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# Surface-mounting Thermostats

## ATH Type Series

### Particularities

- Sturdy case (protection rating IP 54)
- Microswitch
- Self-monitoring (STB/STW) in the event of a pressure drop
- Safety switch-off (STB/STW)
- Tested as per DIN EN 14597

### Brief description

Thermostats control and monitor thermal processes. Instruments of the ATH type series are available as temperature controllers TR, temperature monitors TW, safety temperature monitors STW (STB) and safety temperature limiters STB. When faults occur, the STB places the system being monitored in a safe operating state.

Surface-mounting thermostats work on the principle of liquid expansion, with a microswitch acting as the electrical switching device.

### Switching function

#### Temperature controllers TR and temperature monitors TW

When the temperature present at the temperature probe exceeds the specified setpoint, the microswitch mechanism operates and the circuit is opened or closed. If the value falls below the specified setpoint (by the switching differential) the microswitch returns to its initial condition.

#### Restart lockout on the safety temperature limiter STB

Should the temperature present at the temperature probe exceed the specified limit, the circuit opens and the microswitch is mechanically locked.

Once the temperature falls below the alarm temperature by about 10 % of the scale range (about 15% for a limit setting > + 350°C), the microswitch lockout can be manually deactivated.

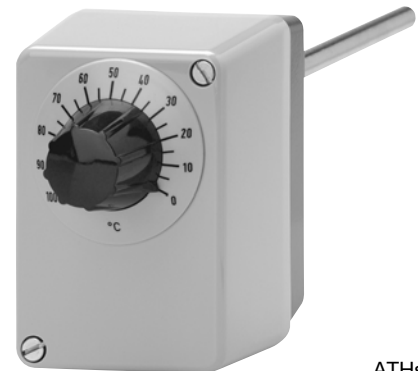
#### Using the safety temperature monitor STW as a safety temperature limiter STB

The circuit subsequent to the thermostat must comply with EN 14597 and VDE 0116.

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

With the STB and the STW (STB), if the measuring system is destroyed, that is, should the expansion fluid escape, the pressure in the diaphragm will fall and the circuit will be permanently open. It is then no longer possible to deactivate the lockout.

The circuit will also open if the temperature at the probe cools to below about -20°C. If the temperature rises above about -20°C, STB lockout must first be manually deactivated by pressing the reset button. Reset is automatic for the STW (STB).



ATHs-1



ATHf-70

### Approvals




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## Approvals

Types		Switching function	DIN reg. no.	Tests	You will find Declarations of Conformity on the Internet at: www.jumo.net ⇒ Products ⇒ Thermostats ⇒ Data Sheet 603021 or they can be sent to you on request.
with rigid stem	with capillary				
ATHs-1	ATHf-1	TR	TR 89107	 - EN 14597 - Pressure Equipment Directive 97/23/EC (ATH.-20 and ATH.-70 only)	
ATHs-2	ATHf-2	TW	TW 89207		
ATHs-20	ATHf-20	STW (STB)	STW (STB) 89407 S		
ATHs-70	ATHf-70	STB	STB 89507		

## Technical data

### Control ranges and temperature probes

liquid-filled					
Type	Control limit ranges in °C	Max. permissible probe temperature in °C	Maximum capillary length in mm	Probe length dim. "L" in mm	
				probe ø "d" in mm, ø "6" = standard	8
ATH.-1 ATH.-2	-20 ... + 50 -10 ... + 40 0 ... + 50 0 ... +100 +20 ... + 90 +20 ... +120 +20 ... +150 +30 ... +110 +50 ... +200 +50 ... +250 +50 ... +300 +50 ... +350 +60 ... +130	60 50 60 125 115 140 175 135 230 290 345 405 150	5000	141 185 185 107 138 106 88 125 101 73 63 53 135	92 115 115 75 91 75 65 84 72 54 49 - - - 90
ATH.-20 ATH.-70	+20 ... +150 +30 ... +110 +50 ... +250 +50 ... +300 +60 ... +130	175 135 290 345 150	5000	77 108 64 55 116	60 75 49 - - - 79
gas-filled					
ATH.-1 ATH.-2	+20 to +400 +20 to +500 +20 to +500	460 550 550	1000 2000 4000	278 148 202	158 92 119
ATH.-20 ATH.-70	+20 to +400 +20 to +500 +20 to +500	460 550 550	1000 2000 4000	176 127 202	106 81 119

### Capillaries and temperature probes

Type	End of scale	Capillary	Temperature sensor	Comments
ATH.- . .	up to 200°C	copper (Cu) ø 1.5mm material ref. Cu-DHP	copper (Cu) material ref. Cu-DHP brazed	-
	up to 350°C	copper (Cu) ø 1.5mm material ref. Cu-DHP	stainless steel (CrNi) material no. 1.4571 brazed	-
	up to 500°C	stainless steel (CrNi) ø 1.5mm material no. 1.4571	stainless steel (CrNi) material no. 1.4571 welded	-
	up to 350°C	stainless steel (CrNi) ø 1.5mm material no. 1.4571	stainless steel (CrNi) material no. 1.4571 welded	for extra charge
Capillary length	1000 mm, max. 5000 mm as standard			
min. bending radius of capillary	5 mm			

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**Electrical data**

Switching device	ATH.-1 ATH.-2 ATH.-20	ATH.-70	ATH.-70/574
	microswitch with changeover contact	microswitch with normally-closed contact and restart lockout	microswitch with normally-closed contact, restart lockout and additional signal contact
Max. contact rating	230 V AC +10%, 10 (2) A, cos φ = 1 (0.6) 230 V DC +10%, 0.25A		
	at switching differential 1.5% and 2% 230 V AC +10%, 6 (1.2) A, cos φ = 1 (0.6)	-	-
	gold-plated microswitch, extra code /702* (*for 3%, 5%, and 7% switching differentials only) 24 V AC / DC, 0.1 A contact resistance 2.5 - 10 mΩ	-	-
Contact reliability	To ensure that switching is as reliable as possible, we recommend a minimum loading of: for silver contacts: AC / DC = 24 V, 100 mA for gold-plated contacts ("702" symbol): AC / DC = 10 V, 5 mA		

**Operating data**

Switching differential as % of the control / limit range	Switching function	for a liquid-filled measuring system				
		Nominal value	potential actual value			
	TR, TW	3	3 max. 4	as standard		
		6	6 max. 8	on request		
		1,5	1 max. 2	extra charge		
		for a gas-filled measuring system				
		5	4 max. 8	as standard		
		9	8 max. 12	on request		
	STW (STB)	2	1.5 max. 2.5	extra charge		
		for a liquid-filled measuring system				
		5	4 max. 6	as standard		
		9	8 max. 11	on request		
		2	1 max. 3	extra charge		
for a gas-filled measuring system						
7	5 max. 12	as standard				
9	8 max. 16	on request				
2	1.5 max. 3	extra charge				
Switching point accuracy as % of control / limit range	TR, TW: in upper third of scale ± 1.5%, at start of scale ± 6% STB, STW (STB): in upper third of scale +0/-5%, at start of scale +0/-10%					
Ambient temperature error related to control / limit range	Should the ambient temperature at the housing deviate from the calibration ambient temperature of 22°C, there is 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	
	TR / TW	STB/STW (STB)	TR / TW	STB/STW (STB)	TR / TW	STB/STW (STB)
	effect on thermostat head					
	0.08%/°C	0.17%/°C	0.06%/°C	0.13%/°C	0.14%/°C	0.12%/°C
effect on capillary per meter						
0.047%/°C	0.054%/°C	0.09%/°C	0.11%/°C	0.04%/°C	0.03%/°C	
Permissible storage temperature	-50...+50°C					
Permissible ambient temperature in use	+80°C max.					
Nominal position (NL)	to DIN 16 257, NL 0 - NL 90 (other NL on request)					

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**Housing**

as standard	Cover: polycarbonate, impact-resistant Base: die-cast aluminum, painted	Color: pebble gray RAL 7032 Color: anthracite gray RAL 7015
Code "701"	cover is painted, die-cast aluminum	Color: pebble gray RAL 7032
Setpoint adjustment	ATH-1: switching point adjustable from outside by turning knob	ATH-2, ATH-20, ATH-70: switching point adjustable by screwdriver, once the cover is removed from the housing
Protection	EN 60 529-IP 54	
Cable entry	as standard: clamping gland M 20 x 1.5, sealing area 8-10 mm	
Weight	approx. 0.5 kg	
Thermostat head mounting ATHf- . . . type series with capillary	as standard	Screw connection with locknut M 18 x 1 on housing spigot, capillary exit at spigot
	Extra codes	
	711	with 2 screws through base of housing, capillary exit at side of housing, plastic cover and base
	764	sheet-steel mounting flange, capillary exit at housing spigot
248	wall support	

**Process connection\***

Type series ATHs- with rigid stem	End of scale <u>up to</u> 150°C <b>pocket „20“</b>	End of scale <u>over</u> 150°C <b>pocket „30“</b>
	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 spacer, so that the ambient temperature at the housing does not exceed the permissible maximum of +80°C
Type series ATHf- with capillary	<b>plain cylindrical probe "10"</b> (standard)	
	<b>Screw-in sheath "20"</b> (on request)	
	Screw-in pocket with screw-in spigot G 1/2 Form A to DIN 3852/2 and clamp with locking screw for holding the probe in position	
Material	<b>pocket „20“</b>	<b>pocket „30“</b>
	up to +150°C CuZn as standard above +150°C CrNi	above +150°C CrNi
Fitting length S	Standard lengths: 100, 120, 150, 200 or 300 mm other lengths on request	
Immersion tube Ø	D = 8 mm, D = 10 mm	

\*for other process connections and pockets, see Data Sheet 606710.

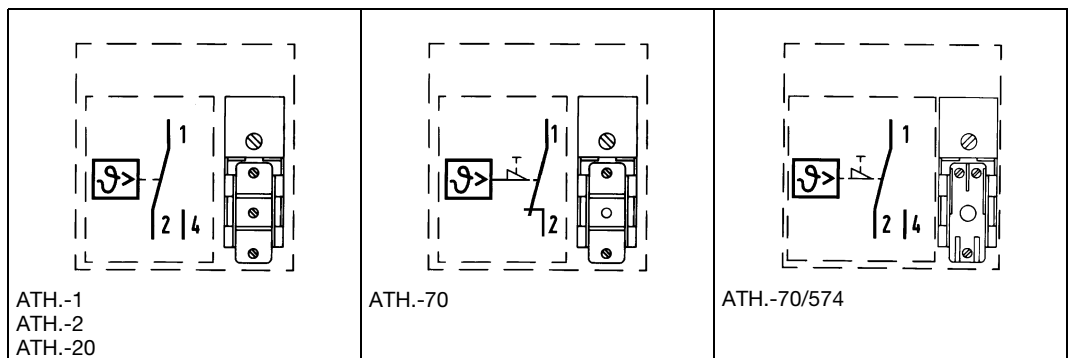
**Note:**

Physical and toxicological properties of the expansion media which might escape should the measuring system fracture.

Control range with end of scale	Dangerous reactions	Fire and explosion hazard		Risk to water	Toxicological data		
		ignition temperature	explosion limit		irritant	danger to health	toxic
< +200°C	no	+ 355°C	0.6 - 8 V%	yes	yes	1	no
≥ 200°C ≤ +350°C	no	+ 490°C	- -	yes	yes	1	no
> 350°C ≤ +500°C	no	no	no	no	no	no	no

The health authorities have yet to comment on possible risks to health from short-term exposure at low concentration, such as might occur should a measuring system fracture.

**Connection diagrams**



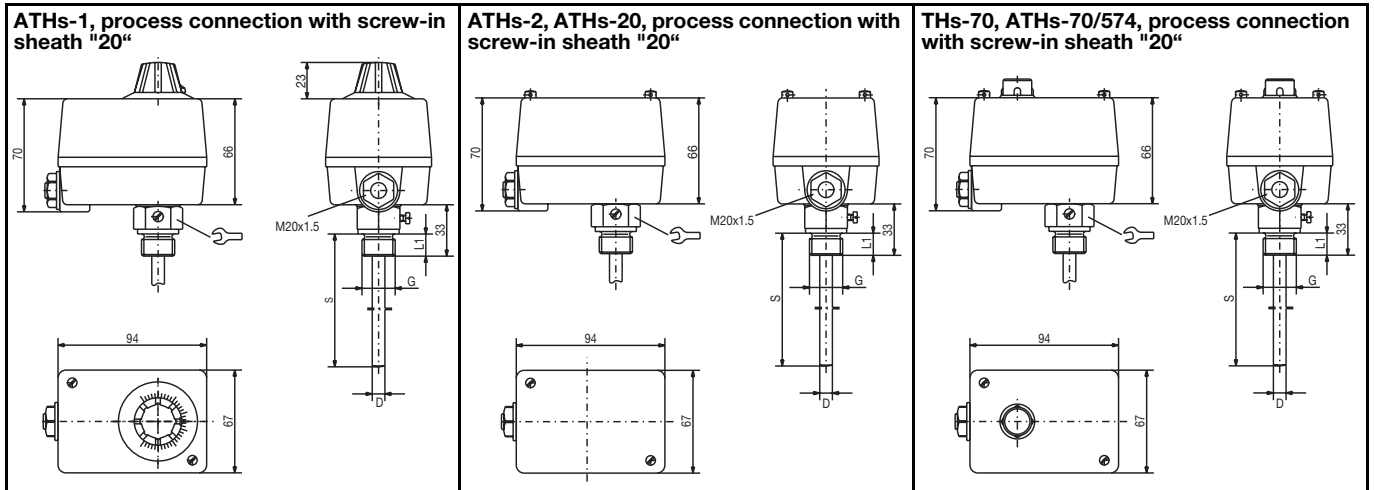
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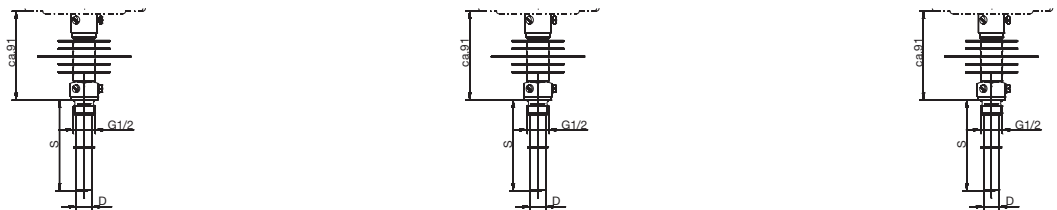
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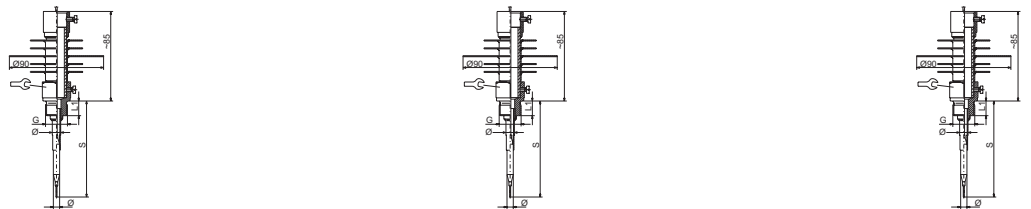
## Dimensions for rigid stem versions



Process connection with screw-in sheath "30" and intermediate piece for scale limit value above +150°C:



Process connection with screw-in sheath „31“ with intermediate piece, open:



## Stock items with rigid stem Temperature controller (TR)

(delivery within 3 working days after receipt of order)

Sales No.	Type	Control / limit range °C	Switching differential %	Process connection	Immersion tube dia. x length mm
60/60001517	ATHs-1	-10 ... + 40	3-4	„20“ G <sup>1</sup> / <sub>2</sub>	8x200
60/60000634	ATHs-1	0 ... + 50	1.5		15x100 CrNi
60/60000332	ATHs-1	0 ... +100	3-4		8x120
60/60001548	ATHs-1	0 ... +100	3-4		8x120 CrNi
60/60001125	ATHs-1	0 ... +100	3-4		8x150
60/60000174	ATHs-1	0 ... +100	1.5		8x200
60/60001126	ATHs-1	0 ... +100	3-4		8x200
60/60000481	ATHs-1	+20 ... +150	3-4		8x100
60/60001035	ATHs-1	+20 ... +150	3-4		8x200
60/60001127	ATHs-1	+20 ... +150	3-4		8x300
60/60001037*	ATHs-1	+50 ... +200	3-4	„30“ G <sup>1</sup> / <sub>2</sub>	8x200 steel
60/60003316	ATHs-1	+50 ... +200	3-4		8x200 CrNi
60/60003317	ATHs-1	+50 ... +300	3-4		8x150 CrNi
60/60003318	ATHs-1	+20 ... +500	5		8x200 CrNi

\* Discontinued type

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## Stock items with rigid stem Operating temperature monitor (TW)

(delivery within 3 working days after receipt of order)

Sales No.	Type	Control / limit range °C	Switching differential %	Process connection	Immersion tube dia. x length mm	
60/60001135	ATHs-2	-10 ... + 40	3-4	„20“ G <sup>1</sup> / <sub>2</sub>	8x200	
60/60001549	ATHs-2	0 ... + 50	1.5		15x100 CrNi	
60/60001128	ATHs-2	0 ... + 50	3-4		8x200	
60/60000177	ATHs-2	+20 ... + 90	1.5		15x100	
60/60000959	ATHs-2	+20 ... + 90	6-8		15x100	
60/60001129	ATHs-2	+20 ... + 90	3-4		8x150	
60/60000331	ATHs-2	0 ... +100	3-4		8x120	
60/60001552	ATHs-2	0 ... +100	3-4		8x120 CrNi	
60/60000179	ATHs-2	0 ... +100	3-4		8x150	
60/60001039	ATHs-2	0 ... +100	3-4		8x200	
60/60001130	ATHs-2	0 ... +100	3-4		8x300	
60/60000483	ATHs-2	+20 ... +150	3-4		8x100	
60/60001551	ATHs-2	+20 ... +150	3-4		8x100 CrNi	
60/60000485	ATHs-2	+20 ... +150	3-4		8x200	
60/60001554	ATHs-2	+20 ... +150	3-4		8x200 CrNi	
60/60000182	ATHs-2	+20 ... +150	3-4		8x300	
60/60003319	ATHs-2	+50 ... +200	3-4		„30“ G <sup>1</sup> / <sub>2</sub>	8x120 CrNi
60/60003320	ATHs-2	+50 ... +200	3-4			8x200 CrNi
60/60001556	ATHs-2	+50 ... +300	3-4			8x150 CrNi
60/60003322	ATHs-2	+50 ... +500	5			8x200 CrNi

## Protection temperature monitor STW (STB)

(delivery within 3 working days after receipt of order)

Sales No.	Type	Control / limit range °C	Switching differential %	Process connection	Immersion tube dia. x length mm
60/60001478	ATHs-20	+20 ... +150	4-6	„20“ G <sup>1</sup> / <sub>2</sub>	8x150
60/60003323	ATHs-20	+50 ... +300	5	„30“ G <sup>1</sup> / <sub>2</sub>	8x200 CrNi
60/60002217	ATHs-20	+50 ... +350	4-6	„46“ G <sup>3</sup> / <sub>4</sub>	170 steel, conical
60/60003324	ATHs-20	+20 ... +500	7	„31“ G <sup>1</sup> / <sub>2</sub>	8x200 CrNi

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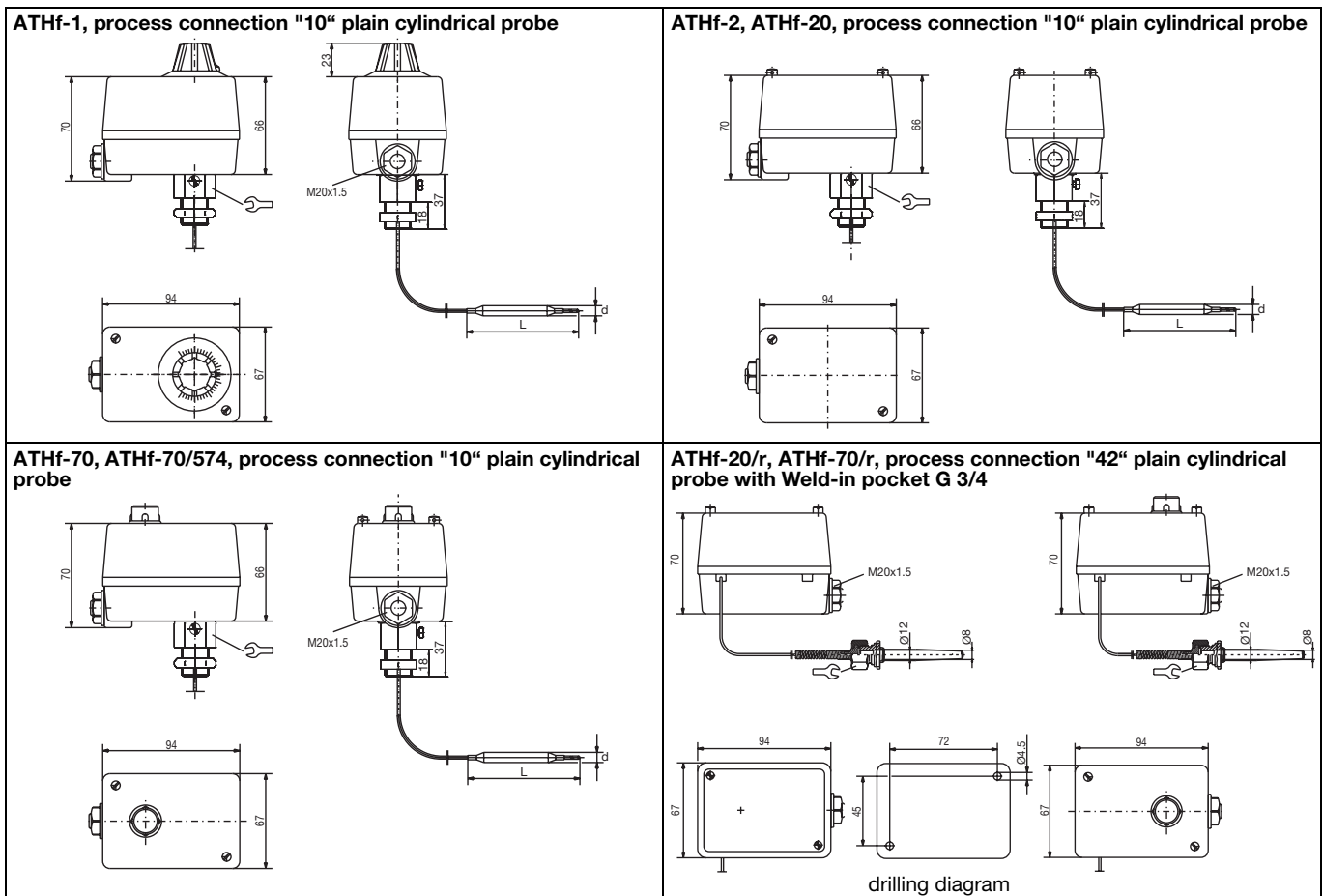


## Stock items with rigid stem Protection temperature limiter (STB)

(delivery within 3 working days after receipt of order)

Sales No.	Type	Control / limit range °C	Switching differential %	Process connection	Immersion tube dia. x length mm
60/60000982	ATHs-70	+ 30 ... +110	--	„20“ G <sup>1</sup> / <sub>2</sub>	8x150
60/60001043	ATHs-70	+ 30 ... +110	--		8x200
60/60000189	ATHs-70	+ 30 ... +110	--		8x300
60/60001044	ATHs-70	+ 60 ... +130	--		8x150
60/60000190	ATHs-70	+ 60 ... +130	--		8x200
60/60001020	ATHs-70	+ 20 ... +150	--		8x200
60/60003325	ATHs-70	+130 ... +200	--	„30“ G <sup>1</sup> / <sub>2</sub>	8x150 CrNi
60/60003326	ATHs-70	+130 ... +200	--		8x300 CrNi
60/60003327	ATHs-70	+ 50 ... +300	--		8x200 CrNi
60/60001524	ATHs-70/574	+ 30 ... +110	--	„20“ G <sup>1</sup> / <sub>2</sub>	8x150
60/60001522	ATHs-70/574	+ 20 ... +150	--		8x200
60/60003328	ATHs-70/574	+ 50 ... +300	--	„30“ G <sup>1</sup> / <sub>2</sub>	8 x 200 CrNi
60/60002218	ATHs-70/574	+ 50 ... +350	--	„46“ G <sup>3</sup> / <sub>4</sub>	170 steel, conical
60/60003329	ATHs-70/574	+ 20 ... +500	--	„31“ G <sup>1</sup> / <sub>2</sub>	8x200 CrNi
60/60001476	ATHs-70/574	+ 20 ... +500	--	„30“ G <sup>1</sup> / <sub>2</sub>	8x200 CrNi

## Dimensions for capillary versions



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## Stocks items with capillary

### Temperature controller (TR)

(delivery within 3 working days after receipt of order)

Sales No.	Type	Control / limit range °C	Switching differential %	Capillary mm	Process connection	Probe dia. x length mm
60/60001134	ATHf-1	-10 ... + 40	3-4	1000	„10“ plain cylindrical probe	6x185
60/60000477*	ATHf-1	0 ... + 50	3-4	1000		6x185
60/60001004	ATHf-1	0 ... +100	3-4	1000		6x107
60/60000955	ATHf-1	+20 ... +150	3-4	1000		6x 88
60/60001133	ATHf-1	+50 ... +300	3-4	1000		6x 63
60/60002113	ATHf-1	+20 ... +500	5	1000		6x148

### Operating temperature monitor (TW)

(delivery within 3 working days after receipt of order)

Sales No.	Type	Control / limit range °C	Switching differential %	Capillary mm	Process connection	Probe dia. x length mm
60/60000482	ATHf-2	0 ... + 50	3-4	1000	„10“ plain cylindrical probe	6x185
60/60000965*	ATHf-2	+20 ... + 90	3-4	1000		6x138
60/60000962	ATHf-2	0 ... +100	3-4	1000		6x107
60/60001212	ATHf-2	0 ... +100	3-4	2000		6x107
60/60000963	ATHf-2	+20 ... +150	3-4	1000		6x 88
60/60001210	ATHf-2	+20 ... +150	3-4	2000		6x 88
60/60000187	ATHf-2	+50 ... +200	3-4	1000		6x101
60/60001038	ATHf-2	+50 ... +300	3-4	1000		6x 63
60/60001208	ATHf-2	+50 ... +300	3-4	2000		6x 63
60/60002122	ATHf-2	+20 ... +500	5	1000		6x148
60/60002114	ATHf-2	+20 ... +500	5	2000		6x148

### Protection temperature monitor (STW) and limiter (STB)

(delivery within 3 working days after receipt of order)

Sales No.	Type	Control / limit range °C	Switching differential %	Capillary mm	Process connection	Probe dia. x length mm
60/60002261	ATHf-20/r	+ 20 ... +500	7	4000	„42“ G <sup>3</sup> / <sub>4</sub> **	200
60/60001136	ATHf-70	+ 30 ... +110	--	1000	„10“ plain cylindrical probe	6x108
60/60001206	ATHf-70	+ 30 ... +110	--	2000		6x108
60/60001097*	ATHf-70	+ 60 ... +130	--	1000		6x116
60/60001041	ATHf-70	+ 20 ... +150	--	1000		6x 77
60/60001205	ATHf-70	+ 20 ... +150	--	2000		6x 77
60/60001525	ATHf-70/574	+ 20 ... +150	--	1000		6x 77
60/60001204	ATHf-70	+ 50 ... +200	--	2000		6x 85
60/60001290	ATHf-70/574	+ 50 ... +200	--	1000		6x 85
60/60001002*	ATHf-70	+130 ... +200	--	1000		6x114
60/60001040	ATHf-70	+ 50 ... +300	--	1000		6x 55
60/60001191	ATHf-70	+ 50 ... +300	--	2000		6x 55
60/60001528	ATHf-70/574	+ 50 ... +300	--	1000		6x 55
60/60002086	ATHf-70	+ 20 ... +500	--	1000		6x127
60/60002088	ATHf-70/574	+ 20 ... +500	--	1000		6x127
60/60002099	ATHf-70/574	+ 20 ... +500	--	2000		6x127
60/60002262	ATHf-70/574/711	+ 20 ... +500	--	4000		„42“ G <sup>3</sup> / <sub>4</sub> **

\*Discontinued type

\*\*Weld-in pocket



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## Order details

(please observe our versions on stock and specify the Sales No.)

### Surface-mounting thermostat, ATH series

Order code	(1) Basic type
603021	Surface-mounting thermostat, ATH series
	<b>(2) Basic type extensions</b>
01	ATH-1 Temperature controller TR
02	ATH-2 Operating temperature monitor TW
20	ATH-20 Protection temperature monitor STW (STB)
70	ATH-70 Protection temperature limiter STB
	<b>(3) Style</b>
1	ATHs with rigid shaft
2	ATHf with long-distance line
	<b>(4) Control / limit ranges °C</b>
014	-20 ... + 50 (only for TR and TW)
016	-10 ... + 40 (only for TR and TW)
021	0 ... + 50
025	0 ... +100
041	+20 ... + 90
042	+20 ... +120
043	+20 ... +150
045	+20 ... +400
046	+20 ... +500
052	+30 ... +110
062	+50 ... +200
063	+50 ... +250
064	+50 ... +300
066	+60 ... +130
	<b>(5) Switching differential</b>
00	without hysteresis (-70 STB)
15	1,5 % of the scale range (only for TR + TW)
20	2 % vomof the scale range (only for STW (STB))
30	3 % of the scale range (only for TR + TW)
50	5 % of the scale range (only for TR + TW + STW (STB))
60	6 % of the scale range (only for TR + TW)
70	7 % of the scale range (only for STW (STB))
90	9 % of the scale range (only for STW (STB))
	<b>(6) Capillary length</b>
0	ATHs without long-distance line
1000	1000 mm
2000	2000 mm
3000	3000 mm
4000	4000 mm
5000	5000 mm
....	(Special length, specifications in plain text)
	<b>(7) Material of capillary</b>
00	ATHs without long-distance line
40	Cu (Copper)
20	CrNi (Stainless steel 1.4571)

