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DC DRIVES

## **DCS880**

### **Interface Board SDCS-SUB-4 (+S186)**

Size H1 ... H5

**Types concerned**      **DCS880**

**General**

**Use Safety Instructions in:**

- DCS880 Firmware manual ([3ADW000474](#))

**Further documentation in:**

- DCS880 Hardware manual ([3ADW000462](#))
- DCS880 Firmware manual ([3ADW000474](#))
- DCS880 Service manual ([3ADW000488](#))

## Safety Instructions

### Use of warnings and notes

There are two types of safety instructions throughout this manual: warnings and notes. Warnings caution you about conditions which can result in serious injury or death and / or damage to the equipment. They also tell you how to avoid the danger. Notes draw attention to a particular condition or fact, or give information on a subject. The warning symbols are used as follows:



Dangerous voltage warning warns of high voltage which can cause physical injury and / or damage to the equipment.



General warning warns about conditions, other than those caused by electricity, which can result in physical injury and / or damage to the equipment.



Electrostatic discharge warning warns of electrostatic discharge which can damage the equipment.



#### Warning!

- The printed circuit boards contain components sensitive to electrostatic discharge. Wear a grounding wrist band when handling the boards. Do not touch the boards unnecessarily.
- Use grounding strip:

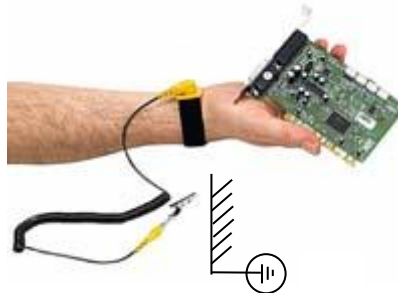


ABB order no.: 3ADV050035P0001

## Installation and maintenance work

These warnings are intended for all who work on the drive, motor cable or motor. Ignoring the instructions can cause physical injury or death.

Only qualified electricians are allowed to install and maintain the drive.



- Never work on the drive, motor cable or motor when main power is applied.
- Always ensure by measuring with a multimeter (impedance at least 1 M $\Omega$ ) that:
  1. Voltage between drive input phases U1, V1 and W1 and the frame is close to 0 V.
  2. Voltage between terminals C+ and D- and the frame is close to 0 V.
- Do not work on the control cables when power is applied to the drive or to the external control circuits. Externally supplied control circuits may cause dangerous voltages inside the drive even when the main power on the drive is switched off.
- Do not make any insulation or voltage withstand tests on the drive or drive modules.
- When reconnecting the motor cable, always check that the C+ and D- cables are connected with the proper terminal.

#### Notes:

- The motor cable terminals on the drive are at a dangerously high voltage when the input power is on, regardless of whether the motor is running or not.
- Depending on the external wiring, dangerous voltages (115 V, 220 V or 230 V) may be present on the terminals of relay outputs of the drive system XRO or FDIO.
- DCS880 with enclosure extension: Before working on the drive, isolate the whole drive from the supply.

## Hardware options for voltage measurement for supply voltages $\leq 120\text{ V}_{AC}$

Voltage measurement for supply voltages  $\leq 120\text{ V}_{AC}$  are supported by DCS880 by an additional measurement card called SDCS-SUB-4. This additional hardware can be ordered via plus code or separately.

### Ordering DCS880 with plus code +S186

The plus code +S186 is available for DCS880 unit types (sizes H1 ... H5). If these devices are ordered together with plus code +S186 no additional modification is required.

### Ordering Standard DC880 H1 ... H5 + SDCS-SUB-4 package

In this case the required SDCS-SUB-4 is ordered separately and needs to be inserted into the DCS880. In addition the cabling needs to be done. All needed steps are described in the present manual.

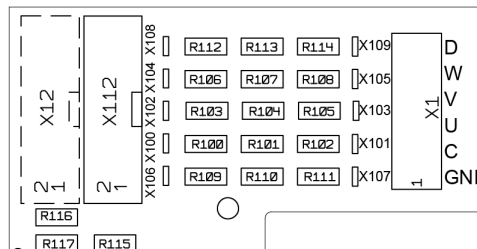
| Type       | Description        | Code            |
|------------|--------------------|-----------------|
| SDCS-SUB-4 | SDCS-SUB-4 Package | 3ADT220148R0001 |

## Basics

On SDCS-PIN-H01 and SDCS-PIN-51 the line voltage and DC voltage measurement is done by high ohmic resistors typical  $5\text{ M}\Omega$  for 500 V units.

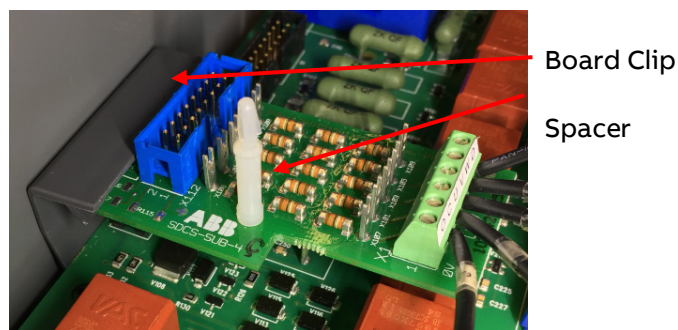
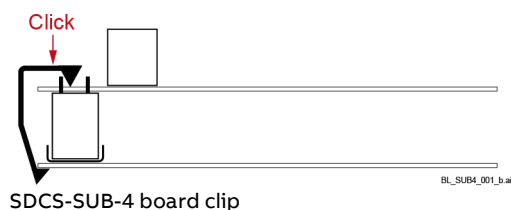
Voltages below 100 V line voltage must be adapted by smaller resistance and rescaled measurement channel. Such rescaling provides improved mains synchronization and DC measurement resolution at small voltage.

SDCS-SUB-4 board provides a different scaling of voltage measurement. The default selection is  $1.17\text{ M}\Omega$  with maximum mains voltage of 120 V. The maximum measurement voltage scale is 200 V. The voltage scaling needs to be adjusted according to the table below.

|                                                                                     |                      |                         |                  |           |
|-------------------------------------------------------------------------------------|----------------------|-------------------------|------------------|-----------|
|  | Mains voltage<br>[V] | Chain RC ... RD<br>[MΩ] | Setting<br>95.28 | Size      |
|                                                                                     | 30 ... 120 V         | appr. 1.17              | 117 V            | H1 ... H5 |

## SDCS-SUB-4 mounting guidelines

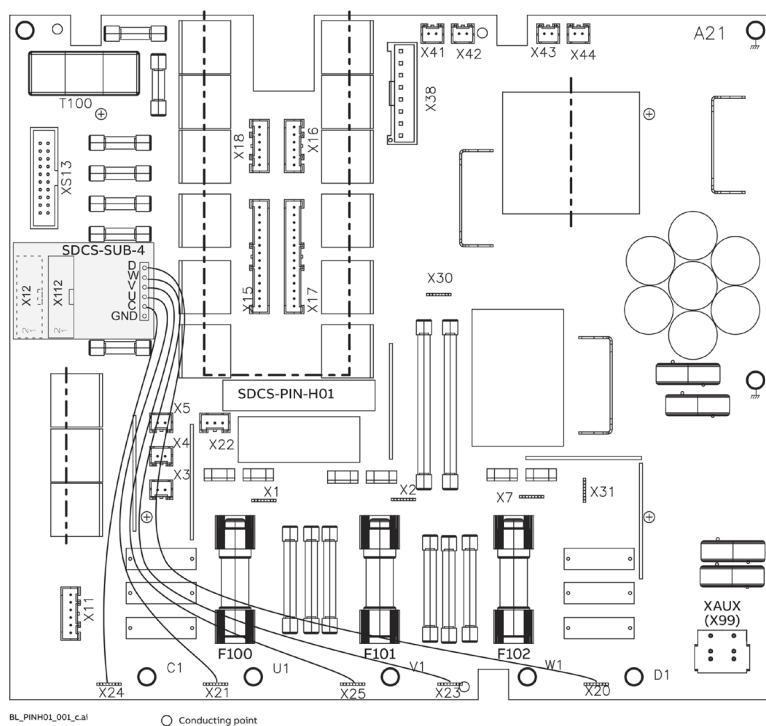
1. Open the DCS880, unplug and remove the SDCS-CON-H01 board, according to the DCS880 service manual.
2. Plug the spacer onto the SDCS-SUB-4 (see red arrow below).
3. Remove the connector from socket XC12 from the SDCS-PIN-H01 board. Plug the SDCS-SUB-4 on the socket XC12.
4. Keep the boards fixed by attaching the board clip.



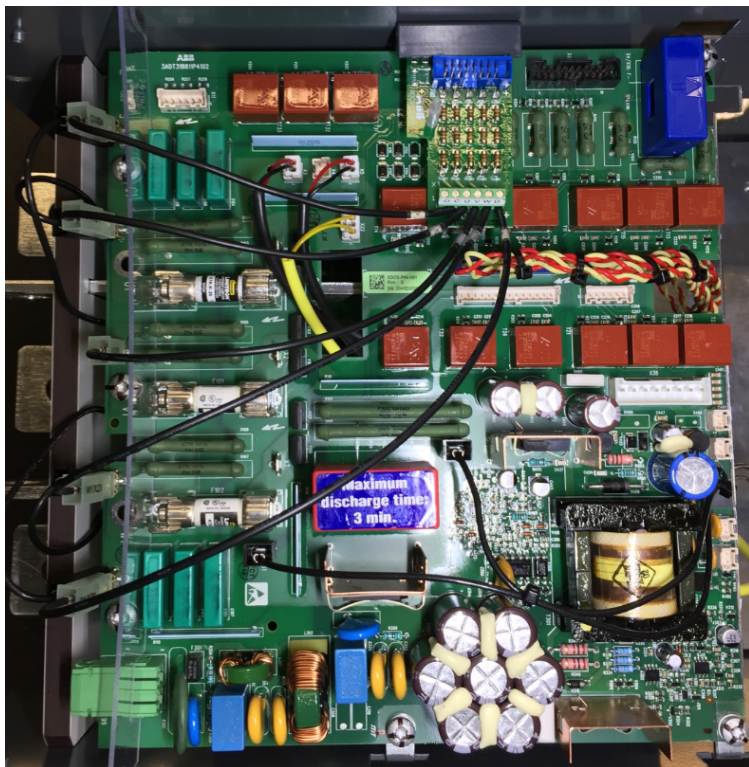
SDCS-SUB-4 fixed by board clip

5. Put back the connector to the socket XC12 onto the SDCS-SUB-4.
6. Connect SDCS-SUB-4 and SDCS-PIN-H01 by using the provided wiring harness:

| SDCS-SUB-4 | SDCS-PIN-H01 |
|------------|--------------|
| C          | X24          |
| D          | X20          |
| U          | X21          |
| V          | X25          |
| W          | X23          |



Installation & cabling of SDCS-SUB-4 board



SDCS-SUB-4 installed on the SDCS-PIN-H01 including all cabling

7. Reconnect the SDCS-CON-H01 board, according to DCS880 service manual and close the housing.
8. Set parameter 95.28 = 117 V

**Note:** 95.28 Set: Drive AC voltage scaling is write protected. (To enable use 95.24 Service mode = Set Type code. 95.24 Service mode = Set Type code must be set back to Normal mode by the user.)



Please don't swap sockets XC12 and XS13 as this can destroy your unit.

## Order Numbers

In case the mains voltage is  $< 120 V_{AC}$ , the option for low voltage measurement can be ordered via plus code +S186. This will be reflected on the name plate as plus code +S186:

|                          |                                   |                                          |                     |
|--------------------------|-----------------------------------|------------------------------------------|---------------------|
| ABB Automation Products  | U1 IEC: 3~230-525 V <sub>AC</sub> | U2 IEC: 0-610 V <sub>DC</sub>            | Assembled in Poland |
| DCS880-S01-0740-05X0     | I1 : 604 A <sub>AC</sub>          | I2 : 740 A <sub>DC</sub>                 | +S551+K475+L526+    |
| Ser No: 0374900P20510156 | f1 : 50/60Hz                      | If : 2-30 A <sub>DC</sub>                | 0S163 <b>+S186</b>  |
|                          | SCCR: 65 kA                       | U <sub>FAN</sub> : 1~230 V <sub>AC</sub> |                     |

Nameplate of the modified converter including plus code +S186

|                                                                                                                                                                                                                                                                                                                                                 |                          |                                                                                                                                                    |                                                                                                       |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| <b>ABB</b>                                                                                                                                                                                                                                                                                                                                      |                          | ABB Automation Products GmbH<br>Wallstadter Str. 59<br>68526 Ladenburg, Germany                                                                    |                                                                                                       |
| DCS880-S01-0740-05X0                                                                                                                                                                                                                                                                                                                            |                          | Ser No:                                                                                                                                            | <br>0374900P20510156 |
| +S551+K475+L526+0S163 <b>+S186</b>                                                                                                                                                                                                                                                                                                              |                          |                                                                                                                                                    |                                                                                                       |
| Rated Converter Data                                                                                                                                                                                                                                                                                                                            |                          |                                                                                                                                                    |                                                                                                       |
| U1 IEC: 3~230-525 V <sub>AC</sub>                                                                                                                                                                                                                                                                                                               | I1: 604 A <sub>AC</sub>  | U <sub>FAN</sub> : 1~230 V <sub>AC</sub>                                                                                                           | Size: H4                                                                                              |
| U2 IEC: 0-610 V <sub>DC</sub>                                                                                                                                                                                                                                                                                                                   | I2: 740 A <sub>DC</sub>  | Airflow: 390 m <sup>3</sup> /h                                                                                                                     | IP: 00                                                                                                |
| U1 UL : 3~230-525 V <sub>AC</sub>                                                                                                                                                                                                                                                                                                               | If: 2-30 A <sub>DC</sub> | U <sub>AUX</sub> : 115/230 V <sub>AC</sub>                                                                                                         | UL: open type                                                                                         |
| U2 UL : 0-610 V <sub>DC</sub>                                                                                                                                                                                                                                                                                                                   | f1: 50/60Hz              | SCCR: 65 kA                                                                                                                                        | Temp: 40 C                                                                                            |
| Designed by ABB in Germany                                                                                                                                                                                                                                                                                                                      |                          | Assembled in Poland                                                                                                                                |                                                                                                       |
|     |                          |  <div>Functional Safety<br/>www.tuv.com<br/>ID: 060000000</div> |                                                                                                       |

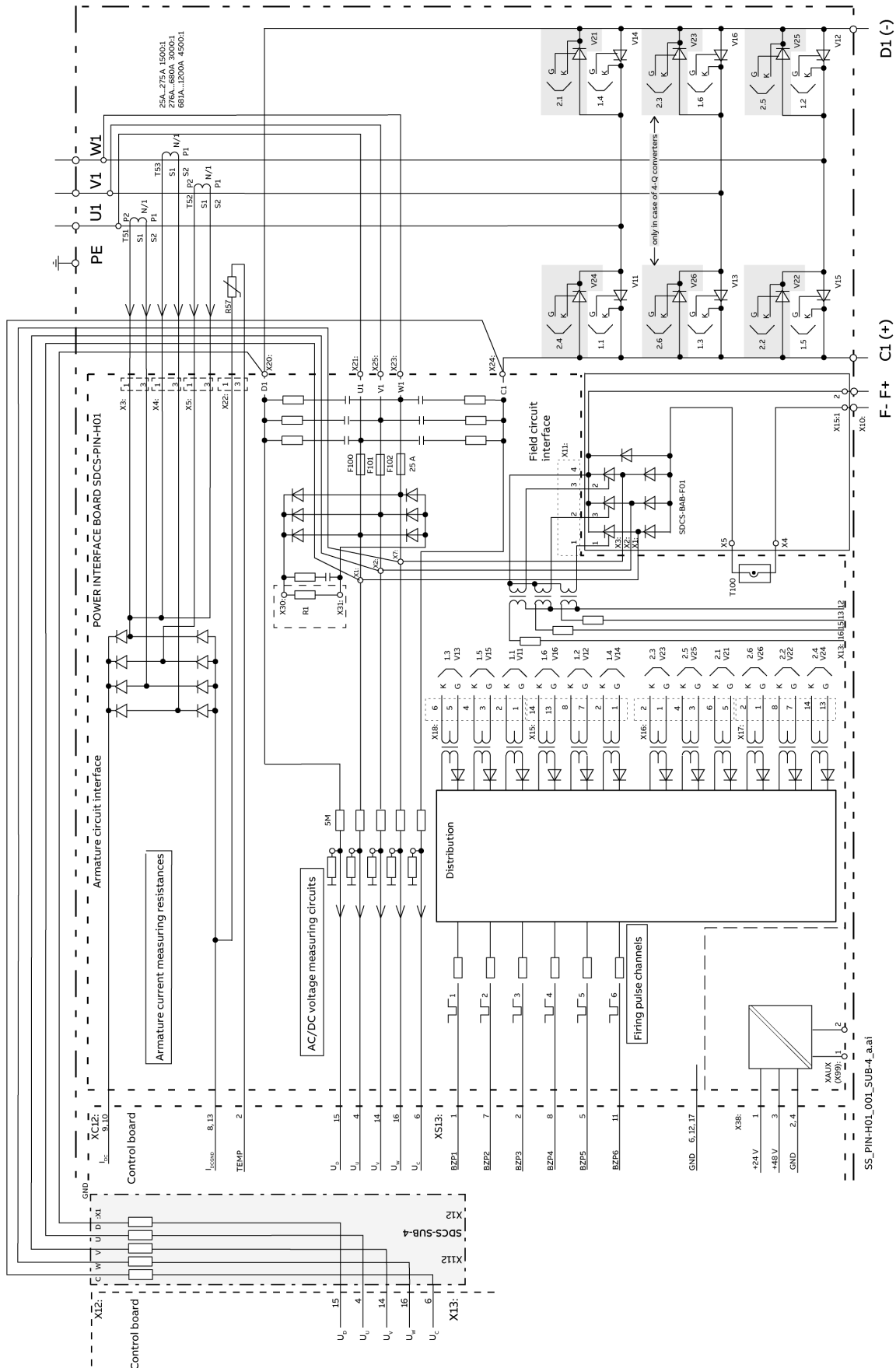
Nameplate of the modified converter including plus code +S186

In addition, the SDCS-SUB-4 interface board can be ordered separately as a spare part using the ident number: 3ADT220148R0001.

If the modification (insertion of SDCS-SUB-4) is done after production of the DCS880 the name plate needs to be adapted accordingly to show the additionally inserted SDCS-SUB-4 interface board. In that case the label needs to be modified as shown above.

After final assembling functional tests need to be conducted.

## Usage of SDCS-SUB-4 inside DCS880



Circuit Diagram SDCS-PIN-H01 together with SDCS-SUB-4

# DCS Family



## DCS550-S modules The compact drive for machinery application

20 ... 1,000 A<sub>DC</sub>  
0 ... 610 V<sub>DC</sub>  
230 ... 525 V<sub>AC</sub>  
IP00

- Compact
- Robust design
- Adaptive and winder program
- High field exciter current



## DCS880 modules For safe productivity

20 ... 5,200 A<sub>DC</sub>  
0 ... 1,600 V<sub>DC</sub>  
230 ... 1,000 V<sub>AC</sub>  
IP00

- Safe torque off (STO) built in as standard
- Compact and robust
- Single drives, 20 A to 5,200 A, up to 1,600 V<sub>DC</sub>
- IEC 61131 programmable
- Intuitive control panel and PC tool with USB connection and start up assistant
- Wide range of options to serve any DC motor application



## DCS880-A enclosed converters Complete drive solutions

20 ... 20,000 A<sub>DC</sub>  
0 ... 1,500 V<sub>DC</sub>  
230 ... 1,200 V<sub>AC</sub>  
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



## DCT880 modules Thyristor power controller

20 ... 4,200 A<sub>AC</sub>  
110 ... 990 V<sub>AC</sub>  
IP00

- Precise power control in industrial heating applications
- Two or three phase devices
- Power optimizer for peak load reduction
- Built on ABB's all-compatible drives architecture
- Intuitive control panel and PC tool with USB connection and start up assistant
- Application control programs and drive application programming with IEC 61131 programming



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