

# Mechanical temperature switches

**ML1H**

Local mount type

## Features

- ▶ Local mount type single switch
- ▶ Explosion proof housing
- ▶ Terminal clip and set point adjustment in °C and °F under tamper protected cover
- ▶ Protection class: IP65, NEMA 4 / 13
- ▶ Optional:
  - Disconnection with manual reset, G (RD)-micro switch
  - Adjustable hysteresis (switch-back difference), S-micro switch
- ▶ Thermowell in stainless steel and brass  
3/4" NPT male thread
- ▶ Option thermowell: W = Brass  
WS = Stainless steel SS316Ti, 1.4571
- ▶ Approvals: Ex ia, UL, CSA, SIL2 (IEC 61508)

## Adjustment ranges

-45 °C...+24 °C to +66 °C...+232 °C

## Applications

Temperature monitoring in machine and machine tool industry, shipbuilding, power plants, antifreeze, heating systems, compressor monitoring



## Technical Data

|  |  |
|--|--|
| <b>Housing material:</b>   | Die-cast aluminium, anodized   |
| <b>Process connection:</b>   | Standard 1/2" NPT male, option W/WS 3/4" NPT male  |
| <b>Temperature sensor material:</b>                                    | Standard: brass / copper, version S: stainless steel (SS304 / 1.4301). If not equipped with thermowell the sensor may only be used up to 21 bar max. For W and WS pressure values refer to table in chap. Accessories. |
| <b>Operation pressure:</b><br>without thermowell:<br>with thermowell:  | max. 21 bar (max. 300 psi)<br>see page "Accessories" table 1.4   |
| <b>Operation temperature:</b><br><b>Housing:</b><br><br><b>Sensor:</b> | -40°C...+75°C (-40°F...167°F)<br>except temperature code 454:<br>-18°C...+75°C (0°F...167°F)<br>see table "Adjustment range"<br>(Sensor temperature limits)  |
| <b>Electrical values:</b>  | All models are equipped with SPDT contacts   |

|                               |   |
|-------------------------------|---|
| <b>Micro switch type:</b>     | H, M, GH, GM, S, G (RD)   |
| <b>Electrical connection:</b> | 1/2" NPT female, internal screw terminal, cable gland in PA, for cable size 6...12 mm is included   |
| <b>Protection class:</b>      | IP65, NEMA 4 / 13   |
| <b>Set point adjustment:</b>  | Turn adjustment knob clockwise to increase the actuation point  |
| <b>Standards:</b>             | The equipment is in conformity with the following harmonised European standards:<br>EN 60014 1977 + A1 to A4 and EN 500120 1977 + A1  |
| <b>Intrinsic safety:</b>      | The switches are also suitable for intrinsically safe applications. In this case we recommend gold contacts. Add "Exi" in case of ordering. Maximum rating according to ATEX:<br>U <sub>max</sub> = 28 V I <sub>max</sub> = 50 mA |
| <b>Approvals:</b>             | Ex ia, UL, CSA  |
| <b>Weight:</b>                | 1.0 kg approx.  |

## Adjustment ranges

| Codeadjustment range | Sensor temperature limits (°C) | Adjustment range (°C) | Hysteresis (°C)* for micro switch |            |             |              |
|----------------------|--------------------------------|-----------------------|-----------------------------------|------------|-------------|--------------|
|                      |                                |                       | H, GH                             | M, GM      | S           | G (RD)       |
|                      |                                |                       |                                   |            |             | 2.8...manual |
| 201                  | -73 ... +121                   | -45... +24            | 0.5... 1.6                        | 1.7... 3.3 | 3.3... 11.2 |              |
| 202                  | -73 ... +121                   | -9... +60             | 0.5... 1.6                        | 1.7... 3.3 | 3.3... 11.2 |              |
| 203                  | -73 ... +121                   | +24... +93            | 0.5... 1.6                        | 1.7... 3.3 | 3.3... 11.2 |              |
| 204                  | -73 ... +121                   | -45... +93            | 0.5... 1.6                        | 1.7... 3.3 | 3.3... 11.2 |              |
| 351                  | -73 ... +205                   | +38... +107           | 0.5... 1.6                        | 1.7... 3.3 | 3.3... 11.2 |              |
| 354                  | -73 ... +205                   | +38... +177           | 0.5... 1.6                        | 1.7... 3.3 | 3.3... 11.2 |              |
| 454                  | -18 ... +260                   | +66... +232           | 1.6... 3.3                        | 3.3... 5.0 | 5.5... 16.8 |              |

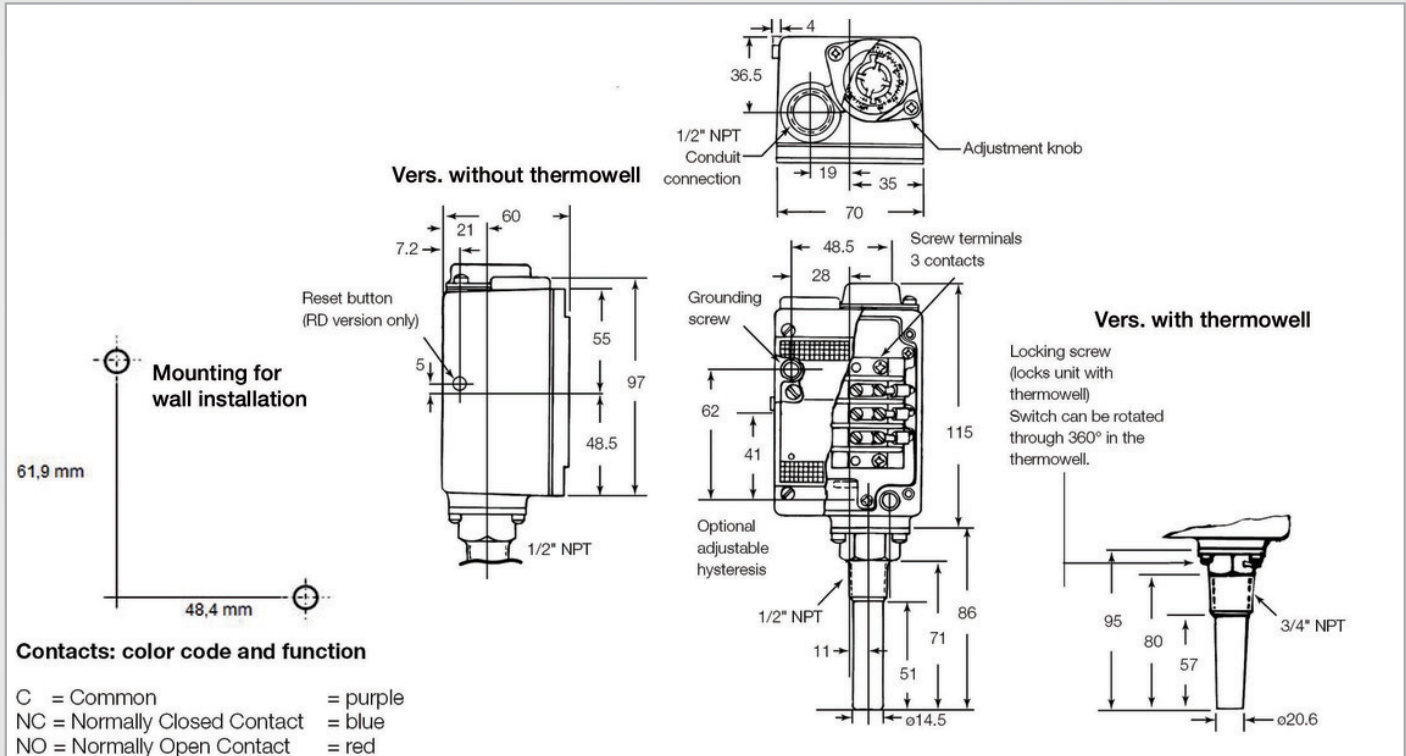
\* Dependent on medium

# Temperature

## Mechanical temperature switches

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### Dimensions (mm / inch)



### Electrical Ratings

| Micro switch | Special features  | Volt AC 50/60 Hz  | Ind. Load A   | Res.load A    | Volt DC         | Ind load A           | Res. Load A        | Comments                                    |
|--------------|---|-------------------|---------------|---------------|-----------------|----------------------|--------------------|---|
| H            | Micro switch with silver contacts   | 125<br>250<br>480 | 10<br>10<br>3 | 10<br>10<br>3 | 6<br>to<br>28   | 0.50                 | 0.5                | Small hysteresis;<br>High AC / low DC loads |
| M            | Micro switch with silver contacts   | 125<br>250<br>480 | 10<br>10<br>3 | 10<br>10<br>3 | 12<br>24<br>250 | 5.00<br>1.00<br>0.25 | 15.0<br>2.0<br>0.4 | Medium hysteresis;<br>High AC and DC loads  |
| GH           | Micro switch with gold contacts for low voltage and low current (e. g. "Exi") | 125               | 1             | 1             | 24              | 1.00                 | 1.00               | Small hysteresis                            |
| GM           |   | 30                | 0.1           | 0.1           | 30              | 0.10                 | 0.1                | Medium hysteresis                           |
| S            | Micro switch with silver contacts   | 480               | 15            | 15            | 125             | 0.05                 | 0.4                | Adjustable hysteresis                       |
| G            | Micro switch with silver contacts   | 480               | 10            | 10            | 125             | 0.4                  | 0.75               | Manual reset (RD)                           |

Hermetically sealed micro switch (HML1H) on request

### Sensor material / Options

| Sensor material |                 | Options 1 |                                     | Options 2 |   |
|-----------------|-----------------|-----------|-------------------------------------|-----------|---|
| ---             | Brass/copper    | W         | Thermowell of brass                 | RD        | Manual reset                              |
| S               | Stainless steel | WS        | Thermowell of SS (1.4571, SS316 Ti) | EXI       | for intrinsically safe application, Ex ia |

### Order Code

Example for order number

| Type | Micro switch | Code Adjustment range | Sensor length* | Option 1 | Option 2 |
|------|--------------|-----------------------|----------------|----------|----------|
| ML1H | GH           | 202                   | S              | WS       | EXI      |

\* Brass/cooper, option: S = Stainless steel

Your order number

|      |   |  |   |  |   |  |
|------|---|--|---|--|---|--|
| ML1H | - |  | - |  | - |  |
|------|---|--|---|--|---|--|