TECHNICAL NOTE

DCT880 Hardware hint

T6 New Control Design

Contents

PREPARED		STATUS	SECURITY LEVEL		
2024/01/10	Christian Barten	Approved	Public		
APPROVED		DOCUMENT KIND			
2024/01/10	Falk Scheinhardt	Change note			
OWNING ORGANIZATION		DOCUMENT ID.	REV.	LANG.	PAGE
MO-DCP		3ADW000845R0101	A	en	1/14

1. Introduction

This document describes the changes of the new hardware and control design for DCT880 frame size T6 introduced in Q1 2024. The changes regarding the control design, hardware, dimensions as well as the changes in commissioning and installation will be explained in the following chapters. The main changes are affecting the PCB and spare parts of the T6 frame size.

2. Summary

DCT880 unit size T6 have been equipped with a new control design indicated for T6 within the ending of the type code **X0**:

DCT880-W0x-1300/1750-0bX0 *

The new module design is equipped with the following PCB boards:

2x **SDCS-PIN-H51**
1x **SDCS-PIN-H41**
1x **SDCS-CMI-H02**
1x **SDCS-CON-H01 or SDCS-CON-H01L**
1x **SDCS-POW-H01**

Auxiliary supply rating changed from 24V DC (for size T6 DCT880-W0b-xxxx-ddXS) to **230V AC/115V AC** (for size T6 DCT880-W0b-xxx-ddX0) due to the replacement of SDCS-PIN-H11A on frame size T6 by the above-mentioned PCB-boards (**SDCS-POW-H01**).

Dimensions changed from:

Old design …-XS/XT	**New design …-X0**
1200 x 468 x 431/ H x B x D in mm	1200 x 468 x **432** / H x B x D in mm

For the new T6 design the type code setting is valid. The description can be found in the chapter – Type code setting.

Note*: W0x describes the leg configuration (x can be 2 or 3 – W02 or W03) and 0b indicates the rated AC voltage for T6 can be 04 = 415V_{AC}, 05 = 525V_{AC}, 07 = 690V_{AC} and 08 = 800V_{AC}. For further information check chapter Type code description.

3. Change description

Due to the replacement of the SDCS-PIN-H11A the external voltage measurement is done via the SDCS-PIN-H51 boards. Board A42 is used to measure the input voltages U1, V1, W1 and N1 and board A43 is used for the output voltage measurement U2, V2, W2 and N2 (see connection diagram on page Connection diagrams – new T6 design). The neutral connection points are available on the site of the module (see section Hardware changes).

The current measurement via CTs is rooted via the SDCS-CMI-H02 board to the SDCS-PIN-H51 board A43 connector X65. For further information please check the chapter Hardware changes.

This document describes the adaptions and the concerned units:

New design	Old design
DCT880-W02-1300-04X0	DCT880-W02-1300-04XS
DCT880-W02-1300-05X0	DCT880-W02-1300-05XS
DCT880-W02-1300-07X0	DCT880-W02-1300-07XS
DCT880-W02-1300-08X0	
DCT880-W03-1300-04X0	DCT880-W03-1300-04XS
DCT880-W03-1300-05X0	DCT880-W03-1300-05XS
DCT880-W03-1300-07X0	DCT880-W03-1300-07XS
DCT880-W03-1300-08X0	
DCT880-W02-1750-04X0	DCT880-W02-1750-04XS
DCT880-W02-1750-05X0	DCT880-W02-1750-05XS
DCT880-W02-1750-07X0	DCT880-W02-1750-07XS
DCT880-W02-1750-08X0	
DCT880-W03-1750-04X0	DCT880-W03-1750-04XS
DCT880-W03-1750-05X0	DCT880-W03-1750-05XS
DCT880-W03-1750-07X0	DCT880-W03-1750-07XS
DCT880-W03-1750-08X0	

The type code for the new design T6 is available from firmware version DCTF1x3.00.2. and newer. The type code settings for the both designs (**DCT880-aab-cccc-ddef**) is described in a later chapter.

3.1. Type code description

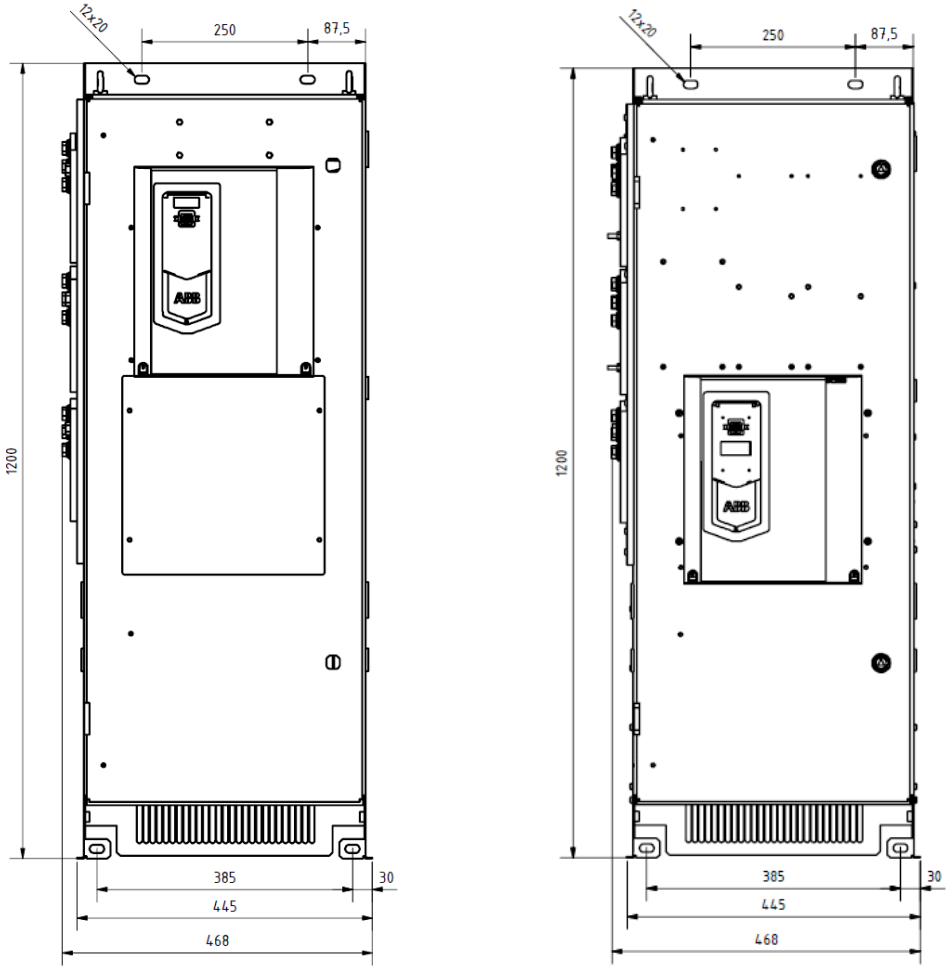
The thyristor power controller´s type code: **DCT880-aab-cccc-ddef**			
Product family	DCT880		
Product type:	aa	= W0	Standard
Power part type:	b	= 2	Two-leg anti-parallel circuit
		= 3	Three-leg anti-parallel circuit
Unit type:	cccc	=	Rated AC current (RMS) per leg
Rated AC voltage:	dd	= 04	110 V_{AC} … 415 V_{AC}/400 V_{AC} (UL)
		= 05	110 V_{AC} … 525 V_{AC} (IEC)/(UL)
		= 07	315 V_{AC} … 690 V_{AC}/600 V_{AC} (UL)
		= 08	360 V_{AC} … 800 V_{AC}
		= 10	450 V_{AC} … 990 V_{AC}
Power connection	e	= X	Standard
Revision code	f	= 0	T1…T5: With SDCS-PIN-H11
		= 0	**T6: equipped with SDCS-PIN-H51, SDCS-PIN-H41 and SDCS-POW-H01**
		= A	With SDCS-PIN-H11A
		= B	**T5: New cooling fan R2E250-RE04-10**
		= S	**T6: Special design**
		= T	**T6: Special design and new cooling fan R2E250-RE04-10**
		= 0	T1…T5: With SDCS-PIN-H11

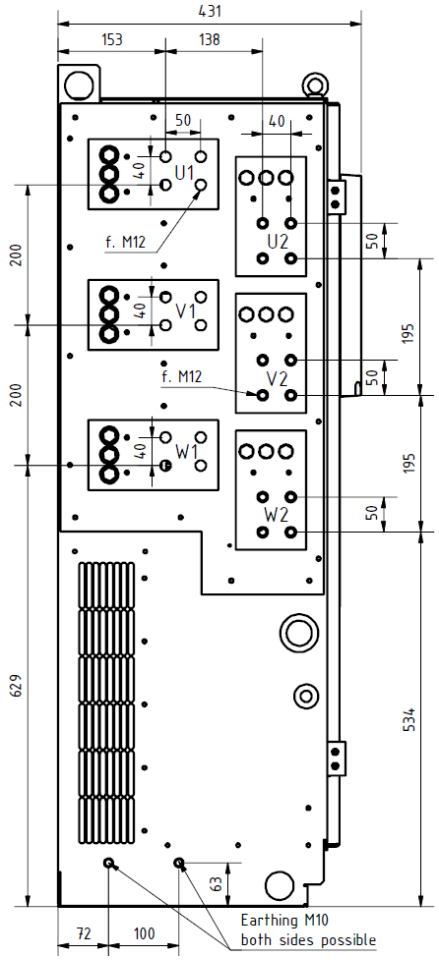
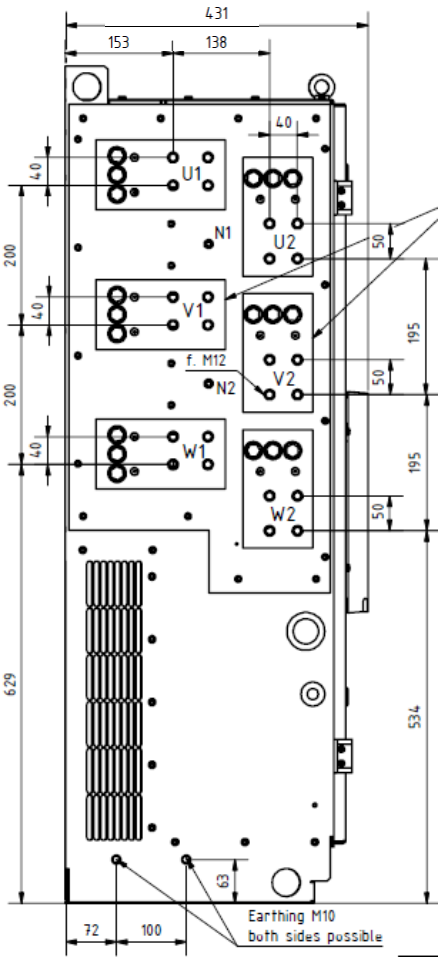
3.2. Hardware changes

This chapter describes the hardware changes. The following PCB-boards have been replaced/exchanged.

The following sections will describe the old and the new hardware configuration of the DCT880 T6.

T6 old design: DCT880-W0x-cccc-dd-**XS/XT**	T6 new design: DCT880-W0x-cccc-dd-**X0**
Changed PCBs	
SDCS-CON-H01/H01L	SDCS-CON-H01/H01L
SDCS-PIN-H11A	**SDCS-POW-H01**
SDCS-REB-H11	**2x SDCS-PIN-H51**
SDCS-PIN-46	**SDCS-PIN-H41**
SDCS-CMI-H02	**SDCS-CMI-H02**
Summary: Only Control Board – SDCS-CON-H01 remains	
Changed hardware Layout	



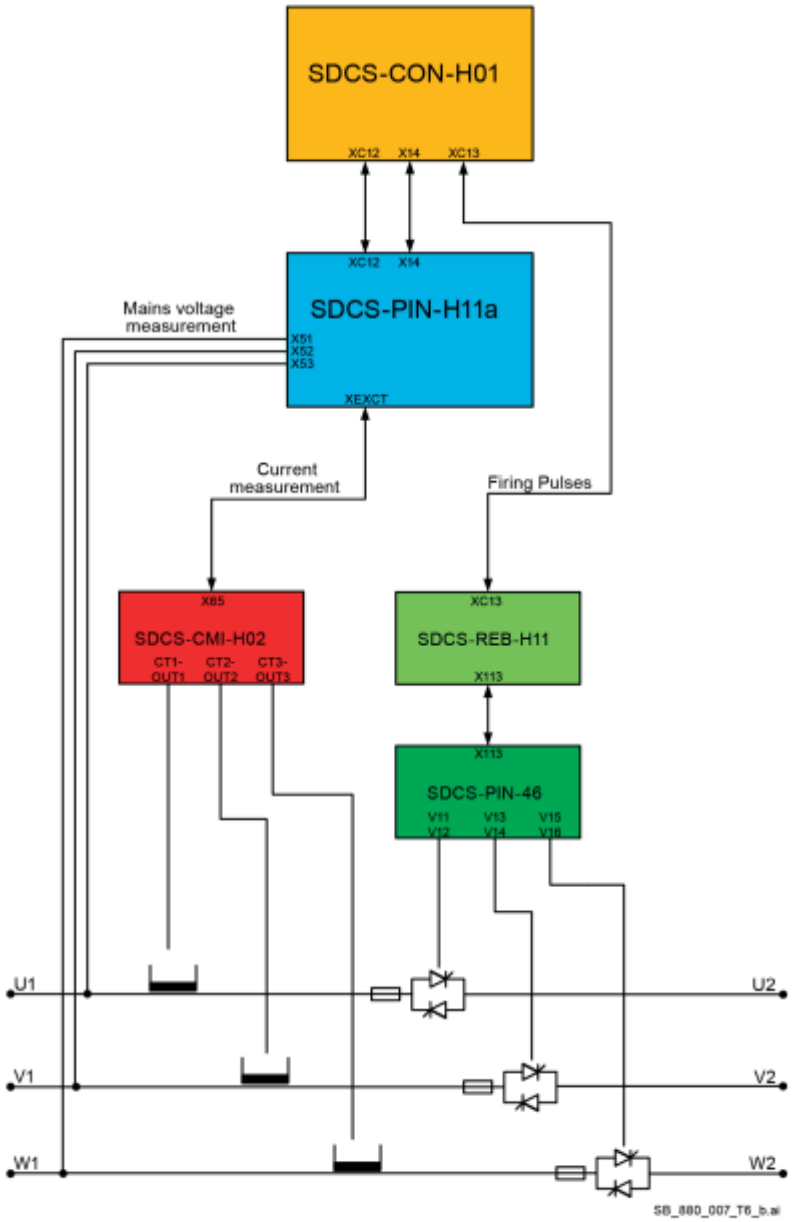
T6 old design: DCT880-W0x-cccc-dd-**XS/XT**	T6 new design: DCT880-W0x-cccc-dd-**X0**
	
	• Door design changes – Control Unit is lower

4. Connection diagrams

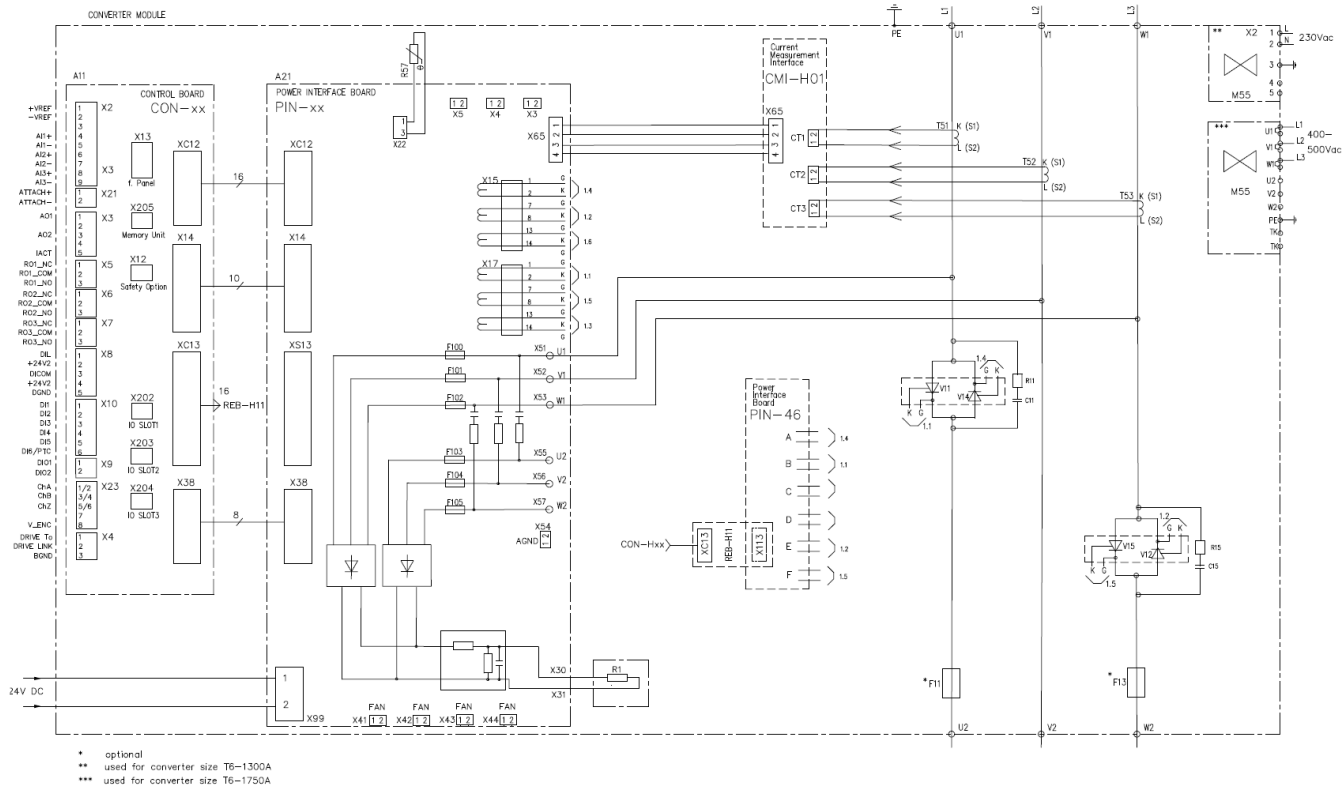
4.1. Old design -XS/XT

DCT880-W0x-cccc-dd-**XS/XT**:

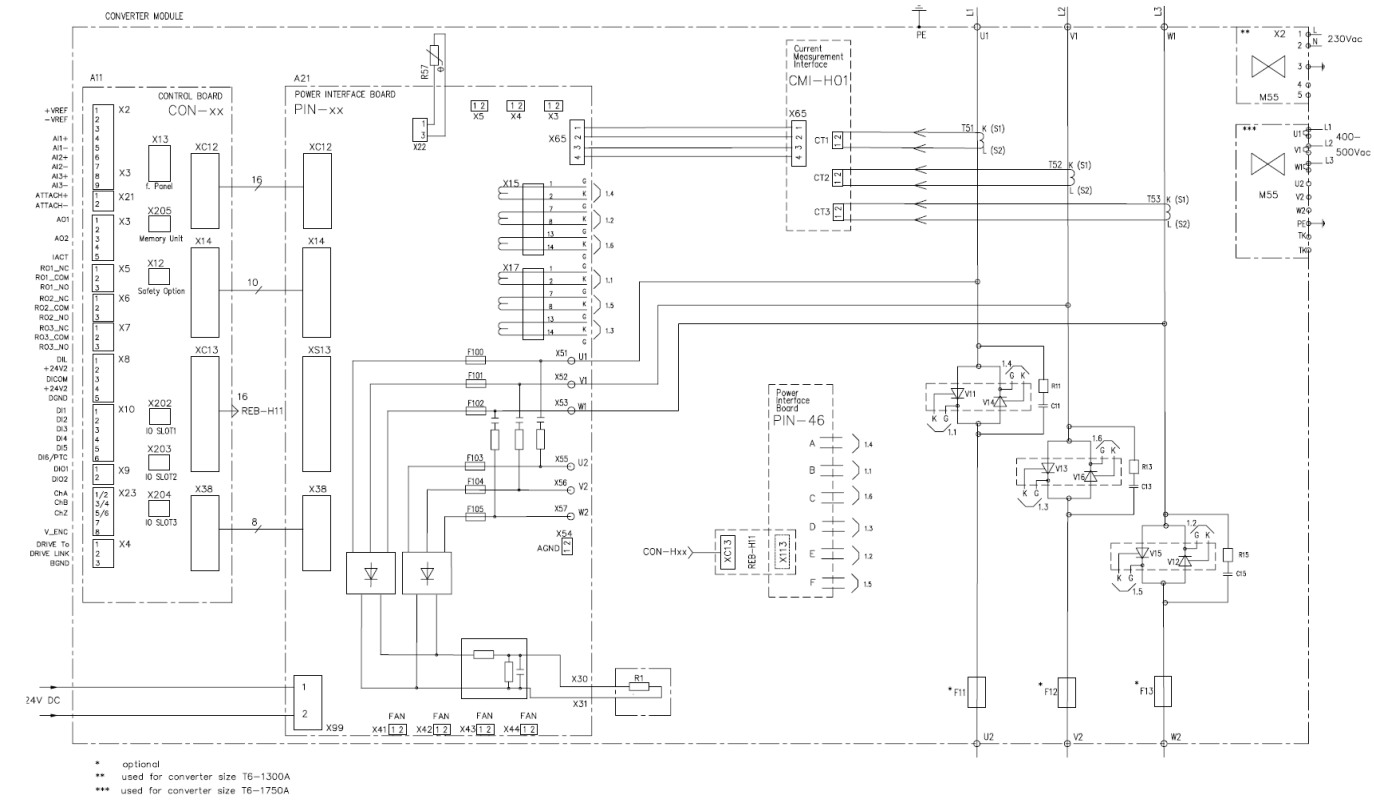
- SDCS-CON-H01.
- SDCS-PIN-H11a.
- SDCS-CMI-H02.
- SDCS-REB-H11.
- SDCS-PIN-46.



DCT880-W02-1300/1750-04/05/07**XS/XT** circuit diagram:

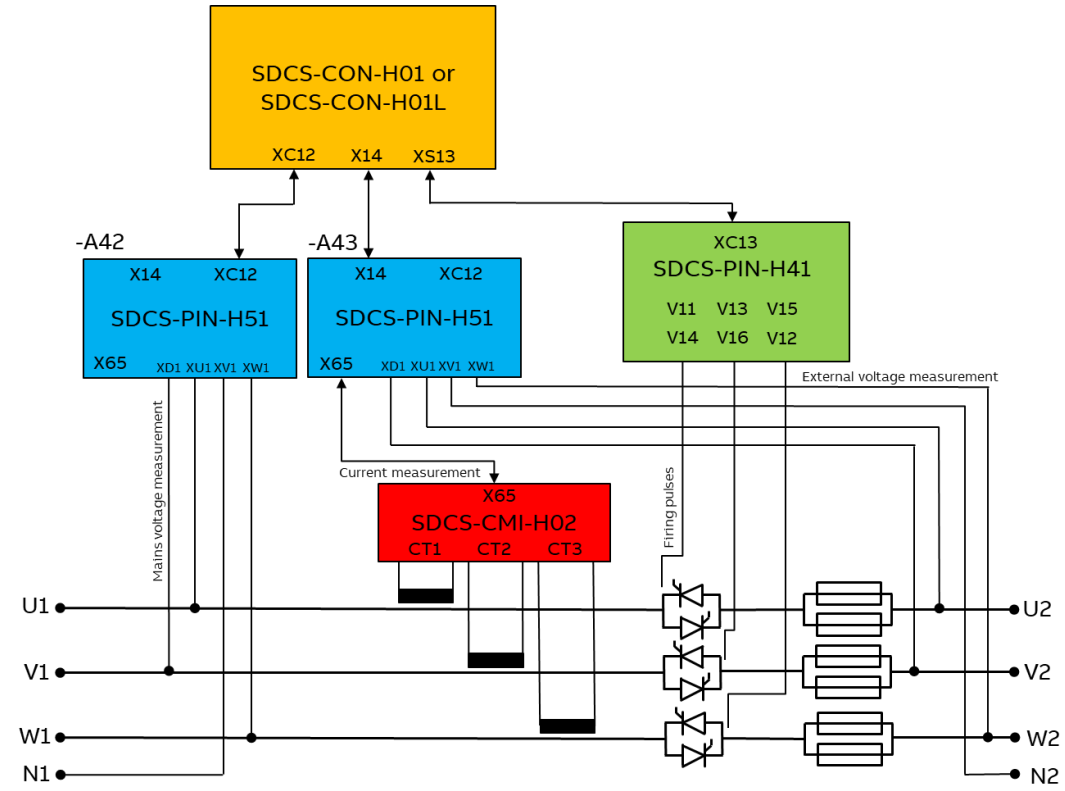


DCT880-W03-1300/1750-04/05/07**XS/XT** circuit diagram:

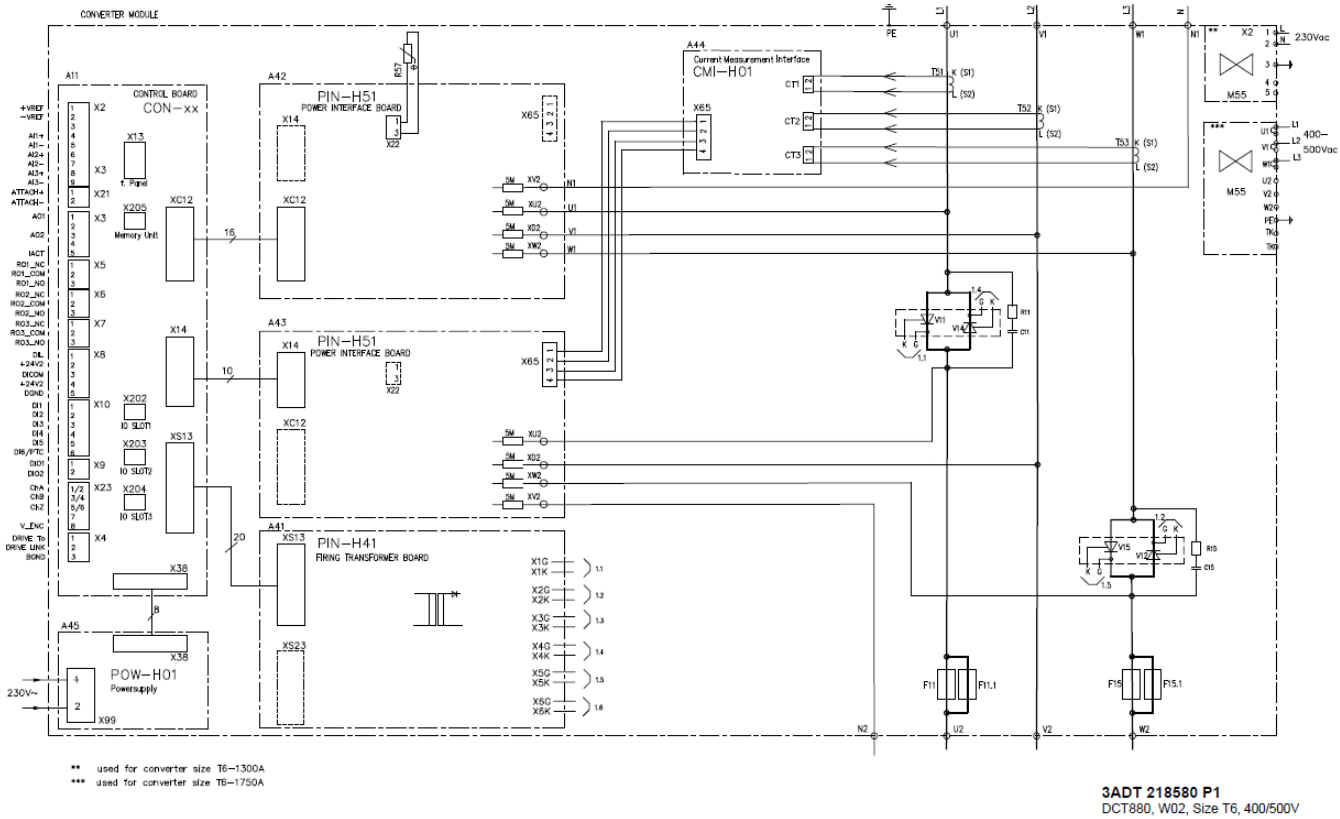


4.2. New design -X0

DCT880-W0x-cccc-dd-**X0:**

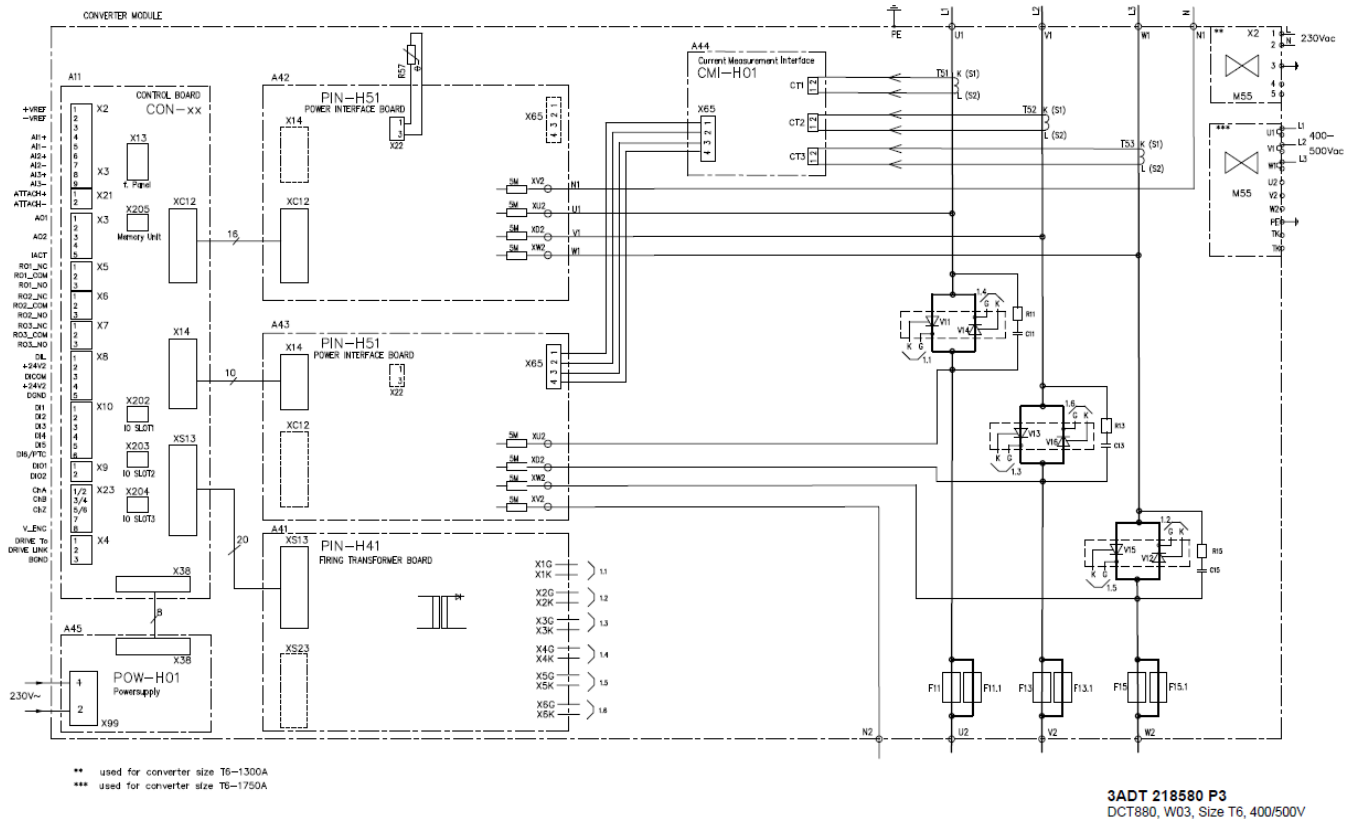


4.2.1. DCT880-W02-1300/1750-04/05X0 circuit diagram



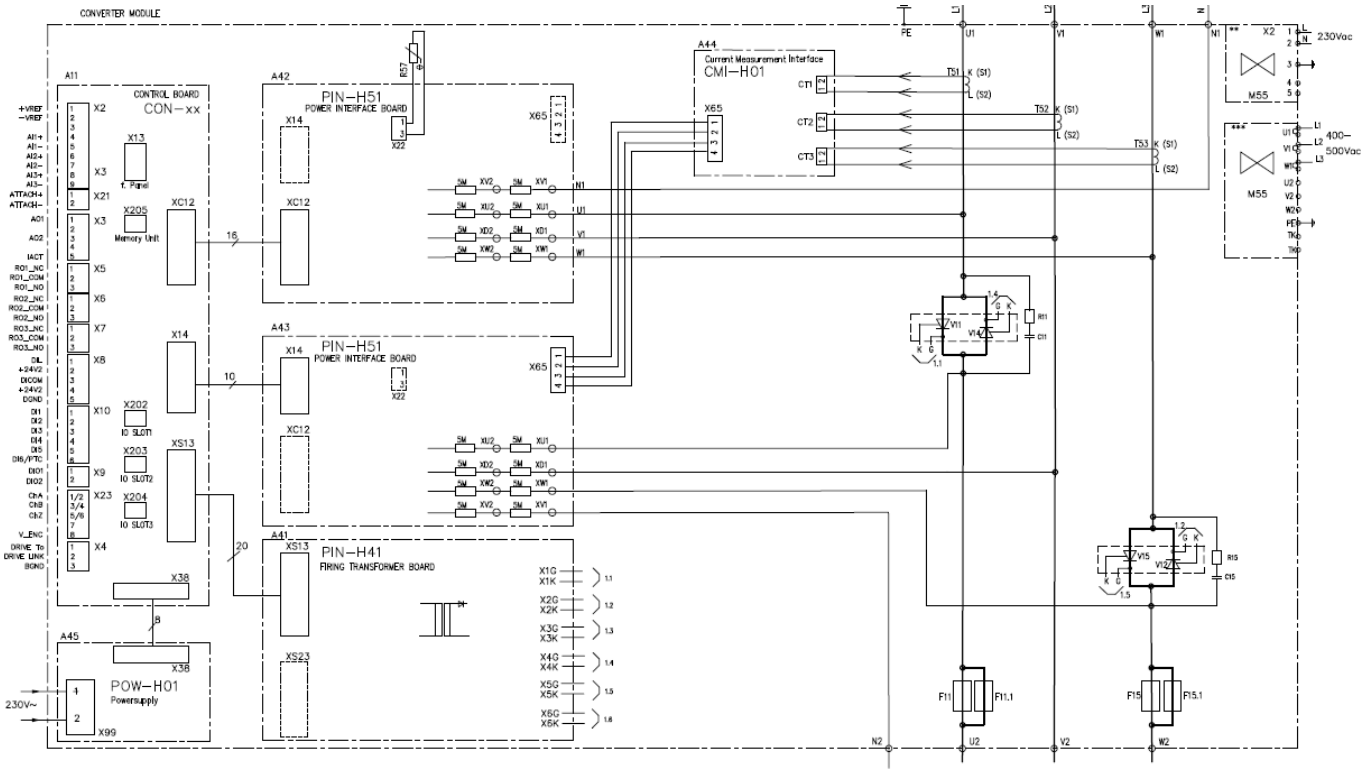
3ADT 218580 P1
DCT880, W02, Size T6, 400/500V

4.2.2. DCT880-W03-1300/1750-04/05X0 circuit diagram



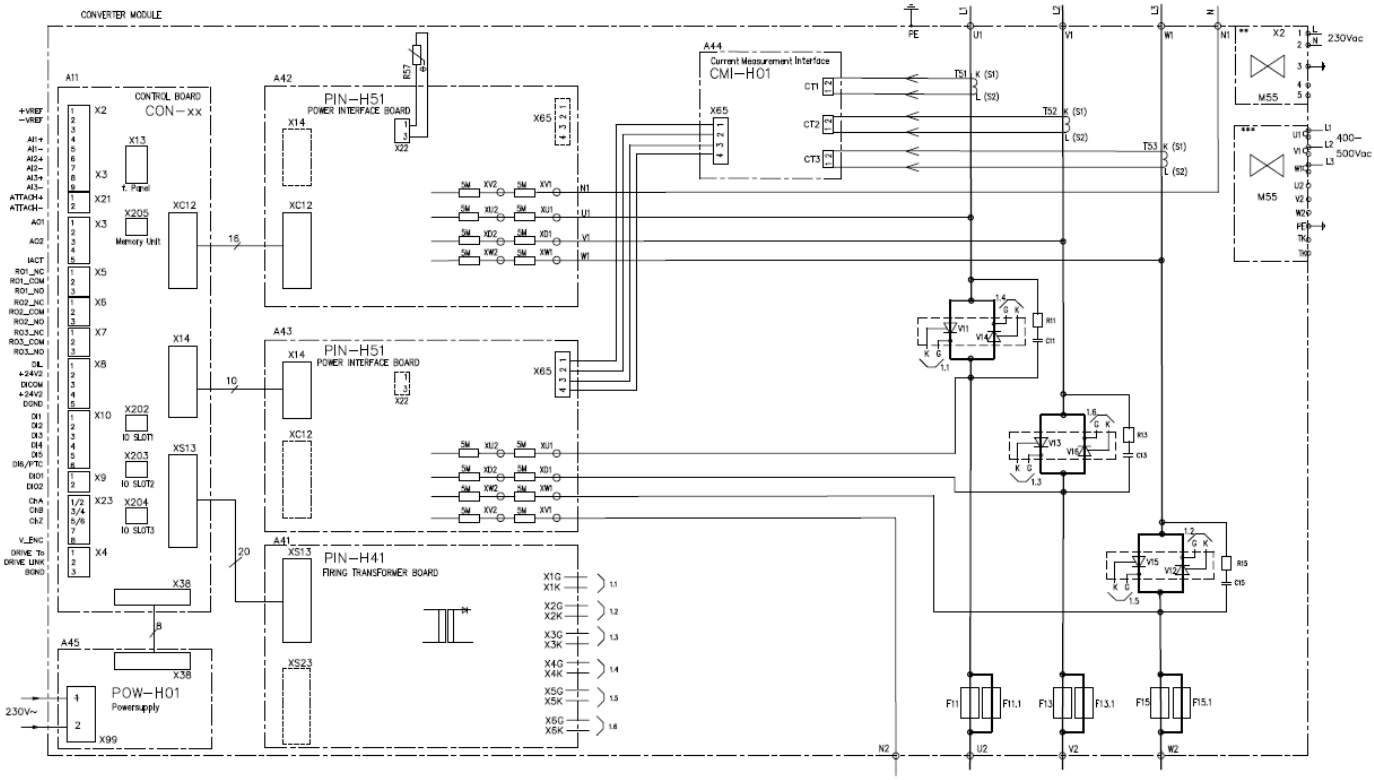
3ADT 218580 P3
DCT880, W03, Size T6, 400/500V

4.2.3. DCT880-W02-1300/1750-07X0 circuit diagram



3ADT 218580 P2
DCT880, W02, Size T6, 690V

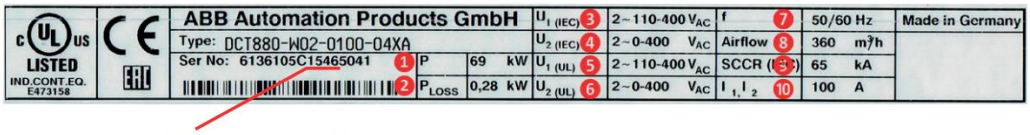
4.2.4. DCT880-W03-1300/1750-07X0 circuit diagram



3ADT 218580 P4
DCT880, W03, Size T6, 690V

5. Type code setting

The type code can be found on name plate of the DCT880:



Production year 2015 and week 46

1: Rated power
2: Losses
3: Rated input voltage for IEC
4: Rated output voltage for IEC
5: Rated input voltage for UL
6: Rated output voltage for UL
7: Mains frequency
8: Airflow
9: **S**hort **C**ircuit **C**urrent **R**ating
10: Rated input/output current

The type code settings in the DCT880 firmware is dependent on the control design. The differences between the PCB boards require different settings. The following chapter describes the settings in the firmware for each control design of the T6 frame size accordingly.

5.1. Design T6 DCT880-W0x-cccc-dd-**XS/XT**

T6 **old** design:
DCT880-W0x-cccc-dd-**XS/XT**

For the SDCS-PIN-H11 design solution, no type code is available. In case the type code of the DCT880 T6 frame size ends with -**XS** or -**XT**, the following settings are required.

Set Unit legs according to type code -W0x-:
→ [95.17] Set: Unit legs = 2 legs if -W02-
→ [95.17] Set: Unit legs = 3 legs if -W03-

95. HW configuration						
17	Set: Unit legs	**2 Legs**	NoUnit			**Automatic**

Set the Unit output scaling for all T6 sizes (independent if 1300A or 1750A device) to 2500A:

95. HW configuration						
18	Set: Unit output current scaling	**2500**	A	0	30000	**0**

To finish the settings, set the maximum power part temperature to 47°C:

95. HW configuration						
20	Set: Unit max power part temp	**47**	°C	0	150	**0**

5.2. Design T6 DCT880-W0x-cccc-dd-**X0**

T6 **new** design:
DCT880-W0x-cccc-dd-**X0**

For the new design solution, a type code setting is available.

To set the type code for a DCT880 T6 frame size set parameter [99.07] Service Mode = Set Type code.

99. Basic Settings				
7	Service Mode	**Set Type Code**	No Unit	**Normal operation**

Select with parameter [95.16] Set: Unit type code accordingly to the device type code.

95. HW configuration						
16	Set: Unit type code	**W03-1300-05**	No Unit			**W00-0000-00**
17	Set: Unit legs		No Unit			Automatic
18	Set: Unit output current sc…		A	0	30000	0
19	Set: Unit input voltage scal…		V	0,0	3250,0	0,0
20	Set: Unit max power part t…		°C	0	150	0
26	Stack configuration		No Unit			CD1
30	**PLL input deviation**		°	**-180,00**	**180,00**	0,00
31	**PLL output, internal mai…**		**Hz**	**0,00**	**100,00**	0,00
34	PLL offset synchronization…		°	-60,00	60,00	0,00
35	PLL deviation level		°	5,00	20,00	10,00
36	PLL proportional gain		No Unit	0,01	2,00	0,50
37	PLL filter time		ms	0,0	500,0	0,0
38	PLL Uk compensation		%	0,0	15,0	0,0
50	PLL sync mode		No Unit			1

W03-1300-04
W03-1300-05
W03-1300-07
W03-1300-08
W03-1750-04
W03-1750-05
W03-1750-07
W03-1750-08
W02-1300-04
W02-1300-05
W02-1300-07
W02-1300-08
W02-1750-04
W02-1750-05
W02-1750-07
W02-1750-08

To finish the type code setting, reset parameter [99.07] Service mode = Normal operation.

99. Basic Settings						
7	Service Mode	Normal operati	No Unit			Normal operation
8	External Current T	Normal operation	A	0,0	30000,0	0,0

6. Additional Information

6.1. Listing of related documents

Ref #	Document Kind, Title	Document No.
1	DCT880 T6 New cooling fan R2E250-RE04-10	3ADW000782R0101
2	DCT880 Manual	3ADW000431R0101

7. Revisions

Rev.	Page (P) Chapt. (C)	Description	Date Dept./Init.
A	-	First edition	MO-DCP 10.01.2024 Ch. B.