



# ExConnection Rail

## Ex Installation Manual for Type 04

Revision 05 for the 1st Addendum to the  
ATEX Prototype Test and to the 1<sup>st</sup> IECEx Certificate

## Table of Contents

<b>1</b>	<b>Introduction .....</b>	<b>4</b>
<b>2</b>	<b>General Safety Instructions.....</b>	<b>5</b>
<b>3</b>	<b>Area of application .....</b>	<b>6</b>
<b>4</b>	<b>Certification and compliance with standards .....</b>	<b>7</b>
<b>5</b>	<b>Technical Data .....</b>	<b>7</b>
5.1	Ex-d housing made of light metal (GUBox series 8265).....	7
5.2	Ex-e terminal compartment made of moulded plastic (series 8146).....	13
5.3	Ex-d e housing combinations .....	15
<b>6</b>	<b>Transportation, Storage and Recycling.....</b>	<b>16</b>
<b>7</b>	<b>Installation .....</b>	<b>16</b>
7.1	Housing dimensions, drilling holes and fastening distances.....	16
7.2	Installation requirements .....	18
7.3	Assembly and Use .....	19
7.4	Electrical interface.....	23
7.5	High Frequency Emitting Interface .....	28
7.6	Optical Interface .....	30
7.7	Making additional through-holes .....	31
<b>8</b>	<b>Starting the device operation .....</b>	<b>31</b>
<b>9</b>	<b>Operation .....</b>	<b>32</b>
9.1	Function .....	32
<b>10</b>	<b>Service, maintenance and troubleshooting.....</b>	<b>33</b>
10.1	Specification of lubrication and protective materials.....	33
10.2	Required Accessories .....	35
10.3	Maintenance and regular servicing.....	36
10.4	Cleaning .....	36
10.5	Repair instructions.....	36
<b>11</b>	<b>Recycling.....</b>	<b>37</b>
<b>12</b>	<b>Technical drawings.....</b>	<b>37</b>
<b>13</b>	<b>Certificates of the ExConnection Rails (T04) .....</b>	<b>38</b>
13.1	EU Declaration of Conformity .....	38
13.2	EC Prototype Test Certificate, 10 ATEX 7969 X .....	39
13.3	EC Prototype Test Certificate, IECEx.....	43

## Table of figures

Tab.6.1: Ex-d outer dimensions and empty housing weight .....	8
Tab.6.2: Ex-d Power dissipation and temperature class:.....	9
Fig.6.1: Dimension drawings of the GUBox series 8265 .....	12
Tab.6.4: Ex outer dimensions and empty weight .....	14
Tab.6.5: Ex-e assembly and installation dimensions .....	15
Fig. 7-1 Mounting of the housing .....	16
Tab.8.1: T04 ExCR fastening dimensions .....	17
Tab.8.2: T04 ExCR Fastening screws .....	17
Fig.8.1: Mounting and installation dimensions of ExConnection Rail.....	18
Fig.8.2: Intrinsically safe circuits of the ExConnection Rail.....	24
Tab.8.3: Tightening torques for various types of screws .....	27
Fig.8.3: Connecting the protective conductor .....	28
Tab.8.4: Power limit levels for HF emitters .....	29
Tab.8.5: Energy limit levels for HF emitters .....	29
Tab.8.6: Safe optical radiation power and irradiation intensity.....	31
Fig.11.1: Breathers against condensation .....	35

## Records of revisions

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 Authors: Steffen Seibert, Grad. Engr.  
 Thiemo Gruber, Grad. Engr.  
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5	13.02.2017	Steffen Seibert	Various reviews	

# 1 Introduction

The ExConnection Rail (type 04) is a connecting and transmission unit for audio, video and process signals. It is intended for a direct installation and applications in areas exposed to gas and dust explosion. The core ignition protection category is based on the principle of pressure-resistant encapsulation (Ex d acc. to DIN EN 60079-1).

The ExConnection Rail, hereinafter called ExCR, can convert, for instance, digital video streams (IP/TCP/RTSP, 3G HD-SDI, etc.) and analogue camera signals (FBAS, etc.), as well as audio and process signals (MSR) into signals of other transmission methods and media (copper conductors, optical wave-guides, WLAN, DECT, RFID, UMTS etc.) It can manage these signals, radially or annularly distribute them in an explosion-endangered area and transport them into a safe area (not Ex).

The T04 ExConnection Rail series can be used very flexibly and for very different industrial applications, preferably in chemical and petrochemical industry, offshore installations, firedamp-endangered pits and bio-gas plants.

The ExConnection Rail series belongs to electrical equipment of device group II in accordance with ATEX Product Directive 2014/34/EU and can be used in the Ex zones 1, 2, 21 and 22 including explosion groups IIC (e.g. acetylene) and IIIC (conductive dust and combustible fluffing) without risk and danger. Its resistance to extreme environmental conditions is improved by a die-cast aluminium housing with optional surface protection coating. The housing can be optionally equipped with a borosilicate sight-glass. So the staff in the Ex area can e.g. capture status LEDs or visualizations of monitoring, as well as control and analyse the devices directly on site.

## 2 General Safety Instructions



**Please note!**

**ExConnection Rail is only suitable for zone 0 and zone 2.  
Heed the temperature class and explosion group given on the name plate of ExConnection Rail!  
Never modify or change anything in ExConnection Rail!  
Use ExConnection Rail in an undamaged and proper condition only!**



**Please note!**

**ExConnection Rail is not approved for device group I, category M1 and M2 (firedamp-endangered pits)!**



**Please note!**

**For repair purposes, only use original parts from Samcon Prozessleittechnik GmbH! Repairs affecting explosion protection and safety may only be done by Samcon Prozessleittechnik GmbH in accordance with applicable national rules.**



**Please note!**

**During installation and assembly, please pay attention to external heat and/or cold sources (radiation and convection). Observe the ranges of permissible temperatures!**



**Please note!**

**For more information and individual provisions, please see the attached papers and product-specific device documentation.**



**Please note!**

**Unauthorized work on the device is prohibited!  
Installation, service, maintenance and troubleshooting must be carried out by authorized and qualified staff only!**

When installing and operating the device, observe the following points:

- Damaging the device can cause failures of explosion protection.
- Adhere to national and local safety regulations.
- Adhere to national and local regulations for prevention of accidents.
- Adhere to national and local regulations for assembly and erection.
- Adhere to generally recognized rules of technology.
- Adhere to the safety Instructions given in the present Ex Installation Instructions.
- Heed the characteristic values and rated operating conditions given on the nameplates and data plates.
- Observe the additional warning signs on the device.
- Never do any modifications or changes to the device!

### **3 Area of application**

ExConnection Rail is suitable for use in explosion-endangered areas of zones 1 and 2, as well as zones 21 and 22 in accordance with DIN EN 60079-10. The units may only be used within the respectively approved ignition protection category and temperature class.



**Please note!**

**Heed the information on the name plate and the warnings!**

## 4 Certification and compliance with standards

The T04 ExConnection Rail meets at least the requirements of the following standards and directives:

**DIN**

- IEC 60079-0:2011 modified + Cor.:2012 + Cor.:2013, EN 60079-0:2014-07-01
- IEC 60079-1:2014, EN 60079-1:2014
- IEC 60079-7:2006, EN 60079-7:2007
- IEC 60079-11:2011+ Cor.:2012, EN 60079-11:2012
- IEC 60079-18:2009 + Corrigendum 2009, EN 60079-18:2009
- IEC 60079-28:2006, EN 60079-28:2007, IEC 60079-28:2006/ ISH1:2014, EN 60079-28:2007 (supplement 1:2014-09)
- IEC 60079-31:2008, EN 60079-31:2009
- IEC 60529:1989 + A1:1999 + A2:2013, EN 60529:1991+A1:2000 + A2:2013

Appointed testing authority:	TÜV Rheinland (Number 0035)
EC prototype test certificates:	TÜV 10 ATEX 7969 X_1st supplement
Addition / Rev. Index:	01
ATEX test report:	557 / Ex 969.00/10

## 5 Technical Data

### 5.1 Ex-d housing made of light metal (GUBox series 8265)

#### Brief description:

The explosion-proof enclosures (Ex-d) made of light metal in 6 basic sizes for direct and indirect cable and wiring entries, can be combined with various Ex e terminal boxes of series 8146, 8125 and 8150. A large cover opening allows an efficient use of the mounting space and easy maintenance.

Several perforated bars and threaded holes in the housing base allow flexible and vibration-resistant assembly of units to be installed by means of multi-storey mounting plate structures, spacer bolts and DIN mounting rails, e.g.

**Material:** aluminium, copper-free (seawater-proof) AL Si7Mg03 T6 acc. to EN 13195, in the case of direct contact with seawater, an appropriate lacquering is recommended!

Optional sight glass made of borosilicate according to DIN7080

Protective coating (optional) with epoxy primer, RAL7032/ 7035

**Ambient temperature range:** see the nameplate

**Protection level:** IP66 with a silicone O-ring, -60°C ... (blue)

<b>Electrical parameters (max.):</b>	$U_e$	= 1000 V (standard)
	$U_e$	= 10 kV (special)
	$I_e$	= max. 160 A (T04.1 ... T04.4)
	$I_e$	= max. 250 A (T04.5 ... T04.6)

### Outer dimensions and empty housing weight:

ExCR model	Ex-d external dimensions <sup>1</sup>					Borosili- cate	Ex-d weight (empty hous- ing, net weight)
	L <sub>R</sub>	L <sub>G</sub>	B <sub>R</sub>	B <sub>G</sub>	H <sub>G</sub>	Ø effec- tively <sup>2</sup>	
	[mm]						
T04.1	125	150	125	150	132	<i>n.a.</i>	2.750
T04.1* ( <i>borosilicate sight glass</i> )	125	150	125	150	132	68	2.750
T04.2	155	192	155	192	132	<i>n.a.</i>	3.850
T04.2* ( <i>borosilicate sight glass</i> )	155	192	155	192	132	105	4.100
T04.3	195	234	195	234	172	<i>n.a.</i>	6.580
T04.3* ( <i>borosilicate sight glass</i> )	195	234	195	234	172	141	6.630
T04.4	236	289	236	289	227	<i>n.a.</i>	10.640
T04.4* ( <i>borosilicate sight glass</i> )	236	289	236	289	227	186	11.130
T04.5	285	348	285	348	230	<i>n.a.</i>	18.300
T04.5* ( <i>borosilicate sight glass</i> )	285	348	285	348	230	186	18.300
T04.6	335	410	335	410	281	<i>n.a.</i>	27.800
T04.6* ( <i>borosilicate sight glass</i> )	335	410	335	410	281	186	28.800

Tab.6.1: Ex-d outer dimensions and empty housing weight

<sup>1</sup> Dimension parameters "X<sub>R</sub>" are referred to the square area of the fuselage (the circular cover is not included. Dimension parameters "X<sub>G</sub>" are referred to the overall dimensions incl. circular cylindrical screw cap (absolute dimensions).

<sup>2</sup> Visible/effective cut-out for the borosilicate glass, external circular area (glued-in area/compound is not included)



**Power dissipation<sup>3</sup> and temperature class:**

ExCR model	T6 / T80°		T5 / T95°	
	T <sub>AMB</sub>		T <sub>AMB</sub>	
	40°C	60°C	40°C	60°C
T04.1	27 W	13 W	38 W	22 W
T04.1* (protective coating)	35 W	16 W	49 W	28 W
T04.2	40 W	18 W	58 W	35 W
T04.2* (protective coating)	52 W	23 W	75 W	45 W
T04.3	58 W	23 W	85 W	52 W
T04.3* (protective coating)	75 W	26 W	110 W	67 W
T04.4	85 W	38 W	130 W	72 W
T04.4* (protective coating)	110 W	49 W	169 W	93 W
T04.5	117 W	49 W	190 W	96 W
T04.5* (protective coating)	152 W	63 W	247 W	124 W
T04.6	138 W	58 W	205 W	115 W
T04.6* (protective coating)	179 W	75 W	266 W	149 W

Tab.6.2: Ex-d Power dissipation and temperature class:

**Maximum number of threaded holes (ignition-puncture-proof gaps!):**

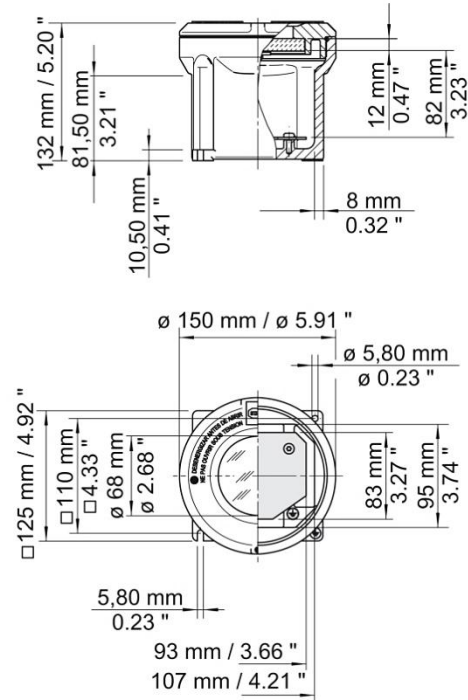
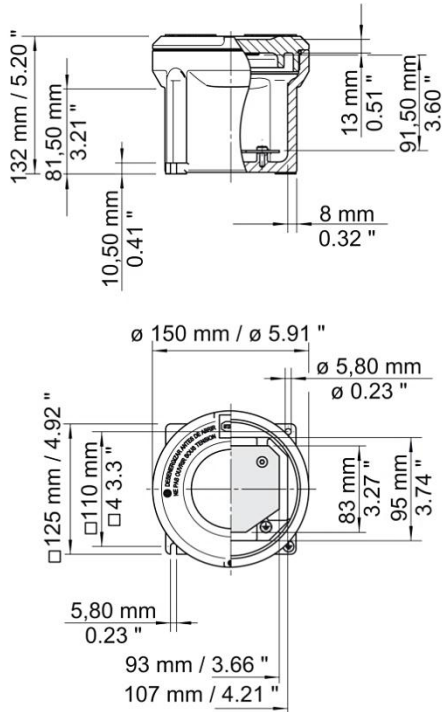
ExCR model	Metric holes <sup>4</sup> per side of the housing								
	M20 x1.5	M25 x1.5	M32 x1.5	M40 x1.5	M50 x1.5	M63 x1.5	M75 x1.5	M90 x1.5	M105 x1.5
T04.1	3	1	1	1	-	-	-	-	-
T04.2	3	2	2	1	-	-	-	-	-
T04.3	8	4	3	2	1	1	1	-	-
T04.4	16	9	6	4	3	1	1	-	-
T04.5	18	9	8	5	3	2	1	1	-
T04.6	28	16	12	8	5	3	2	1	1

<sup>3</sup> In the case of a lower ambient temperature declaration, the power dissipation of the next higher ambient temperature from Tab.6.2 shall apply. In the case of Ex-d e combinations, the permissible power dissipation input may be less than the values in the table above! In the built-in and built-on components of the ExCRs (Ex [ia], Ex-mb, etc.) that are relevant to explosion protection, the permissible thermal power dissipation can be reduced, if necessary (-> temperature coefficients  $\Delta T_{Ex\ d\ in}$  [K/W])

<sup>4</sup> Thread acc. to ISO 965-1/-3, tolerance class "medium" or better. Other thread types complying with IEC/EN 60079-1, Table 3 and 4 are also possible. For thread dimensions within the ranges specified in the table below, the maximum number depends on the next larger thread size given in the table.

### Dimension drawings of the GUBox series 8265:

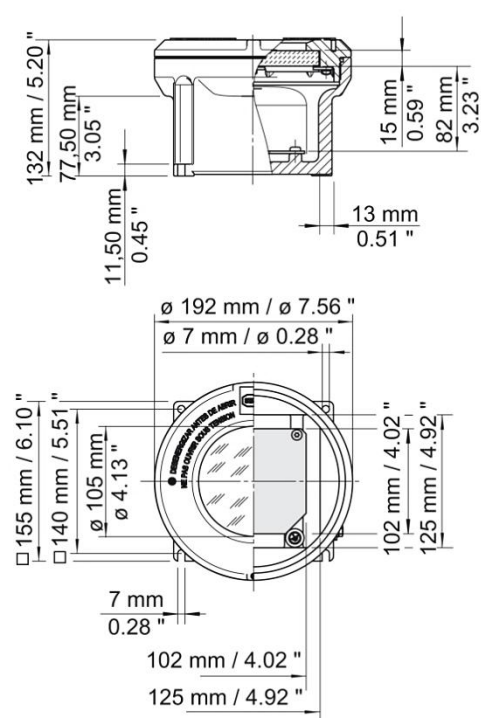
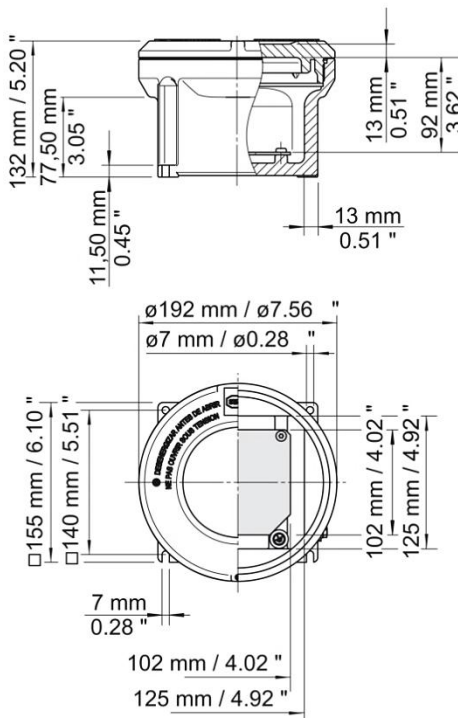
(Installation dimensions and gross weights of the T04 ExCRs at the assembly and installation location must be observed!)



11396E00

**Gehäuse Größe 1**  
**8265/1-000,**  
**ohne Schauglas**

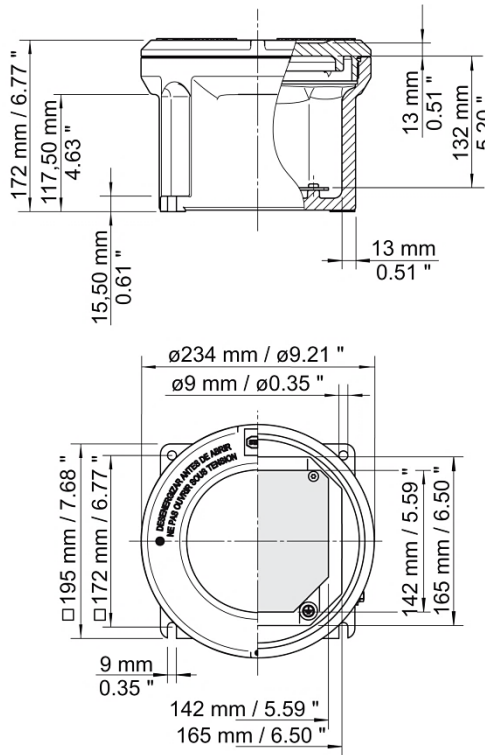
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**8265/1-001,**  
**mit Schauglas**



05575E00

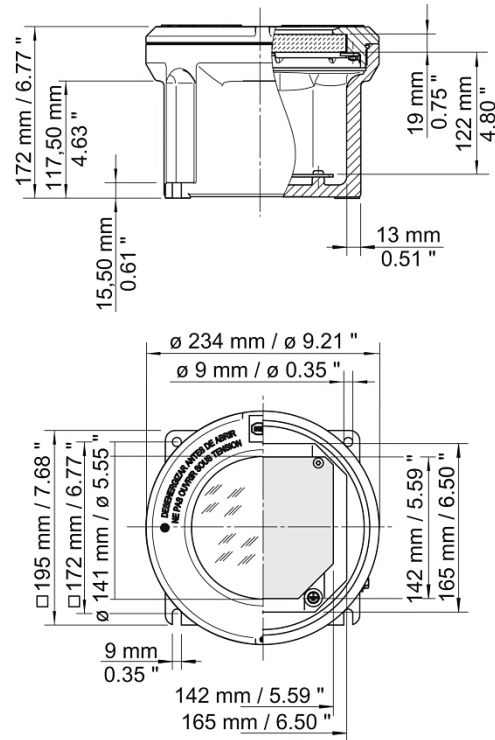
**Gehäuse Größe 2**  
**8265/2-000,**  
**ohne Schauglas**

**Gehäuse Größe 2**  
**8265/2-001,**  
**mit Schauglas**

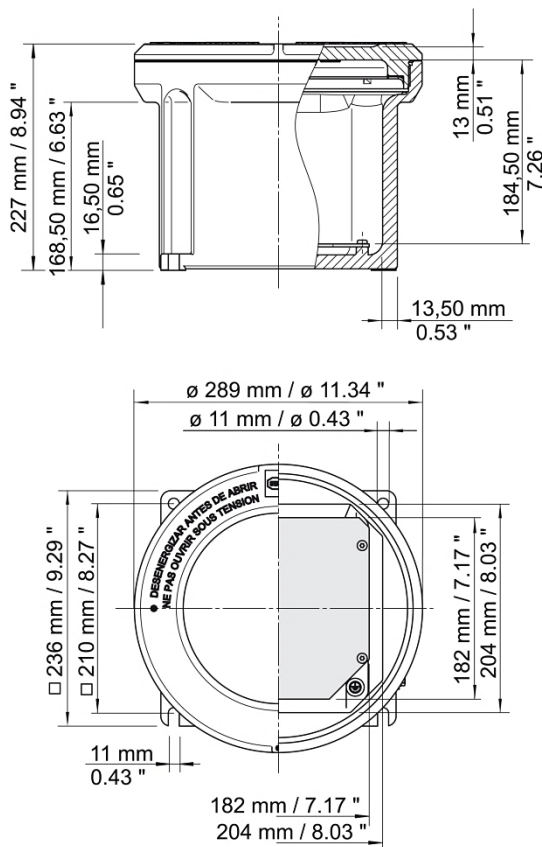


**Gehäuse Größe 3**  
8265/.3-000,  
ohne Schauglas

05580E00

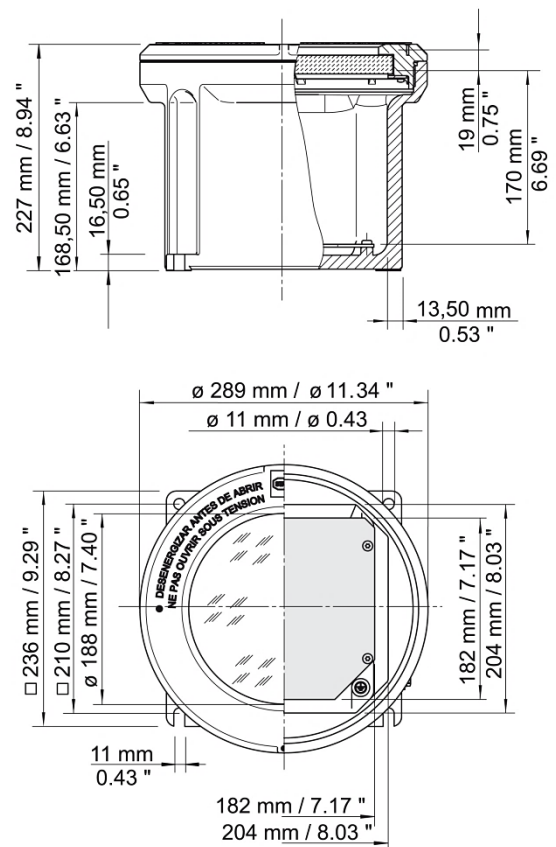


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mit Schauglas

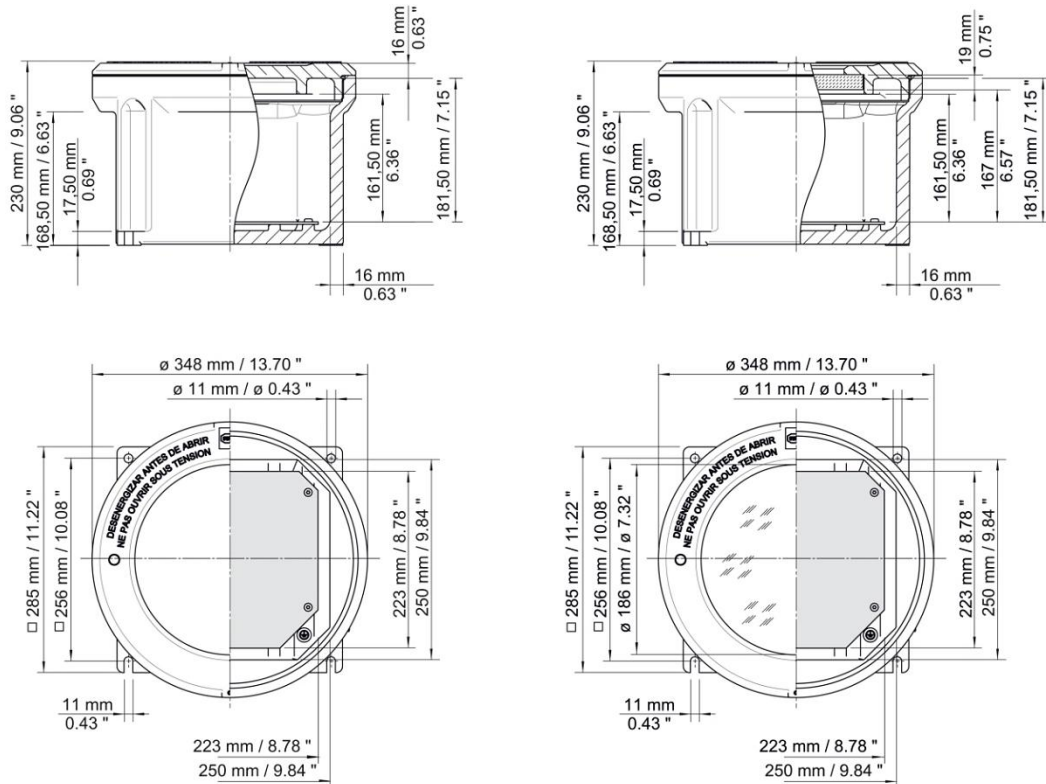


**Gehäuse Größe 4**  
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ohne Schauglas

05584E00



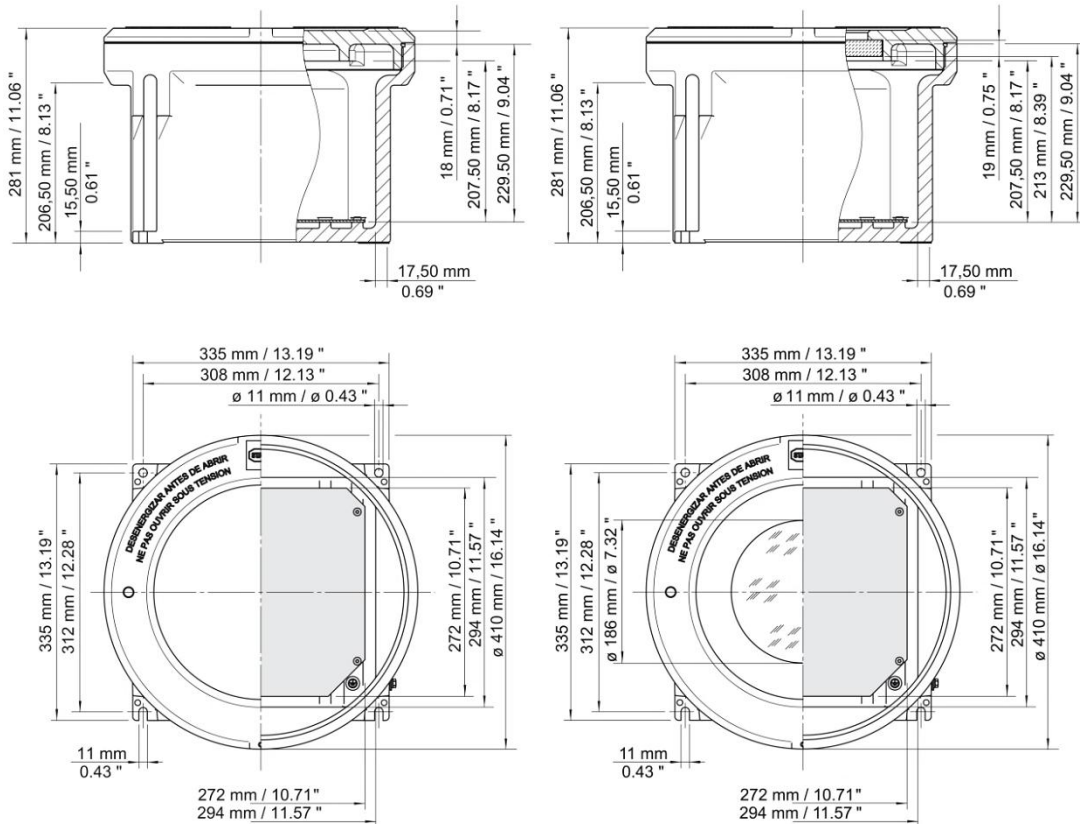
**Gehäuse Größe 4**  
8265/.4-001,  
mit Schauglas



11398E00

**Gehäuse Größe 5**  
**8265/5-000,**  
**ohne Schauglas**

**Gehäuse Größe 5**  
**8265/5-001,**  
**mit Schauglas**



13133E00

13134E00

**Gehäuse Größe 6**  
**8265/6-000,**  
**ohne Schauglas**

**Gehäuse Größe 6**  
**8265/6-001,**  
**mit Schauglas**

Fig.6.1: Dimension drawings of the GUBox series 8265

## 5.2 Ex-e terminal compartment made of moulded plastic (series 8146)

### **Brief description:**

Connector housing made of moulded material, combined with Ex-d housings of series 8265, for indirect cable and wire entries, modular housing dimensions, low weight, low maintenance cost, cover cap with M6 captive combi-slotted screws made of stainless steel or, optionally equipped with lid hinges.

### **Material:**

Glass-fibre reinforced polyester resin, corrosion-resistant, dark grey  $\approx$  RAL7024, impact resistance  $\geq 7\text{J}$ , surface resistance  $\leq 10^9\Omega$ , fire-retarding as per IEC/EN 60695, UL 94 VO ASTM D635, self-extinguishing and silicone-free. Seal: silicone foam / PU foam (optional)  $-20^\circ\text{C} \dots +80^\circ\text{C}$

<b>Ambient temperature range:</b>	see the nameplate
<b>Protection level:</b>	IP66
<b>Electrical parameters (max.):</b>	$U_e = 1100\text{ V}$
	$I_e = \text{max. } 630\text{ A}$

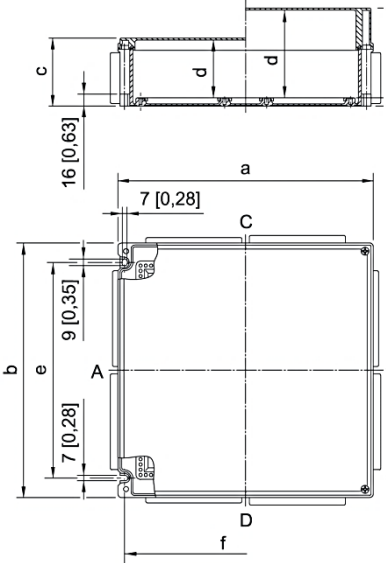
**Outer dimensions and empty housing weight:**

Ex-e design	Ex-e outer dimensions			Ex-e empty weight
	L	B	H	
	[mm]			[kg]
8146/.031	112.5	112.5	91.0	0.470
8146/.041	170.0	112.5	91.0	0.580
8146/.051	170.0	170.0	91.0	0.860
8146/.052	170.0	170.0	131.0	1.100
8146/.061	227.0	170.0	91.0	1.150
8146/.062	227.0	170.0	131.0	1.400
8146/.S71	340.5	170.0	91.0	1.600
8146/.071	340.5	170.0	91.0	1.600
8146/.072	340.5	170.0	131.0	1.950
8146/.B73	340.5	170.0	150.0	1.800
8146/.S73	340.5	170.0	150.0	1.800
8146/.073	340.5	170.0	150.0	1.800
8146/.B75	340.5	170.0	190.0	2.100
8146/.075	340.5	170.0	190.0	2.300
8146/.081	340.5	340.5	91.0	2.950
8146/.082	340.5	340.5	131.0	3.450
8146/.083	340.5	340.5	150.0	3.400
8146/.084	340.5	340.5	171.0	3.700
8146/.085	340.5	340.5	190.0	3.900
8146/.086	340.5	340.5	230.0	4.200
8146/.091	681.5	340.5	91.0	5.600
8146/.092	681.5	340.5	131.0	6.300
8146/.093	681.5	340.5	150.0	6.200
8146/.095	681.5	340.5	190.0	6.900

Tab.6.4: Ex outer dimensions and empty weight

### Assembly and installation dimensions:

Type	Ex-e maximum assembly and installation dimensions!					
	a	b	c	d	e	f
	[mm]					
8146/.031	112.5	112.5	91.0	77.0	60.0	94.0
8146/.041	170.0	112.5	91.0	77.0	118.0	94.0
8146/.241	227.0	112.5	91.0	77.0	175.0	94.0
8146/.242	227.0	112.5	131.0	117.0	175.0	94.0
8146/.051	170.0	170.0	91.0	77.0	118.0	152.0
8146/.052	170.0	170.0	131.0	117.0	118.0	152.0
8146/.061	227.0	170.0	91.0	77.0	175.0	152.0
8146/.062	227.0	170.0	131.0	117.0	175.0	152.0
8146/.071	340.5	170.0	91.0	77.0	288.5	152.0
8146/.S71	340.5	170.0	91.0	77.0	322.5	118.0
8146/.072	340.5	170.0	131.0	117.0	288.5	152.0
8146/.073	340.5	170.0	150.0	136.0	288.5	152.0
8146/.S73	340.5	170.0	150.0	136.0	322.5	118.0
8146/.075	340.5	170.0	190.0	176.0	288.5	152.0
8146/.081	340.5	340.5	91.0	77.0	288.5	322.5
8146/.082	340.5	340.5	131.0	117.0	288.5	322.5
8146/.083	340.5	340.5	150.0	136.0	288.5	322.5
8146/.084	340.5	340.5	171.0	157.0	288.5	322.5
8146/.085	340.5	340.5	190.0	176.0	288.5	322.5
8146/.086	340.5	340.5	230.0	216.0	288.5	322.5
8146/.091	681.5	340.5	91.0	77.0	629.5	322.5
8146/.092	681.5	340.5	131.0	117.0	629.5	322.5
8146/.093	681.5	340.5	150.0	136.0	629.5	322.5
8146/.095	681.5	340.5	190.0	176.0	629.5	322.5



Tab.6.5: Ex-e assembly and installation dimensions

### 5.3 Ex-d e housing combinations

**Ambient temperature range:** see the nameplate

**Protection level:** IP66 with a silicone O-ring, -60°C ... (blue)

**Electrical parameters (max.):**

$U_e$	=	1000 V
$I_e$	=	max. 160 A (T04.1 ... T04.4)
$I_e$	=	max. 250 A (T04.5 ... T04.6)
$\varnothing_{max}$	=	95 mm <sup>2</sup> (T04.1 ... T04.4)
$\varnothing_{max}$	=	120 mm <sup>2</sup> (T04.5 ... T04.6)

## 6 Transportation, Storage and Recycling

Transportation: avoid vibrations, transport in the original carton and handle it carefully!

Storage: keep dry and away of vibrations, in original packaging!

Recycling: Ensure an environmentally friendly disposal of all components in accordance with the national regulations for waste disposal!

## 7 Installation

### 7.1 Housing dimensions, drilling holes and fastening distances

During assembly, absolutely adhere to the dimension parameters and fastening dimensions/ requirements at the place of the device use. Check them in advance (see Section 6.1 and Section 6.2)!

The T04 ExConnection Rail has four mounting bases (T04.1 has only two, diagonally!) arranged in a square for fixing them with screws, threaded rods or studs and nuts.

Fixing positions "A1"/ "A2" are designed as boreholes, and "B1"/"B2" are designed as long holes (cp. Fig. 8.1). Thus, when assembling, you can place the T04 ExConnection Rail onto pre-installed screws or pins. This makes the device assembly so comfortable and easy that it can be done by a single person!

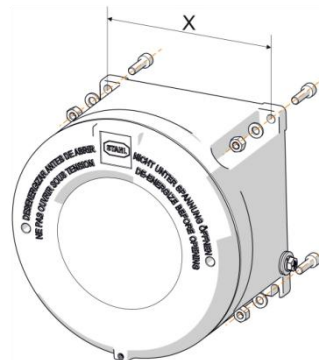


Fig. 7-1 Mounting of the housing

The maximum opening width for hexagonal head screws ISO4014/ DIN931 may vary between 13 ... 27 [mm] (T04.1 ... T04.6), but the cap thickness is flexible.

Usually the fastening screws should be identical and tightened in a cross-diagonal pattern! Tightening torques in accordance with Table 8.3. Ideally, T04 ExConnection Rail should be installed in the horizontal position and should not be exposed to long-time vibrations or shaking at the place of its use.

For distances and hole patterns of the fastening screws, see the table below and figure 8.1.



## Mounting and installation dimensions:

(cp. fig. 8.1)

ExCR	Ex-d	Ex-e	„X1“	„X2“	„Y1“	„Y2“	„Z1“	„Z2“ <sup>5</sup>
			[mm]					
T04.1	8265/01-...	8146/....	110.0	125.0	110.0	125.0	1.5	n.a.
T04.2	8265/02-...	8146/....	140.0	155.0	140.0	155.0	1.5	n.a.
T04.3	8265/03-...	8146/....	172.0	195.0	172.0	195.0	1.5	n.a.
T04.4	8265/04-...	8146/....	210.0	236.0	210.0	236.0	1.5	n.a.
T04.5	8265/05-...	8146/....	256.0	285.0	256.0	285.0	1.5	n.a.
T04.6	8265/06-...	8146/....	312.0	335.0	312.0	335.0	1.5	n.a.

Tab.8.1: T04 ExCR fastening dimensions

The T04 ExConnection Rail should be mounted with four screws or threaded bolts with nuts and washers. It is recommended to use e.g. hexagon screws for dowel mounting acc. to DIN 571 or hexagon screws with shank and metric coarse or fine thread (DIN13-1/-2) according to ISO 4014, which are made of stainless steel material A4 (material no. 1.4401 [X5CrNiMo17-12-2], 1.4432 [X2CrNiMo17-12-3], 1.4435 [X2CrNiMo18-14-3], 1.4436 [X3CrNiMo17-13-3] or 1.4571 [X6CrNiMoTi17-12-2] (A5))

## Recommended mounting screws/ fastening:

(cp. fig. 8.1)

ExCR	Ex-d	Ex-e	Number of pieces	Specifications of the screws ( <i>recommended</i> )
T04.1	8265/01-...	8146/....	2x	M5* 0,8 l=40mm ISO 4041/ V4A / 4g6g
T04.2	8265/02-...	8146/....	4x	M6* 1,0 l=40mm ISO 4041/ V4A / 4g6g
T04.3	8265/03-...	8146/....	4x	M8* 1,25 l=50mm ISO 4041/ V4A / 4g6g
T04.4	8265/04-...	8146/....	4x	M10* 1,5 l=50mm ISO 4041/ V4A / 4g6g
T04.5	8265/05-...	8146/....	4x	M10* 1,5 l=60mm ISO 4041/ V4A / 4g6g
T04.6	8265/06-...	8146/....	4x	M10* 1,5 l=70mm ISO 4041/ V4A / 4g6g

Tab.8.2: T04 ExCR Fastening screws

<sup>5</sup> Distance "Z2" is not binding and can vary. In the extreme case, the rear panel of the Ex-e terminal compartment is level with the surface of the mounting base. Please provide enough space at the place of use. No additional fastening of the Ex-e terminal compartment is permitted!

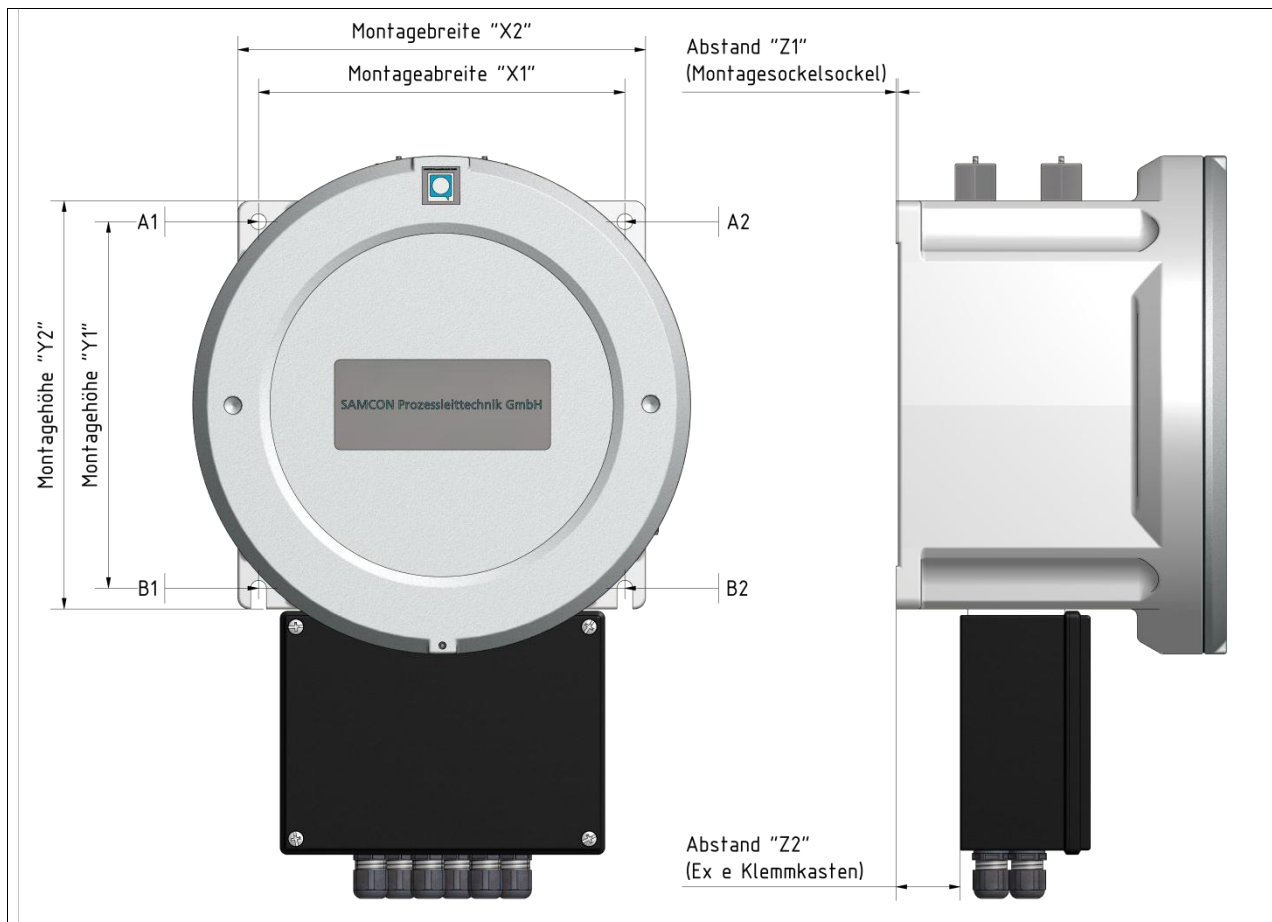


Fig.8.1: Mounting and installation dimensions of ExConnection Rail

## 7.2 Installation requirements

- Protect the device against mechanical stresses!
- The device is suitable for use in indoor and outdoor areas!
- In the case of free weathering, it is recommended to equip the ExConnection Rail with a protective roof or protective wall!
- If direct contacts with seawater are expected, the external surfaces of the Ex-d housing should be provided with a protective lacquering coat!
- At the place of use, absolutely pay attention to the Ex d housing GUBox's resistance against chemical substances and other media. See the General Specification for GUBox aluminium alloy "Al Si7Mg03 T6 according to EN 13195" or ask the Samcon company!
- Internal wiring shall be exclusively made by Samcon. The wiring must never be modified or supplemented!
- Lines (in particular, wire and cable penetrations of Ex-d<->Ex-e of series 8174, etc.) are designed for existing potential temperatures and for the minimum current carrying capacity (e.g. of type "H0 7G-K", "S0 7G-K", "NSGAFÖU" or "AWM UL 1015")

- At the place of the installation, absolutely pay attention to the installation weight of and mechanical load from the ExConnection Rail and from the mounting medium and check it (cf. also Tab.6.1, 6.4 and 6.6). Consider a safety margin of min. 20% in the device weights!
- Use only the recommended erection bolts (cf. Tab.8.2)! The bolts are not included in delivery!
- Heed the bending radii of the cables and supply lines!
- For optional wireless connections via "Solexy Wireless AXF Antenna Coupler", heed the antenna dimensions and antenna alignments (omni spotlights, directional radio, polarization, local miniature rod aerials with type 2.15 dBi or, possibly, external antennas up to 15 dBi etc.) at the place of use with regard to the radio wave propagation, as well as sending and receiving quality!

### 7.3 Assembly and Use



- Not correctly performed installation can cause severe injuries!
- The service line must comply with the currently applicable regulations and should be of the required cross section!
- The diameter must match the dimensions given on the cable bushing!
- Ensure by an appropriate configuration of the used lines and their kind of routing that the maximum permissible conductor temperature is not exceeded.
- Heed the permissible ambient temperature stated on the name plate of the respective device!

#### Installation in dust-explosive areas!



- The ExConnectionRail must not be used in areas where high electrical charges are generated, mechanical friction and separation processes are carried out, or electrons are sprayed (e.g. in the environment of electrostatic painting equipment), or there is pneumatically conveyed dust.
- Heed the respective note on the nameplate and/or warning sign of the ExConnectionRail!
- If you select a connecting cable which causes a temperature higher than +70 °C at the cable entries, you should respectively lay out the cable entries for such a temperature!



Mount the device with suitable screws, lock washers, accessories etc. in the provided fixing holes (cf. section 8.1)!

Pay attention to the weight of the housing!

If necessary, use suitable auxiliary aids for the transportation!

When mounting the device, ensure that the base under the device is even!

You can fasten the device in any position which is allowed in the device documentation or given on its name plate!

### Opening the Ex-d housing cover:



**Please note!**

Depending on the product and model type, there are different rules applicable for opening and closing the Ex-d housing, in particular in hazardous areas!

Absolutely observe the instructions given on the nameplate and in the device documentation!

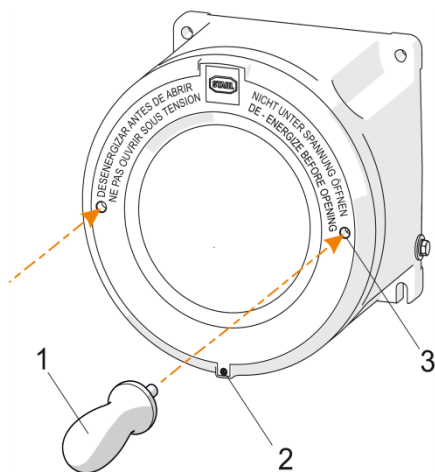
Warnings can be as follows:

**“WARNUNG – DO NOT OPEN WHILE ENERGIZED”  
„WARNING – DO NOT OPEN WHEN ENERGIZED“**

or

**“Warning - DO NOT OPEN IN AN EXPLOSION-ENDANGERED  
AREAS”**

**“WARNING - DO NOT OPEN IN POTENTIALLY EXPLOSIVE  
ATMOSPHERES “**



- Loosen the headless screw / stop bar "M5x16-A2" (with crest) (2).

- Insert the socket wrench (1) into the borehole (3) and carefully unscrew the housing cover counter-clockwise.

**Caution: Danger of damage to the ignition-puncture-proof gap (DIN 13-2 /grade min. 6H)!**

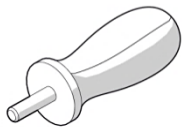
- Carefully put the housing cover onto a clean place. Be careful! Do not touch the screw connection of the cover with your hand or clothes! The screw connection is coated with fat "OKS 403" or "Molykote® P-40" against mechanical stresses.

**Caution: risk of contamination of the ignition-puncture-proof thread by lints, fluffs or metal chips sticking to the fatty coat!**

Important note:

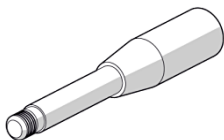
To open the ExConnectionRail T4.1, T4.2 and T4.4, T4.3, two socket wrenches of type „142059“ are recommended!

(← see the figure on the left)



To open the ExConnectionRail T4.5 and T4.6, two screw keys of type "221927" are required!

(← see the figure on the left)



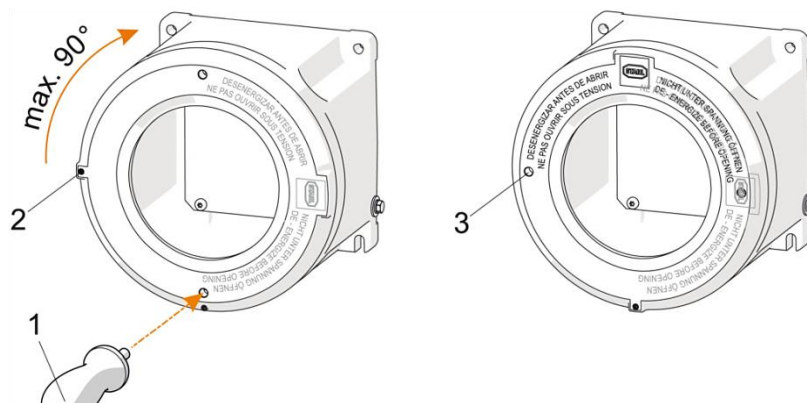
For each T04 device, two suitable tools for opening the housing cover are delivered!



**Please note!**

**Never leave foreign bodies in the Ex-d housing and never do any constructive changes!**

## Closing the Ex-d housing cover:



- Check the fine thread of the Ex-d cover screw connection and see that there is no contamination or damage! If necessary, clean the thread with nitro-thinner, acetone or similar fat solvents and re-grease it with "OKS 403" or "Molykote® P-40"!
- Carefully and evenly put the housing cover with its external thread onto the internal thread of the housing body!
- Plug the recommended special socket wrench (1/type 142059 or type 221927) into blind holes (3) and evenly screw the housing cover screw in a clockwise direction.
- Screw the housing cover completely (the end position is reached with a slight force resistance; there is no defined tightening torque). Turn the housing cover by maximum of 90° back, so that the Samcon logo on the housing top can be vertically plumb, if desired  
**(load-bearing threads ≥ 5)!**

**DIN**

Information:

DIN EN 60079-1:20102008 (ignition-puncture-proof threaded gap):



In accordance with Table 3 "Cylindrical Thread Gaps", for the threads with thread pitches  $\geq 0.7$  mm and of thread shapes and grades "medium" and "fine", tolerances according to ISO 965-1 and ISO 965-3, the number of engaged thread fillets should be more than 5.

Please observe: For Ex-d housings of volumes less than 100 cm<sup>3</sup>, the screw-in depth has to be at least 5 mm; for housing volumes exceeding 100 cm<sup>3</sup>, the screw-in depth must be minimum 8.0 [mm] (T04 ExConnection Rail). The pressure chamber empty volume of the T04 ExConnection Rail series may be from 800 cm<sup>3</sup> ( $\pm 0.8$  L) to 19500 cm<sup>3</sup> ( $\pm 19.5$  L), depending on its type and version!!!

## 7.4 Electrical interface



### Caution!!!

**Only qualified specialists are allowed to connect the equipment to the electrical power supply!**

- Absolutely observe the information in the chapter "Technical Data", as well as in the device-specific operating instructions and in the accompanying documentation, wiring diagrams, etc.
- When connecting a conductor, apply a particular care and thoroughness.
- The conductor insulation must reach up to the clamping points.
- Make sure that you do not damage or score the conductor when stripping it.
- By selection of suitable conductors and types of wiring, ensure that the maximum permissible conductor temperature and the maximum permissible surface temperatures are not exceeded.



### Warning!

- If the conductors are not correctly laid in the Ex-e terminal compartment, the explosion protection is no longer guaranteed!
- Observe the required creeping distances and clearances.
- Support rails and elements are properly fastened by Samcon and must not be loosened, disconnected or modified.



- Incorrect laying the cables or lines is dangerous! Danger of severe injuries!

### Intrinsically safe circuits (Ex-i)!

If the T04 ExConnection Rail contains intrinsically safe circuits (Ex-i inputs/ Ex-i outputs), special conditions for the design of these cables and lines are applicable:

- a) Follow the safety instructions in the enclosed Device Documentation for Ex-i isolated switching amplifiers or Ex-i barriers and/or circuit diagrams!
- b) Please observe the electrical parameters!  
(e.g..  $U_0/V_{0C}=23.6$  V,  $I_0/I_{SC}=72$  mA,  $P_0/P_0=424$  mW, etc.)
- c) Observe the parameters of the external power circuit (capacity/ inductance) for the required gas group! (e.g for IIC:  $C_0/C_a=0.13\mu\text{F}$ ,  $L_0/L_a=6.8\text{mH}$ ,  $L_0/R_0=83.9\mu\text{H}/\Omega$ )
- d) "Intrinsically safe circuits must be visually, constructively and clearly

isolated from "non-intrinsically safe circuits " (see Fig. 8.2).

Colour coding for the intrinsic safety according to DIN EN 60079-11: 2012 is blue (e.g. RAL 5015)/ BU (IEC 60757). Conductor jackets, cap nuts from cable entries, through-terminals or protection tubes and spiral hoses for Ex-i circuits must be coded with the respective colours!

- e) Attention! Connected intrinsically-safe circuits of the ExConnection Rail must be neither non-intrinsically safe nor crossed over or twisted with other intrinsically safe electric circuits. The lines must be parallel to each other!



Fig.8.2: Intrinsically safe circuits of the ExConnection Rail

- f) Intrinsically safe devices and circuits within the T04 ExConnection Rail are identically arranged for all the devices. They use separate wire cable penetrations (ALDs Ex-d → Ex-e).

The intrinsically-safe clamping points are always arranged rightmost in the Ex-e control box (see Fig. 8.2)! However, the power supply is always placed on the left side of the terminal board supporting rail.



- Use only insulated wires and cables whose test voltage is at least 500 V AC and the minimum quality is H05!
- The diameters of individual conductors must not be less than 0.1 [mm].
- The diameter of individual wires of finely stranded conductors and litzes must not be less than 0.1 [mm].
- For "**intrinsic safety against the earth** ", a circuit insulation voltage value should be at least 500 V (otherwise, it should be a double value of the rated operational voltage of intrinsically-safe circuits).
- For "**intrinsic safety against non-intrinsically safe**", an insulation voltage rate of at least 1500 V is applicable (otherwise, it should be a double sum of the rated operating voltages of intrinsically safe circuits plus 1000 V).
- Incorrect wiring of the cables can cause short circuits and sparks!



- Cables must be laid at a distance of at least 8 [mm] to lines and cables of the other intrinsically safe circuits.
- **Exception:** Cables of intrinsically safe or non-intrinsically safe electrical circuits are surrounded by grounded shields.
- Between the connection points of intrinsically safe and non-intrinsically safe circuits, a distance of 5 [mm] or a thread measure by an insulating ( $\geq 1$  mm) or grounded metallic ( $\geq 0.45$  mm) separating plate should be provided around.
- Between the connection points of intrinsically safe and non-intrinsically safe circuits, a separating plate should be provided which comes up to  $\leq 1.5$  [mm] to the housing wall.

### Series terminals in the Ex-e terminal compartment

Specification, design and integration of the series terminals (different types are possible, e.g. push-in through-terminal "PT2,5/10 - 321003" manufactured by Phoenix Contact) is to be carried out exclusively by SAMCON GmbH!

### External Wiring

Connection cables of the T04 ExConnection Rail can be analogue, digital or hybrid system cables, as well as power cables from Samcon (e.g. "SKA02", "Ska03-T", "SKD01", "SKAD02", "SSKA01", "ÖLFLEX® ROBUST 210", etc.), or cables which the user or system integrator selects and supplies himself.

In this case, the plant operator is explicitly pointed out and obliged to ensure that all the connection cables of the T04 ExConnection Rail must comply with all applicable regulations of DIN EN 60079-14:2014 (IEC 60079-14:2013) "*Design, Selection and Erection of Electrical Systems*" and with the data of the integrated cable entries and have the required conductor cross-sections!



**!!! Attention: Connection cables in the explosion-endangered areas must fulfil the following important requirements of DIN EN 60079-14:2014:**



- *Jackets have to be: Halogen-free, UV-resistant and, as far as possible, resistant to chemicals (various materials, e.g. PUR, FEP, PTFE, PE, except PVC as it releases chlorine in the case of fire).*
- *Requirements on non-inflammability according to IEC 60332-1-2*
- *In accordance with Section [9.3.2] "Cables and Wires for the Fixed Laying" must be:*

- a) *clad with a thermoplastic, thermosetting-plastic or elastomer material. They must be circular and compact. All embedding or claddings must be extruded. If there are fillers: the fillers must not be hygroscopic; or*
  - b) *mineral-insulated metal-sheathed; or*
  - c) *special cable, e.g. flat cable with a suitable cable entries. They must be compact. All embedding and claddings must be extruded. Fillers, if any, must not be hygroscopic!*
  - d) *Moreover, the outer cladding should be flame-retardant according to IEC 60322-1-2 (regarding 1KW flame) and UV-resistant!*
- Configuration and design of connection cables and cable glands in the explosive area are to be carried out by Samcon in full accordance with the strict requirements of DIN EN 60079-14. In accordance with DIN EN 60079-14:2014 [**Section 10.6.2**]<sup>6</sup>, the plant operator should especially observe the following points:
    - a) ... for connecting cable lengths  $\geq 3\text{m}$  , the cable gland can be made without integrated pressure barrier and with elastomer seal on the outer sheath and additional strain relief.
    - b) ...for connecting cable length  $< 3\text{m}$ , the cable gland **must be** made with integrated pressure barrier/ epoxy compound encapsulation of the individual wires and thermosetting-plastic elastomer seal on the outer sheath!
  - The user may only connect electric potentials on the output side in the Ex-e terminal compartment (in the direction of the Ex zone)!
  - Connections and interventions on the terminal strip on the Ex-e <-> Ex-d side are prohibited!
  - When designing and assembly the wiring, absolutely heed the permissible minimum and maximum conductor cross-sections and AWG size for rigid and flexible wires (according to IEC 60947-7-1" and "IEC/EN 60079-7").
  - It is only permitted to connect a single conductor to each terminal point. The user is not allowed to do any later bridging!
  - Partition walls must not be impaired!
  - For additionally necessary protection against fanning out, use wire end sleeves or cable shoes!

---

<sup>6</sup> In accordance with current standard DIN EN 60079-14:2014, the dimensioning does not longer depend on the designated gas explosion group (IIB, IIC) or the Ex-d pressure chamber volume ( $< 2000\text{cm}^3$ ,  $\geq 2000\text{cm}^3$ ), no matter if the cable glands have integrated pressure barriers/compounds or not. It is only a criterion of the used connection cable lengths ( $< 3\text{m}$ ,  $\geq 3\text{m}$ ).

- The cross-section of the fanning protection must comply with the conductor cross-section!
- Lay the connecting cables with their entire outer insulation into the connection area through the cable gland (e.g. cable inlets of type "8161/7-M20 1307" manufactured from polyamide by R.STAHL)!  
Ensure that the cable diameter match the terminal cross-section on the cable entry.
- Please note! Unused cable entries must absolutely be provided with appropriate plugs (included in the delivery)!
- Before you start to operate the device, make sure that the hex jam nuts (with or without claws) of the cable glands are firmly seated. For tightening torques, see the device-specific documentation. The torques had been already checked before the device was shipped. So the tightness (IP protection class) of the Ex-e connection compartment and the strain relief protection of connection points are ensured!
- When laying the connecting cables in the terminal compartment, pay attention to the following:
  - Ensure the bending radii minimum permissible for the respective conductor cross-sections;
  - Exclude any mechanical damaging the conductor by sharp edges or by moving metal parts.

### Connection terminals

- Secure the slotted screws (not required for push-in or tensioning-spring connection) by using the specified tightening torques (see Table 8.3).

Specification (coarse thread <sup>7</sup> )	M3	M4	M5	M6	M8	M10
Torque [Nm]	0.8	2.0	3.5	5.0	10.0	17.0

Tab.8.3: Tightening torques for various types of screws

<sup>7</sup> Tightening torques for metric screws (e.g. hex socket head, cylinder head, DIN912) with coarse threads according to DIN 13-1. Pre-stressing forces [kN] [Nm] and tightening torques for metric screws with ISO-fine threads (DIN 13-2) are different and slightly higher!

### Protective earth conductor (PE/ PA)

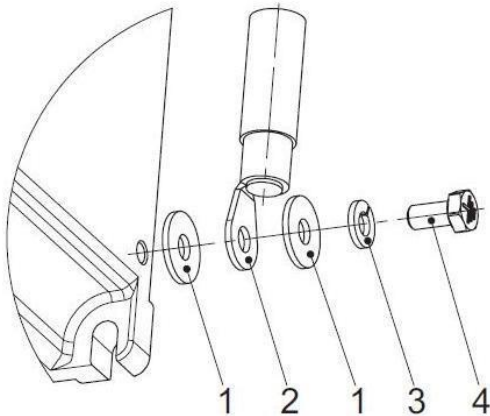


Fig.8.3: Connecting the protective conductor

- Always connect the protective conductor (PE and/or PA) with a cable lug (2) on the housing. In front of and behind the cable lug, use a washer (1) and secure the bolt (4) with a screw lock (3) against loosening.
- Integrate all the bare non-live metal parts into the protective conductor system, irrespective of the operating voltage.
- The outer protective conductor connection is intended for the for cable lug. The cable must be routed close to the housing in such a way that any rotating and loosening of the cable is excluded.
- The protective conductor must have the following properties:

<b>a) colour coding of the sheathing:</b>	<b>GN/YE (IEC 60757)</b>
<b>b) conductor cross-section:</b>	<b><math>\geq 4\text{mm}^2</math></b>
<b>c) Type of conductor:</b>	<b>rigid</b>

## 7.5 High Frequency Emitting Interface



The T04 ExConnection Rail can be equipped with explosion-protected antenna couplers Ex-d MB [ia] (SOLEXY SRL). In this case, adhere to the particular operating conditions given in the enclosed Device Documentation or in the circuit diagrams. The antenna coupler dampens and limits the RF transmit power to a harmless level. At the same time, the signal side placed in the explosion-endangered area is isolated from the critical low-frequency voltages and DC voltages. The device technology and the specification of the HF transmitting source (radio) within the T04 ExConnection rails are flexible.

In this context, the following points must be observed:

- a) Antenna cable and rod aerials can be connected and disconnected under voltage in the Ex-area!
- b) Observe the maximum permissible antenna gain/ directional radio effect [dBi] or the specified attenuation values of the coaxial cable. Isotropic omnidirectional performance [dBm] for each sending device within the operating frequency range is evaluated separately and must not be exceeded (cf. limit values in Tab 8.4 and Tab. 8.5)!
- c) Be careful when connecting the RF antenna cable and the rod aerials to the RP-SMA or N-plug of the AX antenna coupler.

When doing installation work, pay attention to the forces, torques and point loads which the explosion-proof HF-barriers are exposed to, as well as the antenna alignment and the cable marshalling! Heed the bending radii and strain relieves by means of cable clamps or cable ties. Provide them, if necessary!

Information:



*According to DIN EN 60079-0: 2012 [6.6.1], the following power limits are applicable for devices which radiate electromagnetic and ultrasound energy: high- frequencies from 9 kHz to 60 GHz and continuous and pulsed radiation!*

Geräte der	Ausgangs-Strahlungsleistung W	Zündinduktionszeit µs
Gruppe I	6	200
Gruppe IIA	6	100
Gruppe IIB	3,5	80
Gruppe IIC	2	20
Gruppe III	6	200

Tab.8.4: Power limit levels for HF emitters

*For pulsed radiation and other radiation kinds in which the pulses are short compared to the impulse duration, the values of the output radiation energy  $Z_{th}$  should not exceed the values listed in the table below!*

Geräte der	Ausgangs-Strahlungsenergie $Z_{th}$ µJ
Gruppe I	1500
Gruppe IIA	950
Gruppe IIB	250
Gruppe IIC	50
Gruppe III	1500

Tab.8.5: Energy limit levels for HF emitters

## 7.6 Optical Interface



If the T04 ExConnection Rail contains optical data interface (OWG), special conditions shall apply for the cables, optical wave-guides, patches and couplings in the Ex-area, as well as for the connecting of the remote station (FX transmitting / receiving device).

The connection and transmission technology intended for large ranges is very flexible (e.g. ST, SC, MTRJ, LC connector, SFP module, 1310 nm multi-mode and single-mode fibres, GI/ graded-index, 100BASE-FX via G50(62.5)/125µm, 1000BASE-LX, Fibre Channel "1GFC", HD-SDI fibre 1485 Gbps, etc.).

For optical sources within the T04 ExConnection Rail, the current requirements and conditions of EN 6007 9-28:2007 and of the Supplement 1 "IEC 6007 9-28:2006/ISH1.2014" must be adhered to.

The following efficient protection mechanisms can be used for optical radiation sources within ExConnection Rail.

- |           |   |                   |
|-----------|---|-------------------|
| <b>a)</b> | <b>protected optical radiation</b>          | <b>[Ex op pr]</b> |
| <b>b)</b> | <b>intrinsically-safe optical radiation</b> | <b>[Ex op is]</b> |

ExConnection Rail can also contain status or infra-red LEDs, which need not to be evaluated according to DIN EN 6007 9-28: 2007 Explanation Sheet 1:2014-09 or need an additional explosion protection. In this case, the optical source should fulfil the following requirement:

- c) LEDs with diffuse radiation,  
low power/energy emission,  
not designed in the "matrix arrangement" [Not Ex]**

!!! Attention: When dealing with the optical interfaces, absolutely observe and adhere to the instructions given on the nameplate and in the device-specific documentation, circuit diagrams, etc.

Information on "optical radiation in the Ex-area":



According to DIN EN 60079-28: 2007 [5.2.2], the radiation power rates and intensity of irradiation from unprotected continuous radiation sources (optical intrinsic safety Ex op is) shall not exceed the limits given below.

Betriebsmittelgruppe	I	IIA	IIA	IIB	IIC	
Temperaturklasse		T3	T4	T4	T4	T6
Temperaturklasse (°C)	< 150	< 200	< 135	< 135	< 135	< 85
Leistung (mW)	150	150	35	35	35	15
Bestrahlungsstärke (mW/mm <sup>2</sup> ) (Oberfläche bis 400 mm <sup>2</sup> )	20 <sup>a</sup>	20 <sup>a</sup>	5	5	5	5
<sup>a</sup> Für bestrahlte Flächen größer als 30 mm <sup>2</sup> , bei denen brennbare Materialien in den Strahl gelangen können, gilt ein Grenzwert der Bestrahlungsstärke von 5 mW/mm <sup>2</sup> .						

Tab.8.6: Safe optical radiation power and irradiation intensity

## 7.7 Making additional through-holes



**Attention: It is strictly forbidden to make additional holes in the Ex-control boxes, as well as to modify the Ex-d housing and make other thread holes or blind holes, etc.!**

**Unauthorised and not permitted actions will lead to immediate exclusion of the guarantee for the device and for its protection against explosion!!!!**

## 8 Starting the device operation

Prior to the device starting, you should carry out all the required tests which are mentioned in the national regulations. Moreover, before starting the device, check the correct function and installation of the equipment in accordance with this Operating Instructions and other applicable rules.

Improper installation and operation of the T04 ExConnection Rail can result in the loss of the guarantee and of the explosion protection!

- Make sure that the product and its components are not damaged.
- Make sure that the device is properly installed.
- Remove the foreign bodies from the device and clean the connection area.
- Check the cable guides and closing plugs for proper fit.
- Check the screws and nuts for proper tightness.
- Make sure that all other connections are tightened firmly.

- On the pressure-resistant encapsulation (ignition-puncture-proof threaded gap), check whether there is no contamination or damage on the cable guides and fine threads (DIN 13-2) of “medium or “fine” tolerance classes / grade "6G" or "5G" (ISO 965-1/-3).
- Check the tightening torques (see Tab.8.3)
- Make sure that unused cable entries in the Ex-e terminal box are sealed with the plugs certified by Directive 2014/34/EU (e.g. type 8161) and open holes are sealed with the closing plugs certified by Directive 2014/34/EU (e.g. Type 8290).
- Make sure that the connection was performed properly.
- Make sure that the minimum connecting cable lengths comply with the built-in pressure-resistant cable glands in accordance with DIN EN 60079-14:2014 [**Section 10.6.2**]! (cf. Chapter 8.4).
- Make sure that the nameplate is clearly recognisable, readable and not dirty!

*(Please note:*

*Device nameplates ("X") are usually made of metal sheet or acetone-resistant thermal script foil and placed on the screwed cover in the middle. In GUBoxes of size 1.2, the name plate can also be placed on the lateral side of the device. The identification labels ("U") of Ex-d and Ex-e components are always located on a housing inner surface. Thus they are separated from the device identification marking and cannot be mixed up with them!)*

## **9 Operation**

### **9.1 Function**

The function is individual and depends on the installed components.

For technical information on use and configuration of built-in devices, as well as on the system integration of the device, please see the device-specific documentation (operating instructions, circuit diagrams, function diagrams, additional instructions for safety and assembly).

On the attached USB data carrier, you may find more information, software tools/ firmware, as well as customised configuration profiles (e.g. *.ini* files) of network devices and video servers available at the time of delivery.



## 10 Service, maintenance and troubleshooting



Adhere to the national regulations applicable to maintenance and servicing of electrical equipment in hazardous explosion-endangered areas. Other regulations, intervals and scopes of the tests are set in DIN EN 60079-17: 2014 -10 101150.



**Please note!**

The ignition-puncture-proof thread gap of the GUBox Ex-d housing should be provided with a sufficient and clean oil/grease protective layer between the screwed cover and the housing fuselage!

The T04 ExConnection Rail is delivered with sufficiently greased screw cover! Because of mechanical stresses resulting from frequent opening and closing or from impurities and wear caused by environmental conditions at the place of use, it may be necessary to re-grease the ignition-puncture-proof thread.

At first, carefully clean the fine thread with a suitable kind of grease solvent (e.g. nitro-thinner, acetone, etc..)!

Before doing that, remove the silicone O-ring seal!

### 10.1 Specification of lubrication and protective materials

The ignition-proof fine threads (DIN 13-2) of the Ex-d housing are coated with thin layers of different lubricants and protective materials.

The goal is to protect the T04 ExConnection Rail against corrosion and mechanical stresses, as well as to prevent the bolted connections from loosening by impacts, vibrations etc.. In addition, these substances improve sealing properties.

**"Molykote® P-40"** is a suitable and recommended lubricant for the pressure-resistant screw cover of the GUBox housing. This metal-free and adhesive paste consists of substrate oil with low evaporation rate and of heat-resistant solid lubricants.

The lubricating paste is ideally suitable for assembly and permanent lubrication of components which are exposed to extremely high temperatures and corrosive influences. For offshore applications or permanent wet areas with salt water influence, we recommend **grease "OKS 403"** as protection of threads. The OKS 403 special grease for coastal and marine areas is standard lubricant for the screwed cover.



**Be careful and do not touch the threads of the pressure-resistant cover with your skin or clothes!**  
**Heed to the safety data sheets for dealing with hazardous substances in the attached documentation!**

Specification MOLYKOTE P-40:

Temperature:	-40°C ... +230°C (as paste) -40°C ... +1200°C (as solid lubricant)
Drop point:	...°C (none) DIN 21176
Intrinsic viscosity (40°C):	360 mm <sup>2</sup> /s DIN 51562
Friction oxidation:	25x10 <sup>6</sup>
Interference fit:	0.12 μ (friction coefficient)
Bolt thread:	0.10 μ (friction coefficient)
Vibration resistance:	0.13 μ (300N, 50Hz, Amp.0.5mm, 2hours)
Salt spray test:	500 hours
Degree of corrosion:	0 (DIN 51802)

Specification of OKS-403 (for seawater influence):

Identification (DIN 51825):	KP1-2E-20 (DIN 51502)
Temperature:	-25°C ... +80°C
Dropping point:	>100 °C (IP 396)
Viscosity (+40°C):	100 [mm <sup>2</sup> /S] (DIN 51562-1)
Viscosity (+100°C):	9 [mm <sup>2</sup> /S] (DIN 51562-1)
Corrosion protection (3% NaCl):	Degree of corrosion 0..1 (DIN 51802)
Weld load (tested with a four-ball apparatus):	3000 N (DIN 51350-4)
Water resistance (+40°C):	0 ... 40 degrees (DIN 51807)
DN value:	350.000 mm/min
Colour:	brownish
Density (+20°C):	0.94 [g/cm <sup>3</sup> ] (DIN 51757)

The fine threads (according to DIN13-2 with good degree 6G/5G according to ISO 965-1/-3) of through holes in the pressure-resistant encapsulation contain the acrylate **LOC-TITE® 243™**. It is used in the case of pressure-resistant cable glands (e.g. of type Peppers UB- 20S M20, ADE 4F MsNi Type5-M20x1.5, etc.), Ex d plug contacts (e.g. of type Cooper Crouse-Hinds eXLink series), Ex-d closing plug (e.g. R.Stahl, series 8292), Ex-d mb HF barriers (e.g. of type Solexy AXF/ AXN), not for wire cable penetrations (e.g. R.STAHL, series 8174).

The LOCTITE® 243™ bolt locking prevents the bolted connections from both intentional and not intentional loosening by shocks, vibration and improper use, etc. It is additionally used for better sealing. The product cures under exclusion of air between the tight-fitting metal surfaces.



**Be careful and do not touch the threads of the pressure-resistant cable glands and aerial guides with your skin or clothes! Heed to the safety data sheets for dealing with hazardous substances in the attached documentation!**

Specification LOCTITE® 243™:

Application:	bolt locking
Technology:	acrylate
Chemical base:	dimethacrylatester
Appearance (not hardened):	blue, liquid, fluorescent
Components:	one-component, no mixing required
Viscosity:	medium, thixotropic
Curing:	anaerobic
Secondary hardening:	activator
Hardness:	medium

## 10.2 Required Accessories

### Breathers

If during starting or maintenance of the device you see moisture or drops in the pressure chamber, it may be necessary to install a suitable breather!

The breathers provide permanent pressure equalization between the pressure-resistant housing interior space of the T04 ExConnection Rail and atmosphere surrounding the housing. This prevents the moisture from its penetration through the seals into the housing and its condensing there.



**If condensation occurs, we absolutely recommend a vent and drain nozzle of type "107998" (with R 3/8" thread) or of type "107999" (with R 1/2" thread).**

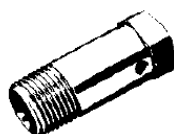


Fig.11.1: Breathers against condensation

### 10.3 Maintenance and regular servicing

The required maintenance intervals depend on the application. Therefore, they are to be set by the plant operator depending on the conditions of use. In the course of the maintenance, the most important is to check the components on which the type of ignition protection depends.

The following tests should be done in the course of the maintenance:

- Checking the cables for secure seating
- Checking the device for visible damage
- Compliance with the permissible temperatures according to IEC/EN 60079-0
- Checking for proper functionality



**It is recommended to use a wrist cuff or a similar aid with electric potential bonding/protective earthing, when doing maintenance and installation in the internal area of the pressure-resistant encapsulation. Voltage surges as a result of electrostatic charging can damage the built-in devices!**

### 10.4 Cleaning

- Cleaning the device with a damp cloth, a hand broom, electric industrial vacuum cleaner or similar.
- For wet cleaning, use water or mild, non-abrasive detergents.
- Never use aggressive cleaning agents or solvents.
- Ensure potential bonding and protection against overvoltage!

### 10.5 Repair instructions

- Never try to repair the device yourself. De-energize the device and return it to Samcon!

## 11 Recycling

- Observe the national regulations for waste disposal and recycling.

## 12 Technical drawings

Detailed technical drawings of the devices are contained in the product-specific documentation. For DXF files, 3D models in PDF format and other diverse file formats and drawings of accessories, please visit [Http://www.samcon.eu](http://www.samcon.eu)

If something is missing, please send us a message by e-mail to <mailto:support@samcon.eu>

# 13 Certificates of the ExConnection Rails (T04)

## 13.1 EU Declaration of Conformity

### EG/EU - Konformitätserklärung

EC/EU – Declaration of Conformity / CE/UE – Déclaration de Conformité

Der Hersteller / The manufacturer / Le fabricant



**Schillerstraße 17**  
**35102 Lohra-Altenvers**


erklärt in alleiniger Verantwortung, dass sein Produkt / declares under his sole responsibility, that his product /  
 déclare sous sa seule responsabilité, que son produit

### ExConnection Rail - T04...

gekennzeichnet mit / marked with / marqué avec

Model Keys: T04.x

Gas:

 II 2G Ex d IIC T6 Gb

Dust:

 II 2D Ex tb IIIC T85°C Db IP66

Optional and additional type of Protection markings for all Types:

[op is]	= for models with [op is] FOC connectors,	[op pr]	= for models with [op pr] FOC Connectors
mb	= for models with HF Barrier	[ia Ga/Da]	= for models with [ia Ga/Da] intrinsically safe circuits
e	= for models with Ex-e terminal box	[ib Gb/Db]	= for models with [ib Gb/Db] intrinsically safe circuits

The explosion group can be downgraded to IIB if required  
 The ambient temperature range can be downgraded if required  
 The temperature class (gas) and the temperature value (dust) can be downgraded if required.

bescheinigt mit EG-Baumusterprüfbescheinigung / certified by EC type examination certificate /  
 ayant fait l'objet de l'attestation CE de type

### TÜV 10 ATEX 7969 X

auf das sich diese Erklärung bezieht, mit der/den folgenden Richtlinien, Normen oder normativen Dokumenten übereinstimmt:  
 referred to by this declaration is in conformity with the following directives, standards or normative documents:  
 auquel se rapporte la présente déclaration, est conforme aux directives, normes ou aux documents normatifs suivants:

ATEX Richtlinie/ ATEX Directive/ Directive ATEX	
Bis/Until/Jusque	Ab/From/De
2016-04-19	2016-04-20
94 / 9 / EG	2014/34/EU
94 / 9 / CE	2014/34/EU
94 / 9 / EC	2014/34/UE

Normen / Standards / Normes	
EN 60079-0:	2014
EN 60079-1:	2014
EN 60079-7:	2007
EN 60079-11:	2012
EN 60079-18:	2009
EN 60079-28:	2007 & (Addition 1:2014-09)
EN 60079-31:	2009



Digital unterschrieben von Steffen  
 Seibert  
 DN: cn=Steffen Seibert, o=SAMCON,  
 ou, email=s.seibert@samcon.eu,  
 c=DE  
 Datum: 2016.05.06 10:50:52 +02'00'

Dipl.-Ing. Steffen Seibert  
 Geschäftsführer

Lohra-Altenvers, den / the / le 06.05.2016

Doc. - Id.: 160506-PT04BAU-SS-EU Konformitätserklärung.docx

## 13.2 EC Prototype Test Certificate, 10 ATEX 7969 X

### (1) EU TYPE-EXAMINATION CERTIFICATE



- (2) Equipment and Protective Systems intended for use in Potentially Explosive Atmosphere - **Directive 14/34/EU**
- (3) EU Type-Examination Certificate Number

**TÜV 10 ATEX 7969 X**

Issue: 01

- (4) Equipment: **ExConnection Rail Series T04.x**
- (5) Manufacturer: **SAMCON Prozeßleittechnik GmbH**
- (6) Address: **Schillerstraße 17  
35102 Lohra- Altenvers Deutschland**
- (7) This product and any acceptable variation thereto are specified in the schedule to this certificate and the documents therein referred to.
- (8) The TÜV Rheinland Zertifizierungsstelle for ex-protected products of TÜV Rheinland Industrie Service GmbH, Notified Body No. 0035 in accordance with Article 21 of the Council Directive 14/34/EU of 26<sup>th</sup> February 2014, certifies this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmosphere, given in Annex II to the Directive.
- The examination and test results are recorded in the confidential report 557 / Ex 969.01 / 10.
- (9) Compliance with the Essential Health and Safety Requirements, with the exception of those listed in the schedule of this certificate, has been assessed by reference to:
- EN 60079-0:2012+A11:2013    EN 60079-1:2014    EN 60079-7:2007    EN 60079-11:2012**  
**EN 60079-18:2009            EN 60079-28:2007    EN 60079-28:2007 (ISH 1:2014)**  
**EN 60079-31:2009**
- (10) If the sign "X" is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.
- (11) This EU Type-Examination Certificate relates only to the design and specification for construction of the equipment or protective system. It does not cover the process for actual manufacture or supply of the equipment or protective system, for which further requirements of the directive are applicable.

(12)  II 2 G see technical data

 II 2 D see technical data

TÜV Rheinland ExNB for explosion protected equipment

Cologne, 06.07.2016

  
 Dipl.-Ing. Klauspeter Graffi

This EU Type-Examination Certificate without signature and stamp shall not be valid.  
 This EU Type-examination Certificate may be circulated only without alteration. Extracts or alterations are subject to approval by the  
 TÜV Rheinland Industrie Service GmbH TÜV Rheinland Group Am Grauen Stein 51105 Köln  
 Tel. +49 (0) 221 806-0 Fax. + 49 (0) 221 806 114

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 Precisely Right.

(13) Annex

(14) **EU Type Examination Certificate**  
**TÜV 10 ATEX 7969 X** Issue: 01

(15) Description of equipment

15.1 Equipment and type:

ExConnection Rail Series T04.x.. (Type details see Technical Data)

15.2 Description / Details of Change

General product information

The ExConnection Rail (Type 04) is a connection and transmission unit for audio, video, and process signals intended for applications in the hazardous area requiring devices of the category 2G, 3G as well as 2D, 3D. The usage of available external interfaces is limited to those categories.

The ExConnection Rail converts digital and analog camera signals as well as audio and process signals into signals of other transmission technologies. As target transmission media it is possible to use Ethernet TX (copper), Ethernet FX (optic fiber), and HF.

The design of the ExConnection Rail predominantly consists of a flameproof component-certified housing with an optionally installed terminal box of increased safety protection (PTB 06 ATEX 1023U). In this housing, different components can be installed, corresponding to the individual application requirements. Only devices and components disposing of electrical interfaces reflecting the ignition protection level [ia/ib] or [op is] are used. The applicable EC/EU type examination certificates for those components have to be available.

The content of 1st Supplement is:

Change the certificate language into English.  
Added more enclosure combination (T04.1, T04.2, T04.3, and T04.5)  
Increase the ambient temperature range.  
Update according to the latest standards.

This EU Type Examination Certificate without signature and official stamp shall not be valid.  
This certificate may be circulated without alteration. Extracts or alterations are subject to approval by:  
Zertifizierungsstelle of TÜV Rheinland Industrie Service GmbH



## Technical Data

### Supply Voltage:

Type: T04.x.: up to 11kV, depending on the used terminals, cable glands, etc...

T AMB.. -60°C ≤ T<sub>amb</sub> ≤ +60°C \*can be decreased if required ( look at device document ).

### Maximum Input Power:

Model	T6/T80°		T5/T95°	
	T <sub>AMB</sub>		T <sub>AMB</sub>	
	+40°C	+60°C	+40°C	+60°C
T04.1	27 W	13 W	38 W	22 W
T04.1 (coated)	35 W	16 W	49 W	28 W
T04.2	40 W	18 W	58 W	35 W
T04.2 (coated)	52 W	23 W	75 W	45 W
T04.3	58 W	23 W	85 W	52 W
T04.3 (coated)	75 W	26 W	110 W	67 W
T04.4	85 W	38 W	130 W	72 W
T04.4 (coated)	110 W	49 W	169 W	93 W
T04.5	117 W	49 W	190 W	96 W
T04.5 (coated)	152 W	63 W	247 W	124 W
T04.6	138 W	58 W	205 W	115 W
T04.6 (coated)	179 W	75 W	266 W	149 W

### Marking (options)

Gas:



II 2G Ex d IIC T6 Gb

Dust:



II 2D Ex tb IIIC T85°C Db IP 66

Optional and additional Type of Protection markings for all Types depending on the components used:

This EU Type Examination Certificate without signature and official stamp shall not be valid.  
 This certificate may be circulated without alteration. Extracts or alterations are subject to approval by:  
 Zertifizierungsstelle of TÜV Rheinland Industrie Service GmbH

[ia Ga/Da]	= for models with [ia Ga/Da] intrinsically safe circuits
[ib Gb/Db]	= for models with [ib Gb/Db] intrinsically safe circuits
[op is]	= for models with [op is] FOC connectors or illuminators
[op pr]	= for models with [op pr] FOC Connectors
mb	= for models with HF Barrier
e	= for models with Ex-e terminal boxes
IIB	= downgrade possible

The temperature class T6 resp. T85°C and explosion group IIC can be decreased according device document (see special conditions point 4) and table above.

(16) Test-Report No. 557 / Ex 969.01 / 10

(17) Special Conditions for safe use

The original certificate has to be observed.

1. At installation of the devices, the requirements of the EN 60079-14 standard have to be observed.
2. The specific conditions of the used components have to be observed.
3. Only cable entries suitable for the applicable housing protection level must be used.
4. NEW in 1<sup>st</sup> ADDENDUM:  
The device documentation with the Doc.-Id's: -PT04xxx (serial number) has to be transmitted to the customer. All built-in devices/components must be listed in this document.

(18) Basic Safety and Health Requirements

Covered by afore mentioned standard.

TÜV Rheinland ExNB for explosion protected equipment

Cologne, 2016-07-06



Dipl.-Ing. Klauspeter Graffi

This EU Type Examination Certificate without signature and official stamp shall not be valid.  
 This certificate may be circulated without alteration. Extracts or alterations are subject to approval by:  
 Zertifizierungsstelle of TÜV Rheinland Industrie Service GmbH

### 13.3 EC Prototype Test Certificate, IECEx

 		<h2 style="margin: 0;">IECEX Certificate of Conformity</h2>	
<b>INTERNATIONAL ELECTROTECHNICAL COMMISSION</b> <b>IEC Certification Scheme for Explosive Atmospheres</b> <small>for rules and details of the IECEx Scheme visit <a href="http://www.iecex.com">www.iecex.com</a></small>			
Certificate No.:	IECEX TUR 16.0025X	issue No.:	0
Status:	Current		
Date of Issue:	2016-07-06	Page 1 of 3	Certificate history:
Applicant:	<b>SAMCON Prozessleittechnik GmbH</b> Schillerstraße 17, D-35102 Lohra-Allenvers Germany		
Equipment:	ExConnection Rail Series T04		
Optional accessory:			
Type of Protection:	d, tb, ia, lb, op is, op pr, mb and e		
Marking:	Basic marking: Ex d IIC T6 Gb Ex tb IIIC T85°C Db IP66 Optional and additional Type of Protection markings for all Types see attachment.		
Approved for issue on behalf of the IECEx Certification Body:	Dipl.-Ing. Klauspeter Graffi		
Position:	Head of Certification Body		
Signature: (for printed version)			
Date:	<u>2016-07-06</u>		
1. This certificate and schedule may only be reproduced in full. 2. This certificate is not transferable and remains the property of the issuing body. 3. The Status and authenticity of this certificate may be verified by visiting the <a href="http://www.iecex.com">Official IECEx Website</a> .			
Certificate issued by:			
<b>TUV Rheinland Industrie Service GmbH</b> Am Grauen Stein 51105 Cologne Germany		 <b>TÜVRheinland</b>	



## IECEx Certificate of Conformity

Certificate No.: IECEx TUR 16.0025X  
Date of Issue: **2016-07-06** Issue No.: **0**  
Page 2 of 3  
Manufacturer: **SAMCON Prozessleittechnik GmbH**  
Schillerstraße 17,  
D-35102 Lohra-Altenvers  
Germany

Additional Manufacturing location  
(s):

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended.

#### STANDARDS:

The electrical apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

<b>IEC 60079-0 : 2011</b> Edition: 6.0	Explosive atmospheres - Part 0: General requirements
<b>IEC 60079-1 : 2014-06</b> Edition: 7.0	Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d"
<b>IEC 60079-11 : 2011</b> Edition: 6.0	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
<b>IEC 60079-18 : 2009</b> Edition: 3	Explosive atmospheres Part 18: Equipment protection by encapsulation "m"
<b>IEC 60079-28 : 2015</b> Edition: 2	Explosive atmospheres - Part 28: Protection of equipment and transmission systems using optical radiation
<b>IEC 60079-31 : 2008</b> Edition: 1	Explosive atmospheres – Part 31: Equipment dust ignition protection by enclosure "t"
<b>IEC 60079-7 : 2006-07</b> Edition: 4	Explosive atmospheres - Part 7: Equipment protection by increased safety "e"

*This Certificate does not indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.*

#### TEST & ASSESSMENT REPORTS:

*A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in*

Test Report:  
[DE/TUR/EXTR16.0025/00](#)

Quality Assessment Report:  
[DE/BVS/QAR14.0006/02](#)



## IECEx Certificate of Conformity

Certificate No.: IECEx TUR 16.0025X

Date of Issue: 2016-07-06

Issue No.: 0

Page 3 of 3

### Schedule

#### EQUIPMENT:

*Equipment and systems covered by this certificate are as follows:*

ExConnection Rail Series T04.x..

The ExConnection Rail (Type 04) is an explosion proof connection and transmission unit for audio, video and process signals. The ExConnection Rail serves the purpose of transferring digital and analog camera signals as well as audio and process signals into signals of different transmission technologies.

As optional certified target transmission media, Ethernet TX (copper conductor), Ethernet FX (optical fiber) and HF, are possible equipment.

See attachment for further details.

#### CONDITIONS OF CERTIFICATION: YES as shown below:

1. At installation of the devices, the requirements of the IEC 60079-14 standard have to be observed.
2. The specific conditions of the used components have to be observed.
3. Only cable entries suitable for the applicable housing protection level must be used.
4. The device documentation with the Doc.-Id's: -PT04xxx (serial number) has to be transmitted to the customer. All built-in devices/components must be listed in this document.

**Annex:** DE-IECEx\_TUR\_16.0025\_X\_00\_Attachment\_2016-07-06.docx



Attachment to Certificate  
 IECEx TUR 16.0025X  
 Revision 0

Attachment to Certificate IECEx TUR 16.0025X

**Device:** ExConnection Rail Series T04.x  
**Type:** T04.x (details refer to Technical Data section)

**Manufacturer:** SAMCON Prozeßleittechnik GmbH

**Address:** Schillerstraße 17  
 35102 Lohra- Altenvers, Deutschland

**General product information:**

The ExConnection Rail (Type 04) is a connection and transmission unit for audio, video, and process signals intended for applications in the hazardous area requiring devices of the EPL Gb, Gc as well as Db, Dc. The usage of available external interfaces is limited to those categories.

The ExConnection Rail converts digital and analog camera signals as well as audio and process signals into signals of other transmission technologies. As target transmission media it is possible to use Ethernet TX (copper), Ethernet FX (optic fiber), and HF.

The design of the ExConnection Rail predominantly consists of a flameproof component-certified housing with an optionally installed terminal box of increased safety protection (IECEx PTB 07.0027U).

In this housing, different components can be installed, corresponding to the individual application requirements. Only devices and components disposing of electrical interfaces reflecting the ignition protection level [ia/ib] or [op is] are used. The applicable certificates of conformity (CoC) for those components have to be available.

**Technical data**

**Supply Voltage:**

Type: T04.x..: up to 11kV, depending on the used terminals, cable glands, etc...

T<sub>AMB</sub>.. -60°C ≤ T<sub>amb</sub> ≤ +60°C \*can be decreased if required ( look at device document ).

**Maximum Input Power:**

Model	T6/T80°		T5/T95°	
	T <sub>AMB</sub>		T <sub>AMB</sub>	
	+40°C	+60°C	+40°C	+60°C
T04.1	27 W	13 W	38 W	22 W
T04.1 (coated)	35 W	16 W	49 W	28 W

TÜV Rheinland Industrie Service GmbH Am Grauen Stein 51105 Köln  
 Tel. +49 (0) 221 806-0 Fax. + 49 (0) 221 806 114


 Attachment to Certificate  
 IECEx TUR 16.0025X  
 Revision 0

T04.2	40 W	18 W	58 W	35 W
T04.2 (coated)	52 W	23 W	75 W	45 W
T04.3	58 W	23 W	85 W	52 W
T04.3 (coated)	75 W	26 W	110 W	67 W
T04.4	85 W	38 W	130 W	72 W
T04.4 (coated)	110 W	49 W	169 W	93 W
T04.5	117 W	49 W	190 W	96 W
T04.5 (coated)	152 W	63 W	247 W	124 W
T04.6	138 W	58 W	205 W	115 W
T04.6 (coated)	179 W	75 W	266 W	149 W

**Marking (options)**
*Gas:*

Ex d IIC T6 Gb

*Dust:*

Ex tb IIIC T85°C Db IP 66

Optional and additional Type of Protection markings for all Types depending on the components used:

[ia Ga/Da]	= for models with [ia Ga/Da] intrinsically safe circuits
[ib Gb/Db]	= for models with [ib Gb/Db] intrinsically safe circuits
[op is]	= for models with [op is] FOC connectors or illuminators
[op pr]	= for models with [op pr] FOC Connectors
mb	= for models with HF Barrier
e	= for models with Ex-e terminal boxes
IIB	= downgrade possible

The temperature class T6 resp. T85°C and explosion group IIC can be decreased according device document (see special conditions point 4) and table above.

**“Specific Conditions of Use” for Ex Equipment:**

1. At installation of the devices, the requirements of the IEC 60079-14 standard have to be observed.
2. The specific conditions of the used components have to be observed.
3. Only cable entries suitable for the applicable housing protection level must be used.
4. The device documentation with the Doc.-Id's: -PT04xxx (serial number) has to be transmitted to the customer. All built-in devices/components must be listed in this document.



**SAMCON**  
Prozessleittechnik GmbH

Schillerstraße 5a, D-35102 Lohra-Altenvers  
[www.samcon.eu](http://www.samcon.eu), [info@samcon.eu](mailto:info@samcon.eu)  
fon: +49 6426 9231-0, fax: -31