

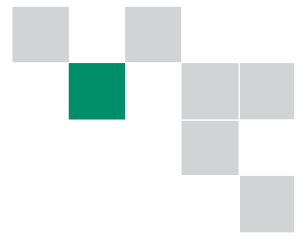
ABB DCS800 DC Drive

DCS800 20 A to 5200 A
Technical catalogue



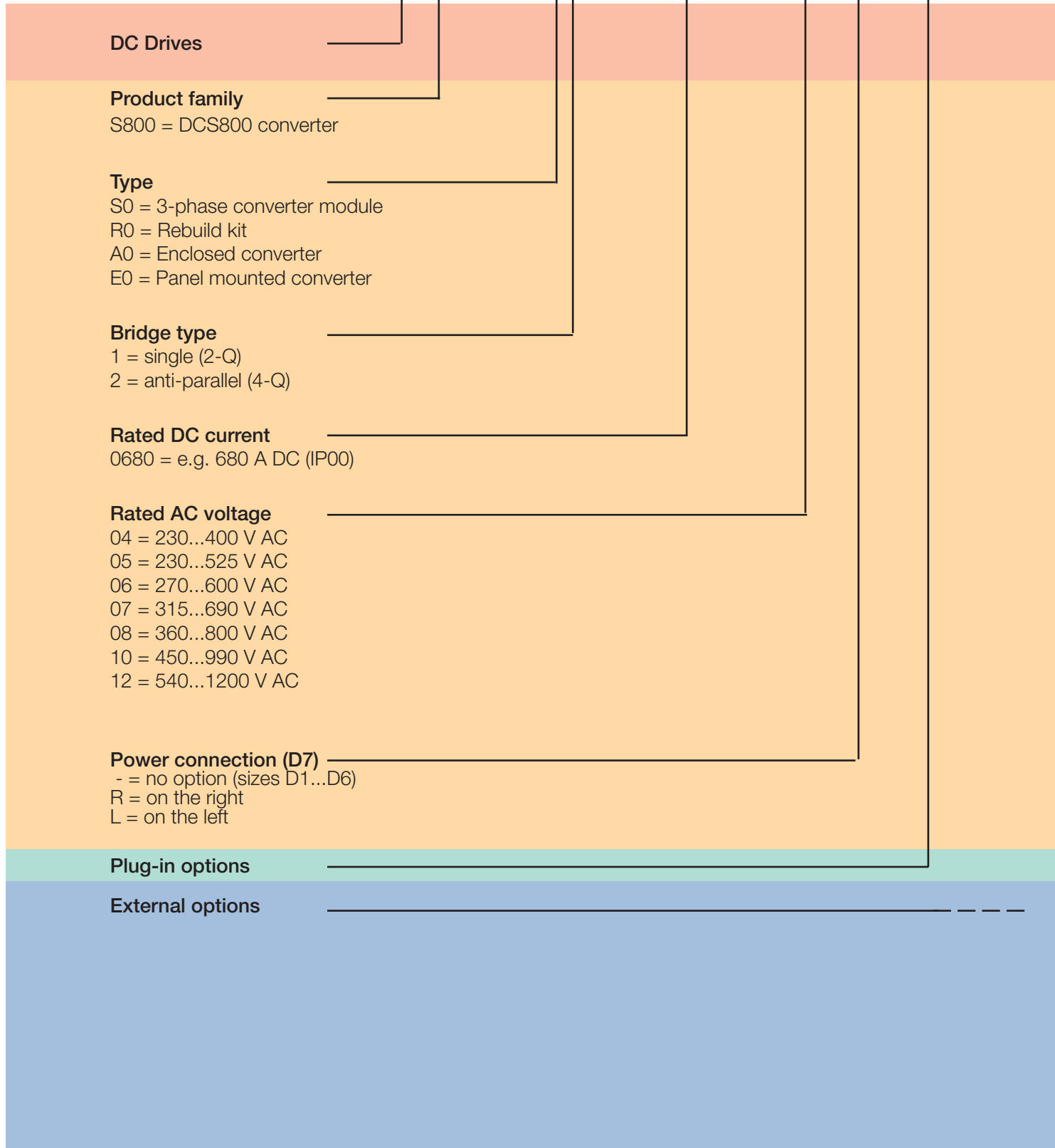
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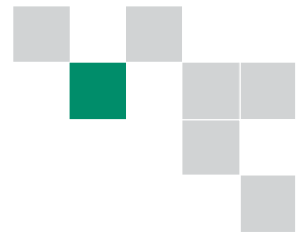
Type code



Type code:

DCS800 - **S01** - **0680** - **04** - **+ B055**





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ABB DCS800 DC Drive

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What is an DCS800 DC Drive?

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

- Precise delivery
- Quick installation
- Rapid startup

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.

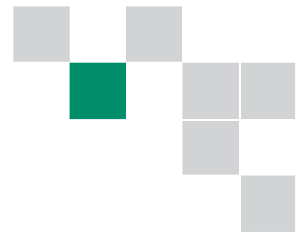
Highlights

- 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 IEC1131 programming.
- Flexible fieldbus system with built-in Modbus and numerous internally mountable fieldbus adapters.

What are its main features?

| Feature | Note | Benefit |
|-------------------------|--|--|
| Assistant control panel | Two soft-keys, function of which changes according to the state of the panel Built-in "Help" button Real-time clock, allows timed tracing of faults Changed parameters menu | Easy commissioning Fast set-up Easier configuration; Rapid fault diagnosis Quick access to recent parameter changes |
| Startup assistant | Available in DriveWindow Light tool and DCS800 Panel | Guided commissioning Preselected important parameter Help function Reduced commissioning time |
| Several Autotunings | Speed-, armature current, field current control and field weakening | Reduced commissioning time Reduced training |
| Connectivity | Simple to install: Easy connection of cables Easy connection to external fieldbus systems through multiple I/Os and plug-in options | Reduced installation time Secure cable connections |
| Diagnostic assistant | Activated when fault occurs | Quick fault diagnostics, short commissioning |
| Advanced DC operation | 12-pulse parallel, 12-pulse serial, sequential control and sandwich configuration | Drive fit to all classic and advanced installation up to highest power |
| Advanced motor control | Motor voltage controller takes care on line voltage level and sudden voltage drop | Reliable and safe operation also for weak networks |
| Fieldbus | Built-in Modbus using RS 485 Optional plug-in fieldbus modules | Reduced cost |
| Highest motor voltage | By reduced dynamic the motor voltage can be increased | Simple upgrading of original 2-Quadrant installations to 4-Quadrant operation |
| ACS800 interfaces | All HW options and PC tools of ACS800 are available with same plus code | Reduced spare parts Reduced training Simple ordering |

DCS800 Power Converter Modules



General

The power converter modules DCS800-S0x have the protection class IP00 and are to be mounted in a cubicle or finger protected area. There are different sizes (D1, D2, D3, D4, D5, D6, D7), graduated in terms of current and voltage ranges.

All units are equipped with control panel DCS 800PAN. It can be snapped into place on the power converter module or installed in the switchgear cubicle door by means of a mounting kit.

Accessories such as external fuses, line reactors etc. are also available, to compose a complete drive system.

All converter modules up to 525 V and 1000 A (D1...D4) are equipped with field exciters.

The power section of the converters is available as single (2-Q) bridge or double (4-Q) bridge. 4-Q drives are required for regenerative braking. 4-Q drives can be built by:

- Double (4-Q) armature bridge or
- Single (2-Q) armature bridge plus field converter bridge with double bridge

Reference variables

The voltage characteristics are shown in the table beside. The DC voltage characteristics have been calculated using the following assumptions:

- U_{VN} = rated input terminal voltage, 3-phase
- Voltage tolerance $\pm 10\%$
- Internal voltage drop approx. 1%
- If a deviation or a voltage drop has to be taken into consideration in compliance with IEC and VDE standards, the output voltage or the output current must be reduced by the actual factor according to the table on the right.

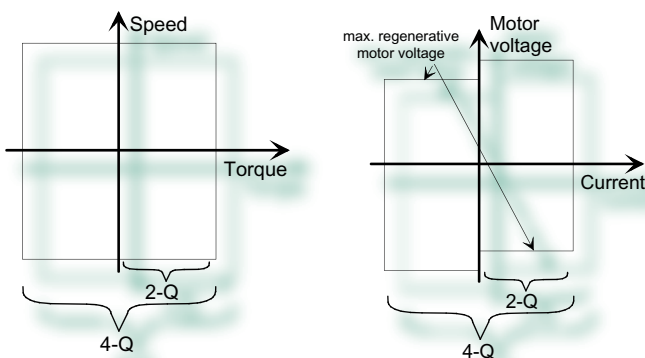
The bridge type has an influence on the maximum output voltage of the converter. See table below.

| System connection voltage | DC voltage (recommended) | | Ideal DC voltage without load | Recommended DCS800 Voltage class |
|---------------------------|--------------------------|-----------------|-------------------------------|----------------------------------|
| | $U_{dmax\ 2-Q}$ | $U_{dmax\ 4-Q}$ | | |
| U_{VN} [M] | [M] | [M] | U_{dio} [M] | |
| 230 | 265 | 240 | 310 | 04 |
| 380 | 440 | 395 | 510 | 04 |
| 400 | 465 | 415 | 540 | 04 |
| 415 | 480 | 430 | 560 | 04 |
| 440 | 510 | 455 | 590 | 05 |
| 460 | 530 | 480 | 620 | 05 |
| 480 | 555 | 500 | 640 | 05 |
| 500 | 580 | 520 | 670 | 05 |
| 525 | 610 | 545 | 700 | 06 * |
| 575 | 670 | 600 | 770 | 06 |
| 600 | 700 | 625 | 810 | 06 |
| 660 | 765 | 685 | 890 | 07 |
| 690 | 800 | 720 | 930 | 07 |
| 800 | 915 | 820 | 1060 | 08 |
| 990 | 1160 | 1040 | 1350 | 10 |
| 1200 | 1380 | 1235 | 1590 | 12 |

* Sizes D1...D4 - voltage class 05 can be used

If armature voltages higher than recommended are requested, please check carefully, whether your system is still working under safe conditions.


The maximum output voltage of a 4-Q drive can be increased up to the level of $U_{dmax\ 2-Q}$ if the torque reversal time motor --> regenerative mode is increased up to 300 ms.



Ratings, types and voltages



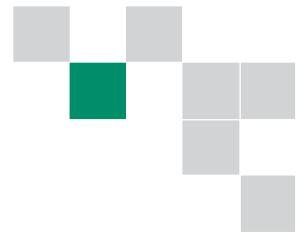
Current ratings, dimensions and weights



| Unit size | 2-Q rated Current DCS800-S01 I_{DC} [A] | 4-Q rated Current DCS800-S02 I_{DC} [A] | Supply voltage $[V_{AC}]$ | | | | | | | Weight [kg] | Dimensions | |
|-----------|--|--|------------------------------|-----|-----------------|-----------------|-----|-----------------|------|------------------|-----------------------|----------------------|
| | | | 400 | 500 | 600 | 690 | 800 | 990 | 1200 | | h x w x d [mm] | h x w x d [inch] |
| D1 | 20 | 25 | ● | ● | | | | | | 11 | 310 x 270 x 200 | 12.50 x 10.75 x 8.00 |
| | 45 | 50 | ● | ● | | | | | | | | |
| | 65 | 75 | ● | ● | | | | | | | | |
| | 90 | 100 | ● | ● | | | | | | | | |
| | 125 | 140 | ● | ● | | | | | | | | |
| D2 | 180 | 200 | ● | ● | | | | | 16 | 310 x 270 x 270 | 13.75 x 10.75 x 10.75 | |
| | 230 | 260 | ● | ● | | | | | | | | |
| D3 | 315 | 350 | ● | ● | ● ³⁾ | | | | 25 | 400 x 270 x 310 | 15.75 x 10.75 x 12.50 | |
| | 405 | 450 | ● | ● | ● ³⁾ | | | | | | | |
| | 470 | 520 | ● | ● | ● ³⁾ | | | | | | | |
| D4 | 610 | 680 | ● | ● | ● ³⁾ | | | | 38 | 580 x 270 x 345 | 23.00 x 10.75 x 13.75 | |
| | 740 | 820 | ● | ● | ● ³⁾ | | | | | | | |
| | 900 | 1000 | ● | ● | ● ³⁾ | | | | | | | |
| D5 | 900 | 900 | ● | ● | ● | ● | | | 110 | 1050 x 510 x 410 | 41.50 x 20.25 x 16.25 | |
| | 1200 | 1200 | ● | ● | ● | ● | | | | | | |
| | 1500 | 1500 | ● | ● | ● ¹⁾ | ● ¹⁾ | | | | | | |
| | 2000 | 2000 | ● | ● | ● ¹⁾ | ● ¹⁾ | | | | | | |
| D6 | 1900 | 1900 | | ● | ● | ● | ● | | 180 | 1750 x 460 x 410 | 69.00 x 18.25 x 16.25 | |
| | 2050 | 2050 | | ● | ● | ● | ● | | | | | |
| | 2500 | 2500 | ● | ● | ● | ● | ● | | | | | |
| | 3000 | 3000 | ● | ● | ● | ● | ● | | | | | |
| D7 | 2050 | 2050 | | | | | | ● | 315 | 1750 x 760 x 570 | 69.00 x 30.00 x 22.50 | |
| | 2600 | 2600 | | | | | | ● ²⁾ | | | | |
| | 3300 | 3300 | ● | ● | ● | ● | ● | ● ²⁾ | | | | |
| | 4000 | 4000 | ● | ● | ● | ● | ● | ● ²⁾ | | | | |
| | 4800 | 4800 | ● | ● | ● | ● | ● | ● ²⁾ | | | | |
| | 5200 | 5200 | ● | ● | ● | ● | ● | ● ²⁾ | | | | |

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

Current ratings



The current ratings for the DCS800 with 50 Hz and 60 Hz supplies are given below. The symbols are described below the table. The characteristics are based on an ambient temperature of max. 40°C and an elevation of max. 1000m a.s.l.

| Unit type 2-Q converters | P _{out} ④ | | Unit type 4-Q converters | P _{out} ④ | | int. field current | Fan volt. | Air volume | P _{Loss} | Frame size | | |
|-----------------------------|--------------------|------|-----------------------------|-----------------------|-------|--------------------|-----------|------------|-------------------|------------|-------|----|
| | IDC I | [kW] | | [kW] | IDC I | | | | | | [kW] | |
| | [A] | 400V | 500V | | 400V | 500V | [V AC] | [m³/h] | [kW] | | | |
| 400 V / 500 V / 525 V | | | | | | | | | | | | |
| DCS800-S01-0020-04/05 | 20 | 9 | 12 | DCS800-S02-0025-04/05 | 25 | 10 | 13 | 6 | without fan | 300 | 0.11 | D1 |
| DCS800-S01-0045-04/05 | 45 | 21 | 26 | DCS800-S02-0050-04/05 | 50 | 21 | 26 | 6 | 115/230; 1-ph | 300 | 0.17 | D1 |
| DCS800-S01-0065-04/05 | 65 | 30 | 38 | DCS800-S02-0075-04/05 | 75 | 31 | 39 | 6 | | 300 | 0.22 | D1 |
| DCS800-S01-0090-04/05 | 90 | 42 | 52 | DCS800-S02-0100-04/05 | 100 | 42 | 52 | 6 | | 300 | 0.28 | D1 |
| DCS800-S01-0125-04/05 | 125 | 58 | 73 | DCS800-S02-0140-04/05 | 140 | 58 | 73 | 6 | | 300 | 0.38 | D1 |
| DCS800-S01-0180-04/05 | 180 | 84 | 104 | DCS800-S02-0200-04/05 | 200 | 83 | 104 | 15 | | 300 | 0.56 | D2 |
| DCS800-S01-0230-04/05 | 230 | 107 | 133 | DCS800-S02-0260-04/05 | 260 | 108 | 135 | 15 | | 300 | 0.73 | D2 |
| DCS800-S01-0315-04/05 | 315 | 146 | 183 | DCS800-S02-0350-04/05 | 350 | 145 | 182 | 20 | | 600 | 0.91 | D3 |
| DCS800-S01-0405-04/05 | 405 | 188 | 235 | DCS800-S02-0450-04/05 | 450 | 187 | 234 | 20 | | 600 | 1.12 | D3 |
| DCS800-S01-0470-04/05 | 470 | 213 | 280 | DCS800-S02-0520-04/05 | 520 | 218 | 276 | 20 | | 600 | 1.32 | D3 |
| DCS800-S01-0610-04/05 | 610 | 284 | 354 | DCS800-S02-0680-04/05 | 680 | 282 | 354 | 25 | | 950 | 1.76 | D4 |
| DCS800-S01-0740-04/05 | 740 | 344 | 429 | DCS800-S02-0820-04/05 | 820 | 340 | 426 | 25 | 950 | 2.14 | D4 | |
| DCS800-S01-0900-04/05 | 900 | 049 | 522 | DCS800-S02-1000-04/05 | 1000 | 415 | 520 | 25 | 1900 | 2.68 | D4 | |
| DCS800-S01-1200-04/05 | 1200 | 558 | 696 | DCS800-S02-1200-04/05 | 1200 | 498 | 624 | 25 ③ | 800 | 5.10 | D5 | |
| DCS800-S01-1500-04/05 | 1500 | 698 | 870 | DCS800-S02-1500-04/05 | 1500 | 623 | 780 | 25 ③ | 800 | 5.30 | D5 | |
| DCS800-S01-2000-04/05 | 2000 | 930 | 1160 | DCS800-S02-2000-04/05 | 2000 | 830 | 1040 | 25 ③ | 800 | 6.60 | D5 | |
| DCS800-S01-2050-05 | 2050 | 953 | 1189 | DCS800-S02-2050-05 | 2050 | 851 | 1066 | - | 1600 | 8.00 | D6 | |
| DCS800-S01-2500-04/05 | 2500 | 1163 | 1450 | DCS800-S02-2500-04/05 | 2500 | 1038 | 1300 | - | 400-500; 3-ph | 1600 | 9.00 | D6 |
| DCS800-S01-3000-04/05 | 3000 | 1395 | 1740 | DCS800-S02-3000-04/05 | 3000 | 1245 | 1560 | - | 1600 | 11.10 | D6 | |
| DCS800-S01-3300-04/05 | 3300 | 1535 | 1914 | DCS800-S02-3300-04/05 | 3300 | 1370 | 1716 | - | 4200 | 11.70 | D7 | |
| DCS800-S01-4000-04/05 | 4000 | 1860 | 2320 | DCS800-S02-4000-04/05 | 4000 | 1660 | 2080 | - | 400/690; 3-ph | 4200 | 13.00 | D7 |
| DCS800-S01-5200-04/05 | 5200 | 2418 | 3016 | DCS800-S02-5200-04/05 | 5200 | 2158 | 2704 | - | 4200 | 19.00 | D7 | |
| 600 V / 690 V | | 600V | 690V | | 600V | 690V | | | | | | |
| DCS800-S01-0290-06 | 290 | 203 | | DCS800-S02-0320-06 | 320 | 200 | | - | 115/230; 1-ph | 600 | 0.91 | D3 |
| DCS800-S01-0590-06 | 590 | 413 | | DCS800-S02-0650-06 | 650 | 405 | | - | 230; 1-ph ① | 950 | 1.86 | D4 |
| DCS800-S01-0900-06/07 | 900 | 630 | 720 | DCS800-S02-0900-06/07 | 900 | 563 | 648 | 25 ③ | 230; 1-ph | 800 | 5.10 | D5 |
| DCS800-S01-1500-06/07 | 1500 | 1050 | 1200 | DCS800-S02-1500-06/07 | 1500 | 938 | 1080 | 25 ③ | | 800 | 6.30 | D5 |
| DCS800-S01-2000-06/07 | 2000 | 1400 | 1600 | | | | | 25 ③ | | 800 | 8.10 | D5 |
| DCS800-S01-2050-06/07 | 2050 | 1435 | 1640 | DCS800-S02-2050-06/07 | 2050 | 1281 | 1476 | - | 525-690; 3-ph ② | 1600 | 9.20 | D6 |
| DCS800-S01-2500-06/07 | 2500 | 1750 | 2000 | DCS800-S02-2500-06/07 | 2500 | 1563 | 1800 | - | | 1600 | 10.20 | D6 |
| DCS800-S01-3000-06/07 | 3000 | 2100 | 2400 | DCS800-S02-3000-06/07 | 3000 | 1875 | 2160 | - | | 1600 | 12.20 | D6 |
| DCS800-S01-3300-06/07 | 3300 | 2310 | 2640 | DCS800-S02-3300-06/07 | 3300 | 2063 | 2376 | - | 400/690; 3-ph | 4200 | 13.10 | D7 |
| DCS800-S01-4000-06/07 | 4000 | 2800 | 3200 | DCS800-S02-4000-06/07 | 4000 | 2500 | 2880 | - | | 4200 | 15.10 | D7 |
| DCS800-S01-4800-06/07 | 4800 | 3360 | 3840 | DCS800-S02-4800-06/07 | 4800 | 3000 | 3456 | - | | 4200 | 19.50 | D7 |
| 800 V | | 800V | | | 800V | | | | | | | |
| DCS800-S01-1900-08 | 1900 | 1739 | | DCS800-S02-1900-08 | 1900 | 1558 | | - | 400-500; 3-ph | 1600 | 9.00 | D6 |
| DCS800-S01-2500-08 | 2500 | 2288 | | DCS800-S02-2500-08 | 2500 | 2050 | | - | | 1600 | 10.70 | D6 |
| DCS800-S01-3000-08 | 3000 | 2745 | | DCS800-S02-3000-08 | 3000 | 2460 | | - | | 1600 | 12.70 | D6 |
| DCS800-S01-3300-08 | 3300 | 3020 | | DCS800-S02-3300-08 | 3300 | 2706 | | - | 400/690; 3-ph | 4200 | 13.40 | D7 |
| DCS800-S01-4000-08 | 4000 | 3660 | | DCS800-S02-4000-08 | 4000 | 3280 | | - | | 4200 | 15.60 | D7 |
| DCS800-S01-4800-08 | 4800 | 4392 | | DCS800-S02-4800-08 | 4800 | 3936 | | - | | 4200 | 20.00 | D7 |
| 990 V | | 990V | | | 990V | | | | | | | |
| DCS800-S01-2050-10 | 2050 | 2378 | | DCS800-S02-2050-09 | 2050 | 2132 | | - | 400/690; 3-ph | 4200 | 9.70 | D7 |
| DCS800-S01-2600-10 | 2600 | 3016 | | DCS800-S02-2600-09 | 2600 | 2704 | | - | | 4200 | 12.10 | D7 |
| DCS800-S01-3300-10 | 3300 | 3828 | | DCS800-S02-3300-09 | 3300 | 3432 | | - | | 4200 | 16.60 | D7 |
| DCS800-S01-4000-10 | 4000 | 4640 | | DCS800-S02-4000-09 | 4000 | 4160 | | - | | 4200 | 20.20 | D7 |
| 1200 V | Data on request | | | | | | | | | | | |

- ① with plus code 115 V selectable
- ② with plus code 400-500 V selectable
- ③ FEX425 internal field exciter as option; three-phase or single phase, separate supply max. 500 V AC
- ④ ratings for rated input voltage -10%

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. | |
| D1 | 55 dBA | ?? dBA | 0.5 g, 5...55 Hz |
| D2 | 55 dBA | ?? dBA | |
| D3 | 60 dBA | ?? dBA | |
| D4 | 66...70 dBA, depending on fan | 77 dBA | |
| D5 | 73 dBA | 78 dBA | 1 mm, 2...9 Hz 0.3 g, 9...200 Hz |
| D6 | 75 dBA | 73 dBA | |
| D7 | 82 dBA | 80 dBA | |

| | |
|--|---------------------------------|
| Environmental limit values | |
| Permissible cooling air temperatur. | |
| - at converter module air inlet: | 0 to +55°C |
| with rated DC current: | 0 to +40°C |
| w. different DC current | +30 to +55°C |
| - Options: | 0 to +40°C |
| Relative humidity (at 5...+40°C): | 5 to 95%, no condensation |
| Relative humidity (at 0...+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

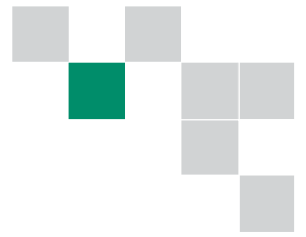
In North America the system components fulfil the requirements of the table below.

| 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 above. Available for converter modules including field exciter units. | EN / IEC types: on request (for details see table above) |

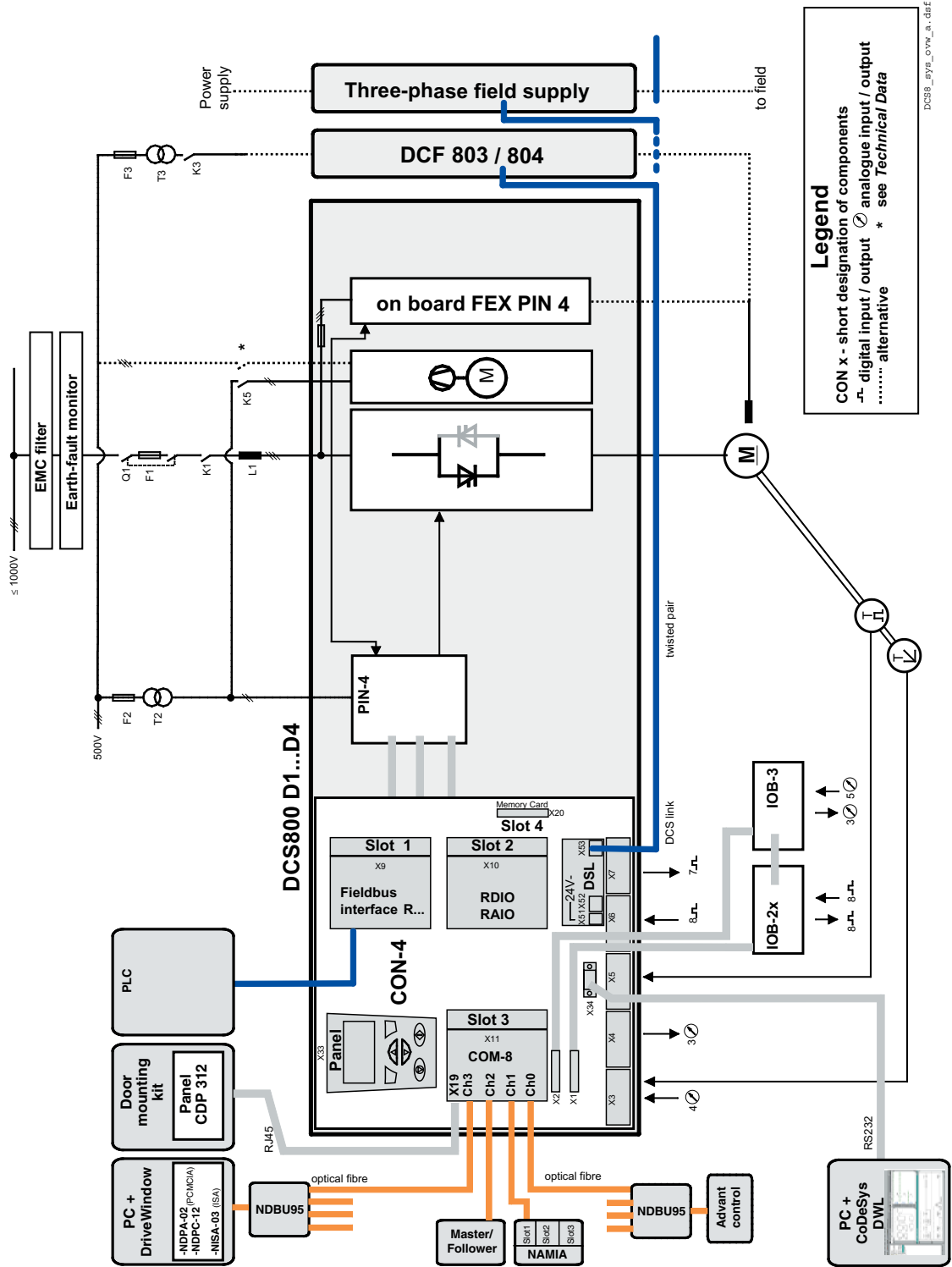
Regulatory Compliance

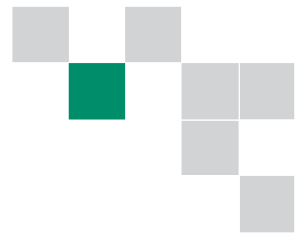
The converter module and enclosed converter components are designed for use in industrial environments. In EEA countries, the components fulfil the requirements of the EU directives, see table below.

| European Union Directive | Manufacturer's Assurance | Harmonized Standards | |
|--|---|---|--|
| | | Converter module | Enclosed converter |
| Machinery Directive 98/37/EEC 93/68/EEC | Declaration of Incorporation | EN 60204-1 [IEC 60204-1] | EN 60204-1 [IEC 60204-1] |
| Low Voltage Directive 73/23/EEC 93/68/EEC | Declaration of Conformity | EN 60146-1-1 [IEC 60146-1-1] EN 61800-5-1 (EN 50178 [IEC --]) see additional IEC 60664 | EN 60204-1 [IEC 60204-1] EN 61800-5-1 EN 60439-1 [IEC 60439-1] |
| EMC Directive 89/336/EEC 93/68/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 [IEC 61800-3] ① in accordance with 3ADW 000 032 | EN 61800-3 ① [IEC 61800-3] ① in accordance with 3ADW 000 032/3ADW 000 091 |

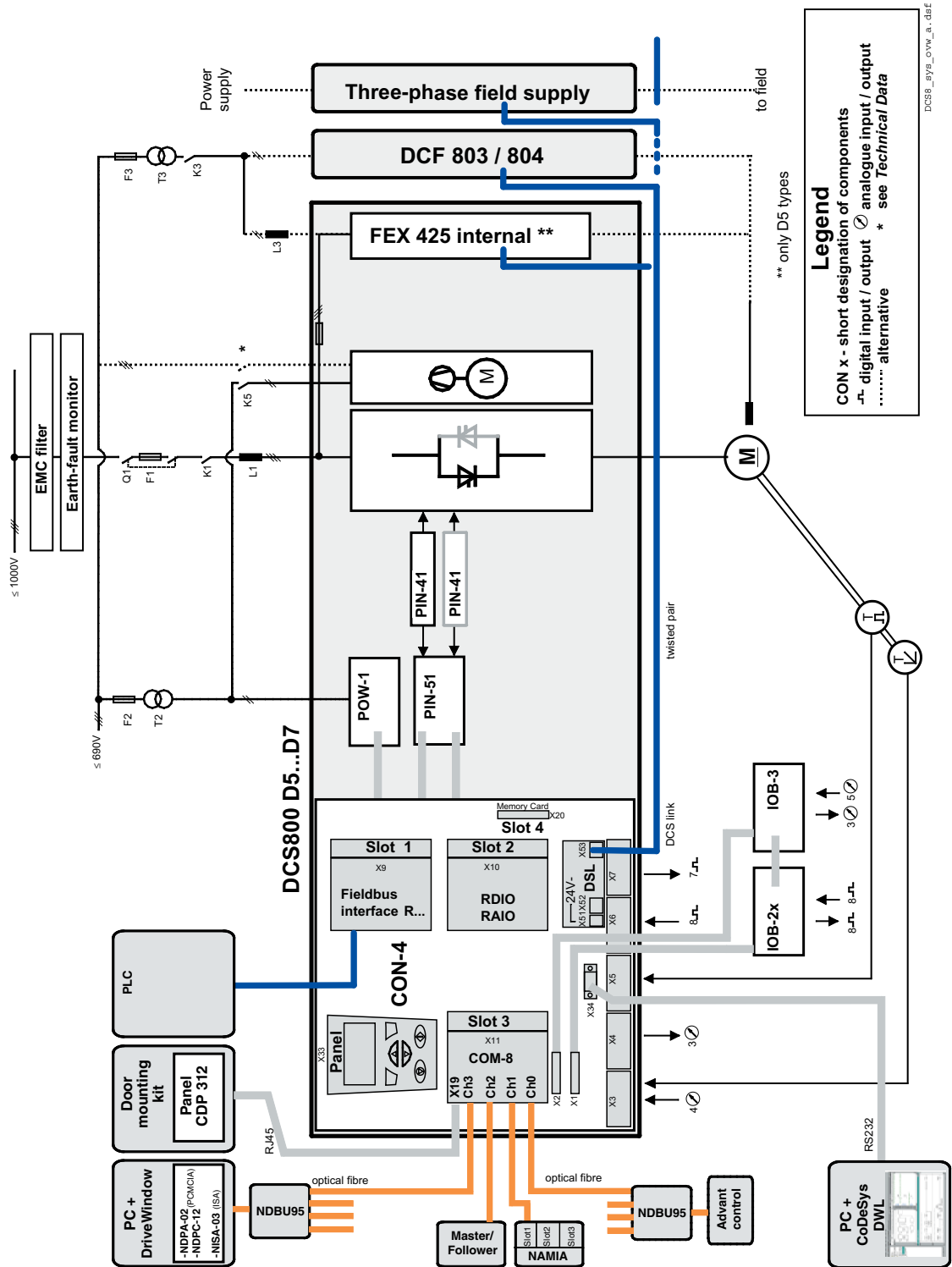


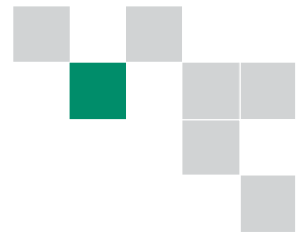
Components overview of converter size D1...D4 (400...525 V)





Components overview of converter size D5...D7





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 catalogue 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

The screenshot displays the DriveSize 2.4 software interface. It includes a 'Welcome to DriveSize 2.4' dialog box, a 'System configuration' tree showing a hierarchy of drives and converters, a 'Converter load' panel with various parameters like 'Load type', 'Duty cycle', and 'Short time current', and a 'Selected converter data' table. A 'Drivers' window is open, showing a list of drivers with columns for Name, Code, Qty, and Unit. A 'Load profile' graph is visible at the bottom, plotting Load [%] against Time [s].

| Parameter | Value |
|----------------------|------------|
| Selection method | Standard |
| Rated AC supply [V] | 400 |
| Rated AC current [A] | 1000 |
| Max DC voltage [V] | 1000 |
| Catalogue [DC-1] [A] | 1000 |
| Rated duty type [A] | 1000 |
| Quadrant type | 2-quadrant |
| Modular Enclosed | No |
| With Air Filter | No |
| Field reversal | No |
| Protection class | IP21 |

| Name | Code | Qty | Unit |
|--|------|------|-------|
| Standard-Kit. Mod. | | | |
| Advanced control | | | |
| Name plate | | | |
| Power switching | | | |
| Field switch | | | |
| Documentation | | | |
| AC Field supply [V] | 380 | | |
| AC Field supply [V] | 400 | | |
| Fieldbus interface modules for DCS400 | | | |
| for Profibus, MPBA-12 | 0 | 870 | |
| for Modbus, MABA-01 | 0 | 870 | |
| for CANopen NCAN-02 | 0 | 870 | |
| for DeviceNet NDNA-02 | 0 | 870 | |
| Power supply 230VAC/230VDC/3A, NPSM-01 | 0 | 990 | |
| I/O Digital Connection board | | | |
| Standard SDCS-40B-23 (230V control voltage + 230V) | 0 | 0 | |
| Changing to SDCS-40B-21 (230V control voltage, 40V) | 1 | 770 | |
| Changing to SDCS-40B-22 (115V control voltage, 11V) | 0 | 1,35 | |
| I/O extension board | | | |
| SDCS-40B-1 (with process terminals; don't forget 24V) | 0 | 1,49 | |
| Adaption board for analog latch | | | |
| PSS311-SE1 (for board latch gain adjust by Prof) | 0 | 320 | |
| DC Transducer I. with customer measurement, (max 2 or 4 PT100 measurement unit for each 230V module) | 1 | 1,41 | |
| Discount [K] | 0 | | |
| Total list price | | | ABB I |
| Total net price | | | ABB I |

Easy Commissioning



General

Easy-to-use saves customer time consumption and keeps required training low. Easy commissioning is based on three columns.

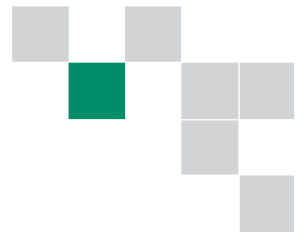
- DCS800 is equipped with macros to cover the most frequent parameter settings.
- Assistance guide through required parameter setting during commissioning and all auto-tunings.
- Adaptive programming provides a very flexible set of function blocks and solves problems during commissioning.

DCS800 Macros

DCS800 is equipped with seven different macros to cover the most frequent parameter settings. Macros are pre-programmed parameter sub-sets. During startup, the drive can be configured easily without changing individual parameters. The functions of all inputs and several outputs and of allocations in the control structure are influenced by the selection of a macro. This means, whether the drive is speed-controlled or torque-controlled, whether supplementary references are processed, which actual values are available at the analog outputs, which reference value sources are used etc. is already defined in the macro.

| | | Terminal Allocation by Macros | | | | | | |
|----------|----------------------|-------------------------------|---------------------|-------------------------|--------------------|--------------------|---------------------|---------------------------------|
| Terminal | Signal | Factory | Standard | Manual / constant speed | Hand / auto | Hand / motor pot | Motor pot | Torque control |
| X3: | 1 90...270 V AITAC- | - | - | - | - | - | - | - |
| | 2 30...90 V AITAC- | - | - | - | - | - | - | - |
| | 3 8...30 V AITAC- | - | - | - | - | - | - | - |
| | 4 AITAC+ | - | - | - | - | - | - | - |
| | 5 AI1- | - | - | - | - | - | - | - |
| | 6 AI1+ | - | Speed reference | Speed reference | Speed reference | Speed reference | - | Torque reference |
| | 7 AI2- | - | - | - | - | - | - | - |
| | 8 AI2+ | - | Torque limit | - | - | - | - | - |
| | 9 AI3- | - | - | - | - | - | - | - |
| | 10 AI3+ | - | - | - | - | - | - | - |
| X4: | 1 AI4- | - | - | - | - | - | - | - |
| | 2 AI4+ | - | - | - | - | - | - | - |
| | 3 0 V | - | - | - | - | - | - | - |
| | 4 +10 V | - | - | - | - | - | - | - |
| | 5 -10 V | - | - | - | - | - | - | - |
| | 6 0 V | - | - | - | - | - | - | - |
| | 7 AO1 | - | Motor speed | Motor speed | Motor speed | Motor speed | Motor speed | Motor speed |
| | 8 AO2 | - | Actual armat. volt. | Actual motor curr. | Actual motor curr. | Actual motor curr. | Actual armat. volt. | Motor torque |
| | 9 IACT | Actual current | Actual current | Actual current | Actual current | Actual current | Actual current | Actual current |
| | 10 0 V | - | - | - | - | - | - | - |
| X5: | 1 Ch A+ | - | - | - | - | - | - | - |
| | 2 Ch A- | - | - | - | - | - | - | - |
| | 3 Ch B+ | - | - | - | - | - | - | - |
| | 4 Ch B- | - | - | - | - | - | - | - |
| | 5 Ch Z+ | - | - | - | - | - | - | - |
| | 6 Ch Z- | - | - | - | - | - | - | - |
| | 7 0 V | - | - | - | - | - | - | - |
| | 8 Sense 0 V | - | - | - | - | - | - | - |
| | 9 Power out + | - | - | - | - | - | - | - |
| | 10 Sense power out + | - | - | - | - | - | - | - |
| X6: | 1 DI1 | Converter fan ack. | Jog1 | Jog1 | StartStop | Motor pot up | Direction | Off2 (coast stop) |
| | 2 DI2 | Motor fan ack. | Jog2 | Jog2 | HandAuto | Motor pot down | Motor pot up | Torque select |
| | 3 DI3 | Main contact. ack. | External fault | Direction | Direction | Direction | Motor pot down | External fault |
| | 4 DI4 | Off2 (coast stop) | External alarm | Parameter select | Speed ref. select | Speed ref. select | Motor pot minimum | - |
| | 5 DI5 | E-Stop | E-Stop | E-Stop | E-Stop | E-Stop | E-Stop | E-Stop |
| | 6 DI6 | Reset | Reset | Reset | Reset | Reset | Reset | Reset |
| | 7 DI7 | OnOff1 | OnOff1 | On Start pulse | OnOff1 | On Start pulse | OnOff1 | OnOff1 |
| | 8 DI8 | StartStop | StartStop | Off1 Stop pulse NC | - | Off1 Stop pulse NC | StartStop | StartStop |
| | 9 +24 V | - | - | - | - | - | - | - |
| | 10 0 V | - | - | - | - | - | - | - |
| X7: | 1 DO1 | Fans On cmd. | ReadyRun | ReadyOn | ReadyOn | ReadyOn | ReadyRun | ReadyRun |
| | 2 DO2 | Field excit. On cmd. | ReadyRef (running) | ReadyRef (running) | ReadyRef (running) | ReadyRef (running) | Above limit | ReadyRef (running) |
| | 3 DO3 | Main contact. On cmd. | Fault or alarm | Tripped (fault) | Tripped (fault) | Tripped (fault) | Fault or alarm | Fault or alarm |
| | 4 DO4 | - | Zero speed | Zero speed | Zero speed | Zero speed | Zero speed | Zero speed |
| | 5 DO5 | - | Above limit | Above limit | Above limit | Above limit | At setpoint | Zero speed DC-breaker trip cmd. |
| | 6 DO6 | - | - | - | - | - | - | - |
| | 7 DO7 | - | - | - | - | - | - | - |
| | 8 0 V | - | - | - | - | - | - | - |
| X96: | 1 DO8 Relay | Main contact. On cmd. | - | - | - | - | - | |
| 2 | Serial communication | Speed reference | - | - | Speed reference | - | - | |

Startup Assistant



Faster and easier commissioning

The Startup 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. It also comes with an online info system with step-by-step reference to printed manuals.

On-line info system

To make it easier and more informative, there is an on-line info system available at each step, helping to set the correct values for each parameter and troubleshoot the problems.

Startup Assistant Features

- Easy and fast commissioning procedure
- Intelligent guide to assist you through the commissioning
- Your own language
- On-line info system always available
- Auto detection of connected hardware

The DCS800 DC Drive offers you all this as standard features.



Adaptive Programming

Optimal adaptability

- Small PLC inside.
- Program your drive on-site during commissioning.
- Create your own I/O signals, modify speed or torque reference, chain or set a timer.
- Do it without any additional hardware or software.
- As simple as setting a parameter.
- Access to any signal or control bit.

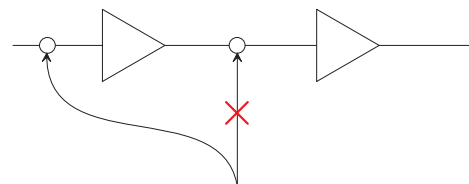
There is also a DWL AP PC tool available for graphical display of Adaptive Programming.

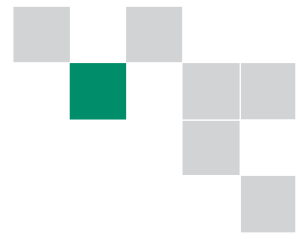


Adaptive Programming Features

- 16 programmable function blocks
- Available functions:
 - Logical: AND, OR and XOR
 - Mathematical: add, mul, div, abs, max and min
 - Other: timer, switch, comparator, filter, SR, PI and user-defined warnings or faults
- Freely definable execution order
- Easy documentation

The DCS800 DC Drive offers you all this as standard features.





DCS800 Basic firmware

DCS800 firmware includes the basic function of speed control, armature current, field current and motor voltage. The flexible design for command location enables field bus control or master-follower control or control from hardware signals as well as a mixed structure. The design of drive logic enables a drive reaction defined by Profibus standard but can also be configured to adapt classic command structures.

The firmware interface for several fieldbuses and module bus is included. All parameters can be accessed by the serial communication or by IEC 61131 or adaptive programming.

Five macros are predefined and two user macros can be configured by the customer.

Functions of basic firmware

- Different speed ramp function
- Speed control
- Torque control
- Armature current control
- Field current control
- Automatic field weakening
- E-stop function according to profibus standard
- Dual field control
- Mechanical brake control
- DC breaker control
- Interface for fieldbus and module bus
- Programmable digital and analogue outputs
- Master follower bus
- 16 blocks Adaptive Program
- Interface for IEC 61131 programming
- 12-pulse function - parallel, serial, sequential
- 3-phase field exciter operation
- Converter protection (temperature, voltage,...)

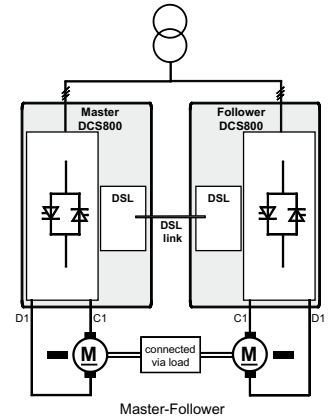
Motor protections

- Stall protections
- Thermal motor model
- 2 channel motor temperature measurement PTC or PT100
- Klixon supervision
- Speed feedback error
- Over speed
- Armature current ripple
- Armature over current
- Minimum field current

Master-Follower Applications

Drives connected in Master-Follower application

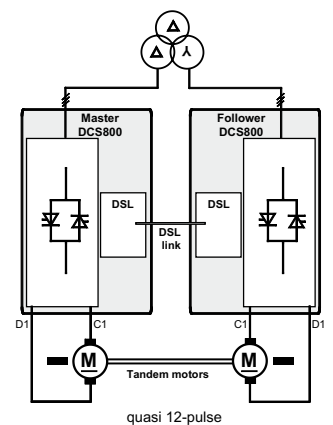
If motors run with the same speed / torque connected to the same shaft or gearbox are called MASTER - FOLLOWER.



Quasi 12-pulse Master-Follower configuration

The converters are fed by a 12-pulse transformer with separated secondary windings whose phase positions differ by 30°el.

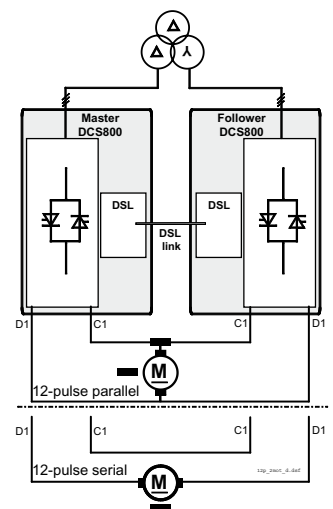
This configuration delivers the same advantages concerning harmonics to the network as a standard 12-pulse application (see next item), but no T-reactor is needed.



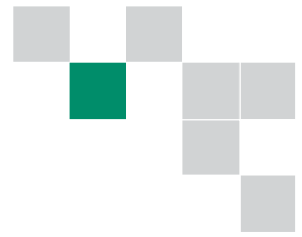
Typical configuration for high power drives connected in 12-pulse parallel, serial or sequential application

12-pulse systems are used for reduced line harmonics, reduced motor noise level, enlarged output current or voltage of converter system. Only the 11th and 13th, the 23rd and 25th, the 35th a.s.o. are existing. The harmonics on the DC side are reduced too, which gives a higher efficiency.

It is **not** possible to connect two 12-pulse systems (2 converters, T-reactor and 1 motor) to one 12-pulse transformer. For more information, please see *manual 12-pulse operation*.



Plug-in options



DCS800 - S01 - 0025 - 04 + B055

Basic control panel

The basic control panel features a single line numeric display. The panel can be used to control the drive, set the parameter values or copy them from a drive to another one. It comes with every DCS800.

plus code

- +0J400 If no control panel is required
- +J404 Basic control panel DCS800PAN
- Panel mounting kit ACS/H-CP-EXT plus cable

Plug-in fieldbus module

The plug-in fieldbus options bring connectivity to major automation systems. A single twisted pair avoids large amounts of conventional cabling, thereby reducing cost and increasing system reliability. The board must be located in slot1.

For plus codes see *Fieldbus control* (page 21)

I/O extension option module

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.

plus code

- +L501 RDIO-01 Digital extension module 3xDI, 2xDO
- +L500 RAIO-01 Analog extension module 2xAI, 2xAO

Fast optical DDCS communication module

DCS800 provides an interface SDCS-COM-8 fast serial communication:

- Master channel Module bus to AC800M
- I/O channel to AIMA-01 board
- Master-Follower DDCS channel
- Tools channel e.g DriveWindow, Remote diagnostic NETA, as well as the CDP 312 from ACS800 range can be connected on this board
- The board must be located in slot3.

plus code

- +L508 Module bus 10 Mbd (SDCS-COM-81)
- +L509 NxxA fieldbus adapter 5 Mbd (SDCS-COM-82)

Drive-specific serial communication board

The SDCS-DSL board provides the serial communication for:

- Drive to drive
- Drive to external field exciter
- 12-pulse applications

plus code

- +S199 SDCS-DSL communication board



External Field Supply



General data

- Currents from 0.3 to 520 A
- Minimum field current monitor
- Integrated external field power converter or completely separate switchgear cubicle
- single-phase or 3-phase model
- Controlled by serial communication via DSL board

All field converters are controlled by the armature converter via a serial interface (SDCS-DSL Board). This interface serves to parameterize, control and diagnose the field converter and thus provides an option for exact control.

We recommend integrating an autotransformer in the field power converter's supply circuit to adjust the AC input voltage to the field voltage and for reducing the voltage ripple in the field circuit **for single-phase** operation.

Field converter types

DCF803-0035

- Half-controlled thyristor/diode bridge (1-Q)
- Three-phase or single-phase operation
- Microprocessor control, with the electronic system being supplied by the armature-circuit converter (24 V).
- Construction and components have been designed for an insulation voltage of 600 V AC.
- Fast-response excitation is possible with an appropriate voltage reserve; de-excitation takes place by field time constant.
- Output voltage U_A (single-phase operation):



$$U_A \leq U_V * \left(\frac{100\% + TOL}{100\%} \right) * 0.9$$

TOL = tolerance of line voltage in %

U_V = Line voltage

- Recommendation (single-phase operation):
Field voltage 0.6 to 0.8 * U_V
- Output voltage U_A (three-phase operation):

$$U_A \leq U_V * \left(\frac{100\% + TOL}{100\%} \right) * 1.35$$

TOL = tolerance of line voltage in %

U_V = Line voltage

Note: Calculation valid also for FEX425 internal

Table of field converter units

| Unit type | Output current I_{DC} | AC field supply voltage | auxiliary supply voltage | Remarks |
|--------------------|-------------------------|---|--------------------------|---|
| DCF803-0035 | 0.3...35 A | 110V -15%...500V/1-ph +10% single-phase or three-phase | 24 V DC 200 mA | external fuse for 3-phase operation use ND01, ND02 for 1-phase operation use ND30 \Rightarrow 16A |
| DCF803-0050 | 0.3...50 A | 110V -15%...500V/1-ph +10% | 115 or 230 V | if necessary via matching autotransformer; fuse external; Dimensions HxWxD: 370x125x342 [mm] |
| DCF804-0050 | 0.3...50 A | 110V -15%...500V/1-ph +10% | | |
| DCS800-S0x-xxxx-05 | see table on page 7 | 200V...500V/3-ph | | |

Current reduction see also *Environmental conditions* in *Hardware manual*



DCF803-0050

- Single-phase power stack
- Half-controlled thyristor/diode bridge (1-Q).
- Built-in line chokes.
- Microprocessor control with the control electronics being supplied separately (115...230 V/1-ph).
- Construction and components have been designed for an insulation voltage of 690 V AC.



- Output voltage U_A :

$$U_A \leq U_V * \left(\frac{100\% + TOL}{100\%} \right) * 0.9$$

TOL = tolerance of line voltage in %
 U_V = Line voltage

- Recommendation:
 Field voltage 0.6 to 0.8 * U_V

DCF804-0050

- Single-phase power stack
- Fully-controlled antiparallel thyristor bridges (4-Q)
- This unit offers field reversal as well as fast-response excitation / de-excitation.

In the steady-state condition, the fully-controlled bridge runs in half-controlled mode so as to keep the voltage ripple as low as possible. With a quickly alternating field current, the bridge runs in fully-controlled mode.

- Same design as DCF803.
- Built-in line chokes.

Autotransformer for single-phase field supply

| for field current I_f | Autotransformer type 50/60 Hz | DCF803-0035 FEX 425 internal | DCF803-0050 DCF804-0050 |
|-------------------------|-------------------------------|------------------------------|-------------------------|
| | $U_{prim} = \leq 500 V$ | | |
| $\leq 6 A$ | T 3.01 | x ** | x |
| $\leq 12 A$ | T 3.02 | x ** | x |
| $\leq 16 A$ | T 3.03 | x ** | x |
| $\leq 30 A$ | T 3.04 | x * | x |
| $\leq 50 A$ | T 3.05 | | x |
| | $U_{prim} = \leq 600 V$ | | |
| $\leq 6 A$ | T 3.11 | x ** | x |
| $\leq 12 A$ | T 3.12 | x ** | x |
| $\leq 16 A$ | T 3.13 | x ** | x |
| | $U_{prim} = \leq 690 V$ | | |
| $\leq 30 A$ | T 3.14 | | x |
| $\leq 50 A$ | T 3.15 | | x |

* three-phase operation recommended

** requires ND 30 line choke

DCS800

This converter can also be used for field exciter operation, an additional over-voltage protection unit is required. It provides field currents from 25 A up to 520 A unipolar and bipolar for field reversal function.



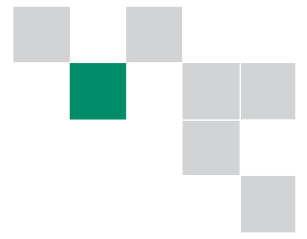
- Output voltage U_A respectively $U_{dmax 2-Q}$:
 see table on page 5
- Recommendation:
 Field voltage 0.5 to 1.1 * U_V
- The three-phase field supply converters DCS800-S01/S02 need a separate active Overvoltage Protection unit DCF 506 for protecting the power part against inadmissibly high voltages.
 The overvoltage protection unit DCF 506 is suitable for 2-Q converters DCS800-S01 and for 4-Q converters DCS800-S02.

Assignment of field supply converter to Overvoltage protection unit

| Field supply converter for motor fields | Overvoltage Protection |
|---|------------------------|
| DCS80x-0020-51 | DCF506-0140-51 |
| ... | |
| DCS80x-0140-51 | |
| DCS80x-0200-51 | DCF506-0520-51 |
| ... | |
| DCS80x-0520-51 | |



DCF506-140-51, without cover



Fuse connections

Recommended fuse connections see tables below.

Semiconductor type F1 fuses and fuse holders for AC and DC power lines (DCS800-S01 / DCS800-S02)

The converter units are subdivided into two groups:

- Unit sizes D1, D2, D3 and D4 with rated currents up to 1000 A require external line fuses.
- In unit sizes D5, D6 and D7 with rated currents of 900 A to 5200 A, the semiconductor fuses are installed internally (no additional external semiconductor fuses are needed).

The table assigns the AC fuse types to the converter types. In case the converter should be equipped with DC fuses according to the hints use the same type of fuse used on the AC side now in the plus and minus line. Blade type fuses are used for all the converters of construction type D1...D4 except the converters (610 A, 680 A, 740 A, 820 A, 900 A, 1000 A)

| Type of converter | | Type | Fuse holder | Design fig. |
|-----------------------|-----------------------|-----------|--------------|-------------|
| 2-Q Converter | 4-Q Converter | | | |
| DCS800-S01-0020-04/05 | DCS800-S02-0025-04/05 | 170M 1564 | OFAX 00 S3L | 1 |
| DCS800-S01-0045-04/05 | DCS800-S02-0050-04/05 | 170M 1566 | OFAX 00 S3L | 1 |
| DCS800-S01-0065-04/05 | DCS800-S02-0075-04/05 | 170M 1568 | OFAX 00 S3L | 1 |
| DCS800-S01-0090-04/05 | DCS800-S02-0100-04/05 | 170M 1568 | OFAX 00 S3L | 1 |
| DCS800-S01-0125-04/05 | DCS800-S02-0140-04/05 | 170M 3815 | OFAX 1 S3 | 1 |
| DCS800-S01-0180-04/05 | DCS800-S02-0200-04/05 | 170M 3816 | OFAX 1 S3 | 1 |
| DCS800-S01-0230-04/05 | DCS800-S02-0260-04/05 | 170M 3817 | OFAX 1 S3 | 1 |
| DCS800-S01-0315-04/05 | DCS800-S02-0350-04/05 | 170M 5810 | OFAX 2 S3 | 1 |
| DCS800-S01-0405-04/05 | DCS800-S02-0450-04/05 | 170M 6811 | OFAX 3 S3 | 1 |
| DCS800-S01-0470-04/05 | DCS800-S02-0520-04/05 | 170M 6811 | OFAX 3 S3 | 1 |
| DCS800-S01-0610-04/05 | DCS800-S02-0680-04/05 | 170M 6163 | 3x 170H 3006 | 2 |
| DCS800-S01-0740-04/05 | DCS800-S02-0820-04/05 | 170M 6163 | 3x 170H 3006 | 2 |
| DCS800-S01-0900-04/05 | DCS800-S02-1000-04/05 | 170M 6166 | 3x 170H 3006 | 2 |
| DCS800-S01-0290-06 | DCS800-S02-0320-06 | 170M 5810 | OFAX 2 S3 | 1 |
| DCS800-S01-0590-06 | DCS800-S02-0650-06 | 170M 6813 | OFAX 3 S3 | 1 |

Fuses and fuse holders (details see Technical Data)



Fig. 1

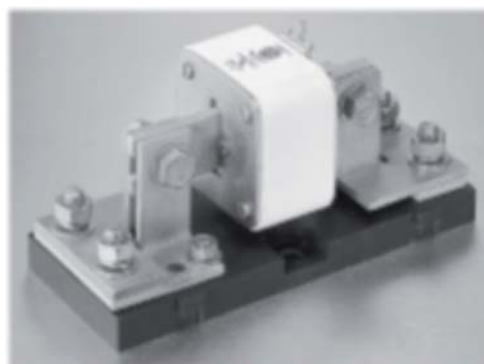


Fig. 2

Line reactors L1



| DCS Type 400V-690V 50/60 Hz | | Line choke type for configur. A | Design Fig. | Line choke type for configur. B | Design Fig. |
|-----------------------------------|-----------------------------|--|----------------|--|----------------|
| 2-Q Converter | 4-Q Converter | | | | |
| DCS800-S01-0020-04/05 | DCS800-S02-0025-04/05 | ND01 | 1 | ND401 | 4 |
| DCS800-S01-0045-04/05 | DCS800-S02-0050-04/05 | ND02 | 1 | ND402 | 4 |
| DCS800-S01-0065-04/05 | DCS800-S02-0075-04/05 | ND04 | 1 | ND403 | 5 |
| DCS800-S01-0090-04/05 | DCS800-S02-0100-04/05 | ND06 | 1 | ND404 | 5 |
| DCS800-S01-0125-04/05 | DCS800-S02-0140-04/05 | ND06 | 1 | ND405 | 5 |
| DCS800-S01-0180-04/05 | DCS800-S02-0200-04/05 | ND07 | 2 | ND406 | 5 |
| DCS800-S01-0230-04/05 | DCS800-S02-0260-04/05 | ND07 | 2 | ND407 | 5 |
| DCS800-S01-0290-06 | DCS800-S02-0320-06 | ND08 | 2 | on request | - |
| DCS800-S01-0315-04/05 | DCS800-S02-0350-04/05 | ND09 | 2 | ND408 | 5 |
| DCS800-S01-0405-04/05 | DCS800-S02-0450-04/05 | ND10 | 2 | ND409 | 5 |
| DCS800-S01-0590-06 | DCS800-S02-0650-06 | ND13 | 3 | on request | - |
| DCS800-S01-0470-04/05 | DCS800-S02-0520-04/05 | ND10 | 2 | ND410 | 5 |
| DCS800-S01-0610-04/05 | DCS800-S02-0680-04/05 | ND12 | 2 | ND411 | 5 |
| DCS800-S01-0740-04/05 | DCS800-S02-0820-04/05 | ND13 | 3 | ND412 | 5 |
| DCS800-S01-0900-04/05 | DCS800-S02-1000-04/05 | ND13 | 3 | ND413 | 5 |
| DCS800-S01-0900-06/07 | DCS800-S02-0900-06/07 | ND13 | 3 | on request | - |
| DCS800-S01-1200-04/05 | DCS800-S02-1200-04/05 | ND14 | 3 | on request | - |
| DCS800-S01-1500-04/05/06/07 | DCS800-S02-1500-04/05/06/07 | ND15 | 3 | on request | - |
| DCS800-S01-2000-04/05 | DCS800-S02-2000-04/05 | ND16 | 3 | on request | - |
| DCS800-S01-2000-06/07 | | ND16 * | 3 | on request | - |

* with forced cooling



Fig. 1

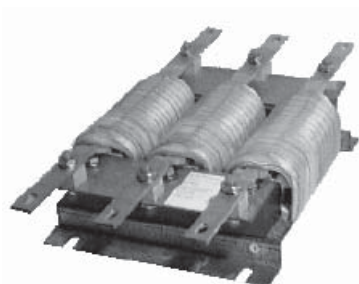


Fig. 2



Fig. 3



Fig. 4



Fig. 5

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.

The ControlBuilder is based on the common tool CoDeSys. Due to its intuitive Windows based user interface even beginners are able to start programming immediately. Additionally a set of drive specific function blocks eases the programming of the DCS800.

By means of completely supporting all five programming languages of the IEC61131-3 standard everyone is able to find the right programming environment:

- instruction list IL
- sequential function chart AS
- function block diagram FDB
- structured text ST
- ladder diagram LD
- additionally a free graphical function plan (CFC) is available

The extremely user-friendly online debugging function offers besides single step-, single cycle- and breakpoint mode an event triggered recording tool for variables and signals.

Due to the offline simulation mode it is possible to use the debugging function without connected hardware.

The application program is stored on a compact flash (Memory Card - MC), which is plugged into the drive. Thus it is possible to store the binary code as well as all source codes. Of course protection of the application program with a password is possible.

Advantages of the ControlBuilder DCS800:

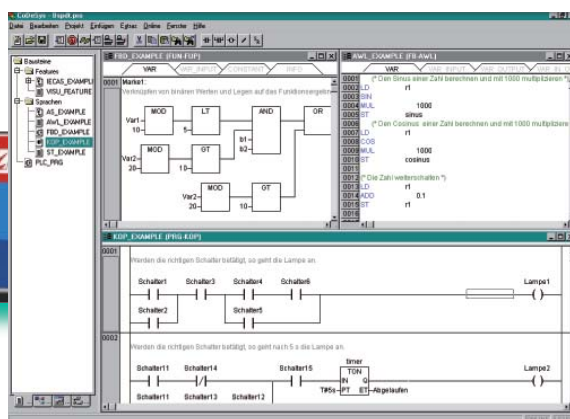
- Fast and easy adaptation of DCS800 DC Drive to the used application.
- Less spare parts.
- The application, including source code, is always part of the drive and thus can be maintained during the whole live cycle of the machine.
- The source code can be password protected against unauthorized access.

Requirements:

- PC with Windows NT, 2000 or XP
- One free serial port



Memory Card



Programming



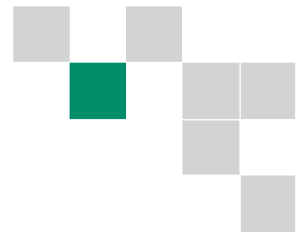
Motor



Application



Member of Automation Alliance



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.

Manufacturing flexibility

Drive control

The drive Control Word (16 bit) provides a wide variety of functions from Start, Stop and Reset to Ramp Generator control. Typical setpoint values like Speed, Torque and Position can be transmitted to the drive with 15 bit accuracy.

Drive monitoring

A set of drive parameters and/or actual signals, like torque, speed, position, current etc., can be selected for cyclic data transfer providing fast data for operators and the manufacturing process.

Drive diagnostics

Accurate and reliable diagnostic information can be obtained via the drive Alarm, Limit and Fault Words, reducing the drive downtime and therefore also the downtime of the manufacturing process.

Drive parameter handling

Total integration of the drives in the production process is achieved by single parameter read/write up to complete parameter set-up or download.

Easy to expand

Serial communication simplifies the latest trend of modular machine design enabling the installation to be expanded at a later stage with low effort.

Reduced installation and engineering effort

Cabling

Substituting the large amount of conventional drive control cabling with a single twisted pair reduces costs and increases system reliability.

Design

The use of Fieldbus Control reduces engineering time at installation due to the modular structure of the hardware and software.

Commissioning and assembly

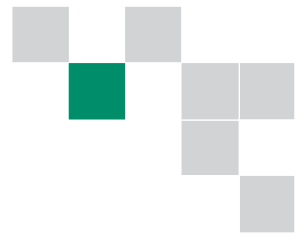
The modular machine configuration allows pre-commissioning of single machine sections and provides easy and fast assembly of the complete installation.

Currently available gateways

- | | plus code |
|---------------|-----------|
| • PROFIBUS-DP | +K454 |
| • DeviceNet | +K451 |
| • CANopen | +K457 |
| • ControlNet | +K462 |
| • Modbus | +K458 |
| • Ethernet | |



DriveWindow Light 2 Startup and Maintenance Tool



PC tool for ABB drives

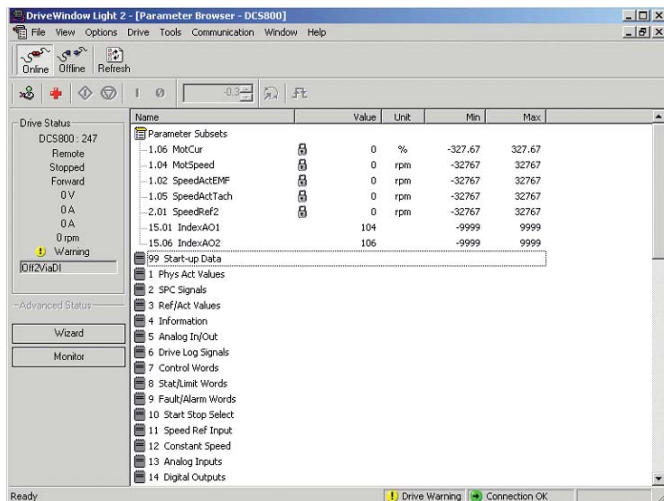
DriveWindow Light 2 is an easy-to-use startup and maintenance tool for ABB drives. Supported drives are ACS140, ACS160, ACS350, ACH400, **DCS400**, ACS550, ACH550, **DCS800** and ACS800.

Highlights

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

DriveWindow Light requirements

- Windows 98 / NT / 2000 / XP
- Free serial port from a PC
- Standard RS232 cable

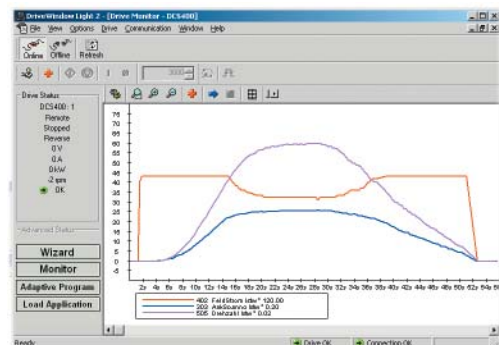


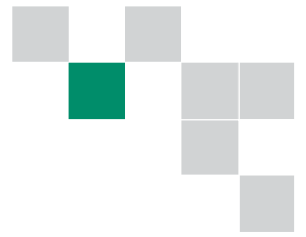
Light software with heavy features

DriveWindow Light offers many functions in an easy-to-use package. It can be used in an offline mode, which enables parameter setting at the office even before going to the actual site. The parameter browser enables viewing, editing and saving of parameters. The parameter comparison feature makes it possible to compare parameter values between the drive and the file. With the parameter subset you can create your own parameter sets. Controlling of the drive is naturally one of the features in DriveWindow Light. Drive status and fault information keeps commissioning time low.

| Name | Browser | Drive/File |
|-----------------------|----------|--------------|
| 95.03 M1NonCur | 11 | 0 |
| 95.11 M1NonPldCur | 1 | 0.3 |
| 7.01 MainCblWard | 0 | 6 |
| 7.04 UsedMCDW | 400 | 476 |
| 7.06 RFE CblWard | 2 | 0 |
| 8.01 MainStatWard | 300 | 331 |
| 8.02 AuxStatWard | 3840 | 1840 |
| 8.05 DI StatWard | 0 | 18 |
| 9.06 AlarmWard1 | 3 | 0 |
| 10.06 MotFanAck | NotUsed | DI2 |
| 10.20 ConvFanAck | NotUsed | DI1 |
| 10.21 MainContAck | NotUsed | DI3 |
| 11.03 Ref1Sel | A11 | SpeedRef2301 |
| 15.01 IndexAO1 | 104 | 0 |
| 15.05 ScaleAO1 | 5000 | 10000 |
| 15.06 IndexAO2 | 106 | 0 |
| 16.09 US1 Sel | Extended | Compact |
| 22.01 AccTime1 | 3 | 20 |
| 22.02 DecTime1 | 3 | 20 |
| 24.03 Kp5 | 90 | 5 |
| 24.09 TIS | 200 | 2500 |
| 43.06 M1KpAmCur | 0.08 | 0.1 |
| 43.07 M1AlmCur | 14 | 50 |
| 43.08 M1DiscontCurLim | 81.81 | 100 |
| 43.09 M1AmL | 17.39 | 0 |
| 43.10 M1AmR | 1180 | 0 |
| 44.01 FldChMode | EMF | Flx |

With DriveWindow Light, you can monitor up to four signals simultaneously. This can be done in both graphical and numerical format. Any signal can be set to stop the monitoring, from a predefined level.





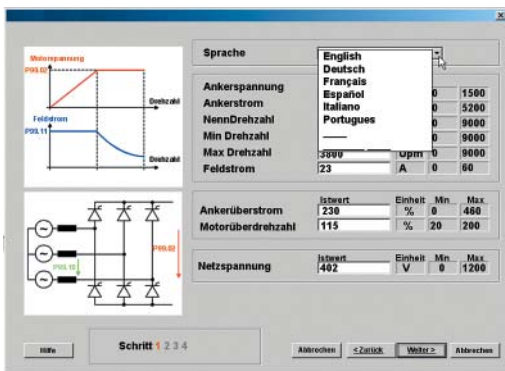
DWL Startup Assistant

DWL Startup Assistant for DCS800 gives important assistance for commissioning by interactive dialog. The commissioning steps are presented in correct sequence and necessary parameters are preselected.

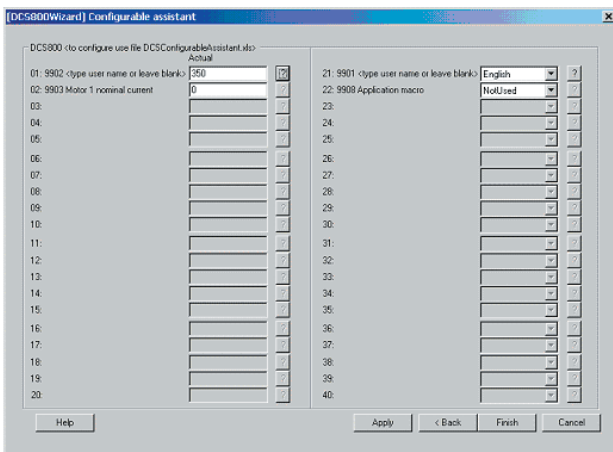
The basic port collects basic motor and connection data and executes controller auto tunings.

The advanced port provides assistance for 12-pulse operation, field reversal, serial communication (field-bus) and master-follower configuration.

A context-sensitive help function is present during the whole sequence.



One page is freely configurable by the user. An individual commissioning sequence or parameter selection can be setup to application, machine or motor demands.

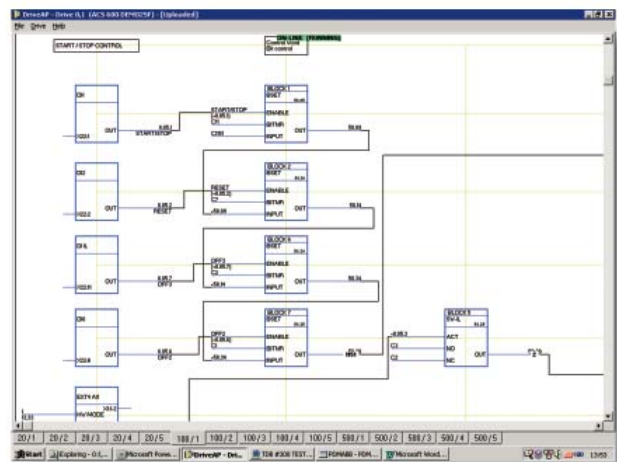


DWL AP Tool

DWL AP is a graphical PC tool to create, document, edit and download Adaptive Programs. DWL AP supports Adaptive Programming of DCS800. Adaptive Program contains 16 function blocks and is available in standard firmware. DWL AP offers a clear and easy way to develop, test and document these programs with a PC.

It is a user-friendly tool to modify function blocks and their connections. No special programming skills are required, basic knowledge about block programming is sufficient.

Adaptive Programs are easy to document as hard copies or store as PC files. All related information is saved directly to the drive by parameter.



Startup, maintenance and integration

DriveWindow 2



Startup and maintenance tool

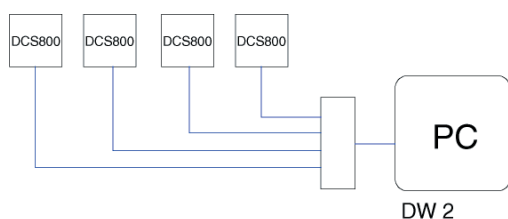
ABB's DriveWindow is an advanced, easy-to-use PC software tool for the startup and maintenance of ABB DCS800 DC Drives. Its host of features and clear, graphical presentation of the operation make it a valuable addition to your system providing information necessary for troubleshooting, maintenance and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

Additionally, the client part of DriveWindow may reside on one Local Area Network PC, and the server side on another PC closer to the drives. This enables plant-wide monitoring to be easily accomplished with two PCs.

High speed communication

DriveWindow uses a high-speed fibre optic cable network with DDCS communication protocol. This makes communication between PC and drives very fast. The fibre optic network is safe and extremely immune against external disturbance. The fibre optic communication card is needed inside the computer.



Monitoring drives

Using DriveWindow you can monitor several drives simultaneously. The history buffer makes it possible to record a large amount of data in the PC's memory. The drive's data logger can be accessed with DriveWindow and viewed in graphical form. The fault logger inside the drive automatically documents every fault, warning and event which occurs. The fault history stored in the drive can be uploaded to your computer.

Versatile back-up functions

Drive parameters can be saved to the PC with DriveWindow, and can easily be downloaded back to the drive whenever needed.

DriveWindow 2 features

Easy-to-use tool for commissioning and maintenance. Several drives connected and monitored at the same time.

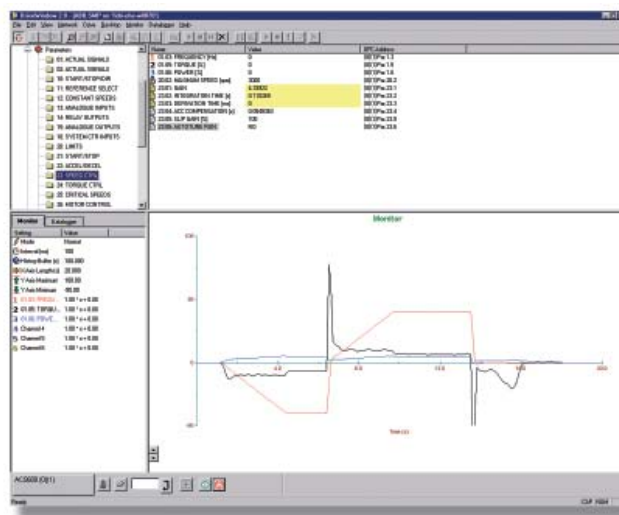
Monitor, edit or save signals and parameters, clear graphical presentation.

High speed communication between PC and drive.

Versatile back-up functions.

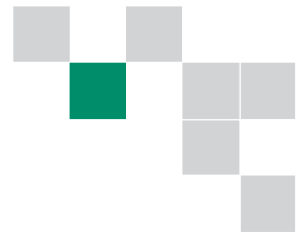
View data collected and stored in the drive.

Fault diagnosis; DriveWindow indicates the status of drives, and also reads fault history data from the drive.



Startup, maintenance and integration

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.

Remote monitoring

DriveOPC enables remote connection via LAN (local area networks). The remote PC can be connected by its IP address (e.g. "164.12.43.33") or by the DNS name (e.g. "Gitas213").

OPC based software

OPC is an industry standard created in cooperation with Microsoft. It is an open architecture interface design, managed by the international OPC foundation. OPC is meant for different kinds of factory automation.



DriveOPC is based on OPC foundation data access standard 1.0A and Microsoft COM/DCOM technology. DriveOPC has full access to all drives, even when remote connection via LAN is used.

High speed communication

DriveOPC uses a high-speed fibre optic cable network with DDCS communication protocol. This makes communication between PC and drives very fast. The fibre optic network is safe and extremely immune against external disturbance. The fibre optic communication card is needed inside the computer.

DriveOPC features

DriveOPC supports OPC's data access 1.0A.

Read access to:

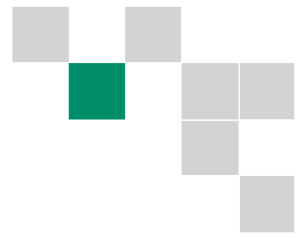
- Drive status: local, running, direction, fault, warning, reference
- Signals and parameters
- Fault logger contents
- Event logger contents
- General drive information
- Data logger settings, status and contents

Write access to:

- Drive Control: local, start, stop, forward, reverse, coast stop, reset fault, home, teach-in, contactor on/off, reference
- Parameters
- Fault logger clear
- Data logger init, start, trig, clear

Remote monitoring tool

Ethernet module



Browser-based, user-friendly

The intelligent Ethernet NETA-01 module gives simple access to the drive by means of the Internet communicating via a standard web browser. The user can set up a virtual monitoring room wherever there is a PC with an Internet connection or via a simple dial-up modem connection. This enables remote monitoring, configuration, diagnostics and, when needed, control. The drive can also provide process related information, such as load level, run time, energy consumption and I/O data, the bearing temperature of the driven machine, for instance.

This opens new possibilities for the monitoring and maintenance of unmanned applications across a range of industries, for instance water, wind power, building services and oil & gas, as well as any application where the user needs access to the drives from more than one location. It also provides an opportunity for OEMs and system integrators to support their installed base globally.

No PC needed at local end

The intelligent Ethernet module has an embedded server with the necessary software for the user interface, communication and data storage. This gives ease of access, realtime information and the possibility for two-way communication with the drive, enabling immediate response and actions, saving time and money. This is possible without using a PC at the local end, as required by other remote solutions.

Powerful and versatile

Up to nine drives can be connected to the intelligent Ethernet module via fibre optic links. It is available as an option for new drives, as well as an upgrade for existing systems. Access to the module is secured by user ID and passwords.

It connects to the drive with fibre optic cables. The size of the module is 93 (h) x 35 (w) x 76.5 (d) mm.

The web page of the module is opened like any other web address. The home page shows a general overview of the system with traffic lights and action buttons to guide the user through the different sections.

Features

- Virtual monitoring room for
 - Monitoring
 - Configuration of parameters
 - Diagnostics
 - Control, if needed
- Browser based access via
 - Intra-/extra-/Internet or
 - Simple dial-up modem connection
- No PC needed at the local end
- Can be used as a Modbus/TCP bridge for control purposes



Service products



To reduce the total cost of owning ABB drives and to maximize their availability ABB offers the following services:

Training services

ABB offers dedicated training on ABB drives for your service and operating personnel. Upon successful completion of the training course your personnel will have acquired the skills to use ABB drives correctly and safely, and also to get the best results from their application.

| Service product code | Service type | Description |
|----------------------|-----------------|----------------------------|
| G560 | DCS800 - 3 days | Basic training |
| G561 | DCS800 - 1 day | Startup & Service Hands-on |

ABB has a service organization that spans the globe. Contact your local ABB sales office for more information about our services.

www.abb.com/abbuniversity

Spare part services

ABB offers a fast and effortless information and ordering system to facilitate spare part management. Parts OnLine is at your service 24 hours.

<http://www.abb.com/partsonline>

Startup services

Using ABB's startup services you can trust that your drives are correctly commissioned and well-tuned to their application. ABB employs authorized professionals who have been thoroughly trained for their job.

ABB maintenance services

ABB maintenance services ensure optimal operation of your drives and extend their useful life.



DCS800 family



DCS800-S Modules

The versatile drive for any application

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

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



DCS800-A Enclosed Converters

Complete drive solutions

20 ... 20,000 A_{DC}
0 ... 1,500 V_{DC}
230 ... 1,200 V_{AC}
IP21 – IP54

- Individually adaptable to customer requirements
- User-defined accessories like external PLC or automation systems can be included
- High power solutions in 6- und 12-pulse up to 20,000 A, 1,500 V
- In accordance to usual standards
- Individually factory load tested
- Detailed documentation



DCS800-E Series

Pre-assembled drive-kits

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

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



DCS800-R Rebuild Kit

Digital control-kit for existing powerstacks

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

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



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