



**Installation and Operating Instructions**  
**Thermostat**  
**Series**  
**ExR-1/21**

Version 1.1 Status 08.03.2011

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## General information / Technical details

### Manufacturer

Lm-therm GmbH, Sulzbachstraße 15, 94501 Aldersbach, Germany

### Type

Series ExR-1/21: max. 230V AC / 10 A resp. 115V AC / 15A as NO/NC contact in several versions (see type list) and temperatures from 5°C – 60°C°.

### Applied standards

Standards DIN EN60079-0 Version March 2010, DIN EN60079-1 Version April 2008 and DIN EN60079-31 Juli 2010

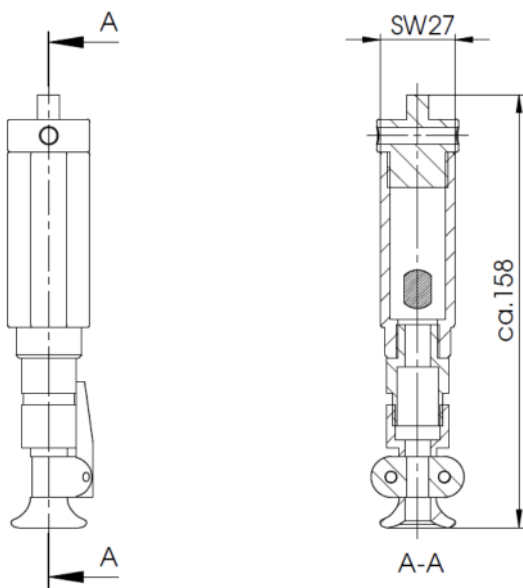
### Type plate (Example for the KKTO-15-Version)



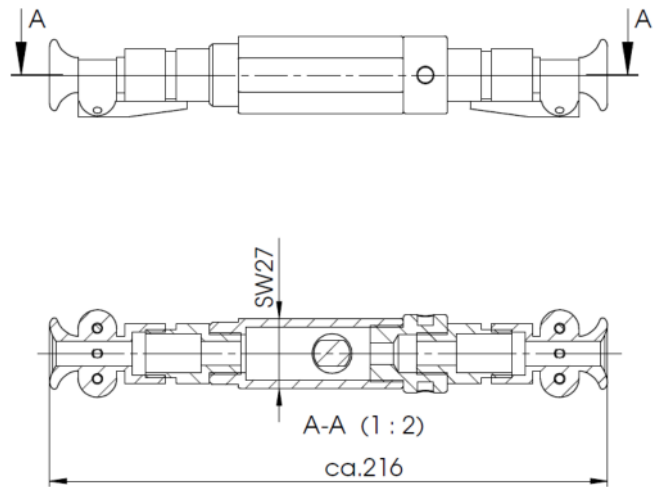
## Series ExR1/21

Type	Picture	Voltage / Power rating	Standard 1	Specs Label Standard 1	Standard 2	Specs Label Standard 2
ExR-1/21 -KTO-XX°C	1	230V (AC)/10A or 115V(AC)/15A	EN60079 -0/-1	{Ex} II 2G Ex d IIC T6 Gb -40°C<=Ta<=+60°C	EN60079- 31	{Ex} II 2D Ex tb IIIC T 85°C Db -40°C<=Ta<=+60°C
ExR-1/21 -KKTO-XX°C	2					
ExR-1/21 -KTS-XX°C	1					
ExR-1/21 -KKTS-XX°C	2					
ExR-1/21 -KTOx-XX°C	3					
ExR-1/21 -KTSx-XX°C	3					
ExR-1/21 -KTSiO-XX°C	4					
ExR-1/21 -KTSiS-XX°C	4					
ExR-1/21 -KKTSiO-XX°C	5					
ExR-1/21 -KKTSiS-XX°C	5					
ExR-1/21 -KTSiOx-XX°C	6					
ExR-1/21 -KTSiSx-XX°C	6					
ExR-1/21 -KKTOx-XX°C	7					
ExR-1/21 -KKTSx-XX°C	7					
ExR-1/21 -KKTSiOx-XX°C	8					
ExR-1/21 -KKTSiSx-XX°C	8					

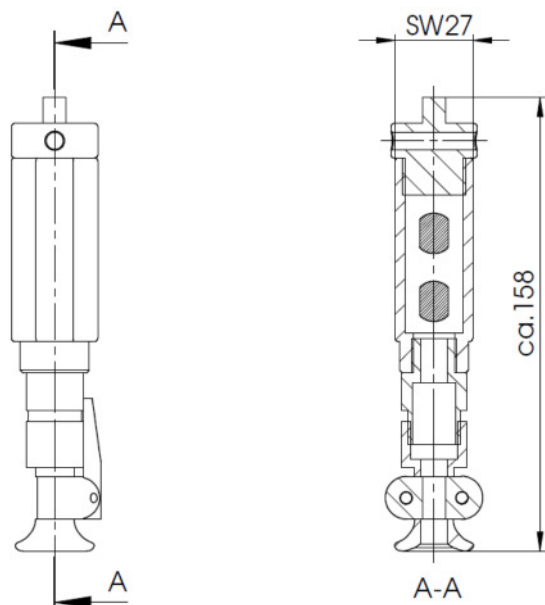
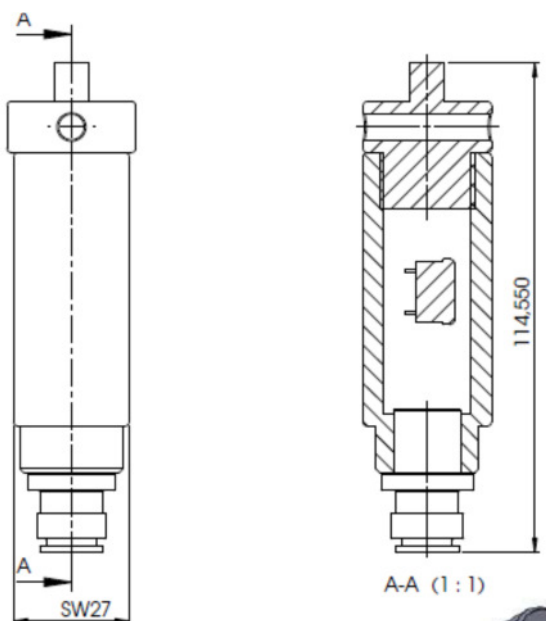
Picture 1: Sectional view KTO-XX and KTS-XX



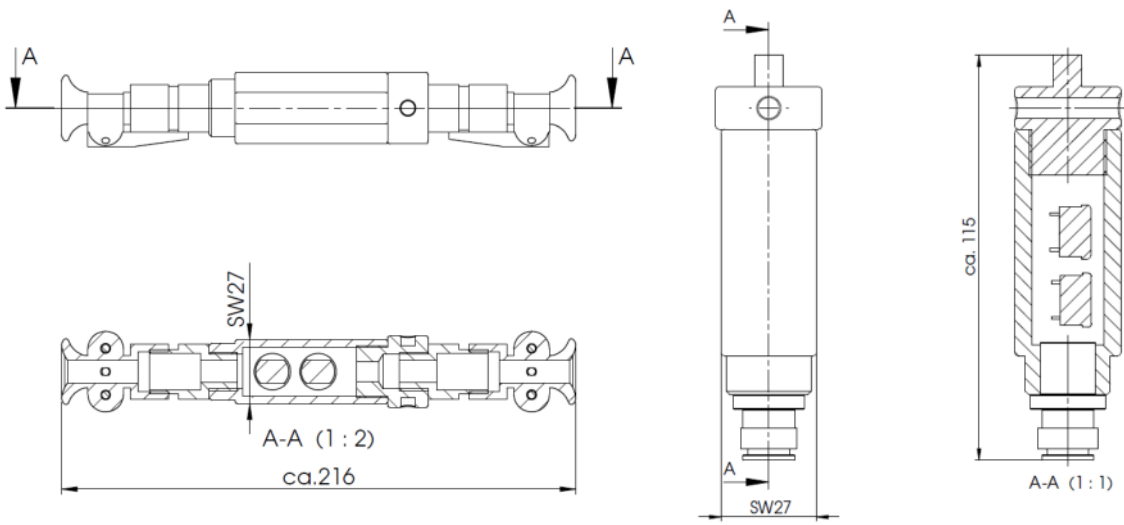
Picture 2: Sectional view KKTO-XX and KKTS-XX



Picture 3: Sectional view KTOx-XX and KTSx-XX  
Picture 4: Sectional view KTSiO-XX and KTSiS-XX

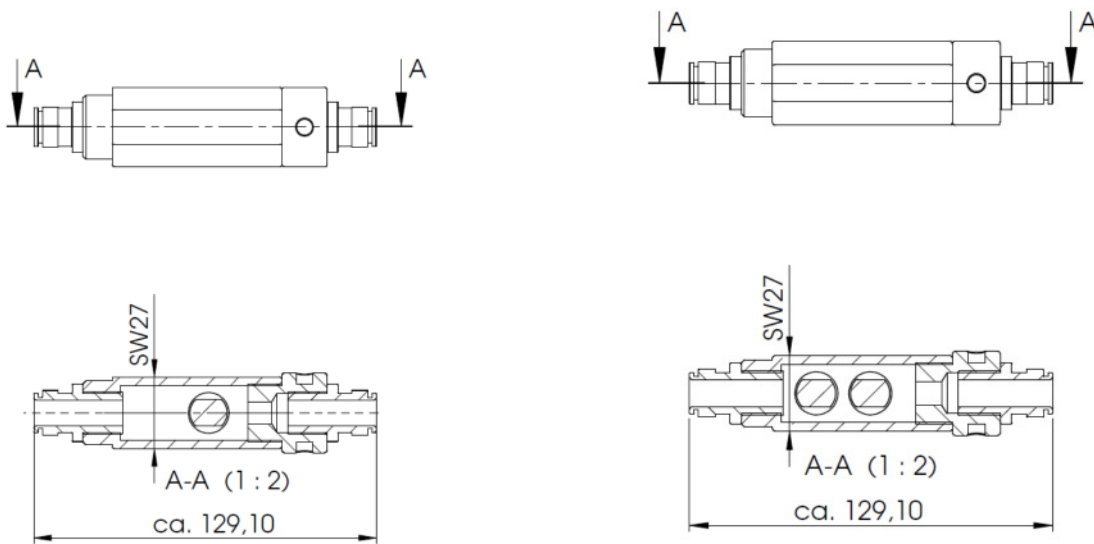


Picture 5: Sectional view KKTSiO-XX&KKTSiS-XX    Picture 6: Sectional view KTSiOx-XX&KTSiSx-XX



Picture 7: Sectional view KKTOx-XX & KKTSx-XX

Picture 8: Sectional view KKTSiOx-XX&KKTSiSx-XX



## **Operating conditions**

Controller ExR-1/21:	Gas zone 1 (DIN EN60079-0/-1) / Dust zone 21 (DIN EN60079-31)
Storage temperature range:	- 40 °C to +60 °C
Operating temperature range:	- 40 °C to +60 °C
Tightness IP66 and IP67:	By suitable gland, which is with Loctite 620 to the profile permanently connected and mechanically only with a great effort removeable. All removeable parts, which will contribute to the density and compressive strength also bonded with Loctite 620.

## **Application:**

- Ambient area: ExR-1/21 gas zone1 (EN60079-0/-1) / Dust zone21 (EN60079-31)
- As a rule- and control unit in the above-mentioned areas.
- As a warning and reporting unit (especially versions safety) in the above-mentioned areas.
- In conjunction with a cabinet heater to prevent condensation and avoid temperature fluctuations (protection of the installations) and to avoid low temperature (frost protection) within enclosures and other protective enclosures.
- In conjunction with cooling equipment and fans for cooling and ventilation of enclosures and other protective enclosures.

## **Installation**

### **Condition**

- Ambient conditions gas zone 1, dust zone 21 (see operating conditions) or less.
- Storage and operating ambience temperature –40 °C to +60 °C
- See also operating conditions ExH-1/21

### **Connection lead**

- Connection of the free end of leads must either be made outside of the explosion hazard area or inside an explosion-protected equipment approved for the respective category of devices.

- An equipotential bonding conductor can be connected to the exterior ground terminal when required, minimum cross section 4 mm<sup>2</sup> (standard section 15). The equipment bonding conductor must contact at the specified crimp cable lug. The cable lug must be secured against loosening and twisting using the enclosed serrated and plain washers when screwed on.
- A suitable strain relief for the connection lead should be ensured by the unit operator for the models with “x” in the type designation. These types are only for a permanent mounting predicted.
- All versions without „x“ in the type designation have a cable gland with integrated strain relief.
- The connection lead length of the controller should not fall below 0,5m. The controllers can be ordered with individual lead length. A modification of the lead of the end-user is not allowed.
- If the controller types KKT-Types are delivered together with ExH-1/21, so the lead of the controller with a minimum length of 1m as the starting lead of the controller is used, that is the distance between heater and controller shall be minimum 0,5m. Connection of the free end of leads must either be made outside of the explosion hazard area or inside an explosion-protected equipment approved for the respective category of devices.

Installation may be done only by a qualified electrician under existing regulations.

## **Assembly**

- In the upper third of the enclosure, combustible or flammable materials should be well away when overheating of the enclosure should be avoided, or, in the bottom third, when it comes to a frost protection application.
- Minimum distance to other components and wires is 50mm.
- The controller should not be covered, sufficient air circulation within the control cabinet, particularly in the area around the controller, must be assured.
- Installation must ensure protection against accidental contact and compliance with statutory protective measures.
- Connection leads must not come in contact with the heat sink of the heater.
- The used controllers regulate the temperature of the enclosure, but the controller doesn't influence the surface temperature of the heater. Therefore the heater is still “hot surface”.



## Electrical connection

- Please adhere to the specifications on the type plate.
- The circuit is unipolar, so during the installation, make sure that the phase is switched, to ensure that the end user is zero-potential at the nonoperating condition. Die Stromkreise der Regler und Endgeräte sollten extra abgesichert werden.
- The circuits of the controller should be fused separately.
- Controller and heaters should not be operated in series connection.
- When dimensioning should be noted the starting current.

## Putting in operation

- Visual inspection
- Functional test

## Adjustment

The controllers do not require any adjustment.

## Accessories

Accessories, e.g. heaters and other devices, may only be used with zone 1/21 type approval and the EX certification mark. You will find accessories in the current catalogues and brochures of Lm-therm GmbH.

## Maintenance

- Keep surface free of dust and dirt to ensure constant heat transmission.
- The controller itself is maintenance-free.
- In case of repair or technical changes warranty claims are forfeited.

**CE-Konformitätserklärung**  
(Herstellereklärung)

Als Hersteller bestätigen wir, die Firma

**Lm-therm GmbH**  
**Sulzbachstr. 15**

**D-94501 Aldersbach**

**Produkte:**

Temperaturregler für EX-Bereich Typ: ExR1-21

**EU-Richtlinie:**

73/23/EWG

Richtlinie über elektrische Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen (Niederspannungsrichtlinie)

EN 60950

-89/336/EWG

Elektromagnetische Verträglichkeit (EMV-Richtlinie)

EN55011

EN55022

EN50082-1

EN61000-3-2

EN61000-3-3

EN61000-6-2


EN60079-0:2010


EN60079-1:2008

EN60079-31:2010

EG-Baumusterprüfbescheinigung  
IBExU10ATEXXXXX X

IBExU Institut für Sicherheitstechnik GmbH  
Fuchsmühlenweg 7  
D-09599 Freiberg  
Kenn-Nr.: 0637

Kennzeichen:  II2G Ex d IIC T6 Gb

 II2D Ex tb IIIC T80°C Db

Das bezeichnete und o. g. Produkt wird ausschließlich aus CE-konformen Komponenten hergestellt.

Gleichbleibende Qualität wird durch 100%-Prüfung gewährleistet.