



**Variable frequency drive, 400 V AC, 3-phase, 9.5 A, 4 kW, IP20/NEMA 0,
Radio interference suppression filter, Brake chopper, FS2**



Part no. DC1-349D5FB-A20CE1

185755

**EL Number
(Norway)**

4137032

General specifications		
Product name		Eaton DC1 Variable frequency drive
Part no.		DC1-349D5FB-A20CE1
EAN		4015081812547
Product Length/Depth		152 millimetre
Product height		231 millimetre
Product width		107 millimetre
Product weight		2 kilogram
Certifications		CSA-C22.2 No. 14 UL File No.: E172143 IEC/EN 61800-3 RoHS, ISO 9001 Certified by UL for use in Canada EAC CUL UL Category Control No.: NMMS, NMMS7 IEC/EN61800-3 UkrSEPRO Safety requirements: IEC/EN 61800-5-1 Specification for general requirements: IEC/EN 61800-2 UL UL report applies to both US and Canada UL 508C IEC/EN61800-5 RCM CE
Product Tradename		DC1
Product Type		Variable frequency drive
Product Sub Type		None
Catalog Notes		Environmental class: 3C2, 3S2 Overload cycle for 60 s every 600 s
Features & Functions		
Features		Parameterization: drivesConnect Parameterization: drivesConnect mobile (App) Parameterization: Fieldbus Parameterization: Keypad
Fitted with:		IGBT inverter Brake chopper Control unit Radio interference suppression filter PC connection Internal DC link Breaking resistance 7-digital display assembly Additional PCB protection
Functions		4-quadrant operation possible
General information		
Cable length		C3 ≤ 25 m, Radio interference level, maximum motor cable length 150 m, unscreened, maximum permissible, Motor feeder C2 ≤ 5 m, Radio interference level, maximum motor cable length 100 m, screened, maximum permissible, Motor feeder 200 m, screened, with motor choke, maximum permissible, Motor feeder 300 m, unscreened, with motor choke, maximum permissible, Motor feeder
Communication interface		Modbus RTU, built in SmartWire-DT, optional CANopen®, built in OP-Bus (RS485), built in
Connection to SmartWire-DT		In conjunction with DX-NET-SWD3 SmartWire DT module Yes
Degree of protection		IP20 NEMA Other
Electromagnetic compatibility		1st and 2nd environments (according to EN 61800-3)
Frame size		FS2

Mounting position		Vertical
Product category		Variable frequency drives
Protection		Finger and back-of-hand proof, Protection against direct contact (BGV A3, VBG4)
Protocol		EtherNet/IP Other bus systems CAN MODBUS
Radio interference class		C2, C3: depending on the motor cable length, the connected load, and ambient conditions. External radio interference suppression filters (optional) may be necessary. Optional external radio interference suppression filter for longer motor cable lengths and for use in different EMC environments
Suitable for		Branch circuits, (UL/CSA)
Climatic environmental conditions		
Altitude		Above 1000 m with 1 % derating per 100 m Max. 4000 m
Ambient operating temperature - min		-10 °C
Ambient operating temperature - max		50 °C
Ambient operating temperature at 150% overload - min		-10 °C
Ambient operating temperature at 150% overload - max		50 °C
Ambient storage temperature - min		-40 °C
Ambient storage temperature - max		60 °C
Climatic proofing		< 95 average relative humidity (RH), no condensation, no corrosion
Main circuit		
Efficiency		96.6 % (η)
Heat dissipation at current/speed		119 W at 100% current and 50% speed 141 W at 100% current and 90% speed 50 W at 25% current and 0% speed 53 W at 25% current and 50% speed 61 W at 50% current and 0% speed 67 W at 50% current and 50% speed 80 W at 50% current and 90% speed 97 W at 100% current and 0% speed
Input current ILN at 150% overload		11.5 A
Leakage current at ground IPE - max		12.6 mA
Mains switch-on frequency		Maximum of one time every 30 seconds
Mains voltage - min		380 V
Mains voltage - max		480 V
Operating mode		U/f control Speed control with slip compensation Sensorless vector control (SLV) BLDC motors PM motors Synchronous reluctance motors
Output frequency - min		0 Hz
Output frequency - max		500 Hz
Output voltage (U2)		400 V AC, 3-phase 480 V AC, 3-phase
Overload current IL at 150% overload		14.25 A
Rated control supply voltage		10 V DC (Us, max. 10 mA)
Rated frequency - min		48 Hz
Rated frequency - max		62 Hz
Rated operational current (Ie)		9.5 A at 150% overload (at an operating frequency of 16 kHz and an ambient air temperature of +50 °C)
Rated operational power at 380/400 V, 50 Hz, 3-phase		4 kW
Rated operational voltage		400 V AC, 3-phase 480 V AC, 3-phase
Resolution		0.1 Hz (Frequency resolution, setpoint value)
Short-circuit protection rating		15 A, UL (Class CC or J), Safety device (fuse or miniature circuit-breaker), Power Wiring
Starting current - max		175 %, IH, max. starting current (High Overload), For 2.5 seconds every 600 seconds, Power section
Supply frequency		50/60 Hz
Switching frequency		8 kHz, 4 - 32 kHz adjustable (audible), fPWM, Power section, Main circuit
System configuration type		AC supply systems with earthed center point

Voltage rating - max		480 V
Motor rating		
Assigned motor current IM at 110/120 V, 60 Hz, 150% overload		7.6 A
Assigned motor current IM at 115 V, 50 Hz, 150% overload		8.5 A
Assigned motor current IM at 220 - 240 V, 60 Hz, 150% overload		7.6 A
Assigned motor current IM at 230 V, 50 Hz, 150% overload		8.5 A
Assigned motor current IM at 400 V, 50 Hz, 150% overload		8.5 A
Assigned motor current IM at 440 - 480 V, 60 Hz, 150% overload		7.6 A
Assigned motor power at 115/120 V, 60 Hz, 1-phase		5 HP
Assigned motor power at 230/240 V, 60 Hz, 1-phase		5 HP
Assigned motor power at 460/480 V, 60 Hz		5 HP
Assigned motor power at 460/480 V, 60 Hz, 3-phase		5 HP
Apparent power		
Apparent power at 400 V		6.58 kV-A
Apparent power at 480 V		7.9 kV-A
Braking function		
Braking resistance		120 Ω
Braking torque		Max. 30 % MN, Standard - Main circuit Max. 100 % of rated operational current I _e with external braking resistor - Main circuit Max. 100 % of rated operational current I _e , variable, DC - Main circuit
Switch-on threshold for the braking transistor		780 V DC
Control circuit		
Number of inputs (analog)		2 (parameterizable, 0 - 10 V DC, 0/4 - 20 mA)
Number of inputs (digital)		4 (parameterizable, 10 - 30 V DC)
Number of outputs (analog)		1
Number of outputs (digital)		1
Number of relay outputs		1 (parameterizable, N/O, 6 A (250 V, AC-1) / 5 A (30 V, DC-1))
Design verification		
Equipment heat dissipation, current-dependent P _{vid}		136 W
Heat dissipation capacity P _{diss}		0 W
Heat dissipation per pole, current-dependent P _{vid}		0 W
Rated operational current for specified heat dissipation (I _n)		9.5 A
Static heat dissipation, non-current-dependent P _{vs}		0 W
Heat dissipation details		Operation (with 150 % overload)
10.2.2 Corrosion resistance		Meets the product standard's requirements.
10.2.3.1 Verification of thermal stability of enclosures		Meets the product standard's requirements.
10.2.3.2 Verification of resistance of insulating materials to normal heat		Meets the product standard's requirements.
10.2.3.3 Resist. of insul. mat. to abnormal heat/fire by internal elect. effects		Meets the product standard's requirements.
10.2.4 Resistance to ultra-violet (UV) radiation		Meets the product standard's requirements.
10.2.5 Lifting		Does not apply, since the entire switchgear needs to be evaluated.
10.2.6 Mechanical impact		Does not apply, since the entire switchgear needs to be evaluated.
10.2.7 Inscriptions		Meets the product standard's requirements.
10.3 Degree of protection of assemblies		Does not apply, since the entire switchgear needs to be evaluated.
10.4 Clearances and creepage distances		Meets the product standard's requirements.
10.5 Protection against electric shock		Does not apply, since the entire switchgear needs to be evaluated.
10.6 Incorporation of switching devices and components		Does not apply, since the entire switchgear needs to be evaluated.
10.7 Internal electrical circuits and connections		Is the panel builder's responsibility.
10.8 Connections for external conductors		Is the panel builder's responsibility.
10.9.2 Power-frequency electric strength		Is the panel builder's responsibility.
10.9.3 Impulse withstand voltage		Is the panel builder's responsibility.
10.9.4 Testing of enclosures made of insulating material		Is the panel builder's responsibility.
10.10 Temperature rise		The panel builder is responsible for the temperature rise calculation. Eaton will provide heat dissipation data for the devices.
10.11 Short-circuit rating		Is the panel builder's responsibility. The specifications for the switchgear must be observed.

10.12 Electromagnetic compatibility		Is the panel builder's responsibility. The specifications for the switchgear must be observed.
10.13 Mechanical function		The device meets the requirements, provided the information in the instruction leaflet (IL) is observed.

Technical data ETIM 9.0

Low-voltage industrial components (EG000017) / Frequency converter =< 1 kV (EC001857)		
Electric engineering, automation, process control engineering / Electrical drive / Static frequency converter / Static frequency / Servo converter = < 1 kV (ecl@ss13-27-02-31-01 [AKE177019])		
Mains voltage	V	380 - 480
Mains frequency		50/60 Hz
Number of phases input		3
Number of phases output		3
Max. output frequency	Hz	500
Max. output voltage	V	500
Nominal output current I2N	A	9.5
Max. output at quadratic load at rated output voltage	kW	4
Max. output at linear load at rated output voltage	kW	4
Power consumption	W	136
Relative symmetric net frequency tolerance	%	10
Relative symmetric net voltage tolerance	%	10
Number of analogue outputs		1
Number of analogue inputs		2
Number of digital outputs		1
Number of digital inputs		4
With control element		Yes
Application in industrial area permitted		Yes
Application in domestic- and commercial area permitted		Yes
Supporting protocol for TCP/IP		No
Supporting protocol for PROFIBUS		No
Supporting protocol for CAN		Yes
Supporting protocol for INTERBUS		No
Supporting protocol for ASI		No
Supporting protocol for KNX		No
Supporting protocol for Modbus		Yes
Supporting protocol for Data-Highway		No
Supporting protocol for DeviceNet		No
Supporting protocol for SUCONET		No
Supporting protocol for LON		No
Supporting protocol for PROFINET IO		No
Supporting protocol for PROFINET CBA		No
Supporting protocol for SERCOS		No
Supporting protocol for Foundation Fieldbus		No
Supporting protocol for EtherNet/IP		Yes
Supporting protocol for AS-Interface Safety at Work		No
Supporting protocol for DeviceNet Safety		No
Supporting protocol for INTERBUS-Safety		No
Supporting protocol for PROFIsafe		No
Supporting protocol for SafetyBUS p		No
Supporting protocol for BACnet		No
Supporting protocol for other bus systems		Yes
Number of HW-interfaces industrial Ethernet		0
Number of interfaces PROFINET		0
Number of HW-interfaces RS-232		0
Number of HW-interfaces RS-422		0
Number of HW-interfaces RS-485		1
Number of HW-interfaces serial TTY		0

Number of HW-interfaces USB			0
Number of HW-interfaces parallel			0
Number of HW-interfaces other			0
With optical interface			No
With PC connection			Yes
Integrated breaking resistance			Yes
4-quadrant operation possible			Yes
Type of converter			U converter
Degree of protection (IP)			IP20
Degree of protection (NEMA)			Other
Height		mm	231
Width		mm	107
Depth		mm	152