DCS800

Quick guide
DCS800 Drives (20 A to 5200 A)

ABB

DCS800 Quick Guide

english

Contents

Standard Features

- compact
- highest power ability
- simple operation
- comfortable assistants, e.g. for autotuning or commissioning
- scalable to all applications
- free programmable by means of integrated IEC61131-PLC

DCS800 DC Drives

Technical data

Mains supply volt.	230...1,200 V, +/–10 %, 3~
Frequency	50...60 Hz, +/–5 Hz
Electronics supply	115...230 V, –15 % / +10 %, 1~
DC Output current	20...5,200 A
Overload capability	200 %

Ambient conditions

Ambient temperat.	0° ... +40° C 40° ... 55°C with reduction
Storage temperat.	–40° ... +55° C
Transport temper.	–40° ... +70° C
Relative humidity	5 ... 95 %, not condensing (max. 50 % betw. 0°...5° C)
Pollution degree	Class 2
Protection class	IP 00
Altitude	< 1,000 m height above sea level: nominal Current > 1,000 m height above sea level: with reduction

I/O

Digital inputs: 8 standard, up to 14 optional
Digital outputs: 8 standard, up to 12 optional
Analog inputs: 4 standard +/– 10 V; 0/2…10 V, up to 8 optional +/ 20 mA; 0/4…20 mA
Analog outputs: 3 standard (1x I$_{act}$) +/-10 V; 0/2…10 V, up to 7 optional –20 mA; 0/4…20 mA

PC-Tools

DriveWindow Light: free of charge with every converter, Standard RS232 PC-connection
DriveWindow: Real-time optical connection
ControlBuilder DCS800: IEC61131 programming tool
DriveSize: Converter- and motor dimensioning

Maintenance / Diagnosis

Remote diagnosis with any Internet-PC worldwide
• with internet browser / internet explorer
• or with DriveWindow full drive control via OPC

Approvals CE c(UL)us

Adaptive Programming

pre-defined drive-specific function blocks, e.g.
• Free process controller (PI-Controller)
• I/O- and digital Operations
With control panel or PC-Tool, no need for additional hardware

Speed Feedback

EMF
Analogue tacho
Encoder
2nd Encoder possible (RTAC)

Communication

Serial communication
• Ethernet
• CANopen
• ControlNet
• Modbus
• CS31
• Selma2
• Profibus
• DeviceNet
• DDCS
• AF100
Industrial IT© enabled

DCSLink Peer-to-Peer

• up to 800 kBaud, < 2.5 ms
• Master-Follower
• Armature-fieldconverter
• Free selectable data

High Current Solutions

• 12-pulse up to 20,000 A, serial and parallel
• Hard parallel and sequential
• up to 1,500 V

Protections

Speed feedback monitoring • Temperature • Overload • Over speed • Motor stalled • Motor over current • Motor over voltage • Field over current • Field over voltage • Minimum field current • Zero speed • Armature current ripple • Mains over- and under voltage

Integrated IEC 61131-PLC

• Open standard programming tool ControlBuilder DCS800
• Support of all five IEC-languages
• Drive-specific function blocks
• Saving of program and source in Memory Card
• Online debugging and forcing

Current ratings, dimensions

Unit size	2-Q rated Current DCS800-01 I$_{DC}$[A]	4-Q rated Current DCS800-02 I$_{DC}$[A]	Supply voltage [V$_{AC}$]								max. field current internal [A$_{DC}$]	Dimensions h x w x d [mm]	h x w x d [inch]
			400	500	525	600	690	800	990	1200			
D1	20	25	●		●						6	310 x 270 x 200	12.25 x 10.65 x 7.90
	45	50	●		●								
	65	75	●		●								
	90	100	●		●								
	125	140	●		●								
D2	180	200	●		●						15	310 x 270 x 270	12.25 x 10.65 x 10.65
	230	260	●		●								
D3	315	350	●		●	● 3)					20	400 x 270 x 310	15,75 x 10,65 x 12,25
	405	450	●		●								
	470	520	●		●								
D4	610	680	●		●	● 3)					25	580 x 270 x 345	22.85 x 10.65 x 13.60
	740	820	●		●								
	900	1000	●		●								
D5	900	900				●	●				25	1050 x 510 x 410	41.35 x 20.10 x 16.15
	1200	1200	●	●									
	1500	1500	●	●		●	●						
	2000	2000	●	●		○ 1)	○ 1)						
D6	1900	1900						●			external field 35/60A, 1~ 520A, 3~	1750 x 460 x 410	68.90 x 18.15 x 16.15
	2050	2050		●		●	●						
	2500	2500	●	●		●	●	●					
	3000	3000	●	●		●	●	●					
D7	2050	2050							●		external field 35/60A, 1~ 520A, 3~	1750 x 760 x 570	68.90 x 29.95 x 22.45
	2600	2600							●	○ 2)			
	3300	3300	●	●		●	●	●	●	○ 2)			
	4000	4000	●	●		●	●	●	●				
	4800	4800				●	●	●					
	5200	5200	●	●									

○ 1) only available as 2-Q drive   ○ 2) on request   ● 3) 600V
2-Q -> 290 A / 590 A
4-Q -> 320 A / 650 A

Notes, brief instructions for 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 **CD-ROM** in addition to this brief documentation. The CD-ROM is part of this document and features the following contents:

Documentation

Our documentation is basically structured according to the following system:

Technical catalogue
as comprehensive information to engineer complete DC drive systems.

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

Service Manual
for maintenance and repair of the converters.

Additional **information about applications** (e.g. 12-pulse) and **technical accessories** (e.g. Hardware extension or Field bus interfaces) handled by separate manuals see *table DCS800 Drive manuals*.

System requirements to use the CD-ROM

- Operating system WINDOWS 2000, XP
- ACROBAT READER 4.0 is sufficient (we recommend 8.0 - included on the CD-ROM)

In case the CD ROM does not start automatically please double-click on **Setup.exe**.

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

you'll find abundant information for
- DC products
- service support
- the latest updates
- tools
- downloads, etc.

Please don't hesitate to visit us.

Contacts
If you require any further information, please contact your nearest **ABB Drives** office or send an email to:
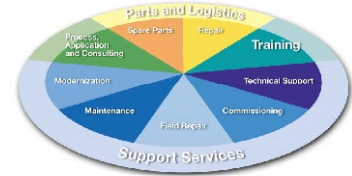
DC-Drives@de.abb.com

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

ABB Drive Service

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:

- The same service products are globally available.
- Consistent way of sales and delivery globally.
- Consistency in global agreements.
- Consistent and high quality service around the world.

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

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	+1 51 48 32 65 00
China	ABB China Ltd	BEIJING	+86 10 84 56 66 88
Czech Republic	ABB S.R.O.	PRAHA	+42 2 22 83 23 60
Finland	ABB Oy Service	KUUSANKOSKI	+35 8 10 22 51 00
Finland	ABB Oy Product Service	HELSINKI	+35 8 10 22 20 00
Finland	ABB Oy Service	NOKIA	+35 8 10 22 51 40
France	ABB Automation ABB Process Industry	MASSY MONTLUEL	+33 1 64 47 64 26 +33 4 37 40 40 00
Germany	ABB Process Industries	MANNHEIM	+49 18 05 12 35 80
Greece	ABB SA	METAMORPHOSSIS	+30 1 02 89 16 51
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New Zealand	ABB Service ltd	AUCKLAND	+64 92 76 60 16
Poland	ABB Centrum IT Sp.zo.o	WROCLAW	+48 4 26 13 49 62
Russia	ABB Automation LLC	MOSCOW	+7 09 59 56 05 44
Switzerland	ABB AG	DÄTTWIL	+41 5 85 86 87 86
Singapore	ABB Industry Pte Ltd	SINGAPORE	+65 67 76 57 11
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Venezuela	ABB S.A.	C R C S	+58 (0) 22 38 24 11 / 12

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DCS800 Drive Manuals

	Public. number	Language					
		E	D	I	ES	F	CN
DCS800 Quick Guide	3ADW000191	x	p	p	p	p	
DCS800 Tools & Documentation CD	3ADW000211	x					
DCS800 Converter module							
Flyer DCS800	3ADW000190	x	x	p	x	p	p
Technical Catalogue DCS800	3ADW000192	x	x	x	x	p	x
Hardware Manual DCS800	3ADW000194	x	x	p	p	p	p
Firmware Manual DCS800	3ADW000193	x	p	p	p	p	p
Installation according to EMC	3ADW000032	x					
Technical Guide	3ADW000163	x					
Service Manual DCS800	3ADW000195	x	p				
Planning and Start-up for12-Pulse converters	3ADW000196	p					
CMA-2 Board	3ADW000136	p					
Flyer Hard - Parallel	3ADW000153	p					
Drive Tools							
DriveWindow 2.x - User's Manual	3BFE64560981	x					
DriveOPC 2.x - User's Manual	3BFE00073846	x					
Optical DDCS Communication Link	3AFE63988235	x					
DDCS Branching Units - User´s Manual	3BFE64285513	x					
DCS800 Applications							
PLC Programming with CoDeSys	CoDeSys_V23	x	x			x	
61131 DCS800 target +tool description - Application Program	3ADW000199	x					
Winding with the DCS 800XXXXX	3ADW000058						
Winder application description							
Flyer magnetic application							
Magnetic application description							
DCS800-E Panel Solution							
Flyer DCS800-E Panel solution	3ADW000210	x					
Hardware Manual DCS800-E	3ADW000224	x					
DCS800-A Enclosed Converters							
Flyer DCS800-A	3ADW000213	x					
System description DCS800-A	3ADW000198	p	p				
Installation of DCS800-A	3ADW000091	p	p				
DCS800-R Rebuild System							
Flyer DCS800-R	3ADW000007	p	p				
DCS800-R Manual	3ADW000197	p					
DCS500/DCS600 upgrade manual							
Extension Modules							
RAIO-01 Analogue IO Extension	3AFE64484567	x					
RDIO-01 Digital IO Extension	3AFE64485733	x					
AIMA R-slot extension	3AFE64661442	x					
Serial Communication							
Drive specific serial communication							
NETA Remote diagnostic interface	3AFE64605062	x					
Fieldbus Adapter with DC Drives RPBA- (PROFIBUS)	3AFE64504215	x					
Fieldbus Adapter with DC Drives RCAN-02 (CANopen)							
Fieldbus Adapter with DC Drives RCNA-01 (ControlNet)	3AFE64506005	x					
Fieldbus Adapter with DC Drives RDNA- (DeviceNet)	3AFE64504223	x					
Fieldbus Adapter with DC Drives RMBA (MODBUS)	3AFE64498851	x					
Fieldbus Adapter with DC Drives RETA (Ethernet)	3AFE64539736	x					
x -> existing p -> planned							
Status 01.2007							

DCS800 Drive Manuals-List_c.doc

Notes on EMC

You will find further information in publication:

Technical Guide chapter: EMC Compliant Installation and Configuration for a Power Drive System

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	

Left diagram:

Medium-voltage network

Residential area — Supply transformer for a residential area (rating normally ≤ 1,2 MVA)

Earthed neutral

Earthed public 400-V network with neutral conductor

Mains filter

Line reactor

Converter — Converter

To other loads, e.g. drive systems

To other loads which have to be protected from the system disturbances caused by power converters (HF interference and commutation notches)

M — M

Operation at public low-voltage network together with other loads of all kinds.

An isolating transformer with an earthed screen and earthed iron core renders mains filter and line reactor superfluous.

Right diagram:

Medium-voltage network

Light industry — Supply transformer for a residential area (rating normally ≤ 1.2 MVA) — Residential area

Earthed neutral

Earthed public 400-V network with neutral conductor

Mains filter — Line reactor + Y-capacitor — Converter

To other loads, e.g. drive systems

Earthed public 400-V network with neutral conductor

Mains filter — Line reactor — Converter

alternative — alternative

M — M — M — M

Operation at public low-voltage network together with other loads of all kinds.

To other loads which have to be protected from the system disturbances caused by power converters (HF interference and commutation notches)

Commutation notches < 20%

Operation at public low-voltage network together with other loads of all kinds.

An isolating transformer with an earthed screen and earthed iron core renders mains filter and line reactor superfluous.

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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 (**P**ower**D**rive-**S**ystem), 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 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

Operation at low-voltage network together with other loads of all kinds, apart from some kinds of sensitive communication equipment.

PDS category C4

Operation with separate power converter transformer. If there are other loads at the same secondary winding, these must be able to cope with the commutation gaps caused by the power converter. In some cases, commutating reactors will be required.

emv_classif_b.def

Classification

The following overview utilises the terminology and indicates the action required in accordance with Product Standard

EN 61800-3

For the DCS800 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:
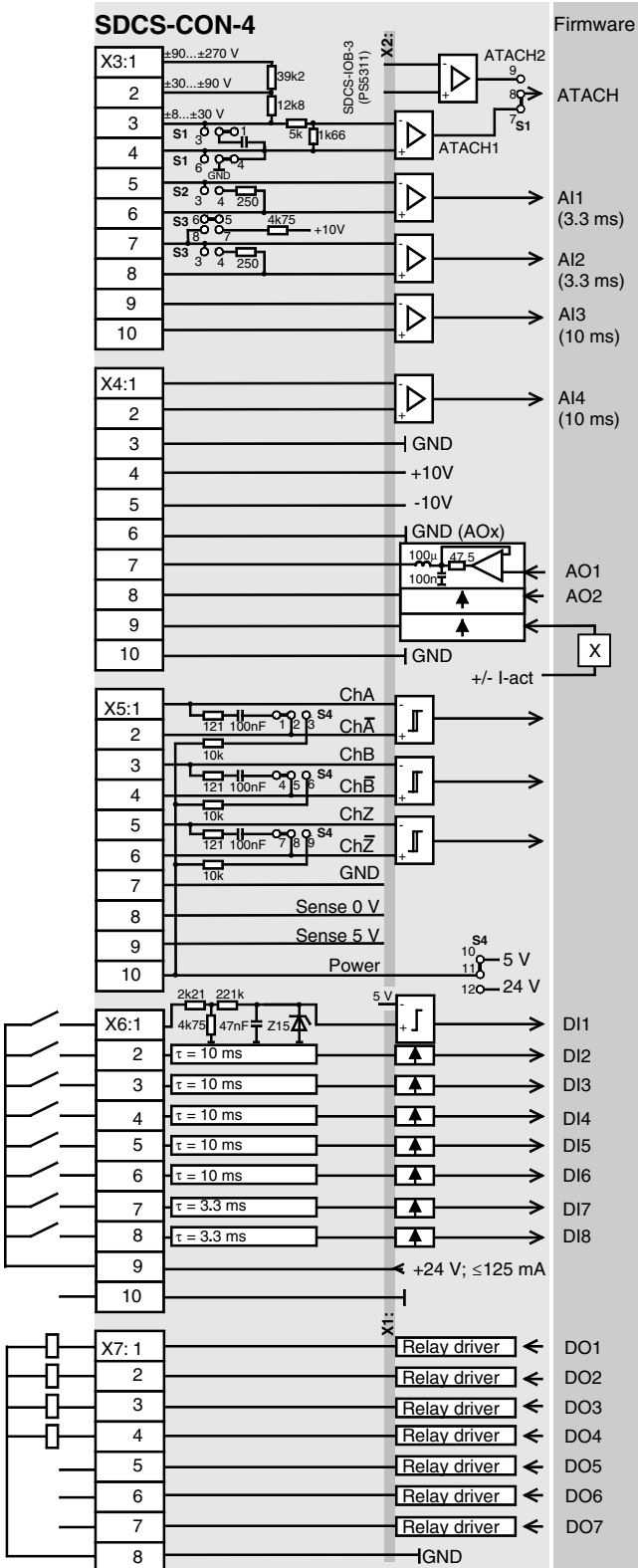
This is a product of category C2 under IEC 61800-3:2004. In a domestic/residential environment this product may cause radio interference in which case supplementary mitigation measures my be required.

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

Standard function assignments for the terminals

SDCS-CON-4 (with terminal assignments X3, X4, X5, X6, X7, X1, X2) — ATACH2, ATACH, ATACH1, AI1 (3.3 ms), AI2 (3.3 ms), AI3 (10 ms), AI4 (10 ms), GND, +10V, -10V, GND (AOx), AO1, AO2, GND, +/- I-act, ChA, ChĀ, ChB, ChB̄, ChZ, ChZ̄, GND, Sense 0 V, Sense 5 V, Power, DI1–DI8, +24 V; ≤125 mA, DO1–DO7, GND

Con4_I_O-a.dsf

Resolution [bit]	Input/output values Hardware	Scaling by	Common mode range	Remarks
15 + sign	±90...270 V ±30...90 V ±8...30 V	① Firmware	±15 V	
15 + sign	-10...0...+10 V	Firmware	±15 V	
15 + sign	-10...0...+10 V	Firmware	±15 V	
15 + sign	-10...0...+10 V	Firmware	±15 V	
15 + sign	-10...0...+10 V	Firmware	±15V	

			Power	
	+10 V		≤ 5 mA	for ext. use e.g. refer. pot.
	-10 V		≤ 5 mA	
11 + sign	-10...0...+10 V	Firmware	≤ 5 mA	
11 + sign	-10...0...+10 V	Firmware	≤ 5 mA	
	-10...0...+10 V	Firmware+ Hardware	≤ 5 mA	4 V -> 325% of [99.03], max. 230% of [4.05]

Encoder supply		Remarks
		Inputs not isolated Impedance = 120 Ω, if selected max. frequence ≤ 300 kHz
5 V 24 V	≤ 250 mA ≤ 250 mA	Sense lines for GND and supply to correct voltage drops on cable (only if 5 V encoder is in use).

Input value	Signal definition by	Remarks
0...7.3 V 7.5...50 V	Firmware	-> "0" status -> "1" status

Output value	Signal definition by	Remarks
50 * mA 22 V at no load	Firmware	Current limit for all 7 outputs = 160 mA Do not apply any reverse voltages!

* short circuit protected
① gain can be varied in 15 steps between 1 and 4 by software parameter

Connection example

Converters D1...D4 drive configuration using 'OnBoard' field exciter
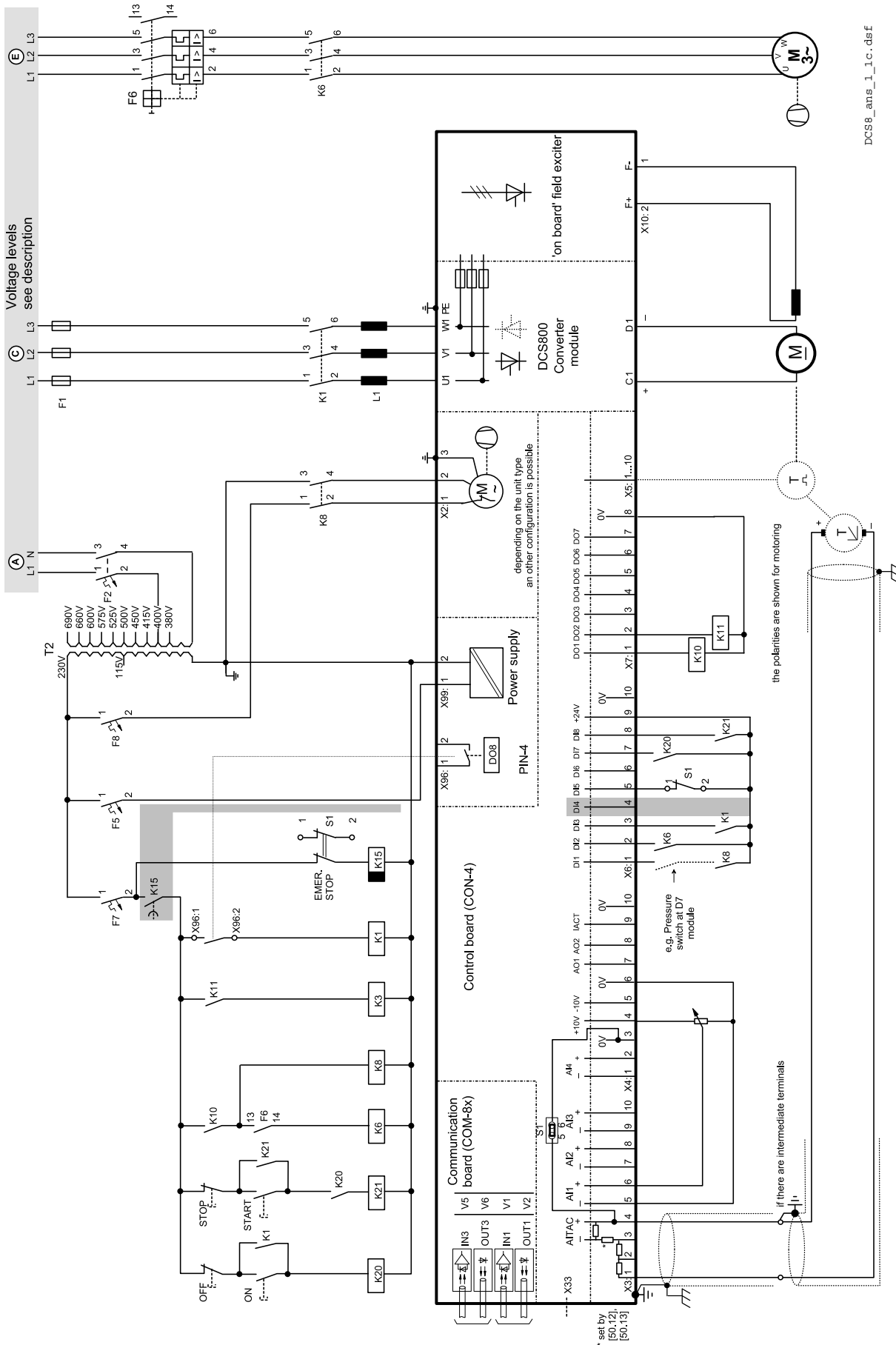
START, STOP and E-STOP control

The relay logic can be split into three parts:

a: Generation of the ON/OFF and START/STOP command:

The commands represented by K20 and K21 (latching interface relay) can be e.g. generated by a PLC and transferred to the terminals of the converter either by relays, using galvanic isolation or directly via 24V signals. There is no need to use hardwired signals. These commands can be as well transferred via serial communication. Even a mixed solution can be realized by selecting different possibilities for the one or the other signal (see parameter group 11).

gen_ctrl_cmd_a.dsf
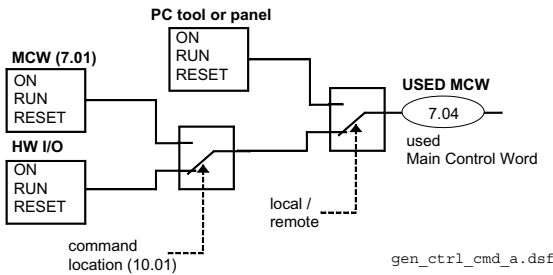
b: Generation of control and monitoring signals:

The main contactor K1 for the armature circuit is controlled by a dry contact (DO 8) located on the SDCS-PIN-4, Status of fans and fans klixon can be monitored by means of fans ack signals: MotFanAck (10.06) and ConvFanAck (10.20).

c: OFF2, OFF3 Stop function:

Beside ON/OFF and START/STOP the drive is equipped with two additional stop functions OFF2 and OFF3 according Profibus standard. OFF3 is a scalable stop function (rampstop, max torque stop, dynamic braking …) to perform stop category 1. This function should be connected to the E-STOP button without any time delay. In case of ramp stop selection the K 15 timer relay must be set longer than EStopRamp (22.04). For COAST selection the drive opens the main contactor immediately.

OFF2 switches off DC current as fast as possible and prepares the drive for opening main contactor or drop down mains supply. For a normal DC motor load the time to switch OFF the DC current is below 20 ms. This function should be connected to all signals and safety functions opening the main contactor. This function is important for 4-quadrant drives. Do not open main contactor during regenerative current.

The correct sequence is

1. switch off regenerative current
2. then open the main contactor

In case of E-STOP is hit, the information is transferred to the converter via digital input 5. In case of (rampstop, or max

torque selection) the converter will decelerate the motor and then open main contactor.

If the drive has not finished the function within the K15 timer setting, the drive must get the command to switch OFF the current via K16. After K16 timer set has elapsed the main contactor is opened independent of the drives status.

Anschl_special_a.dsf

Stop-Mode_a.dsf

E-Stop reaction
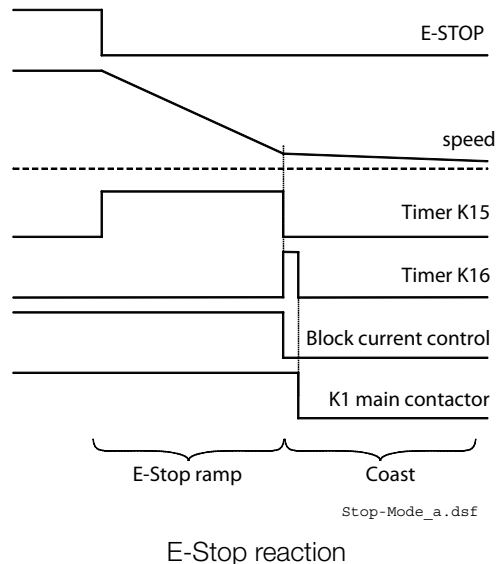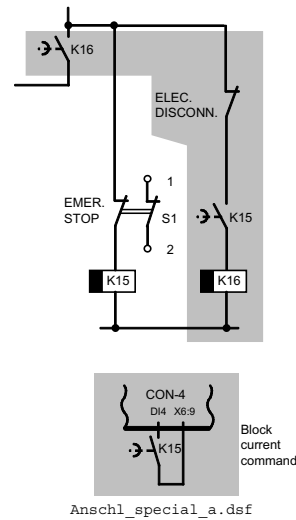
Safety and operating instructions

for drive converters DCS / DCF / DCR

(in conformity with the low-voltage directive 73/23/EEC)

1. General

In operation, drive converters, depending on their degree of protection, may have live, uninsulated, and possibly also moving or rotating parts, as well as hot surfaces.

In case of inadmissible removal of the required covers, of improper use, wrong installation or maloperation, there is the danger of serious personal injury and damage to property.

For further information, see documentation.

All operations serving transport, installation and commissioninng as well as maintenance are to be carried out by skilled technical personnel (Observe IEC 364 or CENELEC HD 384 or DIN VDE 0100 and IEC 664 or DIN/VDE 0110 and national accident prevention rules!).

For the purposes of these basic safety instructions, "skilled technical personnel" means persons who are familiar with the installation, mounting, commissioning and operation of the product and have the qualifications needed for the performance of their functions.

2. Intended use

Drive converters are components designed for inclusion in electrical installations or machinery.

In case of installation in machinery, commissioning of the drive converter (i.e. the starting of normal operation) is prohibited until the machinery has been proved to conform to the provisions of the directive 89/392/EEC (Machinery Safety Directive - MSD). Account is to be taken of EN 60204.

Commissioning (i.e. the starting of normal opertion) is admissible only where conformity with the EMC directive (89/336/EEC) has been established.

The drive converters meet the requirements of the low-voltage directive 73/23/EEC. They are subject to the harmonized standards of the series prEN 50178/DIN VDE 0160 in conjunction with EN 60439-1/ VDE 0660, part 500, and EN 60146/ VDE 0558.

The technical data as well as information concerning the supply conditions shall be taken from the rating plate and from the documentation and shall be strictly observed.

3. Transport, storage

The instructions for transport, storage and proper use shall be complied with.

The climatic conditions shall be in conformity with prEN 50178.

4. Installation

The installation and cooling of the appliances shall be in accordance with the specifications in the pertinent documentation.

The drive converters shall be protected against excessive strains. In particular, no components must be bent or isolating distances altered in the course of transportation or handling. No contact shall be made with electronic components and contacts.

Drive converters contain electrostatic sensitive components which are liable to damage through improper use. Electric components must not be mechanically damaged or destroyed (potential health risks).

5. Electrical connection

When working on live drive converters, the applicable national accident prevention rules (e.g. VBG 4) must be complied with. The electrical installation shall be carried out in accordance with the relevant requirements (e.g. cross-sectional areas of conductors, fusing, PE connection). For further information, see documentation.

Instructions for the installation in accordance with EMC requirements, like screening, earthing, location of filters and wiring, are contained in the drive converter documentation. They must always be complied with, also for drive converters bearing a CE marking. Observance of the limit values required by EMC law is the responsibility of the manufacturer of the installation or machine.

6. Operation

Installations which include drive converters shall be equipped with additional control and protective devices in accordance with the relevant applicable safety requirements, e.g. Act respecting technical equipment, accident prevention rules etc. Changes to the drive converters by means of the operating software are admissible.

After disconnection of the drive converter from the voltage supply, live appliance parts and power terminals must not be touched immediately because of possibly energized capacitors. In this respect, the corresponding signs and markings on the drive converter must be respected.

During operation, all covers and doors shall be kept closed.

7. Maintenance and servicing

The manufacturer's documentation shall be followed.

Keep safety instructions in a safe place!

Installing the DCS800 PC tools on Your computer

After inserting the DCS800 CD all programs and documentation necessary to work with the DCS800 will be automatically installed. This includes:

1. DriveWindow Light for parameterization, commissioning and service
2. Hitachi FDT 2.2 for firmware download
3. Installation CD of DCS800 Drive for e.g. DWL Wizard, ABB documents
4. CoDeSys for 61131 application programming

Attention:
If You do not want to install a certain program just skip it by using Cancel at the beginning of the program's wizard.

If the installation routine does not start automatically:
- Go to Start/Run and browse for setup.exe on the CD. Now start the installation by confirming with OK
- Compact installtion for DriveWindow Light + Commsioning Wizard + DriveWindow Light AP is reccomended
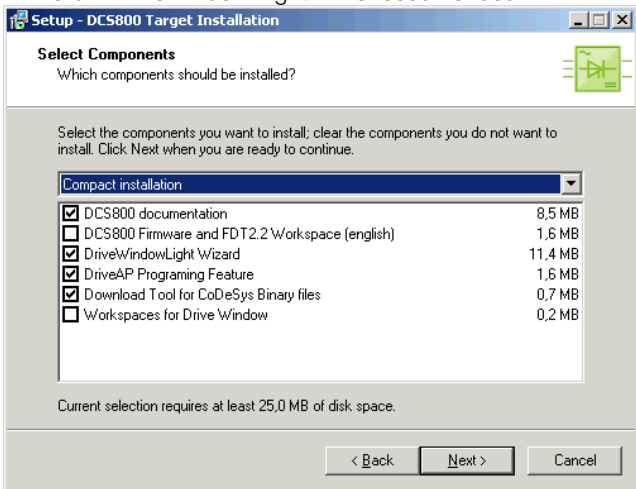
Steps to connect Drive to PC
- The documentation can be found under
  C:\ABB\DCS800\Docu
- Remove design cover from the converter module
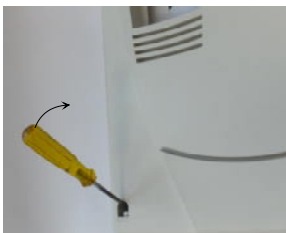
Remove the DCS800 Control Panel if present. Depress the locks to remove the cover
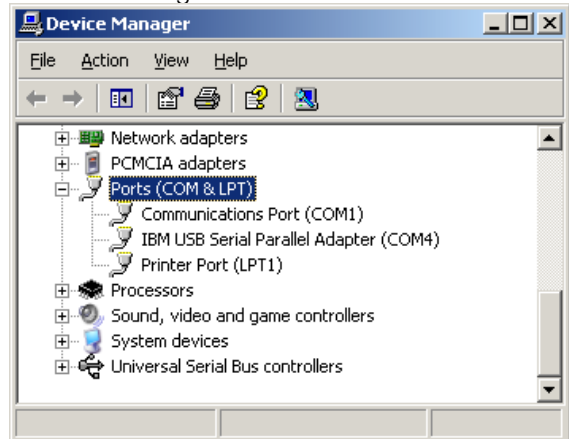
Connect drive (X34) to your PC COM port

- Start DriveWindow Light PC tool
  Check the communication setting of your COM port
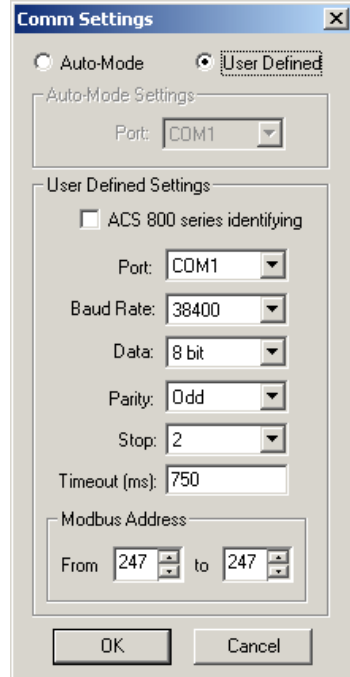
If You use USB to COM port interface double check the active COM enabled by USB
Start => Settings => Control Panel => System => Hardware => Device Manager

COM address of USB interface **can** change after the next boot procedure or after disconnecting and reconnecting of the USB interface.

Utilize DriveWindow Light or DCS800 Panel Wizard continue with chapter *Commissioning* in this manual.

For commissioning by DriveWindow find a workspace description in the DCS800 Firmware manual.

Commissioning

Danger! High voltage: this symbol warns of high voltages which may result in injuries to persons and/or damage to equipment. Where appropriate, the text printed adjacent to this symbol describes how risk of this kind may be avoided.

General warning: this symbol warns of non-electrical risks and dangers which may result in serious or even fatal injuries to persons and/or damage to equipment. Where appropriate, the text printed adjacent to this symbol describes how risk of this kind may be avoided.

Warning of electrostatic discharge: this symbol warns you against electrostatic discharges which may damage to unit. Where appropriate, the text printed adjacent to this symbol describes how risk of this kind may be avoided.

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.
- Recommendations for motor and field voltages see *Technical catalogue.*
- 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
- 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?

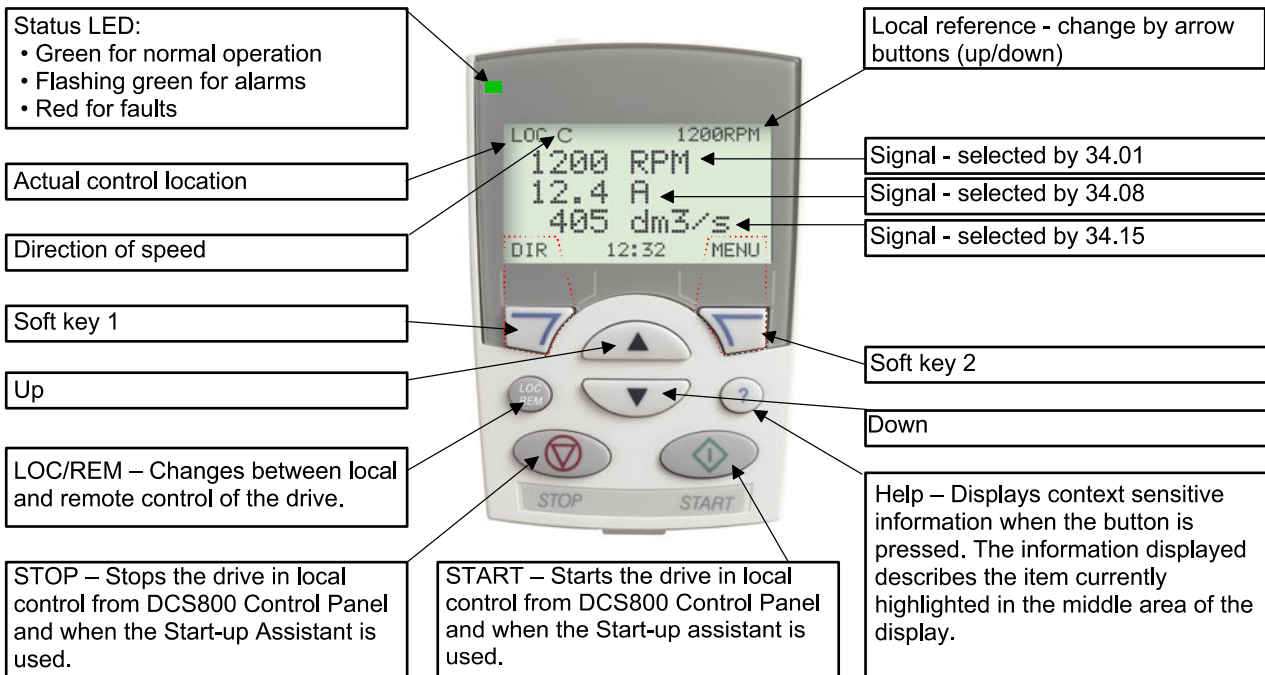Start the wizard in DriveWindow Light:
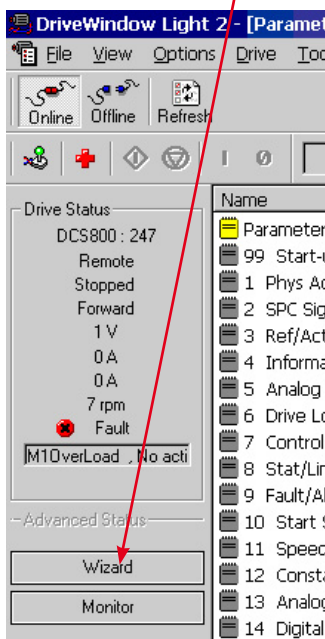
For basic commissioning press the *Start* button or select a specific assistant:
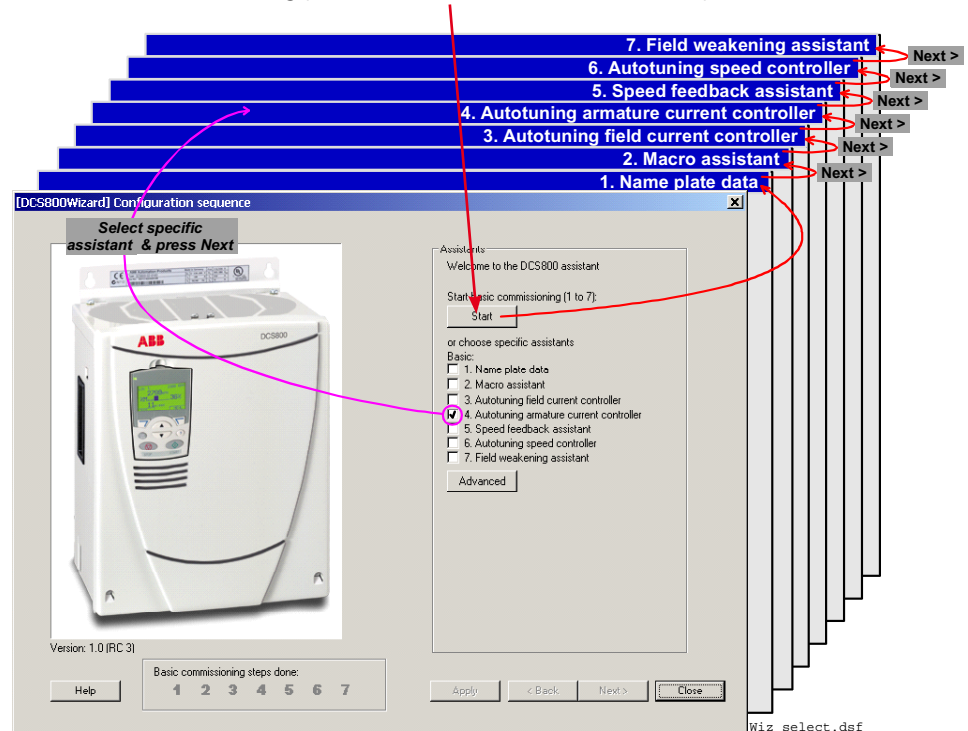
For more information about the wizard, parameters faults and alarms press the *Help* button!

Display overview

The following table summarizes the button functions and displays of the DCS800 Control Panel (DCS CP).

Status LED: • Green for normal operation • Flashing green for alarms • Red for faults	Local reference – change by arrow buttons (up/down)
Actual control location	Signal - selected by 34.01
Direction of speed	Signal - selected by 34.08
	Signal - selected by 34.15
Soft key 1	
Up	Soft key 2
LOC/REM – Changes between local and remote control of the drive.	Down
STOP – Stops the drive in local control from DCS800 Control Panel and when the Start-up Assistant is used.	START – Starts the drive in local control from DCS800 Control Panel and when the Start-up assistant is used.	Help – Displays context sensitive information when the button is pressed. The information displayed describes the item currently highlighted in the middle area of the display.

Display shows:
LOC C   1200RPM
1200 RPM
12.4 A
405 dm3/s
DIR   12:32   MENU

DCS800 QG pan ov_a.dsf

With USISel (16.09) it is possible to limit the amount of displayed parameters!

General display features

Following modes are available in the MAIN MENU:
1. Parameters mode
2. Start-up assistants mode
   a. Name plate data
   b. Macro assistant
   c. Autotuning field current controller
   d. Autotuning armature current controller
   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)
3. Macros mode (currently not used)
4. Changed parameters mode (compare to default and display changed parameters)
5. Fault logger mode (Display fault history)
6. Clock set mode
7. Parameter backup mode
   • copy active parameter set from the drive into the DCS800 Control Panel (only in local mode)
   • copy parameter set from DCS800 Control Panel into the drive (only in local mode)
8. I/O settings mode (currently not used)

Dimensional drawings

Dimensional drawings of the DCS800 are shown below. The dimensions are given in milllimeters.

Module D1
DCS800-S01-0020
DCS800-S01-0045
DCS800-S01-0065
DCS800-S01-0090
DCS800-S01-0125

DCS800-S02-0025
DCS800-S02-0050
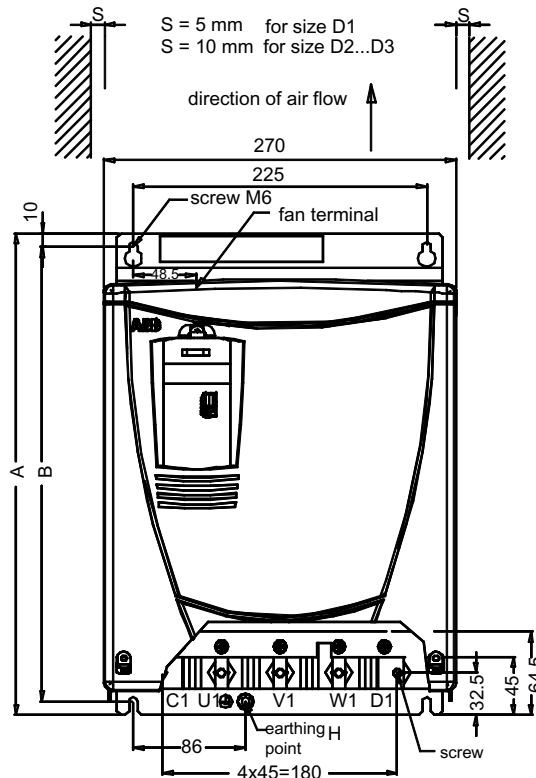DCS800-S02-0075
DCS800-S02-0100
DCS800-S02-0140

Module D2
DCS800-S01-0180
DCS800-S01-0230

DCS800-S02-0200
DCS800-S02-0260

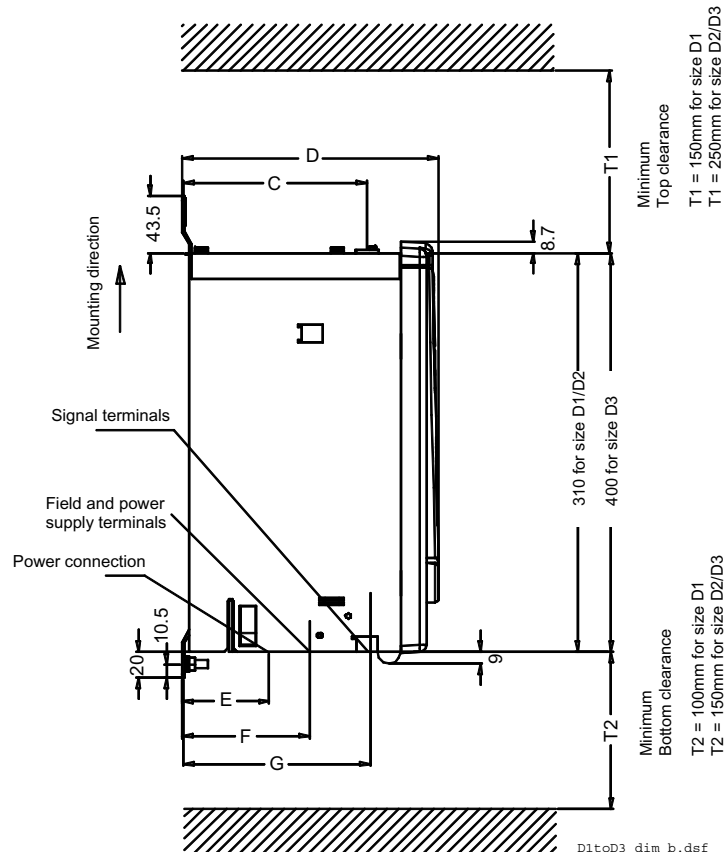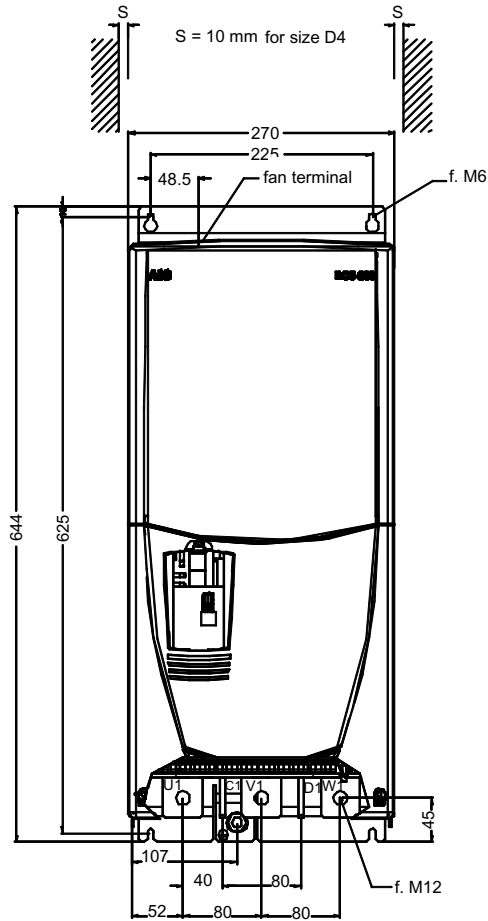## Module D3
DCS800-S01-0315
DCS800-S01-0405
DCS800-S01-0470

DCS800-S02-0350
DCS800-S02-0450
DCS800-S02-0520

600 V types
DCS800-S01-0290
DCS800-S02-0320

Size	A	B	C	D	E	F	G	H	Weight
D1	370	350	142	200	67	98	145	M6	ca. 11kg
D2	370	350	209	267	121,5	163,5	212	M10	ca. 16kg
D3	459	437,5	262,5	310	147,5	205	252	M10	ca. 25kg

D1toD3_dim_b.dsf

Module D4

DCS800-S01-0610
DCS800-S01-0740
DCS800-S01-0900

DCS800-S02-0680
DCS800-S02-0820
DCS800-S02-1000

600 V types
DCS800-S01-0590
DCS800-S02-0650

Weight appr. 38 kg

S = 10 mm for size D4

270
225
48.5
fan terminal
f. M6

644
625

U1 C1V1 D1W1

45
107
40   80
52   80   80
f. M12

Power terminal: Busbar 40x5 mm
Weight appr. 38 kg

345
298
fan terminal
42
8.7
250
min. Top clearance

Direction of air flow

577

Earthing
M12
25
20
147.5
195.5
240(PIN-4)
287.5(CON-4)

9
150
min. Bottom clearance

D4_dim_b.dsf

Firmware structure diagram

TORQUE CONTROL CHAIN

ABB Drive profile control
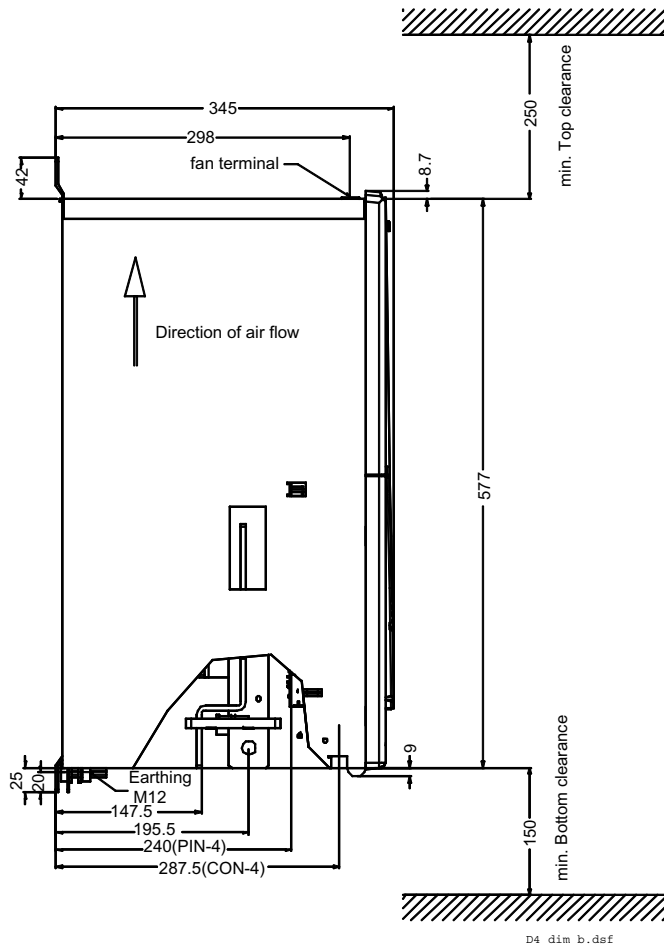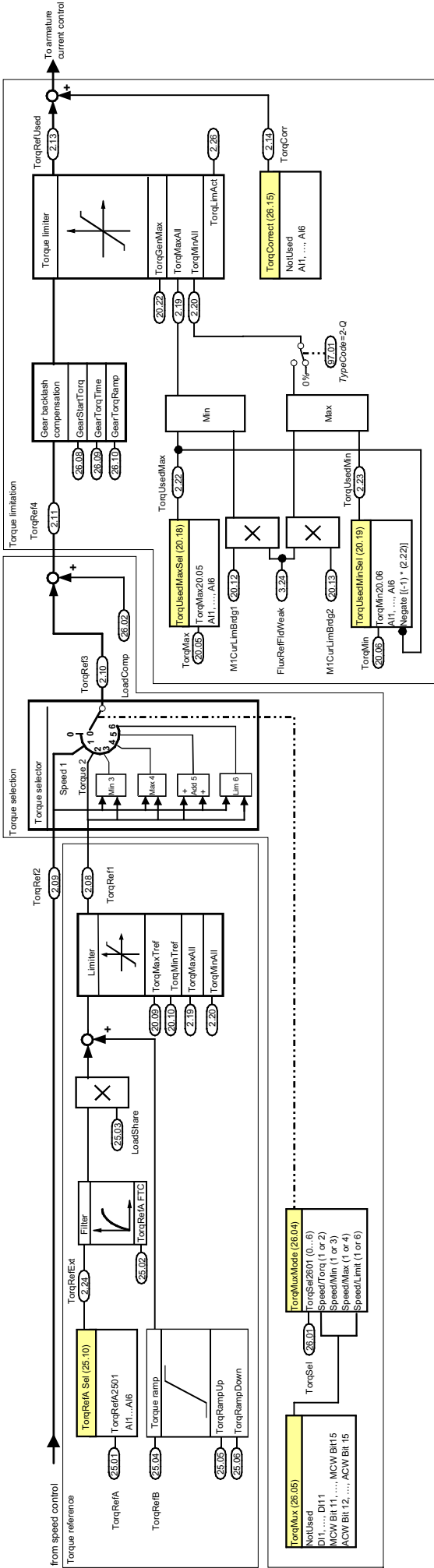
AuxCtrlWord (7.02)	AuxCtrlWord (7.03)	MainCtrlWord (7.01)	UsedMCW (7.04)	Drive Logic	CurCtrlStat1 (6.03)	MainStatWord (8.01)	AuxStatWord (8.02)
Bit0 RestartDataLog	Bit0 reserved	Bit0 On (Off1N)	Bit0 On (Off1N)	Faults	Bit0 FansOn Cmd.	Bit0 RdyOn	Bit0 DataLogReady
Bit1 TrigDataLog	Bit1 reserved	Bit1 Off2N (Coast Stop)	Bit1 Off2N (Coast Stop)	Alarms	Bit1 reserved	Bit1 RdyRun	Bit1 OutOfWindow
Bit2 RampBypass	Bit2 reserved	Bit2 Off3N (E-Stop)	Bit2 Off3N (E-Stop)	MotSpeed	Bit2 reserved	Bit2 RdyRef	Bit2 E-StopCoast
Bit3 BalRampOut	Bit3 reserved	Bit3 Run	Bit3 Run	Off1Mode	Bit3 motor heating	Bit3 Tripped	Bit3 User1
Bit4 LimSpeedRef4	Bit4 DisableBridge1	Bit4 RampOutZero	Bit4 RampOutZero	StopMode	Bit4 field direction	Bit4 Off2NStatus	Bit4 User2
Bit5 reserved	Bit5 DisableBridge2	Bit5 RampHold	Bit5 RampHold	E StopMode	Bit5 FieldOn Cmd.	Bit5 Off3NStatus	Bit5 SyncRdy
Bit6 HoldSpeedCtrl	Bit6 reserved	Bit6 RampInZero	Bit6 RampInZero	FlyStart	Bit6 dynamic braking	Bit6 OnInhibited	Bit6 Fex1Act
Bit7 WindowCtrl	Bit7 reserved	Bit7 Reset	Bit7 Reset	FanDly	Bit7 MainContactorOn Cmd	Bit7 Alarm	Bit7 Fex2Ack
Bit8 BalSpeedCtrl	Bit8 DriveDirection	Bit8 Inching1	Bit8 Inching1	MainContCtrlMode	Bit8 DynamicBrakingOn Cmd	Bit8 AtSetpoint	Bit8 BrakeCmd
Bit9 SyncCommand	Bit9 reserved	Bit9 Inching2	Bit9 Inching2	FldHeatSel	Bit9 drive generating	Bit9 Remote	Bit9 Limiting
Bit10 SyncDisable	Bit10 DirectSpeedRef	Bit10 RemoteCmd	Bit10 RemoteCmd		Bit10 reserved	Bit10 AboveLimit	Bit10 TorqCtrl
Bit11 ResetSyncRdy	Bit11 reserved	Bit11...Bit15 aux. control	Bit11...Bit15 aux. control		Bit11 firing pulses	Bit11 reserved	Bit11 ZeroSpeed
Bit12 aux. control	Bit12 ForceBrake				Bit12 continuous current	Bit12 reserved	Bit12 EMFSpeed
Bit13 aux. control	Bit13 reserved				Bit13 zero current	Bit13 reserved	Bit13 FaultOrAlarm
Bit14 aux. control	Bit14 reserved				Bit14 DC-breaker trip cmd	Bit14 reserved	Bit14 DriveDirectionNeg
Bit15 aux. control	Bit15 ResetPIDCtrl				Bit15 DC-breaker trip cmd	Bit15 reserved	Bit15 AutoReclosing

ARMATURE CURRENT CONTROL
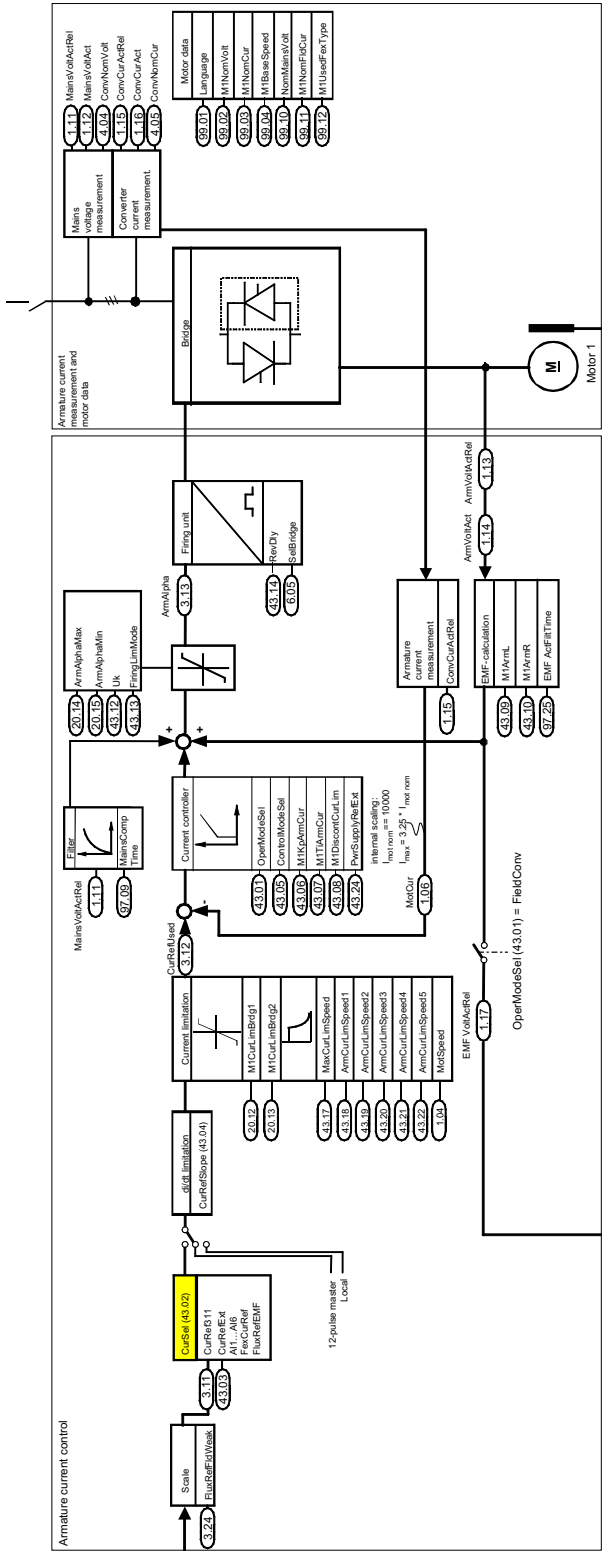
FIELD CURRENT CONTROL
(one field exciter)
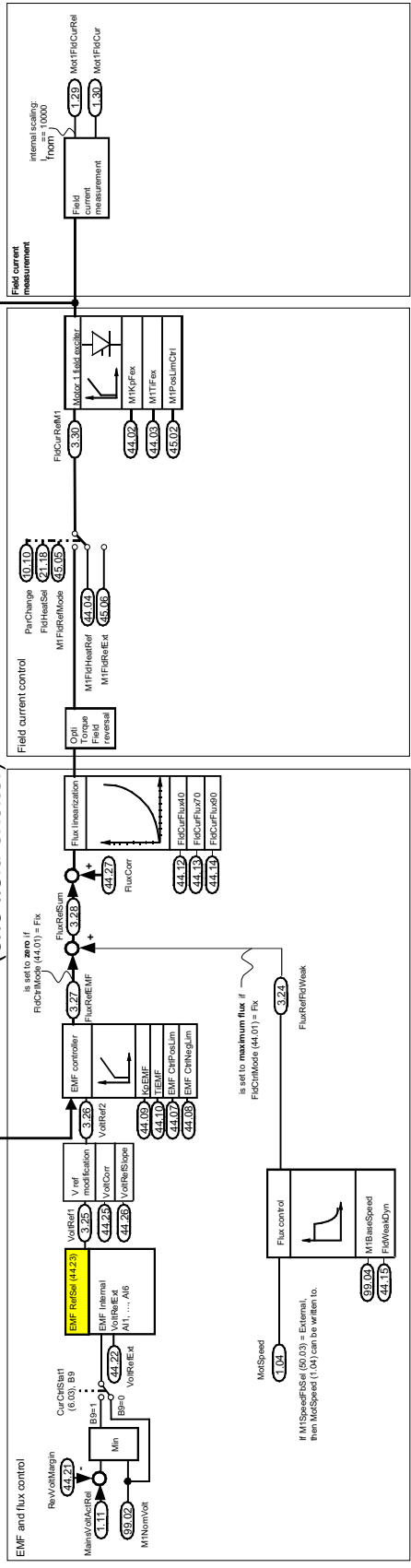
Declaration of Conformity

(Directive 73/23/EEC [Low Voltage], as amended by 93/68/EEC)
(Directive 89/336/EEC [EMC], as amended by 93/68/EEC)

Document code : ABB/DEAPR/AD 06-02

We,
ABB Automation Products GmbH
Division Drives & Motors
Wallstadter Str. 59 D68526 Ladenburg, Germany

herewith declare under our sole responsibility, that the product series

DCS 800 Converter Module up to supply voltage of 1000V~

to which this declaration relates, is a BDM / CDM according EN 61800-1: 1998
[IEC 61 800-1]

It is in conformity with

- the **Low Voltage Directive (LVD) 73/23/EEC**, including amendment 93/68/EEC.
Following standards have been applied:

  - EN 61800-1: 1998   [IEC 61 800-1]
  - EN 60204-1: 1997   [IEC 60 204-1] and

- the **Electromagnetic Compatibility (EMC) Directive 89/336/EEC,** including
amendment 93/68/EEC. Following standards have been applied:

  - EN 61800-3: 2004   [IEC 61800-3]

This declaration is based on Technical Construction File, code 3ADT061024. It is provided, that instructions for installation, operation and maintenance are according the product documentation.

Ladenburg, 24.03.2006

APR Christian Wendler
President

APR / AD Harald Jetses
PRU Manager

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.

Herstellbescheinigung / *Certificate of Manufacture*

Datum / *date*: 01.12.2005

Identifizierung des Produktes / *Identification of product*

Typ / *type* : ABB DC Converter Families DCS 400, DCS 500, DCS 600, DCS 800

Prüfung / *Test*

Die Prüfung erfolgt nach interner, produktspezifischer Prüfanweisung.

Routine test is performed in accordance with ABB product specific test instruction.

Erklärung / *Declaration*

Wir bestätigen die einwandfreie Herstellung und Prüfung der oben erwähnten Produkte in unserer Fabrik in Lampertheim, Deutschland nach unseren Normen und Sicherheits-vorschriften.

We hereby confirm that the above mentioned products are manufactured and tested in our facility in Lampertheim, Germany in conformity with our standards and safety rules.

ABB Automation Products GmbH
BUU Drives & Motors
Factory Lampertheim

Werksleiter
General Manager

Harald Jetses

Produktionsleiter
Operations Manager

Bernd Schmalenberger

2310

3ADW 000 208 R0101

DCS800 family

DCS800-S modules
The versatile drive for any application

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

ABB

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