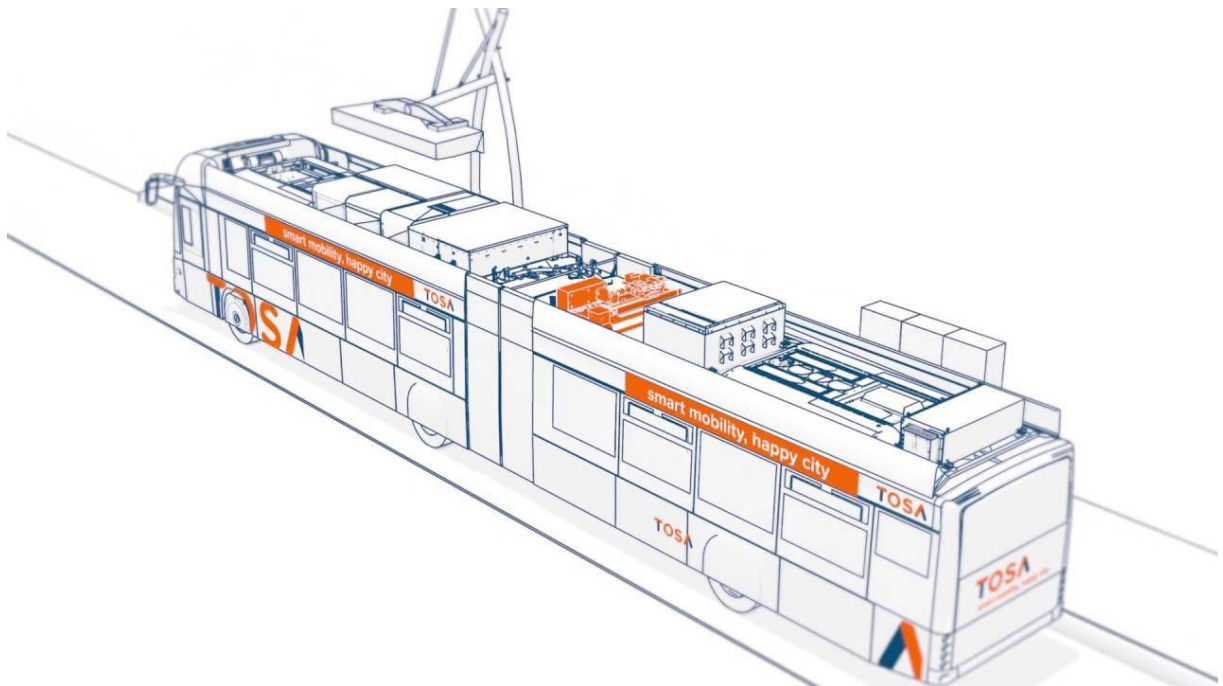

ABB INDUSTRIAL DRIVES

DCS880 drives **H4T (Tosa) manual**



DCS880 Drive Manuals


General	Publication number	EN	DE	IT	ES	FR	PL	ZH	RU
DCS880 Quick guide	3ADW000545	EN	DE	IT	ES	FR			
Safety instructions all languages	3ADW000481	EN	DE	IT	ES	FR	PL	ZH	RU
DCS880 Manual set	 DCS880 Manual set	EN							
DCS880 Units									
DCS880 Flyer	3ADW000475	EN	DE	IT	ES	FR		ZH	RU
DCS880 Technical catalog	3ADW000465	EN	DE	IT	ES	FR	PL	ZH	RU
DCS880 Hardware manual	3ADW000462	EN	DE	IT	ES	FR	PL		RU
DCS880 Firmware manual	3ADW000474	EN	DE	IT	ES	FR	PL		RU
DCS880 Service manual	3ADW000488	EN							
DCS880 Hardparallel manual (on request only)	3ADW000530	EN							
DCS880 12-pulse manual	3ADW000533	EN							
DCS880 Current measurement aid (SDCS-CMA-2) manual	3ADW000745	EN							
ACS-AP-x assistant control panels user's manual	3AUA0000085685	EN							
DCS Thyristor power converter – Technical guide	3ADW000163	EN							
DCS External DC voltage measurement H1 ... H5	3ADW000601	EN							
Functional safety									
Supplement for functional safety	3ADW000452	EN		IT	ES	FR	PL		RU
Functional safety for enclosed converter									
+Q957 Prevention of unexpected Start Up	3ADW000504	EN							
+Q951 Emergency stop, category 0 with MC opening	3ADW000505	EN							
+Q952 Emergency stop, category 1 with MC opening	3ADW000506	EN							
+Q963 Emergency stop, category 0 without MC opening	3ADW000507	EN							
+Q964 Emergency stop, category 1 without MC opening	3ADW000508	EN							
Enclosed converter									
DCS880-A Catalog	3ADW000531	EN							
DCS880-A Installation manual	3ADW000627	EN							
DCS800-A +S880 Enclosed converters, flyer	3ADW000523	EN							
Rebuild and upgrade systems									
DCS880-R Rebuild manual	3ADW000599	EN							
DCS880-U Upgrade manual	3ADW000719	EN							
Door mounting kits									
DPMP-01 mounting platform for ACS-AP control panel	3AUA0000100140	EN							
DPMP-02 mounting platform for ACS-AP control panel	3AUA0000136205	EN							
Serial communication									
FCAN-01 CANopen adapter module	3AFE68615500	EN	DE						
FDNA-01 DeviceNet™ adapter module	3AFE68573360	EN							
FECA-01 EtherCAT adapter module	3AUA0000068940	EN	DE		ES				
FENA-11/-21 Ethernet adapter module	3AUA0000093568	EN						ZH	
FEPL-02 Ethernet POWERLINK adapter module	3AUA0000123527	EN	DE						
FPBA-01 PROFIBUS DP adapter module	3AFE68573271	EN	DE				PL	ZH	
FSCA-01 RS-485 adapter module	3AUA0000109533	EN						ZH	
FDCO-01/02 DDCS communication modules	3AUA0000114058	EN							
FSPS-21 PROFIsafe safety functions module	3AXD50000158638	EN							
FSO-21 Safety functions module	3AXD50000015614	EN							
Tool and maintenance manuals and guides									
Drive Composer PC tool	3AUA0000094606	EN							
Drive application programming (IEC61131-3) manual	3AUA0000127808	EN							
Adaptive programming, Application guide	3AXD50000028574	EN							
NETA-21 remote monitoring tool	3AUA0000096939	EN							
NETA-21 remote monitoring tool guide	3AUA0000096881	EN							
DDCS branching unit NDBU-95 user's manual	3BFE64285513	EN							
Extension modules									
FIO-11 Analog extension module	3AFE68784930	EN	DE	IT					
FIO-01 Digital extension module	3AFE68784921	EN	DE	IT					
FAIO-01 Analog extension module	3AUA0000124968	EN	DE						
FDIO-01 Digital extension module	3AUA0000124966	EN							
FEN-01 TTL encoder interface	3AFE68784603	EN	DE	IT				ZH	
FEN-31 HTL encoder interface	3AUA0000031044	EN						ZH	
FSE-31 pulse encoder interface module user's manual	3AXD50000016597	EN							
FEA-03 F series extension adapter	3AUA0000115811	EN							
Ethernet tool network for ACS880 drives appl. guide	3AUA0000125635	EN							
Status 04.2022	DCS880 Manuals list en s.docx								

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Safety instructions

What this chapter contains

This chapter contains the safety instructions you must follow when installing, operating and servicing the drive/unit.

If ignored, physical injury or death may follow, or damage may occur to the drive/unit, the motor/load 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 line DCS880, the converter modules DCS880-S0x size H1 ... H8, field exciter units DCF80x, Rebuild Kit DCS880-R00, etc.

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 warns of electrostatic discharge which can damage the equipment.

Installation and maintenance work

These warnings are intended for all who work on the drive/unit, motor/load cable or motor/load. Ignoring the instructions can cause physical injury or death and/or damage to the equipment.



WARNING

- **Only qualified electricians are allowed to install and maintain the drive/unit!**
- Never work on the drive/unit, motor/load cable or motor/load when mains power is applied.
- Always ensure by measuring with a multimeter (impedance at least 1 MΩ) that:
 - 1. Voltage between drive/unit 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/unit or to the external control circuits. Externally supplied control circuits may cause dangerous voltages inside the drive/unit even when the mains power on the drive/unit is switched off.
- Do not make any insulation resistance or voltage withstand tests on the drive/unit or drive modules.
- Isolate the motor/load cables from the drive/unit when testing the insulation resistance or voltage withstand of the cables or the motor/load.
- When reconnecting the motor/load cable, always check that the C+ and D- cables are connected with the proper terminal.

Notes:

- The motor/load cable terminals on the drive/unit are at a dangerously high voltage when the mains power is on, regardless of whether the motor/load 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/unit system (e.g. XRO1 ... XRO3).
- DCS880 with enclosure extension: Before working on the drive/unit, isolate the whole drive/unit system from the supply.

Grounding

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

**WARNING**

- Ground the drive/unit, motor/load 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/unit installation, connect each drive/unit separately to protective earth (PE \oplus).
- Minimize EMC emission and make a 360° high frequency grounding (e.g. conductive sleeves) of screened cable entries at the cabinet lead-through plate.
- Do not install a drive/unit equipped with an EMC filter to an ungrounded power system or a high resistance-grounded ($> 30 \Omega$) power system.

Notes:

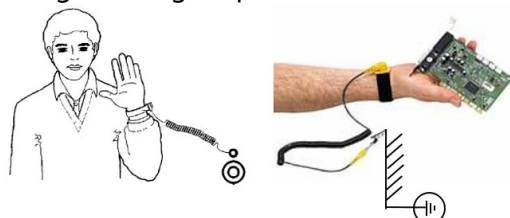
- Power cable shields are suitable as equipment grounding conductors only when adequately sized to meet safety regulations.
- As the normal leakage current of the drive/unit is higher than 3.5 mA_{AC} or 10 mA_{DC} a fixed protective earth connection is required.
- This product can cause a DC current in the protective earthing conductor. Where a residual current-operated protective (RCD) or monitoring (RCM) device is used for protection in case of direct or indirect contact, only an RCD or RCM of Type B is allowed on the supply side of this product.

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 wrist band 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.).

Mechanical installation

These notes are intended for all who install the drive/unit. Handle the unit carefully to avoid damage and injury.



WARNING



- DCS880 sizes H4 ... H8:
 - The drive/unit is heavy. Lift the drive/unit by lifting lugs only.
 - The drive's/unit's center of gravity is high. Do not tilt the drive/unit. The drive/unit will overturn from a tilt of about 6 degrees. An overturning drive/unit can cause physical injury.
 - Do not lift the drive/unit by the front cover.
 - Place drives/units H4 ... H6 only on their back.
- Make sure that dust from drilling does not enter the drive/unit when installing. Electrically conductive dust inside the drive/unit may cause damage or lead to malfunction.
- Ensure sufficient cooling.
- Do not fasten the drive/unit by riveting or welding.

Operation

These warnings are intended for all who plan the operation of the drive/unit or operate the drive/unit. Ignoring the instructions can cause physical injury or death and/or damage to the equipment.




WARNING

- Before adjusting the drive/unit and putting it into service, make sure that the motor/load and all driven equipment are suitable for operation throughout the speed/voltage range provided by the drive/unit. The drive can be adjusted to operate the motor at speeds above and below the base speed.
- Do not control the motor/load with the disconnecting device (disconnecting mains); instead, use the control panel keys  and , or commands via the I/O board of the drive/unit.
- Mains connection:
You can use a disconnect switch (with fuses) to disconnect the electrical components of the drive/unit from the mains for installation and maintenance work. The type of disconnect switch used must be as per EN 60947-3, Class B, so as to comply with EU regulations, or a circuit-breaker type which switches off the load circuit by means of an auxiliary contact causing the breaker's main contacts to open. The mains disconnect must be locked in its "OPEN" position during any installation and maintenance work.
- EMERGENCY STOP buttons must be installed at each control desk and at all other control panels requiring an emergency stop function. Pressing the STOP button on the control panel of the drive/unit will neither cause an emergency stop of the motor/load, nor will the drive/unit be disconnected from any dangerous potential.
- To avoid unintentional operating states, or to shut the unit down in case of any imminent danger according to the standards in the safety instructions it is not sufficient to merely shut down the drive/unit via signals "RUN", "drive/unit OFF" or "Emergency Stop" respectively "control panel" or "PC tool".
- Intended use:
The operating instructions cannot take into consideration every possible case of configuration, operation or maintenance. Thus, they mainly give such advice only,

which is required by qualified personnel for normal operation of the machines and devices in industrial installations.

If in special cases the electrical machines and devices are intended for use in non-industrial installations - which may require stricter safety regulations (e.g. protection against contact by children or similar) - these additional safety measures for the installation must be provided by the customer during assembly.

Note:

- When the control location is not set to Local (Local not shown in the status row of the display), the stop key on the control panel will not stop the drive/unit. To stop the drive/unit using the control panel, press the Loc/Rem key and then the stop key .

Introduction to this manual

This manual contains all additional information needed for DCS880 units size H4T using the higher mains voltage and DC voltage setup.

H4T

To increase the mains voltage and DC voltage of some DCS880 2-Q units size H4 the SDCS-PIN-H01 has been substituted by an SDCS-POW-H01 together with an SDCS-PIN-H51 and an SDCS-PIN-H41. This creates DCS880 2-Q units size H4T.

Application

H4T units are mainly used for non-motoric applications.

Related documents

A list of related manuals is shown on the inside of the front cover under [DCS880 Drive Manuals](#).

Terms and abbreviations

Term/Abbreviation	Definition
AC 800M	Type of programmable controller manufactured by ABB.
ACS-AP-I	Types of control panel used with DCS880 drives and DCT880 units.
ACS-AP-W	
Adaptive Program (AP)	Adaptive Program of the drive/unit. See Adaptive programming, Application guide (3AXD50000028574)
AI	Analog input; interface for analog input signals.
AO	Analog output; interface for analog output signals.
Application program	Program written by the Automation Builder. See Drive (IEC61131-3) application programming manual (3AUA0000127808) .
Automation Builder	Tool to write application programs. See Drive (IEC61131-3) application programming manual (3AUA0000127808) .
Control unit	Contains the electronics and I/O connections of the drive/unit. The control unit is connected to the power unit.
D2D	Drive-to-Drive or Device-to-Device; communication link between drives/units.
DCS880	A product family of ABB drives.
DCSLink	Communication between the armature converter and the field exciters or 12-pulse communication.
DDCS	Distributed drives communication system. A protocol used in communication between ABB equipment.
DI	Digital input; interface for digital input signals.
DIO	Digital input/output; interface that can be used as a digital input or output.
DO	Digital output; interface for digital output signals.
Drive	Converter to control DC motors/loads.
DriveBus	A communication link used by, for example, ABB controllers. DCS880 drives/units can be connected to the DriveBus link of the controller.
DriveAP	Adaptive Programming of the drive/unit. See Adaptive programming, Application guide (3AXD50000028574) .
Drive Composer	PC tool for commissioning and maintenance of ABB drives/units.
EFB	Embedded fieldbus.
FAIO-01	Optional analog I/O extension module.
FBA	Fieldbus adapter.
FCAN-01	Optional CANopen adapter.
FCNA-01	Optional ControlNet adapter.
FDCO-0x	Optional DDCS communication module.
FDIO-01	Optional digital I/O extension module.
FDNA-01	Optional DeviceNet adapter.
FEA-03	Optional I/O extension module.
FECA-01	Optional EtherCAT® adapter.
FEN-01	Optional TTL encoder interface module.
FEN-11	Optional absolute encoder interface module.
FEN-21	Optional resolver interface module.
FEN-31	Optional HTL encoder interface module.
FENA-11	Optional Ethernet/IP, Modbus/TCP and PROFINET IO adapter.

Term/Abbreviation	Definition
FENA-21	Optional dual-port Ethernet/IP, Modbus/TCP and PROFINET IO adapter.
FEPL-02	Optional POWERLINK adapter.
FIO-01	Optional digital I/O extension module.
FIO-11	Optional analog I/O extension module.
FPBA-01	Optional PROFIBUS DP adapter.
FPTC-01	Optional thermistor protection module.
FPTC-02	Optional ATEX-certified thermistor protection module for potentially explosive atmospheres.
FSCA-01	Optional Modbus/RTU adapter.
FSO-21	Optional safety functions module.
FSPS-21	Optional PROFIsafe safety functions module.
HTL	High-threshold logic.
I/O	Input/Output.
ModuleBus	A communication link used by, for example, ABB controllers. DCS880 drives/units can be connected to the optical ModuleBus link of the controller.
Network control	With fieldbus protocols based on the Common Industrial Protocol (CIP™), such as DeviceNet and Ethernet/IP, denotes the control of the drive/unit using the Net Ctrl and Net Ref objects of the ODVA AC/DC Drive Profile. For more information, see www.odva.org , and the following manuals: <ul style="list-style-type: none"> – FDNA-01 DeviceNet adapter module User's manual (3AFE68573360). – FENA-11/-21 Ethernet adapter module User's manual (3AUA0000093568).
Off3 (emergency stop)	Function in Drive: Off3 (emergency stop) with configurable deceleration time according to cat. 1.
OPL	Optical power link. Protocol used in communication between the control unit and the power unit.
Parameter	User-adjustable operation instruction to the drive/unit.
PID controller	Proportional-integral-derivative controller. The speed control is based on a PID algorithm.
PLC	Programmable logic controller.
Power unit	Contains the power electronics and power connections of the drive/unit. The control unit is connected to the power unit.
PTC	Positive temperature coefficient.
PU	See power unit.
RFG	Ramp function generator.
RO	Relay output; interface for a digital output signal. Implemented with a relay.
Signal	Value measured or calculated by the drive/unit. It can also contain status information. Most signals are read-only, but some (especially counter-type signals) can be reset.
SS1	Safe stop 1.
SSI	Synchronous serial interface.
STO	Safe torque off.
TTL	Transistor-transistor logic.
UPS	Uninterruptible power supply: Power supply equipment with battery to maintain output voltage during power failure.

Cybersecurity disclaimer

This product is designed to be connected to and to communicate information and data via a network interface. It is the customer's sole responsibility to provide and continuously ensure a secure connection between the product and the customer network or any other network (as the case may be). The customer shall establish and maintain any appropriate measures (such as but not limited to the installation of firewalls, application of authentication measures, encryption of data, installation of anti-virus programs, etc.) to protect the product, the network, its system and the interface against any kind of security breaches, unauthorized access, interference, intrusion, leakage and/or theft of data or information. ABB and its affiliates are not liable for damages and/or losses related to such security breaches, any unauthorized access, interference, intrusion, leakage and/or theft of data or information.

H4T hardware

Type code

The type code contains information on the specification and configuration of the unit. The first digits from left show the basic configuration (e.g. DCS880-S01-2000). The optional selections are given thereafter on the name plate by plus code. The main selections are described below. Not all selections are available for all types.

The unit's basic type code: DCS880-aab-cccc-ddef + plus code			
Product family:	DCS880		
Product type:	aa	= S0	Standard converter module
		= R0	Rebuild kit
		= U1	Upgrade kit
		= A0	Enclosed converter
Bridge type:	b	= 1	Single bridge (2-Q)
		= 2	2 anti-parallel bridges (4-Q)
Module type:	cccc	=	Rated DC current (IP00)
Rated AC voltage:	dd	= 04	100 V _{AC} ... 415 V _{AC}
		= 05	100 V _{AC} ... 500 V _{AC} (IEC)/525 V _{AC} (UL)
		= 06	270 V _{AC} ... 600 V _{AC}
		= 07	315 V _{AC} ... 690 V _{AC}
		= 08	360 V _{AC} ... 800 V _{AC}
		= 10	450 V _{AC} ... 990 V _{AC}
		= 12	540 V _{AC} ... 1200 V _{AC}
Power connection:	e	= X	Standard H1 ... H7
		= L	Left side H8
		= R	Right side H8
Revision code:	f	= 0	1 st generation
		= A	H7: fusing adaption due to UL certification
		= B	H5/H6: New cooling fan R2E250-RE04-10
Field exciter configuration:	+0S163	H1 ... H4 without OnBoard field exciter	
	+S164	H5 and H6 with internal field exciter, supply external (H5 and H6: 25 A, Rebuild kit: 16 A/25 A)	
Fan voltage:	Standard	Size H4	
		Fan voltage: 230 V/1-ph	
Application programming:	+S551	Memory unit including drive application programming license	
SDCS-DSL-H10:	+S521	1 DCSLink channel, 0 channels optical power link SDCS-DSL-H10	
Voltage measurement:	+S185	SDCS-PIN-H51 configured for 20 V _{AC} ... 100 V _{AC} (H6 ... H8)	
Control panel:	+0J404	Without control panel	
	+J428	Daisy-chain option DPI-H01 kit	
	+J429	Bluetooth control panel ACS-AP-W	

The technical data and specifications are valid as of going to press. ABB reserves the right to make subsequent alterations.

Type code units size H4T

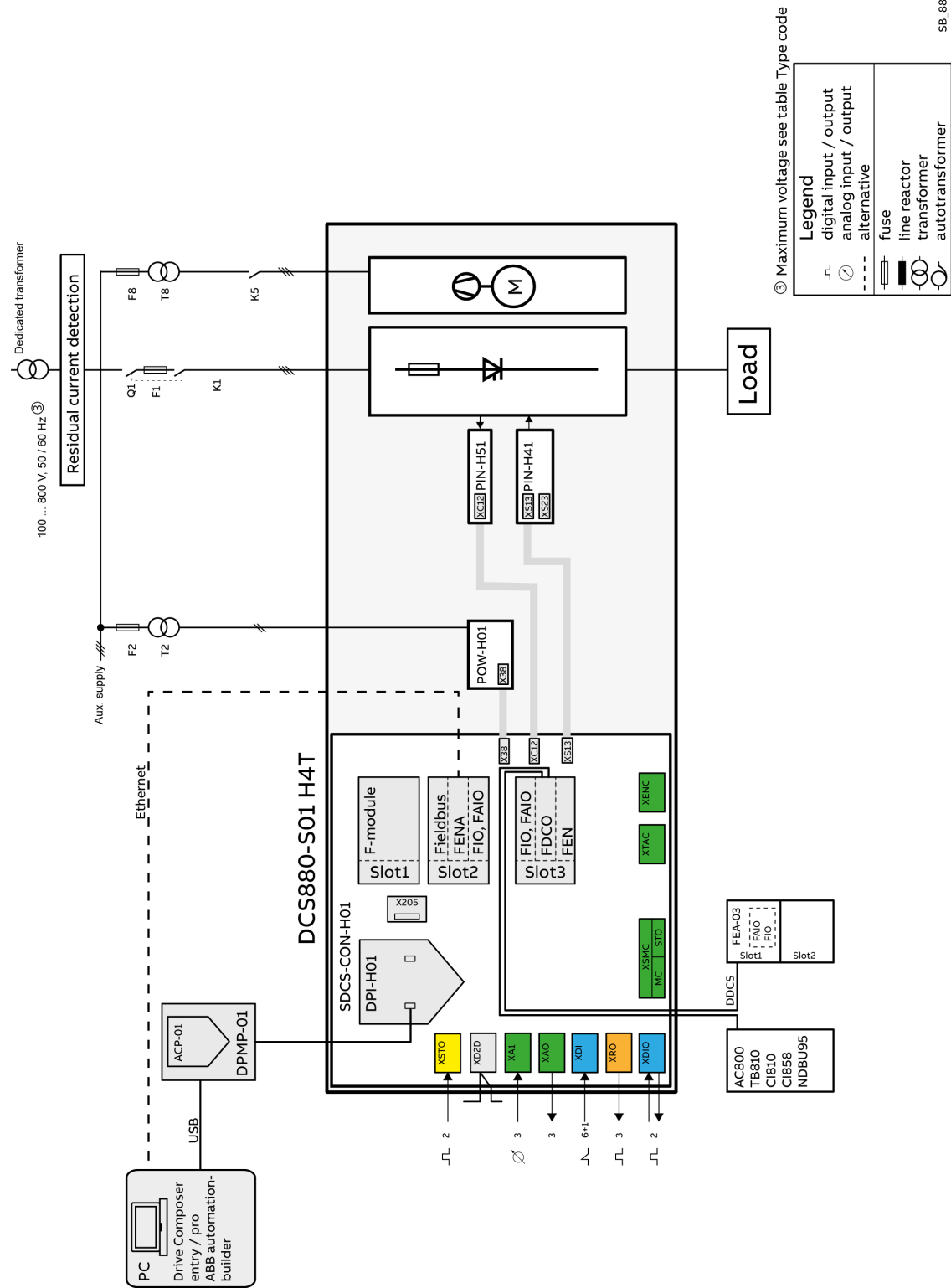
There are two units size H4T:

DCS880-S01-0630-07 for mains voltages up to 690 V_{AC}.

DCS880-S01-0590-08 for mains voltages up to 800 V_{AC}.

Main circuit and control

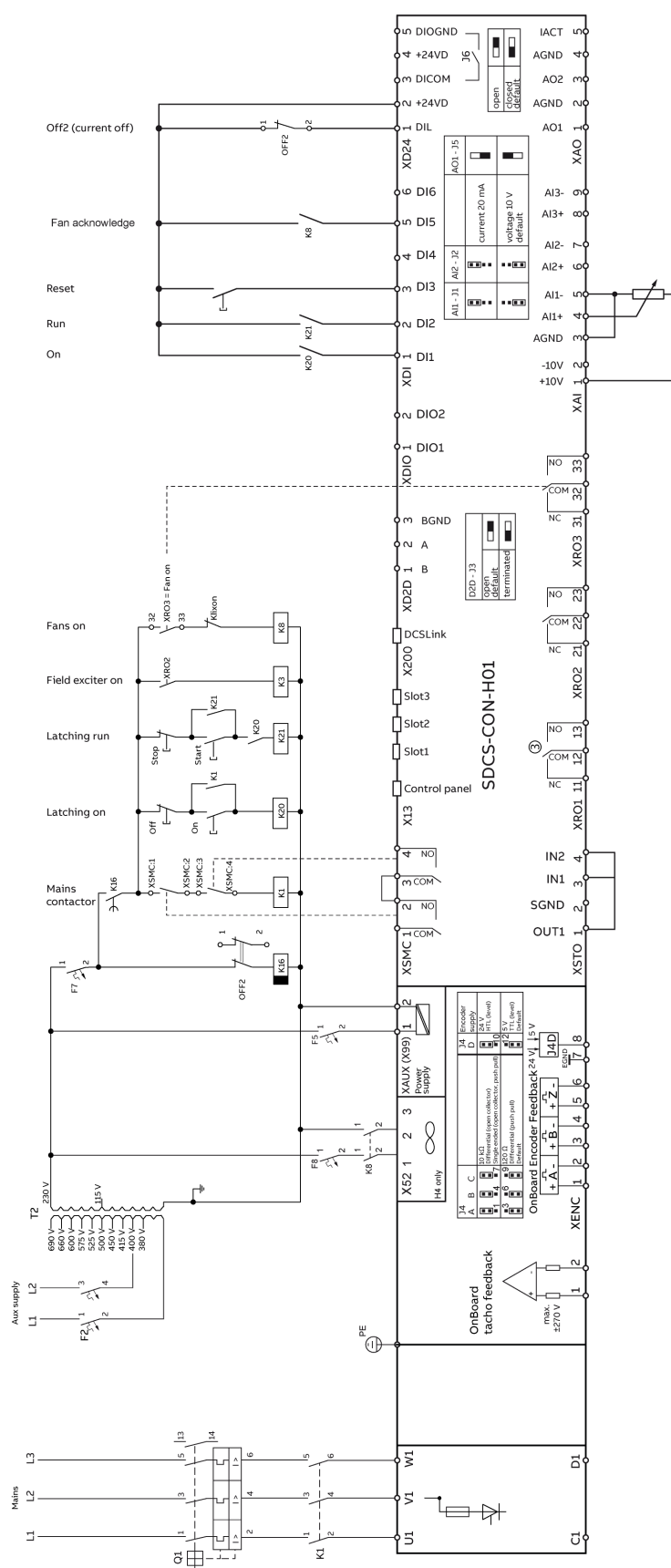
Armature converter DCS880 H4T



SB_880_050_H4T Tosa_a.ai

Converters size H4T configuration

Wiring the unit according to this diagram offers the highest degree of monitoring functions done by the unit.



③ For proper feedback set 10.24 R01 source = 31.91.b07 or 31.98.b11

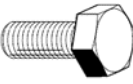
SF_880_000_DCS_anschluss.gal

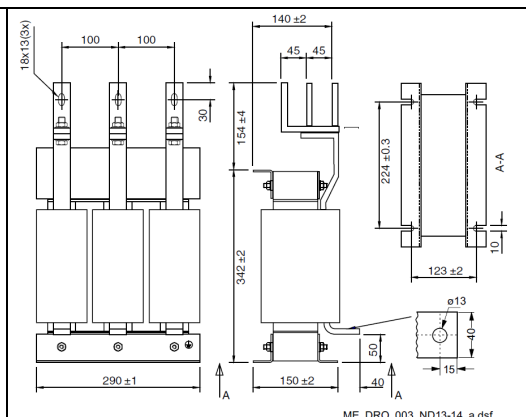
Mains power connection

The H4T unit DCS880-S01-0630-07 can be connected to either an ND13 or to a dedicated transformer.
The H4T unit DCS880-S01-0590-08 must be connected to a dedicated transformer.

Line reactor type ND13 all busbars are 40 x 10:

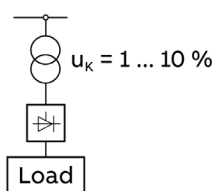
Tightening torque

		Torque [Nm]
ND13	M10	25



Dedicated transformer:

Only one unit is connected to the dedicated transformer.
No additional equipment is connected to the dedicated transformer.
Typically for units size H4T.



Cooling fans

Fan assignment for DCS880

Converter type	Size	Configuration	Fan type	Airflow built in [m³/h]
DCS880-S01-0590-08	H4T	4	1 x W2E200	388
DCS880-S01-0630-07			230 V; 1~	

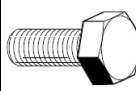
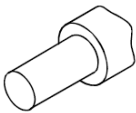
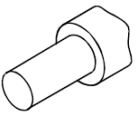
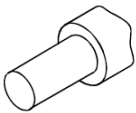
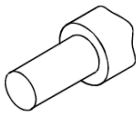
Fan cable sizes and tightening torque connected at the fan terminals

Fan terminals are X52 for H4T.

Converter type	Flexible cable		Solid cable	
	max [mm²]	torque [Nm]	max [mm²]	torque [Nm]
DCS880-S01-0590-08	0.5 ... 1.5	0.5 ... 0.6	0.5 ... 1.0	0.5 ... 0.6
DCS880-S01-0630-07				

Cross-sectional areas - Tightening torques

Recommended cross-sectional area according to DIN VDE 0276-1000 and DIN VDE 0100-540 (PE) in a trefoil arrangement, up to 50°C ambient temperature. The necessary wire torque at 60°C wire temperature is the same as recommended in the following table.

Converter type	C1, D1			U1, V1, W1		PE		[Nm]
	I _{DC} [A-]	1  [mm²]	(2.)  [mm²]	I _V [A~]	 [mm²]	 [mm²]		
DCS880-S01-0590-08	590	2 x 120	-	484	2 x 120	1 x 120	1 x M12	50
DCS880-S01-0630-07	630	2 x 120	-	517	2 x 120	1 x 120	1 x M12	50

Current ratings - IEC non regenerative converters (S01)

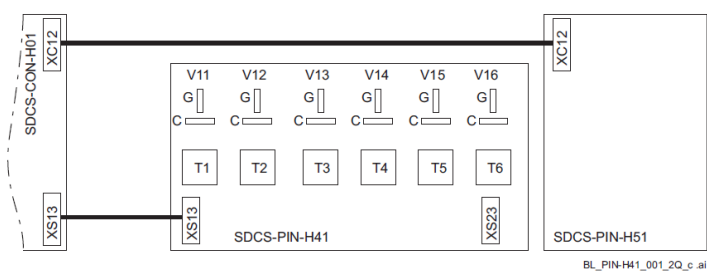
Unit type	IDC I	IDC II		IDC III		IDC IV		Size	Internal field current
2-Q converters	continuous	100 % 15 min	150 % 60 s	100 % 15 min	150 % 120 s	100 % 15 min	200 % 10 s		
690 V									
DCS880-S01-0630-07	630	No overload						H4T	-
800 V									
DCS880-S01-0590-08	590	No overload						H4T	-

Note: AC current $I_{AC} = 0.82 * I_{DC}$.

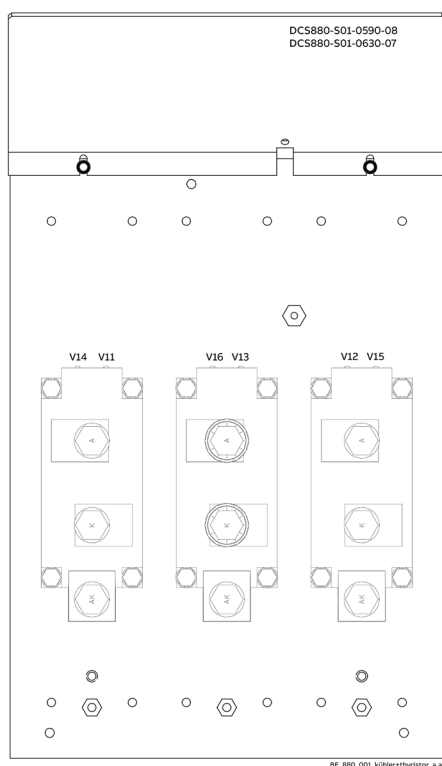
2-Q units size H4T

To increase the mains voltage and DC voltage of some DCS880 2-Q units size H4 the SDCS-PIN-H01 has been substituted by an SDCS-POW-H01 together with an SDCS-PIN-H51 and an SDCS-PIN-H41. This creates DCS880 2-Q units size H4T.

Connection between firing board and control board

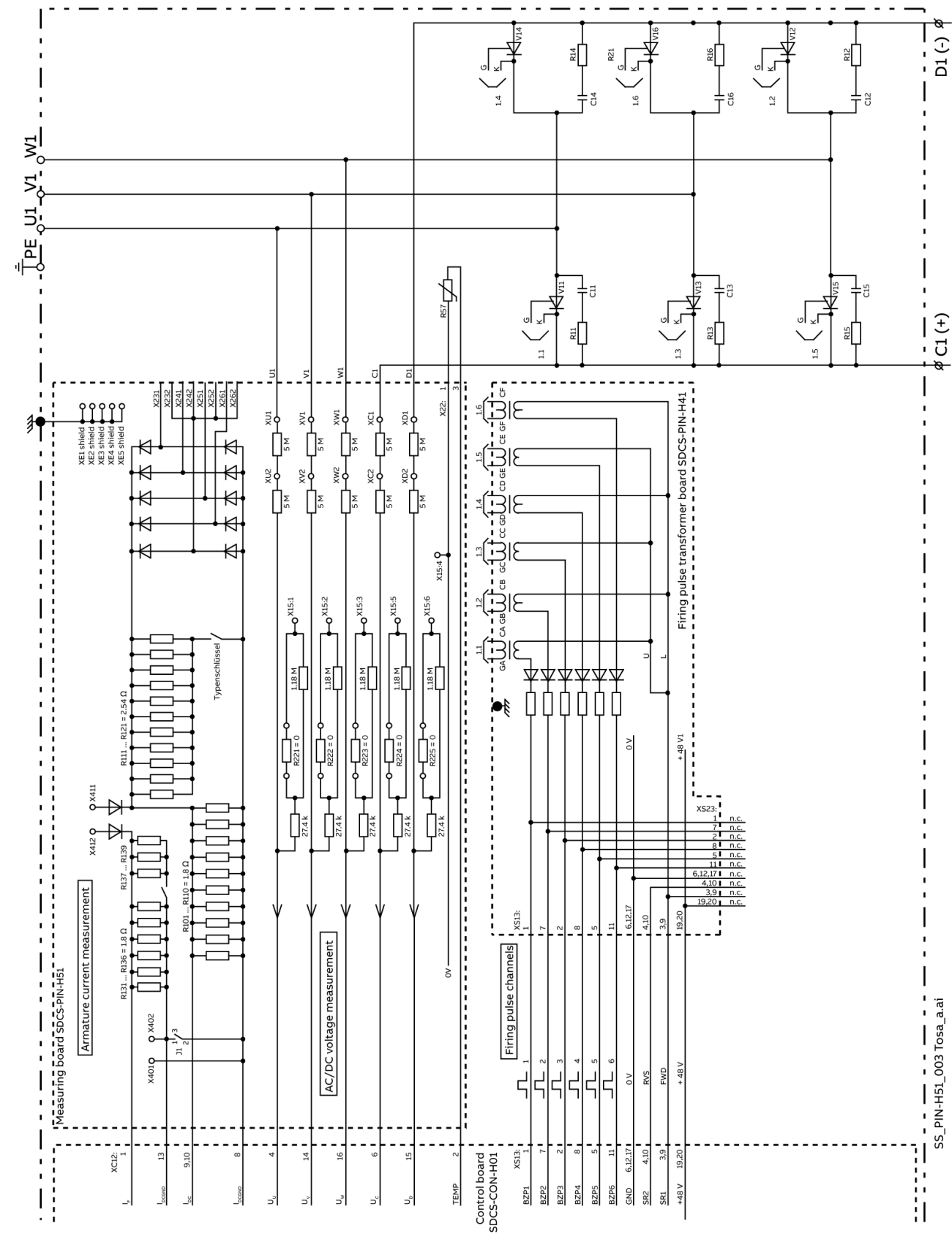


Location of the thyristors in frame H4T



Circuit diagram

Typical armature circuit diagram for module size H4T with SDCS-PIN-H51 and SDCS-PIN-H41:



Galvanic isolation - T90, A92, F11, F90

The Galvanic isolation is an option for converters size H4T, H6 ... H8 and rated voltages ≤ 1000 V. It is used to replace the high-ohmic voltage measurement and gives the advantage of a total isolation between power part and drive electronics.

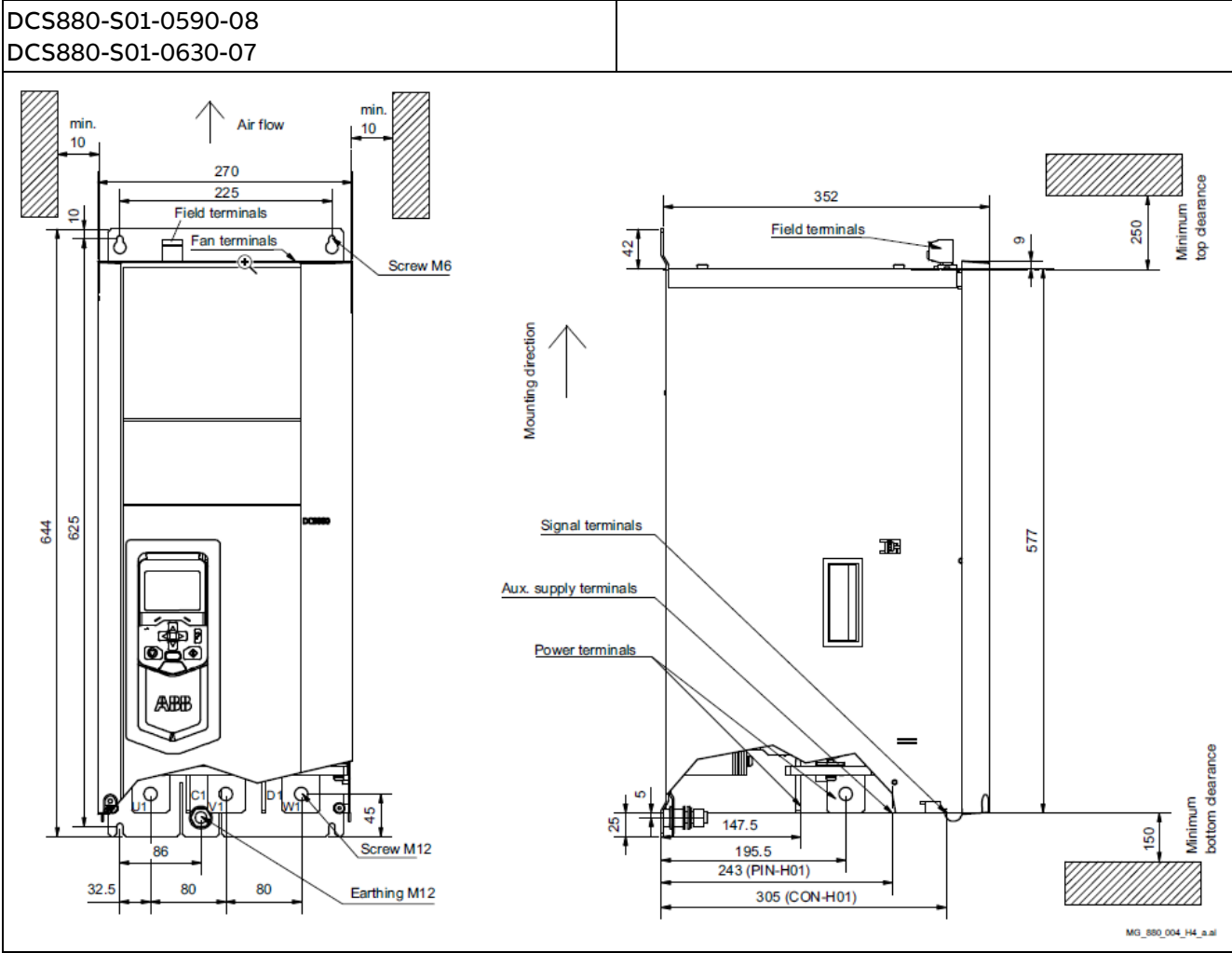
The transformer T90 and the DC-DC transducer A92 are located outside the converter module. The internal AC and DC voltage measurement channels are removed and connected to T90 and A92.

Voltage coding		
Size	H4T	
Unit nominal voltage [V] U1 [V _{AC}] ①	c = 7 (690 V)	c = 8 (800 V)
Rated mains voltage [V _{AC}]	315 ... 690	360 ... 800
Voltage measurement scaled by type code or parameter (95.28)	690	800
Measuring board	SDCS-PIN-H51 use connector X15	

Galvanic isolation		
Fuse F11	1500 V, 5 A	
DC-DC transducer A92	P42000D3-0111 (3ADN260008P0001)	
Switch position R _G	2 (945 V)	3 (1080 V)
Fuse F90	1000 V, 10 A	
Transformer T90	3ADT745047P0001	
Secondary Terminals	2U3 2V3 2W3 2N	2U4 2V4 2W4 2N

① Rated voltage see the name plate of the unit.

Size H4T

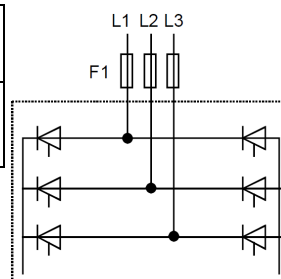


Fuses and fuse holders IEC for converter size H4T

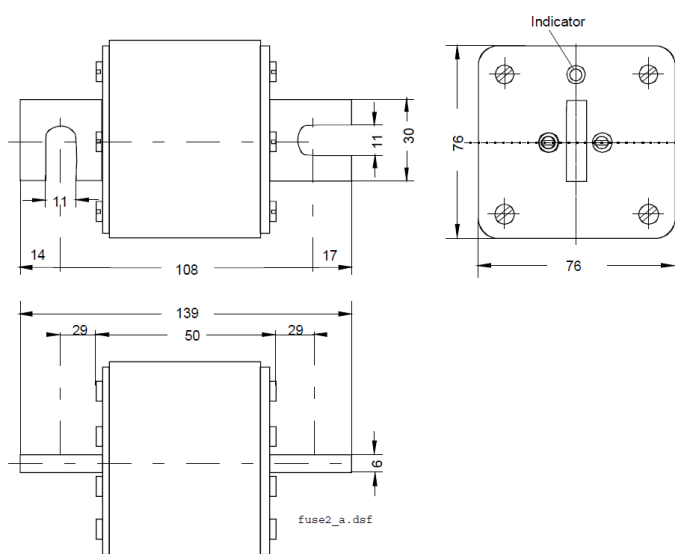
The DCS880 size H4T requires external mains fuses.

The 4th column of the table below assigns the line fuse to the unit.

Size	Converter type	Fuse type	Fuse Size	Resistance [mOhm]	Fuse holder
H4T	DCS880-S01-0590-08	800A/1000V UR	4	0.15	3 x 170H 3006
	DCS880-S01-0630-07				



Size 4



H4T firmware

For H4T units the standard DCS880 firmware is used. There are no additional signals or parameters used for H4T units.

H4T service

Current ratings

Unit size	2-Q rated current DCS880-01 [A _{DC}]	4-Q rated current DCS880-02 [A _{DC}]	Supply voltage [V _{AC}]						
			400	525	600	690	800	990	1200
H4T	590						X		
	630					X			

Fault Tracing Thyristors

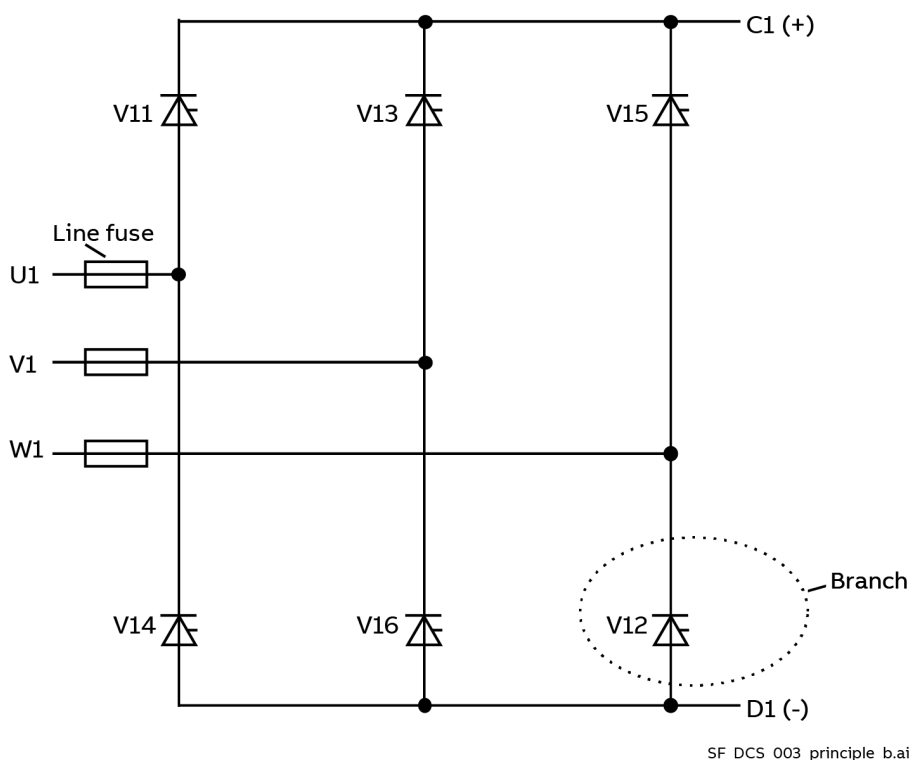
Units size H4T

These units require semiconductor fuses in the 3 AC lines.

- The unit must be disconnected from the mains.
- One load cable should be disconnected from the unit.

Blown fuses

- Make sure, that the connection to the load is open (e.g., disconnect load cables).
- Using the OHM function of a normal multimeter, measurements must be made from each AC terminal (U1 to C1, V1 to C1, W1 to C1, U1 to D1, V1 to D1 and W1 to D1:



Bridge configuration H4T

- Normally, each measurement should show high resistance ($> 1 \text{ k}\Omega$).
- Target: Find a short circuit, indicated by low resistance ($< 1 \text{ }\Omega$) (destroyed thyristor).
- If the unit is designed with thyristor modules, then a module consists of two thyristors. In this case it is sufficient to know which thyristor module has a defective thyristor because the complete module must be replaced.
- After a thyristor module is replaced, the above mentioned measurement should be done another time to make sure that all faulty thyristors have been detected!

Note:

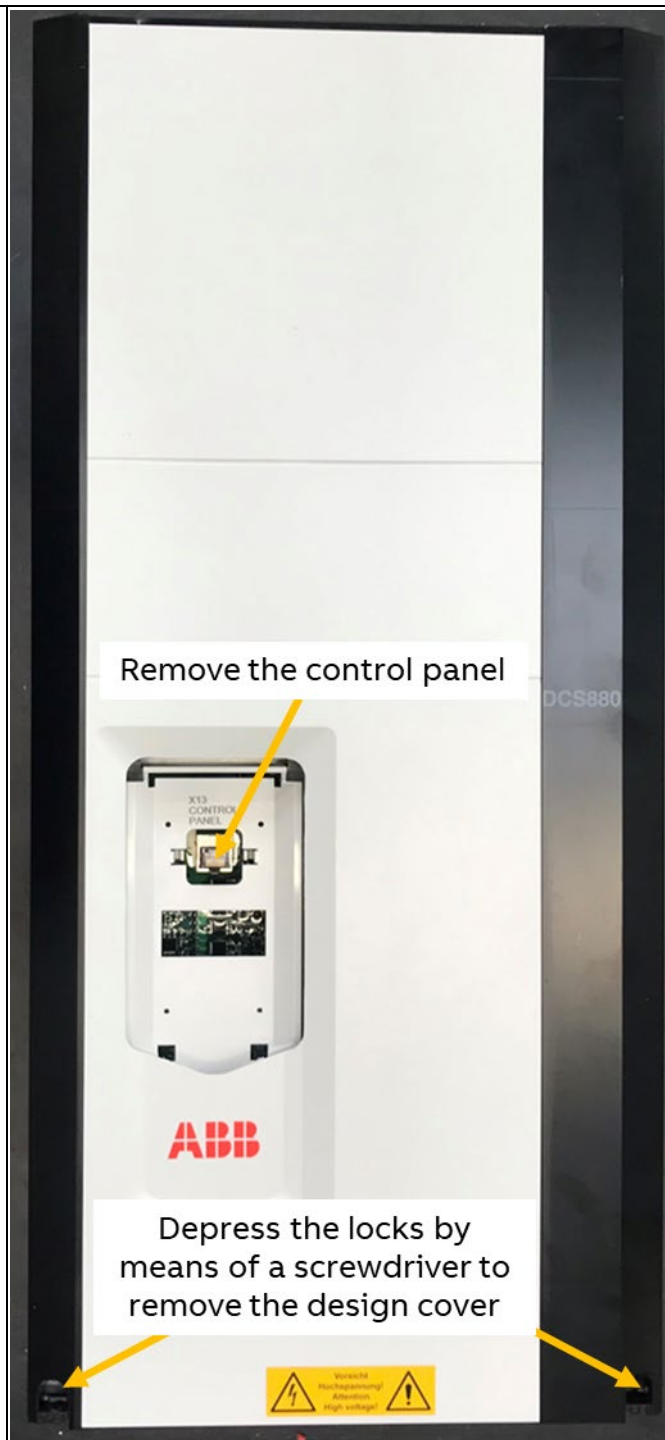
The RC/snubber circuit could also cause 0 Ohm results for a short time.

The measurement, showing less resistance than 1 Ohm should be made a second time with test leads applied to the terminals with opposite polarity; if this measurement shows the same result, one or two thyristors located in that path are faulty; they need to be replaced.

Exchange thyristors size H4T

Remove faulty thyristor modules

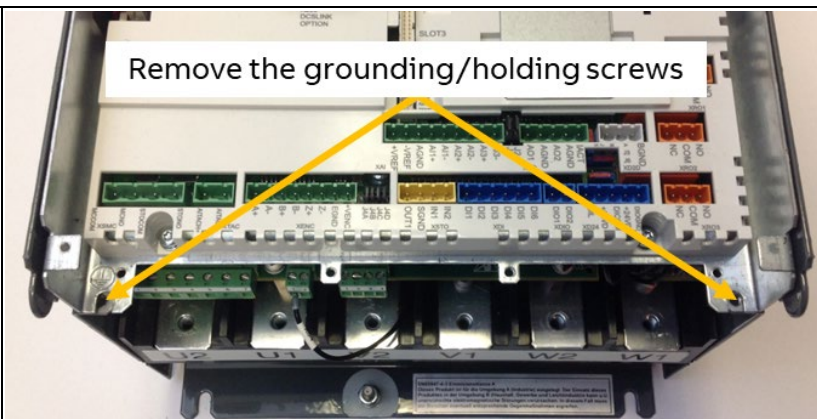
1. Remove control panel and design cover.



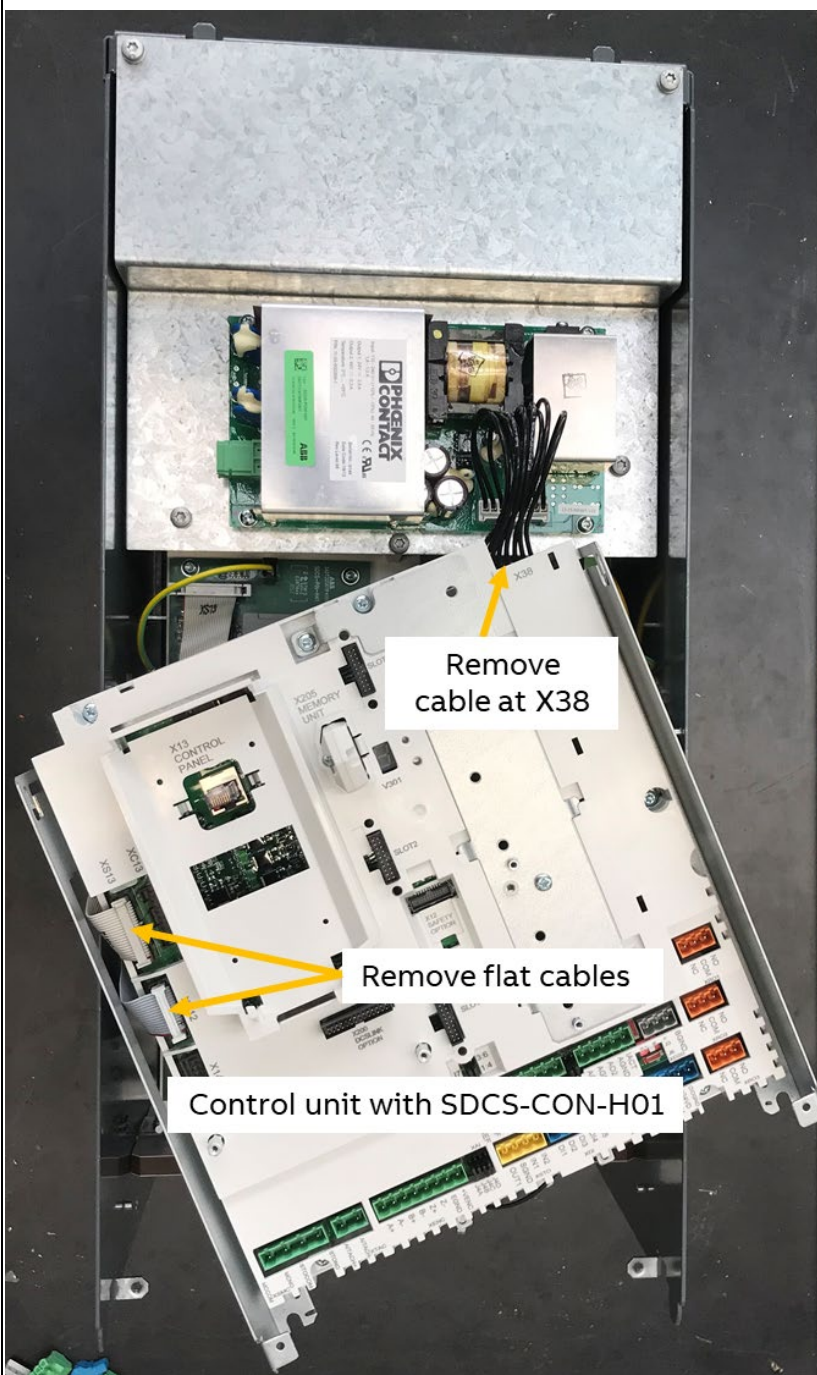
2. Disconnect all I/O plugs from the electronic unit.
3. Disconnect all connections from present plug in options.



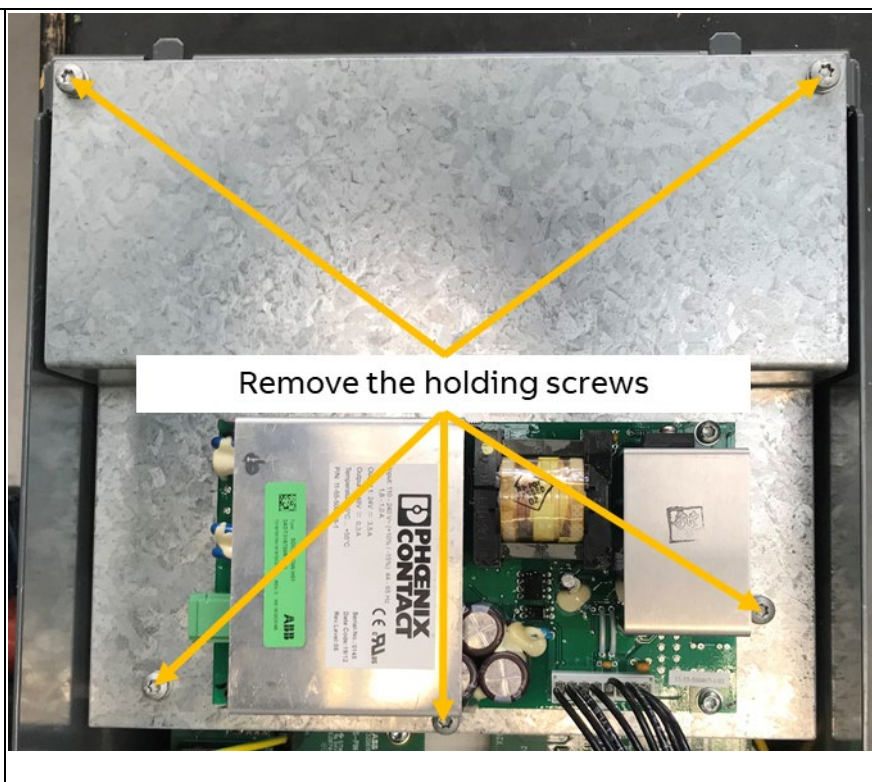
4. Remove the grounding/holding screws from the electronic unit.



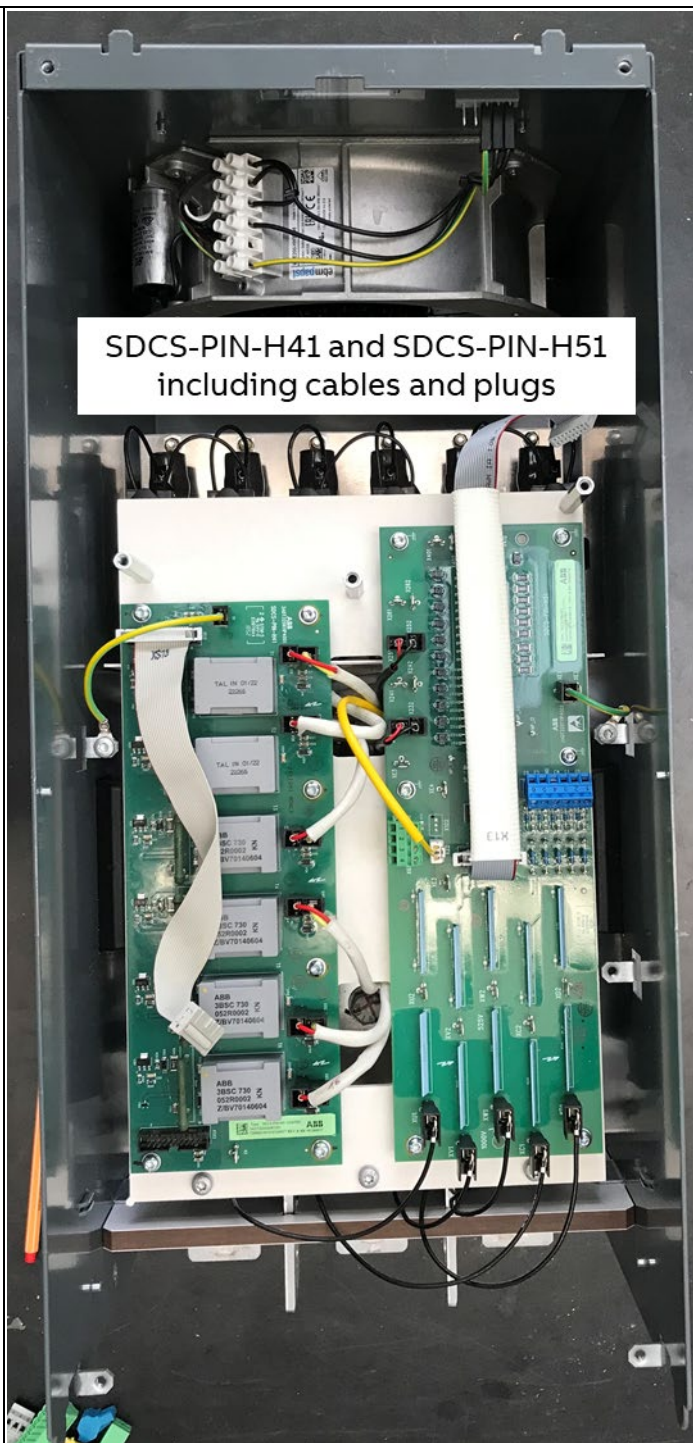
5. To unhinge the electronic unit pull it up and then out.
6. Before removing the electronic unit completely unplug the flat cables (XC12, XS13) and the cable connected at X38.
7. Remove the electronic unit completely.



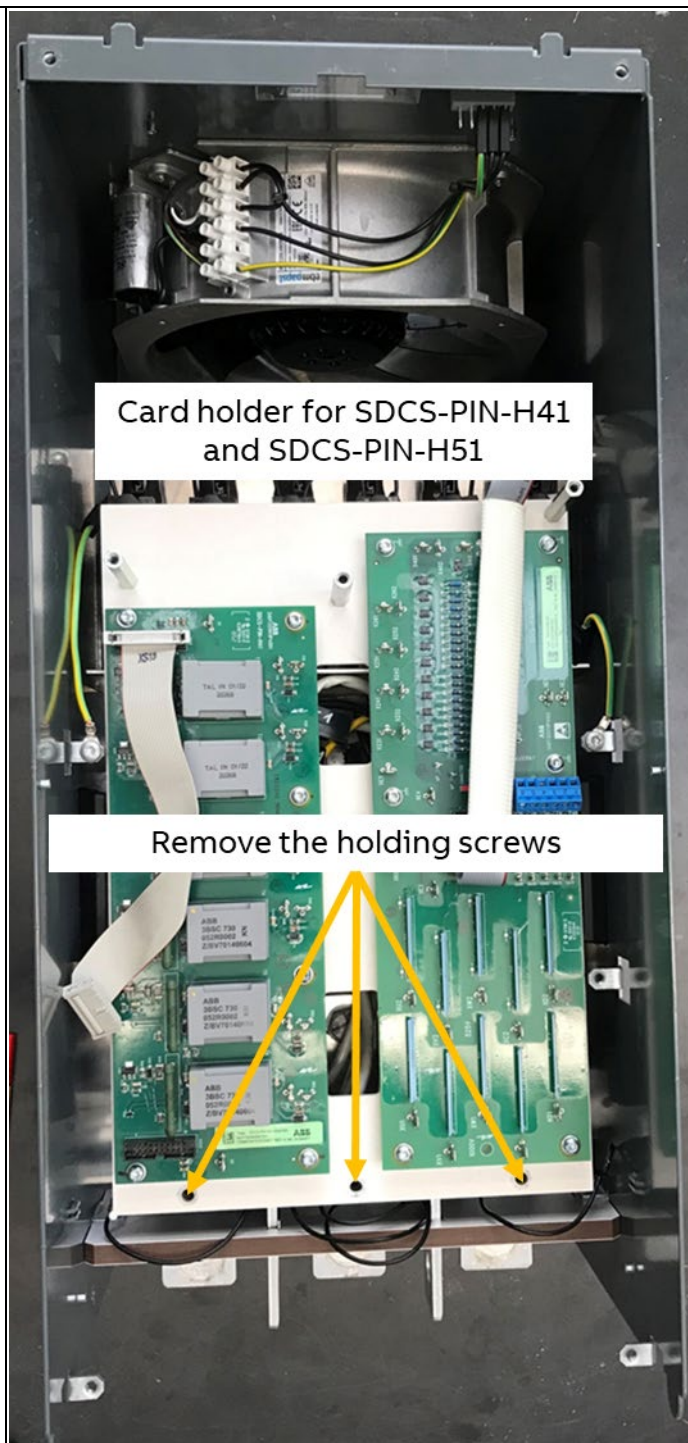
8. Remove the metal sheet containing the power supply.



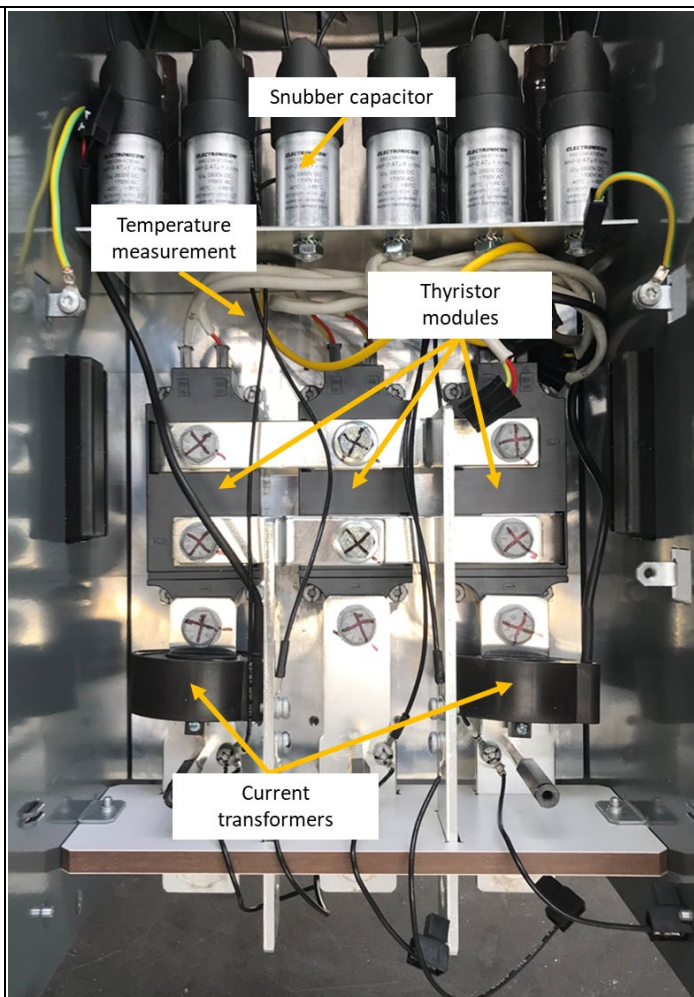
9. Remove all cables and plugs at the SDCS-PIN-H41:
 - X1G ... X6G gate leads.
 - X1 ground.
10. Remove all cables and plugs at the SDCS-PIN-H51:
 - X1E ground.
 - XC1 and XD1 DC voltage measurement.
 - XU1, XV1, XW1 mains voltage measurement.
 - X22 temperature sensor.
 - X231 and X251 current transformers.



11. Remove the card holder containing the SDCS-PIN-H41 and the SDCS-PIN-H51.



12. The result looks like this.



13. Remove the gate leads from the faulty thyristor module and mark the connectors clearly.

14. Remove the busbars necessary to get full access to the faulty thyristor module.

15. If a current transformer must be removed, mark its position, direction and the connections clearly.

Note:

Remove only as many parts as needed around the faulty thyristor module.

16. Remove the faulty thyristor module and mark it clearly as defective.

Install new thyristor modules

1. Ensure that the new thyristor module is of the correct type.
2. Remove old heat-conducting compound (grease) from the heat sink. Clean the mounting surfaces (heat sink and thyristor module) with an appropriate solvent (e.g. ethanol) by means of tissue paper. When the heat sink is clean, spread out the heat-conducting compound with a rubber spatula or by hand.

3. Apply a **thin** layer of heat-conducting compound to the new thyristor module.



4. Spread the heat-conducting compound evenly by moving the thyristor module forward and backward on the heat sink.
5. Tighten all clamping screws by hand until the screw heads touch the bottom of the thyristor module. Then pre-torque the screws to 2.0 Nm.

Note:

If the thyristor module is mounted by means of four screws, tighten the screws crosswise.

6. Tighten the screws to nominal torque according to table Nominal mounting torque for thyristor modules.

Thyristor modules		Nominal mounting torque	
Size (width)	Type	Electrical connections	Thyristor module to heat sink
60 mm block	MT3	10.8 ... 13.2 Nm	5.1 ... 6.9 Nm

7. Reinstall the current transformer. Make sure, its position and direction is correct.
8. Reinstall the busbars. Make sure, the correct torque is applied according to table above.
9. Reconnect all gate leads to the thyristor module.
10. Perform an OHM test to make sure the thyristor is ok.
11. Reconnect all cables and plugs at the SDCS-PIN-H51:
 - X1E ground.
 - XC1 and XD1 DC voltage measurement.
 - XU1, XV1, XW1 mains voltage measurement.
 - X22 temperature sensor.
12. Reconnect all cables and plugs at the SDCS-PIN-H41:
 - X1G ... X6G gate leads.
 - X1 ground.
13. Reinstall the card holder containing the SDCS-PIN-H41 and the SDCS-PIN-H51.
14. Reinstall the metal sheet containing the power supply.
15. At the SDCS-CON-H01 reconnect the flat cables (XC12, XS13), the cable connected at X38 and re-hinge the electronic unit.
16. Reconnect the grounding/holding screws at the electronic unit.
17. Reconnect all I/O plugs at the electronic unit and all connections at the present plug in options.
18. Reinstall the design cover and the control panel.

Commissioning

For H4T units follow the standard commissioning procedures.

DCS Family



DCS550-S modules The compact drive for machinery application

20 ... 1,000 A_{DC}
0 ... 610 V_{DC}
230 ... 525 V_{AC}
IP00

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



DCS880 modules For safe productivity

20 ... 5,200 A_{DC}
0 ... 1,500 V_{DC}
230 ... 1,200 V_{AC}
IP00

- Safe torque off (STO) built in as standard
- Compact and robust
- Single drives, 20 A_{DC} to 5,200 A_{DC}, up to 1,500 V_{DC}
- 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_{DC}
0 ... 1,500 V_{DC}
230 ... 1,200 V_{AC}
IP21 – IP54

- Suitable for motoric and non motoric applications (e.g. electrolysis & hydrogen production)
- 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_{DC}, 1,500 V_{DC}
- In accordance to usual standards
- Individually factory load tested
- Detailed documentation



DCT880 modules Thyristor power controller

20 ... 4,200 A_{AC}
110 ... 990 V_{AC}
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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