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Panel-Mounted Thermostats ETH

Special features

- Self-monitoring (STB/STW [STB]) and safety cut-out (STB/STW [STB]) in the event of a pressure drop
- Version according to DIN EN 14597 and to Pressure Equipment Directive 2014/68/EU
- Microswitch

Brief description

Panel-mounted thermostats ETH monitor thermal processes. The devices are available as safety-temperature monitors STW (STB) and safety temperature limiters STB. In the event of a malfunction, the STB switches the monitored machine to a safe operating status.

Panel-mounted thermostats operate according to the fluid expansion principle. A microswitch is used as an electrical switching element.

Switching functions

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 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 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 STW (STB) and STB sensors cools down to the negative temperature range, the circuit opens, but must be unlocked manually by the reclosing button when the temperature rises. The STW (STB) restarts automatically.



ETH-20 (Type 602010/20-...)



ETH-70 (Type 602010/70-...)

Approvals and approval marks (see technical data)



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Technical data

Control ranges and temperature probes

| Switching function | Liquid-filled | | | | |
|--------------------|----------------------------------|---|-----------------------------|--|-----|
| | Control/limit value ranges °C | Max. admissible excessive probe temperature °C | Max. capillary length mm | Length of the temperature probe Probe-Ø „d“ = 6 mm ^a mm | |
| | | | | Ø 6 | Ø 8 |
| STW, STB | 30 to 110 | 135 | 5,000 | 108 | 75 |
| | 60 to 130 | 150 | | 116 | 79 |
| | 20 to 150 | 175 | | 77 | 60 |
| | 50 to 250 | 290 | | 64 | 49 |
| | 50 to 300 | 345 | | 55 | - |

| STW, STB | Gas-filled | | | | |
|----------|------------|-----|-------|-----|-----|
| | 20 to 400 | 460 | 1,000 | 176 | 106 |
| | 20 to 500 | 575 | 2,000 | 127 | 81 |
| | 20 to 500 | 575 | 4,000 | 202 | 119 |

^a Standard

Capillary and temperature probe

| Type | Scale limit value | Capillary | Temperature probe |
|--------------------------------------|--|--|--|
| ETH... | up to 200 °C | Copper (Cu), Ø 1.5 mm, material no. 2.0090 | Copper (Cu), material no. 2.0090, hard soldered |
| | up to 350 °C | Copper (Cu), Ø 1.5 mm, material no. 2.0090 | Stainless steel (CrNi), Ø 1.5 mm, material no. 1.4571 |
| | up to 500 °C | Stainless steel (CrNi), Ø 1.5 mm | Stainless steel (CrNi), Ø 1.5 mm, material no. 1.4571 |
| | up to 350 °C | Stainless steel (CrNi), Ø 1.5 mm | Stainless steel (CrNi), Ø 1.5 mm, material no. 1.4571 (extra cost) |
| Capillary length | Standard length: 1,000 mm, max. 5,000 mm | | |
| Min. bending radius of the capillary | 5 mm | | |

Electrical data

| Switching function | STW (-20) | STB (-70) | STB (-70/U) |
|--|---|--|---|
| | Microswitch with changeover contact | Microswitch with NC contact and restart lock | Microswitch with NC contact, restart lock and additional signal contact |
| Max. switching capacity with switching differential 2 % | AC 230 V +10 %, 10 (2) ^a A, cos φ = 1 (0.6) ^a , DC 230 V +10 %, 0.25 A | | |
| | AC 230 V +10 %, 6 (1.2) ^a A, cos φ = 1 (0.6) ^a | - | - |
| | Microswitch with gold-plated contacts, extra code 702, AC/DC 24 V, 0.1 A, contact resistance 2.5 to 10 mΩ | | |

^a Inductive loads

| | |
|---|---|
| Contact reliability with silver contacts with gold-plated contacts (extra code 702) | To ensure a high switching reliability, we recommend a minimum load of: AC/DC = 24 V, 100 mA AC/DC = 10 V, 5 mA |
|---|---|

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Environmental influences

| Switching differential in % from the control/limit value range | Nominal value | Poss. actual value | Nominal value | Poss. actual value | |
|---|--|--------------------|-------------------|--------------------|-------------------|
| | Liquid-filled | | Gas-filled | | |
| Switching function STW, STB | 5 | 4 max. 6 | 7 | 5 max. 12 | (Standard) |
| | 9 | 8 max. 11 | 9 | 8 max. 16 | (upon request) |
| | 2 | 1 max. 3 | 2 | 1.5 max. 3 | (extra cost) |
| Switching point accuracy in % of the control/limit value range | In the upper third of the scale 0/-5 %, at scale beginning 0/-10 % | | | | |
| Ambient temperature influence | Based on 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 | | | | |
| Panel-mounted thermostats with scale limit value | < 200 °C | | ≥ 200 °C ≤ 350 °C | | > 350 °C ≤ 500 °C |
| Influence on the switching head | 0.17 %/K | | 0.13 %/K | | 0.12 %/K |
| Influence on the capillary per meter | 0.054 %/K | | 0.11 %/K | | 0.03 %/K |
| Admissible storage temperature | -50 to +80 °C or up to max. admissible ambient temperature, see nameplate | | | | |
| Admissible ambient temperature during use | See nameplate | | | | |
| Rated position (NL) | Any | | | | |

Switching head

| | |
|-----------------------|---|
| Material | |
| Chassis | Sheet steel, galvanized |
| Fastening | 2 M3 screws, spacing 22 mm |
| Scale range | 250° |
| Electrical connection | Screw connection up to 2.5 mm ² conductor cross section |
| Limit value setting | The limit value can be adjusted with a screwdriver on the adjustment spindle before installation. |
| Protection type | IP00, according to DIN EN 60529 |
| Weight | Approx. 200 g |

Process connection

| | |
|-------------------------|---|
| Type ETH with capillary | Process connection 10: Plain cylindrical probe (standard) Process connection 20: Screw-in thermowell (upon request) Screw-in sleeve with screw-in spigot G 1/2, form A, according to DIN 3852/2, and clamping piece with fixing screw to lock the probe |
| Material | Up to 150 °C: CuZn, nickel-plated (standard) Over 150 °C: CrNi |
| Fitting length | Standard lengths: 100, 120, 150, 200 or 300 mm (other lengths upon request) |
| Immersion tube Ø | D = 8 mm |

⇒ For different process connections and thermowells refer to data sheet 606710.

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Approvals and approval marks

| | |
|---|---|
| DIN Testing agency Certificates/certification numbers Inspection basis Valid for | DIN CERTCO/TÜV Süd STW(STB)799S DIN EN 14597 ETH-20 (Type 602010/20 [STW (STB)]) |
| DIN Testing agency Certificates/certification numbers Inspection basis Valid for | DIN CERTCO/TÜV Süd STB800 DIN EN 14597 ETH-70 (Type 602010/70 [STB]) |
| 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 ETH-20 (Type 602010/20 [STW]), ETH-70 (Type 602010/70 [STB]) |
| EAC ^a Testing agency Certificates/certification numbers Inspection basis Valid for | GOST Norm AG 0198420 TR ZU 004/2011 (LVD) ETH (Type 602010) |

^a Russian documentation upon request.

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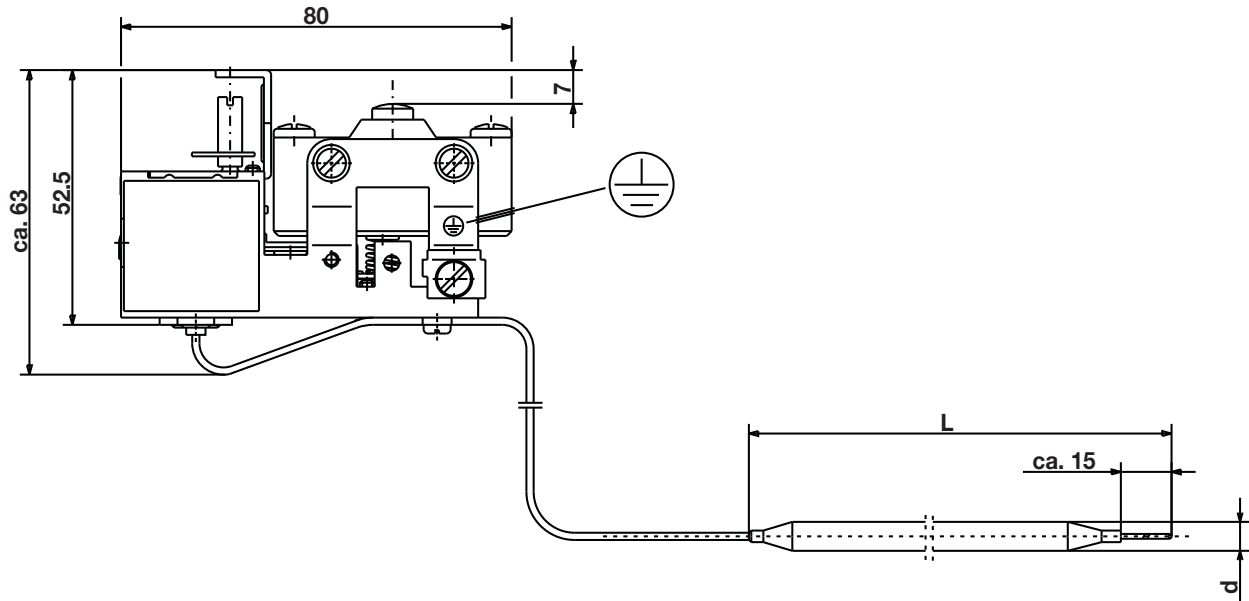
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Dimensions

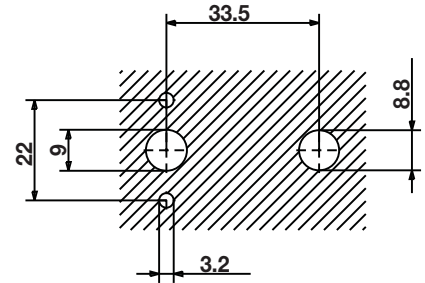
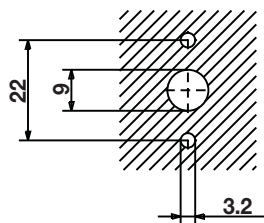
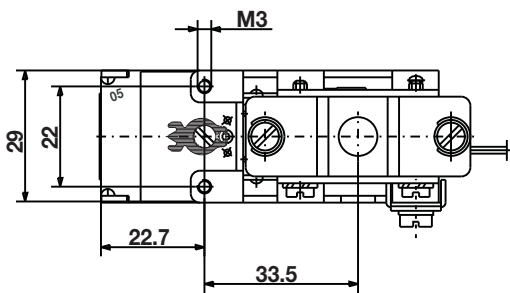
ETH-70 (Type 602010/70)

Process connection plain cylindrical probe, without thermowell



ETH-20 (Type 602010/20)

ETH-70 (Type 602010/70)



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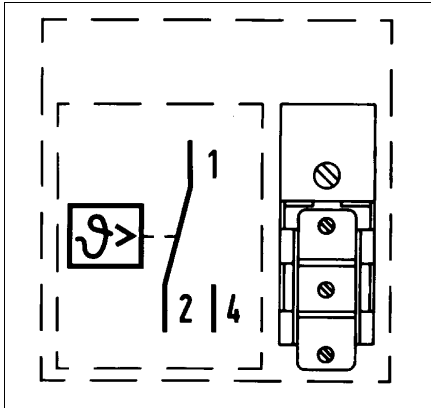
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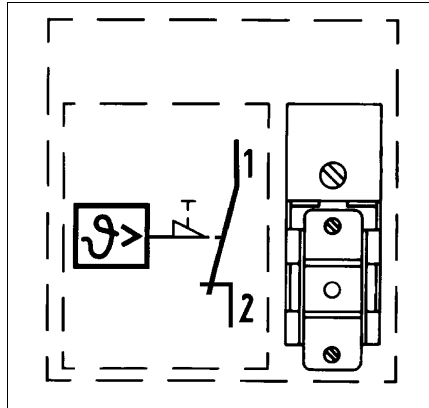
Connection diagram

The connection diagram in the data sheet provides information on product selection.

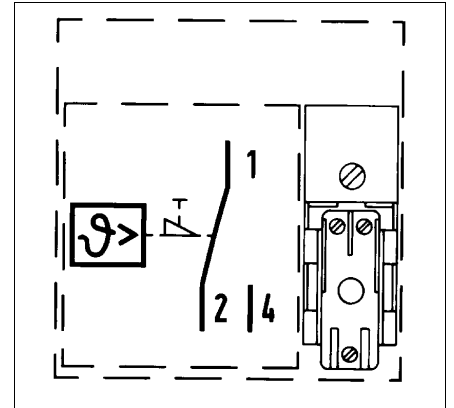
For the electrical connection, only use the installation instructions or the operating manual.



ETH-20 (Type 602010/20)
 with changeover contact



ETH-70 (Type 602010/70)
 with NC contact, and restart lock



ETH-70 (Type 602010/70)
 with NC contact, restart lock, and additional
 signal contact

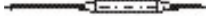
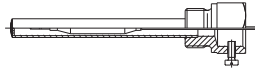
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Order details

| | | |
|--------|---|---|
| | (1) Basic type | |
| 602010 | Panel-mounted thermostats ETH | |
| | (2) Basic type extension | |
| 20 | ETH-20 Safety temperature monitor (STW) | |
| 70 | ETH-70 Safety temperature limiter (STB) | |
| | (3) Control range | |
| 043 | 20 to 150 °C | |
| 045 | 20 to 400 °C | |
| 046 | 20 to 500 °C | |
| 052 | 30 to 110 °C | |
| 063 | 50 to 250 °C | |
| 064 | 50 to 300 °C | |
| 066 | 60 to 130 °C | |
| | (4) Switching differential | |
| 00 | None | |
| 20 | 2 % | |
| 50 | 5 % | |
| 70 | 7 % | |
| 90 | 9 % | |
| | (5) Capillary length | |
| 1000 | 1,000 mm | |
| 2000 | 2,000 mm | |
| 3000 | 3,000 mm | |
| 4000 | 4,000 mm | |
| 5000 | 5,000 mm | |
| | (6) Capillary material Fernleitung | |
| 20 | CrNi (stainless steel) | |
| 40 | Cu (copper) | |
| | (7) Process connection | |
| 10 | Plain cylindrical probe |  |
| 20 | Screw-in thermowell |  |
| | (8) Process connection thread | |
| 00 | None | |
| 13 | G 1/2 | |
| | (9) Process connection material | |
| 00 | None | |
| 20 | CrNi (stainless steel) | |
| 46 | CuZn (brass) | |
| | (10) Insertion length | |
| 000 | Without thermowell | |
| 100 | 100 mm | |
| 120 | 120 mm | |
| 150 | 150 mm | |
| 200 | 200 mm | |
| 300 | 300 mm | |

