Interface board SDCS-PIN-4 / SDCS-PIN-4b

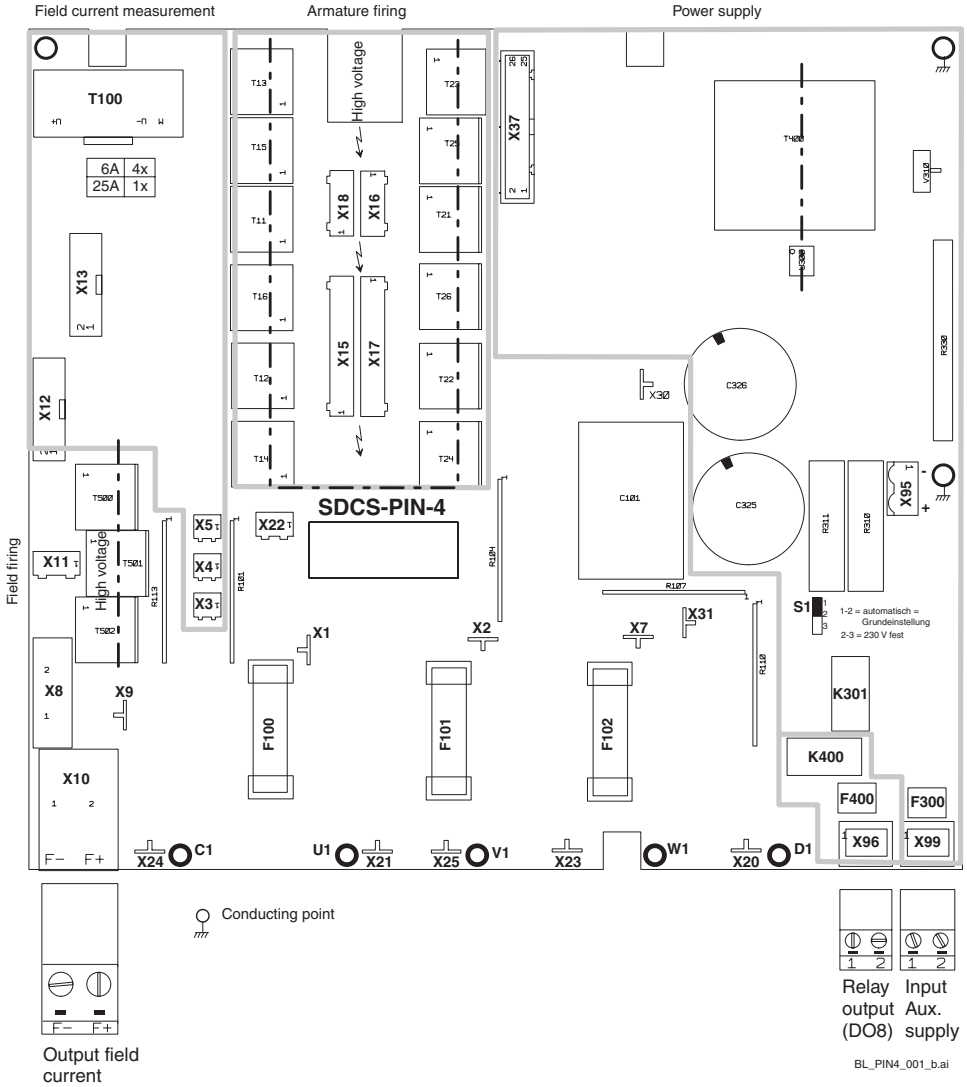
General

The SDCS-PIN-4 / SDCS-PIN-4b is designed for DCS800 converter modules sizes D1 to D4+ (20 A - 1190 A).
It has three different functions:

1. The power supply for all small voltages of the whole drive and the connected options (D1 - D4+).
2. Control of armature bridge including high ohmic measurement of DC- and AC voltage and an interface for the current transformer measuring the armature current (D1 - D4+).
3. Control of the OnBoard field exciter and field current measurement (D1 - D4).

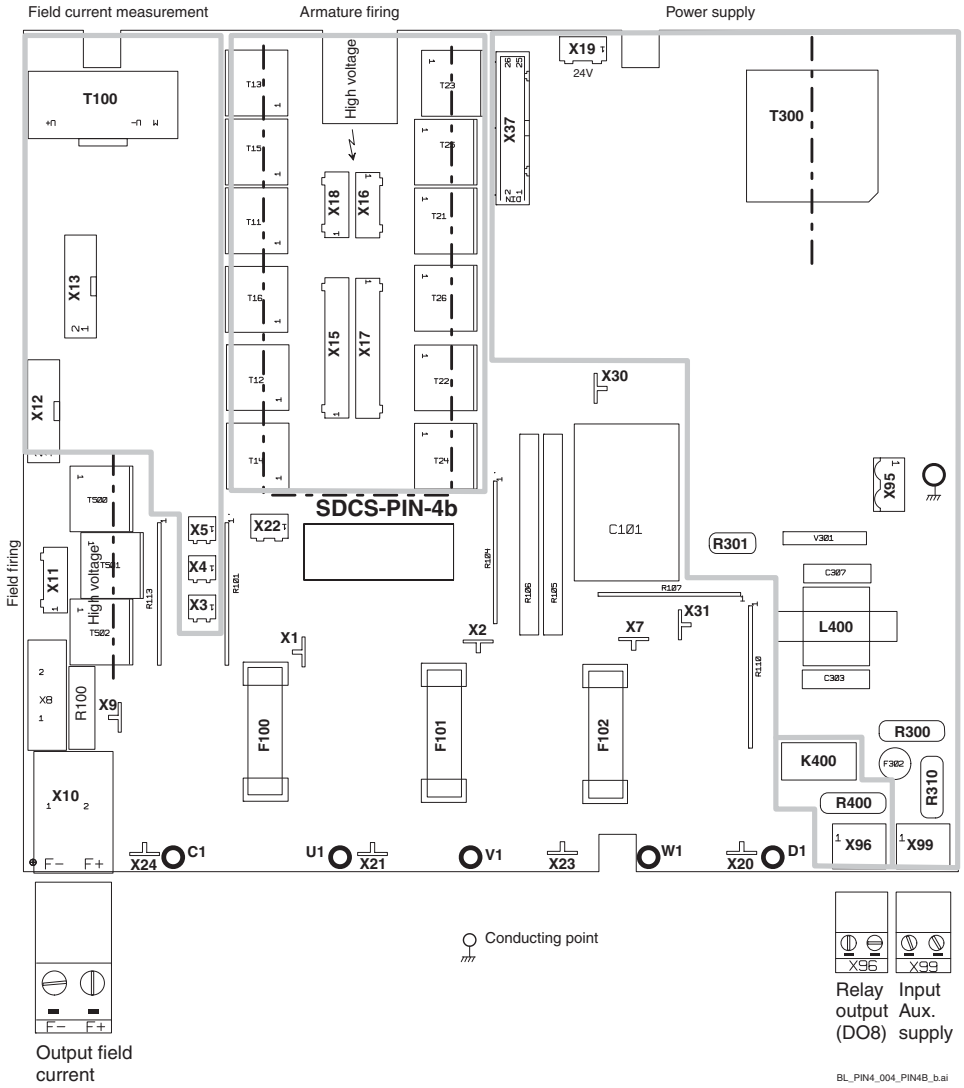
The board is connected to ground at points (⏚) inside the module.
The board is used for mains supply voltages from 230 V up to 525 V and 600 V.
The DCS800 provides an automatic adjustment for current and voltage measurement, burden resistor settings and 2-Q or 4-Q operation by means of setting parameters in the firmware.

Layout SDCS-PIN-4



Layout SDCS-PIN-4

Layout SDCS-PIN-4b



Layout SDCS-PIN-4b

Power supply

SDCS-PIN-4:

The SDCS-PIN-4 automatically adapts the auxiliary voltage of either 230 V_{AC} or 115 V_{AC} and switches relay K301 in case of jumper setting S1 = 1-2.

In case of varying 230 V_{AC} input voltage (e.g. diesel generator network) the operation must be fixed to 230 V_{AC} by setting jumper S1 = 2-3.

SDCS-PIN-4b:

The SDCS-PIN-4b automatically adapts the auxiliary voltage of either 230 V_{AC} or 115 V_{AC}.

Technical data

Auxiliary incoming power X99

Auxiliary voltage	115 V_{AC}	230 V_{AC}	230 V_{DC} (SDCS-PIN-4b only)
Tolerance	-15 % / +10 %	-15 % / +10 %	-15 % / +10 %
Frequency	45 Hz - 65 Hz	45 Hz - 65 Hz	-
Power consumption	120 VA	120 VA	-
Power loss	≤ 60 W	≤ 60 W	≤ 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. 30 ms (SDCS-PIN-4) min. 300 ms (SDCS-PIN-4b)	min. 150 ms
Powerfail	< 95 V_{AC}	< 185 V_{AC} (SDCS-PIN-4) < 95 V_{AC} (SDCS-PIN-4b)	< 140 V_{DC}

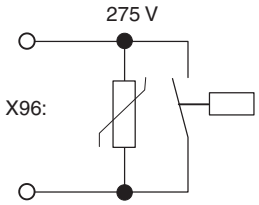
Jumper S1 (SDCS-PIN-4 only)

1-2: Automatic detection of auxiliary voltage (default). Either 115 V_{AC} or 230 V_{AC}.

2-3: Auxiliary voltage is fixed to 230 V_{AC}.

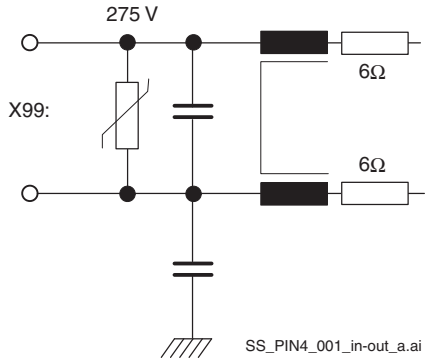
Relay output X96 (DO8)

Isolated by relay (normally open contact)
Contact ratings: **AC**: 250 V~ / ≤ 3 A~
DC: 24 V- / ≤ 3 A- or
115 / 230 V- / ≤ 0.3 A-



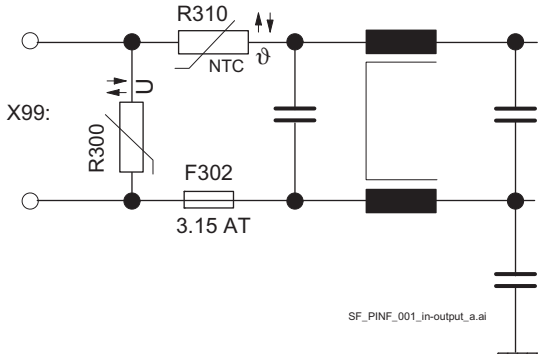
Input circuit X99

SDCS-PIN-4:



SDCS-PIN-4b:

X99 features a hardware filter and a voltage limitation.



Armature circuit interface

The function for the armature circuit interface consist of:

- Firing the armature bridge of 6 or 12 thyristors.
- High ohmic measurement of DC and AC voltages.
- Residual measurement current of armature circuit to ground = 5 mA at 500 V supply (≈ 1 MΩ).
- Interface for the current transformers for current measurement.
- Snubber circuit for the thyristor protection together with R1 on the heatsink.
- Interface for heatsink temperature measurement with a PTC.
- Fuses for overvoltage protection and field circuit.

Field circuit interface (D1 - D4)

The OnBoard field exciter is located internally. The firing pulses are synchronized using the mains circuit L1, L2, L3 and the SDCS-CON-4. The pulses are amplified on the SDCS-PIN-4 / SDCS-PIN-4b. The hardware structure is a three phase half controlled bridge supplied directly from the mains U1, V1 , W1 via fuses F100, F101, F102.

If the OnBoard field exciter is not needed it can be deselected in the firmware.

The field circuit interface consists of:

- Firing the three phase half controlled field bridge.
- Measuring the field current on the DC side. The scaling is automatically selected using the rated motor field current.
- The snubber circuit is shared with the armature bridge.
- Fuses F100, F101, F102 are used for cable and motor field winding protection.
- Size D3 and D4 converters for 600 V are always delivered without OnBoard field exciter.
- Size D4+ converters do not use the field circuit interface on the SDCS-PIN-4 / SDCS-PIN-4b.

Ratings OnBoard field exciter

AC voltage range	110 - 525 V
AC insulation voltage	600 V
Frequency	50 Hz / 60 Hz
AC input current	< Field current
Minimum field current	300 mA

Cables

Size	D1	D2	D3	D4
DC output current	6 A	15 A	20 A	25 A
max. cross sectional area	6 mm² AWG 10	6 mm² AWG 10	6 mm² AWG 10	6 mm² AWG 10
min. cross sectional area	1 mm² AWG 16	2.5 mm² AWG 13	4 mm² AWG 11	6 mm² AWG 10
Fuse type	KTK - 25			

Typical thyristor converter diagram with SDCS-PIN-4 / SDCS-PIN-4b for D1 - D4 converter.

