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Explosion-protected surface-mounting Thermostat ATH-Ex Series

EC type examination to ATEX Directive 94/9/EC for explosive gas atmosphere Zone 1 and explosive dust atmosphere Zone 21

TW temperature monitor
STW fail-safe temperature monitor



Brief description

Explosion-protected surface-mounting thermostats in the ATH-Ex series control and monitor thermal processes. They can be used directly in the hazardous area (zone 1 and zone 21). The thermostats are available both as temperature monitor TW and temperature monitor STW (fail-safe).

Ex thermostats operate on the principle of liquid or gas expansion. The electrical switching device is a microswitch inside a flameproof enclosure.

Ex marking

⊕ Ex II 2G EEx ed IIC T6 for explosive gas atmospheres

⊕ Ex II 2D IP65 T80°C for explosive dust atmospheres

Explosion protection

⊕ Ex II 2G Equipment group II, Category 2, Equipment for explosive gas atmospheres

⊕ Ex II 2D Equipment group II, Category 2, Equipment for explosive dust atmospheres

Type of explosion protection:

EEx ed IIC T6

EEx	General requirements	Euronorm EN 50014 / VDE 0170 / 0171 Part 1
e	Increased safety	Euronorm EN 50019 / VDE 0170 / 0171 Part 6
d	Flameproof enclosure	Euronorm EN 50018 / VDE 0170 / 0171 Part 5
IIC	Gas group	
T6	Temperature class	

IP65 T80°C

Application in combustible dusts Euronorm EN 50281-1-1 / VDE 0170 / 0171 Part 15-1-1

IP65 Protection to EN 60529-IP65
T80°C Max. permissible surface temperature (use in combustible dusts)



Switching action

<p>Temperature monitor TW and fail-safe temperature monitor STW</p> <p>If the temperature at the probe exceeds the selected setpoint, the microswitch is operated through a mechanism, and the circuit is opened or closed. If the temperature falls below the selected setpoint (by the amount of the switching differential), the microswitch returns to its initial position.</p>	<p>Self-monitoring facility on the fail-safe temperature monitor STW</p> <p>A failure of the measuring system, i.e. when the expansion liquid escapes, will cause the pressure under the diaphragm to drop (STW), thus permanently opening the circuit. The thermostat can no longer be reset.</p> <p>If the probe cools down to a temperature in accordance with the control range table, e.g. below -20°C, the circuit will also open. The STW is reset automatically.</p>
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Types and approvals

Type	Switching action	Test certificate	Test	DIN Reg. No.
ATH-Ex-2	TW	PTB 03 ATEX 1167	 Pressure Equipment Directive 97/23/EC (ATH-Ex-20 only)	TW 76602
ATH-Ex-20	STW			

Technical data

Control ranges and probe table

Control range °C	Switching point accuracy in upper third of scale *		Maximum capillary length mm	Maximum probe temp. to DIN 3440 °C	STW opens at probe temp. below (°C):	Probe length L for d = 6 mm	
	TW	STW				TW	STW
-20 to + 50	+ 0 °C - 3 °C	+ 0 °C - 3.5 °C	5000	+ 60	-30	153	132
0 to + 50	+ 0 °C - 2 °C	+ 0 °C - 2.5 °C		+ 60	-10	202	172
0 to +100	+ 0 °C - 4 °C	+ 0 °C - 5 °C		+115	-10	117	102
+40 to +120	+ 0 °C - 3 °C	+ 0 °C - 4 °C		+140	-10	135	117
+50 to +200	+ 0 °C - 6 °C	+ 0 °C - 8 °C		+230	-10	107	94
+80 to +250	+ 0 °C - 7 °C	+ 0 °C - 8.5 °C		+300	-20	90	78
+50 to +300	+ 0 °C - 10 °C	+ 0 °C - 12.5 °C		+345	-30	67	60
+20 to +400	+ 0 °C - 15 °C	+ 0 °C - 19 °C	1000	+460	-30	- - -	202
+20 to +500	+ 0 °C - 19 °C	+ 0 °C - 24 °C	2000	+550	-30	237	149

* The switching point accuracy can be shifted to a different part of the scale, to special order.

Capillary and temperature probe

Type	End of scale	Capillary 1.5mm dia.	Temperature probe	Notes
ATH-Ex-..	up to 200 °C	copper (Cu) Mat. Ref. 2.0090 electrotinned	copper (Cu) Mat. Ref. 2.0090 braze electrotinned	-
	up to 300 °C	copper (Cu) Mat. Ref. 2.0090 electrotinned	stainless steel (CrNi) Mat. Ref. 1.4571 braze	-
	up to 500 °C	stainless steel (CrNi) Mat. Ref. 1.4571	stainless steel (CrNi) Mat. Ref. 1.4571 welded	-
	up to 300 °C	stainless steel (CrNi) Mat. Ref. 1.4571	stainless steel (CrNi) Mat. Ref. 1.4571 welded	at extra cost
Capillary length	1000 mm is standard, max. 5000 mm			
Min. bending radius of capillary	5 mm			

Electrical data

Switching device	microswitch in flameproof enclosure with changeover contact
Contact rating	5 A, 230 V AC +10%, p.f. ≥ 0.9
Electrical connection	screw terminals in housing, suitable for conductor cross-section up to 2.5 mm ²

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Operating data

Switching differential in % of control /limit range	Ranges with end of scale $\leq 350^{\circ}\text{C}$			Ranges with end of scale $> 350^{\circ}\text{C}$		
	Switching action	Nominal value	Possible measured value	Switching action	Nominal value	Possible measured value
	TW	3	3-5	TW	5	5-9
	STW	5	5-7	STW	6	6-11
Ambient temperature error referred to control /limit range	A deviation of the ambient temperature at the housing from the calibrated ambient temperature 22°C will result in a displacement of the switching point: higher ambient temperature = lower switching point lower ambient temperature = higher switching point surface-mounting thermostats with end of scale					
	$< 200^{\circ}\text{C}$		$\geq 200^{\circ}\text{C} \leq 350^{\circ}\text{C}$		$> 350^{\circ}\text{C} \leq 500^{\circ}\text{C}$	
	TW	STW (STB)	TW	STW (STB)	TW	STW (STB)
	on thermostat head $\%/^{\circ}\text{C}$					
	0.08	0.17	0.06	0.13	0.14	0.12
	on capillary $\%/^{\circ}\text{C}$ per meter					
	0.047	0.054	0.09	0.11	0.04	0.03
Permissible storage temperature	-50 to $+50^{\circ}\text{C}$					
Permissible ambient temperature in operation		Capillary		Thermostat head		with end of scale
	max.	$+50^{\circ}\text{C}$		$+50^{\circ}\text{C}$		
	min.	-40°C		-20°C		$< 200^{\circ}\text{C}$
		-20°C		-20°C		$\geq 200^{\circ}\text{C} \leq 350^{\circ}\text{C}$
	-40°C		-20°C		$> 350^{\circ}\text{C} \leq 500^{\circ}\text{C}$	
Nom. position (NL)	to DIN 16257, NL 0 – NL 90 (other NL on request)					

Housing

Material	black polyester housing, glass-fiber reinforced, with lead-sealable screws
Limit setting	limit adjustable at setpoint spindle, after removal of housing cover
Protection	EN 60 529-IP65
Cable entry	Ex cable gland M 20 x 1.5, for cable diameters 6 – 12 mm
Weight	approx. 0.6 kg
Thermostat mounting	by 4 screws, after removal of housing cover

Process connection*

Series ATH-Ex-... with capillary	plain cylindrical probe A (standard)
	pocket U (on request)
	screw-in pocket with screw-in spigot G 1/2 Form A to DIN 3852/2 and clamping clip with fixing screw for securing the probe
Material Pocket U	up to $+150^{\circ}\text{C}$: CuZn is standard above $+150^{\circ}\text{C}$: St is standard (CrNi on request)
Fitting length S	standard lengths: 100, 120, 150, 200 or 300 mm (other lengths on request)
Immersion tube dia.	D = 8 mm

*for other process connections and pockets, see Data Sheet 60.6710 (US, UO, Q and V only).

Note

Physical and toxicological properties of the expansion media that may escape in the event of a measuring system fracture.

Control range with end of scale	Dangerous reactions	Fire/explosion hazard		Water contamination	Toxicological data		
		Ignition temp. $^{\circ}\text{C}$	Explosion limit $\%v/v$		irritant	danger to health	toxic
$< +200^{\circ}\text{C}$	no	+ 355	0,6 – 8	yes	yes	¹⁾	no
$\geq 200^{\circ}\text{C} \leq 350^{\circ}\text{C}$	no	+ 490	- -	yes	yes	¹⁾	no
$> 350^{\circ}\text{C} \leq 500^{\circ}\text{C}$	no	no	no	no	no	no	no

¹⁾ At present there is no statement from the health authorities concerning any danger to health over short periods and at low concentration, e.g. after a fracture of the measuring system.

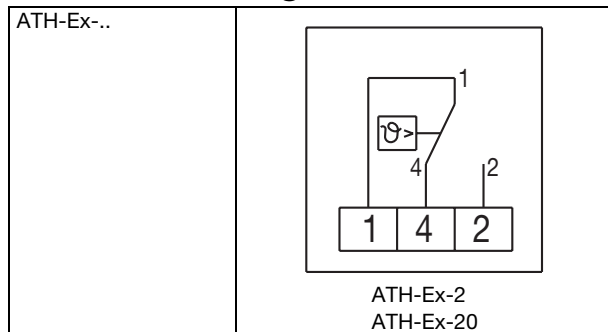
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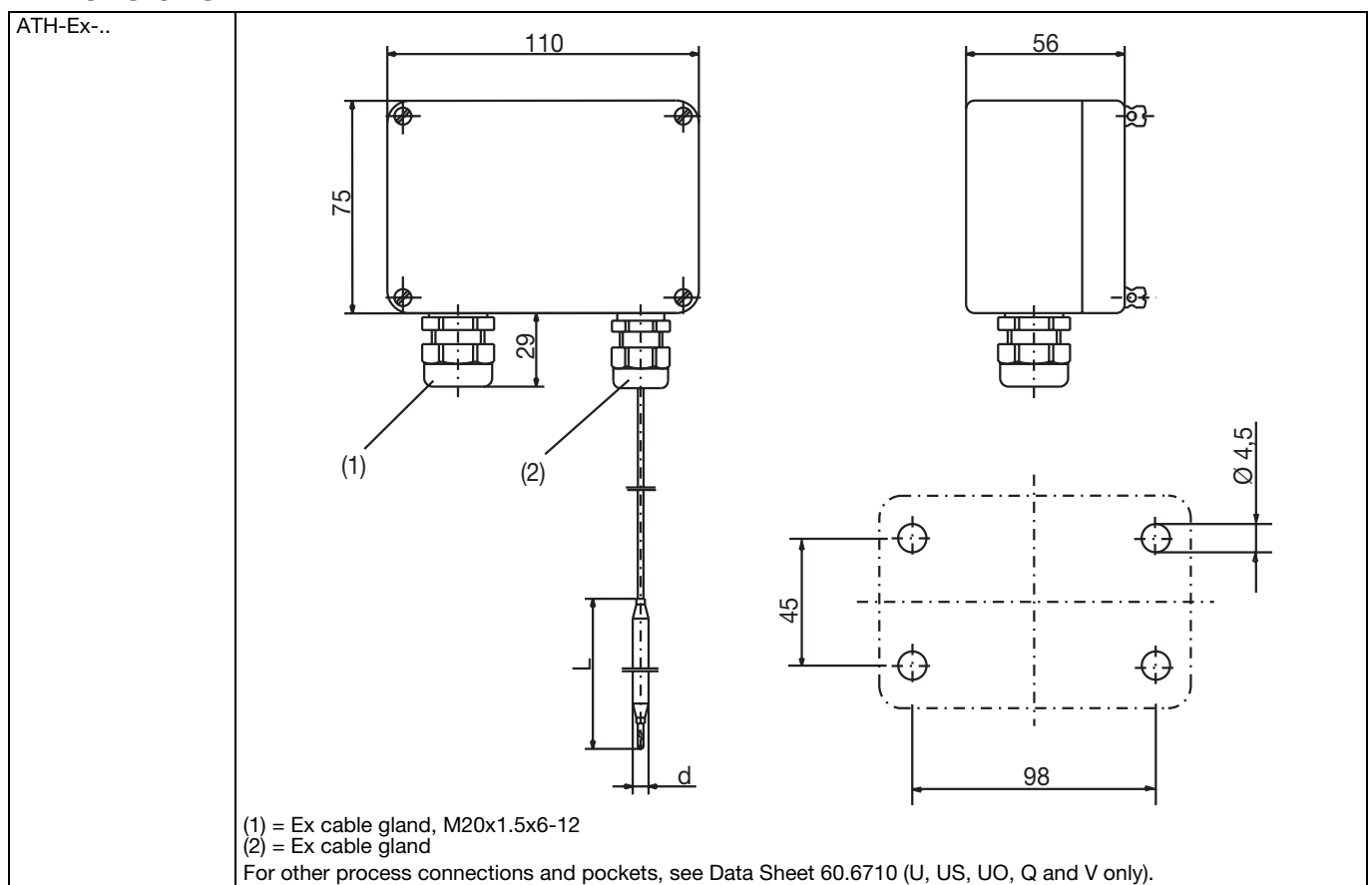
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Connection diagram



Dimensions



Stock items

(delivery 3 working days after receipt of order)

Sales No.	Type	Control range °C	Material of measuring system	Capillary mm	Probe dia. x length mm
60/60001242	ATH-Ex-2	-20+ 50	CrNi	2000	6 x 153
60/60001243	ATH-Ex-2	0+ 50	CrNi	2000	6 x 202
60/60001244	ATH-Ex-2	+40+120	CrNi	2000	6 x 135
60/60001246	ATH-Ex-2	+50+300	CrNi	2000	6 x 67
60/60001247	ATH-Ex-20	+40+120	CrNi	2000	6 x 117
60/60001248	ATH-Ex-20	+50+300	CrNi	2000	6 x 60

