BARTEC

# User Manual - TRANSLATION

## POLARIS PROFESSIONAL

## POLARIS Panel PC Professional 15" up to 24"

## Type 17-71V1-….

## ATEX / IECEx

## Zone 1 and Zone 21

Document no. 11-71V1-7D0007 / 236273

Revision 7 / Status: 17 April 2019

Reservation: Technical data subject to change without notice. Changes, errors and misprints may not be used as a basis for any claim for damages.

| Content | Pages |
|---|---|
| English | 1 - 69 |

BARTEC GmbH
Max-Eyth-Straße 16
97980 Bad Mergentheim
GERMANY

Phone: +49 7931 597-0
Fax: +49 7931 597-119

Support: support-polaris@bartec.de
Download: http://automation.bartec.de
Internet: www.bartec.de

**1. Basic safety instructions ... 1**
1.1 Notes on this manual ... 1
1.1.1 Languages ... 2
1.1.2 Changes in the document ... 2
1.2 Handling the product ... 2
1.3 Intended use ... 2
1.3.1 Exclusive purpose ... 2
1.3.2 Unintended use ... 3
1.4 Duties of the operator ... 3
1.5 Safety information ... 3
1.5.1 General ... 3
1.6 General safety information for operation ... 3
1.6.1 Maintenance ... 3
1.6.2 Servicing ... 4
1.6.3 Inspection ... 4
1.6.4 Repairs ... 4
1.6.5 Commissioning ... 4
1.7 Labelling, test certificate and standards ... 4
1.8 Warranty ... 4
**2. Product description ... 6**
2.1 Definition ... 6
2.2 Schematic design ... 7
**3. Explosion protection and approvals ... 8**
**4. Technical data ... 10**
4.1 POLARIS Professional ... 10
4.1.1 General data ... 10
4.1.2 Characteristics POLARIS Panel PC Professional 15" ... 11
4.1.3 Characteristics POLARIS Panel PC Professional 15" Sunlight ... 11
4.1.4 Characteristics POLARIS Panel PC Professional 17.3" ... 12
4.1.5 Characteristics POLARIS Panel PC Professional 19.1" ... 12
4.1.6 Characteristics POLARIS Panel PC Professional 24" ... 13
4.2 Keyboard ... 14
4.2.1 Explosion protection ... 14
4.2.2 General data ... 14
4.2.3 Characteristics enclosure for keyboard ... 15
4.3 Finger mouse, trackball, touchpad and joystick ... 15
4.3.1 Explosion protection ... 15
4.3.2 General data ... 16
4.3.3 Variants ... 16
4.4 Ex i Memory stick ... 17
4.4.1 Explosion protection ... 17
4.4.2 General data ... 17
4.5 USB Smart Device ... 18
4.5.1 Explosionsschutz ... 18
4.5.2 Technical data ... 18
4.5.3 Electric data (USB standard) ... 19
4.5.4 Technical data (Bluetooth) ... 19
4.5.5 Technical data (WLAN) ... 19
4.6 Product labelling ... 20
**5. Transport, storage, scope and assembly ... 21**
5.1 Transport ... 21
5.2 Intermediate storage ... 21
5.3 Scope of delivery ... 21
5.3.1 Accessories optional ... 21
5.4 Assembly ... 22
5.4.1 Installation options ... 22
**6. Installation ... 23**
6.1 Requirements ... 23
6.2 Mechanical installation ... 24

6.2.1 Installation in 2G-/2D-enclosure ... 25
6.2.2 Installation as a system solution in the stainless steel enclosure "Exclusive II" ... 26
6.2.3 Floor mounting (Stainless steel enclosure "Exclusive II") ... 27
6.2.4 Wall mounting (Stainless steel enclosure "Exclusive II") ... 27
6.2.5 Table mounting swivel/tilt (Stainless steel enclosure "Exclusive II") ... 28
6.3 Electrical installation ... 29
6.3.1 Installation guidelines ... 29
6.4 Terminal compartments ... 30
6.5 PE conductor connection ... 31
6.6 Ex e terminal compartments ... 32
6.6.1 Cable entries ... 32
6.6.2 Supply voltage terminal assignment) ... 33
6.6.3 Ethernet terminal assigment ... 33
6.6.4 RS422 interface ... 34
6.6.5 RS485 interface ... 35
6.6.6 PROFIBUS-DP interface (optional) ... 36
6.6.7 TTY interface (optional) ... 37
6.6.8 RS232 interface (optional) ... 38
6.6.9 Siemens PROFIBUS-DP interface (optional) ... 39
6.6.10 USB interface (optional) ... 40
6.6.11 Interface RS422/USB (optional) ... 40
6.7 Ex i terminal compartment ... 41
6.7.1 Connection of Ex i keyboard to the POLARIS (optional) ... 41
6.7.2 Ex i USB interface for BARTEC Ex i memory stick ... 42
6.7.3 Ex d socket (optional) ... 42
6.7.4 Connection of a BARTEC BCS 160ex hand scanner (optional) ... 43
6.7.5 Fibre-optic port (optional) ... 44
6.8 EMC (Electromagnetic compatibility) ... 45
6.8.1 Voltage supply (AC- and DC- variants) ... 45
6.8.2 Back-up fuse ... 46
6.8.3 Interference suppression ... 46
6.8.4 Shielding ... 47
6.8.5 Connection of shielding ... 47
6.8.6 Examples of shielding connections ... 47
6.8.7 Ethernet cable ... 48

**7. Commissioning ... 50**
7.1 Final inspection ... 50

**8. Operation ... 51**
8.1 Operating system ... 51
8.2 Commissioning Software ... 51
8.2.1 Windows 10 Iot Enterprise LRSB ... 51
8.2.2 Windows 7 Ultimate ... 52
8.3 On-board Bartec Recovery Solution ... 52
8.3.1 Bartec Recovery Solution ... 52
8.3.2 Start of the device in the Recovery mode ... 52
8.3.3 Recovery surroundings ... 53
8.3.4 Recovery application ... 53
8.3.5 Restoration in the work state ... 55
8.3.6 Finish the recovery ... 56
8.4 Recovery/Backup Function ... 57
8.4.1 Recovery stick image ... 57
8.4.2 Backup ... 58
8.4.3 Switching off and shutting down ... 58
8.5 Network (Ethernet) setup ... 59
8.5.1 Requirements ... 59
8.6 Touch screen ... 60

**9. Faults and troubleshooting ... 61**

**10. Maintenance, inspection, repair ... 62**
10.1 Maintenance intervals ... 62
10.2 Inspection ... 62
10.3 Maintenance and repair work ... 62

10.3.1 Instructions for repairs ..... 63
**11. Disposal ..... 63**
**12. Dispatch and packaging instructions ..... 63**
**13. Accessories, spare parts ..... 64**
**14. Order numbers ..... 65**
**15. Additional information ..... 66**
**16. Declaration of conformity ..... 67**

blank

# 1. Basic safety instructions

## 1.1 Notes on this manual

**Read carefully before putting the devices into operation.**

The user manual is a fixed part of the product. It must be kept in the direct vicinity of the device and the installation, operating and service staff must have access to it at all times.

The user manual contains important information, safety instructions and test certificates which are necessary for the perfect function of the device in operation.

The user manual is directed at all individuals concerned with the commissioning, handling and servicing of the product. The applicable guidelines and standards for areas with gas and dust atmosphere (2014/34/-EU, EN/IEC 60079-17 and
EN/IEC 60079-19) must be observed when conducting this work.

Knowledge of the safety and warning information in this user manual and the strict compliance with it is essential for safe installation and commissioning. Accidents, injuries and material damage can be avoided by circumspect handling and systematically following the instructions.

The examples, tables, and figures provided in this user manual are for illustration purposes. Due to the different requirements of the respective application, the BARTEC company cannot assume responsibility or liability for actual use based on the examples and figures.

The BARTEC company reserves the right to carry out technical changes at any time.

In no event will BARTEC company be responsible or liable for indirect or consequential damages resulting from the use or application of this user manual.

Safety instructions and warnings are specially highlighted in these operating instructions and marked by symbols.

**⚠ DANGER**

**DANGER** describes a directly imminent danger. If not avoided, death or severe injury will be the consequence.

**⚠ WARNING**

**WARNING** describes a possibly imminent danger. If not avoided, death or severe injury may be the consequence.

**⚠ CAUTION**

**CAUTION** describes a possibly imminent danger. If not avoided, mild or slight injury may be the consequence.

**ATTENTION**

**ATTENTION** describes a possibly damaging situation. If not avoided, the plant or objects in its vicinity may be damaged.

Important information on effective, economical & environmentally compliant handling.

### 1.1.1 Languages

The original user manual with safety information is written in English. All other available languages are translations of the original user manual.

The user manual is available in English. If further languages are required, these must be requested from BARTEC or stated on placing an order.

### 1.1.2 Changes in the document

BARTEC reserves the right to change the content of this document without notification. No warranty is assumed for the correctness of the information. In cases of doubt, the German safety instructions apply because it is not possible to rule out errors of translation or printing. In the case of legal disputes, the “General Terms and Conditions of Business” of the BARTEC GmbH also apply.

The current versions of the datasheets, operating instructions, certificates and EU declarations of conformity can be downloaded from www.bartec.de or may be requested directly from BARTEC GmbH.

## 1.2 Handling the product

The product described in these operating instructions has been tested and left the factory in perfect condition as regards meeting safety requirements. To maintain this condition and ensure that this product operates perfectly and safely, it may be used only in the manner described by the manufacturer. Appropriate transportation, suitable storage and careful operation are also essential for the perfect and safe operation of this product. The POLARIS must be installed properly and securely if it is to work perfectly and correctly.

The safe and perfect mounting of the POLARIS is a precondition for faultless and correct operation.

## 1.3 Intended use

### 1.3.1 Exclusive purpose

It is used exclusively in combination with operating devices which satisfy the requirements for Overvoltage Category I.

The POLARIS PROFESSIONAL Panel PCs have been designed specially for use in hazardous (potentially explosive) areas in Zone 1 or Zones 21.

It is essential to observe the permissible operational data for the device being used.

### 1.3.2 Unintended use

Any other use is not in accordance with the intended purpose and can cause damage and accidents. The manufacturer will not be liable for any use beyond that of its "Exclusive II" intended purpose.

## 1.4 Duties of the operator

The owner/managing operator undertakes to restrict permission to work with the POLARIS to people who:

- are familiar with the basic regulations on safety and accident prevention and have been instructed in the use of the POLARIS;
- have read and understood the documentation, the chapter on safety and the warnings.

The owner/managing operator must check that the safety regulations and accident prevention rules valid for the respective application are being observed.

## 1.5 Safety information

### 1.5.1 General

- Take the device out of the hazardous area before wiping it with a dry cloth or cleaning it!
- Do not open devices in a hazardous area.
- The general statutory regulations or directives relating to safety at work, accident prevention and environmental protection legislation must be observed, e.g. the German industrial health and safety ordinance (BetrSichV) or the applicable national ordinances.
- In view of the risk of dangerous electrostatic charging, wear appropriate clothing and footwear.
- Avoid the influence of heat that is higher or lower than the specified temperature range.
- Protect the device from external influences! Do not expose the device to any caustic/aggressive liquids, vapours or mist! In the event of malfunctioning or damage to the enclosure, take the device out of the potentially explosive area immediately and bring it to a safe place.

## 1.6 General safety information for operation

### 1.6.1 Maintenance

The pertinent erection and operating provisions for electrical systems must be observed! (e.g. Directive RL 2014/34/EU, BetrSichV and nationally applicable ordinances EN 60079-14, IEC 60079-14 and the series DIN VDE 0100)!

Observe the national waste disposal regulations when disposing of materials.

### 1.6.2 Servicing

No constant servicing will be necessary if operated correctly under consideration of the assembly instructions and environmental conditions. See Chapter "Service, inspection, repair" in this respect.

### 1.6.3 Inspection

According to EN/IEC 60079-17 and EN/IEC 60079-19, the operator of electrical systems in potentially explosive atmospheres is obliged to have these inspected by an electrician to ensure correct condition.

### 1.6.4 Repairs

Repairs to explosion-proof equipment may only be performed by persons authorized by BARTEC, who must employ the latest technological practices, observe the manufacturer's instructions and use only original spare parts. The applicable regulations are to be observed here.

### 1.6.5 Commissioning

It must be checked that all components and documents are available before commissioning.

## 1.7 Labelling, test certificate and standards

The device features an explosion protection label, as well as a test certificate. For an explanation of the symbols and information used, see chapter 4 "Technical data".

The POLARIS PROFESSIONAL Panel PC series complies with Directive 2014/34/EU on equipment and protective systems intended for use in potentially explosive atmospheres (ATEX Directive). For information on standards that must be observed, see chapter 3 "Explosion protection and approvals".

## 1.8 Warranty

**WARNING**

**Explosion protection cannot be guaranteed if non-specified components are used.**

- ▶ Do not make any changes or perform any reconstruction work on the device.
- ▶ Use only original spare parts.

The manufacturer provides a full warranty exclusively for the spare parts it supplies. When using parts from third parties, there is no guarantee that they have been designed or manufactured to handle the requisite stress or offer the requisite degree of safety.

As a fundamental rule, our “General Conditions of Sale and Delivery” apply. These are made available to the owner/managing operator at the latest on formation of a contract. Guarantee and liability claims for personal injury and damage to property are excluded if they are due to one or more of the following reasons

- Use of the POLARIS for a purpose other than that for which it is intended.
- Incorrect installation, commissioning, operation and maintenance.
- Non-compliance with the instructions in the manual with respect to transport, storage, assembly, commissioning, operation and maintenance.
- Structural modifications without our prior authorisation.
- Inadequate monitoring of components that are subject to wear
- Repairs done incorrectly.
- Disasters due to the effects of foreign matter or Act of God (events outside human control).

BARTEC grants a warranty period of one year on the POLARIS series, starting from the BARTEC delivery date. The warranty period for accessories is 1 year from the date of delivery. This warranty covers all parts of the delivery and is limited to the free-of-charge replacement of or repair of the defective parts by BARTEC. The packaging supplied should ideally be retained for this purpose (return shipping). If necessary and following written consultation, the products should be sent to us with an RMA form. No claims may be submitted for repair work to be performed at the installation location.

# 2. Product description

## 2.1 Definition

The **POLARIS PROFESSIONAL Panel PC** series are the all-rounders for machine-oriented operation and observation in hazardous areas. The Panel PCs have a high-resolution display with a touchscreen of up to 24" and offer the optimum interface and brilliant images for every application

*Illustration 1: POLARIS PROFESSIONAL Panel PC series*

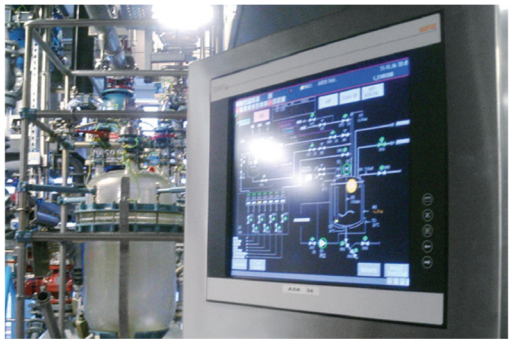
The POLARIS PROFESSIONAL Panel PC series is open to a great number of software applications. The pre-installed, multi-lingual Windows® 7 Ultimate operating system (optional Windows® 10 IoT LTSB) allows the use of its standard visualisation or the BMS-Graf-pro 7 visualisation software from BARTEC.

This is facilitated by a faster Intel® Atom™ E3845, 4 x 1.91 GHz, which allows an excellent execution of extensive applications locally too. Robust hard disks or solid-state drives are available as storage media also.

Ethernet (copper or fibre optic), USB, PROFIBUS-DP, serial interfaces and optional WLAN offer reliable interfaces to the control system or to the control in safe areas.

High-quality keypads in various languages and a variety of mouse versions enhance the operating comfort.

The use of the BARTEC Ex i memory stick through the intrinsically safe USB interface allows data to be transferred easily and stored.



The front-panel mounting design makes installation easy. On request, the devices are also available as a ready-made system solution in a stainless steel enclosure for wall, floor or table mounting.

For particularly harsh areas of use with temperatures as low as down to -40 °C, we equip the POLARIS series with electrical heating. On request, we produce customised solutions with more command and signalling devices.

## 2.2 Schematic design

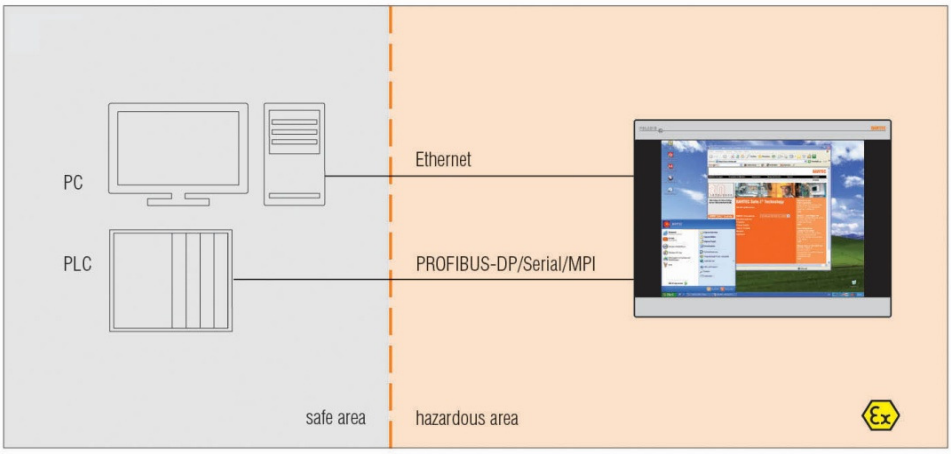



*Illustration 2: System configuration*

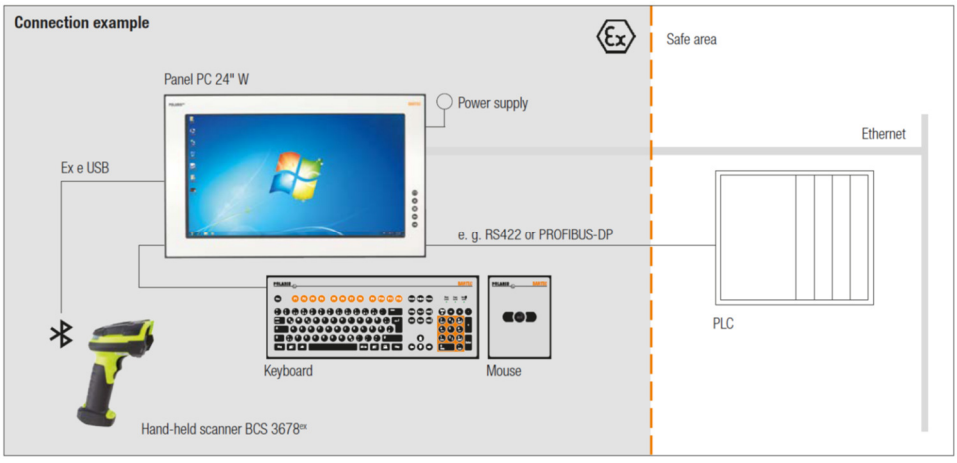



*Illustration 3: System configuration with barcode scanner and external keyboard*

# 3. Explosion protection and approvals

| POLARIS Panel PC PROFESSIONAL<br>Type 17-71V1-…. | |
|---|---|
| **ATEX** | |
| **Ex protection type** | II 2G Ex db eb mb q [ib op pr] IIC T4 Gb<br>II 2D Ex mb tb IIIC T120°C Db<br>-20 °C ≤ Ta ≤ 60 °C |
| **Certification** | IBExU 05 ATEX 1117 X |
| **Standards** in accordance with EMC Directive 2014/34/EU | EN 60079-0:2012+A11:2013<br>EN 60079-1:2014<br>EN 60079-5:2015<br>EN 60079-7:2015<br>EN 60079-11:2012<br>EN 60079-18:2015<br>EN 60079-28:2015<br>EN 60079-31:2014 |
| **IECEx** | |
| **Ex protection type** | Ex db eb qb [ib op pr] IIC T4<br>Ex tb IIIC T120 °C Db |
| **Certification** | IECEx IBE 11.0007X |
| **Standards** in accordance with EMC Directive 2014/34/EU | IEC 60079-0:2011 Edition: 6<br>IEC 60079-1:2014-06 Edition: 6<br>IEC 60079-5:2015 Edition: 4<br>IEC 60079-7:2015 Edition: 5<br>IEC 60079-11:2011 Edition: 6<br>IEC 60079-18:2015 Edition: 4<br>IEC 60079-28:2015 Edition: 2<br>IEC 60079-31:2013 Edition: 2 |
| **Special conditions** | The intrinsically safe circuits and the enclosure are galvanically connected. The equipotential bonding must be guaranteed at the installation of the intrinsically safe circuits.<br>High charging mechanisms at the operation surface of the Visual units respectively accessories (for example pneumatic particle transport) must be excluded at the application. The degree of protection (IP code) must be ensured by the installation of the units in enclosures (IP code). |

Die POLARIS HMI are marked exclusively according to ATEX und IECEx.
Future markungs must be requested separately.

| Depending of the variant, optional additional test certificates and labeling on request | |
|---|---|
| **INMETRO** | 11/UL-BRHZ-0131X |
| **Customs Union Russia (EAC)** | TC RU C-DE.GB06.B.00334 |
| **Korea** | KTL 14-KB4BO-0258X |
| **India** | CCEs P261984 |
| **China** | NEPSI GYJ18.1382X |
| **America** | CSA 70010166 |
| **More test certificates** | www.bartec.de |
| **EU-conformity** | |
| **RoHS-Directive** | 2011/65/EU |
| **Standards** in accordance with EMC Directive 2014/30/EU | EN/IEC 61000-6-2:2005<br>EN 61000-6-4:2007 + A1:2011<br>IEC 61000-6-4:2006 + A1:2010<br>EN 60529:1991 + A1 2000 + A2 :2013<br>IEC 60529:1989 + A1 1999 + A2 :2013 |
| **Electrical safety** | EN/IEC 61010-1:2010 |
| **Product labelling** | CE 0044 |

# 4. Technical data

## 4.1 POLARIS Professional

### 4.1.1 General data

| | |
|---|---|
| **Construction** | Front panel fitting; Optional turn-key system solutions in a stainless steel enclosure as wall, floor or table mounting versions. |
| **Computer capacity** | Intel® Atom™ E3845, 4 x 1.91 GHz<br>RAM: 4 GB or 8 GB<br>100 GB HD or 128 GB SSD (MLC) |
| **Operating system** | Windows® 7 Ultimate<br>Windows® 10 IoT LTSB<br>Open platform for customer-specific visualization software, e. g. ProTool,<br>WIN CC flexible, etc. |
| **Interface**<br>(basic version) | 1 x Ex e Ethernet 100/10BaseT<br>1 x Ex e RS422<br>1 x Ex e USB<br>1 x Ex i USB for Ex i memory stick<br>2 x Ex i for PS/2 for intrinsically safe keyboard and mouse |
| **Optional interface modules** | 1 x Ex i Supply module for hand-held scanner<br>1 x Ex d USB connection (Ex d socket) |
| **Display** | Antireflection coating glass pane<br>Optional touchscreen |
| **Power supply** | AC 90 V to 253 V ± 10 %, 50 Hz to 60 Hz<br>DC 24 V ±10 % |
| **Max. power consumption** | $P_{max}$ < 100 W depending on the version |
| **Relative air humidity** | 5 to 95 % non-condensing |
| **Vibration** | 0.7 G/1 mm; 5 Hz-500 Hz pulse in all 3 axes |
| **Schock** | 15 G, 11 ms pulse in all 3 axes |
| **Material**<br>Front<br>Rear panel | <br>Polyester foil on anodised aluminium plate (conditionally UV-resistant)<br>galvanised sheet steel, bichromated |
| **Protection class**<br>Front<br>Rear site | <br>IP66<br>IP54 |
| **Optional approved accessories** | Keyboard<br>Mouse variants<br>Ex i USB memory stick<br>Smart USB Device ( WLAN od Bluetooth) |

### 4.1.2 Characteristics POLARIS Panel PC Professional 15"

| | |
|---|---|
| **Display**  | 15" graphics-capable TFT display<br>XGA resolution<br>1024 x 768 pixels<br>16.7 million colours<br>Brightness 350 cd/m²<br>Visible surface approx. 304 x 228 mm<br>Contrast 400:1 |
| **Backlighting** | CFL technology, Service life approx. 50,000 hours (at +25 °C) |
| **Permissible ambient temperature**<br>Storage/Transport<br>Operation | <br>-20 °C to +50 °C<br>0 °C to +50 °C |
| **Dimensions**<br>(width x height x depth) | 411 mm x 332 mm x approx. 135 mm |
| **Wall cut-out**<br>(width x height) | 394.5 mm x 315.5 mm + 0.5 mm |
| **Weight** | approx. 23 kg |

### 4.1.3 Characteristics POLARIS Panel PC Professional 15" Sunlight

| | |
|---|---|
| **Display**  | 15" graphics-capable TFT display<br>XGA resolution<br>1024 x 768 pixels<br>16.7 million colours<br>Brightness 1000 cd/m²<br>Visible surface approx. 304 x 228 mm<br>Contrast 700:1 |
| **Backlighting** | LED technology, Service life approx. 50,000 hours (at +25 °C) |
| **Permissible ambient temperature**<br>Storage/Transport<br>Operation | <br>-20 °C to +60 °C<br>-20 °C to +60 °C |
| **Dimensions**<br>(width x height x depth) | 411 mm x 322 mm x approx. 135 mm |
| **Wall cut-out**<br>(width x height) | 394,5 mm x 315,5 mm ± 0.5 mm |
| **Weight** | approx. 23 kg |

### 4.1.4 Characteristics POLARIS Panel PC Professional 17.3"

| | |
|---|---|
| **Display**  | 17.3" graphics-capable TFT display<br>Full HD resolution<br>1920 x 1080 pixels<br>16.7 million colours<br>Brightness 400 cd/m²<br>Visible surface approx. 302 x 215 mm<br>Contrast 600:1 |
| **Backlighting** | LED technology, Service life<br>approx. 50,000 hours (at +25 °C) |
| **Permissible ambient temperature**<br>Storage/Transport<br>Operation | <br>-20 °C to +50 °C<br>0 °C to +50 °C |
| **Dimensions**<br>(width x height x depth) | 503 mm x 314 mm x ca. 135 mm |
| **Wall cut-out**<br>(width x height) | 489 mm x 300 mm + 0,5 mm |
| **Weight** | approx. 33 kg |

### 4.1.5 Characteristics POLARIS Panel PC Professional 19.1"

| | |
|---|---|
| **Display**  | 19.1" graphics-capable TFT display<br>SXGA resolution<br>1280 x 1024 pixels<br>16.7 million colours<br>Brightness 300 cd/m²<br>Visible surface approx. 380 x 305 mm<br>Contrast 1300:1 |
| **Backlighting** | CFL technology, Service life<br>approx. 40,000 hours (at +25 °C) |
| **Permissible ambient temperature**<br>Storage/Transport<br>Operation | <br>-20 °C to +50 °C<br>0 °C to +50 °C |
| **Dimensions**<br>(width x height x depth) | 498 mm x 400.5 mm x approx. 135 mm |
| **Wall cut-out**<br>(width x height) | 484 mm x 386.5 mm + 0.5 mm |
| **Weight** | approx. 33 kg |

### 4.1.6 Characteristics POLARIS Panel PC Professional 24"

| | |
|---|---|
| **Display** | 24" graphics-capable TFT display<br>Full HD resolution<br>1920 x 1080 pixels<br>16.7 million colours<br>Brightness 300 cd/m$^2$<br>Visible surface approx. 521 x 299 mm<br>Contrast 3000:1 |
| **Backlighting** | LED technology, Service life<br>approx. 40,000 hours (at +25 °C) |
| **Permissible ambient temperature**<br>Storage/Transport<br>Operation | <br>-20 °C to +50 °C<br>0 °C to +50 °C |
| **Dimensions**<br>(width x height x depth) | 644 mm x 406 mm x approx. 135 mm |
| **Wall cut-out**<br>(width x height) | 630 mm x 392 mm + 0.5 mm |
| **Weight** | approx. 38 kg |

# 4.2 Keyboard

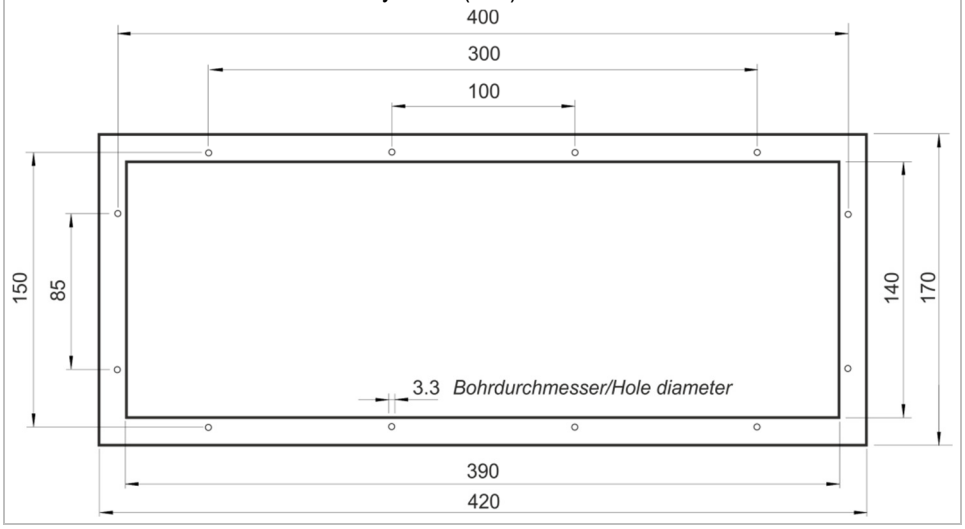
## 4.2.1 Explosion protection

| | |
|---|---|
| **Type** | 17-71VZ-40.. |
| **Ex protection type ATEX** | II 2G Ex ib IIC T4 Gb<br>II 2D Ex ib IIIC T120°C Db<br>-20 °C ≤ Ta ≤ +60 °C (50°C) |
| **Certification** | IBExU 05 ATEX 1117 X |
| **Ex protection type IECEx** | Ex ib IIC T4 Gb<br>Ex ib IIIC T120 °C Db |
| **Certification** | IECEx IBE 11.0007X |
| **More test certificates** | www.bartec.de |

## 4.2.2 General data

| | |
|---|---|
| **Construction** | Front panel fitting |
| **Material** | Polyester foil on aluminium sheet (conditionally UV-resistant) |
| **Protection class** (front) | IP65 |
| **Dimensions** (width x height) | 420 mm x 170 mm |
| **Wall cut-out** (width x height) | 391 mm x 140 mm |
| **Installation depth** | 18 mm |
| **Weight** | approx. 700 g |
| **Other features** | Keyboard available in various languages |

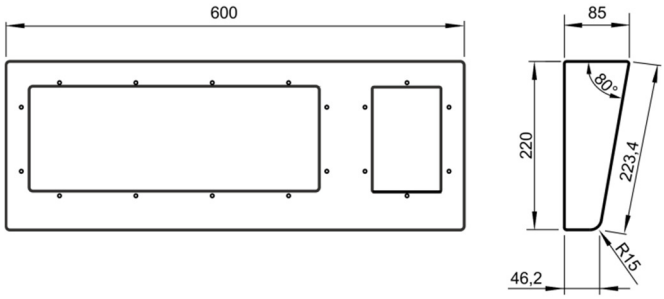
Dimensions and wall cut-out for keyboard (mm)



### 4.2.3 Characteristics enclosure for keyboard

| | |
|---|---|
| **Order no.** | 05-0041-0277 |
| **Material** | Stainless steel 1.4301; AISI 304 |
| **Dimensions** (width x height x depth) | 600 mm x 85 mm x 220 mm |
| **Protection class** | IP65 |

Dimensions (mm)




## 4.3 Finger mouse, trackball, touchpad and joystick

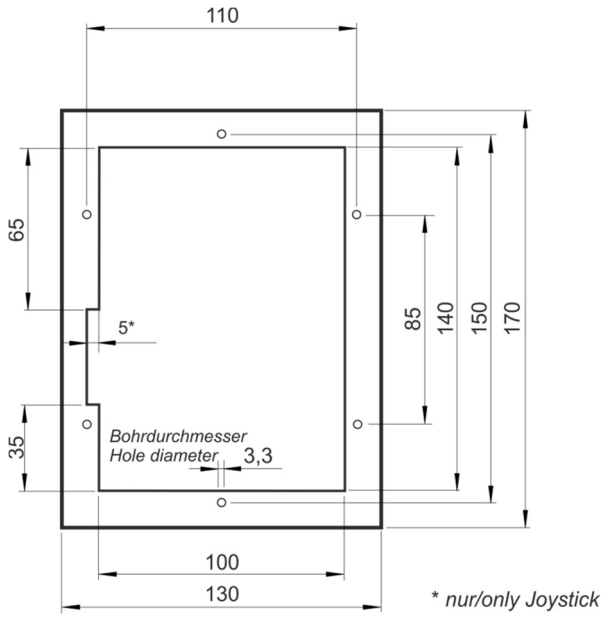
### 4.3.1 Explosion protection

| | |
|---|---|
| **Ex protection type ATEX** | II 2G Ex ib IIC T4 Gb<br>II 2D Ex ib IIIC T120°C Db<br>-20 °C ≤ Ta ≤ +60 °C (50°C) |
| **Certification** | IBExU 05 ATEX 1117 X |
| **Ex protection type IECEx** | Ex ib IIC T4 Gb<br>Ex ib IIIC T120 °C |
| **Certification** | IECEx IBE 11.0007X |
| **More test certificates** | www.bartec.de |

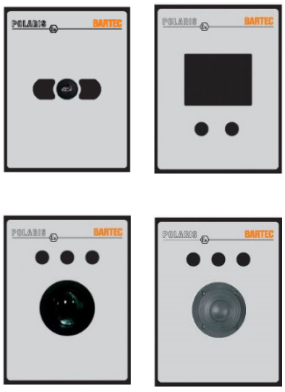
### 4.3.2 General data

| | | |
|---|---|---|
| **Construction** | | Front panel fitting |
| **Material** | | Polyester foil on aluminium sheet (conditionally UV-resistant) |
| **Protection class** | | |
| Fingermouse/Joystick/Touchpad | | IP65 front site |
| Trackball | Static | IP65 front site |
| | Dynamic | IP51 front site |
| **Dimensions** | (width x height) | 130 mm x 170 mm |
| **Wall cut-out** | (width x height) | 100 mm x 140 mm |

Dimensions and wall cut-out (mm)




### 4.3.3 Variants



| | |
|---|---|
| **Finger mouse** | Type 17-71VZ-1000 |
| Installation depth | 15 mm |
| Weight | approx. 270 g |
| **Touchpad** | Type 17-71VZ-2000 |
| Installation depth | 15 mm |
| Gewicht | approx. 250 g |
| **Trackball** | Type 17-71VZ-3000 |
| Installation depth | 43 mm |
| Weight | approx. 500 g |
| **Joystick with button** | Type 17-71VZ-9000 |
| Installation depth | 43 mm |
| Weight | approx. 500 g |

# 4.4 Ex i Memory stick


## 4.4.1 Explosion protection

| | |
|---|---|
| **Type** | 17-71VZ-5000/0100 |
| **Ex protection type ATEX** | II 2G Ex ib IIC T4<br>-20 °C ≤ Ta ≤ 60 °C |
| **Certification** | IBExU 05 ATEX 1117 X |
| **Standards** | EN 60079-0:2009<br>EN 60079-11:2012<br>EN 60079-31:2009 |
| **Ex protection type IECEx** | Ex ib IIC T4 |
| **Certification** | IECEx IBE 11.0007X |
| **Standards** | IEC 60079-0:2007 Edition: 5<br>IEC 60079-11:2011-06 Edition: 6<br>IEC 60079-31:2008 Edition: 1 |
| **More test certificates** | www.bartec.de |

## 4.4.2 General data

| | |
|---|---|
| **Product type** | USB flash drive |
| **Storage capacity** | 4 GB |
| **Dimensions**<br>(length x width x depth) | approx. 92 mm x 22 mm x 7.2 mm |
| **Weight** | 28 g |
| **Enclosure material** | Anodised aluminium |
| **Use** | Data backup |

# 4.5 USB Smart Device

## 4.5.1 Explosionsschutz

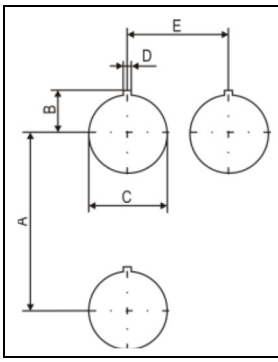
| | |
|---|---|
| **Type** | 17-71VZ-A0x0/0000 |
| **Ex protection type ATEX** | II 2G Ex eb mb IIC T4 Gb<br>II 2D Ex tb IIIC T120 °C Db |
| **Certification** | IBExU 05 ATEX 1117 X |
| **Kennzeichnung IECEx** | Ex eb mb IIC T4<br>Ex tb IIIC T120 °C |
| **Certification** | IECEx IBE 11.0007X |
| **Possible ambient temperature** | -20 °C bis + 60 °C |
| **Protection class** | IP 66 (threaded base) |

Suitable for the installation in 2G-,2D-, 3G-or 3D enclosure. Connection via USB Ex-e.

## 4.5.2 Technical data

| | |
|---|---|
| **Fastening** | M30 x 1,5 (suitable for fixing holes 30,3mm with recess for anti-twist safeguard) |
| **Installation** | Wall thickness 1mm to 6mm<br>impact resistance: 7Nm |
| **Torque of panel nut** | 2,8 to 3,4 Nm |
| **Material** | Enclosure thermoplastic |

**Dimensions**




| | mm | in |
|---|---|---|
| A | 70 | 2.8 |
| B | 16,5 | 0.65 |
| C | Ø 30,3$^{+0,3}$ | Ø 1.9$^{+0,01}$ |
| D | 3 | 0.12 |
| E | 40 | 1.6 |

Fixing hole of the size Ø 30,3 mm (1.9 in) with recess for anti-twist safeguard, typical position on top (12 o`clock position).

Minimum distances of the fixing holes:

- horizontal 40 mm (1.6in)
- vertical 70 mm (2.8 in)

Recommended distance for mushroom push button, shock switch as well as selector switch with protective collar: 100 mm (3.9 in

### 4.5.3 Electric data (USB standard)

| USB-connection | Colour | Function | |
|---|---|---|---|
| 1 | RD | V+ | |
| 2 | WH | Data- | USB-data signal |
| 3 | GN | Data+ | USB-data signal |
| 4 | BK | V- | |

**Bluetooth**


### 4.5.4 Technical data (Bluetooth)

| | |
|---|---|
| **Bluetooth** | 4.0 |
| **Downward compatible** | 2.0/2.1/3.0 |
| **Range** | Up to 10m (open terrain) |
| For more technical data see description of the bluetooth-stick manufacturer. | |

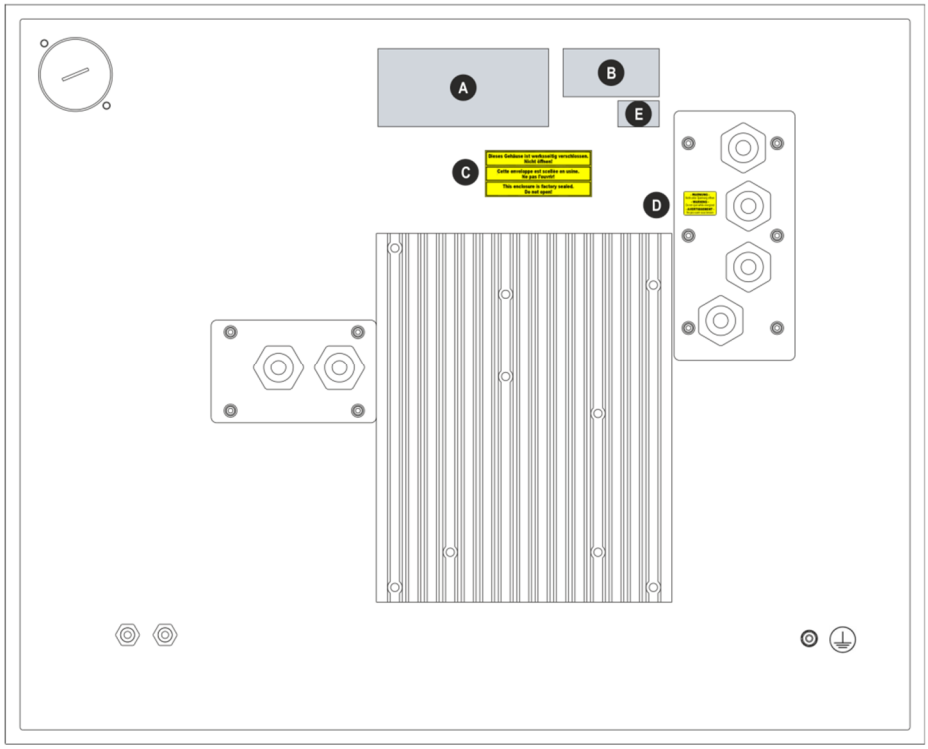
**WLAN**

For the wireless network connection.


### 4.5.5 Technical data (WLAN)

| | |
|---|---|
| **Wifi - standard** | IEEE802.11n<br>IEEE802.11g<br>IEEE802.11b |
| **Transfer rate** | max. 150 Mbit/s |
| **WLAN - frequency** | 2.4 GHz |
| For more technical data see description of the W-LAN-stick manufacturer. | |

## 4.6 Product labelling




| | |
|---|---|
| **A**<br>**Example:**<br>**Type label with labelling of international approvals** | CE 0044<br>POLARIS *****<br>Typ 17-7*V*-****<br>IBExU 05 ATEX 1117 X<br>II 2 G / II 2 D<br>Ex eb qb [ib] IIC T4<br>Ex tb IIIC T120°C IP6X<br>IECEx IBE 11.0007X<br>KTL 14-KB4BO-0258X<br>TC RU C-DE.<br>ГБ06.B.00334<br>0°C≤ Ta ≤ +50°C<br>DC 24 V<br>C US<br>Class I, Zone 1<br>A/Ex d e q [ib] IIC T4; Gb<br>Class II, Zone 21<br>A/Ex tb IIIC T120°C; Db<br>CSA 15.70010166<br>BARTEC<br>97980 Bad Mergentheim<br>Germany<br>S/N: 000100 / 1703<br>Version: ***<br>Built: ***<br>weitere Daten siehe Betriebsanleitung<br>further data see operating instruction<br>voir la notice d'instructions pour des données plus complètes |
| **B**<br>**Optional Label for other certification: exsample IMMETRO** | Segurança<br>INMETRO<br>BARTEC<br>97980 Bad Mergentheim / Germany<br>11/UL-BRHZ-0131X<br>ATENÇÃO - NÃO SEPARE QUANDO ENERGIZADO<br>ATENÇÃO - ESTE INVÓLUCRO VEM SELADO DA FÁBRICA.<br>NÃO ABRA. |
| **C**<br>**Warnings on the device** | **Dieses Gehäuse ist werksseitig verschlossen. Nicht öffnen!**<br>**Cette enveloppe est scellée en usine. Ne pas l'ouvrir!**<br>**This enclosure is factory sealed. Do not open!** |
| **D**<br>**Warning on terminal compartment!** | **- WARNUNG -**<br>Nicht unter Spannung öffnen<br>**- WARNING -**<br>Do not open while energized<br>**- AVERTISSEMENT -**<br>Ne pas ouvrir sous tension |
| **E**<br>**Test sticker** | Ex geprüft<br>A 0712 |

# 5. Transport, storage, scope and assembly

## 5.1 Transport

A written report of any transport damage or missing items must be given to the appointed forwarder and to BARTEC GmbH immediately on receipt of the delivery.

Damage caused by incorrect storage and transport shall not fall within the warranty provisions of BARTEC GmbH.

**⚠ CAUTION**

**This device is heavy (23-38 kg).**

**There is a risk of injury if it is lifted or moved incorrectly.**

▶ You will need help from others when transporting it.

## 5.2 Intermediate storage

**ATTENTION**

**Damage to property through incorrect storage!**

▶ Comply with the correct storage temperatures.

▶ Keep the POLARIS free of moisture.

## 5.3 Scope of delivery

1 x POLARIS PROFESSIONAL Panel PC

1 x Reinforcement frame

1 x Set of mounting clamps

1 x User manual POLARIS PROFESSIONAL – Panel PC

**Not enclosed**

– Assembly material

– Cable for voltage supply and data line(s)

### 5.3.1 Accessories optional

– Enclosure and supporting system for wall, floor and table mounting

– Keyboard, finger mouse, touchpad, trackball, joystick, USB-Stick

– Smart Device (W-LAN or Bluetooth)

## 5.4 Assembly

Before assembling the device, make sure you have all the components and documents.

| | | |
|---|---|---|
| **Required Tools:** | POLARIS (mounting clamps) | 1 x hex key 3 mm<br>1 x slotted screwdriver |
| | POLARIS termination-compartments | 1 x hex key 2,5 mm<br>1 x slotted screwdriver |
| | POLARIS PE-connection | 1 x ring spanner 7 mm |
| | POLARIS accessories | 1 x socket wrench 5.5 mm |
| | System solution in an “Exklusive II” enclosure | 1 x hex key 5 mm (to fix the supporting system in place) |

### 5.4.1 Installation options

The POLARIS can be installed directly in:

- Enclosures
- Switch cabinet doors
- Operating consoles

The POLARIS series are mounted by fitting them into front panels, which can be done with very little effort. On request, we supply the operating devices as ready-to-use system solutions in stainless steel enclosures for mounting onto walls, floors or tables.

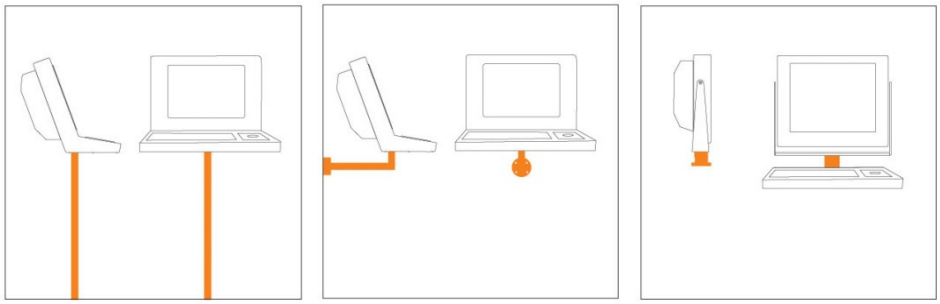


*Illustration 4: Examples of floor, wall and table mounting in an "Exclusive II" enclosure*

# 6. Installation

We recommend setting up and testing the entire system before its ultimate installation in the ex-area. If a long connection cable is not available, please use a patch cable to test the basic functions.

**DANGER**

**Electrostatic charging through a stream of particles.**
**There is a risk of fatal injury in an explosive atmosphere!**

- ▶ Make sure there are no highly energetic charging mechanisms at the user interface on the display unit or its accessories.
- ▶ Do not install the device in the stream of particles.

**DANGER**

**No PE connection. Risk of fatal injury in an explosive atmosphere!**

- ▶ The POLARIS must be integrated in the equipotential bonding.

The POLARIS Series is approved for an ambient temperature of from 0 °C to +50 °C or from -20 °C to +60 °C and a relative air humidity of from 5 to 95 % without condensation.

## 6.1 Requirements

- The place where the POLARIS is installed must have sufficient mechanical stability/fastening.
- The enclosure intended for accommodating the POLARIS must be designed to bear the device's weight.
- If a supporting system is used, the surface underneath and the means of fastening the supporting system must be designed to bear the weight of the POLARIS

**Selecting the location**

**CAUTION**

**Pay attention to wall and ground condition!**

**A sufficiently stable wall (e.g. concrete or limestone) or floor (e.g. concrete) must be selected for securing the load-bearing system.**

- ▶ The structural stability of the wall or floor must be able to bear 4 times the weight of the POLARIS as system solution.
- ▶ The support arm system must be assembled using suitable mounting materials (M12) (e.g. dowels or stud bolts).

- Choose the optimum height for operating the POLARIS.
- Ensure good lighting conditions for a perfectly legible display (no direct exposure to the sun's rays).
- Do not mount in direct proximity to switching or current changing devices.
- Only install the POLARIS in conjunction with the reinforcement frame in an IP65 enclosure. Failure to comply with this can lead to water penetrating and damaging the device.

**Outdoor installation**

**ATTENTION**

**Damage from condensation or overheating!**

- ▶ Avoid direct sunlight!
  Remedy: e.g. shelter with sufficient air circulation.
- ▶ Remove condensation on the POLARIS immediately.
- ▶ A POLARIS built into an enclosure must be heated and not removed from the mains.
- ▶ Equip the protective housing with breather.

## 6.2 Mechanical installation

**⚠ CAUTION**

**This device is heavy (23-38 kg).**

**There is a risk of injury if it is lifted or moved incorrectly.**

- ▶ You will need help from others when transporting it.

Only qualified personnel, i.e. trained skilled specialists will have the necessary specialised know-how to be able to perform all the mechanical work. Familiarity with and the technically perfect implementation of the safety instructions described in this manual are preconditions for safe installation and commissioning.

### 6.2.1 Installation in 2G-/2D-enclosure

In order to guarantee the IP degree of enclosure protection = IP54 for installation in 2G enclosures of Ex e type of protection (e.g. control equipment), and = IP6X for installation in 2D enclosures in areas where combustible dusts exist - with “protection through the enclosure” type of protection - the reinforcement frame should be used for fastening on the front side.

A reinforcement frame is inserted between the retaining brackets and the enclosure material for good transmission of the clamping force. This ensures even transmission of force.

**For POLARIS built into the enclosure door**

The open door must be supported and secured during the installation and servicing phase. Otherwise the wall thickness specified may lead to the door sagging slightly when open.

**DANGER**

**If there is no reinforcement frame, it will not be possible to maintain the IP protection. There is a risk of fatal injury in an explosive atmosphere!**

- ▶ Only use enclosure with at least 2 mm wall thickness.
- ▶ Insert the reinforcement frame between the holder and the enclosure.

| Reinforcement frame for maintenance of protection class IP65 | |
|---|---|
| POLARIS 15" / 15" Sunlight | 05-0205-0009 |
| POLARIS 17.3" | 05-0205-0013 |
| POLARIS 19.1" | 05-0205-0010 |
| POLARIS 24" | 05-0205-0012 |

**Fit the reinforcement frame**

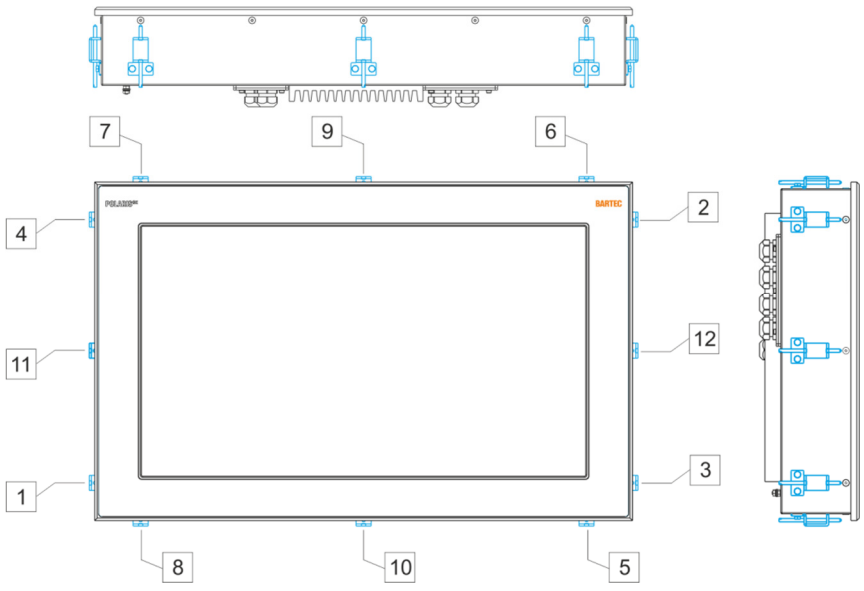



*Illustration 5: Minimum installation depth and mounting reinforcement frame*

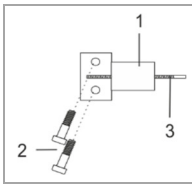
**Work steps**

(1) Insert the POLARIS into the cut-out in the enclosure.

(2) From the back, place the reinforcement frame over the POLARIS.

(3) Using the M4x12 (2) screws to fasten the mounting clamps (1) to the rear side of the POLARIS and tighten to 1.37 Nm.

(4) Tighten the terminal screw (3) on the reinforcement frame in the order 1 to 12 to a torque of 1.02 Nm.




| Number of mounting clamps | |
|---|---|
| POLARIS 15"/17.3"/19.1" | 12 pieces |
| POLARIS 24" | 14 pieces |

Always tighten the mounting clamps crosswise.

### 6.2.2 Installation as a system solution in the stainless steel enclosure "Exclusive II"

The POLARIS is available as a ready-made system solution in a stainless steel enclosure e.g. "Exclusive II" for floor, wall or table mounting.

**CSA approval**

The CSA approval for the POLARIS series includes an POLARIS system solution in stainless steel enclosure "Exclusive II" for wall and floor mounting.

Other system solutions and mounting systems (e.g. table mounting) have **not** been tested and approved in accordance with CSA.

**Selecting the location**

**CAUTION**

**Pay attention to wall and ground condition!**

**A sufficiently stable wall (e.g. concrete or limestone) or floor (e.g. concrete) must be selected for securing the load-bearing system.**

- ▶ The structural stability of the wall or floor must be able to bear 4 times the weight of the POLARIS as system solution.
- ▶ The support arm system must be assembled using suitable mounting materials (M12) (e.g. dowels or stud bolts).

**Work steps (Stainless steel enclosure "Exclusive II")**

(1) Prepare supply and data line(s).

(2) Prepare installation on the basis of the drilling template (see illustration 6 - 8).

(3) Install supply and data line(s) in the base.

(4) Fasten the supporting system.

(5) Pull supply and data line(s) through the cable glands provided into the enclosure. Ensure there is sufficient length.

(6) Mount the enclosure on the supporting system.

(7) Open the terminal compartments on the POLARIS and feed the supply and data line(s) through the cable glands and wire them. Block unused terminal compartments with a blanking plug.

(8) Close the door of the "Exclusive II" enclosure.

### 6.2.3 Floor mounting (Stainless steel enclosure "Exclusive II")

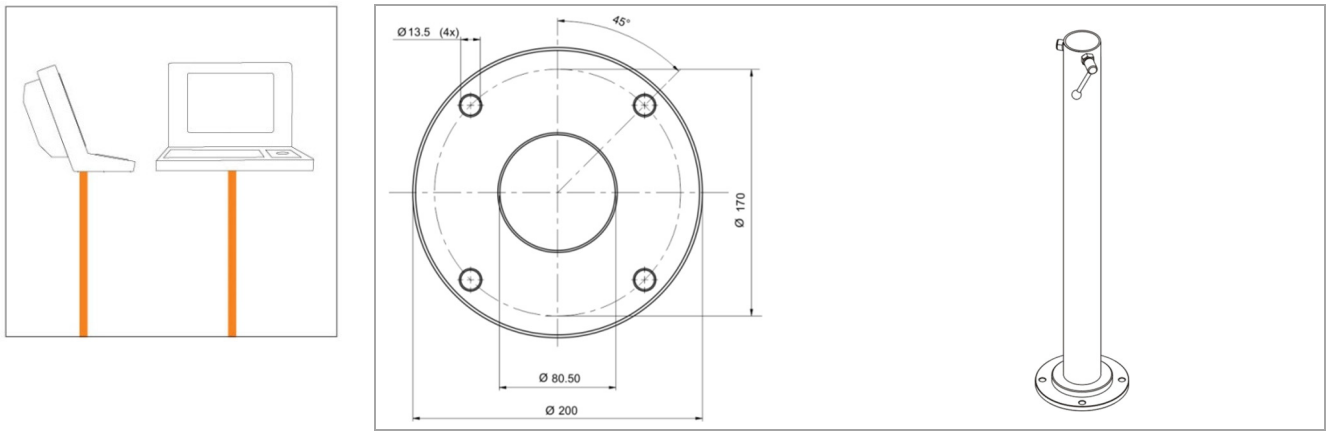



*Illustration 6: Drilling pattern - supporting system for floor mounting*

### 6.2.4 Wall mounting (Stainless steel enclosure "Exclusive II")

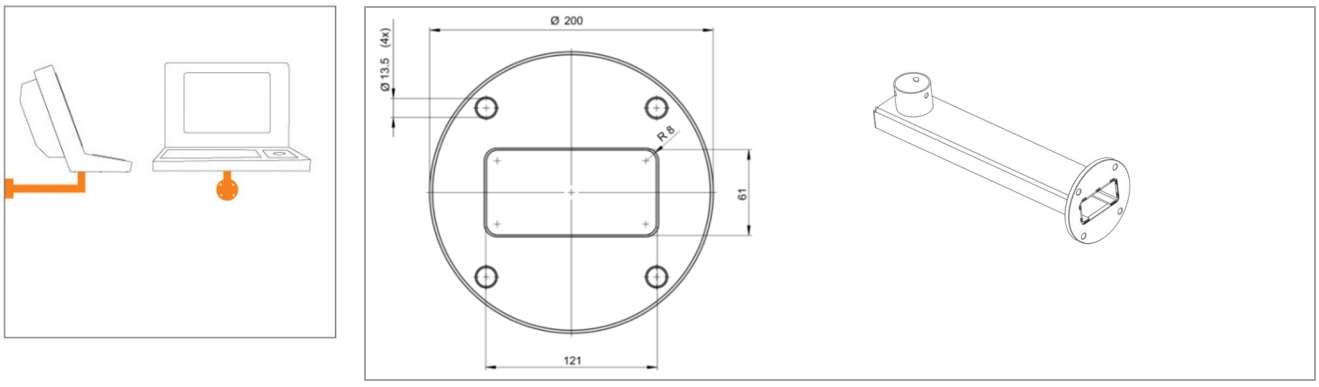



*Illustration 7: Drilling pattern - supporting system for wall mounting*

### 6.2.5 Table mounting swivel/tilt (Stainless steel enclosure "Exclusive II")

**CAUTION**

**Movable enclosure parts on the swivel-mounted enclosure.**
**There is a risk of injury by hands being crushed.**

- 3 people are needed for assembly/disassembly.
- When lifting the POLARIS, always pick up the swivel-mounted adapter and enclosure together.
- Hold up the POLARIS on both sides (two people), so that the third person can lay the supply and data line(s) in the supporting system. Make sure that your fingers do not get caught between the swivel adapter and the enclosure as you set up the POLARIS.

**CSA approval**

The system solutions table mounting have **not** been tested and approved in accordance with CSA. Must be checked separately in each individual case.

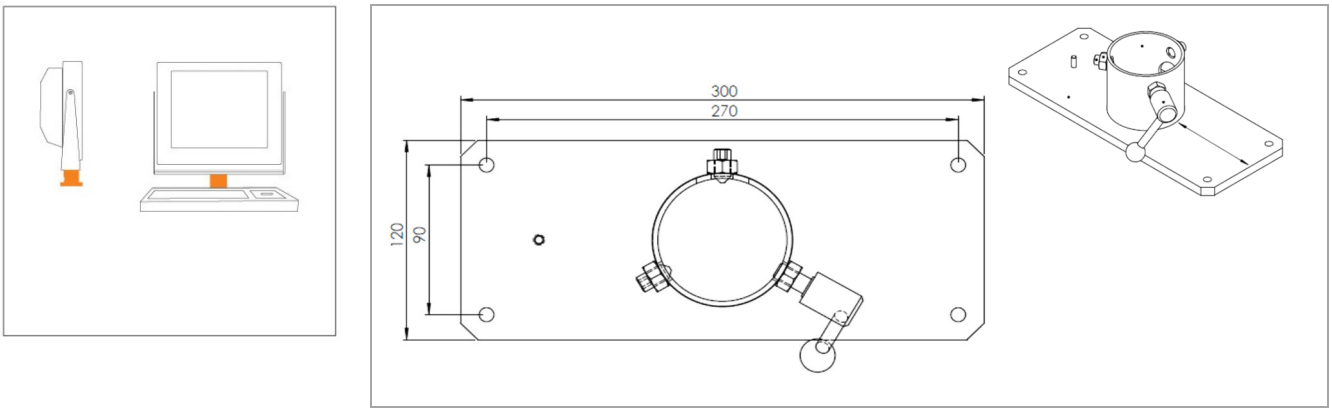



*Illustration 8: Drilling pattern - supporting system for table mounting*

**Rotating**

The POLARIS is fixed using two side T screws.

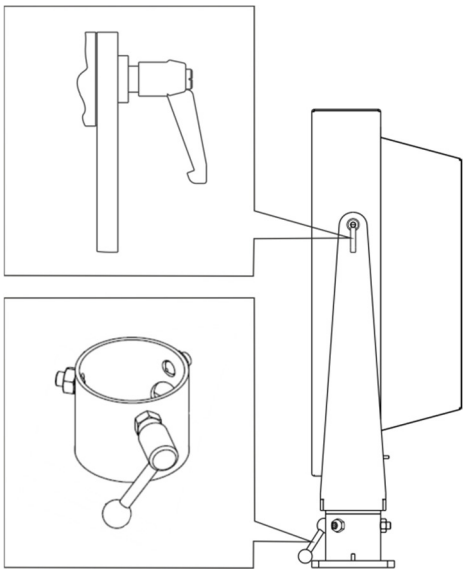
The angle of rotation can be changed once the screws have been loosened

**Inclining**

The POLARIS is fixed on the carrier system using two hexagon socket screws M10 and a T screw.

The angle of rotation can be changed once the screws have been loosened.

Tools: hex key 5 mm



# 6.3 Electrical installation

## 6.3.1 Installation guidelines

Only qualified personnel, i.e. trained electricians will have the required specialised knowledge to be able to do all the electrical work.

Familiarity with and the technically perfect implementation of the safety instructions described in this manual are preconditions for safe installation and commissioning.

- The user may do only the wiring at the terminals that are accessible to him/her (Ex i and Ex e terminal compartment).
- Any unused cable glands on the Ex e terminal compartment should be closed using an approved blanking plug.
- More extensive dismantling work on the device may be done only by the manufacturer or by persons authorised by the manufacturer for this purpose. The device is factory-sealed. Never open it!
- The equipotential bonding connection point must be connected to the equipotential bonding conductor in the hazardous area. Since the intrinsically safe circuits are galvanically connected to earth, equipotential bonding is required throughout the entire installation of the intrinsically safe circuits.
- The safety and accident prevention regulations applicable to the respective individual case must be observed.
- Devices must be properly installed first before they may be operated.
- It must be possible at all times to disconnect the devices from the voltage supply (in fixed installations by means of an all-pole mains isolating switch or fuse).
- It must be ensured that the supply voltage agrees with the specifications in this user manual and the tolerances must be observed. Use smoothed direct current.
- Malfunctioning cannot be ruled out if levels exceed or drop below the specified tolerances.
- If there is a power failure or if the power supply is interrupted, make sure the system has not been put into a dangerous, undefined condition.
- EMERGENCY STOP mechanisms must remain effective throughout all modes and states of operation.
- Connection cables (particularly data transmission cables) must be selected and laid in a way that ensures that capacitive and inductive interference will not have any adverse effect on the equipment. Appropriate measures must be taken to handle line interruptions to prevent any undefined states occurring.
- Wherever malfunctioning can cause material damage or personal injuries, additional external safety circuits must be provided (e.g. limit switch, mechanical interlocking devices etc.).

## 6.4 Terminal compartments

**DANGER**

**Sealed locking screw! The device is closed in the factory.**

**The explosion protection is lost if opened, and danger to life exists in an explosive atmosphere!**

▶ Do not open the locking screw!

**DANGER**

**Non-certified cable glands and non-sealed cable entries endanger the IP protection and accordingly the protection against explosions.**

**There is a risk of fatal injury in an explosive atmosphere!**

▶ Use Ex-certified cable glands.

▶ Close non-sealed cable entries.

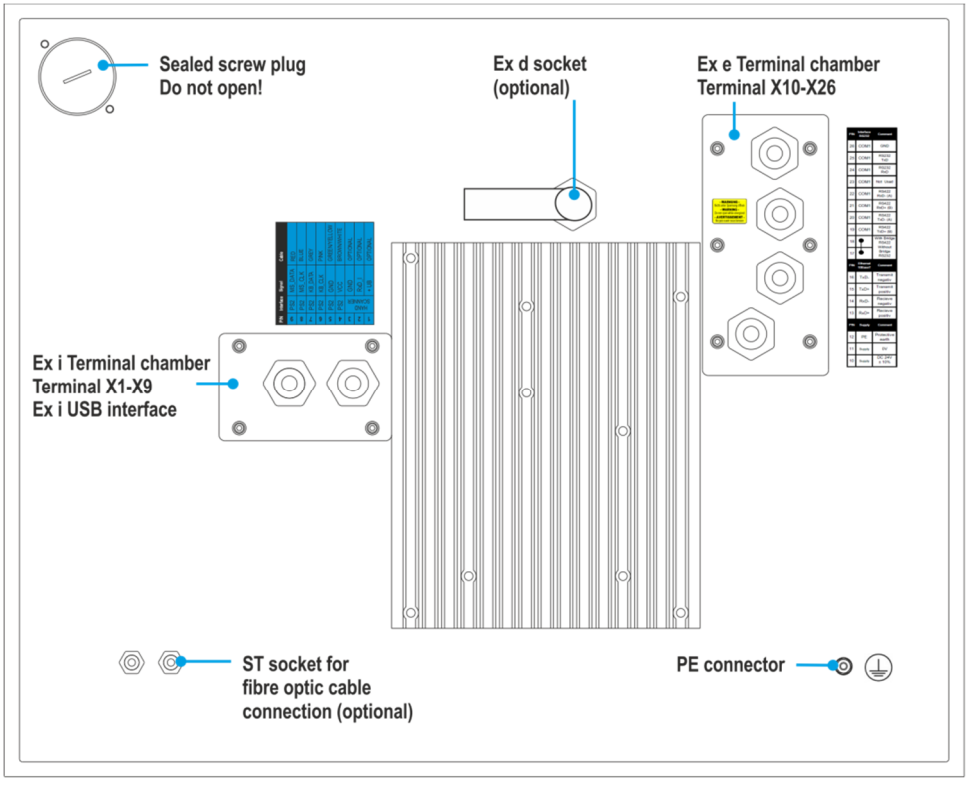



*Illustration 9: Pin assignment POLARIS*

All connection screws and terminals in the terminal compartment must be tightened with a torque spanner under consideration of the recommended torque of 0.4 Nm up to a max. 0.5 Nm.

## 6.5 PE conductor connection

**DANGER**

**Death or danger of injury as a result of no PE conductor connection.**
**There is no explosion protection.**

- ▶ Equipotential bonding with a core cross-section of at least 4 mm² is to be set up for the POLARIS (see Figure).
- ▶ Secure PE conductor connections against self-loosening.

**Stainless steel enclosure "Exclusive II"**

- ▶ Attach equipotential bonding to the enclosure.
- ▶ All moving parts must be earthed.
- ▶ Secure PE conductor connections against self-loosening.

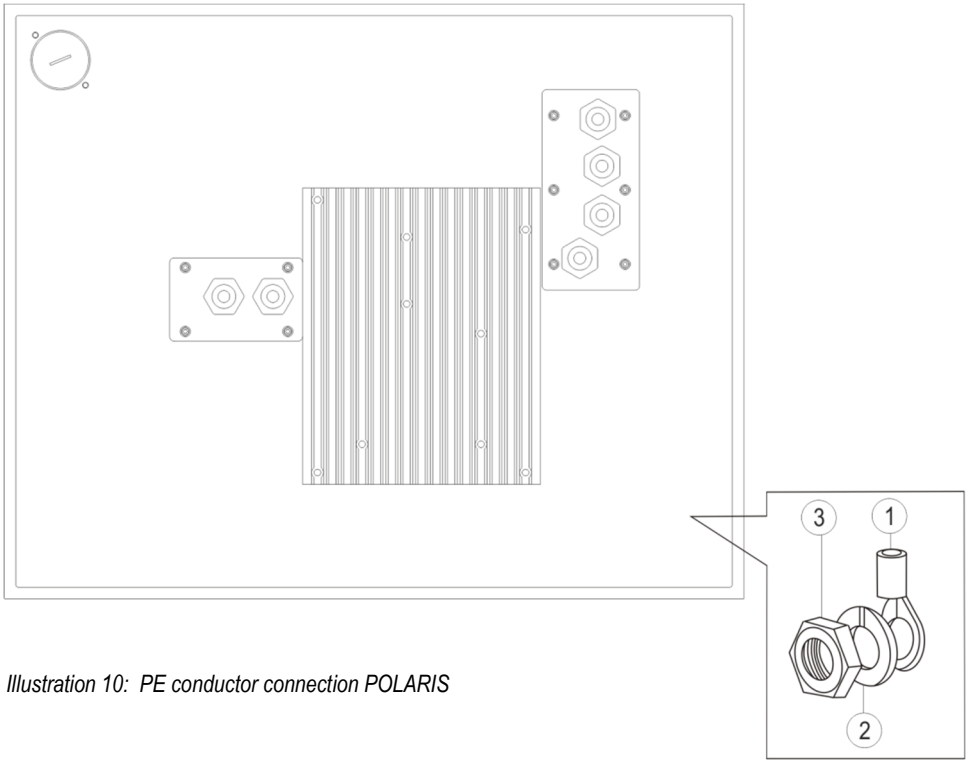



*Illustration 10: PE conductor connection POLARIS*

**Work steps**

(1) Washer on to earthing stud.

(2) Push non-sheathed cable with PE cable lug (1) on to earthing stud.

(3) Washer then position spring washer (2) on threaded bolt and secure with hexagonal nut (3), max. torque: 2.9 Nm.

(4) Lay cable close to enclosure so that it cannot become loose.

**ATTENTION**

**Device can be damaged by differences in potential!**

- ▶ Avoid differences in potential (see Chapter 6.8.5)

# 6.6 Ex e terminal compartments

## 6.6.1 Cable entries

When connecting cables and leads to supplies / communications equipment in increased safety protected areas, Ex certified cable entries must be used which are suitable for each type of cable and lead. You must maintain the protection concept “e” and include a suitable sealing element so that an IP rating of at least IP 54 is maintained.

The terminal area of the M20 cable glands is printed on the cable glands.

A different terminal area may only be substituted with a cable gland that complies with the current version of the approval.

The assembly instructions and installation conditions for the cable glands must be observed.

**Tightening torque of the cable glands**

| Torque | Connecting thread | Nut |
|---|---|---|
| non-armoured cables | 2.3 Nm | 1.5 Nm |
| armoured cables | 8 Nm | 5 Nm |

**DANGER**

**If the power supply is active there is a danger of life in an explosive atmosphere!**

- ▶ Disconnect the device before starting work.
- ▶ Only use certified cable glands that have been approved for the cable diameter of the connection cable.
- ▶ Unused cable glands must be sealed using an approved blanking plug.

### 6.6.2 Supply voltage terminal assignment)

| Mains connection variant AC | | | |
|---|---|---|---|
| **Terminal** | **Interface** | **Signal** | **Remarks** |
| X10 | Supply | L | AC 110 - 230 V ± 10 % |
| X11 | Supply | N | Neutral |
| X12 | Supply | PE | Protective earth |
| **Mains connection variant DC 24 V** | | | |
| **Terminal** | **Interface** | **Signal** | **Remarks** |
| X10 | Supply | + | DC 24 V ± 10 % |
| X11 | Supply | - | 0 Volt |
| X12 | Supply | PE | Protective earth |

### 6.6.3 Ethernet terminal assigment

| Configuration Ethernet | | | |
|---|---|---|---|
| **Terminal** | **Interface** | **Signal** | **Remarks** |
| X13 | Ethernet | RxD + | 100/10 BaseT Receive positive |
| X14 | Ethernet | RxD - | 100/10 BaseT Receive negative |
| X15 | Ethernet | TxD + | 100/10 BaseT Transmit positive |
| X16 | Ethernet | TxD - | 100/10 BaseT Transmit negative |

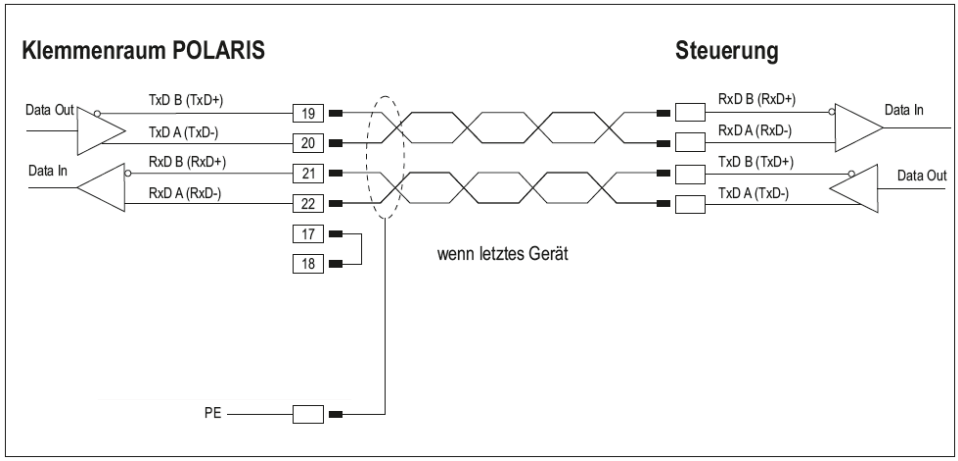
**Assignment RJ45 plug for Ethernet to POLARIS terminal block**


| Connection RJ45 | | POLARIS |
|---|---|---|
| **PIN** | **Signal** | **Terminal** |
| 1 | TX+ | X13 |
| 2 | TX- | X14 |
| 3 | RX+ | X15 |
| 4 | not used | |
| 5 | not used | |
| 6 | RX- | X16 |
| 7 | not used | |
| 8 | not used | |

### 6.6.4 RS422 interface

| Configuration RS422 | | | | |
|---|---|---|---|---|
| **Terminal** | **Interface** | **Signal** | **Remarks** | |
| X17<br>X18 | Termination<br>On/Off | | Jumper between terminal X17 and X18 for activation of the terminator resistors | |
| X19 | Interface COM 1 | TxD B (TxD+) | Transmission cable | Input |
| X20 | Interface COM 1 | TxD A (TxD-) | Transmission cablel | Input |
| X21 | Interface COM 1 | RxD B (RxD+) | Receiving cable | Input |
| X22 | Interface COM 1 | RxD A (RxD-) | Receiving cable | Input |

Connection PLC with RS422 interface to POLARIS.




Maximum length of the data line 1,000 m.

Setting of the terminal resistors at the start and end of the bus line is not necessary in most cases due to internal EMC measures. Depending on local circumstances, the data transmission may worsen in individual cases.

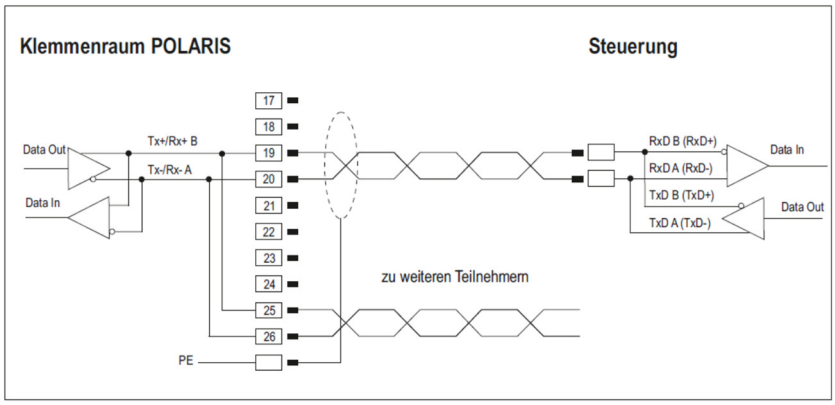
The appropriate pin assignment of the controller can be found in the manufacturer's interface description.

Under Os Windows 7 or 10 is only a point to point connection possible.

### 6.6.5 RS485 interface

| Configuration RS485 | | | |
|---|---|---|---|
| **Klemme** | **Schnittstelle** | **Signal** | **Bemerkungen** |
| X17 | N.C. | | |
| X18 | N.C. | | |
| X19 | Interface COM 1 | TxD B (TxD+) | to PLC |
| X20 | Interface COM 1 | TxD A (TxD-) | |
| X21 | N.C. | | |
| X22 | N.C. | | |
| X23 | N.C. | | |
| X24 | N.C. | | |
| X25 | Interface COM 1 | RxD B (RxD+) | to next POLARIS |
| X26 | Interface COM 1 | RxD A (RxD-) | |

Connection PLC with RS485 to POLARIS




Maximum length of the data line 1,000 m

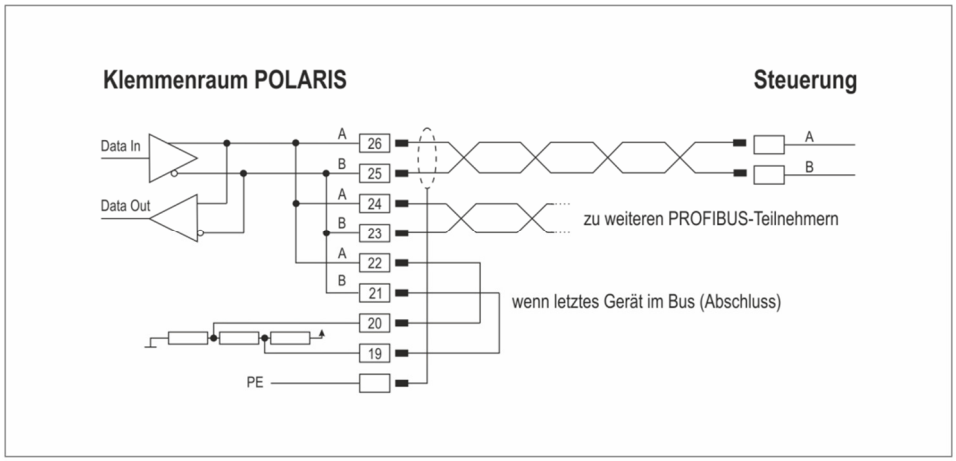
The appropriate pin assignment of the controller can be found in the manufacturer's interface description.

### 6.6.6 PROFIBUS-DP interface (optional)

The PROFIBUS DP (BARTEC) interface can be used only in conjunction with the BMS-Graf-pro 7 visualisation software

| Configuration PROFIBUS-DP | | | |
|---|---|---|---|
| **Terminal** | **Interface** | **Signal** | **Remarks** |
| X17 | not connected | | |
| X18 | not connected | | |
| X19 | Interface COM 1 | Termination B2 | Bridge for terminating network (B1-B2) |
| X20 | Interface COM 1 | Termination A2 | Bridge for terminating network (A1-A2) |
| X21 | Interface COM 1 | Termination B1 | Bridge for terminating network (B1-B2) |
| X22 | Interface COM 1 | Termination A1 | Bridge for terminating network (A1-A2) |
| X23 | Interface COM 1 | Out B | Signal B Output |
| X24 | Interface COM 1 | Out A | Signal A Output |
| X25 | Interface COM 1 | In B | Signal B Input |
| X26 | Interface COM 1 | In A | Signal A Input |

Connection of a controller via the PROFIBUS-DP interface of the POLARIS.




Maximum line length: see PNO specification.

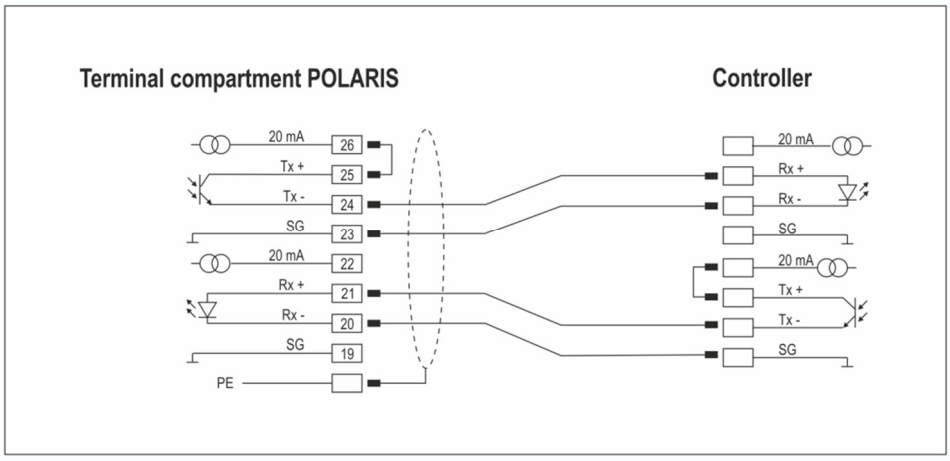
Pins 26-24-22, 25-23-21 are already connected inside.

See the interface description from the controller manufacturer for the relevant pin assignment of the controller.

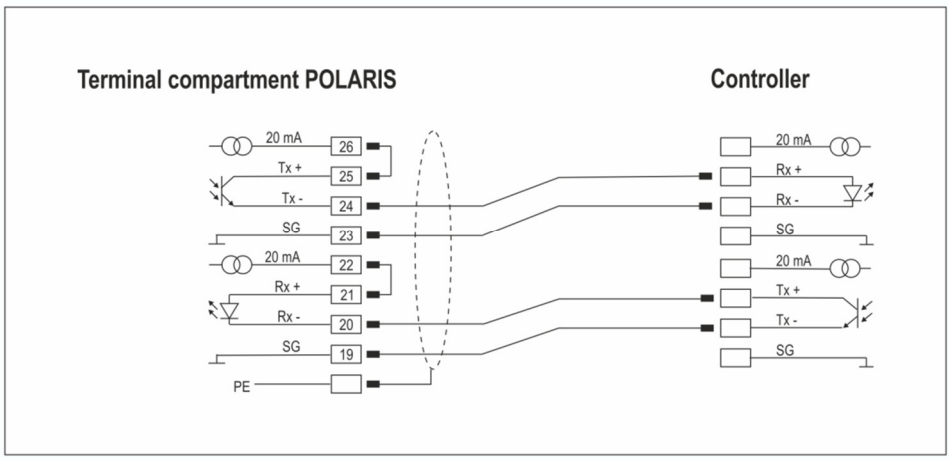
### 6.6.7 TTY interface (optional)

| Configuration TTY | | | |
|---|---|---|---|
| **Terminal** | **Interface** | **Signal** | **Remarks** |
| X17 | Not connected | | |
| X18 | Not connected | | |
| X19 | Interface COM 1 | GND | Signal ground for receiver |
| X20 | Interface COM 1 | Rx- | Cathode |
| X21 | Interface COM 1 | Rx+ | Anode |
| X22 | Interface COM 1 | 20 mA | Signal power source for receiver |
| X23 | Interface COM 1 | GND | Signal ground for transmitter |
| X24 | Interface COM 1 | Tx- | Emitter |
| X25 | Interface COM 1 | Tx+ | Collector |
| X26 | Interface COM 1 | 20 mA | Signal power source for transmitter |

The transmitter is active and the receiver is passive in both the POLARIS and the control.




In the POLARIS the transmitter and receiver are active. The control is completely passive.



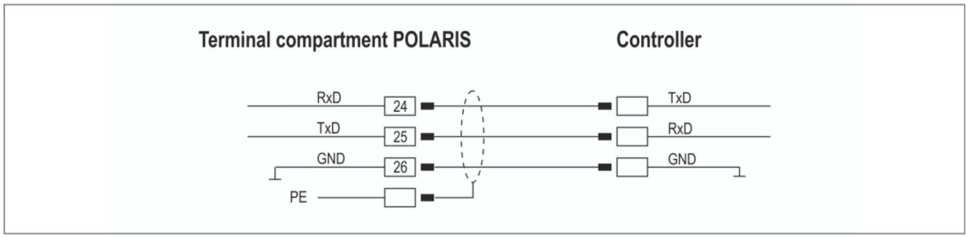

Maximum line length depending on baud rate of up to 1,000 m.

See the interface description from the controller manufacturer for the relevant pin assignment of the controller.

### 6.6.8 RS232 interface (optional)

| Configuration RS232 | | | |
|---|---|---|---|
| **Terminal** | **Interface** | **Signal** | **Remarks** |
| X17 | Not connected | | |
| X18 | Not connected | | |
| X19 | Not connected | | |
| X20 | Not connected | | |
| X21 | Not connected | | |
| X22 | Not connected | | |
| X23 | Not connected | | |
| X24 | Interface COM 1 | RxD | Receive |
| X25 | Interface COM 1 | TxD | Transmit |
| X26 | Interface COM 1 | GND | Signal ground |

Connection of a controller via RS232 interface of the POLARIS.



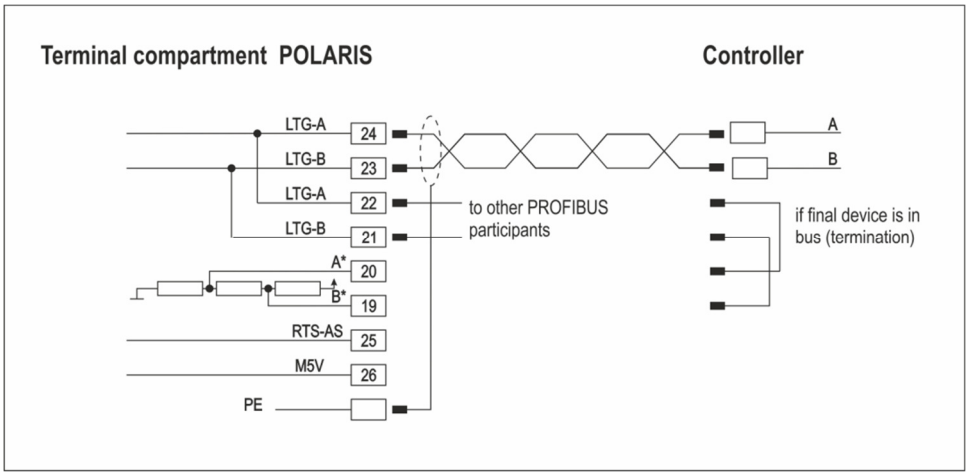

Maximum length of the data line 15 m.

See the interface description from the controller manufacturer for the relevant pin assignment of the controller.

### 6.6.9 Siemens PROFIBUS-DP interface (optional)

| Configuration Siemens PROFIBUS (supported only WinCC flexible) | | | |
|---|---|---|---|
| **Terminal** | **Interface** | **Signal** | **Remarks** |
| X17 | Not connected | | |
| X18 | Not connected | | |
| X19 | Interface COM 1 | B* | Termination |
| X20 | Interface COM 1 | A* | Termination |
| X21 | Interface COM 1 | LTG-B | Out B |
| X22 | Interface COM 1 | LTG-A | Out A |
| X23 | Interface COM 1 | LTG-B | In B |
| X24 | Interface COM 1 | LTG-A | In A |
| X25 | Interface COM 1 | RTS-AS | |
| X26 | Interface COM 1 | M5V | |

Connection of a controller via a Siemens PROFIBUS-DP interface of the POLARIS.




Maximum line length: see PNO specification.

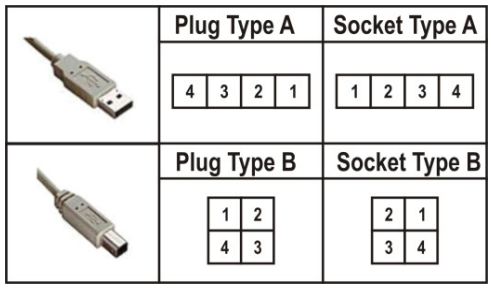
Pins 24-22, 23-21 are already connected inside.

See the interface description from the controller manufacturer for the relevant pin assignment of the controller.

### 6.6.10 USB interface (optional)

| Configuration USB | | | |
|---|---|---|---|
| **Terminal** | **Interface** | **Signal** | |
| X17 - X22 | not connected | | |
| X23 | USB | VCC | +5 V |
| X24 | USB | Data- | USB data signal |
| X25 | USB | Data+ | USB data signal |
| X26 | USB | GND | |

The individual conductors are colour-coded in a 4-wire USB cable as follows:




| Panel PC | USB connection | Colour | Function |
|---|---|---|---|
| X23 | 1 | RD | VCC (+5 V) |
| X26 | 4 | BK | GND |
| X25 | 3 | GN | + Data |
| X24 | 2 | WH | - Data |

The maximum length of a lead should not exceed 2 m.

Maximum current: 300 mA.

When configuration the HMI (Outside the Ex area) it is recommended to use an external USB HUB (USB 2.0) to work.

### 6.6.11 Interface RS422/USB (optional)

| Configuration RS422/USB | | | | |
|---|---|---|---|---|
| **Terminal** | **Interface** | **Signal** | | |
| X17 - X18 | not connected | | | |
| X19 | COM 1 | TxD B (TxD+) | Transmission cable | Input |
| X20 | COM 1 | TxD A (TxD-) | Transmission cable | Input |
| X21 | COM 1 | RxD B (RxD+) | Receiving cable | Input |
| X22 | COM 1 | RxD A (RxD-) | Receiving cable | Input |
| X23 | USB | VCC | +5 V | |
| X24 | USB | Data- | USB data signal | |
| X25 | USB | Data+ | USB data signal | |
| X26 | USB | GND | | |

## 6.7 Ex i terminal compartment

Do not connect the keyboard, mouse, trackball, touchpad, joystick while the power supply is active.

**DANGER**

**Accessories which have not been approved jeopardise the explosion protection. Danger to life exists in an explosive atmosphere!**

▶ Only use POLARIS accessories!

The cover for the Ex i terminal compartment need not be used when deploying a protective enclosure with protection class of at least IP20.

### 6.7.1 Connection of Ex i keyboard to the POLARIS (optional)

| PS/2 for input devices | | | | | |
|---|---|---|---|---|---|
| **Terminal** | **Interface** | **Colour** | **Signal** | **Remarks** | |
| X4 | PS/2 | WH/BR | VCC | Supply voltage | |
| X5 | PS/2 | GN/YE | GND | Mass connected to protective earth | |
| X6 | PS/2 | PK | KB_CLK | Keyboard | clock signal |
| X7 | PS/2 | GR | KB_DATA | Keyboard | data signal |
| X8 | PS/2 | BL | MS_CLK | Mouse | clock signal |
| X9 | PS/2 | RD | MS_DATA | Mouse | data signal |

- Make the connection between the POLARIS Panel PC and the Ex i keyboard.
- Connection by means of a 1.80-metre-long connection cable
- Keyboard and mouse — Type 05-0068-0163
- Keyboard and trackball/joystick — Type 05-0068-0172
- Keyboard and touchpad — Type 05-0068-0183
- (Optional: 3-metre-long connection cable)

### 6.7.2 Ex i USB interface for BARTEC Ex i memory stick

**USB socket, 4-pole, Type A**

**ATTENTION**

**The Ex i interface has not been designed for USB devices with their own power supply. Damage to property through incorrect use!**

- ▶ Do not connect any USB equipment with its own power supply to the Ex i interface.

**Extension of the USB when using a protective enclosure (IP20)**

The USB wall bushings on the protective enclosure must correspond at least to protection class IP20.

The following types of cable should be used for the extension (max. 2 m).

Cable name: Inline E258105 AWM STYLE 2725, 80°C 30V VW-1
28AWGX1P, 24AWGX2C; USB 2.0 High speed cable

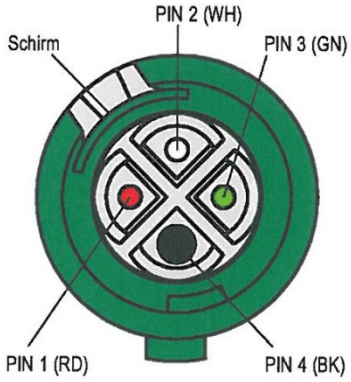
### 6.7.3 Ex d socket (optional)

**DANGER**

**Live plug-in connections! Risk of fatal injury if opened in an explosive atmosphere!**

- ▶ Before opening the protective cap on the Ex socket on the POLARIS, make sure there is no connection to voltage.
- ▶ Plug-in connections must be closed with a protective cap immediately after separation. The closing element must be positioned correctly.
- ▶ Use flanged socket outlets and appliance couplers only with appropriate plug-in connectors/couplings that are not damaged in any way.

Plug-in connectors in the (red insert) series cannot be combined with plugs in the new geometrically modified (green insert) series. When replacements are delivered, the plug-in system must be replaced in pairs.




| PIN | Signal | Colour |
|---|---|---|
| Pin 1 | VCC1 | RD |
| Pin 2 | Data- | WH |
| Pin 3 | Data + | GN |
| Pin 4 | GND | BK |

### 6.7.4 Connection of a BARTEC BCS 160ex hand scanner (optional)

Do not connect the hand scanner when there is an active power supply.

| Configuration of hand scanner connection (optional) | | | | |
|---|---|---|---|---|
| **Terminal** | **Interface** | **Signal** | **Remarks** | |
| X1 | Hand scanner | +UB | Supply voltage +5 V | |
| X2 | Hand scanner | RxD-I | Data input RS232-Signal | |
| X3 | Hand scanner | GND | Earth connected to protective ground | |
| Intrinsically safe data and supply current circuits<br><br>Terminal X1-X3 | | $U_0$ | 5.5 | V |
| | | $I_0$ | 440 | mA |
| | | $P_0$ | 1.25 | W |
| | | $R_i$ | 25 | Ω |
| | | $C_0$ | 55.8 | µF |
| | | $L_0$ | 0.2 | mH |

The BCS 160ex hand scanner series can only be used with the original connection cable from BARTEC.

**Connection cable to BCS 160ex Barcode hand scanner (pre-assembled)**

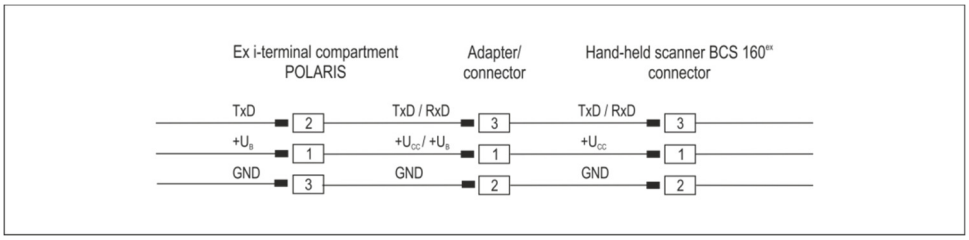
| Cable specified for connection to: | Scanner cable | Version | Length | BARTEC order no. |
|---|---|---|---|---|
| POLARIS supply module | RS232/RS422<br>RS232/RS422 | Smooth<br>spiral | 1.8 m<br>3.8 m | 17-21BE-M000/0000<br>17-21BE-M010/0000 |

**Connection cable to BCS 160ex BT Bluetooth hand scanner (pre-assembled)**

| Cable specified for connection to: | Scanner cable | Version | Length | BARTEC order no. |
|---|---|---|---|---|
| POLARIS supply module | RS232/RS422<br>RS232/RS422 | Smooth<br>spiral | 1.8 m<br>3.8 m | 17-21BE-M020/0000<br>17-21BE-M030/0000 |

**Terminal connection diagram**

BCS 160ex hand scanner to supply module by means of connector/adapter.



### 6.7.5 Fibre-optic port (optional)

For the fibre-optic transmission a fibre-optic converter is used inside the POLARIS and it converts the Ethernet/IP to fibre-optic signals (Ethernet/IP Ex e connection is not required).

For transmission a converter of the same type is needed for the non-hazardous area. This is included in the scope of supply.

**Technical Data**

| | |
|---|---|
| **Connection of the POLARIS** | ST connector |
| **External fibre-optic converter** | Connection of the ST connector/RJ 45 plug |
| **Power supply** | external power pack |
| **Data rate** | 100 MBit/s |
| **Permissible ambient temperatures** | |
| Storage/transport | -20 °C bis +80 °C |
| Operation | 0 °C bis +55 °C |
| **Multi-mode** | |
| Converter | MS400161 |
| Range | up to 2 km |
| Fibre type | 62.5/125 µm or 50/125 µm |
| Min. transmitting power | 19 dBm |
| Min. sensitivity | 31 dBm |
| Wave length | 1310 m |
| Plug connector | ST |
| **Single-mode** | |
| Converter | MS400163 |
| Range | up to 15 km |
| Fibre type | 9/125 µm |
| Min. transmitting power | 15 dBm |
| Min. sensitivity | 31 dBm |
| Wave length | 1310 m |
| Plug connector | ST |

**The POLARIS fibre-optic connection is approved for op pr. The following must be observed when installing.**

**⚠ DANGER**

**There is a risk of fatal injury in an explosive atmosphere!**

- ▶ Protect the ST sockets from impact effects.
- ▶ Make sure the plug on the fibre-optic cable is connected or closed before you put the POLARIS into operation.
- ▶ The fibre optic cable must laid with protection. (e.g. robust cabling, protective tubes or cable channel)

## 6.8 EMC (Electromagnetic compatibility)

This is a class A unit and can cause radio interference in residential areas; if it does, the owner/managing operator may be required to implement suitable measures and pay for loss or damage.

Only shielded conductors may be used as connecting conductors. This applies both to the data line and to all other conductors too.

The data lines must be stranded in pairs.
Example 2 x 2 x 0.75 mm² LIYCY TP.

As far as possible, separate conductors should be used for power supply and data

### 6.8.1 Voltage supply (AC- and DC- variants)

To supply voltage to the DC variant, it is necessary to use a regulated power supply unit with a power level of at least 5 A. The voltage supply at the place of installation may neither exceed nor drop below DC 24 V ± 10 %. Observe the voltage drop on the supply cable and correct if necessary.

The voltage drop in the DC variant of the supply line is calculated with the following formula:

| | | |
|---|---|---|
| $\Delta U$ | Voltage drop on the supply line at power supply voltage of DC 24 V | Max. 2.4 V |
| $\Delta U$ | Voltage drop on the supply line with maximum permissible mains adapter overvoltage DC 24 V +10 % (26.4 V) | Max. 4.8 V (until 10 % undervoltage is achieved) |
| $I$ | Electricity for a POLARIS | At least 4 A |
| $A$ | Cable cross-section of the supply line | |
| $\kappa$ | Specific conductance of copper | $56\frac{m}{\Omega \cdot mm^2}$ |
| $l$ | Length of the supply line (consider both the outgoing and return line) | |

$$R = \frac{l}{\kappa \cdot A} \quad R = \frac{\Delta U}{I} \qquad \Delta U = \frac{l}{\kappa \cdot A} \cdot I$$

If the voltage drop cannot be balanced out or the calculation produces excessive cable cross-sections, a separate mains adapter must be installed near the installation site.

Example: pressure-tight encapsulation or ex-free area on the outside of the building.

As a result of the connection of the power supply to the POLARIS, the earth for the power supply is connected to the PE. It is essential to ensure that the earth for the power supply on the POLARIS, if this is not electrically isolated, indicates no potential difference to the PE/PA.

### 6.8.2 Back-up fuse

In the DC variant The POLARIS PROFESSIONAL Panel PC series is protected internally by a 4-A time-lag fuse and in the AC variant it is protected by a 1.6 A time-lag fuse.The fuse may be triggered in the case of voltage dips or undervoltage.

| Internal fuse | | I2 value | External fuse | |
|---|---|---|---|---|
| **Little fuse 1.6 A T** | 1500A@250VAC | 6.83 $A^2$ s | Siba 1.6 A F | 1500A@250VAC |
| | | | Siba 2.0 A F | 1500A@250VAC |
| | | | Siba 2.5 A F | 1500A@250VAC |
| **Little fuse 2.5 A T** | 1500A@250VAC | 22.29 | Eska 1.6 A M | 1000A@250VAC |
| | | | Eska 2 A M | 1000A@250VAC |

We recommend protecting the POLARIS with an upstream fuse to prevent blowing the fuse inside the device. Only BARTEC can change the internal fuse.

Upstream fuse for AC: 1.6 A quick-acting (since June 2015: 2.5 A)
DC: 4 A quick-acting.

The $I^2$ value must be taken into consideration for other versions of fuses.

### 6.8.3 Interference suppression

Certain basic measures must be taken to ensure freedom from interference when the POLARIS are installed:

- The interference voltages coupled into the device via power, data and signal line and the electrostatic voltage caused by contact are to be dissipated through the equipotential bonding.
- The installation point should be as far as possible away from fields of electromagnetic interference. This is especially important if there are frequency converters in the vicinity. Under certain circumstances will it be advisable to set up partitions to isolate the graphic display from interference.
- If inductive devices are fitted in the vicinity (e.g. contactor, relay or solenoid coils), especially if they are powered from the same source, protective circuits (e.g. RC elements) must be installed.
- Power supply and data cables must be laid so as to avoid interference. This can be achieved, for example, by avoiding laying such cables in close proximity to high-current carrying cables.

### 6.8.4 Shielding

- Only cables with braided shielding should be used (recommended cover density > 80%).
- Sheet shielding should not be used.
- Generally, connection of the shielding at both ends results in optimum damping of all interference frequencies.
- Connection of the shielding at one side only may be more advisable if a difference in potential exists and no equipotential bonding cable can be laid.

### 6.8.5 Connection of shielding

A low impedance connection to the circuit protective conductor is important to ensure a low current fault path. When sub-D connectors are used, the shielding should always be connected to the metal casing of the sub-D plug.

The plug casing of some controllers is not always well connected to earth. In such cases it may prove advantageous to insulate the shielding from the sub-D plug of the controller and connect it directly to the protective earth conductor by means of a cable that should be kept as short as possible (0.75 mm² …1.5 mm²).

### 6.8.6 Examples of shielding connections

**ATTENTION**

**Device can be damaged by differences in potential!**

▶ Avoid differences in potential.

**Double-sided shield connection on the connecting cables:**

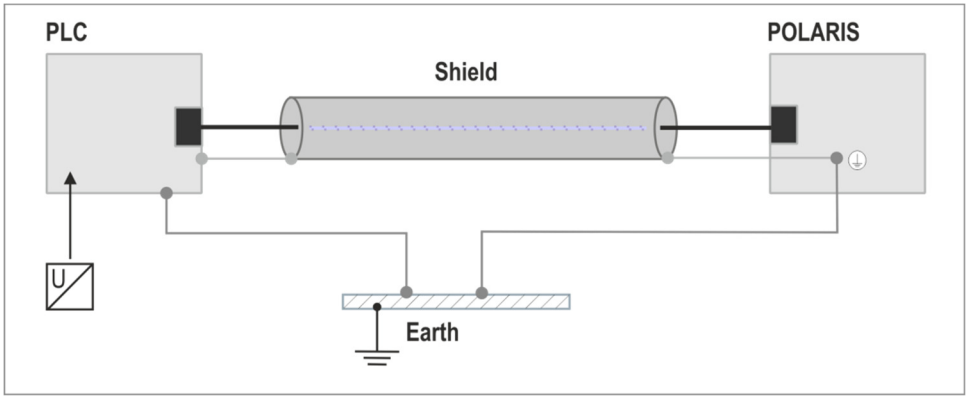



*Illustration 11: Example of double-sided shield connection*

Generally, connection of the shielding at both ends results in optimum damping of all interference frequencies. This method is to be recommended when there is good equipotential bonding between the individual units. In such cases it is possible to make use of the controller's voltage supply cable even if this is not electrically isolated.

**Single-sided shield connection on the connecting cables**

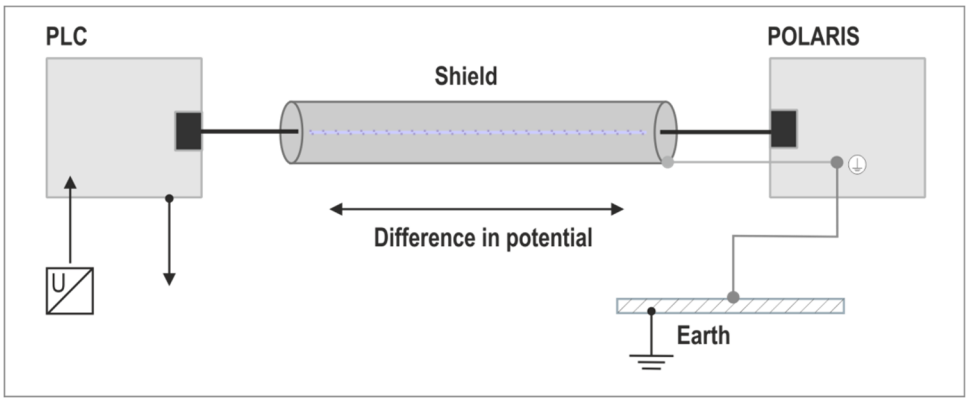



*Illustration 12: Example of single-sided shield connection*

Connection of the shielding at one end only is recommended when there is inadequate equipotential bonding, or none at all. In such cases an electrically isolated power supply unit must be used. Before the equipment goes into service the directions from the controller manufacturer regarding proper assembly and operation must be read carefully. They should then be applied taking full account of the recommendations we make here.

### 6.8.7 Ethernet cable

Als Ethernet Kabel ist ein Industrial Ethernet Kabel (4-adrig, geschirmt CAT 5) zu verwenden.

The Ethernet cable used an Industrial Ethernet cable (4-core, shielded CAT 5

As an example:

For highly flexible applications

Lapp: Type ETHERLINE® PN Cat.5 FD


For fixed application:

Eku: Type: Industrial Ethernet, 2YY(ST)CY 2x2x0,64/1,5-100GN


With 8- wire cable :

Unused wire must be grounded.

# 7. Commissioning

For electrical systems the relevant installation and operating specifications (e.g. Directives 2014/34/EU, BetrSichV and the applicable national ordinances, IEC 60 079-14 and the DIN VDE 0100 series) must be observed.

The operator of an electrical system in a hazardous environment must keep the operating equipment in an orderly condition, operate it correctly, monitor it and do the required maintenance and repairs.

Before commissioning the devices, check that all components and documents are there.

## 7.1 Final inspection

**Check the following requirements before commissioning the device:**

Only open the ex e terminal compartment with terminals for the supply and data line(s) once it has been ensured that no potentially explosive atmosphere is present and that the power supply has been turned off.

**POLARIS Panel PC**

- Has the reinforcement frame between the bracket and enclosure been inserted?
- Is there no damage to seals, cable connections or glass panel?
- Are the supply and data line(s) correctly wired?
- Is the PE connection correctly earthed?
- Have the supply and data line(s) been tightened in the screw terminals?
- Are all terminal compartments closed?
- Have all cable glands been tightened and all open cable entries closed with blanking plugs?

Only start the POLARIS (if a potentially explosive atmosphere is present) once the final inspection has been carried out.

# 8. Operation

The device can be put into operation after the final check has been made.

The POLARIS series does not have any ON/OFF switch.

## 8.1 Operating system

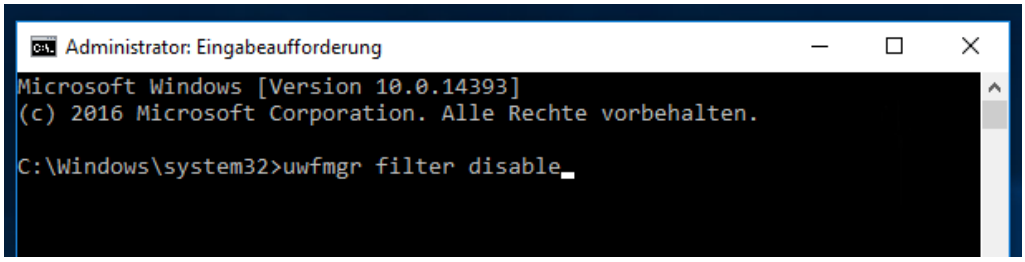
The POLARIS series devices have the Windows 7 Ultimate or the Windows 10 IOT Enterprise LTSB operating system pre-installed. According to the licence for Windows it is not permissible to use this system as an office PC.

## 8.2 Commissioning Software

### 8.2.1 Windows 10 Iot Enterprise LRSB

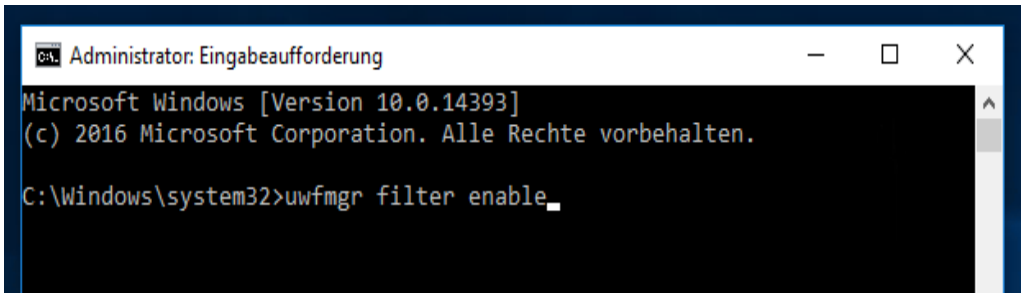
The devices are delivered with active writing filter (UWF). This UWF prevents that changes in the disk drive C: can be made.

To carry out changes the UWF must be deactivated. Moreover Command Prompt (CMD) must be started as an administrator and „uwfmgr filter disable“ executed.




After a reboot the UFW is deactivated and changes in the system can be protected.

The turn on the UWF`s is proceed as follows:
Start the Command Prompt (CMD) as an administrator. After the reboot of the device the command „uwfmgr filter enable“ activates the writing filter.




After the reboot the device is protected again.

Important:

1) To install a windows update, update a virus data bank and for changing other settings the UWF must be switched off. It can also cause problems if an applications package want to be saved on disk drive C:. In the worst case the RAM-Overlay (buffer of the changes of disk drive C:) can overrun which hinders the implementation of the applications.

2) Ist he UWF not activated switching off can lead to destruction of parts of the operating system up to the impossibility of another starting of the device.

### 8.2.2 Windows 7 Ultimate

By first introduction the operating system must be installed for the user, please follow the instructions on the screen.

The Windows 7 Ultimate operating systems do not support EWF!

## 8.3 On-board Bartec Recovery Solution

### 8.3.1 Bartec Recovery Solution

The Bartec HMI Polaris Smart devices are equipped with an On-Board-Recovery solution. The Bartec Recovery is a software package preloaded on the devices which serves the disregard of the device in the work state. In case of a mistake every device can be booted up in the Recovery mode to move afterwards the operating system into the work state.

No other software is necessary for the restoration. The Recovery service already disposes of all necessary program routines or the Recovery-Wizard to play in the operating system anew. The process can be carried out any time if necessary also on site. The duration of the process amounts approx. 25 minutes.

### 8.3.2 Start of the device in the Recovery mode

To change in the Recovery mode, one must press the F6 key while booting up the device. This possibility is available for approx. 10 sec. During this time the announcement "**Press F6 key to start Bartec Recovery"** appears on the screen.

**ATTENTION**

**All data on Windows partition are definitely extinguished during the recovery of process!**

▶ All self-provided data or use data should be protected from starting the recovery.

For the Recovery mode the hard disk contains a hidden partition to the storage of the Recover engine and the image file (effigy of the operating system). If the Recovery partition exists not any more or is damaged, the device can be restored only from an external medium or USB Flash drive.

The hidden partition is approx. 10 GB. That's why the available storage space on the hard disk is lower than the given capacity.

### 8.3.3 Recovery surroundings

The Recovery mode bases on a slender Windows operating system or so-called PE surroundings (Windows Preinstallation Environment). Besides, Windows starts only with a basic equipment of services and drivers.

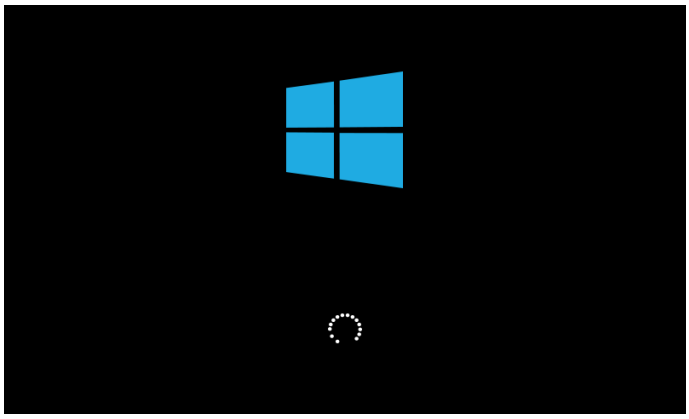


*Illustration 13: Start Windows PE.*

*As soon as the surroundings are completely loaded and are ready for use, the Recovery engine will check in the background whether the applications necessary for the device, tools and drivers exist. All information about internal expiries is indicated in the window CMD.*

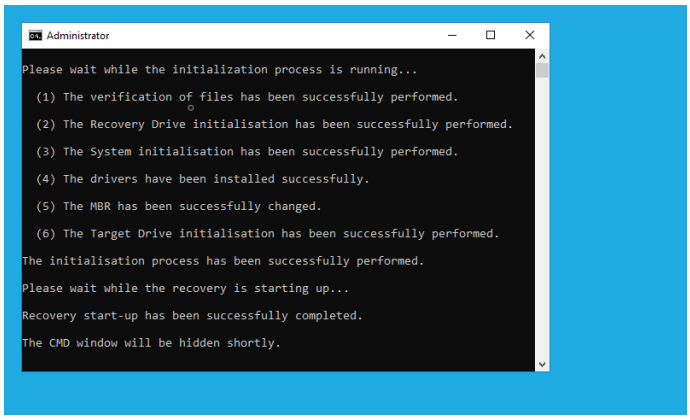



*Illustration 14: CMD window with information*

### 8.3.4 Recovery application

Should the check be concluded successfully, the Recovery application is begun (besides, the window CMD is automatically closed). Before the restoration of the device in the work state must be agreed Microsoft software Licence terms interactively.

In case of Windows 7 Embedded of operating system (Ultimate or standard) the licence terms on Windows 7 Embedded family are indicated in the window. In case of Windows 10 IoT of operating system the licence terms on Windows 10 IoT family are to be seen.

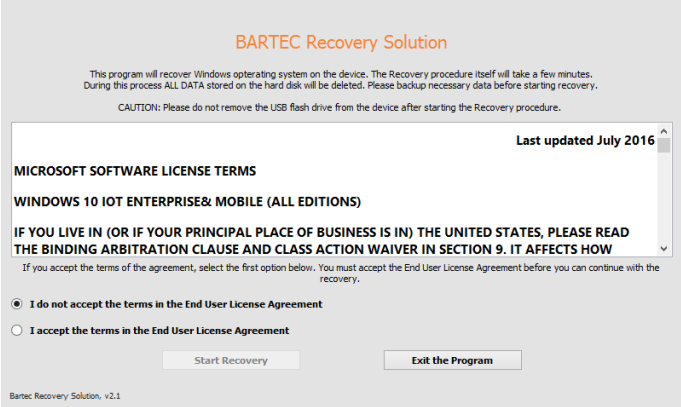



*Illustration 15: Licence terms*

To accept the licence terms, the option **"I accept the terms in the End User License Agreement"** must be activated or be selected. The button "Start Recovery" is released enclosed. With confirming the Recovery process is begun.

All other pictures in the instructions refer to Recovery of Windows 10 IoT Enterprise of operating system. In case of the restoration of Windows 7 Embedded Ultimate or standard of operating system the pictures look similar. Besides, all background expiries are identical, with the differences it is only about inscriptions.

The operation (navigating over window, selecting and activation of tax elements etc. ) takes place via keyboard input and mouse or Track ball-Clicks as well as by Touch.

In the next window all available Recovery functions are listed. In the upper area of the window there is information about the operating system which is played in by the Recovery programme. In the middle area there are the Recovery functions. Should all conditions be given, the function is active. Otherwise the function remains inactive.

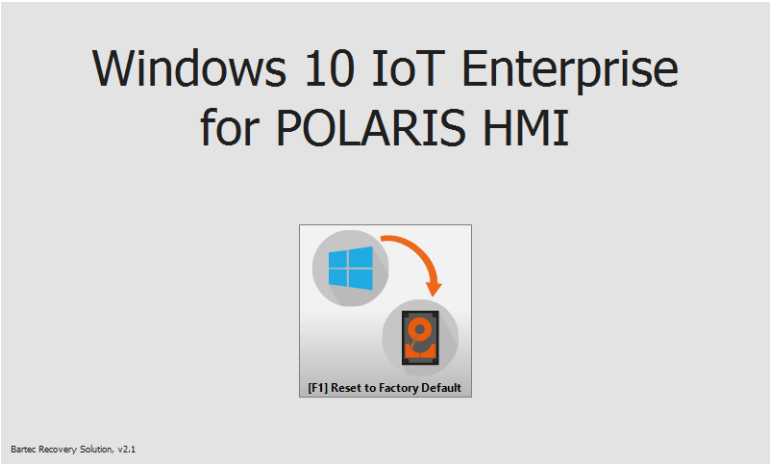



*Illustration 16: Choice of functions*

Device can be reset to factory settings

### 8.3.5 Restoration in the work state

With confirming the function with all matching background processes is begun immediately or without following security queries.

**ATTENTION**

**With starting the restoration of the operating system in the work state all data on the operating system partition get lost!**

▶ Contents and format of all other partitions on the hard disk are preserved consistently.

In the upper area of the window the inscription of the well-chosen function is indicated. In the next line – the inscription of the already running background process. Should a process be computable, the proportional issue appears in the next line how far the process is already concluded. As a rule all time-luxurious processes are computable. The progress beam in the middle of the window returns the graphic picture of the percent value. For the processes without percent issue the progress beam is indicated in the uncertain form.

**ATTENTION**

**All background processes are automated completely, therefore no intervention is necessary. In addition, some background processes run in s. g. Single fashion or they are sensitive to the other parallel processes and to Interrupts of external periphery devices!**

▶ To avoid the interruptions of all kind, should take place during the process no keyboard input, mouse, track ball-Clicks as well as no touching of the screen.

The Recovery begins with verifying (Calculate and comparisons of the test sum) to the available effigy file.

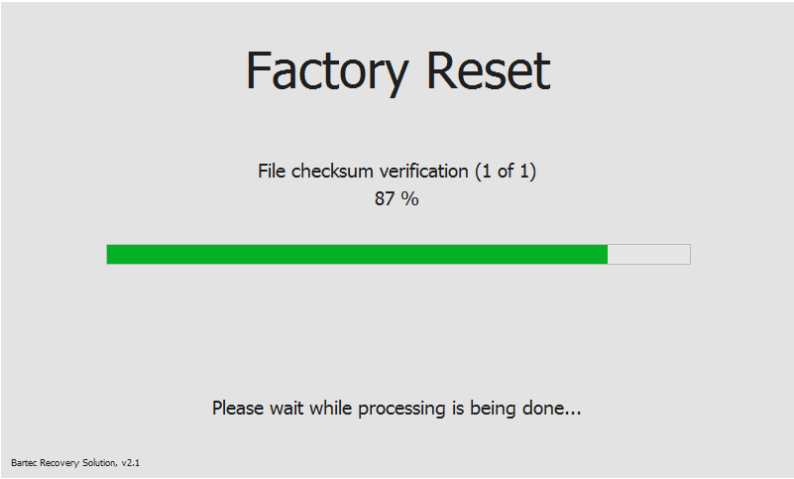



*Illustration 17: Verify to the effigy file*

After the successful check, the formatting of the operating system partition is begun.

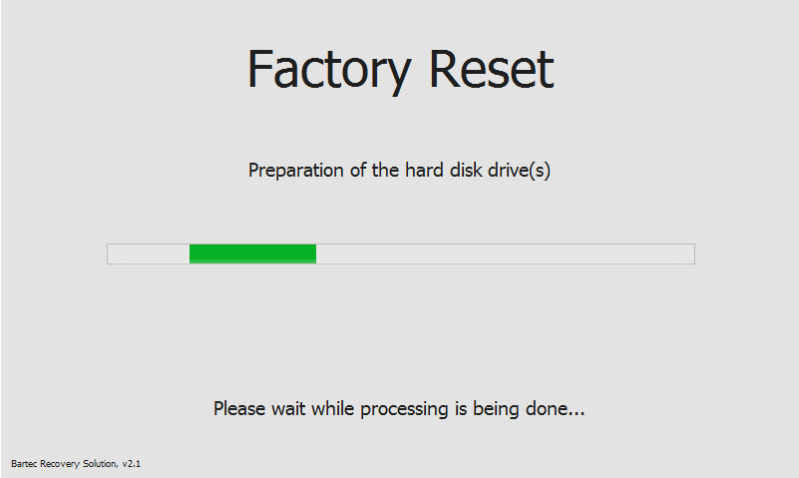



*Illustration 18: Prepare the partition*

After preparing the partition all files from the effigy image stored on the Recovery partition are unpacked and transferred on the operating system partition.

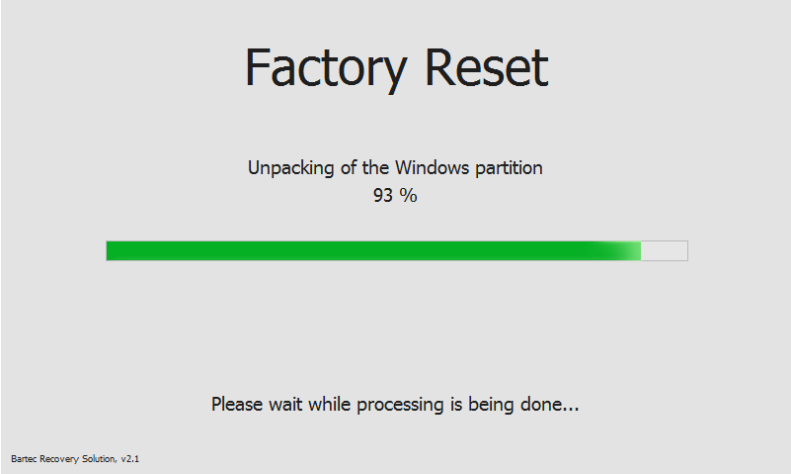



*Illustration 19: Transferred by system files on operating system partition*

Transferring of system files is the last process with the Widerherstellung of the operating system in the work state.

### 8.3.6 Finish the recovery

After the Recovery process is completely concluded, it is indicated suitable information in the window. A button in the middle of the window closes the Recovery surroundings and the device restart.

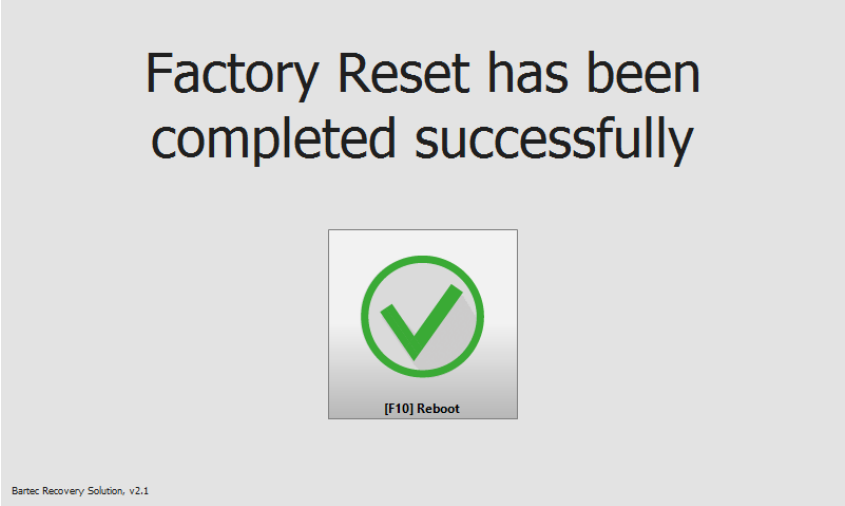



*Illustration 20: Successful closure of the recovery process*

After the new start of the device the operating system partition is active again and this restored operating system is begun.

The first start (so called: Ridge time boat) of the put back operating system can last some minutes. On this occasion, it is about two phases. During the first phase components of the device are recognised the hardware and are integrated into the operating system. During the second phase the final settings are put. Between the phases or within the phase the device is automatically restarted several times.

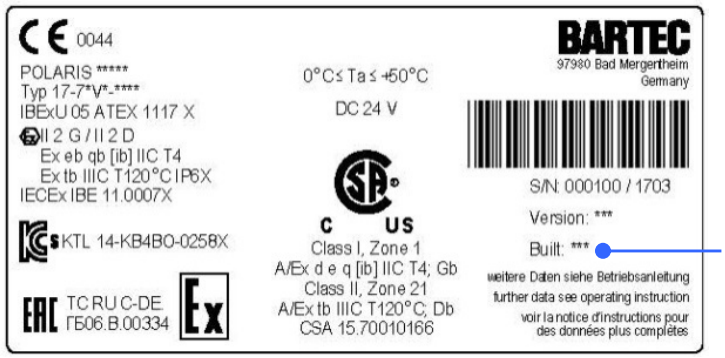
## 8.4 Recovery/Backup Function

The POLARIS can be restored to delivery status by means of a recovery stick.

The recovery flash drive is not included in the scope of supply.
If necessary, contact the following contact address: support-polaris@bartec.de

### 8.4.1 Recovery stick image

The recovery stick image for the POLARIS Panel PC can be found on the POLARIS type label.




Addition
e. g. Built 384

### 8.4.2 Backup

We expressly point out that it is the user's responsibility to make a backup of the POLARIS and all its functions!

We expressly recommend that such a backup of the POLARIS be saved on an external storage medium (USB stick [recovery stick], CD, DVD or suchlike) and/or in the company network!

### 8.4.3 Switching off and shutting down

Irrespective of the application, the Microsoft Windows operating system saves important data in the working memory during system operation. Before the PC or the POLARIS is switched off, this data must be saved on the hard disk.

**ATTENTION**

**Shutting down the POLARIS in an orderly fashion prevents malfunctioning in the operating system.**

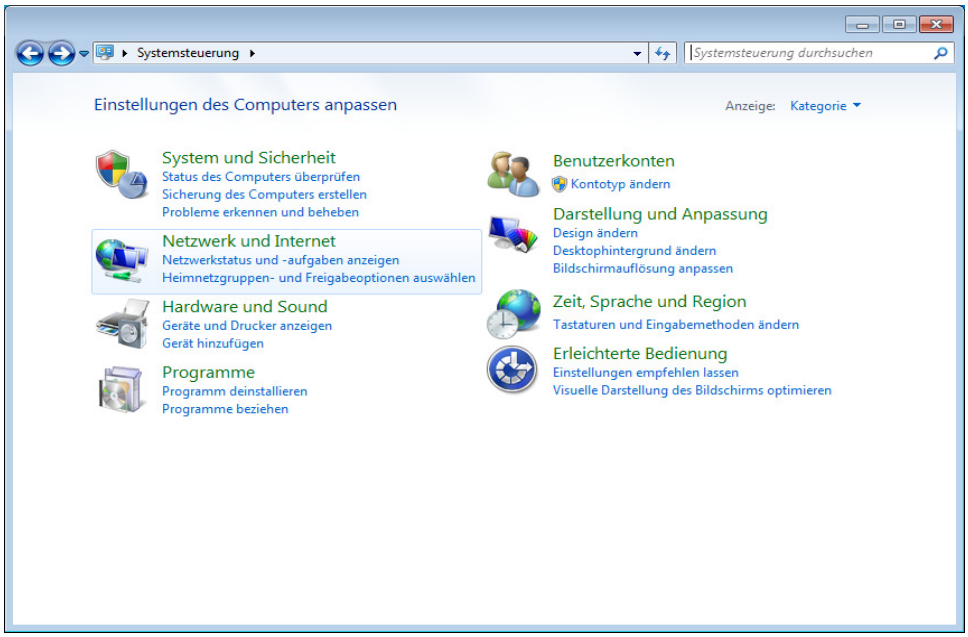
- ▶ Use the Windows button to shut down or switch off the POLARIS.
- ▶ Do not switch off the POLARIS until Windows informs the user that the data has been saved (appearance of the logout script).

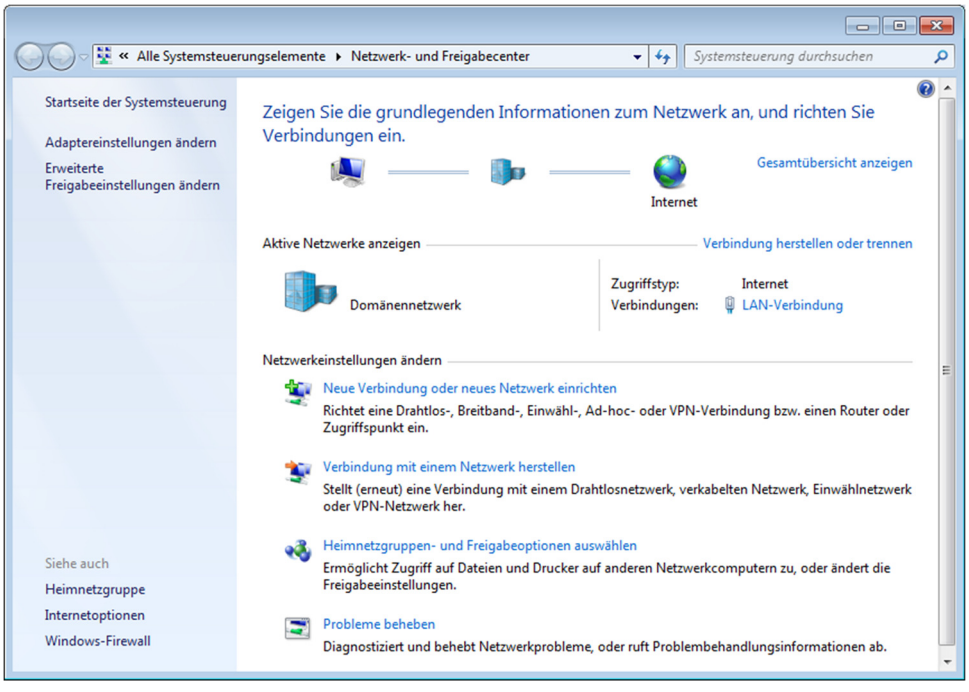
# 8.5 Network (Ethernet) setup

## 8.5.1 Requirements

Network (Ethernet) setup: Physical connection (connection of Ethernet cable to a network (e. g. switch, hub, server)

- Go to Start ⇨ Control panel <double click>.
- Mark "Network connections" and activate with <double click>.
- Select LAN connection with < double click >.



– To select the function Internet Protocol click (figure 1) on sub item "Properties"
– With a < double click > on Internet Protocol (figure 2) the function is activated.

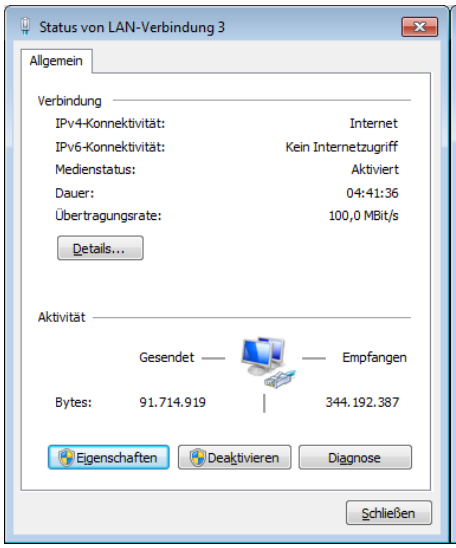



*Figure 1*

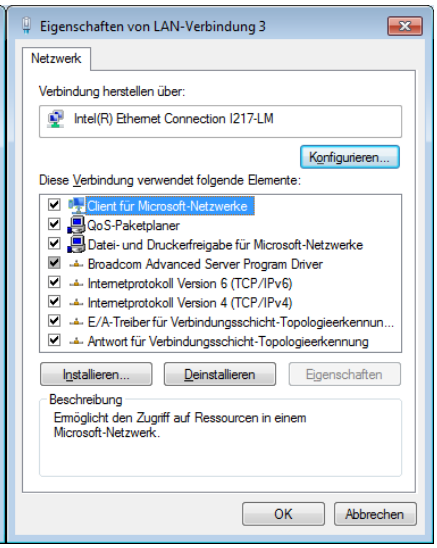



*Figure 2*

– The chart (figure 3) appears when the network and a DHCP server are available.
– Configuration example (figure 4) when no DHCP server is available (connection via switch or HUB).

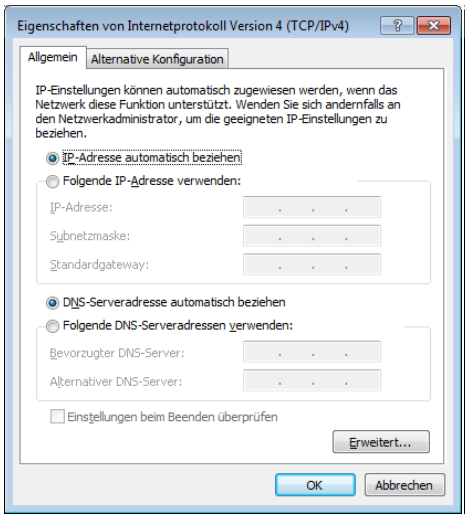



*Figure 3*

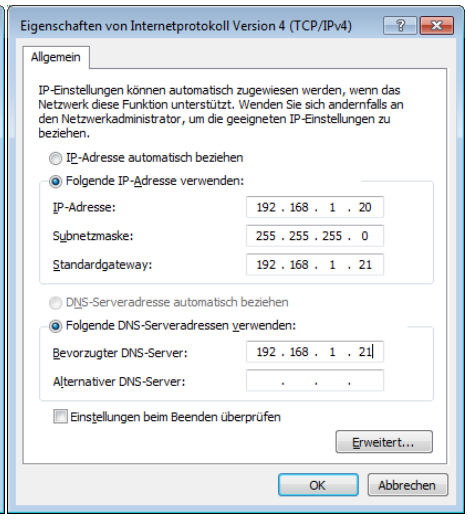



*Figure 4*

## 8.6 Touch screen

In the device variants with touchscreen, the touchscreen software is pre-installed already.

The touch screen software is available for download at: http://automation.bartec.de.

# 9. Faults and troubleshooting

| Fault | Possible cause | Remedy |
|---|---|---|
| **Nothing is shown on the display** | No power supply present | Check connection of the power supply |
| | External back-up fuse has tripped | Check fuse |
| | Internal fuse has tripped | Return to the manufacturer |
| | Backlighting faulty | Return to the manufacturer<br><br>Replace the backlighting |
| | Device malfunction | Return to the manufacturer |
| **No current consumption** | No power supply present | Check connection of the power supply |
| | External back-up fuse has tripped | Check the fuse |
| | Internal fuse has tripped | Return to the manufacturer |
| | Device malfunction | Return to the manufacturer |
| **Display turns on and off constantly** | Power supply is too low. | Check diameter and length of cable. see Chapter 5.8 |
| **Display always has stripes.** | Display is defective or the device doesn't boot up. | Return to the manufacturer |
| **Dark background** | The backlighting is coming to the end of its service life. | Return to the manufacturer<br>Replace the backlighting |
| | Power Save activated | Press any button. |
| **Touchscreen not working** | Driver deactivated<br>Driver not installed | Check driver installation or install a driver. |
| **Mouse cursor and point of contact on the screen do not agree** | Touchscreen calibrated incorrectly. | Calibrate touchscreen. |

# 10. Maintenance, inspection, repair

Only trained and qualified personnel may commission and do maintenance work on the POLARIS! Trained qualified personnel are people who are familiar with the installation, assembly, commissioning and operation of the POLARIS, have been instructed about the risks and have the appropriate qualifications by virtue of the work they do.

## 10.1 Maintenance intervals

The mechanical status of the devices should be checked at regular intervals. The length of the maintenance intervals depends on the ambient conditions. We recommend checking at least once a year. Regular maintenance is not necessary if operated appropriately in conformance with the installation instructions and with due consideration to the ambient conditions.

**⚠ DANGER**

**Prevent electrostatic charging in hazardous (potentially explosive) areas.**

**There is a risk of a fatal injury in an explosive atmosphere!**

▶ Take devices out of hazardous areas before wiping them dry or cleaning them!

**ATTENTION**

**There is a risk of condensation forming when installed outside. Damage to property may occur if this is not checked!**

▶ Regularly check the POLARIS for the formation of condensation.

## 10.2 Inspection

Under EN/IEC 60079-17 and EN/IEC 60079-19 the owner/ managing operator of electrical installations in hazardous areas is obliged to have these installations checked by a qualified electrician to ensure that they are in a proper condition.

## 10.3 Maintenance and repair work

Adhere to the applicable regulations under EN/IEC 60079-17 and EN/IEC 60079-19 when servicing, doing maintenance work on and testing associated operating equipment!

Assembly/disassembly, operating and maintenance work may be done only by trained specialists. The statutory rules and other binding directives on workplace safety, accident prevention and environmental protection must be observed.

### 10.3.1 Instructions for repairs

If you wish to send in a defective device for repair, please read the RMA procedure guidance first. Then fill in and sign the RMA (Return Merchandise Authorisation) form and send it to our "Retouren Center".

E-Mail: services@bartec.de
Fax: +49 7931 597-119

We cannot guarantee any contractually agreed processing times for devices that are sent in without an RMA number.

The RMA guide and the RMA form are available on our homepage for downloading.

http://www.bartec.de

Have you any questions? Write us an e-mail or call us.

E-Mail: services@bartec.de
Phone: +49 7931 597-444

# 11. Disposal

The component of the POLARIS contains metal, plastic parts and electronic components.

Our devices are intended as professional electric devices for business use only, referred to as B2B devices under the WEEE-Directive. The WEEE directive sets the framework for waste electric and electronic equipment handling procedures which are to apply throughout the EU. This means that you are not permitted to dispose of this equipment in normal household refuse. It should not be given to the collection sites set up by the public waste management authorities either but instead it should be disposed of in a separate collection in an environmentally sound manner.

Any product we supply can be returned by our customers to us when the time has come to dispose of it. We will ensure that it is disposed of in accordance with the respective applicable statutory regulations.

The sender pays the costs of the dispatch/packaging.

# 12. Dispatch and packaging instructions

**ATTENTION**

**Sensitive Devices! Damage to property due to incorrect packaging!**

- ▶ Take the device's maximum weight into account when selecting the packaging and mode of transport.
- ▶ Use the original packaging for transportation.

# 13. Accessories, spare parts

**Included in the scope of the delivery:**

| Name | | Order no. |
|---|---|---|
| POLARIS Panel PC with Windows® 7 Embedded MUI or Windows® 7 Ultimate | | |
| Driver for Mainboard and Touch | | |
| Mounting clamps | | |
| Reinforcement frame | POLARIS 15" / 15" Sunlight | 05-0205-0009 |
| | POLARIS 17.3" | 05-0205-0013 |
| | POLARIS 19.1" | 05-0205-0010 |
| | POLARIS 24" | 05-0205-0012 |

**Accessories/spare parts for POLARIS Panel PCs:**

| Name | | | | Order no. |
|---|---|---|---|---|
| Keyboard in respective national language | | | | 17-71VZ-40.0 |
| Input devies | Mouse | | | 17-71VZ-1000 |
| | Trackball | | | 17-71VZ-2000 |
| | Touchpad | | | 17-71VZ-3000 |
| | Joystick with button | | | 17-71V2-9000 |
| Connection cable | for keyboard and mouse | | 1.8 m | 05-0068-0163 |
| | | | 3.0 m | 03-0068-0204 |
| | for keyboard and trackball/joystick | | 1.8 m | 03-0068-0172 |
| | | | 3.0 m | 05-0068-0205 |
| | for keyboard and touchpad | | 1.8 m | 03-0068-0183 |
| | | | 3.0 m | 03-0068-0206 |
| Ex i memory stick | | | | 17-71VZ-5000/0100 |
| Enclosure "Exclusive II" | POLARIS 15" / 15" Sunlight | | | 03-8900-0224 |
| | POLARIS 17.3" | | | on request |
| | POLARIS 19.1" | | | 03-8900-0225 |
| | POLARIS 24" | | | on request |
| Support system | Stand for floor mounting | | | 05-0005-0050 |
| | Support arm for wall mounting | | | 05-0005-0058 |
| | Stand for desk mounting | | | 05-0005-0070 |
| Enclosure for keyboard and mouse | | | | 05-00410277 |
| Mounting clamps | 4 pieces | | | 05-0091-0111 |
| | 6 pieces | | | 05-0091-0112 |
| Fibre optic converter | | | | on request |
| LAN STP cable | CAT.7 4x2x23 AWG, outer diameter: 7.9 mm | | | 02-4082-0002 |
| | CAT.7 4x2x22 AWG, outer diameter: 18 mm; armoured | | | 02-4082-0004 |
| Visualization software | BMS-Graf-Pro 7 | | | 17-28TF-0075 |
| BCS 160$^{ex}$ hand scanner | | | | 17-21BA-M3.S.-…… |
| External converter | Converter external | RS232-RS422 | Non Ex | 03-9600-0258 |
| Original packing | POLARIS 15" / 15" Sunlight | | | 04-9035-0007 |
| | POLARIS 17.3" | | | on request |
| | POLARIS 19.1" | | | 04-9035-0008 |
| | POLARIS 24" | | | on request |

# 14. Order numbers

## POLARIS Panel PC 15"

**Ordering information**

| Description | Code no. | Interfaces | Code no. | Operating system | Code no. | Variant | Code no. | Computer capacity | Code no. |
|---|---|---|---|---|---|---|---|---|---|
| Panel PC 15" without touchscreen | 4 | USB Ex e/RS422 (recommended version) | 76 | Windows 7 Ultimate 32bit incl. Recovery (at 4 GB RAM) | S | AC | 0 | 100 GB HD | 0 |
| | | | | Windows 10 IOT LTSB 32bit incl. Recovery (at 4 GB RAM) | K | | | | |
| Panel PC 15" with touchscreen | 6 | Further Interface combinations on request | XX | Windows 10 IOT LTSB 64bit incl. Recovery (at 8 GB RAM) | L | DC | 2 | 128 GB SSD | 2 |

**Complete order no. 17-71V1-** ☐0☐☐/☐**000**☐☐**00**
Please insert correct code. Technical data subject to change without notice.
You will find the accessories with order details on the accessories pages.

## POLARIS Panel PC 15" Sunlight

| Description | Code no. | Interfaces | Code no. | Operating system | Code no. | Variant | Code no. | Computer capacity | Code no. |
|---|---|---|---|---|---|---|---|---|---|
| Panel PC 15" Sunlight with touchscreen | 6 | USB Ex e/RS422 (recommended version) | 76 | Windows 7 Ultimate 32bit incl. Recovery (at 4 GB RAM) | S | AC | 0 | 100 GB HD | 0 |
| | | | | Windows 10 IOT LTSB 32bit incl. Recovery (at 4 GB RAM) | K | | | | |
| | | Further Interface combinations on request | XX | Windows 10 IOT LTSB 64bit incl. Recovery (at 8 GB RAM) | L | DC | 2 | 128 GB SSD | 2 |

**Complete order no. 17-71V1-** ☐2☐☐/☐**000**☐☐**00**
Please insert correct code. Technical data subject to change without notice.
You will find the accessories with order details on the accessories pages.

## POLARIS Panel PC 19"

| Description | Code no. | Interfaces | Code no. | Operating system | Code no. | Variant | Code no. | Computer capacity | Code no. |
|---|---|---|---|---|---|---|---|---|---|
| Panel PC 19.1" without touchscreen | 5 | USB Ex e/RS422 (recommended version) | 76 | Windows 7 Ultimate 32bit incl. Recovery (at 4 GB RAM) | S | AC | 0 | 100 GB HD | 0 |
| | | | | Windows 10 IOT LTSB 32bit incl. Recovery (at 4 GB RAM) | K | | | | |
| Panel PC 19.1" with touchscreen | 7 | Further Interface combinations on request | XX | Windows 10 IOT LTSB 64bit incl. Recovery (at 8 GB RAM) | L | DC | 2 | 128 GB SSD | 2 |

**Complete order no. 17-71V1-** ☐0☐☐/☐**000**☐☐**00**
Please insert correct code. Technical data subject to change without notice.
You will find the accessories with order details on the accessories pages.

## POLARIS Panel PC 17,3"

| Description | Code no. | Interfaces | Code no. | Operating system | Code no. | Variant | Code no. | Computer capacity | Code no. |
|---|---|---|---|---|---|---|---|---|---|
| Panel PC 17.3" W without touchscreen | E | USB Ex e/RS422 (recommended version) | 76 | Windows 7 Ultimate 32bit incl. Recovery (at 4 GB RAM) | S | AC | 0 | 100 GB HD | 0 |
| | | | | Windows 10 IOT LTSB 32bit incl. Recovery (at 4 GB RAM) | K | | | | |
| Panel PC 17.3" W with touchscreen | F | Further Interface combinations on request | XX | Windows 10 IOT LTSB 64bit incl. Recovery (at 8 GB RAM) | L | DC | 2 | 128 GB SSD | 2 |

**Complete order no. 17-71V1-** ☐0☐☐/☐**000**☐☐**00**
Please insert correct code. Technical data subject to change without notice.
You will find the accessories with order details on the accessories pages.

## POLARIS Panel PC 24"

| Description | Code no. | Interfaces | Code no. | Operating system | Code no. | Variant | Code no. | Computer capacity | Code no. |
|---|---|---|---|---|---|---|---|---|---|
| Panel PC 24" W without touchscreen | C | USB Ex e/RS422 (recommended version) | 76 | Windows 7 Ultimate 32bit incl. Recovery (at 4 GB RAM) | S | AC | 0 | 100 GB HD | 0 |
| | | | | Windows 10 IOT LTSB 32bit incl. Recovery (at 4 GB RAM) | K | | | | |
| Panel PC 24" W with touchscreen | D | Further Interface combinations on request | XX | Windows 10 IOT LTSB 64bit incl. Recovery (at 8 GB RAM) | L | DC | 2 | 128 GB SSD | 2 |

**Complete order no. 17-71V1-** ☐0☐☐/☐**000**☐☐**00**
Please insert correct code. Technical data subject to change without notice.
You will find the accessories with order details on the accessories pages.

# 15. Additional information

## Resistance list – polyester front foil
## POLARIS series

BARTEC

Page 1 of 1

**The polyester front foil material used for the POLARIS series in accordance with DIN 42115, section 2, is resistant against the testing material specified as follows:**

**Alcohols**
- Ethyl acohol
- Cyclohexanone
- Glycol
- Glycerol
- Isopropanol
- Methanol

**Hydrocarbons**
- Aliphatic hydrocarbons
- General
- Benzine
- Benzene
- Toluene
- Xylene

**Chlorinated hydrocarbons**
- Chlorofluorocarbon
- Perchloroethylene
- III-trichloroethane
- Trichloroethylene

**Ester**
- Ethyl acetate

**Other organic solvents**
- Aether
- Dimethyl formamide
- Dioxane

**Acids**

| | |
|---|---|
| Formic acid | < 50 % |
| Acetic acid | |
| Phosphoric acid | < 30 % |
| Hydrochloric acid | ≤ 10 % |
| Nitric acid | ≤ 10 % |

**Aldehydes**
- Acetaldehyde
- Formaldehyde

**Caustic solutions**

| | |
|---|---|
| Ammonia | < 2 % |
| Caustic soda | < 2 % |

**Saline solutions**
- Alkalicarbonate
- Bichromate
- Prussiate of potash

**Different substances**

| | |
|---|---|
| Molecular chlorine | |
| Liquid cresolphenole soaps | |
| Oxygen | |
| Tricresyl phosphate | |
| Water | < 100 °C |
| Hydrogen peroxide | < 25 % |

**Detergents, scavengers and cleaning agents**
- Potassium soap
- Detergent solutions (tenside)
- Fabric softeners

**Technical oils and fats**
- Cutting emulsion
- Diesel oil
- Varnish
- Heating oil
- Paraffin oil
- Ricinus oil
- Silicone oil
- Turpentine oil and turpentine oil substitute

(Where not stated otherwise: concentration = 100%)

**Polyester membranes have a limited resistance to UV light and should therefore not be exposed to direct sunlight for extended periods of time.**

D_BMS791.doc • Resistance list Polyester front foil • Revision 1 / Status: July, 18th 2006 • Technical data subject to change

# 16. Declaration of conformity

EU Konformitätserklärung
EU Declaration of Conformity
Déclaration UE de conformité

BARTEC
BARTEC GmbH
Max-Eyth-Straße 16
97980 Bad Mergentheim
Germany

Nº 11-71V0-7C0001_D

| Wir | We | Nous |
|---|---|---|
| **BARTEC GmbH,** | | |
| erklären in alleiniger Verantwortung, dass das Produkt | declare under our sole responsibility that the product | attestons sous notre seule responsabilité que le produit |
| **POLARIS Serie** | **POLARIS serie** | **POLARIS sèrie** |
| **Typ 17-71V0-****/******<br>**Typ 17-71V1-****/******<br>**Typ 17-71V2-****/******<br>**Typ 17-71V3-****/******<br>**Typ 17-71V6-****/******<br>**Typ 17-71VZ-****/****** | | |
| auf das sich diese Erklärung bezieht den Anforderungen der folgenden **Richtlinien (RL)** entspricht | to which this declaration relates is in accordance with the provision of the following **directives (D)** | se référant à cette attestation correspond aux dispositions des **directives (D)** suivantes |
| **ATEX-Richtlinie 2014/34/EU**<br>**EMV-Richtlinie 2014/30/EU**<br>**RoHS-Richtlinie 2011/65/EU**<br>**RED-Richtlinie 2014/53/EU** | **ATEX-Directive 2014/34/EU**<br>**EMC-Directive 2014/30/EU**<br>**RoHS-Directive 2011/65/EU**<br>**RED-Directive 2014/53/EU** | **Directive-ATEX 2014/34/UE**<br>**Directive-CEM 2014/30/UE**<br>**Directive-RoHS 2011/65/UE**<br>**Directive RED 2014/53/UE** |
| und mit folgenden Normen oder normativen Dokumenten übereinstimmt | and is in conformity with the following standards or other normative documents | et est conforme aux normes ou documents normatifs ci-dessous |

**EN 60079-0:2012+A11 :2013**
**EN 60079-1:2014**
**EN 60079-5:2015**
**EN 60079-7:2015**
**EN 60079-11:2012**
**EN 60079-18:2015**
**EN 60079-28:2015**
**EN 60079-31:2014**
**EN 61000-6-2:2005**
**EN 61000-6-4:2007 +A1 :2011**
**EN 60529 :1991 +A1 :2000 +A2 :2013**
**EN61010-1 :2010**
**EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011 + AC:2011 + A2:2013**
**EN 62479 :2010**
**EN 62311 :2008**
**EN 300 328 V 2.1.1 (2016-11)**
**EN 55022 :2010 / AC :2011**
**EN 55024 :2010 / A1 :2015**
**EN 55032 :2012 / AC : 2013**
**EN 55032 :2015 / AC : 2016**
**EN 61000-3-2 :2014**
**EN 61000-3-3 :2013**
**EN 301 489-1 V2.1.1. (2017-02)**
**EN 301 489 -17 V3.1.1 (2017-02)**

03-0383-0362

Seite / page / page 1 von / of / de 2

EU Konformitätserklärung
EU Declaration of Conformity
Déclaration UE de conformité

Nº 11-71V0-7C0001_D

BARTEC

BARTEC GmbH
Max-Eyth-Straße 16
97980 Bad Mergentheim
Germany

| Kennzeichnung | Marking | Marquage |
|---|---|---|

**Visualisierungseinheit**

| | |
|---|---|
| II 2G | Ex db eb mb q [ib op pr] IIC T4 Gb |
| II 2D | Ex mb tb IIIC T120° C Db |

**Zubehör**

| | |
|---|---|
| II 2G | Ex ib IIC T4 Gb |
| II 2D | Ex ib IIIC T120° C Db |

**USB Smart Device**

| | |
|---|---|
| II 2G | Ex mb IIC T4 Gb |
| II 2D | Ex mb IIIC T120° C Db |

**The marking is variable on type and components used**

| Verfahren der EU-Baumuster-prüfung / Benannte Stelle | Procedure of EU-Type Examination / Notified Body | Procédure d'examen UE de type / Organisme Notifié |
|---|---|---|

**IBExU 05 ATEX 1117 X**
**0637 IBExU, Fuchsmühlenweg 7, 09599 Freiberg, D**

CE 0044

Bad Mergentheim, den 07.12.2017

i.V. Nader Hamuschi
Head of BU

i.V. Gitta Kugler
Director Global Test, Certification & IP Management

03-0383-0362

Seite / page / page 2 von / of / de 2

All certificates see www.bartec.de