

Operational Instruction

Distribution box Type 07-5103-..../....., 07-5105-..../....., 07-5106-..../.... and 07-5107-..../.....



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Distribution box Type 07-5103-..../....., 07-5105-..../....., 07-5106-..../..... and 07-5107-..../.....



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 BARTEC Varnost distribution boxes, type 07-5103-..../....., 07-5105-..../....., 07-5106-..../..... and 07-5107-..../....., are used for connections and distribution of incoming and outgoing cables and wires with certified connecting and/or rail-mounted terminals. The distribution boxes are used for connecting lights, devices and signals.

The enclosure is made of glassfiber reinforced polyester. The lid and base are fastened with stainless steel captive screws (+/- crosshead).

A grooved spring system with inserted sealing chord in between the lid and the base provides for the high protection type IP66.

The distribution boxes are mounted by means of fixing holes outside of the sealed space.

The distribution boxes are also suitable for intrinsically safe electric circuit's connections. In this case, a special marking is required.

The distribution boxes can be used in hazardous areas of both zone 1 and 2 with certified explosion subgroups II and the temperature class T5/T6 and as well as in zone 21 and 22 with certified max. surface temperature.

The maximum number of conductors for each enclosure size, which is subject to the cross section and the permissible continuous current, is shown in the supplements (www.IECEx.com). Enclosures and cabinets with windows shall only be used in conditions with low level mechanical risk.

Explosion protection

| | |
|--|--|
| ATEX | Ex II 2G Ex eb ia/ib IIA, IIB, IIC T6, T5 Gb Ex II 2G Ex ia/ib IIA, IIB, IIC T6, T5 Gb For type 07-5103-..../..... and 07-5105-..../..... also: Ex II 2D Ex tb IIIC T80 °C, T95 °C Db IP66 For type 07-5105-..../..... also: Ex II 2D Ex ia/ib IIIC T80 °C Db |
| Certification | PTB 08 ATEX 1064X |
| IECEX | Ex eb ia/ib IIA, IIB, IIC T6, T5 Gb Ex ia/ib IIA, IIB, IIC T6, T5 Gb For type 07-5103-..../..... and 07-5105-..../..... also: Ex tb IIIC T80 °C, T95 °C Db IP66 For type 07-5105-..../..... also: Ex ia/ib IIIC T80 °C Db |
| Certification | IECEX PTB 09.0009X |
| Working temperature ranges | With EPDM gasket: -20 °C to +95 °C (-4 °F to +203 °F) With inspection windows: -25 °C to +95 °C (-13 °F to +203 °F) With silicone gasket: -55 °C to +100 °C (-67 °F to +212 °F) |
| Ambient temperature ranges | Depending on the temperature class: By T95 °C, T5 and for the Ex ia/ib IIC T6 Gb version, silicone gasket: -55 °C to +55 °C (-67 °F to +131 °F) T6 and T80 °C, silicone gasket: -55 °C to +40 °C (-67 °F to +104 °F) T6 EPDM gasket and inspection win-dow(s): -20 °C to +40 °C (-4 °F to +104 °F) |
| Approved for zones | 1 and 2 21 and 22 |
| Technical data | |
| Protection class | Max. IP66 |
| Rated voltage (U _e) | AC/DC 1000 V Depending on the type of terminal |
| Rated current | Please refer to page 4 - 10 |
| Mechanical strength | Impact energy: 7 Joule |
| Enclosure material/ manufacturing process | Type 07-5103-..../..... and 07-5105-..../..... Glass-fiber reinforced polyester Surface resistance <10 ⁹ Ω RAL 9005 black Type 07-5106-..../..... and 07-5107-..../..... Glass-fiber reinforced polyester Surface resistance >10 ¹² Ω RAL 9000/RAL 7001 grey |
| Lid screws | Stainless Steel, cross-head (+-) |
| Recommended tightening torque | M4 screw: ca. 1.2 Nm M6 screw: ca. 1.4 Nm |
| Terminals | Certified connecting and/or rail-mounted terminals with a maximum rated voltage of 1100 V AC/DC and a maximum rated cross section of 300 mm ² . For information about the tightening torque of the terminal screw, Tightening torques, see manufacturer's instructions |
| Dimensions in mm (in) | From 80 x 75 x 55 (3.1 x 3 x 2.2) to 600 x 250 x 120 (23.6 x 9.8 x 4.7), see also Bartec catalogue |

Safety instructions

The distribution box may be used within the specified temperature class and the temperature range indicated for it (see type label).

The distribution box may be operated only if it is clean and not damaged in any way. Dust deposits > 5 mm (> 0.2 in) must be removed.

As for distribution boxes used in flammable dust, the ignition temperature of the dust/air mixture and the glowing temperature of the dust concerned must be greater than the maximum surface temperature of the distribution box taking into account of the given safety factor specified in EN 60079-0.

Utilization in areas other than those specified or the modification of the product by anyone other than the manufacturer is not permitted and will exempt BARTEC Varnost from liability for defects and any further liability.

The generally applicable statutory rules and other binding directives relating to workplace safety, accident prevention and environmental protection must be observed.

Observe the applicable laws and directives when commissioning or restarting operation.

Always follow the safety instructions on the operating equipment.

Marking

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



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



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



CAUTION indicates a potentially hazardous situation which, if not avoided, may result in death or serious injury.



NOTICE indicates a potentially hazardous situation which, if not avoided, may result in property damage.



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

Standards conformed to

EN 60079-0:2018/IEC 60079-0:2017

EN 60079-7:2015/IEC 60079-7:2015

EN 60079-11:2012/IEC 60079-11:2011

EN 60079-31:2014/IEC 60079-31:2013

as well as

EN 62208:2011/IEC 62208:2011

EN 60445:2010/IEC 60445:2010

EN 60529:1991 + AC:2016-12

Transport, storage



CAUTION

Risk of injury due to heavy loads.

- Use an appropriate carrying aid or an appropriate means of transport (e.g. a fork-lift) with an adequate load-carrying ability.
- Ensure that the lifted load will not tip over or slip off.



NOTICE

Damage through incorrect transport or incorrect storage.

- Transport the distribution box in original packaging, handle with care, and do not drop.
- Store the distribution box dry in original packaging.

Assembly, installation, and commissioning



WARNING

Risk of serious injury due to incorrect proceedings.

- Only qualified personnel who are authorized and trained to assemble electrical components in hazardous (potentially explosive) areas may do any of the assembly, disassembly, installation and commissioning work.
- For assembly and operation of explosion protected electrical equipment, relevant installation and operating regulations are to adhere (e.g. Betr.SichV, IEC/EN 60079-14 and series DIN VDE 0100).
- The data on the label and the EEC design test data are to be observed. Further technical information is provided in the BARTEC catalog and on the product itself.
- User may not drill holes in the distribution boxes and add terminals.
- Do not open the distribution box when energized.

Assembly / disassembly



DANGER

Death or serious injury because of a missing protective earth connection.

- Metallic conductor entries must be connected to the ground. With plastic enclosures, BARTEC Earth loc or appropriate ground plates serve the similar purpose.



WARNING

Risk of serious injury due to incorrect proceedings.

- The assembly with connecting and/or rail-mounted terminals must be implemented under the consideration of the EEC design inspection certificate.

Check when assembling:

- Use suitable tools.
- Pay attention to the type of mounting required (for fitting into enclosure/attachment with distribution box).
- For distribution boxes placed in outdoors, steps must be taken to ensure smooth operation, for example rain protected roofs, and if necessary, sufficient enclosure protection.

Installation



WARNING

Risk of injury due to incorrect proceedings.

- Extensions or modifications to the distribution box are only permissible if the manufacturer's approval is obtained first.
- The IEC/EN60079-14 must be observed.

Installations for the highly combustible range must exhibit an EEC design inspection certificate. Installation of these components must take place in such way, so that at least the enclosure remains IP54.

Connection of cables and conductors to equipment in hazardous areas require Ex certified entries, which are suitable for respective cable and conductor types. They must possess the protection type "e" and contain a suitable sealing gasket, so that the protection class of the enclosure remains at least IP54.

Unused holes for cable entries have to be sealed with Ex-certified plugs. Connection of cables and conductors of zone 21 and 22 equipment require at least the protection class IP 66.

Connecting conductors



WARNING

Risk of serious injury due to incorrect proceedings.

- All terminal positions, including the unused ones, are to be tightened firmly.
- The connections must be secured against self-loosening.

Take care when connecting conductors:

- Remove approx. 6 mm (0.24 in) conductor insulation from the cores.
- Prepare the ends of fine-stranded and multi-stranded conductors: Crimp wire end sleeves with suitable crimping tools in order to achieve a constant pressure quality.



NOTICE! Take care not to damage the individual wires.

- Release terminals.
- Put the wire in the terminals.
- Tight the terminals with a maximum permissible torque depending from the size of the screws. For information about tightening torque of the terminal screw, see manufacturer's instructions.

Commissioning

Before commissioning, check that:

- The distribution box has been installed in compliance with regulations.
- The distribution box is not damaged.
- The connection has been established properly.
- The cables have been laid correctly.
- All screws have been tightened securely.
- The distribution box functions perfectly.



NOTE Electrical equipments, before putting into operation, and at certain time intervals, are to be subjected and to examination by an electrical expert.

Operation



DANGER

Death or serious injury through improper use.

- The distribution box may be operated only within the technical limits that apply to it (see page 1).

Maintenance and fault clearance



WARNING

Risk of serious injury due to incorrect proceedings.

- Only authorized qualified personnel are allowed to do any of the work relating to maintenance and fault clearance.
- IEC/EN 60079-17 must be observed.
- Do not open the distribution box when energized.



WARNING

Risk of serious injury due to damaged parts.

- If any part of the equipment is damaged, it should be exchanged only with original parts (e.g. sealing gasket/ cable glands/ terminals).

Maintenance



WARNING

Risk of serious injury due to electrostatic charging.

- For type 07-5106-.../....., 07-5107-.../....., and for windows with surface resistance of $>10^9 \Omega$ potential electrostatic charging hazard exist. Only wet cleaning is allowed..

The operator of the distribution box must keep it in good condition, monitor it and clean it regularly. He has to determine the maintenance intervals depending on the conditions of use.

Within the scope of maintenance:

- Check distribution box, cable entries, sealings, and cables regularly for cracks and damage.
- Make sure that they are properly established.

Fault clearance

The distribution box is defective if the encapsulation is damaged and/or if one of the components does not function any longer.

In this case:

- Replace defective parts in the encapsulation with original parts immediately.
- Replace or repair the defective components with original parts



NOTE Follow the components mounting instructions/ operating instructions to replace or repair the components.

Accessories, spare parts

For accessories and spare parts, see BARTEC catalogue.

Disposal

The distribution box and its components 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).



NOTE Ensure environmentally friendly disposal of all components according to legal regulations.

Service Address

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1410 Zagorje ob Savi Slovenia

Tel.: +386 59 221 471

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Current Load value tables

Housing size in mm L(W) = 260 ; W(H) = 160 ; H(D) = 90

| Current (A) | Cross section (mm ²) | | | | | | | | | | | | | | | |
|-------------|----------------------------------|-----|-----|----|----|----|----|-----|----|----|----|-----|-----|-----|-----|-----|
| | 1.5 | 2.5 | 4 | 6 | 10 | 16 | 25 | 35 | 50 | 70 | 95 | 120 | 150 | 185 | 240 | 300 |
| 6 | | | | | | | | | | | | | | | | |
| 10 | 52 | | | | | | | | | | | | | | | |
| 16 | 18 | 34 | 135 | | | | | | | | | | | | | |
| 20 | 7 | 20 | 39 | | | | | | | | | | | | | |
| 25 | | 9 | 22 | 42 | | | | | | | | | | | | |
| 35 | | | 6 | 16 | 41 | | | | | | | | | | | |
| 50 | | | | 2 | 13 | 34 | | | | | | | | | | |
| 63 | | | | | 4 | 16 | 56 | | | | | | (2) | | | |
| 80 | | | | | | 6 | 17 | 63 | | | | | | | | |
| 100 | | | | | | | 7 | 16 | | | | | | | | |
| 125 | | | | | | | | 6 | 17 | | | | | | | |
| 160 | | | | | | | | | 5 | 15 | | | | | | |
| 200 | | | | | | | | | | 5 | 13 | 40 | | | | |
| 225 | | | | | | | | | | 2 | 7 | 15 | | | | |
| 250 | | | | | | | | (3) | | | 4 | 9 | 20 | | | |
| 315 | | | | | | | | | | | | 2 | 5 | 12 | | |
| 400 | | | | | | | | | | | | | | 2 | 8 | 23 |
| 500 | | | | | | | | | | | | | | | | 4 |

(1)

Housing size in mm L(W) = 360 ; W(H) = 160 ; H(D) = 90

| Current (A) | Cross section (mm ²) | | | | | | | | | | | | | | | |
|-------------|----------------------------------|-----|-----|----|----|----|----|-----|----|----|----|-----|-----|-----|-----|-----|
| | 1.5 | 2.5 | 4 | 6 | 10 | 16 | 25 | 35 | 50 | 70 | 95 | 120 | 150 | 185 | 240 | 300 |
| 6 | | | | | | | | | | | | | | | | |
| 10 | 53 | | | | | | | | | | | | | | | |
| 16 | 18 | 35 | 138 | | | | | | | | | | | | | |
| 20 | 7 | 20 | 40 | | | | | | | | | | | | | |
| 25 | | 9 | 22 | 43 | | | | | | | | | | | | |
| 35 | | | 6 | 17 | 42 | | | | | | | | | | | |
| 50 | | | | 2 | 13 | 35 | | | | | | | | | | |
| 63 | | | | | 4 | 16 | 58 | | | | | | (2) | | | |
| 80 | | | | | | 6 | 18 | 64 | | | | | | | | |
| 100 | | | | | | | 7 | 17 | | | | | | | | |
| 125 | | | | | | | | 6 | 17 | | | | | | | |
| 160 | | | | | | | | | 6 | 15 | | | | | | |
| 200 | | | | | | | | | | 5 | 13 | 40 | | | | |
| 225 | | | | | | | | | | 2 | 7 | 16 | | | | |
| 250 | | | | | | | | (3) | | | 4 | 9 | 20 | | | |
| 315 | | | | | | | | | | | | 2 | 5 | 12 | | |
| 400 | | | | | | | | | | | | | | 2 | 8 | 23 |
| 500 | | | | | | | | | | | | | | | | 4 |

(1)

Housing size in mm L(W) = 560 ; W(H) = 160 ; H(D) = 90

| Current (A) | Cross section (mm ²) | | | | | | | | | | | | | | | |
|-------------|----------------------------------|-----|-----|----|----|----|----|-----|----|----|----|-----|-----|-----|-----|-----|
| | 1.5 | 2.5 | 4 | 6 | 10 | 16 | 25 | 35 | 50 | 70 | 95 | 120 | 150 | 185 | 240 | 300 |
| 6 | | | | | | | | | | | | | | | | |
| 10 | 53 | | | | | | | | | | | | | | | |
| 16 | 18 | 35 | 138 | | | | | | | | | | | | | |
| 20 | 7 | 20 | 40 | | | | | | | | | | | | | |
| 25 | | 9 | 22 | 43 | | | | | | | | | | | | |
| 35 | | | 6 | 17 | 42 | | | | | | | | | | | |
| 50 | | | | 2 | 13 | 35 | | | | | | | | | | |
| 63 | | | | | 4 | 16 | 58 | | | | | | (2) | | | |
| 80 | | | | | | 6 | 18 | 64 | | | | | | | | |
| 100 | | | | | | | 7 | 17 | | | | | | | | |
| 125 | | | | | | | | 6 | 17 | | | | | | | |
| 160 | | | | | | | | | 6 | 15 | | | | | | |
| 200 | | | | | | | | | | 5 | 13 | 40 | | | | |
| 225 | | | | | | | | | | 2 | 7 | 16 | | | | |
| 250 | | | | | | | | (3) | | | 4 | 9 | 20 | | | |
| 315 | | | | | | | | | | | | 2 | 5 | 12 | | |
| 400 | | | | | | | | | | | | | | 2 | 8 | 23 |
| 500 | | | | | | | | | | | | | | | | 4 |

(1)

Current Load value tables

Housing size in mm L(W) = 400 ; W(H) = 250 ; H(D) = 120

| Current (A) | Cross section (mm ²) | | | | | | | | | | | | | | | |
|-------------|----------------------------------|-----|-----|----|----|----|----|-----|----|----|----|-----|-----|-----|-----|-----|
| | 1.5 | 2.5 | 4 | 6 | 10 | 16 | 25 | 35 | 50 | 70 | 95 | 120 | 150 | 185 | 240 | 300 |
| 6 | | | | | | | | | | | | | | | | |
| 10 | 75 | | | | | | | | | | | | | | | |
| 16 | 26 | 50 | 196 | | | | | | | | | | | | | |
| 20 | 10 | 29 | 57 | | | | | | | | | | | | | |
| 25 | | 14 | 32 | 62 | | | | | | | | | | | | |
| 35 | | | 9 | 24 | 60 | | | | | | | | | | | |
| 50 | | | | 3 | 19 | 50 | | | | | | | | | | |
| 63 | | | | | 6 | 23 | 82 | | | | | | (2) | | | |
| 80 | | | | | | 9 | 25 | 92 | | | | | | | | |
| 100 | | | | | | | 11 | 24 | | | | | | | | |
| 125 | | | | | | | | 9 | 24 | | | | | | | |
| 160 | | | | | | | | | 8 | 21 | | | | | | |
| 200 | | | | | | | | | | 7 | 18 | 58 | | | | |
| 225 | | | | | | | | | | 3 | 10 | 22 | | | | |
| 250 | | | | | | | | (3) | | | 5 | 14 | 29 | | | |
| 315 | | | | | | | | | | | | 3 | 8 | 17 | | |
| 400 | | | | | | | | | | | | | | 3 | 12 | 34 |
| 500 | | | | | | | | | | | | | | | | 6 |

(1)

Housing size in mm L(W) = 400 ; W(H) = 250 ; H(D) = 160

| Current (A) | Cross section (mm ²) | | | | | | | | | | | | | | | |
|-------------|----------------------------------|-----|-----|----|----|----|----|-----|----|----|----|-----|-----|-----|-----|-----|
| | 1.5 | 2.5 | 4 | 6 | 10 | 16 | 25 | 35 | 50 | 70 | 95 | 120 | 150 | 185 | 240 | 300 |
| 6 | | | | | | | | | | | | | | | | |
| 10 | 87 | | | | | | | | | | | | | | | |
| 16 | 30 | 58 | 225 | | | | | | | | | | | | | |
| 20 | 12 | 34 | 65 | | | | | | | | | | | | | |
| 25 | | 16 | 37 | 71 | | | | | | | | | | | | |
| 35 | | | 11 | 28 | 69 | | | | | | | | | | | |
| 50 | | | | 4 | 22 | 57 | | | | | | | | | | |
| 63 | | | | | 7 | 26 | 94 | | | | | | (2) | | | |
| 80 | | | | | | 10 | 29 | 105 | | | | | | | | |
| 100 | | | | | | | 12 | 28 | | | | | | | | |
| 125 | | | | | | | | 11 | 28 | | | | | | | |
| 160 | | | | | | | | | 9 | 25 | | | | | | |
| 200 | | | | | | | | | | 9 | 21 | 66 | | | | |
| 225 | | | | | | | | | | 3 | 12 | 26 | | | | |
| 250 | | | | | | | | (3) | | | 6 | 16 | 33 | | | |
| 315 | | | | | | | | | | | | 3 | 9 | 19 | | |
| 400 | | | | | | | | | | | | | | 4 | 13 | 39 |
| 500 | | | | | | | | | | | | | | | 2 | 7 |

(1)

Housing size in mm L(W) = 600 ; W(H) = 250 ; H(D) = 120

| Current (A) | Cross section (mm ²) | | | | | | | | | | | | | | | |
|-------------|----------------------------------|-----|-----|----|----|----|----|-----|----|----|----|-----|-----|-----|-----|-----|
| | 1.5 | 2.5 | 4 | 6 | 10 | 16 | 25 | 35 | 50 | 70 | 95 | 120 | 150 | 185 | 240 | 300 |
| 6 | | | | | | | | | | | | | | | | |
| 10 | 78 | | | | | | | | | | | | | | | |
| 16 | 26 | 52 | 201 | | | | | | | | | | | | | |
| 20 | 11 | 30 | 58 | | | | | | | | | | | | | |
| 25 | | 14 | 33 | 64 | | | | | | | | | | | | |
| 35 | | | 9 | 25 | 62 | | | | | | | | | | | |
| 50 | | | | 3 | 20 | 51 | | | | | | | | | | |
| 63 | | | | | 6 | 24 | 84 | | | | | | | (2) | | |
| 80 | | | | | | 9 | 26 | 95 | | | | | | | | |
| 100 | | | | | | | 11 | 25 | | | | | | | | |
| 125 | | | | | | | | 10 | 25 | | | | | | | |
| 160 | | | | | | | | | 8 | 22 | | | | | | |
| 200 | | | | | | | | | | 8 | 19 | 59 | | | | |
| 225 | | | | | | | | | | 3 | 11 | 23 | | | | |
| 250 | | | | | | | | (3) | | | 6 | 14 | 29 | | | |
| 315 | | | | | | | | | | | | 3 | 8 | 17 | | |
| 400 | | | | | | | | | | | | | | 4 | 12 | 35 |
| 500 | | | | | | | | | | | | | | | | 7 |

(1)

Note

1. Maximum count of conductors, dependent on the cross section and the allowed continuous current from the above mentioned housing size. Each established router and each internal connection conductor counts as a conductor, bridges and protection conductors are not counted
2. In this area under compliance with the instructions and the defined installation dimensions in the housing there can be an maximum number of elements as physically possible following relevant standards
3. The assembly in this area requires an additional temperature rise test from manufacturer

Instructions

When choosing the unassigned continuous currents for the cross sections, the maximum charge currents of the clamps used and the connected cables and conductors are to be observed. Conductors, in the interior of the housings equipped as in the table above, must be qualified for a temperature of between 70 to 80°C.

In case of using values in the table, the simultaneous or charge factors comprising IEC 439 must be kept in mind.

Mixing of assemblies with circuits of varying cross sections and currents is possible with a use of the proportionately adjusted table values.

Example

| Cross section/mm ² | Current/A | Number | Workload |
|-------------------------------|-----------|--------------|----------------------|
| 2,5 | 16 | 10 (of 30) | 33% |
| 16 | 50 | 12 (of 48) | 25% |
| 25 | 63 | 36 (of 90) | 40% |
| | | Total | 98% < 100% |

Different types of equipment with smaller or larger cross sections than used in this supplementary sheet were not measured. They are to be specially considered in connection with the permissible flows, and require, in any case, a measurement (warming verification).

BARTEC

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