

Variable frequency drive



**Part no. DB1-1D3D2FN-N2CC
199347**

General specifications		
Product name		Eaton DB1 Variable frequency drive
Part no.		DB1-1D3D2FN-N2CC
EAN		4015081975938
Product Length/Depth		74 millimetre
Product height		130 millimetre
Product width		118 millimetre
Product weight		0.7 kilogram
Certifications		UL Category Control No.: NMMS, NMMS7 UL 508C UL report applies to both US and Canada RoHS, ISO 9001 IEC/EN61800-5 CE marking CSA-C22.2 No. 14 CE CUL IEC/EN 61800-3 IEC/EN 61800-5-1 RCM UL File No.: E172143 IEC/EN 61800-2 UL Certified by UL for use in Canada CSA-C22.2 No. 274 UL Listed
Product Tradename		DB1
Product Type		Variable frequency drive
Product Sub Type		None
Catalog Notes		For normal internally and externally ventilated four-pole three-phase asynchronous motors with 1500 rpm at 50 Hz and 1800 rpm at 60 Hz - Rated operational current at an operating frequency of 8 kHz and an ambient air temperature of +60 °C
Features & Functions		
Features		Parameterization: drivesConnect mobile (App) Tool-less swapping of fan Parameterization: Fieldbus Temperature-controlled fan Parameterization: drivesConnect Parameterization: Keypad
Fitted with:		Radio interference suppression filter PC connection Internal DC link Additional PCB protection IGBT inverter
General information		
Cable length		10 m, screened, maximum permissible cable length C2 ≤ 3 m, maximum motor cable length C3 ≤ 10 m, maximum motor cable length C1 ≤ 1 m, maximum motor cable length
Communication interface		CANopen®, built in OP-Bus (RS485), built in Modbus RTU, built in
Connection to SmartWire-DT		No
Degree of protection		IP20 NEMA Other
Electromagnetic compatibility		1st and 2nd environments (according to EN 61800-3)
Frame size		FS1
Number of slots		1 (expansion)
Product Category		Variable frequency drives
Protection		Finger and back-of-hand proof, Protection against direct contact (BGV A3, VBG4)
Protocol		Other bus systems MODBUS CAN

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. C1: for conducted emissions only
Suitable for		Branch circuits, (UL/CSA)
Ambient conditions, mechanical		
Mounting position		Depending on the cooling As required
Shock resistance		15 g, Mechanical, According to IEC/EN 60068-2-27, 11 ms
Vibration		Resistance: According to EN 61800-5-1
Climatic environmental conditions		
Altitude		Above 1000 m with 1 % derating per 100 m Max. 2000 m Max. 1000 m
Ambient operating temperature - min		-10 °C
Ambient operating temperature - 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		95 % (η)
Heat dissipation at current/speed		16.07 W at 25% current and 0% speed 17.05 W at 50% current and 0% speed 20.45 W at 25% current and 50% speed 21.61 W at 100% current and 0% speed 25.14 W at 50% current and 50% speed 33.98 W at 50% current and 90% speed 36.36 W at 100% current and 90% speed 36.59 W at 100% current and 50% speed
Input current ILN at 150% overload		11.4 A
Leakage current at ground IPE - max		3.5 mA (at 115 V)
Mains switch-on frequency		Maximum of one time every 30 seconds
Mains voltage - min		110 V
Mains voltage - max		115 V
Operating mode		Sensorless vector control (SLV) Speed control with slip compensation BLDC motors PM motors Synchronous reluctance motors U/f control
Output frequency - min		0 Hz
Output frequency - max		500 Hz
Output voltage (U2)		230 V AC, 3-phase
Overload current IL at 150% overload		4.8 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) at 150% overload		3.2 A
Rated operational power at 220/230 V, 50 Hz, 1-phase		0.5 kW
Rated operational voltage		115 V AC, 1-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 3.75 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		120 V
Motor rating		
Assigned motor current IM at 220 - 240 V, 60 Hz, 150% overload		3.2 A
Assigned motor current IM at 230 V, 50 Hz, 150% overload		3.2 A
Assigned motor power at 230/240 V, 60 Hz, 1-phase		0.75 HP

Apparent power		
Apparent power at 230 V		0.73 kV-A
Apparent power at 240 V		0.76 kV-A
Braking function		
Braking torque		Max. 100 % of rated operational current I _e , variable, DC - Main circuit Max. 30 % MN, Standard - Main circuit
Control circuit		
Number of inputs (analog)		2
Number of inputs (digital)		4
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))
Rated control voltage (U _c)		24 V DC (external, max. 100 mA)
Design verification		
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	110 - 115
Mains frequency		50/60 Hz
Number of phases input		1
Number of phases output		3
Max. output frequency	Hz	500
Max. output voltage	V	250
Nominal output current I _{2N}	A	32
Max. output at quadratic load at rated output voltage	kW	0.55
Max. output at linear load at rated output voltage	kW	0.55
Power consumption	W	42
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			No
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			No
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			No
4-quadrant operation possible			No
Type of converter			U converter
Degree of protection (IP)			IP20
Degree of protection (NEMA)			Other
Height		mm	130
Width		mm	118
Depth		mm	74