



Temperature

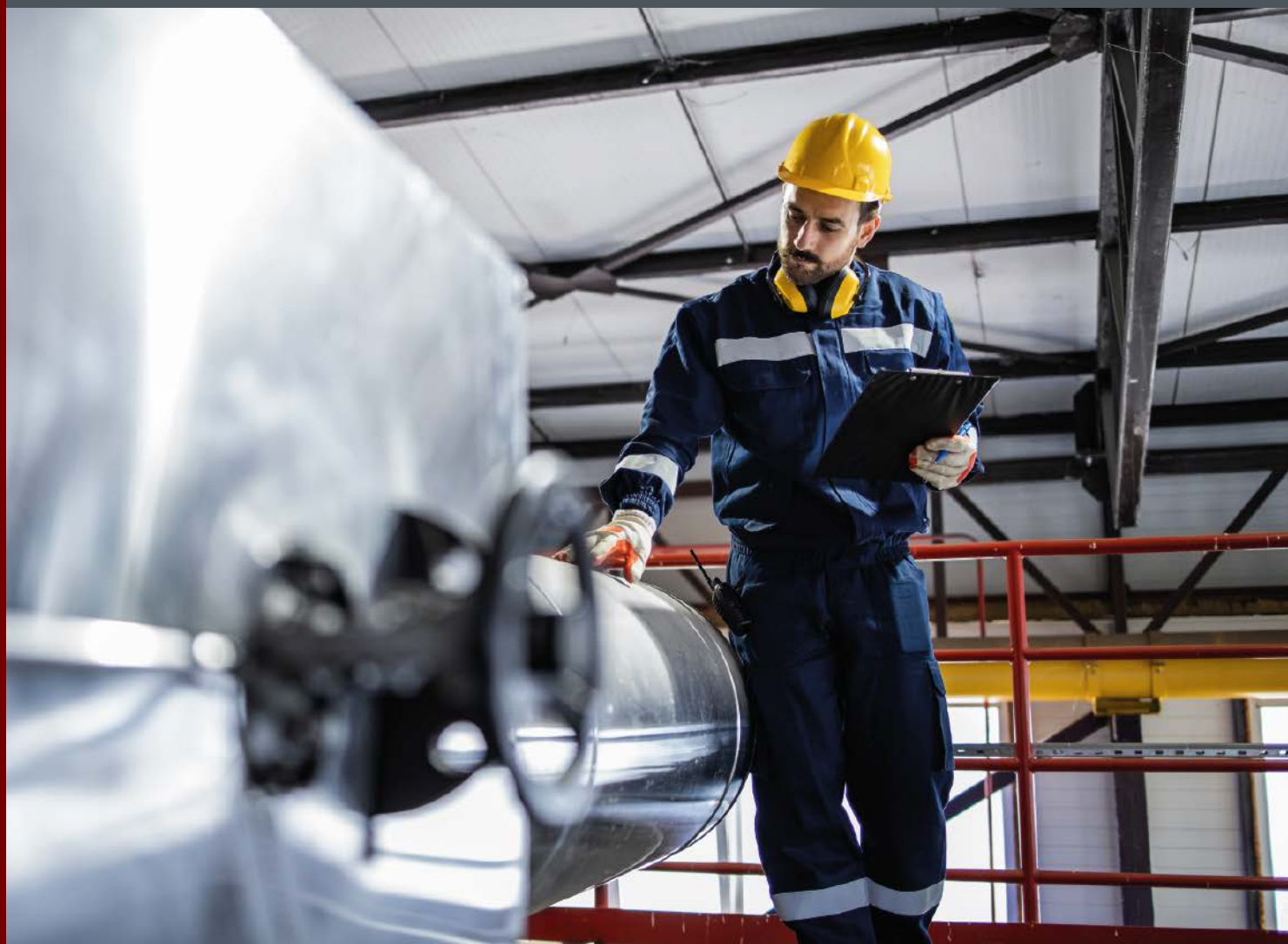
THERMASREG® Temperature controllers – everything under control from hot to cold

Our temperature controllers and thermostats are known for their rugged, long-life and reliable measuring technology, widely field-proven in everyday use.

Well engineered and manufactured in customized versions, these devices have a perfect fit in high-end installations.

Application Areas

- Office and administration buildings
- Schools, hotels and public authorities
- Power plants and district heating plants
- Industrial buildings and production facilities
- Food industry
- Heating and ventilation systems





THERMASREG®

TEMPERATURE CONTROLLERS, THERMOSTATS

Room temperature controllers

RTR-B	Room temperature controller	331
--------------	-----------------------------	------------

Surface contact thermostats

ALTR060	Surface-contact thermostat	348
ALTR090	Surface-contact thermostat	348
ALTR1	Surface-contact thermostat	349
ALTR3	Surface-contact thermostat	349
ALTR5	Surface-contact thermostat	349
ALTR7	Surface-contact thermostat	349

Built-in controllers, duct controllers

ETR	Built-in temperature controller, one-step and two-step	341
KTR	Duct temperature controller, one-step and two-step	347
TRxx-F	Temperature controller with remote sensor	335
FST-K	Duct frost protection thermostat, mechanical, one-step, switching	357

Wet room temperature controllers

TR040	Temperature controller	332
TR060	Temperature controller	332
TR22	Temperature controller	333
TR04040	Temperature controller, two-step	334

Frost protection thermostats

FST	Frost protection thermostat, mechanical, one-step, switching	353
FST-K	Duct frost protection thermostat, mechanical, one-step, switching	357
FS-20	2-phase frost protection thermostat, with control and cascading input, two-step, switching	361

Immersion sleeves and accessories

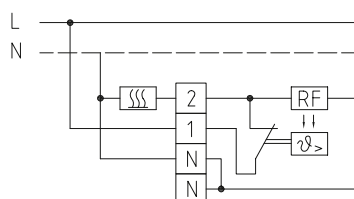
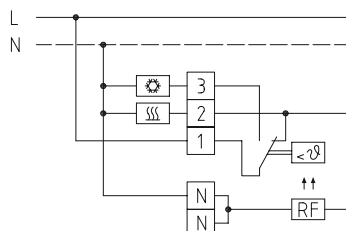
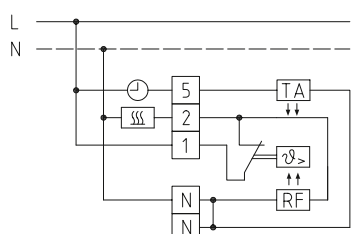
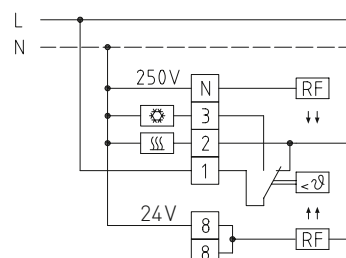
see chapter Accessories	644
-------------------------	------------

**Room temperature controllers, mechanical,
on-wall**

One-step mechanical single room controller **THERMASREG® RTR-B** in bi-metal technology with thermal feedback for monitoring or controlling temperatures in dry rooms, or for activating any kind of heating system as room thermostat. For currentless open radiator valves, the cooling output from the changeover contact (normally open contact) must be connected. At breaker contacts, a maximum of 10 valve actuators can be connected and at normally open contacts a maximum of 5 valve actuators.

TECHNICAL DATA

Switching capacity: (Contact load)	230 V AC, 50-60 Hz heating: 10 mA...10 (4) A, DC 30 W cooling: 10 mA...5 (2) A
Sensor element:	bi-metal
Control range:	+5...+30 °C
Output:	breaker or changeover contact
Operating difference:	approx. 0.5 K
Housing:	plastic, flame retardant (UL 94 V-0), PC/ABS material, colour white (similar to RAL 9016)
Dimensions:	75 x 75 x 25 mm (E1)
Electrical connection:	0.14-2.5 mm ² via terminal screws
Installation:	wall mounting or on in-wall flush box Ø55 mm, base with 4-hole for mounting on vertically or horizontally installed in-wall flush boxes for cable entry from the back, with predetermined breaking point for on-wall cable entry from top / bottom in case of plain on-wall installation
Protection class:	II (according to EN 60 730)
Protection type:	IP 30 (according to EN 60 529)
Standards:	CE conformity, EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU

Connecting diagram **RTR-B 121**Connecting diagram **RTR-B 721**Connecting diagram **RTR-B 124**Connecting diagram **RTR-B 747**



S+S REGELTECHNIK

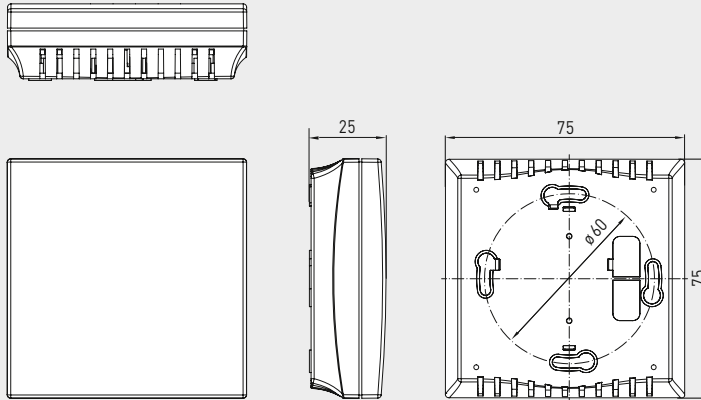
THERMASREG® RTR-B

Room temperature controllers, mechanical,
on-wall



Dimensional drawing

Housing E1
(Picture similar)

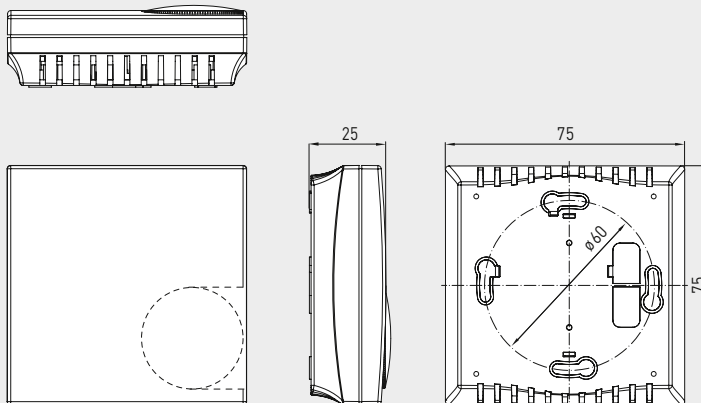


RTR-B 747
with internal setting



Dimensional drawing

Housing E1
with one potentiometer
(Picture similar)



RTR-B 121
RTR-B 124
RTR-B 721
with external setting



THERMASREG® RTR-B Room temperature controllers

Type / WG01	Temperature Range	Function	Output	Item No.
RTR-B 121 / B 124 / B 721				External setting
RTR-B 121	+5...+30 °C	Heating	Breaker	1102-4011-2100-000
RTR-B 124	+5...+30 °C	Heating, temperature reduction -5 K	Breaker	1102-4011-2400-000
RTR-B 721	+5...+30 °C	Heating, cooling	Changeover contact	1102-4017-2100-000
RTR-B 747				Internal setting
RTR-B 747	+5...+30 °C	Heating, cooling	Changeover contact	1102-4017-4700-000

**Temperature controllers, one-step,
with switching output**

Mechanical temperature controllers/wet room temperature controllers **THERMASREG® TR 040 / TR 060** with switching output (one-step) and stainless steel capillary (spiral coil sensor), working without external voltage. They are used for monitoring and controlling temperatures in heat generation plants, in heating, ventilation and air conditioning systems, for ventilation, cooling and climate control in halls, cold storage rooms, greenhouses, nurseries, stables, breeding rooms, as industrial room thermostat or surface-mounted thermostat in industrial applications as well as in wet room and outdoor areas.

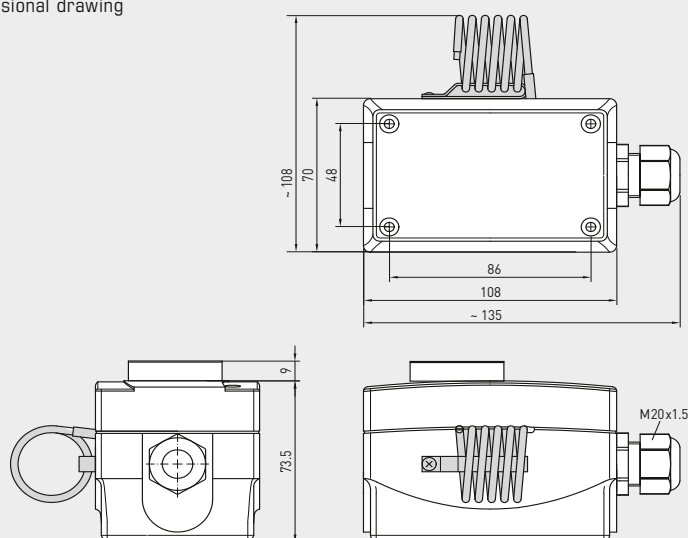
TECHNICAL DATA

Switching capacity: (Contact load)	24...250 V AC +10%, 16 A, cos φ = 1.0 24...250 V AC +10%, 1.5 A, cos φ = 0.6 at 24 V AC min. 150 mA
Contact:	dust-proof switch block unit as potential-free, single-pole or two-pole changeover contact
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 70 x 73.5 mm (Thor2)
Cable gland:	M20 x 1.5; including strain relief
Housing temperature:	-35...+65 °C
Capillary:	stainless steel V2A (1.4303)
Tolerance:	$T_{min} \pm 3$ K; $T_{max} \pm 3$ K; at +20 °C ± 1 K
Electrical connection:	0.14 - 2.5 mm ² via terminal screws
Routing:	admissible vibration load $\leq \frac{1}{2}g$
Protection class:	I (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529)
Standards:	CE conformity, EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU

FUNCTION

- Heating:** The preset setpoint (scale value) is equivalent to the switch-off value of the heating.
The switch-on value is lower by the amount of operating difference.
Contact 2 - 3 breaks when temperature rises to the preset value.
- Cooling:** The preset setpoint (scale value) is equivalent to the switch-on value of the cooling.
The switch-off value is lower by the amount of operating difference.
Contact 1 - 2 closes when temperature rises to the preset value.

Dimensional drawing



**TR 040
TR 060**

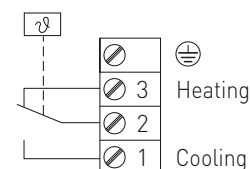


**TR 040
TR 060**
(one-step)
TR



**TR 040 U
TR 060 U**
(one-step)
TW

Connecting diagram



**TR 040
TR 060**

THERMASREG® TR 040 / TR 060 Temperature controllers, one-step

Type / WG01	Temperature Range	Thermal Operating Difference (fixed) approx.	Max. Capillary Temperature	Item No.
TR 040 / 060				TR (External setting)
TR-040	0...+40 °C	2 K	+65 °C	1102-1050-1100-200
TR-060	0...+60 °C	2 K	+75 °C	1102-1050-1100-300
TR 040 U / 060 U				TW (Internal setting)
TR-040 U	0...+40 °C	2 K	+65 °C	1102-1050-2100-200
TR-060 U	0...+60 °C	2 K	+75 °C	1102-1050-2100-300



S+S REGELTECHNIK

THERMASREG® TR 22

Temperature controllers, one-step,
with switching output

Mechanical temperature controller / wet room temperature controller **THERMASREG® TR 22** with switching output (one-step) and copper capillary, working without external voltage. It is used for monitoring and controlling temperatures in heat generation plants, in heating, ventilation and air conditioning systems, for ventilation, cooling and climate control in halls, cold storage rooms, greenhouses, nurseries, stables, breeding rooms, as industrial room thermostat or surface-mounted thermostat in industrial applications as well as in wet room and outdoor areas.

TR 22
(one-step)
TR

TECHNICAL DATA

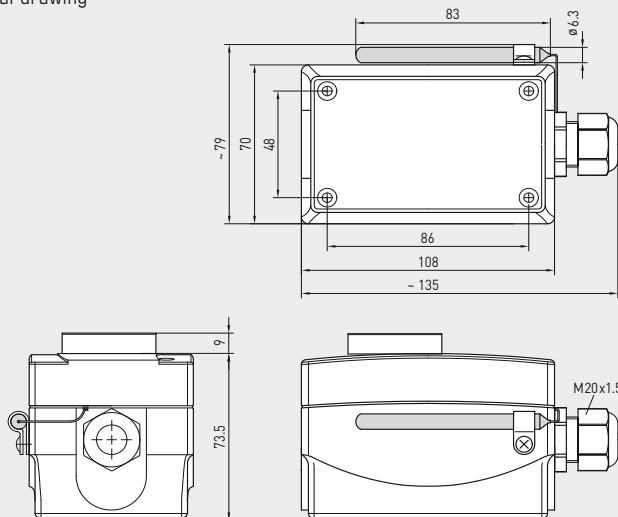
Switching capacity: (Contact load)	24...250V AC +10 %, 16 A, cos φ = 1.0 24...250V AC +10 %, 1.5 A, cos φ = 0.6 at 24V AC min. 150 mA
Contact:	dust-proof switch block unit as potential-free single-pole changeover contact
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 70 x 73.5 mm (Thor 2)
Cable gland:	M20 x 1.5; including strain relief
Housing temperature:	-35...+65 °C
Design principle:	torsion meter with liquid filling
Capillary:	copper
Tolerance:	T _{min} ± 3 K; T _{max} ± 3 K
Routing:	admissible vibration load ≤ ½g
Electrical connection:	0.14 - 2.5 mm² via terminal screws
Protection class:	I (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU

FUNCTION

Heating: The preset setpoint (scale value) is equivalent to the switch-off value of the heating.
The switch-on value is lower by the amount of operating difference.
Contact 2 - 3 breaks when temperature rises to the preset value.

Cooling: The preset setpoint (scale value) is equivalent to the switch-on value of the cooling.
The switch-off value is lower by the amount of operating difference.
Contact 1 - 2 closes when temperature rises to the preset value.

Dimensional drawing



TR 22

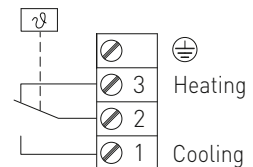


TR 22 U
(one-step)
TW



Connecting diagram

TR 22



THERMASREG® TR 22 Temperature controllers, one-step

Type / WG01	Temperature Range	Thermal Operating Difference (fixed) approx.	Max. Capillary Temperature	Item No.
TR 22				TR (External setting)
TR-22	-35...+35 °C	3 K (± 1 K)	+60 °C	1102-1050-1100-100
TR 22 U				TW (Internal setting)
TR-22 U	-35...+35 °C	3 K (± 1 K)	+60 °C	1102-1050-2100-100

Temperature controllers, two-step, with switching output

Mechanical temperature controller/wet room temperature controller **THERMASREG® TR 04040** with two independently switching outputs, which are separately adjustable (e.g. for switching between day and night time) and stainless steel capillary (spiral coil sensor), working without external voltage. It is used for monitoring and controlling temperatures in heat generation plants, in heating, ventilation and air conditioning systems, for ventilation, cooling and climate control in halls, cold storage rooms, greenhouses, nurseries, stables, breeding rooms, as industrial room thermostat or surface-mounted thermostat in industrial applications as well as in wet room and outdoor areas.

TECHNICAL DATA

Switching capacity:	24...250 V AC +10%, 16 A, cos φ = 1.0 (Contact load) 24...250 V AC +10%, 1.5 A, cos φ = 0.6 at 24 V AC min. 150 mA
Contact:	dust-proof switch block unit as potential-free single-pole changeover contact (two changeover contacts, separately adjustable)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 70 x 73.5 mm (Thor 2)
Cable gland:	2x M20 x 1.5; including strain relief
Housing temperature:	-10...+65 °C
Capillary:	stainless steel V2A (1.4303)
Tolerance:	T _{min} ± 3 K; T _{max} ± 3 K; at +20 °C ± 1 K
Electrical connection:	0.14 - 2.5 mm ² via terminal screws
Routing:	admissible vibration load ≤ ½g
Protection class:	I (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU

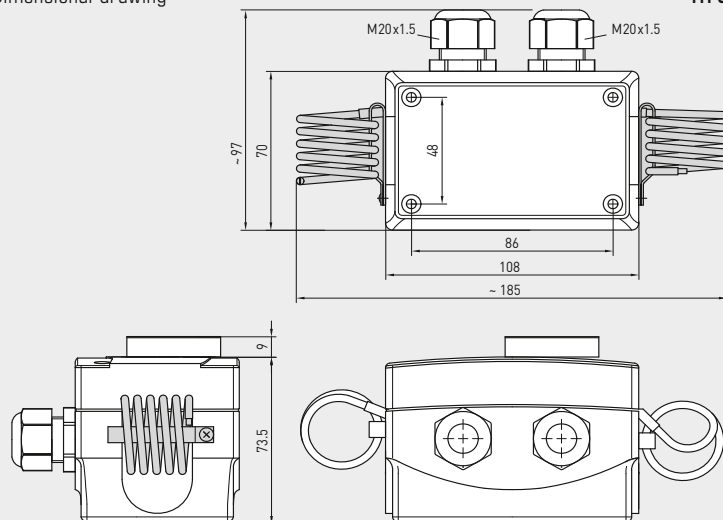
FUNCTION

Heating: Contacts 2-3 and 5-6 break when temperature rises to the preset value.

Cooling: Contacts 2-1 and 5-4 break when temperature drops to the preset value.

Dimensional drawing

TR 04040



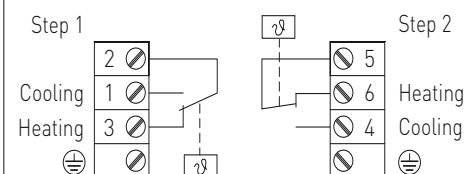
TR 04040



TR 04040U

Connecting diagram

TR 04040



THERMASREG® TR 04040 Temperature controllers, two-step

Type / WG01	Temperature Range (adjustable)		Thermal Operating Difference (fixed) approx.		Max. Capillary Temperature	Item No.
	1.	2.	1.	2.		
TR 04040						TR + TW (External/Internal setting)
TR-04040	0...+40 °C	0...+40 °C	2 K	2 K	+65 °C	1102-1050-1200-200
TR 04040 U						TW + TW (Internal setting)
TR-04040 U	0...+40 °C	0...+40 °C	2 K	2 K	+65 °C	1102-1050-2200-200



S+S REGELTECHNIK

THERMASREG® TR xx - F

Temperature controllers with remote sensor, one-step,
with switching output

Mechanical temperature controller **THERMASREG® TR xx - F** with remote sensor and switching output (one-step), working as capillary thermostat / capillary controller without external voltage. This capillary controller is used for monitoring and to control temperatures of non-aggressive liquid or gaseous media in heating, ventilation and air conditioning technology as well as in mechanical and apparatus engineering, for installation in immersion sleeves or air conditioning ducts.

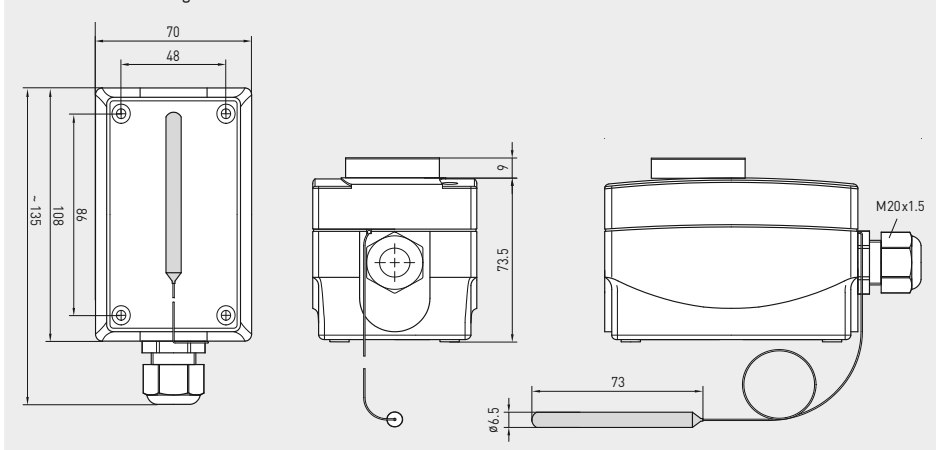
TECHNICAL DATA

Switching capacity:	24...250 V AC +10 %, 16 A, cos φ = 1.0 24...250 V AC +10 %, 1.5 A, cos φ = 0.6 at 24 V AC min. 150 mA
Contact:	dust-proof switch block unit as potential-free single-pole changeover contact
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 70 x 73.5 mm (Thor 2)
Cable gland:	M20 x 1.5; including strain relief
Housing temperature:	-10...+65 °C
Design principle:	torsion meter with liquid filling
Sensor:	copper tube, length of capillary = 1 m with PVC protective hose, Ø 6.8 mm
Tolerance:	$T_{\min} \pm 3 \text{ K}$; $T_{\max} \pm 3 \text{ K}$
Inserted length:	immersion sleeves EL = 150 mm (accessories see table)
Routing:	bending radius > 35 mm admissible vibration load $\leq \frac{1}{2}g$ admissible tensile load < 100 N
Electrical connection:	0.14 - 2.5 mm ² via terminal screws
Protection class:	I (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU

FUNCTION

Heating: wire contacts 2 - 3
Cooling: wire contacts 2 - 1

Dimensional drawing



TRxx-F

TRxx-F

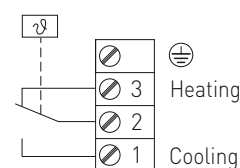


TRxx-F-U



Connecting diagram

TRxx-F



THERMASREG® TR xx - F Temperature controllers, one-step

Type / WG01	Temperature Range	Thermal Operating Difference (fixed) approx.	Max. Capillary Temperature	Item No.
TRxx-F				TR (External setting)
TR-1-F	−35... +35 °C	3 K (± 1 K)	+60 °C	1102-1056-1110-100
TR-060-F	0... +60 °C	3 K (± 1 K)	+75 °C	1102-1050-1110-300
TR-090-F	0... +90 °C	3 K (± 1 K)	+120 °C	1102-1050-1110-400
TR-0120-F	0...+120 °C	5 K (± 1 K)	+135 °C	1102-1050-1110-500
TR-50140-F	+50...+140 °C	5 K (± 1 K)	+150 °C	1102-1050-1110-600
Extra charge:	U = Internal setting (TW), e.g. TR-090-F-U			
ACCESSORIES				
THR-MS-08/150	Brass immersion sleeve, EL = 150 mm, Ø 8 x 0.5 mm			7100-0011-3404-000
THR-VA-09/150	Stainless steel immersion sleeve V2A (1.4301), EL = 150 mm, Ø 9 x 1.0 mm			7100-0012-3032-000
For further information, see the last chapter!				

Equipment sensor/controller, including immersion sleeve,
EC type-tested, TÜV tested,
with switching output

DIN-tested German quality product. Temperature control and limiting device for heat generation plants in accordance with DIN EN 14597. Safety temperature limiter (STB) with EC type test (module B) according to directive 2014/68/EU.

Mechanical temperature control device/rod thermostat THERMASREG® ETR with switching output, used for monitoring, controlling or limiting the temperatures of liquid or gaseous media as a boiler controller or in heating, air conditioning technology as well as in mechanical and apparatus engineering and in heat generation plants. It is available as one-step or two-step device, as adjustable temperature controller TR, temperature monitor TW, or as safety temperature limiter STB.



TECHNICAL DATA

Switching capacity: (Contact load)	24 ... 250 V AC + 10 %, 10 A, $\cos \varphi = 1.0$ 24 ... 250 V AC + 10 %, 1.5 A, $\cos \varphi = 0.6$ at 24 V AC min. 150 mA
Contact:	dust-proof switch block unit as potential-free single-pole or two-pole changeover contact
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 70 x 73.5 mm (Thor2)
Cable gland:	M20 x 1.5; including strain relief
Measuring element:	torsion meter with liquid filling, liquid expansion temperature feeler
Mounting position:	arbitrary
Ambient temperature:	-10...+65 °C at the switch block housing
Tolerance:	$T_{\min} \pm 5 \text{ K}$; $T_{\max} \pm 3 \text{ K}$
Immersion sleeves:	THR-MS-08/xx , Single sleeve brass, nickel-plated, $\varnothing = 8 \text{ mm}$, R 1/2", SW 22, $p_{\max} = 10 \text{ bar}$, $T_{\max} = +150 \text{ °C}$ THR-VA-09/xx , Single sleeve stainless steel V4A (1.4571), $\varnothing = 9 \text{ mm}$, G 1/2", SW 27, $p_{\max} = 25 \text{ bar}$, $T_{\max} = +150 \text{ °C}$ THR-VA-17/xx , Double sleeve stainless steel V4A (1.4571), $\varnothing = 17 \text{ mm}$, G 1/2", SW 27, $p_{\max} = 25 \text{ bar}$, $T_{\max} = +150 \text{ °C}$ (Depending on the type, the relevant immersion sleeve is included in the scope of delivery, see table)
Operating medium:	Water, oil, air and exhaust gas
Inserted length:	100 mm / 150 mm / 200 mm (see table)
Process connection:	screwed socket
Electrical connection:	0.14 - 2.5 mm ² via terminal screws
Protection class:	I (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529)
Standards:	CE conformity according to EMC directive 2014/30/EU, low-voltage directive 2014/35/EU
Tests:	EC type test (module B) according to directive 2014/68/EU , certificate No.: IS-TAF-MUC 18 03 2652130 002, DIN EN 14597, register Nos.: STB 1201, TR/STB 1202
FUNCTION	TW, TR: Contact 2-3 breaks when temperature rises to the preset value. STB: Contact 2-1 or 5-4 (two-step) breaks when temperature rises to the preset value. Restart is possible only after cooling off by approx. 15 K-20 K by pressing the reset button.



Configuration variants:

TW

Temperature monitor
(internal setting)

TR

Temperature controller
(external setting)

STB

Safety temperature limiter
(internal setting)

TW+TW

Double temperature monitor
(internal setting)

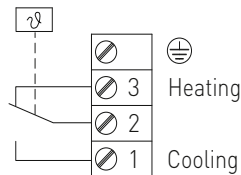
TR + STB

Temperature controller
(external setting) +

Safety temperature limiter
(internal setting)

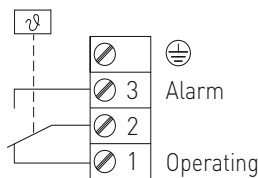
Connecting diagram
TW, TR

ETR
(one-step)



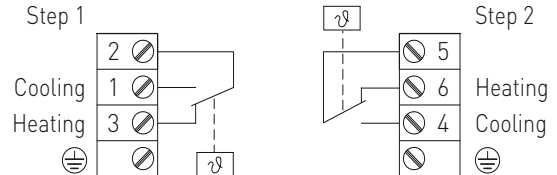
Connecting diagram

ETR
(one-step)



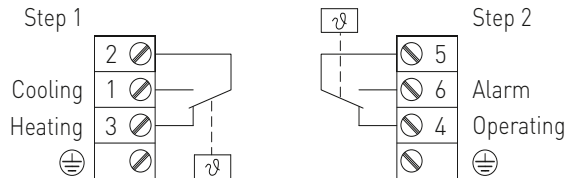
Connecting diagram
TW+TW

ETR
(two-step)



Connecting diagram
TR+STB

ETR
(two-step)



ZERTIFIKAT ◆ CERTIFICATE ◆ CERTIFICADO ◆ CERTIFICAT ◆ 認証証書 ◆



CERTIFICATE

valid until: 25.02.2028

ZERTIFIKAT

gültig bis: 25.02.2028

EU Type examination (module B) - production type - according to Directive 2014/68/EU

EU-Baumusterprüfung (Modul B) - Baumuster - nach Richtlinie 2014/68/EU

Certificate No.:

Z-IS-TAF-MUC-18-03-2652130-002

Zertifikat-Nr.:

Name and address of manufacturer:

S+S Regeltechnik GmbH

Name und Anschrift des Herstellers:

Pirmaer Str. 20
90411 Nürnberg

We herewith certify that the type mentioned below meets the requirements of the Directive 2014/68/EU.

Hermit wird bescheinigt, dass das unten genannte Baumuster die Anforderungen der Richtlinie 2014/68/EU erfüllt.

Evaluation report No.:

C-T 1382-01/18 dated 2018-02-26

Prüfbericht Nr.:

Scope of examination:

Geltungsbereich:

Safety temperature limiter as safety accessory

type: ETR and KTR (see page 3)

basis of examination and details see page 3

Manufacturing plant:

Fertigungsort:

S+S Regeltechnik GmbH

Pirmaer Str. 20
90411 Nürnberg

München, 26.02.2018

(Place, date)

(Ort, Datum)

Verification of Certificate by TÜV SÜD App Verify
Echtzeitprüfung durch App TÜV SÜD Verify

Notified Body, No. 0036

Notifizierte Stelle, Kennnummer 0036

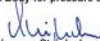
TÜV SÜD Industrie Service GmbH

Viestandstr. 159

80881 München

GERMANY

TÜV SÜD Industrie Service GmbH
Certification Body for pressure equipment


Johannes Stieglacher

089 5190-1027
fuerung@tuv-sud.de



Page 1 of the certificate No. 7 Seite 1 zum Zertifikat Nr. Z-IS-TAF-MUC-18-03-2652130-002

TÜV®



page 3 of certificate no. IS-TAF-MUC-18-03-2652130-002

Replaces certificate dated
 IS-TAF-MUC 08 02 100248356 001
Basis of examination:
 VdTUV-Merkblatt Temperatur 100.2017-03
 DIN EN 14597 :2015-01
 Essential safety requirements of Directive 2014/68/EU

Type code

Type	Code	Technical data
ETR-R6585	STB	Range: from 65 °C to 85 °C
ETR-R90110	STB	Range: from 90 °C to 110 °C
KTR-R6585	STB	Same function as ETR R6585, with the following difference: The tube is not closed to the medium.
KTR-R90110	STB	Same function as ETR R90110, with the following difference: The tube is not closed to the medium.

Type	Code	Technical data
ETR-060R85	TR/STB	Combination of two single types: TR and STB with the range: TR: from 0 °C to +60 °C STB: from +65 °C to + 85°
ETR-090R110	TR/STB	Combination of two single types: TR and STB with the range: TR: from 0 °C to +90 °C STB: from +90 °C to + 110°
KTR-060R85	TR/STB	Same function as ETR-060R85, with the following difference: The tube is not closed to the medium
KTR-090R110	TR/STB	Same function as ETR-090R110, with the following difference: The tube is not closed to the medium

The conditions listed below have to be considered:

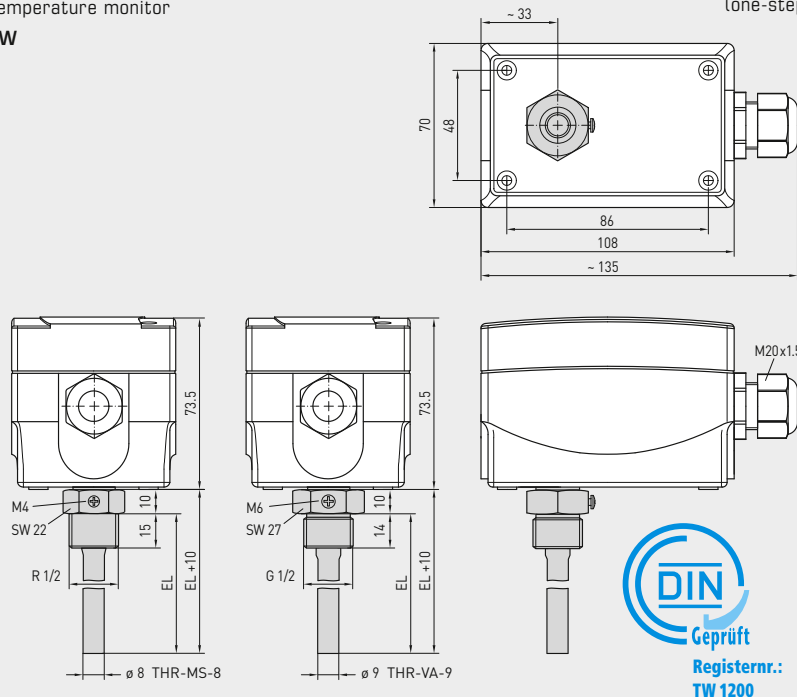
- 1 To keep the specified response time the types ETR... shall be used with the provided tube and thermal conducting paste
- 2 Possible risks caused by external fire or by traffic, wind and earthquake loading shall be examined separately depending from the installation situation of the pressure equipment



Appendix of certificate / Anlage zum Zertifikat Z-IS-TAF-MUC-18-03-2652130-002

Dimensional drawing
Temperature monitor
TW

ETR-xx U
(one-step)

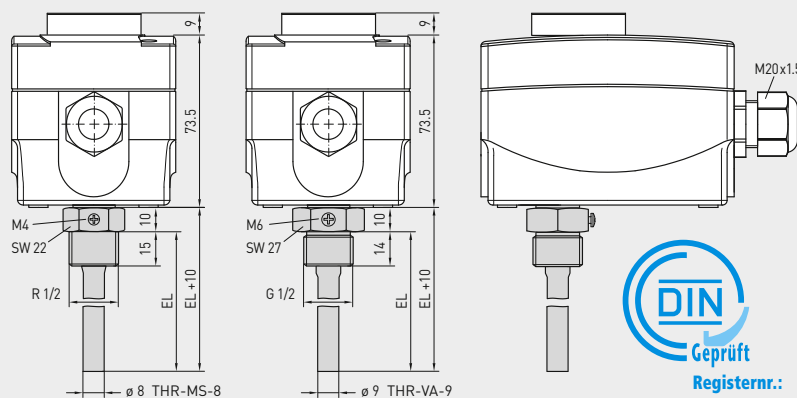


ETR-060 U
ETR-090 U
(one-step)
TW



Dimensional drawing
Temperature controller
TR

ETR-xx
(one-step)

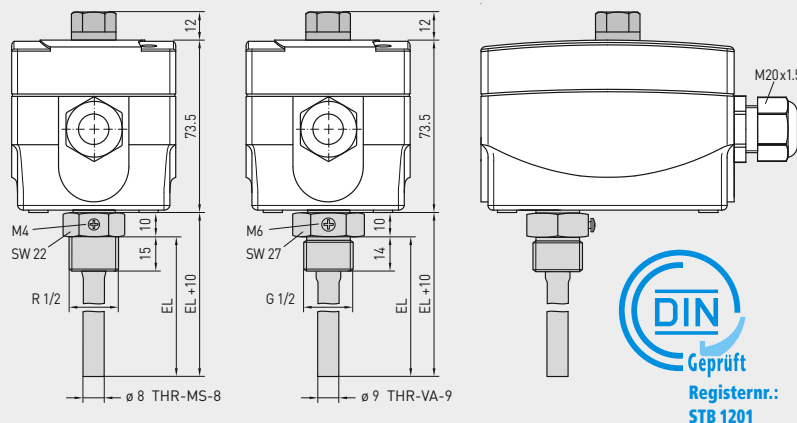


ETR-1
ETR-060
ETR-090
ETR-0120
ETR-50140
(one-step)
TR



Dimensional drawing
Safety temperature limiter
STB

ETR-Rxx
(one-step)



ETR-R6585
ETR-R90110
(one-step)
STB
selectable





S+S REGELTECHNIK

THERMASREG® ETR

one-step

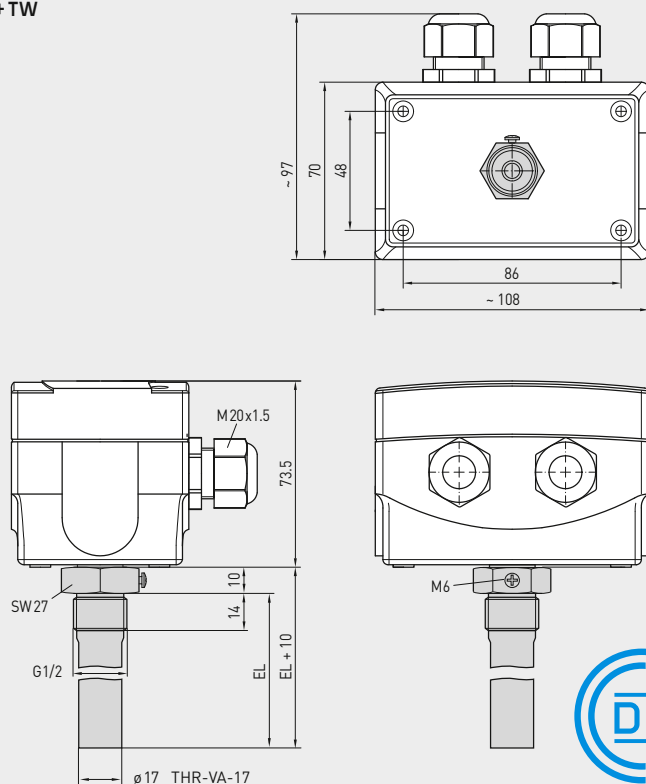
Equipment sensor / controller, including immersion sleeve,
EC type-tested, TÜV tested,
with switching output

THERMASREG® ETR Equipment sensor / controller, one-step, including immersion sleeve

Type / WG02	Inserted Length (EL)	Temperature Ranges (adjustable)	Thermal Operating Difference (fixed) approx.	Maximum Capillary Temp.	Item No.
ETR-060 U					TW
ETR-060 U MS/100	100 mm	0...+60 °C	3 K	+75 °C	1102-2010-2100-380
ETR-060 U MS/150	150 mm	0...+60 °C	3 K	+75 °C	1102-2010-2100-310
ETR-060 U MS/200	200 mm	0...+60 °C	3 K	+75 °C	1102-2010-2100-320
ETR-060 U VA/100	100 mm	0...+60 °C	3 K	+75 °C	1102-2010-2100-390
ETR-060 U VA/150	150 mm	0...+60 °C	3 K	+75 °C	1102-2010-2100-330
ETR-060 U VA/200	200 mm	0...+60 °C	3 K	+75 °C	1102-2010-2100-340
ETR-090 U					TW
ETR-090 U MS/100	100 mm	0...+90 °C	3 K	+120 °C	1102-2010-2100-480
ETR-090 U MS/150	150 mm	0...+90 °C	3 K	+120 °C	1102-2010-2100-410
ETR-090 U MS/200	200 mm	0...+90 °C	3 K	+120 °C	1102-2010-2100-420
ETR-090 U VA/100	100 mm	0...+90 °C	3 K	+120 °C	1102-2010-2100-490
ETR-090 U VA/150	150 mm	0...+90 °C	3 K	+120 °C	1102-2010-2100-430
ETR-090 U VA/200	200 mm	0...+90 °C	3 K	+120 °C	1102-2010-2100-440
ETR-1					TR
ETR-1 MS/100	100 mm	-35...+35 °C	3 K	+75 °C	1102-2010-1100-180
ETR-1 MS/150	150 mm	-35...+35 °C	3 K	+75 °C	1102-2010-1100-110
ETR-1 MS/200	200 mm	-35...+35 °C	3 K	+75 °C	1102-2010-1100-120
ETR-1 VA/100	100 mm	-35...+35 °C	3 K	+75 °C	1102-2010-1100-190
ETR-1 VA/150	150 mm	-35...+35 °C	3 K	+75 °C	1102-2010-1100-130
ETR-1 VA/200	200 mm	-35...+35 °C	3 K	+75 °C	1102-2010-1100-140
ETR-060					TR
ETR-060 MS/100	100 mm	0...+60 °C	3 K	+75 °C	1102-2010-1100-380
ETR-060 MS/150	150 mm	0...+60 °C	3 K	+75 °C	1102-2010-1100-310
ETR-060 MS/200	200 mm	0...+60 °C	3 K	+75 °C	1102-2010-1100-320
ETR-060 VA/100	100 mm	0...+60 °C	3 K	+75 °C	1102-2010-1100-390
ETR-060 VA/150	150 mm	0...+60 °C	3 K	+75 °C	1102-2010-1100-330
ETR-060 VA/200	200 mm	0...+60 °C	3 K	+75 °C	1102-2010-1100-340
ETR-090					TR
ETR-090 MS/100	100 mm	0...+90 °C	3 K	+120 °C	1102-2010-1100-480
ETR-090 MS/150	150 mm	0...+90 °C	3 K	+120 °C	1102-2010-1100-410
ETR-090 MS/200	200 mm	0...+90 °C	3 K	+120 °C	1102-2010-1100-420
ETR-090 VA/100	100 mm	0...+90 °C	3 K	+120 °C	1102-2010-1100-490
ETR-090 VA/150	150 mm	0...+90 °C	3 K	+120 °C	1102-2010-1100-430
ETR-090 VA/200	200 mm	0...+90 °C	3 K	+120 °C	1102-2010-1100-440
ETR-0120					TR
ETR-0120 MS/100	100 mm	0...+120 °C	5 K	+135 °C	1102-2010-1100-580
ETR-0120 MS/150	150 mm	0...+120 °C	5 K	+135 °C	1102-2010-1100-510
ETR-0120 MS/200	200 mm	0...+120 °C	5 K	+135 °C	1102-2010-1100-520
ETR-0120 VA/100	100 mm	0...+120 °C	5 K	+135 °C	1102-2010-1100-590
ETR-0120 VA/150	150 mm	0...+120 °C	5 K	+135 °C	1102-2010-1100-530
ETR-0120 VA/200	200 mm	0...+120 °C	5 K	+135 °C	1102-2010-1100-540
ETR-50140					TR
ETR-50140 MS/100	100 mm	+50...+140 °C	5 K	+150 °C	1102-2010-1100-680
ETR-50140 MS/150	150 mm	+50...+140 °C	5 K	+150 °C	1102-2010-1100-610
ETR-50140 MS/200	200 mm	+50...+140 °C	5 K	+150 °C	1102-2010-1100-620
ETR-50140 VA/100	100 mm	+50...+140 °C	5 K	+150 °C	1102-2010-1100-690
ETR-50140 VA/150	150 mm	+50...+140 °C	5 K	+150 °C	1102-2010-1100-630
ETR-50140 VA/200	200 mm	+50...+140 °C	5 K	+150 °C	1102-2010-1100-640
ETR-R6585					STB
ETR-R6585 MS/100	100 mm	+65...+85 °C	+0 / -15...20 K	+120 °C	1102-2010-6100-780
ETR-R6585 MS/150	150 mm	+65...+85 °C	+0 / -15...20 K	+120 °C	1102-2010-6100-710
ETR-R6585 MS/200	200 mm	+65...+85 °C	+0 / -15...20 K	+120 °C	1102-2010-6100-720
ETR-R6585 VA/100	100 mm	+65...+85 °C	+0 / -15...20 K	+120 °C	1102-2010-6100-790
ETR-R6585 VA/150	150 mm	+65...+85 °C	+0 / -15...20 K	+120 °C	1102-2010-6100-730
ETR-R6585 VA/200	200 mm	+65...+85 °C	+0 / -15...20 K	+120 °C	1102-2010-6100-740
ETR-R90110					STB
ETR-R90110 MS/100	100 mm	+90...+110 °C	+0 / -15...20 K	+120 °C	1102-2010-6100-880
ETR-R90110 MS/150	150 mm	+90...+110 °C	+0 / -15...20 K	+120 °C	1102-2010-6100-810
ETR-R90110 MS/200	200 mm	+90...+110 °C	+0 / -15...20 K	+120 °C	1102-2010-6100-820
ETR-R90110 VA/100	100 mm	+90...+110 °C	+0 / -15...20 K	+120 °C	1102-2010-6100-890
ETR-R90110 VA/150	150 mm	+90...+110 °C	+0 / -15...20 K	+120 °C	1102-2010-6100-830
ETR-R90110 VA/200	200 mm	+90...+110 °C	+0 / -15...20 K	+120 °C	1102-2010-6100-840
Type designation: ETR-xx_immersion sleeve material / inserted length (mm)					
MS = Brass nickel-plated, VA = Stainless steel V4A (1.4571)					
For further information and accessories see next page...					

Dimensional drawing
Double temperature monitor
TW + TW

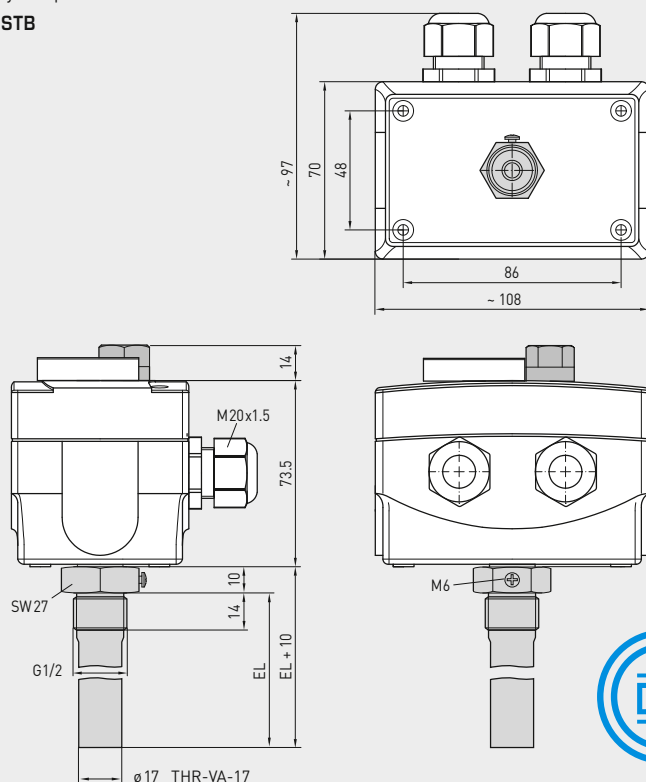
ETR-xx U
(two-step)



ETR-090090 U
(two-step)
TW + TW

Dimensional drawing
Temperature controller +
safety temperature limiter
TR + STB

ETR-xx Rxx
(two-step)



ETR-060 R 85
ETR-090 R 110
(two-step)
TR + STB
selectable



THERMASREG® ETR Equipment sensor / controller, two-step, including immersion sleeve							
Type / WG02	Inserted Length (EL)	Temperature Ranges (adjustable)		Thermal Operating Difference (fixed) approx.		Maximum Capillary Temp.	Item No.
		1.	2.	1.	2.		
ETR-090090 U							TW + TW
ETR-090090 U VA/150	150 mm	0...+90 °C	0...+90 °C	3 K	3 K	+120 °C	1102-2010-2205-130
ETR-090090 U VA/200	200 mm	0...+90 °C	0...+90 °C	3 K	3 K	+120 °C	1102-2010-2205-140
ETR-060R85							TR + STB
ETR-060R85 VA/150	150 mm	0...+60 °C	+65...+85 °C	3 K	+0 / -15...20 K	+120 °C	1102-2010-7205-230
ETR-060R85 VA/200	200 mm	0...+60 °C	+65...+85 °C	3 K	+0 / -15...20 K	+120 °C	1102-2010-7205-240
ETR-090R110							TR + STB
ETR-090R110 VA/150	150 mm	0...+90 °C	+90...+110 °C	3 K	+0 / -15...20 K	+135 °C	1102-2010-7205-330
ETR-090R110 VA/200	200 mm	0...+90 °C	+90...+110 °C	3 K	+0 / -15...20 K	+135 °C	1102-2010-7205-340
Type designation:	ETR-xx_immersion sleeve material / inserted length (mm) MS = Brass nickel-plated, VA = Stainless steel V4A (1.4571)						
Extra charge:	U = Internal setting, unless included in a certain type /2 = 2 steps, unless included in a certain type on request						
Features:	TR = Temperature controller (external setting) TW = Temperature monitor (internal setting) STB = Safety temperature limiter (internal setting), selectable , with external switchpoint confirmation and restart interlock, restart by reset button at approx. 15...20 K below switching temperature (+0 K / - 15...20 K); with EC type test (module B) according to directive 2014 / 68 / EU						
Note:	To ensure accurate responsiveness series ETR devices must only be used in connection with the immersion sleeves included in the scope of delivery while applying heat-conductive paste						

ACCESSORIES		
WLP-1	Heat-conductive paste, silicone-free	7100-0060-1000-000
For further information see last chapter!		

THERMASGARD® THR Immersion sleeve Ø 8 / 9 / 17 mm							
Type / WG01	p _{max} (static)	T _{max}	Time Constant for Medium:			Inserted Length (EL)	Item No. Ø
			Air	Water	Oil		
THR-ms-08 / xx Brass nickel-plated							Ø 8 x 0.5 mm
THR-MS-08/100	10 bar	+150 °C	106 s	18 s	53 s	100 mm	7100-0011-3022-000
THR-MS-08/150	10 bar	+150 °C	106 s	18 s	53 s	150 mm	7100-0011-3404-000
THR-MS-08/200	10 bar	+150 °C	106 s	18 s	53 s	200 mm	7100-0011-3403-000
THR-VA-09 / xx Stainless steel V4A (1.4571)							Ø 9 x 1.0 mm
THR-VA-09/100	25 bar	+150 °C	92 s	17 s	41 s	100 mm	7100-0012-3022-000
THR-VA-09/150	25 bar	+150 °C	92 s	17 s	41 s	150 mm	7100-0012-3032-000
THR-VA-09/200	25 bar	+150 °C	92 s	17 s	41 s	200 mm	7100-0012-3042-000
THR-VA-17 / xx Stainless steel V4A (1.4571)							Ø 17 x 1.0 mm
THR-VA-17/150	25 bar	+150 °C	–	45 s	55 s	150 mm	7100-0012-3033-000
THR-VA-17/200	25 bar	+150 °C	–	45 s	55 s	200 mm	7100-0012-3404-000
Ordering example:	THR - ms - 08 / 100 (Brass immersion sleeve, Ø = 8 mm, EL = 100 mm) THR - VA - 09 / 150 (Stainless steel immersion sleeve, Ø = 9 mm, EL = 150 mm) THR - VA - 17 / 200 (Stainless steel immersion sleeve, Ø = 17 mm, EL = 200 mm)						
Note:	inner diameter of socket 15.0 mm						

Duct temperature controllers, including mounting flange,
EC type-tested, TÜV tested,
with switching output

DIN-tested German quality product. Temperature control and limiting device for heat generation plants in accordance with DIN EN 14597. Safety temperature limiter (STB) with EC type test (module B) according to directive 2014/68/EU.

Mechanical temperature control device / rod thermostat THERMASREG® KTR with switching output, used for monitoring, controlling or limiting the temperatures of gaseous media as a boiler controller or in heating, air conditioning technology as well as in mechanical and apparatus engineering and in heat generation plants. It is available as one-step or two-step device, as adjustable temperature controller TR, temperature monitor TW, or as safety temperature limiter STB.



TECHNICAL DATA

Switching capacity: (Contact load)	24...250 V AC +10%, 10 A, $\cos \varphi = 1.0$ 24...250 V AC +10%, 1.5 A, $\cos \varphi = 0.6$ at 24 V AC min. 150 mA
Contact:	dust-proof switch block unit as potential-free, single-pole or two-pole changeover contact
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 70 x 73.5 mm (Thor 2)
Cable gland:	M20 x 1.5; including strain relief
Measuring element:	torsion meter with liquid filling, liquid expansion temperature feeler
Mounting position:	arbitrary
Ambient temperature:	-10...+65 °C at the switch block housing
Tolerance:	$T_{\min} \pm 5 \text{ K}$; $T_{\max} \pm 3 \text{ K}$
Operating medium:	Air
Protective tube:	metal, material CuZn37 (2.0321), $\varnothing 14 \text{ mm}$, NL = 205 mm
Inserted length:	approx. 205 mm (with flange); approx. 184 mm (without flange)
Process connection:	by mounting flange (included in the scope of delivery)
Electrical connection:	0.14 - 2.5 mm ² via terminal screws
Protection class:	I (according to EN 60730)
Protection type:	IP 65 (according to EN 60529)
Standards:	CE conformity according to EMC directive 2014/30/EU, low-voltage directive 2014/35/EU
Tests:	EC type test (module B) according to directive 2014/68/EU, certificate No.: IS-TAF-MUC 18 03 2652130 002, DIN EN 14597, register Nos.: STB 1201, TR/STB 1202

FUNCTION

TW, TR:

Contact 2-3 breaks when temperature rises
to the preset value.

STB:

Contact 2-1 or 5-4 (two-step) breaks
when temperature rises to the preset value.
Restart is possible only after cooling off by
approx. 15 K - 20 K by pressing the reset button.



Configuration variants:

TW

Temperature monitor
(internal setting)

TR

Temperature controller
(external setting)

STB

Safety temperature limiter
(internal setting)

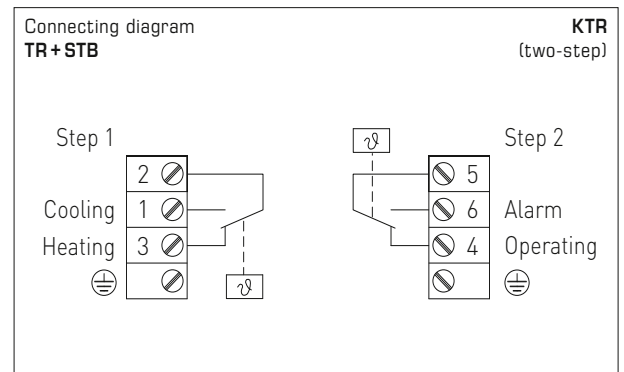
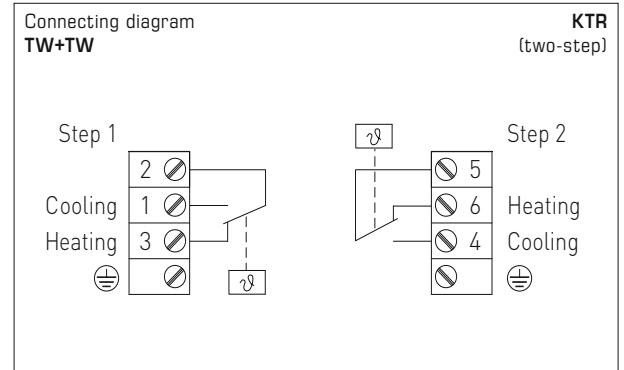
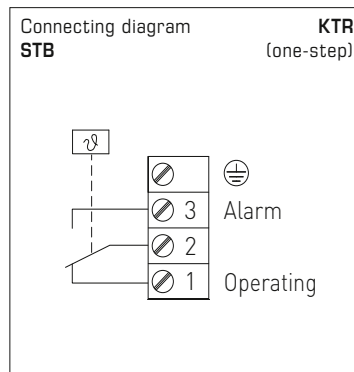
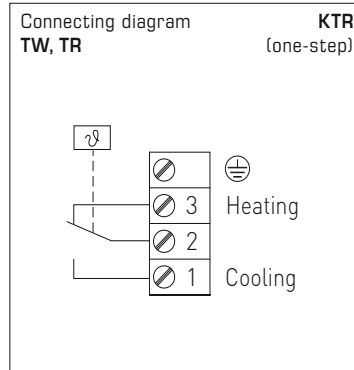
TW+TW

Double temperature monitor
(internal setting)

TR + STB

Temperature controller
(external setting) +

Safety temperature limiter
(internal setting)



ZERTIFIKAT ◆ CERTIFICATE ◆ CERTIFICADO ◆ СЕРТИФИКАТ ◆ 認証証書 ◆ ZERTIFIKAT ◆ CERTIFICATE ◆ CERTIFICADO ◆ СЕРТИФИКАТ ◆ 認証証書 ◆



CERTIFICATE

valid until: 25.02.2028

ZERTIFIKAT

gültig bis: 25.02.2028

EU Type examination (module B) - production type - according to Directive 2014/68/EU

EU-Baumusterprüfung (Modul B) - Baumuster - nach Richtlinie 2014/68/EU

Certificate No.:

Z-IS-TAF-MUC-18-03-2652130-002

Zertifikat-Nr.:

Name and address of manufacturer:

S+S Regeltechnik GmbH

Name und Anschrift des Herstellers:

Pirmaer Str. 20
90411 Nürnberg

We herewith certify that the type mentioned below meets the requirements of the Directive 2014/68/EU.

Hermit wird bescheinigt, dass das unten genannte Baumuster die Anforderungen der Richtlinie 2014/68/EU erfüllt.

Evaluation report No.:

C-T 1382-01/18 dated 2018-02-26

Prüfbericht Nr.:

Scope of examination:

Geltungsbereich:

Safety temperature limiter as safety accessory

type: ETR and KTR (see page 3)

basis of examination and details see page 3

Manufacturing plant:

Fertigungsort:

S+S Regeltechnik GmbH

Pirmaer Str. 20
90411 Nürnberg

München, 26.02.2018

(Place, date)

(Ort, Datum)

Verification of Certificate by TÜV SÜD App Verify
Echtkeitsprüfung durch App TÜV SÜD Verify

Notified Body No. 0036

Notifizierte Stelle, Kennnummer 0036

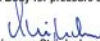
TÜV SÜD Industrie Service GmbH

Viertendorfer 159

90461 Mannheim

GERMANY

TÜV SÜD Industrie Service GmbH
Certification Body for pressure equipment


Johannes Stieglacher

089 5190-1027
fuerung@tuv-sud.de



Page 1 of the certificate No. 7 Seite 1 zum Zertifikat Nr. Z-IS-TAF-MUC-18-03-2652130-002

TÜV®



 Industrie Service

page 3 of certificate no. IS-TAF-MUC-18-03-2652130-002

Replaces certificate dated
 IS-TAF-MUC 08 02 100248356 001
 Basis of examination:
 VdTUV-Merkblatt Temperatur 100.2017-03
 DIN EN 14597 :2015-01
 Essential safety requirements of Directive 2014/68/EU

Type code

Type	Code	Technical data
ETR-R6585	STB	Range: from 65 °C to 85 °C
ETR-R90110	STB	Range: from 90 °C to 110 °C
KTR-R6585	STB	Same function as ETR R6585, with the following difference: The tube is not closed to the medium.
KTR-R90110	STB	Same function as ETR R90110, with the following difference: The tube is not closed to the medium.

Type	Code	Technical data
ETR-060R85	TR/STB	Combination of two single types: TR and STB with the range: TR: from 0 °C to +60 °C STB: from +65 °C to +85 °C
ETR-090R110	TR/STB	Combination of two single types: TR and STB with the range: TR: from 0 °C to +90 °C STB: from +90 °C to +110 °C
KTR-060R85	TR/STB	Same function as ETR-060R85, with the following difference: The tube is not closed to the medium
KTR-090R110	TR/STB	Same function as ETR-090R110, with the following difference: The tube is not closed to the medium

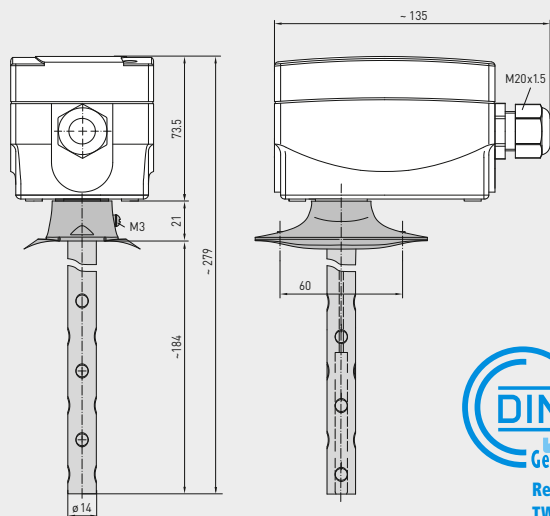
The conditions listed below have to be considered:

- 1 To keep the specified response time the types ETR... shall be used with the provided tube and thermal conducting paste
- 2 Possible risks caused by external fire or by traffic, wind and earthquake loading shall be examined separately depending from the installation situation of the pressure equipment

Appendix of certificate / Anlage zum Zertifikat Z-IS-TAF-MUC-18-03-2652130-002

Dimensional drawing
Temperature monitor

TW



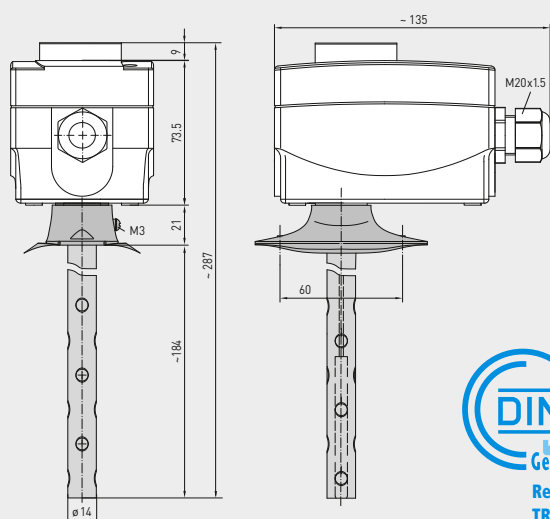
KTR-xxU
(one-step)



KTR-060U
KTR-090U
(one-step)
TW

Dimensional drawing
Temperature controller

TR



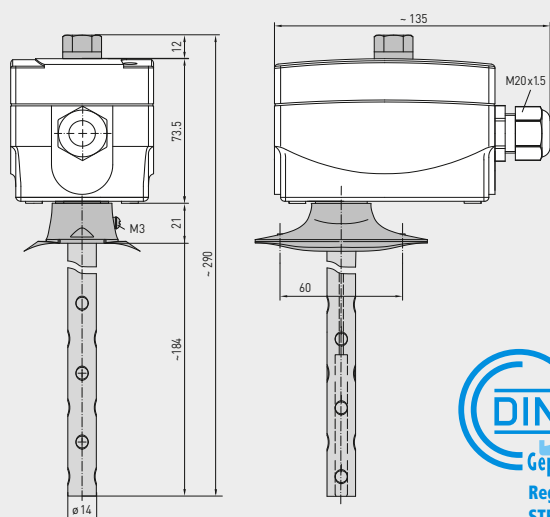
KTR-xx
(one-step)



KTR-1
KTR-060
KTR-090
KTR-0120
KTR-50140
(one-step)
TR

Dimensional drawing
Safety temperature limiter

STB



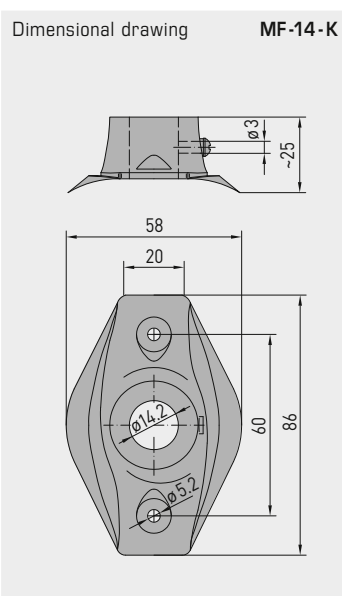
KTR-Rxx
(one-step)



KTR-R6585
KTR-R90110
(one-step)
STB
adjustable

THERMASREG® KTR Duct temperature controllers, one-step					
Type / WG02	Ø mm	Temperature Ranges (adjustable)	Thermal Operating Difference (fixed) approx.	Maximum Capillary Temp.	Item No.
KTR-060 U / 090 U					TW
KTR-060 U	14	0...+60 °C	3 K	+75 °C	1102-3010-2100-350
KTR-090 U	14	0...+90 °C	3 K	+120 °C	1102-3010-2100-450
KTR-xx					TR
KTR-1	14	-35...+35 °C	3 K	+75 °C	1102-3010-1100-150
KTR-060	14	0...+60 °C	3 K	+75 °C	1102-3010-1100-350
KTR-090	14	0...+90 °C	3 K	+120 °C	1102-3010-1100-450
KTR-0120	14	0...+120 °C	5 K	+135 °C	1102-3010-1100-550
KTR-50140	14	+50...+140 °C	5 K	+150 °C	1102-3010-1100-650
KTR-R6585 / R90110					STB
KTR-R6585	14	+65...+85 °C	+0 / -15...20 K	+120 °C	1102-3010-6100-750
KTR-R90110	14	+90...+110 °C	+0 / -15...20 K	+120 °C	1102-3010-6100-850
Extra charge:	U = Internal setting, unless included in a certain type /2 = 2 steps, unless included in a certain type on request				
Equipment:	FT = Manual reset when temperature drops ST = Manual reset when temperature rises TR = Temperature controller (external setting) TB = Temperature limiter (internal setting) TW = Temperature monitor (internal setting) STB = Safety temperature limiter (internal setting), selectable , with external switchpoint confirmation and restart interlock, restart by reset button at approx. 15...20 K below switching temperature (+ 0 K / - 15...20 K) with EC type test (module B) according to directive 2014 / 68 / EU				

ACCESSORIES		
MF-14-K	Mounting flange, plastic	7100-0030-2000-000
For further information see last chapter!		

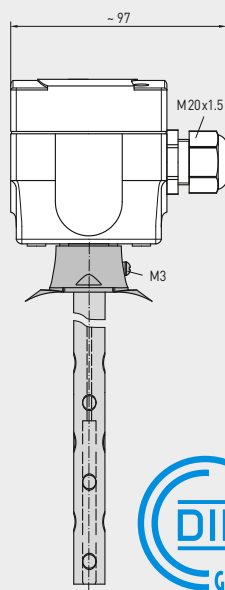
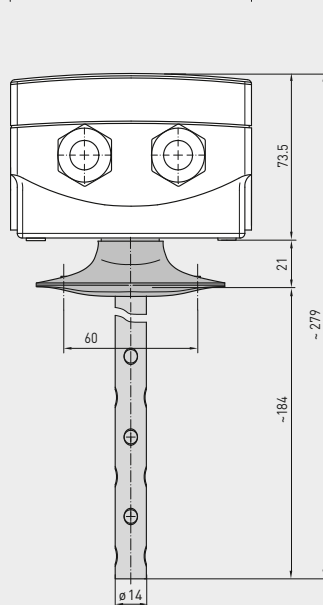
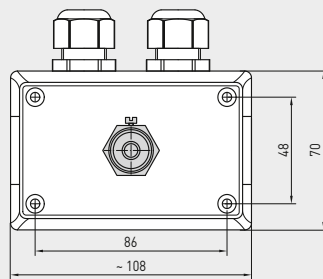


MF-14-K
Mounting flange,
plastic



Dimensional drawing
Double temperature monitor
TW + TW

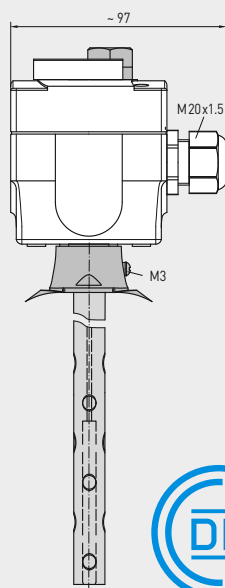
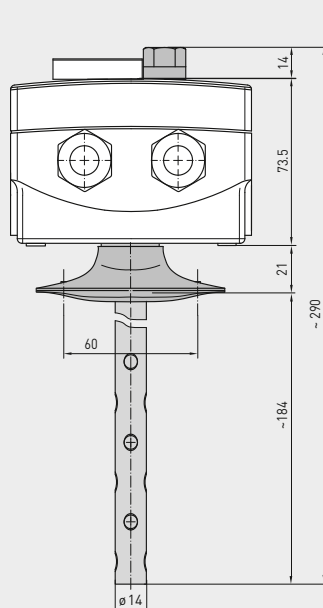
KTR-xx U
(two-step)



KTR-090090 U
(two-step)
TW + TW

Dimensional drawing
Temperature controller +
safety temperature limiter
TR + STB

KTR-xx R xx
(two-step)



KTR-060R85
KTR-090R110
(two-step)
TR + STB
adjustable



THERMASREG® KTR Duct temperature controllers, two-step

Type / WG02	Ø mm	Temperature Ranges (adjustable)		Thermal Operating Difference (fixed) approx.		Maximum Capillary Temp.	Item No.
		1.	2.	1.	2.		
KTR-090090 U							TW+TW
KTR-090090 U	14	0...+90 °C	0...+90 °C	3 K	3K	+120 °C	1102-3010-2205-150
KTR-060R85							TR+STB
KTR-060R85	14	0...+60 °C	+65...+85 °C	3 K	+0 / -15...20 K	+120 °C	1102-3010-7205-250
KTR-090R110							TR+STB
KTR-090R110	14	0...+90 °C	+90...+110 °C	3 K	+0 / -15...20 K	+135 °C	1102-3010-7205-350
Extra charge:	U /2	= Internal setting, unless included in a certain type = 2 steps, unless included in a certain type					on request
Features:	TR TW STB	= Temperature controller (external setting) = Temperature monitor (internal setting) = Safety temperature limiter (internal setting), selectable, with external switchpoint confirmation and restart interlock, restart by reset button at approx. 15...20 K below switching temperature (+ 0 K / - 15...20 K) with EC type test (module B) according to directive 2014 / 68 / EU					

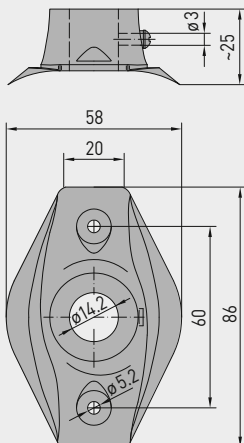
ACCESSORIES

MF-14-K	Mounting flange, plastic	7100-0030-2000-000
For further information see last chapter!		

Dimensional drawing

MF-14-K

MF-14-K

Mounting flange,
plastic

Surface contact temperature controllers, including tension spring

Mechanical temperature controllers / contact thermostats **THERMASREG® ALTR** with switching output (two-position controller) for monitoring, controlling and limitation of temperatures at pipes or vessels, e.g. in connection with hot-water or floor heating systems. The contact temperature controller ALTR is built as one-step device, as adjustable temperature controller **TR** (with external setting) or as adjustable temperature monitor **TW** (with internal setting).

TECHNICAL DATA

Switching capacity: (Contact load)	16 (4) A; 24...250 V AC at 24 V AC min. 150 mA
Max. sensor temperature:	+110 °C
Contact:	dust-proof switch block unit as potential-free single-pole changeover contact
Housing:	ABS (acrylonitrile butadiene styrene), fibre-glass reinforced, base: steel, galvanised, top: grey, M16 x 1.5
Housing temperature:	-35...+65 °C
Tolerance:	$T_{min} \pm 5 K$; $T_{max} \pm 5 K$
Sensor element:	bi-metal
Housing dimensions:	38 x 48 x 103 mm
Process connection:	by metal tension spring, 220 mm long (included in the scope of delivery)
Electrical connection:	0.14 - 1.5 mm ² via terminal screws
Protection class:	I (according to EN 60 730)
Protection type:	IP 40 (according to EN 60 529)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU

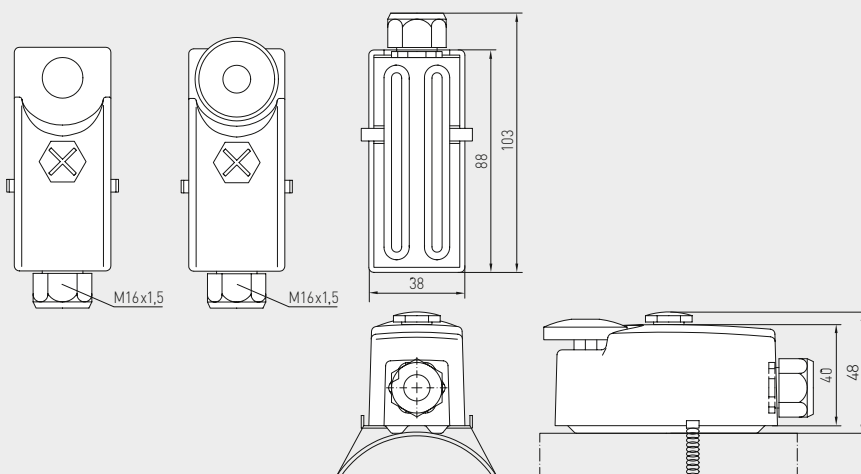
FUNCTION

Heating: wire contacts C - 1
Cooling: wire contacts C - 2

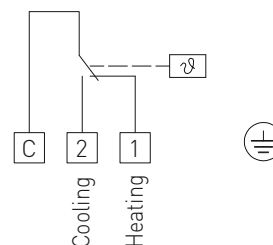


Dimensional drawing

ALTR 060 / 090



Connecting diagram ALTR 060 / 090



THERMASREG® ALTR 060 / 090 Surface contact temperature controllers

Type / WG01	Temperature Range	Thermal Operating Difference (fixed) approx.	Max. Capillary Temperature	Item No.
ALTR 060 / 090				TR (External setting)
ALTR-060	0...+60 °C	8 K (± 1 K)	+110 °C	1102-1040-1100-300
ALTR-090	0...+90 °C	8 K (± 1 K)	+110 °C	1102-1040-1100-400
ALTR 060 / 090 U				TW (Internal setting)
ALTR-060 U	0...+60 °C	8 K (± 1 K)	+110 °C	1102-1040-2100-300
ALTR-090 U	0...+90 °C	8 K (± 1 K)	+110 °C	1102-1040-2100-400



S+S REGELTECHNIK

THERMASREG® ALTR 1
THERMASREG® ALTR 3
THERMASREG® ALTR 5
THERMASREG® ALTR 7

Surface contact temperature controllers, including strap

Mechanical temperature controllers / contact thermostats **THERMASREG® ALTR** with switching output (two-position controller) for monitoring, controlling and limitation of temperatures at pipes or vessels, e.g. in connection with hot-water or floor heating systems. The contact temperature controller ALTR is built as one-step device, as adjustable temperature controller **TR** (with external setting) or as adjustable temperature monitor **TW** (with internal setting).

TECHNICAL DATA

Switching capacity:	24 ... 250 V AC + 10 %, 16 A, cos φ = 1.0 (Contact load) 24 ... 250 V AC + 10 %, 1.5 A, cos φ = 0.6 at 24 V AC min. 150 mA
Contact:	dust-proof switch block unit as potential-free single-pole changeover contact
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 70 x 73.5 mm (Thor 2)
Cable gland:	M20 x 1.5; including strain relief
Housing temperature:	-35...+65 °C
Tolerance:	$T_{\min} \pm 5 \text{ K}$; $T_{\max} \pm 5 \text{ K}$
Design principle:	torsion meter with liquid filling
Process connection:	endless strap with metal tightener (included in the scope of delivery), $\varnothing = 13 - 92 \text{ mm}$ (1/4 - 3"), L = 300 mm
Electrical connection:	0.14 - 2.5 mm ² via terminal screws
Protection class:	I (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU

FUNCTION

Heating: The preset setpoint (scale value) is equivalent to the switch-off value of the heating.

The switch-on value is lower by the amount of operating difference.

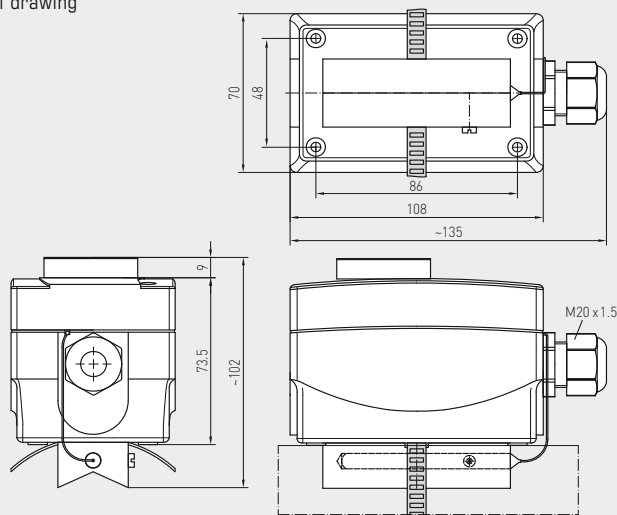
Contact 2-3 breaks when temperature rises to the preset value.

Cooling: The preset setpoint (scale value) is equivalent to the switch-on value of the cooling.

The switch-off value is lower by the amount of operating difference.

Contact 1-2 closes when temperature rises to the preset value.

Dimensional drawing



ALTR 1/3/5/7



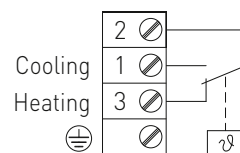
ALTR 1/3/5/7



ALTR 1/3/5/7U

Connecting
diagram

ALTR 1/3/5/7



THERMASREG® ALTR 1 / 3 / 5 / 7 Surface contact temperature controllers

Type / WG01	Temperature Range	Thermal Operating Difference (fixed) approx.	Max. Capillary Temperature	Item No.
ALTR 1 / 3 / 5 / 7				
ALTR-1	-35... +35 °C	5 K (± 1 K)	+60 °C	TR (External setting) 1102-1030-1100-100
ALTR-3	0... +60 °C	5 K (± 1 K)	+75 °C	1102-1030-1100-300
ALTR-5	0... +90 °C	5 K (± 1 K)	+120 °C	1102-1030-1100-400
ALTR-7	0... +120 °C	5 K (± 1 K)	+130 °C	1102-1030-1100-500
Extra charge:	U = Internal setting (TW), e.g. ALTR - 1 U			

Frost protection thermostats, mechanical, one-step, with switching output

S+S REGELTECHNIK

The mechanical frost protection thermostat / frost monitor **THERMASREG® FST** with switching output, fully-active sensor rod, with automatic reset, or with mechanical locking and manual reset, is available with capillaries in lengths of 0.6 m, 1.8 m, 3 m, 6 m, or 12 m. This frost protection monitor is used for air- and water-side temperature monitoring at heat exchangers, water circulation systems, and heating registers to prevent freezing up and to avoid frost damages, e. g. in ventilation and air conditioning ducts. All devices are self-secure with sensor breakage detection. In case of damage to the capillary tube – membrane system, the relay automatically switches to heating function. **FST-3** can also be used for monitoring liquids. The sensor tube can be installed inside an immersion sleeve. Mounting clamps **MK-05-K** are included in the delivery.

FST-1D/5D/7D/8D



TECHNICAL DATA

Switching capacity:	10 (2) A, AC 250 V; because of gold-plated switching contacts also switching of signal voltages < 24 V
Setting range:	-10...+15 °C / +14 °F...+59 °F, factory setting to w = +5 °C (+41 °F)
Operating difference:	2 ± 1 K (3.6 ± 1.8 °F)
Reproducibility:	± 0.5 K (± 0.9 °F)
Contact:	dust-proof micro switch as single-pole potential-free changeover contact
Sensor responding length:	approx. 40 cm
Length of capillary tube:	see table of types (0.6...12 m)
Resetting:	FST-xD automatic FST-xD-HR manual
Permissible medium:	FST-1D/5D/7D/8D air FST-3D water
Ambient temperatures:	maximum operating temperature: +70 °C (+158 °F) minimum operating temperature: w + min. +2 °C (min. +3.6 °F) storage / transport: -30...+70 °C (-22...+158 °F) capillary: max. +150 °C (+302 °F)
Process connection:	by mounting clamps MK-05-K (included in the scope of delivery)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016)
Housing dimensions:	126 x 90 x 50 mm (Tyr2)
Cable gland:	M 16 x 1.5; including strain relief
Other materials:	mechanical sheet metal parts: galvanised steel capillary tube: copper capillary tube filling: R 507 switching contacts: Ag / Ni (90% / 10%) gold-plated (3 µm)
Installation length:	arbitrary
Routing:	bending radius > 35mm admissible vibration load ≤ ½g admissible tensile load < 100N
Electrical connection:	0.14 - 2.5 mm²
Protection class:	I (according to EN 60 730-1)
Protection type:	IP 65 (according to EN 60 529)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU
FUNCTION	Contact C-2: danger of frost / sensor breakage Contact C-3: normal operation For further information see next page...
ACCESSORIES	see table

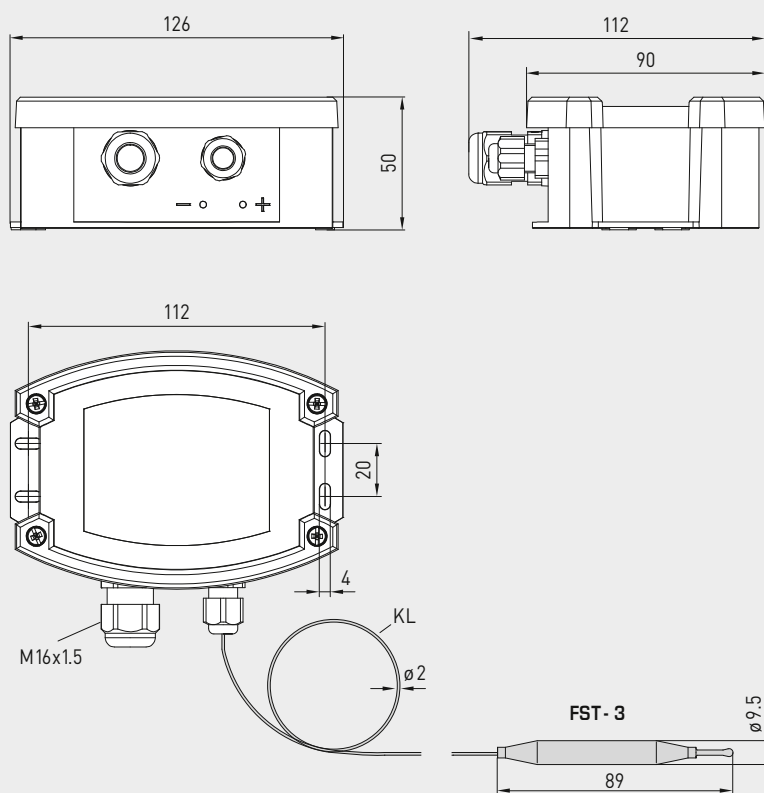
FST-3D





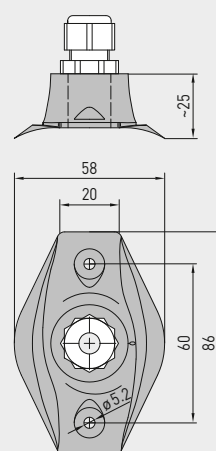
Dimensional drawing

FST



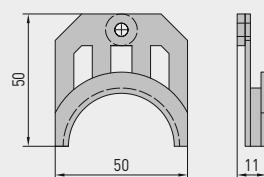
Dimensional drawing

KRD-04



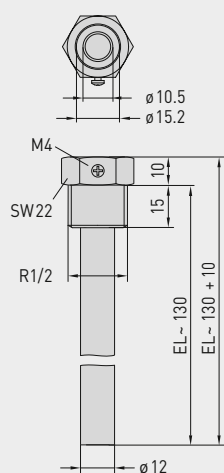
Dimensional drawing

MK-05-K



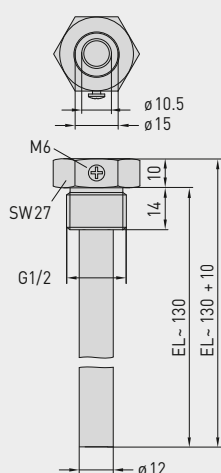
Dimensional drawing

TH-MS-01

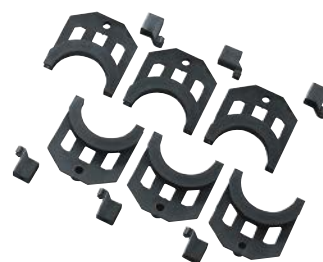


Dimensional drawing

TH-VA-02



MK-05-K

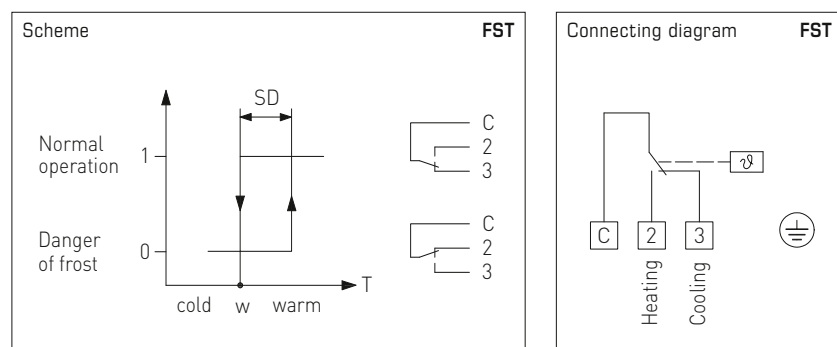


KRD-04



Frost protection thermostats, mechanical, one-step, with switching output

FST - 1D / 5D / 7D / 8D - HR
(manual rest)



FUNCTION

The switch inside frost protection thermostat **FST** responds (closes contact C-2) when temperature falls below the preset temperature setpoint over a capillary tube length of at least 40 cm. Simultaneously contact C-3 breaks and can be used as a signal contact. Resetting (closing contact C-3) happens automatically when temperature rises above the preset setpoint value again (on type **FST-xR** resetting must be done manually by pressing the reset button).

The **FST** is "intrinsically safe", i.e., in the event of damage to the capillary tube-membrane system, it automatically switches to the heating function. Contact C-2 closes and therefore can be used as operating contact. The air temperature is detected over the entire sensor length (capillary tube). The gas-filled (R507) membrane system and the capillary tube constitute one measuring unit, which is mechanically coupled to the microswitch.

Capillary tube: The capillary tube is laid uniformly at the hot side of the air heater to be protected (in case of air coolers in front of the air cooler) at a distance of approx. 5 cm cross-wise to the heat exchanger tubes over the entire area. For test purposes, it is recommended to make a loop of approx. 20 cm directly underneath the housing and before entering the air duct. To avoid damaging the capillary tube, a minimum bending radius of 20 mm must be observed. Installation is facilitated by using the mounting clamps available under accessories.

Frost simulation: The frost situation can be simulated and functioning of the device can be tested by dipping the capillary tube testing loop into a pot filled with ice water.

FST-3D-HR
(manual rest)



WS-03

Weather and sun protection hood
(optional)



FST-xD
TW = temperature monitor
(automatically switching)



FST-xD-HR
TB = temperature limiter
(manual reset)



THERMASREG® FST Frost protection thermostats, mechanical

Type / WG03B	Temperature Range	Thermal Operating Difference (fixed) approx.	Length of Capillary	Permissible Medium	Item No.
FST-xx D					TW
FST-1D *	-10...+15 °C	2 K (± 1 K)	6.0 m	air	1102-1021-0102-000
FST-3D *	-10...+15 °C	2 K (± 1 K)	1.8 m	air / water	1102-1023-0102-000
FST-5D *	-10...+15 °C	2 K (± 1 K)	3.0 m	air	1102-1022-0102-000
FST-7D *	-10...+15 °C	2 K (± 1 K)	12.0 m	air	1102-1025-0102-000
FST-8D	-10...+15 °C	2 K (± 1 K)	0.6 m	air	1102-1024-0102-000
FST-xx D-HR					TB
FST-1D-HR *	-10...+15 °C	2 K (± 1 K)	6.0 m	air	1102-1021-1102-000
FST-3D-HR *	-10...+15 °C	2 K (± 1 K)	1.8 m	air / water	1102-1023-1102-000
FST-5D-HR *	-10...+15 °C	2 K (± 1 K)	3.0 m	air	1102-1022-1102-000
FST-7D-HR *	-10...+15 °C	2 K (± 1 K)	12.0 m	air	1102-1025-1102-000
FST-8D-HR	-10...+15 °C	2 K (± 1 K)	0.6 m	air	1102-1024-1102-000
Features:	FST-x D FST-x D-HR	TW = temperature monitor (automatically switching) TB = temperature limiter (manual reset)			

ACCESSORIES

KRD-04	Capillary tube gland bracket	7100-0030-7000-000
MK-05-K	Mounting clamps (6 pieces) plastic (* = included in the scope of delivery)	7100-0034-1000-000
TH-MS-01	Immersion sleeves, brass, for FST-3 Installation length (EL) = 130 mm, flange = 10 mm, R1/2"	7100-0011-5402-000
TH-VA-02	Immersion sleeves, stainless steel V2A (1.4301), for FST-3 Installation length (EL) = 130 mm, flange = 10 mm, G1/2"	7100-0012-5402-000
WS-03	Weather and sun protection hood, 200 x 180 x 150 mm, stainless steel V2A (1.4301)	7100-0040-6000-000

For further information see last chapter!

**Duct frost protection thermostat,
incl. mounting flange, mechanical, one-step,
with switching output**

Mechanical frost protection thermostat / frost monitor **THERMASREG® FST-K** with switching output, duct tube monitored across the entire length, with automatic reset or with mechanical locking, with/without optional manual reset.

The frost protector is suitable for air side temperature monitoring at heat exchangers and heating registers to prevent freezing up and to avoid frost damage, e.g. in ventilation and air conditioning ducts. The FST-K is intrinsically safe and is equipped with sensor breakage detection. In the event of damage to the capillary membrane system, the frost sensor automatically switches to the heating function. The scope of delivery includes the mounting flange **MF-14-K**.

TECHNICAL DATA

Switching capacity:	10 (2) A, AC 250 V; because of gold-plated switching contacts also switching of signal voltages < 24 V
Setting range:	-10...+15 °C / +14 °F...+59 °F, factory setting to $w = +5 °C$ (+41 °F)
Operating difference:	$2 \pm 1 K$ ($3.6 \pm 1.8 °F$)
Reproducibility:	$\pm 0.5 K$ ($\pm 0.9 °F$)
Contact:	dust-proof micro switch as single-pole potential-free changeover contact
Resetting:	FST-K automatic FST-K-HR manual (by hand)
Permissible medium:	Air
Ambient temperatures:	maximum operating temperature: +70 °C (+158 °F) minimum operating temperature: $w + \min. +2 °C$ (min. +3.6 °F) storage / transport: -30...+70 °C (-22...+158 °F)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 70 x 73.5 mm (Thor 2)
Cable gland:	M 20 x 1.5; with strain relief
Process connection:	by mounting flange, plastic (included in the scope of delivery)
Electrical connection:	0.14 - 2.5 mm ² , via screw terminals
Protective tube:	metal , material CuZn37 (2.0321), Ø 14 mm, NL = 205 mm
Other materials:	mechanical sheet metal parts: galvanised steel capillary tube: copper capillary tube filling: R 507 switching contacts: Ag / Ni (90% / 10%) gold-plated (3 µm)
Protection class:	I (according to EN 60 730-1)
Protection type:	IP 65 (according to EN 60 529)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU, Low Voltage Directive 2014 / 35 / EU
FUNCTION	Contact C-2: danger of frost / sensor breakage Contact C-3: normal operation
For further information and accessories see next page...	



S+S REGELTECHNIK

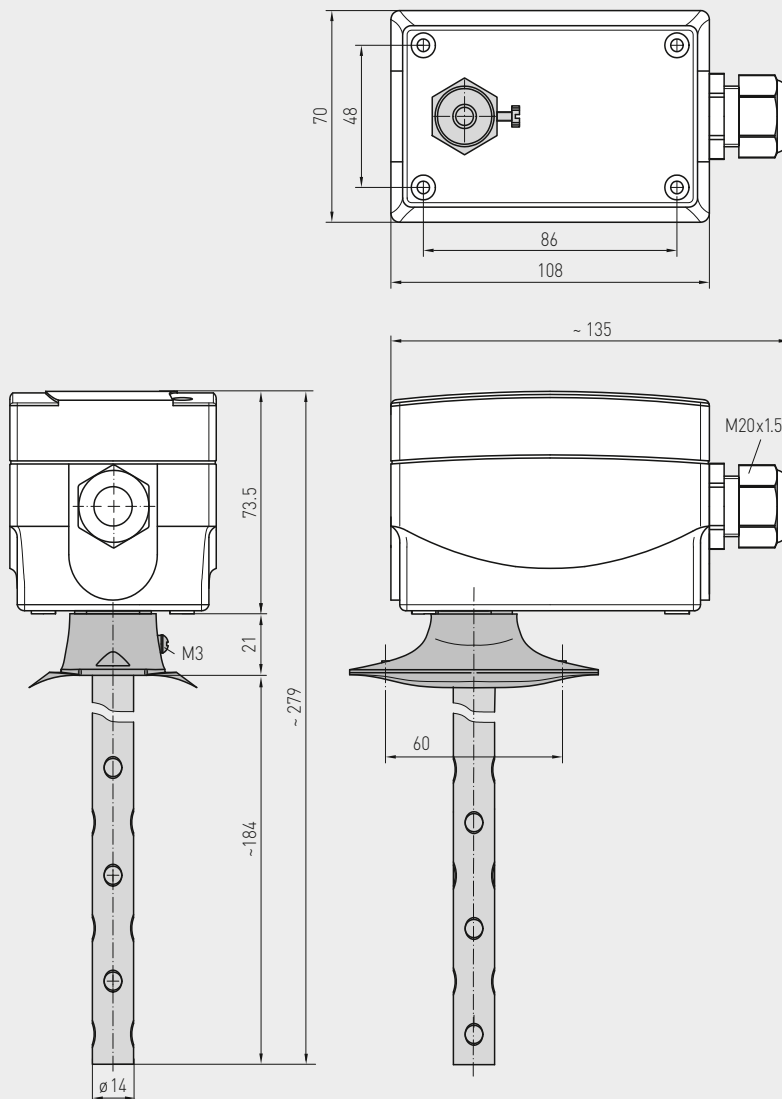
THERMASREG® FST-K

Duct frost protection thermostat,
incl. mounting flange, mechanical, one-step,
with switching output



Dimensional drawing

FST-K



FST-K



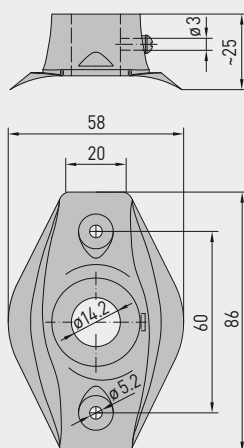
FST-K-HR
with manual reset



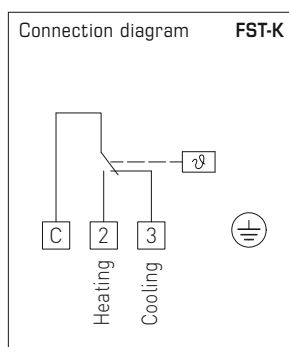
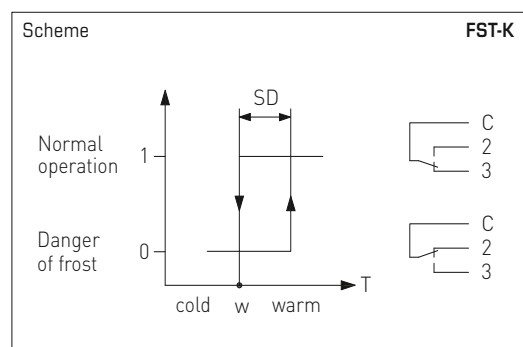
Dimensional drawing

MF-14-K

MF-14-K
Mounting flange,
plastic



Duct frost protection thermostat,
incl. mounting flange, mechanical, one-step,
with switching output



FUNCTION

The switch in the **FST-K** duct frost protection thermostat responds if the temperature across the entire length of the duct tube falls below the preset temperature setpoint (closes contact C-2). Contact C-3 opens at the same time and can be used as a signal contact. Resetting occurs automatically (contact closes C-3) if the temperature rises above the preset setpoint again (on type **FST-K-HR**, resetting must be performed manually using the reset button).

The **FST-K** is "intrinsically safe", i.e., in the event of damage to the capillary tube-membrane system, it automatically switches to the heating function. Contact C-2 closes and can therefore be used as an operating contact. The air temperature is detected over the entire length of the sensor (capillary tube). The gas-filled (R507) membrane system and the capillary tube constitute one measuring unit, which is mechanically coupled to the microswitch.



S+S REGELTECHNIK

THERMASREG® FST-K

Duct frost protection thermostat,
incl. mounting flange, mechanical, one-step,
with switching output

FST-K

TW = temperature monitor
(automatically switching)



FST-K-HR

TB = temperature limiter
(manual reset)



THERMASREG® FST-K Duct frost protection thermostat, mechanical

Type / WG02	Temperature Range	Thermal Operating Difference (fixed) approx.	Function	Permissible Medium	Item No.
FST-K					TW
FST-K	-10...+15 °C	2 K (± 1 K)	TW	air	1102-1064-0100-001
FST-K-HR					TB
FST-K HR	-10...+15 °C	2 K (± 1 K)	TB	air	1102-1064-1100-000
Equipment:	FST-K FST-K-HR	TW = temperature monitor (automatically switching) TB = temperature limiter (manual reset)			

ACCESSORIES

MF-14-K	Mounting flange, plastic	7100-0030-2000-000
For further information see last chapter!		

**2-phase frost protection thermostat,
with control and cascading input,
with active and switching output**

Electronic frost protection thermostat / frost monitor **THERMASREG® FS-20** with switching relay output, continuous temperature and valve output (summation output 0–10V) and control and cascading output (0–10V), optionally with connection for heating element, in an impact-resistant plastic housing with quick-locking screws, with display by default, with fully active sensorrod made from copper.

The frost monitor is used to monitor air conditioning systems, heat exchangers, heating registers and similar systems, and protects against frost damage and freezing. Falling below the limit value is detected at the coldest measuring point of the capillary tube, the sensor rod is active along its entire length. Uses internal diagnostics to detect capillary breakage, power failure or electric damage to the sensor as an error and the relay automatically switches to frost.

The innovative 2-phase frost protection thermostat enables simple combination of several devices (cascading) for demand-oriented, comprehensive frost monitoring. The delivery scope includes the mounting clamps **MMK-05-K** for expert attachment of the sensor rod.

FS-20



TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %)
Load resistance:	$R_L > 50 \text{ k}\Omega$
Measuring range:	0...+15 °C
Input:	1 x 0-10 V control input DDC 1 x 0-10 V cascading input
Output:	1 x 0-10 V output temperature (corresponding to 0...+15 °C) 1 x 0-10 V output valve (frost signal with control voltage and cascading) 1 x potential-free changeover contact (24 V), range of adjustment 0...+15 °C
Current consumption:	max. 100 mA at 24 V DC (FS-20 without heating element) max. 200 mA at 24 V DC (FS-20 xx HE with heating element)
Accuracy:	typically ± 1 K (at +10 °C)
Hysteresis of the switch step:	2K
Turn-on/run-in time:	< 1 min
Response time:	$t_{90} < 5 \text{ s}$
Sensor and capillary tube:	Copper sensor rod, length of 3 m or 6 m, active along the entire sensor length, min. response length of 25 cm
Ambient temperatures:	Sensor and capillary tube: –20...+60 °C (capillary tube at a distance of > 20 cm from the housing) Housing: –15...+50 °C Storage/transport: –30...+70 °C
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
Cable gland:	M 16 x 1.5 ; including strain relief, exchangeable, max. inner diameter 10.4 mm
Process connection:	by mounting clamps MMK-05-K (included in the scope of delivery)
Electrical connection:	0.14 - 1.5 mm ² , via screw terminals
Routing:	bending radius > 35mm admissible vibration load ≤ ½g admissible tensile load < 100N
Permitted humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529)
Standards:	CE-conformity according to EMC directive 2014 / 30 / EU
Equipment:	display with illumination , three-line, cutout approx. 70 x 40 mm (W x H), for displaying the actual temperature, measuring range overrange/underrange of the set switch point (frost protection temperature), and alarm indicator for "frost" or "error" (capillary breakage, overvoltage/undervoltage)
Internal diagnostics:	Error 1 in case of cable / capillary breakage Error 2 in case of undervoltage / overvoltage (relay automatically switches to frost)



S+S REGELTECHNIK

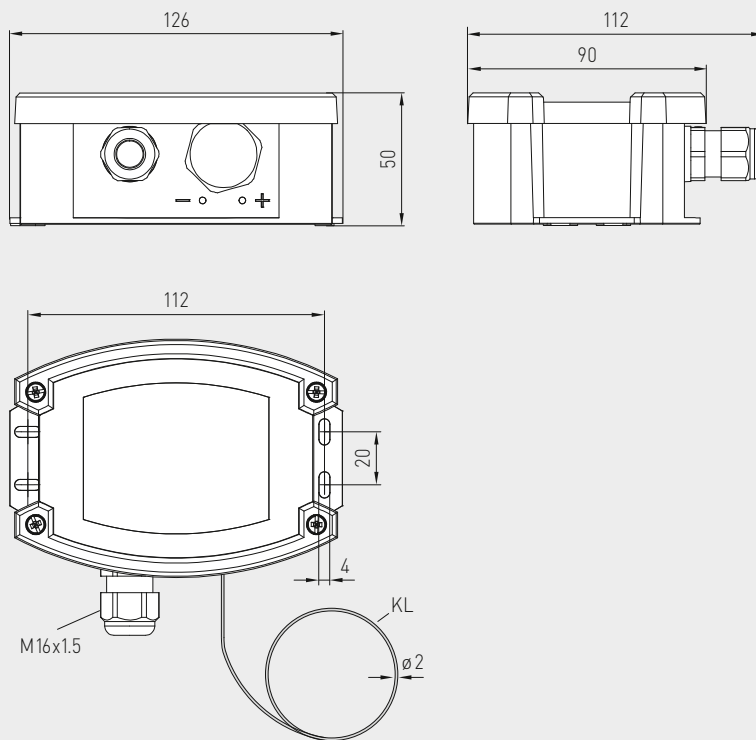
THERMASREG® FS-20

2-phase frost protection thermostat,
with control and cascading input,
with active and switching output



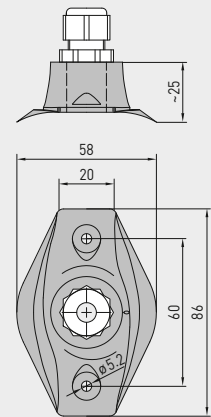
Dimensional drawing

FS-20



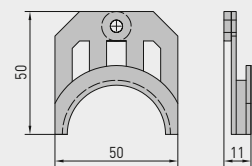
Dimensional drawing

KRD-04



Dimensional drawing

MK-05-K



WS-03

Weather and sun protection hood
(optional)



MK-05-K



KRD-04



2-phase frost protection thermostat, with control and cascading input, with active and switching output

FUNCTION

The filling used in the copper capillary tube in the frost protection monitor generates a pressure signal that is proportional to the lowest temperature on the entire capillary tube (but min. 200mm). This is converted into an electrical signal by a sensor and electronically amplified. The standard signal 0-10V generated as a result corresponding to 0...+15°C is issued. This voltage is available at the "Temp." terminal.

The internal potentiometer can be used to specify a **frost switchpoint** "FS" for the potential-free changeover contact in the range from 0°C (left limit stop) to +15°C (right limit stop). If this switchpoint "FS" is undershot, the relay output switches to the "frost protection" position (contact "W" connected to contact "Ö"). If the temperature rises by more than 2K above the set switchpoint "FS", the device switches back to normal operating mode if **"Reset Auto"** is selected. The relay drops out to the initial position (contact "W" connected to contact "S"). If the **"Reset Hand"** operating mode is selected, the relay output does not automatically switch even if the set switchpoint "FS" +2K is exceeded, but must be manually reset from the **reset button**.

In addition, a second voltage output "AV", mapped by 0-10V, is available. At a voltage of 0V at the control input "SE", the output voltage "AV" is always 0V if the measured temperature is at least 6K above the set switchpoint "FS". If the measured temperature falls below the set switchpoint "FS" +6K, the voltage output "AV" increases in a linear fashion from 0V to 10V. The increase here amounts to 1.67 V for every degree Kelvin by which the temperature approaches the preset switchpoint "FS". The output voltage 10V is therefore issued at "FS" = measured temperature. If you increase "SE", the output voltage "AV" is increased by this amount. The "AV" output therefore represents a summation output for the input variables "SE" and "Frost signal". In this case, the "Frost signal" variable describes the output behaviour of "AV" at "SE" = 0V. The maximum output voltage is restricted to 10V.

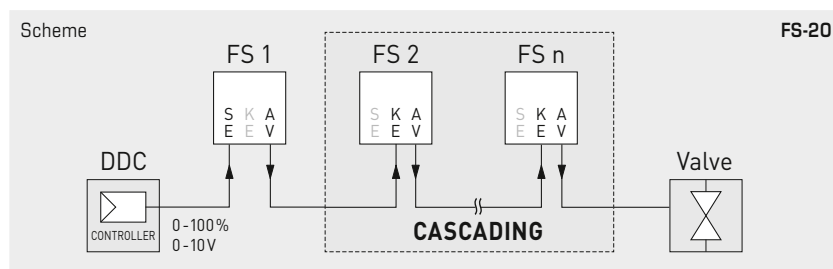
Several frost protection devices can be connected to each other via the **cascading input** "KE" to cover a larger channel cross-section for frost monitoring. The AV output of the first device is connected to the KE input of the second device. The internal device logic decides on the priority frost signal of both devices for controlling the heating register valve.

In the event of capillary breakage, electrical sensor damage (cable breakage), voltage failure, falling short of the permissible voltage level or exceeding it, the relay output is automatically switched to "Frost protection" (contact "W" connected to contact "Ö").

NOTE

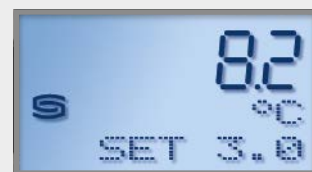
The capillary tube must be securely seated in the socket and must not twist.

A redundant setup to protect critical systems is **absolutely necessary**.



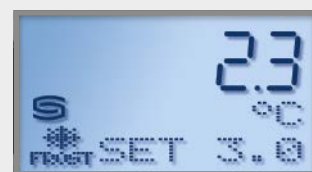
Display readout

FS-20



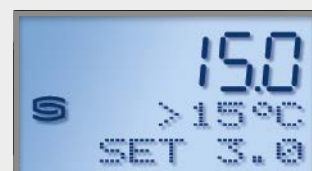
Normal operation

Actual temperature and
set switchpoint temperature



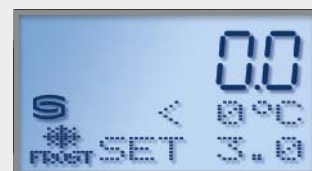
Frost protection alarm

Actual temperature is
below switchpoint temperature



Measuring range exceeded

Actual temperature rises
above +15°C



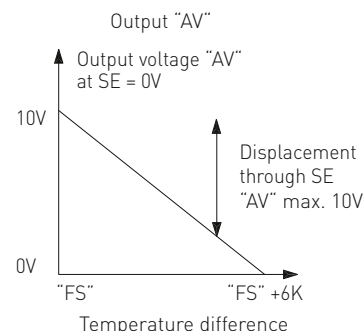
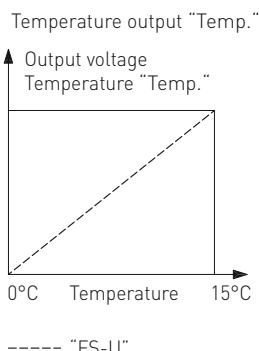
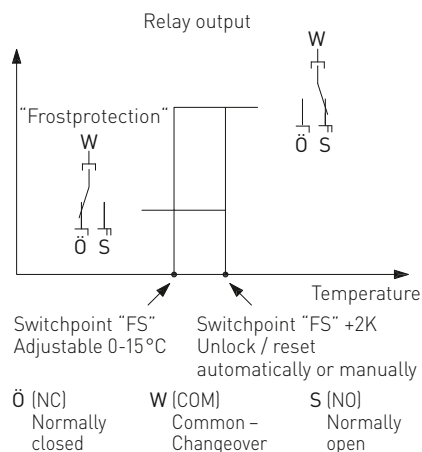
Measuring range underranged

Actual temperature falls
below 0°C

- 1
ERROR
- Error message 1
in case of cable/
capillary breakage
- 2
ERROR
- Error message 2
in case of undervoltage/
overvoltage

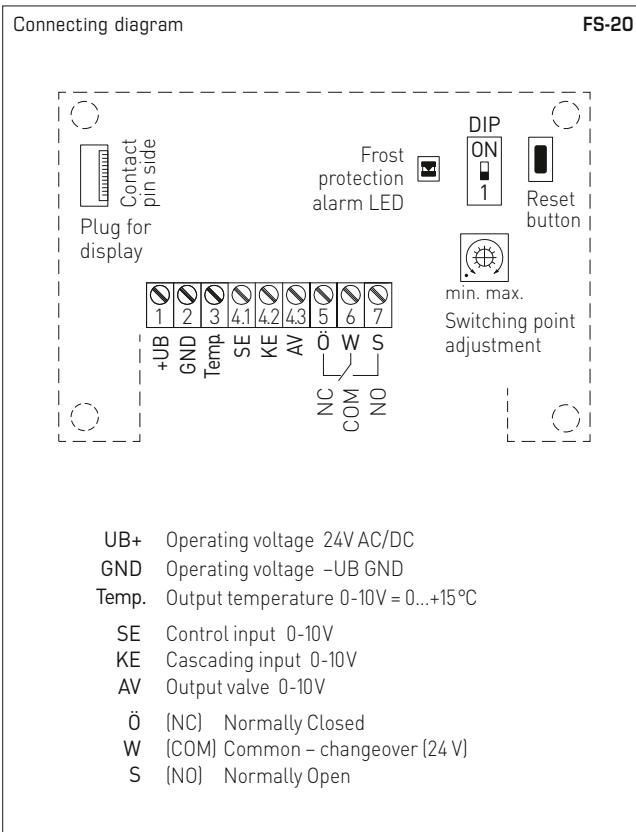
Function

FS-20





2-phase frost protection thermostat,
with control and cascading input,
with active and switching output



DIP switch	FS-20
Resetting after frost protection (Mode adjustable)	DIP 1
Reset Hand (manually) Alarm remains saved	ON
Reset Auto (automatically) Alarm is reset automatically (default)	OFF

THERMASREG® FS-20 Two-phase frost protection thermostats					
Type/WG02	Measuring Range	Output	Sensor length	Display	Item No.
FS-20					
FS20-UW 3m LCD	0...+15 °C	2 x 0-10V, 1 x changeover contact	3,0m	■	1102-1012-2102-030
FS20-UW 6m LCD	0...+15 °C	2 x 0-10V, 1 x changeover contact	6,0m	■	1102-1011-2102-030
FS-20 xx HE with heating element					
FS20-UW-HE 3m LCD	0...+15 °C	2 x 0-10V, 1 x changeover contact	3,0m	■	1102-1012-2112-030
FS20-UW-HE 6m LCD	0...+15 °C	2 x 0-10V, 1 x changeover contact	6,0m	■	1102-1011-2112-030

ACCESSORIES		
KRD-04	Capillary tube gland bracket	7100-0030-7000-000
MK-05-K	Mounting clamps (6 pieces) plastic (included in the scope of delivery)	7100-0034-1000-000
WS-03	Weather and sun protection hood, 200 x 180 x 150 mm, stainless steel V2A (1.4301)	7100-0040-6000-000

For further information see last chapter!