DATASHEET - DA1-34039FB-B20C

Frequency inverter, 400 V AC, 3-phase, 39 A, 18.5 kW, IP20/NEMA 0, Radio interference suppression filter, Additional PCB protection, FS4

Part no. **DA1-34039FB-B20C**
197494

General specifications

Product name		Eaton DA1 Variable frequency drive
Part no.		DA1-34039FB-B20C
EAN		4015081940691
Product Length/Depth		241 millimetre
Product height		419 millimetre
Product width		173 millimetre
Product weight		9.2 kilogram
Certifications		RCM UL CE UL Category Control No.: NMMS, NMMS7 RoHS, ISO 9001 Safety: EN 61800-5-1: 2003 IEC/EN 61800-2 UL report applies to both US and Canada UkrSEPRO CUL UL 508C IEC/EN61800-5 IEC/EN61800-3 EAC Certified by UL for use in Canada IEC/EN 61800-3 UL File No.: E172143
Product Tradename		DA1
Product Type		Variable frequency drive
Product Sub Type		None
Catalog Notes		The brake resistors are assigned based on the maximum rated power of the variable frequency drive. Additional brake resistors and designs (e.g. different duty cycles) are available upon request.

General information

Cable length		200 m, unscreened, with motor choke, maximum permissible cable length C2 ≤ 5 m, maximum motor cable length 100 m, screened, maximum permissible cable length C3 ≤ 25 m, maximum motor cable length 150 m, unscreened, maximum permissible cable length 200 m, screened, with motor choke, maximum permissible cable length
Communication interface		EtherCAT, optional Ethernet IP, optional Modbus RTU PROFIBUS, optional PROFINET, optional SmartWire-DT, optional OP-Bus (RS485) CANopen® Modbus-TCP, optional DeviceNet, optional
Connection to SmartWire-DT		Yes In conjunction with DX-NET-SWD1 SmartWire DT module
Degree of protection		IP20 NEMA Other
Electromagnetic compatibility		1st and 2nd environments (according to EN 61800-3)
Fitted with:		Breaking resistance OLED display Control unit IGBT inverter Radio interference suppression filter PC connection Internal DC link Brake chopper Additional PCB protection
Frame size		FS4
Functions		4-quadrant operation possible
Mounting position		Vertical

Product Category	Variable frequency drives
Protection	Finger and back-of-hand proof, Protection against direct contact (BGV A3, VBG4)
Protocol	TCP/IP MODBUS PROFINET IO EtherNet/IP Other bus systems CAN PROFIBUS DeviceNet
Safety function/level	STO (Safe Torque Off, SIL2, PLc Cat 2)
Suitable for	Branch circuits, (UL/CSA)
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.

Climatic environmental conditions

Ambient operating temperature - min	-10 °C
Altitude	Max. 1000 m Max. 4000 m Above 1000 m with 1 % derating per 100 m
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	97.5 % (η)
Heat dissipation at current/speed	181 W at 25% current and 0% speed 202 W at 25% current and 50% speed 230 W at 50% current and 0% speed 258 W at 50% current and 50% speed 301 W at 50% current and 90% speed 386 W at 100% current and 0% speed 461 W at 100% current and 50% speed 536 W at 100% current and 90% speed
Input current ILN at 150% overload	47 A
Leakage current at ground IPE - max	2.47 mA
Mains switch-on frequency	Maximum of one time every 30 seconds
Mains voltage - min	380 V
Mains voltage - max	480 V
Operating mode	Sensorless vector control (SLV) Speed control with slip compensation Optional: Vector control with feedback (CLV) U/f control
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	58.5 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	39 A
Rated operational power at 380/400 V, 50 Hz, 3-phase	18.5 kW
Rated operational voltage	480 V AC, 3-phase 400 V AC, 3-phase
Resolution	0.1 Hz (Frequency resolution, setpoint value)
Short-circuit protection rating	60 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 4 seconds every 40 seconds, Power section
Supply frequency	50/60 Hz
Switching frequency	8 kHz, 4 - 24 kHz adjustable (audible), fPWM, Power section, Main circuit

System configuration type		AC supply systems with earthed center point
Voltage rating - max		480 V AC

Motor rating

Assigned motor current IM at 400 V, 50 Hz, 150% overload		39 A
Assigned motor current IM at 440 - 480 V, 60 Hz, 150% overload		34 A
Assigned motor power at 460/480 V, 60 Hz, 3-phase		25 HP

Apparent power

Apparent power at 400 V		27.02 kV·A
Apparent power at 480 V		32.42 kV·A

Braking function

Braking resistance		22 O
Braking torque		Adjustable to 100 % (DC) Max. 100 % of rated operational current Ie with external braking resistor - Main circuit Max. 30 % MN, Standard - Main circuit
Switch-on threshold for the braking transistor		780 V DC

Control circuit

Number of inputs (analog)		2
Number of inputs (digital)		5
Number of outputs (analog)		2
Number of outputs (digital)		2
Number of relay outputs		2 (parameterizable, 1 N/O and 1 changeover contact, 6 A (250 V, AC-1) / 5 A (30 V, DC-1))
Rated control voltage (Uc)		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	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	39	
Max. output at quadratic load at rated output voltage	kW	18.5	
Max. output at linear load at rated output voltage	kW	18.5	
Power consumption	W	444	
Relative symmetric net frequency tolerance	%	10	
Relative symmetric net voltage tolerance	%	10	
Number of analogue outputs		2	
Number of analogue inputs		2	
Number of digital outputs		2	
Number of digital inputs		5	
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		Yes	
Supporting protocol for SUCONET		No	
Supporting protocol for LON		No	
Supporting protocol for PROFINET IO		Yes	
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	419	

Width		mm	173
Depth		mm	241