

## **Technical Manual**

Option Box OB11  
Option Box OB31



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# 1 Safety

## 1.1 Validity

The chapter „Safety“ is valid as operating instruction.

Specific process and instructions in this document require special precautions to guarantee the safety of personal.

## 1.2 General safety instructions

The operator of the system is responsible in terms of planning, mounting, commissioning, operating and maintenance.

Installation and commissioning of all devices must be performed by a trained professional only.

Protection of operating personnel and system is not ensured if the product is not used in accordance with its intended purpose.

Laws and regulations applicable to the usage or the intended purpose must be observed. The devices are only approved for appropriate and intended use. Ignoring these instructions will void any warranty and absolve the manufacturer from any liability.

The Declaration of Conformity, Certificate of Compliance, Statement of Conformity, EC-type-examination certificate and data sheets are an integral part of this document.


The data sheet contains the electrical data of the Declaration of Conformity, the Certificate of Compliance and the EC-type-examination certificate.


The documents mentioned are available from <http://www.pepperl-fuchs.com> or contact your local Pepperl+Fuchs representative.


## 1.3 Symbols used

This document contains information that you must read for your own personal safety and to avoid property damage. The warning signs are displayed in descending order of hazardous depending on the hazard category, as follows:


### Safety-relevant Symbols


	<p><b>Danger!</b></p> <p>This symbol indicates a warning about a possible danger.</p> <p>In the event the warning is ignored, the consequences may range from personal injury to death.</p>
---	---

	<p><b>Warning!</b></p> <p>This symbol indicates a warning about a possible danger.</p> <p>In the event the warning is ignored, the consequences may cause personal injury or heaviest property damage.</p>
---	--

	<p><b>Caution!</b></p> <p>This symbol warns of a possible fault.</p> <p>Failure to observe the instructions given in this warning may result in the devices and any connected facilities or systems develop a fault or fail completely.</p>
---	---

### Informative Symbols

	<p><b>Note!</b></p> <p>This symbol brings important information to your attention.</p>
---	--

	<p><b>Action!</b></p> <p>This symbol marks an acting paragraph.</p>
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## 1.4 Delivery, transport, and storage

Check the packaging and the contents for damage. If you discover any instances of damage, please notify the postal service or forwarding agent as well as the supplier.

Check the contents of the consignment against the order and make sure all delivery documents are complete and correct.

Keep the original packaging.

The device should only be stored or transported in the original packaging.

The device must always be stored in a dry, clean environment. The permissible storage temperature must not be exceeded (refer to the data sheet).

## 1.5 Intended Use

### 1.5.1 Option Box OB11

The Option Box OB11 represents an external extension modul with integrated AC power supply, designed for devices of the product families VisuNet EX1 RM and VisuNet EX1 PC.

### 1.5.2 Option Box OB31

The Option Box OB31 is designed for use in hazardous area zones 1, 2, 21 and 22. It can be connected the Panel PCs VisuNet EX1 PC / Remote Monitors VisuNet EX1 RM on one side and FO converters, switch and Ethernet on the other side. The Option Box has a modular architecture and can be configured with modules in the works.

## 1.6 Installation and commissioning

The identification plate must not be removed.

The installation instructions in accordance with IEC/EN 60079-14 must be observed.

If devices have already been operated in general electrical systems, they may subsequently no longer be installed in electrical systems used in combination with hazardous areas.

The device must only be operated in the ambient temperature range and at the relative humidity (noncondensing) specified.

Use shielded cable

To connect interfaces only use shielded cable.

Screwing/locking connectors

To advance the cable shield screw/lock the connectors.

Leading of data cables and power circuit lines

Lead data cable and power circuit line in separate cable channels.

Check cable and connectors

Before commissioning the system check all cables and connectors.

The Option Box is only allowed to be operated when the Ex e terminal compartment is closed. If the Ex e terminal compartment is open, the explosion protection is no longer effective.

To provide the necessary Ex-safety (ingress protection) for the Ex-e connection area, it is mandatory to use only the original screws with attached sealing. If this sealing is corrupted the screws have to be exchanged by the original type.

(order number: 206803,

SCREWSET-OB11/OB31-EXE)

Required torque of the retaining screws: 2.6 Nm

(cover Exe compartment)

The chemical resistance of the gaskets have to be considered necessarily.

The gaskets are Ex relevant.

(See chap. 8 Chemical resistance)

Wait 3 minutes after switching off the supply voltage before opening the Ex e terminal compartment . Internal capacitors may otherwise still be charged and cause an explosion in the event of a short-circuit.

If glass balls are visible the Option Box is to be taken out immediately out of operation. This is because safety reasons.

The enclosures of the OB device family may not be opened. This enclosures are factory sealed and cannot be repaired!

Devices being operated in connection with hazardous areas may not be changed or manipulated. In case of defect, the device must be removed and replaced with a new one.

For wiring of interfaces with the type of protection “e” increased safety the following chapter of the standard EN 60079-14: 2003 have to be considered:

Chapter 9 Wiring systems

Chapter 11.3 Additional requirements for type of protection “e” – Increased safety: Wiring systems

Explosion-protected electrical equipment in a metal case must be provided with external equipotential bonding, which must be connected to the equipotential bonding of the system over the shortest possible distance.

(cross section: min. 4mm<sup>2</sup>)

## 1.7 Technical Data

### 1.7.1 OB11

<b>Input Power Supply (230 V AC)</b>	
Connection	Terminals A-1, A-2
Type of protection	Ex e
Voltage Un	100 ... 240 V AC ±10% 50 ... 60 Hz
Current In	Max. 1.75 A @ 100 V

<b>Power Supply output (24 V DC)</b>	
Connection	Terminals A-4, A-5
Type of protection	Ex e
Voltage Un	24 V DC
Current In	Max. 5 A



## 1.7.2 OB31

<b>Input Power Supply 230 V AC</b>	
Connection	Terminals A-1, A-2, A-3 A-3 see chap. 3.3
Type of protection	Ex e
Voltage $U_n$	100 ... 240 V AC $\pm 10\%$ 50 ... 60 Hz
Current $I_n$	1 A

<b>Input Power Supply DC*</b>	
Connection	Terminals A-4, A-5
Type of protection	Ex e
Voltage $U_n$	20 ... 28 V DC
Current $I_n$	1,25 A
*only at DC versions	

<b>Output Power Supply 24 V DC</b>	
Connection	Terminals A-7, A-6
Type of protection	Ex e
Voltage $U_n$	24 V DC
Current $I_n$	5 A

<b>Ethernet</b>	
Connection Ethernet 1	Terminals B-1a,B-2a,B-3a,B-4a
Connection Ethernet 2	Terminals B-5a,B-6a,B-7a,B-8a
Connection Ethernet 3	Terminals B-9a,B-10a,B-11a,B-12a
Connection Ethernet 4	Klemmen B-13a,B-14a,B-15a,B-16a
Connection Ethernet 5	Terminals B-17a,B-18a,B-19a,B-20a
Type of protection	Ex e
Voltage $U_n$	48 V
Current $I_n$	400 mA
Power $P_n$	15 W


## 1.8 Labelling

All Option Box variants for installation in hazardous area are labelled with:


<b>OB11</b>	<b>OB31</b>
Pepperl + Fuchs	Pepperl + Fuchs
D-68301 Mannheim	D-68301 Mannheim
www.pepperl-fuchs.com	www.pepperl-fuchs.com
OB11	OB31

### 1.8.1 Additional labelled acc. to ATEX and depending upon variant


Option Box variants without fibre optic for installation in hazardous areas **category 2G (ATEX)** are additional labelled with:

<b>OB11 and OB31</b>
BVS 07 ATEX E 026
 II 2G Ex eq IIC T4

Option Box variants with fibre optic for installation in hazardous areas category **2G (ATEX)** are additional labelled with:

<b>OB11 and OB31</b>
BVS 07 ATEX E 026
 II 2G Ex eq [op pr] IIC T4

Option Box variants for installation in hazardous areas category **2D (ATEX)** are additional labelled with:

<b>OB11 and OB31</b>
BVS 07 ATEX E 026
 II 2D Ex tD A21 IP 64 T95°C

### 1.8.2 Additional labelled acc. to IECx and depending upon variant

Option Box variants for installation in hazardous areas **IECEX zone 1** are additional labelled with:

<b>OB11 and OB31</b>
IECEX BVS 08.0024
Ex eq IIC T4

Option Box for installation in hazardous areas category **IECEX zone 21** are additional labelled with:

<b>OB11 and OB31</b>
IECEX BVS 08.0024
Ex tD A21 IP64 T95°C

Option Box for installation in hazardous areas category **IECEX zone 22** are additional labelled with:

<b>OB11 and OB31</b>
IECEX BVS 08.0024
Ex tD A22 IP64 T95°C

## 1.9 Applied standards and guidelines

This is an addition to Pepperl+Fuchs Declaration of Conformity in accordance with EN 45014:1998 in the appendix.

<b>Directives</b>		<b>Applied harmonized standards</b>
EC-directives	94/9EG (ATEX)	EN 60079-0:2006 IEC 60079-5:2007_Ed.3 EN 60079-7:2007 IEC 60079-28:2006_Ed.1 EN 61241-0:2006 EN 61241-1:2004
<b>EMV-directive 89/336/EWG</b>		

<b>Directive</b>		<b>Applied harmonized standards</b>
Directive	IECEX	IEC 60079-0:2004 IEC 60079-5:2007-03 IEC 60079-7:2006-07 IEC 61241-0:2004 IEC 61241-1:2004

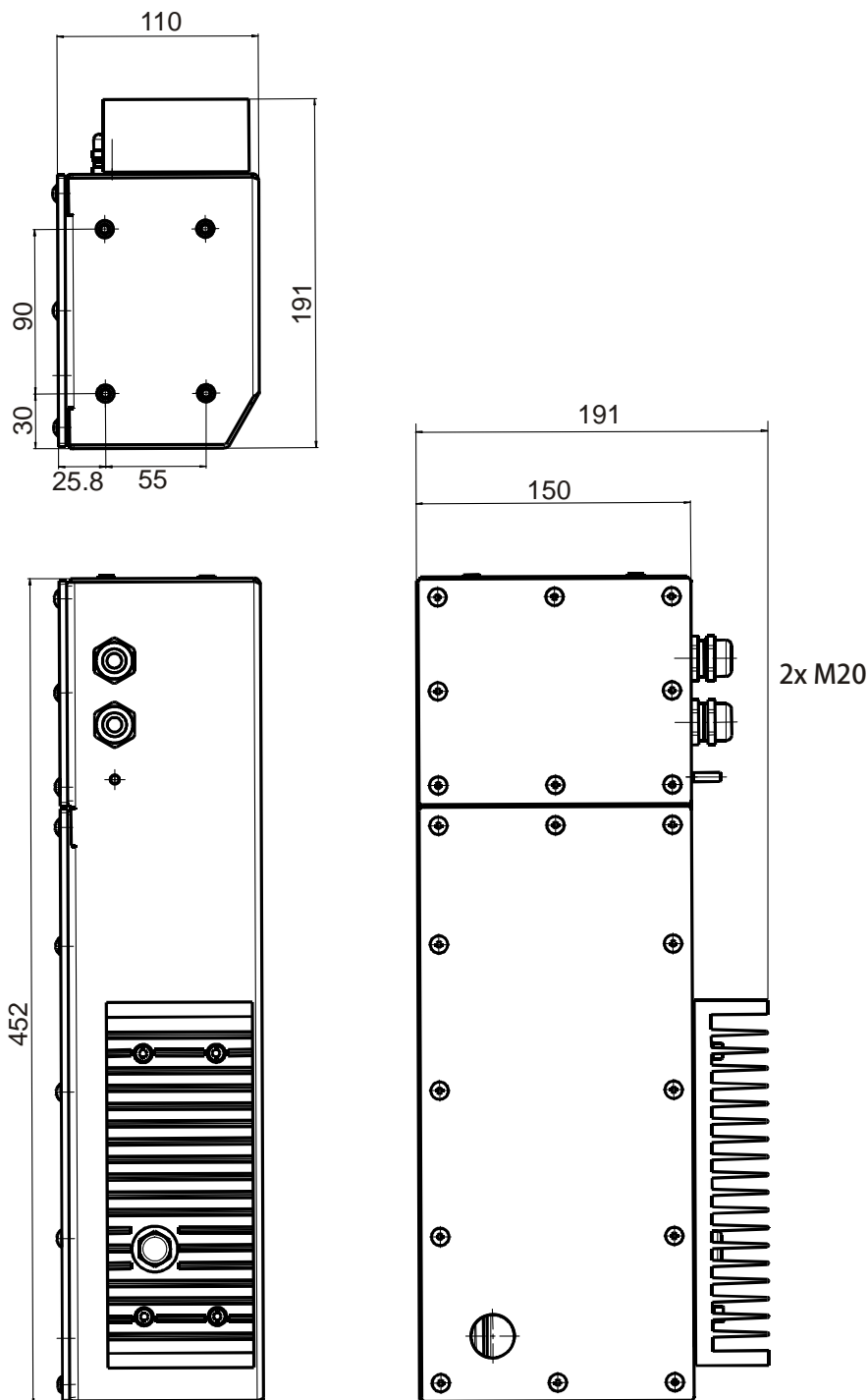
## 2 Product Specifications

### 2.1 Option Box OB11

#### 2.1.1 Function of the Option Box OB11

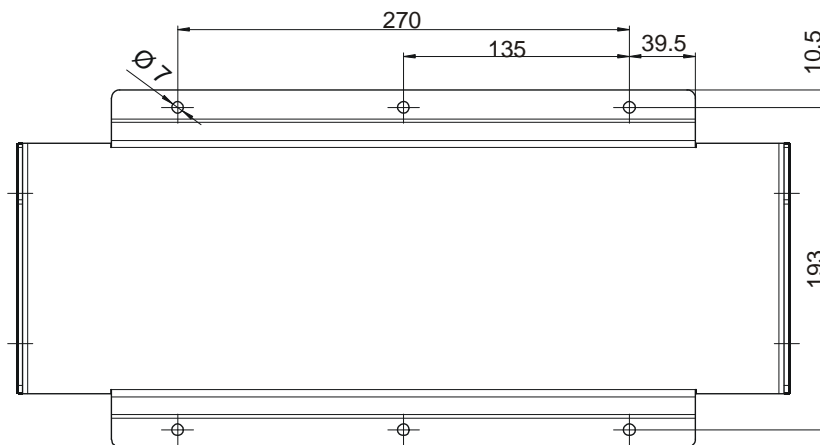
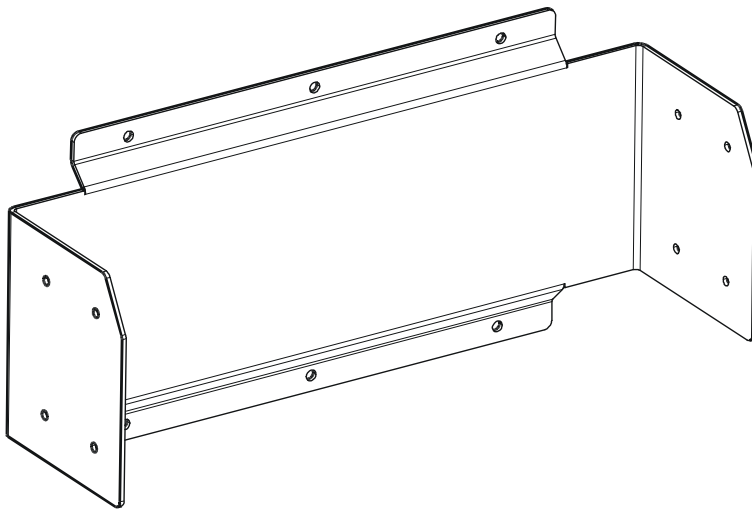
The Option Box OB11 represents an external extension modul with integrated AC power supply, designed for devices of the product families VisuNet EX1 RM and VisuNet EX1 PC.

#### 2.1.2 Dimensions OB11





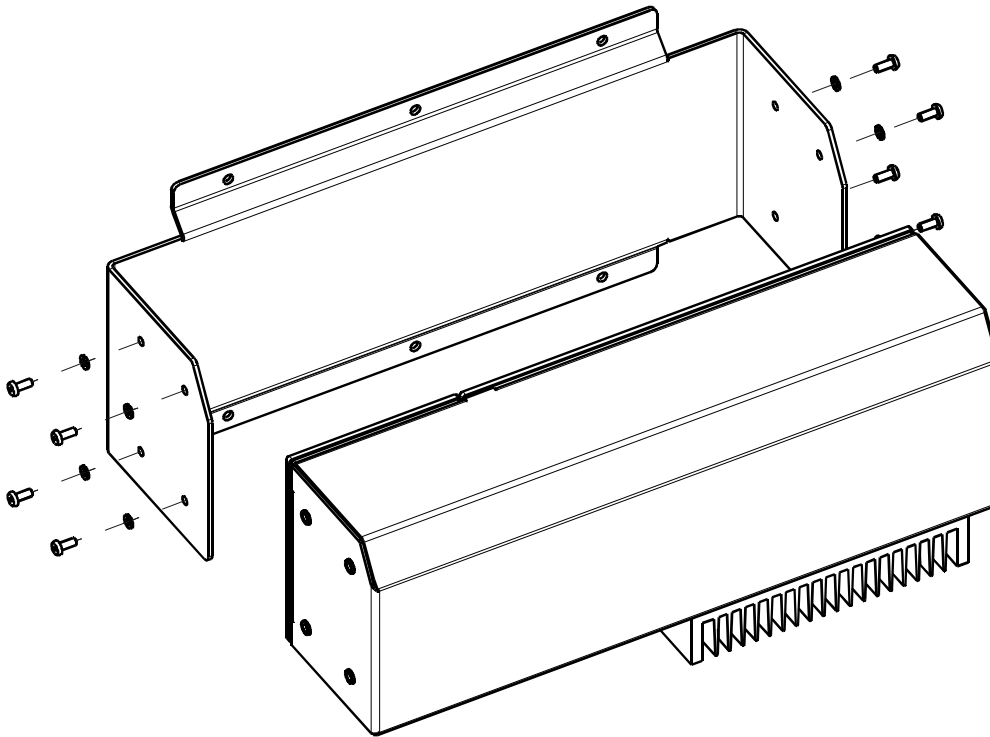
### 2.1.3 Direct wall mount bracket for Option Box OB11

(included in scope of supply of OB11)



6 x M6


	<p><b>Note!</b></p> <p>Please tight the screws <u>to mount the Option Box</u> with specified troque.</p> <div style="border: 1px solid black; padding: 5px; display: inline-block;">  <p>max. 4 Nm max. 35 lbf in</p> </div>
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### 2.1.4 Technical data Option Box OB11

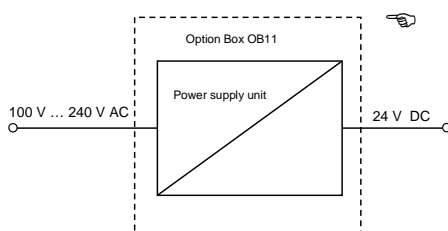
<b>General operating and limit values:</b>		
<b>Approvals</b>	<b>Option Box OB11</b> variants with protection according to <b>ATEX</b>	<b>Option Box OB11</b> Variants with protection according to <b>IECEX</b>
<b>EC-directives 94/9/EC</b>	⊕ II 2G Ex eq II C T4	Ex eq II C T4
optional	⊕ II 2D, Ex tD A21 IP64 T95°C	Ex tD A21 IP64 T95°C Ex tD A22 IP64 T95°C
<b>Degree of protection of case:</b>		
Degree of protection of case:	IP 66	
<b>Ambient conditions:</b>		
Operating temperature range:	-20°C ... +50°C	
Storage temperature range:	-20°C ... +60°C	
Relative humidity:	Max. 85% without condensation (48 h endurance test)	

<b>Technical data</b>	<b>OB11</b>	
<b>Dimensions (WxHxD) in mm</b>		
Surface-mounting case:	452 x 191 x 110	
<b>Mass:</b>	Approx. 16 kg	
<b>Power supply AC:</b>		
Power supply:	100 – 240 V AC $\pm 10\%$ , 50-60 Hz	
Power consumption: (typ.):	100 W (VisuNet power consumption)	
Type of protection:	EX e	
Place of connection:	Terminal block A	
	Terminal A1, A2, A3	
Type of connection:	Spring Cage Feed-Through Terminal Blocks	
Range of cross-section:	0,08 - 2,5mm <sup>2</sup> AWG 28 ... 14	flexible
	0,08 – 4 mm <sup>2</sup> AWG 28 ... 12	solid
	0,25 – 2,5 mm <sup>2</sup> AWG 23 ... 14	Flexible: with end sleeve

	<p><b>Note!</b></p> <p>Cross-sections for EX e not smaller than 0,25 mm<sup>2</sup></p>
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## 2.1.5 AC power supply module OB11

### 2.1.5.1 Block diagram OB11:

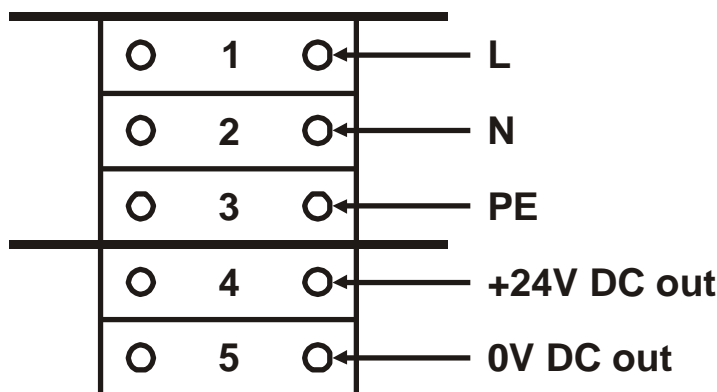


**2.1.6 Specification module power supply 24 V:**

<b>Input</b>	
Rated voltage	100 - 240 V AC, $\pm 10\%$ 50 - 60 Hz Wide-range power supply without switching
<b>Output</b>	
DC output voltage	+ 24 V
Accuracy	$\pm 3\%$ over the complete load and input voltage range
Load control	< 0.5% 0 - I <sub>max</sub>
Output current (max.)	5 A (nom. load)
Output current (min.)	0 A
Ripple (20 MHz)	< 20 mV ripple voltage U <sub>rms</sub> < 40 mV transient voltage spikes U <sub>pp</sub>
Current limitation (typ.)	7.5 A
<b>Efficiency</b>	
Efficiency (typ.)	88% @ nominal load, @U <sub>in</sub> nom. = 230 V
<b>General specifications</b>	
Short-circuit resistance	Yes
No-load protection	Yes
Power loss ride-through	> 50 ms over the complete input voltage range
RoHs conformity	Yes
<b>Safety</b>	
Output	Safety extra-low voltage (SELV) acc. to EN 60950
Leakage current	< 3.5 mA (47 - 63 Hz line frequency and U <sub>in-max</sub> )
<b>Electromagnetic compatibility (EMC)</b>	
Interference emission	EN 55022 Class B Line harmonic distortion acc. to EN 61000-3-2
Interference immunity	EN 61000-6-1 / -2
<b>Ambient conditions</b>	
Operating temperature range	-20°C to +50°C
Storage temperature range	-25°C to +85°C

**2.1.7 Terminal compartment Option Box OB11**

Terminal block A



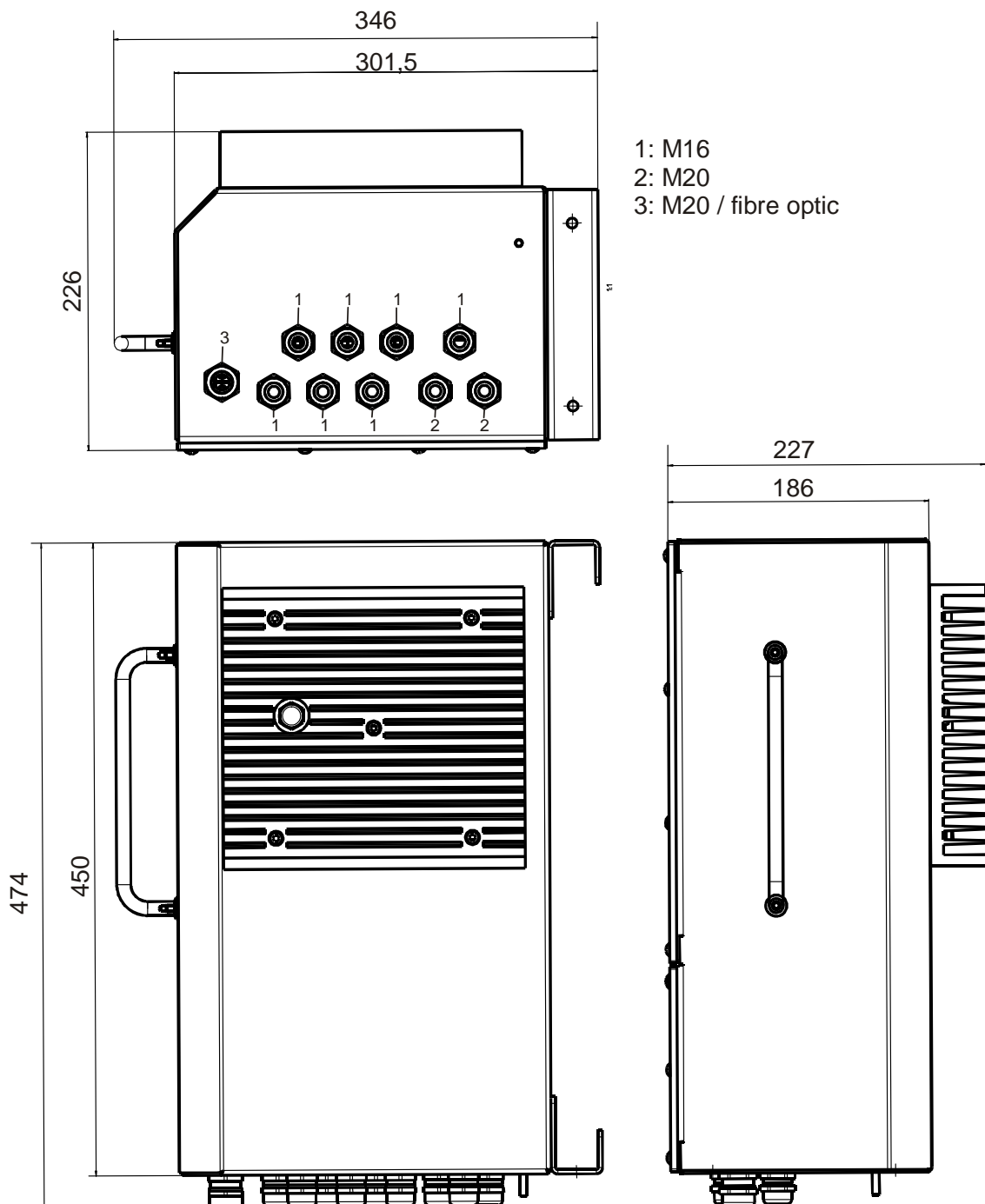


## 2.2 Option Box OB31

### 2.2.1 Function Option Box OB31

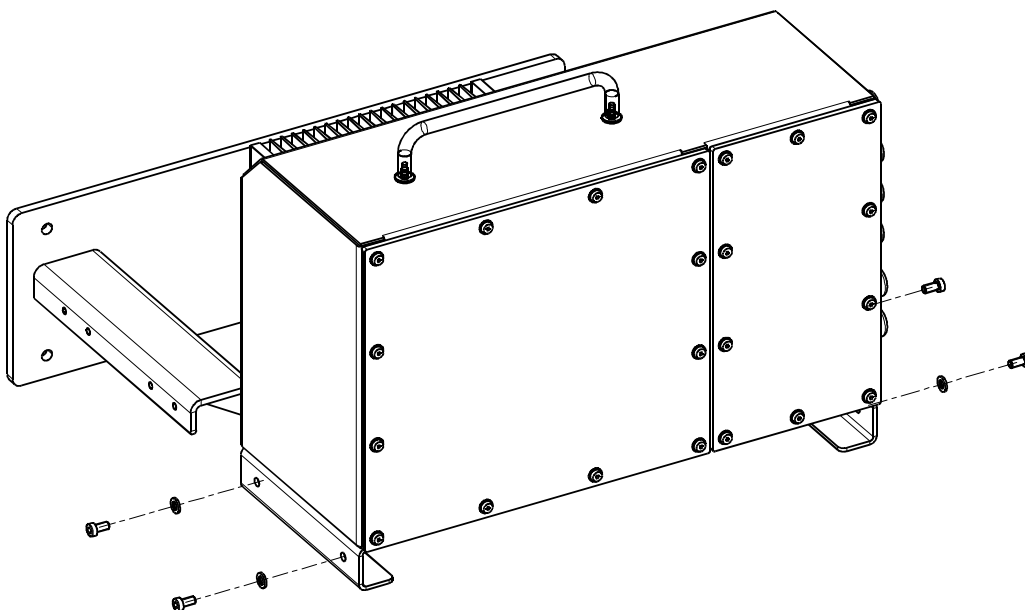
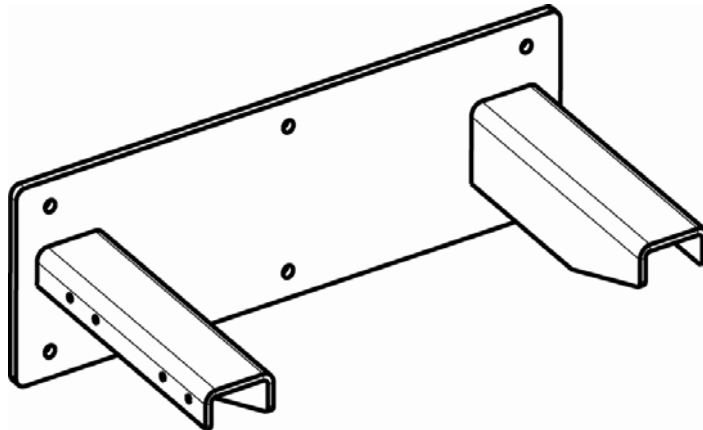
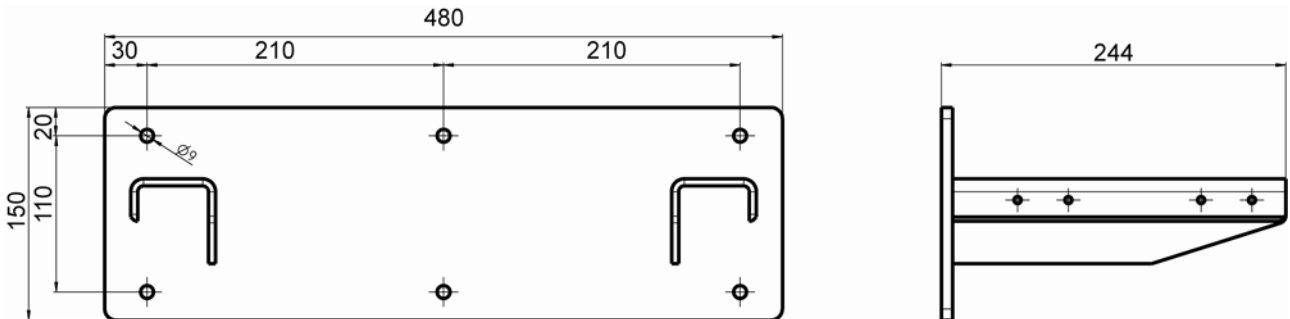
The Option Box OB31 is designed for use in hazardous area zones 1, 2, 21 and 22. It can be connected the Panel PCs VisuNet EX1 PC / Remote Monitors VisuNet EX1 RM on one side and FO converters, switch and Ethernet on the other side. The Option Box has a modular architecture and can be configured with modules in the works.

### 2.2.2 Dimensions Option Box OB31





### 2.2.3 Direct wall mount bracket for Option Box OB31

(included in the scope of supply of OB31)




## 2.2.4 Technical Data OB31

	<b>OB31</b>	
<b>Dimensions (WxHxD) in mm</b>		
Surface-mounting case:	450 x 302 x 226	
<b>Mass:</b>	Approx. 40 kg	
<b>Power supply AC:</b>		
Power supply:	100 – 240 V AC $\pm$ 10%, 50-60 Hz	
Power consumption: (typ.):	120 W (VisuNet power consumption)	
Type of protection:	EX e	
Place of connection:	Terminal block A	
	Terminal A1, A2, A3	
Type of connection:	Spring Cage Feed-Through Terminal Blocks	
Range of cross-section:	0,2 - 2,5mm <sup>2</sup> AWG 24 ... 14	flexible
	0,08 – 4 mm <sup>2</sup> AWG 28 ... 12	solid
	0,25 – 2,5 mm <sup>2</sup> AWG 23 ... 14	Flexible: with end sleeve
Rate of the cross-section of the cabel gland	M16 M20	5 ... 10 mm 7 ... 13 mm
<b>Power supply DC:</b>		
Power supply:	24V DC (20-28V DC)	
Power consumption:	20 ... 120 W	
Type of protection:	EX e	
Place of connection:	Terminal block A	
	Terminal A4, A5	
Type of connection:	Spring Cage Feed-Through Terminal Blocks	
Range of cross-section :	0,2 - 2,5mm <sup>2</sup> AWG 24... 14	flexible
	0,08 – 4 mm <sup>2</sup> AWG 28... 12	solid
	0,25 – 2,5 mm <sup>2</sup> AWG 23... 14	Flexible with end sleeve,
Rate of the cross-section of the cabel gland	M20	7 ... 13 mm

<b>General operating and limit values:</b>		
<b>Approvals</b>	<b>Option Box OB31</b> variants with protection according to <b>ATEX</b>	Option Box OB31 variants with protection according to <b>IECEX</b>
<b>EC-directives 94/9/EC</b>	 II 2G Ex eq IIC T4	Ex eq IIC T4
optional	 II 2D Ex tD A21 IP 64 T95°C	Ex tD A21 IP64 T95°C Ex tD A22 IP64 T95°C
<b>Degree of protection of case:</b>		
Degree of protection of case:	IP 66	
<b>Ambient conditions:</b>		
Operating temperature range:	-20°C ... +50°C	
Storage temperature range:	-20°C ... +60°C	
Relative humidity:	Max. 85% without condensation (48 h . endurance test)	

## 2.2.5 Technical Data interfaces OB31

<b>Terminal compartment for external devices</b>		<b>OB31</b>
<b>Ethernet 1 to 5</b>		
Type of protection:	<b>Ex e</b>	
Interface, type:	10/100 BASE-TX	
Type of connection:	Spring Cage Feed-Through Terminal Blocks	
Place of connection:	Terminal block B-1a to B-20 a	
Range of cross-section:	0,08 – 1,5 mm <sup>2</sup> AWG 28 ... 16	flexible or solid
	0,25 – 1,5 mm <sup>2</sup> AWG 23 ... 16	Flexible: with end sleeve,
Rate of the cross-section of the cabel gland	M16	5 ... 10 mm

	<p><b>Note!</b></p> <p>Cross-sections for EX e not smaller than 0,25 mm<sup>2</sup></p>
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### 2.2.6 General modules, Option Box OB31

The Option Box OB31 is designed for use in hazardous areas (Zones 1, 2, 21, 22). It can be connected the panel PCs VisuNet RM / VisuNet PC on one side and FO converters, switch and Ethernet on the other side.

The Option Box has a modular architecture and can be configured with modules that provide the following main functionalities:

**- Power supply**

**- AC power supply module**

Used to supply AC power to devices in the VisuNet RM/PC product families

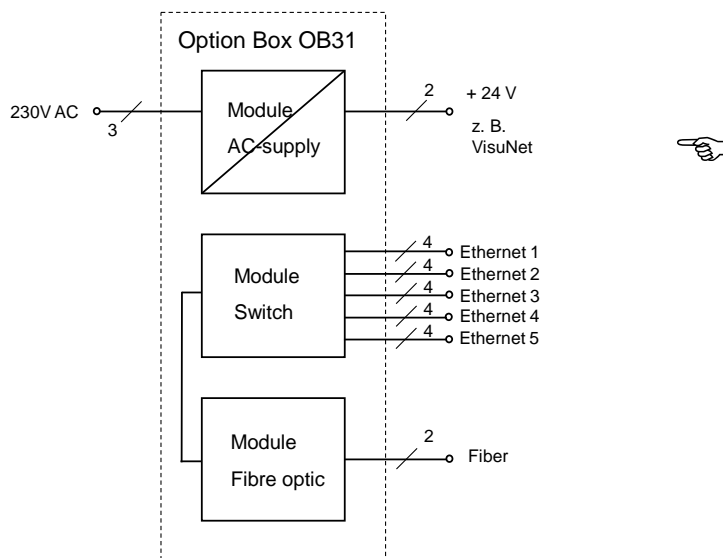
**- Data communication / network interface**

**- FO module**

**- Ethernet switch module**

The bridgeable distance depends on the module configuration. (see chapter 2.2.10)

### 2.2.7 Block diagram module Option Box OB31



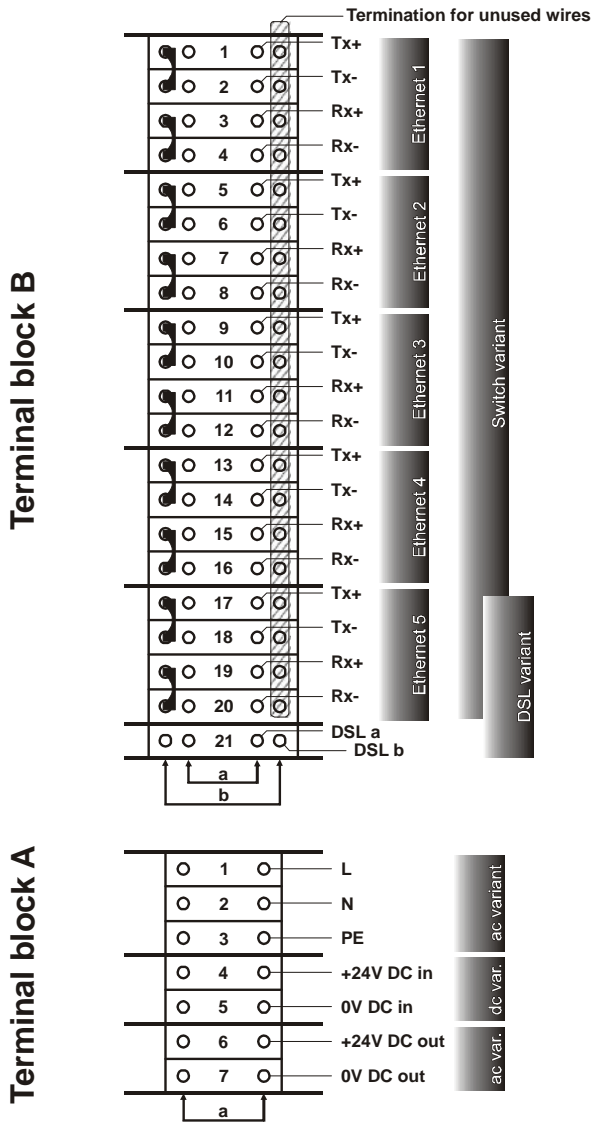
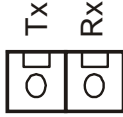
**2.2.8 Specification AC power supply module OB31 (24V)**

<b>Input</b>	
Rated voltage (AC-version)	100 - 240 V AC $\pm 10\%$ , 50 - 60 Hz Wide-range power supply without switching
Rated voltage (DC-version)	20 ... 28 V DC
<b>Output</b>	
DC output voltage	+ 24 V
Accuracy	$\pm 3\%$ over the complete load and input voltage range
Load control	< 0.5% 0 - I <sub>max</sub>
Output current (max.)	5 A (nom. load)
Output current (min.)	0 mA
Ripple (20 MHz)	< 20 mV ripple voltage U <sub>rms</sub> < 40 mV transient voltage spikes U <sub>pp</sub>
Current limitation (typ.)	7.5 A
<b>Efficiency</b>	
Efficiency (typ.)	88% @ nominal load, @U <sub>in</sub> nom. = 230 V
<b>General specifications</b>	
Short-circuit resistance	Yes
No-load protection	Yes
Power loss ride-through	> 50 ms over the complete input voltage range
RoHs conformity	Yes
<b>Safety</b>	
Output	Safety extra-low voltage (SELV) acc. to EN 60950
Leakage current	< 3.5 mA (47 - 63 Hz line frequency and U <sub>in-max</sub> )
<b>Electromagnetic compatibility (EMC)</b>	
Interference emission	EN 55022 Class B Line harmonic distortion acc. to EN 61000-3-2
Interference immunity	EN 61000-6-1 / -2
<b>Ambient conditions</b>	
Operating temperature range	-20°C to +50°C
Storage temperature range	-25°C to +85°C

## 2.2.9 Terminal compartment Option Box OB31

### OB31

FO connection



TIA 568A		Farb code
1 Tx+	wh/gn	bu .. blue
2 Tx-	gn	bn .. brown
3 Rx+	wh/og	gn .. green
4 --	bu	gy .. grey
5 --	wh/bu	og .. orange
6 Rx-	og	pk .. pink
7 --	wh/bn	wh .. white
8 --	bn	ye .. yellow

## 2.2.10 General for the data communication / network binding

There are different alternatives to data communication / network binding:

### Comparison of the alternatives: Ethernet and FO

	<b>Ethernet 100 base Tx</b>	<b>FO</b>
Rate/ Bandwith:	100 MBit	100 MBit
Distance:	Max.100 m*	2 km
Wires:	2 x 2 STP (Shielded Twisted Pair)	2 x Fx

\*90m from VisuNet RM/PC to Option Box OB31 (via Ethernet)

## 2.3 Module fibre optic

### 2.3.1 Switch and Media converter fibre optic

#### Option Box OB31 (Ex) and media converter SK-FX-100-1-8 in safe area

1 FO – 1 Ethernet

<b>Specifications</b>	
<b>Media converter fibre optic in OB31 (EX) and Switch media converter SK-FX-100-1-8 in safe area</b>	
Standard	IEEE 802.3 10BASE-T, IEEE 802.3u 100Base-TX & 100Base-FX
Conversion	10BASE-T to 100BASE-FX 100BASE-TX to 100BASE-FX
TP Port	Auto MDA/MDI-X crossover function Auto-negotiation function for speed and duplex mode Full-duplex and half duplex support 10Mbps/ 100Mbps
Fiber (FX) Port	Multimode SC 100 Mbps Full-duplex and half-duplex support MMF 50/125 µm, 60/125 µm fiber cabel
Standard	IEEE 802.3 10BASE-T, IEEE 802.3u 100Base-TX & 100Base-FX
Plug and cabel specification: FX & Cabel Wavelength Tx Power Rx Sensitivity Rx max. Power	SC MMF 1310 nm -19 - -14 dBm -34 dBm max. -14 dBm min.



<b>Specification media converter in safe area: (SK-FX-100-1-8)</b>  <b>(These specifications are <u>not</u> valid for the media converter fibre optic in OB31)</b>	
Configuration Setting Switches  (In the OB31 switches are inaccessible)	Auto/forced mode, TP speed, TP duplex FX port duplex, Link fault pass through function, Forward mode, 802.3x function
Mounting support	DIN Rail mounting, Plane mounting

### 3 Installation and commissioning Obox


#### 3.1 General instructions and explosion protection requirements

The general installation instructions for hazardous areas must be complied. Cabels are only allowed to be connected when deenergized. Make sure that all terminal compartments are tightly sealed in accordance with regulations prior to starting up the equipment.

All cabel glands must be screwed tight and checked to ensure that they are securely in position.

The minimum clearances in air and creepage distances in the vicinity of the terminals must be maintained; they must not be shortened by stripping the wires too far. (isolated wire end sleeve with lmax=8mm)

- The cabels in the vicinity of terminal compartments (Ex e) must be fixed-mounted.

	<p><b>Warning:</b></p> <p><b>For wiring of interfaces with the type of protection “e” increased safety the following chapter of the standard EN 60079-14: 2003 have to be considered:</b></p> <p><b>Chapter 9 Wiring systems</b></p> <p><b>Chapter 11.3 Additional requirements for type of protection “e” – Increased safety: Wiring systems</b></p>
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## 3.2 External equipotential bonding

Explosion-protected electrical equipment in a metal case must be provided with external equipotential bonding, which must be connected to the equipotential bonding of the system over the shortest possible distance.


(cross section: min. 4mm<sup>2</sup>)

## 3.3 Commissioning Option Box

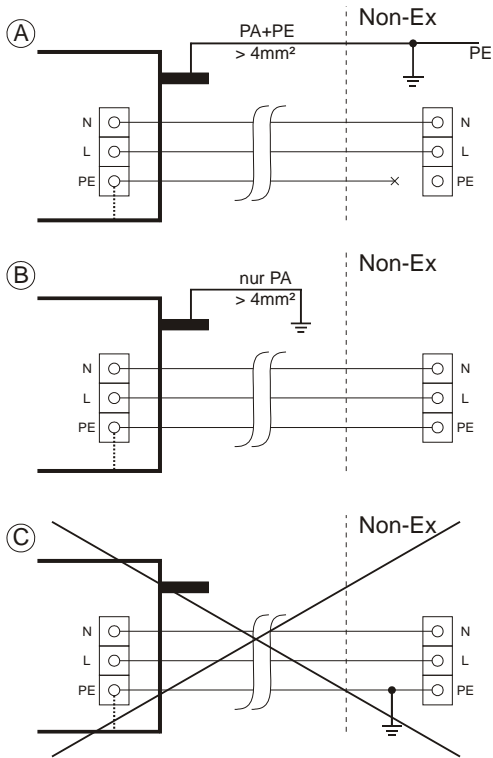
### 3.3.1 General information

Proceed as follows to start up the equipment:


- Deenergize the system or machine
- Make sure that the installation area is free of flammable gases and types of dust for the duration of the startup procedure if any non-intrinsically safe voltages need to be wired and/or non-intrinsically safe devices opened
- Install the Option Box at the location at which it is to be operated
- Connect the external equipotential bonding to the case of the Option Box




	<p><b>Danger!</b></p> <p>The case must be provided with external equipotential bonding. The wire must have a cross-section of at least 4 mm<sup>2</sup> and be as short as possible.</p>
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Example for equipotential bonding




- Connect the other system components (refer also to section )
- Switch on the power supply
- Switch on the system or machine
- Check the functions of the complete system or machine

	<p><b>Danger!</b></p> <p>The system or machine may malfunction if the Option Box is not correctly connected and configured.</p>
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	<p><b>Danger!</b></p> <p>The Option Box is only allowed to be operated when the Ex e terminal compartment is closed. If the Ex e terminal compartment is open, the explosion protection is no longer effective.</p> <p>To provide the necessary Ex-safety (ingress protection) for the Ex-e connection area, it is mandatory to use only the original screws with attached sealing. If this sealing is corrupted the screws have to be exchanged by the original type. (order number: 206803, SCREWSET-OB11/OB31-EXE)</p> <p>Required torque of the retaining screws: 2.6 Nm (cover Exe compartment)</p> <p>The <u>chemical resistance of the gaskets</u> have to be considered necessarily. The gaskets are Ex relevant. (See chap. 8 Chemical resistance)</p>
	<p><b>Danger!</b></p> <p>Wait 3 minutes after switching off the supply voltage before opening the Ex e terminal compartment . Internal capacitors may otherwise still be charged and cause an explosion in the event of a short-circuit.</p>
	<p><b>Danger!</b></p> <p>If glass balls are visible the Option Box is to be taken out immediately out of operation. This is because safety reasons.</p>

## 4 Service and maintenance

The function and transmission properties of the devices are stable over long periods of time. For this reason, regular adjustment or service or the like is unnecessary.

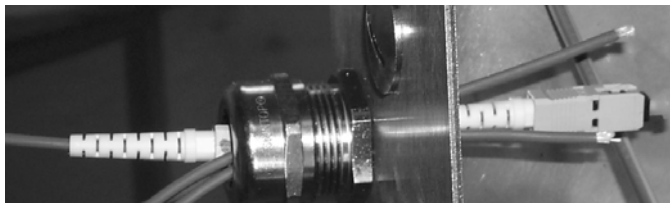
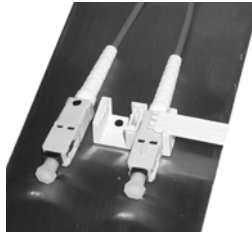
	<p><b>Note!</b></p> <p>The enclosures of the OB device family may not be opened. This enclosures are factory sealed and cannot be repaired!</p>
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## 5 Fibre optic cabel

### 5.1 Assembly instruction fibre optic cabel



Please note the following when you take through a cable gland:

- 1.) Separate the plug from the SCD-Clip
- 2.) Mark the SC-plug and the SCD-Clip
- 3.) Separate the second plug from SCD-Clip
- 4.) Take through the cables separately



- 5.) Mount the plug on the SCD-Clip, and please note the mark at the SC-plug.

### 5.2 Note for installation fibre optic cables

	<p><b>Note:</b> The physical parameters of the used fiber optic cable must not be exceeded. E.g., a smaller radius in the cable layout may result in higher loss of the F.O. cable after some months. Please refer to the F.O. cable manufacturer's specification.</p> <p>Example for installation</p> <div style="display: flex; align-items: center;"> <div style="margin-right: 20px;"> <p>Connector to the sealed area of the OB31</p> </div>  <div style="margin-left: 20px;"> <p>from field</p> </div> </div> <p>The SC connector has to be plugged-in in the terminal compartment and pressed into the socket until you recognise a 'click'</p> <p>The cable glands have to be tightened that the necessary tractive force for the used cable type and the IP rating is secured. Please refer to the manual of the cable gland manufacturer and the fibre optic cable manufacturer. (reference: Cable Glands of company Lapp GmbH, Stuttgart, Germany Product number: 53112720 <a href="http://www.lappkabel.de">http://www.lappkabel.de</a> --&gt; "Productfinder" --&gt; "search" = datasheet )</p>
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**Installation of Fibre-optic cables**

Fibre-optic cables must be installed in such a way that they are protected from mechanical damage and that no optical rays can escape into the explosion hazardous area.

Possible methods to achieve this protection are:

- 1) Installing the F-O cable inside a sealed enclosure.
- 2) Laying the F-O cable in suitable electrical installation conduit. Suitable conduit has a classification of min. 33\*\* (Medium compression strength, medium resistance to impact) in accordance with IEC 61386-1.
- 3) Using armoured F-O cable which provides the same degree of protection as electrical installation conduit as in paragraph 2 above. Only F-O cables which Pepperl + Fuchs have approved for use in conjunction with "Option boxes" may be employed.

**5.3 Technical Data for fibre optic cables**

The cables DATL-LWL4-2-2SC / DATL-LWL4-3-2SC / DAT-LWL-4-4SC (see chap. 9.1) offered by Pepperl + Fuchs have the following characteristics:

<p><b>Fibre optical cable:</b>                  Rodent protected cable sheath</p> <p>Light weight, flexible and metal-free outdoor cable, for laying in cable-tray, tube and earth</p> <p>(Cable sheath made of Polyethylene, offers good protection against water ingress)</p>		
<b>Physical properties:</b>		
Min. radius	laid: dynamic:	15x cable outside diameter 20x cable outside diameter
Max. tractive force Max. side force,	continuously: continuously:	1750 N 1500 N/dm
<b>Fire behavior:</b>		
Cable sheath is without halogen, no toxic or corrosive combustion gases		
<b>Thermal properties:</b>		
Transport and storage:	-25°C bis +70°C	
Installation:	-5°C bis +50°C	
Operation:	-20°C bis +60°C	

## 5.4 Cleaning fiber optic connectors

Fiber optic connectors are extremely intolerant of dirt. Dirt particles in the air are similar in size to the diameter of a fiber core. If they are not removed, a massive increase in attenuation is likely.

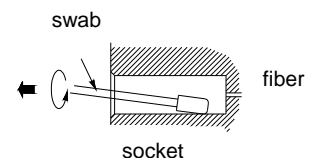
**The instructions below should be heeded when handling or cleaning fiber optic connectors:**

- Fit the ends of the connectors with suitable dust caps to protect them from dirt whenever they are unplugged.
- Only clean fiber optic connectors when absolutely necessary (visible dirt, malfunctioning), because merely cleaning the connector surface can cause minor damage.
- Always use the enclosed cleaning fluid and a lint-free cloth or special polyurethane foam swabs to clean connectors. **Caution:** Unsuitable cleaning agents may attack the adhesives in the plug connector or leave deposits. The connector will then be susceptible to contamination. Cotton cloths cause streaking.
- Avoid all pressure on the connector ferrule or the fiber end when cleaning. If the dirt cannot simply be wiped off, it should be soaked for a while in cleaning fluid or isopropyl alcohol.
- Never use a cleaning cloth or swab for more than 3 or 4 plug connectors, depending on the degree of contamination, because the dirt from the first connector is always transferred via the cloth to the next connector.

**Procedure for cleaning with the Pepperl+Fuchs cleaning set:**

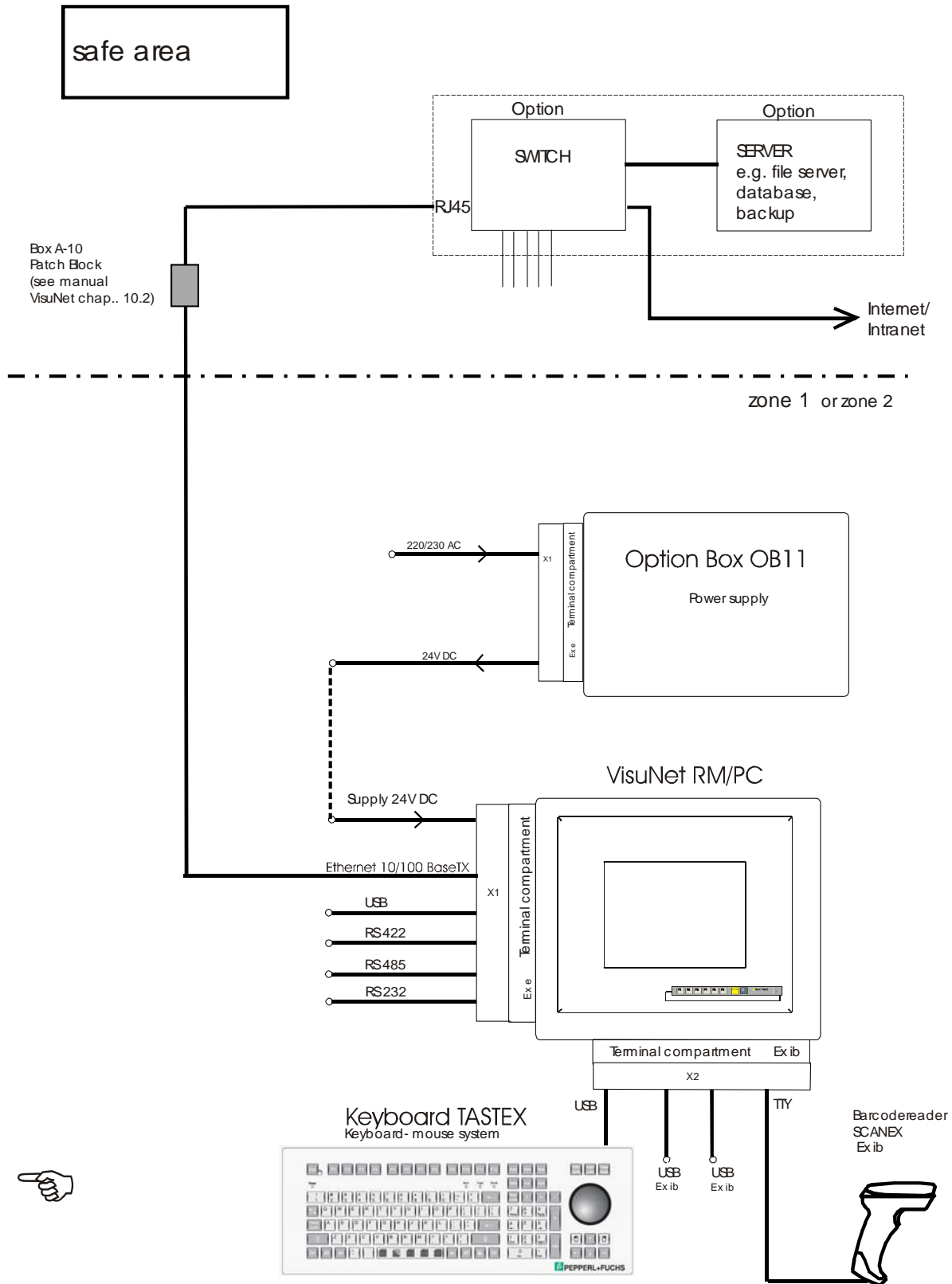
**Important! The air spray and cleaning fluid contain harmful substances. Please read the material safety sheet!**

1. Always blow out both parts of the connector with an air can before cleaning it mechanically with a cloth or swabs. This removes coarser particles that could otherwise damage the connector when you wipe the end face. Remember to hold the air can vertically, to prevent propellant from dripping into the connector.
2. The pin side of the connector should be wiped with a cloth that has been slightly moistened with cleaning fluid. Alternatively, the connector end face can simply be rinsed with cleaning fluid. To do so, point the end face of the connector into the funnel of the pump can and spray it once or twice.
3. Dirt that has accumulated on female contacts must be removed from the socket using cleaning swabs. To do so, moisten the tip of a swab with cleaning fluid and wipe the socket in a circular motion outwards from the fiber.



## 6 Examples for configuration Option Box OB11

Option Box OB11 with power supply    Order number: OB11-F-AC1-N-N-N-N

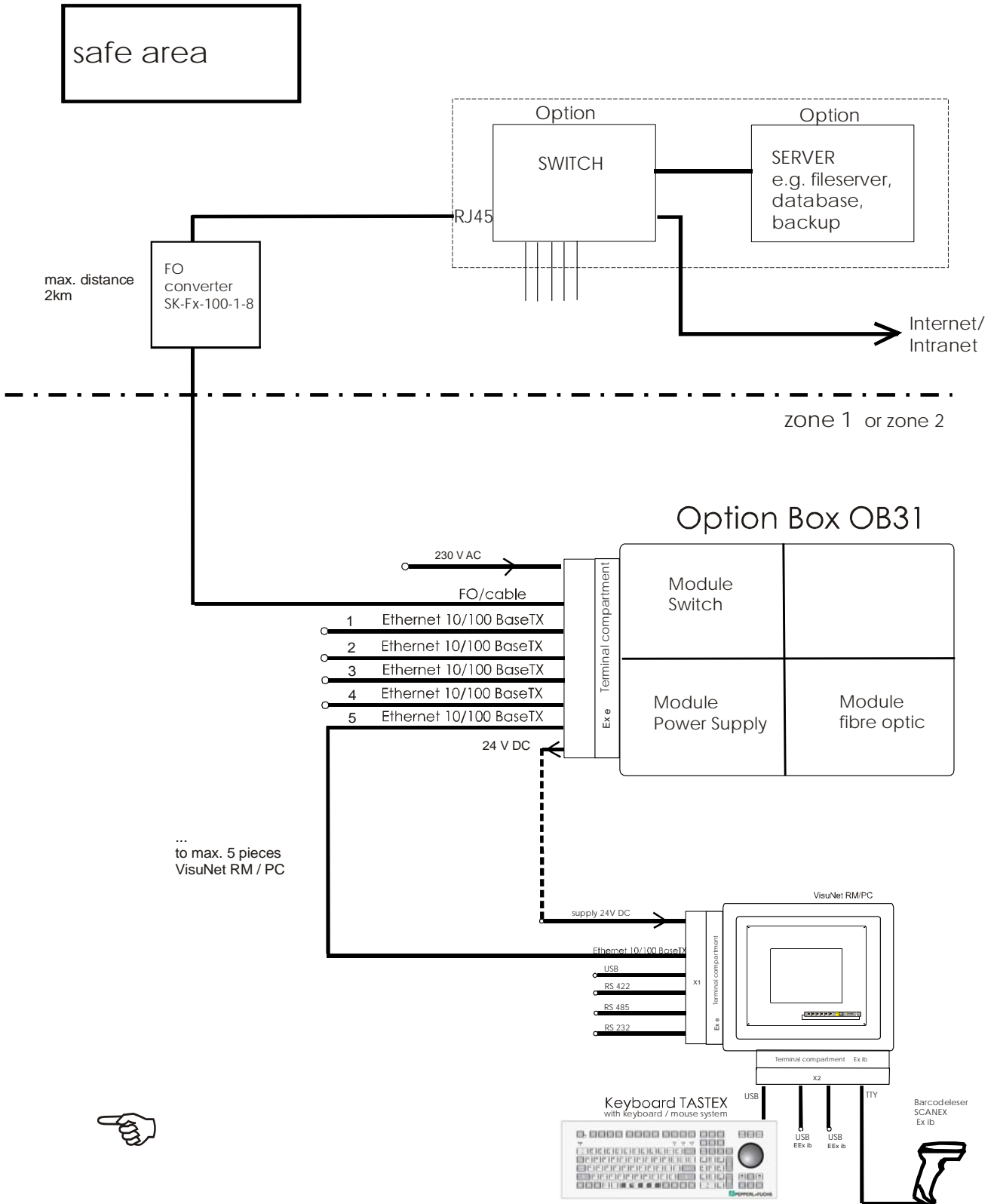




## 7 Examples for configuration Option Box OB31

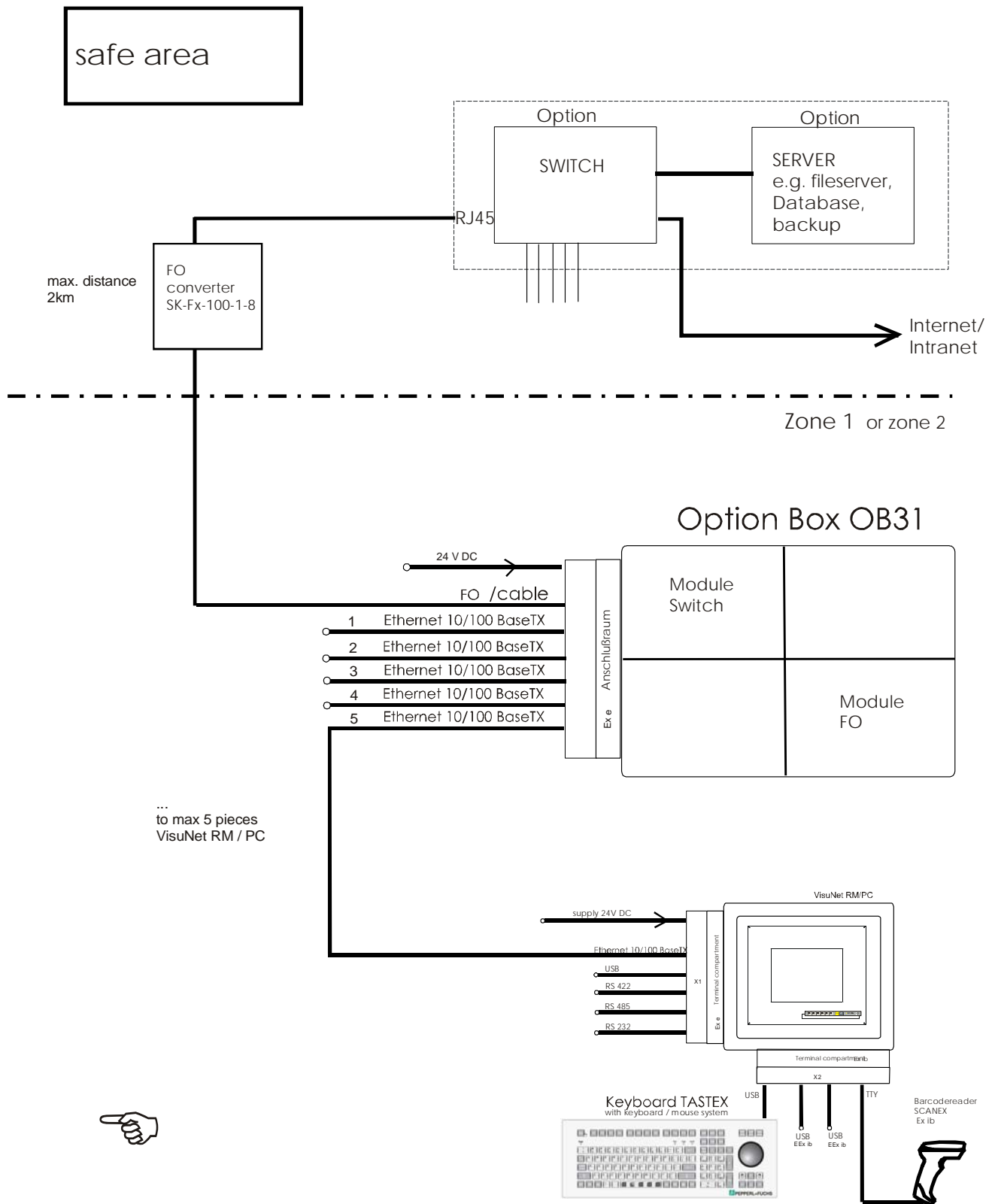
### 7.1 Power supply 230V AC and switch with fibre optic

Order designation: OB31-J-AC1-EF1-N-N-N



## 7.2 power supply 24 V DC, switch with fibre optic

Order designation: OB31-J-DC-EF1-N-N-N




### 7.3

## 8 Chemical resistance

#### Chemical resistance of the following gaskets

- Gasket of the case
- Gasket of the cable gland
- Sealing of the original screws

	<p><b>Danger!</b></p> <p>The <u>chemical resistance of all gaskets</u> have to be considered necessarily.</p> <p>The gaskets are Ex relevant.</p> <p>The list of resistance doesn't lodge a claim to completeness. In doubt the chemical have to be demanded at Pepperl+Fuchs or tested by yourself.</p>
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#### All gaskets are resistant to these chemicals

The values are based on intensive or saturated solutions.

The test temperature is standard at 20 ° C

When chemicals are mixed with other solvents or water, this solvent should be tested for compatibility.

The permeability has to be checked. It may be that some media in gaseous state attack the material, although the medium is suitable in the liquid state.

Salts
Washing agent (soaps)
Arsenic acid
Boric acid (hydrous)
Citric acid
Tannic acid
Oxalic acid (hydrous)
Palmitic acid
Silicic acid
Stearic acid

## 9 Accessories

### 9.1 Cable

For wiring in safe area ---- OB31 and For wiring OB31 --- VisuNet RM/ VisuNet PC	
<b>Ethernet 10/100 BaseTX cable</b>	
Part code:	Order number
DATL-CAT71-8-2	193075

<b>Cable for power supply OB11 / OB31</b>		
Part code:	Order number	
DATL-A3-1.5-1	193077	For 230 V AC in
DATL-A3-2.5-2	193078	For 24V DC in

<b>Fiber Optic outdoor cable, rodent protected cable sheath</b>		
Part code:	Order number:	Cable description:
*DATL-LWL4-2-2SC	193103	4-wire cable, 2 off with F.O. connector type SC, on both sides
DATL-LWL4-3-2SC	193106	4-wire cable, 3 off with F.O. connector type SC, on both sides
DATL-LWL4-4-2SC	193107	4-wire cable, 4 off with F.O. connector type SC, on both sides
*Standard cable		

### 9.2 Others

#### Fibre optic Cleaning Set

(containing: cleaning fluid, cleaning swabs, air spray)

Part code:	Order number
<b>Fibre optic Cleaning Set</b>	525209

#### SCREWSET (for Ex-e connection area)

Part code:	Order number
<b>SCREWSET-OB11/OB31-EXE</b>	206803

#### Media converter fibre optic SK-FX-100-1-8 for safe area

<b>Media converter SK-FX-100-1-8 for safe area</b>	
Part code:	Order number
SK-FX-100-1-8	200910

## 10 Order designation Option Box OB11 / OB31

### 10.1 Option Box OB11

<b>OB11</b>	
Part code:	Order number
OB11-F-AC1-N-N-N-N	200906

### 10.2 Option Box OB31

<b>OB31</b>	
Part code:	Order number
OB31-J-AC1-EF1-N-N-N Supply 230V AC Switch with FO	216087

<b>OB31</b>	
Part code:	Order number
OB31-J-DC-EF1-N-N-N Supply 24V DC Switch with FO	216089

## **11 Appendix**

### **11.1 Repair send back form (in case of a repair)**

Repair send back form

### **11.2 Certifications**

Declaration of Conformity Pepperl + Fuchs (1 page)

EC Type Examination Certificate

BVS 07 ATEX E 026 (4 pages in German, 4 pages in English)

1. Supplement (4 pages in German, 4 pages in English)

IECEX Certificate of Conformity







## Konformitätserklärung / Declaration of Conformity

nach EN 45014:1998 / in accordance with EN 45014:1998

**Diese Konformitätserklärung gilt nur in Zusammenhang mit dem gültigen Pepperl+Fuchs Datenblatt und Betriebsanleitung für alle Pepperl+Fuchs Produkte, die unter die Richtlinie 73/23/EWG (Niederspannungsrichtlinie), 89/336/EWG (EMV) und 94/9/EG (ATEX) fallen.**

This Declaration of Conformity is only valid in connection with the valid datasheet and instruction of Pepperl+Fuchs, for all Pepperl+Fuchs products that are relevant to the EC-directive 73/23/EWG (Low Voltage Directive), 89/336/EWG (EMV) and 94/9/EG (ATEX)

**Die Pepperl+Fuchs GmbH in 68301 Mannheim erklärt hiermit in alleiniger Verantwortung, daß alle richtlinienrelevanten Produkte mit den angegebenen Normen oder normativen Dokumenten übereinstimmen und, wenn notwendig, von einer zuständigen Stelle freigegeben wurden.**

We, Pepperl+Fuchs GmbH at 68301 Mannheim hereby declare under our sole responsibility that all directive relevant products are in accordance with the listed harmonized standards or normative documents and, where necessary, a competent body has been released.

### Angewandte harmonisierte Normen :

Applied harmonized standards

**Siehe gültiges Datenblatt und Betriebsanleitung  
See valid datasheet and instruction**

### Benannte Stelle für QS-Überwachung :

Notified body for QA-Assessment

**PTB Physikalisch-Technische Bundesanstalt Nr.: 0102**



Reg. Nr. 14 760-02

Hersteller Unterschrift :  
Signature of manufacturer

*P. Adolphs*  
Dr. Adolphs

Funktion des Unterzeichners :  
Function of the signer

Geschäftsführer  
Managing Director

*J. Kegel*  
Dr. Kegel  
Geschäftsführer  
Managing Director

Datum / date : September 2003

