



ATEX / IECEx

Zone 1 and Zone 21



User Manual

POLARIS
POLARIS BASIC

POLARIS Control Type 17-71V0-....

User Manual - TRANSLATION**POLARIS BASIC****POLARIS Control****Type 17-71V0-....****ATEX / IECEx Zone 1 and Zone 21**

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Appendix Declaration of Conformity

1. Basic Safety Instructions

1.1 Notes on this manual



Please read carefully before commissioning the devices.

The user manual is a constituent part of the product. It must be kept in the direct vicinity of the device and accessible at all times to installation, operating and maintenance personnel.

It contains important notes, safety instructions and test certificates which are necessary for perfect functioning when the devices are being operated and handled.

The user manual is written for all people who carry out assembly, installation, commissioning and maintenance work on the product, whereby the directives and standards applicable to areas with a gas or dust atmosphere (99/92/EC, EN 60079-17, EN 60079-19, IEC 60079-17, IEC 60079-19) must be observed when doing such work.

Familiarity with and strict adherence to the safety instructions and warnings in this manual are essential for safe installation and commissioning. Careful handling and consistent observation of these instructions can prevent accidents, personal injuries and damage to property.

The illustrations in these operating instructions serve to make the information and descriptions more clear. They are not necessarily true to scale and may deviate slightly from the actual construction of the device.

Safety instructions and warnings are specially highlighted in this manual and marked by symbols.

DANGER

DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

ATTENTION

ATTENTION identifies a potentially damaging situation which, if not avoided, could damage the equipment or something in its environment.



Important instructions and information on effective, economical and environmentally compatible handling.

1.1.1 Languages

The original user manual is written in German. All other available languages are translations of the original user manual.

The user manual is available in German, English, French, Russian and Brazilian Portuguese. If you require any other languages, please ask BARTEC or request them when placing the order.

1.1.2 Changes to the document

BARTEC reserves the right to alter the contents of this document without notice. No guarantee is given for the correctness of the information. In case of doubt, the German safety instructions shall apply because it is not possible to rule out errors in translation or in printing. In the event of a legal dispute, the "General Terms and Conditions" of the BARTEC group shall apply in addition.

The respective up-to-date versions of data sheets, manuals, certificates, EC Declaration of Conformity may be downloaded at www.bartec-group.com under products and solutions in the area "Automatic Technology" or ordered directly from BARTEC GmbH.

1.2 Handling the Product

The product described in these user manual 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 Use in Accordance with the Intended Purpose

1.3.1 Exclusive Purpose

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

The POLARIS BASIC series 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 Improper 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 intended purpose.

1.4 Owner's/Managing Operator's Obligations

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 Instructions

1.5.1 General Safety Instructions

- ▶ 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 Safety Instructions for Operation

1.6.1 Upkeep

For electrical systems the relevant installation and operating regulations must be complied with (e.g. Directive 99/92/EC, Directive 94/9/EC and the national applicable ordinances IEC 60079-14 and the DIN VDE 0100 series)!

The disposal of this equipment must comply with the national regulations on the disposal of waste.

1.6.2 Maintenance

Regular servicing is not necessary if the equipment is operated correctly in accordance with the installation instructions and environmental conditions. In this context, please refer to Chapter "Maintenance, Inspection, Repair".

1.6.3 Inspection

Under IEC 60079-19 and EN 60079-17, 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.

1.6.4 Repairs

Repairs on explosion-protected operating equipment may be done only by authorised persons working in accordance with the latest developments in technology and using original spare parts. The applicable regulations must be observed.

1.6.5 Commissioning

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

1.7 Ex Protection Type, Certification and Standards

Markings specifying Ex protection and certification are put on the device. For Ex protection markings, see Chapter 3 "Technical Data".

The POLARIS BASIC series conform to Directive 94/9/EC for devices and protective systems for use to their intended purpose in potentially explosive areas (ATEX Directive). For the standards conformed to, see Chapter 3 "Technical Data".

1.8 Warranty

WARNING

It is not permissible to make any modifications or implement any conversions unless the manufacturer gives his approval in writing.

If components other than those specified are used, protection against explosion can no longer be assured. It cannot be guaranteed that parts procured from other suppliers have been designed and produced in conformance to safety requirements and with the necessary stress tolerance.

- Before implementing any modifications or conversions, contact the manufacturer and obtain approval. Use only original spare parts and original expendable parts.



The manufacturer grants a complete warranty only and exclusively for the spare parts ordered from him, the manufacturer.

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, installation, 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).

We guarantee the POLARIS and its accessories for a period of 1 year starting on the date of delivery from the Bad Mergentheim factory. This guarantee covers all parts of the delivery and is restricted to the replacement free of charge or the repair of the defective parts in our Bad Mergentheim factory. As far as possible, the delivery packaging should be kept for this purpose. In the event of such a claim, the product must be returned to us after written arrangement. The customer cannot claim to have the repairs done at the site of installation.

2. Product Description

2.1 Definition

The **POLARIS Control** is the ideal solution for all simple applications requiring texts and smallscale graphics. POLARIS Control developed by BARTEC is a real alternative to local control stations or text display. For the display, an extremely conveniently readable daylight blue-colour display is utilised.

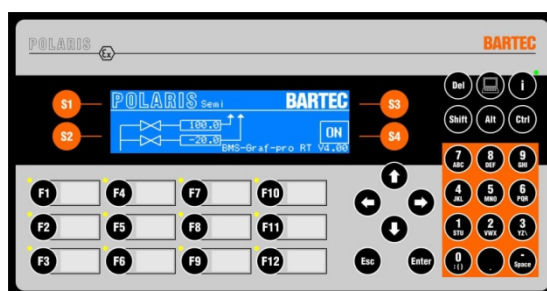


Illustration 1: POLARIS Control - POLARIS BASIC - Series

With the POLARIS Control it is possible to connect directly to the potentially explosive area process visualisations without additional intrinsically safe separator cards.

The laying of blue lines for intrinsically safe circuits is dropped. A separate wiring of the data line is not necessary.

The POLARIS Control can be directly connected to the PROFIBUS-DP or the communication interface of the control station.

Available features include e. g. RS422/RS485, PROFIBUS-DP, RS232 or TTY. An intrinsically safe USB interface for a USB Ex i-memory stick enables the device configuration's easy transferability.



Illustration 2: USB Ex i memory stick

The creation of a visualisation is carried out using the "BMS-Graf-pro" Version 6.xxx program package which has been specially developed for this purpose.



Illustration 3: Visualisation software BMS-Graf-pro Version 6.xxx

Standard assembly of the POLARIS BASIC Series is mounting on the front panel which can be performed quickly and easily. On request we also supply the POLARIS BASIC Series as turn-key system solution in a stainless steel enclosure for wall and floor mounting. Customised designs are possible on request.



Illustration 4: Types of enclosure

2.2 Schematic diagram

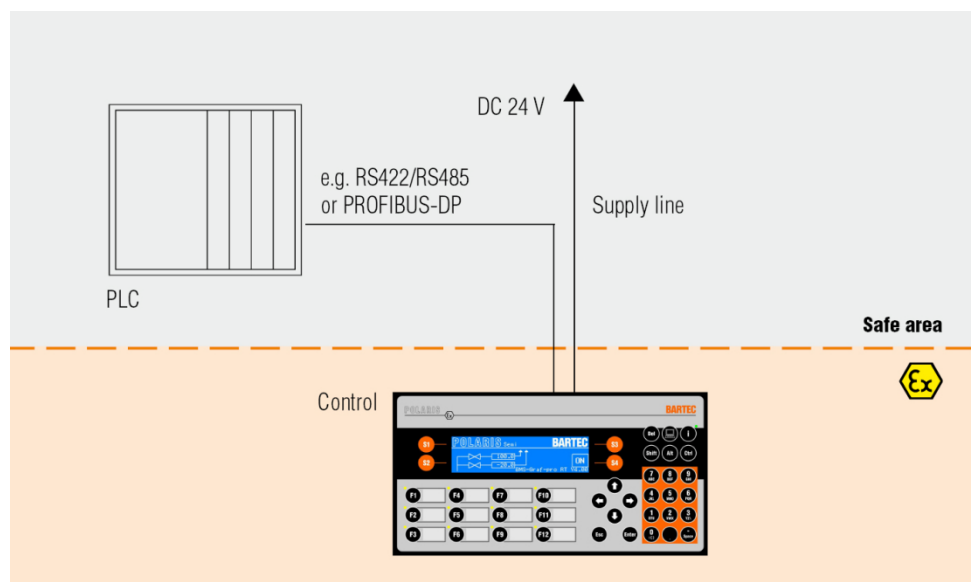





Illustration 5: Simple set-up

3. Technical Data

3.1 POLARIS Control

3.1.1 Explosion Protection

Type	17-71V1-....	
Ex protection type ATEX	 II 2G Ex db eb qb [ib] IIC T4 or  II 2D Ex tb IIIC T120°C IP 6X	
Certification	IBExU 05 ATEX 1117 X	
Standards	EN 60079-0:2009 EN 60079-5:2007 EN 60079-11:2012	EN 60079-1:2007 EN 60079-7:2007 EN 60079-31:2009
Ex protection type IECEx	Ex db eb qb [ib] IIC T4 or Ex tb IIIC T120°C IP 6X	
Certification	IECEx IBE 11.0007X	
Standards	IEC 60079-0:2011 IEC 60079-1:2003 IEC 60079-5:2007-03 IEC 60079-7:2006-07 IEC 60079-11:2011-06 IEC 60079-31:2008	Edition: 6 Edition: 5 Edition: 3 Edition: 4 Edition: 6 Edition: 1
Directives	94/9/EC 2004/108/EC	
Product marking	 0044	
Further test certificates	Brazil Russia Belarus India	
	– 11/UL-BRHZ-0131X – GOST R POCC DE.ME92.B02509 – PPC 00-37280 – GOSPROMNADZOR 11-02-0015-2012 – CCEs P261984	
Protection class	Front Rear site	IP65 IP54

3.1.2 General Data

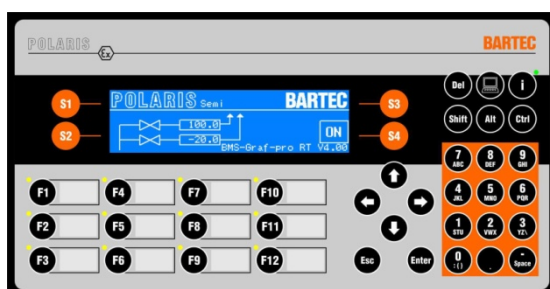
Construction	Front panel fitting, optional turn-key system solutions in a stainless steel enclosure as floor or wall mounting.
Permissible ambient temperature	
Storage/Transport	-20 °C to +50 °C
Operation	0 °C to +50 °C
Relative air humidity	5 to 95 % non-condensing
Vibration	0.7 G/1 mm; 5 Hz-500 Hz pulse in all 3 axes
Shock	15 G, 11 ms pulse in all 3 axes

Material	Front	Polyester foil on anodised aluminium plate (conditionally UV-resistant)
	Rear panel	galvanised sheet steel, bichromated
Computer capacity	<ul style="list-style-type: none"> – Processor 500 MHz – 256 MB RAM – Compact Flash 512 MB 	

3.1.3 Electrical Data

Power supply	DC 24 V \pm 10 %
Max. power consumption	P _{max} <15 W


3.1.4 Characteristics



Display	<ul style="list-style-type: none"> – LCD display – 2 colours white/blue – 240 x 64 pixels – Visible surface approx. 133 mm x 40 mm – Antireflection coating glass pane – Daylight display technology
Backlighting	LED technology
Keyboard (short-stroke keys)	<ul style="list-style-type: none"> – Alphanumeric key block – 4 special keys – 12 function keys able to be labelled with LEDs
Interface (Basic version)	<ul style="list-style-type: none"> – 1 x Ex e RS422/RS485 – 1 x Ex i USB for Ex i memory stick
Dimensions (width x height x depth)	290 mm x 151 mm x approx. 130 mm
Wall cut-out (width x height)	275 mm x 131 mm \pm 0,5 mm
Weight	approx. 6 kg

3.2 USB Ex i Memory Stick

3.2.1 Explosion Protection

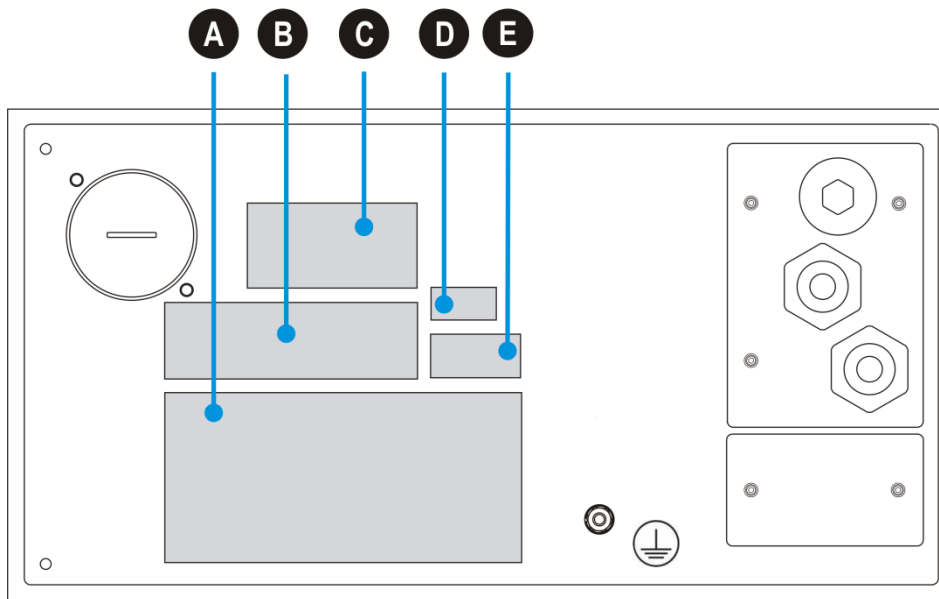
Type	17-71VZ-5000										
Ex protection type ATEX	 II 2G Ex ib IIC T4 $-20\text{ °C} \leq T_a \leq 60\text{ °C}$										
Certification	IBExU 05 ATEX 1117 X										
Standards	EN 60079-0:2009 EN 60079-7:2007 EN 60079-11:2012 EN 61241-11:2007										
Ex protection type IECEx	Ex ib IIC T4										
Certification	IECEx IBE 11.0007X										
Standards	IEC 60079-0:2007 IEC 60079-7:2006 IEC 60079-11:2006 IEC 61241-11:2005										
Further test certificates	<table> <tr> <td>Brazil</td><td>– 11/UL-BRHZ-0131X</td></tr> <tr> <td>Russia</td><td>– GOST R POCC DE.ME92.B02509</td></tr> <tr> <td></td><td>– PPC 00-37280</td></tr> <tr> <td>Belarus</td><td>– GOSPROMNADZOR 11-02-0015-2012</td></tr> <tr> <td>India</td><td>– CCEs P261984</td></tr> </table>	Brazil	– 11/UL-BRHZ-0131X	Russia	– GOST R POCC DE.ME92.B02509		– PPC 00-37280	Belarus	– GOSPROMNADZOR 11-02-0015-2012	India	– CCEs P261984
Brazil	– 11/UL-BRHZ-0131X										
Russia	– GOST R POCC DE.ME92.B02509										
	– PPC 00-37280										
Belarus	– GOSPROMNADZOR 11-02-0015-2012										
India	– CCEs P261984										

3.2.2 General Data



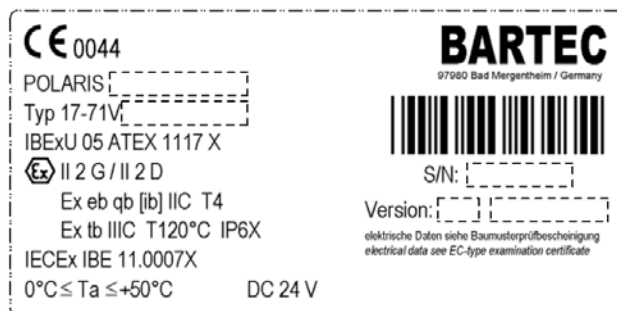
Product type	USB flash drive
Storage capacity	64 MB / FAT 16 system
Dimensions (width x height x depth)	approx. 92 mm x 22 mm x 7,2 mm
Weight	28 g
Material Enclosure	Anodised aluminium

3.3 Product Labelling



A

Example:
Type label with
label
ATEX and IECEx



B

Type label with
label
INMETRO



C

Warnings on the
device



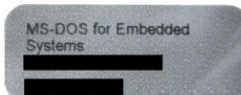
D

Test sticker



E

Licence sticker



4. Transport und Assembly

4.1 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.

4.1.1 Intermediate Storage

ATTENTION

Damage to property through incorrect storage!

- ▶ Comply with the correct storage temperatures.
- ▶ Keep the POLARIS free of moisture.

4.2 Assembly

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

Scope:	1 x POLARIS Control	
	1 x Reinforcement frame	
	1 x Set of mounting clamps	
	1 x User manual POLARIS BASIC – POLARIS Control	
Optional:	Enclosure and supporting system for floor and wall mounting	
Not enclosed:	Assembly material and cable for voltage supply and data line	
Required Tools:	POLARIS	1 x hex key 3 mm
	(mounting clamps)	1 x slotted screwdriver
	POLARIS	1 x hex key 2.5 mm
	termination compartments	1 x slotted screwdriver
	POLARIS PE connection	1 x ring spanner 7 mm

4.2.1 Installation options

The POLARIS Control can be installed directly in:

- Enclosures, Switch cabinet doors or operating consoles

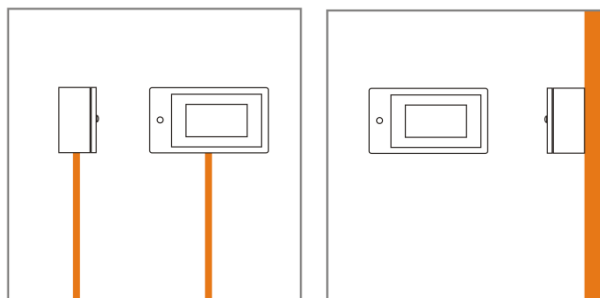


Illustration 6: Examples of floor and wall mounting

5. Installation



We recommend setting up and testing the entire system before its ultimate installation in the ex-area.

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 Control is approved for an ambient temperature of from 0 °C to +50 °C and a relative air humidity of from 5 to 95% without condensation.

5.1 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.
- 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 to the formation of condensation or from overheating!**

- ▶ Avoid direct sunlight.
- ▶ Remove condensation on the POLARIS immediately.
- ▶ A POLARIS installed in an enclosure should be heated and not disconnected from the mains.
- ▶ The enclosure should be fitted with air conditioning.

5.2 Mechanical Installation



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.

⚠ 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!

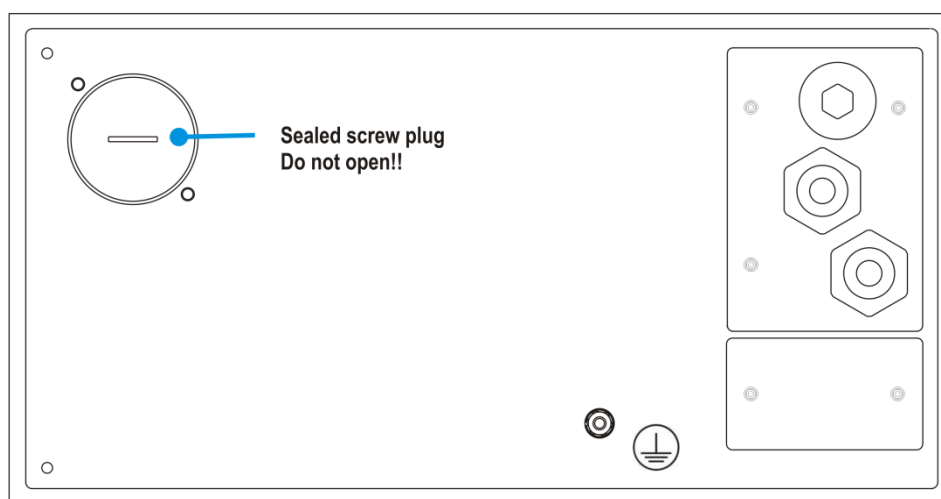


Illustration 7: Rear panel POLARIS

5.2.1 Installation in 2G/3D 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.

⚠ 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 Control

05-0205-0011

Work steps:

- Insert the POLARIS into the cut-out in the enclosure.
- From the back, place the reinforcement frame over the POLARIS.
- Use screws to fasten the mounting clamps onto the POLARIS and tighten the clamping screws evenly.

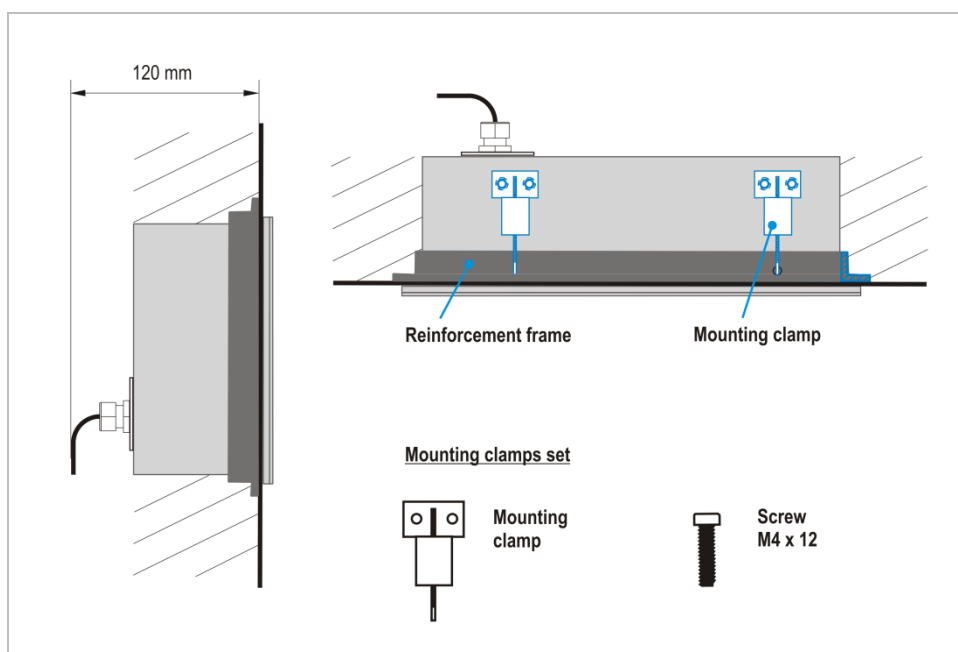


Illustration 8: Minimum installation depth and mounting reinforcement frame

5.2.2 Installation as a System Solution in the Stainless Steel Enclosure

The POLARIS is available as turn-key system solution in a stainless steel enclosure for floor or wall mounting.

Stainless steel enclosure "Standard" for floor and wall mounting

Type	Dimensions (Width x Height x Depth)
POLARIS Control	450 mm x 240 mm x 150 mm

Work steps for floor mounting:

- Prepare supply and data line(s).
- Prepare installation on the basis of the drilling template (see Illustration 9).
- Install supply and data line(s) in the base.
- Attach base to the floor using suitable material.
- Pull supply and data line(s) through the cable glands provided into the enclosure. Ensure there is sufficient length.
- Mount the enclosure on the base.
- Open the enclosure and wire according to the terminal assignment.

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.

- Close the enclosure door.

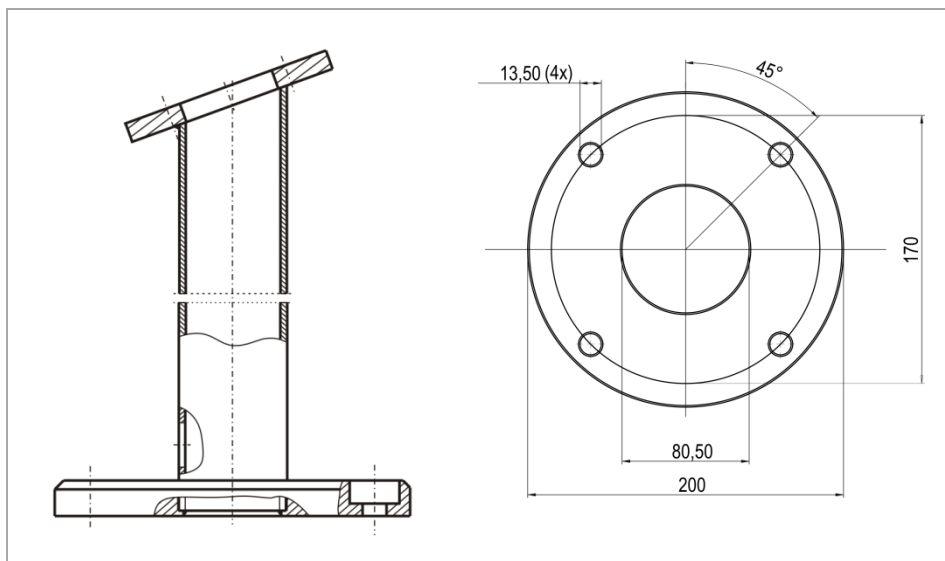


Illustration 9: Base – drilling template base plate

Work steps for wall mounting:

- Prepare supply and data line(s).
- Prepare installation on the basis of the drilling template (see Illustration 10).
- Attach POLARIS to the wall.
- Pull supply and data line(s) through the cable glands provided into the enclosure. Ensure there is sufficient length
- Open the enclosure and wire according to the terminal assignment.



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.

- Insert the supply and data line(s) through the cable glands and connect up. Close unused cable glands with blanking plugs.
- Close the enclosure door.

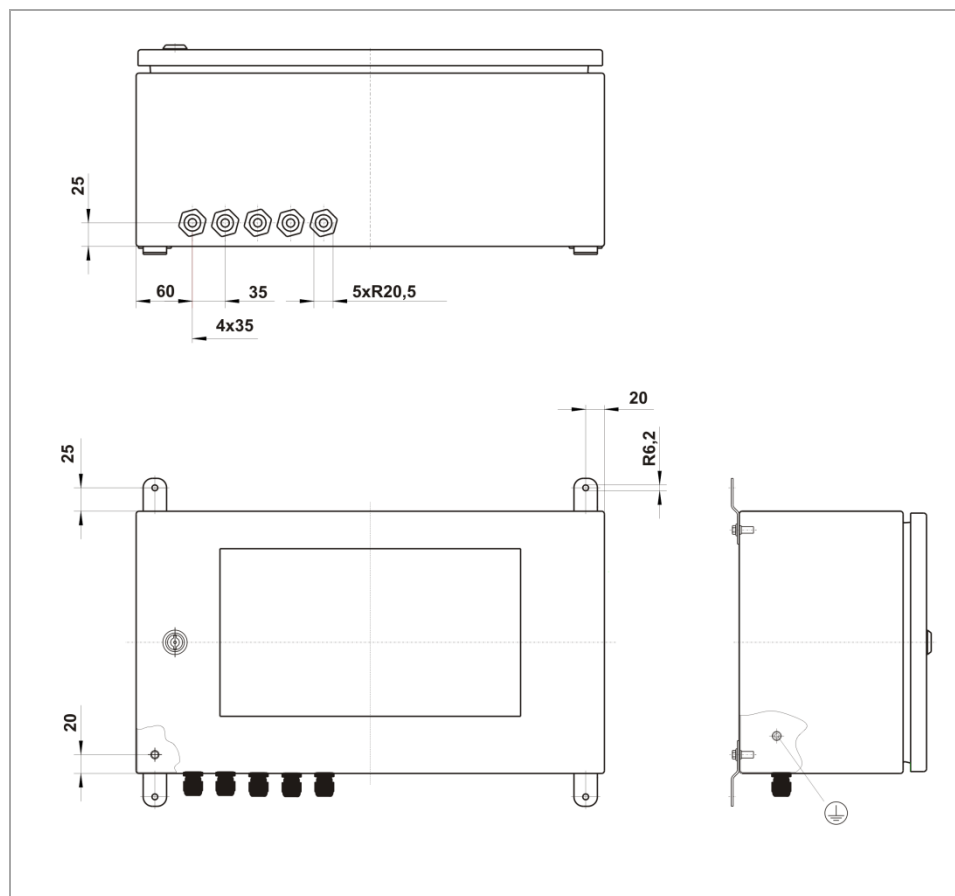


Illustration 10: Wall mounting – dimensions of mounting straps

5.3 Electrical Installation

5.3.1 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.).

5.4 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.

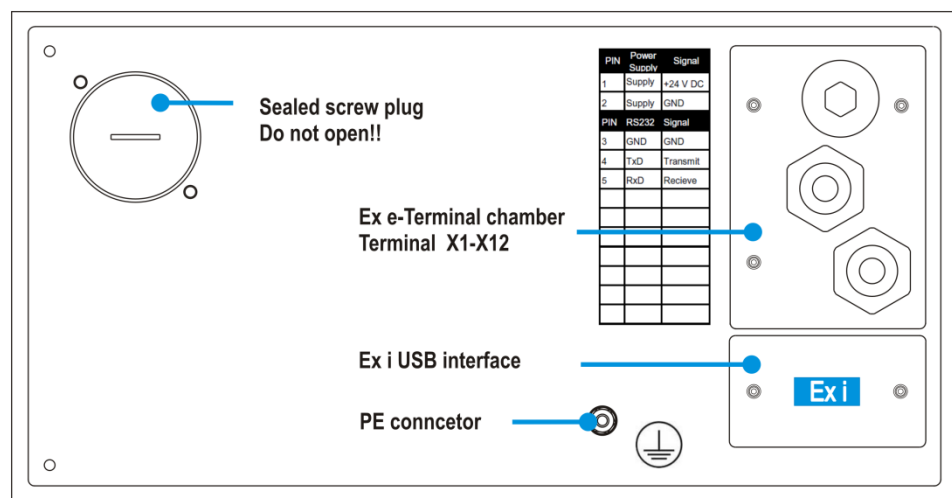


Illustration 11: Pin assignment POLARIS

5.5 Ex e terminal compartments

5.5.1 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.

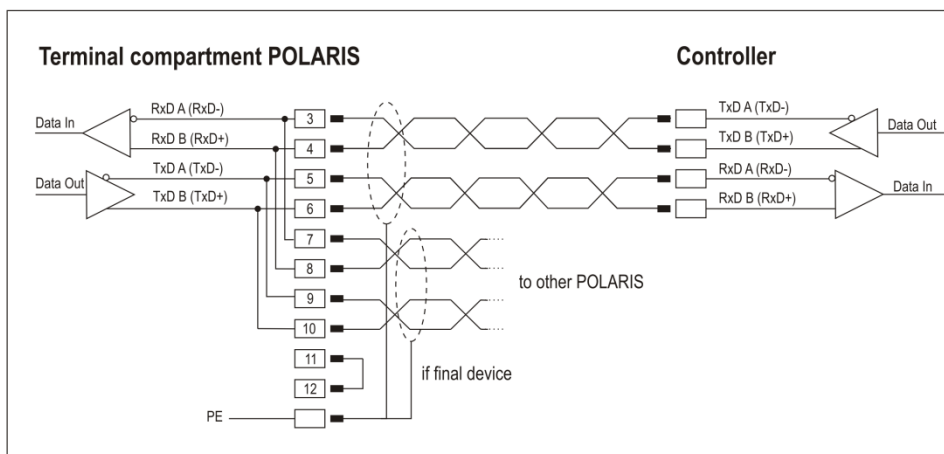
5.5.2 Supply voltage terminal assignment

Mains Connection Variant DC 24 V			
Terminal	Interface	Signal	Remarks
X1	Supply	+	DC 24 V \pm 10 %
X2	Supply	-	0 Volt

5.5.3 RS422/RS485 interface (optional)

Configuration RS422			
Terminal	Interface	Signal	Remarks
X3	Interface COM 1	RxD A (RxD-)	Receiving cable Input
X4	Interface COM 1	RxD B (RxD+)	Receiving cable Input
X5	Interface COM 1	TxD A (TxD-)	Transmission cable Input
X6	Interface COM 1	TxD B (TxD+)	Transmission cable Input
X7	Interface COM 1	RxD A (RxD-)	Receiving cable Output
X8	Interface COM 1	RxD B (RxD+)	Receiving cable Output
X9	Interface COM 1	TxD A (TxD-)	Transmission cable Output
X10	Interface COM 1	TxD B (TxD+)	Transmission cable Output
X11 X12	Termination On/Off		Jumper between terminal X11 and X12 for activation of the terminator resistors

RS422 connection mode (full duplex)



- Maximum length of the data line 1,000 m.

Pins 3-7, 4-8, 5-9, 6-10 are already connected inside.



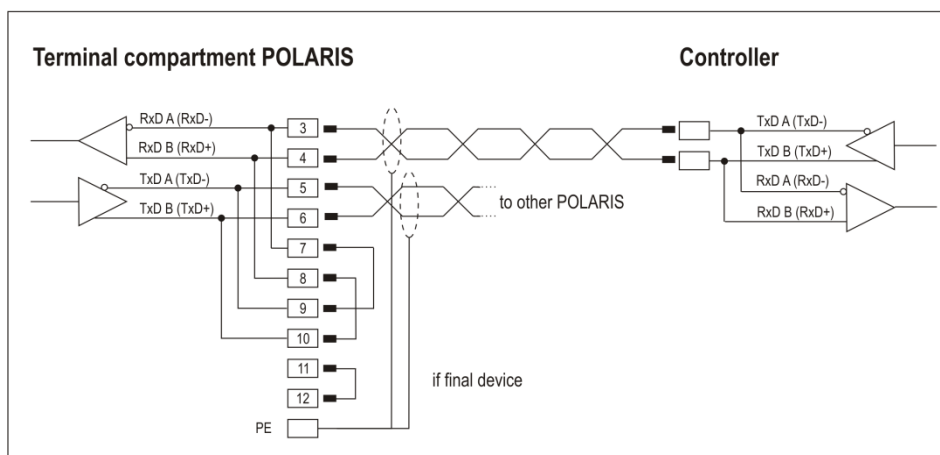
Setting of the terminal resistors at the start and end of the bus line is not necessary in most cases due to internal EMC measures. Depending on local circumstances, the data transmission may worsen in individual cases.

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

RS485 connection mode (semi duplex)



BARTEC delivers all RS485 interfaces as RS422.



- Maximum length of the data line 1,000 m.

If the RS422 interface is used as RS485, external bridges must be placed between pin 7/pin 9 and between pin 8/pin 10.

Pins 3-7, 4-8, 5-9, 6-10 are already internally connected.



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.

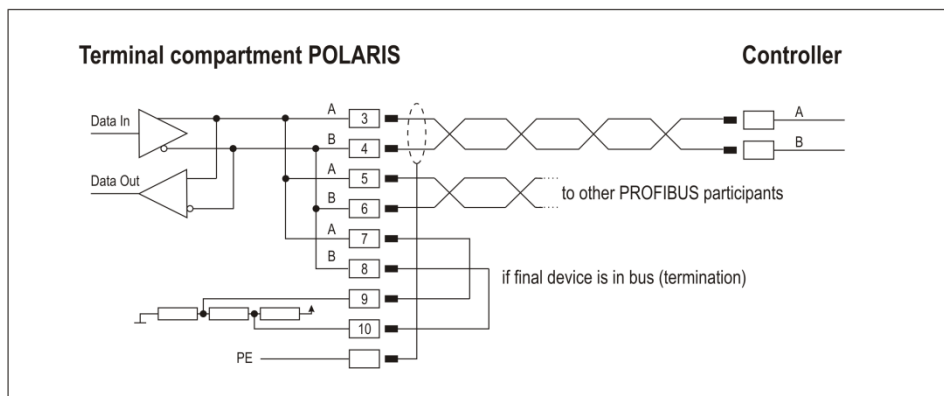
Depending on local circumstances, the data transmission may worsen in individual cases.

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

5.5.4 PROFIBUS-DP interface (optional)

Configuration PROFIBUS-DP			
Terminal	Interface	Signal	Remarks
X3	Interface COM 1	In A	Signal A Input
X4	Interface COM 1	In B	Signal B Input
X5	Interface COM 1	Out A	Signal A Output
X6	Interface COM 1	Out B	Signal B Output
X7	Interface COM 1	Termination A1	Bridge for terminating network (A1-A2)
X8	Interface COM 1	Termination B1	Bridge for terminating network (B1-B2)
X9	Interface COM 1	Termination A2	Bridge for terminating network (A1-A2)
X10	Interface COM 1	Termination B2	Bridge for terminating network (B1-B2)
X11	not connected		
X12	not connected		

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



► Maximum line length: see PNO specification.



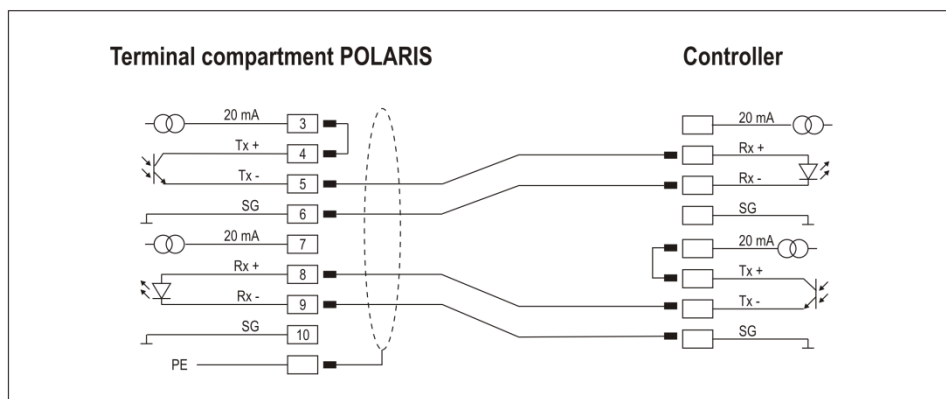
Pins 3-5-7, 4-6-8 are already connected inside.

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

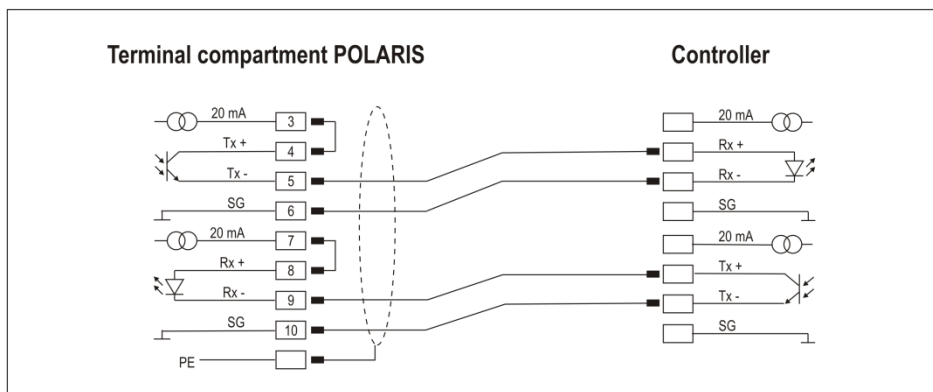
5.5.5 TTY interface (optional)

Configuration TTY			
Terminal	Interface	Signal	Remarks
X3	Interface COM 1	20 mA	Signal power source for transmitter
X4	Interface COM 1	Tx+	Collector
X5	Interface COM 1	Tx-	Emitter
X6	Interface COM 1	GND	Signal ground for transmitter
X7	Interface COM 1	20 mA	Signal power source for receiver
X8	Interface COM 1	Rx+	Anode
X9	Interface COM 1	Rx-	Cathode
X10	Interface COM 1	GND	Signal ground for receiver

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.



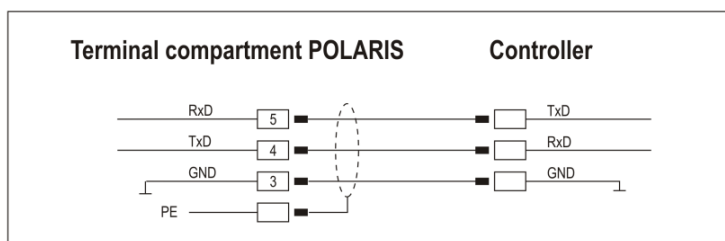
See the interface description from the controller manufacturer for the relevant pin assignment of the controller.

5.5.6 RS232 interface (optional)

Configuration RS232

Terminal	Interface	Signal	Remarks
X3	Interface COM 1	GND	Signal ground
X4	Interface COM 1	TxD	Transmit
X5	Interface COM 1	RxD	Receive

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.

5.6 Ex i terminal compartment

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.

5.6.1 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

5.7 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.

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

5.7.1 Power supply

A regulated mains adapter with an output of at least 2 A must be used as power supply. It is not permitted to fall below or exceed the power supply of DC 24 V ± 10 % at the installation site. The voltage drop on the supply line must be observed and corrected where necessary.

The voltage drop on the supply line is calculated according to the following equation:

ΔU	Voltage drop on the supply line at power supply voltage of DC 24 V	Max. 2.4 V
ΔU	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% under voltage is achieved)
I	Electricity for a POLARIS Control	At least 0.6 A
A	Cable cross-section of the supply line	
κ	Specific conductance of copper	$56 \frac{m}{\Omega \cdot mm^2}$
l	Length of the supply line (consider both the outgoing and return line)	

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

Examples	Cable cross-section	Maximum line length
Supply voltage DC 24 V	0.75 mm ²	approx. 50 m
	1.5 mm ²	approx. 100 m
	2.5 mm ²	approx. 170 m

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 Control, 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.

5.7.2 Back-up fuse

The POLARIS BASIC Series with DC 24 V is internally protected by a slow 1 A fuse. The fuse can trip in the case of voltage drops or under voltage.



We recommend protecting the devices with a fast-acting 1 A back-up fuse to prevent the tripping of the internal fuse in the device. The internal fuse can only be changed by BARTEC.

5.7.3 Interference suppression

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

- 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.

5.7.4 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.

5.7.5 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).

5.7.6 Examples of Shielding Connections

Double-sided shield connection on the connecting cables:

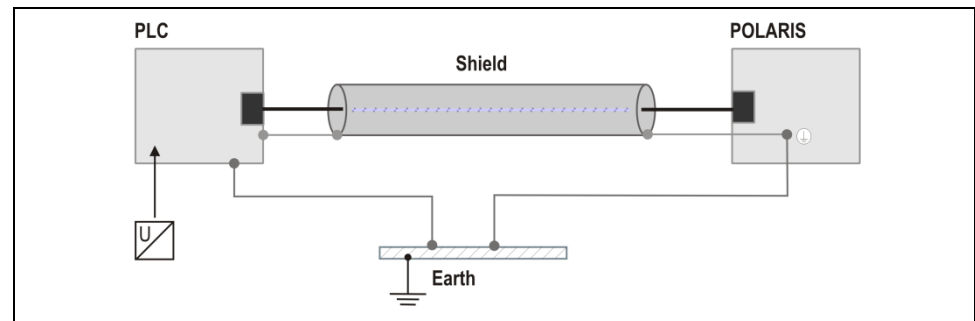


Illustration 12: Example of double-sided shield connection

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:

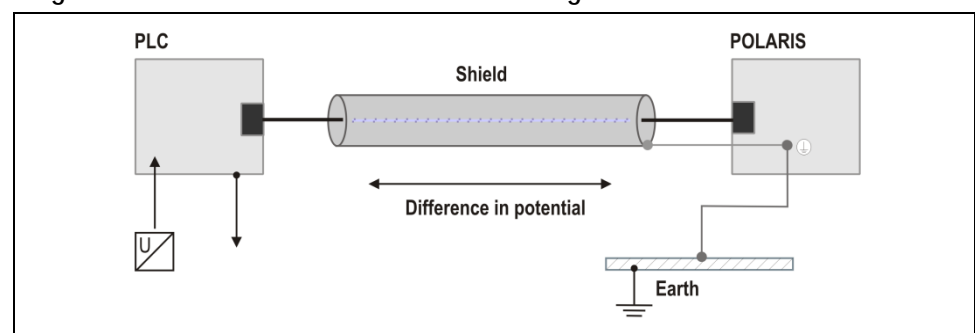


Illustration 13: Example of single-sided shield connection

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. Commissioning

For electrical systems the relevant installation and operating specifications (e.g. Directives 99/92/EC and 94/9/EC, 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.

6.1 Final Inspection

Check the following requirements before commissioning the device:

Only open the external 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.

- ▶ 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?
- ▶ 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.

7. Operation

Once the final inspection has been carried out, the device can be put into operation.



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

7.1 Operating System

The MS-DOS operating system is preinstalled on devices from the POLARIS BASIC Series. The licence sticker can be found on the back of the POLARIS.

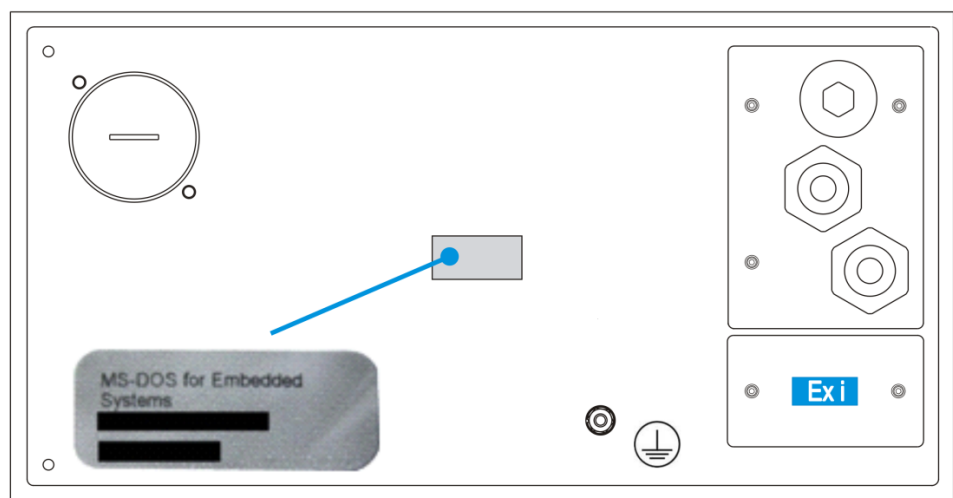


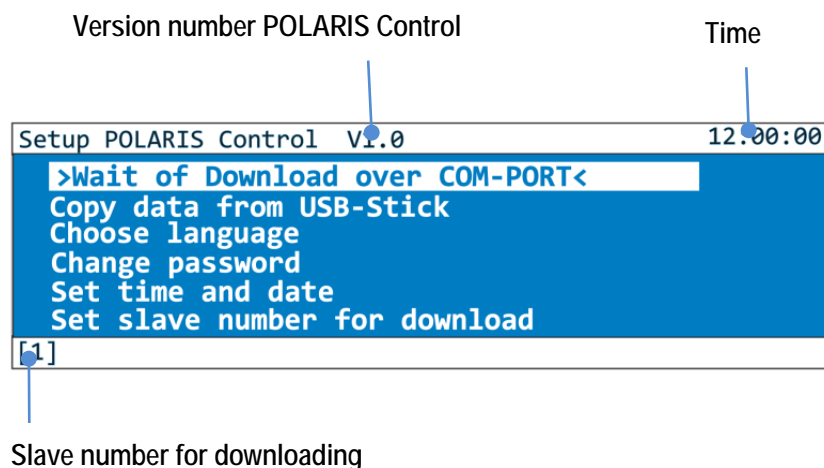
Illustration 14: Licence sticker

7.2 Configuration/Setup



The set-up languages are exclusively German, English and French.

The SETUP menu starts approx. 5 sec. after connecting the POLARIS to the power supply.



Slave number for downloading

The SETUP supports the basic configuration of the POLARIS BASIC Series and enables own programs to be downloaded for example.

- ▶ Select the menu item using the "↑" and "↓" buttons.
- ▶ Confirm with the "Enter" button.

>Wait of Download over COM<



Download via PROFIBUS is not possible.

Transferring a project with BMS-Graf-pro to the POLARIS.

- ▶ Select the menu item with the "Enter" button.
- ▶ Enter the password.
- ▶ Download starts.
- ▶ Exit download with the "ESC" button.

>Copy data from USB-Stick<

- ▶ Create project in BMS-Graf-pro and transfer to the POLARIS using a USB stick.
- ▶ Select menu item with the "Enter" button.
- ▶ Enter the password.
- ▶ Insert USB stick (with project in the created folder BGXP2005).
- ▶ Start transfer by pressing the "Enter" button.

>Choose language<

- ▶ Select menu item with the "Enter" button.
- ▶ Displays all available languages.
- ▶ Change to selected language using the "Enter" button.

>Change password<

- ▶ Select menu item with the "Enter" button.
- ▶ Enter the password.
- ▶ Optionally create new password.
- ▶ Confirm change.
- ▶ Return to the SETUP menu.

>Set time and date<

- ▶ Select menu item with the "Enter" button.
- ▶ Enter the password.
- ▶ Change the time/date using the cursor buttons.
- ▶ Adopt the new values using the "Enter" button.

>Set slave number for download<

- ▶ Select menu item with the "Enter" button.
- ▶ Enter the password.
- ▶ Enter new slave number using keypad.
- ▶ Adopt the new values using the "Enter" button.

8. 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 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 Replace the backlighting
No transfer of project possible using the USB stick	The wrong USB stick has been used.	Check that the BARTEC Ex i Memory Stick is being used.
	Incorrect format (FAT32 or NTFS)	Format the USB stick in FAT 16
	No directory created on the USB stick.	See Add-On User Manual for BMS-Graf pro V6.x.x.x http://www.bartec.de/automation-download/

9. 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.

9.1 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.

9.2 Inspection

Under IEC 60079-17, IEC 60079-19, EN 60079-17 and EN 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.

9.3 Maintenance and Repair Work

Adhere to the applicable regulations under Directive 99/92/EC, IEC 60079-19 and IEC 60079-17 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.

9.3.1 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>

> Quality and culture

> RMA form

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

E-mail: services@bartec.de

Phone: +49 7931 597-444

10. Disposal

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



The statutory requirements for electrical scrap must be observed therefore (e.g. disposal by an approved disposal company).

11. 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.

12. Accessories, Spare Parts

Included in the scope of the delivery:

Name	Order no.
Mounting clamps 4 pieces	05-0091-0111
Reinforcement frame	05-0205-0011

Accessories, Spare Parts for POLARIS Control:

Name	Order no.
Visualization software „BMS-Graf-pro V6.x.x.x“ Full version	17-28TF-0071/0x00
Upgrade	17-28TF-0071/0x01
Ex i memory stick	17-71VZ-5000
Mounting clamps 4 pieces	05-0091-0111
Stainless steel enclosure for floor mounting including stand	07-56D7-2800/9002
Stainless steel enclosure for wall mounting including mounting straps	07-56D7-2800/9001
Label strip White DIN A4 sheet for laser printer	03-8900-0224
External converter Converter external RS232 - RS422 Non Ex	03-9600-0258
MPI interface Converter external MPI - RS422 Non Ex	17-28TZ-0007
Original packing POLARIS Control	04-9035-0003

13. Order Numbers

POLARIS Control

Selection chart

Version	Interfaces	Code no.
POLARIS Control	RS422/RS485	00
	PROFIBUS-DP*	01
	RS232	02
	TTY	03

* Download only via USB Ex i-memory stick.



Complete order no. 17-71V0-00



14. 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 alcohol
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

Alkal carbonate
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

EG-Konformitätserklärung
EC-Declaration of Conformity
CE-Déclaration de Conformité

BARTEC

Wir

We

Nous

BARTEC GmbH, Max-Eyth-Strasse 16, 97980 Bad Mergentheim

erklären, dass das Produkt

declare, that the product

attestons, que le produit

POLARIS Serie

POLARIS series

POLARIS série

Typ-Nr.: 17-71Vx-xxxx/xxxx



auf das sich diese Erklärung
bezieht, den Bestimmungen
der folgenden Richtlinien
entspricht

to which this declaration
relates is in accordance with
the provision of the following
directives

se référant à cette attestation
correspond aux dispositions
des directives suivantes

**94/9/EG,
89/336/EWG**

**94/9/EC,
89/336/EEC**

**94/9/CE,
89/336/CEE**

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 60 079 - 0: 2004

E IEC 60 079 - 5: 2005

EN 60 079 - 7: 2003

E IEC 60 079 - 11: 2005

E EN 61 241 - 0: 2004 mit EN 61 241 - 1: 2004

EN 61 000 - 6 - 2: 2001

EN 61 000 - 6 - 4: 2001

EN 60950 - 1: 2001

EG-Baumusterprüf-
bescheinigung

EC-Type Examination
Certificate

Attestation d'examen CE de
type

IBExU 05 ATEX 1117 X

Qualitätssicherung
Produktion

Production Quality
Assessment

Assurance Qualité
Production

TÜV 96 ATEX 1086 Q

Kennzeichnung

Marking

Marquage

CE0032

Ⓔ II 2G Ex e q [ib] IIC T4

bzw. Ⓔ II 2G Ex d e q [ib] IIC T4 (Visualisierungsgerät)

Ⓔ II 2G Ex ib IIC T4 (Zubehör)

Ⓔ II 2D Ex tD A21 IP6X T80°C (Visualisierungsgerät, USB-Stick)

Ⓔ II 2D Ex ibD 21 T120°C (Tastatur, Maus, Trackball, Touchpad)

BARTEC GmbH
Max-Eyth-Straße 16
97980 Bad Mergentheim

Bad Mergentheim, den 07.09.2006

Lothar Mezger
Geschäftsführung

BARTEC protects
people and
the environment
by the safety

of components,
systems
and plants.

