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Казахстан +7(7172)727-132

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ПРИВОДЫ ПОСТОЯННОГО ТОКА

Техническое описание на DCA



Cabling Instructions

Power Cables

The mains and motor cables must be dimensioned *according to local regulations* and:

- 1.) to carry the DCA 500 / DCA 600 load current
- 2.) for at least 60 °C (140 °F)
- 3.) to fulfil short-circuit protection
- 4.) the inductance and impedance of the cable must be rated according permissible touch voltage appearing under fault conditions (so that the fault point voltage will not rise too high when an earth fault occurs).
- 5.) the cable screens according to safety regulations.

Control / Signal Cables

The cables for digital signals, which are longer than 3 m and all cables for analogue signals, must be screened. Each screen must be connected at **both** ends by metal clamps (see *Figure 3-1*) or comparable means directly on clean metal surfaces, if **both earthing points belong to the same earth line**. Otherwise a capacitor (e.g. 3.3 nF/3000 V) must be connected to earth on one end. In the converter cabinet this kind of connection must be made directly on the sheet metal close to the terminals (see *Figure 3-3* ③) and if the cable comes from outside also on the PE bar (see *Figure 3.3* ① and ②). At the other end of the cable the screen must be well connected with the housing of the signal emitter or receiver.

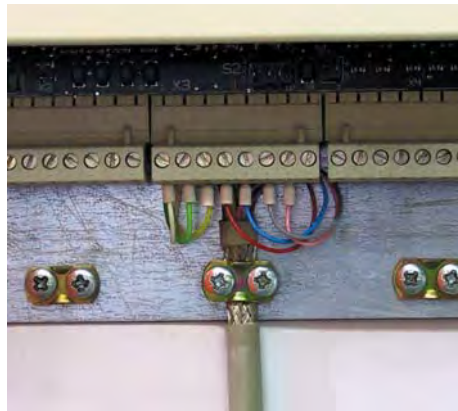


Figure 3-1 Connection of a cable screen with the aid of metal clamp to the metal surface

A double shielded twisted pair cable (*Figure 3-2 a*), e.g. JAMAK by NK Cables, Finland) must be used for analogue signals and the pulse encoder signals. Employ one individually shielded pair for each signal. Do not use common return for different analogue signals.

A double shielded cable is the best alternative for low voltage digital signals but single shielded twisted multipair cable (*Figure 3-2 b*) is also

usable.

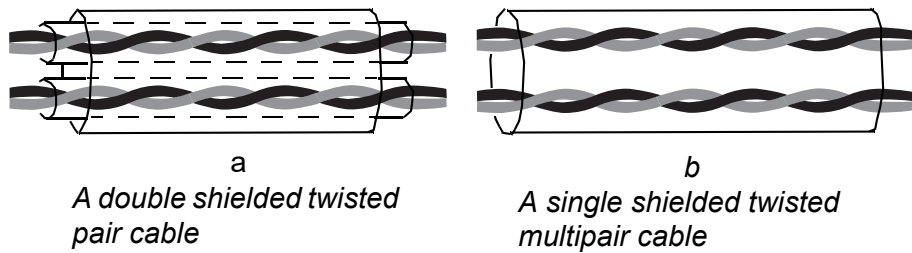


Figure 3-2 Different shielded twisted cables

Pairs should be twisted as close to terminals as possible.

The analogue and digital signals should be run in separate, screened cables.

Relay-controlled signals, providing their voltage does not exceed 48 V, can be run in the same cables as digital input signals. It is recommended that the relay-controlled signals be run as twisted pairs.



Caution: Never mix 24 VDC and 115 / 230 VAC signals in the same cable!

Co-axial Cables

Recommendations for use with DC Enclosed Converters series DCA 500 / DCA 600:

- 75 Ω type;
- RG59 cable with diameter 7 mm or RG11 cable 11 mm;
- The maximum cable length is 300 m.

Relay Cable

Cable types with braided metallic screens (e.g. ÖLFLEX, LAPPKABEL, Germany) has been tested and approved by ABB.

Control Panel Cable

In remote use the cable connecting the Control Panel CDP 312 to the DCS 500 / DCS 600 thyristor power converter module must not exceed 3 meters. The cable type tested and approved by ABB is included in the Control Panel option kits.

Optical Cables

The max. cable length for optical cables depends on the converter family (series DCA 500, DCA 600 ...) and on the type of optical cable selected (plastic or glass fibre, HCS silicate); for details please refer to the corresponding manual *Technical Data*. Moreover follow the instructions concerning the use of optical cables given by the cable suppliers.

Location of Cable Connections within the Cabinet

DC thyristor power converter modules series DCS 500 / DCS 600 are used in **DC Enclosed Converters** series **DCA 500 / DCA 600**. The standard version is equipped with a bottom entry for power and control cables. Basically all control cable connections are located on the left side of the cabinet.

Motor Cable Connection

Conductive Sleeves

Conductive sleeves are supplied by ABB as option to provide 360° high frequency grounding for motor cables. Follow these instructions:

- 1). Pull cable into the cabinet through the conductive sleeve.
- 2). If a rubber grommet is used, slide it over the cable.
- 3). Connect phase conductors to terminals.
- 4). Twist the shield wires of the cable together and connect them to ground terminal or PE busbar.
- 5). Peel off 3 to 5 cm of the outer cover of the cable above the entry plate for the 360° high frequency grounding.
- 6). Fasten the conductive sleeve to the cable shield with a cable tie.
- 7). Tie up the unused conductive sleeves with cable ties.

Cable Entry

Figure 3-10 shows a bottom cable entry for power cables of DCA 500 / DCA 600. Tighten the EMC sleeve on the stripped part of the cable with cable ties. For IP 54 units, add a rubber grommet on the cable under the EMC-cable-entry-plate.

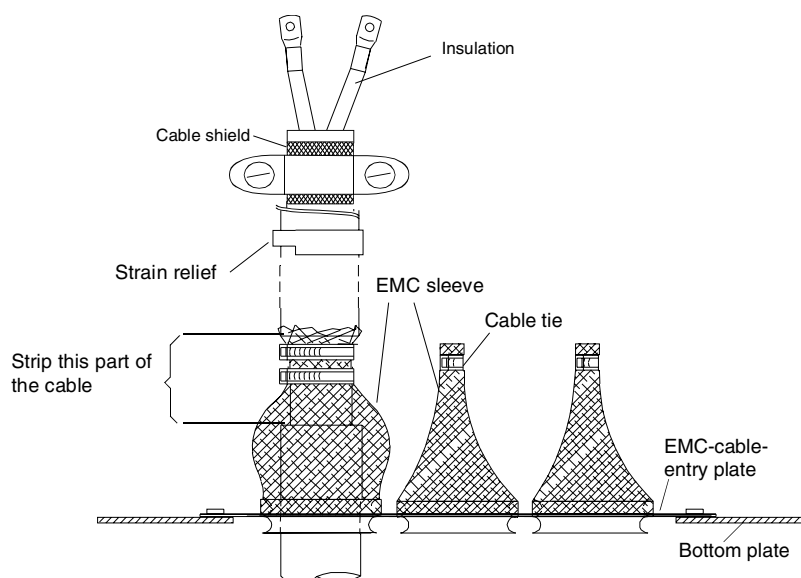


Figure 3-10 Conductive sleeves

Control Cable Connection

Connect the control cables to the appropriate terminal block (or optional terminal block and other options on the DIN rail at the left side of the cabinet). Tighten the screw to secure the connection. Connect the twisted screen (as short as possible) to the earthing rail \oplus of the terminal. See also *Figure 3-1* and *3-3*.

EMC Grounding at the Cable Entry

360° high frequency grounding of the control cable screen at the cable entry is available as an option from ABB (see *Figure 3-11*).

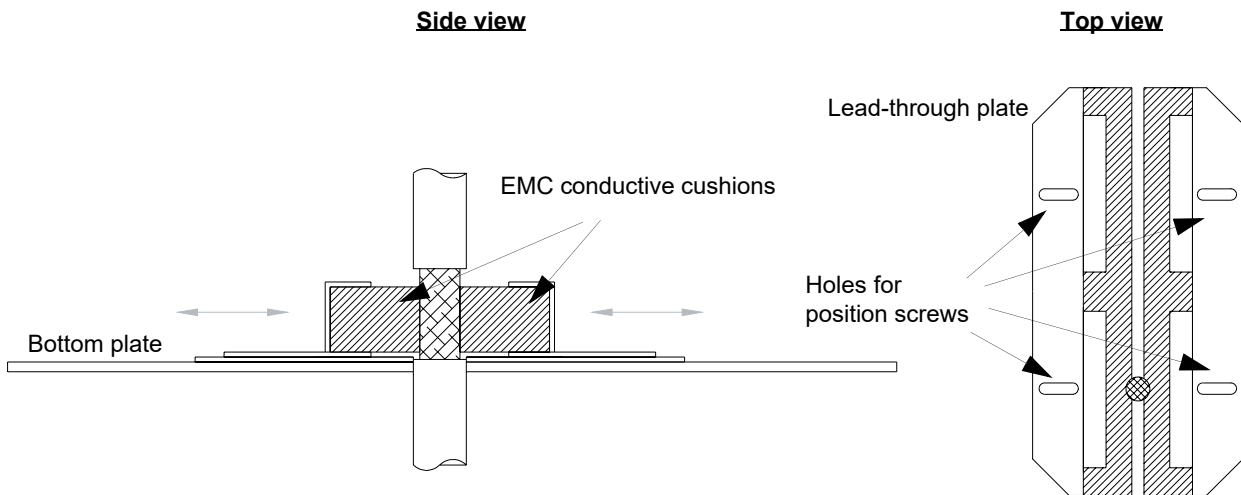


Figure 3-11 Conductive cushions

Special for Top Entry

When each cable has its own rubber grommet, sufficient IP and EMC protection can be achieved. However, if lots of control cables are connected to one cabinet, plan the installation beforehand as follows:

- 1). Make a list of the cables to be connected to the cabinet.
- 2). Sort the cables connected to the left into one group and the cables connected to the right into another group to avoid unnecessary crossing of cables inside the cabinet.
- 3). Sort the cables in each group according to size.
- 4). Group the cables for each grommet as follows:

Cable diameter in mm	Max. number of cables per grommet
≤ 13	4
≤ 17	3
< 25	2
≥ 25	1

- 5). Divide the bunches so that cables will be arranged according to size between the EMC conductive cushions.

View from below

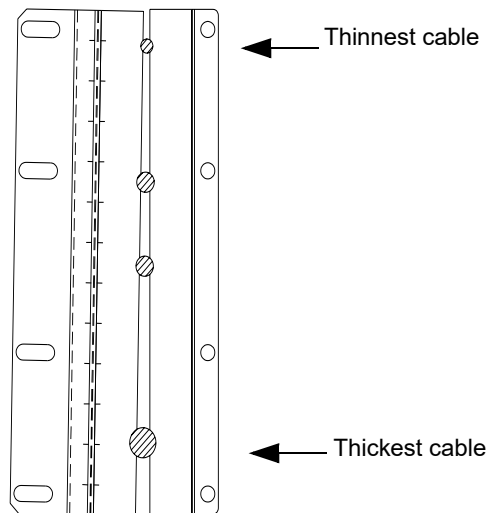


Figure 3-12 Lead-through plate

Bottom and Top Entry

Proceed as follows:

- 1). Loosen the lead-through plate position screws. Pull the two parts apart.

- 2). Bottom entry

Lead the cable inside the cabinet through the EMC conductive cushions.

Top entry

Lead the cable inside the cabinet through the grommet and the EMC conductive cushions. If you have several cables, bunch them together at the grommet, but ensure that each cable has a proper contact to the cushions on both sides.

- 3). Strip off the cable plastic sheath above the base plate (just enough to ensure proper connection of the bare screen and the EMC conductive cushions).

- 4). Earth the screen by means of the EMC conductive cushions:
 - a. If the outer surface of the screen is conductive:
 - Push the two parts of the lead-through plate together so that the EMC conductive cushions presses tightly around the bare screen.
 - b. If the outer surface of the screen is covered with non-conductive material:

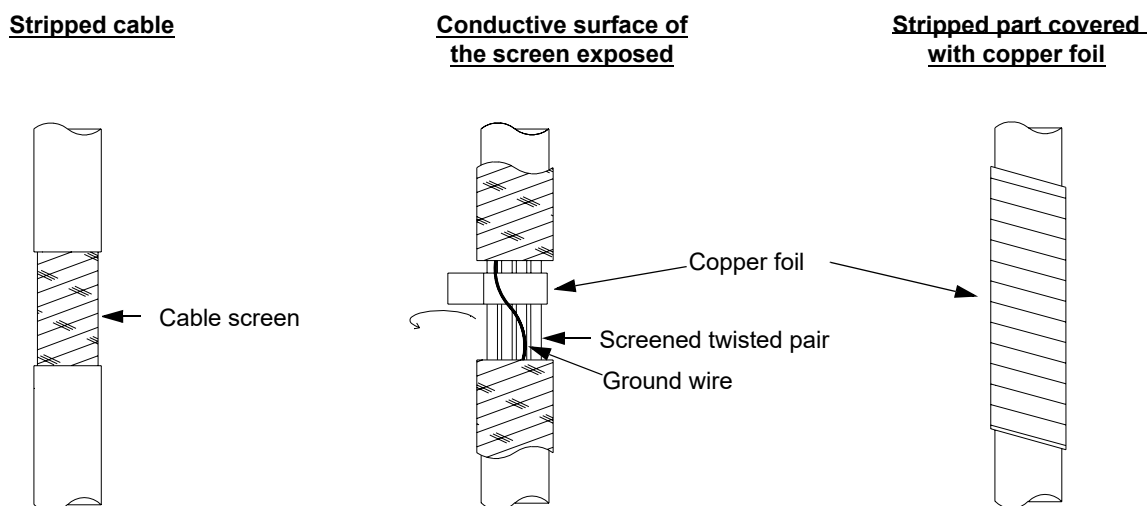


Figure 3-13 Cable screen

- Cut the screen at the midpoint of the bare part. Be careful not to cut the conductors.
 - Turn the screen inside out to expose its conductive surface.
 - Cover the turned screen and the stripped cable with copper foil to keep the shielding continuous. **Note:** The ground wire (if present) must not be cut.
 - Push the two parts of the lead-through plate together so that the EMC conductive cushions press tightly round the foil-covered screen.
- 5). Lock the two parts of the lead-through plate by tightening the positioning screws.

- 6). Top entry: If more than one cable go through a single grommet, the grommet must be sealed by Loctite 5221 (catalogue number 25551).

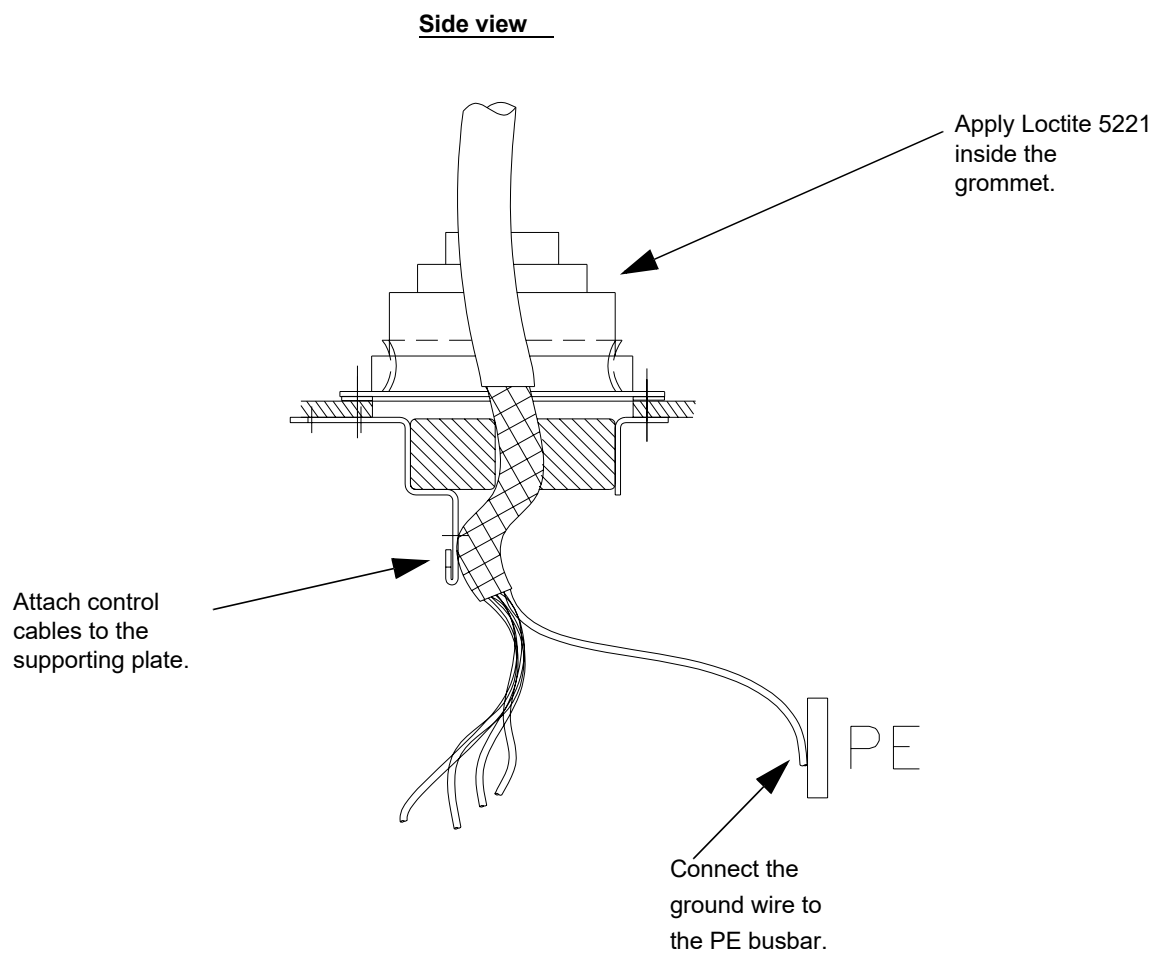


Figure 3-14 Top entry

Installation of Optional Modules (only for DCA 600)

This section gives general installation instructions for DCA 600 optional modules.

There are various serial interface options available for operation, commissioning, diagnosis and controlling. For the control and display panel CDP 312 are serial connections X33:/X34: on the SDCS-CON-2 available. Three additional serial interfaces are available on the SDCS-AMC-DC 2 board.

These interfaces use plastic or HCS optical fibres. Channel 3 is used for drive/PC interfacing. Channel 0 for fieldbus module interfacing or communication to the overriding control system. Channel 2 is used for Master-Follower link or for I/O extension. All three serial interfaces are independent from each other.

Different SDCS-AMC 2 boards are available to adapt optical cables, cable length and serial interfaces. The different SDCS-AMC 2 boards are equipped with 10 or 5 Mbaud optical transmitter and receiver devices.

A few basic rules must be considered:

- Never connect 5 Mbaud and 10 Mbaud devices.
- 5 Mbaud can handle only plastic fibre optic.
- 10 Mbaud can handle plastic or HCS cable.
- The branching unit NDBU 95 extends the maximum distance.
- The maximum distance and suitable configuration can be found in the manual *Configuration Instructions NDBU 85/95; Doc no.: 3ADW000100*.

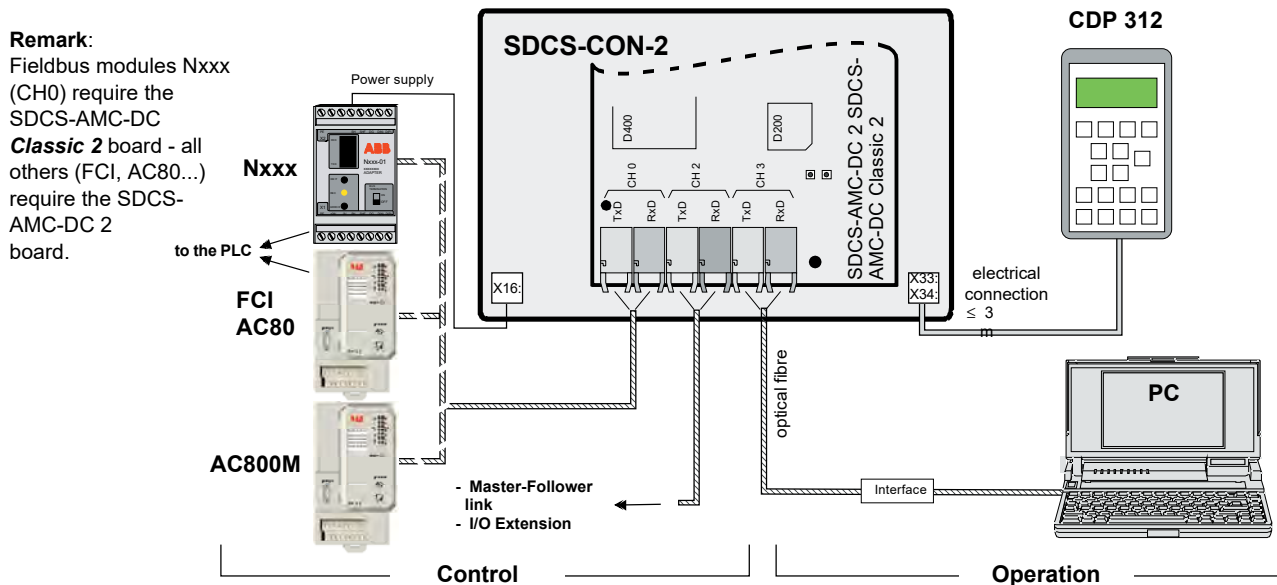


Figure 3-15 Options for serial communication

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