



Operating Instructions for Temperature Switch

Model: TWR



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Manufactured and sold by:

Kobold Messring GmbH
Nordring 22-24
D-65719 Hofheim
Tel.: +49(0)6192-2990
Fax: +49(0)6192-23398
E-Mail: info.de@kobold.com
Internet: www.kobold.com

2. Note

Please read these operating instructions before unpacking and putting the unit into operation. Follow the instructions precisely as described herein.

The instruction manuals on our website www.kobold.com are always for currently manufactured version of our products. Due to technical changes, the instruction manuals available online may not always correspond to the product version you have purchased. If you need an instruction manual that corresponds to the purchased product version, you can request it from us free of charge by email (info.de@kobold.com) in PDF format, specifying the relevant invoice number and serial number. If you wish, the operating instructions can also be sent to you by post in paper form against an applicable postage fee.

Operating instructions, data sheet, approvals and further information via the QR code on the device or via www.kobold.com

The devices are only to be used, maintained and serviced by persons familiar with these operating instructions and in accordance with local regulations applying to Health & Safety and prevention of accidents.

When used in machines, the measuring unit should be used only when the machines fulfil the EC-machine guidelines.

The minimum service life is 100,000 switching cycles at a maximum of 150 °C when the switching capacities specified in the operating instructions are observed.

3. Regulation Use

TWR model devices are used to monitor the temperature of liquids. The temperature switches are delivered with a preset temperature switching value with N/O or N/C contacts. Only liquids to which the thermostat materials are resistant should be monitored.

4. Operating Principle

The switching element in the model TWR is a thermal time-delay switch. Two strips of metal with different coefficients of thermal expansion are rolled together in the switch. When temperature is applied the bimetal reed bends and thus opens/closes the contact. The switching function is current-independent.

5. Instrument Inspection

The devices are inspected before shipping and are sent out in perfect working condition. Should there be any visible damage to the device, we recommend that the delivery packaging is carefully examined. Immediately inform the postal service or forwarding agency in the event of a claim, as the haulier is responsible for damage in transit.

Scope of delivery:

The standard delivery includes:

- Temperature Switch model: TWR

6. Use in Hazardous Areas

6.1. General

The temperature switches TWR-3 **** and TWR-4 **** can be used as follows (taking into account the notes and the approved electrical limit values):

- a) In zone 2 (Gas-Ex, EPL Gc) in explosion group IIA, IIB and IIC
- b) In zone 22 (Dust Ex, EPL Dc) in explosion groups IIIA, IIIB and IIIC

The temperature switch also fulfills the requirements for a simple electrical apparatus according to EN 60079-14 and EN 60079-11 and can be used in zone 1/21 as follows:

- c) In zone 1 (Gas-Ex, EPL Gb) in explosion group IIA, IIB and IIC, if the temperature switch is operated via an intrinsically safe isolation amplifier taking into account the defined characteristic data.
- d) In zone 21 (Dust Ex, EPL Db) in explosion groups IIIA, IIIB and IIIC, if the temperature switch is operated via an intrinsically safe isolating amplifier taking into account the defined characteristic data.

6.2. Electrical Contact

The following limit values for the switching contact must not be exceeded:

| | | |
|----------------|---|--|
| U _i | = | 30 V AC/DC for IIC |
| | | 45 V AC/DC for IIB and IIIC |
| I _i | = | 150 mA for IIC |
| | | 250 mA for IIB and IIIC |
| P _i | = | 1.3 W for IIC and medium temperature up to +40 °C |
| | | 550 mW for IIC and medium temperature up to +125 °C |
| | | 750 mW for IIIC and medium temperature up to +40 °C |
| | | 465 mW for IIIC and medium temperature up to +125 °C |
| L _i | = | negligible |
| C _i | = | negligible |

The electrical connection is explained in section 8 Electrical Connection.

6.3. Equipotential Bonding

In order to achieve potential equilibrium, the temperature switch should be properly grounded. This will occur only when the connection pipes are made of metal.

6.4. Warnings for use in hazardous areas

- a) Equalizing currents must not be routed through the metallic constructions.
- b) The temperature switch must be installed so that possible electrostatic charges can be charged off. (Leakage resistance to PA <1 MΩ)
- c) The temperature switch should be protected against mechanical shocks.
- d) At medium temperatures > 90 ° C the installation must ensure that the plugs do not overheat.
- e) Stuck parts, e.g. by frost or corrosion, must not be released by force in the presence of an explosive atmosphere.
- f) In order to ensure the protection against explosion, electrical equipment and additional (mechanical) equipment must comply with the requirements of the local conditions and must be checked separately by the installer of the machine.
- g) The ignition limit curves from EN 60079-11 must be taken into account without a safety factor and must be complied with during installation.
- h) The requirements for simple electrical equipment in the gas and dust explosion area of zone 1/21 according to EN 60079-11 section 5.7 should be met.
- i) Operation only in intrinsically safe circuits.
- j) A power reduction P_i according to 15c) must be complied with at higher ambient temperatures.
- k) The installer / operator must prepare a control drawing (proof of intrinsic safety) and attach the explosion protection document.

7. Mechanical Connection

Before installation:

- Make sure that the desired TWR switching temperature and switching function corresponds with your plant requirements. The TWR data is to be found on the metal nameplate (OFF = N/C contact, ON = N/O contact at the specified temperature).
- Ensure that the permitted maximum operating pressures for the temperature switches are not exceeded.

Installation:

- The TWR is installed in a G 3/4 fitting. Seal the connection threads with sealing tape or a flat gasket.
- Chose the installation position so that the sensor tip is always immersed in the liquid, thus optimising the heat exchange between medium and temperature switch.
- Please note that solid deposits in soiled media may cause thermal insulation and thus inaccuracies.
- If possible, after mechanical installation, check that the joint connection pipe fitting is sealed.

8. Electrical Connection



Important! Ensure that voltage and current values in your plant do not exceed the temperature switch values.

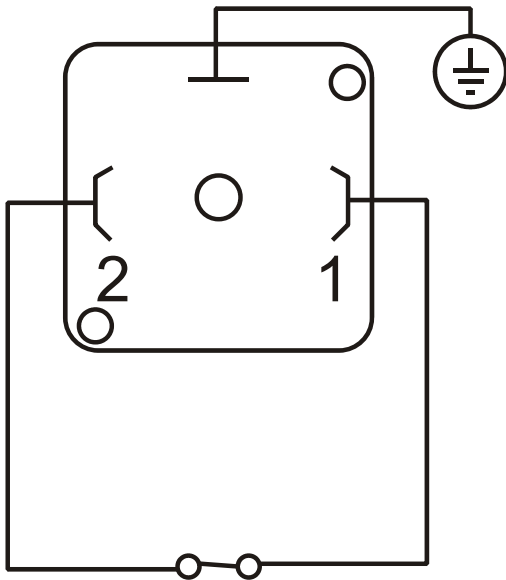
- Make sure that electrical supply lines are de-energized.
- Undo the retaining screw from the plug cap and remove the cap from the plug socket.
- Install the supply line in the plug cap according to the wiring diagram below.
- Mount the connector on the contact base and fasten with the retaining screw.

The device is ready for operation when you have connected your external devices to the limit output.

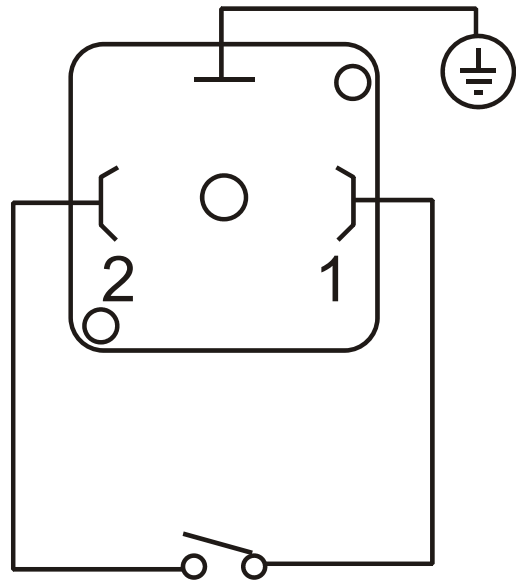
TWR

Contacts

TWR-1...
TWR-3...



TWR-2...
TWR-4...



TWR-1/3...

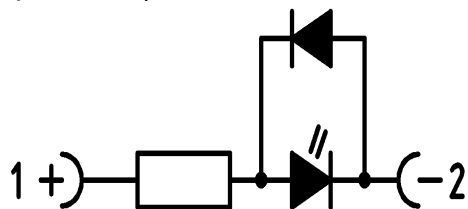
TWR-2/4..., N/O function

The contact closes when the temperature rises and the switching value has been reached or exceeded. It opens again when the temperature falls below the limit value less the switching hysteresis.

Electrical wiring option -L and -G

(The circuit is placed inside of the connector in parallel to the contact, not for ATEX version):

Option -L (24VAC/DC)



Option -G (230VAC)



Hysteresis

Hysteresis is the difference between make and break points, which are at different temperatures. The hysteresis is max.20 °C.

Example: TWR-110500

Contact opens at 50 °C ±5 °C

Contact closes at approximately 30 °C ±5 °C



Note: Temperature switches with low switching temperatures, when used at high ambient temperatures, are only reset when the switch is cooled to below the ambient temperature.

Example: TWR-210300, ambient temperature 25 °C

Contact closes at 30 °C ±5 °C

Contact opens at approximately 10 °C ±5 °C
(i.e., below ambient temperature)

9. Maintenance

The TWR requires no maintenance if the measured medium is clean. Dirt deposits can cause inaccuracies or a malfunction. Depending on the degree of soiling of your medium, we recommend that the devices are checked at regular intervals.

10. Accessories

10.1) 2-pin connector with lamp 180–240 V_{AC} incl. silicone gasket
(energized if contact is open)

10.2) 2-pin connector with LED 24 V_{DC/AC} incl. silicone gasket
(energized if contact is open)

11. Technical Information

Operating instructions, data sheet, approvals and further information via the QR code on the device or via www.kobold.com

12. Order Codes

Operating instructions, data sheet, approvals and further information via the QR code on the device or via www.kobold.com

13. Dimensions

Operating instructions, data sheet, approvals and further information via the QR code on the device or via www.kobold.com

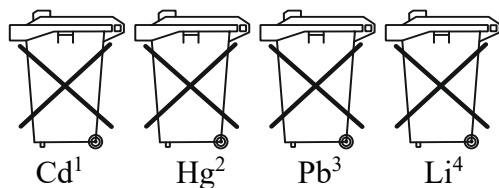
14. Disposal

Note!

- Avoid environmental damage caused by media-contaminated parts
- Dispose of the device and packaging in an environmentally friendly manner
- Comply with applicable national and international disposal regulations and environmental regulations.

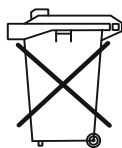
Batteries

Batteries containing pollutants are marked with a sign consisting of a crossed-out garbage can and the chemical symbol (Cd, Hg, Li or Pb) of the heavy metal that is decisive for the classification as containing pollutants:



1. „Cd" stands for cadmium
2. „Hg" stands for mercury
3. „Pb" stands for lead
4. „Li" stands for lithium

Electrical and electronic equipment



15. Statement of Conformity



STATEMENT OF CONFORMITY


- (1)
- (2) Equipment and protective systems intended for use in potentially explosive atmospheres – directive 2014/34/EU
- (3) Document No.

ExGuide 17 ATEX 0006

Edition 2

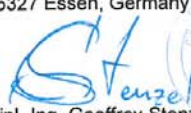
- (4) Equipment: **Temperature Switches type TWR-*******
- (5) Manufacturer: **KOBOLD Messring GmbH**
- (6) Address: **Nordring 22-24
65719 Hofheim, Germany**
- (7) The design of this product and the various permissible versions are specified in the annex to this certificate and the documents listed therein.
- (8) ExGuide Technology - Geoffrey Stenzel, as a certified engineering company, certifies that the product meets the basic safety and health requirements for the design and construction of category 3 equipment for use in potentially explosive atmospheres in accordance with Annex II of Directive 2014/34/EU. The results of the test are documented in the confidential test report No. P20220024PB02.

The QM system of the engineering offices ExGuide Technology - Geoffrey Stenzel is monitored according to ISO 9001:2015 by AJA Europe Ltd. and listed under certificate No. AJ AEU/19/15703.
- (9) The essential health and safety requirements are met by compliance with:
EN IEC 60079-0: 2018 EN 60079-11:2012
- (10) If the sign "X" is placed after a certificate number, special conditions for the safe use of the equipment are indicated in the appendix to this certificate. If no certificate number according to (3) is applied to the device, the sign "X" must be placed after the Ex marking according to (12).
- (11) This certificate refers only to the design and specifications for the construction of the device according to directive 2014/34/EU. Further requirements apply to the manufacture and placing into market of this product. These requirements are not covered by this certificate.
- (12) The Ex-marking of the product must contain the following information:

 **II 3G Ex ic IIB/IIC T4 Gc
II 3D Ex ic IIIC T125 °C Dc**

ExGuide Technology – Geoffrey Stenzel
Katernberger Str. 107
45327 Essen, Germany

Essen, dated 02 February 2023


Dipl.-Ing. Geoffrey Stenzel

Page 1 of 3

This declaration of conformity has no validity without signature and stamp and may only be distributed unchanged. Excerpts and changes require the approval of ExGuide Technology - Geoffrey Stenzel, Katernberger Str. 107, 45327 Essen, Germany
Tel. +49 (0) 522910-93, Fax. + 49 (0) 522910-99





(13) Annex

(14) **ExGuide 17 ATEX 0006** Edition 2

(15) Description of the product

15.1 Subject and type designation
Temperature Switches type TWR-*****

Explanation of the type designation

| TWR | Product series |
|----------------|---|
| 1. Asterisk | Switching function 3 = N/O contact 4 = N/C contact |
| 2. Asterisk | Enclosure material 1 = Brass 2 = Stainless steel |
| 3.-5. Asterisk | Switching range 030 = 30 °C 035 = 35 °C 040 = 40 °C 045 = 45 °C 050 = 50 °C 060 = 60 °C 070 = 70 °C 080 = 80 °C 090 = 90 °C 100 = 100 °C 110 = 112 °C 120 = 118 °C |

15.2 Description

The Temperature Switches type TWR-***** works with a bi-metal switch and serve to monitor temperature of liquids in piping and vessels.

The instruments are available in brass or stainless steel and are screwed through a G $\frac{3}{4}$ screw-in thread into a screwed socket that is welded onto the line or vessel. The temperature contacts have a fixed switch point in intervals of 5 °C in the range +30 °C...+50 °C, and in intervals of 10 °C between +50 °C...+120 °C. They are available as N/C or N/O contacts. Standard electrical connection is made through a plug connector.

Description of change

Application of harmonized standard EN IEC 60079-0:2018.

15.3 Technical data

15.3.1 Thermal data

Ambient temperature range T_a -20 °C up to +90 °C
Medium temperature range -30 °C up to +125 °C

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15.3.2 Electrical data

| | | |
|--------------------------------|----------------|---|
| Maximum input voltage | U _i | 30 V AC/DC for IIC 45 V AC/DC for IIB and IIIC |
| Maximum input current | I _i | 150 mA for IIC 250 mA for IIB and IIIC |
| Maximum input power | P _i | 1.3 W for IIC and medium temperature up to +40 °C 550 mW for IIC and medium temperature up to +125 °C 750 mW for IIIC and medium temperature up to +40 °C 465 mW for IIIC and medium temperature up to +125 °C |
| Effective internal inductance | L _i | negligible |
| Effective internal capacitance | C _i | negligible |

15.4 Minimum marking requirements on this equipment

| | |
|--|--|
| Manufacturer's name and postal address | KOBOLD Messring GmbH Nordring 22-24 65719 Hofheim, Germany |
| Type designation | TWR-***** |
| Serial No. | |
| Year of manufacture | |
| Ex symbol | |
| Ex marking: | II 3G Ex ic IIB/IIC T4 Gc II 3D Ex ic IIIC T125 °C Dc |
| CE marking | |
| Ambient temperature range | -20 °C ≤ T _a ≤ +90 °C |
| Medium temperature range | -30 °C up to +125 °C |

- (16) Test and assessment report No. P20220024PB02, dated 02.02.2023
- (17) Special conditions for safe use
None
- (18) Essential health and safety requirements
Fulfilled by compliance with the above-mentioned standards.

ExGuide Technology – Geoffrey Stenzel
Katernberger Str. 107
45327 Essen, Germany

Essen, dated 02 February 2023

Dipl.-Ing. Geoffrey Stenzel



16. EU Declaration of Conformance Standard version

We, KOBOLD Messring GmbH, Nordring 22-24, 65719 Hofheim, Germany, declare under our sole responsibility that the product:

Temperature Switch Model TWR-...

to which this declaration relates is in conformity with the following EU directives stated below:

| | |
|--------------------|---------------------------------------|
| 2014/35/EU | Low Voltage Directive |
| 2011/65/EU | RoHS (category 9) |
| 2015/863/EU | Delegated Directive (RoHS III) |

Also, the following standards are fulfilled:

EN 60529:2014
Degrees of protection provided by enclosures (IP Code)

EN IEC 63000:2018 Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

Hofheim, 04 Sept. 2023



H. Volz
General Manager

J. Burke
Compliance Manager

17. EU Declaration of Conformance (ATEX version)

We, KOBOLD Messring GmbH, Nordring 22-24, 65719 Hofheim, Germany, declare under our sole responsibility that the product:

Device: **Temperature Switch Model TWR-...**

Fulfills all relevant requirements of the following directive(s):

2014/34/EU Devices and protective systems for the intended use in potentially explosive atmospheres

The following harmonized standards have been applied for conformity assessment:

EN IEC 60079-0:2018 Equipment - General requirements
EN 60079-11:2012 Equipment protection by intrinsic safety "i"

Ex marking:: II 3G Ex ic IIB/IIC T4 Gc
 II 3D Ex ic IIIC T125 °C Dc

For installation in zones 1/22:

The TWR fulfils the requirements for simple electrical apparatus according to EN 60079-14 and EN 60079-11. When operated via an intrinsically safe isolating amplifier, it is suitable for installation in Zone 1/21.

The safety instructions for explosion protection in the manufacturer's operating instructions must be observed.

The product also complies with the following EU directives and EU standards:

- 2011/65/EU RoHS (category 9)
- 2015/863/EU Delegated Directive (RoHS III)
- EN IEC 63000:2018 Technical documentation for the assessment of electrical and electronic equipment with regard to the restriction of hazardous substances

Hofheim, 04. Sept. 2023



H. Volz
General Manager

J. Burke
Compliance Manager

18. UK Declaration of Conformity Standard version

We, KOBOLD Messring GmbH, Nordring 22-24, 65719 Hofheim, Germany, declare under our sole responsibility that the product:

Temperature Switch Model TWR-...

to which this declaration relates is in conformity with the following UK directives stated below:

| | |
|-----------------------|--|
| S.I. 2016/1101 | Electrical Equipment (Safety) Regulations 2016 |
| S.I. 2012/3032 | The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012 |

Also, the following standards are fulfilled:

BS EN 60529:1992+A2:2013
Degrees of protection provided by enclosures (IP-Code)

BS EN IEC 63000:2018
Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances.

Hofheim, 04 Sept. 2023



H. Volz
General Manager

J. Burke
Compliance Manager

19. REACH-SCIP Declaration

Kobold Messring supports the goals of REACH (Registration, Evaluation and Authorization of Chemicals, No. 1907/2006) and is aware of the company's obligations to comply with the directive, including informing our customers if substances registered on the SVHC candidate list are contained within our products.

With this declaration, we are fulfilling our obligation to provide this information.

The following product(s) contain(s) one or more substances listed in the candidate list and Annex XVII for which there is an obligation to provide information according to Article 33 of the REACH Regulation.

| Product | Model-Codes | Affected Parts |
|---------|-------------|----------------|
| TWR | TWR-x1xxx x | Brass Fitting |

Where; X denotes a non-relevant model-code position

These products are registered in the SCIP database as follows:

| Substance: | Contained in: | CAS N°: | Homogeneous Concentration: |
|---------------|---|-----------|----------------------------|
| Lead | Alloying Component of Brass (CuZn39Pb3) | 7439-92-1 | < 3,5 % |
| SCIP Reg. N°. | b08900c6-7876-49cc-8ca0-2773a12ab423 | | |

Additional Information regarding lead content in Brass:

Lead is known to be toxic for reproduction, for this reason it was included in the candidate list. However, lead as an alloy component is “bound” in the brass, so no exposure is to be expected. Therefore, no additional information for its safe use is required.

The use of copper alloys with up to 4% lead content has however been regulated for many years, for example, in the relevant RoHS Directive 2011/65/EU. Here, Copper alloys containing lead are explicitly excluded from the prohibited substance list, exception 6(c).

The information contained herein is based on declarations obtained from our sub-suppliers and is correct and reliable to the best of our knowledge and belief at the time of publication. However, if this is not the case, we assume no liability for the accuracy and completeness of this information.

Hofheim, 08 Feb. 2024

J. Burke
Compliance Manager