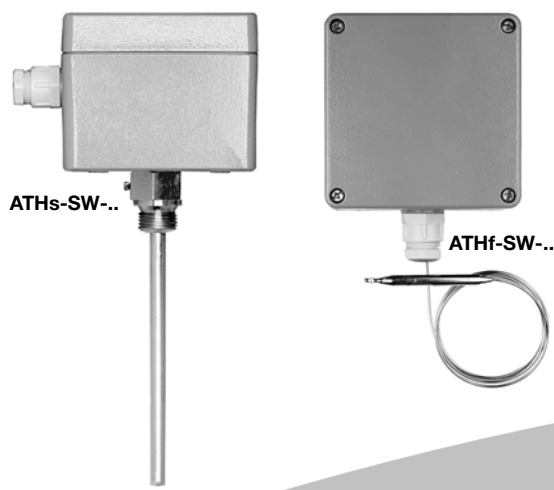


Surface-mounting Thermostats Series ATH.-SW-...



B 603035.0 Operating Instructions



V1.00/EN/00408320

- ☞ Please read these operating instructions before commissioning the instrument. Keep these operating instructions in a place which is accessible to all users at all times. Please assist us to improve these operating instructions, where necessary. Your comments will be appreciated.
Phone +49 661 6003-0
Fax +49 661 6003-607
- ☞ If any difficulties should arise during starting up, please refrain from any unauthorized manipulations or actions. The warranty will become null and void! Please contact the supplier or the head office.
- ☞ The instruments are maintenance-free. In the event of malfunction, please return the instrument to the supplier, with precise details of the fault. The staff at our field offices, branches and agencies are always available to provide service and advice.



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EU Konformitätserklärung
 EU Declaration of Conformity / Déclaration UE de conformité

Dokument-Nr. CE 207
Document No. / Document n°

Hersteller JUMO GmbH & Co. KG
Manufacturer / Fabricant

Anschrift Moritz-Juchheim-Straße 1, 36039 Fulda
Address / Adresse

Produkt Beschreibung: Aufbauthermostat ATH, ATH-SW, ATH-SE
 Typ Serie: 6030211... 6030261... 6030301... 6030351...
 Typenblatt-Nr.: 603021; 603026; 603031; 603035
Product / Produit

Wir erklären in alleiniger Verantwortung, dass das bezeichnete Produkt die Schutzanforderungen der Europäischen Richtlinien erfüllt.
 We hereby declare in sole responsibility that the designated product fulfills the safety requirements of the European directives.
 Nous déclarons sous notre seule responsabilité que le produit remplit les directives européennes.

Richtlinie
 Directive / Directive

2004/108/EG	[EMV-Richtlinie (EMC)]	bis 19.04.2016	96
2014/53/EU	[Elektronagn. Verträglichkeit (EMC)]	ab 20.04.2016	96
97/23/EG	[Druckgeräte-Richtlinie (PED)]	Mod. B+D, Kat. IV, bis 18.07.2016	02
2014/68/EU	[Druckgeräte (PED)]	Art. 13, ab 01.06.2015	02
2014/68/EU	[Druckgeräte (PED)]	Mod. B+D, Kat. IV, ab 19.07.2016	02
2006/95/EG	[Niederspannungs-Richtlinie (LVD)]	bis 19.04.2016	96
2014/35/EU	[Niederspannung (LVD)]	ab 20.04.2016	96

EU-Baumusterprüfbescheinigung
 Type examination / Tests échantillon
 IS-TAF-MUC 07 12 7377 020 (PED)

Angewendete Normen/Spezifikationen
 Standards/Specifications applied / Normes/Spécifications appliquées

EN 61326-1	Ausgabe: 2013
EN 60730-1	Ausgabe: 2011
EN 60730-2-9	Ausgabe: 2010
EN 14597	Ausgabe: 2012
AD 2000	Merblätter

Anerkante Qualitätssicherungssysteme der Produktion
 Recognized quality assurance systems used in production / Organisme notifié agréé

nach Druckgeräte-Richtlinie (PED)
 TÜV SÜD Industrie Service GmbH, Westendstraße 199, 80686 München, Germany
 Kennnummer 0036
 Identification No. 0036, N° d'identification 0036

Aussteller: Firma / Company / Société
 Issued by / Établi par: JUMO GmbH & Co. KG, Fulda
Ort, Datum: Fulda, 2015-06-01
 Place, date / Lieu, date:
Rechtsverbindliche Unterschrift
 Legally binding signature / Signature juridique valable
 Befeihaltung Verkauf
 ppa. Wolfgang Vogl

Kommanditgesellschaft, Sitz: 36039 Fulda, Amtsgericht Fulda, HRA 302 USt.-M.-Nr. DE 112411234, Persönlich haftende Gesellschafterin: M. K. JUCHHEIM GmbH, Sitz: 36039 Fulda, Amtsgericht Fulda, HRB 17, Geschäftsführer: Dipl.-Ing. Bernhard Juchheim, Dipl.-Kfm. Michael Juchheim

1. Introduction / Application

ATH-SW series surface-mounting thermostats are approved as:

- temperature monitors (TW)
- safety temperature limiters (STB)
- safety temperature monitors STW (STB)
- Type examination to:
 - DIN EN 14597
 - Pressure Equipment Directive 97/23/EC (all types, apart from ATH.-SW-2 and ATH.-SW-22)

Safety notes

Physical and toxicological properties of substances which may escape, should the system fracture:

End of scale	Dangerous reactions	Fire / explosion hazard		Water contamination	Toxicology		
		Ignition temperature °C	Explosion limit % v/v		irritant	danger to health	toxic
liquid-filled							
< +200°C	no	+355°C	0.6 - 8	yes	yes	1	no
≥ +200°C ≤ +350°C	no	+490°C	--	yes	yes	1	no
gas-filled							
≥ +400°C ≤ +500°C	no						

1 Should the measuring system fracture, the fill fluid may escape. At present, there is no restrictive statement from the health authorities concerning danger to health in the event of short-term exposure at low concentration, for example, should the measuring system fracture.

2. Instrument identification / type declaration

Type designation

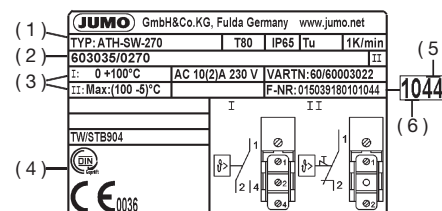
ATH . -SW /
 ATH Surface-mounting thermostat with microswitch with screw-in pocket, attached to housing (rigid stem) ("20" or "30" pockets) with capillary
 f -SW dustproof and jet-proof housing made from diecast aluminum, IP65 protection
 -2 temperature monitor (TW) with changeover contact
 -20 safety temperature monitor STW (STB), with changeover contact
 -70 safety temperature limiter (STB), with break contact and lock-out
 /au gold-plated snap-action switch contact

Types

Single thermostats	Twin thermostats
ATH.-SW-2	ATH.-SW-22
ATH.-SW-20	ATH.-SW-220
ATH.-SW-70	ATH.-SW-270
	ATH.-SW-2020
	ATH.-SW-2070
	ATH.-SW-7070

Nameplate

(prime example)



- (1) Type / max. housing temperature / protection
- (2) Order code
- (3) Control range / contact rating / sales number / serial number
- (4) Mark of approval / connection diagram
- (5) Week of production
- (6) Year of production

3. Mounting / General information

Capillary / temperature probe / protection tube

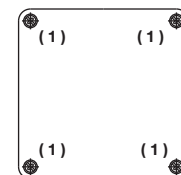
General information

- If the capillary of the surface-mounting thermostat is cut through or becomes kinked, this could result in permanent device failure!
- The minimum bending radius allowed for the capillary is 5 mm.
- The devices may be operated only with suitable pockets.
- The temperature probe must be fully immersed in the measurement medium.
- When air is the measurement medium, you must choose a process connection without a pocket.
- If 2 probes are assigned, the contact springs supplied ex works must be fitted in the pocket.
- With pockets 22, 32, 41, 42, and 45 made from St 35.8l materials, the allowed operating period at operating temperatures above 420°C is limited to 200,000 hours. Compliance with TRD 508 is essential for applications in this range.

Probe Ø	Protective tube Ø	Material (protective tube)
6 mm	8 x 0.75 mm	Brass/stainless steel
8 mm	10 x 0.75 mm	
2 x 6 mm	15 x 0.75 mm	

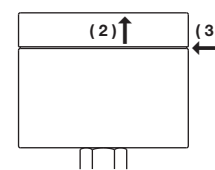
Fixing the surface-mounting thermostat

Nom. position (NL)
 to DIN 16 257,
 NL 0 ... NL 90 (other NLs on request)



Opening the housing

1. Loosen the 4 cover screws (1)
2. Remove the top of the housing (2)



☞ When re-assembling, make sure the seal is properly seated (3)!

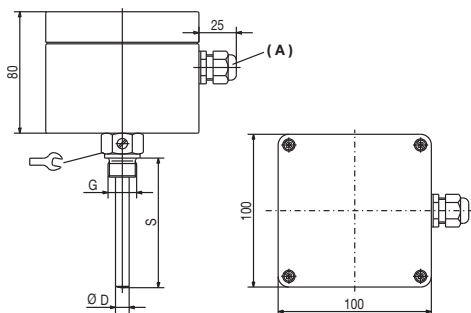
4. Dimensions

Thermostats with rigid stem ATHs-SW-..

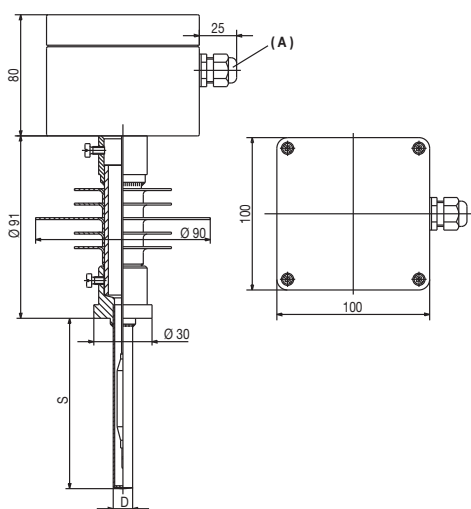
Code s (rigid stem)

The housing spigot is secured in the enlarged open end of the pocket by a fixing screw.

ATHs-SW-...
 with "20"
 protection tube



ATHs-SW-...
 with "32"
 protection tube

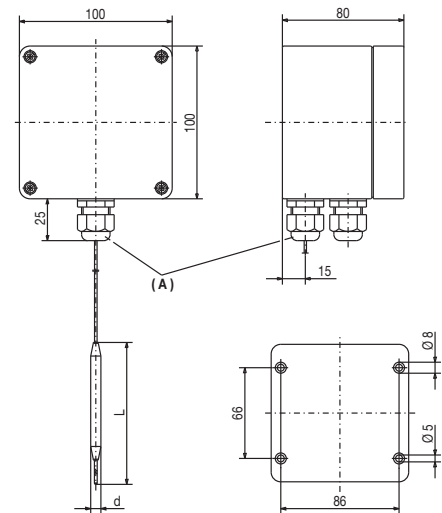


Thermostats with capillary ATHf-SW-..

Code "f" (with capillary)

Mounting bracket with 4 screws through the housing base, capillary exit at side of housing

ATHf-SW-...
 with plain
 "10" cylindrical
 probe, without
 protection tube



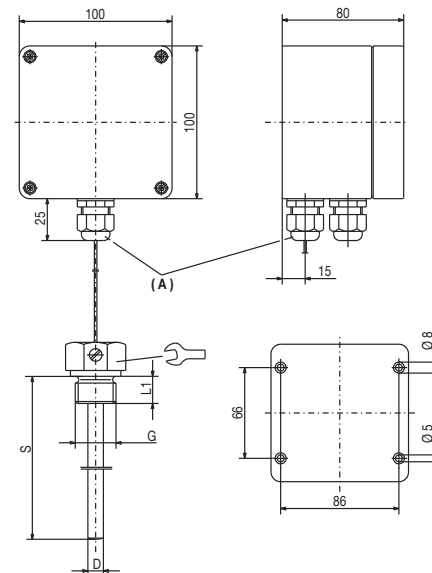
(A) Threaded coupling M 20x1.5

Thermostats with capillary ATHf-SW-..

Code "f" (with capillary)

Mounting bracket with 4 screws through the housing base, capillary exit at side of housing

ATHf-SW-...
 with "20"
 protection tube



Permissible loading on the pocket 20, 21, 30, 32, 40, 42 and 45 protection tubes

The values below refer to the maximum loading on the probe mounting concerned. The actual maximum sealable pressure depends on the mounting conditions and may possibly be lower.

Steel protection tube

Materials:
Tube: St 35.8 I
Screw-in nipple up to 300°C: 1.0038
Welding nipple: Steel 1.5415

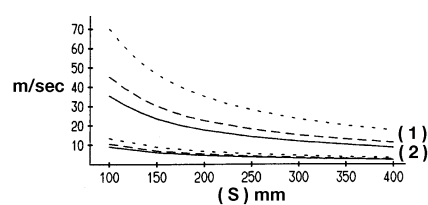
Loading

Temperature	Tube diameter "D"		
	8 x 0.75 mm or conical	10 x 0.75 mm	15 x 0.75 mm
	maximum permissible pressure		
100°C	89 bar	72 bar	48 bar
150°C	83 bar	67 bar	45 bar
200°C	78 bar	63 bar	42 bar
300°C	59 bar	47 bar	32 bar
350°C	50 bar	40 bar	27 bar

Permissible incident flow velocity

Temperature: +200°C
Heat carrier: air (1), water, oil (2)
Tube diameter "D": 8 mm, 10 mm, 15 mm

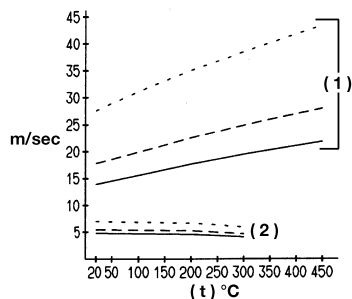
Permissible incident flow velocity (m/sec) at maximum permitted pressure loading and different immersion tube lengths (S).



The values below refer to the maximum loading on the probe mounting concerned. The actual maximum sealable pressure depends on the mounting conditions and may possibly be lower.

Immersion tube length 200 mm:
Material: steel
Temperature: +200°C
Heat carrier: air (1), water, oil (2)
Tube diameter "D": 8 mm, 10 mm, 15 mm

Permissible incident flow velocity (m/sec) at maximum permitted pressure loading and different immersion tube temperatures (t).



Protection tube

Temperature	Tube and nipple: X 6 CrNiMoTi 17 122		
	Tube diameter "D"		
	8 x 0.75 mm or conical	10 x 0.75 mm	15 x 0.75 mm
	maximum permissible pressure		
100°C	92 bar	74 bar	50 bar
150°C	88 bar	71 bar	48 bar
200°C	83 bar	67 bar	45 bar
300°C	72 bar	58 bar	39 bar
400°C	67 bar	54 bar	36 bar
Temperature	Tube and nipple: CuZn		
	Tube diameter "D"		
	8 x 0.75 mm	10 x 0.75 mm	15 x 0.75 mm
	maximum permissible pressure		
100°C	50 bar	40 bar	27 bar
150°C	48 bar	39 bar	26 bar

- permissible incident flow velocity: on request -

Approved temperature probes, screw-connections and protection tubes

see data sheet 606710	
Temperature probes	10 and 15
Screw-connections	50, 52, 54, 60 and 65
protection tubes	20, 21, 22, 30, 31, 32, 40, 41, 42, 45 and 46

5. Installation

Regulations and notes

- The electrical connection must only be carried out by qualified personnel.
- The choice of cable, the installation and the electrical connection must conform to the requirements of VDE 0100 "Regulations on the Installation of Power Circuits with Nominal Voltages below 1000 V" and the appropriate local regulations.
- If contact with live parts is possible when working on the device, it must be completely disconnected from the electrical supply.
- Ground the instrument to the protective earth at the PE terminal. The cross-section of this cable must be at least the same as that of the supply cables. Wire the grounding conductors in a star configuration to a common earth point that is connected to the PE conductor of the electrical supply. Do not loop the grounding cables, that is, do not run them from one instrument to another.
- Apart from faulty installation, incorrect settings on the thermostat may also adversely affect the proper functioning of the subsequent process or cause other damage. It should only be possible for qualified personnel to make these settings. Please observe the relevant safety regulations for such matters.

Electrical connection

The instrument complies to Protection

- Remove safety protection.
- Pass the connection cable (cable diameter 5 to 10 mm) through the compression gland (A). Screw connection up to 2.5 mm² conductor cross-section.
- Make the connection to the terminals (1, 2 and 4), as shown in the relevant connection diagram.
- Connect the protective earth conductor to terminal "PE".
- Replace the safety protection.
- The reset button (B) on the STB must be free to move.

Class I.

The connection is suitable for fixed wiring. Cable entry is without fixed strain relief. Attachment type "X" (no special tools).

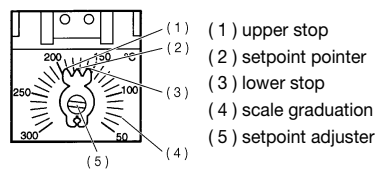
Cu capillary tube with PE function

With CrNi capillary tubes it is the user's responsibility to provide the requisite protective measures against electric shock.

6. Setpoint and limit setting

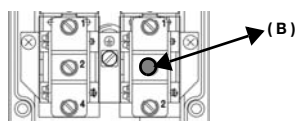
TW, STW (STB) and STB

- Open the housing
- Use a screwdriver to set the limit on the setpoint adjuster (5).
- Close the housing



Resetting the STB

Once the temperature has fallen below the set limit (safe temperature limit) by about 10% of the scale range, the microswitch can be reset.



- Open the housing
- Press the reset button (B) until the microswitch is reset.
- Close the housing

Self-monitoring

Response to a fracture of the measuring system

With the STB and STW (STB), a fracture of the measuring system (leaking) causes the circuit to stay open permanently. With the STB, the microswitch is also locked.

Response to low temperature

The electrical circuit opens when cooling the probe of STW (STB) and STB down to the negative temperature range, but it then closes again if the temperature rises. The STB must be unlocked manually if the minimum probe temperature is exceeded. The STW (STB) unlocks itself automatically.

Using the STW (STB) as an STB

The required lock-out facility must be ensured by the subsequent circuit. This circuit must comply with VDE 0116.

7. Technical data

Mode of operation to EN 60730-1, EN 60730-2-9 and EN 14597

TW 2 BL
STW (STB) 2 BKLNP
STB 2 BFHKLNPV

Permissible ambient temperature during use

At high-voltage line and switch head: see type plate specification
At probe: max. setpoint value +25 K or +15%

Permissible storage temperature: max. 50°C, min. -50°C

Switching point accuracy: Switching point accuracy in % of the control / limit value range

TW: in the upper third of the scale ± 1.5%, at scale beginning ± 6%

STB, STW (STB): in the upper third of the scale +0/-5%, at scale beginning +0/-10%

Probe mountings 50, 52 and 54

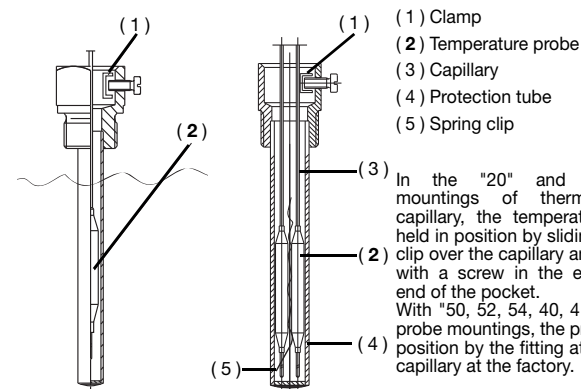
(probe in direct contact with medium)

Probe material	Nipple material		
	Copper (CuZn)	Steel (St)	Stainless steel (CrNi)
	Max. temperature		
	200°C	300°C	400°C
	Ø mm		Device function
		TW	STB, STW (STB)
Cu-DHP	4	6 bar	2 bar
	5	5 bar	
	6	4 bar	
	7	3 bar	
	8	3 bar	
	9	3 bar	
10	3 bar		
1.4571; St 35	4 - 10	10 bar	2 bar

Process connections 10, 15, 21, 31, 60 and 65 must only be used in unpressurized media.

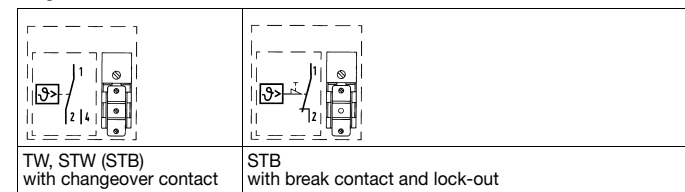
Mounting the probe

The temperature probe (2) must be fully immersed in the medium, otherwise there will be appreciable variations in the switching point.

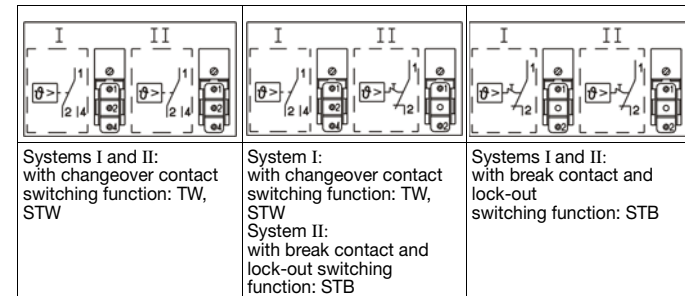


Connection diagrams

Single thermostats



Twin thermostat



Closing the housing

- Check that the plastic seal (3) in the housing base (2) is correctly seated.
- Place the top of the housing (2) onto the base (4).
- Tighten the cover screws (1).

Mean ambient temperature effect

as % of scale range, relative to limit value. If the ambient temperature at the thermostat head housing and / or the capillary deviates from the calibration ambient temperature value of +22°C in, this shifts 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	
TW	STB/STW (STB)	TW	STB/STW (STB)
Effect on the thermostat head			
0.08% per °C	0.17% per °C	0.06% per °C	0.13% per °C
Effect on capillary per meter			
0.047% per °C	0.054% per °C	0.09% per °C	0.11% per °C
Surface-mounting thermostats with end of scale			
≥ +350°C ≤ +500°C			
TW		STB/STW (STB)	
Effect on the thermostat head			
0.14% per °C		0.12% per °C	
Effect on capillary per meter			
0.04% per °C		0.03% per °C	

Maximum permissible contact rating (additional info to details on nameplate)

230 V AC +10%, 10(2) A, cos φ = 1(0.6)
230 V DC +10%, 0.25 A or
230 V AC +10%, 6(1.2) A, cos φ = 1(0.6)
for gold-plated microswitch, code /au
24 V AC/DC, 0.1 A

Contact reliability

To ensure maximum switching reliability, we recommend a minimum loading of: 24 V AC/DC, 20 mA for silver contacts (standard)
10 V AC/DC, 10 mA for gold-plated contacts (code /au)

Rated surge voltage

2500 V

Overvoltage category II

For required fusing, see maximum switching current

Operating medium

Water, oil, air, superheated steam

Time constant t _{0.632}	in water	in oil	in air / superheated steam
		≤ 45 s	≤ 60 s

Enclosure protection

EN 60 529 - IP 65, use under normal conditions