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SAMCON liteServer Ex.micro Extreme Compact and Robust Scene Illumination Device User Manual

Contents

SAMCON

SAMCON liteServer Ex.micro Extreme Compact and Robust Scene Illumination Device

Product Information

Introduction

The product is a luminaire designed for explosion protection in hazardous areas. It is suitable for use in Zone 1 and 2 for gas explosion protection and Zone 21 and 22 for dust explosion protection.

Technical Data

Parameters of the explosion protection:

- Identification marks: II 2G (Zone 1 and 2), II 2D (Zone 21 and 22)
- Protection level: IP 66/68 (IEC/EN 60529) (30min/8m water column)
- Transportation/storage temperature: Not specified
- Ambient temperature (EX): Not specified
- Noticed body: EU Type Examination
- IECEx certificate: Not specified

Electrical parameters:

- Power supply of the luminaire: Not specified
- Power supply (CO, WA): Not specified
- Power supply (IR): Not specified
- Maximum power consumption (CO, WA): 13.1 W @ 24 VDC
- Maximum power consumption (IR): 13.7 W @ 24 VDC

Other technical data:

- Housing material: Stainless steel 1.4404

Illustration of the Model Key

The model key provides information about various specifications of the product:

- Ex productname: Not specified
- Power: Not specified
- LED: CO (Cold white), WA (Warm white), IR (Infrared)
- Beam angle: 90 degrees
- Type: T20 (SAMCON Production type 20)

- Housing combination: VA0.1.K1.BOR

- Temperature range: L.N (Not specified)

- Cable termination: xxx.1-K (Length of the connection line in meters at delivery)

Product Usage Instructions
As detailed information regarding product usage and installation is not provided in the text extract, please refer to the complete user manual for step-by-step instructions on installation, electrical connection, and safety precautions.

Introduction

The liteServer® Ex.micro is an extreme compact and robust scene illumination device (type T20) which is manufactured by SAMCON Prozessleittechnik GmbH. The liteServer® Ex.micro LED lighting fixture housed in the Ex-d stainless steel housing is available in 3 versions, with 3 different light sources to choose from. All 3 variants of the liteServer® Ex.micro are based on efficient and durable LED technology in circuit board construction (COB). The emitted radiation includes visible white light in the full color spectrum of dif-ferent color temperatures (3000K, 6500K) or infrared light IR850. Depending on the in-stalled LED (cold white, warm white or infrared), the luminaire can be used flexibly for a wide variety of industrial applications. It is suitable either for area illumination purposes, but also for selective illumination for short and medium object distances in plant and pro-cess monitoring and with IR LEDs in extremely light weak areas. The device is therefore perfectly suited to complement and support camera systems in dimly lit areas.
The liteServer® series (type 20) is electrical equipment and is certified and approved as a pressure-resistant lighting system. The luminaires may be used in Ex zones 1, 2, 21, 22, including explosion groups IIC (e.g. acetylene) and IIIC (conductive and combustible dust).
The explosion-proof liteServer® Ex.micro searchlight allows both stationary device instal-lation and mobile use (hand-held operation, etc.).

Technical Data

Parameters of the explosion protection

- Identification marks according to Directive RL 2014/34/EU: II 2G (Zone 1 and 2)
    - II 2D (Zone 21 and 22)
- Explosion protection (gas): Ex db IIC T5 Gb

- Explosion protection (dust): Ex tb IIIC T95°C Db

- Protection level: IP 66/68 (IEC/ EN 60529) (30min/8m water column)

- Transportation / storage temperature: 0°C … +70°C

- Ambient temperature (EX): -30°C … +50°C

- Noticed body: TÜV Rheinland (number 0035)

- EU Type Examination: TÜV 21 ATEX 8696 X (2021)

- IECEx certificate: IECEx TUR 22.0076X (2022)

Attention!
The instructions stated on the type and instruction plates have to be observed!

Electrical parameters

- Power supply oft he luminaire:

- Power supply (CO, WA): 24 VDC ± 3 VDC

- Power supply (IR): 24 VDC ± 3 VDC
- Maximum power consumption (CO , WA): 13.1 W @ 24 VDC
- Maximum power consumption (IR): 13.7 W @ 24 VDC

Other technical data

Housing material: Stainless steel 1.4404

Illustration of the model key

1) Ex product-name	2) Power	3) LED	4) Beam angle	5) Type	6) Housing combination	7) Tempera- ture range	8) Cable	9) Termination
liteServer® Ex.micro.	24.	CO	90	T20-	VA0.1.K1.BOR-	L.N-	xxx.1-	K-
	24.	WA	90	T20-	VA0.1.K1.BOR-	L.N-	xxx.1-	K-
	24.	IR	90	T20-	VA0.1.K1.BOR-	L.N-	xxx.1-	K-

Explanations:

1. liteServer® Ex.micro = Functional description of the liteServer® Series (technical data / specification of the individual module)
2. 24. = Power supply 24VDC
3. CO = COB-LED cold white, color temperature 6500K
   - WA = COB-LED warm white, color temperature 3000K
   - IR = Infrared SMD-LED
4. 90 = Beam angle 90°
5. T20 = SAMCON Production type 20
6. VA0.1.K1.BOR = T07 Ex d housing (stainless steel 1.4404) with small diameter (ØVA=79mm)
   - VA0.1.K1.BOR= T07 VA0.x housing with minimum body length (LVA1.2.R = 127mm)
   - VA0.1.K1.BOR= K1 cable gland flange (axial cable gland, standard) VA0.1.K1.BOR= Borosilicate sight glass DIN7080 standard execution
7. L.N No integrated heating / no cooling system installed; temperature range (-30°C to +50°C)
8. xxx.1 = Length of the connection line in meter at delivery. The standard cable length is 5 m, minimum / maximum cable length is: 001…100 [m] xxx.1 = Cable type 1; Ölflex Heat 125MC G3x0,75
9. K = Terminal block termination Electrical connection of the illuminant 24VDC (see chapter electrical connection)

Connection cable

ÖLFLEX HEAT 125 MC
Electron beam cross-linked cables for increased application requirements; connecting cable

- Outer diameter: 6.8mm
- Conductor design: 3G0.75; 3×0.75mm2 (ø=1.4mm), fine-wired tinned Cu-strands acc. IEC 60228 or VDE 295

- Bending radius: 15 x outer diameter at installation 4 x outer diameter after installation
- Temperature range: -35°C … +120°C (at point of installation)
  - -55°C … +125°C (fixed installed)
- Outer sheath/characteristics: Electron beam cross-linked, based on polyolefin copolymer, black, halogen free, flame resistant (EN 60332-1-2), UV and oil resistant

Attention!
For wiring and connection of the liteServer, DIN/EN/IEC 60079-14 has to be observed.

Cable gland

Ex d gland ADE 1F2 Type 4 – M20x1.5 (Capri)
The cable-cable gland combination has been tested with the following values:

- Static pressure resistance: < 26 bar
- Longitudinal tightness: acc. to IEC/EN 60079-14 Appendix E.

Test reports you can find in the Downloads: **https://www.samcon.eu/en/products/luminaires/liteserver-exmicro/**

Technical specification of the illuminant / LED illumination

Cold white (CO) LED
A cold white high-power COB LED with a nominal power of 10.0 W is used in this device as a radiation source for visible light.
The COB LED is characterized by the following technical properties:

- LED Type: COB-LED (InGaN), single phosphor dot, non-matrix arranged, divergent, non-focusing
- Power consumption: 10W
- Max. power consumption: 13.1W@24VDC
- Rated current: 625mA@12VDC, 313mA@24VDC
- Color rendering: 440nm to 690nm
- Color temperature: 6500K cold white
- Luminous flux: 900lm … 1100lm
- Beam angle: 90°
- Operating hours: 50000h
- Dimensions (ØxH): 28 x 2.4 mm

Warm white (WA) LED
A warm white high-power COB LED with a nominal power of 10.0 W is used in this device as a radiation source for visible light.
The COB LED is characterized by the following technical properties:

- LED Type: COB-LED (InGaN), single phosphor dot, non-matrix arranged, divergent, non-focusing
- Power consumption: 10W
- Max. power consumption: 13.1W@24VDC
- Rated current: 625mA@12VDC, 313mA@24VDC

- Color rendering: 440nm to 690nm

- Color temperature: 3000K warm white

- Luminous flux: 900lm … 1100lm

- Beam angle: 90°

- Operating hours: 50000h

- Dimensions (ØxH): 28 x 2.4 mm

IR-LED
A SMD IR-LED with a radiance of 4120 mW is used in this device as a radiation source for visible light..
The IR LED is characterized by the following technical properties:

- LED Type: High Power 12W IR SMD-LED

- Max. power consumption: 13.7W

- Infrared centroid wavelength: 850nm

- Radiation intensity (IR850): 4120mW

- Beam angle: 90°

- Operating hours: 50000h

Attention!
Infrared radiation emanates from this product. Do not look directly at the operating lamp.

- **Safety Instructions**

  Please absolutely observe the installation instruction's safety directions of the T20 liteServer® series!

- **Quick link:**

  https://www.samcon.eu/fileadmin/documents/en/40-Lightening-systems/liteServer-Series-T20-Ex-Installation-Manual.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!**

  Luminaires of the type liteServer® Series T20 are not suitable for use in zones 0 and 20. The ambient temperature, temperature class, and explosion group stated on the enclosure's type plate, must absolutely be observed! The customer is not allowed to make any alterations inside or outside at the housing and must only be used for the intended purpose and in an immaculate condition.

- **Attention!**

  Only original parts from SAMCON Prozessleittechnik GmbH may be used for repair. Repair works affecting the explosion protection may only be carried out in accordance with the regulations applicable in the country of use and only by SAMCON Prozessleittechnik GmbH.

- **Attention**!

  Prior to installation, please consider external sources of heat or cold!

  The permissible temperature range must absolutely be observed!

- **Attention!**

Observe the warnings given on the type plate!

- **"WARNING – DO NOT OPEN IN HAZARD AREAS"**
    - **Note:** Depending on the classification of hazard areas, a work approval must be obtained. When adjusting the lighting fixture, you shall prevent a potentially explosive atmosphere!
    - Using the luminaire in explosion-protected areas with regard to temperature and dust layers is defined in the respective national regulations.
    - When installing the liteServer®, adhere to the requirements of the EN/IEC 60079-14.

Attention!

The sight glass must not be directly covered by foreign objects. The light must be able to leave the optics of the protective housing unhindered.
Regular cleaning intervals of the sight glass should be observed in order to avoid adhesion and dust deposits.
Risk of burns from hot surfaces (≤80°C)!
Do not stare into the direct beam. Danger of impairment of vision due to high exposure to light!

- Prior to the first use, you should test the luminaire corresponding to the instructions given in the chapter Commissioning.
- Please observe the national safety regulations and regulations for prevention of accidents, as well as to the safety instructions given below in this User Manual!

Installation

For the liteServer® Ex.micro's installation and operation, the relevant national regulations, as well as the generally accepted rules of technology shall prevail. Before mounting the liteServer®, thoroughly check it for any transportation damages, especially at the housing and cable. Installation, electrical connection, and the first commissioning must only be carried out by qualified personnel.

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 scene lighting 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 regulations regarding security, installation, and accident prevention (e.g. IEC EN 60079-14) and the safety guidelines described in the user and in the EX installation manual!
- Attention!
  Please observe the installation and commissioning advices described in the Ex-installation manual!
  Install the liteServer® Ex.micro at the desired location. Mounting options and conditions, accessories, as well

as safety guidelines are described in the EX installation manual of the T20 liteServer® Series.

- Attention!

 Prior to the luminaire installation, take external sources of heat or cold into account! Observe the permissible temperature range!

Drawings for drill hole patterns and further information can be viewed on our product page:
Quicklink:
https://www.samcon.eu/en/products/luminaires/liteserver-exmicro/

Optional mounting accessories

Wall bracket WMB-…		**WALL MOUNT BRACKET WMB-VA0.x/VA1.x** Wall bracket for devices of zhe T20-VA0.x- Series Suitable for hanging luminaires on walls. Material: Stainless steel 1.4404 Weight: 0.68 kg Dimensions: 80 x 100 x 205 mm
Pole adapter PMB-…		**POLE MOUNT BRACKET PMB- VA0.x/VA1.x** 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 at pole Ø 60 mm)
Hinge attachment SCH-…		**Hinge attachment SCH-VAx.x** Hinge attachment for easy mounting on round sight glasses acc. to DIN 28120/28121 or simi- lar for VA Material: Stainless steel AISI 316L/1.4404 Weight: 0.04 kg Dimensions WxHxD [mm]: 29.2x40x73.1

Electrical connection

Attention!
The electrical connection of the equipment must be executed by qualified personnel only!
Attention!
It is mandatory that the housing of the liteServer® Series has to be grounded via a PE-connection!
Attention!
If possible, carry out initial commissioning when the outside temperature is above 0°C to prevent condensation inside the housing.

The liteServer® Ex.micro is manufactured with a cable pigtail reflecting the desired cable length. Any electro-technical or mechanical work inside the flameproof enclosure which is done by the user is prohibited and not required. The ending of the liteServer's cable connection is furnished with a terminal block termination.
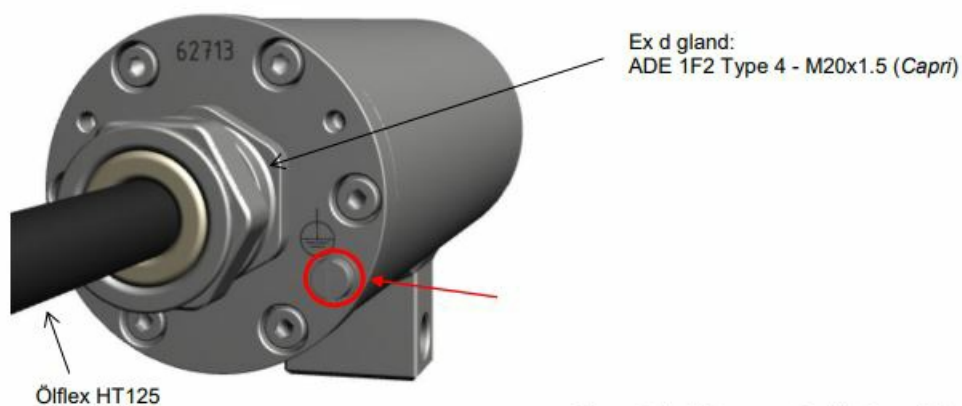
Potential equalization

Figure 5.1 – PE connection liteServer® Ex.micro

The potential equalization (earthing of the housing) is mandatory in order to avoid electrostatic charging and hence spark generation. The screw terminal on the housing's rear side is intended for this purpose (q.v. figure 5.1). The profile of the potential equalization has to reflect the national grounding instructions (min. 4 mm2).

Connection table:

Potential	Color (IEC 60757)	Profile	Comment
PE	GN/YE	4 mm2 (fix)	Screw terminal: Slotted screw M4 x 0.7 (DIN 84) with washer Ø 9 mm (DIN 125A). 3Nm tightening torque has to be observed!

Connection and protection

Power supply of the luminaire:

- Power supply: 24 VDC ± 3 VDC
- Maximum power consumption (CO , WA): 13.1 W @ 24 VDC; (40 Vmax.)
- Maximum power consumption (IR): 13.7 W @ 24 VDC; (46 Vmax.)

Short circuit protection
Figure 5.2 illustrates the cable termination for the liteServer Ex.micro.

Figure 5.2 – liteServer® Ex.micro T20-VA0.1.K1.BOR-N.N –xxx.1-K

Via the black cable the illuminant is supplied with voltage.

- Attention!

  No reverse polarity protection! It is essential to ensure the correct polarity when making the electrical connection!

- 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.

- Attention!

  Use only terminals approved by SAMCON.

The power supply has to be done via the brown (BR) as well as the blue (BU) connection strand.

Connection table:

Potential	Color (IEC 60757)	Potential level	Profile	Remarks
DC+	BR	+24 V DC	0.75 mm²	AWG22, fine stranded wire
DC GND-	BU	0 V DC / GND	0.75 mm²	AWG22, fine stranded wire

The dimensioning of the equipment or the supply protection depends on:

- The cable length
- The national regulations

The following safety recommendations may serve as a basis:

Supplied power	Length system cable	Recommended protection	Comments
24 V DC	≤ 100 m	800 mA – mT	In case the transmission range exceeds 100 m and it is intended to supply the luminaire with 24 V DC, please make sure to use an adjustable power supply in order to compensate voltage drops

The release current of the protection has to be less than the maximum short-circuit current of the power supply (switch-mode power supply)!

Tests prior to switching on voltage

- **Attention!**

  Prior to commissioning, all tests as indicated by the national regulations have to be executed. In addition, it is mandatory that the proper functioning of the operating device in accordance with this user manual and all other applicable regulation has been executed.
- Attention!

  Incorrect installation and operation of the liteServer may lead to a loss of warranty!
- Attention!

  If possible, carry out initial commissioning when the outside temperature is above 0°C to prevent condensation inside the housing.

Exchanging the illuminant / LED-block

The illuminant should only be exchanged if it is defect. It must be replaced by an original spare part of the same model. In this special case it is allowed and necessary to open the Ex d housing. All required steps are described in this user manual; the descriptions stat-ed in the T20 liteServer® Series Ex installation manual have to be observed! Perhaps our video will help you: "Replacing the illuminant of liteServer Ex.micro" **http://go.samcon.eu/change-led-micro**

Figure 6.1 – Replacing the illuminant

Work preparation

- Attention!

  Please carry out any pre-operational work carefully and in accordance with the applicable regulations.
- Attention:

Note: Depending on the zone classification, it might be necessary to obtain a work permit/clearance! When adjusting the luminaire settings potentially explosive atmosphere must be avoided by any means!

- Use appropriate tools
- Make sure you have a secure foothold
- void static charge

Opening the pressure-resistant housing

Opening the pressure–resistant housing is only allowed to replace a defect LED. After-wards, the housing has to be closed explosion-proof again! The steps below have to be followed very carefully:

„WARNING – DO NOT OPEN IN HAZARDOUS AREA"

Attention:
For opening the liteServer®'s pressure-resistant stainless steel housing T07 VA0.1.K1.BOR, it is mandatory to follow the step-by-step instructions as stated in the T20 Ex installation manual!
Loosen the six M3 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. Caution: do not touch the screw threads with your skin or clothes! On the threads, there is LOCTI-TE® 243™ (chemical basis is dimethacrylate ester) applied to prevent the bolted connec-tion from unintentional loosening because of impacts and vibrations.
Carefully pull out the cable and supply flange to the rear, as straight as possible. Becau-se of negative pressure, it may be difficult to remove the flange. The cylindrical clearance fit (H8f7 – DIN ISO 286) of the housing body and flange may not be tilted! Risk of damage to the flame-proof gap (DIN EN 60079-1:2012)!
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 mechani-cal 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!
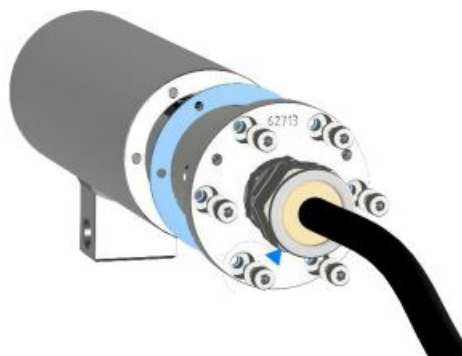Pull out the luminaire carefully and pay attention not to clamp the cables.

Figure 6.2 – Opening the liteServer®

- Attention!

  Beware not to damage the surface of bore hole and shaft (fit) at the flame proof gap preventing the

  transmission of ignition.
- Attention!

  Please make sure not to damage housing sealings and to keep them clean.

Replacing the LED block

To replace the LED-block the 2 grub screws on the side must be carefully loosened. The LED block is plugged in and can easily be removed after loosening the grub screws. Seperate it at the plug contacts.
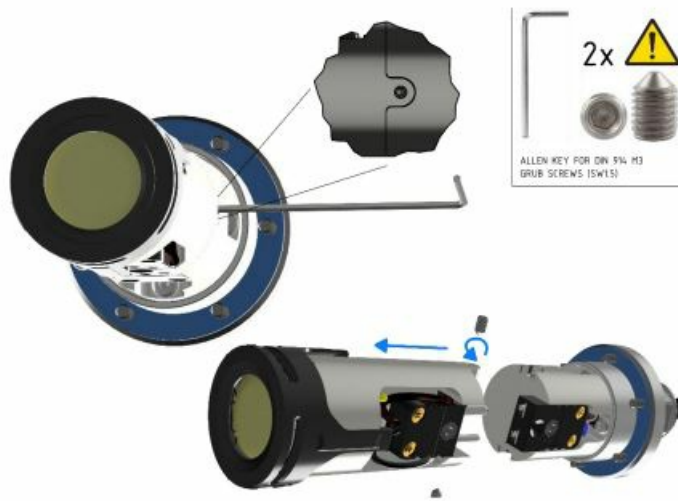
Figure 6.3 – Removal of the LED block

Insert the plug of the new LED replacement block into the connection socket oft he hou-sing flange. Make sure that the plug contacts and contact surface oft he aluminium heat sink are clean and undamaged. After successfully replacing the LED block, the grub screws must be tightened again. Only use new, original grub screws. Tightening torque is 1.0 Nm! Loctite 243 may be used for screw locking.
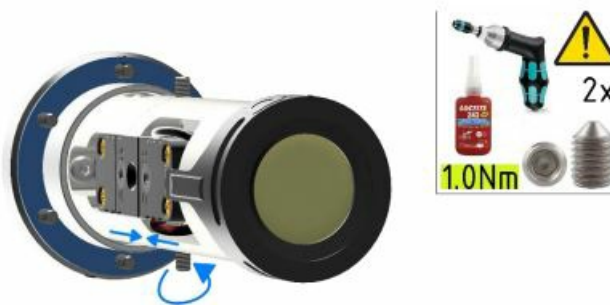

Figure 6.4 – Installation of the new LED block

When touching electrical components, potential equalization (ground-ing of the body) has to be observed (ESD clothing, PE wristband etc.)!

When closing the housing, the cable routing has to be observed! In order to avoid colli-sions and mechanical strain within the closed housing as well as to observe the neces-sary bending radius, the cable has to be looped.

Closing of the pressure-resistant housing

Attention:

For closing the pressure-tight stainless steel T07 VA1.2.K1.BOR housing of the liteServer® Ex.micro, the instructions of the T20 Ex installation manual have to be fol-lowed step by step! For closing the housing, proceed in reverse order as when opening. Use exclusively original screws included in the supply. Check whether the threaded holes are undamaged and clean. Before closing, it is also absolutely imperative to check the flame-proof gap (circularcylindrical fit).

- ATTENTION:

  In case of any mechanical damages that happened to the flameproof joint, the housing must not be used

  anymore!

- ATTENTION!

  Do not lock-in any foreign objects in the housing

- ATTENTION!

  Insert the flange to reach the end position, in order to ensure ignition protection and the protection level (IP) of 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 applica-tion (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 com-ponents must always be tightened crosswise to a torque of 1.2 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. The screws must be provided with a little LOCTITE 243.

Cylinder head screws used for explosion-proof connection of the housing body with the flanges, always have to be tightened evenly and crosswise with a tightening torque of 1.2 Nm

Maintenance / Servicing / Alterations

The national regulations concerning the maintenance and servicing of electrical devices within hazardous areas are to be observed. The required maintenance intervals are spe-cific to the individual devices. The operating company has to determine these intervals depending on the application parameters. During maintenance, focus has to be put on checking parts concerning the ignition protection category such as the integrity of the housing, the sealings and the cable glands. If maintenance measures are necessary they have to be initiated and/or executed.

Repairs and Maintenance

Repairs must only be carried out with original parts of SAMCON Prozessleittechnik GmbH. Damaged pressure-resistant housings have to be replaced completely. If in doubt, return the applicable part to SAMCON Prozessleittechnik GmbH.
Repairs concerning the explosion protection must only be carried out by SAMCON Prozessleittechnik GmbH or a qualified electrical technician authorized by SAMCON Prozessleittechnik GmbH in accordance with nationally applied regulations. Rebuilding of or alterations to the devices are not permitted.

Disposal / Recycling

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

Drawings, 3D models, certificates & further documentation

Drawings, 3D models, certificates and more you can find in the download:
https://www.samcon.eu/en/products/luminaires/liteserver-exmicro/

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- fax: – 31

Documents / Resources

liteServer® Ex.micro User Manual SAMCON	**SAMCON liteServer Ex.micro Extreme Compact and Robust Scene Illumination Device** [pdf] User Manual liteServer-Ex.micro, liteServer Ex.micro Extreme Compact and Robust Scene Illumination Device, liteServer Ex.micro, Extreme Compact and Robust Scene Illumination Device

References

- **YouTube**
- **Explosion Proof Camera Housings - IECEx and ATEX CCTV Systems**
- **Explosion Proof Camera Housings - IECEx and ATEX CCTV Systems**
- **liteServer Ex.micro - Explosion Proof Luminaire with coldwhite-, warmwhite or IR-LED, ATEX, IECEx & IP66, IP68**

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