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)	UL type Open (IP00)	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	Profibus DP, CANopen, DeviceNet, Ethernet IP, Modbus TCP, Modbus RTU, EtherCat, ControlNet, ProfiNet	Profibus DP, CANopen, DeviceNet, Ethernet IP, Modbus TCP, Modbus RTU, EtherCat, ControlNet, ProfiNet	Profibus DP, CANopen, DeviceNet, Ethernet IP, Modbus TCP, Modbus RTU, EtherCat, ControlNet, ProfiNet
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	

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

-				

Module size
DC current rating, see chart below for details

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

-		

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

+				

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 *DCS800 Hardware Manual*
Motor field	Type	D1 - D4: Internal, current controlled, full wave half controlled thyristor/diode bridge; D5 - D7: External, see *DCS800 Hardware Manual*
	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

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
	Input update time	AI1 & AI2 = 2.8 msec; AI3 & AI4 = 5 msec
Analog outputs	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

460 VAC / 500 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		
4-quadrant (reversing)									
DCS800-S02-0025-05	20	23	10	20	10	20	10	D1	$3,952
DCS800-S02-0050-05	41	47	25	38	20	38	20	D1	$4,310
DCS800-S02-0075-05	61	71	40	54	30	54	30	D1	$4,512
DCS800-S02-0100-05	82	95	50	84	50	79	40	D1	$4,687
DCS800-S02-0140-05	114	133	75	125	75	110	60	D1	$4,978
DCS800-S02-0200-05	163	190	100	166	100	166	100	D2	$6,044
DCS800-S02-0260-05	212	247	150	208	125	208	125	D2	$6,600
DCS800-S02-0350-05	286	333	200	287	150	264	150	D3	$7,952
DCS800-S02-0450-05	367	428	250	360	200	357	200	D3	$9,222
DCS800-S02-0520-05	424	489	300	405	250	405	250	D3	$10,271
DCS800-S02-0680-05+S171	506	647	400	605	300	544	300	D4	$12,362
DCS800-S02-0820-05+S171	669	806	500	740	400	664	400	D4	$15,454
DCS800-S02-1000-05+S171	816	965	600	815	500	810	500	D4	$19,573
DCS800-S02-1190-05+S164*	930	1040	600	840	500	815	500	D4+	$22,010
DCS800-S02-1200-05B+S164	979	1105	700	950	600	851	500	D5	$24,556
DCS800-S02-1500-05B+S164	1224	1450	900	1320	800	1280	800	D5	$29,258
DCS800-S02-2000-05B+S164	1632	1885	1100	1490	900	1479	900	D5	$32,493
DCS800-S02-2050-05B	1673	1985	1250	1585	1000	1585	1000	D6	$35,979
DCS800-S02-2500-05B	2040	2395	1500	1995	1250	1990	1250	D6	$46,046
DCS800-S02-3000-05B	2448	2820	1750	2382	1500	2382	1500	D6	$55,216
DCS800-S02-3300-05LB	2693	3178	2000	2416	1500	2416	1500	D7	$62,287
DCS800-S02-3300-05RB	2693	3178	2000	2416	1500	2416	1500	D7	$62,287
DCS800-S02-4000-05LB	3264	3690	2250	2890	1750	2890	1750	D7	$78,025
DCS800-S02-4000-05RB	3264	3690	2250	2890	1750	2890	1750	D7	$78,025
DCS800-S02-5200-05LB	4243	4820	3000	3972	2500	3800	2250	D7	$101,619
DCS800-S02-5200-05RB	4243	4820	3000	3972	2500	3800	2250	D7	$101,619

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 he 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 saftey options” for ordering information.
Note 5: Frame D6 and D7 do not include field supplies. A field supply is required for most 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 (special order).
Note 8: Plus code +S164 is to specify an internal field supply for the D4+ and the D5 drives. D4+ requires external field fuses, D5 does not.
* UL Listing is pending. Continuous ratings is 1190 A_{dc} at 35°C; 1140 A_{dc} at 40°C

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