BUILDING AUTOMATION
CONTROL TECHNOLOGY
SENSOR TECHNOLOGY

alre

PRODUCT CATALOGUE 2016 / 2017

Intelligent solutions
for intelligent people.

CERTIFICATE

This is to confirm that the organisation

ALRE-IT Regeltechnik GmbH
Richard-Tauber-Damm 10
12277 Berlin
Germany

has implemented and maintains a Management System
in accordance with the standard

DIN EN ISO 9001:2008

The scope of the certification covers:

Design, production and sales of
electromechanical and electronic controls
for heating, cooling and air conditioning technology

This certificate is valid from 2015-07-05 until 2018-07-04
and is subject to annual surveillance audits.

Registration Number: 594300/QM/10.08

Audit report: 594300-9100-0001/209640

VDE Prüf- und Zertifizierungsinstitut GmbH
VDE Testing and Certification Institute
Certification Managmentsystems

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D-ZM-12061-02-01

VDE INSTITUT

ALRE-IT Regeltechnik GmbH
Your reliable partner.




Soon, Alre IT-Regeltechnik GmbH will turn 50. We are proud of this, as it shows that we meet your demands as well as our own. As a German owner-operated company, we have our headquarters in Berlin. We also produce our high-quality control technology here.

We quickly recognise trends and react to these with innovative products. In doing so, we combine state-of-the-art technology with decades of know-how. We develop and produce components and systems for the controlling and automation of heating, air-conditioning and plant technology.

Perfect customer service and the highest quality are a must for us. Since 1994, the ISO 9001 certificate has proved this.

In this product catalogue 2016/2017, you will find our wide selection of products.

We look forward to a continued collaboration.

alre

Your reliable partner, when everything should be perfect.

Overview:

Heating technology

Air conditioning technology

Industrial technology

Sensor technology

Accessories / miscellaneous / Sauna controllers

HEATING TECHNOLOGY

Cozy warmth made easy.

HEATING TECHNOLOGY
Warmth for your well-being.




From simple individual room thermostats to wireless and remote controlled solutions for the whole house. We offer a wide range of products in a timeless elegant design.

The right solution for every need.

Overview of heating technology:

Room temperature controllers

Floor temperature controllers

Radio-controlled heating

Terminal strips for heating manifolds / valve actuators

Overview of heating controllers

	Type	RTBSB-001.000	RTBSB-001.002	RTBSB-001.010	RTBSB-001.026	RTBSB-001.045	RTBSB-001.048	RTBSB-001.050	RTBSB-001.062	RTBSB-001.065	RTBSB-001.075	RTBSB-001.086	RTBSB-001.096	RTBSB-001.110	RTBSB-001.202	RTBSB-001.500	RTBSB-001.910	RTBSB-001.910/2	RTBSB-001.948/1	RTBSB-201.000	RTBSB-201.002	RTBSB-201.010	RTBSB-201.012	RTBSB-201.034	RTBSB-201.062	RTBSB-201.065	RTBSB-201.075	RTBSB-201.202	RTBSB-201.500	RTBSB-001.401	RTBSB-001.411	RTBSB-001.474	HTRTB-210.100	HTRTB-250.100	HTRRBu-110.117/21	HTRRBu-110.121/21	FTR 101.000	FTR 101.002	FTR 101.010	FTR 101.034	FTR 101.052	FTR 101.062	FTR 101.063	FTR 101.065	FTR 101.075	FTR 101.086	FTR 101.202	FTR 101.210	FTR 101.262	FTR 101.902	HTRRUu-210.021	HTRRB-011.010	HTRRB-011.310	HTRRB-011.410	HTRRBu-110.017	HTRRBu-110.021	HTRRBu-110.122	HTRRBu-110.123	FETR 101.715	FETR 101.716	FETR 101.745	FETR 101.700
	Page	11	11	12	12	12	13	13	13	14	14	14	15	15	15	16	16	16	17	18	18	18	19	19	19	19	19	20	20	21	22	22	23	23	24	24	26	26	27	27	28	28	28	28	29	29	29	30	30	30	40	44	44	44	46	46	48	48	50	51	51	50
Design	Berlin 1000																			x	x	x	x	x	x	x	x	x	x				x	x																												
	Berlin 2000	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x																																	x	x	x								
	Berlin 3000																																		x	x																			x	x	x	x				
	Berlin flush-mounted																																				x	x	x	x	x	x	x	x	x	x	x	x	x	x	x								x	x	x	x
	Berlin 2000 with plug																													x	x	x																														
Sensor	Bimetal (NC contact)	x	x					x	x			x	x		x	x				x	x			x	x		x	x	x	x	x	x					x	x		x	x	x			x	x	x		x	x												
	Bimetal (toggler)			x	x	x	x			x	x			x			x	x	x			x	x			x													x				x	x				x														
	NTC, internal																																x	x	x	x															x						x	x			x	
	NTC, external																																																		x	x	x	x	x	x			x	x		x
	NTC for floor monitoring																																																		x						x	x			x	
Controller type	Heating controller	x	x	x*	x*	x*	x*	x	x	x*	x*	x	x	x*	x	x	x*	x*	x*	x	x	x*	x*	x	x	x*	x	x	x	x	x	x	x	x	x	x	x	x	x*	x	x	x	x	x*	x	x	x	x*	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	Cooling function			x		x	x			x				x			x	x	x			x	x			x													x				x	x				x														
	Cooling function with fan output				x																																																									
	Model with timer																																		x	x															x											
Pipe system	Air conditioning controller in 2-pipe system			x	x	x	x			x				x			x	x	x			x	x			x													x				x	x				x														
Application	Natural stone heating											x	x																						x	x										x					x											
	Tiled stove heating																																																					x								
	Electric direct heating systems											x	x																	x	x	x			x	x										x					x											
	Electric floor heating																																		x	x															x	x	x		x	x	x	x	x	x	x	x
	Night storage heater							x																																	x																					
	Hot water floor heating	x	x	x	x	x	x		x	x	x			x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x				x	x	x	x	x	x	x	x		x	x	x	x		x	x	x	x	x				x	x	x	x				
	Partial air conditioner			x	x	x	x			x				x			x	x	x			x	x			x													x				x	x				x														
Features	Output "temperature reduction"																																		x	x																			x	x	x	x				
	Input "temperature reduction"		x						x		x				x		x	x			x		x		x		x	x										x	x			x			x		x		x	x									x	x	x	x
	Switch "On/Off"				x			x	x																x										x	x						x							x			x	x	x					x	x	x	
	Switch "Heating/Cooling"									x																x																		x																		
	Switch "Heating/Off/Cooling"																																										x																			
	Switch "Reduction/Comfort/Automatic"										x																x								x	x									x																	
	Switch "Auxiliary heating"							x																																	x																					
	Display																																		x																				x		x					
	Display with backlighting																																			x															x					x		x				
	Indicator lamp "On/Off"																																																													
	Indicator lamp "Heating"							x	x				x											x	x		x						x	x						x		x							x		x	x	x	x					x	x	x	x
	Indicator lamp "Reduction"										x																																		x														x	x	x	x
	Indicator lamp "Auxiliary heating"							x																																	x																					
Technology	Control range −20 … +30 °C					x																																																								
	Control range 5 … 30 °C	x	x	x	x			x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x						x	x			x	
	Control range 10 … 42 °C																																																		x		x		x	x				x		
	Control range 10 … 50 °C																																																										x			x
	Control range 10 … 60 °C						x												x																																	x										
	Control range 20 … 80 °C																																																					x								
	3000 W switching power											x	x																	x	x															x																
	Internal setting																x	x	x																															x												
	2-wire connection															x													x																																	
	24 V~														x			x										x						x													x	x	x													
	230 V~	x	x	x	x	x	x	x	x	x	x	x	x			x	x			x	x	x	x	x	x	x	x		x	x	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x				x	x	x	x	x	x	x	x	x	x	x	x	x
	24 V~ or 230 V~													x					x																																											

x * Heating controllers using normally open valve actuators

Mechanical room temperature controller, RTBSB

Surface-mounted installation – Design Berlin 2000

Technical data

Design:	Berlin 2000
Surface finish:	matt
Colour of housing:	pure white, like RAL 9010
Material of housing:	ABS plastic
Storage temperature:	–20 … +70 °C
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Electrical connection:	screw-type terminals 0.12 mm² to 2.5 mm²
Mounting / attachment:	surface- / wall-mounting (4-hole assembly on flush-mounted socket)
Protection rating:	IP 30
Safety and EMC:	according to DIN EN 60730
Average power consumption:	< 0.5 W
Switching element:	bimetallic contact
Sensor:	bimetal
General features:	thermal feedback

Application

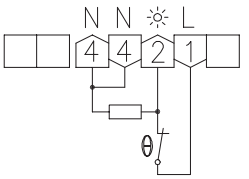
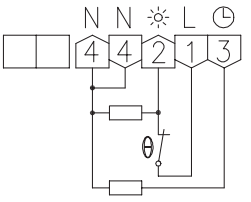
Control or monitoring of temperatures in closed spaces. Suitable for all heating systems.

Valve actuator: normally closed. If normally open heating valves are available, they should be connected with the cooling output of the changeover switch (toggler).

Up to a maximum of 10 actuators for valves can be connected (normally closed, NC); with a toggler, on the NO contact, up to 5 units (in this context, please check the switching capacity listed in the technical specifications).

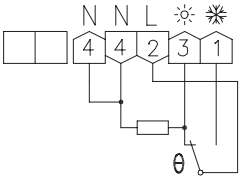
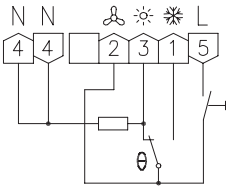
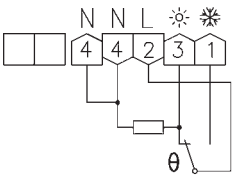
Installation note: Owing to the existing wiring space in the controller itself, installation on a flush-mounted socket is recommended, but it can also be performed on a plane, non-conducting substrate.

Explanations of technical terms can be found in the annex to the product catalogue or at www.alre.de.

Type / image	Item no.	Features	Circuit diagram	PG
RTBSB-001.000 	MA010000	**General features:** mechanical range limitation; scale: degrees Celsius; external setting **Operating voltage:** 230 VAC, 50 Hz **Ambient temperature:** 0…30 °C **Protection class:** II, if properly mounted **Max. switching current:** 10 (4) A **Max. switching voltage:** 230 VAC, 50 Hz **Min. switching voltage:** 230 VAC, 50 Hz **Switching power:** 2300 W **Switching contact:** NC contact (max. 10 actuators) **Output signal:** switching (230 VAC, 50 Hz) **Control function:** heating **Control range:** 5…30 °C **Hysteresis:** approx. 0.5 K at a temperature change of max. 4 K/h		I
RTBSB-001.002 	MA010100	**General features:** ECO function; mechanical range limitation; scale: degrees Celsius; external setting **Operating voltage:** 230 VAC, 50 Hz **Ambient temperature:** 0…30 °C **Protection class:** II, if properly mounted **Max. switching current:** 10 (4) A **Max. switching voltage:** 230 VAC, 50 Hz **Min. switching voltage:** 230 VAC, 50 Hz **Switching power:** 2300 W **Switching contact:** NC contact (max. 10 actuators) **Output signal:** switching (230 VAC, 50 Hz) **Control function:** heating **Control range:** 5…30 °C **Hysteresis:** approx. 0.5 K at a temperature change of max. 4 K/h **Input "temperature reduction":** approx. 4 K (230 VAC, 50 Hz)		I

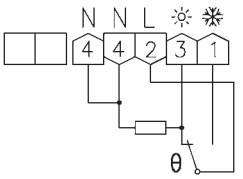
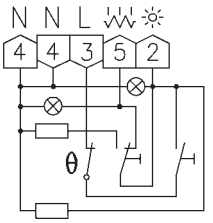
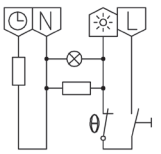
Mechanical room temperature controller, RTBSB

Surface-mounted installation – Design Berlin 2000

Type / image	Item no.	Features	Circuit diagram	PG
RTBSB-001.010 	MA010200	**General features:** mechanical range limitation; scale: degrees Celsius; external setting **Operating voltage:** 230 VAC, 50 Hz **Ambient temperature:** 0 … 30 °C **Protection class:** II, if properly mounted **Max. switching current:** heating (terminal 3) 10 (4) A, cooling (terminal 1) 5 (2) A **Max. switching voltage:** 230 VAC, 50 Hz **Min. switching voltage:** 230 VAC, 50 Hz **Switching power:** Terminal 3: 2300 W, terminal 1: 1150 W **Switching contact:** changeover switch (toggler, max. 10 actuators output terminal 3, max. 5 actuators output terminal 1) **Output signal:** switching (230 VAC, 50 Hz) **Control function:** heating or cooling **Control range:** 5 … 30 °C **Hysteresis:** approx. 0.5 K at a temperature change of max. 4 K / h		I
RTBSB-001.026 	MA010900	**General features:** mechanical range limitation; scale: degrees Celsius; **on / off switch**; external setting **Operating voltage:** 230 VAC, 50 Hz **Ambient temperature:** 0 … 30 °C **Protection class:**II, if properly mounted **Max. switching current:** heating (terminal 3) 10 (4) A, cooling (terminal 1) 5 (2) A, fan (terminal 2) 5 (2) A **Max. switching voltage:** 230 VAC, 50 Hz **Min. switching voltage:** 230 VAC, 50 Hz **Switching power:** terminal 3: 2300 W, terminal 1: 1150 W, terminal 2: 1150 W **Switching contact:** changeover switch (toggler, max. 10 actuators output terminal 3, max. 5 actuators output terminal 1) **Output signal:** switching (230 VAC, 50 Hz); fan permanently operating (230 VAC, 50 Hz) if device has been switched on **Control function:** heating or cooling **Control range:** 5 …30 °C **Hysteresis:** approx. 0.5 K at a temperature change of max. 4 K / h		I
RTBSB-001.045 	MA011200	**General features:** mechanical range limitation; scale: degrees Celsius; external setting **Operating voltage:** 230 VAC, 50 Hz **Ambient temperature:** –20 … +30 °C **Protection class:**II, if properly mounted **Max. switching current:** heating (terminal 3) 10 (4) A, cooling (terminal 1) 5 (2) A **Max. switching voltage:** 230 VAC, 50 Hz **Min. switching voltage:** 230 VAC, 50 Hz **Switching power:** terminal 3: 2300 W, terminal 1: 1150 W **Switching contact:** changeover switch (toggler, max. 10 actuators output terminal 3, max. 5 actuators output terminal 1) **Output signal:** switching (230 VAC, 50 Hz) **Control function:** heating or cooling **Control range:** –20 … +30 °C **Hysteresis:** approx. 1.5 K at a temperature change of max. 4 K / h		I

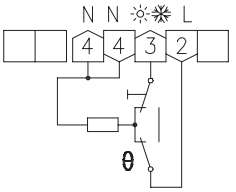
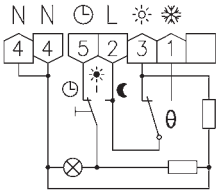
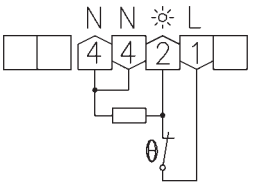
Mechanical room temperature controller, RTBSB

Surface-mounted installation – Design Berlin 2000

Type / image	Item no.	Features	Circuit diagram	PG
RTBSB-001.048 	MA011300	**General features:** mechanical range limitation; scale: degrees Celsius; external setting **Operating voltage:** 230 VAC, 50 Hz **Ambient temperature:** 10…60 °C **Protection class:**II, if properly mounted Max. switching current: heating (terminal 3) 10 (4) A, cooling (terminal 1) 5 (2) A **Max. switching voltage:** 230 VAC, 50 Hz **Min. switching voltage:** 230 VAC, 50 Hz **Switching power:** terminal 3: 2300 W, terminal 1: 1150 W **Switching contact:** changeover switch (toggler, max. 10 actuators output terminal 3, max. 5 actuators output terminal 1) **Output signal:** switching (230 VAC, 50 Hz) **Control function:** heating or cooling **Control range:** 10…60 °C **Hysteresis:** approx. 1.5 K at a temperature change of max. 4 K/h		I
RTBSB-001.050 	MA011400	**General features: "heating" display; "auxiliary heating" display;** mechanical range limitation; scale: degrees Celsius; **on / off switch; auxiliary heating switch**; external setting **Operating voltage:** 230 VAC, 50 Hz **Ambient temperature:** 0…30 °C **Protection class:**II, if properly mounted **Max. switching current:** the total current (heating + auxiliary heating) may not exceed 10 (4) A **Max. switching voltage:** 230 VAC, 50 Hz **Min. switching voltage:** 230 VAC, 50 Hz **Switching power:** the total power output (heating + auxiliary heating) may not exceed 2300 W **Switching contact:** NC contact (max. 10 actuators output terminal 2, max. 5 actuators output terminal 5) **Output signal:** switching (230 VAC, 50 Hz) **Control function:** heating **Control range:** 5…30 °C **Hysteresis:** approx. 0.5 K at a temperature change of max. 4 K/h		I
RTBSB-001.062 	MA012400	**General features:** ECO function; **"heating" display;** mechanical range limitation; scale: degrees Celsius; **on / off switch;** external setting **Operating voltage:** 230 VAC, 50 Hz **Ambient temperature:** 0…30 °C **Protection class:**II, if properly mounted **Max. switching current:** 10 (4) A **Max. switching voltage:** 230 VAC, 50 Hz **Min. switching voltage:** 230 VAC, 50 Hz **Switching power:** 2300 W **Switching contact:** NC contact (max. 10 actuators) **Output signal:** heating, switching (230 VAC, 50 Hz) **Control function:** heating **Control range:** 5…30 °C **Hysteresis:** approx. 0.5 K at a temperature change of max. 4 K/h **Input "temperature reduction":** approx. 4 K (230 VAC, 50 Hz)		I

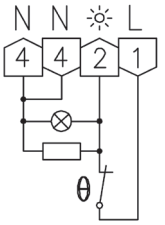
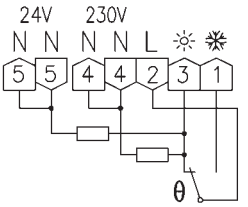
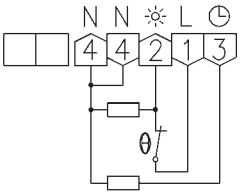
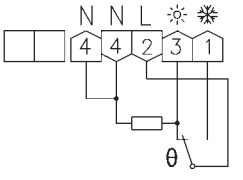
Mechanical room temperature controller, RTBSB

Surface-mounted installation – Design Berlin 2000

Type / image	Item no.	Features	Circuit diagram	PG
RTBSB-001.065 	MA010600	**General features:** mechanical range limitation; scale: degrees Celsius; **Heating / Cooling switch**; external setting **Operating voltage:** 230 VAC, 50 Hz **Ambient temperature:** 0 … 30 °C **Protection class:**II, if properly mounted **Max. switching current:** 5 (2) A **Max. switching voltage:** 230 VAC, 50 Hz **Min. switching voltage:** 230 VAC, 50 Hz **Switching power:** 1150 W **Switching contact:** changeover switch (toggler, max. 5 actuators) **Output signal:** switching (230 VAC, 50 Hz) **Control function:** heating or cooling **Control range:** 5 … 30 °C **Hysteresis:** approx. 0.5 K at a temperature change of max. 4 K / h		I
RTBSB-001.075 	MA010500	**General features:** ECO function; **“reduction” display;** mechanical range limitation; scale: degrees Celsius; **switch for reduction / heating / reduction via external timer;** external setting **Operating voltage:** 230 VAC, 50 Hz **Ambient temperature:** 0 … 30 °C **Protection class:** II, if properly mounted **Max. switching current:** heating (terminal 3) 10 (4) A, cooling (terminal 1) 5 (2) A **Max. switching voltage:** 230 VAC, 50 Hz **Min. switching voltage:** 230 VAC, 50 Hz **Switching power:** terminal 3: 2300 W, terminal 1: 1150 W **Switching contact:** changeover switch (toggler, max. 10 actuators output terminal 3, max. 5 actuators output terminal 1) **Output signal:** switching (230 VAC, 50 Hz) **Control function:** heating or cooling **Control range:** 5 … 30 °C **Hysteresis:** approx. 0.5 K at a temperature change of max. 4 K / h **Input “temperature reduction”:** approx. 4 K (230 VAC, 50 Hz)		I
RTBSB-001.086 	MA010800	**General features:** mechanical range limitation; 3000 W switching power, for electric direct heating systems, natural stone heating; multi-digit display 1 … 6; external setting **Operating voltage:** 230 VAC, 50 Hz **Ambient temperature:** 0 … 30 °C **Protection class:** II, if properly mounted **Max. switching current:** 13 (4) A **Max. switching voltage:** 230 VAC, 50 Hz **Min. switching voltage:** 230 VAC, 50 Hz **Switching power:** 3000 W **Switching contact:** NC contact **Output signal:** switching (230 VAC, 50 Hz) **Control function:** heating **Control range:** 5 … 30 °C **Hysteresis:** approx. 1 K at a temperature change of max. 4 K / h **Accessories:** can be combined with plug-in socket JZ-19		I

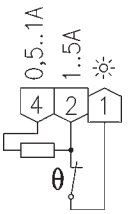
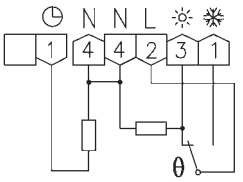
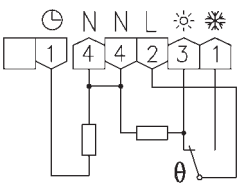
Mechanical room temperature controller, RTBSB

Surface-mounted installation – Design Berlin 2000

Type / image	Item no.	Features	Circuit diagram	PG
RTBSB-001.096 	MA012500	like RTBSB-001.086, **but with "heating" display (LED red)**		I
RTBSB-001.110 	MA012701	**General features:** mechanical range limitation; scale: degrees Celsius; external setting **Operating voltage:** 230 VAC, 50 Hz or 24 VAC, 50 Hz **Ambient temperature:** 0…30 °C **Protection class:** II, if properly mounted; with 24 V, protection class III **Max. switching current:** heating (terminal 3) 230 VAC 10 (4) A or 24 VAC 2 (2) A, cooling (terminal 1) 5 (2) A or 24 VAC 2 (2) A **Max. switching voltage:** 230 VAC, 50 Hz **Min. switching voltage:** 24 VAC, 50 Hz **Switching power:** terminal 3: 2300 W at 230 VAC, 48 W at 24 VAC, terminal 1: 1150 W, 48 W at 24 VAC **Switching contact:** changeover switch (toggler, max. 5 actuators) **Output signal:** switching (230 VAC, 50 Hz or 24 VAC, 50 Hz) **Output signal:** cooling, switching (230 VAC, 50 Hz or 24 VAC, 50 Hz) **Control function:** heating or cooling **Control range:** 5…30 °C **Hysteresis:** approx. 0.5 K at a temperature change of max. 4 K/h		I
RTBSB-001.202 	MA011700	**General features:** ECO function; mechanical range limitation; scale: degrees Celsius; external setting **Operating voltage:** 24 VAC, 50 Hz **Ambient temperature:** 0…30 °C **Protection class:** III **Max. switching current:** 1 (1) A **Max. switching voltage:** 24 VAC, 50 Hz **Min. switching voltage:** 24 VAC, 50 Hz **Switching power:** 24 W **Switching contact:** NC contact (max. 5 actuators) **Output signal:** switching (24 VAC, 50 Hz) **Control function:** heating **Control range:** 5…30 °C **Hysteresis:** approx. 0.5 K at a temperature change of max. 4 K/h **Input "temperature reduction":** approx. 4 K (24 VAC, 50 Hz)		I
RTBSB-001.210 	MN011801	**General features:** mechanical range limitation; scale: degrees Celsius; external setting **Operating voltage:** 24 VAC, 50 Hz **Ambient temperature:** 0…30 °C **Protection class:** III **Max. switching current:** 1 (1) A **Max. switching voltage:** 24 VAC, 50 Hz **Min. switching voltage:** 24 VAC, 50 Hz **Switching power:** 24 W **Switching contact:** changeover switch (toggler, max. 3 actuators) **Output signal:** switching (24 VAC, 50 Hz) **Control function:** heating or cooling **Control range:** 5…30 °C **Hysteresis:** approx. 0.5 K at a temperature change of max. 4 K/h		I

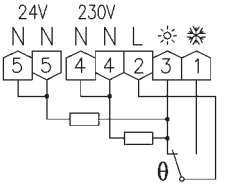
Mechanical room temperature controller, RTBSB

Surface-mounted installation – Design Berlin 2000

Type / image	Item no.	Features	Circuit diagram	PG
RTBSB-001.500 	MA013401	**General features: 2-wire room temperature controller;** mechanical range limitation; multi-digit display *…6; external setting **Operating voltage:** 230 VAC, 50 Hz **Ambient temperature:** 0…30 °C **Protection class:** II, if properly mounted **Max. switching current:** 1 A or 5 A (see circuit diagram) **Min. switching current:** 0.5 A or 1 A (see circuit diagram) **Min. switching voltage:** 230 VAC, 50 Hz **Min. switching voltage:** 230 VAC, 50 Hz **Switching power:** 230 W or 1150 W (see circuit diagram) **Switching contact:** NC contact **Output signal:** switching (230 VAC, 50 Hz) **Control function:** heating **Control range:** 5…30 °C **Hysteresis:** approx. 1 K at a temperature change of max. 4 K/h (load-dependent)		I
RTBSB-001.910 	MA012000	**General features:** ECO function; scale: degrees Celsius; internal setting **Operating voltage:** 230 VAC, 50 Hz **Ambient temperature:** 0…30 °C **Protection class:**II, if properly mounted **Max. switching current:**heating (terminal 3) 10 (4) A, cooling (terminal 1) 5 (2) A **Max. switching voltage:** 230 VAC, 50 Hz **Min. switching voltage:** 230 VAC, 50 Hz **Switching power:** terminal 3: 2300 W, terminal 1: 1150 W **Switching contact:** changeover switch (toggler, max. 10 actuators output terminal 3, max. 5 actuators output terminal 1) **Output signal:** switching (230 VAC, 50 Hz) **Control function:** heating or cooling **Control range:** 5…30 °C **Hysteresis:** approx. 0.5 K at a temperature change of max. 4 K/h **Input "temperature reduction":** approx. 4 K (230 VAC, 50 Hz)		I
RTBSB-001.910/2 	MA012100	**General features:** ECO function; scale: degrees Celsius; internal setting **Operating voltage:** 24 VAC, 50 Hz **Ambient temperature:** 0…30 °C **Protection class:** III **Max. switching current:** 1 (1) A **Max. switching voltage:** 24 VAC, 50 Hz **Min. switching voltage:** 24 VAC, 50 Hz **Switching power:** 24 W **Switching contact:** changeover switch (toggler, max. 3 actuators) **Output signal:** switching (24 VAC, 50 Hz) **Control function:** heating or cooling **Control range:** 5…30 °C **Hysteresis:** approx. 0.5 K at a temperature change of max. 4 K/h **Input "temperature reduction":** approx. 4 K (24 VAC, 50 Hz)		I

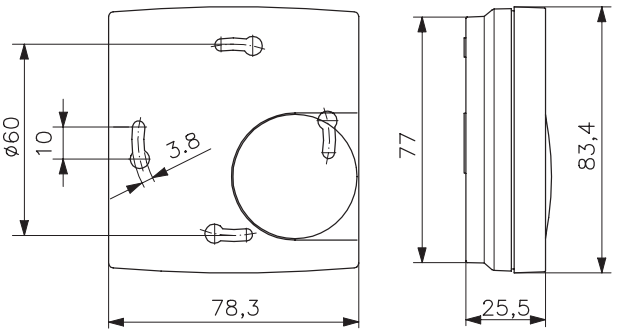
Mechanical room temperature controller, RTBSB

Surface-mounted installation – Design Berlin 2000

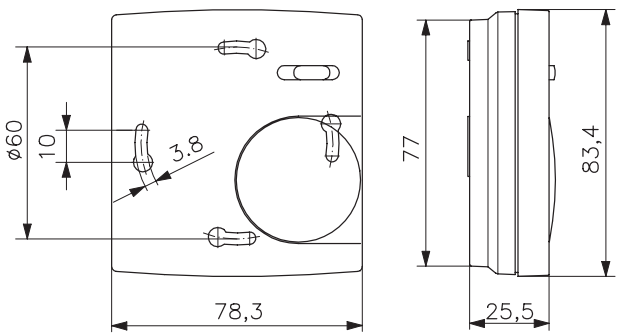
Type / image	Item no.	Features	Circuit diagram	PG
RTBSB-001.948 / 1 	MA012600	**General features:** scale: degrees Celsius; internal setting **Operating voltage:** 230 VAC, 50 Hz or 24 VAC, 50 Hz **Ambient temperature:** 10 … 60 °C **Protection class:** II, if properly mounted; with 24 V, protection class III **Max. switching current:** Heating (terminal 3) 230 VAC 10 (4) A or 24 VAC 2 (2) A, cooling (terminal 1) 5 (2) A or 24 VAC 2 (2) A **Max. switching voltage:** 230 VAC, 50 Hz **Min. switching voltage:** 24 VAC, 50 Hz **Switching power:** terminal 3: 2300 W at 230 VAC, 48 W at 24 VAC, terminal 1: 1150 W, 48 W at 24 VAC **Switching contact:** changeover switch (toggler, max. 10 actuators output terminal 3, max. 5 actuators output terminal 1) **Output signal:** switching (230 VAC, 50 Hz or 24 VAC, 50 Hz) **Control function:** heating or cooling **Control range:** 10 … 60 °C **Hysteresis:** approx. 1.5 K at a temperature change of max. 4 K / h		I

Accessories: terminal strips VOOxx, suitable valve actuators ZBOOA
You can find other / similar controllers with outputs for heating / cooling in the “Air conditioning technology” section.

RTBSB



RTBSB with switch



Mechanical room temperature controller, RTBSB

Surface-mounted superflat installation – Design Berlin 1000

Technical data

Design:	Berlin 1000
Surface finish:	glossy
Housing colour:	pure white, like RAL 9010
Housing material:	ABS plastic
Ambient temperature:	0 … 30 °C
Storage temperature:	– 20 … + 70 °C
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Electrical connection:	screw-type terminals 0.33 mm² to 1.5 mm²
Mounting / attachment:	surface- / wall-mounting (4-hole assembly on flush-mounted socket)
Protection rating:	IP 30
Safety and EMC:	according to DIN EN 60730
Average power consumption:	< 0.25 W
Max. switching current:	2 (1) A
Switching element:	bimetallic contact
Sensor:	bimetal
Control range:	5 … 30 °C
Hysteresis:	approx. 0.5 K at a temperature change of max. 4 K / h
General features:	mechanical range limitation; thermal feedback; external setting

Application

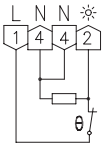
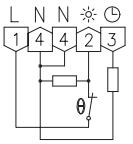
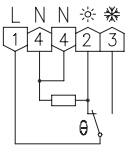
Control or monitoring of temperatures in closed spaces.

Valve actuator: normally closed. If normally open heating valves are available, they should be connected with the cooling output of the changeover switch (toggler).

Up to a maximum of 10 actuators for valves can be connected (normally closed, NC); with a toggler, on the NO contact, up to 5 units (in this context, please check the switching capacity listed in the technical specifications).

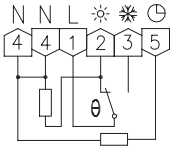
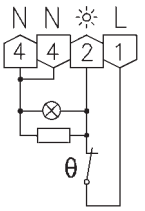
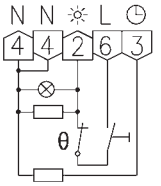
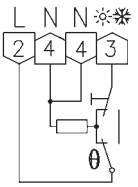
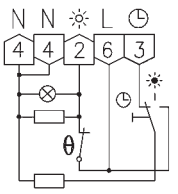
Installation note: Owing to the existing wiring space in the controller itself, installation on a flush-mounted socket is recommended, but it can also be performed on a plane, non-conducting substrate.

Explanations of technical terms can be found in the annex to the product catalogue or at www.alre.de.

Type / image	Item no.	Features	Circuit diagram	PG
RTBSB-201.000 	MA300000	**General features:** scale: degrees Celsius colour RAL 9016 (traffic white) upon request **Operating voltage:** 230 VAC, 50 Hz **Protection class:** II, if properly mounted **Max. switching voltage:** 230 VAC, 50 Hz **Min. switching voltage:** 230 VAC, 50 Hz **Switching power:** 460 W **Switching contact:** NC contact (max. 10 actuators) **Output signal:** switching (230 VAC, 50 Hz) **Control function:** heating		I
RTBSB-201.000 / 08	MA300008	like RTBSB-201.000 but with multi-digit display *… 6, minimum lot size 1 packaging unit (50 units each)		I
RTBSB-201.002 	MA300100	**General features:** ECO function; scale: degrees Celsius **Operating voltage:** 230 VAC, 50 Hz **Protection class:** II, if properly mounted **Max. switching voltage:** 230 VAC, 50 Hz **Min. switching voltage:** 230 VAC, 50 Hz **Switching power:** 460 W **Switching contact:** NC contact (max. 10 actuators) **Output signal:** switching (230 VAC, 50 Hz) **Control function:** heating **Input "temperature reduction":** approx. 3 K (230 VAC, 50 Hz)		I
RTBSB-201.002 / 07	MA300107	like RTBSB-201.002 but with multi-digit display *… 6, minimum lot size 1 packaging unit (50 units each)		I
RTBSB-201.010 	MA300200	**General features:** scale: degrees Celsius **Operating voltage:** 230 VAC, 50 Hz **Protection class:** II, if properly mounted **Max. switching voltage:** 230 VAC, 50 Hz **Min. switching voltage:** 230 VAC, 50 Hz **Switching power:** 460 W **Switching contact:** changeover switch (toggler, max. 10 actuators (NC contact), max. 5 actuators (NO contact)) **Output signal:** switching (230 VAC, 50 Hz) **Control function:** heating or cooling		I

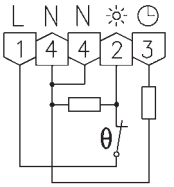
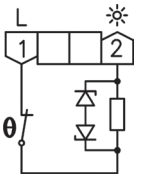
Mechanical room temperature controller, RTBSB

Surface-mounted superflat installation – Design Berlin 1000

Type / image	Item no.	Features	Circuit diagram	PG
RTBSB-201.012 	MA300700	**General features:** ECO function; scale: degrees Celsius **Operating voltage:** 230 VAC, 50 Hz **Protection class:** II, if properly mounted **Max. switching voltage:** 230 VAC, 50 Hz **Min. switching voltage:** 230 VAC, 50 Hz **Switching power:** 460 W **Switching contact:** changeover switch (toggler, max. 10 actuators (NC contact), max. 5 actuators (NO contact)) **Output signal:** switching (230 VAC, 50 Hz) **Control function:** heating or cooling **Input "temperature reduction":** approx. 3 K (230 VAC, 50 Hz)		I
RTBSB-201.034 	MA301400	**General features: "heating" display;** scale: degrees Celsius **Operating voltage:** 230 VAC, 50 Hz **Protection class:** II, if properly mounted **Max. switching voltage:** 230 VAC, 50 Hz **Min. switching voltage:** 230 VAC, 50 Hz **Switching power:** 460 W **Switching contact:** NC contact (max. 10 actuators) **Output signal:** switching (230 VAC, 50 Hz) **Control function:** heating		I
RTBSB-201.062 	MA300400	**General features:** ECO function; **"heating" display;** scale: degrees Celsius; **on / off switch** **Operating voltage:** 230 VAC, 50 Hz **Protection class:** II, if properly mounted **Max. switching voltage:** 230 VAC, 50 Hz **Min. switching voltage:** 230 VAC, 50 Hz **Switching power:** 460 W **Switching contact:** NC contact (max. 10 actuators) **Output signal:** switching (230 VAC, 50 Hz) **Control function:** heating **Input "temperature reduction":** approx. 3 K (230 VAC, 50 Hz)		I
RTBSB-201.065 	MA300500	**General features:** climate controller for 2-pipe systems, especially heat pumps, scale: degrees Celsius; **heating / cooling switch** **Operating voltage:** 230 VAC, 50 Hz **Protection class:** II, if properly mounted **Max. switching voltage:** 230 VAC, 50 Hz **Min. switching voltage:** 230 VAC, 50 Hz **Switching power:** 460 W **Switching contact:** changeover switch (toggler, max. 5 actuators) **Output signal:** switching (230 VAC, 50 Hz) **Control function:** Heating or cooling		I
RTBSB-201.065 / 02	MA300502	like RTBSB-201.065 but with multi-digit display *…6, minimum lot size 1 packaging unit (50 units each)		I
RTBSB-201.075 	MA300600	**General features:** ECO function; **"heating" display;** scale: degrees Celsius; **switch for reduction / heating / reduction via external timer** **Operating voltage:** 230 VAC, 50 Hz **Protection class:** II, if properly mounted **Max. switching voltage:** 230 VAC, 50 Hz **Min. switching voltage:** 230 VAC, 50 Hz **Switching power:** 460 W **Switching contact:** NC contact (max. 10 actuators) **Output signal:** switching (230 VAC, 50 Hz) **Control function:** heating **Input "temperature reduction":** approx. 3 K (230 VAC, 50 Hz)		I

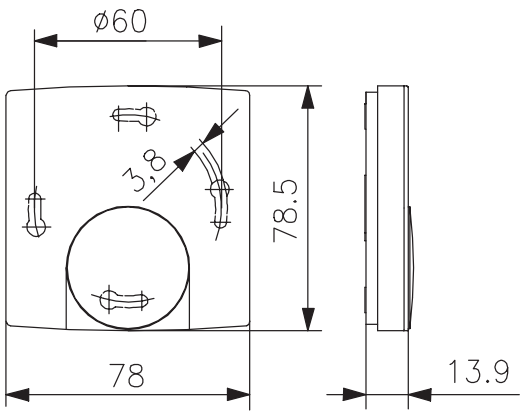
Mechanical room temperature controller, RTBSB

Surface-mounted superflat – Design Berlin 1000

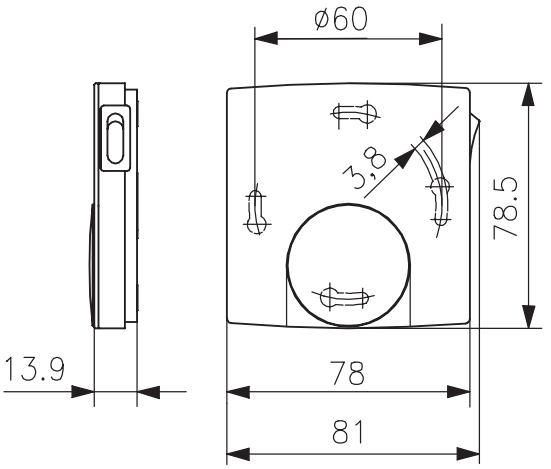
Type / image	Item no.	Features	Circuit diagram	PG
RTBSB-201.202 	MA302100	**General features:** ECO function; scale: degrees Celsius **Operating voltage:** 24 VAC, 50 Hz **Protection class:** III **Max. switching voltage:** 24 VAC, 50 Hz **Min. switching voltage:** 24 VAC, 50 Hz **Switching power:** 48 W **Switching contact:** NC contact (max. 5 actuators) **Output signal:** switching (24 VAC, 50 Hz) **Control function:** heating **Input "temperature reduction":** approx. 3 K (24 VAC, 50 Hz)		I
RTBSB-201.500 	MA304000	**General features:** 2-wire room temperature controller; mechanical range limitation; multi-digit display * … 6; external setting **Operating voltage:** 230 VAC, 50 Hz **Protection class:** II, if properly mounted **Max. switching current:** 20mA **Min. switching current:** 5mA **Max. switching voltage:** 230 VAC, 50 Hz **Min. switching voltage:** 230 VAC, 50 Hz **Switching power:** 4,6 W (max. 2 actuators NC) **Switching contact:** NC contact **Output signal:** switching (230 VAC, 50Hz) **Control function:** heating **Control range:** 5…30 °C **Hysteresis:** approx. 0.5 K at a temperature change of max. 4 K/h		I

Accessories: terminal strips VOOxx, suitable valve actuators ZBOOA
You can find other controllers with outputs for heating/cooling in the "Air conditioning technology" section.

RTBSB-201.xxx



RTBSB-201.xxx with "ON/OFF" switch at the side



Mechanical room temperature controller, RTBSB

Surface-mounted or plug-in installation – Design Berlin

Technical data

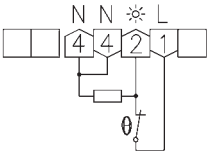
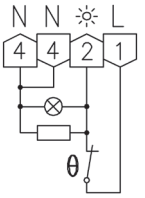
Design:	Berlin 2000
Surface finish:	matt
Housing colour:	pure white, like RAL 9010
Housing material:	ABS plastic
Operating voltage:	230 VAC, 50 Hz
Ambient temperature:	0 … 30 °C
Storage temperature:	– 20 … + 70 °C
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Protection rating:	IP 30
Protection class:	II for loads of protection classes I and II
Safety and EMC:	according to DIN EN 60730
Max. switching voltage:	230 VAC, 50 Hz
Min. switching voltage:	230 VAC, 50 Hz
Switching element:	bimetallic contact
Switching contact:	NC contact
Output signal:	switching (230 VAC, 50 Hz)
Sensor:	bimetal
Control function:	heating
Control range:	5 … 30 °C
Hysteresis:	approx. 1 K at a temperature change of max. 4 K/h

Application

For controlling the room temperature for radiators, heating chimneys, direct electric heating systems, marble heating systems etc.

Attention! For loads > 2,300 W, the wall socket must be designed for 16 A (danger of fire).

The plugs are designed in such a way that they can also be used in sockets with a central pin (for example, as used in France).

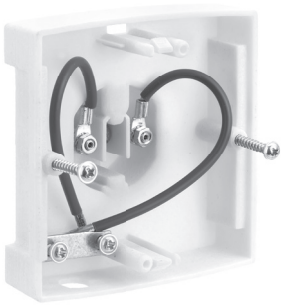
Type / image	Item no.	Features	Circuit diagram	PG
JZ-19 	MN990003	**General features:** plug-in socket (as with RTBSB-001.411 / RTBSB-001.474) completely pre-wired **Mounting / attachment:** Can be fitted with room thermostats RTBSB-001.xxx **Protection rating:** Depends on the pre-fitted room thermostat **Protection class:** Depends on the pre-fitted room thermostat **Max. switching current:** Depends on the pre-fitted room thermostat **Switching power:** 3000 W		I
RTBSB-001.086 	MA010800	**General features:** mechanical range setting; 3000 W switching power for electric direct heating systems, natural stone heating; thermal feedback; multi-digit display 1 … 6; external setting **Electrical connection:** screw-type terminals 0.12 mm² to 2.5 mm² **Average power consumption:** < 0.5 W **Max. switching current:** 13 (4) A **Switching power:** 3000 W **Accessories:**can be combined with plug-in socket JZ-19		I
RTBSB-001.096 	MA012500	like RTBSB-001.086, but with “heating” display (LED red)		I
RTBSB-001.401 	MA013100	**General features:** mechanical range limitation; 3000 W switching power for electric direct heating systems, natural stone heating; multi-digit display 1 … 6; external setting **Electrical connection:** Schuko adapters **Mounting / attachment:** optionally surface- / wall-mounting (4-hole assembly on flush-mounted socket) or with adapter plate (2-hole assembly) for wall hanging **Average power consumption:** < 0.1 W **Max. switching current:** 13 (4) A **Switching power:** 3000 W **Connecting cable:** 1.5 m		I

Mechanical room temperature controller, RTBSB

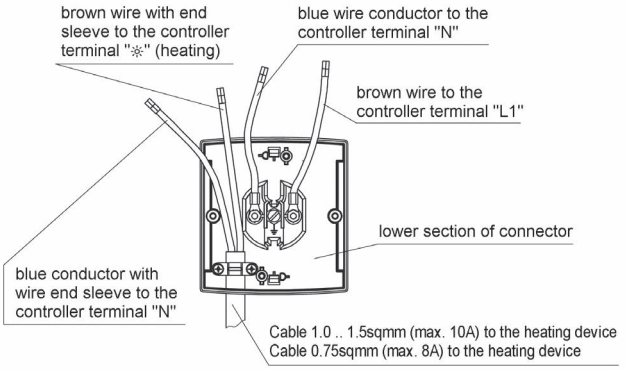
Surface-mounted or plug-in installation – Design Berlin

Type / image	Item no.	Features	Circuit diagram	PG
RTBSB-001.411 	MA013200	**General features:** mechanical range limitation; 3000 W switching power, for electric direct heating systems, natural stone heating; multi-digit display 1 … 6; external setting **Electrical connection:** pre-fitted Schuko plug-in socket JZ-19 at the controller, 1.5-m cable with Schuko coupling **Mounting / attachment:** ready-to-plug **Average power consumption:** < 0.1 W **Max. switching current:** 13 (4) A **Switching power:** 3000 W **Hysteresis:** approx. 1 K at a temperature change of max. 4 K / h		I
RTBSB-001.474 	MA013300	**General features: "on / off" display; "heating" display;** mechanical range limitation; thermal feedback; scale: degrees Celsius; **on / off switch;** external setting **Electrical connection:** pre-fitted Schuko plug-in socket JZ-19 at the controller, 1.5 m cable with Schuko coupling **Mounting / attachment:** ready-to-plug **Average power consumption:** < 0.5 W **Max. switching current:** 5 (2) A **Switching power:** 1200 W **Connecting cables:** 1.5 m		I

Plug-in socket

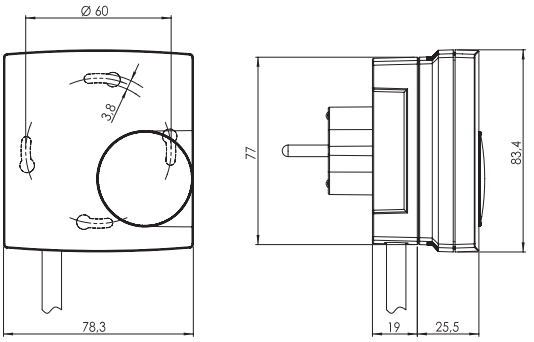


Plug-in socket



RTBSB-001.411

RTBSB-001.411 / RTBSB-001.474
(Different from dimensions of RTBSB-001.401)



RTBSB-001.401

RTBSB-001.474

Electronic room temperature controller with triac output

Surface-mounted **superflat** installation – Design Berlin 1000

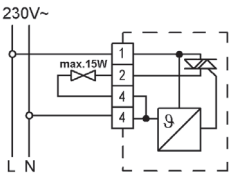
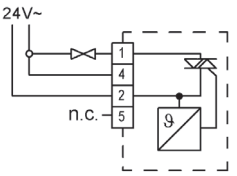
Technical data

Design:	Berlin 1000
Surface finish:	glossy
Housing colour:	pure white, like RAL 9010
Housing material:	ABS plastic
Ambient temperature:	0 … 40 °C
Storage temperature:	–20 … +70 °C
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Electrical connection:	screw-type terminals 0.5 mm² to 1.5 mm²
Mounting / attachment:	surface- / wall-mounting (4-hole assembly on flush-mounted socket)
Protection rating:	IP 30
Safety and EMC:	according to DIN EN 60730
Average power consumption:	< 0.8 W (5 VA)
Switching power:	15 W
Switching element:	triac
Switching contact:	NO contact
Sensor:	NTC
Control function:	heating
Control range:	5 … 30 °C
Proportional range:	approx. 1 K
General features:	“heating” display; mechanical range setting; scale: degrees Celsius; external setting

Application

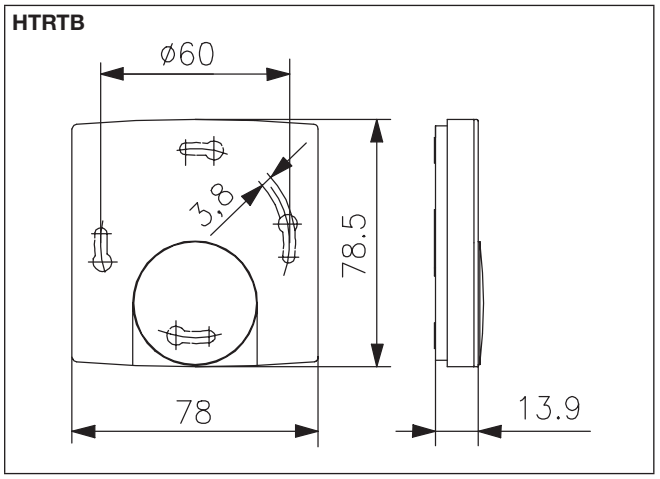
This room temperature controller, which is specifically designed for temperature control and monitoring in offices, homes and hotels, can be connected directly to the valve actuators for hot water heating systems. Electrical underfloor heating systems need to be controlled via an additional power contactor. A maximum of five normally closed valves can be connected to the heating output of hot water heating systems.

The room temperature controller measures the room temperature with an internal sensor and activates the heating system depending on the deviation from the configured setpoint temperature. As the switching element used is a triac rather than a relay or bimetal, the system operates **without bothersome switching sounds**.

Type / image	Item no.	Features	Circuit diagram	PG
HTRTB-210.100 	MA700600	**Operating voltage:** 230 VAC, 50 Hz **Protection class:** II, if properly mounted **Max. switching current:** 65 mA **Max. switching voltage:** 230 VAC, 50 Hz **Min. switching voltage:** 230 VAC, 50 Hz **Output signal:** switching (230 VAC, 50 Hz) **Other / similar items:** triac controller with ECO contact: KTRTB-211.108		I
HTRTB-250.100 	MA700700	**Operating voltage:** 24 VAC, 50 Hz **Protection class:** III **Max. switching current:** 600 mA **Max. switching voltage:** 24 VAC, 50 Hz **Min. switching voltage:** 24 VAC, 50 Hz **Output signal:** switching (24 VAC, 50 Hz) **Other / similar items:** triac controller with ECO contact: KTRTB-251.108		I

Accessories: terminal strips VOOxx, suitable valve actuators ZBOOA
You can find other controllers with outputs for heating / cooling in the “Air conditioning technology” section.

HTRTB



Electronic room temperature controller with timer, HTRRBu

Surface-mounted installation – Design Berlin 3000

Technical data

Design:	Berlin 3000
Surface finish:	matt
Housing colour:	pure white, like RAL 9010
Housing material:	ABS plastic
Operating voltage:	230 VAC, 50 Hz
Ambient temperature:	0 … 30 °C
Storage temperature:	–20 … +70 °C
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Electrical connection:	screw-type terminals
Mounting / attachment:	surface / wall-mounting or by means of adapter plate on flush-mounted socket
Protection rating:	IP 30
Protection class:	II, if properly mounted
Safety and EMC:	according to DIN EN 60730
Max. switching current:	heating (terminal 4) 8 (2) A, cooling (terminal 3) 100 mA,
Max. switching voltage:	230 VAC, 50 Hz
Min. switching voltage:	230 VAC, 50 Hz
Switching power:	terminal 4: 1840 W, terminal 3: 23 W
Switching element:	relay
Switching contact:	NO contact
Output signal:	heating, switching (230 VAC, 50 Hz)
Sensor:	NTC
Control function:	heating
Control range:	5 … 30 °C
Hysteresis:	< 1 K
Display type:	symbol display
Output “temperature reduction”:	switching (230 VAC, 50 Hz) (for pilot function)

Application

For time-dependent control of temperatures in closed spaces. Suitable for all heating systems.

Valve actuator: normally closed.

It can be used as a master (pilot regulator) for the temperature reduction of other controllers. Controllers of the series FETR, FTR and RTBSB are suitable as slaves (satellite controllers).

Programming procedures for every day, familiar from mechanical timers, by means of “electronic tabs”. Shortest switching time 15 min.

Load setting: The control accuracy is influenced by the different levels of intrinsic heating of the controller depending on the magnitude of the heating load. By inputting the heating load, this influence is compensated and the control accuracy is retained.

General features:
pilot function; ECO function, ECO value adjustable; “ECO” display; “on / off” display; “heating” display; digital actual value display; child-safe features; power reserve (approx. 4 – 7 days); load setting; actual value correction / measured value correction; learning function; valve protection; holiday setting; party setting; automatic adjustment to standard / daylight savings time; mechanical range limitation; scale: degrees Celsius; reduction / comfort / automatic button; external setting; operation using direct-dial buttons; on / off button; information button; party function button; holiday setting button

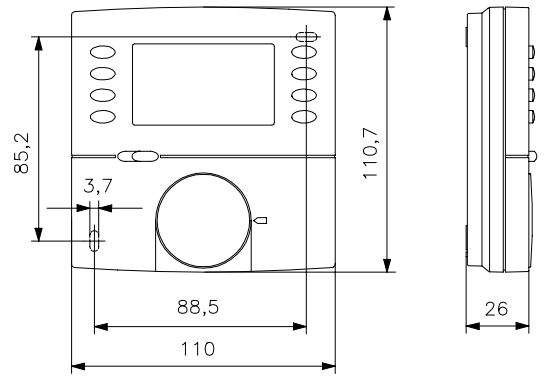
Type / image	Item no.	Features	PG
HTRRBu-110.117 / 21 	MA600003		I
HTRRBu-110.121 / 21 	MA600301	like HTRRBu-110.117 / 21, but with backlighting	I

Accessories	Item no.	Features	PG
JZ-17 	MN 990001	**General features:** adapter plate for mounting devices on flush-mounted sockets (including fastening screws for mounting the controller on the adapter plate) **Surface finish:** matt **Housing colour:** pure white like RAL 9010 **Housing material:** ABS plastic	II

Electronic room temperature controller with timer, HTRRBu

Surface-mounted installation – Design Berlin 3000

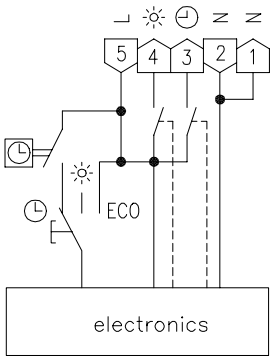
HTRRBu-110.XXX



Factory setting:

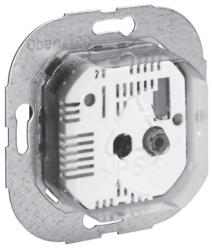
- Setback temperature 17 °C
- Continuous time display
- Programme display using switching segments enabled
- Child-safe features disabled
- Automatic adjustment to standard/daylight savings time enabled
- °C display, valve and pump protection disabled
- Learning function disabled
- Heating load 0.0 kW
- Comfort times:
  Mon-Fri 5 am – 9 am / 4 pm – 10 pm,
  Sat/Sun 6 am – 10 pm

Circuit diagram HTRRBu-110.XXX



Mechanical room temperature controller, FTR

Flush-mounted installation – Design Berlin UP



Technical data

Design:	Berlin UP (flush-mounted)
Housing material:	PC plastic
Ambient temperature:	0 … 30 °C
Storage temperature:	– 20 … + 70 °C
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Electrical connection:	screw-type terminals
Mounting / attachment:	in flush-mounted socket – with cover set 50 x 50 mm or 55 x 55 mm, can be used with almost all switch ranges (deep flush-mounted socket recommended)
Protection rating:	IP 30
Protection class:	II, if properly mounted, with 24 VAC, protection class III
Safety and EMC:	according to DIN EN 60730
Max. power consumption:	< 0,5 W
Switching element:	bimetallic contact
Output signal:	switching
Sensor:	bimetal
Control range:	5 … 30 °C
Setting range:	5 … 30 °C
Hysteresis:	approx. 0.5 K at a temperature change of max. 4 K / h
General features:	thermal feedback; multi-digit display * … 6

Application

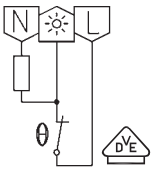
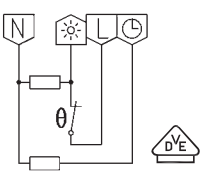
Control or monitoring of temperatures in closed, dry spaces. Suitable for all heating systems.

Valve actuator: normally closed. If normally open heating valves are available, they should be connected to the cooling output of the changeover switch (toggler), e.g., FTR 101.010.

Up to a maximum of 10 actuators for valves can be connected (normally closed, NC); with a toggler, on the NO contact, up to 5 units.

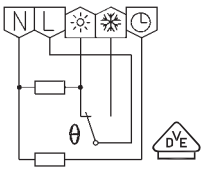
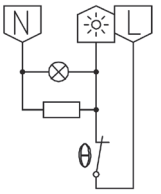
The 55 x 55-mm variants visually fit perfectly in many switch ranges of 55 x 55 mm without an insert frame.

The 50 x 50-mm variants fit in nearly all switch ranges with the use of an insert frame.

Type / image	Item no.	Features	Circuit diagram	PG
FTR 101.000#00 	UA010017	**General features:** mechanical range limitation; external setting; protective cap; contact hazard protection cover plate; VDE-tested **Operating voltage:** 230 VAC, 50 Hz **Max. switching current:** 10 (4) A **Max. switching voltage:** 230 VAC, 50 Hz **Min. switching voltage:** 230 VAC, 50 Hz **Switching power:** 2300 W **Switching contact:** NC contact (max. 10 actuators) **Control function:** heating Cover sets are offered in various designs (see the separate overview, “alre flush-mounted range (cover sets)”) and are not included in the delivery. **Suitable set no: JZ-001.xxx, for example:** cover set 50 x 50 mm, pure white, glossy: JZ-001.000 cover set 55 x 55 mm, pure white, glossy: JZ-001.100		I
FTR 101.000#21 	UN010009	like FTR 101.000#00, but with scope of delivery: Controller, alre frame “Berlin” (neutral), cover 50 x 50 mm, pure white (like RAL 9010), glossy		I
FTR 101.002#00 	UA010134	**General features:** ECO function; mechanical range limitation; external setting; protective cap; contact hazard protection cover plate; VDE-tested **Operating voltage:** 230 VAC, 50 Hz **Max. switching current:** 10 (4) A **Max. switching voltage:** 230 VAC, 50 Hz **Min. switching voltage:** 230 VAC, 50 Hz **Switching power:** 2300 W **Switching contact:** NC contact (max. 10 actuators) **Control function:** heating **Input “temperature reduction”:** approx. 4 K (230 VAC, 50 Hz) Cover sets are offered in various designs (see the separate overview, “alre flush-mounted range (cover sets)” and are not included in the delivery. **Suitable set no: JZ-001.xxx, for example:** cover set 50 x 50 mm, pure white, glossy: JZ-001.000 cover set 55 x 55 mm, pure white, glossy: JZ-001.100		I

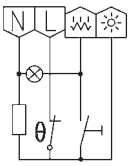
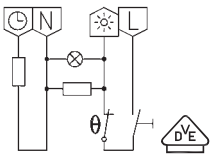
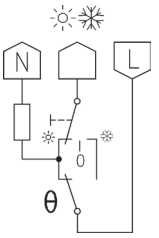
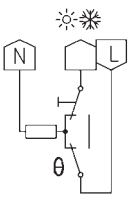
Mechanical room temperature controller, FTR

Flush-mounted installation – Design Berlin UP

Type / image	Item no.	Features	Circuit diagram	PG
FTR 101.002#21 	UN010114	like FTR 101.002#00, but with scope of delivery: Controller, alre frame “Berlin” (neutral), cover 50 x 50 mm, pure white (like RAL 9010), glossy		I
FTR 101.010#00 	UA010222	**General features:** ECO function; mechanical range limitation; external setting; protective cap; contact hazard protection cover plate; VDE-tested **Operating voltage:** 230 VAC, 50 Hz **Max. switching current:** heating terminal 10 (4) A, cooling terminal 5 (2) A, **Max. switching voltage:** 230 VAC, 50 Hz **Min. switching voltage:** 230 VAC, 50 Hz **Switching power:** heating terminal: 2300 W, **Cooling terminal:** 1150 W **Switching contact:** changeover switch (toggler, max. 10 actuators output heating, max. 5 actuators output cooling) **Control function:** heating or cooling **Input “temperature reduction”:** approx. 4 K (230 VAC, 50 Hz) Cover sets are offered in various designs (see the separate overview, “alre flush-mounted range (cover sets)” and are not included in the delivery. **Suitable set no: JZ-001.xxx, for example:** cover set 50 x 50 mm, pure white, glossy: JZ-001.000 cover set 55 x 55 mm, pure white, glossy: JZ-001.100		I
FTR 101.010#21 	UN010206	like FTR 101.010#00, but with scope of delivery: Controller, alre frame “Berlin” (neutral), cover 50 x 50 mm, pure white (like RAL 9010), glossy		I
FTR 101.034#07 	UA012404	**General features: “heating” display;** mechanical range limitation; external setting; contact hazard protection cover plate **Operating voltage:** 230 VAC, 50 Hz **Max. switching current:** 10 (4) A **Max. switching voltage:** 230 VAC, 50 Hz **Min. switching voltage:** 230 VAC, 50 Hz **Switching power:** 2300 W **Switching contact:** NC contact (max. 10 actuators) **Control function:** heating **Scope of delivery:** controller, cover 50 x 50 mm, pure white (like RAL 9010), glossy		I
FTR 101.034#55	UA012405	like FTR 101.034#07 but with 55 x 55 mm cover		I

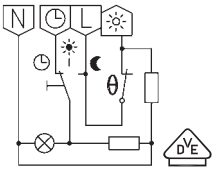
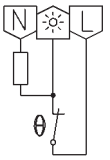
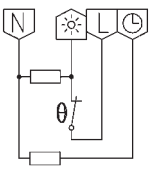
Mechanical room temperature controller, FTR

Flush-mounted installation – Design Berlin UP

Type / image	Item no.	Features	Circuit diagram	PG
FTR 101.052#21 	UA010702	**General features: "auxiliary heating" display;** mechanical range limitation; **auxiliary heating switch;** external setting **Operating voltage:** 230 VAC, 50 Hz **Max. switching current:** the total current (heating + auxiliary heating) may not exceed 10 (4) A **Max. switching voltage:** 230 VAC, 50 Hz **Min. switching voltage:**230 VAC, 50 Hz **Switching power:** the total power output (heating + auxiliary heating) may not exceed 2300 W **Switching contact:** NC contact (max. 10 actuators) **Control function:** heating **Scope of delivery:** controller, alre frame "Berlin" (neutral), cover 50 x 50 mm, pure white (like RAL 9010), glossy		I
FTR 101.062#00 	UA010811	**General features:** ECO function; **"heating" display**; mechanical range limitation; **on / off switch;** external setting; protective cap; contact hazard protection cover plate; VDE-tested **Operating voltage:** 230 VAC, 50 Hz **Max. switching current:** 10 (4) A **Max. switching voltage:** 230 VAC, 50 Hz **Min. switching voltage:** 230 VAC, 50 Hz **Switching power:** 2300 W **Switching contact:** NC contact (max. 10 actuators) **Control function:** heating **Input "temperature reduction":** approx. 4 K (230 VAC, 50 Hz) Cover sets are offered in various designs (see the separate overview, "alre flush-mounted range (cover sets)") and are not included in the delivery. **Suitable set no: JZ-002.xxx, e.g.:** cover set 50 x 50 mm, pure white, glossy: JZ-002.000 cover set 55 x 55 mm, pure white, glossy: JZ-002.100		I
FTR 101.062#21	UN010800	like FTR 101.062#00, but with scope of delivery: Controller, alre frame "Berlin" (neutral), cover 50 x 50 mm, pure white (like RAL 9010), glossy		I
FTR 101.063#00 	UA011000	**General features:** mechanical range limitation; Switch Heating / Off / Cooling; external setting; protective cap; contact hazard protection cover plate **Operating voltage:** 230 VAC, 50 Hz **Max. switching current:** 5 (2) A **Max. switching voltage:** 230 VAC, 50 Hz **Min. switching voltage:** 230 VAC, 50 Hz **Switching power:** 1150 W **Switching contact:** changeover switch (toggler, max. 5 actuators) **Control function:** heating or cooling Cover sets are offered in various designs (see the separate overview, "alre flush-mounted range (cover sets)") and are not included in the delivery. **Suitable set no: JZ-012.000, 50 x 50 mm, pure white, glossy**		I
FTR 101.065#00 	UA010910	**General features:** climate controller for 2-pipe systems, especially heat pumps; mechanical range limitation; **heating / cooling switch;** external setting; protective cap; contact hazard protection cover plate **Operating voltage:** 230 VAC, 50 Hz **Max. switching current:** 5 (2) A **Max. switching voltage:** 230 VAC, 50 Hz **Min. switching voltage:** 230 VAC, 50 Hz **Switching power:** 1150 W **Switching contact:** changeover switch (toggler, max. 5 actuators) **Control function:** heating or cooling Cover sets are offered in various designs (see the separate overview, "alre flush-mounted range (cover sets)") and are not included in the delivery. **Suitable set no: JZ-004.xxx, e.g.:** cover set 50 x 50 mm, pure white, glossy: JZ-004.000 cover set 55 x 55 mm, pure white, glossy: JZ-004.100		I
FTR 101.065#21	UN010900	like FTR 101.065#00, but with scope of delivery: Controller, alre frame "Berlin" (neutral), cover 50 x 50 mm, pure white (like RAL 9010), glossy		I

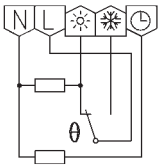
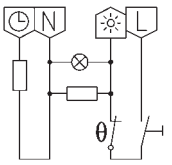
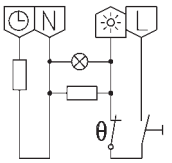
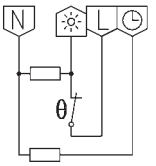
Mechanical room temperature controller, FTR

Flush-mounted installation – Design Berlin UP

Type / image	Item no.	Features	Circuit diagram	PG
FTR 101.075#00 	UA010415	**General features:** ECO function; **"reduction" display;** mechanical range limitation; **switch for reduction / heating / reduction via external timer;** external setting; protective cap; contact hazard protection cover plate; VDE-tested **Operating voltage:** 230 VAC, 50 Hz **Max. switching current:** 10 (4) A **Max. switching voltage:** 230 VAC, 50 Hz **Min. switching voltage:** 230 VAC, 50 Hz **Switching power:** 2300 W **Switching contact:** NC contact (max. 10 actuators) **Control function:** heating **Input "temperature reduction":** approx. 4 K (230 VAC, 50 Hz) Cover sets are offered in various designs (see the separate overview, "alre flush-mounted range (cover sets)") and are not included in the delivery. **Suitable set no: JZ-003.xxx, e.g.:** cover set 50 x 50 mm, pure white, glossy: JZ-003.000 cover set 55 x 55 mm, pure white, glossy: JZ-003.100		I
FTR 101.075#21	UN010407	like FTR 101.075#00, but with scope of delivery: Controller, alre frame "Berlin" (neutral), cover 50 x 50 mm, pure white (like RAL 9010), glossy		I
FTR 101.086#00 	UA010615	**General features:** mechanical range limitation; 3000 W switching power for electric direct heating systems, natural stone heating; external setting; protective cap; contact hazard protection cover plate **Operating voltage:** 230 VAC, 50 Hz **Max. switching current:** 13 (4) A **Max. switching voltage:** 230 VAC, 50 Hz **Min. switching voltage:** 230 VAC, 50 Hz **Switching power:** 3000 W **Switching contact:** NC contact **Control function:** heating Cover sets are offered in various designs (see the separate overview, "alre flush-mounted range (cover sets)") and are not included in the delivery. **Suitable set no: JZ-001.xxx, for example:** cover set 50 x 50 mm, pure white, glossy: JZ-001.000 cover set 55 x 55 mm, pure white, glossy: JZ-001.100		I
FTR 101.086#21 	UN010607	like FTR 101.086#00, but with scope of delivery: Controller, alre frame "Berlin" (neutral), cover 50 x 50 mm, pure white (like RAL 9010), glossy		I
FTR 101.202#00 	UA012008	**General features:** ECO function; mechanical range limitation; external setting; protective cap; contact hazard protection cover plate **Input "temperature reduction":** approx. 4 K (24 VAC/50 Hz, 24 VDC) **Operating voltage:** 24 VAC/50 Hz, 24 VDC **Max. switching current:**1 (1) A **Max. switching voltage:** 24 VAC/50 Hz, 24 VDC **Min. switching voltage:** 24 VAC/50 Hz, 24 VDC **Switching power:** 24 W **Switching contact:** NC contact (max. 5 actuators) **Control function:** heating Cover sets are offered in various designs (see the separate overview, "alre flush-mounted range (cover sets)") and are not included in the delivery. **Suitable set no: JZ-001.xxx, for example:** cover set 50 x 50 mm, pure white, glossy: JZ-001.000 cover set 55 x 55 mm, pure white, glossy: JZ-001.100		I
FTR 101.202#21 	UN102009	like FTR 101.202#00, but with scope of delivery: Controller, alre frame "Berlin" (neutral), cover 50 x 50 mm, pure white (like RAL 9010), glossy		I

Mechanical room temperature controller, FTR

Flush-mounted installation – Design Berlin UP

Type / image	Item no.	Features	Circuit diagram	PG
FTR 101.210#00 	UA012301	**General features:** ECO function; mechanical range limitation; external setting; protective cap; contact hazard protection cover plate **Operating voltage:** 24 VAC/50 Hz, 24 VDC **Max. switching current:**1 (1) A **Max. switching voltage:** 24 VAC/50 Hz, 24 VDC **Min. switching voltage:** 24 VAC/50 Hz, 24 VDC **Switching power:** 24 W **Switching contact:** changeover switch (toggler, max. 5 actuators) **Control function:** heating or cooling **Input "temperature reduction":** approx. 4 K (24 VAC / 50 Hz, 24 VDC) Cover sets are offered in various designs (see the separate overview, "alre flush-mounted range (cover sets)") and are not included in the delivery. **Suitable set no: JZ-001.xxx, for example:** cover set 50 x 50 mm, pure white, glossy: JZ-001.000 cover set 55 x 55 mm, pure white, glossy: JZ-001.100		I
FTR 101.262#00 	UA012500	**General features:** ECO function; **"heating" display**; mechanical range limitation; **on / off switch;** external setting; protective cap; contact hazard protection cover plate; **Operating voltage:** 24 VAC / 50 Hz **Max. switching current:** 1 (1) A **Max. switching voltage:** 24 VAC / 50 Hz **Max. switching voltage:** 24 VAC / 50 Hz **Switching power:** 24 W **Switching contact:** NC contact (max. 5 actuators) **Control function:** heating **Input "temperature reduction":**approx. 4 K (24 VAC / 50 Hz) Cover sets are offered in various designs (see the separate overview, "alre flush-mounted range (cover sets)") and are not included in the delivery. **Suitable set no: JZ-002.xxx, e.g.:** cover set 50 x 50 mm, pure white, glossy: JZ-002.000 cover set 55 x 55 mm, pure white, glossy: JZ-002.100		I
FTR 101.262#21	UA012501	like FTR 101.262#00, but with scope of delivery: Controller, alre frame "Berlin" (neutral), cover 50 x 50 mm, pure white (like RAL 9010), glossy		I
FTR 101.902#07 	UA013000	**General features:** ECO function; internal setting; contact hazard protection cover plate **Operating voltage:** 230 VAC, 50 Hz **Max. switching current:** 10 (4) A **Max. switching voltage:** 230 VAC, 50 Hz **Min. switching voltage:** 230 VAC, 50 Hz **Switching power:** 2300 W **Switching contact:** NC contact (max. 10 actuators) **Control function:** heating **Input "temperature reduction":** approx. 4 K (230 VAC, 50 Hz) **Scope of delivery:** Controller, cover 50 x 50 mm, pure white (like RAL 9010), glossy		I

For model FTR 101.xxx#21, the contact hazard protection cover plate and protective cap are not included in the delivery.

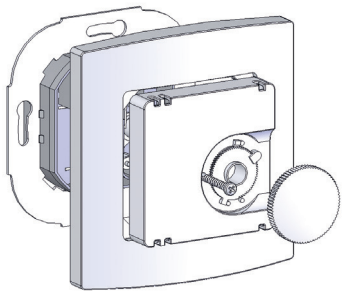
Accessories: terminal strips VOOxx, suitable valve actuators ZBOOA, suitable cover sets: see separate overview "alre flush-mounting range (cover sets)"

Mechanical room temperature controller, FTR

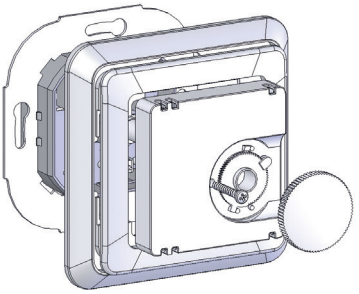
Flush-mounted installation – Design Berlin UP

Type / image	Item no.	Features	PG
JZ-090.900 	VV000025	**General features:** alre frame “Berlin” (neutral) for all flush-mounted controllers with cover 50 x 50 mm **Design:** Berlin **Surface finish:** glossy **Housing colour:** pure white like RAL 9010 **Housing material:** plastic PC	I
JZ-090.910	VV000010	like JZ-090.900 but RAL 1013	I

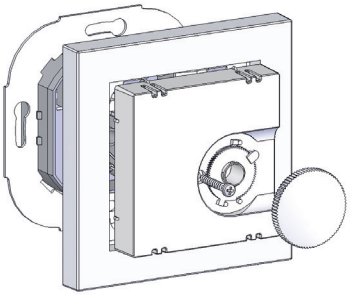
alre frame “Berlin” (#21 types)



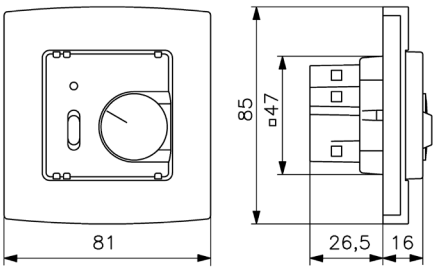
with 50 x 50 insert frame



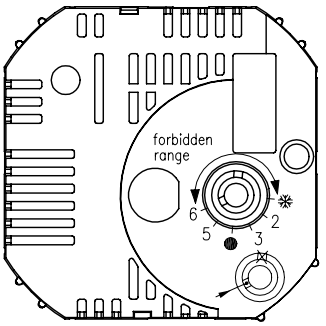
without 55 x 55 insert frame



FTR with alre frame “Berlin” (FTR 101.xxx#21 types)



FTR 101.902#07 contact hazard protection cap with setting range (internal setting)



alre flush-mounted range (cover sets)

all basic types and suitable cover sets **50 x 50 mm**

Basic type	Cover set 50 x 50 mm pure white (RAL 9010) glossy (JZ-xxx.000)		Cover set 50 x 50 mm pure white (RAL 9010) matt (JZ-xxx.001)		Cover set 50 x 50 mm pearl white (RAL 1013) glossy (JZ-xxx.010)		PG
	Cover set	Item no.	Cover set	Item no.	Cover set	Item no.	
FTR 101.000#00	JZ-001.000	UN 990035	JZ-001.001	UN 990040	JZ-001.010	UN 990045	I
FTR 101.002#00	JZ-001.000	UN 990035	JZ-001.001	UN 990040	JZ-001.010	UN 990045	I
FTR 101.010#00	JZ-001.000	UN 990035	JZ-001.001	UN 990040	JZ-001.010	UN 990045	I
FTR 101.062#00	JZ-002.000	UN 990036	JZ-002.001	UN 990041	JZ-002.010	UN 990046	I
FTR 101.063#00	JZ-012.000	UN990104	-	-	-	-	I
FTR 101.065#00	JZ-004.000	UN 990037	JZ-004.001	UN 990042	JZ-004.010	UN 990047	I
FTR 101.075#00	JZ-003.000	UN 990038	JZ-003.001	UN 990043	JZ-003.010	UN 990048	I
FTR 101.086#00	JZ-001.000	UN 990035	JZ-001.001	UN 990040	JZ-001.010	UN 990045	I
FTR 101.202#00	JZ-001.000	UN 990035	JZ-001.001	UN 990040	JZ-001.010	UN 990045	I
FTR 101.210#00	JZ-001.000	UN 990035	JZ-001.001	UN 990040	JZ-001.010	UN 990045	I
FTR 101.262#00	JZ-002.000	UN990036	JZ-002.001	UN990041	JZ-002.010	UN990046	I

In flush-mounted socket, it can be adapted to fit virtually any switch range.

Basic type	Cover set 50 x 50 mm traffic/studio white (RAL 9016) glossy (JZ-xxx.020)		Cover set 50 x 50 mm traffic/studio white (RAL 9016) matt (JZ-xxx.021)		PG
	Cover set	Item no.	Cover set	Item no.	
FTR 101.000#00	JZ-001.020	UN990071	JZ-001.021	UN990100	I
FTR 101.002#00	JZ-001.020	UN990071	JZ-001.021	UN990100	I
FTR 101.010#00	JZ-001.020	UN990071	JZ-001.021	UN990100	I
FTR 101.062#00	JZ-002.020	UN990072	JZ-002.021	UN990101	I
FTR 101.065#00	JZ-004.020	UN990073	JZ-004.021	UN990103	I
FTR 101.075#00	JZ-003.020	UN990074	JZ-003.021	UN990102	I
FTR 101.086#00	JZ-001.020	UN990071	JZ-001.021	UN990100	I
FTR 101.202#00	JZ-001.020	UN990071	JZ-001.021	UN990100	I
FTR 101.210#00	JZ-001.020	UN990071	JZ-001.021	UN990100	I
FTR 101.262#00	JZ-002.020	UN990072	JZ-002.021	UN990101	I

Cover set (example), individually foil-wrapped

all basic types and suitable cover sets **55 x 55 mm**

Basic type	Cover set 55 x 55 mm pure white (RAL 9010) glossy (JZ-xxx.100)		Cover set 55 x 55 mm pure white (RAL 9010) matt (JZ-xxx.101)		Design 55 x 55 mm pearl white (RAL 1013) glossy		PG	Cover set 55 x 55 mm traffic/studio white (RAL 9016) glossy (JZ-xxx.120)		PG
	Cover set	Item no.	Cover set	Item no.	Cover set	Item no.		Cover set	Item no.	
FTR 101.000#00	JZ-001.100	UN 990050	JZ-001.101	UN 990055	JZ-001.110	UN 990060	I	JZ-001.120	UN 990086	I
FTR 101.002#00	JZ-001.100	UN 990050	JZ-001.101	UN 990055	JZ-001.110	UN 990060	I	JZ-001.120	UN 990086	I
FTR 101.010#00	JZ-001.100	UN 990050	JZ-001.101	UN 990055	JZ-001.110	UN 990060	I	JZ-001.120	UN 990086	I
FTR 101.062#00	JZ-002.100	UN 990051	JZ-002.101	UN 990056	JZ-002.110	UN 990061	I	JZ-002.120	UN 990088	I
FTR 101.065#00	JZ-004.100	UN 990052	JZ-004.101	UN 990057	JZ-004.110	UN 990062	I	JZ-004.120	UN 990089	I
FTR 101.075#00	JZ-003.100	UN 990053	JZ-003.101	UN 990058	JZ-003.110	UN 990063	I	JZ-003.120	UN 990090	I
FTR 101.086#00	JZ-001.100	UN 990050	JZ-001.101	UN 990055	JZ-001.110	UN 990060	I	JZ-001.120	UN 990086	I
FTR 101.202#00	JZ-001.100	UN 990050	JZ-001.101	UN 990055	JZ-001.110	UN 990060	I	JZ-001.120	UN 990086	I
FTR 101.210#00	JZ-001.100	UN 990050	JZ-001.101	UN 990055	JZ-001.110	UN 990060	I	JZ-001.120	UN 990086	I
FTR 101.262#00	JZ-002.100	UN 990051	JZ-002.101	UN 990056	JZ-002.110	UN 990061	I	JZ-002.120	UN 990088	I

In flush-mounted sockets, it can be adapted to fit many switch ranges (for a current overview of the suitable frames and insert frames, see page 34).

Sample photos of adapting alre flush-mounted controllers

Flush-mounted installation – Design Berlin UP

Examples of integration in switches with or without insert frames

Examples of integration: Berker

Examples of integration: Busch-Jaeger

Examples of integration: Gira

Examples of integration: Jung

Examples of integration: Merten

For more examples of integrating components into 55 x 55 mm frames, see page 42

Adaptation of alre flush-mounted controllers

Manufacturer	Range	Colour RAL 9010 (surface finish)	Adaptation possible using "55 x 55" cover set	Only adaptation with "50 x 50" cover set requires an insert frame from the manufacturer
BERKER	S.1	polar white (matt)	✓	1109 19 19
BERKER	S.1	polar white (glossy)	✓	1109 90 89
BERKER	Arsys	polar white (glossy)		1108 01 69
BERKER	B.3	aluminium/polar white (matt)	✓	1109 19 19
BERKER	B.3	aluminium/polar white (glossy)	✓	1109 90 89
BERKER	B.7	glass/polar white (matt)	✓	1109 19 19
BERKER	B.7	glass/polar white (glossy)	✓	1109 90 89
BERKER	Q.1	polar white (velvet)		1109 60 79
BERKER	K.1	polar white (glossy)		1108 71 09
BUSCH-JAEGER	Reflex SI/SI Linear	alpine white (glossy)		1746-214-101
BUSCH-JAEGER	Busch-balance SI	polar white (glossy)	✓	1746-914-101
BUSCH-JAEGER	impuls	alpine white (glossy)		1746/10-74
BUSCH-JAEGER	solo/future/axcent etc.	studio white – see RAL 9016 below		
GIRA	rocker switch	pure white (glossy)		0282 112
GIRA (System 55)	Standard/E 2	pure white (semi-gloss)	✓	0282 27
GIRA (System 55)	Standard/E 2	pure white (glossy)	✓	0282 03
GIRA (System 55)	E 22	pure white (glossy)	✓	0282 03
GIRA (System 55)	Event	pure white (semi-gloss) + opaque …	✓	0282 27
GIRA (System 55)	Event	pure white (glossy) + opaque …	✓	0282 03
GIRA (System 55)	Esprit	pure white (semi-gloss) + glass, aluminium …	✓	0282 27
GIRA (System 55)	Esprit	pure white (glossy) + glass, aluminium …	✓	0282 03
GIRA	S-Color	pure white (high-gloss)		0282 40
JUNG	CD 500/CD plus	alpine white (glossy)		CD 590 Z WW
JUNG	A 500/AS 500/A plus	alpine white (glossy)	✓	A 590 Z WW
JUNG	LS 990	alpine white (glossy)		LS 961 Z WW
JUNG	LS plus	alpine white (glass)		LS 961 Z WW
JUNG	A creation	alpine white (glossy)	✓	A 590 Z WW
JUNG	LS Design	alpine white (glossy)		LS 961 Z WW
MERTEN (System M)	M-Smart, Arc, Plan, Star	polar white (matt)	✓	5181 19
MERTEN (System M)	M-Smart, Arc, Plan, Star, M-Creativ, M-Pure	polar white (glossy)	✓	5185 19
MERTEN (System Basis)	1-M/Atelier-M	polar white (glossy)	✓	5185 19
MERTEN (System Design)	Artec/Trancent/Antik	polar white (glossy)		5160 99
MERTEN	1-M/M-Smart/M-Plan etc./M-pure	active white – see RAL 9016 below		
PEHA	Standard	pure white (glossy)		80.670.02 ZV
PEHA	Dialog	pure white (glossy)		95.670.02 ZV
PEHA	Aura	pure white (matt) / glass		20.670.02 ZV
PEHA	Badora	pure white (glossy)		11.670.02 ZV

Manufacturer	Range	Colour RAL 9016 (surface finish)	Adaptation possible using "55 x 55" cover set	Only adaptation with "50 x 50" cover set requires an insert frame from the manufacturer
BUSCH-JAEGER	solo/future/future linear	studio white (RAL 9016, glossy)		1746/10-84
BUSCH-JAEGER	future linear	studio white (RAL 9016, matt)		1746/10-884
BUSCH-JAEGER	impuls	studio white (RAL 9016, matt)		1746/10-774
BUSCH-JAEGER	axcent	studio white (RAL 9016, glossy)		1746/10-84
BUSCH-JAEGER	carat (glass, bronze, gold)	studio white (RAL 9016, glossy)		1746/10-84
BUSCH-JAEGER	alpha (nea/exclusive*)	studio white (RAL 9016, glossy)		1746/10-24G
BUSCH-JAEGER	alpha (nea/exclusive*)	studio white (RAL 9016, matt)		1746/10-24
MERTEN	M-Smart, Plan, M-Pure	active white (RAL 9016, glossy)	✓	5185 25
MERTEN	1-M/Atelier-M	active white (RAL 9016, glossy)	✓	5185 25
PEHA	Standard	arctic		D 80.670 ZV AW

*) During assembly, you need to remove four plastic tabs located at the rear of the frame

NOTE: Most light switch ranges are designed in the colour "like RAL 9010", although different switch manufacturers have different designations for this colour. Coloured, glass and aluminium frames are also combined with white jacks or plugs so that controllers with white covers can also be integrated into these frames. Check the precise application in each individual case. The frames have different surface qualities (matt/glossy). For design reasons, the cover of the controller should have the same quality as the frame. We accept no liability for slight variations in colour and surface finish or for accuracy of fit. When installing devices into multi frames, always assemble the temperature controllers at the lowermost position.

"50 x 50 controller": The housing covers of the 50 x 50 controllers are 50 x 50 mm in size. Using a 50 x 50-mm insert frame, the 50 x 50 controllers can be integrated into nearly all light switch ranges in accordance with DIN 49075. The 50 x 50-mm insert frames must be ordered from the light switch manufacturer or from a wholesaler. The order number of the insert frame corresponding to the switch range in question can be found in the column "Only for adaptation with '50 x 50' cover set".

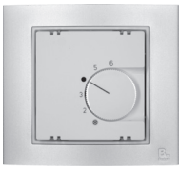
"55 x 55 controller": The housing covers of the 55 x 55 controllers are 55 x 55 mm in size. Many light switch ranges have inner dimensions of 55 x 55 mm. Therefore, the 55 x 55 controllers can be installed directly in the light switch frame without the use of an insert frame. See the column "Adaptation with '55 x 55' cover set" to determine whether the 55 x 55 controller fits in the given light switch range (✓).

All information regarding switch manufacturers' product lines and item numbers was last updated in 12/2015 | No liability is assumed for the information provided. | Technical specifications subject to change. An adaptation list for RAL 1013 switch ranges is available from our website at www.alre.de.

Product finder for alre cover sets for switches from BERKER

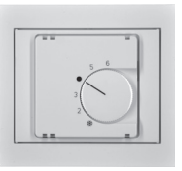
Integration examples

FTR … in S.1



FTR … in B.3

FTR … in B.7



FTR … in K.1

FTR … in Arsys

Type alre	Berker range	Colour (RAL) / surface finish	alre cover set	Cover set Item no.	PG	insert frame 50 x 50 *
FTR 101.000#00 FTR 101.002#00 FTR 101.010#00 FTR 101.086#00 FTR 101.202#00 FTR 101.210#00	**S.1 / B.3 / B.7**	polar white (RAL 9010) glossy	JZ-001.100 (55 x 55, glossy)	UN 990050	I	not required
	S.1 / B.3 / B.7	polar white (RAL 9010) matt	JZ-001.101 (55 x 55, matt)	UN 990055	I	not required
	Arsys	polar white (RAL 9010) glossy	JZ-001.000 (50 x 50, glossy)	UN 990035	I	1108 01 69
	Q.1 / Q.3	polar white (RAL 9010) velvet	JZ-001.001 (50 x 50, matt)	UN 990040	I	1109 60 79
	K.1	polar white (RAL 9010) glossy	JZ-001.000 (50 x 50, glossy)	UN 990035	I	1108 71 09
	**S.1**	white (RAL 1013) glossy	JZ-001.110 (55 x 55, glossy)	UN 990060	I	not required
	Arsys	white (RAL 1013) glossy	JZ-001.010 (50 x 50, glossy)	UN 990045	I	1108 01 02

standard (without switch)

Type alre	Berker range	Colour (RAL) / surface finish	alre cover set	Cover set Item no.	PG	insert frame 50 x 50 *
FTR 101.062#00 FTR 101.262#00	**S.1 / B.3 / B.7**	polar white (RAL 9010) glossy	JZ-002.100 (55 x 55, glossy)	UN 990051	I	not required
	S.1 / B.3 / B.7	polar white (RAL 9010) matt	JZ-002.101 (55 x 55, matt)	UN 990056	I	not required
	Arsys	polar white (RAL 9010) glossy	JZ-002.000 (50 x 50, glossy)	UN 990036	I	1108 01 69
	Q.1 / Q.3	polar white (RAL 9010) velvet	JZ-002.001 (50 x 50, matt)	UN 990041	I	1109 60 79
	K.1	polar white (RAL 9010) glossy	JZ-002.000 (50 x 50, glossy)	UN 990036	I	1108 71 09
	**S.1**	white (RAL 1013) glossy	JZ-002.110 (55 x 55, glossy)	UN 990061	I	not required
	Arsys	white (RAL 1013) glossy	JZ-002.010 (50 x 50, glossy)	UN 990046	I	1108 01 02

(ON / OFF switch, LED)

Type alre	Berker range	Colour (RAL) / surface finish	alre cover set	Cover set Item no.	PG	insert frame 50 x 50 *
FTR 101.065#00	**S.1 / B.3 / B.7**	polar white (RAL 9010) glossy	JZ-004.100 (55 x 55, glossy)	UN 990052	I	not required
	S.1 / B.3 / B.7	polar white (RAL 9010) matt	JZ-004.101 (55 x 55, matt)	UN 990057	I	not required
	Arsys	polar white (RAL 9010) glossy	JZ-004.000 (50 x 50, glossy)	UN 990037	I	1108 01 69
	Q.1 / Q.3	polar white (RAL 9010) velvet	JZ-004.001 (50 x 50, matt)	UN 990042	I	1109 60 79
	K.1	polar white (RAL 9010) glossy	JZ-004.000 (50 x 50, glossy)	UN 990037	I	1108 71 09
	**S.1**	white (RAL 1013) glossy	JZ-004.110 (55 x 55, glossy)	UN 990062	I	not required
	Arsys	white (RAL 1013) glossy	JZ-004.010 (50x50, glossy)	UN 990047	I	1108 01 02

(H / C switch)

Type alre	Berker range	Colour (RAL) / surface finish	alre cover set	Cover set Item no.	PG	insert frame 50 x 50 *
FTR 101.075#00	**S.1 / B.3 / B.7**	polar white (RAL 9010) glossy	JZ-003.100 (55 x 55, glossy)	UN 990053	I	not required
	S.1 / B.3 / B.7	polar white (RAL 9010) matt	JZ-003.101 (55 x 55, matt)	UN 990058	I	not required
	Arsys	polar white (RAL 9010) glossy	JZ-003.000 (50 x 50, glossy)	UN 990038	I	1108 01 69
	Q.1 / Q.3	polar white (RAL 9010) velvet	JZ-003.001 (50 x 50, matt)	UN 990043	I	1109 60 79
	K.1	polar white (RAL 9010) glossy	JZ-003.000 (50 x 50, glossy)	UN 990038	I	1108 71 09
	**S.1**	white (RAL 1013) glossy	JZ-003.110 (55 x 55, glossy)	UN 990063	I	not required
	Arsys	white (RAL 1013) glossy	JZ-003.010 (50 x 50, glossy)	UN 990048	I	1108 01 02

(triple switch, LED)

*) must be ordered from switch manufacturer or electronics wholesaler

Product finder for alre cover sets for switches from BUSCH-JAEGER

Integration examples

FTR … in Reflex SI

FTR … in Busch-balance SI

FTR … in future linear

FTR … in solo

FTR … in alpha nea

Type alre	Busch-Jaeger range	Colour (RAL) / surface finish	alre cover set	Cover set Item no.	PG	insert frame 50 x 50 *
FTR 101.000#00 FTR 101.002#00 FTR 101.010#00 FTR 101.086#00 FTR 101.202#00 FTR 101.210#00	**Reflex SI / SI Linear**	alpine white (RAL 9010) glossy	JZ-001.000 (50 x 50, glossy)	UN 990035	I	1746-214-101
	Busch-balance SI	alpine white (RAL 9010) glossy	JZ-001.100 (55x55 glossy)	UN 990050	I	not required
	impuls	alpine white (RAL 9010) glossy	JZ-001.000 (50 x 50, glossy)	UN 990035	I	1746/10-74
	future linear / solo / axcent / carat	studio white (RAL 9016) glossy	JZ-001.020 (50 x 50, glossy)	UN 990071	I	1746/10-84
	future linear	studio white (RAL 9016) matt	JZ-001.021 (50 x 50, matt)	UN 990100	I	1746/10-884
	alpha nea	studio white (RAL 9016) glossy	JZ-001.020 (50 x 50, glossy)	UN 990071	I	1746/10-24G
	alpha nea	studio white (RAL 9016) matt	JZ-001.021 (50 x 50, matt)	UN 990100	I	1746/10-24
 standard (without switch)	**Duro 2000 SI / SI Linear**	white (RAL 1013) glossy	JZ-001.010 (50 x 50, glossy)	UN 990045	I	1746-212-101
	future linear / solo / carat	ivory white (RAL 1013) glossy	JZ-001.010 (50 x 50, glossy)	UN 990045	I	1746/10-82
	alpha nea	ivory white (RAL 1013) glossy	JZ-001.010 (50 x 50, glossy)	UN 990045	I	1746/10-22G
	impuls	ivory white (RAL 1013) glossy	JZ-001.010 (50 x 50, glossy)	UN 990045	I	1746/10-72

Type alre	Busch-Jaeger range	Colour (RAL) / surface finish	alre cover set	Cover set Item no.	PG	insert frame 50 x 50 *
FTR 101.062#00 FTR 101.262#00	**Reflex SI / SI Linear**	alpine white (RAL 9010) glossy	JZ-002.000 (50 x 50, glossy)	UN 990036	I	1746-214-101
	Busch-balance SI	alpine white (RAL 9010) glossy	JZ-002.100 (55x55 glossy)	UN 990051	I	not required
	impuls	alpine white (RAL 9010) glossy	JZ-002.000 (50 x 50, glossy)	UN 990036	I	1746/10-74
	future linear / solo / axcent / carat	studio white (RAL 9016) glossy	JZ-002.020 (50 x 50, glossy)	UN 990072	I	1746/10-84
	future linear	studio white (RAL 9016) matt	JZ-002.021 (50 x 50, matt)	UN 990101	I	1746/10-884
	alpha nea	studio white (RAL 9016) glossy	JZ-002.020 (50 x 50, glossy)	UN 990072	I	1746/10-24G
 (ON/OFF switch, LED)	**alpha nea**	studio white (RAL 9016) matt	JZ-002.021 (50 x 50, matt)	UN 990101	I	1746/10-24
	Duro 2000 SI / SI Linear	white (RAL 1013) glossy	JZ-002.010 (50 x 50, glossy)	UN 990046	I	1746-212-101
	future linear / solo / carat	ivory white (RAL 1013) glossy	JZ-002.010 (50 x 50, glossy)	UN 990046	I	1746/10-82
	alpha nea	ivory white (RAL 1013) glossy	JZ-002.010 (50 x 50, glossy)	UN 990046	I	1746/10-22G
	impuls	ivory white (RAL 1013) glossy	JZ-002.010 (50 x 50, glossy)	UN 990046	I	1746/10-72

Type alre	Busch-Jaeger range	Colour (RAL) / surface finish	alre cover set	Cover set Item no.	PG	insert frame 50 x 50 *
FTR 101.065#00	**Reflex SI / SI Linear**	alpine white (RAL 9010) glossy	JZ-004.000 (50 x 50, glossy)	UN 990037	I	1746-214-101
	Busch-balance SI	alpine white (RAL 9010) glossy	JZ-004.100 (55x55 glossy)	UN 990052	I	not required
	impuls	alpine white (RAL 9010) glossy	JZ-004.000 (50 x 50, glossy)	UN 990037	I	1746/10-74
	future linear / solo / axcent / carat	studio white (RAL 9016) glossy	JZ-004.020 (50 x 50, glossy)	UN 990073	I	1746/10-84
	future linear	studio white (RAL 9016) matt	JZ-004.021 (50 x 50, matt)	UN 990103	I	1746/10-884
	alpha nea	studio white (RAL 9016) glossy	JZ-004.020 (50 x 50, glossy)	UN 990073	I	1746/10-24G
 (H/C switch)	**alpha nea**	studio white (RAL 9016) matt	JZ-004.021 (50 x 50, matt)	UN 990103	I	1746/10-24
	Duro 2000 SI / SI Linear	white (RAL 1013) glossy	JZ-004.010 (50x50, glossy)	UN 990047	I	1746-212-101
	future linear / solo / carat	ivory white (RAL 1013) glossy	JZ-004.010 (50x50, glossy)	UN 990047	I	1746/10-82
	alpha nea	ivory white (RAL 1013) glossy	JZ-004.010 (50x50, glossy)	UN 990047	I	1746/10-22G
	impuls	ivory white (RAL 1013) glossy	JZ-004.010 (50x50, glossy)	UN 990047	I	1746/10-72

Type alre	Busch-Jaeger range	Colour (RAL) / surface finish	alre cover set	Cover set Item no.	PG	insert frame 50 x 50 *
FTR 101.075#00	**Reflex SI / SI Linear**	alpine white (RAL 9010) glossy	JZ-003.000 (50 x 50, glossy)	UN 990038	I	1746-214-101
	Busch-balance SI	alpine white (RAL 9010) glossy	JZ-003.100 (55x55 glossy)	UN 990053	I	not required
	impuls	alpine white (RAL 9010) glossy	JZ-003.000 (50 x 50, glossy)	UN 990038	I	1746/10-74
	future linear / solo / axcent / carat	studio white (RAL 9016) glossy	JZ-003.020 (50 x 50, glossy)	UN 990073	I	1746/10-84
	future linear	studio white (RAL 9016) matt	JZ-003.021 (50 x 50, matt)	UN 990102	I	1746/10-884
	alpha nea	studio white (RAL 9016) glossy	JZ-003.020 (50 x 50, glossy)	UN 990074	I	1746/10-24G
 (triple switch, LED)	**alpha nea**	studio white (RAL 9016) matt	JZ-003.021 (50 x 50, matt)	UN 990102	I	1746/10-24
	Duro 2000 SI / SI Linear	white (RAL 1013) glossy	JZ-003.010 (50 x 50, glossy)	UN 990048	I	1746-212-101
	future linear / solo / carat	ivory white (RAL 1013) glossy	JZ-003.010 (50 x 50, glossy)	UN 990048	I	1746/10-82
	alpha nea	ivory white (RAL 1013) glossy	JZ-003.010 (50 x 50, glossy)	UN 990048	I	1746/10-22G
	impuls	ivory white (RAL 1013) glossy	JZ-003.010 (50 x 50, glossy)	UN 990048	I	1746/10-72

*) must be ordered from switch manufacturer or electronics wholesaler
For BJ future/solo there are also 55 x 55 insert frames (for the use of alre 55 x 55 cover set) – BJ item no. 1747-84 (studio white) and 1784-82 (ivory white)

Note: Busch-Jaeger central disc cannot be used with alre FTR.

Product finder for alre cover sets for switches from GIRA

Integration examples

FTR … in Standard 55

FTR … in E2

FTR … in Event

FTR … in rocker switch

FTR … in E22

Type alre	Gira range	Colour (RAL) / surface finish	alre cover set	Cover set Item no.	PG	insert frame 50 x 50 *
FTR 101.000#00 FTR 101.002#00 FTR 101.010#00 FTR 101.086#00 FTR 101.202#00 FTR 101.210#00	**Standard 55 / E2 / E22 / Event / Esprit**	pure white (RAL 9010) glossy	JZ-001.100 (55 x 55, glossy)	UN 990050	I	not required
	Standard 55 / E2 / E22 / Event / Esprit	pure white (RAL 9010) matt	JZ-001.101 (55 x 55, matt)	UN 990055	I	not required
	Rocker switch	pure white (RAL 9010) glossy	JZ-001.000 (50 x 50, glossy)	UN 990035	I	0282 112
	S-Color	pure white (RAL 9010) glossy	JZ-001.000 (50 x 50, glossy)	UN 990035	I	0282 40
	Standard 55 / Event / Esprit / ClassiX	cream white (RAL 1013) glossy	JZ-001.110 (55 x 55, glossy)	UN 990060	I	not required
	Rocker switch	cream white (RAL 1013) glossy	JZ-001.010 (50 x 50, glossy)	UN 990045	I	(discontinued 2013)

standard (without switch)

Type alre	Gira range	Colour (RAL) / surface finish	alre cover set	Cover set Item no.	PG	insert frame 50 x 50 *
FTR 101.062#00 FTR 101.262#00	**Standard 55 / E2 / E22 / Event / Esprit**	pure white (RAL 9010) glossy	JZ-002.100 (55 x 55, glossy)	UN 990051	I	not required
	Standard 55 / E2 / E22 / Event / Esprit	pure white (RAL 9010) matt	JZ-002.101 (55 x 55, matt)	UN 990056	I	not required
	Rocker switch	pure white (RAL 9010) glossy	JZ-002.000 (50 x 50, glossy)	UN 990036	I	0282 112
	S-Color	pure white (RAL 9010) glossy	JZ-002.000 (50 x 50, glossy)	UN 990036	/ I	0282 40
	Standard 55 / Event / Esprit / ClassiX	cream white (RAL 1013) glossy	JZ-002.110 (55 x 55, glossy)	UN 990061	I	not required
	Rocker switch	cream white (RAL 1013) glossy	JZ-002.010 (50 x 50, glossy)	UN 990046	I	(discontinued 2013)

(ON / OFF switch, LED)

Type alre	Gira range	Colour (RAL) / surface finish	alre cover set	Cover set Item no.	PG	insert frame 50 x 50 *
FTR 101.065#00	**Standard 55 / E2 / E22 / Event / Esprit**	pure white (RAL 9010) glossy	JZ-004.100 (55 x 55, glossy)	UN 990052	I	not required
	Standard 55 / E2 / E22 / Event / Esprit	pure white (RAL 9010) matt	JZ-004.101 (55 x 55, matt)	UN 990057	I	not required
	Rocker switch	pure white (RAL 9010) glossy	JZ-004.000 (50 x 50, glossy)	UN 990037	I	0282 112
	S-Color	pure white (RAL 9010) glossy	JZ-004.000 (50 x 50, glossy)	UN 990037	I	0282 40
	Standard 55 / Event / Esprit / ClassiX	cream white (RAL 1013) glossy	JZ-004.110 (55 x 55, glossy)	UN 990062	I	not required
	Rocker switch	cream white (RAL 1013) glossy	JZ-004.010 (50x50, glossy)	UN 990047	I	(discontinued 2013)

(H / C switch)

Type alre	Gira range	Colour (RAL) / surface finish	alre cover set	Cover set Item no.	PG	insert frame 50 x 50 *
FTR 101.075#00	**Standard 55 / E2 / E22 / Event / Esprit**	pure white (RAL 9010) glossy	JZ-003.100 (55 x 55, glossy)	UN 990053	I	not required
	Standard 55 / E2 / E22 / Event / Esprit	pure white (RAL 9010) matt	JZ-003.101 (55 x 55, matt)	UN 990058	I	not required
	Rocker switch	pure white (RAL 9010) glossy	JZ-003.000 (50 x 50, glossy)	UN 990038	I	0282 112
	S-Color	pure white (RAL 9010) glossy	JZ-003.000 (50 x 50, glossy)	UN 990038	I	0282 40
	Standard 55 / Event / Esprit / ClassiX	cream white (RAL 1013) glossy	JZ-003.110 (55 x 55, glossy)	UN 990063	I	not required
	Rocker switch	cream white (RAL 1013) glossy	JZ-003.010 (50 x 50, glossy)	UN 990048	I	(discontinued 2013)

(triple switch, LED)

*) must be ordered from switch manufacturer or electronics wholesaler

**) for GIRA rocker switches, there are also 55 x 55 insert frames (for the use of alre 55 x 55 cover set) – GIRA item no. 0289 112 (pure white) and 0289 111 (cream white)

Product finder for alre cover sets for switches from JUNG

Integration examples

FTR … in AS 500

FTR … in A 500

FTR … in A plus

FTR … in A creation

FTR … in LS-design

Type alre	Jung range	Colour (RAL) / surface finish	alre cover set	Cover set Item no.	PG	insert frame 50 x 50 *
FTR 101.000#00 FTR 101.002#00 FTR 101.010#00 FTR 101.086#00 FTR 101.202#00 FTR 101.210#00	**AS 500 / A 500 / A creation / A plus**	alpine white (RAL 9010) glossy	JZ-001.100 (55 x 55, glossy)	UN 990050	I	not required
	CD 500 / CD plus	alpine white (RAL 9010) glossy	JZ-001.000 (50 x 50, glossy)	UN 990035	I	CD 590 Z WW
	LS 990 / LS design / LS plus	alpine white (RAL 9010) glossy	JZ-001.000 (50 x 50, glossy)	UN 990035	I	LS 961 Z WW **
 standard (without switch)	**AS 500**	white (RAL 1013) glossy	JZ-001.110 (55 x 55, glossy)	UN 990060	I	not required
	CD 500 / CD plus	white (RAL 1013) glossy	JZ-001.010 (50 x 50, glossy)	UN 990045	I	590 Z
	LS 990 / LS design / LS plus	white (RAL 1013) glossy	JZ-001.010 (50 x 50, glossy)	UN 990045	I	LS 961 Z**

Type alre	Jung range	Colour (RAL) / surface finish	alre cover set	Cover set Item no.	PG	insert frame 50 x 50 *
FTR 101.062#00 FTR 101.262#00	**AS 500 / A 500 / A creation / A plus**	alpine white (RAL 9010) glossy	JZ-002.100 (55 x 55, glossy)	UN 990051	I	not required
	CD 500 / CD plus	alpine white (RAL 9010) glossy	JZ-002.000 (50 x 50, glossy)	UN 990036	I	CD 590 Z WW
	LS 990 / LS design / LS plus	alpine white (RAL 9010) glossy	JZ-002.000 (50 x 50, glossy)	UN 990036	I	LS 961 Z WW **
 (ON / OFF switch, LED)	**AS 500**	white (RAL 1013) glossy	JZ-002.110 (55 x 55, glossy)	UN 990061	I	not required
	CD 500 / CD plus	white (RAL 1013) glossy	JZ-002.010 (50 x 50, glossy)	UN 990046	I	590 Z
	LS 990 / LS design / LS plus	white (RAL 1013) glossy	JZ-002.010 (50 x 50, glossy)	UN 990046	I	LS 961 Z**

Type alre	Jung range	Colour (RAL) / surface finish	alre cover set	Cover set Item no.	PG	insert frame 50 x 50 *
FTR 101.065#00	**AS 500 / A 500 / A creation / A plus**	alpine white (RAL 9010) glossy	JZ-004.100 (55 x 55, glossy)	UN 990052	I	not required
	CD 500 / CD plus	alpine white (RAL 9010) glossy	JZ-004.000 (50 x 50, glossy)	UN 990037	I	CD 590 Z WW
	LS 990 / LS design / LS plus	alpine white (RAL 9010) glossy	JZ-004.000 (50 x 50, glossy)	UN 990037	I	LS 961 Z WW **
 (H / C switch)	**AS 500**	white (RAL 1013) glossy	JZ-004.110 (55 x 55, glossy)	UN 990062	I	not required
	CD 500 / CD plus	white (RAL 1013) glossy	JZ-004.010 (50x50, glossy)	UN 990047	I	590 Z
	LS 990 / LS design / LS plus	white (RAL 1013) glossy	JZ-004.010 (50x50, glossy)	UN 990047	I	LS 961 Z**

Type alre	Jung range	Colour (RAL) / surface finish	alre cover set	Cover set Item no.	PG	insert frame 50 x 50 *
FTR 101.075#00	**AS 500 / A 500 / A creation / A plus**	alpine white (RAL 9010) glossy	JZ-003.100 (55 x 55, glossy)	UN 990053	I	not required
	CD 500 / CD plus	alpine white (RAL 9010) glossy	JZ-003.000 (50 x 50, glossy)	UN 990038	I	CD 590 Z WW
	LS 990 / LS design / LS plus	alpine white (RAL 9010) glossy	JZ-003.000 (50 x 50, glossy)	UN 990038	I	LS 961 Z WW **
 (triple switch, LED)	**AS 500**	white (RAL 1013) glossy	JZ-003.110 (55 x 55, glossy)	UN 990063	I	not required
	CD 500 / CD plus	white (RAL 1013) glossy	JZ-003.010 (50 x 50, glossy)	UN 990048	I	590 Z
	LS 990 / LS design / LS plus	white (RAL 1013) glossy	JZ-003.010 (50 x 50, glossy)	UN 990048	I	LS 961 Z**

*) must be ordered from switch manufacturer or electronics wholesaler
**) for the Jung LS series, there are also 55 x 55 insert frames (for the use of alre 55 x 55 cover set) – JUNG item no. LS 961 Z5 WW (alpine white) and LS 961 Z5 (white)

Product finder for alre cover sets for switches from MERTEN

Integration examples

FTR ... in 1-M

FTR ... in M-Smart

FTR ... in M-Plan

FTR ... in Artec

FTR ... in Antik

Type alre	Merten range	Colour (RAL) / surface finish	alre cover set	Cover set Item no.	PG	insert frame 50 x 50 *
FTR 101.000#00 FTR 101.002#00 FTR 101.010#00 FTR 101.086#00 FTR 101.202#00 FTR 101.210#00	**1-M, Atelier-M / M-Smart, M-Pure, M-Plan, M-Creativ**	polar white (RAL 9010) glossy	JZ-001.100 (55 x 55, glossy)	UN 990050	I	not required
	1-M, Atelier-M / M-Smart, M-Pure, M-Plan, M-Creativ	polar white (RAL 9010) matt	JZ-001.101 (55 x 55, matt)	UN 990055	I	not required
	1-M, Atelier-M / M-Smart, M-Pure, M-Plan, M-Creativ	active white (RAL 9016) glossy	JZ-001.120 (55 x 55, glossy)	UN 990086	I	not required
	System Design: Artec, Antik	polar white (RAL 9010) glossy	JZ-001.000 (50 x 50, glossy)	UN 990035	I	5160 99
	1-M, Atelier-M / M-Smart, M-Pure, M-Plan, M-Creativ	white (RAL 1013) glossy	JZ-001.110 (55 x 55, glossy)	UN 990060	I	not required
	System Design: Artec, Antik	white (RAL 1013) glossy	JZ-001.010 (50 x 50, glossy)	UN 990045	I	5160 94

standard (without switch)

Type alre	Merten range	Colour (RAL) / surface finish	alre cover set	Cover set Item no.	PG	insert frame 50 x 50 *
FTR 101.062#00 FTR 101.262#00	**1-M, Atelier-M / M-Smart, M-Pure, M-Plan, M-Creativ**	polar white (RAL 9010) glossy	JZ-002.100 (55 x 55, glossy)	UN 990051	I	not required
	1-M, Atelier-M / M-Smart, M-Pure, M-Plan, M-Creativ	polar white (RAL 9010) matt	JZ-002.101 (55 x 55, matt)	UN 990056	I	not required
	1-M, Atelier-M / M-Smart, M-Pure, M-Plan, M-Creativ	active white (RAL 9016) glossy	JZ-002.120 (55 x 55, glossy)	UN 990088	I	not required
	System Design: Artec, Antik	polar white (RAL 9010) glossy	JZ-002.000 (50 x 50, glossy)	UN 990036	I	5160 99
	1-M, Atelier-M / M-Smart, M-Pure, M-Plan, M-Creativ	white (RAL 1013) glossy	JZ-002.110 (55 x 55, glossy)	UN 990061	I	not required
	System Design: Artec, Antik	white (RAL 1013) glossy	JZ-002.010 (50 x 50, glossy)	UN 990046	I	5160 94

(ON / OFF switch, LED)

Type alre	Merten range	Colour (RAL) / surface finish	alre cover set	Cover set Item no.	PG	insert frame 50 x 50 *
FTR 101.065#00	**1-M, Atelier-M / M-Smart, M-Pure, M-Plan, M-Creativ**	polar white (RAL 9010) glossy	JZ-004.100 (55 x 55, glossy)	UN 990052	I	not required
	1-M, Atelier-M / M-Smart, M-Pure, M-Plan, M-Creativ	polar white (RAL 9010) matt	JZ-004.101 (55 x 55, matt)	UN 990057	I	not required
	1-M, Atelier-M / M-Smart, M-Pure, M-Plan, M-Creativ	active white (RAL 9016) glossy	JZ-004.120 (55 x 55, glossy)	UN 990089	I	not required
	System Design: Artec, Antik	polar white (RAL 9010) glossy	JZ-004.000 (50 x 50, glossy)	UN 990037	I	5160 99
	1-M, Atelier-M / M-Smart, M-Pure, M-Plan, M-Creativ	white (RAL 1013) glossy	JZ-004.110 (55 x 55, glossy)	UN 990062	I	not required
	System Design: Artec, Antik	white (RAL 1013) glossy	JZ-004.010 (50x50, glossy)	UN 990047	I	5160 94

(H / C switch)

Type alre	Merten range	Colour (RAL) / surface finish	alre cover set	Cover set Item no.	PG	insert frame 50 x 50 *
FTR 101.075#00	**1-M, Atelier-M / M-Smart, M-Pure, M-Plan, M-Creativ**	polar white (RAL 9010) glossy	JZ-003.100 (55 x 55, glossy)	UN 990053	I	not required
	1-M, Atelier-M / M-Smart, M-Pure, M-Plan, M-Creativ	polar white (RAL 9010) matt	JZ-003.101 (55 x 55, matt)	UN 990058	I	not required
	1-M, Atelier-M / M-Smart, M-Pure, M-Plan, M-Creativ	active white (RAL 9016) glossy	JZ-003.120 (55 x 55, glossy)	UN 990090	I	not required
	System Design: Artec, Antik	polar white (RAL 9010) glossy	JZ-003.000 (50 x 50, glossy)	UN 990038	I	5160 99
	1-M, Atelier-M / M-Smart, M-Pure, M-Plan, M-Creativ	white (RAL 1013) glossy	JZ-003.110 (55 x 55, glossy)	UN 990063	I	not required
	System Design: Artec, Antik	white (RAL 1013) glossy	JZ-003.010 (50 x 50, glossy)	UN 990048	I	5160 94

(triple switch, LED)

*) must be ordered from switch manufacturer or electronics wholesaler
Note: Merten central plates cannot be used with alre FTR.

Electronic room temperature controller with timer HTRRUu

Flush-mounted installation – Design Berlin UP

Technical data

Design:	Berlin UP (flush-mounted)
Housing material:	PC, PMMA, ABS plastic
Operating voltage:	230 VAC, 50 Hz
Storage temperature:	–20 … +70 °C
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Electrical connection:	pluggable screw terminals
Mounting / attachment:	in flush-mounted socket, can be adapted to fit virtually any switch range (deep flush-mounted socket recommended), see adaptation list on page 43
Protection rating:	IP 30
Protection class:	II, if properly mounted
Safety and EMC:	according to DIN EN 60730
Max. switching current:	10 (2) A
Max. switching voltage:	230 VAC, 50 Hz
Min. switching voltage:	230 VAC, 50 Hz
Switching power:	2300 W
Switching element:	relay
Switching contact:	NO contact
Output signal:	230 VAC, 50 Hz
Sensor:	internal NTC, optional external NTC
Sensor rupture and short-circuit safeguarding:	If the internal or external sensor is faulty or the external sensor is not connected in the functions room temperature controller with floor monitoring or floor temperature controller, emergency operation is triggered.
Control function:	heating
Control range:	5 … 30 °C (room) / 10 … 42 °C (floor)
Setting range:	The setting range varies, depending on the use of the controller as a room temperature controller (5 … 30 °C) or floor temperature controller (10 … 42 °C)
Hysteresis:	for room control < 1 K, for floor control < 2 K
Display type:	illuminated graphical display
Display:	setpoint, actual temperature / date, time; setpoint, actual temperature or date, time
Accessories:	terminal strips: VOOPL / VOOPD suitable valve actuators: ZBOOA-010.100

Application

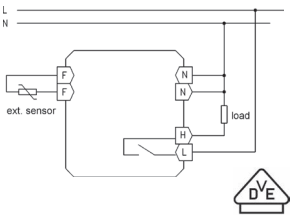
Flush-mounted controller for time-dependent single room or floor temperature control for electrical and hot water heating systems (normally closed actuators). The device can be used as a room temperature controller or, in combination with an optional remote sensor, also as a room temperature controller with floor monitoring or floor temperature controller. (Remote sensor is not a part of the scope of delivery)

This timer thermostat has a weekly timer with individually adjustable programs (factory setting: “normal” daily sequences.

Self-learning function: Automatic adjustment of the controller to the start of the heating period. The goal is to achieve the comfort temperature at the time that has been set. The learning function is disabled upon delivery, but it can be enabled.

OFF function: This function disables the control; frost protection is still ensured.

General features:
ECO function, ECO value adjustable; “ECO” display; “on / off” display; “heating” display; digital actual value display; backlighting; operating mode off with frost protection monitoring; child-safe features; load setting; power reserve (approx. 5 days); actual value correction / measured value correction; learning function; valve protection; holiday setting; party setting; external setting; operation using direct-dial buttons; VDE-tested

Type / image	Item no.	Features	Circuit diagram	PG
HTRRUu-210.021#21 	UA060000	Scope of delivery: controller, cover 50 x 50 mm, **pure white** (like RAL 9010), **glossy, alre frame** “Berlin”		I
HTRRUu-210.021#21 / 7 	UN060011	like HTRRUu-210.021#21, but with scope of delivery: controller, cover **50 x 50** mm, **pure white** (like RAL 9010), **glossy, alre frame** “Berlin”, **external floor sensor** (HF-8 / 4-K2)		I
HTRRUu-210.021#07 	UA060001	like HTRRUu-210.021#21, but with scope of delivery: controller, cover **50 x 50** mm, **pure white** (like RAL 9010), **glossy,** without frame		I

Electronic room temperature controller with timer HTRRUu

Flush-mounted installation – Design Berlin UP

Type / image	Item no.	Features	Circuit diagram	PG
HTRRUu-210.021#09 	UA060002	like HTRRUu-210.021#21, but with scope of delivery: controller, cover **50 x 50** mm, **pearl white** (like RAL 1013), **glossy,** without frame		I
HTRRUu-210.021#27 	UA060003	like HTRRUu-210.021#21, but with scope of delivery: controller, cover **50 x 50** mm, **traffic white** (like RAL 9016), **glossy,** without frame		I
HTRRUu-210.021#28 	UA060006	like HTRRUu-210.021#21, but with scope of delivery: controller, cover for use with **BUSCH-JAEGER Reflex SI / SI Linear pure white** (similar to RAL 9010), **glossy,** without frame		I
HTRRUu-210.021#55 	UA060004	like HTRRUu-210.021#21, but with scope of delivery: Controller, cover **55 x 55** mm, **pure white** (like RAL 9010), **glossy,** without frame		I
HTRRUu-210.021#56 	UA060020	like HTRRUu-210.021#21, but with scope of delivery: Controller, cover 55 x 55 mm, **pure white** (like RAL 9010), **matt,** without frame		I
HTRRUu-210.021#57 	UA060005	like HTRRUu-210.021#21, but with scope of delivery: controller, cover **55 x 55** mm, **pearl white** (like RAL 1013), **glossy,** without frame		I
HTRRUu-210.021#59 	UA060014	like HTRRUu-210.021#21, but with scope of delivery: controller, cover **55 x 55** mm, **traffic white** (like RAL 9016), **glossy,** without frame		I

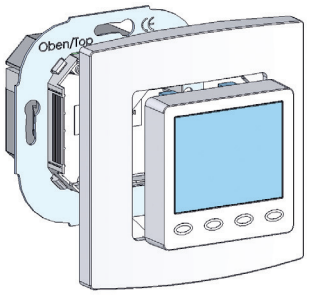
Accessories	Item no.	Features	PG
HF-8 / 4-K2 	G8000370	**General features:** optional, external floor sensor **Ambient temperature:** – 5 … + 70 °C **Protection rating:** IP 65 **Sensor:** NTC **Connecting cable:** 4 m, PVC	II
HF-8 / 6-K2 	G8000368	**General features:** optional, external floor sensor **Ambient temperature:** – 5 … + 70 °C **Protection rating:** IP 65 **Sensor:** NTC **Connecting cable:** 6 m, PVC	II
WP-01	G9990180	**General features:** heat conduction paste 2 ml; R > 1 TΩ / cm, silicon-free **Ambient temperature:** – 40 … + 150 °C **Heat conductivity:** > 0.7 W / mK	II
THF 	C1809515	**General features:** protective sleeve for screed mounting (for sleeve sensor HF Ø 7.7, for example, HF-8 / 4-K2 or HF-8 / 6-K2), copper	II
JZ-090.900 	VV000025	**General features:** alre frame “Berlin” (neutral) for all flush-mounted controllers with cover 50 x 50 mm **Design:** Berlin **Surface finish:** glossy **Housing colour:** pure white like RAL 9010 **Housing material:** PC plastic	II

Electronic room temperature controller with timer HTRRUu

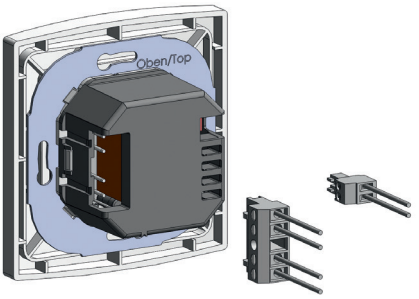
Flush-mounted installation – Design Berlin UP

Accessories	Item no.	Features	PG
JZ-090.910	VV000010	**General features:** alre frame “Berlin” (neutral) for all flush-mounted controllers with cover 50 x 50 mm **Design:**Berlin **Surface finish:** glossy **Housing colour:** pearl white like RAL 1013 **Housing material:** PC plastic	II

HTRRUu with alre frame “Berlin”



pluggable screw-type terminals



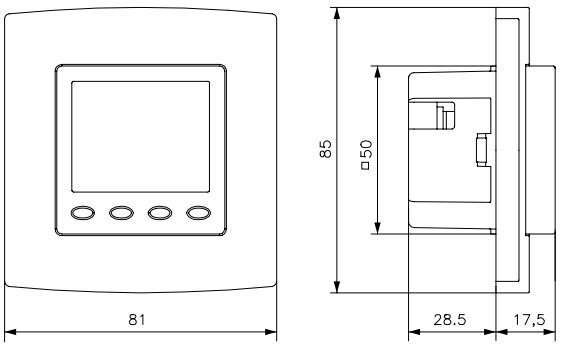
other benefits:

- Pluggable screw-type terminals facilitate quick and easy assembly
- Illuminated, graphics-capable display
- Choice of four different external sensors (2, 12, 15, 33 kOhm), thus also ideal for retrofitting
- VDE mark
- Automatic adjustment to standard/daylight savings time
- Learning function
- Correction of measurement values
- Configurable display content during installation, choice of various languages: German, English, French, Dutch, Polish, Spanish, Czech, Russian
- Limit setting for floor temperature
- OFF frost protection function
- Key lock
- Valve protection function
- Configurable control method (PI-PWM or 2-point control)
- Holiday and party function
- Power reserve
- “Heating operation” display (LED orange)
- Load setting for improved control

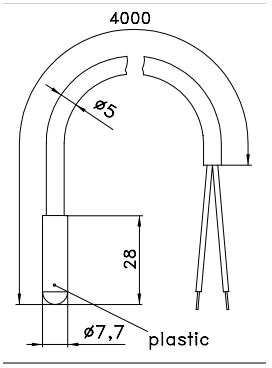
Factory setting:

- Holiday temperature 17 °C,
- Setback temperature 17 °C,
- Comfort temperature 20 °C,
- Comfort times: Mon – Fri 5 am – 9 am/4 pm – 10 pm, Sat/Sun 6 am – 10 pm
- Key lock disabled
- Automatic adjustment to standard/daylight savings time enabled
- Valve and pump protection disabled
- Learning function disabled
- Display lighting 10 s
- Heating load 0.1 kW
- 2-point control method
- External sensor
- 2 kOhm and max. floor temperature 42 °C (if configured as floor temperature controller)

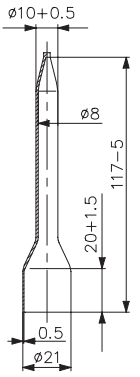
HTRRUu with alre frame “Berlin”



HF-8/4-K2



THF



Examples of integration in switches with or without insert frame

Adaptation of alre flush-mounted HTRRUu-210.021 controllers

Manufacturer	Range	Colour RAL 9010 (surface finish)	Adaptation in switch range “55 x 55” possible using …	“50 x 50” adaptation possible with … (insert frame from manufacturer required)
BERKER	S.1	polar white (matt)	HTRRUu-210.021#56	not required
BERKER	S.1	polar white (glossy)	HTRRUu-210.021#55	not required
BERKER	Arsys	polar white (glossy)		HTRRUu-210.021#07 + (1108 01 69)
BERKER	B.3	aluminium/polar white (matt)	HTRRUu-210.021#56	not required
BERKER	B.3	aluminium/polar white (glossy)	HTRRUu-210.021#55	not required
BERKER	B.7	glass/polar white (matt)	HTRRUu-210.021#56	not required
BERKER	B.7	glass/polar white (glossy)	HTRRUu-210.021#55	not required
BERKER	K.1	polar white (glossy)		HTRRUu-210.021#07 + (1108 71 09)
BUSCH-JAEGER	Reflex SI/SI Linear	alpine white (glossy)	HTRRUu-210.021#28	not required
BUSCH-JAEGER	Busch-balance SI	polar white (glossy)	HTRRUu-210.021#55	not required
BUSCH-JAEGER	impuls	alpine white (glossy)		HTRRUu-210.021#07 + (1746/10-74)
BUSCH-JAEGER	solo / future / axcent etc.	studio white – see RAL 9016 below		
GIRA	rocker switch	pure white (glossy)		HTRRUu-210.021#07 + (0282 112)
GIRA (System 55)	Standard/E 2	pure white (semi-gloss)	HTRRUu-210.021#56	not required
GIRA (System 55)	Standard/E 2	pure white (glossy)	HTRRUu-210.021#55	not required
GIRA (System 55)	E 22	pure white (glossy)	HTRRUu-210.021#55	not required
GIRA (System 55)	Event	pure white (semi-gloss) + opaque …	HTRRUu-210.021#56	not required
GIRA (System 55)	Event	pure white (glossy) + opaque …	HTRRUu-210.021#55	not required
GIRA (System 55)	Esprit	pure white (semi-gloss) + glass, aluminium …	HTRRUu-210.021#56	not required
GIRA (System 55)	Esprit	pure white (glossy) + glass, aluminium …	HTRRUu-210.021#55	not required
GIRA	S-Color	pure white (high-gloss)		HTRRUu-210.021#07 + (0282 40)
JUNG	CD 500/CD plus	alpine white (glossy)		HTRRUu-210.021#07 + (CD 590 Z WW)
JUNG	A 500/AS 500/A plus	alpine white (glossy)	HTRRUu-210.021#55	not required
JUNG	LS 990	alpine white (glossy)		HTRRUu-210.021#07 + (LS 961 Z WW)
JUNG	LS plus	alpine white (glass)		HTRRUu-210.021#07 + (LS 961 Z WW)
JUNG	A creation	alpine white (glossy)	HTRRUu-210.021#55	not required
JUNG	LS Design	alpine white (glossy)		HTRRUu-210.021#07 + (LS 961 Z WW)
MERTEN (System M)	M-Smart, Arc, Plan, Star	polar white (matt)	HTRRUu-210.021#56	not required
MERTEN (System M)	M-Smart, Arc, Plan, Star, M-Creativ, M-Pure	polar white (glossy)	HTRRUu-210.021#55	not required
MERTEN (System Basis)	1-M/Atelier-M	polar white (glossy)	HTRRUu-210.021#55	not required
MERTEN (System Design)	Artec/Trancent/Antik	polar white (glossy)		HTRRUu-210.021#07 + (5160 99)
MERTEN	1-M/M-Smart/M-Plan/M-pure etc.	active white – see RAL 9016 below		
PEHA	Standard	pure white (glossy)		HTRRUu-210.021#07 + (80.670.02 ZV)
PEHA	Dialog	pure white (glossy)		HTRRUu-210.021#07 + (95.670.02 ZV)
PEHA	Aura	pure white (matt)/glass		HTRRUu-210.021#07 + (20.670.02 ZV)
PEHA	Badora	pure white (glossy)		HTRRUu-210.021#07 + (11.670.02 ZV)

Manufacturer	Range	Colour RAL 9016 (surface finish)	Adaptation in switch range “55 x 55” possible using …	“50 x 50” adaptation possible with … (insert frame from manufacturer required)
BUSCH-JAEGER	solo/future/future linear	studio white (RAL 9016, glossy)		HTRRUu-210.021#27 + (1746/10-84)
BUSCH-JAEGER	axcent	studio white (RAL 9016, glossy)		HTRRUu-210.021#27 + (1746/10-84)
BUSCH-JAEGER	carat (glass, bronze, gold)	studio white (RAL 9016, glossy)		HTRRUu-210.021#27 + (1746/10-84)
BUSCH-JAEGER	alpha (nea/exclusive*)	studio white (RAL 9016, glossy)		HTRRUu-210.021#27 + (1746/10-24G)
MERTEN	M-Smart, Plan	active white (RAL 9016, glossy)	HTRRUu-210.021#59	not required
MERTEN	1-M/Atelier-M	active white (RAL 9016, glossy)	HTRRUu-210.021#59	not required
PEHA	Standard	arctic		HTRRUu-210.021#27 + (D 80.670 ZV AW)

*) During assembly, you need to remove four plastic tabs located at the rear of the frame

NOTE: Most light switch ranges are designed in the colour “like RAL 9010”, although different switch manufacturers have different designations for this colour. Coloured, glass and aluminium frames are also combined with white jacks or plugs so that controllers with white covers can also be integrated into these frames. Check the precise application in each individual case. The frames have different surface qualities (matt/glossy). For design reasons, the cover of the controller should have the same quality as the frame. We accept no liability for slight variations in colour and surface finish or for accuracy of fit. When installing devices into multi frames, always assemble the temperature controllers at the lowermost position.

“50 x 50 controller”: The housing covers of the 50 x 50 controllers are 50 x 50 mm in size. Using a 50 x 50-mm insert frame, the 50 x 50 controllers can be integrated into nearly all light switch ranges in accordance with DIN 49075. The 50 x 50-mm insert frames must be ordered from the light switch manufacturer or from a wholesaler. The order number of the insert frame corresponding to the switch range in question can be found in the column “For adaptation of size ‘50 x 50’ HTRRUu”.

“55 x 55 controller”: The housing covers of the 55 x 55 controllers are 55 x 55 mm in size. Many light switch ranges have inner dimensions of 55 x 55 mm. Therefore, the 55 x 55 controllers can be installed directly in the light switch frame without the use of an insert frame. See the column “Adaptation with switch range (55 x 55)” to determine whether the 55 x 55 controller fits in the given light switch range (HTRRUu-210.021#xx).

All information regarding switch manufacturers’ product lines and item numbers was last updated in 12/2015 | No liability is assumed for the information provided. | Technical specifications subject to change.
An adaptation list for RAL 1013 switch ranges is available from our website at www.alre.de.

Electronic floor or surface temperature controller with remote sensor (for floor heating / wall and ceiling heating / tiled stove) HTRRB

Surface-mounted installation – Design Berlin 2000

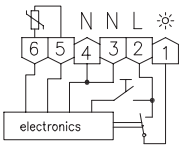
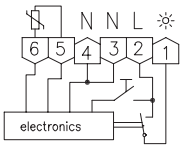
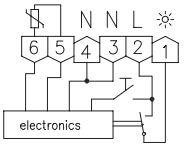
Technical data	
Design:	Berlin 2000
Surface finish:	matt
Housing colour:	pure white, like RAL 9010
Housing material:	ABS plastic
Operating voltage:	230 VAC, 50 Hz
Ambient temperature:	0 … 30 °C
Storage temperature:	– 20 … + 70 °C
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Electrical connection:	screw-type terminals
Mounting / attachment:	surface- / wall-mounting (4-hole assembly on flush-mounted socket)
Protection rating:	IP 30
Protection class:	II, if properly mounted
Safety and EMC:	according to DIN EN 60730
Max. switching current:	13 (2) A
Max. switching voltage:	230 VAC, 50 Hz
Min. switching voltage:	230 VAC, 50 Hz
Switching power:	3000 W
Switching element:	relay
Switching contact:	NO contact
Output signal:	230 VAC, 50 Hz
Sensor:	external, NTC
Sensor rupture and short-circuit safeguarding:	heating is switched off
Control function:	heating
Hysteresis:	approx. 1 K
General features:	“heating” display: mechanical range limitation; 3000 W switching power for electric direct heating systems, natural stone heating; “on / off” switch; external setting

Application

Temperature control (e.g., of electrical heating systems) for floor, fringe zone, bathroom, ceiling, tiled stove, marble and wall heating systems or tempering systems.

Note: The sensor line is to be routed in a protective duct. Parallel routing together with lines that carry AC voltage is not permissible.

Floor temperature controller with timer: HTRRBu-110.021
Floor temperature controller for distributor assembly:
ITR 79 series (industrial engineering)

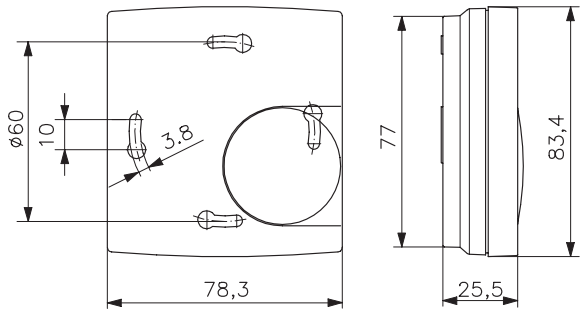
Type / image	Item no.	Features	Circuit diagram	PG
HTRRB-010.310 	DA400003	**General features:** Floor temperature controller with remote sensor HF-8 / 4-K2 4 m **Control range:** 10 … 42 °C **Operating elements:** Multi-digit display 1 … 4		I
HTRRB-011.010 	DA400000	**General features:** Floor temperature controller with remote sensor HF-8 / 4-K2 4 m, multi-digit display 1 … 6 **Control range:** 10 … 60 °C		I
HTRRB-011.410 	DA400100	**General features:** tiled stove surface temperature controller with remote sensor HF-5 / 4-K3 4 m; scale: degrees Celsius; threshold arrow **Control range:** 20 … 80 °C		I

Electronic floor or surface temperature controller with remote sensor (for floor heating / wall and ceiling heating / tiled stove) HTRRB

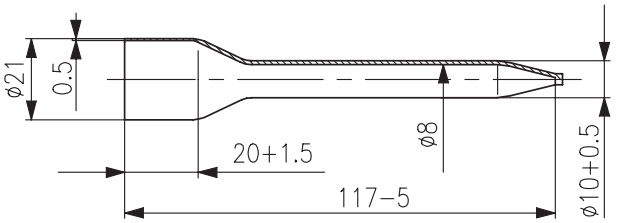
Surface-mounted installation – Design Berlin 2000

Accessories	Item no.	Features	PG
HF-8/4-K2 	G8000370	**General features:** Spare sensor for HTRRB-010.310, HTRRB-011.010 **Ambient temperature:** –5 … +70 °C **Protection rating:** IP 65 **Sensor:** NTC **Connecting cable:** 4 m, PVC	II
HF-8/6-K2 	G8000368	**General features:** Spare sensor for HTRRB-010.310, HTRRB-011.010 **Ambient temperature:** –5 … +70 °C **Protection rating:** IP 65 **Sensor:** NTC **Connecting cable:** 6 m, PVC	II
HF-5/4-K3 	D4771304	**General features:** Spare sensor for HTRRB-011.410 **Ambient temperature:** –50 … +150 °C **Protection rating:** IP 65 **Sensor:** NTC **Connecting cable:** 4 m, silicone, H05SS-F <VDE> 2x0.75 mm²	II
WP-01	G9990180	**General features:** Heat conduction paste 2 ml; R > 1 TΩ/cm, silicon-free Heat conductivity: > 0.7 W/mK **Ambient temperature:** –40 … +150 °C	II
THF 	C1809515	**General features:** protective sleeve for screed mounting (for sleeve sensor HF Ø 7.7, for example, HF-8/4-K2 or HF-8/6-K2), copper	II

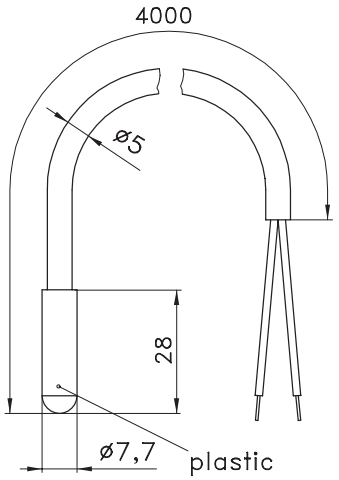
HTRRB



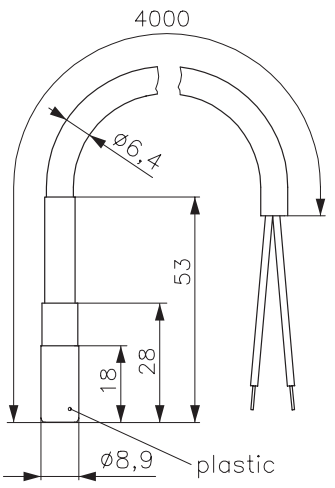
THF



HF-8/4-K2



HF-5/4-K3



Electronic floor or surface temperature controller with timer and remote sensor (for floor heating / wall and ceiling heating) HTRRBu

Surface-mounted installation – Design Berlin 3000

Technical data

Design:	Berlin 3000
Surface finish:	matt
Housing colour:	pure white, like RAL 9010
Housing material:	ABS plastic
Operating voltage:	230 VAC, 50 Hz
Ambient temperature:	0 … 30 °C
Storage temperature:	– 20 … + 70 °C
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Electrical connection:	screw-type terminals 0.5 … 1.5 mm²
Mounting / attachment:	Surface- / wall-mounting or by means of adapter plate on flush-mounted socket
Protection rating:	IP 30
Protection class:	II, if properly mounted
Safety and EMC:	according to DIN EN 60730
Max. switching current:	heating (terminal 4) 13 (2) A, timer output (terminal 3) 100 mA
Max. switching voltage:	230 VAC, 50 Hz
Min. switching voltage:	230 VAC, 50 Hz
Switching power:	terminal 4: 3000 W, terminal 3: 23 W
Switching element:	relay
Switching contact:	NO contact
Output signal:	switching (230 VAC, 50 Hz)
Sensor:	external, NTC
Control function:	heating
Control range:	10 … 42 °C
Hysteresis:	approx. 1 K
Display type:	symbol display
Output “temperature reduction”:	switching (230 VAC, 50 Hz), for pilot function

Application

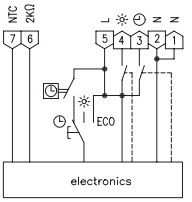
Time-dependent temperature control (for example, of electrical heating systems) for floor, fringe zone, bathroom, ceiling, tiled stove, marble and wall heating systems or tempering systems.

It can be used as a master (pilot regulator) for the temperature reduction of other controllers. Controllers of the series FETR, FTR and RTBSB are suitable as slaves (satellite controllers).

Note: The sensor line is to be routed in a protective duct. Parallel routing together with lines that carry AC voltage is not permissible.

Programming procedures for every day, familiar from mechanical timers, by means of “electronic tabs”. Shortest switching time 15 min.

General features:
Pilot function; ECO function; ECO value adjustable; display “ECO”; display “On / Off”; display “Heating”; child-safe features; power reserve (approx. 4 – 7 days); learning function; valve protection; holiday setting; party setting; automatic adjustment to standard / daylight savings time; mechanical range limitation; reduction / comfort / automatic button; external setting; operation using direct-dial buttons; on / off button; information button; party function button; holiday setting button

Type / image	Item no.	Features	Circuit diagram	PG
HTRRBu-110.017 	MA600100			I
HTRRBu-110.021 	MA600400	like HTRRBu-110.017, but with backlighting		I

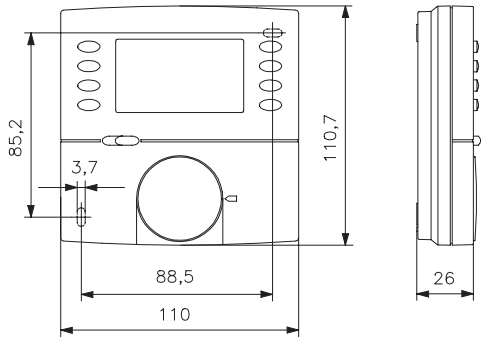
Accessories: terminal strips: VOOPL / VOOPD, suitable valve actuators: ZBOOA-010.100

Electronic floor or surface temperature controller with timer and remote sensor (for floor heating / wall and ceiling heating) HTRRBu

Surface-mounted installation – Berlin 3000

Accessories	Item no.	Features	PG
JZ-17 	MN990001	**General features:** adapter plate for mounting devices on flush-mounted sockets (including fastening screws for mounting the controller to the adapter plate) **Surface finish:** matt **Housing colour:** pure white like RAL 9010 **Housing material:** ABS plastic	II
HF-8/4-K2 	G8000370	**General features:** spare sensor for HTRRBu-110.017, HTRRBu-110.021 **Ambient temperature:** –5 … +70 °C **Protection rating:** IP 65 **Sensor:** NTC **Connecting cable:** 4 m, PVC	II
HF-8/6-K2 	G8000368	**General features:** spare sensor for HTRRBu-110.017, HTRRBu-110.021 **Ambient temperature:** –5 … +70 °C **Protection rating:** IP 65 **Sensor:** NTC **Connecting cable:** 6 m, PVC	II
WP-01	G9990180	**General features:** heat conduction paste 2 ml; R > 1 TΩ/cm, silicon-free **Ambient temperature:** –40 … +150 °C	II
THF 	C1809515	**General features:** protective sleeve for screed mounting (for sleeve sensor HF Ø 7.7, for example, HF-8/4-K2 or HF-8/6-K2), copper	II

HTRRBu-110.XXX

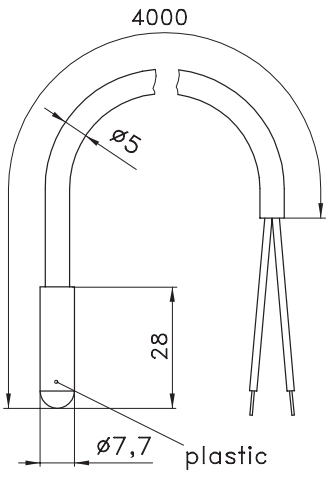


JZ-17

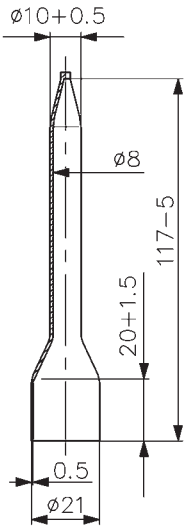
Factory setting:

- Setback temperature 1.7 °C
- Continuous time display
- Programme display using switching segments enabled
- Child-safe features disabled
- Automatic adjustment to standard/daylight savings time enabled
- Valve and pump protection disabled
- Learning function disabled
- Comfort times:
  Mon–Fri 5 am–9 am/4 pm–10 pm,
  Sat/Sun 6 am–10 pm
- Sensor rupture and short-circuit safeguarding:
  In case of a sensor rupture or sensor short-circuit, the heating is activated with a power-on time of 30% to prevent cooling or frost damage in the room. Temperatures below –20 °C are also evaluated as sensor rupture, and the emergency function is triggered.

HF-8/4-K2



THF



Electronic room temperature controller with timer and floor monitoring (for floor heating / wall and ceiling heating) HTRRBu

Surface-mounted installation – Design Berlin 3000

Technical data

Design:	Berlin 3000
Surface finish:	matt
Housing colour:	pure white, like RAL 9010
Housing material:	ABS plastic
Operating voltage:	230 VAC, 50 Hz
Ambient temperature:	0 … 30 °C
Storage temperature:	– 20 … + 70 °C
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Electrical connection:	screw-type terminals 0.5 … 1.5 mm²
Mounting / attachment:	surface- / wall-mounting or by means of an adapter plate on a flush-mounted socket
Protection rating:	IP 30
Protection class:	II, if properly mounted
Safety and EMC:	according to DIN EN 60730
Max. switching current:	heating (terminal 4) 8 (2) A, timer output (terminal 3) 100 mA
Max. switching voltage:	230 VAC, 50 Hz
Min. switching voltage:	230 VAC, 50 Hz
Switching power:	terminal 4: 1840 W, terminal 3: 23 W
Switching element:	relay
Switching contact:	NO contact
Output signal:	switching (230 VAC, 50 Hz)
Sensor:	internal and external (HF-8 / 4 K2 included in scope of delivery), NTC
Control function:	heating
Control range:	5 … 30 °C (room), 20 … 42 °C (floor temperature limiter)
Hysteresis:	approx. 1 K
Display type:	symbol display
Scope of delivery:	controller, external sensor HF-8 / 4 K2
Output “temperature reduction”:	switching (230 VAC, 50 Hz), for pilot function

Application

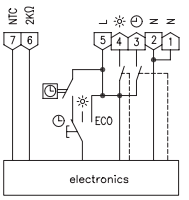
Time-dependent temperature control (for example, of electrical heating systems) for floor, fringe zone, bathroom, ceiling, tiled stove, marble and wall heating systems or tempering systems.

It can be used as a master (pilot regulator) for the temperature reduction of other controllers. Controllers of the series FETR, FTR and RTBSB are suitable as slaves (satellite controllers).

Note: The sensor line is to be routed in a protective duct. Parallel routing together with lines that carry AC voltage is not permissible.

Programming procedures for every day, familiar from mechanical timers, by means of “electronic tabs”. Shortest switching time 15 min.

General features:
pilot function; ECO function, ECO value adjustable; “ECO” display; “on / off” display; “heating” display; digital actual value display; child-safe features; load setting; power reserve (approx. 4 – 7 days); actual value correction / measured value correction; learning function; valve protection; holiday setting; party setting; automatic adjustment to standard / daylight savings time; mechanical range limitation; scale: degrees Celsius; reduction / comfort / automatic button; external setting; operation using direct-dial buttons; on / off button; information button; party function button; holiday setting button

Type / image	Item no.	Features	Circuit diagram	PG
HTRRBu-110.122 	MA600200			I
HTRRBu-110.123 	MA600500	like HTRRBu-110.122, but with backlighting		I

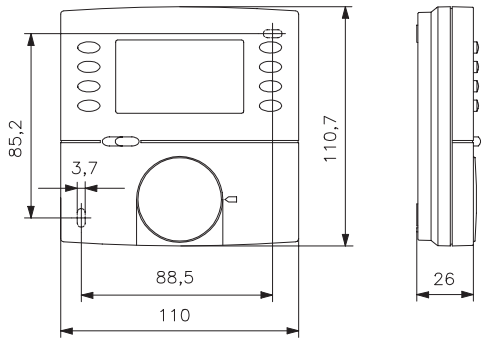
Accessories: terminal strips: VOOPL / VOOPD, suitable valve actuators: ZBOOA-010.100

Electronic room temperature controller with timer and floor monitoring (for floor heating / wall and ceiling heating) HTRRBu

Surface-mounted installation – Design Berlin 3000

Accessories	Item no.	Features	PG
JZ-17 	MN990001	**General features:** adapter plate for mounting devices on flush-mounted sockets (including fastening screws for mounting the controller on the adapter plate) **Surface finish:** matt **Housing colour:** pure white like RAL 9010 **Housing material:** ABS plastic	II
HF-8/4-K2 	G8000370	**General features:** spare sensor for HTRRBu-110.122, HTRRBu-110.123 **Ambient temperature:** –5 … +70 °C **Protection rating:** IP 65 **Sensor:** NTC **Connecting cable:** 4 m, PVC	II
HF-8/6-K2 	G8000368	**General features:** spare sensor for HTRRBu-110.122, HTRRBu-110.123 **Ambient temperature:** –5 … +70 °C **Protection rating:** IP 65 **Sensor:** NTC **Connecting cable:** 6 m, PVC	II
WP-01	G9990180	**General features:** heat conduction paste 2 ml; R > 1 TΩ/cm, silicon-free **Ambient temperature:** –40 … +150 °C	II
THF 	C1809515	**General features:** protective sleeve for screed mounting (for sleeve sensor HF Ø 7.7, for example, HF-8/4-K2 or HF-8/6-K2), copper	II

HTRRBu-110.XXX

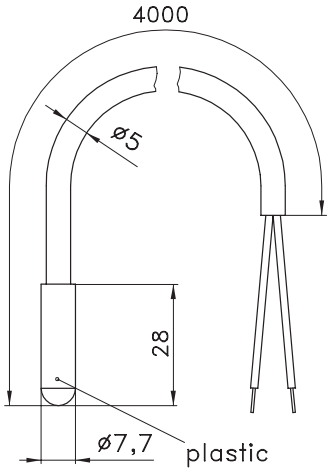


JZ-17

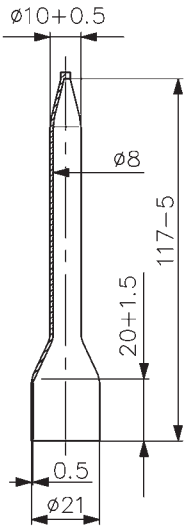
Factory setting:

- Setback temperature 1.7 °C
- Continuous time display
- Programme display using switching segments enabled
- Child-safe features disabled
- Automatic adjustment to standard/daylight savings time enabled
- Valve and pump protection disabled
- Learning function disabled
- Comfort times:
  Mon–Fri 5 am–9 am/4 pm–10 pm,
  Sat/Sun 6 am–10 pm
- Sensor rupture and short-circuit safeguarding:
  In case of a sensor rupture or sensor short-circuit, the heating is activated with a power-on time of 30% to prevent cooling or frost damage in the room. Temperatures below –20 °C are also evaluated as sensor rupture, and the emergency function is triggered.

HF-8/4-K2

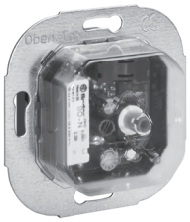


THF



Electronic floor or surface temperature controller with remote sensor (for floor heating / wall and ceiling heating) FETR

Flush-mounted installation – Design Berlin UP



Technical data

Design:	Berlin UP (flush-mounted)
Housing material:	PC plastic
Operating voltage:	230 VAC, 50 Hz
Storage temperature:	–20 … +70 °C
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Electrical connection:	screw-type terminals
Mounting / attachment:	in flush-mounted socket (deep flush-mounted socket recommended), adaptable with cover set 50 x 50 mm or 55 x 55 mm in almost all switch ranges
Protection rating:	IP 30
Protection class:	II, if properly mounted
Safety and EMC:	according to DIN EN 60730
Max. switching voltage:	230 VAC, 50 Hz
Min. switching voltage:	230 VAC, 50 Hz
Switching element:	relay
Switching contact:	NO contact
Output signal:	switching (230 VAC, 50 Hz)
Sensor:	external or internal / external (monitors)
Sensor type (external):	HF-8 / 4-K2
Sensor rupture and short-circuit safeguarding:	heating is switched off
Sensor wire extendable up to:	50 m with min. 0.5 mm² double-insulated
Control function:	heating
Hysteresis:	< 1 K
General features:	ECO function; “reduction” display; “heating” display
Input “temperature reduction”:	approx. 5 K (230 VAC, 50 Hz)

Application

Temperature control (e.g., of electrical heating systems) for floor, fringe zone, bathroom, ceiling, tiled stove, marble and wall heating systems or tempering systems, direct floor heating systems.

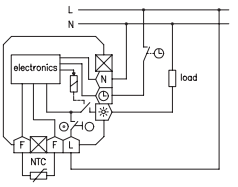
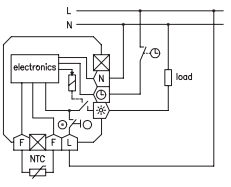
Reduction: With these flush-mounted controllers, the temperature can be reduced by 5 K. For this purpose, potential is applied to the timer input terminal by an external pilot controller or an external timer L1.

Note: The sensor line is to be routed in a protective duct. Parallel routing together with lines that carry alternating currents is not admissible.

The 55 x 55-mm variants visually fit perfectly without an insert frame in many switch ranges of 55 x 55 mm.

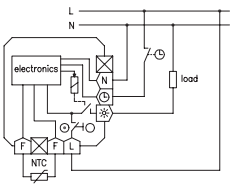
Using an insert frame, the 50 x 50-mm variants fit in almost all switch ranges.

Overview of possible combinations and insert frames on page 34.

Type / image	Item no.	Features	Circuit diagram	PG
FETR 101.700#07 	UN030000	**General features:** floor temperature controllers; internal setting; multi-digit display 1 … 6 **Ambient temperature:** 0 … 40 °C **Max. switching current:**16 (2) A **Switching power:** 3680 W **Control range:** 10 … 60 °C **Scope of delivery:** controller, remote sensor 4 m, cover 50 x 50 mm, pure white (like RAL 9010), glossy		I
FETR 101.715#00 	UA030119	**General features:** floor temperature controller; mechanical range limitation; **on / off switch;** external setting; protective cap; contact hazard protection cover plate; multi-digit display 1 … 5 **Ambient temperature:** 0 … 40 °C **Max. switching current:**16 (2) A **Switching power:** 3680 W **Control range:** 10 … 50 °C **Scope of delivery:** controller, remote sensor 4 m Cover sets are offered in various designs (see the separate overview, “alre flush-mounted range (cover sets)”) and are not included in the delivery. **Suitable set no: JZ-005.xxx, for example:** cover set 50 x 50 mm, pure white, glossy: JZ-005.000 cover set 55 x 55 mm, pure white, glossy: JZ-005.100		I

Electronic floor or surface temperature controller with remote sensor (for floor heating / wall and ceiling heating) FETR

Flush-mounted installation – Design Berlin UP

Type / image	Item no.	Features	Circuit diagram	PG
FETR 101.715#21 	UN030109	like FETR 101.715#00, but with scope of delivery: controller, remote sensor 4 m, alre frame “Berlin” (neutral), cover 50 x 50 mm, pure white (like RAL 9010), glossy		I
FETR 101.716#00 	UA030502	like FETR 101.715#00, but control range 0 … 42 °C (multi-digit display 1 … 4) Cover sets are offered in various designs (see the separate overview, “alre flush-mounted range (cover sets)”) and are not included in the delivery. **Suitable set no: JZ-009.xxx, e.g.:** cover set 50 x 50 mm, pure white, glossy: JZ-009.000 cover set 55 x 55 mm, pure white, glossy: JZ-009.100		I
FETR 101.716#21 	UN030500	like FETR 101.716#00, but with scope of delivery: controller, remote sensor 4 m, alre frame “Berlin” (neutral), cover 50 x 50 mm, pure white (like RAL 9010), glossy		I
FETR 101.745#00 	UA030412	**General features:** room temperature controller with floor monitoring; mechanical range limitation; multi-digit display * … 6; **on / off switch;** external setting; protective cap; contact hazard protection cover plate **Ambient temperature:** 0 … 30 °C **Max. switching current:** 10 (1.5) A **Switching power:** 2300 W **Control range:** 5 … 30 °C (room), 20 … 60 °C (internal scale for limiting the floor temperature) **Scope of delivery:** controller, remote sensor 4 m Cover sets are offered in various designs (see the separate overview, “alre flush-mounted range (cover sets)”) and are not included in the delivery. **Suitable set no: JZ-006.xxx, for example:** cover set 50 x 50 mm, pure white, glossy: JZ-006.000 cover set 55 x 55 mm, pure white, glossy: JZ-006.100		I
FETR 101.745#21 	UN030404	like FETR 101.745#00, but with scope of delivery: Controller, remote sensor 4 m, alre frame “Berlin” (neutral), cover 50 x 50 mm, pure white (like RAL 9010), glossy		I

Accessories	Item no.	Features	PG
HF-8 / 4-K2 	G8000370	**General features:** spare sensor for FETR 101.7xx **Ambient temperature:** – 5 … + 70 °C **Protection rating:** IP 65 **Sensor:** NTC **Connecting cable:** 4 m, PVC	II
HF-8 / 6-K2 	G8000368	**General features:** spare sensor for FETR 101.7xx **Ambient temperature:** – 5 … + 70 °C **Protection rating:** IP 65 **Sensor:** NTC **Connecting cable:** 6 m, PVC	II
WP-01	G9990180	**General features:** heat conduction paste 2 ml; R > 1 TΩ / cm, silicon-free **Ambient temperature:** – 40 … + 150 °C	II
THF 	C1809515	**General features:** protective sleeve for screed mounting (for sleeve sensor HF Ø 7.7, for example, HF-8 / 4-K2 or HF-8 / 6-K2), copper	II

Electronic floor or surface temperature controller with remote sensor (for floor heating / wall and ceiling heating) FETR

Flush-mounted installation – Design Berlin UP

Accessories	Item no.	Features	PG
JZ-090.900 	VV000025	**General features:** alre frame "Berlin" (neutral) for all flush-mounted controllers with cover 50 x 50 mm **Design:**Berlin **Surface finish:** glossy **Housing colour:** pure white like RAL 9010 **Housing material:** PC plastic	I
JZ-090.910	VV000010	**General features:** alre frame "Berlin" (neutral) for all flush-mounted controllers with cover 50 x 50 mm **Design:**Berlin **Surface finish:** glossy **Housing colour:** pearl white like RAL 1013 **Housing material:** PC plastic	I

alre flush-mounted range (cover sets)

all basic types and suitable cover sets **50 x 50 mm**

Basic type	Cover set 50 x 50 mm pure white (RAL 9010) glossy (JZ-xxx.000)		Cover set 50 x 50 mm pure white (RAL 9010) matt (JZ-xxx.001)		Cover set 50 x 50 mm pearl white (RAL 1013) glossy (JZ-xxx.010)		Cover set 50 x 50 mm traffic/studio white (RAL 9016) glossy (JZ-xxx.020)		PG
	Cover set	Item no.	Cover set	Item no.	Cover set	Item no.	Cover set	Item no.	
FETR 101.715#00	JZ-005.000	UN 990003	JZ-005.001	UN 990006	JZ-005.010	UN 990009	JZ-005.020	UN 990075	I
FETR 101.716#00	JZ-009.000	UN 990004	JZ-009.001	UN 990007	JZ-009.010	UN 990010	JZ-009.020	UN 990076	I
FETR 101.745#00	JZ-006.000	UN 990005	JZ-006.001	UN 990008	JZ-006.010	UN 990011	JZ-006.020	UN 990077	I

Basic type	Cover set 50 x 50 mm traffic white (RAL 9016) matt (JZ-xxx.021)		PG
	Cover set	Item no.	
FETR 101.715#00	JZ-005.021	UN 990104	I
FETR 101.716#00	JZ-009.021	UN 990106	I
FETR 101.745#00	JZ-006.021	UN 990105	I

In flush-mounted socket, it can be adapted to fit virtually any switch range.

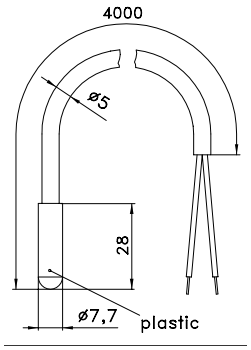
all basic types and suitable cover sets **55 x 55 mm**

Basic type	Cover set 55 x 55 mm pure white (RAL 9010) glossy (JZ-xxx.100)		Cover set 55 x 55 mm pure white (RAL 9010) matt (JZ-xxx.101)		Cover set 55 x 55 mm pearl white (RAL 1013) glossy (JZ-xxx.110)		Cover set 55 x 55 mm traffic/studio white (RAL 9016) glossy (JZ-xxx.120)		PG
	Cover set	Item no.	Cover set	Item no.	Cover set	Item no.	Cover set	Item no.	
FETR 101.715#00	JZ-005.100	UN 990012	JZ-005.101	UN 990015	JZ-005.110	UN 990018	JZ-005.120	UN 990091	I
FETR 101.716#00	JZ-009.100	UN 990013	JZ-009.101	UN 990016	JZ-009.110	UN 990019	JZ-009.120	UN 990092	I
FETR 101.745#00	JZ-006.100	UN 990014	JZ-006.101	UN 990017	JZ-006.110	UN 990020	JZ-006.120	UN 990093	I

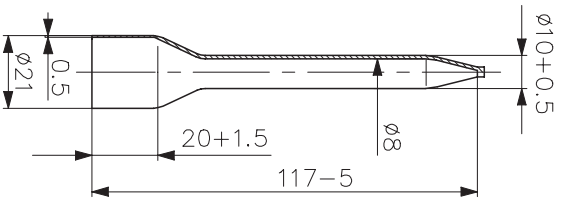
Electronic floor or surface temperature controller with remote sensor (for floor heating / wall and ceiling heating) FETR

Flush-mounted installation – Design Berlin UP

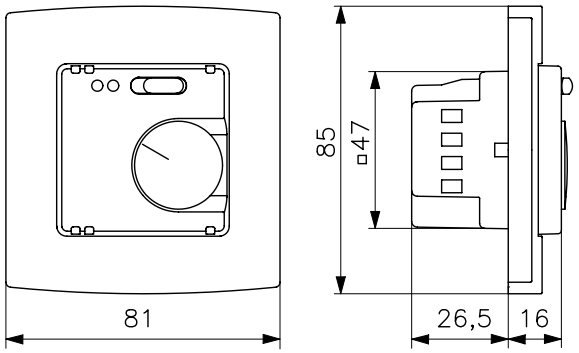
HF-8/4-K2



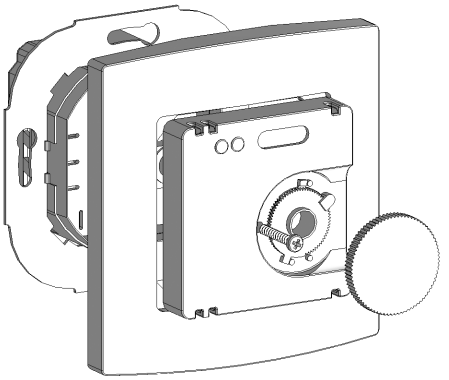
THF



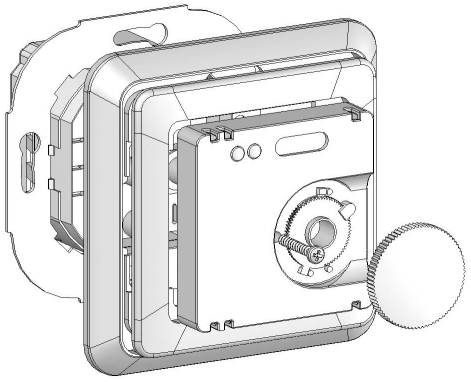
FETR with alre frame "Berlin" (#21 types)



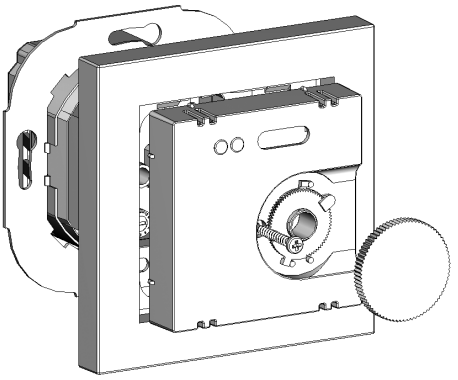
alre frame "Berlin" (#21 types)



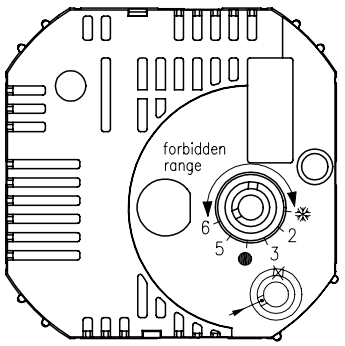
with 50 x 50-mm insert frame



without 55 x 55-mm insert frame



Contact hazard protection cap with setting range (for FETR 101.700 with internal setting – similar to illustration)



Electronic room temperature or floor temperature controller with timer HTRRUu

Flush-mounted installation – Design Berlin UP

Technical data

Design:	Berlin UP (flush-mounted)
Housing material:	PC, PMMA, ABS plastic
Operating voltage:	230 VAC, 50 Hz
Storage temperature:	–20 … +70 °C
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Electrical connection:	pluggable screw terminals
Mounting / attachment:	in flush-mounted socket, can be adapted to fit virtually any switch range (deep flush-mounted socket recommended) see adaptation list on page 57
Protection rating:	IP 30
Protection class:	II, if properly mounted
Safety and EMC:	according to DIN EN 60730
Max. switching current:	10 (2) A
Max. switching voltage:	230 VAC, 50 Hz
Min. switching voltage:	230 VAC, 50 Hz
Switching power:	2300 W
Switching element:	relay
Switching contact:	NO contact
Output signal:	230 VAC, 50 Hz
Sensor:	NTC, internal, optional external
Sensor rupture and short-circuit safeguarding:	If the internal or external sensor is faulty or the external sensor is not connected in the functions room temperature controller with floor monitoring or floor temperature controller, emergency operation is triggered.
Control function:	heating
Control range:	5 … 30 °C (room) / 10 … 42 °C (floor)
Setting range:	The setting range varies, depending on the use of the controller as a room temperature controller (5 … 30 °C) or floor temperature controller (10 … 42 °C)
Hysteresis:	for room control < 1 K, for floor control < 2 K
Display type:	illuminated graphical display
Display:	setpoint, actual temperature / date, time; setpoint, actual temperature or date, time
Accessories:	terminal strips: VOOPL / VOOPD suitable valve actuators: ZBOOA-010.100

Application

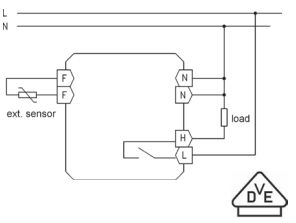
Flush-mounted controller for time-dependent single room or floor temperature control for electrical and hot water heating systems (normally closed actuators). The device can be used as a room temperature controller or, in combination with an optional remote sensor, also as a room temperature controller with floor monitoring or floor temperature controller. (Remote sensor is not a part of the scope of delivery)

This timer thermostat has a weekly timer with individually adjustable programs (factory setting: “normal” daily sequences.

Self-learning function: Automatic adjustment of the controller to the start of the heating period. The goal is to achieve the comfort temperature at the time that has been set. The learning function is disabled upon delivery, but it can be enabled.

OFF function: This function disables the control; frost protection is still ensured.

General features:
ECO function, ECO value adjustable; “ECO” display; “on / off” display; “heating” display; digital actual value display; backlighting; operating mode off with frost protection monitoring; child-safe features; load setting; power reserve (approx. 5 days); actual value correction / measured value correction; learning function; valve protection; holiday setting; party setting; external setting; operation using direct-dial buttons; VDE-tested

Type / image	Item no.	Features	Circuit diagram	PG
HTRRUu-210.021#21 	UA060000	Scope of delivery: controller, cover **50 x 50** mm, **pure white** (like RAL 9010), **glossy, alre frame** “Berlin”		I
HTRRUu-210.021#21 / 7 	UN060011	like HTRRUu-210.021#21, but with scope of delivery: controller, cover **50 x 50** mm, **pure white** (like RAL 9010), **glossy, alre frame** “Berlin”, external floor sensor (HF-8 / 4-K2)		I
HTRRUu-210.021#07 	UA060001	like HTRRUu-210.021#21, but with scope of delivery: controller, cover **50 x 50** mm, **pure white** (like RAL 9010), **glossy,** without frame		I

Electronic room temperature or floor temperature controller with timer HTRRUu

Flush-mounted installation – Design Berlin UP

Type / image	Item no.	Features	Circuit diagram	PG
HTRRUu-210.021#09 	UA060002	like HTRRUu-210.021#21, but with scope of delivery: controller, cover **50 x 50** mm, **pearl white** (like RAL 1013), **glossy,** without frame		I
HTRRUu-210.021#27 	UA060003	like HTRRUu-210.021#21, but with scope of delivery: controller, cover **50 x 50** mm, **traffic white** (like RAL 9016), **glossy,** without frame		I
HTRRUu-210.021#28 	UA060006	like HTRRUu-210.021#21, but with scope of delivery: controller, cover for use with **BUSCH-JAEGER Reflex SI / SI Linear pure white** (similar to RAL 9010), **glossy,** without frame		I
HTRRUu-210.021#55 	UA060004	like HTRRUu-210.021#21, but with scope of delivery: Controller, cover **55 x 55** mm, **pure white** (like RAL 9010), **glossy,** without frame		I
HTRRUu-210.021#56 	UA060020	like HTRRUu-210.021#21, but with scope of delivery: Controller, cover **55 x 55** mm, **pure white** (like RAL 9010), **matt,** without frame		I
HTRRUu-210.021#57 	UA060005	like HTRRUu-210.021#21, but with scope of delivery: controller, cover **55 x 55** mm, **pearl white** (like RAL 1013), **glossy,** without frame		I
HTRRUu-210.021#59 	UA060014	like HTRRUu-210.021#21, but with scope of delivery: controller, cover **55 x 55** mm, **traffic white** (like RAL 9016), **glossy,** without frame		I

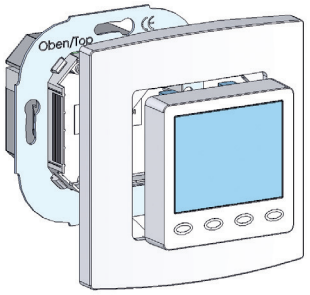
Accessories	Item no.	Features	PG
HF-8 / 4-K2 	G8000370	**General features:** optional, external floor sensor **Ambient temperature:** –5 … +70 °C **Protection rating:** IP 65 **Sensor:** NTC **Connecting cable:** 4 m, PVC	II
HF-8 / 6-K2 	G8000368	**General features:** optional, external floor sensor **Ambient temperature:** –5 … +70 °C **Protection rating:** IP 65 **Sensor:** NTC **Connecting cable:** 6 m, PVC	II
WP-01	G9990180	**General features:** heat conduction paste 2 ml; R > 1 TΩ / cm, silicon-free **Ambient temperature:** –40 … +150 °C **Heat conductivity:** > 0.7 W / mK	II
THF 	C1809515	**General features:** protective sleeve for screed mounting (for sleeve sensor HF Ø 7.7, for example, HF-8 / 4-K2 or HF-8 / 6-K2), copper	II
JZ-090.900 	VV000025	**General features:** alre frame “Berlin” (neutral) for all flush-mounted controllers with cover 50 x 50 mm **Design:**Berlin **Surface finish:** glossy **Housing colour:** pure white like RAL 9010 **Housing material:** PC plastic	II

Electronic room temperature or floor temperature controller with timer HTRRUu

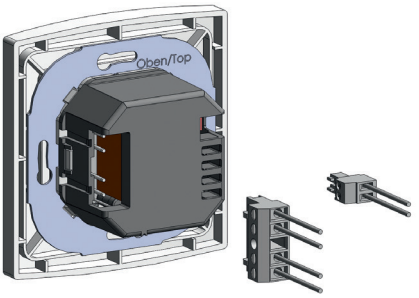
Flush-mounted installation – Design Berlin UP

Accessories	Item no.	Features	PG
JZ-090.910	VV000010	**General features:** alre frame "Berlin" (neutral) for all flush-mounted controllers with cover 50 x 50 mm **Design:** Berlin **Surface finish:** glossy **Housing colour:** pearl white like RAL 1013 **Housing material:** PC plastic	II

HTRRUu with alre frame "Berlin"



pluggable screw-type terminals



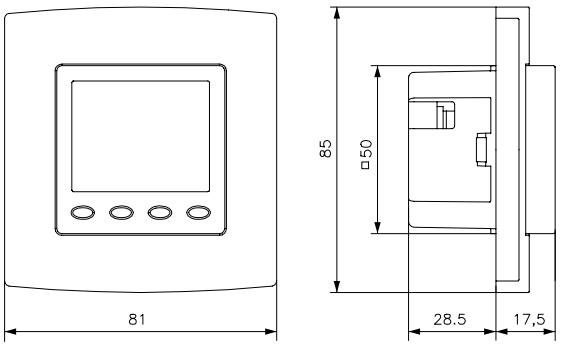
other benefits:

- Pluggable screw-type terminals facilitate quick and easy assembly
- Illuminated, graphics-capable display
- Choice of four different external sensors (2, 12, 15, 33 kOhm), thus also ideal for retrofitting
- VDE mark
- Automatic adjustment to standard/daylight savings time
- Learning function
- Correction of measurement values
- Configurable display content during installation, choice of various languages: German, English, French, Dutch, Polish, Spanish, Czech, Russian
- Limit setting for floor temperature
- OFF frost protection function
- Key lock
- Valve protection function
- Configurable control method (PI-PWM or 2-point control)
- Holiday and party function
- Power reserve
- "Heating operation" display (LED orange)
- Load setting for improved control

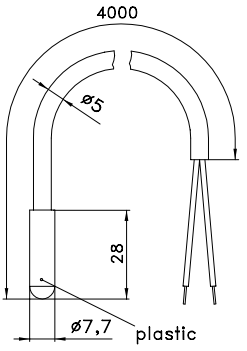
Factory setting:

- Holiday temperature 17 °C,
- Setback temperature 17 °C,
- Comfort temperature 20 °C,
- Comfort times: Mon – Fri 5 am – 9 am/4 pm – 10 pm, Sat/Sun 6 am – 10 pm
- Key lock deactivated
- Automatic adjustment to standard/daylight savings time enabled
- Valve and pump protection disabled
- Learning function disabled
- Display lighting 10 s
- Heating load 0.1 kW
- 2-point control method
- External sensor
- 2 kOhm and max. floor temperature 42 °C (if configured as floor temperature controller)

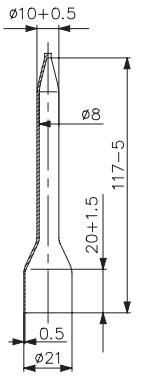
HTRRUu with alre frame "Berlin"



HF-8/4-K2



THF



Examples of integration in switches with or without insert frame

Adaptation of alre flush-mounted HTRRUu-210.021 controllers

Manufacturer	Range	Colour RAL 9010 (surface finish)	Adaptation in switch range "55 x 55" possible using …	"50 x 50" adaptation possible with … (insert frame from manufacturer required)
BERKER	S.1	polar white (matt)	HTRRUu-210.021#56	not required
BERKER	S.1	polar white (glossy)	HTRRUu-210.021#55	not required
BERKER	Arsys	polar white (glossy)		HTRRUu-210.021#07 + (1108 01 69)
BERKER	B.3	aluminium / polar white (matt)	HTRRUu-210.021#56	not required
BERKER	B.3	aluminium / polar white (glossy)	HTRRUu-210.021#55	not required
BERKER	B.7	glass / polar white (matt)	HTRRUu-210.021#56	not required
BERKER	B.7	glass / polar white (glossy)	HTRRUu-210.021#55	not required
BERKER	K.1	polar white (glossy)		HTRRUu-210.021#07 + (1108 71 09)
BUSCH-JAEGER	Reflex SI/SI Linear	alpine white (glossy)	HTRRUu-210.021#28	not required
BUSCH-JAEGER	Busch-balance SI	polar white (glossy)	HTRRUu-210.021#55	not required
BUSCH-JAEGER	impuls	alpine white (glossy)		HTRRUu-210.021#07 + (1746/10-74)
BUSCH-JAEGER	solo/future/axcent etc.	studio white – see RAL 9016 below		
GIRA	rocker switch	pure white (glossy)		HTRRUu-210.021#07 + (0282 112)
GIRA (System 55)	Standard/E 2	pure white (semi-gloss)	HTRRUu-210.021#56	not required
GIRA (System 55)	Standard/E 2	pure white (glossy)	HTRRUu-210.021#55	not required
GIRA (System 55)	E 22	pure white (glossy)	HTRRUu-210.021#55	not required
GIRA (System 55)	Event	pure white (semi-gloss) + opaque …	HTRRUu-210.021#56	not required
GIRA (System 55)	Event	pure white (glossy) + opaque …	HTRRUu-210.021#55	not required
GIRA (System 55)	Esprit	pure white (semi-gloss) + glass, aluminium …	HTRRUu-210.021#56	not required
GIRA (System 55)	Esprit	pure white (glossy) + glass, aluminium …	HTRRUu-210.021#55	not required
GIRA	S-Color	pure white (high-gloss)		HTRRUu-210.021#07 + (0282 40)
JUNG	CD 500/CD plus	alpine white (glossy)		HTRRUu-210.021#07 + (CD 590 Z WW)
JUNG	A 500/AS 500/A plus	alpine white (glossy)	HTRRUu-210.021#55	not required
JUNG	LS 990	alpine white (glossy)		HTRRUu-210.021#07 + (LS 961 Z WW)
JUNG	LS plus	alpine white (glass)		HTRRUu-210.021#07 + (LS 961 Z WW)
JUNG	A creation	alpine white (glossy)	HTRRUu-210.021#55	not required
JUNG	LS Design	alpine white (glossy)		HTRRUu-210.021#07 + (LS 961 Z WW)
MERTEN (System M)	M-Smart, Arc, Plan, Star	polar white (matt)	HTRRUu-210.021#56	not required
MERTEN (System M)	M-Smart, Arc, Plan, Star, M-Creativ, M-Pure	polar white (glossy)	HTRRUu-210.021#55	not required
MERTEN (System Basis)	1-M/Atelier-M	polar white (glossy)	HTRRUu-210.021#55	not required
MERTEN (System Design)	Artec/Trancent/Antik	polar white (glossy)		HTRRUu-210.021#07 + (5160 99)
MERTEN	1-M/M-Smart/M-Plan/M-pure etc.	active white – see RAL 9016 below		
PEHA	Standard	pure white (glossy)		HTRRUu-210.021#07 + (80.670.02 ZV)
PEHA	Dialog	pure white (glossy)		HTRRUu-210.021#07 + (95.670.02 ZV)
PEHA	Aura	pure white (matt)/glass		HTRRUu-210.021#07 + (20.670.02 ZV)
PEHA	Badora	pure white (glossy)		HTRRUu-210.021#07 + (11.670.02 ZV)

Manufacturer	Range	Colour RAL 9016 (surface finish)	Adaptation in switch range "55 x 55" possible using …	"50 x 50" adaptation possible with … (insert frame from manufacturer required)
BUSCH-JAEGER	solo/future/future linear	studio white (RAL 9016, glossy)		HTRRUu-210.021#27 + (1746/10-84)
BUSCH-JAEGER	axcent	studio white (RAL 9016, glossy)		HTRRUu-210.021#27 + (1746/10-84)
BUSCH-JAEGER	carat (glass, bronze, gold)	studio white (RAL 9016, glossy)		HTRRUu-210.021#27 + (1746/10-84)
BUSCH-JAEGER	alpha (nea/exclusive*)	studio white (RAL 9016, glossy)		HTRRUu-210.021#27 + (1746/10-24G)
MERTEN	M-Smart, Plan	active white (RAL 9016, glossy)	HTRRUu-210.021#59	not required
MERTEN	1-M/Atelier-M	active white (RAL 9016, glossy)	HTRRUu-210.021#59	not required
PEHA	Standard	arctic		HTRRUu-210.021#27 + (D 80.670 ZV AW)

*) During assembly, you need to remove four plastic tabs located at the rear of the frame

NOTE: Most light switch ranges are designed in the colour "like RAL 9010", although different switch manufacturers have different designations for this colour. Coloured, glass and aluminium frames are also combined with white jacks or plugs so that controllers with white covers can also be integrated into these frames. Check the precise application in each individual case. The frames have different surface qualities (matt/glossy). For design reasons, the cover of the controller should have the same quality as the frame. We accept no liability for slight variations in colour and surface finish or for accuracy of fit. When installing devices into multi frames, always assemble the temperature controllers at the lowermost position.

"50 x 50 controller": The housing covers of the 50 x 50 controllers are 50 x 50 mm in size. Using a 50 x 50-mm insert frame, the 50 x 50 controllers can be integrated into nearly all light switch ranges in accordance with DIN 49075. The 50 x 50-mm insert frames must be ordered from the light switch manufacturer or from a wholesaler. The order number of the insert frame corresponding to the switch range in question can be found in the column "For adaptation of size '50 x 50' HTRRUu".

"55 x 55 controller": The housing covers of the 55 x 55 controllers are 55 x 55 mm in size. Many light switch ranges have inner dimensions of 55 x 55 mm. Therefore, the 55 x 55 controllers can be installed directly in the light switch frame without the use of an insert frame. See the column "Adaptation with switch range (55 x 55)" to determine whether the 55 x 55 controller fits in the given light switch range (HTRRUu-210.021#xx).

All information regarding switch manufacturers' product lines and item numbers was last updated in 12/2015 | No liability is assumed for the information provided. | Technical specifications subject to change.

An adaptation list for RAL 1013 switch ranges is available from our website at www.alre.de.

Radio-controlled heating

Overview of transmitters:

Radio-controlled transmitter

Surface-mounted radio-controlled sensor with setpoint generator as superflat transmitter

Surface-mounted radio-controlled sensor with setpoint generator as transmitter

Flush-mounted radio-controlled sensor with optional external sensors as transmitter with timer

Surface-mounted radio-controlled sensor with setpoint generator as transmitter with timer

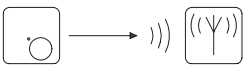
Surface-mounted radio-controlled sensor as superflat transmitter for averaging and central control

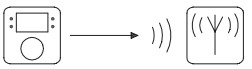
Surface-mounted radio-controlled sensor as transmitter for averaging and central control

Surface-mounted radio-controlled ECO contact

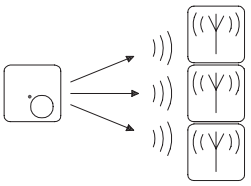
Sample applications (possible transmitter / receiver combinations):

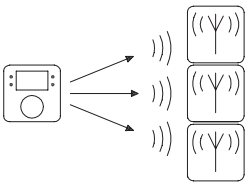
One transmitter to one receiver



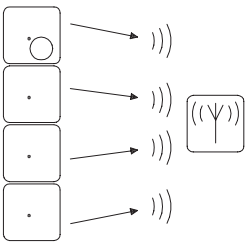


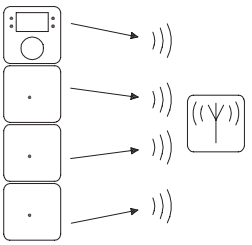
One transmitter to any number of receivers



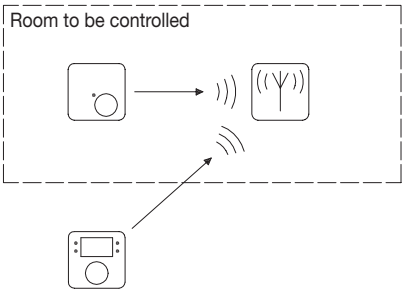


Averaging: (each receiver calculates the average value based on data from max. seven transmitters without setpoint adjuster and a transmitter with setpoint adjuster)





Master-slave operation: (comfort temperature through room transmitter, scheduled ECO control, ON/OFF, holiday and party function in combination with a configured timer transmitter)



Radio-controlled heating

Overview of receivers

Radio-controlled receiver

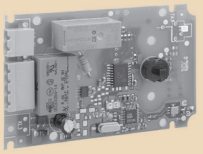
Surface-mounted radio-controlled receiver

Flush-mounted radio-controlled receiver

radio-controlled receiver for radiator valves

Pluggable radio-controlled receiver

Radio-controlled receiver rail for assembly into the heating manifold (four or eight heating circuits)

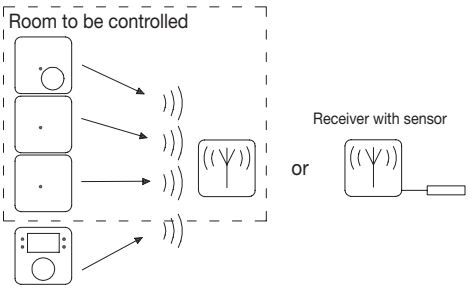


Integrated radio-controlled receiver

Radio-controlled receiver with sensor input for integration in the distribution box

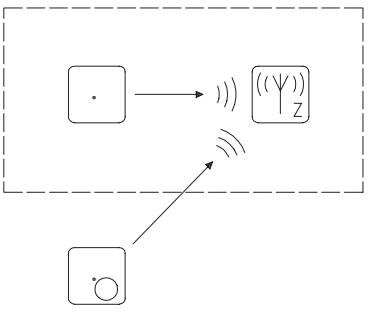
Sample applications (possible transmitter / receiver combinations):

Master-slave operation including averaging (each receiver calculates the average value based on data from max. seven transmitters without setpoint adjuster and a transmitter with setpoint adjuster); scheduled ECO control, on / off, holiday and party function in combination with a configured timer transmitter

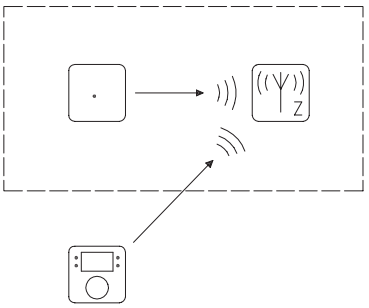


Sample applications for central control (HTFRB-010.101 / HTFRU-010.101 / HTFRU-110.124):

one (optionally up to seven transmitters) **without setpoint adjuster** with any number of receivers; the target temperature is provided by an external transmitter with setpoint adjuster



one (optionally up to seven transmitters) **without setpoint adjuster** with any number of receivers; the target temperature is provided by an external transmitter with setpoint adjuster and timer (additionally: scheduled ECO control, on / off, holiday and party function)



Radio-controlled heating – TRANSMITTER

Design BERLIN

Technical data

Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Protection rating:	IP 30
Safety and EMC:	according to DIN EN 60730 and DIN EN 300220
Radio frequency:	868.3 MHz
Range:	150 m line-of-sight or up to 30 m in buildings, depending on the construction
Transmission interval:	approx. 3 min and after setpoint change

Application

Radio-controlled room temperature sensor for measuring temperature in home, office and hotel spaces with normal levels of cleanliness. A single room temperature control can be implemented when used with alre radio receivers. Primarily targets use in renovation applications or for heating system extensions.

Expensive breaking down and plastering work for cable laying is avoided. Particularly suitable for office floors in which flexible room partitioning is of primary importance.

Berlin “3000” housing: Programming methods for every day, familiar from mechanical timers, by means of “electronic tabs” (minimum switching time 15 min).

Battery change: If a battery change is required shortly, this is indicated by a flashing red LED on the transmitter. In addition, the upcoming required replacement is indicated at an early time on the display of the timer transmitter.

After a voltage interruption at the transmitter or receiver, the wireless connection is restored automatically.

Type / image	Item no.	Features	PG
FKRFB-080.151 	BA010900	**General features:** radio transmitter for switching an alre radio-controlled receiver into ECO mode via an external contact (for example, phone or window contact); “learning mode / battery discharged state” display **Design:** Berlin 2000 **Surface finish:** matt **Housing colour:** pure white like RAL 9010 **Housing material:**ABS plastic **Operating voltage:** 2x micro AAA batteries, 1.5 V, 1100 mAh **Ambient temperature:** – 10 … + 50 °C **Storage temperature:** – 10 … + 50 °C **Mounting / attachment:** Surface- / wall-mounting (4-hole assembly on flush-mounted socket) **Protection class:** III **ECO contact:** characteristic switchable NO / NC **Setting range:** setting range of the ECO temperature either 5 … 20 °C absolute or – 3 … – 15 K relative **Scope of delivery:** device, batteries **Operating elements:** learn button	I
FTRFB-080.101 	BA010100	**General features:** radio-controlled transmitter for acquiring the room temperature for calculating the average value or centralised control; “learning mode / battery discharged state” display **Design:** Berlin 2000 **Surface finish:** matt **Housing colour:** pure white like RAL 9010 **Housing material:** ABS plastic **Operating voltage:** 2x micro AAA batteries, 1.5 V, 1100 mAh **Ambient temperature:** – 10 … + 50 °C **Storage temperature:** – 10 … + 50 °C **Mounting / attachment:** direct surface / wall mounting by means of screws or adhesive pads **Protection class:** III **Sensor:** NTC, internal **Scope of delivery:** device, batteries, adhesive pads **Operating elements:** learning button	I

Radio-controlled heating – TRANSMITTER

Design BERLIN

Type / image	Item no.	Features	PG
FTRFB-080.119 	BA010101	**General features:** radio-controlled transmitter for acquiring and setting room temperature; “Learning mode / battery discharged state” display; mechanical range setting; scale: degrees Celsius; external setting **Design:** Berlin 2000 **Surface finish:** matt **Housing colour:** pure white like RAL 9010 **Housing material:** ABS plastic **Operating voltage:** 2x micro AAA batteries, 1.5 V, 1100 mAh **Ambient temperature:** – 10 … + 50 °C **Storage temperature:** – 10 … + 50 °C **Mounting / attachment:** direct surface / wall mounting by means of screws or adhesive pads **Protection class:** III **Sensor:** NTC, internal **Setting range:** 5 … 30 °C **Scope of delivery:** device, batteries, adhesive pads **Operating elements:** learning button	I
FTRFB-080.120 	BA010102	**General features:** radio-controlled transmitter for acquiring and setting room temperature; reduction 4 K fixed; ECO function; “Learning mode / battery discharged state” display; mechanical range setting; scale: degrees Celsius; external setting **Design:** Berlin 2000 **Surface finish:** matt **Housing colour:** pure white like RAL 9010 **Housing material:** ABS plastic **Operating voltage:** 2x micro AAA batteries, 1.5 V, 1,100 mAh **Ambient temperature:** – 10 … + 50 °C **Storage temperature:** – 10 … + 50 °C **Mounting / attachment:** direct surface- / wall-mounting by means of screws or adhesive pads **Protection class:** III **Sensor:** NTC, internal **Setting range:** 5 … 30 °C **Scope of delivery:** device, batteries, adhesive pads **Operating elements:** “comfort / ECO” switch, learn button	I
FTRFB-280.101 	BA010400	**General features:** radio-controlled transmitter for acquiring the room temperature for calculating the average value or centralised control; “learning mode / battery discharged state” display **Design:** Berlin 1000 **Surface finish:** glossy **Housing colour:** pure white like RAL 9010 **Housing material:** ABS plastic **Operating voltage:** 2x micro AAA batteries, 1.5 V, 1,100 mAh **Ambient temperature:** – 10 … + 50 °C **Storage temperature:** – 10 … + 50 °C **Mounting / attachment:** direct surface- / wall-mounting by means of screws or adhesive pads **Protection class:** III **Sensor:** NTC, internal **Scope of delivery:** device, batteries, adhesive pads **Operating elements:** learning button	I
FTRFB-280.119 	BA010409	**General features:** radio-controlled transmitter for acquiring and setting room temperature; “Learning mode / battery discharged state” display; mechanical range setting; scale: degrees Celsius; external setting **Design:** Berlin 1000 **Surface finish:** glossy **Housing colour:** pure white like RAL 9010 **Housing material:** ABS plastic **Operating voltage:** 2x micro AAA batteries, 1.5 V, 1,100 mAh **Ambient temperature:** – 10 … + 50 °C **Storage temperature:** – 10 … + 50 °C **Mounting / attachment:** direct surface- / wall-mounting by means of screws or adhesive pads **Protection class:** III **Sensor:** NTC, internal **Setting range:** 5 … 30 °C **Scope of delivery:** device, batteries, adhesive pads **Operating elements:** learning button	I

Radio-controlled heating – TRANSMITTER

Design BERLIN

Type / image	Item no.	Features	PG
FTRFB-280.120 	BA010401	**General features:** radio-controlled transmitter for acquiring and setting room temperature; reduction 4 K fixed; ECO function; "Learning mode / battery discharged state" display; mechanical range setting; scale: degrees Celsius; external setting **Design:** Berlin 1000 **Surface finish:** glossy **Housing colour:** pure white like RAL 9010 **Housing material:** ABS plastic **Operating voltage:** 2x micro AAA batteries, 1.5 V, 1,100 mAh **Ambient temperature:** – 10 … + 50 °C **Storage temperature:** – 10 … + 50 °C **Mounting / attachment:** direct surface- / wall-mounting by means of screws or adhesive pads **Protection class:** III **Sensor:** NTC, internal **Setting range:** 5 … 30 °C **Scope of delivery:** device, batteries, adhesive pads **Operating elements:** "comfort / ECO" switch, learn button	I
FTRFBu-180.117 / V2 	BA010200	**General features:** pilot function; ECO function, ECO value adjustable; "ECO" display; "on / off" display; "Learning mode / battery discharged state" display; digital actual value display; child-safe features; actual value correction / measured value correction; learning function; valve protection; holiday setting; party setting; automatic adjustment to standard / daylight savings time; mechanical range setting; scale: degrees Celsius; reduction / comfort / automatic button; external setting; operation using direct-dial buttons; on / off button; information button; party function button; holiday setting button **Design:** Berlin 3000 **Surface finish:** matt **Housing colour:** pure white like RAL 9010 **Housing material:** ABS plastic **Operating voltage:** 2x micro AAA batteries, 1.5 V, 1100 mAh **Ambient temperature:** – 10 … + 50 °C **Storage temperature:** – 10 … + 50 °C **Mounting / attachment:** direct surface / wall mounting by means of screws or adhesive pads **Protection class:** III **Sensor:** NTC, internal **Setting range:** 5 … 30 °C **Display type:** Symbol display **Scope of delivery:** device, batteries, adhesive pads **Accessories:** optional adapter snap-on plate JZ-18	I
FTRFBu-180.121 / V2	BA010201	like FTRFBu-180.117, but with backlighting Operating voltage: 3x micro AAA batteries, 1.5 V, 1100 mAh (3rd battery for backlighting)	I
FTRFUd-210.123#21 	UA080000	**General features:** flush-mounted radio-controlled transmitter for acquiring and setting the room temperature with the timer, holiday setting, party setting; different timer programs can be set for heating and cooling; usable as the master for master-slave operation (pilot controller); pilot function; ECO function; ECO value adjustable; "ECO" display; "on / off" display; digital actual value display; backlighting; child-safe features; power reserve (3 days); actual value correction / measured value correction; learning function; valve protection; holiday setting; party setting; automatic adjustment to standard / daylight savings time; external setting; operation using direct-dial buttons **Design:** Berlin UP (flush-mounted) **Surface finish:** glossy **Housing colour:** pure white like RAL 9010 **Housing material:** ABS plastic, PC, PMMA **Operating voltage:** 230 VAC, 50 Hz **Ambient temperature:** 0 … 40 °C **Storage temperature:** – 20 … + 70 °C **Electrical connection:** pluggable screw terminals **Mounting / attachment:** any flush-mounted socket (deep flush-mounted socket recommended), see adaptation list on page 65 **Protection class:** III, if properly mounted average power consumption: <1 W **Sensor:** NTC, internal, optional external („Sensor 2" / „Sensor 8") **Control range:** 5 … 30 °C **Display type:** illuminated graphical display **Scope of delivery:** controller, cover **50 x 50** mm, **pure white** (like RAL 9010), **glossy** alre frame "Berlin"	I

Radio-controlled heating – TRANSMITTER

Design BERLIN

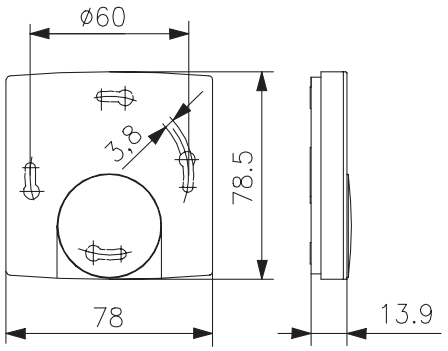
Type / image	Item no.	Features	PG
FTRFUd-210.123#07 	UA080001	like FTRFUd-210.123#21, but with scope of delivery: controller, cover **50 x 50** mm, **pure white** (like RAL 9010), **glossy,** without frame	I
FTRFUd-210.123#09 	UA080002	like FTRFUd-210.123#21, but with scope of delivery: controller, cover **50 x 50** mm, **pearl white** (like RAL 1013), **glossy,** without frame	I
FTRFUd-210.123#27 	UA080003	like FTRFUd-210.123#21, but with scope of delivery: controller, cover 50 x 50 mm, **traffic white** (like RAL 9016), **glossy,** without frame	I
FTRFUd-210.123#28 	UA080006	like FTRFUd-210.123#21, but with scope of delivery: controller, cover suitable for **BUSCH-JAEGER Reflex SI / SI Linear pure white** (like RAL 9010), **glossy,** without frame	I
FTRFUd-210.123#55 	UA080004	like FTRFUd-210.123#21, but with scope of delivery: controller, cover **55 x 55** mm, **pure white** (like RAL 9010), **glossy,** without frame	I
FTRFUd-210.123#56 	UA080008	like FTRFUd-210.123#21, but with scope of delivery: controller, cover **55 x 55** mm, **pure white** (like RAL 9010), **matt,** without frame	I
FTRFUd-210.123#57 	UA080005	like FTRFUd-210.123#21, but with scope of delivery: controller, cover **55 x 55** mm, **pearl white** (like RAL 1013), **glossy,** without frame	I
FTRFUd-210.123#59 	UA080007	like FTRFUd-210.123#21, but with scope of delivery: controller, cover **55 x 55** mm, **traffic white** (like RAL 9016), **glossy,** without frame	I

Radio-controlled heating – TRANSMITTER

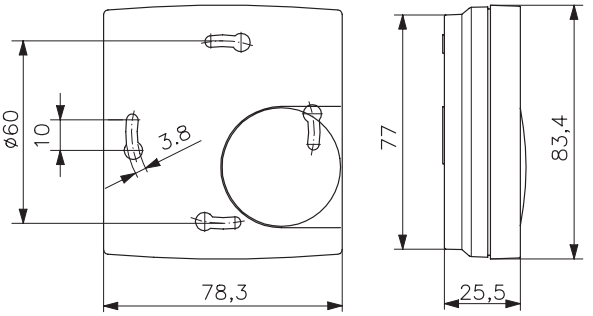
Design BERLIN

Accessories	Item no.	Features	PG
JZ-18 	MN990002	**General features:** optional adapter snap-on plate for timer transmitter FTRFBu with universal perforation pattern for mounting. The use of the adapter is recommended since the transmitter becomes detachable as a result and facilitates simpler battery changing. **Surface finish:** matt **Housing colour:** pure white like RAL 9010 **Housing material:** ABS plastic	II
JZ-090.900 	VV000025	**General features:** alre frame “Berlin” (neutral) for all flush-mounted controllers with cover 50 x 50 mm **Surface finish:** glossy **Housing colour:** Pure white like RAL 9010 **Housing material:** PC plastic	II
JZ-090.910	VV000010	**General features:** alre frame “Berlin” (neutral) for all flush-mounted controllers with cover 50 x 50 mm **Surface finish:** glossy **Housing colour:** pearl white like RAL 1013 **Housing material:** PC plastic	II

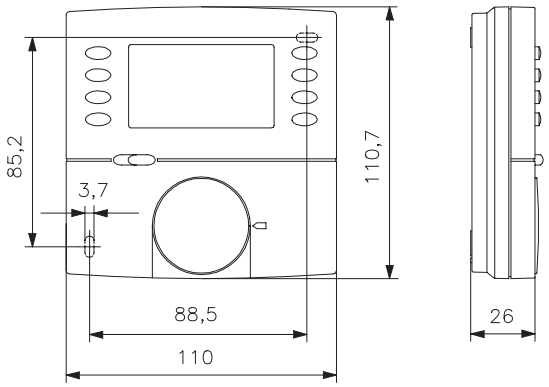
“Berlin 1000”



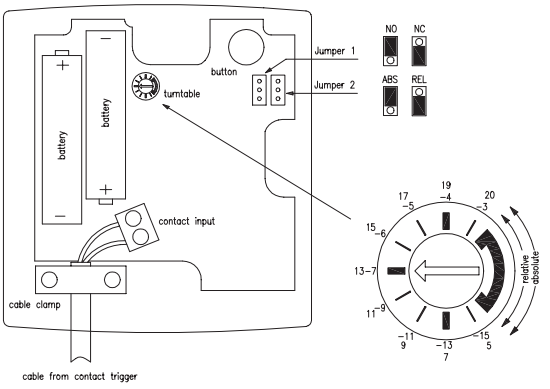
“Berlin 2000”



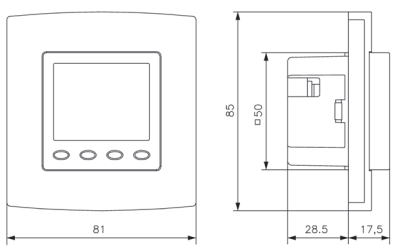
“Berlin 3000”



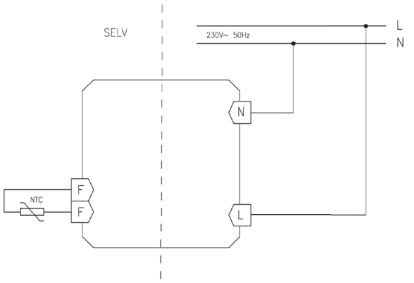
FKRFB circuit diagram



FTRFUd



FTRFUd circuit diagram



Adaptation of alre FTRxUd-210.xxx flush-mounted transmitters

Manufacturer	Range	Colour RAL 9010 (surface finish)	Adaptation in switch range “55 x 55” possible using …	“50 x 50” adaptation possible with … (insert frame from manufacturer required)
BERKER	S.1	polar white (matt)	FTRxUd-210.xxx#56	not required
BERKER	S.1	polar white (glossy)	FTRxUd-210.xxx#55	not required
BERKER	Arsys	polar white (glossy)		FTRxUd-210.xxx#07 + (1108 01 69)
BERKER	B.3	aluminium/polar white (matt)	FTRxUd-210.xxx#56	not required
BERKER	B.3	aluminium/polar white (glossy)	FTRxUd-210.xxx#55	not required
BERKER	B.7	glass/polar white (matt)	FTRxUd-210.xxx#56	not required
BERKER	B.7	glass/polar white (glossy)	FTRxUd-210.xxx#55	not required
BERKER	K.1	polar white (glossy)		FTRxUd-210.xxx#07 + (1108 71 09)
BUSCH-JAEGER	Reflex SI/SI Linear	alpine white (glossy)	FTRxUd-210.xxx#28	not required
BUSCH-JAEGER	Busch-balance SI	polar white (glossy)	FTRxUd-210.xxx#55	not required
BUSCH-JAEGER	impuls	alpine white (glossy)		FTRxUd-210.xxx#07 + (1746/10-74)
BUSCH-JAEGER	solo/future/axcent etc.	studio white – see RAL 9016 below		
GIRA	rocker switch	pure white (glossy)		FTRxUd-210.xxx#07 + (0282 112)
GIRA (System 55)	Standard/E 2	pure white (semi-gloss)	FTRxUd-210.xxx#56	not required
GIRA (System 55)	Standard/E 2	pure white (glossy)	FTRxUd-210.xxx#55	not required
GIRA (System 55)	E 22	pure white (glossy)	FTRxUd-210.xxx#55	not required
GIRA (System 55)	Event	pure white (semi-gloss) + opaque …	FTRxUd-210.xxx#56	not required
GIRA (System 55)	Event	pure white (glossy) + opaque …	FTRxUd-210.xxx#55	not required
GIRA (System 55)	Esprit	pure white (semi-gloss) + glass, aluminium …	FTRxUd-210.xxx#56	not required
GIRA (System 55)	Esprit	pure white (glossy) + glass, aluminium …	FTRxUd-210.xxx#55	not required
GIRA	S-Color	pure white (high-gloss)		FTRxUd-210.xxx#07 + (0282 40)
JUNG	CD 500/CD plus	alpine white (glossy)		FTRxUd-210.xxx#07 + (CD 590 Z WW)
JUNG	A 500/AS 500/A plus	alpine white (glossy)	FTRxUd-210.xxx#55	not required
JUNG	LS 990	alpine white (glossy)		FTRxUd-210.xxx#07 + (LS 961 Z WW)
JUNG	LS plus	alpine white (glass)		FTRxUd-210.xxx#07 + (LS 961 Z WW)
JUNG	A creation	alpine white (glossy)	FTRxUd-210.xxx#55	not required
JUNG	LS Design	alpine white (glossy)		FTRxUd-210.xxx#07 + (LS 961 Z WW)
MERTEN (System M)	M-Smart, Arc, Plan, Star	polar white (matt)	FTRxUd-210.xxx#56	not required
MERTEN (System M)	M-Smart, Arc, Plan, Star, M-Creativ, M-Pure	polar white (glossy)	FTRxUd-210.xxx#55	not required
MERTEN (System Basis)	1-M/Atelier-M	polar white (glossy)	FTRxUd-210.xxx#55	not required
MERTEN (System Design)	Artec/Trancent/Antik	polar white (glossy)		FTRxUd-210.xxx#07 + (5160 99)
MERTEN	1-M/M-Smart/M-Plan/M-pure etc.	active white – see RAL 9016 below		
PEHA	Standard	pure white (glossy)		FTRxUd-210.xxx#07 + (80.670.02 ZV)
PEHA	Dialog	pure white (glossy)		FTRxUd-210.xxx#07 + (95.670.02 ZV)
PEHA	Aura	pure white (matt)/glass		FTRxUd-210.xxx#07 + (20.670.02 ZV)
PEHA	Badora	pure white (glossy)		FTRxUd-210.xxx#07 + (11.670.02 ZV)

Manufacturer	Range	Colour RAL 9016 (surface finish)	Adaptation in switch range “55 x 55” possible using …	“50 x 50” adaptation possible with … (insert frame from manufacturer required)
BUSCH-JAEGER	solo/future/future linear	studio white (RAL 9016, glossy)		FTRxUd-210.xxx#27 + (1746/10-84)
BUSCH-JAEGER	axcent	studio white (RAL 9016, glossy)		FTRxUd-210.xxx#27 + (1746/10-84)
BUSCH-JAEGER	carat (glass, bronze, gold)	studio white (RAL 9016, glossy)		FTRxUd-210.xxx#27 + (1746/10-84)
BUSCH-JAEGER	alpha (nea/exclusive*)	studio white (RAL 9016, glossy)		FTRxUd-210.xxx#27 + (1746/10-24G)
MERTEN	M-Smart, Plan	active white (RAL 9016, glossy)	FTRxUd-210.xxx#59	not required
MERTEN	1-M/Atelier-M	active white (RAL 9016, glossy)	FTRxUd-210.xxx#59	not required
PEHA	Standard	arctic		FTRxUd-210.xxx#27 + (D 80.670 ZV AW)

*) During assembly, you need to remove four plastic tabs located at the rear of the frame

NOTE: Most light switches are designed in the colour “like RAL 9010”, although different switch manufacturers have different designations for this colour. Coloured, glass and aluminium frames are also combined with white jacks or plugs so that controllers with white covers can also be integrated into these frames. Check the precise application in each individual case. The frames have different surface qualities (matt/glossy). For design reasons, the cover of the controller should have the same quality as the frame. We accept no liability for slight variations in colour and surface finish or for accuracy of fit. When installing devices into multi frames, always assemble the temperature controllers at the lowermost position.

“50 x 50 controller”: The housing covers of the 50 x 50 controllers are 50 x 50 mm in size. Using a 50 x 50-mm insert frame, the 50 x 50 controllers can be integrated into nearly all light switch ranges in accordance with DIN 49075. The 50 x 50-mm insert frames must be ordered from the light switch manufacturer or from a wholesaler. The order number of the insert frame corresponding to the switch in question can be found in the column “For adaptation of ‘50 x 50’ FTRxUd”.

“55 x 55 controller”: The housing covers of the 55 x 55 controllers are 55 x 55 mm in size. Many light switch ranges have inner dimensions of 55 x 55 mm. Therefore, the 55 x 55 controllers can be installed directly in the light switch frame without the use of an insert frame. See the column “Adaptation in switch range (55 x 55)” to determine whether the 55 x 55 controller fits in the given light switch (FTRxUd-210.xxx#xx).

All information regarding switch manufacturers’ product lines and item numbers was last updated in 12/2015 | No liability is assumed for the information provided. | Technical specifications subject to change.
An adaptation list for RAL 1013 switch ranges is available on our website at www.alre.de.

Radio-controlled heating – RECEIVER

Technical data

Surface finish:	matt
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Control function:	heating
Hysteresis:	approx. 0.5 K
Radio frequency:	868.3 MHz
Safety and EMC:	according to DIN EN 60950-1, DIN EN 300220

Application

Wireless heating controllers (receivers) that realise a single room climate control in conjunction with alre radio-controlled room temperature transmitters. Primarily targets use in renovation applications or for heating system extensions.

After a voltage interruption at the transmitter or receiver, the wireless connection is restored automatically.

If there is an existing wireless connection, the relevant channel(s) can be displayed at the receiver retrospectively, by pressing the learn button on the transmitter.

Type / image	Item no.	Features	PG
HTFMA-180.161 	G8000422	**General features:** radio-controlled temperature controller (receiver) for radiator valves; “learning mode / battery discharged state” display; emergency operation; adapter for Danfoss RA, RAV, RAVL **Housing colour:** pure white like RAL 9010 **Housing material:** plastic **Operating voltage:** 2 x AA, 1.5 V / 2000 mAh. Do not use rechargeable batteries or lithium batteries! **Ambient temperature:** 0 … 50 °C **Storage temperature:** – 20 … + 50 °C **Mounting / attachment:** M30 x 1.5, included adapter for Danfoss RA, RAV, RAVL **Protection rating:** IP 20 **Protection class:** III **Sensor:** NTC internal (for emergency operation control) **Nominal stroke:** approx. 5 mm **Nominal closing force:** approx. 100 N **Control range:** 8 … 28 °C **Display:** ready to mount / mechanical adjustment / mechanical adjustment error / loss of connection / learning mode **Operating elements:** learn button, installation button	I
HTFRA-010.101 	BA110300	**General features:** 1-channel radio-controlled temperature controller (receiver); emergency operation; 3000 W switching power for electrical direct heaters, natural stone heating **Housing colour:** pure white like RAL 9010 **Housing material:** plastic **Operating voltage:** 230 VAC, 50 Hz **Ambient temperature:** 0 … 40 °C **Storage temperature:** – 20 … + 70 °C **Electrical connection:** Schuko adapter **Protection rating:** IP 30 **Protection class:** II for loads of protection classes I and II **Max. switching current:** 13 (3) A **Max. switching voltage:** 230 VAC, 50 Hz **Min. switching voltage:** 230 VAC, 50 Hz **Switching power:** 3000 W **Switching element:** relay **Switching contact:** NO contact **Control range:** 5 … 30 °C **Display:** installation mode / function check / connection loss / learning mode **Operating elements:** learning button	I

Radio-controlled heating – RECEIVER

Type / image	Item no.	Features	PG
HTFRB-010.101 	BA110500	**General features:** 1-channel radio-controlled temperature controller (receiver); central control; emergency operation; 3000 W switching power for electrical direct heaters, natural stone heating **Design:** Berlin 2000 **Housing colour:** pure white like RAL 9010 **Housing material:** ABS plastic **Operating voltage:** 230 VAC, 50 Hz **Ambient temperature:** 0 … 40 °C **Storage temperature:** – 20 … + 70 °C **Electrical connection:** screw-type terminals 0.5 … 2.5 mm² **Mounting / attachment:** surface- / wall-mounting (4-hole assembly on flush-mounted socket) **Protection rating:** IP 30 **Protection class:** II for loads of protection classes I and II **Max. switching current:** 13 (3) A **Max. switching voltage:** 230 VAC, 50 Hz **Min. switching voltage:** 230 VAC, 50 Hz **Switching power:** 3000 W **Switching element:** relay **Switching contact:** NO contact **Control range:** 5 … 30 °C **Display:** installation mode / function check / connection loss / learning mode **Operating elements:** learning button	I
HTFRU-010.101 	BA110200	**General features:** 1-channel radio-controlled temperature controller (receiver); central control, emergency operation **Design:** Berlin UP (flush-mounted) **Housing colour:** pure white like RAL 9010 **Housing material:** plastic PC **Operating voltage:** 230 VAC, 50 Hz **Ambient temperature:** – 20 … + 50 °C **Storage temperature:** – 20 … + 70 °C **Electrical connection:** screw-type terminals 0.5 … 2.5 mm² **Mounting / attachment:** in flush-mounted socket (deep flush-mounted socket recommended); if installed behind radiators, the wall clearance of the radiator must be at least 3 cm **Protection rating:** IP 30 **Protection class:** II for loads of protection classes I and II **Max. switching current:** 11 A, from 30 °C ambient temperature 7.5 A **Max. switching voltage:** 230 VAC, 50 Hz **Min. switching voltage:** 230 VAC, 50 Hz **Switching power:** 2500 W, from 30 °C ambient temperature 1700 W **Switching element:** relay **Switching contact:** NO contact **Control range:** 5 … 30 °C **Display:** installation mode / function check / connection loss / learning mode **Operating elements:** learning button	I
HTFRU-110.124 	BA110201	**General features:** 1-channel radio-controlled temperature controller (receiver); for activating an (electrical) floor heating system, the controller has a sensor input to which an optionally available remote sensor can be connected, which is then embedded in the floor; the following operating modes can be realised in conjunction with such a sensor: floor temperature control function or room temperature control function with floor monitoring and direct or central setpoint temperature setting (central control); if the sensor is dispensed with, the HTFRU-110.124 works as a room temperature controller with direct or central setpoint temperature setting (central control); central control; emergency operation **Housing colour:** pure white like RAL 9010 **Housing material:** plastic PC **Operating voltage:** 230 VAC, 50 Hz **Ambient temperature:** – 20 … + 50 °C **Storage temperature:** – 20 … + 70 °C **Electrical connection:** screw-type terminals 0.5 … 1.5 mm² **Mounting / attachment:** in flush-mounted socket (deep flush-mounted socket recommended) **Protection rating:** IP 20 **Protection class:** II for loads of protection classes I and II **Safety and EMC:**according to DIN EN 60950-1, DIN EN 300220 **Max. switching current:** 10 A to 30 °C ambient temperature **Max. switching voltage:** 230 VAC, 50 Hz **Min. switching voltage:** 230 VAC, 50 Hz **Switching power:** 2300 W up to 30 °C ambient temperature **Switching element:** relay **Switching contact:** NO contact **Control range:** 5 … 30 °C **Display:** installation mode / function check / connection loss / learning mode **Operating elements:** learning button	I

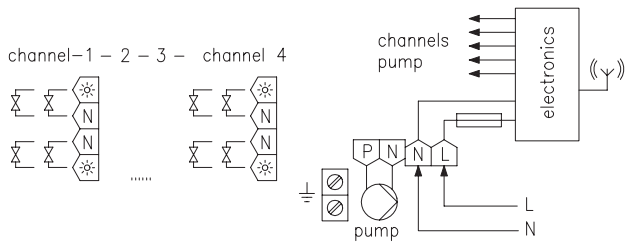
Radio-controlled heating – RECEIVER

Type / image	Item no.	Features	PG
HTFRL-214.140 	BA121000	**General features:** 4-channel radio-controlled temperature controller (receiver) for mounting in the heating manifold, max. 4 actuators / channel can be directly connected, including pump module, one time zone per channel possible, master-slave operation, average value calculation with up to 8 measurement points The upper part can be removed for configuring the radio transmitters in the individual rooms. The precondition is the use of an optional commercial 9-V battery. By using the channel selection button and a learning button, the transmitters can be configured very easily. Emergency operation; 4 fastening screws for wall mounting (see page 120 for implementation of central control using KTFRx) **Housing colour:** light grey like RAL 7035 **Housing material:** ABS plastic **Operating voltage:** 230 VAC, 50 Hz **Ambient temperature:** – 20 … + 50 °C **Storage temperature:** – 20 … + 70 °C **Electrical connection:** spring-cage terminals 0. … 1.5 mm² **Mounting / attachment:** surface / wall-mounting **Protection rating:** IP 20 **Protection class:** II for loads of protection classes I and II **Max. switching current:**5 (1) A **Max. switching voltage:** 230 VAC, 50 Hz **Min. switching voltage:** 230 VAC, 50 Hz **Switching power:** total 1150 W, 180 W of this for pump output **Switching element:** 5 relays **Switching contact:**5 NO contacts **Control range:** 5 … 30 °C **Display:** installation mode, connection and status check, connection loss, learning mode are indicated per channel **Operating elements:** channel selection button, learn button	I
HTFRD-214.140 	BA120600	like HTFRL-214.140, but with protection rating: IP 65	I
HTFRL-316.125 	BA120800	**General features:** 8-channel radio-controlled temperature controller (receiver) for mounting in the heating manifold, max. 4 actuators / channel can be directly connected, including pump module, one time zone per channel possible, master-slave operation, average value calculation with up to 8 measurement points; 4 fastening screws for wall mounting; installation mode; connection and status check, connection loss, learning mode are indicated per channel. The upper part can be removed for configuring the radio transmitters in the individual rooms. The precondition is the use of an optional commercial 9-V battery. By using the channel selection button and a learning button, the transmitters can be configured very easily. (see page 120 for implementation of central control using KTFRx) **Housing colour:** light grey like RAL 7035 **Housing material:** ABS plastic **Operating voltage:** 230 VAC, 50 Hz **Ambient temperature:** – 20 … + 50 °C **Storage temperature:** – 20 … + 70 °C **Electrical connection:** spring-cage terminals 0.5 … 1.5 mm² **Mounting / attachment:** surface / wall-mounting **Protection rating:** IP 20 **Protection class:** II for loads of protection classes I and II **Max. switching current:**5 (1) A **Max. switching voltage:** 230 VAC, 50 Hz **Min. switching voltage:** 230 VAC, 50 Hz **Switching power:** total 1150 W, 180 W of this for pump output **Switching element:** 9 relays **Switching contact:** 9 NO contacts **Control range:** 5 … 30 °C **Operating elements:** channel selection button, learn button	I
HTFRD-316.125 	BA120400	like HTFRD-316.125, but with protection rating: IP 65	I

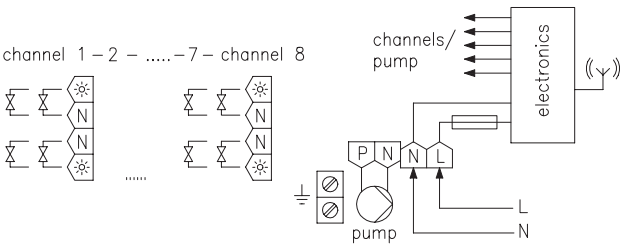
Radio-controlled heating – RECEIVER

Type / image	Item no.	Features	PG
HF-8/4-K2 	G8000370	**General features:** optional, external floor sensor for HTFRU-110.124 **Ambient temperature:** –5 … +70 °C **Protection rating:** IP 65 **Sensor:** NTC **Connecting cable:** 4 m, PVC	II
HF-8/6-K2 	G8000368	**General features:** optional, external floor sensor for HTFRU-110.124 **Ambient temperature:** –5 … +70 °C **Protection rating:** IP 65 **Sensor:** NTC **Connecting cable:** 6 m, PVC	II
WP-01	G9990180	**General features:** heat conduction paste 2 ml; R > 1 TΩ/cm, silicon-free **Ambient temperature:** –4 … +150 °C **Heat conductivity:** > 0.7 W/mK	II
JZ-24 	BN990002	**General features:** magnetic fastening set for simple and safe fastening of the multi-channel receiver on a metallic underground (for example, heating manifold)	II
JZ-25 	BN990003	**General features:** external antenna for reception enhancement under difficult reception conditions of the multi-channel receiver (antenna cable JZ-26 is not a part of the delivery scope) **Design:** Berlin 1000 **Surface finish:** glossy **Housing colour:** pure white like RAL 9010 **Housing material:** ABS plastic **Storage temperature:** –20 … +70 °C **Admissible humidity:** max. 95% rel. humidity, non-condensing **Protection rating:** IP 30	II
JZ-26	BN990004	**General features:** antenna cable for connecting the external antenna (JZ-25) with multi-channel receivers **Connecting cable:** 1 m	II
THF 	C1809515	**General features:** protective sleeve for screed mounting (for sleeve sensor HF Ø 7.7, for example, HF-8/4-K2 or HF-8/6-K2), copper	II

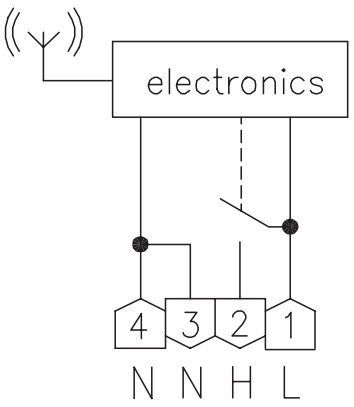
HTFRx-214.140 (4-channel)



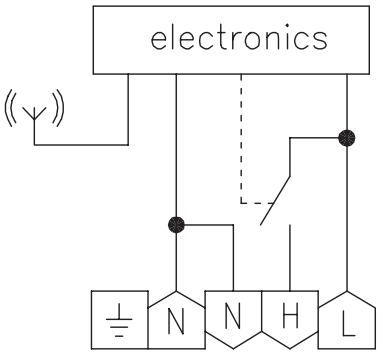
HTFRx-316.125 (8-channel)



HTFRB-010.101



HTFRU-010.101



Smart controlling with b@home

Intelligent remote control operation for heating and cooling systems

b@home – the clever way to control heating and cooling systems from anywhere and at any time through the new alre b@home Gate. alre wireless systems, both existing and yet to be set up, can be controlled via the internet or home network: simply using a free app (iOS/Android) or via standard PC/notebook browser. The intuitive, simple operation can access rooms individually or centrally, and can optimise energy consumption.

After a one-off registration on the b@home portal, the user can access the wireless system from anywhere via a https connection. This is also possible without an internet connection via WLAN/LAN. The b@home Gate is the interface between the alre wireless system and the WLAN/LAN router.

The wireless room temperature sensor FTRCUd-210.021 is the central access point to the settings of all channels or hot/cold zones. It can also be used as a room temperature sensor with timer and actuator, and works with all conventional switches.

1 Infrared heating

2 Underfloor warm-water heating

3 Underfloor electrical heating

4 Radiator

5 Cooling ceiling

An overview of all options and advantages

- Secure control, monitoring and programming of the hot/cold system from any location
- Up to 32 rooms or hot/cold zones
- Fast and easy commissioning
- Intuitive operation
- Individual room control
- Suitable for all types of heating
- A variety of mobile terminal equipment usable
- An internet connection is not required for the control function
- Upgradeable in existing alre wireless systems*
- Free apps, no follow-up costs such as monthly subscription fees

* Excludes the timer transmitters FTRFBu-180.1xx and FTRFUd-210.123, as the relevant functions are realised via APP/gate/web portals.

Radio-controlled heating – BIDIRECTIONAL

For corresponding transmitters and receivers, see "Radio-controlled heating" and "Radio-controlled heating / cooling" (except for FTRFBu / FTRFUd)

Technical data

Ambient temperature:	0 … 40 °C
Storage temperature:	–20 … +70 °C
Permissible atmospheric humidity:	max. 95% relative humidity non-condensing
Protection rating:	IP 30
Safety and EMC:	according to DIN EN 60730 and DIN EN 300220
Radio frequency:	868.3 MHz
Range:	150 m line-of-sight or up to 30 m in buildings, depending on the construction

Application

Using the new b@home gate MGCBB-064.360, alre radio-controlled systems can be monitored and controlled over the Internet or a WLAN / LAN.
After completing the free registration process at the b@home gate portal, users can operate the b@home gate system simply and intuitively via a smartphone app or a notebook / PC. This allows users to control, monitor and reprogram the temperature controls at any time and from any location, either for each individual room or centrally for all rooms. It is also possible to access the system without an Internet connection using the local WLAN / LAN network.

The bidirectional b@home operating element FTRCUd-210.021, together with the b@home gate MGCBB-064.360, offers central access to the settings of additional channels and can be used as a room temperature sensor with a timer and as an operating element. Changes made using the b@home app or via PC / notebook are shown in the graphic display.

It is possible to install this system in existing installations (except for the FTRFBu and FTRFUd radio-controlled room temperature sensors with timer).

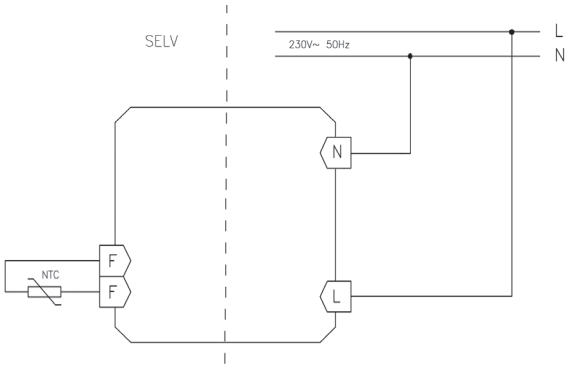
Type / image	Item no.	Features	PG
MGCBB-064.360 	BA210101	Radio room temperature management system can be controlled remotely via the Internet or a smartphone **Design:** Berlin 2000 **Surface finish:** matt **Housing colour:** pure white like RAL 9010 **Housing material:** ABS plastic **Operating voltage:** +5 VDC **Mounting / attachment:** direct surface / wall mounting by means of screws **Protection class:** III **Operating elements:** confirmation button **Scope of delivery:** b@home gate, network cable (CAT5) / cable length 3 m, MicroUSB power supply plug / cable length 1.8 m	I
FTRCUd-210.021#21 	UA070000	**Radio room temperature sensor with timer for acquiring and setting the room temperature; operating element for additional active channels;** different timer programs can be set for heating and cooling; usable as the master for master-slave operation (pilot controller) **General features:** digital actual value display; "ECO" display; "On / Off" display; automatic adjustment to standard / daylight savings time; ECO function; ECO value adjustable; power reserve (approx. 3 days); backlighting; actual value correction / measured value correction; child-safe features; learning function; party setting; pilot function; holiday setting; valve protection; external setting; operation using direct-dial buttons **Design:** Berlin UP (flush-mounted) **Surface finish:** glossy **Housing colour:** pure white like RAL 9010 **Housing material:** ABS plastic, PC, PMMA **Operating voltage:** 230 VAC, 50 Hz **Electrical connection:** pluggable screw terminals **Mounting / attachment**: in flush-mounted socket (deep flush-mounted socket recommended); can be adapted to fit virtually any flush-mounted switch range, see adaptation list on page 65 **Protection class:** II, if properly mounted **Average power consumption:** <1 W **Sensor:** NTC, internal, optional external **Control range:** 5 … 30 °C **Transmission interval:** approx. 3 min and after setpoint change **Display type:** illuminated graphical display **Display:** setpoint, actual temperature / date, time; setpoint, actual temperature or date, time **Scope of delivery:** radio-controlled transmitter, cover **50 x 50** mm **pure white** (like RAL 9010), **glossy,** alre frame "Berlin"	I

Radio-controlled heating – BIDIRECTIONAL

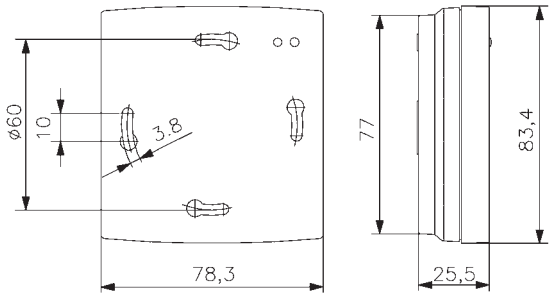
Type / image	Item no.	Features	PG
FTRCUd-210.021#07 	UA070001	like FTRCUd-210.021#21, but with scope of delivery: radio-controlled transmitter, cover **50 x 50** mm **pure white** (like RAL 9010), **glossy,** without frame	I
FTRCUd-210.021#09 	UA070002	like FTRCUd-210.021#21, but with scope of delivery: radio-controlled transmitter, cover **50 x 50** mm**, pearl white** (like RAL 1013), **glossy,** without frame	I
FTRCUd-210.021#27 	UA070003	like FTRCUd-210.021#21, but with scope of delivery: radio-controlled transmitter, cover **50 x 50** mm**, traffic white** (like RAL 9016), **glossy,** without frame	I
FTRCUd-210.021#28 	UA070006	like FTRCUd-210.021#21, but with scope of delivery: radio-controlled transmitter, cover **suitable for BUSCH-JAEGER Reflex SI / SI Linear pure white** (like RAL 9010), **glossy,** without frame	I
FTRCUd-210.021#55 	UA070004	like FTRCUd-210.021#21, but with scope of delivery: radio-controlled transmitter, cover **55 x 55** mm **pure white** (like RAL 9010), **glossy,** without frame	I
FTRCUd-210.021#56 	UA070008	like FTRCUd-210.021#21, but with scope of delivery: radio-controlled transmitter, cover **55 x 55** mm**, pure white** (like RAL 9010), **matt,** without frame	I
FTRCUd-210.021#57 	UA070005	like FTRCUd-210.021#21, but with scope of delivery: radio-controlled transmitter, cover **55 x 55** mm**, pearl white** (like RAL 1013), **glossy,** without frame	I
FTRCUd-210.021#59 	UA070007	like FTRCUd-210.021#21, but with scope of delivery: radio-controlled transmitter, cover **55 x 55** mm**, traffic white** (like RAL 9016), **glossy,** without frame	I

Radio-controlled heating – BIDIRECTIONAL

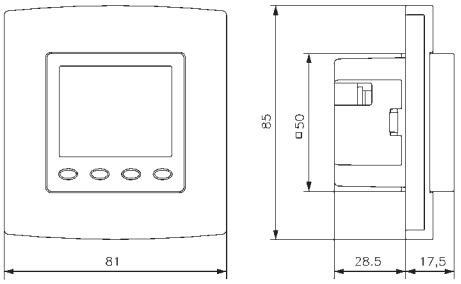
FTRCUd-210.021



MGCBB-064.360



FTRCUd with alre frame “Berlin”



Electrothermal valve actuators

for heating, ventilation and air conditioning technology

Technical data

Housing colour:	pure white, like RAL 9010
Housing material:	PC plastic, GF (20%)
Ambient temperature:	0…50 °C
Storage temperature:	–20…+70 °C
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Mounting/attachment:	M 30 x 1.5
Protection rating:	IP 42
Protection class:	II
Safety and EMC:	according to DIN EN 60730
Average power consumption:	approx. 3 W
Opening/closing time:	approx. 4 min
Nominal stroke:	3 mm
Function type:	normally closed
Nominal closing force:	90 N
Connecting cable:	0.8 m/2 x 0.5 mm²
Valve position indicator:	2X (at the top and the side)

Application

Extremely compact design:
Can be fitted quickly and comfortably thanks to the slim shape in the area around the fastening nut.

Can be fitted in any position:
Lateral drainage holes carry off any leakage water that from the valve plunger into the open, thus avoiding damage to the drive.

Additional valve monitoring:
Two additional viewing windows at the side allow users to visually check the respective valve position with ease; this does not work when mounted in a suspended manner.

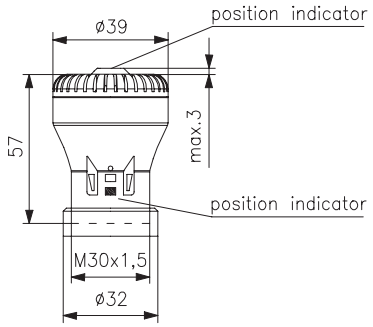
Type/image	Item no.	Features	PG
ZBOOA-010.100 	H9100010	**Operating voltage:** 230 V~, 50 Hz **Max. power consumption:** 70 W **Max. starting current:** approx. 0.3 A	I
ZBOOA-040.100 	H9100000	**Operating voltage:** 24 VDC or 24 VAC **Max. power consumption:** 12 W **Max. starting current:** approx. 0.5 A	I

Thanks to their M 30 x 1.5 fastening and their characteristics (normally closed), the actuators are suitable for the following valve and distributor makes: Beulco, Empur, Heimeier, Kamo, Purmo, SBK, SKV, Strawa, Taconova, Watts

Brief description:
The drive features a compact, space-saving design.
The device can be mounted easily thanks to the narrowed shape, especially in the fastening area of the nut.
The fastening cable is not located near the fastening nut. This reduces the probability of contact with equipment carrying hot water.
Since the fastening nut allows continuous screwing onto the thread, by unscrewing the nut by two or three turns, it is possible to open the valve in an electrically de-energised state – something that cannot be done with bayonet couplings and impulse couplings.
Discharged water is dissipated via a draining system.
Gaskets are not required thanks to the careful design.

The double position display has the following advantages:
The upper display provides the option of a visual or, in conditions of bad visibility, tactile function test of the drive.
The lower viewing window allows an additional check to determine whether the valve to be actuated follows the lifting movement of the drive.
At the beginning of the heating period, it can sometimes happen that the valve plungers get “stuck”. Therefore, with the additional display, it is possible to determine whether the cause lies with the actuator or with the valve in the event the valve does not open. However, that is not possible when mounted in a suspended manner.

Valve actuator



Valve actuator with extended push rod

Terminal strip for heating manifold

for 5 or 8 room thermostats

Technical data

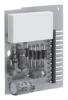
Surface finish:	matt
Housing colour:	light grey, like RAL 7035
Housing material:	ABS plastic
Operating voltage:	230 VAC, 50 Hz or 24 VAC, 50 Hz (only usable without pump module WUSRE)
Ambient temperature:	–10 … +50 °C
Storage temperature:	–20 … +70 °C
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Electrical connection:	spring-cage terminals 0.2 mm² to 1.5 mm²; if end sleeves are used, 0.25 mm² to 0.75 mm²
Mounting / attachment:	Surface / wall mounting with 4 fastening screws included in delivery or using optional JZ-24 magnetic fastening set
Protection class:	II, if properly mounted
Max. switching voltage:	230 VAC, 50 Hz
Min. switching voltage:	24 VAC, 50 Hz, only usable without pump module (WUSRE)
Control function:	heating or cooling

Application

Wiring strip for heating controllers with or without ECO function, also for heating / cooling controllers with integrated heating / cooling switch, and for use with “normally closed” valve actuators.

If timer regulators are used, up to 3 master-slave time zones can be defined.

As soon as a channel registers a heating request, the optional pump module is switched on.

Type / image	Item no.	Features	PG
VOOPL-215.000 	DA480500	**General features:** terminal strip in housing for wiring up to 5 room thermostats and up to 20 actuators, up to 4 actuators per channel are possible, T4A / 250 V device fuse, installation dimensions Ø 5 x 20 mm (also secures the circuits of the connected controllers, the pump and the valve gears) **Protection rating:** IP 20	I
VOOPD-215.000 	DA480200	like VOOPL-215.000, but with protection rating: IP 65	I
VOOPL-318.000 	DA480400	**General features:** terminal strip in housing for wiring up to 8 room thermostats and up to 32 actuators, up to 4 actuators per channel are possible, T6,3A / 250 V device fuse, installation dimensions Ø 5 x 20 mm (also secures the circuits of the connected controllers, the pump and the valve gears) **Protection rating:** IP 20	I
VOOPD-318.000 	DA480300	like VOOPL-318.000, but with protection rating: IP 65	I
WUSRE-212.100 	DA800000	**General features:** plug-in pump module for 5-channel terminal strip VOOPx-215.000, energy saving because pump switches on only when needed **Protection rating:** IP 00, after installation the protection class of the terminal strip is decisive **Max. switching current:** 0.78 A **Min. switching voltage:** 230 VAC, 50 Hz **Switching power:** 180 W **Switching element:** relay **Switching contact:** NO contact **Control function:** The pump output of the terminal strip is activated by the pump module every time there is a heating or cooling request without a switch-on or switch-off delay.	I

Terminal strip for heating manifold

for 5 or 8 room thermostats

Type / image	Item no.	Features	PG
WUSRE-213.100 	DA800100	**General features:** plug-in pump module for 8-channel terminal strip VO-OPx-318.000, energy saving because pump switches on only when needed **Protection rating:** IP 00, after installation the protection class of the terminal strip is decisive **Max. switching current:** 0.78 A **Min. switching voltage:** 230 VAC, 50 Hz **Switching power:** 180 W **Switching element:** relay **Switching contact:** NO contact **Control function:** The pump output of the terminal strip is activated by the pump module every time there is a heating or cooling request without a switch-on or switch-off delay.	I

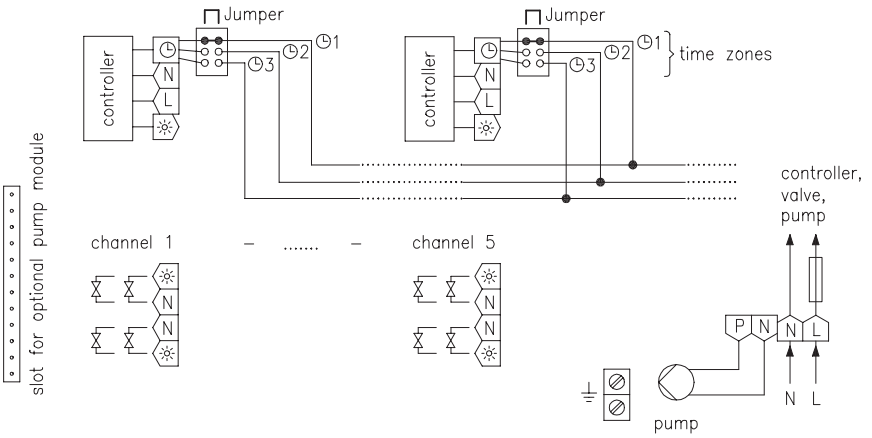
other / similar items: VOORL terminal strip for heating and cooling
Accessories: suitable ZBOOA valve actuators

It is permissible to connect an operating voltage of 24 V AC as well as to use controllers and electrothermal valve actuators with an operating voltage of 24 V AC at the VOOPx wiring strips. Connect the 24 V AC power supply to terminals L and N.

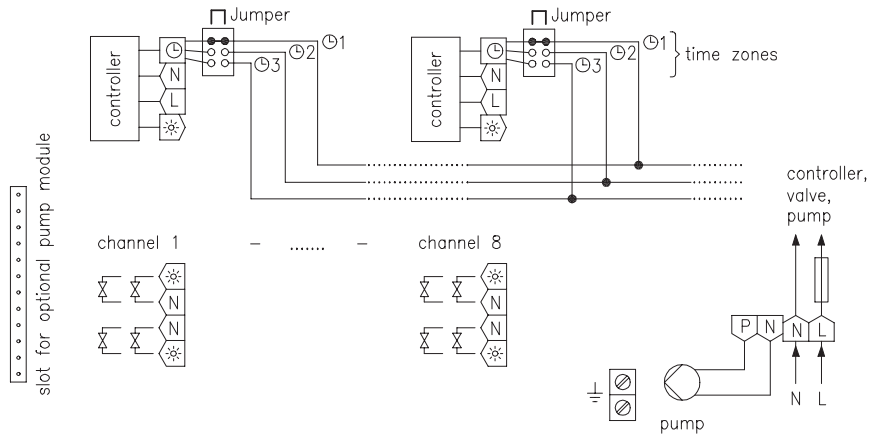
Note that the optional WUSRE pump modules are not suitable for operation at 24 V AC and may thus not be used.

Accessories	Item no.	Features	PG
JZ-24 	BN990002	**General features:** magnetic fastening set for simple and safe fastening of the terminal strip on a metallic underground (for example, heating manifold)	II

VOOPx-215.000



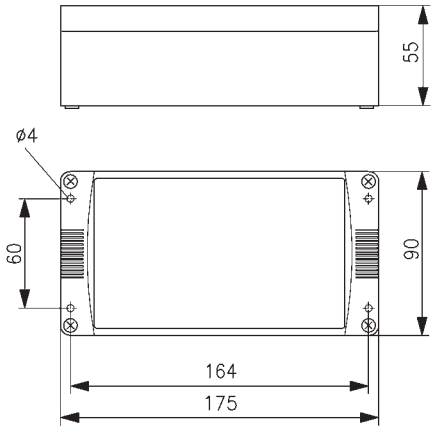
VOOPx-318.000



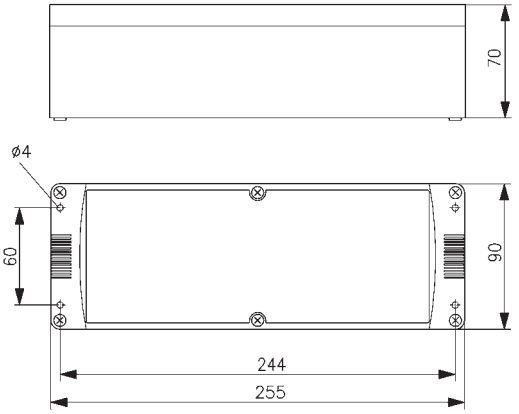
Terminal strip for heating manifold

for 5 or 8 room thermostats

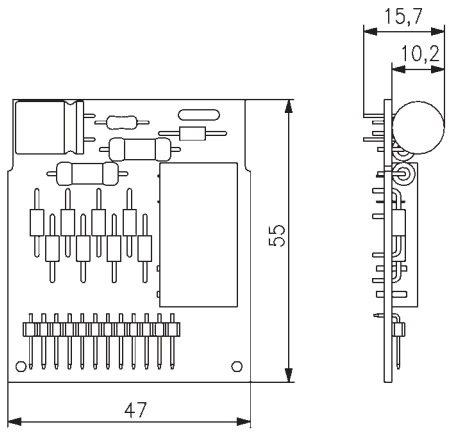
VOOPx-215.000



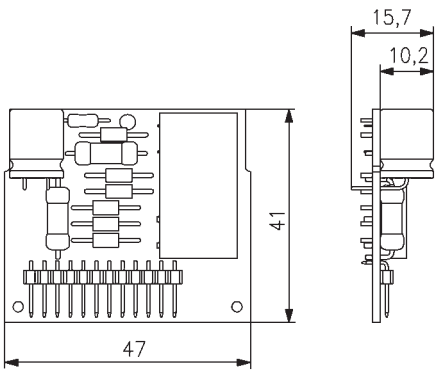
VOOPx-318.000



WUSRE-213.100



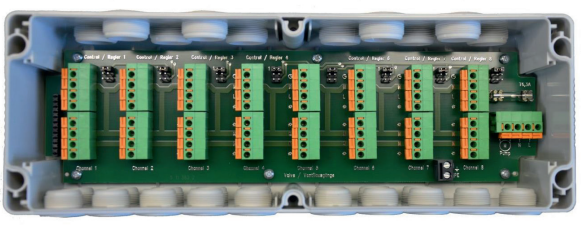
WUSRE-212.100



VOOPL-215.000 (IP 20)

VOOPD-215.000 (IP 65)

Internal view VOOPD-318.000 (IP 65)



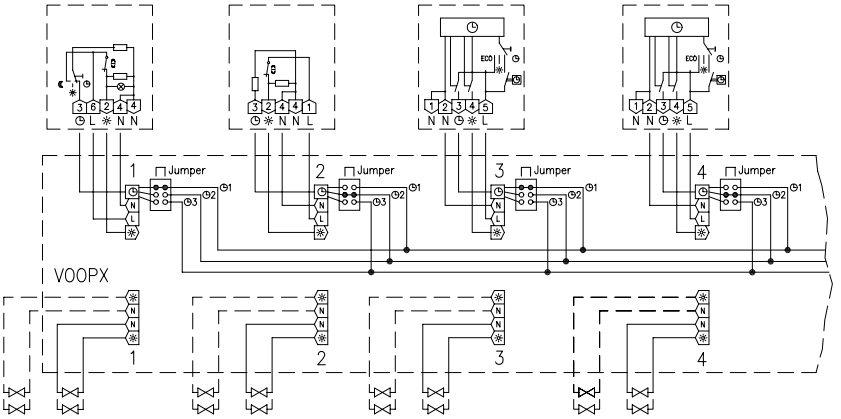
Notes and examples of wiring for VOOPx terminal strips

1 Heating system with master-slave time zones

Office	Children's room	Living room	Bedroom
RTBSB-201.075/ FTR 101.075 (slave time zone 1)	RTBSB-201.002/ FTR 101.002 (slave time zone 2)	HTRRBu 110.121 (master time zone 1)	HTRRBu 110.121 (master time zone 2)

The controllers, valve actuators and pump are supplied with power via the wiring strip.

The equipment and features of the individual controller types can be found in the controller matrix on page 10. The information listed in this matrix applies for normally closed valve actuators.



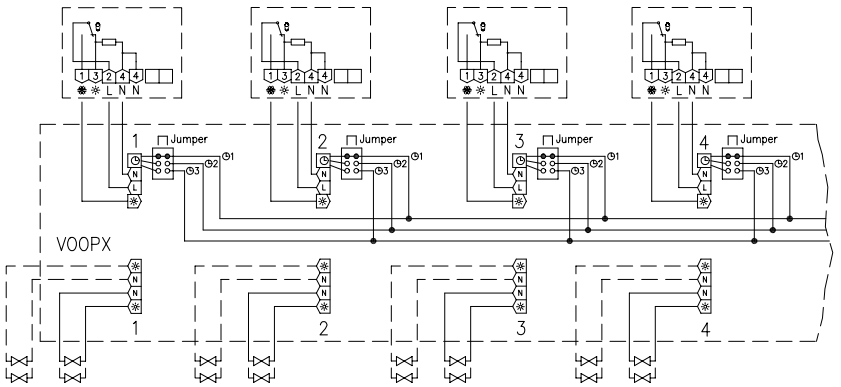
Jumpers for master and corresponding slaves must always be plugged into the same time zone. No specific sequence needs to be observed.

2 Cooling system

Office	Children's room	Living room	Bedroom
RTBSB-201.010/ FTR 101.010	RTBSB-201.010/ FTR 101.010	RTBSB-201.010/ FTR 101.010	RTBSB-201.010/ FTR 101.010

The controllers, valve actuators and pump are supplied with power via the wiring strip.

The equipment and features of the individual controller types can be found in the controller matrix on page 10. The information listed in this matrix applies for normally closed valve actuators.

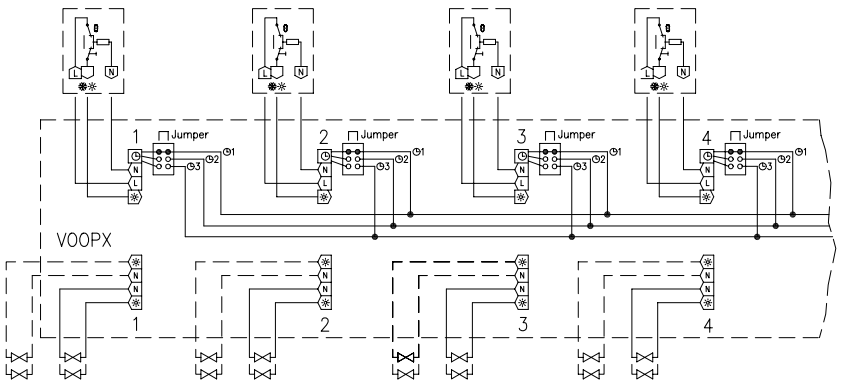


3 Heating/cooling systems with heating/cooling switches at the controllers

Office	Children's room	Living room	Bedroom
RTBSB-201.065/ FTR 101.065	RTBSB-201.065/ FTR 101.065	RTBSB-201.065/ FTR 101.065	RTBSB-201.065/ FTR 101.065

The controllers, valve actuators and pump are supplied with power via the wiring strip.

The equipment and features of the individual controller types can be found in the controller matrix on page 10. The printing on the heating/cooling changeover switches on the FTR 101.065 applies to normally closed valve actuators. The medium status "hot" or "cold" must always correspond to the switch settings.



AIR-CONDITIONING TECHNOLOGY

When it gets too hot,
you can rely on our help.

AIR CONDITIONING
The perfect climate for your comfort.




Office buildings, hotel rooms and living rooms require efficient control technology for the perfect climate. The key parameters in this context are temperature, humidity and air quality. The optimum combination of these provides an ambient temperature tailored to individual needs.

Safe and comfortable operation is what sets our controllers apart. Our devices offer numerous additional functions to continue to control the temperature in an economical and environmentally friendly manner–also in the evening and at night. This means that any energy not required is saved, which reduces the impact on the environment and your wallet.

Comfort thanks an ideal indoor climate.

Air conditioning overview:
Climate controllers

Dew point monitoring

Remote controls for air conditioning systems

Hygrostats/Hygro-thermostats

Radio-controlled heating/cooling

Terminal strips for heating manifold/valve actuators

Climate controller overview

	Type	KTRTB-211.108	KTRTB-251.108	KTBSB-112.000	KTBSB-113.500	ETBSB-113.500	KTBSB-112.070	KTRRB-111.070	KTRRB-117.128	KTRRB-117.163	KTRRB-117.169	KTRRB-042.211	KTRRB-040.112	KTRRB-040.213	KTRRB-052.244	KTRRB-052.245	KTRRU-052.244#00	KTRRU-052.245#00	KTRRUu-217.456	KTRRUu-257.456	KTRVB-048.100	KTRVB-048.200	KTRVB-042.100	KTRVB-042.205	KTRVB-042.206	KTRVB-042.207	KTRVB-040.209	KTRVB-052.244	KTRVB-052.245	PTR 02.802	PTR 02.803
	Page	83	83	84	85	84	84	84	86	86	86	89	88	88	89	89	91	92	95	96	102	102	101	101	102	102	101	103	103	104	104
Housing design	Berlin 1000	x	x																												
	Berlin 2000											x	x	x	x	x					x	x	x	x	x	x	x	x			
	Berlin 3000			x	x	x	x	x	x	x	x																				
	Berlin flush-mounted kit																x	x	x	x											
	Pikolo																												x	x	
Sensor	Bimetal (toggler)			x	x	x	x	x																					x	x	
	NTC internal	x	x						x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x			
	NTC external								x	x	x				x	x	x	x	x	x					x		x	x			
	Floor monitor (NTC)																														
	Dew point sensor (external)								x	x	x	x	x	x	x	x	x	x	x	x							x	x			
Control type	Cooling controller with fan output																														x
	Climate controllers	x	x									x	x	x																	
	Climate controller (0 ... 10 V)										x								x	x			x	x	x	x	x	x	x		
	Climate controller with fan output			x	x	x													x	x										x	
	Climate controller with neutral zone							x		x		x			x	x	x	x	x	x								x	x		
	Climate controller with neutral zone and fan output						x		x		x								x	x											
	Mixing chamber controller (0 ... 10 V)																				x	x									
Pipe system	Air conditioning controller as a 2-pipe system	x	x			x			x	x	x		x	x	x	x	x	x	x	x							x	x	x	x	
	Air conditioning controller as a 4-pipe system			x	x		x	x	x	x	x	x			x	x	x	x	x	x			x	x	x	x		x	x		
Application examples	Hot water floor heating																						x	x	x	x	x				
	Fan coil			x	x	x	x		x																					x	x
	Air distribution systems			x	x		x		x												x	x								x	x
	Partial air conditioner	x	x	x	x	x	x	x	x	x	x				x	x	x	x	x	x			x	x	x	x	x	x	x	x	x
	Cooling ceiling	x	x									x	x	x	x	x	x	x	x	x			x	x	x	x	x	x			
	Heat pump					x																									
	AC split unit					x																							x	x	
Features	Input “ECO”	x	x						x	x	x		x	x	x	x	x	x	x	x				x	x			x	x		
	Input “changeover – heating/cooling”	x	x												x	x	x	x	x	x								x	x		
	Input “off with frost protection monitoring”								x	x	x				x	x			x	x				x	x						
	Switch “on/off”			x	x	x	x	x																							
	Switch “on/off with frost protection monitoring”								x	x	x																				
	Switch “heating/cooling”												x														x				
	Switch “heating/ ventilation/cooling”				x	x																								x	
	Switch “ECO/comfort/off with frost protection monitoring”													x		x		x							x				x		
	Switch “ventilator”			x	x	x	x		x																					x	x
	Indicator lamp “ON/OFF”				x	x						x													x						
	Indicator lamp “heating mode”					x																									
	Indicator lamp “heating”	x	x		x							x	x	x	x	x	x	x	x	x								x	x		
	Indicator lamp “cooling”	x	x		x							x	x	x	x	x	x	x	x	x								x	x		x
	Indicator lamp “heating/cooling”					x																									
	Indicator lamp "ECO"												x	x											x						
	Indicator lamp “cooling interruption due to condensate”											x	x	x	x	x	x	x										x	x		
Miscellaneous	230 V~	x		x	x	x	x	x	x	x	x								x										x	x
	24 V~		x									x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x		

Electronic climate controller with triac output

Surface-mounted superflat – Design Berlin 1000

Technical data

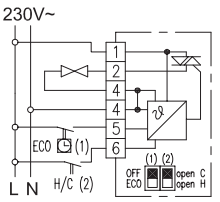
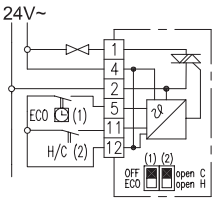
Design:	Berlin 1000
Surface finish:	glossy
Housing colour:	pure white, like RAL 9010
Housing material:	ABS plastic
Ambient temperature:	0 … 40 °C
Storage temperature:	–20 … +70 °C
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Electrical connection:	screw-type terminals 0.5 mm² to 1.5 mm²
Mounting / attachment:	Surface- / wall-mounting (4-hole assembly on flush-mounted socket)
Protection rating:	IP 30
Safety and EMC:	according to DIN EN 60730
Max. power consumption:	< 0.8 W
Switching power:	15 W
Switching element:	triac
Switching contact:	NC contact
Sensor:	NTC, internal
Control function:	heating or cooling
Control range:	5 … 30 °C
Hysteresis:	0 K since control is practically continuous
Proportional range:	approx. 1 K
General features:	ECO function; “heating / cooling” display; “off with frost protection monitoring” operating mode; mechanical range restriction; scale: degrees Celsius; external setting

Application

This controller was specifically designed for heating / cooling regulation of 2-pipe systems used in hotels, homes and offices and can control up to 5 valve actuators (normally closed).

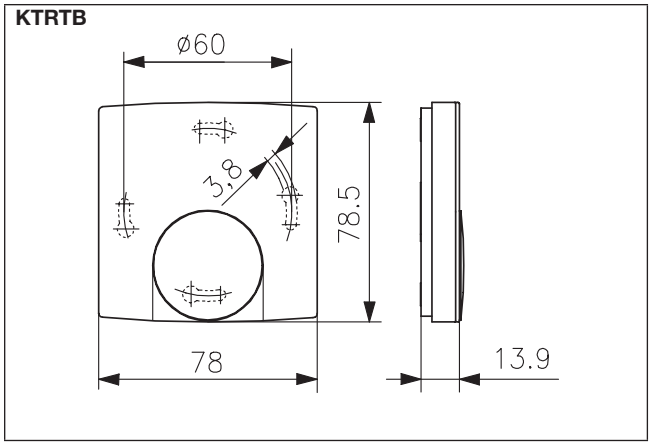
The KTRTB’s internal sensor measures the room temperature and activates heating or cooling depending on the deviation from the configured setpoint temperature. As the switching element used is a triac rather than a relay or bimetal, the system operates without bothersome switching sounds.

ECO function: Selecting this mode enables to adjust to a temperature value that is by 3K lower while heating and to adjust to a temperature value that is by 3K higher while cooling.

Type / image	Item no.	Features	Circuit diagram	PG
KTRTB-211.108 	MA 700300	**Operating voltage:** 230 VAC, 50 Hz **Protection class:** II, if properly mounted **Max. switching current:** 65 mA **Max. switching voltage:** 230 VAC, 50 Hz **Min. switching voltage:** 230 VAC, 50 Hz **Output signal:** switching PWM (230 VAC, 50 Hz) **ECO contact:** 230 VAC, 50 Hz, optionally configurable as ECO or OFF function		I
KTRTB-251.108 	MA 700400	**Operating voltage:** 24 VAC, 50 Hz **Protection class:** III, protective low voltage **Max. switching current:** 625 mA **Max. switching voltage:** 24 VAC, 50 Hz **Min. switching voltage:** 24 VAC, 50 Hz **Output signal:** switching PWM (24 VAC, 50 Hz) **ECO contact:** optionally configurable as ECO or OFF function		I

Accessories: suitable valve actuators ZBOOA

KTRTB



Mechanical climate controllers KTBSB, ETBSB

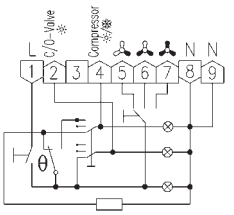
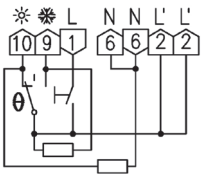
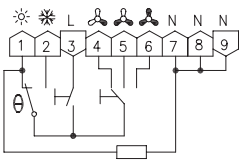
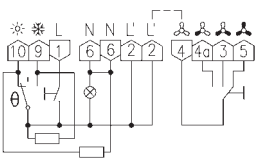
Surface-mounted installation – Design Berlin 3000

Technical data	
Design:	Berlin 3000
Surface finish:	matt
Housing colour:	pure white, like RAL 9010
Housing material:	ABS plastic
Operating voltage:	230 VAC, 50 Hz
Ambient temperature:	0…30 °C
Storage temperature:	–20…+70 °C
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Electrical connection:	screw-type terminals
Mounting / attachment:	surface- / wall-mounting or by means of an adapter plate on a flush-mounted socket
Protection rating:	IP 30
Protection class:	II, if properly mounted
Safety and EMC:	according to DIN EN 60730
Max. switching current:	6 (3) A
Max. switching voltage:	230 VAC, 50 Hz
Min. switching voltage:	230 VAC, 50 Hz
Switching power:	1380 W
Switching element:	bimetallic contact
Switching contact:	changeover
Output signal:	switching (230 VAC, 50 Hz)
Sensor:	bimetal
Control function:	heating or cooling
Control range:	5…30 °C
General features:	mechanical range restriction; thermal feedback; scale: degrees Celsius; on / off switch; external setting

Application

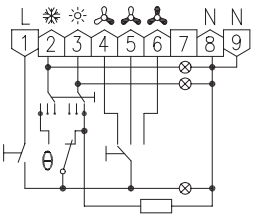
Control and monitoring of temperatures in closed, dry spaces. Remote control of air conditioners, climate chests, fan coil systems in living and office spaces and doctors' practices. Individual room optimisation in central air conditioning systems (hotels, hospitals etc.).

Suitable for all heating systems. (Please note the maximum switching current.)

Type / image	Item no.	Features	Circuit diagram	PG
ETBSB-113.500 	MA 210000	**General features:** to control a heating pump directly, 3-stage fan output; **"on / off" display; "heating" display; "cooling" display; "heating / ventilation / cooling" switch; ventilator 3-stage switch** **Hysteresis:** approx. 0.5 K at a temperature change of max. 4 K / h		I
KTBSB-111.070 	MA200203	**General features:** single-room climate controller with neutral zone for 4-pipe systems; 2x auxiliary output "on / off"; **"on / off" switch-** **Hysteresis:** heating approx. 1 K, cooling approx. 2 K, at a temperature change of max. 4 K / h **Neutral zone:** approx. 2 K		I
KTBSB-112.000 	MA 200100	**General features:** 3-stage fan output; **3-stage fan switch; "on / off" switch** **Hysteresis:** approx. 0.5 K at a temperature change of max. 4 K / h		I
KTBSB-112.070 	MA 200202	**General features:** single-room climate controller with neutral zone for 4-pipe systems; 3-stage fan output; 2x auxiliary output "on / off"; **"on / off" display, 3-stage fan switch; "on / off" switch** **Hysteresis:** heating approx. 1 K, cooling approx. 2 K, at a temperature change of max. 4 K / h **Neutral zone:** approx. 2 K		I

Mechanical climate controllers KTBSB, ETBSB

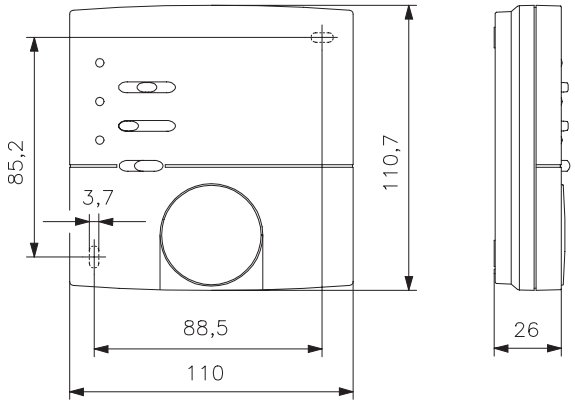
Surface-mounted installation – Berlin 3000

Type / image	Item no.	Features	Circuit diagram	PG
KTBSB-113.500 	MA 200000	**General features: "on / off" display; "heating" display; "cooling" display;** for 4-pipe systems; 3-stage fan output; **heating / ventilation / cooling switch; 3-stage fan switch; "on / off" switch** **Hysteresis:** approx. 0.5 K at a temperature change of max. 4 K / h		I

Accessories: Terminal strips VOOxx, suitable valve actuators ZBOOA-010.100, adapter plates to mount in flush-mounted socket JZ-17
You can find other controllers with outputs for heating / cooling in the "Heating technology" section (RTBSB / FTR).

Accessories	Item no.	Features	PG
JZ-17	MA 210000	**General features:** adapter plate for mounting devices on flush-mounted sockets (including fastening screws for mounting the controller on the adapter plate) **Surface finish:** matt **Housing colour:** pure white like RAL 9010 **Housing material:** ABS plastic	II

KTBSB / ETBSB



JZ-17

Electronic climate controller, KTRRB

Surface-mounted installation – Design Berlin 3000

Technical data

Design:	Berlin 3000
Surface finish:	matt
Housing colour:	pure white, like RAL 9010
Housing material:	ABS plastic
Operating voltage:	230 VAC, 50 Hz
Ambient temperature:	0 … 40 °C
Storage temperature:	–20 … +70 °C
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Electrical connection:	screw-type terminals
Mounting / attachment:	surface- / wall-mounting or by means of an adapter plate on a flush-mounted socket
Protection rating:	IP 30
Protection class:	II, if properly mounted
Safety and EMC:	according to DIN EN 60730
Max. switching voltage:	230 VAC, 50 Hz
Min. switching voltage:	230 VAC, 50 Hz
Switching element:	relay
Switching contact:	NO contact
Output signal:	switching (230 VAC, 50 Hz)
Sensor:	internal NTC, optional external NTC („Sensor 2“)
ECO contact*:	reduction by 3 K; alternatively, this input can be configured as a frost protection contact
Control function:	heating and / or cooling
Control range:	5 … 30 °C
Neutral zone:	approx. 2 K
General features:	operating mode “off with frost protection monitoring”; mechanical range restriction; scale: degrees Celsius; external setting

Application

Single-room temperature controller with neutral zone for 2-pipe or 4-pipe air conditioners.

External flow sensor (H / C sensor):
for automatic switching of the controller to heating or cooling mode in 2-pipe operation depending on the inflow temperature; alternatively, this input can be used as an H / C changeover contact.

Sensor rupture and short-circuit safeguarding:
In case of a sensor rupture or sensor short-circuit, the heating is activated with a power-on time of 30% to prevent cooling or frost damage in the room.

Type / image	Item no.	Features	PG
KTRRB-117.128 	MA 601300	**General features:** single-room climate controller, 3-stage fan output, fan operation in neutral zone ON / OFF selectable; **on / off switch; 3-stage fan switch** **Max. switching current:** heating 5 (1) A, cooling 5 (1) A, fan 3 (1) A **Switching power:** heating 1150 W, cooling 1150 W, fan 230 W **Hysteresis:** approx. 1 K	I
KTRRB-117.163 	MA601400	like KTRRB-117.128 but without 3-stage fan output and 3-stage fan switch	I
KTRRB-117.169 	MA601500	**General features:** single-room climate controller;**“off / manual fan / automatic fan” switch; “ventilator 3-stage 0–10 V” switch;** button “parameterisation 3-stage fan output”;**“heating, cooling,** frost protection, sensor break or short circuiting of the external sensor” display; 3-stage fan output 0–10 V with adjustment to individual fan stages or dynamic 0–10 V to activate **EC fans**; ON / OFF: ventilator use in neutral zone selectable **Max. switching current:** heating 5 (1) A, cooling 5 (1) A **Switching power:** heating 1150 W, cooling 1150 W **Output signal:** analogue 0–10 V (5 mA) for activating an rpm-controlled fan **Hysteresis:** approx. 0.5 K	I

Accessories: Adaptor plate for mounting on flush-mounted socket JZ-17, terminal strips VOOxx, suitable valve actuators ZBOOA, suitable external sensors (sensor 2) see “Sensor technology”.
You can find other / similar controllers with outputs for heating / cooling in the “Heating technology” section (RTBSB / FTR).

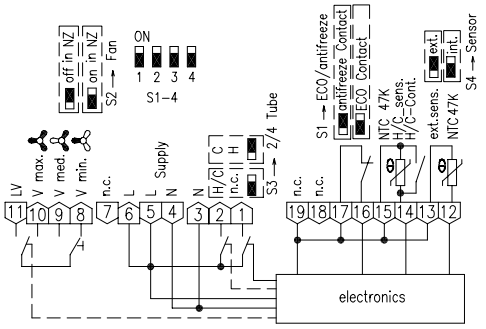
*With ECO operation, the neutral zone (2 K) is extended by the ECO zone (+ / - 3 K). ECO operation is a savings mode that should be controlled, for example, via a window contact and / or a timer.

Electronic climate controller, KTRRB

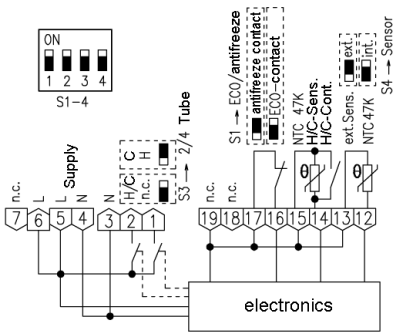
Surface-mounted installation – Design Berlin 3000

Accessories	Item no.	Features	PG
JZ-17 	MA 210000	**General features:** adapter plate for mounting devices on flush-mounted sockets (including fastening screws for mounting the controller on the adapter plate) **Surface finish:** matt **Housing colour:** pure white like RAL 9010 **Housing material:** ABS plastic	II

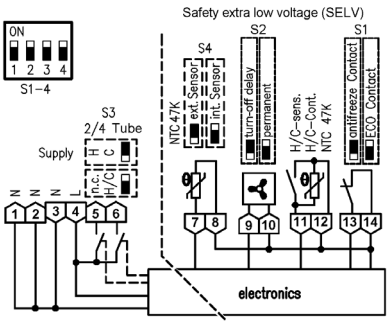
Circuit diagram KTRRB-117.128



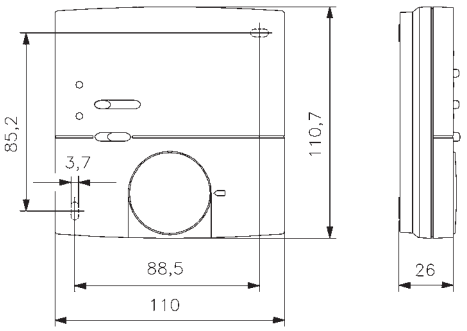
Circuit diagram KTRRB-117.163



Circuit diagram KTRRB-117.169



Housing design – Berlin 3000



Electronic climate controller for cooling ceilings, KTRRB

Surface-mounted installation – Design Berlin 2000

Technical data

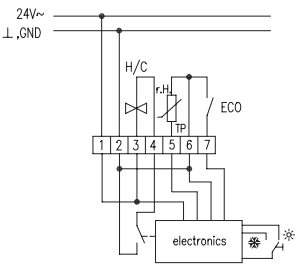
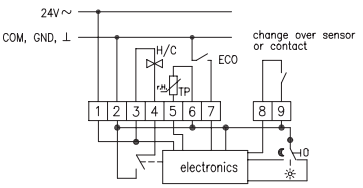
Design:	Berlin 2000
Surface finish:	matt
Housing colour:	pure white, like RAL 9010
Housing material:	ABS plastic
Ambient temperature:	0 … 40 °C
Operating voltage:	24 VAC / 50 Hz, 24 VDC
Storage temperature:	– 20 … +70 °C
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Electrical connection:	screw-type terminals
Mounting / attachment:	Surface- / wall-mounting
Protection rating:	IP 30
Protection class:	III
Safety and EMC:	according to DIN EN 60730
Max. switching current:	1 A
Max. switching voltage:	24 VAC / 50 Hz, 24 VDC
Min. switching voltage:	24 VAC / 50 Hz, 24 VDC
Switching power:	24 W
Switching element:	relay
Switching contact:	NO contact
Output signal:	switching, 24 VAC / 50 Hz, 24 VDC
Hysteresis:	approx. 1 K
General features:	external dew point sensor; mechanical range restriction; external setting

Application

Temperature controller for cooling ceilings / walls and all kinds of hot water heaters in 2- and 4-pipe systems for hotels, offices and private homes. As the KTRRB features dew point monitoring, it is highly suited for controlling ceiling cooling systems.

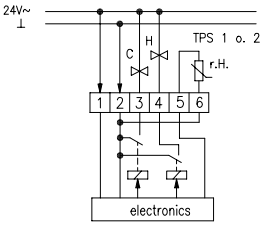
The unit can control up to 5 valve actuators (24 V~ normally closed) per output. The types KTRRB-052.24x can be adapt to the actuator type normally open (up to 5 actuators / 24 V~).

Room temperature controller for continuous control of valve actuators: KTRVB-052.24x

Type / image	Item no.	Features	Circuit diagram	PG
KTRRB-040.112	DA 420100	**General features:** ECO function; ECO value adjustable; **“heating / cooling display; “ECO / cooling interruption due to condensation” display;** scale: degrees Celsius; **“heating / cooling” switch** **Sensor:**NTC internal **ECO contact:** upon closing the contact, the ECO function is actuated **Control function:** heating or cooling, cooling interruption of the dew point sensor upon condensation **Control range:** 5 … 30 °C **Pipe system compatibility:** 2-pipe		I
KTRRB-040.213	DA420200	**General features:** ECO function; ECO value adjustable; **“heating / cooling” display; “ECO / cooling interruption due to condensation” display;** operating mode “off with frost protection monitoring”; relative scale; **off / comfort / ECO switch** **Sensor:** NTC internal **External flow sensor (H / C sensor):** for automatic switching of the controller in heating or cooling mode depending on the inflow temperature; alternatively, this input can be used as an H / C changeover contact („Sensor 2“) **Eco contact:** upon closing the contact, the ECO function is actuated **Control function:** heating or cooling, cooling interruption of the dew point sensor upon condensation, room frost protection at switch position “OFF” **Control range:** 13 … 29 °C **Setting range:** – 3 … +3 °C **Pipe system compatibility:** 2-pipe		I

Electronic climate controller for cooling ceilings, KTRRB

Surface-mounted installation – Design Berlin 2000

Type / image	Item no.	Features	Circuit diagram	PG
KTRRB-042.211 	DA420000	**General features: "heating / cooling" display; "on / cooling interruption due to condensation" display;** relative scale **Sensor:** NTC internal **Control function:** heating and cooling, cooling interruption of the dew point sensor upon condensation **Control range:** 13 … 29 °C **Setting range:** – 3 … + 3 °C **Neutral zone:** 0.25 … 3 K adjustable **Pipe system compatibility:** 4-pipe		I
KTRRB-052.244 	DA420600	**General features:** ECO function; **"heating / cooling / cooling interruption due to condensation / off" display; "sensor break,** sensor short-circuit, frost protection" display; relative scale **Sensor:** NTC internal, optional external („Sensor 2") **External flow sensor (H / C sensor):** for automatic switching of the controller in heating or cooling mode depending on the inflow temperature; alternatively, this input can be used as an H / C changeover contact („Sensor 2") **Eco contact:** upon closing the contact, the ECO function is actuated **Forced switch-off contact:** external switch-off function with frost protection function **Control function:** heating and / or cooling, cooling interruption upon condensation of the dew point sensor, frost protection function in the switched-off condition **Control function:** 13 … 29 °C **Setting range:** – 8 … + 8 °C **Neutral zone:** approx. 2 K **Pipe system compatibility:** 2-pipe and 4-pipe	see next page	I
KTRRB-052.245 	DA420700	**General features:** ECO function; **"heating / cooling / cooling interruption due to condensation / off" display; "sensor break, sensor short-circuit, frost protection" display;** operating mode "off with frost protection monitoring"; relative scale; **off / comfort / ECO switch** **Sensor:** NTC internal, optional external („Sensor 2") **External flow sensor (H / C sensor):** for automatic switching of the controller in heating or cooling mode depending on the inflow temperature; alternatively, this input can be used as an H / C changeover contact („Sensor 2") **ECO contact:** upon closing the contact, the ECO function is actuated **Forced switch-off contact:** external switch-off function with frost protection function **Control function:** heating and / or cooling, cooling interruption upon condensation of the dew point sensor, frost protection function in the switched-off condition **Control range:** 13 … 29 °C **Setting range:** – 8 … + 8 °C **Neutral zone:** approx. 2 K **Pipe system compatibility:** 2-pipe and 4-pipe	see next page	I

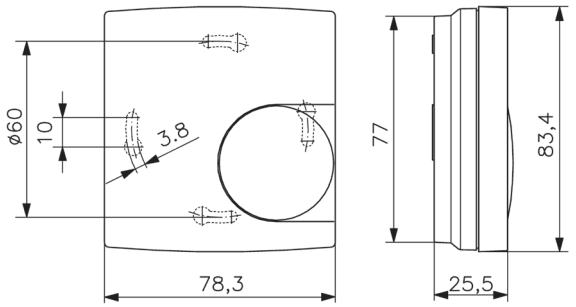
* The internal trimming potentiometer enables to select whether the control operations shall be performed based on the data delivered by the internal sensor (left limit) or the data delivered by the externals sensor (right limit). Any position between these limits determines the importance relation between them when using both sensors. This setting option allows to balance the influences of structural conditions, such as large window areas or to counterpoise other influences from all directions. With controlled systems that react very slowly, we recommend increasing the importance of the radiation sensor in relation to the internal sensor.

Electronic climate controller for cooling ceilings, KTRRB

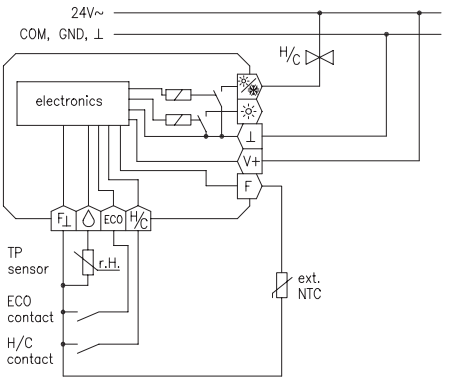
Surface-mounted installation – Design Berlin 2000

Accessories	Item no.	Features	PG
TPS 1 	G8000299	**Mounting / Attachment:** using clips on cooling ceiling capillary pipe **Use:** drywall cooling ceiling (plasterboard) with hung up capillary pipe mat, metal ceiling cooling ceiling with integrated capillary pipe system **Sensor line extendable up to:** 50 m with 2 x 0.5 mm² **Box contents:** sensor, 2 clips for cooling pad	I
TPS 2 	G8000300	**Mounting / Attachment:** using clips on cooling ceiling capillary pipe or cable tie **Use:** pipe systems transporting cold water, plaster cooling ceiling with capillary tube system **Sensor line extendable up to:** 50 m with 2 x 0.5 mm² **Box contents:** sensor, 2 clips for cooling pad, 2 cable ties	I
TPS 3 	SN120000	**Mounting / Attachment:** attach to pipe by means of cable ties **Use:** pipe systems transporting cold water, plaster cooling ceiling with capillary tube system **Sensor line extendable up to:** 50 m with 2 x 0.5 mm² **Box contents:** sensor, 2 clips for cooling pad, 2 cable ties	I

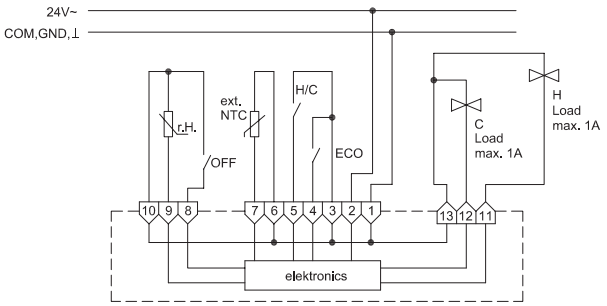
KTRRB



KTRRB-052.24x connection in a 2-pipe system



KTRRB-052.24x connection in a 4-pipe system



Electronic climate controller for cooling ceilings, KTRRU

–with internal and external temperature sensor–flush-mounted installation–Design Berlin UP

Technical data

Design:	Berlin UP (flush-mounted)
Housing material:	PC plastic
Operating voltage:	24 VAC/50 Hz, 24 VDC
Ambient temperature:	0…40 °C
Storage temperature:	–20…+70 °C
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Electrical connection:	screw-type terminals
Protection rating:	IP 30
Protection class:	III
Safety and EMC:	according to DIN EN 60730
Average power consumption:	approx. 0.6 W (1 VA)
Max. switching current:	1 A
Max. switching voltage:	24 VAC/50 Hz, 24 VDC
Min. switching voltage:	24 VAC/50 Hz, 24 VDC
Switching power:	24 W
Switching element:	relay
Switching contact:	NO contact
Output signal:	switching, 24 VAC/50 Hz, 24 VDC
Sensor:	NTC, internal, optional external („Sensor 2“)
ECO contact:	when the contact is closed, the ECO function is actuated (+/- 3 K)
Control function:	heating and/or cooling, cooling interruption upon condensation of the dew point sensor, frost protection function in the switched-off condition
Control range:	13 ... 29 °C
Setting range:	–8 ... +8 °C
Hysteresis:	approx. 1 K
Neutral zone:	approx. 2 K
General features:	single-room climate controller; optional external dew point sensor; ECO function; “heating/cooling/cooling interruption due to condensation/off” display; mechanical range restriction; relative scale; external setting
Pipe system compatibility:	2-pipe and 4-pipe

Application

For heating/cooling control of 2- and 4-pipe systems used in hotels, homes and offices.

The unit can control up to 5 valve actuators (24 V~ normally closed) per output. The controllers are configured for 2-pipe or 4-pipe operation by means of a jumper. In 2-pipe operation, the controller is operated with a common heating/cooling output, whose mode of operation action can be toggled by means of an external contact (changeover contact). Connection of TPS dew point sensors is possible (max. 5 of them in parallel). Condensate formation at the TPS can result in the cooling valve getting closed.

It is possible to actuate the energy saving (ECO) function via an external contact.

With type KTRRU-052.245, in the “off” switch position, the room frost protection function is activated (when the temperature drops below 5 °C, all valves are forced open).

External flow sensor (H/K sensor): for automatic switching of the controller in heating or cooling mode depending on the inflow temperature; alternatively, this input can be used as an H/C changeover contact („Sensor 2”).

Type/image	Item no.	Features	PG
KTRRU-052.244#00 	UA 210301	**Mounting/Attachment:** in flush-mounted socket–adaptable with cover set 50 x 50 mm or 55 x 55 mm in almost all rocker switch ranges (deep flush-mounted socket) **Accessories:** cover sets are offered in several design variants (see “Overview”, page 93) and are not included in the scope of delivery. **Matching set no.:** JZ-008.xxx, for example: cover set 50 x 50 mm, pure white, glossy: JZ-008.000 cover set 55 x 55 mm, pure white, glossy: JZ-008.100 **Scope of delivery:** controller, protective cap	I
KTRRU-052.244#21 	UA 210300	like KTRRU-052.244#00, but with scope of delivery: controller, alre frame “Berlin”, cover 50 x 50 mm, pure white (like RAL 9010), glossy	I

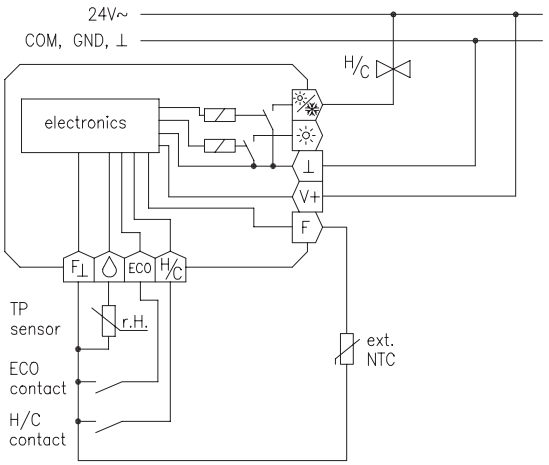
Electronic climate controller for cooling ceilings, KTRRU

– with internal and external temperature sensor – flush-mounted installation – Design Berlin UP

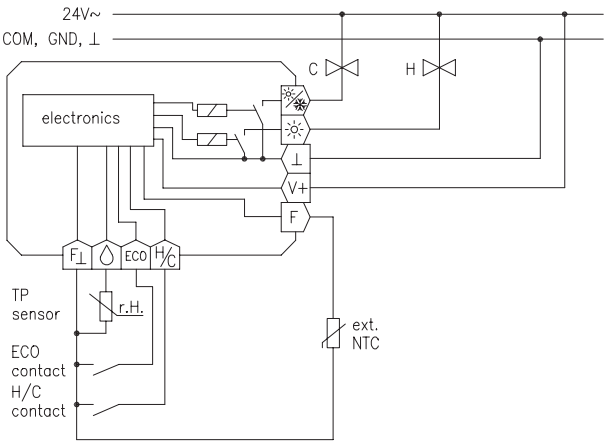
Type / image	Item no.	Features	PG
KTRRU-052.245#00 	UA 210401	**General features:** operating mode “off with frost protection monitoring”; **off / comfort / ECO switch** **Surface finish:** depending on the cover set selected **Housing colour:** depending on the cover set selected **Mounting / Attachment:** in flush-mounted socket – adaptable with cover set 50 x 50 mm or 55 x 55 mm in almost all rocker switch ranges (deep flush-mounted socket) **Accessories:** cover sets are offered in several design variants (see “Overview”, p. 93) and are not included in the delivery scope. **Matching set no.:** JZ-007.xxx, for example: cover set 50 x 50 mm, pure white, glossy: JZ-007.000 cover set 55 x 55 mm, pure white, glossy: JZ-007.100 **Scope of delivery:** controller, protective cap	I
KTRRU-052.245#21 	UA 210400	like KTRRU-052.245#00, but with scope of delivery: controller, alre frame “Berlin”, cover 50 x 50 mm, pure white (like RAL 9010), glossy	I

Accessories: suitable valve actuators ZBOOA-040.100, dew point sensors TPS 1 / TPS 2 / TPS 3, external sensors („Sensor 2“) see sensor technology
For model #21, the protective cap is not included in the delivery.

Circuit diagram KTRRU-052.24x in 2-pipe system



Circuit diagram KTRRU-052.24x in 4-pipe system



alre flush-mounted range (cover sets)

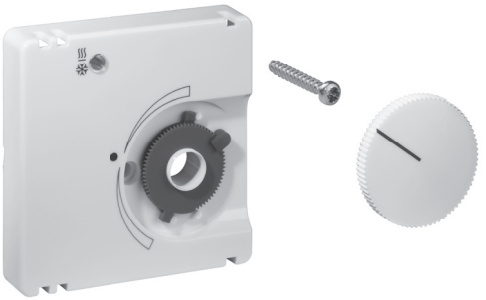
all basic types and suitable cover sets **50 x 50 mm**

Basic type	Cover set 50 x 50 mm, pure white (like RAL 9010), glossy (JZ-xxx.000)		Cover set 50 x 50 mm, pure white (like RAL 9010), matt (JZ-xxx.001)		Cover set 50 x 50 mm, pearl white (like RAL 1013), glossy (JZ-xxx.010)		Cover set 50 x 50 mm, traffic white (like RAL 9016), glossy (JZ-xxx.020)		PG
	Cover set	Item no.	Cover set	Item no.	Cover set	Item no.	Cover set	Item no.	
KTRRU-052.244#00	JZ-008.000	UN 990021	JZ-008.001	UN 990023	JZ-008.010	UN 990025	JZ-008.020	UN 990079	I
KTRRU-052.245#00	JZ-007.000	UN 990022	JZ-007.001	UN 990024	JZ-007.010	UN 990026	JZ-007.020	UN 990080	I
FHY 101.060#00	JZ-021.000	UN 990039	JZ-021.001	UN 990044	JZ-021.010	UN 990049	JZ-021.020	UN 990081	I
Frames									
alre frame	JZ-090.900	VV 000025			JZ-090.910	VV 000010			I

In a flush-mounted socket, it can be adapted to fit virtually any rocker switch range.

alre frame “Berlin” (JZ-090.900)

Cover set (example), individually foil-wrapped

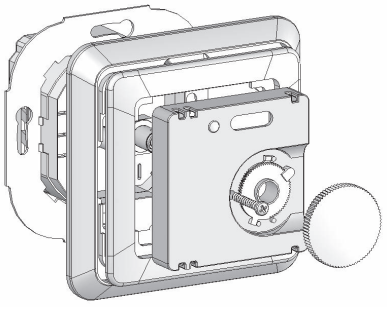


all basic types and suitable cover sets **55 x 55 mm**

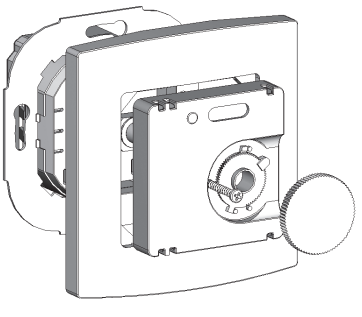
Basic type	Cover set 55 x 55 mm, pure white (like RAL 9010), glossy (JZ-xxx.100)		Cover set 55 x 55 mm, pure white (like RAL 9010), matt (JZ-xxx.101)		Cover set 55 x 55 mm, pearl white (like RAL 1013), glossy (JZ-xxx.110)		Cover set 55x55 mm traffic white (like RAL 9016), glossy (JZ-xxx.120)		PG
	Cover set	Item no.	Cover set	Item no.	Cover set	Item no.	Cover set	Item no.	
KTRRU-052.244#00	JZ-008.100	UN 990027	JZ-008.101	UN 990029	JZ-008.110	UN 990031	JZ-008.120	UN990094	I
KTRRU-052.245#00	JZ-007.100	UN 990028	JZ-007.101	UN 990030	JZ-007.110	UN 990032	JZ-007.120	UN990095	I
FHY 101.060#00	JZ-021.100	UN 990054	JZ-021.101	UN 990059	JZ-021.110	UN 990064	JZ-021.120	UN990096	I

In flush-mounted sockets, it can be adapted to fit many push switch systems (for a current overview of the suitable frames and insert frames, see next page).

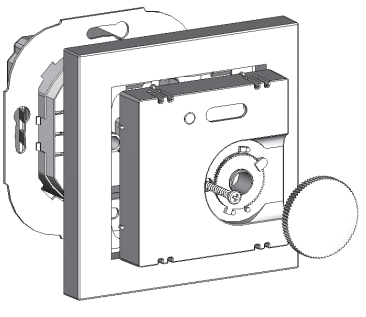
KTRRU with 50 x 50 insert frame



KTRRU with alre frame “Berlin” (#21)



KTRRU without 55 x 55 insert frame



Adaptation of alre flush-mounted controllers

Manufacturer	Range	Colour RAL 9010 (surface finish)	Adaption possible using “55 x 55” cover set	Only adaptation with “50 x 50” cover set requires an insert frame from the manufacturer
BERKER	S.1	polar white (matt)	✓	1109 19 19
BERKER	S.1	polar white (glossy)	✓	1109 90 89
BERKER	Arsys	polar white (glossy)		1108 01 69
BERKER	B.3	aluminium / polar white (matt)	✓	1109 19 19
BERKER	B.3	aluminium / polar white (glossy)	✓	1109 90 89
BERKER	B.7	glass / polar white (matt)	✓	1109 19 19
BERKER	B.7	glass / polar white (glossy)	✓	1109 90 89
BERKER	Q.1/Q.3	polar white (velvet)		1109 60 79
BERKER	K.1	polar white (glossy)		1108 71 09
BUSCH-JAEGER	Reflex SI/SI Linear	alpine white (glossy)		1746-214-101
BUSCH-JAEGER	Busch-balance SI	polar white (glossy)	✓	1746-914-101
BUSCH-JAEGER	impuls	alpine white (glossy)		1746/10-74
BUSCH-JAEGER	solo / future / axcent etc.	studio white – see RAL 9016 below		
GIRA	rocker switch	pure white (glossy)		0282 112
GIRA (System 55)	Standard/E 2	pure white (semi-gloss)	✓	0282 27
GIRA (System 55)	Standard/E 2	pure white (glossy)	✓	0282 03
GIRA (System 55)	E 22	pure white (glossy)	✓	0282 03
GIRA (System 55)	Event	pure white (semi-gloss) + opaque...	✓	0282 27
GIRA (System 55)	Event	pure white (glossy) + opaque...	✓	0282 03
GIRA (System 55)	Esprit	pure white (semi-gloss) + glass, aluminium...	✓	0282 27
GIRA (System 55)	Esprit	pure white (glossy) + glass, aluminium...	✓	0282 03
GIRA	S-Color	pure white (high-gloss)		0282 40
JUNG	CD 500/CD plus	alpine white (glossy)		CD 590 Z WW
JUNG	A 500/AS 500/A plus	alpine white (glossy)	✓	A 590 Z WW
JUNG	LS 990	alpine white (glossy)		LS 961 Z WW
JUNG	LS plus	alpine white (glass)		LS 961 Z WW
JUNG	A creation	alpine white (glossy)	✓	A 590 Z WW
JUNG	LS Design	alpine white (glossy)		LS 961 Z WW
MERTEN (System M)	M-Smart, Arc, Plan, Star	polar white (matt)	✓	5181 19
MERTEN (System M)	M-Smart, Arc, Plan, Star	polar white (glossy)	✓	5185 19
MERTEN (System Basis)	1-M/Atelier-M	polar white (glossy)	✓	5185 19
MERTEN (System Design)	Artec/Trancent/Antik	polar white (glossy)		5160 99
MERTEN	1-M / M-Smart / M-Plan etc.	active white – see RAL 9016 below		
PEHA	Standard	pure white (glossy)		80.670.02 ZV
PEHA	Dialog	pure white (glossy)		95.670.02 ZV
PEHA	Aura	pure white (matt) / glass		20.670.02 ZV
PEHA	Badora	pure white (glossy)		11.670.02 ZV

Manufacturer	Range	Colour RAL 9016 (surface finish)	Adaption possible using “55 x 55” cover set	Only adaptation with “50 x 50” cover set requires an insert frame from the manufacturer
BUSCH-JAEGER	solo/future/future linear	studio white (RAL 9016, glossy)		1746/10-84
BUSCH-JAEGER	future linear	studio white (RAL 9016 matt)		1746/10-884
BUSCH-JAEGER	impuls	studio white (RAL 9016 matt)		1746/10-774
BUSCH-JAEGER	axcent	studio white (RAL 9016, glossy)		1746/10-84
BUSCH-JAEGER	carat (glass, bronze, gold)	studio white (RAL 9016)		1746/10-84
BUSCH-JAEGER	alpha (nea/exclusive*)	studio white (RAL 9016, glossy)		1746/10-24G
BUSCH-JAEGER	alpha (nea/exclusive*)	studio white (RAL 9016 matt)		1746/10-24
MERTEN	M-Smart, Plan	active white (RAL 9016, glossy)		5185 25
MERTEN	1-M/Atelier-M	active white (RAL 9016, glossy)		5185 25
PEHA	Standard	arctic		D 80.670 ZV AW

*) During assembly, you need to remove four plastic tabs located at the rear of the frame

NOTE: Most light switches are designed in the colour “like RAL 9010”, although different switch manufacturers use different designations for this colour. Coloured, glass and aluminium frames are also combined with white jacks or plugs so that controllers with white covers can also be integrated into these frames. Check the precise application in each individual case. The frames have different surface qualities (matt/glossy). For design reasons, the cover of the controller should have the same quality as the frame. We accept no liability for slight variations in colour and surface finish or for accuracy of fit. When installing devices into multi frames, always assemble the temperature controllers at the lowermost position.

“50 x 50 controller”: The housing covers of the 50 x 50 controllers are 50 x 50 mm in size. Using a 50 x 50-mm insert frame, the 50 x 50 controllers can be integrated into nearly all light switch ranges in accordance with DIN 49075. The 50 x 50-mm insert frames must be ordered from the light switch manufacturer or from a wholesaler. The order number of the insert frame corresponding to the switch range in question can be found in the column “Only for adaptation with ‘50 x 50’ cover set”.

“55 x 55 controller”: The housing covers of the 55 x 55 controllers are 55 x 55 mm in size. Many light switch ranges have inner dimensions of 55 x 55 mm. Therefore, the 55 x 55 controllers can be installed directly in these light switch frames without the use of an insert frame. See the column “Adaptation with 55 x 55 cover set” to determine whether the 55 x 55 controller fits in the given light switch model ().

All information regarding switch manufacturers’ product lines and item numbers was last updated in 12/2015 | No liability is assumed for the information provided. | Technical specifications subject to change. An adaptation list for RAL 1013 switch ranges is available from our website at www.alre.de.

Electronic climate controller with timer KTRRUu – 230 VAC

Flush-mounted installation – Design Berlin UP

Technical data

Design:	Berlin UP (flush-mounted)
Housing material:	PC, PMMA, ABS plastic
Ambient temperature:	0 … 40 °C
Storage temperature:	–20 … +70 °C
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Protection rating:	IP 30
Safety and EMC:	according to DIN EN 60730
Max. power consumption:	approx. 1 W (2.2 VA)
Max. switching current:	3 (0.5) A
Switching element:	relay
Switching contact:	NO contact
Output signal:	switching analogue 0–10 V (0.5 mA) for activating an rpm-controlled fan
Sensor:	NTC, internal, optional external („Sensor 2“)
External flow sensor (H/C sensor):	for automatic switching of the controller to heating or cooling mode depending on the inflow temperature; alternatively, this input can be used as an H/C changeover contact („Sensor 2“)
ECO contact:	upon closing the contact, the ECO function is actuated
Control range:	5 … 40 °C
Setting range:	Standard setting range for heating (5 … 30 °C), second setting range for cooling (18 … 40 °C)
Hysteresis:	approx. 1 K
Neutral zone:	adjustable
Display type:	illuminated graphical display
Pipe system compatibility:	2-pipe and 4-pipe

Application

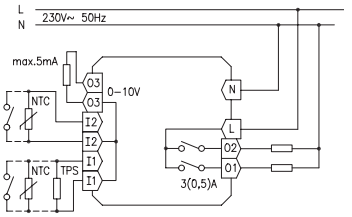
Flush-mounted controller with timer function for heating/cooling regulation of 2- and 4-pipe systems used in hotels, homes and offices. The adaptation takes place in a menu.

The unit can control up to 5 valve actuators (normally open or normally closed) per output. In 2-pipe operation, the operating mode can be changed via an external changeover contact or temperature sensor. The timer can serve as a master for other controllers for switching to ECO mode.

It is possible to activate the energy saving (ECO) or frost protection (OFF) functions via an external contact. Alternatively, the controller's inputs can be configured to connect with an external temperature sensor or dew point sensor (TPS).

A 0–10 V interface can be used to control the fan speed (EC fans).

General features:
Digital rocker switch single-room climate controller with timer; optional external dew point sensor; ECO function, ECO value adjustable; “ECO” display; “on/off” display; “heating” display; “cooling” display; “cooling interruption due to condensation”; digital actual value display; backlighting; operating mode “off with frost protection monitoring”; child-safe features; facilities; power-reserve (3 days); actual value correction/measured value correction; learning function; emergency operating mode; valve protection; holiday setting; party setting; automatic adjustment to standard/daylight savings time; external setting; operation using direct-dial buttons.

Type/image	Item no.	Features	Circuit diagram	PG
KTRRUu-217.456#21 	UA 220000	**Surface finish:** glossy **Housing colour:** pure white like RAL 9010 **Operating voltage:**230 VAC, 50 Hz Electrical connection: pluggable screw-type terminals, voltage supply side 0.75–2.5 mm², low-voltage side 0.08–1.5 mm² **Mounting/Attachment:** in flush-mounted socket – adaptable with cover 50 x 50 mm in almost all rocker switch ranges (deep flush-mounted socket recommended) **Protection class:** II **Max. switching voltage:** 230 VAC, 50 Hz **Min. switching voltage:** 230 VAC, 50 Hz **Switching power:** 690 W **Output signal:** switching heating, cooling, heating/cooling, ECO, OFF, 230 VAC, 50 Hz; analogue 0–10 V (0.5 mA) for activating an rpm-controlled fan **Scope of delivery:** controller, cover **50 x 50** mm, **pure white** (like RAL 9010), **glossy**, alre frame “Berlin”		I

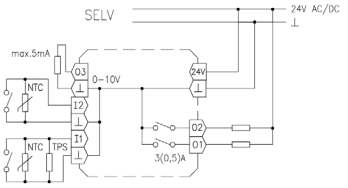
Electronic climate controller with timer KTRRUu – 230 VAC

Flush-mounted installation – Design Berlin UP

Type / image	Item no.	Features	Circuit diagram	PG
KTRRUu-217.456#07 	UA 220002	like KTRRUu-217.456#21, but with delivery scope: controller, cover **50 x 50** mm, **pure white** (like RAL 9010), **glossy,** without frame		I
KTRRUu-217.456#09 	UA 220003	like KTRRUu217.456#21 but with delivery scope: controller, cover **50 x 50** mm, **pearl white** (like RAL 1013), **glossy,** without frame		I
KTRRUu-217.456#27 	UA 220004	like KTRRUu-217.456#21, but with delivery scope: controller, cover **50 x 50** mm, **traffic white** (like RAL 9016), **glossy,** without frame		I
KTRRUu-217.456#28 	UA220007	like KTRRUu-217.456, but with delivery scope: controller, cover for use with **BUSCH-JAEGER Reflex SI / SI Linear, pure white** (similar to RAL 9010), **glossy**, without frame		I
KTRRUu-217.456#55 	UA220005	like KTRRUu-217.456#21, but with delivery scope: controller, cover **55 x 55** mm, **pure white** (like RAL 9010), **glossy,** without frame		I
KTRRUu-217.456#56 	UA220009	like KTRRUu-217.456#21, but with delivery scope: controller, cover **55 x 55** mm, **pure white** (like RAL 9010), **glossy,** without frame		I
KTRRUu-217.456#57 	UA220006	like KTRRUu-217.456#21, but with delivery scope: controller, cover **55 x 55** mm, **pearl white** (like RAL 1013), **matt,** without frame		I
KTRRUu-217.456#59 	UA220008	like KTRRUu-217.456#21, but with delivery scope: controller, cover **55 x 55** mm, **traffic white** (like RAL 9016), **glossy,** without frame		I

Electronic climate controller with timer KTRRUu – 24 VAC/VDC

Flush-mounted installation – Design Berlin UP

Type/image	Item no.	Features	Circuit diagram	PG
KTRRUu-257.456#21 	UA220100	like KTRRUu-217.456#21, but: **Operating voltage:** 24 VAC/50 Hz, 24 VDC **Protection class:** III **Max. switching voltage:** 24 VAC/50 Hz, 24 VDC **Min. switching voltage:** 24 VAC/50 Hz, 24 VDC **Switching power:** 72 W **Output signal:** switching heating/cooling heating/cooling, ECO, OFF, 24 VAC/50 Hz, 24 VDC; analogue 0–10 V (0.5 mA) for controlling an rpm-controlled fan		I
KTRRUu-257.456#07 	UA220103	like KTRRUu-257.456#21, but with delivery scope: controller, cover **50 x 50** mm, **pure white** (like RAL 9010), **glossy,** without frame		I
KTRRUu-257.456#09 	UA220104	like KTRRUu-257.456#21, but with delivery scope: controller, cover **50 x 50** mm, **pearl white** (like RAL 1013), **glossy,** without frame		I
KTRRUu-257.456#27 	UA220105	like KTRRUu-257.456#21, but with delivery scope: controller, cover **50 x 50** mm, **traffic white** (like RAL 9016), **glossy,** without frame		I
KTRRUu-257.456#28 	UA220108	like KTRRUu-257.456#21, but with delivery scope: controller, cover suitable for **BUSCH-JAEGER Reflex SI/SI Linear, pure white** (like RAL 9010), **glossy,** without frame		I
KTRRUu-257.456#55 	UA220106	like KTRRUu-257.456#21, but with delivery scope: controller, cover **55 x 55** mm, **pure white** (like RAL 9010), **glossy,** without frame		I
KTRRUu-257.456#56 	UA220110	like KTRRUu-257.456#21, but with delivery scope: controller, cover **55 x 55** mm, **pure white** (like RAL 9010), **matt,** without frame		I
KTRRUu-257.456#57 	UA220107	like KTRRUu-257.456#21, but with delivery scope: controller, cover **55 x 55** mm, **pearl white** (like RAL 1013), **glossy,** without frame		I
KTRRUu-257.456#59 	UA220109	like KTRRUu-257.456#21, but with delivery scope: controller, cover **55 x 55** mm, **traffic white** (like RAL 9016), **glossy,** without frame		I

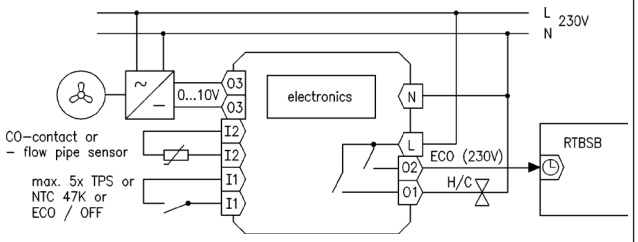
Accessories: suitable valve actuators ZBOOA, dew point sensor TPS 1/TPS 2/TPS 3,
single frame JZ-090.900 (pure white, glossy) / JZ-090.910 (pearl white, glossy)

Electronic climate controller with timer KTRRUu

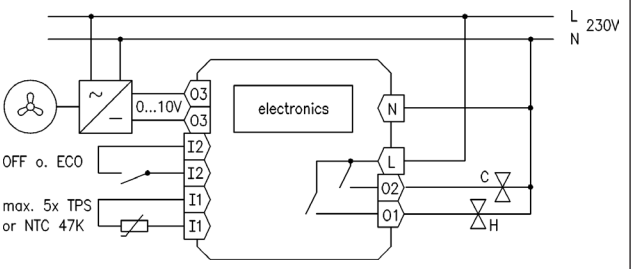
Flush-mounted installation – Design Berlin UP

Accessories	Item no.	Features	PG
JZ-090.900 	VV000025	**General features:** alre frame “Berlin” (neutral) for all flush-mounted controllers with cover 50 x 50 mm **Design:** Berlin **Surface finish:** glossy **Housing colour:** pure white like RAL 9010 **Housing material:** PC plastic	I
JZ-090.910	VV000010	**General features:** alre frame “Berlin” (neutral) for all flush-mounted controllers with cover 50 x 50 mm **Design:** Berlin **Surface finish:** glossy **Housing colour:** pearl white like RAL 1013 **Housing material:** PC plastic	I

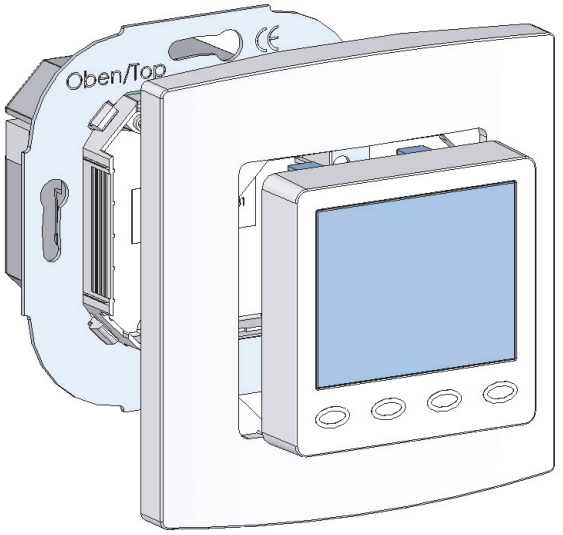
KTRRUu application example – 2-pipe system (230-V version)



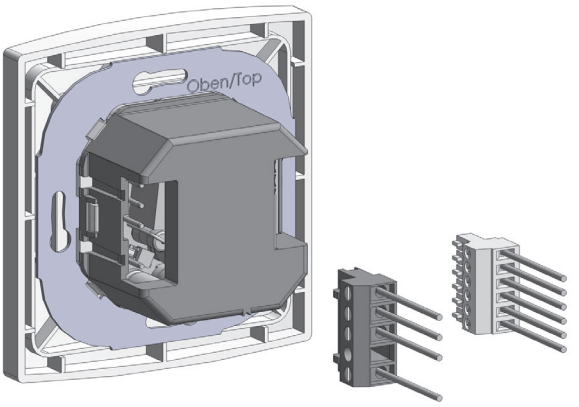
KTRRUu application example – 4-pipe system (230-V version)



KTRRUu with alre frame “Berlin”



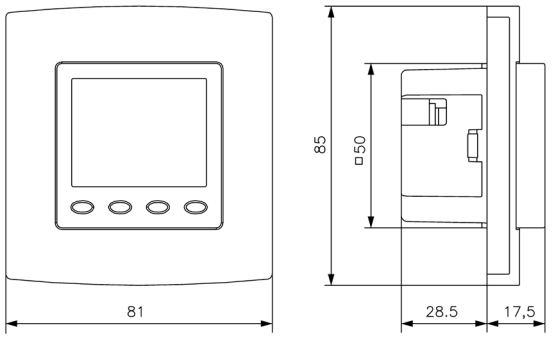
pluggable screw-type terminals



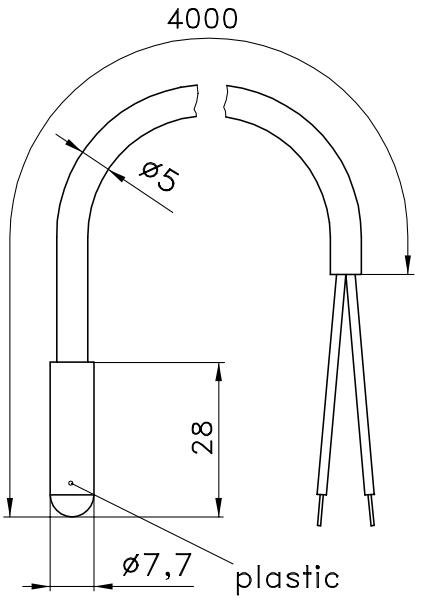
Electronic climate controller with timer KTRRUu

Flush-mounted installation – Design Berlin UP

KTRRUu with alre frame “Berlin”



HF-2



Other benefits:

- Pluggable screw-type terminals facilitate quick and easy assembly
- Illuminated, graphics-capable display
- Automatic adjustment to standard/daylight savings time
- Learning function
- Correction of measurement values
- Configurable display content
- Choice of various languages during installation: German, English, French, Dutch, Polish, Spanish, Czech, Russian
- Configurable inputs and outputs, for example:
  - OFF circuit with frost protection
  - ECO input
  - Dew point sensor input
  - Output: heating/cooling/timer master
- Fan control 0–10 V
- Key lock
- Valve protection function
- Configurable control method (PI-PWM or 2-point control)
- Holiday and party function
- Power reserve
- “Heating operation” indication (LED orange)
- “Cooling operation” indication (LED blue)

Adaptation of alre flush-mounted controllers KTRRUu-2x7.456

Manufacturer	Range	Colour RAL 9010 (surface finish)	Adaptation in switch range “55 x 55” possible using...	“50 x 50” adaptation possible with ... (insert frame from manufacturer required)
BERKER	S.1	polar white (matt)	KTRRUu-2x7.456#56	not required
BERKER	S.1	polar white (glossy)	KTRRUu-2x7.456#55	not required
BERKER	Arsys	polar white (glossy)		KTRRUu-2x7.456#07 + 1108 01 69
BERKER	B.3	aluminium/polar white (matt)	KTRRUu-2x7.456#56	not required
BERKER	B.3	aluminium/polar white (glossy)	KTRRUu-2x7.456#55	not required
BERKER	B.7	glass/polar white (matt)	KTRRUu-2x7.456#56	not required
BERKER	B.7	glass/polar white (glossy)	KTRRUu-2x7.456#55	not required
BERKER	K.1	polar white (glossy)		KTRRUu-2x7.456#07 + 1108 71 09
BUSCH-JAEGER	Reflex SI/SI Linear	alpine white (glossy)	KTRRUu-2x7.456#28	not required
BUSCH-JAEGER	Busch-balance SI	polar white (glossy)	KTRRUu-2x7.456#55	not required
BUSCH-JAEGER	impuls	alpine white (glossy)		KTRRUu-2x7.456#07 + 1746/10-74
BUSCH-JAEGER	solo / future / axcent etc.	studio white–see RAL 9016 below		
GIRA	rocker switch	pure white (glossy)		KTRRUu-2x7.456#07 + 0282 112
GIRA (System 55)	Standard/E 2	pure white (semi-gloss)	KTRRUu-2x7.456#56	not required
GIRA (System 55)	Standard/E 2	pure white (glossy)	KTRRUu-2x7.456#55	not required
GIRA (System 55)	E 22	pure white (glossy)	KTRRUu-2x7.456#55	not required
GIRA (System 55)	Event	pure white (semi-gloss) + opaque...	KTRRUu-2x7.456#56	not required
GIRA (System 55)	Event	pure white (glossy) + opaque...	KTRRUu-2x7.456#55	not required
GIRA (System 55)	Esprit	pure white (semi-gloss) + glass, aluminium...	KTRRUu-2x7.456#56	not required
GIRA (System 55)	Esprit	pure white (glossy) + glass, aluminium...	KTRRUu-2x7.456#55	not required
GIRA	S-Color	pure white (high-gloss)		KTRRUu-2x7.456#07 + 0282 40
JUNG	CD 500/CD plus	alpine white (glossy)		KTRRUu-2x7.456#07 + CD 590 Z WW
JUNG	A 500/AS 500/A plus	alpine white (glossy)	KTRRUu-2x7.456#55	not required
JUNG	LS 990	alpine white (glossy)		KTRRUu-2x7.456#07 + LS 961 Z WW
JUNG	LS plus	alpine white (glass)		KTRRUu-2x7.456#07 + LS 961 Z WW
JUNG	A creation	alpine white (glossy)	KTRRUu-2x7.456#55	not required
JUNG	LS Design	alpine white (glossy)		KTRRUu-2x7.456#07 + LS 961 Z WW
MERTEN (System M)	M-Smart, Arc, Plan, Star	polar white (matt)	KTRRUu-2x7.456#56	not required
MERTEN (System M)	M-Smart, Arc, Plan, Star	polar white (glossy)	KTRRUu-2x7.456#55	not required
MERTEN (System Basis)	1-M/Atelier-M	polar white (glossy)	KTRRUu-2x7.456#55	not required
MERTEN (System Design)	Artec/Trancent/Antik	polar white (glossy)		KTRRUu-2x7.456#07 + 5160 99
MERTEN	1-M / M-Smart / M-Plan etc.	active white–see RAL 9016 below		
PEHA	Standard	pure white (glossy)		KTRRUu-2x7.456#07 + 80.670.02 ZV
PEHA	Dialog	pure white (glossy)		KTRRUu-2x7.456#07 + 95.670.02 ZV
PEHA	Aura	pure white (matt) / glass		KTRRUu-2x7.456#07 + 20.670.02 ZV
PEHA	Badora	pure white (glossy)		KTRRUu-2x7.456#07 + 11.670.02 ZV

Manufacturer	Range	Colour RAL 9016 (surface finish)	Adaptation in switch range “55 x 55” possible using...	To adapt KTRRUu in size “50 x 50”, an insert frame from the manufacturer is required
BUSCH-JAEGER	solo/future/future linear	studio white (RAL 9016, glossy)		KTRRUu-2x7.456#27 + 1746/10-84
BUSCH-JAEGER	axcent	studio white (RAL 9016, glossy)		KTRRUu-2x7.456#27 + 1746/10-84
BUSCH-JAEGER	carat (glass, bronze, gold)	studio white (RAL 9016)		KTRRUu-2x7.456#27 + 1746/10-84
BUSCH-JAEGER	alpha (nea/exclusive*)	studio white (RAL 9016, glossy)		KTRRUu-2x7.456#27 + 1746/10-24G
MERTEN	M-Smart, Plan	active white (RAL 9016, glossy)	KTRRUu-2x7.456#59	not required
MERTEN	1-M/Atelier-M	active white (RAL 9016, glossy)	KTRRUu-2x7.456#59	not required
PEHA	Standard	arctic		KTRRUu-2x7.456#27 + D 80.670 ZV AW

*) During assembly, you need to remove four plastic tabs located at the rear of the frame.

NOTE: Most light switch ranges are designed in the colour “like RAL 9010”, although different switch manufacturers use different designations for this colour. Coloured, glass and aluminium frames are also combined with white jacks or plugs so that controllers with white covers can also be integrated into these frames. Check the precise application in each individual case. The frames have different surface qualities (matt/glossy). For design reasons, the cover of the controller should have the same quality as the frame. We accept no liability for slight variations in colour and surface finish or for accuracy of fit. When installing devices into multi frames, always assemble the temperature controllers at the lowermost position.

“50 x 50 controller”: The housing covers of the 50 x 50 controllers are 50 x 50 mm in size. Using a 50 x 50-mm insert frame, the 50 x 50 controllers can be integrated into nearly all light switch ranges in accordance with DIN 49075. The 50 x 50-mm insert frames must be ordered from the light switch manufacturer or from a wholesaler. The order number of the insert frame corresponding to the switch range in question can be found in the column “For adaptation of KTRRUu into size ‘50 x 50’”.

“55 x 55 controller”: The housing covers of the 55 x 55 controllers are 55 x 55 mm in size. Many light switch ranges have inner dimensions of 55 x 55 mm. Therefore, the 55 x 55 controllers can be installed directly in the light switch frame without the use of an insert frame. See the column “Adaptation in switch range (55 x 55)” to determine whether the 55 x 55 controller fits in the given light switch range (KTRRUu-2x7.456#xx).

All information regarding switch manufacturers’ product lines and item numbers was last updated in 12/2015 | No liability is assumed for the information provided. | Technical specifications subject to change. An adaptation list for RAL 1013 switch ranges is available from our website at www.alre.de.

Continuous electronic climate controller, KTRVB

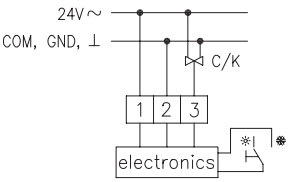
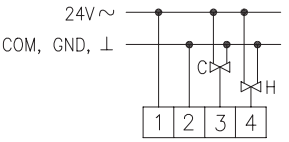
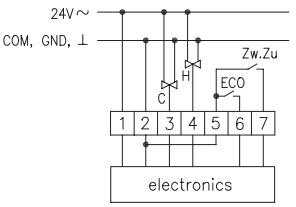
Surface-mounted installation – Design Berlin 2000

Technical data

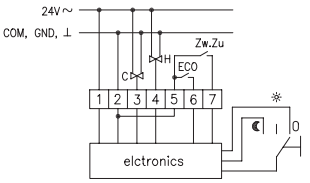
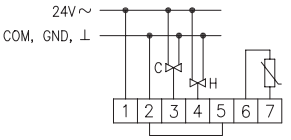
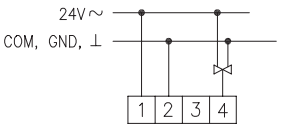
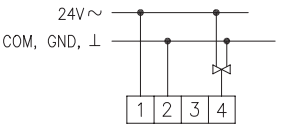
Design:	Berlin 2000
Surface finish:	matt
Housing colour:	pure white, like RAL 9010
Housing material:	ABS plastic
Storage temperature:	–20…+70 °C
Operating voltage:	24 VDC, 24 VAC, 50 Hz
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Electrical connection:	screw-type terminals
Mounting / attachment:	Surface- / wall-mounting
Protection rating:	IP 30
Protection class:	III
Safety and EMC:	according to DIN EN 60730
Switching element:	electronic with analogue output signal
General features:	climate controller for individual room control with proportionally controlled valve; mechanical range restriction; external setting

Application

Room temperature controller for continuous control of valve actuators. Controller for 2-pipe systems (1-duct), 4-pipe systems (2-duct) and mixing chambers.

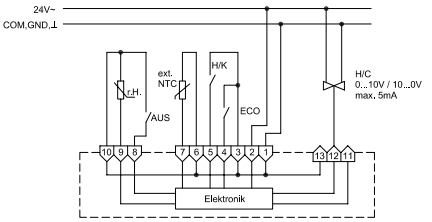
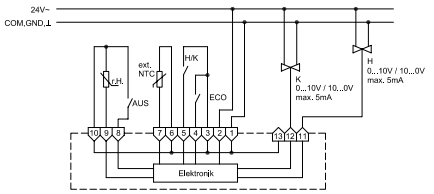
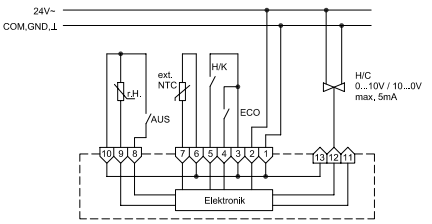
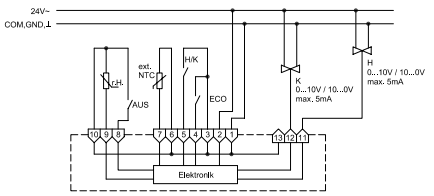
Type / image	Item no.	Features	Circuit diagram	PG
KTRVB-040.209 	DA452200	**General features:** relative scale; heating / cooling switch **Ambient temperature:** 0…50 °C **Max. power consumption:** approx. 1.5 VA **Output signal:** consistently 0–10 V or 10–0 V (can be switched using a jumper), max. 5 mA **Sensor:**NTC internal **Control function:** heating or cooling with adjustable p-band **Control area:** 13…29 °C **Adjustment range:** –3…+3 °C the preset “zero point” of approx. 21 °C can be adjusted in the machine by +/– 5 K **Hysteresis:** 0 K, since control is always via the p-band in the range from +0.5 K ... 3 K (adjustable) **Pipe system compatibility:** 2-pipe		I
KTRVB-042.100 	DA 451000	**General features:** scale: degrees Celsius **Ambient temperature:** 0…50 °C **Output signal:** consistently 0–10 V or 10–0 V (can be switched using a jumper), max. 5 mA **Sensor:**NTC internal **Control function:** heating and cooling with adjustable p-band: **Control range:** 5…30 °C **Hysteresis:** 0 K, since control is always via the p-band in the range from +0.5 K ... 3 K (adjustable) **Neutral zone:** –1…+5 K (adjustable) **Pipe system compatibility:** 4-pipe		I
KTRVB-042.205 	DA 451200	**General features:** ECO function; operating mode “off with frost protection monitoring”; relative scale **Ambient temperature:** 0…50 °C **Output signal:** consistently 0–10 V or 10–0 V (can be switched using a jumper), max. 5 mA **Sensor:** NTC internal **ECO contact:** upon closing the contact, the ECO function is actuated (neutral zone is expanded by the ECO value that has been set (1…5 K)) **Forced switch-off contact:** switching off the control **Control function:** heating and cooling with adjustable p-band: **Control range:** 13…29 °C **Adjustment range:** –3…+3 °C (the preset “zero point” of approx. 21 °C can be adjusted in the device by +/– 5 K **Hysteresis:** 0 K, since control is always via the p-band in the range from +0.5 K…3 K (adjustable) **Neutral zone:** –1…+5 K (adjustable) **Pipe system compatibility:** 4-pipe		I

Continuous electronic climate controller, KTRVB

Type / image	Item no.	Features	Circuit diagram	PG
KTRVB-042.206 	DA 451300	**General features:** ECO function; **“ECO” display; “on / off” display;** operating mode “off with frost protection monitoring”; relative scale; **off / comfort / ECO switch** **Ambient temperature:** 0 … 50 °C **Output signal:** consistently 0–10 V or 10–0 V (can be switched using a jumper), max. 5 mA **Sensor:** NTC internal **ECO contact:** upon closing the contact, the ECO function is actuated (neutral zone is expanded by the ECO value that has been set (1 ... 5 K)) **Forced switch-off contact:** switching off the control (supersedes switch) **Control function:** heating and cooling with adjustable p-band: **Control range:** 13 … 29 °C **Adjustment range:** – 3 … +3 °C (the preset “zero point” of approx. 21 °C can be adjusted in the device by +/– 5 K) **Hysteresis:** 0 K, since control is always via the p-band in the range from 0.5 K ... 3 K (adjustable) **Neutral zone:** – 1 … + 5 K (adjustable) **Pipe system compatibility:** 4-pipe		I
KTRVB-042.207 	DA 451400	**General features:** relative scale; without sensor **Ambient temperature:** 0 … 50 °C **Output signal:** consistently 0–10 V or 10–0 V (can be switched using a jumper), max. 5 mA **Sensor:** NTC external („Sensor 2“) **Control function:** heating and cooling with adjustable p-band: **Control range:** 13 … 29 °C **Adjustment range:** – 3 … +3 °C (the preset “zero point” of approx. 21 °C can be adjusted in the device by +/– 5 K **Hysteresis:** 0 K, since control is always via the p-band in the range from + 0.5 K … 3 K (adjustable) **Neutral zone:** – 1 … + 5 K (adjustable) **Pipe system compatibility:** 4-pipe		I
KTRVB-048.100 	DA 450000	**General features:** scale: degrees Celsius **Ambient temperature:** 0 … 50 °C **Output signal:** consistently 0–10 V or 10–0 V (can be switched using a jumper), max. 5 mA **Sensor:** NTC internal **Control function:**Heating or cooling with adjustable p-band, aligned to 5 V at setpoint temperature **Control range:** 5 … 30 °C **Hysteresis:** 0 K, since control is always via the p-band in the range from + 0.5 K … 3 K (adjustable) **Pipe system compatibility:** 2-pipe		I
KTRVB-048.200 	DA 450100	**General features:** relative scale **Ambient temperature:** 0–50 °C **Output signal:** consistently 0–10 V or 10–0 V (can be switched using a jumper), max. 5 mA **Sensor:** NTC internal **Control function:** heating or cooling with adjustable p-band, aligned to 5 V at setpoint temperature **Control range:** 13 … 29 °C **Adjustment range:** – 3 … +3 °C (the preset “zero point” of approx. 21 °C can be adjusted in the device by +/– 5 K **Hysteresis:** 0 K, since control is always via the p-band in the range from + 0.5 K ... 3 K (adjustable) **Pipe system compatibility:** 2-pipe		I

Continuous electronic climate controller, KTRVB

Surface-mounted installation – Design Berlin 2000

Type / image	Item no.	Features	Circuit diagram	PG
KTRVB-052.244 	DA451500	**General features:** external dew point sensor; ECO function; **“heating / cooling / cooling interruption due to condensation / off” display; “sensor interruption / sensor short-circuit / frost protection” display;** operating mode “off with frost protection monitoring”; relative scale **Ambient temperature:** 0 … 40 °C **Output signal:** consistently 0 – 10 V or 10 – 0 V (can be switched using a jumper), max. 5 mA **Sensor:** NTC internal, optional external („Sensor 2”) **External flow sensor (H / C sensor):** for automatic switching of the controller to heating or cooling mode depending on the inflow temperature; alternatively, this input can be used as an H / C changeover contact („Sensor 2”) **Eco contact:** upon closing the contact, the ECO function is actuated (in heating mode, the temperature is adjusted down by 3 K and in cooling mode it is adjusted up by 3 K) **Forced switch-off contact:** external switch-off function with frost protection function **Control function:** heating and / or cooling with p-band 1 K, cooling interruption upon condensation of the dew point sensor, frost protection function in “off” state **Control range:** 13 … 29 °C **Adjustment range:** 21 °C ± 8 K **Hysteresis:** 0 K, since control is always via the p-band in the range from 1 K **Neutral zone:** approx. 2 K **Pipe system compatibility:** 2-pipe and 4-pipe	 	I
KTRVB-052.245 	DA451600	**General features:** external dew point sensor; ECO function; **“heating / cooling / cooling interruption due to condensation / off” display; “sensor interruption / sensor short-circuit / frost protection” display;** operating mode “off with frost protection monitoring”; relative scale; **“off / comfort / ECO” switch** **Ambient temperature:** 0 … 40 °C **Output signal:** consistently 0 – 10 V or 10 – 0 V (can be switched using a jumper), max. 5 mA **Sensor:** NTC internal, optional external („Sensor 2“) **External flow sensor (H / C sensor):** for automatic switching of the controller to heating or cooling mode depending on the inflow temperature; alternatively, this input can be used as an H / C changeover contact („Sensor 2“) **Eco contact:** upon closing the contact, the ECO function is actuated (in heating mode, the temperature is adjusted down by 3 K and in cooling mode it is adjusted up by 3 K) **Forced switch-off contact:** external switch-off function with frost protection function **Control function:** heating and / or cooling with p-band 1 K, cooling interruption upon condensation of the dew point sensor, frost protection function in “off” state **Control range:** 13 … 29 °C **Adjustment range:** 21 °C ± 8 K **Hysteresis:** 0 K, since control is always via the p-band in the range from 1 K **Neutral zone:** approx. 2 K **Pipe system compatibility:**2-pipe and 4-pipe	 	I

Mechanical climate controller, PTR 02

Surface-mounted – Design Pikolo 2

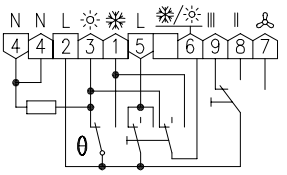
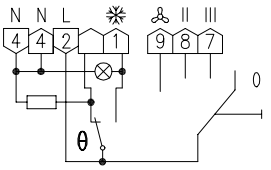
Technical data

Design:	Pikolo 2
Surface finish:	matt
Housing colour:	pure white, like RAL 9010
Housing material:	ABS plastic
Operating voltage:	230 VAC, 50 Hz
Ambient temperature:	0…30 °C
Storage temperature:	–20…+70 °C
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Electrical connection:	screw-type terminals
Mounting / attachment:	Surface- / wall-mounting
Protection rating:	IP 30
Protection class:	II, if properly mounted
Safety and EMC:	according to DIN EN 60730
Average power consumption:	< 0.5 W
Max. switching current:	3 (3) A
Max. switching voltage:	230 VAC, 50 Hz
Min. switching voltage:	230 VAC, 50 Hz
Switching power:	690 W
Switching element:	bimetallic contact
Sensor:	bimetal
Hysteresis:	approx. 0.5 K at a temperature change of max. 4 K / h
General features:	3-stage fan output; mechanical range restriction; thermal feedback; external setting
Pipe system compatibility:	2-pipe

Application

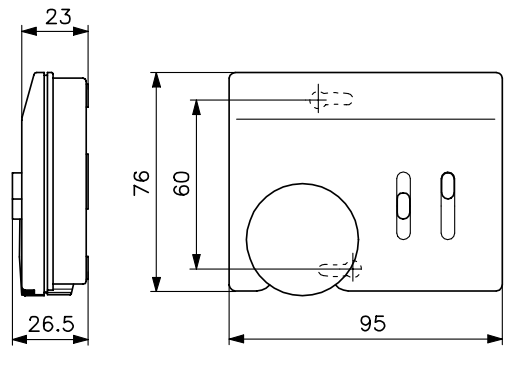
Control or monitoring of temperatures in closed, dry spaces. Suitable for air conditioning systems (fan coils).

Also see the “Accessories / miscellaneous” section, “Technical terms”

Type / image	Item no.	Features	Circuit diagram	PG
PTR 02.802 	A 201154	**General features:** scale: degrees Celsius; **3-stage fan switch; heating / off / cooling switch** **Switching contact:** changeover (toggler) **Output signal:** switching (230 VAC, 50 Hz) **Control function:** heating or cooling **Control range:** 5…30 °C		I
PTR 02.803 	A 201247	**General features: “cooling” display;** relative scale; **4-stage fan switch** **Switching contact:** NO contact **Output signal:** switching (230 VAC, 50 Hz) **Control function:** cooling **Control range:** 15…30 °C		I

The PTR 02.801 is replaced by the KTBSB-112.000.

PTR 02



Electronic dew point monitor, WFRRN

Standard rail mounting

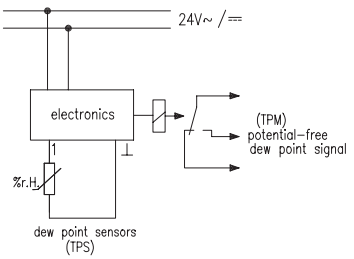
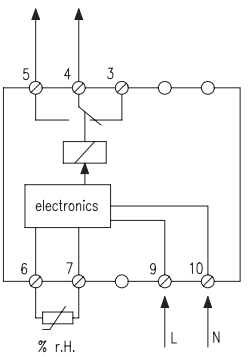
Technical data

Surface finish:	matt
Housing colour:	light grey, like RAL 7035
Housing material:	PC plastic
Ambient temperature:	0…55 °C
Storage temperature:	–20…+70 °C
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Electrical connection:	screw-type terminals up to 2.5 mm²
Mounting / attachment:	Standard rail mounting
Protection rating:	IP 20
Safety and EMC:	according to DIN EN 60730
Average power consumption:	approx. 1 VA
Min. switching current:	depending on the switching voltage (min. 0.3 W)
Min. switching voltage:	depending on the switching current (min. 0.3 W)
Switching element:	relay
Switching contact:	changeover (toggler), potential-free
Output signal:	switching
Control function:	dew point triggering
Hysteresis:	8 MΩ
Break point fixed:	approx. 98% relative humidity
General features:	“dew point triggering” display
Accessories:	dew point sensors (TPS)

Application

For interrupting the cooling, when the relative atmospheric humidity exceeds approx. 98%.

Method of operation:
If the surface temperature of the dew point sensor is equivalent to the dew point, a microscopic film of moisture forms on its surface. This film changes the resistance value of the dew point sensor to such an extent that the connected controller or monitor detects this change and disables the cooling. In this manner, dripping condensate water at maximum cooling, and hence moisture damage to the building, are avoided. When the dew point sensor dries off again, the resistance value increases and cooling is re-enabled. To ensure that a pending undershooting of the dew point is detected in time, the dew point sensor should be assembled at the point where the dew point is most likely to be reached first along the cooling circuit. Generally, these locations are at the inlet coming into the room and / or near windows. If the place where the dew point is most likely to occur cannot be unambiguously determined, it is possible to connect up to 5 dew point sensors in parallel to one controller or monitor.

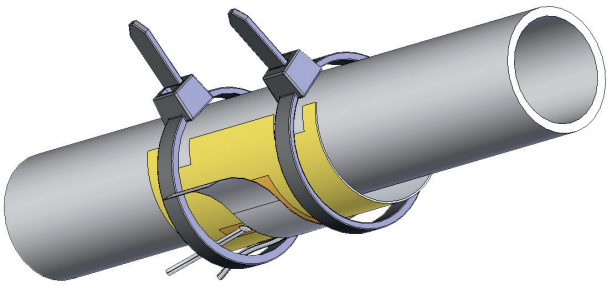
Type / image	Item no.	Features	Circuit diagram	PG
WFRRN-240.018 	D4780587	**Operating voltage:** 24 VDC, 24 VAC, 50 Hz **Protection class:** III **Max. switching current:** 10 (3) A at 48 VAC, 10 A at 30 VDC, 1 A at 60 VDC **Max. switching voltage:** 48 VAC, 50 Hz / 60 VDC **Switching power:** 500 VA at 48 VAC, 300 W at 30 VDC, 60 W at 60 VDC		I
WFRRN-210.018 	D4780572	**Operating voltage:** 230 VAC, 50 Hz **Protection class:** II, if properly mounted **Max. switching current:** 10 (3) A at 230 VAC, 10 A at 30 VDC, 1 A at 60 VDC **Max. switching voltage:** 230 VAC, 50 Hz / 60 VDC **Switching power:** 2300 VA at 230 VAC, 300 W at 30 VDC, 60 W at 60 VDC		I

Dew point sensor, TPS

Technical data		Application
Storage temperature:	–20 … +70 °C	This dew point sensor has been developed in conjunction with an alre dew point monitor and cooling ceiling controller for the specific purpose of capturing and signalling the dew point. It thus prevents dripping condensation water from the cooling parts of the cooling circuit, if installed correctly.
Sensor wire extendable up to:	50 m with 2 x 0.5 mm²	
Connecting cable:	10 m	
Accessories:	For use with dew point sensors (e.g., WFRRN) or climate controllers with dew point monitoring (KTRRB, KTRRU, KTRRUu, KTRVB, KTFRL, KTFRD)	

Type / image	Item no.	Features	PG
TPS 1 	G8000299	**Mounting / Attachment:** to the cooling ceiling capillary pipe using clips **Scope of delivery:** sensor, 2 clips for cooling pad	I
TPS 2 	G8000300	**Mounting / Attachment:** to the cooling ceiling capillary pipe using clips or cable ties **Scope of delivery:** sensor, 2 clips for cooling pad, 2 cable ties	I
TPS 3 	SN120000	**Mounting / Attachment:** to the pipe using cable ties **Scope of delivery:** sensor, 2 cable ties	I

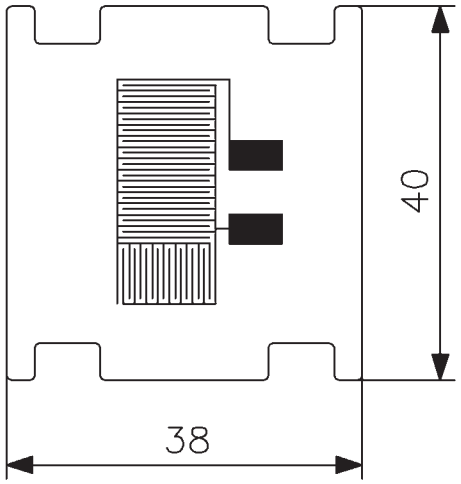
TPS 3



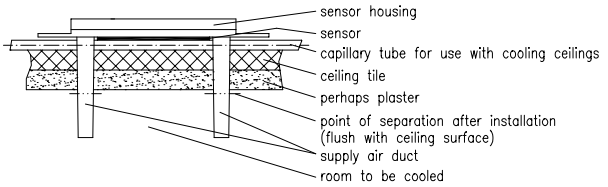
Important note: The inflow ducts of TPS-1 and TPS-2 are closed before shipping to avoid dirtying during assembly. After assembly, they must be shortened with a knife until they are flush with the wall to ensure air circulation. The air ducts should be arranged such that soiling during operation is avoided. It is important that the air surrounding the sensor has the same temperature as the room air to be cooled. If the humidity and temperature of the air to be cooled (ceiling cooling system) is different from that of the air surrounding the sensor, condensation may be detected prematurely or too late. As regards TPS-3, contact with the PCB paths must be avoided to prevent long-term corrosion.
Attention in case of sensor extension: Parallel laying to conductors carrying a mains voltage can result in faults. The use of shielded conductors reduces sensitivity to electromagnetic fields.

Dew point sensor, TPS

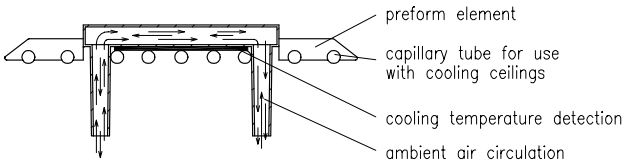
TPS 3



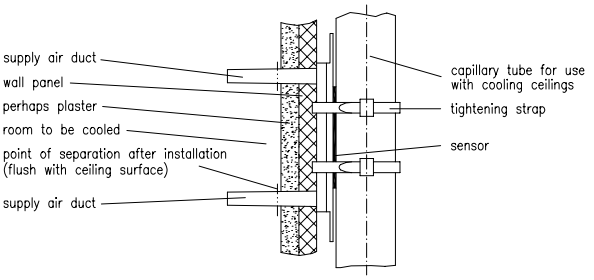
TPS 1



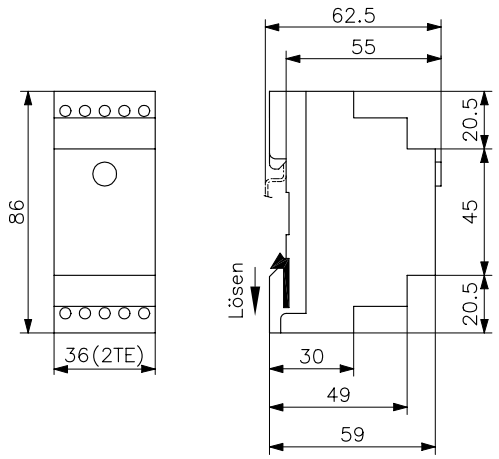
TPS 1



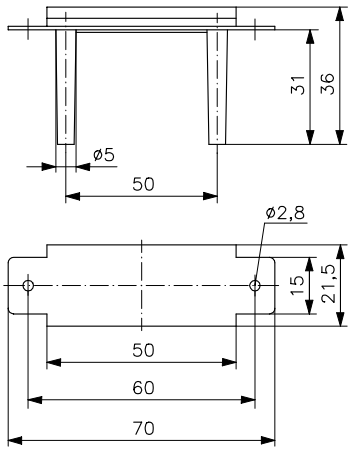
TPS 2



WFRRN



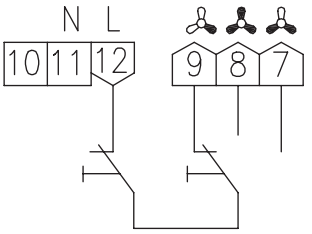
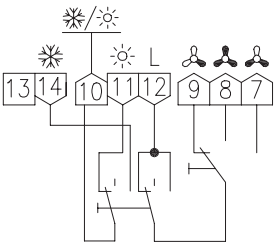
TPS 1/2



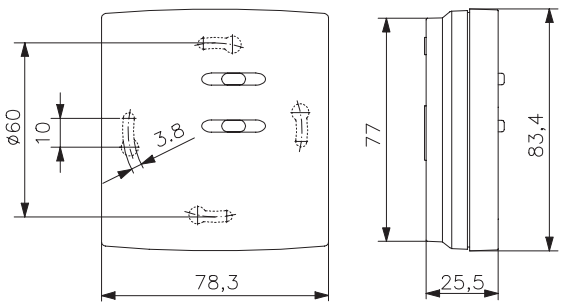
Climate controller remote controls, POOKB

Surface-mounted installation – Design Berlin 2000

Technical data		Application
Design:	Berlin 2000	Remote control for air conditioning systems (e.g., fan coils)
Surface finish:	matt	
Housing colour:	pure white, like RAL 9010	
Housing material:	ABS plastic	
Operating voltage:	none	
Ambient temperature:	–10 … +40 °C	
Storage temperature:	–20 … +70 °C	
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing	
Electrical connection:	screw-type terminals	
Mounting / attachment:	Surface- / wall-mounting	
Protection rating:	IP 30	
Protection class:	II, if properly mounted	
Safety and EMC:	according to DIN EN 60730	
Average power consumption:	0 W	
Max. switching current:	6 (3) A	
Min. switching current:	100 mA at 24 VAC	
Max. switching voltage:	230 VAC, 50 Hz	
Min. switching voltage:	24 VAC, 50 Hz	
Switching power:	1380 W	
Switching element:	sliding switch	
General features:	3-stage fan output; 3-stage fan switch	

Type / image	Item no.	Features	Circuit diagram	PG
POOKB-001.002 	MN030002	on / off switch		I
POOKB-001.003 	MN030003	heating / off / cooling switch		I

POOKB



Mechanical room hygrostats / hygro-thermostats, RFHSB, FHY, RKDSB

Surface-mounted installation – Design Berlin 2000 / 30, flush-mounted installation – Berlin UP

Technical data

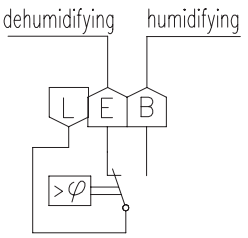
Storage temperature:	–20 … +60 °C
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Electrical connection:	screw-type terminals
Protection rating:	IP 30
Protection class:	II, if properly mounted
Safety and EMC:	according to DIN EN 60730
Min. switching current:	100 mA
Max. switching voltage:	230 VAC, 50 Hz
Min. switching voltage:	24 VAC, 50 Hz
General features:	mechanical range restriction
Other / similar items:	for duct and control cabinet hygrostats, see “Industrial technology”

Application

Hygrostat: The room hygrostat is used to monitor and control the relative humidity, e.g., in offices, homes, winter gardens, baths, swimming pools and data centres. The action of the relative humidity on a measuring tape is made to actuate a potential-free changeover contact. The desired value is set by means of the adjusting knob on the front panel. The setting range can be limited.

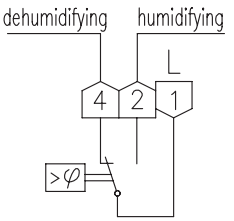
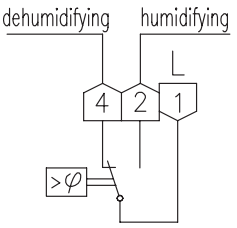
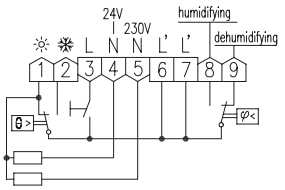
Hygro-thermostat: Monitoring and control of the relative humidity and the temperature in one device.

Note: Observe the wet room distance according to DIN VDE 0100-701!

Type / image	Item no.	Features	Circuit diagram	PG
FHY 101.060#00 	UA 020004	**General features:** external setting; protective cap; contact hazard protection cover plate **Design:** Berlin UP **Surface finish:** according to selected cover set **Housing colour:** according to selected cover set **Housing material:** PC plastic **Operating voltage:** no auxiliary energy necessary **Ambient temperature:** 0 … 50 °C **Mounting / Attachment:** in flush-mounted socket – adaptable with cover set 50 x 50 mm or 55 x 55 mm in almost all switch ranges (deep flush-mounted socket recommended) **Max. switching current:** dehumidifying (terminal E) 5 (0.2) A, humidifying (terminal B) 2 (0.2) A **Switching power:** terminal E: 1150 W, terminal B: 460 W **Switching element:** microswitch **Switching contact:** changeover switch (toggler), potential-free **Output signal:** switching **Sensor:** plastic fibres **Control function:** humidifying or de-humidifying **Control range:** 35 … 85% rel. humidity **Hysteresis:** approx. 5% rel. humidity **Accessories:** Cover sets are offered in various designs (see the separate overview on page 93) and are not included in the delivery. **Suitable set no:** JZ-021.xxx, e.g.: cover set 50 x 50 mm, pure white, glossy: JZ-021.000 cover set 55 x 55 mm, pure white, glossy: JZ-021.100 **Scope of delivery:** controller, protective cap		I

Mechanical room hygrostats / hygro-thermostats, RFHSB, FHY, RKDSB

Surface-mounted installation – Design Berlin 2000 / 30, flush-mounted installation – Berlin UP

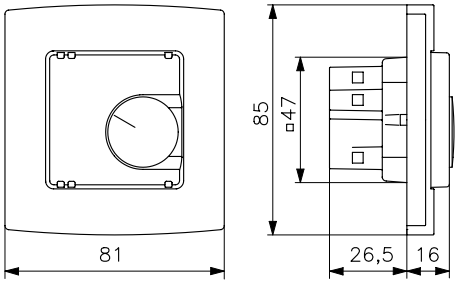
Type / image	Item no.	Features	Circuit diagram	PG
FHY 101.060#21 	UA020003	like FHY 101.060#00, but with delivery scope: controller, alre frame “Berlin”, cover 50 x 50 mm, pure white (like RAL 9010), glossy		I
RFHSB-060.010 	MA 020000	**General features:** external setting **Design:** Berlin 2000 **Surface finish:** matt **Housing colour:** pure white like RAL 9010 **Housing material:** ABS plastic **Operating voltage:** no auxiliary energy necessary **Ambient temperature:** 10 … 60 °C **Mounting / Attachment:** surface- / wall-mounting (4-hole assembly on flush-mounted socket) **Max. switching current:** dehumidifying (terminal 4) 5 (0.2) A, humidifying (terminal 2) 3 (0.2) A **Switching power:** terminal 4: 1150 W, terminal 2: 690 W **Switching element:** microswitch **Switching contact:** changeover switch (toggler), potential-free **Output signal:** switching **Sensor:** plastic fibres **Control function:** humidifying or de-humidifying **Control range:** 30 … 100% rel. humidity **Hysteresis:** approx. 4% rel. humidity		I
RFHSB-060.011 	MA020100	like RFHSB-060.010, but with internal setting		I
RKDSB-171.000 	MA220000	**General features:** external setting **Design:** Berlin 3000 **Surface finish:** matt **Housing colour:** pure white like RAL 9010 **Housing material:** ABS plastic **Operating voltage:** 24 VAC or 230 VAC selectable **Ambient temperature:** 0 … 50 °C **Mounting / Attachment:** surface / wall-mounting or by means of adapter plate on flush-mounted socket **Max. switching current:** dehumidifying (terminal 9) 5 (0.2) A, humidifying (terminal 8) 3 (0.2) A, heating (terminal 1) 10 (4) A at 230 VAC / 1 (1) A at 24 VAC, cooling (terminal 2) 5 (2) A at 230 VAC / 1 (1) A at 24 VAC **Switching power:** terminal 9: 1150 W, terminal 8: 690 W, terminal 1: 2300 W at 230 VAC / 24 W at 24 VAC, terminal 2: 1150 W at 230 VAC / 230 W at 24 VAC **Switching element:** microswitch (hygrostat) / bimetal (thermostat) **Switching contact:** 2x changeover switches (togglers) **Output signal:** heating, switching **Sensor:** plastic fibres for humidity, bimetal for temperature **Control function:** humidifying or de-humidifying, heating or cooling **Control range:** temperature 10 … 35 °C, humidity 30 … 00 % rel. humidity **Setting range:** 10 … 35 °C **Hysteresis:** approx. 4% rel. humidity, approx. 1 K at a temperature change of max. 4 K / h **Accessories:** adapter plate flush-mounted socket mounting: JZ-17		I

Mechanical room hygrostats / hygro-thermostats, RFSB, FHY, RKDSB

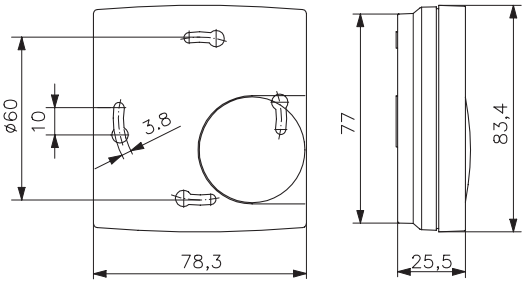
Surface-mounted installation – Design Berlin 2000 / 30, flush-mounted installation – Berlin UP

Accessories	Item no.	Features	PG
JZ-17 	MN990001	**General features:** adapter plate for mounting devices on flush-mounted sockets (including fastening screws for mounting the controller on the adapter plate) **Surface finish:** matt **Housing colour:** pure white like RAL 9010 **Housing material:** ABS plastic	II

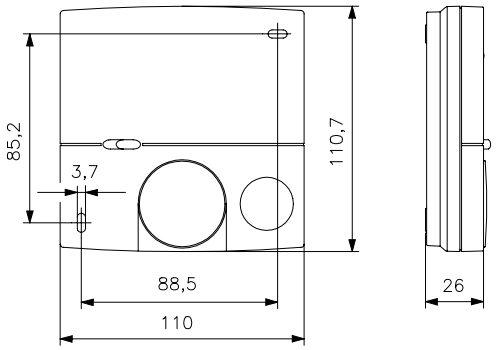
FHY



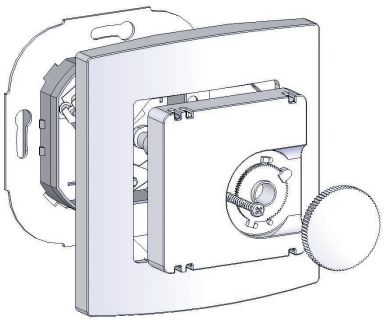
RFHSB



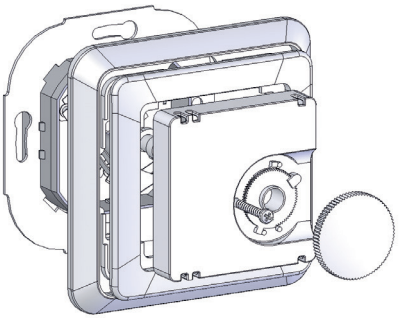
RKDSB



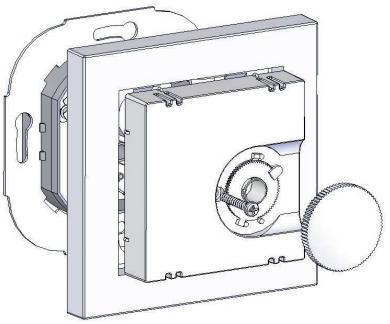
FHY with alre frame “Berlin” (#21 type)



FHY with insert frame



FHY without 55 x 55 insert frame



Radio-controlled heating / cooling

Overview of transmitters

Radio-controlled transmitter

Surface-mounted radio-controlled sensor with setpoint adjuster as a transmitter, superflat

Surface-mounted radio-controlled sensor with setpoint adjuster as a transmitter

Surface-mounted radio-controlled sensor with setpoint adjuster as a transmitter with timer

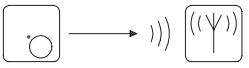
Surface-mounted radio-controlled sensor as superflat transmitter for averaging and central control

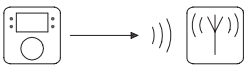
Surface-mounted radio-controlled sensor as transmitter for averaging and central control

Surface-mounted radio-controlled ECO contact

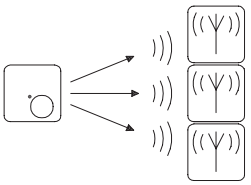
Sample applications (possible transmitter / receiver combinations):

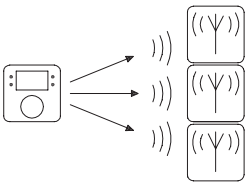
One transmitter to one receiver



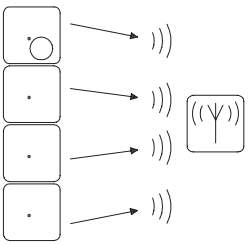


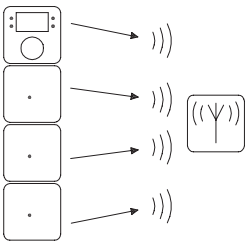
One transmitter to any number of receivers



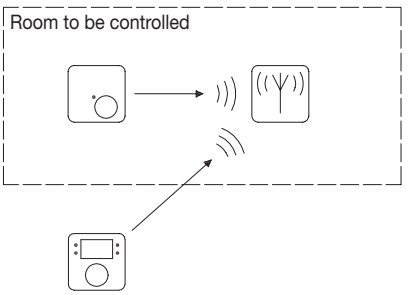


Averaging: (each receiver calculates the average value based on data from max. seven transmitters without setpoint adjuster and a transmitter with setpoint adjuster)





Master-slave operation: (comfort temperature through room transmitter, Scheduled ECO control, on / off, holiday and party function in combination with a configured timer transmitter.)



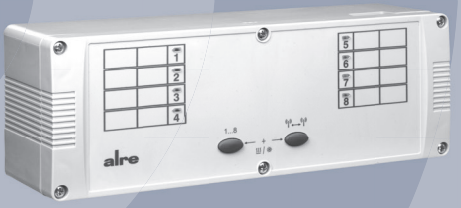
Radio-controlled heating / cooling

Overview of receivers

Radio-controlled receiver

Radio receiver rail for assembly into the heating manifold (4 heating circuits)

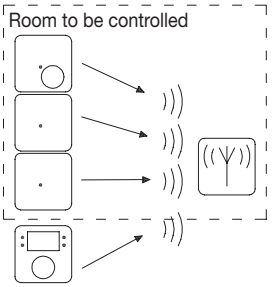
Surface-mounted radio receiver “cooling“



Radio receiver rail for assembly into the heating manifold (8 heating circuits)

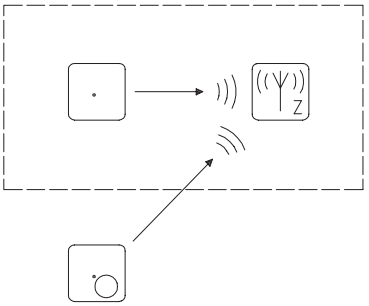
Sample applications (possible transmitter / receiver combinations):

Master-slave operation including averaging (each receiver calculates the average value based on data from max. seven transmitters without setpoint adjuster and a transmitter with setpoint adjuster); scheduled ECO control, on / off, holiday and party function in combination with a configured timer transmitter)

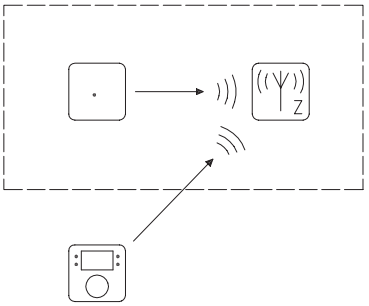


Sample applications for central control:

one (optionally up to seven) transmitter(s) **without setpoint adjuster** with any number of receivers; the target temperature is provided by an external transmitter with setpoint adjuster



one (optionally up to seven) transmitter(s) **without set point adjuster** with any number of receivers; the target temperature is provided by an external transmitter with setpoint adjuster and timer (additionally: scheduled ECO control, on / off, holiday and party function)



Radio-controlled heating / cooling – TRANSMITTER

Design BERLIN

Technical data

Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Protection rating:	IP 30
Safety and EMC:	according to DIN EN 60730 and DIN EN 300220
Radio frequency:	868.3 MHz
Range:	150 m line-of-sight or up to 30 m in buildings, depending on the construction
Transmission interval:	approx. 3 min and after setpoint change

Application

Radio-controlled room temperature sensor for measuring temperature in home, office and hotel spaces with normal levels of cleanliness. A single-room temperature control can be implemented with alre radio receivers. Primarily used in renovation applications or for heating system extensions.

Housing “Berlin 3000”: Programming method for every day, familiar from mechanical timers, by means of “electronic tabs” (minimum switching time 15 min).

Battery change: If a battery change is required shortly, this is indicated by a flashing red LED on the transmitter. In addition, the upcoming required replacement is indicated at an early time on the display of the timer transmitter.

After a voltage interruption at the transmitter or receiver, the wireless connection is restored automatically.

Type / image	Item no.	Features	PG
FKRFB-080.151 	BA010900	**General features:** radio transmitter for switching an alre radio receiver into ECO mode via an external contact (for example, phone or window contact); “learning mode / battery discharged state” display **Design:** Berlin 2000 **Surface finish:** matt **Housing colour:** pure white like RAL 9010 **Housing material:** ABS plastic **Operating voltage:** 2x micro AAA batteries, 1.5 V, 1100 mAh **Ambient temperature:** – 10 … + 50 °C **Storage temperature:** – 10 … + 50 °C **Mounting / attachment:** surface- / wall-mounting (4-hole assembly on flush-mounted socket) **Protection class:** III **ECO contact:** characteristic switchable NO / NC **Setting range:** setting range of the ECO temperature either 5 … 20 °C absolute or – 3 … – 15 K relative **Scope of delivery:** device, batteries **Operating elements:** learning button	I
FTRFB-080.101 	BA010100	**General features:** radio transmitter for acquiring the room temperature for calculating the average value or for centralised control; “learning mode / battery discharged state” display **Scope of delivery:** device, batteries, adhesive pads **Design:** Berlin 2000 **Surface finish:** matt **Housing colour:** pure white like RAL 9010 **Housing material:** ABS plastic **Operating voltage:** 2x micro AAA batteries, 1.5 V, 1100 mAh **Ambient temperature:** – 10 … + 50 °C **Storage temperature:** – 10 … + 50 °C **Mounting / attachment:** direct surface- / wall-mounting by means of screws or adhesive pads **Protection class:** III **Sensor:** NTC, internal **Operating elements:** learning button	I

Radio-controlled heating / cooling – TRANSMITTER

Design BERLIN

Type / image	Item no.	Features	PG
FTRFB-080.119 	BA010101	**General features:** radio transmitter for acquiring and setting room temperature; "learning mode / battery discharge state" display; mechanical range restriction; scale: degrees Celsius; external setting **Design:** Berlin 2000 **Surface finish:** matt **Housing colour:** pure white like RAL 9010 **Housing material:** ABS plastic **Operating voltage:** 2x micro AAA batteries, 1.5 V, 1,100 mAh **Ambient temperature:** – 10 … + 50 °C **Storage temperature:** – 10 … + 50 °C **Mounting / attachment:** direct surface- / wall-mounting by means of screws or adhesive pads **Protection class:** III **Sensor:** NTC, internal **Setting range:** 5 … 30 °C **Scope of delivery:** device, batteries, adhesive pads **Operating elements:** learning button	I
FTRFB-080.120 	BA010102	**General features:** radio transmitter for acquiring and setting room temperature; reduction 4 K fixed; ECO function; "learning mode / battery discharge state" display; mechanical range restriction; scale: degrees Celsius; external setting **Design:** Berlin 2000 **Surface finish:** matt **Housing colour:** pure white like RAL 9010 **Housing material:** ABS plastic **Operating voltage:** 2x micro AAA batteries, 1.5 V, 1,100 mAh **Ambient temperature:** – 10 … + 50 °C **Storage temperature:** – 10 … + 50 °C **Mounting / attachment:** direct surface- / wall-mounting by means of screws or adhesive pads **Protection class:** III **Sensor:** NTC, internal **Setting range:** 5 … 30 °C **Scope of delivery:** device, batteries, adhesive pads **Operating elements:** "comfort / ECO" switch, learning button	I
FTRFB-280.101 	BA010400	**General features:** radio transmitter for acquiring the room temperature for calculating the average value or for centralised control; "learning mode / battery discharged state" display **Scope of delivery:** device, batteries, adhesive pads **Design:** Berlin 1000 **Surface finish:** glossy **Housing colour:** pure white like RAL 9010 **Housing material:** ABS plastic **Operating voltage:** 2x micro AAA batteries, 1.5 V, 1,100 mAh **Ambient temperature:** – 10 … + 50 °C **Storage temperature:** – 10 … + 50 °C **Mounting / attachment:** direct surface- / wall-mounting by means of screws or adhesive pads **Protection class:** III **Sensor:** NTC, internal **Setting range:** 5 … 30 °C **Operating elements:** learning button	I
FTRFB-280.119 	BA010409	**General features:** radio transmitter for acquiring and setting room temperature; "learning mode / battery discharge state" display; mechanical range restriction; scale: degrees Celsius; external setting **Design:** Berlin 1000 **Surface finish:** glossy **Housing colour:** pure white like RAL 9010 **Housing material:** ABS plastic **Operating voltage:** 2x micro AAA batteries, 1.5 V, 1,100 mAh **Ambient temperature:** – 10 … + 50 °C **Storage temperature:** – 10 … + 50 °C **Mounting / attachment:** direct surface- / wall-mounting by means of screws or adhesive pads **Protection class:** III **Sensor:** NTC, internal **Setting range:** 5 … 30 °C **Scope of delivery:** device, batteries, adhesive pads **Operating elements:** learning button	I

Radio-controlled heating / cooling – TRANSMITTER

Design BERLIN

Type / image	Item no.	Features	PG
FTRFB-280.120 	BA010401	**General features:** radio transmitter for acquiring and setting room temperature; reduction 4 K fixed; ECO function; "learning mode / battery discharge state" display; mechanical range restriction; scale: degrees Celsius; external setting **Design:** Berlin 1000 **Surface finish:** glossy **Housing colour:** pure white like RAL 9010 **Housing material:** ABS plastic **Operating voltage:** 2x micro AAA batteries, 1.5 V, 1,100 mAh **Ambient temperature:** – 10 … + 50 °C **Storage temperature:** – 10 … + 50 °C **Mounting / attachment:** direct surface- / wall-mounting by means of screws or adhesive pads **Protection class:** III **Sensor:** NTC, internal **Setting range:** 5 … 30 °C **Scope of delivery:** device, batteries, adhesive pads **Operating elements:** "comfort / ECO" switch, learning button	I
FTRFBu-180.117 / V2 	BA010200	**General features:** pilot function; ECO function, ECO value adjustable; "ECO" display; "on / off" display; "learning mode / battery discharged state" display; digital actual value display; child-safe features; actual value correction / measured value correction; learning function; valve protection; holiday setting; party setting; automatic adjustment to standard / daylight savings time; mechanical range setting; scale: degrees Celsius; reduction / comfort / automatic button; external setting; operation using direct-dial buttons; on / off button; information button; party function button; holiday setting button **Design:** Berlin 3000 **Surface finish:** matt **Housing colour:** pure white like RAL 9010 **Housing material:** ABS plastic **Operating voltage:** 2x micro AAA batteries, 1.5 V, 1,100 mAh **Ambient temperature:** – 10 … + 50 °C **Storage temperature:** – 10 … + 50 °C **Mounting / attachment:** direct surface- / wall-mounting by means of screws or adhesive pads **Protection class:** III **Sensor:** NTC, internal **Setting range:** 5 … 30 °C **Display type:** symbol display **Scope of delivery:** device, batteries, adhesive pads **Accessories:** optional adapter snap-on plate JZ-18	I
FTRFBu-180.121 / V2 	BA010201	like FTRFBu-180.117, but with backlighting **Operating voltage:** 3x micro AAA batteries, 1.5 V, 1,100 mAh (3rd battery for backlighting)	I
FTRFUd-210.123#21 	UA080000	**General features:** flush-mounted radio transmitter for acquiring and setting the room temperature with the timer, holiday setting, party setting, different timer programs can be set for heating and cooling, usable as the master for master-slave operation (pilot controller); pilot function; ECO function; ECO value adjustable; "ECO" display; "on / off" display; digital actual value display; backlighting; child-safe features; power reserve (3 days); actual value correction / measured value correction; learning function; valve protection; holiday setting; party setting; automatic adjustment to standard / daylight savings time; external setting; operation using direct-dial buttons **Design:** Berlin UP **Surface finish:** glossy **Housing colour:** pure white like RAL 9010 **Housing material:** ABS, PC, PMMA plastic **Operating voltage:** 230 VAC, 50 Hz **Ambient temperature:** 0 … 40 °C **Storage temperature:** – 20 … + 70 °C **Electrical connection:** pluggable screw terminals **Mounting / attachment:** in flush-mounted socket (deep flush-mounted socket recommended) **Protection class:** II, if properly mounted **Average power consumption:** <1 W **Sensor:** NTC internal, optional external **Control range:** 5 … 30 °C **Display type:** illuminated graphical display **Scope of delivery:** controller, cover **50 x 50** mm, **pure white** (like RAL 9010), **glossy** alre frame "Berlin"	I

Radio-controlled heating / cooling – TRANSMITTER

Design BERLIN

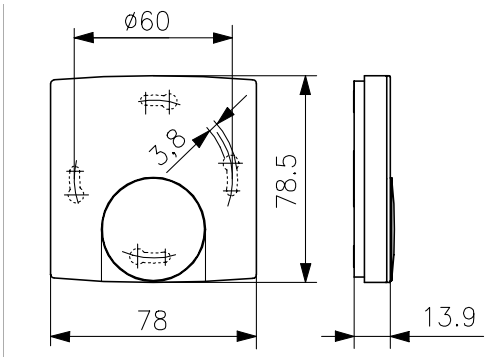
Type / image	Item no.	Features	PG
FTRFUd-210.123#07 	UA080001	like FTRFUd-210.123#21, but with scope of delivery: controller, cover **50 x 50** mm, **pure white** (like RAL 9010), **glossy,** without frame	I
FTRFUd-210.123#09 	UA080002	like FTRFUd-210.123#21, but with scope of delivery: controller, cover **50 x 50** mm, **pearl white** (like RAL 1013), **glossy,** without frame	I
FTRFUd-210.123#27 	UA080003	like FTRFUd-210.123#21, but with scope of delivery: controller, cover **50 x 50** mm, **traffic white** (like RAL 9016), **glossy,** without frame	I
FTRFUd-210.123#28 	UA080006	like FTRFUd-210.123#21, but with scope of delivery: controller, cover for use with **BUSCH-JAEGER Reflex SI / SI Linear pure white**(similar to RAL 9010),**glossy,** without frame	I
FTRFUd-210.123#55 	UA080004	like FTRFUd-210.123#21, but with scope of delivery: controller, cover **55 x 55** mm, **pure white** (like RAL 9010), **glossy,** without frame	I
FTRFUd-210.123#56 	UA080008	like FTRFUd-210.123#21, but with scope of delivery: controller, cover **55 x 55** mm, **pure white** (like RAL 9010), **matt,** without frame	I
FTRFUd-210.123#57 	UA080005	like FTRFUd-210.123#21, but with scope of delivery: controller, cover **55 x 55** mm, **pearl white** (like RAL 1013), **glossy,** without frame	I
FTRFUd-210.123#59 	UA080007	like FTRFUd-210.123#21, but with scope of delivery: controller, cover **55 x 55** mm, **traffic white** (like RAL 9016), **glossy,** without frame	I

Radio-controlled heating / cooling – TRANSMITTER

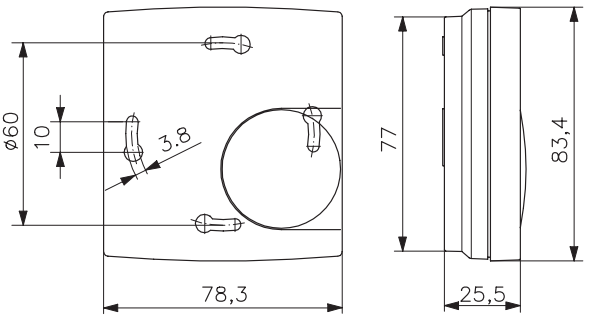
Design BERLIN

Accessories	Item no.	Features	PG
JZ-18 	MN990002	**General features:** optional adapter snap-action plate for timer transmitter FTRFBu with universal perforation pattern for mounting. The use of the adapter is recommended since the transmitter becomes detachable as a result and facilitates simpler battery replacement. **Surface finish:** matt **Housing colour:** pure white like RAL 9010 **Housing material:** ABS plastic	II
JZ-090.900 	VV000025	**General features:** alre frame “Berlin” (neutral) for all flush-mounted controllers with cover 50 x 50 mm **Surface finish:** glossy **Housing colour:** pure white like RAL 9010 **Housing material:** PC plastic	II
JZ-090.910	VV000010	**General features:** alre frame “Berlin” (neutral) for all flush-mounted controllers with cover 50 x 50 mm **Surface finish:** glossy **Housing colour:** pearl white like RAL 1013 **Housing material:** PC plastic	II

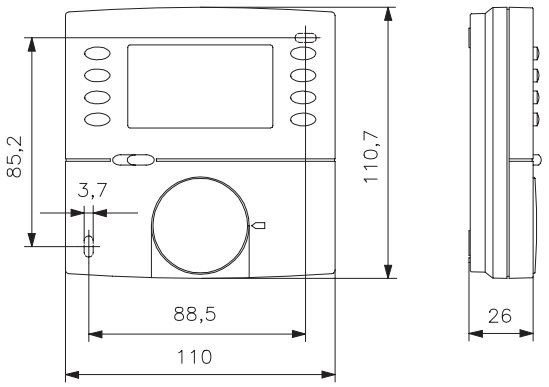
“Berlin 1000”



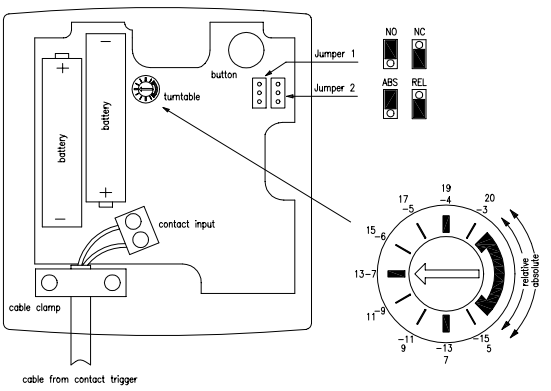
“Berlin 2000”



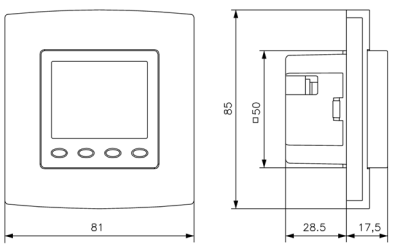
“Berlin 3000”



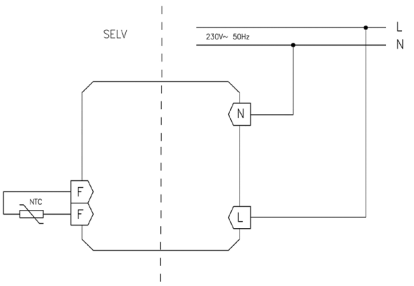
FKRFB circuit diagram



FTRFUd



FTRFUd circuit diagram



Adaptation of alre FTRxUd-210.021 flush-mounted transmitters

Manufacturer	Range	Colour RAL 9010 (surface finish)	Adaptation in switch range "55 x 55" possible using...	"50 x 50" adaptation possible with ... (insert frame from manufacturer required)
BERKER	S.1	polar white (matt)	FTRxUd-210.xxx#56	not required
BERKER	S.1	polar white (glossy)	FTRxUd-210.xxx#55	not required
BERKER	Arsys	polar white (glossy)		FTRxUd-210.xxx#07 + (1108 01 69)
BERKER	B.3	aluminium/polar white (matt)	FTRxUd-210.xxx#56	not required
BERKER	B.3	aluminium/polar white (glossy)	FTRxUd-210.xxx#55	not required
BERKER	B.7	glass/polar white (matt)	FTRxUd-210.xxx#56	not required
BERKER	B.7	glass/polar white (glossy)	FTRxUd-210.xxx#55	not required
BERKER	K.1	polar white (glossy)		FTRxUd-210.xxx#07 + (1108 71 09)
BUSCH-JAEGER	Reflex SI/SI Linear	alpine white (glossy)	FTRxUd-210.xxx#28	not required
BUSCH-JAEGER	Busch-balance SI	polar white (glossy)	FTRxUd-210.xxx#55	not required
BUSCH-JAEGER	impuls	alpine white (glossy)		FTRxUd-210.xxx#07 + (1746/10-74)
BUSCH-JAEGER	solo/future/axcent etc.	studio white – see RAL 9016 below		
GIRA	rocker switch	pure white (glossy)		FTRxUd-210.xxx#07 + (0282 112)
GIRA (System 55)	Standard/E 2	pure white (semi-gloss)	FTRxUd-210.xxx#56	not required
GIRA (System 55)	Standard/E 2	pure white (glossy)	FTRxUd-210.xxx#55	not required
GIRA (System 55)	E 22	pure white (glossy)	FTRxUd-210.xxx#55	not required
GIRA (System 55)	Event	pure white (semi-gloss) + opaque...	FTRxUd-210.xxx#56	not required
GIRA (System 55)	Event	pure white (glossy) + opaque...	FTRxUd-210.xxx#55	not required
GIRA (System 55)	Esprit	pure white (semi-gloss) + glass, aluminium...	FTRxUd-210.xxx#56	not required
GIRA (System 55)	Esprit	pure white (glossy) + glass, aluminium...	FTRxUd-210.xxx#55	not required
GIRA	S-Color	pure white (high-gloss)		FTRxUd-210.xxx#07 + (0282 40)
JUNG	CD 500/CD plus	alpine white (glossy)		FTRxUd-210.xxx#07 + (CD 590 Z WW)
JUNG	A 500/AS 500/A plus	alpine white (glossy)	FTRxUd-210.xxx#55	not required
JUNG	LS 990	alpine white (glossy)		FTRxUd-210.xxx#07 + (LS 961 Z WW)
JUNG	LS plus	alpine white (glass)		FTRxUd-210.xxx#07 + (LS 961 Z WW)
JUNG	A creation	alpine white (glossy)	FTRxUd-210.xxx#55	not required
JUNG	LS Design	alpine white (glossy)		FTRxUd-210.xxx#07 + (LS 961 Z WW)
MERTEN (System M)	M-Smart, Arc, Plan, Star	polar white (matt)	FTRxUd-210.xxx#56	not required
MERTEN (System M)	M-Smart, Arc, Plan, Star, M-Creativ, M-Pure	polar white (glossy)	FTRxUd-210.xxx#55	not required
MERTEN (System Basis)	1-M/Atelier-M	polar white (glossy)	FTRxUd-210.xxx#55	not required
MERTEN (System Design)	Artec/Trancent/Antik	polar white (glossy)		FTRxUd-210.xxx#07 + (5160 99)
MERTEN	1-M/M-Smart/M-Plan/M-pure etc.	active white – see RAL 9016 below		
PEHA	Standard	pure white (glossy)		FTRxUd-210.xxx#07 + (80.670.02 ZV)
PEHA	Dialog	pure white (glossy)		FTRxUd-210.xxx#07 + (95.670.02 ZV)
PEHA	Aura	pure white (matt)/glass		FTRxUd-210.xxx#07 + (20.670.02 ZV)
PEHA	Badora	pure white (glossy)		FTRxUd-210.xxx#07 + (11.670.02 ZV)

Manufacturer	Range	Colour RAL 9016 (surface finish)	Adaptation in switch range "55 x 55" possible using...	"50 x 50" adaptation possible with ... (insert frame from manufacturer required)
BUSCH-JAEGER	solo/future/future linear	studio white (RAL 9016, glossy)		FTRxUd-210.xxx#27 + (1746/10-84)
BUSCH-JAEGER	axcent	studio white (RAL 9016, glossy)		FTRxUd-210.xxx#27 + (1746/10-84)
BUSCH-JAEGER	carat (glass, bronze, gold)	studio white (RAL 9016, glossy)		FTRxUd-210.xxx#27 + (1746/10-84)
BUSCH-JAEGER	alpha (nea/exclusive*)	studio white (RAL 9016, glossy)		FTRxUd-210.xxx#27 + (1746/10-24G)
MERTEN	M-Smart, Plan	active white (RAL 9016, glossy)	FTRxUd-210.xxx#59	not required
MERTEN	1-M/Atelier-M	active white (RAL 9016, glossy)	FTRxUd-210.xxx#59	not required
PEHA	Standard	arctic		FTRxUd-210.xxx#27 + (D 80.670 ZV AW)

*) During assembly, you need to remove four plastic tabs located at the rear of the frame

NOTE: Most light switches are designed in the colour "like RAL 9010", although different switch manufacturers use different designations for this colour. Coloured, glass and aluminium frames are also combined with white jacks or plugs so that controllers with white covers can also be integrated into these frames. Check the precise application in each individual case. The frames have different surface qualities (matt/glossy). For design reasons, the cover of the controller should have the same quality as the frame. We accept no liability for slight variations in colour and surface finish or for accuracy of fit. When installing devices into multi frames, always assemble the temperature controllers at the lowermost position.

"50 x 50 controller": The housing covers of the 50 x 50 controllers are 50 x 50 mm in size. Using a 50 x 50-mm insert frame, the 50 x 50 controllers can be integrated into nearly all light switch ranges in accordance with DIN 49075. The 50 x 50-mm insert frames must be ordered from the light switch manufacturer or from a wholesaler. The order number of the insert frame corresponding to the switch in question can be found in the column "For adaptation of '50 x 50' FTRxUd".

"55 x 55 controller": The housing covers of the 55 x 55 controllers are 55 x 55 mm in size. Many light switch ranges have inner dimensions of 55 x 55 mm. Therefore, the 55 x 55 controllers can be installed directly in the light switch frame without the use of an insert frame. See the column "Adaptation in switch range (55 x 55)" to determine whether the 55 x 55 controller fits in the given light switch (FTRxUd-210.xxx#xx).

All information regarding switch manufacturers' product lines and item numbers was last updated in 12/2015 | No liability is assumed for the information provided. | Technical specifications subject to change. An adaptation list for RAL 1013 switch ranges is available from our website at www.alre.de.

Radio-controlled heating / cooling – RECEIVER

Radio-controlled climate controller “heating / cooling”

Technical data

Surface finish:	matt
Housing colour:	light grey, like RAL 7035
Housing material:	ABS plastic
Operating voltage:	230 VAC, 50 Hz
Ambient temperature:	–10 … +50 °C
Storage temperature:	–20 … +70 °C
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Electrical connection:	spring-cage terminals 0.5 … 1.5 mm²
Mounting / attachment:	surface- / wall-mounting
Protection class:	II for loads of protection classes I and II
Safety and EMC:	according to DIN EN 60950-1, DIN EN 300220
Max. switching voltage:	230 VAC, 50 Hz
Min. switching voltage:	230 VAC, 50 Hz
Control function:	heating or cooling
Control range:	5 … 30 °C
Hysteresis:	approx. 0.5 K
Neutral zone:	adjustable 0 … 6 K
Radio frequency:	868.3 MHz
General features:	External dew point sensor; ECO function; operating mode “off with frost protection monitoring”; central control; emergency operation mode
Factory setting:	neutral zone 0 K
Operating elements:	channel selection button, learning button
Accessories:	suitable valve actuators: ZBOOA-010.100 optional magnetic fastening set for simple installation in heating manifold: JZ-24 external antenna: JZ-25 antenna cable 1 m: JZ-26
Display:	Installation mode, connection and status check, dew-point undershooting, connection loss, learning mode are indicated per channel

Application

Radio receivers used to implement a single-room climate control in conjunction with alre radio-controlled room temperature transmitters.

Functions: Heating, cooling with adjustable neutral zone; H / C changeover on site or via an external contact; on / off switching by contact with frost protection function; individual channels can be excluded from cooling operation; cooling interruption if condensation occurs, through dew point sensor or contact; cooling limit 18 °C; energy-saving function centrally via external timer or centrally or locally in master-slave operation, (max. 4 / 8 time zones possible, i.e., up to 4 / 8 transmitters can be connected to timer); status display of the radio connection for each channel, upon loss of connection, automatic emergency operation; control types: average value determination (up to 8 transmitters can be linked to one channel + 1 transmitter for master-slave operation) or central control (individual channels can be changed over to external setpoint transmitter, “public office function” / central control); the upper part can be removed for configuring the radio transmitters in the individual rooms. The power supply is ensured during this time with a standard commercial 9-V block battery. By using the channel selection button and a learning button, the transmitters can be configured very easily. Attachment: There are 4 screws for wall attachment that are part of the standard kit; as an option, a magnetic attachment set JZ-24 for simple attachment in the heating manifold distribution cabinet can also be supplied.

Type / image	Item no.	Features	PG
KTFRD-213.140 	BA120700	**Protection rating:** IP 65 **Max. switching current:** output 1 – 4: 4 (1) A **Pump output:** 0.75 A* **Total of all the outputs (4 channels + pump output):** 4 (1) A **Switching power:** total 920 W, of which 180 W is pump output **Switching element:** 5 relays **Switching contact:** 5 NO contacts	I
KTFRD-315.125 	BA120500	**Protection rating:** IP 65 **Max. switching current:** output 1 – 8: 5 (1) A **Pump output:** 0.75 A* **Total of all the outputs (8 channels + pump output):** 6 (1) A **Switching power:** total 1380 W, of which 180 W is pump output **Switching element:** 9 relays **Switching contact:** 9 NO contacts	I
KTFRL-213.140 	BA121100	like KTFRD-213.140, but IP 20	I

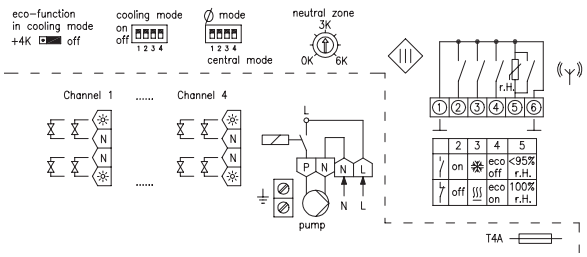
* Pump module included

Radio-controlled heating / cooling – RECEIVER

Radio-controlled climate controller “heating / cooling”

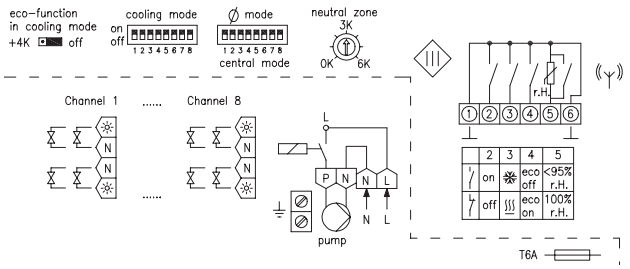
Type / image	Item no.	Features	PG
KTFRL-315.125 	BA120900	like KTFRD-315.125, but IP 20	I
JZ-24 	BN990002	General features: Magnetic fastening set for simple and safe fastening of the multi-channel receiver and terminal strips on a metallic underground (for example, heating circuit distributor)	II
JZ-25 	BN990003	**General features:** External antenna for reception enhancement under difficult reception conditions of the multi-channel receiverexterne (antenna cable JZ-26 is not a part of the delivery scope) **Design:** Berlin 1000 **Surface finish:** glossy **Housing colour:** pure white like RAL 9010 **Housing material:** ABS plastic **Storage temperature:** -20 … +70 °C **Admissible humidity:** max. 95 % rel. humidity, non-condensing **Protection rating:** IP 30	II
JZ-26	BN990004	**General features:** antenna cable for connecting the external antenna (JZ-25) with multichannel receivers **Connecting cable:** 1 m	II

KTFRx-213.140 (4-channel)

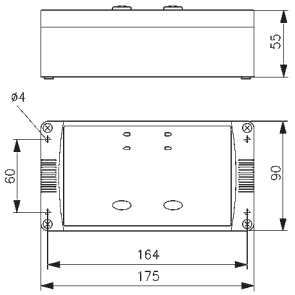


Central control involves individual room control with central specification of the setpoint. For rooms whose setpoint is assigned centrally, radio-controlled temperature sensors without a setpoint adjuster (actual value transmitters) are installed. Central control is particularly suitable in public offices, banks or in the retail sector for areas accessible to the public or in private areas, for example, for children’s rooms or stairwells.

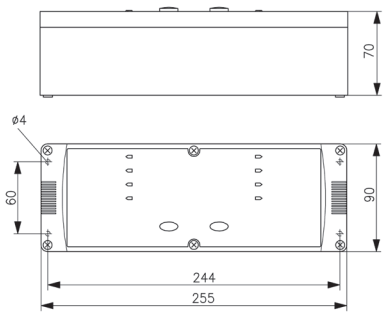
KTFRx-315.125 (8-channel)



KTFRx-213.140



KTFRx-315.125



Radio-controlled cooling – RECEIVER

Technical data

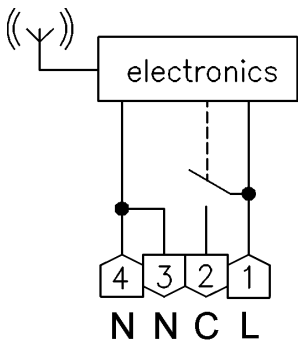
Design:	“Berlin 2000”
Surface finish:	matt
Housing colour:	pure white, like RAL 9010
Housing material:	ABS plastic
Operating voltage:	230 VAC, 50 Hz
Ambient temperature:	–20 … +45 °C
Storage temperature:	–20 … +70 °C
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Electrical connection:	screw-type terminals 0.5 … 2.5 mm²
Mounting / attachment:	Surface- / wall-mounting (4-hole assembly on flush-mounted socket)
Protection rating:	IP 30
Protection class:	II for loads of protection classes I and II
Safety and EMC:	according to DIN EN 60950-1, DIN EN 300220
Average power consumption:	approx. 1.5 W
Max. switching current:	10 (2) A
Max. / min. switching voltage:	230 VAC, 50 Hz
Switching power:	2300 W
Switching element:	relay
Switching contact:	NO contact
Output signal:	switching, 230 VAC, 50 Hz
Control range:	18 ... 40 °C
Hysteresis:	approx. 0.5 K
Neutral zone:	approx. 3 K
Radio frequency:	868.3 MHz
General features:	central control
Pipe system compatibility:	2-pipe
Operating elements:	learn button

Application

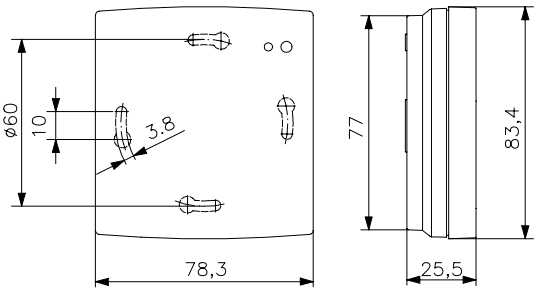
The CTFRB was specifically designed to control electrothermal valve actuators (normally closed) and is used together with one or more radio-controlled room temperature sensors (transmitters).

Type / image	Item no.	Features	PG
CTFRB-010.101 	BA110600	**Control function:** switches on the cooling if the setpoint temperature + neutral zone are exceeded, central control, “installation mode / function check / connection loss / learning mode” display	I

Circuit diagram



Dimension drawing



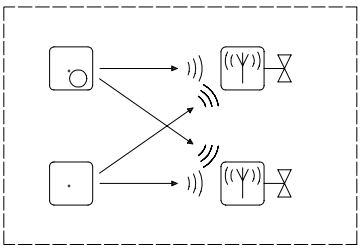
Radio-controlled cooling – RECEIVER

Sample applications (possible transmitter / receiver combinations):

CTFRB for cooling operation, HTFRB (see “Heating technology” section) for heating operation in a 4-pipe system

Averaging: (each receiver calculates the average value based on data from max. seven actual value transmitters and a transmitter with setpoint adjuster)

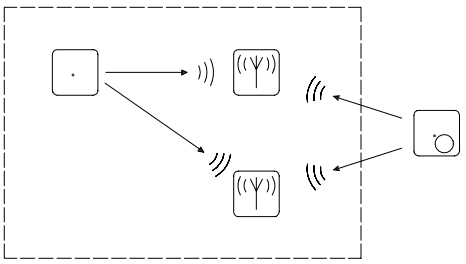
Room to be controlled



CTFRB for cooling operation, HTFRB (see “Heating technology” section) for heating operation in a 4-pipe system

Master-slave operation: (comfort temperature through room transmitter, scheduled ECO control, ON / OFF, holiday and party function in combination with a configured timer transmitter)

Room to be controlled

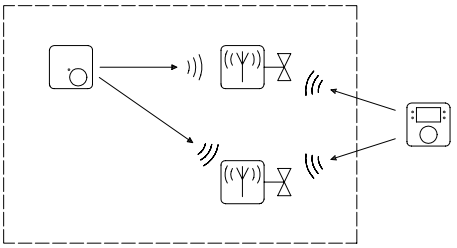


CTFRB for cooling operation, HTFRB (see “Heating technology” section) for heating operation in a 4-pipe system

Centralised control: (one or optionally up to seven transmitters without setpoint adjuster with any number of receivers; the target temperature is provided by an external transmitter with setpoint adjuster)

Application: nurseries, guest accommodations, public offices and spaces

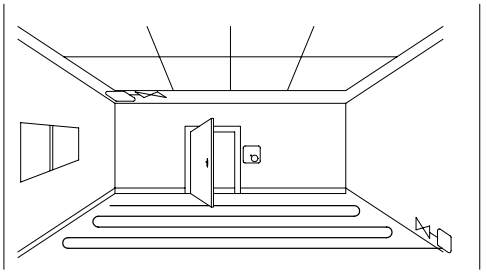
Room to be controlled



CTFRB for cooling operation, HTFRB (see “Heating technology” section) for heating operation in a 4-pipe system

Application example: CTFRB controls the ceiling cooling system, HTFRB controls the underfloor heating system

Room to be controlled



Smart controlling with b@home

Intelligent remote control operation for heating and cooling systems

b@home – the clever way to control heating and cooling systems from anywhere and at any time through the new alre b@home Gate. alre wireless systems, both existing and yet to be set up, can be controlled via the internet or home network: simply using a free app (iOS / Android) or via standard PC / notebook browser. The intuitive, simple operation can access rooms individually or centrally, and can optimise energy consumption.

After a one-off registration on the b@home portal, the user can access the wireless system from anywhere via a https connection. This is also possible without an internet connection via WLAN / LAN. The b@home Gate is the interface between the alre wireless system and the WLAN / LAN router.

The wireless room temperature sensor FTRCUd-210.021 is the central access point to the settings of all channels or hot / cold zones. It can also be used as a room temperature sensor with timer and actuator, and works with all conventional switches.

1 Infrared heating

2 Underfloor warm-water heating

3 Underfloor electrical heating

4 Radiator

5 Cooling ceiling

An overview of all options and advantages

- Secure control, monitoring and programming of the hot / cold system from any location
- Up to 32 rooms or hot / cold zones
- Fast and easy commissioning
- Intuitive operation
- Individual room control
- Suitable for all types of heating
- A variety of mobile terminal equipment usable
- An internet connection is not required for the control function
- Upgradeable in existing alre wireless systems*
- Free apps, no follow-up costs such as monthly subscription fees

* Excludes the timer transmitters FTRFBu-180.1xx and FTRFUd-210.123, as the relevant functions are realised via APP / gate / web portals.

Radio-controlled heating / cooling – BIDIRECTIONAL

For corresponding transmitters and receivers, see "Radio-controlled heating" and "Radio-controlled heating / cooling" (except for FTRFBu / FTRFUd)

Technical data

Ambient temperature:	0 … 40 °C
Storage temperature:	–20 … +70 °C
Permissible atmospheric humidity:	max. 95% relative humidity non-condensing
Protection rating:	IP 30
Safety and EMC:	according to DIN EN 60730 and DIN EN 300220
Radio frequency:	868.3 MHz
Range:	150 m line-of-sight or up to 30 m in buildings, depending on the construction

Application

Using the new b@home gate MGCBB-064.360, alre radio-controlled systems can be monitored and controlled over the Internet or a WLAN / LAN.
After completing the free registration process at the b@home gate portal, users can operate the b@home gate system simply and intuitively via a smartphone app or a notebook / PC.

This allows users to control, monitor and reprogram the temperature controls at any time and from any location, either for each individual room or centrally for all rooms. It is also possible to access the system without an Internet connection using the local WLAN / LAN network.

The bidirectional b@home operating element FTRCUd-210.021, together with the b@home gate MGCBB-064.360, offers central access to the settings of additional channels and can be used as a room temperature sensor with a timer and as an operating element. Changes made using the b@home app or via PC / notebook are shown in the graphic display.

It is possible to install this system in existing installations (except for the FTRFBu and FTRFUd radio-controlled room temperature sensors with timer).

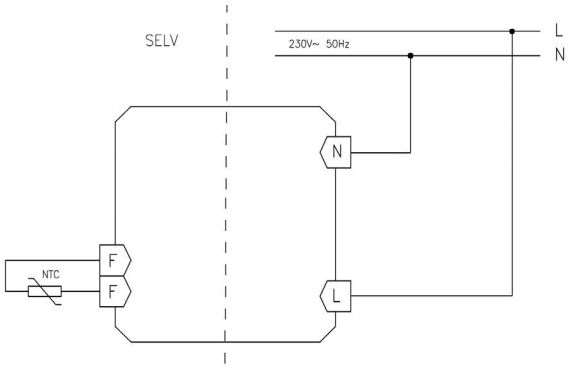
Type / image	Item no.	Features	PG
MGCBB-064.360 	BA210101	Radio room temperature management system, controlled remotely via the Internet or smartphone **Design:** Berlin 2000 **Surface finish:** matt **Housing colour:** pure white like RAL 9010 **Housing material:** ABS plastic **Operating voltage:** +5 VDC **Mounting / attachment:** direct surface- / wall-mounting by means of screws **Protection class:** III **Operating elements:** confirmation button **Scope of supply:** b@home gate, network cable (CAT5) / cable length 3 m, MicroUSB power supply plug / cable length 1.8 m	I
FTRCUd-210.021#21 	UA070000	**Radio room temperature sensor with timer for acquiring and setting the room temperature; operating element for additional active channels,** different timer programs can be set for heating and cooling, usable as the master for the master-slave operation (pilot controller) **General features:** digital actual value display; "ECO" display; "on / off" display; automatic adjustment to standard / daylight savings time; ECO function; ECO value adjustable; power reserve (approx. 3 days); backlighting; actual value correction / measured value correction; child-safe features; learning function; party setting; pilot function; holiday setting; valve protection; external setting; operation using direct-dial buttons **Design:** Berlin UP (flush-mounted) **Surface finish:** glossy **Housing colour:** pure white like RAL 9010 **Housing material:** ABS, PC, PMMA plastic **Operating voltage:** 230 VAC, 50 Hz **Electrical connection:** pluggable screw terminals **Mounting / attachment**: in flush-mounted socket (deep flush-mounted socket recommended); can be adapted to fit virtually any flush-mounted switch range **Protection class:** II, if properly mounted **Average power consumption:** <1 W **Sensor:** NTC, internal, optional external **Control range:** 5 … 30 °C **Transmission interval:** approx. 3 min and after setpoint change **Display type:** illuminated graphical display **Display:** set / actual temperature, date, time; set / actual temperature or date, time **Scope of delivery:** radio transmitter, cover **50 x 50 mm pure white** (like RAL 9010), **glossy,** alre frame "Berlin"	I

Radio-controlled heating / cooling – BIDIRECTIONAL

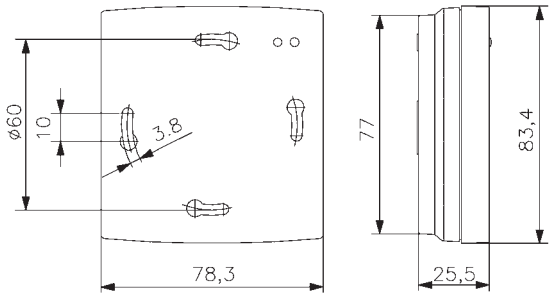
Type / image	Item no.	Features	PG
FTRCUd-210.021#07 	UA070001	like FTRCUd-210.021#21, but with scope of delivery: radio transmitter, cover **50 x 50** mm **pure white** (like RAL 9010), **glossy,** without frame	I
FTRCUd-210.021#09 	UA070002	like FTRCUd-210.021#21, but with scope of delivery: radio-controlled transmitter, cover **50 x 50** mm**, pearl white** (like RAL 1013), **glossy,** without frame	I
FTRCUd-210.021#27 	UA070003	like FTRCUd-210.021#21, but with scope of delivery: radio-controlled transmitter, cover **50 x 50** mm**, traffic white** (like RAL 9016), **glossy,** without frame	I
FTRCUd-210.021#28 	UA070006	like FTRCUd-210.021#21, but with scope of delivery: radio transmitter, cover **suitable for BUSCH-JAEGER Reflex SI / SI Linear pure white** (like RAL 9010), **glossy,** without frame	I
FTRCUd-210.021#55 	UA070004	like FTRCUd-210.021#21, but with scope of delivery: radio-controlled transmitter, cover **55 x 55** mm**, pure white** (like RAL 9010), **glossy,** without frame	I
FTRCUd-210.021#56 	UA070008	like FTRCUd-210.021#21, but with scope of delivery: radio-controlled transmitter, cover **55 x 55** mm**, pure white** (like RAL 9010), **matt,** without frame	I
FTRCUd-210.021#57 	UA070005	like FTRCUd-210.021#21, but with scope of delivery: radio-controlled transmitter, cover **55 x 55** mm**, pearl white** (like RAL 1013), **glossy,** without frame	I
FTRCUd-210.021#59 	UA070007	like FTRCUd-210.021#21, but with scope of delivery: radio-controlled transmitter, cover **55 x 55** mm**, traffic white** (like RAL 9016), **glossy,** without frame	I

Radio-controlled heating / cooling – BIDIRECTIONAL

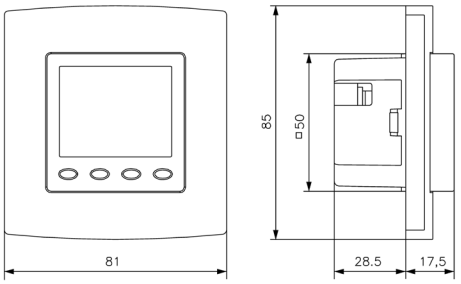
FTRCUd-210.021



MGCBB-064.360



FTRCUd with alre frame “Berlin”



Adaptation of alre FTRxUd-210.021 flush-mounted transmitters

Manufacturer	Range	Colour RAL 9010 (surface finish)	Adaptation in switch range “55 x 55” possible using...	“50 x 50” adaptation possible with ... (insert frame from manufacturer required)
BERKER	S.1	polar white (matt)	FTRxUd-210.xxx#56	not required
BERKER	S.1	polar white (glossy)	FTRxUd-210.xxx#55	not required
BERKER	Arsys	polar white (glossy)		FTRxUd-210.xxx#07 + (1108 01 69)
BERKER	B.3	aluminium/polar white (matt)	FTRxUd-210.xxx#56	not required
BERKER	B.3	aluminium/polar white (glossy)	FTRxUd-210.xxx#55	not required
BERKER	B.7	glass/polar white (matt)	FTRxUd-210.xxx#56	not required
BERKER	B.7	glass/polar white (glossy)	FTRxUd-210.xxx#55	not required
BERKER	K.1	polar white (glossy)		FTRxUd-210.xxx#07 + (1108 71 09)
BUSCH-JAEGER	Reflex SI/SI Linear	alpine white (glossy)	FTRxUd-210.xxx#28	not required
BUSCH-JAEGER	Busch-balance SI	polar white (glossy)	FTRxUd-210.xxx#55	not required
BUSCH-JAEGER	impuls	alpine white (glossy)		FTRxUd-210.xxx#07 + (1746/10-74)
BUSCH-JAEGER	solo/future/axcent etc.	studio white – see RAL 9016 below		
GIRA	rocker switch	pure white (glossy)		FTRxUd-210.xxx#07 + (0282 112)
GIRA (System 55)	Standard/E 2	pure white (semi-gloss)	FTRxUd-210.xxx#56	not required
GIRA (System 55)	Standard/E 2	pure white (glossy)	FTRxUd-210.xxx#55	not required
GIRA (System 55)	E 22	pure white (glossy)	FTRxUd-210.xxx#55	not required
GIRA (System 55)	Event	pure white (semi-gloss) + opaque...	FTRxUd-210.xxx#56	not required
GIRA (System 55)	Event	pure white (glossy) + opaque...	FTRxUd-210.xxx#55	not required
GIRA (System 55)	Esprit	pure white (semi-gloss) + glass, aluminium ...	FTRxUd-210.xxx#56	not required
GIRA (System 55)	Esprit	pure white (glossy) + glass, aluminium...	FTRxUd-210.xxx#55	not required
GIRA	S-Color	pure white (high-gloss)		FTRxUd-210.xxx#07 + (0282 40)
JUNG	CD 500/CD plus	alpine white (glossy)		FTRxUd-210.xxx#07 + (CD 590 Z WW)
JUNG	A 500/AS 500/A plus	alpine white (glossy)	FTRxUd-210.xxx#55	not required
JUNG	LS 990	alpine white (glossy)		FTRxUd-210.xxx#07 + (LS 961 Z WW)
JUNG	LS plus	alpine white (glass)		FTRxUd-210.xxx#07 + (LS 961 Z WW)
JUNG	A creation	alpine white (glossy)	FTRxUd-210.xxx#55	not required
JUNG	LS Design	alpine white (glossy)		FTRxUd-210.xxx#07 + (LS 961 Z WW)
MERTEN (System M)	M-Smart, Arc, Plan, Star	polar white (matt)	FTRxUd-210.xxx#56	not required
MERTEN (System M)	M-Smart, Arc, Plan, Star, M-Creativ, M-Pure	polar white (glossy)	FTRxUd-210.xxx#55	not required
MERTEN (System Basis)	1-M/Atelier-M	polar white (glossy)	FTRxUd-210.xxx#55	not required
MERTEN (System Design)	Artec/Trancent/Antik	polar white (glossy)		FTRxUd-210.xxx#07 + (5160 99)
MERTEN	1-M/M-Smart/M-Plan/M-pure etc.	active white – see RAL 9016 below		
PEHA	Standard	pure white (glossy)		FTRxUd-210.xxx#07 + (80.670.02 ZV)
PEHA	Dialog	pure white (glossy)		FTRxUd-210.xxx#07 + (95.670.02 ZV)
PEHA	Aura	pure white (matt)/glass		FTRxUd-210.xxx#07 + (20.670.02 ZV)
PEHA	Badora	pure white (glossy)		FTRxUd-210.xxx#07 + (11.670.02 ZV)

Manufacturer	Range	Colour RAL 9016 (surface finish)	Adaptation in switch range “55 x 55” possible using...	“50 x 50” adaptation possible with ... (insert frame from manufacturer required)
BUSCH-JAEGER	solo/future/future linear	studio white (RAL 9016, glossy)		FTRxUd-210.xxx#27 + (1746/10-84)
BUSCH-JAEGER	axcent	studio white (RAL 9016, glossy)		FTRxUd-210.xxx#27 + (1746/10-84)
BUSCH-JAEGER	carat (glass, bronze, gold)	studio white (RAL 9016, glossy)		FTRxUd-210.xxx#27 + (1746/10-84)
BUSCH-JAEGER	alpha (nea/exclusive*)	studio white (RAL 9016, glossy)		FTRxUd-210.xxx#27 + (1746/10-24G)
MERTEN	M-Smart, Plan	active white (RAL 9016, glossy)	FTRxUd-210.xxx#59	not required
MERTEN	1-M/Atelier-M	active white (RAL 9016, glossy)	FTRxUd-210.xxx#59	not required
PEHA	Standard	arctic		FTRxUd-210.xxx#27 + (D 80.670 ZV AW)

*) During assembly, you need to remove four plastic tabs located at the rear of the frame

NOTE: Most light switches are designed in the colour “like RAL 9010”, although different switch manufacturers use different designations for this colour. Coloured, glass and aluminium frames are also combined with white jacks or plugs so that controllers with white covers can also be integrated into these frames. Check the precise application in each individual case. The frames have different surface qualities (matt/glossy). For design reasons, the cover of the controller should have the same quality as the frame. We accept no liability for slight variations in colour and surface finish or for accuracy of fit. When installing devices into multi frames, always assemble the temperature controllers at the lowermost position.

“50 x 50 controller”: The housing covers of the 50 x 50 controllers are 50 x 50 mm in size. Using a 50 x 50-mm insert frame, the 50 x 50 controllers can be integrated into nearly all light switch ranges in accordance with DIN 49075. The 50 x 50-mm insert frames must be ordered from the light switch manufacturer or from a wholesaler. The order number of the insert frame corresponding to the switch in question can be found in the column “For adaptation of ‘50 x 50’ FTRxUd”.

“55 x 55 controller”: The housing covers of the 55 x 55 controllers are 55 x 55 mm in size. Many light switch ranges have inner dimensions of 55 x 55 mm. Therefore, the 55 x 55 controllers can be installed directly in the light switch frame without the use of an insert frame. See the column “Adaptation in switch range (55 x 55)” to determine whether the 55 x 55 controller fits in the given light switch (FTRxUd-210.xxx#xx).

All information regarding switch manufacturers’ product lines and item numbers was last updated in 12/2015 | No liability is assumed for the information provided. | Technical specifications subject to change. An adaptation list for RAL 1013 switch ranges is available from our website at www.alre.de.

Terminal strip for heating manifold, VOORL

for 5 or 8 room thermostats

Technical data

Surface finish:	matt
Housing colour:	light grey, like RAL 7035
Housing material:	ABS plastic
Operating voltage:	230 VAC, 50 Hz
Ambient temperature:	–10…+50 °C
Storage temperature:	–20…+70 °C
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Electrical connection:	spring-cage terminals 0.2 mm² to 1.5 mm²; if end sleeves are used, 0.25 mm² to 0.75 mm²
Mounting / attachment:	Surface-/wall-mounting
Protection rating:	IP 20
Protection class:	II, if properly mounted
Max. switching voltage:	230 VAC, 50 Hz
Min. switching voltage:	230 VAC, 50 Hz
Accessories:	suitable valve actuators: ZBOOA-010.100 optional magnetic fastening set for simple installation in heating manifold: JZ-24

Application

This device is specifically designed for fixed wiring of 230 VAC single-room temperature controllers and the associated valve actuators for fixed-location attachment. Switching between heating / cooling is performed via a central contact.

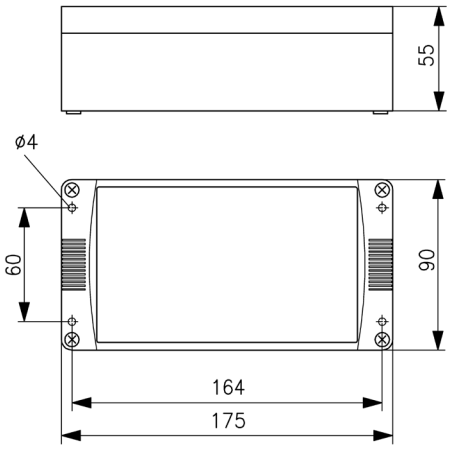
Type / image	Item no.	Features	PG
VOORL-215.008 	DA490100	**General features:** terminal strip in housing for wiring up to 5 room thermostats and up to 10 actuators; up to 2 actuators per channel can be connected **Max. switching current:** output 1–5: 4 (1) A **Total of all the outputs (5 channels):** 4 (1) A **Switching power:** total of 920 W **ECO-contact:** if timer regulators are used, up to 2 master-slave time zones can be defined; time zone 2 can be switched to ECO function via an external switching contact on terminal U	I
VOORL-215.052 	DA490300	As VOORL-215.008, but including an additional pump module	I
VOORL-318.008 	DA490000	**General features:** terminal strip in housing for wiring up to 8 room thermostats and up to 16 actuators; up to 2 actuators per channel can be connected **Max. switching current:** output 1–8: 6 (1) A **Total of all outputs (8 channels):** 6 (1) A **Switching power:** total of 1380 W **ECO-contact:** if timer regulators are used, up to 3 master-slave time zones can be defined; time zone 3 can be switched to ECO function via an external switching contact on terminal U **Control function:** heating or cooling	I
VOORL-318.052 	DA490200	As VOORL-318.008, but including an additional pump module	I

Accessories	Item no.	Features	PG
JZ-24 	BN990002	Magnetic fastening set for simple and safe fastening of the multi-channel receiver on a metallic underground (for example, heating manifold)	II

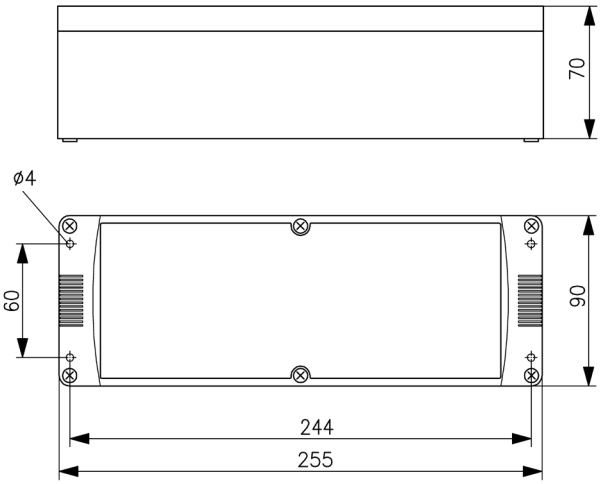
Terminal strip for heating manifold, VOORL

for 5 or 8 room thermostats

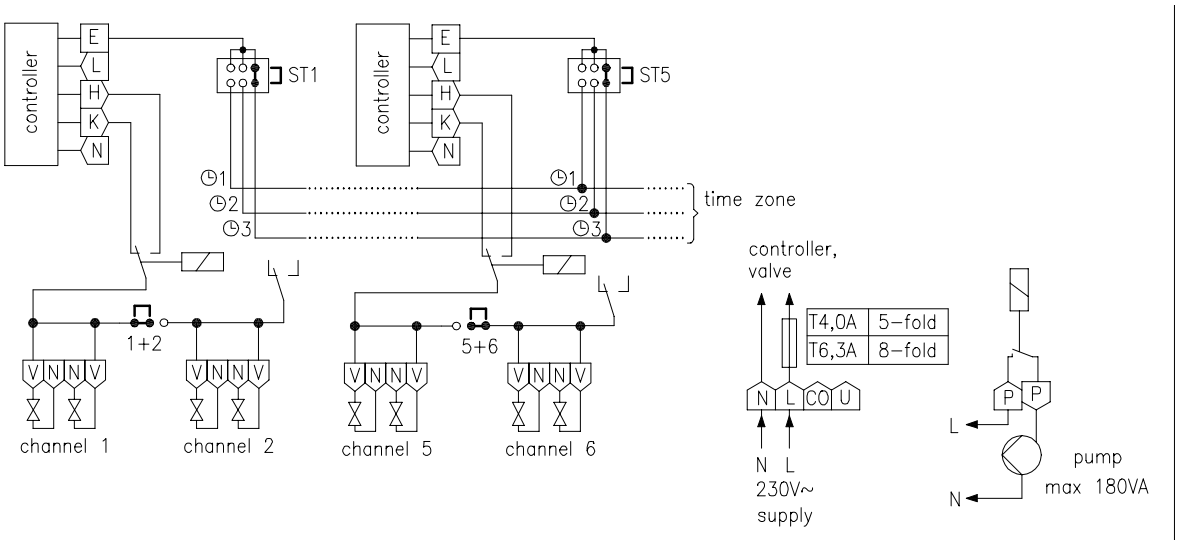
VOORL-215.xxx



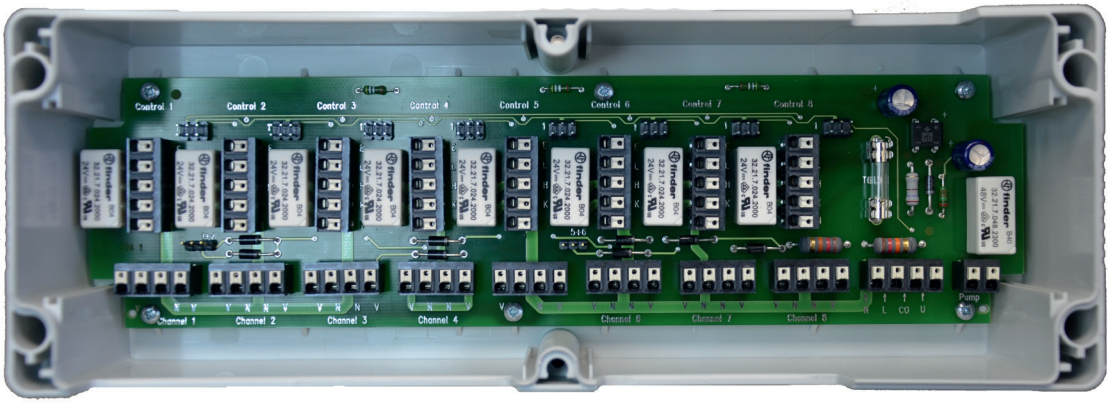
VOORL-318.xxx



VOORL-318.xxx

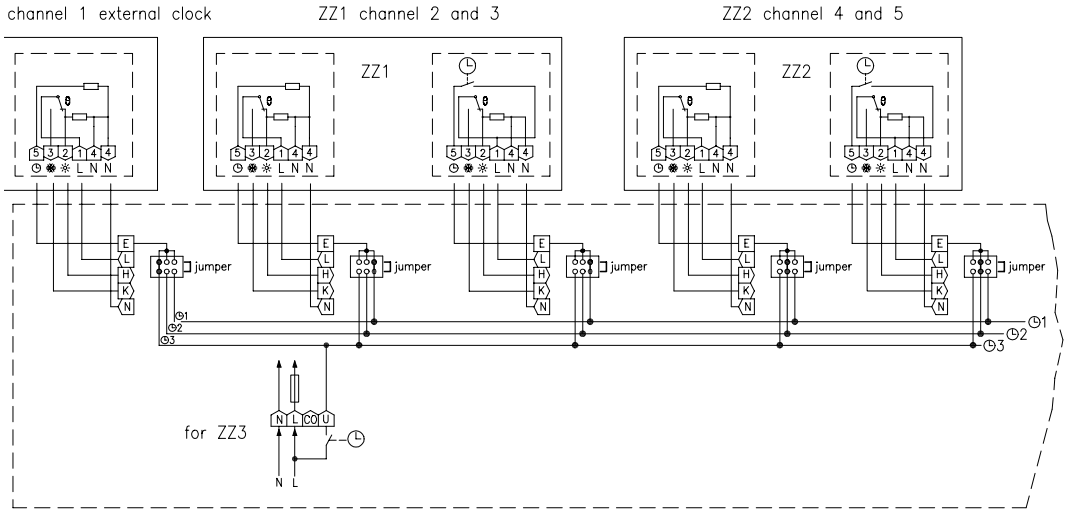


Internal view VOORL-318.xxx



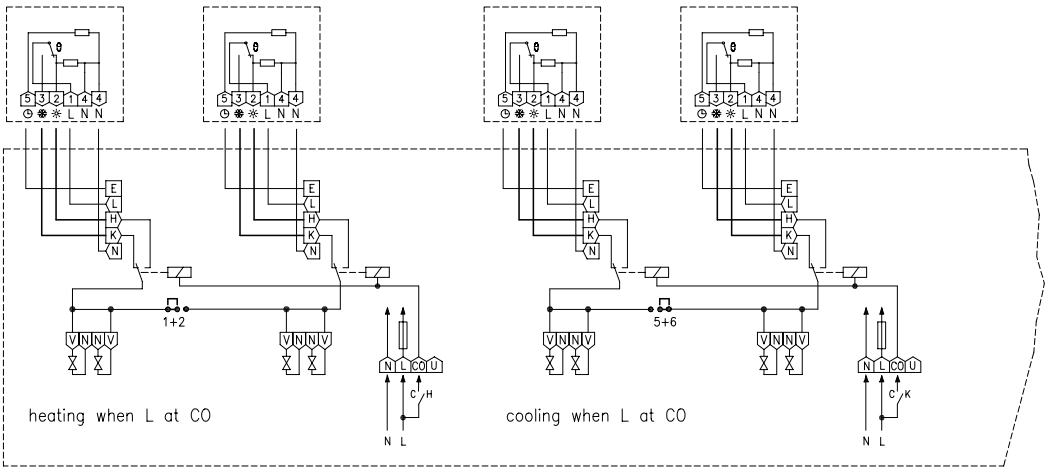
Notes and examples of wiring for VOORL terminal strips

Setting up time zones

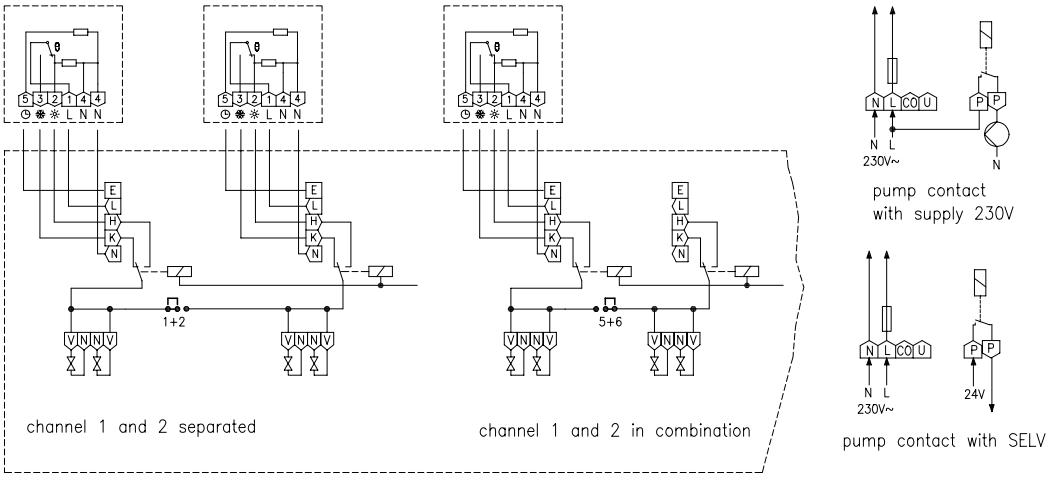


TZ = time zone

Inversion of the CO contact



Standard wiring and combination of channel 1/2



Electrothermal valve actuators

for heating, ventilation and air conditioning technology

Technical data

Housing colour:	pure white, like RAL 9010
Housing material:	PC plastic, GF (20%)
Ambient temperature:	0…50 °C
Storage temperature:	–20…+70 °C
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Mounting/attachment:	M 30 x 1.5
Protection rating:	IP 42
Protection class:	II
Safety and EMC:	according to DIN EN 60730
Average power consumption:	approx. 3 W
Opening/closing time:	approx. 4 min
Nominal stroke:	3 mm
Function type:	normally closed
Nominal closing force:	90 N
Connecting cable:	0.8 m/2 x 0.5 mm²
Valve position indicator:	2X (at the top and the side)

Application

Extremely compact design:
Can be fitted quickly and comfortably thanks to the slim shape in the area around the fastening nut.

Can be fitted in any position:
Lateral drainage holes carry off any leakage water that from the valve plunger into the open, thus avoiding damage to the drive.

Additional valve monitoring:
Two additional viewing windows at the side allow users to visually check the respective valve position with ease; this does not work when mounted in a suspended manner.

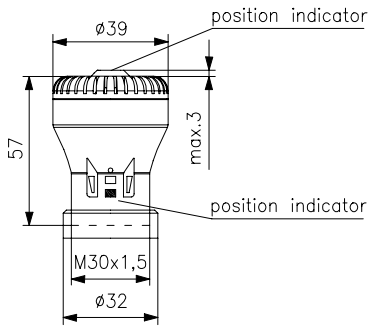
Type/image	Item no.	Features	PG
ZBOOA-010.100 	H9100010	**Operating voltage:** 230 V~, 50 Hz **Max. power consumption:** 70 W **Max. starting current:** approx. 0.3 A	I
ZBOOA-040.100 	H9100000	**Operating voltage:** 24 VDC or 24 VAC **Max. power consumption:** 12 W **Max. starting current:** approx. 0.5 A	I

Thanks to their M 30 x 1.5 fastening and their characteristics (normally closed), the actuators are suitable for the following valve and distributor makes:
Beulco, Empur, Heimeier, Kamo, Purmo, SBK, SKV, Strawa, Taconova, Watts

Brief description:
The drive features a compact, space-saving design.
The device can be mounted easily thanks to the narrowed shape, especially in the fastening area of the nut.
The fastening cable is not located near the fastening nut. This reduces the probability of contact with equipment carrying hot water.
Since the fastening nut allows continuous screwing onto the thread, by unscrewing the nut by two or three turns, it is possible to open the valve in an electrically de-energised state – something that cannot be done with bayonet couplings and impulse couplings.
Discharged water is dissipated via a draining system.
Gaskets are not required thanks to the careful design.

The double position display has the following advantages:
The upper display provides the option of a visual or, in conditions of bad visibility, tactile function test of the drive.
The lower viewing windows allow an additional check to determine whether the valve to be actuated follows the lifting movement of the drive.
At the beginning of the heating period, it can happen off and on that the valve plungers get “stuck”. Therefore, with the additional display, it is possible to determine whether the cause lies with the actuator or with the valve in the event the valve does not open. However, that is not possible when mounted in a suspended manner.

Valve actuator



Valve actuator with extended push rod

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Industry technology must be robust and fail-safe. The most modern industrial plants and production halls have high demands: a raw environment and the most intense of usage.

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Overview of industrial technology products:
Capillary, wet room and frost protection thermostats

Electronic temperature controllers, digital controllers / displays

Humidity, flow, pressure monitoring

Overview of industrial controllers 1:

Industrial room thermostats, wet room thermostats

Industry, capillary, wet room and double thermostats for indoor and out-door use	JET-40	JET-40 F	JET-41	JET-41 F	JET-110 R	JET-110 RF	JET-120 R	JET-120 RF	JMT-212	JMT-212 F	JMT-211	JMT-211 F	JMT-411	JET-30	JET-31	JET-32	PTR 40.000/PTR 40.000/01	PTR 45.000	JET-110 X	JET-110 XF	JET-110 XFG	JET-112 X	JET-112 XF	JET-120 X	JET-120 XF	JET-120 XG	JET-130 X	JET-130 XF	JET-130 XG	JET-133 X	JET-133 XF	JET-140 X	JET-140 XF	JET-143 X	JET-143 XF	JET-150	JET-150 F	JET-153	JET-153 F	WR 81.029-1	WR 81.129-1	WR 81.101-1	WR 81.009-2	WR 81.109-2	JMT-202 X	JMT-202 XF	JMT-203 X	JMT-203 XF	JMT-203 XG	JMT-221 X	JMT-206 X	JMT-204
Page	142	142	142	142	142	142	142	142	143	143	143	143	143	144	144	144	145	145	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146	148	148	148	148	148	149	149	149	149	149	149	149	149
Devices																																																				
Bimetal																	x	x																																			
Industrial room thermostat	x	x	x	x	x	x	x	x	x	x	x	x	x																																							
Capillary thermostat																			x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Wet room thermostat																	x	x																																		
Double thermostat														x	x	x		x																																			
Capillary length																																																			
Capillary 0.5 m																																									x	x										
Capillary 1.5 m																																											x	x	x	x	x	x		x	x	x
Capillary 1.8 m																			x	x		x	x	x	x		x	x		x	x	x	x	x	x	x	x	x	x											
Capillary 2 m																																											x									
Capillary 4.5 m																					x					x			x																				x				
Control range																																																			
–35…+30 °C					x	x													x	x	x	x	x																												
–20…+30 °C																	x	2																																		
–15…+30 °C									x	x																																		x	x						
–10…+40 °C																2																																			
0…35 °C	x	x												x	x																											x	x	x							
0…60 °C							x	x																x	x	x																								
0…70 °C			x	x																																								x	x						
10…45 °C														x	x																																				
10…55 °C											x	x	x																																	x	x	x	x		
20…80 °C																																																		x	
40…100 °C																											x	x	x	x	x																				
50…120 °C																																																		x
70…130 °C																															x	x	x	x																
100…280 °C																																			x	x	x	x												
Output																																																			
Microswitch (potential-free changeover contact)	1	1	1	1	1	1	1	1	2	2	2	2	4	2	2	2			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2
Switching steps	1	1	1	1	1	1	1	1	2	2	2	2	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2
Switching power																																																			
15 (8) A, 24–250 V~	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x				x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
15 (4) A, 24–250 V~																x																																			
10 (4) A, 250 V~, 50 Hz, heating																	x	x																																		
5 (2) A, 250 V~, 50 Hz, cooling																	x	x																																		
Supply voltage																																																			
None	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
230 V~, 50 Hz																	x	x																																	
Degree of protection																																																		
IP 43																																										x	x	x	x	x							
IP 54	x	x	x	x																																															
IP 54 (with screw connection)																																										x	x	x	x	x							
IP 65					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					x	x	x	x	x	x	x
Miscellaneous																																																		
External setting	x		x		x		x		x		x			x					x			x		x			x			x		x		x		x			x			x		x		x	x	x	x
Internal setting		x		x		x		x		x		x	x	x	2	2	x	2		x	x		x		x			x			x		x		x		x			x	x	x		x		x				
Temperature controller	x		x		x		x		x		x			x					x					x		x	x		x			x				x			x			x		x		x	x	x	x
Temperature monitor		x		x		x		x		x		x	x	x	2	2	x	2		x	x				x			x					x				x			x	x		x		x		x				
Temperature limiter																						x	x							x	x			x	x			x	x											

Overview of industrial controllers 2:
Boiler controllers

Boiler, rod thermostats, function without supply voltage		KR 80.003-1	KR 80.108-1	KR 80.109-1	KR 80.027-5	KR 80.035-2	KR 80.028-2	KR 80.116-2	KR 80.029-2	KR 80.029-2 V4A	KR 80.111-3	KR 80.009-1 V4A	KR 80.011-1 V4A	KR 80.120-1	KR 80.206	KR 80.206 IP54	KR 80.000-5	KR 80.001-5	KR 80.001-5 V4A	KR 80.100-5	KR 80.100 IP54	KR 80.101-5	KR 80.124-5	KR 80.112-5	KR 80.102-8	KR 80.103-8	KR 80-008-8	KR 80.006-8	KR 80.106-8	KR 80.207	KR 80.208	KR 80.202	KR 80.203	KR 80.203 IP54	KR 80.309	KR 80.310	KR 80.312	KR 80.318	KR 85.406-2	KR 85.109-2	KR 85.100-5	KR 85.101-5	KR 85.400-5	KR 85.401-5	KR 85.102-5	KR 85.207-5	KR 85.230-5	KR 85.204-8	KR 85.311-2	KR 85.312-2	KR 85.314-5	KR 85.315-5
	Page	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	154	154	154	154	155	155	155	155	155	155	155	155	155	155	157	157	157	157
Capillary length	Rod 100 mm				x	x		x			x				x	x	x			x	x				x		x	x	x	x	x			x		x		x	x	x		x		x		x	x	x		x	
	Rod 120 mm	x	x										x																																							
	Rod 200 mm			x			x					x		x				x	x			x				x							x	x		x		x					x		x				x		x
	Rod 280 mm								x	x													x																													
	Rod 600 mm																							x																											
Control range	0…35 °C	x	x	x																																																
	0…70 °C				x	x	x	x	x	x																														2	2									x	x		
	0…80 °C										x																																									
	10…45 °C											x	x	x																																						
	30…65 °C														x	x																																				
	35…90 °C																																																	x	x
	35…95 °C																x	x	x	x		x	x	x																		2	2	2	2	x	x	x					
	40…110 °C																								x	x	x																									
	50…130 °C																											x	x																	x			x			
	60…95 °C																													x																					
	75 °C +0/–8 K fixed (STB)																																	x	x													x	x		
	85…120 °C																														x																x				
	95…110 °C																																														x				
	95…130 °C																															x	x	x												x				
	100 °C +0/–9 K fixed (STB)																																			x	x												x	x
Output	Microswitch (potential-free changeover contact)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Switching power	15 (8) A, 24–250 V~	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					x	x	x	x	x	x	x	x	x	x				
	10 (3) A, 24–250 V~																																	x	x	x	x											x	x	x	x
Degree of protection	IP 43	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x		x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	IP 54															x					x													x																		
Miscellaneous	Type testing by TÜV in accordance with DIN EN 14597	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					x	x	x	x
	Temperature controller	x			x	x	x		x	x		x	x				x	x	x								x	x												x	x	x		x	x	x	x	x	x	x	x
	Temperature monitor		x	x				x			x			x						x	x	x	x	x	x	x			x									2	x	x	x	2	2	x						
	Temperature limiter														x	x														x	x	x	x	x													x	x	x			
	Safety temperature limiter																																	x	x	x	x													x	x	x	x
	External setting	x			x	x	x		x	x		x	x				x	x	x								x	x												x	x	x		x	x	x	x	x	x	x	x
	Internal setting		x	x				x			x			x	x	x				x	x	x	x	x	x	x			x	x	x	x	x					2	x	x	x	2	2	x						

Overview of industrial controllers 3:

Ventilation controllers, air heater thermostats

	Duct rod sensors with capillary system, function without supply voltage	LR 80.003-1	LR 80.108-1	LR 80.109-1	LR 80.027-5	LR 80.035-2	LR 80.028-2	LR 80.116-2	LR 80.029-2	LR 80.120-1	LR 80.101-5	LR 80.207	LR 80.203	LR 80.309	LR 80.310	LR 80.312	LR 80.318	LR 85.312-2	LR 85.315-5	JTL-2	JTL-8	JTL-11	JTL-8 NR	JTL-17 NR	JTU-50	JTU-1	JTU-3	JTU-20	JTU-5	JTU-6
	Page	153	153	153	153	153	153	153	153	153	153	153	153	154	154	154	154	157	157	165	165	165	165	165	167	167	167	167	167	167
Devices	Duct rod thermostat	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x											
	Duct thermostat																								x	x	x	x	x	x
	Air heater thermostat																			x	x	x	x	x						
Capillary length	Capillary 350 mm																			x	x		x		x	x	x		x	x
	Capillary 1,250 mm																					x		x				x		
	Coil 100 mm				x	x		x				x		x		x														
	Coil 120 mm	x	x																											
	Coil 200 mm			x			x			x	x		x		x		x	x	x											
	Coil 280 mm								x																					
Control range	–25…65 °C																								x					
	0…35 °C	x	x	x																										
	0…70 °C				x	x	x	x	x									x												
	10…45 °C									x																				
	20…70 °C																			x	x	x	x	x						
	20…100 °C																									x	x	x		
	35…90 °C																		x											
	35…95 °C										x																			
	70…90 °C																													
	60…95 °C											x																		
	60…140 °C																						x	x					x	x
	70…95 °C																													
	70…100 °C																			x	x	x								
	75 °C rod fixed													x	x			x												
	95…130 °C												x																	
	100 °C rod fixed															x	x		x				x	x						
Output	Microswitch (potential-free changeover contact)	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Switching power	15 (8) A, 24–250 V~	x	x	x	x	x	x	x	x	x	x	x	x							x	x	x	x	x	x	x	x	x	x	x
	10 (3) A, 24–250 V~													x	x	x	x	x	x											
Degree of protection	IP 40																			x	x	x	x	x	x	x	x	x	x	x
	IP 43	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x											
Miscellaneous	Type testing by TÜV in accordance with DIN EN 14597	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			x	x		
	Temperature controller	x			x	x	x		x									x	x											
	Temperature monitor		x	x				x		x	x									x		x	x	x	x	x			x	
	Temperature limiter											x	x																	x
	Safety temperature limiter													x	x	x	x	x	x		x		x	x			x	x		
	External setting	x			x	x	x		x									x	x											
	Internal setting		x	x				x		x	x	x	x							x	x	x	x	x	x	x	x	x	x	x

Overview of industrial controllers 4:

Contact and frost protection thermostats

Contact and frost protection thermostats		ATR 83.000	ATR 83.100	ATR 83.001	ATR 83.101	WR 81.115-5	WR 81.117-5	JAT-110	JAT-110 F	JAT-120	JAT-120 F	JAT-130	JAT-130 F	JAT-140	JAT-140 F	JTF-1	JTF-1 / 12	JTF-1 W	JTF-2	JTF-2 / 12	JTF-2 W	JTF-3	JTF-3 W	JTF-4	JTF-5	JTF-6	JTF-6 W	JTF-21	JTF-21 / 12	JTF-21 W	JTF-22	JTF-22 / 12	JTF-25	JTF-101	JTF-103	JTF-105	JTF-112
	Page	159	159	159	159	159	159	159	159	159	159	159	159	159	159	161	161	161	161	161	161	161	161	161	161	161	162	162	162	162	162	162	164	164	164	164
Devices	Contact thermostat	x	x	x	x	x	x	x	x	x	x	x	x	x	x																					
	Frost protection thermostat															x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Capillary length	Capillary 1,800 mm																					x	x	x										x		
	Capillary 3,000 mm																								x	x	x						x		x	
	Capillary 6,000 mm															x		x	x		x							x		x	x			x		
	Capillary 12,000 mm																x			x									x			x				x
Output	Microswitch (potential-free change-over contact)	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	2	2	2	2	2	2	x	x	x	x
Control range	–35…+30 °C							x	x																											
	–10…+12 °C															x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			
	–8…+8 °C																																	x	x	x	x
	0…60 °C			x	x					x	x																									
	0…70 °C					x																															
	30…90 °C	x	x																																	
	40…100 °C											x	x																							
	50…130 °C						x																													
	70…130 °C													x	x																					
Switching power	15 (8) A, 24–250 V~					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	16 (2) A, 24–250 V~	x	x	x	x																															
Supply voltage	None	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Degree of protection	IP 20	x	x	x	x																															
	IP 40															x	x		x	x		x		x	x	x		x	x		x	x	x			
	IP 43					x	x																													
	IP 54																																	x	x	x	x
	IP 65							x	x	x	x	x	x	x	x			x			x		x				x			x							
Miscellaneous	Type testing by TÜV in accordance with DIN EN 14597															x	x	x	x	x	x	x	x	x	x	x	x									
	Temperature controller	x		x				x		x		x		x																						
	Temperature monitor		x		x	x	x		x		x		x		x	x	x	x				x	x		x			x	x	x			x	x	x	x	x
	Temperature limiter																															x	x				
	Safety temperature limiter																		x	x	x			x		x											
	External setting	x		x				x		x		x		x		x	x		x	x		x		x	x	x		x	x		x	x	x			
	Internal setting		x		x	x	x		x		x		x		x			x			x		x				x			x				x	x	x	x

Overview of industrial controllers 5:

Temperature controllers, electronic

Electronic temperature controllers, digital controllers / displays		ITR 79.402	ITR 79.404	ITR 79.405	ITR 79.406	ITR 79.408	ITR 79.503	ITR 79.504	ITR 79.508	ITR 79.600	ITR 79.804	ITR 79.811	PTR 01.082	ETR 74.1	ETR 74.2	ETR 77.008-5	ETR 77.108-5	ETR 77.009-5	ETR 77.109-5	ETR 77.109-15	JDI-0	JDI-08	ITR 71.050	ITR 71.100	ITR 71.125	JDI-1	JDI-10	JDI-22	JDU-210	ETR 78.005	ETR 78.006	JBT-21 A	JBT-21 A CP	JBT-22 A	JBT-22 A CP	JBT-23 A	JBT-420 B	JBT-420 BC	JBT-420 BP	JBT-420 BPS	JBT-420 BS	JBT-420 BCS	JBT-61 AS	JBT-81 AS
	Page	172	172	172	172	172	172	172	172	172	172	172	170	174	174	175	175	175	175	175	176	176	177	177	177	177	177	178	179	180	180	181	181	181	181	181	182	182	182	182	183	183	183	183
Devices	Differential temperature controllers																													x	x														
	Standard or top-hat rail controllers	x	x	x	x	x	x	x	x	x	x	x	x																																
	Universal controllers													x	x	x	x	x	x	x																									
	Multi-stage controllers																															x	x	x	x	x	x	x	x	x	x	x	x	x
	Digital displays (front panel)																				x	x																							
	Digital controllers (front panel)																						x	x	x	x	x																		
	Microprocessor controllers (front panel)																											x	x																
Control range	−200 … +850 °C																												x																
	−50 … +200 °C																											x	x																
	−50 … +50 °C															x	x																												
	−40 … +50 °C																						x																						
	−40 … +120 °C																				x	x				x																			
	−40 … +120 °C																										x																		
	−35 … +15 °C	x																																											
	−15 … +15 °C											x																																	
	−15 … +25 °C																															x	x											
	−15 … +30 °C																																										x	x
	−10 … +40 °C					x		x																																				
	−10 … +50 °C																																				x	x	x	x	x	x		
	0 … 11 °C						x																																					
	0 … 50 °C													x	x																														
	0 … 60 °C		x					x			x																				x													
	0 … 100 °C																	x	x	x				x																					
	5 … 30 °C									2																																		
	10 … 50 °C																																	x	x									
	10 … 60 °C												x																																
	35 … 95 °C			x																										x						x								
	40 … 125 °C																								x																				
	70 … 130 °C				x																																							
Switching power	10 (3) A, 24 – 250 V~													x	x								x	x	x	x	x					x	x	x	x	x	x	x	x	x	x	x	x	x
	10 (2) A, 24 – 250 V~ changeover contact																											x	x																
	5 (1) A, 24 – 250 V~ NO contact																											x	x																
	10 (3) A, 250 V~																													x	x														
	10 (3) A, 250 V~, make contact	x	x	x	x	x	x	x	x	x	x	x																																		
	5 (1.5) A / 250 V~, break contact	x	x	x	x	x	x	x	x	x	x	x																																		
	10 (3) A, 250 V~, heating contact															x	x	x	x	x																										
	5 (1) A, 250 V~, cooling contact															x	x	x	x	x																										
	10 (4) A, 230 V~, heating contact												x																																	
	5 (2) A, 230 V~, cooling contact												x																																	
Degree of protection	IP 00																																x		x			x	x	x		x	x	x
	IP 20	x	x	x	x	x	x	x	x	x	x	x	x																																	
	IP 20 (front-side)																				x	x	x	x	x	x	x																	
	IP 54													x	x		x		x	x																										
	IP 54 (front-side)																											x	x																
	IP 65															x		x														x	x	x		x		x	x				x		
Miscellaneous	Temperature controller	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x		x	x			x	x	x	x	x	x	x			x	x	x	x	x		x	x	x		x	x	x
	Temperature monitor															x		x																				x				x			
	External setting												x	x	x		x		x	x			x	x	x	x	x	x	x			x	x	x	x	x		x	x	x		x	x	x
	Internal setting															x		x													x	x					x				x			
	LED heating (red)	x	x	x	x	x					x	x		x	2	x	x	x	x	x																									
	LED cooling (green)							x	x																																				
	Digital display, actual value													x	x						x	x	x	x	x																				
	Digital display, actual / target																									x	x	x	x																
	Display (no output)																				x	x																							
	230 V~, 50 Hz	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

Overview of industrial controllers 6:

Flow monitors and pressure switches

Flow and pressure monitoring		JSL-1 E	JSL-20	JSL-20/24 V	JSL-20 K	JSL-21	JSL-21/24 V	JDW-3/JDW-3Z	JDW-5/JDW-5Z	JDW-10	JDL-109	JDL-111	JDL-112	JDL-113	JDL-115	JDL-116	JDL-116 A	JDL-117 A	JSF-3 E	JSF-4 E	JSF-1 E	JSF-1 RE	JSF-2 E	JSF-2 RE	JSW-3/8	JSW-1/2	JSW-3/4	JSW-1
	Page	187	188	188	188	188	188	190	190	190	190	190	190	191	191	191	191	191	192	192	192	192	192	192	195	195	195	195
Devices	Wind indicator relays	x																										
	Airflow monitors		x	x	x	x	x																					
	Differential pressure switches							x	x	x	x	x	x	x	x	x	x	x										
	Flow monitors																		x	x	x	x	x	x	x	x	x	x
Sensor element	Wind indicator	x																										
	Sensor rod (hot film anemometer)		x	x	x	x	x																					
	Pressure sensor (membrane)							x	x	x	x	x	x	x	x	x	x	x										
	Paddle																		x	x	x	x	x	x	x	x	x	x
Output	Microswitch (potential-free changeover contact)	x						x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	Relay (potential-free changeover contact)		x	x	x	2	2																					
Switching range	0.2–10 m/s		x	x	x	x	x																					
	1–8 m/s switch-off value	x																										
	Dependent on the tube diameter																		x	x	x	x	x	x	x	x	x	x
	20 Pa when shipped										x																	
	20–300 Pa											x																
	20–330 Pa							x																				
	30–500 Pa								x																			
	40 Pa when shipped													x														
	40–600 Pa												x															
	100–1,000 Pa														x													
	250–5,000 Pa															x	x											
	400–1,600 Pa									x																		
	3,000–15,000 Pa																	x										
Switching power	15 (8) A, 24–250 V~	x																	x	x	x	x	x	x				
	10 (3) A, 24–250 V~		x	x	x	x	x																					
	1.5 (0.4) A, 12–250 V~							x	x	x																		
	1 (0.2) A, 12–24 V~/ ⎓							x	x	x	x	x	x	x	x	x	x	x										
	5 (1) A, 12–250 V~										x	x	x	x	x	x	x	x										
	5 (1.5) A, 24–230 V~																								x	x	x	x
Operating voltage	None	x						x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	230 V~, 50 Hz		x		x	x																						
	24 V~, 50/60 Hz			x			x																					
Degree of protection	IP 20										x			x														
	IP 54							x	x	x		x	x		x	x	x	x										
	IP 65	x	x	x	x	x	x												x	x	x	x	x	x	x	x	x	x
Miscellaneous	Type tested by the TÜV according to the current 100 to 6".																		x	x	x	x	x	x				
	External setting																x	x										
	Internal setting	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			x	x	x	x	x	x	x	x	x	x

Single-stage industrial application thermostats JET-40/-41/-110/-120

Capillary system – external sensors

Technical data

Colour:	grey (lower part like RAL 7016, upper part like RAL 7035)
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Operating voltage:	none
Max. switching current:	15 (8) A
Min. switching current:	150 mA
Max. switching voltage:	230 VAC, 50 Hz
Min. switching voltage:	24 VAC, 50 Hz
Switching element:	microswitch
Switching contact:	toggler, potential-free
Control function:	heating or cooling
Electrical connection:	screw-type terminals
Mounting/attachment:	wall mounting
Protection class:	I
Protection rating:	**JET-40/-41:** IP 54 **JET-110 R/-120 R:** IP 65
Safety and EMC:	according to DIN EN 60730
Sensor:	liquid-filled capillary
Sensor material:	**JET-40/-41:** V2A (1.43 01) **JET-110 R/-120 R:** Cu
General features:	Scale: degrees Celsius

Application

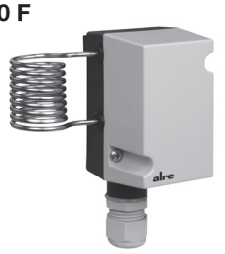
Control or monitoring of the temperature in the industrial domain in a non-aggressive environment, for example, for controlling heating or cooling systems in greenhouses, industrial and sports halls, air-inflated domes, cold storage and refrigeration rooms.

JET-110 RF is particularly suitable as an external thermostat.

Type	Item no.	Control range	Max. sensor temperature	Hysteresis (approx.)	Ambient temperature	Features	PG
JET-40	C 1810605	0…35 °C	40 °C	1 K	–20…+40 °C	External setting, TR	II
JET-40 F	C 1810606	0…35 °C	40 °C	1 K	–20…+40 °C	Internal setting, TW	II
JET-41	C 1810607	0…70 °C	80 °C	2 K	–20…+80 °C	External setting, TR	II
JET-41 F	C 1810608	0…70 °C	80 °C	2 K	–20…+80 °C	Internal setting, TW	II
JET-110 R	JA 045100	–35…+30 °C	35 °C	2…20 K adjustable	–35…+35 °C	External setting with range restriction, TR	II
JET-110 RF	JA 045200	–35…+30 °C	35 °C	2…20 K adjustable	–35…+35 °C	Internal setting with viewing window, TW	II
JET-120 R	JA 046100	0…60 °C	70 °C	2…20 K adjustable	–35…+70 °C	External setting with range restriction, TR	II
JET-120 RF	JA 046200	0…60 °C	70 °C	2…20 K adjustable	–35…+70 °C	Internal setting with viewing window, TW	II

TR = temperature controller, TW = temperature monitor

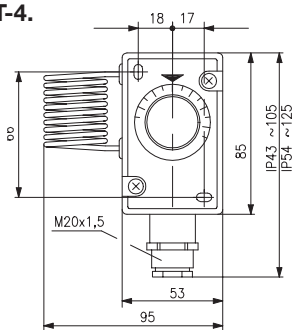
JET-40 F



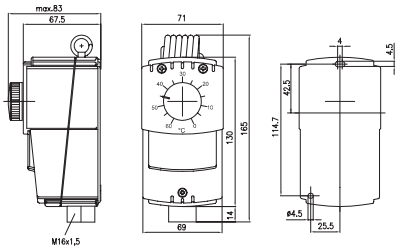
JET-120 R

JET-110 RF

JET-4.



JET-1.



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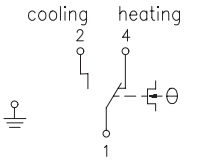

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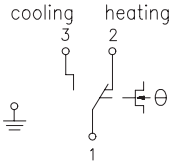


Multi-stage industrial room thermostats JMT-211 / -212 / JMT-411

Capillary system – external sensors – 2-stage or 4-stage

Technical data

Housing colour:	**JMT-2xx: grey** (lower part like RAL 7016, upper part like RAL 7035) **JMT-4xx:** grey
Sensor material:	Cu
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Operating voltage:	none
Max. switching current:	15 (8) A
Min. switching current:	150 mA
Max. switching voltage:	230 VAC, 50 Hz
Min. switching voltage:	24 VAC, 50 Hz
Switching element:	Microswitch, potential-free
Switching contact:	2 or 4 togglers
Control function:	**JMT-2xx:** 2-stage heating, 2-stage cooling, heating and cooling with neutral zone **JMT-4xx:** 4-stage heating, 4-stage cooling, multistage heating and cooling with neutral zone
Hysteresis in the stage:	approx. 1 K
Electrical connection:	screw-type terminals
Mounting / attachment:	wall mounting
Protection class:	I
Protection rating:	IP 65
Safety and EMC:	according to DIN EN 60730
Sensor:	liquid-filled capillary
General features:	Scale: degrees Celsius

Application

Control of temperatures in industrial areas in a non-aggressive environment.

2- or 4-stage “heating or cooling” or “heating and cooling” with neutral zone.

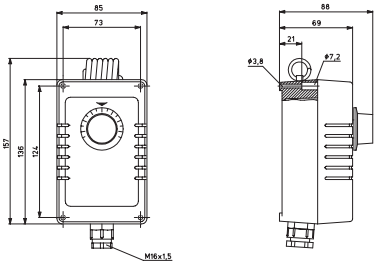
Type	Item no.	Control range	Max. sensor temperature	Switching difference between the stages	Ambient temperature	Features	PG
JMT-212	E 6080001	–15 … +30 °C	35 °C	1 … 7 K adjustable	–15 … +35 °C	External setting, TR	II
JMT-212 F	E 6080102	–15 … +30 °C	35 °C	1 … 7 K adjustable	–15 … +35 °C	Internal setting, TW	II
JMT-211	E 6080049	10 … 55 °C	60 °C	1 … 7 K adjustable	–15 … +60 °C	External setting, TR	II
JMT-211 F	E 6080138	10 … 55 °C	60 °C	1 … 7 K adjustable	–15 … +60 °C	Internal setting, TW	II

TR = temperature controller, TW = temperature monitor

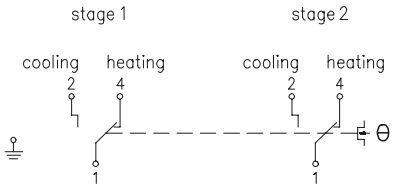
JMT-211 F

JMT-411

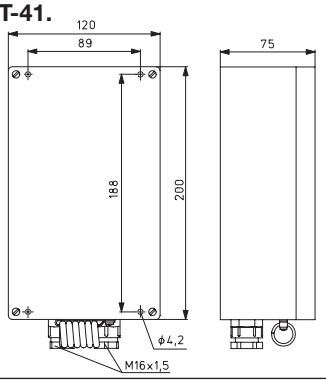
JMT-21.



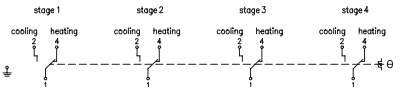
JMT-21.



JMT-41.



JMT-41.



Industrial room thermostats JET-30 / -31 / -32

Capillary system – external sensors – 2 separate setting ranges, 2-stage

Technical data

Housing colour:	grey (lower part like RAL 7016, upper part like RAL 7035)	
Sensor material:	V2A (1.4301)	
Ambient temperature:	**JET-30, -31:** –20 … +40 °C	**JET-32:** –20 … +45 °C
Max. sensor temperature	**JET-30, -31:** 40 °C	**JET-32:** 45 °C
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing	
Operating voltage:	none	
Max. switching current:	**JET-30, -31:** 15 (8) A	**JET-32:** 15 (4) A
Min. switching current:	150 mA	
Max. switching voltage:	230 VAC, 50 Hz	
Min. switching voltage:	24 VAC, 50 Hz	
Switching element:	microswitch	
Switching contact:	2 x togglers, potential-free	
Control function:	**JET-30, -31:** heating or cooling, heating and cooling	**JET-32:** pre-wired for rain pipe heating
Hysteresis:	**JET-30, -31:** approx. 1 K	**JET-32:** approx. 2 K
Electrical connection:	screw-type terminals	
Mounting / attachment:	wall mounting	
Protection rating:	IP 65	
Protection class:	I	
Safety and EMC:	according to DIN EN 60730	
Sensor:	liquid-filled capillary	
General features:	Scale: degrees Celsius	

Application

For external or internal fitting (non-aggressive environment), as a thermostat for temperature control in industrial buildings, trade fair halls and air-inflated domes or as cooling protection in greenhouses.

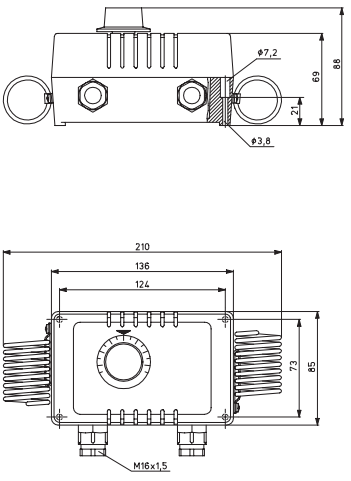
2 separate setting ranges, heating and / or cooling.

The JET-32 type is specially pre-set and pre-wired for a **rain pipe heating system** (see connection diagram).

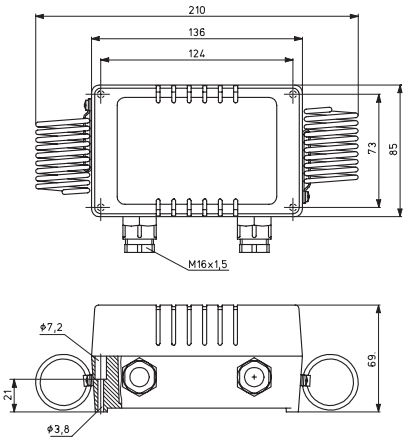
Type	Item no.	1st Control range	2nd Control range	Features	PG
JET-30	C 1820200	10 … 45 °C (external) TR	0 … 35 °C (internal) TW	external setting, internal setting	II
JET-31	C 1820201	10 … 45 °C (internal) TW	0 … 35 °C (internal) TW	Internal setting	II
JET-32	C 1820204	–10 … +40 °C	–10 … +40 °C	1st controller, NC contact pre-set +5 °C 2nd controller, NO contact pre-set –5 °C, internal setting	II

TR = temperature controller, TW = temperature monitor

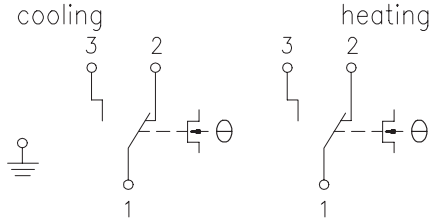
JET-30



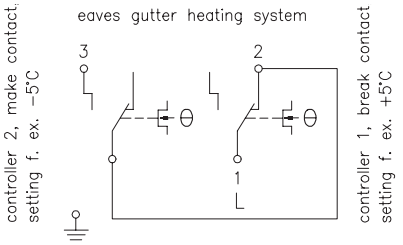
JET-31 / JET-32



JET-30 / JET-31



JET-32



Wet room thermostat / double thermostat PTR 40 / 45

Bimetal

Technical data

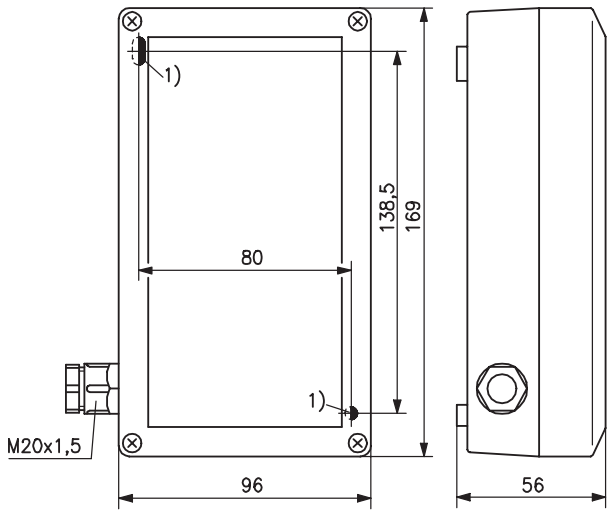
Housing colour:	grey (lower part like RAL 7016, upper part like RAL 7035)
Ambient temperature:	–20 … +60 °C
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Operating voltage:	230 VAC, 50 Hz
Max. switching current:	heating (terminal 3) 10 (4) A, cooling (terminal 1) 5 (2) A
Max. switching voltage:	230 VAC, 50 Hz
Min. switching voltage:	230 VAC, 50 Hz
Switching element:	bimetallic contact
Control range:	–20 … +30 °C
Hysteresis:	approx. 2 K at a temperature change of max. 4 K / h
Electrical connection:	screw-type terminals 0.12 mm² to 2.5 mm²
Mounting / attachment:	wall mounting
Protection rating:	IP 65
Protection class:	II
Safety and EMC:	according to DIN EN 60730
Sensor:	bimetal
Function type:	TW (temperature monitor)
General features:	thermal feedback, internal setting, scale: degrees Celsius

Application

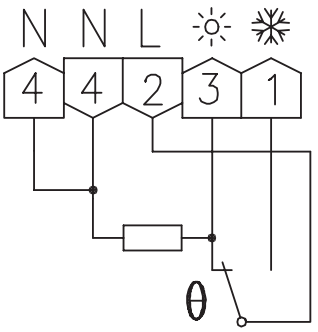
Control and monitoring of temperatures of certain open spaces, for example, driveways or damp rooms (greenhouses, sheds, warehouses and basements, garages etc.) as well as roof gutter heating.

Type	Item no.	Features	PG
PTR 40.000	A 201410	switching contact changeover switch (toggler), control function heating or cooling, viewing window	II
PTR 40.000 / 01	A 201414	switching contact changeover switch (toggler), control function heating or cooling	II
PTR 45.000	A 201413	switching contact 2 changeover switch (toggler), control function heating or cooling / heating and cooling, viewing window	II

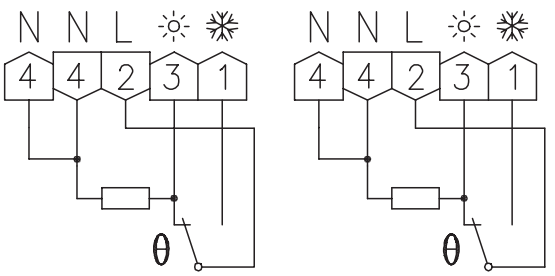
PTR 40 / 45



PTR 40 …



PTR 45.000



Single-stage capillary thermostats JET-1

Technical data

Housing colour:	grey (lower part like RAL 7016, upper part like RAL 7035)
Sensor material:	Cu (capillaries made from V2A)
Capillary length:	1.8 m (for types with “G” in the type specification: 4.5 m)
Ambient temperature:	–20…+55 °C
Max. sensor temperature	top scale value +15%
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Operating voltage:	none
Max. switching current:	15 (8) A
Min. switching current:	150 mA
Max. switching voltage:	230 VAC, 50 Hz
Min. switching voltage:	24 VAC, 50 Hz
Switching element:	microswitch
Switching contact:	toggler, potential-free
Electrical connection:	screw-type terminals
Mounting/attachment:	wall mounting
Protection rating:	IP 65
Protection class:	I
Safety and EMC:	according to DIN EN 60730
Sensor:	liquid-filled capillary
General features:	scale: degrees Celsius, mechanical range restriction when external setting is used

Application

Monitoring or control of temperatures of non-aggressive, liquid and gaseous media. Particularly suitable for wall mounting. The SW-200-12 protecting coil is to be used for temperature control of non-aggressive gases in ducts; for temperature control in non-aggressive fluids, use the TH immersion sleeve, and in aggressive fluids, the NTH immersion sleeve.

Immersion sleeves or protecting coils are not a part of the scope of delivery.

Type	Item no.	Control range	Hysteresis adjustable (approx.)	Sensor a x l	Features	PG
JET-110X	JA 040100	–35…+30 °C	2…20 K	9.6 x 122 mm	external setting/TR*	II
JET-110XF	JA 040200	–35…+30 °C	2…20 K	9.6 x 122 mm	internal setting/TW*	II
JET-110XFG	JA 040201	–35…+30 °C	2…20 K	9.6 x 122 mm	internal setting/TW*	II
JET-112X	JA 040300	–35…+30 °C		9.6 x 122 mm	external setting/TB**	II
JET-112XF	JA 040400	–35…+30 °C		9.6 x 122 mm	internal setting/TB**	II
JET-120X	JA 041100	0…60 °C	2…20 K	9.6 x 122 mm	external setting/TR*	II
JET-120XG	JA 041101	0…60 °C	2…20 K	9.6 x 122 mm	external setting/TR*	II
JET-120XF	JA 041200	0…60 °C	2…20 K	9.6 x 122 mm	internal setting/TW*	II
JET-130X	JA 042100	40…100 °C	2…20 K	9.6 x 122 mm	external setting/TR*	II
JET-130XG	JA 042101	40…100 °C	2…20 K	9.6 x 122 mm	external setting/TR*	II
JET-130XF	JA 042200	40…100 °C	2…20 K	9.6 x 122 mm	internal setting/TW*	II
JET-133X	JA 042300	40…100 °C		9.6 x 122 mm	External setting/TB***	II
JET-133XF	JA 042400	40…100 °C		9.6 x 122 mm	internal setting/TB***	II
JET-140X	JA 043100	70…130 °C	2…20 K	9.6 x 122 mm	external setting/TR*	II
JET-140XF	JA 043200	70…130 °C	2…20 K	9.6 x 122 mm	internal setting/TW*	II
JET-143X	JA 043300	70…130 °C		9.6 x 122 mm	External setting/TB***	II
JET-143XF	JA 043400	70…130 °C		9.6 x 122 mm	internal setting/TB***	II
JET-150	JA 044100	100…280 °C	8…50 K	6 x 80 mm	external setting/TR*	II
JET-150F	JA 044200	100…280 °C	8…50 K	6 x 80 mm	internal setting/TW*	II
JET-153	JA 044300	100…280 °C		6 x 80 mm	External setting/TB***	II
JET-153F	JA 044400	100…280 °C		6 x 80 mm	internal setting/TB***	II

TR = temperature controller, TW = temperature monitor, TB = temperature limiter

* Control function heating or cooling
** Control function heating or cooling, gets locked when temperature drops, manual reset after temperature rise of at least 8 K
*** Control function heating or cooling, gets locked when temperature rises, manual reset after temperature rise of at least 8 K

Accessories

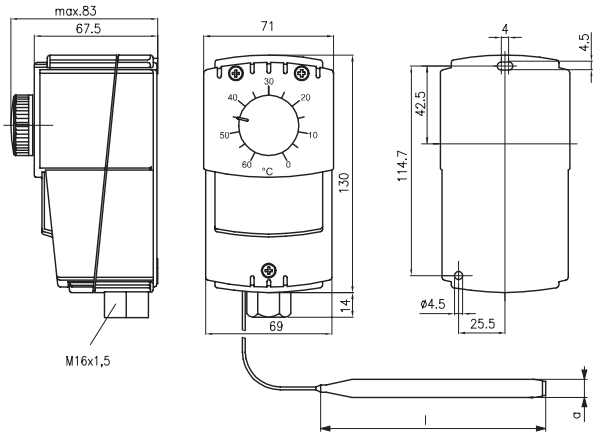
For protecting coils and immersion sleeves, see the “Accessories/miscellaneous” section.
Immersion sleeves are not included in the delivery.
for types with “X” in the type specification: TH/NTH-140
for types without “X” in the type specification: TH/NTH-100/200/280

Single-stage capillary thermostats JET-1

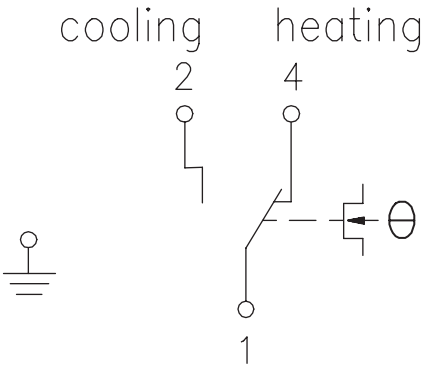
Temperature monitor (TW)

Temperature limiter (TB)

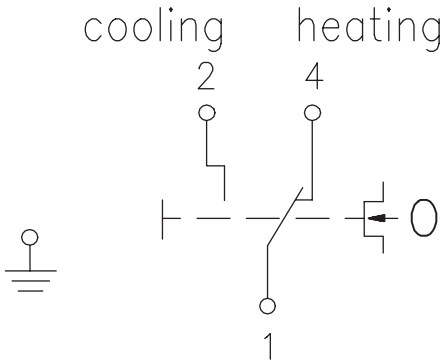
Temperature controller (TR)



TR / TW



TB



Single-stage capillary thermostats WR 81

Technical data

Housing colour:	grey (lower part like RAL 7016, upper part like RAL 7035)
Sensor material:	Cu (bulbs and capillaries)
Ambient temperature:	–20…+55 °C
Max. sensor temperature	top scale value +15%
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Operating voltage:	none
Max. switching current:	15 (8) A
Min. switching current:	150 mA
Max. switching voltage:	230 VAC, 50 Hz
Min. switching voltage:	24 VAC, 50 Hz
Switching element:	microswitch
Switching contact:	toggler, potential-free
Control function:	heating or cooling
Electrical connection:	screw-type terminals
Mounting/attachment:	wall mounting
Protection rating:	IP 43
Protection class:	I
Safety and EMC:	according to DIN EN 60730
Sensor:	liquid-filled capillary
General features:	Scale: degrees Celsius

Application

Monitoring or control of temperatures of non-aggressive, liquid and gaseous media. Particularly suitable for wall mounting.

The protecting coil SW-200 is to be used for temperature control of non-aggressive gases in the duct; for temperature in non-aggressive fluids, the immersion sleeve TH, and in aggressive fluids, the immersion sleeve NTH.

Immersion sleeves or protecting coils are not a part of the scope of delivery.

When using screw joints instead of grommets protection rating IP 54.

Type	Item no.	Control range	Hysteresis (approx.)	Sensor Ø x L	Features	PG
WR 81.029-1	C 1810612	0…35 °C	0.5…1 K	7 x 135 mm	external setting, TR capillary length 0.5 m	II
WR 81.129-1	C 1810618	0…35 °C	0.5…1 K	7 x 135 mm	internal setting, TW capillary length 0.5 m	II
WR 81.101-1	C 1810610	0…35 °C	0.5…1 K	7 x 135 mm	Internal setting, TW capillary length 2 m	II
WR 81.009-2	C 1810600	0…70 °C	1…2 K	7 x 90 mm	external setting, TR capillary length 1.5 m	II
WR 81.109-2	C 1810615	0…70 °C	1…2 K	7 x 90 mm	Internal setting, TW capillary length 1.5 m	II

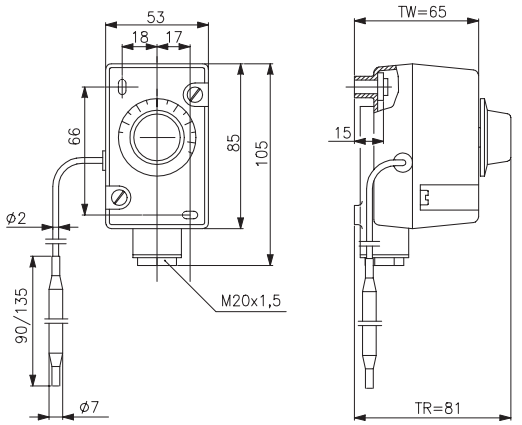
TR = temperature controller, TW = temperature monitor

Accessories

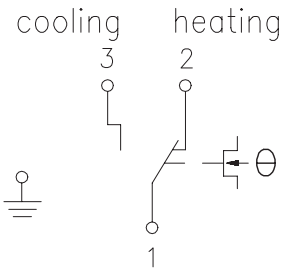
For immersion sleeves (TH-100/200/280, NTH-100/200/280) and protecting coils (SW-200), see the “Accessories/miscellaneous” section.

WR-81.109-2

WR-81



WR-81



Multi-stage capillary thermostats JMT-2

2 stages

Technical data

Housing colour:	grey (lower part like RAL 7016, upper part like RAL 7035)
Sensor material:	Cu
Capillary length:	1.5 m (JMT-203 XG: 4.5 m)
Ambient temperature:	–15…+55 °C
Max. sensor temperature	top scale value +15%
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Operating voltage:	none
Max. switching current:	15 (8) A
Min. switching current:	150 mA
Max. switching voltage:	230 VAC, 50 Hz
Min. switching voltage:	24 VAC, 50 Hz
Switching element:	microswitch
Switching contact:	2 x togglers, potential-free
Control function:	2-stage heating, 2-stage cooling, heating or cooling with neutral zone
Hysteresis between the stages:	approx. 1…7 K, adjustable
Electrical connection:	screw-type terminals
Mounting/attachment:	wall mounting
Protection rating:	IP 65
Protection class:	I
Safety and EMC:	according to DIN EN 60730
Sensor:	liquid-filled capillary
General features:	Scale: degrees Celsius

Application

Multi-stage control of the temperature of liquid or gaseous media, e.g., for activating two-stage burners or heating registers.

The SW-200-12 protecting coil is to be used for temperature control of non-aggressive gases in ducts; for temperature control in non-aggressive fluids, use the TH immersion sleeve, and in aggressive fluids, the NTH immersion sleeve.

Immersion sleeves or protecting coils are not a part of the scope of delivery.

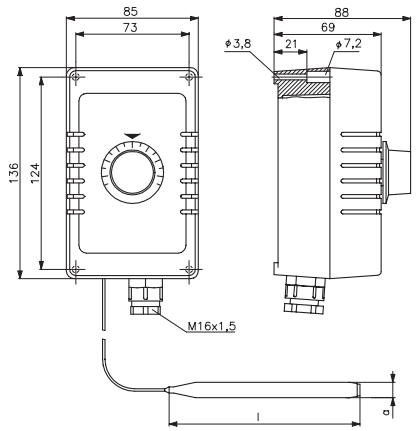
Type	Item no.	Control range	Hysteresis in the stage (approx.)	Sensor a x l (mm)	Features	PG
JMT-202 X	E 6060011	–15…+30 °C	1 K	9.6 x 122 mm	External setting, TR	II
JMT-202 XF	E 6060098	–15…+30 °C	1 K	9.6 x 122 mm	Internal setting, TW	II
JMT-203 X	E 6060023	10…55 °C	1 K	9.6 x 122 mm	External setting, TR	II
JMT-203 XF	E 6060439	10…55 °C	1 K	9.6 x 122 mm	Internal setting, TW	II
JMT-203 XG	E 6060249	10…55 °C	1 K	9.6 x 122 mm	External setting, TR	II
JMT-221 X	E 6060062	10…55 °C	3 K	9.6 x 122 mm	External setting, TR	II
JMT-206 X	E 6060340	20…80 °C	1 K	9.6 x 122 mm	External setting, TR	II
JMT-204	E 6060035	50…120 °C	1 K	8 x 78 mm	External setting, TR	II

TR = temperature controller, TW = temperature monitor

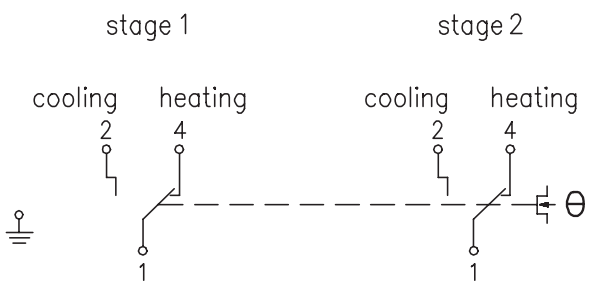
Accessories

For protecting coils and immersion sleeves, see the “Accessories/miscellaneous” section.
for types with “X” in the type specification: TH/NTH-140
for types without “X” in the type specification: TH/NTH-100/200/280

JMT-2..



JMT-2..



Capillary thermostats as boiler controller KR 80

Capillary system – **TÜV-tested**

Technical data

Housing colour:	grey (lower part like RAL 7016, upper part like RAL 7035)
Sensor material:	Cu
Ambient temperature:	–20…+55 °C
Max. sensor temperature	top scale value +15%
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Operating voltage:	none
Max. switching current:	15 (8) A
Min. switching current:	150 mA
Max. switching voltage:	230 VAC, 50 Hz
Min. switching voltage:	24 VAC, 50 Hz
Switching element:	Microswitch
Switching contact:	changer, potential-free
Control function:	heating or cooling
Electrical connection:	screw-type terminals
Mounting / attachment:	on the installed immersion sleeve with a system connection
Protection class:	I
Safety and EMC:	according to DIN EN 60730
Sensor:	liquid-filled capillary
General features:	scale: degrees Celsius
Scope of delivery:	controller, immersion sleeve

Type testing by TÜV in accordance with DIN EN 14597

Application

In heating technology, they are used in boiler systems or tanks, district heat transfer stations and heat transfer plants.

Immersion sleeve included in scope of delivery.

To order replacement immersion sleeves THK / NTHK, see the “Accessories / miscellaneous” section.

DIN Geprüft

Type	Item no.	Control range	Hysteresis (approx.)	Length / Material of immersion sleeve	Features	PG
KR 80.003-1	C 1801726	0…35 °C	1 K	120 mm / nickel-plated brass	external setting / TR, IP 43	II
KR 80.108-1	C 1801707	0…35 °C	1 K	120 mm / nickel-plated brass	internal setting / TW, IP 43	II
KR 80.109-1	C 1801744	0…35 °C	1 K	200 mm / nickel-plated brass	internal setting, TW, IP 43	II
KR 80.027-5	C 1801731	0…70 °C	5 K	100 mm / nickel-plated brass	external setting / TR, IP 43	II
KR 80.035-2	C 1801705	0…70 °C	2 K	100 mm / nickel-plated brass	external setting / TR, IP 43	II
KR 80.028-2	C 1801732	0…70 °C	2 K	200 mm / nickel-plated brass	external setting / TR, IP 43	II
KR 80.116-2	C 1801748	0…70 °C	2 K	100 mm / nickel-plated brass	internal setting / TW, IP 43	II
KR 80.029-2	C 1801733	0…70 °C	2 K	280 mm / nickel-plated brass	external setting / TR, IP 43	II
KR 80.029-2 V4A	C 1801765	0…70 °C	2 K	280 mm / V4A (1.4571)	external setting / TR, IP 43	II
KR 80.111-3	C 1801708	0…80 °C	3 K	100 mm / nickel-plated brass	internal setting / TW, IP 43	II
KR 80.009-1 V4A	C 1801728	10…45 °C	1 K	200 mm / V4A (1.4571)	external setting / TR, IP 43	II
KR 80.011-1 V4A	C 1801730	10…45 °C	1 K	120 mm / V4A (1.4571)	external setting / TR, IP 43	II
KR 80.120-1	C 1801749	10…45 °C	1 K	200 mm / nickel-plated brass	internal setting / TW, IP 43	II
KR 80.206	C 1801720	30…65 °C		100 mm / nickel-plated brass	internal setting / external reset / TB, IP 43	II
KR 80.206 IP54	C 1801722	30…65 °C		100 mm / nickel-plated brass	internal setting / external reset / TB, IP 54	II
KR 80.000-5	C 1801700	35…95 °C	5 K	100 mm / nickel-plated brass	external setting / TR, IP 43	II
KR 80.001-5	C 1801723	35…95 °C	5 K	200 mm / nickel-plated brass	external setting / TR, IP 43	II

Capillary thermostats as boiler controller KR 80

Capillary system – **TÜV-tested**

Type	Item no.	Control range	Hysteresis (approx.)	Length / Material of immersion sleeve	Features	PG
KR 80.001-5 V4A	C 1801725	35 … 95 °C	5 K	200 mm / V4A (1.4571)	external setting / TR, IP 43	II
KR 80.100-5	C 1801711	35 … 95 °C	5 K	100 mm / nickel-plated brass	internal setting / TW, IP 43	II
KR 80.100-5 IP54	C 1801738	35 … 95 °C	5 K	100 mm / nickel-plated brass	internal setting / TW, IP 54	II
KR 80.101-5	C 1801739	35 … 95 °C	5 K	200 mm / nickel-plated brass	internal setting / TW, IP 43	II
KR 80.124-5	C 1801750	35 … 95 °C	5 K	280 mm / nickel-plated brass	internal setting / TW, IP 43	II
KR 80.112-5	C 1801747	35 … 95 °C	5 K	600 mm / nickel-plated brass	internal setting / TW, IP 43	II
KR 80.102-8	C 1801706	40 … 110 °C	8 K	100 mm / nickel-plated brass	internal setting / TW, IP 43	II
KR 80.103-8	C 1801742	40 … 110 °C	8 K	200 mm / nickel-plated brass	internal setting / TW, IP 43	II
KR 80.008-8	C 1801727	40 … 110 °C	8 K	100 mm / nickel-plated brass	external setting / TR, IP 43	II
KR 80.006-8	C 1801704	50 … 130 °C	8 K	100 mm / nickel-plated brass	external setting / TR, IP 43	II
KR 80.106-8	C 1801743	50 … 130 °C	8 K	100 mm / nickel-plated brass	internal setting / TW, IP 43	II
KR 80.207	C 1801710	60 … 95 °C		100 mm / nickel-plated brass	internal setting / external reset / TB, IP 43	II
KR 80.208	C 1801721	85 … 120 °C		100 mm / nickel-plated brass	internal setting / external reset / TB, IP 43	II
KR 80.202	C 1801709	95 … 130 °C		100 mm / nickel-plated brass	internal setting / external reset / TB, IP 43	II
KR 80.203	C 1801719	95 … 130 °C		200 mm / nickel-plated brass	internal setting / external reset / TB, IP 43	II
KR 80.203 IP54	C 1801770	95 … 130 °C		200 mm / nickel-plated brass	internal setting / external reset / TB, IP 54	II

TR = temperature controller, TW = temperature monitor, TB = temperature limiter (manual reset after temperature drop of at least 8 K)

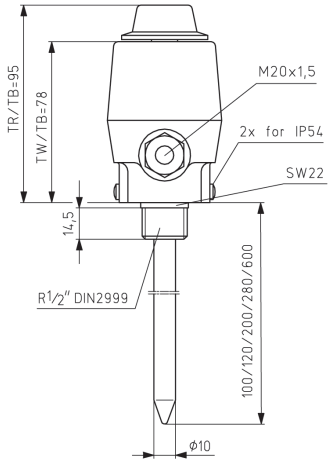
Capillary thermostats as boiler controller KR 80

Capillary system – **TÜV-tested**

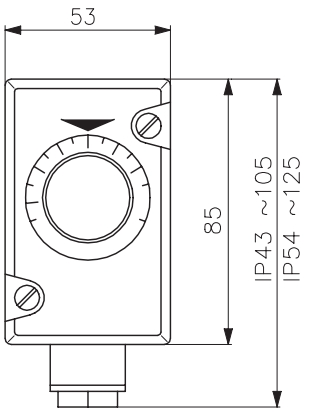
KR 80.108-1

KR 80.207

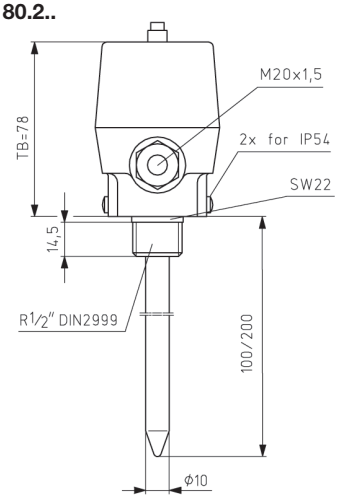
KR 80....



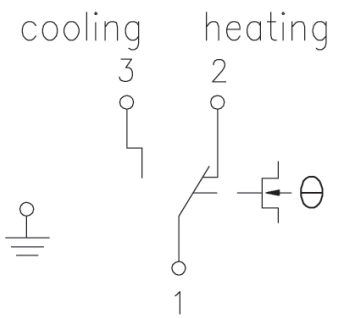
KR 80....



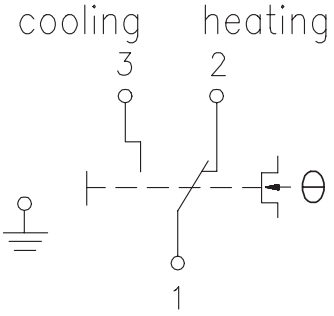
KR 80.2..



KR 80.... (TR/TW)



KR 80.2.. (TB)



Capillary thermostats as ventilation controllers LR 80

Capillary system – **TÜV-tested**

Technical data

Housing colour:	grey (lower part like RAL 7016, upper part like RAL 7035)
Sensor material:	Cu
Material of protecting coil:	steel, nickel-plated
Ambient temperature:	–20…+55 °C
Max. sensor temperature	top scale value +15%
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Operating voltage:	none
Max. switching current:	15 (8) A
Min. switching current:	150 mA
Max. switching voltage:	230 VAC, 50 Hz
Min. switching voltage:	24 VAC, 50 Hz
Switching element:	Microswitch
Switching contact:	changer, potential-free
Control function:	heating or cooling
Electrical connection:	screw-type terminals
Protection rating:	IP 43
Protection class:	I
Safety and EMC:	according to DIN EN 60730
Sensor:	liquid-filled capillary
General features:	scale: degrees Celsius
Scope of delivery:	controller, protecting coil

Application

In ventilation technology, as inflow air monitoring or as a limiter of electric heating registers.

Protecting coil included in scope of delivery.

To order replacement protecting coil SWK, see the “Accessories/miscellaneous” section.

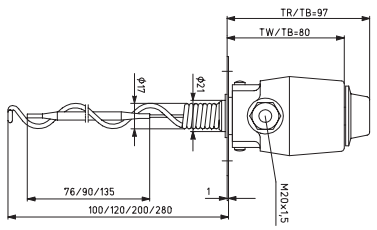
Mounting/attachment:
on the installed protecting coil with a system connection

Type testing by TÜV in accordance with
DIN EN 14597

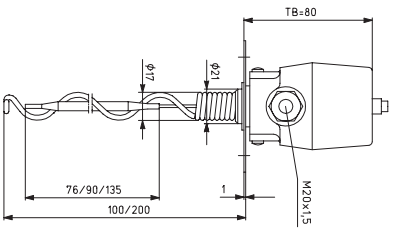
Type	Item no.	Control range	Hysteresis (approx.)	Length of protecting coil	Features	PG
LR 80.003-1	C 1801800	0…35 °C	1 K	120 mm	External setting, TR	II
LR 80.108-1	C 1801801	0…35 °C	1 K	120 mm	Internal setting, TW	II
LR 80.109-1	C 1801810	0…35 °C	1 K	200 mm	Internal setting, TW	II
LR 80.027-5	C 1801806	0…70 °C	5 K	100 mm	External setting, TR	II
LR 80.035-2	C 1801824	0…70 °C	2 K	100 mm	External setting, TR	II
LR 80.028-2	C 1801807	0…70 °C	2 K	200 mm	External setting, TR	II
LR 80.116-2	C 1801811	0…70 °C	2 K	100 mm	Internal setting, TW	II
LR 80.029-2	C 1801816	0…70 °C	2 K	280 mm	External setting, TR	II
LR 80.120-1	C 1801812	10…45 °C	1 K	200 mm	Internal setting, TW	II
LR 80.101-5	C 1801827	35…95 °C	5 K	200 mm	Internal setting, TW	II
LR 80.207	C 1801805	60…95 °C		100 mm	internal setting/external reset/TB	II
LR 80.203	C 1801825	95…130 °C		200 mm	internal setting/external reset/TB	II

TR = temperature controller, TW = temperature monitor, TB = temperature limiter (manual reset after temperature drop of at least 8 K)

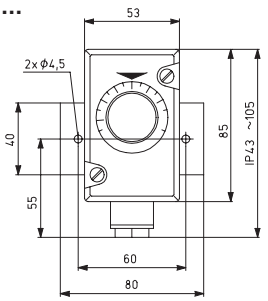
LR 80.2.. (TB)



LR 80.2..

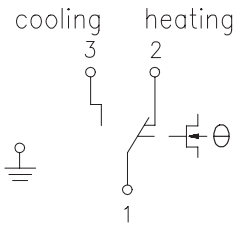


LR 80.…

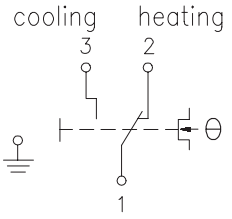


LR 80.108-1

LR 80.… (TR/TW)



LR 80.2.. (TB)



Capillary thermostats as safety temperature limiters KR 80.3 / LR 80.3

Capillary system – **TÜV-tested**

Technical data

Housing colour:	grey (lower part like RAL 7016, upper part like RAL 7035)
Sensor material:	V2A
Material of immersion sleeve:	nickel-plated brass
Material of protecting coil:	steel, nickel-plated
Ambient temperature:	–20 … +55 °C
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Operating voltage:	none
Max. switching current:	10 (3) A
Min. switching current:	150 mA
Max. switching voltage:	230 VAC, 50 Hz
Min. switching voltage:	24 VAC, 50 Hz
Switching element:	microswitch
Switching contact:	changer, potential-free
Control function:	heating or cooling, locked when the temperature is rising
Hysteresis:	manual reset after temperature drop of min. 20 K
Electrical connection:	screw-type terminals
Mounting / attachment:	on the installed immersion sleeve or protecting coil with a system connection
Protection rating:	IP 43
Protection class:	I
Safety and EMC:	according to DIN EN 60730
Sensor:	liquid-filled capillary
Function type:	STB (safety temperature limiter)
General features:	internal reset

Application

For limiting the temperature in boiler, tank and ventilation systems.

STB = safety temperature limiter, switch-off temperature set to a fixed value at the factory.

Immersion sleeve or protecting coil included in scope of delivery.

To order replacement immersion sleeves THK / NTHK or protecting coil SWK, see the “Accessories / miscellaneous” section.

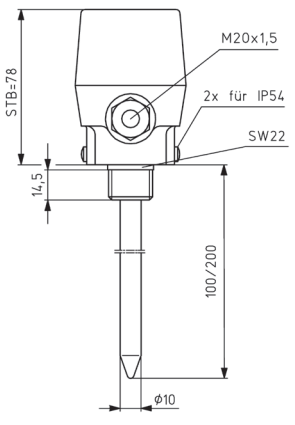
Sensor rupture safeguarding: Triggered at –15 °C

Scope of delivery: controller, KR immersion sleeve / LR protecting coil

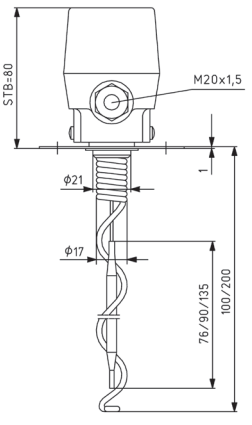
Type testing by TÜV in accordance with DIN EN 14597

Image	Type	Item no.	Cut-off temperature fixed / accuracy	Max. sensor temperature	Length of immersion sleeve / protecting coil	PG
	**KR 80.309**	C 1801590	75 °C +0/–8 K	115 °C	100 mm	II
	KR 80.310	C 1801591	75 °C +0/–8 K	115 °C	200 mm	II
	KR 80.312	C 1801592	100 °C +0/–9 K	135 °C	100 mm	II
	KR 80.318	C 1801593	100 °C +0/–9 K	135 °C	200 mm	II
	**LR 80.309**	C 1801821	75 °C +0/–8 K	115 °C	100 mm	II
	LR 80.310	C 1801822	75 °C +0/–8 K	115 °C	200 mm	II
	LR 80.312	C 1801823	100 °C +0/–9 K	135 °C	100 mm	II
	LR 80.318	C 1801817	100 °C +0/–9 K	135 °C	200 mm	II

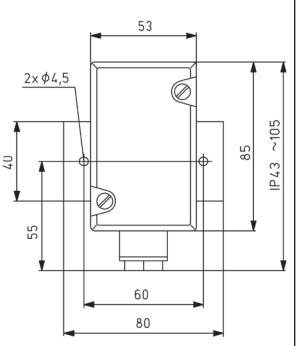
KR 80.3..



LR 80.3..

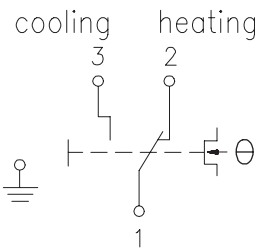


KR 80.3..* / LR 80.3..



*KR 80.3 without mounting plate

STB



Capillary thermostats as boiler dual controllers KR 85

Capillary system – **TÜV-tested**

Technical data

Housing colour:	grey (lower part like RAL 7016, upper part like RAL 7035)
Sensor material:	Cu
Material of immersion sleeve:	nickel-plated brass
Ambient temperature:	–20 … +55 °C
Max. sensor temperature	top scale value +15%
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Operating voltage:	none
Max. switching current:	15 (8) A
Min. switching current:	150 mA
Max. switching voltage:	230 VAC, 50 Hz
Min. switching voltage:	24 VAC, 50 Hz
Switching element:	Microswitch
Switching contact:	2 togglers, potential-free
Electrical connection:	screw-type terminals
Mounting / attachment:	on the installed immersion sleeve with a system connection
Protection rating:	IP 43
Protection class:	I
Safety and EMC:	according to DIN EN 60730
Sensor:	liquid-filled capillary
General features:	scale: degrees Celsius
Scope of delivery:	controller, immersion sleeve

Type testing by TÜV in accordance with DIN EN 14597 except for KR 85.2xx

Application

In heating technology, they are used in boiler systems or tanks, district heat transfer stations and heat transfer plants.

Immersion sleeve included in scope of delivery.

To order replacement immersion sleeves THK … x17 / NTHK … x17, see the “Accessories / miscellaneous” section.

Type	Item no.	Control range / switch-off temperature	Hysteresis (approx.)	Length of immersion sleeve	Features	PG
KR 85.406-2	C 1850506	0 … 70 °C 0 … 70 °C	2 K 2 K	100 mm	internal setting, TW* internal setting, TW*	II
KR 85.109-2	C 1850518	0 … 70 °C 0 … 70 °C	2 K 2 K	100 mm	external setting, TR* internal setting, TW*	II
KR 85.100-5	C 1850502	35 … 95 °C 35 … 95 °C	5 K 5 K	100 mm	external setting, TR* internal setting, TW*	II
KR 85.101-5	C 1850516	35 … 95 °C 35 … 95 °C	5 K 5 K	200 mm	external setting, TR* internal setting, TW*	II
KR 85.400-5	C 1850521	35 … 95 °C 35 … 95 °C	5 K 5 K	100 mm	internal setting, TW* internal setting, TW*	II
KR 85.401-5	C 1850522	35 … 95 °C 35 … 95 °C	5 K 5 K	200 mm	internal setting, TW* internal setting, TW*	II
KR 85.102-5	C 1850517	35 … 95 °C 50 … 130 °C	5 K 8 K	100 mm	external setting, TR* internal setting, TW*	II
KR 85.207-5	C 1850513	35 … 95 °C 85 … 120 °C	5 K	200 mm	external setting, TR* external reset, TB**	II
KR 85.230-5	C 1850504	35 … 95 °C 95 … 110 °C	5 K	100 mm	external setting, TR* internal reset, TB**	II
KR 85.204-8	C 1850512	50 … 130 °C 95 … 130 °C	8 K	100 mm	external setting, TR* external reset, TB**	II

TR = temperature controller, TW = temperature monitor, TB = temperature limiter

* Control function heating or cooling

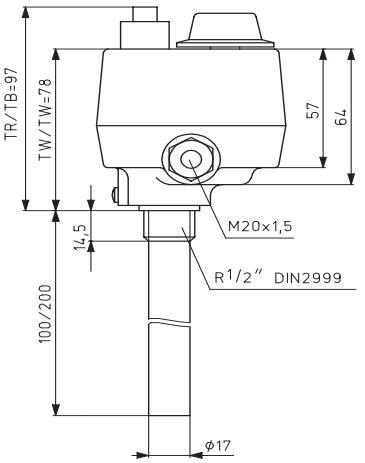
** Control function heating (prewired) or cooling, gets locked when temperature rises, manual reset after temperature drop of at least 8 K

Capillary thermostats as boiler dual controllers KR 85

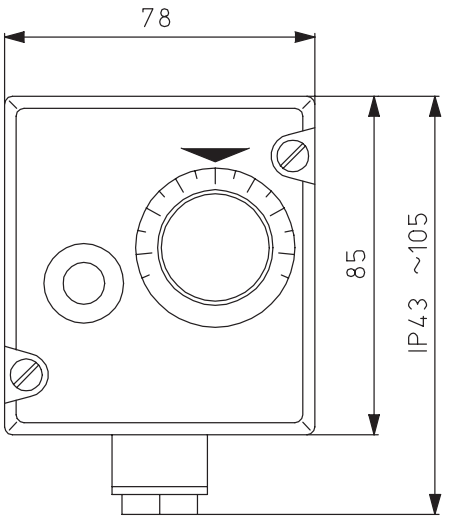
Capillary system – **TÜV-tested**

KR 85.4..

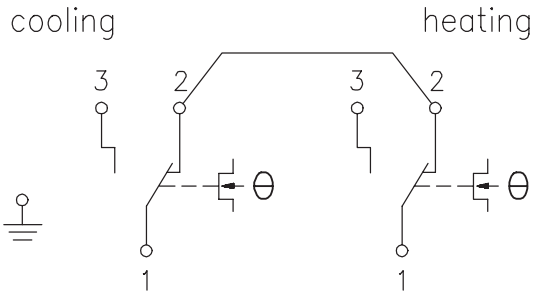
KR 85....



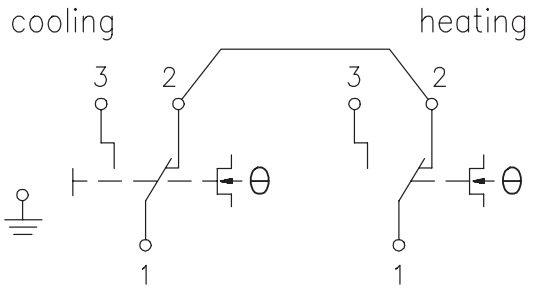
KR 85....



KR 85....



KR 85.2...



Capillary thermostats as boiler dual controllers / safety temperature limiters KR 85.3 / LR 85.3

Capillary system – **TÜV-tested**

Technical data

Housing colour:	grey (lower part like RAL 7016, upper part like RAL 7035)
Sensor material:	Cu (TR) und V2A (STB)
Ambient temperature:	–20…+55 °C
Max. sensor temperature	top scale value +15%
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Operating voltage:	none
Max. switching current:	10 (3) A
Min. switching current:	150 mA
Max. switching voltage:	230 VAC, 50 Hz
Min. switching voltage:	24 VAC, 50 Hz
Switching element:	Microswitch
Switching contact:	2 x toggler, potential-free
Control function:	heating or cooling, locked when the temperature is rising
Hysteresis STB:	manual reset after temperature drop of min. 20 K
Electrical connection:	screw-type terminals
Mounting / attachment:	on the installed immersion sleeve (KR) / protecting coil (LR) with a system connection
Protection rating:	IP 43
Protection class:	I
Safety and EMC:	according to DIN EN 60730
Sensor:	liquid-filled capillary
General features:	scale: degrees Celsius
Scope of delivery:	controller, immersion sleeve (KR) or protecting coil (LR)

Type testing by TÜV in accordance with DIN EN 14597

Application

For limiting the temperature in boiler, tank and ventilation systems.

STB = safety temperature limiter, switch-off temperature set to a fixed value at the factory.

Immersion sleeve or protecting coil included in scope of delivery.

To order replacement immersion sleeves THK … x17 / NTHK … x17 or protecting coil SWK-200, see the “Accessories / miscellaneous” section.

Type	Item no.	Control range / cut-off temperature fixed / accuracy	Hysteresis (approx.)	Length / Material Immersion sleeve / protecting coil	Features	PG
KR 85.311-2	C 1850507	0…70 °C STB 75 °C +0/–8 K	2 K	100 mm nickel-plated brass	External setting, TR internal reset, STB	II
KR 85.312-2	C 1850519	0…70 °C STB 75 °C +0/–8 K	2 K	200 mm Ms nickel-plated	External setting, TR internal reset, STB	II
KR 85.314-5	C 1850520	35…90 °C STB 100 °C +0/–9 K	5 K	100 mm nickel-plated brass	External setting, TR internal reset, STB	II
KR 85.315-5	C 1850505	35…90 °C STB 100 °C +0/–9 K	5 K	200 mm Ms nickel-plated	External setting, TR internal reset, STB	II
LR 85.312-2	C 1850531	0…70 °C STB 75 °C +0/–8 K	2 K	200 mm steel, nickel-plated	External setting, TR internal reset, STB	II
LR 85.315-5	C 1850530	35…90 °C STB 100 °C +0/–9 K	5 K	200 mm steel, nickel-plated	External setting, TR internal reset, STB	II

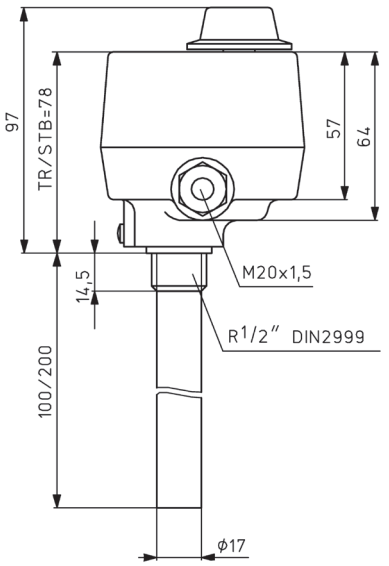
TR = temperature controller, STB = safety temperature limiter

Capillary thermostats as boiler dual controllers / safety temperature limiters, KR 85.3 / LR 85.3

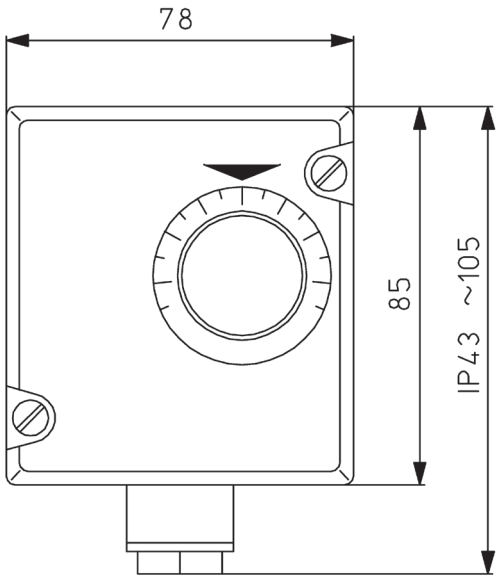
Capillary system – **TÜV-tested**

LR 85.315-5

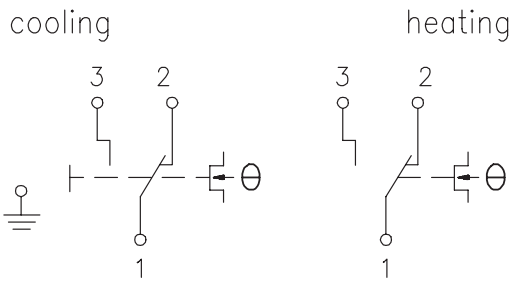
KR 85.3..



KR 85.3.. / LR 85.3..



KR 85.3.. / LR 85.3..



Contact thermostats ATR 83, JAT-1, WR 81

Capillary system

ATR

WR

JAT

Technical data

Housing colour:	grey (lower part like RAL 7016, upper part like RAL 7035)
Sensor material:	Cu
Ambient temperature:	**ATR / WR:** 0 … 80 °C **JAT:** –20 … +55 °C
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Operating voltage:	none
Max. switching current:	**ATR:** 16 (2) A **JAT / WR:** 15 (8) A
Min. switching current:	150 mA
Max. switching voltage:	230 VAC, 50 Hz
Min. switching voltage:	24 VAC, 50 Hz
Switching element:	microswitch
Switching contact:	toggler, potential-free
Control function:	heating or cooling
Hysteresis:	**ATR / WR:** approx. 4 K **JAT:** ca. 2 … 20 K, adjustable
Electrical connection:	screw-type terminals
Mounting / attachment:	**ATR:** on pipe by means of a cable tie (450 x 8.9 mm, easy to remove, heat-resistant up to 105 °C) **WR:** on pipe by means of 400 mm long metal fastening strap with lock **JAT:** on pipe by means of 260 mm long metal fastening strap
Protection class:	I
Safety and EMC:	according to DIN EN 60730
Sensor:	liquid-filled capillary
General features:	Scale: degrees Celsius
Scope of delivery:	controller, cable tie (ATR) or metal fastening strap (JAT / WR)

Application

Control or monitoring of temperatures at heat registers, pipelines or tanks, for example, temperature-dependent pump control or control of motor valves.

Type	Item no.	Control range	Max. sensor temperature	Features	PG
ATR 83.000	C 1810492	30 … 90 °C	100 °C	external setting, TR, IP 20	II
ATR 83.100	C 1810493	30 … 90 °C	100 °C	internal setting, TW, IP 20	II
ATR 83.001	C 1810494	0 … 60 °C	80 °C	external setting, TR, IP 20	II
ATR 83.101	C 1810495	0 … 60 °C	80 °C	internal setting, TW, IP 20	II

Type	Item no.	Control range	Max. sensor temperature	Features	PG
WR 81.115-5	C 1810617	0 … 70 °C	85 °C	internal setting, TW, IP 43	II
WR 81.117-5	C 1810613	50 … 130 °C	150 °C	internal setting, TW, IP 43	II

Type	Item no.	Control range	Max. sensor temperature	Features	PG
JAT-110	JA 030100	–35 … +30 °C	35 °C	external setting, TR, IP 65	II
JAT-110 F	JA 030200	–35 … +30 °C	35 °C	internal setting, TW, IP 65	II
JAT-120	JA 030400	0 … 60 °C	70 °C	external setting, TR, IP 65	II
JAT-120 F	JA 030500	0 … 60 °C	70 °C	internal setting, TW, IP 65	II
JAT-130	JA 030600	40 … 100 °C	115 °C	external setting, TR, IP 65	II
JAT-130 F	JA 030700	40 … 100 °C	115 °C	internal setting, TW, IP 65	II
JAT-140	JA 030800	70 … 130 °C	145 °C	external setting, TR, IP 65	II
JAT-140 F	JA 030900	70 … 130 °C	145 °C	internal setting, TW, IP 65	II

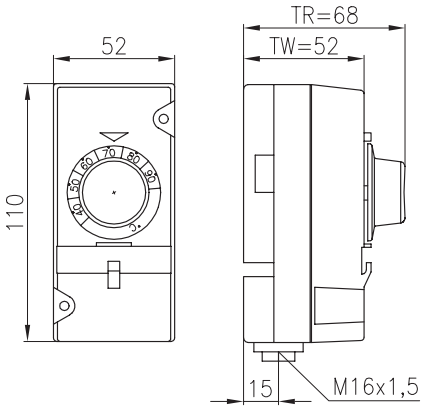
TR = temperature controller, TW = temperature monitor

Contact thermostats ATR 83, JAT-1, WR 81

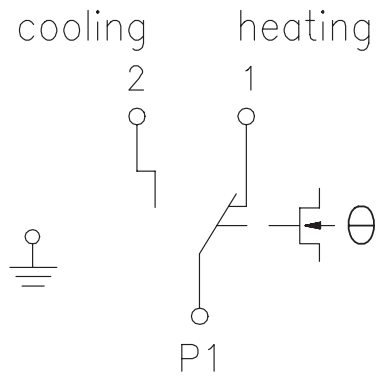
Capillary system

Accessories	Item no.	Features	PG
ATRS-1	C 1809518	temperature determination set for ATR with outside setting (ATR 83.000, ATR 83.001)	II
WP-01	G 9990180	heat conduction paste 2 ml	II

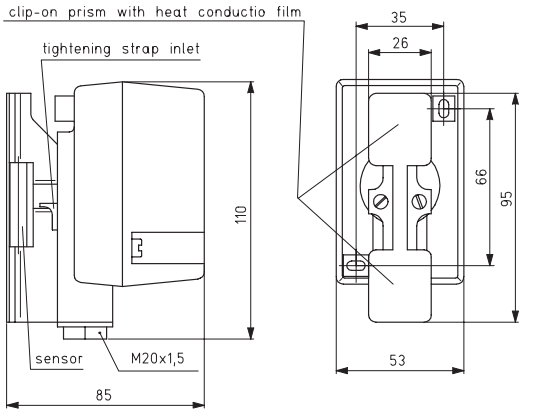
ATR 83.…



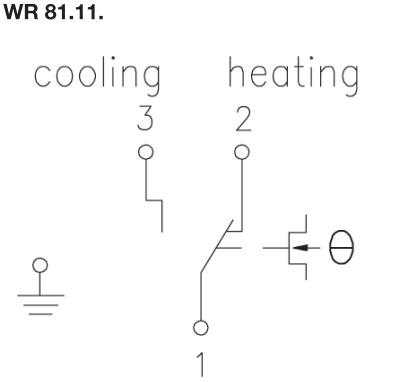
ATR 83.…



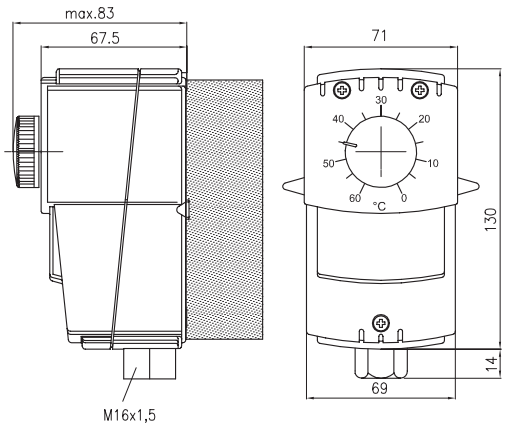
WR 81.11.



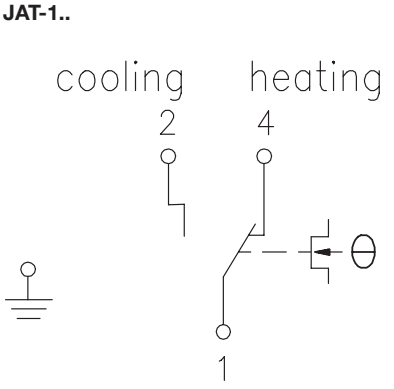
WR 81.11.



JAT-1..



JAT-1..



Frost protection thermostat JTF-1 … -25

Capillary system – 1 or 2 stages – **TÜV-tested** – switching

JTF

JTF-..W

JTF

Technical data

Housing colour:	grey
Sensor material:	Cu
Ambient temperature:	–10 … +55 °C
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Max. sensor temperature	200 °C
Operating voltage:	none
Max. switching current:	15 (8) A
Min. switching current:	150 mA
Max. switching voltage:	230 VAC, 50 Hz
Min. switching voltage:	24 VAC, 50 Hz
Switching element:	microswitch
Switching contact:	toggler, potential-free
Control range:	–10 … +12 °C
Electrical connection:	screw-type terminals
Mounting / attachment:	wall mounting, controller housing must be fitted in such a way that it is not subjected to any temperature that is less than the scale value that has been set
Protection class:	I
Safety and EMC:	according to DIN EN 60730
Sensor:	gas-filled capillary, active over its entire length (except for JTF-3, JTF-3 W und JTF-4)
General features:	intrinsic safety, scale: degrees Celsius

Note:
Mounting flanges, immersion sleeves and protecting coils are not part of the delivery scope and must be ordered separately as accessories.

Application

Securing hot water registers against freezing. The frost protection thermostats JTF-21 to JTF-25 have two switch outputs that allow for intervention in the system before the critical point is reached. All the devices are intrinsically safe and offer a sealable setpoint configuration.

The capillaries, with the exception of JTF-3/-4, are active over the entire length. The device gets actuated when about 30 cm of the capillary (or approx. 60 cm capillary in the case of 12-m variants) reach the defined value.

JTF-1 to -25:
For temperature measurement of non-aggressive gases. The mounting brackets JZ-05/6 M (metal) or JZ-05/6 K (plastic) should be used for bracing the capillaries against the heat register.

JTF-3/-4 (additional application):
The SW-200-12 protecting coil is to be used for temperature measurement of non-aggressive gases in the duct; for temperature measurement in non-aggressive fluids, the TH-140 immersion sleeve is to be used, and in aggressive fluids, the NTH-140 immersion sleeve.

DIN Geprüft

Type testing by TÜV in accordance with DIN EN 14597

Type	Item no.	Capillary length	Features	PG
1-stage				
JTF-1 *	E 6090301	6 m	external setting, TR, IP 40, hysteresis approx. 1 K	II
JTF-1/12 *	E 6090328	12 m	external setting, TR, IP 40, hysteresis approx. 1 K	II
JTF-1 W *	E 6090014	6 m	internal setting, TW, IP 65, hysteresis approx. 1 K	II
JTF-2 **	E 6090308	6 m	external setting, external reset, TB, IP 40, hysteresis: manual reset after temperature rise of approx. 4 K	II
JTF-2/12**	E 6090329	12 m	external setting, external reset, TB, IP 40, hysteresis: manual reset after temperature rise of approx. 4 K	II
JTF-2 W**	E 6090287	6 m	internal setting, external reset, TB, IP 65, hysteresis: manual reset after temperature rise of approx. 4 K	II
JTF-3*	E 6090309	1.8 m	external setting, TR, IP 40, hysteresis approx. 1 K, sensor dimensions: 9.5 x 76 mm, also for use in applications exposed to water	II
JTF-3 W*	E 6090065	1.8 m	internal setting, TW, IP 65, hysteresis approx. 1 K, sensor dimensions: 9.5 x 76 mm, also for use in applications exposed to water	II
JTF-4**	E 6090310	1.8 m	external setting, external reset, TB, IP 40, hysteresis: manual reset after temperature rise of approx. 4 K, sensor dimensions: 9.5 x 76 mm, also for use in applications exposed to water	II
JTF-5*	E 6090311	3 m	external setting, TR, IP 40, hysteresis approx. 1 K	II
JTF-6**	E 6090313	3 m	external setting, external reset, TB, IP 40, hysteresis: manual reset after temperature rise of approx. 4 K	II
JTF-6 W**	E 6090314	3 m	internal setting, internal reset, TB, IP 65, hysteresis: manual reset after temperature rise of approx. 4 K	II

Frost protection thermostat JTF-1 … -25

Capillary system – 1 or 2 stages – **TÜV-tested** – switching

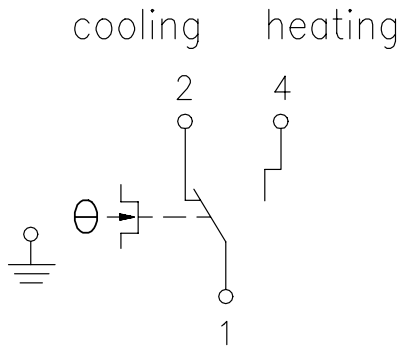
Type	Item no.	Capillary length	Features	PG
2-stage: 1st stage emits a signal 5 K before the switch-off point				
JTF-21* **	E 6090320	6 m	external setting, TR, IP 40, hysteresis in the stage approx. 1 K, hysteresis between the stages approx. 5 K	II
JTF-21/12* **	E 6090330	12 m	external setting, TR, IP 40, hysteresis in the stage approx. 1 K, hysteresis between the stages approx. 5 K	II
JTF-21 W* **	E 6090283	6 m	internal setting, TW, IP 65, hysteresis in the stage approx. 1K, hysteresis between the stages approx. 5 K	II
JTF-22** **	E 6090322	6 m	external setting, external reset, TB, IP 40, hysteresis in the stage approx. 1 K, hysteresis between the stages approx. 5 K	II
JTF-22/12** **	E 6090331	12 m	external setting, external reset, TB, IP 40, hysteresis in the stage approx. 1 K, hysteresis between the stages approx. 5 K	II
JTF-25* **	E 6090324	3 m	external setting, TR, IP 40, hysteresis in the stage approx. 1 K, hysteresis between the stages approx. 5 K	II

TR = temperature controller, TW = temperature monitor, TB = temperature limiter

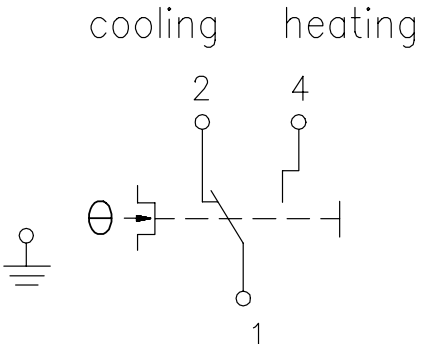
* Control function heating or cooling
** Control function heating or cooling, locked when the temperature is dropping
*** Control function heating or cooling, 1st stage emits a signal 5 K before the switch-off signal
**** Control function heating or cooling, 1st stage emits a signal 5 K before the switch-off signal, locks at dropping temperature (manual reset after temperature rise of approx. 4 K)

Accessories	Item no.	Features	PG
JZ-04	E 6160133	capillary tube leadthrough for air ducts with 30-cm protective hose	II
JZ-05/6 K	C 1809536	1 set of mounting brackets (6 pieces) for frost protection thermostat JTF, made of plastic (max. 145 °C)	II
JZ-05/6 M	C 1809474	1 set of mounting brackets (6 pieces) for frost protection thermostat JTF, made of metal	II
JZ-05/1 M	C 1809462	single mounting bracket for frost protection thermostat JTF, made of metal	II
JZ-07	E 6160145	mounting bracket for frost protection thermostat JTF	II
TH-140	C 1809409	immersion sleeve for JTF-3, JTF-4; material nickel-plated brass	II
NTH-140	C 1809435	immersion sleeve for JTF-3, JTF-4; material V4A (1.4571)	II
SW-200-12	C 1809220	protecting coil for JTF-3, JTF-4 to attach capillary in the air duct; made of nickel-plated steel	II

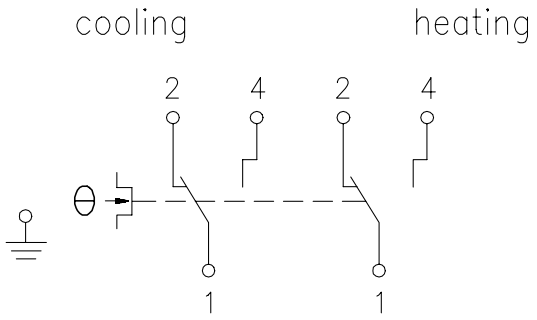
JTF-1/-3/-5



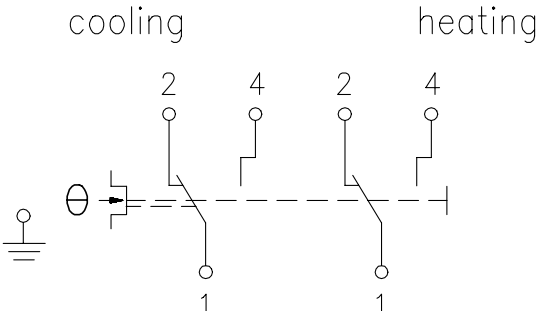
JTF-2/-4/-6



JTF-21/-25

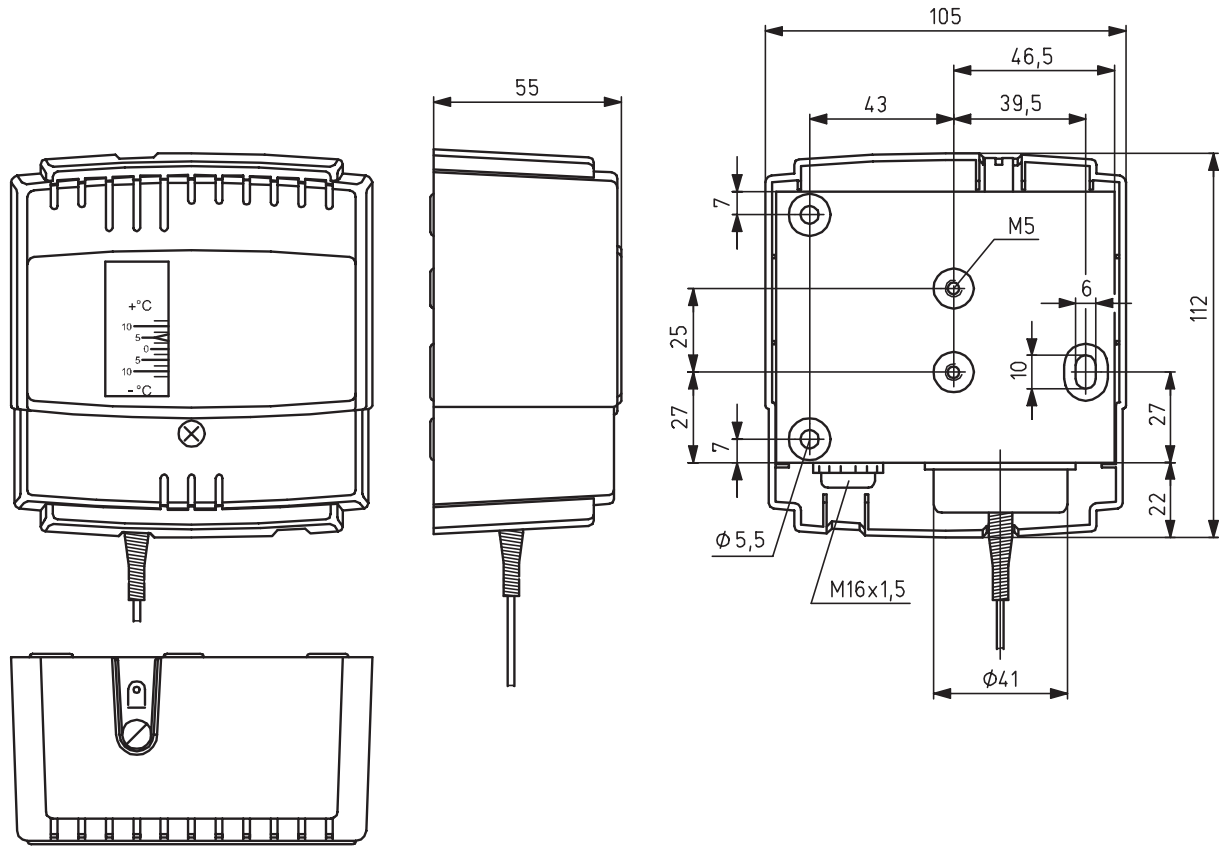


JTF-22

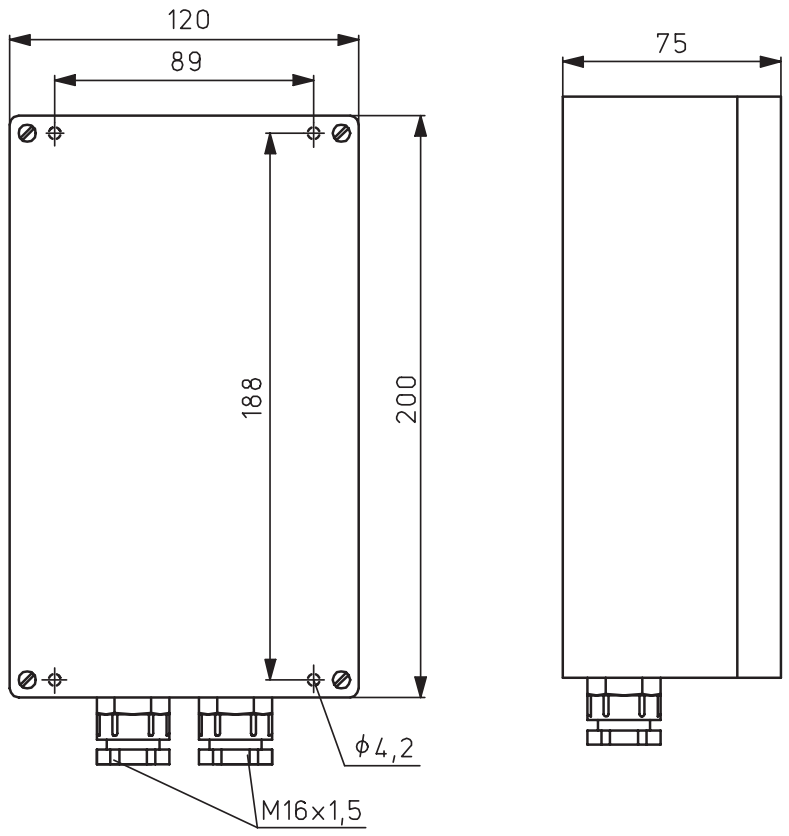


Frost protection thermostat JTF-1 … -25

Capillary system – 1 or 2 stages – **TÜV-tested** – switching



JTF-..W



Frost protection thermostat JTF-101 … -112

Capillary system – 1 stage – switching

Technical data

Housing colour:	grey (lower part like RAL 7016, upper part like RAL 7035)
Sensor material:	Cu
Ambient temperature:	–7 … +55 °C
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Max. sensor temperature	150 °C
Operating voltage:	none
Max. switching current:	15 (8) A
Min. switching current:	150 mA
Max. switching voltage:	230 VAC, 50 Hz
Min. switching voltage:	24 VAC, 50 Hz
Switching element:	microswitch
Switching contact:	toggler, potential-free
Control function:	heating or cooling
Control range:	–8 … +8 °C
Hysteresis:	approx. 1 K
Electrical connection:	screw-type terminals
Mounting / attachment:	wall mounting, controller housing must be fitted in such a way that it is not subjected to any temperature that is less than the scale value that has been set
Protection rating:	IP 54
Protection class:	I
Safety and EMC:	according to DIN EN 60730
Sensor:	gas-filled capillary, active over its entire length
Function type:	TW
General features:	internal setting, intrinsic safety, scale: degrees Celsius

Application

The JTF-1xx is an intrinsically safe frost protection thermostat, designed especially for ensuring air- or water-exposed frost protection of
hot-water heating registers and heat exchangers in ventilation, heating or air conditioning systems.

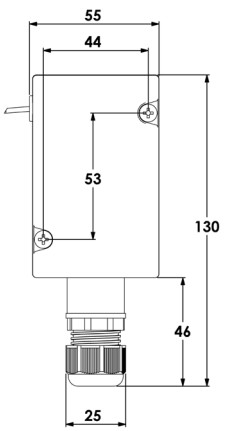
The capillary sensor is active over the entire length. If the ambient temperature falls below the set temperature (factory setting 3 °C) along at least 10% of the entire capillary length (type 105: 0.3 m, type 101: 0.6 m, type 112: 1.2 m), the contacts 1–2 will close. Contacts 1–3 are closed when switched off. The parts of the sensor triggered do not have to be consecutive – only the combined length is decisive. The frost protection monitor automatically switches off if the ambient temperature is higher than the set temperature + switching difference. Type 103 can be used as water-exposed frost protection by means of immersion sleeves. If the sensor breaks, the frost protection will be triggered permanently (contacts 1–2 closed).

Note:
Mounting flanges, immersion sleeves and protecting coils are not part of the delivery scope and must be ordered separately as accessories.

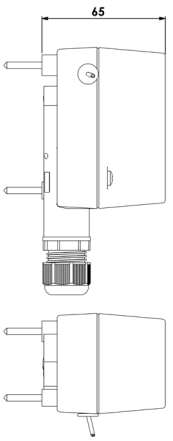
Type	Item no.	Capillary length	Features	PG
JTF-101	JA 044500	6 m	Internal setting	II
JTF-103	JA 044600	1.8 m	sensor dimensions 9.5 x 93 mm, also for water-exposed use	II
JTF-105	JA 044700	3 m	Internal setting	II
JTF-112	JA 044800	12 m	Internal setting	II

Accessories	Item no.	Features	PG
JZ-04	E 6160133	capillary tube leadthrough for air ducts with 30-cm protective hose	II
JZ-05/6 K	C 1809536	1 set of mounting brackets (6 pieces) for frost protection thermostat JTF, made of plastic (max. 145 °C)	II
JZ-05/6 M	C 1809474	1 set of mounting brackets (6 pieces) for frost protection thermostats JTF, made of metal	II
JZ-05/1 M	C 1809462	single mounting bracket for frost protection thermostat JTF, made of metal	II
TH-140	C 1809409	immersion sleeve for JTF-103; material nickel-plated brass	II
NTH-140	C 1809435	immersion sleeves for JTF-103; material V4A (1.4571)	II
SW-200-12	C 1809220	protecting coil for JTF-103 to attach capillary in the air duct; made of nickel-plated steel	II

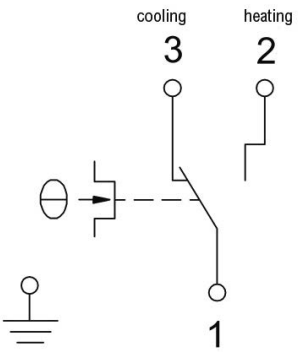
JTF-1xx



JTF-1xx



JTF-1xx



Air heater thermostat JTL-2…-11/JTL-8 NR…-17 NR

Capillary system – 2 functions or 3 functions – **TÜV-tested**

Technical data

Housing colour:	grey
Sensor material:	Cu
Ambient temperature:	–15…+80 °C
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Max. sensor temperature	200 °C
Operating voltage:	none
Max. switching current:	15 (8) A
Min. switching current:	150 mA
Max. switching voltage:	230 VAC, 50 Hz
Min. switching voltage:	24 VAC, 50 Hz
Switching element:	microswitch, toggler, potential-free
Control function:	heating or cooling
Control range ventilator:	20…70 °C
Hysteresis of fan:	adjustable approx. 8…30 K
Electrical connection:	screw-type terminals
Mounting/attachment:	mounting on air duct
Protection rating:	IP 20
Protection class:	I
Safety and EMC:	according to DIN EN 60730
Sensor:	liquid-filled capillary, active over its entire length
General features:	intrinsic safety, protection against cold, internal setting, scale: degrees Celsius
Operating elements:	fan switch

Application

Minimum or maximum thermostat for inflow air monitoring and fan regulation in ventilation and air conditioning systems. Overheating protection thermostat for electrical heat registers and directly fired air heaters with oil and gas operation.

The “MAN – AUTO” switch allows the fan to be used for ventilation in summer.

Type…NR: Temperature-controlled fan regulation, burner monitoring and safety temperature limiter, 3 functions.

Attention: Assemble the device in a vibration-free manner in order to avoid malfunctions and/or sensor rupture.

Type-tested by TÜV according to DIN EN 14597
For hot air heaters in accordance with DIN 4794

DIN Geprüft

Type	Item no.	Control range burner	Hysteresis of burner (approx.)	Capillary length	Features	PG
JTL-2	E 6110013	70…100 °C	8 K	350 mm	TW	II
JTL-8	E 6110049	70…100 °C	external reset	350 mm	STB, locked when the temperature is rising, overheating protection	II
JTL-11	E 6110064	70…100 °C	8 K	1250 mm	TW	II
JTL-8 NR	E 6120038	70…95 °C	8 K	350 mm	locked when the temperature is rising, TW/STB, tolerances: STB +0/–10 K, overheating protection, external reset STB, shut-off temperature STB fixed: 100 °C	II
JTL-17 NR	E 6120077	70…95 °C	8 K	1,250 mm	locked when the temperature is rising, TW/STB, tolerances: STB +0/–10 K, overheating protection, external reset STB, shut-off temperature STB fixed: 100 °C	II

* TW = temperature monitor, STB = safety temperature limiter

JTL-4 is replaced by JTL-8.
JTL-4 NR is replaced by JTL-8 NR.

Intrinsic safety/protection against cold: The devices are intrinsically safe, i.e., upon loss of the sensor medium owing to sensor rupture, for example, the burner is switched off. Since minus temperatures generate the same effect through volume reduction of the sensor medium, the devices are adjusted by means of the “cold screw” such that they switch off the burner only at temperatures below –15 °C. They can only be switched on again manually at temperatures above approx. –5 °C by means of the manual reset button.

Overheating protection: This device provides protection from uncontrolled overheating, which is caused, for example, by heat building up or by creeping capillary filling losses when there is invisible damage to the sensor or the capillary tube etc. Upon reaching a temperature of 220 °C, the safety slot in the sensor melts and, in reaction to losing the filling medium, the device switches off the burner towards the safe side. The burner cannot be switched on again. The device is then unusable and serves as evidence of the presence of an over-temperature of at least 220 °C.

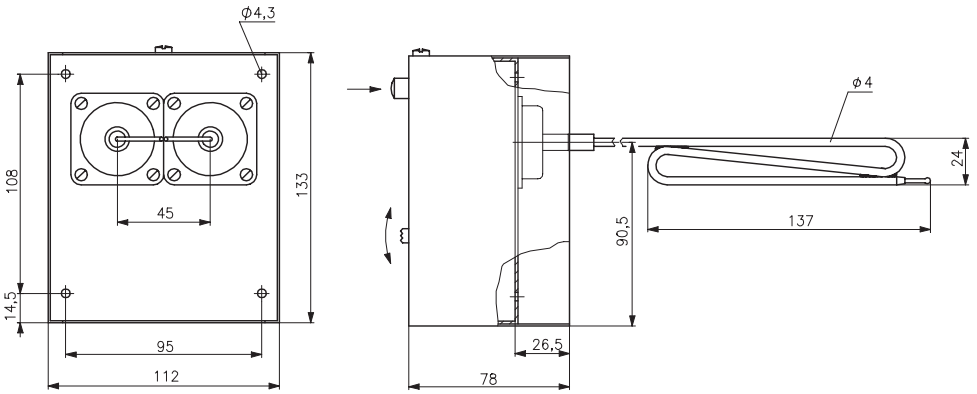
Air heater thermostat JTL-2…-11/JTL-8 NR…-17 NR

Capillary system – 2 functions or 3 functions – **TÜV-tested**

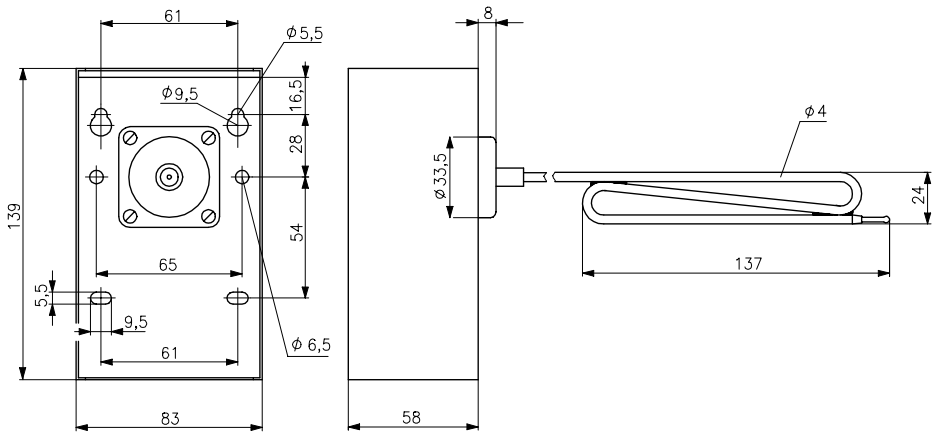
JTL-17 NR

JTL-2

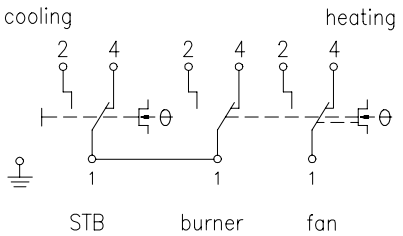
JTL-..NR



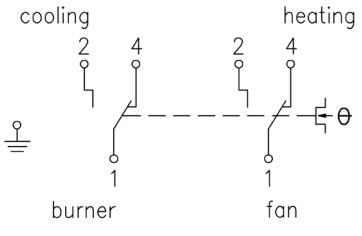
JTL-..



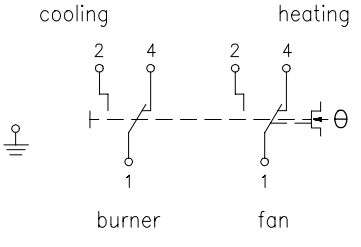
JTL-..NR



JTL..(TW)



JTL-.(STB)



Duct thermostat JTU-1 … -50

Capillary system – **TÜV-tested**

Technical data

Housing colour:	grey
Sensor material:	Cu
Ambient temperature:	–15 … +80 °C
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Max. sensor temperature	200 °C
Operating voltage:	none
Max. switching current:	15 (8) A
Min. switching current:	150 mA
Max. switching voltage:	230 VAC, 50 Hz
Min. switching voltage:	24 VAC, 50 Hz
Switching element:	microswitch
Switching contact:	toggler, potential-free
Electrical connection:	screw-type terminals
Mounting / attachment:	mounting on air duct
Protection rating:	IP 40
Protection class:	I
Safety and EMC:	according to DIN EN 60730
Sensor:	liquid-filled capillary, active over its entire length
General features:	internal setting, scale: degrees Celsius

Application

Minimum or maximum thermostat for inflow air monitoring and fan regulation in ventilation and air conditioning systems.

Overheating protection thermostat for electrical heat registers and directly fired air heaters with oil and gas operation.

Attention: Assemble the device in a vibration-free manner in order to avoid malfunctions and / or sensor rupture.

JTU-1, JTU-20, JTU-50:
Type testing by TÜV in accordance with DIN EN 14597,
for hot air heaters in accordance with DIN 4794

Type	Item no.	Control range	Hysteresis (approx.)	Capillary length	Features	PG
JTU-50	E 6100000	–25 … +65 °C	1.5 K	350 mm	Control function: heating or cooling, TW	II
JTU-1	E 6100012	20 … 100 °C	8 … 30 K adjustable	350 mm	Control function: heating or cooling, TW, intrinsic safety, protection against cold	II
JTU-3	E 6100036	20 … 100 °C	external reset	350 mm	Control function: heating or cooling, locked when the temperature is rising, STB, intrinsic safety, protection against cold, overheating protection	II
JTU-20	E 6100075	20 … 100 °C	external reset	1250 mm	Control function: heating or cooling, locked when the temperature is rising, STB, intrinsic safety, protection against cold	II
JTU-5	E 6100048	60 … 140 °C	8 … 30 K adjustable	350 mm	Control function: heating or cooling, TW	II
JTU-6	E 6100051	60 … 140 °C	external reset	350 mm	Control function: heating or cooling, locked when the temperature is rising, TB	II

TW = temperature monitor, STB = safety temperature limiter, TB = temperature limiter

JTU-2 is replaced by JTU-3.

Intrinsic safety / protection against cold: The devices are intrinsically safe, i.e., upon loss of the sensor medium owing to sensor rupture, for example, the burner is switched off. Since minus temperatures generate the same effect through volume reduction of the sensor medium, the devices are adjusted by means of the “cold screw” such that they switch off the burner only at temperatures below –15 °C. They can only be switched on again manually at temperatures above approx. –5 °C by means of the manual reset button.

Overheating protection: This device provides protection from uncontrolled overheating, which is caused, for example, by a heat build-up or by creeping capillary filling losses when there is invisible damage to the sensor or the capillary tube etc. Upon reaching a temperature of 220 °C, the safety slot in the sensor melts and, in reaction to losing the filling medium, the device switches off the burner towards the safe side. The burner cannot be switched on again. The device is then unusable and serves as evidence of the presence of an over-temperature of at least 220 °C.

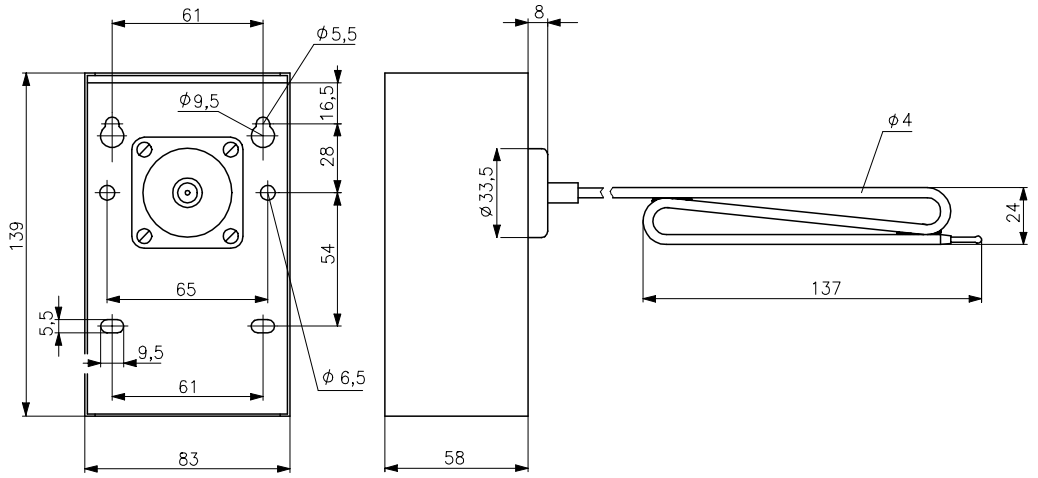
JTU-20

JTU-3

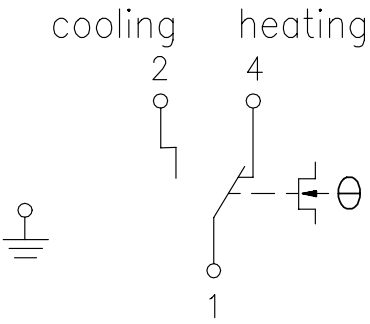
Duct thermostat JTU-1 … -50

Capillary system – **TÜV-tested**

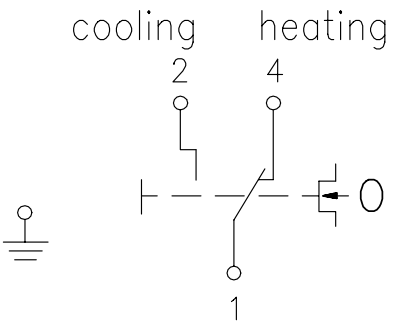
JTU-20



JTU-20



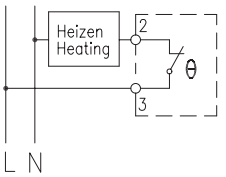
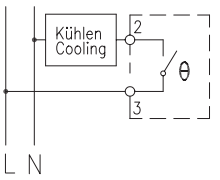
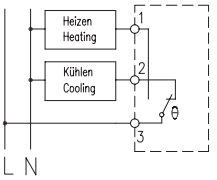
JTU-3



Control cabinet thermostats

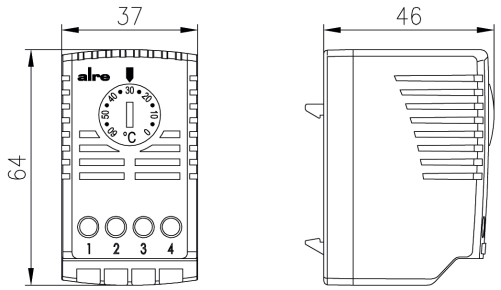
mechanical, bimetal

Technical data		Application
Housing colour:	grey, like RAL 7035	Application scenarios include temperature monitoring in control cabinets, machines and housings.
Ambient temperature:	0…60 °C	
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing	
Max. switching voltage:	230 VAC/50 Hz, 48 VDC	
Min. switching voltage:	24 VAC/50 Hz, 24 VDC	
Min. switching current:	The resistance of the contact transition results in a voltage drop across the contact. This can have a strong influence on very small switching signals.	
Switching element:	bimetallic contact	
Hysteresis:	approx. 4…7 K at a temperature change of max. 4 K/h	
Electrical connection:	screw-type terminals 0.5 mm² up to 2.5 mm²	
Mounting/attachment:	on supporting rails (35 mm) according to EN 60715	
Protection rating:	IP 30	
Protection class:	0, determined by the assembly location	
Safety and EMC:	according to DIN EN 60730	
Sensor:	bimetal	
Function type:	TR (temperature controller)	
General features:	external setting, scale: degrees Celsius, snap-lock control button	
Test mark/Approbation:	UL, VDE	

Type/image	Item no.	Features	Circuit diagram	PG
RTBSS-110.250/04 	ZN 111524	Max. switching current: 10 (2) A/VAC, max. 30 W / VDC Switching contact: NC contact Control function: heating Control range: 0…60 °C scale red		II
RTBSS-111.250/05 	ZN 112525	Max. switching current: 10 (2) A/VAC, max. 30 W / VDC Switching contact: NO contact Control function: cooling Control range: 0…60 °C scale blue		II
RTBSS-112.250/07 	ZN 113527	Max. switching current: NC contact 10 (2) A / VAC, max. 30 W / VDC NO contact 5 (2) A / VAC, max. 30 W / VDC Switching contact: changeover Control function: heating or cooling Control range: 0…60 °C scale grey		II

Accessories	Item no.	Features	PG
JZ-13	ZA 990001	standard rail with drilled holes for fastening control cabinet controllers (length 40 mm)	II

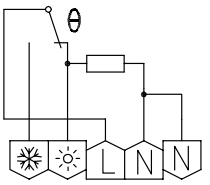
RTBSS



Control cabinet thermostats

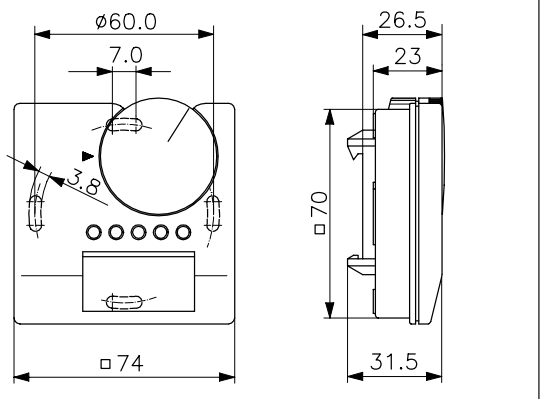
mechanical, bimetal

Technical data		Application
Ambient temperature:	0…60 °C Application scenarios include temperature monitoring in control cabinets, machines and housings	Application scenarios include temperature monitoring in control cabinets, machines and housings.
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing	
Housing colour:	grey	
Operating voltage:	230 VAC, 50 Hz	
Average power consumption:	< 0.5 W	
Max. switching current:	NC contact 10 (4) A, NO contact 5 (2) A	
Max. switching voltage:	230 VAC, 50 Hz	
Min. switching voltage:	230 VAC, 50 Hz	
Switching contact:	changeover	
Control function:	heating or cooling	
Control range:	10…60 °C	
Hysteresis:	approx. 2 K at a temperature change of max. 4 K/h	
Electrical connection:	screw-type terminals	
Mounting/attachment:	on supporting rails (35 mm) according to EN 60715	
Protection rating:	IP 30	
Protection class:	0, determined by the assembly location	
Safety and EMC:	according to DIN EN 60730	
Sensor:	bimetal	
Function type:	TR (temperature controller)	
General features:	internal setting, scale: degrees Celsius, mechanical range setting	

Type/image	Item no.	Features	Circuit diagram	PG
PTR 01.082 	A 201302			II

Accessories	Item no.	Features	PG
JZ-13	ZA 990001	standard rail with drilled holes for fastening control cabinet controllers (length 40 mm)	II

PTR



Control cabinet hygrostats

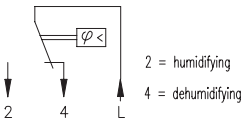
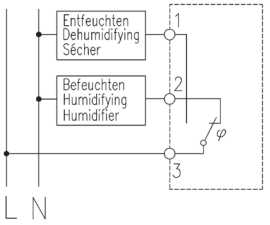
with changeover contact

Technical data

Housing colour:	grey, like RAL 7035
Operating voltage:	none
Max. switching current:	De-humidifying: 5 (0.2) A, Humidifying: 2 (0,2) A
Min. switching current:	100 mA at 24 VAC
Max. switching voltage:	230 VAC, 50 Hz (> 24 V only in dry surroundings)
Min. switching voltage:	24 VAC, 50 Hz
Switching element:	microswitch
Switching contact:	changeover
Control function:	humidifying or de-humidifying
Mounting / attachment:	on supporting rails (35 mm) according to EN 60715
Protection rating:	IP 30
Protection class:	0, determined by the assembly location
Safety and EMC:	according to DIN EN 60730
Sensor:	plastic fibres
Function type:	controller
General features:	external setting

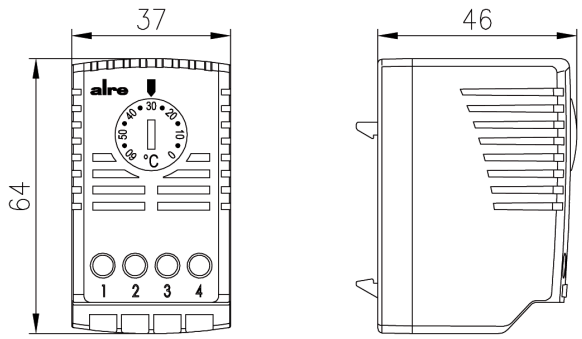
Application

Hygrostat for monitoring and controlling humidity in control cabinets and machines

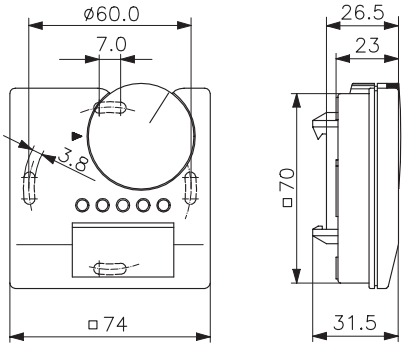
Type / image	Item no.	Features	Circuit diagram	PG
PHY 60.082 	A 261004	Ambient temperature: 10…60 °C Permissible atmospheric humidity: non-condensing Control range: 30…100% rel. humidity Hysteresis: approx. 4% rel. humidity Tolerances: +/- 3% rel. humidity at 50% rel. humidity Electrical connection: screw-type terminals mechanical range setting		II
RF-HSS-114.110/01 	ZN 275001	Ambient temperature: 0…60 °C Admissible humidity: max. 95% rel. humidity, non-condensing Control range: 40…90 % rel. humidity Hysteresis: approx. 5% rel. humidity Electrical connection: screw-type terminals 0.5 mm² to 2.5 mm² Test mark / Approbation: UL for 230 VAC snap-in turning knob		II

Accessories	Item no.	Features	PG
JZ-13	ZA 990001	standard rail with drilled holes for fastening control cabinet controllers (length 40 mm)	II

RFHSS



PHY



Controller for distributor assembly (DIN top hat rail) ITR 79

remote sensor, electronic

Technical data

Housing colour:	grey, like RAL 7035
Ambient temperature:	–10…+40 °C
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Operating voltage:	230 VAC, 50 Hz
Max. switching current:	NO contact: 10 (2) A, NC contact: 5 (1.5) A
Min. switching current:	The resistance of the contact transition results in a voltage drop across the contact. This can have a strong influence on very small switching signals.
Max. switching voltage:	230 VAC, 50 Hz
Min. switching voltage:	5 VAC, 50 Hz
Switching element:	relay
Switching contact:	toggler, potential-free
Electrical connection:	screw-type terminals up to 2.5 mm²
Mounting / attachment:	on supporting rails (35 mm) according to EN 60715
Protection rating:	IP 20
Protection class:	II
Safety and EMC:	according to DIN EN 60730
Function type:	TR (temperature controller)
General features:	external setting

Application

Control and monitoring of the temperature in large halls, greenhouses and floor heating systems. The devices have sensor rupture and sensor short-circuit protection.

Sensors are not a part of the delivery scope
(except for ITR 79.804, ITR 79.811)
For available sensors, see the “Sensors” section.

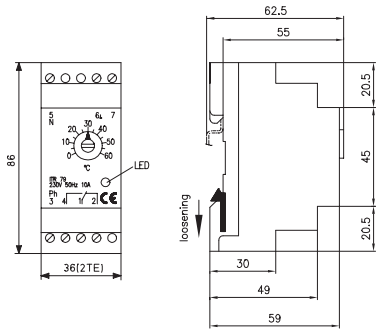
Sensor use according to the specified sensor number (for example, sensor number 24 or 4: All the sensors with this number can be used, e.g., HF-4, LF-24). Avoid parallel routing of sensor wires together with mains voltage-bearing wires ore use shielded wires.

Type	Item no.	Control range	Features	PG
ITR 79.402	D 4780167	–35…+15 °C	Control function: heating, hysteresis adjustable: approx. 0.5…5 K, sensor: NTC 1 K (sensor 1/21), scale: degrees Celsius, display “heating” red	II
ITR 79.404	D 4780155	0…60 °C	Control function: heating, hysteresis adjustable: approx. 0.5…5 K, sensor: NTC 10 K (sensor 4/24), scale: degrees Celsius, display “heating” red	II
ITR 79.405	D 4780181	35…95 °C	Control function: heating, hysteresis adjustable: approx. 0.5…5 K, sensor: NTC 50 K (sensor 5/25), scale: degrees Celsius, display “heating” red	II
ITR 79.406	D 4780205	70…130 °C	Control function: heating, hysteresis adjustable: approx. 0.5…5 K, sensor: NTC 100 K (sensor 6), scale: degrees Celsius, display “heating” red	II
ITR 79.408	D 4780179	–10…+40 °C	Control function: heating, hysteresis adjustable: approx. 0.5…5 K, sensor: NTC 8 K (sensor 3/23), scale: degrees Celsius, display “heating” red	II
ITR 79.503	D 4780524	0…11 °C	Control function: heating, frost protection locked when the temperature is dropping, hysteresis approx. 1.5 K, sensor: NTC 2 K 25 (sensor 0/20), scale: degrees Celsius, display “heating” red	II
ITR 79.504	D 4780371	0…60 °C	Control function: cooling, hysteresis adjustable: approx. 0.5…5 K, sensor: NTC 10 K (sensor 4/24), scale: degrees Celsius, display “cooling” green	II
ITR 79.508	D 4780369	–10…+40 °C	Control function: cooling, hysteresis adjustable: approx. 0.5…5 K, sensor: NTC 8 K (sensor 3/23), scale: degrees Celsius, display “cooling” green	II
Two setpoint adjusters (e.g. day / night temperature via external clock)				**PG**
ITR 79.600	D 4780508	**2** x 5…30 °C	Control function: heating, hysteresis: approx. 0.5 K, sensor: NTC 47 K (sensor 2), ECO contact: toggling between setpoint value 1 and setpoint value 2, scale: degrees Celsius	II
Complete device including remote sensor HF-8/4-K2 (4-m cable)				**PG**
ITR 79.804	D 4780545	0…60 °C	Control function: heating, hysteresis adjustable: approx. 0.5…5 K, sensor: NTC 2 K (sensor 8), multi-digit scale 0…6, display “heating” red	II
ITR 79.811	D 4780559	–15…+15 °C	Control function: heating, hysteresis adjustable: approx. 0.5…5 K, sensor: NTC 2 K (sensor 8), scale: degrees Celsius, display “heating” red	II

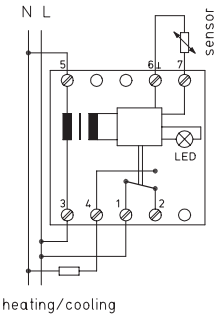
Controller for distributor assembly (DIN top hat rail) ITR 79

remote sensor, electronic

ITR 79.4.../.5.../.8...



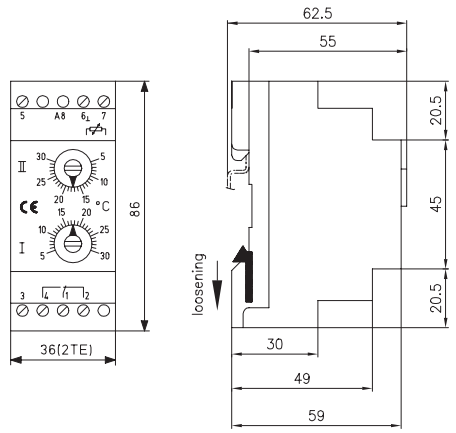
ITR 79.4.../.5.../.8...



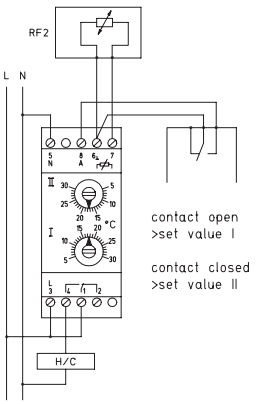
Accessories	Item no.	Features	PG
JZ-13	ZA 990001	standard rail with drilled holes for fastening control cabinet controllers (length 40 mm)	II

ITR 79.804

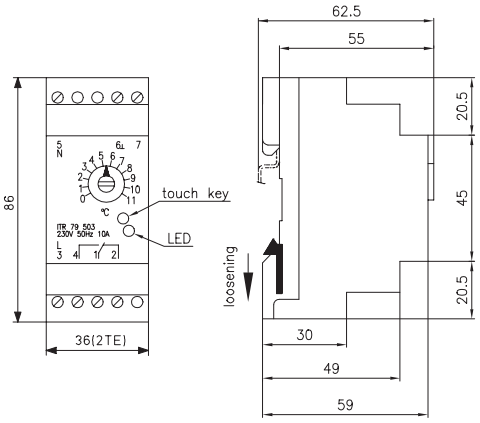
ITR 79.6



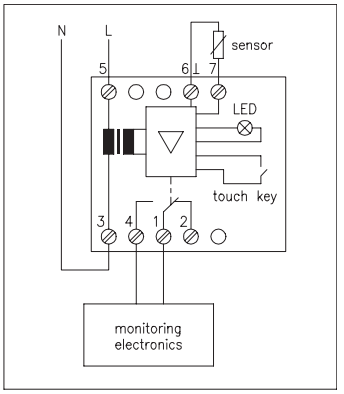
ITR 79.6



ITR 79.503



ITR 79.503



Universal controller ETR 74

remote sensor, electronic, with digital display, 1-/2-stage

Technical data

Housing colour:	grey
Ambient temperature:	0…45 °C
Permissible atmospheric humidity:	max. 95% relative humidity non-condensing
Operating voltage:	230 VAC, 50 Hz
Max. switching current:	10 (4) A
Max. switching voltage:	230 VAC, 50 Hz
Switching element:	relay
Switching contact:	toggler, potential-free
Control range:	0…50 °C
Display type:	7-segment, 3-digit (for actual temperature)
Electrical connection:	screw-type terminals
Mounting/attachment:	wall mounting
Protection rating:	IP 54
Protection class:	II
Safety and EMC:	according to DIN EN 60730
Sensor:	KTY 11-7 (sensor 57)
Function type:	TR (temperature controller)
General features:	external setting, scale: degrees Celsius, operating mode heating/cooling switchable by means of internal jumper, “heating/cooling” display

Application

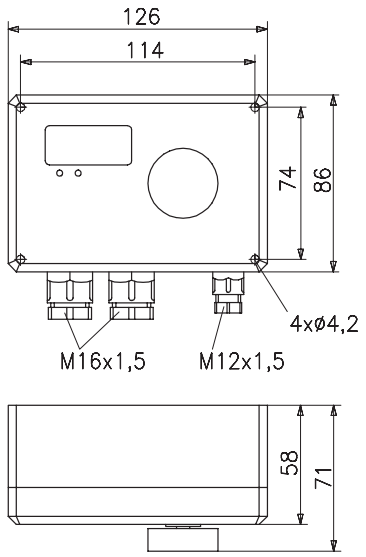
For controlling and/or monitoring the temperatures of liquid or gaseous media with digital actual value display. Suitable for surface-mounting in humid rooms, as a remote controller in industrial and agricultural applications.

Sensors are not a part of the delivery scope
For available sensors, see below or the “Sensors” section.

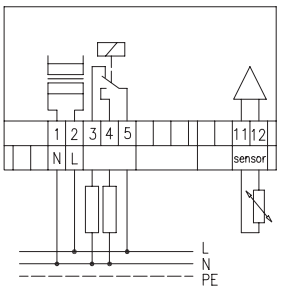
Note: The sensor line is to be routed in a protective duct. Parallel routing together with lines that carry AC voltage is not permissible.

Type	Item no.	Features	PG
ETR 74.1	G 8000272	Control function: heating or cooling, hysteresis: adjustable 0.1…2.5 K	III
ETR 74.2	G 8000273	Control function: heating or cooling 2-stage, hysteresis in the stage: adjustable 0.1…2.5 K hysteresis between the stages: adjustable 1…5 K	III

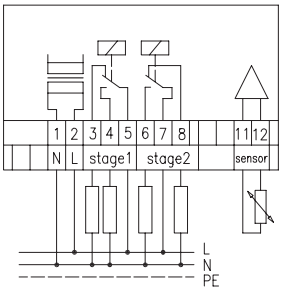
ETR 74



ETR 74.1



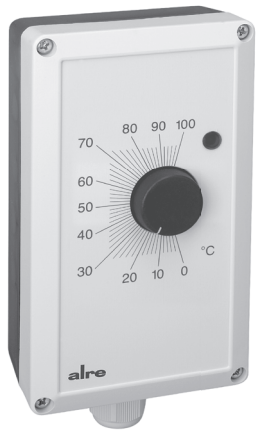
ETR 74.2



Accessories	Item no.	Features	PG
AF-57	G 9040681	external temperature sensor	III
BTF2-Y11/7-0000	SA 140018	room temperature sensor, surface-mounted	III
FUFY-11/7-0000	SN 090202	room temperature controller, flush-mounted, matt	III
HF-57	D 4771286	sleeve temperature sensor with 1.5-m PE cable	III

Universal controller ETR 77

remote sensor, electronic



Technical data

Housing colour:	grey (lower part like RAL 7016, upper part like RAL 7035)
Ambient temperature:	–20 … +50 °C
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Operating voltage:	230 VAC, 50 Hz
Max. switching current:	NO contact: 10 (3) A (heating), NC contact: 5 (1.5) A (cooling)
Max. switching voltage:	230 VAC, 50 Hz
Switching element:	relay
Switching contact:	toggler, potential-free
Control function:	heating or cooling
Electrical connection:	screw-type terminals
Mounting / attachment:	wall mounting
Protection class:	II
Sensor:	KTY 81-121 (sensor 51)

Application

Thanks to various sensor models suitable for universal use in heating, ventilation, air-conditioning and refrigeration technology as well as in mechanical and plant engineering. The heating state is indicated by a red LED.

Sensors are not a part of the delivery scope
For available sensors, see below or the “Sensors” section.

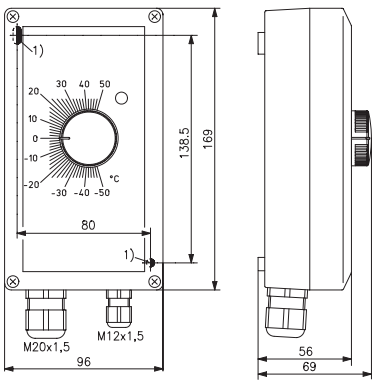
Note: The sensor line is to be routed in a protective duct. Parallel routing together with lines that carry AC voltage is not permissible.

Safety and EMC: according to DIN EN 60730

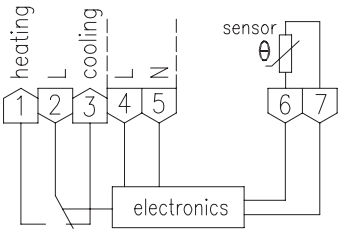
Type	Item no.	Control range	Features	Hysteresis adjustable	PG
ETR 77.008-5	D 4770014	–50 … +50 °C	IP 65, TW, internal setting, scale: degrees Celsius	0.5 … 5 K	II
ETR 77.108-5	D 4770040	–50 … +50 °C	IP 54, TR, external setting, scale: degrees Celsius	0.5 … 5 K	II
ETR 77.009-5	D 4770026	0 … 100 °C	IP 65, TW, internal setting, scale: degrees Celsius	0.5 … 5 K	II
ETR 77.109-5	D 4770053	0 … 100 °C	IP 54, TR, external setting, scale: degrees Celsius	0.5 … 5 K	II
ETR 77.109-15	D 4770089	0 … 100 °C	IP 54, TR, external setting, scale: degrees Celsius	5 … 15 K	II

TR = temperature controller, TW = temperature monitor

ETR 77



ETR 77



Accessories	Item no.	Features	PG
AF-51	G 9040420	external temperature sensor	III
ALF-51	G 9050210	contact temperature sensor	III
BTF2-Y81 / 121-0000	SA 140017	room temperature sensor, surface-mounted	III
FUFY-81 / 121-0000	SN 090201	room temperature controller, flush-mounted, matt	III
GFL-51	G 9060070	assembly-type duct sensor	III
HF-51	D 4779429	sleeve temperature sensor with 1.5-m silicone cable	III
HF-51 / 6	D 4779746	sleeve temperature sensor with 6-m silicone cable	III
LF-51	D 4771149	air temperature sensor with 1.5-m PE cable	III
LF-51 / 6	D 4771159	sleeve temperature sensor with 6-m PE cable	III
STF-51	SN 080500	radiation temperature sensor	III

Digital temperature display JDI-0/-08

DIN rack

Technical data

Housing colour:	black
Ambient temperature:	–20…+50 °C
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Operating voltage:	230 VAC, 50 Hz
Control function:	none
Display type:	7-segment, 3-digit excluding decimal place
Electrical connection:	screw-type terminals up to 2.5 mm²
Mounting/attachment:	assembly in front panels, control cabinet and distributor doors, etc.
Protection rating:	IP 20 front-side
Protection class:	II
Safety and EMC:	according to DIN EN 60730
Function type:	display
Display range:	–40…+120 °C

Application

Usable as a thermometer in conjunction with remote sensors.

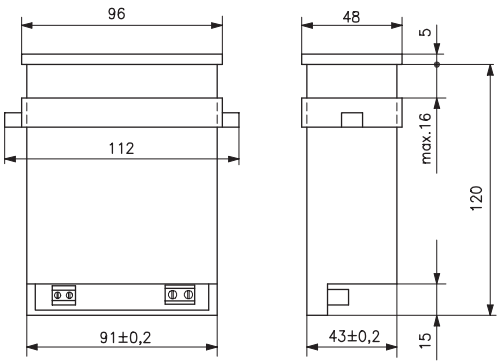
Sensors are not a part of the delivery scope
For available sensors, see the “Sensors” section.

All sensors with the number 51 can be used, (e.g., HF-51, LF-51).

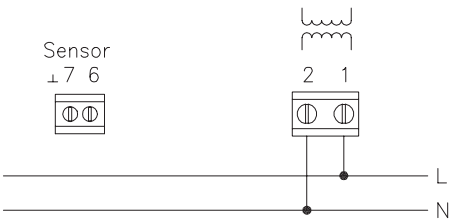
Note: The sensor line is to be routed in a protective duct. Parallel routing together with lines that carry AC voltage is not permissible.

Type	Item no.	Features	PG
JDI-0	D 4780306	Sensor: KTY 81-121 (sensor 51), operating elements: zero equalisation function	II
JDI-08	D 4780395	sensor: up to 8 KTY 81-121 (sensor 51), operating elements: 8-stage rotary switch for measurement point selection	II

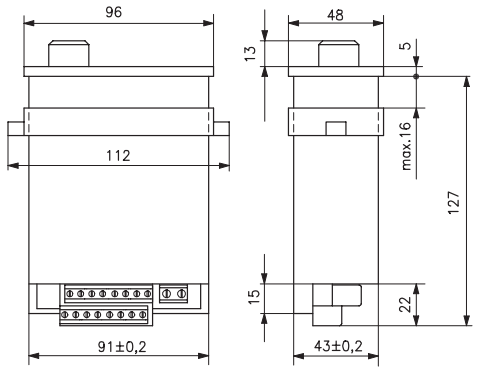
JDI-0



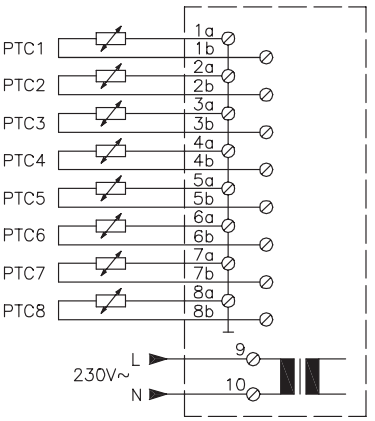
JDI-0



JDI-08



JDI-08



Digital controllers ITR 71 / JDI-1 / -10

Temperature setting via “rotary knob” / temperature setting via “potentiometer”
DIN rack

Technical data

Housing colour:	black
Ambient temperature:	– 20 … + 50 °C
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Operating voltage:	230 VAC, 50 Hz
Max. switching current:	10 (3) A
Max. switching voltage:	230 VAC, 50 Hz
Switching element:	relay
Switching contact:	toggler, potential-free
Control function:	heating or cooling
Hysteresis adjustable:	0.5 … 5 K
Electrical connection:	screw-type terminals up to 2.5 mm²
Mounting / attachment:	assembly in front panels, control cabinet and distributor doors, etc.
Protection rating:	IP 20 front-side
Protection class:	II
Safety and EMC:	according to DIN EN 60730
Sensor:	KTY 81-121 (sensor 51)
Function type:	TR (temperature controller)
General features:	external setting, “heating” display, external setting, switching status display, heating / cooling jumper, “zero equalisation” potentiometer

Application

For controlling or monitoring the temperature of liquid or gaseous media.

Sensors are not a part of the delivery scope
For available sensors, see the “Sensors” section.

Sensor application according to the specified sensor number (all sensors with the number 51 can be used, e.g., HF-51, LF-51).

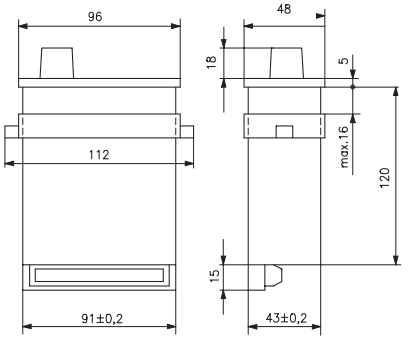
Note: Make sure the sensor line is routed in the protective duct. Parallel routing together with lines that carry alternating currents is not admissible.

Type	Item no.	Control range	Display	PG
ITR 71.050	D 4710018	– 40 … + 50 °C	Display type: 7-segment, 3-digit excluding decimal place, scale: degrees Celsius	II
ITR 71.100	D 4710006	0 … 100 °C	Display type: 7-segment, 3-digit excluding decimal place, scale: degrees Celsius	II
ITR 71.125	D 4710020	40 … 125 °C	Display type: 7-segment, 3-digit excluding decimal place, scale: degrees Celsius	II

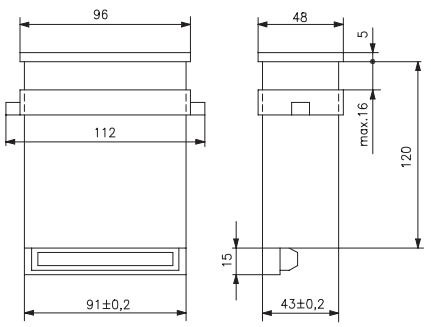
Type	Item no.	Control range	Display	PG
JDI-1	D 4780318	– 40 … + 120 °C	Display type: 7-segment, 3-digit excluding decimal place	II
JDI-10	D 4780539	– 40 … + 120 °C	Display type: 7-segment, 4-digit with decimal place	II

JDI-1

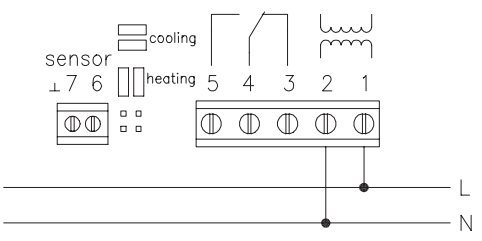
ITR-71



JDI-1 / -10

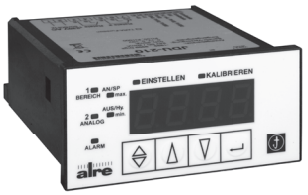


ITR 71 … + JDI-1 / -10



Microprocessor controller JDI-22

For PT-100 sensors
DIN rack



Technical data

Housing colour:	black, front side white
Ambient temperature:	– 20 … + 50 °C
Permissible atmospheric humidity:	max. 80% rel. humidity, non-condensing
Operating voltage:	230 VAC, 50 Hz
Max. switching current:	Changeover contact: 10 (2) A, NO contact: 5 (1) A
Max. switching voltage:	230 VAC, 50 Hz
Min. switching voltage:	24 VAC, 50 Hz
Switching element:	relay
Switching contact:	1x toggler, 1x NO contact, potential-free
Control function:	heating and/or cooling, 2-stage heating, 2-stage cooling
Control range:	– 50 … + 200 °C
Hysteresis adjustable:	freely programmable
Display type:	7-segment, 4-digit with decimal place
Electrical connection:	screw-type terminals, push-type terminals up to 1.5 mm²
Mounting/attachment:	assembly in front panels, control cabinet and distributor doors, etc.
Protection rating:	IP 54 front-side
Protection class:	II front-side
Safety and EMC:	according to DIN EN 60730
Sensor:	PT 100 (2-/3-conductor)
Function type:	2-/3-point controller
General features:	external setting, operation using direct-dial buttons, digital actual value display, digital target value display
Accuracy:	< 0.3% FS +/- 1 digit at 25 °C
Measurement rate:	approx. 4 measurements/s
Resolution:	0.1 °C

Application

2-/3-point controller for controlling and/or monitoring the temperatures of liquid or gaseous media, with decimal place, digital setpoint/actual value display for front panel integration. As a digital remote controller for use in the industrial, agricultural and in mechanical/plant engineering sectors.

Sensors are not a part of the delivery scope
For available sensors, see the “Sensors” section.

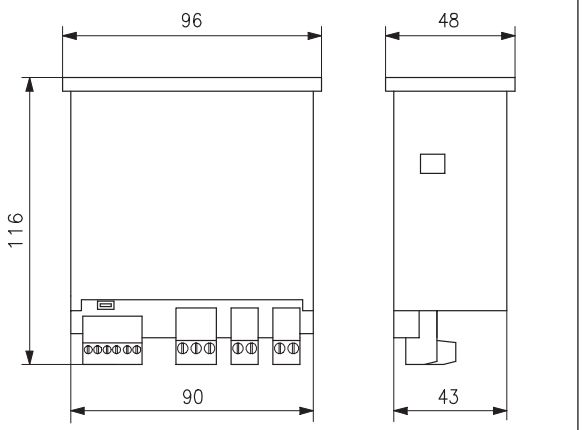
Note: The sensor line is to be routed in a protective duct. Parallel routing together with lines that carry AC voltage is not permissible.

Relay pin assignment:
Relay 1: terminal 3 – input
terminal 4 – NO contact
Relay 2: terminal 5 – input
terminal 6 – NO contact
terminal 7 – NC contact

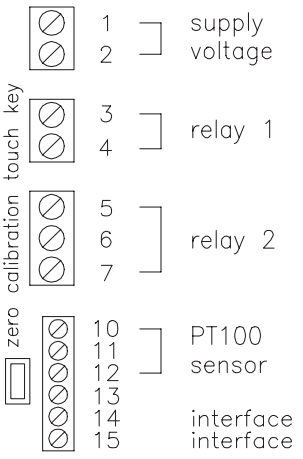
Replacement for old types JDI-2/JDI-21

Type	Item no.	PG
JDI-22	G 8000398	III

JDI-22

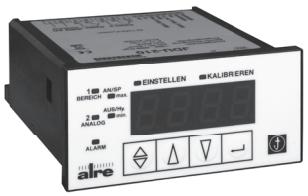


JDI-22



Microprocessor controller JDU-210

For PT-100/PT-1000 sensors and transducers
DIN rack



Technical data

Housing colour:	black, front side
Ambient temperature:	–20…+50 °C
Permissible atmospheric humidity:	max. 80% rel. humidity, non-condensing
Operating voltage:	230 VAC, 50 Hz
Max. switching current:	Changeover contact: 10 (2) A, NO contact: 5 (1) A
Max. switching voltage:	230 VAC, 50 Hz
Min. switching voltage:	24 VAC, 50 Hz
Switching element:	relay
Switching contact:	1x toggler, 1x NO contact, potential-free
Control function:	outputs freely programmable in connection with the measurement value
Control range:	–50.0…+200.0 °C, –200…+850 °C, –1999…+9999 digit
Hysteresis:	freely programmable
Display type:	7-segment, 4-digits, with decimal display
Electrical connection:	screw-type terminals, push-type terminals up to 1.5 mm²
Mounting/attachment:	assembly in front panels, control cabinet and distributor doors, etc.
Protection rating:	IP 54 front-side
Protection class:	II front-side
Safety and EMC:	according to DIN EN 60730
Sensor:	PT 100 (2-/3-conductor), PT 1000 (2-conductor), measuring transducer (0–1 V, 0–10 V, 0–20 mA, 4–20 mA)
Function type:	2-/3-point controller, 2-point controller with alarm
General features:	external setting, operation using direct-dial buttons

Application

2-/3-point controller for controlling and/or monitoring the temperatures of liquid or gaseous media, with decimal place, digital setpoint/actual value display for front panel integration. As a digital remote controller for use in the industrial, agricultural and in mechanical/plant engineering sectors.
Our transducers can be used with standardised signals for the JDU-210 controller. The physical size is determined by the transducer.

Sensors and transducers are not a part of the delivery scope.
For available sensors or measuring transducers, see the “Sensors” section.

Note: The sensor line is to be routed in a protective duct. Parallel routing together with lines that carry AC voltage is not permissible.

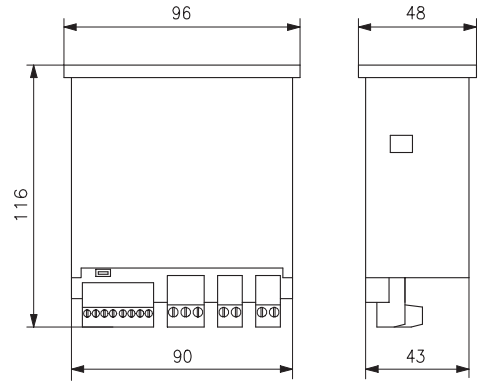
Relay pin assignment:
Relay 1: terminal 3–input
terminal 4–NO contact
Relay 2: terminal 5–input
terminal 6–NO contact
terminal 7–NC contact

Replacement for old types:
JDI-210/JDR 1/JDR-210

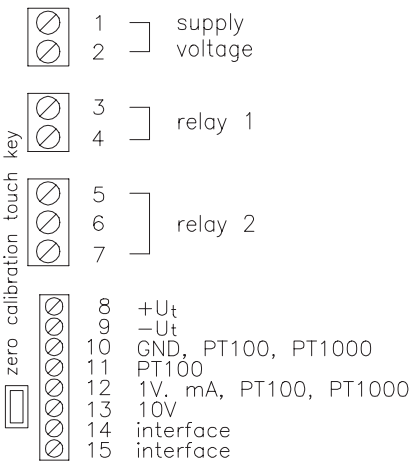
Accuracy:
PT 100/PT 1000: < 0.3% FS
+/- 1 digit at 25 °C, standard signal: < 0.2% FS
+/- 1 digit at 25 °C
Measurement rate:
PT: approx. 4 measurements/s
Standard signal: approx. 100 measurements/s
Resolution: 0.1 °C at –50.0…+200.0 °C,
1.0 °C at–200…+850 °C
Transducer power supply:
24 VDC +/- 5% max. 20 mA,
galvanically isolated

Type	Item no.	PG
JDU-210	G 8000399	III

JDU-210



JDU-210



Differential temperature controller ETR 78

remote sensor, electronic

Technical data

Housing colour:	grey (lower part like RAL 7016, upper part like RAL 7035)
Ambient temperature:	–20…0 °C
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Operating voltage:	230 VAC, 50 Hz
Max. switching current:	10 (3) A
Max. switching voltage:	230 VAC, 50 Hz
Switching element:	relay
Switching contact:	toggler, potential-free
Control function:	heating or cooling
Setting range Δ T:	1…20 °C
Hysteresis adjustable:	0.1…2 K
Electrical connection:	screw-type terminals
Mounting/attachment:	wall-mounting, position-independent
Protection rating:	IP 64
Protection class:	II
Safety and EMC:	according to DIN EN 60730
Function type:	TW (temperature monitor)
General features:	Internal setting

Application

Capture of the temperature difference between 2 independent NTC sensors. Predominant use in solar heating systems for activating the circulating pump; also for controlling heating and raw water pumps, valves or heat pumps based on a temperature difference.

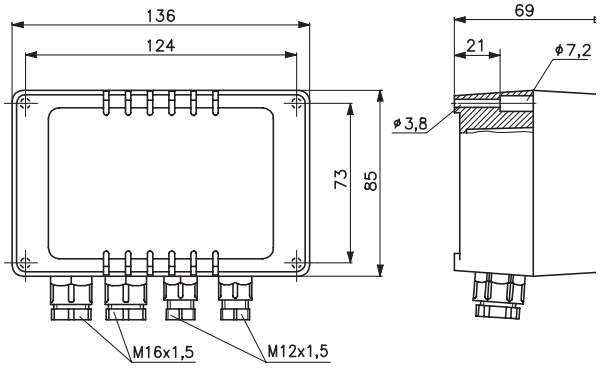
Sensors are not a part of the delivery scope. For available sensors, see the “Sensors” section.

Sensor application according to specified sensor number (e.g., sensor number 5/25: all the sensors with this number can be used, e.g., HF-5, LF-25 or AF-5). You must order **two sensors** per device.

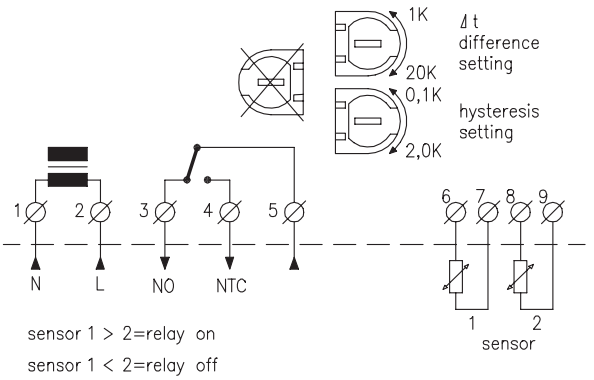
Note: The sensor line is to be routed in a protective duct. Parallel routing together with lines that carry AC voltage is not permissible.

Type	Item no.	Control range	Features	PG
ETR 78.005	D 4780041	35…95 °C	Sensor: NTC 50 K (sensor 5/25)	II
ETR 78.006	D 4780080	0…60 °C	Sensor: NTC 8 K (sensor 3/23)	II

ETR 78



ETR 78



Function: 2 temperature sensors are connected to the controller, between which the temperature can be compared; when the specified temperature difference Δ is exceeded, a switching process is actuated. The sensors employed can have different shapes, depending on their purpose, e.g., external sensors, sleeve sensors, air duct sensors etc. The relevant sensors must be ordered separately. The output relay is designed to be potential-free. Upon actuation, the potential present at terminal 5 is connected through to the working contact terminal 4 (terminal 3 = break contact).

Method of operation: As long as the temperature at sensor 1 is lower than at sensor 2, the output relay remains disabled. The output relay only actuates when the temperature at sensor 1 exceeds that at sensor 2 by the preset temperature difference. The absolute sensor temperatures have no influence on the function. Care must be taken, however, that both sensor temperatures are within the working range of the controller.

2-stage controller JBT-2

remote sensor, electronic

Technical data

Ambient temperature:	0…55 °C
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Operating voltage:	230 VAC, 50 Hz
Max. switching current:	10 (3) A
Max. switching voltage:	230 VAC, 50 Hz
Switching element:	relay
Switching contact:	2 x togglers, potential-free
Control function:	2-stage heating, 2-stage cooling, heating and cooling with neutral zone
Hysteresis in the stage:	adjustable 0.2…1.5 K
Hysteresis between the stages:	adjustable 0.2…6 K
Electrical connection:	screw-type terminals
Safety and EMC:	according to DIN EN 60730
Function type:	TR (temperature controller)
General features:	external setting, scale: degrees Celsius

Application

2-stage heating or cooling. With the corresponding wiring of the relay contacts, heating and cooling can also be realised with a neutral zone. The desired function can be selected by means of jumpers.

Sensors are not a part of the delivery scope
For available sensors, see the “Sensors” section.

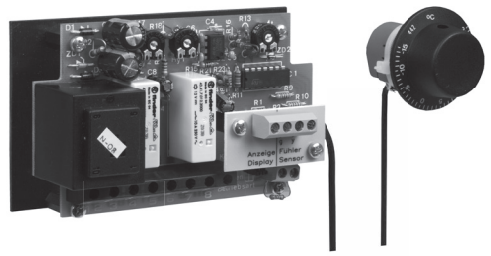
The specified sensor numbers mean that all sensors, e.g., HF, BTF2 or LF with this number can be used, e.g., HF-3 or LF-23.

Note: The sensor line is to be routed in a protective duct. Parallel routing together with lines that carry AC voltage is not permissible.

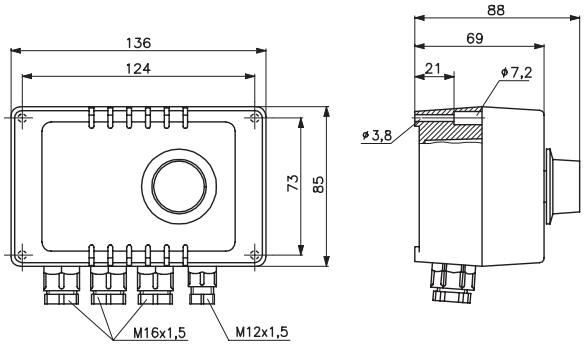
Housing colour: grey (lower part like RAL 7016, upper part like RAL 7035)
JBT-21 ACP/JBT-22 ACP without housing

Type	Item no.	Control range	Features	PG
JBT-21 A	D 4760025	−15…+25 °C	Mounting/attachment: wall mounting Degree of protection: IP 65/protection class: II Sensor: NTC 2 K 25 (sensor 0/20)	II
JBT-21 A CP	D 4760468	−15…+25 °C	Mounting/attachment: on supporting rails (35 mm) according to EN 60715 Degree of protection: IP 00/protection class: 0 Sensor: NTC 2 K 25 (sensor 0/20) remote set value adjusters with 1-m cable	II
JBT-22 A	D 4760037	10…50 °C	Mounting/attachment: wall mounting Degree of protection: IP 65/protection class: II Sensor: NTC 8 (sensor 3/23)	II
JBT-22 A CP	D 4760456	10…50 °C	Mounting/attachment: on supporting rails (35 mm) according to EN 60715 Degree of protection: IP 00/protection class: 0 Sensor: NTC 8 (sensor 3/23) remote set value adjusters with 1-m cable	II
JBT-23 A	D 4760254	35…95 °C	Mounting/attachment: wall mounting Degree of protection: IP 65/protection class: II Sensor: NTC 50 (sensor 5/25)	II

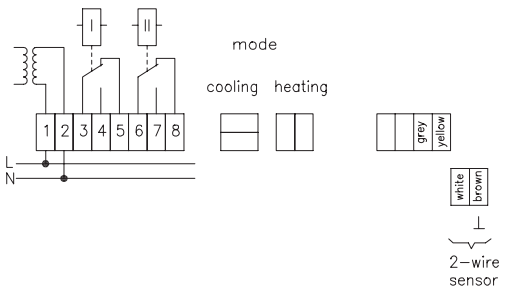
JBT-21 A CP



JBT-2.A



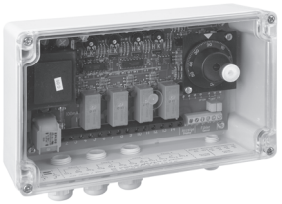
JBT-2.A



Sensor connection: w/br = NTC

4-, 6- and 8-stage controller JBT-4/-6/-8

remote sensor, electronic



Technical data

Ambient temperature:	0…55 °C
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Operating voltage:	230 VAC, 50 Hz
Max. switching current:	10 (3) A
Max. switching voltage:	230 VAC, 50 Hz
Switching element:	relay, potential-free
Electrical connection:	screw-type terminals
Safety and EMC:	according to DIN EN 60730
General features:	Scale: degrees Celsius
Display:	switch status display with LEDs

Application

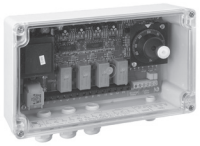
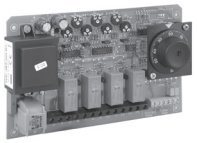
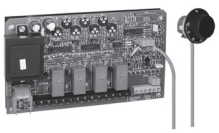
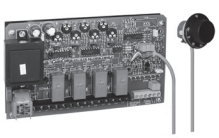
JBT-4: 4-stage “heating or cooling”.
With the corresponding wiring of the relay contacts, “heating and cooling” with a neutral zone can also be implemented. The desired function can be selected by means of jumpers.

JBT-6/-8: 6 or 8 stages “heating or cooling“.
Desired function can be selected with switches. LED serves as indication of operation.

Sensors are not a part of the delivery scope
For available sensors, see the “Sensors” section.

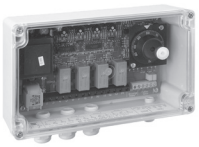
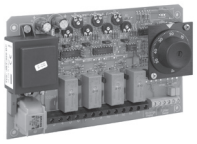
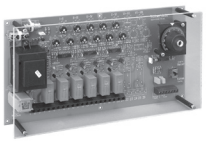
The specified sensor numbers mean that all sensors, e.g., HF, BTF2 or LF with this number can be used, e.g., HF-3 or LF-23.

Note: The sensor line is to be routed in a protective duct. Parallel routing together with lines that carry AC voltage is not permissible.

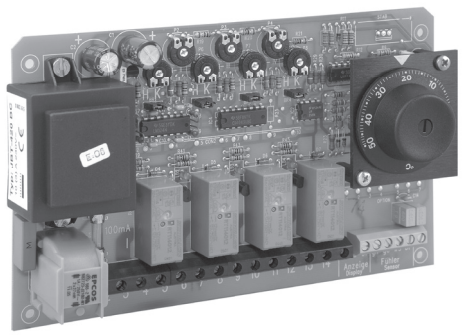
Type	Item no.	Control range	Features	PG
JBT-420 B 	D 4760494	–10…+50 °C	Housing colour: grey (lower part like RAL 7016, upper part transparent) Switching contact: 4 x togglers Control function: 4-stage heating, 4-stage cooling, multistage heating and cooling with neutral zone Hysteresis in the stage: adjustable 0.25…2 K Hysteresis between the stages: adjustable 0.5…6 K Mounting/attachment: wall mounting Degree of protection: IP 65 Protection class: II Sensor: NTC 8 K (sensor 3/23) Function type: TW Internal setting	II
JBT-420 BC 	D 4760544	–10…+50 °C	Without housing Switching contact: 4 x togglers Control function: 4-stage heating, 4-stage cooling, multistage heating and cooling with neutral zone Hysteresis in the stage: adjustable 0.25…2 K Hysteresis between the stages: adjustable 0.5…6 K Mounting/attachment: on mounting plate Degree of protection: IP 00 Protection class: 0 Sensor: NTC 8 K (sensor 3/23) Function type: TR external setting	II
JBT-420 BP 	D 4760520	–10…+50 °C	Without housing Switching contact: 4 x togglers Control function: 4-stage heating, 4-stage cooling, multistage heating and cooling with neutral zone Hysteresis in the stage: adjustable 0.25…2 K Hysteresis between the stages: adjustable 0.5…6 K Mounting/attachment: on supporting rails (35 mm) according to EN 60715 Degree of protection: IP 00 Protection class: 0 Sensor: NTC 8 K (sensor 3/23) Function type: TR external setting, remote setpoint adjuster with 1-m cable	II
JBT-420 BPS 	D 4760532	–10…+50 °C	like JBT-420 BP, but with adjustable start-up delay from 2 to 200 s	II

4-, 6- and 8-stage controller JBT-4/-6/-8

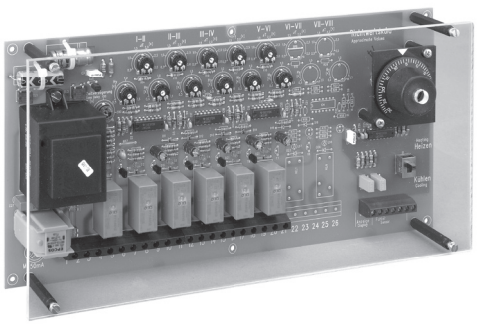
remote sensor, electronic

Type	Item no.	Control range	Features	PG
JBT-420 BS 	D 4760470	–10…+50 °C	Housing colour: grey (lower part like RAL 7016, upper part transparent) Switching contact: 4 x togglers Control function: 4-stage heating, 4-stage cooling, multistage heating and cooling with neutral zone Hysteresis in the stage: adjustable 0.25…2 K Hysteresis between the stages: adjustable 0.5…6 K Mounting/attachment: wall mounting Degree of protection: IP 65 Protection class: II Sensor: NTC 8 K (sensor 3/23) Function type: TW internal setting, with adjustable start-up delay from 2 to 200 s	II
JBT-420 BCS 	D 4760557	–10…+50 °C	Without housing Switching contact: 4 x togglers Control function: 4-stage heating, 4-stage cooling, multistage heating and cooling with neutral zone Hysteresis in the stage: adjustable 0.25…2 K Hysteresis between the stages: adjustable 0.5…6 K Mounting/attachment: on mounting plate Degree of protection: IP 00 Protection class: 0 Sensor: NTC 8 K (sensor 3/23) Function type: TR external setting, with adjustable start-up delay from 2 to 200 s	II
JBT-61 AS 	D 4760616	–15…+30 °C	Without housing Switching contact: 6 x togglers Control function: 6-stage heating or 6-stage cooling Hysteresis in the stage: adjustable 0.5…1.5 K Hysteresis between the stages: adjustable 0.5…3 K Mounting/attachment: on mounting plate Degree of protection: IP 00 Protection class: 0 Sensor: NTC 2 K 25 (sensor 0/20) Function type: TR external setting, with adjustable start-up delay from 2 to 200 s	II
JBT-81 AS	D 4760280	–15…+30 °C	Without housing Switching contact: 8 x togglers Control function: 8-stage heating or 8-stage cooling Hysteresis in the stage: adjustable 0.5…1.5 K Hysteresis between the stages: adjustable 0.5…3 K Mounting/attachment: on mounting plate Degree of protection: IP 00 Protection class: 0 Sensor: NTC 2 K 25 (sensor 0/20) Function type: TR external setting, with adjustable start-up delay from 2 to 200 s	II

JBT-420 BC



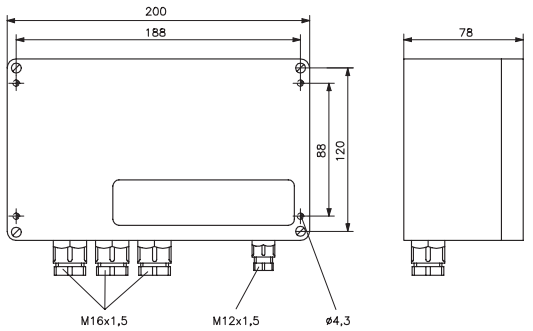
JBT-61 AS



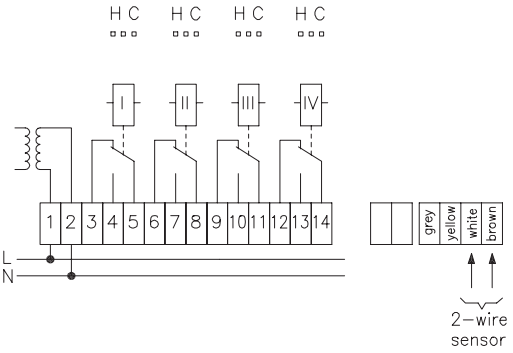
4-, 6- and 8-stage controller JBT-4/-6/-8

remote sensor, electronic

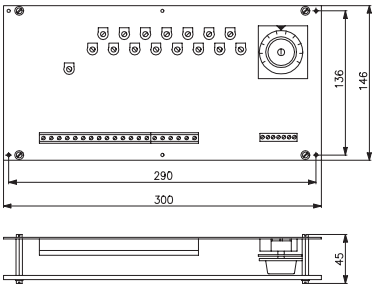
JBT-4..B



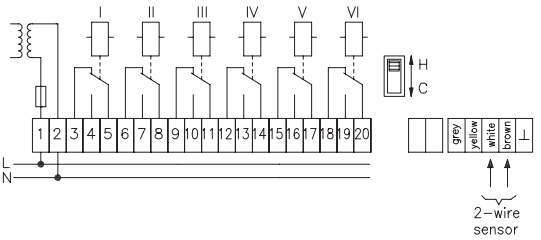
JBT-4..B



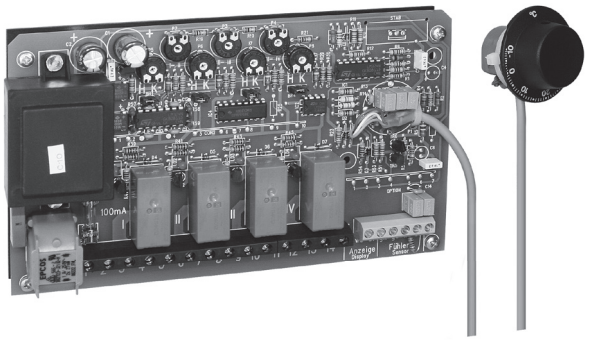
JBT-61 AS/JBT-8. AS



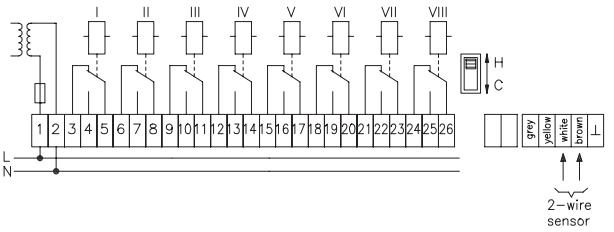
JBT-61 AS



JBT-420 BP



JBT-8. AS



Mechanical hygrostats

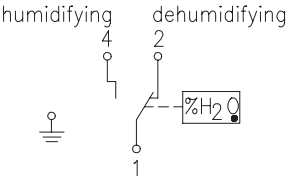
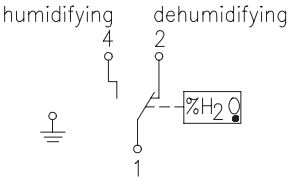
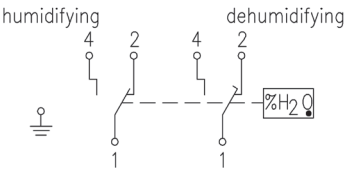
Duct assembly

Technical data

Housing colour:	grey (lower part like RAL 7016, upper part like RAL 7035)
Ambient temperature:	0 … 60 °C
Permissible atmospheric humidity:	non-condensing
Operating voltage:	none
Max. switching current:	15 (8) A
Min. switching current:	150 mA at 125 VAC
Max. switching voltage:	230 VAC, 50 Hz (> 24 V only in dry surroundings)
Min. switching voltage:	24 VAC, 50 Hz
Switching element:	microswitch
Switching contact:	toggler, potential-free
Control range:	30 … 100% rel. humidity
Hysteresis:	approx. 5% rel. humidity
Tolerances:	> 50%: +/- 3.5% relative humidity < 50%: +/- 4% relative humidity
Electrical connection:	screw-type terminals
Mounting / attachment:	mounting on air duct or wall mounting using accessory JZ-20-1
Protection rating:	IP 65 front-side
Protection class:	II
Safety and EMC:	according to DIN EN 60730
Sensor:	plastic fibres

Application

Use in ventilation and air-conditioning ducts, climate exposure cabinets and dehumidifiers for controlling and / or monitoring the atmospheric humidity in industrial and agricultural applications. Not suitable for aggressive gases.
Max. air speed 8 m / s, with sensor protection FS-HI 15 m / s.

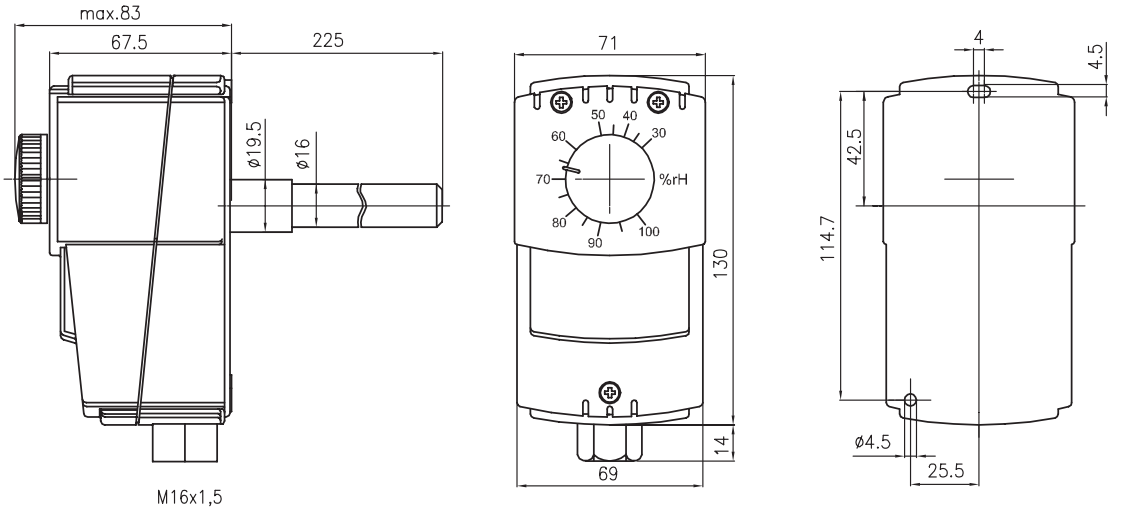
Type / image	Item no.	Features	Circuit diagram	PG
HI-1 	JA 010100	Control function: humidifying or de-humidifying Function type: controller external setting, mechanical range setting		II
HI-1F 	JA 010200	Control function: humidifying or de-humidifying Function type: monitor Internal setting		II
HI-2 	JA 010300	Control function: 2 x humidifying or de-humidifying Hysteresis between the stages: adjustable 3 … 15% rel. humidity Function type: controller external setting, mechanical range setting		II

Mechanical hygrostats

Duct assembly

Accessories / options	Item no.	Features	PG
JZ-20-1 	E 6130144	Wall bracket for HI	II
FS-HI 	H 530975	Sensor protection for HI: finely woven mesh wire, for use at high air speeds of over 8 m/s	II
FS2-HI 	H 531011	PTFE filter for HI: fine sensor protection against dust and contamination	II

HI-.



Air flow switch JSL-1E

mechanical

Technical data

Housing colour:	grey (lower part like RAL 7016, upper part like RAL 7035)
Ambient temperature:	– 40 … + 80 °C
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Max. medium temperature:	85 °C
Operating voltage:	none
Max. switching current:	15 (8) A
Min. switching current:	150 mA at 24 VAC
Max. switching voltage:	230 VAC, 50 Hz
Min. switching voltage:	24 VAC, 50 Hz
Switching element:	microswitch
Switching contact:	toggler, potential-free
Control function:	airflow monitoring
Hysteresis:	approx. 1 m/s
Electrical connection:	screw-type terminals
Mounting/attachment:	mounting on air duct
Protection rating:	IP 65 housing side, IP 20 medium side
Protection class:	I
Safety and EMC:	according to DIN EN 60730
Sensor:	wind indicator
Material of lug:	V2A (1.4301)
Material of lever:	brass
Function type:	monitor
General features:	Internal setting

Application

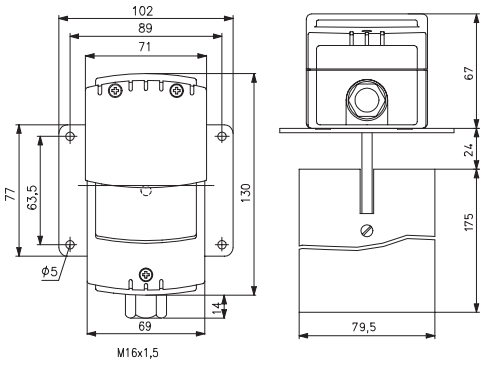
Monitoring of air flows in ducts, in air supply and air exhausting devices of fans or electrical heat registers.

The wind indicator relay is set to the minimum switching points at the factory. By turning the inside screw to the right, the switch-on/switch-off values can be increased. Fitting is done in the vertical paddle position from the top in a horizontal pipe/duct.

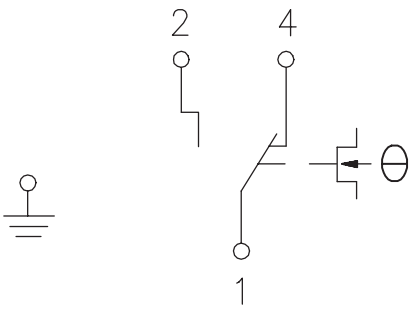
Type	Item no.	Min. switch-on value:	Min. switch-off value:	Max. switch-on value:	Max. switch-off value:	PG
JSL-1E	JA 070100	2 m/s	1 m/s	9.2 m/s	8 m/s	II

Type	Item no.	Features	PG
JZ-08	E 6150031	spare vane for JSL-1E	II

JSL-1E



JSL-1E



Mounting: The device can be mounted in any alignment, but attention must be paid to the correct direction of flow. When fitting in a vertical duct, the weight of the vane must be balanced at the range screw, which results in changed switching values. Attention: Owing to the changed switching values, at flows near the minimum set value the wind indication relay may not function properly! At air speeds higher than 5 m/s, owing to the danger of breakage, the vane must be cut on the sides where indicated. This increases the minimum switch-off value set at the factory from 1 m/s to 2.5 m/s. A calming path that is 5 times the duct diameter must be provided before and after the assembly location. The scope of delivery includes a seal to be fitted between the duct and the device.

Function: The devices are set to the minimum switch-off value at the factory. A higher value can be selected by turning the range screw to the right. If the flow exceeds the value that has been set, contacts 1–2 close and the corresponding assembly is enabled. If the flow drops below the value that has been set, contacts 1–2 open and contacts 1–4 close.

Airflow monitors JSL-20/21

electronic

Technical data

Housing colour:	grey (lower part like RAL 7016, upper part like RAL 7035)
Ambient temperature:	0…60 °C
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Max. sensor temperature	100 °C
Max. switching current:	10 (3) A
Min. switching current:	150 mA at 24 VAC
Max. switching voltage:	230 VAC, 50 Hz
Min. switching voltage:	24 VAC, 50 Hz
Switching element:	relay, potential-free
Control range:	0.2 m/s…10 m/s max. air speed at the sensor 10 m/s
Hysteresis adjustable:	1…10%
Switching on delay:	15…120 s (adjustable)
Switching off delay:	2…20 s (adjustable)
Electrical connection:	screw-type terminals
Fitting length:	approx. 150 mm
Protection rating:	IP 65
Protection class:	II
Safety and EMC:	according to DIN EN 60730
Sensor type:	hot film anemometer
Function type:	monitor
General features:	Internal setting

Application

For flow-dependent monitoring of fans, adjusting butterfly valves of humidifiers and electric heat registers according to DIN 57100, part 420, or for use in conjunction with DDC systems.

Note: The sensor line is to be routed in a protective duct. Parallel routing together with lines that carry AC voltage is not permissible.
Cable recommendation: 4 x 0.75 mm², shielded. Sensor cables can be extended up to 100 m.

Attention: The controller device and the sensor form an integral unit and are calibrated to one another. Only they are compatible with one another. Both have the same device number. Connecting sensors of other devices is not permissible and results in malfunctions.

Type	Item no.	Features	PG
JSL-20	G 8000004	Operating voltage: 230 VAC, 50 Hz Switching contact: changeover Control function: gets actuated when the flow rate that has been set is undershot (without locking) Mounting/attachment: wall mounting, position-independent Sensor: with connecting cable	III
JSL-20/24 V AC	G 8000117	Operating voltage: 24 VAC, 50 Hz Switching contact: changeover Control function: gets actuated when the flow rate that has been set is undershot (without locking) Mounting/attachment: wall mounting, position-independent Sensor: with connecting cable	III
JSL-20 K	G 8000204	Operating voltage: 230 VAC, 50 Hz Switching contact: changeover Control function: gets actuated when the flow rate that has been set is undershot (without locking) Mounting/attachment: mounting on air duct Sensor: fastened on housing	III
JSL-21	G 8000016	Operating voltage: 230 VAC, 50 Hz Switching contact: 2 x toggler Control function: gets actuated when the flow speed that has been set is undershot, with additional alarm contact (with locking: before restarting, the machine must be de-energised electrically (Reset)) Mounting/attachment: wall mounting, position-independent Sensor: with connecting cable	III
JSL-21/24 V AC	G 8000133	Operating voltage: 24 VAC, 50 Hz Switching contact: 2 x toggler Control function: gets actuated when the flow speed that has been set is undershot, with additional alarm contact (with locking: before restarting, the machine must be de-energised electrically (Reset)) Mounting/attachment: wall mounting, position-independent Sensor: with connecting cable	III

Measuring principle: The airflow has a cooling effect on a heated sensor situated in the sensor pipe. The higher the airflow, the greater the cooling of the sensor. The effect of the air temperature is compensated for by a second measuring element.

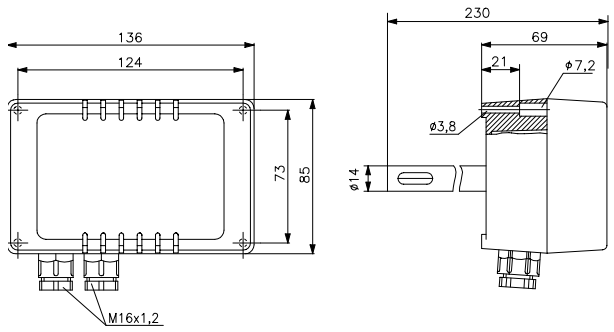
Airflow monitors JSL-20/21

electronic

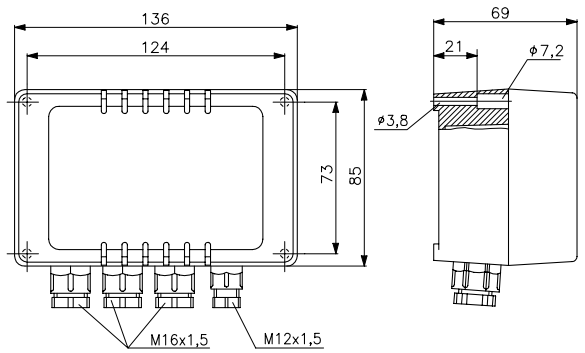
Function JSL-20xx: Contacts 4/5 close upon applying the supply voltage. When the switch-on delay lapses and the flow speed is greater than the set value, the relay remains actuated; else the relay is deactivated (contacts 4/3 close). If during operation the flow speed drops below the set value, the relay deactivates after the defined switch-off delay.

Function JSL-21xx: After applying the operating voltage and building up the desired flow speed within the start-up delay, relay 2 is actuated (contacts 7/6 close) and the downstream assembly is activated. Thus, possibly harmful heating/humidification without air exhausting is prevented. If the necessary air speed is not reached within the start-up delay, relay 1 switches to the alarm contact 4/5. If the flow drops below the set value during operation, the associated effect is triggered after the switch-off delay has elapsed. The contacts 7/6 are opened (heating off) and the contacts 4/5 are simultaneously closed (alarm). Before restarting, the device must be electrically de-energised and the voltage applied afresh.

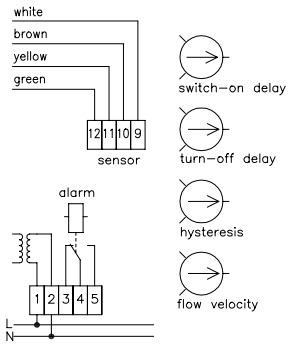
JSL-20 K



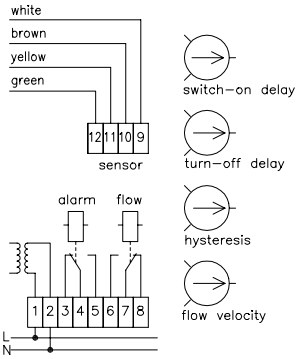
JSL-20/-21



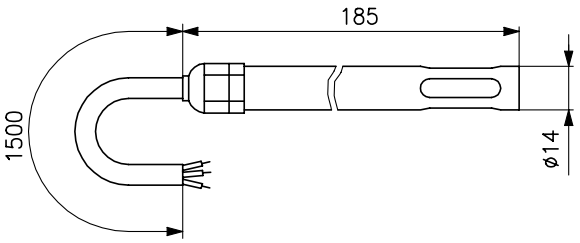
JSL-20



JSL-21



Sensor for JSL-20 / -21



Differential pressure switch JDW-3…10/JDL-109…117

JDW-3

JDL-109

JDL-111

JDL-112

JDL-113

Technical data

Housing colour:	black
Ambient temperature:	– 15 … + 80 °C
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Max. sensor temperature	80 °C
Permissible medium temperature:	– 15 … + 80 °C
Operating voltage:	none
Min. switching current:	1 mA
Max. switching voltage:	230 VAC/50 Hz, 24 VDC
Min. switching voltage:	12 VAC/50 Hz, 12 VDC
Switching element:	microswitch
Switching contact:	toggler, gold contact, potential-free
Control function:	switches if the pressure is undershot or exceeded
Pressure connection:	6.2 mm
Mounting/attachment:	wall mounting
Electrical connection:	screw-type terminals (JDL-109/JDL-113 spade plug)
Protection class:	II
Protection rating:	IP 54 (JDL-109/JDL-113 IP 20)
Safety and EMC:	according to DIN EN 60730
Sensor:	pressure membrane
Function type:	monitor (JDL-116 A/JDL-117 A controller)

Application

Monitoring of overpressure, differential or under-pressure of air and incombustible, non-aggressive gases. Exhaust or fan monitoring or flow monitor for securing electrical heat registers, as filter monitoring, air pressure shortage safeguard, limit value controller.

JDW-…: Supplied without mounting bracket; can be screwed on directly (with 2 screws).

JDW-…Z: Supplied with attached mounting bracket JZ-10.

JDL…: Supplied with attached mounting bracket JZ-10.

Note: Once the differential pressure switch has connected a voltage > 24 V and a current > 0.1 A, the gold layer at the contacts will have burnt away. Thereafter, the differential pressure switch can only be operated at this or a higher power.

Note: The hose set is not a part of the delivery scope and must be ordered separately.

Conversion table pressure

	Pa	kPa	bar	mbar	mmWs
1 Pa =	1	0.001	0.00001	0.01	0.101971
1 kPa =	1,000	1	0.01	10	101.971
1 bar =	100,000	100	1	1,000	10197.1
1 mbar =	100	0.1	0.001	1	10.1971
1 mmWs =	9.80665	0.00980665	0.0000980665	0.0980665	1

Type	Item no.	Control range	Max. pressure	Hysteresis (dependent on setting range)	Features	PG
JDW-3	H 531002	20…330 Pa	5,000 Pa	approx. 8…20 Pa	Max. switching current: 1.5 (0.4) AAC, 1 (0.2) ADC Internal setting	II
JDW-3 Z	H 531001	20…330 Pa	5,000 Pa	approx. 8…20 Pa	Max. switching current: 1.5 (0.4) AAC, 1 (0.2) ADC internal setting, fixing bracket	II
JDW-5	H 530996	30…500 Pa	5,000 Pa	approx. 10…25 Pa	Max. switching current: 1.5 (0.4) AAC, 1 (0.2) ADC Internal setting	II
JDW-5 Z	H 531000	30…500 Pa	5,000 Pa	approx. 10…25 Pa	Max. switching current: 1.5 (0.4) AAC, 1 (0.2) ADC internal setting, fixing bracket	II
JDW-10	H 530997	400…1600 Pa	5,000 Pa	approx. 30…60 Pa	Max. switching current: 1.5 (0.4) AAC, 1 (0.2) ADC Internal setting	II
JDL-109	H 530959	20 Pa fixed	15,000 Pa	approx. 10 Pa	Max. switching current: 5 (1) AAC, 1 (0.2) ADC silicon-free	II
JDL-111	H 5309098	20…300 Pa	15,000 Pa	approx. 10…15 Pa	Max. switching current: 5 (1) AAC, 1 (0.2) ADC internal setting, silicon-free	II
JDL-112	H 5309100	40…600 Pa	30,000 Pa	approx. 22…33 Pa	Max. switching current: 5 (1) AAC, 1 (0.2) ADC internal setting, silicon-free	II

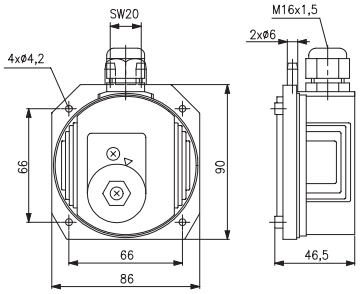
Differential pressure switch JDW-3…10/JDL-109…117

Type	Item no.	Control range	Max. pressure	Hysteresis (dependent on setting range)	Features	PG
JDL-113	H 530998	40 Pa fixed	5,000 Pa	approx. 15 Pa	Max. switching current: 5 (1) AAC, 1 (0.2) ADC	II
JDL-115	H 5309136	100…1,000 Pa	30,000 Pa	approx. 20…40 Pa	Max. switching current: 5 (1) AAC, 1 (0.2) ADC internal setting, silicon-free	II
JDL-116	H 530960	250…5,000 Pa	30,000 Pa	approx. 60…150 Pa	Max. switching current: 5 (1) AAC, 1 (0.2) ADC internal setting, silicon-free	II
JDL-116 A	H 530978	250…5,000 Pa	30,000 Pa	approx. 60…150 Pa	Max. switching current: 5 (1) AAC, 1 (0.2) ADC external setting, silicon-free	II
JDL-117 A	H 530991	3,000…15,000 Pa	30,000 Pa	approx. 250…600 Pa	Max. switching current: 5 (1) AAC, 1 (0.2) ADC external setting, scale mbar, silicon-free	II

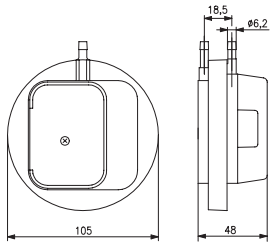
Accessories

Type	Item no.	Features	PG
JZ-06/1	H 5309229	connection set with duct connections made of plastic silicon-free, 2 x 90° angles 2 extensions 90 mm, 4 self-tapping screws, 2 m tube (Ø 6 mm outside)	II
JZ-10	H 5309237	mounting bracket with screws for JDL-109/113 and JDW-3/-5/-10 (Z shape)	II
JZ-28	H 531012	IP-65 cover set, consisting of a cover with pressure compensation element, O-ring and 3 screws, suitable for retrofitting types JDL-111, JDL-112, JDL-113, JDL-115 and JDL-116	II

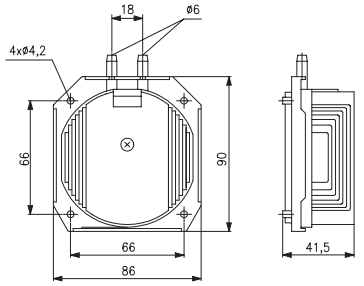
JDW-3/-5/-10



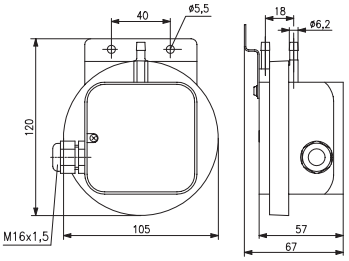
JDL-109



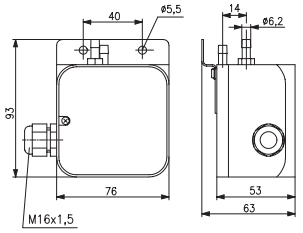
JDL-113



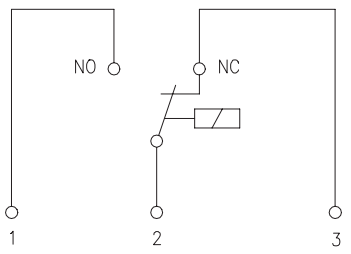
JDL-111



JDL-112/115…-17

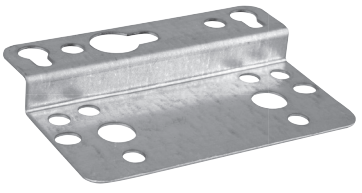


JDW-…/JDL-…



JZ-06/1

JZ-10



JDL-116 A

Flow switch JSF-1 E…4 E

mechanical – **TÜV-tested**

Technical data

Housing colour:	grey (lower part like RAL 7016, upper part like RAL 7035)
Ambient temperature:	– 40 … + 85 °C
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Permissible medium temperature:	120 °C
Operating voltage:	none
Max. switching current:	15 (8) A
Min. switching current:	150 mA at 24 VAC, 50 Hz
Max. switching voltage:	230 VAC, 50 Hz
Min. switching voltage:	24 VAC, 50 Hz
Switching element:	Microswitch
Switching contact:	toggler, potential-free
Control function:	switches if the set value is undershot or exceeded
Hysteresis:	depends on the pipe diameter (see the table of switching values)
Electrical connection:	screw-type terminals
Mounting / attachment:	assembly by means of tapered Whitworth pipe thread R1"
Protection rating:	IP 65
Protection class:	I
Safety and EMC:	according to DIN EN 60730
Sensor:	flow paddle
Material of paddle:	stainless steel
Function type:	monitor
General features:	Internal setting
Accuracy:	+/– 15% of the set value
Test mark / Approbation:	JSF-1E / JSF-2E / JSF-3E / JSF-4E TÜV.SW.016-13 JSF-1RE / JSF-2RE TÜV.SW.017-13

Type-tested by the TÜV according to the "Flow 100" VdTÜV circular

Application

Flow monitoring of liquid media in pipes from ½" to 8", for example, oil, cooling and lubricant circuits or as safety against a shortage of water.

Assembly: Vertical in a horizontal pipe.

Calming path at least 5 times the pipe diameter before and after the paddle.*

The max. flow can be significantly higher than the maximum setting value of the monitor.

Not approved for drinking water applications.

TÜV test up to 6" or for all diameters

Type	Item no.	Pipe	Medium	Features	PG
JSF-3 E	JA 060500	½"	normal	material of carrier: brass max. pressure: 5 bar attached T-piece, grey iron	II
JSF-4 E	JA 060600	¾"	normal	material of carrier: brass max. pressure: 5 bar attached T-piece, grey iron	II
JSF-1 E	JA 060100	1" … 8"	normal	material of carrier: brass max. pressure: 8 bar	II
JSF-1 RE	JA 060200	1" … 8"	normal	material of carrier: brass max. pressure: 5 bar reduced switching values**	II
JSF-2 E	JA 060300	1" … 8"	aggressive***	material of carrier: V4A max. pressure: 13 bar	II
JSF-2 RE	JA 060400	1" … 8"	aggressive***	material of carrier: V4A max. pressure: 5 bar reduced switching values**	II

Flow switch JSF-1 E…4 E
mechanical – **TÜV-tested**

Accessories	Item no.	Features	PG
JZ-09	E 6140170	spare paddles (each 4 units) from 1“ … to 8“	II

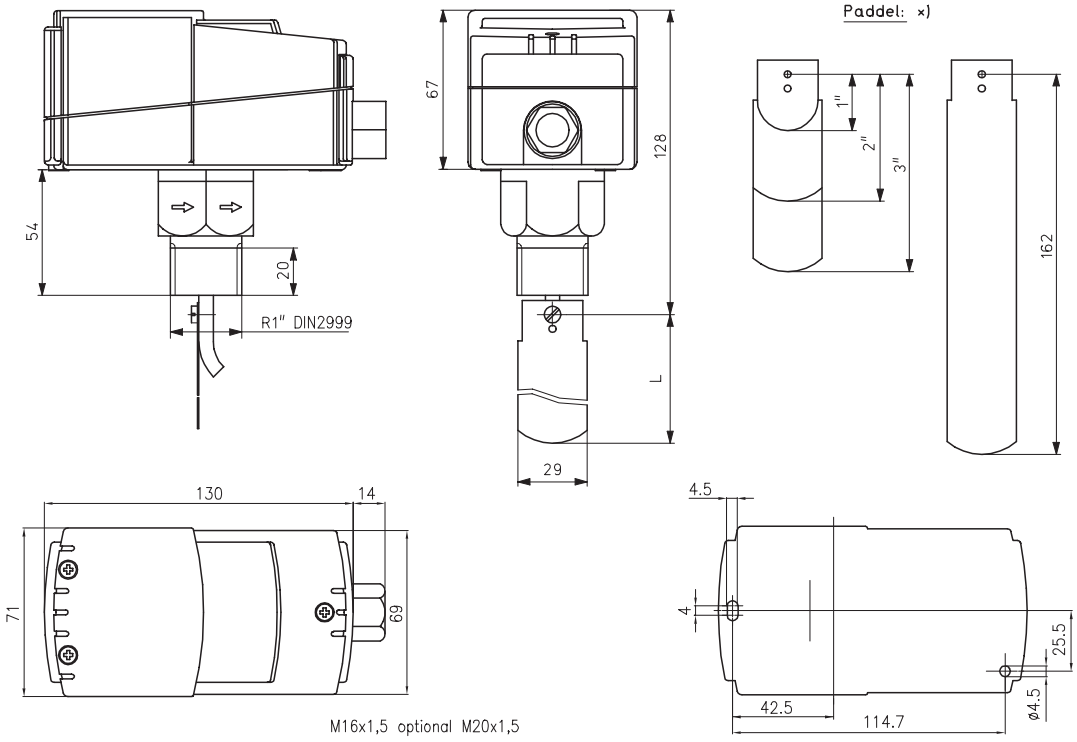
* for 1“ = paddle 1
for 2“ = paddle 1 and 2
for 3“ to 8“ = paddles 1, 2 and 3

If reduced flow values (marked in the table under the “Pipe” column with added letter Z) marked) are to be reached, paddle 4 should be used as follows:
at 4“ = paddles 1, 2, 3, 4 (shorten paddle 4 to 92 mm)
for 5“ = paddles 1, 2, 3, 4 (shorten paddle 4 to 117 mm)
for 6“ = paddles 1, 2, 3, 4 (shorten paddle 4 to 143 mm)
for 7“ and 8“ = paddles 1, 2, 3, 4 (paddle 4 not shortened)

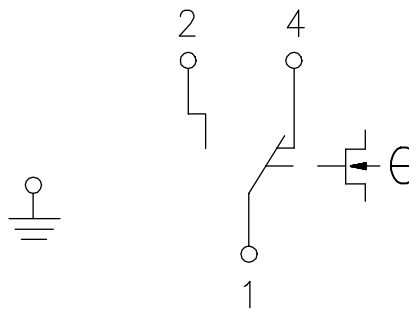
** device types for low flow volume (see switching value table) “RE”

*** medium aggressive: All parts of the current monitor touching the medium are made of V4A.

JSF-.E/RE



JSF-.E/RE



DN nominal width	Pipe thread inches
6	1/8"
8	1/4"
10	3/8"
15	1/2"
20	3/4"
25	1"
32	1 1/4"
40	1 1/2"
50	2"
65	2 1/2"
80	3"
100	4"
125	5"
150	6"

Flow switch JSF-1 E…4 E

mechanical – **TÜV-tested**

Switching value table in m^3/h for JSF-1 E / 2 E / 1 RE / 2 RE

Type	Pipe diameter	Min. setting (factory setting)		Max. setting	
		Off	On	Off	On
E	1"	0.55	0.86	2.00	2.10
RE	1"	0.19	0.57	1.00	1.10
E	1¼"	0.82	1.30	2.80	3.00
RE	1¼"	0.24	0.90	1.40	1.60
E	1½"	1.10	1.70	4.00	4.20
RE	1½"	0.50	1.20	1.90	2.20
E	2"	2.10	3.20	7.30	7.80
RE	2"	0.90	2.30	3.60	4.10
E	2½"	2.80	4.30	9.80	10.50
RE	2½"	1.20	3.10	4.90	5.50
E	3"	4.00	6.10	13.80	14.70
RE	3"	2.10	4.90	7.40	8.20
E	4"	10.40	15.40	32.00	33.90
RE	4"	4.90	11.30	17.10	19.10
E	4" Z	7.00	10.50	21.70	23.10
RE	4" Z	3.30	7.70	11.60	13.00
E	5"	20.80	30.60	63.50	67.30
RE	5"	9.70	22.40	34.00	37.90
E	5" Z	10.70	15.80	33.30	34.70
RE	5" Z	5.00	11.50	17.50	19.60
E	6"	29.20	43.00	89.10	94.50
RE	6"	13.60	31.50	47.60	53.20
E	6" Z	13.10	19.30	39.90	42.40
RE	6" Z	6.10	14.10	21.40	23.90
E	8"	72.60	85.10	165.70	172.50
RE	8"	25.70	59.60	90.10	100.70
E	8" Z	38.60	46.50	90.80	94.20
RE	8" Z	21.70	36.50	55.30	61.80

When there is a “Z” (=additional paddle) in the “Pipe” column, the long paddle 4 included in the delivery must be used in addition to the 3 factory-installed paddles.

Switching value table in l / h for JSF-3 E / -4 E

3 E	½	174	480	846	948
4 E	¾	138	408	768	858

The accuracy of the specified values depends on the actual diameter of the pipe, the actual reduction in the extra paddle and the flow monitor’s installation depth.

The devices are set to the minimum switch-off value at the factory. By turning the inner adjusting screw in a clockwise direction, you can set a higher deactivation value. The actual flow quantity must in any case be higher than the one specified in the switch table or the switch-on value, but there is no upper limit. The values specified apply to volume-related mass (density) of water. If the flow drops below the value that has been set, contacts 1 and 2 open and contacts 1 and 4 close.

Flow switch JSW

with device plug

Technical data

Housing colour:	black
Material of paddle:	stainless steel
Material of carrier:	nickel-plated brass
Ambient temperature:	–20…+70 °C
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Max. pressure:	25 bar
Permissible medium temperature:	110 °C
Operating voltage:	none
Max. switching current:	5 A
Min. switching current:	100 mA at 24 VAC, 50 Hz
Max. switching voltage:	230 VAC, 50 Hz
Min. switching voltage:	24 VAC, 50 Hz
Switching element:	microswitch
Switching contact:	toggler, potential-free
Control function:	switches if the set value is undershot or exceeded
Electrical connection:	4-pin plug according to DIN EN 175301-803 (previously DIN 43650 - A/ISO 4400)
Mounting/attachment:	union nut G 3/8" on brazing spout (for brazing in a standard copper T-piece with outlet 1/2") or T-piece
Protection rating:	IP 65
Protection class:	II
Safety and EMC:	according to DIN EN 60730
Sensor:	flow paddle
Function type:	monitor
General features:	Internal setting
Accuracy:	+/– 15% of the set value (switching values are only accurate if the flow monitor has been installed in our T-piece If copper T-pieces are used, the switching values will increase.)

Brass union nut G 3/4" with o-ring and brazing spout for brazing in a standard copper T-piece with outlet 1/2" included in the scope of delivery.

Application

Monitoring small and medium, non-aggressive quantities of liquid in pipes with small diameters $^{3}/_{8}$" to 1".

Assembly: Vertical in a horizontal pipe. Calming path at least 5 times the pipe diameter before and after the paddle.

Not approved for drinking water applications.

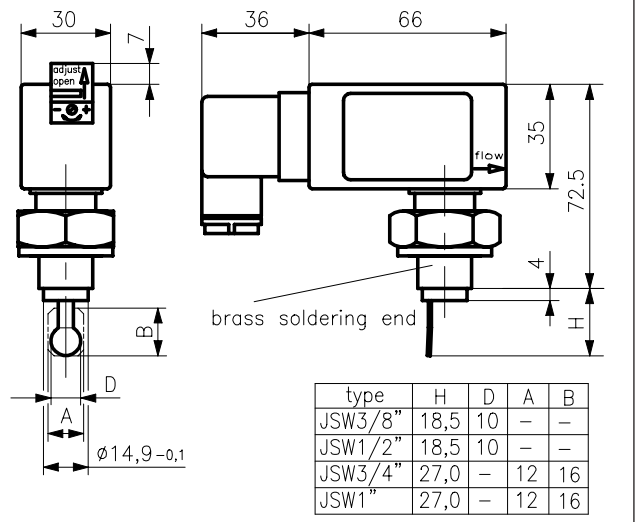
Type	Item no.	Pipe	DN	Max.	Switching point dropping*	Switching point rising	ΔI/min	PG
JSW-3/8	H 530943	$^{3}/_{8}$"	10	10 l/min	3.5…5 l/min	4…5.5 l/min	0.5	III
JSW-1/2	H 530944	$^{1}/_{2}$"	15	20 l/min	5…6.5 l/min	5.5…7 l/min	0.5	III
JSW-3/4	H 530945	¾"	20	40 l/min	7…9.5 l/min	9…11 l/min	2	III
JSW-1	H 530946	1"	25	60 l/min	13.5…16.5 l/min	17…20.5 l/min	3.5	III

T-piece (nickel-plated brass):		
T-piece $^{3}/_{8}$"	H 530958	III
T-piece $^{1}/_{2}$"	H 530957	III
T-piece ¾"	H 530951	III
T piece 1"	H 530953	III

Flow switch JSW

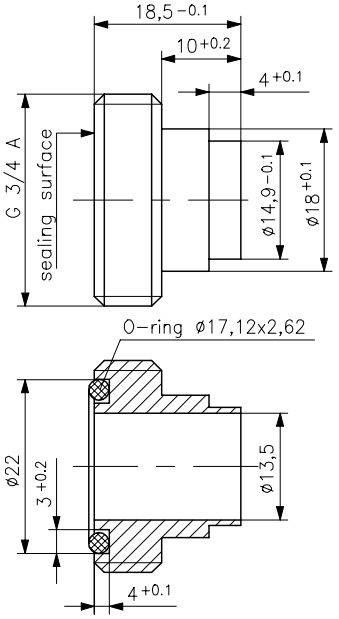
with device plug

JSW

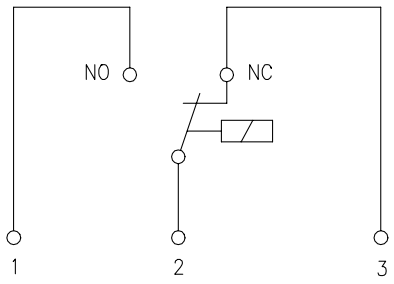


type	H	D	A	B
JSW3/8"	18,5	10	–	–
JSW1/2"	18,5	10	–	–
JSW3/4"	27,0	–	12	16
JSW1"	27,0	–	12	16

JSW



JSW

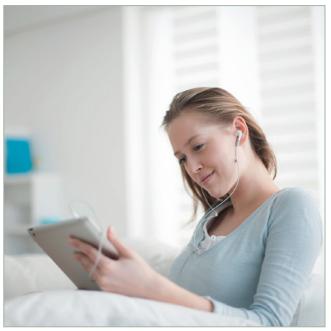


The device works according to the principle of a spring-loaded paddle with magnetic control of a microswitch. When in rest position or if the switch-off value is undershot (= “dropping switching point”), contacts 2 and 3 are closed and can be used as signal contacts. Upon reaching the upper switching value (= switch-on value or “switching point rising”), the contact changes and 2 to 1 are closed. If used as a water shortage safeguard, for example, a pump can be switched on with these contacts. The actual flow quantity must in any case be higher than the switch-on value, but there is no upper limit. The switching points given in the table apply to flow monitors with an attached T-piece and a water temperature of 20 °C in a horizontal pipe. The devices are set to the minimum value at the factory, but can be adapted to an existing system. To that end, the cover of the setting screw on the front side (which is designed so that it cannot be lost) is pushed up in the direction of the arrow and the setting screw is rotated by a maximum of 7 revolutions in the plus direction. With a switching value range of, for example, 13–16.5 l/min, a setting range of 3.5 l/min is obtained. With a total of 7 permissible screw revolutions, this gives a change of 0.5 l/min per screw revolution.

SENSOR TECHNOLOGY

If you wish to adjust,
you have to sense.

SENSOR TECHNOLOGY
A proper sense of feeling to act intelligently.

Sensor technology is becoming increasingly more important. It makes life more comfortable and secure through processing diverse data. Physical values (temperature, flow, humidity, pressure or air quality) are measured and provided to the intelligent control technology.

Sensor technology as the basis for security and comfort.

Overview of sensor technology:
Temperature

Air stream / pressure / differential pressure

Air quality

Humidity

Sensor characteristic curves (see the technical annex in section “Accessories / miscellaneous”)

Room temperature sensors – surface-mounted BTF2

Surface-mounted superflat – Design Berlin 1000, for measuring the temperature in dry rooms

Technical data

Design:	Berlin 1000
Housing colour:	pure white, like RAL 9010
Housing material:	ABS plastic
Ambient temperature:	–10 … +50 °C
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Electrical connection:	screw-type terminals 0.33 mm² to 1.5 mm² only at protective low voltage max. 30 VAC / 42 VDC
Max. measurement current:	< 1 mA
Sensor wire extendable:	depending on the cross-section of the conductor and the sensor unit type
Tolerances:	PT100 / PT1000 DIN EN 60751 B Ni 1000 DIN EN 43760 B
Mounting / attachment:	surface- / wall-mounting (4-hole assembly on flush-mounted socket)
Protection rating:	IP 30
Protection class:	III
Safety and EMC:	according to DIN EN 60730
Sensor characteristic curves:	The sensor characteristic curves can be found under “Miscellaneous”

Application

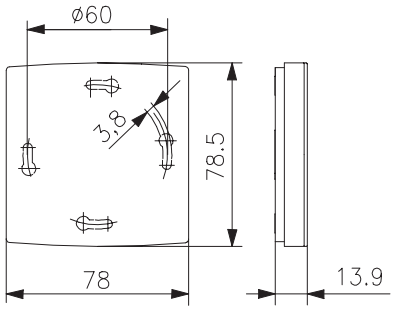
Temperature measurement in living spaces and office spaces.

Assembly and wiring of the lower part can take place separately, surface-mounted or on a switch socket Ø 60 mm by means of socket screws.

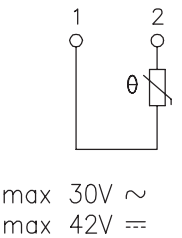
Please follow the EMC directives. Avoid parallel routing with mains voltage-bearing wires, or use shielded wires.

Sensor	Type	Item no.	PG
PT-100	BTF2-P100-0000	SA 140000	III
PT-1000	BTF2-P1000-0000	SA 140001	III
Ni-1000	BTF2-N1000-0000	SA 140002	III
Ni-1000 TK 5000	BTF2-N1000TK5000-0000	SA 140003	III
LM 235Z	BTF2-LM-0000	SA 140012	III
NTC 2K25 “Sensor 0”	BTF2-C225-0000	SA 140013	III
NTC 47K “Sensor 2”	BTF2-C47-0000	SA 140014	III
NTC 8K “Sensor 3”	BTF2-C08-0000	SA 140015	III
NTC 10K “Sensor 4”	BTF2-C10-0000	SA 140006	III
NTC 2K “Sensor 8”	BTF2-C02-0000	SA 140016	III
KTY 81-121 “Sensor 51”	BTF2-Y81/121-0000	SA 140017	III
KTY 11-7 “Sensor 57”	BTF2-Y11/7-0000	SA 140018	III

Dimension drawing Berlin 1000



Circuit diagram



Room temperature sensors – flush-mounted FUF

for measuring the temperature in dry rooms

Technical data

Design:	Berlin UP (flush-mounted)
Housing colour:	pure white, like RAL 9010
Housing material:	PC plastic
Ambient temperature:	–10…+50 °C
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Electrical connection:	screw-type terminals 0.5 mm² to 1.5 mm² only at protective low voltage max. 30 VAC/42 VDC
Max. measurement current:	< 1 mA
Sensor wire extendable:	depending on the cross-section of the conductor and the sensor unit type
Tolerances:	PT100/PT1000 DIN EN 60751 B Ni 1000 DIN EN 43760 B
Mounting/attachment:	in flush-mounted socket, can be adapted to fit virtually any rocker switch ranges 50 x 50 mm
Protection rating:	IP 30
Protection class:	III
Safety and EMC:	according to DIN EN 60730
Sensor characteristic curves:	The sensor characteristic curves can be found under “Miscellaneous”

Application

Temperature measurement in living spaces and office spaces.

The room temperature sensor with 50 x 50-mm cover can be integrated into almost all switch ranges by means of an insert frame.
(Frames are not a part of the delivery scope.) For integration examples, see the “Heating technology” section.

Please follow the EMC directives. Avoid parallel routing with mains voltage-bearing wires, or use shielded wires.

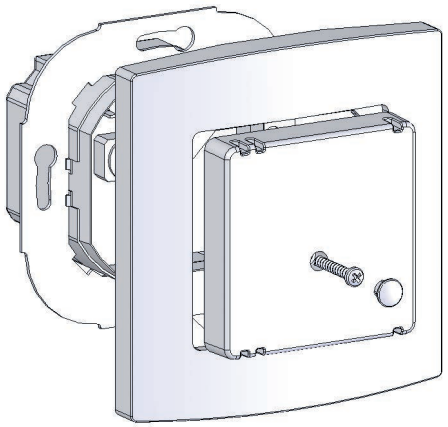
Sensor	Type	Item no.	Surface finish	PG
PT-100	FUFP 100-0000	SN 090000	glossy	III
PT-100	FUFP 100-0000 matt	SN 090203	matt	III
PT-1000	FUFP 1000-0000	SN 090001	glossy	III
PT-1000	FUFP 1000-0000 matt	SN 090204	matt	III
Ni-1000	FUFN 1000-0000	SN 090002	glossy	III
Ni-1000	FUFN 1000-0000 matt	SN 090205	matt	III
Ni-1000 TK 5000	FUFN 1000 TK 5000-0000	SN 090003	glossy	III
Ni-1000 TK 5000	FUFN 1000 TK 5000-0000 matt	SN 090206	matt	III
LM 235Z	FUFLM-0000	SN 090150	glossy	III
LM 235Z	FUFLM-0000 matt	SN 090207	matt	III
NTC 2K25 “Sensor 0”	FUFC 225-0000	SN 090197	glossy	III
NTC 2K25 “Sensor 0”	FUFC 225-0000 matt	SN 090208	matt	III
NTC 47K “Sensor 2”	FUFC 47-0000	SN 090198	glossy	III
NTC 47K “Sensor 2”	FUFC 47-0000 matt	SN 090209	matt	III
NTC 8K “Sensor 3”	FUFC 08-0000	SN 090199	glossy	III
NTC 8K “Sensor 3”	FUFC 08-0000 mat	SN 090210	matt	III
NTC 10K “Sensor 4”	FUFC 10-0000	SN 090005	glossy	III
NTC 10K “Sensor 4”	FUFC 10-0000 matt	SN 090211	matt	III
NTC 2K “Sensor 8”	FUFC 02-0000	SN 090200	glossy	III
NTC 2K “Sensor 8”	FUFC 02-0000 matt	SN 090212	matt	III
KTY 81-121 “Sensor 51”	FUFY 81/121-0000	SN 090201	glossy	III
KTY 81-121 “Sensor 51”	FUFY 81/121-0000 matt	SN 090213	matt	III
KTY 11-7 “Sensor 57”	FUFY 11/7-0000	SN 090202	glossy	III
KTY 11-7 “Sensor 57”	FUFY 11/7-0000 matt	SN 090214	matt	III

Accessories	Item no.	Features	PG
JZ-090.900	VV000025	alre frame “Berlin” for all flush-mounted controllers and sensors with 50 x 50-mm pure white cover, glossy, like RAL 9010	I

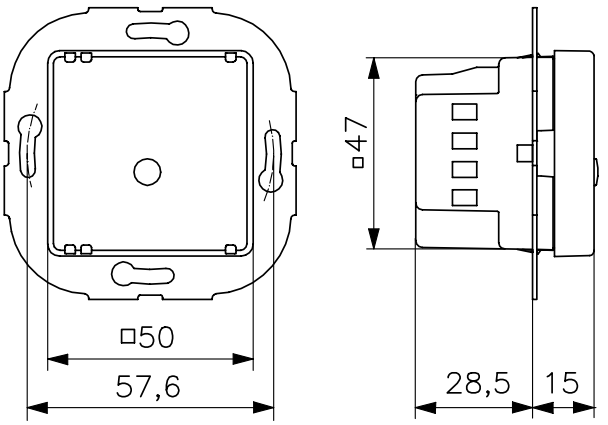
Room temperature sensors – flush-mounted FUF

for measuring the temperature in dry rooms

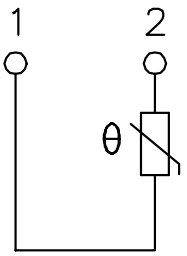
FUF with alre frame “Berlin”



Dimension drawing FUF



Circuit diagram FUFxx-0000



Outdoor temperature sensors AF with passive output

AF … outdoor temperature sensor with inside sensor

AF

Technical data

Housing colour:	pure white, like RAL 9010
Housing material:	PA plastic (30% GF reinforced)
Ambient temperature:	–30 … +70 °C
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Electrical connection:	screw-type terminals 0.14 mm² up to 2.5 mm² only at protective low voltage max. 30 VAC / 42 VDC
Max. measurement current:	< 1 mA
Sensor wire extendable:	depending on the cross-section of the conductor and the sensor unit type
Tolerances:	PT100 / PT1000 DIN EN 60751 B Ni 1000 DIN EN 43760 B
Mounting / attachment:	surface- / wall-mounting
Protection rating:	IP 65
Protection class:	III
Safety and EMC:	according to DIN EN 60730
Sensor characteristic curves:	The sensor characteristic curves can be found under “Miscellaneous”

Application

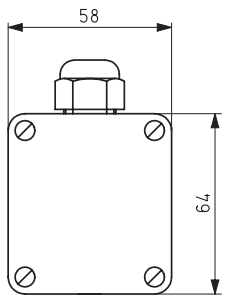
The AF outdoor temperature sensors are used for temperature measurement in the outdoors, in damp environments, in cold storage rooms and greenhouses as well as in industrial applications and are specially protected against dust and moisture. If there is direct incident sunlight on the sensor housing, the use of a sun shade is recommended.

Please follow the EMC directives, avoid parallel routing with mains voltage-bearing wires, or use shielded wires.

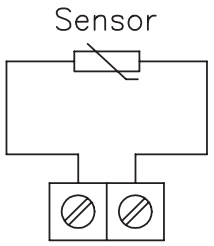
Sensor	Type	Item no.	PG
PT 100	**AFP 100**	G 9040010	III
PT 1000	**AFP 1000**	G 9040020	III
NI 1000	**AFN 1000**	G 9040030	III
NI 1000 TK 5000	**AFN 1000 TK 5000**	G 9040040	III
LM 235 Z	**AFLM**	G 9040130	III
NTC 2K25 “Sensor 0”	**AF-0**	G 9040360	III
NTC 1K “Sensor 1”	**AF-1**	G 9040370	III
NTC 47K “Sensor 2”	**AF-2**	G 9040380	III
NTC 8K “Sensor 3”	**AF-3**	G 9040390	III
NTC 10K “Sensor 4”	**AF-4**	G 9040400	III
NTC 50K “Sensor 5”	**AF-5**	G 9040561	III
NTC 2K “Sensor 8”	**AF-8**	G 9040410	III
KTY 81-121 “Sensor 51”	**AF-51**	G 9040420	III
KTY 11-7 “Sensor 57”	**AF-57**	G 9040681	III

Accessories	Item no.	Features	PG
S protection 01	G 9990170	Ball impact guard, sun and rain protection; 150 x 90 x 47 mm; stainless steel V4A 1.4571	III

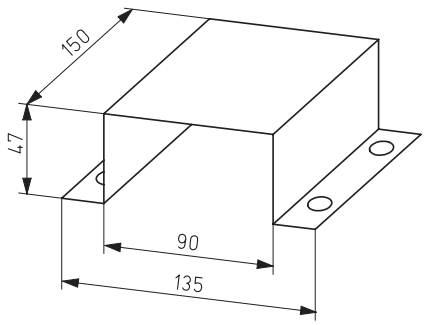
Dimension drawing



Sensor circuit diagram



S protection 01



Outdoor temperature sensors with passive and active output

AFH… outdoor temperature sensor with sleeve lead-out
AFHM… outdoor temperature sensor with transducer 4–20 mA with sensor sleeve lead-out
MTRVD… outdoor temperature sensor with transducer 0–10 V with sensor sleeve lead-out

Technical data

Housing colour:	pure white, like RAL 9010
Housing material:	PA plastic (30% GF reinforced)
Operating voltage (active):	24 VDC
Ambient temperature:	–30…+70 °C
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Max. measurement current (passive):	< 1 mA
Electrical connection:	screw-type terminals 0.14 mm² to 2.5 mm² only at protective low voltage, Max. passive output: 30 VAC/42 VDC, AFHP 100/3L 3-conductor, AFHP 100/4L 4-conductor,
Sensor wire extendable:	depending on the cross-section of the conductor and the sensor unit type
Tolerances:	PT100/PT1000 DIN EN 60751 B Ni 1000 DIN EN 43760 B
Mounting/attachment:	surface-/wall-mounting
Protection rating:	IP 65
Protection class:	III
Safety and EMC:	according to DIN EN 60730

Application

The outdoor temperature sensors are used for temperature measurement in the outdoors, in damp room applications, in cold storage rooms and greenhouses as well as in industrial applications and are specially protected against dust and moisture. Owing to the external sensor sleeve, this outdoor sensor has a very good actuation response to temperature changes. When the outdoor temperature sensor is active, the temperature-dependent resistance of the sensor is converted linearly into a current signal of 4–20 mA or a voltage signal between 0–10 V.
If there is direct incident sunlight on the sensor, the use of a sun shade is recommended.

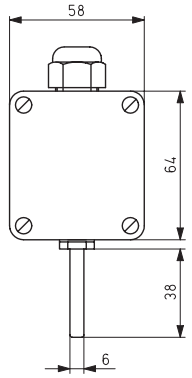
Please follow the EMC directives, avoid parallel routing with mains voltage-bearing wires, or use shielded wires.

Sensor	Type (passive)	Item no.	PG
PT 100	**AFHP 100**	G 9040160	III
PT 100	**AFHP 100/3L**	G 9040631	III
PT 100	**AFHP 100/4L**	G 9040571	III
PT 1000	**AFHP 1000**	G 9040170	III
NI 1000	**AFHN 1000**	G 9040180	III
NI 1000 TK 5000	**AFHN 1000 TK 5000**	G 9040190	III
NTC 10 K "Sensor 4"	**AFHC 10**	G 9040220	III
NTC 10 K "Sensor 5"	**AFHC 50**	G 9040260	III
LM 235 Z	**AFHLM**	G 9040280	III

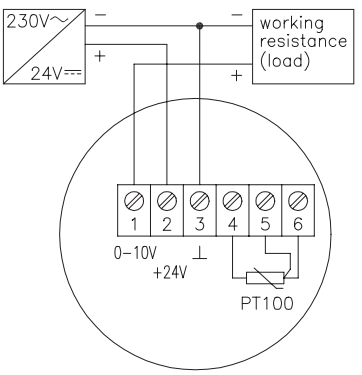
Type (active)	Item no.	Output signal	Measurement range	PG
MTRVD-965.758	G 9040711	0–10 V	–50…+50 °C, 0…50 °C, –20…+80 °C, 0…100 °C	III
AFHM/4–20	G 9040300	4–20 mA	–50…+50 °C	III
AFHM/2/4–20	G 9040351	4–20 mA	0…50 °C	III

Accessories	Item no.	Features	PG
S protection 01	G 9990170	Ball impact guard, sun and rain protection; 150 x 90 x 47 mm; stainless steel V4A 1.4571	III

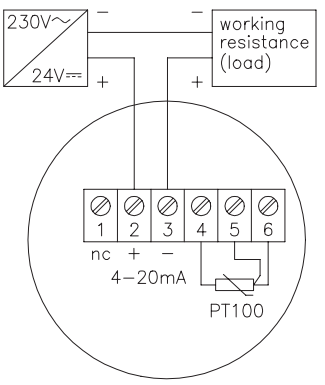
Dimension drawing



Connection circuit diagram 0–10 V



Connection circuit diagram 4–20 mA



Sleeve temperature sensors HF

HF…/P sleeve temperature sensor with PVC cable
HF…/S sleeve temperature sensor with silicone cable

Technical data (HF.../P and HF.../S)

Sensor dimensions:	Ø 6 mm x 45 mm
Sensor sleeve material:	V2A (1.4301)
Permissible atmospheric humidity:	max. 95% relative humidity, non-condensing
Max. measurement current:	< 1 mA
Electrical connection:	screw-type terminals 0.14 mm² to 2.5 mm² only at protective low voltage, max. 30 VAC/42 VDC, HFP 100/S/3L 3-conductor, HFP 100/S/4L 4-conductor
Connecting cable:	1 m, 2 x 0.5 mm² (HFP 100/S/6 m: 6 m, 2 x 0.5 mm²)
Sensor wire extendable:	depending on the cross-section of the conductor and the sensor unit type
Tolerances:	PT100/PT1000 DIN EN 60751 B Ni 1000 DIN EN 43760 B
Mounting/attachment:	in immersion sleeve, protective coil, on pipe etc.
Protection rating:	IP 65, moisture-impregnable burnishing
Protection class:	III
Safety and EMC:	according to DIN EN 60730
Sensor characteristic curves:	The sensor characteristic curves can be found under “Miscellaneous”
Immersion sleeves:	Immersion sleeves can be found in the “Miscellaneous” section.

Application

The HF sleeve sensors are used for temperature measurement in liquid or gaseous media. Thanks to the moisture-impermeable burnishing, the sleeve sensor is particularly protected against moisture and dust.

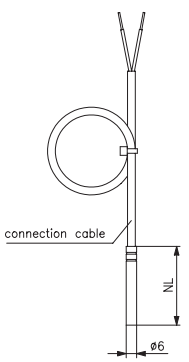
If used in liquid media, integration in an immersion sleeve is necessary.

Please follow the EMC directives, avoid parallel routing with mains voltage-bearing wires, or use shielded wires.

Sensor	Type	Item no.	Features	PG
PT 100	**HFP 100/P**	G 9030010	Sensor wire PVC, –35…+105 °C	III
PT 1000	**HFP 1000/P**	G 9030020	Sensor wire PVC, –35…+105 °C	III
Ni 1000	**HFN 1000/P**	G 9030030	Sensor wire PVC, –35…+105 °C	III
Ni 1000 TK 5000	**HFN 1000 TK 5000/P**	G 9030040	Sensor wire PVC, –35…+105 °C	III
NTC 10 K	**HFC 10/P**	G 9030070	Sensor wire PVC, –35…+105 °C	III
LM 235 Z	**HFLM/P**	G 9030130	Sensor wire PVC, –35…+105 °C	III

Sensor	Type	Item no.	Features	PG
PT 100	**HFP 100/S**	G 9030140	Sensor wire, silicone, –50…+150 °C	III
PT 100	**HFP 100/S/6 m**	G 9030411	Sensor wire, silicone, –50…+150 °C	III
PT 100	**HFP 100/S/3L**	G 9030331	Sensor wire, silicone, –50…+150 °C	III
PT 100	**HFP 100/S/4L**	G 9030911	Sensor wire, silicone, –50…+150 °C	III
PT 1000	**HFP 1000/S**	G 9030150	Sensor wire, silicone, –50…+150 °C	III
Ni 1000	**HFN 1000/S**	G 9030160	Sensor wire, silicone, –50…+150 °C	III
Ni 1000 TK 5000	**HFN 1000 TK 5000/S**	G 9030170	Sensor wire, silicone, –50…+150 °C	III
NTC 10 K	**HFC 10/S**	G 9030200	Sensor wire, silicone, –50…+150 °C	III
LM 235 Z	**HFLM/S**	G 9030260	Sensor wire, silicone, –50…+125 °C	III

Dimension drawing



Sleeve temperature sensors HF

(remote sensor for alre standard devices, for example, ITR79 …

Technical data

Sensor dimensions:	see dimension schematic
Sensor sleeve material:	V2A (1.4301) HF-5/4K2 and HF-5/4K3 plastic
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Max. measurement current:	< 1 mA
Electrical connection:	only at protective low voltage max. 30 VAC/42 VDC HF-100 and HF-100/6 4-conductor
Sensor wire extendable up to:	depending on the cross-section of the conductor and the sensor unit type
Tolerances:	PT100/PT1000 DIN EN 60751 B NI1000 DIN EN 43760 B
Mounting/attachment:	in immersion sleeve, protective coil, on pipe etc.
Protection rating:	IP 65
Protection class:	III
Safety and EMC:	according to DIN EN 60730
Sensor characteristic curves:	The sensor characteristic curves can be found under “Miscellaneous”
Immersion sleeves:	Immersion sleeves can be found in the “Miscellaneous” section.

Application

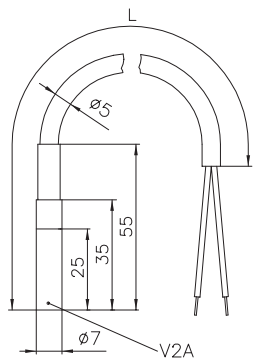
For temperature measurement of liquid media by integrating in immersion sleeves (TH/NTH). For line lengths different from the ones shown in the product portfolio, use sensor type GFL. For temperature measurement of air and non-aggressive gases in the air duct by integration in a protecting coil (SW-200, see the “Accessories/miscellaneous” section).

Please follow the EMC directives, avoid parallel routing with mains voltage-bearing wires, or use shielded wires. Time constant approx. 20 s, in moving water.

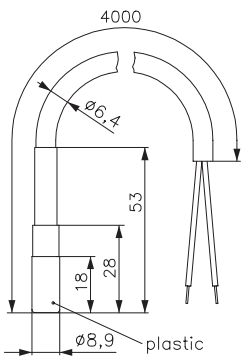
Sensor	Type	Item no.	Features	PG
“Sensor 0” (NTC 2 K 25)	**HF-0**	D 4779114	Wire PE, 1.5 m, –50…+85 °C	III
“Sensor 0” (NTC 2 K 25)	**HF-0/6**	D 4779126	Wire PE, 6 m, –50…+85 °C	III
“Sensor 1” (NTC 1K)	**HF-1**	D 4779203	Wire PE, 1.5 m, –50…+85 °C	III
“Sensor 2” (NTC 47K)	**HF-2**	D 4779823	Wire PE, 1.5 m, –50…+85 °C	III
“Sensor 3” (NTC 8 K)	**HF-3**	D 4779090	Wire PE, 1.5 m, –50…+85 °C	III
“Sensor 3” (NTC 8 K)	**HF-3/6**	D 4779102	Wire PE, 6 m, –50…+85 °C	III
“Sensor 4” (NTC 10 K)	**HF-4**	D 4779088	Wire PE, 1.5 m, –50…+85 °C	III
“Sensor 4” (NTC 10 K)	**HF-4/6**	D 4779710	Wire PE, 6 m, –50…+85 °C	III
“Sensor 5” (NTC 50 K)	**HF-5**	D 4779025	Wire PE, 1.5 m, –50…+85 °C	III
“Sensor 5” (NTC 50 K)	**HF-5/4 K2**	D 4771303	Wire PVC (HAR), 4 m, –5 … +70 °C	III
“Sensor 5” (NTC 50 K)	**HF-5/4 K 3 ***	D 4771304	Wire silicone, 4 m, –50…+150 °C	III
“Sensor 5” (NTC 50 K)	**HF-5/6**	D 4779619	Wire PE, 6 m, –50…+85 °C	III
“Sensor 6” (NTC 100 K)	**HF-6**	D 4779037	Wire silicone, 1.5 m, –50…+150 °C	III
“Sensor 6” (NTC 100 K)	**HF-6/3**	D 4779835	Wire silicone, 3 m, –50…+150 °C	III
“Sensor 51” (KTY 81-121)	**HF-51**	D 4779429	Wire silicone, 1.5 m, –50…+150 °C	III
“Sensor 51” (KTY 81-121)	**HF-51/6**	D 4779746	Wire silicone, 6 m, –50…+150 °C	III
“Sensor 57” (KTY 11-7)	**HF-57**	D 4771286	Wire PE, 1.5 m, –50…+85 °C	III
PT-100	**HF-100**	D 4771184	Wire silicone, 1.5 m, –50…+150 °C	III
PT-100	**HF-100/6**	D 4771185	Wire silicone, 6 m, –50…+150 °C	III
PT-1000	**HF-1000**	D 4771130	Wire silicone, 1.5 m, –50…+150 °C	III

* Attention: larger Ø 8.9 mm for TH/NTH 140 see page 230

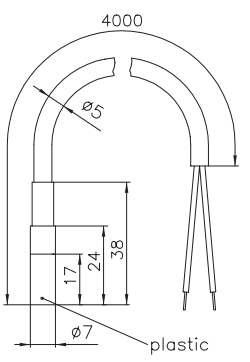
Dimension drawing HF



Dimension drawing HF-5/4K3



Dimension drawing HF-5/4K2



Air temperature sensor LF

(remote sensor for alre standard devices, for example, ITR79 …)

Technical data

Sensor material:	plastic sleeve, PE wire
Sensor dimensions:	7.5 mm x 40 mm
Ambient temperature:	–50 … +85 °C
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Max. measurement current:	< 1 mA
Electrical connection:	only at protective low voltage max. 30 VAC/42 VDC
Sensor wire extendable:	depending on the cross-section of the conductor and the sensor unit type
Tolerances:	PT100/PT1000 DIN EN 60751 B
Mounting/attachment:	in protective coil
Protection rating:	IP 65
Protection class:	III
Safety and EMC:	according to DIN EN 60730
Sensor characteristic curves:	The sensor characteristic curves can be found under “Miscellaneous”

Application

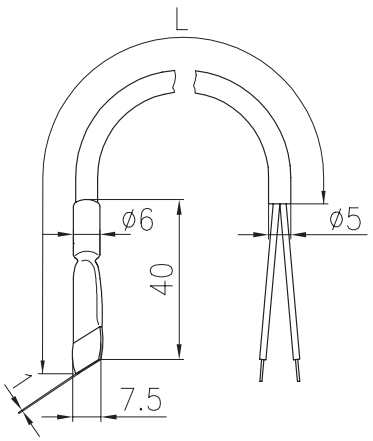
For temperature measurement of air and non-aggressive gases in the air duct by integration in a protecting coil (SW-200).

Please follow the EMC directives, avoid parallel routing with mains voltage-bearing wires, or use shielded wires.
The sensor element is covered with a shrink-wrapped sleeve; the time constant is approx. 10 s, in moving air 2 m/s.

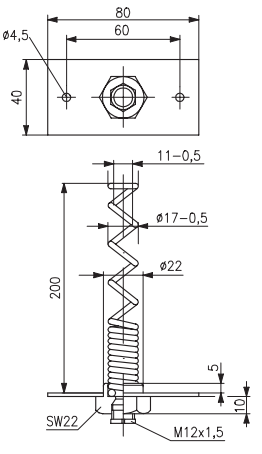
Sensor	Type	Item no.	Features	PG
“Sensor 0” (NTC 2 K 25)	**LF-20**	D 4779330	1.5 m	III
“Sensor 1” (NTC 1 K)	**LF-21**	D 4771134	1.5 m	III
“Sensor 2” (NTC 47K)	**LF-22**	D 4779239	1.5 m	III
“Sensor 3” (NTC 8 K)	**LF-23**	D 4779355	1.5 m	III
“Sensor 4” (NTC 10 K)	**LF-24**	D 4771133	1.5 m	III
“Sensor 4” (NTC 10 K)	**LF-24/4**	D 4779660	4 m	III
“Sensor 4” (NTC 10 K)	**LF-24/6**	D 4771135	6 m	III
“Sensor 5” (NTC 50 K)	**LF-25**	D 4779367	1.5 m	III
“Sensor 5” (NTC 50 K)	**LF-25/4**	D 4771199	4 m	III
“Sensor 8” (NTC 2 K)	**LF-8/4**	D 4771210	4 m	III
“Sensor 51” (PTC 1K)	**LF-51**	D 4771149	1.5 m	III
“Sensor 51” (PTC 1K)	**LF-51/6**	D 4771159	6 m	III
PT-100	**LF-100**	D 4771179	1.5 m	III
PT-1000	**LF-1000**	D 4771206	1.5 m	III

Accessories	Item no.	Length of	Ø Screw connection	Diameter	Material	PG
SW-200	C 1809219	200 mm	8 mm	11 x 17 mm	steel, nickel-plated	II

Dimension drawing LF



Dimension drawing SW-200



Contact temperature sensor with passive and active output

ALF … contact temperature sensor

MTRKK … contact temperature sensor with transducer 0–10 V or 4–20 mA

Technical data

Housing colour:	pure white, like RAL 9010
Housing material:	PA plastic (30% GF reinforced)
Ambient temperature:	–30 … +70 °C
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Max. measurement current (passive):	< 1 mA
Electrical connection:	Screw-type terminals 0.14 mm² to 2.5 mm² only at protective low voltage passive max. 30 VAC / 42 VDC
Mounting / attachment:	on pipe by means of cable tie
Tolerances:	PT100 / PT1000 DIN EN 60751 B NI1000 DIN EN 43760 B
Protection rating:	IP 65
Protection class:	III
Safety and EMC:	according to DIN EN 60730
Sensor characteristic curves:	The sensor characteristic curves can be found under “Miscellaneous”

Application

The ALF contact temperature sensors are used for temperature measurement on pipes, tubes or heat carriers.

When the contact temperature sensor is active, the temperature-dependent resistance of the sensors is converted linearly into a voltage signal of 0–10 V or a current signal of 4–20 mA.

For better temperature transmission between the pipe and the contact sensor, the use of a heat conducting paste is recommended.

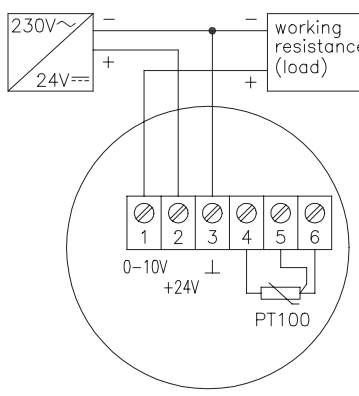
Please follow the EMC directives, avoid parallel routing with mains voltage-bearing wires, or use shielded wires.

Sensor	Type	Item no.	PG
PT 100	**ALFP 100**	G 9050010	III
PT 1000	**ALFP 1000**	G 9050020	III
NI 1000	**ALFN 1000**	G 9050030	III
NI 1000 TK 5000	**ALFN 1000 TK 5000**	G 9050040	III
LM 235 Z	**ALFLM**	G 9050130	III
“Sensor 0” (NTC 2K25)	**ALF-0**	G 9050270	III
“Sensor 2” (NTC 47K)	**ALF-2**	G 9050160	III
“Sensor 3” (NTC 8K)	**ALF-3**	G 9050180	III
“Sensor 4” (NTC 10K)	**ALF-4**	G 9050190	III
“Sensor 5” (NTC 50K)	**ALF-5**	G 9050200	III
“Sensor 51” (KTY 81-121)	**ALF-51**	G 9050210	III

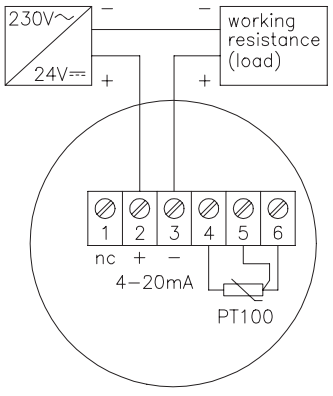
Contact temperature sensor, active	Item no.	Features	PG
MTRKK-965.758	G 9050350	**Measurement ranges:** –50 … +50 °C, 0 … +50 °C, –20 … +80 °C, 0 … +100 °C **Operating voltage:** 24 VDC **Output signals:** continuous 0–10 VDC, continuous 4–20 mA **Sensor type:** PT-100 2-conductor (0–10 V), 3-conductor (4–20 mA)	III

Accessories	Item no.	Features	PG
WP-01	G 9990180	heat conduction paste 2 ml	II

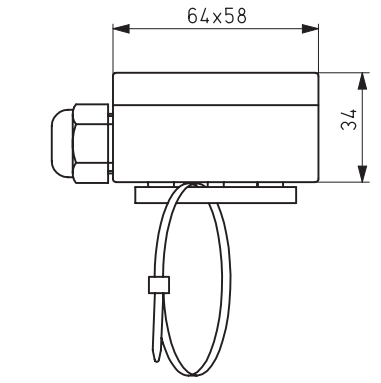
Connection diagram 0–10 V



Connection diagram 4–20 mA



Dimension drawing



Pendulum temperature sensor PF

Technical data

Sensor material:	Al black, PVC wire
Sensor dimensions:	Ø 60 mm
Ambient temperature:	–30 … +80 °C
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Max. measurement current:	< 1 mA
Electrical connection:	only at protective low voltage max. 30 VAC / 42 VDC
Sensor wire extendable:	The ALF contact temperature sensors are used for temperature measurement on pipes, tubes or heat carriers. When the contact temperature sensor is active, the temperature-dependent resistance of the sensors is converted linearly into a voltage signal of 0–10 V or a current signal of 4–20 mA. For better temperature transmission between the pipe and the contact sensor, the use of a heat conducting paste is recommended.
Connecting cable:	2 x 0.5 mm²
Mounting / attachment:	suspended
Tolerances:	PT100 / PT1000 DIN EN 60751 B NI1000 DIN EN 43760 B
Protection rating:	IP 65
Protection class:	III
Safety and EMC:	according to DIN EN 60730
Sensor characteristic curves:	The sensor characteristic curves can be found in the “Miscellaneous” section.

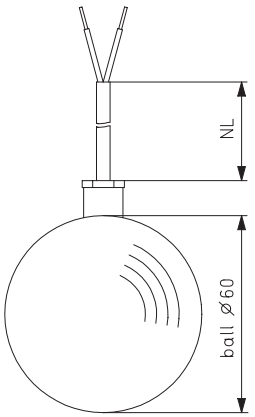
Application

The pendulum temperature sensor PF serves to measure the temperatures in larger spaces. Owing to the spherical form, this sensor captures the temperature from all directions of the room, so that when correctly positioned in the room, a representative measurement result can be achieved.

Please follow the EMC directives, avoid parallel routing with mains voltage-bearing wires, or use shielded wires.

Sensor	Type	Item no.	Features	PG
PT 100	**PFP 100**	G 9130010	Wire length: 1 m	III
PT 1000	**PFP 1000**	G 9130020	Wire length: 1 m	III
NI 1000	**PFN 1000**	G 9130030	Wire length: 1 m	III
“Sensor 4” NTC 10 K	**PFC 10**	G 9130070	Wire length: 1 m	III
LM 235 Z	**PFLM**	G 9130130	Wire length: 1 m	III
“Sensor 2” NTC 47 K	**PFC 47 / 6 (6 m)**	G 9130180	Wire length: 6 m	III

PF dimension drawing



Radiation temperature sensor STF

Technical data

Design:	Berlin 200
Housing colour:	pure white, like RAL 9010, ball black
Housing material:	ABS plastic
Ambient temperature:	–20 ... +60 °C
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Max. measurement current:	< 1 mA
Electrical connection:	screw-type terminals 0.14 mm² up to 1.5 mm² only at protective low voltage max. 30 VAC / 42 VDC
Sensor wire extendable:	depending on the cross-section of the conductor and the sensor unit type
Mounting / attachment:	surface / wall mounting (4-hole assembly on flush-mounted socket)
Protection rating:	IP 30
Protection class:	III
Safety and EMC:	according to DIN EN 60730
Sensor characteristic curves:	The sensor characteristic curves can be found in the “Miscellaneous” section.

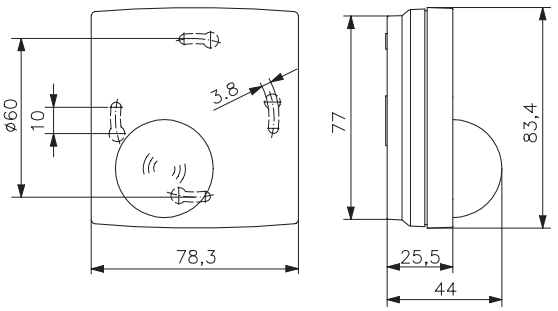
Application

The radiation temperature sensor is a dual sensor for the measurement of radiation and room heat. The radiation sensor is located in the black hemisphere; the room sensor is located the plastic housing. Connection with screw-type terminals.

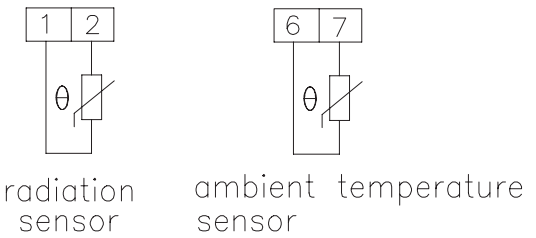
Please follow the EMC directives, avoid parallel routing with mains voltage-bearing wires, or use shielded wires.

Sensor	Type	Item no.	PG
“Sensor 0” 2x NTC 2 K 25	**STF-0**	SN 080100	III
“Sensor 2” 2x NTC 47 K	**STF-2**	SN 080200	III
“Sensor 4” 2x NTC 10 K	**STF-4**	SN 080400	III
“Sensor 51” 2x KTY 81-121	**STF-51**	SN 080500	III

STF dimension drawing

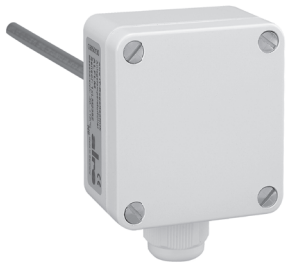


STF connection diagram



Assembly-type duct sensor EKF/GFL

with passive output



Technical data

Housing colour:	pure white, like RAL 9010
Housing material:	PA plastic (30% GF reinforced)
Sensor tube material:	V2A (1.4301)
Ambient temperature:	–30 ... +70 °C
Max. sensor temperature	150 °C (sensor type LM 235 Z 125 °C)
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Electrical connection:	screw-type terminals 0.14 mm² up to 2.5 mm² only at protective low voltage max. 30 VAC/42 VDC
Tolerances:	PT100/PT1000 DIN EN 60751 B NI1000 DIN EN 43760 B
Mounting/attachment:	in immersion sleeves (THMs, THV) for fluids or with mounting flange (MF) in air ducts
Protection rating:	IP 65
Protection class:	III
Safety and EMC:	according to DIN EN 60730
Sensor characteristic curves:	The sensor characteristic curves can be found in the “Miscellaneous” section.
Immersion sleeves:	subtract 15 mm from the fitting length (EL) to determine the nominal length (NL) of the immersion sleeve, for example, EL = 65 mm corresponds to THV/50

Application

The assembly-type duct sensors EKF/GFL are used for measuring temperatures in liquids and gases in pipes, air ducts or tanks. The mounting flange (MF) is required for use in air ducts. If used in liquids, immersion sleeves made of brass with nickel plating (THMs) should be used. For aggressive media, immersion sleeves made of stainless steel V4A (THV) are recommended. Immersion sleeves or mounting flanges are not part of the delivery scope and must be **ordered separately** as accessories.

Accessories: mounting flange for installation in air ducts: MF matching immersion sleeves in brass: immersion sleeves with brass plating can be found under “Miscellaneous”, matching immersion sleeves stainless steel (V4A): immersion sleeves made of stainless steel V4A can be found in the “Miscellaneous” section

Sensor wire extendable: depending on the cross-section of the conductor and the sensor unit type

Please follow the EMC directives, avoid parallel routing with mains voltage-bearing wires, or use shielded wires.

Sensor	Fitting length 65 mm (for 50-mm immersion sleeves)	Fitting length 115 mm (for 100-mm immersion sleeves)	Fitting length 165 mm (for 150-mm immersion sleeves)	PG
PT 100	**EKFP 100/50** Item no.: G 9140010	**EKFP 100/100** Item no.: G 9140140	**EKFP 100/150** Item no.: G 9140270	III
PT 1000	**EKFP 1000/50** Item no.: G 9140020	**EKFP 1000/100** Item no.: G 9140150	**EKFP 1000/150** Item no.: G 9140280	III
NI 1000	**EKFN 1000/50** Item no.: G 9140030	**EKFN 1000/100** Item no.: G 9140160	**EKFN 1000/150** Item no.: G 9140290	III
NI 1000 TK 5000	**EKFN 1000 TK 5000/50** Item no.: G 9140040	**EKFN 1000 TK 5000/100** Item no.: G 9140170	**EKFN 1000 TK 5000/150** Item no.: G 9140300	III
NTC 10K “Sensor 4”	**EKFC 10/50** Item no.: G 9140070	**EKFC 10/100** Item no.: G 9140200	**EKFC 10/150** Item no.: G 9140330	III
LM 235 Z	**EKFLM/50** Item no.: G 9140130	**EKFLM/100** Item no.: G 9140260	**EKFLM/150** Item no.: G 9140390	III

Sensor	Fitting length 215 mm (for 200-mm immersion sleeves)	Fitting length 265 mm (for 250-mm immersion sleeves)	Fitting length 315 mm (for 300-mm immersion sleeves)	PG
PT 100	**EKFP 100/200** Item no.: G 9140400	**EKFP 100/250** Item no.: G 9140530	**EKFP 100/300** Item no.: G 9141581	III
PT 1000	**EKFP 1000/200** Item no.: G 9140410	**EKFP 1000/250** Item no.: G 9140540	**EKFP 1000/300** Item no.: G 9141421	III
NI 1000	**EKFN 1000/200** Item no.: G 9140420	**EKFN 1000/250** Item no.: G 9140550	**EKFN 1000/300** Item no.: G 9141521	III
NI 1000 TK 5000	**EKFN 1000 TK 5000/200** Item no.: G 9140430	**EKFN 1000 TK 5000/250** Item no.: G 9140560	**EKFN 1000 TK 5000/300** Item no.: G 9141591	III
NTC 10K “Sensor 4”	**EKFC 10/200** Item no.: G 9140460	**EKFC 10/250** Item no.: G 9140590	**EKFC 10/300** Item no.: G 9141621	III
LM 235 Z	**EKFLM/200** Item no.: G 9140520	**EKFLM/250** Item no.: G 9140650	**EKFLM/300** Item no.: G 9141342	III

Assembly-type duct sensor EKF / GFL

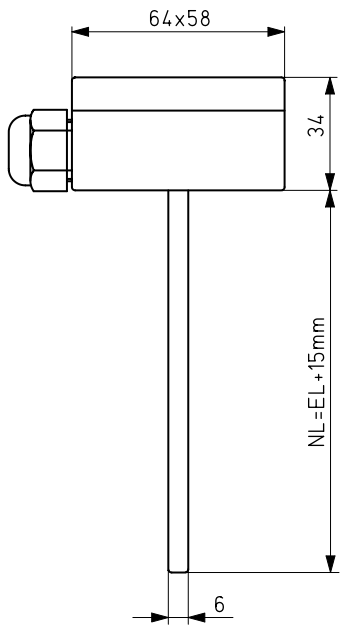
with passive output

Sensor	Fitting length 415 mm (for 400-mm immersion sleeves)	Fitting length 515 mm (for 500-mm immersion sleeves)	Fitting length 615 mm (for 600-mm immersion sleeves)	PG
PT 100	**EKFP 100/400** Item no.: G 9141381	**EKFP 100/500** Item no.: G 9141841	**EKFP 100/600** Item no.: G 9142071	III
PT 1000	**EKFP 1000/400** Item no.: G 9141551	**EKFP 1000/500** Item no.: G 9141531	**EKFP 1000/600** Item no.: G 9142081	III
NI 1000	**EKFN 1000/400** Item no.: G 9141511	**EKFN 1000/500** Item no.: G 9142091	**EKFN 1000/600** Item no.: G 9142101	III
NI 1000 TK 5000	**EKFN 1000 TK 5000/400** Item no.: G 9141931	**EKFN 1000 TK 5000/500** Item no.: G 9142111	**EKFN 1000 TK 5000/600** Item no.: G 9142121	III
NTC 10K "Sensor 4"	**EKFC 10/400** Item no.: G 9142131	**EKFC 10/500** Item no.: G 9142141	**EKFC 10/600** Item no.: G 9142151	III
LM 235 Z	**EKFLM/400** Item no.: G 9141791	**EKFLM/500** Item no.: G 9141391	**EKFLM/600** Item no.: G 9142161	III

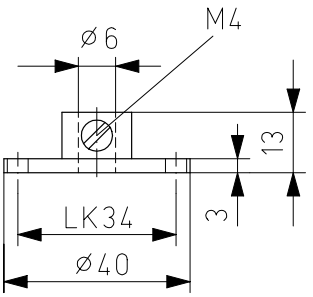
Sensor	Type (Fitting length 215 mm)	Item no.	PG
"Sensor 0" NTC 2K25	**GFL-0**	G 9060010	III
"Sensor 1" NTC 1 K	**GFL-1**	G 9060020	III
"Sensor 2" NTC 47K	**GFL-2**	G 9060030	III
"Sensor 3" NTC 8K	**GFL-3**	G 9060040	III
"Sensor 4" NTC 10K	**GFL-4**	G 9060050	III
"Sensor 5" NTC 50K	**GFL-5**	G 9060060	III
"Sensor 51" KTY 81-121	**GFL-51**	G 9060070	III

Accessories	Item no.	Features	PG
MF	G 9990160	mounting flange for integrated duct sensor	III

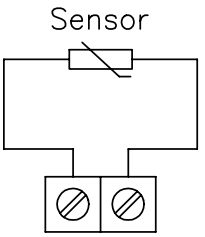
Dimension schematic, assembly-type duct sensor



Dimension schematic, mounting flange MF



Circuit diagram, assembly-type duct sensor



Assembly-type duct sensor

with active output (transducer 0–10 V or 4–20 mA)

Technical data

Housing colour:	pure white, like RAL 9010
Housing material:	PA plastic (30% GF reinforced)
Sensor tube material:	V2A (1.4301)
Operating voltage:	24 VDC
Ambient temperature:	–30 ... +70 °C
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Max. sensor temperature	100 °C
Electrical connection:	screw-type terminals 0.14 mm² to 2.5 mm²
Tolerances:	PT 100, DIN EN 60751, class B
Mounting / attachment:	in immersion sleeves (THMs, THV) for fluids or with mounting flange (MF) in air ducts
Protection rating:	IP 65
Protection class:	III
Safety and EMC:	according to DIN EN 60730
Sensor:	PTC, internal
Immersion sleeves:	from the fitting length (EL), subtract 15 mm to determine the nominal length (NL) of the immersion sleeve, for example, EL = 65 mm corresponds to THV / 50
Sensor type:	PT-100
Output signal:	continuous 4 ... 20 mA or 0 ... 10 V selectable
Measurement ranges:	–50 ... +50 °C, 0 ... +50 °C, –20 ... +80 °C, 0 ... +100 °C selectable

Application

The assembly-type duct sensor MTRKK is used for measuring temperatures in liquids and gases in pipes, air ducts or tanks. The temperature-dependent resistance of the sensor is converted linearly into a current signal of 4–20 mA or a voltage signal of 0–10 V. The transducer is supplied calibrated to the measurement range of –50 … +50 °C, 0 … +50 °C or 0 … +100 °C.
The mounting flange (MF) is required for use in air ducts. If used in liquids, immersion sleeves made of brass should be used with nickel plating (THMs). For aggressive media, immersion sleeves made of stainless steel V4A (THV) are recommended. Immersion sleeves or mounting flanges are not part of the delivery scope and must be **ordered separately** as accessories.

Accessories: mounting flange for installation in air ducts: MF matching immersion sleeves

Brass: immersion sleeves with brass plating can be found in the “Miscellaneous” section, matching immersion sleeves

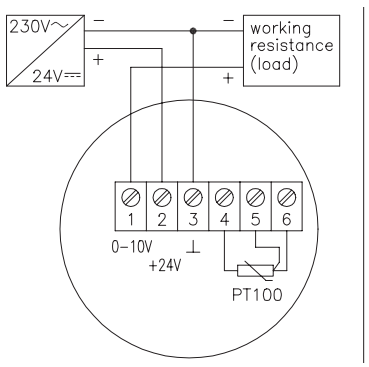
Stainless steel V4A: immersion sleeves made of stainless steel V4A can be found in the “Miscellaneous” section

Please follow the EMC directives, avoid parallel routing with mains voltage-bearing wires, or use shielded wires.

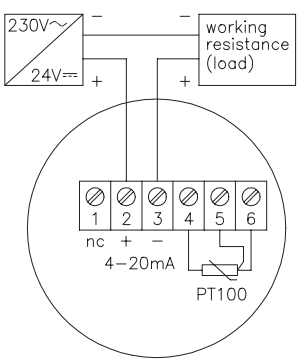
Fitting length	Type	Item no.	PG
65 mm (NL) (for 50-mm immersion sleeve)	**MTRKK-965.758/50 mm**	G 9142171	III
115 mm (NL) (for 100-mm immersion sleeve)	**MTRKK-965.758/100 mm**	G 9142181	III
165 mm (NL) (for 150-mm immersion sleeve)	**MTRKK-965.758/150 mm**	G 9142191	III
215 mm (NL) (for 200-mm immersion sleeve)	**MTRKK-965.758/200 mm**	G 9142201	III
265 mm (NL) (for 250-mm immersion sleeve)	**MTRKK-965.758/250 mm**	G 9142211	III
315 mm (NL) (for 300-mm immersion sleeve)	**MTRKK-965.758/300 mm**	G 9142221	/III

Accessories	Item no.	Features	PG
MF	G 9990160	mounting flange for integrated duct sensor	III

Connection diagram 0–10 V



Connection diagram 4–20 mA



Industrial assembly-type duct sensor IKF1 (Form B)

with passive output

Technical data

Housing colour:	silver-grey
Housing material:	aluminium
Sensor tube material:	V2A (1.4301)
Ambient temperature:	–30 … +100 °C
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Max. sensor temperature	150 °C (sensor type LM 235 Z max. 125 °C)
Electrical connection:	screw-type terminals 0.14 mm² up to 2.5 mm² only at protective low voltage max. 30 VAC / 42 VDC
Tolerances:	PT100 / PT1000 DIN EN 60751 B NI1000 DIN EN 43760 B
Mounting / attachment:	in immersion sleeves (THMs, THV) for fluids or with mounting flange (MF) in air ducts
Protection rating:	IP 43
Protection class:	III
Safety and EMC:	according to DIN EN 60730
Sensor characteristic curves:	The sensor characteristic curves can be found in the “Miscellaneous” section.
Immersion sleeves:	from the fitting length (EL), subtract 15 mm to determine the nominal length (NL) of the immersion sleeve, for example, EL = 65 mm corresponds to THV / 50
Accessories:	mounting flange for installation in air ducts: MF matching immersion sleeves in brass: immersion sleeves with brass plating can be found in the “Miscellaneous” section matching immersion sleeves stainless steel (V4A): immersion sleeves made of stainless steel can be found in the “Miscellaneous” section

Application

The industrial assembly-type duct sensor IKF1 is used for measuring temperatures of liquids and gases in pipes, air ducts or tanks in the mechanical and plant engineering sector. A mounting flange (MF) is required for use in air ducts. If used in liquids, immersion sleeves made of brass with nickel plating (THMs) should be used. For aggressive media, immersion sleeves made of stainless steel V4A (THV) are recommended. Immersion sleeves or mounting flanges are not part of the delivery scope and must be **ordered separately** as accessories.

Sensor wire extendable:
Depending on the cross-section of the conductor and the sensor unit type

Please follow the EMC directives, avoid parallel routing with mains voltage-bearing wires, or use shielded wires.

Sensor	Fitting length (EL) 65 mm (for 50-mm immersion sleeves)	Fitting length (EL) 115 mm (for 100-mm immersion sleeves)	Fitting length (EL) 165 mm (for 150-mm immersion sleeves)	PG
PT 100	**IKF1P 100/50** Item no.: G 9150010	**IKF1P 100/100** Item no.: G 9150140	**IKF1P 100/150** Item no.: G 9150270	III
PT 1000	**IKF1P 1000/50** Item no.: G 9150020	**IKF1P 1000/100** Item no.: G 9150150	**IKF1P 1000/150** Item no.: G 9150280	III
NI 1000	**IKF1N 1000/50** Item no.: G 9150030	**IKF1N 1000/100** Item no.: G 9150160	**IKF1N 1000/150** Item no.: G 9150290	III
NI 1000 TK 5000	**IKF1N 1000 TK 5000/50** Item no.: G 9150040	**IKF1N 1000 TK 5000/100** Item no.: G 9150170	**IKF1N 1000 TK 5000/150** Item no.: G 9150300	III
NTC 10 K “Sensor 4”	**IKF1C 10/50** Item no.: G 9150070	**IKF1C 10/100** Item no.: G 9150200	**IKF1C 10/150** Item no.: G 9150330	III
LM 235 Z		**IKF1LM/100** Item no.: G 9150260	**IKF1LM/150** Item no.: G 9150390	III

Sensor	Fitting length (EL) 215 mm (for 200-mm immersion sleeves)	Fitting length (EL) 265 mm (for 250-mm immersion sleeves)	Fitting length (EL) 315 mm (for 300-mm immersion sleeves)	PG
PT 100	**IKF1P 100/200** Item no.: G 9150400	**IKF1P 100/250** Item no.: G 9150530	**IKF1P 100/300** Item no.: G 9151710	III
PT 1000	**IKF1P 1000/200** Item no.: G 9150410	**IKF1P 1000/250** Item no.: G 9150540	**IKF1P 1000/300** Item no.: G 9151760	III
NI 1000	**IKF1N 1000/200** Item no.: G 9150420	**IKF1N 1000/250** Item no.: G 9150550	**IKF1N 1000/300** Item no.: G 9151177	III
NI 1000 TK 5000	**IKF1N 1000 TK 5000/200** Item no.: G 9150430	**IKF1N 1000 TK 5000/250** Item no.: G 9150560	**IKF1N 1000 TK 5000/300** Item no.: G 9151780	III
NTC 10 K “Sensor 4”	**IKF1C 10/200** Item no.: G 9150460	**IKF1C 10/250** Item no.: G 9150590	**IKF1C 10/300** Item no.: G 9151810	III
LM 235 Z	**IKF1LM/200** Item no.: G 9150520	**IKF1LM/250** Item no.: G 9150650	**IKF1LM/300** Item no.: G 9151870	III

Fitting lengths 215 mm, 265 mm, 315 mm, 415 mm, 515 mm and 615 mm, see the next page.
For the dimension schematic and circuit diagram of the industrial assembly type duct sensor, see the next page. For the dimension schematic of the mounting flange, see the next page.

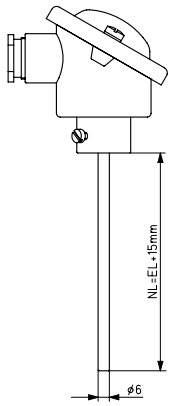
Industrial assembly-type duct sensor IKF1 (Form B)

with passive output

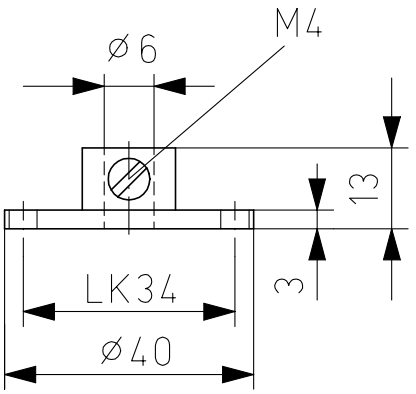
Sensor	Fitting length (EL) 415 mm (for 400-mm immersion sleeves)	Fitting length (EL) 515 mm (for 500-mm immersion sleeves)	Fitting length (EL) 615 mm (for 600-mm immersion sleeves)	PG
PT 100	**IKF1P 100/400** Item no.: G 9151720	**IKF1P 100/500** Item no.: G 9152130	**IKF1P 100/600** Item no.: G 9151920	III
PT 1000	**IKF1P 1000/400** Item no.: G 9152140	**IKF1P 1000/500** Item no.: G 9152150	**IKF1P 1000/600** Item no.: G 9152160	III
NI 1000	**IKF1N 1000/400** Item no.: G 9152170	**IKF1N 1000/500** Item no.: G 9152180	**IKF1N 1000/600** Item no.: G 9152190	III
NI 1000 TK 5000	**IKF1N 1000 TK 5000/400** Item no.: G 9152200	**IKF1N 1000 TK 5000/500** Item no.: G 9152210	**IKF1N 1000 TK 5000/600** Item no.: G 9152220	III
NTC 10 K "Sensor 4"	**IKF1C 10/400** Item no.: G 9152230	**IKF1C 10/500** Item no.: G 9152240	**IKF1C 10/600** Item no.: G 9152250	III
LM 235 Z	**IKF1LM/400** Item no.: G 9152260	**IKF1LM/500** Item no.: G 9152270	**IKF1LM/600** Item no.: G 9152280	III

Accessories	Item no.	Features	PG
MF	G 9990160	mounting flange for integrated duct sensor	III

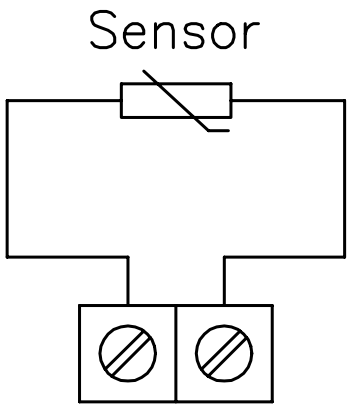
Dimension schematic, industrial assembly-type duct sensor



Dimension schematic, mounting flange MF



Connection diagram IKF



Industrial assembly-type duct sensor IKF1M (Form B)

with active output (transducer 0–10 V or 4–20 mA)

Technical data

Housing colour:	silver-grey
Housing material:	aluminium
Sensor tube material:	V2A (1.4301)
Operating voltage:	24 VDC
Ambient temperature:	–30 … +100 °C
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Max. sensor temperature	100 °C
Electrical connection:	screw-type terminals 0.14 mm² to 1.5 mm²
Tolerances:	PT 100, DIN EN 60751, class B
Mounting / attachment:	in immersion sleeves (THMs, THV) for fluids or with mounting flange (MF) in air ducts
Protection rating:	IP 43
Protection class:	III
Safety and EMC:	according to DIN EN 60730
Sensor:	PTC, internal
Immersion sleeves:	from the fitting length (EL), subtract 15 mm to determine the nominal length (NL) of the immersion sleeve, for example, EL = 65 mm corresponds to THV/50
Accessories:	mounting flange for installation in air ducts: MF matching immersion sleeves in brass: immersion sleeves with brass plating can be found in the “Miscellaneous” section matching immersion sleeves stainless steel (V4A): immersion sleeves made of stainless steel can be found in the “Miscellaneous” section
Sensor type:	PT-100

Application

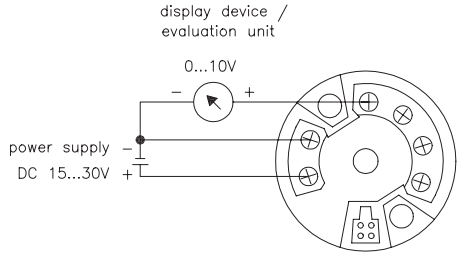
The industrial assembly-type duct sensor IKF1M is used for measuring temperatures of liquids and gases in pipes, air ducts or tanks in the mechanical and plant engineering sector. The temperature-dependent resistance of the sensor is converted linearly into a current signal of 4–20 mA or a voltage signal of 0–10 V. The transducer is supplied calibrated to the measurement range of –50 … +50 °C or 0 … +100 °C. A mounting flange (MF) is required for use in air ducts. If used in liquids, immersion sleeves made of brass with nickel plating (THMs) should be used. For aggressive media, immersion sleeves made of stainless steel V4A (THV) are recommended. Immersion sleeves or mounting flanges are not part of the delivery scope and must be **ordered separately** as accessories.

Please follow the EMC directives, avoid parallel routing with mains voltage-bearing wires, or use shielded wires.

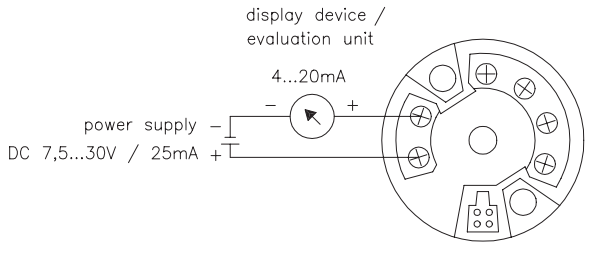
Sensor tube	Measurement range: –50 … +50 °C		Measurement range: 0 … +100 °C		
	Output 0–10 V	Output 4–20 mA	Output 0–10 V	Output 4–20 mA	PG
65 mm (NL) (for 50-mm immersion sleeve)	**IKF1M/1/0-10/50** Item: G 9150660	**IKF1M/1/4-20/50** Item: G 9150670	**IKF1M/2/0-10/50** Item: G 9150760	**IKF1M/2/4-20/50** Item: G 9150770	III
115 mm (NL) (for 100-mm immersion sleeve)	**IKF1M/1/0-10/100** Item: G 9150680	**IKF1M/1/4-20/100** Item: G 9150690	**IKF1M/2/0-10/100** Item: G 9150780	**IKF1M/2/4-20/100** Item: G 9150790	III
165 mm (NL) (for 150-mm immersion sleeve)	**IKF1M/1/0-10/150** Item: G 9150700	**IKF1M/1/4-20/150** Item: G 9150710	**IKF1M/2/0-10/150** Item: G 9150800	**IKF1M/2/4-20/150** Item: G 9150810	III
215 mm (NL) (for 200-mm immersion sleeve)	**IKF1M/1/0-10/200** Item: G 9150720	**IKF1M/1/4-20/200** Item: G 9150730	**IKF1M/2/0-10/200** Item: G 9150820	**IKF1M/2/4-20/200** Item: G 9150830	III
265 mm (NL) (for 250-mm immersion sleeve)	**IKF1M/1/0-10/250** Item: G 9150740	**IKF1M/1/4-20/250** Item: G 9150750	**IKF1M/2/0-10/250** Item: G 9150840	**IKF1M/2/4-20/250** Item: G 9150850	III
315 mm (NL) (for 300-mm immersion sleeve)	**IKF1M/1/0-10/300** Item: G 9151880	**IKF1M/1/4-20/300** Item: G 9151890	**IKF1M/2/0-10/300** Item: G 9151900	**IKF1M/2/4-20/300** Item: G 9151910	III

Accessories	Item no.	Features	PG
MF	G 9990160	mounting flange for integrated duct sensor	III

Connection diagram IKF1M 0–10 V



Connection diagram IKF1M 4–20 mA



Transducer “Pressure” MUD

MUD… transducer for liquid and gaseous media 0–10 V or 4–20 mA

Technical data

Housing colour:	silver
Housing material:	stainless steel
Operating voltage:	12–32 VDC
Ambient temperature:	–30…+80 °C
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Max. sensor temperature	100 °C
Electrical connection:	Plug according to DIN 43650
Mounting / attachment:	G 1/4", with adapter G 1/2"
Protection rating:	IP 65
Protection class:	III
Safety and EMC:	according to DIN EN 60730
Sensor:	maintenance-free pressure membrane
Accuracy:	linearity error +/-0.5% FS, total error +/-1.5% FS
Max. pressure:	2 times the measurement range
Accessories:	adapter G 1/2": MUD-A

Application

The MUD transducer is used for measuring pressure in non-aggressive gaseous or liquid media in hydraulics, pneumatics, in mechanical and plant engineering as well as in process engineering.

The stainless steel membrane is fully vacuum tight. The pressure sensors are maintenance free.

Please follow the EMC directives, avoid parallel routing with mains voltage-bearing wires, or use shielded wires.

Transducer, pressure 0–160 mbar

Type	Item no.	Measurement range	Output signal	PG
MUD/0–10/0.16	G 9240010	0–160 mbar	0–10 V	III
MUD/4–20/0.16	G 9240020	0–160 mbar	4–20 mA	III

Transducer, pressure 0–2.5 bar

Type	Item no.	Measurement range	Output signal	PG
MUD/0–10/2.5	G 9240030	0–2.5 mbar	0–10 V	III
MUD/4–20/2.5	G 9240040	0–2.5 mbar	4–20 mA	III

Transducer, pressure 0–6 bar

Type	Item no.	Measurement range	Output signal	PG
MUD/0–10/6	G 9240050	0–6 bar	0–10 V	III
MUD/4–20/6	G 9240060	0–6 bar	4–20 mA	III

Transducer, pressure 0–10 bar

Type	Item no.	Measurement range	Output signal	PG
MUD/0–10/10	G 9240070	0–10 bar	0–10 V	III
MUD/4–20/10	G 9240080	0–10 bar	4–20 mA	III

Transducer “Pressure” MUD

MUD… transducer for liquid and gaseous media 0–10 V or 4–20 mA

Transducer, pressure 0–25 bar

Type	Item no.	Measurement range	Output signal	PG
MUD/0–10/25	G 9240090	0–25 bar	0–10 V	III
MUD/4–20/25	G 9240100	0–25 bar	4–20 mA	III

Transducer, pressure 0–60 bar

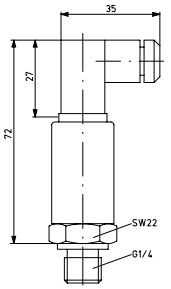
Type	Item no.	Measurement range	Output signal	PG
MUD/0–10/60	G 9240110	0–60 bar	0–10 V	III
MUD/4–20/60	G 9240120	0–60 bar	4–20 mA	III

Accessories	Item no.	Features	PG
MUD-A ½"	G 9990190	Adapter G ½"	III

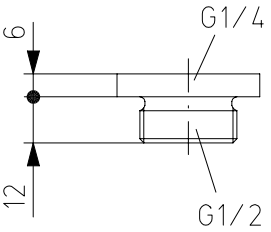
Conversion table for pressure

	Pa	kPa	bar	mbar	mWs
1 Pa =	**1**	**0.001**	**0.00001**	**0.01**	**0.000101971**
1 kPa =	**1.000**	**1**	**0.01**	**10**	**0.101971**
1 bar =	**100,000**	**100**	**1**	**1.000**	**10.1971**
1 mbar =	**100**	**0.1**	**0.001**	**1**	**0.0101971**
1 mWs =	**9,806.65**	**9.80665**	**0.0980665**	**98.0665**	**1**

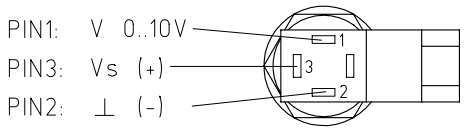
Dimension drawing



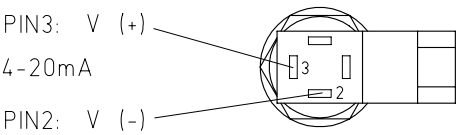
Adapter for MUD



Circuit diagram 0–10 V



Circuit diagram 4–20 mA



Transducer “Differential pressure – air”

Technical data

Housing colour:	grey
Housing material:	plastic
Material of parts coming in contact with the medium:	Ni, PU, Al, Au, Pyrex glass, silicone, Kovar, Duraplast, Ultem Plasic
Operating voltage:	15 – 30 VDC, 15 – 30 VAC
Ambient temperature:	10 … 50 °C
Permissible atmospheric humidity:	max. 80% rel. humidity, non-condensing
Max. pressure:	5 times the measurement range end value (relative pressure)
Electrical connection:	screw-type terminals up to 1.5 mm²
Mounting / attachment:	wall mounting
Protection rating:	IP 54
Protection class:	III
Safety and EMC:	according to DIN EN 60730
Sensor:	piezo-resistive pressure sensor
Pressure connection:	d x L: 6.6 x 10 mm (for flexible tubes d = 6 mm)
Cable gland:	M 12 x 1.5
Output signal:	continuous, adjustable 0 – 10 V, 0 – 20 mA, 4 – 20 mA
Accuracy:	Linearity: +/ – 2% FS Influence of supply: <0.05% Influence of position: 0.1% at 3000 Pa, 0.3% at 1500 Pa, 0.9% at 500 Pa, 1.8% at 250 Pa Temperature drift: offset and range respectively +/ – 0.12% FS/K Long-term stability: +/ – 2% FS/year

Application

The microprocessor-controlled pressure transducers are suitable for detecting overpressure, underpressure or differential pressure of non-aggressive gases.

They are used in heating, ventilation or air conditioning applications as well as in clean room technology or for fine draft measurement.

The pressure measurement is performed using a piezo-resistive pressure sensor.

For details on the suitable microprocessor controller JDU-210, see the “Industrial technology” section.

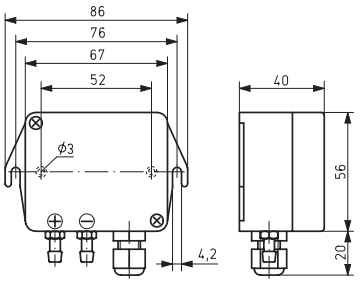
The types MDEKD replace the types DF.

Please follow the EMC directives, avoid parallel routing with mains voltage-bearing wires, or use shielded wires.

Type	Item no.	Measurement ranges	PG
MDEKD-940.000	G 9270010	1000 Pa, 750 Pa; 500 Pa; 250 Pa relative pressure	III
MDEKD-940.100	G 9270020	10000 Pa; 7500 Pa; 5000 Pa; 2500 Pa relative pressure	III

Accessories	Item no.	Features	PG
JZ-27	G 9990450	cover with 3.5-digit LC display for MDEKD, easy assembly	III
JZ-01 L	H 5309226	Single duct connection made of plastic (grey) Ø 6 mm outside for differential pressure switch JDW, JDL, pressure transducer	II
JZ-06 / 1	H 5309229	Connection set with duct connections made of plastic, 2 x 90° angles, 2 extensions 90 mm, 4 self-tapping screws, 2-m tube Ø 6 mm outside for differential pressure switch JDW, JDL, pressure transducer	II

Dimension drawing



MDEKD with JZ-27

Transducer “Air stream”

Technical data

Housing colour:	grey
Housing material:	PC plastic
Operating voltage:	19–29 VDC
Ambient temperature:	–20…+60 °C
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Electrical connection:	only at protective low voltage, 3-conductor
Mounting / attachment:	duct assembly by means of mounting flange
Protection rating:	sensor head IP 20, enclosure IP 40
Protection class:	III
Safety and EMC:	according to DIN EN 61326-1, 61326-2-3
Sensor:	Hot film anemometer
Connecting cable:	0.5 m, 3 x 0.25 mm², PVC
Output signal:	continuous 0–10 V
Accuracy:	+/– (0.4 m/s + 6% MV)
Actuation time T90 at 10 m/s:	typ. 4 s (at constant temperature)
Measurement range:	0…20 m/s

Application

The MVEVK-961.100 is a compact air speed transducer for mass applications. Thanks to its small size, the sensor can be used in almost any application. The use of a high-quality thin-layer sensor element, based on the hot film anemometer principle, guarantees the highest accuracy and high sensitivity.

Thanks to their design, the flow sensor elements are less sensitive to dust and other types of soiling than traditional hot wire anemometers and thus facilitate the highest reproducibility as well as proven long-term stability of the measurement results.

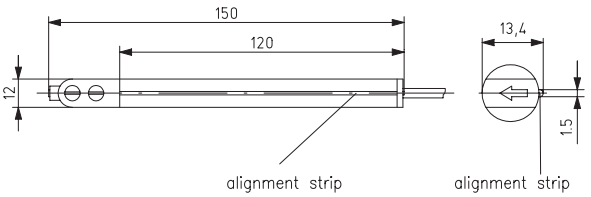
The MVEVK-961.100 can be assembled quickly and easily. The sensor alignment is defined by a guiding strip and the mounting flange suitable for it. The immersion depth can be set in a freely variable manner with the mounting flange.

For details on the suitable microprocessor controller JDU-210, see the “Industrial technology” section.

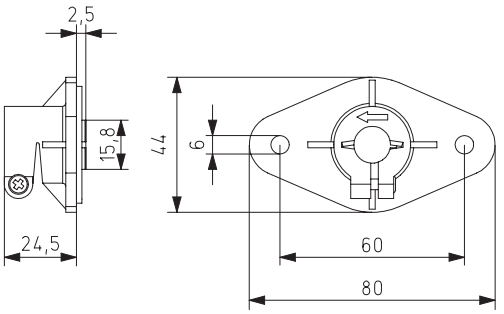
Please follow the EMC directives, avoid parallel routing with mains voltage-bearing wires, or use shielded wires.

Type	Item no.	Output	PG
MVEVK-961.100	G 8000134	Air speed transducer with mounting flange	III

Dimension schematic, sensor

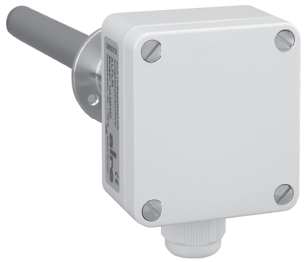


Dimension schematic, flange



Air quality sensor KLS (duct version)

Air quality sensor with transducer 0–10 V and 4–20 mA
or switching output with transducer 0–10 V and 4–20 mA



Technical data

Housing colour:	pure white, like RAL 9010
Housing material:	plastic
Operating voltage:	21.6–26.4 VDC/VAC, 50 Hz
Ambient temperature:	0…50 °C
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Electrical connection:	screw-type terminals 0.14 mm² to 1.5 mm² only at protective low voltage
Mounting/attachment:	duct assembly by means of mounting flange
Protection rating:	IP 65
Protection class:	III
Safety and EMC:	according to DIN EN 60730
Sensor:	broadband mixed gas sensor (VOC)
Accuracy:	+/– 25% switch-on value (relative to calibration gas)

Application

The air quality sensor is used for needs-based ventilation in living spaces, offices, conference rooms, hotels or restaurants. It serves for the qualitative evaluation of the room air pollution with polluting gases like exhaled air, tobacco fumes, solvent vapours, cleaning agents and automobile exhausts.

The room air measured by the sensor is converted into an output signal in the range 0–10 V or 4–20 mA, with a minimum value at the output interpreted as clean air and a maximum value as highly polluted air.

The version with an additional switching output is pre-set in the factory to 70% of the maximum starting value. This value can be adapted internally to the individual population and usage conditions of the spaces.

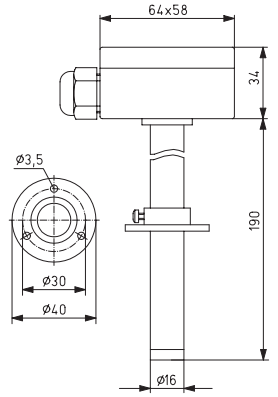
A selective CO_2 measurement is not possible with this air quality sensor.

Attention:
The air quality sensor may not be used for safety-relevant applications.

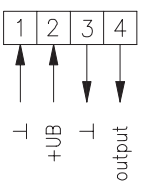
Please follow the EMC directives, avoid parallel routing with mains voltage-bearing wires, or use shielded wires.

Type	Item no.	Features	PG
KLS	G 9230040	**Output signal:** continuous 0–10 V, 4–20 mA	III
KLS/R	G 9230050	**Output signal 1:** continuous 0–10 V or 4–20 mA **Output signal 2:** switching **Max. switching voltage:** 30 VAC, 50 Hz, 120 VDC **Max. switching current:** 1 (0.2) A **Switching element:** relay **Switching contact:** NO contact, potential-free	III

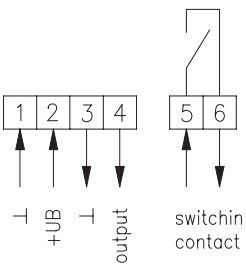
KLS dimension schematic



KLS circuit diagram



KLS-R circuit diagram



Air quality sensor MLEVB (room version)

Air quality sensor with transducer 0–10 V and room temperature transducer 0–10 V

Technical data

Design:	Berlin 2000
Housing colour:	pure white, like RAL 9010
Housing material:	ABS plastic
Operating voltage:	24 VDC/VAC, 50 Hz
Ambient temperature:	0…50 °C
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing
Electrical connection:	screw-type terminals 0.25 mm² to 1.5 mm² only at protective low voltage
Mounting/attachment:	surface/wall mounting (4-hole assembly on flush-mounted socket)
Protection rating:	IP 30
Protection class:	III
Safety and EMC:	according to DIN EN 60730
Sensor:	broadband mixed gas sensor (VOC)
Measurement ranges:	0…4000 ppm VOC, 0…30 °C
Sensor reaction time T90:	< 30 s, < 3 min diffusion time
Accuracy:	+/– 300 ppm VOC, repeatability > 95%
Measurement ranges:	0…4000 ppm VOC, 0…30 °C

Application

The air quality sensor is used for needs-based ventilation in living spaces, offices, conference rooms, hotels or restaurants. It serves for the qualitative evaluation of the room air pollution with polluting gases like exhaled air, tobacco fumes, solvent vapours, cleaning agents and automobile exhausts.

The room air that is captured by the sensor is converted into an output signal from 0–10 V, with a minimum value at the output being interpreted as clean air and a maximum value as highly polluted air. Furthermore, the room temperature is captured in the range 0–30 °C and output as a 0–10 V signal.

A selective CO_2 measurement is not possible with this air quality sensor.

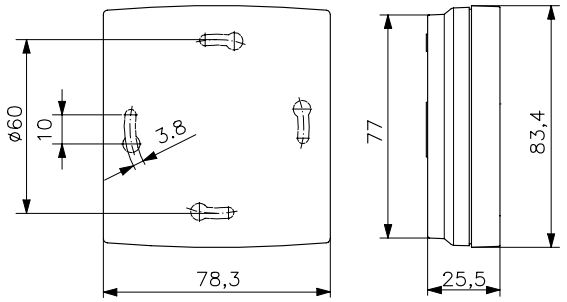
For details on the suitable microprocessor controller JDU-210, see the "Industrial technology" section.

Attention: The air quality sensor may not be used for safety-relevant applications.

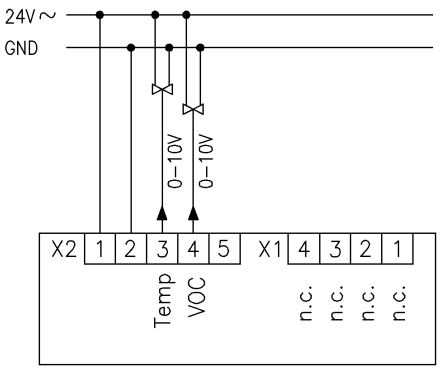
Please follow the EMC directives, avoid parallel routing with mains voltage-bearing wires, or use shielded wires.

Type	Item no.	Output signal	PG
MLEVB-042.000	G 9230070	**Air quality:** continuous 0–10 V **Temperature:** continuous 0–10 V	III

Dimension drawing



Circuit diagram



After a restart/power failure, a signal of 100% is output to trigger maximum ventilation for 20 minutes. During this time, the air quality sensor assumes the current VOC value to be the 450 ppm base value. With the resultant output signal of 1.125 V (approx. 11%), basic ventilation is ensured. If there is an improvement in the air quality, the base value is automatically corrected.

Transducer “Temperature and humidity”

Room and duct version

Room version

Duct version

Technical data	Room…	Duct...
Housing colour:	pure white, like RAL 9010	
Housing material:	**Room:**ABS plastic **Duct:**PA plastic (30% GF reinforced)	
Operating voltage:	**Room:** 24 VAC (0–10 V), 15–35 VDC (4–20 mA) **Duct:** 24 VAC (0–10 V), 16–32 VDC (0–10 V/4–20 mA)	
Ambient temperature:	–10…+60 °C	
Permissible atmospheric humidity:	non-condensing	
Electrical connection:	screw-type terminals 0.14 mm² to 1.5 mm²	
Mounting/attachment:	**Room:** surface-/wall-mounting (4-hole assembly on flush-mounted socket) **Duct:** duct assembly by means of mounting flange	
Protection rating:	**Room:** IP 30 **Duct:** IP 65	
Protection class:	III	
Accuracy:	**Room humidity:** +/– 3% rel. humidity (40…60% at 20 °C), else +/– 5% rel. humidity **Room temperature:** +/– 0.5 K (0–10 V), +/– 0.8 K (4–20 mA) **Duct humidity:** +/– 2% r.h. (20…80%), else +/– 3.5% r.h. **Duct temperature:** +/– 0.5 K	

Application

For measuring the temperature, the relevant humidity or the temperature and the relative humidity and conversion into an electrical quantity (standard signal 0–10 V/4–20 mA).

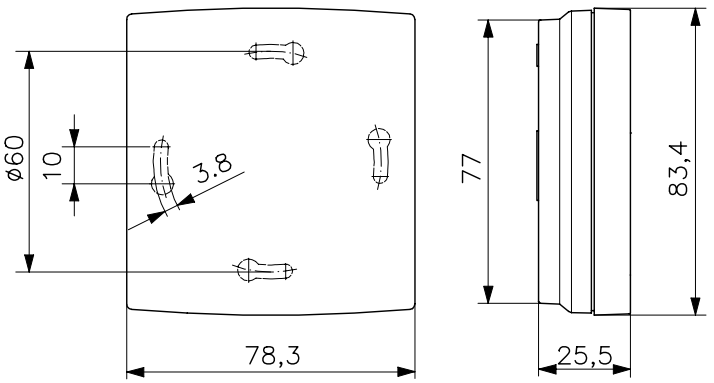
Usable in refrigeration, air conditioning, ventilation and process engineering as a room or duct sensor.

For details on the suitable microprocessor controller JDU-210, see the “Industrial technology” section.

Please follow the EMC directives, avoid parallel routing with mains voltage-bearing wires, or use shielded wires.

Type	Item no.	Features	Output signal	PG
MFEKB-045.000	G 9262210	Room humidity, 0…100% rel. humidity	continuous 4–20 mA/0–10 V	III
MTEKB-045.000	G 9262310	Room temperature, 0 … 50 °C	continuous 4–20 mA/0–10 V	III
MKEAB-045.100	G 9261610	Room humidity/room temperature, 0…50 °C, 0…100% rel. humidity	continuous 4–20 mA	III
MKEVB-045.100	G 9261310	Room humidity/room temperature, 0…50 °C, 0…100% rel. humidity	continuous 0–10 V	III
MFEKK-945.000	G 9261910	Duct humidity, 0…100% rel. humidity	continuous 4–20 mA/0–10 V	III
MTRKK-965.758 / 200 mm	G 9142201	Duct temperature, –50…+50 °C, 0…+50 °C, –20…+80 °C, 0…+100 °C	continuous 4–20 mA/0–10 V	III
MKEKK-945.000	G 9262110	Duct humidity/duct temperature, 0…+50 °C, –20…+80 °C, 0…100% rel. hum.	continuous 4–20 mA/0–10 V	III

MxEKB, MKExB



Transducer “Temperature and humidity” MKEKD, for outdoor use

MKEKD transducer temperature/humidity, 0–10 V/4–20 mA
AFT humidity transducer, 0–10 V and 4–20 mA with passive temperature sensor

Technical data

Housing colour:	pure white, like RAL 9010
Housing material:	PA plastic (30% GF reinforced)
Operating voltage:	**AFT:** 24 VAC, 16–32 VDC, **MKEKD:** 24 VAC (0–10 V), 16–32 VDC (0–10 V/4–20 mA)
Ambient temperature:	**AFT:** 0…50 °C **MKEKD:** –10…+60 °C
Permissible atmospheric humidity:	non-condensing
Electrical connection:	screw-type terminals 0.14 mm² to 1.5 mm²
Mounting/attachment:	Surface-/wall-mounting
Protection rating:	IP 65
Protection class:	III
Safety and EMC:	according to DIN EN 61010 and DIN EN 50081
Accuracy:	Humidity: ±2% rel. humidity (20…80%), else ±3.5% rel. humidity Temperature: ±0.5 °C
Measurement range, humidity:	0…100% rel. humidity

Application

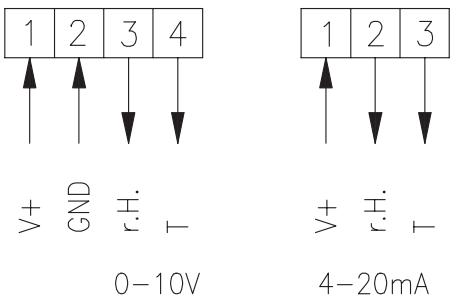
The temperature-humidity-transmitter is used in building automation, refrigeration and air-conditioning, as well as in clean room technology, in greenhouses, medicine rooms and in meteorological applications.

For details on the suitable microprocessor controller JDU-210, see the “Industrial technology” section.

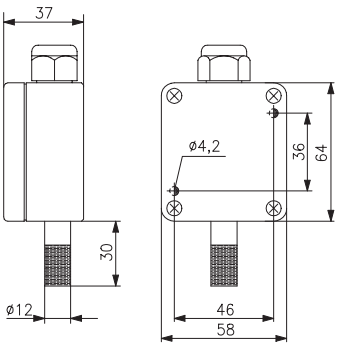
Please follow the EMC directives, avoid parallel routing with mains voltage-bearing wires, or use shielded wires.

Type	Item no.	Features	PG
MKEKD-945.700	G 9262410	Temperature/humidity 0–10 V/4–20 mA; 0…50 °C; –20…+80 °C; 0…100% rel. humidity	III
AFT/P100	G 9260510	Humidity 0–10 V/4–20 mA, passive temperature sensor PT100	III
AFT/P1000	G 9260610	Humidity 0–10 V/4–20 mA, passive temperature sensor PT1000	III
AFT/NI1000	G 9260710	Humidity 0–10 V/4–20 mA, temperature sensor NI1000	III
AFT/NI1000 TK 5000	G 9261210	Humidity 0–10 V/4–20 mA, temperature sensor NI1000 TK 5000	III

Connection diagram 0–10 V/4–20 mA



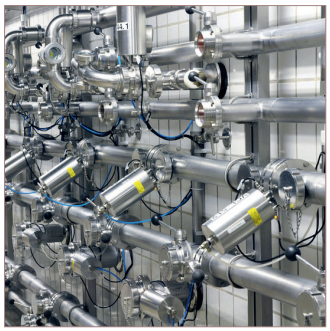
Dimension drawing

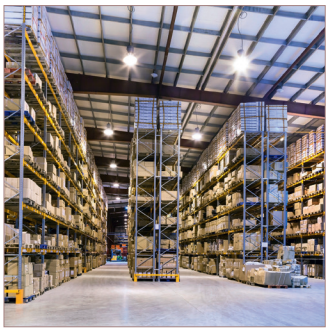


ACCESSORIES AND MISCELLANEOUS

Individuality straight off the rack.

ACCESSORIES AND MISCELLANEOUS
Additions for your range of services.






Perfect control technology can be made even more perfect through our accessories – we have an extensive selection to choose from. Exact installation is achieved with the assistance of the technical explanatory notes, assembly aids, as well as tips concerning proper use.

Here you will not only find the whole range of accessories, but rather also valuable tips for professionals.

It's good when it's getting better.

Overview, miscellaneous:
Sauna controllers

Accessories

Technical annex

Index

General information/Contact/Addresses

Sauna controllers SAUNATHERM VU / HYGROTHERM VU

For dry and wet saunas

Technical data	
Colour:	cream white, like RAL 9001
Housing material:	ABS
Mains voltage:	400 VAC, 3/N 50 Hz
Features:	sensor rupture/short-circuit safe-guarding, “light” switch, “ON/OFF” switch, “light/fan/electronics” micro-fuse, “ON/OFF” contact input
Trigger temperature of safety temperature limiter:	approx. 141 °C
Heating time limit:	6 h / 12 h / none
Pre-selection timer:	can be set to max. 12 h, 1-h intervals
Switching power, furnace:	max. 9 kW (max. 3 kW per phase)
Switching power, light:	max. 100 W, 230 VAC, 50 Hz
Switching power, fan:	max. 100 W, 230 VAC, 50 Hz
Switching element:	safety protection, relay 3-stage switching
Hysteresis:	approx. 1 K
Display type:	LED
Protection rating:	IP 44
Protection class:	II, if properly mounted
Safeguarding:	T1, 25 A (5 x 20)
Scope of delivery:	control unit, sensor/STB, fastening screws
Mounting:	wall mounting
Ambient temperature:	– 15 … +25 °C
Electrical connection:	screw-type terminals
Permissible atmospheric humidity:	max. 95% rel. humidity, non-condensing

Application

Sauna controllers for dry saunas or dry/wet saunas.

Load expansion possible with
LG 9/18 (18 kW) or
LG 9/30 (30 kW).

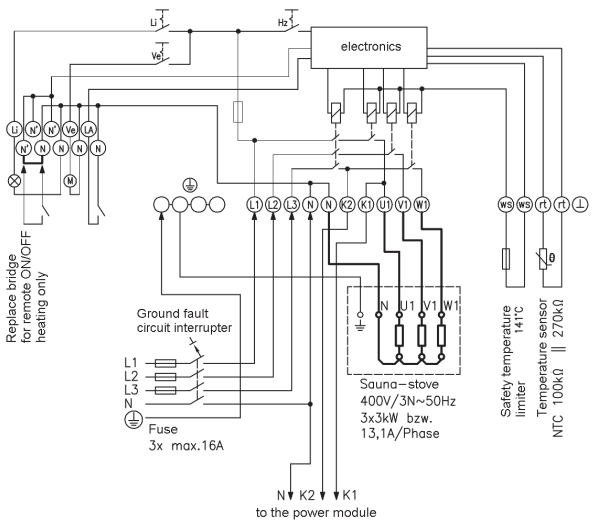
Type/image	Item no.	Features	PG
Saunatherm VU 	D4700653	Sauna controller for dry saunas (Finnish) Control range: 30 … 120 °C Switch: “Fan On/Off” Indicators: “HEATING”, “ON/OFF”, “Pre-selection timer”	III
Hygrotherm VU 	D4700736	Sauna controller for dry saunas (Finnish) or wet saunas Control range, dry sauna: 80 … 110 °C Control range, wet sauna: 40 … 60 °C / approx. 40 … 95 % rel. humidity Switching power vaporiser: max. 3 kW Switch: “Fan, 3-stage” Indicators: “Heating”, “ON/OFF”, “Pre-selection timer” Water shortage detection Post-operation drying temperature adjustable: approx. 60 … 80 °C Post-operation drying limitation: approx. 3.5 h Fan post-operation time: approx. 15 minutes	III

Accessories, sauna controllers SAUNATHERM VU / HYGROTHERM VU

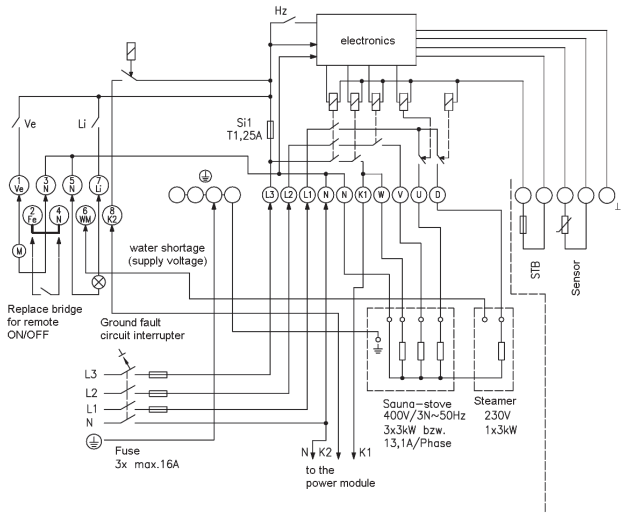
For dry and wet saunas

Type/image	Item no.	Features	PG
LG 9 / 18 	D4710450	Power switching unit 9 kW (max. 3 kW per phase) With this unit, all control units can be enhanced from 9 kW to 18 kW switching power (9 kW via control unit + 9 kW via load switch = 18 kW total power).	III
LG 9 / 30 	H4690008	Power switching unit 21 kW (max. 7 kW per phase) With this unit, all control units can be enhanced from 9 kW to 30 kW switching power (9 kW via control unit + 21 kW via load switch =30 kW total power).	III
Sensor / STB 	D4700662	Spare sensor/STB for Saunatherm VU and Hygrotherm VU	III

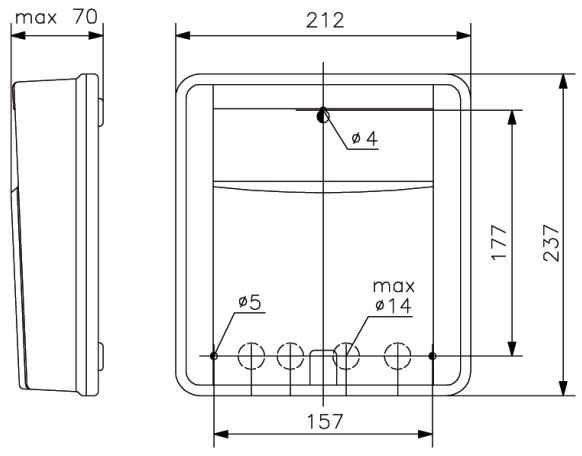
Circuit diagram, Saunatherm VU



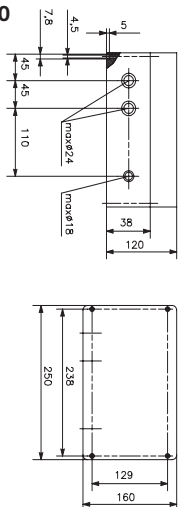
Circuit diagram, Hygrotherm VU



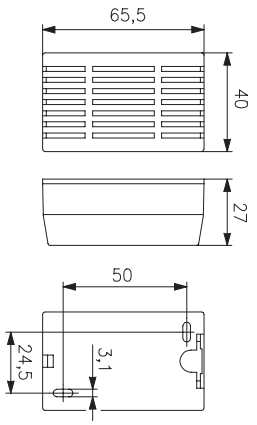
Sauna controllers, LG 9 / 18



LG 9 / 30



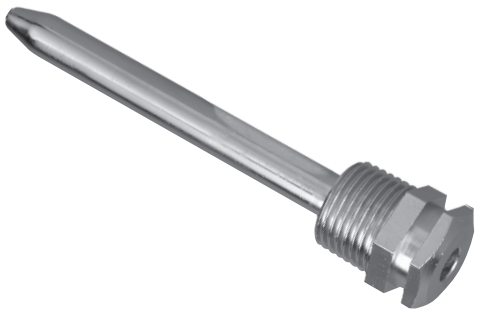
Sensor / STB



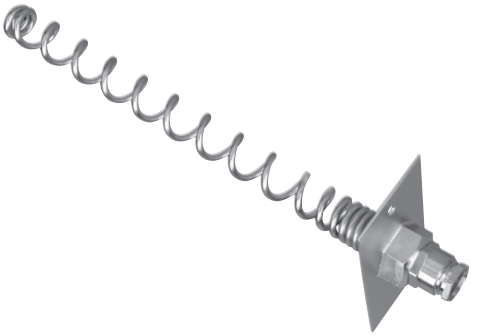
Immersion sleeves / protecting coils for KR/LR 80/85 and for sleeve sensors and air sensors

For industrial applications and heating technology

THK / NTHK



SW-200 / SW-200-12



Type	Item no.	Length of L	Diameter I x A*	Material	Max. pressure (P/bar)	PG
Immersion sleeves for KR 80/85						
THK-100	C 1809043	100 mm	7.5 x 10 mm	nickel-plated brass	20	II
THK-120	C 1809031	120 mm	7.5 x 10 mm	nickel-plated brass	20	II
THK-200	C 1809070	200 mm	7.5 x 10 mm	nickel-plated brass	20	II
THK-280	C 1809106	280 mm	7.5 x 10 mm	nickel-plated brass	20	II
THK-600	C 1809132	600 mm	7.5 x 10 mm	nickel-plated brass	20	II
NTHK-100	C 1809056	100 mm	7.5 x 10 mm	V4 A (1.4571)	40	II
NTHK-120	C 1809005	120 mm	7.5 x 10 mm	V4 A (1.4571)	40	II
NTHK-200	C 1809082	200 mm	7.5 x 10 mm	V4 A (1.4571)	40	II
NTHK-280	C 1809118	280 mm	7.5 x 10 mm	V4 A (1.4571)	40	II
THK-100 x 17	C 1809157	100 mm	14.8 x 17 mm	nickel-plated brass	20	II
THK-200 x 17	C 1809183	200 mm	14.8 x 17 mm	nickel-plated brass	20	II
NTHK-100 x 17	C 1809169	100 mm	14.8 x 17 mm	V4 A (1.4571)	40	II
NTHK-200 x 17	C 1809195	200 mm	14.8 x 17 mm	V4 A (1.4571)	40	II

Type	Item no.	Length of L	Diameter I x A*	Material	PG
Protecting coil for LR 80/85					
SWK 100	C 1809200	100 mm	10.5 x 17 mm	steel, nickel-plated	II
SWK 120	C 1809207	120 mm	10.5 x 17 mm	steel, nickel-plated	II
SWK 200	C 1809498	200 mm	10.5 x 17 mm	steel, nickel-plated	II
SWK 280	C 1809221	280 mm	10.5 x 17 mm	steel, nickel-plated	II

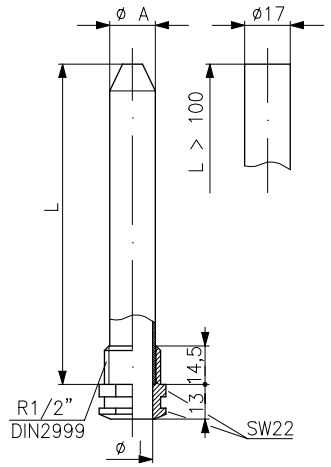
Type	Item no.	Length of L	Cable gland	Diameter I x A*	Material	PG
Protecting coil for capillary fastening in the air duct (JET / JMT / JTF / WR 81) and all sleeve sensors HF and air sensors LF						
SW-200	C 1809219	200 mm	7.8 mm	11 x 17 mm	steel, nickel-plated	II
SW-200-12	C 1809220	200 mm	11.8 mm	11 x 17 mm	steel, nickel-plated	II

* I = minimum inner diameter
A = nominal outer diameter

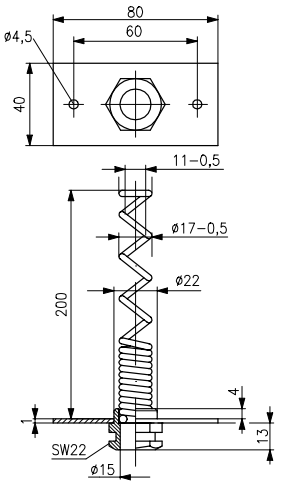
Immersion sleeves / protecting coils for KR/LR 80/85 and for sleeve sensors and air sensors

For industrial applications and heating technology

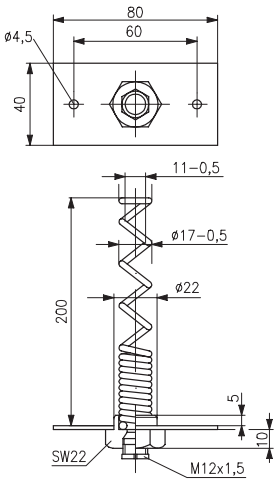
THK / NTHK



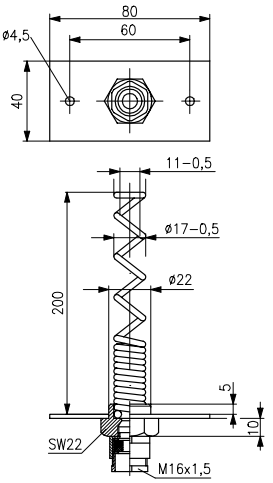
SWK



SW-200



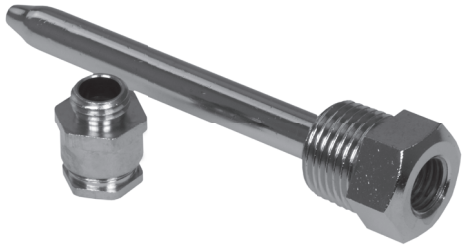
SW-200-12



Immersion sleeves for capillary / frost protection thermostats / HF / screed mounting

For industrial applications and heating technology

TH / NTH



THF

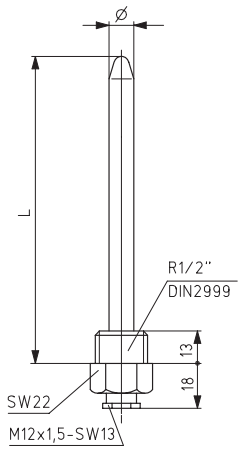
Type	Item no.	Length of L	Diameter l x A**	Material	Max. pressure (P/bar)	PG
For sensors HF Ø 7 mm, capillary and frost protection thermostats JET / JMT / WR 81 und JTF (for JTF, only type TH / NTH-140)						
TH-55	C 1809296	55 mm	8 x 10 mm	nickel-plated brass	20	II
TH-100	C 1809310	100 mm	8 x 10 mm	nickel-plated brass	20	II
TH-140*	C 1809409	140 mm	10 x 12 mm	nickel-plated brass	20	II
TH-200	C 1809438	200 mm	8 x 10 mm	nickel-plated brass	20	II
TH-280	C 1809440	280 mm	8 x 10 mm	nickel-plated brass	20	II
NTH-55	C 1809284	55 mm	8 x 10 mm	V4 A (1.4571)	40	II
NTH-100	C 1809308	100 mm	8 x 10 mm	V4 A (1.4571)	40	II
NTH-140*	C 1809435	140 mm	10 x 12 mm	V4 A (1.4571)	40	II
NTH-200	C 1809439	200 mm	8 x 10 mm	V4 A (1.4571)	40	II
NTH-280	C 1809441	280 mm	8 x 10 mm	V4 A (1.4571)	40	II

* suitable for all types with an X in the designation, for example, JET-1 ... X or JMT 202 X
** l = minimum inner diameter
A = nominal outer diameter

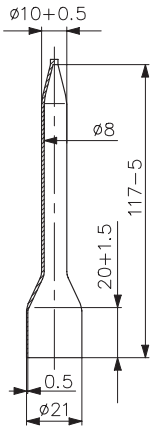
Cu protective sleeve for sleeve sensor HF Ø 7.7 mm for screed mounting

THF	C 1809515	II

TH / NTH



THF

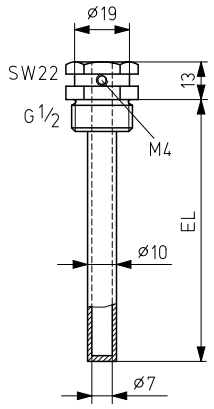


Immersion sleeves / mounting flange for HF, EKF and IKF

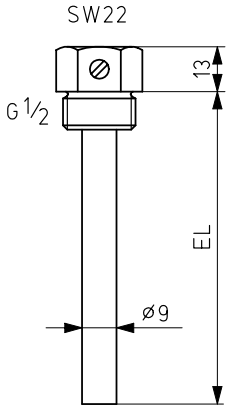
for sleeve sensors Ø 6 mm PVC and silicone, assembly-type and industrial duct sensors

For sensor technology

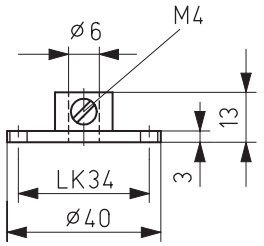
THMs



THV



MF



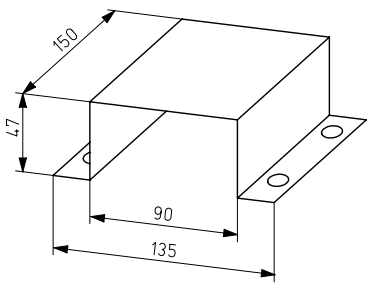
Type	Item no.	Fitting length EL	Diameter I x A*	Max. pressure (P/bar)	PG
Immersion sleeves, nickel-plated, with recess					
THMs/50	G 9990010	50 mm	7 x 10 mm	20	II
THMs/100	G 9990020	100 mm	7 x 10 mm	20	II
THMs/150	G 9990030	150 mm	7 x 10 mm	20	II
THMs/200	G 9990040	200 mm	7 x 10 mm	20	II
THMs/250	G 9990050	250 mm	7 x 10 mm	20	II
THMs/300	G 9990370	300 mm	7 x 10 mm	20	II
Immersion sleeves, stainless steel V4 A 1.4571					
THV/50	G 9990060	50 mm	6.3 x 9 mm	40	II
THV/100	G 9990070	100 mm	6.3 x 9 mm	40	II
THV/150	G 9990080	150 mm	6.3 x 9 mm	40	II
THV/200	G 9990090	200 mm	6.3 x 9 mm	40	II
THV/250	G 9990100	250 mm	6.3 x 9 mm	40	II
THV/300	G 9990200	300 mm	6.3 x 9 mm	40	II
THV/400	G 9990210	400 mm	6.3 x 9 mm	40	II
THV/450	G 9990470	450 mm	6.3 x 9 mm	40	II
THV/500	G 9990220	500 mm	6.3 x 9 mm	40	II
THV/600	G 9990400	600 mm	6.3 x 9 mm	40	II
Mounting flange, aluminium					
MF	G 9990160		6 x 40 mm		III

* I = minimum inner diameter
A = nominal outer diameter

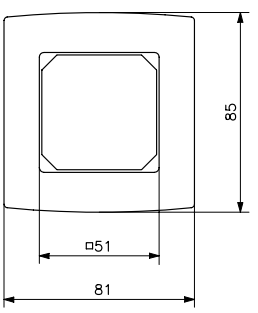
Accessories for heating technology / air conditioning technology / industrial engineering and sensors

Type	Item no.	Description	PG
ATRS-1	C 1809518	Temperature determination set for ATR 83.0 ...	II
FS-HI	H 530975	Sensor protection (protective wire braiding) for duct hygrostat HI	II
FS2-HI	H 531011	PTFE filter fine protection for duct hygrostat HI	II
JZ-01 L	H 5309226	Single duct connection made of plastic (grey) Ø 6 mm outside for differential pressure switch JDW, JDL, pressure transducers	II
JZ-04	E 6160133	Capillary tube leadthrough for air ducts with 30-cm protective hose (JTF frost protection thermostats, JMT capillary controllers, WR, JET)	II
JZ-05 / 6 K	C 1809536	1 set of assembly brackets (6 pieces) for JTF frost protection thermostats made of plastic (max. 145 °C)	II
JZ-05 / 6 M	C 1809474	1 set of mounting brackets (6 pieces) for frost protection thermostats JTF, made of metal	II
JZ-05 / 1 M	C 1809462	single mounting bracket for frost protection thermostat JTF, made of metal	II
JZ-06 / 1	H 5309229	Connection set with duct connections made of plastic, 2 x 90° angles, 2 extensions 90 mm, 4 self-tapping screws, 2-m tube Ø 6 mm outside for JDW differential pressure switch, JDL, DF pressure transducer	II
JZ-07	E 6160145	Mounting bracket for frost protection thermostats JTF	II
JZ-08	E 6150031	Spare vane for wind indication relay JSL	II
JZ-09	E 6140170	Spare paddles (4 pieces), from 1"... 8" for flow monitor JSF	II
JZ-10	H 5309237	Mounting bracket for JDL 109 / -113 and JDW-3 / -5 / -10 with 6 screws	II
JZ-13	ZA 990001	standard rail with drilled holes for fastening control cabinet controllers (length 40 mm)	II
JZ-17	MN 990001	Adapter plate for Berlin 3000 housing (hard-wired)	II
JZ-18	MN 990002	Adapter snap-on plate (controller is detachable) for Berlin 3000 housing (wireless)	II
JZ-19	MN 990003	Fully prewired plug-in socket (as for RTBSB-001.411), can be fitted with room thermostats RTBSB-001.086 or RTBSB-001.096	I
JZ-20-1	E 6130144	Wall holder including fastening material for duct hygrostat (HI), duct transducer TF, FF, FTF, air flow monitor JSL-20 K / 21 K	II
JZ-24	BN 990002	Magnetic fastening set for simple and safe fastening of the multi-channel receivers or wiring strips	II
JZ-25	BN 990003	External antenna for reception enhancement under difficult reception conditions of the multi-channel receiver, antenna cable (JZ-26) is not a part of the delivery scope (see page 41 for product folio)	II
JZ-26	BN 990004	Antenna cable 1 m for connecting the external antenna JZ-25 with multi-channel receivers	II
JZ-27	G 9990450	LC-display 3½ digit, for MDEKD	III
JZ-28	H 531012	IP-65 cover set, consisting of a cover with pressure compensation element, O-ring and 3 screws, suitable for retrofitting of the types JDL-111, JDL-112, JDL-113, JDL-114, JDL-115 and JDL-116	II
JZ-090.900	VV 000025	alre frame “Berlin” for all flush-mounted controllers with cover 50 x 50 pure white, glossy, like RAL 9010	I
JZ-090.910	VV 000010	alre frame “Berlin” for all flush-mounted controllers with cover 50 x 50 pearl white, glossy, like RAL 1013	I
JZ-DA	H 5309230	Covering cap with external setting and seal for JDL-111, -112, -115, -116, -117, spare cap for JDL-11x A types	II
MUD-A ½"	G 9990190	Adapter G ¼" to G ½" for pressure transducer MUD	III
S protection 01	G9990170	Ball impact guard, sun and rain protection; 150 x 90 x 47 mm; stainless steel V4A 1.4571	III
WP-01	G 9990180	heat conduction paste 2 ml	II

S protection 01



alre frame “Berlin”



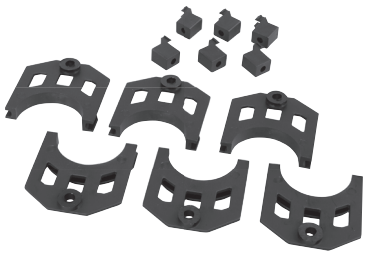
Accessories for heating technology / air conditioning technology / industrial applications and sensors

FS-HI

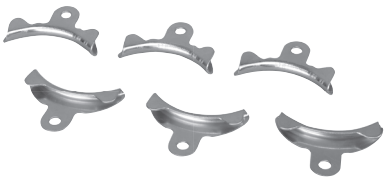
FS2-HI

JZ-04

JZ-05 / 6 K



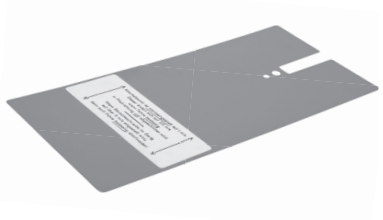
JZ-05 / 6 M



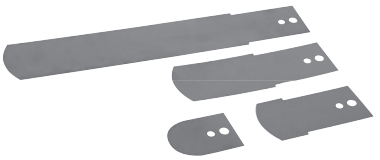
JZ-06 / 1

JZ-07

JZ-08



JZ-09

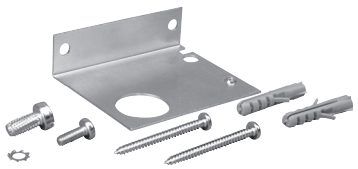


JZ-10

JZ-17

JZ-18

JZ-20-1



JZ-24

alre

Type comparison old/new (JAT, JET and JRT)

Old alre types	Control range	Switching difference	New alre types	Control range	Switching difference
JAT-1; JAT-6	–15…+30 °C	2–20 K	**JAT-110**	–35…+30 °C	2–20 K
JAT-1F; JAT-6F	–15…+30 °C	2–20 K	**JAT-110F**	–35…+30 °C	2–20 K
			JAT-112*	–35…+30 °C	FT
			JAT-120	0…60 °C	2–20 K
			JAT-120F	0…60 °C	2–20 K
JAT-2N; JAT-7N	20…80 °C	2–20 K	**JAT-130**	40…100 °C	2–20 K
JAT-2NF; JAT-7NF	20…80 °C	2–20 K	**JAT-130F**	40…100 °C	2–20 K
JAT-3; JAT-5N	50…120 °C	3–16 K	phased out	alternative WR81.117-5	
JAT-5NF	50…120 °C	3–16 K	phased out	alternative WR81.117-5	
JAT-8	50…120 °C	ST	phased out		
JAT-4	100…200 °C	9–50 K	phased out		
JET-4X; JRT-8X;	–35…+30 °C	2–20 K			
JET-5X; JRT-5X	–35…+30 °C	1 K fixed	**JET-110X**	–35…+30 °C	2–20 K
JRT-8X(N)	–35…+30 °C	2–20 K	phased out		
JET-4XG; JRT-5XG	–35…+30 °C	2–20 K	phased out		
JET-4XF; JRT-8XF;	–35…+30 °C	2–20 K			
JET-5XF; JRT-5XF	–35…+30 °C	1 K fixed	**JET-110XF**	–35…+30 °C	2–20 K
JET-5XFG; JRT-5XFG	–35…+30 °C	1 K fixed	**JET-110XFG**	–35…+30 °C	2–20 K
JRT-7X	–35…+30 °C	FT	**JET-112X**	–35…+30 °C	FT
JRT-7XG	–35…+30 °C	FT	phased out		
JRT-7XF	–35…+30 °C	FT	**JET-112XF**	–35…+30 °C	FT
JET-7X; JRT-11X;	0…60 °C	2–20 K			
JET-8X; JRT-9X	0…60 °C	1 K fixed	**JET-120X**	0…60 °C	2–20 K
JET-7XG; JRT-11XG	0…60 °C	2–20 K	**JET-120XG**	0…60 °C	2–20 K
JET-7XF; JRT-11XF;	0…60 °C	2–20 K			
JET-8XF; JRT-9XF	0…60 °C	1 K fixed	**JET-120XF**	0…60 °C	2–20 K
JET-7XFG; JRT-9XG	0…60 °C	div.	phased out		
JET-16XN;	40…100 °C	2–20 K			
JET-17XN; JRT-14XN	40…100 °C	1 K fixed	**JET-130X**	40…100 °C	2–20 K
JET-16XNG; JRT-14XG	40…100 °C	div.	**JET-130XG**	40…100 °C	2–20 K
JET-16XNF;	40…100 °C	2–20 K			
JET-17XNF; JRT-14XNF	40…100 °C	1 K fixed	**JET-130XF**	40…100 °C	2–20 K
JET-18XN; JRT-17XN	40…100 °C	ST	**JET-133X**	40…100 °C	ST
JET-18XNF	40…100 °C	ST	**JET-133XF**	40…100 °C	ST
JET-10X; JRT-12XN;	70…130 °C	2–20 K	**JET-140X**	70…130 °C	2–20 K
			JET-140XF	70…130 °C	2–20 K
JET-12X; JRT-16X;	70…130 °C	ST	**JET-143X**	70…130 °C	ST
JET-12XF	70…130 °C	ST	**JET-143XF**	70…130 °C	ST
JET-13; JRT-13A	100…280 °C	8–50 K	**JET-150**	100…280 °C	8–50 K
JET-13F	100…280 °C	8–50 K	**JET-150F**	100…280 °C	8–50 K
JET-15	100…280 °C	ST	**JET-153**	100…280 °C	ST
			JET-153F	100…280 °C	ST
JET-20N; JRT-21N;	–35…+20 °C	2–15 K			
JET-21N; JRT-20N;	–35…+20 °C	1 K fixed			
JET-22; JRT-26	–15…+30 °C	2–15 K			
JET-23; JRT-22	–15…+30 °C	1 K fixed	**JET-110R**	–35…+30 °C	2–20 K
JET-20NF;	–35…+20 °C	2–15 K			
JET-21NF; JRT-20NF	–35…+20 °C	1 K fixed			
JET-22F; JRT-26F	–15…+30 °C	2–15 K			
JET-23F; JRT-22F	–15…+30 °C	1 K fixed	**JET-110RF**	–35…+30 °C	2–20 K
JET-24; JRT-27;	10…55 °C	2–15 K			
JET-25; JRT-24	10…55 °C	1 K fixed	**JET-120R**	0…60 °C	2–20 K
JET-24F; JRT-27F	10…55 °C	2–15 K			
JET-26F;	25…55 °C	2–15 K			
JET-25F; JRT-24F	10…55 °C	1 K fixed	**JET-120RF**	0…60 °C	2–20 K
JRT-27FH	10…55 °C	3 K fixed			

* Will be discontinued

Tips for heating installers and electricians

Berlin 1000/2000/3000–bimetal

Problem	Cause
Large temperature variation present in the room (approx. 5–8 K).	1.) The neutral conductor N is not connected to terminal 4 of the controller. 2.) The neutral conductor N is connected to terminal 4 of the controller, but not in the distribution system (distribution box, fuse box).
The setting knob (setpoint transmitter) must be set higher than the desired room temperature.	1.) Incoming and outgoing (switched) phase have been interchanged. As a result, the feedback resistor continuously carries a voltage and acts like a temperature reducer in the room. Moreover, the temperature variation is very high (approx. 5–8 K) 2.) The heating output is dimensioned too low for the room. As a result of this, the power-on time of the controller is too long; the feedback resistor is thus switched on for too long and acts as a temperature reducer in the room. 3.) External heat sources are influencing the controller (for example, the sun, TV, lamp etc.). These external heat sources cause the controller to register a higher-than-actual temperature and, as a result, the room is not heated sufficiently.
The setting knob (setpoint transmitter) must be set lower than the desired room temperature.	1.) The controller has been installed, for example, behind a curtain or on an outer wall or next to a door. The controller registers a lower-than-actual temperature and, as a result, the room is overheated.
The room does not become warm.	1.) Faulty actuator element, actuator element does not open the valve. 2.) There may be coarse construction site dirt in the controller. This dirt is preventing the contact from closing. 3.) The controllers of two rooms have been connected in series. These rooms only become warm when both controller contacts are closed.

Other notes:

1.) Particularly with floor heating, it is important to remember that there are very long reaction times. Therefore, the room heats up very slowly and also cools slowly (incident sunlight, for example, results in overheating). Therefore, do not expect that a cold room will reach the desired room temperature within a short time after having set the adjusting knob to a high value.

2.) Also, with well insulated rooms, remember that the room temperature drops very slowly. As a result, it can happen that at night, despite “Reduced operation” (for example, 4 K lower), the room temperature drops only a little and the heating therefore does not get activated for a prolonged time.

3.) Very often, the function of bimetal controllers is impaired or rendered completely useless by construction site dirt that has penetrated into them. Therefore, the controllers should be installed only after any required spatula, painting or wallpapering work. Avoid drilling dust without fail.

Industrial technology

Note for connecting industrial thermostats and controllers to PLC or DDC:

For connecting industrial thermostats and controllers to programmable logic controllers (PLC) or direct digital controls (DDC), the use of normal commercial coupling relays with 230 V~ coil voltage and gold-plated switching contacts is recommended.

Sensor characteristic curves – table of sensor values

Temperature	PT 100	PT 1000	NI 1000	NI 1000 TK 5000	LM 235 Z
°C	Ω	Ω	Ω	Ω	mVolt
–50	80.30	803.00	742.55	790.88	2232.00
–45	82.30	823.00	766.76	810.75	
–40	84.30	843.00	791.31	830.84	2332.00
–35	86.20	862.00	816.21	851.15	
–30	88.20	882.00	841.46	871.69	2432.00
–25	90.20	902.00	867.04	892.47	
–20	92.20	922.00	892.96	913.48	2532.00
–15	94.10	941.00	919.22	934.74	
–10	96.10	961.00	945.82	956.24	2632.00
–5	98.00	980.00	972.74	977.99	
0	100.00	1000.00	1000.00	1000.00	2732.00
5	102.00	1020.00	1027.59	1022.26	
10	103.90	1039.00	1055.52	1044.79	2832.00
15	105.80	1058.00	1083.77	1067.59	
20	107.80	1078.00	1112.36	1090.65	932.00
25	109.70	1097.00	1141.29	1113.99	2982.00
30	111.70	1117.00	1170.56	1137.62	3032.00
35	113.60	1136.00	1200.16	1161.52	
40	115.50	1155.00	1230.11	1185.71	3132.00
45	117.50	1175.00	1260.41	1210.20	
50	119.40	1194.00	1291.05	1234.98	3232.00
55	121.30	1213.00	1322.05	1260.06	
60	123.20	1232.00	1353.40	1285.45	3332.00
65	125.50	1252.00	1385.12	1311.14	
70	127.10	1271.00	1417.21	1337.15	3432.00
75	129.00	1290.00	1449.67	1363.47	
80	130.90	1309.00	1482.50	1390.12	3532.00
85	132.80	1328.00	1515.73	1417.09	
90	134.70	1347.00	1549.34	1444.39	3632.00
95	136.60	1366.00	1583.36	1472.03	
100	138.50	1385.00	1617.79	1500.00	3732.00
105	140.40	1404.00	1652.62	1528.32	
110	142.30	1423.00	1687.89	1556.98	3832.00
115	144.20	1442.00	1723.58	1586.00	
120	146.10	1461.00	1759.72	1615.37	3932.00
125	148.00	1480.00	1796.30	1645.10	
130	149.80	1498.00	1833.35	1675.19	
140	153.60	1536.00	1908.87	1736.48	
150	157.30	1573.00	1986.35	1799.27	

Sensor characteristic curves – table of sensor values

Temperature	Sensor 0 NTC 2K25	Sensor 1 NTC 1KO	Sensor 2 NTC 47K	Sensor 3 NTC 8K	Sensor 4 NTC 10K	Sensor 5 NTC 50K	Sensor 6 NTC 100K	Sensor 8 NTC 2K	Sensor 51 KTY 81-121	Sensor 57 KTY 11-7
°C	Ω	Ω	Ω	Ω	Ω	Ω	Ω	Ω	Ω	Ω
–50	151398	32540	3152409	537827	672283	2820844	8276704	77977	510	1051
–45	106557	24432	2230085	378534	473168	2027885	5751387	57655	535	1103
–40	75923	18515	1595524	269709	337137	1473182	4044707	43039	562	1156
–35	54731	14156	1153886	194427	243033	1080969	2877133	32427	589	1212
–30	39895	10916	843120	141724	177155	800794	2069021	24651	617	1269
–25	29390	8486	622133	104107	130508	598684	1503450	18902	647	1328
–20	21871	6648	463401	77696	97120	451517	1103398	14615	677	1390
–15	16434	5248	348285	58379	72973	343390	817535	11391	708	1453
–10	12462	4172	264028	44269	55337	263262	611269	8947	740	1518
–5	9533	3340	201812	33866	42333	203390	461045	7079	773	1586
0	7355	2691	155480	26126	32658	158300	350656	5642	807	1655
5	5719	2182	120696	20318	25397	124082	268840	4527	842	1726
10	4482	1780	94377	15923	19903	97925	207702	3657	877	1799
15	3539	1460	74314	12570	15713	77789	161654	2973	914	1874
20	2813	1205	58910	9994	12492	62184	126708	2431	951	1951
25	2252	1000	47000	8000	10000	50000	100000	2000	990	2030
30	1814	834	37732	6445	8056	40455	79428	1654	1029	2111
35	1471	699	30472	5224	6530	32910	63489	1376	1070	2194
40	1199	588	24750	4260	5325	26916	51056	1151	1111	2279
45	984	498	20214	3494	4368	22129	41297	967	1153	2366
50	811	423	16597	2882	3602	18285	33591	816	1196	2456
55	673	361	13697	2389	2986	15182	27470	693	1241	2545
60	560	309	11360	1991	2488	12664	22582	590	1286	2638
65	469	266	9466	1667	2084	10612	18656	505	1331	2733
70	395	230	7925	1402	1753	8931	15478	434	1378	2829
75	334	199	6664	1185	1481	7547	12917	374	1426	2928
80	283	173	5627	1006	1258	6404	10821	324	1475	3029
85	241	151	4771	857	1072	5456	9105	282	1525	3131
90	207	133	4062	734	917	4665	7693	246	1575	3236
95	177	117	3471	631	788	4004	6527	215	1627	3342
100	153	103	2978	544	680	3448	5559	189	1679	3451
105	132	91	2563	471	588	2980	4752	167	1732	3561
110	115	81	2215	409	511	2584	4077	147	1786	3674
115	100	72	1919	356	445	2248	3511	130	1841	3788
120	88	64	1669	12	389	1962	3033	116	1896	3905
125	77	57	1456	273	342	1717	2629	103	1950	4023
130	68	51	1274	240	301	1507	2287	91	2003	4143
140	53	41	984	188	235	1171	1745	73	2103	4390
150	42	34	769	148	185	920	1348	60	2189	4644

Technical terms

Range limitation (mechanical):

Below the adjusting knob, there are “setting flags” (red/blue) for mechanically delimiting the min./max. temperature range.
In this manner, an undesired mis-setting of the setpoint can be prevented, for example, in children’s rooms or public buildings.

Bimetal:

Thermo-bimetal is generally constructed of layers of metal or alloys of more or less the same thickness, which are firmly joined to one another and have different coefficients of thermal elongation. As a result, they bend under temperature changes, so that upon heating, the side with the component that has a lower heat elongation becomes hollow. The heat is transferred by conduction, radiation or convection from the surroundings (indirect heating).

Defrosting:

Defrosting is the regular de-icing or heating up of the heat exchanger or cooling unit to maintain efficient operation of the system.

Intrinsic safety (JTU, JTL)

Intrinsic safety / protection against cold: The devices are intrinsically safe, i.e., upon loss of the sensor medium owing to sensor rupture, for example, the burner is switched off. Since minus temperatures generate the same effect through volume reduction of the sensor medium, the devices are adjusted by means of the “cold screw” such that they switch off the burner only at temperatures below –15 °C. They can only be switched on again manually at temperatures above approx. –5 °C by means of the manual reset button.

Air conditioner, 2-pipe fan convector (fan coil):

The 2-pipe air conditioners are supplied with heating or cooling water for heat exchange, depending on the requirement, through the same pipe system via 2 pipes (inflow and outflow).

Air conditioner, 4-pipe fan convector (fan coil):

The 4-pipe air conditioners are supplied with heating or cooling water for heat exchange, depending on the requirement, through a heating circuit and a cooling circuit (4 pipes).

Cooling ceiling:

The cooling ceiling belongs to the group of panel heaters. Cooling ceilings are used often in office spaces for passive cooling. In such systems, cold water (usually at 16 °C) flows through a network of pipes and cools the room air. Lower inflow temperatures are not possible because of condensation water formation.

Neutral zone:

The control range in which neither heating nor cooling takes place is called the neutral zone.

Break contact (bimetal):

The control contact opens with increasing temperature and closes at dropping temperature (for “heating”).

Proportional band (p-band):

The proportional band is the range around the target temperature within which the controller delivers a steady output signal. This means that the room temperature is kept more or less constant within the proportional band by the controller (if the heating capacity is sufficient).

2-point control (ON/OFF control):

Control algorithm which, for example, switches off the output when the set temperature is exceeded and switches it on again when the current temperature falls short of the setpoint value. The temperature in the room is always subject to certain variations (control deviations). This deviation results from the switching temperature difference of the controller and the properties of the room, such as heating speed, heat loss etc.

3-point control:

In a 3-point control system, the controller can change between the operating modes heating, neutral zone and cooling.

PWM (pulse width modulation):

Process for generating a continuous-like transmission behaviour in a control path. By varying the power-on time at the input, owing to the time constant of the transmission path, a continuous-like (smooth) signal waveform is generated at its output.

Switching difference (hysteresis):

Difference between the switching on and switching off of the heater or the controller.
a) There is the switching temperature difference of the controller, which depends on the construction of the device.
b) There is the switching temperature difference of the room, which is dependent on the behaviour of the entire control path, i.e. on the floor design, the action of external heat sources, the installation location of the controller and the controller itself.
The switching temperature difference always refers to the controller. It does not express the actual switching temperature difference of the control path. The latter changes according to the deployment location and conditions. Any indoor temperature is constantly subject to variations. This deviation results from the switching temperature difference of the controller and the properties of the room, such as heating speed, heat loss etc.

Technical terms

NO contact (bimetal):

NO contact (bimetal): The control contact closes with increasing temperature and opens at dropping temperature (for “cooling”).

Changeover / toggler (bimetal):

This is a changeover / toggler with an NC contact and an NO contact. It operates as described for NC and NC contacts.

Split unit / Multi-split unit:

Split AC units consist of at least two heat exchangers in which one is installed as a vaporiser in the rooms to be cooled and the other serves as a condenser for heat dissipation. Most split units allow reverse operation for heating the rooms if this is required. Multi-split units consist of several vaporisers connected to a condenser (liquefier).

Valve actuator:

Electrical controllable valve for regulating, for example, the hot water flow in heating systems.
A distinction is made here between ON/OFF valve actuators and proportional valve actuators.
Proportional valves are designed for connecting controllers with a continuous control mode.

Continuous control:

The controller provides an analogue output signal. The value of the output signal changes continuously, i.e., without any steps or jumps, in response to the output signal.

Temperature reduction (TR):

The TR is also implemented via a resistor, as is the case with thermal recirculation. This resistor is activated manually or by a timer. As a result, the bimetal is made to feel a simulated temperature that is about 4 K higher than the actual temperature in the room. Consequently, in a room with a controller setting of, for example, 20 °C, the temperature in the room can drop to a value 4 K lower, to max. 16 °C. If the temperature drops further, the heating system switches on again, and at > 16 °C, it gets switched off. The magnitude of the temperature reduction to be actually achieved depends on the insulation of the building and the reduction period (one night, weekend, holiday).

Thermal recirculation (RF):

By means of an additional integrated heating resistor, the controller is made to switch off at the right time during the heating process.
As a result, exceeding the desired room temperature is minimised, and there is a smaller switching difference.

Heat pump:

Rooms can be cooled or heated with heat pumps. Modern systems allow efficient heating and cooling operation since they allow reversible process reversing.

Reversing valve:

A reversing valve (4-way control valve) facilitates a reversing cycle by turning the condenser (liquefier) into an evaporator which causes the cooling unit to heat up or defrost.

Valve and pump protection function:

The valve and pump protection function serves to prevent the valve seat and / or the pump(s) from corroding up during longer stop times. If using the device for the control of warm-water heating systems, activating the valveprotection function is recommended. After activation of the valve and pump protection function, the controller actuates the valve(s) or triggers a heating pump every Monday between 11.00 and 12.00 o’clock a.m. over a 5 minute time period. The valve and pump protection function is rendered active only if no heating operations were executed within the last week. Unnecessary heating during the heating season is thus avoided, thereby leaving the control system unaffected.

Evaporator/Liquefier:

A liquefier or condenser is a heat exchanger in a cooling unit that liquefies a gaseous medium through the dissipation of heat. Usually, further cooling of the cooling agent takes place in the liquefier. According to the definition of terms in the European Standard EN 378 Part 1, the condenser in cooling units is called the liquefier in order to easily distinguish it from an electrical condenser. The vaporiser implements the opposite process, evaporating the liquid medium by heating it up.

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Terms and conditions of sale and supply

General: We supply ex works in accordance with the familiar “General conditions for the supply of products and services of the electrical and electronics industry”, in the valid version at the time the contract is concluded, with the addition of the “Supplementary stipulation: Extended retention of title”, which we can make available if desired. These “General conditions for the supply of products and services of the electrical and electronics industry” apply together with the following terms and conditions of sale and supply, but with the stipulation that in case of contradictions between the “General conditions for the supply of products and services of the electrical and electronics industry” and our terms and conditions of sale and supply, the latter shall apply. Upon acceptance of the order, these “General conditions for the supply of products and services of the electrical and electronics industry” as well as our terms and conditions of sale and supply come into force in place of any terms and conditions of purchase of the customer, even if, according to these terms and conditions of the supplier, acceptance of the order is supposed to indicate recognition of these terms and conditions of purchase. By accepting our order confirmation without contradiction, the buyer agrees to renounce the demurrer derived from his terms and conditions of purchase; we accept this renunciation. Our conditions also apply to all future business relationships, even if they are not expressly agreed again. At a time not later than acceptance of the delivery or service by the buyer, our conditions will be considered to have once again been accepted. Any confirmation of the buyer with a reference to his terms and conditions of purchase is hereby rendered null and void. Deviations from our terms and conditions are only valid if they have been agreed to by us in writing.

1. Quotes: Our quotes are subject to change and without obligation. Declarations of acceptance and purchase orders need our written confirmation for them to become legally valid; the same applies to supplements, changes and subsidiary agreements. Drawings, illustrations, dimensions and other performance data are only binding if they are agreed expressly in writing.

2. Prices: The prices quoted by us are the prices ex works, plus the applicable value added tax. Packing, freight, insurance and customs costs are not included. If there is a substantial change in the material prices, the wages, salaries, freight, taxes and tolls or other cost-determining factors between the time of the contract sign-off and the delivery date, we reserve the right to apply a corresponding reasonable price increase.

3. Delivery: Due dates and deadlines specified by us are only approximate and non-binding, unless there is an express agreement to the contrary. We are not responsible for delays in delivery and performance owing to force majeure and circumstances beyond our control that render the delivery significantly more difficult or impossible – this includes, in particular, subsequent difficulties in procuring materials, operational disturbances, strikes, blockades, shortage of personnel, shortage of transport, governmental directives, also if such circumstances affect our suppliers or their sup-suppliers – even if binding due dates and deadlines have been agreed. Such circumstances entitle us to postpone the delivery and performance, or to withdraw partially or entirely from the contract. In such a case, the buyer will be informed about this situation without delay. In case of withdrawal, any payments that have been made will be returned immediately. If we are responsible for not complying with agreed, binding due dates and deadlines, the buyer, if he can prove loss owing to the delay, is entitled to damage compensation of 0.5% for every completed week of the delay, subject however to a maximum of 5% of the invoice value of the deliveries and services affected by the delay. Any additional claims, especially damage compensation claims of the buyer owing to delays in the supply or also damage compensation claims instead of the performance, which exceed the limits specified above, are excluded in all cases of delayed
delivery. This does not apply to mandatory liability in case of wilful intent, gross negligence or in case of loss of life,
bodily injuries or harm to health. We are entitled to make partial deliveries or to partial performance at all times.
For technical production-related reasons, we reserve the right to supply excess or short deliveries of up to 10% of the agreed ordered quantity. Compliance with exact quantities cannot be demanded.

4. Packaging: The packaging will be charged according to actual expenses and will not be taken back, unless this is required by law. If certain specially marked solid packing containers are returned freight-paid, a reasonable credit note will be issued.

5. Payment: Our invoices are payable 14 days 2 % discount, 30 days net. From the 31st day after the invoice date, the buyer will owe penal interest at the rate being charged by the commercial banks for overdrafts on current accounts, subject, however, to a minimum of 5% above the base rate, plus the applicable value added tax. We are entitled to offset payments from the buyer against his older or less well secured debts first, despite there being stipulations to the contrary from the buyer. If costs and interest have already been incurred, we are entitled to set off the payment first against the costs, then against the interest and then against the principal. A payment is considered to have been made only after we have access to the funds. In case of submission of a cheque, only after realisation of the cheque. Bills do not hold good as payments, they will only be accepted as fulfilment. Orders from buyers unknown to us will only be accepted with advance payment or with cash on delivery. If the buyer does not meet any of his payment obligations, or if a cheque issued by him is not honoured, or if he stops making payments, or if there is a bill protest, or if we receive information on steps being initiated to force payment, or on any other circumstances that cast doubt on the creditworthiness of the buyer, all invoice amounts become due immediately, with the nullification of all agreed payment periods. In such a case, we are entitled to demand advance payments or collateral. The buyer can only withhold a payment if the defect has been recognised or is obvious, but only to the extent of the probable costs of correcting the defect as regards the individual defective object. The acceptance of a payment reminder is considered acceptance of the balance contained therein, unless contested in writing within one week.

6. Retention of title: Until such time as all the claims due to us from the buyer for any legal reason are fulfilled, the following collateral will be provided to us, which we shall release only upon request from the buyer by his choice, provided their value sustainably exceeds existing and identifiable future claims by more than 20%. The supplied goods remain our property, and processing and transfiguration always take place for us as the manufacturer, but without any obligation for us. If our ownership title expires through incorporation, it is agreed at this point that ownership of the buyer in the resulting item shall be transferred to us in proportion to the invoice value. The buyer will hold our property free of cost. Goods which are our property or partially our property in this manner are reserved goods. The buyer is entitled to process and sell the reserved goods in the normal course of business,
provided there has been no delay on his part in making payments to us. Pledging and transfer as collateral are not permitted. The buyer assigns to us, right at this stage, the claims in their entirety arising from the onward sale or from any other legal reason regarding the reserved goods
by way of security. The buyer empowers us to collect such claims on our account in the buyer's own name. If so required by us, the buyer will disclose the assignment to us and provide us with the required documents and information. If a third party accesses these reserved goods, the buyer will indicate that it is our property and inform us immediately. If the goods are transferred, whether processed or unprocessed, the buyer undertakes to similarly retain ownership through simple and extended retention of title. In case of violation of the contract by the buyer, especially delay in payment, we are entitled to take back the reserved goods at the cost of the buyer, or to institute a claim for return on a third party. The reclaiming or attaching of the reserved goods by us does not constitute a withdrawal from the contract, provided that the Consumer Credit Act (Verbraucherkreditgesetz) is not applicable.

7. Complaints: Claims against defects lapse after six months. This does not apply if the law compulsorily prescribes longer periods, or in cases of loss of life, bodily injuries or harm to health, in case of violation of obligations with wilful intent or gross negligence, and in case of fraudulent concealment of a defect. Damage compensation claims are otherwise covered by Clause 9 (Limitation of liability) of our terms and conditions of supply. The buyer is obliged to immediately inspect our delivery. Claims against defects can only be filed if the complaint is made in writing not later than one week after receipt of the goods. If our operating or assembly instructions or other instructions were not followed, or if changes are made to or repair work is carried out on our products, or parts replaced, or if our products are used contrary to the contractually required suitability, there will be no entitlements because of defects. The same applies if the buyer, in a manner that is not transparent to us, joins, mixes or processes our products, contrary to their normal and/or usual suitability, with his products or products of third parties, or uses our products contrary to the state of science and technology, or in any other manner contrary to their normal and/or usual suitability. All the information that we provide about the function and quality of our products in quotes, catalogues and other product descriptions refer exclusively to the results of examinations in standard and recognised laboratory conditions; we accept liability only to that extent, but not for the specific respective use by the buyer. In case of material defects, we may, at our discretion, replace the defective part by means of a free delivery of the replacement, or repair the part through our contractor at the buyer's premises. Repair or replacement is conditional upon the buyer having paid a reasonable proportion of the purchase price, taking the defect into consideration. When we supply a defect-free product for the purposes of replacement, the buyer must return the previously supplied defective product to us. For warranty claims, the product has to be delivered to us. If expressly desired by the buyer and if a corresponding purchase order is issued, we will also perform work on-site. The service deployment will be charged on the basis of our current "Service charges table". The calculation will be performed regardless of whether there is a warranty claim. Any other claims by the buyer, especially damage compensation claims, regardless of the legal reason, are excluded. This does not apply in case of mandatory liability in case of wilful intent, gross negligence or in case of loss of life, bodily injuries or harm to health.

8. Drawings, samples, designs, technical illustrations and similar documents will remain our property and may neither be used elsewhere nor disclosed to third parties without express written permission. Software may not be copied, nor be used directly or indirectly for any purpose other than the purpose of the contract related to the delivery.

9. Limitation of liability: Damage and expense reimbursement claims (in short: damage compensation claims), no matter for what legal reason, especially owing to violation of responsibilities from the contract obligation, and to impermissible actions, are excluded. This does not apply in cases where there is a mandatory liability, for example, according to the Product Liability Act, in case of wilful intent, gross negligence or in case of loss of life, bodily injuries or harm to health or in case of violation of essential contractual obligations. However, the damage compensation claim for the violation of essential contractual obligations is limited to the foreseeable damage typical for the contract, unless there is wilful intent, gross negligence or in case of loss of life, bodily injuries or harm to health. If the buyer is entitled to damage compensation claims according to this Clause 9, these will also lapse after six months. Damage compensation claims according to the Product Liability Law are subject to the legal statute of limitations, if they are mandatory.

10. Final provision: The laws of the Federal Republic of Germany apply to the legal relationship between us and the buyer. The place of fulfilment for the delivery and payment is Berlin. Insofar as is legally permissible, Berlin is the exclusive place of jurisdiction for all disputes arising directly or indirectly from the contractual relationship. If individual provisions of these terms and conditions of business or other conditions become invalid, the applicability of all the other provisions or conditions and the entire contract shall not be affected. The invalid provisions shall be replaced by another, which will achieve the intended financial purpose in a permissible manner. The German version is decisive for the meaning and explanation in case of any lack of clarity.

Safety regulations
When handling products, the applicable EU Directives and the assembly and installation instructions in the operating manuals must be followed without fail.

Notes on the technical data

The technical data specified in the catalogue were determined in laboratory conditions in accordance with the applicable standards. Only to that extent are the properties assured. All the equipment and components shown in this catalogue may only be used in keeping with their intended purpose. Testing for suitability for the purpose intended by the customer or for the use of the part under usage conditions is the responsibility of the customer; we do not provide any kind of guarantee.

We reserve the right to make changes to products and documentation as may be required for technical progress and continuous improvement and therefore, there may be deviations from the information in the catalogue. Printing errors excepted.

This price list is valid from 01.01.2016. This price list supersedes all previous price lists and renders them invalid.

We reserve the right to make changes.

General notes

REACH, RoHS, WEEE

The EU is striving to make the trade of chemical substances as safe as possible. This is based on the guiding principle of a “knowledge-based economy”. As part of this effort, the EU Commission has introduced a new chemical policy: REACH. This directive provides rules for the registering, assessing and approving of chemicals produced in or imported to the EU in quantities of 1 t/a or higher.

Alre-IT Regeltechnik is not subject to this new directive since the amount of chemicals used in our products is significantly less than a metric ton per annum.

We further hereby confirm that all our products subject to the directives of RoHS as well as WEEE (2002/96/EC) comply with the corresponding requirements.

Product testing

For information on our declarations of conformity and various product tests, please visit our website at
www.alre.de.

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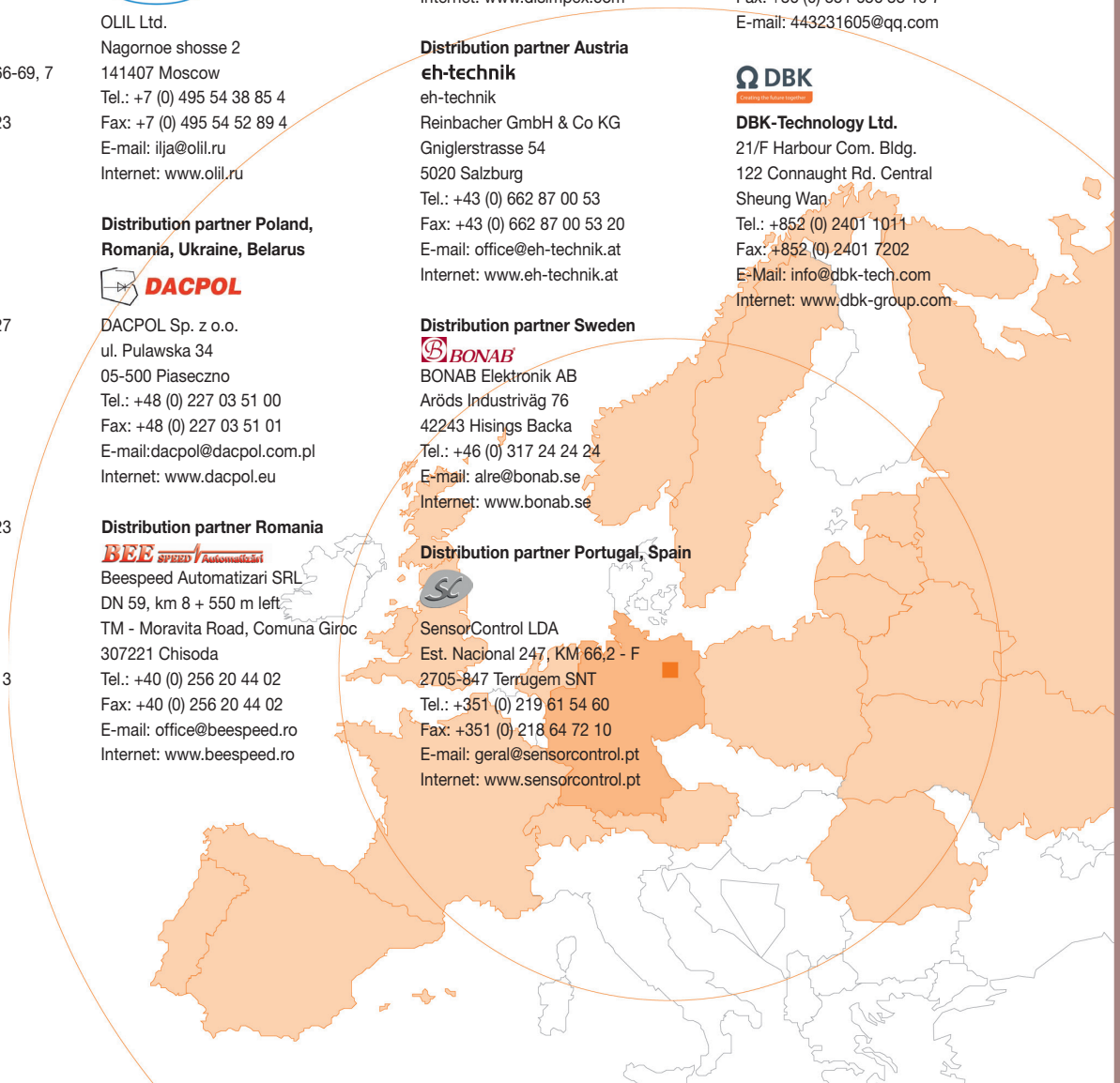

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GB/01-2016/1500