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

to monitor seagoing vessel equipment

Operating Manual

60303100T90Z002K000

V7.00/EN/00073788/2025-04-22

Further information and downloads

qr-603031-en.jumo.info

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1 About this documentation

1.1 Purpose

This documentation is part of the device and includes all information to ensure that it is used safely and as intended across all phases of the product lifecycle.

If you do not follow the documentation and safety information, this may result in risk to life and damage to property due to improper use.

- Read and follow the documentation and the safety information and warnings.
- Store the document in its entirety, in an easily accessible location, and so that it can be read in full at all times.
- Contact the manufacturer if you have any questions about the device and documentation.

1.2 Target group

This documentation is intended to be used by personnel for plant mechanical systems for sanitary, heating and air-conditioning technology, electrical engineering or mechanical and plant engineering.

1.3 Definition of terms

Use in the documentation	Definition
Device, product	Surface-mounted thermostat
Medium	Liquids
Measurement medium	Temperature
Product lifecycle	Overall consideration of Product identification, acceptance of the goods, storage, mounting, connection, operation, troubleshooting, maintenance to disposal

1.4 Symbols

REFERENCE!

This symbol refers to **further information** in other sections, chapters, or other manuals.

2 Safety

2.1 Intended use

The panel-mounted thermostat controls and monitors thermal processes.

The device is suitable for use as a temperature controller TR, temperature monitor TW, safety temperature monitor STW, or safety temperature limiter STB.

The device is used in heating or cooling sources, climate monitoring and machine rooms.

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.

2.2 Qualification of personnel

The personnel deployed must meet the following requirements in all phases of the product lifecycle:

- Ausgebildetes Personal der Anlagenmechanik für Sanitär-, Heizungs- und Klimatechnik, der Elektrotechnik oder des Maschinen- und Anlagenbaus.
- Members of personnel are familiar with this documentation and the safety information and warnings it contains.

2.3 Hazardous materials

Using hazardous materials as a medium may result in abrasive and corrosive damage to components of the product that come into contact with the medium. The medium may leak and present a fire hazard and a risk to health.

Carry out a risk assessment taking into consideration the safety data sheet for the relevant hazardous substance for mounting, operation, maintenance, cleaning, and disposal:

- Comparison and systematic checking of the durability of the components of the product that come into contact with the medium and the admissible environmental influences.
- Assessment of the risk to people and the environment.
- Assessment of the fire hazard due to the product materials, the admissible environmental influences, and the voltage supply.

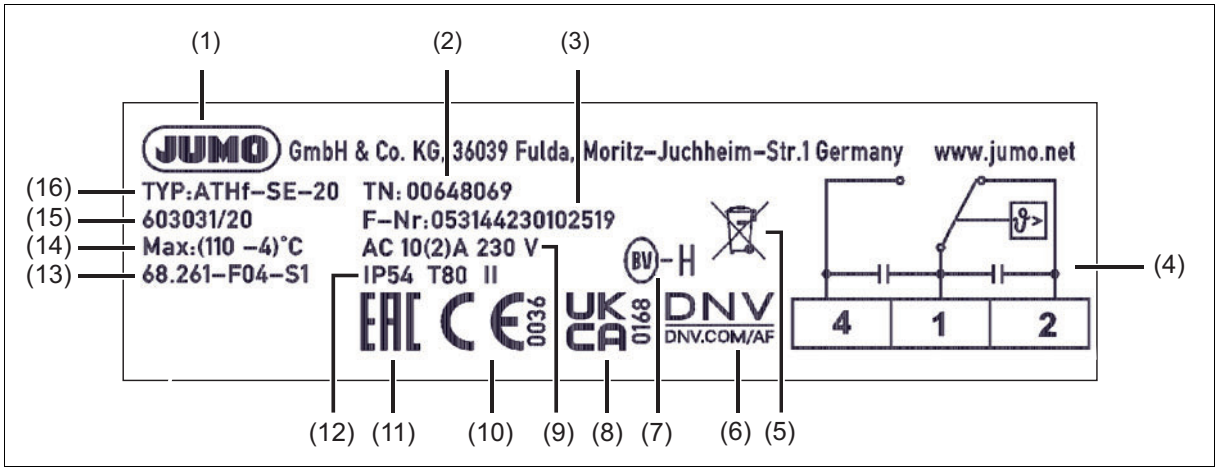
2.4 Transport and storage damage

The device can be damaged if it is insufficiently protected during transport and/or improperly stored.

- Transport the device protected from moisture and dirt in shockproof packaging.
- Protect all electrical and mechanical connections from damage.
- Observe the admissible storage temperature of the device.
- Store the device in a dry and dust-free environment.

3.1 Nameplate

Example:



1	Manufacturer	9	Voltage supply
2	Part number (TN)	10	CE conformity mark
3	Fabrication number (F-Nr)	11	EAC conformity mark
4	Connection diagram	12	Protection type
5	Disposal	13	Parts list number
6	DNV mark	14	Control range
7	BV mark	15	Order code
8	UKCA conformity mark	16	Device designation

3.2 Approval marks and certificates

Certificates for approved device versions are available for download on the manufacturer's website. Russian documentation upon request.

4 Technical data

4.1 Electrical data

Switching element	
Type 603031/02 (ATH.-SE-2) TW, Typ 603031/20 (ATH.-SE-20) STW (STB)	Microswitch with change-over contact
Type 603031/70 (ATH.-SE-70) STB	Microswitch with N/C contact and restart lock
Type 603031/70-.../574 (ATH-SE-70/574) STB	Microswitch with N/C contact, restart lock and additional signal contact
Max. contact raiting	AC 230 V +10 %, 10 (2)[a] A, cos φ = 1 (0.6)[a] DC 230 V +10 %, 0.25 A
With a hysteresis of 1.5 %	
Type 603031/02 (ATH.-SE-2) TW, Type 603031/20 (ATH.-SE-20) STW (STB)	AC 230 V +10 %, 6 (1.2)[a] A, cos φ = 1 (0.6)[a]
Mode of operation	DIN EN 60730-1, DIN EN 60730-2-9 and DIN EN 14597
TW: 2BL	Automatic mode of operation with micro shutdown during operation, as no auxiliary power source is required
STW (STB): 2BKLNP	Automatic mode of operation with micro-disconnection in operation, with breakage safety device
STB: 2BFHKLNPV	

[a] Inductive loads

4.2 Control ranges and temperature probes

	Control/limit value ranges	Max. admissible excessive probe temperature	Length of the temperature probe in mm			
			Copper (Cu)		Stainless steel (CrNi)	
	°C	°C	Ø 6	Ø 8	Ø 6	Ø 8
Type 603031/02 (ATH.-SE-2) TW	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
Type 603031/20 (ATH.-SE-20) STW (STB),	30 to 110	135	112	78	104	70
Type 603031/70 (ATH.-SE-70) STB	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	-

4.3 Capillary and temperature probe

	Scale limit value	Capillary	Temperature probe
Type 603031/02 (ATH.-SE-2) TW, Type 603031/20 (ATH.-SE-20) STW (STB), Type 603031/70 (ATH.-SE-70) STB	≤ 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 as standard, max. 2000 mm		
Min. bending radius of the capillary	5 mm		

4.4 Environmental influences

Hysteresis in % of the control/limit value range (only for type 603031/02 (ATH.-SE-2) and type 603031/20 (ATH.-SE-20))	Reted value	Possible process value		Designation
	3 6 1.5	3 to 4 6 to 8 1 to 2		S1 S2 S3
Switching point accuracy Type 603031/02 (ATH.-SE-2) TW, Type 603031/20 (ATH.-SE-20), 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	
	Type 603031/02 (ATH.-SE-2)	Type 603031/20 (ATH.-SE-20), Type 603031/70 (ATH.-SE-70)	Type 603031/02 (ATH.-SE-2)	Type 603031/20 (ATH.-SE-20), Type 603031/70 (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, see nameplate 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, see nameplate			
Admissible over temperature safety	Max. scale end value 15 % on the probe during use			

Time constant $t_{0.632}$	
In water	≤ 45 s
In oil	≤ 60 s
In air, superheated steam	≤ 120 s
Protection type	IP54, according to EN 60529

4.5 Mechanical features

Housing material	Aluminium die cast with sealable screws (nickel-plated brass), cable gland (bare brass)
Surface with impact resistant Textured paint	Lid: RAL 7032 Bottom section: RAL 7015
Connection line	
Diameter	10 to 16.5 mm
Conductor cross section	Max. 2.5 mm^2
Rated position (NL)	NL 0 to NL 90 (other rated position upon request), according to DIN 16257
Operating medium	Water, oil, air, superheated steam
Installation position	Any (for outdoor installation upon request)
Weight	
With capillary	Approx. 700 g
With rigid shaft	Approx. 650 g, with screw-in thermowell „20“, approx. 850 g, with screw-in thermowell and adapter „30“

4.6 Process connection

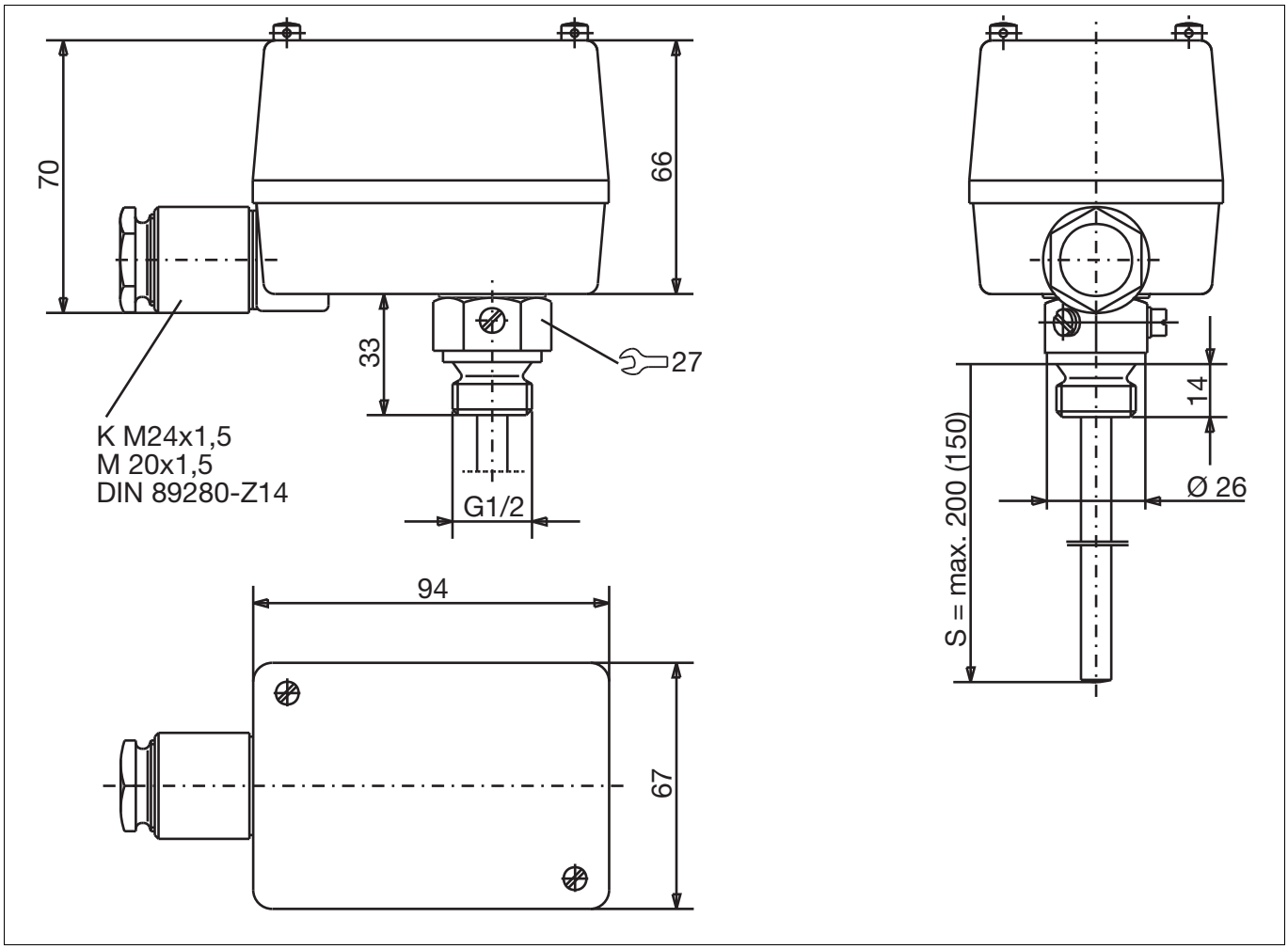
Type 603031/...-1-... (ATHs-SE-..) with rigid shaft	Sclae limit value **up to** 150 °C, thermowell „20“	Scale limit value **exceeding** 150 °C, thermowell „30“
	Screw-in sleeve with screw-in spigot G 1/2", form A according to DIN 3852/2	Screw-in sleeve with screw-in journal G 1/2", form A according to DIN 3852/2 and intermediate piece, to ensure that the max. admissible ambient temperatur of 80 °C is not exceeded on the housing.
Material	Up to 150 °C: CuZn as standard	-
	Over 150 °C: CrNi as standard	Over 150 °C: CrNi as standard

Type 603031/...-2-... (ATHf-SE-..) with capilar	Plain cylindrical probe „10“ (standard), Screw-in thermowell „20“ (on request), 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	
Material	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. 200 mm)	Standard length: 100, 120, 150 mm (material CuZn or CrNi), with 200 mm only CuZn	
Immersion tube Ø	D = 8 mm (for probe Ø 6 mm) or D = 10 mm (for probe Ø 8 mm)	

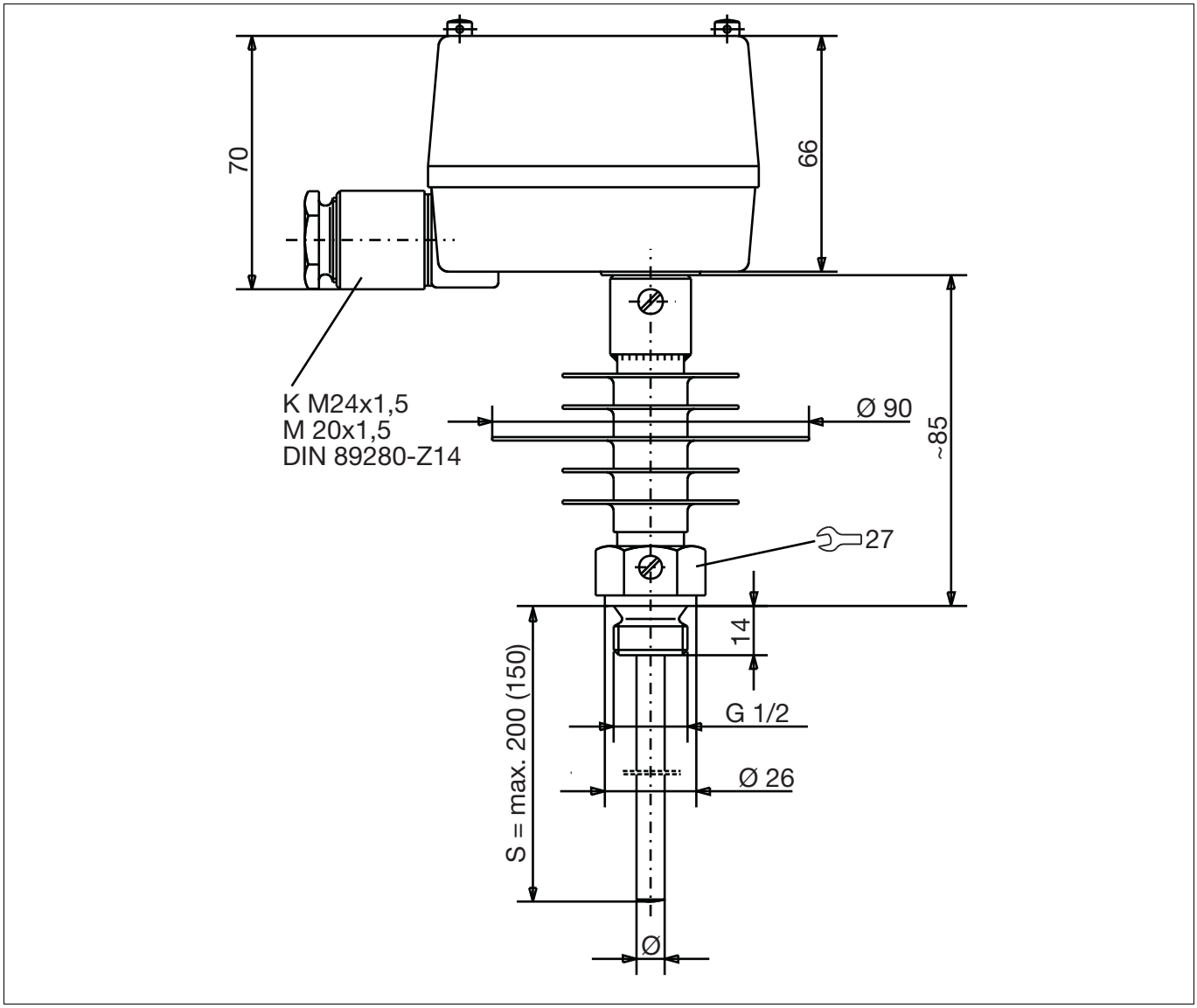
4 Technical data

4.7 Dimensions

Type 603031/02-1-043-XX-X-XX-20-... (ATHs-SE-2),
Type 603031/20-1-043-XX-X-XX-20-... (ATHs-SE-20)

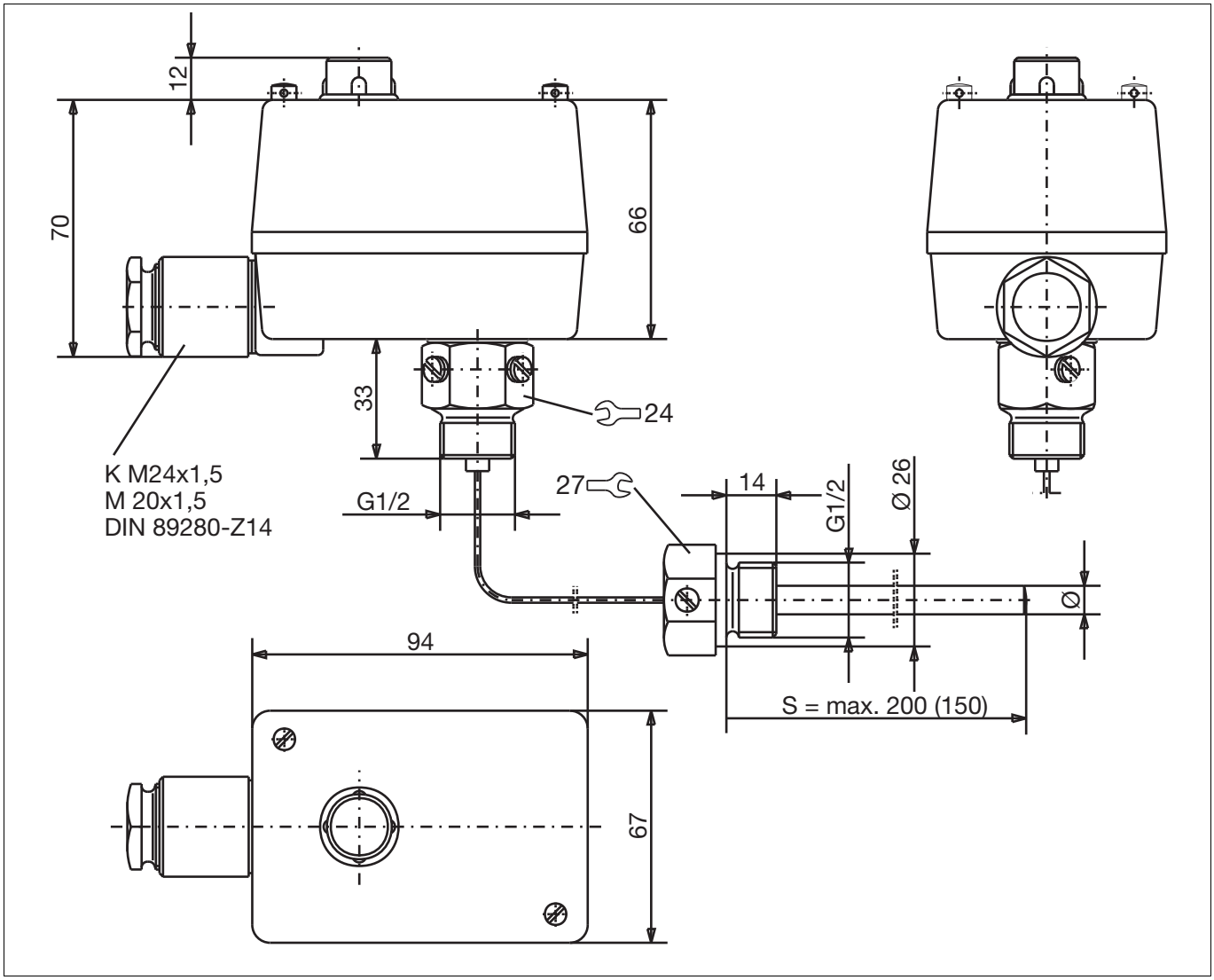


Type 603031/70-1-064-XX-X-XX-30-... (ATHs-SE-70)



4 Technical data

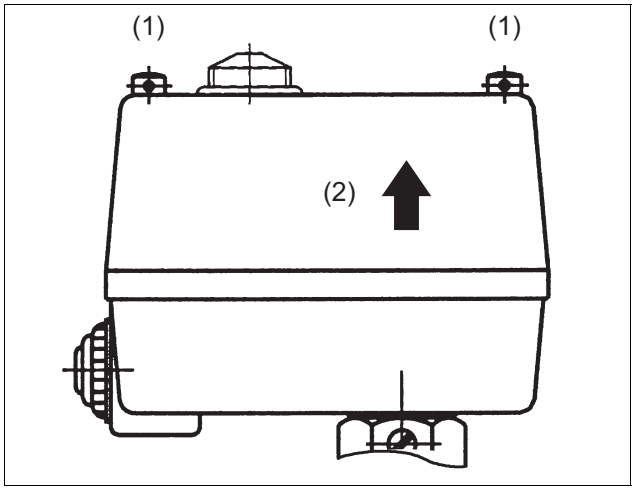
Type 603031/70-2-064-XX-X-XX-20-... (ATHs-SE-70)



5.1 Opening the housing

Procedure:

1. Unscrew the two leaded cheese-head screws (1).
2. Remove the upper part of the housing (2) upwards.



5.2 Fixing the device

5.2.1 Code "s" (rigid shaft)

Procedure:

1. Secure the cas spigot in the enlarged open end of the thermowell by two fixing screws.

5.2.2 Code "f" (capillary)

Procedure:

1. Fix the fitting G 1/2 on the case spigot.

5.3 Capillary, temperature probe and thermowell

The temperatur 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.

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 (data sheet 606710), otherwise the approval of the device expires.

5.3.1 Approved process connections

Temperature probe

Process connection 10: Plain cylindrical probe (only with type 603031/... with capillary [ATHf-SE])

Thermowells

Process connection 20: Screw-in thermowell,

process connection 30: Screw-in thermowell with intermediate piece

5.4 Permissible pressure at the thermowell

5.4.1 Thermowells 20 and 30

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

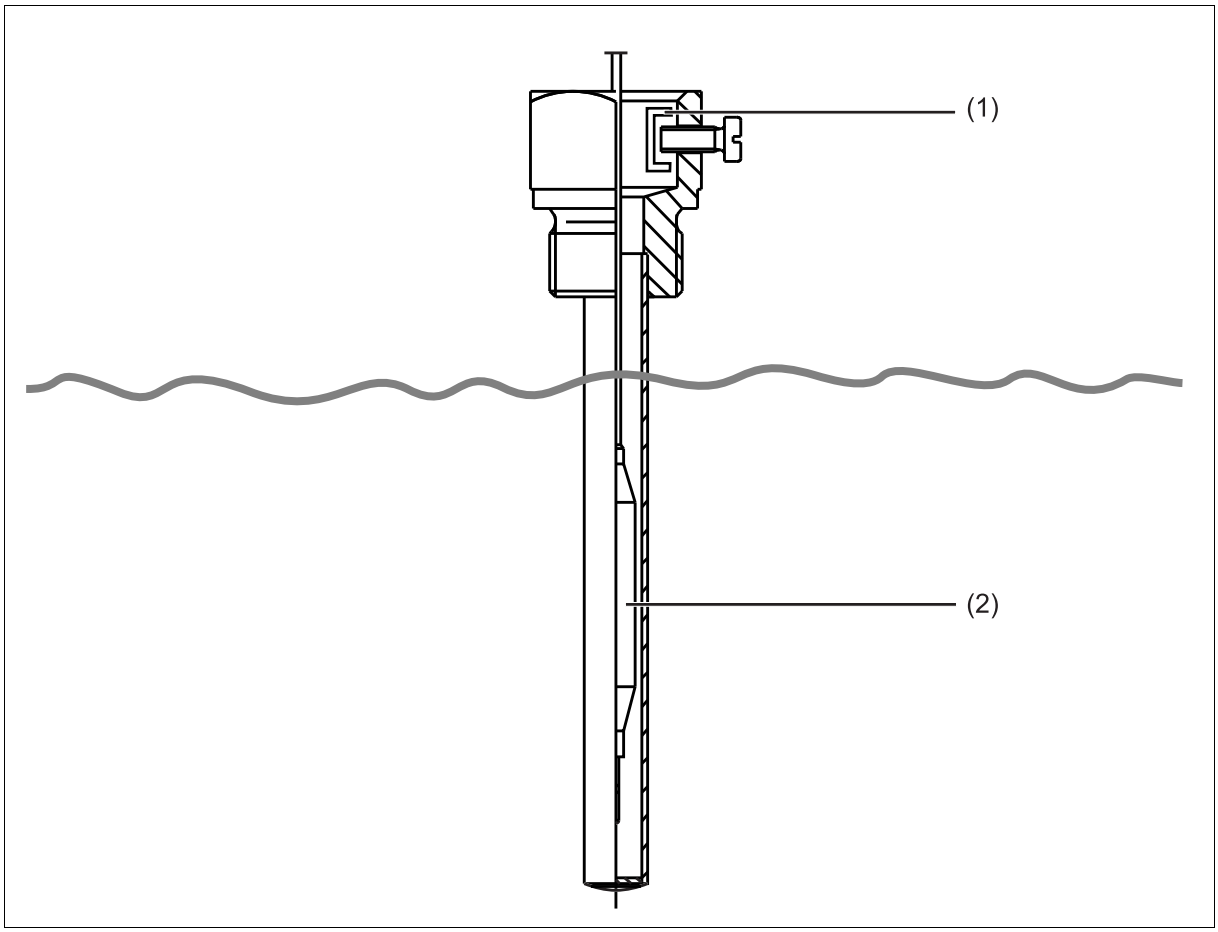
Temperature in °C	Tube diameter 8 × 0.75 mm	Tube diameter 10 × 0.75 mm
	Max. permissible pressure in bar	
100	50	40
150	48	39

Permitted flow velocities	Upon request

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

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

5.5 Probe installation



1 Clamping piece
2 Temperature probe

Procedure:

1. Immerse the protective sleeve and temperature sensor into the medium.
   a) Submerge the temperature sensor completely to eliminate any switching point deviations.
   b) For thermostats with a capillary (abbreviation "f") and a screw-in protective sleeve, secure the temperature sensor in the protective sleeve using the clamp.

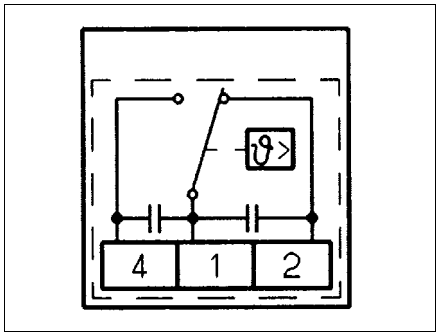
6 Installation

6.1 Installation notes

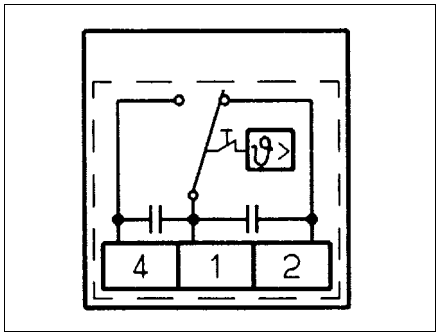
- The choice of cable, the installation and the electrical connection must conform to the requirements of VDE 0100 „Regulations for the installation of power circuits with nominal voltages below 1000 V“, or the appropriate local regulations.
- If contact with live parts is possible while working on the device, it must be completely disconnected from the supply.
- Ground the device 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. Ground lines must be run in a star configuration to a common grounding point which is connected to the protective ground of the supply. Do not loop ground lines, i.e. do not run them from one device to another.
- Apart from faulty installation, incorrect settings can affect the proper functioning of the following process or lead to damage. Setting up must therefore be restricted to qualified personnel. Observe the appropriate safety regulations.

6.2 Connection diagram

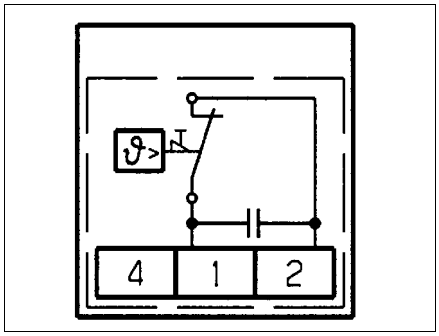
TW/STW (STB)



STB as N/C contact
with signal contact



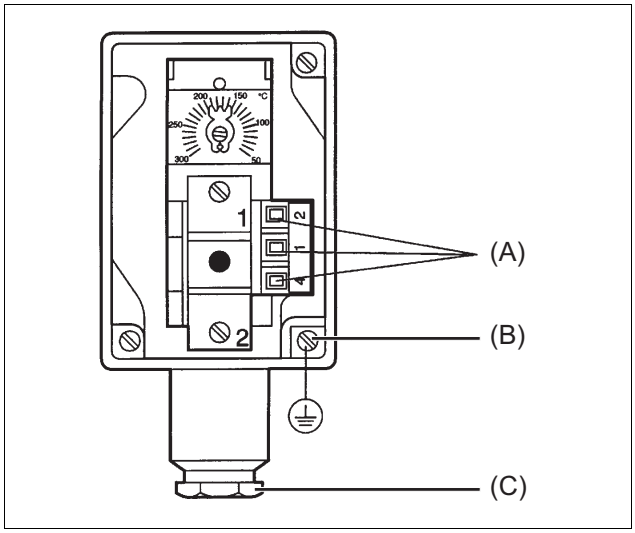
STB with N/C contact



6.3 Connecting the device

Procedure:

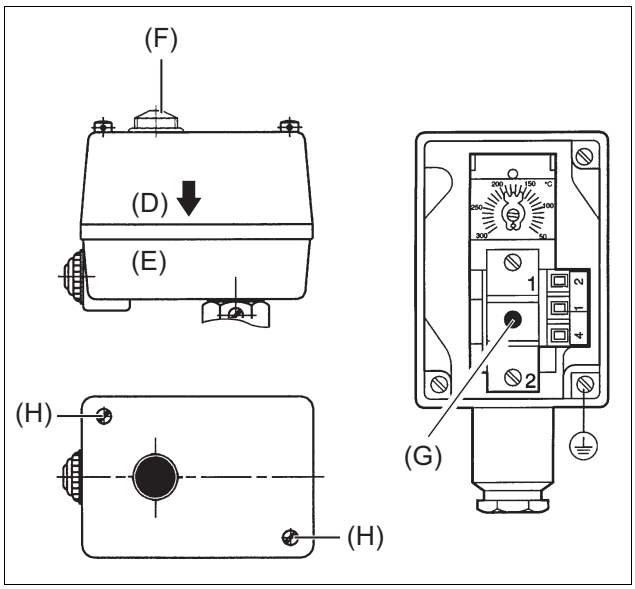
1. Open the housing, ⇨ Page 15.
2. Pass the connection cable (cable diameter 10 to 16.5 mm) through the screw connection (C).
   Fitting type „X“ (no special tools), screw connection up to 2.5 mm^2 conductor cross-section.
3. Establish the connection to the terminals (A) in accordance with the appropriate connectin diagram.
4. Connect the protective conductor to terminal PE (B).



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

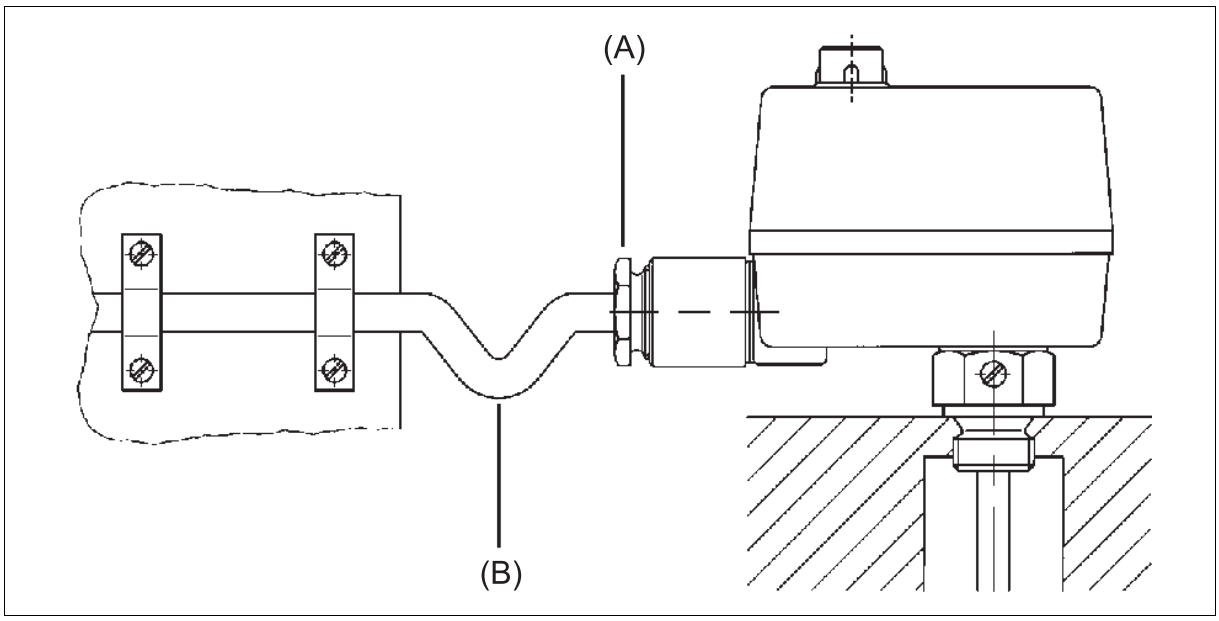
   On the thermostate with code -70, the **external** reset button (F) must be located precisely on top the **internal** reset button (G) on the microswitch. Only in this way can the restart button be actuated from the **outside** (F).
6. Place the upper part of the housing (D) onto the lower part (E).
7. Tighten the lead-sealable cheese-head screws (H).

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



Cable relief

Procedure:

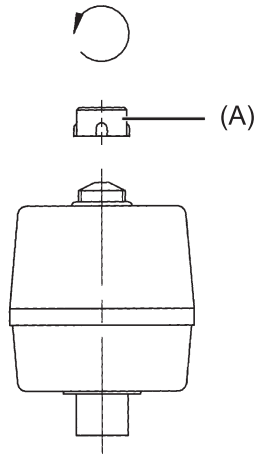
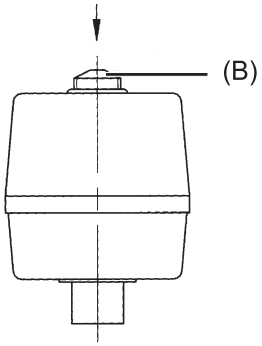
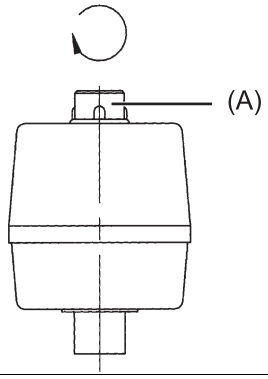


1. Turn the screw connection (A) clockwise until the cable inlet is sealed.

   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.

7.1 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.

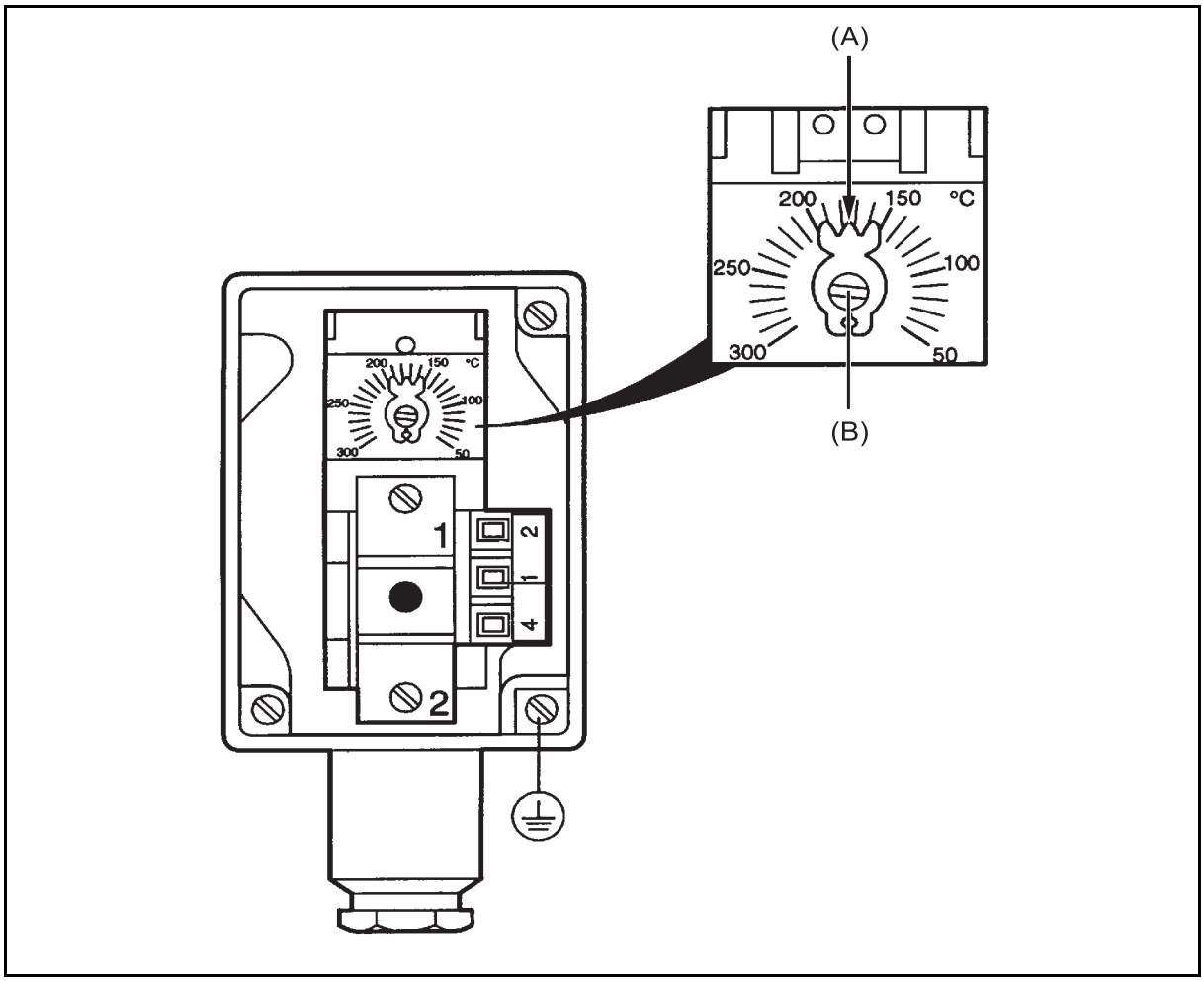
1.	2.	3.
		

Procedure:

1. Unscrew the cap nut (A).
2. Press the rest button (B) until the microswitch is reset.
3. Screw the cap nut (A) back on.

7 Startup

7.2 Limit value setting



Procedure:

1. Open the housing.
2. Set the limit value (A) on the setpoint adjuster (B) using a screw-driver.

7.3 Switching functions

Temperature monitor TW, and safety temperatur monitor STW

If the temperature on the temperature probe exceeds the setpoint value, the electrical circuit is opened or closed by a microswitch. If the temperature falls below the selected setpoint value (by the switching differential), the microswitch is reset 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 the microswitch is mechanically locked. After falling below the limit value by approx. 10 % of the temperature range (approx. 15 % of the limit value setting > +350 °C), the switch can be unlocked manually.

Use of the safety temperature monitor STW as a safety temperature limiter STB
The circuitry used with the thermostat must comply with DIN EN 14597 and VDE 0631.

Self-monitoring on the safety temperature limiter STB and the 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 no longer possible.
When the STW (STB) and STB probe cools down into the negative temperature range, the electrical circuit opens. The STB must be manually reset by hand using the reset button when the temperature rises. The reset for the STW (STB) occurs automatically.

8 Maintenance and cleaning

8.1 Maintenance

The device is maintenance-free.

8.2 Cleaning

Requirements:

- A suitable cleaning agent is available that does not attack the surface and seals.

Procedure:

1. Clean the device with a cloth lightly moistened with cleaning agent

9.1 Returns

Procedure:

1. The supplementary sheet for product returns must first be completed correctly and signed. Then enclose it with the shipping documents and attach it to the packaging, ideally on the outside.
2. Use the original packaging or a suitably secure container for sending the device.

9.2 Disposal

- Do not dispose of the device or replaced parts in the trash after use.
- Delete programs and data stored on the device.
- Remove batteries, if any, if this can be done without damaging the device.
- Dispose of the device and the packaging material in a responsible and environmentally friendly manner.
- Observe the country-specific laws and regulations for waste treatment and disposal.

In accordance with Directive 2012/19/EU on Waste from Electrical and Electronic Equipment, manufacturers are obliged to offer the option of returning waste equipment. Request the return from the manufacturer.

10 Certificates

产品组别 Product group: 603031 部件名称 Component Name	产品中有害物质的名称及含量 China EEP Hazardous Substances Information					
	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)	○	○	○	○	○	○

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.
○：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.

×：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.

JUMO GmbH & Co. KG
Street address:
Moritz-Juchheim-Straße 1
36039 Fulda, Germany
Delivery address:
Mackenrodtstraße 14
36039 Fulda, Germany
Postal address:
36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO UK LTD
JUMO House
Temple Bank, Riverway
Harlow, Essex, CM20 2DY, UK
Phone: +44 1279 63 55 33
Fax: +44 1279 62 50 29
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6724 Joy Road
East Syracuse, NY 13057, USA
Phone: +1 315 437 5866
Fax: +1 315 437 5860
Email: info.us@jumo.net
Internet: www.jumousa.com