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Explosion protected add-on thermostat

ATH-EXx type series

Particularities

- 10 A contact rating
- can be directly fitted in zone 1, 2, 21 and 22
- optional -50 °C used
- Control ranges from -20 to +500°C are possible

Brief description

Explosion protected add-on thermostats of the ATH-EXx type series control and monitor thermal processes and can be directly used in explosive areas - Zone 1 and Zone 21.

The devices are available as temperature monitor TW, temperature controller TB, break-proof temperature monitor STW and break-proof safety temperature limiter STB. The thermostats operate according to the fluid or gas expansion principle. The electrical switching element is a pressure resistant encapsulated micro switch.

Version as per DIN EN 14597:

TW	Temperature monitor
TB	Temperature limiter
STW	Break-proof temperature monitor
STB	Break-proof safety temperature limiter



ATH-EXx-..



ATH-EXx-2

Ex identification

	II 2G Ex ed IIC T5 or T6	for explosive gas atmosphere
	II 2D Ex tD A21 IP65 T95°C or T80°C	for explosive dust atmosphere

Explosion protection

	II 2G	Device group II, category 2, equipment for explosive gas atmosphere
	II 2D	Device group II, category 2, equipment for explosive dust atmosphere

Approval/approval marks (see Technical Data)



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Technical Data

Switching function

Temperature monitor TW and break-proof temperature monitor STW	Restart lock for temperature limiter TB and break-proof safety temperature limiter STB	Self-monitoring for break-proof temperature monitor STW and break-proof safety temperature limiter STB
If the temperature exceeds the set point value set on the temperature probe, the micro switch will be tripped by the transmission mechanics and the current circuit opened or closed. The micro switch is reset to its original status once the set point value set is gone below (by the hysteresis).	If the temperature exceeds the limit value set on the temperature probe, the current circuit is opened and the micro switch mechanically locked. The micro switch can be manually unlocked, once the dangerous temperature drops by approx. 10 % of the scale range (approx. 15% with a limit value setting > 350°C).	If the measuring system is destroyed, i.e. if the expansion fluid escapes, the pressure in the diaphragm of the STB and STW drops and permanently opens the current circuit. Unlocking is no longer possible. If the probe has cooled down to a temperature specified in the control range table, e.g. below -20°C, the current circuit is also opened. If the temperature exceeds -20°C, the STB must be unlocked manually first. The STW automatically restarts.

Control ranges and probe table

Control range in °C	Switching point accuracy in the upper third of the scale range ^a		maximum long-distance line length in mm	maximum probe temperature as per DIN EN 14597 in °C	STW + STB open at a probe temperature under °C	Probe length "L" for "d" = 6 mm	
	TW, TB	STW, STB				TW, TB	STW, STB
-20...+50	+0 K -3 K	+0 K -3.5 K	5000	+60	-10	142	115
0...+50	+0 K -2 K	+0 K -2.5 K		+60		185	149
0...+100	+0 K -4 K	+0 K -5 K		+115		107	89
+40...+120	+0 K -3 K	+0 K -4 K		+140		125	103
+50...+200	+0 K -6 K	+0 K -8 K		+230	101	83	
+80...+250	+0 K -7 K	+0 K -8.5 K		+300	-20	82	68
+50...+300	+0 K -10 K	+0 K -12.5 K		+345	-30	63	53
+20...+400	+0 K -15 K	+0 K -19 K	1000	+460	-30	278	176
+20...+500	+0 K -19 K	+0 K -24 K	2000	+550	-30	148	127
			4000			202	

^a Offset of the switching point accuracy to a different scale range is possible upon customer request.

Long-distance line and temperature probe

Type	Scale limit value	Long-distance line Ø 1.5 mm	Temperature probe
ATH-EXx-..	up to 200°C	Copper (Cu) material No. 2.0090 tin-plated	Copper (Cu) material No. 2.0090 hard soldered, tin-plated
	up to 300°C	Stainless steel (CrNi) material No. 1.4571	Stainless steel (CrNi) material No. 1.4571
	up to 500°C		
Long-distance line length	standard 1000 mm, maximum 5000 mm		
minimum bending radius of the long-distance line	5 mm		

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Electrical data

Switching element	TW, STW	TB, STB
	pressure resistant encapsulated micro switch with change-over contact	pressure resistant encapsulated micro switch with N/C contact, restart lock and additional signal contact
maximum contact rating	Terminal 1-4: (N/C contact) AC-1: 230 V +10%, 10 A AC-15: 230 V +10%, 2 A DC-1: 230 V +10%, 0.25 A	Terminal 1-4: (N/C contact) AC-1: 230 V +10%, 16 A AC-15: 230 V +10%, 2 A DC-1: 230 V +10%, 0.25 A
	Terminal 1-2: (N/O contact) AC-1: 230 V +10%, 5 A AC-15: 230 V +10%, 0.8 A DC-1: 230 V +10%, 0.25 A	Terminal 1-2: (N/O contact) AC-1: 230 V +10%, 10 A AC-15: 230 V +10%, 1.5 A DC-1: 230 V +10%, 0.25 A
Electrical connection	5-pole terminal strip suitable for a cable cross section up to 2.5 mm ²	

Operating data

Hysteresis in % of the control / limit value range	Ranges with scale limit value ≤ 350°C			Ranges with scale limit value > 350°C		
	Switching function	Rated value	Possible actual value	Switching function	Rated value	Possible actual value
	TW	3	3-5	TW	5	5-9
STW	5	5-7	STW	6	6-11	
Ambient temperature influence based on the control / limit value range	When the ambient temperature on the case deviates from the calibration ambient temperature 22°C, a switch point offset occurs. Higher ambient temperature = lower switching point Lower ambient temperature = higher switching point					
	Add-on thermostats with scale limit value					
	< 200°C		≥ 200°C ≤ 350°C		> 350°C ≤ 500°C	
	TW / TB	STB / STW	TW / TB	STB / STW	TW / TB	STB / STW
	Influence on the switch head					
	0.08%/K	0.17%/K	0.06%/K	0.13%/K	0.14%/K	0.12%/K
Influence on the long distance line per metre						
0.047%/K	0.054%/K	0.09%/K	0.11%/K	0.04%/K	0.03%/K	
Permissible storage temperature	-20...+50°C (-50...+50°C for TZ 679)					
admissible ambient temperature during use	Long-distance line °C	Switch head		Max operating temperature of the cable screw-connection for the TZ 679: +70°C		
		T6	T5			
	max.	+40°C	+40°C			
	max.	+55°C	+55°C			
min.	-20°C (-50 for TZ 679)					
Rated position	as per DIN 16 257, NL 0 to NL 90 (different rated positions (NL) on request)					

Case

Material	Polyester case, glass fibre reinforced, black (option: aluminum)	
ATH-EXx-2 ATH-EXx-7 ATH-EXx-20	Limit value can be set on the set point value setter after removing the case lid.	
ATH-EXx-70	Limit value can be set on the set point value setter after removing the case lid. The set point value setter must be subsequently sealed by the fitter to secure the set limit value.	
Protection type	EN 60 529-IP 65	
Cable inlet	Ex cable screw connection M 20 x 1.5, sealing range 6-12 mm	
Switch head is fastened	with 4 screws once the case lid is removed	
Weight	approx. 1.2 kg	

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Process connection^a

Type series ATH-EXx-.. with long-distance line	plain cylindrical probe 10 (standard)
	Sheath 20 (on request)
	Screw-in sleeve with screw-in spigot G 1/2 form A as per DIN 3852/2 and clamping piece with locking screw to lock the probe
Material of sheaths 20	up to +150°C CuZn, nickel-plated, standard; over +150°C as a standard CrNi
Fitting length S	Standard lengths: 100, 120, 150, 200 or 300 mm (different lengths on request)
Immersion tube Ø	D = 8 mm

^a For different process connections and sheaths see data sheet 609710 (only 20, 21, 60 and 65).

Approvals/approval marks

Types	Switching function	Certificates/test certificate	Inspections
ATH-EXx-2	TW	PTB 03 ATEX 1187	ATEX
ATH-EXx-20	STW		
ATH-EXx-7	TB		
ATH-EXx-7-F ^a	TB		
ATH-EXx-70	STB		
ATH-EXx-70-F ^a	STB		

^a Limit value permanently factory-set and sealed.

Ignition protection class	Exed		European Standard		
	Ex	General regulations			EN 60079-0
	e	increased safety			EN 60079-7
	d	pressure resistant encapsulation			EN 60079-1
	IIC	Gas group			
T6	Temperature class				

IP 65 T 80°C	Use in flammable dust	European Standard	EN 61241-0 EN 61241-1	
	IP 65	Protection class as per EN 60529-IP65		
	T 80°C	max. admissible surface temperature (use in flammable dust)		

Note

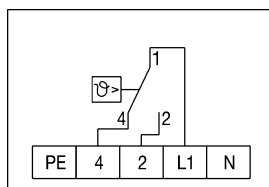
Physical and toxic features of the expansion means, which could emerge in the event of a measuring system break.

Control range with scale limit value	Hazardous reactions	Fire and explosion hazard		hazardous to waters	Information about toxicology		
		Ignition temperature	Explosion limit		irritant	dangerous to health	toxic
≤ +200°C	no	+355°C	0.6 - 8V%	yes	yes	a	no
≤ +200°C		+490°C	- -				
≤ +200°C		no	0.6 - 8V%	no	no	no	

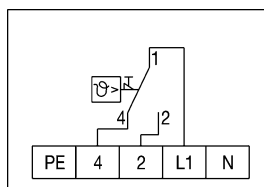
^a There is currently no statement by the health authority concerning hazards to health in the event of short-term exposure and low concentration, e.g. measuring system break.

Wiring diagrams

ATH-EXx-..



ATH-EXx-2 / ATH-EXx-20



ATH-EXx-7 / ATH-EXx-70

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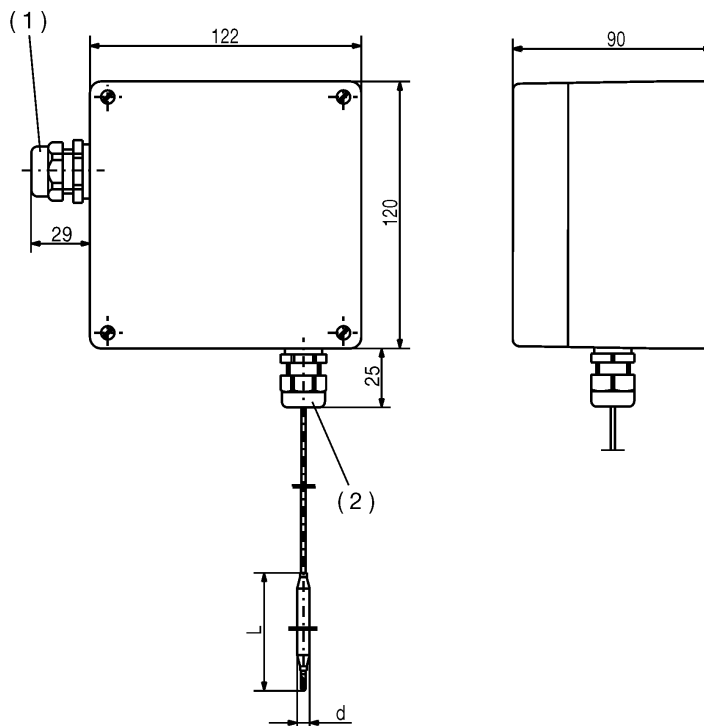
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Dimensions

ATH-EXx-..



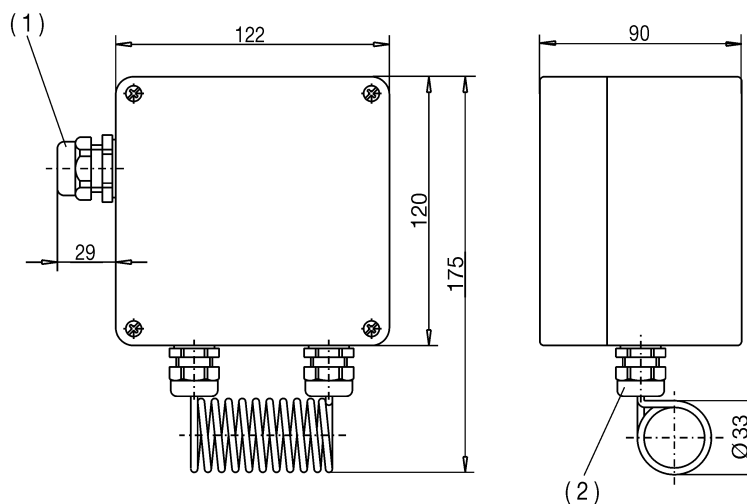
(1) = Ex cable screw connection
 M20 x 1.5 x6-12

(2) = Ex cable screw connection

For different process connections and
 sheaths see data sheet 606010
 (only 20, 21, 22, 60 and 65)

ATH-EXx-2

with spiral probe "15"
 (only for control range
 -20...+40°C, -20...+50°C and
 0...+50°C)



(1) = Ex cable screw connection
 M20 x 1.5 x6-12

(2) = Ex cable screw connection

Stock versions

Part No.	Type	Control range (CR) °C	Probe
60/60002314	ATH-EXx-2	-20...+40	Spiral probe "15"

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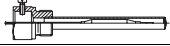
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Order details

Explosion-protected add-on thermostat, type series ATH-EXx-..

Order code	(1) Basic type
605051	add-on thermostat for explosive areas, type series ATH-EXx
	(2) Basic type extensions
02	ATH-EXx-2 Temperature monitor TW
20	ATH-EXx-20 Break-proof temperature monitor STW
07	ATH-EXx-7 Temperature limiter TB
70	ATH-EXx-70 Break-proof safety temperature limiter STB
	(3) Control / limit value ranges °C
013	-20...+40
014	-20...+50
021	0...+50
025	0...+100
056	+40...+120
062	+50...+200
080	+80...+250
064	+50...+300
045	+20...+400
046	+20...+500
	(4) Long-distance line length
1000	1000 mm
2000	2000 mm
3000	3000 mm
4000	4000 mm
5000	5000 mm
....	(Special length, specifications in plain text in mm)
	(5) Long-distance line material
20	CrNi Stainless steel (1.4571)
40	Cu Copper, tin-plated (only possible up to 200°C)
	(6) Process connection (PC)
10	plain cylindrical probe (standard) 
15	Spiral probe  (only at -20...+40°C, -20...+50°C and 0...+50°C)
20	Screw-in sleeve 
	(7) Thread of process connection
00	without thread (process connection 10)
13	External thread G 1/2
	(8) Material of process connection
00	only with process connection 10
46	CuZn (Brass up to 150°C)
20	CrNi (Stainless steel 1.4571)

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**(9) Fitting length "S" (immersion tube length)**

000	ATH-EXx-.. without sheath
100	100 mm
120	120 mm
150	150 mm
200	200 mm
300	300 mm
400	400 mm

(10) Diameter "D" (immersion tube diameter)

00	ATH-EXx-.. without sheath
8	8 mm

(11) Diameter "d" (probe diameter)

6	6 mm
---	------

(12) Extra codes^a

000	without extra codes
520	Limit value permanently factory-set and sealed (only TB + STB)
679	perating temperatures up to -50°C

^a State extra codes one after another, separated by commas.

Order code

(1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11) (12)
 605051 / [] - [] - [] - [] - [] - [] - [] - [] - [] - [] - [] / [] , ...

Order example

605051 / [70] - [062] - [2000] - [20] - [10] - [00] - [00] - [000] - [00] - [6] / [000^a] , ...

^a State extra codes one after another, separated by commas.