



# ENAPART



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# JUMO exTHERM-AT

## Explosion-proof surface-mounted thermostat for zones 1, 2, 21, and 22

### Special features

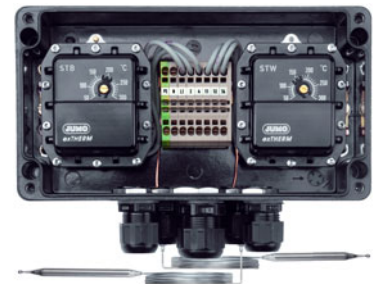
- Single thermostat and double thermostat with capillary or rigid thermowell
- Switching capacity up to 25 A
- Admissible ambient temperatures -55 to +70 °C (standard -40 to +70 °C)
- Thermowell for use in zone 0 available as an accessory
- Quick and safer electrical connection through Push-In® terminal technology
- Stable switching points through standard ambient temperature compensation

### Brief description

The explosion-proof surface-mounted thermostats of the JUMO exTHERM series are built to monitor and control temperatures in potentially explosive areas. The use in environments with gas and steam is permitted (zones 1 and 2); use in environments with conductive dust (zones 21 and 22) is also permitted.

The JUMO exTHERM-AT is available as temperature monitor TW, safety temperature monitor (STW), and safety temperature limiter (STB). The thermostats work according to the liquid expansion or gas expansion principle. The electrical switching element is a pressure-resistant encapsulated thermostat with a snap-action switch. Stable switching points when ambient temperatures fluctuate are made possible by the standard ambient temperature compensation.

The thermostats of the JUMO exTHERM-AT series are RoHS conform and cadmium free.



JUMO exTHERM-AT double thermostat



JUMO exTHERM-AT single thermostat

Version according to DIN EN 14597:

|            |                            |
|------------|----------------------------|
| <b>TW</b>  | Temperature monitor        |
| <b>STW</b> | Safety temperature monitor |
| <b>STB</b> | Safety temperature limiter |

#### ATEX mark

|  |  |
|--|--|
|  | <b>II 2G Ex db eb IIC T4/T5/T6 Gb</b><br>For explosive gas atmosphere              |
|  | <b>II 2D Ex tb IIIC T85 °C/T100 °C/T130 °C Db</b><br>For explosive dust atmosphere |

#### IECEx mark

|  |  |
|--|--|
|  | <b>Ex db eb IIC T4/T5/T6 Gb</b><br>For explosive gas atmosphere              |
|  | <b>Ex tb IIIC T85 °C/T100 °C/T130 °C Db</b><br>For explosive dust atmosphere |

#### Test certificate ATEX

EPS 11 ATEX 1 354

#### Test certificate IECEx

IECEx EPS 13.0046

#### Test certificate EAC-Ex

RU C-DE.HB07.B.00057/20

#### Test certificate SIL

EPS 11 ATEX 1 354 (SIL 2)

### Approvals and approval marks (see technical data)



\* Available with extra code (TZ 240)

\*\* Available with extra code (TZ 372)

\*\*\* Available with extra code (TZ 073)

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## Technical data

### Switching functions

| Temperature monitor TW and safety temperature monitor STW   | Restart lock for the safety temperature limiter STB   | Self-monitoring for the safety temperature monitor STW and safety temperature limiter STB   |
|---|---|---|
| <p>If the temperature on the temperature probe exceeds the setpoint value, the microswitch is activated by the transmission mechanics and the electrical circuit is opened or closed.</p> <p>If the temperature falls below the selected setpoint value (by the amount of the switching differential), the microswitch is reset to its initial position</p> | <p>If the temperature on the temperature probe exceeds the set limit value, the electrical circuit is opened and the microswitch is mechanically locked.</p> <p>The microswitch can be manually unlocked once the dangerous temperature of the setpoint value drops by approx. 20 % of the scale range.</p> | <p>If the measuring system is destroyed (i.e. if the expansion fluid escapes) the pressure in the membrane of the STB and STW drops and permanently opens the electrical circuit. Unlocking is then no longer possible.</p> <p>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.</p> <p>The STW unlocks itself automatically.</p> |

### Temperature compensation

When the ambient temperature on the switching head and the capillary deviates – from the calibration ambient temperature of 22 °C – a switching point offset occurs. This switching point offset is reduced to a minimum due to the temperature compensation.

### Housing

|                           |   |
|---------------------------|---|
| Material                  | Polyester case, glass fiber reinforced, black (option: stainless steel)<br>Due to the conductive soot-doped surface with a low surface resistance, static charging is not possible. |
| Protection type           | EN 60529 - IP65 (polyester case), pollution level 2, IP 66 with extra code 861  |
| Setpoint value adjustment | With screwdriver (once the case lid has been removed)   |
| Switching head fastening  | Using four screws (once the case lid has been removed)  |
| Weight                    | Approx. 1200 g single thermostat/approx. 2000 g double thermostat   |
| Cable inlet               | Ex cable gland M20 × 1.5, sealing area 6 to 13 mm<br>and Ex cable gland M25 × 1.5, sealing area 7 to 17 mm  |

### Process connection

|                                |  |
|--------------------------------|--|
| JUMO exTHERM-AT with capillary | Plain cylindrical probe (standard), rigid thermowell, spiral probe for room thermostat version |
|--------------------------------|--|

### Accessories

|                 |   |
|-----------------|---|
| JUMO exTHERM-AT | Multi-section standard thermowells made out of CrNi for use in zones 1, 2, 21, 22 (see data sheet 606710)<br>Multi-section thermowells made out of CrNi for use in zone separation 0/1, 20/21 (see new data sheet 605057) |
|-----------------|---|

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## Operating data

|  |  |
|--|--|
| Medium ambient temperature influence   | When the ambient temperature on the switching head and/or the capillary deviates from the calibration ambient temperature of 22 °C, a switching point offset occurs.<br><br>Higher ambient temperature = lower switching point<br>Lower ambient temperature = higher switching point |
| Admissible storage temperature/<br>admissible ambient temperature<br>when in use | -40 °C, optionally -60 to +70 °C<br>(referring to T4, at 25 A max. 55 °C)  |
| Max. probe temperature   | +15 % of the limit value/max. adjustment value or 25 K   |
| Rated position (NL)  | According to DIN 16257, NL 0 to NL 90  |

## Electrical data

|                         |  |   |
|-------------------------|--|---|
| Max. switching capacity | Selectable on the N/C contact (contact deck 1-2):  |   |
|                         | AC 400 V +10 %, 16 A   |   |
|                         | AC 230 V +10 %, 16 (2.5) A, $\cos \varphi = 1 (0.6)^a$   |   |
|                         | AC 230 V +10 %, 25 (4) A, $\cos \varphi = 1 (0.6)$   |   |
|                         | DC 230 V +10 %, 0.25 A   |   |
|                         | Selectable on the N/O contact (contact deck 1-4):  |   |
|                         | TW, STW  | STB   |
|                         | AC 400 V +10 %, 6.3 A  | AC 400 V +10 %, 2 A                                   |
|                         | AC 230 V +10 %, 6.3 (2.5) A, $\cos \varphi = 1 (0.6)^a$  | AC 230 V +10 %, 2 (0.4) A, $\cos \varphi = 1 (0.6)^a$ |
|                         | AC 230 V +10 %, 2 (0.4) A, $\cos \varphi = 1 (0.6)$  | AC 230 V +10 %, 2 (0.4) A, $\cos \varphi = 1 (0.6)$   |
| DC 230 V +10 %, 0.25 A  | AC 230 V +10 %, 0.25 A   |   |
|                         | Snap-action switch, gold-plated AC/DC = 24 V, 0.1 A  |   |
| Min. switching capacity | To ensure the greatest possible switching reliability we recommend a minimum load of:<br>AC/DC = 24 V, 100 mA for silver contacts<br>AC/DC = 10 V, 5 mA for gold-plated contacts |   |

<sup>a</sup> standard

## Capillary and temperature probe

| Type                     | Capillary Ø 1.5 mm            | Temperature probe                     |
|--------------------------|-------------------------------|---------------------------------------|
| JUMO exTHERM-AT          | Stainless steel (CrNi) 1.4571 | Stainless steel (CrNi) 1.4571, welded |
| Capillary length         | Max. 5000 mm                  |                                       |
| Capillary bending radius | ≥ 5 mm                        |                                       |

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## Control ranges and probe table

| Control range | Max. capillary length | Probe length „L“ |             |                |             |     |
|---------------|-----------------------|------------------|-------------|----------------|-------------|-----|
|               |                       | For „d“ = 4 mm   |             | For „d“ = 6 mm |             |     |
|               |                       | TW               | STW, STB    | TW             | STW         | STB |
| in °C         | in mm                 | Hysteresis       |             |                |             |     |
|               |                       | Approx. 2.5 %    | Approx. 7 % | Approx. 2.5 %  | Approx. 7 % | -   |
| -20 to +50    | 5000                  | -                | -           | 138            | 81          | 81  |
| 0 to 120      | 5000                  | 203              | 115         | 90             | 65          | 65  |
| 0 to 190      | 5000                  | 136              | 79          | 71             | 52          | -   |
| 60 to 300     | 3000                  | -                | -           | -              | 155         | -   |
| 20 to 500     | 5000                  | -                | -           | 278            | -           | -   |
| 140 to 500    | 5000                  | -                | -           | -              | 133         | 133 |
| 70 to 190     | 5000                  | -                | 99          | -              | 59          | 59  |
| 20 to 400     | 3000                  | -                | -           | 155            | -           | -   |
| 150 to 300    | 3000                  | -                | -           | -              | -           | 155 |

## Switching point tolerance in the middle section of the scale

| Control range             | TW      | STW upward adjustment | STW downward adjustment | STB    |
|---------------------------|---------|-----------------------|-------------------------|--------|
| in °C                     | in K    | in K                  | in K                    | in K   |
| -20 to +40 (spiral probe) | +2/-2   | -                     | -                       | -      |
| -20 to +50                | +3/-3   | +0/-5                 | +5/-0                   | -      |
| 0 to 120                  | +5/-5   | +0/-10                | +10/-0                  | +0/-10 |
| 0 to 190                  | +8/-8   | +0/-16                | +16/-0                  | -      |
| 70 to 190                 | -       | +0/-16                | +16/-0                  | +0/-16 |
| 130 to 190                | -       | -                     | -                       | +0/-16 |
| 20 to 400                 | +18/-18 | -                     | -                       | -      |
| 60 to 300                 | -       | +0/-36                | +36/-0                  | -      |
| 150 to 300                | -       | -                     | -                       | +0/-36 |
| 140 to 500                | -       | +0/-44                | +44/-0                  | +0/-44 |
| 20 to 500                 | +22/-22 | -                     | -                       | -      |

Temperature monitors (TW) and safety temperature monitors (STW) are adjusted ascendingly in the middle section of the scale as standard procedure. Safety temperature limiters (STB) are adjusted in the upper section of the scale. Special adjustments are possible upon request.

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## Approvals and approval marks

|   |  |
|---|--|
| <b>ATEX</b><br>Testing agency<br>Certificate/certification numbers<br>Inspection basis<br>Valid for               | Bureau Veritas<br>EPS 11 ATEX 1 354<br>EN IEC 60079-0, EN 60079-1, EN IEC 60079-7, EN 60079-26, EN 60079-31, EN 50495,<br>EN ISO 80079-37<br>Type 605055/... |
| <b>IECEX</b><br>Testing agency<br>Certificate/certification numbers<br>Inspection basis<br>Valid for              | Bureau Veritas<br>IECEx EPS 13.0046<br>IEC 60079-0, IEC 60079-1, IEC 60079-31, IEC 60079-7<br>Type 605055/... with extra code 372                            |
| <b>EAC-Ex<sup>a</sup></b><br>Testing agency<br>Certificate/certification numbers<br>Inspection basis<br>Valid for | Profitext Limited Liability Company, Moscow<br>RU C-DE.HB07.B00057/20<br>TR ZU 012/2011 (Ex)<br>Typ 605055/... with extra code 240                           |
| <b>UA TR</b><br>Testing agency<br>Certificate/certification numbers<br>Inspection basis<br>Valid for              | SERTIS-CENTER<br>CLJ 21.0635<br>DSTU EN 60079-0, DSTU EN 60079-1, DSTU EN 60079-7, DSTU EN 60079-31<br>Type 605055/...                                       |
| <b>SIL</b><br>Testing agency<br>Certificate/certification numbers<br>Inspection basis<br>Valid for                | Bureau Veritas<br>EPS 11 ATEX 1 354<br>DIN EN 50495<br>Type 605055/... with extra code 073   |

<sup>a</sup> Russian documentation on request

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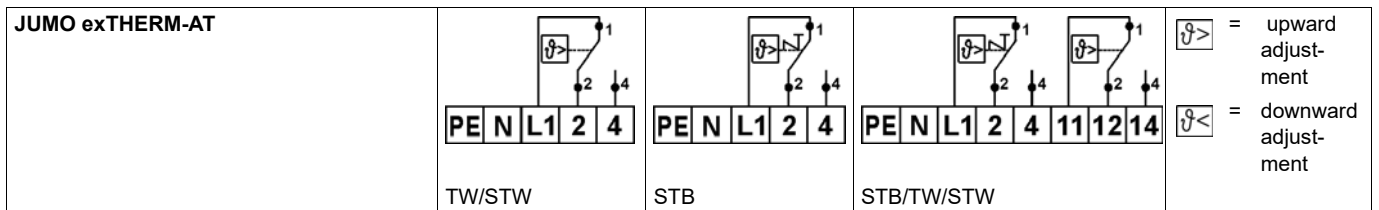
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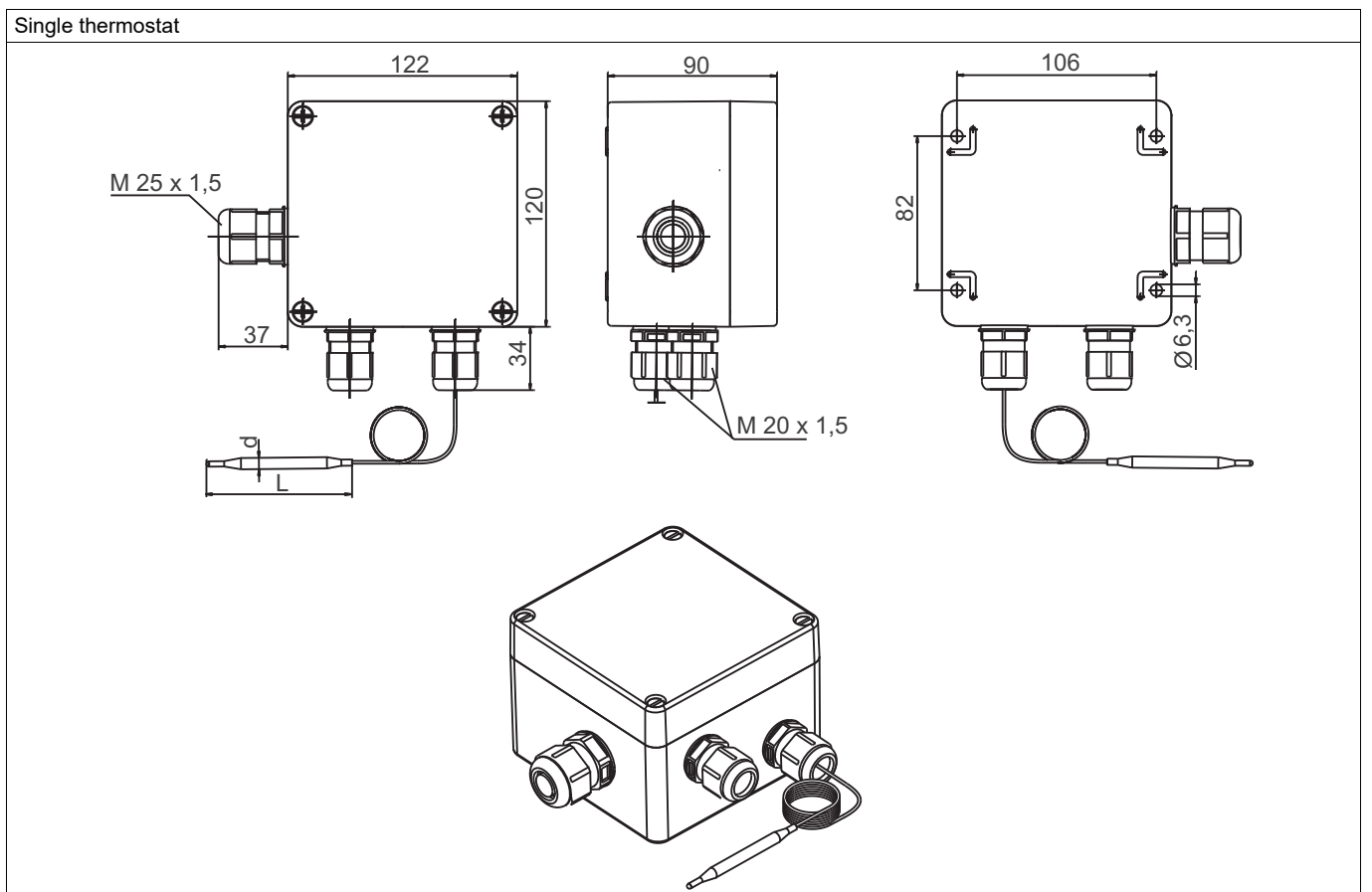


## Connection diagram

The connection diagram in the data sheet provides preliminary information about the connection options. For the electrical connection, only use the installation instructions or the operating manual. The knowledge and the correct technical compliance with the safety information and warnings contained in these documents are mandatory for mounting, electrical connection, and startup as well as for safety during operation.



## Dimensions



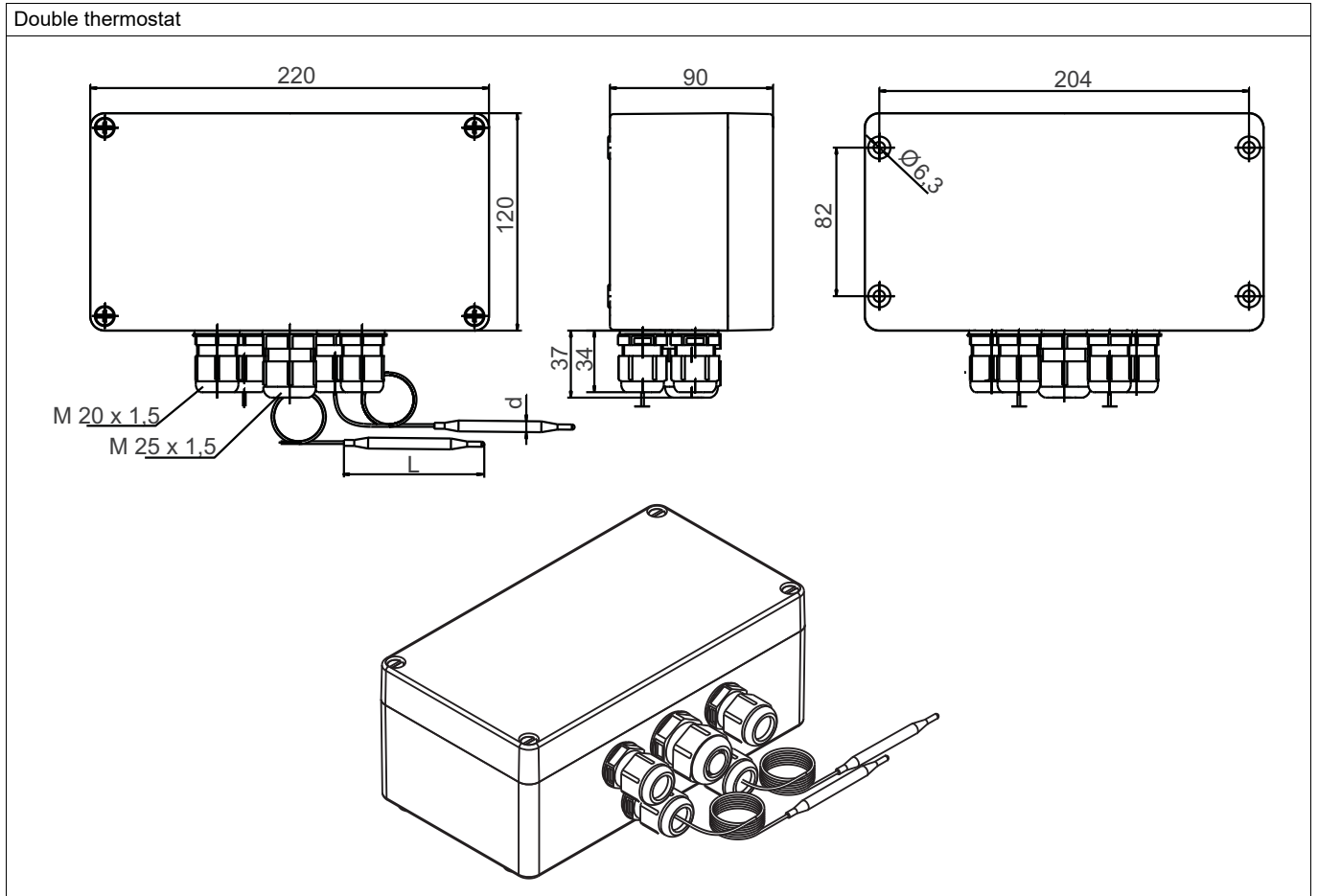
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Double thermostat





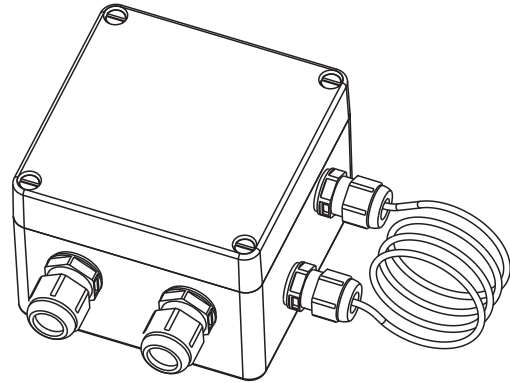
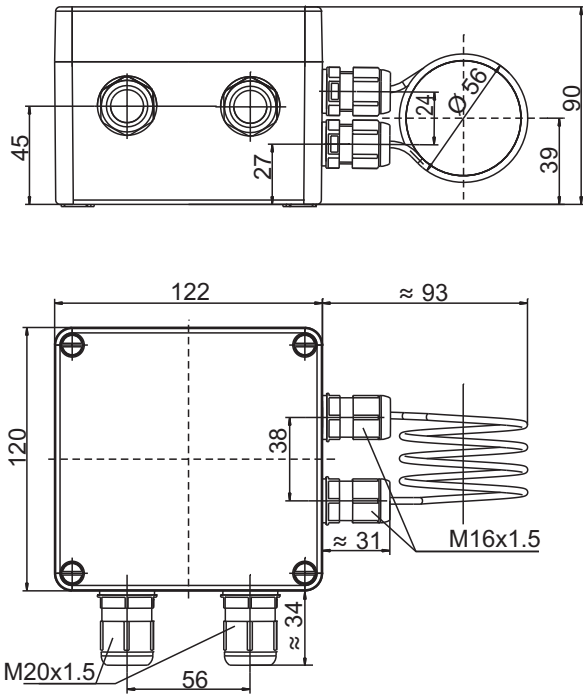
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Room thermostat



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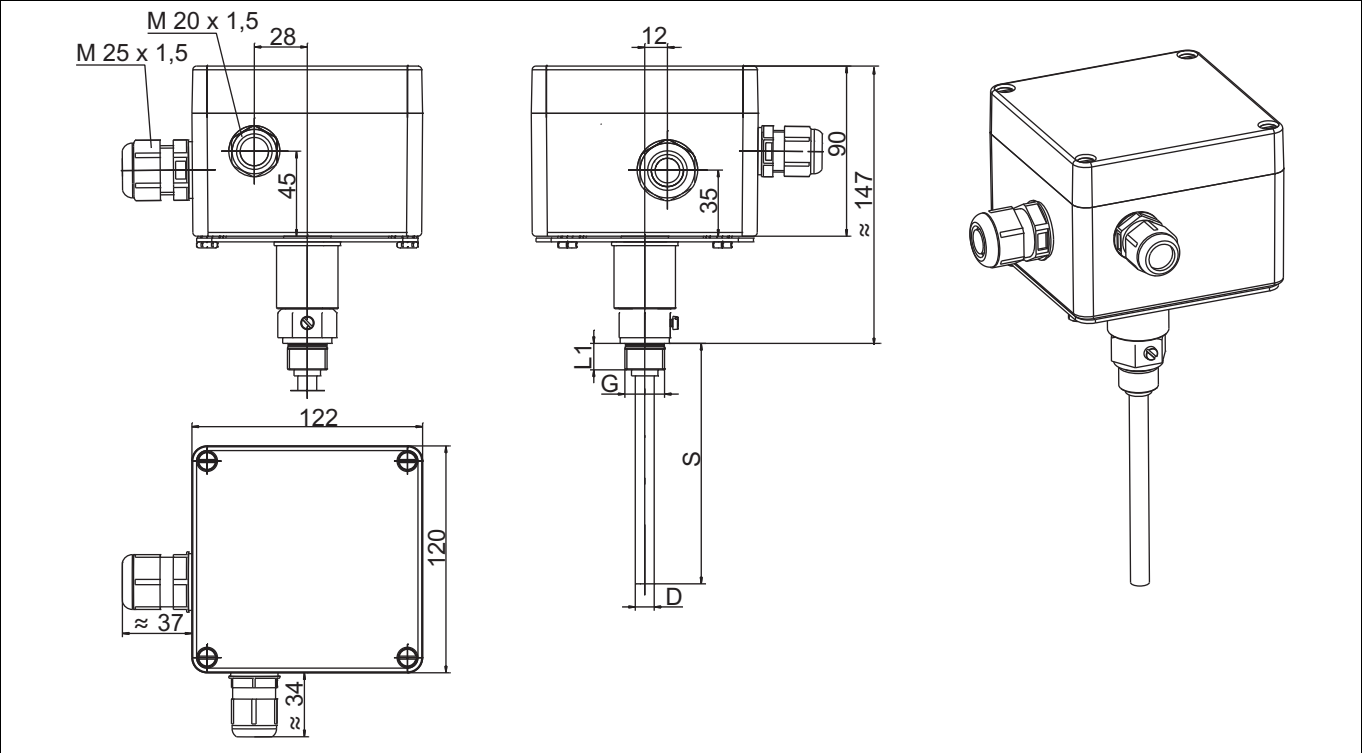
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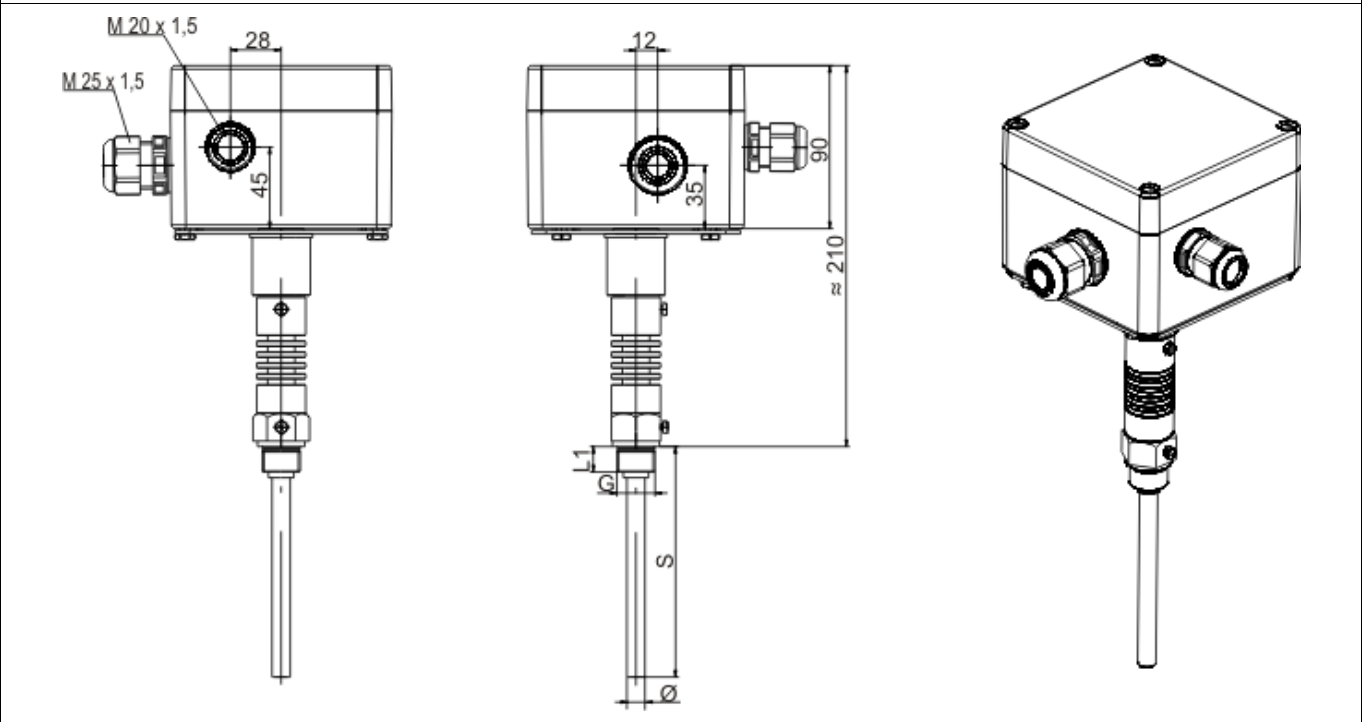


Thermostat with rigid thermowell (process connection 74)

Thermowells can be ordered separately according to data sheet 605057 (with ATEX approval) or data sheet 606710 (without ATEX approval)



Thermostat with sleeve and heat sink, limit value > 150 to 300 °C



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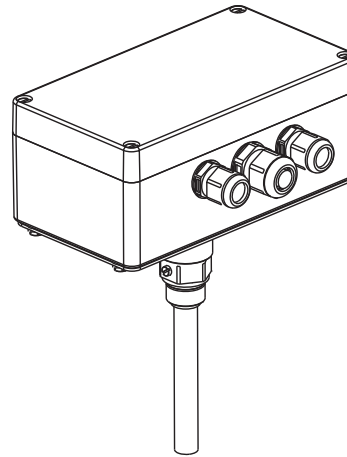
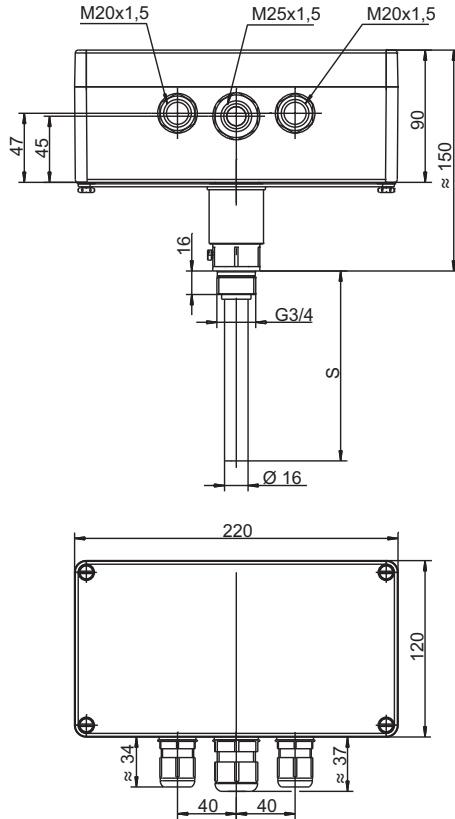
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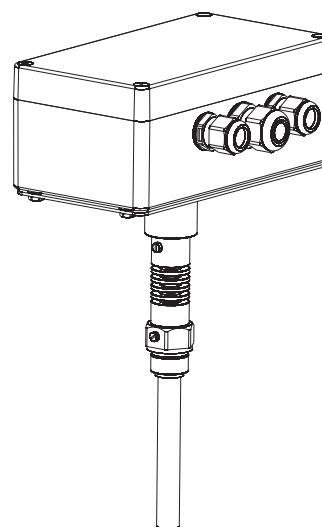
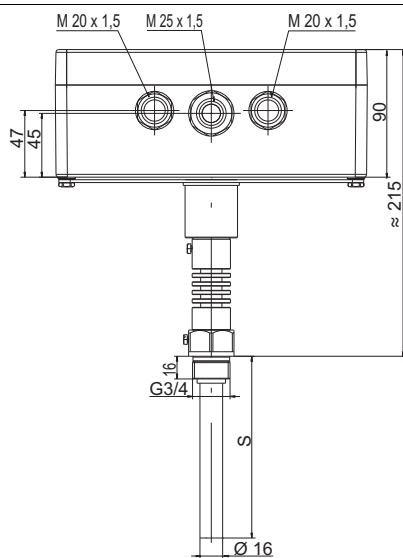


Double thermostat with sleeve (process connection 74)

Thermowells can be ordered separately according to data sheet 605057 (with ATEX approval) or data sheet 606710 (without ATEX approval)



Double thermostat with sleeve and heat sink, limit value > 150 to 300 °C



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## Order details

|        |   |    |             |                     |
|--------|---|----|-------------|---------------------|
|        | <b>(1) Basic type</b>   |    |             |                     |
| 605055 | JUMO exTHERM-AT – Explosion-proof surface-mounted thermostat for zones 1, 2, 21, and 22 |    |             |                     |
|        | <b>(2) Basic type extension</b>   |    |             |                     |
| 0002   | Temperature monitor (TW)  |    |             |                     |
| 0020   | Safety temperature monitor (STW)  |    |             |                     |
| 0070   | Safety temperature limiter (STB)  |    |             |                     |
| 0270   | Temperature monitor/Safety temperature limiter (TW/STB)                                 |    |             |                     |
| 2070   | Safety temperature monitor/Safety temperature limiter (STW/STB)                         |    |             |                     |
|        | <b>(3) Design type</b>  |    |             |                     |
| 5      | Surface-mounted thermostat  |    |             |                     |
| 6      | Room thermostat   |    |             |                     |
|        | <b>(4) Housing</b>  |    |             |                     |
| 4      | Polyester case black (standard)   |    |             |                     |
| 6      | Stainless steel housing   |    |             |                     |
|        | <b>(5) Control range (TW)</b>   |    |             |                     |
| 013    | -20 to +40 °C   |    |             |                     |
| 014    | -20 to +50 °C   |    |             |                     |
| 026    | 0 to 120 °C   |    |             |                     |
| 045    | 20 to 400 °C  |    |             |                     |
| 195    | 0 to 190 °C   |    |             |                     |
| 427    | 60 to 300 °C  |    |             |                     |
| 429    | 70 to 190 °C  |    |             |                     |
| 532    | 130 to 190 °C   |    |             |                     |
| 539    | 140 to 500 °C   |    |             |                     |
| 553    | 150 to 300 °C   |    |             |                     |
|        | <b>(6) Limit value range (STB)</b>  |    |             |                     |
| 000    | Only single thermostat  |    |             |                     |
| 014    | -20 to +50 °C   |    |             |                     |
| 026    | 0 to 120 °C   |    |             |                     |
| 045    | 20 to 400 °C  |    |             |                     |
| 195    | 0 to 190 °C   |    |             |                     |
| 427    | 60 to 300 °C only STB gas filling   |    |             |                     |
| 429    | 70 to 190 °C  |    |             |                     |
| 532    | 130 to 190 °C   |    |             |                     |
| 539    | 140 to 500 °C   |    |             |                     |
| 553    | 150 to 300 °C   |    |             |                     |
|        | <b>(7) Switching capacity</b>   |    |             |                     |
| 11     | AC/DC 24 V, 0.1 A   |    |             |                     |
| 21     | AC 230 V, 16 (2.5) A, cos φ = 1 (0.6)   |    |             |                     |
| 25     | AC 230 V, 25 (4) A, cos φ = 1 (0.6)   |    |             |                     |
| 41     | AC 400 V, 16 A  |    |             |                     |
|        | <b>(8) Admissible ambient temperature at the housing</b>                                |    |             |                     |
| 340    | -55 to +40 °C   | T6 | (+70 °C T4) | (+55 °C T4 at 25 A) |
| 467    | -40 to +40 °C   | T6 | (+70 °C T4) | (+55 °C T4 at 25 A) |
|        | <b>(9) Switching differential</b>   |    |             |                     |
| 00     | None  |    |             |                     |
| 25     | Approx. 2.5 %   |    |             |                     |
| 70     | Approx. 7 %   |    |             |                     |



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## Stock versions

| Designation   | Control range (TW) | Capillary length | Probe diameter | Part no. |
|---|--------------------|------------------|----------------|----------|
| 605055/002-6-4-013-00-21-467-25-00-0-0-20-15-56-0-0/000     | -20 to +40 °C      | 0 mm             | 56 mm          | 60003366 |
| 605055/0020-5-4-014-000-21-467-70-00-1000-0-20-10-6-0-0/000 | -20 to +50 °C      | 1000 mm          | 6 mm           | 60003365 |
| 605055/0020-5-4-026-000-21-467-70-00-1000-0-20-10-6-0-0/000 | 0 to 120 °C        | 1000 mm          | 6 mm           | 60003367 |
| 605055/0070-5-4-026-000-21-467-00-00-1000-0-20-10-6-0-0/000 | 0 to 120 °C        | 1000 mm          | 6 mm           | 60003421 |
| 605055/0070-5-4-429-000-21-467-00-00-1000-0-20-10-6-0-0/000 | 70 to 190 °C       | 1000 mm          | 6 mm           | 60003423 |
| 605055/0020-5-4-195-000-21-467-70-00-1000-0-20-10-6-0-0/000 | 0 to 190 °C        | 1000 mm          | 6 mm           | 60003424 |
| 605055/0002-5-4-195-000-21-467-25-00-1000-0-20-10-6-0-0/000 | 0 to 190 °C        | 1000 mm          | 6 mm           | 60003425 |
| 605055/0020-5-4-427-000-21-467-70-00-1000-0-20-10-6-0-0/000 | 60 to 300 °C       | 1000 mm          | 6 mm           | 60003426 |