

Operating Instructions for Temperature Switch

Model: TWR



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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.

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.

as per PED 2014/68/EU

No CE mark

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
- 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.

The temperature switch also fulfills the requirements for a simple apparatus according to EN 60079-14, section 12 and EN 60079-11, section 5.7.

6.2. Electrical Contact

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

Max. Switch capacity: U_i IIC = 30 V AC / DC

U_i IIB = 45 V AC / DC

Switching current: I_i IIC = 150 mA

I_i IIB = 250 mA

I_i IIIB = 250 mA

$P_{III} = 1.2 \text{ W } 40^\circ \text{ C}$ $550 \text{ mW } @ 125^\circ \text{ C}$

$L_i = \text{negligible}$

$C_i = \text{negligible}$

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.

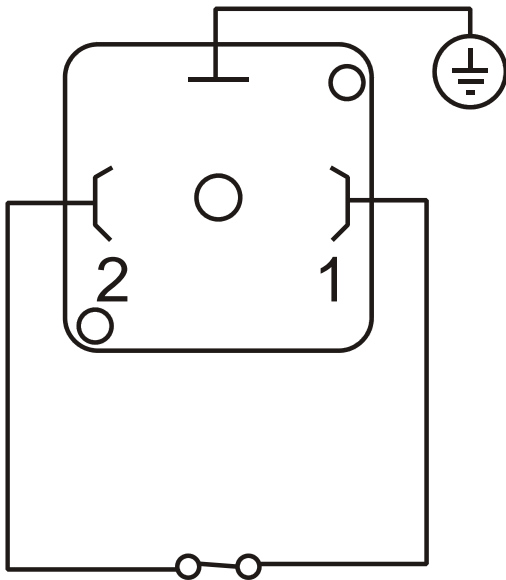
- Make sure that electrical supply lines are de-energized.
- Undo the retaining screw from the plug cap and remove the cap from the plug socket.
- Install the supply line in the plug cap according to the wiring diagram below.
- Mount the connector on the contact base and fasten with the retaining screw.

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

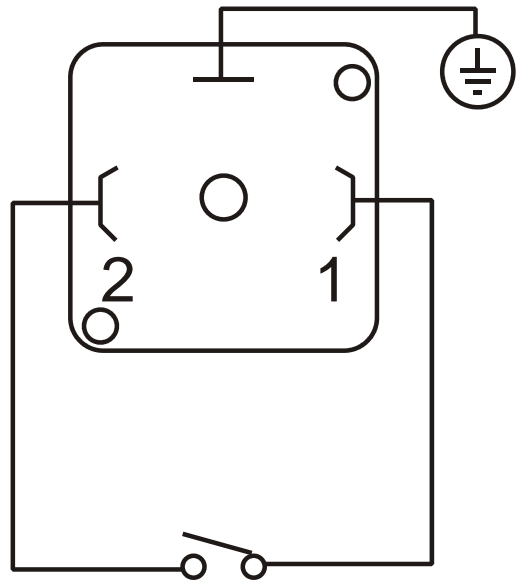
TWR

Contacts

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



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



TWR-1/3...

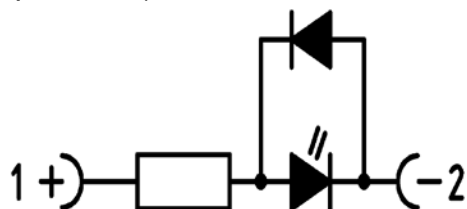
TWR-2/4..., N/O function

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 \pm 5 °C

Contact closes at approximately 30 °C \pm 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 \pm 5 °C

Contact opens at approximately 10 °C \pm 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

Contact operation:	N/O contact or N/C contact
Electrical connection:	plug connector according to DIN EN 175301-803 optional with pilot lamp
Max. switch capacity:	250 V _{AC} ; 30 V _{DC} ; (TWR-1...0, TWR-2...0) 250 V _{AC} ; 42 V _{DC} ; (TWR-3...0, TWR-4...0) 24 V _{DC} (TWR-...L) 230 V _{AC} (TWR-...G)
Switching-current:	0.1...4 A (TWR-1...0, TWR-2...0) 0.1...1 A (TWR-1...L, TWR-2...L) 0.1...1 A (TWR-1...G, TWR-2...G) max. 5...200 mA (TWR-3, TWR-4)
Housing:	brass or stainless steel 1.4301
Connection:	G 3/4 male
Nominal pressure:	PN 64
Weight:	0.5 kg
Ambient temperature:	-30...125 °C
Switching hysteresis max.:	20 °C
Accuracy:	

switch points	Typ	
	TWR-1/2	TWR-3/4
30...90 °C	+5 K	+3 K
100...120 °C	+7 K	+4 K

Protection: IP 65

Technical data ATEX version see section 6.2

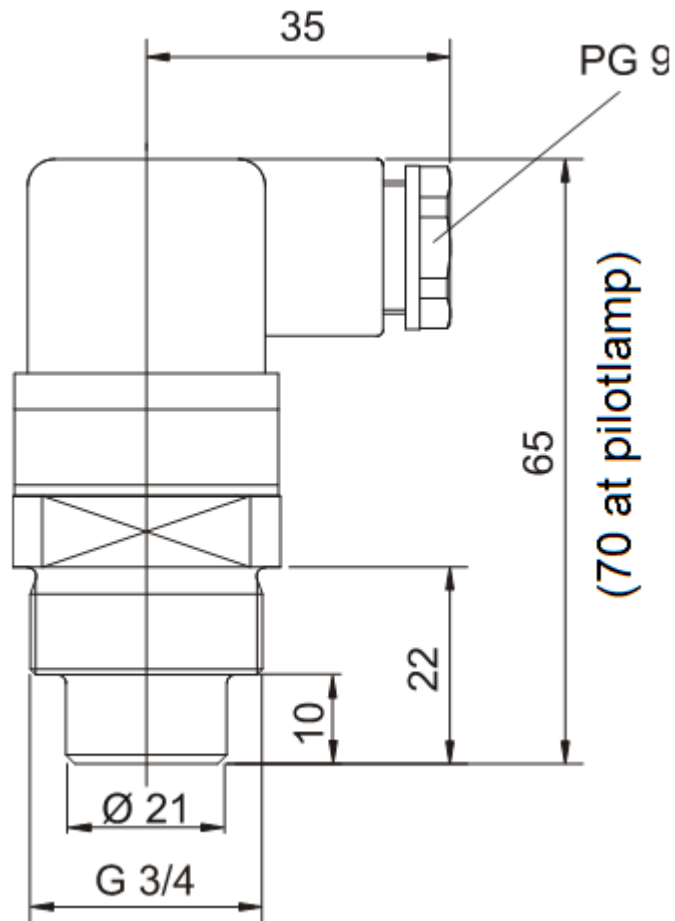
12. Order Codes

Order Details (Example Standard version: TWR-11030L
 Example ATEX version: TWR-31030 0)

Switching-function (with rising temperature)	Type		Switching range	Pilot lamp (only standard)
	brass	st. st.		
N/C contact	TWR-11..	TWR-12..	..030.. = 30 °C	..0 = without ..L = LED 24 VDC ..G = Pilot lamp 230 VAC
			..035.. = 35 °C	
N/O contact	TWR-21..	TWR-22..	..040.. = 40 °C	
			..045.. = 45 °C	
			..050.. = 50 °C	
N/C contact* (for PLC; intrinsically safe)	TWR-31..	TWR-32..	..060.. = 60 °C	..0 = without
			..070.. = 70 °C	
N/O contact* (for PLC; intrinsically safe)	TWR-41..	TWR-42..	..080.. = 80 °C	
			..090.. = 90 °C	
			..100.. = 100 °C	
			..112.. = 112 °C	
			..118.. = 118 °C	

* Intrinsically safe only without LED and pilot lamp

13. Dimensions



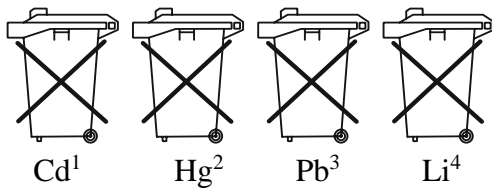
14. Disposal

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.

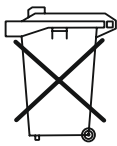
Batteries

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. EU Declaration of conformance ATEX version

EU-KONFORMITÄTSERKLÄRUNG zur Bestätigung der
Übereinstimmung einer Baugruppe mit der Richtlinie
2014/34/EU
Nr. 2016-04-4711

*EU DECLARATION OF CONFORMITY to confirm the
conformance of a device with the Directive
2014/34/EU
No. 2016-04-4711*

Der Hersteller

The manufacturer

Kobold Messring GmbH, Nordring 22-24, DE 65719 Hofheim

erklärt hiermit in alleiniger Verantwortung, dass die nachfolgende
Maschine oder Baugruppe

*hereby declares under sole responsibility, that the
machinery or subassembly equipment described below*

Bezeichnung

Description

Temperaturwächter TWR-3** oder/or TWR-4******

Kennzeichnung / Marking:

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

Fertigungs-Nummer lt. Lieferpapieren und Typenschild

Serial number see shipping documents and type label

mit den Bestimmungen folgender harmonisierter Normen der
Europäischen Union, in der zum Unterschriftsdatum gültigen
Fassung, übereinstimmt:

*conforms with the provisions of the following harmonized
standards in the version of the European Union, valid at
signature date:*

- EN 60079-0:2012 + A11:2013 Explosionsgefährdete Bereiche - Teil 0: Betriebsmittel - Allgemeine Anforderungen
- EN 60079-11:2012 Explosionsgefährdete Bereiche – Teil 11: Geräteschutz durch Eigensicherheit "i"

- *EN 60079-0:2012 + A11:2013 Explosive atmospheres – Part 0: General Requirements*
- *EN 60079-11:2012 Explosive atmospheres – Part 11: Equipment protection by intrinsic safety "i"*

Ebenfalls mit folgenden Europäischen und Nationalen Normen
und technischen Vorschriften in der zum Unterschriftsdatum
gültigen Fassung übereinstimmt:

*Also conforms with the following European and National
Standards and technical provisions in the version, valid
at signature date:*

- Technische Regeln für Gefahrstoffe (TRGS) 727, Vermeidung von Zündgefahren infolge elektrostatischer Aufladungen

- *Technical rules for hazardous substances (TRGS) 727, Avoidance of ignition hazards as consequence of electrostatic charging*

Ausgefertigt in Hofheim am 24. August 2017

done at Hofheim on August, 24, 2017

Name des Unterzeichners / *Name of signatory*

Name des Unterzeichners / Name of signatory



H. Peters, Geschäftsführer / *CEO*

Manfred Wenzel, Prokurist / *authorized signatory*

Unterszeichnet für und im Namen der / *Signed for and on behalf of Kobold GmbH*

16. EU Declaration of Conformance Standard version

We, KOBOLD-Messring GmbH, Hofheim-Ts, Germany, declare under our sole responsibility that the product:

Temperature Switch Model TWR-...

to which this declaration relates is in conformity with the standards noted below:

EN 61010-1:2011

Safety requirements for electrical equipment for measurement, control and laboratory use - Part 1: General requirements

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

Also, the following EC guidelines are fulfilled:

2014/35/EU

Low Voltage Directive

2011/65/EU

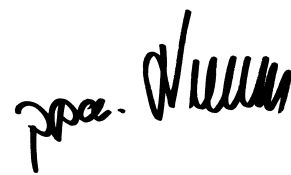
RoHS (category 9)

2015/863/EU

Delegated Directive (RoHS III)



H. Peters
General Manager



M. Wenzel
Proxy Holder

Hofheim, 08 Febr. 2021

17. UK Declaration of Conformity Standard version

We, KOBOLD Messring GmbH, Hofheim-Ts, Germany, declare under our sole responsibility that the product:

Temperature Switch Model TWR-...

to which this declaration relates is in conformity with the standards noted below:

BS EN 61010-1:2010

Safety requirements for electrical equipment for measurement, control, and laboratory use. General requirements

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.

Also, the following UK guidelines are fulfilled:

S.I. 2016/1101

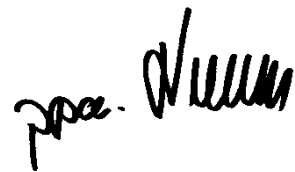
Electrical Equipment (Safety) Regulations 2016

S.I. 2012/3032

The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012



H. Peters
General Manager



M. Wenzel
Proxy Holder

Hofheim, 08 Febr. 2021