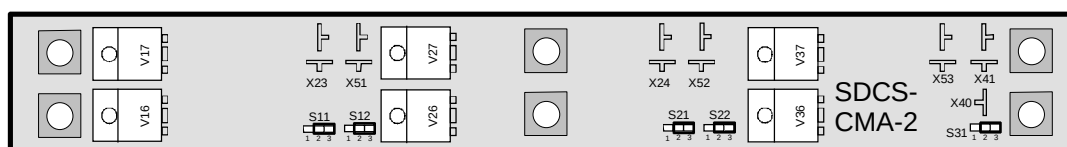
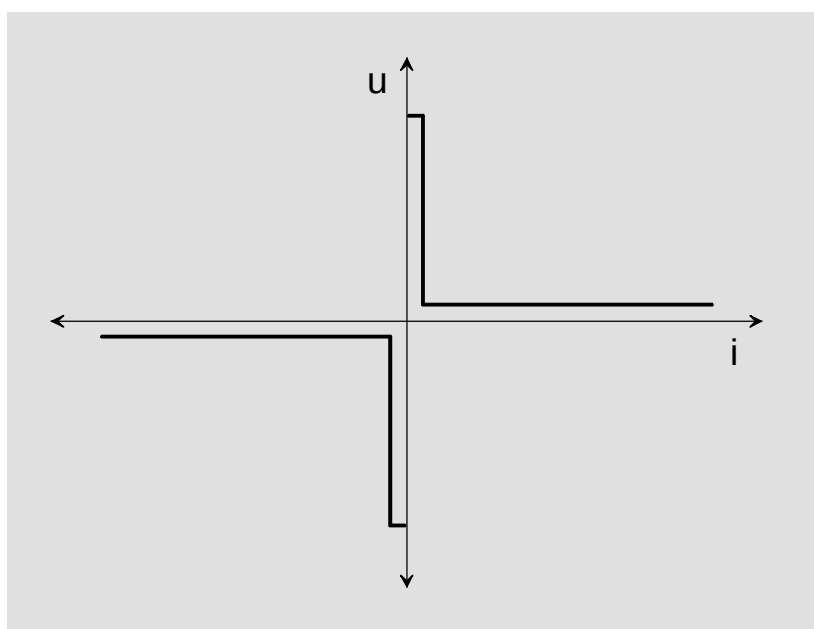


DCS Thyristor Power Converters for DC Drive Systems 900 to 5200 A

Instructions for mounting the **SDCS-CMA-2** in D5/D6/D7 Modules or Rebuild Kits



Thyristor Power Converters

Series

DCS800-S0x

900 to 5200 A

DCS800-R0x

Instructions for mounting the SDCS-CMA-2 in D5/D6/D7 Modules or Rebuild Kits

Code: 3ADW 000396R0101 Rev A

EFFECTIVE:	April 21st, 2011
SUPERSEDES:	none

Safety Instruction

This product does not need detailed commissioning. It only has to be mounted at the converter, wired up according to the drawings including the setting of jumpers.

This work **has** to be done with the converter / cubicle disconnected to any power supply!

In addition to that, attention has to be paid to the safety instructions listed within the manuals being a part of the system *DCS800*.

Every type of fault, like wrong wiring or incorrect working parts will result in an overcurrent condition, most likely together with broken fuses or any other damage because this product is introduced into the current feedback signal.

Great care has to be taken for the installation. The commissioning procedure listed in chapter 6 has to be carried out **before** current is run for the first time after the board has been installed.

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General

At real networks there are some abnormalities like different actual values of the phase voltages and not symmetrical phase shift. The chance, that they occur becomes bigger at such networks, where big consumers (single or three phase) are connected too. Additionally those networks may be quite weak and therefore more sensitive against load changes of any kind.

If drives are connected to and used at weak networks it may happen that an interaction can be recognized between the network and the drive. Sometimes it will appear as a current instability or an increased bridge changeover time.

To reduce such interactions to a minimum a SDCS-CMA-2 (**C**urrent **M**easurement **A**id) board is available.

To utilize the current measurement improvement at a converter a construction set named DCR 000 9701 can be used. This set contains the SDCS-CMA-2 board as the main part and some cables.

There are different conditions for the use of this set:

Purpose of the current measurement aid

The **SDCS-CMA-2** board **should** be used at:

- D5, D6 or D7 type converters used in 12-pulse parallel configuration with interphase transformer. In this case the board has to be ordered using the procedure described at *Ordering*. The board then serves for improved current measurement. Only 2 channels of the board are used.
- D5, D6 or D7 converters used in 6-pulse configuration and very bad network conditions (indications above).

Converter types concerned

All types of DCS800 converters, construction type D5, D6 or D7 and the DCS800-R0x kits can be equipped with this current measurement principle.

Reference

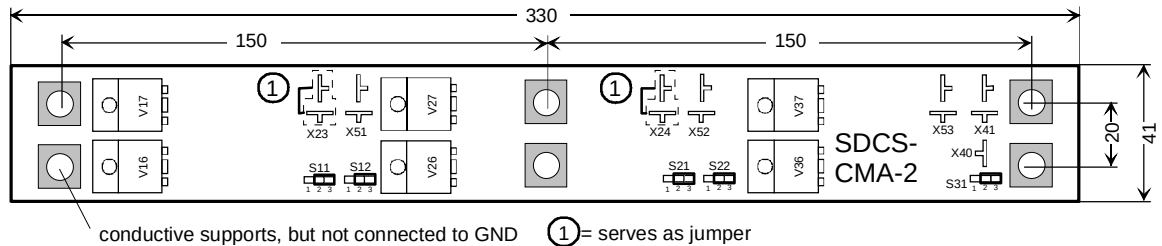
The **SDCS-CMA-2** board **is** also used at:

- D7 converters, which are directly connected to each other; this configuration is named paralleling of DCS converters; in this case the board is part of the DCS800-R00-9802/03 package and does not need to be ordered separately; details are described within the documentation
*Basics, Design, Installation and Start-Up Manual
 for paralleling DCS Converters*
 Code: 3 ADW 000 274

SDCS-CMA-2 board features

The SDCS-CMA-2 board contains following features:

- Connection to current transformers
- Connection to interface board SDCS-PIN-51 for current measurement
- Jumpers to select the application
- Actual current signal processing

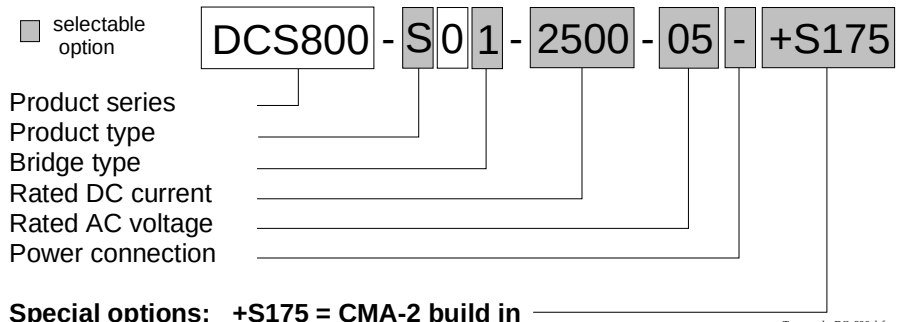


Jumpers S11...S31 and X23, X24 are shown in the factory setting

Ordering

As mentioned before this board can be used at D5, D6 and D7 converters type DCS800. In addition to that it can be used together with the rebuild kit DCS800-R0x. Because of the multi usage it can be ordered adapted to the needs:

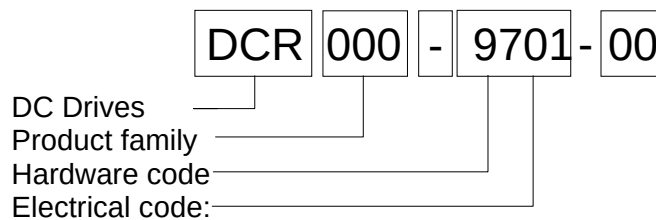
- use the “plus” code in case a DCS800 converter needs to be ordered, e.g. for a brand new installation (it doesn't matter, if the converter is used in 6 pulse or 12 pulse parallel configuration); in this case the converter will be equipped with the board during production, the jumpers will have the correct position and all the components will be tested as a system



Special options: +S175 = CMA-2 build in

Type_code_DCS800.dsf

- use the ordering code for the set when the functionality is needed for a DCS800-R0x or if the performance of an installed converter shall be improved



The code for the set is derived from the name originally used for the rebuild kit, which consists of boards and loose parts. The space normally used to specify the converter current is now used to define an option.

Parts included in the set

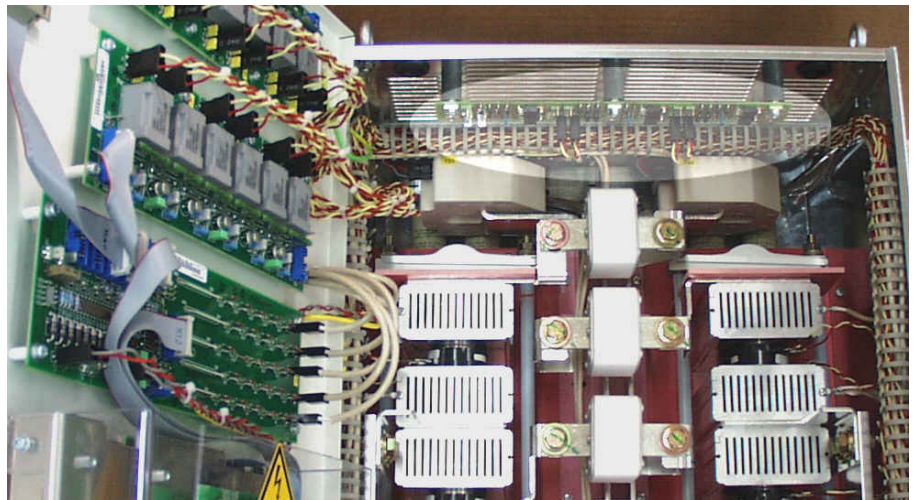
The DCR 000 9701 set consists of:

- SDCS-CMA-2 board with 2 jumpers, plugged on X23: / X24:
- 2 ultra short cables with a length of appr. 200 mm; 3 cables with a length of 650 mm and 2 cables with a length of appr. 1400 mm for the connection between the current transformer and the SDCS-CMA-2 board or between SDCS-CMA-2 and SDCS-PIN-51; not all the cables are necessarily needed with the 3 types of converters
- some mechanics

Mounting in a D5 converter

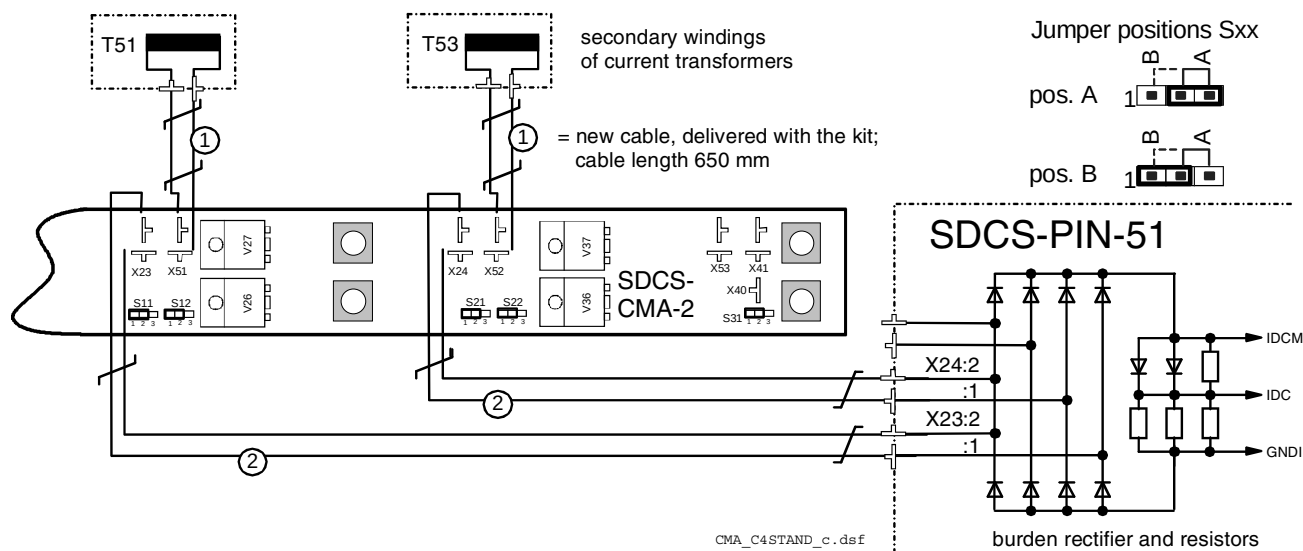
Mounting the SDCS-CMA-2 board in a D5 converter

- Remove the jumpers from the connectors X23: and X24: on the SDCS-CMA-2 board.
- **Set the jumpers S12 and S22 to position 1-2 (position B).**
- **Set the jumpers S11, S21 and S31 to position 1-2 (position B).**
- Open the door of the converter. At the top panel (roof panel) you will find 3 holes. These holes shall be used to fix the SDCS-CMA-2. The next figure may serve as an additional aid.
- Mount the stand-offs at the inner side of the converter with nut and washer M5 delivered with the kit.
- Mount the board on the stand-offs as shown on the next figure. It doesn't matter, if the first or the second row of holes at the SDCS-CMA-2 will be used.



- Remove the complete cables which connect the current transformers with the SDCS-PIN-51 board via connectors X23: / X24:.. Connect T51 with connector X51: (T53 with connector X52:) at the SDCS-CMA-2 board using the short cables (1) delivered with the set.
- Use the long cables (2) delivered with the set and connect connector X23: at SDCS-CMA-2 with connector X23: at SDCS-PIN-51. Do the same with connectors X24: as shown on the next figure.
- Fold the exceptional length of the cables and fix it with the ty-wraps delivered with the set or stow them within the cable tray.

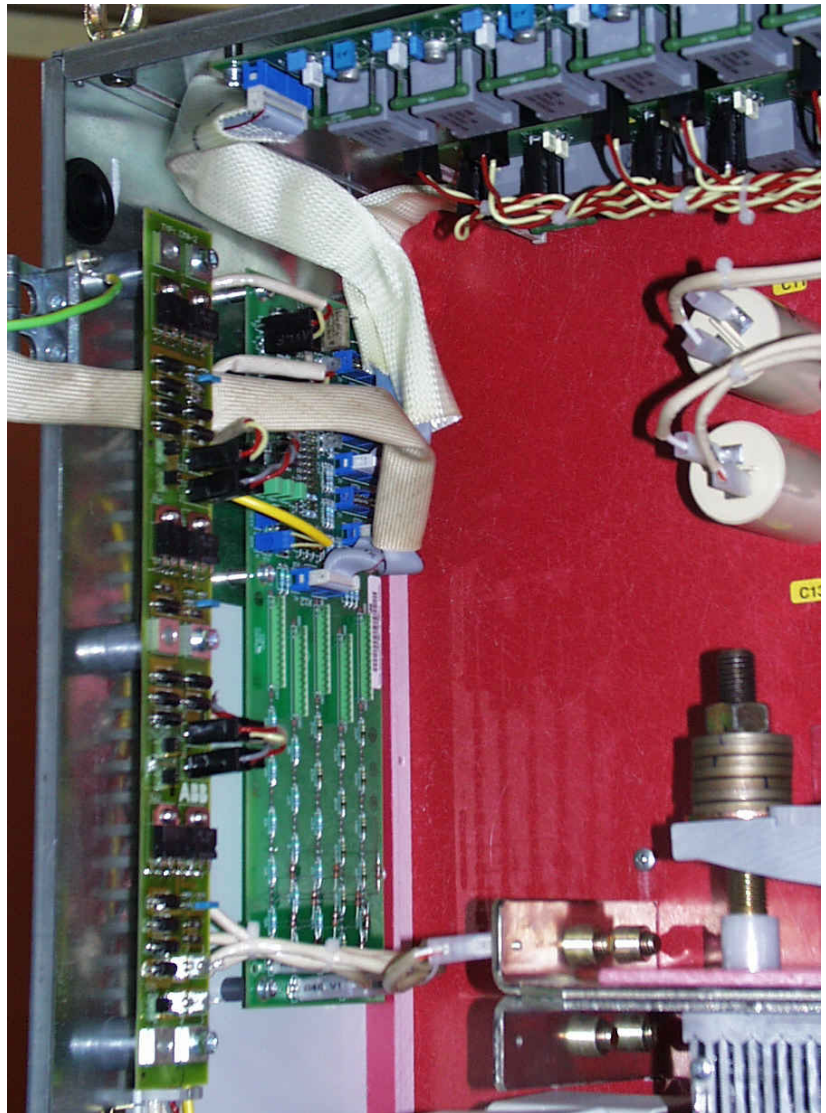
Mounting in a D5 converter



Mounting in a D6 converter

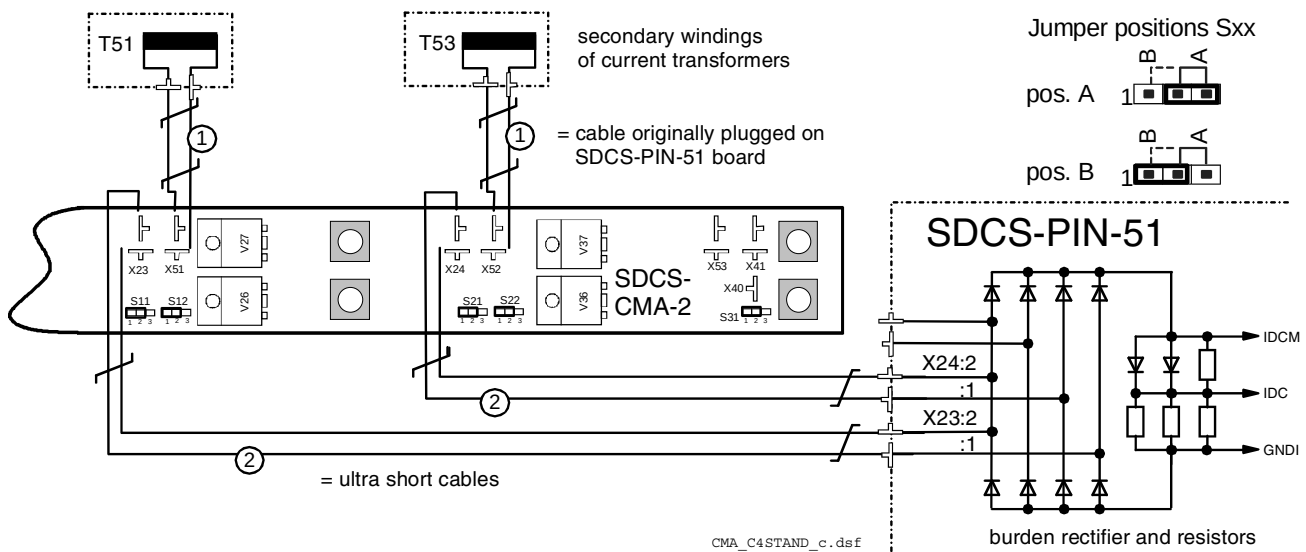
Mounting the SDCS-CMA-2 board in a D6 converter

- Remove the jumpers from the connectors X23: and X24: on the SDCS-CMA-2 board.
- **Set the jumpers S12 and S22 to position 1-2 (position B).**
- **Set the jumpers S11, S21 and S31 to position 1-2 (position B).**
- Open the door of the converter. At the left side panel top corner of the converter's body close to the SDCS-PIN-51 board there are three holes. These holes will be used to fix the SDCS-CMA-2. The next figure may serve as an additional aid.
- Mount the stand-offs at the inner side of the converter with nut and washer M5 delivered with the kit.
- Mount the board on the stand-offs as shown on the next figure. It doesn't matter, if the first or the second row of holes at the SDCS-CMA-2 will be used.



Mounting in a D6 converter

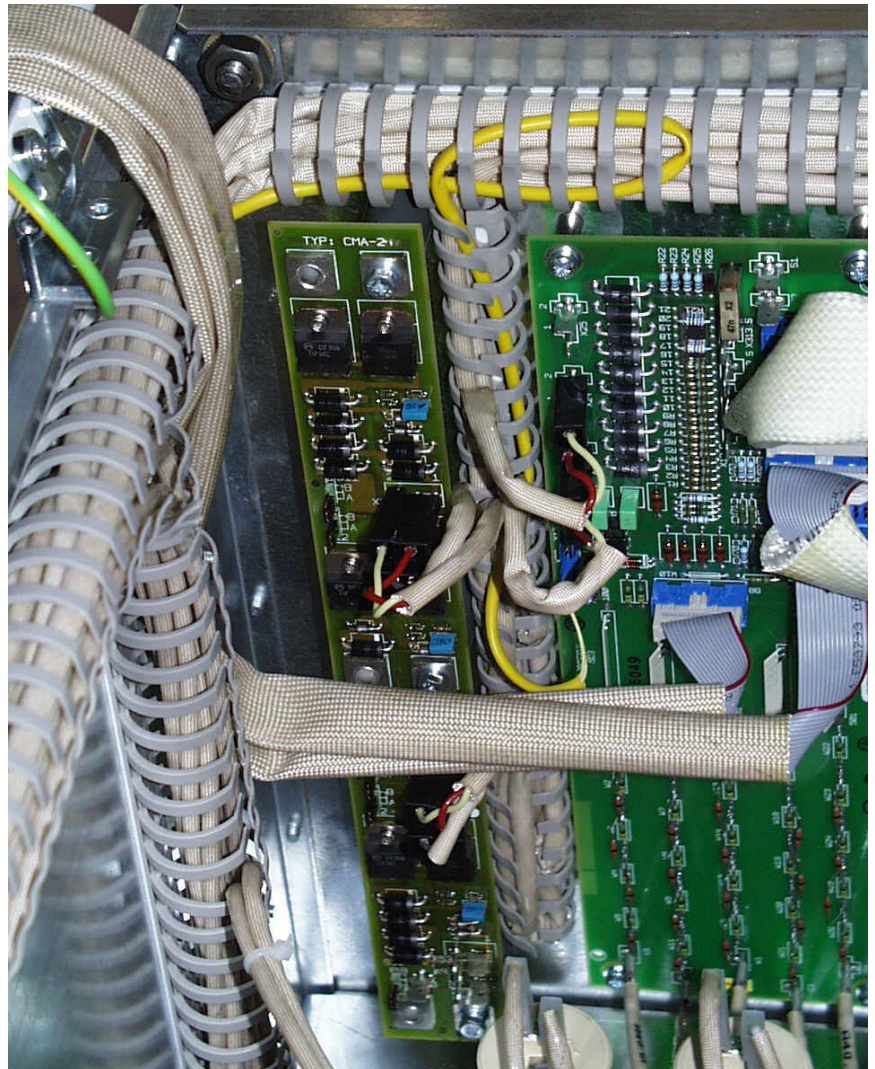
- Remove the plug from connector X23: of the SDCS-PIN-51 board and connect it with connector X51: of the SDCS-CMA-2 board.
Remove the plug at connector X24: of the SDCS-PIN-51 board and put it on connector X52: of the SDCS-CMA-2 board.
- Connect connector X23: at SDCS-PIN-51 with connector X23: at the SDCS-CMA-2 board using the ultra short cables (2) delivered with the set. Do the same with connector X24: (SDCS-PIN-51) and connector X24: (SDCS-CMA-2) as shown on the next figure.
- Fold the exceptional length of the cables and fix it with the ty-wraps delivered with the set or stow them within the cable tray.



Mounting in a D7 converter

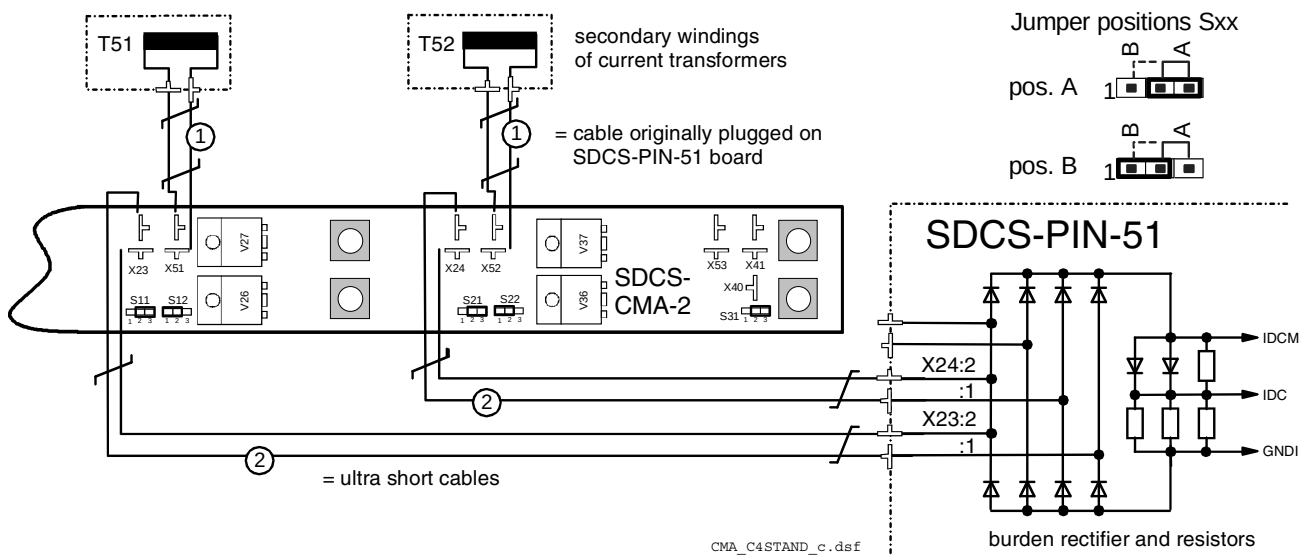
Mounting the SDCS-CMA-2 board in a D7 converter

- Remove the jumpers from the connectors X23: and X24: on the SDCS-CMA-2 board.
- Set the jumpers S12 and S22 to position 1-2 (position B).
- Set the jumpers S11, S21 and S31 to position 2-3 (position A).
- Open the door of the converter. At the top panel (roof panel) you will find 3 holes at the left hand side of the SDCS-PIN-51 board. These holes will be used to fix the SDCS-CMA-2. The next figure shall serve as additional mounting instructions. Mounting is independent of **Left** or **Right** type.
- Mount the stand-offs at the inner side of the converter with nut and washer M5 delivered with the kit.
- Mount the board on the stand-offs as shown on the next figure. It will nicely fit into the free space when oriented as shown.



Mounting in a D7 converter

- Remove the plug from connector X23: of the SDCS-PIN-51 board and put it on connector X51: of the SDCS-CMA-2 board. Remove the plug at connector X24: of the SDCS-PIN-51 board and put it on connector X52: of the SDCS-CMA-2 board. If necessary do the cable routing on a shorter path.
- Connect connector X23: at SDCS-PIN-51 with connector X23: at the SDCS-CMA-2 board using the ultra short cables (2) delivered with the set. Do the same with connector X24: (SDCS-PIN-51) and connector X24: (SDCS-CMA-2) as shown on the next figure.
- Fold the exceptional length of the cables and fix it with the ty-wraps delivered with the set or stow them within the cable tray.



Commissioning

Commissioning

SDCS-CMA-2

No special setting either at the hardware nor by software is necessary. Nevertheless some precautions should be done to avoid damage to components of the drive system in case of failures:

- Before the drive is released the first time, the parameter for the minimum firing angle should be set to values higher than 90 degrees. Allow the system some moments to adapt to the new value. This limits the output voltage of the drive and gives a safe operation, even with a fault in the current feedback circuit. That's only possible with no EMF at the DC circuit. Precautions should be done like disable field current or motor blocking, if the drive will be released and will generate current.
- Generate small current references within zero and limit discontinuous / continuous current. Everything is o.k., if the current can be varied and don't hits the limit set by the parameter or inverter limit position.
- In case of trouble check the wiring for open loop or wrong connections as well as the positions of the jumpers.
- Don't forget to set the parameter for minimum firing angle position back to original!

DCS800 family



DCS800-S modules

The versatile drive for any application

20 ... 5,200 A_{DC}
0 ... 1,160 V_{DC}
230 ... 1,000 V_{AC}
IP00

- Compact
- Highest power ability
- Simple operation
- Comfortable assistants, e.g. for commissioning or fault tracing
- Scalable to all applications
- Free programmable by means of integrated IEC61131-PLC



DCS800-A enclosed converters

Complete drive solutions

20 ... 20,000 A_{DC}
0 ... 1,500 V_{DC}
230 ... 1,200 V_{AC}
IP21 – IP54

- Individually adaptable to customer requirements
- User-defined accessories like external PLC or automation systems can be included
- High power solutions in 6- and 12-pulse up to 20,000 A, 1,500 V
- In accordance to usual standards
- Individually factory load tested
- Detailed documentation



DCS800-E series

Pre-assembled drive-kits

20 ... 2,000 A_{DC}
0 ... 700 V_{DC}
230 ... 600 V_{AC}
IP00

- DCS800 module with all necessary accessories mounted and fully cabled on a panel
- Very fast installation and commissioning
- Squeezes shut-down-times in revamp projects to a minimum
- Fits into Rittal cabinets
- Compact version up to 450 A and Vario version up to 2,000 A



DCS800-R Rebuild Kit

Digital control-kit for existing powerstacks

20 ... 20,000 A_{DC}
0 ... 1,160 V_{DC}
230 ... 1,200 V_{AC}
IP00

- Proven long life components are re-used, such as power stacks, (main) contactors, cabinets and cabling / busbars, cooling systems
- Use of up-to-date communication facilities
- Increase of production and quality
- Very cost-effective solution
- Open Rebuild Kits for nearly all existing DC drives tailor-made solutions for...
 - BBC PxD
 - BBC SZxD
 - ASEA TYRAK
 - other manufacturers



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