DATASHEET - DC1-344D1FB-A20CE1

Variable frequency drive, 400 V AC, 3-phase, 4.1 A, 1.5 kW, IP20/NEMA 0, Radio interference suppression filter, Brake chopper, FS2

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Part no.	**DC1-344D1FB-A20CE1**
	185749
EL Number (Norway)	4137030

General specifications

Product name	Eaton DC1 Variable frequency drive
Part no.	DC1-344D1FB-A20CE1
EAN	4015081812486
Product Length/Depth	152 millimetre
Product height	231 millimetre
Product width	107 millimetre
Product weight	1.2 kilogram
Certifications	UL Category Control No.: NMMS, NMMS7 IEC/EN61800-5 RoHS, ISO 9001 UkrSEPRO IEC/EN 61800-3 Safety requirements: IEC/EN 61800-5-1 UL File No.: E172143 Specification for general requirements: IEC/EN 61800-2 CSA-C22.2 No. 14 UL 508C RCM IEC/EN61800-3 CUL UL report applies to both US and Canada CE Certified by UL for use in Canada EAC UL
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 Radio interference suppression filter PC connection 7-digital display assembly Control unit Internal DC link Breaking resistance Additional PCB protection
Functions	4-quadrant operation possible

General information

Cable length	200 m, screened, with motor choke, maximum permissible, Motor feeder C3 ≤ 25 m, Radio interference level, maximum motor cable length C2 ≤ 5 m, Radio interference level, maximum motor cable length 100 m, screened, maximum permissible, Motor feeder 150 m, unscreened, maximum permissible, Motor feeder 300 m, unscreened, with motor choke, maximum permissible, Motor feeder
Communication interface	OP-Bus (RS485), built in Modbus RTU, built in CANopen®, built in SmartWire-DT, optional
Connection to SmartWire-DT	Yes In conjunction with DX-NET-SWD3 SmartWire DT module
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 MODBUS CAN
Radio interference class		Optional external radio interference suppression filter for longer motor cable lengths and for use in different EMC environments C2, C3: depending on the motor cable length, the connected load, and ambient conditions. External radio interference suppression filters (optional) may be necessary.
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		94.9 % (η)
Heat dissipation at current/speed		31 W at 25% current and 0% speed 35 W at 25% current and 50% speed 39 W at 50% current and 0% speed 45 W at 50% current and 50% speed 52 W at 50% current and 90% speed 56 W at 100% current and 0% speed 61 W at 100% current and 50% speed 73 W at 100% current and 90% speed
Input current ILN at 150% overload		5.6 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		6.15 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)		4.1 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		1.5 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		6 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		3.4 A
Assigned motor current IM at 115 V, 50 Hz, 150% overload		3.6 A
Assigned motor current IM at 220 - 240 V, 60 Hz, 150% overload		3.4 A
Assigned motor current IM at 230 V, 50 Hz, 150% overload		3.6 A
Assigned motor current IM at 400 V, 50 Hz, 150% overload		3.6 A
Assigned motor current IM at 440 - 480 V, 60 Hz, 150% overload		3.4 A
Assigned motor power at 115/120 V, 60 Hz, 1-phase		2 HP
Assigned motor power at 230/240 V, 60 Hz, 1-phase		2 HP
Assigned motor power at 460/480 V, 60 Hz		2 HP
Assigned motor power at 460/480 V, 60 Hz, 3-phase		2 HP

Apparent power

Apparent power at 400 V		2.84 kV·A
Apparent power at 480 V		3.41 kV·A

Braking function

Braking resistance		250 Ω
Braking torque		Max. 100 % of rated operational current Ie, variable, DC - Main circuit Max. 30 % MN, Standard - Main circuit Max. 100 % of rated operational current Ie with external braking resistor - 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 Pvid		76.5 W
Heat dissipation capacity Pdiss		0 W
Heat dissipation per pole, current-dependent Pvid		0 W
Rated operational current for specified heat dissipation (In)		4.1 A
Static heat dissipation, non-current-dependent Pvs		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	4.1
Max. output at quadratic load at rated output voltage	kW	1.5
Max. output at linear load at rated output voltage	kW	1.5
Power consumption	W	76.5
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