DATASHEET - DM1-34038EB-S20S-EM

Variable frequency drive, 400 V AC, 3-phase, 38 A, 18.5 kW, IP20/NEMA0, Radio interference suppression filter, 7-digital display assembly, Setpoint potentiometer, Brake chopper, FS4

Part no.	**DM1-34038EB-S20S-EM**
	3-5015-004A
EL Number (Norway)	**4132302**

General specifications

Product name	Eaton DM1 Variable frequency drive
Part no.	DM1-34038EB-S20S-EM
EAN	4015081981076
Product Length/Depth	195 millimetre
Product height	300 millimetre
Product width	184 millimetre
Product weight	6.3 kilogram
Certifications	CE CSA-C22.2 No. 274-13 IEC/EN 61800-5-1 UL Category Control No.: NMMS, NMMS7 IEC/EN61800-3 C-Tick IEC/EN61800-5 UL report applies to both US and Canada CUL EAC RoHS, ISO 9001 IEC/EN 61800-2 IEC/EN 61800-3 UL Listed CSA-C22.2 No. 274-17 UL File No.: E134360 UL UkrSEPRO CE marking UL 508C 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 m^3/h
Cable length	C3 ≤ 25 m, maximum motor cable length C2 ≤ 5 m, maximum motor cable length
Communication interface	SmartWire-DT, optional PROFIBUS, optional Modbus TCP, built in CANopen®, optional Modbus RTU, built in BACnet MS/TP, built in Ethernet IP, built in DeviceNet, optional BACnet TCP
Connection to SmartWire-DT	In conjunction with DXG-NET-SWD SmartWire DT module Yes
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: Power Xpert inControl Parameterization: Fieldbus

	Parameterization: Keypad Temperature-controlled fan
Fitted with:	Setpoint potentiometer IGBT inverter Radio interference suppression filter Brake chopper Internal DC link 7-digital display assembly DC link choke 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. C1: with external filter, for conducted emissions only Optional external radio interference suppression filter for longer motor cable lengths and for use in different EMC environments
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)
Climatic environmental conditions	
Altitude	Max. 3000 m Above 1000 m with 1 % derating per 100 m Max. 2000 m for Corner Grounded TN Systems 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	70 °C
Climatic proofing	< 95 average relative humidity (RH), no condensation, no corrosion
Main circuit	
Current limitation	0.1 - 2 x IH (CT), motor, main circuit
Heat dissipation at current/speed	170.2 W at 50% current and 50% speed 178 W at 25% current and 0% speed 187.9 W at 100% current and 50% speed 195.7 W at 50% current and 90% speed 197.6 W at 25% current and 50% speed 267.1 W at 100% current and 0% speed 334.9 W at 50% current and 0% speed 335 W at 100% current and 90% speed
Input current ILN at 110% overload	52.9 A
Input current ILN at 150% overload	43.7 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	Sensorless vector control (SLV) PM motors U/f control Speed control with slip compensation Torque regulation
Output frequency - min	0 Hz
Output frequency - max	400 Hz
Output voltage (U2)	480 V AC, 3-phase 500 V AC, 3-phase 400 V AC, 3-phase
Overload current IL at 110% overload	50.6 A
Overload current IL at 150% overload	57 A
Rated conditional short-circuit current (Iq)	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	46 A
Rated operational current (Ie) at 150% overload	38 A
Rated operational power at 380/400 V, 50 Hz, 110% overload	22 kW
Rated operational power at 380/400 V, 50 Hz, 3-phase	18.5 kW
Rated operational power at 500 V, 50 Hz, 3-phase	22 kW
Rated operational power at 500 V, 50 Hz, 3-phase, 110% overload	30 kW
Rated operational voltage	500 V AC, 3-phase 400 V AC, 3-phase 480 V AC, 3-phase
Resolution	0.01 Hz (Frequency resolution, setpoint value)
Short-circuit protection rating	63 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

Motor rating

Assigned motor current IM at 400 V, 50 Hz, 110% overload	41 A
Assigned motor current IM at 400 V, 50 Hz, 150% overload	36 A
Assigned motor current IM at 440 - 480 V, 60 Hz, 150% overload	34 A
Assigned motor current IM at 440/480 V, 60 Hz, 110% overload	40 A
Assigned motor current IM at 500 V, 50 Hz, 110% overload	44 A
Assigned motor current IM at 500 V, 50 Hz, 150% overload	33 A
Assigned motor power at 460/480 V, 60 Hz	25 HP
Assigned motor power at 460/480 V, 60 Hz, 110% overload	30 HP

Braking function

Braking resistance	17 Ω
Braking torque	Adjustable to 150 %, 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	800 V DC

Control circuit

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.)

Design verification

Equipment heat dissipation, current-dependent Pvid	473.4 W
Rated operational current for specified heat dissipation (In)	46 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 I2N	A	38
Max. output at quadratic load at rated output voltage	kW	22
Max. output at linear load at rated output voltage	kW	18.5
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

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