



Catalog

ABB DC Drives
DCS800-A Enclosed Converters
18 A to 9800 / 19600 A

DCS800 Drive Manuals

	Public. number	Language										
		E	D	I	ES	F	CN	RU	PL	PT	SE	
DCS800 Quick Guide	3ADW000191	x	x	x	x	x					x	x
DCS800 Tools & Documentation CD	3ADW000211	x										
DCS800 Converter module												
Flyer DCS800	3ADW000190	x	x		x	x					x	
Technical Catalog DCS800	3ADW000192	x	x	x	x	x	x	x	x	x	x	
Hardware Manual DCS800	3ADW000194	x	x	x	x	x	x	x	x	x		
Hardware Manual DCS800 update DCF503B/DCF504B	3ADW000194Z	x										
Firmware Manual DCS800	3ADW000193	x	x	p	x	x	x	x	x			
Installation according to EMC	3ADW000032	x										
Technical Guide	3ADW000163	x										
Service Manual DCS800	3ADW000195	x	x									
12-Pulse Manual	3ADW000196	x										
CMA-2 Board	3ADW000136	x										
Flyer Hard - Parallel	3ADW000213	x										
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 C_____s	C_____s V23	x	x			x						
61131 DCS800 target +tool description - Application Program	3ADW000199	x										
DCS800 Crane Drive												
DCS800 Crane Drive Manual suppl.	3AST004143	x										
DCS800 Crane Drive Product note	PDC5 EN	x										
DCS800 Winder ITC												
DCS800 Winder Product note	PDC2 EN	x										
DCS800 Winder description ITC	3ADW000308	x										
Winder Questionnaire	3ADW000253Z	x										
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										
Technical Catalog DCS800-A	3ADW000198	x										
Installation of DCS800-A	3ADW000091	x	x									
DCS800-R Rebuild System												
Flyer DCS800-R	3ADW000007	x	x									
DCS800-R Rebuild Kits	3ADW000197	x										
DCS800-R Optical Rebuild Kits	3ADW000415	x										
DCS800-R DCS500/DCS600 Upgrade Kits	3ADW000256	x										
Extension Modules												
RAIO-01 Analog IO Extension	3AFE64484567	x										
RDIO-01 Digital IO Extension	3AFE64485733	x										
RRIA-01 Resolver Interface Module	3AFE68570760	x										
RTAC-01 Pulse Encoder Interface	3AFE64486853	x										
RTAC-03 TTL Pulse Encoder Interface	3AFE68650500	x										
AIMA R-slot extension	3AFE64661442	x										
Door mounting kits												
Door mounting DCS Control Panel (IP54, click in)	3AUA0000076085	x										
Door mounting DCS Control Panel (fix mounting)	3AFE68294673	x										
Door mounting DCS Control Panel (IP66, fix mounting)	3AFE68829593	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 01.2015												

DCS800 Manuals-list e m.docx

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DCS800-A Enclosed Converters

Latest Technology, High Performance and a User-Friendly Concept

DCS800-A are DCS800 converter modules mounted in an enclosure.

The series is a complete range of enclosed converters intended for the supply and control of DC machines. DCS800-A provides maximum flexibility in the firmware, the drive itself is programmable as well as a serial communication (e.g. Profibus) interface plus 12-pulse parallel, serial and sequential.

DCS800-A enclosed converters are fully digital. Optional equipment is available to meet different safety standards. The converter can be used for standard applications but has the flexibility to be customized for the most demanding applications.

Comprehensive Product Range

DCS800-A enclosed converters are available as 6-/12-pulse and in 2- or 4-quadrant, with current ranges from 18 to 9800/19600 A and supply voltages of 230 ... 990 (1200) V AC. A selection of options is available to provide the user with a system meeting the most demanding technical requirements and performance expectations. Common control electronics throughout the product range reduces spare parts inventory and training requirements.

DCS800-A Concept

- A single drive control technology is available for a wide power range to reduce training costs and meets the requirements of various applications.
- Common AC busbar designs for group drives are available for the most cost-efficient and functional system structure.
- Incoming supply section for group drives can be equipped with air circuit breakers or insulation switches.
- Control cubicles offer various I/O solutions in combination with ABB controls e.g. AC800M.
- Approval for many application specific standards (e.g. ABS, DNV, Lloyd, UL, CSA) can be ordered as option.
- Flexible design of power cable entry provide simple installation and minimum power down time especially for upgrades.



Digital Control

To meet the most stringent control requirements, the DCS800-A features speed control, which reduces the effects from gear backlash and torsional vibration arising in mechanical systems. High-performance speed and torque control will fulfill all requirements for rapid response and high control accuracy. Autotuning for armature, field current and speed controller simplifies the commissioning.



What is a DCS800 DC drive?

The DCS800 DC Drive is simple to buy, install, configure and use, saving considerable time.

- Precise delivery
- Quick installation
- Rapid start-up

The drive has common user and process interface with fieldbus, common software tools for sizing, commissioning, maintenance and common spare parts.

Where can it be used?

DCS800 can be used in the wide range of all industrial application of

- Metals
- Pulp & Paper
- Material handling
- Test rigs
- Food & Beverage
- Printing
- Plastic & Rubber
- Vessels
- Ski lifts
- Magnets
- Mining
- Electrolysis
- Battery Chargers
- and more

DCS800 DC drive promises

The drive meet the requirement of all demanding drive application like: • testrig • mine hoist • rolling mill as well as none motoric applications like: electrolysis • magnetics • battery charger

Embedded software functions offer the upgrades of all classic installations 12-pulse, shared motion, double motor operation, field reversal control.



Highlights

- Assistant control panel providing intuitive use of the drive.
- Excellent control performance up to highest dynamic application in field weakening operation.
- All ACS800 PC tools (via DDCS) can be connected
- Reduced installation and commissioning work.
- Internal three phase field exciter without additional external hardware.
- Prepared for additional software function by adaptive programming and IEC61131 programming.
- Flexible fieldbus system with built-in Modbus and numerous internally mountable fieldbus adapters.

Software Tools

Start-up assistant

Faster and easier commissioning

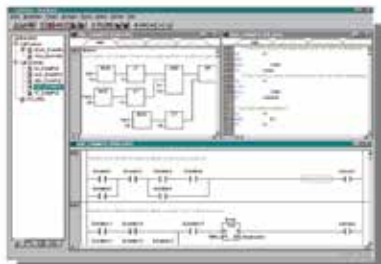
The Start-up assistant serves in DCS800 DC Drives. It guides you actively through the commissioning procedure either by the control panel or ABB PC tools. It is multilingual, requests data with clear and plain text messages, and sets the required parameters to your needs.

IEC 61131 programming

ControlBuilder DCS800

The ControlBuilder is a user-friendly tool based on the IEC61131-3 standard for programming the DCS800. With the ControlBuilder it is possible to develop - in a fast and easy way - new function e.g. winders, decentralized controls, safety functions, ... directly in the drive.

Fieldbus control



Gateway to your process

DCS800 DC Drives have connectivity to major automation systems. This is achieved with a dedicated gateway concept between the fieldbus systems and ABB drives. The fieldbus gateway module can easily be mounted inside the drive. As a result of the wide range of fieldbus gateways, your choice of automation system is independent from your decision to use first-class ABB drives.

Start-up and maintenance tool

DriveWindow Light 2 PC tool for ABB drives

DriveWindow Light 2 is an easy-to-use start-up and maintenance tool for ABB drives. Supported drives are ACS140, ACS160, ACS350, ACH400, **DCS550**, ACS550, ACH550, **DCS800** and ACS800.

- Viewing and setting parameters in offline and online mode
- Editing, saving and downloading parameters
- Comparing parameters
- Graphical and numerical signal monitoring
- Drive control
- Start-up assistants
- DWL AP tool for DCS800
- All DCS800 DC drives are equipped with DriveWindow Light

Start-up, maintenance and integration

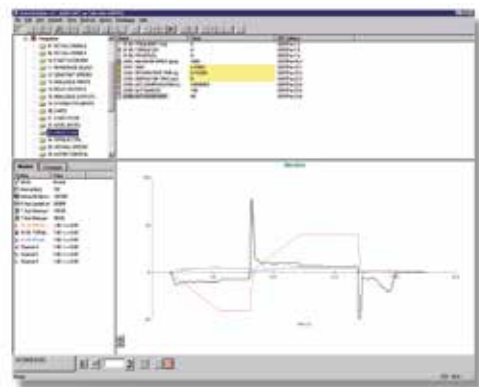
DriveWindow 2

ABB's DriveWindow is an advanced, easy-to-use PC software tool for the start-up and maintenance of ABB DCS800 DC Drives. Its host of features and clear, graphical presentation of the operation make it a valuable addition to your system providing information necessary for troubleshooting, maintenance and service, as well as training.

With DriveWindow the user is able to follow the co-operation of several drives simultaneously by collecting the actual values from the drives onto a single screen or printout.

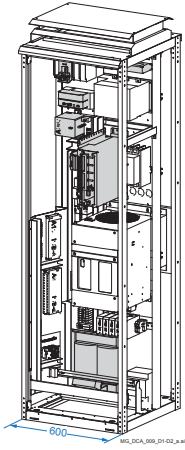
DriveOPC

Integration tool

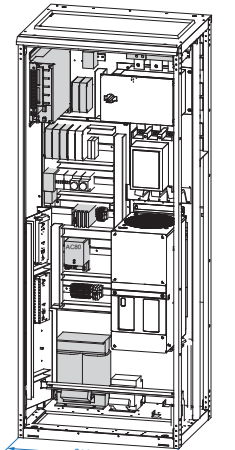


DriveOPC is a software package which allows OLE for Process Control (OPC) communication between Windows applications and DCS800 DC drives. It allows Object Linking and Embedding (OLE) for Process Control (OPC) communication. This OPC server is an ideal tool for integrating DCS800 DC drives and commercial PC software and creating PC-based controlling and monitoring systems.

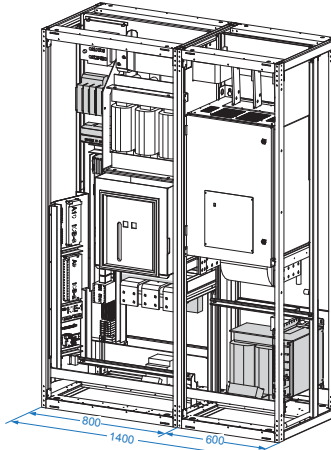
Description of DCS800-A Enclosed Converters



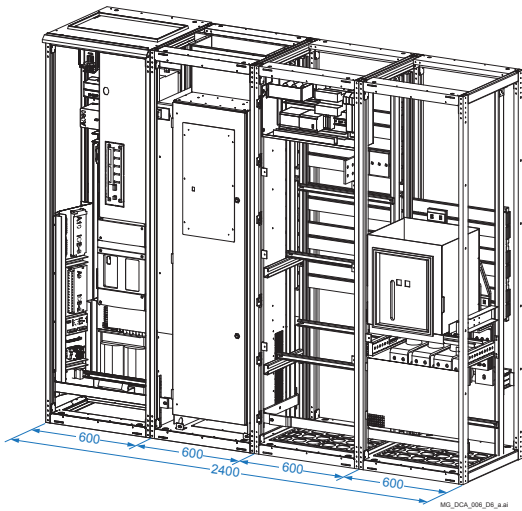
0025 ... 0350 (D1/D2/D3-350)



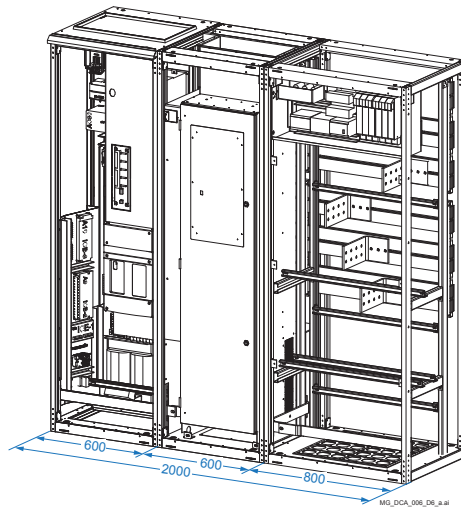
0520 ... 1000 (D3/D4)



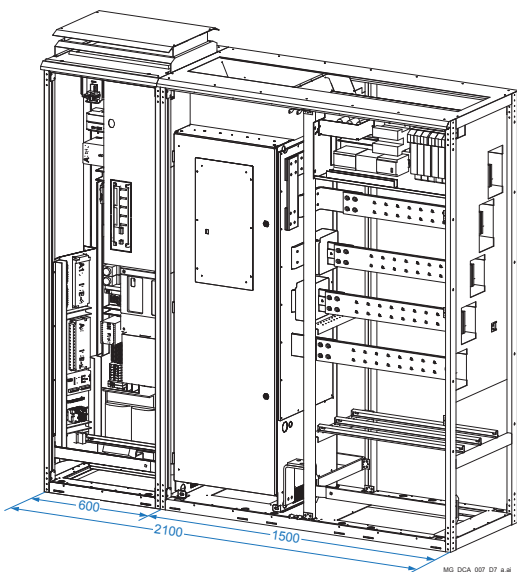
900 ... 2000 (D5)



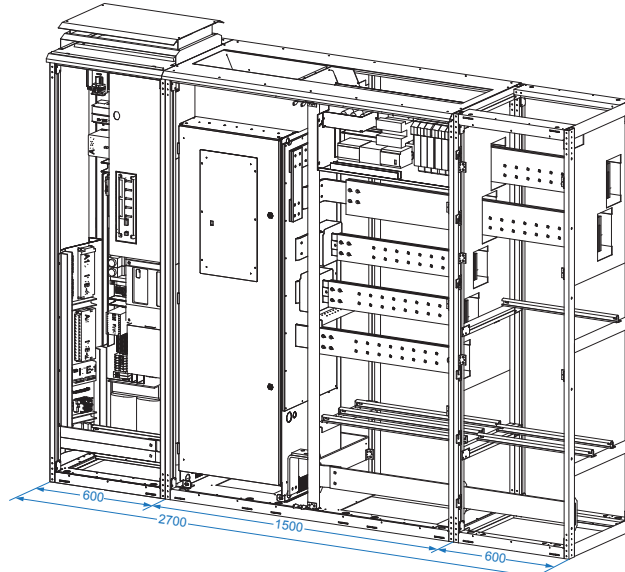
2050 ... 3000 (D6 with breaker)



1900 ... 3000 (D6 without breaker)



2050 ... 3300 (D7)



4000 ... 5200 (D7)

Mechanics

The robust and strong frame body of the cabinets is made from steel with a thickness of 2.5 mm and all metal sheets are softline design to avoid accidents and are 1.5 mm thick. A basic protection against corrosion is given by a hot zink galvanisation of all metal work. The standard height is 2120 mm (height is including detachable hood (120 mm)) with various widths (200/400/600/800/1000 mm) and depths (600) depending on the power and the size of the converter.

All dimensions in mm.

Structure of line-ups

DCS800-A enclosed converters

DCS800-A enclosed converters are suitable for three-phase supply voltages from 230 V to 990 (1200) V, 50 or 60 Hz. The rated DC current range is from 18 to 9800 / 19600 A.

DCS800-A enclosed converters with rated DC current from 18 A up to 1850 A are available in two different layouts:

- Single drive configuration without horizontal busbars therefore AC cable connection
- Group drive configuration with horizontal busbars (size-dependending on rated amps)

Group drives from sizes D6 and D7 on request.

DCS800-A can be tailored to meet different needs by using combinations of the following options:

- Earth Fault Detection (current sensitive)
- Insulation Monitor (voltage sensitive)
- Motor Fan Starter
- Galvanic Isolation of converter voltage measurement
- Cabinet design according to EMC-regulations
- EMC Filters
- Protection Class IP 21-Standard
- Protection Class IP 31 with filter (insect screen) in air inlet and outlet
- Protection Class IP 42 with filter in air inlet; air outlet same as IP 21
- IP 54 on request
- Gland plate and bottom plate
- Special Colour (only outside) acc. to RAL standard
- Heater
- Lighting
- Horizontal Busbars

Important!

CE mark requires the options

- EMC procedure / part list check
- EMC filter or dedicated transformer (performed by the customer)
- Cable marking A2 plus

Incoming Supply Sections for Group Drives

Incoming supply sections (DCA63x) are used to supply several group drives connected by horizontal busbars.

The connection to the AC supply can be made by cables or busbars. The cable / busbar entry is at the bottom of the incoming supply section as standard.

The incoming supply section can be located preferable left side of line-ups, but also right side and even in the middle of line-ups.

The cabinets standard protection class is IP21.

Basic design

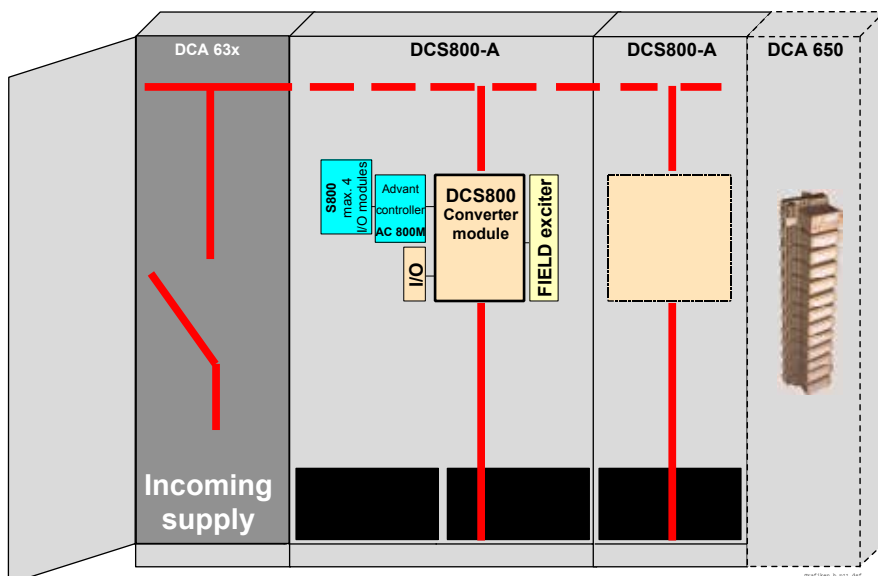
Rated voltage:	400, 500, 600, 690 V
Rated frequency:	50 or 60 Hz
Rated current:	1000, 2000, 3000, 4000 A _{AC}
Short circuit ratings:	50 kA (1 sec.) $i_{dyn} = 105 \text{ kA (peak)}$

Options

- Cabinet design according to EMC-regulations
- Isolation Switch (DCA631)
- Air circuit breaker (DCA632)
- Earthing switch
- Residual Current Detection
- AC Current Measurement
- AC Voltage Measurement
- Arc Detecting Relay
- Emergency stop relays, tripping circuits

EN61800-3 (IEC 1800-3) standard requires the options

- EMC procedure/part list check
- EMC filter or dedicated transformer (performed by the customer)



Field Exciters

Several Solutions available

- Ratings from 6 to 450 A
- Integrated, separate or external
- 2-phase or 3-phase versions
- 1-; 2-; 4-Quadrant
- Digital control
- Auto/manual tuning

The field exciters are controlled via a serial DCSLink with a speed of 500 kBaud for fast and accurate control.

Internal field exciters

Field exciters from 6 A up to 25 A can be included in armature converter modules up to 500 / 525 V, 2000 A (Size D5).

On board field exciters are 3-phase half controlled field exciters 6 A / 15 A / 20 A / 25 A in D1 up to D4 converter modules (525 V). These field exciters are directly supplied from mains circuit internally and do not require any autotransformer in three-phase operation.

FEX425 field exciter is also a 25 A 3-phase half controlled unit assembled in a D5 converter module. It can be supplied directly from mains circuit or from a separate field supply voltage.

DCF803-0050

2-phase, 1-quadrant, half controlled, outside the converter module. An autotransformer is optional to reduce voltage ripple in the field circuit by adapting the AC voltage to a suitable level.

DCF804-0050

2-phase, 4-quadrant, full controlled, field exciter for field reversal. An autotransformer is optional to reduce voltage ripple in the field circuit by adapting the AC voltage to a suitable level.

DCS800-A21: 18 ... 400 A

18 ... 400 A, 3-phase, 2-quadrant, full controlled, separate cabinet including overvoltage protection

DCS800-F01: 18 ... 285 A

18 ... 285 A, 3-phase, 2-quadrant, inside D6/D7 armature cabinet is possible; including overvoltage protection

DCS800-A22: 22 ... 450 A

22 ... 450 A, 3-phase, 4-quadrant, full controlled, for field reversal, separate cabinet; overvoltage protection included

DCS800-F02: 22 ... 300 A

22 ... 300 A 4-quadrant for field reversal, inside D6/D7 armature cabinet is possible; overvoltage protection included

DCS800 Converter modules

Basic design

All units are provided with the same digital control board and software. The DCS800 flexibility allows the user to configure functions of the drive easily, suitable for different applications. Functions of the DCS800 are normally activated by parameters.

The basic software includes following options:

Processing the speed reference with a speed ramp generator (S-ramp capability, accel/decel ramp) • Processing the speed feedback • Speed controller • Torque reference processing • Current controller • Field weakening • Automatic/manual field reversal • Autotuning of current controller • Autotuning of speed controller • Speed monitor • Drive control logic • Remote/local operation • Emergency stop • Electronic circuits are not sensitive to line phase sequence • Motor overload protection • Dual field • Programmable analog outputs • Field supply • Master/follower via fibre optics • 12-Pulse link

Monitoring functions

• Self-test • Fault logger • Motor protection • Power converter protection • Incorrect supply protection

I/O's of the converter module

The I/O connections in the DCS800 converter modules are used for safety and other drive specific functions like emergency stop and motor temperature measurement: • 1 analog tachometer input • 4 analog inputs • 2 voltage reference outputs • 3 analog outputs • 1 actual armature current output • 1 pulse encoder input (with IOB-3 isolated) • 8 digital inputs • 7 digital outputs

More detailed information about SDCS-IOB-2x/3 see *Hardware manual DCS800*.

DCS 800 Marine drive design (group drives)



DCS800-A Marine Drive

Typical Applications for Marine Drives

The DCS800-A marine cabinet is designed for standard marine applications like ships and oil rigs.

The typical applications are propulsion, thrusters, mud pumps, draw works, rotary tables and top drives.

Ordering

The standardized and type-approved design of DCS800-A Enclosed Converters allow DNV Certification of the complete cabinet line up. The DCS800-A marine cabinets include all components which are necessary for a standard marine drive application. A converter type of either 2-Q (single bridge) or 4-Q (double bridge) can be selected. Footprint 800 x 800 mm meets requirement of original converter.

The DCS800-A marine cabinets have a footprint of 800 x 800 mm. If motor assignment breakers or cable connection from top are required the footprint can be extended to a depth of 1200 mm.

Scope of delivery

- Type tested design and equipped DNV marine approval:
- 45°C ambient temperature
- IP22
- Marine hand grips and door stoppers
- IEC 332-3 flame retard cable

2-Q and 4-Q DCS800 drives

- 50 A or 60 A field exciter
- Options: RDIO/RAIO I/O Extension modules

DCA650 Control Cabinet

ABB controller AC 800 • Fieldbus interface FCI (AF100)
• Location of full range of S800 I/O modules.

Advant controller and S800 I/O System

The S800 I/O system consists of the control module (FCI, AC 800M), digital and analog I/O modules. The control module has a connection to several different bus systems and optical channels to connect the drives. The modules are located on mounting rails (DIN).



AF 100 field bus interface FCI

Within this AF 100 interface up to 12 drives can be connected.

Advant controller AC 800M

Powerful controller with several fieldbus interfaces. Up to 12 drives can be connected with the optical module bus. The above mentioned control modules can also handle up to 12/24 I/O modules.

Digital inputs and outputs

8 channels • input voltages from 24 V ... 250 V

Analog inputs and outputs (12 bit resolution)

8 channels

Drive Bus Communication

The Drive Bus Communication module CI854 provides another fast optical DDCS communication channel to the drives

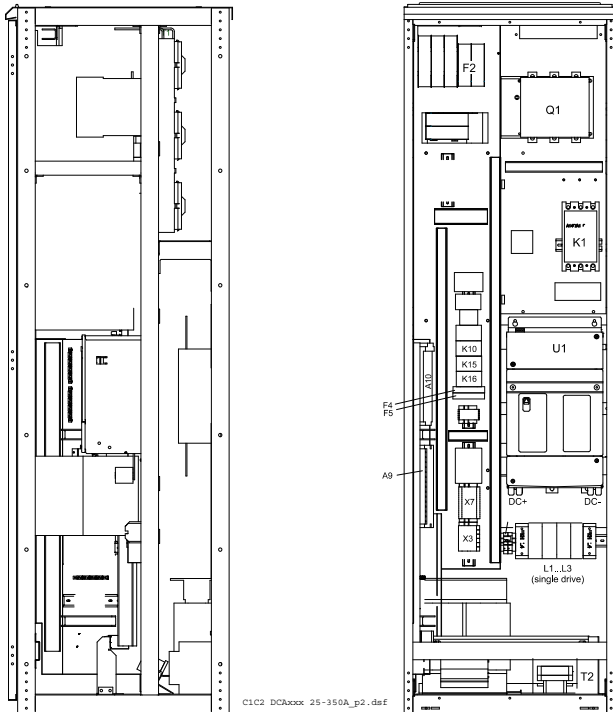
Safety functions

Many different kinds of safety functions are available and requirements differ from application to application.

Safety functions are always an option.

Safety circuits, including safety relays, will be included according to customer specification.

Overview Enclosed converter DCS800-A-0020 ... 0350 (D1/D2/D3-350)



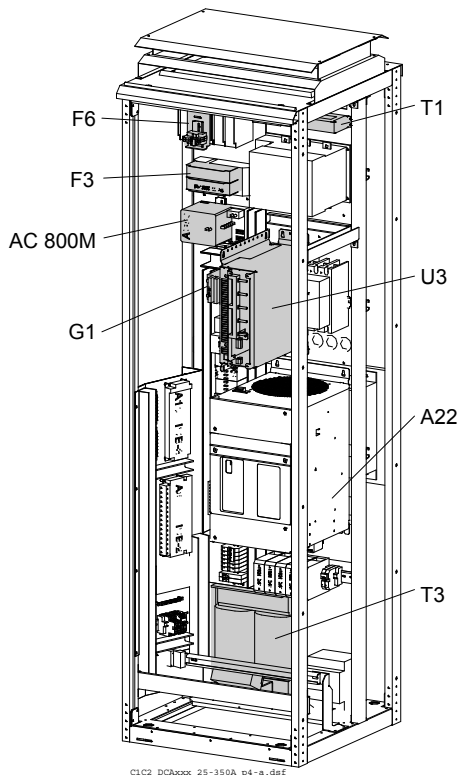
DCS800-A-0020 ... 0350 standard group drive

Component list (standard)

- Degree of protection **IP 21**
- Armature converter module **U1**
- Isolation switch with semiconductor fuses **Q1**
- Main contactor **K1**
- Line reactor **L1**
- Internal excitation On-board 6 - 15 A **A22**
- Process terminals **X1/X6/X7**
- Aux. supply voltage transformer **T2**
- Aux. supply voltage fuses **F2**
- Converter fan fuse **F4***
- Auxiliary circuit fuse **F5***
- Converter fan relay **K8***
- E - stop relay **K15***
- Electrical disconnect relay **K16***
- I/O board SDCS-IOB-2x **A9***
- I/O board SDCS-IOB-3 **A10***

Note 1: On-board field exciter keeps main contactor ON during field heating

Note 2: * Wiring see section *Basic circuit diagrams*.

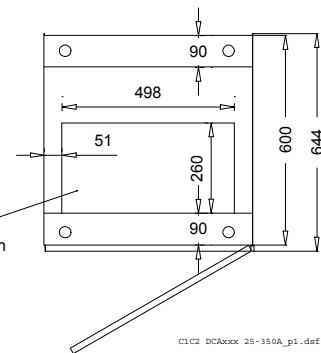
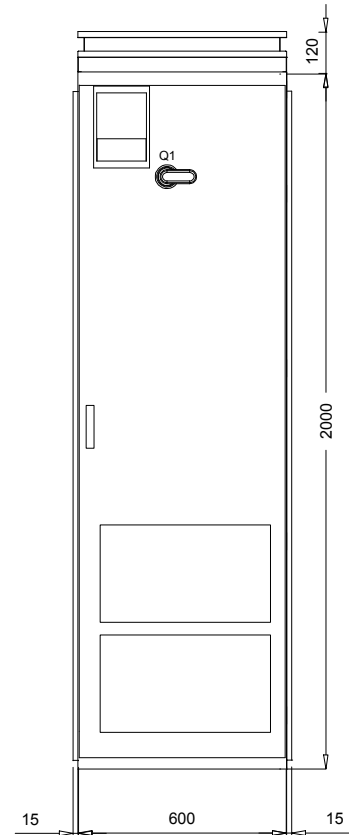
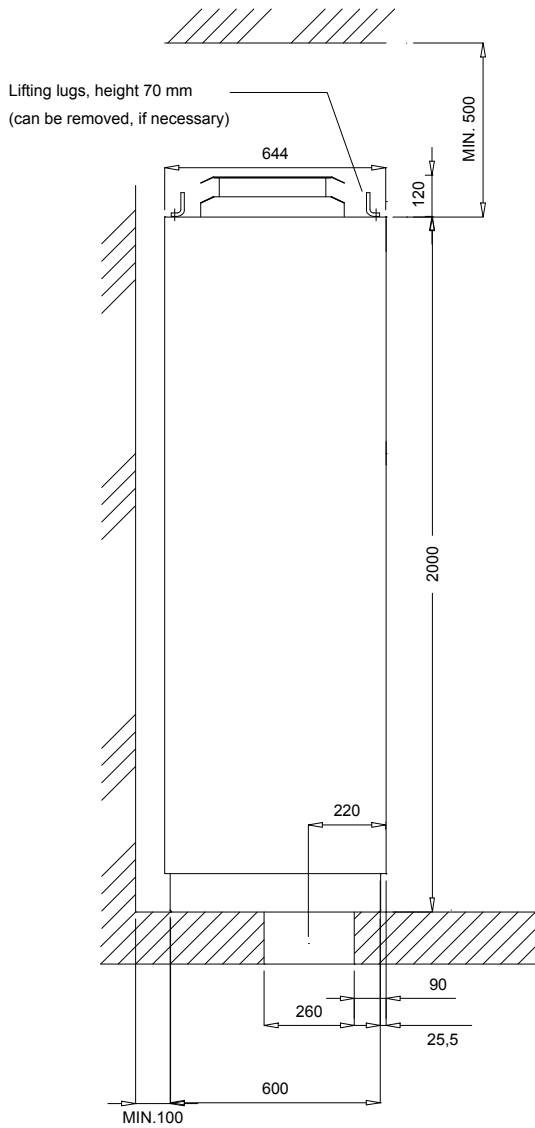


DCS800-A-0020 ... 0350 group drive with selected options (shaded)

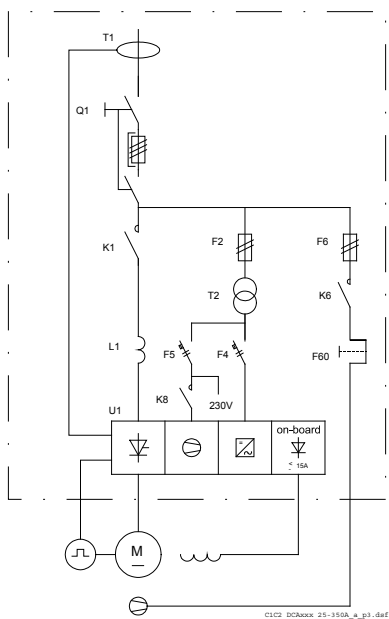
Component list (options)

- Excitation contactor **K3**
- Excitation line reactor **L3**
- Excitation fuse **F3**
- Excitation autotransformer **T3**
- Excitation unit DCF803/804 **U3**
- Residual current detection **T1**
- Motor fan starter contactor **K6**
- Motor fan starter thermal overload **F60**
- Motor fan starter fuses **F6**
- Advant controller **AC 800M**
- 24 VDC power supply **G1**

Note 3: Not all options are shown. For more options see section *Mechanical options* and *Electrical options*!



DCS800-A-0020 ... 0350 dimensions group and single drive

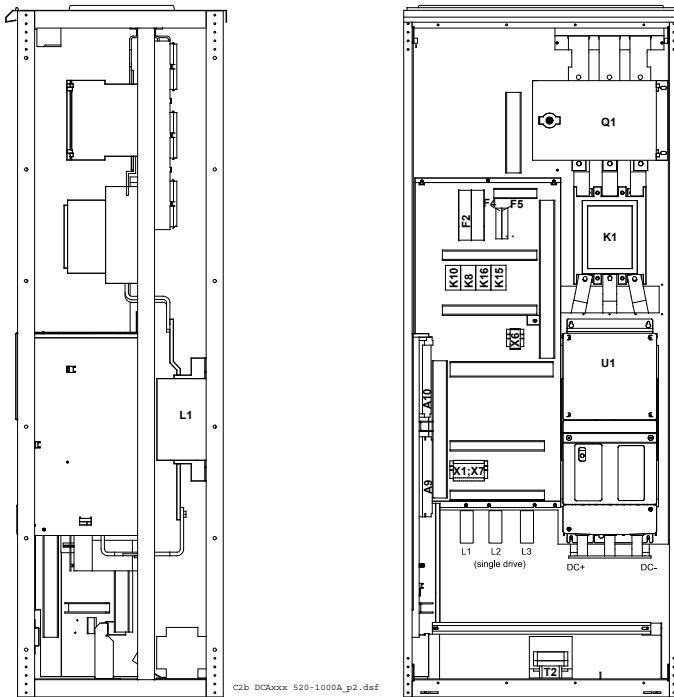


DCS800-A-0020 ... 0350 single line diagram group and single drive

Note 4: For more details (e.g. losses and weight) see tables on page 43 and 44.

Note 5: All enclosed converters are available as group and single drives. Group drive require the option horizontal busbars.

Overview Enclosed converter DCS800-A-0470 ... 1000 (D3/D4)



C2b DCSxxxx 520-1000A_p2..dsf

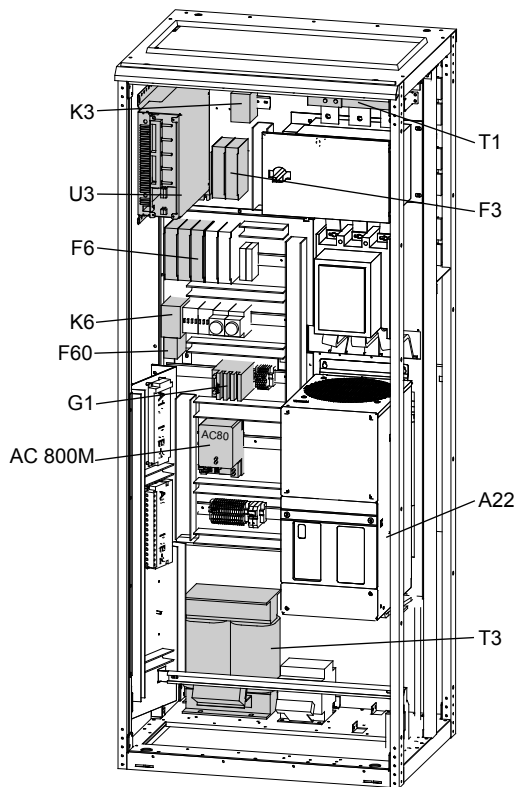
Component list (standard)

Degree of protection **IP 21**
 Armature converter module **U1**
 Isolation switch with semiconductor fuses **Q1**
 Main contactor **K1**
 Auxiliary relay **K10**
 Line reactor **L1**
 Internal excitation On-board 20 - 25 A **A22**
 Process terminals **X1/X6/X7**
 Aux. supply voltage transformer **T2**
 Aux. supply voltage fuses **F2**
 Converter fan fuse **F4***
 Auxiliary circuit fuse **F5***
 Converter fan relay **K8***
 E - stop relay **K15***
 Electrical disconnect relay **K16***
 I/O board SDCS-IOB-2x **A9***
 I/O board SDCS-IOB-3 **A10***

Note 1: On-board field exciter keeps main contactor ON during field heating

Note 2: * Wiring see section *Basic circuit diagrams*.

DCS800-A-0470 ... 1000 standard group drive



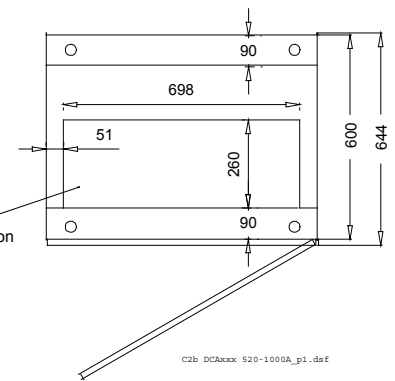
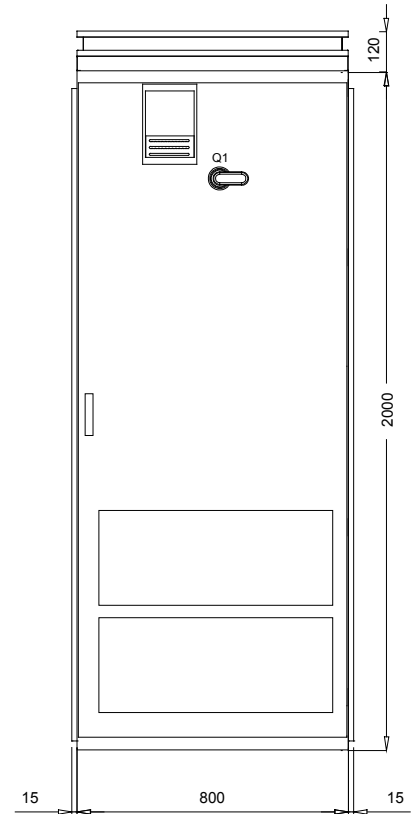
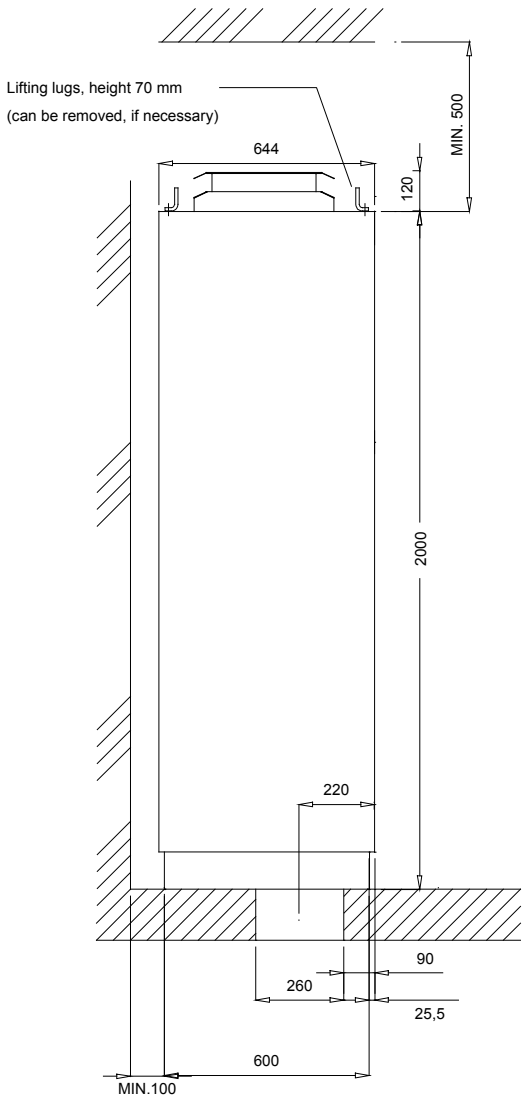
C2b DCSxxxx 520-1000A_p4+o..dsf

Component list (options)

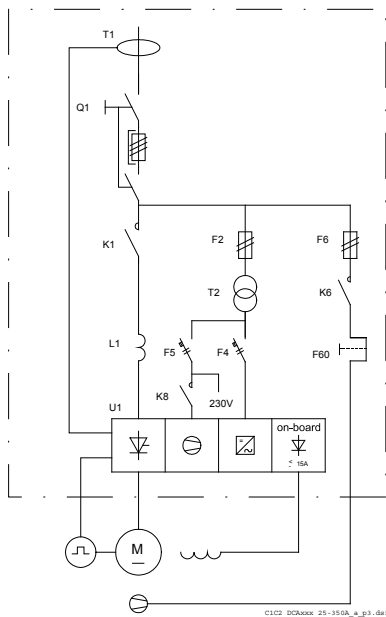
External excitation DCF803/804 **U3**
 Excitation contactor **K3**
 Excitation fuse **F3**
 Excitation autotransformer **T3**
 Residual current detection **T1**
 Motor fan starter contactor **K6**
 Motor fan starter thermal overload **F60**
 Motor fan starter fuses **F6**
 Advant controller **AC 800M**
 24 VDC power supply **G1**

Note 3: Not all options are shown. For more options see section *Mechanical options and Electrical options!*

DCS800-A-0470 ... 1000 group drive with selected options (shaded)



DCS800-A-0470 ... 1000 dimensions group and single drive

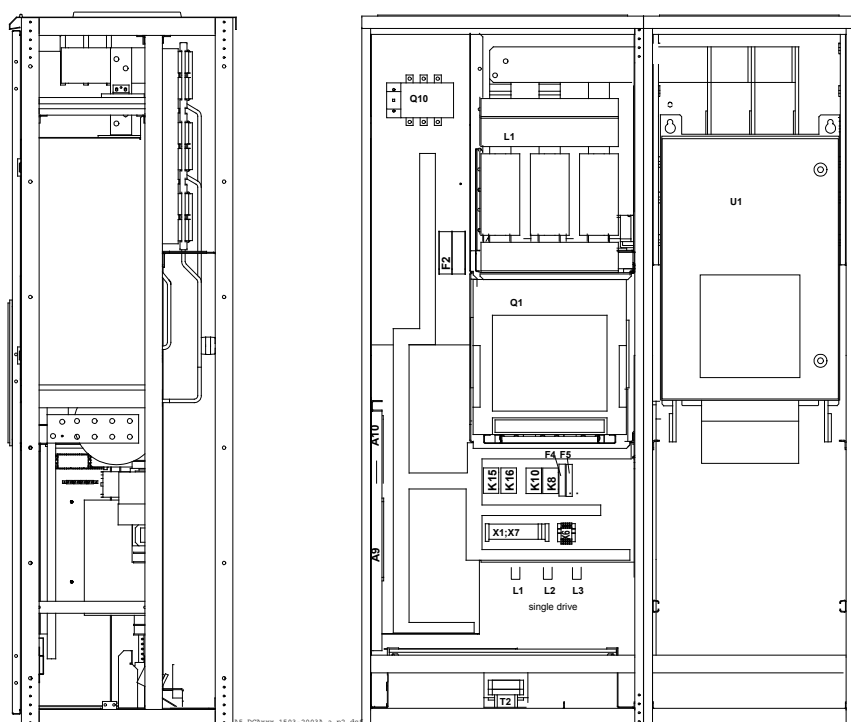


DCS800-A-0470 ... 1000 single line diagram group and single drive

Note 4: For more details (e.g. losses and weight) see tables on page 43 and 44

Note 5: All enclosed converters are available as group and single drives. Group drive require the option horizontal busbars.

Overview Enclosed converter DCS800-A-(900)1200 ... 2000 (D5)



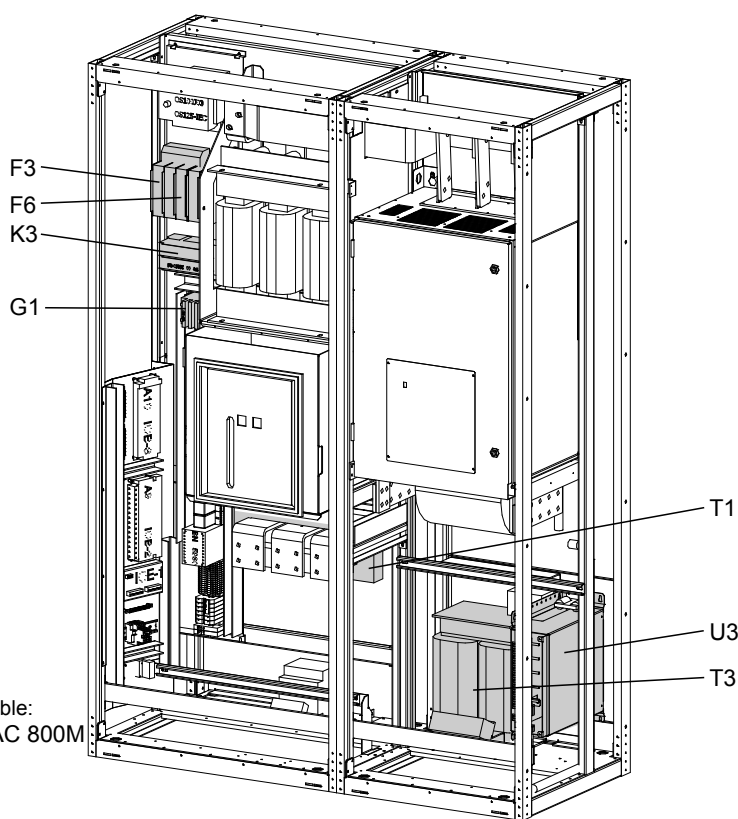
DCS800-A-(900)1200 ... 2000 standard group drive

Component list (standard)

- Degree of protection **IP 21**
- Armature converter module **U1**
- Circuit breaker **Q1**
- Isolation switch with fuses for aux. supply voltage **Q10**
- Auxiliary relay **K10**
- Line reactor **L1**
- Process terminals **X1/X6/X7**
- Aux. supply voltage transformer **T2**
- Aux. supply voltage fuses **F2**
- Converter fan fuse **F4***
- Auxiliary circuit fuse **F5***
- Converter fan relay **K8***
- E - stop relay **K15***
- Electrical disconnect relay **K16***
- I/O board SDCS-IOB-2x **A9***
- I/O board SDCS-IOB-3 **A10***

Note 1: This standard list does not include any options or the excitation! Please choose the excitation from the options list.

Note 2: * Wiring see section *Basic circuit diagrams*.



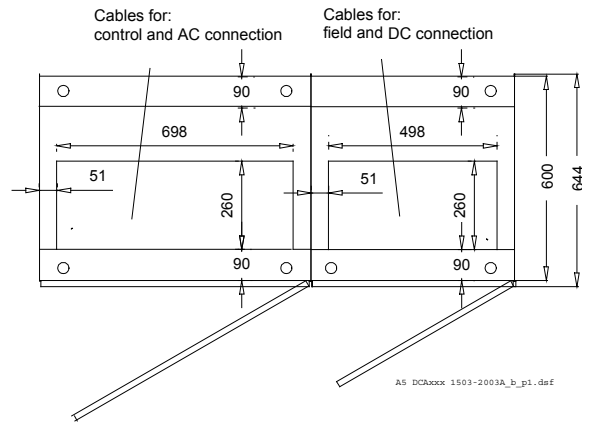
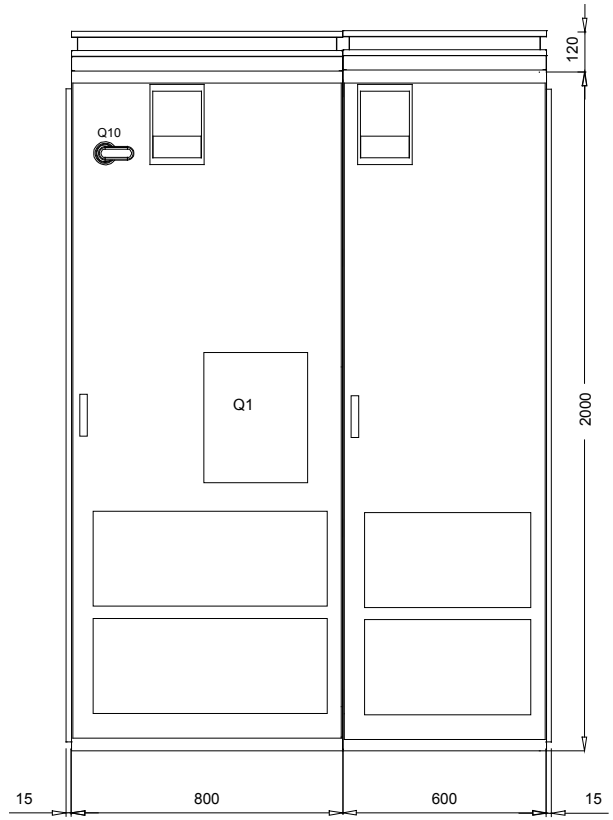
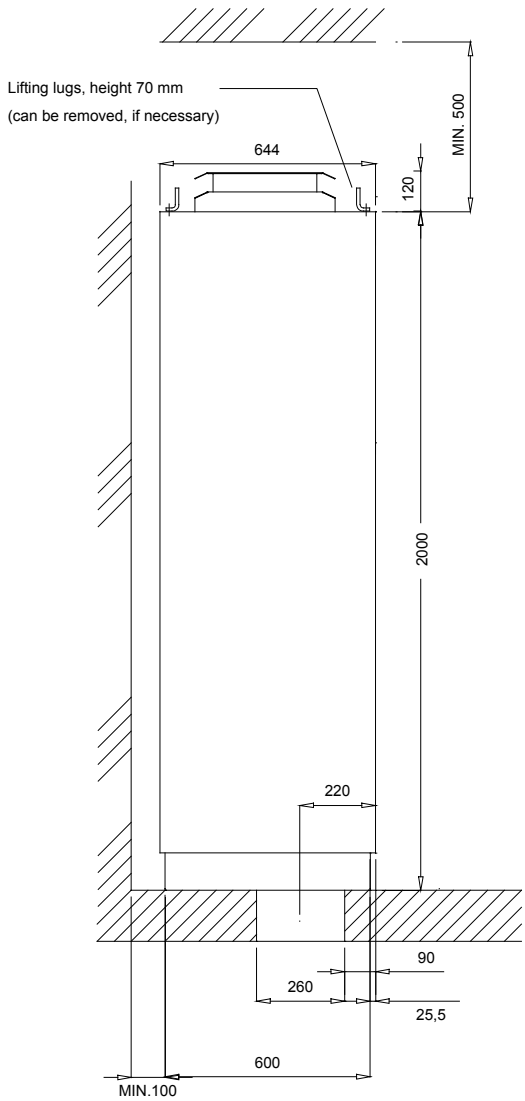
not visible:
F60, AC 800M

DCS800-A-(900)1200 ... 2000 group drive with selected options (shaded)

Component list (options)

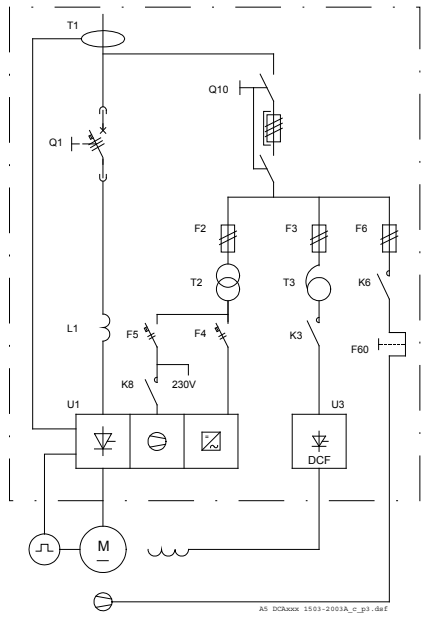
- Internal field exciter FEX425 INTERNAL 25 A
- External excitation DCF803/804 **U3**
- Excitation contactor **K3**
- Excitation fuse **F3**
- Excitation autotransformer **T3**
- Residual current detection **T1**
- Motor fan starter contactor **K6**
- Motor fan starter thermal overload **F60**
- Motor fan starter fuses **F6**
- Advant controller **AC 800M**
- 24 VDC power supply **G1**

Note 3: Not all options are shown. For more options see section *Mechanical options and Electrical options!*



A5 DCAxxxx 1503-2003A_b_p1.dxf

DCS800-A-(900)1200 ... 2000 dimensions group and single drive

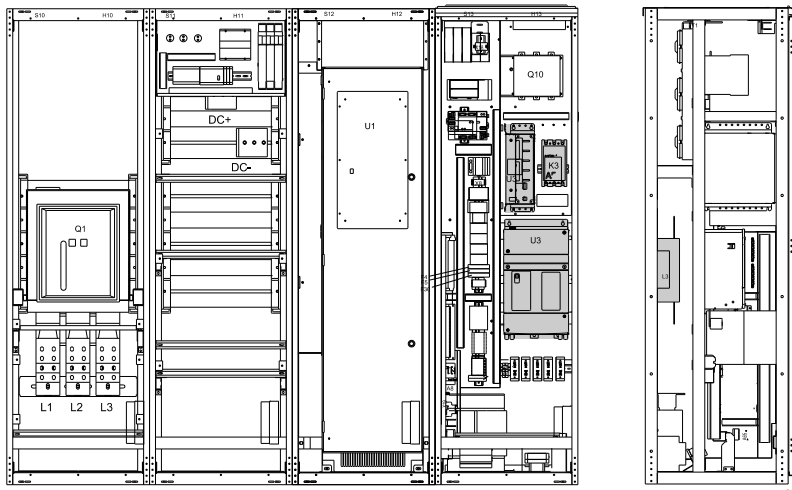


A5 DCAxxxx 1503-2003A_c_p3.dxf

DCS800-A-(900)1200 ... 2000 single line diagram group and single drive

- Note 4:** For more details (e.g. losses and weight) see *tables on page 43 and 44.*
- Note 5:** All enclosed converters are available as group and single drives. Group drive require the option horizontal busbars.
- Note 6:** For easy connection of cables use additional incoming cabinet DCA635 (see *section Incoming DCA635*).

Overview Enclosed converter DCS800-A-2050 ... 3000 (D6 ≤ 690 V)



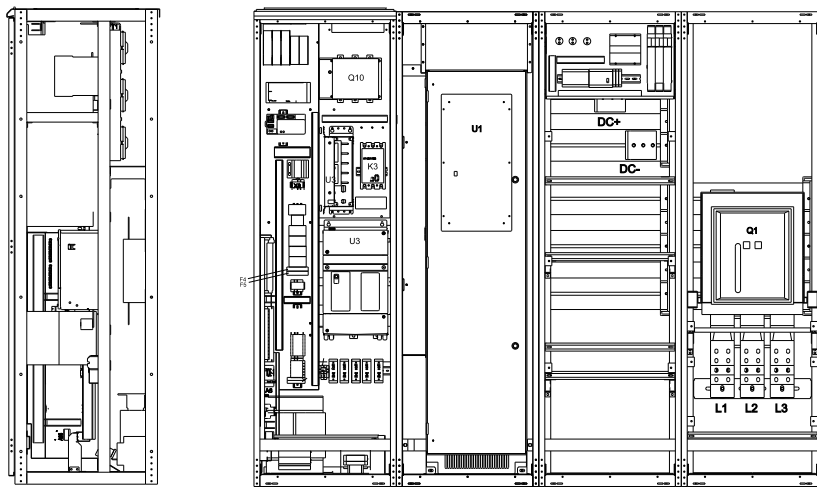
DCS800-A-2050 ... 3000 standard single drive (left hand connection)

Component list (standard)

- Degree of protection **IP 21**
- Armature converter module **U1**
- Circuit breaker **Q1**
- Isolation switch with fuses for aux. supply voltage **Q10**
- Auxiliary relay **K10**
- Process terminals **X1/X6/X7**
- Aux. supply voltage transformer **T2**
- Aux. supply voltage fuses **F2**
- Converter fan fuse **F4***
- Auxiliary circuit fuse **F5***
- Converter fan relay **K8***
- E - stop relay **K15***
- Electrical disconnect relay **K16***
- I/O board SDCS-IOB-2x **A9***
- I/O board SDCS-IOB-3 **A10***

Note 1: This standard list does not include any options or the excitation! Please choose the excitation from the options list.

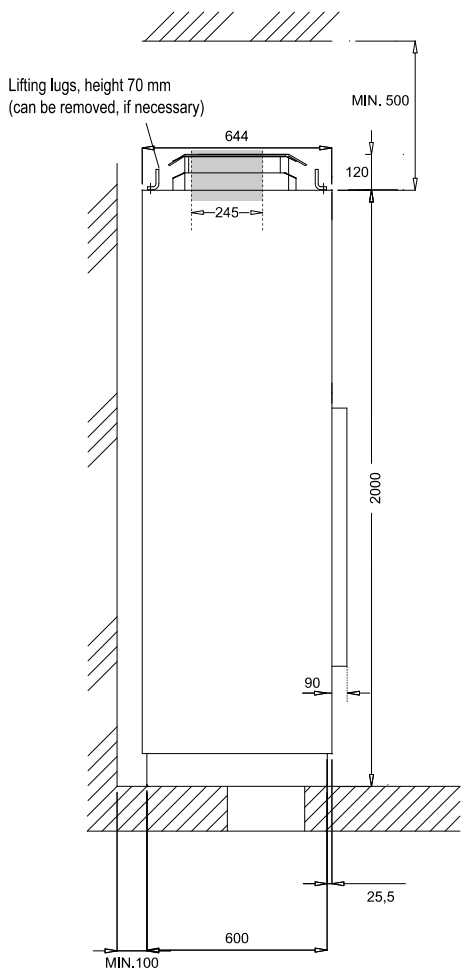
Note 2: * Wiring see section *Basic circuit diagrams*.



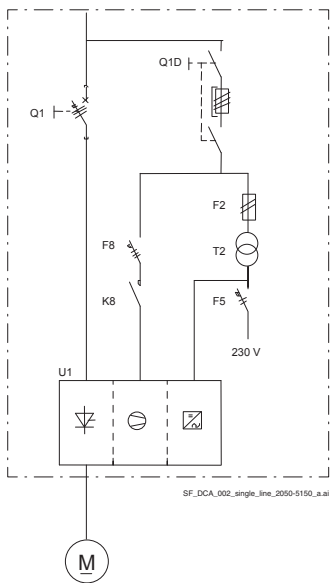
DCS800-A-2050 ... 3000 standard single drive (right hand connection)

Component list (options)

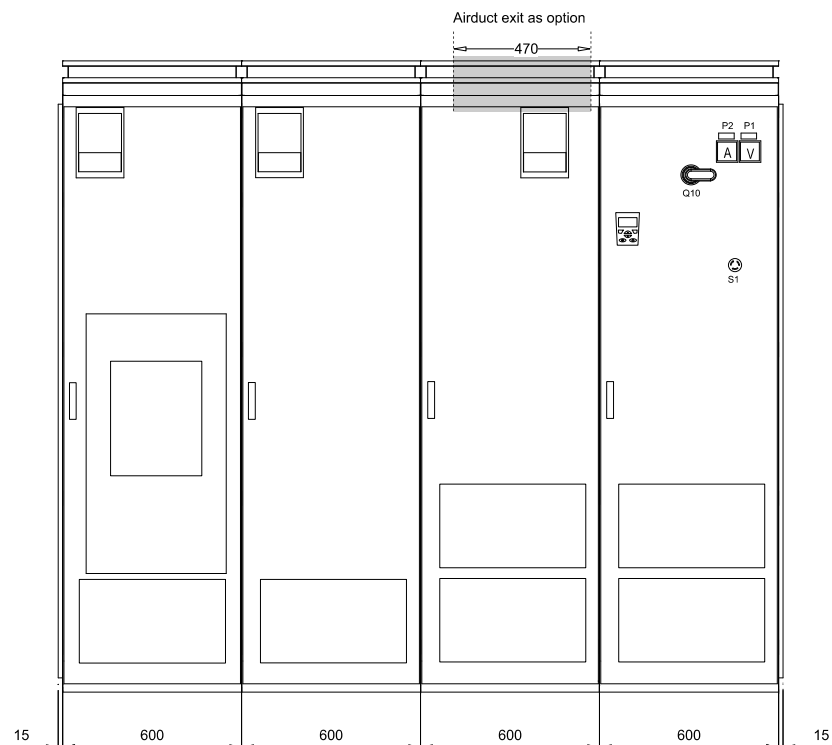
- Excitation **U3/K3**
- DCF803/804; to 50 A
- or
- DCS800-S01/S02; 25 ... 350
- plus DCF506 - Overvoltage protection
- Line reactor L1
- Aux control of HSDC-breaker



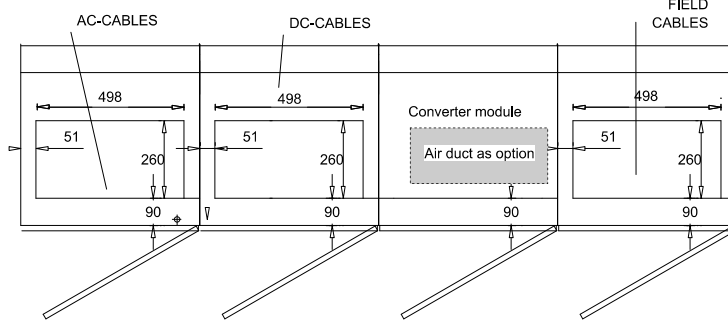
DCS800-A-2050 ... 3000 dimensions single drive (left hand connection)



Single line diagram DCS800-A-2050 ... 3000 400 V ... 690 V with breaker

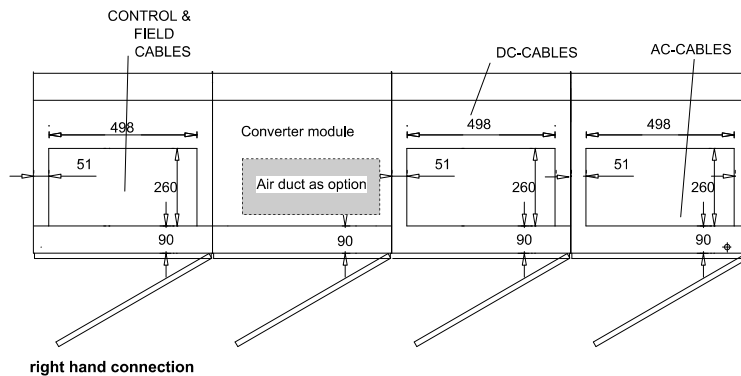


left hand connection



left hand connection

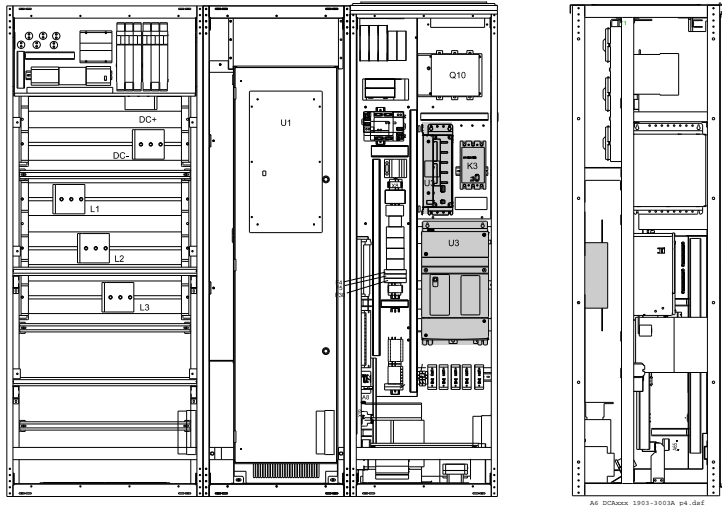
A6 DCAXxx 2053-3003A_a_p3.dsf



right hand connection

Note 3: Drive without line choke L1. Designed to be connected to dedicated transformers.

Overview Enclosed converter DCS800-A-1900 ... 3000 (D6, 790 V)



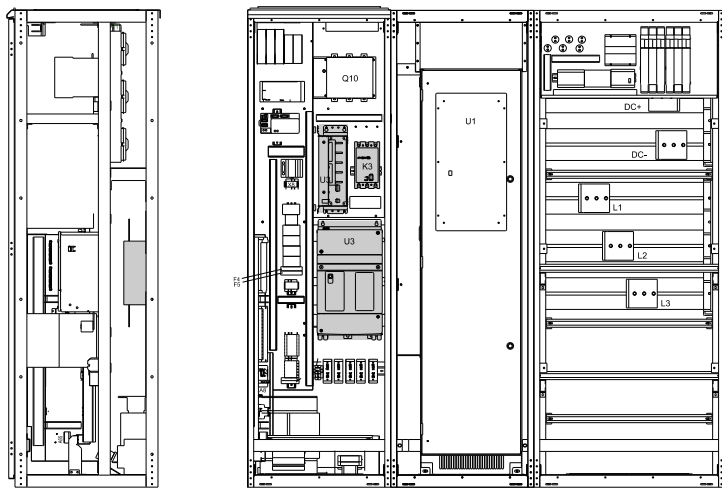
DCS800-A-1900 ... 3000 standard single drive (left hand connection)

Component list (standard)

- Degree of protection **IP 21**
- Armature converter module **U1**
- Isolation switch with fuses for aux. supply voltage **Q10**
- Auxiliary relay **K10**
- Process terminals **X1/X6/X7**
- Aux. supply voltage transformer **T2**
- Aux. supply voltage fuses **F2**
- Converter fan fuse **F4***
- Auxiliary circuit fuse **F5***
- Converter fan relay **K8***
- E - stop relay **K15***
- Electrical disconnect relay **K16***
- I/O board SDCS-IOB-2x **A9***
- I/O board SDCS-IOB-3 **A10***

Note 1: This standard list does not include any options or the excitation! Please choose the excitation from the options list.

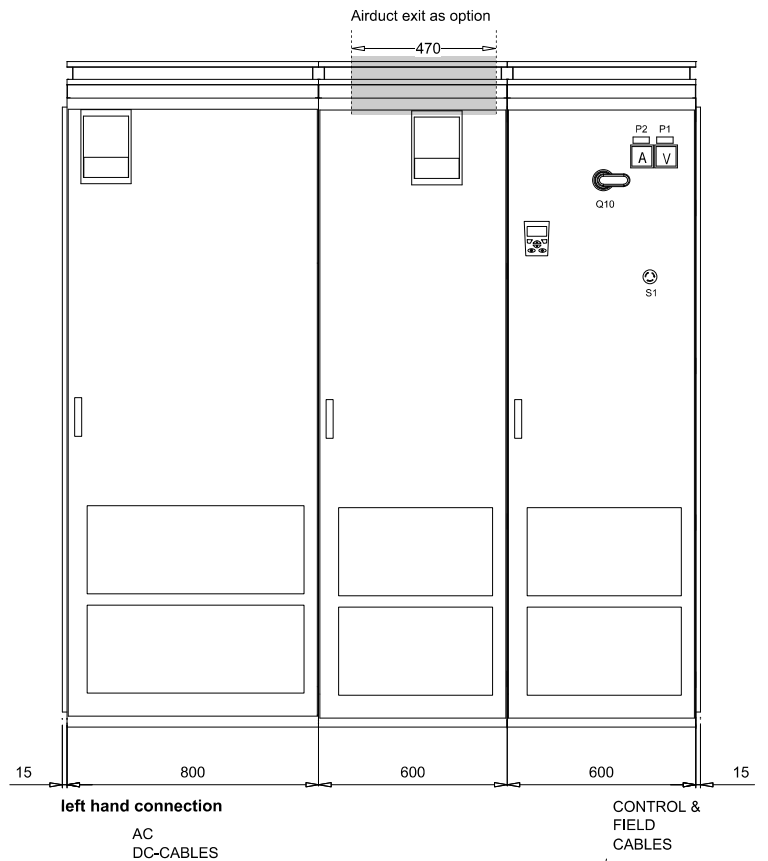
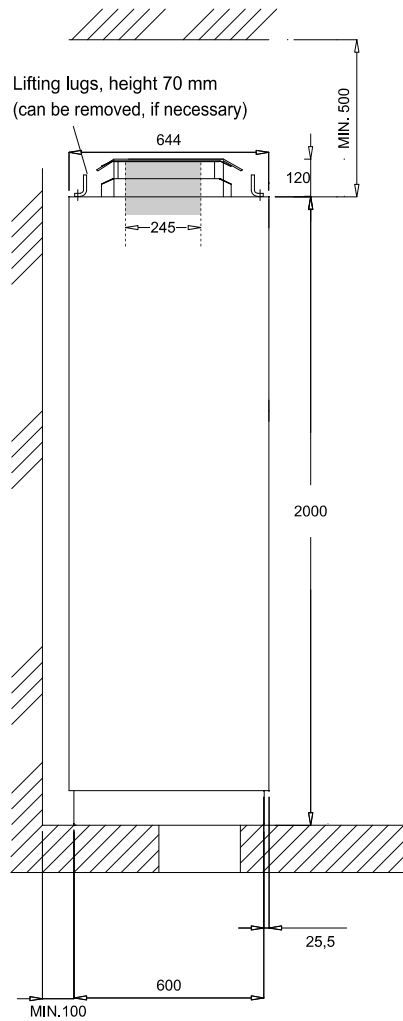
Note 2: * Wiring see section *Basic circuit diagrams*.



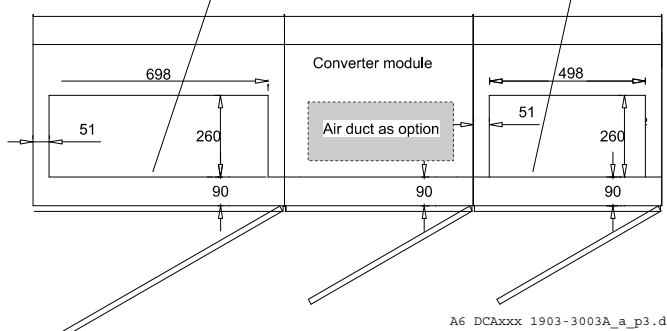
DCS800-A-1900 ... 3000 standard single drive (right hand connection)

Component list (options)

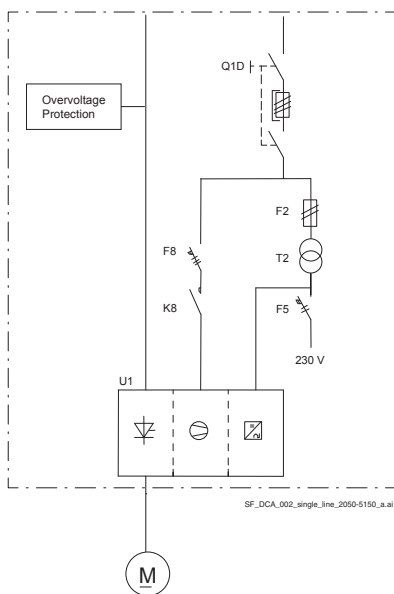
- Excitation **U3/K3**
- DCF803/804; to 50 A
- or
- DCS800-S01 / S02; 25 ... 350
- plus DCF506 - Overvoltage protection
- Aux control of HSDC-breaker



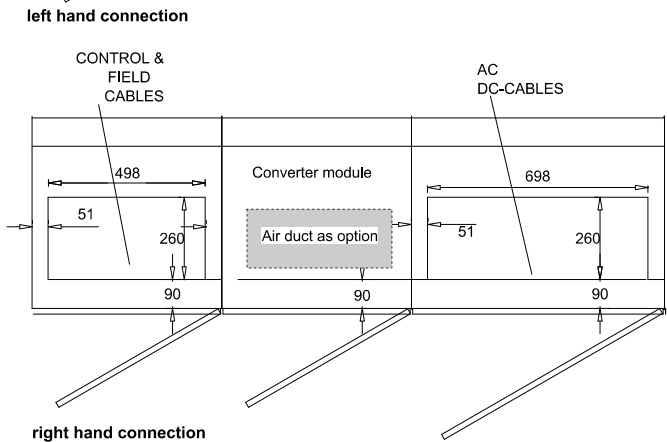
DCS800-A-1900 ... 3000 dimensions single drive (left hand connection)



A6 DCxxxx 1903-3003A_a_p3.dsf

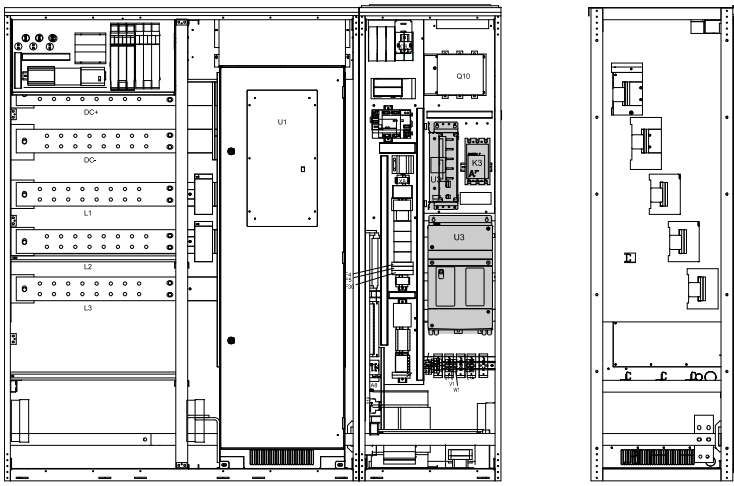


Single line diagram DCS800-A-1900 ... 3000
800 V without breaker



Note 3: Drive without line choke L1. Designed to be connected to dedicated transformers.

Overview Enclosed converter DCS800-A-2050 ... 3300 (D7)



DCS800-A-2050 ... 3300 standard single drive (left hand connection)

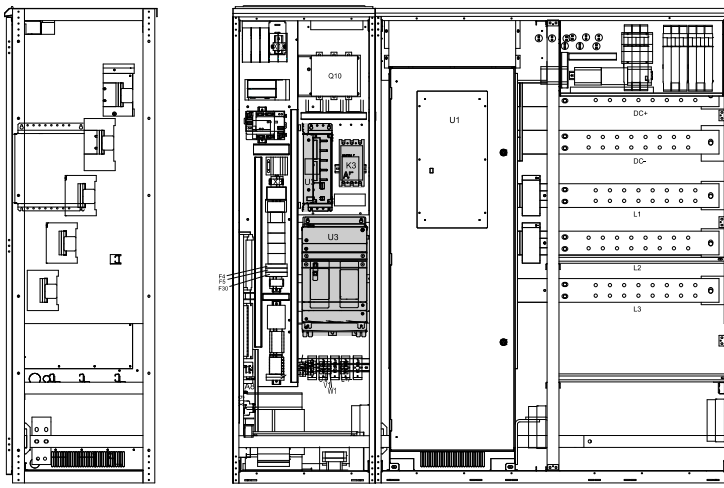
Component list (standard)

Degree of protection **IP 21**
 Armature converter module **U1**
 Isolation switch with fuses for aux. supply voltage **Q10**
 Auxiliary relay **K10**
 Process terminals **X1/X6/X7**
 Aux. supply voltage transformer **T2**
 Aux. supply voltage fuses **F2**
 Converter fan fuse **F4***
 Auxiliary circuit fuse **F5***
 Converter fan relay **K8***
 E - stop relay **K15***
 Electrical disconnect relay **K16***
 I/O board SDCS-IOB-2x **A9***
 I/O board SDCS-IOB-3 **A10***

Note 1: This standard list does not include any options or the excitation! Please choose the excitation from the options list.

Note 2: * Wiring see section *Basic circuit diagrams*

Note 3: Circuit breaker Q1 on request



DCS800-A-2050 ... 3300 standard single drive (right hand connection)

Component list (options)

Excitation **U3/K3**

DCF803/804; to 50 A

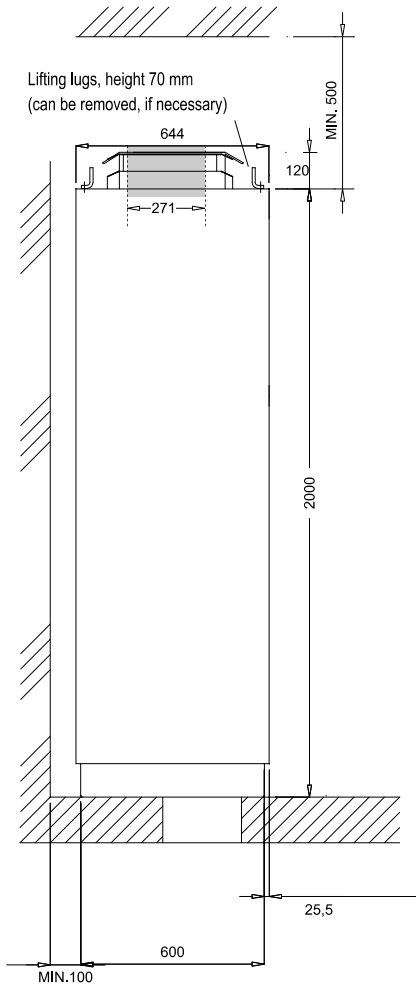
or

DCS800-S01 / S02; 25 ... 350

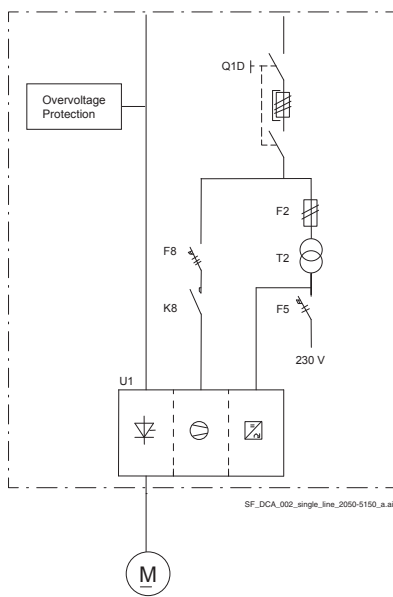
plus DCF506 - Overvoltage protection

+P907 U1 control located in control cubicle (swing frame)

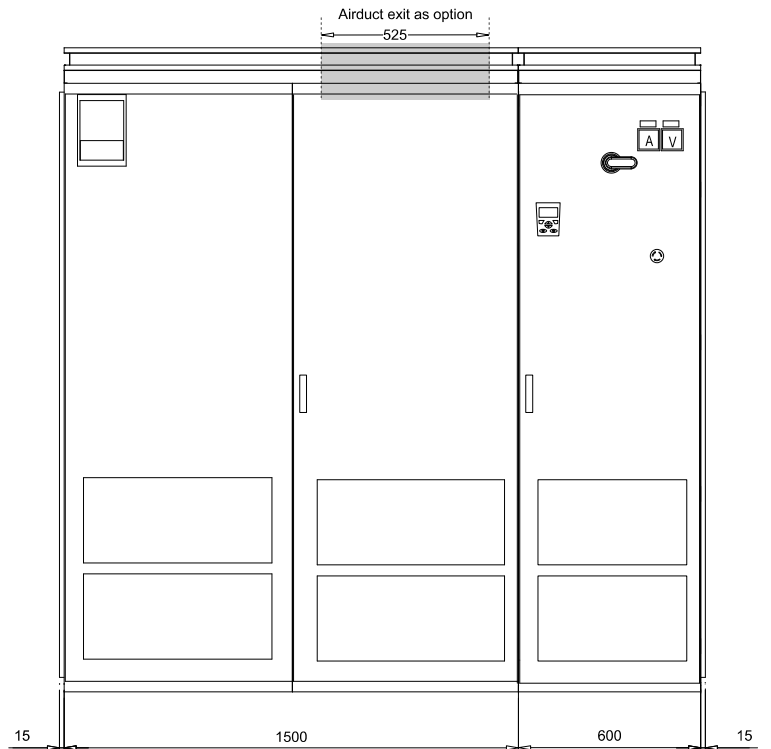
Aux control of HSDC-breaker



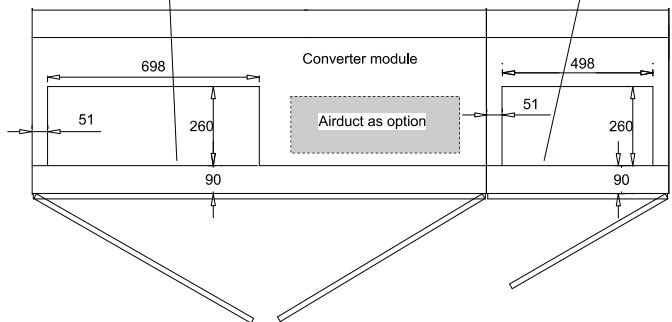
DCS800-A-2050 ... 3300 dimensions single drive (left hand connection)



Single line diagram DCS800-A-2050 ... 3300 without breaker

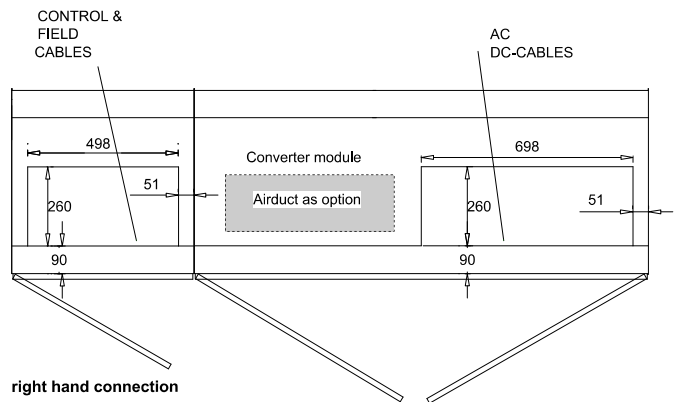


left hand connection AC DC-CABLES CONTROL & FIELD CABLES



left hand connection

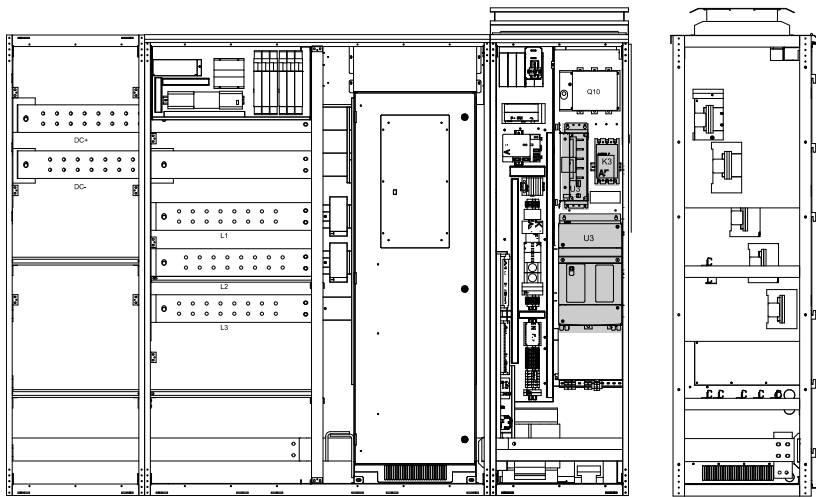
A7 DCxxxx 2050-3300A_a_p3.dsE



right hand connection

Note 3: Drive without line choke L1. Designed to be connected to dedicated transformers.

Overview Enclosed converter DCS800-A-4000 ... 5200 (D7)



DCS800-A-4000 ... 5200 standard single drive (left hand connection)

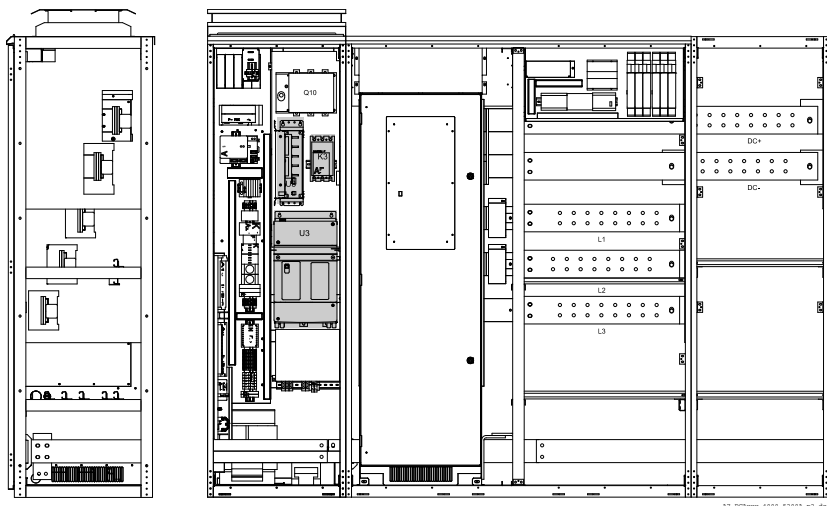
Component list (standard)

Degree of protection **IP 21**
 Armature converter module **U1**
 Isolation switch with fuses for aux. supply voltage **Q10**
 Auxiliary relay **K10**
 Process terminals **X1/X6/X7**
 Aux. supply voltage transformer **T2**
 Aux. supply voltage fuses **F2**
 Converter fan fuse **F4***
 Auxiliary circuit fuse **F5***
 Converter fan relay **K8***
 E - stop relay **K15***
 Electrical disconnect relay **K16***
 I/O board SDCS-IOB-2x **A9***
 I/O board SDCS-IOB-3 **A10***

Note 1: This standard list does not include any options or the excitation! Please choose the excitation from the options list.

Note 2: * Wiring see section *Basic circuit diagrams*

Note 3: Circuit breaker on request



DCS800-A-4000 ... 5200 standard single drive (right hand connection)

Component list (options)

Excitation **U3/K3**

DCF803/804; to 50 A

or

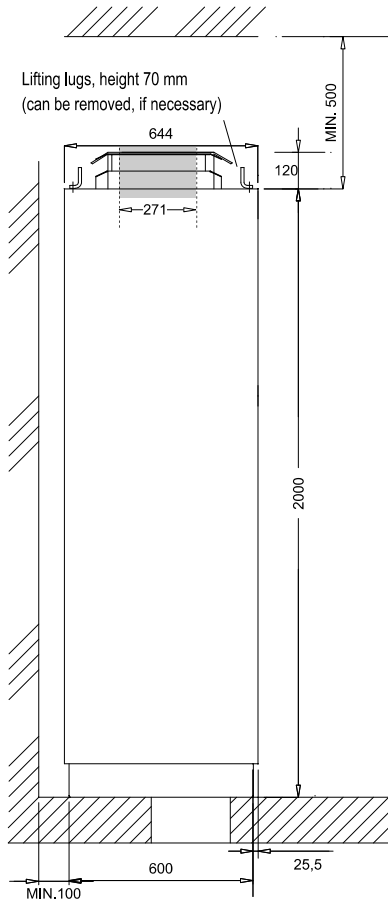
DCS800-S01 / S02; 25 ... 350

plus DCF506 - Overvoltage protection

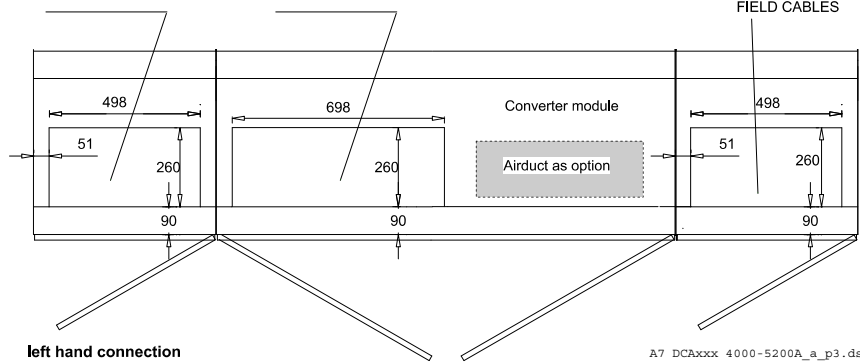
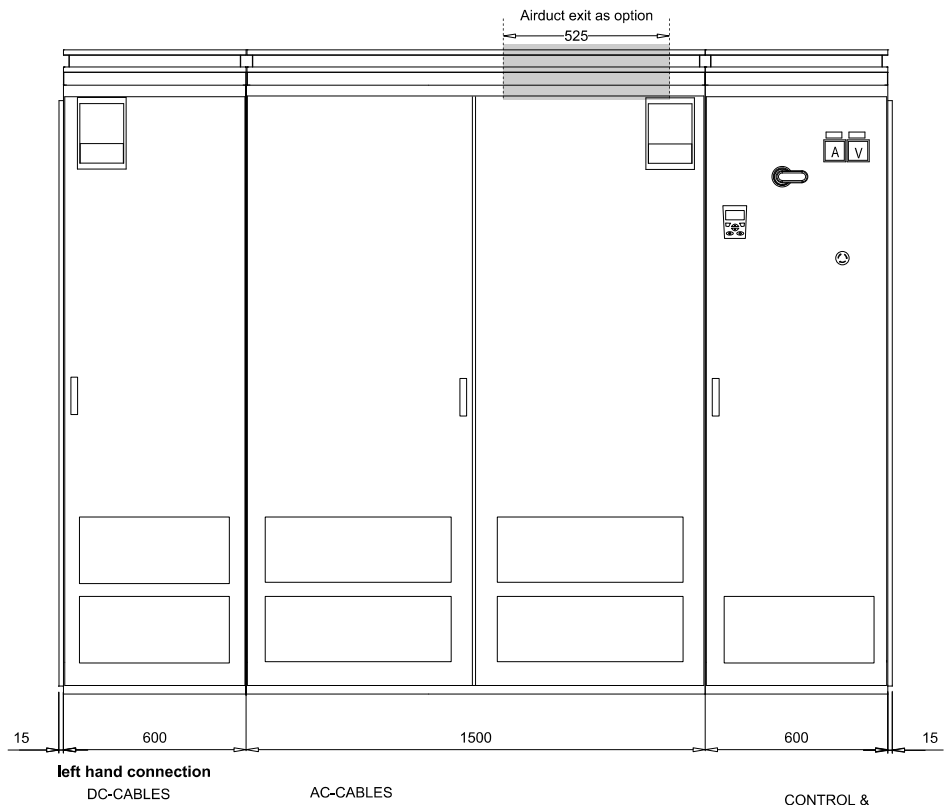
Circuit breaker **Q1**

+P907 U1 control located in control cubicle (swing frame)

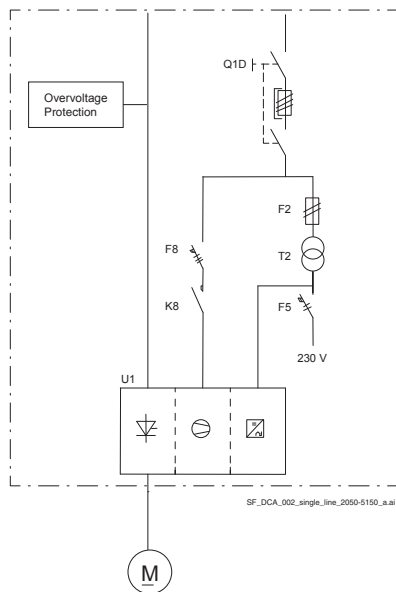
Aux control of HSDC-breaker



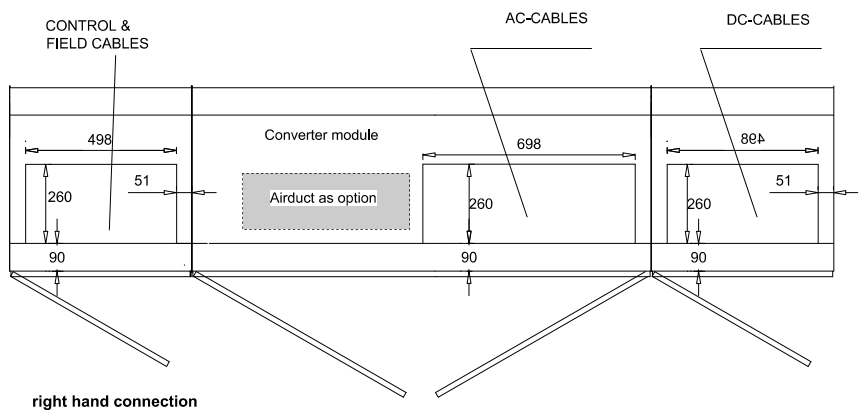
DCS800-A-4000 ... 5200 dimensions single drive (left hand connection)



A7 DCAxxx 4000-5200A_a_p3.dsf

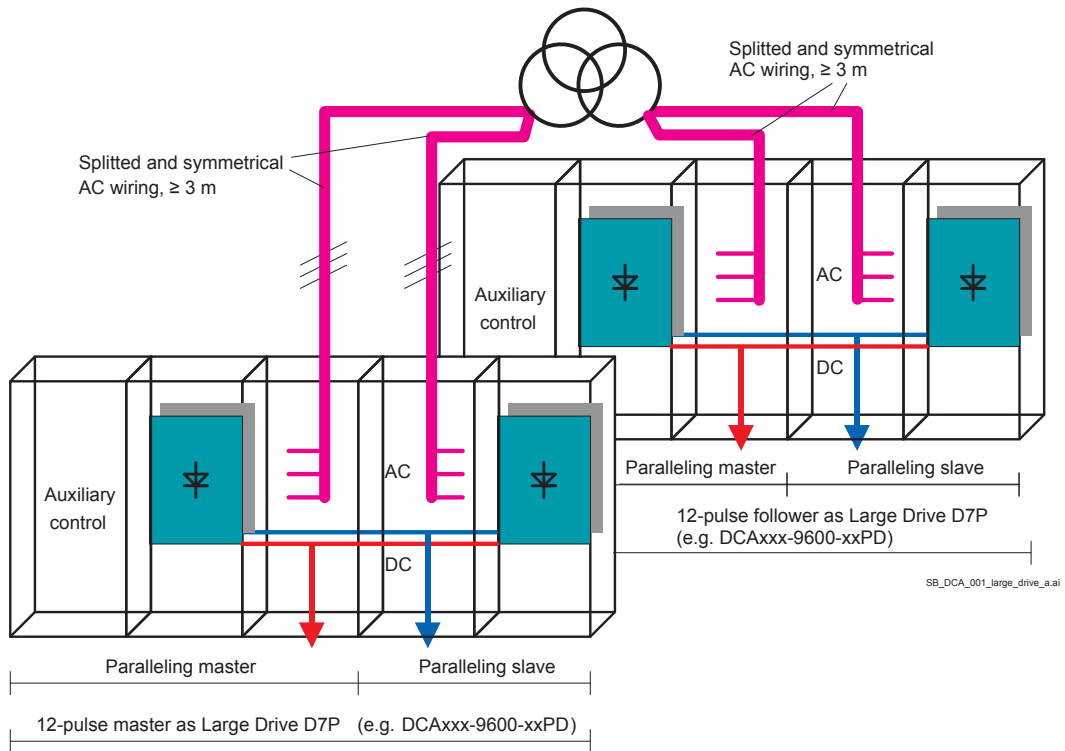


Single line diagram DCS800-A-4000 ... 5200 without breaker

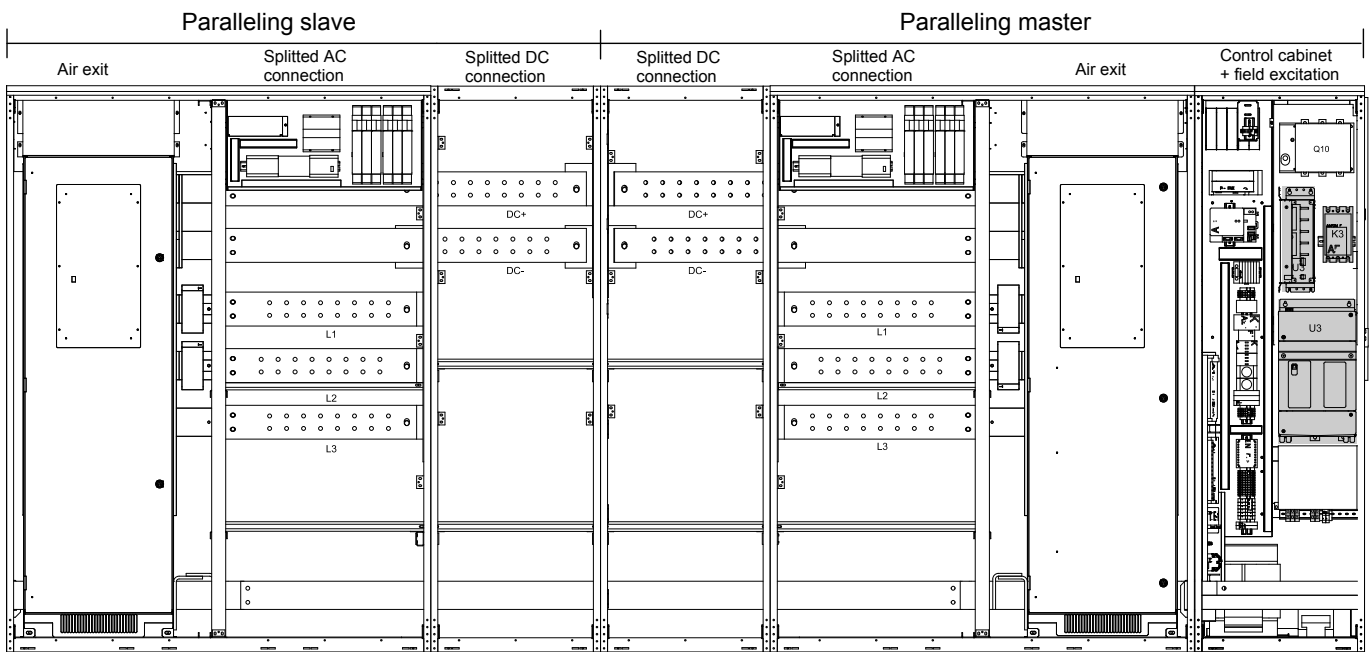


Note 3: Drive without line choke L1. Designed to be connected to dedicated transformers.

Overview Enclosed converter Series D7P in Large Drive design



Configuration of 12-pulse parallel (12-pulse master and follower) in combination with hard parallel (paralleling master and slave)



Layout of DCS800-A0x-9600-xxPD + three-phase field exciter (as option)

DCS800-A Mechanical options

CE mark

Requires options of EMC regulation and cable marking.

– EMC procedure according to part list check

for Converters 25 A up to 5200 A.

The DCS800-A converters and their options do not require an EMC-modified cabinet.

Note: see also *Technical Guide 3ADW000163*

– Marking of conductors

Conductors, cables and busbars are provided with either **Standard Marking** or **Special Marking** as an option.

Three different cable markings are available

- **Standard Marking** (not sufficient for CE mark) the main circuit input and output connections and the ribbon cables are marked. Marking is made by imprints, adhesive labels, pliotex PT-V rings or equivalent.

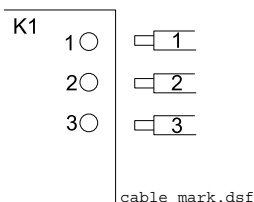
Class A2 plus

This cable marking complies with Standard EN60204 for CE marking.

Conductors between

- converter module and
- apparatus (e.g. contactor, switch)

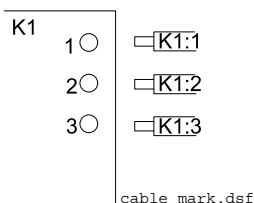
are marked with terminal numbers



The marking is done for long conductors and short obvious conductors.

– Class B1

In addition to the marking A2 cable marking provides the apparatus symbols.



Standard Design is IP21

Air inlet 8 mm longitudinal slots, air outlet same as air inlet plus a air ventilation hood on the top.

Insect screen in air inlet / outlet (IP31)

To clean the incoming air in dirty environment. Only in combination with gland plate and bottom plate.

Insect screens reduce the rated current of the enclosed converters. The reduction is calculated by DC DriveSize.

Air inlet filters (IP41)

Air input IP41, air output standard IP21.

To clean the incoming air in dirty environment. Only in combination with the option gland plate and bottom plate.

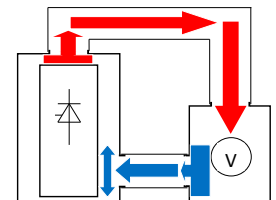
Air inlet filters reduce the rated current of the enclosed converters. The reduction is calculated by DC DriveSize.

IP54R

The IP54R cabinet designed (option) to allow cooling by supply air duct of a recirculation air cooling system.

The air entry (left or right side) and the air exit (top) are realized by rectangular flanges (400 x 600 mm).

Ventilation shafts of the supply air duct to the air water recirculation heat exchanger are connected to these flanges.



Gland plate and bottom plate

Cable glands for control-, field- and AC cables located in the bottom plate.

Bottom plate (without cable holes)

The cable holes must be drilled by the customer.

Bottom plate with conductive sleeves (according to EMC)

Bottom plate are equipped with conductive sleeves which provide simple cable screen connection. The bottom plate is not required for CE mark.

Special color (according to RAL standard)

Standard color is light grey RAL7035. Outside color of a cabinet can be chosen freely according to RAL standard. Special colors on request.

Key lock

For this doors

- a triangular key is standard
- a safety key lock is an option.

End panels

End panels have to be chosen to make a complete cabinet. For a line-up only one pair of panels is needed.

Horizontal AC busbars

Horizontal busbars are used to feed the entire line-up from the incoming supply section.

Tin plated copper busbars inside the cabinet are optional.

- without AC busbars => single drive
- copper (tin plated possible), 1000 A_{AC} => group drives
- copper (tin plated possible), 2000 A_{AC} => group drives
- copper (tin plated possible), 3000 A_{AC/WW} => group drives

Current rating depends on the power needed. Maximum current is 3000 A for horizontal AC-busbars. 4000 A incoming sections should be placed in the middle of a line up, in order to distribute the AC-current to left and right side.

AC cable connection for single drives

- Bottom entry/exit is standard and is included in converter basic design.
- Top entry/exit on request (needs additional engineering).

Control cable connection

- Bottom connection is standard and is included in converter basic design.
- Top connection on request.

Air circuit breaker

- Air circuit breaker is optional for drives with 4000 A and 400 ... 690 V_{AC}.
- Air circuit breakers for more than 690 V_{AC} or ≥ 4800 A on request.

DCA680 Additional empty cabinets (without end panels and bottom plate)

Empty cabinet without end panels are available.

- Depth 600 mm:
200 mm - busbar joining cabinet to connect shipping splits
- Depth 600 mm *:
400, 600, 800, 1000 mm - empty cabinet

* **Bottom plate** with conductive sleeves as option

Bottom plate are equipped with conductive sleeves which can provide simple cable screen connection.

Note1:

If a line up is splitted into several transportation segments an additional joining cabinet is needed per segment (except the last segment) for connection.

Note2:

Max. length of one transportation segment is 3.40 m.

EMC-Filters for drives cabinets

- Located in separate cabinet next to drive cabinet. Separate cabinet (on request).
- Instead of EMC filters a dedicated transformer can be used.

12-Pulse Configuration parallel, serial, sequential

The converters can be ordered with connection between 12-pulse master and 12-pulse follower.

For the 12-pulse serial the emergency short circuit busbars are available.

12-pulse parallel configuration available for:

20 A ... 5200 A, 230 ... 1000 (1190) V_{AC}

12-pulse serial and sequential configuration available for:

900 A ... 2000 A, 230 ... 345 V_{AC} per D5 converter

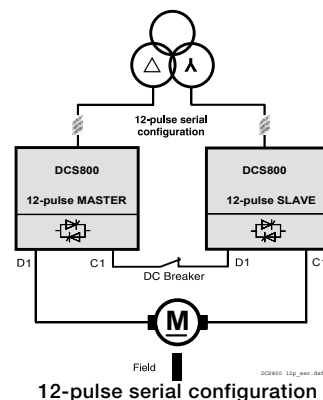
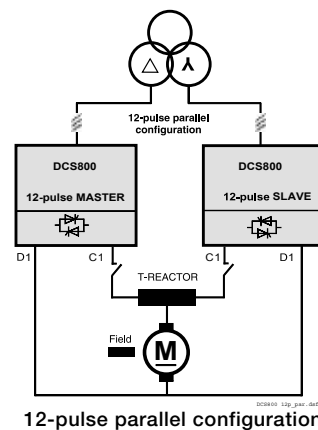
2050 A ... 5200 A, 230 ... 600 V_{AC} per D6, D7 converter

Serial sandwich configuration available for:

- 1900 A ... 3000 A, 230 V_{AC} ... 800 V_{AC} per D6

- 2050 A ... 5200 A, 230 V_{AC} ... 1000 V_{AC} per D7

Note: see also *Manual for 12-pulse operation 3ADW000115*



DCS800-A Electrical options

Description of Electrical options

2-phase Field Exciters

(assembled in armature converter cabinet > 1000 A)

Package includes

- Field supply
The field exciter for enclosed converter is a complete field supply package (except autotransformer). The two phase line reactor is included.

Package does not include

- Autotransformers
An autotransformer is used to adapt the supply voltage of the single-phase field exciter and to reduce voltage ripple.

Available units

- DCF803-0035 35 A, single-phase or three-phase operation outside converter module maximum input voltage 600 V
- DCF803 30, 50 A, outside converter module
- DCF804 7, 16, 30, 50 A, outside converter module

Options for two-phase field exciters

- Autotransformers 400 V ... 690 V (single-phase)
The maximum input voltage of 690 V for DCF803-0050 / DCF804-0050.
Higher input voltages require an insulating transformer. An autotransformer is recommended for single-phase DCF803, if the rated field voltage of the motor is lower than 60 % of the rated field AC supply voltage.
- Two different sizes available.
Transformer 3.0x; AC input 400 ... 500 V
Transformer 3.1x; AC input 525 ... 690 V
7 A - 57 A autotransformers. The autotransformer is selected according to the customer specification of the AC field supply voltage.

Note: In the standard design the field exciter is connected to the main supply.

Typing a different voltage into the AC FIELD SUPPLY (DC DriveSize) the wiring is automatically changed to external field supply terminals.

Safety circuits

Ordering STO and SS1 safety circuits according ordering guide page 48.

Interfaces

Fieldbus

Adapter for several fieldbus systems available (e.g. Profibus, Modbus, etc.)

I/O digital connection board

- SDCS-IOB-23 is the standard equipment for a DCS 800-A.
Control voltage for relay outputs max. 230 V_{AC}
Digital input voltage 230 V_{AC}
- Changing to SDCS-IOB-21 (option)
Control voltage for relay outputs max. 230 V_{AC}
Digital input voltage 24 / 48 V_{DC}
- Changing to SDCS-IOB-22 (option)
Control voltage for relay outputs max. 230 V_{AC}
Digital input voltage 115 V_{AC}

RDIO / RAIO I/O Extension modules

This plug-in option offers two additional relay outputs. They can be used, for example, in a Master-Follower application for interlocking functions. All the relays can be programmed to on/off by parameter. Alternatively, fieldbus can be used to control any external components in the system.

RDIO-01 Digital extension module

- 3 x Digital Input
- 2 x Digital Output (as relay)

RAIO-01 Analog extension module

- 2 x Analog Input
- 2 x Analog Output
- 2 x Temperature measurement

AIMA Extension socket

I/O channel to AIMA-01 board together with SDCS-COM-8 board

DC Transducer

Additional measurement devices for customer signals

- PT 100 measurement device (230 V_{AC} supply is needed)
- PTC measurement device (Custorapid 230 V_{AC} supply is needed)
- DC-DC transducer (0 ... 10 V → 4 ... 20 mA; 24 V_{DC} supply is needed)
- DC-DC transducer (-10 ... +10 V → 4 ... 20 mA; 24 V_{DC} supply is needed)

Branching unit NDBU-95

The NDBU-95 is available in the armature converter cabinet, if no DCF803 / 804 and not in combination with 3-phase field exciter (DCS800-F0x) is used.

Separately the NDBU-95 is available in a 400 mm cabinet.

Other accessories

Anticondensation heater of cabinet

- 50 W heater per cabinet to prevent condensation. Supplied by 230 V_{AC} from customer via terminals (X19).

Lighting of the cabinet

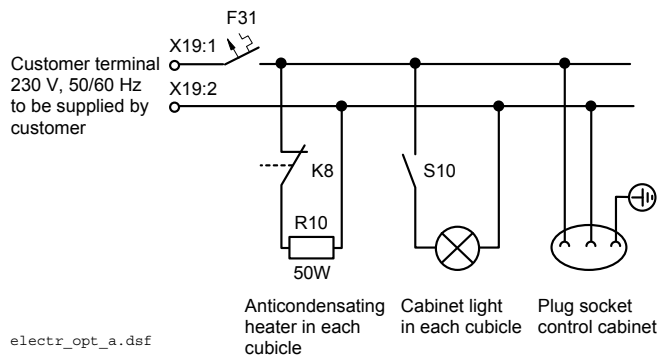
- LED lighting, including door contact. Supplied by 230 V_{AC} / 115 V_{AC} from customer via terminals (X19).

Interface to external UPS

- Separate 230 V_{AC} input terminal to supply all necessary components for serial communication (including monitoring network [DW], branching unit NDBU), if the DCS800-A cabinet is switched off.
230 V UPS performed by customer.

Plug socket

- The plug socket is wired to 230 V_{AC} customer terminal (X19) and the housing is according to German standard.



Latching function

- Interface relays K11, K12 for local I/O control (ON, RUN, START, STOP)

Residual current measurement with transformer

used for earthed (TN, TT) networks.

Earth fault detection includes a zero measuring current transformer T1 connected to the mains of the drive. The monitoring operates on the current summation principle and a converter fault can be enabled in case of an earth fault (not possible for isolated mains network).

The transformer is available for 20 ... 2000 A.

The transformer is available for 2050 ... 3000 A in combination with a circuit breaker.

Insulation monitor IRDH275-4 or IDRH375-4 (A90) earth fault detection for isolated (IT) networks. An insulation monitor device can be used to continuously measure the insulation status in an unearthed network. The insulation monitor is installed between mains and protective earth (PE). If the insulation resistance is below adjusted values output relays are activated.

For detection of earth faults in both AC and DC circuits. Available for converter ratings 903 ... 5200 A. (25 ... 1000 A on request).

The monitor can be mounted inside the cabinet or at the door. For redundant measurement 275 B type is an option.

Galvanic isolation necessary if there is any customer requirement and rated voltage from 790 V and higher (applicable for 2050 A ... 5200 A_{DC}).

DCS800-A enclosed converters measure the actual voltage by means of high ohmic resistors. This measurement is according the IEC standard (2 Mohm for voltages starting at 790 V).

The option galvanic isolation is a complete isolation of this voltage measurement channels.

This isolation is performed a by transformer for the AC voltage and a galvanically isolated transducer for the DC voltage.

This option could also be required for 12-pulse serial/sequential above 2 x 345 V_{AC}.

Motor fan starter

Only one starter is possible in the standard design.

- **D1 size (0020 ... 0140)** 0.63 A ... 6.3 A
- **D2/D3 size (0230 ... 0520)** 0.63 A ... 12.5 A
- **D4 ... D7 size (0680 ... 5200)** 6.30 A ... 25A

For overload and short-circuit protection of an external AC (fan) motor such as a motor cooling fan. Available ratings are 0.63 ... 25 A, 400V, 500 V, 600 V, 690 V. The starter output is supplied by AC mains voltage or auxiliary voltage. There is no transformer included.

A second starter requires an additional cabinet DCA680.

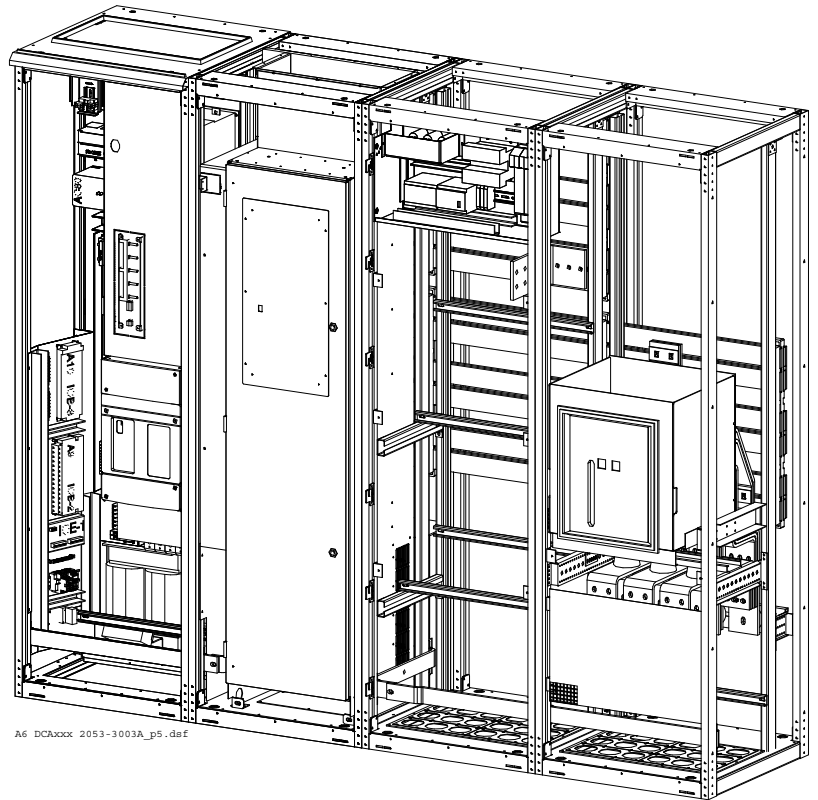
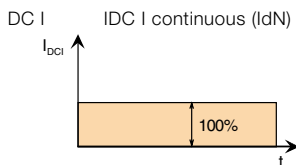
=> Do not forget to fill in the current and voltage into DC DriveSize!

Note: In the standard design the motor fan is connected to the main supply.

Typing a different voltage into the SUPPLY VOLT (DC DriveSize) the wiring is automatically changed to external fan supply terminals.

Location of 3-phase exciter DCS800-A0x-1900 ... 5200 (D6/D7)

Unit type	DC I	Power loss	Size
525 V	[A]	[kW]	
DCS800-F01-0020-05-C	16	0.58	D1
DCS800-F02-0025-05-C	22	0.58	
DCS800-F01-0045-05-C	40	0.65	
DCS800-F02-0050-05-C	45	0.65	
DCS800-F01-0065-05-C	57	0.72	
DCS800-F02-0075-05-C	67	0.72	
DCS800-F01-0090-05-C	84	0.85	
DCS800-F02-0100-05-C	92	0.85	
DCS800-F01-0180-05-C	160	1.40	D2
DCS800-F02-0200-05-C	180	1.40	
DCS800-F01-0315-05-C	285	1.81	D3
DCS800-F02-0350-05-C	300	1.81	



Electrical options of Enclosed converter DCS800-A-2050 - 3000

Option three phase field exciters assembled in armature circuit enclosed converter DCS800-A0x-1900 ... 5200

Field supply (DCS800-S0x-0020 ... 0350 converter modules, 230 ... 500 V AC + overvoltage protection)

Field exciters integrated in enclosed converters are available as packages. The packages includes all necessary parts (e.g. overvoltage protection DCF506, line reactor). Autotransformers for field supply assembled in an enclosed converter are excluded.

- All 3-phase field exciters have to be ordered separately.
- 3-phase field exciter (DCS800-F0x ... 0350 units) can be integrated in an armature cabinet together with converter units size D6/D7 (1900 ... 5200). More than 285 A / 300 A excitation are available in separate cabinets (s. chap. DCS800-A2x 3-phase field exciters in a separate cabinet).

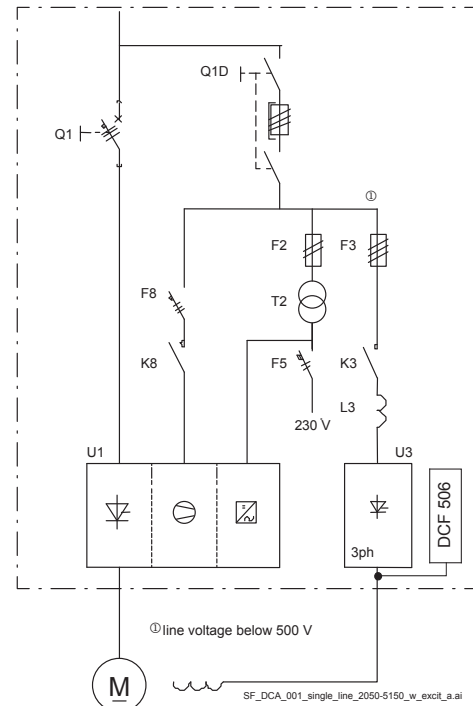
In order to get a complete field supply following additional components have to be considered.

Auto- and insulating transformers

An autotransformer is used to have a suitable supply voltage level for a field exciter and to reduce the voltage ripple. For each 3-phase field exciter an autotransformer is dimensioned individually.

Placing the transformer inside the cabinet depends on the size of the transformer. For dimensioning please contact ABB. Higher input voltages (> 600 V / 690 V) require an insulating transformer.

Single line diagram DCS800-A-1900 (D6) ... 5200 (D7) including field supply



Single line diagram 1900 ... 5200 units with 3-phase field

DCA630 Incomings

Incoming Supply Sections for Line-ups DCA63x

Incomings DCA63x are described in options for converters. These cabinets must only be selected if the drive system consists of group drives from 20 up to 2000 A since these converters are supplied by horizontal busbars.

In the incoming supply section (DCA63x) only busbars are used. The connection to the AC supply can be made by cables or busbars. The cable / busbar entry is at the bottom of the incoming supply section.

Cable or busbar connection for 1000 A and 2000 A is standard.

Cable connection for 3000 A and 4000 A is on request, busbar connection is standard.

The cabinets standard protection class is IP21.

Basic design

Rated voltage:	400 V, 500 V, 600 V, 690 V
Rated frequency:	50 Hz or 60 Hz
Rated current:	1000 A, 2000 A, 3000 A, 4000 A
Short circuit ratings:	50 kA (1 sec.)
idyn=	105 kA (peak)

Note: AC horizontal busbars for 4000 A are not available. The 4000 A incoming supply section must be located in the middle of the line-up.

Cabinet Modifications for Incoming Supply Sections DCA630, 631, 632

CE mark

Requires options for EMC regulation and cable marking.

- EMC procedure according to part list check see section DCS800-A Mechanical options
- Marking of conductors see section DCS800-A Mechanical options
- Standard: (not sufficient for CE mark): see section DCS800-A Mechanical options
- Class A2 Plus: Special Marking according to EN60204-1 see section DCS800-A Mechanical options
- Class B1: Special Marking see section DCS800-A Mechanical options

EMC filters in separate EMC-cabinets next to incoming cabinet (DCA640)

- 400 ... 500 V_{AC}, 320 ... 600 A_{AC}
- 600 ... 690 V_{AC}, 600 ... 2500 A_{AC}
Please select size of filters according to sum of all rated converter currents minus 10 %. The current mentioned above is the nominal current (Irms) on the line side.
- Instead of EMC filters a dedicated transformer can be used.

Bottom plate with conductive sleeves

Bottom plate are equipped with conductive sleeves which provide simple cable screen connection.

Insulation monitor IDRH 275-4 (A90) earth fault detection for isolated (IT) networks

An insulation monitoring device can be used to continuously measure the insulation status in an unearthed network. The insulation monitor is installed between mains and protective earth (PE). If the insulation resistance is below adjusted values output relays are activated. This option includes a 230 V transformer.

For detection of earth faults in both DC and AC circuits.

The insulation monitor can be mounted inside the cabinet or at the door (DCA630, 631, 632).

AC current measurement

- 3-phase (meters and current transformers)
All three phases are monitored by means of current transformers and meters. Location of the meters is in the door of the incoming supply section.

AC voltage measurement

- Meter and a switch
All three phases are monitored by means of a switch and a meter. Location of the switch and the meter is in the door in the incoming supply section. No transformers are used.
- With voltage transformers
Voltage transformers are included for AC voltages above 660 V.

Arc detecting

- An arc detecting relay is used to supervise the AC bus bars. The type TVOC can handle up to 9 detectors.



Arc detecting

- Detecting elements with fibre optic cable lengths of 2 to 20 m are available. It is possible to supervise several spots in one line-up.



Decting element

- Overcurrent relay for arc detecting.
An overcurrent relay is used in combination with an arc detecting relay to eliminate false trips. The overcurrent relay can use the current transformers used by the measurement circuits. For example if an AC current measurement is used there is no need for extra current transformers for the overcurrent relay.



Current transformers

- If no AC current measurement is used, three current transformers are needed for the overcurrent relay.
- Location in separate 400 mm cabinet for DCA631 and DCA 632

Anticondensation heater of incoming section

- 50 W heater to prevent condensation.
Supplied by 230 V_{AC} from customer via terminals (X19)

Branching unit NDBU-95

- The branching unit for DriveWindow and channel 0 optical networks can be located inside the incoming supply DCA630, 631, 632 (max. 2).
- NDBU-95
 - NPSM-01 24 V_{DC} power supply is required

Lighting of the cabinet

- LED lighting, including door contact. Supplied by 230 V_{AC} / 115 V_{AC} from customer via terminals (X19).

End panel left or right

Isolation switch option (for DCA631)

option for insulation switch

- Electrical interlocking
It is possible to have an interlocking between isolating switch and earthing switch. Therefore the isolating switch needs an interlocking coil.

Circuit breaker option (for DCA632)

The circuit breaker is equipped with

- Overcurrent detection
- Undervoltage detection
- Auxiliary contacts (2 NC, 2 NO)

Earthing switch

available for 1000 A, 2000 A, 3000 A supply

- Switch
An earthing switch can be used to ground the AC busbars to earth for safety reasons when work must be done in the line-up.



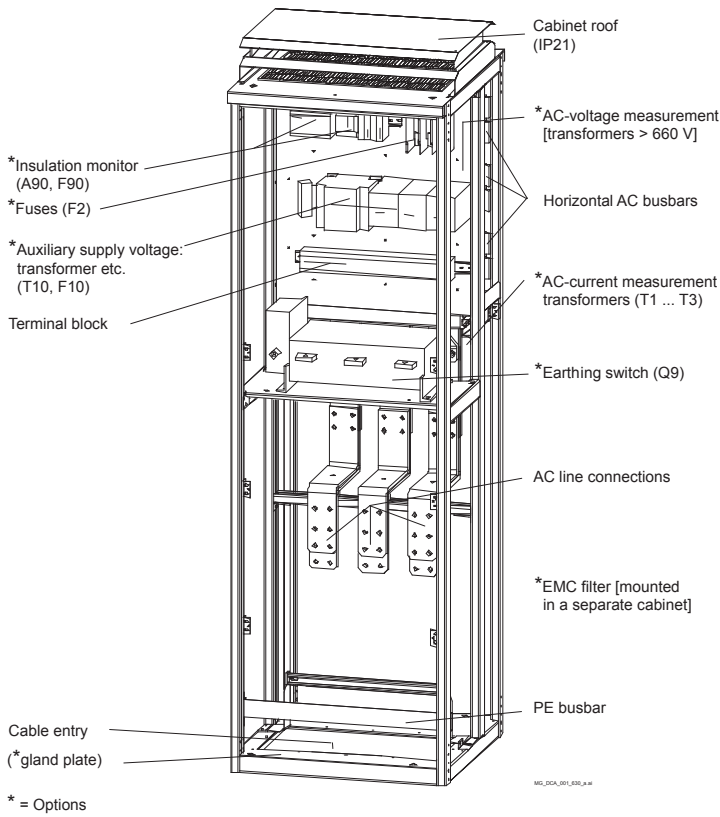
Earthing switch

- Electrical interlocking
It is possible to have an electrical interlocking between an earthing switch and a supply side isolating switch or circuit breaker. Therefore the earthing switch needs an interlocking coil.



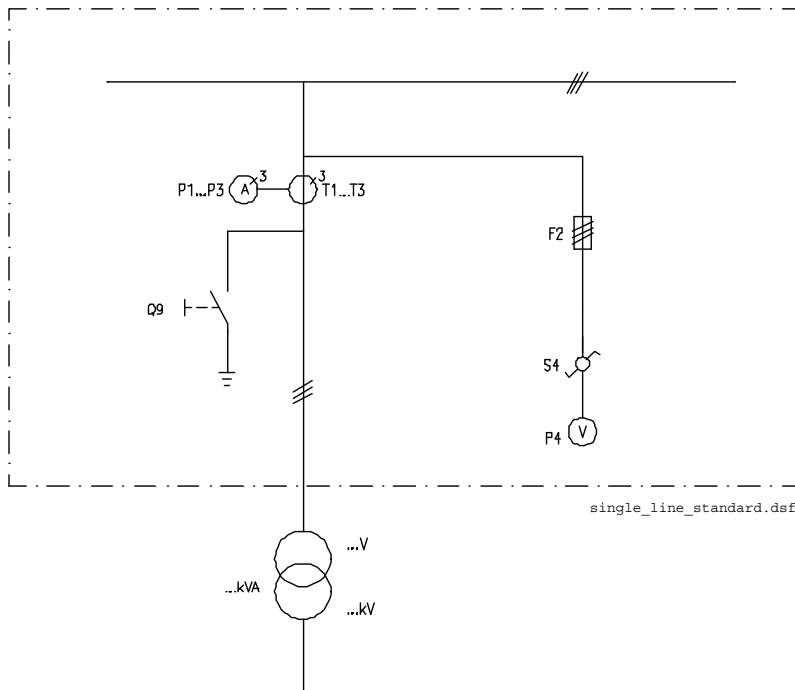
Interlocking coil

Incoming DCA630 (without switch)



Incoming DCA630

Single line diagram Incoming DCA630

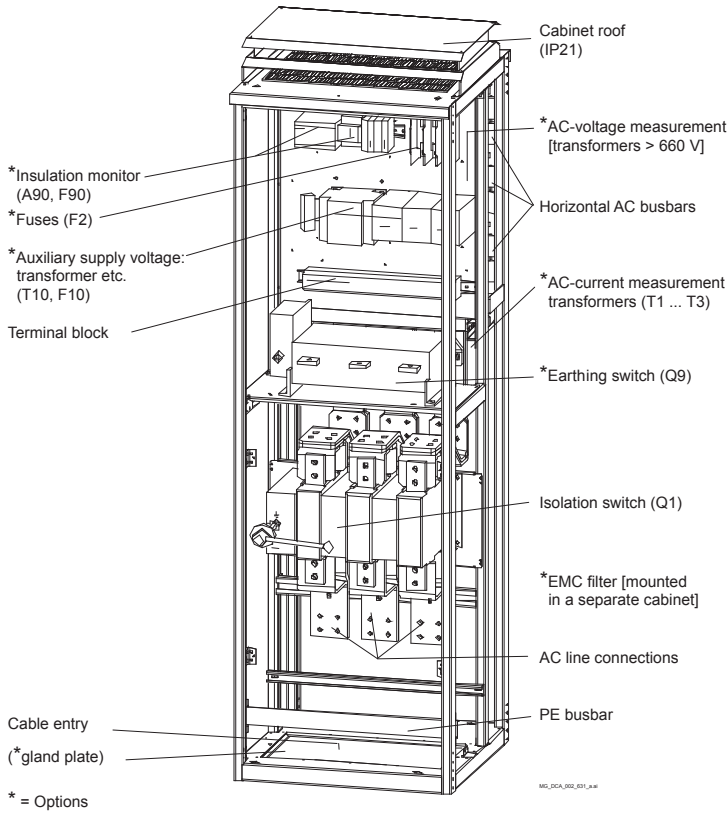


Single line diagram Incoming DCA630

Note 1: Dimensions see table 2, section Dimensions Converter cabinet

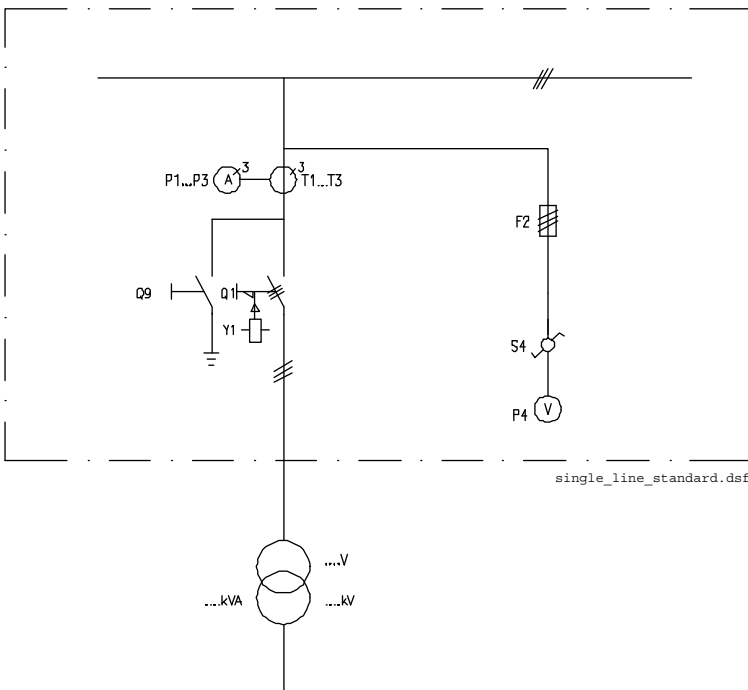
Note 2: Available in 1000 A, 2000 A, 3000 A and 4000 A - AC

Incoming DCA631 (isolation switch)



Incoming DCA631

Single line diagram Incoming DCA631

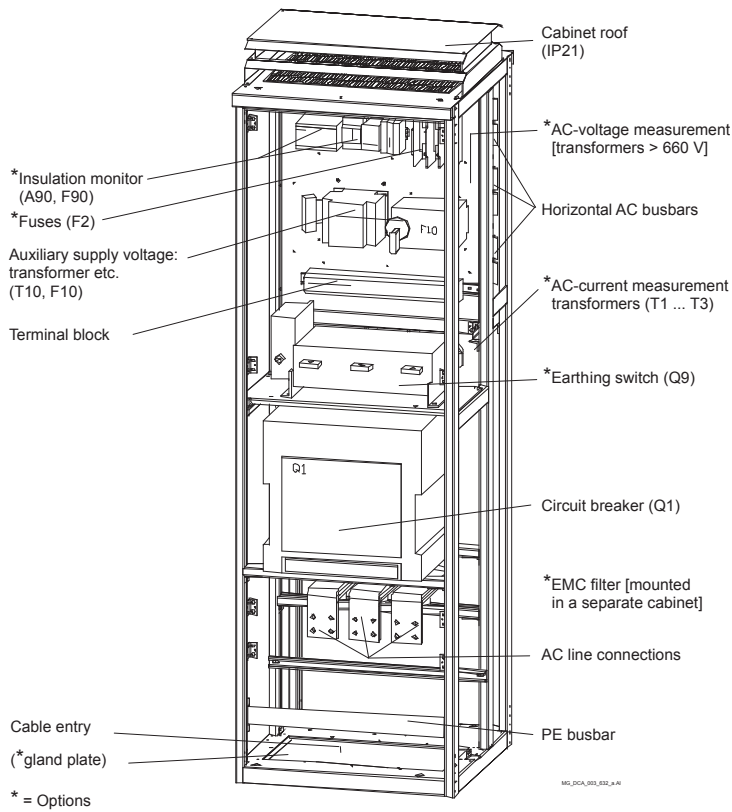


Single line diagram Incoming DCA631

Note 1: Dimensions see table 2, section Dimensions Converter cabinet

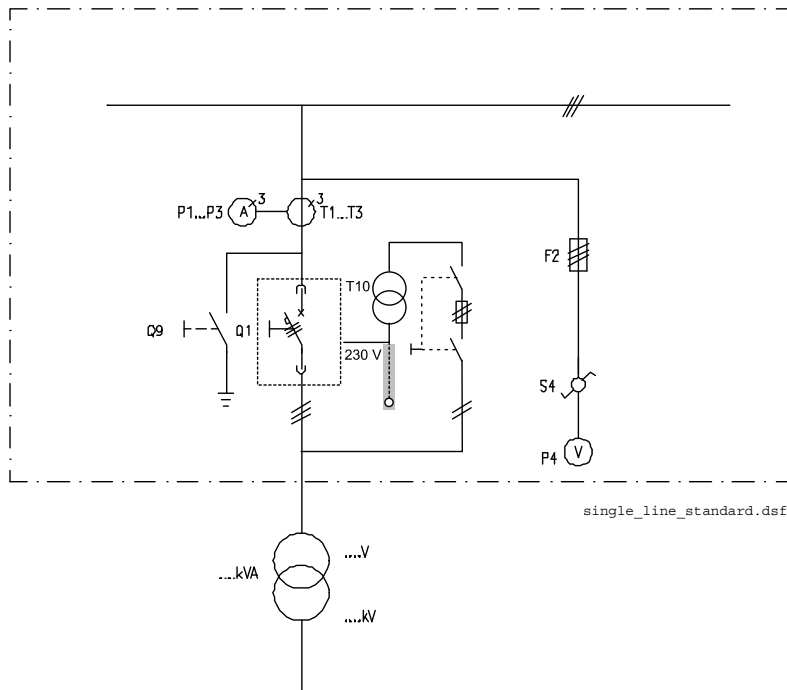
Note 2: Available in 1000 A, 2000 A and 3000 A - AC

Incoming DCA632 (circuit breaker)



Incoming DCA632

Single line diagram Incoming DCA632

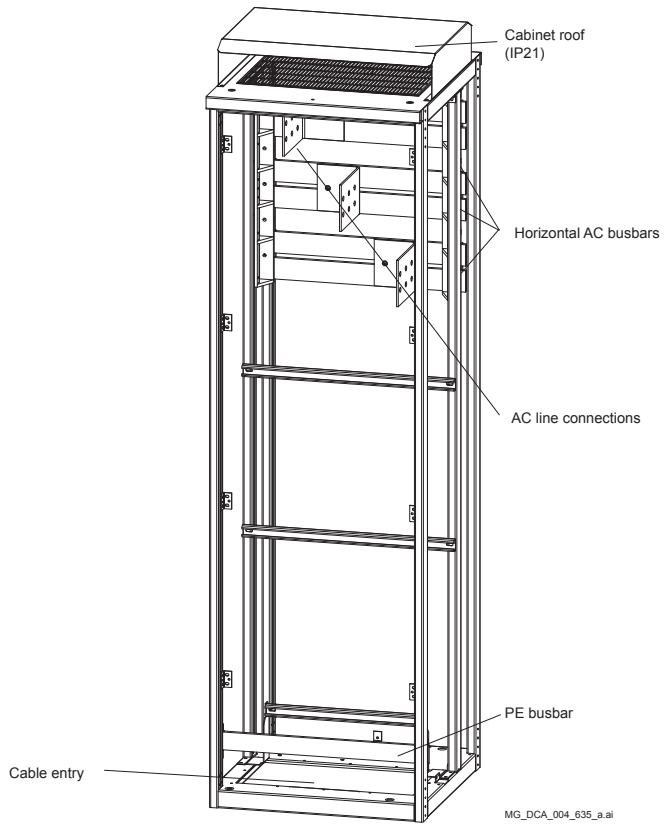


Single line diagram Incoming DCA632

Note 1: Dimensions see table 2, section Dimensions Converter cabinet

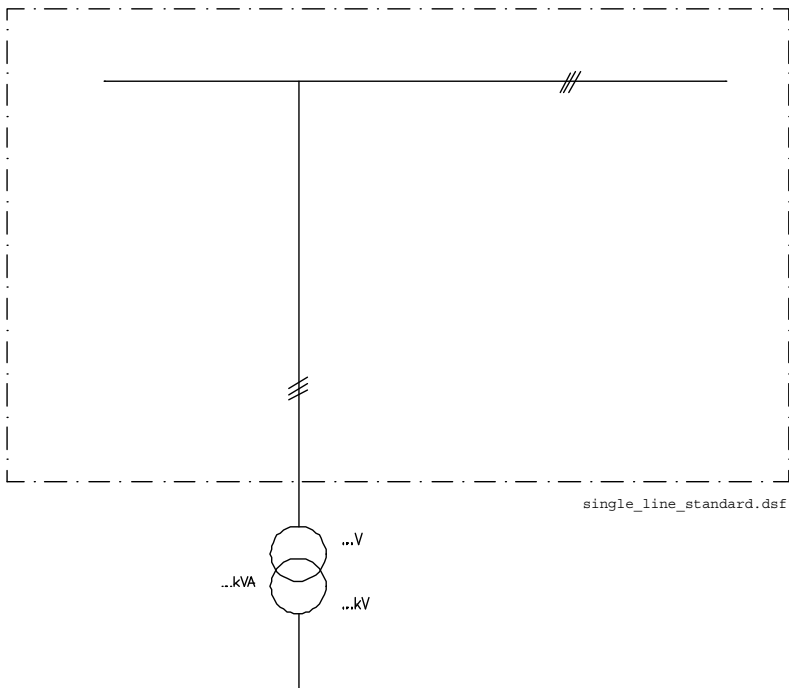
Note 2: Available in 1000 A, 2000 A, 3000 A and 4000 A - AC

Incoming DCA635 (without switch and options)



Incoming DCA635

Single line diagram Incoming DCA635



Single line diagram Incoming DCA635

Note 1: Dimensions see table 2, section Dimensions Converter cabinet

Note 2: Available in 1000 A, 2000 A and 3000 A - AC

DCS800-A2x 3-phase field exciters in a separate cabinet

DCS800-A2x

These converters are intended to supply high inductive loads like motor fields or chokes. They are equipped with three phase DCS800-S01 or DCS800-S02 converter modules plus DCF506 over voltage protection.

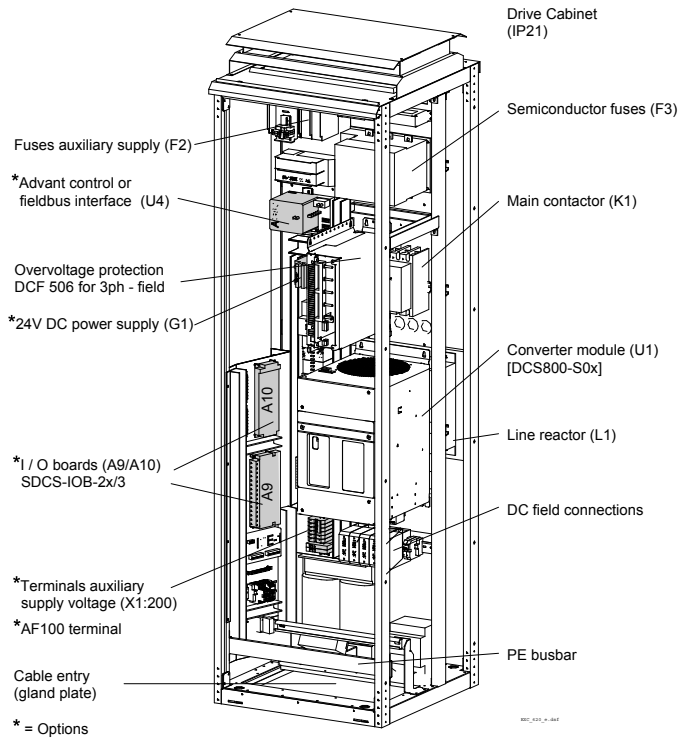
Options

Auto- and insulating transformers

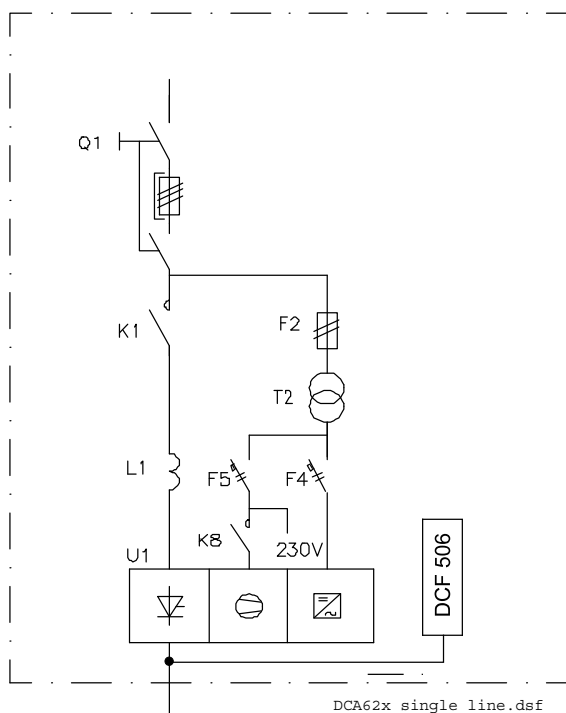
An autotransformer is used to have a suitable supply voltage level for a field exciter and to reduce voltage ripple. For each 3-phase field exciter an autotransformer is dimensioned individually.

For dimensioning please contact ABB Automation Products GmbH, Ladenburg, Germany.

Higher input voltages (> 600 V / 690 V) require an insulating transformer.



Field exciter in a separate cabinet



Single line diagram of Field exciter DCAx2x

Basic equipment

- Degree of protection **IP 21**
- Converter module **U1**
- Line reactor **L1**
- Transformer **T2** only if required
- Overvolt. protect. **DCF506**
- I/O board SDCS-IOB-2x
- I/O board **SDCS-IOB-3**
- Fuses auxiliary supply **F2**
- Auxiliary relays **K8, K15, K16**
- Isolation switch **Q1**
- Main contactor **K1**

DCS800-A Door layout

Panels and Metering

Control panel in the door

- DCS800 control panel is always mounted on converter module inside the cabinet as standard
- Control panel socket on cabinet door for DCS800 control panel is an option

Meters in the door

- Analog meters
 - Armature current meter - analog output drive
 - Armature voltage meter - DC motor connection
- Third meter
 - The third meter is connected to AO1 of the converter (e.g. excitation current)

Buttons in the door

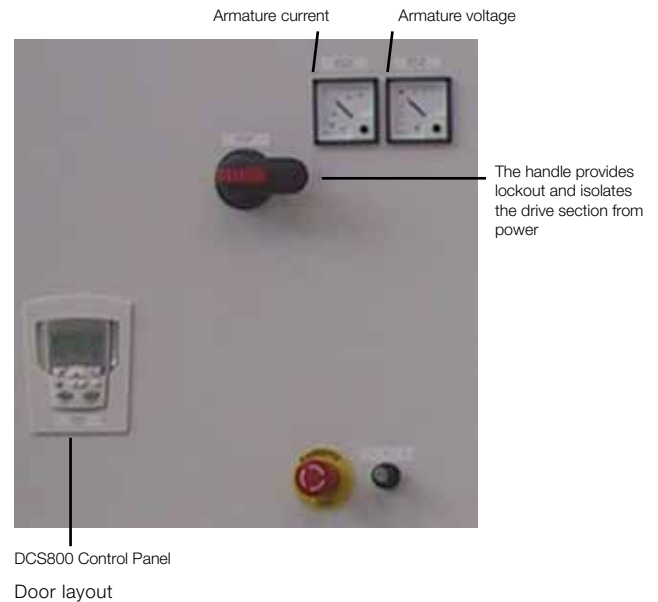
- Emergency stop
 - Stop category 1
 - Safety category according to EN 954 B
- Electrical disconnect (coast stop)
 - Stop category 0
 - Function opens all main contactors of the line-up and blocks the firing pulses of each converter allowing the motors to coast stop.

Note: Only one of the buttons, emergency stop or electrical disconnect, can be chosen at the same time.

Insulation monitor IDRH 375-4 (A90) earth fault detection for isolated (IT) networks.

An insulation monitoring device can be used to continuously measure the insulation status in an unearthed network. The insulation monitor is installed between mains and protective earth (PE). If the insulation resistance is below adjusted values output relays are activated. Type IDRH 375 is used for door mounting.

For detection of earth faults in both DC and AC circuits.
Available for converter ratings 900 ... 5200 A, size D5 ... D7 and incomings (DCA630, 631, 632).



DCA650 Overriding control

Fieldbus adapter modules

– R fieldbus adapter modules are available for different serial communications for control purposes

- PROFIBUS-DP
- DeviceNet
- CANopen
- ControlNet
- Modbus
- Ethernet

The adapters are located direct on the converter module.



Fieldbus adapter modules

To ensure serial communication during auxiliary supply failure the option 'Interface to external UPS' (230 V) is available.

Advant controller and S800 I/O System

The S800 I/O system consists of the control module (FCI, AC 800M), digital and analog I/O modules. The control module has a connection to several different bus systems and optical channels to connect the drives. The modules are mountable on mounting rails (DIN).

Note: see *S800 User Guide* (Doc no. 3BSE008878)

AF 100 field bus interface FCI

Within this AF 100 interface up to 12 drives can be connected.

Advant controller AC 800M

Powerful controller with several fieldbus interfaces. Drives can be connected with the optical module bus or optical Drive Bus (CI 858) or via Profibus (CI 851).

The above mentioned control modules can also handle up to 12/24 I/O modules.

Digital inputs and outputs

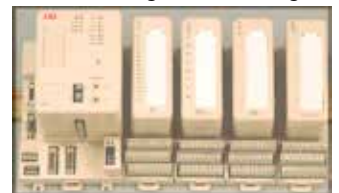
8 channels, input voltages from 24 V ... 250 V

Analog inputs and outputs (12 bit resolution) 8 channels

Engineering Tool for Individual Programming

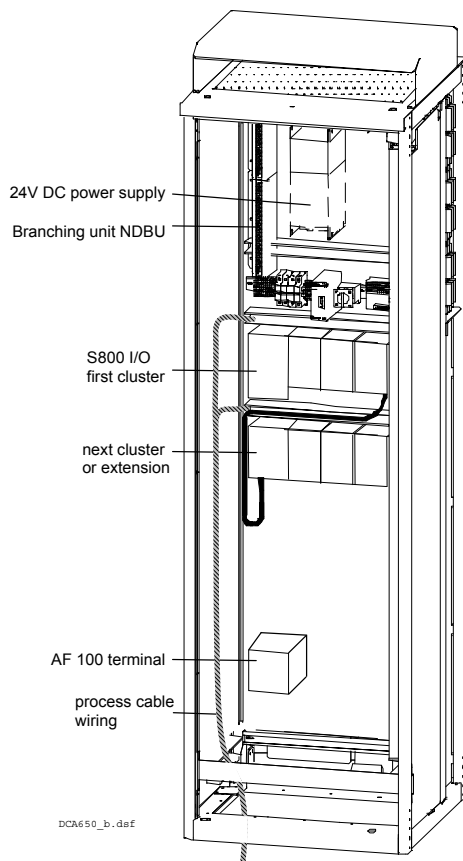
The Advant controller (AC 800M) are programmable controllers using Control ^{IT} Control Builder.

- Graphical editor for creating and modifying program diagrams
- Function-oriented engineering
- Windows-based application programming
- Online editing
- Constant and parameter value changes
- Connection changes
- Deleting/Inserting function blocks or tasks
- Program downloading to AC 800M
- Temporary change of input terminal values
- Displaying actual values from terminals



DCA650 - Control cabinet

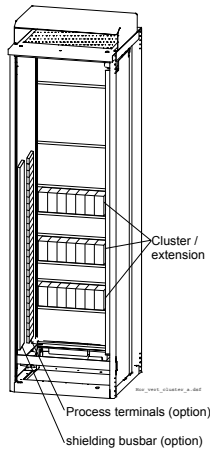
- S800 option in a control cabinet:
 - CI810 (FCI)
 - PM864 (AC 800M)
 - +24 V power supply internal
 - NDBU-95 branching unit
 - Full range S800 I/O modules
 - AF 100 connection
 - Clusters extended and compact socket horizontal located
 - Clusters extended socket vertical located
 - Cabinet widths: 600, 800 mm



DCA650 cabinet

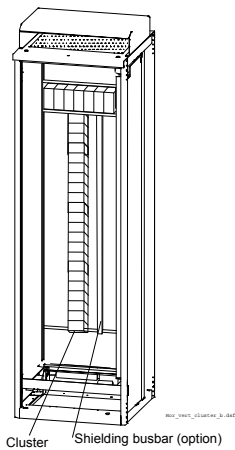
The DCA650 control cabinet is designed to control several drives assembled in one line-up. To control processes with many input and output signals the S800 I/O's can be included. The design is splitted in two different layouts:

Horizontal clusters: This layout is recommend for short clusters with compact sockets. The process terminal are located at the side panel.



DCA650 control cabinet with horizontal clusters

Vertical clusters: This layout is recommended for long clusters with extended sockets normally without process terminals.



DCA650 control cabinet with vertical clusters

The standard design of this control cabinet takes care of the amount of control cables and EMC requirements (shielded connection) which limits the amount of S800 I/O modules.

S800 I/O, horizontal location

The upper area is reserved for power supply, fuses and other control circuits.

The lower area is prepared for maximum three clusters. The amount of S800 sockets depends on the cabinet size.

	600 mm	800 mm
Possible layouts per cluster	2 extended sockets + advant controller	4 extended sockets + advant controller
Process /control cable entry	4 compact sockets + advant controller	8 compact sockets + advant controller
	6 wholes D = 55 mm	6 wholes D = 55 mm
	2 slots 250 mm x 20 mm	2 slots 250 mm x 20 mm

Instead of an advant controller one extended or two compact sockets can be used.

The control cables are fixed to the side panel.

The process terminals are an option and also located at the side panel.

Maximum amount of process terminals:

250 terminals without the horizontal busbar option

140 terminals in combination with the horizontal busbar option

because the back panel is moved to the front (e.g. group drive).

S800 I/O, vertical location

This option is only possible together with extended sockets. The AC 800M controller must be located in the top cluster and connected via TB 820 interface

The upper area is reserved for power supply, fuses and AC 800M clusters (+Drive Bus module).

The lower area is prepared for clusters and for the process cable wiring. The amount of S800 clusters depends on the cabinet size.

	600 mm	800 mm
Possible layouts	1 cluster	2 clusters
	7 extended sockets + TB 820 Modul bus interf.	7 extended sockets + TB 820 Modul bus interf.
	1 cluster	1 cluster
	7 extended sockets + TB 820 Modul bus interf. + process terminals	7 extended sockets + TB 820 Modul bus interf. + process terminals
		1 cluster
		7 extended sockets + advant controller + 2 process cable ducts
Process /control cable entry	6 wholes D = 55 mm	6 wholes D = 55 mm
	2 slots 250 mm x 20 mm	2 slots 250 mm x 20 mm

The amount of process terminals is limited to 180

Attention: The combination with the horizontal busbar option is not possible. So the cabinet must be located at the end of the line-up.

Process terminals

The need of process terminals depends on:

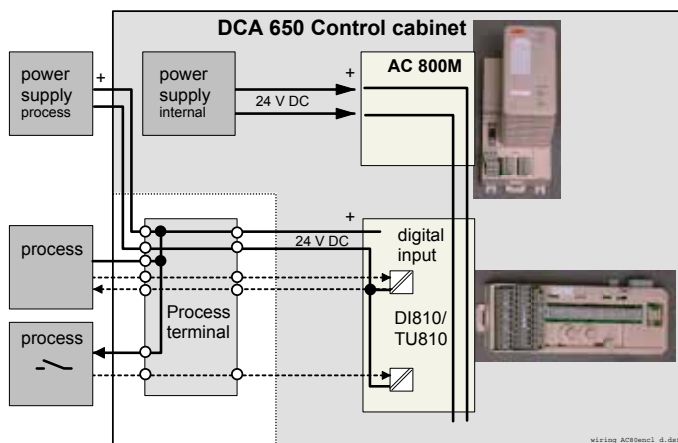
- customer requirements
- selected sockets
- selected control voltage

Extended sockets

Extended sockets can supply the process with 24 V control voltage and analog supply voltage.

Therefore these sockets give the advantage to avoid process terminals in case of 24 V digital signals and analog circuits.

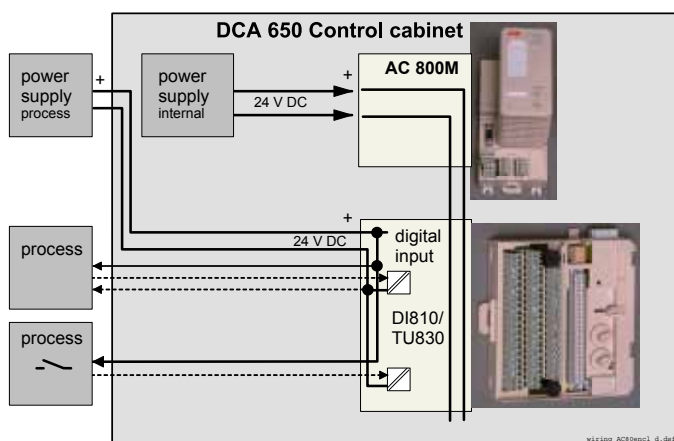
For 115 V and 230 V control circuit - process terminals are needed in every case.



Wiring extended socket

Compact sockets

Compact sockets have smaller size, but process terminals are recommended.



Wiring compact socket

The process terminal option includes:

- circuit diagrams
 - wiring from the sockets to the process terminals
 - input terminals for the process power supply
 - marking of the process terminals in the same order as sockets
- example: socket A1 -> terminals X A1:1, 2, 3 ...

Options

Process power supply

On request.

This power supply is needed to supply all process devices outside the cabinet. The rated power and rated voltage of the active process devices must be considered.

Shielding busbar

Shielding busbar is an option and used for small shielded control and process cables.

The cable shielding of the control and process cables must be connected.

Shielding of very thick cables should be connected at the cable entry.

Note: see *Installation manual* doc.no 3ADW000091.

Small cable can also be connected at a shielding busbar located in parallel to the terminals.

Other mechanical options

see *chapter 3*

- Horizontal busbars
- EMC bottom plate
- Cable marking **A2 plus**

DCS800-A Unit data

Environmental conditions

System connection	
Voltage, 3-phase:	230 to 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 to 30 cycles.

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

Degree of protection	
Converter module and options (line chokes, fuse holder, field supply unit, etc.):	IP 00
Enclosed converters:	IP 20/21/31/41
Paint finish	
Converter module:	RAL 9002
Enclosed converter:	light grey RAL 7035

Sound pressure level

Size	Sound pressure level L_p (1 m distance)	Vibration
	as module	enclosed conv. as module
D1	55 dBA	68 dBA
D2	55 dBA	72 dBA
D3	60 dBA	78 dBA
D4	66 ... 70 dBA, depending on fan	77 dBA
D5	73 dBA	78 dBA
D6	75 dBA	73 dBA
D7	82 dBA	80 dBA

Environmental limit values

Permissible cooling air temperature:

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

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 600 V	UL 508 C Power Conversion Equipment CSA C 22.2 No. 14-95 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
> 600 V to 1000 V	EN / IEC xxxxx see table below. Available for converter modules including field exciter units.	EN / IEC types: on request (for details see table below)

Regulatory compliance

The converter module and enclosed converter components are designed for use in industrial environments. In EEA countries, the components fulfil the requirements of the EU directives, see table below.

European union directive	Manufacturer's assurance	Harmonized standards	
		Converter module	Enclosed converter
Machinery Directive			
98/37/EEC	Declaration of Incorporation	EN 60204-1	EN 60204-1
93/68/EEC		[IEC 60204-1]	[IEC 60204-1]
Low Voltage Directive			
73/23/EEC	Declaration of Conformity	EN 60146-1-1	EN 60204-1
93/68/EEC		[IEC 60146-1-1] EN 61800-5-1 (EN 50178 [IEC --]) see additional IEC 60664	[IEC 60204-1] EN 61800-5-1 EN 60439-1 [IEC 60439-1]
EMC Directive			
89/336/EEC	Declaration of Conformity (Provided that all installation instructions concerning cable selection, cabling and EMC filters or dedicated transformer are followed.)	EN 61800-3 ①	EN 61800-3 ①
93/68/EEC		[IEC 61800-3] ① in accordance with 3ADW000032	[IEC 61800-3] ① in accordance with 3ADW000032 / 3ADW000091

DCS800-A Enclosed Converter unit types

Unit type	DC I *		DC II current		DC III current		DC IV current		int. field current	Power loss	Frame size
	[A]	[A]	100 % 15 min	150 % 60 sec.	100 % 15 min	150 % 120 sec.	100 % 15 min	200 % 10 sec.			
400 V / 525 V											
DCS800-A01-0020-04/05-D	18	17	25	16	25	14	28	6	<0.58	D1	
DCS800-A02-0025-04/05-D	22	21	32	20	31	18	35	6	<0.58		
DCS800-A01-0045-04/05-D	40	35	52	32	48	31	62	6	<0.65		
DCS800-A02-0050-04/05-D	45	40	59	37	56	36	72	6	<0.65		
DCS800-A01-0065-04/05-D	60	46	69	43	64	43	86	6	<0.72		
DCS800-A02-0075-04/05-D	67	53	80	50	75	50	100	6	<0.72		
DCS800-A01-0125-04/05-D	115	87	130	83	123	83	166	6	<1.00		
DCS800-A02-0140-04/05-D	125	95	142	91	136	91	186	6	<1.00		
DCS800-A01-0230-04/05-D	200	140	210	130	195	120	248	15	<1.51	D2	
DCS800-A02-0260-04/05-D	230	159	239	150	225	132	264	15	<1.51		
DCS800-A01-0315-04/05-D	285	219	329	211	316	192	384	20	<1.89	D3	
DCS800-A02-0350-04/05-D	300	228	342	222	333	200	400	20	<1.89		
DCS800-A01-0470-04/05-D	400	308	462	290	435	275	550	20	<2.57		
DCS800-A02-0520-04/05-D	450	345	517	330	495	308	616	20	<2.57		
DCS800-A01-0610-04/05-D	540	432	648	427	641	391	781	25	<3.01	D4	
DCS800-A02-0680-04/05-D	600	480	720	475	712	434	868	25	<3.01		
DCS800-A01-0740-04/05-D	680	551	826	537	806	488	977	25	<3.65		
DCS800-A02-0820-04/05-D	750	607	911	593	889	539	1077	25	<3.65		
DCS800-A01-0900-04/05-D	810	620	931	596	894	547	1094	25	<4.80		
DCS800-A02-1000-04/05-D	900	689	1034	662	994	608	1215	25	<4.80		
400 V / 525 V											
DCS800-A0x-1200-04/05-D	1140	843	1265	820	1230	731	1461	25	<7.64	D5	
DCS800-A0x-1200T-04/05-D	1140	1095	1643	1055	1583	912	1824	25	<7.64		
DCS800-A0x-1500-04/05-D	1425	1140	1709	1048	1573	1048	2097	25	<10.34		
DCS800-A0x-2000-04/05-D	1850	1368	2052	1259	1889	1259	2518	25	<10.62		
DCS800-A0x-2050-05-D	1950	1550	2325	1480	2220	1450	2900		<9.70	D6	
DCS800-A01-2500-04/05-D	2450	1980	2970	1880	2820	1920	3840		<10.20		
DCS800-A02-2500-04/05-D	2450	2000	3000	1930	2895	1790	3580		<11.20		
DCS800-A01-3000-04/05-D	3000	2350	3525	2220	3330	2280	4560		<11.90		
DCS800-A02-3000-04/05-D	3000	2330	3495	2250	3375	2080	4160		<13.70		
DCS800-A0x-3300-04/05-D	3300	2300	3450	2250	3375	2130	4260		<17.20	D7	
DCS800-A0x-4000-04/05-D	4000	2800	4200	2730	4095	2600	5200		<18.00		
DCS800-A0x-5200-04/05-D	5100	3850	5775	3750	5625	3650	7300		<23.50		
DCS800-A0x-6600-04/05PD	6200	4370	6555	4275	6412	4047	8094		<34.40	D7P	
DCS800-A0x-8000-04/05PD	7600	5320	7980	5187	7780	4940	9880		<36.00		
DCS800-A0x-10400-04/05PD	9800	7315	10971	7125	10687	6935	13870		<47.00		
600 V / 690 V											
DCS800-A01-0290-06-D	220	174	260	152	228	152	304		<1.81	D3	
DCS800-A02-0320-06-D	240	190	285	166	249	166	332		<1.81		
DCS800-A01-0590-06-D	370	290	435	258	387	258	516		<2.47	D4	
DCS800-A02-0650-06-D	400	313	469	279	418	279	558		<2.47		
DCS800-A0x-0900-06/07-D	855	650	974	565	847	565	1129	25	<7.20	D5	
DCS800-A0x-1500-06/07-D	1425	1140	1709	1048	1573	1048	2097	25	<10.34		
DCS800-A01-2000-06/07-D	1850	1368	2052	1259	1889	1259	2518	25	<10.62		
DCS800-A0x-2050-06/07-D	1950	1520	2280	1450	2175	1430	2860		<10.70	D6	
DCS800-A01-2500-06/07-D	2450	1940	2910	1840	2760	1880	3760		<11.70		
DCS800-A02-2500-06/07-D	2450	1940	2910	1870	2805	1740	3480		<12.80		
DCS800-A01-3000-06/07-D	3000	2530	3795	2410	3615	2430	4860		<13.10		
DCS800-A02-3000-06/07-D	3000	2270	3405	2190	3285	2030	4060		<14.50		
DCS800-A0x-3300-06/07-D	3300	2360	3540	2310	3465	2180	4360		<17.90	D7	
DCS800-A0x-4000-06/07-D	4000	3000	4500	2850	4275	2900	5800		<20.10		
DCS800-A0x-4800-06/07-D	4700	3600	5400	3500	5250	3600	7200		<23.70		
DCS800-A0x-6600-06/07PD	6200	4484	6726	4389	6583	4142	8284		<35.70	D7P	
DCS800-A0x-8000-06/07PD	7600	5700	8550	5415	8122	5510	11020		<40.20		
DCS800-A0x-9600-06/07PD	9000	6840	10260	6650	9975	6840	13680		<47.30		
800 V											
DCS800-A0x-1900-08-D	1900	1500	2250	1430	2145	1400	2800		<9.90	D6	
DCS800-A01-2500-08-D	2500	1920	2880	1820	2730	1860	3720		<11.00		
DCS800-A02-2500-08-D	2500	1910	2865	1850	2775	1710	3420		<11.50		
DCS800-A01-3000-08-D	3000	2500	3750	2400	3600	2400	4800		<12.50		
DCS800-A02-3000-08-D	3000	2250	3375	2160	3240	2000	4000		<13.90		
DCS800-A0x-3300-08-D	3300	2350	3525	2300	3450	2170	4340		<18.10	D7	
DCS800-A0x-4000-08-D	4000	2950	4425	2800	4200	2800	5600		<20.30		
DCS800-A0x-4800-08-D	4700	3600	5400	3500	5250	3500	7000		<23.90		
DCS800-A0x-6600-08PD	6200	4465	6697	4370	6555	4123	8246		<36.00	D7P	
DCS800-A0x-8000-08PD	7600	5605	8407	5320	7980	5320	10640		<40.50		
DCS800-A0x-9600-08PD	9000	6840	10260	6650	9975	6650	13300		<46.50		
990 V											
DCS800-A0x-2050-10-D	2050	1500	2250	1450	2175	1350	2700		<15.10	D7	
DCS800-A0x-2600-10-D	2600	1850	2275	1800	2700	1700	3400		<18.50		
DCS800-A0x-3300-10-D	3300	2450	3675	2350	3525	2300	4600		<22.80		
DCS800-A0x-4000-10-D	4000	2850	4275	2800	4200	2750	5500		<23.50		
DCS800-A0x-5200-10PD	4900	3515	5272	3420	5130	3230	6460		<36.80	D7P	
DCS800-A0x-6600-10PD	6200	4655	6982	4465	6697	4370	8740		<45.60		
DCS800-A0x-8000-10PD	7600	5415	8122	5320	7980	5225	10450		<46.80		
1200 V											
DCS800-A0x-2600-12-D	2600	1900	2850	1830	2745	1700	3400		<21.20	D7	
DCS800-A0x-3300-12-D	3300	2390	3585	2310	3465	2310	4620		<22.80		
DCS800-A0x-4000-12-D	3800 A at 7% uk			4000 A at 14% uk					<24.50		

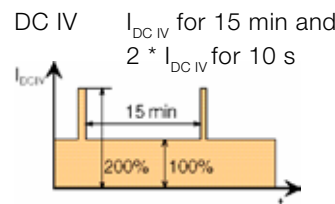
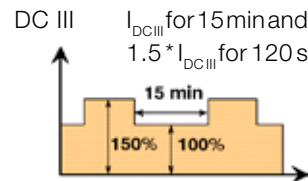
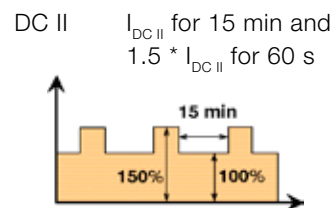
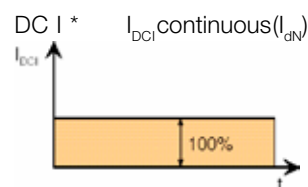
Table 1: DCS800-A types

x=1 ⇒ 2-Q converter
x=2 ⇒ 4-Q converter
P ⇒ hard parallel (two conv. mod. in parallel)
Voltage class: (example: DCS800-A0x-0025-04y-D)
04 ⇒ 400V 05 ⇒ 500/525V 06 ⇒ 600V
07 ⇒ 690V 08 ⇒ 800V 10 ⇒ 990V
12 ⇒ 1200V

* Ratings are valid for IP 21; for IP 31 and IP 41 the current derating is calculated by DriveSize
① = Air circuit breaker on request
② = Air circuit breaker not available
③ = Reduced current due to standard air circuit breaker. Larger air circuit breakers are available on request
④ with air exit IP20 ⇒ plus 100 A
⑤ FEX425 internal field exciter as option; three-phase or single phase, separate supply max. 500 V_{AC}
⑥ Requires 3-phase aux. fan supply 3 x 400 V or 3 x 525 V, 50 Hz or 3 x 460 V, 60 Hz
⑦ Requires 3-phase aux. fan supply 3 x 400 V, 50 Hz or 3 x 460 V, 60 Hz

DCS800-A enclosed converters are suitable for three-phase supply voltages from: **230 ... 990 (1200) V_{AC}** **50 or 60 Hz**
Select the DCS800-A type from Table 1, according to the nominal supply voltage and the rated DC current.

Load cycles



Enclosed 3-phase Field exciters

Unit type	DC I [A]	Power loss [kW]	Size
525 V			
DCS800-A21-0020-05-D	16	0.58	D1
DCS800-A22-0025-05-D	22	0.58	
DCS800-A21-0045-05-D	40	0.65	
DCS800-A22-0050-05-D	45	0.65	
DCS800-A21-0065-05-D	57	0.72	
DCS800-A22-0075-05-D	67	0.72	
DCS800-A21-0090-05-D	84	0.85	
DCS800-A22-0100-05-D	92	0.85	
DCS800-A21-0180-05-D	160	1.40	D2
DCS800-A22-0200-05-D	180	1.40	
DCS800-A21-0315-05-D	285	1.89	D3
DCS800-A22-0350-05-D	300	1.89	
DCS800-A21-0405-05-D	340	2.40	
DCS800-A22-0450-05-D	380	2.40	
DCS800-A21-0610-05-D	520	3.00	D4
DCS800-A22-0680-05-D	520	3.00	

Dimensions converter cabinet

	Single drive				Group drive			
	Height ①	Depth ②	Width ③	Weight [kg]	Height ①	Depth ②	Width ③	Weight ⑦
DC-Converter, Size D1			-Frame size-				-Frame size-	
DCS800-A0x-0020-04/05-D	2120	600	600	220	2120	600	600	190+z
DCS800-A0x-0025-04/05-D	2120	600	600	220	2120	600	600	190+z
DCS800-A0x-0045-04/05-D	2120	600	600	230	2120	600	600	200+z
DCS800-A0x-0050-04/05-D	2120	600	600	230	2120	600	600	200+z
DCS800-A0x-0065-04/05-D	2120	600	600	230	2120	600	600	200+z
DCS800-A0x-0075-04/05-D	2120	600	600	230	2120	600	600	200+z
DCS800-A0x-0125-04/05-D	2120	600	600	250	2120	600	600	220+z
DCS800-A0x-0140-04/05-D	2120	600	600	250	2120	600	600	220+z
DC-Converter, Size D2/D3								
DCS800-A0x-0200-04/05-D	2120	600	600	250	2120	600	600	220+z
DCS800-A0x-0250-04/05-D	2120	600	600	250	2120	600	600	220+z
DCS800-A0x-0315-04/05-D	2120	600	600	300	2120	600	600	270+z
DCS800-A0x-0350-04/05-D	2120	600	600	300	2120	600	600	270+z
DCS800-A0x-0470-04/05-D	2120	600	800	310	2120	600	800	280+z
DCS800-A0x-0520-04/05-D	2120	600	800	310	2120	600	800	280+z
DC-Converter, Size D4								
DCS800-A0x-0610-04/05-D	2120	600	800	360	2120	600	800	330+z
DCS800-A0x-0680-04/05-D	2120	600	800	360	2120	600	800	330+z
DCS800-A0x-0740-04/05-D	2120	600	800	360	2120	600	800	330+z
DCS800-A0x-0820-04/05-D	2120	600	800	360	2120	600	800	330+z
DCS800-A0x-0900-04/05-D	2120	600	800	360	2120	600	800	330+z
DCS800-A0x-1000-04/05-D	2120	600	800	360	2120	600	800	330+z
DC-Converter, Size D5								
DCS800-A0x-0900-06/07-D	2120	600	1400	620	2120	600	1400	590+z
DCS800-A0x-1200-04/05-D	2120	600	1400	640	2120	600	1400	610+z
DCS800-A0x-1500-04/05/06/07-D	2120	600	1400	720	2120	600	1400	690+z
DCS800-A0x-2000-04/05/06/07-D ⑥	2120	600	1400	740	2120	600	1400	710+z
DC-Converter, Size D6								
DCS800-A0x-1900-08-D ④	2120	600	-	2000	850			
DCS800-A0x-2050-05/06/07-D ⑥	2120	600	2400	-	1100			
DCS800-A0x-2500-04/05/06/07-D ⑥	2120	600	2400	-	1100			
DCS800-A0x-2500-08-D ④	2120	600	-	2000	850			
DCS800-A0x-3000-04/05/06/07-D ⑥	2120	600	2400	-	1250			
DCS800-A0x-3000-08-D ④	2120	600	-	2000	950	on request		
DC-Converter, Size D7								
DCS800-A0x-2050-10-D ④	2120	600	-	2100	790			
DCS800-A0x-2600-10/12-D ④	2120	600	-	2100	850			
DCS800-A0x-3300-04/05/6/07/08/10/12-D ④	2120	600	-	2100	950			
DCS800-A0x-4000-04/05/06/07/08/10/12-D ④	2120	600	-	2700 ⑧	1170			
DCS800-A0x-4800-06/07/08-D ④	2120	600	-	2700 ⑧	1200			
DCS800-A0x-5200-04/05-D ④	2120	600	-	2700 ⑧	1200			
DC-Converter, Size D7P								
DCS800-A0x-5200-10PD	2120	600	-	3600	1430	not available		
DCS800-A0x-6600-04/05/06/07/08/10PD	2120	600	-	3600	1630			
DCS800-A0x-8000-04/05/06/07/08/10PD	2120	600	-	4800 ⑧	2070			
DCS800-A0x-9600-06/07/08PD	2120	600	-	4800 ⑧	2140			
DCS800-A0x-10400-04/05PD	2120	600	-	4800 ⑧	2140			
Incoming Supply Sections								
DCA63u-1000-04/05/06/07-D					2120	600	600	300
DCA63u-2000-4/5/6/7-D					2120	600	600	320
DCA63u-3000-4/5/6/7-D ⑩			not available		2120	600	800	340
DCA63u-4000-4/5/6/7-D ⑩					2120	600	1000	380
Busbar joining cabinet ⑥					2120	600	200	30+z

Fan data

Fan type	Air volume freely blowing [m³/h]	Converter size
2x CN2B2	50 Hz:60 Hz 320 360	D1 D2 D3
4x CN2B2	640 720	D3 D405 - 0520
W2E200 (230 V)	925 1030	D4 0610 - 0820
W2E200 (115 V)	925 1030	D4 0610 - 0820
W2E250 (230 V)	1860 1975	D4 0900 - 1000
W2E250 (115 V)	1835 1940	D4 0900 - 1000
R2E 250	800 750	D5 *
GR28C	1500 1600	D6 **
400 V / 500 V / 50 Hz or 460 V, 60 Hz		**
GR35C	4200 4500	D7 *
400 V, 50 Hz		**
460 V, 60 Hz		

* air outlet as air duct interface available
 ** Fans according new ErP high efficiency compliance. Fans are designed for typical Aux supply 400 V, 500 V, 50 Hz and 460 V, 60 Hz. Other aux supply for fans on request.

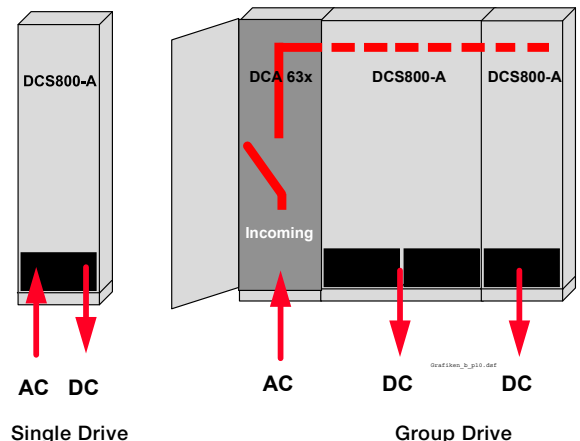
Table 2: Dimensions of the DCS800-A series.

x=1 ⇒ 2-Q converter u=0 ⇒ incoming without switch
 x=2 ⇒ 4-Q converter u=1 ⇒ incoming with insulation switch
 u=2 ⇒ incoming with circuit breaker
 P ⇒ hard parallel (two conv. mod. in parallel) u=5 ⇒ incoming without options

Voltage class: (example: DCS800-A0x-0025-04y-D)
 04 ⇒ 400 V 05 ⇒ 500/525 V 06 ⇒ 600 V 07 ⇒ 690 V
 08 ⇒ 800 V 10 ⇒ 990 V 12 ⇒ 1200 V

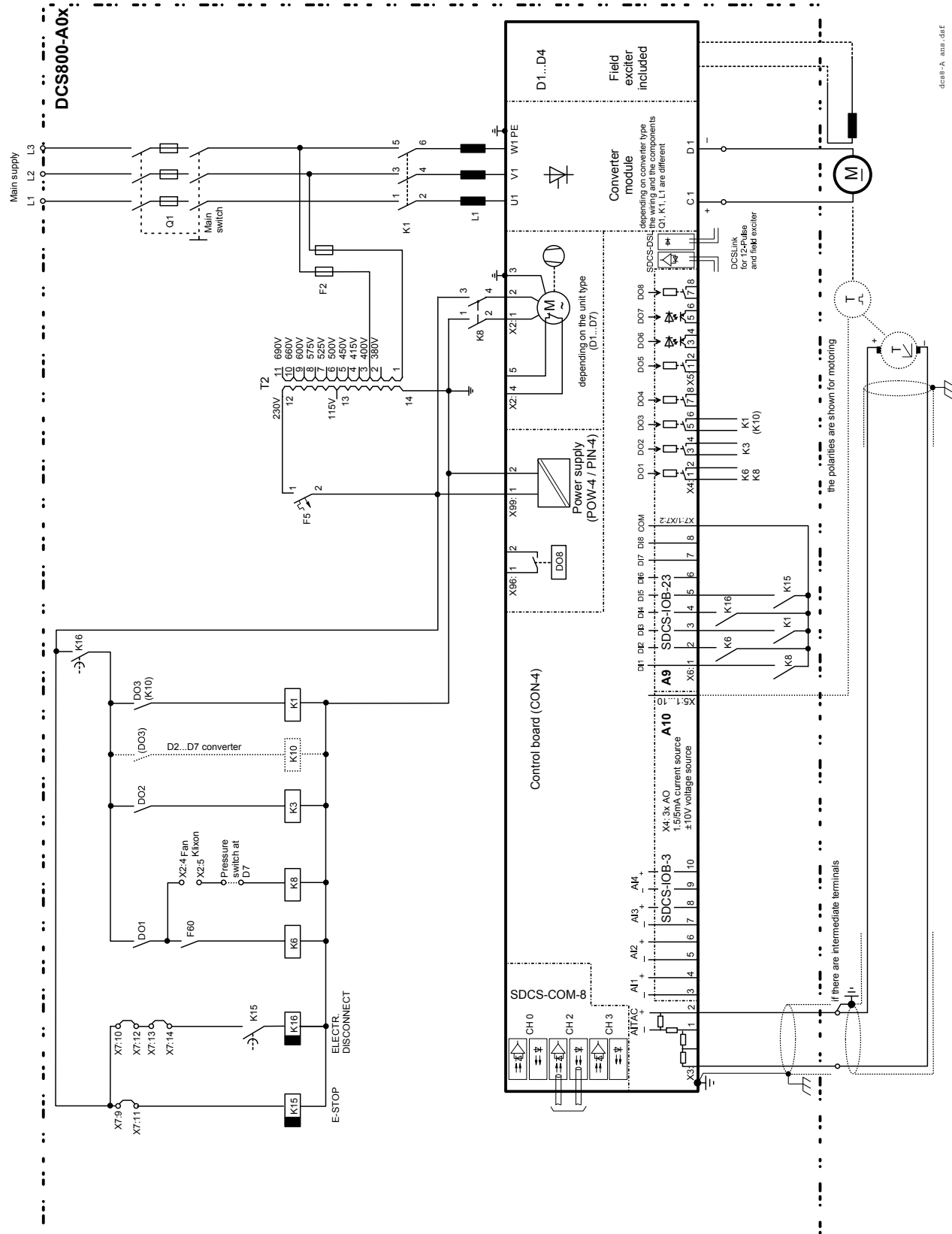
Notes:
 All dimensions are in mm
 Please add for each end panel 15 mm and for a door (without buttons) 20 mm

- ① Height is including detachable hood (120 mm)
- ② with circuit breaker or contactor
- ③ without circuit breaker or contactor
- ④ DCS800-A with AC supply voltage 3 x 800 V ... 1200 V or current ≥ 3300 A are generally without circuit breaker.
- ⑤ Max length of a shipping split is 3.40 m. If the line-up width is longer than 3.40 m busbar joining cabinets are required.
- ⑥ at 600 V (6) and 690 V (7) only available as 2-Q converter
- ⑦ z: Weight for busbars: 1000 A / 2000 A = 35 kg/m; 3000 A = 70 kg/m
- ⑧ The air circuit breaker stands out of the line-up's front. Thus 78 mm have to be added to the total depth of the line-up.
- ⑨ Listed width for cable connection reduced width for busbar connection on request
- ⑩ DCA632 rated current as IEC rating 3000 A UL type on request



DCS800-A Basic circuit diagrams

Basic diagram without electrical options

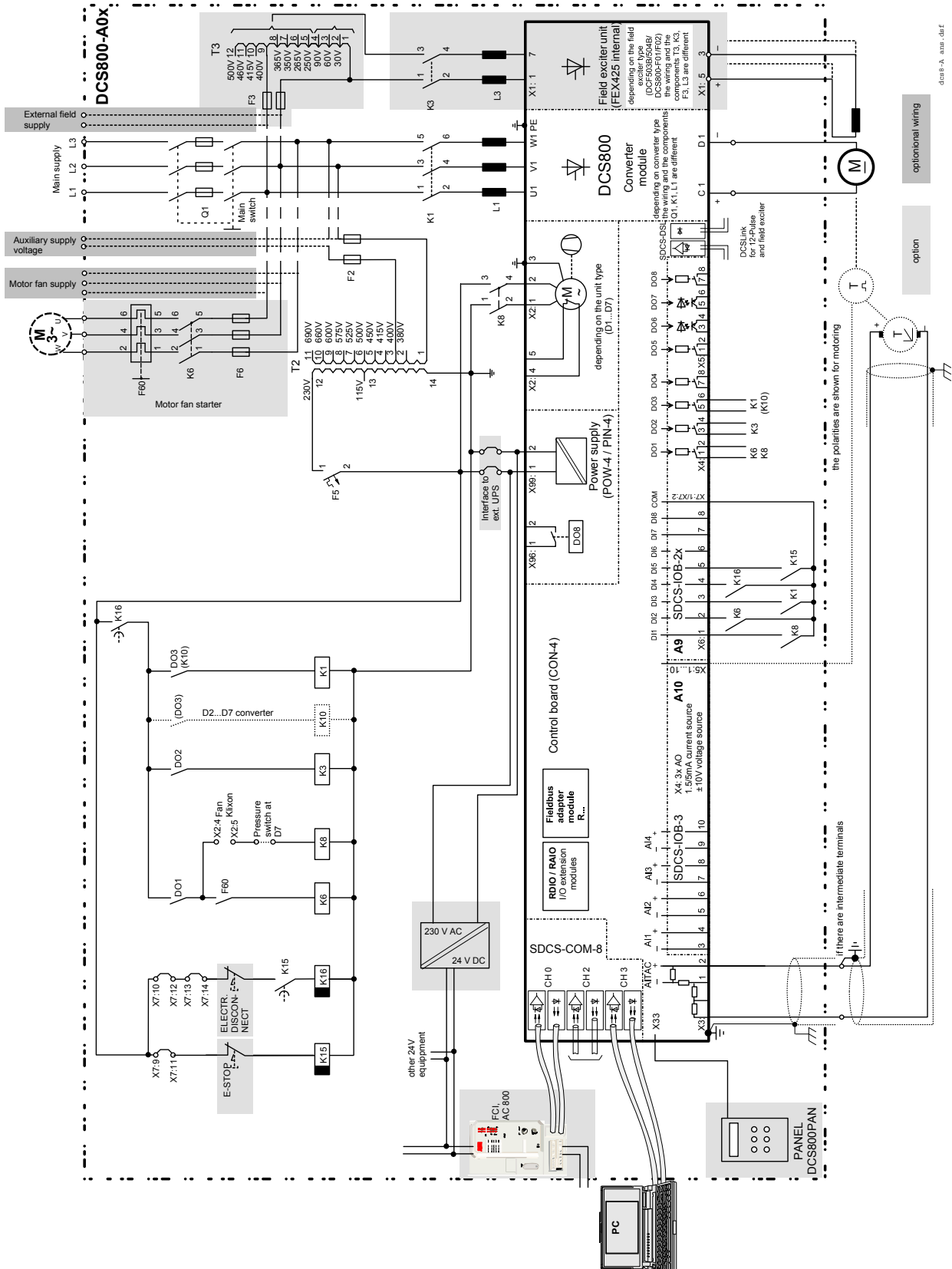


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Note: Converters with rated voltage > 690 V_{AC} are always equipped with separate auxiliary supply voltage input (see single line diagrams)

Basic diagram with electrical options

Basic diagram with electrical options



Note: Converters with rated voltage > 690 V_{AC} are always equipped with separate auxiliary-, fan- and field exciter supply voltage input (see single line diagrams).

Dimensioning DriveSize

Quality dimensioning

DriveSize is a PC program for helping the user to select an optimal converter and options, especially in those cases where a straightforward selection from a catalog is not possible. Documents about the dimensioning based on actual load.

The default values make DriveSize simple to use, but the user is provided with many options for drive selection. The shortcut keys make drive selection easy while still honouring the relatively complicated rules.

A manual selection mode is also supported.

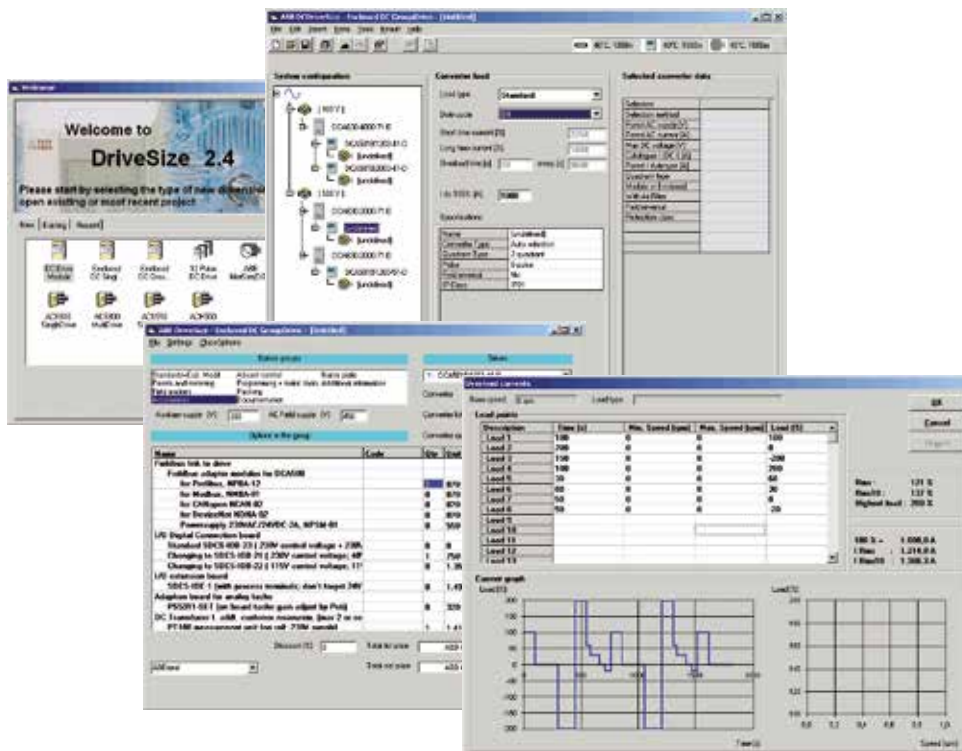
DriveSize is currently used by more than 1000 engineers globally.

DriveSize is for drive system components

- DCS converter modules
- DCS enclosed converters
- Group drives (line-ups)
- Drive options

DriveSize features

- Select an drive unit, incoming unit
- Calculate duty load cycles for converters
- Supply dimensioning results in graphical and numerical format
- Print and save the results



DCS800-A Safety option ordering

DCS800-A0X Cabinet with Contactor, AC Breaker or DC Breaker

ABB offers following options to help the system integrator to fulfill customer's safety regulations

Exclusion of liability

ABB is not responsible for the implementation, verification and validation of the overall safety system. It is the responsibility of the system integrator (or other party) who is responsible for the overall system and system safety.

The system integrator (or other responsible party) must make sure that the entire implementation complies with all relevant standards, directives and local electrical code, and that the system is tested, verified and validated correctly.

Coast Stop Function (non safety related) K16 timer + Electrical Stop function (non safety related) K15 timer

Option Stop Category 0

Option 1: +S951 STO (please check if below options are needed)

Description: Safe Torque OFF (STO) function prescribed in IEC/EN60204-1, Stop Category 0 (Uncontrolled Stop) and compliant with Functional Safety Standard.

Stop Function: Safe Torque OFF (STO) (IEC/EN61800-5-2:2007)
 Response time: 500 ms or less (from input to the terminal to Safe Torque OFF)
 Safety integrity level (SIL): 2
 Category: 3
 Performance level (PL): PL-d (if Main Contactor (AC), High Speed DC Breaker or Sace E-Max (ACB) is used)
 Pollution degree: max. 2
 Hardware: A14 STO safety relay

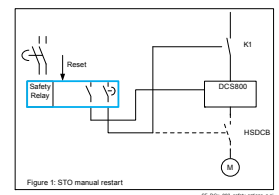


Figure 1: STO manual restart

Option 1.1 +S952: STO plus **automatic start** function !

ATTENTION - AUTOMATIC START

According to IEC/EN 60204-1 part 9.2.5.4.2 and 10.8.3 it is not allowed to restart automatically after emergency stop. Therefore the machine control has to disable the automatic start after emergency stop.

Hardware Automatic start circuit; basic option 1 (+S951) required
 not in combination with option 1.4 (+S955)

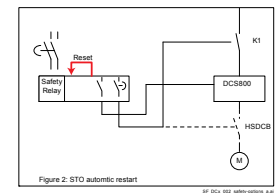


Figure 2: STO automatic restart

Option 1.2 +S953 E-STOP cat 0 button in cabinet door ;

basic option 1 (+S951) required

Option 1.3 +S954 Prevention of start up indication lamp in cabinet door ;

basic option 1 (+S951) required

Option 1.4 +S955 STO Reset button in door ;

basic option 1 (+S951) required

not in combination with option 1.1 (+S952)

Option 1.5 +S956 STO mechanically coupled motors ;

basic option 1 (+S951) in each drive required

Option 1.9 +S957 STO plus duplicating for up to 50 drives (e.g. for rolltables)

Safe Torque OFF (STO) function prescribed in IEC/EN60204-1, Stop Category 0 (Uncontrolled Stop) and compliant with Functional Safety Standard.

Total number of Drives up to:	Needed Pluscode ordering for +S957
1	None
8	1 x +S957
14	2 x +S957
20	3 x +S957
26	4 x +S957
32	5 x +S957
38	6 x +S957
44	7 x +S957
50	8 x +S957

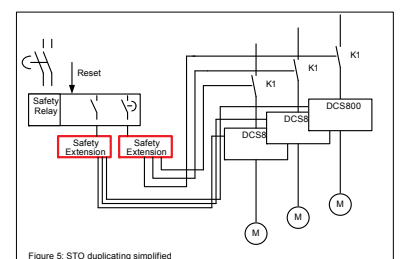
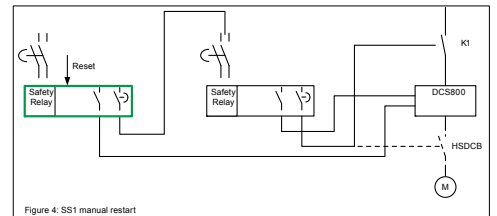


Figure 5: STO duplicating simplified

Option Stop Category 1

Option 2.x: Time based Safe Stop 1 (SS1) function prescribed in IEC/EN60204-1, Stop Category 1 (ramped stop) and compliant with functional Safety Standard

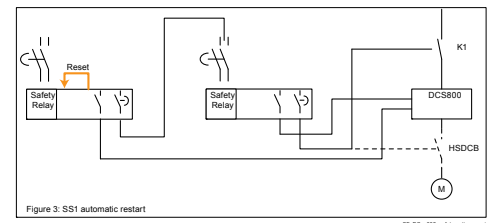
- Option 2.1+S961 Ramped Stop time level 1 ... 10 s
- Option 2.2+S962 Ramped Stop time level 3 ... 30 s
- Option 2.3+S963 Ramped Stop time level 30 ... 300 s



Stop Function: Safe Stop 1 (SS1) (IEC/EN61800-5-2:2007)
 Response time: 60 ms or less from input to the terminal to trigger the 0 to 300 s (as set by Safety timer relay) for ramped stop and additionally 500 ms or less (from input to the terminal to Safe Torque OFF)
 Safety integrity level (SIL): 2
 Category: 3
 Performance level (PL): PL-d (if Main Contactor (AC) or High Speed DC Breaker is used) and PL-c (if Sace E-Max (ACB) is used)
 Pollution degree: max. 2
 Hardware: A15 SS1 safety timer relays;
 basic STO option 1 (+S951) required (A14 safety relays)

- Option 2.4+S964 Time based Safe Stop 1 (SS1) function prescribed in IEC/EN60204-1, Stop Category 1 (ramped stop), **automatic start** and compliant with functional Safety Standard

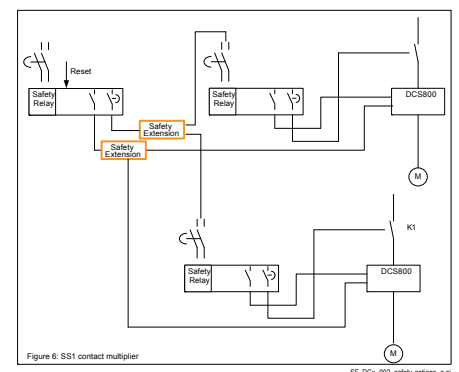
ATTENTION - AUTOMATIC START!
 According to IEC/EN 60204-1 part 9.2.5.4.2 and 10.8.3 it is not allowed to restart automatically after emergency stop.
 Therefore the machine control has to disable the automatic start after emergency stop.



Hardware: Automatic start circuit;
 basic option 2.x (+S961 or +S962 or +S963) required
 not in combination with option 2.6 (+S966)

- Option 2.5+S965 E-stop cat 1 push button in cabinet Door
 basic option 2.x (+S961 or +S962 or +S963) required
- Option 2.6+S966 SS1 reset button in cabinet door; not in combination with option 2.4 (+S964)
 basic option 2.x (+S961 or +S962 or +S963) required
- Option 2.7+S967 OFF3 acknowledge of drive; basic option 2.x (+S961 or +S962 or +S963) required
- Option 2.8+S968 SS1 common for multiple drives;
 Hardware: A15.2 safety contact multiplier;
 basic option 2.x (+S961 or +S962 or +S963) required
 Option SS1 common (+S968) requires option STO (+S951)
 in each individual drive. The interface between individual drive and SS1 circuit X95 bus is used.

Total number of Drives up to:	Needed Pluscode ordering for +S968
1	None
8	1 x +S968
14	2 x +S968
20	3 x +S968
26	4 x +S968
32	5 x +S968
38	6 x +S968
44	7 x +S968
50	8 x +S968



No DCS800-A Safety Option

- Customer specified safety function

Description: Circuit diagrams and components according Customer specification

Type Code (Ordering Code)

When ordering your DCS800-A or external field exciter, please specify the type code according to the type code tables.

Type code table for DCS800-A0x drives cabinets

DCS800 - A02 - 0680 - 05 - D B N

DC DRIVES
Product family
S800 = DCS800 converter

Type
S0 = 3-phase converter module
R0 = Rebuild kit
A0 = Enclosed converter
E0 = Panel mounted converter

Bridge type
1 = Single bridge 2-Q
2 = Double bridge 4-Q

Rated DC current
0680 = 680 ADC (IP00 module current)

Rated AC voltage
04 = 230...400 VAC
05 = 230...500/525 VAC
06 = 270...800 VAC
07 = 315...690 VAC
08 = 360...800 VAC
10 = 450...990 VAC
12 = 540...1200 VAC

Power connection (D7)
- = Standard D1...D6
L = on the left
R = on the right
P = hard parallel configuration

Cabinet type
D = ABB Drive cabinet
DE = EMC protected ABB Drive cabinet

Cabling
B = Bottom entry / exit
T = Top entry / exit

AC-connection
N = No horizontal busbars / single drive
1 = 1000 A horizontal busbars / group drive
2 = 2000 A horizontal busbars / group drive
3 = 3000 A horizontal busbars / group drive

DCS_type_code_e_def

Type code table for DCS800-A2x 3-phase field exciters in a separate cabinet

DCS800 - A22 - 0100 - 05 - D B N

DC DRIVES CABINET
Product family
DCS800

Section type
21 = 2-Q Field converter
22 = 4-Q Field converter

Module type
related to modul current IP00 e.g. 0075 = 75 A

Rated AC voltage [V]
4 = 230...400V
5 = 415...500V

Cabinet type
D = ABB Drive cabinet
DE = EMC protected ABB Drive cabinet

AC-connection
N = No horizontal busbars / single drive
1 = 1000 A horizontal busbars / group drive
2 = 2000 A horizontal busbars / group drive
3 = 3000 A horizontal busbars / group drive

DCS_type_code_e_def

Type code table for DCA63x incoming cabinets

DC A 6 30 - 1000 - 5 5 - D B 1

DC DRIVES INCOMING

Section type
30 = incoming with options
31 = incoming insulation switch
32 = incoming circuit breaker
35 = incoming without options

Module type
Rated AC current for incoming

Rated AC voltage [V]
4 = 230...400V
5 = 415...500V
6 = 525...600V
7 = 660...690V

Frequency [Hz]
5 = 50 Hz
6 = 60 Hz

Cabinet type
D = ABB Drive cabinet
DE = EMC protected ABB Drive cabinet

AC-connection
1 = 1000 A horizontal busbars
2 = 2000 A horizontal busbars
3 = 3000 A horizontal busbars

DCS_type_code_e_def

Type code table for a DCS800-F0x 3-phase field exciter in the armature cabinet 1900 A (D6) ... 5200 A (D7)

DCS800 - F01 - 0075 - 05

DC DRIVES FIELD EXCITER

Bridge type
01 = 2-Q Armature converter
02 = 4-Q Armature converter

Module type
related to modul current IP00 e.g. 0075 = 75 A

Rated AC voltage [V]
4 = 230...400V
5 = 415...500V

DCS_type_code_e_def

Type code table for DCF80x 2-phase field exciters (up to 50 A) in the armature cabinet

DC F 80 3 0050 - C

DC DRIVES FIELD EXCITER

Bridge type
3 = 1-Q half controlled
4 = 4-Q full controlled

Module type
0007 = 7 A
0017 = 17 A } only DCF 504B
0033 = 33 A
0050 = 50 A

DCS_type_code_e_def

Note: Order control cabinet with: DCA650
Order empty cabinet with: DCA680

DCS family



DCS550-S modules

The compact drive for machinery application

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

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



DCS800-S modules

The versatile drive for process industry

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

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



DCT880 Thyristor power controller

Controlling electro-thermal processes

16 ... 4,160 A_{DC}
14 kW... 5 MW
230 ... 690 (1200) V_{AC}

- Resistive and inductive loads, infrared heaters
- Phase angle, full wave burst and half wave mode
- U, I, P, I² control
- Clear text display with USB port
- Load monitoring
- For all typical load configurations star, delta, open delta, single phase, and multitap
- Reduces energy costs by power optimizer function



DCS800-E series

Pre-assembled drive-kits

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

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



DCS800-R Rebuild Kit

Digital control-kit for existing powerstacks

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

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

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