

## VARMESLANGER



## REGULATORER

# COMPACT CONTROLLERS

## HT 43 SERIES

### Electronic controller

Thanks to its compact design, the HT 43 temperature controller is a universal controller in machine, system and apparatus applications. In the design of this device, particular attention was paid to making its handling simple and comprehensible.

The controllers are permanently configured ex works and require no further reprogramming.

The contactless switching power is 2300 Watt. All our standard series heating hoses have a 6+PE-pin plug that is perfectly matched to this controller.



Voltage supply	230 Volt AC / 60 Hz, option 115 Volt
Switching power	2300 Watt, 10A
Sensor types	Fe-CuNi (J), NiCr-Ni (K) with reference point compensation, sensor breakage protection and sensor polarity control PT100 2-wire DIN/IEC
Tolerance	0.1 % – 0.2 % of full range
Controller outputs	elect. switch (controller) (10 A), triac
Alarm outputs	alarm output relay 6 A, limit comparator Y3, $\pm 10$ K from setpoint, alarm output limit contact set to max. temperature range, Y2
Controller response	P-PID
Display actual/target value	4-digit LED display (13 mm)
Deviation display	7 LED $\pm 12^{\circ}\text{C}$ flashes
Operation	foil keypad 4 push buttons
Housing material	Makrolon
Housing dimensions	160 x 80 x 55 (L x W x H)
Mounting plate dimensions	160 x 100 mm H x W / serves as a heat sink
Fastening	4 bores for M4 screws
Protection type	IP65 (EN 60529), protection class I
Load outputs	6+PE-pin socket, mains cable 1.2 m, 1 x for signal outputs, KV screw connectors
Mains plug	German "Schuko" mains plug, 1.2 m long
Option	external setpoint input

Setting ex works					
Sensor type PT100		Sensor type Fe-CuNi (J)		Sensor type NiCr-Ni (K)	
Type	Control range	Type	Control range	Type	Control range
HT 43 – 10P	0 – 100°C	HT 43 – 10P	0 – 100°C	HT 43 – 10P	0 – 100°C
HT 43 – 20P	0 – 200°C	HT 43 – 20F	0 – 200°C	HT 43 – 20N	0 – 200°C
HT 43 – 25P	0 – 250°C	HT 43 – 25F	0 – 250°C	HT 43 – 25N	0 – 250°C
HT 43 – 50P	0 – 500°C	HT 43 – 50F	0 – 500°C	HT 43 – 50N	0 – 500°C
		HT 43 – 100F	0 – 999°C	HT 43 – 100N	0 – 999°C

# COMPACT CONTROLLERS HT 41/42 SERIES

## Controller / limiter combination

As a result of their free configurability and compact design, the HT 41 / 42 self-programmable temperature controllers are universal controllers in machine, system and apparatus applications.

In the design of this device, particular attention was paid to the limiter function with a permanent shutdown for unattended operation according to DIN/VDE 0721 and to non-contact switching of 3680 Watt.

Voltage supply	230 Volt AC / 60 Hz, option 115 Volt
Switching power	3680 Watt, 16 A
Sensor types	Fe-CuNi (J), NiCr-Ni (K) with reference point compensation, sensor breakage protection and sensor polarity control, PT100 2-wire DIN/IEC
Tolerance	0.1% - 0.2% of full range
Controller outputs	elect. switch (controller) (16 A), triac
Alarm outputs	alarm output relay 6 A, limit comparator Y3, $\pm 10$ K from setpoint
Controller response	P-PID
Limiter function	Signal via 2 <sup>nd</sup> PT100
Cutout temperature Limiter	50°C - 500°C adjustable, actuates 16 A mechanical relay
Display actual/target value	4-digit LED display (13 mm)
Measuring range	-199 to +999 digits
Deviation display	7 LED $\pm 12^\circ\text{C}$ flashes
Operation	foil keypad 4 push buttons
Housing material	Makrolon
Housing dimensions	160 x 80 x 56 mm (W x H x D)
Mounting plate dimensions	160 x 100 mm (H x W), serves as a heat sink
Fastening	4 bores for M4 screws
Protection type	IP65 (EN 60529), protection class I
Type HT41 cable inputs/outputs	8+PE-pin socket HANQ8 / load mains cable 1.2 m with German "Schuko" mains plug
Type HT42 terminal connections	KV screw connectors without mains cable
Option	external setpoint input

Setting ex works  
Sensor type PT100

Type	Control range
HT 41	0 - 200°C
HT 42	0 - 200°C

These parameters can be reprogrammed by the customer, or we will supply the setting as required (additional charge).



HT42 with screw connections



HT41 with 8-pin socket

# COMPACT CONTROLLERS

## HT 44 SERIES

### Power output via SSR, 3-pin, 6900 Watt

Thanks to its compact design, the HT44 temperature controller is a universal controller in machine, system and apparatus applications. In the design of this device, particular attention was paid to making its handling simple and comprehensible. Operation as with the HT40 series.

Voltage supply	230/400 V AC 50/60 Hz
SSR switching power	3 x 2300 W 3 x 10A, electronic
Control range	0 to 999°C
Sensor types	PT100, Fe-CuNi (J), NiCr-Ni(K)
Alarm output	limit comparator
Display actual/target value	4-digit LED display 13 mm
Deviation display	7 LEDs +/- 12°C flashes
Operation	4 push-buttons, foil keypad
Protection type	IP65 (EN60529), protection class I
Housing dimensions	ABS, dimensions 180x190x70 mm (WxHxD) incl. connection socket
Mounting plate dimensions	180 x 160mm (W x H)
Mains cable length	1.5 m
Plug	CEE plug, 16 A
Output / load	HAN Q8 socket, 8-pin



## HT 45 SERIES

### Power output via SSR, 1-pin, 4600 Watt

Thanks to its compact design, the HT45 temperature controller is a universal controller in machine, system and apparatus applications. In the design of this device, particular attention was paid to making its handling simple and comprehensible. Operation as with the HT40 series.

Voltage supply	230 V AC 50/60 Hz
SSR switching power	1 x 4600 W 1 x 20 A, electronic
Control range	0 to 999°C
Sensor types	PT100, Fe-CuNi (J), NiCr-Ni(K)
Alarm output	limit comparator
Display actual/target value	4-digit LED display 13 mm
Deviation display	7 LEDs +/- 12°C flashes
Operation	4 push-buttons, foil keypad
Protection type	IP65 (EN60529), protection class I
Housing dimensions	ABS, dimensions 180x190x70 mm (WxHxD) incl. connection socket
Mounting plate dimensions	180 x 160 mm (W x H)
Mains cable length	1.5 m / 3x2.5 mm²
Plug	without plug
Output / load	Binder 694 4-pin + PE



# COMPACT CONTROLLERS

## HTI 16 / HTP 16 SERIES

### Integral controller / monitor combination

The device impresses with its perfect matching with our trace heating systems with HTI heating conductor and its compact design and simple handling. Easy mounting via the mounting plate serving as a heat sink and modern connection systems are self-evident.

The HTI 16 temperature controller controls the temperature of the heating conductor via the change in resistance of the heating wire without further sensors. The integral controller does not measure at one point, but rather the average value over the entire length / surface of the heating system directly from the heating wire and registers a temperature change immediately without any delay. The measured value corresponds to the temperature profile over the entire system and not the temperature at a single point, as is the case with a sensor. A special nickel alloy is used as the heating wire. A PT100 is also required as a HTP 16 controller-monitor.



Voltage supply	230 V AC (optional 115 V / 400 V AC), 50 ... 60 Hz
Controllable heating power	3680 W (max. 16 A resistive load, ED 70 ... 80 %) 230 V 6400 W at 400 Volt, 1840 W at 115 Volt
Min. output current	1 A resistive load
Control range (-20 ... +250°C in 4 segments)	-20 – +40°C 0 – 100°C 10 – 150°C 10 – 250°C
Display actual/target value	3-digit LED display
Temperature setting	digital via keys
Power unit	triac
Signal relay	changeover relay 230 V AC, 6 A
Protection type	IP65 (EN 60529), protection class I
Mounting surface	160 x 122 mm (H x W)
Fastening	4 bores for M4 screws
Terminal clamps	2.5 mm <sup>2</sup>
Control	pulse package control with zero passage detection and defined heating pause
Versions Output / load	D – 1.3 m cable with Schuko plug K – terminal clips / KV screw connection
Housing dimensions	81 x 161 x 65 mm (W x H x D) ABS housing without screw connections
Option HTP 16	2nd control circuit with PT100 sensor as controller-monitor combination

The HTI controller is always calibrated on the corresponding heating circuit. On supply of a heating system with an assigned controller system, the device is factory set. The heating system and the controller are then labelled accordingly. The calibration is stored as a mode and can be performed without great effort.

The calibration and matching to different heating systems is performed at the press of a button.

# COMPACT CONTROLLERS

## HT 55 SERIES

### Self-optimizing dual controller for the installation in a switchgear cabinet on a top-hat rail

Thanks to its free configurability, the HT 55 is a universal controller in machine, system and apparatus applications. In the design of this device, particular attention was paid to making its handling simple and comprehensible. Mounting on standard rails and the removable terminals (plug-in blocks) guarantee use even under difficult installation conditions in the switchgear cabinet.



Voltage supply	230 Volt AC / 50 Hz or 24 Volt DC 115 Volt AC / 50 – 60 Hz
Sensor types	optional Pt100 (J), NiCr-Ni (K) PT100 NI-120, sensor breakage protection, sensor polarity control, short-circuit monitoring
Tolerance	1 % of the relative temperature
Actual/target value display	3-digit LED display (13 mm) scan operation between channel 1 and 2
Measuring range	0 – 250°C units
Controller output A	via 2 internal triacs max. power 1200 W for both channels together
Controller output B	via two mechan. changeover relays, switching power 2 x 1500 W at 230 V
Controller output C	2 x 12 V DC to control a solid state relay to switch higher powers
Configuration	as dual controller, each channel is configured as a controller / limiter each channel monitors the other
Optional	two independent 4 – 20 mA inputs for external setting of setpoint
Protection type	IP40 (EN 60529), protection class
Controller dimensions	72 x 70 x 90 mm (H x W x D)
Connections	pluggable connection terminals
Operation	parameter assignment and configuration using keypad
Special functions	self-optimization of controller parameters for fast adaptation to environmental conditions. Safety operation mode by connecting the relays before the triac control to switch off fault alarm. Setpoint limitation and setpoint correction adjustable. Attachment on 35 x 7.5 mm rail according to DIN 50022

Installation housing for HT 55	
Housing dimensions HZ-EK 2	for 1 unit 125 x 200 x 122 mm
Housing dimensions HZ-EK 4	for 2 units 200 x 200 x 122 mm
Housing dimensions HZ-EK 6	for 3 units 250 x 200 x 122 mm
HT 55 protection type	IP40 (EN 60529) without housing IP65 (EN 60529) in installation housing
Design	in accordance with VDE 0631



# COMPACT CONTROLLERS

## HT 55H SERIES

### HT 55H dual controller

Installed in housing

Design with socket or screw connections. Ready wired. For controlling two heating circuits

Technical data, see HT 55

The HT 55 is illustrated in the HZ-EK2 housing, installed and ready to plug in.



## HLD 55 SERIES

### Temperature controller for high load currents

Three-phase or deviating voltages can be connected potential-free (floating) via an in-built contactor or SSR relay.

The modern wall housing is easy to mount and the integrated microprocessor controller is programmable for every task.

Switching power	with contactor 3 x 4.6 kW (20 A) with SSR relay 1 x 5.7 kW (25 A) 2-channel double power
Panel mounting controller	data, see HT 55
Voltage supply	230 Volt / 400 Volt AC
Inputs	KV screw connections
Terminal clamps	2.5 – 4 mm <sup>2</sup>
Protection type	IP65 (EN 60529), protection class I
Housing	polystyrene (with transparent cover), hinged cover
Housing dimensions	depending on the design



## HTM 55 SERIES

### Multi-channel controller

Control circuits	4 – 10
Switching power	per circuit triac 600 W or relay 1500 W
Voltage supply	230 Volt / 400 Volt AC
Panel mounting controller	data, see HT 55
Inputs	KV screw connections
Protection type	IP65 (EN 60529), protection class I
Housing	polystyrene (with transparent cover), hinged cover
Housing dimensions	depending on the number of controllers



# PANEL CONTROLLERS

## HTE 53 SERIES

### Simple controller for top-hat rail installation 2300 Watt / 230 Volt

The dimensions of this controller correspond to a conventional builtin fuse and is easy to install in switchgear cabinets and distribution fuse boards.

Voltage supply	230V AC
Switching power	1 x 2300 W, 10 A, mechanical
Control range	-200°C ... +500°C adjustable
Sensor type	PT100 2-wire
Special features	switchable to Fahrenheit
Display actual/target value	3 digits LCD display 16mm high
Switching status	1 LED
Operation	3 push buttons
Protection type	IP20 (EN 60529)
Housing material	polycarbonate
Housing dimensions	23x90x62mm (W x H x D)
Connection	screw terminals
Fastening	top-hat rail 35x7.5 mm

Installation housing for HTE 53	
Housing dimensions HZ-EK 2	for 4 units 125 x 200 x 122 mm
Housing dimensions HZ-EK 4	for 8 units 200 x 200 x 122 mm
Housing dimensions HZ-EK 6	for 12 unit 250 x 200 x 122 mm
Protection type	IP65 (EN 60529), in housing
Design	in accordance with VDE 0631





# PANEL CONTROLLERS

## HT 52 SERIES

### Front panel mounted controller 3680 Watt / 230 Volt

Front panel controllers generally have very low switching power, in the range of 2 - 3 Amperes. This is why additional power switches must be built into control cabinets, at substantial extra cost, in order to accommodate higher heating power requirements.

In contrast, our HT52 panel regulator is a true power package capable of providing 3680 Watt – without contacts – via a SSR from a 16 A, 230 Volt power source.

This regulator is also very simple to program and it has practical functions, like ramp-up circuitry, self-optimisation, heat circuit control and broken sensor indicator.

Voltage supply	230V (optional: 24V DC)
Switching power	1 x 3680W 16A, electronic
Control range	0 ... 999°C (adjustable)
Sensor types	PT100 / FeCuNi (J) / NiCr Ni (K)
Alarm output	2x relay (closer) 2 A
Display actual/target value	10 mm high segmented display
Controller type	two-point controller
Operation	4 push-buttons, foil keypad
Switching status	LED
Protection type	IP20 (front-side IP50), protection class I
Housing dimensions	Noryl, 96 x 96 x 95 mm (W x H x D)
Connection	terminal strip / pluggable



# PANEL CONTROLLERS

## UTR SERIES

### Temperature controller for wall mounting

This is a simple and inexpensive temperature controller with PTC sensor, and internal or external setpoint setting. It is built into a housing and carries out simple temperature control of heating strips and underfloor heating systems. The PTC temperature sensor can be extended up to 50 m.

Voltage supply	230 V AC, +6 / -15%, 50 / 60 Hz
Switching power	3600 Watt
Display	"Heating on", "Sensor break" LED
Perm. ambient temp.	-20° to +50°C
Switching temperature difference	adjustable approx. 10 K
Max. perm. switching current	16 A
Contact (relay contact)	1 changeover contact, potential-free (floating)
Electr. connections	screw connections
Setpoint setting	knob
Mounting	wall mounting
Protection type	IP65 (EN 60529), protection class II
Cable entry	3 x KV screw connectors
Housing material	plastic
Housing dimensions	120 x 122 x 56 mm (W x H x D)

PTC temperature sensor	Type: UTR-175-PTC
Sensor	(PTC) linearised, self-monitoring
Cable length	1.5 m
Sensor diameter	8.5 mm
Ambient temp.	-20° to +175°C



Type	Control range
UTR-60	0 – 60°C
UTR-100	40 – 100°C
UTR-160	100 – 160°C



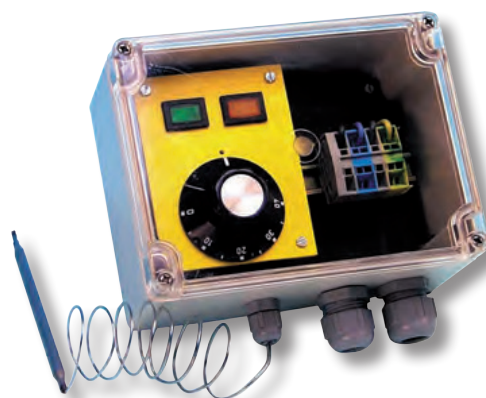
Sensor UTR (optional)

## HTK SERIES

### Mechanical two-point controller

This capillary tube controller is suitable for simple temperature control or monitoring, for example for antifreeze and roof gutter heating. It is available in three temperature ranges.

Voltage supply	230 V AC, 50 / 60 Hz
Switching power	3600 W / 16 A
Switching hysteresis	5 K
Protection type	IP65 (EN 60529), protection class II
Accuracy class	5 %
Control response	P
Connection	screw terminals
Power control	via spring contact
Housing material	ABS, polycarbonate
Housing dimensions	160 x 80 x 75 mm (H x W x D)



Type	Control range
HTK 40	0 – 40°C
HTK 85	0 – 85°C
HTK 200	50 – 250°C

# SIMPLE MECHANICAL CONTROLLERS

## AZT SERIES

### Electronic antifreeze controller

This is an inexpensive electronic antifreeze controller, with internal or external setpoint setting.

When the outside temperature drops, it switches the heating on for antifreeze protection and switches off again when the outside temperature rises.

Voltage supply	230 V AC, +6 / -15%, 50 / 60 Hz
Display	"Heater on" control lamp
Control range	-15° to +15°C
Max. perm. switching current	10 A / 250 V
Switching power	2.2 kW
Contact (relay contact)	1 changeover contact
Perm. ambient temp.	-20° to +40°C
Switching temperature difference	approx. 0.5 K
Sensor element	NTC linearised, in the housing
Protection type	IP54 (EN 60529), protection class II
Mounting	wall mounting
Internal setting	Type: AZT-I 15
External setting	Type: AZT-A 15
Housing material	plastic
Housing dimensions	91 x 91 x 46 mm (W x H x D)



## HTL 13 SERIES

### Interval power controller

The Hillesheim HTL 13 is suitable for automatic, continuously adjustable temperature control of electrical heating systems and heating units. The load is connected via an in-built flange socket. The continuously adjustable temperature control is achieved by automatically switching the power supply on and off in precise time intervals. The duty cycle of the power supply can be continuously adjusted with the knob on the power controller. This means that with a low setting the power output cycle is briefly on - long off, with a higher setting the power controller is briefly off - long on.

Voltage supply	230 V AC, 50 / 60 Hz
Controllable heating power	2990 W (max. 13 A)
Temperature setting	knob / scale
Switching cycle	depending on setting 10 – 80%, or max. 100%
Protection type	IP54 (EN 60529) in the connected state
Connecting cable	1.3 m
Plug	Euro 16 A
Socket	Hirschmann STAKEI 200, 2 + PE
Housing material	polycarbonate, grey
Housing dimensions	80 x 80 x 80 mm (W x H x D)



# MINI CONTROLLERS

## HTI 6 SERIES

### Integral mini-controller

The HTI 6 is a temperature controller manufactured with highly integrated electronic components used in nano Watt technology.

Temperature detection is accomplished directly through the heater wire. The temperature setting is made by way of a DIP switch which permits settings in 2°C increments up to a maximum of 254°C. A triac is used in this temperature controller to achieve wear-free switching.

Voltage supply	230 V AC +6/-10%, / 50...60 Hz
Switching power	max. 1500 Watt (max. 7A) min. load current 1A
Controller type	integral / without sensor / special heating conductor
Display	LED red / green
Power switch	triac in zero-crossing
Control range	0 .... 254°C, +/-5°C
Setting	setpoint setting 2°C steps with a DIP switch
Protection type	IP42 / Cast: IP65 (EN 60529)
Response	two-point controller
Inputs	cable glands
Housing material	PA glass-fibre reinforced
Housing dimensions	62 x 44 mm (D x W)



## HT 54 SERIES

### SMD miniature controller for PT100 sensor

The idea of integrating a temperature controller directly on the relevant heating system failed in the past due to the size of the components. Today's SMD technology only takes up a fraction of the space of earlier electronics. This prompted us to develop a complete temperature controller for installation in the upper part of the PA hard cap of our heating hoses.

The HT 54 is the result!

We have accommodated the controller board on an area of just 35 x 40 mm. Thanks to this construction, the customer can save on external control devices. This creates space in the switchgear cabinet.

The HT 54 can also be used just as well for control purposes on heating jacket heating plates or heating strips. Its small dimensions open up new fields of application.

Voltage supply	230 V AC / 50 Hz
Switching power	1000 W / 5 A
Power switch	triac in zero-crossing
Control range	0 .... 254°C, +/-5°C
Setting	setpoint setting 2°C steps with a DIP switch
Display	heating operation yellow LED
Protection type	IP42 / Cast: IP65 (EN 60529)
Response	two-point controller
Sensor	PT100
Inputs	cable glands
Housing material	PA glass-fibre reinforced
Housing dimensions	62 x 44 mm (D x W)



# SSR RELAYS

## HE SERIES

### SSR electronic load relay 30 A / 20 A

The HER load relay is a ready-to-install electronic power actuator for electrical heating systems. It is intended for continuous use with high switching frequency. In contrast to an electromechanical relay or contactor, no wear of switching contacts is possible here. The HER is prepared for use on a top-hat rail (TS 35), completely equipped with heat sink and over-voltage protection.

Load voltage	230 V AC
HER 30 D load current	0.2 – 30 A AC 1 at < 40°C
HER 20 D load current	0.2 – 20 A AC 1 at < 40°C
Protection type	IP20 (EN 60529), protection class II
Connection terminals	2.5 mm <sup>2</sup> / 4 mm <sup>2</sup>
Housing dimensions	81 x 22.5 x 100 mm (H x W x D)

Type	Control voltage
HER	4 – 32 V DC



### Solid state relay – SSR 25 A

This electronic switching relay can be installed anywhere, saving space in the housing.

Installation in a metal housing is recommended for high load currents to ensure sufficient cooling for dissipated heat.

Load voltage	24 to 230 V AC
Load current	25 A AC 1 (max. load)
Protection type	IP20 (EN 60529), protection class I
Connection terminals	2.5 mm <sup>2</sup>
Dissipated heat	sufficient cooling must be ensured for switching power above 5 A (heat sink)
Housing dimensions	57 x 45 x 30 mm (H x W x D)
Note	Solid state relay pass residual current even in the open switching state. Therefore connect an upstream main switch or contactor.

Type	Control voltage
HED	3 – 32 V DC
HEA	90 – 280 V DC





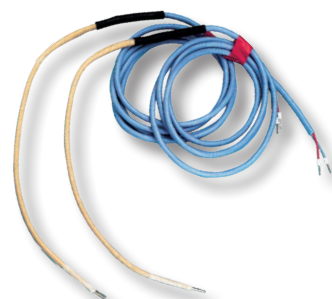
# CONTROL TECHNOLOGY

## TEMPERATURE SENSOR

### Thermocouple flat sensor

with 1.5 m long silicone-insulated compensating cable

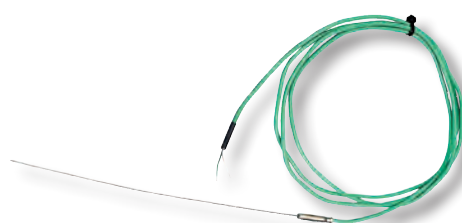
Order no.	Sensor type	Max. temperature
HT/FF	Fe-CuNi (J)	450°C
HT/NF	NiCr-Ni (K)	450°C



### Thermocouple rod sensor

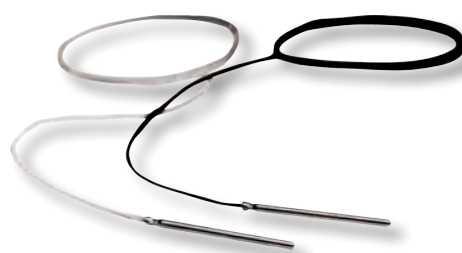
Mineral-insulated, sensor tip bendable, for soldering-in, preferably for use at high temperatures, in fluids and aggressive atmospheres, diameter 1.5 mm, length 250 mm, silicone-insulated, 2 m long, compensating cable

Order no.	Sensor type	Max. temperature	Jacket material
HT/FM	Fe-CuNi (J)	600°C	1.4571
HT/NM	NiCr-Ni (K)	1000°C	2.4816 (Inconel)



### PT100 sleeve sensor

PT100 sensor +200°C	PT100 sensor +250°C	PT100 sensor +350°C
Brass diameter 4 mm, length 40 mm, PTFE-insulated, 2 m cable	Jacket material 1.4571, diameter 4 mm, length 40 mm, PTFE-insulated, 2 m cable	Jacket material 1.4571, diameter 4 mm, length 40 mm, glass silk insulated, 2 m cable
Order no.	Order no.	Order no.
HTI/MS	HTI/PM	HTI/PH

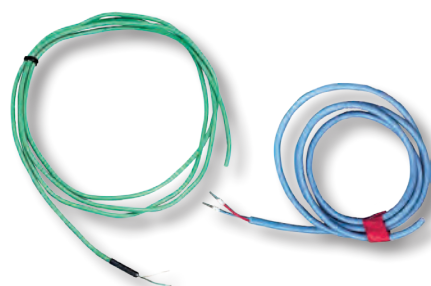


PT 100 in EExi design also available.

### Compensating cables

For extending the connecting cables for the temperature sensors above. Structure: Silicone / silicone-insulated, 2 x 0.25 mm<sup>2</sup>, diameter 5 mm

Order no.	Sensor type
AG/F	Fe-CuNi (J)
AG/N	NiCr-Ni (K)







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