## 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	<u>.</u>	<u>.</u>	<u>i</u>
5 to 3250 HP at 480 Vac	10 - 600 HP at 480 Vac	10 - 500 HP at 480 Vac 600 - 3000 HP at 480	
Voltage range	1	1	<u> </u>
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	<u>i</u>	<u>i</u>	<u>.</u>
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
- Food & Beverage

- Material handling

- Pulp & Paper
  Battery Chargers
- Ski lifts
- Test rigsPlastic & Rubber
- PrintingMagnets
- 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



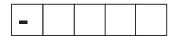


#### Construction

S0 = DCS800 power module

S01 = 2-quadrant non-reversing

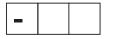
S02 = 4-quadrant reversing



### Module size

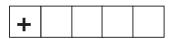
DC current rating, see chart below for details

	D1	D2	D3	D4	D5	D6	D7
	0020	0180	0315	0610	1200	2050	3300
	0045	0230	0405	0740	1500	2500	4000
S01-xxxx-05	0065		0470	0900	2000	3000	5200
	0090						
	0125						
	0025	0200	0350	0680	1200	2050	3300
	0050	0260	0450	0820	1500	2500	4000
S02-xxxx-05	0075		0520	1000	2000	3000	5200
	0100						
	0140						
			0290	0590	0900	2050	3300
S01-xxxx-06					1500	2500	4000
					2000	3000	4800
			0320	0650	0900	2050	3300
S02-xxxx-06					1500	2500	4000
						3000	4800
					0900	2050	3300
S01-xxxx-07					1500	2500	4000
					2000	3000	4800
					0900	2050	3300
S02-xxxx-07					1500	2500	4000
						3000	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	Input Voltage	115 VAC or 230 VAC auto sensing, 45 - 65 Hz.					
Connection	Power consumption	120 VA					
Notor 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	Туре	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 /	Speed resolution	With encoder 0.005% of nominal speed; with analog tach 0.1% (16 bits)					
accuracy	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 wit 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	Al1 & Al2 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	Al1 & Al2 = 2.8 msec; Al3 & Al4 = 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

600 VAC / 600 VDC

Type code	Nominal ratings						Frame	UL type open	
	Input	out Normal Duty		Standard Duty		Heavy Duty		size	(IP 00) list price
	I <sub>I</sub> A <sub>RMS</sub>	I <sub>nd</sub> A <sub>dc</sub>	P <sub>nd</sub> HP	I <sub>sd</sub> A <sub>dc</sub>	P <sub>sd</sub> HP	I <sub>hd</sub> A <sub>dc</sub>	P <sub>hd</sub> HP		not price
2-Quadrant (non-reversing)						•		1	•
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 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 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

- Continuous rms input current for any duty cycle
- Continuous dc output current (normal duty) allowing 10% overload for 1 minute every 10 minutes
- I<sub>nd</sub> P<sub>nd</sub> Typical motor power in normal duty use
- Continuous dc output current (standard duty) allowing 50% overload for 1/2 minute every 15 minutes
- Typical motor power in standard duty use
- I<sub>sd</sub> P<sub>sd</sub> I<sub>hd</sub> P<sub>hd</sub> Continuous dc output current (heavy duty) allowing 50% overload for 1 minute every 15 minutes
- Typical motor power in heavy duty use