

DC DRIVES

ABB industrial drives

DCS880 Quick guide



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ABB Drive Service EN

In order to offer the same after sales service to our customer around the world, ABB has created the DRIVE SERVICE CONCEPT.

ABB's after sales service is globally consistent due to common targets, rules, and the way of operation. This means for our customers:

Please visit the ABB drive service homepage
www.abb.com/drivesservices

ABB Drive Service FR

Pour offrir la même qualité de service à tous nos clients, ABB a créé DRIVE SERVICE CONCEPT.

Dans le monde entier, les équipes de service proposent les mêmes prestations aux mêmes conditions avec les mêmes objectifs.

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ABB Drive Service DE

Um jedem Kunden rund um die Welt die gleiche Service Dienstleistung anbieten zu können, hat ABB das DRIVE SERVICE CONCEPT entwickelt.

Durch die Definition von einheitlichen Zielen, Regeln, und Arbeitsvorschriften kann ABB die Dienstleistungs Produkte weltweit auf gleichwertig hohem Qualitätsniveau anbieten. Für unsere Kunden bedeutet dies:

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ABB Drive Service IT

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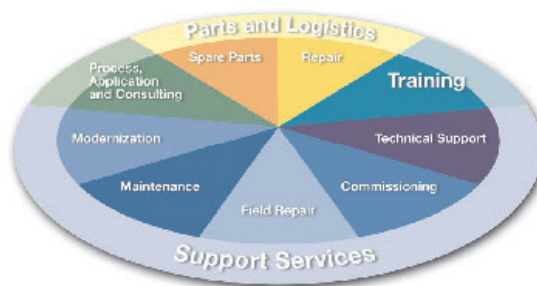
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ABB Drive Service ES

Para poder ofrecer el mismo servicio posventa a nuestros clientes en todo el mundo, ABB ha creado el CONCEPTO DE SERVICIO DE CONVERTIDORES.

El servicio posventa de ABB está mundialmente consolidado gracias a unos objetivos y normas comunes, así como a su funcionamiento. Esto significa para nuestros clientes:

Visiten el portal de convertidores de ABB
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DC Drives worldwide service network

Country	Local ABB Service	Town	Service Phone No.
Argentina	Asea Brown Boveri S.A.	BUENOS AIRES	+54 (0) 12 29 55 00
Australia	ABB	NOTTING HILL	+61 (0) 3 85 44 00 00
Austria	ABB AG	WIEN	+43 1 60 10 90
Belgium	ABB N.V.	ZAVENTEM	+32 27 18 64 86 +32 27 18 65 00 - 24h service
Brazil	ABB Ltda.	OSASCO	+55 (0) 11 70 84 91 11
Canada	ABB Inc.	SAINT-LAURENT	+1800 865 7628
China	ABB China Ltd	BEIJING	+86 40 08 10 88 85 - 24h service
Czech Republic	ABB S.R.O.	PRAHA	+42 02 34 32 23 60
Finland	ABB Oy Service	KUUSANKOSKI	+35 8 10 22 51 00
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Finland	ABB Oy Service	NOKIA	+35 8 10 22 51 40
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Germany	ABB Process Industries	MANNHEIM	+49 18 05 22 25 80
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Russia	ABB Automation LLC	MOSCOW	+74 95 96 0
Switzerland	ABB AG	DÄTTWIL	+41 5 85 86 87 86
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Slovakia	ABB Elektro s.r.o.	BANSKA BYSTRICA	+42 19 05 58 12 78
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Taiwan	ABB Ltd.	TAIPEI 105	+88 62 25 77 60 90
Thailand	ABB Limited	SAMUTPRAKARN	+66 27 09 33 46
Turkey	ABB Elektirk Sanayi A.S	ISTANBUL	+90 2 16 36 52 90
USA	ABB Industrial Products	NEW BERLIN	+1 26 27 85 32 00 +1 262 435 7365
Venezuela	ABB S.A.	C R C S	+58 (0) 22 38 24 11 / 12

DCS880 Drive manuals

	Publication number	Language						
		E	D	I	ES	F	CN	RU
General								
DCS880 Quick Guide	3ADW000480	x						
Safety instructions all languages	3ADW000481	x	x	x	x	x	x	x
DCS880 Documentation pack	DCS880 CD download	x						
DCS880 Units								
DCS880 Flyer	3ADW000475	x	x			x		
DCS880 Technical catalog	3ADW000465	x						
DCS880 Hardware manual	3ADW000462	x						
DCS880 Firmware manual	3ADW000474	x						
DCS880 Service manual	3ADW000488	x						
DCS880 Hardparallel manual	3ADW000530	x						
DCS880 12-pulse manual	3ADW000533	x						
Instructions for mounting the SDCS-CMA-2	3ADW000396	x						
ACS-AP-x assistant control panels user's manual	3AUA0000085685	x						
Functional safety								
Supplement for functional safety	3ADW000452	x						
Functional safety for enclosed converter								
+Q957 Prevention of unexpected Start Up	3ADW000504	x						
+Q951 Emergency stop, category 0 with MC opening	3ADW000505	x						
+Q952 Emergency stop, category 1 with MC opening	3ADW000506	x						
+Q963 Emergency stop, category 0 without MC opening	3ADW000507	x						
+Q964 Emergency stop, category 1 without MC opening	3ADW000508	x						
Enclosed converter								
Installation manual	3ADW000091	x	x					
DCS800-A +S880 Enclosed Converters - Flyer	3ADW000523	x	x					
Door mounting kits								
DPMP-01 mounting platform for ACS-AP control panel	3AUA0000100140	x						
DPMP-02 mounting platform for ACS-AP control panel	3AUA0000136205	x						
Serial communication								
FCAN-01 CANopen adapter module	3AFE68615500	x	x					
FDNA-01 DeviceNet™ adapter module	3AFE68573360	x						
FECA-01 EtherCAT adapter module	3AUA0000068940	x	x					
FENA-11/-21 Ethernet adapter module	3AUA0000093568	x						
FEPL-02 Ethernet POWERLINK adapter module	3AUA0000123527	x	x					
FPBA-01 PROFIBUS DP adapter module	3AFE68573271	x	x					
FSCA-01 RS-485 adapter module	3AUA0000109533	x						
FDCO-01/02 DDCS communication modules	3AUA0000114058							
Tool and maintenance manuals and guides								
Drive composer PC tool	3AUA0000094606	x						
Drive (IEC61131-3) application programming manual	3AUA0000127808	x						
Adaptive programming, Application guide	3AXD5000028574	x						
NETA-21 remote monitoring tool	3AUA0000096939	x						
NETA-21 remote monitoring tool guide	3AUA0000096881	x						
Extension modules								
FIO-11 Analog extension module	3AFE68784930	x						
FIO-01 Digital extension module	3AFE68784921	x						
FAIO-01 Analog extension module	3AUA0000124968	x						
FDIO-01 Digital extension module	3AUA0000124966	x						
FEN-01 TTL encoder interface	3AFE68784603	x						
FEN-31 HTL encoder interface	3AUA0000031044	x						
FEA-03 F series extension adapter	3AUA0000115811	x						

Status 10.2018 x → existing p → planned DCS880 Manuals list e.g.docx

DCS880

All information are available on the Internet by following links:

- DCS880 documentation



www.abb.com → Search for DCS880
Direct link: [DCS880 CD download](#)

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



www.abb.com → Search for drive composer
Direct link: [ABB Drive composer](#)

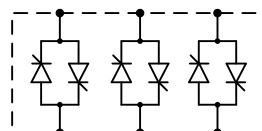


DCS880 DC drive

Our DCS880 industrial drives are customized to meet the precise needs of industries such as oil and gas, mining, metals, cement, non motoric, material handling, pulp and paper, rubber and plastics, marine, water and wastewater, food and beverage and automotive. They control a wide range of applications such as cranes, extruders, winches, winders, conveyors, mixers, millstands, centrifuges, test benches, elevators, electrolysis, kiln.

Thyristor Power controller DCT880

With the new DCT880 ABB offers its customers a thyristor power controllers for precise control of resistive or inductive heaters and infrared heaters in applications for annealing, drying, melting or heating in glass, plastic or metal industry.



Ratings, types and voltages

Current ratings, dimensions and weights

Unit size	2-Q		4-Q		Supply voltage [V _{AC}]						Internal field current [A]	Weight [kg]	Dimensions		
	rated Current DCS880-S01	rated Current DCS880-S02	I _{DC} [A]	I _{DC} [A]	400	500/525	600	690	800	990			1190	h x w x d [mm]	h x w x d [inch]
H1	20	25	●	●								6	11	370 x 270 x 215	14.56 x 10.63 x 8.46
	45	50	●	●								12			
	65	75	●	●								12			
	90	100	●	●								12			
H2	135	150	●	●								18	16	370 x 270 x 271	14.56 x 10.63 x 10.67
	180	200	●	●								18			
	225	250	●	●								18			
	270	300	●	●								18			
H3	290	320					●					-	25	460 x 270 x 317	18.11 x 10.63 x 12.48
	315	350	●	●								25			
	405	450	●	●								25			
	470	520	●	●								25			
H4	590	650					●					-	38	645 x 270 x 352	25.39 x 10.63 x 13.86
	610	680	●	●								30			
	740	820	●	●								30			
	900	1000	●	●								30			
H5	1190	1190	●	●								25 ①	55	750 x 270 x 372	29.53 x 10.63 x 14.65
H6	900	900					●	●				25 ①	110	944 x 510 x 410	37.17 x 20.08 x 16.14
	1200	1200	●	●								25 ①			
	1500	1500	●	●	●	●						25 ①			
	2000		●	●	●	●						25 ①			
		2000	●	●								25 ①			
H7	1900	1900							●			-	180	1750 x 460 x 410	68.90 x 18.11 x 16.14
	2050	2050		●	●	●						-			
	2500	2500	●	●	●	●	●					-			
	3000	3000	●	●	●	●	●					-			
H8	2050	2050								●		-	315	1750 x 760 x 570	68.90 x 29.92 x 22.44
	2600	2600								●	●	-			
	3300	3300	●	●	●	●	●	●	●	●		-			
	4000	4000	●	●	●	●	●	●	●	●		-			
	4800	4800			●	●	●					-			
	5200	5200	●	●								-			

① FEX-425 Int option

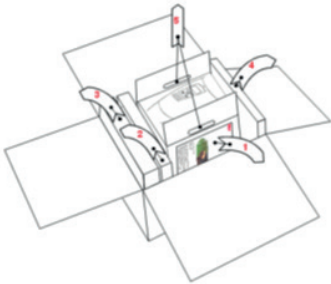


Unpacking and mechanical installation

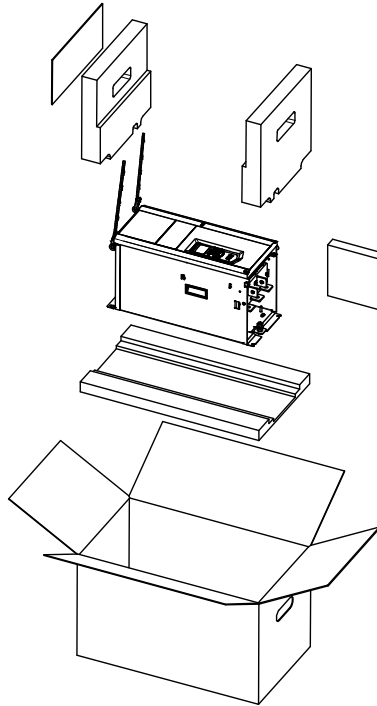
Unpacking and examining the delivery

Size H1 ... H3

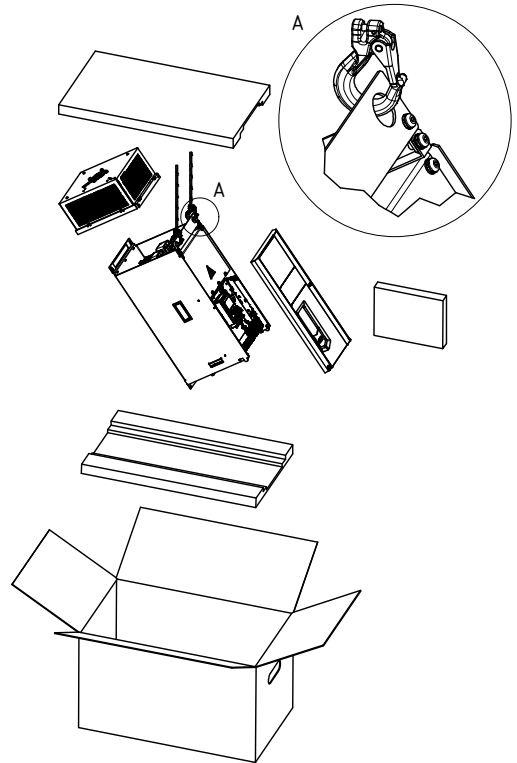
Do not lift the drive by the cover!



Size H4



Size H5



Mechanical installation

Before installation

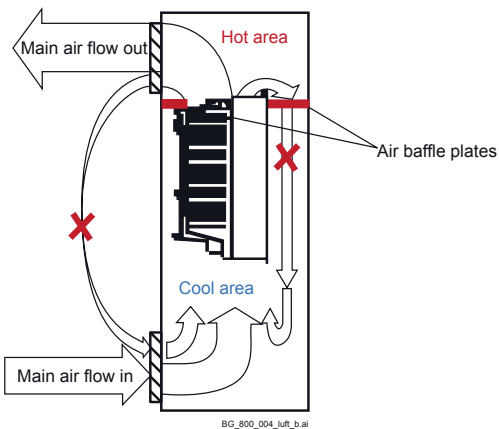
Install the drive in an upright position with the cooling section facing a wall. Check the installation site according to the requirements below. Refer to chapter Dimensions and weights in the Hardware manual for frame details.

Cabinet installation

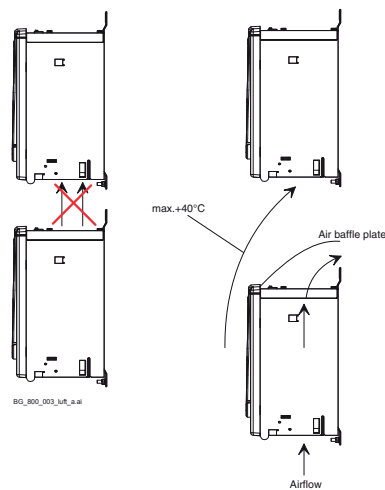
The required distance between parallel units is five millimetres (0.2 in.) in installations without the front cover. The cooling air entering the unit must not exceed +40 °C (+104 °F).

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 see chapter Dimensions and weights.

Type code and plus codes

The type code contains information on the specification and configuration of the drive. 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.

Type code

The drive's basic type code: DCS880-aab-cccc-ddef + plus code

The drive's basic type code: DCS880			
Product family	DCS880		
Product family	aa	= S0 = R0 = E0 = A0	Standard converter module Rebuild kit Panel solution Enclosed converter
Bridge type:	b	= 1 = 2	Single bridge (2-Q) 2 anti-parallel bridges (4-Q)
Module type:	cccc	=	Rated DC current (IP00)
Rated AC voltage:	dd	= 04 = 05 = 06 = 07 = 08 = 10 = 12	100 V _{AC} ... 415 V _{AC} 100 V _{AC} ... 525 V _{AC} 270 V _{AC} ... 600 V _{AC} 315 V _{AC} ... 690 V _{AC} 360 V _{AC} ... 800 V _{AC} 450 V _{AC} ... 990 V _{AC} 540 V _{AC} ... 1200 V _{AC}
Power connection:	e	= X = L = R	Standard H1 ... H7 Left side H8 Right side H8
Revision code:	f	= 0	1 st generation
Field exciter configuration:		+0S163 +S164	H1 ... H4 without OnBoard field exciter H5 and H6 with internal field exciter, supply external (H5 and H6: 25 A, Rebuild kit: 16 A / 25 A)
DCSLink communication		+S521	SDCS-DSL-H10 board added (12-pulse, 3-phase fieldexciter)
Application programming		+S551	Memory unit including drive application programming license

Plus codes

Option	Option code	Description
no ACS-AP-I	0J404	No control panel
DPI-H01	+J428	Panel bus daisy-chain option
ACS-AP-W	+J429	Bluetooth control panel
FDNA-01	+K451	Fieldbus DeviceNet
FPBA-01	+K454	Fieldbus PROFIBUS
FCAN-01	+K457	Fieldbus CANOpen
FSCA-01	+K458	Fieldbus Modbus
FCNA-01	+K462	Fieldbus ControlNet
FECA-01	+K469	Fieldbus EtherCat
FEPL-02	+K470	Fieldbus Ethernet POWERLINK
FENA-11	+K473	Ethernet/IP, Modbus/TCP, Profinet
FENA-21	+K475	Ethernet/IP, Modbus/TCP, Profinet
FIO-11	+L500	Analog I/O Extension (3 AI, 1 AO, 2 DIO)
FIO-01	+L501	Digital I/O Extension (4 DIO, 2 RO)
FAIO-01	+L525	Analog I/O Extension (2 AI, 2 AO)
FDIO-01	+L526	Digital I/O Extension (3 DI, 2 RO)
FEN-01	+L517	TTL Encoder interface
FEN-21	+L516	Resolver Interface
FEN-31	+L502	HTL Encoder Interface
FDCO-01	+L503	DDCS communication 10/10 MBd

Brief instructions for virtual CD and documents overview

We appreciate that you purchased an ABB DC drive power converter and thank you for the trust you put in our products.

This brochure was put together to make sure that you continue to be satisfied with our product. It is intended to provide you with a brief overview of the product's key data, EMC notes, typical applications, start-up and trouble-shooting.

If you need more information about the product you are provided with a virtual DCS880 CD in addition to this brief documentation. The virtual DCS880 CD is part of this document and features the following contents:

Documentation

Our documentation is basically structured according to the following system:

Technical catalogue (3ADW000465)

as comprehensive information to engineer complete DC drive systems.

Hardware manual (3ADW000462)

as detailed information, with all important particulars about the individual components, like module dimensions, electronic boards, fans and auxiliary components. Information for mechanical and electrical installation are also included.

Firmware manual (3ADW000474)

detailed information with all important issues about firmware and setting of parameters. The manual includes information for start-up and maintenance of the entire drive, in detailed form.

This manual also includes Fault and Alarm codes and information for trouble shooting.

Supplement functional safety manual (3ADW000452)

detailed technical information about DCS880 STO function and how to handle.

Service manual (3ADW000488)

for maintenance and repair of the converters.

Applications

DCS880 DC Drive can include application software e.g. magnet control, winders. In such case following procedures and assistants can be blocked or not completed. Please check for further documentation and manuals (check group 7).

Additional information about applications (e.g. 12-pulse) and technical accessories (e.g. Hardware extension or Field bus interfaces) are handled by separate manuals.

See table DCS880 Drive manuals.

System requirements to use the virtual DCS880 CD

All manuals of DCS880 and hardware extensions as well as PC tools are collected on a virtual DCS880 CD.

The virtual CD can be downloaded from internet by link [DCS880 CD download](#)



- Goto internet search for DCS880 Quick guide (3ADW000480)
- Goto [page 6](#) or use this link
- Download CD to PC



Further support

In addition we offer further support, since we can only be satisfied when you, as our customer, are satisfied with us and our products.

Internet

On the ABB homepage under

www.abb.com/dc-drives

you'll find abundant information for

- DC products
- service support
- the latest updates
- tools
- downloads, etc.

Please don't hesitate to visit us.

Register your drive: <https://drivereg.drivesapplications.fi/>

Contacts

If you require any further information, please contact your nearest ABB Drives office or send an email to:

dc-drives@de.abb.com

Please give us your name, your company address and phone number. We immediately put you in contact with our specialist.

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

Notes on EMC

Further information is available in the Technical Guide

The paragraphs below describe selection of the electrical components in conformity with the EMC Guideline.

The aim of the EMC Guideline is, as the name implies, to achieve electromagnetic compatibility with other products and systems. The guideline ensures that the emissions from the product concerned are so low that they do not impair another product's interference immunity. In the context of the EMC Guideline, two aspects must be borne in mind:

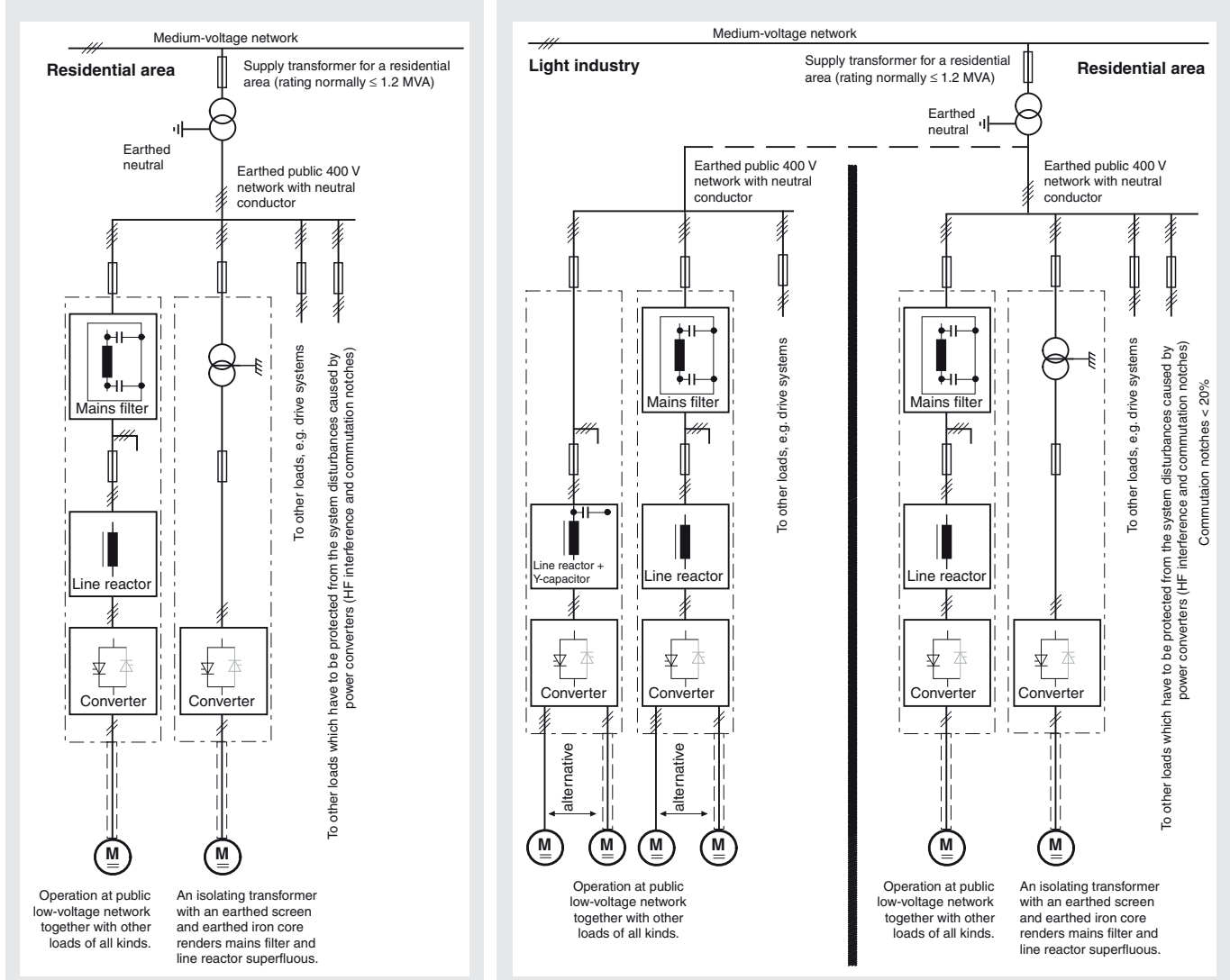
- the product's interference immunity
- the product's actual emissions

The EMC Guideline expects EMC to be taken into account when a product is being developed; however, EMC cannot be designed in, it can only be quantitatively measured.

Note on EMC conformity

The conformity procedure is the responsibility of both the power converter's supplier and the manufacturer of the machine or system concerned, in proportion to their share in expanding the electrical equipment involved.

First environment (residential area with light industry) with PDS category C2	
Not applied, since category C1 (general distribution sales channel) excluded	
Not applicable	satisfied
satisfied	



For compliance with the protection objectives of the German EMC Act (EMVG) in systems and machines, the following EMC standards must be satisfied:

Product Standard EN 61800-3

EMC standard for drive systems (PowerDriveSystem), interference immunity and emissions in residential areas, enterprise zones with light industry and in industrial facilities. This standard must be complied with in the EU for satisfying the EMC requirements for systems and machines!

For emitted interference, the following apply:

- EN 61000-6-3** Specialised basic standard for emissions in **light industry** can be satisfied with special features (mains filters, screened power cables) in the lower rating range *(EN 50081-1).
- EN 61000-6-4** Specialised basic standard for emissions in **industry** *(EN 50081-2)

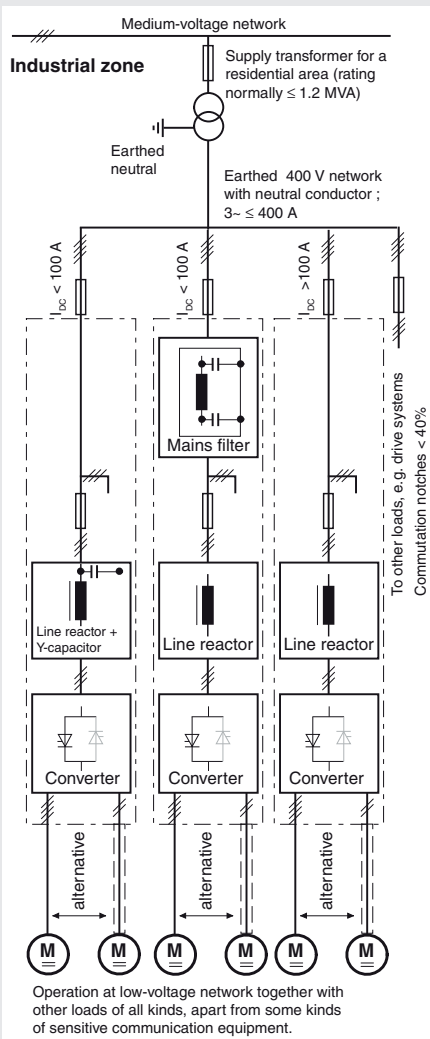
For interference immunity, the following apply:

- EN 61000-6-1** Specialised basic standard for interference immunity in **residential areas** *(EN 50082-1)
- EN 61000-6-2** Specialised basic standard for interference immunity in **industry**. If this standard is satisfied, then the EN 61000-6-1 standard is automatically satisfied as well *(EN 50082-2)

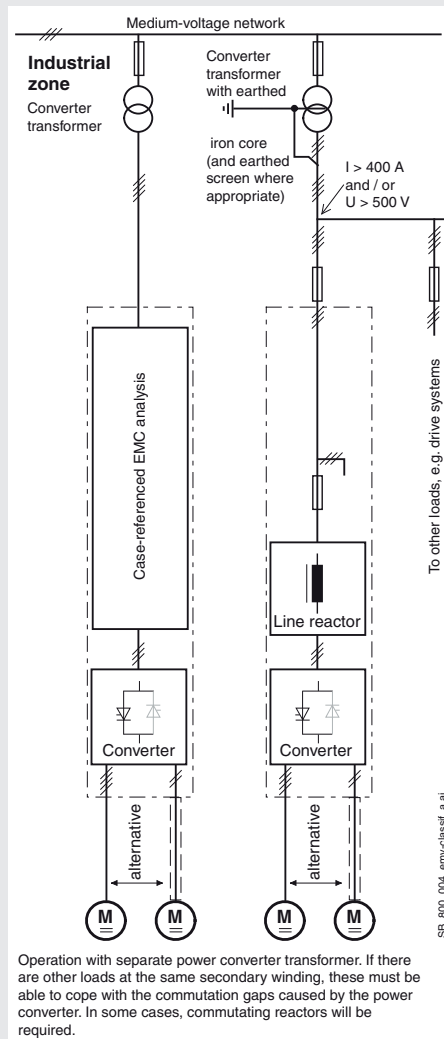
* The old generic standards are given in brackets

			Standards
Second environment (industry) with PDS categories C3, C4			EN 61800-3
Not applicable			EN 61000-6/3
satisfied	on customer's request	satisfied	EN 61000-6/3
satisfied			EN 61000-6-2 EN 61000-6-1

PDS category C3



PDS category C4



Classification

The following overview utilises the terminology and indicates the action required in accordance with Product Standard EN 61800-3.

For the DCS880 series, the limit values for emitted interference are complied with, provided the measure indicated is carried out. PDS of category C2 (formerly restricted distribution in first environment) is intended to be installed and commissioned only by a professional (person or organization with necessary skills in installing and/or commissioning PDS including their EMC aspects).

For power converters without additional components, the following warning applies: This is a product of category C2 under IEC 61800-3:2004. In a domestic/residential environment this product may cause radio interference in which case supplementary mitigation measures may be required.

The field supply is not depicted in this overview diagram. For the field current cables, the same rules apply as for the armature-circuit cables.

Legend

	Screened cable
	Unscreened cable with restriction

SB_800_004_emv-classif_de.at

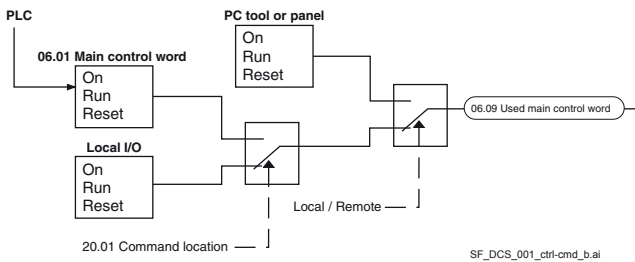
Start, Stop and E-Stop control

The relay logic is splitted into four parts:

1: Generation of the On / Off and Start / Stop command:

The commands represented by K20 and K21 (latching interface relay) can also be generated by a PLC and transferred to the terminals of the converter either by relays, using galvanic isolation or directly via 24 V signals.

There is no need to use hardwired signals. Transfer these commands via serial communication. Even a mixed solution can be realized by selecting different possibilities for the one or the other signal (see parameter groups 06 and 20):



2: Generation of control and monitoring signals:

Control the mains contactor (K1) of the armature circuit by the relay contact of XSMC. The status of the drive and / or motor fans (K8) can be monitored by means of 20.38 Drive fan acknowledge source and 20.39 Motor fan acknowledge source.

3: Off2 (emergency off / electrical disconnect / fast current off) and Off3 (emergency stop):

Beside On / Off and Start / Stop the drive is equipped with two additional stop functions Off2 and Off3 according to Profibus standard.

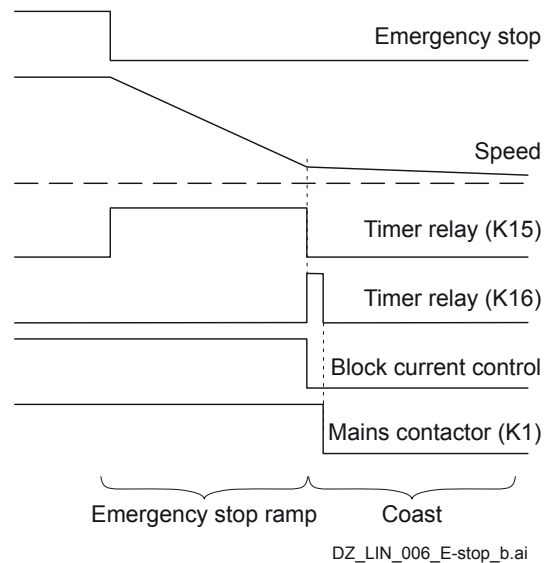
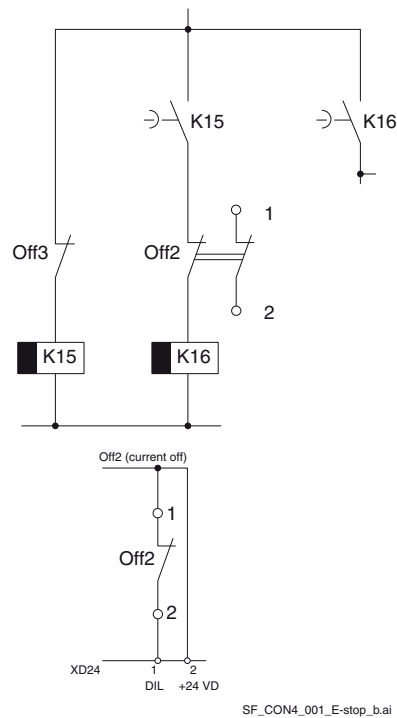
Off3 is scalable via 21.03 Emergency stop mode to perform a ramp stop according to category 1. Connect this function to the E-stop push button (off3) without any time delay. In case of 21.03 Emergency stop mode = Ramp stop the timer relay (K15) must be set longer than 23.23 Emergency stop time. For 21.03 Emergency stop mode = Coast stop the drive opens the mains contactor immediately.

Off2 switches the DC current off as fast as possible and prepares the drive to open the mains contactor or drop the mains supply. For a normal DC motor load the time to force the DC current to zero is below 20 ms. This function should be connected to all signals and safety functions opening the mains contactor. This function is important for 4-Q drives. Do not open mains contactor during regenerative current. The correct sequence is:

1. Switch off regenerative current.
2. Then open the mains contactor (K16 timer delay).

In case the E-stop push button is hit, the information is transferred to a digital input of the converter. In case 21.03 Emergency stop mode = Ramp stop or Torque limit the converter will decelerate the motor and then open the mains contactor. If the drive has not finished the function within the timer relay (K15) setting, the drive must get the command to switch off the current via timer relay (K16). After the timer relay (K16) has elapsed, the mains contactor is opened immediately, independent of the drive's status.

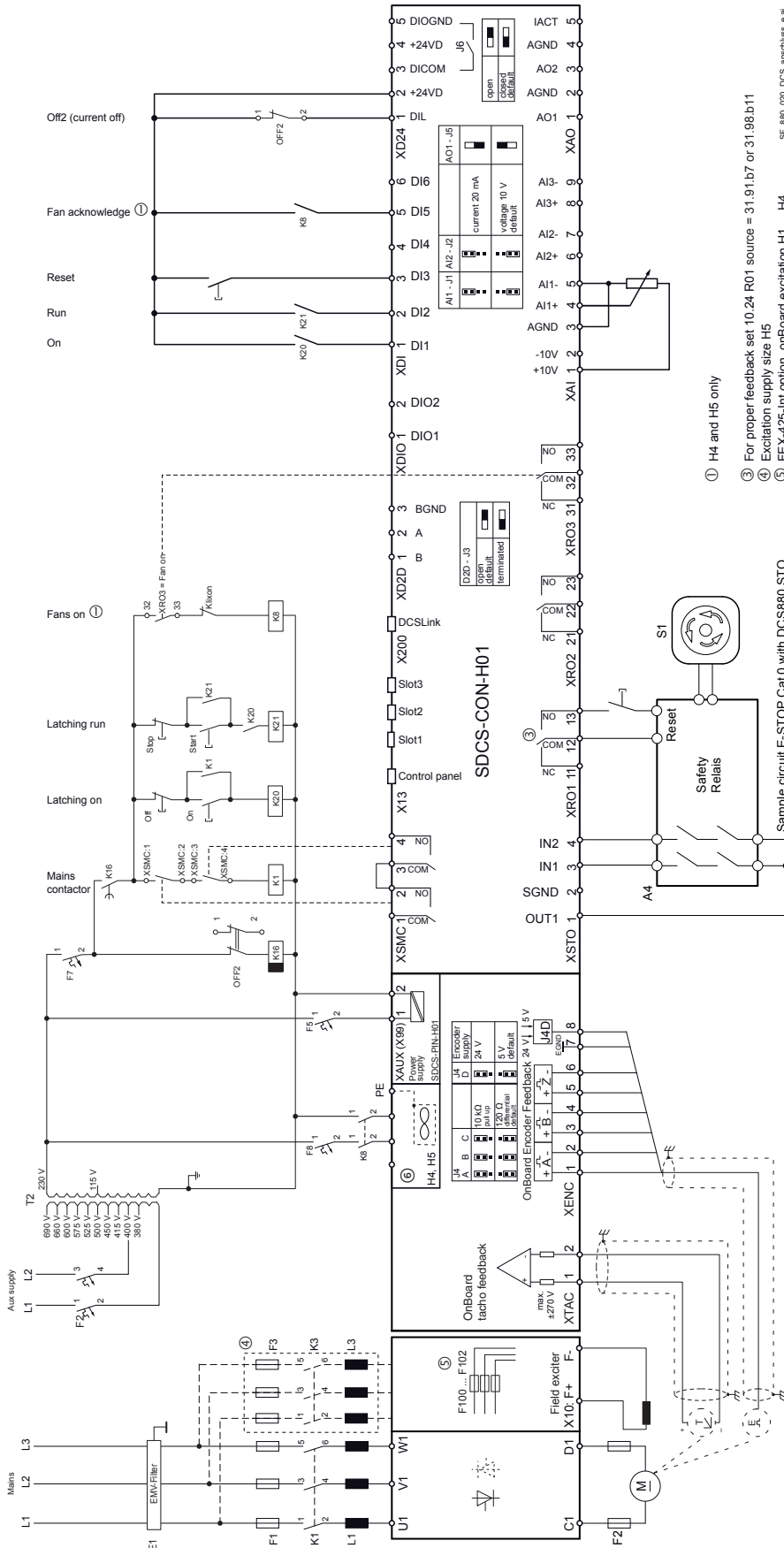
Emergency stop reaction



Planning the electrical installation, size H1 ... H5

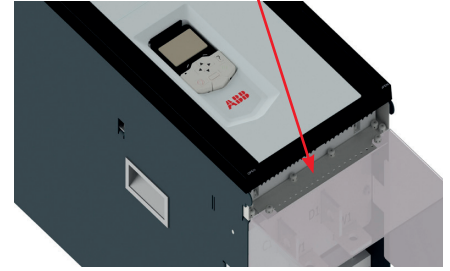
Converters size H1 ... H5 configuration using an OnBoard field exciter

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



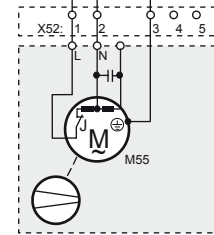
Attention:

Do not forget to mount the cable shield grounding plate from the accessory pack:

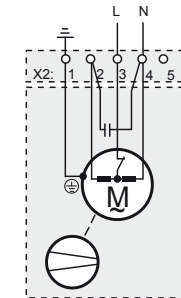


Example for DC main terminal cover for H4 converter modules.

⑥ H4 fan connection

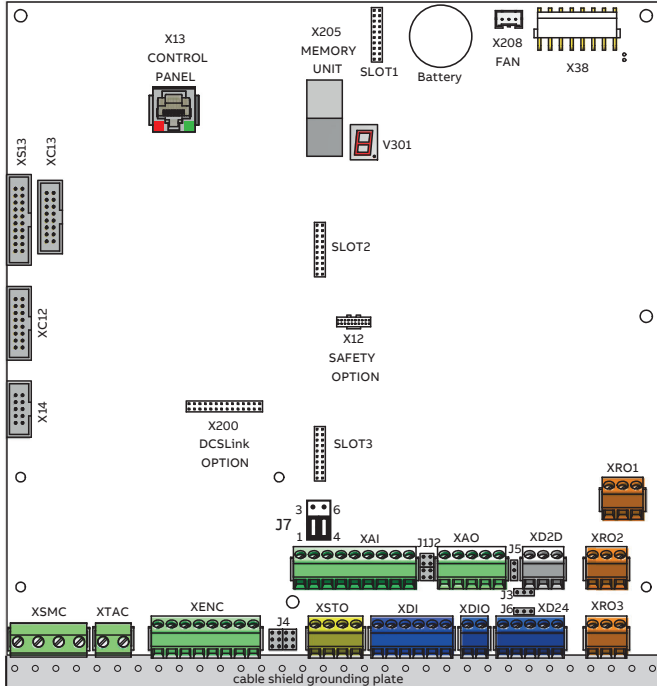


⑥ H5 fan connection

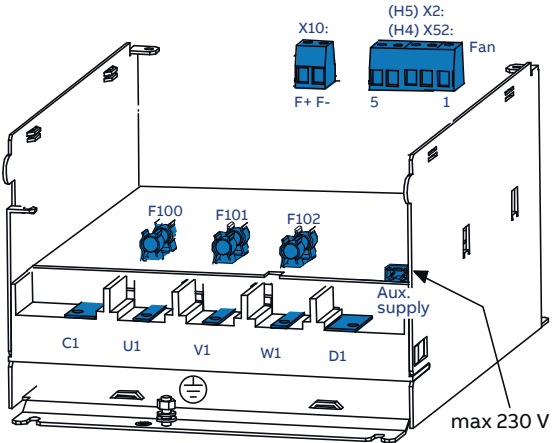


Terminal locations of the converter

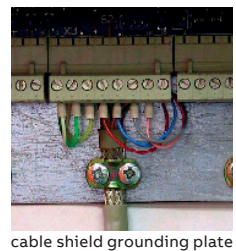
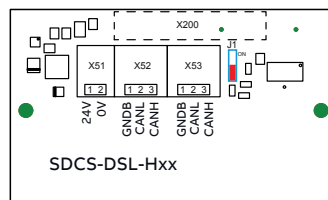
SDCS-CON-H: Connector allocation



DCS880 module: Terminal allocation



DCS880 Accessories



cable shield grounding plate

SDCS-CON-H: Terminal allocation

XSMC 1 2 3 4 COM NO COM NO	XENC (Encoder) 1 2 3 4 5 6 7 8 Ch. A+ Ch. A- Ch. B+ Ch. B- Ch. Z+ Ch. Z- GND	XSTO 1 2 3 4 OUT1 SGND IN1 IN2	XDI 1 2 3 4 5 6 D11 D12 D13 D14 D15 D16	XDO 1 2 DO1 DO2	XD24 1 2 3 4 5 DIL +24VD D1COM +24VD D10GND	XAI 1 2 3 4 5 6 7 8 9 +10V -10V AGND AI1+ AI1- AI2+ AI2- AI3+ AI3- GND	XAO 1 2 3 4 5 AO1 +10V -10V GND AO1	XD2D 1 2 3 B A BGND	XRO1 11 12 13 NC COM NO	XRO2 21 22 23 NC COM NO	XRO3 31 32 33 NC COM NO
---	---	---	--	------------------------------	--	---	--	----------------------------------	--------------------------------------	--------------------------------------	--------------------------------------

BL_CONH01_002_allocation_b.ai

Cross section areas - Tightening torques

Recommended cross-sectional area to DIN VDE 0276-1000 and DIN VDE 0100-540 (PE) trefoil arrangement, up to 50°C ambient temperature.

Armature:

Converter type	I_{DC} [A-]	1 [mm ²]	C1, D1 (2.) [mm ²]	I_V [A~]	U1, V1, W1 [mm ²]	PE [mm ²]	[Nm]	
DCS880-S0x-0025-xx	25	1 x 6	-	21	1 x 4	1 x 10	1 x M6	6
DCS880-S0x-0050-xx	50	1 x 10	-	41	1 x 6	1 x 10	1 x M6	6
DCS880-S0x-0075-xx	75	1 x 25	-	61	1 x 25	1 x 16	1 x M6	6
DCS880-S0x-0100-xx	100	1 x 25	-	82	1 x 25	1 x 16	1 x M6	6
DCS880-S0x-0150-xx	150	1 x 35	-	114	1 x 35	1 x 16	1 x M10	25
DCS880-S0x-0200-xx	200	2 x 35	1 x 95	163	2 x 25	1 x 25	1 x M10	25
DCS880-S0x-0250-xx	250	2 x 35	1 x 95	204	2 x 25	1 x 25	1 x M10	25
DCS880-S0x-0300-xx	300	2 x 70	1 x 95	220	2 x 50	1 x 50	1 x M10	25
DCS880-S0x-0320-xx	320	2 x 70	1 x 95	220	2 x 50	1 x 50	1 x M10	25
DCS880-S0x-0350-xx	350	2 x 70	-	286	2 x 50	1 x 50	1 x M10	25
DCS880-S0x-0450-xx	450	2 x 95	-	367	2 x 95	1 x 95	1 x M10	25
DCS880-S0x-0520-xx	520	2 x 95	-	424	2 x 95	1 x 95	1 x M10	25
DCS880-S0x-0650-xx	650	2 x 120	-	555	2 x 120	1 x 120	1 x M12	50
DCS880-S0x-0680-xx	680	2 x 120	-	555	2 x 120	1 x 120	1 x M12	50
DCS880-S0x-0820-xx	820	2 x 150	-	669	2 x 120	1 x 120	1 x M12	50
DCS880-S0x-0900-6/7	900	4 x 95	3 x 150	734	4 x 70	1 x 150	2 x M12	50
DCS880-S0x-1000-xx	1000	2 x 185	-	816	2 x 150	1 x 150	1 x M12	50
DCS880-S0x-1190-xx	1190	4 x 120	-	971	4 x 95	2 x 95	2 x M12	50

You will find instructions on how to calculate the PE conductor's cross-sectional area in VDE 0100 or in equivalent national standards. We would remind you that power converters may have a current-limiting effect.

Excitation:

Size	H1	H1	H2	H3, H5, H6	H4	H5
DC output current	6 A	12 A	18 A	25 A	30 A	
max. cross sectional area	6 mm ² / AWG 10	6 mm ² / AWG 10	6 mm ² / AWG 10	6 mm ² / AWG 10	6 mm ² / AWG 10	
min. cross sectional area	1 mm ² / AWG 16	2.5 mm ² / AWG 13	4 mm ² / AWG 11	6 mm ² / AWG 10	6 mm ² / AWG 10	
Tightening torque	1.5 ... 1.7 Nm					

Notes For North American Installations

1. **EMC conformity** is not usually required in North America. In most cases, the section “Notes on EMC” can be bypassed. In this manual, you will see references to DIN, EN and VDE standards. These are European standards and, generally, do not apply to North America. It is, however, the responsibility of the user to determine which standards need to be followed.

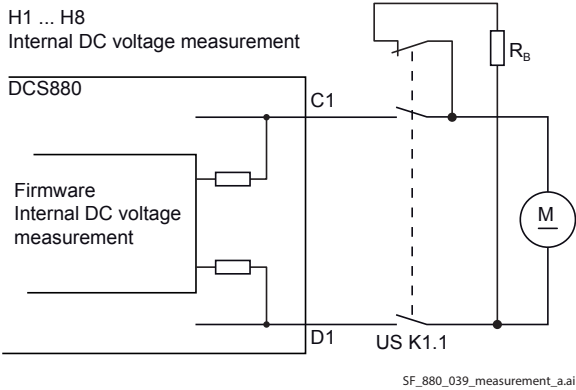
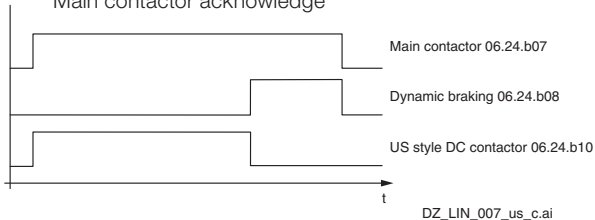
2. If using a DC contactor, you must connect an auxiliary contact to a digital input of your choice and set para. MainContAck accordingly. Set the following parameters:

- 20.34 Mains contactor acknowledge source = D16 (or any input you choose for the DC cont. auxiliary contact)
- 10.24 RO1 source = Close US style DC-Contactor 04.24b10
- 20.33 Mains contactor control mode = DCcontact (3)
- 95.37 DC voltage measurement mode = See table below

Set these parameters AFTER macros are loaded but BEFORE the drive is commissioned. Relay out 1 (XRO1) must be used to turn the DC contactor on and off.

DC contactor US:

DC contactor US K1.1 is a special designed contactor with 2 x NO contacts for C1 and D1 connection and 1 x NC contact for connection of Dynamic Brake resistor RB. The contactor should be controlled by signal 6.24 bit 10. The acknowledge can be connected to parameter: 20.34 Main contactor acknowledge



95.37 DC voltage measurement mode = DC contactor

3. If using Dynamic Braking, the drive allows you to select the stopping method under three different situations. Parameters 21.02, 21.03 and 21.04 select the stopping method for loss of the OnOff, run command (StartStop, Jog1, Jog2, etc.), and E-Stop input, respectively.

Each can be set to:

- Coast stop
- Ramp stop
- Torque limit
- Dynamic braking

In order to command the drive to perform a DB stop, one or more of these parameters must be set to DynBraking. Most users will want the drive to ramp stop when OnOff or a run command (StartStop, Jog1, Jog2, etc.) input is cleared, and dynamically brake when the E-Stop input is cleared. In that case, use the following settings:

- 21.02 Off1 mode = Ramp stop
- 21.04 Stop mode = Ramp stop
- 21.03 Emergency stop mode = Dynamic braking

However, any case is allowed and the final decision is left to the user.

Other parameters control stops during faults. See:

- 31.13 Fault stop mode communication
- 31.14 Stop mode trip level 3
- 31.15 Stop mode trip level 4

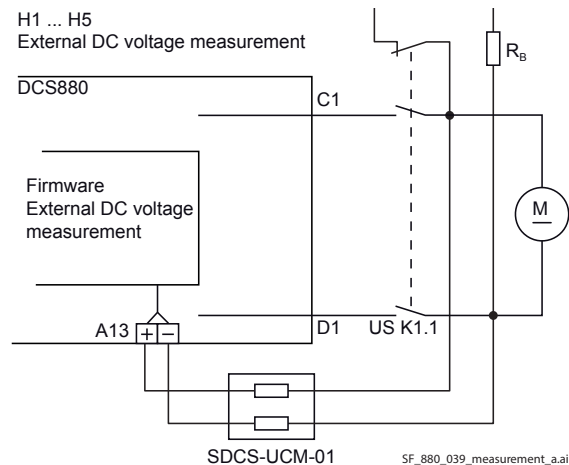
If using EMF feedback with dynamic braking, set:

- 20.44 Dynamic braking delay = t

Where: t = The time (sec) it normally takes the motor to stop during dynamic braking

External motor voltage measurement

In case field weakening is used, external DC voltage measurement at the motor terminals is mandatory. External DC voltage measurement for sizes H1 ... H5 can be made using a SDCS-UCM-01 or a DC-DC transducer. Sizes H6 ... H8 internal DC voltage measurement cables can be rewired to the motor terminals.



95.37 DC voltage measurement mode = AI3 scaled

	Internal	External
	DC volt measurement	DC volt measurement H1 ... H5 via AI3 H6 ... H8 re-wire
20.33 Mains contactor control mode	DC contactor	On
95.37 DC voltage measurement mode	DC contactor	H1 ... H5 = AI3 H6 ... H8 = Manual

Overview of the Installation and Commissioning Process

Step 1:

Check converter for damage. Contact ABB Technical Support if damage is found. In North America, call 1-800-435-7365 (1-800-HELP-365)

Step 2:

Select supporting hardware for the converter:
For specific recommendations for fuses, reactors, and contactors, see the DCS880 hardware manual or technical catalog.

Circuit breaker or disconnect:

$$\begin{aligned} \text{Current rating} &= I_{dc} * 0.816 * 1.25 \text{ (min)} \\ &= I_{dc} * 0.816 * 2.50 \text{ (max)} \end{aligned}$$

Where: I_{dc} = nominal DC motor current

Fuses:

AC Line Fuses: To properly protect the converter, semi-conductor fuses on the incoming AC power line are required in all cases.

DC Output Fuses: Fuses between the motor and the converter are required for all regenerative (4-Q) converters. This is to protect the motor and converter if a commutation fault should occur. NOTE: DC output fuses are the same type and size as AC line fuses.

Line reactor:

All thyristor-based dc converters cause notching in the AC line due to motor commutation. A properly sized line reactor will mitigate the effect on the line. Unless the converter uses a dedicated isolation transformer, each converter requires its own line reactor.

AC or DC contactor:

A contactor is required to safely disconnect the motor from the incoming power when the converter is off. The contactor can be installed between the line and the converter (an AC contactor) or between the converter and the motor (a DC contactor). Do not use both.

IMPORTANT: Other equipment may be necessary depending on application and local codes.

Step 3:

Mount and wire the converter and supporting hardware inside an industrial enclosure with adequate cooling (DCS880 modules have rating of NEMA type OPEN). The following control and signal wiring is required:

- If using an AC contactor, we recommend wiring an auxiliary contact to the digital input you have designated as 20.34 Mains contactor acknowledge source or 20.06 Run/Stop source.
- If using a DC contactor, you must wire an auxiliary contact from the contactor to the digital input you have designated as 20.34 Mains contactor acknowledge source.
- Wire 115 or 230 Vac 1-phase power to terminal block 99 for converter control power.
- Wire 1-phase power to converter for cooling fans. See table and wiring diagrams in this manual.
 - H1 ... H3 frames: Fan internal supplied.
 - H4 frame: use 230 Vac. Fan terminal X2 is on top of the converter.
- Wire tachometer or encoder to terminal block XTAC (tacho) or XENC (encoder).

- Wire analog inputs (e.g., speed reference) and outputs (e.g., meters for motor voltage, current) to terminal block XAI.
- Wire high speed serial interface if needed. (Requires optional fieldbus interface board.)
- The DCS880 allows you to choose the usage of each digital and analog input and output. The converter has factory default settings which can be changed by loading a macro, but some designations are universal. They include:
 - Digital input DI1: Off2 (fast current off)
 - Digital input DI1: On/Off (maintained) or On-Start (pulsed)
 - Digital input DI2: Start/Stop (maintained) or Off-Stop (pulsed)
 - Digital input DI3: Fault reset
 - XR01: DC contactor US
 - XSMC: Main Contactor (AC), On (3 Amps max. at 115 – 230 Vac)
- Other signals may be required depending on your application (e.g., motor fan acknowledge input, Off2 input, fan-on output, brake output).
- You will select the macro and / or choose the configuration for digital and analog inputs and outputs in step 2 of the commissioning process, or by updating group 20 parameters.
- Check all wire terminations (with continuity tester) before proceeding to the next step.

Step 4:

Connect the drive system to incoming power and the motor to the converter (both field and armature) as well as accessory equipment (motor fan, thermal switch, brake, etc.).

- See hardware manual for typical cable size and tightening torque recommendations.
- **IMPORTANT:** Be sure all safety equipment is properly sized for your application

Step 5:

Apply control power to the converter.

- **IMPORTANT:** See section "Safety and Operating Instructions" in this manual before proceeding.
- Apply power to terminal block 99 and X2. The keypad should light up and show the menu screen. The converter fans should start to run (if converter has fans).

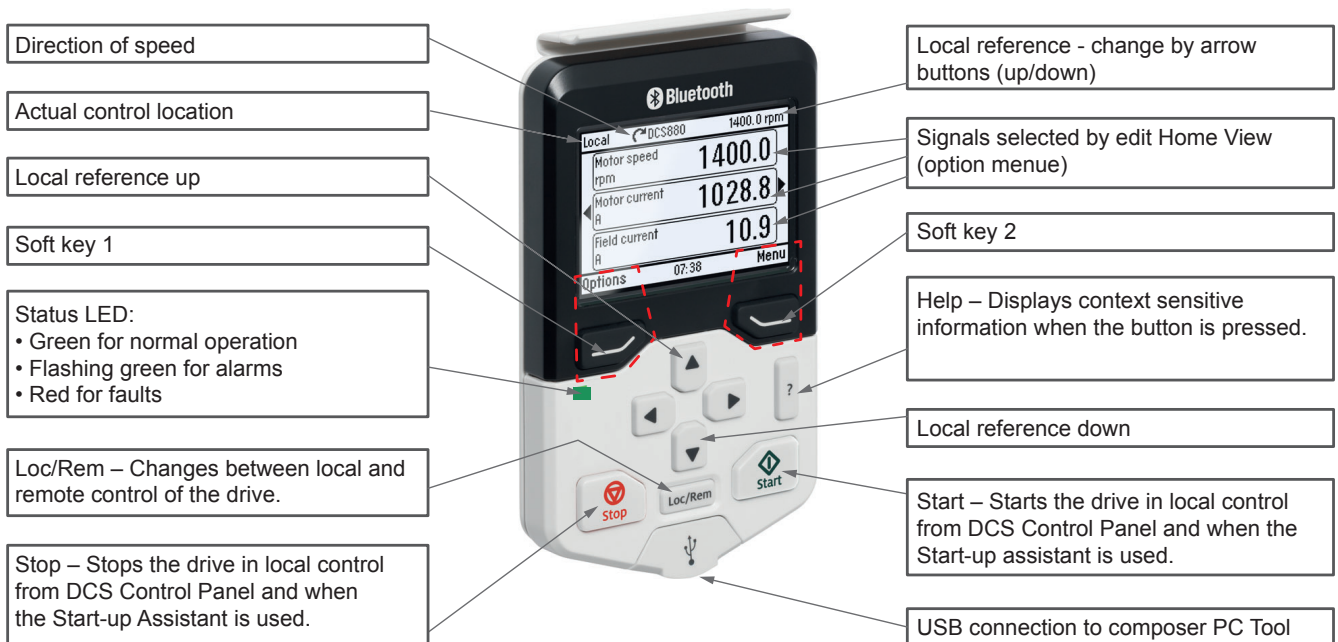
Step 6:

Commission the converter using Drive Composer Pro (preferred) or the control panel.

- **IMPORTANT:** See safety alerts and general instructions in the section "Commissioning" before proceeding.
- Connect DCS880 PC tools of your computer to DCS880.
- If no PC is available, commission your drive using the control panel as follows:
 - On the control panel, press the softkey to select MENU.
 - Using the down arrow, select ASSISTANTS. Then press SELECT.
 - Starting with "BASIC SETUP" for date and time, press SELECT.
 - Second step „DCS880 SETUP“ for name plate data and autotunings, press SELECT.

DCS880 control panel

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



BE_PAN_002_DCS880_overview_a.ai

DCS880 Set up control panel assistant

DCS880 commissioning is supported by assistants available in the control panel.

The digital inputs can be tested by 10.04 DI force data.

The analog inputs can be tested by 12.11 AI1 actual value and AI1 scaled value 12.12 (AI2 = 12.21 and 12.22).

Start commissioning always with date and time setting, follow the assistants and close with parameter backup in the control panel.

General display features

Following modes are available in the MAIN MENU:

1. Basic assistant (menue / assistant)
 - a. Data and time
2. DCS880 assistant (menue / assistant)
 - a. Name plate data
 - b. Autotuning field current controller
 - c. Autotuning armature current controller
 - d. First time motor turning
 - e. Speed feedback assistant
(Tacho fine tuning not available)
 - f. Autotuning speed controller
 - g. Field weakening assistant (only used when maximum speed is higher than base speed)
 - h. Make a back up
3. Parameter backup (menue / parameter backup)

Parameters entered by assistant

- 99.07 M1 used field exciter type
- 99.10 Nominal mains voltage
- 99.11 M1 nominal current
- 99.12 M1 nominal voltage
- 99.13 M1 nominal field current
- 99.14 M1 nominal (base) speed
- 30.11 M1 minimum speed
- 30.12 M1 maximum speed
- 30.19 Minimum torque 1
- 30.20 Maximum torque 1
- 30.35 M1 current limit bridge 1
- 30.34 M1 current limit bridge 2
- 31.30 M1 overspeed trip margin
- 31.44 Armature overcurrent level
- 94.23 OnBoard encoder pulses/revolution
- 94.24 OnBoard encoder type
- 94.25 OnBoard encoder speed calculation mode
- 94.07 M1 tacho type
- 94.08 M1 tacho voltage at 1000 rpm
- 90.41 M1 feedback selection
- 23.12 Acceleration time 1
- 23.13 Deceleration time 1
- 31.58 M1 field current low level
- 28.17 M1 EMF/field control mode

Drive composer PC tool

Drive composer entry

Test DCS880

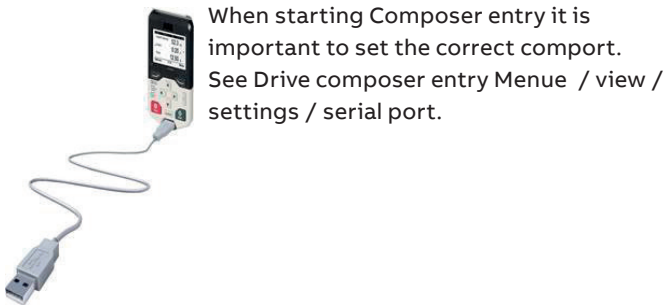
- Parameters
- Adaptive Programming
- System info
- Event logger
- Backup/restore
- Register drive
- Search drive from DIB
- Create service report

Drive composer entry PC tool is the same version for AC and DC drive.

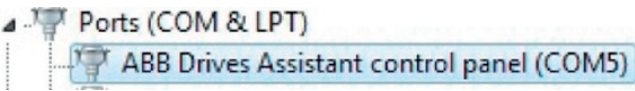
The tool can be downloaded free of charge from ABB internet home page.

Drive composer entry include following function:

Composer entry will be connected at Control Panel USB port:



Please double check the automatic selection of comport of control panel in your computer.

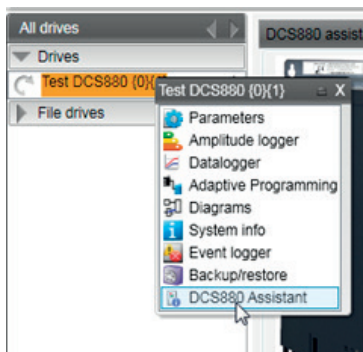


Commissioning assistant

The DCS880 commissioning assistant support easy and fast start up DC drive. Parameter set in correct sequence, auto tunes are activated in correct sequence.

- a. Name plate data
- b. Autotuning field current controller
- c. Autotuning armature current controller
- d. First motor tuning
- e. Speed feedback assistant (Tacho fine tuning not available)
- f. Autotuning speed controller
- g. Field weakening assistant (only used when maximum speed is higher than base speed)
- h. Make a back up

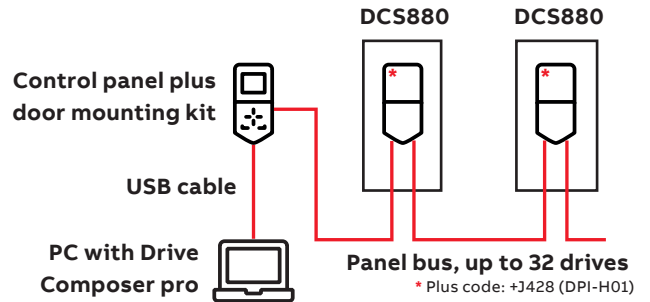
Start the wizard in drive composer



Drive composer pro

The PCTool Drive composer pro offer professional commissioning features:

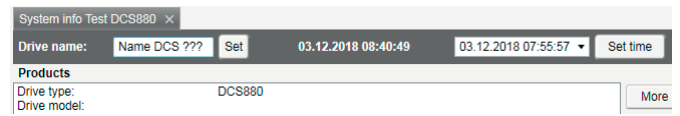
- DCS880 commissioning assistants
- Compare parameter files and parameter sets
- Fast monitoring of signals
- One or more drive can be connected via Control panel USB port (Panel bus) or via Ethernet port FENA21



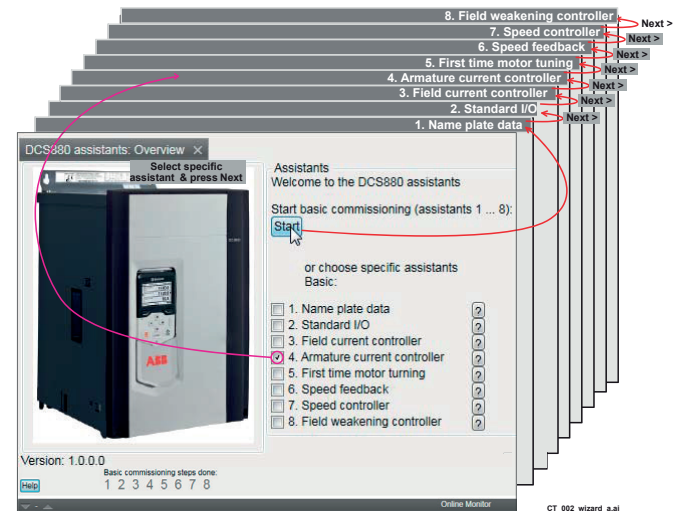
System info menu

With the menue system info the drive name and drive internal clock can be set.

It is important for backup function and makes datalogger handling very easy.



For basic commissioning press the Start button or select a specific assistant:



For more information about the drive composer, parameters, faults and alarms press the Help button!

Parameter groups

Summary of parameter groups

Group	Contents
01 Actual values	Volt, Amps, rpm.
03 Input references	Fieldbus, D2D.
04 Warnings and faults	
05 Diagnostics	Run-time-type counters, bridge temperature.
06 Control and status words	Control status words.
07 System info	Hardware and firmware information.
10 Standard DI, RO	Digital inputs, relay outputs.
11 Standard DIO, FI, FO	
12 Standard AI	Analog inputs.
13 Standard AO	Analog outputs.
14 I/O extension module 1	
15 I/O extension module 2	
16 I/O extension module 3	
19 I/O Operation mode	Speed/torque selection.
20 Start/Stop/Direction	Digital input, Main control word
21 Start/Stop mode	Ramp, coast.
22 Speed reference selection	Analog input, fieldbus
23 Speed reference ramp	
24 Speed reference conditioning	
25 Speed control	
26 Torque reference chain	
27 Armature current control	
28 EMF and field current control	
29 12-pulse/Hardparallel	
30 Control limits	Drive operation limits.
31 Fault functions and fault levels	External events, tripping level.
32 Supervision	
33 Generic timer & counter	Maintenance.
35 Motor thermal protection	Temperature measurement, load curve definition.
36 Load analyzer	
37 User load curve	
40 Process PID	
42 Shared motion (2nd motor)	
44 Mechanical brake control	
45 Energy efficiency	
46 Monitoring/Scaling settings	Speed supervision settings, signal filtering and general scaling settings.

Group	Contents
47 Data storage	Data storage parameters that can be written to and read from using other parameters' source and target settings.
49 Panel port communication	Local time out.
50 Fieldbus adapter (FBA)	Fieldbus communication configuration.
51 FBA A settings	Fieldbus adapter A.
52 FBA A data in	Data sent to fieldbus adapter A to the master (e.g. PLC).
53 FBA A data out	Data read from fieldbus.
54 FBA B settings	Fieldbus adapter B.
55 FBA B data in	Data sent to fieldbus.
56 FBA B data out	Data read from fieldbus.
58 Embedded fieldbus	
60 DDCS Communication	D2D + DDCS port.
61 D2D and DDCS transmit data	Defines the data sent from the drive to the DDCS/D2D link.
62 D2D and DDCS receive data	Defines the data sent from the DDCS/D2D link to the drive.
70 DCSSLink Communication	External extension, 12-pulse
74 ... 89 Application specific groups	
90 Feedback selection	Analog tacho, encoder ...
91 Encoder module settings	Configuration of the encoder interface modules.
92 Encoder 1 configuration	FENxx
93 Encoder 2 configuration	FENxx
94 OnBoard speed feedback configuration	CON-H01 analog tacho and OnBoard encoder.
95 HW configuration	e.g. Type code
96 System	Language selection; access levels; macro selection; parameter save and restore; control board reboot; user parameter sets; unit selection; data logger triggering; parameter; user lock.
99 Motor data	Motor settings, autotuning

Control loops most wanted signals

Optimization of control loop requires comparison of reference and actual values

Input signals

10.01 DI status	b0 digital input DI1 b1 digital input DI2 b2 digital input DI3 b3 digital input DI4 b4 digital input DI5 b5 digital input DI6 b15 digital input DIL
12.11 AI1 actual value	analog input
12.21 AI2 actual value	analog input

Speed control loop

23.03 Speed reference 7	speed reference ramped
90.01 Motor speed for control	speed feedback

Armature current control loop

27.02 Used current reference	
27.05 Motor current	actual value

Safety instructions, drives commissioning



Dangerous voltage warning warns of high voltage which can cause physical injury 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 discharge warning warns of electrostatic discharge which can damage the equipment.

Installation and maintenance work

Warning



- **Only qualified electricians are allowed to install and maintain the drive!**
- Apply always the five safety rules
- Never work on the drive, motor cable or motor when main power is applied.
- Do not work on the control cables when power is applied to the drive or to the external control circuits. Externally supplied control circuits may cause dangerous voltages inside the drive even when the main power on the drive is switched off.

Grounding

Warning



- Ground the drive, motor and adjoining equipment to ensure personnel safety in all circumstances, and to reduce electromagnetic emission and pick-up.
- Make sure that grounding conductors are adequately sized and marked as required by safety regulations.

Notes:

- Power cable shields are suitable as equipment grounding conductors only when adequately sized to meet safety regulations.
- 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.

Mechanical installation

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

Warning



- DCS880 sizes H4 ... H8:
 - The drive is heavy. Lift the drive by lifting lugs only.
 - The drive's center of gravity is high. Do not tilt the unit. The unit will overturn from a tilt of about 6 degrees. An overturning drive can cause physical injury.
 - Do not lift the unit by the front cover.
 - Place units H4 ... H6 only on their back.
- Make sure that dust from drilling does not enter the drive 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

Warning



- Before adjusting the drive and putting it into service, make sure that the motor and all driven equipment are suitable for operation throughout the speed range provided by the drive.
- 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 will neither cause an emergency stop of the motor, nor will the drive 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 via signals "RUN", "drive OFF" or "Emergency Stop" respectively "control panel" or "PC tool".

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. To stop the drive using the control panel, press the Loc/Rem key and then the stop key .

NEC motor overload protection

The DCS800 provides a solid-state motor overload protection in accordance with the NEC. The overload protection (e.g. protection level in percent of full-load motor current) can be adjusted by parameters in group 31 and group 99.

The instructions can be found in chapter Motor thermal model of the DCS800 Firmware manual.

General instructions

- This short commissioning refers to Chapter 5 Connection examples of this publication.
- Safety and operating instructions - see chapter 6 of this publication.
- In accordance with DIN 57 100 Part 727 / VDE 0100 Part 727, precautions must be taken to enable the drive to be shut down, e.g. in the event of danger. The unit's digital inputs or the control panel are not sufficient as the sole measure for this purpose!

Preparations

- Check unit for any damage!
- Install unit and wire it up, connect PE
- Supply voltage level / Rated value correct for electronics and fan?
- Supply voltage level / Rated value correct for armature-circuit converter?
- Supply voltage level / Rated value correct for field supply?
- Wiring / cross-sections, etc. correct?
- EMERGENCY STOP functioning properly?
- COAST STOP functioning properly?

Autotuning warning AF90

Aux codes	Cause and what to do
Autotuning	Check the AUX code (format XXXXXXXY). XXXX specifies the autotuning or assistant. <ul style="list-style-type: none"> • 0001: Field current autotuning. • 0002: Armature current autotuning. • 0003: Speed feedback assistant. • 0004: Speed controller autotuning. • 0006: Flux linearization autotuning. • 0007: Thyristor test. • 0008: Tacho fine tuning. YYYY indicates the problem. Actions see below.
00010001	<ul style="list-style-type: none"> • The drive was stopped before the autotuning finished. • The On command (06.09.b00 Used main control word) was prematurely removed. • Autotuning aborted by a fault. Repeat autotuning until successful.
00010002	Motor is turning. No speed zero indication.
00010003	Armature current not zero.
00010004	Field current autotuning wrongly started in armature drive, please use the field exciter.
00010005	No field exciter selected. See 99.07 M1 used field exciter type.
00010006	Autotuning timeout, On command (06.09.b00 Used main control word) was not set in time.
00010007 ... 0001000A	<ul style="list-style-type: none"> • Measured field current does not reach the field current reference. • No detection of field resistance. • Field circuit open (e.g. not connected) respectively interrupted.
0001000B	Unable to detect a field inductance.
0001000C	Firmware fault. Contact your local ABB representative.
00020002	<ul style="list-style-type: none"> • The drive was stopped before the autotuning finished. • The Run command (06.09.b03 Used main control word) was prematurely removed. • Autotuning aborted by a fault. Repeat autotuning until successful.
00020003	Autotuning timeout, Run command (06.09.b03 Used main control word) was not set in time or is missing.
00020004	<ul style="list-style-type: none"> • Invalid nominal armature current setting. • Armature current 99.11 M1 nominal current is set to zero.
00020005	Motor is turning. No speed zero indication.
00020006	Armature circuit and/or armature voltage measurement circuit wrongly connected (e.g. at C1/D1 or at the SDCS-PIN-H51).
00020007	No load connected to armature circuit.
00020008	Armature voltage measurement circuit open (e.g. not connected at C1/D1 or at the SDCS-PIN-H51) or interrupted. This can be checked by measuring the motor resistance at C1/D1 and the SDCS-PIN-H51. Check also current and torque limits.
00020009	Firmware fault. Contact your local ABB representative.
00030001	<ul style="list-style-type: none"> • The drive was stopped before the autotuning finished. • The Run command (06.09.b03 Used main control word) was prematurely removed. • Autotuning aborted by a fault. Repeat autotuning until successful.
00030002	Tuning of speed controller, speed feedback assistant or tacho fine-tuning not possible due to speed limitation - see 30.11 M1 minimum speed and 30.12 M1 maximum speed.
00030003	Tuning of speed controller, speed feedback assistant or tacho fine-tuning not possible due to voltage limitation. During the tuning of the speed controller, the speed feedback assistant or the tacho fine-tuning base speed, 99.14 M1 nominal (base) speed, might be reached. Thus full armature voltage, 99.12 M1 nominal voltage, is necessary. In case the mains voltage is too low to provide for the needed armature voltage the autotuning procedure is canceled. Check and adapt if needed: <ul style="list-style-type: none"> • 99.10 Nominal mains voltage. • 99.12 M1 nominal voltage. • 99.14 M1 nominal (base) speed.

Aux codes	Cause and what to do
00030004	Autotuning timeout, Run command (06.09.b03 Used main control word) was not set in time or is missing.
00030005	Motor could not accelerate to base speed. Decrease 23.12 Acceleration time 1 to get more torque and current. Increase torque step or decrease speed step. See 25.38 Autotune torque step and 25.39 Autotune speed step.
00030006	Tacho adjustment faulty or not OK or the tacho voltage is too high during autotuning.
00040001	<ul style="list-style-type: none"> • The drive was stopped before the autotuning finished. • The Run command (06.09.b03 Used main control word) was prematurely removed. • Autotuning aborted by a fault. Repeat autotuning until successful.
00040002	Autotuning timeout, Run command (06.09.b03 Used main control word) was not set in time or is missing.
00040003	Tuning of speed controller, speed feedback assistant or tacho fine-tuning not possible due to speed limitation - see 30.11 M1 minimum speed and 30.12 M1 maximum speed.
00040004 ... 00040006 00040007	<ul style="list-style-type: none"> • Motor is turning. No speed zero indication. Motor could not decelerate with full autotuning torque. Decrease 23.13 Deceleration time 1 to get more torque and current. Decrease torque step or speed step. See 25.38 Autotune torque step and 25.39 Autotune speed step.
00040008	Armature current not zero.
00040009	Tuning of speed controller, speed feedback assistant or tacho fine-tuning not possible due to voltage limitation. During the tuning of the speed controller, the speed feedback assistant or the tacho fine-tuning base speed, 99.14 M1 nominal (base) speed, might be reached. Thus full armature voltage, 99.12 M1 nominal voltage, is necessary. In case the mains voltage is too low to provide for the needed armature voltage the autotuning procedure is canceled. Check and adapt if needed: <ul style="list-style-type: none"> • Mains voltage • 99.12 M1 nominal voltage • 99.14 M1 nominal (base) speed
0004000A	Required torque reference could not be reached before the drive reached base speed. Decrease torque step or increase speed step. See 25.38 Autotune torque step and 25.39 Autotune speed step.
0004000B	Drive is not in speed control mode. See 19.01 Actual operation mode.
0004000C	Motor could not accelerate to base speed. Decrease 23.12 Acceleration time 1 to get more torque and current. Increase torque step or decrease speed step. See 25.38 Autotune torque step and 25.39 Autotune speed step.
0004000D	No writing of control parameters of speed controller possible.
0004000E	Firmware fault. Contact your local ABB representative.
00060001	<ul style="list-style-type: none"> • The drive was stopped before the autotuning finished. • The Run command (06.09.b03 Used main control word) was prematurely removed. • Autotuning aborted by a fault. Repeat autotuning until successful.
00060002	Autotuning timeout, Run command (06.09.b03 Used main control word) was not set in time or is missing.
00060003	Field weakening not allowed. See 90.41 M1 feedback selection and 28.41EMF/Field control mode.
00060004	Motor is turning. No speed zero indication.
00060005	Drive is not in speed control mode. See 19.01 Actual operation mode.
00060006	Requested speed was not reached after 300 seconds.
00060007	Wrong order of measurement results in the flux linearization parameters. See 28.31 Field current at 40 % flux, 28.32 Field current at 70 % flux and 28.33 Field current at 90 % flux.
00060008	Firmware fault. Contact your local ABB representative.

Environmental conditions

System connections

Voltage, 3-phase:	100 ... ≤ 1000 V acc. to IEC 60038
Voltage deviation:	±10 % continuous; ±15 % short-time *
Rated frequency:	50 Hz or 60 Hz
Static frequency deviation:	50 Hz ± 2 %; 60 Hz ± 2 %
Dynamic: frequency range:	50 Hz ± 5 Hz; 60 Hz ± 5 Hz
df/dt:	17 % / s

* = 0.5 ... 30 cycles

Please note: Special consideration must be taken for voltage deviation in regenerative mode.

Degree of protection

Converter module and options (line IEC: IP 00; UL: open type chokes, fuse holder, field exciter, etc.):

Overvoltage category (IEC 60664-1) (all inputs): III

Protective class (IEC 61800-5-1): I

Paint finish

Converter module: Body RAL 7012;
Cover RAL 9017 & RAL 9002

Enclosed converter: Light grey RAL 7035

Environmental limit values

Permissible cooling air temp.	
- at converter module air inlet:	0 ... +55°C
with rated DC current:	0 ... +40°C
with different DC current:	+30 ... +55°C
- Options:	0 ... +40°C
Relative humidity (at 5...+40°C):	5 ... 95 %, no condensation
Relative humidity (at 0...+5°C):	5 ... 50 %, no condensation
Change of the ambient temp.:	< 0.5°C / minute

Storage temperature: -40 ... +55°C

Transport temperature: -40 ... +70°C

Pollution degree (IEC 60664-1, IEC 60439-1): 2

Site elevation

< 1000 m above M.S.L.: 100 %, without current reduction
> 1000 m above M.S.L.: with current reduction,

Permissible supply systems: IT, TN, TT (neutral earthed),
IT (corner earthed),
TT (corner earthed)

Sound pressure level and vibration

Size	Sound pressure level LP (1 m distance)		Vibration
	as module	enclosed conv.	
H1	55 dBA	68 dBA	3 mm, 2 ... 9 Hz 1 g, 9 ... 200 Hz
H2	55 dBA	72 dBA	
H3	60 dBA	78 dBA	
H4	66 dBA	77 dBA	
H5	66 dBA	-	

North American Standards

In North America the system components fulfil the requirements of the table below

Rated supply voltage	Standards	
	Converter module	Enclosed converter
to 990 V	UL 61800-5-1 Power Conversion Equipment CSA C 22.2 No. 274-13 Industrial Control Equipment, Industrial Products Available for converter modules including field exciter units. Types with UL mark: • see UL Listing www.ul.com/ certificate no. E196914 • or on request	UL/CSA types: on request

User macros

ABB Standard

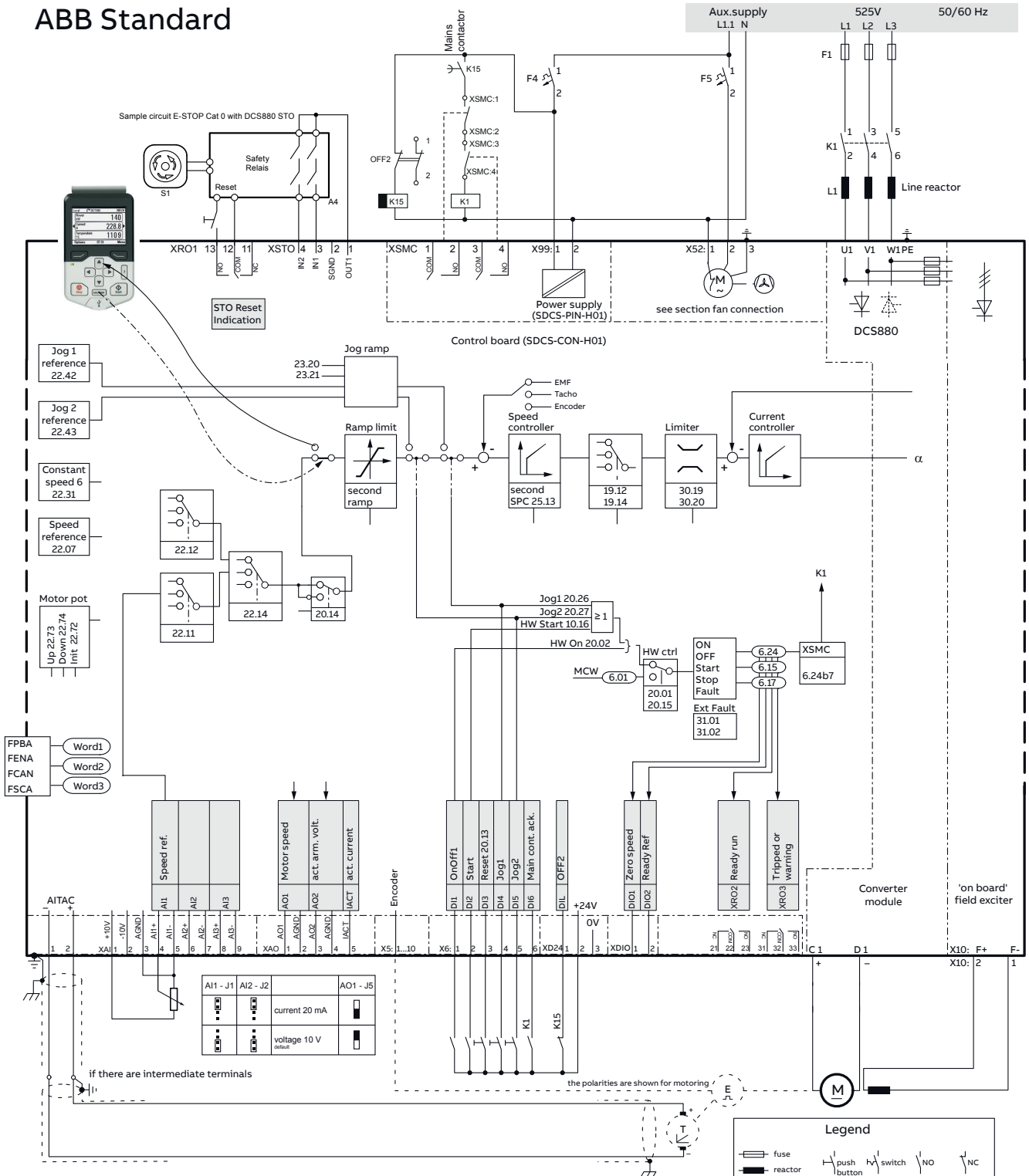
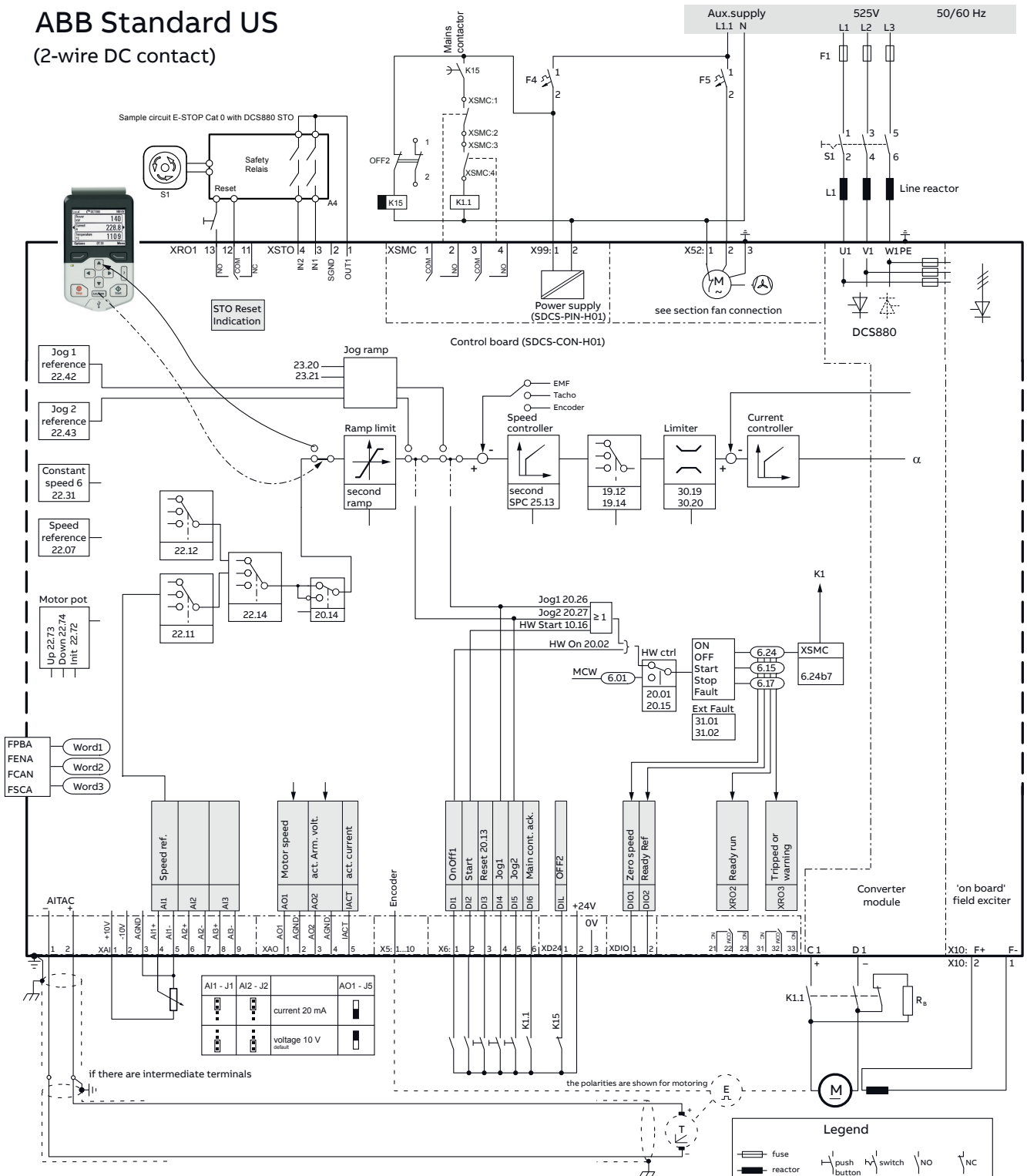
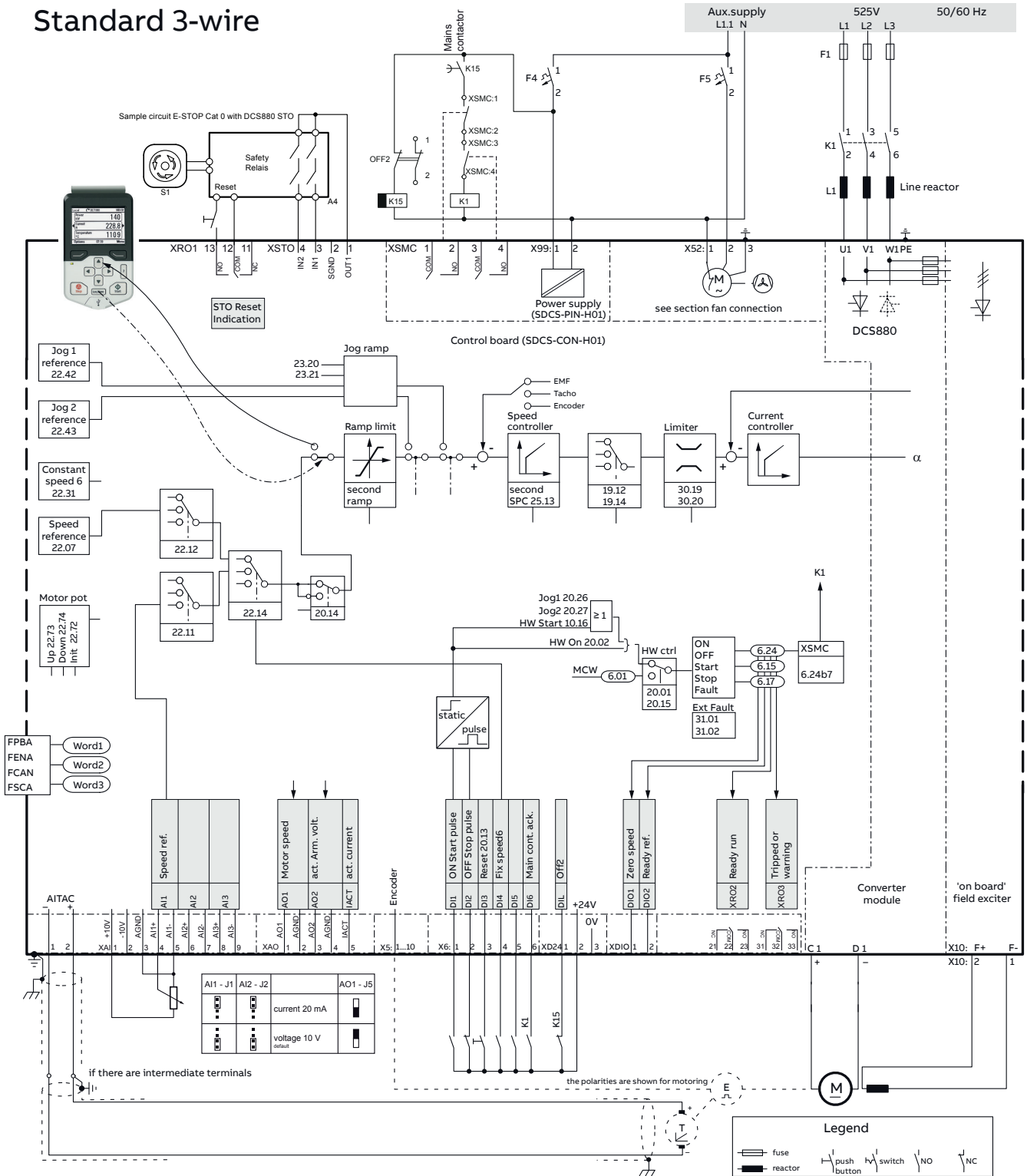


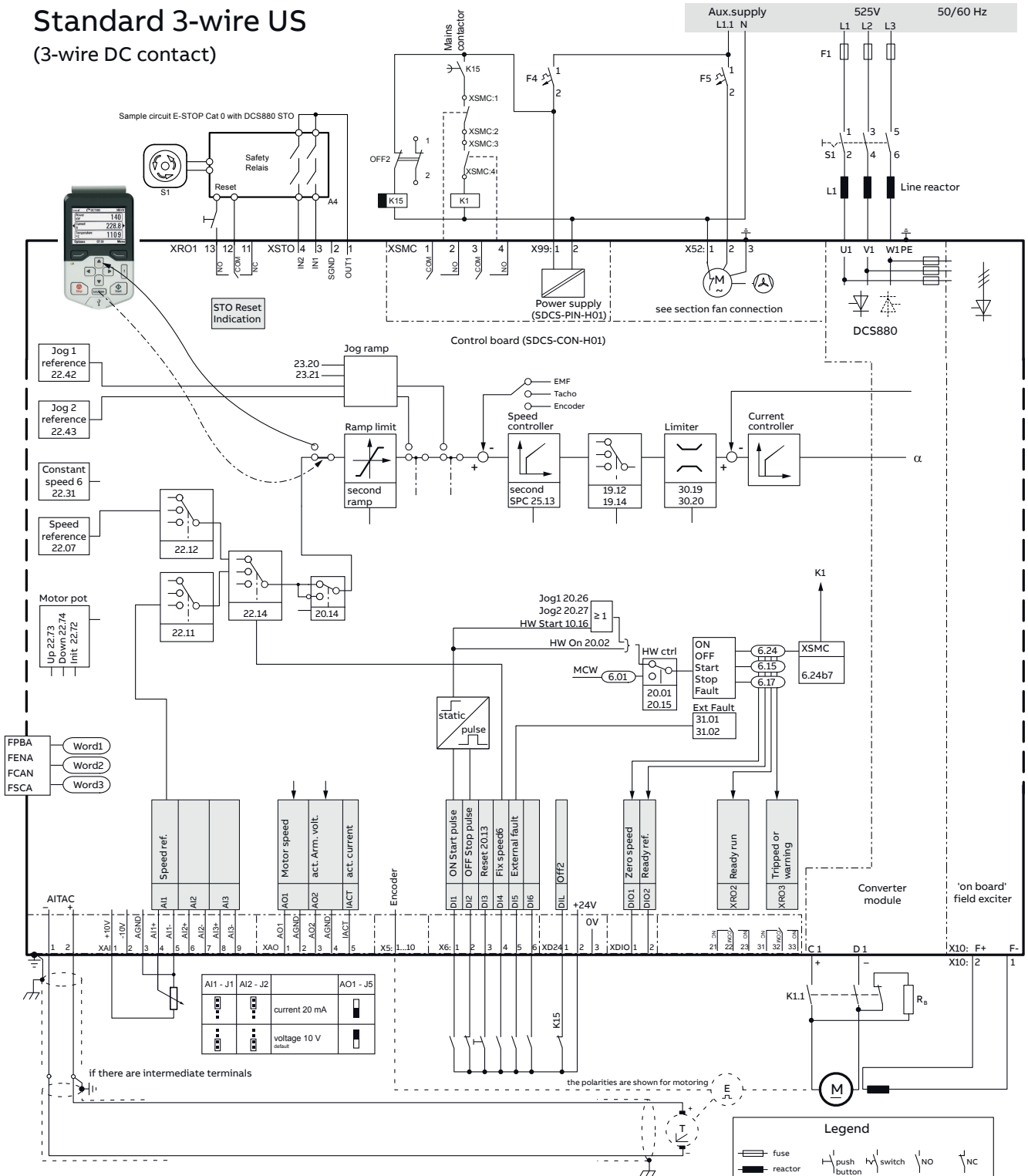
ABB Standard US (2-wire DC contact)



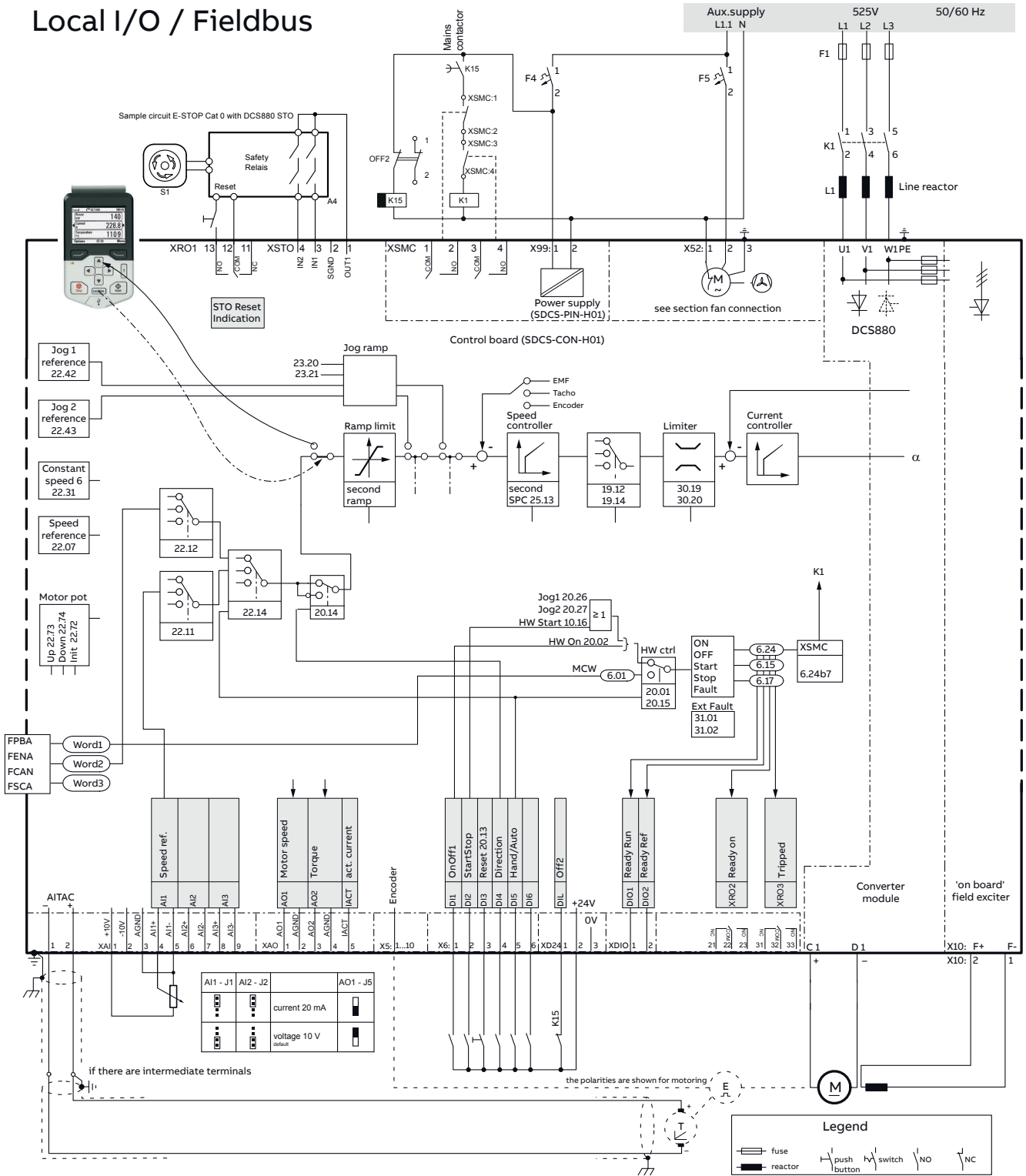
Standard 3-wire



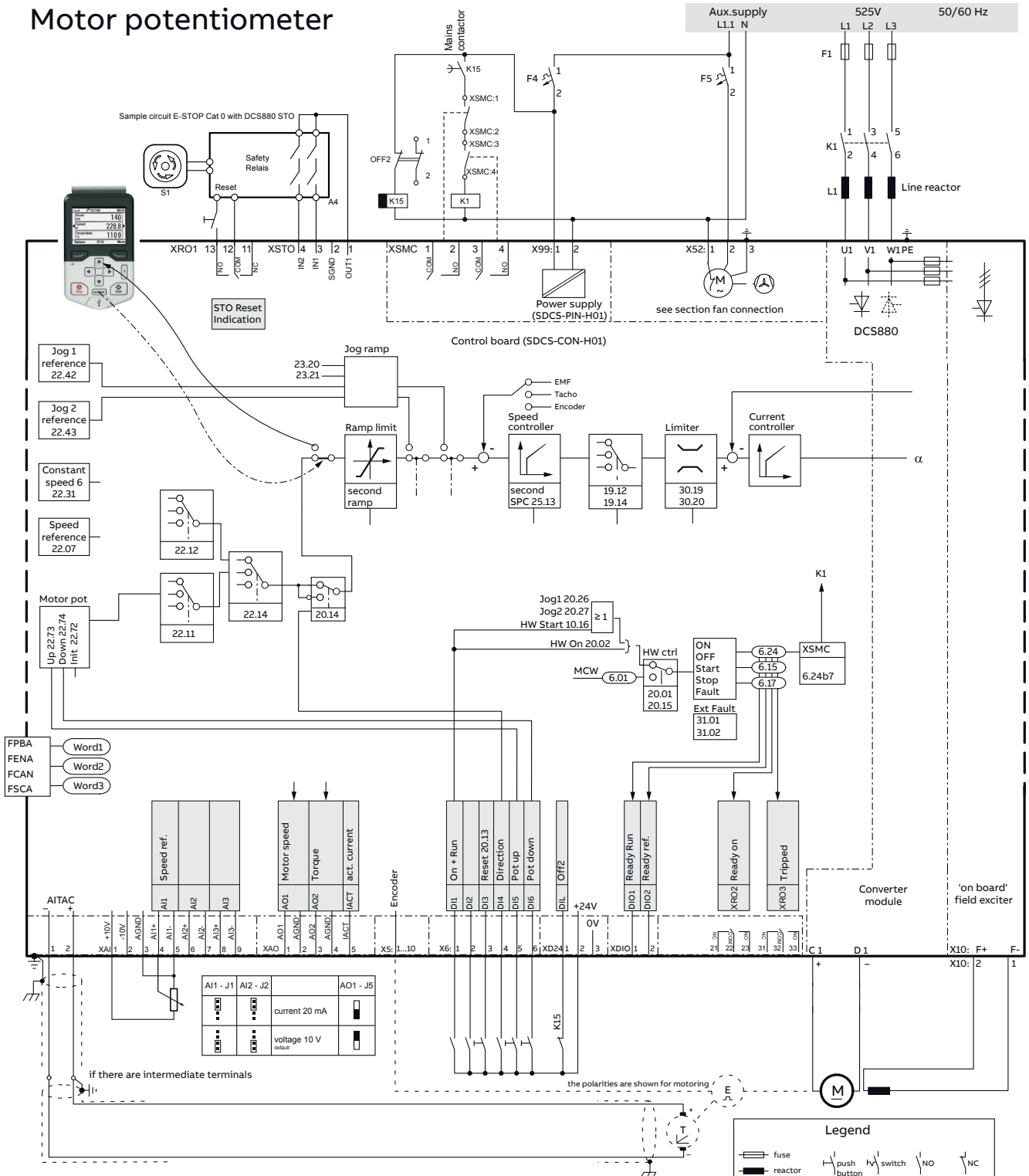
Standard 3-wire US (3-wire DC contact)



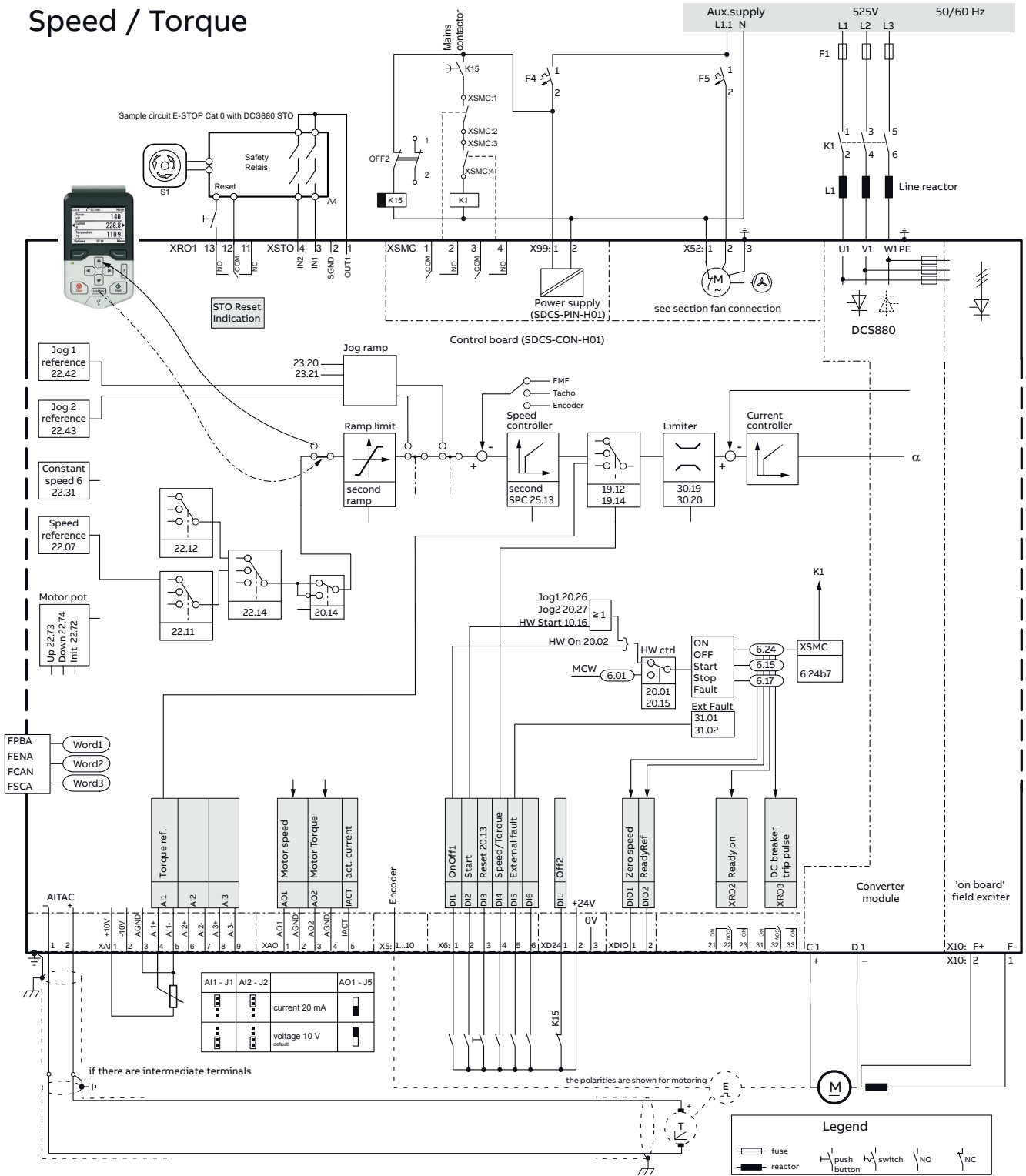
Local I/O / Fieldbus



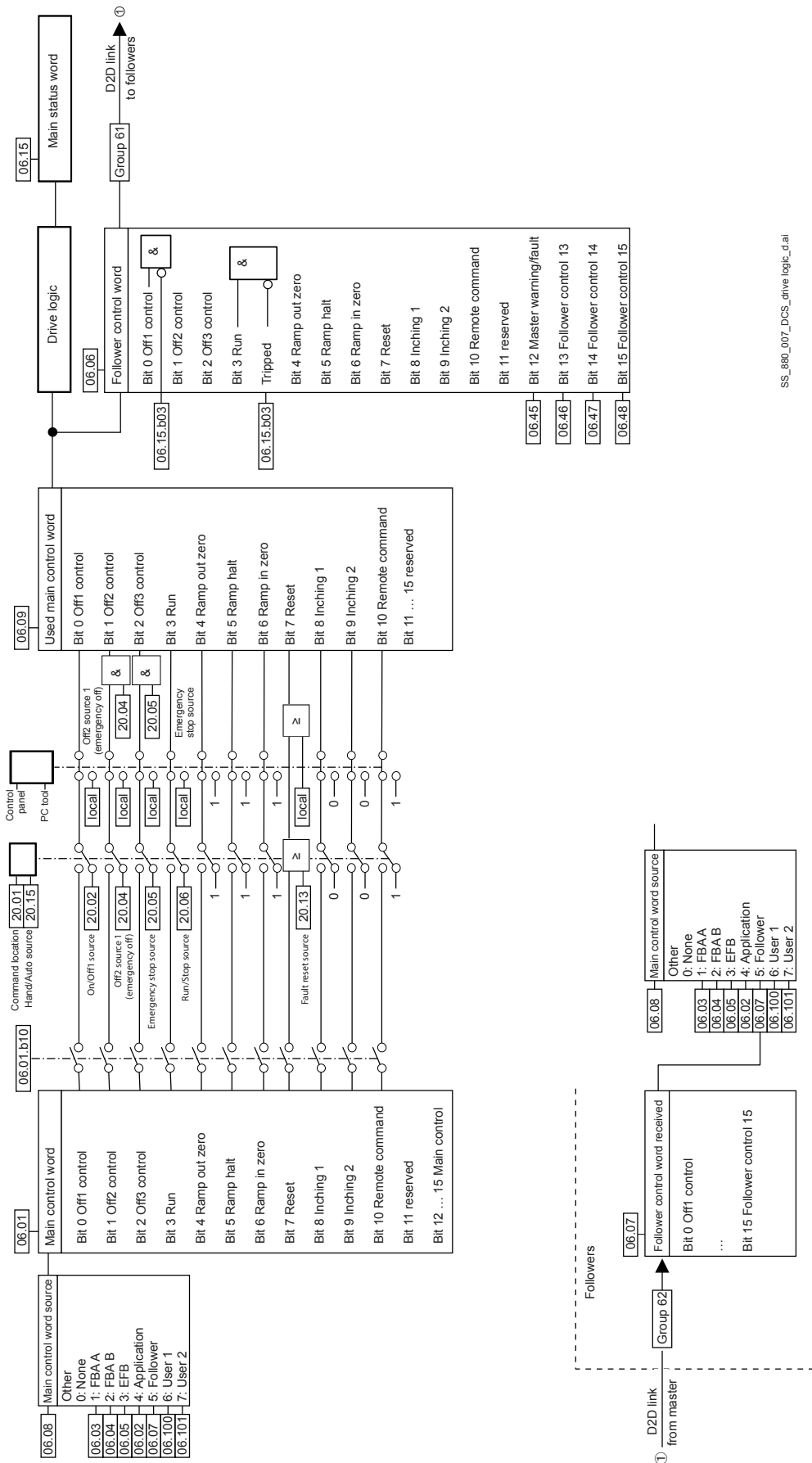
Motor potentiometer



Speed / Torque



Drive logic and main control word

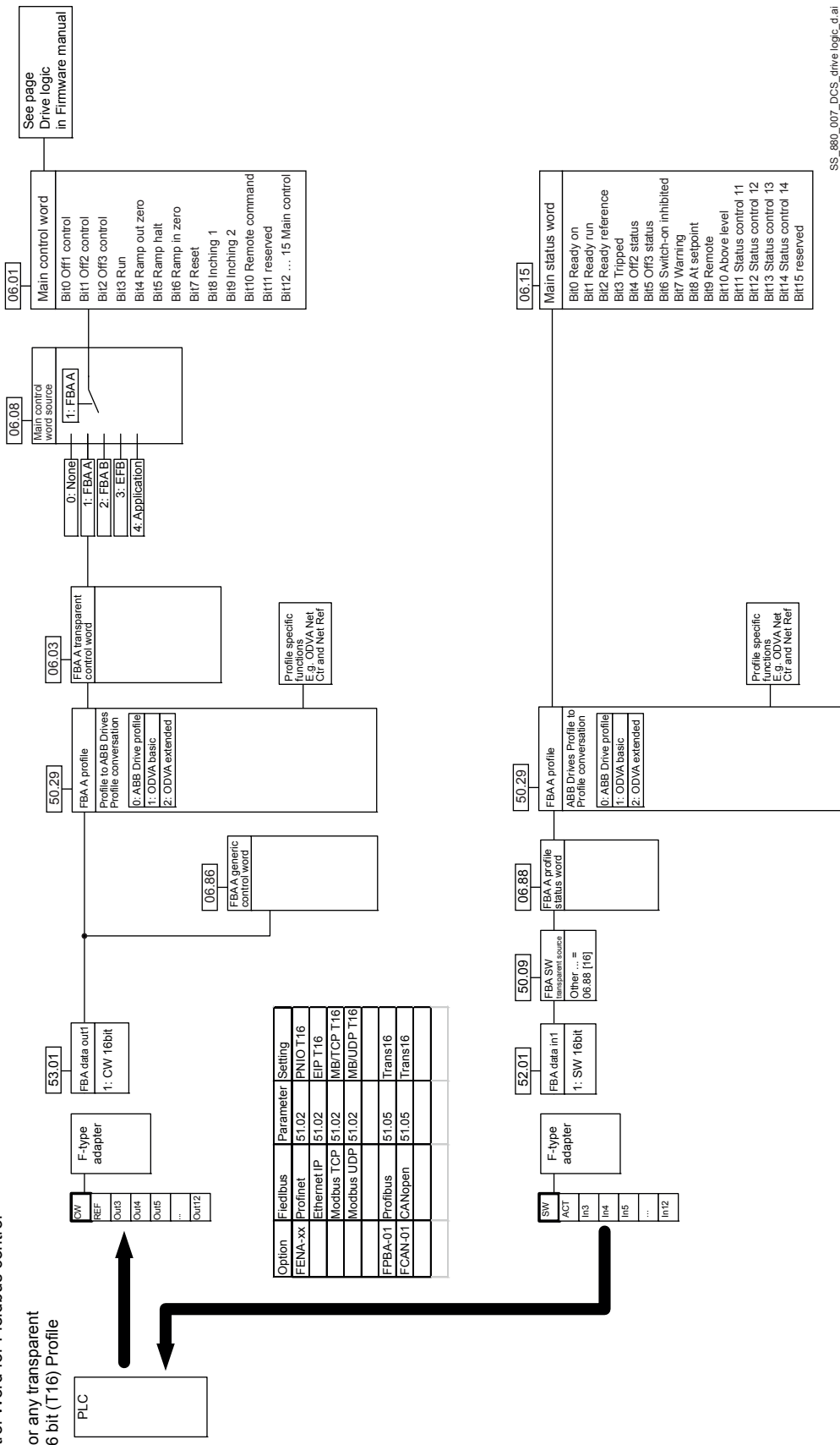


SS_880_007_DCS_drive logic_d1.ai

Fieldbus control

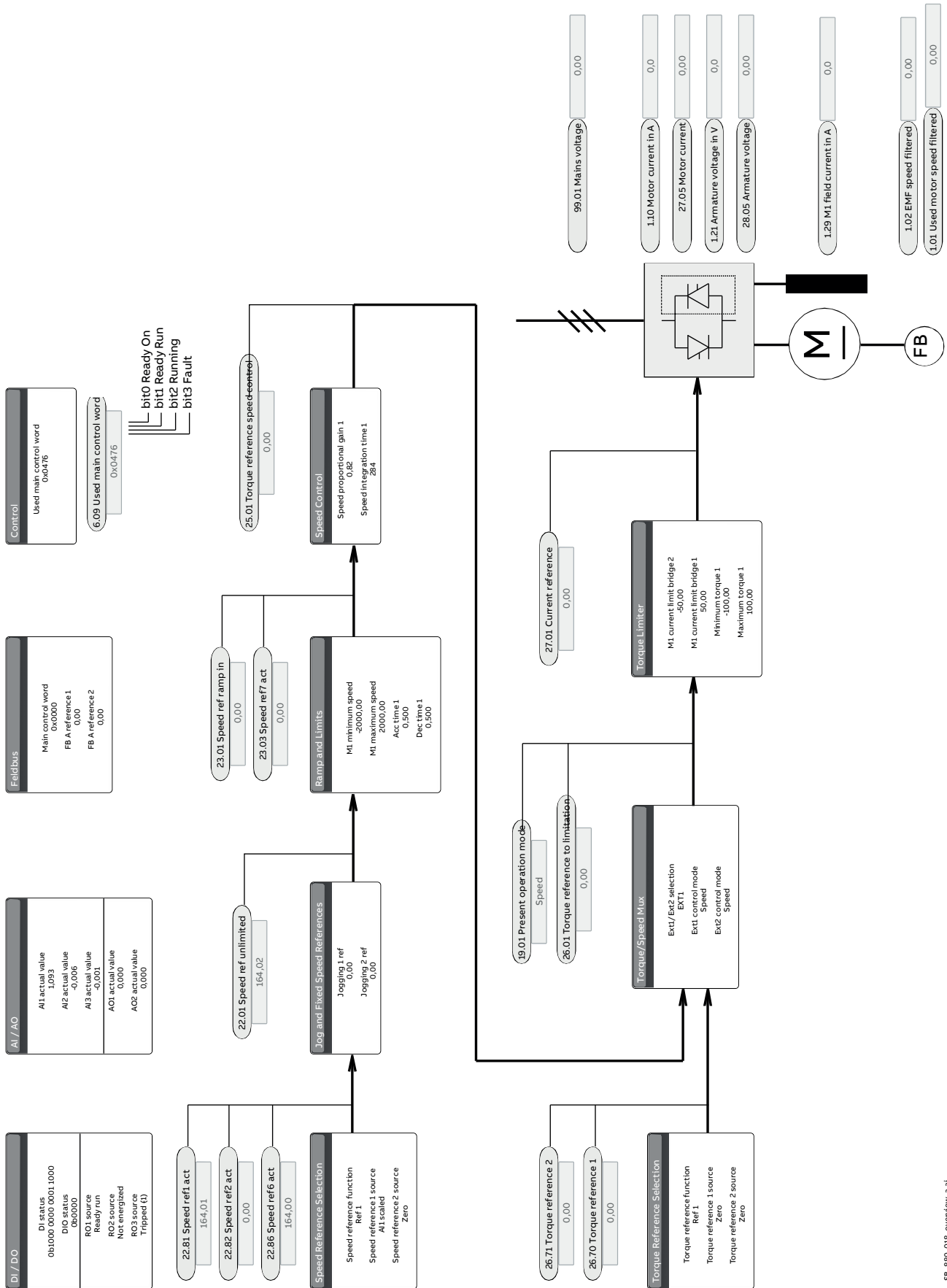
Status and Control Word for Fieldbus control

For any transparent 16 bit (T16) Profile



SS_880_007_DCS_drive_logic_dal

Overview control (Drive composer printout)



Declarations



Declaration of Conformity

(Directive 2011/65/EU [RoHS II Directive])

Document code: 3ADW000483R0101

We, ABB Automation Products GmbH
Wallstadter Str. 59
D-68526 Ladenburg, Germany

herewith declare under our sole responsibility, that the product series

DCS 880 Converter Module

to which this declaration relates, do not contain substances which are restricted by Directive 2011/65/EU on the Restriction of the Use of Certain Hazardous Substances in EEE (RoHS II).

This declaration is given based on and subject to declarations of RoHS II conformity received by ABB Automation Products GmbH from its component suppliers. ABB Automation Products GmbH shall not assume any liability whatsoever for RoHS II non-compliance of the product as a result of or in connection with any faulty or misleading declaration of RoHS II conformity issued to ABB Automation Products GmbH by a supplier.

The product referred in this Declaration of Conformity fulfil the relevant provisions of other European Union Directives which are notified in Single EU Declaration of Conformity, see 3ADW00484.

Year of CE-marking: 2016

Ladenburg, 21.10.2016



Holger Kröhler
Local Division IMS Manager
Wallstadter Str.59, D-68526 Ladenburg



Bernd Schmalenberger
Local Operation Manager
Wallstadter Str.59, D-68526 Ladenburg

This declaration does not express any assurance of characteristics.
Installation and safety instructions mentioned in our installation manual must be obeyed.
The conformity was tested in a typical configuration.



Declaration of Conformity

(DIRECTIVE 2014/35/EU [Low Voltage Directive])
(DIRECTIVE 2014/30/EU [EMC Directive])

Document code: 3ADW000478R0201

We, ABB Automation Products GmbH
Wallstadter Str. 59
D-68526 Ladenburg, Germany

herewith declare under our sole responsibility, that the product series

DCS 880 Converter Module

to which this declaration relates, is a BDM / CDM according EN 61800-1:1998 [IEC 61800-1:1997].

It is in conformity with the Low Voltage Directive (LVD) 2014/35/EU and the EMC Directive (EMCD) 2014/30/EU, provided that the equipment is selected, installed and used according our instructions.

Following European standards have been applied:

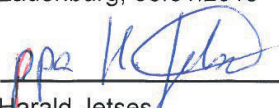
- EN 61800-5-1:2007 [IEC 61800-5-1:2007]
*Adjustable speed electrical power drive systems –
Part 5-1: Safety requirements – Electrical, thermal and energy*
- EN 61800-3:2004 + A1:2012 [IEC 61800-3:2004 + A1:2011]
*Adjustable speed electrical power drive systems –
Part 3: EMC requirements and specific test methods*

Year of CE-marking: 2016

This declaration is based on Technical Construction File, code 3ADT061070. It is provided, that instructions for installation, operation and maintenance are according the product documentation.

The product referred in this Declaration of Conformity fulfil the relevant provisions of other European Union Directives which are notified in Single EU Declaration of Conformity, see 3ADW000484.

Ladenburg, 08.01.2018


Harald Jetses
Local Product Group Manager
Wallstadter Str.59, D-68526 Ladenburg


Holger Kröhler
Local R&D Manager
Wallstadter Str.59, D-68526 Ladenburg

This declaration does not express any assurance of characteristics.
Installation and safety instructions mentioned in our installation manual must be obeyed.
The conformity was tested in a typical configuration.

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 ... 1,600 V_{DC}
230 ... 1,000 V_{AC}
IP00

- Safe torque off (STO) built in as standard
- Compact and robust
- Single drives, 20 A to 5,200 A, up to 1,600 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



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



DCT880 modules Thyristor 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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www.abb.com/dc-drives
www.abb.com/drivespartners

