

DCS800-S0 Technical Specifications

Enclosure Rating

The DCS800-S0x power converter module carries a NEMA TYPE OPEN (IP00) rating and must be mounted in a protective enclosure. There are seven different frame sizes, D1 through D7, graduated in terms of current and voltage.

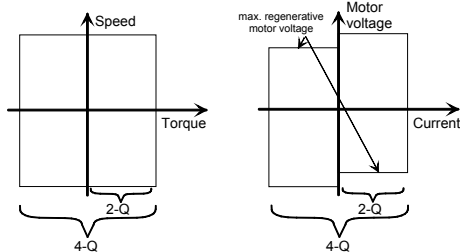
Reversing and Non-Reversing Drives

Non-reversing (2-Q) power converter modules are used when motor torque and speed are always in the same direction and when significant stopping power is not required.

This is ideal for applications such as:

- Fan or blower
- Mixer
- Pump
- Extruder

It is not possible for a 2-Q drive to slow down an inertial load. The load will stop only due to friction, windage, or another form of load resistance. It is also not possible for a 2-Q drive to reverse direction unless field reversal is used.



Reversing (4-Q) power converter modules are used when motor torque can occur in either direction. This is for applications such as:

- Stop-start conveyor
- Draw Roll
- Rolling mill
- Unwinder
- Overhead crane hoist

A 4-Q drive is able to start and stop an inertial load in both forward and reverse directions.

Field Power Supplies and Fusing

Converter modules sizes D1 through D5 are equipped with fused internal field power supplies. Sizes D6 – D7 require an external field power supply. See page 21 for details.

AC line fuses and DC armature fuses must be separately mounted. See page 24 for fuse information as well as information on other optional system components.

AC line fuses to be separately mounted on sizes D1 - D4. They are included internally on D5 - D7. DC armature fuses are

needed for all 4-Q drives and are to be separately mounted. See page 26 for fuse recommendations as well as specifications for other external system components.

Voltage Selection

The output voltage of the drive depends on the incoming AC line voltage and whether a 2-Q or 4-Q drive is selected. The table below shows the maximum output voltage that will result for various input voltages for both the 2-Q and 4-Q drives.

System input AC line voltage	DC voltage (recommended)		Ideal DC voltage without load	Recommended DCS800 voltage class type code
	2Q	4Q		
U_{VN} [V]	$U_{dmax\ 2-Q}$ [V]	$U_{dmax\ 4-Q}$ [V]	U_{d10} [V]	
230	265	240	310	05
380	440	395	510	05
400	465	415	540	05
415	480	430	560	05
440	510	455	590	05
460	530	480	620	05
480	555	500	640	05
500	580	520	670	05
525	610	545	700	05 (D1-D4), 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

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 from motor to regenerative mode is set above 300 ms.

Low Mains Voltage - (30 to 120 V) SDCS-SUB-4 (+S186)

External DC Voltage Measurement - Measures V_{dc} at the motor; (D1-D4) SDCS-UCM-1; (not needed D5-D7)

Analog, Digital and Encoder Interface

The drive is equipped with high-speed, high-resolution analog inputs and outputs to interface with user signals. Analog inputs are 16-bit resolution (15 plus one sign bit) which is the highest resolution in the industry.

The following interfaces are standard features:

- Analog DC tachometer
- Pulse encoder
- Motorized pot, speed pot and up to two analog meters

Optional modules are available to increase the number of analog, digital, tachometer, and encoder interfaces and to add isolated interfaces for temperature sensors and other devices.

Technical Specifications - Power Converter Modules

System connection	
Voltage, 3-phase	240 to 990 V per IEC 60038
Voltage deviation	±10% continuous; ±15% up to 0.5 sec.
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
NOTE: Special consideration must be taken for voltage deviation in regenerative mode.	
Short Circuit Current Rating (SCCR)	D1 - D4 = 65 kA D5 - D7 = 100 kA
Protection Class	
Converter module and options (line chokes, fuse holder, field supply unit, etc.)	UL Type Open
Speed Feedback / Accuracy	
Speed resolution	with encoder 0.005% of nominal speed, with analog tach, 0.1% (16 bits)
Cycle time, speed and current controller	2.77 ms at 60 Hz, 3.33 ms at 50 Hz
Step response, current controller	5 ms
Speed feedback	EMF (transducerless), analog tach, encoder, 2nd encoder with RTAC
Analog tach voltage	±8-30 Vdc, ±30-90 Vdc, ±90-270 Vdc
Pulse encoder voltage	5, 12, 15, 24 Vdc
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	+40 to +55°C derating (1%/1°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 temperature	< 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 derating
1000 to 4000 M.S.L.	with derating (1%/100m)
4000 to 5000 M.S.L.	with derating and factory approval

Sound pressure level

Size	Sound pressure level L _p (1 m distance)		Vibration
	as module	enclosed conv.	as module
D1	55 dBA	54 dBA	1.5 mm, 2...9 Hz 0.5 g, 9...200 Hz
D2	55 dBA	55 dBA	
D3	60 dBA	73 dBA	
D4	66 - 70 dBA	77 dBA	
D5	73 dBA	78 dBA	1 mm, 2...9 Hz 0.1 g, 9...200 Hz
D6	75 dBA	73 dBA	
D7	82 dBA	80 dBA	

North American Standards

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

Rated supply voltage	Standards	
	Converter module	Enclosed converter
to 600 V	UL 508 C Power Conversion Equipment cULus C 22.2 No. 14-95 Industrial Control Equipment, Industrial Products Available for converter modules including field power supply units. Types with UL mark: • see UL Listing www.ul.com/ / certificate no. E196914 • or on request	DCS800-A0 cabinet drives are built to UL specifications, but are not UL listed. DCS800-PC cabinet drives are UL listed per UL-508A.
>600 V to 1000 V	EN / IEC: see table below. Available for converter modules including field power supply 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 fulfill 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

Current Ratings - Modules

Non-Reversing (2-Quadrant)

Type code Non-reversing (2-Q)*	Frame Size	Input RMS Current A _{rms}	Normal Duty I _{2Nd} A _{dc}	P _{2Nd} HP	Standard Duty I _{2Sd} A _{dc}	P _{2Sd} HP	Heavy Duty I _{2Hd} A _{dc}	P _{2Hd} HP	Internal field current A	Air Flow 60 Hz ft ³ /min	Heat Dissipation BTU/hr
500 Vdc											
DCS800-S01-0020-05	D1	16	19	10	18	10	18	10	6A	nonvent.	375
DCS800-S01-0045-05		37	42	25	38	20	38	20		210	580
DCS800-S01-0065-05		53	61	30	54	30	54	30		210	751
DCS800-S01-0090-05		73	88	50	78	40	78	40		210	955
DCS800-S01-0125-05		102	124	75	111	60	104	60		210	1297
DCS800-S01-0180-05	D2	147	171	100	164	100	148	75	15A	210	1911
DCS800-S01-0230-05		188	219	125	205	125	205	125		210	2491
DCS800-S01-0315-05	D3	257	300	150	264	150	264	150	20A	210	3105
DCS800-S01-0405-05		330	385	200	325	200	325	200		420	3822
DCS800-S01-0470-05		384	447	250	405	250	405	250		420	4504
DCS800-S01-0610-05+S171	D4	498	580	300	490	300	484	300	25A	610	6005
DCS800-S01-0740-05+S171		604	704	400	670	400	664	400		610	7302
DCS800-S01-0900-05+S171		734	865	500	795	500	795	500		1160	9145
DCS800-S01-1190-05+S164** ***	D4+	930	1040	600	840	500	815	500	25A	500	TBD
DCS800-S01-1200-05B+S164 ***	D5	979	1105	700	950	600	851	550	25A	500	17402
DCS800-S01-1500-05B+S164 ***		1224	1450	900	1320	800	1280	800		500	18084
DCS800-S01-2000-05B+S164 ***		1632	1904	1100	1480	900	1479	900		500	22520
DCS800-S01-2050-05B ***	D6	1673	1985	1250	1585	1000	1585	1000	External	940	27297
DCS800-S01-2500-05B ***		2040	2395	1500	1986	1250	1990	1250		940	30709
DCS800-S01-3000-05B ***		2448	2820	1750	2416	1500	2416	1500		940	37875
DCS800-S01-3300-05B ***	D7	2693	3178	2000	2416	1500	2416	1500	External	2500	39922
DCS800-S01-4000-05B ***		3264	3690	2250	2890	1750	2897	1750		2500	44358
DCS800-S01-5200-05B ***		4243	4820	3000	3972	2500	3800	2250		2500	64831
600 Vdc											
DCS800-S01-0290-06	D3	237	280	200	268	200	268	200	External	210	3105
DCS800-S01-0590-06+S171	D4	481	561	400	480	300	470	300	External	610	6347
DCS800-S01-0900-06B***	D5	734	828	600	665	500	665	500	External	500	17402
DCS800-S01-1500-06B***		1224	1428	1000	1325	1000	1325	1000		500	21496
DCS800-S01-2000-06B***		1632	1850	1250	1490	1100	1479	1100		500	27638
DCS800-S01-2050-06B***	D6	1673	1850	1250	1490	1100	1479	1100	External	940	31392
DCS800-S01-2500-06B***		2040	2380	1750	1990	1500	1990	1500		940	34804
DCS800-S01-3000-06B ***		2448	2790	2000	2380	1750	2380	1750		940	41628
DCS800-S01-3300-06B ***	D7	2693	3035	2250	2380	1750	2380	1750	External	2500	44699
DCS800-S01-4000-06B ***		3264	3720	2500	2970	2250	2970	2250		2500	51523
DCS800-S01-4800-06B ***		3917	4410	3250	3507	2500	3507	2500		2500	66537
700 Vdc											
DCS800-S01-0900-07B ***	D5	734	820	700	620	500	620	500	External	500	17402
DCS800-S01-1500-07B ***		1224	1428	1250	1160	1000	1160	1000		500	21496
DCS800-S01-2000-07B ***		1632	1850	1500	1490	1250	1479	1250		500	27638
DCS800-S01-2050-07B ***	D6	1673	1850	1500	1490	1250	1479	1250	External	940	31392
DCS800-S01-2500-07B ***		2040	2380	2000	1990	1750	1990	1750		940	34804
DCS800-S01-3000-07B ***		2448	2790	2500	2380	2000	2380	2000		940	41628
DCS800-S01-3300-07B ***	D7	2693	3035	2500	2380	2000	2380	2000	External	2500	44669
DCS800-S01-4000-07B***		3264	3720	3250	2970	2500	2970	2500		2500	51523
DCS800-S01-4800-07B***		3917	4480	4000	3507	3000	3507	3000		2500	66537

360 - 800 Vdc line voltage DATA AVAILABLE UPON REQUEST

450 - 990 Vdc line voltage DATA AVAILABLE UPON REQUEST

540 - 1200 Vdc line voltage DATA AVAILABLE UPON REQUEST

* 2-quadrant drives CANNOT decelerate a load or power motors in the reverse direction.

Current Ratings - Modules

Reversing (4-Quadrant)

Type code Reversing (4-Q)	Frame Size	Input RMS Current A _{rms}	Normal Duty I _{2Nd} A _{dc}	P _{2Nd} HP	Standard Duty I _{2Sd} A _{dc}	P _{2Sd} HP	Heavy Duty I _{2Hd} A _{dc}	P _{2Hd} HP	Internal field current A	Air Flow 60 Hz ft³/min	Heat Dissipation BTU/hr
500 Vdc											
DCS800-S02-0025-05	D1	20	23	10	20	10	20	10	6A	nonvent.	375
DCS800-S02-0050-05		41	47	25	38	20	38	20		210	580
DCS800-S02-0075-05		61	71	40	54	30	54	30		210	751
DCS800-S02-0100-05		82	95	50	84	50	79	40		210	955
DCS800-S02-0140-05		114	133	75	125	75	110	60		210	1297
DCS800-S02-0200-05	D2	163	190	100	166	100	166	100	15A	210	1911
DCS800-S02-0260-05		212	247	150	208	125	208	125		210	2491
DCS800-S02-0350-05	D3	286	333	200	287	150	264	150	20A	210	3105
DCS800-S02-0450-05		367	428	250	360	200	357	200		420	3822
DCS800-S02-0520-05		424	489	300	405	250	405	250		420	4504
DCS800-S02-0680-05+S171	D4	506	647	400	605	300	544	300	25A	610	6005
DCS800-S02-0820-05+S171		669	806	500	740	400	664	400		610	7302
DCS800-S02-1000-05+S171		816	965	600	815	500	810	500		1160	9145
DCS800-S02-1190-05+S164**, ***	D4+	930	1040	600	840	500	815	500	25A	500	TBD
DCS800-S02-1200-05B+S164 ***	D5	979	1105	700	950	600	851	500	25A	500	17402
DCS800-S02-1500-05B+S164 ***		1224	1450	900	1320	800	1280	800		500	18084
DCS800-S02-2000-05B+S164 ***		1632	1885	1100	1490	900	1479	900		500	22520
DCS800-S02-2050-05B ***	D6	1673	1985	1250	1585	1000	1585	1000	External	940	27297
DCS800-S02-2500-05B ***		2040	2395	1500	1995	1250	1990	1250		940	30709
DCS800-S02-3000-05B ***		2448	2820	1750	2382	1500	2382	1500		940	37875
DCS800-S02-3300-05B ***	D7	2693	3178	2000	2416	1500	2416	1500	External	2500	39922
DCS800-S02-4000-05B ***		3264	3690	2250	2890	1750	2890	1750		2500	44358
DCS800-S02-5200-05B ***		4243	4820	3000	3972	2500	3800	2250		2500	64831
600 Vdc											
DCS800-S02-0320-06	D3	261	295	200	268	200	268	200	External	210	3105
DCS800-S02-0650-06+S171	D4	530	619	400	540	400	540	400	External	610	6347
DCS800-S02-0900-06B ***	D5	734	828	600	665	500	665	500	External	500	17402
DCS800-S02-1500-06B ***		1224	1428	1000	1325	1000	1325	1000		500	21496
DCS800-S02-2050-06B ***	D6	1673	1850	1250	1490	1100	1490	1100	External	940	31392
DCS800-S02-2500-06B ***		2040	2380	1750	1980	1500	1980	1500		940	34804
DCS800-S02-3000-06B ***		2448	2790	2000	2293	1750	2293	1750		940	41628
DCS800-S02-3300-06B ***	D7	2693	3035	2250	2370	1750	2370	1750	External	2500	44699
DCS800-S02-4000-06B ***		3264	3720	2500	2970	2250	2970	2250		2500	51523
DCS800-S02-4800-06B ***		3917	4410	3250	3507	2500	3507	2500		2500	66537
700 Vdc											
DCS800-S02-0900-07B ***	D5	734	820	700	620	500	620	500	External	500	17402
DCS800-S02-1500-07B ***		1224	1428	1250	1160	1000	1160	1000		500	21496
DCS800-S02-2050-07B ***	D6	1673	1850	1500	1490	1250	1490	1250	External	940	31392
DCS800-S02-2500-07B ***		2040	2380	2000	1990	1750	1983	1750		940	34804
DCS800-S02-3000-07B ***		2448	2790	2500	2280	2000	2275	2000		940	41628
DCS800-S02-3300-07B ***	D7	2693	3035	2500	2380	2000	2380	2000	External	2500	44669
DCS800-S02-4000-07B ***		3264	3720	3250	2970	2500	2965	2500		2500	51523
DCS800-S02-4800-07B ***		3917	4480	4000	3507	3000	3507	3000		2500	66537
360 - 800 Vdc line voltage	DATA AVAILABLE UPON REQUEST										
450 - 990 Vdc line voltage	DATA AVAILABLE UPON REQUEST										
540 - 1200 Vdc line voltage	DATA AVAILABLE UPON REQUEST										

Note: Normal Duty: 110% overload for 60 seconds; then <= 100% for 10 minutes
Standard Duty: 150% overload for 30 seconds; then <= 100% for 15 minutes
Heavy Duty: 150% overload for 60 seconds; then <= 100% for 15 minutes

** Continuous rating is 1190 A_{dc} at 35°C; 1140 A at 40°C.

*** The "B" after the voltage indicates a European compliant fan for energy consumption and efficiency. It is physically different than older designs.

