

DCS800, industrial drives

Drive selection chart

S0 modules



EP modules



PC modules



A0 modules



Main attributes

Widest available power and voltage range in the industry; Customizable with Adaptive Programming and optional Control Builder; Easy to start up

Drive module and system components mounted on a back panel; space-efficient multilevel panel; easy to maintain; easy to specify and install

Pre-engineered UL Listed cabinet drives; top entry and exit; reactor included; expertly engineered

Pre-engineered cabinet drives; wide variety of configurations and options; built to UL specifications

HP range

5 to 3250 HP at 480 Vac

10 - 600 HP at 480 Vac

10 - 500 HP at 480 Vac

600 - 3000 HP at 480 Vac

Voltage range

240 to 1200 Vdc

240 to 500 Vdc

240 to 500 Vdc

480 to 1200 Vdc

Enclosure type

UL type Open (IP00)

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NEMA type 1
NEMA type 12 filtered

IP21 (NEMA type 1)
IP42 (NEMA type 12 filtered)

Control mode

N/A

N/A

N/A

N/A

Connectivity options

Profibus DP, CANopen, DeviceNet, Ethernet IP, Modbus TCP, Modbus RTU, EtherCat, ControlNet, ProfiNet

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Operator interface

Local or door mounted LCD display and keypad; DriveWindow Light PC Software included

Local or remote mounted LCD display and keypad; DriveWindow Light PC Software included

Door mounted LCD display and keypad; DriveWindow Light PC Software included

Local or remote mounted LCD display and keypad; DriveWindow Light PC Software included

DCS800-S0, industrial drives

ABB DC industrial drives

The DCS800 DC industrial drive from ABB combines a powerful controller with a thyristor power platform that has been proven in factories all over the world. The DCS800 boasts a wider power range than any other DC drive on the market. The hardware and software are designed with you, the user in mind. Special features make installation and configuration simple and allow you to customize the application to your needs.

Industrial Applications

The DCS800 can be used in a wide range of industrial applications including:

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

DCS800 DC Drive Promises

The drive meets the requirements of the most demanding drive applications. Embedded software functions offer upgrades to all classic installations like 12-pulse, double motor operation, and field reversal.

Highlights

- Reduced installation and commissioning work
- Internal three phase field power supply without additional external hardware (D1-D5)
- Excellent control performance up to highest dynamic application in field weakening operation
- All ACS800 PC tools (via DDCS) can be connected
- Able to be customized to your needs with Adaptive Programming and with option Control Builder
- Flexible fieldbus system with numerous internally mountable fieldbus adapters
- Virtually all DCS800 component parts are suitable for recycling.
- Coated circuit boards as standard

PC Tool for ABB Drives

DriveWindow Light is an easy-to-use tool for your PC for start up and maintenance of your ABB drive. It is included with every DCS800 drive and has the following features:

- User interface tool to view and set parameters
- Startup Assistant tool
- Adaptive Programming (AP) tool

It supports a wide range of ABB industrial drives, including ACS350, ACS550, ACS800, as well as the DCS800.

Main Features

- Basic control
 - Transducer and transducerless operation
 - Macros to simplify setup
 - High-speed serial via Ethernet, ControlNet, etc.
 - On/Off control with pulsed or maintained inputs
 - Field heating
 - Adaptive Programming
 - Remembers two sets of motor parameters
 - Drive position display
 - Save parameter set to PC or keypad
- Motor Control
 - Easily switches between local control via keypad and remote control via digital I/O or high-speed network
 - Window speed control
 - Flying start
 - Field reversal, boost and opti-torque
 - Motor pot up and down control
- Drive Configurations
 - Stand-alone
 - Master-follower (up to 10 followers)
 - 12-pulse operation
 - Hard-parallel operation (D7 only)
- Inputs and outputs
 - All user-designated inputs and outputs
 - Relay output for AC or DC contactor control
 - Motor brake control, including torque proving input
 - Motor temperature sensor monitoring
 - High speed DC breaker monitoring
- Faults and Diagnostics
 - Fault logging with time and date stamp
 - Diagnostic assistant activates when fault occurs



DCS800-S0, industrial drives

Type code sheet

D	C	S	8	0	0	-	S	0		-					-			+				
Product series						Construction				Size				Voltage			Options					

-	S	0		
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Construction

S0 = DCS800 power module
 S01 = 2-quadrant non-reversing
 S02 = 4-quadrant reversing

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Module size

DC current rating, see chart below for details

	D1	D2	D3	D4	D5	D6	D7
S01-xxxx-05	0020	0180	0315	0610	1200	2050	3300
	0045	0230	0405	0740	1500	2500	4000
	0065		0470	0900	2000	3000	5200
	0090						
	0125						
S02-xxxx-05	0025	0200	0350	0680	1200	2050	3300
	0050	0260	0450	0820	1500	2500	4000
	0075		0520	1000	2000	3000	5200
	0100						
	0140						
S01-xxxx-06	---	---	0290	0590	0900	2050	3300
					1500	2500	4000
					2000	3000	4800
S02-xxxx-06	---	---	0320	0650	0900	2050	3300
					1500	2500	4000
						3000	4800
S01-xxxx-07	---	---	---	---	0900	2050	3300
					1500	2500	4000
					2000	3000	4800
S02-xxxx-07	---	---	---	---	0900	2050	3300
					1500	2500	4000
						3000	4800

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Voltage rating

05 = 230...525 VAC
 06 = 600 VAC
 07 = 690 VAC

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Option codes

Letter code followed by 3 digit number (see option code page)
 Example: +S164 = Internal field power supply; +S171 = 120 VAC fan

DCS800-S0, industrial drives

Data sheet

10 thru 4000 HP 230 to 990 VAC 3 Phase - 50/60 Hz

Input ratings	Input Voltage range	230 VAC through 990 VAC; 1190 VAC available upon request
	Input Voltage tolerance	±10% continuous; ±15% up to 0.5 sec.
	Phase	3 Phase
	Frequency	50 Hz ±2%, 60 Hz ±2%
	Short circuit rating (UL 508a)	65,000 rms symmetrical Amperes through D4; 100,000 rms symmetrical Amperes D5 through D7
Output ratings	Horsepower	5-250 HP @ 230 VAC; 10-3000 HP @ 460 VAC; 200-3250 @ 600 VAC; 700-4000 @ 690 VAC
	Normal duty overload	110% for 60 seconds every 10 minutes
	Standard duty overload	150% for 30 seconds every 15 minutes
	Heavy duty overload	150% for 60 seconds every 15 minutes
	Motor types	DC wound-field motors, DC series-wound motors
	Accel/decel	0.01 to 30,000 sec
Control Power Connection	Input Voltage	115 VAC or 230 VAC auto sensing, 45 - 65 Hz.
	Power consumption	120 VA
Motor armature	Output Voltage	2Q (S01): 0 to 1.15 * input voltage; 4Q (S02): 0 to 1.03 * input voltage
	Current	See rating tables or <i>DCS800 Hardware Manual</i>
Motor field	Type	D1 - D4: Internal, current controlled, full wave half controlled thyristor/diode bridge; D5 - D7: External, see <i>DCS800 Hardware Manual</i>
	Input Voltage	D1 - D4: 3 phase, internally fused (shares armature line power)
	Output Voltage	D1 - D4: 0 to 1.35 x Input Voltage
	Output current	D1: 0.3 to 6 A; D2: 0.3 to 15 A; D3: 0.3 to 20 A; D4: 0.3 to 25 A
Protective features	Armature overvoltage	Armature Voltage exceeds limit
	Armature overcurrent	Armature current exceeds limit
	Armature current rise maximum	Change in armature current exceeds limit
	Field undercurrent	Field current below minimum limit
	Field overcurrent	Field current exceeds limit
	Motor thermal protection	Actual or estimated motor temperature exceeds limit
	External fault & alarm	Rising or falling edge of digital input triggers alarm or fault
	Speed feedback monitor	Compares actual speed to speed measured by motor EMF
	Motor overspeed	Motor speed exceeds limit
	Current ripple	Amplitude of AC current component of DC armature current exceeds limit
	Input Voltage monitor	Line voltage above or below normal range
	Local control loss (panel loss)	Loss of signal from control panel while panel is speed reference
	Communication control loss	Loss of signal from fieldbus (e.g., Ethernet IP) while fieldbus is speed reference
Environmental	Temperature	0° to 40° C (32° to 104° F); 0° to 55° C (32° to 132° F) w/ derate
	Cooling	Forced air
	Enclosure	UL Type Open (IP00)
	Altitude	Sea level to 3300 ft (1000m); up to 6600 ft (2000m) derate 1% per 330 ft (100m); up to 10,000 ft (3000m) contact ABB
	Humidity	5% to 95% RH non-condensing down to 5°C; 5% to 50% RH non-condensing 0° to 5° C
	Vibration	D1 - D4: 1.5mm @ 2 to 9 Hz, 0.5g @ 9 to 200 Hz; D5-D7: 0.3mm @ 2 to 9Hz, 0.1g @ 9 to 200Hz
	Shock	D1 - D4: 7 g / 22 msec; D5 - D7: 4 g / 22 msec

DCS800-S0, industrial drives

Data sheet

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 msec at 60 Hz, 3.33 msec at 50 Hz
	Step response, current controller	5 msec
	Speed feedback	EMF (transducerless), analog tach, encoder, 2nd encoder with RTAC, Resolver with RRIA-01 or FEN-21
	Analog tach Voltage	±8-30 Vdc, ±30-90 Vdc, ±90-270 Vdc
	Pulse encoder Voltage	5, 12, 15, 24 Vdc
Analog inputs	AI1 & AI2 Voltage config	-10 Vdc to +10 Vdc, Input Resistance RI = 200 kOhms
	AI1 & AI2 current config	0 to 20 mA, Input Resistance RI = 250 Ohms
	AI3 & AI4 Voltage only	-10 Vdc to +10 Vdc, Input Resistance RI = 200 kOhms
	Common mode range	±15 V
	Resolution	15 bit + sign bit
Analog outputs	Input update time	AI1 & AI2 = 2.8 msec; AI3 & AI4 = 5 msec
	Two (2) programmable Voltage	-10 Vdc to +10 Vdc, maximum load of 5 mA
	One (1) dedicated armature current output	4 Vdc = 325% of rated motor current entered in Parm 99.03
	Resolution	11 bit + sign bit
	Output update time	5 msec
Digital inputs	Eight (8) digital inputs	24 Vdc, (-15%) to max of 48 Vdc
	Logical switch thresholds	Below 7.3 Vdc = status "0"; above 7.5 Vdc = status "1"
	Input current	5 mA
	Filter time constant	2 msec
	Input update time	DI1 to DI6 = 5 msec, DI7 & DI8 = 2.8 msec
	Internal 24 Vdc for digital inputs	24 Vdc, 125 mA, short circuit proof; external 24 Vdc allowed
Digital outputs	Seven (7) Digital Outputs	Transistor for signal driving only
	Signal level	Status 1 = 22 Vdc at no load
	Output updating time	2.8 msec
Relay output	One (1) relay output	Normally open (NO) factory set for AC line contactor control
	Maximum switching current	3 A at 24 Vdc or 115/230 Vac; 0.3 A at 120 Vdc
	Isolation test voltage	4 kVac, 1 minute
	Output updating time	2.8 msec
Digital encoder	Encoder Voltage supply	5 Vdc @ 250 mA max; 24 Vdc @ 200 mA max (default is 5 Vdc selected via S4 jumper)
	Encoder mode	Single ended or differential (default is differential selected via S4 jumper)
	Pulse encoder voltage	5Vdc or 24 Vdc; 12 Vdc with IOB-3; 15 Vdc with RTAC-01
	Maximum input frequency	300 kHz
Fuse protection	AC line	D1 - D4: External semiconductor fuses required (3); See ratings table in DCS800 Hardware Manual D5 - D7: Internal semiconductor fuses included
	DC load (4Q S02 only)	(2) semiconductor fuses; see ratings table in DCS800 Hardware Manual
Input impedance	Line reactor or isolation transformer	Customer-supplied 1.5 to 10 pct impedance required; See DCS800 Hardware Manual

DCS800-S0, industrial drives

List prices

600 VAC / 600 VDC

Type code	Nominal ratings							Frame size	UL type open (IP 00) list price
	Input	Normal Duty		Standard Duty		Heavy Duty			
	I_l A_{RMS}	I_{nd} A_{dc}	P_{nd} HP	I_{sd} A_{dc}	P_{sd} HP	I_{hd} A_{dc}	P_{hd} HP		
2-Quadrant (non-reversing)									
DCS800-S01-0290-06	237	280	200	268	200	268	200	D3	\$8,198
DCS800-S01-0590-06+S171	481	561	400	480	300	470	300	D4	\$11,799
DCS800-S01-0900-06B	734	828	600	665	500	665	500	D5	\$16,562
DCS800-S01-1500-06B	1224	1428	1000	1325	1000	1325	1000	D5	\$21,820
DCS800-S01-2000-06B	1632	1850	1250	1490	1100	1479	1100	D5	\$27,641
DCS800-S01-2050-06	1673	1850	1250	1490	1100	1479	1100	D6	\$29,772
DCS800-S01-2500-06	2040	2380	1750	1990	1500	1990	1500	D6	\$37,013
DCS800-S01-3000-06	2448	2790	2000	2380	1750	2380	1750	D6	\$44,997
DCS800-S01-3300-06LB	2693	3035	2250	2380	1750	2380	1750	D7	\$50,559
DCS800-S01-3300-06RB	2693	3035	2250	2380	1750	2380	1750	D7	\$50,559
DCS800-S01-4000-06LB	3264	3720	2500	2970	2250	2970	2250	D7	\$71,085
DCS800-S01-4000-06RB	3264	3720	2500	2970	2250	2970	2250	D7	\$71,085
DCS800-S01-4800-06LB	3917	4410	3250	3507	2500	3507	2500	D7	\$90,953
DCS800-S01-4800-06RB	3917	4410	3250	3507	2500	3507	2500	D7	\$90,953
4-Quadrant (reversing)									
DCS800-S02-0320-06	261	295	200	268	200	268	200	D3	\$11,538
DCS800-S02-0650-06+S171	530	619	400	540	400	540	400	D4	\$15,516
DCS800-S02-0900-06B	734	828	600	665	500	665	500	D5	\$22,144
DCS800-S02-1500-06B	1224	1428	1000	1325	1000	1325	1000	D5	\$29,172
DCS800-S02-2050-06B	1673	1850	1250	1490	1100	1490	1100	D6	\$40,612
DCS800-S02-2500-06B	2040	2380	1750	1980	1500	1980	1500	D6	\$48,431
DCS800-S02-3000-06B	2448	2790	2000	2293	1750	2293	1750	D6	\$63,390
DCS800-S02-3300-06LB	2693	3035	2250	2370	1750	2370	1750	D7	\$66,647
DCS800-S02-3300-06RB	2693	3035	2250	2370	1750	2370	1750	D7	\$66,647
DCS800-S02-4000-06LB	3264	3720	2500	2970	2250	2970	2250	D7	\$92,074
DCS800-S02-4000-06RB	3264	3720	2500	2970	2250	2970	2250	D7	\$92,074
DCS800-S02-4800-06LB	3917	4410	3250	3507	2500	3507	2500	D7	\$116,010
DCS800-S02-4800-06RB	3917	4410	3250	3507	2500	3507	2500	D7	\$116,010

Notes:

Note 1: The ratings apply at an ambient temperature of 40 °C (104 °F).

Note 2: 2-quadrant drives CANNOT decelerate a load or power motors in the reverse direction

Note 3: The DCS800 drive requires a line reactor or isolation transformer

Note 4: Frame D6 drives do not include busbar tabs for the power connection. There are five - 4 hole lug terminals on the side of the drive unit (3 for AC, 2 for DC). If busbar tabs are required, they must be ordered separately. See "Power and safety options" section for ordering information

Note 5: Drives rated 600V and above do not include field supplies. A field supply is required for all DC motor applications. See "Field Supplies" section for selection and ordering information.

Note 6: In Frame D7, the 'L' is for left-hand bus arrangement and the 'R' is for right-hand bus arrangement.

Note 7: Plus code +S171 is to specify fan voltage of 120 Vac for the D4 drives. Remove +S171 for 240 Vac fan voltage.

Definitions

I_L	Continuous rms input current for any duty cycle
I_{nd}	Continuous dc output current (normal duty) allowing 10% overload for 1 minute every 10 minutes
P_{nd}	Typical motor power in normal duty use
I_{sd}	Continuous dc output current (standard duty) allowing 50% overload for 1/2 minute every 15 minutes
P_{sd}	Typical motor power in standard duty use
I_{hd}	Continuous dc output current (heavy duty) allowing 50% overload for 1 minute every 15 minutes
P_{hd}	Typical motor power in heavy duty use