

Variable frequency drive, 400 V AC, 3-phase, 31 A, 15 kW, IP20/NEMA0,  
Radio interference suppression filter, 7-digital display assembly, Setpoint  
potentiometer, Brake chopper, FS4



**Part no.** DM1-34031EB-S20S-EM  
3-5015-003A  
**EL Number** 4132232  
**(Norway)**

General specifications		
Product name		Eaton DM1 Variable frequency drive
Part no.		DM1-34031EB-S20S-EM
EAN		4015081981069
Product Length/Depth		195 millimetre
Product height		300 millimetre
Product width		184 millimetre
Product weight		6.3 kilogram
Certifications		IEC/EN 61800-5-1 CSA-C22.2 No. 274-13 RoHS, ISO 9001 UL report applies to both US and Canada EAC UkrSEPRO UL File No.: E134360 CUL CE C-Tick CSA-C22.2 No. 274-17 IEC/EN 61800-2 UL Category Control No.: NMMS, NMMS7 IEC/EN61800-5 IEC/EN 61800-3 IEC/EN61800-3 UL Listed CE marking UL 508C UL Certified by UL for use in Canada
Product Tradename		DM1
Product Type		Variable frequency drive
Product Sub Type		None
Catalog Notes		Assigned motor rating: for normal internally and externally ventilated 4 pole, three-phase asynchronous motors with 1500 rpm at 50 Hz or 1800 min at 60 Hz Assigned motor rating: Overload cycle for 60 s every 600 s Braking resistance: P:n = "n" resistors connected in parallel for PM motors Operation with 110 % overload (1 min./10 min.): -10 to +40 (max. +55 with 1% derating per Kelvin above limit) Operation with 150% overload (1 min./10 min.): -10 to +50 (max. +60 with 1% derating per Kelvin above limit) Rated operational current for a switching frequency of 1 - 16 kHz and an ambient temperature of +50 °C for a 150% overload and +40 °C for a 110% overload
General information		
Air volume capacity		98 m³/h
Cable length		C2 ≤ 5 m, maximum motor cable length C3 ≤ 25 m, maximum motor cable length
Communication interface		SmartWire-DT, optional Modbus RTU, built in Modbus TCP, built in BACnet TCP PROFIBUS, optional Ethernet IP, built in BACnet MS/TP, built in CANopen®, optional DeviceNet, optional
Connection to SmartWire-DT		Yes In conjunction with DXG-NET-SWD SmartWire DT module
Degree of protection		IP20 NEMA Other
Electromagnetic compatibility		1st and 2nd environments (according to EN 61800-3)
Environmental class		3C2, 3S2 (Air quality)
Features		Parameterization: Keypad Parameterization: Power Xpert inControl

		Temperature-controlled fan Parameterization: Fieldbus
Fitted with:		7-digital display assembly Internal DC link IGBT inverter DC link choke Brake chopper Setpoint potentiometer Radio interference suppression filter Breaking resistance Control unit PC connection
Frame size		FS4
Mounting position		Vertical
Number of slots		1 (expansion)
Overvoltage category		III
Pollution degree		2
Product Category		Variable frequency drives
Protection		Finger and back-of-hand proof, Protection against direct contact (BGV A3, VBG4)
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 C1: with external filter, for conducted emissions only
Safety function/level		STO (Safe Torque Off, SIL2, PLc Cat 2)
Shock resistance		0.75 mm (peak) at 10 - 57 Hz, max. 1 g at 57 - 150 Hz, according to EN 61800-5-1, EN 60068-2-6: 10 - 150 Hz
Suitable for		Branch circuits, (UL/CSA)
<b>Climatic environmental conditions</b>		
Altitude		Max. 2000 m for Corner Grounded TN Systems Max. 3000 m Max. 1000 m Above 1000 m with 1 % derating per 100 m
Ambient operating temperature - min		-10 °C
Ambient operating temperature - max		50 °C
Ambient storage temperature - min		-40 °C
Ambient storage temperature - max		70 °C
Climatic proofing		< 95 average relative humidity (RH), no condensation, no corrosion
<b>Main circuit</b>		
Current limitation		0.1 - 2 x I <sub>H</sub> (CT), motor, main circuit
Heat dissipation at current/speed		169 W at 25% current and 0% speed 213.8 W at 25% current and 50% speed 231.4 W at 100% current and 50% speed 236.5 W at 50% current and 90% speed 248.5 W at 50% current and 50% speed 335.8 W at 100% current and 0% speed 485.5 W at 100% current and 90% speed 497 W at 50% current and 0% speed
Input current I <sub>LN</sub> at 110% overload		43.7 A
Input current I <sub>LN</sub> at 150% overload		35.7 A
Mains current distortion		40 %
Mains switch-on frequency		Maximum of one time every 60 seconds
Mains voltage - min		380 V
Mains voltage - max		480 V
Operating mode		U/f control PM motors Sensorless vector control (SLV) Speed control with slip compensation Torque regulation
Output frequency - min		0 Hz
Output frequency - max		400 Hz
Output voltage (U <sub>2</sub> )		500 V AC, 3-phase 480 V AC, 3-phase 400 V AC, 3-phase
Overload current I <sub>L</sub> at 110% overload		41.8 A
Overload current I <sub>L</sub> at 150% overload		46.5 A
Rated conditional short-circuit current (I <sub>q</sub> )		100 kA

Rated control supply voltage		10 V DC (Us, max. 10 mA)
Rated frequency - min		45 Hz
Rated frequency - max		66 Hz
Rated operational current (Ie) at 110% overload		38 A
Rated operational current (Ie) at 150% overload		31 A
Rated operational power at 380/400 V, 50 Hz, 110% overload		18.5 kW
Rated operational power at 380/400 V, 50 Hz, 3-phase		15 kW
Rated operational power at 500 V, 50 Hz, 3-phase		18.5 kW
Rated operational power at 500 V, 50 Hz, 3-phase, 110% overload		22 kW
Rated operational voltage		400 V AC, 3-phase 480 V AC, 3-phase 500 V AC, 3-phase
Resolution		0.01 Hz (Frequency resolution, setpoint value)
Short-circuit protection rating		50 A, UL (Class CC or J), Safety device (fuse or miniature circuit-breaker), Power Wiring
Starting current - max		200 %, IH, max. starting current (High Overload), For 2 seconds every 20 seconds, Power section
Supply frequency		50/60 Hz
Switching frequency		3.6 kHz, 1 - 16 kHz adjustable, fPWM, Power section, Main circuit
System configuration type		TN-S, TN-C, TN-C-S, TT, IT
Voltage rating - max		500 V
<b>Motor rating</b>		
Assigned motor current IM at 400 V, 50 Hz, 110% overload		36 A
Assigned motor current IM at 400 V, 50 Hz, 150% overload		29.3 A
Assigned motor current IM at 440/480 V, 60 Hz, 110% overload		34 A
Assigned motor current IM at 500 V, 50 Hz, 110% overload		33 A
Assigned motor current IM at 500 V, 50 Hz, 150% overload		28.9 A
Assigned motor power at 460/480 V, 60 Hz		20 HP
Assigned motor power at 460/480 V, 60 Hz, 110% overload		25 HP
<b>Braking function</b>		
Braking resistance		17 Ω
Braking torque		Max. 30 % MN, Standard - Main circuit Adjustable to 150 %, DC - Main circuit Max. 100 % of rated operational current Ie with external braking resistor - Main circuit
Switch-on threshold for the braking transistor		800 V DC
<b>Control circuit</b>		
Number of inputs (analog)		1
Number of inputs (digital)		4
Number of outputs (analog)		1
Number of relay outputs		2 (parameterizable, 1 changeover contact and 1 N/O, 3 A (240 V AC) / 3 A (24 V DC))
Rated control voltage (Uc)		24 V DC (external, max. 100 mA options incl.)
<b>Design verification</b>		
Equipment heat dissipation, current-dependent Pvid		393.8 W
Rated operational current for specified heat dissipation (In)		38 A
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 8.0

Low-voltage industrial components (EG000017) / Frequency converter <= 1 kV (EC001857)

Electric engineering, automation, process control engineering / Electrical drive / Static frequency converter / Static frequency converter = < 1 kV (ecl@ss10.0.1-27-02-31-01 [AKE177014])

Mains voltage	V	380 - 480
Mains frequency		50/60 Hz
Number of phases input		3
Number of phases output		3
Max. output frequency	Hz	400
Max. output voltage	V	500
Nominal output current I <sub>2N</sub>	A	31
Max. output at quadratic load at rated output voltage	kW	18.5
Max. output at linear load at rated output voltage	kW	15
Relative symmetric net frequency tolerance	%	10
Relative symmetric net voltage tolerance	%	10
Number of analogue outputs		1
Number of analogue inputs		1
Number of digital outputs		0
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		Yes
Supporting protocol for PROFIBUS		Yes
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		Yes

Supporting protocol for other bus systems			Yes
Number of HW-interfaces industrial Ethernet			1
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			1
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	300
Width		mm	184
Depth		mm	195