

# ExCam<sup>®</sup> IPQ1645

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## User Manual



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## History of revisions

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## 1 Introduction

The ExCam IPQ1645 is a powerful mega-pixel IP camera (2-mega-pixel resolution). It is certified by ATEX, IECEx, EAC-Ex and IA. The camera has a high-definition television resolution (1920x1080 with 100/120 images/s) and is equipped with a powerful remote zoom and remote focus lens.

The ExCam series is certified both in accordance with the European (ATEX) and international directive (IECEx). The explosion-protected housing is approved for the ATEX group II for zones 1, 2, 21 and 22 including the explosion groups IIC / IIIC. To see other approvals, please visit our website at [www.samcon.eu/en](http://www.samcon.eu/en)

When designing the ExCam IPQ1645, we attached a very high importance to safety, mechanical precision and high quality of stainless steel.


## 2 Technical data

### 2.1 Explosion protection

Identification marks

acc. to Directive 2014/34/EU:

 II 2G (zone 1 and 2)

 II 2D (zone 21 and 22)

Explosion protection (gas):

Ex db IIC T6 Gb

Explosion protection (dust):

Ex tb IIIC T80°C Db

Protection class:

IP 68 (IEC /EN 60529)

Transport/storage temperature:

0°C...+40°C

Ambient temperature (EX):

-10°C...+60°C (Type...N.H...)

-60°C...+60°C (Type...LL.H...)<sup>1</sup>

-10°C...+130°C (Type...N.HH)<sup>2</sup>

Named testing laboratory:

TÜV Rheinland (number 0035)

EU type approval certificate:

TÜV 18 ATEX 8218X (2018)

IECEx Certificate of Conformity:

TUR 18.0023X (2018)

EAC-Ex TUR Report:

TC RU C-DE.AB.61.B.00381/19

Other certificates see:

<https://www.samcon.eu/en/products/network/excam-ipq1645/>



**Attention!**

**The instructions stated on the type plates have to be observed!**

<sup>1</sup> The temperature class must be reduced to T5.

<sup>2</sup> This model requires the SAMCON cool.Jacket. The temperature class must be reduced to T3.

## Illustration of the model key

1) Ex product- name	2) Type	3) Housing- combination	4) Temp.- range	5) Cable length [m]	6) Cable termin.
ExCam IPQ1645	T08-	VA2.3.K3.BOR2-	N.H-	005.N-	P-
	T08-	VA2.3.K3.BOR2-	N.H-	005.N-	T-
	T08-	VA2.3.K3.BOR2-	N.H-	005.A-	P-
	T08-	VA2.3.K3.BOR2-	N.H-	005.A-	T-
	T08-	VA2.3.K3.BOR2-	LL.H-	005.N-	P-
	T08-	VA2.3.K3.BOR2-	LL.H-	005.N-	T-
	T08-	VA2.3.K3.BOR2-	LL.H-	005.A-	P-
	T08-	VA2.3.K3.BOR2-	LL.H-	005.A-	T-
	T08-	VA2.3.K3.BOR2-	N.HH-	005.N-	T

Table 2-1 Model key

### Explanations:

- 1) **ExCam IPQ1645** = Functional camera description of the ExCam Series (technical data/  
specification of the individual camera module)
- 2) **T08** = SAMCON Production- Type 08
- 3) **VA2.3.K3.BOR2** = T07 ex d housing (stainless steel 1.4404) with large diameter  
 $\varnothing_{VA2}=113\text{mm}$   
**VA2.3.K3.BOR2** = T07 VA2.3 housing with maximum body length ( $L_R = 310\text{mm}$ )  
**VA2.3.K3.BOR2** = K3 cable gland flange  
**VA2.3.K3.BOR2** = Borosilicate sight glass DIN7080 (standard, for video cameras within visible  
spectral range:  $\lambda = 350\dots2000$  [nm] and photografical infrared range (NIR),  
not suitable for thermographic applications (MIR/ FIR)
- 4) **N.X** = Normal ambient temperature range, no heater installed ( $T_{amb} > -10^\circ\text{C}$ )  
**N.H**= High temperature ( $T_{amb} < +60^\circ\text{C}$ )  
**N.HH**= Active cooling system for hot ambient temperatures ( $T_{amb} < +130^\circ\text{C}$ )  
**LL.H**= PTC heater installed ( $T_{amb} > -60^\circ\text{C}$ )  
**LL.H**= High temperature battery installed ( $T_{amb} < +60^\circ\text{C}$ )
- 5) **005.N** = Length of the connection line in meter at delivery; 5m is the  
standard cable length, max. cable length is: 003...100 [m]  
**005.N** = Non armoured cable  
**005.A** = Armoured cable
- 6) **P** = Plug- termination (standard)  
 CAT6, RJ-45 network plug (heavy duty), AWG 26-22,  
 contact assignment acc. To specification EIA/TIA-568B
- T** = Terminal Box termination (optional)  
 4 x PoE Mode A connection (camera PoE)  
 24VDC (Heater) (see chapter electrical connection)

## 2.2 Electrical parameters of the camera

### Supply of 24 V DC for the heating:

Voltage supply:	22 V DC < $U_{in}$ < 26 V DC
Power consumption:	Approx. 40W @ -60°C (depends on temperature)

### Power supply of the camera via Ethernet (PoE):

Voltage supply:	PoE, IEEE 802.3af/802.3at type 1 class 3
Reference voltage:	+48 V DC (44...54 V DC)
Maximum power consumption:	9.1 W
Typical power consumption:	4.5 W

## 2.3 Connection cable Ex-d - Ex-e

Description:	Data transfer and power supply of the camera module (compliant with DIN EN 60079-14)
Jacket colour:	Green (GN), similar to RAL3001

### 2.3.1 Connection cable for models without heater (SKD02-T/ASKD02-T)

#### Systemcable SKD02-T:

Outside diameter:	$8.9 \pm 0.3$ mm
Bending radius:	8 x $D_a$ when installed and 4 x $D_a$ after relocation
Data line:	4 x 2 x AWG23/1 CAT.6
Properties:	PUR halogen-free, flame-retardant, UV-resistant, chemical resistance, shielded

Quick link:

[https://www.samcon.eu/fileadmin/documents/en/60-Assembling%26mounting/SKD02-T\\_Datasheet.pdf](https://www.samcon.eu/fileadmin/documents/en/60-Assembling%26mounting/SKD02-T_Datasheet.pdf)

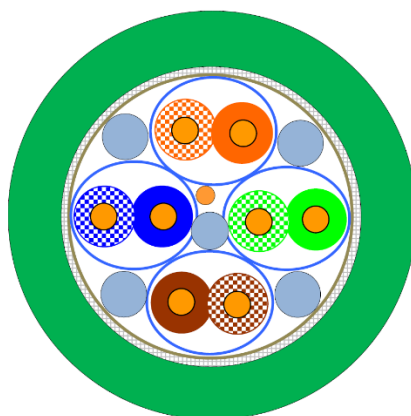


Figure 2-1 Sectional view of SKD02-T

**Systemcable ASKD02-T:**

Outside diameter:	12.0 ± 0.4 mm
Bending radius:	20 x D <sub>a</sub> when installed and 10 x D <sub>a</sub> after relocation
Data line:	4 x 2 x AWG23/1 CAT.6
Properties:	PUR halogen-free, flame-retardant, UV- resistant, chemical resistance, shielded (see <a href="http://www.samcon.eu">www.samcon.eu</a> )

**Quicklink:**

[https://www.samcon.eu/fileadmin/documents/en/60-Assembling%26mounting/ASKD02-T\\_Datasheet.pdf](https://www.samcon.eu/fileadmin/documents/en/60-Assembling%26mounting/ASKD02-T_Datasheet.pdf)

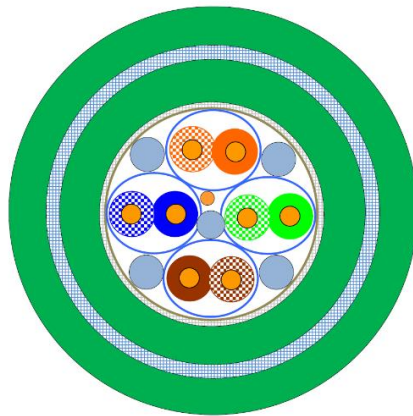


Figure 2-2 Sectional view of ASKD02-T

**2.3.2 Connection cable for models with heater (SKDP03-T/ASKDP03-T)**
**Systemcable SKDP03-T:**

Outside diameter:	12.40 ± 0.3 mm
Bending radius:	8 x D <sub>a</sub> when installed and 4 x D <sub>a</sub> after relocation
Data line:	4 x 2 x AWG23/1 CAT.6
Performance elements:	3G1.5 (BK-BU-GN/YE)
Properties:	PUR halogen-free, flame-retardant, UV- resistant, chemical resistance, shielded

**Quick link:**

[https://www.samcon.eu/fileadmin/documents/en/60-Assembling%26mounting/SKDP03-T\\_Datasheet.pdf](https://www.samcon.eu/fileadmin/documents/en/60-Assembling%26mounting/SKDP03-T_Datasheet.pdf)

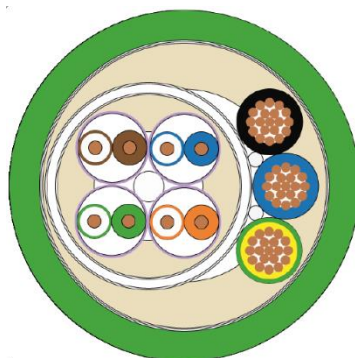


Figure 2-3 Sectional view of SKDP03-T



### Systemcable ASKDP03-T:

Outside diameter:	15.50 ± 0.6 mm
Bending radius:	15 x D <sub>a</sub> when installed and 10 x D <sub>a</sub> after relocation
Data line:	4 x 2 x AWG23/1 CAT.6
Performance elements:	3G1.5 (BK-BU-GN/YE)
Properties:	PUR halogen-free, flame-retardant, UV-resistant, chemical resistance, shielded

#### Quicklink:

[https://www.samcon.eu/fileadmin/documents/en/60-Assembling%26mounting/ASKDP03-T\\_Datasheet.pdf](https://www.samcon.eu/fileadmin/documents/en/60-Assembling%26mounting/ASKDP03-T_Datasheet.pdf)

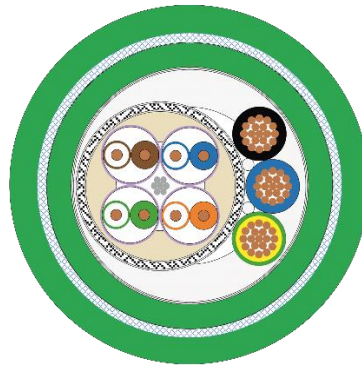


Figure 2-4 Sectional view of ASKDP03-T

### 2.3.3 Connection cable for model with cool jacket (SKD05-HT)

Description:	Data transfer and power supply of the camera module (compliant with DIN EN 60079-14)
Jacket colour:	Grey (GY)

### Systemcable SKD05-HT:

Outside diameter:	6.60 ± 0.2 mm
Bending radius:	8 x D <sub>a</sub> when installed and 4 x D <sub>a</sub> after relocation
Data line:	4 x 2 x AWG26/7 CAT.6
Properties:	FEP, flame-retardant, UV-resistant, chemical resistance, for extreme hot temperatures

#### Quick link:

[https://www.samcon.eu/fileadmin/documents/en/60-Assembling%26mounting/SKD05-HT\\_Datasheet.pdf](https://www.samcon.eu/fileadmin/documents/en/60-Assembling%26mounting/SKD05-HT_Datasheet.pdf)

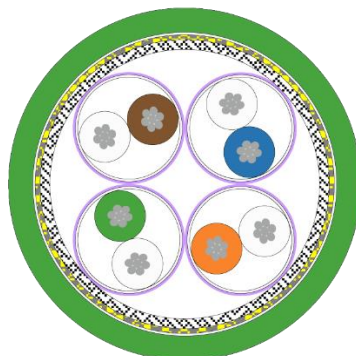


Figure 2-5 Sectional view of SKD05-HT

## 2.4 Video-technical characteristics

We use the AXIS Q 1645 Network Camera in a pressure-resistant enclosure. For details, please refer to the Product Documentation, video-technical data of AXIS®:

<https://www.axis.com/products/axis-q1645>



## 2.5 Other technical data

	<b>Camera (Ex-d)</b>	<b>Terminal box (Ex-e)</b>
Permissible ambient temperature	-10°C ... +130°C (for PoE power supply) -60°C ... +60°C (In the event of additional 24 V DC power supply)	-60°C ... +55°C
Protection class as per EN 60529/IEC 529	IP68 (Test conditions: 24h/3m water column 5°C)	IP66
Housing material	stainless steel, mat. no. 1.4404	polyester resin
Weight	about 11 kg	about 1 kg
Dimensions	D113mm x 310mm	145mm x 145mm x 71mm

Table 2-2 Other technical data

### 3 Safety Instructions

Please absolutely observe the installation instruction's safety directions of the T08 ExCam series!



Quick link:

<https://www.samcon.eu/fileadmin/documents/en/22-Ex-Network-Cameras/ExCam-Series-T08-EX-Installation-Manual-2018.pdf>

It is absolutely mandatory to adhere to the national safety regulations and regulations for prevention of accidents, as well as to the safety instructions given below in this User Manual!



**Attention!**

Cameras of type T08 ExCam are not suitable for use in zones 0 and 20. The ambient temperature, temperature class and explosion group written on the enclosure nameplate must be absolutely adhered to! The customer is not allowed to make any alterations of the camera! The camera must be operated in a proper and sound condition and only in the way intended.



**Attention!**

Repairs may only be carried out by using original parts from the manufacturer. Repairs which affect the explosion protection may only be carried out in accordance with the nationally applied regulations and exclusively by the manufacturer.



**Attention!**

Prior to installation, take external sources of heat or cold into account! The temperature ranges prescribed for storage, transport and operating must be adhered to!



**Attention!**

Adhere to the warnings given on the nameplate:

**“WARNING – DO NOT OPEN IN HAZARD AREAS“**

**“WARNING – DO NOT OPEN WHILE ENERGIZED“**



Using the camera in explosion-protected areas with regard to temperature and dust layers is defined in the respective national regulations.



When installing the ExCam, adhere to the requirements of the EN/IEC 60079-14.

## 4 Installation

For commissioning and operating the camera, the relevant national regulations, as well as the generally accepted rules of technology shall prevail. Before mounting the camera, thoroughly check it for any transport damage, especially on the housing and cable. Installation, electrical connection and the first start must only be carried out by qualified specialists.

### Work preparation:



**Attention!**

**Prepare your work carefully and in accordance with the relevant regulations.**



**Attention!**

**Depending on classification of hazard areas, it is imperative to obtain a work approval first!**

**When you open the pressure-resistant enclosure under voltage, it is absolutely necessary to prevent potentially explosive atmosphere!**

To ensure the best image quality delivered by the network camera, plan the installation site carefully (consider light conditions, object distance or size, angle and minimum object distance to the focus).

- Use appropriate tools and aids.
- When working, ensure a safe stand.
- Make sure that any static charge is avoided.



**Attention!**

**Please observe the national security, installation and accident prevention regulations (e.g. DIN EN 60079-14) and the safety instructions in this User Manual, as well as the ones in the Installation Guidelines!**



**Attention!**

**Adhere to the provisions of the IECEx, ATEX and EX installation instructions for mounting and starting up!**

The ExCam® IPQ1645 consists of a flame-proof camera housing (Ex-d) and, optionally (models with a terminal box ...-T), a terminal box of a high degree of safety (Ex-e). Both units are connected via a reinforced 5 m cable. Mount the camera according to the desired field of view. Install the terminal box so that a good accessibility is provided, in order to facilitate electrical connection. In case of camera with cool.Jacket the cooling system is installed on top of the Ex-d housing. This unit is connected with the terminal box with a 10 m cable.



**Attention!**  
 Please pay attention to the national and local regulations for mounting heavy loads. In case of doubt, take appropriate security measures.

Drawings for drill hole patterns and further information can be viewed on our product page:

Quick link:

<https://www.samcon.eu/en/products/network/excam-ipq1645/>



### Optional mounting accessories

Wall bracket WMB-...		<p><b>WALL MOUNT BRACKET WMB-VA2.3</b>          Wall bracket for devices of T08-VA2.3 series          Suitable for hanging the camera on walls.          Material: stainless steel 1.4404          Load bearing: 45 kg          Dimensions: 445 x 140 x 185 mm</p>
Weather protec- tion roof WPR-...		<p><b>WEATHER PROTECTION ROOF WPR-VA2.3</b>          Weathershield for cameras of the T08-VA2.3-          Series</p>
Pole adapter PMB-...		<p><b>WALL MOUNT BRACKET PMB-VA2.3</b>          Pole adapter for VA wall mount          Material: stainless steel 1.4404          Suitable for pole diameters          between 50 and 105 mm          Load-bearing capacity: 45 kg          Dimensions: 120 x 180 (x 130 bei Mast          Ø 60 mm)</p>

Table 4-1 Mounting accessories

## 5 Electrical connection



### Attention!

The electrical connection of the equipment may only be carried out by qualified and skilled personnel!



### Attention!

It is absolutely necessary to ground the ExCam<sup>®</sup> series' housing via the PA connection.



### Attention!

Please observe the national security, installation and accident prevention regulations (e.g. DIN EN 60079-14) and the safety instructions in this User Manual, as well as the ones in the Installation Guidelines!

The delivered ExCam<sup>®</sup> IPQ1645 is equipped with an electrical connection cable of the type (A)SKD02-T (models without heater) or type (A)SKDP03-T (models with heater) or SKD05-HT (models with cool jacket). The maximum transmission range from the camera to the next active network interface is 100 meters and can be individually specified by the client. The user is NOT authorised to do electrical connection procedures inside the pressure-resistant enclosure.

### 5.1 Potential equalization

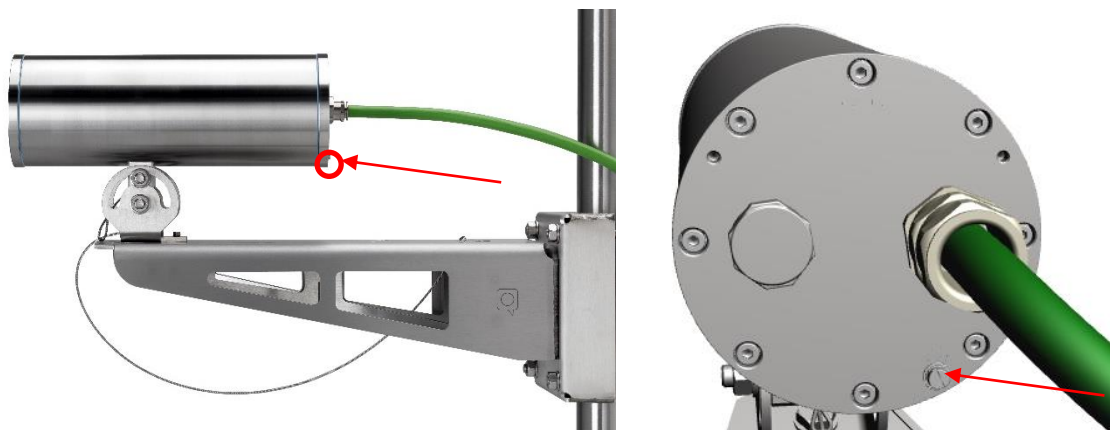


Figure 5-1 ExCam IPQ1645 Potential equalization

Potential equalization/grounding of the camera housing is absolutely necessary, in order to avoid static charges and thus the formation of sparks. For this purpose, a screw terminal is provided at the rear side, at the bottom (right) (see Figure 5-1). The cross-section of the potential equalization should comply with the National Ground Rules (at least 4mm<sup>2</sup>).

Wiring table:

Potential	Colour (IEC 60757)	Cross-section	Comment
PA	GN/YE	4 mm <sup>2</sup> (rigid)	Terminal: Slotted screw M4x0.7 (DIN 84) with washer Ø9mm (DIN 125A), Keep 3 Nm tightening torque!

Table 5-1 Potential equalization

## 5.2 Connection work at the device (terminal box) and fuses

### Supply of 24V DC for the heating

Voltage supply:

22 V DC <  $U_{in}$  < 26 V DC

Power consumption:

Approx. 40W @ -60°C (depends on temperature)

### Power supply for the camera (PoE)

Voltage supply:

PoE, IEEE 802.3af/802.3at type 1 class 3

Reference voltage:

+48 V DC (44...54 V DC)

Maximum power consumption:

9.1 W

Typical power consumption:

4.5 W

The figures 5.2 and 5.3 illustrate the potential cable terminations of the ExCam IPQ1645. Possible terminations are: terminal box or plug.

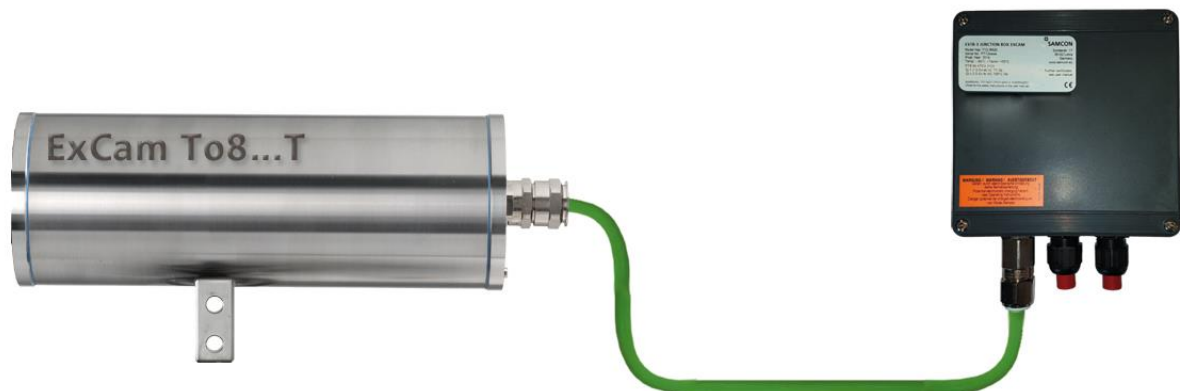


Figure 5-2 ExCam IPQ1645 T08-VA2.3.K3.BOR2-N.H-xxx.N-I



Figure 5-3 ExCam IPQ1645 T08-VA2.3.K3.BOR2-N.H-xxx.N-P

Figure 5.4 illustrates the ExCam IPQ1645 with the active cooling system cool.Jacket. It is always equipped with a terminal box.



Figure 5-4 ExCam IPQ1645 T08-VA2.3.K3.BOR2-N.HH-010.N-I



**Attention!**  
Never open the Ex-e terminal box under voltage!



**Attention!**  
Adhere to the international installation regulations for connection chambers with increased safety (Ex-e).



**Attention!**  
Adhere to attached separate User Manual for the Ex-e terminal box.



Figure 5-5 Camera (Ex-d) and terminal box (Ex-e)



## Video Tutorial:

Observe our video tutorial:

“SAMCON 01 Wiring the cable SKDP03-T to the junction box ExTB-3”  
<https://go.samcon.eu/v01>



Figure 5-6 Video Tutorial ExTB-3

The pin assignment of the SKD02-T is executed in accordance with the standard EIA/TIA-568B for 100BaseTX and 24VDC, as follows:

Camera (Ex-d) (T568B)	Colour SKD02-T (IEC60757)	Terminal ExTB-3	Cross- sectional surface	Comment
Tx+	WH / OG	1	0.26 mm <sup>2</sup>	Solid conductor
Tx-	OG	2	0.26 mm <sup>2</sup>	Solid conductor
Rx+	WH / GN	3	0.26 mm <sup>2</sup>	Solid conductor
Rx-	GN	4	0.26 mm <sup>2</sup>	Solid conductor
(PoE +48 VDC)	WH / BU	5	0.26 mm <sup>2</sup>	Solid conductor
(PoE +48 VDC)	BU	6	0.26 mm <sup>2</sup>	Solid conductor
(PoE GND)	WH / BN	7	0.26 mm <sup>2</sup>	Solid conductor
(PoE GND)	BN	8	0.26 mm <sup>2</sup>	Solid conductor
GND/SHD	YE / GN	PE	2.5 mm <sup>2</sup>	Flex

Table 5-2. Wire assignment of terminal box ExTB-3 (without heater)

The pin assignment of the ASKD02-T is executed in accordance with the standard EIA/TIA-568B for 100BaseTX and 24VDC, as follows:

Camera (Ex-d) (T568B)	Colour ASKD02-T (IEC60757)	Terminal ExTB-3	Cross- sectional surface	Comment
<b>Reinforcement</b>	<b>YE / GN</b>	<b>PE</b>	<b>2.5 mm<sup>2</sup></b>	<b>Flex</b>
Tx+	WH / OG	1	0.26 mm <sup>2</sup>	Solid conductor
Tx-	OG	2	0.26 mm <sup>2</sup>	Solid conductor
Rx+	WH / GN	3	0.26 mm <sup>2</sup>	Solid conductor
Rx-	GN	4	0.26 mm <sup>2</sup>	Solid conductor
(PoE +48 VDC)	WH / BU	5	0.26 mm <sup>2</sup>	Solid conductor
(PoE +48 VDC)	BU	6	0.26 mm <sup>2</sup>	Solid conductor
(PoE GND)	WH / BN	7	0.26 mm <sup>2</sup>	Solid conductor
(PoE GND)	BN	8	0.26 mm <sup>2</sup>	Solid conductor
<b>GND/SHD</b>	<b>YE / GN</b>	<b>PE</b>	<b>2.5 mm<sup>2</sup></b>	<b>Flex</b>

Table 5-3 Wire assignment of terminal box ExTB-3 (model N and L/ASKD02-T)

The pin assignment of the SKDP03-T is executed in accordance with the standard EIA/TIA-568B for 100BaseTX and 24VDC, as follows:

Camera (Ex-d) (T568B)	Colour SKDP03-T (IEC60757)	Terminal ExTB-3	Cross- sectional surface	Comment
Tx+	WH / OG	1	0.26 mm <sup>2</sup>	Solid conductor
Tx-	OG	2	0.26 mm <sup>2</sup>	Solid conductor
Rx+	WH / GN	3	0.26 mm <sup>2</sup>	Solid conductor
Rx-	GN	4	0.26 mm <sup>2</sup>	Solid conductor
(PoE +48 VDC)	WH / BU	5	0.26 mm <sup>2</sup>	Solid conductor
(PoE +48 VDC)	BU	6	0.26 mm <sup>2</sup>	Solid conductor
(PoE GND)	WH / BN	7	0.26 mm <sup>2</sup>	Solid conductor
(PoE GND)	BN	8	0.26 mm <sup>2</sup>	Solid conductor
<b>GND/SHD</b>	<b>YE / GN</b>	<b>PE</b>	<b>2.5 mm<sup>2</sup></b>	<b>Flex</b>
L+	BK	9	1.5 mm <sup>2</sup>	L+ 24VDC
L-	BU	10	1.5 mm <sup>2</sup>	L- 24VDC
<b>PE</b>	<b>YE / GN</b>	<b>PE</b>	<b>1.5 mm<sup>2</sup></b>	<b>PE</b>

Table 5-4. Wire assignment of terminal box ExTB-3 (integrated heater)

The pin assignment of the ASKDP03-T is executed in accordance with the standard EIA/TIA-568B for 100BaseTX and 24VDC, as follows:

Camera (Ex-d) (T568B)	Colour ASKDP03-T (IEC60757)	Terminal ExTB-3	Cross-sectional surface	Comment
<b>Reinforcement</b>	<b>YE / GN</b>	<b>PE</b>	<b>2.5 mm<sup>2</sup></b>	<b>Flex</b>
Tx+	WH / OG	1	0.26 mm <sup>2</sup>	Solid conductor
Tx-	OG	2	0.26 mm <sup>2</sup>	Solid conductor
Rx+	WH / GN	3	0.26 mm <sup>2</sup>	Solid conductor
Rx-	GN	4	0.26 mm <sup>2</sup>	Solid conductor
(PoE +48 VDC)	WH / BU	5	0.26 mm <sup>2</sup>	Solid conductor
(PoE +48 VDC)	BU	6	0.26 mm <sup>2</sup>	Solid conductor
(PoE GND)	WH / BN	7	0.26 mm <sup>2</sup>	Solid conductor
(PoE GND)	BN	8	0.26 mm <sup>2</sup>	Solid conductor
<b>GND/SHD</b>	<b>YE / GN</b>	<b>PE</b>	<b>2.5 mm<sup>2</sup></b>	<b>Flex</b>
L+	BK	9	1.5 mm <sup>2</sup>	L+ 24VDC
L-	BU	10	1.5 mm <sup>2</sup>	L- 24VDC
PE	YE / GN	PE	1.5 mm <sup>2</sup>	PE

Table 5-5 Wire assignment of terminal box ExTB-3 (model LL/ASKDP03-T)

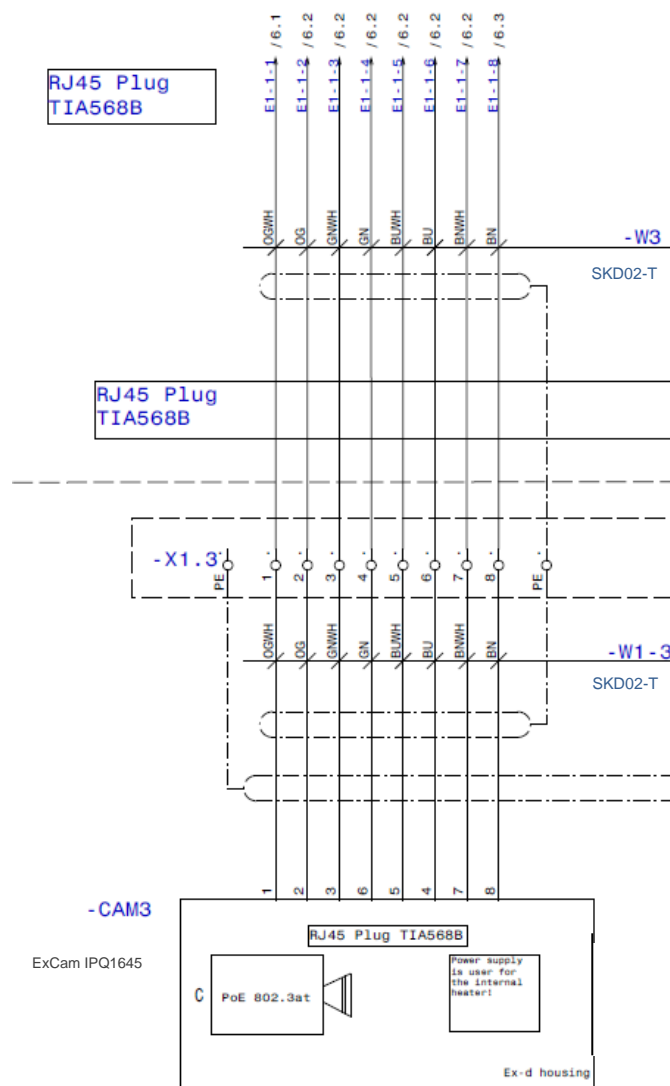


Figure 5-7 Sample circuit of terminal box ExTB-3 (without heater)

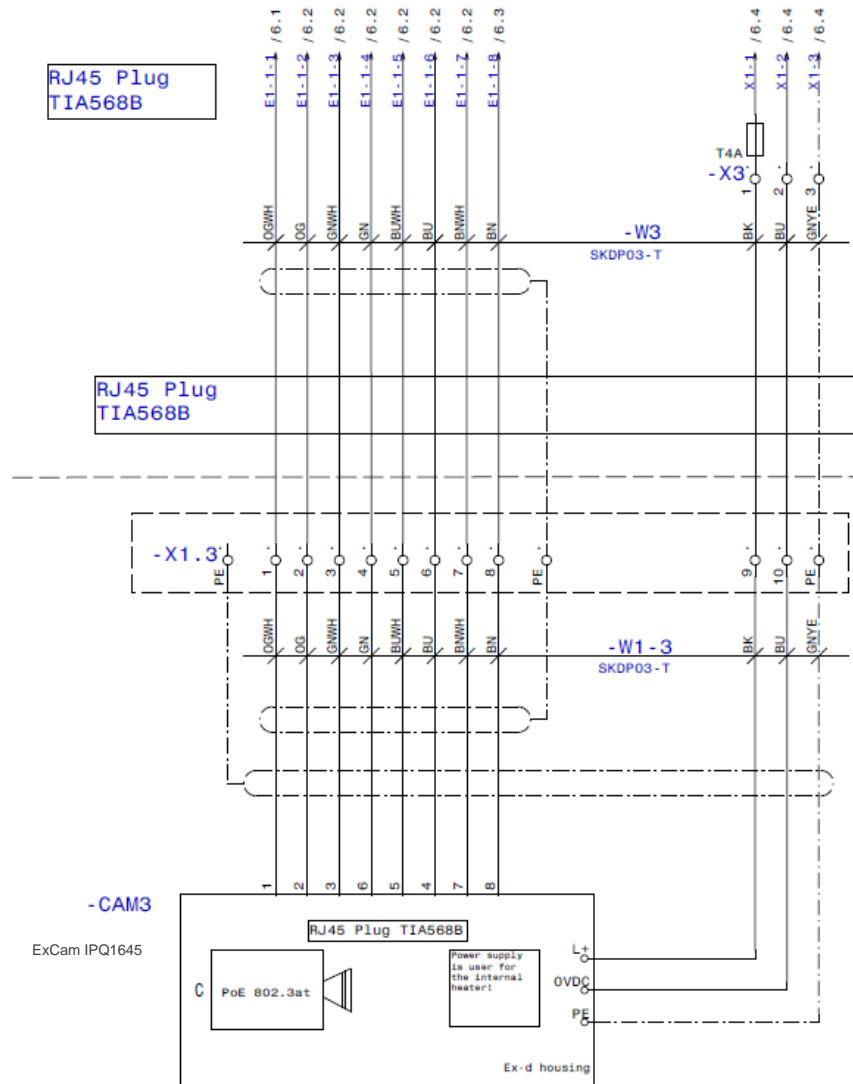


Figure 5-8 Sample circuit of terminal box ExTB-3 (heater integrated)

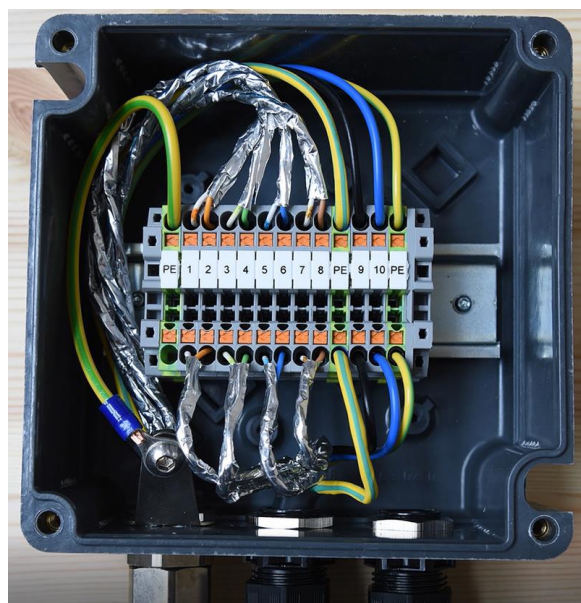


Figure 5-9 Photo of the wired terminal box ExTB-3


**Attention!**

Introduce the foiling up to about 15 mm close to the terminals, in order to prevent alien crosstalk. Make sure that the foiling cannot cause any short circuit of the data pairs!


**Attention!**

Bring the twisted pair composite up to about 10 mm close to the terminals, in order to ensure interference immunity.


**Attention!**

Use only terminals approved by SAMCON.


**Attention!**

Finally, check your network installation with a Class-D Link Test.

Note:

If the camera is equipped with a camera cooling system (SAMCON **cool.Jacket** for model key type N.HH), the wiring is executed via the cable SKD05-HT.

The pin assignment of the SKD05-HT is executed in accordance with the standard EIA/TIA-568B for 100BaseTX and 24VDC, as follows:

Camera (Ex-d) (T568B)	Colour SKD05-HT (IEC60757)	Terminal ExTB-3	Cross- sectional surface	Comment
Tx+	WH / OG	1	0.13 mm <sup>2</sup>	Solid conductor
Tx-	OG	2	0.13 mm <sup>2</sup>	Solid conductor
Rx+	WH / GN	3	0.13 mm <sup>2</sup>	Solid conductor
Rx-	GN	4	0.13 mm <sup>2</sup>	Solid conductor
(PoE +48 VDC)	WH / BU	5	0.13 mm <sup>2</sup>	Solid conductor
(PoE +48 VDC)	BU	6	0.13 mm <sup>2</sup>	Solid conductor
(PoE GND)	WH / BN	7	0.13 mm <sup>2</sup>	Solid conductor
(PoE GND)	BN	8	0.13 mm <sup>2</sup>	Solid conductor
GND/SHD	YE / GN	PE	2.5 mm <sup>2</sup>	Flex

Table 5-6. Wire assignment of terminal box ExTB-3 (without cool.Jacket)

An appropriate water supply has to be provided by the customer. For further information, please refer to the applicable datasheet of the ExCam IPQ1645 cool.Jacket.

## 5.3 External connection and protection

There are several options of routing the ExTB-3 terminal box to a safe area:

### 5.3.1 Direct routing from the ExTB-3 into the safe area

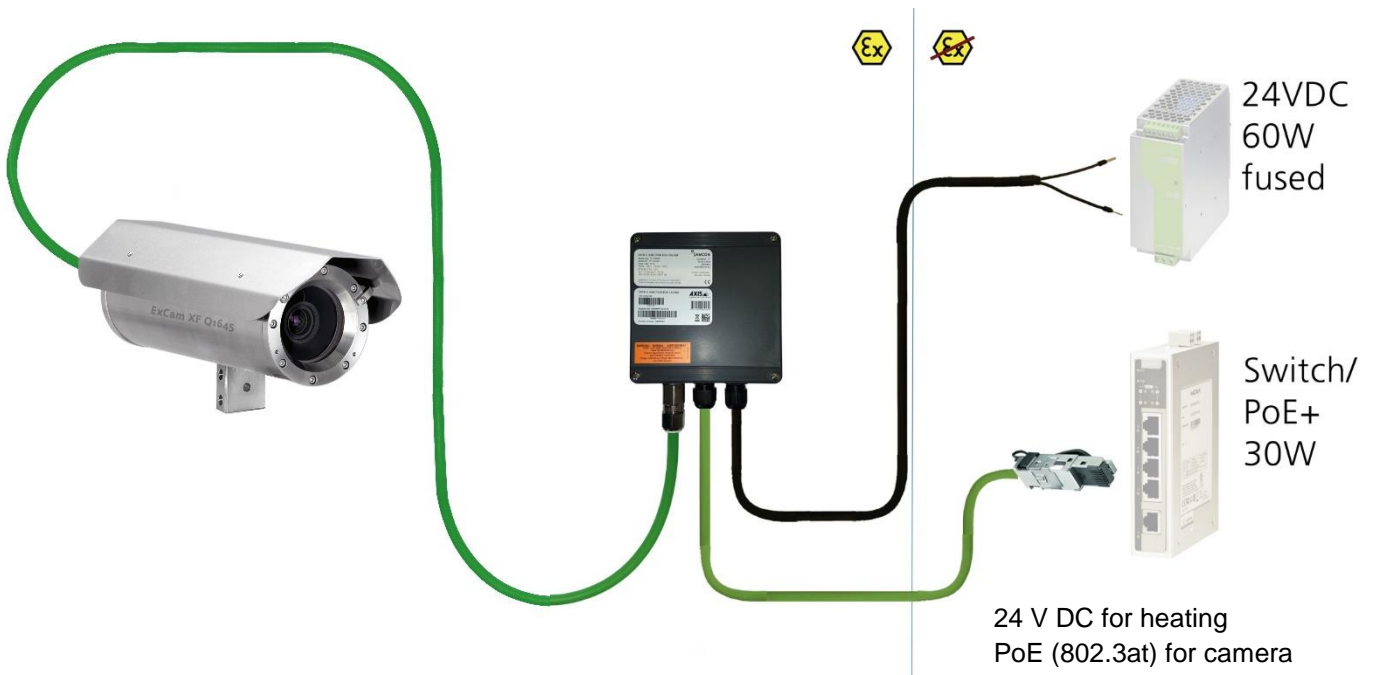


Figure 5-10 ExTB-3 -> Safe area

In the case of direct routing from ExTB-3 to the safe area, the power supply and the voltage signal are led from the safe area to the terminal box. Please observe the terminal box assignment, as described above.



**Attention!**

**Cables and wires must comply with the requirements of the IEC 60079-0/1/7 & 14.**



**Attention!**

**The supply line must have a sufficient cross-section. The cable protection must comply with national and international regulations.**

### 5.3.2 Routing via ExConnection Rail (optional accessories)

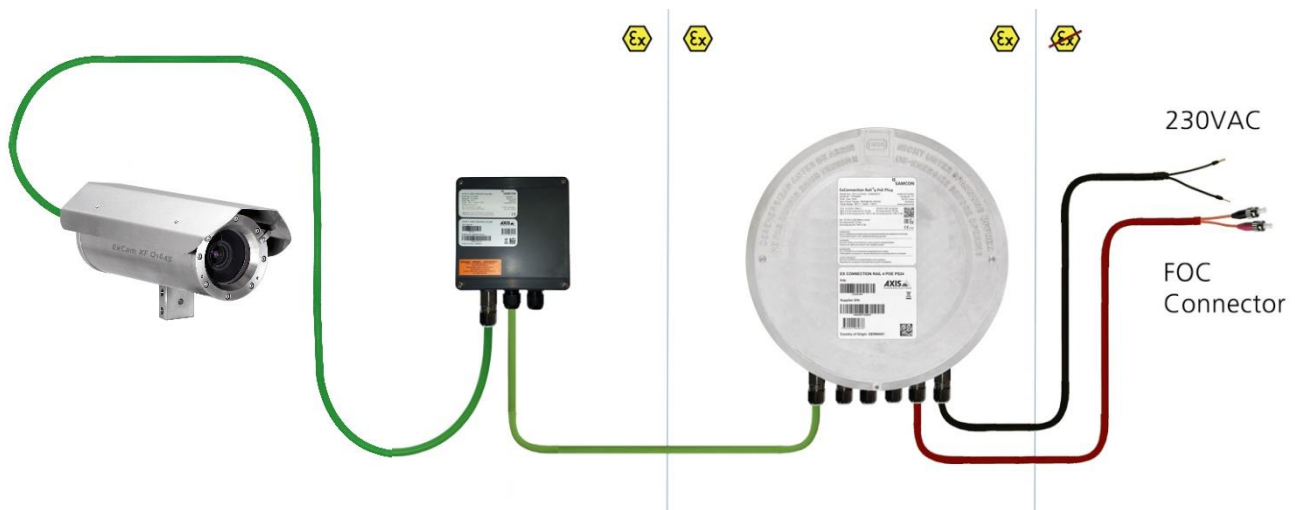


Figure 5-11 ExTB-3 -> ExConnection Rail

In the case of routing the ExTB-3 into an ExConnection Rail, larger installation distances can be managed.

*Note:*

*In hazardous areas, the ExConnection Rail (optional accessories) acts as a PoE+ switch, a media converter from copper to fibre-optic cable, as well as a power supply for the cameras.*



**Attention!**  
Cables and wires must comply with the requirements of the IEC 60079-0/1/7 & 14.



**Attention!**  
The supply line must have a sufficient cross-section. The cable protection must comply with national and international regulations.

### 5.3.3 Appropriate cables & cable entries

An integral part of the device safety is the correct selection of the cables, wires and cable entries.



**Attention!**  
Cables and wires must comply with the requirements of the IEC 60079-0/1/7 & 14.



**Attention!**

**The supply line must have a sufficient cross-section. The cable protection must comply with national and international regulations.**

For non-binding configuration and planning guidelines, please visit our website:



Particularly for installations requiring a suitable barrier gland, make sure that you handle them correctly and observe the rules and notes given in the respective mounting and assembly instructions.

We show the essential procedures in the following video tutorial:

**Video Tutorial:**

Please note our video tutorial:



“SAMCON 02 Mounting and installing Ex-d barrier glands to ExConnection Rails”  
<https://go.samcon.eu/v02>



Figure 5-12 Barrier gland



### 5.3.4 Fusing

PoE power supply requires no fuses. The power supply fusing depends on the cable cross-section and length.



**Attention!**

**Recommendation for fusing relates to 40W@24VDC at 100 meters and 1.5 mm<sup>2</sup>**



**Attention!**

**When the heating switches on, high current peaks occur! Use slow-blow fuses.**



**Attention!**

**Please pay attention to the national and international regulations regarding selectivity and line protection.**

Potential/ Wire no.	Colour (IEC60757)	Conductor	Voltage	Maximum power consumption/fusing:
L+ / 1	BK	1.5mm <sup>2</sup> , stranded wire	+24 V DC	40 W of continuous power Fine-wire fuse (L+) 4000 mA -T- slow-blow (high inrush load!)
L- / 2	BU	1.5mm <sup>2</sup> , stranded wire	0 V DC / GND	
PE	YE/GN	1.5mm <sup>2</sup> , stranded wire	PE	

Table 5-7 Recommendation for fusing

### 5.3.5 Plug assignments (RJ45)

The data transfer of the ExCam IPQ1645 series uses a 100 Mbit/s Ethernet connection (100BASE-TX). If the cable termination uses a plug, the latter should be plugged into the RJ45 PoE slot of the network device (PSE). Prior to connecting it to the camera, the network device (PSE) can already be supplied with power, hence there is no „power ON“ priority which has to be observed.



**Attention!**

**Use appropriate RJ45 plugs! Check the cable shielding, cross-section and the outside diameter!**



**Attention!**

**It is imperative to ensure a correct routing of the individual wires according to the EIA/TIA-568B"**



**Attention!**

**Finally, check your network installation with a Class-D Link Test.**

Detailed instructions on how to connect a RJ45 plug are available in our video tutorial: “SAMCON 03 Mounting and installing the RJ45 jack to SAMCON cables”  
<https://go.samcon.eu/v03>

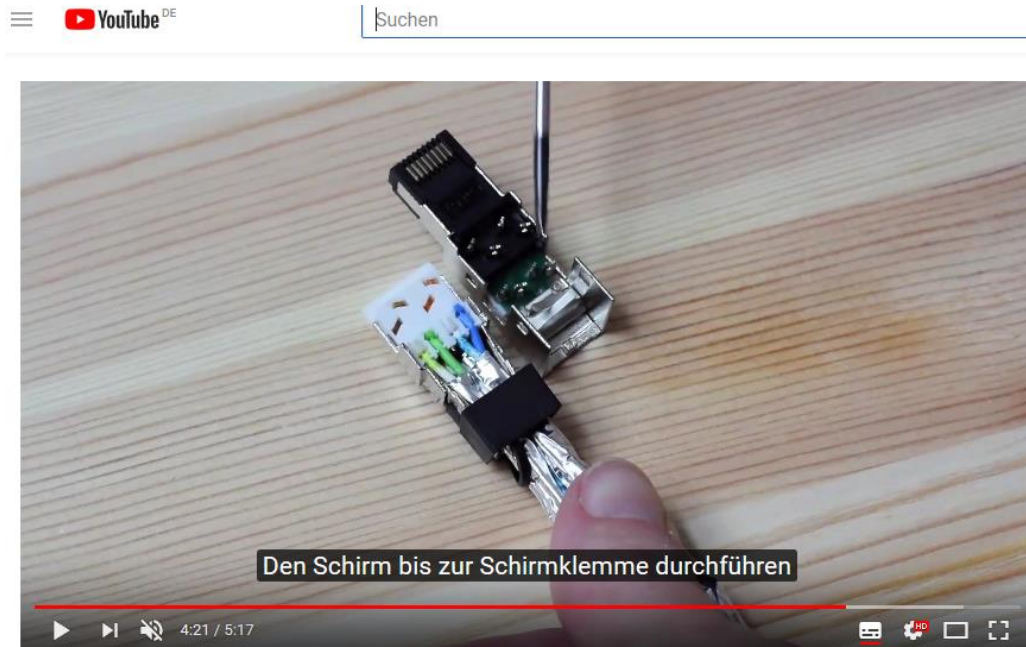


Figure 5-13 Plug assignment, RJ45

### 5.3.6 Tests prior to switching on voltage



**Attention!**

Prior to starting the device, perform all tests as indicated by the national regulations. Furthermore, check the correct function and installation of the device in accordance with this User Manual and other applicable regulations.



**Attention!**

Incorrect installation or operation of the camera may lead to a loss of warranty!



**Attention!**

Do not switch on the camera at temperatures below 0°C!

## 6 Working inside the camera housing (Ex-d)

The customer may open the housing only if it is absolutely necessary. Only exchanging the SD memory card or a hardware reset are reasons for this.

### 6.1 Preparation for work:



**Attention!**

**Prepare your work carefully and in accordance with the relevant regulations.**



**Attention!**

**Depending on classification of hazard areas, it is imperative to obtain a work approval first!**

**If you adjust the camera yourself or open the pressure-resistant enclosure (Ex-d) under voltage, it is absolutely imperative to prevent potentially explosive atmosphere!**

### 6.2 Opening the pressure-resistant housing



**WARNING – MAY NOT BE OPENED IN HAZARD AREAS**

**Note: Depending on classification of hazard areas, it is imperative to obtain a work approval first!**

**Even after switching on the power supply, it is absolutely imperative to avoid potentially explosive atmosphere when opening the camera housing. Opening the housing requires disassembly and working in a safe (i.e. non-explosive!) area.**



**Attention!**

**Pay attention not to damage the thread surface of the flame-proof gap.**



**Attention!**

**Pay attention not to damage the housing seals. Keep them clean!**

If the ExCam IPQ1645 is equipped with a weather protection roof this has to be removed prior to starting your work! To do so, loosen the 4x8mm lens screws M4\*0.7 at the front and rear sides of the bracket holders (Figure 6-1).

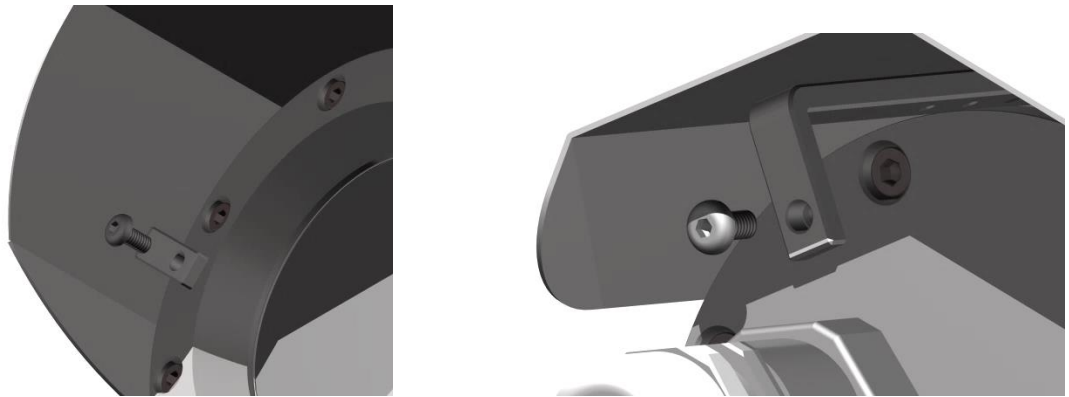


Figure 6-1 Removing the weather protection roof (1/2) (this illustration is an example)

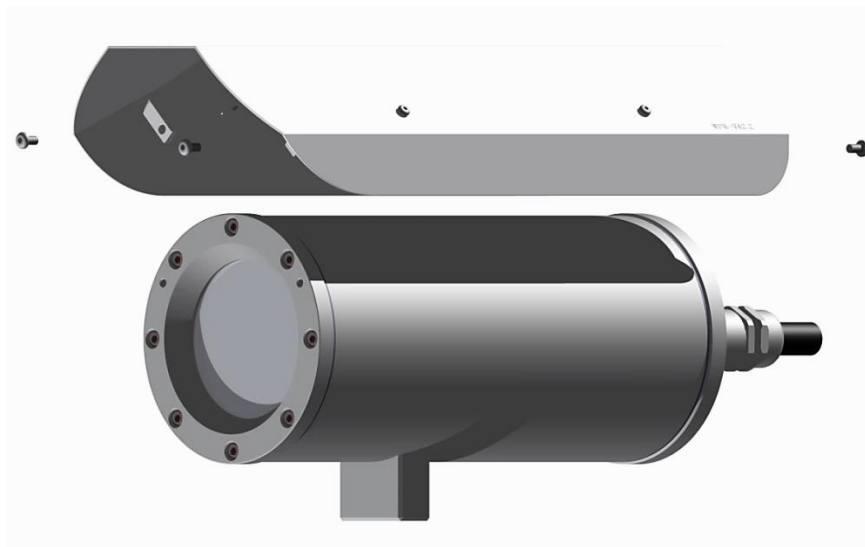


Figure 6-2 Removing the weather protection roof (2/2) (similar illustration)

If the ExCam IPQ1645 is equipped with a cool.Jacket the two screws on the back side have to be loosened prior to starting your work! The cool.Jacket has to be lifted to remove the K-flange.

To open the stainless-steel housing (T07 VA2.3.x.x) of ExCam IPQ1645, loosen the eight cylinder-head hexagon screws (DIN 912/ ISO 4762) together with their spring rings (DIN 127A) on the rear side of the cable and power supply flange (see Figure 6-3). Caution: do not touch the screw threads with your skin or clothes! On the threads, there is LOCTITE® 243™ (chemical basis is dimethacrylate ester) applied to prevent the bolted connection from unintentional loosening because of impacts and vibrations and to seal them tightly. It is not permitted for the customer to open the front-side sight glass flange! There is no need of such an action.

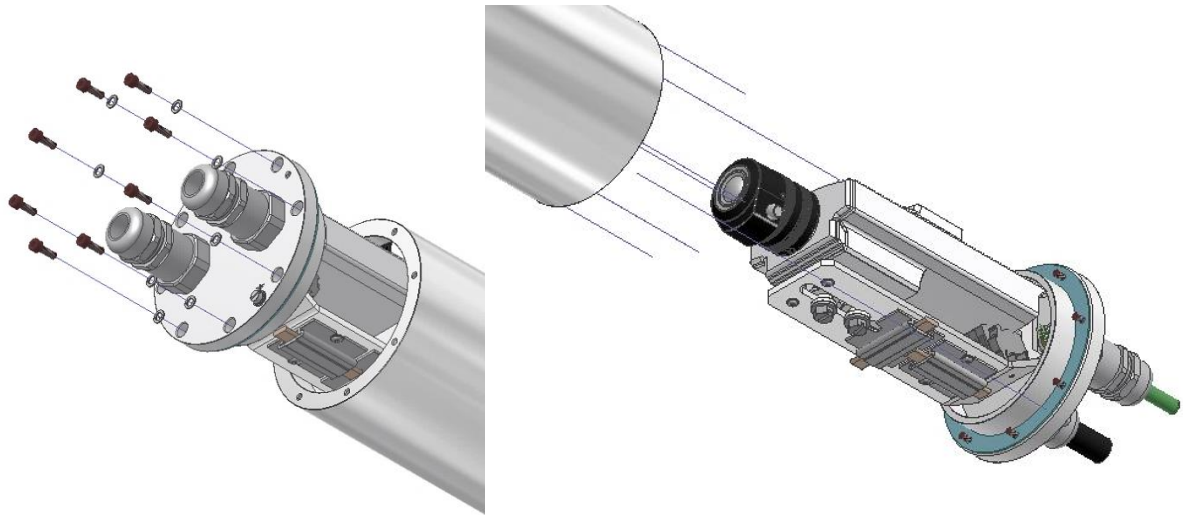


Figure 6-3 Opening the ExCam IPQ1645 (similar illustration)

Carefully pull out the cable and supply flange to the rear, as straight as possible. Because of negative pressure, it may be difficult to remove the flange. The cylindrical clearance fit (H8f7 - DIN ISO 286) of the camera body and flange may not be tilted! Risk of damage to the flame-proof gap (DIN EN 60079-1:2012)!

Attention: The mounting adapter with the housing's PTC heater, camera module and optics, as well as the temperature control, and (if applicable) auxiliary relays and terminal block are fixed on the cable and supply flange. Dealing with these components, too, you have to work very carefully and precisely in order to avoid canting and damage to the in-built components! Caution: do not touch the cylindrical fit surface with your skin or clothes! On the surface, there is oil lubricating paste to protect the surface against fretting corrosion and mechanical stresses.

When you open the housing, pay attention that you do not damage the GYLON® flat seal (blue, RAL5012) and do not make it dirty! The flat gasket is loosely attached to the cable and power supply flange. It is fixed only by the bolted connections!



**Attention!**

**Pay attention not to damage the surface of the drill hole and the shaft (fitting) of the flame-proof gap.**



**Attention!**

**Pay attention not to damage the housing seals. Keep them clean!**

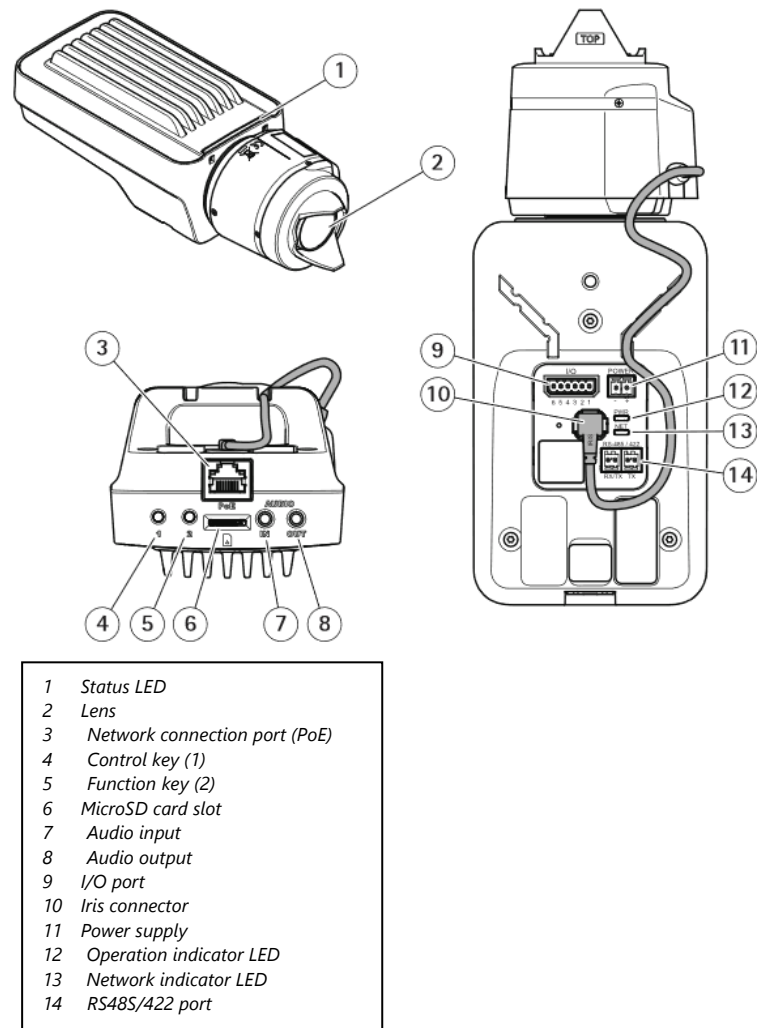


Figure 6-4 Structure of the camera (similar illustration)

### 6.3 Removing / inserting a SD memory card

**Note:**

The ExCam IPQ1645 has a slot for a micro SDHC memory card (card not included). Saved video files can be played and deleted via the web interface. They are also available in a download list. Moreover, the videos available in the memory card can also be accessed via FTP server in the network.

If the memory card has to be replaced by the user, it should be, as far as possible, empty and pre-formatted with an ext4 or vFAT file system.



**When touching electrical components, observe potential equalization (grounding of the body): carry electrostatic-discharge clothes, a PE wristband etc.!**

## 6.4 Hardware Reset

To set all the parameters of the ExCam IPQ1645 (including the IP address) to default values, you should run a hardware reset.

The parameters can be reset via the web interface or manually. If the camera placed in the network can no longer be reached or its state is uncontrollable, the reset should be performed manually. To do so, proceed as follows:

1. Disconnect the camera installation module (Axis Q1645) from the power supply.
2. Press and hold the control button (see the illustration below) and, at the same time, connect the system to the voltage supply (PoE).
3. Hold the control button pressed for about 30 seconds.
4. Release the control button. After about a minute, the AXIS Q1645 will return to factory defaults. If there is a DHCP server in the network, the IP address will be the following: 192.168.0.90 (subnet masking 255.255.255.0).
5. IP address and password can be redefined. If the hardware reset is not satisfactory or the network camera shows serious conflicts or does not work as usual (errors in the browser visualisation, frozen images, control commands no longer processed, slowing down of the system, etc.), it may be necessary to re-install the current firmware, or to install an update (see Chapter 7).

## 6.5 Closing of the pressure-resistant housing

For closing the housing, proceed in reverse order as when opening. Use exclusively original screws included in the supply.

The cable and power-supply flange (K3) is fixed by 8 cylinder-head screws M4\*0,0.7 (ISO metric right-turning) with 30 mm thread length (DIN 912/ ISO 4762, grade 6g). Materials of bolted connections are identical to the pressure-resistant stainless steel housing (standard material no. 1.4404 AISI316L). Check whether the threaded holes are undamaged and clean. Before closing, it is also absolutely imperative to check the flame-proof gap (circular cylindrical fit).



**Attention!**

**If any mechanical damages occurred to the fitting gap, it is no longer allowed to use the housing!**



**Attention!**

**Do not lock-in any foreign objects in the housing.**

Dismantled screw locks (spring washers DIN 127A) must be used again.

The GYLON® gasket must be used in undamaged condition, according to the flange hole pattern, and placed between the flange and the hull. The lateral position of the flat surface / contact surface is arbitrary.

If, when closing the housing, you see that the surface of the fitting gap is dirty or insufficiently lubricated, clean it with a clean cloth and de-grease it with a suitable cleaning agent. Then re-grease it with lubricant suitable for this specific application (e.g., Molykote® P-40 gel for standard applications or special grease OKS 403 in the event of heavy seawater influence).

The screwed connections of flange and body components must always be tightened *crosswise* to a torque of **3 Nm**! Do not tighten the screw too strongly! It can cause rupture of the cylinder head or over-stretching the threads, and thus to impairment of the pressure resistance or ignition protection class



**Cylinder-head bolts for explosion-proof connection of the camera body with the flange component must always be tightened at a 3 Nm torque - crosswise and evenly!**

## 6.6 Battery

The ExCam IPQ1645 is equipped with a high-temperature resistant Panasonic button cell BR2330A/VAN. This cell supplies energy to the internal real time clock (RTC). The customer is not allowed to replace the battery! In this case, please contact the manufacturer.



## 7 Network access and visualization

The most important procedures of the first starting up the camera are described below. The configuration menu of the web surface allows an intuitive navigation and offers several configuration possibilities. For detailed documentation and information how to use the web Interface, please see the User Manual for Axis or visit the following website:

<https://www.axis.com/products/axis-q1645>



The delivered ExCam IPQ1645 is set to the applicable net frequency (50Hz or 60Hz). If the camera is used at a location with a differing net frequency, the image might start to flicker, particularly in surroundings with fluorescent tubes. In such a case, the applicable settings have to be carried out inside the menu “System Options > Advanced > Plain Config”.

User: root  
Password: root



### 7.1 Browser Support

A list of the currently supported web browsers, operating systems, required add-ons, etc. can be viewed at:

[http://www.axis.com/techsup/cam\\_servers/tech\\_notes/browsers.htm](http://www.axis.com/techsup/cam_servers/tech_notes/browsers.htm)

### 7.2 Assigning the IP address

The ExCam IPQ1645 is intended for use in an Ethernet network and requires an IP address to access and control it. In the most today's networks, a DHCP server is integrated. This server automatically assigns an IP address.

If there is no DHCP server available in the network, the IP default address of ExCam IPQ1645 is **“192.168.0.90” (subnet masking 255.255.255.0)**.

With the “AXIS IP Utility”, it is possible to determine the IP address under Windows; the included USB stick contains this application.



**If it is not possible to assign the IP address, it might be necessary to change the firewall settings!**

The “AXIS IP Utility“ tool automatically recognizes all ExCam devices and visualises them in the device list. It can also be used to manually assign a static IP address. For this purpose, the ExCam IPQ1645 network camera has to be installed in the same physical network segment (physical subnet) as the computer on which the AXIS IP Utility is running. The network signature of ExCam IPQ1645 is "AXIS Q1645" (see Figure 7-1). MAC address and serial number for clear device identification are also detected and displayed.

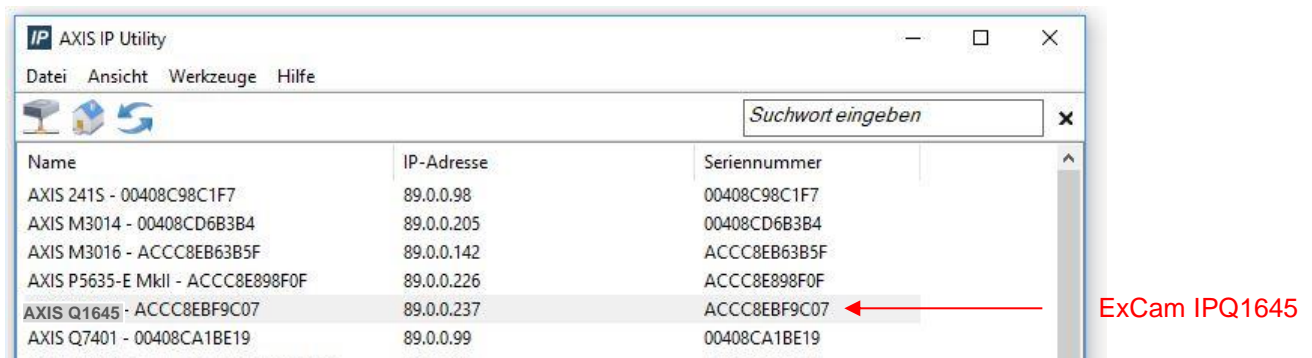


Figure 7-1 Axis IP Utility

### 7.3 Password/ Identification

The following user name is set at the factory: **root**

The following password is set at the factory: **root**

## 8 Maintenance / Modification

The applicable regulations for the maintenance and servicing of electrical devices in potentially explosive atmospheres must be adhered to.

The required maintenance intervals are specific to the individual devices. The operating company has to determine these intervals depending on the application parameters. The maintenance tasks especially include examination of parts on which the ignition protection depends (e.g., proper condition of the casing, seals and cable entry points). If maintenance measures are necessary they have to be initiated and/or executed.

Repairs may only be carried out with original parts of SAMCON Prozessleittechnik GmbH. Damaged pressure-resistant housings have to be replaced completely. In case of doubt, send the part in question back to SAMCON Prozessleittechnik GmbH.

Reparations concerning the explosion protection must only be carried out in accordance with nationally applied regulations by SAMCON Prozessleittechnik GmbH or by an authorised electrical technician authorised by SAMCON Prozessleittechnik GmbH. Rebuilding of or alterations to the devices are not permitted.

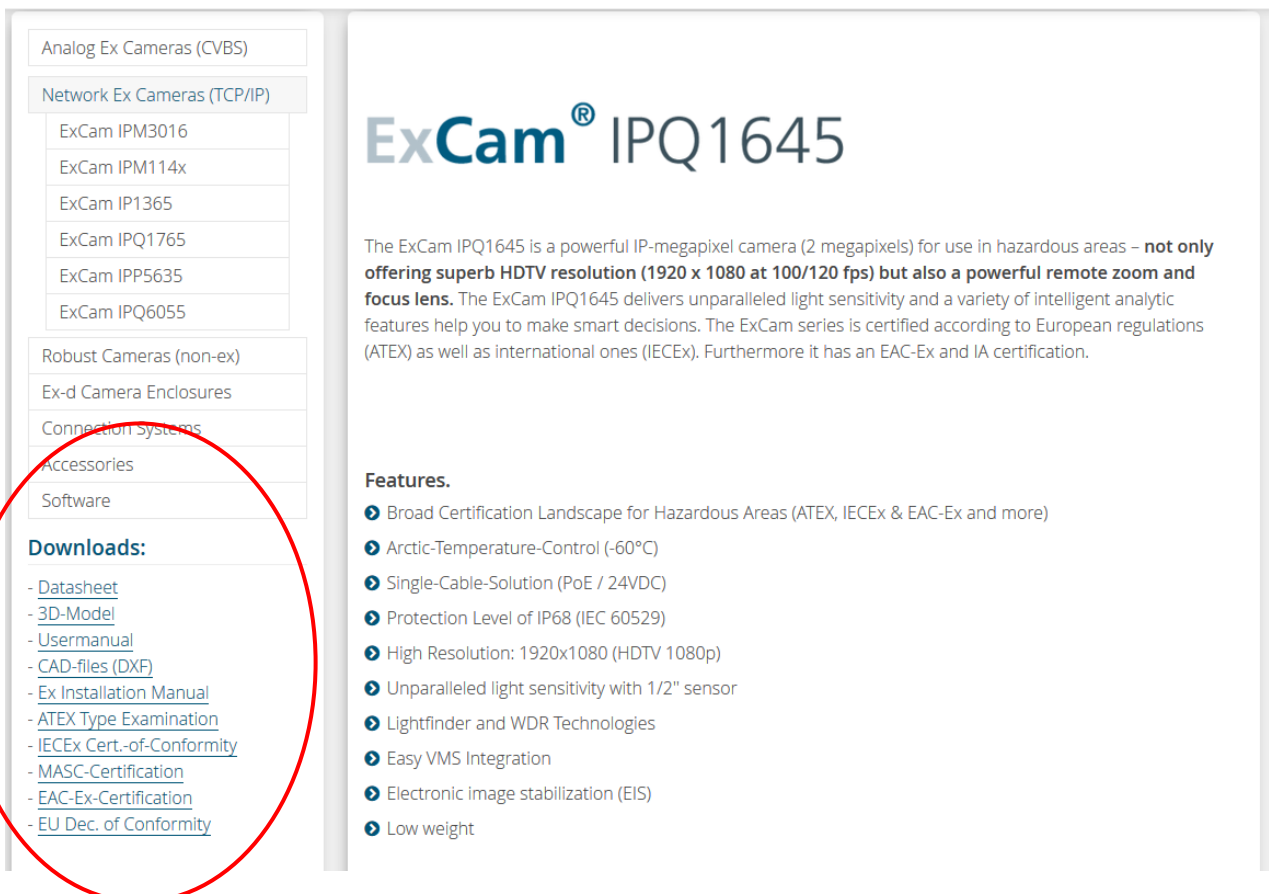
## 9 Disposal / Recycling

When disposing of the device, nationally applicable regulations must be observed.  
 This Document is subject to alterations and additions.

## 10 Drawings & 3D models

All drawings, 3D models, certificates and other information are available in the download area of the product page on our website:

<https://www.samcon.eu/en/products/network/excam-ipq1645/>



The screenshot shows a product page for the ExCam IPQ1645. On the left is a navigation menu with categories like 'Analog Ex Cameras (CVBS)', 'Network Ex Cameras (TCP/IP)', 'Robust Cameras (non-ex)', 'Ex-d Camera Enclosures', 'Connection Systems', 'Accessories', and 'Software'. The 'Downloads:' section is circled in red and lists links for Datasheet, 3D-Model, Usermanual, CAD-files (DXF), Ex Installation Manual, ATEX Type Examination, IECEx Cert.-of-Conformity, MASCCertification, EAC-Ex-Certification, and EU Dec. of Conformity. The main content area features the product name 'ExCam® IPQ1645', a descriptive paragraph, and a list of features.

**ExCam® IPQ1645**

The ExCam IPQ1645 is a powerful IP-megapixel camera (2 megapixels) for use in hazardous areas – **not only offering superb HDTV resolution (1920 x 1080 at 100/120 fps) but also a powerful remote zoom and focus lens.** The ExCam IPQ1645 delivers unparalleled light sensitivity and a variety of intelligent analytic features help you to make smart decisions. The ExCam series is certified according to European regulations (ATEX) as well as international ones (IECEX). Furthermore it has an EAC-Ex and IA certification.

**Features.**

- Broad Certification Landscape for Hazardous Areas (ATEX, IECEx & EAC-Ex and more)
- Arctic-Temperature-Control (-60°C)
- Single-Cable-Solution (PoE / 24VDC)
- Protection Level of IP68 (IEC 60529)
- High Resolution: 1920x1080 (HDTV 1080p)
- Unparalleled light sensitivity with 1/2" sensor
- Lightfinder and WDR Technologies
- Easy VMS Integration
- Electronic image stabilization (EIS)
- Low weight

If you wish additional technical information, please contact us at: [support@samcon.eu](mailto:support@samcon.eu)

## 11 Certificates and further documentation

Certificates and further documentation are available in the download area at the product website:

<https://www.samcon.eu/en/products/network/excam-ipq1645/>



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