

DCT880

Quick guide

DCT880 Thyristor power controller (20 A bis 4160 A)



Safety Instructions

Chapter overview

This chapter contains the safety instructions you must follow when installing, operating and servicing the thyristor power controller. If ignored, physical injury or death may follow, or damage may occur to the thyristor power controller or the connected 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 DCT880.

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 thyristor power controller, the cables or the connected equipment. 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 thyristor power controller!

- Never work on the thyristor power controller, the cables or the connected equipment when main power is applied. Always ensure by measuring with a multimeter (impedance at least 1 Mohm) that:
 1. Voltage between thyristor power controller input phases U1, V1, W1 and the frame is close to 0 V.
 2. Voltage between thyristor power controller output phases U2, V2, W2 and the frame is close to 0 V.
- Do not work on the control cables when power is applied to the thyristor power controller or to the external control circuits. Externally supplied control circuits may cause dangerous voltages inside the thyristor power controller even when the main power on the thyristor power controller is switched off.
- Do not make any insulation resistance or voltage withstand tests on the thyristor power controller.
- Isolate the cables to the equipment from the thyristor power controller when testing the insulation resistance or voltage withstand of the cables or the equipment.
- When reconnecting the cables to the equipment, always check that the U2, V2 and W2 cables are connected with the proper terminal.

Note:

- The output phase cable terminals on the thyristor power controller are at a dangerously high voltage when the main power is on.
- 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. XRO1 ... XRO3).
- DCT880 with enclosure extension: Before working on the thyristor power controller, isolate the whole thyristor power controller system from the supply.

Grounding

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



WARNING!

- Ground the thyristor power controller, the connected equipment and adjoining devices 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 thyristor power controller installation, connect each thyristor power controller 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 thyristor power controller 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. Touch the boards only when necessary. Use a grounding strip:

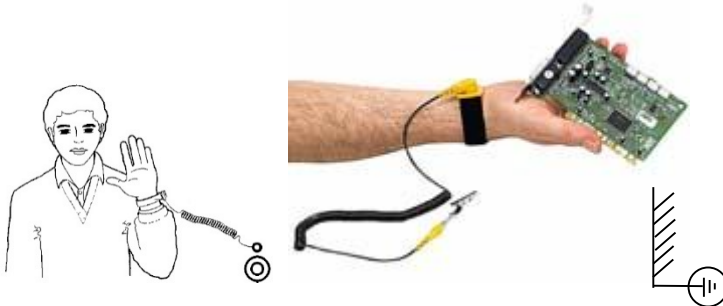


ABB order no.: 3ADV050035P0001

Mechanical installation

These notes are intended for all who install the thyristor power controller. Handle the unit carefully to avoid damage and injury.



WARNING!



- DCT880 sizes T4 and T5: The thyristor power controller is heavy. Do not lift it alone. Do not lift the unit by the front cover. Place units T4 and T5 only on its back.
- Make sure that dust from drilling does not enter the thyristor power controller when installing. Electrically conductive dust inside the unit may cause damage or lead to malfunction.
- Ensure sufficient cooling.
- Do not fasten the drive by riveting or welding.

Operation

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



WARNING!

- Before adjusting the thyristor power controller and putting it into service, make sure that all connected equipment is suitable for operation throughout the voltage/current range provided by the thyristor power controller.
- Do not control the connected equipment with the disconnecting device (disconnecting mains); instead, use the control panel keys  and  , or commands via the I/O board of the thyristor power controller.
- Mains connection
You can use a disconnect switch (with fuses) to disconnect the electrical components of the thyristor power controller 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 POWER OFF buttons must be installed at each control desk and at all other control panels requiring an emergency off function. Pressing the Stop button on the control panel of the thyristor power controller will not cause an emergency off by the thyristor power controller and it will not disconnect the thyristor power controller 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 via signals Run, Enable respectively from 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 thyristor power controller. To stop the thyristor power controller using the control panel, press the Loc/Rem key and then the Stop key .

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DCT880 Manuals and Tools

List of manuals

	Publication number	Language						
		E	D	I	ES	F	CN	RU
Quick Guide		x	p	p	p	p		
DCT880 Modules								
DCT880 Flyer	3ADW000429	x	x					
DCT880 Technical Catalog		p						
DCT880 Manual	3ADW000431	x						
ACS-AP-x assistant control panels user's manual	3AUA0000085685							
Option manuals and guides								
CDPI-01 communication adapter module	3AXD50000009929	x						
DPMP-01 mounting platform for ACS-AP control panel	3AUA0000100140	x						
DPMP-02 mounting platform for ACS-AP control panel	3AUA0000136205	x						
FCAN-01 CANopen adapter module	3AFE68615500	x						
FDNA-01 DeviceNet™ adapter module	3AFE68573360	x						
FECA-01 EtherCAT adapter module	3AUA0000068940	x						
FENA-01/-11/-21 Ethernet adapter module	3AUA0000093568	x						
FEPL-02 Ethernet POWERLINK adapter module	3AUA0000123527	x						
FPBA-01 PROFIBUS DP adapter module	3AFE68573271	x						
FSCA-01 RS-485 adapter module	3AUA0000109533	x						
Drive (IEC61131-3) application programming manual	3AUA0000127808	x						
Tool and maintenance manuals and guides								
Drive composer PC tool	3AUA0000094606	x						
NETA-21 remote monitoring tool	3AUA00000969391	x						
NETA-21 remote monitoring tool installation and startup guide	3AUA0000096881	x						
DCT880 Service Manual		p						
x -> existing p -> planned								
Status 08.2014								

DCT880 Manuals list e b.docx

DCT880

All information are available on the Internet by following links:

- DCT880 documentation



www.abb.com → Search for DCT880

Direct link: <http://www.abb.com/product/ap/seitp322/a6cbaa9b42b7b113c1257c6e0077ecec.aspx>

- ABB Drive composer entry PC tool for parameterization, commissioning and service



www.abb.com → Search for drive composer

Direct link: <http://www.abb.com/product/seitp322/48a055ea7aea0b2dc125794f0056382f.aspx>

Type code

The type code contains information on the specifications and configuration of the thyristor power controller:

The thyristor power controller's basic type code: DCT880-AAB-CCCC-DD-E			
Product family:	DCT880		
Type:	AA	= W0	Standard
Bridge type:	B	= 2	Two-leg anti-parallel circuit
		= 3	Three-leg anti-parallel circuit
Module type:	CCCC	=	Rated AC current (RMS)
Rated AC voltage:	DD	= 04	110 V _{AC} ... 400 V _{AC}
		= 05	110 V _{AC} ... 525 V _{AC}
		= 07	315 V _{AC} ... 690 V _{AC}
Revision code:	E	= 0	Standard

Precautions for using thyristor power controllers



WARNING!

Only a qualified electrician may carry out the work. Follow the [Safety Instructions](#) on the first pages of this manual. Ignoring the safety instructions can cause injury or death. Make sure that the thyristor power controller is disconnected from the mains (input power) during installation. If the thyristor power controller was already connected to the mains, wait for 5 min. after disconnecting mains power.

Environmental conditions

System connection		Environmental limit values	
Voltage, 3-phase:	110 ... 690 V acc. to IEC 60038	Permissible cooling air temperature	
Voltage deviation:	±10 % continuous; ±15 % short-time (0.5 to 30 cycles)	with rated AC current (forced	0 ... +40°C
		ventilation):	
Rated frequency:	50 Hz or 60 Hz	with different AC current see	+30 ... +55°C
Static frequency deviation:	50 Hz ±2 %; 60 Hz ±2 %	figure below:	
Dynamic frequency range:	50 Hz: ±5 Hz; 60 Hz: ±5 Hz	for options:	0 ... +40°C
df/dt:	17 % / s	Relative humidity (at +5 ... +40°C):	5 ... 95 %, no condensation
Degree of protection		Relative humidity (at 0 ... +5°C):	5 ... 50 %, no condensation
Thyristor power controllers	IP 00 (EN 60529)	Change of the ambient temperature	< 0.5°C / minute
and options (fuses, etc.):		Storage temperature:	-40 ... +55°C
Paint finish		Transport temperature:	-40 ... +70°C
Thyristor power controllers:	Dark grey RAL 7012	Pollution degree (IEC 60664-1, IEC	2
Installation category		60439-1, EN 60947-1):	
Power network:	installation category III up to 600 V	Vibration class:	3M3
	installation category II up to 690 V	Site elevation	
Auxiliary fan supply:	230 V _{AC} (only T4)	<1000 m above mean sea level:	100 %, no current reduction
Utilization categories		>1000 m above mean sea level:	current reduction, see figure
AC51:	non inductive or slightly inductive		below
	loads, resistance furnaces	Duty cycle:	uninterrupted duty / continuous
AC56a:	switching of transformers		operation
		Form designation:	form 4
EMC	EN60947-4-3 Emissions class A This product has been designed for environment A (Industrial). Use of this product in environment B (domestic, commercial and light industrial) may cause unwanted electromagnetic disturbances in which cases the user may be required to take adequate mitigation measures.		

Ratings

Current and power ratings

Current and Power ratings with 50 Hz and 60 Hz supplies see below. The current ratings are based on an ambient temperature of maximum 40°C and an elevation of maximum 1000 m above mean sea level.

Size	I [A] (RMS)	P _{out} [kW] ①	P _{out} [kW] ②	P _{loss} W03 [kW]	P _{loss} W02 [kW]	Air flow [m3/h]	Auxiliary voltage	Fan Voltage
T1	20	13	17	1.28	1.09	no fan	+24 V _{DC} , ±10 %	internal
	35	24	30	2.05	1.64			
	55	38	47	3.25	2.50	132		
	80	55	69	3.51	2.66			
	100	69	86	4.56	3.43			
	125	86	108	5.33	3.90			
T2	160	110	138	7.16	5.18			
	200	138	173	7.44	5.40			
	245	169	212	9.43	6.83			
T3	325	225	281	11.00	7.94			
	360	249	311	12.24	8.74			
	420	291	363	14.31	10.23	264		
T4	550	381	476	19.69	13.92	925	230V _{AC}	
	675	467	584	21.79	15.28			
	740	512	640	24.37	16.68	1860		

① Power ratings for a 3-phase load in star configuration at 400 V_{AC} (e.g. $\sqrt{3} \times 20 \text{ A} \times 400 \text{ V} / 1000 = 13 \text{ kW}$)

② Power ratings for a 3-phase load in star configuration at 500 V_{AC} (e.g. $\sqrt{3} \times 20 \text{ A} \times 500 \text{ V} / 1000 = 17 \text{ kW}$)

Installation and wiring

Installation

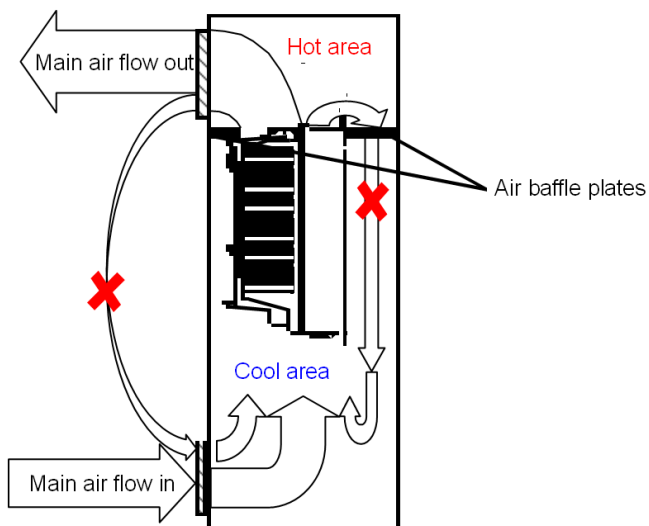
Dimensions and weights

See the dimensional drawings of the DCT880 below. The dimensions are in millimeters.

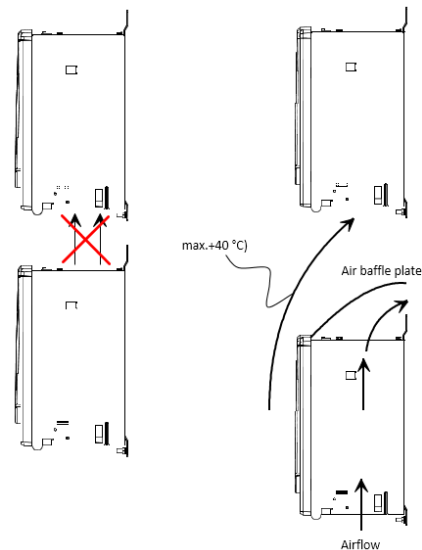
Size	Thyristor power controller	h × w × d (mounting holes h × w [mm])	weight [kg]	Distance parallel units [mm]	Top clearance [mm]	Bottom clearance [mm]
T1	DCT880-W0x-0020-04/05 DCT880-W0x-0035-04/05 DCT880-W0x-0055-04/05 DCT880-W0x-0080-04/05 DCT880-W0x-0100-04/05 DCT880-W0x-0125-04/05	370 × 270 × 215 (350 × 225)	11	10	150	100
T2	DCT880-W0x-0160-04/05 DCT880-W0x-0200-04/05 DCT880-W0x-0245-04/05	370 × 270 × 270 (350 × 225)	16	10	250	150
T3	DCT880-W0x-0325-04/05 DCT880-W0x-0360-04/05 DCT880-W0x-0420-04/05	466 × 270 × 315 (438,5 × 225)	25	10	250	150
T4	DCT880-W0x-0550-04/05 DCT880-W0x-0675-04/05 DCT880-W0x-0740-04/05	670 × 270 × 352 (625 × 225)	38	10	250	150

Preventing cooling air recirculation

Prevent air recirculation inside and outside the cabinet



Unit above another

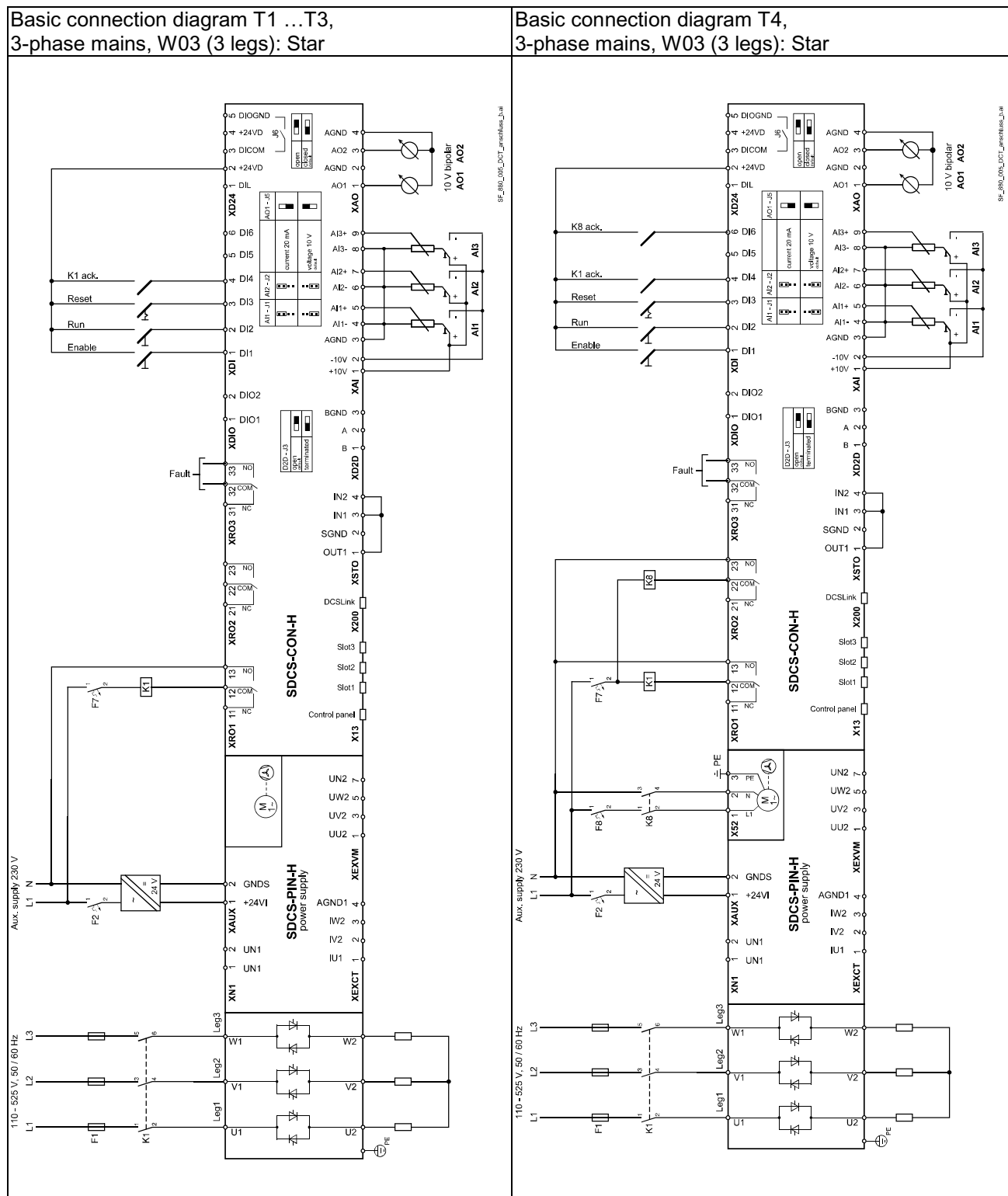


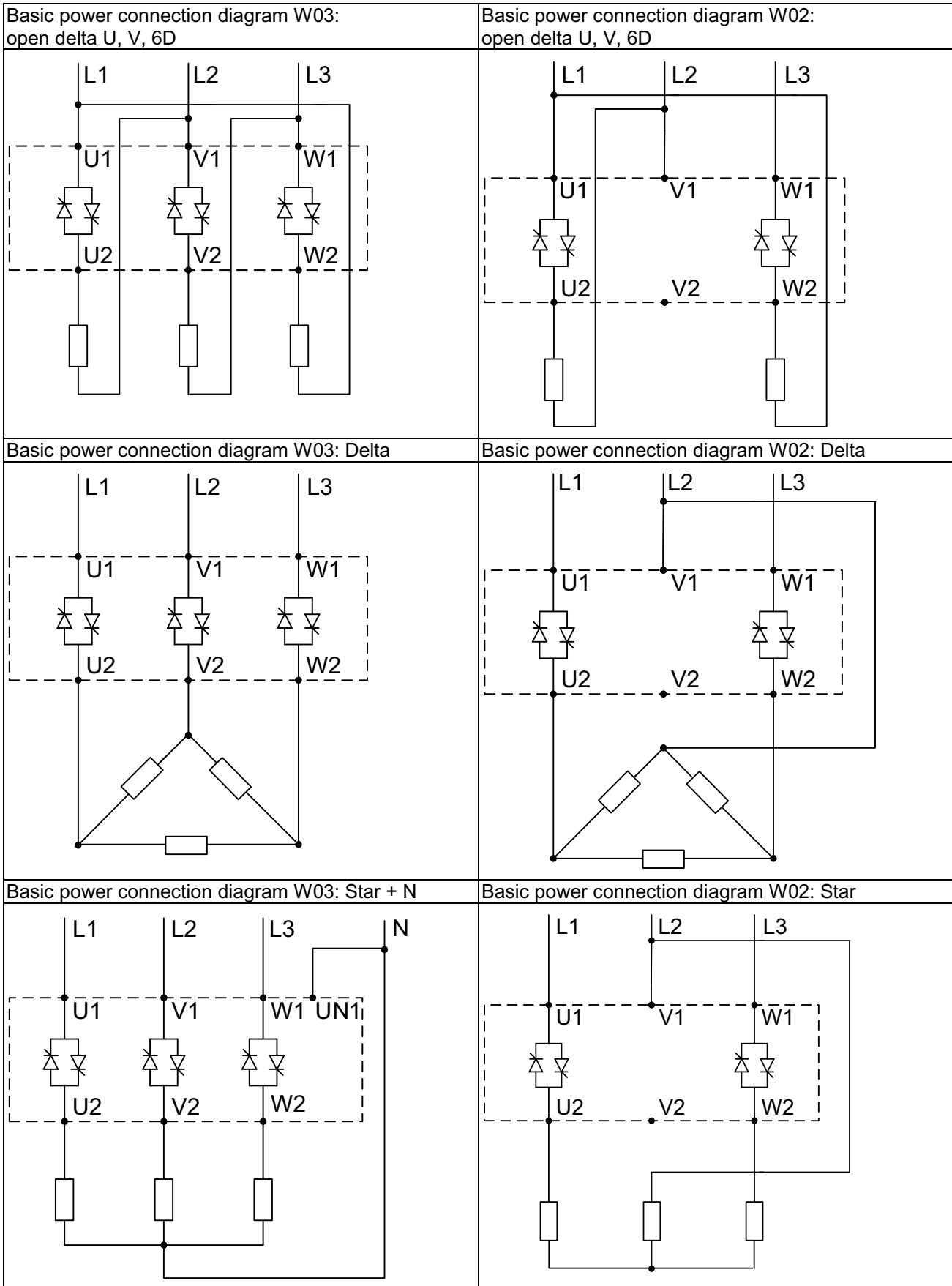
Lead the exhaust cooling air away from the unit above. Distances table above.

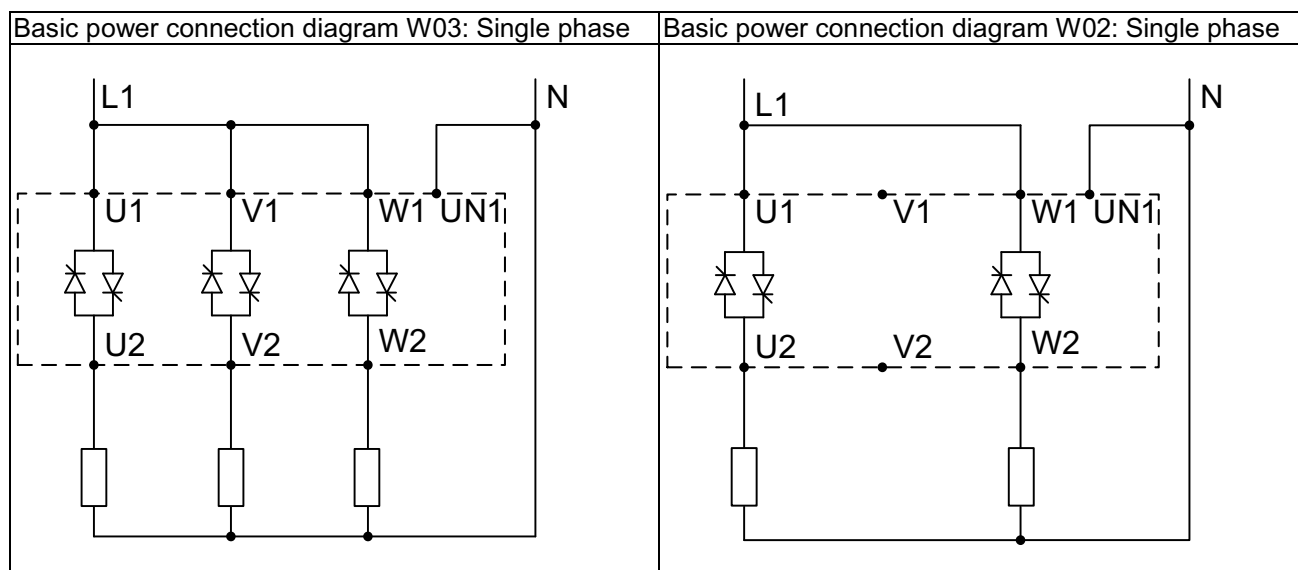
Wiring

This chapter contains the instructions that must be followed when selecting cables, protections, cable routing and way of operation of the thyristor power controller. Always follow local regulations. This chapter applies to all DCT880 thyristor power controllers.

Connection and wiring example for thyristor power controllers T1 ... T4:

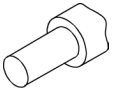
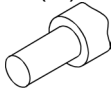






Cabling

U1, V1, W1 are the input power terminal. U2, V2, W2 are the output power terminal. PE is the terminal for protective earth.

Size	Thyristor power controller	U1, V1, W1 / U2, V2, W2			PE		
		Iv [A~]	1  [mm ²]	(2.)  [mm ²]			
T1	DCT880-W0x-0020-04/05	20	1 x 4	-	1x 4	1 x M6	6
	DCT880-W0x-0035-04/05	35	1 x 6	-	1x 6	1 x M6	6
	DCT880-W0x-0055-04/05	55	1 x 25	-	1x 16	1 x M6	6
	DCT880-W0x-0080-04/05	80	1 x 25	-	1x 16	1 x M6	6
	DCT880-W0x-0100-04/05	100	1 x 35	-	1x 16	1 x M6	6
	DCT880-W0x-0125-04/05	125	2 x 25	1 x 70	1x 25	1 x M6	6
T2	DCT880-W0x-0160-04/05	160	2 x 25	1 x 70	1x 25	1 x M10	25
	DCT880-W0x-0200-04/05	200	2 x 25	1 x 95	1x 25	1 x M10	25
	DCT880-W0x-0245-04/05	245	2 x 50	-	1x 50	1 x M10	25
T3	DCT880-W0x-0325-04/05	325	2 x 95	-	1x 50	1 x M10	25
	DCT880-W0x-0360-04/05	360	2 x 95	-	1x 50	1 x M10	25
	DCT880-W0x-0420-04/05	420	2 x 95	-	1x 50	1 x M10	25
T4	DCT880-W0x-0550-04/05	550	2 x 120	-	1x120	1 x M12	50
	DCT880-W0x-0675-04/05	875	2 x 150	-	1x150	1 x M12	50
	DCT880-W0x-0740-04/05	740	2 x 150	-	1x150	1 x M12	50

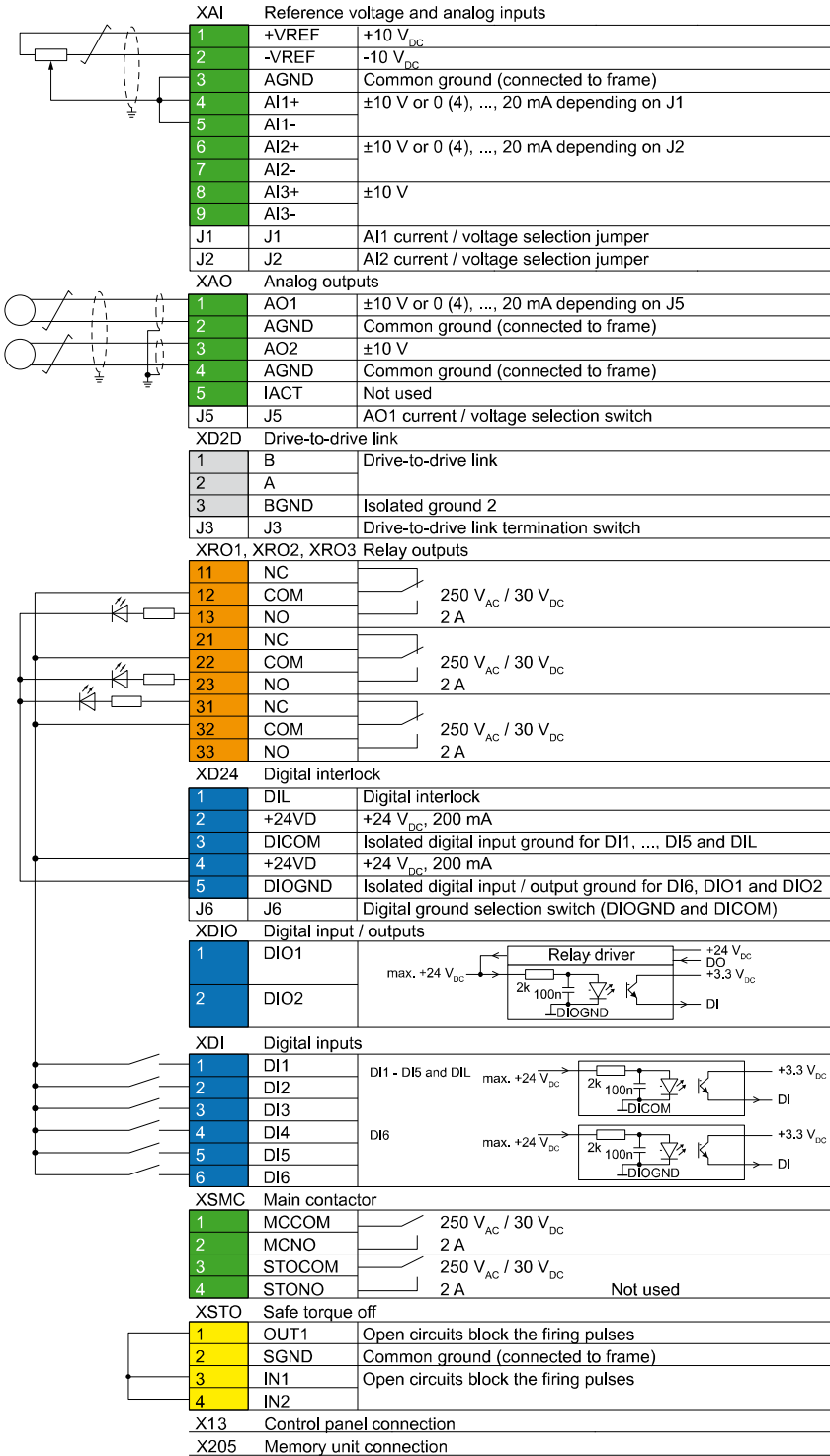
Control circuit terminals

The control circuit terminals are common for all module sizes T1 ... T4.

Control cables:

Wire sizes:	Tightening torques:
0.5 ... 2.5 mm ² (24 ... 12 AWG)	0.5 Nm (5 lbf-in) for both stranded and solid wiring

Control circuit terminal layout



SA_880_001_a.ai

Power interface terminals

The power interface terminals are common for all module sizes T1 ... T4.

Power interface cables:

Wire sizes:	Tightening torques:
0.5 ... 2.5 mm ² (24 ... 12 AWG)	0.5 Nm (5 lbf·in) for both stranded and solid wiring

Power interface circuit terminal layout

XAUX Auxiliary voltage input (X99)

1	+24VI	24 V _{DC} , 2.5 A *
2	GNDS	Common ground (connected to frame)

XN1 Mains voltage neutral (X54)

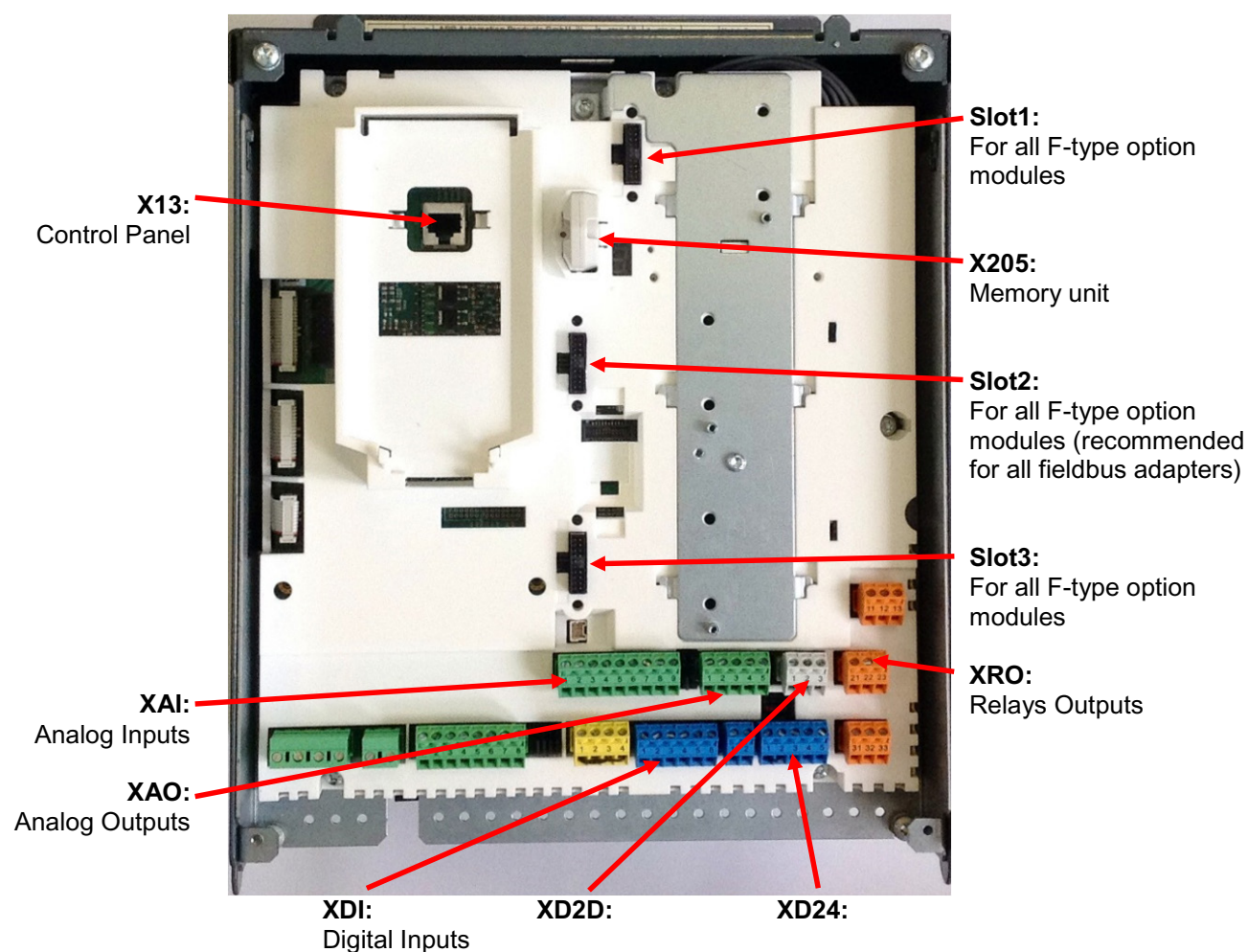
1	UN1	Neutral of mains (N1)
2	UN1	XN1:1 and XN1:2 are internally connected

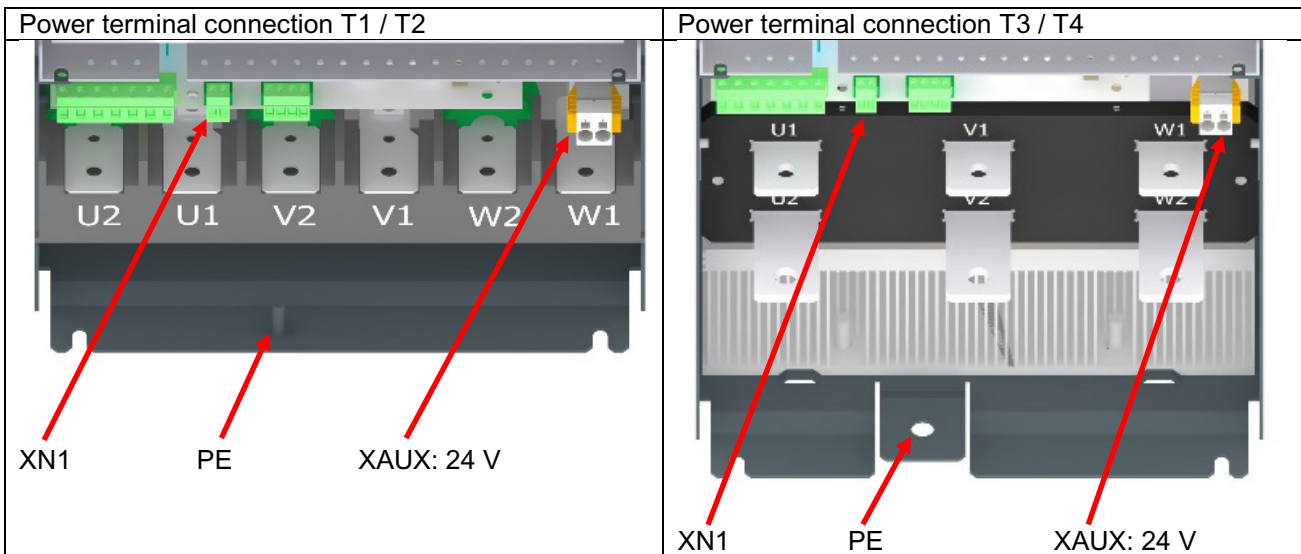
* Exception: DCT880-W0x-0420 ≥ 3 A

Interfaces and F-type option modules

Location of interfaces and F-type option modules

Tighten the screws to secure the F-type option modules.





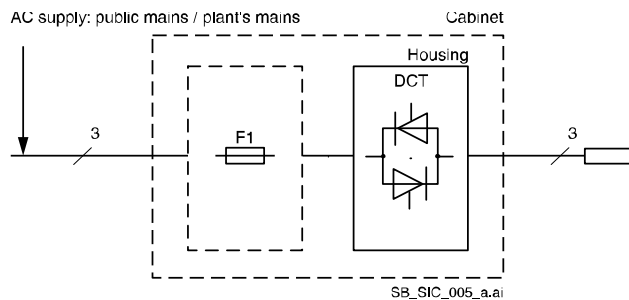
Accessories

Semiconductor fuses (F1)

Aspects of fusing for the thyristor power controller

Thyristor power controller configuration

Fuses are required in all cases to protect against further damage.



The figure shows the arrangement of external fuses in the thyristor power controller. External fuses are standard for all T1 ... T4 with a mains voltage up to 690 V_{AC}.

Size	Thyristor power controller 400 V / 525 V	Maximum allowed I ² t value at rated voltage [A ² s]	External fuses			
			Fuse type	Fuse holder	Fuse size	
T1	DCT880-W0x-0020-04/05	1,050	50 A 690V UR	OFAX 00 S3L	DIN 00 Type T	
	DCT880-W0x-0035-04/05		80 A 690V UR			
	DCT880-W0x-0055-04/05					
	DCT880-W0x-0080-04/05	5,000	125 A 690V UR		OFAX 1 S3	DIN 1
	DCT880-W0x-0100-04/05	11,000	160 A 690V UR			
	DCT880-W0x-0125-04/05	20,000	200 A 690V UR			
T2	DCT880-W0x-0160-04/05	137,000	250 A 690V UR	OFAX 2 S3		
	DCT880-W0x-0200-04/05		315 A 690V UR			
	DCT880-W0x-0245-04/05		350 A 690V UR			
T3	DCT880-W0x-0325-04/05	320,000	450 A 690V UR	OFAX 3 S3	DIN 2	
	DCT880-W0x-0360-04/05		500 A 690V UR			
	DCT880-W0x-0420-04/05		630 A 690V UR			
T4	DCT880-W0x-0550-04/05	781,000	800 A 690V UR	3 * 170H3006	DIN 3	
	DCT880-W0x-0675-04/05	980,000	900 A 690V UR			
	DCT880-W0x-0740-04/05		1000 A 690V UR			

Internal semiconductor fuses (option)

Thyristor power controllers require either external or internal semiconductor fuses. Optional internal fuses are available for all T1 ... T4 with a mains voltage up to 525 V_{AC}.

Please note:

Internal UR fuses can be ordered using pluscode +S500.

Using the control panel

Refer to ACS-AP-x assistant control panels user's manual (3AUA0000085685) for detailed information.

Basic operation

What this chapter contains

The chapter describes the basic operations and components of the user interface, lists common user tasks and gives short instructions on how to complete them.

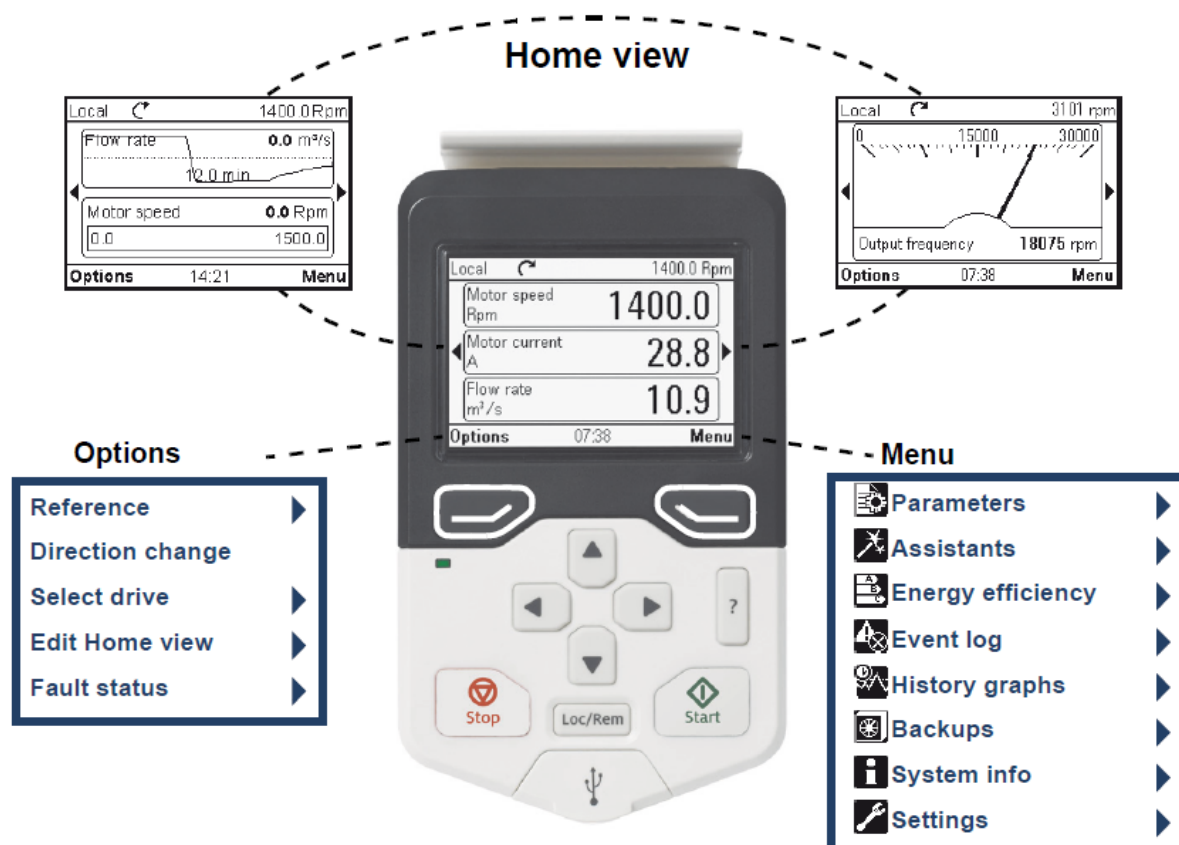
User interface overview

The user interface has the following main components:

- The Home view through which you can monitor signals.
- The main Menu through which you can access most functions of the control panel. The Menu functions are described in detail in chapter Functions in the main Menu.
- The Options menu through which you can set a reference, select the drive, edit Home view pages, and see the fault and warning status. The Options menu is described in detail in chapter Functions in the Options menu.
- The Help view which provides advice in many situations.
- Faults and warnings view which appear when the drive or the control panel experiences an error.

Control panel navigation

Use the arrow keys and softkeys for navigation. Follow the choices on the screen.



Navigation memory

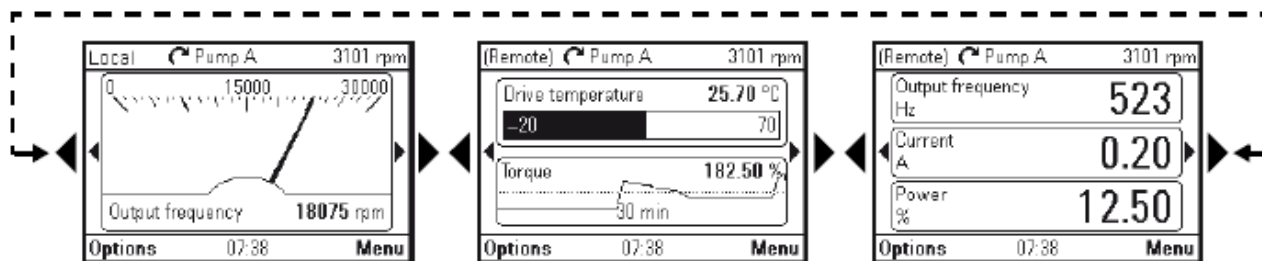
The Assistant control panel has a navigation memory that allows you to backtrack your steps through the user interface with the arrow keys and . The path you have last accessed remains in the memory for 10 minutes.

- The left arrow key (←) moves you backwards in the menu structure. If you press repeatedly, you return back to the Home view.
- The right arrow key (→) moves you forward in the menu structure. If you press repeatedly, you move forward along the path in the menu structure you had previously accessed.

Home view

The main view of the control panel is called the Home view. In the Home view, you can monitor the status of the drive, such as its speed, torque or power. The Home view has one or more pages, each of which can display up to three signals.


The number of pages and the signals shown on each page are customizable, and the Home view configuration is saved to the drive whenever you change it. The maximum total number of signals displayed varies from 9 to 21, depending on the drive. In the example below, three Home view pages are used, showing different display formats.



Each application macro and user set has a default Home view configuration. When you select an application macro or restore a user set, the Home view configuration changes accordingly. There is a default Home view configuration in each drive, which can be restored in the Settings menu.

The Home view opens automatically when you power up the drive. The Home view is also displayed from the Options menu or the main Menu if no key is pressed for 10 minutes.

Tip:

You can return to the Home view from any view except special screens by holding down the left softkey .

Navigating in the Home view

- Use and to move between the different pages of the Home view. The page numbers are shown while you scroll between pages.
- Use or to adjust the reference (visible in the top right corner).
- Press (Menu) to open the main Menu.
- Press (Options) to open the Options menu.

Help

You can open a context-sensitive help page in all menus and views by pressing.

The help page provides information on the use of the current view or menu, or on possible problems associated with it.

On the help page, you can:

Press again or (Exit) to exit.

Common user tasks

The following tables list common user tasks and describe how to complete them.

See Functions in the main Menu and Functions in the Options menu for detailed descriptions of functions in the menus.

Basic operation of the drive

Task	Actions
Start and stop the drive.	In local control, press to start the drive and to stop the drive.
Set the reference (for example, speed) in the Home view.	In local control, go to Options > Reference. Set the reference with the arrow keys.
Switch between local and remote control.	Press REM/LOC

Parameters

Task	Actions
Choose parameters displayed on the Favorites list.	Go to Menu > Parameters > Favorites > Edit.
View/edit parameters.	Go to Menu > Parameters to view parameters. Move by arrow keys and save using left soft key.
View parameters that differ from Application Macro defaults.	Go to Menu > Parameters > Modified.

System information and help

Task	Actions
How to get help.	Press to open the context-sensitive help.
View control panel version.	Go to Menu > System info > Control panel.
View drive information.	Go to Menu > System info > Drive.

Faults and warnings

Task	Actions
Hide/view an active fault.	Faults are automatically displayed. If you hide a fault by pressing (Hide), it automatically reappears after 60 seconds of no key presses. You can also view the fault through Options > Fault status.
Open help page on a fault.	Press to view the help page.
Reset an active fault.	Press (Reset) to reset an active fault.
View tripping faults.	Go to Menu > Event log > Primary faults.
Hide/view an active warning.	Warnings are automatically displayed. If you hide a warning by pressing (Hide), it automatically reappears if the warning is still active after 60 seconds of no key presses.
Open help page on a warning.	Press (How to fix) or to view the help page.
Reset an active warning.	Warnings disappear automatically once the condition that has triggered it goes away.
View past warnings and faults.	Go to Menu > Event log > Other events.

Basic settings and assistants

Task	Actions
Change language.	Go to Menu > Settings > Language.
Change time and date, and related settings.	Go to Menu > Settings > Date & time.
Launch an assistant.	Go to Menu > Assistants and select an assistant to launch.

Backups

Task	Actions
Create a backup.	Creates an backup of firmware parameters to the panel.
Restore a backup.	Restores a backup to the firmware parameters of DCT880. It is mandatory to set the unit in local mode before.

Set UP Procedure

Follow the procedure below for setting up the thyristor power controller

Checking prior to powering On

Check the following before powering on the thyristor power controller

- (1) Check the wiring to the input terminals U1, V1 and W1 and output terminals U2, V2 and W2. Also check that the grounding wires are connected to the grounding terminals (PE).



WARNING!

Be sure to connect the grounding wires of the power controller to the ground electrodes. Otherwise, an electric shock could occur.

- (2) Check the wiring to the aux. voltage supply.
 (3) Check the wiring to neutral point connection for single phase or 3ph + neutral configurations connected to XN1 : 1
 (4) Check the control circuit terminals and main circuit terminals for short circuit or ground faults.
 (5) Check for loose terminals, connectors and screws.
 (6) Make sure that all switches of devices connected to the power controller are turned OFF.
 Power on the power controller with any of those switches being ON may cause unexpected behavior at load side.

Power ON and check



WARNING!

Be sure to mount the front cover before turning the power ON. Do not remove the cover when the power controller is ON.
 Do not operate switches with wet hands.
 Otherwise, an electric shock could occur.

Turn the aux. power ON and check the following points. The following is a case when no parameter data is changed from factory defaults.

- (1) Check that the assistant control panel displays no fault and set date and time
 (2) Check that the used analog and digital inputs work properly
 Check signals 12.11, 12.21 and 12.31 for analog inputs
 Check signals 10.1 for digital inputs
 Set the inputs from voltage to current if needed

Turn on the input power and check the following points.

- (1) Check following parameters
 a. In case of three phase system supply
 Voltage between input phases
 signals 1.07, 1.08, 1.09
 b. In case of single phase system supply
 Voltage between phase and neutral
 signals 1.01, 1.02, 1.03

Set basic parameters and control modes

Please look up your configuration in following tables and set up accordingly

Basic settings for supply and load configuration

Parameters	Parameter name	Parameters setting		
99.01	Supply Voltage	Actual supply voltage (U1, V1, W1 / U1, N)		
99.02	Load current	Rated load current		
99.03	Load Voltage	Rated voltage across the load		
99.04	Supply Configuration	0 3ph UVW For W03		
		1 3ph UW eco For W02		
		2 3 x 1ph + N For W03 and W02 connected to single phase		
		6 2ph Scot For W02		
		For detailed description see Chapter Parameters		
99.05	Load Configuration	0 3ph Star (3S)		
		1 3ph Star +N (4S)		
		2 3ph Delta (3D)		
		3 3ph open Delta UV (6D)		
		4 3ph open Delta UW (6D)		
		5 3ph Transformer (3D/3S)		
		6 3ph Transformer UV (6D)		
		7 3ph Transformer UW (6D)		
		8 Scot Transformer		
		9 3 x 1ph loads		
		10 3 x 1ph transformer loads		
For detailed description see Chapter Parameters				
99.10	Leg 1 Control Mode	2 Full Wave Fix Cycle		
		3 Full Wave Variable Cycle		
		4 Half Wave		
		5 U α Open loop control		
		6 U ² α Open loop control		
		7 I α Control		
		8 I ² α Control		
		9 U α Control		
		10 U ² α Control		
		11 P α Control		
		12 Leg 1 External Ref 23.65		
		99.25	Leg 2 Control Mode	As 99.10 for separately controlled loads
				13 Follow Leg 1, for 3ph common controlled loads
99.40	Leg 3 Control Mode	As 99.10 for separately controlled loads		
		13 Follow Leg 1, for 3ph common controlled loads		

Additional settings for Phase Angle Control

Parameters	Parameter name	Parameters setting
99.16 / 99.31 / 99.46	Leg 1 / 2 / 3 Phase Angle Soft Start Ramp	Set to desired soft start period, to prevent current overshoot at start

Additional settings for Full Wave Fix Cycle

Parameters	Parameter name	Parameters setting
99.11 / 99.26 / 99.41	Leg 1 / 2 / 3 Cycle Time	Set to desired fixed cycle time
99.12 / 99.27 / 99.42	Leg 1 Start Mode	1 First Angle Starts always using first angle 99.13 / 28 / 43
		2 Soft Start Starts using 99.14 / 29 / 44 one time
		3 Soft Start / Soft Down Start using 99.14 / 29 / 44 Stops using 99.15 / 30 / 45
		4 Soft Start / first Angle First Start using 99.14 / 29 / 44 after using 99.13 / 28 / 43
For detailed description see Chapter Parameters		
99.13 / 99.28 / 99.43	Leg 1 / 2 / 3 First Angle	First angle to magnetize the transformer. Recommended setting range 80° ~ 90°
99.14 / 99.29 / 99.44	Leg 1 / 2 / 3 Burst Soft Start Ramp	Set to desired soft start period
99.15 / 99.30 / 99.45	Leg 1 / 2 / 3 Burst Soft Down Ramp	Set to desired soft down period

Additional settings for Full Wave Fix Cycle and Full Wave Variable Cycle

Parameters	Parameter name	Parameters setting
23.23 / 25.23 / 27.23	Leg 1 / 2 / 3 Minimum Cycle variable Burst	Set the minimum cycle for variable burst

Setting up the Command Chain

By factory default the ON/OFF Control is set to following:

	LEG 1	Parameter	LEG 2	Parameter	LEG 3	Parameter
Enable	DI1	19.01	DI1	19.03	DI1	19.05
RUN	DI2	19.02	DI2	19.04	DI2	19.06
Reset	DI3		19.15		See Leg 1	
Command Location Selector	DI5	19.10	DI5	19.11	DI5	19.12

See also DI Status in parameter 10.01.

If you need differently please check settings of given parameters.

Setting up the Reference Chain

By factory default the reference chain is set to following:

	LEG 1	Parameter	LEG 2	Parameter	LEG 3	Parameter
Main Reference	AI1 scaled	22.15	AI2 scaled	24.15	AI3 scaled	26.15

See also AI Status in parameters 12.12, 12.22 and 12.32.

If you need differently please check settings of given parameter and also description of Reference Groups 22 / 24 / 26.

Run the operation check

Main diagnostic signals

Parameter	Parameter name	Description
1.26 / 1.27 / 1.28	Mains Voltage Leg 1 / 2 / 3 relative	Relative measured mains voltage
1.30 / 1.31 / 1.32	Leg 1 / 2 / 3 Current RMS actual	RMS current per leg
1.40 / 1.41 / 1.42	Leg 1 / 2 / 3 Alpha actual	Actual firing angle
1.60 / 1.61 / 1.62	Leg 1 / 2 / 3 Voltage RMS relative actual	Actual relative output voltage
6.05 / 6.06 / 6.07	Leg 1 / 2 / 3 Status word	Actual status words

List of event codes

If the power controller detects an event, check whether any warning or fault code appears on the assistant control panel.

As listed below, some warnings and fault codes are followed by sub codes that denote the detailed error causes. For codes not followed by sub codes, "--" is written in the table below.

Events valid for all legs are only listed at leg 1.

For the alarm sub code checking procedure please see chapter "Using the control panel"

Table Abnormal states detectable (Fault and Warning Objects)

Leg1 Fault code	Leg1 Warning code	Leg2 Fault code	Leg2 Warning code	Leg3 Fault code	Leg3 Warning code	Error cause	Auto Reset object	Sub code	Detailed error cause
3101	2101	3201	2201	3301	2301	Overcurrent	X		
3102	2102	3202	2202	3302	2302	Overvoltage	X		
3103	2103	3203	2203	3303	2303	Thyristor short circuit			
3104	2104	3204	2204	3304	2304	Thyristor open			
3105	2105	3205	2205	3305	2305	Under voltage	X		
3154	2154	3354	2254	3354	2354	Unit overload	X		
5211	1201					External Event 1	X	--	
5212	1202					External Event 2	X	--	
5213	1203					External Event 3	X	--	
5214	1204					External Event 4	X	--	
5215	1205					External Event 5	X	--	
	1132					Parameter setting conflict			
3151	2151	3251	2251	3351	2351	Load loss	X		
3152	2152	3252	2252	3352	2352	Partial load loss	X		
3153	2153	3253	2252	3353	2353	Partial load short circuit	X		
3155	2155	3255	2255	3355	2355	Load overload	X		
3157	2157	3257	2257	3357	2357	Load aging			
3158	2158	3258	2258	3358	3358	Load current imbalance	X		

PC-tool “Drive composer entry”

Drive composer entry is a free of charge startup and maintenance PC tool for ABB's common architecture industrial devices series such as ACS880, DCT880 etc.

The key functions of Drive composer entry are the following:

- Connect point-to-point to one DCT880 using Assistant control panel's USB port
- Show the actual status of the connected DCT880
- View, edit on line and search the DCT880 parameters
- Show modified DCT880 parameters (Not at default)
- Print parameters
- Save parameters from DCT880 to PC and download parameters from PC to DCT880
- Monitor drive signals graphically and numerically (Limited functionality)
- Local Control of a DCT880
- Use of workspace and customized parameter windows

Download the software from the internet: www.abb.com → Search for Drive composer

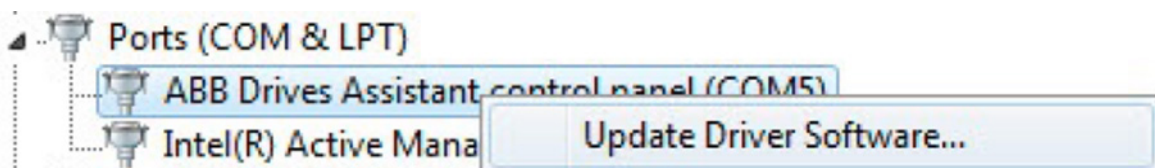
Unzip the **Drive_composer_entry.zip** file

Start the installation program **Setup.exe** of Drive composer entry and follow the instruction carefully

Connect the panel to your PC

Install the second part of drivers manually as follows

In the **Start** menu of your computer, enter *Device manager* in the search field and click **Device Manager**



Click **Browse my computer for driver software** to search the driver software

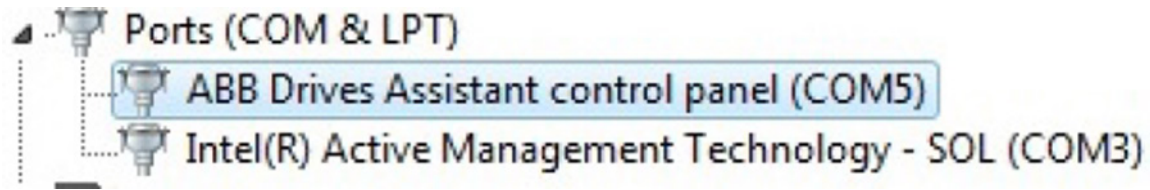
Local Disk (C:) ▶ Program Files (x86) ▶ DriveWare ▶ Drive composer entry ▶ PanelDriver

Click **Browse** to locate the drivers and click **Next**.

In the **Windows Security** window, click **Install** to install the device software

After installation is complete, click **Close**.

The Driver software for the device is installed at given COM port



First time connect the PC-tool to the DCT880 power controller

1. Connect your PC to the Assistant control panel with a USB cable.

The following text appears on the Assistant control panel screen: "USB connected".

Note: The Assistant control panel cannot be used when it is connected to a PC.

2. Launch Drive composer by double-clicking **Drive composer entry.exe**
3. Select the COM port that your Assistant control panel is using.

This question is asked only when the program is launched for the first time. If you want to change the COM port settings, go to **View** → **Settings** in Drive composer.

Appendix

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



DCS800-S modules

The **versatile drive for process industry**

20 ... 5,200 A_{DC}
0 ... 1,160 V_{DC}
230 ... 1,000 V_{AC}
IP00

- Compact
- Highest power ability
- Simple operation
- Comfortable assistants, e.g. for commissioning or fault tracing
- Scalable to all applications
- Free programmable by means of integrated IEC61131-PLC



DCS800-A enclosed converters

Complete drive solutions

20 ... 20,000 A_{DC}
0 ... 1,500 V_{DC}
230 ... 1,200 V_{AC}
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



DCS800-E series

Pre-assembled drive-kits

20 ... 2,000 A_{DC}
0 ... 700 V_{DC}
230 ... 600 V_{AC}
IP00

- DCS800 module with all necessary accessories mounted and fully cabled on a panel
- Very fast installation and commissioning
- Squeezes shut-down-times in revamp projects to a minimum
- Fits into Rittal cabinets
- Compact version up to 450 A and Vario version up to 2,000 A



DCS800-R Rebuild Kit

Digital control-kit for existing powerstacks

20 ... 20,000 A_{DC}
0 ... 1,160 V_{DC}
230 ... 1,200 V_{AC}
IP00

- Proven long life components are re-used, such as power stacks, (main) contactors, cabinets and cabling / busbars, cooling systems
- Use of up-to-date communication facilities
- Increase of production and quality
- Very cost-effective solution
- Open Rebuild Kits for nearly all existing DC drives
- tailor-made solutions for...
 - BBC PxD
 - BBC SZxD
 - ASEA Tyrak
 - other manufacturers



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