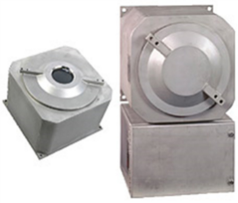
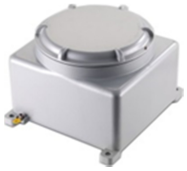
Type 07-41..-..../....

Type 07-43..-..../....



Type 07-45..-..../....



Type 07-4C..-..../....

Type 07-4D..-..../....

Type

Explosion protection

ATEX

Ex type of protection

Ⓔx *

CE 0044

EC Type Examination Certificate

DEKRA 13 ATEX 0209

IECEx

Ex type of protection

*

Certificate of Conformity

IECEx DEK 13.0075

Ambient temperature range

*

Other applicable documents

- circuit diagram
- mounting instructions/operating instructions for the installed components
- delivery note

Retention of these documents is mandatory.

Technical data

Supply data

U_n: *

I_n: *

P: *

Production year

*

Serial number

*

Type label

Please refer to the notes on the type label

Text label

Depending on the technical execution

Note on instructions

When working in hazardous areas, the safety of personnel and equipment depends on compliance with the relevant safety regulations. The people in charge of installation and maintenance bear a special responsibility. It is essential that they have an exact knowledge of the applicable rules and regulations.

The instructions provide a summary of the most important safety measures and must be read by everyone working with the product so that they will be familiar with the correct handling of the product.

The instructions have to be kept for future reference and must be available throughout the expected life of the product.

Description

The explosion proof control panels of series BARTEC-B, BARTEC-C, BARTEC-D, BARTEC-E are possibly either as independent stand-alone unit or in combination with other enclosures of this series being applied.

In case of combination the marking will be BARTEC-x-ASSEMBLY. (x = type of most significant type of protection of the enclosure on which the type label will be applied). The types of protection which are possible for the applicable enclosures are flameproof enclosure (Ex d), increased safety (Ex e) or protection by enclosure for dust (Ex t).

It may occur that out of the enclosures intrinsically safe circuits (Ex i) will enter the hazardous area. It belongs also to the possibilities that moulded encapsulation (Ex m) will be applied in enclosures based on increased safety (Ex e). The marking on the type label will give you always the correct status.

Notes on the type label

“Specific conditions of use” of either built in or attached components or equipment, which are important for the installation, the use or the maintenance of the assembly, will be unabbreviated adopted in to this manual.

Eventually ‘loop assessment’ information of ‘associated apparatus’ you can find (when applicable) in attached Certificate(s) of Conformity.

The (threaded) entries for cable entries in Ex d enclosures need to be administrated concerning quantity, size and thread art. You can find this information in the respective packing list with identical reference number. A copy packing list is always part of the to the delivery attached documents.

In case of loss always by mentioning the type and the serial number (see type label) at BARTEC office (see Service Address on page 4) traceable.

01-4000-7D0001/B-06/15-STVT-375605

Safety Instructions

The technical data, which are on the type label need to be maintained just like all possible warning (caution) texts on the outside of the enclosure.

On the basis of the EPL marking you'll have to check whether the manufactured panel in your application will be installed in the correct zone.

Zone	Category	EPL	Possible suitability
0	1G only	Ga only	×
1	2G or 1G	min. Gb	✓
2	3G, 2G or 1G	min. Gc	✓
20	1D only	Da only	×
21	2D or 1D	min. Db	✓
22	3D, 2D or 1D	min. Dc	✓

This table gives only information about main type of protection which is applicable for the control panel. The type label is leading.

The table shows in which zone this panel may be installed under application of the belonging EC Type Examination Certificate. All intrinsically safe circuits, generated by 'associated apparatus' conform type of protection Ex ia may enter zone 0 or 20 when corresponding Category 1 marking is on the type label only.

Rebuilds and changes to the enclosures which affect the explosion safety are not permitted.

This operational instruction and possible other lose (spare) parts may not be left in the control panel during operation.

Use explosion proof panels only in good shape, which means undamaged, healthy maintenance condition and important with fully closed enclosures.

Take care of all national applicable safety & work instructions and all safety instructions mentioned in this operational instruction whenever work is necessary to explosion proof panels.

Only authorized and qualified personnel who are authorized and trained to assemble electrical components in hazardous (potentially explosive) areas may do any of the assembly, installation, commissioning, maintenance, and repair work.

For installation requirements we redirect you to:

EN 60079-14: 2008 or newer

IEC 60079-14: 2007 or newer

Marking

Particularly important points in these instructions are marked with a symbol:

⚠ 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.

NOTICE

NOTICE is used to address practices not related to personal injury.

ⓘ Note

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

Conformity to EN/IEC standards

The explosion proof control panels are examined according following standards (depending on technical execution and application more than one standard may be applicable).

Main standard

EN 60079-0:2012 or EN 60079-0: 2009
EN 60079-1:2007
EN 60079-7:2007
EN 60079-31:2009

IEC 60079-0:2011 or IEC 60079-0: 2007
IEC 60079-1:2007
IEC 60079-7:2007
IEC 60079-31:2008

Technical data

Page 1 of this operating instructions describes the exact technical execution. Below follows an overview of possible variants and the general technical data.

Type	Type of Protection
BARTEC B	flameproof enclosure Ex d IIB or Ex d IIB+H_2
BARTEC C	flameproof enclosure Ex d IIC
BARTEC D	protection by enclosure Ex tb IIIC
BARTEC E	increased safety Ex e IIC

Marking according to EN 60079-0/ IEC 60079-0

Depending on the type of enclosure it can be possible to have an application in hazardous areas of zones 1and 2 as well as in hazardous areas of zones 21 and 22. The marking on the type label is leading (see page 1).

Type(s) of Protection against ignition

Ex d IIB
Ex d IIB+H_2
Ex d IIC
Ex tb IIIC
Ex e IIC

Gas group

Depending on applicable enclosure construction; see marking on the panel. This can be for gas: IIA, IIB or IIC.

Dust group

Depending on applicable enclosure construction; see marking on the panel. This can be for dust: IIIA, IIIB or IIIC.

Temperature class or maximum surface temperature

Depending on built-in heat dissipation in the enclosure; see marking on the panel. This can be: T3, T4, T5 or T6 (for gas) or:
T130°C, T95°C or T80°C (for dust).

Equipment Protection Level

This is marked with either
Gb after the temperature class (for gas) or Db after the maximum surface temperature (for dust)

Protection class

Ingress protection degree: depending on applicable enclosure; IP 5x or IP 6x, but minimum IP 54 for gas and minimum IP 65 for dust.

Ambient temperature range

-20 °C to +40 °C (default)
-40 °C to +55 °C (possible in main application)

Maximum ambient temperature range

-55 °C to +80 °C (for limited execution)
Ambient temperature range as indicated on page 1 is leading.

ⓘ Note

For deviating ambient conditions you are advised to have consultation with BARTEC.

01-4000-7D0001/B-06/15-STVT-375605

Enclosure material

Ex d	'copper free' aluminium alloy (<0,05 % copper and < 6 % magnesium) or stainless steel ALSI 303/304/316
Ex t	black reinforced glassfibre polyester (halogenfree, surface resistance <10^9 Ω) or aluminium alloy ALSI 12 (<6 % magnesium) or 'copper free' aluminium alloy (<0,05 % copper and <6 % magnesium) or stainless steel ALSI 304/316
Ex e	black reinforced glassfibre polyester (halogenfree, surface resistance <10^9 Ω) or aluminium alloy ALSI 12 (<6% magnesium) or stainless steel ALSI 304/316

Max. nominal supply voltage

AC 1000 V or DC 1500 V

Max. nominal supply current

1000 A

Max. working (generated) voltage

Ex d and t:	25 kV
Ex e:	11 kV

Max. supply cable cross section

400 mm²

Transport, Storage

NOTICE

Damage to the control panel through incorrect transport or incorrect storage.

➢ Transport and storage is permissible in original packaging only.

Assembly / Disassembly

⚠ WARNING

Risk of injury due to incorrect proceedings.

➢ When installing and operating explosion proof equipment, take care of the applicable safety standards and generally known electrical safety standards.

⚠ WARNING

Risk of injury and property damage because of disregarding minimum distances.

➢ The physical distance between the flanges of a flame proof enclosure and possible other flameproof enclosures or massive obstacles must be minimum either 30 mm for gas group IIB, or 40 mm for gas group IIC.

This is necessary because of cooling down effect by releasing hot gases from an internal explosion over the flameproof joint. Wherever the empty enclosure has been tested with smaller distances this may be allowed. Ask BARTEC service address for more information on such application.

Check when assembling:

- Choose the location for the installation of the panel with care; possible in the flameproof enclosure mounted pilot lights and windows may not being exposed to a chance of mechanical damage.
- Mount the enclosure without torsion, on a flat underground only.

Note

The mounting sizes of stand alone enclosures are free available in (online) catalogues. Due to the fact that many control panels are assembled within more enclosures built together, the mounting sizes of an 'assembly' can be asked for at BARTEC with serial number as a reference.

Installation

⚠ DANGER

Death or serious injury through improper use.

➢ A main switch in a flameproof enclosure is not able to provide a voltage free condition. At the primary connections of the main switch may be voltage available.

➢ Switch the control panel to zero-potential. This is possible by either an installation isolator switch in the power line or by disconnecting the feeding group of the concerning (main) power distribution board.

Closing of flameproof IIB enclosures is allowed with belonging stainless steel socket head bolts only. The bolts must be carefully and evenly tightened over the surface of the flanged cover.

For socket head bolts:

M8:	torque 18 Nm
M10:	torque 35 Nm
M12:	torque 56 Nm
M16:	torque 100 Nm

Make sure each bolt is tightened in its place!

Note

In case of lost bolts: ask for genuine bolts from BARTEC.

Cabling and wiring

The electrical cable entries must be realized according the valid installation standard EN / IEC 60079-14.

- You'll have to choose the cross sections of the cables in a manner that no overload and thereafter possibly inadmissible temperature rising may occur.
  - ➢ Notice! Special attention is required for the selection of direct cable entries in flameproof enclosure Ex d (see Clause 10.4.2 of EN 60079-14:2008 / IEC 60079-14:2007 or clause 10.6.2. of EN 60079-14:2014 / IEC 60079-14:2014.

Also for protection method Ex e and Ex t there's a need for carefully selection of cable entries on the applicable cable diameter to maintain the required ingress protection (IP) degree.

Remark the fact that many cable entries offer no guarantee for strain relief (recognizable with an EC Type Examination Certificate number ending on an 'X').

  - ➢ Notice! Here's a mandatory need for cable clamping within a limited distance to the enclosure to be sure no strain on the cable entry may occur.

Unused cable entries must be closed with a certified stopping plug according the applicable protection method Ex d or Ex e. Attention for 'protection by enclosure' Ex t enclosures, the stopping plug needs to have a marking with 't' as well.

Ex d cable glands are allowed in combination with maximum 1 Ex d adapter or reducer in the threaded entry of the Ex d enclosure, where Ex d stopping plugs are not allowed in combination with Ex d adapters or reducers.

The insulation class of electrical wires needs to be chosen according the temperature class or max. surface temperature; most regular is:

Temp. class	T4	T5	T6
Max. surface temp.	T130°C	T95 °C	T80 °C
Max. internal temp.	110 °C	75 °C	60 °C
Wire insulation quality	H07G (EVA 110 °C)	H07V2 (PVC/ XLPE 90 °C)	H05V/ H07V (PVC 70 °C)

The external grounding facility of the explosion proof control panel must be connected to the protective earth system. Each non energized blank metal part must be grounded (PE).

In particular the terminal connections (junctions) in a possible present junction box in protection method increased safety (Ex e) need to be carefully maintained. Possibly applied terminal bridges need to maintain the explosion safety requirements as well (apply genuine manufactures only and apply insulation walls on the beginning and end of each terminal bridge).

Note

The insulation of the wires must reach up to the terminal. Conductor ends have to be protected against splaying, for example by the use of cable lugs, ferrules, or by the design of the terminal block (e.g. cage clamp) applied.

- Be aware of a correct application of the corresponding size of the cross section. The insulation of the wires may not be damaged.
  - ➢ NOTICE! Be during installation aware of the minimum required bending radius of the applicable wires. All screw terminals, - also the unused -, must be fix tightened.

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Note

When bigger sizes; consult the belonging manual or datasheet of the applicable terminals.

- Take in to account the minimum required clearance and creepage distances.

The manufacturer takes care of the necessary creepage and clearance distances when positioning the terminals. This is required for terminals of intrinsically safe circuits as well; the minimum distance between the reachable connections of intrinsically safe and non-intrinsically safe circuits must be at least 50 mm. Wherever a clearance of 50 mm is not feasible the application of a separation wall is allowed.

➢ NOTICE! When moving the terminals, take care of the necessary creepage and clearance distances according EN/IEC 60079-7.

For bolt based (metric size) terminals:

Screw size	Torque
M3:	0.8 Nm
M4:	2.0 Nm
M5:	3.5 Nm
M6:	5.0 Nm
M8:	10.0 Nm
M10:	17.0 Nm

For screw terminals (source: WEIDMÜLLER):

Terminal size	Torque
$2{,}5^2$:	0.4-0.7 Nm
4^2:	0.5-1.0 Nm
6^2:	0.8-1.6 Nm
10^2:	1.2-2.4 Nm
16^2:	2.0-4.0 Nm
35^2:	2.5-5.0 Nm
70^2:	6.0-12.0 Nm

Commissioning

Before commissioning, check that:

- The device has been installed in compliance with the manufacturer instructions.
- The enclosure is not damaged.
- The enclosure is fully closed.
- The connection has been established properly.
- The cables have been installed correctly.
- All screws have been tightened securely.
- The device functions perfectly.

Note

Protect the installation with a corresponding fuse or automatic circuit breaker. The power supply must have a sufficient short circuit current capacity to be sure that in case of a short circuit the fuse will trip guaranteed.

Operation

DANGER

Death or serious injury through improper use.

➢ The control panel may be operated only within the technical limits that apply to it (see page 1).

Maintenance and Fault Clearance

WARNING

Risk of injury due to incorrect proceedings.

➢ The national valid regulatory for maintenance, inspection, and repair is applicable for electrical equipment for the use in hazardous areas.

➢ Damaged flameproof components (e.g. windows, pilot lights, switches and cable entries) must be directly replaced by genuine BARTEC spare parts.

Maintenance cycles

There should be maintenance within regular intervals. Recommended is to formulate a maintenance plan according EN / IEC 60079-17.

Inspection

Follow the national law and regulatory for inspection of explosion proof equipment. This should be done by skilled and qualified personnel only.

During inspection following parts of the panels need special attention:

- Ex d enclosure: Visual inspection of either flange- or screw cover (flame path) and belonging gasket (O-ring).
  - ➢ NOTICE! The flame proof joint may not being damaged with scratches or grooves. Whenever the joint is damaged, the joint width (gap) may be bigger than acceptable, the enclosure needs to return to the factory for overhaul.
  - ➢ NOTICE! The flameproof joint may not been painted.
- To protect flameproof joints against corrosion they have to be greased by an acid-free non-curing grease (recommended is: Molykote, type Longterm W2).

Ex e / Ex t enclosure

- Check all gaskets and O-rings.
- Replace gaskets and O-rings when aged or damaged with new ones of the same type.
- Check if all terminals (junctions) and cable entries and/or line bushings are completely tightened.
- Polyester (glass fibre reinforced) enclosures may not show any cracks.

Repair

- Disconnect from power supply before starting any repair to equipment.
- Replace faulty vital explosion proof components with original genuine BARTEC components only.
  - ➢ NOTICE! Be aware not every repair is allowed to be performed on your own. In case of doubt; ask for the technical service from BARTEC (see Service Address).

Special conditions

When applying 'associated apparatus' you should perform for each intrinsically safe circuit, entering the hazardous area a so-called 'loop check'.

- Check if you fulfill to all safety requirements stated in certificate and/or manual.
  - ➢ NOTICE! None of the safety output parameters of the 'associated apparatus' may exceed the entity parameters of the connected field apparatus. In case of doubt: ask the manufacturer.
- Fulfill all applicable caution text labels on the panel.

Disposal

The components in the control panel contain metal and plastic parts.

Therefore the statutory requirements for disposing of electronic scrap must be observed (e.g. disposal by an approved disposal company).

Production Location / Service Address

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

01-4000-7D0001/B-06/15-STVT-375605