

Product Overview Building Services Engineering

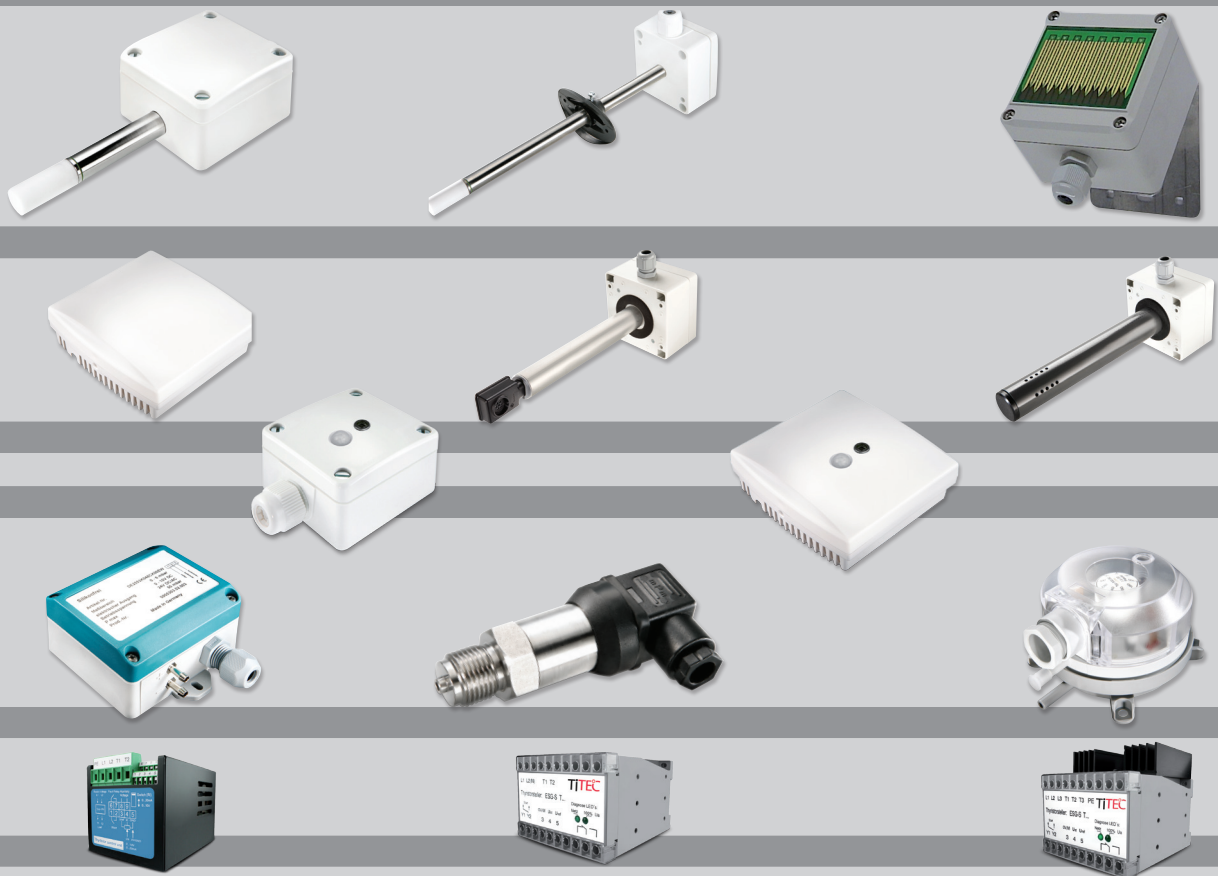
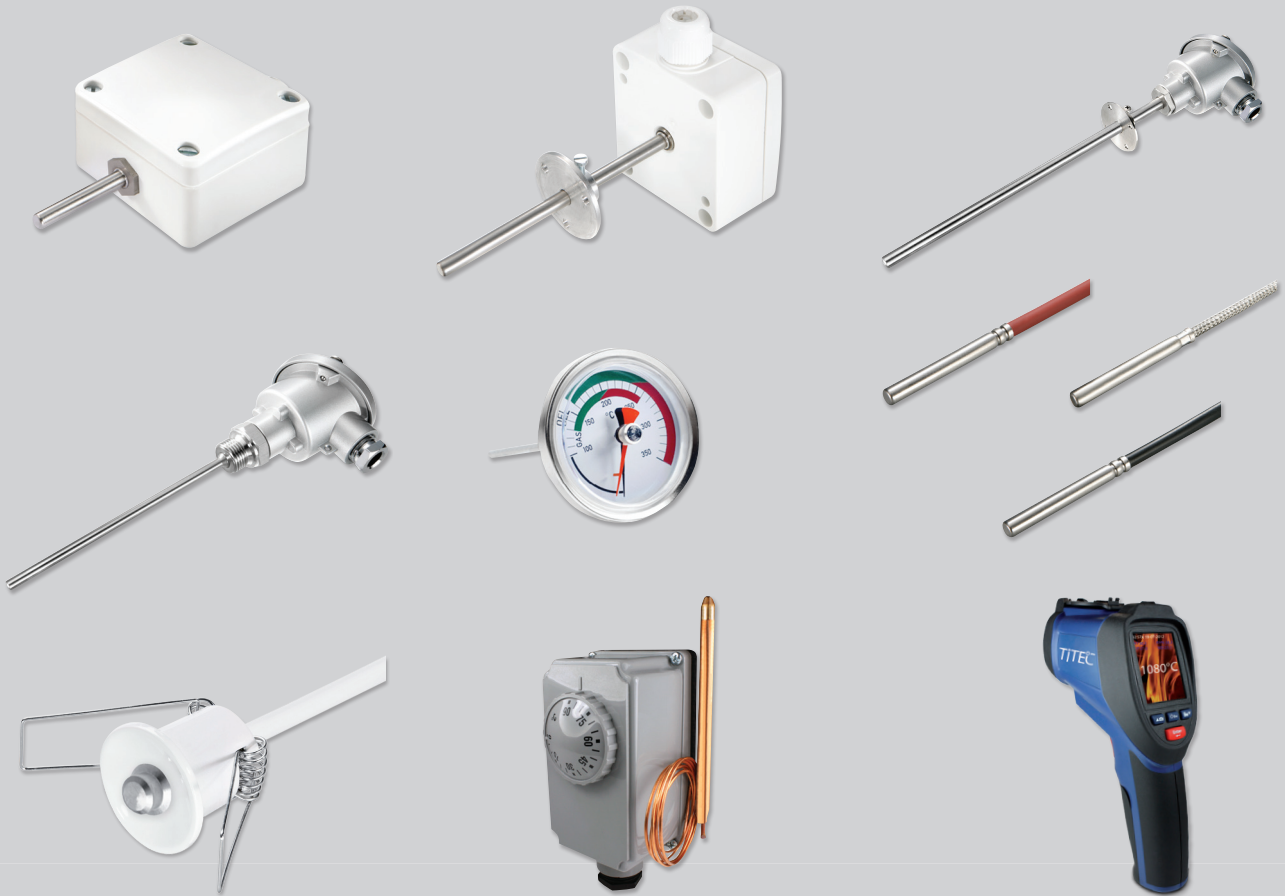
Issue 2013/2014

MADE IN
GERMANY

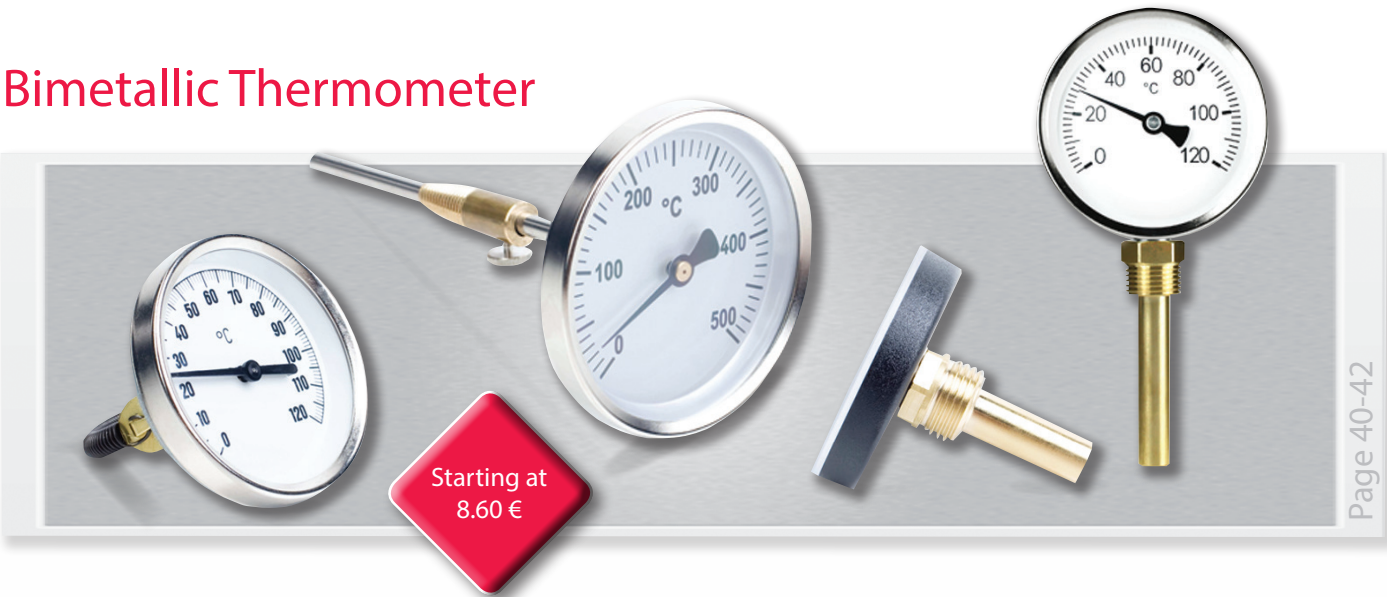


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Product Examples



Bimetallic Thermometer



Thyristor Controller



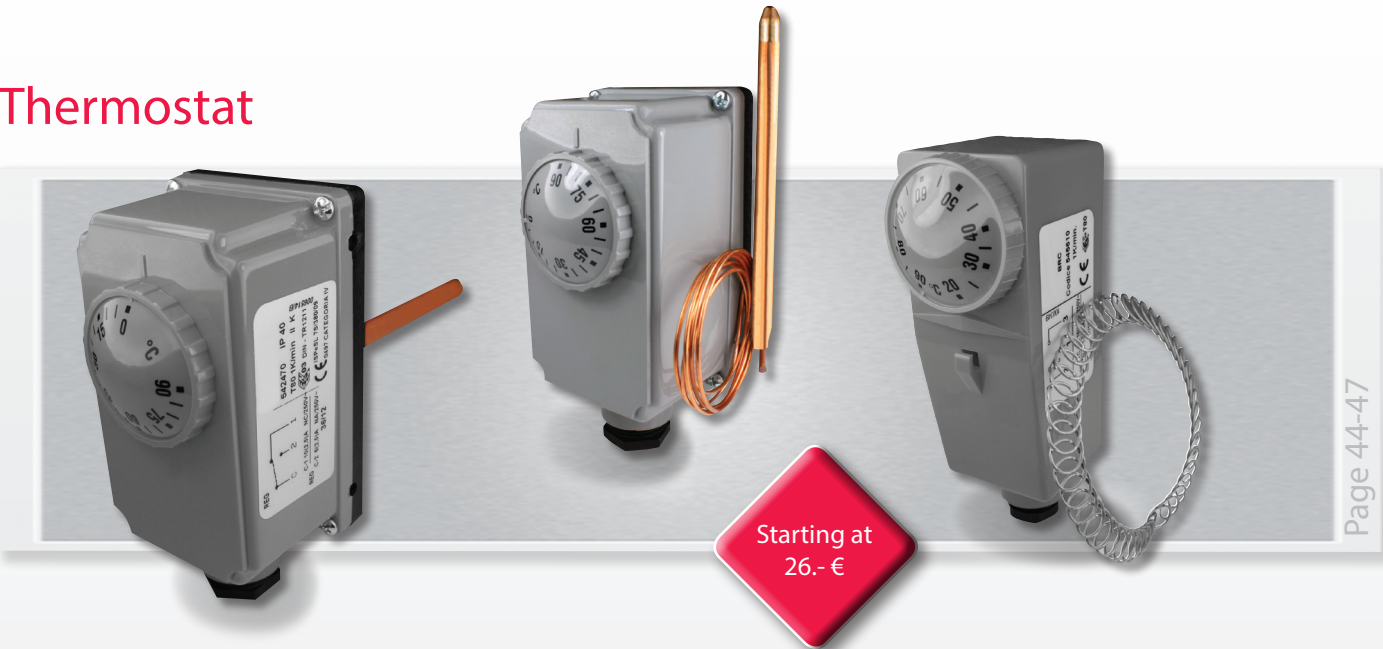
Infrared Thermometer



Temperature Controller



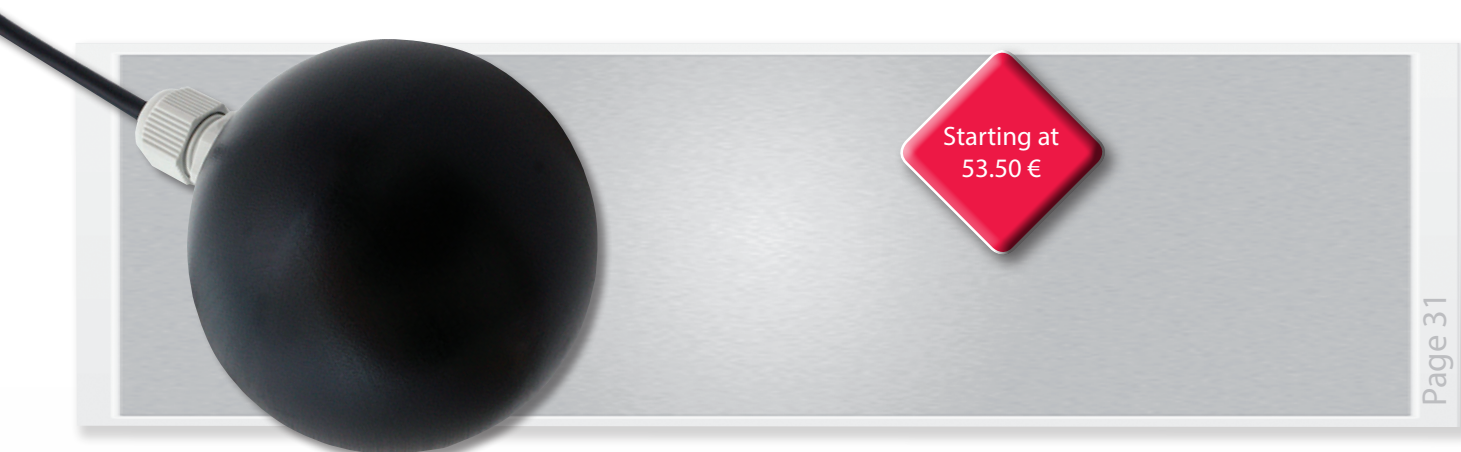
Thermostat



Motion / Light Sensor



Radiation Pendulum Sensor



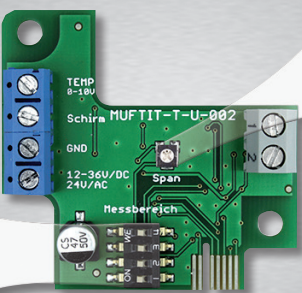
Freeze Protection Thermostat



Air Quality Sensor for Living Spaces



Temperature Measurement Transducer



The image shows a green printed circuit board (PCB) for a temperature measurement transducer. It features a blue terminal block on the left with four terminals labeled 'TEMP 8-18V', 'GND', '12-36V/DC 24V/AC', and 'Span'. A small circular inset shows a close-up of a component on the board, labeled 'Offset'. Another inset shows a DIP switch with four positions labeled 'ON', 'WE', '1', '2', '3', '4', with a label 'DIP switch For 12 measuring ranges'. The PCB is labeled 'Schirmer MUFTIT-T-U-002' and 'Messbereich'.

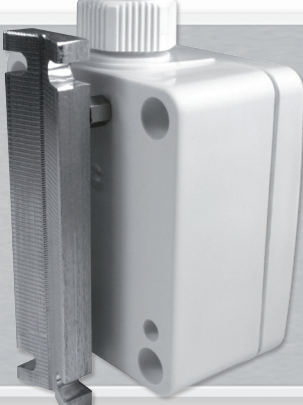
DIP switch
For 12 measuring ranges

Offset

Starting at 270.-€

Page 50

Condensation Monitor



The image shows a white, rectangular condensation monitor with a metal mounting bracket on the left side. A red diamond-shaped callout indicates the starting price.

Starting at 48.60 €

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Air Quality Sensor (flush-mounted)



The image shows a white, square air quality sensor with a flush-mounted design. A red diamond-shaped callout indicates the starting price.

Starting at 54.- €

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The company

Company history

Thermotec

1992 Slobodan Tomasev originally establishes the company under the name Thermotec.

The company specializes in the production and distribution of gas analysis probes and temperature sensors sold on-premise.

1994 Premises with an overall space of 100 m² are rented, the production is expanded by adding turned and milled parts used for temperature measurement to the portfolio.

1996 The production area is expanded to 250 m².

2000 The new building with a plot space of 1200 m² is commissioned for the first time. The machinery is expanded by various laser and welding machines as well as machines for turning and milling. By now the company has 10 employees.

2003 **TiTEC®TemperaturmesstechnikGmbH** The company TiTEC® Temperaturmesstechnik GmbH is established by Oliver Tomasev. The company specializes in developing and manufacturing measurement products.

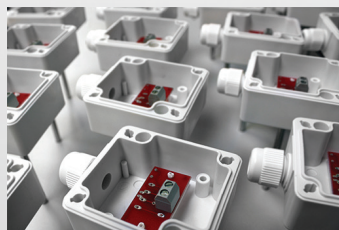
2007 Thermotec is integrated into TiTEC® Temperaturmesstechnik GmbH. An additional production area with an overall space of 500 m² is taken into operation.

2009 The merchandise planning and control system SAP is introduced.

2010 TiTEC® Temperaturmesstechnik GmbH becomes a registered trademark.

2011 A new building with a plot area of 6000 m² is under construction.

2012 The new area is taken into operation, the office, warehouse and production space is now around 3.000 m² large. By now the company has 45 employees.





A new building

In order to be true to designated use of our products and in an effort to protect the environment, the new building is equipped with a roof mounted photovoltaic system. The building itself is completely heated by teleheating. By means of efficient isolation methods, the requirements of the energy saving regulations for new buildings could be undershot by far. The primary energy demand is 51 kWh/(m²*a).

Made in Germany

German quality
applied worldwide

The TITEC® Temperaturmesstechnik GmbH develops and produces high quality temperature sensors and system components for industrial, laboratory, scientific and building engineering purposes for the entire European market.

Be it series or individual production, all processes are undertaken within our own facilities. Our in-house production allows for highest product quality and the advantages of independent delivery, a service which is much appreciated by our customers.

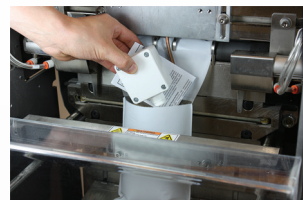
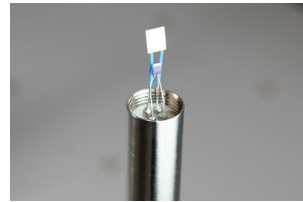


Because quality
is a standard for us



Our qualified personnel is well-trained and able to manufacture state-of-the-art products, thereby creating quality products to meet the most challenging demands. Just give us a call, and we will be happy to help you find a solution to your individual measuring task.

All products are available even in small quantities and without minimum purchase value.

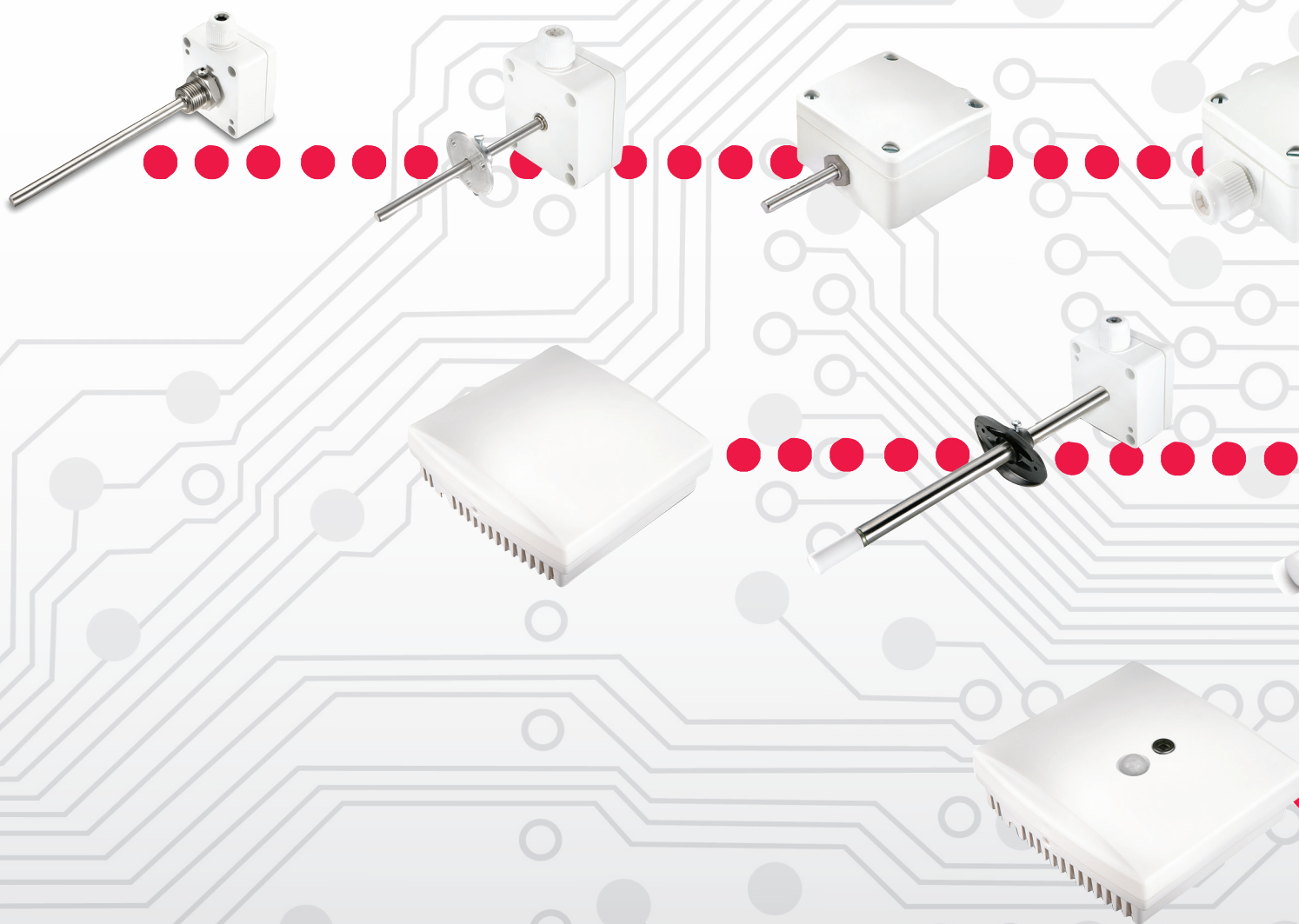


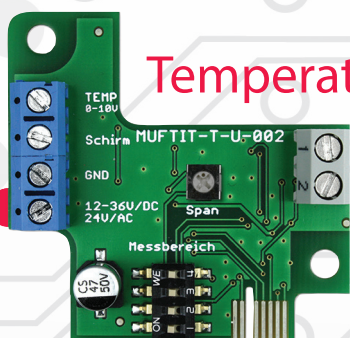
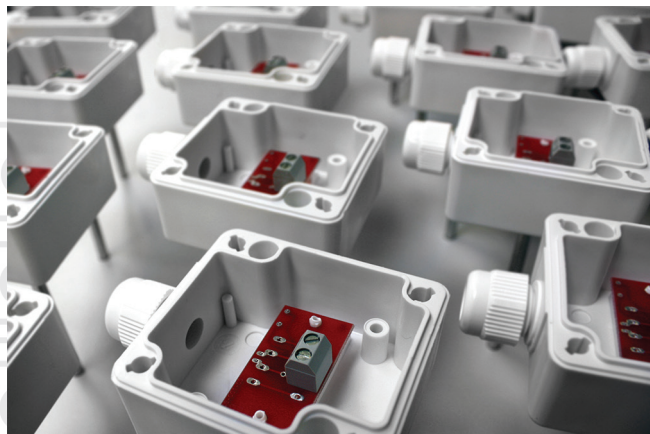
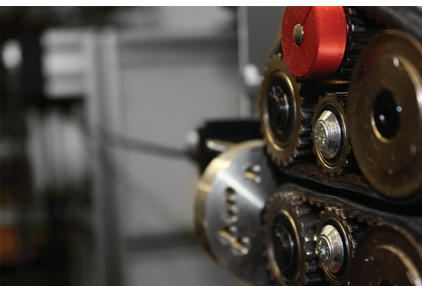
Since we highly trust our own products, we can gladly offer you a 3-year-warranty on certain products. This applies to all products marked with the warranty logo.



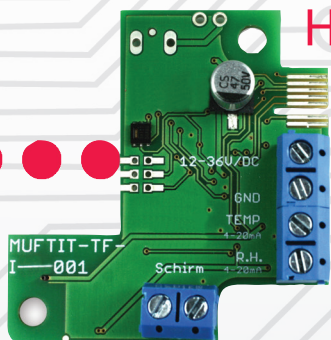
TiTEC® takes a step further in the field of building automation

We aim to offer you the best solution to lower your energy demand. A further criterion for us is to make your building automation project as economical as possible. In order to be able to offer you cost advantages in this highly competitive market of the building industry we have started to develop and produce our electrical components such as measuring transducers for temperature, humidity, air quality as well as light and motion sensors at our facility in Bräunlingen (Germany).

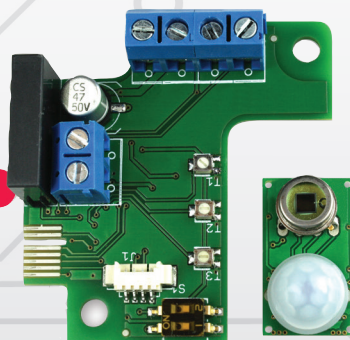




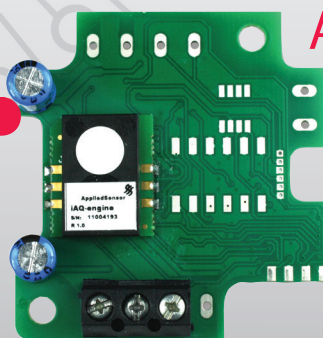
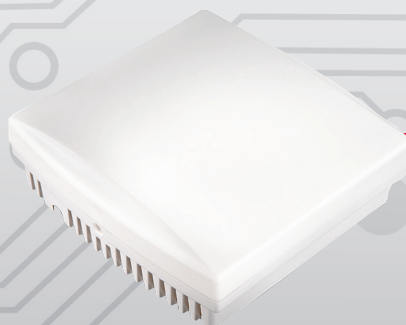
Temperature



Humidity



Light and motion



Air quality

Quality from a single source!



QUALITY FROM
A SINGLE SOURCE!

Directly from the
manufacturer



Flexibility and competence are our guiding theme

With 20 years of experience, we are able to understand customer needs precisely and to put them into practice quickly. Just give us a call and we will be happy to help you.



Labeling

If you wish so, we will label our sensors with your individual company logo or Article descriptions, be it in pad printing, via laser marking or in form of a plain label. Feel free to contact us!



Calibration service

WKS certificates (Standard Calibration Certificate)

Calibration can be traced back to a federal standard norm and is used for the following applications (among others): Documentation of individual measuring points, in-house sensor documentation, accuracy certification.

ISO certificates

In accordance with the requirements of ISO 9000:2000, ISO 10012-1, GMP, CFR, VDA, QS9000, ISO TS 16949, HACCP.

DKD certificates

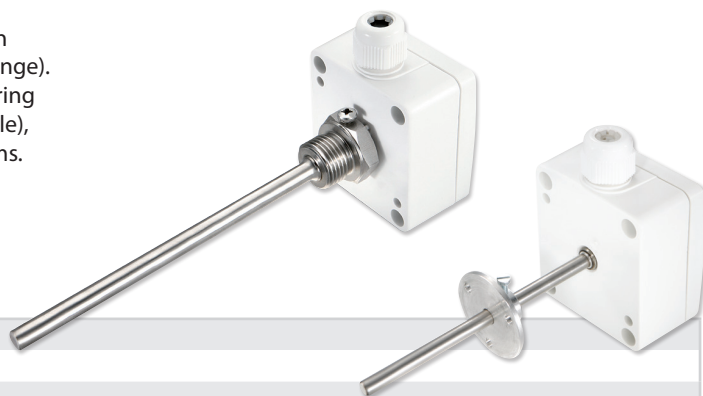
Applicable for factory and utility norms, f.ex. authorized experts, pharmaceutical, test laboratories.



Duct/Immersion Temperature Sensor - KNTF

Application

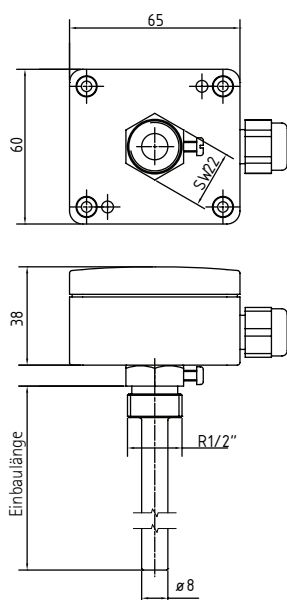
Apparatus for measuring the temperature in liquid (in combination with an immersion sleeve) or gaseous media (when combined with a mounting flange). The fields of application are heating, ventilation and refrigeration engineering as well as air-conditioning. With the help of the respective sensors (see table), the device can be connected to all conventional control and display systems.



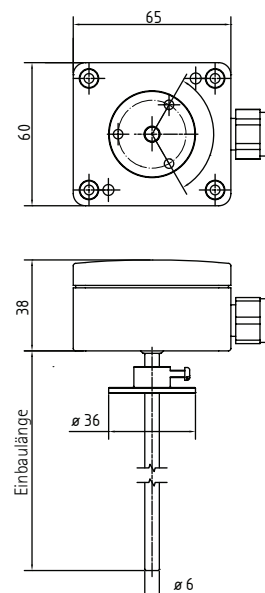
Technical Data

Measuring range (peak):	-50°C...+180°C - depending on sensor
Tmax. Casing:	+100°C
Sensor:	according to customer request (see table)
Switching mode:	2-wire connection (standard)
Terminal:	Screw clamps max to 1.5 mm ²
Casing:	PA6 15% GK, Colour RAL 9010
Protective tube: :	ø 6 mm
Dimensions (l x w x h):	65 x 60 x 38 mm
Protection class:	IP65

Dimension Drawing KNTF with Brass Immersion Sleeve



Dimension Drawing KNTF with Flange



Price List (Product Group 1)

Fitting length

Sensor type	50 mm	100 mm	150 mm	200 mm	300 mm	400 mm
PT100	24.00 €	25.00 €	26.00 €	27.00 €	28.00 €	29.00 €
PT100 1/3DIN	26.00 €	27.00 €	28.00 €	29.00 €	30.00 €	31.00 €
PT1000	24.00 €	25.00 €	26.00 €	27.00 €	28.00 €	29.00 €
PT1000 1/3DIN	26.00 €	27.00 €	28.00 €	29.00 €	30.00 €	31.00 €
Ni1000	26.00 €	27.00 €	28.00 €	29.00 €	30.00 €	31.00 €
Ni1000TK5000	26.00 €	27.00 €	28.00 €	29.00 €	30.00 €	31.00 €
NTC 5k. 10k. 20k. Precon. KTY81-210	22.00 €	23.00 €	24.00 €	25.00 €	26.00 €	27.00 €
NTC 1.8 kOhm	24.00 €	25.00 €	26.00 €	27.00 €	28.00 €	29.00 €
LM235Z	24.00 €	25.00 €	26.00 €	27.00 €	28.00 €	29.00 €
Surcharges:						
Mounting Flange (MF)	4.00 €	4.00 €	4.00 €	4.00 €	4.00 €	4.00 €
Brass immersion sleeve (Ms)	6.00 €	7.00 €	8.00 €	9.00 €	10.00 €	11.00 €
Stainless steel immersion sleeve (VA)	11.00 €	12.00 €	13.00 €	14.00 €	15.00 €	16.00 €
Measuring transducer 4-20 mA (MUA) 3-wire	54.00 €	54.00 €	54.00 €	54.00 €	54.00 €	54.00 €
Measuring transducer 0-10 V (MUV) 3-wire	54.00 €	54.00 €	54.00 €	54.00 €	54.00 €	54.00 €

Order example: Immersion Temperature Sensor with PT100-sensor, 150 mm brass immersion sleeve and 0-10V measuring transducer = KNTF/PT100/150/Ms

Special models available on demand. Please inquire in advance.

Duct Temperature Sensor (fast response time) - KNTFS

Application

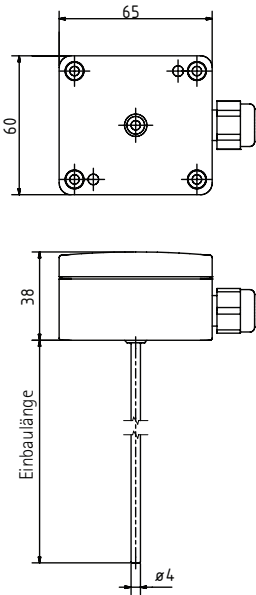
Apparatus for measuring the temperature in gaseous media (when combined with a mounting flange). The fields of application are heating, ventilation and refrigeration engineering as well as air-conditioning. With the help of the respective sensors (see table) , the device can be connected to all conventional control and display systems.



Technical Data

Measuring range (peak):	-50°C...+180°C - depending on sensor
Tmax. casing:	+100°C
Sensor:	according to customer request (see table)
Switching mode:	2-wire connection (standard)
Protective tube: :	VA 1.4571, ø 4 mm
Terminal:	Screw clamps max. 1.5 mm ²
Casing:	polyamide, pure white (quick release cover)
Dimensions (l x w x h):	65 x 60 x 38 mm
Protection class:	IP65
Response time t90:	20 seconds

Dimension Drawing KNTFS Duct Temperature Sensor



Pice List (Product Group 1)

Sensor type	Fitting Length					
	50 mm	100 mm	150 mm	200 mm	300 mm	400 mm
PT100	24.00 €	25.00 €	26.00 €	27.00 €	28.00 €	29.00 €
PT100 1/3DIN	26.00 €	27.00 €	28.00 €	29.00 €	30.00 €	31.00 €
PT1000	24.00 €	25.00 €	26.00 €	27.00 €	28.00 €	29.00 €
PT1000 1/3DIN	26.00 €	27.00 €	28.00 €	29.00 €	30.00 €	31.00 €
Ni1000	26.00 €	27.00 €	28.00 €	29.00 €	30.00 €	31.00 €
Ni1000TK5000	26.00 €	27.00 €	28.00 €	29.00 €	30.00 €	31.00 €
NTC 5k, 10k, 20k, Precon	22.00 €	23.00 €	24.00 €	25.00 €	26.00 €	27.00 €
NTC 1.8 kOhm	24.00 €	25.00 €	26.00 €	27.00 €	28.00 €	29.00 €
Surcharges:						
Mounting flange (MF)	4.00 €	4.00 €	4.00 €	4.00 €	4.00 €	4.00 €
Measuring transducer 4-20 mA (MUA) 3-wire	54.00 €	54.00 €	54.00 €	54.00 €	54.00 €	54.00 €
Measuring transducer 0-10 V (MUV) 3-wire	54.00 €	54.00 €	54.00 €	54.00 €	54.00 €	54.00 €

Order example: Immersion Temperature Sensor with PT100-sensor, 150mm brass immersion sleeve = KNTFS/PT100/150/Ms

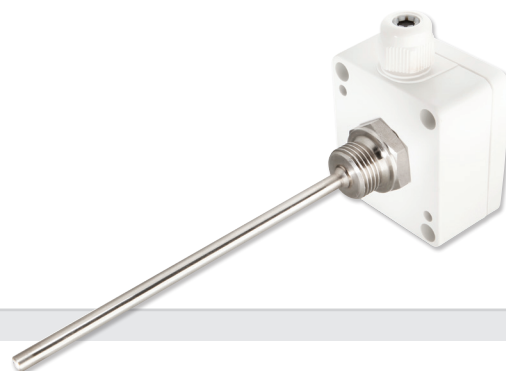
Special models available on demand. Please inquire in advance.



Screw-Connect/Immersion Temperature Sensor - ENTf

Application

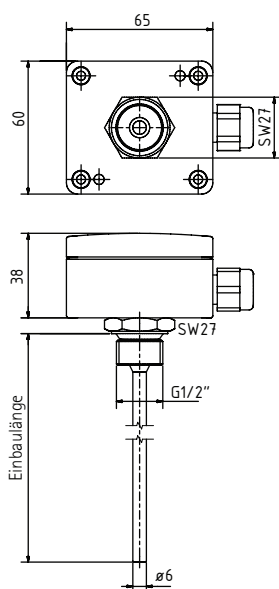
Apparatus for measuring the temperature in liquid media. The fields of application are heating, ventilation and refrigeration engineering as well as air-conditioning. With the help of the respective sensors (see table), the device can be connected to all conventional control and display systems.



Technical Data

Measuring range (peak):	-50°C...+180°C - depending on sensor
Tmax. Casing:	+100°C
Sensor:	according to customer request (see table)
Switching mode:	2-wire connection (standard)
Protective tube:	VA 1.4571, ø 6 mm
Terminal thread:	G 1/2"
Terminal:	screw clamps, max. 1.5 mm ²
Casing:	polyamide, pure white (quick release cover)
Dimensions (l x w x h):	65 x 60 x 38 mm
Protection class:	IP65

Dimension drawing ENTf



Price List (Product Group 1)

Fitting Length

Sensor type	50 mm	100 mm	150 mm	200 mm	300 mm	400 mm
PT100	34.00 €	35.00 €	36.00 €	37.00 €	38.00 €	39.00 €
PT100 1/3DIN	36.00 €	37.00 €	38.00 €	39.00 €	40.00 €	41.00 €
PT1000	34.00 €	35.00 €	36.00 €	37.00 €	38.00 €	39.00 €
PT1000 1/3DIN	36.00 €	37.00 €	38.00 €	39.00 €	40.00 €	41.00 €
Ni1000	36.00 €	37.00 €	38.00 €	39.00 €	40.00 €	41.00 €
Ni1000TK5000	36.00 €	37.00 €	38.00 €	39.00 €	40.00 €	41.00 €
NTC 5k, 10k, 20k, Precon,	32.00 €	33.00 €	34.00 €	35.00 €	36.00 €	37.00 €
NTC 1.8 kOhm	34.00 €	35.00 €	36.00 €	37.00 €	38.00 €	39.00 €
LM235Z	34.00 €	35.00 €	36.00 €	37.00 €	38.00 €	39.00 €
Surcharges:						
Measuring transducer 4-20 mA (MUA) 3-wire	54.00 €	54.00 €	54.00 €	54.00 €	54.00 €	54.00 €
Measuring transducer 0-10 V (MUV) 3-wire	54.00 €	54.00 €	54.00 €	54.00 €	54.00 €	54.00 €

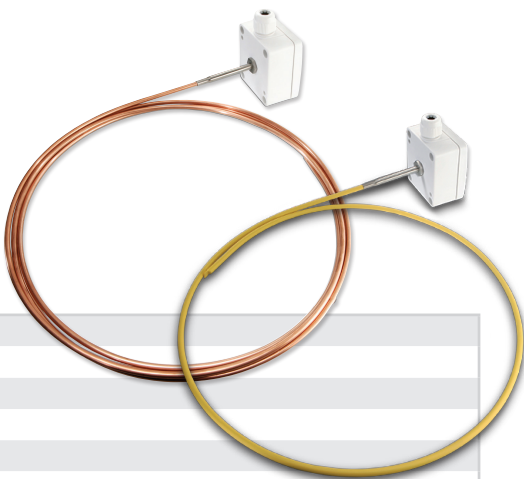
Order example: Immersion Temperature Sensor with PT100-sensor, 150mm brass immersion sleeve = ENTf/PT 100/150/Ms

Special models available on demand. Please inquire in advance.

Mean Value Temperature Sensor - MWTF

Application

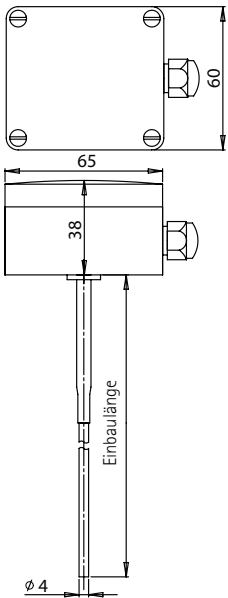
Apparatus for measuring the temperature of gaseous media such as in ducts of ventilation systems (in combination with a mounting flange). With the help of the respective sensors (see table) , the device can be connected to all conventional control and display systems.



Technical Data

Measuring range (sensor capillary):	-30°C...+80°C
Tmax. casing:	+100°C
Sensor:	according to customer request (see table)
Sensor capillary:	4 x 0.5 mm copper (medium hard), length: (see table)
Neck pipe:	60 mm made from VA steel Ø 6 mm
Switching mode:	2-wire connection (standard)
Terminal:	screw clamps, max. 1.5 mm ²
Casing:	PA6 15% GK, Colour RAL 9010
Dimensions (l x w x h):	65 x 60 x 38 mm
Protection class:	IP65
Accessories (optional):	Mounting brackets, mounting flange

Dimension drawing MWTF



Mounting brackets



Mounting flange

Price List (Product Group 1)

Price List (Product Group 1)	Fitting Length (blank) "B"			Fitting length (shrunk) "S"		
Sensor type	3 m	6 m	10 m	3 m	6 m	10 m
PT100	93.60 €	131.40 €	203.40 €	99.00 €	140.70 €	221.40 €
PT1000	96.60 €	132.90 €	207.30 €	102.00 €	143.70 €	225.60 €
Ni1000	96.60 €	132.90 €	207.30 €	102.00 €	143.70 €	225.60 €
Ni1000TK5000	96.60 €	132.90 €	207.30 €	102.00 €	143.70 €	225.60 €
Accessories						
Mounting brackets MK (6 units)	6.00 €					
Mounting flange MF	4.00 €					
Surcharges:						
Measuring transducer 4-20 mA (MUA) 3-wire	54.00 €					
Measuring transducer 0-10 V (MUV) 3-wire	54.00 €					

Order example: Mean Value Temperature Sensor with Ni1000 sensor and 3 m sensor capillary (blank) = MWTF/Ni1000/3/B

Special models available on demand. Please inquire in advance.

Outdoor Temperature Sensor - AUTF

Application

Apparatus for measuring the temperature in outdoor areas. With the help of the respective sensors (see table), the device can be connected to all conventional control and display systems.

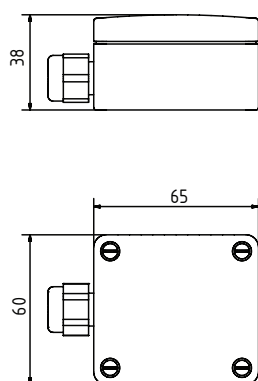
Note: The AUTF is not equipped with WPC.



Technical Data

Measuring range:	-50°C...+100°C (Standard)
Sensor:	according to customer request (see table)
Switching mode:	2-wire connection (standard)
Terminal:	Screw clamps, max. 1.5 mm ²
Casing:	PA6 15% GK, color RAL 9010
Dimensions (l x w x h):	65 x 60 x 38 mm
Sleeve length (AUTFext):	42 mm
Protection class:	IP65

Dimension drawing AUTF



Price List (Product Group 1)

	AUTF
Sensor type	
PT100	12.00 €
PT100 1/3DIN	14.00 €
PT1000	12.00 €
PT1000 1/3DIN	14.00 €
Ni1000	14.00 €
Ni1000TK5000	14.00 €
NTC 5k, 10k, 20k, Precon, KTY81-210	10.00 €
NTC 1.8k Ohm	12.00 €
LM235Z	12.00 €
Surcharges:	
Measuring transducer 4-20 mA (MUA) 3-wire	54.00 €
Measuring transducer 0-10 V (MUV) 3-wire	54.00 €

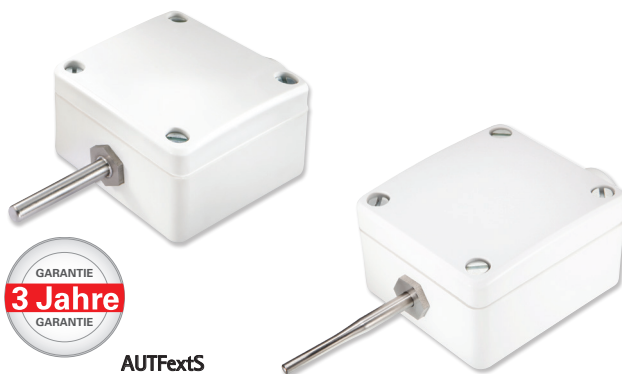
Order example: Outdoor Temperature Sensor with Ni1000 sensor = AUTF/Ni100

Special models available on demand. Please inquire in advance.

Outdoor Temperature Sensor - AUTFext/AUTFextS

Application

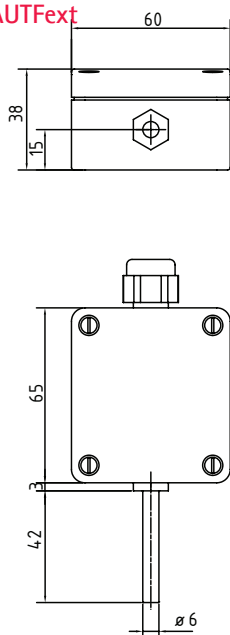
Apparatus for measuring the temperature in outdoor areas. The AUTF/ ext is well suited for temperature measurements within warehouses and production halls where a higher degree of protection is required. The sensor of the AUTF/extS is molded with a tapered external filter sleeve, allowing for a faster response characteristic. With the help of the respective sensors (see table) , the device can be connected to all conventional control and display systems.



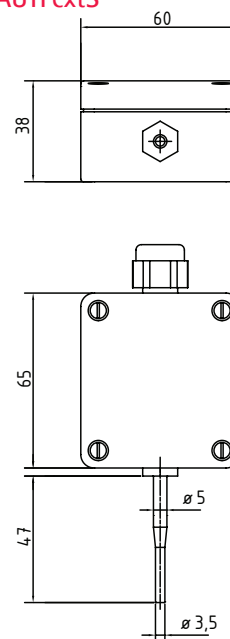
Technical Data

	AUTFext	AUTFextS
Measuring range:	-50°C...+100°C (Standard)	-50°C...+100°C (Standard)
Sensor:	according to customer request (see table)	according to customer request (see table)
Switching mode:	2-wire connection	2-wire connection
Terminal:	Screw clamps, max. 1.5 mm ²	Screw clamps, max. 1.5 mm ²
Casing:	Polyamide, pure white (quick release cover)	Polyamide, pure white (quick release cover)
Dimensions (l x w x h):	65 x 60 x 38 mm	65 x 60 x 38 mm
Sleeve length (AUTFext):	6 x 42 mm	5 x 47 mm verjüngt auf 3,5 x 25 mm
Protection class:	IP65	IP65
Response time _{τ0} :	20 seconds	16 Seconds

Dimension drawing AUTFext



Dimension drawing AUTFextS



Price List (Product Group 1)

	AUTFext	AUTFextS
Sensor type		
PT100	22.00 €	27.00 €
PT100 1/3DIN	26.00 €	31.00 €
PT1000	22.00 €	27.00 €
PT1000 1/3DIN	26.00 €	31.00 €
Ni1000	26.00 €	31.00 €
Ni1000TK5000	26.00 €	31.00 €
NTC 5k, 10k, 20k, Precon	18.00 €	31.00 €
KTY81-210	18.00 €	
NTC 1.8k Ohm	22.00 €	31.00 €
LM235Z	22.00 €	
Surcharges:		
Measuring transducer 4-20 mA (MUA) 3-wire	54.00 €	54.00 €
Measuring transducer 0-10 V (MUV) 3-wire	54.00 €	54.00 €

Order example: Outdoor Temperature Sensor with Ni1000 sensor = AUTFext/ Ni1000

Special models available on demand. Please inquire in advance.



Room Temperature Sensor (surface-mounted) - RTF3/RTFVA

Application

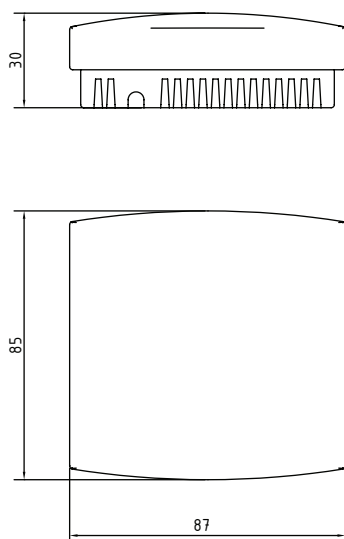
Apparatus for measuring the temperature in living and office spaces, reception halls, foyers etc. With the help of the respective sensors (see table), the device can be connected to all conventional control and display systems.



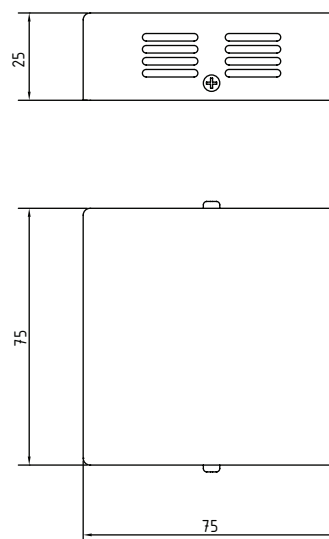
Technical Data

	RTF3	RTFVA
Measuring range:	-35°C...+70°C	-35°C...+70°C
Tmax Casing:	+100°C	+100°C
Sensor:	according to customer request (see table)	according to customer request (see table)
Switching mode:	2-wire connection (standard)	2-wire connection (standard)
Terminal:	screw clamps, max. 1.5 mm	screw clamps, max. 1.5 mm
Casing:	ABS in RAL9010	Stainless steel 1.4571
Dimensions (l x w x h):	85 x 87 x 30 mm	75 x 75 x 25 mm
Protection class:	IP20	IP20

Dimension drawing RTF3



Dimension drawing RTFVA



Price List (Product Group 1)

	RTF3	RTFVA
Sensor type		
PT100	16.00 €	58.00 €
PT100 1/3DIN	18.00 €	60.00 €
PT1000	16.00 €	58.00 €
PT1000 1/3DIN	18.00 €	60.00 €
Ni1000	16.00 €	58.00 €
Ni1000TK5000	16.00 €	58.00 €
Fet	24.00 €	66.00 €
NTC 5k, 10k, 20k, Precon	14.00 €	56.00 €
NTC 1.8 kOhm	16.00 €	58.00 €
LM235Z	16.00 €	58.00 €
Surcharges:		
Measuring transducer 4-20 mA (MUA) 3-wire	54.00 €	54.00 €
Measuring transducer 0-10 V (MUV) 3-wire	54.00 €	54.00 €

Order example: Room Temperature Sensor 3 with Ni1000 sensor
= RTF3/Ni1000

Special models available on demand. Please inquire in advance.

Room Temperature Sensor with Control Element - RTF1xxx

Application

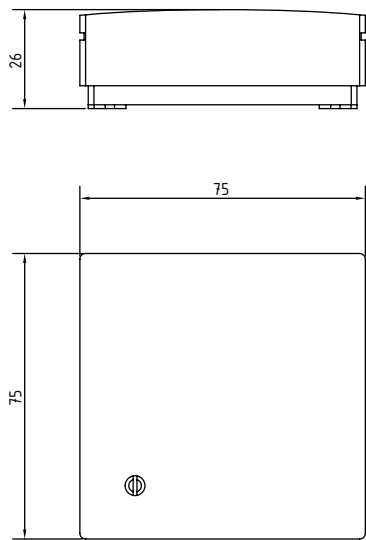
Apparatus for measuring the temperature in living and office spaces, reception halls, foyers etc. With the help of the respective sensors (see table), the device can be connected to all conventional control and display systems. The room temperature sensors are available with various control elements like a potentiometer, LED, pushbutton and rotary switch.



Technical Data

Temperature sensors:	Pt100, Pt1000, Ni1000, Ni1000TK5000 (L+G), NTC10k, NTC20k, PRECON, LM235Z
Power supply:	24 V AC/DC (with potentiometer)
Potentiometer:	1 kOhm
Pushbutton:	Make contact, 24 V/AC; 130 mA
LED:	24 V DC, 8 mA
Rotary switch:	24 V AC; 130 mA -0; 1; 2; 3
Casing:	Plastic, colour pure white (RAL9010)
Dimensions (l x w x h):	85 x 87 x 30 mm
Measuring range Temp.:	0°C...+50°C
Connection:	screw clamps, max. 1.5 mm ²
Switching mode (sensor):	2-wire connection (standard)
Storage temperature:	-30°C...+50°C
Operating temperature:	-30°C...+60°C
Protection class:	IP20

Dimension drawing RTF1



Price List (Product Group 2)

RTF1xxx

Sensor type	Item Price	Price
RTF1/Sensor	Room Temperature Sensor	17.50 €
RTF1/Sensor/P	Room Temperature Sensor with 1 kOhm potentiometer	44.60 €
RTF1/Sensor/L/T	Room Temperature Sensor with LED (green) and pushbutton	43.80 €
RTF1/Sensor/P/S	Room Temperature Sensor with potentiometer and rotary switch 0; 1; 2; 3	60.00 €
RTF1/Sensor/P/T/L	Room Temperature Sensor with potentiometer, pushbutton and LED (green)	56.30 €
RTF1/Sensor/P/S/2L	Room Temperature Sensor with potentiometer, 2 LEDs (green, red) and rotary switch 0; 1; 2; 3	75.80 €

Order example: Room Temperature Sensor with Ni1000 sensor, potentiometer and pushbutton = RTF1/Ni1000/P/T/L

Special models available on demand. Please inquire in advance.



Room Temperature Sensor with Control Element - RTF3xxx

Application

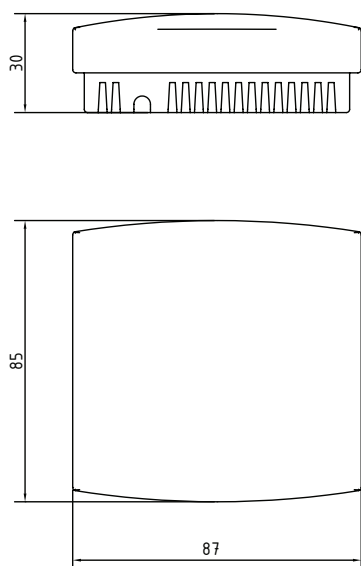
Apparatus for measuring the temperature in living and office spaces, reception halls, foyers etc. With the help of the respective sensors (see table), the device can be connected to all conventional control and display systems. The room temperature sensors are available with various control elements like a potentiometer, LED, pushbutton and a 5-step slide switch.



Technical Data

Temperature sensors:	Pt100, Pt1000, Ni1000, Ni1000TK5000 (L+G), NTC10k, NTC20k, PRECON, LM235Z or active output 0-10 V
Power supply:	24 V AC/DC
Potentiometer:	0-10 V, 1 kOhm, 5 kOhm, 10 kOhm
Pushbutton:	10 mA, 35 V DC
LED:	24 V/DC in green, yellow and red
5-step slide switch:	
Casing:	ABS, colour white (RAL9010)
Dimensions (l x w x h):	85 x 87 x 30 mm
Measuring range Temp.:	0°C...+50°C
Connection:	Screw clamps, max. 1,5 mm ²
Switching mode (sensor):	2-wire connection (standard)
Storage temperature:	-30°C...+50°C
Operating temperature:	-30°C...+60°C
Protection class:	IP20

Room Temperature Sensor - RTF3xxx



Price List (Product Group 2)

Type Item	Item Price	
RTF3	standard type passive (incl. sensor)	28.10 €
RTF3.1	standard type passive (incl. sensor)	48.60 €

Configuration

P1k	Potentiometer (for passive type) 1 kOhm	12.20 €
P5k	Potentiometer (for passive type) 5 kOhm	12.20 €
P10k	Potentiometer (for passive type) 10 kOhm	12.20 €
PA	Potentiometer (for passive type) 0...10 V	7.80 €
T	Pushbutton	10.00 €
T/L	Pushbutton+LED	12.80 €
Lgr	LED green	8.20 €
Lge	LED yellow	8.20 €
Lrt	LED red	8.20 €
S	5-Step-slide switch	12.20 €

Order example: Room Temperature Sensor with Ni1000 sensor, pushbutton, 5 kOhm potentiometer and yellow LED = RTF3/Ni1000/P5k/T/Lge (23.10 € + 12.20 € + 12.80 € + 8.20 € = 56.30 €)

Special models available on demand. Please inquire in advance.

Room Temperature Sensor with/without Control Element

Application

Flush-mounted indoor sensors are applied in order to ensure the smoothness of indoor installation. For measuring the temperature, adjusting the set value, and yielding status and occupancy signals. With the help of the respective sensors (see below), the device can be connected to all conventional control and display systems.



Technical Data

Power supply:	24 V AC/DC (active devices)
Measuring range Temp.:	0°C...+50°C
Switching mode (sensor):	2-wire connection
Potentiometer:	1 kOhm (standard)
Pushbutton:	Make contacts, 24 V/AC; 8 mA
Rotary switch	24 V/AC +20%; -15%, 50/60 Hz
LED:	green/red, 8 mA 24 V/DC
Power connection:	plug-in/screw terminals (dependent on switch range)
Protection rating:	III
Protection class:	IP20
Temperature sensors:	Pt100, Pt1000, Ni1000, Ni1000TK5000 (L+G), NTC1.8k, NTC10k, NTC20k, LM235Z or active output 0-10 V (additional charge – please inquire!)
Switch ranges:	Berker Module2 (BM2) – Berker S1 (BS1) – Busch Jaeger Reflex SI alpine white (BJR) – Busch Jaeger Duro 2000I white (BJD) Busch Jaeger Future manhattan/graphite (BJF) GIRA S55, pure white (GS55) – GIRA E2, silk matt (GE2) – Jung LS990 (JLS990) Merten M-Plan (MMP) – Merten M-SMType (MMS) Further switch ranges and versions available upon request!

Price List (Product Group 2)

Switching range (at buyer's option)	Sensor models (at buyer's option)	Configuration	Order Code	Price
(see above)	(see above)	Sensor only	1	54.60 €
(see above)	(see above)	Sensor and potentiometer 1 kOhm	2	59.40 €
(see above)	(see above)	Sensor, pushbutton and LED (green)	3	69.50 €
(see above)	(see above)	Sensor, potentiometer 1 kOhm, slide switch 0,1,2,3 4	4	87.50 €
(see above)	(see above)	Sensor, potentiometer 1 kOhm, 2 pushbuttons and 2 LEDs (green and red)	5	78.80 €
(see above)	(see above)	Sensor, potentiometer 1 kOhm, 1 pushbutton and 1 LED (green)	6	78.80 €
(see above)	(see above)	Sensor, potentiometer 1 kOhm, 1 pushbutton and 2 LEDs (green and red)	7	85.00 €

Order example: Berker Modul 2 (BM2)/ Ni1000 sensor/potentiometer 1 kOhm, 2 pushbuttons and 2 LEDs (5)
= BM2-Ni1000-5; unit price 76.95 €

Special models available on demand. Please inquire in advance.



Contact Temperature Sensor - ANTF1/ANTF2

Application

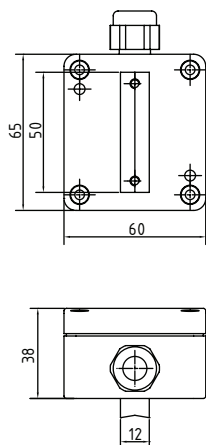
Apparatus for measuring the temperature on pipes/drain pipes. With the help of the respective sensors (see table), the device can be connected to all conventional control and display systems. A tension band is included in the delivery.



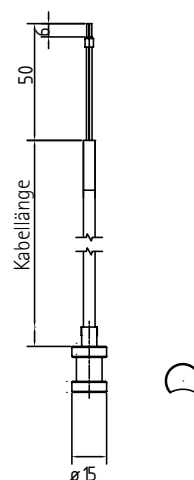
Technical Data

	ANTF1	ANTF2
Measuring range:	-50°C...+100°C (Standard)	-50°C...+105°C
Tmax Casing:	-50°C...+100°C	---
Sensor:	according to customer request (see table)	according to customer request (see table)
Switching mode:	2-wire connection (standard)	2-wire connection (standard)
Terminal:	Screw clamps, max. 1.5 mm ²	core-end sleeves
Power supply cord:	---	2 m PVC (Standard)
Casing:	PA6 15% GK, color RAL 9010	aluminum sleeve
Dimensions (l x w x h):	65 x 60 x 38 mm	29 x 15 mm
Protection class:	IP65	IP54

Dimension drawing ANTF1



Dimension drawing ANTF2



Price List (Product Group 1)

	ANTF1	ANTF2
Sensor type		
PT100	16.00 €	14.00 €
PT100 1/3DIN	18.00 €	16.00 €
PT1000	16.00 €	14.00 €
PT1000 1/3DIN	18.00 €	16.00 €
Ni1000	16.00 €	14.00 €
Ni1000TK5000	16.00 €	14.00 €
NTC 5k, 10k, 20k, Precon, KTY81-210	16.00 €	14.00 €
NTC 1.8 kOhm	18.00 €	16.00 €
LM235Z	18.00 €	16.00 €
Surcharges:		
Tension band:	included	included
Measuring transducer 4-20 mA (MUA) 3-wire	54.00 €	64.00 €
Measuring transducer 0-10 V (MUV) 3-wire	54.00 €	64.00 €

Order example: Contact Temperature Sensor (Casing) with Ni1000 sensor = ANTF/Ni1000

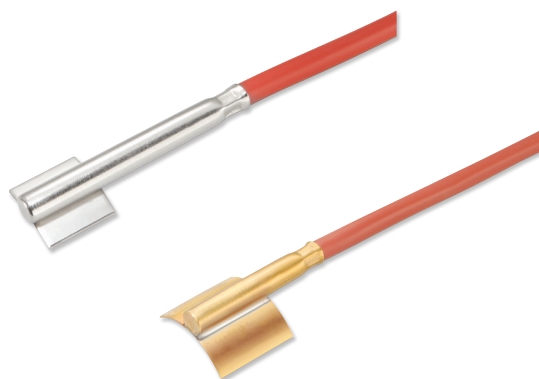
Special models available on demand. Please inquire in advance.

Contact Temperature Sensor - ANTF3VA/ANTF3MS

Application

Apparatus for measuring the temperature on pipes/drain pipes. With the help of the respective sensors (see table), the device can be connected to all conventional control and display systems.

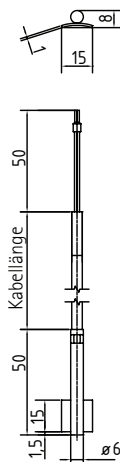
A tension band is included in the delivery.



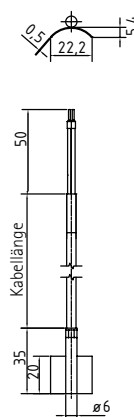
Technical Data

	ANTF3VA	ANTF3MS
Measuring range (peak):	-50°C...+105°C	-50°C...+105°C
Sensor:	according to customer request (see table)	according to customer request (see table)
Switching mode:	2-wire connection (standard)	2-wire connection (standard)
Connection:	Core-end sleeves	Core-end sleeves
Power supply cord:	2 m PVC (standard)	2 m PVC (standard)
Casing:	Stainless steel sleeve 1.4571	Brass sleeve
Dimensions (l x w x h):	see dimension drawing	see dimension drawing
Protection class:	IP54	IP54

Dimension drawing ANTF3VA



Dimension drawing ANTF3MS



Price List

	ANTF3VA	ANTF3MS
Sensor Type		
PT100	16.00 €	14.00 €
PT100 1/3DIN	18.00 €	16.00 €
PT1000	16.00 €	14.00 €
PT1000 1/3DIN	18.00 €	16.00 €
Ni1000	16.00 €	14.00 €
Ni1000TK5000	16.00 €	14.00 €
NTC 5k, 10k, 20k, Precon	16.00 €	14.00 €
NTC 1.8 kOhm	18.00 €	16.00 €
LM235Z	18.00 €	16.00 €
Surcharges:		
Measuring transducer 4-20 mA (MUA) 3-wire	64.00 €	64.00 €
Measuring transducer 0-10 V (MUV) 3-wire	64.00 €	64.00 €

Order example: Contact Temperature Sensor ANTF3MS with Ni1000 sensor
= ANTF3MS/Ni1000

Special models available on demand. Please inquire in advance.



Cable/Surface Temperature Sensor - KBTF

Application

Apparatus for measuring the temperature in gaseous media. In combination with an immersion sleeve, the KBTF can also be used for measuring the temperature of liquid media (as in pipes, kettles or water tanks). With the help of the respective sensors (see table), the device can be connected to all conventional control and display systems. The sleeve is double roller-burnished as standard.

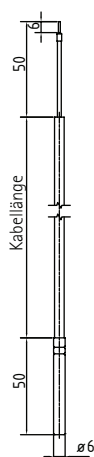
Note: The KBTF with fibre glass connection can not be equipped with WPC.



Technical Data

Measuring range (peak):	see table
Sensor:	according to customer request (see table)
Switching mode:	2-wire connection (standard)
Terminal:	Core-end sleeves
Power supply cord:	2 m (see table)
Fitting length:	6 x 50 mm
Protection class:	IP65 (Standard)

Dimension drawing KBTF



Price List (Product Group 1)

Supply Cord KBTF	Fitting Length					
	PVC (up to 105°C) "P"	Silicone (up to 180°C) "S"	High-temperature silicone (up to 250°C) "T"	Glass fibre (up to 400°C) "G"		
Sensor type						
PT100	8.00 €	10.00 €	14.00 €	14.00 €		
PT100 1/3DIN	10.00 €	12.00 €	16.00 €	-		
PT1000	8.00 €	10.00 €	14.00 €	14.00 €		
PT1000 1/3DIN	10.00 €	12.00 €	16.00 €	-		
Ni1000	8.00 €	10.00 €	14.00 €	-		
Ni1000TK5000	8.00 €	10.00 €	14.00 €	-		
NTC 5k, 10k, 20k, Precon, KTY81-210	8.00 €	10.00 €	-	-		
NTC 1.8 kOhm	10.00 €	12.00 €	-	-		
LM235Z	10.00 €	12.00 €	-	-		
Surcharge per meter	0.50 €	0.80 €	1.20 €	2.10 €		
Fitting length (immersion sleeve)	50 mm	100 mm	150 mm	200 mm	300 mm	400 mm
Brass immersion sleeve	6.00 €	7.00 €	8.00 €	9.00 €	10.00 €	11.00 €
Stainless steel immersion sleeve	11.00 €	12.00 €	13.00 €	14.00 €	15.00 €	16.00 €
Surcharges						
Measuring transducer 4-20 mA (MUA) 3-wire	64.00 €	64.00 €	64.00 €	64.00 €	64.00 €	64.00 €

Order example: Cable Temperature Sensor with Ni1000 sensor and 4 m high-temperature silicone cable = KBTF/
Ni1000/4.0/T

Special models available on demand. Please inquire in advance.

Surface Temperature Sensor - OBTF

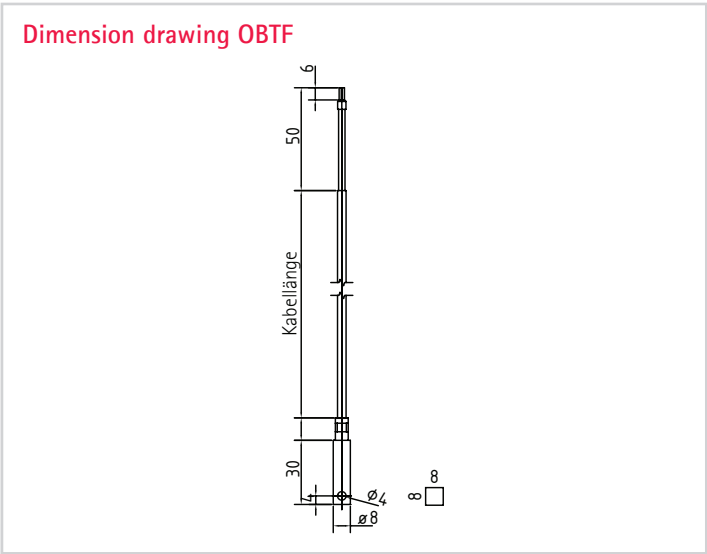
Application

Apparatus for measuring the temperature in gaseous media. In combination with an immersion sleeve, the KBTF can also be used for measuring the temperature of liquid media (as in pipes, kettles or water tanks). With the help of the respective sensors (see table), the device can be connected to all conventional control and display systems. The sleeve is double roller-burnished as standard.



Technical Data

Measuring range (peak):	-35°C...+105°C
Sensor:	according to customer request (see table)
Switching mode:	2-wire connection (standard)
Terminal:	Core-end sleeves
Power supply cord:	2 m PVC (standard)
Fitting length:	8 x 8 x 40 mm (aluminum)
Protection class:	IP54



Price List (Product Group 1)

Sensor type	Fitting Length
	OBTF (with PVC up to 105°C)
PT100	20.00 €
PT100 1/3DIN	22.00 €
PT1000	20.00 €
PT1000 1/3DIN	22.00 €
Ni1000	20.00 €
Ni1000TK5000	20.00 €
NTC 5k, 10k, 20k, Precon	20.00 €
NTC 1.8 kOhm	22.00 €
Surcharge per meter	0.50 €
Measuring transducer 4-20 mA (MUA) 3-wire	64.00 €
Measuring transducer 0-10 V (MUV) 3-wire	64.00 €

Order example: Surface Temperature Sensor with Ni1000 sensor and 4 m high-temperature silicone cable = OBTF/ Ni1000/4.0/T

Special models available on demand. Please inquire in advance.



Indoor Pendulum Temperature Sensor - RPF

Application

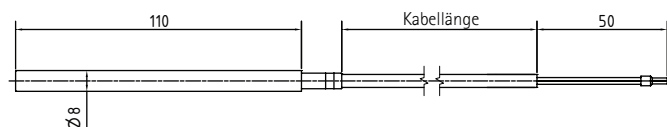
For indoor temperature measuring applications. With the help of the respective sensors (see table), the device can be connected to all conventional control and display systems.



Technical Data

Measuring range:	-50°C...+105°C
Measuring range (casing):	-50°C...+105°C
Sensor:	according to customer request (see table)
Switching mode:	2-wire connection (standard)
Terminal:	Core-end sleeves
Power supply cord:	2 m PVC 2 x 0.25 mm (standard)
Sleeve:	Stainless steel 1.4571
Dimensions (w x l):	8 x 110 mm
Protection class:	IP54

Dimension drawing Indoor Pendulum Temperature Sensor - RPF



Price List (Product Group 1)

	2m PVC	5m PVC	10m PVC
Sensor type			
PT100	18.00 €	21.00 €	26.00 €
PT100 1/3DIN	19.00 €	22.00 €	27.00 €
PT1000	18.00 €	21.00 €	26.00 €
PT1000 1/3DIN	19.00 €	22.00 €	27.00 €
Ni1000	19.00 €	22.00 €	27.00 €
Ni1000TK5000	19.00 €	22.00 €	27.00 €
Fet	26.00 €	29.00 €	34.00 €
NTC 5k, 10k, 20k, Precon	18.00 €	21.00 €	26.00 €
NTC 1.8 kOhm	18.00 €	21.00 €	26.00 €
LM235Z	19.00 €	22.00 €	27.00 €
Surcharges:			
Measuring transducer 4-20 mA (MUA) 3-wire	64.00 €	64.00 €	64.00 €
Measuring transducer 0-10 V (MUV) 3-wire	64.00 €	64.00 €	64.00 €

Order example: Indoor Pendulum Temperature Sensor with 5m supply cord and Ni1000 sensor = RPF/Ni 1000/5.0

Special models available on demand. Please inquire in advance.

Radiation Sensor - STF

Application

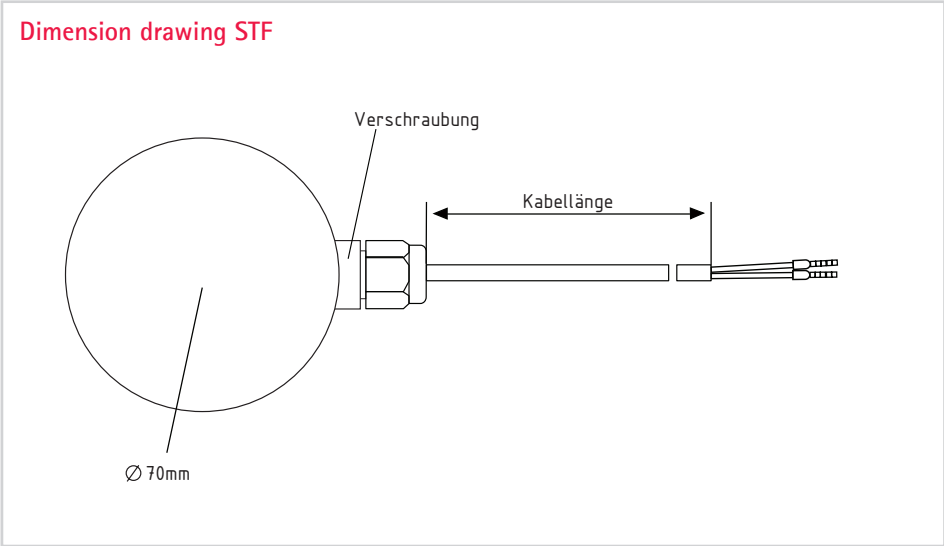
For indoor temperature measuring applications. The sensor is suspended from above, making it especially suitable for temperature measurements in large rooms and halls with a high ceiling. With the help of the respective sensors (see table), the device can be connected to all conventional control and display systems.



Technical Data

Measuring range:	-30°C...+70°C
Sensor:	according to customer request (see table)
Switching mode:	2-wire connection (standard)
Terminal:	Core-end sleeves
Power supply cord:	PVC black, 2 x 0.25 mm²
Ball:	plastic, diameter 70 mm

Further cable types and lengths (including multiple wire connections and combination sensors) on demand.



Price List (Product Group 1)

Supply cord STF	1.5m	3m	5m	10m
Sensor type				
PT100	45.00 €	46.50 €	48.50 €	53.50 €
PT100 1/3DIN	46.00 €	47.50 €	49.50 €	54.50 €
PT1000	45.00 €	46.50 €	48.50 €	53.50 €
PT1000 1/3DIN	46.00 €	47.50 €	49.50 €	54.50 €
Ni1000	46.00 €	47.50 €	49.50 €	54.50 €
Ni1000TK5000	46.00 €	47.50 €	49.50 €	54.50 €
NTC 5k, 10k, 20k, Precon	45.00 €	46.50 €	48.50 €	53.50 €
NTC 1.8 kOhm	45.00 €	46.50 €	48.50 €	53.50 €
LM235Z	45.00 €	46.50 €	48.50 €	53.50 €
Surcharges				
Measuring transducer 4-20 mA (MUA) 3-wire	54.00 €	54.00 €	54.00 €	54.00 €
Measuring transducer 0-10 V (MUV) 3-wire	54.00 €	54.00 €	54.00 €	54.00 €

Special models available on demand. Please inquire in advance.



Screw-Connect Temperature Sensor - ESF

Application

Apparatus for measuring the temperature in liquid or gaseous media. Applicable in the fields of heating and ventilation engineering as well as air-conditioning. With the help of the respective sensors (see table), the device can be connected to all conventional control and display systems.

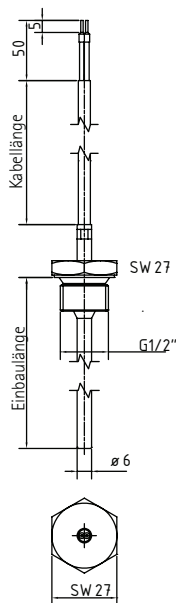
Note: The ESF with glass fibre connection can not be equipped with WPC.



Technical Data

Measuring range (peak):	-50°C...+105°C (standard)
Sensor:	according to customer request (see table)
Measuring range (peak):	-50°C... +180°C (for NTC max. +150°C, for LM235Z max. +125°C)
Connection thread:	G 1/2", SW27
Werkstoff	V4A, 1.4571
Connection cable:	2000 mm PVC (up to +105°C), silicone (up to +180°C) or glass fibre (up to +400°C)
Switching mode:	2-wire connection (standard)
Cable end:	50 mm free ends with core-end sleeves
Protection class:	IP54
Pressure resistance immersion sleeve:	up to 40 bar

Dimension drawing Screw-Connect Temperature Sensor - ESF



Price List (Product Group 1)

Sensor type	Fitting length (with PVC cable max. 105°C) "P"		Fitting length (with SIL cable max. 180°C) "S"		Fitting length (with glass fibre cable max. 400°C) "G"	
	50 mm	100 mm	50 mm	100 mm	50 mm	100 mm
PT100	26.00 €	27.00 €	27.00 €	28.00 €	32.00 €	33.00 €
PT100 1/3DIN	28.00 €	29.00 €	29.00 €	30.00 €	-	-
PT1000	26.00 €	27.00 €	27.00 €	28.00 €	32.00 €	33.00 €
PT1000 1/3DIN	28.00 €	29.00 €	29.00 €	30.00 €	-	-
Ni1000	27.00 €	28.00 €	28.00 €	29.00 €	-	-
Ni1000TL5000	27.00 €	28.00 €	28.00 €	29.00 €	-	-
NTC 5k, 10k, 20k, Precon	26.00 €	27.00 €	-	-	-	-
NTC 1.8 kOhm	26.00 €	27.00 €	-	-	-	-
LM235Z	26.00 €	27.00 €	-	-	-	-
Surcharges						
Measuring transducer 4-20 mA (MUA) 3-wire	54.00 €	54.00 €	54.00 €	54.00 €	54.00 €	54.00 €
Measuring transducer 0-10 V (MUV) 3-wire	54.00 €	54.00 €	54.00 €	54.00 €	54.00 €	54.00 €

Order example: Screw-Connect Temperature Sensor with Ni1000 sensor, 100 mm fitting length and 2 m silicone cable = ESF/Ni1000/100/2.0/S

Special models available on demand. Please inquire in advance.

High Temperature Sensor - HTFB1

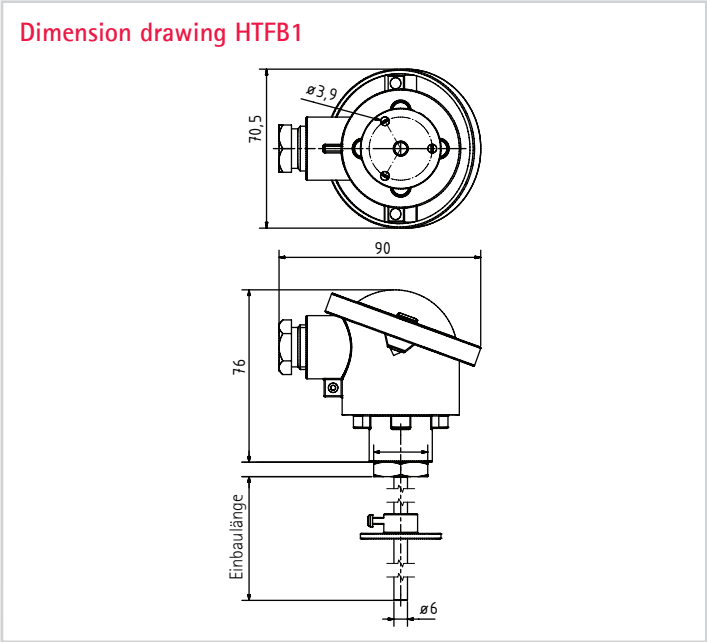
Application

Apparatus for measuring the temperature in liquid or gaseous media. Applicable in the fields of heating and ventilation engineering as well as air-conditioning. With the help of the respective sensors (see table), the device can be connected to all conventional control and display systems.



Technical Data

Measuring range (peak):	-50°C...+600°C
Tmax. head:	100°C (max. 70 °C for versions with measuring transducer)
Sensor:	according to customer request (see table)
Switching mode:	2-wire connection (standard)
Terminal:	Screw clamps, max. 1.5 mm ²
Casing:	Aluminum, B shape
Cable inlet:	M20x2,5
Protection class:	IP54
Protective tube: :	V4A
With fixed measuring unit Ø 6 mm	



Price List (Product Group 1)

Sensor type	Fitting Length	
	250 mm	400 mm
PT100	81.00 €	86.00 €
PT1000	81.00 €	86.00 €
Surcharges:		
Mounting flange	4.00 €	4.00 €
Measuring transducer 4-20 mA (MUA) 2-wire	54.00 €	54.00 €
Measuring transducer 0-10 V (MUV) 2-wire	54.00 €	54.00 €
3-wire connection	1.40 €	1.40 €
4-wire connection	2.80 €	2.80 €

Order example: High Temperature Sensor with Ni1000 sensor = HTFB1/Ni1000

Special models available on demand. Please inquire in advance.



Screw-In Sensor (without Neck Pipe) - HTFB2

Application

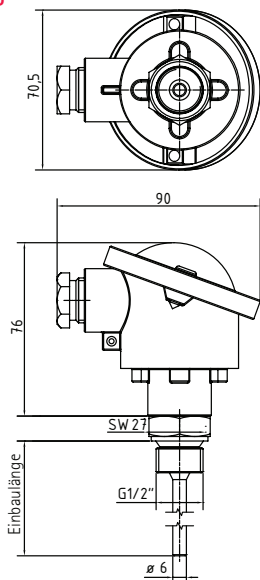
Apparatus for measuring the temperature in liquid or gaseous media. Applicable in the fields of heating and ventilation engineering as well as air-conditioning. With the help of the respective sensors (see table), the device can be connected to all conventional control and display systems.



Technical Data

Measuring range (peak):	-50°C...+180°C (bei NTC's max. +150°C, LM235Z max. +125°C)
Tmax. head:	100°C (bei Ausführung mit Messumformer max. 70°C)
Sensor:	according to customer request (see table)
Switching mode:	2-wire connection (standard)
Terminal:	Screw clamps, max. 1.5 mm ²
Casing:	Aluminum, B shape
Cable inlet:	M20 x 1.5 mm
Pressure resistance immersion sleeve:	up to 40 bar
Protection class:	IP54
Protective tube: :	V4A
With fixed measuring unit	

Dimension drawing HTFB2



Price List (Product Group 1)

	Fitting Length		
Sensor type	100 mm	200 mm	400 mm
PT100	44.00 €	46.00 €	48.00 €
PT100 1/3DIN	46.00 €	48.00 €	50.00 €
PT1000	44.00 €	46.00 €	48.00 €
PT1000 1/3DIN	46.00 €	48.00 €	50.00 €
Ni1000	44.00 €	46.00 €	48.00 €
Ni1000TK5000	44.00 €	46.00 €	48.00 €
Fet	52.00 €	54.00 €	56.00 €
NTC 5k, 10k, 20k, Precon	44.00 €	46.00 €	48.00 €
NTC 1.8 kOhm	46.00 €	48.00 €	50.00 €
LM235Z	46.00 €	48.00 €	50.00 €
Surcharges:			
Measuring transducer 4-20 mA (MUA) 2-wire	54.00 €	54.00 €	54.00 €
Measuring transducer 0-10 V (MUV) 2-wire	54.00 €	54.00 €	54.00 €
3-wire connection	1.40 €	1.40 €	1.40 €
4-wire connection	2.80 €	2.80 €	2.80 €

Order example: High Temperature Sensor with Ni1000-Sensor = HTFB2/Ni1000

Special models available on demand. Please inquire in advance.

Screw-In Sensor (with Neck Pipe) - HTFB3

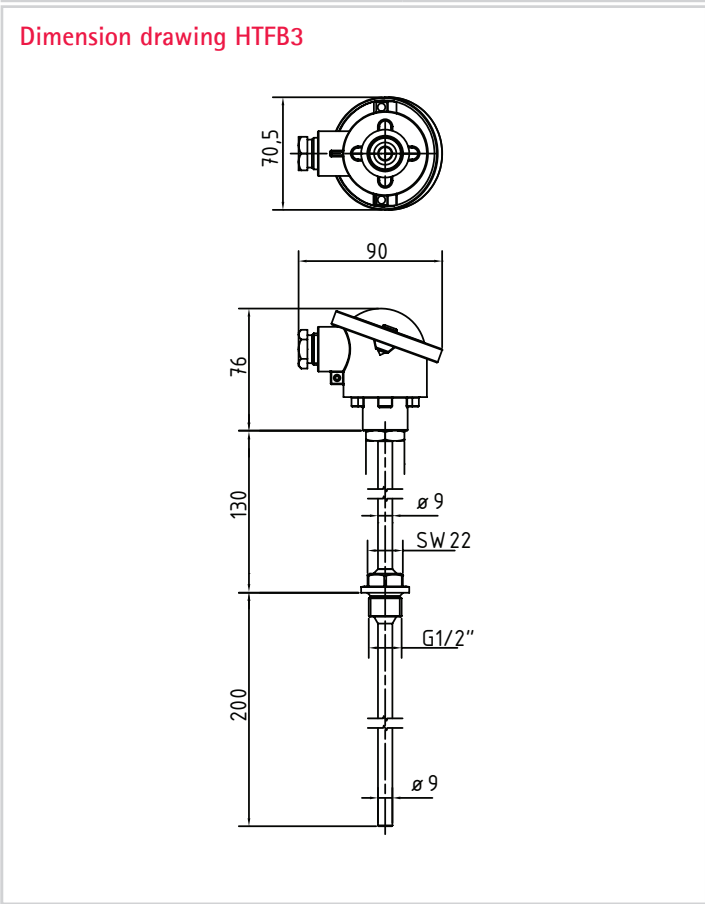
Application

Apparatus for measuring the temperature in liquid or gaseous media. Applicable in the fields of heating and ventilation engineering as well as air-conditioning. With the help of the respective sensors (see table), the device can be connected to all conventional control and display systems.



Technical Data

Measuring range (peak):	-50°C...+600°C (standard)
Tmax. head:	100°C (max. 70 °C for versions with measuring transducer)
Sensor:	according to customer request (see table)
Switching mode:	2-wire connection (standard)
Terminal:	Screw clamps, max. 1.5 mm ²
Casing:	Aluminum, B shape
Cable inlet:	M20 x 1.5 mm
Pressure resistance immersion sleeve:	up to 40 bar
Protection class:	IP54
Protective tube: :	V4A
Supplied with exchangeable Ø 6 mm measuring unit	



Price List (Product Group 1)	Fitting Length	
Sensor type	250 mm	400 mm
PT100	115.00 €	122.00 €
PT1000	115.00 €	122.00 €
Surcharges:		
Measuring transducer 4-20 mA (MUA) 2-wire	54.00 €	54.00 €
Measuring transducer 0-10 V (MUV) 2-wire	54.00 €	54.00 €
3-wire connection	1.40 €	1.40 €
4-wire connection	2.80 €	2.80 €

Order example: High Temperature Sensor with PT100 sensor = HTFB3/PT100

Special models available on demand. Please inquire in advance.



Ceiling-mounted Temperature Sensor - DEBF

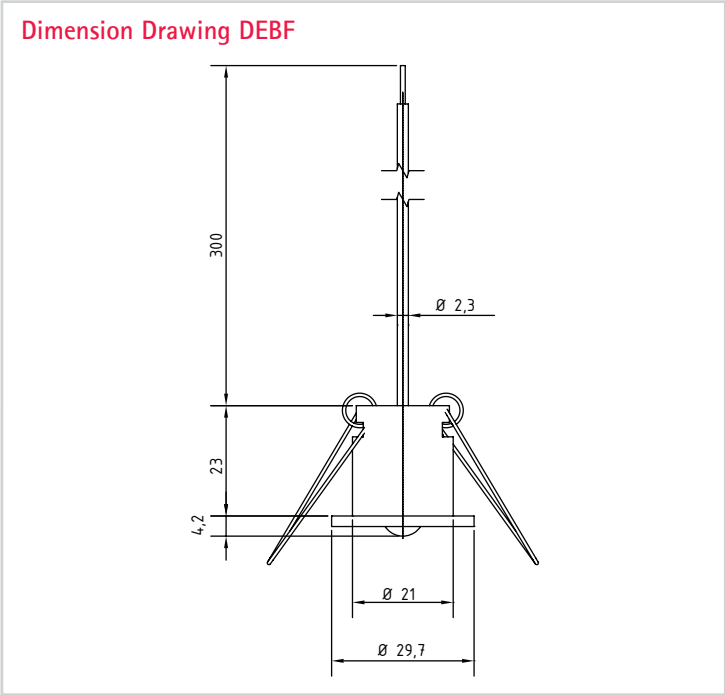
Application

For indoor temperature measuring applications (to be flush-mounted). With the help of the respective sensors (see table), the device can be connected to all conventional control and display systems.



Technical Data

Measuring range:	-20°C...+90°C (standard)
Sensor:	according to customer request (see table)
Power supply cord:	0.3 m PVC 2 x 0.25 mm ² (standard)
Switching mode:	2-wire connection (standard)
Protection class:	IP20



Price List (Product Group 1)

Sensor type	2 m PVC
PT100	37.00 €
PT100 1/3DIN	37.00 €
PT1000	37.00 €
PT1000 1/3DIN	37.00 €
Ni1000	37.00 €
Ni1000TK5000	37.00 €
NTC 5k, 10k, 20k, Precon	37.00 €
NTC 1.8 kOhm	37.00 €
Surcharges	
Measuring transducer 4-20 mA (MUA) 3-wire	54.00 €
Measuring transducer 0-10 V (MUV) 3-wire	54.00 €

Order example: Ceiling-mounted sensor with Ni1000 sensor = DEBF/Ni1000

Special models available on demand. Please inquire in advance.

Sheath Thermocouple Element - MTE

Application

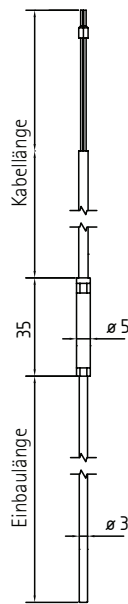
For temperature measurements between -220 and +1150°C in liquid or gaseous media. Because of their special interior layout, thermocouple elements can be used for applications under high pressure and vibrations. The sheath thermocouple element is flexible and has a fast response time. The MTEs are installed with the help of screw clamps.



Technical Data

Thermocouple:	NiCr-Ni type K pursuant to DIN IEC 584 - isolated
Diameter:	1 mm, 1.5 mm, 3 mm und 6 mm
Fitting Length:	100 mm, 150 mm, 200 mm, 300 mm, 500 mm
Material:	Inconel - 2.4816
Connective sleeve:	8 x 40 mm, diameter 6 mm / all others 5 x 35 mm
Supply cord:	Glass fibre with VA coating 2 x 0.22 mm ²
Length of supply cord:	2000 mm (standard), further lengths available on demand
Terminal connection:	50 mm free ends with core-end sleeves
Protection class:	IP65
Max. Operating temperature MTE:	-220°C... +1150°C
Max. operating temp. supply cord:	-50°C... +400°C

Dimension drawing MTE



Price List (Product Group 1)

	Fitting Length				
Diameter	100 mm	150 mm	200 mm	300 mm	500 mm
1.0 mm	30.00 €	30.50 €	31.00 €	32.00 €	34.00 €
1.5 mm	30.50 €	31.00 €	31.50 €	32.50 €	34.50 €
3.0 mm	31.00 €	31.50 €	32.00 €	33.00 €	35.00 €
6.0 mm	33.50 €	34.50 €	35.50 €	37.50 €	41.50 €
Surcharges					
Cord per meter	1.50 €	-	-	-	-

Order example: Sheath thermocouple Ø 3.0mm, fitting length 200mm, cable length 3000mm = MTE 3.0/200/3m
Please call us for information on measuring devices, temperature controllers and display equipment.

Special models available on demand. Please inquire in advance.

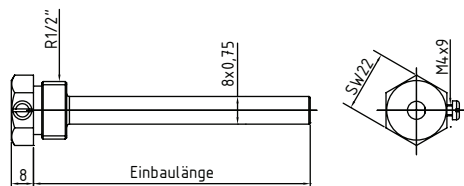


Accessories

Brass Immersion Sleeves THMS

Fitting dimensions:	see drawing
Fitting length:	50/100/150/200/250/300/350/400 mm
Material:	Galvanized brass
Thread socket:	G1/2" DIN EN10226-1 (tapered)
Width across flats:	SW22
Max. operating temperature:	+160°C
Pressure range:	up to 16 bar (static)

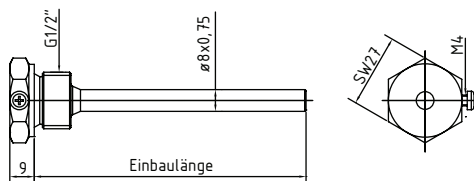
Dimension drawing THMS



Stainless Steel Immersion Sleeve THVA

Fitting dimensions:	see drawing
Fitting length:	50/100/150/200/250/300/350/400 mm or according to customer request
Material:	Stainless steel 1.4571
Thread socket:	G1/2" DIN 2999
Width across flats:	SW27
Max. operating temperature:	+400°C
Pressure range:	up to 40 bar (static)

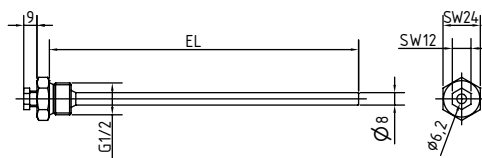
Dimension drawing THVA



Stainless Steel Immersion Sleeve THVA2, welded type, with pressure screw with clamping ring

Fitting dimensions:	see drawing
Fitting length:	100/150/200/300/400/ mm or according to customer request
Material:	Stainless steel 1.4571
Thread socket:	G1/2"
Width across flats:	SW24
Pressure screws: (incl. teflon seal)	SW12
Max. operating temperature:	+160°C
Pressure range:	up to 40 bar (static)

Dimension drawing THVA2



Price List (Product Group 1)

	Fitting Length					
	50 mm	100 mm	150 mm	200 mm	300 mm	400 mm
Brass immersion sleeve (THMs)	6.00 €	7.00 €	8.00 €	9.00 €	10.00 €	11.00 €
Stainless steel immersion sleeve (THVA)	11.00 €	12.00 €	13.00 €	14.00 €	15.00 €	16.00 €
Stainless steel immersion sleeve with pressure screw (THVA2)	15.00 €	16.00 €	17.00 €	18.00 €	20.00 €	22.00 €

Accessories

Threaded Clamps

Threaded clamps for fixing/sealing temperature sensors and sheath thermocouples.



Material:	Stainless steel 1.4571
Pressure resistance:	16 bar
The clamping rings are available as the following models	
Teflon:	up to 200°C; pressure resistant up to 10 bar
VA:	up to 400°C; pressure resistant up to 40 bar
(Please submit your desired model/temperature range when ordering)	

Price List (Product Group 2)

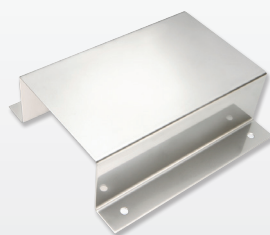
	Model	Width across flats					
	G1/4" (1)	19					
Drill hole:			3 mm	4 mm	6 mm	8 mm	-
Order No.			KV 1.3	KV 1.4	KV 1.6	KV 1.8	-
Price			10.00 €	10.00 €	10.00 €	10.00 €	-
	G1/2" (2)	27					
Drill hole:			3 mm	4 mm	6 mm	8 mm	11 mm
Order No.			KV 2.3	KV 2.4	KV 2.6	KV 2.8	KV 2.11
Price			14.00 €	14.00 €	14.00 €	14.00 €	16.00 €
	M8x1 (3)	12	0				
Drill hole:			1 mm	1,5 mm	2 mm	3 mm	4 mm
Order No.			KV 3.1	KV 3.1,5	KV 3.2	KV 3.3	KV 3.4
Price			9.00 €	9.00 €	9.00 €	9.00 €	9.00 €

Sun Protection Cover/Physical Impact Protection Cover

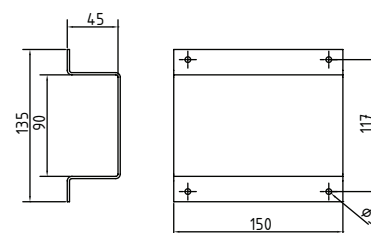
Cover to protect outdoor/indoor temperature/humidity sensors against mechanical impact or extreme weather conditions.

Price List (Product Group 1)

Type	Price
G25.1	28.00 €



Dimension drawing G25.1



50-110 mm Tension Band for Contact Sensors

For fixating the contact sensors ANTF1 and ANTF2 on drain pipes/pipes.

Price List (Product Group 1)

Type	Price
Z-65	2.10 €



Thermal Grease

5 g tube

Price List (Product Group 1)

Type	Price
VM-101	2.10 €



Bimetallic Thermometer - BMT (Axial and Contact Type, for flue gas)

Application

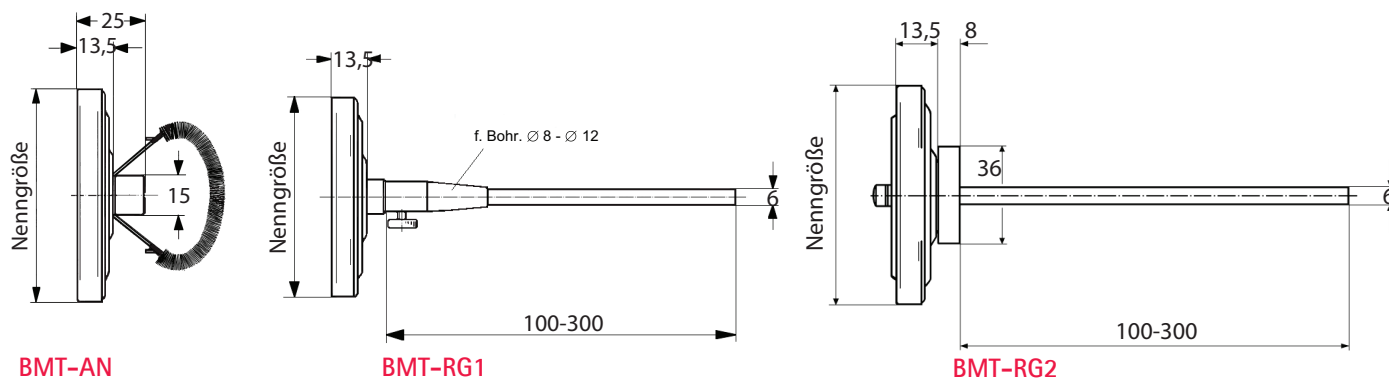
Bimetallic Thermometers are used for various industrial tasks as well as for heating, air conditioning, sanitary and process engineering purposes etc.



Technical Data

	BMT-AN	BMT-RG1	BMT-RG2
Type:	Bimetallic Contact Thermometer	Bimetallic Flue Gas Thermometer 0°C...+500°C	Bimetallic Flue Gas Thermometer 0°C...+350°C
Application:	Heating, sanitary	Burner control for gas and oil firing equipment	Burner control for gas and oil firing equipment
Nominal size:	63 mm	63 mm	80 mm
Length of shaft:		100 – 150 – 200 – 300 mm	100 – 150 – 200 – 300 mm
Casing:	Galvanized sheet metal	Galvanized sheet metal	Galvanized sheet metal
Retaining ring:	Galvanized sheet metal	Galvanized sheet metal	Galvanized sheet metal
Inspection glass:	Instrument flat glass polystyrene	Instrument flat glass polystyrene	Instrument flat glass polystyrene, arched
Instrument dial:	ABS white, with elevated rim as bezel	Aluminum grey - Scale black	Aluminum, grey - Scale black with green and red control fields
Indicator:		Aluminum, black	Aluminum, black - RTC with additional drag indicator for max. value in red
Connection:	NG 63 and NG 80 with heat conducting plate and fixation spring	Immersion pipe Stainless steel, 1.4301, smooth with adjustable cone, Brass	Immersion pipe Stainless steel, 1.4301, smooth with annular magnet fastener
Measuring element:	Bimetallic spiral	Bimetallic coil	Bimetallic coil
Measuring range:	0°C...+120°C - Other ranges available	0°C...+500°C - Other ranges available	0°C...+350°C - Other ranges available
Display accuracy:	Class 2 (DIN 16203 / DIN EN 13190)	Class 2 (DIN 16203)	Class 2 (DIN 16203 / DIN EN 13190)

Dimension drawing



Price List (Product Group 2)

Type		100 mm	150 mm	200 mm	300 mm
BMT-AN	11.90 €				
BMT-RG1		21.30 €	22.30 €	23.20 €	25.20 €
BMT-RG2		38.90 €	39.70 €	40.40 €	42.50 €

Special models available on demand. Please inquire in advance.

Axial Bimetallic Thermometer - BMT-AX

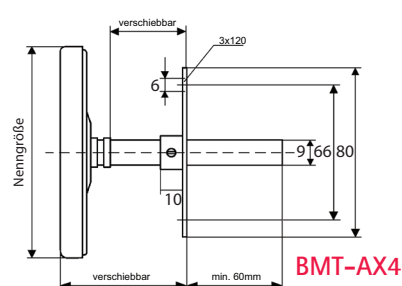
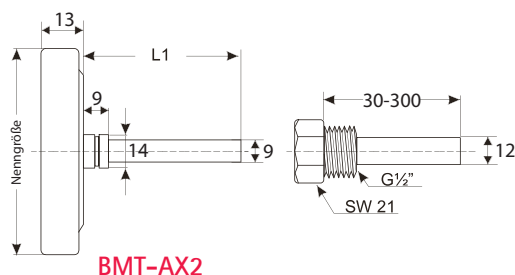
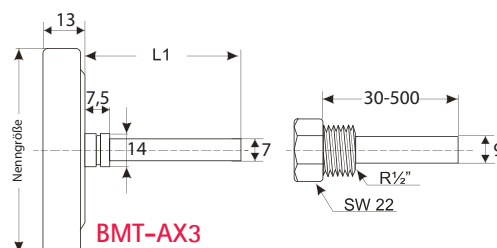
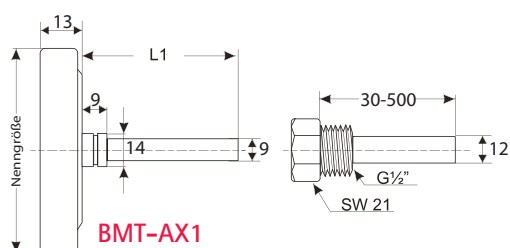
Application

Bimetallic Dial Thermometer for various industrial measuring tasks.



Technical Data	BMT-AX1	BMT-AX2	BMT-AX3	BMT-AX4
Application:	Heating, sanitary, process engineering, others	Heating, sanitary, process engineering, others	Heating, sanitary, process engineering	Air conditioning and ventilation
Nominal size:	63 mm	63 mm	63 mm	63 mm
Length of shaft:	30 – 500 mm	30 – 300 mm	30 – 500 mm	100 – 150 – 200 mm
Casing:	Galvanized sheet metal	Stainless steel 1.4301	Galvanized sheet metal	Galvanized sheet metal
Retaining ring:	Galvanized sheet metal	Stainless steel 1.4301	Galvanized sheet metal	Galvanized sheet metal
Inspection glass:	Polystyrene / Instrument flat glass	Polystyrene / Instrument flat glass	Polystyrene / Instrument flat glass	Polystyrene / Instrument flat glass
Instrument dial:	ABS white or plate scale with elevated rim as bezel	ABS white or plate scale with elevated rim as bezel	ABS white or plate scale with elevated rim as bezel	ABS white with elevated rim as bezel
Connection:	G½" with O ring oder fixation screw	G½" with O ring oder fixation screw	G½" with O ring oder fixation screw	Immersion pipe brass, axial, Ø 9 mm
Immersion shaft:	Ø 9 mm	Ø 9 mm	Ø 7 mm	
Protective tube: :	MS Ø 12 mm outer diameter, detachable	Stainless steel MS Ø 12 mm outer diameter, detachable	MS Ø 12 mm outer diameter, detachable	
Operating pressure at protective tube:	max. 6 bar	max. 6 bar	max. 6 bar	
Flange:				Galvanized steel 40/80 mm
Measuring element:	Bimetallic coil	Bimetallic coil	Bimetallic coil	Bimetallic coil
Measuring range:	0°C...+120°C Other ranges available	0°C...+120°C Other ranges available	0°C...+120°C Other ranges available	0°C...+60°C Other ranges available
Display accuracy:	Class 2 (DIN 16203 / DIN EN 13190)	Class 2 (DIN 16203 / DIN EN 13190)	Class 2 (DIN 16203 / DIN EN 13190)	Class 2 (DIN 16203 / DIN EN 13190)

Dimension drawing



Price List (Product Group 2)

Type	40 mm	63 mm	100 mm	150 mm	200 mm
BMT-AX1	8.60 €	10.00 €	11.60 €	13.80 €	15.80 €
BMT-AX2	33.10 €	35.40 €	38.10 €	41.00 €	45.20 €
BMT-AX3	12.90 €	15.00 €	17.40 €	20.70 €	23.70 €
BMT-AX4			23.10 €	23.80 €	24.50 €

Special models available on demand. Please inquire in advance.

Radial Bimetallic Thermometer - BMT-RA

Application

Bimetallic Dial Thermometer for various industrial measuring tasks and heating applications.

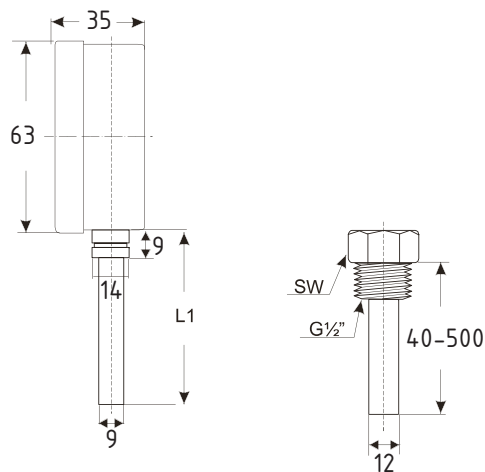


Technical Data

Application:	Heating, sanitary, process engineering
Nominal size:	63 mm
Length of shaft:	40 – 200 mm
Casing:	Galvanized steel plate
Retaining ring:	Galvanized steel plate
Inspection glass:	Polysterene / Instrument flat glass
Instrument dial:	Sheet metal, with elevated rim as bezel
Connection:	G½" with O ring oder fixation screw
Immersion shaft:	Ø 9 mm
Protective tube: :	MS Ø 12 mm outer diameter, detachable
Operating pressure at protective tube:	max. 6 bar
Measuring element:	Bimetallic coil
Measuring range:	0°C...+120°C - Other ranges available
Display accuracy:	Class 2 (DIN 16203 / DIN EN 13190)

Further options, further measuring ranges and protective tube diameters
standard immersion tube – length 50 mm, with self-sealing
PTFE seal ring oder inner O ring
(further lengths available on demand)

Dimension drawing BMT-RA



Price List (Product Group 2)

Type	40 mm	63 mm	100 mm	150 mm	200 mm
BMT-RA	38.30 €	39.80 €	41.30 €	43.50 €	45.90 €

Special models available on demand. Please inquire in advance.

Freeze-Protection Thermostat - FST3/FST6

Application

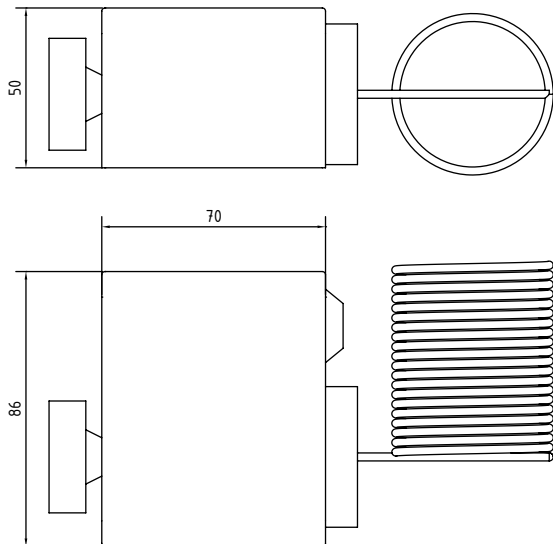
Device for the surveillance of hot water heating coils and heat exchangers in ventilation and air-conditioning systems as well as heating appliances. The freeze protection thermostat prevents water-bearing tanks and heat exchangers from freezing over. The FST is equipped with an automatic reset.



Technical Data (Product Group 1)

Switching capacity:	16 A, 250 V open or closed, 1 A, 250 V opposite side
Terminals:	1 common, 2 opens contact at higher temperature. 4 closes contact at higher temperature
Cable inlet:	O 16 conductor isolation, 14 mm
Storage temperature:	-30°C...+55°C
Installation:	Two threaded holes in the backside of the casing (M4x6, included in the delivery)
Adjustment:	via hex nut
Casing:	Plastic Noryl SE1 cover grey
Dimensions (l x w x h):	86x49x76mm
Protection rating:	IP44
Sensor element:	Gas-filled tin-coated copper capillary tube
Temperature range/adjustment range:	-18°C...+13°C
Accuracy:	±1.2°C
Accessories:	Set of fasteners for the capillaries + mounting bracket (included)

Dimension drawing FSTnE



Price List (Product Group 2)

Type	Description	Setting	Price
FST3	3 m capillary	TR, automatic	51.00 €
FST6	6 m capillary	TR, automatic	54.00 €



Contact Safety Temperature Limiter/Monitor/Thermostat

Application

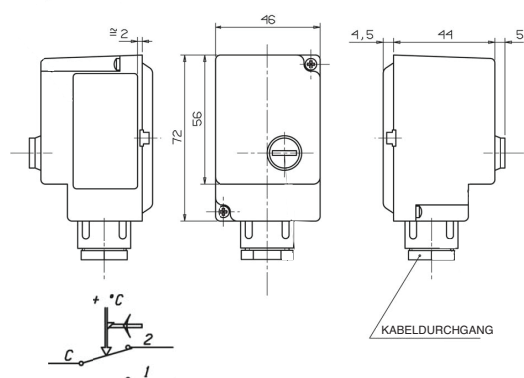
The type AN Contact Sensors are suited for temperature control and adjustment in pipes/drain pipes.



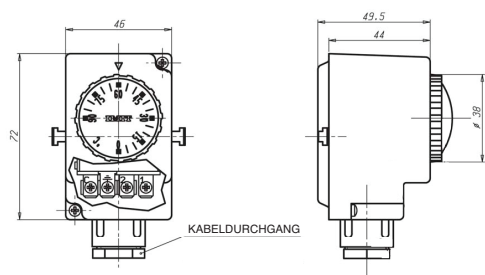
Technical Data

	ANSTB1	ANTW1	ANTH3
	Contact Safety Temperature Limiter	Contact Temperature Monitor	Contact Thermostat
Presetting limiting temperature:	+60°C		
Limiting temperature range:	+40°C...+70°C	0°C...+90°C	+20°C...+90°C
Tolerance:	0...10K	±5K	8±3K
Reset temperature:	Trigger at 25K±8K		
Differential:		10±3K	8±3K
Protection class:	IP40	IP40	IP 30
Insulation class:	I	I	I
Temperature gradient:	<1K/min.	<1K/min.	<1K/min.
Max. tip temperature:	+55°C	+55°C	+85°C
Max. sensor temperature:	+125°C	+125°C	
Storage temperature:	-15°C...+60°C	-15°C...+60°C	-15°C...+60°C
Contact capability:	C-1: 0.5 A / 250 V AC C-2: 10(2.5) A / 250 V AC	C-1: 10 A / 250 V AC C-2: 6(2.5) A / 250 V AC	1-2: 16(2.5) A / 250 V AC 1-3: 2.5 A / 250 V AC
Cable entry:	3/8"GAS	3/8"GAS – M20x1.5	M20X1.5

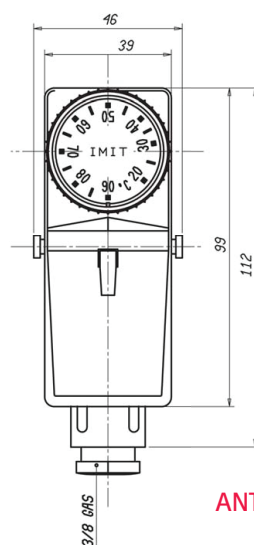
Dimension drawings



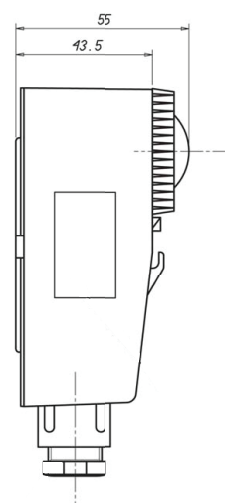
ANTH1



ANTH2



ANTW1



Price List (Product Group 2)

Type	Switchpoint - adjustment/reset	Price
ANSTB1	outside	35.00 €
ANTW1	outside	31.00 €
ANTH3	outside	26.00 €

Industrial Room Thermostat - IRT H1 / Room Thermostat - RTH

Application

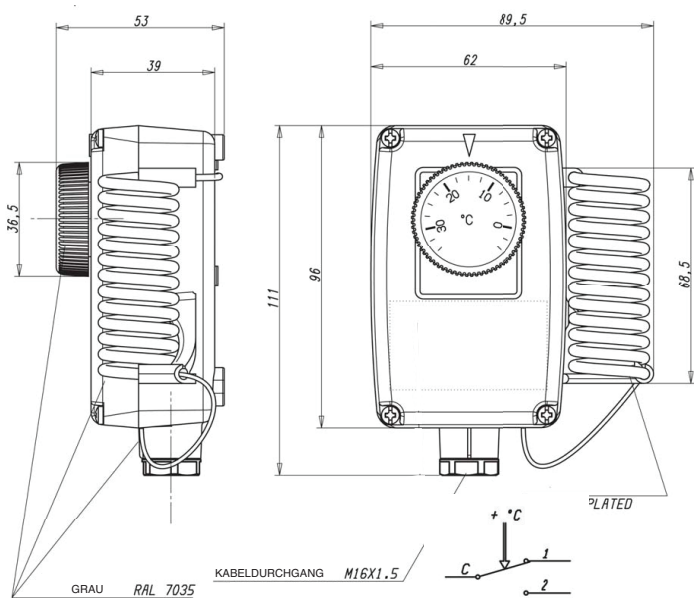
The Thermostats are suited for indoor temperature control and adjustment. Because of its higher protection class, the IRT H1 can be applied for industrial purposes.



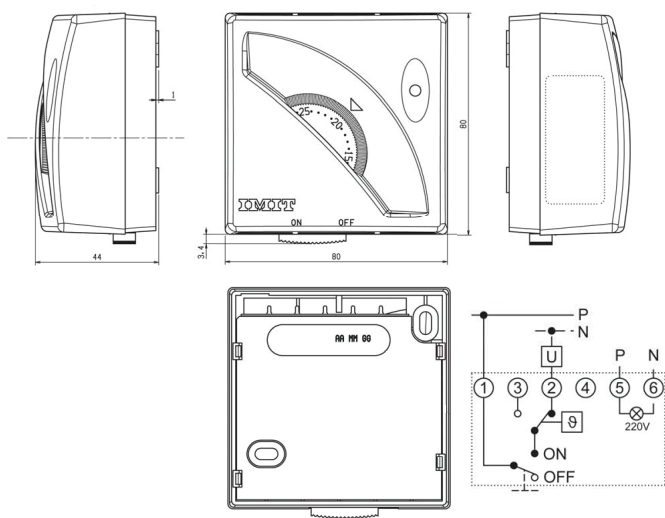
Technical Data

	IRT H1	RTH
	Industrial Room Thermostat	Room Thermostat
Adjustment range:	-5°C...+35°C ± 2°C	-5°C...+30°C
Differential gap:	Δt 2 ± 1K	Δt < 1K
Max. temperature casing:	+50°C	+50°C
Max. temperature capillary:	+50°C	-
IP Protection class:	IP 54	IP 20
Contact load:	C1 16(2.5) A / 250 V C2 6(2.5) V	NA 16(2.5) 250 V NC 16(2.5) 250 V

Dimension drawings



IRT H1



RTH

Price List (Product Group 2)

Type	Switchpoint - adjustment	Price
IRT H1	outside	43.00 €
RTH	outside	26.00 €

Immersion Thermostat with Remote Sensor (single-level) - KTTH

Application

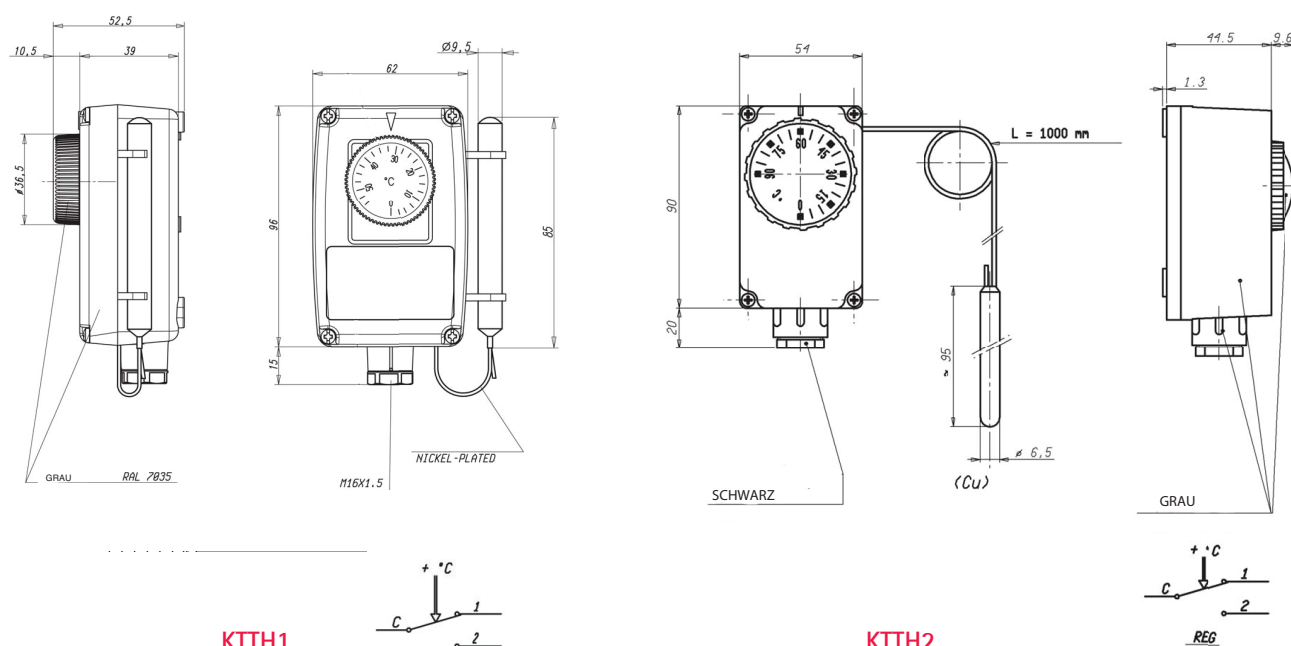
The Thermostats are suited for temperature control and adjustment indoors as well as in pipes/drain pipes (in combination with an immersion sleeve).



Technical Data

	KTTH1	KTTH2
Adjustment range:	0°C...+55°C ±2°C	0°C...+90°C ±3°C
Differential gap:	Δt 3K ±1K	Δt 4°C ±1°C
Max. temperature casing:	85°C	80°C
Max. temperature capillaries:	60°C	150°C
IP Protection class:	IP54	IP40
Contact load:	C1 16(6) A / 250 V C2 6(4) A / 250 V	C1 10(2.5) A NC / 250 V C2 6(2.5) A NA / 250 V
Length of capillary:		1000 mm
Brass immersion sleeve R 1/2":		7 x 8 x 100 mm

Dimension drawings



Price List (Product Group 2)

Type	Switchpoint - adjustment	Price
KTTH1	outside	46.00 €
KTTH2	outside	36.00 €

Immersion Thermostat - TSTB1 / DTTH1 / TTH1

Application

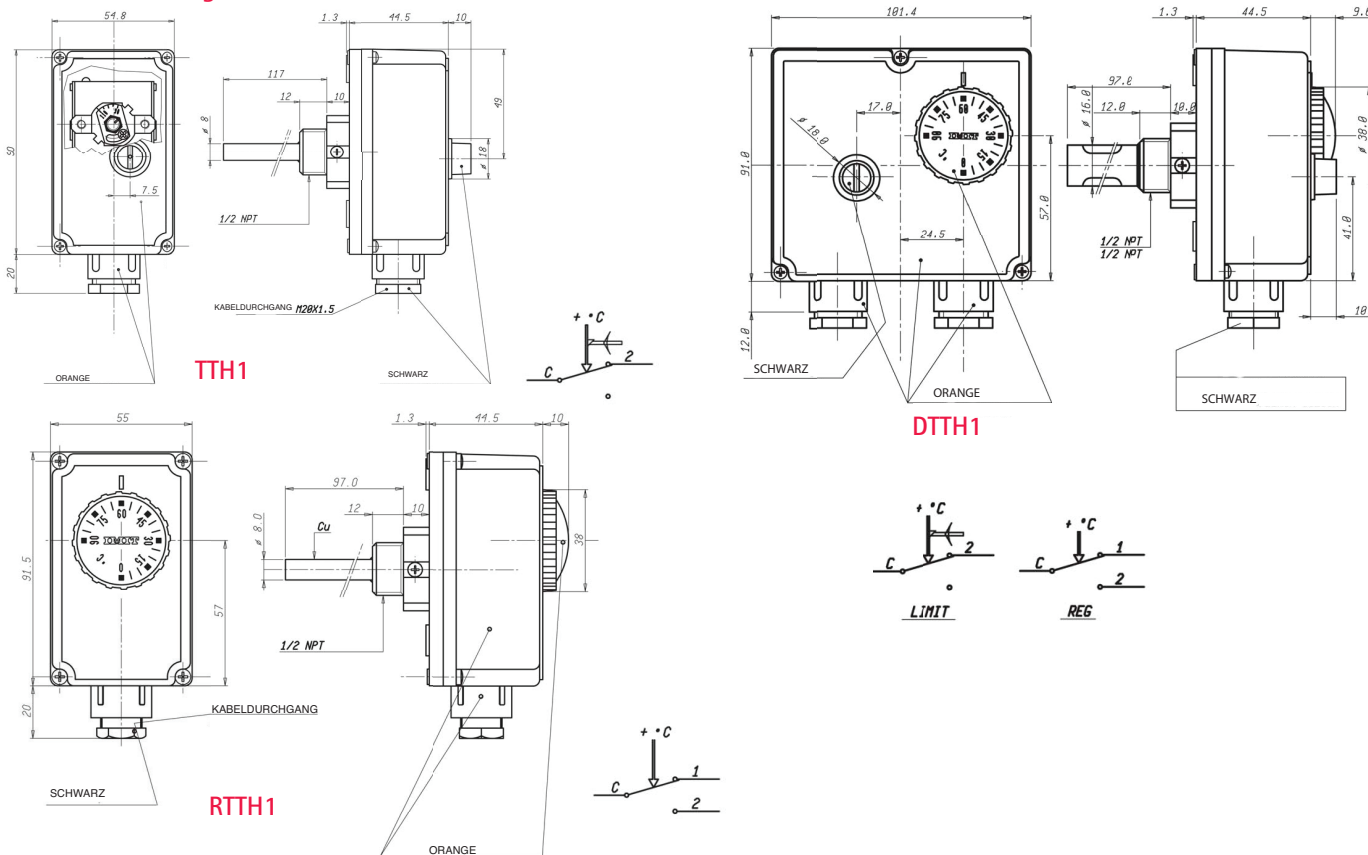
The type AN Contact Sensors are suited for temperature control and adjustment in pipes/drain pipes.



Technical Data

	TSTB1	DTTH1	TTH1
Temperature adjustment range:	Safety Temperature Limiter +90°C...+110°C	Double Thermostat Controller 0°C...+90°C, Limiter +90°C...+110°C	Adjustment Thermostat 0°C...+90°C
Tolerance:	-6K/-15K (depending on model)	Controller ±5, Limiter -15K; -6k (depending on model)	±5k
Differential:	25±8K/15±8K (depending on model)	Controller 6±2K; 4±1k (depending on model), Limiter 25±8K; 15±8k (depending on model)	6±2K
Rückstellung:	Manual	manual/automatic	none
Protection class:	IP 40	IP 40	IP 40
Insulation class:	I	I	I
Temperature gradient:	<1K/min.	<1K/min.	<1K/min.
Max. start temperature:	+80°C	+80°C	+80°C
Max. sensor temperature:	+125°C	+125°C	+125°C
Storage temperature:	-15°C...+55°C	-15°C...+55°C	-15°C...+55°C
Max. envelope pressure:	10 bar	10 bar	10 bar
Response time:	>1'	<1'	<1'
Contact capability:	C-1: 0,5 A / 250 V AC C-2: 10(2.5) A / 250V AC	C-1 REG.: 10(2.5) A / 250 V AC C-2 REG.: 6(2.5) A / 250 V AC C-1 LIM.: 0.5 A / 250 V AC C-2 LIM.: 10(2.5) A / 250 V AC	C-1: 10(2.5) A / 250 V AC C-2: 6(2.5) A / 250 V AC
Cable entry:	M20x1.5	M20x1.5	M20x1.5
Brass immersion sleeve R1/2":	7 x 8 x 120 mm	15 x 16 x 100 mm	7 x 8 x 100 mm

Dimension drawings



Price List (Product Group 2)

Type	Function	Price
TSTB1	Safety Temperature Limiter	41.00 €
DTTH1	Temperatur Controller/Safety Temperature Limiter	60.00 €
TTH1	Temperature Controller	34.00 €

Temperature Controller - TR-ETC1311

Application

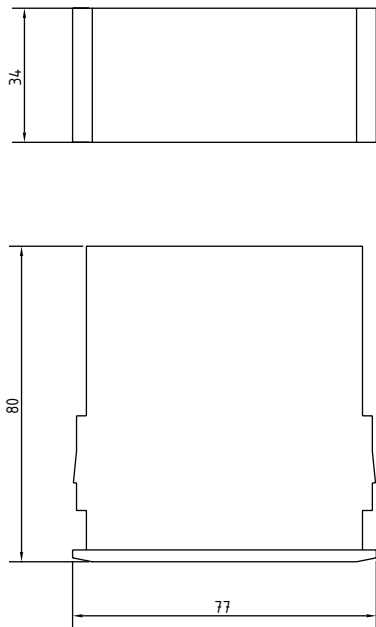
Digital adjustable thermostat for heating and cooling applications. Conveniently operable via the front buttons. With adjustable hysteresis, set value and off-set function.



Technical Data

Power supply:	230 V/AC / optional: 12 V
Power consumption:	max. 4 VA
Input (sensor):	Type J or K thermocouples or PT100 (please specify when ordering)
Scale:	Type J and K thermocouples: 0°C...+600°C / PT100: -100°C...+600°C
Resolution:	1°C
Accuracy:	+/- 0.5°C of full scale reading
Switching output:	Relay, Changeover contact
Set Value selection:	1 set value setting
Control response:	ON/OFF switching mode
Hysteresis:	Adjustable between +1°C and +20°C
Casing:	Switchboard installation (DIN43700), fastening equipment
Dimensions:	34 x 77 x 80 mm
Display:	3 digits, character height 12.5 mm
Terminal connection:	50 mm free ends with core-end sleeves

Dimension drawing TR-ETC1311



Price List (Product Group 2)

Sensor input	Item No.	Price
Fe-CuNi Type J	ETC1311-J	55.00 €
Ni-CrNi Type K	ETC1311-K	55.00 €
PT100	ETC1311-P	55.00 €

Special models available on demand. Please inquire in advance.

PID Controller - ETC4420

Application

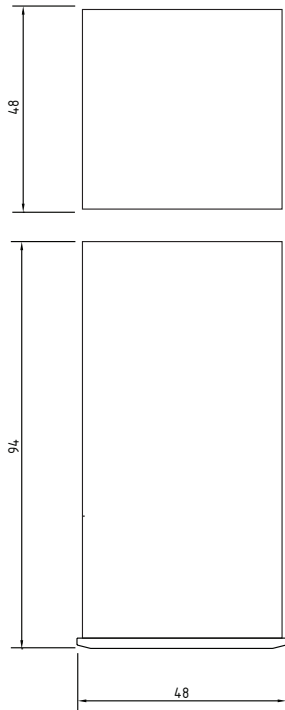
The PID Temperature Controller ETC4420 is equipped with ON/OFF function or PID control with self-adjustment. Actual and set value can be displayed simultaneously. Additionally, the ETC4420 is equipped with a soft start function (ramp function) and a security code function to prevent unauthorized value adjustment. Measuring input for 2/3-wire connection with Pt100 or thermocouples type J, K, T, S and R. The horizontal and vertical menu navigation allows for easy and intuitive operation and make the ETC4420 one of our best-selling products.



Technical Data

Power supply:	230 V/AC / Optional 9...30 V/DC resp. 7...24 V/AC
Power consumption:	max. 5 VA
Input (sensor):	PT100, thermocouples type J, K, T, S, R
Resolution:	0,1°C
Accuracy :	+/- 2°C of full scale reading
Outputs:	
Control/AL 2 output	Relay: Changeover contact 250 V/AC / 2A
AL 1 alarm output	Relay: Make contact 250 V/AC / 2A
SRR output	SRR output max. 12 V / 20 mA
Life span of the relay	30 million switching operations (without load) at 250 V AC / 2 A 300,000 switching operations
Control type:	ON/OFF setting / P, PI, PD, PID
Dimensions:	48 x 48 x 94 mm
Protection class:	IP65 (front) - IP20 (back)

Dimension drawing TR-ETC4420



Features

- Soft start (ramp function)
- RS-485 interface with ModBus protocol (optional)
- Control output adjustable as relay or SSR output
- Relay output adjustable as 2nd alarm or as control output
- AL 1 as alarm output
- Heating and cooling function selectable
- Offset adjustment for input size
- Periodical switching mode of the output with sensor break adjustable
- Parameter protection against unauthorized adjustment
- Programmable via buttons or ModBus protocol

Price List (Product Group 2)

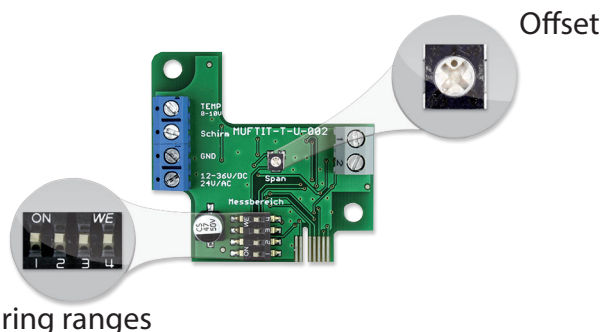
Type	Description	Price
ETC4420-SM (9...30 V DC or resp. 7...24 V AC)		159.10 €
ETC4420-RS	with RS485 interface	172.10 €
ETC4420	without RS485 interface	149.50 €

Special models available on demand. Please inquire in advance.

Temperature Measurement Transducer - MUFTIT-T-I-001/U-001

Application

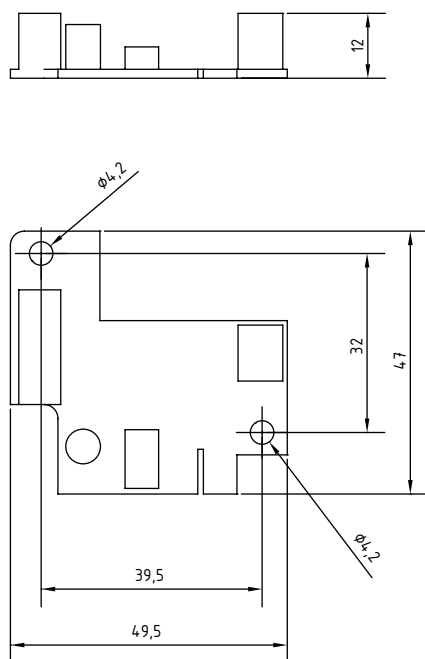
The measuring transducer measures the temperature via a connected PT100 sensor and converts the value into a standardized analogue output signal in the range between 0-10V/4-20 mA. 12 measuring ranges can be selected and adjusted with the help of a DIP switch. The offset can be corrected by $\pm 3K$ using the potentiometer.



Technical Data

Power supply:	15...36 V/DC, dependent on apparent ohmic resistance (at 4-20 mA) 15-36 V DC, 24 V/AC (at 0-10 V)
Analogue output apparent ohmic resistance:	300-1000 Ohm (at 4-20 mA)
Analogue output load:	Min. load resistance 10 kOhm (at 0-10 V)
Accuracy:	$\pm 0.2K$ + max 3% of input value
Measuring range:	12 measuring ranges selectable
Operating temperature MUF:	-30°C...+70°C
Operating temperature (relative humidity):	0...98%, non-condensing
Temperature sensor:	PT100 DIN EN 60751, Class B
Terminal/Connection:	Screw clamps 1.5 mm ²
Protection class:	IP00
Norms:	EMC according to EN 61326-1 2006, EMC directive 89/336/EEC
Connection:	3-wire

Dimension drawing MUFTIT



Measuring range °C	1	2	3	4
-50°C...+50°C	OFF	OFF	OFF	OFF
-50°C...+150°C	ON	OFF	OFF	OFF
-30°C...+70°C	OFF	ON	OFF	OFF
-20°C...+50°C	ON	ON	OFF	OFF
-20°C...+80°C	OFF	OFF	ON	OFF
-20°C...+120°C	ON	OFF	OFF	OFF
-20°C...+150°C	OFF	ON	ON	OFF
0°C...+50°C	ON	ON	ON	OFF
0°C...+70°C	OFF	OFF	OFF	ON
0°C...+100°C	ON	OFF	OFF	ON
0°C...+150°C	OFF	ON	OFF	ON

Price List (Product Group 2)

Measuring transducer	Price
MUFTIT-T-I-001	54.00 €
MUFTIT-T-U-001	54.00 €

Special models available on demand. Please inquire in advance.

Temperature Measurement Transducer - SEM206 / SEM1603

Application

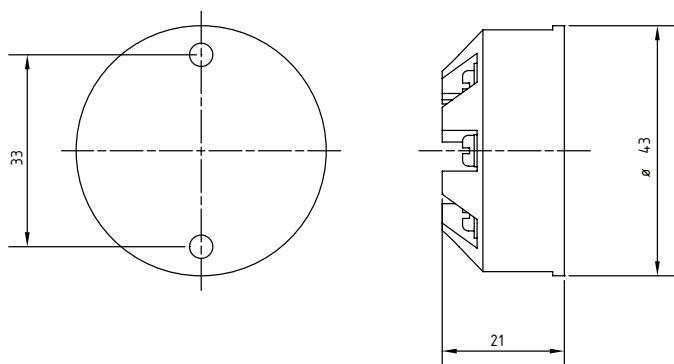
All our measuring transducers can be preset to your desired measuring range prior to delivery. Optionally, the transducer can be adjusted by the customer himself with the help of an optional USB kit.



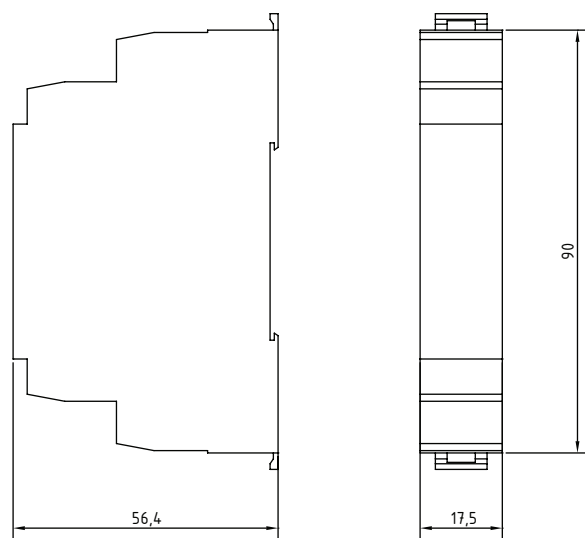
Technical Data

	SEM206P (PT100)	SEM206T (Thermocouple elements)	SEM1603P (PT100)	SEM1603T (Thermocouple elements)
Sensor input:	PT100 2/3-wire	K, J, N, E, T, R, S	Pt100 2/3-wire	K, J, N, E, T, R, S
Temperature range:	-200°C...+850°C	-200°C...+1760°C	-200°C...+850°C	-200°C...+1760°C
Accuracy:	±0.2°C	±0.2°C	±0.2°C	±0.2°C
Power supply:	10...30 V DC	10...30 V DC	11...30 V DC	11...30V DC
Output:	4...20 mA	4...20 mA	4...20 mA	4...20 mA
Response time:	1 sec	1 sec	0.5 sec	0.5 sec
Sensor connection:	Screw clamps	Screw clamps	Screw clamps	Screw clamps
Standard measuring range (preset):	0°C...+100°C	0°C...+100°C	0°C...+100°C	0°C...+100°C
Connection:	2-wire	2-wire	2-wire	2-wire

Dimension drawing SEM206 and 206T for head mounting



Dimension drawing SEM1603 and 1603T for top head rail mounting



Price List (Product Group 2)

Measuring transducer	Item No.	Price
SEM206P – PT100	SEM206P	60.00 €
SEM206T – Thermocouple element	SEM206T	62.00 €
SEM1603P – PT100	SEM1603P	90.00 €
SEM1603T – Thermocouple element	SEM1603T	90.00 €
USB programming kit	USB-CONFIG	62.00 €

Special models available on demand. Please inquire in advance.

Infrared Thermometer with Camera and Recorder - IRT1

Application

The IRT1 is a cost-efficient alternative to conventional infrared cameras. The surface temperature is taken by aiming the IRT at the area to be measured. The measurement can be displayed as a photo or video where every change in temperature is recorded. This way temperature curves can be visualized for all types of assemblies. The recordings can be analyzed via the integrated 55 mm TFT color display or with the help of a computer using the USB connection. The relative air humidity as well as the dew point can also be measured with the integrated sensor.

The device is typically used in the areas of machine construction, gastronomy, HVAC and the food industry.



Technical Data

Temperature measuring range:	IR thermometer: -50°C...+1000°C Air temperature: 0°C...+50°C External type K sensor: -50°C...+1370°C
Resolution temperature:	0.1K
Standard accuracy:	0.1K
Laser coverage ratio (DS):	50:1
TFT color display:	55 mm with 320 x 240 pixel display CMOS camera sensor: 300,000 px Resolution: 640 x 480
Dimensions (l x w x h):	58 x 205 x 125 mm
Power supply:	Lithium ion battery, 3.7 V

Example of use



Features

- High-resolution video camera: CMOS, 300.00 pixels, 640 x 480
- Response time: 300 ms
- Wide temperature range: -50°C...+1000°C
- An external type K sensor can be connected
- High accuracy with a deviation of 0.1°C
- Additional feature for air temperature measurement (0°C...+50°C)
- Alarm mode
- High performance battery, can be charged via USB cable
- Integrated 8 GB SD card

Scope of delivery

- Thermometer
- Tripod
- USB cable
- SD memory card
- Type K sensor
- Lithium ion battery
- Charger
- User manual
- Plastic case

Price List (Product Group 2)

Type	Price
IRT-1	345.40 €

Special models available on demand. Please inquire in advance.

Outdoor Combination Sensor for Temperature/Humidity - ARFT/R-x/S

Application

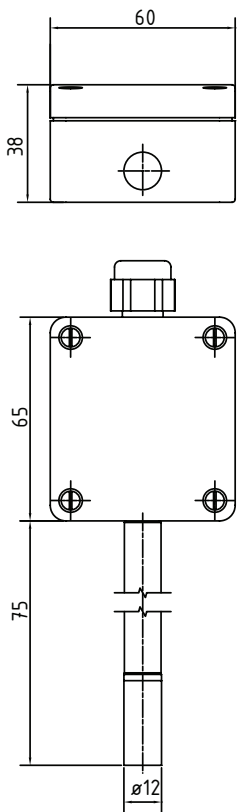
Device for measuring the relative humidity/temperature in outdoor areas or indoor areas subject to high requirements.



Technical Data

Sensor element (humidity):	Capacitive sensor
Sensor element (temperature):	PT100, class B pursuant to DIN 60751
Humidity measuring range:	0...100% r. h.
Output:	0...10 V or 4...20 mA
Tolerance at 35...70% r.h:	±2% (25...90% r.h.)
Temperature drift:	Compensated
Temperature measuring range:	-30°C...+70°C
Output:	0...10 V, 4...20 mA or passive
Accuracy:	±0.5K
Power supply:	24 V AC/DC
Power input:	9.3 mA
Terminal clamps:	Diameter 0.75 mm
Casing:	PA 15% GK, color RAL 9010
Casing dimensions (l x w x h):	65 x 60 x 38 mm
Protection class:	IP65
Sensor protection:	Sintered filter made from HD polyethylene
Passive temperature sensors:	PT100, PT1000, Ni1000, Ni1000TK5000 (L+G), NTC10k, NTC20k, PRECON, LM235Z

Dimension drawing ARTF/R-x/S



Accessories for fast response time



Plastic wire mesh filter, 12 x 17, stainless steel	
Dimensions:	12x27 mm
Price:	18.50 €

Price List (Product Group 2)

Type	Supply voltage	Temp. output	Humidity output	Price
ARFT/R-U/S	24 V AC/DC	0...10 V	0...10 V	125.00 €
ARFT/R-I/S	24 V AC/DC	4...20 mA	4...20 mA	130.00 €
ARFTP/R-xxx/S	24 V AC/DC	passive	0...10 V	130.00 €



Duct Humidity Sensor - KFF/R-x/S

Application

Device for measuring the relative humidity in air-conditioning ducts.

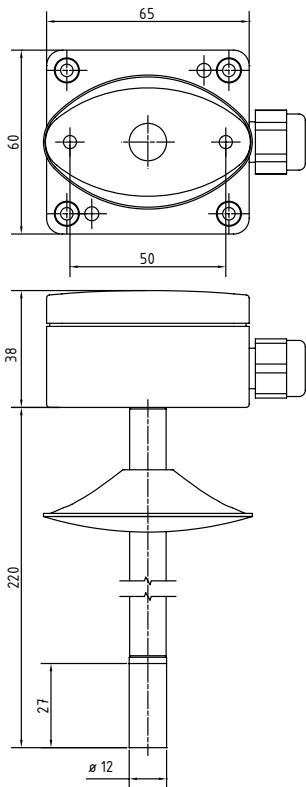


Technical Data

Sensor element (humidity):	Capacitive sensor
Humidity measuring range:	0...100% r. h.
Output:	0...10 V or 4...20 mA
Tolerance at 35...70% r.h:	±2% (25...90% r.h.)
Accuracy:	± 0,5 K
Power supply:	24 V AC/DC
Power input:	9.3 mA
Terminal:	Diameter 0.75 mm
Casing:	PA6 15% GK, color RAL 9010
Casing dimensions (l x w x h):	65 x 60 x 38 mm
Protection class:	IP65
Sensor protection:	Sintered filter made from HD polyethylene

Plastic wire mesh filter, 12 x 17, stainless steel
Dimensions 12 x 27 mm with thread socket M 11 x 0.75 mm and sealing ring.

Dimension drawing KFF/R-x/S



Accessories for fast response time



Plastic wire mesh filter, 12 x 17, stainless steel	
Dimensions:	12x27 mm
Price:	18.50 €

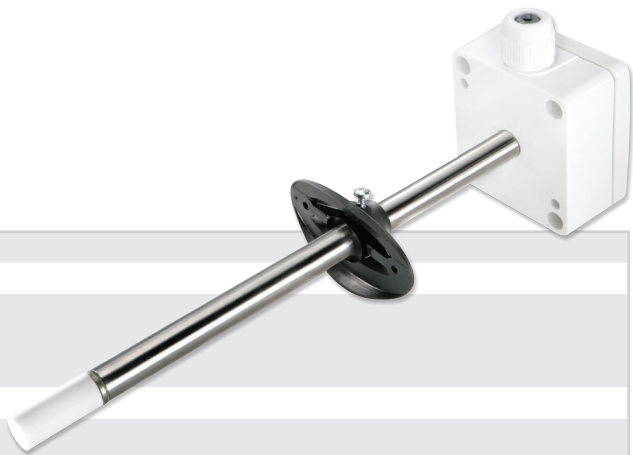
Price List (Product Group 2)

Type	Supply voltage	Temp. output	Price
KFF/R-U/S	24 V AC/DC	0...10 V	120.00 €
KFF/R-I/S	24 V AC/DC	4...20 mA	120.00 €

Duct Combination Sensor for Temperature/Humidity - KFFT/R-x/S

Application

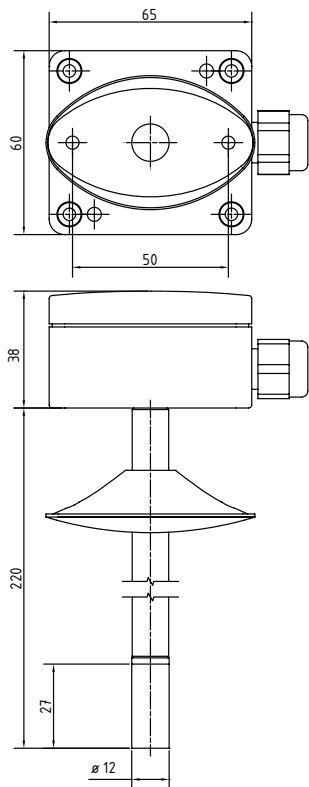
Device for measuring the relative humidity and/or temperature in air-conditioning ducts.



Technical Data

Sensor element (humidity):	Capacitive sensor Sensor
Sensor element (temperature):	PT100, class B pursuant to DIN 60751
Humidity measuring range:	0...100% r. h.
Output:	0...10 V or 4...20 mA
Tolerance at 35...70% r.h.:	±2% (25...90% r.h.)
Temperature drift:	Compensated
Measuring range Temperatur:	-30°C...+70°C
Output:	0...10 V, 4...20 mA or passive
Accuracy:	± 0.5 K
Power supply:	24 V AC/DC
Power input:	9.3 mA
Terminal:	Diameter 0.75 mm
Casing:	PA6 15% GK, color RAL 9010
Casing dimensions (l x w x h):	65 x 60 x 38 mm
Protection class:	IP65
Sensor protection:	Sintered filter made from HD polyethylene
Passive temperature sensors:	PT100, PT1000, Ni1000, Ni1000TK5000 (L+G), NTC10k, NTC20k, PRECON, LM235Z

Dimension drawing KFFT/R-x/S



Accessories for fast response time



Plastic wire mesh filter, 12 x 17, stainless steel	
Dimensions:	12x27 mm
Price:	18.50 €

Price List (Product Group 2)

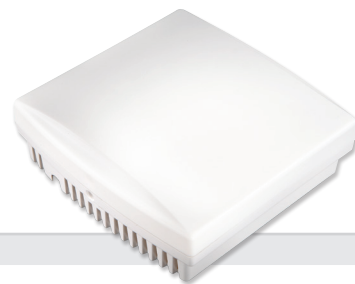
Type	Supply voltage	Temp. output	Humidity output	Price
KFFT/R-I/S	24 V AC/DC	4...20 mA	4...20 mA	130.00 €
KFFT/R-U/S	24 V AC/DC	0...10 V	0...10 V	125.00 €



Indoor Sensor for Relative Humidity - RFF/R-U/S

Application

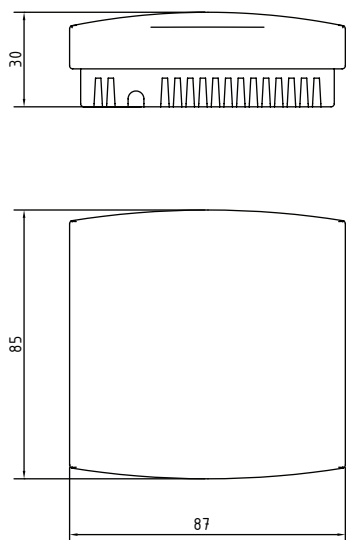
Apparatus for measuring the relative humidity in living and office spaces, reception halls, foyers etc.



Technical Data

Sensor element (humidity):	Capacitive sensor
Humidity measuring range:	0...100% r. h.
Output:	0...10 V
Tolerance at 5...90% r.h:	±3% (25°C)
Power supply:	24 V AC/DC
Power input:	max. 7.3 mA
Terminal:	Diameter 0.75 mm
Casing:	ABS, color RAL 9010
Casing dimensions (l x w x h):	85 x 87 x 30 mm
Protection class:	IP20

Dimension drawing RFF/R



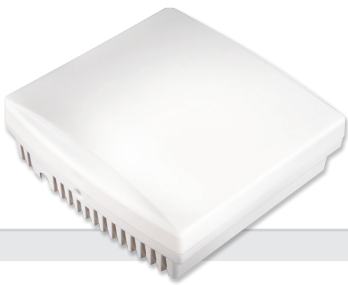
Price List (Product Group 2)

Type	Supply voltage	Humidity output	Price
RFF/R-U/S	24 V AC/DC	0...10 V	102.00 €

Indoor Combination Sensor for Temperature/Humidity - RFFT/R-x/S

Application

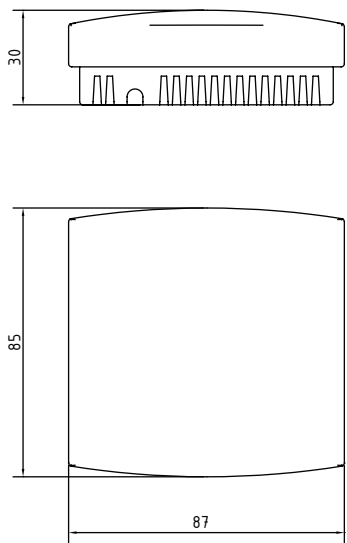
Apparatus for measuring the relative humidity and/or temperature in living and office spaces, reception halls, foyers etc.



Technical Data

Sensor element (humidity)	Capacitive sensor
Sensor element (temperature):	PT100, class B pursuant to DIN 60751
Humidity measuring range:	0...100% r. h.
Output:	0...10 V
Tolerance at 5...90% r.h:	±3% (25°C)
Measuring range Temperatur:	0°C...+50°C
Accuracy:	±0.5°C
Output:	0...10 V
Power supply:	24 V AC/DC
Power input:	max. 7.3 mA
Terminal:	Diameter 0.75 mm
Casing:	ABS, color RAL 9010
Casing dimensions (l x w x h):	85 x 87 x 30 mm
Protection class:	IP20
Passive Temperatursensoren:	PT100, PT1000, Ni1000, Ni1000TK5000 (L+G), NTC10k, NTC20k, PRECON, LM235Z

Dimension drawing RFFT/R-x/S



Price List (Product Group 2)

Type	Supply voltage	Temp. output	Humidity output	Price
RFFT/R-U/S	24 V AC/DC	0...10 V	0...10 V	124.00 €
RFFT/R-xxx/S	24 V AC/DC	passive	0...10 V	130.00 €



Condensation Monitor - KDW2

Application

The controller device is typically used on cooling ceilings and in the following areas:

- In indoor swimming pools or on shop windows in order to keep the isolating glass free from condensation or ice.
- In water treatment plants or industrial plants in order to detect condensation on cold pipe networks.
- In halls or storage rooms in order to prevent condensation build-up on cold outer walls or steel doors and to protect the masonry.
- With floor creed renovation, drying out concrete structures or flat roof renovation in order to determine the end of the drying process.
- In switching cabinets or machines in order to detect condensation build-up on fragile electrical components.
- For humidity and leak monitors: the isolated closed current contact is compatible with all commercially available alarm and detection systems.



Technical Data

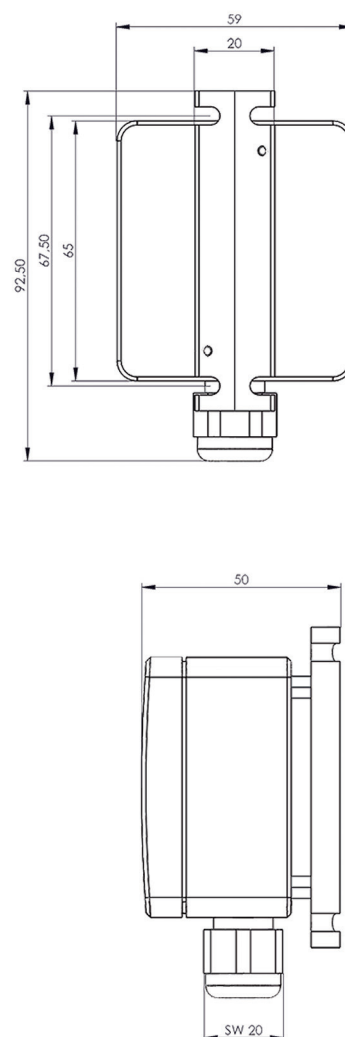
Sensor system	
Switchpoint:	94% r.h., $\pm 4\%$, mill-calibrated
Switching hysteresis:	ca -4% r.h.
Operating range:	0% - 100% r.h.
Max. operating temperature:	+10°C...+60°C
Thawing:	Admissible
Condensation:	temporarily admissible
Measuring medium:	Ambient air without atmospheric pollution
Response time:	ca. 120 sec with switching from 75 % to thawing
Dust protection filter:	Polyethylene, sintered material
Power supply	
Operating voltage:	Isolated auxiliary voltage, 24 V/AC $\pm 20\%$, 50 Hz or 20-28 V/DC
Operating current:	typically 5 mA, max. 7 mA
Function control:	red LED when in operation
Output circuit	
Switching characteristic:	Isolated relay with switching contact, closed at normal operation (condensate free). Open at missing operating voltage or thawing.
Actuator:	Relay, interference-suppressed with varistor
Contact voltage:	max. 39 V _{ss}
Switching current:	max. 3 A AC/DC
Display:	red LED for closed contact (dry)
Further data	
Dimensions (l x w x h):	ca. 81 x 57 x 60 mm (without cable)
Connecting terminal:	PHOENIX CONTACT 1.5 mm ²
Protection class:	IP 20
EMI:	EN 61000 - 6 - 3
EMV:	EN 61000 - 6 - 1
Mounting position:	variable
Scope of delivery:	Electronics with built-in prism sensor

Terminal assignment

Pin	Function
1	Relay center contact
2	Relay break contact
3	Relay make contact
4	Operating voltage 24 V
5	Operating voltage 24 V

The drawing shows the dew point switch with view of the plug contacts.

Dimension drawing KDW2



Price List (Product Group 2)

Type	Description	Price
KDW2-P	Prisma	48.60 €
KDW2-F	Flat sensor	48.60 €
KDW2-12	for Ø 12 mm pipe	48.60 €
KDW2-15	for Ø 15 mm pipe	48.60 €
KDW2-18	for Ø 18 mm pipe	48.60 €
KDW2-22	for Ø 22 mm pipe	48.60 €

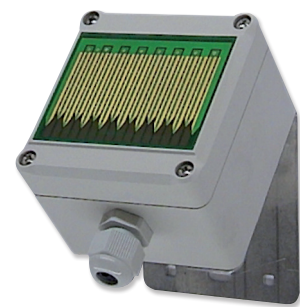
available in
spring 2013!

Order example: Condensation Monitor for Ø 15 pipe: KDW-D15-BU

Rain Sensor - RGM1

Application

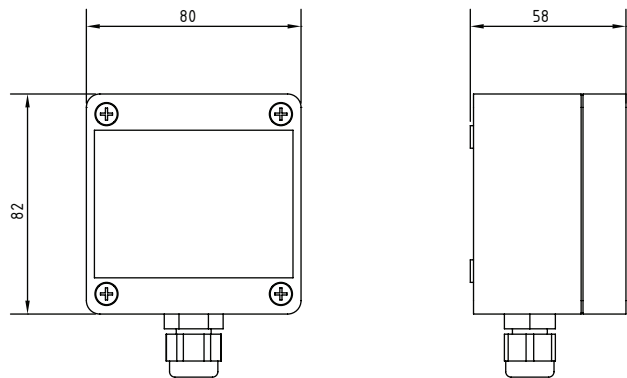
Device for detecting precipitation as either rain or snow. The circuit polarity and sensitivity are adjustable. A connectible heating prevents the formation of ice or dew and helps the device to dry faster.



Technical Data

Operating voltage:	24 V DC/AC +10%
Power input:	50 mA Heating: 40-180 mA (PTC)
Measuring principle:	Electrolytic AC measuring
Contact load:	max. 30V DC / 4 A
Terminal connection:	0.5-1.5 mm ² Clamp with wire protection
Dimensions (l x w x h):	80 x 82 x 58 mm
Cable inlet:	M16
Protection class:	IP54

Dimension drawing RGM1



Price List (Product Group 2)

Type	Description	Price
Rain Sensor RGM1		88.50 €
Accessories	Fastener for wall mounting	19.60 €

Special models available on demand. Please inquire in advance.

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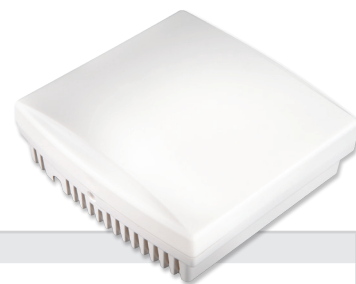
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Air Quality Sensor for Living Spaces - RALQ

Application

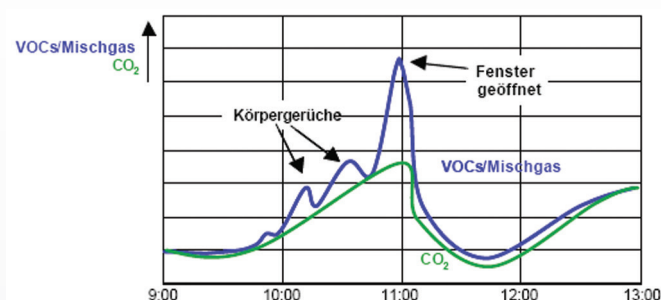
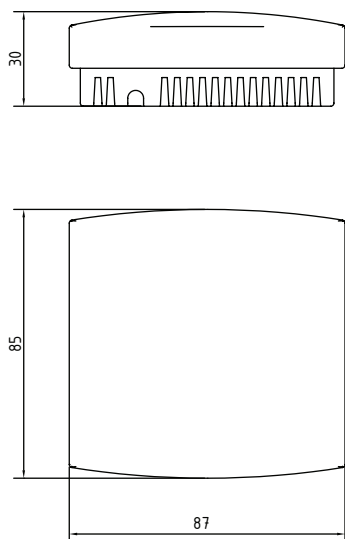
Device for measuring the air quality in living and office spaces, equipped with a 0-10V standard output. The RALQ/S is a mixed gas/VOC sensor. The CO₂ equivalents are derived from a conforming algorithm as the odor emissions are overlaying the CO₂ value (see graphics).



Technical Data RALQ

Power supply:	15...36 V DC $\pm 10\%$
Power input:	max. 45 mA
Output:	0...10 V
Calibration (equivalent to):	good quality air ca. 1 V = 250 ppm CO ₂ equivalent 5 V = 1175 ppm CO ₂ equivalent 9 V = 2000 ppm CO ₂ equivalent
Operating temperature:	0°C...+40°C
Humidity:	5...95% r.h.
Protection class:	IP20
Casing:	ABS
Casing dimensions (l x w x h):	85 x 87 x 30 mm

Dimension drawing RALQ



Price List (Product Group 2)

Type	Output	Price
RALQ	0...10 V	150.00 €

Air Quality Sensor with LED Display - RALQA-U/RALQA-I

Application

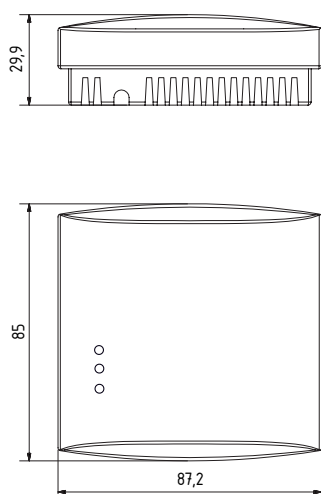
The measuring transducer measures the atmospheric conditions via a mixed gas sensor and yields a corresponding CO₂ signal which is then transformed into a standardized analogue output signal (0-10V).



Technical Data

	RALQA-U	RALQA-I
Power supply:	15...36 V DC	15...36 V DC
Output:	0...10 V	4...20 mA
Measuring range:	0...2000 ppm	0...2000 ppm
Analogue output (load):	min. load resistance 10 kOhm	Working resistance 600 Ohm
Operating temperature (transducer):	0°C...+50°C	0°C...+50°C
Operating temperature (relative humidity):	0...95%, non-condensing	0...95%, non-condensing
Terminals:	Screw clamps 1.5 mm ²	Screw clamps 1.5mm ²
Protection class:	IP00	IP00

Dimension drawing RALQA



Price List (Product Group 2)

Type	Output	Price
RALQA-U	0...10 V	195.00 €
RALQA-I	4...20 mA	195.00 €

Special models available on demand. Please inquire in advance.

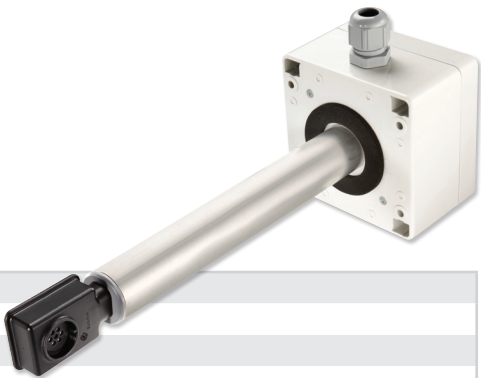
available in
spring 2013!



Duct Air Quality Sensor – KALQ

Application

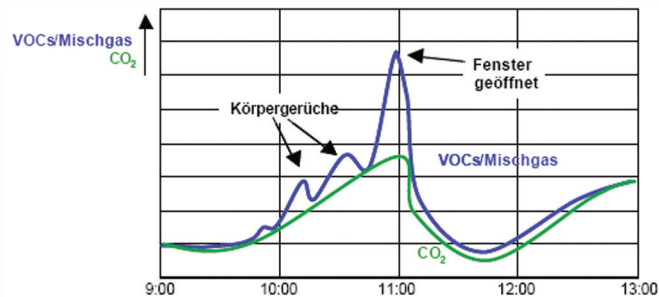
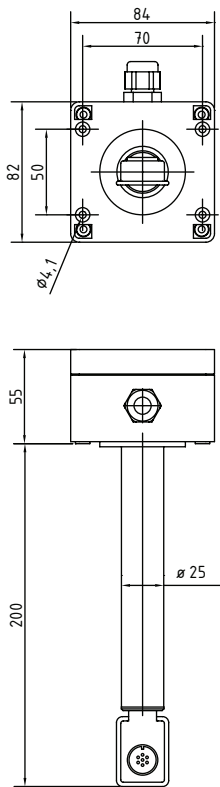
Device for measuring the air quality in air ducts, equipped with a 0-10V standard output.



Technical Data

Power supply:	15-24 V AC/DC $\pm 10\%$
Power input:	max. 45 mA
Output:	0...10 V
Calibration (equivalent to):	good quality air ca. 1 V = 250 ppm CO ₂ equivalent 5 V = 1175 ppm CO ₂ equivalent 9 V = 2000 ppm CO ₂ equivalent
Operating temperature:	0°C...+40°C
Humidity:	5...95% r.h.
Protection class:	IP65 (Casing)
Casing:	ABS

Dimension drawing KALQ



Price List (Product Group 2)

Type	Output	Price
KALQ	0...10 V	218.00 €

Air Quality Sensor for Living Spaces (flush-mounted) - RALQ-UP

Application

Our VOC sensor is known to be very energy-efficient. The sensor is equipped with a 0-10 V/DC output signal and is available for up to 3 measuring categories (only available as VOC sensor for the moment).

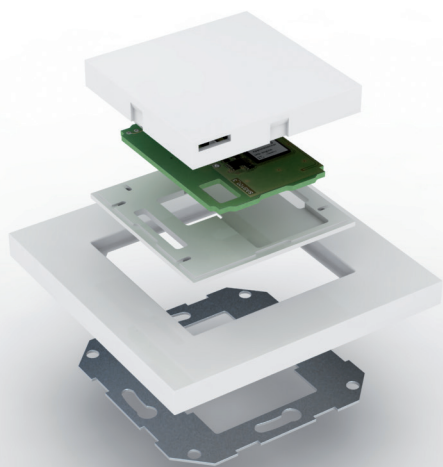
The VOCup can be combined with the following switch series:
GIRA E2, Event / Merten System M / Jung A500, Ap581, AS500 / Berker B.1, B.7



Technical Data

Sensor system	
VOC sensor:	Metal oxide sensor with semi-automatic calibration
Fields of application:	Indoors 0°C...+50°C, 5..95% r.h. (without dewing)
Measuring range:	450...2000 ppm CO ₂ equivalent
Electronics	
Supply voltage :	12...25 V AC or 12...25 V DC
Power consumption:	14 mA @ 24 V DC
Signal output:	0-10 V/DC (further ranges tbd, please inquire)
Warm-up phase:	15 min after current contact
Dimensions	
Casing (w x h):	55 x 55 mm
Casing depth:	ca. 10 mm
Wall mounting:	into receptacle provided by customer, Ø 60 mm, with galvanized steel mounting plate
Connections:	Plug with screw clamps for 0.25-1.5 mm ² (cable/strand)
Casing:	Plastic (partially painted)
Pure white, gloss (similar to RAL 9010), matt or special colors	

Assembly RALQ-UP



available in spring 2013
with additional
option for temperature
and humidity
measurements!

Price List (Product Group 2)

Type	Output	Price
RALQ-UP	0...10 V	270.00 €



Room Sensor for CO₂ and Temperature Measurements - RACO2

Application

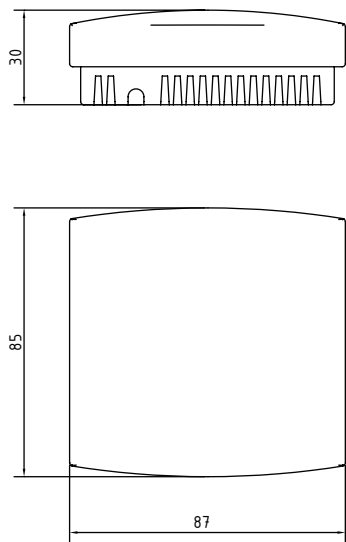
Device for measuring the CO₂ content and temperature in living and office spaces etc., equipped with a 0-10 V standard output.



Technical Data RACO₂

Power supply:	24 V AC/DC ± 20%
Power input:	9 mA
Electrical connection:	Screw clamps
Output:	0...10 V
Sensor element:	nondispersive infrared (NDIR) sensor with automatic background calibration
Measuring range CO ₂ :	0...2000 ppm
Accuracy:	< ± (50ppm +2% of scale reading) at 25°C and 1013 mbar
Optional:	
Temperature:	0...10 V / 0°C...+50°C
Accuracy:	±0.5°C
Humidity:	0...10 V / 0...100% r.h.
Accuracy:	< ± 3% bei 25°C between 10...90% r.h.
Operating temperature:	0°C...+50°C
Humidity:	10...95% r.h.
Protection class:	IP20

Dimension drawing RACO₂



Price List (Product Group 2)

Type		Output	Price
RACO ₂	CO ₂	0...10 V	238.00 €
RACO ₂ /T	CO ₂ and temperature	2x0...10 V	268.00 €
RACO ₂ /T/F	CO ₂ , temperature and humidity	3x0...10 V	356.00 €

Duct Sensor for Carbon Dioxide Measurements - KACO2

Application

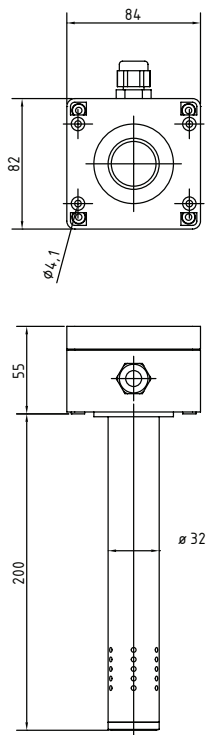
Device for measuring the CO₂ content in air ducts of HVAC installations, equipped with a 0-10V standard output.



Technical Data KACO₂

Power supply:	24 V AC/DC + 20%
Power input:	< 9 mA
Electrical connection:	Screw clamps
Output:	0...10 V
Sensor element:	nondispersive infrared (NDIR) sensor with automatic background calibration
Measuring range CO ₂ :	0...2000 ppm
Accuracy:	< ± (50ppm 2% of scale reading) at 25°C and 1013 mbar
Optional:	
Temperature:	0...10 V / -30°C...+70°C
Accuracy:	± 0.5°C
Humidity:	0...10 V / 0...100% r.h.
Accuracy:	< ± 3% bei 25°C between 10...90% r.h.
Operating temperature:	-20°C...+50°C
Humidity:	10...95% r.h.
Protection class:	IP65 (Casing)
Casing:	Plastic
Color:	Grey

Dimension drawing KACO₂



Price List (Product Group 2)

Type		Output	Price
KACO ₂	CO ₂	0...10 V	316.00 €
KACO ₂ /T	CO ₂ and temperature	2x0...10 V	346.00 €
KACO ₂ /T/F	CO ₂ temperature und humidity	3x0...10 V	434.00 €



Motion and Light Sensor - PIRLUX

Application

The combination sensor for motion and light can be used both indoors and outdoors. The light sensor is equipped with a DIP switch for 4 different light levels. The motion sensor's time constant of the relay output can be set between 1 second and 10 minutes.



Technical Data

Power supply:	15...36 V DC, 24 V AC
Analogue output U:	min. load resistance 10 kOhm
Analogue output I:	Ohmic resistance 300-1000 Ohm
Connection power:	Relay PIR 48V/2A
Accuracy LUX:	± 10%
Measuring range LUX:	4 selectable measuring ranges
Operating temperature:	-30°C...+70°C
Operating temperature (relative humidity):	0...98%, non-condensing
Terminals:	Screw clamps 1.5 mm ²
Protection class:	IP00
Norms :	CE, EMC according to EN 61326-1 2006, EMC directive 89/336/EEC

Measuring range selection

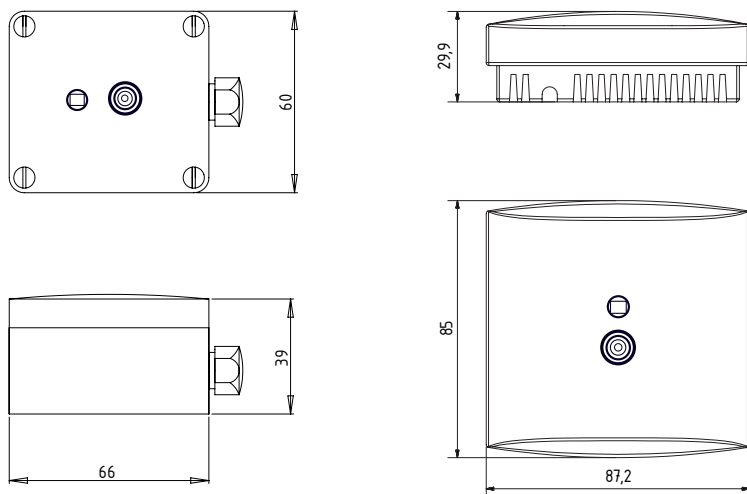
Measuring range Lux	1	2
0...1000	OFF	OFF
0...10000	ON	OFF
0...50000	OFF	ON
0...100000	ON	ON

Motion detection and light sensor

Light sensor:
Active output: 0-10 V or 4-20 mA
various measuring ranges

Motion sensor:
Relay output
Adjustable time

Dimension drawing PIRLUX



Price List (Product Group 2)

For indoor use

Type	Output	Price
IPIRLUX-U	Relay / 0-10 V	178.00 €
IPIRLUX-I	Relay / 4-20 mA	178.00 €
IPIR	Relay	105.00 €
ILUX-U	0...10 V	84.00 €
ILUX-I	4...20 mA	84.00 €

For outdoor use

Type	Output	Price
APIRLUX-U	Relay / 0-10 V	178.00 €
APIRLUX-I	Relay / 4-20 mA	178.00 €
APIR	Relay	116.00 €
ALUX-U	0...10 V	84.00 €
ALUX-I	4...20 mA	84.00 €

available in spring
2013!

Special models available on demand. Please inquire in advance.

Pressure/Differential Pressure Transducer - FDE25

Application

Digital pressure transducer for the measurement of excess pressure, negative pressure and differential pressure. This series' transmitter is well suited for a wide range of measurement tasks for dry, neutral or gaseous media in the fields of air conditioning, ventilation and environmental technology.



Technical Data

Pressure range (bar):	see table (order code)
Max. static operating pressure:	see table (order code)
Bursting pressure	1.5 times the maximum static pressure
Linearity:	± 1% of measuring range (typ. 0.5%)
Hysteresis:	± 0,2% of measuring range (typ. 0.05%)
Admissible ambient temperature:	-10°C...+50°C
Admissible media temperature:	-10°C...+50°C
Pressure connection:	Conduit fittings for 6/4 mm tubings
Power connection:	At the interior terminal strip or M12 plug-in connection
Protection class:	IP65 pursuant to EN 60529

Digital Differential Pressure Transmitter FDE25 (Product Group 2)

Short Description										Price in Euro	
Standard measuring ranges from 0-4 mbar to 0-100bar without display Class 2.5 IP65 Protection Class										Basic price	
										137.00 €	
Construction Type		Order Code								Surcharge	
Measuring range	admissible operating pressure										
0...4 mbar	50 mbar	5	2							0.00 €	
0...6 mbar	50 mbar	5	3							0.00 €	
0...10 mbar	100 mbar	5	4							0.00 €	
0...16 mbar	100 mbar	5	5							0.00 €	
0...25 mbar	250 mbar	5	6							0.00 €	
0...40 mbar	250 mbar	5	7							0.00 €	
0...60 mbar	500 mbar	5	8							0.00 €	
0...100 mbar	500 mbar	5	9							0.00 €	
-2.5...+2.5 mbar	50 mbar	A	6							0.00 €	
-4...+4 mbar	50 mbar	A	7							0.00 €	
-6...+6 mbar	100 mbar	A	8							0.00 €	
-10...+10 mbar	100 mbar	A	9							0.00 €	
-16...+16 mbar	250 mbar	B	1							0.00 €	
-25...+25 mbar	250 mbar	B	2							0.00 €	
-40...+40 mbar	500 mbar	C	5							0.00 €	
-60...+60 mbar	500 mbar	B	3							0.00 €	
Characteristic deviation (relative pressure)											
Characteristic deviation < 2.5%					K					0.00 €	Standard
Characteristic deviation < 1.0%					M					26.00 €	
Pressure connections											
Plug connection for 6/4mm tubing					0	4	5			0.00 €	Standard
Plug connection for 8/4mm tubing					0	4	6			0.00 €	
Electrical output signal											
0...20 mA linear, three-wire								A		0.00 €	
0...10 V linear, three-wire								C		0.00 €	
4...20 mA linear, three-wire								P		0.00 €	
0...5 V linear, three-wire								U		0.00 €	
Operating voltage											
24 V DC/AC (12...32 VDC/AC)								K		0.00 €	
Electrical connection											
internal terminal strip									E	0.00 €	
M 12 plug connection									M	8.00 €	
Assembly											
integrated wall mounting straps									W	0.00 €	Standard
FDE25 0 K 0 0 W											
Accessories:											
M12 Coupling (4-pole); PUR cable 2 m (connection cable for supply/signal), order-No.-06401993										17.40 €	
M12 Coupling (4-pole); PUR cable 5 m (connection cable for supply/signal), order-No.-06401994										20.80 €	
M12 Coupling (4-pole); PUR cable 15 m (connection cable for supply/signal), order-No.-06401566										50.00 €	
Quickon coupling (4-pole); order-No.-06401863, for individual cable assembly										18.20 €	

FDE25 0 0 K 0 0 W

Pressure/Differential Pressure Transducer without Display - FDE23

Application

Digital pressure transducer for the measurement of excess pressure, negative pressure and differential pressure. This series' transmitter is well suited for a wide range of measurement tasks for dry, neutral or gaseous media in the fields of air conditioning, ventilation and environmental technology.



Technical Data

Pressure range (bar):	see table (order code)
Max. stat. operating pressure:	1.0 bar
Bursting pressure:	1.7 bar
Admissible ambient temperature:	-10°C...+70°C
Admissible media temperature:	-10°C...+70°C
Pressure connection:	Conduit fittings for 6/4 mm or 8/4 mm tubings
Electrical connection:	1 circular connector (5-pole, male)
Protection class:	IP65 pursuant to EN 60529

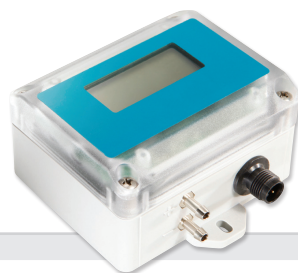
Digital Differential Pressure Transmitter FDE23 without display (Product Group 2)

Short Description										Price in Euro		
Standard measuring ranges from 0-25 Pa to 0-1000 Pa Abmissible stat. operating pressure: 70 kPa Class 1.0 IP65 Protection Class										Basic price		
										292.00 €		
Construction Type					Order Code					Surcharge		
Measuring range												
0...25 Pa					D	1						0.00 €
0...50 Pa					J	6						0.00 €
0...100 Pa					D	4						0.00 €
0...250 Pa					D	6						0.00 €
0...500 Pa					J	7						0.00 €
0...1000 Pa					D	9						0.00 €
-12.5...+12.5 Pa					L	4						0.00 €
-25....+25 Pa					L	5						0.00 €
-50....+50 Pa					L	2						0.00 €
-100....+100 Pa					L	7						0.00 €
Pressure connections												
Aluminum screw connection for 6/4 mm tubing								4	0			0.00 € Standard
Aluminum screw connection for 8/4 mm tubing								4	1			0.00 €
Electrical output signal												
4...20 mA linear												

Differential Pressure Transmitter with Display - FDE27

Application

Digital pressure transducer with optional LCD display for the measurement of excess pressure, negative pressure and differential pressure. This series' transmitter is well suited for a wide range of measurement tasks for dry, neutral or gaseous media in the fields of air conditioning, ventilation and environmental technology.



Technical Data

Pressure range (bar):	see table (order code)
Max. stat. operating pressure:	see table (order code)
Bursting pressure:	1.5 times the maximum static pressure
Admissible ambient temperature:	-10°C...+70°C
Admissible media temperature:	-10°C...+70°C
Pressure connection:	Conduit fittings for 6/4 mm tubings
Electrical connection:	M12 circular plug
Protection class:	IP65 pursuant to EN 60529

Differential Pressure Transmitter FDE27 (Product Group 2)

Short Description										Price in Euro							
Standard measuring ranges from 0-4 mbar to 0-100bar Class 2.5 IP65 Protection Class										Basic price							
										162.00 €							
Construction Type		Max. adm. stat. operating pressure		Order Code						Surcharge							
Measuring range																	
0...4 mbar		50 mbar		5	2					0.00 €							
0...6 mbar		50 mbar		5	3					0.00 €							
0...10 mbar		100 mbar		5	4					0.00 €							
0...16 mbar		100 mbar		5	5					0.00 €							
0...25 mbar		250 mbar		5	6					0.00 €							
0...40 mbar		250 mbar		5	7					0.00 €							
0...60 mbar		500 mbar		5	8					0.00 €							
0...100 mbar		500 mbar		5	9					0.00 €							
-2,5...+2,5 mbar		50 mbar		A	6					0.00 €							
-4...+4 mbar		50 mbar		A	7					0.00 €							
-6...+6 mbar		100 mbar		A	8					0.00 €							
-10...+10 mbar		100 mbar		A	9					0.00 €							
-16...+16 mbar		250 mbar		B	1					0.00 €							
-25...+25 mbar		250 mbar		B	2					0.00 €							
-40...+40 mbar		500 mbar		C	5					0.00 €							
-60...+60 mbar		500 mbar		B	3					0.00 €							
Characteristic deviation (relative pressure)																	
Characteristic deviation < 2.5 %										K	0.00 € Standard						
Characteristic deviation < 1.0 %										M	22.00 €						
Pressure connections																	
Plug connection for 6/4 tubing										0	4	5	0.00 €				
Electrical output signal																	
4...20 mA two-wire										B	0.00 €						
0...10 V three-wire										C							
Operating voltage																	
3-wire 24 V DC/AC (12...32 V DC/AC)										K	0.00 €						
2-wire 24 V DC (6...32 V)										P	0.00 €						
Scale																	
Without scale reading										0	0.00 € Standard						
3.5 digit LCS value display										1	48.00 €						
Electrical connection																	
M 12 plug connection										M	0.00 €						
Assembly																	
integrated wall mounting straps										W	0.00 €						
FDE27											0	4	5		0	M	W
Assembly																	
M12 coupling (4-pole); PUR cable 2m (connection cable for supply/signal), Order-no. -06401993										17.80 €							
M12 coupling (4-pole); PUR cable 5m (connection cable for supply/signal), Order-no. -06401994										21.40 €							
M12 Coupling (4-pole); PUR Cable 15 Meter (Anschlußkabel für Versorgung/Signal), Order-no. -06401566										51.20 €							
Quickon coupling (4-pole). Order-no. -06401863, for individual cable assembly										18.60 €							
Front panel assembly set										45.20 €							
Adapter for computer parameterization, three-wire: order-no. EU03.F300; two-wire: order-no. EU03.F200										219.60 €							

Pressure Transmitter - FME11

Application

Pressure transmitter with ceramic measuring cell for negative pressure and overpressure measurements. This series' transmitter is well suited for a wide range of measurement tasks in the fields of process engineering, process technology as well as environmental technology and building services engineering.



Technical Data

Pressure range:	see table (order code)	
Linearity:	< 1% of measuring range	
Hysteresis	< 0.5% of measuring range	
Admissible ambient temperature:	0°C...+60°C	
Admissible media temperature:	0°C...+85°C	
Pressure connection:	G1/2 B, 1.4305	
Electrical connection:	Standard plug pursuant to DIN EN 175301-803-A	
Protection class:	IP65 pursuant to EN 60529	
Material (parts in contact with the medium):	Chrome/nickel/steel 1.4305, ceramic Al2O3, gasket: FKM (Viton®) – standard	
Casing material:	Chrome/nickel/steel 1.4305	
	TWO-WIRE	THREE-WIRE
Nominal voltage:	24 V DC	24 V DC/AC
Admissible supply voltage:	6...30 V DC	15...30 V DC
		15...30 V AC
Output signal	4...20 mA	0...10 V DC
Hinweis:	Der Transmitter ist mit Kurzschluss und Verpolungsschutz ausgestattet	

Pressure Transmitter - FME11 (Product Group 2)

Pressure Transmitter FME11 (Product Group 2)										Price in Euro		
Short Description Standard measuring ranges 0-1.6 tp 0-60 bar Class 1.0 Parts in contact with the medium: Chrome/nickel/steel 1.4305, ceramic and O ring Admissible media temp.: 0°C to +85°C Protection class: IP65 pursuant to EN 40050										Basic price		
										102.00 €		
Construction Type				Order Code						Surcharge		
Measuring range												
0...1.6 bar				0	3					0.00 €		
0...2.5 bar				0	4					0.00 €		
0...4 bar				0	5					0.00 €		
0...6 bar				0	6					0.00 €		
0...10 bar				0	7					0.00 €		
0...16 bar				0	8					0.00 €		
0...25 bar				0	9					0.00 €		
0...40 bar				1	0					0.00 €		
0...60 bar				1	1					0.00 €		
-1...0 bar				3	1					0.00 €		
-1...+0.6 bar				3	2					0.00 €		
-1...+1,5 bar				3	3					0.00 €		
-1...+3 bar				3	4					0.00 €		
-1...+5 bar				3	5					0.00 €		
-1...+9 bar				3	6					0.00 €		
-1...+15 bar				3	7					0.00 €		
-0...-1 bar				3	9					0.00 €		
Further range				9	9					on demand		
Accuracy												
Class 1.0				M						0.00 €		
Connections												
G 1/4 B, VA						8	5				0.00 €	
G1/2 B, VA						8	7				0.00 €	
1/4 - 18 NPT EXT						8	8				0.00 €	
Schrader® screw-in connection						S	1				10.00 €	
Output signals												
4...20 mA, two-wire								B	H	9	0.00 €	
0...10 V, three-wire								C	H		0.00 €	
Operating voltage												
24 V DC										9		
24 V DC/AC (three-wire only)										L	0.00 €	
Gasket in contact with medium												
FKM										V	0.00 € Standard	
CR neoprene										C	6.00 €	
EPDM										E	0.00 €	
H-NBR (up to -25°C)										H	on demand	
Measuring system type												
Standard										0	0.00 € Standard	
for O2 measurements (only for ranges -1...+60 bar with FKM)										3	30.00 €	
moulded type										V	16.00 €	
silicon-free type										A	6.00 €	
FME11												

FME11 0 0 0 0 0 0 H 0 0 0

Differential Pressure Controller - DDW

Application

Apparatus for monitoring incombustible and non-aggressive gaseous media.

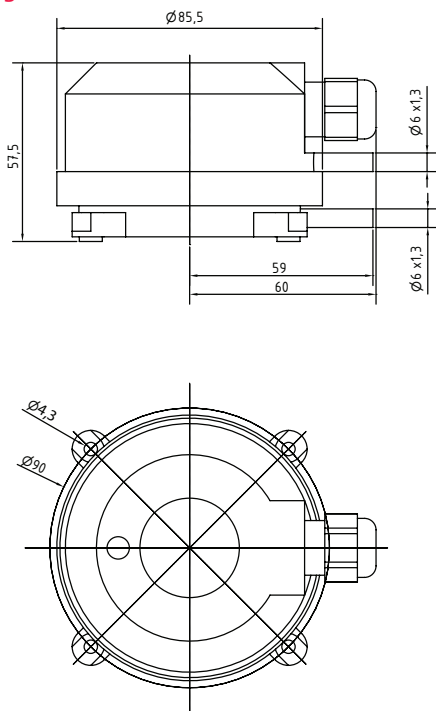
- Adjustable with large scale
- Metric cable glands
- Duct connection nipples: Length 60 mm
- Horizontal or vertical mounting position



Technical Data (Product Group 1)

Pressure ranges:	see table
Pressure media:	Air, incombustible and non-aggressive gases
Protection class:	IP54
Casing material:	Switch casing PA 6.6, fastening parts POM
Lifespan:	10 ⁶ switching operations
Diaphragm material:	Silicone
Temperature range:	-20°C...+85°C
Max. operating excess pressure:	50 mbar
Pressure connections:	Kunststoff mit 6.00mm Diameter
Switching capacity:	1.0 A, 250 V/AC
Electrical connection:	Blade terminal 6.3x0.8mm pursuant to DIN 64244 with screw clamps up to 2.5 mm ²
Accessories:	Mounting kit consists of: 2 plastic duct connection nipples with mounting screws and 2m PVC hose Ø 6 mm

Dimension drawing DDW



Price List (Product Group 2)

Type	Pressure range	Differential gap	Tolerance	Price
DDW/H-10	20...300 Pa	10 Pa	±15%	29.00 €
DDW/H-20	30...400 Pa	15 Pa	±15%	29.00 €
DDW/H-40	50...500 Pa	20 Pa	±15%	29.00 €
DDW/H-50	200...1000 Pa	100 Pa	±15%	29.00 €

Single-Phase Thyristor Controller 2-12 A (Steiner) - TLSxxx1ph

Application

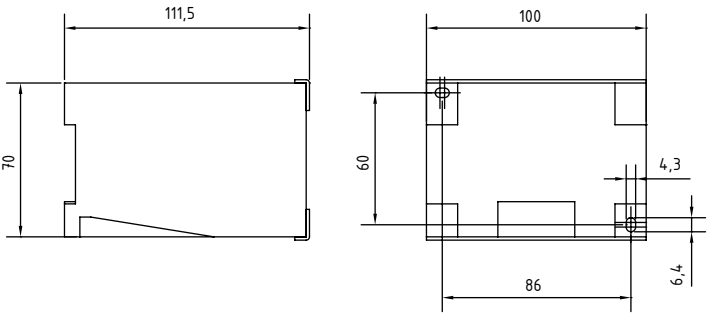
The Thyristor Controller is mainly used in areas where larger ohmic and inductive loads need to be kept under control. The modular, compact design and the activation with a steady control signal make this power controller the perfect actuator for industrial power control applications. The power element of the Thyristor Controller consists of two antiparallel connection thyristors, the isolated cooling element and the control logics.



Technical Data

Rated operating voltage:	110-440 V/AC (line voltage)
Rated control voltage:	24 V/DC, 110 V AC, 230 V/AC or generated internally from line voltage
Rated frequency:	45...65 Hz
Rotating field:	Self-synchronized
Load types:	Ohmic and inductive loads
Test voltage:	According to VDE 0160, tab. 6 / DIN 50178 tab. 18
Protection class:	Casing: IP40 Clamps: IP20 (VBG 4) variable
Resistance to climatic conditions:	Humidity class FDIN 40040
Ambient temperature:	Operation: 0°C...+45°C Storage: -10°C...+70°C
Vibration resistance:	4g
Installation:	Snapable to DIN rail system (DIN 46277-3; 35 x 7.5 mm) or panel mounting
Casing:	ABS (Terulan) 877 T, UL 94 HB
Weight:	0.5 kg
Display of the operating modes:	Operation: LED "gn" Modulation 100%: LED "gn"
Signal contact:	Modulation 100% 250 V/AC, 2 A; 24 V/DC, 3 A
CE mark of conformity:	Pursuant to the European Low Voltage Directive 73/23/EEC and EMC directive 89/336/EEC for industrial applications
Norms:	VDE 0160, EN 60204, IEC 947-4-2
Inputs:	0-10 V, 0-20 mA or potentiometer (2.5-10 kOhm)

Dimension drawing TLSxxx1ph



Price List (Product Group 2)

Type	Price
TLS1 02A 1ph	207.50 €
TLS1 02A 1ph/SP	207.50 €
TLS1 04A 1ph	240.00 €
TLS1 04A 1ph/SP	240.00 €
TLS1 06A 1ph	270.00 €
TLS1 06A 1ph/SP	270.00 €
TLS1 08A 1ph	282.50 €
TLS1 08A 1ph/SP	282.50 €
TLS1 10A 1ph	295.00 €
TLS1 10A 1ph/SP	295.00 €
TLS1 12A 1ph	322.50 €
TLS1 12A 1ph/SP	322.50 €

Special models available on demand. Please inquire in advance.

Single-Phase Thyristor Controller 60-160 A (Steiner) - TLSxxx1ph

Application

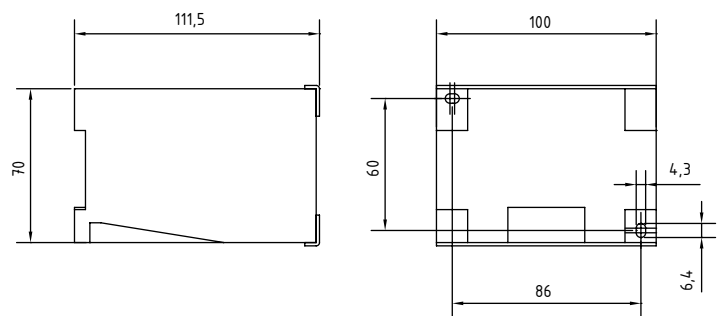
The Thyristor Controller is mainly used in areas where larger ohmic and inductive loads need to be kept under control. The modular, compact design and the activation with a steady control signal make this power controller the perfect actuator for industrial power control applications. The power element of the Thyristor Controller consists of two antiparallel connection thyristors, the isolated cooling element and the control logics.



Technical Data

Rated operating voltage:	110-440 V/AC (line voltage)
Rated control voltage:	24 V/DC, 110 V/AC, 230 V/AC or generated internally from line voltage
Rated frequency:	45...65 Hz
Rotating field:	Self-synchronized
Load types:	Ohmic and inductive loads
Test voltage:	According to VDE 0160, tab. 6 / DIN 50178 tab. 18
Protection class:	Casing: IP40 Clamps: IP20 (VBG 4) variable
Resistance to climatic conditions:	Humidity class FDIN 40040
Ambient temperature:	Operation: 0°C...+45°C Storage: -10°C...+70°C
Vibration resistance:	4g
Installation:	Snapable to DIN rail system (DIN 46277-3; 35 x 7.5 mm) or panel mounting
Casing:	ABS (Terulan) 877 T, UL 94 HB
Weight:	0.5 kg
Display of the operating modes:	Operation: LED "gn" Modulation 100%: LED "gn"
Signal contact:	Modulation 100% 250 V/AC, 2 A; 24 V/DC , 3 A
CE mark of conformity:	Pursuant to the European Low Voltage Directive 73/23/EEC and EMC directive 89/336/EEC for industrial applications
Norms:	VDE 0160, EN 60204, IEC 947-4-2

Dimension drawing TLSxxx1ph



Price List (Product Group 21)

Type	Price
TLS2 15A 1ph	287.50 €
TLS2 15A 1ph/SP	287.50 €
TLS2 25A 1ph	382.50 €
TLS2 25A 1ph/SP	382.50 €
TLS2 35A 1ph	410.00 €
TLS2 35A 1ph/SP	410.00 €
TLS2 50A 1ph	472.50 €
TLS2 50A 1ph/SP	472.50 €

Three-Phase Thyristor Controller 2-10 A (Steiner) - TLS1xxx3ph

Application

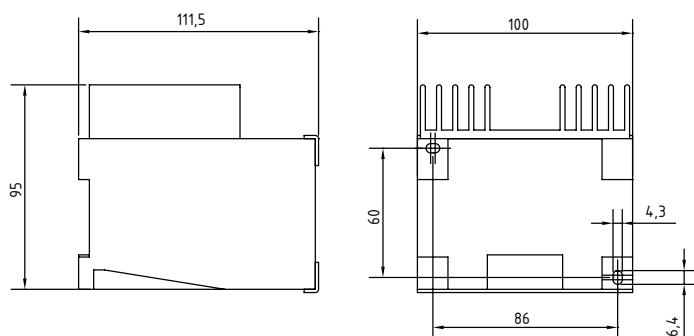
The Thyristor Controller is mainly used in areas where larger ohmic and inductive loads need to be kept under control. The modular, compact design and the activation with a steady control signal make this power controller the perfect actuator for industrial power control applications. The power element of the Thyristor Controller consists of two antiparallel connection thyristors, the isolated cooling element and the control logics.



Technical Data

Rated operating voltage:	3 x 400 V/AC (line voltage)
Rated control voltage:	400 V/AC via L1, L2 or 230 V/AC (optional input)
Rated frequency:	45...65 Hz
Rotating field:	Self-synchronized
Load types:	Ohmic and inductive loads
Test voltage:	According to VDE 0160, tab. 6 / DIN 50178 tab. 18
Protection class:	Casing: IP40 Clamps: IP20 (VBG 4) variable
Resistance to climatic conditions:	Humidity class FDIN 40040
Ambient temperature:	Operation: 0°C...+45°C Storage: -10°C...+70°C
Vibration resistance:	4g
Installation:	Snapable to DIN rail system (DIN 46277-3; 35 x 7.5 mm) or panel mounting
Casing:	ABS (Terulan) 877 T, UL 94 HB
Weight:	0.35 kg (ESG-S T02) 0.50 kg with cooling element (ESG-S T04, 06, 08, 10)
Display of the operating modes	Operation: LED "gn" Modulation 100%: LED "gn"
Signal contact:	Modulation 100% 250 V/AC, 2 A; 24 V/DC, 3 A
CE mark of conformity:	Pursuant to the European Low Voltage Directive 73/23/EEC and EMC directive 89/336/EEC for industrial applications
Norms:	VDE 0160, EN 60204, IEC 947-4-2
Inputs:	0-10 V, 0-20 mA or potentiometer (2.5-10 kOhm)

Dimension drawing TLS1xxx3ph



Price List (Product Group 2)

Type	Price
TLS1 02A 3ph	422.40 €
TLS1 02A 3ph/SP	422.40 €
TLS1 04A 3ph	497.20 €
TLS1 04A 3ph/SP	497.20 €
TLS1 06A 3ph	550.00 €
TLS1 06A 3ph/SP	550.00 €
TLS1 08A 3ph	638.00 €
TLS1 08A 3ph/SP	638.00 €
TLS1 10A 3ph	730.40 €
TLS1 10A 3ph/SP	730.40 €

Special models available on demand. Please inquire in advance.

Three-Phase Thyristor Controller 60-160 A (Steiner) - TLS3xxx3ph

Application

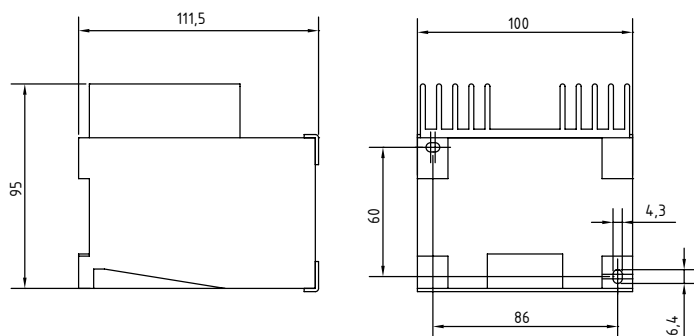
The Thyristor Controller is mainly used in areas where larger ohmic and inductive loads need to be kept under control. The modular, compact design and the activation with a steady control signal make this power controller the perfect actuator for industrial power control applications. The power element of the Thyristor Controller consists of two antiparallel connection thyristors, the isolated cooling element and the control logics.



Technical Data

Rated operating voltage:	3 x 400 V/AC (line voltage)
Rated control voltage:	400 V/AC via L1, L2 or 230 V/AC (optional input)
Rated frequency:	45...65 Hz
Rotating field:	Self-synchronized
Load types:	Ohmic and inductive loads
Test voltage:	According to VDE 0160, tab. 6 / DIN 50178 tab. 18
Protection class:	Casing: IP40 Clamps: IP20 (VBG 4) variable
Resistance to climatic conditions:	Humidity class FDIN 40040
Ambient temperature:	Operation: 0°C...+45°C Storage: -10°C...+70°C
Vibration resistance:	4g
Installation:	Snapable to DIN rail system (DIN 46277-3; 35 x 7.5 mm) or panel mounting
Casing:	ABS (Terulan) 877 T, UL 94 HB
Weight:	0.35 kg (ESG-S T02) 0.50 kg with cooling element (ESG-S T04, 06, 08,10)
Display of the operating modes	Operation: LED "gn" Modulation 100%: LED "gn"
Signal contact:	Modulation 100% 250 V/AC, 2 A; 24 V/DC , 3 A
CE mark of conformity:	Pursuant to the European Low Voltage Directive 73/23/EEC and EMC directive 89/336/EEC for industrial applications
Norms:	VDE 0160, EN 60204, IEC 947-4-2
Inputs:	0-10 V, 0-20 mA or potentiometer (2.5-10 kOhm)

Dimension drawing TLS3xxx3ph



Price List (Product Group 2)

Type	Price
TLS3 60A 3ph	976.00 €
TLS3 60A 3ph/SP	976.00 €
TLS3 75A 3ph	1110.00 €
TLS3 75A 3ph/SP	1110.00 €
TLS3 90A 3ph	1288.00 €
TLS3 90A 3ph/SP	1288.00 €
TLS3 120A 3ph	1416.00 €
TLS3 120A 3ph/SP	1416.00 €
TLS3 160A 3ph	1670.00 €
TLS3 160A 3ph/SP	1670.00 €

Single-Phase Thyristor Controller 15-50A (Tyco) - TLSxxx1ph

Application

The Thyristor Controller is mainly used in areas where ohmic and inductive loads need to be controlled. The modular, compact design and the activation with a steady control signal make this power controller the perfect actuator for industrial power control applications.

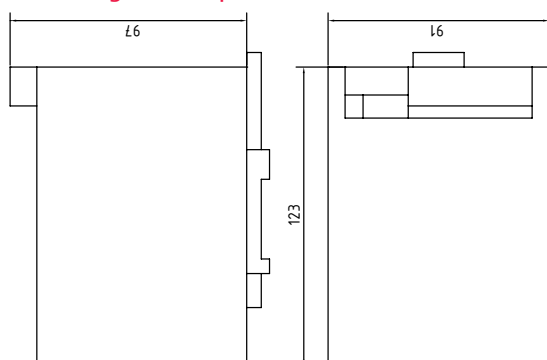
The power element of the Thyristor Controller consists of two antiparallel connection thyristors, the isolated cooling element and the control logics.



Technical Data

Rated voltage:	400 V AC $\pm 15\%$ (optional: 110V, 230V, 240V, 440V, 500V)
Auxiliary voltage:	230 V/AC, voltage class 8 and 9 (optional: internal voltage supply)
Frequency:	45-65 Hz, self-synchronized
Inputs:	<ul style="list-style-type: none"> • 0...10 V • 0...20 mA • potentiometer connection: 2.5-10 Ohm • switchable input impedance 500 Ohm, 50 kOhm
Protection function:	Thermal cut-out with LED displaying: "Fault"
LED display:	Auxiliary voltage, start, 100% ULoad,, Fault
Setting options:	Time for soft start: 0...10 s, with PWM activation: 0...5 s
Outputs:	Fault message: Clamps 6, 7 closed, load 2 A, 230 V /AC, AC1
Power connections:	<ul style="list-style-type: none"> • L1, L2 input voltage • T1, T2 output voltage
Control mode:	Leading-edge (optional: Signal series operation)
Dissipation loss:	1.1W per Ampere
Operating temperature:	0°C...+50°C
Storage temperature:	-10°C...+70°C
Air humidity:	5 % - 95 % r.h., non-condensing
Ambient conditions:	Dry, non-conductive surrounding
Max. installation altitude	1000 m
Weight:	1.1 kg
Protection class:	IP40
Dimensions (l x w x h):	92 x 125 x 90 mm
Mounting:	On DIN rail system (optional: with mounting plate)
CE mark of conformity:	Pursuant to the European Low Voltage Directive 73/23/EEC and EMC directive 89/336/EEC for industrial applications

Dimension drawing TLSxxx1ph



Price List (Product Group 2)

Type	Price
TLS2 15A 1ph	230.00 €
TLS2 15A 1ph/SP	230.00 €
TLS2 25A 1ph	306.00 €
TLS2 25A 1ph/SP	306.00 €
TLS2 35A 1ph	328.00 €
TLS2 35A 1ph/SP	328.00 €
TLS2 50A 1ph	378.00 €
TLS2 50A 1ph/SP	378.00 €

Special models available on demand. Please inquire in advance.

Three-Phase Thyristor Controller 15-50A (Tyco) - TLS1xxx3ph

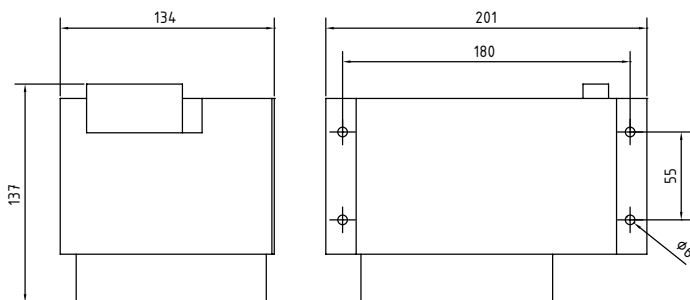
Application

The Thyristor Controller is mainly used in areas where larger ohmic and inductive loads need to be kept under control. The modular, compact design and the activation with a steady control signal make this power controller the perfect actuator for industrial power control applications. The power element of the Thyristor Controller consists of two antiparallel connection thyristors, the isolated cooling element and the control logics.



Technical Data	TYCO-3/...15	TYCO-3/...25	TYCO-3/...35	TYCO-3/...50
Load voltage:	400 V AC $\pm 15\%$ (optional: 110 V, 230 V, 500 V)			
Load current:	15 A	25 A	35 A	50 A
Auxiliary voltage:	230 V/AC (optional: internal voltage supply)			
Frequency:	45-65 Hz, self-synchronized			
Inputs:	0...10 V; 0...20 mA, potentiometer connection: 2,5...10 kOhm; 10...0 V inverse input (optional); 5 V / 5...10 kHz PWM input			
Input impedance:	Switchable input impedance 500 kOhm, 50 kOhm			
Protection function:	Phase control and device temperature monitoring (red LED: "Fault" and shutdown)			
LED display:	Operation, start, 100 % ULoad, fault, modulation (level)			
Setting options:	Time for soft start: 0...10 s, with PWM activation: 0...5 s			
Outputs:	Fault condition: Cl. 13, 14 closed; load: 2 A, 230 V/AC, AC1; S1 relay output: Cl. 19, 20 closed; load: 2 A, 230 V/AC, AC1; S2 relay output: Cl. 16, 17 closed; load: 2 A, 230 V/AC, AC1;			
Power connections:	L1, L2, L3 input voltage; T1, T2, T3 output voltage			
Control mode:	Leading-edge (optional: Signal series operation)			
Dissipation loss:	1.1 W per Ampere			
Operating temperature:	0°C...+50°C			
Storage temperature:	-10°C...+70°C			
Air humidity:	5 % - 95 % r.h., non-condensing			
Ambient conditions:	Dry, non-conductive surrounding			
Max. installation altitude	1000 m			
Weight:	1.95 kg			
Protection class:	IP40			
Einbau:	vertical with power connections on bottom side			
Dimensions (l x w x h):	130 x 200 x 135 mm			
Mounting:	for screw mounting in control cabinet			
CE mark of conformity:	Pursuant to the European Low Voltage Directive 73/23/EEC and EMC directive 89/336/EEC for industrial applications			
Norms:	VDE 0160, EN 60204			

Dimension drawing TLS1xxx3ph



Price List (Product Group 2)

Type	Price
TLS2 15A 3ph	412.00 €
TLS2 15A 3ph/SP	412.00 €
TLS2 25A 3ph	456.00 €
TLS2 25A 3ph/SP	456.00 €
TLS2 35A 3ph	518.00 €
TLS2 35A 3h/SP	518.00 €
TLS2 50A 3ph	578.00 €
TLS2 50A 3ph/SP	578.00 €



Temperature sensors

Temperature sensors for industrial purposes are not subject to constructive standards. We manufacture individually and according to your demands. Please submit your requirements and we will find the optimal solution to your measurement tasks. The quality of our products and short delivery times are highly important to us.

Here is a basic overview for the different construction types of our temperature sensors.



General Information

For reasons of clarity, you will find a selection of standard configurations for our products in this catalogue. However, we are happy to discuss any deviating customer-specific demands in order to find the perfect solution to your measuring task.

Order Information

We accept orders in written form, via fax, telephone or E-mail. When placing an order, please submit your desired item(s) including the type description, quantity and - in certain cases - the desired date of delivery. Orders concerning special and extraordinary constructions must be submitted with the respective technical specifications.

Delivery

The standard range of products is constantly available ex works if ordered in subsets. We reserve the right of prior sale. For large or special orders, the allocation of the date of delivery is carried out according to prior agreement. We reserve the right to make partial deliveries. In case of any unforeseen, unusual or inevitable occurrences, meaning natural disasters, strikes, difficulties in acquiring materials etc., we reserve the right to withdraw from the contract.

Shipping Conditions

The delivery and passing of the risk takes place ex works. The items will be shipped via a parcel service or a forwarding agency if the customer wishes so. In individual cases, the order can be delivered free to your doorstep. Additional costs for express deliveries will be calculated separately. The customer is obliged to check the shipment for missing items/defects etc. after having received the goods.

Prices/Range of Products

All prices in the catalogue are list prices stated in € plus value added tax. The costs for delivery and packaging are added separately to the bill. Our price offers are non-binding and subject to change at all time. We shall not be obliged to deliver any items before the order has been confirmed.

Payment Conditions

Any payments have to be made within 14 days. We reserve the right to charge a minimum order surcharge of 20 Euros for any orders that do not exceed a net value of 100 Euros.

Guarantee

We offer a 3-year warranty for all products from the range of temperature and pressure measurement marked with the warranty logo. The warranty only includes the flawlessness of the items for a three year duration period counting from the date of shipment/date of collection (Condition and durability warranty). In a warranty case, the customer is entitled to request a new delivery of a flawless item at the expense of TITEC. However, the customer himself remains responsible for the appropriate use with regards to the intended application purpose.

Imprint

The buyer himself remains responsible to check in advance if a product suits the application purpose for which the buyer/user has intended it. We take no responsibility and shall not be liable for this.

In general, our terms and conditions shall apply. We take no responsibility for the correctness of this catalogue and reserve the right to change any technical and optical details or prices.

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Resistance characteristics (passive sensors)

Temp °C	Pt100 Ohm	Pt1000 Ohm	Ni1000 Ohm	Ni1000 TK5000 Ohm	NTC 1kOhm Ohm	NTC 1.8kOhm Ohm	NTC 3kOhm Ohm	NTC 5kOhm Ohm
-50.00	80.31	803.10	743.00	790.88	32886.00		200338.00	
-40.00	84.27	842.70	791.00	830.83	18641.00	40374.60	100701.00	166555.11
-30.00	88.22	882.20	842.00	871.69	10961.00	22905.50	53005.00	87897.04
-20.00	92.16	921.60	893.00	913.48	6662.00	13476.90	29092.00	48322.75
-10.00	96.09	960.90	946.00	956.24	4175.00	8197.80	16589.00	27584.38
0.00	100.00	1000.00	1000.00	1000.00	2961.00	5140.90	9795.20	16300.00
10.00	103.90	1039.00	1056.00	1044.79	1781.00	3315.20	5971.12	9942.85
20.00	107.79	1077.90	1112.00	1090.65	1205.00	2193.30	3748.10	6244.88
25.00	109.74	1097.40	1141.00	1113.99	1000.00	1800.00	3000.00	5000.00
30.00	111.67	1116.70	1171.00	1137.61	834.20	1485.60	2416.80	4029.18
40.00	115.54	1155.40	1230.00	1185.71	589.20	1028.30	1597.50	2664.83
50.00	119.40	1194.00	1291.00	1234.97	424.00	726.10	1080.30	1803.23
60.00	123.24	1232.40	1353.00	1285.44	310.40	522.30	746.12	1246.23
70.00	127.07	1270.00	1417.00	1337.14	231.00	382.20	525.49	878.27
80.00	130.89	1308.90	1483.00	1390.12	174.50	284.10	376.85	630.25
90.00	134.70	1347.00	1549.00	1444.39	133.60	214.30	274.83	459.92
100.00	138.50	1385.00	1618.00	1500.00	103.70	163.80	203.59	340.89
110.00	142.29	1422.00	1688.00	1556.98	81.40	126.90	153.03	256.35
120.00	146.06	1460.60	1760.00	1615.36	64.70	99.40	116.58	195.40
130.00	149.82	1498.20	1883.00	1675.18	51.90		89.95	150.83
140.00	153.58	1535.80	1909.00	1736.47	42.10		70.22	117.80
150.00	157.31	1573.10	1987.00	1799.26	34.40		55.44	93.02

Temp. °C	NTC 10kOhm kOhm	NTC 15kOhm kOhm	NTC 20kOhm kOhm	KTY81-210 Ohm	KTY11-6 Ohm	KTY81-110 Ohm	KTY81-121 Ohm	LM23SZ mV
-50.00	667.83	454.91		1068.65	1035.91	515.00	510.00	2232.00
-40.00	335.67	245.09	804.17	1158.95	1139.27	567.00	562.00	2332.00
-30.00	176.68	137.30	412.79	1269.25	1250.39	624.00	617.00	2432.00
-20.00	96.97	79.73	220.73	1385.15	1396.25	684.00	677.00	2532.00
-10.00	55.30	47.84	122.44	1508.65	1495.86	747.00	740.00	2632.00
0.00	32.65	29.59	70.44	1639.60	1630.21	815.00	807.00	2732.00
10.00	19.90	18.82	41.54	1778.10	1772.32	886.00	877.00	2832.00
20.00	12.49	12.27	25.34	1924.15	1922.17	961.00	951.00	2932.00
25.00	10.00	10.00	20.00	2000.00	2000.00	1000.00	990.00	2982.00
30.00	8.06	8.19	15.89	2077.80	2079.77	1040.00	1029.00	3032.00
40.00	5.32	5.59	10.21	2238.90	2245.17	1122.00	1111.00	3132.00
50.00	3.60	3.89	6.72	2407.60	2418.21	1209.00	1196.00	3232.00
60.00	2.49	2.76	4.52	2583.80	2599.06	1299.00	1286.00	3332.00
70.00	1.75	1.99	3.10	2767.50	2787.65	1392.00	1378.00	3432.00
80.00	1.26	1.46	2.17	2958.80	2983.99	1490.00	1475.00	3532.00
90.00	0.92	1.08	1.54	3152.50	3188.08	1591.00	1575.00	3632.00
100.00	0.68	0.82	1.11	3363.90	3399.91	1696.00	1679.00	3732.00
110.00	0.51	0.62	0.82	3577.75	3619.50	1805.00	1786.00	3832.00
120.00	0.39	0.48	0.61	3799.10	3846.83	1915.00	1896.00	3932.00
130.00	0.30	0.38	0.46	4028.05	4081.91	2023.00	2003.00	4032.00
140.00	0.23	0.30	0.35	4188.10	4324.74	2124.00	2103.00	4132.00
150.00	0.18	0.24	0.27	4397.70	4575.31	2211.00	2189.00	4232.00

General Terms of Business

I. Jurisdiction

1. The following general terms and conditions are valid for the business between the TITEC Temperatursmesstechnik corporation (AG Freiburg; HRB 611848) - called „TITEC“ - and its contracting partners - hereinafter referred to as “customer”.
2. Customers in accordance with the conditions of sale are any natural or legal persons or legally valid business partnerships who enter into a business relation with TITEC and who are exercising a commercial or independent professional act.
3. Any deviating terms and conditions of the customer will not apply without our written consent, even if we do not explicitly oppose them. In the event of a customer basing his order on deviating conditions, we shall solely accept his order based on our own General Terms and Conditions. We shall only carry out orders on the basis of our conditions for the extended retention of ownership. We can fulfill our duty to transfer title thereto only in accordance with those provisions.

II. Conclusion of Contract

1. Our quotations are always subject to change and not binding. A customer order is always binding and will be deemed accepted if/when confirmed in writing and shipped. Only the statements in our order confirmation are binding. To be valid, all agreements and legally binding declarations of the contract parties must be executed in written form.
2. The documents, drawings, weight indications etc. our offers are based on, are only approximately valid if no other offer yields the opposite. Changes in construction, design, choice of materials and fabrication remain reserved even after forwarding the order confirmation, as long as neither the price, the relevant construction details or the time of shipping is altered and otherwise unreasonable for the customer.

III. Terms of Payment

1. Our prices are for goods ex-works and exclude packaging and shipping. If requested, the order will be shipped at the expense of the customer. In the case of orders with a net goods value of less than 100,00 EUR we will add a small-order supplement of 20,00 EUR to the invoice.
2. Each price quoted is based on cost-factors prevailing at the time the offer was submitted. If these conditions change substantially and unpredictably in the period between the time of the conclusion of the contract and the date of shipping, we reserve the right to alter the price in appropriate relation to the increased costs.
3. If the shipment is assigned to us by the customer and no further conditions have been agreed upon, the means of transport and route including the related costs of shipment shall be chosen by TITEC. The goods will be insured only upon the customer's express request and at his cost and expense.
4. We deliver free of charge within Germany by special agreement within the framework of the order confirmation, if the goods are accepted as one and a distinctive minimum order value has been set.
5. In particular cases we reserve the right to deliver only against advanced payment or a reasonable surety; the customer will be informed about this previous to the delivery. This applies especially if there exists a reasonable doubt concerning the customer's credit worthiness. If the customer does not make the down payment and/or the final payment when due, even after a deadline is set and threats have been made to refuse shipping if the deadline is exceeded, TITEC is entitled to withdraw from the business contract.
6. Unless otherwise agreed upon, the price of any of the goods shall be paid immediately upon delivery or provision. Discount agreements are only valid in the case the customer is not in arrears with payments of previous orders; these require an explicit written agreement.
7. The customer is in default no later than 24 days after having access to the invoice. Readily, the customer will fall into arrears if he refuses to make the payment within 30 days after having received the order. After the aforementioned due dates have been exceeded, the customer will fall into arrears without further warning.
8. Should the customer be in arrears, interest will be charged on amounts payable at 8% above the respective base rate published by the German Federal Bank. Instead of this interest rate, we are entitled to charge interest at the higher rate for overdrafts charged by our own bank (including overdraft commission) if, during the time of arrears on the part of the customer, we are obliged to operate on bank credit of at least the same amount as our respective account receivable. A claim for further damages on our part is thereby not excluded.
9. All arrears in payments, even those of previous contracts, entitle us to withdraw from the contract or to claim damages.
10. Set-off entitlements may only be accorded the customer if his counter claims are found to be legally valid, or have not been contested. In this case, the customer is entitled to retention. He is furthermore entitled to retention if the reason for retention consists of an order deficiency which has been caused by us. In this case, the right to retention of title may only be executed in relation to the actual deficiency of the order.
11. The customer may exercise the right to retention only if the customer's counter claim is based on the same contract. Customers only hold the right to retention if his counter-claim is undisputed or has been legally established in a final form.

IV. Retention of Title

1. The goods supplied remain our property until all claims arising from the business relationship between ourselves and the customer have been settled in full. The application of individual claims in a current account and the striking of a balance and the acknowledgement thereof will not affect the retention of title. The receipt of payment is only valid if the full amount agreed upon has been transferred to our bank account.
2. The customer has the right of resale, but is not entitled to chattel mortgages or seizures. The customer is required to ensure our rights in the case of resale of goods subject to retention of title on credit.
3. The customer hereby assigns to us its claims under the resale of the reserved goods, and we hereby accept such assignment. Regardless of the assignment and our right to collect, the customer will be entitled to collect as long as he meets his obligations to us and his financial situation does not deteriorate drastically. Upon request, the customer must provide us with information pursuant to claims which have been assigned required for the purpose of collection and notify debtors as to such assignment.
4. Any preparation or processing of reserved goods will be undertaken by the purchaser on our behalf without any obligations arising for us. In the case of processing, combination, amalgamation or commingling of the reserved goods with other items, we shall be entitled to a co-ownership share in the resulting product in relation to the invoice value of the goods delivered by us in proportion to the invoice value of the remaining goods. Where the customer acquires sole ownership to a new item, it is agreed that the customer shall grant us co-title thereto in the same proportion as aforesaid and shall keep the item on our behalf free of charges.
5. If the reserved goods are sold again together with other goods, regardless of whether without or after processing, combination, mixing or blending, the advanced assignment agreed upon above shall apply only in an amount equal to the invoiced price of the reserved resold goods.
6. The customer shall inform us immediately of any debt enforcement measures by a third party in relation to the reserved goods and must supply the documents necessary for an intervention (according in particular to § 771 ZPO – [German Civil Proceedings Code]). In case that the third party is not capable of refunding us with the cost of the action in and out of court according to § 771 ZPO the customer will be held accountable for our loss.
7. We commit ourselves to releasing the securities to which we are entitled according to the aforementioned regulation as far as their value surpasses the claims to be secured by 20%.
8. Should it become apparent after the conclusion of the contract that our payment claim is endangered due to the lack of the customer's capability, we are entitled to request the goods subject to retention to be surrendered to us. The same applies in case the customer falls into payment arrears. Reclaim and withdrawal of mentioned goods as well as of the co-ownership to which we are entitled will be deemed as withdrawal from the contract.
9. In the case of impairment of our reserved ownership through culpable conduct of a third party - including committees or employees of the customer -, the customer assigns the arising claims for compensation against the third party solely to us. We hereby accept this assignment.
10. Should we reclaim the delivered goods due to reservation of ownership, the customer will be held responsible for compensating for all arising costs. Apart from that, we shall credit all reclaimed goods to the customer at the time of revocation. We shall determine the value according to reasonable discretion.

General Terms of Business

V. Shipping, Availability of Goods

1. Information regarding the delivery deadline is not binding, unless the promised delivery date had been bindingly assured as an exception. The delivery deadline shall begin on the date of the order confirmation, but not before all questions concerning technical details have been settled.
2. Partial deliveries shall be permissible.
3. Prepaid orders shall only be shipped after the money receipt is considered complete by TITEC, and TITEC shall not make reservations for ordered goods before the aforementioned receipt.
4. The delivery period shall be prolonged appropriately by any unforeseen, unusual or inevitable occurrences, meaning in particular strikes and punctual deliveries, even if these occur during an already prevailing delay. TITEC shall inform the customer of such occurrences immediately.
5. If dispatch or shipment is delayed at the customer's request or for reasons we are not to be held responsible for, the customer will be charged with the arising additional costs and the risk of disappearance or impairment of the order passes over to him at the time of notification of dispatch readiness.
6. Should the goods be collected directly by the customer or upon delivery of the goods to the dispatching agent, but upon leaving the factory at the latest, the risk of accidental destruction or deterioration of the goods passes on to the customer, regardless of whether the consignment is dispatched from the place of fulfillment and of who bears the freight costs. TITEC being designated as the carrier of the goods is also considered as collection. If the goods are ready for dispatch and if dispatch or acceptance is delayed for reasons beyond our control, then the risk is passed on to the customer upon receipt of the note of dispatch readiness.

VII. Warranty

1. A warranty or assurance for the quality or preservability of our goods is only granted in individual cases and on the basis of a specific written consent, but not on the basis of the contents of brochures, item descriptions, technical specifications or other printed goods or information.
2. We take no responsibility whatsoever with regards to the usability, durability, storage or shipping abilities of our goods that are not customary or otherwise unknown. Therefore, a warranty can only be granted if defects occur despite proper use, transport or storage of an item. For items requiring a proper installation, it is necessary that the customer has tested the respective product with regards for its specific purpose. The customer bears the burden of proof for fulfilling the prerequisites.
3. The customer is obliged to inspect the delivery for defects (f.ex. deficiencies, transport damages, identity and quantity) immediately after acceptance. Notifications of non-latent defects of goods delivered or erroneous assembly instructions have to be carried out within one week after receipt of the goods at the latest. The customer is also obliged to notify us of latent defects immediately - meaning within 10 days as a general rule - after having detected the defect. The notification of defects must be made directly to us and in writing. If the customer (orderer) fails to announce a defect immediately or within due time, the item will count as approved and any warranty claims shall be ruled out. Otherwise § 377 of HGB (German Commercial Code) shall apply.
4. If the delivered goods are defective at the time of passing of the risk, or if distinct assured features are missing, or if a defect occurs during the admissible warranty period a customer has, we reserve the right to either deliver a replacement or remedy the product within a reasonable period of time. As long as the amendments have not failed their purpose, the customer is entitled to the statutory right of withdrawal. The amendment is deemed a failure upon the second unsuccessful attempt. The return of products must be discussed with and approved of by us. If the amendment is deemed a failure, the customer may withdraw freely. If the additional service has been carried out by means of a compensation delivery, the customer is obliged to return the previously delivered products within 10 days at the expense of TITEC.
5. We shall be liable for the replacement items amendments to the same extent as for the original item delivered, whereas the warranty period is not reset to its starting point.
6. Any amendments performed by a third party or the customer without our explicit written consent will lead to an immediate expiration of the warranty rights. This shall not apply if the customer has proof that the defect concerning the product has not been caused by the aforementioned performance.
7. A further liability for material defects of new products is generally ruled out as far as legally possible. The sale of used, movable goods will only be carried out excluding the warranty of quality.
8. Claims based on defects are subject to a limitation period of 12 months after the transfer of risk. This shall not apply in the event that longer statutory expiration periods are applied. The period of limitations begins with the shipment of products or with the time of possibility for shipment if the shipment is delayed due to reasons within the framework of the customers own risk.

VIII. Image Representation

The images used for representing the products are example photos. These do not necessarily represent the product true to nature or scale, but serve the purpose of illustration. Especially sizes and colors may deviate from the original. The descriptions of the respective item are decisive. Moreover, we expressly reserve changes occurring due to technical advancements.

IX. Liability

Further claims of the customer, especially claims for damages or reimbursement, are ruled out subject to a deviating agreement. This shall not apply in the case of mandatory liability, e.g. under the German Product Liability Act (Produkthaftungsgesetz), in the case of intent, gross negligence, injury of life, body or health, or breach of a condition. The claim to damages for the neglect of essential contractual obligations is strictly limited to foreseeable damage according to contracts unless it is a case of premeditation, gross negligence or unless liability is mandatory because of damage to life, bodily injury or damage to health.

X. Final Provisions

1. The legislation of the Federal Republic of Germany shall apply exclusively to the legal relations between TITEC and its customers under exclusion of the UN purchase law.
2. If the customer is a tradesman, a legal person under public law or a public special estate, the only place of jurisdiction for any legal disputes arising out of this contract shall be the location of TITEC. The decision to file a suit at the place of jurisdiction of the customer shall lie with us. This shall apply as far as legally possible, if the customer is an entrepreneur according to § 14 BGB [German Civil Code].
3. TITEC shall merely be obliged to ensure that the delivery effected will only be free of any industrial property rights and copyrights of third parties within the Federal Republic of Germany. Any further liability of TITEC shall be ruled out.
4. All data necessary for the processing of business transactions shall be stored in our data processing equipment subject to the Federal Data Protection Act.
5. If any one of these provisions should be or become invalid, this shall not affect the validity of the other provisions.

Bräunlingen, 2012-11-30
TITECGmbH
The executive board





TiTEC® *Wir haben die
Temperatur
im Griff*

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