor for temperature measurement in large, high rooms and spaces like open space offices, arcades, production plants. Especially designed for control and display systems.

### Technical Data

<b>Measured values</b>	temperature
<b>Material in touch with media</b>	Sensor probe: Ø=15 mm, stainless steel V2A (1.4305), length 100 mm, hex pressed (IP65)
<b>Operating range temperature</b>	-35..+90 °C
<b>Protection (IP)</b>	IP65, according to EN 60529
<b>Connection cable</b>	PVC, 0,25 mm <sup>2</sup> , 2-wire, white

### Room pendulum sensor temperature – passive

Item description	Item No.	Group	€
RPF100 Pt100 L1000	81566	T2	80,00
RPF100 Pt1000 L1000	90827	T2	82,50
RPF100 Pt1000 1/3 DIN L1000	90865	T2	86,50
RPF100 Ni1000 L1000	90902	T2	82,20
RPF100 Ni1000TK5000 L1000	160612	T2	86,50
RPF100 NTC10k L1000	91060	T2	78,40

### Options

Description	€
2-wire connection cable L2000 for T100	2,80
2-wire connection cable L4000 for T100	8,40
2-wire connection cable L6000 for T100	14,00
4-wire connection cable L1000 for T100	13,40
4-wire connection cable L2000 for T100	17,20
4-wire connection cable L4000 for T100	24,80
4-wire connection cable L6000 for T100	32,40
Other connection types and lengths	on request
Connection enclosure USE-S incl. mounting base pure white	26,00
Add to price of NTC10k for sensor NTC10k Precon   NTC10k Carel   NTC1,8k   NTC5k   NTC20k   LM235Z	0,00
Other sensor elements	on request

## RPF100+

Pendulum sensor for temperature measurement in large, high rooms and spaces like open space offices, arcades, production plants. Especially designed for control and display systems.



0..10 V / 4..20 mA  

Technical Data	
Measured values	temperature
Configuration	USEapp, uConfig, BUS, jumper
Network technology	RS485 Modbus, RS485 BACnet (MS/TP)
Output signal temperature	scaling analogue output: selectable from 4 temperature ranges -50..+50   -20..+80   -15..+35   -10..+120   0..+50   0..+100   0..+160   0..+250 °C adjustable at the transducer, optionally configurable via app or uConfig <b>TRV/TRA/Relay:</b> 0..+160 °C (default setting) <b>LCD/BUS:</b> -20..+80 °C (default setting)
Power supply	<b>TRV:</b> 15..24 V = (±10%) SELV, 24 V ~ (±10%) SELV <b>TRA:</b> 24 V ~ (±10%) SELV <b>LCD/BUS/Relay:</b> 15..35 V = SELV, 19..29 V ~ SELV
Power consumption	<b>TRV:</b> typ. 0,4 W (24 V =), 0,8 VA (24 V ~) <b>TRA:</b> typ. 0,5 W (24 V =) <b>LCD/BUS/Relay:</b> typ. 2,5 W (24 V =), 4,3 VA (24 V ~)
Material in touch with media	Sensor probe: Ø=15 mm, stainless steel V2A (1.4305), length 100 mm, hex pressed (IP65)
Display	LCD 29x35 mm, RGB backlight, with traffic light function, threshold values configurable, optionally configurable via app or uConfig
Enclosure	<b>TRV/TRA:</b> USE-S, impact- and shock-resistant enclosure with quick-release cover, PC <b>LCD/BUS/Relay:</b> USE-M, impact- and shock-resistant enclosure with quick-release cover, PC
Colour	pure white
Operating range temperature	-35..+70 °C
Protection (IP)	IP65, according to EN 60529

Technical Data	
Connection	removable plug-in terminal, max. 2,5 mm <sup>2</sup> BUS max. 1,5 mm <sup>2</sup> , relay max. 1,5 mm <sup>2</sup> <b>TRV/TRA/Relay:</b> removable cable entry flextherm M20 for wire Ø=4,5..9 mm <b>LCD/BUS:</b> removable cable entry M25 with fourfold cable entry for wire with max. Ø=7 mm
	<b>Connection cable</b>
Delivery content	PVC, 0,25 mm <sup>2</sup> , white
	incl. mounting set (screws and accessories) <b>TRV/TRA:</b> incl. mounting base enclosure USE-S pure white <b>LCD/BUS/Relay:</b> incl. mounting base enclosure USE-M pure white

Room pendulum sensor temperature – active			
Item description	Item No.	Group	€
RPF100+ TRV MultiRange L1000	658423	T2	155,00
RPF100+ TRA MultiRange L1000	658430	T2	155,00

Options	
Description	€
2-wire connection cable L2000 for T100	2,80
2-wire connection cable L4000 for T100	8,40
2-wire connection cable L6000 for T100	14,00
Other connection types and lengths	on request
RS485 Modbus in enclosure USE-M with option board	87,00
RS485 BACnet (MS/TP) in enclosure USE-M with option board	87,00
2x floating contact NO in enclosure USE-M with option board for 24 V ~ or 24 V = / 3 A	81,70
LCD 29x35 mm, RGB backlight in enclosure USE-M with option board	79,50

Accessories			
Item description	Item No.	Group	€
Mounting kit universal for enclosure USE	698511	A1	10,70
<b>TRV/TRA:</b> Mounting base enclosure USE-S pure white	667722	A1	6,70
<b>LCD/BUS/Relay:</b> Mounting base enclosure USE-M pure white	668354	A1	9,60
<b>LCD/BUS/Relay:</b> BLE dongle with micro-USB for devices USE-M / USE-L / NOVOS / thanos EVO	668262		32,10
<b>LCD/BUS/Relay:</b> USB interface for devices USE-M / USE-L / NOVOS / thanos EVO / SR06 LCD	597838	A1	39,50

## FTP+

Room pendulum sensor for sectional measurement of relative humidity and temperature in large and high spaces (e.g. exhibition halls, churches and similar applications). Alternatively, the output can also be set to measure absolute humidity, enthalpy or dew point rather than relative humidity. The design ensures optimal installation and precise measurements. The accuracy of the humidity sensor is 2%.



0..10 V / 4..20 mA  

### Technical Data

<b>Measured values</b>	temperature, relative humidity, absolute humidity, enthalpy, dew point
<b>Configuration</b>	USEapp, uConfig, BUS, jumper, DIP switches (depending on type)
<b>Network technology</b>	RS485 Modbus, RS485 BACnet (MS/TP)
<b>Output signal temperature</b>	-20..+80 °C (default setting) selectable from 4 temperature ranges -40..+60   0..+50   -20..+80   -15..+35 °C adjustable at the transducer, optionally configurable
<b>Measuring range humidity</b>	0..100% rH non-condensing, 0..85 KJ/kg enthalpy, 0..50   0..80 g/m <sup>3</sup> absolute humidity, 0..+50   -20..+80 °C dew point adjustable at the transducer, optionally configurable
<b>Power supply</b>	<b>VV:</b> 15..24 V = (±10%) SELV, 24 V ~ (±10%) SELV <b>AA:</b> 15..24 V = (±10%) SELV <b>LCD/BUS:</b> 15..35 V = SELV, 19..29 V ~ SELV
<b>Power consumption</b>	<b>VV:</b> typ. 0,4 W (24 V =), 0,8 VA (24 V ~) <b>AA:</b> typ. 1 W (24 V =), <b>LCD/BUS:</b> max. 2,5 W (24 V =), 4,3 VA (24 V ~)
<b>Material in touch with media</b>	Pipe: Ø=20 mm, PA6, black, length 210 mm, with filter stainless steel wire mesh
<b>Display</b>	LCD 29x35 mm, RGB backlight, with traffic light function, threshold values configurable, optionally configurable via app or uConfig
<b>Enclosure</b>	USE-M, impact- and shock-resistant enclosure with quick-release cover, PC
<b>Colour</b>	pure white <b>LCD:</b> transparent cover
<b>Operating range temperature</b>	-20..+70 °C
<b>Protection (IP)</b>	IP20, according to EN 60529 enclosure IP65, according to EN 60529

Technical Data	
<b>Connection</b>	removable plug-in terminal, max. 2,5 mm <sup>2</sup> BUS max. 1,5 mm <sup>2</sup> <b>VV/AA:</b> removable cable entry flextherm M20 for wire Ø=4,5..9 mm <b>LCD/BUS:</b> removable cable entry M25 with fourfold cable entry for wire with max. Ø=7 mm
<b>Connection cable</b>	PVC, 0,14 mm <sup>2</sup> , grey
<b>Delivery content</b>	incl. mounting base enclosure USE-M pure white incl. mounting set (screws and accessories)

Room pendulum sensor humidity + temperature – active			
Item description	Item No.	Group	€
FTP+ VV L2000	699952	H1	198,50
FTP+ VV L4000	699983	H1	204,40
FTP+ AA L2000	699976	H1	217,70
FTP+ AA L4000	700016	H1	223,60

Options	
Description	€
Other connection types and lengths	on request
RS485 Modbus	51,60
RS485 BACnet (MS/TP)	51,60
2x floating contact NO for 24 V ~ or 24 V = / 3 A	48,40
LCD 29x35 mm, RGB backlight	46,20

Accessories			
Item description	Item No.	Group	€
Filter stainless steel, wire mesh FTK+ / FTA54+ / FTP+ (spare part)	231169	A1	11,90
Mounting base enclosure USE-M pure white	668354	A1	9,60
Mounting kit universal for enclosure USE	698511	A1	10,70
<b>LCD/BUS/Relay:</b> BLE dongle with micro-USB for devices USE-M / USE-L / NOVOS / thanos EVO	668262		32,10
<b>LCD/BUS/Relay:</b> USB interface for devices USE-M / USE-L / NOVOS / thanos EVO / SR06 LCD	597838	A1	39,50

## LP+

Room pendulum sensor for measuring CO2 in large rooms (exhibition halls, factories, museums etc.). The LP+ comes with an analogue 0..10 V output for connecting to a BMS or monitoring system.



0..10 V  

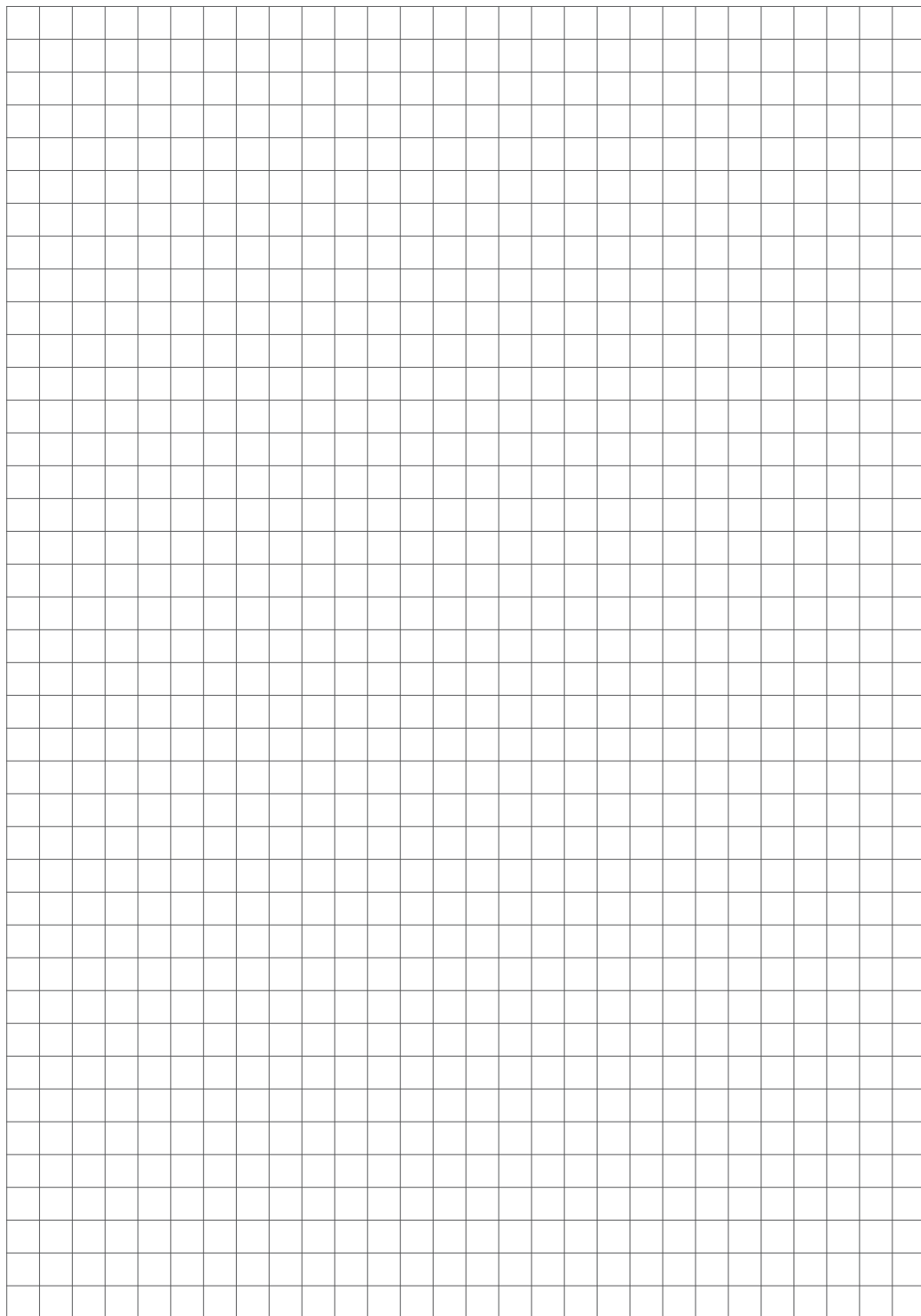
Technical Data	
Measured values	temperature, relative humidity, absolute humidity, enthalpy, dew point, CO2
Configuration	USEapp, uConfig, BUS, jumper, DIP switches (depending on type)
Network technology	RS485 Modbus, RS485 BACnet (MS/TP)
Measuring range humidity	0..100% rH non-condensing, 0..85 KJ/kg enthalpy, 0..50   0..80 g/m <sup>3</sup> absolute humidity, 0..+50   -20..+80 °C dew point, optionally configurable
Measuring range CO2	0..2000 ppm, 0..5000 ppm, optionally configurable
Power supply	15..35 V = SELV, 19..29 V ~ SELV
Power consumption	max. 2,5 W (24 V =), 4,3 VA (24 V ~)
Material in touch with media	Sensor head, black, length 126 mm
Display	LCD 29x35 mm, RGB backlight, with traffic light function, threshold values configurable, optionally configurable via app or uConfig
Enclosure	USE-M, impact- and shock-resistant enclosure with quick-release cover, PC
Colour	pure white <b>LCD:</b> transparent cover
Operating range temperature	0..+50 °C
Protection (IP)	IP20, enclosure IP65
Connection	removable plug-in terminal, max. 2,5 mm <sup>2</sup> BUS max. 1,5 mm <sup>2</sup> <b>VV:</b> removable cable entry flextherm M20 for wire Ø=4,5..9 mm, <b>LCD/BUS:</b> removable cable entry M25 with fourfold cable entry for wire with max. Ø=7 mm
Connection cable	PVC, 0,25 mm <sup>2</sup> , black
Delivery content	incl. mounting base enclosure USE-M pure white incl. mounting set (screws and accessories)

Room pendulum sensor CO2 + temperature – active				
Item description	USEapp	Item No.	Group	€
LP+ CO2 temp VV L5000		690331	Q1	323,40
LP+ CO2 LCD temp VV L5000	✓	764957	Q1	369,60

Room pendulum sensor CO2 + temperature – BUS				
Item description	USEapp	Item No.	Group	€
LP+ CO2 temp_rH RS485 Modbus L5000	✓	776233	Q1	418,00
LP+ CO2 LCD temp_rH RS485 Modbus L5000	✓	774376	Q1	464,20

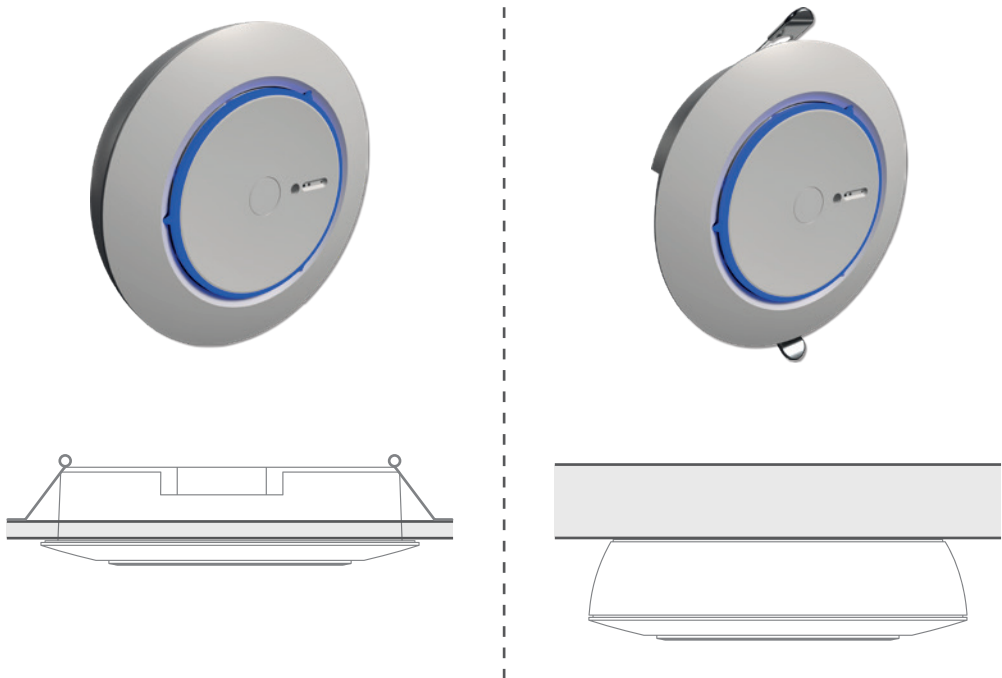
Options	
Description	€
Other connection types and lengths	on request
RS485 BACnet (MS/TP)	51,60
2x floating contact NO for 24 V ~ or 24 V = / 3 A	48,40
Add for additional humidity sensor	43,00

Accessories			
Item description	Item No.	Group	€
Mounting base enclosure USE-M pure white	668354	A1	9,60
Mounting kit universal for enclosure USE	698511	A1	10,70
BLE dongle with micro-USB for devices USE-M / USE-L / NOVOS / thanos EVO	668262		32,10
USB interface for devices USE-M / USE-L / NOVOS / thanos EVO / SR06 LCD	597838	A1	39,50



## thevios HUB

The thevios HUB ceiling sensor is the central component of the theGRID sensor network. It aggregates all the data collected by the connected satellites (thevios SAT) and makes it available to the building management system in a standardised format via the BACnet/IP protocol. At the same time, the HUB itself functions as a fully-fledged multi-sensor, measuring up to seven different parameters. A total of up to eight satellites (thevios SAT) can be connected to the thevios HUB. They can be integrated particularly easily and cost-effectively via a two-wire bus. Installation can be carried out either flush-mounted or surface-mounted (surface-mounted frame available as an option, see accessories). This gives you maximum flexibility when installing in different applications and installation scenarios.



### Technical Data

<b>Measured values</b>	temperature, relative humidity, absolute humidity, enthalpy, dew point, CO <sub>2</sub> , VOC, CO <sub>2</sub> /VOC mix, luminosity, motion, presence, radiation temperature, Particulate matter
<b>Configuration</b>	web interface
<b>Network technology</b>	BACnet IP, theGRID (RS485 Master)
<b>Output signal temperature</b>	0..+50 °C
<b>Measuring range humidity</b>	0..100% rH non-condensing
<b>Measuring range CO<sub>2</sub></b>	0..2000 ppm, 0..5000 ppm, optionally configurable
<b>Measuring VOC (mixed gas)</b>	heated metal oxide semiconductor
<b>Measuring range light</b>	0..1000 Lux

Technical Data	
Measuring range particulate matter	PM1,0 (< 1 µm), PM2,5 (< 2,5 µm), PM4,0 (< 4 µm), PM10 (< 10 µm) optionally configurable
Power supply	24 V = (±10%) SELV, 24 V ~ (±10%) SELV
Display	RGB LED, with traffic light function, threshold values configurable
Enclosure	PC V0
Colour	pure white
Operating range temperature	0..50 °C
Protection (IP)	IP30, according to EN 60529
Connection	tool-free mountable spring clamp, max. 1,5 mm <sup>2</sup> lever terminal, max. 1,5 mm <sup>2</sup> RJ45 socket (8P8C) 10/100 MBit/s Ethernet
Mounting	ceiling flush mount or with enclosure for surface mounting
Notes	Mixed-gas sensors detect volatile organic compounds (VOC) such as body odours, tobacco smoke and off-gassing from materials (furniture, carpets, paint, adhesives, etc.)

#### Ceiling sensor with up to 8 measured values

Item description	Item No.	Group	€
thevios HUB Occ Lum temp_rH BACnet IP	837712	L1	320,00
thevios HUB Occ Lum CO2 temp_rH BACnet IP	837705	L1	382,90
thevios HUB Occ Lum CO2+VOC temp_rH BACnet IP	837699	L1	435,30
thevios HUB Occ Lum PM CO2+VOC temp_rH BACnet IP	837682	L1	523,30
thevios HUB Occ Lum PM CO2+VOC temp_rH IR BACnet IP	837675	L1	566,80

**NOTE:** A maximum of eight thevios SAT units can be connected to each thevios HUB

#### Ceiling sensor with up to 5 measured values

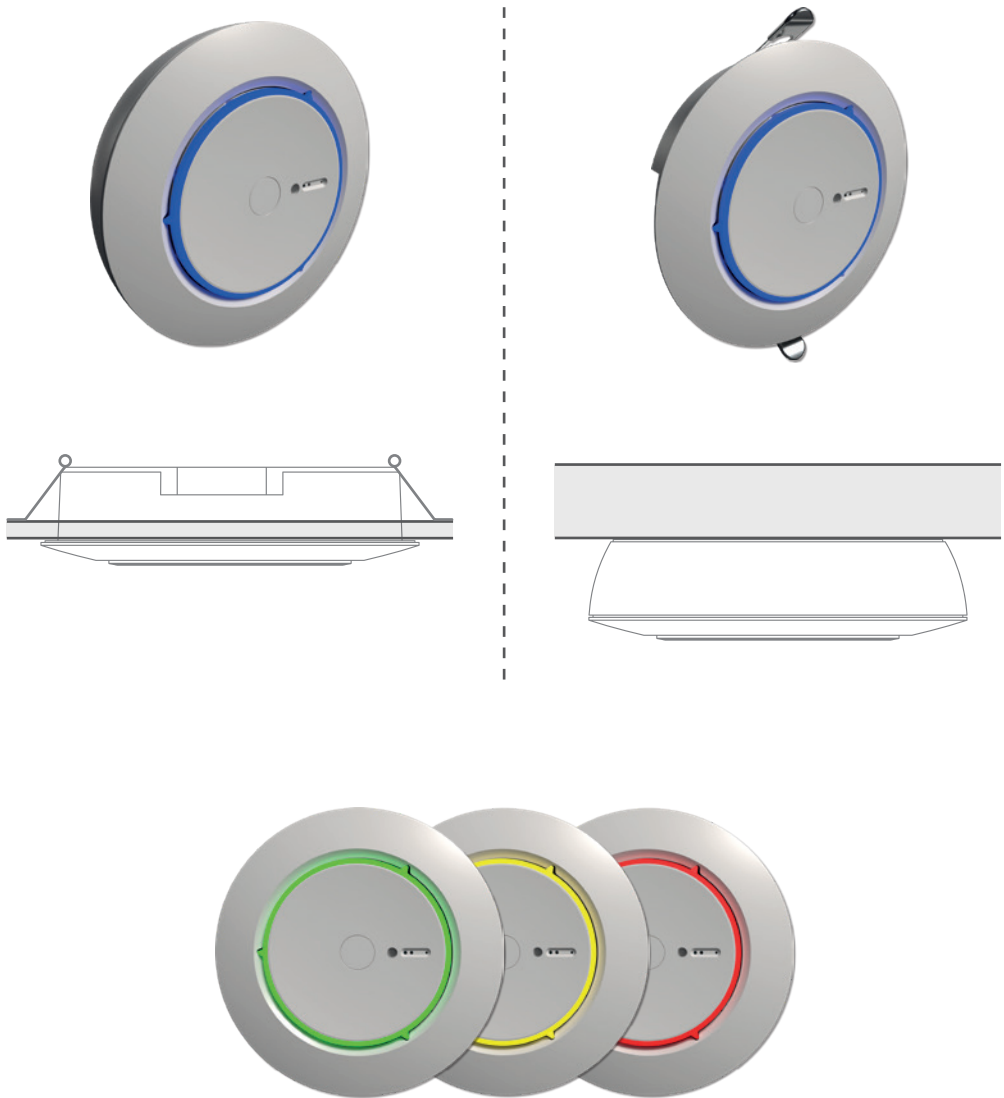
Item description	Item No.	Group	€
thevios SAT Occ Lum	850869	L1	111,00
thevios SAT Occ Lum temp_rH	850876	L1	154,00
thevios SAT Occ Lum temp_rH IR	850880	L1	197,50

#### Accessories

Item description	Item No.	Group	€
Frame for surface mounting thevios 5 / thevios HUB white	826402	A1	29,30
Frame for surface mounting thevios 3 / thevios SAT white	837279	A1	23,80

## **thevios 5**

The thevios 5 multi-sensor allows up to seven different parameters to be measured, enabling the efficient, demand-based control of modern buildings. The sensor integrates seamlessly into the building automation system via BACnet IP. Quick installation either flush-mounted or surface-mounted (surface-mounted frame available as an option, see accessories) and simple commissioning ensure straightforward deployment in both new and existing buildings. An integrated LED ring can be used to display measured values (traffic light function) or to indicate specific statuses. Typical applications include offices, schools, seminar and conference rooms, as well as other areas where reliable room data acquisition and convenient building automation are required.





Technical Data	
Measured values	temperature, relative humidity, absolute humidity, enthalpy, dew point, CO <sub>2</sub> , VOC, CO <sub>2</sub> /VOC mix, luminosity, motion, presence, radiation temperature, Particulate matter
Configuration	web interface
Network technology	BACnet IP
Output signal temperature	0..+50 °C
Measuring range humidity	0..100% rH non-condensing
Measuring range CO <sub>2</sub>	0..2000 ppm, 0..5000 ppm
Measuring VOC (mixed gas)	heated metal oxide semiconductor
Measuring range light	0..1000 Lux
Measuring range particulate matter	PM <sub>1,0</sub> (< 1 µm), PM <sub>2,5</sub> (< 2,5 µm), PM <sub>4,0</sub> (< 4 µm), PM <sub>10</sub> (< 10 µm) optionally configurable
Power supply	PoE
Display	RGB LED with traffic light function, threshold values configurable
Enclosure	PC V0
Colour	pure white
Operating range temperature	0..50 °C
Protection (IP)	IP30, according to EN 60529
Connection	RJ45 socket (8P8C) 10/100 MBit/s Ethernet
Mounting	ceiling flush mount or with enclosure for surface mounting
Notes	Mixed-gas sensors detect volatile organic compounds (VOC) such as body odours, tobacco smoke and off-gassing from materials (furniture, carpets, paint, adhesives, etc.)

**NOTE:** thevios 5 is not compatible with theGRID – see page 240 for thevios HUB

### Ceiling sensor with up to 8 measured values

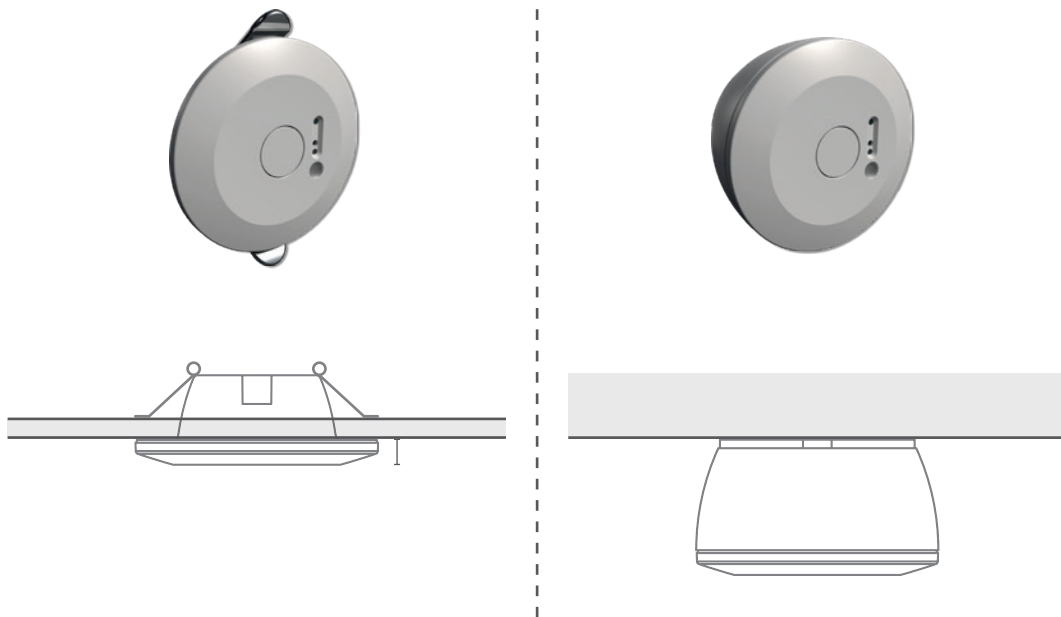
Item description	Item No.	Group	€
thevios 5 Occ Lum temp_rH BACnet IP	837767	L1	287,00
thevios 5 Occ Lum CO <sub>2</sub> temp_rH BACnet IP	837750	L1	349,90
thevios 5 Occ Lum CO <sub>2</sub> +VOC temp_rH BACnet IP	837743	L1	402,30
thevios 5 Occ Lum PM CO <sub>2</sub> +VOC temp_rH BACnet IP	837736	L1	490,30
thevios 5 Occ Lum PM CO <sub>2</sub> +VOC temp_rH IR BACnet IP	837729	L1	533,80

### Accessories

Item description	Item No.	Group	€
Frame for surface mounting thevios 5 / thevios HUB white	826402	A1	29,30

## thevios 3

The thevios 3 multi-sensor allows up to four different parameters to be measured, enabling the efficient, demand-based control of modern buildings. The sensor integrates seamlessly into the building automation system via RS485 Modbus. Quick installation either flush-mounted or surface-mounted (surface-mounted frame available as an option, see accessories) and simple commissioning ensure straightforward deployment in both new and existing buildings. Typical applications include offices, schools, seminar and conference rooms, as well as other areas where reliable room data acquisition and convenient building automation are required.



### Technical Data

Measured values	temperature, relative humidity, absolute humidity, enthalpy, dew point luminosity, motion
Configuration	uConfig
Network technology	RS485 Modbus
Output signal temperature	0..+50 °C
Measuring range humidity	0..100% rH non-condensing
Measuring range light	0..1000 Lux
Power supply	24 V = (±10%) SELV
Enclosure	PC V0
Colour	pure white
Operating range temperature	0..50 °C
Protection (IP)	IP30, according to EN 60529
Mounting	ceiling flush mount or with enclosure for surface mounting

**NOTE:** thevios 3 is not compatible with theGRID – see page 240 for thevios SAT

**Ceiling sensor with up to 5 measured values**

Item description	Item No.	Group	€
thevios 3 Occ Lum RS485 Modbus	850061	L1	111,00
thevios 3 Occ Lum temp_rH RS485 Modbus	850058	L1	154,00
thevios 3 Occ Lum temp_rH IR RS485 Modbus	850059	L1	197,50

**Accessories**

Item description	Item No.	Group	€
Frame for surface mounting thevios 3 / thevios SAT white	837279	A1	23,80



## RDF18+

Ceiling sensor for measuring relative humidity and temperature in rooms. The ideal solution for an inconspicuous, architectural integration into ceiling slabs or hollow walls. Especially designed for use in museums or showrooms. The precise measurements provided to a BMS system contribute to a comfortable room climate and prevent mold formation.

0..10 V / 4..20 mA  

Technical Data	
Measured values	temperature, relative humidity, absolute humidity, enthalpy, dew point
Configuration	USEapp, uConfig, BUS, jumper, DIP switches (depending on type)
Network technology	RS485 Modbus, RS485 BACnet (MS/TP)
Output signal temperature	scaling analogue output: <b>VV/AA:</b> 0..+50 °C (default setting) <b>LCD/BUS:</b> -20..+80 °C (default setting) selectable from 4 temperature ranges -40..+60   0..+50   -20..+80   -15..+35 °C adjustable at the transducer, optionally configurable via app or uConfig
Measuring range humidity	0..100% rH non-condensing, 0..85 KJ/kg enthalpy, 0..50   0..80 g/m <sup>3</sup> absolute humidity, 0..+50   -20..+80 °C dew point adjustable at the transducer, optionally configurable
Power supply	<b>VV:</b> 15..24 V = (±10%) SELV, 24 V ~ (±10%) SELV <b>AA:</b> 15..24 V = (±10%) SELV <b>LCD/BUS:</b> 15..35 V = SELV, 19..29 V ~ SELV
Power consumption	<b>VV:</b> typ. 0,4 W (24 V =), 0,8 VA (24 V ~) <b>AA:</b> max. 1 W (24 V =) <b>LCD/BUS:</b> typ. 2,5 W (24 V =), 4,3 VA (24 V ~)
Material in touch with media	Sensor head, Ø=30 mm, ABS, white
Display	LCD 29x35 mm, RGB backlight
Enclosure	USE-M, impact- and shock-resistant enclosure with quick-release cover, PC
Colour	pure white <b>LCD:</b> transparent cover
Operating range temperature	-35..+70 °C
Protection (IP)	IP30, according to EN 60529 enclosure IP65, according to EN 60529
Connection	removable plug-in terminal, max. 2,5 mm <sup>2</sup> BUS max. 1,5 mm <sup>2</sup> <b>VV/AA:</b> removable cable entry flextherm M20 for wire Ø=4,5..9 mm <b>BUS:</b> removable cable entry M25 with fourfold cable entry for wire with max. Ø=7 mm
Connection cable	flat ribbon cable, for mounting 15 mm from the sensor head, separable by means of RJ12 socket and plug, black
Mounting	facet mounting
Delivery content	incl. mounting base enclosure USE-M pure white incl. mounting set (screws and accessories)

**Ceiling flush mount sensor temperature + humidity – active**

Item description	USEapp	Item No.	Group	€
RDF18+ temp_rH VV	✓	659031	H1	357,20
RDF18+ temp_rH AA	✓	659055	H1	376,40

**Options**

Description	€
RS485 Modbus	51,60
RS485 BACnet (MS/TP)	51,60
LCD 29x35 mm, RGB backlight in enclosure USE-M with option board	79,50

**Accessories**

Item description	Item No.	Group	€
Mounting base enclosure USE-M pure white	668354	A1	9,60
Mounting kit universal for enclosure USE	698511	A1	10,70



## RDF18

Ceiling flush-mounted sensor for temperature measurement in indoor spaces to be mounted inconspicuously into ceiling panels, thus contributing to an overall clean architectural design.

### Technical Data

<b>Measured values</b>	temperature
<b>Material in touch with media</b>	Sensor head, Ø=30 mm, ABS, white
<b>Operating range temperature</b>	-35..+70 °C
<b>Protection (IP)</b>	IP30, according to EN 60529
<b>Connection cable</b>	PVC, 0,25 mm <sup>2</sup> , 2-wire, grey
<b>Mounting</b>	facet mounting

### Ceiling flush mount sensor temperature – passive

Item description	Item No.	Group	€
RDF18 Pt100 L1000	471237	T2	41,70
RDF18 Pt1000 L1000	459235	T2	44,20
RDF18 Pt1000 1/3 DIN L1000	458276	T2	48,20
RDF18 Ni1000 L1000	463669	T2	43,90
RDF18 Ni1000TK5000 L1000	471251	T2	48,20
RDF18 NTC10k L1000	457828	T2	40,10

### Options

Description	€
2-wire connection cable L2000 for T100	2,80
2-wire connection cable L4000 for T100	8,40
2-wire connection cable L6000 for T100	14,00
4-wire connection cable L1000 for T100	13,40
4-wire connection cable L2000 for T100	17,20
4-wire connection cable L4000 for T100	24,80
4-wire connection cable L6000 for T100	32,40
Other connection types and lengths	on request
Connection enclosure USE-S incl. mounting base pure white	26,00
Add to price of NTC10k for sensor NTC10k Precon   NTC10k Carel   NTC1,8k   NTC5k   NTC20k   LM235Z	0,00
Other sensor elements	on request

## RDI

Ceiling-mounted sensor for motion detection in rooms. The small design (d=30mm) permits an inconspicuous installation in suspended ceilings. Available with 3 detection ranges (standard, small range, spot). The RDI can be used e.g. for an occupancy-based switching of lights or temperature reduction if unoccupied, which in return increases energy-efficiency.



RDI Standard



RDI Small Range



RDI Spot

### Technical Data

<b>Measured values</b>	motion
<b>Output switch contact</b>	1x contact NO, load max. 1 A for 24 V =/~, floating with follow-up time 8 seconds  <b>Standard:</b> detection range, angle 110°/93° (H/V) – with an installation height of 2,5 m range detection will be 7,1x5,3 m
<b>Detection range</b>	<b>Small Range:</b> detection range, angle 100°/82° (H/V) – with an installation height of 2,5 m range detection will be 6x4,3 m  <b>Spot:</b> detection range, angle 38°/22° (H/V) – with an installation height of 2,5 m range detection will be 1,7x1 m
<b>Power supply</b>	15..24 V = (±10%) SELV, 24 V ~ (±10%) SELV
<b>Power consumption</b>	typ. 0,5 W (24 V =), 1,1 VA (24 V ~)
<b>Enclosure</b>	ABS
<b>Operating range temperature</b>	-20..+50 °C
<b>Protection (IP)</b>	IP20, according to EN 60529
<b>Connection</b>	plug-in terminal, max. 1,5 mm <sup>2</sup>
<b>Connection cable</b>	PVC, 0,25 mm <sup>2</sup>
<b>Mounting</b>	ceiling flush mount

### Ceiling flush mount sensor motion

Item description	Item No.	In stock	Group	€
RDI Standard	187060	⊖	L2	111,90
RDI Small Range	426503		L2	111,90
RDI Spot	436670		L2	111,90

## RDF-IR

Ceiling flush-mounted sensor for surface temperature measurement in rooms, office spaces and other workplaces. Using the infrared measuring principle, an averaged temperature over the circular detection range (optical detection range  $80 \pm 5^\circ$ ) is calculated. If two IR sensors are used, the mean, minimum or maximum value of both temperature signals can be provided in addition to the individually measured temperatures of each sensor (configurable via Thermokon USEapp).



RDF-IR



RDF-IR Dual

0..10 V / 4..20 mA  

Technical Data	
Measured values	radiation temperature
Configuration	USEapp, uConfig, BUS, jumper, DIP switches (depending on type)
Network technology	RS485 Modbus, RS485 BACnet (MS/TP)
Output signal temperature	0..+50 °C (default setting), selectable from 4 temperature ranges -40..+60   0..+50   -20..+80   -15..+35 °C, adjustable at the transducer
Power supply	15..35 V = SELV, 19..29 V ~ SELV
Power consumption	typ. 0,6 W (24 V =), 1,5 VA (24 V ~)
Display	LCD 29x35 mm, RGB backlight, with traffic light function, threshold values configurable, optionally configurable via app or uConfig
Enclosure	USE-M, impact- and shock-resistant enclosure with quick-release cover, PC
Colour	pure white
Operating range temperature	-20..+70 °C
Protection (IP)	IP30, according to EN 60529
Connection	removable plug-in terminal, max. 2,5 mm <sup>2</sup> BUS max. 1,5 mm <sup>2</sup> <b>V/VV:</b> removable cable entry flextherm M20 for wire Ø=4,5..9 mm, <b>LCD/BUS:</b> removable cable entry M25 with fourfold cable entry for wire with max. Ø=7 mm
Connection cable	patch cable, RJ45 plug, <b>Dual:</b> 2x patch cable, RJ45 plug
Delivery content	incl. mounting base enclosure USE-M pure white

**Ceiling flush mount sensor radiation temperature – active**

Item description	USEapp	Item No.	Group	€
RDF-IR V L1500	✓	699150	T1	174,40
RDF-IR Dual VV 2xL1500	✓	699167	T1	228,50

**Ceiling flush mount sensor radiation temperature – BUS**

Item description	USEapp	Item No.	Group	€
RDF-IR RS485 BACnet (MS/TP) L1500	✓	732604	T1	226,00
RDF-IR Dual RS485 BACnet (MS/TP) 2xL1500	✓	748087	T1	280,10
RDF-IR RS485 Modbus L1500	✓	774789	T1	226,00
RDF-IR Dual RS485 Modbus 2xL1500	✓	774796	T1	280,10

**Options**

Description	€
LCD 29x35 mm, RGB backlight	46,20

**Accessories**

Item description	Item No.	Group	€
Mounting base enclosure USE-M pure white	668354	A1	9,60
Sensor wire 3 m with RJ45 connector	708852	A1	8,80
Sensor wire 7,5 m with RJ45 connector	708869	A1	16,30

## LDF+

Ceiling-mounted sensor used for the measurement of brightness or ambient light levels. Depending on the prism (straight or diagonal), light levels can be detected reliably and selectively in living rooms, offices and work spaces. The sensor is adapted to the spectral sensitivity of human eyes and contributes to a demand-based efficient control of light and sunblinds/shading systems. The remote sensor can be connected to the enclosure with a conventional RJ45 cable, allowing for an easy installation even in hardly accessible locations. If two sensors are used, the average, minimum or maximal value of both brightness signals can be provided in addition to the independent measurements of each sensor (configurable via Thermokon USEapp).



straight prism



Dual



diagonal prism



Dual

0..10 V / 4..20 mA  

### Technical Data

Measured values	luminosity
Configuration	USEapp, uConfig, BUS, jumper, DIP switches (depending on type)
Output switch contact	<b>Relay:</b> 2x floating contact NO for 24 V ~ or 24 V = / 3 A
Network technology	RS485 Modbus, RS485 BACnet (MS/TP), LON FT (free topology)
Measuring range light	selectable from 6 ranges 0..200 lux   0..1000 lux   0..2 klux   0..10 klux   0..20 klux   0..50 klux, optionally configurable
Power supply	15..35 V = SELV, 19..29 V ~ SELV
Power consumption	typ. 0,6 W (24 V =), , max. 40 mA, 1,5 VA (24 V ~)
Material in touch with media	prism: acrylic glass clear straight (mainly for interior lighting) diagonal (mainly for outdoor lighting)
Enclosure	USE-M, impact- and shock-resistant enclosure with quick-release cover, PC
Colour	pure white
Operating range temperature	-25..+65 °C
Protection (IP)	IP30, enclosure IP65, according to EN 60529
Connection	removable plug-in terminal, max. 2,5 mm <sup>2</sup> BUS max. 1,5 mm <sup>2</sup> , relay max. 1,5 mm <sup>2</sup> <b>V/VV/A/AA:</b> removable cable entry flextherm M20 for wire Ø=4,5..9 mm, <b>Relay/BUS:</b> removable cable entry M25 with fourfold cable entry for wire with max. Ø=7 mm
Connection cable	patch cable, RJ45 plug, 2x patch cable, RJ45 plug
Delivery content	incl. mounting base enclosure USE-M pure white incl. mounting set (screws and accessories)

**LDF+ active 0..10 V**

Ceiling flush mount sensor luminosity – active				
Item description	USEapp	Item No.	Group	€
LDF+ V L1500 straight prism	✓	662604	L2	184,10
LDF+ V L1500 diagonal prism	✓	662628	L2	184,10
LDF+ A L1500 straight prism	✓	662635	L2	184,10
LDF+ A L1500 diagonal prism	✓	662642	L2	184,10
LDF+ V L1500 straight prism relay	✓	707336	L2	228,40
LDF+ V L1500 diagonal prism relay	✓	707350	L2	228,40

**LDF+ Dual active 2x0..10 V**

Dual ceiling flush mount sensor luminosity – active				
Item description	USEapp	Item No.	Group	€
LDF+ Dual VV 2xL1500 straight prism	✓	700849	L1	239,40
LDF+ Dual VV 2xL1500 diagonal prism	✓	700856	L1	239,40
LDF+ Dual AA 2xL1500 straight prism	✓	700863	L1	258,60
LDF+ Dual AA 2xL1500 diagonal prism	✓	700870	L1	258,60
LDF+ Dual VV 2xL1500 straight prism relay	✓	707374	L1	283,70
LDF+ Dual VV 2xL1500 diagonal prism relay	✓	707381	L1	283,70

**LDF+ BUS**

Ceiling flush mount sensor luminosity – BUS				
Item description	USEapp	Item No.	Group	€
LDF+ RS485 BACnet (MS/TP) L1500 straight prism	✓	700900	L1	217,10
LDF+ RS485 BACnet (MS/TP) L1500 diagonal prism	✓	700917	L1	217,10
LDF+ RS485 Modbus L1500 straight prism	✓	700887	L1	217,10
LDF+ RS485 Modbus L1500 diagonal prism	✓	700894	L1	217,10

**LDF+ Dual BUS**

Dual ceiling flush mount sensor luminosity – BUS				
Item description	USEapp	Item No.	Group	€
LDF+ Dual RS485 BACnet (MS/TP) 2xL1500 straight prism	✓	700948	L1	272,40
LDF+ Dual RS485 BACnet (MS/TP) 2xL1500 diagonal prism	✓	700955	L1	272,40
LDF+ Dual RS485 Modbus 2xL1500 straight prism	✓	700924	L1	272,40
LDF+ Dual RS485 Modbus 2xL1500 diagonal prism	✓	700931	L1	272,40

Options	
Description	€
2x floating contact NO for 24 V ~ or 24 V = / 3 A	48,40
LCD 29x35 mm, RGB backlight	46,20

Accessories			
Item description	Item No.	Group	€
Mounting base enclosure USE-M pure white	668354	A1	9,60
Sensor wire 3 m with RJ45 connector	708852	A1	8,80
Sensor wire 7,5 m with RJ45 connector	708869	A1	16,30
BLE dongle with micro-USB for devices USE-M / USE-L / NOVOS / thanos EVO	668262		32,10
USB interface for devices USE-M / USE-L / NOVOS / thanos EVO / SR06 LCD	597838	A1	39,50

**Valid for: WRF06 x, WRF06 passive, WRF06 i**

Discount group: Depending on device | Other switch ranges and colours on request (S1)

Prices for frames only valid in connection with basic device

Switch Ranges			
Description	Colour	Dimensions (BxH)	€
<b>BERKER</b> Berker S.1	polar white (g/m)	55x55	0,00
<b>BUSCH-JAEGER</b> Busch-balance® SI	alpine white	55x55	0,00
<b>BUSCH-JAEGER</b> future® linear	studioweiß (g/m), anthracite, black	63x63	15,80
<b>GIRA</b> E2	pure white (g/m), anthracite	55x55	0,00
<b>GIRA</b> E3	pure white (g)	55x55	0,00
<b>GIRA</b> Standard 55	pure white (g/m)	55x55	0,00
<b>JUNG</b> LS 990 Kunststoff	alpine white (g)	70x70	15,80
<b>JUNG</b> A 550	alpine white	55x55	0,00
<b>JUNG</b> AS 500/AS 500 antib.	alpine white	55x55	0,00
<b>MERTEN</b> M-Smart	polar white (g/m), aktivweiß (g)	55x55	0,00
<b>MERTEN</b> M-Plan	polar white (g/m), active white (g), anthracite	55x55	0,00
<b>MERTEN</b> M-Pure	polar white (g), active white (g), anthracite	55x55	0,00

Explanation: g = glossy m = matt



**BERKER** Berker S.1



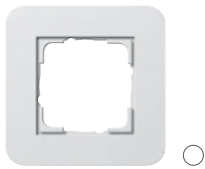
**BJ** Busch-balance® SI



**BJ** future® linear  
*(incl. intermediate frame)*



**GIRA** E2



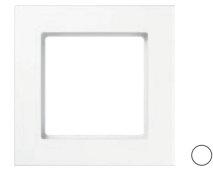
**GIRA** E3



**GIRA** Standard 55



**JUNG** LS 990  
*(incl. intermediate frame)*



**JUNG** A 550



**JUNG** AS 500



**MERTEN** M-Smart



**MERTEN** M-Plan



**MERTEN** M-Pure

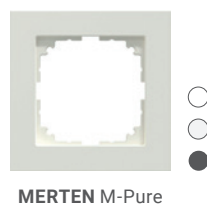
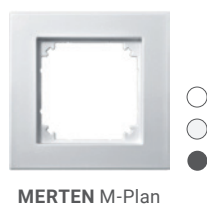
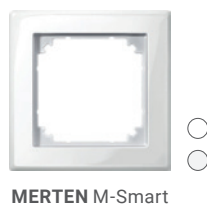
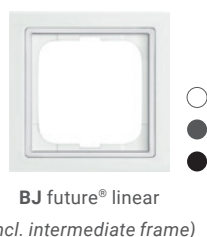
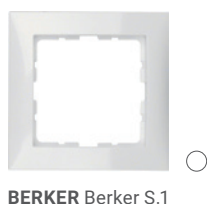
Valid for: **SR06 LCD, SR07 (x), WRF06 LCD, WRF07 (x), WRF06 active/BUS, Switches 55x55**

Discount group: A1 | Other switch ranges and colours on request (S1)

Prices for frames only valid in connection with basic device

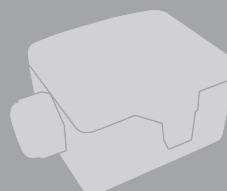
Switch Ranges			
Description	Colour	Dimensions (BxH)	€
<b>BERKER</b> Berker S.1	polar white (g/m)	55x55	6,00
<b>BUSCH-JAEGER</b> Busch-balance® SI	alpine white	55x55	6,00
<b>BUSCH-JAEGER</b> future® linear	studioweiß (g/m), anthracite, black	63x63	15,80
<b>GIRA</b> E2	pure white (g/m), anthracite	55x55	6,00
<b>GIRA</b> E3	pure white (g)	55x55	6,00
<b>GIRA</b> Standard 55	pure white (g/m)	55x55	6,00
<b>JUNG</b> LS 990 Kunststoff	alpine white (g)	70x70	15,80
<b>JUNG</b> A 550	alpine white	55x55	6,00
<b>JUNG</b> AS 500/AS 500 antib.	alpine white	55x55	6,00
<b>MERTEN</b> M-Smart	polar white (g/m), aktivweiß (g)	55x55	6,00
<b>MERTEN</b> M-Plan	polar white (g/m), active white (g), anthracite	55x55	6,00
<b>MERTEN</b> M-Pure	polar white (g), active white (g), anthracite	55x55	6,00

Explanation: g = glossy m = matt



# Outdoor Application

With our outdoor sensors, you always get the optimal solution for your application. Depending on type, the integrated sensors measure temperature, humidity, enthalpy, dew point, CO2 and VOC concentration, brightness or atmospheric air pressure and make our products incomparably flexible.



Outdoor  
Application

## Outdoor Sensors

AGS54+	Temperature	258
AGS55+	Temperature	260
FTA54+	Temperature, humidity	264
WSA	Temperature, humidity	266
LA+	Temperature, humidity, CO2, VOC	268
Li65+	Light, air pressure, temp., humidity	271

## AGS54+

Passive sensor for temperature measurement in outdoor areas, cold rooms, greenhouses, production plants and warehouses. A hinged cover and tool-free wiring as well as removable cable entries ensure a quick and easy installation.



### Technical Data

<b>Measured values</b>	temperature
<b>Configuration</b>	jumper
<b>Enclosure</b>	USE-S, impact- and shock-resistant enclosure with quick-release cover, PC
<b>Colour</b>	pure white
<b>Operating range temperature</b>	-35..+90 °C
<b>Protection (IP)</b>	IP65, according to EN 60529
<b>Connection</b>	removable cable entry flextherm M20 for wire Ø=4,5..9 mm, removable plug-in terminal, max. 2,5 mm <sup>2</sup>
<b>Delivery content</b>	incl. mounting base enclosure USE-S pure white, incl. mounting set (screws and accessories)

Outdoor sensor temperature passive				
Item description	Item No.	In stock	Group	€
AGS54+ Pt100	622837		T2	18,10
AGS54+ Pt1000	622851	☉	T2	20,60
AGS54+ Pt1000 1/3 DIN	622783	☉	T2	24,60
AGS54+ NTC10k	622790	☉	T2	16,50
AGS54+ NTC10k Carel	651547		T2	16,50
AGS54+ NTC10k Precon	622868		T2	16,50
AGS54+ NTC5k	624275		T2	16,50
AGS54+ NTC20k	622875		T2	16,50
AGS54+ NTC1,8k	643825		T2	16,50
AGS54+ Ni1000	622806	☉	T2	20,30
AGS54+ Ni1000TK5000	622813	☉	T2	24,60
AGS54+ LM235Z	622820		T2	18,60
AGS54+ KTY81-110	622899		T2	24,60
AGS54+ KTY81-121	622905		T2	24,60
AGS54+ KTY81-122	622912		T2	24,60
AGS54+ KTY81-210	622929		T2	24,60

Options	
Description	€
4-wire connection (4-wire)	13,40
Other sensor elements	on request

Accessories			
Item description	Item No.	Group	€
Mounting clip enclosure USE-S pure white	667739	A1	5,70
Mounting base enclosure USE-S pure white	667722	A1	6,70
Fixing kit rawplugs and screws (2x each)	660945	A1	1,10
Housing protection BS150, transparent	730075	A1	27,50
Cable entry M20 USE white, sealing insert Flextherm Ø=4,5..9 mm (4 pcs)	851077	A1	12,30
Sealing insert M20 USE white, Flextherm Ø=4,5..9 mm (10 pcs)	752206	A1	12,30
Sealing insert M20 USE white, 2x Ø=7 mm (10 pcs)	641333	A1	12,30
Cable entry M25 USE white, sealing insert 4x Ø=7 mm (4 pcs)	641364	A1	12,30

## AGS55+

Outdoor temperature sensor with external stainless steel probe (fast response) for measuring temperature in outdoor areas, cold rooms, greenhouses, production plants and warehouses. A hinged cover and tool-free wiring as well as removable cable entries ensure a quick and easy installation.



AGS55+



AGS55+ relay / BUS



AGS55+ LCD

passive / 0..10 V / 4..20 mA  

Technical Data	
Measured values	temperature
Configuration	USEapp, uConfig, BUS, jumper, DIP switches (depending on type)
Network technology	RS485 Modbus, RS485 BACnet (MS/TP)
Output signal temperature	scaling analogue output: selectable from 4 temperature ranges -50..+50   -20..+80   -15..+35   -10..+120   0..+50   0..+100   0..+160   0..+250 °C adjustable at the transducer, optionally configurable <b>TRV/TRA/Basic:</b> -20..+80 °C (default setting) <b>Relay/LCD/BUS:</b> -50..+50 °C (default setting)
Power supply	<b>TRV/Basic:</b> 15..24 V = (±10%) SELV, 24 V ~ (±10%) SELV, <b>TRA:</b> 15..24 V = (±10%) SELV <b>Relay/LCD/BUS:</b> 15..35 V = SELV, 19..29 V ~ SELV
Power consumption	<b>TRV:</b> typ. 0,4 W (24 V =), 0,8 VA (24 V ~) <b>TRA:</b> typ. 0,5 W (24 V =) <b>Basic:</b> max. 0,7 W (24 V =), 1,8 VA (24 V ~) <b>Relay/LCD/BUS:</b> max. 2,5 W (24 V =), 4,3 VA (24 V ~)
Material in touch with media	Sensor probe, Ø=6 mm, stainless steel V2A (1.4305)
Display	LCD 29x35 mm, RGB backlight, with traffic light function, threshold values configurable, optionally configurable via app or uConfig
Enclosure	<b>passive/TRV/TRA/Basic:</b> USE-S, impact- and shock-resistant enclosure with quick-release cover, PC <b>Relay/LCD/BUS:</b> USE-M, impact- and shock-resistant enclosure with quick-release cover, PC
Colour	pure white, <b>LCD:</b> transparent cover
Operating range temperature	-35..+90 °C
Protection (IP)	IP65, according to EN 60529

Technical Data	
<b>Connection</b>	removable plug-in terminal, max. 2,5 mm <sup>2</sup> BUS max. 1,5 mm <sup>2</sup> , relay max. 1,5 mm <sup>2</sup> <b>passive/TRV/TRA/Basic:</b> removable cable entry flextherm M20 for wire Ø=4,5..9 mm, <b>Relay/LCD/BUS:</b> removable cable entry M25 with fourfold cable entry for wire with max. Ø=7 mm
<b>Delivery content</b>	incl. mounting set (screws and accessories) <b>passive/TRV/TRA/Basic:</b> incl. mounting base enclosure USE-S pure white <b>Relay/LCD/BUS:</b> incl. mounting base enclosure USE-M pure white

## AGS55+ passive

Outdoor sensor temperature passive					
Item description	USEapp	Item No.	In stock	Group	€
AGS55+ Pt100	✓	622998		T2	39,40
AGS55+ Pt1000	✓	623018	⊕	T2	41,90
AGS55+ Pt1000 1/3 DIN	✓	622943		T2	45,90
AGS55+ NTC10k	✓	622950		T2	37,80
AGS55+ NTC10k Carel	✓	645027		T2	37,80
AGS55+ NTC10k Precon	✓	623025		T2	37,80
AGS55+ NTC5k	✓	624268		T2	37,80
AGS55+ NTC20k	✓	623032		T2	37,80
AGS55+ NTC1,8k	✓	645812		T2	37,80
AGS55+ Ni1000	✓	622967		T2	41,60
AGS55+ Ni1000TK5000	✓	622974		T2	45,90
AGS55+ LM235Z	✓	622981		T2	39,90
AGS55+ KTY81-110	✓	623049		T2	45,90
AGS55+ KTY81-121	✓	623056		T2	45,90
AGS55+ KTY81-122	✓	623063		T2	45,90
AGS55+ KTY81-210	✓	623070		T2	45,90

Options	
Description	€
4-wire connection (4-wire)	13,40
Other sensor elements	on request

## AGS55+ active

Outdoor sensor temperature – active				
Item description	Item No.	In stock	Group	€
AGS55+ TRV MultiRange	623087		T2	90,80
AGS55+ TRA MultiRange	623094	⊖	T2	90,80

Accessories				
Item description	Item No.		Group	€
Mounting clip enclosure USE-S pure white	667739		A1	5,70
Mounting base enclosure USE-S pure white	667722		A1	6,70
Fixing kit rawlplugs and screws (2x each)	660945		A1	1,10
Housing protection BS150, transparent	730075		A1	27,50
Cable entry M20 USE white, sealing insert Flextherm Ø=4,5..9 mm (4 pcs)	851077		A1	12,30
Sealing insert M20 USE white, Flextherm Ø=4,5..9 mm (10 pcs)	752206		A1	12,30
Sealing insert M20 USE white, 2x Ø=7 mm (10 pcs)	641333		A1	12,30
Cable entry M25 USE white, sealing insert 4x Ø=7 mm (4 pcs)	641364		A1	12,30

## AGS55+ Relay / LCD

Outdoor sensor temperature – active – 0..10 (0..5) V + relay				
Item description	USEapp	Item No.	Group	€
AGS55+ TRV MultiRange Relais	✓	663069	T2	139,20

Outdoor sensor temperature – LCD				
Item description	USEapp	Item No.	Group	€
AGS55+ LCD TRV MultiRange	✓	658614	T2	137,00
AGS55+ LCD TRA MultiRange	✓	658621	T2	137,00
AGS55+ LCD TRV MultiRange Relais	✓	663076	T2	185,40

## AGS55+ BUS

Outdoor sensor temperature – BUS				
Item description	USEapp	Item No.	Group	€
AGS55+ Basic RS485 Modbus		747844	T2	90,80
AGS55+ RS485 BACnet (MS/TP)	✓	699686	T2	126,80
AGS55+ LCD RS485 BACnet (MS/TP)	✓	699693	T2	173,00
AGS55+ RS485 Modbus	✓	658584	T2	126,80
AGS55+ LCD RS485 Modbus	✓	658607	T2	173,00

Accessories				
Item description		Item No.	Group	€
<b>Basic RS485 Modbus:</b> Mounting clip enclosure USE-S pure white		667739	A1	5,70
<b>Basic RS485 Modbus:</b> Mounting base enclosure USE-S pure white		667722	A1	6,70
Mounting base enclosure USE-M pure white		668354	A1	9,60
Fixing kit rawlplugs and screws (2x each)		660945	A1	1,10
Housing protection BS150, transparent		730075	A1	27,50
BLE dongle with micro-USB for devices USE-M / USE-L / NOVOS / thanos EVO		668262		32,10
USB interface for devices USE-M / USE-L / NOVOS / thanos EVO / SR06 LCD		597838	A1	39,50
Cable entry M20 USE white, sealing insert Flextherm Ø=4,5..9 mm (4 pcs)		851077	A1	12,30
Sealing insert M20 USE white, Flextherm Ø=4,5..9 mm (10 pcs)		752206	A1	12,30
Sealing insert M20 USE white, 2x Ø=7 mm (10 pcs)		641333	A1	12,30
Cable entry M25 USE white, sealing insert 4x Ø=7 mm (4 pcs)		641364	A1	12,30

## FTA54+

Outdoor sensor for measuring relative humidity and temperature in HVAC applications, greenhouses, industrial halls and in meteorology. The output can also be configured to measure absolute humidity, enthalpy or dew point. The optional features, such as relay outputs for 2-point controllers or 2-stage 2-point controllers and an LCD with traffic light indication enable a wide range of applications. The accuracy of the humidity sensor is 2%. A hinged cover and tool-free wiring as well as removable cable entries ensure a quick and easy installation.



FTA54+



FTA54+ LCD

0..10 V / 4..20 mA  

Technical Data	
Measured values	temperature, relative humidity, absolute humidity, enthalpy, dew point
Configuration	App, uConfig, BUS, jumper, DIP switches (depending on type)
Network technology	RS485 Modbus, RS485 BACnet (MS/TP)
Output signal temperature	scaling analogue output: -20..+80 °C (default setting) selectable from 4 temperature ranges -40..+60   0..+50   -20..+80   -15..+35 °C adjustable at the transducer, optionally configurable
Measuring range humidity	0..100% rH non-condensing, 0..85 KJ/kg enthalpy, 0.50   0..80 g/m <sup>3</sup> absolute humidity, 0..+50   -20..+80 °C dew point, optionally configurable
Power supply	<b>TRV/Basic:</b> 15..24 V = (±10%) SELV, 24 V ~ (±10%) SELV <b>TRA:</b> 15..24 V = (±10%) SELV <b>Relay/LCD/BUS:</b> 15..35 V = SELV, 19..29 V ~ SELV
Power consumption	<b>TRV:</b> typ. 0,4 W (24 V =), 0,8 VA (24 V ~) <b>TRA:</b> typ. 1 W (24 V =) <b>Basic:</b> max. 0,7 W (24 V =), 1,8 VA (24 V ~), <b>Relay/LCD/BUS:</b> max. 2,5 W (24 V =), 4,3 VA (24 V ~)
Material in touch with media	Pipe, PC, pure white, with filter stainless steel wire mesh
Display	LCD 29x35 mm, RGB backlight, with traffic light function, threshold values configurable, optionally configurable via app or uConfig
Enclosure	USE-M, impact- and shock-resistant enclosure with quick-release cover, PC
Operating range temperature	-20..+70 °C
Protection (IP)	IP65, according to EN 60529
Connection	removable plug-in terminal, max. 2,5 mm <sup>2</sup> BUS max. 1,5 mm <sup>2</sup> , relay max. 1,5 mm <sup>2</sup> <b>TRV/TRA/Basic:</b> removable cable entry flextherm M20 for wire Ø=4,5..9 mm, <b>Relay/LCD/BUS:</b> removable cable entry M25 with fourfold cable entry for wire with max. Ø=7 mm

**Technical Data**

<b>Delivery content</b>	incl. mounting base enclosure USE-M pure white incl. mounting set (screws and accessories) incl. sun/rain protection PC, white
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**Outdoor sensor humidity + temperature – active**

Item description	USEapp	Item No.	In stock	Group	€
FTA54+ VV		659147	☉	H1	192,50
FTA54+ AA		659154	☉	H1	211,70
FTA54+ VV relay	✓	661003		H1	240,90
FTA54+ LCD VV	✓	660983		H1	238,70
FTA54+ LCD AA	✓	660990		H1	257,90
FTA54+ LCD VV relay	✓	661010		H1	287,10

**Outdoor sensor humidity + temperature – BUS**

Item description	USEapp	Item No.	Group	€
FTA54+ Basic RS485 Modbus		747752	H1	219,80
FTA54+ RS485 BACnet (MS/TP)	✓	700191	H1	239,40
FTA54+ LCD RS485 BACnet (MS/TP)	✓	700214	H1	285,60
FTA54+ RS485 Modbus	✓	659178	H1	239,40
FTA54+ LCD RS485 Modbus	✓	661034	H1	285,60

**Options**

Description	€
Add for additional passive temperature sensor (Pt100   Pt1000   NTC10k   Ni1000   Ni1000TK5000)	24,50
Other sensor elements	on request

**Accessories**

Item description	Item No.	Group	€
Mounting base enclosure USE-M pure white	668354	A1	9,60
Mounting kit universal for enclosure USE	698511	A1	10,70
Filter stainless steel, wire mesh FTK+ / FTA54+ / FTP+ (spare part)	231169	A1	11,90
BLE dongle with micro-USB for devices USE-M / USE-L / NOVOS / thanos EVO	668262		32,10
USB interface for devices USE-M / USE-L / NOVOS / thanos EVO / SR06 LCD	597838	A1	39,50
Cable entry M20 USE white, sealing insert Flextherm Ø=4,5..9 mm (4 pcs)	851077	A1	12,30
Sealing insert M20 USE white, Flextherm Ø=4,5..9 mm (10 pcs)	752206	A1	12,30
Sealing insert M20 USE white, 2x Ø=7 mm (10 pcs)	641333	A1	12,30
Cable entry M25 USE white, sealing insert 4x Ø=7 mm (4 pcs)	641364	A1	12,30



## WSA

Weatherproof humidity and temperature sensor for outdoor applications. The radiation shield protects the sensors from rain, hail and radiated heat. The curved shape of the plates ensure that air can move across the sensors to keep radiated temperature from rooftops and other surrounding surfaces away and guarantee proper measurement. Typical applications are meteorology, greenhouses and industrial environments.

0..10 V / 4..20 mA  

Technical Data	
Measured values	temperature, relative humidity, absolute humidity, enthalpy, dew point
Configuration	USEapp, uConfig, BUS, jumper, DIP switches (depending on type)
Network technology	RS485 Modbus, RS485 BACnet (MS/TP)
Output signal temperature	scaling analogue output, -20..+80 °C (default setting) selectable from 4 temperature ranges -40..+60   0..+50   -20..+80   -15..+35 °C adjustable at the transducer, optionally configurable
Measuring range humidity	0..100% rH non-condensing, 0..85 KJ/kg enthalpy, 0..50   0..80 g/m <sup>3</sup> absolute humidity, 0..+50   -20..+80 °C dew point
Power supply	<b>VV:</b> 15..24 V = (±10%) SELV, 24 V ~ (±10%) SELV <b>AA:</b> 15..24 V = (±10%) SELV <b>BUS:</b> 15..35 V = SELV, 19..29 V ~ SELV
Power consumption	<b>VV:</b> typ. 0,4 W (24 V =), 0,8 VA (24 V ~) <b>AA:</b> max. 1 W (24 V =) <b>BUS:</b> max. 2,5 W (24 V =), 4,3 VA (24 V ~)
Material in touch with media	Pipe, Ø=19,5 mm, PA6, with filter stainless steel wire mesh weather protection PC, stainless steel
Display	LCD 29x35 mm, RGB backlight, with traffic light function, threshold values configurable, optionally configurable via app or uConfig
Enclosure	<b>VV/AA:</b> USE-S, impact- and shock-resistant enclosure with quick-release cover, PC <b>BUS:</b> USE-M, impact- and shock-resistant enclosure with quick-release cover, PC
Operating range temperature	-20..+70 °C
Protection (IP)	IP65, according to EN 60529
Connection	removable plug-in terminal, max. 2,5 mm <sup>2</sup> BUS max. 1,5 mm <sup>2</sup> , relay max. 1,5 mm <sup>2</sup> <b>VV/AA:</b> removable cable entry flextherm M20 for wire Ø=4,5..9 mm <b>BUS:</b> removable cable entry M25 with fourfold cable entry for wire with max. Ø=7 mm
Mounting	mounting at the wall or at a pole
Delivery content	incl. mounting set (screws and accessories)

## WSA active

Weather protected outdoor sensor humidity + temperature – active				
Item description	USEapp	Item No.	Group	€
WSA VV	✓	626408	H2	311,10
WSA AA	✓	626415	H2	330,30

Options	
Description	€
LCD 29x35 mm, RGB backlight in enclosure USE-M with option board	79,50
Add for additional passive temperature sensor (Pt100   Pt1000   NTC10k   Ni1000   Ni1000TK5000)	24,50
Other sensor elements	on request

## WSA BUS

Weather protected outdoor sensor humidity + temperature – BUS				
Item description	USEapp	Item No.	Group	€
WSA temp_rH RS485 BACnet (MS/TP)	✓	700184	H1	357,90
WSA temp_rH RS485 Modbus	✓	626439	H1	357,90

Options	
Description	€
LCD 29x35 mm, RGB backlight	46,20

Accessories			
Item description	Item No.	Group	€
Filter stainless steel, wire mesh FTK+ / FTA54+ / FTP+ (spare part)	231169	A1	11,90
Weather protection for FTK+, WSA (replacement)	625241	A1	82,20
BLE dongle with micro-USB for devices USE-M / USE-L / NOVOS / thanos EVO	668262		32,10
USB interface for devices USE-M / USE-L / NOVOS / thanos EVO / SR06 LCD	597838	A1	39,50
Cable entry M20 USE white, sealing insert Flextherm Ø=4,5..9 mm (4 pcs)	851077	A1	12,30
Sealing insert M20 USE white, Flextherm Ø=4,5..9 mm (10 pcs)	752206	A1	12,30
Sealing insert M20 USE white, 2x Ø=7 mm (10 pcs)	641333	A1	12,30
Cable entry M25 USE white, sealing insert 4x Ø=7 mm (4 pcs)	641364	A1	12,30

## LA+

Air quality sensor for measuring CO<sub>2</sub>, mixed gas (VOC), optionally temperature and humidity outdoors and in areas requiring high IP protection class (e.g. underground stations, tunnels, exhibition halls, cold chains and greenhouses as well as in production halls and warehouses). For devices with CO<sub>2</sub> and VOC, every output can be configured to be a mixed output (selectable ratio between CO<sub>2</sub> and VOC). Devices with a relay option can be used as 2-point controllers or 2-stage controllers.



LA+



LA+ (Temp)



LA+ (Temp\_rH)

0..10 V / 4..20 mA  

### Technical Data

<b>Measured values</b>	temperature, relative humidity, absolute humidity, enthalpy, dew point, CO <sub>2</sub> , VOC
<b>Configuration</b>	USEapp, uConfig, BUS, jumper, DIP switches (depending on type) <b>CO<sub>2</sub>+VOC</b> : each output can be set to get a variable mix of CO <sub>2</sub> and VOC by configuration via app or uConfig
<b>Network technology</b>	RS485 Modbus, RS485 BACnet (MS/TP)
<b>Output signal temperature</b>	scaling analogue output: 0..+50 °C (default setting) selectable from 4 temperature ranges -40..+60   0..+50   -20..+80   -15..+35 °C optionally configurable
<b>Measuring range humidity</b>	0..100% rH non-condensing, 0..85 kJ/kg enthalpy, 0..50   0..80 g/m <sup>3</sup> absolute humidity, 0..+50   -20..+80 °C dew point
<b>Measuring range CO<sub>2</sub></b>	0..2000 ppm, 0..5000 ppm, optionally configurable
<b>Measuring VOC (mixed gas)</b>	heated metal oxide semiconductor, self-calibration
<b>Power supply</b>	15..35 V = SELV, 19..29 V ~ SELV
<b>Power consumption</b>	max. 2,5 W (24 V =), 4,3 VA (24 V ~)
<b>Material in touch with media</b>	<b>Temp:</b> Sensor probe, stainless steel V2A (1.4305) <b>Temp+rH:</b> Pipe, PC, with filter stainless steel wire mesh
<b>Display</b>	LCD 29x35 mm, RGB backlight, with traffic light function, threshold values configurable, for example to display the air quality optionally configurable via app or uConfig
<b>Enclosure</b>	USE-M, impact- and shock-resistant enclosure with quick-release cover, PC
<b>Colour</b>	pure white, <b>LCD</b> : transparent cover
<b>Operating range temperature</b>	0..+50 °C
<b>Protection (IP)</b>	IP65, according to EN 60529

Technical Data	
<b>Connection</b>	removable plug-in terminal, max. 2,5 mm <sup>2</sup> BUS max. 1,5 mm <sup>2</sup> , relay max. 1,5 mm <sup>2</sup> <b>V/VV/3xV:</b> removable cable entry flextherm M20 for wire Ø=4,5..9 mm <b>Relay/BUS/LCD:</b> removable cable entry M25 with fourfold cable entry for wire with max. Ø=7 mm
<b>Delivery content</b>	incl. mounting base enclosure USE-M pure white incl. mounting set (screws and accessories) incl. sun/rain protection PC, white
<b>Notes</b>	Mixed-gas sensors detect volatile organic compounds (VOC) such as body odours, tobacco smoke and off-gassing from materials (furniture, carpets, paint, adhesives, etc.)

## LA+ active

Outdoor sensor CO2 + VOC or mix + temperature + humidity – active				
Item description	USEapp	Item No.	Group	€
LA+ CO2 V	✓	690171	Q1	263,30
LA+ CO2 temp VV	✓	700542	Q1	310,70
LA+ CO2 temp_rH 3xV	✓	700573	Q1	367,40
LA+ CO2+VOC VV	✓	698993	Q1	386,20
LA+ CO2+VOC temp 3xV	✓	751650	Q1	433,60
LA+ CO2+VOC temp_rH 4xV	✓	788953	Q1	490,30

## LA+ BACnet

Outdoor sensor CO2 + VOC or mix + temperature + humidity – RS485 BACnet (MS/TP)				
Item description	USEapp	Item No.	Group	€
LA+ CO2 RS485 BACnet (MS/TP)	✓	700580	Q1	314,90
LA+ CO2 temp RS485 BACnet (MS/TP)	✓	700641	Q1	362,30
LA+ CO2 temp_rH RS485 BACnet (MS/TP)	✓	817783	Q1	419,00
LA+ CO2+VOC RS485 BACnet (MS/TP)	✓	700627	Q1	437,80
LA+ CO2+VOC temp_rH RS485 BACnet (MS/TP)	✓	700665	Q1	528,20

## LA+ RS485 Modbus

Outdoor sensor CO2 + VOC or mix + temperature + humidity – RS485 Modbus				
Item description	USEapp	Item No.	Group	€
LA+ CO2 RS485 Modbus	✓	698719	Q1	314,90
LA+ CO2 temp RS485 Modbus	✓	700634	Q1	362,30
LA+ CO2 temp_rH RS485 Modbus	✓	767781	Q1	419,00
LA+ CO2+VOC RS485 Modbus	✓	700610	Q1	437,80
LA+ CO2+VOC temp_rH RS485 Modbus	✓	700658	Q1	528,20

Options	
Description	€
LCD 29x35 mm, RGB backlight	46,20

Accessories			
Item description	Item No.	Group	€
Mounting base enclosure USE-M pure white	668354	A1	9,60
Mounting kit universal for enclosure USE	698511	A1	10,70
BLE dongle with micro-USB for devices USE-M / USE-L / NOVOS / thanos EVO	668262		32,10
USB interface for devices USE-M / USE-L / NOVOS / thanos EVO / SR06 LCD	597838	A1	39,50
Cable entry M20 USE white, sealing insert Flextherm Ø=4,5..9 mm (4 pcs)	851077	A1	12,30
Sealing insert M20 USE white, Flextherm Ø=4,5..9 mm (10 pcs)	752206	A1	12,30
Sealing insert M20 USE white, 2x Ø=7 mm (10 pcs)	641333	A1	12,30
Cable entry M25 USE white, sealing insert 4x Ø=7 mm (4 pcs)	641364	A1	12,30

## Li65+

Outdoor sensor for measuring light, temperature, humidity and atmospheric pressure in outdoor areas, greenhouses, warehouses or industrial halls. The device has an integrated ambient light sensor with a precise optical filter adapted to the spectral sensitivity of human eyes. Relay outputs for a 2-point controller or a 2-stage 2-point controller allow for a wide range of applications. A hinged cover and tool-free wiring as well as removable cable entries ensure a quick and easy installation.



Li65+



Li65+ Temp



Li65+ Temp\_rH

0..10 V / 4..20 mA  

### Technical Data

<b>Measured values</b>	temperature, relative humidity, absolute humidity, enthalpy, dew point, luminosity, atmospheric pressure
<b>Configuration</b>	USEapp, App, uConfig, BUS, jumper, DIP switches (depending on type)
<b>Network technology</b>	RS485 Modbus, RS485 BACnet (MS/TP)
<b>Output signal temperature</b>	scaling analogue output: -20..+80 °C (default setting) selectable from 4 temperature ranges -40..+60   0..+50   -20..+80   -15..+35 °C adjustable at the transducer, optionally configurable
<b>Measuring range humidity</b>	0..100% rH non-condensing
<b>Measuring range light</b>	0..1000 lux (default setting) selectable from 6 ranges 0..200 lux   0..1000 lux   0..2 klux   0..10 klux   0..20 klux   0..50 klux
<b>Measuring range atm. pressure</b>	500..1500 hPa
<b>Power supply</b>	15..35 V = SELV, 19..29 V ~ SELV
<b>Power consumption</b>	typ. 0,6 W (24 V =), 1,5 VA (24 V ~)
<b>Enclosure</b>	USE-M, impact- and shock-resistant enclosure with quick-release cover, PC
<b>Colour</b>	pure white, translucent cover PC
<b>Operating range temperature</b>	-30..+70 °C
<b>Protection (IP)</b>	IP65, according to EN 60529
<b>Connection</b>	removable plug-in terminal, max. 2,5 mm <sup>2</sup> BUS max. 1,5 mm <sup>2</sup> , relay max. 1,5 mm <sup>2</sup> <b>V/VV/3xV/4xV/A/AA:</b> removable cable entry flextherm M20 for wire Ø=4,5..9 mm <b>BUS:</b> removable cable entry M25 with fourfold cable entry for wire with max. Ø=7 mm
<b>Delivery content</b>	incl. mounting base enclosure USE-M pure white incl. mounting set (screws and accessories)

**Li65+ active**

Outdoor sensor light – active					
Item description	USEapp	Item No.	In stock	Group	€
Li65+ V	✓	662680	⊕	L2	152,60
Li65+ A	✓	662697	⊕	L2	152,60

Outdoor sensor light + temperature – active					
Item description	USEapp	Item No.	Group	€	
Li65+ temp VV	✓	700672	L1	178,20	
Li65+ temp AA	✓	700689	L1	197,40	
Li65+ temp VV relay	✓	707305	L1	222,50	

Outdoor sensor light + temperature + humidity + atmospheric pressure – active					
Item description	USEapp	Item No.	Group	€	
Li65+ temp_rH 3xV	✓	700696	L1	221,20	
Li65+ temp_rH_hPa 4xV	✓	700702	L1	264,20	

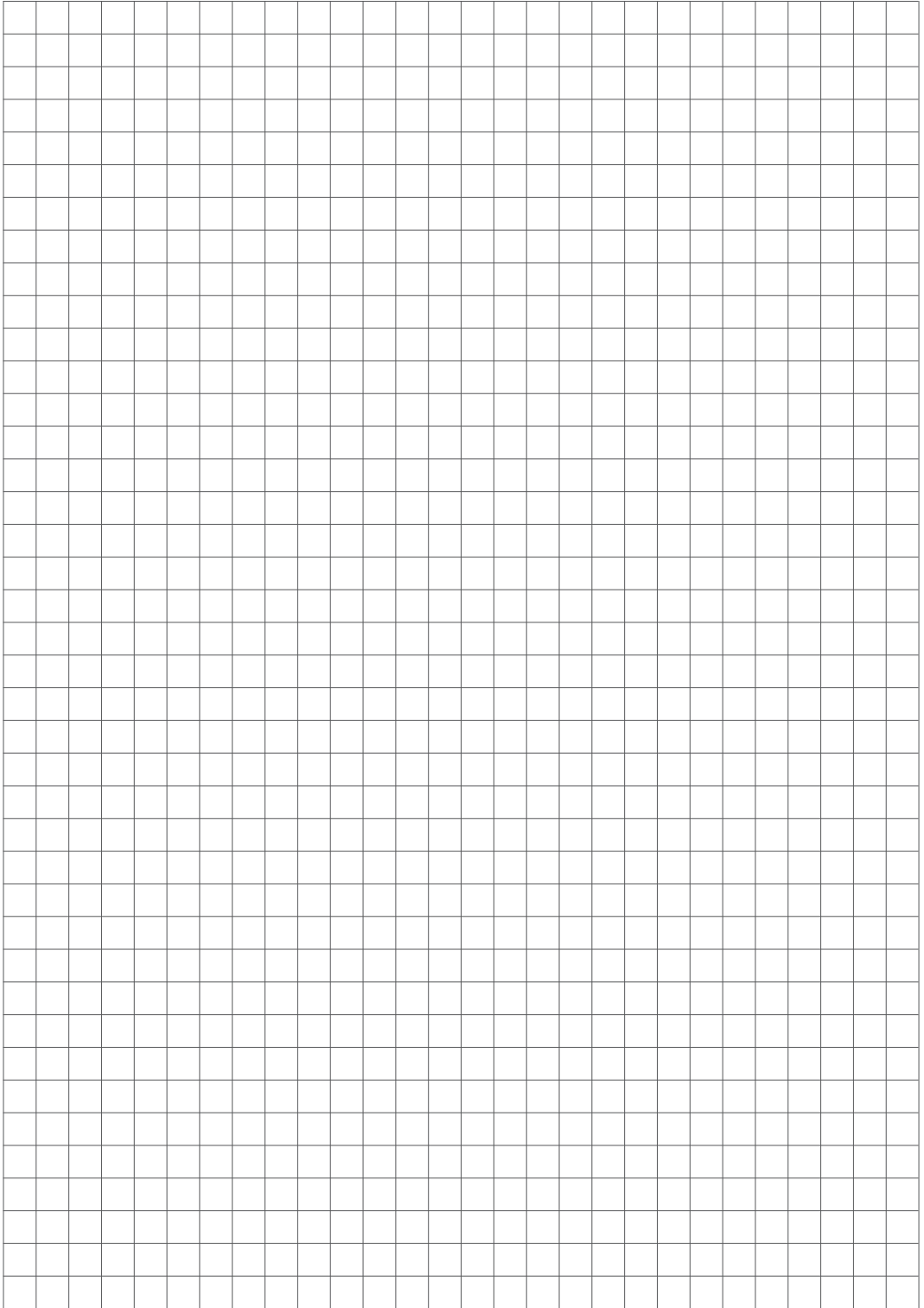
Accessories					
Item description	Item No.	Group	€		
Mounting base enclosure USE-M pure white	668354	A1	9,60		
Mounting kit universal for enclosure USE	698511	A1	10,70		
BLE dongle with micro-USB for devices USE-M / USE-L / NOVOS / thanos EVO	668262		32,10		
USB interface for devices USE-M / USE-L / NOVOS / thanos EVO / SR06 LCD	597838	A1	39,50		
Cable entry M20 USE white, sealing insert Flextherm Ø=4,5..9 mm (4 pcs)	851077	A1	12,30		
Sealing insert M20 USE white, Flextherm Ø=4,5..9 mm (10 pcs)	752206	A1	12,30		
Sealing insert M20 USE white, 2x Ø=7 mm (10 pcs)	641333	A1	12,30		
Cable entry M25 USE white, sealing insert 4x Ø=7 mm (4 pcs)	641364	A1	12,30		

**Li65+ BUS**

Outdoor sensor light + temperature – BUS				
Item description	USEapp	Item No.	Group	€
Li65+ temp RS485 BACnet (MS/TP)	✓	700740	L1	229,00
Li65+ temp RS485 Modbus	✓	700733	L1	229,00

Outdoor sensor light + temperature + humidity + atmospheric pressure – BUS				
Item description	USEapp	Item No.	Group	€
Li65+ temp_rH RS485 BACnet (MS/TP)	✓	700764	L1	272,00
Li65+ temp_rH_hPa RS485 BACnet (MS/TP)	✓	700788	L1	315,00
Li65+ temp_rH RS485 Modbus	✓	700757	L1	272,00
Li65+ temp_rH_hPa RS485 Modbus	✓	700771	L1	315,00

Accessories				
Item description		Item No.	Group	€
Mounting base enclosure USE-M pure white		668354	A1	9,60
Mounting kit universal for enclosure USE		698511	A1	10,70
BLE dongle with micro-USB for devices USE-M / USE-L / NOVOS / thanos EVO		668262		32,10
USB interface for devices USE-M / USE-L / NOVOS / thanos EVO / SR06 LCD		597838	A1	39,50
Cable entry M20 USE white, sealing insert Flextherm Ø=4,5..9 mm (4 pcs)		851077	A1	12,30
Sealing insert M20 USE white, Flextherm Ø=4,5..9 mm (10 pcs)		752206	A1	12,30
Sealing insert M20 USE white, 2x Ø=7 mm (10 pcs)		641333	A1	12,30
Cable entry M25 USE white, sealing insert 4x Ø=7 mm (4 pcs)		641364	A1	12,30



# Duct Application

Our duct and immersion sensors reliably measure and monitor temperature, humidity and air quality in ducts or pipes of heating, ventilation and air conditioning systems.



## Duct Sensors

AKF10+	Temperature	276
FTK+	Temperature, humidity	284
LK+	CO <sub>2</sub> , VOC, temperature, humidity	288
FSK01	Humidity	294
AVT	Air flow, temperature	295

## Average Duct Sensors

MWF+	Temperature	296
MWF400+	Temperature	299

## Screw-in Duct Sensors

SFK02+	Temperature	302
SFK02+ FR	Temperature	309
SFK01	Temperature	313
SFK03	Temperature	315

## High Temperature Duct Sensors

KFK01	Temperature	319
KFK03	Temperature	322

## **AKF10+**

Duct sensor for measuring air temperature and other gaseous media (e.g. in ventilation and air conditioning systems). Combined with a thermowell pocket, it can be used as an immersion temperature sensor as well. Models with a relay output for a 2-point controller or a 2-stage 2-point controller and color-changing LCD allow for a wide range of applications. A hinged cover and tool-free wiring as well as removable cable entries ensure a quick and easy installation.



AKF10+



AKF10+



AKF10+ relay / BUS



AKF10+ LCD

Technical Data	
Measured values	temperature
Configuration	USEapp, uConfig, BUS, jumper, DIP switches (depending on type)
Network technology	RS485 Modbus, RS485 BACnet (MS/TP)
Output signal temperature	scaling analogue output: selectable from 4 temperature ranges -50..+50   -20..+80   -15..+35   -10..+120   0..+50   0..+100   0..+160   0..+250 °C <b>TRV/TRA:</b> 0..+160 °C (default setting) <b>Relay/LCD/BUS:</b> -20..+80 °C (default setting)
Power supply	<b>TRV:</b> 15..24 V = (±10%) SELV, 24 V ~ (±10%) SELV <b>TRA:</b> 15..24 V = (±10%) SELV <b>Relay/LCD/BUS:</b> 15..35 V = SELV, 19..29 V ~ SELV
Power consumption	<b>TRV/Basic:</b> typ. 0,4 W (24 V =), 0,8 VA (24 V ~) <b>TRA:</b> typ. 0,5 W (24 V =) <b>Basic:</b> max. 0,7 W (24 V =), 1,8 VA (24 V ~) <b>Relay/LCD/BUS:</b> max. 2,5 W (24 V =), 4,3 VA (24 V ~)
Material in touch with media	Sensor probe: Ø=6 mm, stainless steel V4A (1.4571) suitable for usage in aggressive media
Installation length	50 mm, 100 mm, 150 mm, 200 mm, 250 mm, 300 mm, 450 mm
Display	LCD 29x35 mm, RGB backlight, with traffic light function, threshold values configurable, optionally configurable via app or uConfig
Enclosure	<b>passive/TRV/TRA/Basic:</b> USE-S, impact- and shock-resistant enclosure with quick-release cover, PC <b>Relay/LCD/BUS:</b> USE-M, impact- and shock-resistant enclosure with quick-release cover, PC
Colour	pure white, <b>LCD:</b> transparent cover
Operating range temperature	-50..+160 °C   <b>NTC10k:</b> -50..+150 °C
Protection (IP)	IP65, according to EN 60529
Connection	removable plug-in terminal, max. 2,5 mm <sup>2</sup> BUS max. 1,5 mm <sup>2</sup> , relay max. 1,5 mm <sup>2</sup> <b>passive/TRV/TRA/Basic:</b> removable cable entry flextherm M20 for wire Ø=4,5..9 mm removable cable entry M25 with fourfold cable entry for wire with max. Ø=7 mm
Delivery content	incl. mounting set (screws and accessories) <b>passive/TRV/TRA/Basic:</b> incl. mounting clip enclosure USE-S pure white <b>Relay/LCD/BUS:</b> incl. mounting flange MF6DS flexible

## AKF10+ passive

Duct/immersion sensor -50..+160 °C – Pt100 DIN cl. B T3		
Item description	Item No.	€
AKF10+ Pt100 050.06	621175	38,80
AKF10+ Pt100 100.06	621182	40,10
AKF10+ Pt100 150.06	621199	41,60
AKF10+ Pt100 200.06	621205	42,30
AKF10+ Pt100 250.06	621212	44,30
AKF10+ Pt100 300.06	621229	45,60
AKF10+ Pt100 450.06	621236	47,70

Duct/immersion sensor -50..+160 °C – Pt1000 1/3 DIN T3		
Item description	Item No.	€
AKF10+ Pt1000 1/3 DIN 050.06	620796	45,30
AKF10+ Pt1000 1/3 DIN 100.06	620802	46,60
AKF10+ Pt1000 1/3 DIN 150.06	620819	48,10
AKF10+ Pt1000 1/3 DIN 200.06	620826	48,80
AKF10+ Pt1000 1/3 DIN 250.06	620833	50,80
AKF10+ Pt1000 1/3 DIN 300.06	620840	52,10
AKF10+ Pt1000 1/3 DIN 450.06	620857	54,20

Duct/immersion sensor -50..+160 °C – Ni1000 DIN cl. B T3		
Item description	Item No.	€
AKF10+ Ni1000 050.06	620932	41,00
AKF10+ Ni1000 100.06	620949	42,30
AKF10+ Ni1000 150.06	620956	43,80
AKF10+ Ni1000 200.06	620963	44,50
AKF10+ Ni1000 250.06	620970	46,50
AKF10+ Ni1000 300.06	620987	47,80
AKF10+ Ni1000 450.06	620994	49,90

Duct/immersion sensor -50..+120 °C – LM235Z T3		
Item description	Item No.	€
AKF10+ LM235Z 050.06	621106	39,30
AKF10+ LM235Z 100.06	621113	40,60
AKF10+ LM235Z 150.06	621120	42,10
AKF10+ LM235Z 200.06	621137	42,80
AKF10+ LM235Z 250.06	621144	44,80
AKF10+ LM235Z 300.06	621151	46,10
AKF10+ LM235Z 450.06	621168	48,20

Duct/immersion sensor -50..+160 °C – Pt1000 DIN cl. B T3		
Item description	Item No.	€
AKF10+ Pt1000 050.06	621311	41,30
AKF10+ Pt1000 100.06	621328	42,60
AKF10+ Pt1000 150.06	621335	44,10
AKF10+ Pt1000 200.06	621342	44,80
AKF10+ Pt1000 250.06	621359	46,80
AKF10+ Pt1000 300.06	621366	48,10
AKF10+ Pt1000 450.06	621373	50,20

Duct/immersion sensor -50..+150 °C – NTC10k T3		
Item description	Item No.	€
AKF10+ NTC10k 050.06	620864	37,20
AKF10+ NTC10k 100.06	620871	38,50
AKF10+ NTC10k 150.06	620888	40,00
AKF10+ NTC10k 200.06	620895	40,70
AKF10+ NTC10k 250.06	620901	42,70
AKF10+ NTC10k 300.06	620918	44,00
AKF10+ NTC10k 450.06	620925	46,10

Duct/immersion sensor -50..+160 °C – Ni1000TK5000 T3		
Item description	Item No.	€
AKF10+ Ni1000TK5000 050.06	621007	45,30
AKF10+ Ni1000TK5000 100.06	621014	46,60
AKF10+ Ni1000TK5000 150.06	621021	48,10
AKF10+ Ni1000TK5000 200.06	621038	48,80
AKF10+ Ni1000TK5000 250.06	621045	50,80
AKF10+ Ni1000TK5000 300.06	621052	52,10
AKF10+ Ni1000TK5000 450.06	621069	54,20

Options	
Description	€
<b>Pt100   Pt1000 (1/3 DIN)   Ni1000   Ni1000TK5000:</b> Temperature -80..+260 °C (T260)	26,60
4-wire connection (4-wire)	13,40
Add to price of NTC10k for sensor NTC10k Precon   NTC10k Carel   NTC1,8k   NTC5k   NTC20k	0,00
Other sensor elements	on request

## AKF10+ active

Duct/immersion sensor -50..+160 °C active 0..10 (0..5) V			
Item description	Item No.	Group	€
AKF10+ TRV MultiRange 050.06	621595	T3	89,50
AKF10+ TRV MultiRange 100.06	621601	T3	90,60
AKF10+ TRV MultiRange 150.06	621618	T3	91,70
AKF10+ TRV MultiRange 200.06	621625	T3	92,10
AKF10+ TRV MultiRange 250.06	621632	T3	93,60
AKF10+ TRV MultiRange 300.06	621649	T3	94,80
AKF10+ TRV MultiRange 450.06	621656	T3	96,10

Duct/immersion sensor -50..+160 °C active 4..20 mA				
Item description	Item No.	In stock	Group	€
AKF10+ TRA MultiRange 050.06	621663		T3	89,50
AKF10+ TRA MultiRange 100.06	621670	⊖	T3	90,60
AKF10+ TRA MultiRange 150.06	621687	⊖	T3	91,70
AKF10+ TRA MultiRange 200.06	621694		T3	92,10
AKF10+ TRA MultiRange 250.06	621700		T3	93,60
AKF10+ TRA MultiRange 300.06	621717		T3	94,80
AKF10+ TRA MultiRange 450.06	621724		T3	96,10

Duct/immersion sensor -50..+160 °C active 0..10 (0..5) V + relay				
Item description	Item No.	Group	€	
AKF10+ TRV MultiRange 050.06 relay	663304	T2	167,40	
AKF10+ TRV MultiRange 100.06 relay	663311	T2	168,50	
AKF10+ TRV MultiRange 150.06 relay	663328	T2	169,60	
AKF10+ TRV MultiRange 200.06 relay	663335	T2	170,00	
AKF10+ TRV MultiRange 250.06 relay	663342	T2	171,50	
AKF10+ TRV MultiRange 300.06 relay	663359	T2	172,70	
AKF10+ TRV MultiRange 450.06 relay	663366	T2	174,00	

<b>Duct/immersion sensor -50..+160 °C active 0..10 (0..5) V LCD</b>				
Item description	USEapp	Item No.	Group	€
AKF10+ LCD TRV MultiRange 050.06	✓	663380	T2	169,00
AKF10+ LCD TRV MultiRange 100.06	✓	663397	T2	170,10
AKF10+ LCD TRV MultiRange 150.06	✓	663403	T2	171,20
AKF10+ LCD TRV MultiRange 200.06	✓	663410	T2	171,60
AKF10+ LCD TRV MultiRange 250.06	✓	663427	T2	173,10
AKF10+ LCD TRV MultiRange 300.06	✓	663434	T2	174,30
AKF10+ LCD TRV MultiRange 450.06	✓	663441	T2	175,60

<b>Duct/immersion sensor -50..+160 °C active 4..20 mA LCD</b>				
Item description	USEapp	Item No.	Group	€
AKF10+ LCD TRA MultiRange 050.06	✓	663526	T2	169,00
AKF10+ LCD TRA MultiRange 100.06	✓	663533	T2	170,10
AKF10+ LCD TRA MultiRange 150.06	✓	663540	T2	171,20
AKF10+ LCD TRA MultiRange 200.06	✓	663557	T2	171,60
AKF10+ LCD TRA MultiRange 250.06	✓	663564	T2	173,10
AKF10+ LCD TRA MultiRange 300.06	✓	663571	T2	174,30
AKF10+ LCD TRA MultiRange 450.06	✓	663588	T2	175,60

<b>Duct/immersion sensor -50..+160 °C active 0..10 (0..5) V + relay LCD</b>				
Item description	USEapp	Item No.	Group	€
AKF10+ LCD TRV MultiRange 050.06 relay	✓	663458	T2	201,40
AKF10+ LCD TRV MultiRange 100.06 relay	✓	663465	T2	202,50
AKF10+ LCD TRV MultiRange 150.06 relay	✓	663472	T2	203,60
AKF10+ LCD TRV MultiRange 200.06 relay	✓	663489	T2	204,00
AKF10+ LCD TRV MultiRange 250.06 relay	✓	663496	T2	205,50
AKF10+ LCD TRV MultiRange 300.06 relay	✓	663502	T2	206,70
AKF10+ LCD TRV MultiRange 450.06 relay	✓	663519	T2	208,00

<b>Options</b>	
Description	€
Temperature -80..+260 °C (T260)	26,60

## AKF10+ BUS

Duct/immersion sensor -50..+160 °C Basic RS485 Modbus			
Item description	Item No.	Group	€
AKF10+ Basic RS485 Modbus 050.06	747783	T2	89,50
AKF10+ Basic RS485 Modbus 100.06	748032	T2	90,60
AKF10+ Basic RS485 Modbus 150.06	747769	T2	91,70
AKF10+ Basic RS485 Modbus 200.06	747790	T2	92,10
AKF10+ Basic RS485 Modbus 250.06	748049	T2	93,60
AKF10+ Basic RS485 Modbus 300.06	747776	T2	94,80
AKF10+ Basic RS485 Modbus 450.06	748056	T2	96,10

Duct/immersion sensor -50..+160 °C RS485 BACnet (MS/TP)				
Item description	USEapp	Item No.	Group	€
AKF10+ RS485 BACnet 050.06	✓	699174	T2	127,90
AKF10+ RS485 BACnet 100.06	✓	699181	T2	129,00
AKF10+ RS485 BACnet 150.06	✓	683838	T2	130,20
AKF10+ RS485 BACnet 200.06	✓	699198	T2	130,60
AKF10+ RS485 BACnet 250.06	✓	699204	T2	132,10
AKF10+ RS485 BACnet 300.06	✓	699211	T2	133,20
AKF10+ RS485 BACnet 450.06	✓	699228	T2	134,60

Duct/immersion sensor -50..+160 °C RS485 BACnet (MS/TP) LCD				
Item description	USEapp	Item No.	Group	€
AKF10+ LCD RS485 BACnet 050.06	✓	699235	T2	174,10
AKF10+ LCD RS485 BACnet 100.06	✓	699242	T2	175,20
AKF10+ LCD RS485 BACnet 150.06	✓	682848	T2	176,40
AKF10+ LCD RS485 BACnet 200.06	✓	699259	T2	176,80
AKF10+ LCD RS485 BACnet 250.06	✓	699266	T2	178,30
AKF10+ LCD RS485 BACnet 300.06	✓	699273	T2	179,40
AKF10+ LCD RS485 BACnet 450.06	✓	699280	T2	180,80

Duct/immersion sensor -50..+160 °C RS485 Modbus				
Item description	USEapp	Item No.	Group	€
AKF10+ RS485 Modbus 050.06	✓	621823	T2	127,90
AKF10+ RS485 Modbus 100.06	✓	621830	T2	129,00
AKF10+ RS485 Modbus 150.06	✓	621847	T2	130,20
AKF10+ RS485 Modbus 200.06	✓	621854	T2	130,60
AKF10+ RS485 Modbus 250.06	✓	621861	T2	132,10
AKF10+ RS485 Modbus 300.06	✓	621878	T2	133,20
AKF10+ RS485 Modbus 450.06	✓	621885	T2	134,60

<b>Duct/immersion sensor -50..+160 °C RS485 Modbus LCD</b>				
Item description	USEapp	Item No.	Group	€
AKF10+ LCD RS485 Modbus 050.06	✓	663618	T2	174,10
AKF10+ LCD RS485 Modbus 100.06	✓	663625	T2	175,20
AKF10+ LCD RS485 Modbus 150.06	✓	663632	T2	176,40
AKF10+ LCD RS485 Modbus 200.06	✓	663649	T2	176,80
AKF10+ LCD RS485 Modbus 250.06	✓	663656	T2	178,30
AKF10+ LCD RS485 Modbus 300.06	✓	663663	T2	179,40
AKF10+ LCD RS485 Modbus 450.06	✓	663670	T2	180,80

<b>Options</b>	
Description	€
Temperature -80..+260 °C (T260)	26,60

## **Accessories – passive / TRV / TRA**

<b>Accessories</b>			
Item description	Item No.	Group	€
Mounting clip enclosure USE-S pure white	667739	A1	5,70
Mounting base enclosure USE-S pure white	667722	A1	6,70
Mounting kit AKF10+ for enclosure USE-S	748551	A1	8,30

## **Accessories – Relay / LCD / BUS**

<b>Accessories</b>			
Item description	Item No.	Group	€
Mounting base enclosure USE-M pure white	668354	A1	9,60
Mounting kit universal for enclosure USE	698511	A1	10,70
BLE dongle with micro-USB for devices USE-M / USE-L / NOVOS / thanos EVO	668262		32,10
USB interface for devices USE-M / USE-L / NOVOS / thanos EVO / SR06 LCD	597838	A1	39,50
Cable entry M20 USE white, sealing insert Flextherm Ø=4,5..9 mm (4 pcs)	851077	A1	12,30
Sealing insert M20 USE white, Flextherm Ø=4,5..9 mm (10 pcs)	752206	A1	12,30
Sealing insert M20 USE white, 2x Ø=7 mm (10 pcs)	641333	A1	12,30
Cable entry M25 USE white, sealing insert 4x Ø=7 mm (4 pcs)	641364	A1	12,30

## Accessories

Accessories			
Item description	Item No.	Group	€
Mounting flange MF6DS flexible (suitable for Ø=6 mm)	669016	A2	7,80
Mounting flange MF6 brass (suitable for Ø=6 mm)	3407	A1	7,80
Syringe thermal contact fluid	102308	A1	1,80
Mounting bracket with cable gland for duct sensors Ø=6 mm	670593	A1	14,80
Compression fittings KL6VA for Ø=6 mm with cutting ring, stainless steel	103213	A1	15,60

Thermowells brass for sensors with pocket Ø=6 mm						
Item description	Length	Inst. length	Item No.	In stock	Group	€
MS-thermowell 50 mm type THMSDS50	50 mm	36 mm	610995	●	A2	9,90
MS-thermowell 100 mm type THMSDS100	100 mm	86 mm	611008	●	A2	11,20
MS-thermowell 150 mm type THMSDS150	150 mm	136 mm	611015	●	A2	11,80
MS-thermowell 200 mm type THMSDS200	200 mm	186 mm	611022	●	A2	12,30
MS-thermowell 250 mm type THMSDS250	250 mm	236 mm	611985	●	A2	14,10
MS-thermowell 300 mm type THMSDS300	300 mm	286 mm	611039	●	A2	14,60
MS-thermowell 450 mm type THMSDS450	450 mm	436 mm	611046	●	A2	14,90

Thermowells stainless steel for sensors with pocket Ø=6 mm						
Item description	Length	Inst. length	Item No.	In stock	Group	€
VA-thermowell 50 mm type THVADS50	50 mm	36 mm	611152	●	A2	23,10
VA-thermowell 100 mm type THVADS100	100 mm	86 mm	611817	●	A2	25,30
VA-thermowell 150 mm type THVADS150	150 mm	136 mm	611824	●	A2	27,40
VA-thermowell 200 mm type THVADS200	200 mm	186 mm	611848	●	A2	28,70
VA-thermowell 250 mm type THVADS250	250 mm	236 mm	611862	●	A2	35,60
VA-thermowell 300 mm type THVADS300	300 mm	286 mm	611879	●	A2	37,30
VA-thermowell 450 mm type THVADS450	450 mm	436 mm	611893	●	A2	38,60
Pressure screw with sealing PTFE (without silicone) for thermowell pocket THVADS			666473	●	A2	22,20

## FTK+

Duct sensor for measuring relative and absolute humidity, enthalpy, dew point and temperature in gaseous media of heating, ventilation and air-conditioning systems as well as clean rooms. The optional features, such as relay outputs for 2-point controllers or 2-stage 2-point controllers and color-changing LCD allow for a wide range of applications. The accuracy of the humidity sensor is 2%. A hinged cover and tool-free wiring as well as removable cable entries ensure a quick and easy installation.



FTK+



FTK+ relay / BUS



FTK+ LCD

0..10 V / 4..20 mA  

Technical Data	
Measured values	temperature, relative humidity, absolute humidity, enthalpy, dew point
Configuration	USEapp, uConfig, BUS, jumper, DIP switches (depending on type)
Network technology	RS485 Modbus, RS485 BACnet (MS/TP)
Output signal temperature	scaling analogue output: -20..+80 °C (default setting) selectable from 4 temperature ranges -40..+60   0..+50   -20..+80   -15..+35 °C adjustable at the transducer, optionally configurable
Measuring range humidity	0..100% rH non-condensing, 0..85 KJ/kg enthalpy, 0..50   0..80 g/m <sup>3</sup> absolute humidity, 0..+50   -20..+80 °C dew point, optionally configurable
Power supply	<b>VV/Basic:</b> 15..24 V = (±10%) SELV, 24 V ~ (±10%) SELV <b>AA:</b> 15..24 V = (±10%) SELV <b>Relay/LCD/BUS:</b> 15..35 V = SELV, 19..29 V ~ SELV
Power consumption	<b>VV:</b> typ. 0,4 W (24 V =), 0,8 VA (24 V ~) <b>AA:</b> max. 1 W (24 V =) <b>Basic:</b> max. 0,7 W (24 V =), 1,8 VA (24 V ~) <b>Relay/LCD/BUS:</b> max. 2,5 W (24 V =), 4,3 VA (24 V ~)
Material in touch with media	Pipe, PA6, with filter stainless steel wire mesh, black, Ø=19,5 mm
Installation length	140 mm, 270 mm, 400 mm
Display	LCD 29x35 mm, RGB backlight, with traffic light function, threshold values configurable, optionally configurable via app or uConfig
Enclosure	<b>VV/AA/Basic:</b> USE-S, impact- and shock-resistant enclosure with quick-release cover, PC, <b>Relay/LCD/BUS:</b> USE-M, impact- and shock-resistant enclosure with quick-release cover, PC

Technical Data	
Colour	pure white, LCD: transparent cover
Operating range temperature	-20..+70 °C
Protection (IP)	IP65, according to EN 60529
Connection	removable plug-in terminal, max. 2,5 mm <sup>2</sup> BUS max. 1,5 mm <sup>2</sup> , relay max. 1,5 mm <sup>2</sup> <b>VV/AA/Basic:</b> removable cable entry flextherm M20 for wire Ø=4,5..9 mm, <b>Relay/LCD/BUS:</b> removable cable entry M25 with fourfold cable entry for wire with max. Ø=7 mm
Delivery content	incl. mounting flange incl. mounting set (screws and accessories)
Notes	air speed max. 12 m/s

## FTK+ VV / AA

Duct sensor humidity + temperature active 0..10 (0..5) V				
Item description	Item No.	In stock	Group	€
FTK+ 140 VV	626347	⊕	H2	192,00
FTK+ 270 VV	626354	⊕	H2	200,70
FTK+ 400 VV	626361		H2	209,20

Duct sensor humidity + temperature active 4..20 mA			
Item description	Item No.	Group	€
FTK+ 140 AA	626378	H2	211,20
FTK+ 270 AA	626385	H2	219,90
FTK+ 400 AA	626392	H2	228,40

Options	
Description	€
Add for additional passive temperature sensor (Pt100   Pt1000   NTC10k   Ni1000   Ni1000TK5000)	24,50
Other sensor elements	on request

## FTK+ Relay / LCD

Duct sensor humidity + temperature active 0..10 (0..5) V + relay				
Item description	USEapp	Item No.	Group	€
FTK+ 140 VV Relais	✓	663151	H1	240,40
FTK+ 270 VV Relais	✓	663168	H1	249,10
FTK+ 400 VV Relais	✓	663175	H1	257,60

<b>Duct sensor humidity + temperature active 0..10 (0..5) V LCD</b>				
Item description	USEapp	Item No.	Group	€
FTK+ 140 LCD VV	✓	663083	H1	271,50
FTK+ 270 LCD VV	✓	663090	H1	280,20
FTK+ 400 LCD VV	✓	663113	H1	288,70

<b>Duct sensor humidity + temperature active 4..20 mA LCD</b>				
Item description	USEapp	Item No.	Group	€
FTK+ 140 LCD AA	✓	663120	H1	290,70
FTK+ 270 LCD AA	✓	663137	H1	299,40
FTK+ 400 LCD AA	✓	663144	H1	307,90

<b>Duct sensor humidity + temperature active 0..10 (0..5) V + relay LCD</b>				
Item description	USEapp	Item No.	Group	€
FTK+ 140 LCD VV Relais	✓	663205	H1	286,60
FTK+ 270 LCD VV Relais	✓	663229	H1	295,30
FTK+ 400 LCD VV Relais	✓	663236	H1	303,80

<b>Options</b>	
Description	€
Add for additional passive temperature sensor (Pt100   Pt1000   NTC10k   Ni1000   Ni1000TK5000)	24,50
Other sensor elements	on request

## **FTK+ BUS**

<b>Duct sensor humidity + temperature Basic RS485 Modbus</b>			
Item description	Item No.	Group	€
FTK+ 140 Basic RS485 Modbus	747738	H1	192,00
FTK+ 270 Basic RS485 Modbus	747745	H1	200,70
FTK+ 400 Basic RS485 Modbus	756037	H1	209,20

<b>Duct sensor humidity + temperature RS485 BACnet (MS/TP)</b>				
Item description	USEapp	Item No.	Group	€
FTK+ 140 RS485 BACnet (MS/TP)	✓	700122	H1	243,60
FTK+ 270 RS485 BACnet (MS/TP)	✓	700139	H1	252,30
FTK+ 400 RS485 BACnet (MS/TP)	✓	700146	H1	260,80
FTK+ 140 LCD RS485 BACnet (MS/TP)	✓	700153	H1	289,80
FTK+ 270 LCD RS485 BACnet (MS/TP)	✓	692878	H1	298,50
FTK+ 400 LCD RS485 BACnet (MS/TP)	✓	700177	H1	307,00

Duct sensor humidity + temperature RS485 Modbus				
Item description	USEapp	Item No.	Group	€
FTK+ 140 RS485 Modbus	✓	659093	H1	243,60
FTK+ 270 RS485 Modbus	✓	659109	H1	252,30
FTK+ 400 RS485 Modbus	✓	659116	H1	260,80
FTK+ 140 LCD RS485 Modbus	✓	663243	H1	289,80
FTK+ 270 LCD RS485 Modbus	✓	663250	H1	298,50
FTK+ 400 LCD RS485 Modbus	✓	663267	H1	307,00

## Accessories – Relay / LCD / BUS

Accessories				
Item description		Item No.	Group	€
BLE dongle with micro-USB for devices USE-M / USE-L / NOVOS / thanos EVO		668262		32,10
USB interface for devices USE-M / USE-L / NOVOS / thanos EVO / SR06 LCD		597838	A1	39,50

## Accessories

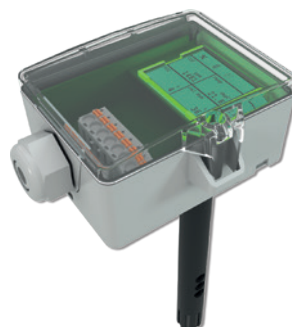
Accessories				
Item description		Item No.	Group	€
Filter stainless steel, wire mesh FTK+ / FTA54+ / FTP+ (spare part)		231169	A1	11,90
Mounting flange MF20		612562	A1	14,40
Weather protection for FTK+, WSA (replacement)		625241	A1	82,20

## LK+

The maintenance-free and multi-functional duct air quality sensor measures CO<sub>2</sub>, mixed gas (VOC), temperature and humidity (relative, absolute, enthalpy, dew point). Optional features, such as a relay output for a 2-point controller or a 2-stage 2-point controller, LCD and traffic light function allow for a wide range of applications. A hinged cover and tool-free wiring as well as removable cable entries ensure a quick and easy installation.



LK+



LK+ LCD

0..10 V / 4..20 mA  

### Technical Data

<b>Measured values</b>	temperature, relative humidity, absolute humidity, enthalpy, dew point, CO <sub>2</sub> , VOC
<b>Configuration</b>	USEapp, uConfig, BUS, jumper, DIP switches (depending on type) <b>CO<sub>2</sub>+VOC</b> : each output can be set to get a variable mix of CO <sub>2</sub> and VOC by configuration via app or uConfig
<b>Network technology</b>	RS485 Modbus, RS485 BACnet (MS/TP)
<b>Output signal temperature</b>	scaling analogue output: 0..+50 °C (default setting) selectable from 4 temperature ranges -40..+60   0..+50   -20..+80   -15..+35 °C, optionally configurable
<b>Measuring range humidity</b>	0..100% rH non-condensing, 0..85 KJ/kg enthalpy, 0..50   0..80 g/m <sup>3</sup> absolute humidity, 0..+50   -20..+80 °C dew point, optionally configurable
<b>Measuring range CO<sub>2</sub></b>	0..2000 ppm, 0..5000 ppm, optionally configurable
<b>Measuring VOC (mixed gas)</b>	heated metal oxide semiconductor
<b>Power supply</b>	15..35 V = SELV, 19..29 V ~ SELV
<b>Power consumption</b>	max. 2,5 W (24 V =), 4,3 VA (24 V ~)
<b>Material in touch with media</b>	with filter stainless steel wire mesh, <b>types V</b> : without filter Pipe: Ø=19,5 mm, black
<b>Installation length</b>	180 mm <b>models without temperature</b> : 150 mm <b>types 100</b> : 100 mm <b>models 100 without temperature</b> : 70 mm

Technical Data	
Display	LCD 29x35 mm, RGB backlight, with traffic light function, threshold values configurable, optionally configurable via app or uConfig
Enclosure	USE-M, impact- and shock-resistant enclosure with quick-release cover, PC
Operating range temperature	0..+50 °C
Protection (IP)	IP65, according to EN 60529
Connection	removable plug-in terminal, max. 2,5 mm <sup>2</sup> BUS max. 1,5 mm <sup>2</sup> , relay max. 1,5 mm <sup>2</sup> <b>VV/AA:</b> removable cable entry flextherm M20 for wire Ø=4,5..9 mm, <b>Relay/BUS:</b> removable cable entry M25 with fourfold cable entry for wire with max. Ø=7 mm
Delivery content	incl. mounting flange incl. mounting set (screws and accessories)
Notes	Mixed-gas sensors detect volatile organic compounds (VOC) such as body odours, tobacco smoke and off-gassing from materials (furniture, carpets, paint, adhesives, etc.) air speed 0,3..12 m/s

## LK+ CO2 – active / Relay / LCD

Duct sensor CO2 active					
Item description	Item No.	In stock	Group	€	
LK+ CO2 V	662253	⊖	Q2	254,70	

Duct sensor CO2 + temperature active					
Item description	USEapp	Item No.	In stock	Group	€
LK+ CO2 temp VV		662260	⊖	Q2	302,10
LK+ CO2 temp AA	✓	662277		Q2	321,30
LK+ CO2 temp VV relay	✓	662307		Q1	350,50
LK+ CO2 LCD temp VV	✓	662284		Q1	348,30
LK+ CO2 LCD temp AA	✓	662291		Q1	367,50
LK+ CO2 LCD temp VV relay	✓	662314		Q1	396,70

Duct sensor CO2 + temperature + humidity active					
Item description	USEapp	Item No.	Group	€	
LK+ CO2 temp_rH 3xV	✓	662321	Q2	345,10	
LK+ CO2 LCD temp_rH 3xV	✓	662338	Q1	391,30	

Options	
Description	€
Add for additional passive temperature sensor (Pt100   Pt1000   NTC10k   Ni1000   Ni1000TK5000)	24,50
Other sensor elements	on request

## LK+ CO2 – BUS

Duct sensor CO2 + temperature BUS				
Item description	USEapp	Item No.	Group	€
LK+ CO2 temp RS485 BACnet (MS/TP)	✓	700405	Q1	353,70
LK+ CO2 LCD temp RS485 BACnet (MS/TP)	✓	700436	Q1	399,90
LK+ CO2 temp RS485 Modbus	✓	662345	Q1	353,70
LK+ CO2 LCD temp RS485 Modbus	✓	662352	Q1	399,90

Duct sensor CO2 + temperature + humidity BUS				
Item description	USEapp	Item No.	Group	€
LK+ CO2 temp_rH RS485 BACnet (MS/TP)	✓	700467	Q1	396,70
LK+ CO2 LCD temp_rH RS485 BACnet (MS/TP)	✓	700504	Q1	442,90
LK+ CO2 temp_rH RS485 Modbus	✓	662376	Q1	396,70
LK+ CO2 LCD temp_rH RS485 Modbus	✓	662383	Q1	442,90

Accessories				
Item description		Item No.	Group	€
Mounting flange MF20		612562	A1	14,40
Mounting kit universal for enclosure USE		698511	A1	10,70
BLE dongle with micro-USB for devices USE-M / USE-L / NOVOS / thanos EVO		668262		32,10
USB interface for devices USE-M / USE-L / NOVOS / thanos EVO / SR06 LCD		597838	A1	39,50

## LK+ CO2 100 – active / Relay / LCD

Duct sensor CO2 active				
Item description		Item No.	Group	€
LK+ CO2 100 V		670418	Q2	254,70

Duct sensor CO2 + temperature active				
Item description	USEapp	Item No.	Group	€
LK+ CO2 100 temp VV		670432	Q2	302,10
LK+ CO2 100 temp AA	✓	670449	Q2	321,30
LK+ CO2 100 temp VV relay	✓	670456	Q1	350,50
LK+ CO2 100 LCD temp VV	✓	670463	Q1	348,30
LK+ CO2 100 LCD temp AA	✓	670470	Q1	367,50
LK+ CO2 100 LCD temp VV relay	✓	670487	Q1	396,70

**Duct sensor CO2 + temperature + humidity active**

Item description	USEapp	Item No.	Group	€
LK+ CO2 100 temp_rH 3xV	✓	670494	Q2	345,10
LK+ CO2 100 LCD temp_rH 3xV	✓	670500	Q1	391,30

**Options**

Description	€
Add for additional passive temperature sensor (Pt100   Pt1000   NTC10k   Ni1000   Ni1000TK5000)	24,50
Other sensor elements	on request

## LK+ CO2 100 – BUS

**Duct sensor CO2 + temperature BUS**

Item description	USEapp	Item No.	Group	€
LK+ CO2 100 temp RS485 BACnet (MS/TP)	✓	704120	Q1	353,70
LK+ CO2 100 LCD temp RS485 BACnet (MS/TP)	✓	704137	Q1	399,90
LK+ CO2 100 temp RS485 Modbus	✓	670555	Q1	353,70
LK+ CO2 100 LCD temp RS485 Modbus	✓	670562	Q1	399,90

**Duct sensor CO2 + temperature + humidity BUS**

Item description	USEapp	Item No.	Group	€
LK+ CO2 100 temp_rH RS485 BACnet (MS/TP)	✓	704144	Q1	396,70
LK+ CO2 100 LCD temp_rH RS485 BACnet (MS/TP)	✓	704151	Q1	442,90
LK+ CO2 100 temp_rH RS485 Modbus	✓	670579	Q1	396,70
LK+ CO2 100 LCD temp_rH RS485 Modbus	✓	670586	Q1	442,90

**Accessories**

Item description	Item No.	Group	€
Mounting flange MF20	612562	A1	14,40
Mounting kit universal for enclosure USE	698511	A1	10,70
BLE dongle with micro-USB for devices USE-M / USE-L / NOVOS / thanos EVO	668262		32,10
USB interface for devices USE-M / USE-L / NOVOS / thanos EVO / SR06 LCD	597838	A1	39,50

## LK+ CO2+VOC – active / Relay / LCD

Duct sensor CO2 + VOC or mix active				
Item description	USEapp	Item No.	Group	€
LK+ CO2+VOC VV		662024	Q2	377,60
LK+ CO2+VOC AA	✓	662031	Q2	396,80
LK+ CO2+VOC VV relay	✓	662062	Q1	426,00
LK+ CO2+VOC LCD VV	✓	662079	Q1	423,80
LK+ CO2+VOC LCD AA	✓	662086	Q1	443,00
LK+ CO2+VOC LCD VV relay	✓	662093	Q1	472,20

Options	
Description	€
Add for additional passive temperature sensor (Pt100   Pt1000   NTC10k   Ni1000   Ni1000TK5000)	24,50
Other sensor elements	on request

Duct sensor CO2 + VOC or mix + temperature active				
Item description	USEapp	Item No.	Group	€
LK+ CO2+VOC temp 3xV	✓	662130	Q2	425,00
LK+ CO2+VOC LCD temp 3xV	✓	662147	Q1	471,20

Duct sensor CO2 + VOC or mix + temperature + humidity active				
Item description	USEapp	Item No.	Group	€
LK+ CO2+VOC temp_rH 4xV	✓	662154	Q2	468,00
LK+ CO2+VOC LCD temp_rH 4xV	✓	662161	Q1	514,20

## LK+ CO2+VOC – BUS

Duct sensor CO2 + VOC or mix BUS				
Item description	USEapp	Item No.	Group	€
LK+ CO2+VOC RS485 BACnet (MS/TP)	✓	700368	Q1	429,20
LK+ CO2+VOC LCD RS485 BACnet (MS/TP)	✓	700382	Q1	475,40
LK+ CO2+VOC RS485 Modbus	✓	662109	Q1	429,20
LK+ CO2+VOC LCD RS485 Modbus	✓	662116	Q1	475,40

Duct sensor CO2 + VOC or mix + temperature BUS				
Item description	USEapp	Item No.	Group	€
LK+ CO2+VOC temp RS485 BACnet (MS/TP)	✓	700429	Q1	476,60
LK+ CO2+VOC LCD temp RS485 BACnet (MS/TP)	✓	700450	Q1	522,80
LK+ CO2+VOC temp RS485 Modbus	✓	662178	Q1	476,60
LK+ CO2+VOC LCD temp RS485 Modbus	✓	662185	Q1	522,80

Duct sensor CO2 + VOC or mix + temperature + humidity BUS				
Item description	USEapp	Item No.	Group	€
LK+ CO2+VOC temp_rH RS485 BACnet (MS/TP)	✓	682862	Q1	519,60
LK+ CO2+VOC LCD temp_rH RS485 BACnet (MS/TP)	✓	700528	Q1	565,80
LK+ CO2+VOC temp_rH RS485 Modbus	✓	662192	Q1	519,60
LK+ CO2+VOC LCD temp_rH RS485 Modbus	✓	662208	Q1	565,80

Accessories				
Item description		Item No.	Group	€
Mounting flange MF20		612562	A1	14,40
Mounting kit universal for enclosure USE		698511	A1	10,70
BLE dongle with micro-USB for devices USE-M / USE-L / NOVOS / thanos EVO		668262		32,10
USB interface for devices USE-M / USE-L / NOVOS / thanos EVO / SR06 LCD		597838	A1	39,50



## FSK01

Hygrostat for ON/OFF control of ventilation and air conditioning, humidification and dehumidification equipment. Designed for applications, where humidity has to be closely controlled or monitored, e.g. in office spaces, data centers, food stores, cooling rooms for fruits and vegetables, greenhouses, the textile industry, paper and printing industries, the film industry, hospitals and similar applications.

Technical Data	
Measured values	relative humidity
Operating functions	threshold adjustment
Operating elements	rotary button
Measuring range humidity	30..100% rH non-condensing
Material in touch with media	Pipe, Ø=16 mm, stainless steel, length 220 mm
Installation length	220 mm
Enclosure	ABS
Operating range temperature	0..+60 °C
Protection (IP)	IP54, IP64, according to EN 60529
Connection	cable entry M20 for wire Ø=8 mm, terminal block, max. 1,5 mm <sup>2</sup>
Notes	air speed max. 8 m/s with stainless steel filter, wire mesh (see accessories) max. 15 m/s with filter PTFE (see accessories) >15 m/s

Duct hygostat			
Item description	Item No.	Group	€
FSK01	427593	H1	272,40
FSK01 internal adjuster	708517	H1	272,40

Accessories			
Item description	Item No.	Group	€
Mounting flange MF19	527705	A1	14,40



## AVT

Air velocity transmitter with 3 field-selectable measuring ranges for measuring and monitoring air velocities in ventilation systems in order to control regulation flaps or damper actuators. An integrated LCD and relay contacts for limiting the air volume are available as options.

Technical Data	
Measured values	temperature, Air velocity
Configuration	jumper
Output signal temperature	0..+50 °C
Measuring range velocity	0..2, 0..10, 0..20 m/s, optionally configurable
Power supply	15..24 V = (±10%) SELV, 24 V ~ (±10%) SELV
Power consumption	<b>AVT   AVT LCD:</b> max. 2 W <b>AVT LCD Relay:</b> max. 2,4 W
Material in touch with media	Sensor probe, Ø=10 mm, stainless steel V2A (1.4305), length 210 mm
Installation length	195 mm
Display	LCD 3.5", 45.7x12.7 mm to show measured value
Enclosure	ABS, cover PC
Colour	light grey
Operating range temperature	0..+50 °C
Protection (IP)	IP54, according to EN 60529
Connection	terminal block, max. 1,5 mm <sup>2</sup> cable entry M16 for wire Ø=8 mm <b>Relay:</b> 2x cable entry M16 for wire Ø=8 mm
Delivery content	incl. mounting flange
Notes	adjustable immersion length using mounting flange 50..180 mm adjustable switching threshold and hysteresis

### Air velocity and temperature transmitter

Item description	Item No.	Group	€
AVT	831130	P1	176,70
AVT LCD	831147	P1	226,70
AVT LCD relay	831154	P1	250,40

## MWF+

Duct sensor for measuring the average temperature in air ducts. The sensor measures the mean temperature value throughout the entire length. A spring at the connection head reduces vibrations. Mounting angles are included in the delivery content. Models with a relay output for a 2-point controller or a 2-stage 2-point controller and color-changing LCD allow for a wide range of applications. A hinged cover and tool-free wiring as well as removable cable entries ensure a quick and easy installation.



MWF+ passive / active



MWF+ passive (NTCxx)



MWF+ relay / BUS



MWF+ LCD

passive / 0..10 V / 4..20 mA  

### Technical Data

<b>Measured values</b>	temperature
<b>Configuration</b>	USEapp, uConfig, BUS, jumper, DIP switches (depending on type)
<b>Network technology</b>	RS485 Modbus, RS485 BACnet (MS/TP)
<b>Output signal temperature</b>	scaling analogue output: -20..+80 °C (default setting) selectable from 4 temperature ranges -50..+50   -20..+80   -15..+35   -10..+120   0..+50   0..+100   0..+160   0..+250 °C adjustable at the transducer, optionally configurable via app or uConfig
<b>Power supply</b>	<b>TRV:</b> 15..24 V = (±10%) SELV, 24 V ~ (±10%) SELV <b>TRA:</b> 15..24 V = (±10%) SELV <b>Relay/LCD/BUS:</b> 15..35 V = SELV, 19..29 V ~ SELV
<b>Power consumption</b>	<b>TRV:</b> typ. 0,4 W (24 V =), 0,8 VA (24 V ~) <b>TRA:</b> typ. 0,5 W (24 V =) <b>Relay/LCD/BUS:</b> max. 2,5 W (24 V =), 4,3 VA (24 V ~)
<b>Installation length</b>	3000 mm, 6000 mm
<b>Display</b>	LCD 29x35 mm, RGB backlight, with traffic light function, threshold values configurable, optionally configurable via app or uConfig
<b>Enclosure</b>	<b>passive/TRV/TRA:</b> USE-S, impact- and shock-resistant enclosure with quick-release cover, PC <b>Relay/LCD/BUS:</b> USE-M, impact- and shock-resistant enclosure with quick-release cover, PC
<b>Colour</b>	pure white, <b>LCD:</b> transparent cover
<b>Operating range temperature</b>	-30..+70 °C
<b>Protection (IP)</b>	IP65, according to EN 60529

## Technical Data

### Connection

removable plug-in terminal, max. 2,5 mm<sup>2</sup>

BUS max. 1,5 mm<sup>2</sup>, relay max. 1,5 mm<sup>2</sup>

**passive/TRV/TRA:**

removable cable entry flextherm M20 for wire Ø=4,5..9 mm

**Relay/LCD/BUS:**

removable cable entry M25 with fourfold cable entry for wire with max. Ø=7 mm

### Delivery content

incl. mounting flange

incl. mounting set (screws and accessories)

incl. installation set

Duct averaging sensor -50..+80 °C		T1
Item description	Item No.	€
MWF+ Pt1000 L3000	620413	98,80
MWF+ Pt1000 L6000	620420	110,00
MWF+ Ni1000 L3000	620437	98,80
MWF+ Ni1000 L6000	620444	110,00
MWF+ Ni1000TK5000 L3000	675888	98,80
MWF+ Ni1000TK5000 L6000	674324	110,00

Duct averaging sensor 0..+50 °C		T1
Item description	Item No.	€
MWF+ NTC10k L3000	670128	136,20
MWF+ NTC10k L6000	670135	154,80
MWF+ NTC10k Precon L3000	670142	136,20
MWF+ NTC10k Precon L6000	670159	154,80
MWF+ NTC20k L3000	670166	136,20
MWF+ NTC20k L6000	670173	154,80

## Options

### Description

Other sensor elements

on request

## Duct averaging sensor temperature active 0..10 (0..5) V | 4..20 mA

Item description	Item No.	Group	€
MWF+ TRV MultiRange L3000	620475	T1	164,30
MWF+ TRV MultiRange L6000	620482	T1	174,30
MWF+ TRA MultiRange L3000	620499	T1	164,30
MWF+ TRA MultiRange L6000	620505	T1	174,30

## Accessories

Item description	Item No.	Group	€
Mounting base enclosure USE-S pure white	667722	A1	6,70
Mounting kit universal for enclosure USE	698511	A1	10,70
Installation set TFR / MWF+	679466	A1	10,30

<b>Duct averaging sensor temperature active 0..10 (0..5) V + relay</b>				
Item description	USEapp	Item No.	Group	€
MWF+ TRV MultiRange relay L3000	✓	662758	T1	212,70
MWF+ TRV MultiRange relay L6000	✓	662765	T1	222,70

<b>Duct averaging sensor temperature active 0..10 (0..5) V   4..20 mA</b>				
Item description	USEapp	Item No.	Group	€
MWF+ LCD TRV MultiRange L3000	✓	662772	T1	210,50
MWF+ LCD TRV MultiRange L6000	✓	662789	T1	220,50
MWF+ LCD TRA MultiRange L3000	✓	662796	T1	210,50
MWF+ LCD TRA MultiRange L6000	✓	662802	T1	220,50

<b>Duct averaging sensor temperature active 0..10 (0..5) V + relay</b>				
Item description	USEapp	Item No.	Group	€
MWF+ LCD TRV MultiRange relay L3000	✓	662819	T1	258,90
MWF+ LCD TRV MultiRange relay L6000	✓	662826	T1	268,90

<b>Duct averaging sensor temperature RS485 BACnet (MS/TP)</b>				
Item description	USEapp	Item No.	Group	€
MWF+ RS485 BACnet (MS/TP) L3000	✓	699310	T1	215,90
MWF+ RS485 BACnet (MS/TP) L6000	✓	699327	T1	225,90
MWF+ LCD RS485 BACnet (MS/TP) L3000	✓	699334	T1	262,10
MWF+ LCD RS485 BACnet (MS/TP) L6000	✓	699341	T1	272,10

<b>Duct averaging sensor temperature RS485 Modbus</b>				
Item description	USEapp	Item No.	Group	€
MWF+ RS485 Modbus L3000	✓	662833	T1	215,90
MWF+ RS485 Modbus L6000	✓	662840	T1	225,90
MWF+ LCD RS485 Modbus L3000	✓	662857	T1	262,10
MWF+ LCD RS485 Modbus L6000	✓	662864	T1	272,10

<b>Accessories</b>				
Item description		Item No.	Group	€
Mounting base enclosure USE-M pure white		668354	A1	9,60
Mounting kit universal for enclosure USE		698511	A1	10,70
BLE dongle with micro-USB for devices USE-M / USE-L / NOVOS / thanos EVO		668262		32,10
USB interface for devices USE-M / USE-L / NOVOS / thanos EVO / SR06 LCD		597838	A1	39,50
Installation set TFR / MWF+		679466	A1	10,30

## MWF400+

Duct sensor for measuring the average temperature in air ducts. The sensor measures the mean temperature value throughout the entire length. A spring at the connection head reduces vibrations. Mounting angles are included in the delivery content. Models with a relay output for a 2-point controller or a 2-stage 2-point controller and color-changing LCD allow for a wide range of applications. A hinged cover and tool-free wiring as well as removable cable entries ensure a quick and easy installation.



MWF400+



MWF400+ relay / BUS

passive / 0..10 V / 4..20 mA  

### Technical Data

Measured values	temperature
Configuration	USEapp, uConfig, BUS, jumper, DIP switches (depending on type)
Network technology	RS485 Modbus, RS485 BACnet (MS/TP)
Output signal temperature	scaling analogue output: -20..+80 °C (default setting) selectable from 4 temperature ranges -50..+50   -20..+80   -15..+35   -10..+120   0..+50   0..+100   0..+160   0..+250 °C adjustable at the transducer, optionally configurable
Power supply	<b>TRV:</b> 15..24 V = (±10%) SELV, 24 V ~ (±10%) SELV <b>TRA:</b> 15..24 V = (±10%) SELV <b>Relay/LCD/BUS:</b> 15..35 V = SELV, 19..29 V ~ SELV
Power consumption	<b>TRV:</b> typ. 0,4 W (24 V =), 0,8 VA (24 V ~) <b>TRA:</b> max. 0,5 W (24 V =) <b>Relay/LCD/BUS:</b> max. 2,5 W (24 V =), 4,3 VA (24 V ~)
Material in touch with media	Sensor rod, copper, bendable, Ø=4 mm Sensor neck, stainless steel V4A (1.4571), Ø=6 mm
Installation length	400 mm
Display	LCD 29x35 mm, RGB backlight, with traffic light function, threshold values configurable, optionally configurable via app or uConfig
Enclosure	<b>passive/TRV/TRA:</b> USE-S, impact- and shock-resistant enclosure with quick-release cover, PC <b>Relay/LCD/BUS:</b> USE-M, impact- and shock-resistant enclosure with quick-release cover, PC

Technical Data	
<b>Colour</b>	pure white, <b>LCD:</b> transparent cover
<b>Operating range temperature</b>	-30..+80 °C
<b>Protection (IP)</b>	IP65, according to EN 60529
<b>Connection</b>	removable plug-in terminal, max. 2,5 mm <sup>2</sup> BUS max. 1,5 mm <sup>2</sup> , relay max. 1,5 mm <sup>2</sup> <b>passive/TRV/TRA:</b> removable cable entry flextherm M20 for wire Ø=4,5..9 mm <b>Relay/LCD/BUS:</b> removable cable entry M25 with fourfold cable entry for wire with max. Ø=7 mm
<b>Delivery content</b>	incl. mounting flange MF6DS flexible incl. mounting clip enclosure USE-S pure white incl. fixing kit rawlplugs and screws (2x each)

Duct averaging sensor -30..+80 °C passive			
Item description	Item No.	Group	€
MWF400+ Pt100	654166	T1	84,10
MWF400+ Pt1000	660518	T1	84,10
MWF400+ Ni1000	641395	T1	84,10
MWF400+ Ni1000TK5000	641425	T1	84,10
MWF400+ NTC10k	641449	T1	82,00
MWF400+ NTC20k	670319	T1	82,00
MWF400+ NTC1,8k	670333	T1	82,00

Options	
Description	€
Other sensor elements	on request

**Duct averaging sensor -30..+80 °C active**

Item description	Item No.	Group	€
MWF400+ TRV MultiRange	642088	T1	147,60
MWF400+ TRA MultiRange	642095	T1	147,60

**Accessories**

Item description	Item No.	Group	€
Mounting clip enclosure USE-S pure white	667739	A1	5,70
Mounting base enclosure USE-S pure white	667722	A1	6,70
Mounting flange MF6DS flexible (suitable for Ø=6 mm)	669016	A2	7,80
Mounting flange MF7 brass (suitable for MWF+ and Ø=7 mm)	102360	A1	7,80
Mounting kit universal for enclosure USE	698511	A1	10,70

**Duct averaging sensor -30..+80 °C active**

Item description	USEapp	Item No.	Group	€
MWF400+ TRV MultiRange Relais	✓	662871	T1	196,00
MWF400+ LCD TRV MultiRange	✓	662925	T1	193,80
MWF400+ LCD TRA MultiRange	✓	662956	T1	193,80
MWF400+ LCD TRV MultiRange Relais	✓	662963	T1	242,20

**Duct averaging sensor -30..+80 °C BUS**

Item description	USEapp	Item No.	Group	€
MWF400+ RS485 BACnet (MS/TP)	✓	699365	T1	244,90
MWF400+ LCD RS485 BACnet (MS/TP)	✓	699372	T1	291,10
MWF400+ RS485 Modbus	✓	662970	T1	244,90
MWF400+ LCD RS485 Modbus	✓	662987	T1	291,10

**Accessories**

Item description	Item No.	Group	€
Mounting base enclosure USE-M pure white	668354	A1	9,60
Mounting flange MF6DS flexible (suitable for Ø=6 mm)	669016	A2	7,80
Mounting flange MF7 brass (suitable for MWF+ and Ø=7 mm)	102360	A1	7,80
Mounting kit universal for enclosure USE	698511	A1	10,70
BLE dongle with micro-USB for devices USE-M / USE-L / NOVOS / thanos EVO	668262		32,10
USB interface for devices USE-M / USE-L / NOVOS / thanos EVO / SR06 LCD	597838	A1	39,50

## **SFK02+**

Immersion sensor for temperature measurement of gases and liquids in HVAC applications. The sensor can be optionally screwed directly into a bonded pocket (see accessories). Types SFKH02+ with a 70 mm neck pipe are designed for applications with insulation materials. The measuring insert can be exchanged without disassembling the entire sensor. Models with a relay output for a 2-point controller or a 2-stage 2-point controller and color-changing LCD allow for a wide range of applications. A hinged cover and tool-free wiring as well as removable cable entries ensure a quick and easy installation.



SFK02+



SFKH02+




SFK02+ relay / BUS



SFK02+ LCD



SFKH02+ relay / BUS

passive / 0..10 V / 4..20 mA  

Technical Data	
Measured values	temperature
Configuration	USEapp, uConfig, BUS, jumper, DIP switches (depending on type)
Network technology	RS485 Modbus, RS485 BACnet (MS/TP)
Output signal temperature	scaling analogue output: <b>TRV/TRA:</b> 0..+160 °C (default setting), <b>Relay/LCD/BUS:</b> -20..+80 °C (default setting) selectable from 4 temperature ranges -50..+50   -20..+80   -15..+35   -10..+120   0..+50   0..+100   0..+160   0..+250 °C adjustable at the transducer, optionally configurable
Power supply	<b>TRV/Basic:</b> 15..24 V = (±10%) SELV, 24 V ~ (±10%) SELV <b>TRA:</b> 15..24 V = (±10%) SELV <b>Relay/LCD/BUS:</b> 15..35 V = SELV, 19..29 V ~ SELV
Power consumption	<b>TRV:</b> typ. 0,4 W (24 V =), 0,8 VA (24 V ~) <b>TRA:</b> max. 0,5 W (24 V =) <b>Basic:</b> typ. 0,7 W (24 V =), 1,8 VA (24 V ~) <b>Relay/LCD/BUS:</b> max. 2,5 W (24 V =), 4,3 VA (24 V ~)
Material in touch with media	suitable for usage in aggressive media Sensor probe: Ø=8 mm, stainless steel V4A (1.4571), G1/2" Neck pipe (optionally): stainless steel V2A (1.4305), Ø=12 mm, length 70 mm
Installation length	50 mm, 100 mm, 150 mm, 200 mm, 250 mm, 450 mm
Display	LCD 29x35 mm, RGB backlight, with traffic light function, threshold values configurable, optionally configurable via app or uConfig
Enclosure	<b>passive/TRV/TRA/Basic:</b> USE-S, impact- and shock-resistant enclosure with quick-release cover, PC <b>Relay/LCD/BUS:</b> USE-M, impact- and shock-resistant enclosure with quick-release cover, PC
Colour	pure white, <b>LCD:</b> transparent cover
Operating range temperature	-50..+160 °C   <b>NTC10k:</b> -50..+150 °C
Protection (IP)	IP65, according to EN 60529
Connection	removable plug-in terminal, max. 2,5 mm <sup>2</sup> BUS max. 1,5 mm <sup>2</sup> , relay max. 1,5 mm <sup>2</sup> <b>passive/TRV/TRA/Basic:</b> removable cable entry flextherm M20 for wire Ø=4,5..9 mm <b>Relay/LCD/BUS:</b> removable cable entry M25 with fourfold cable entry for wire with max. Ø=7 mm
Delivery content	incl. mounting set (screws and accessories)

Immersion sensor -50..+160 °C – Pt100 DIN cl. B			T2
Item description	Item No.	€	
SFK02+ Pt100 050.08	622295	49,80	
SFK02+ Pt100 100.08	622301	50,80	
SFK02+ Pt100 150.08	622318	52,80	
SFK02+ Pt100 200.08	622325	55,10	
SFK02+ Pt100 250.08	622332	57,00	
SFK02+ Pt100 450.08	622349	60,00	

Immersion sensor -50..+160 °C – Pt1000 DIN cl. B			T2
Item description	Item No.	€	
SFK02+ Pt1000 050.08	622417	52,30	
SFK02+ Pt1000 100.08	622424	53,30	
SFK02+ Pt1000 150.08	622431	55,30	
SFK02+ Pt1000 200.08	622448	57,60	
SFK02+ Pt1000 250.08	622455	59,50	
SFK02+ Pt1000 450.08	622462	62,50	

Immersion sensor -50..+160 °C – Pt1000 1/3 DIN			T2
Item description	Item No.	€	
SFK02+ Pt1000 1/3 DIN 050.08	621946	56,30	
SFK02+ Pt1000 1/3 DIN 100.08	621953	57,30	
SFK02+ Pt1000 1/3 DIN 150.08	621960	59,30	
SFK02+ Pt1000 1/3 DIN 200.08	621977	61,60	
SFK02+ Pt1000 1/3 DIN 250.08	621984	63,50	
SFK02+ Pt1000 1/3 DIN 450.08	621991	66,50	

Immersion sensor -50..+150 °C – NTC10k			T2
Item description	Item No.	€	
SFK02+ NTC10k 050.08	622004	48,20	
SFK02+ NTC10k 100.08	622011	49,20	
SFK02+ NTC10k 150.08	622028	51,20	
SFK02+ NTC10k 200.08	622035	53,50	
SFK02+ NTC10k 250.08	622042	55,40	
SFK02+ NTC10k 450.08	622059	58,40	

Immersion sensor -50..+160 °C – Ni1000 DIN cl. B			T2
Item description	Item No.	€	
SFK02+ Ni1000 050.08	622080	52,00	
SFK02+ Ni1000 100.08	622097	53,00	
SFK02+ Ni1000 150.08	622103	55,00	
SFK02+ Ni1000 200.08	622110	57,30	
SFK02+ Ni1000 250.08	622127	59,20	
SFK02+ Ni1000 450.08	622141	62,20	

Immersion sensor -50..+160 °C – Ni1000TK5000			T2
Item description	Item No.	€	
SFK02+ Ni1000TK5000 050.08	622158	56,30	
SFK02+ Ni1000TK5000 100.08	622165	57,30	
SFK02+ Ni1000TK5000 150.08	622189	59,30	
SFK02+ Ni1000TK5000 200.08	622196	61,60	
SFK02+ Ni1000TK5000 250.08	622202	63,50	
SFK02+ Ni1000TK5000 450.08	622219	66,50	

Immersion sensor -50..+120 °C – LM235Z			T2
Item description	Item No.	€	
SFK02+ LM235Z 050.08	622226	50,30	
SFK02+ LM235Z 100.08	622233	51,30	
SFK02+ LM235Z 150.08	622240	53,30	
SFK02+ LM235Z 200.08	622257	55,60	
SFK02+ LM235Z 250.08	622264	57,50	
SFK02+ LM235Z 450.08	622288	60,50	

Options	
Description	€
<b>Pt100   Pt1000 (1/3 DIN)   Ni1000   Ni1000TK5000:</b> Temperature -80..+260 °C (T260)	26,60
4-wire connection (4-wire)	13,40
Neck pipe 70.12 (for applications with insulation materials)	37,20
Add to price of NTC10k for sensor NTC10k Precon   NTC10k Carel   NTC1,8k   NTC5k   NTC20k	0,00
Other sensor elements	on request

Immersion sensor -50..+160 °C active 0..10 (0..5) V			
Item description	Item No.	Group	€
SFK02+ TRV MultiRange 050.08	622592	T2	103,00
SFK02+ TRV MultiRange 100.08	622608	T2	103,80
SFK02+ TRV MultiRange 150.08	622615	T2	105,20
SFK02+ TRV MultiRange 200.08	622622	T2	107,30
SFK02+ TRV MultiRange 250.08	622639	T2	108,60
SFK02+ TRV MultiRange 450.08	622646	T2	110,90

Immersion sensor -50..+160 °C active 4..20 mA			
Item description	Item No.	Group	€
SFK02+ TRA MultiRange 050.08	622653	T2	103,00
SFK02+ TRA MultiRange 100.08	622660	T2	103,80
SFK02+ TRA MultiRange 150.08	622677	T2	105,20
SFK02+ TRA MultiRange 200.08	622684	T2	107,30
SFK02+ TRA MultiRange 250.08	622691	T2	108,60
SFK02+ TRA MultiRange 450.08	622707	T2	110,90

Immersion sensor -50..+160 °C active 0..10 (0..5) V + relay				
Item description	USEapp	Item No.	Group	€
SFK02+ TRV MultiRange 050.08 relay	✓	665568	T2	151,40
SFK02+ TRV MultiRange 100.08 relay	✓	665575	T2	152,20
SFK02+ TRV MultiRange 150.08 relay	✓	665582	T2	153,60
SFK02+ TRV MultiRange 200.08 relay	✓	665599	T2	155,70
SFK02+ TRV MultiRange 250.08 relay	✓	665605	T2	157,00
SFK02+ TRV MultiRange 450.08 relay	✓	665612	T2	159,30

Immersion sensor -50..+160 °C active 0..10 (0..5) V LCD				
Item description	USEapp	Item No.	Group	€
SFK02+ LCD TRV MultiRange 050.08	✓	665476	T2	149,20
SFK02+ LCD TRV MultiRange 100.08	✓	665483	T2	150,00
SFK02+ LCD TRV MultiRange 150.08	✓	665490	T2	151,40
SFK02+ LCD TRV MultiRange 200.08	✓	665506	T2	153,50
SFK02+ LCD TRV MultiRange 250.08	✓	665513	T2	154,80
SFK02+ LCD TRV MultiRange 450.08	✓	665520	T2	157,10

Immersion sensor -50..+160 °C active 4..20 mA LCD				
Item description	USEapp	Item No.	Group	€
SFK02+ LCD TRA MultiRange 050.08	✓	665681	T2	149,20
SFK02+ LCD TRA MultiRange 100.08	✓	665698	T2	150,00
SFK02+ LCD TRA MultiRange 150.08	✓	665704	T2	151,40
SFK02+ LCD TRA MultiRange 200.08	✓	665711	T2	153,50
SFK02+ LCD TRA MultiRange 250.08	✓	665728	T2	154,80
SFK02+ LCD TRA MultiRange 450.08	✓	665735	T2	157,10

Immersion sensor -50..+160 °C active 0..10 (0..5) V + relay LCD				
Item description	USEapp	Item No.	Group	€
SFK02+ LCD TRV MultiRange 050.08 relay	✓	665629	T2	197,60
SFK02+ LCD TRV MultiRange 100.08 relay	✓	665636	T2	198,40
SFK02+ LCD TRV MultiRange 150.08 relay	✓	665643	T2	199,80
SFK02+ LCD TRV MultiRange 200.08 relay	✓	665650	T2	201,90
SFK02+ LCD TRV MultiRange 250.08 relay	✓	665667	T2	203,20
SFK02+ LCD TRV MultiRange 450.08 relay	✓	665674	T2	205,50

Options	
Description	€
Temperature -80..+260 °C (T260)	26,60
Neck pipe 70.12 (for applications with insulation materials)	37,20

## Immersion sensor -50..+160 °C RS485 BACnet (MS/TP)

Item description	USEapp	Item No.	Group	€
SFK02+ RS485 BACnet (MS/TP) 050.08	✓	699389	T2	142,30
SFK02+ RS485 BACnet (MS/TP) 100.08	✓	699396	T2	143,00
SFK02+ RS485 BACnet (MS/TP) 150.08	✓	699402	T2	144,60
SFK02+ RS485 BACnet (MS/TP) 200.08	✓	699419	T2	146,60
SFK02+ RS485 BACnet (MS/TP) 250.08	✓	699426	T2	147,80
SFK02+ RS485 BACnet (MS/TP) 450.08	✓	699433	T2	150,30

## Immersion sensor -50..+160 °C RS485 BACnet (MS/TP) LCD

Item description	USEapp	Item No.	Group	€
SFK02+ LCD RS485 BACnet (MS/TP) 050.08	✓	699440	T2	188,50
SFK02+ LCD RS485 BACnet (MS/TP) 100.08	✓	699457	T2	189,20
SFK02+ LCD RS485 BACnet (MS/TP) 150.08	✓	699464	T2	190,80
SFK02+ LCD RS485 BACnet (MS/TP) 200.08	✓	699471	T2	192,80
SFK02+ LCD RS485 BACnet (MS/TP) 250.08	✓	699488	T2	194,00
SFK02+ LCD RS485 BACnet (MS/TP) 450.08	✓	699495	T2	196,50

## Immersion sensor -50..+160 °C RS485 Modbus

Item description	USEapp	Item No.	Group	€
SFK02+ RS485 Modbus 050.08	✓	665742	T2	142,30
SFK02+ RS485 Modbus 100.08	✓	665759	T2	143,00
SFK02+ RS485 Modbus 150.08	✓	665766	T2	144,60
SFK02+ RS485 Modbus 200.08	✓	665773	T2	146,60
SFK02+ RS485 Modbus 250.08	✓	665780	T2	147,80
SFK02+ RS485 Modbus 450.08	✓	665797	T2	150,30

## Immersion sensor -50..+160 °C RS485 Modbus LCD

Item description	USEapp	Item No.	Group	€
SFK02+ LCD RS485 Modbus 050.08	✓	665803	T2	188,50
SFK02+ LCD RS485 Modbus 100.08	✓	665810	T2	189,20
SFK02+ LCD RS485 Modbus 150.08	✓	665827	T2	190,80
SFK02+ LCD RS485 Modbus 200.08	✓	665834	T2	192,80
SFK02+ LCD RS485 Modbus 250.08	✓	665841	T2	194,00
SFK02+ LCD RS485 Modbus 450.08	✓	665858	T2	196,50

Immersion sensor -50..+160 °C Basic RS485 Modbus				
Item description	USEapp	Item No.	Group	€
SFK02+ Basic RS485 Modbus 050.08	✓	755986	T2	103,00
SFK02+ Basic RS485 Modbus 100.08	✓	747837	T2	103,80
SFK02+ Basic RS485 Modbus 150.08	✓	755993	T2	105,20
SFK02+ Basic RS485 Modbus 200.08	✓	756006	T2	107,30
SFK02+ Basic RS485 Modbus 250.08	✓	756013	T2	108,60
SFK02+ Basic RS485 Modbus 450.08	✓	756020	T2	110,90

Options	
Description	€
Temperature -80..+260 °C (T260)	26,60
Neck pipe 70.12 (for applications with insulation materials)	37,20

Accessories			
Item description	Item No.	Group	€
BLE dongle with micro-USB for devices USE-M / USE-L / NOVOS / thanos EVO	668262		32,10
USB interface for devices USE-M / USE-L / NOVOS / thanos EVO / SR06 LCD	597838	A1	39,50
Cable entry M20 USE white, sealing insert Flextherm Ø=4,5..9 mm (4 pcs)	851077	A1	12,30
Sealing insert M20 USE white, Flextherm Ø=4,5..9 mm (10 pcs)	752206	A1	12,30
Sealing insert M20 USE white, 2x Ø=7 mm (10 pcs)	641333	A1	12,30
Cable entry M25 USE white, sealing insert 4x Ø=7 mm (4 pcs)	641364	A1	12,30

Bonded pockets						
Item description	Length	Inst. length	Item No.	In stock	Group	€
Bonded pocket St52-3 Typ ESH110	110 mm	105 mm	103459	⊕	A1	60,10
Bonded pocket St52-3 Typ ESH160	160 mm	155 mm	103466	⊕	A1	68,80
Bonded pocket St52-3 Typ ESH210	210 mm	205 mm	103473	⊕	A1	77,40
Bonded pocket St52-3 Typ ESH260	260 mm	255 mm	173247	⊕	A1	85,00

## SFK02+ FR

Immersion sensor with  $\varnothing=4$  mm pocket for a fast response and integrated thermowell for temperature measurement of gases and liquids in HVAC applications. Bonded pockets are available as well (see „Accessories“). Models with a relay output for a 2-point controller or a 2-stage 2-point controller and color-changing LCD allow for a wide range of applications. A hinged cover and tool-free wiring as well as removable cable entries ensure a quick and easy installation.



SFK02+ FR



SFK02+ FR relay / BUS



SFK02+ FR LCD

passive / 0..10 V / 4..20 mA  

### Technical Data

<b>Measured values</b>	temperature
<b>Configuration</b>	USEapp, uConfig, BUS, jumper, DIP switches (depending on type)
<b>Network technology</b>	RS485 Modbus, RS485 BACnet (MS/TP)
<b>Output signal temperature</b>	scaling analogue output: <b>TRV/TRA:</b> 0..+160 °C (default setting) <b>Relay/LCD/BUS:</b> -20..+80 °C (default setting) selectable from 4 temperature ranges -50..+50   -20..+80   -15..+35   -10..+120   0..+50   0..+100   0..+160   0..+250 °C adjustable at the transducer, optionally configurable
<b>Power supply</b>	<b>TRV:</b> 15..24 V = ( $\pm 10\%$ ) SELV, 24 V ~ ( $\pm 10\%$ ) SELV <b>TRA:</b> 15..24 V = ( $\pm 10\%$ ) SELV <b>Relay/LCD/BUS:</b> 15..35 V = SELV, 19..29 V ~ SELV
<b>Power consumption</b>	<b>TRV:</b> typ. 0,4 W (24 V =), 0,8 VA (24 V ~) <b>TRA:</b> max. 0,5 W (24 V =) <b>Relay/LCD/BUS:</b> max. 2,5 W (24 V =), 4,3 VA (24 V ~)
<b>Material in touch with media</b>	Sensor probe 50 mm: $\varnothing=4$ mm Sensor probe 100/200 mm: $\varnothing=6$ mm, end of sensor $\varnothing=4$ mm, stainless steel V4A (1.4571), G1/2" suitable for usage in aggressive media
<b>Installation length</b>	50 mm, 100 mm, 200 mm
<b>Display</b>	LCD 29x35 mm, RGB backlight, with traffic light function, threshold values configurable, optionally configurable via app or uConfig
<b>Enclosure</b>	<b>passive/TRV/TRA:</b> USE-S, impact- and shock-resistant enclosure with quick-release cover, PC <b>Relay/LCD/BUS:</b> USE-M, impact- and shock-resistant enclosure with quick-release cover, PC

Technical Data	
<b>Colour</b>	pure white, <b>LCD</b> : transparent cover
<b>Protection (IP)</b>	IP65, according to EN 60529
<b>Connection</b>	removable plug-in terminal, max. 2,5 mm <sup>2</sup> BUS max. 1,5 mm <sup>2</sup> , relay max. 1,5 mm <sup>2</sup> <b>passive/TRV/TRA:</b> removable cable entry flextherm M20 for wire Ø=4,5..9 mm <b>Relay/LCD/BUS:</b> removable cable entry M25 with fourfold cable entry for wire with max. Ø=7 mm
<b>Delivery content</b>	incl. mounting set (screws and accessories)

Immersion sensor -50..+160 °C – Pt100 DIN cl. B T2			
Item description	Item No.	€	
SFK02+ FR Pt100 050.04	665926	53,50	
SFK02+ FR Pt100 100.06/04	665933	54,40	
SFK02+ FR Pt100 200.06/04	665940	58,90	

Immersion sensor -50..+160 °C – Pt1000 DIN cl. B T2			
Item description	Item No.	€	
SFK02+ FR Pt1000 050.04	655583	56,00	
SFK02+ FR Pt1000 100.06/04	638807	56,90	
SFK02+ FR Pt1000 200.06/04	640749	61,40	

Immersion sensor -50..+160 °C – Pt1000 1/3 DIN T2			
Item description	Item No.	€	
SFK02+ FR Pt1000 1/3 DIN 050.04	665988	60,00	
SFK02+ FR Pt1000 1/3 DIN 100.06/04	665995	60,90	
SFK02+ FR Pt1000 1/3 DIN 200.06/04	666008	65,40	

Immersion sensor -50..+150 °C – NTC10k T2			
Item description	Item No.	€	
SFK02+ FR NTC10k 050.04	655545	51,90	
SFK02+ FR NTC10k 100.06/04	640725	52,80	
SFK02+ FR NTC10k 200.06/04	640763	57,30	

Immersion sensor -50..+160 °C – Ni1000 DIN cl. B T2			
Item description	Item No.	€	
SFK02+ FR Ni1000 050.04	666015	55,70	
SFK02+ FR Ni1000 100.06/04	657280	56,60	
SFK02+ FR Ni1000 200.06/04	666022	61,10	

Immersion sensor -50..+160 °C – Ni1000TK5000 T2			
Item description	Item No.	€	
SFK02+ FR Ni1000TK5000 050.04	655590	60,00	
SFK02+ FR Ni1000TK5000 100.06/04	640732	60,90	
SFK02+ FR Ni1000TK5000 200.06/04	640770	65,40	

Options	
Description	€
Add to price of NTC10k for sensor NTC10k Precon   NTC10k Carel   NTC1,8k   NTC5k   NTC20k   LM235Z	0,00
Other sensor elements	on request

## Immersion sensor -50..+160 °C active 0..10 (0..5) V

Item description	Item No.	Group	€
SFK02+ FR TRV MultiRange 050.04	655620	T2	106,60
SFK02+ FR TRV MultiRange 100.06/04	645881	T2	107,30
SFK02+ FR TRV MultiRange 200.06/04	655637	T2	110,90

## Immersion sensor -50..+160 °C active 4..20 mA

Item description	Item No.	Group	€
SFK02+ FR TRA MultiRange 050.04	655606	T2	106,60
SFK02+ FR TRA MultiRange 100.06/04	645867	T2	107,30
SFK02+ FR TRA MultiRange 200.06/04	655613	T2	110,90

## Immersion sensor -50..+160 °C active 0..10 (0..5) V + relay

Item description	USEapp	Item No.	Group	€
SFK02+ FR TRV MultiRange 050.04 relay	✓	666169	T2	155,00
SFK02+ FR TRV MultiRange 100.06/04 relay	✓	666176	T2	155,70
SFK02+ FR TRV MultiRange 200.06/04 relay	✓	666183	T2	159,30

## Immersion sensor -50..+160 °C active 0..10 (0..5) V LCD

Item description	USEapp	Item No.	Group	€
SFK02+ FR LCD TRV MultiRange 050.04	✓	666091	T2	152,80
SFK02+ FR LCD TRV MultiRange 100.06/04	✓	666107	T2	153,50
SFK02+ FR LCD TRV MultiRange 200.06/04	✓	666114	T2	157,10

## Immersion sensor -50..+160 °C active 4..20 mA LCD

Item description	USEapp	Item No.	Group	€
SFK02+ FR LCD TRA MultiRange 050.04	✓	666121	T2	152,80
SFK02+ FR LCD TRA MultiRange 100.06/04	✓	666138	T2	153,50
SFK02+ FR LCD TRA MultiRange 200.06/04	✓	666145	T2	157,10

## Immersion sensor -50..+160 °C active 0..10 (0..5) V + relay LCD

Item description	USEapp	Item No.	Group	€
SFK02+ FR LCD TRV MultiRange 050.04 relay	✓	666190	T2	201,20
SFK02+ FR LCD TRV MultiRange 100.06/04 relay	✓	666206	T2	201,90
SFK02+ FR LCD TRV MultiRange 200.06/04 relay	✓	666213	T2	205,50

Immersion sensor -50..+160 °C RS485 BACnet (MS/TP)				
Item description	USEapp	Item No.	Group	€
SFK02+ FR RS485 BACnet (MS/TP) 050.04	✓	699501	T2	158,20
SFK02+ FR RS485 BACnet (MS/TP) 100.06/04	✓	699518	T2	158,90
SFK02+ FR RS485 BACnet (MS/TP) 200.06/04	✓	699525	T2	162,50

Immersion sensor -50..+160 °C RS485 BACnet (MS/TP) LCD				
Item description	USEapp	Item No.	Group	€
SFK02+ FR LCD RS485 BACnet (MS/TP) 050.04	✓	699532	T2	204,40
SFK02+ FR LCD RS485 BACnet (MS/TP) 100.06/04	✓	699549	T2	205,10
SFK02+ FR LCD RS485 BACnet (MS/TP) 200.06/04	✓	699556	T2	208,70

Immersion sensor -50..+160 °C RS485 Modbus				
Item description	USEapp	Item No.	Group	€
SFK02+ FR RS485 Modbus 050.04	✓	666220	T2	158,20
SFK02+ FR RS485 Modbus 100.06/04	✓	666237	T2	158,90
SFK02+ FR RS485 Modbus 200.06/04	✓	666244	T2	162,50

Immersion sensor -50..+160 °C RS485 Modbus LCD				
Item description	USEapp	Item No.	Group	€
SFK02+ FR LCD RS485 Modbus 050.04	✓	666251	T2	204,40
SFK02+ FR LCD RS485 Modbus 100.06/04	✓	666268	T2	205,10
SFK02+ FR LCD RS485 Modbus 200.06/04	✓	666275	T2	208,70

Accessories				
Item description		Item No.	Group	€
BLE dongle with micro-USB for devices USE-M / USE-L / NOVOS / thanos EVO		668262		32,10
USB interface for devices USE-M / USE-L / NOVOS / thanos EVO / SR06 LCD		597838	A1	39,50
Cable entry M20 USE white, sealing insert Flextherm Ø=4,5..9 mm (4 pcs)		851077	A1	12,30
Sealing insert M20 USE white, Flextherm Ø=4,5..9 mm (10 pcs)		752206	A1	12,30
Sealing insert M20 USE white, 2x Ø=7 mm (10 pcs)		641333	A1	12,30
Cable entry M25 USE white, sealing insert 4x Ø=7 mm (4 pcs)		641364	A1	12,30



## SFK01

Immersion sensor with an integrated thermowell for temperature measurement of liquids in HVAC applications (e.g. water lines or water tanks). The type SFKH01 with a 70 mm neck pipe is designed for applications using insulation materials. Bonded pockets are available as well (see „Accessories“).

### Technical Data

Measured values	temperature
Material in touch with media	suitable for usage in aggressive media Sensor probe: Ø=8 mm, stainless steel V4A (1.4571), SW24, G1/2" Neck pipe (optionally): stainless steel V2A (1.4305), Ø=12 mm, length 70 mm
Installation length	50 mm, 100 mm, 150 mm, 200 mm, 250 mm, 450 mm
Enclosure	shape J, aluminium
Operating range temperature	-50..+160 °C   <b>NTC10k</b> : -50..+150 °C
Protection (IP)	IP65, according to EN 60529
Connection	cable entry M16 for wire Ø=8 mm terminal block, max. 1,5 mm <sup>2</sup>

Immersion sensor -50..+160 °C – Pt100 DIN cl. B			T1
Item description	Item No.	€	
SFK01 Pt100 050.08	37662	55,20	
SFK01 Pt100 100.08	27717	56,60	
SFK01 Pt100 150.08	27724	58,30	
SFK01 Pt100 200.08	27731	60,60	
SFK01 Pt100 250.08	27748	61,10	
SFK01 Pt100 450.08	27755	64,60	

Immersion sensor -50..+160 °C – Pt1000 DIN cl. B			T1
Item description	Item No.	€	
SFK01 Pt1000 050.08	27823	57,70	
SFK01 Pt1000 100.08	27830	59,10	
SFK01 Pt1000 150.08	27847	60,80	
SFK01 Pt1000 200.08	27854	63,10	
SFK01 Pt1000 250.08	27861	63,60	
SFK01 Pt1000 450.08	27878	67,10	

Immersion sensor -50..+160 °C – Pt1000 1/3 DIN			T1
Item description	Item No.	€	
SFK01 Pt1000 1/3 DIN 050.08	27885	61,70	
SFK01 Pt1000 1/3 DIN 100.08	27892	63,10	
SFK01 Pt1000 1/3 DIN 150.08	36740	64,80	
SFK01 Pt1000 1/3 DIN 200.08	36757	67,10	
SFK01 Pt1000 1/3 DIN 250.08	36764	67,60	
SFK01 Pt1000 1/3 DIN 450.08	36771	71,10	

Immersion sensor -50..+150 °C – NTC10k			T1
Item description	Item No.	€	
SFK01 NTC10k 050.08	45421	53,60	
SFK01 NTC10k 100.08	45438	55,00	
SFK01 NTC10k 150.08	45445	56,70	
SFK01 NTC10k 200.08	45452	59,00	
SFK01 NTC10k 250.08	45469	59,50	
SFK01 NTC10k 450.08	45476	63,00	

Immersion sensor -50..+160 °C – Ni1000 DIN cl. B			T1
Item description	Item No.	€	
SFK01 Ni1000 050.08	36788	57,40	
SFK01 Ni1000 100.08	36795	58,80	
SFK01 Ni1000 150.08	36801	60,50	
SFK01 Ni1000 200.08	36818	62,80	
SFK01 Ni1000 250.08	36825	63,30	
SFK01 Ni1000 450.08	45292	66,80	

Immersion sensor -50..+160 °C – Ni1000TK5000			T1
Item description	Item No.	€	
SFK01 Ni1000TK5000 050.08	45308	61,70	
SFK01 Ni1000TK5000 100.08	45315	63,10	
SFK01 Ni1000TK5000 150.08	45322	64,80	
SFK01 Ni1000TK5000 200.08	45339	67,10	
SFK01 Ni1000TK5000 250.08	45346	67,60	
SFK01 Ni1000TK5000 450.08	45353	71,10	

Immersion sensor -50..+120 °C – LM235Z			T1
Item description	Item No.	€	
SFK01 LM235Z 050.08	45605	55,70	
SFK01 LM235Z 100.08	45612	57,10	
SFK01 LM235Z 150.08	45629	58,80	
SFK01 LM235Z 200.08	45636	61,10	
SFK01 LM235Z 250.08	45643	61,60	
SFK01 LM235Z 450.08	45650	65,10	

Options	
Description	€
<b>Pt100   Pt1000 (1/3 DIN)   Ni1000   Ni1000TK5000:</b> Temperature -80..+260 °C (T260)	26,60
4-wire connection (4-wire)	13,40
Neck pipe 70.12 (for applications with insulation materials)	37,20
Add to price of NTC10k for sensor NTC10k Precon   NTC10k Carel   NTC1,8k   NTC5k   NTC20k	0,00
Other sensor elements	on request

Bonded pockets						
Item description	Length	Inst. length	Item No.	In stock	Group	€
Bonded pocket St52-3 Typ ESH110	110 mm	105 mm	103459	⊕	A1	60,10
Bonded pocket St52-3 Typ ESH160	160 mm	155 mm	103466	⊕	A1	68,80
Bonded pocket St52-3 Typ ESH210	210 mm	205 mm	103473	⊕	A1	77,40
Bonded pocket St52-3 Typ ESH260	260 mm	255 mm	173247	⊕	A1	85,00



## SFK03

Immersion sensor in the enclosure form B with an integrated thermowell for temperature measurement of liquids in HVAC applications (e.g. water lines or water tanks). Designed for connection to superior control systems. The type SFKH03 with a 70 mm neck pipe is designed for applications using insulation materials.

passive / 0..10 V / 4..20 mA

Technical Data	
Measured values	temperature
Output signal temperature	scaling analogue output: <b>TRV1/TRA1:</b> 0..+50 °C <b>TRV2/TRA2:</b> -50..+50 °C <b>TRV3/TRA3:</b> -10..+120 °C <b>TRV4/TRA4:</b> 0..+160 °C <b>TRV5/TRA5:</b> 0..+300 °C
Power supply	<b>TRV:</b> 15..24 V = (±10%) SELV, 15..26 V ~ SELV <b>TRA:</b> 15..35 V = SELV,
Power consumption	<b>TRV:</b> typ. 1 W (24 V =), 1,4 VA (24 V ~) <b>TRA:</b> typ. 0,5 W (24 V =)
Material in touch with media	suitable for usage in aggressive media Sensor probe: Ø=8 mm, stainless steel V4A (1.4571), SW24, G1/2" Neck pipe (optionally): stainless steel V2A (1.4305), Ø=15 mm, length 70 mm
Installation length	100 mm, 150 mm, 200 mm, 250 mm
Enclosure	shape B, aluminium
Operating range temperature	-50..+160 °C   <b>NTC10k:</b> -50..+150 °C
Protection (IP)	IP66, according to EN 60529
Connection	cable entry M20 for wire Ø=7 mm terminal block, max. 1,5 mm <sup>2</sup>

Immersion sensor -50..+160 °C – Pt100 DIN cl. B T1			
Item description	Item No.	€	
SFK03 Pt100 100.08	64309	65,50	
SFK03 Pt100 150.08	71079	67,90	
SFK03 Pt100 200.08	71086	70,30	
SFK03 Pt100 250.08	71093	73,80	

Immersion sensor -50..+160 °C – Pt1000 DIN cl. B T1			
Item description	Item No.	€	
SFK03 Pt1000 100.08	71147	68,00	
SFK03 Pt1000 150.08	71154	70,40	
SFK03 Pt1000 200.08	71161	72,80	
SFK03 Pt1000 250.08	71178	76,30	

Immersion sensor -50..+160 °C – Pt1000 1/3 DIN T1			
Item description	Item No.	€	
SFK03 Pt1000 1/3 DIN 100.08	71185	72,00	
SFK03 Pt1000 1/3 DIN 150.08	71192	74,40	
SFK03 Pt1000 1/3 DIN 200.08	71208	76,80	
SFK03 Pt1000 1/3 DIN 250.08	71215	80,30	

Immersion sensor -50..+150 °C – NTC10k T1			
Item description	Item No.	€	
SFK03 NTC10k 100.08	71345	63,90	
SFK03 NTC10k 150.08	71352	66,30	
SFK03 NTC10k 200.08	71369	68,70	
SFK03 NTC10k 250.08	71376	72,20	

Immersion sensor -50..+160 °C – Ni1000 DIN cl. B			T1
Item description	Item No.	€	
SFK03 Ni1000 100.08	71222	67,70	
SFK03 Ni1000 150.08	71239	70,10	
SFK03 Ni1000 200.08	71246	72,50	
SFK03 Ni1000 250.08	71253	76,00	

Immersion sensor -50..+160 °C – Ni1000TK5000			T1
Item description	Item No.	€	
SFK03 Ni1000TK5000 100.08	71260	72,00	
SFK03 Ni1000TK5000 150.08	71277	74,40	
SFK03 Ni1000TK5000 200.08	71284	76,80	
SFK03 Ni1000TK5000 250.08	71291	80,30	

Immersion sensor -50..+120 °C – LM235Z			T1
Item description	Item No.	€	
SFK03 LM235Z 100.08	71468	66,00	
SFK03 LM235Z 150.08	71475	68,40	
SFK03 LM235Z 200.08	71482	70,80	
SFK03 LM235Z 250.08	71499	74,30	

Options	
Description	€
<b>Pt100   Pt1000 (1/3 DIN)   Ni1000   Ni1000TK5000:</b> Temperature -80..+260 °C (T260)	26,60
4-wire connection (4-wire)	13,40
Neck pipe 70.15 (for applications with insulation materials)	37,20
Add to price of NTC10k for sensor NTC10k Precon   NTC10k Carel   NTC1,8k   NTC5k   NTC20k	0,00
Other sensor elements	on request

Bonded pockets						
Item description	Length	Inst. length	Item No.	In stock	Group	€
Bonded pocket St52-3 Typ ESH110	110 mm	105 mm	103459	⊕	A1	60,10
Bonded pocket St52-3 Typ ESH160	160 mm	155 mm	103466	⊕	A1	68,80
Bonded pocket St52-3 Typ ESH210	210 mm	205 mm	103473	⊕	A1	77,40
Bonded pocket St52-3 Typ ESH260	260 mm	255 mm	173247	⊕	A1	85,00

Immersion sensor -50..+50 °C			T1
Item description	Item No.	€	
SFK03 TRV1 100.08	318853	167,50	
SFK03 TRV1 150.08	352024	169,10	
SFK03 TRV1 200.08	352062	170,60	
SFK03 TRV1 250.08	352109	173,10	

Immersion sensor -10..+120 °C			T1
Item description	Item No.	€	
SFK03 TRV2 100.08	335744	167,50	
SFK03 TRV2 150.08	352031	169,10	
SFK03 TRV2 200.08	246958	170,60	
SFK03 TRV2 250.08	352253	173,10	

Immersion sensor 0..+50 °C			T1
Item description	Item No.	€	
SFK03 TRV3 100.08	281775	167,50	
SFK03 TRV3 150.08	352048	169,10	
SFK03 TRV3 200.08	352079	170,60	
SFK03 TRV3 250.08	352260	173,10	

Immersion sensor 0..+160 °C			T1
Item description	Item No.	€	
SFK03 TRV4 100.08	298414	167,50	
SFK03 TRV4 150.08	292115	169,10	
SFK03 TRV4 200.08	324403	170,60	
SFK03 TRV4 250.08	352277	173,10	

Immersion sensor 0..+300 °C			T1
Item description	Item No.	€	
SFK03 TRV5 100.08	243933	176,70	
SFK03 TRV5 150.08	295314	178,20	
SFK03 TRV5 200.08	297509	179,90	
SFK03 TRV5 250.08	306607	182,30	

Immersion sensor -50..+50 °C			T1
Item description	Item No.	€	
SFK03 TRA1 100.08	194440	167,50	
SFK03 TRA1 150.08	200899	169,10	
SFK03 TRA1 200.08	352055	170,60	
SFK03 TRA1 250.08	254908	173,10	

Immersion sensor -10..+120 °C			T1
Item description	Item No.	€	
SFK03 TRA2 100.08	189316	167,50	
SFK03 TRA2 150.08	344166	169,10	
SFK03 TRA2 200.08	315746	170,60	
SFK03 TRA2 250.08	352086	173,10	

Immersion sensor 0..+50 °C			T1
Item description	Item No.	€	
SFK03 TRA3 100.08	132220	167,50	
SFK03 TRA3 150.08	165044	169,10	
SFK03 TRA3 200.08	165280	170,60	
SFK03 TRA3 250.08	303835	173,10	

Immersion sensor 0..+160 °C			T1
Item description	Item No.	€	
SFK03 TRA4 100.08	293051	167,50	
SFK03 TRA4 150.08	295024	169,10	
SFK03 TRA4 200.08	239226	170,60	
SFK03 TRA4 250.08	352093	173,10	

Immersion sensor 0..+300 °C			T1
Item description	Item No.	€	
SFK03 TRA5 100.08	131674	176,70	
SFK03 TRA5 150.08	146821	178,20	
SFK03 TRA5 200.08	152884	179,90	
SFK03 TRA5 250.08	157421	182,30	

Options	
Description	€
Neck pipe 70.15 (for applications with insulation materials)	37,20

Bonded pockets						
Item description	Length	Inst. length	Item No.	In stock	Group	€
Bonded pocket St52-3 Typ ESH110	110 mm	105 mm	103459	☉	A1	60,10
Bonded pocket St52-3 Typ ESH160	160 mm	155 mm	103466	☉	A1	68,80
Bonded pocket St52-3 Typ ESH210	210 mm	205 mm	103473	☉	A1	77,40
Bonded pocket St52-3 Typ ESH260	260 mm	255 mm	173247	☉	A1	85,00



## KFK01

Passive duct sensor for measuring air temperature and other gaseous media of HVAC applications (e.g. supply and exhaust ducts). The sensor can be mounted by means of a mounting flange. Combined with a thermowell, it can be used as an immersion temperature sensor as well.

### Technical Data

<b>Measured values</b>	temperature
<b>Material in touch with media</b>	Sensor probe, Ø=6 mm, stainless steel V4A (1.4401)
<b>Installation length</b>	50 mm, 100 mm, 150 mm, 200 mm, 250 mm, 300 mm, 450 mm
<b>Enclosure</b>	shape J, aluminium
<b>Operating range temperature</b>	-50..+160 °C   <b>NTC10k</b> : -50..+150 °C
<b>Protection (IP)</b>	IP65, according to EN 60529
<b>Connection</b>	cable entry M16 for wire Ø=8 mm, terminal block, max. 1,5 mm <sup>2</sup>
<b>Mounting</b>	when used as duct sensors: please use mounting flange MF6DS flexible (+90..+120 °C) or MF6 (brass, +120..+260 °C), for use as immersion sensors please use immersion pocket THVADS / THMSDS

### Duct/immersion sensor -50..+160 °C – Pt100 DIN cl. B T1

Item description	Item No.	€
KFK01 Pt100 050.06	626446	51,90
KFK01 Pt100 100.06	626453	52,90
KFK01 Pt100 150.06	626477	54,70
KFK01 Pt100 200.06	626484	56,60
KFK01 Pt100 250.06	626491	59,50
KFK01 Pt100 300.06	626507	62,00
KFK01 Pt100 450.06	626514	66,10

### Duct/immersion sensor -50..+160 °C – Pt1000 DIN cl. B T1

Item description	Item No.	€
KFK01 Pt1000 050.06	626590	54,40
KFK01 Pt1000 100.06	626606	55,40
KFK01 Pt1000 150.06	626613	57,20
KFK01 Pt1000 200.06	626620	59,10
KFK01 Pt1000 250.06	626637	62,00
KFK01 Pt1000 300.06	626644	64,50
KFK01 Pt1000 450.06	626651	68,60

### Duct/immersion sensor -50..+160 °C – Pt1000 1/3 DIN T1

Item description	Item No.	€
KFK01 Pt1000 1/3 DIN 050.06	626675	58,40
KFK01 Pt1000 1/3 DIN 100.06	626682	59,40
KFK01 Pt1000 1/3 DIN 150.06	626699	61,20
KFK01 Pt1000 1/3 DIN 200.06	626705	63,10
KFK01 Pt1000 1/3 DIN 250.06	626712	66,00
KFK01 Pt1000 1/3 DIN 300.06	626729	68,50
KFK01 Pt1000 1/3 DIN 450.06	626736	72,60

### Duct/immersion sensor -50..+150 °C – NTC10k T1

Item description	Item No.	€
KFK01 NTC10k 050.06	626880	50,30
KFK01 NTC10k 100.06	626897	51,30
KFK01 NTC10k 150.06	626903	53,10
KFK01 NTC10k 200.06	626910	55,00
KFK01 NTC10k 250.06	626927	57,90
KFK01 NTC10k 300.06	626934	60,40
KFK01 NTC10k 450.06	626941	64,50

Duct/immersion sensor -50..+160 °C – Ni1000 DIN cl. B T1		
Item description	Item No.	€
KFK01 Ni1000 050.06	626743	54,10
KFK01 Ni1000 100.06	626750	55,10
KFK01 Ni1000 150.06	626767	56,90
KFK01 Ni1000 200.06	626774	58,80
KFK01 Ni1000 250.06	626781	61,70
KFK01 Ni1000 300.06	626798	64,20
KFK01 Ni1000 450.06	626804	68,30

Duct/immersion sensor -50..+160 °C – Ni1000TK5000 T1		
Item description	Item No.	€
KFK01 Ni1000TK5000 050.06	626811	58,40
KFK01 Ni1000TK5000 100.06	626828	59,40
KFK01 Ni1000TK5000 150.06	626835	61,20
KFK01 Ni1000TK5000 200.06	626842	63,10
KFK01 Ni1000TK5000 250.06	626859	66,00
KFK01 Ni1000TK5000 300.06	626866	68,50
KFK01 Ni1000TK5000 450.06	626873	72,60

Duct/immersion sensor -50..+120 °C – LM235Z T1		
Item description	Item No.	€
KFK01 LM235Z 050.06	627092	52,40
KFK01 LM235Z 100.06	627108	53,40
KFK01 LM235Z 150.06	627115	55,20
KFK01 LM235Z 200.06	627122	57,10
KFK01 LM235Z 250.06	627139	60,00
KFK01 LM235Z 300.06	627146	62,50
KFK01 LM235Z 450.06	627153	66,60

Options	
Description	€
<b>Pt100   Pt1000 (1/3 DIN)   Ni1000   Ni1000TK5000:</b> Temperature -80..+260 °C (T260)	26,60
4-wire connection (4-wire)	13,40
Add to price of NTC10k for sensor NTC10k Precon   NTC10k Carel   NTC1,8k   NTC5k   NTC20k	0,00
Other sensor elements	on request

Accessories			
Item description	Item No.	Group	€
Mounting flange MF6DS flexible (suitable for Ø=6 mm)	669016	A2	7,80
Mounting flange MF6 brass (suitable for Ø=6 mm)	3407	A1	7,80

## Thermowells brass for sensors with pocket Ø=6 mm

Item description	Length	Inst. length	Item No.	In stock	Group	€
MS-thermowell 50 mm type THMSDS50	50 mm	36 mm	610995	☉	A2	9,90
MS-thermowell 100 mm type THMSDS100	100 mm	86 mm	611008	☉	A2	11,20
MS-thermowell 150 mm type THMSDS150	150 mm	136 mm	611015	☉	A2	11,80
MS-thermowell 200 mm type THMSDS200	200 mm	186 mm	611022	☉	A2	12,30
MS-thermowell 250 mm type THMSDS250	250 mm	236 mm	611985	☉	A2	14,10
MS-thermowell 300 mm type THMSDS300	300 mm	286 mm	611039	☉	A2	14,60
MS-thermowell 450 mm type THMSDS450	450 mm	436 mm	611046	☉	A2	14,90

## Thermowells stainless steel for sensors with pocket Ø=6 mm

Item description	Length	Inst. length	Item No.	In stock	Group	€
VA-thermowell 50 mm type THVADS50	50 mm	36 mm	611152	☉	A2	23,10
VA-thermowell 100 mm type THVADS100	100 mm	86 mm	611817	☉	A2	25,30
VA-thermowell 150 mm type THVADS150	150 mm	136 mm	611824	☉	A2	27,40
VA-thermowell 200 mm type THVADS200	200 mm	186 mm	611848	☉	A2	28,70
VA-thermowell 250 mm type THVADS250	250 mm	236 mm	611862	☉	A2	35,60
VA-thermowell 300 mm type THVADS300	300 mm	286 mm	611879	☉	A2	37,30
VA-thermowell 450 mm type THVADS450	450 mm	436 mm	611893	☉	A2	38,60
Pressure screw with sealing PTFE (without silicone) for thermowell pocket THVADS			666473	☉	A2	22,20

## KFK03

Passive duct sensor for measuring air temperature and other gaseous media of HVAC applications (e.g. in supply and exhaust ducts). Designed for connection to superior controls systems. The sensor can be mounted by means of a mounting flange. Combined with a thermowell, it can be used as an immersion temperature sensor as well.



passive / 0..10 V / 4..20 mA

Technical Data	
Measured values	temperature
Output signal temperature	scaling analogue output: TRV1/TRA1: -50..+50 °C TRV2/TRA2: -10..+120 °C TRV3/TRA3: 0..+50 °C TRV4/TRA4: 0..+160 °C TRV5/TRA5: 0..+250 °C
Power supply	TRV: 15..24 V = (±10%) SELV, 15..26 V ~ SELV TRA: 15..35 V = SELV
Power consumption	TRV: max. 1 W (24 V =), 0,8 VA (24 V ~) TRA: max. 0,5 W (24 V =)
Material in touch with media	Sensor probe, Ø=8 mm, stainless steel V4A (1.4571)
Installation length	100 mm, 150 mm, 200 mm, 250 mm
Enclosure	shape B, aluminium
Operating range temperature	-50..+160 °C   NTC10k: -50..+150 °C
Protection (IP)	IP66, according to EN 60529
Connection	cable entry M20 for wire Ø=7 mm terminal block, max. 1,5 mm <sup>2</sup>
Mounting	when used as duct sensors: please use mounting flange MF8 stainless steel for use as immersion sensors please use immersion pocket THVA

## KFK03 – passive

Duct/immersion sensor -50..+160 °C – Pt100 DIN cl. B T1		
Item description	Item No.	€
KFK03 Pt100 100.08	37877	64,30
KFK03 Pt100 150.08	37884	66,60
KFK03 Pt100 200.08	37891	68,80
KFK03 Pt100 250.08	37907	71,40

Duct/immersion sensor -50..+160 °C – Pt1000 DIN cl. B T1		
Item description	Item No.	€
KFK03 Pt1000 100.08	37952	66,80
KFK03 Pt1000 150.08	37969	69,10
KFK03 Pt1000 200.08	37976	71,30
KFK03 Pt1000 250.08	37983	73,90

Duct/immersion sensor -50..+160 °C – Pt1000 1/3 DIN T1		
Item description	Item No.	€
KFK03 Pt1000 1/3 DIN 100.08	37990	70,80
KFK03 Pt1000 1/3 DIN 150.08	39765	73,10
KFK03 Pt1000 1/3 DIN 200.08	39772	75,30
KFK03 Pt1000 1/3 DIN 250.08	39789	77,90

Duct/immersion sensor -50..+150 °C – NTC10k T1		
Item description	Item No.	€
KFK03 NTC10k 100.08	39918	62,70
KFK03 NTC10k 150.08	39925	65,00
KFK03 NTC10k 200.08	39932	67,20
KFK03 NTC10k 250.08	39949	69,80

Duct/immersion sensor -50..+160 °C – Ni1000 DIN cl. B T1		
Item description	Item No.	€
KFK03 Ni1000 100.08	39796	66,50
KFK03 Ni1000 150.08	39802	68,80
KFK03 Ni1000 200.08	39819	71,00
KFK03 Ni1000 250.08	39826	73,60

Duct/immersion sensor -50..+160 °C – Ni1000TK5000 T1		
Item description	Item No.	€
KFK03 Ni1000TK5000 100.08	39833	70,80
KFK03 Ni1000TK5000 150.08	39840	73,10
KFK03 Ni1000TK5000 200.08	39857	75,30
KFK03 Ni1000TK5000 250.08	39864	77,90

Duct/immersion sensor -50..+120 °C – LM235Z T1		
Item description	Item No.	€
KFK03 LM235Z 100.08	40037	64,80
KFK03 LM235Z 150.08	40044	67,10
KFK03 LM235Z 200.08	40051	69,30
KFK03 LM235Z 250.08	40068	71,90

Options	
Description	€
<b>Pt100   Pt1000 (1/3 DIN)   Ni1000   Ni1000TK5000:</b> Temperature -80..+260 °C (T260)	26,60
4-wire connection (4-wire)	13,40
Add to price of NTC10k for sensor NTC10k Precon   NTC10k Carel   NTC1,8k   NTC5k   NTC20k	0,00
Other sensor elements	on request

### **KFK03 – active**

<b>Duct/immersion sensor -50..+50 °C active</b>			
<b>Item description</b>	<b>Item No.</b>	<b>Group</b>	<b>€</b>
KFK03 TRV1 100.08	350983	T1	155,50
KFK03 TRV1 150.08	351010	T1	157,00
KFK03 TRV1 200.08	277860	T1	158,70
KFK03 TRV1 250.08	286879	T1	160,40

<b>Duct/immersion sensor -10..+120 °C active</b>			
<b>Item description</b>	<b>Item No.</b>	<b>Group</b>	<b>€</b>
KFK03 TRV2 100.08	332453	T1	155,50
KFK03 TRV2 150.08	326711	T1	157,00
KFK03 TRV2 200.08	351096	T1	158,70
KFK03 TRV2 250.08	347242	T1	160,40

<b>Duct/immersion sensor 0..+50 °C active</b>			
<b>Item description</b>	<b>Item No.</b>	<b>Group</b>	<b>€</b>
KFK03 TRV3 100.08	272315	T1	155,50
KFK03 TRV3 150.08	351027	T1	157,00
KFK03 TRV3 200.08	284905	T1	158,70
KFK03 TRV3 250.08	285094	T1	160,40

<b>Duct/immersion sensor 0..+160 °C active</b>			
<b>Item description</b>	<b>Item No.</b>	<b>Group</b>	<b>€</b>
KFK03 TRV4 100.08	351003	T1	155,50
KFK03 TRV4 150.08	261418	T1	157,00
KFK03 TRV4 200.08	351102	T1	158,70
KFK03 TRV4 250.08	347969	T1	160,40

<b>Duct/immersion sensor 0..+250 °C active</b>			
<b>Item description</b>	<b>Item No.</b>	<b>Group</b>	<b>€</b>
KFK03 TRV5 100.08	350990	T1	164,70
KFK03 TRV5 150.08	309127	T1	166,30
KFK03 TRV5 200.08	351119	T1	167,80
KFK03 TRV5 250.08	335607	T1	169,60

## Duct/immersion sensor -50..+50 °C active

Item description	Item No.	Group	€
KFK03 TRA1 100.08	152464	T1	155,50
KFK03 TRA1 150.08	165334	T1	157,00
KFK03 TRA1 200.08	232166	T1	158,70
KFK03 TRA1 250.08	204668	T1	160,40

## Duct/immersion sensor -10..+120 °C active

Item description	Item No.	Group	€
KFK03 TRA2 100.08	242639	T1	155,50
KFK03 TRA2 150.08	351034	T1	157,00
KFK03 TRA2 200.08	351041	T1	158,70
KFK03 TRA2 250.08	351133	T1	160,40

## Duct/immersion sensor 0..+50 °C active

Item description	Item No.	Group	€
KFK03 TRA3 100.08	338585	T1	155,50
KFK03 TRA3 150.08	170239	T1	157,00
KFK03 TRA3 200.08	161909	T1	158,70
KFK03 TRA3 250.08	134804	T1	160,40

## Duct/immersion sensor 0..+160 °C active

Item description	Item No.	Group	€
KFK03 TRA4 100.08	315920	T1	155,50
KFK03 TRA4 150.08	338981	T1	157,00
KFK03 TRA4 200.08	337380	T1	158,70
KFK03 TRA4 250.08	303057	T1	160,40

## Duct/immersion sensor 0..+250 °C active

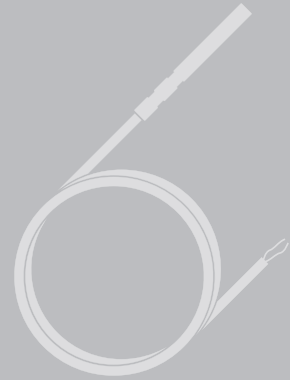
Item description	Item No.	Group	€
KFK03 TRA5 100.08	239080	T1	164,70
KFK03 TRA5 150.08	320948	T1	166,30
KFK03 TRA5 200.08	404792	T1	167,80
KFK03 TRA5 250.08	281577	T1	169,60

Accessories			
Item description	Item No.	Group	€
Mounting flange MF8 stainless steel (suitable for Ø=8 mm)	103305	A1	27,60

Thermowells stainless steel for sensors with pocket Ø=8 mm						
Item description	Length	Inst. length	Item No.	In stock	Group	€
VA-thermowell 100 mm type THVA100 (KFK03)	100 mm	87 mm	584180	☹	A2	36,20
VA-thermowell 150 mm type THVA150 (KFK03)	150 mm	137 mm	584197	☹	A2	38,00
VA-thermowell 200 mm type THVA200 (KFK03)	200 mm	187 mm	584203	☹	A2	40,00
VA-thermowell 250 mm type THVA250 (KFK03)	250 mm	237 mm	594738	☹	A2	42,10

# Cable Sensors Contact Sensors

Durable materials and state-of-the-art pressing and rolling processes guarantee the quality and durability of our cable and contact sensors. This makes them the first choice in building, heating, ventilation and air conditioning technology.



## Cable Sensors

TF25	Temperature	328
TF25+	Temperature	334
TF14	Temperature	338
TF14+	Temperature	342

## Surface Sensors

PR25	Temperature	344
PR25+	Temperature	347
OF14	Temperature	349
OF14+	Temperature	358

## Contact Sensors

VFG54+	Temperature	353
AF25	Temperature	356
AF25+	Temperature	358



## TF25

Cable sensor for temperature measurement in HVAC or refrigeration applications. In combination with a thermowell, the TF25 can also be used for temperature measurement in liquid media. Depending on the application requirements, different PVC, silicone, high-temperature silicone and fibreglass cables are available.

Technical Data	
Measured values	temperature
Material in touch with media	Sensor probe, Ø=6 mm, stainless steel V4A (1.4571) 16-point pressed (IP65)
Installation length	50 mm, 100 mm, 150 mm
Operating range temperature	-50..+400 °C
Protection (IP)	IP65, according to EN 60529
Connection cable	0,22 mm <sup>2</sup> , <b>T400</b> : 0,25 mm <sup>2</sup> <b>T100</b> : PVC, <b>T125/T150/T180</b> : silicone, <b>T250</b> : HT-silicone, <b>T400</b> : GI/GI-V2A cable ends with conductor sleeves as standard
Length connection wire	1 m
Notes	PE connection wire available (please request)

## TF25 (-35..+100 °C)

Cable sensor -35..+100 °C					
	Item description	In stock	Item No.	Group	€
PT100	TF25 Pt100 T100 050.06 L1000		35019	T3	14,50
	TF25 Pt100 T100 050.06 L2000		35071	T3	17,30
	TF25 Pt100 T100 050.06 L4000		35132	T3	22,90
	TF25 Pt100 T100 050.06 L6000		35194	T3	28,50
PT1000	TF25 Pt1000 T100 050.06 L1000	●	35484	T3	17,00
	TF25 Pt1000 T100 050.06 L2000	●	35545	T3	19,80
	TF25 Pt1000 T100 050.06 L4000		35606	T3	25,40
	TF25 Pt1000 T100 050.06 L6000		35668	T3	31,00
PT1000 1/3 DIN	TF25 Pt1000 1/3 DIN T100 050.06 L1000		35729	T3	21,00
	TF25 Pt1000 1/3 DIN T100 050.06 L2000		35781	T3	23,80
	TF25 Pt1000 1/3 DIN T100 050.06 L4000		35842	T3	29,40
	TF25 Pt1000 1/3 DIN T100 050.06 L6000		35903	T3	35,00
NTC10k	TF25 NTC10k T100 050.06 L1000		41539	T3	12,90
	TF25 NTC10k T100 050.06 L2000		41607	T3	15,70
	TF25 NTC10k T100 050.06 L4000		41676	T3	21,30
	TF25 NTC10k T100 050.06 L6000		41744	T3	26,90

Cable sensor -35..+100 °C					
	Item description	In stock	Item No.	Group	€
Ni1000	TF25 Ni1000 T100 050.06 L1000		26116	T3	16,70
	TF25 Ni1000 T100 050.06 L2000		26123	T3	19,50
	TF25 Ni1000 T100 050.06 L4000		26130	T3	25,10
	TF25 Ni1000 T100 050.06 L6000		26147	T3	30,70
Ni1000TK5000	TF25 Ni1000TK5000 T100 050.06 L1000		26352	T3	21,00
	TF25 Ni1000TK5000 T100 050.06 L2000		26369	T3	23,80
	TF25 Ni1000TK5000 T100 050.06 L4000		26376	T3	29,40
	TF25 Ni1000TK5000 T100 050.06 L6000		649582	T3	35,00

Options	
Description	€
4-wire connection cable L1000 for T100	13,40
4-wire connection cable L2000 for T100	17,20
4-wire connection cable L4000 for T100	24,80
4-wire connection cable L6000 for T100	32,40
Other connection types and lengths	on request
Connection enclosure USE-S incl. mounting base pure white	26,00
Other sleeve lengths	on request
Protection class IP67 (rolled)	4,10
Tension spring (tensp)	3,80
Add to price of NTC10k for sensor NTC10k Precon   NTC10k Carel   NTC1,8k   NTC5k   NTC20k   LM235Z	0,00
Other sensor elements	on request

Cable sensor -50..+180 °C					
	Item description		Item No.	Group	€
Pt100	TF25 Pt100 T180 050.06 L1000		52771	T3	18,90
	TF25 Pt100 T180 050.06 L2000		52832	T3	23,50
	TF25 Pt100 T180 050.06 L4000		52894	T3	32,70
	TF25 Pt100 T180 050.06 L6000		52955	T3	41,90
PT1000	TF25 Pt1000 T180 050.06 L1000		58247	T3	21,40
	TF25 Pt1000 T180 050.06 L2000		58308	T3	26,00
	TF25 Pt1000 T180 050.06 L4000		58360	T3	35,20
	TF25 Pt1000 T180 050.06 L6000		58421	T3	44,40

Cable sensor -50..+180 °C   NTC10k: -50..+150 °C				
Item description		Item No.	Group	€
PT1000 1/3 DIN	TF25 Pt1000 1/3 DIN T180 050.06 L1000	58483	T3	25,40
	TF25 Pt1000 1/3 DIN T180 050.06 L2000	58544	T3	30,00
	TF25 Pt1000 1/3 DIN T180 050.06 L4000	851480	T3	39,20
	TF25 Pt1000 1/3 DIN T180 050.06 L6000	58667	T3	48,40
NTC10k	TF25 NTC10k T150 050.06 L1000	59466	T3	17,30
	TF25 NTC10k T150 050.06 L2000	60493	T3	21,90
	TF25 NTC10k T150 050.06 L4000	60554	T3	31,10
	TF25 NTC10k T150 050.06 L6000	60615	T3	40,30
Ni1000	TF25 Ni1000 T180 050.06 L1000	58728	T3	21,10
	TF25 Ni1000 T180 050.06 L2000	58780	T3	25,70
	TF25 Ni1000 T180 050.06 L4000	58841	T3	34,90
	TF25 Ni1000 T180 050.06 L6000	58902	T3	44,10
Ni1000TK5000	TF25 Ni1000TK5000 T180 050.06 L1000	58964	T3	25,40
	TF25 Ni1000TK5000 T180 050.06 L2000	59022	T3	30,00
	TF25 Ni1000TK5000 T180 050.06 L4000	59084	T3	39,20
	TF25 Ni1000TK5000 T180 050.06 L6000	59145	T3	48,40

Options	
Description	€
4-wire connection cable L1000 for T180	20,10
4-wire connection cable L2000 for T180	31,50
4-wire connection cable L4000 for T180	54,30
4-wire connection cable L6000 for T180	77,10
Other connection types and lengths	on request
Connection enclosure USE-S incl. mounting base pure white	26,00
Other sleeve lengths	on request
Protection class IP67 (rolled)	4,10
Tension spring (tensp)	3,80
Add to price of NTC10k for sensor NTC10k Precon   NTC10k Carel   NTC1,8k   NTC5k   NTC20k   LM235Z	0,00
Other sensor elements	on request

Cable sensor -50..+250 °C				
	Item description	Item No.	Group	€
Pt100	TF25 Pt100 T250 050.06 L1000	167406	T3	23,80
	TF25 Pt100 T250 050.06 L2000	185882	T3	31,20
	TF25 Pt100 T250 050.06 L4000	173780	T3	46,00
	TF25 Pt100 T250 050.06 L6000	851476	T3	60,80
PT1000	TF25 Pt1000 T250 050.06 L1000	168717	T3	26,30
	TF25 Pt1000 T250 050.06 L2000	176170	T3	33,70
	TF25 Pt1000 T250 050.06 L4000	176828	T3	48,50
	TF25 Pt1000 T250 050.06 L6000	685894	T3	63,30
PT1000 1/3 DIN	TF25 Pt1000 1/3 DIN T250 050.06 L1000	356749	T3	30,30
	TF25 Pt1000 1/3 DIN T250 050.06 L2000	318068	T3	37,70
	TF25 Pt1000 1/3 DIN T250 050.06 L4000	851478	T3	52,50
	TF25 Pt1000 1/3 DIN T250 050.06 L6000	851482	T3	67,30
Ni1000	TF25 Ni1000 T250 050.06 L1000	151863	T3	26,00
	TF25 Ni1000 T250 050.06 L2000	177641	T3	33,40
	TF25 Ni1000 T250 050.06 L4000	284899	T3	48,20
	TF25 Ni1000 T250 050.06 L6000	851491	T3	63,00
Ni1000TK5000	TF25 Ni1000TK5000 T250 050.06 L1000	150781	T3	30,30
	TF25 Ni1000TK5000 T250 050.06 L2000	851493	T3	37,70
	TF25 Ni1000TK5000 T250 050.06 L4000	851484	T3	52,50
	TF25 Ni1000TK5000 T250 050.06 L6000	851496	T3	67,30

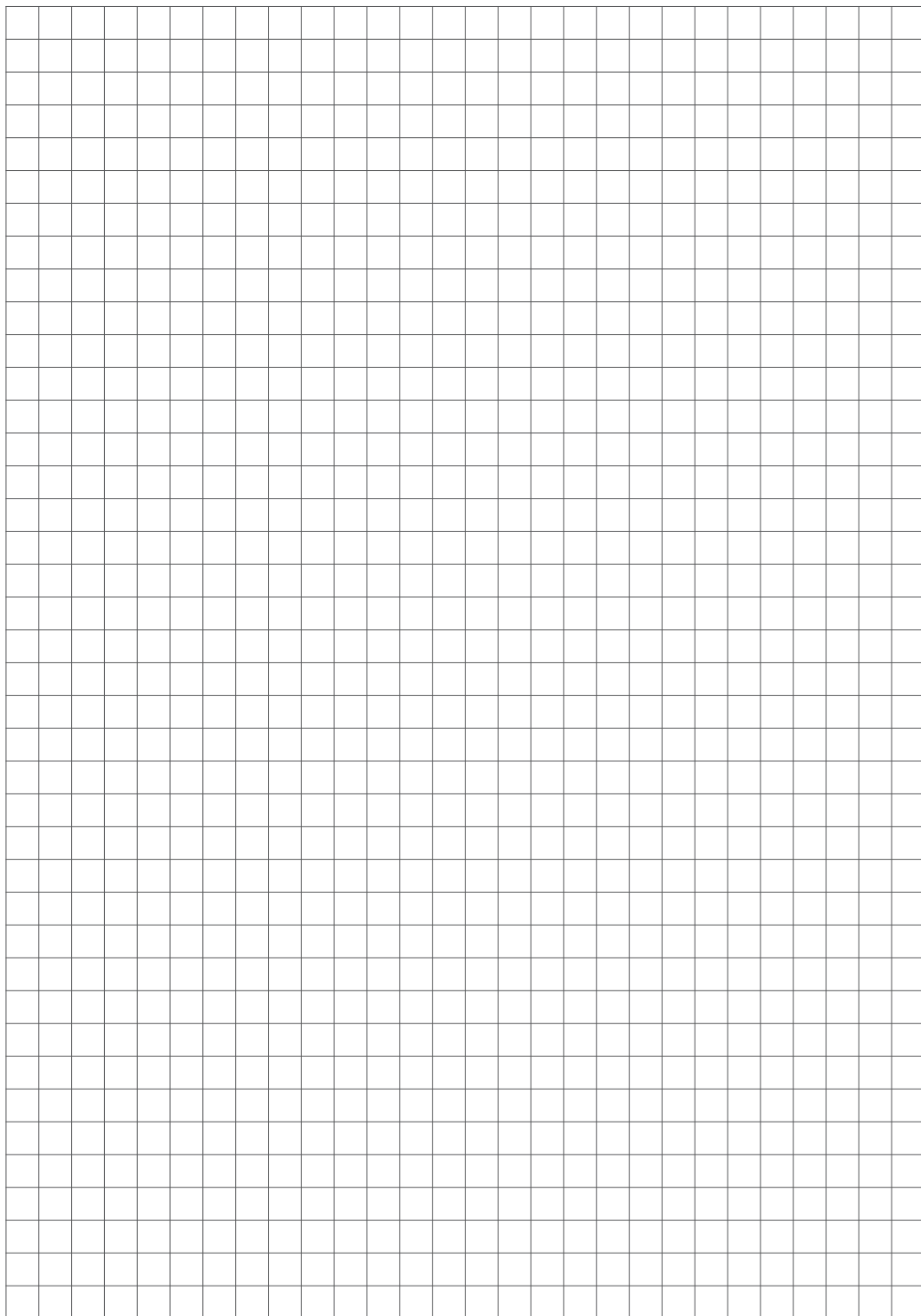
Options	
Description	€
4-wire connection cable L1000 for T250	15,60
4-wire connection cable L2000 for T250	33,00
4-wire connection cable L4000 for T250	67,80
4-wire connection cable L6000 for T250	102,60
Other connection types and lengths	on request
Connection enclosure USE-S incl. mounting base pure white	26,00
Other sleeve lengths	on request
Protection class IP67 (rolled)	4,10
Tension spring (tensp)	3,80
Other sensor elements	on request

Cable sensor -50..+400 °C				
	Item description	Item No.	Group	€
PT100	TF25 Pt100 T400 050.06 L1000	257923	T3	34,70
	TF25 Pt100 T400 050.06 L2000	799645	T3	40,80
	TF25 Pt100 T400 050.06 L4000	356985	T3	65,20
	TF25 Pt100 T400 050.06 L6000	851486	T3	89,60
PT1000	TF25 Pt1000 T400 050.06 L1000	341035	T3	37,50
	TF25 Pt1000 T400 050.06 L2000	166201	T3	43,30
	TF25 Pt1000 T400 050.06 L4000	431279	T3	67,70
	TF25 Pt1000 T400 050.06 L6000	248211	T3	92,10

Options	
Description	€
Connection enclosure USE-S incl. mounting base pure white	26,00
Other sleeve lengths	on request
Protection class IP67 (rolled)	4,10
Tension spring (tensp)	3,80
Other sensor elements	on request

Accessories				
Item description	Item No.	Group	€	
Mounting flange MF6DS flexible (suitable for Ø=6 mm)	669016	A2	7,80	
Mounting flange MF6 brass (suitable for Ø=6 mm)	3407	A1	7,80	
Compression fittings KL6VA for Ø=6 mm with cutting ring, stainless steel	103213	A1	15,60	
Tension clamp for pipes Ø up to 110 mm with contact fluid	658911	A1	3,30	
Tension clamp for pipes Ø up to 250 mm with contact fluid	648103	A1	5,20	
Tightening strap PA (max. 85 °C) for pipes Ø up to 100 mm with contact fluid	668071	A1	3,30	

Thermowells							
Item description	Length	Inst. length	Item No.	In stock	Group	€	
MS-thermowell 50 mm type THMSDS50	50 mm	36 mm	610995	⊕	A2	9,90	
VA-thermowell 50 mm type THVADS50	50 mm	36 mm	611152	⊕	A2	23,10	



## TF25+

Cable sensor for temperature measurement in HVAC or refrigeration applications. In combination with a thermowell, the TF25 can also be used for temperature measurement in liquid media. Depending on the application requirements, different PVC, silicone, high-temperature silicone and fibreglass cables are available.



TF25+



TF25+ BUS

0..10 V / 4..20 mA  

Technical Data	
Measured values	temperature
Configuration	USEapp, uConfig, BUS, jumper, DIP switches (depending on type)
Network technology	RS485 Modbus, RS485 BACnet (MS/TR)
Output signal temperature	scaling analogue output: 0..+160 °C (default setting) selectable from 4 temperature ranges -50..+50   -20..+80   -15..+35   -10..+120   0..+50   0..+100   0..+160   0..+250 °C adjustable at the transducer, optionally configurable via app or uConfig
Power supply	15..24 V = (±10%) SELV, 24 V ~ (±10%) SELV 15..24 V = (±10%) SELV 15..35 V = SELV, 19..29 V ~ SELV
Power consumption	<b>TRV</b> : typ. 0,4 W (24 V =), 0,8 VA (24 V ~) <b>TRA</b> : max. 0,5 W (24 V =) <b>Relay/LCD/BUS</b> : max. 2,5 W (24 V =), 4,3 VA (24 V ~)
Material in touch with media	Sensor probe, Ø=6 mm, stainless steel V4A (1.4571) 16-point pressed (IP65)
Installation length	50 mm, 100 mm, 150 mm
Display	LCD 29x35 mm, RGB backlight, with traffic light function, threshold values configurable, optionally configurable via app or uConfig
Enclosure	<b>TRV/TRA</b> : USE-S, impact- and shock-resistant enclosure with quick-release cover, PC <b>Relay/LCD/BUS</b> : USE-M, impact- and shock-resistant enclosure with quick-release cover, PC
Colour	pure white, <b>LCD</b> : transparent cover
Operating range temperature	-50..+250 °C
Connection	removable plug-in terminal, max. 2,5 mm <sup>2</sup> BUS max. 1,5 mm <sup>2</sup> , relay max. 1,5 mm <sup>2</sup> <b>TRV/TRA</b> : removable cable entry flextherm M20 for wire Ø=4,5..9 mm <b>Relay/LCD/BUS</b> : removable cable entry M25 with fourfold cable entry for wire with max. Ø=7 mm
Connection cable	0,25 mm <sup>2</sup> , silicone, <b>T250</b> : HT-silicone
Length connection wire	1 m

Technical Data	
<b>Delivery content</b>	incl. mounting set (screws and accessories) <b>TRV/TRA:</b> incl. mounting base enclosure USE-S pure white <b>Relay/LCD/BUS:</b> incl. mounting base enclosure USE-M pure white
<b>Notes</b>	PE connection wire available (please request)

## TF25+ 0..10 V (TRV) / 4..20 mA (TRA)

Cable sensor -50..+180 °C – active – 0..10 (0..5) V			
Item description	Item No.	Group	€
TF25+ TRV MultiRange T180 050.06 L1000	658959	T2	84,20
TF25+ TRV MultiRange T180 100.06 L1000	658966	T2	86,00
TF25+ TRV MultiRange T180 150.06 L1000	658973	T2	86,40

Cable sensor -50..+180 °C – active – 4..20 mA			
Item description	Item No.	Group	€
TF25+ TRA MultiRange T180 050.06 L1000	658980	T2	84,20
TF25+ TRA MultiRange T180 100.06 L1000	658997	T2	86,00
TF25+ TRA MultiRange T180 150.06 L1000	659000	T2	86,40

Options	
Description	€
Temperature -50..+250 °C (T250)	26,60
2-wire connection cable L2000 for T135 / T160 / T180	4,60
2-wire connection cable L4000 for T135 / T160 / T180	13,80
2-wire connection cable L6000 for T135 / T160 / T180	23,00
2-wire connection cable L2000 for T250	7,40
2-wire connection cable L4000 for T250	22,20
2-wire connection cable L6000 for T250	37,00
Other connection types and lengths	on request
2x floating contact NO in enclosure USE-M with option board for 24 V ~ or 24 V = / 3 A	81,70
Other sleeve lengths	on request
Protection class IP67 (rolled)	4,10
Tension spring (tensp)	3,80

<b>Accessories</b>				
Item description	Item No.	Group	€	
Mounting flange MF6DS flexible (suitable for Ø=6 mm)	669016	A2	7,80	
Mounting flange MF6 brass (suitable for Ø=6 mm)	3407	A1	7,80	
Compression fittings KL6VA for Ø=6 mm with cutting ring, stainless steel	103213	A1	15,60	
Tension clamp for pipes Ø up to 110 mm with contact fluid	658911	A1	3,30	
Tension clamp for pipes Ø up to 250 mm with contact fluid	648103	A1	5,20	
Tightening strap PA (max. 85 °C) for pipes Ø up to 100 mm with contact fluid	668071	A1	3,30	
Mounting clip enclosure USE-S pure white	667739	A1	5,70	
Mounting base enclosure USE-S pure white	667722	A1	6,70	

## TF25+ LCD / BUS

<b>Cable sensor -50..+160 °C – active – LCD</b>				
Item description	USEapp	Item No.	Group	€
TF25+ LCD TRV MultiRange T160 050.06 L1000	✓	707039	T2	163,70
TF25+ LCD TRV MultiRange T160 100.06 L1000	✓	693806	T2	165,50

<b>Cable sensor -50..+160 °C – BUS</b>				
Item description	USEapp	Item No.	Group	€
TF25+ RS485 BACnet (MS/TP) T160 050.06 L1000	✓	699723	T2	125,30
TF25+ RS485 BACnet (MS/TP) T160 100.06 L1000	✓	699730	T2	126,90
TF25+ RS485 Modbus T160 050.06 L1000	✓	659024	T2	125,30
TF25+ RS485 Modbus T160 100.06 L1000	✓	668255	T2	126,90

<b>Options</b>	
Description	€
Temperature -50..+250 °C (T250)	26,60
2-wire connection cable L2000 for T135 / T160 / T180	4,60
2-wire connection cable L4000 for T135 / T160 / T180	13,80
2-wire connection cable L6000 for T135 / T160 / T180	23,00
2-wire connection cable L2000 for T250	7,40
2-wire connection cable L4000 for T250	22,20
2-wire connection cable L6000 for T250	37,00
Other connection types and lengths	on request
2x floating contact NO in enclosure USE-M with option board for 24 V ~ or 24 V = / 3 A	81,70
LCD 29x35 mm, RGB backlight in enclosure USE-M with option board	79,50
Other sleeve lengths	on request
Protection class IP67 (rolled)	4,10
Tension spring (tensp)	3,80

Accessories			
Item description	Item No.	Group	€
Mounting flange MF6DS flexible (suitable for Ø=6 mm)	669016	A2	7,80
Mounting flange MF6 brass (suitable for Ø=6 mm)	3407	A1	7,80
Compression fittings KL6VA for Ø=6 mm with cutting ring, stainless steel	103213	A1	15,60
Tension clamp for pipes Ø up to 110 mm with contact fluid	658911	A1	3,30
Tension clamp for pipes Ø up to 250 mm with contact fluid	648103	A1	5,20
Tightening strap PA (max. 85 °C) for pipes Ø up to 100 mm with contact fluid	668071	A1	3,30
Mounting base enclosure USE-M pure white	668354	A1	9,60
BLE dongle with micro-USB for devices USE-M / USE-L / NOVOS / thanos EVO	668262		32,10
USB interface for devices USE-M / USE-L / NOVOS / thanos EVO / SR06 LCD	597838	A1	39,50

Thermowells brass for sensors with pocket Ø=6 mm						
Item description	Length	Inst. length	Item No.	In stock	Group	€
MS-thermowell 50 mm type THMSDS50	50 mm	36 mm	610995	●	A2	9,90
MS-thermowell 100 mm type THMSDS100	100 mm	86 mm	611008	●	A2	11,20
MS-thermowell 150 mm type THMSDS150	150 mm	136 mm	611015	●	A2	11,80

Thermowells stainless steel for sensors with pocket Ø=6 mm						
Item description	Length	Inst. length	Item No.	In stock	Group	€
VA-thermowell 50 mm type THVADS50	50 mm	36 mm	611152	●	A2	23,10
VA-thermowell 100 mm type THVADS100	100 mm	86 mm	611817	●	A2	25,30
VA-thermowell 150 mm type THVADS150	150 mm	136 mm	611824	●	A2	27,40
Pressure screw with sealing PTFE (without silicone) for thermowell pocket THVADS			666473	●	A2	22,20



## TF14

Cable sensor for temperature measurement in HVAC applications. Depending on the application requirements, different PVC, silicone and PTFE cables are available. The TF14 with its 4 mm diameter pocket is well suited for fast response applications.

Technical Data	
Measured values	temperature
Material in touch with media	Sensor probe, Ø=4 mm, stainless steel V4A (1.4571) 16-point pressed (IP65), rolled (IP67)
Installation length	50 mm, 100 mm, 150 mm
Connection cable	0,14 mm <sup>2</sup> <b>T100:</b> PVC, <b>T150/T180:</b> silicone, <b>T250:</b> PTFE
Length connection wire	1 m

Cable sensor -35..+100 °C				
	Item description	Item No.	Group	€
PT100	TF14 Pt100 T100 050.04 L1000	64347	T3	15,00
	TF14 Pt100 T100 050.04 L2000	68956	T3	17,80
	TF14 Pt100 T100 050.04 L4000	69021	T3	23,40
	TF14 Pt100 T100 050.04 L6000	69069	T3	29,00
PT1000	TF14 Pt1000 T100 050.04 L1000	69267	T3	17,50
	TF14 Pt1000 T100 050.04 L2000	69304	T3	20,30
	TF14 Pt1000 T100 050.04 L4000	69342	T3	25,90
	TF14 Pt1000 T100 050.04 L6000	69380	T3	31,50
PT1000 1/3 DIN	TF14 Pt1000 1/3 DIN T100 050.04 L1000	69427	T3	21,50
	TF14 Pt1000 1/3 DIN T100 050.04 L2000	69465	T3	24,30
	TF14 Pt1000 1/3 DIN T100 050.04 L4000	73004	T3	29,90
	TF14 Pt1000 1/3 DIN T100 050.04 L6000	73042	T3	35,50
NTC10k	TF14 NTC10k T100 050.04 L1000	73844	T3	13,40
	TF14 NTC10k T100 050.04 L2000	77323	T3	16,20
	TF14 NTC10k T100 050.04 L4000	77606	T3	21,80
	TF14 NTC10k T100 050.04 L6000	77880	T3	27,40
Ni1000	TF14 Ni1000 T100 050.04 L1000	73080	T3	17,20
	TF14 Ni1000 T100 050.04 L2000	73127	T3	20,00
	TF14 Ni1000 T100 050.04 L4000	73165	T3	25,60
	TF14 Ni1000 T100 050.04 L6000	73202	T3	31,20
Ni1000TK5000	TF14 Ni1000TK5000 T100 050.04 L1000	73240	T3	21,50
	TF14 Ni1000TK5000 T100 050.04 L2000	73288	T3	24,30
	TF14 Ni1000TK5000 T100 050.04 L4000	73325	T3	29,90
	TF14 Ni1000TK5000 T100 050.04 L6000	73363	T3	35,50

Options	
Description	€
4-wire connection cable L1000 for T100	13,40
4-wire connection cable L2000 for T100	17,20
4-wire connection cable L4000 for T100	24,80
4-wire connection cable L6000 for T100	32,40
Other connection types and lengths	on request
Connection enclosure USE-S incl. mounting base pure white	26,00
Other sleeve lengths	on request
Protection class IP67 (rolled)	4,10
Tension spring (tensp)	3,80
Add to price of NTC10k for sensor NTC10k Precon   NTC10k Carel   NTC1,8k   NTC5k   NTC20k   LM235Z	0,00
Other sensor elements	on request

Cable sensor -50..+180 °C				
	Item description	Item No.	Group	€
PT100	TF14 Pt100 T180 050.04 L1000	64354	T3	20,60
	TF14 Pt100 T180 050.04 L2000	78054	T3	25,20
	TF14 Pt100 T180 050.04 L4000	78108	T3	34,40
	TF14 Pt100 T180 050.04 L6000	78153	T3	43,60
PT1000	TF14 Pt1000 T180 050.04 L1000	78405	T3	23,10
	TF14 Pt1000 T180 050.04 L2000	78412	T3	27,70
	TF14 Pt1000 T180 050.04 L4000	78429	T3	36,90
	TF14 Pt1000 T180 050.04 L6000	78436	T3	46,10
PT1000 1/3 DIN	TF14 Pt1000 1/3 DIN T180 050.04 L1000	78603	T3	27,10
	TF14 Pt1000 1/3 DIN T180 050.04 L2000	78610	T3	31,70
	TF14 Pt1000 1/3 DIN T180 050.04 L4000	851487	T3	40,90
	TF14 Pt1000 1/3 DIN T180 050.04 L6000	851489	T3	50,10
NTC10k	TF14 NTC10k T150 050.04 L1000	80408	T3	19,00
	TF14 NTC10k T150 050.04 L2000	80415	T3	23,60
	TF14 NTC10k T150 050.04 L4000	80422	T3	32,80
	TF14 NTC10k T150 050.04 L6000	851504	T3	42,00
Ni1000	TF14 Ni1000 T180 050.04 L1000	78795	T3	22,80
	TF14 Ni1000 T180 050.04 L2000	78801	T3	27,40
	TF14 Ni1000 T180 050.04 L4000	78818	T3	36,60
	TF14 Ni1000 T180 050.04 L6000	78825	T3	45,80
Ni1000TK5000	TF14 Ni1000TK5000 T180 050.04 L1000	78993	T3	27,10
	TF14 Ni1000TK5000 T180 050.04 L2000	79006	T3	31,70
	TF14 Ni1000TK5000 T180 050.04 L4000	79013	T3	40,90
	TF14 Ni1000TK5000 T180 050.04 L6000	851500	T3	50,10

Options	
Description	€
4-wire connection cable L1000 for T180	20,10
4-wire connection cable L2000 for T180	31,50
4-wire connection cable L4000 for T180	54,30
4-wire connection cable L6000 for T180	77,10
Other connection types and lengths	on request
Connection enclosure USE-S incl. mounting base pure white	26,00
Other sleeve lengths	on request
Protection class IP67 (rolled)	4,10
Tension spring (tensp)	3,80
Add to price of NTC10k for sensor NTC10k Precon   NTC10k Carel   NTC1,8k   NTC5k   NTC20k   LM235Z	0,00
Other sensor elements	on request

Cable sensor -80..+250 °C				
	Item description	Item No.	Group	€
PT100	TF14 Pt100 T250 050.04 L1000	95563	T3	23,80
	TF14 Pt100 T250 050.04 L2000	96133	T3	37,20
	TF14 Pt100 T250 050.04 L4000	96140	T3	64,00
	TF14 Pt100 T250 050.04 L6000	96157	T3	90,80
PT1000	TF14 Pt1000 T250 050.04 L1000	97185	T3	26,30
	TF14 Pt1000 T250 050.04 L2000	97208	T3	39,70
	TF14 Pt1000 T250 050.04 L4000	97215	T3	66,50
	TF14 Pt1000 T250 050.04 L6000	97222	T3	93,30
PT1000 1/3 DIN	TF14 Pt1000 1/3 DIN T250 050.04 L1000	91633	T3	30,30
	TF14 Pt1000 1/3 DIN T250 050.04 L2000	91640	T3	43,70
	TF14 Pt1000 1/3 DIN T250 050.04 L4000	91657	T3	70,50
	TF14 Pt1000 1/3 DIN T250 050.04 L6000	91664	T3	97,30
Ni1000	TF14 Ni1000 T250 050.04 L1000	91831	T3	26,00
	TF14 Ni1000 T250 050.04 L2000	91848	T3	39,40
	TF14 Ni1000 T250 050.04 L4000	548700	T3	66,20
	TF14 Ni1000 T250 050.04 L6000	91862	T3	93,00
Ni1000TK5000	TF14 Ni1000TK5000 T250 050.04 L1000	97338	T3	30,30
	TF14 Ni1000TK5000 T250 050.04 L2000	851510	T3	43,70
	TF14 Ni1000TK5000 T250 050.04 L4000	97352	T3	70,50
	TF14 Ni1000TK5000 T250 050.04 L6000	851502	T3	97,30

Options	
Description	€
4-wire connection cable L1000 for T250	15,60
4-wire connection cable L2000 for T250	33,00
4-wire connection cable L4000 for T250	67,80
4-wire connection cable L6000 for T250	102,60
Other connection types and lengths	on request
Connection enclosure USE-S incl. mounting base pure white	26,00
Other sleeve lengths	on request
Protection class IP67 (rolled)	4,10
Tension spring (tensp)	3,80
Other sensor elements	on request

Accessories				
Item description	Item No.	Group	€	
Mounting flange MF6 flexible (suitable for Ø=4 / 6 / 7 mm)	399098	A2	7,80	
Mounting flange MF4 brass (suitable for Ø=4 mm)	102438	A1	6,30	
Compression fittings KL4VA for Ø=4 mm with cutting ring, stainless steel	103206	A1	15,60	
Tension clamp for pipes Ø up to 110 mm with contact fluid	658911	A1	3,30	
Tension clamp for pipes Ø up to 250 mm with contact fluid	648103	A1	5,20	
Tightening strap PA (max. 85 °C) for pipes Ø up to 100 mm with contact fluid	668071	A1	3,30	



## TF14+

Cable sensor for temperature measurement in HVAC applications. Depending on the application requirements, different PVC, silicone and PTFE cables are available. A hinged cover and tool-free wiring as well as removable cable entries ensure a quick and easy installation. The TF14 with its 4 mm diameter pocket is well suited for fast response applications.

0..10 V / 4..20 mA  

Technical Data	
Measured values	temperature
Configuration	jumper
Output signal temperature	scaling analogue output: 0..+160 °C (default setting) selectable from 4 temperature ranges -50..+50   -20..+80   -15..+35   -10..+120   0..+50   0..+100   0..+160   0..+250 °C adjustable at the transducer
Power supply	<b>TRV:</b> 15..24 V = (±10%) SELV, 24 V ~ (±10%) SELV <b>TRA:</b> 15..24 V = (±10%) SELV
Power consumption	<b>TRV:</b> typ. 0,4 W (24 V =), 0,8 VA (24 V ~) <b>TRA:</b> max. 0,5 W (24 V =)
Material in touch with media	Sensor probe, Ø=4 mm, stainless steel V4A (1.4571) 16-point pressed (IP65)
Installation length	50 mm, 100 mm, 150 mm
Enclosure	USE-S, impact- and shock-resistant enclosure with quick-release cover, PC
Colour	pure white
Operating range temperature	-50..+250 °C
Protection (IP)	IP65, according to EN 60529
Connection	removable plug-in terminal, max. 2,5 mm <sup>2</sup> removable cable entry flextherm M20 for wire Ø=4,5..9 mm
Connection cable	0,14 mm <sup>2</sup> , <b>T180:</b> silicone, <b>T250:</b> PTFE
Length connection wire	1 m
Delivery content	incl. mounting base enclosure USE-S pure white incl. mounting set (screws and accessories)

### Cable sensor -50..+180 °C – active

Item description	Item No.	Group	€
TF14+ TRV MultiRange T180 050.04 L1000	658850	T2	82,80
TF14+ TRV MultiRange T180 100.04 L1000	658867	T2	84,50
TF14+ TRV MultiRange T180 150.04 L1000	658874	T2	85,00
TF14+ TRA MultiRange T180 050.04 L1000	658881	T2	82,80
TF14+ TRA MultiRange T180 100.04 L1000	658898	T2	84,50
TF14+ TRA MultiRange T180 150.04 L1000	658904	T2	85,00

Options	
Description	€
Temperature -50..+250 °C (T250)	26,60
2-wire connection cable L2000 for T135 / T160 / T180	4,60
2-wire connection cable L4000 for T135 / T160 / T180	13,80
2-wire connection cable L6000 for T135 / T160 / T180	23,00
2-wire connection cable L2000 for T250	7,40
2-wire connection cable L4000 for T250	22,20
2-wire connection cable L6000 for T250	37,00
Other connection types and lengths	on request
RS485 Modbus in enclosure USE-M with option board	87,00
RS485 BACnet (MS/TP) in enclosure USE-M with option board	87,00
2x floating contact NO in enclosure USE-M with option board for 24 V ~ or 24 V = / 3 A	81,70
LCD 29x35 mm, RGB backlight in enclosure USE-M with option board	79,50
Protection class IP67 (rolled)	4,10
Tension spring (tensp)	3,80

Accessories				
Item description	Item No.	Group	€	
Mounting flange MF6 flexible (suitable for Ø=4 / 6 / 7 mm)	399098	A2	7,80	
Mounting flange MF4 brass (suitable for Ø=4 mm)	102438	A1	6,30	
Compression fittings KL4VA for Ø=4 mm with cutting ring, stainless steel	103206	A1	15,60	
Tension clamp for pipes Ø up to 110 mm with contact fluid	658911	A1	3,30	
Tension clamp for pipes Ø up to 250 mm with contact fluid	648103	A1	5,20	
Tightening strap PA (max. 85 °C) for pipes Ø up to 100 mm with contact fluid	668071	A1	3,30	
Mounting clip enclosure USE-S pure white	667739	A1	5,70	
Mounting base enclosure USE-S pure white	667722	A1	6,70	
Cable entry M20 USE white, sealing insert Flextherm Ø=4,5..9 mm (4 pcs)	851077	A1	12,30	
Sealing insert M20 USE white, Flextherm Ø=4,5..9 mm (10 pcs)	752206	A1	12,30	
Sealing insert M20 USE white, 2x Ø=7 mm (10 pcs)	641333	A1	12,30	
Cable entry M25 USE white, sealing insert 4x Ø=7 mm (4 pcs)	641364	A1	12,30	

## PR25



Contact sensor with connection cable and aluminum prism for temperature measurement (cold or hot water) on pipes and other suitable surfaces.

### Technical Data

Measured values	temperature
Material in touch with media	Sensor probe, Ø=11/15 mm, aluminium, hex pressed (IP65)
Installation length	28 mm
Protection (IP)	IP65, according to EN 60529
Connection cable	0,25 mm <sup>2</sup> , <b>T100</b> : PVC, <b>T180</b> : silicone
Length connection wire	1 m

### Contact Sensor -35..+100 °C

	Item description	Item No.	Group	€
PT100	PR25 Pt100 T100 L1000	81696	T2	22,20
	PR25 Pt100 T100 L2000	94672	T2	25,00
	PR25 Pt100 T100 L4000	94689	T2	30,60
	PR25 Pt100 T100 L6000	94696	T2	36,20
PT1000	PR25 Pt1000 T100 L1000	94894	T2	24,70
	PR25 Pt1000 T100 L2000	94900	T2	27,50
	PR25 Pt1000 T100 L4000	94917	T2	33,10
	PR25 Pt1000 T100 L6000	94924	T2	38,70
PT1000 1/3 DIN	PR25 Pt1000 1/3 DIN T100 L1000	94931	T2	28,70
	PR25 Pt1000 1/3 DIN T100 L2000	94948	T2	31,50
	PR25 Pt1000 1/3 DIN T100 L4000	851512	T2	37,10
	PR25 Pt1000 1/3 DIN T100 L6000	94962	T2	42,70
NTC10k	PR25 NTC10k T100 L1000	95808	T2	20,60
	PR25 NTC10k T100 L2000	95815	T2	23,40
	PR25 NTC10k T100 L4000	95822	T2	29,00
	PR25 NTC10k T100 L6000	851505	T2	34,60
Ni1000	PR25 Ni1000 T100 L1000	94979	T2	24,40
	PR25 Ni1000 T100 L2000	94986	T2	27,20
	PR25 Ni1000 T100 L4000	94993	T2	32,80
	PR25 Ni1000 T100 L6000	92241	T2	38,40
Ni1000TK5000	PR25 Ni1000TK5000 T100 L1000	95686	T2	28,70
	PR25 Ni1000TK5000 T100 L2000	95693	T2	31,50
	PR25 Ni1000TK5000 T100 L4000	95709	T2	37,10
	PR25 Ni1000TK5000 T100 L6000	95716	T2	42,70

Options	
Description	€
4-wire connection cable L1000 for T100	13,40
4-wire connection cable L2000 for T100	17,20
4-wire connection cable L4000 for T100	24,80
4-wire connection cable L6000 for T100	32,40
Other connection types and lengths	on request
Connection enclosure USE-S incl. mounting base pure white	26,00
Add to price of NTC10k for sensor NTC10k Precon   NTC10k Carel   NTC1,8k   NTC5k   NTC20k   LM235Z	0,00
Other sensor elements	on request

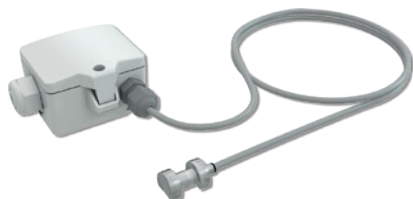
Contact Sensor -50..+180 °C				
	Item description	Item No.	Group	€
PT100	PR25 Pt100 T180 L1000	168168	T2	29,30
	PR25 Pt100 T180 L2000	195164	T2	33,90
	PR25 Pt100 T180 L4000	426305	T2	43,10
	PR25 Pt100 T180 L6000	153263	T2	52,30
PT1000	PR25 Pt1000 T180 L1000	237314	T2	31,80
	PR25 Pt1000 T180 L2000	167314	T2	36,40
	PR25 Pt1000 T180 L4000	134248	T2	45,60
	PR25 Pt1000 T180 L6000	315593	T2	54,80
PT1000 1/3 DIN	PR25 Pt1000 1/3 DIN T180 L1000	252874	T2	35,80
	PR25 Pt1000 1/3 DIN T180 L2000	159562	T2	40,40
	PR25 Pt1000 1/3 DIN T180 L4000	618915	T2	49,60
	PR25 Pt1000 1/3 DIN T180 L6000	510653	T2	58,80
NTC10k	PR25 NTC10k T150 L1000	370646	T2	27,70
	PR25 NTC10k T150 L2000	612852	T2	32,30
	PR25 NTC10k T150 L4000	851517	T2	46,50
	PR25 NTC10k T150 L6000	851506	T2	50,70
Ni1000	PR25 Ni1000 T180 L1000	243940	T2	31,50
	PR25 Ni1000 T180 L2000	319782	T2	36,10
	PR25 Ni1000 T180 L4000	273961	T2	45,30
	PR25 Ni1000 T180 L6000	246354	T2	54,50
Ni1000TK5000	PR25 Ni1000TK5000 T180 L1000	163477	T2	35,80
	PR25 Ni1000TK5000 T180 L2000	376242	T2	40,40
	PR25 Ni1000TK5000 T180 L4000	250276	T2	49,60
	PR25 Ni1000TK5000 T180 L6000	851514	T2	50,70

Options	
Description	€
4-wire connection cable L1000 for T180	20,10
4-wire connection cable L2000 for T180	31,50
4-wire connection cable L4000 for T180	54,30
4-wire connection cable L6000 for T180	77,10
Other connection types and lengths	on request
Connection enclosure USE-S incl. mounting base pure white	26,00
Add to price of NTC10k for sensor NTC10k Precon   NTC10k Carel   NTC1,8k   NTC5k   NTC20k   LM235Z	0,00
Other sensor elements	on request

Accessories			
Item description	Item No.	Group	€
Syringe thermal contact fluid	102308	A1	1,80
Tension clamp for pipes Ø up to 110 mm with contact fluid	658911	A1	3,30
Tension clamp for pipes Ø up to 250 mm with contact fluid	648103	A1	5,20
Tightening strap PA (max. 85 °C) for pipes Ø up to 100 mm with contact fluid	668071	A1	3,30

## PR25+

Contact sensor with connection cable and aluminum prism for temperature measurement (cold or hot water) on pipes and other suitable surfaces.



0..10 V / 4..20 mA  

Technical Data	
Measured values	temperature
Configuration	jumper
Output signal temperature	scaling analogue output: 0..+160 °C (default setting) selectable from 4 temperature ranges -50..+50   -20..+80   -15..+35   -10..+120   0..+50   0..+100   0..+160   0..+250 °C adjustable at the transducer
Power supply	15..24 V = (±10%) SELV, 24 V ~ (±10%) SELV
Power consumption	typ. 0,4 W (24 V =), 0,8 VA (24 V ~) max. 0,5 W (24 V =)
Material in touch with media	Sensor probe, Ø=11/15 mm, aluminium, hex pressed (IP65)
Installation length	28 mm
Enclosure	USE-S, impact- and shock-resistant enclosure with quick-release cover, PC
Colour	pure white
Operating range temperature	-50..+180 °C
Protection (IP)	IP65, according to EN 60529
Connection	removable plug-in terminal, max. 2,5 mm <sup>2</sup> removable cable entry flextherm M20 for wire Ø=4,5..9 mm
Connection cable	PVC, silicone, 0,25 mm <sup>2</sup>
Length connection wire	1 m
Delivery content	incl. mounting base enclosure USE-S pure white incl. fixing kit rawlplugs and screws (2x each)

<b>Contact Sensor -50..+180 °C – active</b>			
<b>Item description</b>	<b>Item No.</b>	<b>Group</b>	<b>€</b>
PR25+ TRV MultiRange T180 L1000	658782	T2	89,50
PR25+ TRA MultiRange T180 L1000	658799	T2	89,50

<b>Options</b>	
<b>Description</b>	<b>€</b>
2-wire connection cable L2000 for T135 / T160 / T180	4,60
2-wire connection cable L4000 for T135 / T160 / T180	13,80
2-wire connection cable L6000 for T135 / T160 / T180	23,00
Other connection types and lengths	on request
RS485 Modbus in enclosure USE-M with option board	87,00
RS485 BACnet (MS/TP) in enclosure USE-M with option board	87,00
2x floating contact NO in enclosure USE-M with option board for 24 V ~ or 24 V = / 3 A	81,70
LCD 29x35 mm, RGB backlight in enclosure USE-M with option board	79,50

<b>Accessories</b>			
<b>Item description</b>	<b>Item No.</b>	<b>Group</b>	<b>€</b>
Syringe thermal contact fluid	102308	A1	1,80
Tension clamp for pipes Ø up to 110 mm with contact fluid	658911	A1	3,30
Tension clamp for pipes Ø up to 250 mm with contact fluid	648103	A1	5,20
Tightening strap PA (max. 85 °C) for pipes Ø up to 100 mm with contact fluid	668071	A1	3,30
Mounting clip enclosure USE-S pure white	667739	A1	5,70
Mounting base enclosure USE-S pure white	667722	A1	6,70
Cable entry M20 USE white, sealing insert Flextherm Ø=4,5..9 mm (4 pcs)	851077	A1	12,30
Sealing insert M20 USE white, Flextherm Ø=4,5..9 mm (10 pcs)	752206	A1	12,30
Sealing insert M20 USE white, 2x Ø=7 mm (10 pcs)	641333	A1	12,30
Cable entry M25 USE white, sealing insert 4x Ø=7 mm (4 pcs)	641364	A1	12,30

## OF14

Surface-mounted sensor for temperature measurement on glass or similar surfaces. Designed for connecting to controls and display systems.



### Technical Data

Measured values	temperature
Material in touch with media	Sensor probe, aluminium, 35x10x6 mm
Installation length	35 mm
Operating range temperature	-35..+70 °C
Protection (IP)	IP65, according to EN 60529
Connection cable	PVC, 0,25 mm <sup>2</sup>
Length connection wire	1 m
Mounting	surface mounting due to self-adhesive sensor surface

### Contact Sensor -35..+70 °C

	Item description	Item No.	Group	€
PT100	OF14 Pt100 L1000	132596	T2	37,90
	OF14 Pt100 L2000	152587	T2	40,70
	OF14 Pt100 L4000	268271	T2	46,30
	OF14 Pt100 L6000	163736	T2	51,90
PT1000	OF14 Pt1000 L1000	114851	T2	40,40
	OF14 Pt1000 L2000	132947	T2	43,20
	OF14 Pt1000 L4000	133234	T2	48,80
	OF14 Pt1000 L6000	155083	T2	54,40
PT1000 1/3 DIN	OF14 Pt1000 1/3 DIN L1000	219303	T2	44,40
	OF14 Pt1000 1/3 DIN L2000	520485	T2	47,20
	OF14 Pt1000 1/3 DIN L4000	851518	T2	52,80
	OF14 Pt1000 1/3 DIN L6000	851509	T2	58,40

<b>Contact Sensor -35..+70 °C</b>				
	<b>Item description</b>	<b>Item No.</b>	<b>Group</b>	<b>€</b>
<b>NTC10k</b>	OF14 NTC10k L1000	190367	T2	36,30
	OF14 NTC10k L2000	397995	T2	39,10
	OF14 NTC10k L4000	609111	T2	44,70
	OF14 NTC10k L6000	198950	T2	50,30
<b>Ni1000</b>	OF14 Ni1000 L1000	113922	T2	40,10
	OF14 Ni1000 L2000	153270	T2	42,90
	OF14 Ni1000 L4000	133623	T2	48,50
	OF14 Ni1000 L6000	189873	T2	54,10
<b>Ni1000TK5000</b>	OF14 Ni1000TK5000 L1000	141864	T2	44,40
	OF14 Ni1000TK5000 L2000	178464	T2	47,20
	OF14 Ni1000TK5000 L4000	851521	T2	52,80
	OF14 Ni1000TK5000 L6000	851523	T2	58,40

<b>Options</b>	
<b>Description</b>	<b>€</b>
Other connection types and lengths	on request
Connection enclosure USE-S incl. mounting base pure white	26,00
Add to price of NTC10k for sensor NTC10k Precon   NTC10k Carel   NTC1,8k   NTC5k   NTC20k   LM235Z	0,00
Other sensor elements	on request

**OF14+**

Surface-mounted sensor for temperature measurement on glass or similar surfaces. Designed for connecting to controls and display systems.



0..10 V / 4..20 mA  

Technical Data	
Measured values	temperature
Configuration	jumper
Output signal temperature	scaling analogue output: 0..+50 °C (default setting) selectable from 4 temperature ranges -50..+50   -20..+80   -15..+35   -10..+120   0..+50   0..+100   0..+160   0..+250 °C adjustable at the transducer
Power supply	<b>TRV:</b> 15..24 V = (±10%) SELV, 24 V ~ (±10%) SELV <b>TRA:</b> 15..24 V = (±10%) SELV
Power consumption	<b>TRV:</b> typ. 0,4 W (24 V =), 0,8 VA (24 V ~) <b>TRA:</b> max. 0,5 W (24 V =)
Material in touch with media	Sensor probe, aluminium, 35x10x6 mm
Installation length	35 mm
Enclosure	USE-S, impact- and shock-resistant enclosure with quick-release cover, PC
Colour	pure white
Operating range temperature	-35..+70 °C
Protection (IP)	IP65, according to EN 60529
Connection	removable cable entry flextherm M20 for wire Ø=4,5..9 mm, removable plug-in terminal, max. 2,5 mm²
Connection cable	PVC, 0,25 mm²
Length connection wire	1 m
Mounting	surface mounting due to self-adhesive sensor surface
Delivery content	incl. mounting base enclosure USE-S pure white incl. mounting set (screws and accessories)

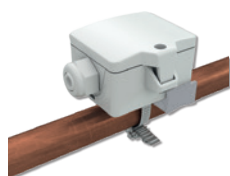
<b>Contact Sensor -35..+70 °C – active</b>			
<b>Item description</b>	<b>Item No.</b>	<b>Group</b>	<b>€</b>
OF14+ TRV3 L1000	658812	T2	106,10
OF14+ TRA3 L1000	658836	T2	106,10

<b>Options</b>	
<b>Description</b>	<b>€</b>
2-wire connection cable L2000 for T100	2,80
2-wire connection cable L4000 for T100	8,40
2-wire connection cable L6000 for T100	14,00
Other connection types and lengths	on request
RS485 Modbus in enclosure USE-M with option board	87,00
RS485 BACnet (MS/TP) in enclosure USE-M with option board	87,00
2x floating contact NO in enclosure USE-M with option board for 24 V ~ or 24 V = / 3 A	81,70
LCD 29x35 mm, RGB backlight in enclosure USE-M with option board	79,50

<b>Accessories</b>			
<b>Item description</b>	<b>Item No.</b>	<b>Group</b>	<b>€</b>
Mounting clip enclosure USE-S pure white	667739	A1	5,70
Mounting base enclosure USE-S pure white	667722	A1	6,70
Mounting kit universal for enclosure USE	698511	A1	10,70

## VFG54+

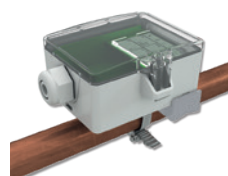
Contact sensor for temperature measurement (cold or hot water) on pipes and other curved surfaces. Spring-loaded brass contact sensor for a fast response. Models with a relay output for a 2-point controller or a 2-stage 2-point controller and color-changing LCD allow for a wide range of applications. A hinged cover and tool-free wiring as well as removable cable entries ensure a quick and easy installation.



VFG54+



VFG54+ relay / BUS



VFG54+ LCD

passive / 0..10 V / 4..20 mA  

### Technical Data

Measured values	temperature
Configuration	USEapp, uConfig, BUS, jumper, DIP switches (depending on type)
Network technology	RS485 Modbus, RS485 BACnet (MS/TP)
Output signal temperature	scaling analogue output: <b>TRV/TRA:</b> 0..+100 °C (default setting) <b>Relay/LCD/BUS:</b> -20..+80 °C (default setting) selectable from 4 temperature ranges -50..+50   -20..+80   -15..+35   -10..+120   0..+50   0..+100   0..+160   0..+250 °C adjustable at the transducer, optionally configurable
Power supply	<b>TRV/Basic:</b> 15..24 V = (±10%) SELV, 24 V ~ (±10%) SELV <b>TRA:</b> 15..24 V = (±10%) SELV <b>Relay/LCD/BUS:</b> 15..35 V = SELV, 19..29 V ~ SELV
Power consumption	<b>TRV:</b> typ. 0,4 W (24 V =), 0,8 VA (24 V ~) <b>TRA:</b> typ. 0,5 W (24 V =) <b>Basic:</b> max. 0,7 W (24 V =), 1,8 VA (24 V ~) <b>Relay/LCD/BUS:</b> max. 2,5 W (24 V =), 4,3 VA (24 V ~)
Material in touch with media	Sensor probe, brass, spring loaded sensor
Display	LCD 29x35 mm, RGB backlight, with traffic light function, threshold values configurable, optionally configurable via app or uConfig
Enclosure	<b>TRV/TRA/Basic:</b> USE-S, impact- and shock-resistant enclosure with quick-release cover, PC <b>Relay/LCD/BUS:</b> USE-M, impact- and shock-resistant enclosure with quick-release cover, PC
Colour	pure white, transparent cover
Operating range temperature	-35..+120 °C
Protection (IP)	IP65, according to EN 60529

Technical Data	
	removable plug-in terminal, max. 2,5 mm <sup>2</sup> BUS max. 1,5 mm <sup>2</sup> , relay max. 1,5 mm <sup>2</sup> <b>TRV/TRA/Basic:</b> removable cable entry flextherm M20 for wire Ø=4,5..9 mm <b>Relay/LCD/BUS:</b> removable cable entry M25 with fourfold cable entry for wire with max. Ø=7 mm
<b>Connection</b>	
<b>Mounting</b>	along the pipe or sideways

Contact Sensor -35..+120 °C					
Item description	USEapp	Item No.	In stock	Group	€
VFG54+ Pt100	✓	620642		T3	23,80
VFG54+ Pt1000	✓	620666	⊕	T3	26,30
VFG54+ Pt1000 1/3 DIN	✓	620598	⊕	T3	30,30
VFG54+ Ni1000	✓	620611	⊕	T3	26,00
VFG54+ Ni1000TK5000	✓	620628	⊕	T3	30,30
VFG54+ NTC10k	✓	620604	⊕	T3	22,20
VFG54+ NTC10k Carel	✓	644662		T3	22,20
VFG54+ NTC10k Precon	✓	620673		T3	22,20
VFG54+ NTC5k	✓	624244		T3	22,20
VFG54+ NTC20k	✓	620680	⊕	T3	22,20
VFG54+ NTC1,8k	✓	643832		T3	22,20
VFG54+ LM235Z	✓	620635		T3	23,80
VFG54+ KTY81-110	✓	620697		T3	30,30
VFG54+ KTY81-121	✓	620703		T3	30,30
VFG54+ KTY81-122	✓	620710		T3	30,30
VFG54+ KTY81-210	✓	620727		T3	30,30

Options	
Description	€
4-wire connection (4-wire)	13,40
Other sensor elements	on request

Accessories			
Item description	Item No.	Group	€
Tension clamp for pipes Ø up to 110 mm with contact fluid	658911	A1	3,30
Tension clamp for pipes Ø up to 250 mm with contact fluid	648103	A1	5,20
Tightening strap PA (max. 85 °C) for pipes Ø up to 100 mm with contact fluid	668071	A1	3,30

**VFG54+ active**

Contact sensor temperature – active				
Item description	USEapp	Item No.	Group	€
VFG54+ TRV MultiRange		620741	T2	86,40
VFG54+ TRA MultiRange		620758	T2	86,40
VFG54+ TRV MultiRange relay	✓	662994	T2	134,80

Contact sensor temperature – active – LCD				
Item description	USEapp	Item No.	Group	€
VFG54+ LCD TRV MultiRange	✓	663014	T2	132,60
VFG54+ LCD TRA MultiRange	✓	663021	T2	132,60
VFG54+ LCD TRV MultiRange relay	✓	663038	T2	181,00

**VFG54+ BUS**

Contact sensor temperature – BUS				
Item description	USEapp	Item No.	Group	€
VFG54+ Basic RS485 Modbus		747806	T2	86,40
VFG54+ RS485 BACnet (MS/TP)	✓	699709	T2	138,00
VFG54+ LCD RS485 BACnet (MS/TP)	✓	699716	T2	184,20
VFG54+ RS485 Modbus	✓	663045	T2	138,00
VFG54+ LCD RS485 Modbus	✓	663052	T2	184,20

Accessories				
Item description		Item No.	Group	€
Tension clamp for pipes Ø up to 110 mm with contact fluid		658911	A1	3,30
Tension clamp for pipes Ø up to 250 mm with contact fluid		648103	A1	5,20
Tightening strap PA (max. 85 °C) for pipes Ø up to 100 mm with contact fluid		668071	A1	3,30
BLE dongle with micro-USB for devices USE-M / USE-L / NOVOS / thanos EVO		668262		32,10
USB interface for devices USE-M / USE-L / NOVOS / thanos EVO / SR06 LCD		597838	A1	39,50
Cable entry M20 USE white, sealing insert Flextherm Ø=4,5..9 mm (4 pcs)		851077	A1	12,30
Sealing insert M20 USE white, Flextherm Ø=4,5..9 mm (10 pcs)		752206	A1	12,30
Sealing insert M20 USE white, 2x Ø=7 mm (10 pcs)		641333	A1	12,30
Cable entry M25 USE white, sealing insert 4x Ø=7 mm (4 pcs)		641364	A1	12,30

## AF25

Contact sensor with connection cable and brass strap for surface temperature measurement (cold or hot water) on pipes and other curved surfaces.



### Technical Data

<b>Measured values</b>	temperature
<b>Material in touch with media</b>	Sensor probe, Ø=6 mm, brass, with contact tongue 16-point pressed (IP65)
<b>Installation length</b>	35
<b>Operating range temperature</b>	-50..+135 °C
<b>Protection (IP)</b>	IP65, according to EN 60529
<b>Connection cable</b>	0,25 mm², <b>T100</b> : PVC, <b>T135</b> : silicone
<b>Length connection wire</b>	1 m

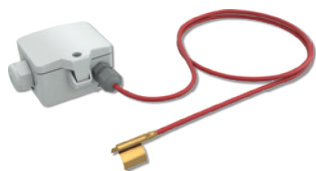
### Contact Sensor -35..+100 °C

	Item description	In stock	Item No.	Group	€
PT100	AF25 Pt100 T100 L1000		81610	T3	15,70
	AF25 Pt100 T100 L2000		80859	T3	18,50
	AF25 Pt100 T100 L4000		81665	T3	24,10
	AF25 Pt100 T100 L6000		9799	T3	29,70
PT1000	AF25 Pt1000 T100 L1000	☉	54263	T3	18,20
	AF25 Pt1000 T100 L2000	☉	54270	T3	21,00
	AF25 Pt1000 T100 L4000		54287	T3	26,60
	AF25 Pt1000 T100 L6000		54294	T3	32,20
PT1000 1/3 DIN	AF25 Pt1000 1/3 DIN T100 L1000		54300	T3	22,20
	AF25 Pt1000 1/3 DIN T100 L2000		54317	T3	25,00
	AF25 Pt1000 1/3 DIN T100 L4000		54324	T3	30,60
	AF25 Pt1000 1/3 DIN T100 L6000		54331	T3	36,20

Contact Sensor -35..+100 °C					
	Item description	In stock	Item No.	Group	€
NTC10k	AF25 NTC10k T100 L1000		92005	T3	14,10
	AF25 NTC10k T100 L2000		92012	T3	16,90
	AF25 NTC10k T100 L4000		92029	T3	22,50
	AF25 NTC10k T100 L6000		92036	T3	28,10
Ni1000	AF25 Ni1000 T100 L1000		54348	T3	17,90
	AF25 Ni1000 T100 L2000		54355	T3	20,70
	AF25 Ni1000 T100 L4000		54362	T3	26,30
	AF25 Ni1000 T100 L6000		54379	T3	31,90
Ni1000TK5000	AF25 Ni1000TK5000 T100 L1000		54386	T3	22,20
	AF25 Ni1000TK5000 T100 L2000		54393	T3	25,00
	AF25 Ni1000TK5000 T100 L4000		54409	T3	30,60
	AF25 Ni1000TK5000 T100 L6000		54416	T3	36,20

Options	
Description	€
4-wire connection cable L1000 for T100	13,40
4-wire connection cable L2000 for T100	17,20
4-wire connection cable L4000 for T100	24,80
4-wire connection cable L6000 for T100	32,40
Other connection types and lengths	on request
Connection enclosure USE-S incl. mounting base pure white	26,00
Add to price of NTC10k for sensor NTC10k Precon   NTC10k Carel   NTC1,8k   NTC5k   NTC20k   LM235Z	0,00
Other sensor elements	on request

Accessories			
Item description	Item No.	Group	€
Tension clamp for pipes Ø up to 110 mm with contact fluid	658911	A1	3,30
Tension clamp for pipes Ø up to 250 mm with contact fluid	648103	A1	5,20
Tightening strap PA (max. 85 °C) for pipes Ø up to 100 mm with contact fluid	668071	A1	3,30
Mounting clip enclosure USE-S pure white	667739	A1	5,70
Mounting base enclosure USE-S pure white	667722	A1	6,70



## AF25+

Contact sensor in the USE enclosure with connection cable and brass lug for surface temperature measurement (cold or hot water) on pipes and other curved surfaces.

0..10 V / 4..20 mA  

Technical Data	
Measured values	temperature
Configuration	USEapp, uConfig, BUS, jumper (depending on type)
Network technology	RS485 Modbus, RS485 BACnet (MS/TP)
Output signal temperature	scaling analogue output: 0..+160 °C (default setting) selectable from 4 temperature ranges -50..+50   -20..+80   -15..+35   -10..+120   0..+50   0..+100   0..+160   0..+250 °C adjustable at the transducer, optionally configurable
Power supply	<b>TRV:</b> 15..24 V = (±10%) SELV, 24 V ~ (±10%) SELV <b>TRA:</b> 15..24 V = (±10%) SELV <b>Relay/LCD/BUS:</b> 15..35 V = SELV, 19..29 V ~ SELV
Power consumption	<b>TRV:</b> typ. 0,4 W (24 V =), 0,8 VA (24 V ~) <b>TRA:</b> typ. 0,5 W (24 V =) <b>Relay/LCD/BUS:</b> max. 2,5 W (24 V =), 4,3 VA (24 V ~)
Material in touch with media	Sensor probe, Ø=6 mm, brass, with contact tongue 16-point pressed (IP65)
Installation length	35 mm
Display	LCD 29x35 mm, RGB backlight, with traffic light function, threshold values configurable, optionally configurable via app or uConfig
Enclosure	<b>TRV/TRA:</b> USE-S, impact- and shock-resistant enclosure with quick-release cover, PC <b>Relay/LCD/BUS:</b> USE-M, impact- and shock-resistant enclosure with quick-release cover, PC
Colour	pure white, <b>LCD:</b> transparent cover
Operating range temperature	-50..+135 °C
Protection (IP)	IP65, according to EN 60529
Connection	removable plug-in terminal, max. 2,5 mm <sup>2</sup> , BUS max. 1,5 mm <sup>2</sup> <b>TRV/TRA:</b> removable cable entry flextherm M20 for wire Ø=4,5..9 mm <b>Relay/LCD/BUS:</b> removable cable entry M25 with fourfold cable entry for wire with max. Ø=7 mm
Connection cable	PVC, 0,25 mm <sup>2</sup>
Length connection wire	1 m
Delivery content	incl. mounting set (screws and accessories) <b>TRV/TRA:</b> incl. mounting base enclosure USE-S pure white <b>Relay/LCD/BUS:</b> incl. mounting base enclosure USE-M pure white

**Contact sensor temperature – active – 0..10 (0..5) V | 4..20 mA**

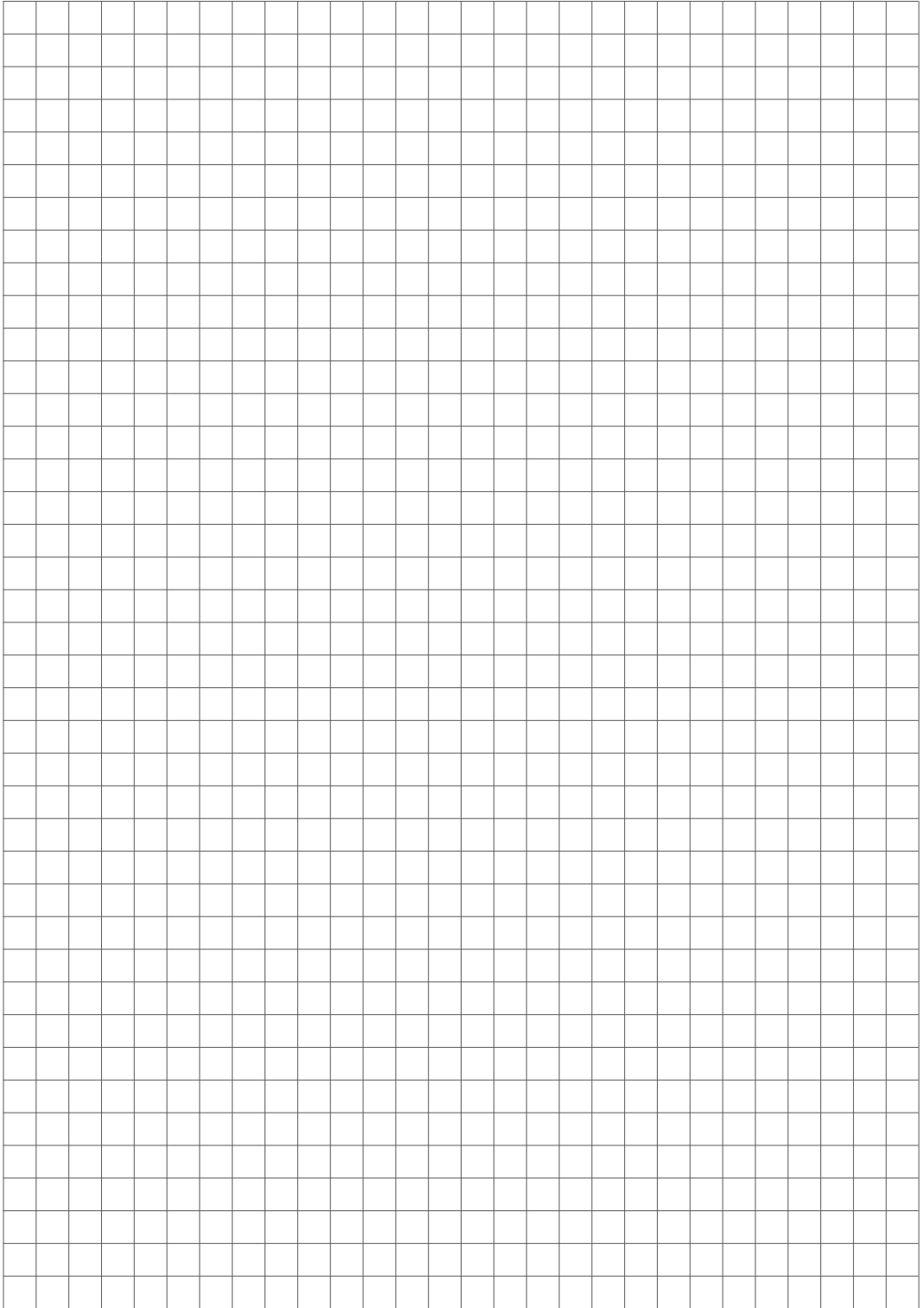
Item description	Item No.	Group	€
AF25+ TRV MultiRange T135 L1000	658751	T2	85,30
AF25+ TRA MultiRange T135 L1000	658768	T2	85,30

**Options**

Description	€
2-wire connection cable L2000 for T135 / T160 / T180	4,60
2-wire connection cable L4000 for T135 / T160 / T180	13,80
2-wire connection cable L6000 for T135 / T160 / T180	23,00
Other connection types and lengths	on request
RS485 Modbus in enclosure USE-M with option board	87,00
RS485 BACnet (MS/TP) in enclosure USE-M with option board	87,00
2x floating contact NO in enclosure USE-M with option board for 24 V ~ or 24 V = / 3 A	81,70
LCD 29x35 mm, RGB backlight in enclosure USE-M with option board	79,50

**Accessories**

Item description	Item No.	Group	€
Tension clamp for pipes Ø up to 110 mm with contact fluid	658911	A1	3,30
Tension clamp for pipes Ø up to 250 mm with contact fluid	648103	A1	5,20
Tightening strap PA (max. 85 °C) for pipes Ø up to 100 mm with contact fluid	668071	A1	3,30
Mounting clip enclosure USE-S pure white	667739	A1	5,70
Mounting base enclosure USE-S pure white	667722	A1	6,70
Cable entry M20 USE white, sealing insert Flextherm Ø=4,5..9 mm (4 pcs)	851077	A1	12,30
Sealing insert M20 USE white, Flextherm Ø=4,5..9 mm (10 pcs)	752206	A1	12,30
Sealing insert M20 USE white, 2x Ø=7 mm (10 pcs)	641333	A1	12,30
Cable entry M25 USE white, sealing insert 4x Ø=7 mm (4 pcs)	641364	A1	12,30



# Condensation Leakage Frost Protection

Our condensation sensors, leakage sensors and frost protection thermostats protect sensitive electronics from leakage damages, which often result in expensive system failures or even dropouts.



## Condensation Sensors

WK02+	Condensation, temperature, humidity	362
WK01+	Condensation	364

## Leakage Detectors

LS02+	Leakage	366
LS02+ ext.	Leakage	367
LS02+ flex	Leakage	369

## Frost Protection Thermostats

TFR	Temperature	371
TFRe	Temperature	372

## WK02+

Condensation sensor with an LED signal and a relay output to prevent condensation on chilled surfaces. For control and monitoring applications or connection to cooling valves to stop the flow of chilled water flow upon condensation. The ,ext.' model uses a 2m remote sensor for a more flexible installation.



### Technical Data

<b>Measured values</b>	temperature, relative humidity, absolute humidity, enthalpy, dew point, condensation
<b>Configuration</b>	USEapp, BUS, DIP switches (depending on type)
<b>Output switch contact</b>	changeover contact, floating, max. 250 V ~, 1 A resistive load
<b>Network technology</b>	RS485 Modbus, RS485 BACnet (MS/TP)
<b>Output signal temperature</b>	scaling analogue output, 0..+50 °C (default setting) selectable from 4 temperature ranges -40..+60   0..+50   -20..+80   -15..+35 °C optionally configurable
<b>Measuring range humidity</b>	0..100% rH non-condensing, 0..85 KJ/kg enthalpy, 0..50   0..80 g/m³ absolute humidity, 0..+50   -20..+80 °C dew point, optionally configurable
<b>Power supply</b>	<b>24 V:</b> 15..24 V = (±10%) SELV, 24 V ~ (±10%) SELV <b>230 V:</b> 230 V ~ (±10%)
<b>Power consumption</b>	<b>24 V:</b> typ. 0,8 W (24 V =), 1,6 VA (24 V ~) <b>230 V:</b> typ. 3,5 W (230 V ~)
<b>Display</b>	LCD 29x35 mm, RGB backlight LED green – power supply OK, LED red – condensation
<b>Enclosure</b>	USE-L, impact- and shock-resistant enclosure with quick-release cover, PC
<b>Colour</b>	pure white, transparent cover
<b>Operating range temperature</b>	0..+50 °C
<b>Protection (IP)</b>	IP65, according to EN 60529
<b>Connection</b>	removable plug-in terminal, max. 2,5 mm², BUS max. 1,5 mm² removable cable entry M25 with fourfold cable entry for wire with max. Ø=7 mm

**Technical Data**

<b>Connection cable</b>	PVC, 0,25 mm <sup>2</sup> , white
<b>Length connection wire</b>	2 m
<b>Delivery content</b>	incl. mounting base enclosure USE-L pure white incl. mounting set (screws and accessories) incl. cable tie 140x3,6 mm incl. syringe thermal contact fluid 1 ml

**Condensation sensor – active – 24 V**

Item description	USEapp	Item No.	Group	€
WK02+ ext. 24 V L2000	✓	737180	H2	211,20

**Condensation sensor – active – 230 V**

Item description	USEapp	Item No.	Group	€
WK02+ ext. 230 V L2000	✓	737197	H2	229,90

**Condensation sensor – BUS – 24 V**

Item description	USEapp	Item No.	Group	€
WK02+ ext. 24 V L2000 RS485 Modbus	✓	744355	H2	262,80
WK02+ ext. 24 V L2000 RS485 BACnet	✓	810975	H2	262,80

**Options**

Description	€
Other connection types and lengths	on request
LCD 29x35 mm, RGB backlight	46,20

**Accessories**

Item description	Item No.	Group	€
Mounting base enclosure USE-L pure white	668361	A1	13,40
Mounting kit universal for enclosure USE	698511	A1	10,70
BLE dongle with micro-USB for devices USE-M / USE-L / NOVOS / thanos EVO	668262		32,10
Cable entry M20 USE white, sealing insert Flextherm Ø=4,5..9 mm (4 pcs)	851077	A1	12,30
Sealing insert M20 USE white, Flextherm Ø=4,5..9 mm (10 pcs)	752206	A1	12,30
Sealing insert M20 USE white, 2x Ø=7 mm (10 pcs)	641333	A1	12,30
Cable entry M25 USE white, sealing insert 4x Ø=7 mm (4 pcs)	641364	A1	12,30

## WK01+

Condensation sensor with an LED signal and a relay output for condensation detection on chilled surfaces. For control and monitoring applications or connection to cooling valves to stop the flow of chilled water upon condensation detection. The ,ext.' model uses a 2 m remote sensor for a more flexible installation.



WK01+ 24 V



WK01+ ext. 230 V

### Technical Data

Measured values	condensation
Power supply	<b>24 V:</b> 15..24 V = ( $\pm 10\%$ ) SELV, 24 V ~ ( $\pm 10\%$ ) SELV <b>230 V:</b> 230 V ~ ( $\pm 10\%$ )
Power consumption	<b>24 V:</b> typ. 0,8 W (24 V =), 1,6 VA (24 V ~) <b>230 V:</b> typ. 3,5 W (230 V ~)
Display	LED green – power supply OK, LED red – condensation
Enclosure	<b>24 V:</b> USE-S, impact- and shock-resistant enclosure with quick-release cover, PC <b>230 V:</b> USE-M, impact- and shock-resistant enclosure with quick-release cover, PC
Colour	pure white, transparent cover
Operating range temperature	<b>24 V:</b> 0..+50 °C <b>230 V:</b> -20..+60 °C
Protection (IP)	IP65, according to EN 60529
Connection	removable cable entry flextherm M20 for wire $\varnothing=4,5..9$ mm removable plug-in terminal, max. 2,5 mm <sup>2</sup>
Connection cable	PVC, 0,25 mm <sup>2</sup> , grey
Length connection wire	2 m
Delivery content	incl. mounting set (screws and accessories) incl. cable tie 140x3,6 mm incl. syringe thermal contact fluid 1 ml <b>ext. 24 V:</b> incl. mounting base enclosure USE-S pure white <b>ext. 230 V:</b> incl. mounting base enclosure USE-M pure white

Condensation sensor			
Item description	Item No.	Group	€
WK01+ 24 V	659215	H2	113,60
WK01+ 230 V	839839	H2	163,10

Accessories			
Item description	Item No.	Group	€
Mounting kit universal for enclosure USE	698511	A1	10,70
Syringe thermal contact fluid	102308	A1	1,80
Cable entry M20 USE white, sealing insert Flextherm Ø=4,5..9 mm (4 pcs)	851077	A1	12,30
Sealing insert M20 USE white, Flextherm Ø=4,5..9 mm (10 pcs)	752206	A1	12,30
Sealing insert M20 USE white, 2x Ø=7 mm (10 pcs)	641333	A1	12,30
Cable entry M25 USE white, sealing insert 4x Ø=7 mm (4 pcs)	641364	A1	12,30

Condensation sensor			
Item description	Item No.	Group	€
WK01+ ext. 24 V L2000	659222	H2	130,90
WK01+ ext. 230 V L2000	837774	H2	180,40

Options	
Description	€
Other connection types and lengths	on request

Accessories			
Item description	Item No.	Group	€
Mounting base enclosure USE-S pure white	667722	A1	6,70
Mounting base enclosure USE-M pure white	668354	A1	9,60
Mounting kit universal for enclosure USE	698511	A1	10,70
Syringe thermal contact fluid	102308	A1	1,80
Cable entry M20 USE white, sealing insert Flextherm Ø=4,5..9 mm (4 pcs)	851077	A1	12,30
Sealing insert M20 USE white, Flextherm Ø=4,5..9 mm (10 pcs)	752206	A1	12,30
Sealing insert M20 USE white, 2x Ø=7 mm (10 pcs)	641333	A1	12,30
Cable entry M25 USE white, sealing insert 4x Ø=7 mm (4 pcs)	641364	A1	12,30



LS02+

## LS02+

Leakage detector with relay output and two signalling LEDs designed for alarm, control and monitoring applications of containers, false floors, suspended ceilings or rooms for preventing unintended ingress of water. The sensor can be adjusted to different heights so that the response time of the sensor can be adapted to the water level that is to be detected.

Technical Data	
Measured values	leakage
Output switch contact	changeover contact, 1 A resistive load, max. 24 V, floating
Power supply	15..24 V = ( $\pm 10\%$ ) SELV, 24 V ~ ( $\pm 10\%$ ) SELV
Power consumption	typ. 0,6 W (24 V =), 1,5 VA (24 V ~)
Material in touch with media	stainless steel V2A (1.4305)
Display	LED green – power supply OK, LED red – alarm, leakage detected
Enclosure	USE-S, impact- and shock-resistant enclosure with quick-release cover, PC
Colour	pure white, transparent cover
Operating range temperature	-35..+70 °C
Protection (IP)	IP65, according to EN 60529
Connection	removable cable entry flextherm M20 for wire $\varnothing=4,5..9$ mm removable plug-in terminal, max. 2,5 mm <sup>2</sup>
Mounting	level compensation through adjustable contacts
Delivery content	incl. mounting base enclosure USE-S pure white incl. fixing kit rawlplugs and screws (2x each)

Leakage detector detector electrodes			
Item description	Item No.	Group	€
LS02+	659253	H2	105,70

Accessories			
Item description	Item No.	Group	€
Mounting base enclosure USE-S pure white	667722	A1	6,70
Mounting kit universal for enclosure USE	698511	A1	10,70
Fixing kit rawlplugs and screws (2x each)	660945	A1	1,10
Cable entry M20 USE white, sealing insert Flextherm $\varnothing=4,5..9$ mm (4 pcs)	851077	A1	12,30
Sealing insert M20 USE white, Flextherm $\varnothing=4,5..9$ mm (10 pcs)	752206	A1	12,30
Sealing insert M20 USE white, 2x $\varnothing=7$ mm (10 pcs)	641333	A1	12,30
Cable entry M25 USE white, sealing insert 4x $\varnothing=7$ mm (4 pcs)	641364	A1	12,30

## LS02+ ext.

Leakage detector with relay output and two signalling LEDs designed for alarm, control and monitoring applications of containers, false floors, suspended ceilings or rooms for preventing unintended ingress of water. The remote sensor element enables flexible mounting. This allows the leakage detector to be individually adapted to the existing installation situation or leakage height to be detected. A potential-free switching contact is used for communication with the higher-level control system.



LS02+ ext.

Technical Data	
Measured values	leakage
Output switch contact	changeover contact, 1 A resistive load, max. 24 V, floating
Power supply	15..24 V = ( $\pm 10\%$ ) SELV, 24 V ~ ( $\pm 10\%$ ) SELV
Power consumption	typ. 0,8 W (24 V =), 1,5 VA (24 V ~)
Material in touch with media	stainless steel V4A (1.4401)
Display	LED green – power supply OK LED red – alarm, leakage detected
Enclosure	USE-S, impact- and shock-resistant enclosure with quick-release cover, PC
Colour	pure white, transparent cover
Operating range temperature	-20..+60 °C
Protection (IP)	IP65, according to EN 60529
Connection	removable cable entry flextherm M20 for wire $\varnothing=4,5..9$ mm removable plug-in terminal, max. 2,5 mm <sup>2</sup>
Connection cable	PVC, 0,25 mm <sup>2</sup>
Length connection wire	5 m
Mounting	level compensation through spring contacts
Delivery content	incl. mounting base enclosure USE-S pure white incl. mounting set (screws and accessories) incl. fixing kit rawlplugs and screws (2x each)

<b>Leakage detector detector electrodes</b>			
<b>Item description</b>	<b>Item No.</b>	<b>Group</b>	<b>€</b>
LS02+ ext. L5000	765725	H2	123,30

<b>Options</b>	
<b>Description</b>	<b>€</b>
Other connection types and lengths	on request

<b>Accessories</b>			
<b>Item description</b>	<b>Item No.</b>	<b>Group</b>	<b>€</b>
Mounting base enclosure USE-S pure white	667722	A1	6,70
Mounting kit universal for enclosure USE	698511	A1	10,70
Fixing kit rawlplugs and screws (2x each)	660945	A1	1,10
Cable entry M20 USE white, sealing insert Flextherm Ø=4,5..9 mm (4 pcs)	851077	A1	12,30
Sealing insert M20 USE white, Flextherm Ø=4,5..9 mm (10 pcs)	752206	A1	12,30
Sealing insert M20 USE white, 2x Ø=7 mm (10 pcs)	641333	A1	12,30
Cable entry M25 USE white, sealing insert 4x Ø=7 mm (4 pcs)	641364	A1	12,30

## LS02+ flex

Leakage detector LS02+ flex with relay output and two signalling LEDs designed for alarm, control and monitoring applications of containers, false floors, suspended ceilings or rooms for preventing unintended ingress of water. The type flex detects water or liquid intrusion over the entire length of the sensor rod. A potential-free switching contact is used for communication with the higher-level control system. Thanks to the compact design of the sensor rod, the sensor can be mounted in a variety of places (floors, ceilings, etc.) to save space. The sophisticated and highly flexible insulation braiding also allows direct mounting on water-bearing pipe systems. The sensor rod can easily be shortened on site.



Technical Data	
Measured values	leakage
Configuration	USEapp
Output switch contact	changeover contact, 1 A resistive load, max. 24 V, floating
Power supply	15..24 V = ( $\pm 10\%$ ) SELV, 24 V ~ ( $\pm 10\%$ ) SELV
Power consumption	typ. 0,6 W (24 V =), 1,6 VA (24 V ~)
Material in touch with media	Sensor rod, Twisted PVC cable
Installation length	2000 mm, 5000 mm, 20000 mm, 30000 mm
Display	LED green – power supply OK LED red – alarm, leakage detected
Enclosure	USE-M, impact- and shock-resistant enclosure with quick-release cover, PC
Colour	pure white, transparent cover
Operating range temperature	-20..+60 °C
Protection (IP)	IP65, according to EN 60529
Connection	removable cable entry flextherm M20 for wire $\varnothing=4,5..9$ mm removable plug-in terminal, max. 2,5 mm <sup>2</sup>
Mounting	additional fixation of the sensor rod possible with adhesive pads (see accessories)
Delivery content	incl. mounting base enclosure USE-M pure white incl. mounting set (screws and accessories) incl. fixing kit rawplugs and screws (2x each)

<b>Leakage detector flexible rod</b>				
Item description	USEapp	Item No.	Group	€
LS02+ flex L2000	✓	819749	H2	162,00
LS02+ flex L5000	✓	819770	H2	191,40
LS02+ flex L10m	✓	819732	H2	240,40
LS02+ flex L20m	✓	819756	H2	338,40
LS02+ flex L30m	✓	819763	H2	436,40

<b>Options</b>	
Description	€
Other connection types and lengths	on request

<b>Accessories</b>			
Item description	Item No.	Group	€
Mounting base enclosure USE-M pure white	668354	A1	9,60
Mounting kit universal for enclosure USE	698511	A1	10,70
Fixing kit rawlplugs and screws (2x each)	660945	A1	1,10
C-clip adhesive pads (5 pieces) – mounting accessories for LS02+ flex	778596	A1	10,30
Cable entry M20 USE white, sealing insert Flextherm Ø=4,5..9 mm (4 pcs)	851077	A1	12,30
Sealing insert M20 USE white, Flextherm Ø=4,5..9 mm (10 pcs)	752206	A1	12,30
Sealing insert M20 USE white, 2x Ø=7 mm (10 pcs)	641333	A1	12,30
Cable entry M25 USE white, sealing insert 4x Ø=7 mm (4 pcs)	641364	A1	12,30



## TFR

Frost protection thermostat for downstream temperature monitoring of e.g. heat exchangers in ventilation and air-conditioning systems. The product offers a small differential gap and a high reproducibility. Resetting can be done automatically or manually (type ,R'). The frost protection thermostat can be used to perform the following functions: stop fan, close outside air dampers, open heating valve 100%, start heating pump, switch-off chiller (condenser) and de-/humidifier, trigger visual and/or audible frost alarm.

Technical Data	
Measured values	temperature
Operating elements	rotary knob, reset button
Material in touch with media	Capillary pipe, copper with tube filling R507 sensor operating length approx. 600 mm contact material Ag/Ni (90%/10%), gold plated (3 µm)
Installation length	1800 mm, 3000 mm, 6000 mm, 12000 mm
Enclosure	PA6 GK30
Operating range temperature	-35..+70 °C
Protection (IP)	IP65, according to EN 60529
Connection	cable entry M16 for wire Ø=8 mm, terminal block, max. 2,5 mm²
Delivery content	incl. installation set
Notes	mounting flange MF2 useable from installation length 3000 mm

Frost protection thermostat automatic reset			
Item description	Item No.	Group	€
TFR 1800	426435	T1	88,70
TFR 3000	430371	T1	89,20
TFR 6000	430395	T1	92,60
TFR 12000	541916	T1	107,80

Frost protection thermostat manual reset			
Item description	Item No.	Group	€
TFR-R 1800	430364	T1	106,10
TFR-R 3000	430388	T1	110,90
TFR-R 6000	430401	T1	114,20
TFR-R 12000	656061	T1	139,00

Accessories			
Item description	Item No.	Group	€
Mounting flange MF2 (suitable for TFR)	435642	A1	7,80
Installation set TFR / MWF+	679466	A1	10,30



## TFRe

Electronic frost protection thermostat for downstream temperature monitoring of e.g. heat exchangers in ventilation and air-conditioning systems. Integrated P-controller for constant control of a heat exchanger valve within its intended operating range. Safety shutdown of the fan and - if necessary - closing the air inlet flaps to protect the heat exchanger in case set thresholds are exceeded. Temperature measurement optionally with a contact sensor, immersion sensor or cable sensor with up to four selectable sensor characteristic curves. For a quick temperature measurement in the return water pipe of the heat exchanger, a fast-response sensor (e.g. TF14 with KL4VA) should be used.

Technical Data	
Measured values	temperature
Operating elements	2 rotary knobs (Talarm and Xp)
Configuration	DIP switches
Input	1x input sensor PT1000 (default), NTC10K, Ni1000, Ni1000TK5000 1x input for external controller for defining set point 1x input for floating contact
Output signal temperature	0..+100 °C
Power supply	15..24 V = (±10%) SELV, 24 V ~ (±10%) SELV
Power consumption	max. 2 VA (24 V ~)
Display	LED green – indicator valve OUT LED red – alarm LED yellow – fan
Enclosure	ABS
Colour	white
Operating range temperature	-40..+70 °C
Protection (IP)	IP20, according to EN 60529
Connection	removable plug-in terminal, max. 2,5 mm <sup>2</sup>
Mounting	prepared for mounting on DIN rail TS35 (35x7,5 mm) according to EN 60715

Electronic frost protection thermostat			
Item description	Item No.	Group	€
TFRe	667203	T1	150,10

# Pressure and Velocity

Pressure and air flow sensors for cooling and air conditioning must resist extreme conditions. Therefore our products are customized to withstand even the harshest environments.



## Gaseous Media

DPA+	Differential pressure, volume flow	374
PS	Differential pressure	380
DPG	Differential pressure	381
MM	Differential pressure	382

## Liquid Media

DLF02	Pressure	383
DPL02	Differential pressure	387

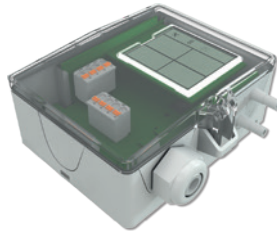
## **DPA+**

Differential pressure transmitter for measuring and monitoring overpressure, underpressure, differential pressure and flow volume of air and other non-aggressive gases in fan and filter systems in duct applications. 8 adjustable pressure and flow volume ranges permit use in HVAC applications of clean rooms, process measurement and controls systems. The optional features, such as relay outputs for 2-point controllers or 2-stage 2-point controllers, an LCD with traffic light indication allow for a wide range of applications. A hinged cover and tool-

free wiring as well as removable cable entries ensure a quick and easy installation. ‚Dual‘ versions with 2 independent sensors for up to 2x differential pressures or 2x flow volume in a single enclosure are available. The mounting base (included in the delivery content) can be used to mount the DPA+ on a flat surface or on DIN rail TS35 (35x7,5 mm) in accordance with EN 60715.



DPA+



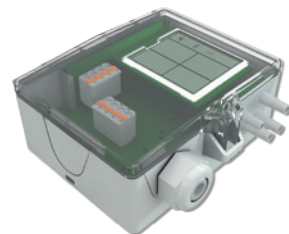
DPA+ LCD



DPA+  
with additional cable entry  
(refer to mounting accessories USE)



DPA+ Dual



DPA+ Dual LCD

Technical Data	
Measured values	differential pressure, volume flow pressure in Pa or inchWC, volume flow in m³/h or cfm optionally configurable via app or uConfig
Configuration	USEapp, uConfig, BUS, jumper, DIP switches (depending on type)
Output switch contact	2x floating contact NO for 24 V ~ or 24 V = / 3 A
Network technology	RS485 Modbus, RS485 BACnet (MS/TP)
Measuring range pressure	<p><b>DPA250+</b>: 0..+25   0..+50   0..+100   0..+250   -25..+25   -50..+50   -100..+100   -150..+150 Pa, 0..+250 Pa (default setting),</p> <p><b>DPA2500+</b>: -100..+100   0..+100   0..+250   0..+500   0..+1000   0..+1500   0..+2000   0..+2500 Pa, 0..+2500 Pa (default setting)</p> <p><b>DPA7000+</b>: 0..+1000   0..+1500   0..+2000   0..+2500   0..+3000   0..+4000   0..+5000   0..+7000 Pa, 0..+7000 Pa (default setting)</p> <p>selectable at the device</p>
Measuring range velocity	0..750.000 m³/h, optionally configurable
Power supply	15..35 V = SELV, 19..29 V ~ SELV <b>AA</b> : 15..35 V = SELV
Power consumption	max. 2,5 W (24 V =), 4,3 VA (24 V ~)
Display	LCD 29x35 mm, RGB backlight, with traffic light function, threshold values configurable, optionally configurable via app or uConfig
Enclosure	USE-L, impact- and shock-resistant enclosure with quick-release cover, PC
Colour	pure white, <b>LCD</b> : transparent cover
Operating range temperature	-10..+50 °C
Protection (IP)	IP65, according to EN 60529
Connection	<p>removable plug-in terminal, max. 2,5 mm²                      BUS max. 1,5 mm², relay max. 1,5 mm²                      inputs max. 1,0 mm²                      pressure connection male Ø=5,0 mm / Ø=6,3 mm                      connection tube: PVC, soft</p> <p><b>VV/4xV/AA</b>:                      removable cable entry flextherm M20 for wire Ø=4,5..9 mm,</p> <p><b>Relay/BUS</b>:                      removable cable entry M25 with fourfold cable entry for wire with max. Ø=7 mm,</p>
Mounting	surface-mounted flat on base using screws prepared for mounting on DIN rail TS35 (35x7,5 mm) according to EN 60715
Delivery content	incl. mounting base enclosure USE-L pure white incl. mounting set (screws and accessories) incl. pressure connection set and 2 m PVC connection hose
Notes	output protection circuit (reverse polarity protected)

## DPA+ VV / AA

Differential pressure and volume flow transducer – active – 0..10 (0..5) V					
Item description	USEapp	Item No.	In stock	Group	€
DPA2500+ VV MultiRange	✓	659369	⊖	P2	154,70
DPA7000+ VV MultiRange	✓	659376		P2	154,70
DPA250+ VV AZ MultiRange	✓	692397		P2	185,90
DPA2500+ VV AZ MultiRange	✓	675970		P2	215,90
DPA7000+ VV AZ MultiRange	✓	675994		P2	215,90

Differential pressure and volume flow transducer – active – 4..20 mA					
Item description	USEapp	Item No.	In stock	Group	€
DPA2500+ AA MultiRange	✓	666985	⊖	P2	173,90
DPA7000+ AA MultiRange	✓	666992		P2	173,90
DPA250+ AA AZ MultiRange	✓	691598		P2	205,10
DPA2500+ AA AZ MultiRange	✓	693981		P2	235,10
DPA7000+ AA AZ MultiRange	✓	705325		P2	235,10

Differential pressure and volume flow transducer – active – 0..10 (0..5) V + relay					
Item description	USEapp	Item No.	Group	€	
DPA2500+ VV MultiRange relay	✓	663694	P1	203,10	
DPA7000+ VV MultiRange relay	✓	663700	P1	203,10	

### Options

Description	€
Relay: Automatic zero-point calibration (AZ)	61,20

## DPA+ VV LCD / AA LCD

Differential pressure and volume flow transducer – active – 0..10 (0..5) V – LCD					
Item description	USEapp	Item No.	In stock	Group	€
DPA2500+ LCD VV MultiRange	✓	659390	⊖	P1	200,90
DPA7000+ LCD VV MultiRange	✓	659406		P1	200,90
DPA250+ LCD VV AZ MultiRange	✓	688420		P1	232,10
DPA2500+ LCD VV AZ MultiRange	✓	676007		P1	262,10
DPA7000+ LCD VV AZ MultiRange	✓	676021		P1	262,10

Differential pressure and volume flow transducer – active – 4..20 mA – LCD				
Item description	USEapp	Item No.	Group	€
DPA2500+ LCD AA MultiRange	✓	667111	P1	220,10
DPA7000+ LCD AA MultiRange	✓	667128	P1	220,10
DPA250+ LCD AA AZ MultiRange	✓	700962	P1	251,30
DPA2500+ LCD AA AZ MultiRange	✓	679725	P1	281,30
DPA7000+ LCD AA AZ MultiRange	✓	703147	P1	281,30

Differential pressure and volume flow transducer – active – 0..10 (0..5) V + relay – LCD				
Item description	USEapp	Item No.	Group	€
DPA2500+ LCD VV MultiRange relay	✓	663748	P1	249,30
DPA7000+ LCD VV MultiRange relay	✓	663755	P1	249,30

Options	
Description	€
Relay: Automatic zero-point calibration (AZ)	61,20

## DPA+ BUS

Differential pressure and volume flow transducer – RS485 BACnet (MS/TP)				
Item description	USEapp	Item No.	Group	€
DPA2500+ RS485 BACnet (MS/TP) MultiRange	✓	700238	P1	159,80
DPA7000+ RS485 BACnet (MS/TP) MultiRange	✓	700252	P1	159,80
DPA250+ RS485 BACnet (MS/TP) AZ MultiRange	✓	705387	P1	191,00
DPA2500+ RS485 BACnet (MS/TP) AZ MultiRange	✓	700306	P1	221,00
DPA7000+ RS485 BACnet (MS/TP) AZ MultiRange	✓	700313	P1	221,00

Differential pressure and volume flow transducer – RS485 Modbus				
Item description	USEapp	Item No.	Group	€
DPA2500+ RS485 Modbus MultiRange	✓	659420	P1	159,80
DPA7000+ RS485 Modbus MultiRange	✓	659437	P1	159,80
DPA250+ RS485 Modbus AZ MultiRange	✓	693745	P1	191,00
DPA2500+ RS485 Modbus AZ MultiRange	✓	676083	P1	221,00
DPA7000+ RS485 Modbus AZ MultiRange	✓	676090	P1	221,00

## DPA+ BUS LCD

Differential pressure and volume flow transducer – RS485 BACnet (MS/TP) – LCD				
Item description	USEapp	Item No.	Group	€
DPA2500+ LCD RS485 BACnet (MS/TP) MultiRange	✓	682855	P1	206,00
DPA7000+ LCD RS485 BACnet (MS/TP) MultiRange	✓	683463	P1	206,00
DPA250+ LCD RS485 BACnet (MS/TP) AZ MultiRange	✓	705370	P1	237,20
DPA2500+ LCD RS485 BACnet (MS/TP) AZ MultiRange	✓	700320	P1	267,20
DPA7000+ LCD RS485 BACnet (MS/TP) AZ MultiRange	✓	700337	P1	267,20

Differential pressure and volume flow transducer – RS485 Modbus – LCD				
Item description	USEapp	Item No.	Group	€
DPA2500+ LCD RS485 Modbus MultiRange	✓	659451	P1	206,00
DPA7000+ LCD RS485 Modbus MultiRange	✓	659468	P1	206,00
DPA250+ LCD RS485 Modbus AZ MultiRange	✓	697767	P1	237,20
DPA2500+ LCD RS485 Modbus AZ MultiRange	✓	676106	P1	267,20
DPA7000+ LCD RS485 Modbus AZ MultiRange	✓	676113	P1	267,20

Options	
Description	€
2x input for NTC10k or floating contact (2IN)	52,95

## DPA+ Dual VV / 4xV / AA (LCD)

Dual differential pressure transducer – active				
Item description	USEapp	Item No.	Group	€
DPA2500+ Dual VV MultiRange	✓	700344	P1	230,90
DPA2500+ Dual AA MultiRange	✓	702898	P1	250,10
DPA2500+ LCD Dual VV MultiRange	✓	705417	P1	277,10
DPA2500+ LCD Dual AA MultiRange	✓	705431	P1	296,30

Dual differential pressure and volume flow transducer – active				
Item description	USEapp	Item No.	Group	€
DPA2500+ Dual 4xV MultiRange	✓	705448	P1	245,80
DPA2500+ LCD Dual 4xV MultiRange	✓	700351	P1	292,00

Options	
Description	€
Automatic zero-point calibration dual (2x AZ)	122,20

## DPA+ Dual BUS (LCD)

Dual differential pressure and volume flow transducer – BUS				
Item description	USEapp	Item No.	Group	€
DPA2500+ Dual RS485 BACnet (MS/TP)	✓	703017	P1	257,30
DPA2500+ LCD Dual RS485 BACnet (MS/TP)	✓	705462	P1	303,50
DPA2500+ Dual RS485 Modbus	✓	703000	P1	257,30
DPA2500+ LCD Dual RS485 Modbus	✓	705455	P1	303,50

Options	
Description	€
2x input for NTC10k or floating contact (2IN)	52,95
Automatic zero-point calibration dual (2x AZ)	122,20

## Accessories

Accessories			
Item description	Item No.	Group	€
T-hose connector for pressure hoses $\varnothing=4$ mm (10 pcs)	668323	A1	36,60
Metal duct connector MKS40 ( $\varnothing=4$ mm, L=40 mm)	265138	A1	5,00
Metal duct connector MKS100 ( $\varnothing=5$ mm, L=100 mm)	302531	A1	5,90
Mounting base enclosure USE-L pure white	668361	A1	13,40
Mounting kit universal for enclosure USE	698511	A1	10,70
BLE dongle with micro-USB for devices USE-M / USE-L / NOVOS / thanos EVO	668262		32,10
USB interface for devices USE-M / USE-L / NOVOS / thanos EVO / SR06 LCD	597838	A1	39,50
Cable entry M20 USE white, sealing insert Flextherm $\varnothing=4,5..9$ mm (4 pcs)	851077	A1	12,30
Sealing insert M20 USE white, Flextherm $\varnothing=4,5..9$ mm (10 pcs)	752206	A1	12,30
Sealing insert M20 USE white, 2x $\varnothing=7$ mm (10 pcs)	641333	A1	12,30
Cable entry M25 USE white, sealing insert 4x $\varnothing=7$ mm (4 pcs)	641364	A1	12,30
Protective enclosure TAP+	782739	A1	40,00



## PS

Adjustable differential pressure switch for air and other non-flammable and non-aggressive gases. Designed for monitoring air filters, fans, damper actuators and other industrial processes. Mounting accessories are included in the delivery content.

Technical Data	
Measured values	differential pressure
Measuring range pressure	<b>PS300:</b> 30..300 Pa <b>PS500:</b> 30..500 Pa <b>PS1500:</b> 100..1500 Pa <b>PS4500:</b> 500..4500 Pa
Enclosure	ABS, membrane silicone
Colour	pure white, translucent cover PC
Operating range temperature	-20..+60 °C
Protection (IP)	IP54, according to EN 60529
Connection	cable entry M16 for wire $\varnothing=8$ mm terminal block, max. 1,5 mm <sup>2</sup> pressure connection male $\varnothing=5,0$ mm / $\varnothing=6,3$ mm connection tube: PVC, soft
Delivery content	incl. fixing screws (2x) incl. pressure connection set and 2 m PVC connection hose

Differential pressure switch				
Item description	Item No.	In stock	Group	€
PS300	269971	☹	P2	35,60
PS500	269995	☹	P2	35,60
PS1500	255202	☹	P2	35,60
PS4500	273138		P2	35,60

Accessories				
Item description	Item No.	Group	€	
Mounting bracket kit for differential pressure switch 135x74x60 mm	669009	A1	10,20	
T-hose connector for pressure hoses $\varnothing=4$ mm (10 pcs)	668323	A1	36,60	
Metal duct connector MKS40 ( $\varnothing=4$ mm, L=40 mm)	265138	A1	5,00	
Metal duct connector MKS100 ( $\varnothing=5$ mm, L=100 mm)	302531	A1	5,90	
Protective enclosure TAP+	782739	A1	40,00	



## DPG

Compact manometer for displaying and monitoring differential air pressure in HVAC applications. Mounting accessories are included in the delivery content.

### Technical Data

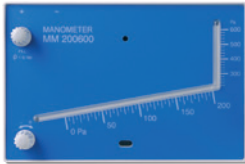
<b>Measured values</b>	differential pressure
<b>Measuring range pressure</b>	<b>DPG60:</b> 0..60 Pa <b>DPG100:</b> 0..100 Pa <b>DPG250:</b> 0..250 Pa <b>DPG500:</b> 0..500 Pa <b>DPG1500:</b> 0..1500 Pa <b>DPG2500:</b> 0..2500 Pa
<b>Display</b>	display Ø=100 mm
<b>Enclosure</b>	aluminium alloy
<b>Colour</b>	aluminium, transparent cover PC
<b>Operating range temperature</b>	-20..+60 °C
<b>Protection (IP)</b>	IP65, according to EN 60529
<b>Connection</b>	connection tube: PVC, soft
<b>Delivery content</b>	incl. fixing screws (4x) incl. pressure connection set and 2 m PVC connection hose

### Differential pressure gauge

Item description	Item No.	Group	€
DPG60	718493	P1	116,40
DPG100	718509	P1	116,40
DPG250	718516	P1	116,40
DPG500	718523	P1	116,40
DPG1500	718530	P1	116,40
DPG2500	718547	P1	116,40

### Accessories

Item description	Item No.	Group	€
T-hose connector for pressure hoses Ø=4 mm (10 pcs)	668323	A1	36,60
Metal duct connector MKS40 (Ø=4 mm, L=40 mm)	265138	A1	5,00
Metal duct connector MKS100 (Ø=5 mm, L=100 mm)	302531	A1	5,90



## MM

Compact inclined tube manometer for displaying and monitoring differential air pressure in HVAC applications. Mounting accessories are included in the delivery content.

Technical Data	
Measured values	differential pressure
Measuring range pressure	<b>MM500:</b> -100..+500 Pa <b>MM600:</b> 0..+600 Pa
Display	liquid indicator
Enclosure	ABS, cover PMMA
Colour	blue
Operating range temperature	-40..+60 °C
Protection (IP)	IP54, according to EN 60529
Connection	cable entry M16 for wire Ø=8 mm terminal block, max. 1,5 mm <sup>2</sup> pressure connection ABS connection tube: PVC, soft
Delivery content	incl. fixing screws (2x) incl. pressure connection set and 2 m PVC connection hose incl. 30 ml gauge fluid incl. 2 indication stickers (red/green)

Differential pressure inclined tube manometer			
Item description	Item No.	Group	€
MM500 (-100..500 Pa)	384452	P1	55,00
MM600 (0..600 Pa)	255240	P1	55,00

## DLF02

Pressure transmitter for measuring absolute pressure of liquids, air or non-aggressive gases. Designed for use in refrigeration, hydraulics, production plants and processes. The dense stainless steel membrane makes the sensor suitable for use with refrigerants as well. For a quick & easy connection, a 5 m cable with a pre-installed connector is available (see 'Accessories'). The DLF can be optionally equipped with a 4-digit LED display.



DLF02 V HS



DLF02 A HS



DLF02 V M12



DLF02 A M12

### Technical Data

Measured values	pressure
Measuring range pressure	<b>DLF-1..0:</b> -1..0 bar <b>DLF1:</b> 0..1 bar <b>DLF2,5:</b> 0..2,5 bar <b>DLF4:</b> 0..4 bar <b>DLF6:</b> 0..6 bar <b>DLF10:</b> 0..10 bar <b>DLF16:</b> 0..16 bar <b>DLF25:</b> 0..25 bar
Power supply	<b>V:</b> 24 V = ( $\pm 10\%$ ) SELV, 24 V ~ ( $\pm 10\%$ ) SELV <b>A:</b> 24 V = ( $\pm 10\%$ ) SELV
Power consumption	<b>V:</b> typ. 0,15 W (24 V =), 0,3 VA (24 V ~) <b>A:</b> typ. 0,5 W (24 V =)
Material in touch with media	stainless steel V2A (1.4301), G1/2", G1/4"
Operating range temperature	-30..+80 °C
Protection (IP)	IP65, according to EN 60529
Connection	<b>HS:</b> plug MVS according to DIN 175301-803 <b>M12:</b> Cable gland M12x1 (DIN EN 61076-2-101),

Pressure transducer – 0..10 V – G1/4" – HS				
Item description	Item No.	In stock	Group	€
DLF02 -1..0 V HS G1/4"	838405		P1	120,80
DLF02 1 V HS G1/4"	838450		P1	120,80
DLF02 2,5 V HS G1/4"	838498		P1	120,80
DLF02 4 V HS G1/4"	838535		P1	120,80
DLF02 6 V HS G1/4"	838573	⊖	P1	120,80
DLF02 10 V HS G1/4"	838610		P1	120,80
DLF02 16 V HS G1/4"	838658		P1	120,80
DLF02 25 V HS G1/4"	838696		P1	120,80

Pressure transducer – 4..20 mA – G1/4" – HS				
Item description	Item No.		Group	€
DLF02 -1..0 A HS G1/4"	838399		P1	115,40
DLF02 1 A HS G1/4"	838443		P1	115,40
DLF02 2,5 A HS G1/4"	838481		P1	115,40
DLF02 4 A HS G1/4"	838528		P1	115,40
DLF02 6 A HS G1/4"	838566		P1	115,40
DLF02 10 A HS G1/4"	838603		P1	115,40
DLF02 16 A HS G1/4"	838641		P1	115,40
DLF02 25 A HS G1/4"	838689		P1	115,40

Pressure transducer – 0..10 V – G1/4" – M12				
Item description	Item No.	In stock	Group	€
DLF02 -1..0 V M12 G1/4"	838436		P1	142,80
DLF02 1 V M12 G1/4"	838474		P1	142,80
DLF02 2,5 V M12 G1/4"	838511		P1	142,80
DLF02 4 V M12 G1/4"	838559		P1	142,80
DLF02 6 V M12 G1/4"	838597	⊖	P1	142,80
DLF02 10 V M12 G1/4"	838634		P1	142,80
DLF02 16 V M12 G1/4"	838672		P1	142,80
DLF02 25 V M12 G1/4"	838719		P1	142,80

**Pressure transducer – 4..20 mA – G1/4" – M12**

Item description	Item No.	Group	€
DLF02 -1..0 A M12 G1/4"	838429	P1	137,40
DLF02 1 A M12 G1/4"	838467	P1	137,40
DLF02 2,5 A M12 G1/4"	838504	P1	137,40
DLF02 4 A M12 G1/4"	838542	P1	137,40
DLF02 6 A M12 G1/4"	838580	P1	137,40
DLF02 10 A M12 G1/4"	838627	P1	137,40
DLF02 16 A M12 G1/4"	838665	P1	137,40
DLF02 25 A M12 G1/4"	838702	P1	137,40

**Pressure transducer – 0..10 V – G1/2" – HS**

Item description	Item No.	In stock	Group	€
DLF02 -1..0 V HS G1/2"	850575		P1	128,80
DLF02 1 V HS G1/2"	850578		P1	128,80
DLF02 2,5 V HS G1/2"	850496		P1	128,80
DLF02 4 V HS G1/2"	850595		P1	128,80
DLF02 6 V HS G1/2"	850599	⊕	P1	128,80
DLF02 10 V HS G1/2"	850488		P1	128,80
DLF02 16 V HS G1/2"	850487		P1	128,80
DLF02 25 V HS G1/2"	850620		P1	128,80

**Pressure transducer – 4..20 mA – G1/2" – HS**

Item description	Item No.	Group	€
DLF02 -1..0 A HS G1/2"	850568	P1	123,40
DLF02 1 A HS G1/2"	850580	P1	123,40
DLF02 2,5 A HS G1/2"	850590	P1	123,40
DLF02 4 A HS G1/2"	850594	P1	123,40
DLF02 6 A HS G1/2"	850589	P1	123,40
DLF02 10 A HS G1/2"	850603	P1	123,40
DLF02 16 A HS G1/2"	850495	P1	123,40
DLF02 25 A HS G1/2"	850609	P1	123,40

<b>Pressure transducer – 0..10 V – G1/2" – M12</b>				
<b>Item description</b>	<b>Item No.</b>	<b>In stock</b>	<b>Group</b>	<b>€</b>
DLF02 -1..0 V M12 G1/2"	850569		P1	150,80
DLF02 1 V M12 G1/2"	850584		P1	150,80
DLF02 2,5 V M12 G1/2"	850592		P1	150,80
DLF02 4 V M12 G1/2"	850597		P1	150,80
DLF02 6 V M12 G1/2"	850611	⊖	P1	150,80
DLF02 10 V M12 G1/2"	850606		P1	150,80
DLF02 16 V M12 G1/2"	850607		P1	150,80
DLF02 25 V M12 G1/2"	850617		P1	150,80

<b>Pressure transducer – 4..20 mA – G1/2" – M12</b>				
<b>Item description</b>	<b>Item No.</b>	<b>Group</b>	<b>€</b>	
DLF02 -1..0 A M12 G1/2"	850576	P1	145,40	
DLF02 1 A M12 G1/2"	850579	P1	145,40	
DLF02 2,5 A M12 G1/2"	850591	P1	145,40	
DLF02 4 A M12 G1/2"	850596	P1	145,40	
DLF02 6 A M12 G1/2"	850600	P1	145,40	
DLF02 10 A M12 G1/2"	850605	P1	145,40	
DLF02 16 A M12 G1/2"	850613	P1	145,40	
DLF02 25 A M12 G1/2"	850616	P1	145,40	

<b>Accessories</b>				
<b>Item description</b>	<b>Item No.</b>	<b>Group</b>	<b>€</b>	
<b>V:</b> UD-V – universal display for 0..10 V	775113	A1	101,80	
<b>A:</b> UD-A – universal display for 4..20 mA	718189	A1	101,80	
Connection wire HS 2 m	809047	A1	17,50	
Connection wire HS 5 m	668309	A1	21,40	
Connection wire HS 10 m	840590	A1	29,00	
Connection wire M12 2 m	840606	A1	19,90	
Connection wire M12 5 m	840613	A1	27,40	
Connection wire M12 10 m	840620	A1	39,90	
Mounting bracket for DLF02/DPL02	841375	A1	18,90	

## DPL02

Differential pressure transmitter for measuring differential pressure in liquids. Typical areas of application include supply and return liquid flows in HVAC systems and process engineering as well as the monitoring of filters and compressors. For a quick & easy connection, a 5 m cable with pre-installed connector is available (see „Accessories“).



DPL02 HS



DPL02 M12

### Technical Data

Measured values	differential pressure
Measuring range pressure	<b>DPL1:</b> 0..1 bar <b>DPL2,5:</b> 0..2,5 bar <b>DPL4:</b> 0..4 bar <b>DPL6:</b> 0..6 bar
Power supply	<b>V:</b> 15..24 V = (±10%) SELV, 24 V ~ (±10%) SELV <b>A:</b> 15..24 V = (±10%) SELV
Power consumption	typ. 0,37 W (24 V =), 0,9 VA (24 V ~)
Material in touch with media	stainless steel, G1/4"
Enclosure	stainless steel V2A (1.4305)
Operating range temperature	-30..+80 °C
Protection (IP)	IP65, according to EN 60529
Connection	<b>HS:</b> plug MVS according to DIN 175301-803 <b>M12:</b> Cable gland M12x1 (DIN EN 61076-2-101)

### Differential pressure transducer – 0..10 V – G1/4" – HS

Item description	Item No.	In stock	Group	€
DPL02 1 V HS G1/4"	840767		P1	346,00
DPL02 2,5 V HS G1/4"	840842	⊖	P1	346,00
DPL02 4 V HS G1/4"	840897		P1	346,00
DPL02 6 V HS G1/4"	840934		P1	346,00

Differential pressure transducer – 4..20 mA – G1/4" – HS				
Item description	Item No.	In stock	Group	€
DPL02 1 A HS G1/4"	840743		P1	346,00
DPL02 2,5 A HS G1/4"	840811	⊖	P1	346,00
DPL02 4 A HS G1/4"	840873		P1	346,00
DPL02 6 A HS G1/4"	840910		P1	346,00

Differential pressure transducer – 0..10 V – G1/4" – M12				
Item description	Item No.	In stock	Group	€
DPL02 1 V M12 G1/4"	840774		P1	368,00
DPL02 2,5 V M12 G1/4"	840859	⊖	P1	368,00
DPL02 4 V M12 G1/4"	840903		P1	368,00
DPL02 6 V M12 G1/4"	840941		P1	368,00

Differential pressure transducer – 4..20 mA – G1/4" – HS				
Item description	Item No.	In stock	Group	€
DPL02 1 A M12 G1/4"	840750		P1	368,00
DPL02 2,5 A M12 G1/4"	840828	⊖	P1	368,00
DPL02 4 A M12 G1/4"	840880		P1	368,00
DPL02 6 A M12 G1/4"	840927		P1	368,00

Accessories				
Item description	Item No.		Group	€
<b>V:</b> UD-V – universal display for 0..10 V	775113		A1	101,80
<b>A:</b> UD-A – universal display for 4..20 mA	718189		A1	101,80
Screw connection set Ø=6 mm stainless steel (2 pcs.)	373388		A1	75,50
Screw connection set Ø=6 mm brass (2 pcs.)	373401		A1	16,70
Screw connection set Ø=8 mm stainless steel (2 pcs.)	373395		A1	86,60
Screw connection set Ø=8 mm brass (2 pcs.)	373418		A1	27,10
Connection wire HS 2 m	809047		A1	17,50
Connection wire HS 5 m	668309		A1	21,40
Connection wire HS 10 m	840590		A1	29,00
Connection wire M12 2 m	840606		A1	19,90
Connection wire M12 5 m	840613		A1	27,40
Connection wire M12 10 m	840620		A1	39,90
Mounting bracket for DLF02/DPL02	841375		A1	18,90

# Power Thyristors

Power thyristors can more and more be found where ohmic and inductive loads must be controlled (e.g. in industrial furnaces ...) By means of the modular and compact construction and control with a continuous control signal power thyristors become the perfect actuators for industrial power control.



## Single-Phase

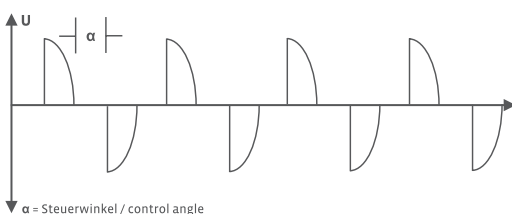
TS1 1-phase	Power thyristor	<b>390</b>
TS3 1-phase	Power thyristor	<b>392</b>

## Three-Phase

TS1 3-phase	Power thyristor	<b>394</b>
TS3 3-phase	Power thyristor	<b>396</b>

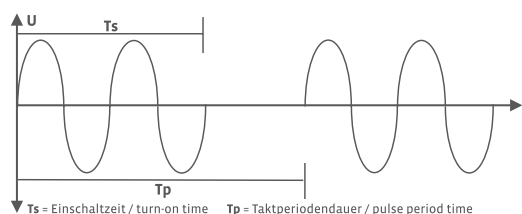
## Phase angle control

The phase angle control can be used for almost any ohmic and inductive consumers and is the most common way to control the power consumption of a consumer. The consumer is connected to the supply network via the power thyristor. The thyristors are controlled in such a way, that the consumer is not supplied with the complete sinusoidal oscillation but only a part (depending on the steering angle), whereas the voltage average value can be adjusted continuously.



## Oscillation control

The oscillation control is used with inert consumers such as heaters. Contrary to the phase angle control, complete sinusoidal waves are switched through to the consumer with the oscillation control. The control of the average voltage value is made by switching through a certain number of oscillations (depending on the switch-on time) within a certain time slot (clock cycle). Thus converter feedback effects to the power supply network in form of harmonic components are avoided.





## TS1 single-phase

The TS1 single-phase power thyristor controller is used to control the load or power of industrial load applications (e.g. fans, pumps, lamps, heating coils, industrial ovens). Its solid and compact design permit seamless installation and a wear-free control with a high degree of efficiency.

Technical Data	
<b>Configuration</b>	DIP switches
<b>Output switch contact</b>	signal contact at 100% U <sub>a</sub> 1x contact NO 3A for 250 V ~ or 24 V =, floating
<b>output for ohmic and inductive loads</b>	<b>2 A:</b> 0,46 kW (230 V ~ / 2 A) <b>4 A:</b> 0,92 kW (230 V ~ / 4 A) <b>6 A:</b> 1,38 kW (230 V ~ / 6 A) <b>8 A:</b> 1,84 kW (230 V ~ / 8 A) <b>10 A:</b> 2,3 kW (230 V ~ / 10 A) <b>12 A:</b> 2,76 kW (230 V ~ / 12 A)
<b>Input</b>	input for potentiometer 2,5..10 kΩ electrical activation via setpoint signal 0..10 V = or 0..20 mA optionally configurable
<b>Power supply</b>	L1, N: 230 V ~ 48..62 Hz, self-synchronizing
<b>Power consumption</b>	<b>2 A:</b> typ. 2,5 W <b>4 A:</b> typ. 4,5 W <b>6 A:</b> typ. 6,5 W <b>8 A:</b> typ. 9 W <b>10 A:</b> typ. 11 W <b>12 A:</b> typ. 13 W
<b>Display</b>	LED – power supply OK, LED – modulation amplitude 100%
<b>Enclosure</b>	PA
<b>Operating range temperature</b>	0..+45 °C
<b>Protection (IP)</b>	IP40, terminal blocks IP23, according to EN 60529
<b>Connection</b>	terminal block, max. 2,5 mm <sup>2</sup>
<b>Mounting</b>	prepared for mounting on DIN rail TS35 (35x7,5 mm) according to EN 60715
<b>Notes</b>	types up to 4 A with cooling plate types 6 A with heat sink types 8 A and higher with heat sink and fan

**Power thyristors – Phase angle**

Item description	Item No.	Group	€
TS1 single-phase 1-ph 2 A 0,46 kW	229678	Y1	250,70
TS1 single-phase 1-ph 4 A 0,92 kW	226639	Y1	292,10
TS1 single-phase 1-ph 6 A 1,38 kW	224000	Y1	340,00
TS1 single-phase 1-ph 8 A 1,84 kW	236980	Y1	375,20
TS1 single-phase 1-ph 10 A 2,3 kW	223874	Y1	404,50
TS1 single-phase 1-ph 12 A 2,76 kW	230605	Y1	439,70

**Power thyristors – Oscillation**

Item description	Item No.	Group	€
TS1 single-phase SP 1-ph 2 A 0,46 kW	283137	Y1	250,70
TS1 single-phase SP 1-ph 4 A 0,92 kW	226622	Y1	292,10
TS1 single-phase SP 1-ph 6 A 1,38 kW	238885	Y1	340,00
TS1 single-phase SP 1-ph 8 A 1,84 kW	255189	Y1	375,20
TS1 single-phase SP 1-ph 10 A 2,3 kW	266109	Y1	404,50
TS1 single-phase SP 1-ph 12 A 2,76 kW	233712	Y1	439,70



## TS3 single-phase

The TS3 single-phase power thyristor controller is used to control the load or power of industrial load applications (e.g. fans, pumps, lamps, heating coils, industrial ovens). Its solid and compact design permit seamless installation and a wear-free control with a high degree of efficiency.

Technical Data	
Configuration	DIP switches
Output switch contact	signal contact in case of fault state 1x contact NO 2A for 230 V ~, floating
output for ohmic and inductive loads	<b>15 A:</b> 3,5 kW (230 V ~ / 15 A) <b>25 A:</b> 5,75 kW (230 V ~ / 25 A) <b>35 A:</b> 8,05 kW (230 V ~ / 35 A) <b>50 A:</b> 11,5 kW (230 V ~ / 50 A)
Input	input for potentiometer 2,5..10 kΩ electrical activation via setpoint signal 0..10 V =, 0..20 or 4..20 mA optionally configurable
Power supply	L1, N: 230 V ~ 45..65 Hz, self-synchronizing
Power consumption	<b>15 A:</b> typ. 13 W <b>25 A:</b> typ. 22 W <b>35 A:</b> typ. 31 W <b>50 A:</b> typ. 45 W
Display	4 LEDs showing status of the device
Enclosure	aluminium
Operating range temperature	0..+50 °C
Protection (IP)	IP40, according to EN 60529
Connection	terminal block
Mounting	prepared for mounting on DIN rail TS35 (35x7,5 mm) according to EN 60715

**Power thyristors – Phase angle**

Item description	Item No.	Group	€
TS3 single-phase 1-ph 15 A 3,45 kW	237161	Y1	482,70
TS3 single-phase 1-ph 25 A 5,75 kW	241649	Y1	685,70
TS3 single-phase 1-ph 35 A 8,05 kW	238489	Y1	725,50
TS3 single-phase 1-ph 50 A 11,5 kW	361200	Y1	840,60

**Power thyristors – Oscillation**

Item description	Item No.	Group	€
TS3 single-phase SP 1-ph 15 A 3,45 kW	245500	Y1	482,70
TS3 single-phase SP 1-ph 25 A 5,75 kW	231091	Y1	685,70
TS3 single-phase SP 1-ph 35 A 8,05 kW	270977	Y1	725,50
TS3 single-phase SP 1-ph 50 A 11,5 kW	344333	Y1	840,60



## TS1 three-phase

The TS1 three-phase power thyristor controller is used to control the load or power of industrial load applications (e.g. fans, pumps, lamps, heating coils, industrial ovens). Its solid and compact design permit seamless installation and a wear-free control with a high degree of efficiency.

Technical Data	
Configuration	DIP switches
Output switch contact	signal contact at 100% U <sub>a</sub> 1x contact NO 3A for 250 V ~ or 24 V =,floating
output for ohmic and inductive loads	<b>2 A:</b> 1,2 kW (400 V ~ / 2 A) <b>4 A:</b> 2,5 kW (400 V ~ / 4 A) <b>6 A:</b> 4 kW (400 V ~ / 6 A) <b>8 A:</b> 5 kW (400 V ~ / 8 A) <b>10 A:</b> 6,5 kW (400 V ~ / 10 A)
Input	input for potentiometer 2,5..10 kΩ electrical activation via setpoint signal 0..10 V = or 0..20 mA optionally configurable
Power supply	L1, L2, L3, N: 400 V ~ 48..62 Hz, self-synchronizing
Power consumption	<b>2 A:</b> typ. 7 W <b>4 A:</b> typ. 13 W <b>6 A:</b> typ. 19 W <b>8 A:</b> typ. 25 W <b>10 A:</b> typ. 31 W
Display	LED – power supply OK, LED – modulation amplitude 100%
Enclosure	PA
Operating range temperature	0..+45 °C
Protection (IP)	IP40, terminal blocks IP23, according to EN 60529
Connection	terminal block, max. 2,5 mm <sup>2</sup>
Mounting	prepared for mounting on DIN rail TS35 (35x7,5 mm) according to EN 60715
Notes	types up to 4 A with cooling plate types 6 A with heat sink types 8 A and higher with heat sink and fan

**Power thyristors – Phase angle**

Item description	Item No.	Group	€
TS1 three-phase 3-ph 2 A 1,2 kW	230148	Y1	286,20
TS1 three-phase 3-ph 4 A 2,5 kW	246514	Y1	315,50
TS1 three-phase 3-ph 6 A 4,0 kW	224260	Y1	350,50
TS1 three-phase 3-ph 8 A 5,0 kW	233736	Y1	387,50
TS1 three-phase 3-ph 10 A 6,5 kW	224314	Y1	428,90

**Power thyristors – Oscillation**

Item description	Item No.	Group	€
TS1 three-phase SP 3-ph 2 A 1,2 kW	273558	Y1	286,20
TS1 three-phase SP 3-ph 4 A 2,5 kW	268226	Y1	315,50
TS1 three-phase SP 3-ph 6 A 4,0 kW	275910	Y1	350,50
TS1 three-phase SP 3-ph 8 A 5,0 kW	275927	Y1	387,50
TS1 three-phase SP 3-ph 10 A 6,5 kW	241182	Y1	428,90



## TS3 three-phase

The TS3 three-phase power thyristor controller is used to control the load or power of industrial load applications (e.g. fans, pumps, lamps, heating coils, industrial ovens). Its solid and compact design permit seamless installation and a wear-free control with a high degree of efficiency.

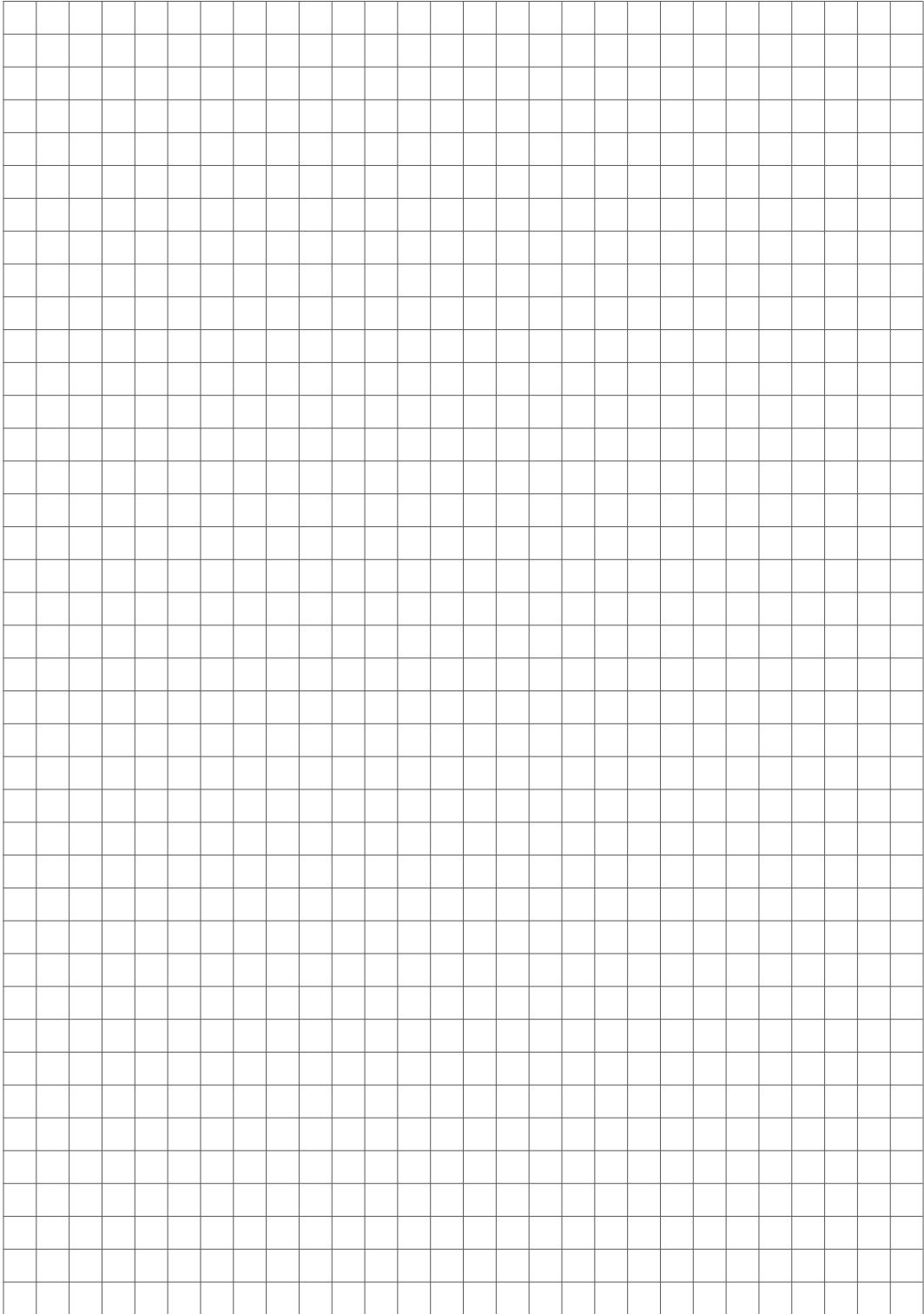
Technical Data	
Configuration	DIP switches
Output switch contact	signal contact at 100% U <sub>a</sub> signal contact in case of fault state changeover contacts 2A for 230 V ~
output for ohmic and inductive loads	<b>15 A:</b> 10 kW (400 V ~ / 15 A) <b>25 A:</b> 16 kW (400 V ~ / 25 A) <b>35 A:</b> 23 kW (400 V ~ / 35 A) <b>50 A:</b> 33 kW (400 V ~ / 50 A)
Input	input for potentiometer 2,5..10 kΩ PWM input 5 V / 5..10 kHz input for PTC according to DIN 44081 input for reset electrical activation via setpoint signal 0..10 V = or 0..20 mA optionally configurable
Power supply	L1, L2, L3, N: 400 V ~ 45..65 Hz, self-synchronizing
Power consumption	<b>15 A:</b> typ. 40 W <b>25 A:</b> typ. 67 W <b>35 A:</b> typ. 94 W <b>50 A:</b> typ. 135 W
Display	4 LEDs showing status of the device
Enclosure	aluminium
Operating range temperature	0..+50 °C
Protection (IP)	IP40, according to EN 60529
Connection	terminal block
Mounting	4 mounting holes Ø=8 mm for mounting on galvanized mounting plates (control cabinet)

**Power thyristors – Phase angle**

Item description	Item No.	Group	€
TS3 three-phase 3-ph 15 A 10 kW	224796	Y1	938,90
TS3 three-phase 3-ph 25 A 16 kW	225649	Y1	1072,70
TS3 three-phase 3-ph 35 A 23 kW	225656	Y1	1252,30
TS3 three-phase 3-ph 50 A 33 kW	256353	Y1	1396,70

**Power thyristors – Oscillation**

Item description	Item No.	Group	€
TS3 three-phase SP 3-ph 15 A 10 kW	225236	Y1	938,90
TS3 three-phase SP 3-ph 25 A 16 kW	240970	Y1	1072,70
TS3 three-phase SP 3-ph 35 A 23 kW	241014	Y1	1252,30
TS3 three-phase SP 3-ph 50 A 33 kW	223836	Y1	1396,70



# Accessories Information



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Fastening and screwing					
	Item description	In stock	Item No.	Group	€
1	Mounting bracket kit for differential pressure switch 135x74x60 mm	☉	669009	A1	10,20
2	Mounting bracket kit for differential pressure transducer 40x60x40 mm	☉	663892	A1	10,80
3	Installation set TFR / MWF+		679466	A1	10,30
4	Mounting bracket with cable gland for duct sensors Ø=6 mm	☉	670593	A1	14,80
5	L-shaped magnetic antenna holder, 180x180 mm		255097	A1	17,50
6	Mounting bracket for DLF02/DPL02		841375	A1	18,90
7	Reinforced mounting plate SAB07		2000144	W2	12,00



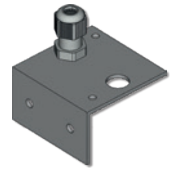
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Fastening and screwing					
Item description	Item No.		Group	€	
Fixing kit rawlplugs and screws (2x each)	660945		A1	1,10	1
Syringe thermal contact fluid	102308		A1	1,80	2
Compression fittings KL4VA for Ø=4 mm with cutting ring, stainless steel	103206	☉	A1	15,60	3
Compression fittings KL6VA for Ø=6 mm with cutting ring, stainless steel	103213	☉	A1	15,60	4
Tension clamp for pipes Ø up to 110 mm with contact fluid	658911		A1	3,30	5
Tension clamp for pipes Ø up to 250 mm with contact fluid	648103		A1	5,20	6
Tightening strap PA (max. 85 °C) for pipes Ø up to 100 mm with contact fluid	668071		A1	3,30	7
C-clip adhesive pads (5 pieces) – mounting accessories for LS02+ flex	778596		A1	10,30	8
Screw connection set Ø=6 mm stainless steel (2 pcs.)	373388		A1	75,50	9
Screw connection set Ø=8 mm stainless steel (2 pcs.)	373395		A1	86,60	10
Screw connection set Ø=6 mm brass (2 pcs.)	373401		A1	16,70	11
Screw connection set Ø=8 mm brass (2 pcs.)	373418		A1	27,10	12



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Mounting accessories USE				
	Item description	Item No.	Group	€
1	Mounting clip enclosure USE-S pure white	667739	A1	5,70
2	Mounting base enclosure USE-S pure white	667722	A1	6,70
3	Mounting base enclosure USE-M pure white	668354	A1	9,60
4	Mounting base enclosure USE-L pure white	668361	A1	13,40
5	Mounting kit AKF10+ for enclosure USE-S	748551	A1	8,30
6	Mounting kit universal for enclosure USE	698511	A1	10,70
7	Cable entry M20 USE white, sealing insert Flextherm $\varnothing=4,5..9$ mm (4 pcs)	851077	A1	12,30
8	Sealing insert M20 USE white, Flextherm $\varnothing=4,5..9$ mm (10 pcs)	752206	A1	12,30
9	Sealing insert M20 USE white, 2x $\varnothing=7$ mm (10 pcs)	641333	A1	12,30
10	Cable entry M25 USE white, sealing insert 4x $\varnothing=7$ mm (4 pcs)	641364	A1	12,30
11	Sealing insert M25 USE white, 2x $\varnothing=9$ mm (10 pcs)	797573	A1	12,30



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**Thermowells brass for sensors with pocket Ø=6 mm**

Item description	Length	Inst. length	Item No.	In stock	Group	€
MS-thermowell 50 mm type THMSDS50	50 mm	36 mm	610995	☉	A2	9,90
MS-thermowell 100 mm type THMSDS100	100 mm	86 mm	611008	☉	A2	11,20
MS-thermowell 150 mm type THMSDS150	150 mm	136 mm	611015	☉	A2	11,80
MS-thermowell 200 mm type THMSDS200	200 mm	186 mm	611022	☉	A2	12,30
MS-thermowell 250 mm type THMSDS250	250 mm	236 mm	611985	☉	A2	14,10
MS-thermowell 300 mm type THMSDS300	300 mm	286 mm	611039	☉	A2	14,60
MS-thermowell 450 mm type THMSDS450	450 mm	436 mm	611046	☉	A2	14,90

**Thermowells stainless steel for sensors with pocket Ø=6 mm**

Item description	Length	Inst. length	Item No.	In stock	Group	€
VA-thermowell 50 mm type THVADS50	50 mm	36 mm	611152	☉	A2	23,10
VA-thermowell 100 mm type THVADS100	100 mm	86 mm	611817	☉	A2	25,30
VA-thermowell 150 mm type THVADS150	150 mm	136 mm	611824	☉	A2	27,40
VA-thermowell 200 mm type THVADS200	200 mm	186 mm	611848	☉	A2	28,70
VA-thermowell 250 mm type THVADS250	250 mm	236 mm	611862	☉	A2	35,60
VA-thermowell 300 mm type THVADS300	300 mm	286 mm	611879	☉	A2	37,30
VA-thermowell 450 mm type THVADS450	450 mm	436 mm	611893	☉	A2	38,60
Pressure screw with sealing PTFE (without silicone) for thermowell pocket THVADS			666473	☉	A2	22,20



THMSDS



THVADS

Thermowells stainless steel for sensors with pocket Ø=8 mm						
Item description	Length	Inst. length	Item No.	In stock	Group	€
VA-thermowell 100 mm type THVA100 (KFK03)	100 mm	87 mm	584180	☹	A2	36,20
VA-thermowell 150 mm type THVA150 (KFK03)	150 mm	137 mm	584197	☹	A2	38,00
VA-thermowell 200 mm type THVA200 (KFK03)	200 mm	187 mm	584203	☹	A2	40,00
VA-thermowell 250 mm type THVA250 (KFK03)	250 mm	237 mm	594738	☹	A2	42,10



Bonded pockets						
Item description	Length	Inst. length	Item No.	In stock	Group	€
Bonded pocket St52-3 Typ ESH110	110 mm	105 mm	103459	☹	A1	60,10
Bonded pocket St52-3 Typ ESH160	160 mm	155 mm	103466	☹	A1	68,80
Bonded pocket St52-3 Typ ESH210	210 mm	205 mm	103473	☹	A1	77,40
Bonded pocket St52-3 Typ ESH260	260 mm	255 mm	173247	☹	A1	85,00



Mounting flanges				
Item description	Item No.	In stock	Group	€
Mounting flange MF2 (suitable for TFR)	435642		A1	7,80
Mounting flange MF6 flexible (suitable for Ø=4 / 6 / 7 mm)	399098	⊕	A2	7,80
Mounting flange MF6DS flexible (suitable for Ø=6 mm)	669016	⊕	A2	7,80
Mounting flange MF4 brass (suitable for Ø=4 mm)	102438		A1	6,30
Mounting flange MF6 brass (suitable for Ø=6 mm)	3407	⊕	A1	7,80
Mounting flange MF7 brass (suitable for MWF+ and Ø=7 mm)	102360		A1	7,80
Mounting flange MF8 stainless steel (suitable for Ø=8 mm)	103305		A1	27,60
Mounting flange MF19	527705		A1	14,40
Mounting flange MF20	612562		A1	14,40



Connections				
	Item description	Item No.	Group	€
1	Metal duct connector MKS40 (Ø=4 mm, L=40 mm)	265138	A1	5,00
2	Metal duct connector MKS100 (Ø=5 mm, L=100 mm)	302531	A1	5,90
3	T-hose connector for pressure hoses Ø=4 mm (10 pcs)	668323	A1	36,60
4	3-valve assembly for DPL02 shut-off and pressure equalization valves	841368	A1	193,60



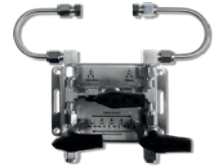
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Wires / Cables				
	Item description	Item No.	Group	€
1	Connection wire HS 2 m	809047	A1	17,50
2	Connection wire HS 5 m	668309	A1	21,40
3	Connection wire HS 10 m	840590	A1	29,00
4	Connection wire M12 2 m	840606	A1	19,90
5	Connection wire M12 5 m	840613	A1	27,40
6	Connection wire M12 10 m	840620	A1	39,90
7	Sensor wire 1,5 m with RJ45 connector	628785	A1	6,90
8	Sensor wire 3 m with RJ45 connector	708852	A1	8,80
9	Sensor wire 5 m with RJ45 connector	794886	A1	12,70
10	Sensor wire 7,5 m with RJ45 connector	708869	A1	16,30
11	Antenna extension 10 m	257206	A1	67,70
12	Antenna extension 20 m	257213	A1	82,40
13	USB extension 3 m	574044		16,30



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**Frames and enclosures**

Item description	Item No.	Group	€	
Frame for surface mounting JOY white	760201	A1	29,30	1
Frame for surface mounting JOY black	760195	A1	29,30	2
Decorative frame JOY white	681452	A1	14,80	3
Decorative frame JOY black	740951	A1	14,80	4
Frame for surface mounting NOVOS 3 white	795050	A1	15,30	5
Frame for surface mounting NOVOS 3 black	795074	A1	55,30	6
Frame for surface mounting thevios 5 / thevios HUB white	826402	A1	29,30	7
Frame for surface mounting thevios 3 / thevios SAT white	837279	A1	23,80	8



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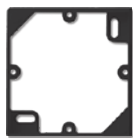
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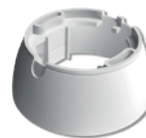
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Valve Adapters				
	Item description	Item No.	Group	€
1	Valve adapter SAB for Giacomini Z810 (22,6 mm)	634724	A1	29,20
2	Valve adapter SAB for Oventrop Z809 (M30x1,0)	611978	A1	29,20
3	Valve adapter SAB for Herz Z807 (M28 X 1,5 mm)	595070	A1	29,20
4	Valve adapter SAB for Danfoss RA2000 Z802	589093	A1	29,20
5	Valve adapter SAB for Danfoss RAV Z803	589109	A1	29,20
6	Valve adapter SAB for Danfoss RAV-L Z804	589116	A1	29,20
7	Valve adapter SAB for Danfoss Z800	589079	A1	29,20
8	Valve adapter SAB for Danfoss Z801	589086	A1	29,20
9	Valve adapter SAB for Vaillant Z805	615181	A1	29,20

Valve Adapters				
	Item description	Item No.	Group	€
10	Valve adapter SAB05/07 for Herz (M28 X 1,5 mm)	836302	A1	9,20
11	Valve adapter SAB05/07 for Danfoss RA-02	836333	A1	9,20
12	Valve adapter SAB05/07 for Danfoss RAV-02	836326	A1	9,20
13	Valve adapter SAB05/07 for Danfoss RAVL-02	836319	A1	9,20



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**Enclosure protection / Anti-theft protection**

Item description	Item No.	In stock	Group	€	
Housing protection BS150, transparent	730075		A1	27,50	1
Weather protection for FTK+, WSA (replacement)	625241		A1	82,20	2
Safety lock dismounting protection SAB	706148	☉	A1	12,70	3
Vandalism protection SAB07	836104	☉	W2	19,60	4
Protective enclosure TAP+	782739		A1	40,00	5



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**Filters**

Item description	Item No.	Group	€	
Filter stainless steel, wire mesh FTK+ / FTA54+ / FTP+ (spare part)	231169	A1	11,90	1



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## » Accessories – Power supply

Power supplies					
	Item description	Item No.	In stock	Group	€
1	PSU-UP24 – flush-mounted power supply 24 V	645737	☹	A1	50,60
2	PSU-HS24 – power supply unit 24 V for DIN rail mounting	764742	☹	A1	129,80



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Batteries				
	Item description	Item No.	Group	€
1	Battery AA 1,5 V lithium L91	819640	A1	8,10
2	Battery AAA 1,5 V lithium L92	2000202	A1	8,30
3	Battery 1/2AA 3.6V Lithium LS14250	315098	A1	5,00
4	Battery AA 3.6 V lithium ER14505	759182	A1	8,40
5	Battery AA 1,5 V Alkaline VARTA 4906	459099	A1	5,00
6	Battery AAA 1,5 V Alkaline VARTA 4003	739351	A1	5,00
	Coin cell CR1225	727310	A1	5,00
7	Coin cell CR1632	597814	A1	5,00
	Coin cell CR2032	347013	A1	5,00



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Hardware				
Item description	Item No.	Group	€	
EnOcean USB transceiver for airConfig/airScan (incl. airScan license)	566704		113,90	1
BLE dongle with micro-USB for devices USE-M / USE-L / NOVOS / thanos EVO	668262		32,10	2
USB interface for devices USE-M / USE-L / NOVOS / thanos EVO / SR06 LCD	597838	A1	39,50	3
USB interface RS485 (Modbus RTU Logger Software + licence)	809917		121,90	4
USB Interface RS485 (incl. driver CD)	668293		63,50	4
USB interface KNX	806190	A1	194,20	4



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Storage Media				
Item description	Item No.	Group	€	
microSD card 2 GB	500098	A1	13,80	



<b>Displays (DLF / DPL)</b>			
Item description	Item No.	Group	€
UD-A – universal display for 4..20 mA	718189	A1	101,80
UD-V – universal display for 0..10 V	775113	A1	101,80



<b>Special printing</b>			
Item description	Item No.	Group	€
Special printing – order quantity 20..49 pcs. (each per colour)			32,70
Special printing – order quantity 50..99 pcs. (each per colour)			24,50
Special printing setup and tool costs (once for one-colour print)	115049		221,30

<b>Special painting</b>			
Item description	Item No.	Group	€
Special painting			on request
Special painting setup costs (once per colour)	114998		390,00

<b>Special engraving / special lasering</b>			
Item description			€
Engraving/lasering			on request

## Inspection certificate 3.1 according to EN 10204

Depending on the application and the field of use, calibration certificates are becoming increasingly important in modern building automation as well as HVAC. Reasoned by physical characteristics, sensors are exposed to and wear off due to mechanical, chemical or thermal stress. Due to these external influences, the initial technical specifications can vary over the lifespan of a sensor. Calibration as a measuring process serves to determine and document the deviation of a sensor at the time of its calibration test compared to a certified reference device. Each device is issued its individual certificate according to DIN EN 10204 with the measured deviations. This document certifies, that the sensor complies with the accuracies defined in the data sheet at the time of manufacture/delivery. An adjustment/offset of the detected deviation is not conducted.

Measured value	Calibration range
Temperature:	-20..+90 °C
rH (relative humidity):	10..90% rH
Pressure (gases):	-100..+7000 Pa
Pressure (liquids):	on request
Thermowells:	on request on request

Material test reports		
Item description	Item No.	€
Inspection certificate 3.1 (EN 10204) temperature – 2 values	119030	on request
Inspection certificate 3.1 (EN 10204) humidity – 2 values	665407	on request
Inspection certificate 3.1 (EN 10204) pressure – 2 values	696647	on request
Additional measuring point		on request

### Note:

Calibration certificates according to DIN EN 10204 cannot be issued for the following products / measured variables:  
EasySens (EnOcean) | CO2 sensors | Temperature 1/10 DIN Class B | Room operating units / Thermostats

## » Sensor characteristics (Ohm)

Temp. °C	Pt100	Pt1000	Ni1000	Ni1000 Tk5000	KTY81-110	KTY81-121	KTY81-122
-50	80,31	803,10	743,00	790,88	515,00	505,00	525,00
-40	84,27	842,70	791,00	830,83	567,00	557,00	577,00
-30	88,22	882,20	842,00	871,69	624,00	614,00	634,00
-20	92,16	921,60	893,00	913,48	684,00	674,00	694,00
-10	96,09	960,90	946,00	956,24	747,00	737,00	757,00
0	100,00	1.000,00	1.000,00	1.000,00	815,00	805,00	825,00
10	103,90	1.039,00	1.056,00	1.044,79	886,00	876,00	896,00
20	107,79	1.077,90	1.112,00	1.090,65	961,00	951,00	971,00
25	109,74	1.097,40	1.141,00	1.113,99	1.000,00	990,00	1.010,00
30	111,67	1.116,70	1.171,00	1.137,61	1.040,00	1.030,00	1.050,00
40	115,54	1.155,40	1.230,00	1.185,71	1.122,00	1.112,00	1.132,00
50	119,40	1.194,00	1.291,00	1.234,97	1.209,00	1.199,00	1.219,00
60	123,24	1.232,40	1.353,00	1.285,44	1.299,00	1.289,00	1.309,00
70	127,07	1.270,00	1.417,00	1.337,14	1.392,00	1.382,00	1.402,00
80	130,89	1.308,90	1.483,00	1.390,12	1.490,00	1.480,00	1.500,00
90	134,70	1.347,00	1.549,00	1.444,39	1.591,00	1.581,00	1.601,00
100	138,50	1.385,00	1.618,00	1.500,00	1.696,00	1.686,00	1.706,00
110	142,29	1.422,00	1.688,00	1.556,98	1.805,00	1.795,00	1.815,00
120	146,06	1.460,60	1.760,00	1.615,36	1.915,00	1.905,00	1.925,00
130	149,82	1.498,20	1.853,00	1.675,18	2.023,00	2.013,00	2.033,00
140	153,58	1.535,80	1.909,00	1.736,47	2.124,00	2.114,00	2.134,00
150	157,31	1.573,10	1.987,00	1.799,26	2.211,00	2.201,00	2.221,00

Temp. °C	KTY81-210	FeT	LM235Z (mVolt)	BALCO 500	NTC1,6k	NTC1,8k	NTC2,2k
-50	1.030,00	-	-	382,10	-	-	-
-40	1.135,00	-	2.332,00	399,80	53.370,00	40.375,00	73.060,00
-30	1.247,00	1.934,70	2.432,00	418,00	28.173,00	22.906,00	38.550,00
-20	1.367,00	2.030,41	2.532,00	435,60	15.489,00	13.477,00	21.200,00
-10	1.495,00	2.127,68	2.632,00	453,30	8.840,00	8.198,00	12.110,00
0	1.630,00	2.226,53	2.732,00	471,00	5.222,00	5.141,00	7.162,00
10	1.772,00	2.327,01	2.832,00	488,70	3.184,00	3.315,00	4.372,00
20	1.922,00	2.429,15	2.932,00	497,30	1.999,00	2.193,00	2.747,00
25	2.000,00	2.480,86	2.982,00	506,30	1.600,00	1.800,00	2.200,00
30	2.080,00	2.533,00	3.032,00	523,60	1.289,00	1.486,00	1.773,00
40	2.245,00	2.638,60	3.132,00	541,30	851,90	1.028,00	1.173,00
50	2.417,00	2.745,99	3.232,00	558,50	576,10	726,00	793,00
60	2.597,00	2.855,23	3.332,00	576,20	397,90	522,00	548,00
70	2.785,00	2.966,36	3.432,00	593,40	280,20	382,00	386,00
80	2.980,00	3.079,42	3.532,00	610,60	200,90	284,00	276,00
90	3.182,00	3.194,47	3.632,00	627,80	146,50	214,00	201,00
100	3.392,00	3.311,56	3.732,00	645,10	108,50	164,00	149,00
110	3.607,00	3.430,75	3.832,00	662,30	81,50	127,00	112,00
120	3.817,00	3.552,09	3.932,00	679,10	62,10	99,00	85,00
130	4.008,00	3.675,65	-	696,30	47,90	-	66,00
140	4.166,00	3.801,48	-	713,10	37,40	-	51,00
150	4.280,00	3.929,65	-	-	29,50	-	40,00

Temp. °C	NTC3k	NTC3,3k	NTC5k	NTC5,369k	NTC-SAT	NTC10k	NTC10k PRE
-50	-	-	333.914,00	-	-	-	-
-40	102.690,00	109.600,00	167.835,50	116.300,00	9.709,00	333.110,00	243.625,00
-30	53.730,00	57.820,00	88.341,50	66.190,00	9.462,00	175.794,00	136.866,00
-20	29.346,00	31.800,00	48.487,00	39.100,00	9.063,00	96.645,00	79.603,00
-10	16.674,00	18.160,00	27.649,00	23.890,00	8.468,00	55.169,00	47.812,00
0	9.822,00	10.740,00	16.325,40	15.060,00	7.658,00	32.600,00	29.584,00
10	5.976,00	6.558,00	9.951,75	9.778,00	6.665,00	19.886,00	18.814,00
20	3.750,00	4.121,00	6.246,85	6.517,00	5.573,00	12.490,00	12.272,00
25	3.000,00	3.300,00	5.000,00	5.369,00	5.025,00	10.000,00	10.000,00
30	2.417,00	2.660,00	4.028,00	4.449,00	4.493,00	8.058,40	8.194,40
40	1.598,00	1.759,00	2.662,45	3.104,00	3.519,00	5.329,70	5.591,20
50	1.081,00	1.190,00	1.800,50	2.209,00	2.704,00	3.606,50	3.892,30
60	747,30	822,00	1.243,55	1.600,00	2.059,00	2.492,50	2.760,40
70	526,80	579,00	875,80	1.178,00	1.566,00	1.756,50	1.991,80
80	378,30	415,00	628,09	880,50	1.198,00	1.260,50	1.460,60
90	276,30	302,00	458,06	666,60	925,00	919,80	1.087,20
100	204,90	224,00	339,32	510,30	725,00	681,80	820,70
110	154,20	168,00	255,03	393,60	577,00	512,70	627,70
120	117,70	128,00	194,30	305,20	468,00	390,80	486,00
130	90,90	98,00	149,91	238,90	386,00	301,70	380,70
140	71,10	77,00	117,04	188,40	325,00	235,60	301,40
150	56,20	60,00	92,40	150,20	278,00	186,00	241,10

Temp. °C	NTC10-CAREL	NTC12k	NTC20k	NTC30k	NTC50k	NTC100k
-50	-	-	1.490.400,00	-	4.168.934,00	-
-40	186.796,00	396.422,72	803.200,00	1.219.114,00	2.033.606,00	3.216.000,00
-30	110.881,00	204.948,28	412.800,00	622.924,00	1.038.697,00	1.721.000,00
-20	67.683,00	111.626,16	220.600,00	331.871,00	553.243,00	955.400,00
-10	42.431,00	63.671,20	122.400,00	183.696,00	306.183,00	548.800,00
0	27.280,00	37.841,88	70.204,00	105.305,00	175.508,00	325.500,00
10	17.961,00	23.332,63	41.560,00	62.343,00	103.903,00	198.900,00
20	12.092,00	14.869,02	25.346,00	38.019,00	63.364,00	125.000,00
25	10.000,00	12.000,00	20.000,00	30.000,00	50.000,00	100.000,00
30	8.312,00	9.761,37	15.886,00	23.828,00	39.714,00	80.530,00
40	5.826,00	6.582,83	10.212,00	15.317,00	25.529,00	53.140,00
50	4.159,00	4.548,87	6.719,00	10.079,00	16.799,00	35.860,00
60	3.020,00	3.213,88	4.518,00	6.778,00	11.297,00	24.690,00
70	2.228,00	2.317,13	3.100,00	4.651,00	7.750,90	17.330,00
80	1.668,00	1.701,83	2.168,00	3.251,00	5.418,70	12.830,00
90	1.266,00	1.271,35	1.542,00	2.313,00	3.854,80	8.996,00
100	974,00	964,72	1.114,00	1.673,00	2.787,20	6.636,00
110	758,00	742,67	816,00	1.228,00	2.046,10	4.966,00
120	597,00	579,39	606,00	915,00	1.523,40	3.766,00
130	475,00	457,60	456,00	-	1.149,50	2.892,00
140	382,00	365,57	346,00	-	878,20	2.247,00
150	310,00	-	-	-	678,80	1.766,00

# Glossary



## OUTPUTS

<b>A, AA, 2A</b>	1 resp. 2 outputs 4..20 mA; output values depending on product
<b>V, VV, 3xV, 4xV or 2V, 3V, 4V</b>	1, 2, 3, 4 outputs 0..10 V; output values depending on product
<b>AS, AAS, VS, VVS</b>	1 resp. 2 active outputs + 1 passive output temperature (S)
<b>TRA</b>	output 4..20 mA, digit for measuring range temperature following
<b>TRV</b>	output 0..10 V, digit for measuring range temperature following
<b>TRA1/TRV1</b>	range -50..+50 °C
<b>TRA2/TRV2</b>	range -10..+120 °C
<b>TRA3/TRV3</b>	range 0..+50 °C
<b>TRA4/TRV4</b>	range 0..+160 °C
<b>TRA5/TRV5</b>	range 0..+250 °C
<b>TRA6/TRV6</b>	range 0..+400 °C
<b>TRA7/TRV7</b>	range 0..+600 °C
<b>TRA8/TRV8</b>	range -15..+35 °C
<b>MultiRange</b>	range adjustable at the device

## SI-PROTECTION

Changes in temperature are causing formation of humidity. Thus, there is a risk that the humidity can permeate in the contact point of the sensor. As a result, the sensor would corrode and oxygenate. Thus, the contact point would become unreliable.

The SI-Protection procedure provides the contact point with epoxy gum and a fluidized bed coating which unites with the insulation material of the wire. Thus, a complete unit is built protecting the sensor against vibrations and humidity.



## DUAL CHANNEL – SELF CALIBRATION

Dual Channel self calibration utilizes an independent 2nd optical beam to compare and reference the measuring beam. Because the 2nd beam is used only once a day it will wear off much less resulting in a negligible error. Contrary to products using the commonly used ABC-Logic™, dual channel sensors can be used for all applications including hospitals, casinos, horticulture and livestock etc, which are in use 24/7.

## COMMUNICATION

<b>EasySens®</b>	Thermokon radio based on EnOcean IEC 14543-3-10
<b>BACnet</b>	RS485 BACnet (MS/TP), communication protocol specifically designed for building automation; BACnet IP, if mentioned in catalogue
<b>Casambi®</b>	Casambi® interface (BLE 2,4 GHz)
<b>KNX</b>	EIB-KNX interface
<b>LON</b>	LON FTX, communication protocol specifically designed for building automation; other standards, if mentioned in catalogue
<b>LoRaWAN®</b>	LoRaWAN® interface (868 MHz)
<b>Modbus</b>	RS485 Modbus RTU

## ROOM OPERATING UNITS: OPERATING ELEMENTS

<b>P</b>	potentiometer (setpoint adjustment)
<b>MS</b>	slide switch
<b>S</b>	switch (e.g. for fan stages)
<b>T</b>	button (e.g. for occupancy status)
<b>D</b>	LED
<b>LCD</b>	inclusive display
<b>TLF</b>	traffic light function indicating air quality via LED(s)
<b>AZ</b>	Automatic zero-point calibration

# TERMS AND CONDITIONS

## Orders

We will gladly take your order by phone, email or facsimile, using either the product name or item number from the catalogue. Please do not hesitate to contact us for technical support or support with specific applications or sensor technology.

## Delivery Time

We keep stock of a large number of standard sensors, so that we can provide an excellent and quick lead time. Products are often shipped immediately after receipt of order. Delivery times for larger quantities or custom designs are available on request.

## Pricing

All prices are list prices in € and do not include value added tax. Prices are valid from 1<sup>st</sup> April 2026. All previous prices become obsolete.

## Delivery Conditions

Our standard delivery terms are ex-works (EXW) by parcel services or forwarders, excluding costs for insurance.

## Product return

Thermokon stock products can be returned within a period of 6 months after delivery for 2/3 credit of the initial purchase price. Only unused products in original packing will be accepted. Custom manufactured products such as room sensors with control elements, custom engraving, custom varnish or custom printing can not be returned.

**Our general terms & conditions as well as warranty conditions can be sent to you upon request. The entire catalogue is subject to technical and price changes; no responsibility is taken for the accuracy of these information. Illustrations may vary.**

# 5 YEARS WARRANTY ON ALL PRODUCTS!



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HOME OF SENSOR TECHNOLOGY

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