MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Reference package for procurement and maintenance review

ABB

SDCS-PIN-F01A 3ADT316300R1502

POWER INTERFACE BOARD

Used with the applicable DCS550 power interface boards configuration.

REFERENCE PACKAGE

OFFICIAL DOCUMENT

Selected official manufacturer pages follow this cover.

Source: ABB DCS550 power interface boards applicable manufacturer documentation

Safety instructions

Chapter overview

This chapter contains the safety instructions you must follow when installing, operating and servicing the drive. If ignored, physical injury or death may follow, or damage may occur to the drive, the motor or driven equipment. Read the safety instructions before you work on the unit.

To which products this chapter applies

The information is valid for the whole range of the product DCS550.

Usage 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, and advice on 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 or death and/or damage to the equipment.



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



Electrostatic sensitive devices warning warn of electrostatic discharge, which can damage the equipment.

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 and/or damage to the equipment.



WARNING!

1. 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 Mohm) 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 resistance or voltage withstand tests on the drive or drive modules.
- Isolate the motor cables from the drive when testing the insulation resistance or voltage withstand of the cables or the motor.
- When reconnecting the motor cable, always check that the C+ and D- cables are connected with the proper terminal.

Note:

- The motor cable terminals on the drive are at a dangerously high voltage when the main 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 relay outputs of the drive system (e.g. RDIO).
- DCS550 with enclosure extension: Before working on the drive, isolate the whole drive system from the supply.

Grounding
These instructions are intended for all who are responsible for the grounding of the drive. Incorrect grounding can cause physical injury, death and/or equipment malfunction and increase electromagnetic interference.

WARNING!
- Ground the drive, motor and adjoining equipment to ensure personnel safety in all circumstances, and to reduce electromagnetic emission and pick-up.
- Make sure that grounding conductors are adequately sized and marked as required by safety regulations.
- In a multiple-drive installation, connect each drive separately to protective earth (PE⏚).
- Minimize EMC emission and make a 360° high frequency grounding (e.g. conductive sleeves) of screened cable entries at the cabinet lead-through plate.

Note:
- Power cable shields are suitable as equipment grounding conductors only when adequately sized to meet safety regulations.
- As the normal leakage current of the drive is higher than 3.5 mA_{AC} or 10 mA_{DC} (stated by EN 50178, 5.2.11.1), a fixed protective earth connection is required.

Printed circuit boards and fiber optic cables
These instructions are intended for all who handle the circuit boards and fiber optic cables. Ignoring the following instructions can cause damage to the equipment.

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

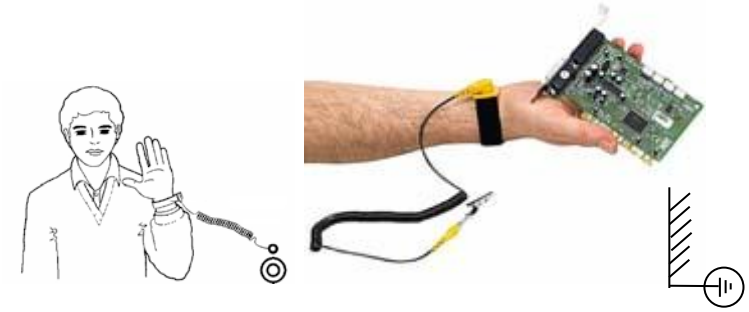


ABB order no.: 3ADV050035P0001

WARNING!
Handle the fiber optic cables with care. When unplugging optic cables, always grab the connector, not the cable itself. Do not touch the ends of the fibers with bare hands, as the fiber is extremely sensitive to dirt. The minimum allowed bend radius is 35 mm (1.38 in.).

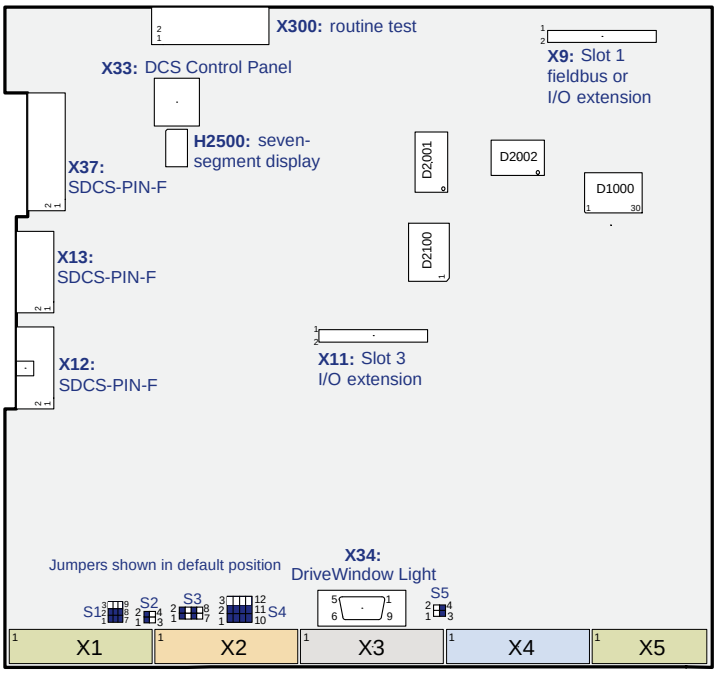
Electronic board details

Chapter overview

This chapter describes the electronics of the DCS550.

Terminal locations

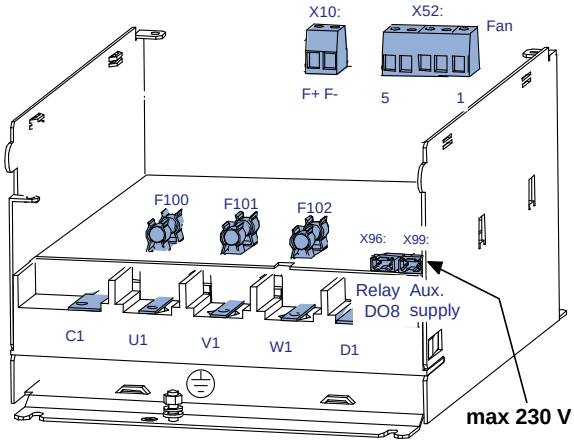
SDCS-CON-F connector allocation



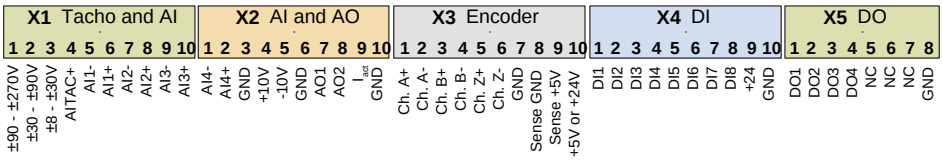
DCS550 module

Terminal allocation

F2 / F3	F4
135 A - 520 A	610 A - 1000 A
Fan supply 230 V AC, X52: 5 4 3 2 1	Fan supply 230 V AC, X52: 5 4 3 2 1
Fan supply 115 V AC, X52: 5 4 3 2 1	



SDCS-CON-F: Terminal allocation



F100, F101, F102	KTK 25
F401, F402, F403	KTK 30

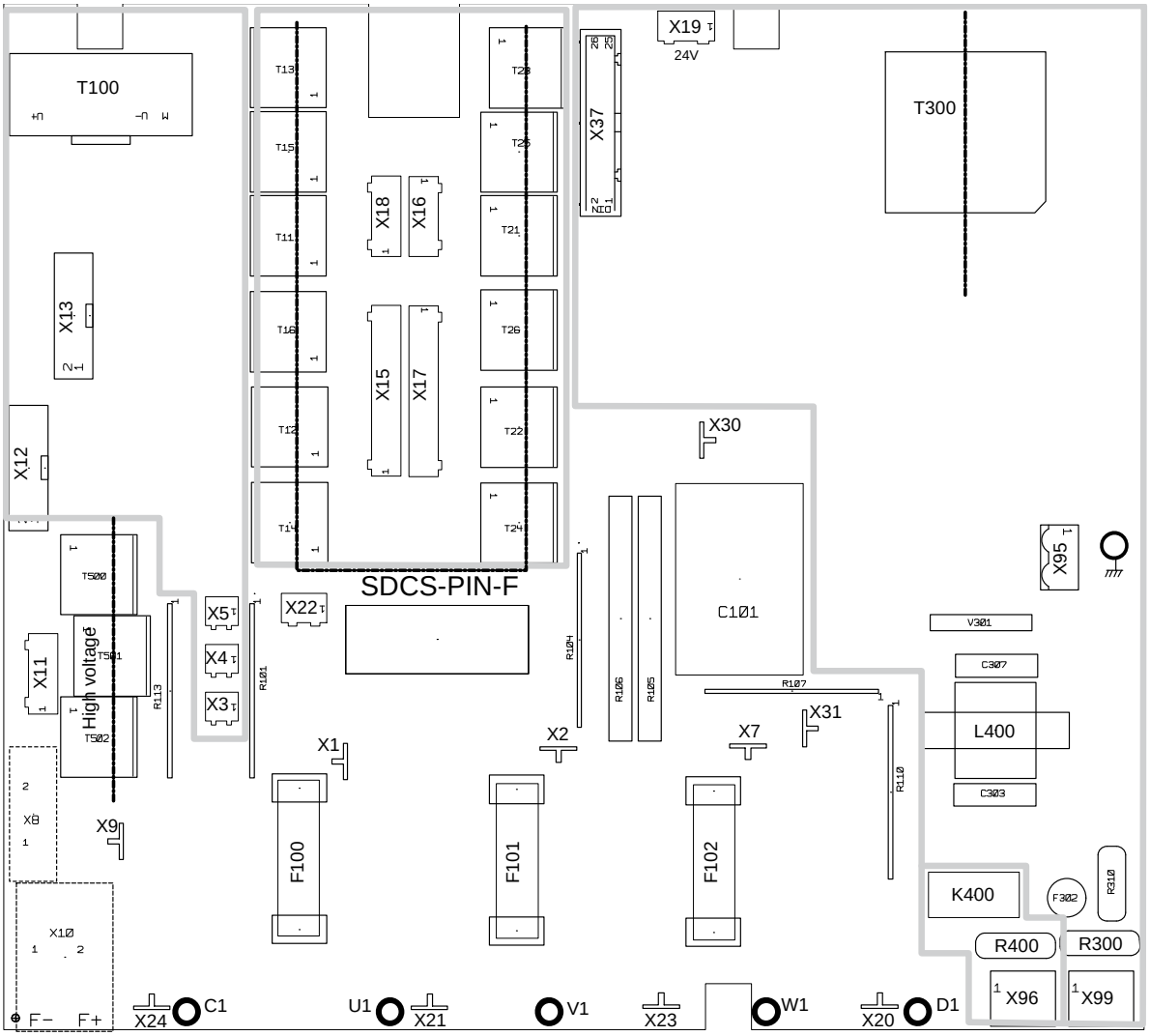
BL_CONF_001_a.ai

Table of used boards

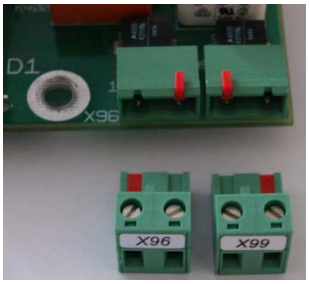
Size	Converter type	SDCS-CON-F	SDCS-PIN-F	SDCS-BAB-F01	SDCS-BAB-F02 Using fuses F100 to F102 on SDCS-PIN-F	SDCS-BAB-F02 Using external fuses F401 to F403
F1	DCS550-S01-0020	X	X	X		
	DCS550-S01-0045	X	X	X		
	DCS550-S01-0065	X	X	X		
	DCS550-S01-0090	X	X	X		
	DCS550-S02-0025	X	X	X		
	DCS550-S02-0050	X	X	X		
	DCS550-S02-0075	X	X	X		
	DCS550-S02-0100	X	X	X		
F2	DCS550-S01-0135	X	X	X		
	DCS550-S01-0180	X	X	X		
	DCS550-S01-0225	X	X	X		
	DCS550-S01-0270	X	X	X		
	DCS550-S02-0150	X	X	X		
	DCS550-S02-0200	X	X	X		
	DCS550-S02-0250	X	X	X		
	DCS550-S02-0300	X	X	X		
F3	DCS550-S01-0315	X	X		X	
	DCS550-S01-0405	X	X		X	
	DCS550-S01-0470	X	X		X	
	DCS550-S02-0350	X	X		X	
	DCS550-S02-0450	X	X		X	
	DCS550-S02-0520	X	X		X	
F4	DCS550-S01-0610	X	X			X
	DCS550-S01-0740	X	X			X
	DCS550-S01-0900	X	X			X
	DCS550-S02-0680	X	X			X
	DCS550-S02-0820	X	X			X
	DCS550-S02-1000	X	X			X

Power Interface board SDCS-PIN-F

Layout



To protect X96 and X99 from being swapped both plugs are coded:



Location

The SDCS-PIN-F is located between the power part and the control board SDCS-CON-F.

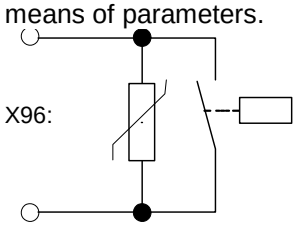
Functions

The DCS550 provides an automatic adjustment for current and voltage measurement, burden resistor settings and 2-Q or 4-Q operation by means of setting parameters in the firmware. The SDCS-PIN-F provides:

- the power supply for all the auxiliary voltages of the whole drive and the connected options,
- control of armature bridge including high ohmic measurement of DC- and AC voltage and an interface for the current transformer measuring the armature current,
- control of the integrated field exciter and field current measurement,
- an interface for the heatsink temperature measurement with a PTC resistor,
- a snubber circuit for thyristor protection together with the snubber resistor mounted on the heatsink.

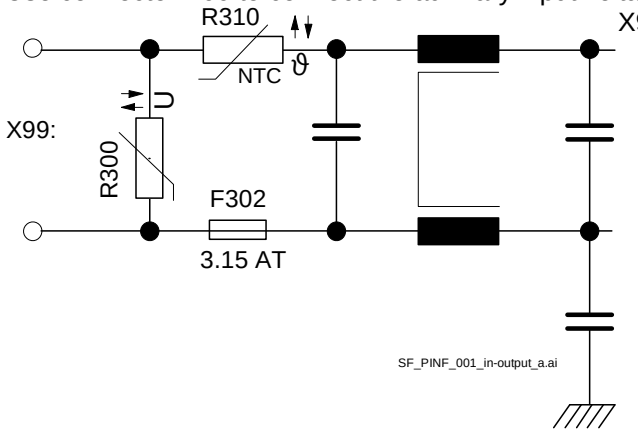
Terminal description

- The integrated field exciter with firing pulse transformers and field current measurement via transformer T100 is located on the SDCS-PIN-F. The power part is a three phase half-controlled bridge supplied from the mains U1, V1, W1 via fuses F100, F101, F102 and is located on the heat sink.
  The measurement of the field current is automatically scaled and selected by the firmware. Deselect a not needed integrated field exciter by means of the firmware.
- Connector X96 controls the main circuit breaker. To save an additional relay in the cabinet the DCS550 provides a normally open relay contact integrated on the SDCS-PIN-F. Digital output 8 controls the relay output at connector X96. The function or signal definition of digital output 8 is done in the firmware by means of parameters.



Isolated relay with a normally open contact
Contact ratings:
- 230 V~ / <3 A~
- 24 V- / <3 A- or 115 / 230 V- / <0.3 A-

- Use connector X99 to connect the auxiliary input voltages of 230 V_{AC}, 115 V_{AC} or 230 V_{DC}.



X99 features a hardware filter and a voltage limitation.

Auxiliary voltages	115 V_{AC}	230 V_{AC}	230 V_{DC}
Tolerance	-15 % / +10 %	-15 % / +10 %	-15 % / +10 %
Frequency	45 Hz to 65 Hz	45 Hz to 65 Hz	
Power consumption	120 VA	120 VA	
Power loss	d 60 W	d 60 W	d 60 W
Inrush current	*20 A / 20 ms	10 A / 20 ms	10 A / 20 ms
recommended fusing	6 AT	6 AT	6 AT
Mains buffering	min 30 ms	min 300 ms	150 ms
Power fail	< 95 V_{AC}	< 95 V_{AC}	< 140 V_{DC}