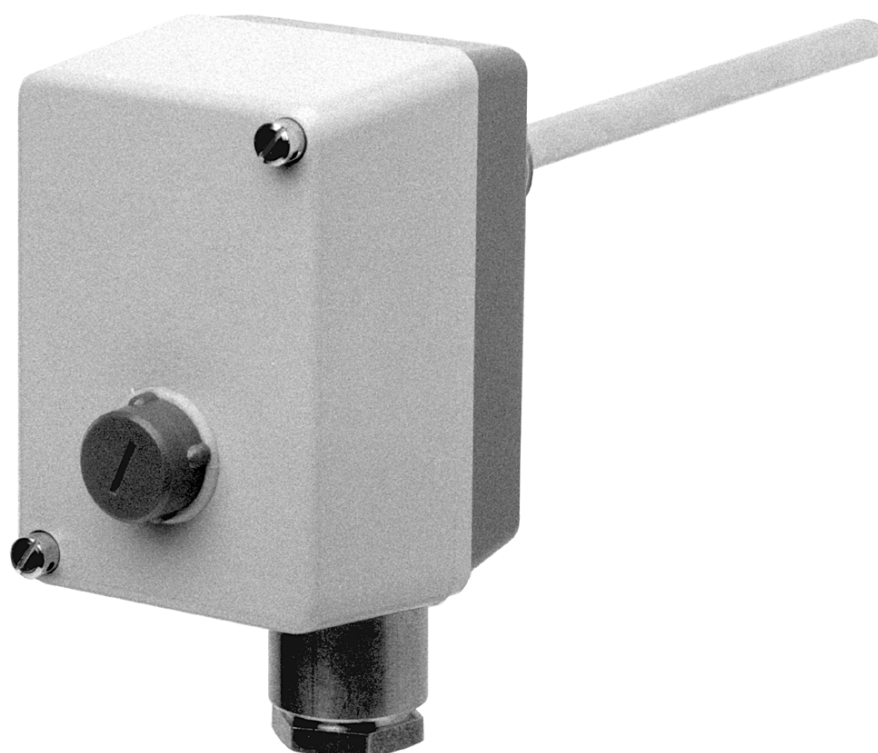


Surface-mounting thermostats ATH.-SE-...

to monitor seagoing vessel equipment

DGRL

EAC



Operating Manual

JUMO

60303100T90Z002K000

V5.01/EN/00073788/2021-05-25

Further information and downloads



qr-603031-en.jumo.info

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1.1 Warning symbols



WARNING!

This symbol in connection with the signal word indicates that **personal injury** may occur if the respective precautionary measures are not carried out.



CAUTION!

This symbol in connection with the signal word indicates that **material damage or data loss** will occur if the respective precautionary measures are not taken.



READ THE DOCUMENTATION!

This symbol, which is attached to the device, indicates that the associated **documentation for the device** must be **observed**. This is necessary to identify the nature of the potential hazard, and to take measures to prevent it.



DISPOSAL!

At the end of its service life, the device and any batteries present do not belong in the trash! Please ensure that they are **disposed of** properly and in an **environmentally friendly** manner.

1.2 Note symbols



NOTE!

This symbol refers to **important information** about the product, its handling, or additional benefits.

2 Introduction

2.1 Brief description

Thermostats are used to control and monitor thermal processes. The devices of the ATH.-SE type series are available as temperature monitors TW, safety temperature monitors STW (STB) and safety temperature limiters STB. In the event of a malfunction, the STB switches the monitored machine line to an operational safe status.

Surface-mounting thermostats operate according to the fluid expansion principle, a microswitch is used as an electrical switching element.

Switching function

Temperature monitor TW and safety temperature monitor STW

If the temperature on the temperature probe exceeds the limit value, the electrical circuit is opened by a microswitch. When the limit value falls below the set limit value (by the switching differential), the switch is returned to its initial position.

Restart lock at safety temperature limiter STB

If the temperature at the temperature sensor exceeds the set limit value, the electrical circuit is opened and mechanically locked. After falling below the limit value by approx. 10 % of the temperature range, the switch can be unlocked manually.

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

In this case, the circuit following the thermostat must comply with DIN EN 14597 and VDE 0116.

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

If the measuring system is destroyed (i.e. if the expansion fluid escapes) the pressure in the membrane of the STB and STW (STB) drops and permanently opens the electrical circuit. Unlocking is then no longer possible. When the STB sensor cools down to the negative temperature range, the circuit opens, but must be manually unlocked by the reclosing button when the temperature rises. The STW (STB) automatically restarts.

2.2 Intended use

The device is approved for monitoring installations on steel-hulled seagoing ships (e.g. steam and boiler plant, indirect heating systems) as:

- Temperature monitor (TW)
- Safety temperature monitor STW (STB)
- Safety temperature limiter (STB)

The version complies with DIN EN 14597 and is approved as per the guidelines of the Classification Societies:

- DNV GL
- Bureau Veritas
- Pressure Equipment Directive 2014/68EU (ATH.-SE-20[STW] and ATH.-SE-70[STB] only)



CAUTION!

Failure of the device

Cutting through or kinking the capillary will lead to permanent failure of the device!



NOTE!

If the measuring system breaks, the filling liquid can escape. So far, there is no restrictive health authority statement on a health hazard in the case of short-term exposure and low concentration, e.g. in the case of a measuring system breakage.

Note

Physical and toxic features of the expansion means, which could occur 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 to 8 V%	Yes	Yes	^a	No
≥ 200 °C ≤ 300 °C	No	490 °C	-	Yes	Yes	^a	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.

2.3 Identification marking



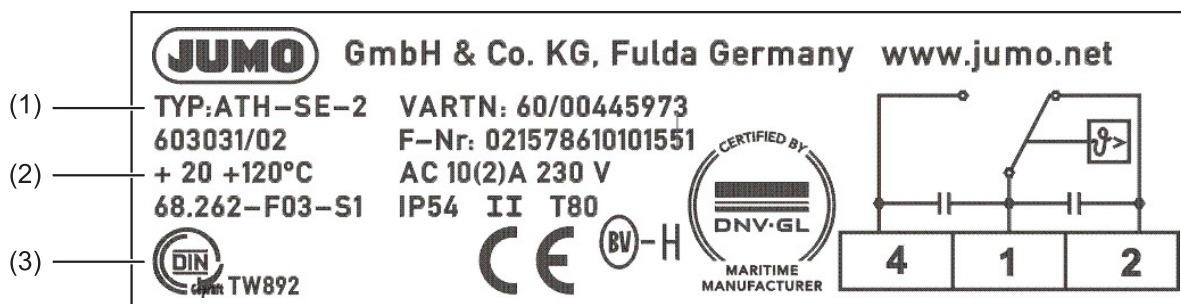
NOTE!

The device is approved as per DIN EN 60730-2-9.

3 Identifying the device version

3.1 Nameplate

Exemplary marking on the device housing:



- (1) Order code
- (2) Control range/contact rating
- (3) Approval mark

3.2 Order details

	(1) Basic type
603031	Surface-mounting thermostat ATH.-SE
	(2) Basic type extension
02	ATH.-SE-2 Temperature monitor TW
20	ATH.-SE-20 Safety temperature monitor (STW [STB])
70	ATH.-SE-70 Safety temperature limiter (STB)
	(3) Design
1	ATHs-SE-.. rigid shaft
2	ATHf-SE-.. capillary
	(4) Control range (TW)
025	0 to 100 °C
041	20 to 90 °C
042	20 to 120 °C
043	20 to 150 °C
052	30 to 110 °C
062	50 to 200 °C
063	50 to 250 °C
064	50 to 300 °C
067	60 to 140 °C
	(5) Hysteresis
00	None
15	1.5 %
30	3 %
60	6 %
	(6) Capillary length
0	None
1000	1000 mm
2000	2000 mm

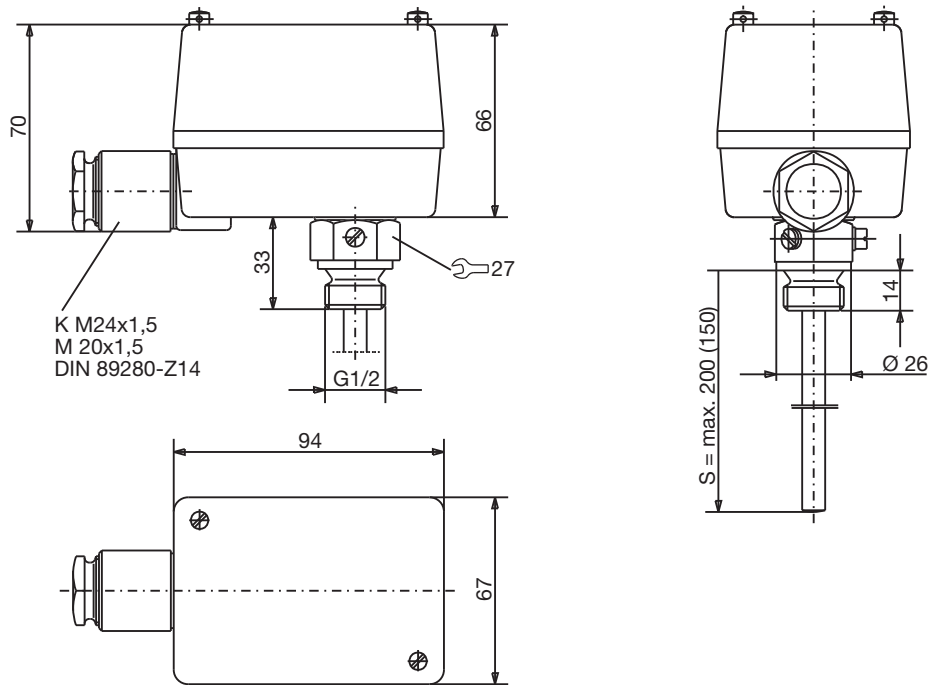
3 Identifying the device version

3.3 Scope of delivery

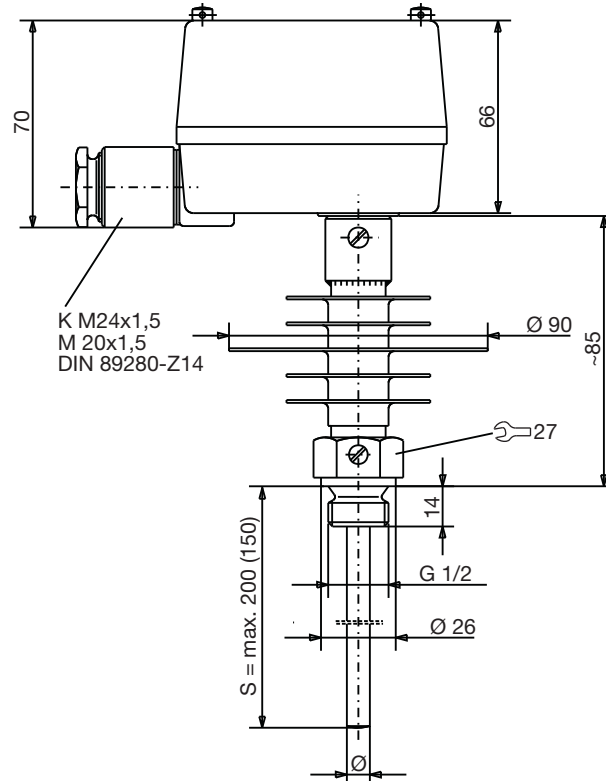
Device in the version ordered
Operating manual

4.1 Dimensions

ATHs-SE-2 (20)
with screw-in thermowell „20“, up to 150 °C



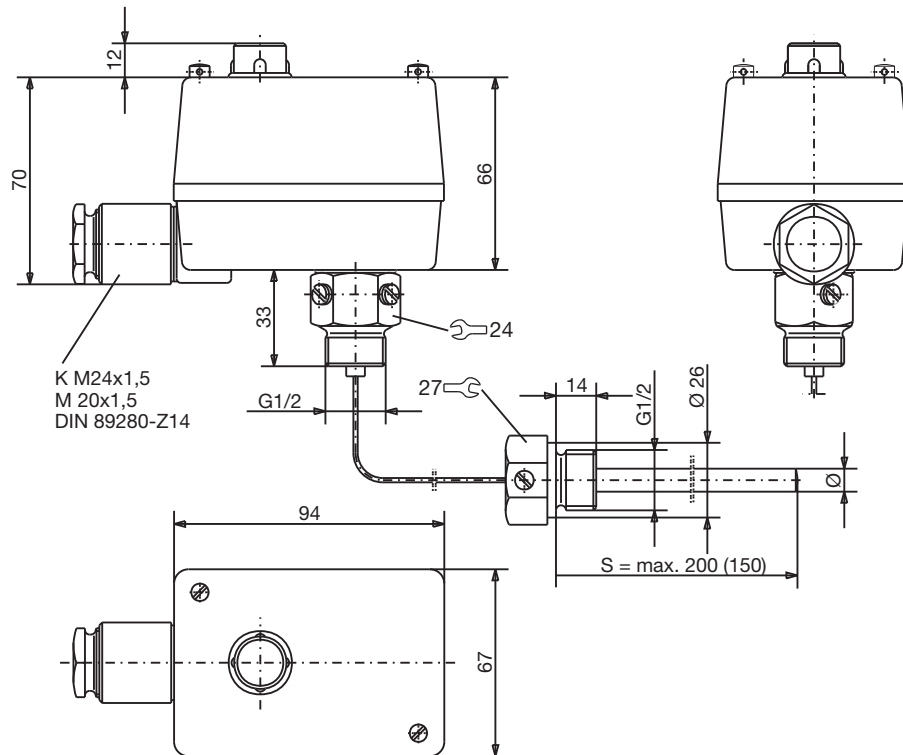
ATHs-SE-70
with screw-in thermowell and intermediate piece „30“, 150 to 300 °C



4 Mounting

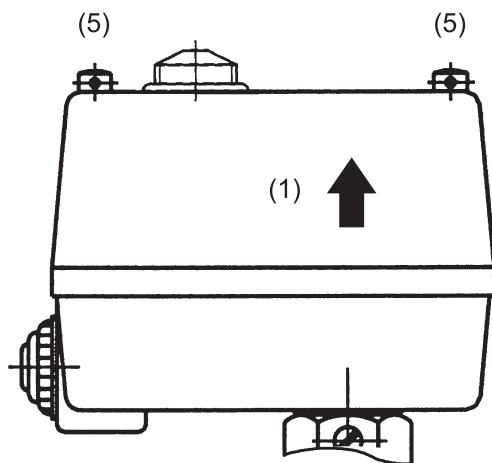
ATHs-SE-70

with screw-in thermowell „20“, up to 300 °C



4.2 Opening the housing

1. Unscrew the two lead-sealable cheese-head screws (5).
2. Remove the upper part of the housing (1).



CAUTION!

Ensure that the gasket is seated correctly when reassembling!

4.3 Fixing the device

Operating position: Any, for open-air mounting on request

4.3.1 Code "s" (rigid shaft)

The housing journal is secured in the enlarged open end of the thermowell by two fixing screws.

4.3.2 Code "f" (with capillary)

Fixing is by G 1/2 screw connection on the housing spigot.

4.4 Capillary, temperature probe and thermowell

4.4.1 General information



CAUTION!

Failure of the device

Cutting through or kinking the capillary will lead to permanent failure of the device!

Minimum permissible bending radius of the capillary is 5 mm.

The temperature probe must be fitted in a JUMO thermowell, otherwise the approval of the device expires.



NOTE!

The temperature probe must be completely submerged in the medium.

In order to ensure the general accuracy of response, the devices must only be used with the thermowells supplied from the factory (diameter D = 8 or 10 mm).

Only probes with a diameter D = 8 mm may be fitted in thermowells with a diameter D = 10 mm.

When the operating medium is air, connection type „10“ (without thermowell) must be selected.

4.4.2 Approved process connections

Temperature probe

Process connection 10: Plain cylindrical probe (only with ATHf-SE)

Thermowells

Process connection 20: Screw-in thermowell,

process connection 30: Screw-in thermowell with intermediate piece



NOTE!

For detailed information, refer to data sheet 606710.

4 Mounting

4.5 Permissible pressure at the thermowell

4.5.1 Thermowells 20 and 30



CAUTION!

The following values refer to the maximum pressure of the probe mounting concerned. The maximum pressure which can be sealed depends on the mounting conditions and may possibly be lower.

Thermowell „20“ made of stainless steel

Material Tube and screw connection	CrNi	
Temperature in °C	Tube diameter 8 × 0.75 mm	Tube diameter 10 × 0.75 mm
	Max. permissible pressure in bar	
100	92	74
150	88	71
200	83	67
300	72	58
Permitted flow velocities	Upon request	

Thermowell „20“ made of brass

Material Tube and screw connection	CuZn, nickel plated	
Temperature in °C	Tube diameter 8 × 0.75 mm	Tube diameter 10 × 0.75 mm
	Max. permissible pressure in bar	
100	50	40
150	48	39
Permitted flow velocities	Upon request	



NOTE!

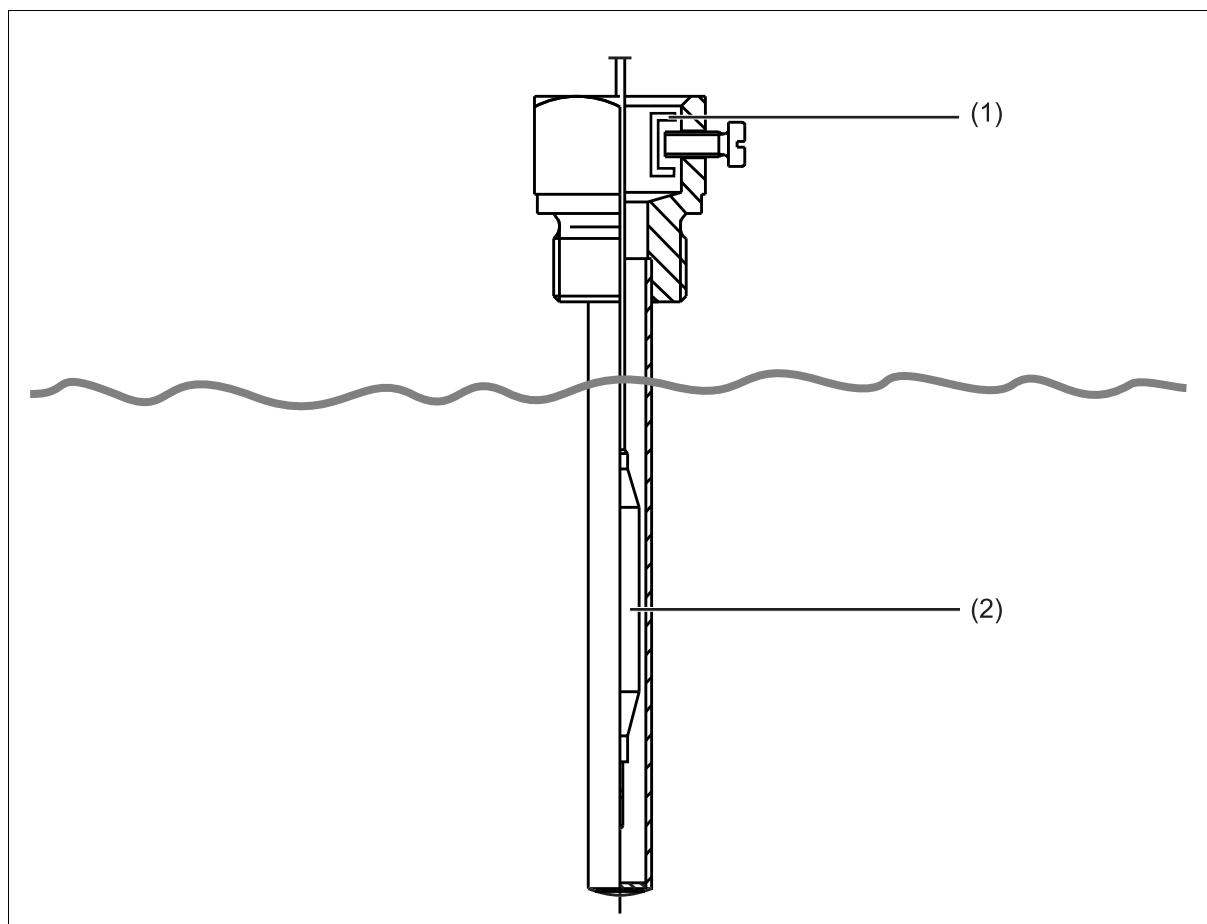
The process connection plain cylindrical probe must **only** be used in pressureless medium.



CAUTION!

Due to the general accuracy of response, the device must only be used with the factory-supplied thermowell.

4.6 Probe installation



- (1) Clamping piece
- (2) Temperature probe



NOTE!

Submerge the thermowell and the temperature probe into the medium. Ensure that the temperature probe is completely submerged in the medium because otherwise, greater switching point deviations will occur.

For thermostats with capillary (code „f“), and a screw-in thermowell (process connectin 20) the temperature probe is fixed in the thermowell with the clamping piece.

5 Installation



NOTE!

If you determine an external defect – also a mechanical way – the differential pressure transmitter has to be sent for repair to the manufacturer.

5.1

Installation notes



CAUTION!

The electrical connection must only be made by qualified personnel.

The choice of cable, the installation and the electrical connection must conform to the requirements of VDE 0100 „Regulations for the installation of power circuits with nominal voltages below 1000 V“, or the appropriate local regulations..

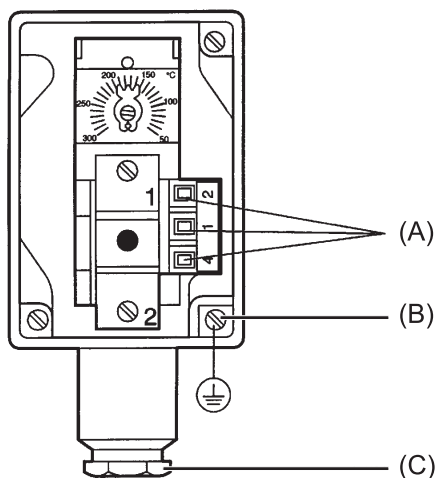
If contact with live parts is possible while working on the unit, it must be completely disconnected from the supply.

Earth the instrument at the PE terminal to the protective conductor. This cable must have a cross-section that is at least as large as the supply cables. Earth cables must be run in a star configuration to a common earth point which is connected to the protective earth of the supply. Do not loop earth cables, i.e. do not run them from one instrument to another.

Apart from faulty installation, incorrect settings on the thermostat can affect the proper functioning of the following process or lead to damage. Setting up must therefore be restricted to qualified personnel. Please observe the appropriate safety regulations in this respect.

5.2 Connection diagram

5.2.1 Opening the housing



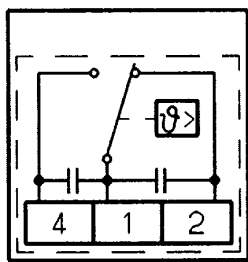
1. Open the housing, ⇒ chapter 4.2 "Opening the housing", Page 12.
2. Pass the connection cable (cable diameter 10 to 16.5 mm) through the screw connection (C); fitting type „X“ (no special tools), screw connection up to 2.5 mm² conductor cross-section.
3. Establish the connection to the terminals (A) in accordance with the appropriate connectin diagram.
4. Connect the protective conductor to terminal PE (B).



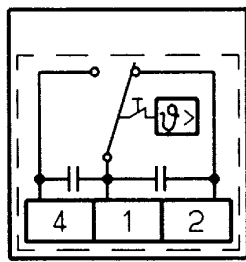
NOTE!

Tightening torque of the clamping screws/protective earth conductor clamp (PE) = 0.45 to 0.68 Nm

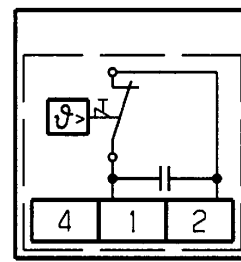
Wiring diagrams



TW/STW (STB)



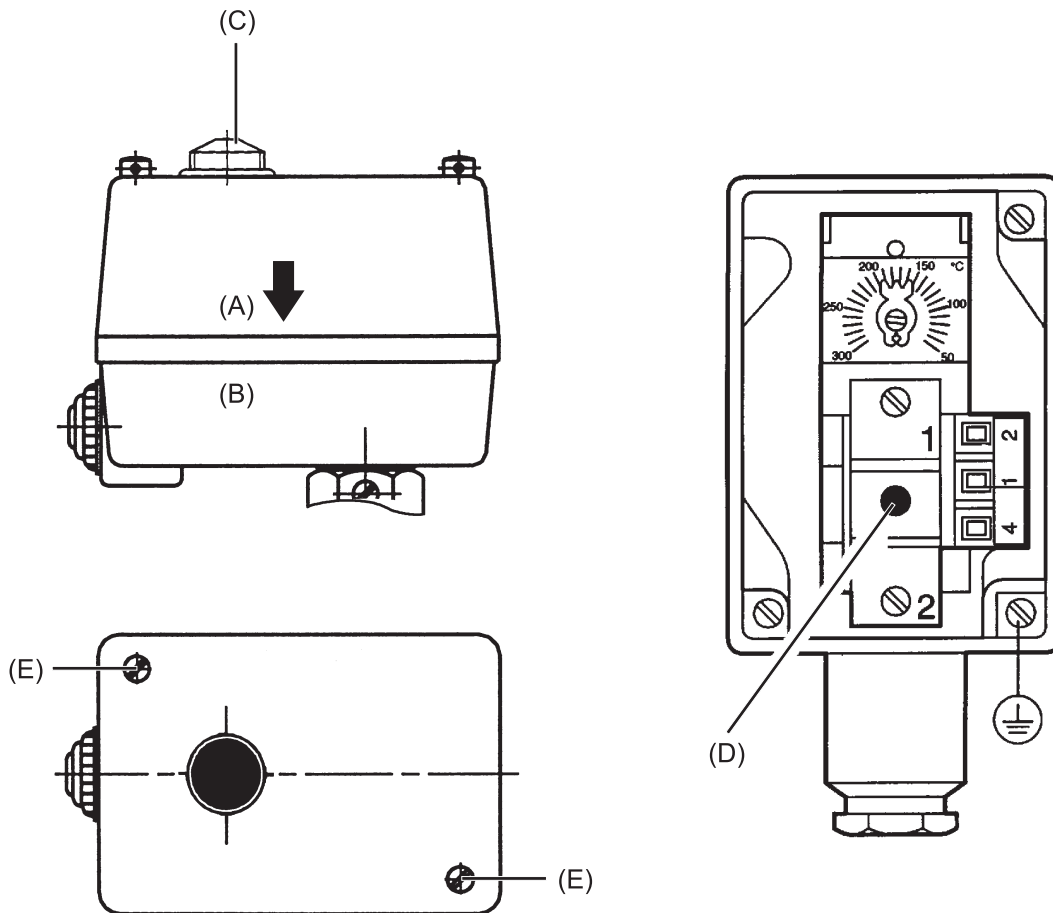
STB as N/C contact with signal contact



STB with N/C contact

5 Installation

5.2.2 Close the housing



1. Make sure that the plastic gasket in the lower part of the housing (B) is checked for correct fit.

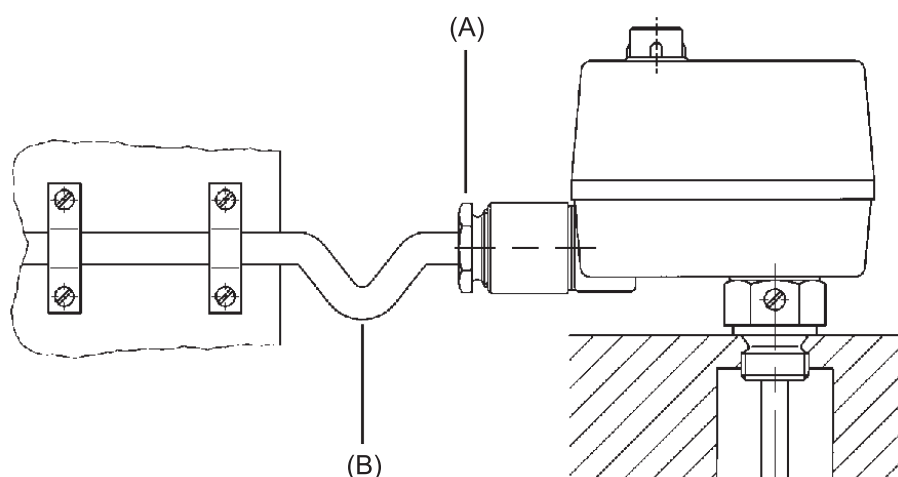


NOTE!

On the thermostat with code -70, the **external** reset button (C) must be located precisely on top the **internal** reset button (D) on the microswitch. Only in this way can the restart button be actuated from the **outside** (C).

2. Place the upper part of the housing (A) onto the lower part (B).
3. Tighten the lead-sealable cheese-head screws (E).

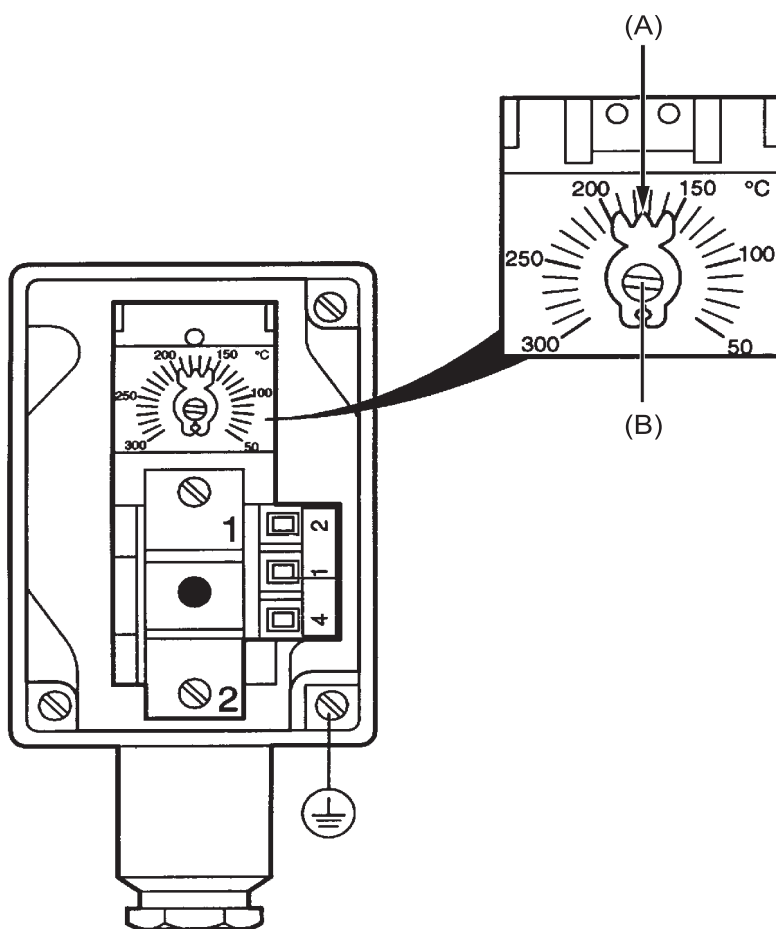
Cable relief



1. Turn the screw connection (A) clockwise until the cable inlet is sealed.
The cable entry is secured against being pulled out.
2. The cable has to be protected against vibration overload by leaving sufficient extra cable length (B).
3. Close the housing.

6 Startup

6.1 Limit value setting

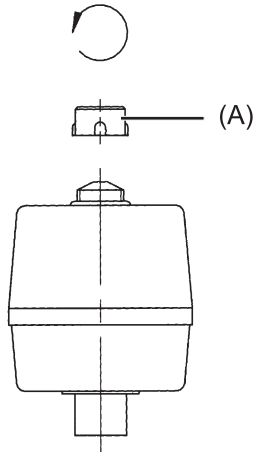


1. Open the housing, chapter 4.2 "Opening the housing", Page 12.
2. Set the limit value (A) on the setpoint adjuster (B) using a screw-driver.

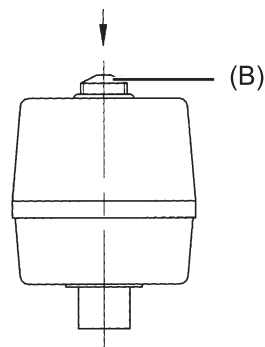
6.2 Unlocking the safety temperature limiter (STB)

If the set limit value is exceeded, the STB switches off and can only be unlocked after the limit value (danger temperature) has been undershot by approx. 10 % of the scale range.

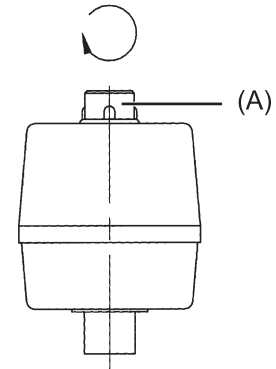
1.



2.



3.



1. Unscrew the cap nut (A).

2. Press the reset button (B) until the microswitch is reset.

3. Screw the cap nut (A) back on.

7 Technical data

7.1 Control ranges and temperature probes

Type	Control/limit value ranges °C	max. admissible excessive probe temperature °C	Length of the temperature probe in mm			
			Copper (Cu)		Stainless steel (CrNi)	
			Ø 6	Ø 8	Ø 6	Ø 8
ATH.-SE-2	0 to 100	125	107	75	99	67
	20 to 90	125	138	91	130	83
	30 to 110	135	125	84	117	76
	20 to 120	140	107	75	99	67
	60 to 140	165	123	83	117	76
	20 to 150	175	88	65	80	57
	50 to 200	230	101	72	93	64
	50 to 250	290	-	-	73	54
	50 to 300	345	-	-	63	49
ATH.-SE-20	30 to 110	135	112	78	104	70
ATH.-SE-70	60 to 140	165	110	77	102	68
	20 to 150	175	80	61	72	53
	50 to 250	290	-	-	66	50
	50 to 300	345	-	-	58	-

7.2 Capillary and temperature probe

Type	Scale limit value	Capillary	Temperature probe
ATH.-SE-2 ATH.-SE-20 ATH.-SE-70	≤ 200 °C	Copper (Cu) Ø 1.5 mm Material no. 2.0090	Copper (Cu) Material no. 2.0090 hard soldered
	> 200 °C	Copper (Cu) Ø 1.5 mm Material no. 2.0090	Stainless steel (CrNi) Material no. 1.4571 hard soldered
	all areas	Stainless steel (CrNi) Ø 1.5 mm	Stainless steel (CrNi) Material no. 1.4571 welded
Capillary length	1000 mm, max. 2000 mm as standard		
Min. bending radius of the capillary	5 mm		

7.3 Electrical data

Switching element	ATH.-SE-2 ATH.-SE-20	ATH.-SE-70	ATH-SE-70/574
	Microswitch with change-over contact	Microswitch with N/C contact and restart lock	Microswitch with N/C contact, restart lock and additional signal contact
Max. contact rating With a hysteresis of 1.5 %	AC 230 V +10 %, 10 (2) A, $\cos \varphi = 1$ (0.6) DC 230 V +10 %, 0.25 A		
	AC 230 V +10 %, 6 (1.2) A, $\cos \varphi = 1$ (0.6)	-	-
Mode of operation TW: 2BL STW (STB): 2BKLN STB: 2BFHKLNPV	According to DIN EN 60730-1, DIN EN 60730-2-9 and DIN EN 14597 Automatic mode of operation with micro shutdown during operation, as no auxiliary power source is required Automatic mode of operation with micro-disconnection in operation, with breakage safety device		

7.4 Mechanical features

Housing material Surface with impact resistant textured paint	Aluminium die cast with sealable screws Lid: RAL 7032 Bottom section: RAL 7015
Connection line Diameter Conductor cross section	10 to 16.5 mm Max. 2.5 mm ²
Rated position (NL)	According to DIN 16257, NL 0 to NL 90 (other rated position upon request)
Operating medium	Water, oil, air, superheated steam
Installation position	Any (for outdoor installation upon request)
Weight ATHf-SE-.. ATHs-SE-..	Approx. 700 g Approx. 650 g, with screw-in thermowell „20“ Approx. 850 g, with screw-in thermowell and adapter „30“

7 Technical data

7.5 Environmental influences

Hysteresis in % of the control/limit value range (only for type 2 and 20)	Retard value	Possible process value		Designation
	3	3 to 4		S1
	6	6 to 8		S2
	1.5	1 to 2		S3
Switching point accuracy TW STB, STW (STB)	Of the control/limit value at T_U 22 °C In the upper third of the scale ± 1.5 %, at the beginning of the scale ± 6 %, in the upper third of the scale $+0/-5$ %, at the beginning of the scale $+0/-10$ %			
Setpoint value adjustment	Switching point adjustable with screwdriver after removing housing cover.			
Ambient temperature influence	Referring to the control/limit value range If the ambient temperature at the switching head and/or the capillary deviates from the calibration ambient temperature 22 °C, a switching point shift occurs. Higher ambient temperatures = lower switching point Lower ambient temperatures = higher switching point			
For devices with scale limit value	< 200 °C		≥ 200 °C	
	ATH.-SE-2	ATH.-SE-20 ATH.-SE-70	ATH.-SE-2	ATH.-SE-20 ATH.-SE-70
On switching head	0.08 %/K	0.17 %/K	0.06 %/K	0.13 %/K
On capillary per m	0.047 %/K	0.054 %/K	0.09 %/K	0.11 %/K
Admissible ambient temperature Capillary, switching head	Max. 80 °C Min. -40 °C at the end of the scale < 200 °C Min. -20 °C at the end of the scale ≥ 200 °C ≤ 300 °C			
Admissible storage temperature	-50 to +50 °C			
Permissible overtemperature safety	Max. scale end value +15 % on the probe during use			
Time constant $t_{0,632}$ In water In oil In air, superheated steam	≤ 45 s ≤ 60 s ≤ 120 s			
Protection type	IP54, according to EN 60529			

7.6 Process connection

Type series ATHs-SE-.. with rigid shaft	Scale limit value up to 150 °C, thermowell „20“	Scale limit value exceeding 150 °C, thermowell „30“
	Screw-in sleeve with screw-in spigot G 1/2, form A according to DIN 3852/2	Screw-in sleeve with screw-in journal G 1/2, form A according to DIN 3852/2 and intermediate piece, to ensure that the max. admissible am- bient temperatur of 80 °C is not ex- ceeded on the housing.
Material	Up to 150 °C: CuZn as standard Over 150 °C: CrNi as standard	- Over 150 °C: CrNi as standard
Type series ATHf-SE-.. with capillary	Plain cylindrical probe „10“ (standard) Screw-in thermowell „20“ (on request)	
Material	Screw-in sleeve with screw-in spigot G 1/2, form A according to DIN 3852/2 and clamping piece with locking screw to lock the probe Thermowell „20“ Thermowell „30“ Up to 150 °C: CuZn as standard - Over 150 °C: CrNi as standard Over 150 °C: CrNi as standard	
Fitting length S (max. 2000 mm)	Standard length: 100, 120, 150 mm (material CuZn, CrNi), with 200 mm only CuZn	
Immersion tube Ø	D = 8 mm, D = 10 mm	

7 Technical data

7.7 Approvals and approval marks

Bureau Veritas Testing agency Certificates/certification numbers Inspection basis Valid for	Marine Division/Frankreich 04567/H0 BV BV Rules for the Classification of Steel Ships Type ATH.-SE-2, Type ATH.-SE-20, Type ATH.-SE-70
DGRL Testing agency Certificates/certification numbers Inspection basis Valid for	TÜV Süd Z-IS-TAF-MUC-17-11-2652099-021 2014/68/EU, DIN EN 14597 Type ATH.-SE-20, Type ATH.-SE-70
DIN Testing agency Certificates/certification numbers Inspection basis Valid for	DIN CERTCO/TÜV Süd TW892 DIN EN 14597 Type ATH.-SE-2
DIN Testing agency Certificates/certification numbers Inspection basis Valid for	DIN CERTCO/TÜV Süd STW(STB)894S DIN EN 14597 Type ATH.-SE-20
DIN Testing agency Certificates/certification numbers Inspection basis Valid for	DIN CERTCO/TÜV Süd STB895 DIN EN 14597 Type ATH.-SE-70
DNV GL Testing agency Certificates/certification numbers Inspection basis Valid for	DNV GL Hamburg TAA000010T Class Guideline DNVGL-CG-0339 Type ATH.-SE-2, Type ATH.-SE-20, Type ATH.-SE-70
EAC ^a Testing agency Certificates/certification numbers Inspection basis Valid for	GOST NORM AG 0198420 TR ZU 004/2011 (LVD) Type ATH.-SE-..
RMRS Testing agency Certificates/certification numbers Inspection basis Valid for	Russian Maritime Register of Shipping (RS) 19.40050.250 - Type ATH.-SE-..

^a Russian documentation upon request

8 Maintenance, cleaning and returns

8.1 Maintenance

The device is maintenance-free.

In case of repair, please return the device clean and complete. Use the original packaging for the return.

8.2 Cleaning



NOTE!

Avoid damage to the device due to improper cleaning.

Do not damage the device, especially the wetted parts.
Cleaning agents must not attack the surface and seals.

8.3 Returns



WARNING!

Personal injury, property damage, environmental damage

Residual medium on the removed product can cause damage to persons, the environment and equipment.

► Take adequate precautionary measures.



NOTE!

The device may only be disassembled in a safe and voltage-free state of the plant by qualified personnel.



NOTE!

All information necessary for return is included in the [Supplementary sheet for product returns](#).

9 China RoHS

						
产品组别 Product group: 603031	产品中有害物质的名称及含量 China EEP Hazardous Substances Information					
部件名称 Component Name						
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
外壳 Housing (Gehäuse)	X	○	○	○	○	○
过程连接 Process connection (Prozessanschluss)	X	○	○	○	○	○
螺母 Nuts (Mutter)	○	○	○	○	○	○
螺栓 Screw (Schraube)	○	○	○	○	○	○
<p>本表格依据SJ/T 11364的规定编制。 This table is prepared in accordance with the provisions SJ/T 11364.</p> <p>○：表示该有害物质在该部件所有均质材料中的含量均在GB/T 26572规定的限量要求以下。 Indicate the hazardous substances in all homogeneous materials' for the part is below the limit of the GB/T 26572.</p> <p>×：表示该有害物质至少在该部件的某一均质材料中的含量超出GB/T 26572规定的限量要求。 Indicate the hazardous substances in at least one homogeneous materials' of the part is exceeded the limit of the GB/T 26572.</p>						



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