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Surface-mounting Thermostats Series ATH-SW

Protection IP65
Single or twin thermostat

Brief description

Thermostats control and monitor thermal processes. Surface-mounting thermostats in the ATH-SW series consist of one or two separate measuring and switching systems. The instruments can be supplied as temperature monitors TW, safety temperature monitors STW (STB) and safety temperature limiters STB. In fault condition, the STB sets the system being monitored to a safe operational state. Surface-mounting thermostats operate on the principle of liquid expansion, with a microswitch serving as the electrical switching device.

Switching action

Temperature monitor TW

When the temperature at the probe exceeds the setpoint, the microswitch is operated via the transmission mechanism and the circuit is opened or closed. When the temperature drops below the setpoint (by the amount of the switching differential), the microswitch returns to its initial position.

Lock-out facility on the safety temperature limiter STB

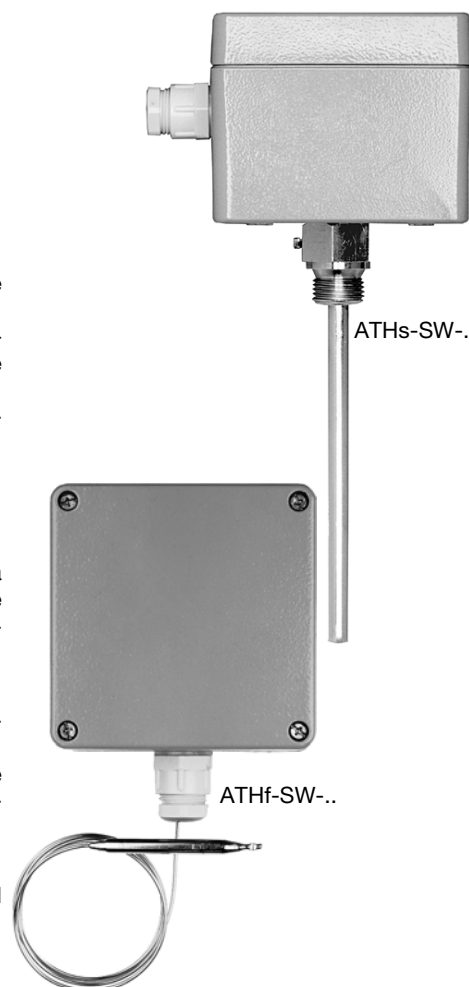
When the temperature at the probe exceeds the set limit, the circuit is opened and the microswitch is locked out mechanically. After the temperature has dropped below the critical temperature by about 10 % of the scale span (approx. 15% for limit setting > +350°C), the microswitch can be reset manually.

Use of the safety temperature monitor STW as safety temperature limiter STB

The circuitry to which the thermostat is connected must comply with DIN 3440 and VDE 0116.


Self-monitoring on the safety temperature limiter STB and the safety temperature monitor STW (STB)

Failure of the measuring system, i.e. a leakage of the expansion fluid, will cause the pressure under the diaphragm to drop (STB and STW (STB)), thus permanently opening the circuit. A reset is now no longer possible. When the temperature at the probe cools down to below approx. -20°C, the circuit will also open. As the temperature rises to above approx. -20°C, the STB has to be reset manually. On the STW (STB), the reset is performed automatically.



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 => Products
 or can be sent to you on request.

Types and approvals

Single thermostats		Switching action	DIN Reg. No.	Test/approval
with rigid stem	with capillary			
ATHs-SW-2 *	ATHf-SW-2 *	TW	TW 89201	 - DIN 3440 - Pressure Equipment Directive 97/23/EC * tested to DIN only
ATHs-SW-20	ATHf-SW-20	STW (STB)	STW (STB) 89401 S	
ATHs-SW-70	ATHf-SW-70	STB	STB 89501	
Twin thermostats		Switching action	DIN Reg. No.	
with rigid stem	with capillary			
ATHs-SW-22 *	ATHf-SW-22 *	TW / TW	TW / TW 90101	
ATHs-SW-220	ATHf-SW-220	TW / STW (STB)	TW / STW (STB) 90301 S	
ATHs-SW-270	ATHf-SW-270	TW / STB	TW / STB 90401	
ATHs-SW-2020	ATHf-SW-2020	STW (STB) / STW (STB)	2 x STW (STB) 90501 S	
ATHs-SW-2070	ATHf-SW-2070	STW (STB) / STB	STW (STB) / STB 90601 S	
ATHs-SW-7070	ATHf-SW-7070	STB / STB	STB / STB 90701	

Technical data

Control ranges and temperature probes

liquid-filled				
Switching action	Control /limit ranges °C	Max. permissible probe temperature °C	Maximum capillary length mm	Probe length L in mm for probe dia. d = 6 mm (standard)
TW	-20 to + 50	60	5000	141
	-10 to + 40	50		185
	0 to + 50	60		185
	0 to + 70	80		138
	0 to +100	125		107
	+20 to + 90	115		138
	+30 to +110	135		125
	+20 to +120	140		106
	+60 to +130	150		135
	+20 to +150	175		88
	+50 to +200	230		101
	+50 to +250	290		73
	+50 to +300	345		63
	+50 to +350	405		53
STW and STB	+30 to +110	135	5000	108
	+60 to +130	150		116
	+20 to +150	175		77
	+50 to +250	290		64
	+50 to +300	345		55
gas-filled				
TW	+20 to +400	460	1000	278
	+20 to +500	550	2000	148
	+20 to +500	550	4000	202
STW and STB	+20 to +400	460	1000	176
	+20 to +500	550	2000	127
	+20 to +500	550	4000	202

Capillary and temperature probe

Type	End of scale	Capillary	Temperature probe	Notes
ATH.-SW- . .	up to 200°C	copper (Cu) 1.5mm dia. Mat. Ref. 2.0090	copper (Cu) Mat. Ref. 2.0090 brazed	-
	up to 350°C	copper (Cu) 1.5mm dia. Mat. Ref. 2.0090	stainless steel (CrNi) Mat. Ref. 1.4571 brazed	-
	up to 500°C	stainless steel (CrNi) 1.5mm dia. Mat. Ref. 1.4571	stainless steel (CrNi) Mat. Ref. 1.4571 welded	-
	up to 350°C	stainless steel (CrNi) 1.5mm dia. Mat. Ref. 1.4571	stainless steel (CrNi) Mat. Ref. 1.4571 welded	at extra cost
Capillary length	1000 mm is standard, up to 5000 mm			
Min. bending radius of capillary	5 mm			

Electrical data

Switching device	TW, STW (STB)	STB
	microswitch with changeover contact	microswitch with break (n.c.) contact and lock-out
Contact rating	10 (2) A, 230 V AC +10%, p.f. = 1 (0.6) 0.25A, 230 V DC +10%	
	with switching differentials 1.5% and 2% 6 (1.2) A, 230 V AC +10%, p.f. = 1 (0.6)	-
	microswitch gold-plated, extra code /au 0.1 A, 24 V AC/DC contact resistance 2.5 – 10 mΩ	

Operating data

Switching differential in % of control /limit range	Switching action	with liquid-filled measuring system				
		Nominal value		Possible actual value		
	TW		3	3 max. 4		standard
			6	6 max. 8		on request
			1.5	1 max. 2		at extra cost
		with gas-filled measuring system				
			5	4 max. 8		standard
			9	8 max. 12		on request
		2	1.5 max. 2.5		at extra cost	
	STW (STB)	with liquid-filled measuring system				
			5	4 max. 6		standard
			9	8 max. 11		on request
			2	1 max. 3		at extra cost
		with gas-filled measuring system				
		7	5 max. 12		standard	
		9	8 max. 16		on request	
		2	1.5 max. 3		at extra cost	
Switching point accuracy in % of control / limit range	in upper third of scale +0/-5 %, at scale start +0/-10 %					
Ambient temperature error referred to control /limit range	A deviation of the ambient temperature at the housing from the 22°C calibration ambient temperature produces a shift in the switching point: higher ambient temperature = lower switching point lower ambient temperature = higher switching point					
	Surface-mounting thermostats with end of scale					
	< 200°C		≥ 200°C ≤ 350°C		> 350°C ≤ 500°C	
	TW	STB/STW (STB)	TW	STB/STW (STB)	TW	STB/STW (STB)
	due to thermostat head, % per °C					
	0.08	0.17	0.06	0.13	0.14	0.12
	due to capillary, % per °C per meter length					
0.047	0.054	0.09	0.11	0.04	0.03	
Permissible storage temperature	-50 to +50°C					
Permissible ambient temperature in operation	max. +80°C					
Nom. position (NL)	unrestricted					

Housing

as standard	die-cast aluminium, painted
Setpoint adjustment	switching point adjustable with screwdriver, after removal of housing cover
Enclosure protection	EN 60 529-IP65
Cable entry	cable gland M 20 x 1.5, for 6 – 12 mm cable diameter
Weight	approx. 1.0 kg
Thermostat mounting Series ATHf-SW with capillary	by 2 screws through base of housing (wall mounting), capillary exit at side of housing

Process connection*

Series ATHs-SW with rigid stem	end of scale up to 150°C pocket U	end of scale above 150°C pocket UZ
	screw-in pocket with screw-in spigot G 1/2 Form A to DIN 3852/2	screw-in pocket with screw-in spigot G 1/2 Form A to DIN 3852/2 and extension, in order not to exceed the maximum permissible ambient temperature of +80°C at the housing
Series ATHf-SW 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 clip with fixing screw for securing the probe	
Material	pocket U	pocket UZ
	up to +150°C: CuZn as standard above +150°C: St as standard (CrNi on request)	above +150°C: St as standard (CrNi on request)
Fitting length S	standard lengths: 100, 120, 150, 200 or 300 mm other lengths on request	
Immersion tube dia.	single thermostat D = 8 mm	twin thermostat D = 15 mm

*see Data Sheet 60.6710 for other process connections and pockets.

Note

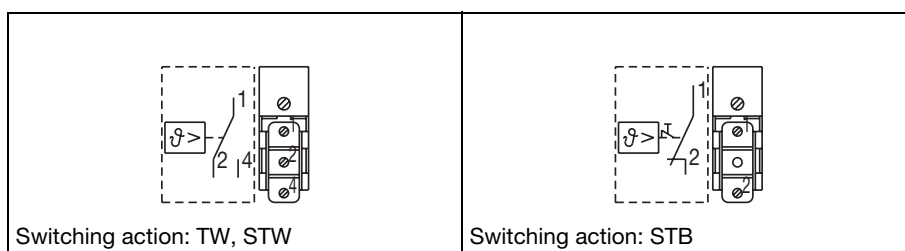
Physical and toxicological properties of the expansion fluid which may escape in the event of a system fracture.

Control range with end of scale °C	Dangerous reactions	Fire/explosion hazard		Water contamination	Toxicological data		
		Ignition temp. °C	Explosion limit % v/v		irritant	danger to health	toxic
< +200	no	+ 355	0.6 – 8	yes	yes	1	no
≥ 200 ≤ +350	no	+ 490	--	yes	yes	1	no
> 350 ≤ +500	no	no	no	no	no	no	no

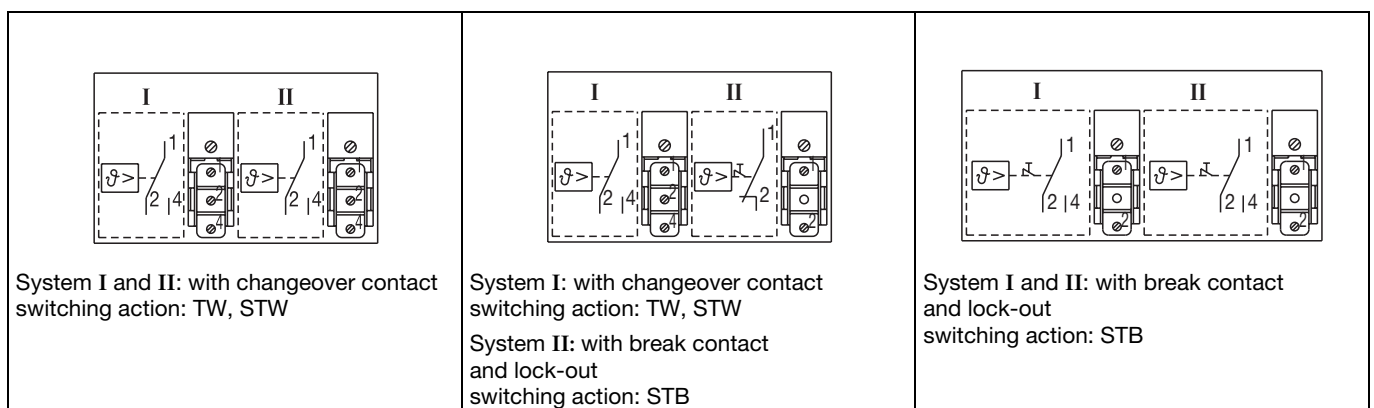
¹ At present there is no restrictive statement from the health authorities concerning any danger to health over short periods and at low concentrations, e.g. after a fracture of the measuring system.

Connection diagrams

Single thermostats

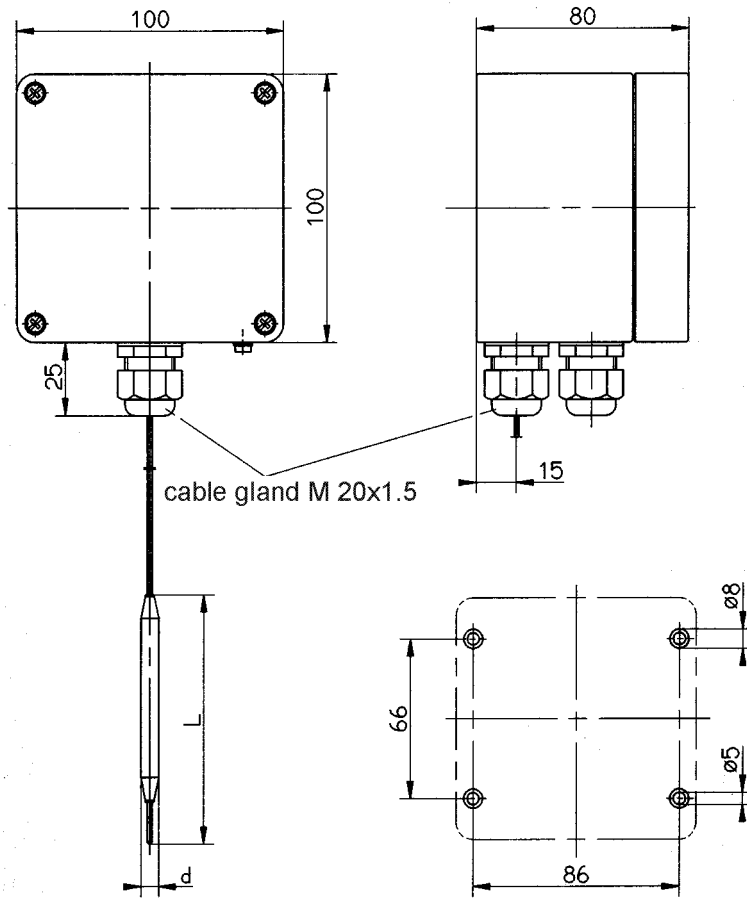


Twin thermostats

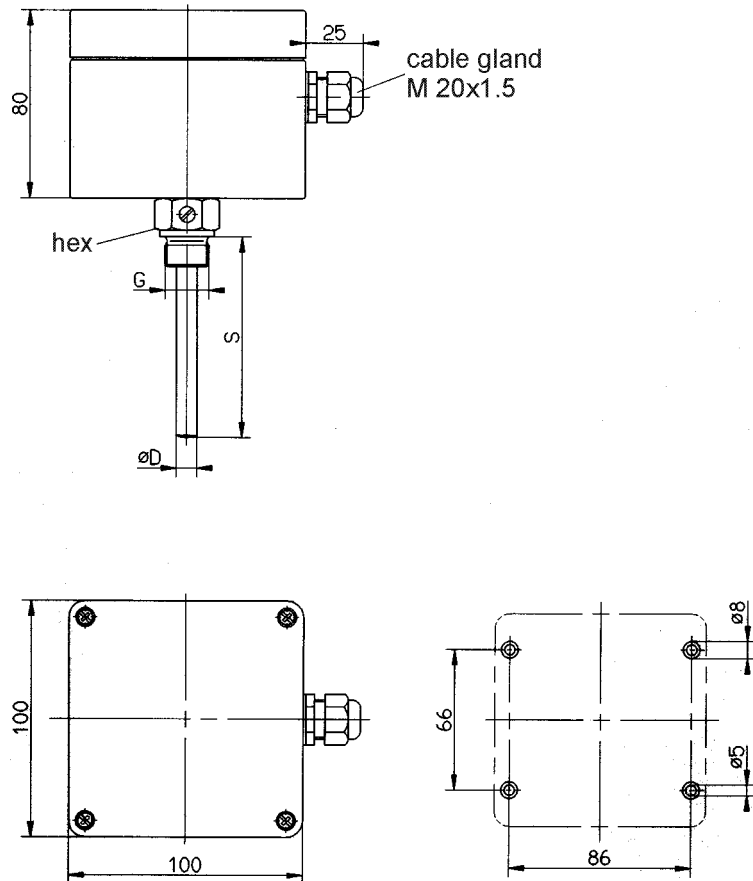


Dimensions

ATHf-SW-..
with capillary





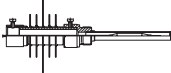
ATHs-SW-..
with rigid stem



Order details for non-stock items

ATH Series

Order code	(1) Basic type		
603035	Surface-mounting thermostat, ATH.-SW Series		
(2) Basic type extension			
0002	ATH.-SW-2	Temperature monitor TW	
0020	ATH.-SW-20	Safety temperature monitor STW (STB)	single thermostats
0070	ATH.-SW-70	Safety temperature limiter STB	
0202	ATH.-SW-22	TW/TW	
0220	ATH.-SW-220	TW/STW (STB)	
0270	ATH.-SW-270	TW/STB	
2020	ATH.-SW-2020	STW (STB)/STW (STB)	twin thermostats
2070	ATH.-SW-2070	STW (STB) / STB	
7070	ATH.-SW-7070	STB/STB	
(3) Style			
1	ATHs-SW-....	with rigid stem	
2	ATHf-SW-....	with capillary	
(4) Control / limit ranges °C			
014	-20 to + 50 *		
016	-10 to + 40 *		
021	0 to + 50		
022	0 to + 70		
025	0 to +100		
041	+20 to + 90		
052	+30 to +110		
042	+20 to +120		
066	+60 to +130		
043	+20 to +150		
062	+50 to +200		
063	+50 to +250		
064	+50 to +300		
045	+20 to +400		
046	+20 to +500		
	* TW only		
(5) Switching differential			
00	without switching differential (-70 STB)		
15	1.5 % of scale span		(TW only)
20	2 % of scale span		(STW (STB) only)
30	3 % of scale span		(TW only)
50	5 % of scale span		(TW + STW (STB) only)
60	6 % of scale span		(TW only)
70	7 % of scale span		(STW (STB) only)
90	9 % of scale span		(STW (STB) only)
(6) Capillary length			
0	ATHs-SW without capillary		
1000	1000 mm		
2000	2000 mm		
3000	3000 mm		
4000	4000 mm		
5000	5000 mm		
...	(special length, details in plain text)		
(7) Material of capillary			
00	ATHs-SW without capillary		
40	Cu (copper)		
20	CrNi (stainless steel 1.4571)		

(8) Process connection *	
10	A = plain cylindrical probe 
20	U = screw-in pocket 
30	UZ = screw-in pocket with extension 
(9) Thread for process connection *	
00	no thread (process connection A)
13	male thread G 1/2
(10) Material of process connection	
00	only with process connection A
46	CuZn (brass)
01	St (steel)
20	CrNi (stainless steel 1.4571)
(11) Fitting length S (immersion tube length)	
000	ATHf-SW without pocket
100	100 mm
120	120 mm
150	150 mm
200	200 mm
300	300 mm
400	400 mm
...	(special length, details in plain text)
(12) Diameter D (immersion tube diameter)	
00	ATHf-SW without pocket
8	8 mm with single thermostats
15	15 mm with twin thermostats
(13) Diameter d (probe diameter)	
6	6 mm
(14) Extra codes	
000	no extra code
702	au snap-action switch contact, gold-plated

* see Data Sheet 60.6710 for additional probe mountings and pockets

Order code

(1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11) (12) (13) (14)
 603035 / [] - [] - [] - [] - [] - [] - [] - [00] - [] - [] - [] - [] - [] / []

Order example

603035 / [0202] - [2] - [043] - [30] - [2000] - [20] - [10] - [00] - [00] - [000] - [00] - [6] / [000]