

Variable frequency drive, 400 V AC, 3-phase, 90 A, 45 kW, IP55/NEMA 12,
Radio interference suppression filter, OLED display, DC link choke



Powering Business Worldwide™

Part no. DA1-34090FB-B55C
169397
EL Number 4137319
(Norway)

General specifications		
Product name		Eaton DA1 Variable frequency drive
Part no.		DA1-34090FB-B55C
EAN		4015081658381
Product Length/Depth		313.5 millimetre
Product height		865 millimetre
Product width		330 millimetre
Product weight		50 kilogram
Certifications		Safety: EN 61800-5-1: 2003 UL 508C RCM UkrSEPRO RoHS, ISO 9001 CE Specification for general requirements: IEC/EN 61800-2 CSA-C22.2 No. 14 UL report applies to both US and Canada CUL UL EAC Certified by UL for use in Canada IEC/EN61800-3 DNV IEC/EN61800-5 UL Category Control No.: NMMS, NMMS7 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		100 m, screened, maximum permissible, Motor feeder 150 m, unscreened, maximum permissible, Motor feeder 200 m, screened, with motor choke, maximum permissible, Motor feeder 300 m, unscreened, with motor choke, maximum permissible, Motor feeder C2 ≤ 5 m, Radio interference level, maximum motor cable length C3 ≤ 25 m, Radio interference level, maximum motor cable length
Communication interface		Ethernet IP, optional SmartWire-DT, optional OP-Bus (RS485), built in PROFIBUS, optional Modbus RTU, built in Modbus-TCP, optional PROFINET, optional EtherCAT, optional CANopen®, built in DeviceNet, optional
Connection to SmartWire-DT		In conjunction with DX-NET-SWD1 SmartWire DT module Yes
Degree of protection		IP55 NEMA 12
Electromagnetic compatibility		1st and 2nd environments (according to EN 61800-3)
Fitted with:		Radio interference suppression filter DC link choke Additional PCB protection IGBT inverter OLED display Internal DC link Breaking resistance Control unit PC connection Brake chopper

Frame size		FS6
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		PROFINET IO MODBUS Other bus systems EtherNet/IP DeviceNet PROFIBUS CAN TCP/IP
Safety function/level		STO (Safe Torque Off, SIL2, PLc Cat 2)
Suitable for		Branch circuits, (UL/CSA)
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
Climatic environmental conditions		
Ambient operating temperature - min		-10 °C
Altitude		Max. 1000 m Above 1000 m with 1 % derating per 100 m Max. 4000 m
Ambient operating temperature - max		40 °C
Ambient operating temperature at 150% overload - min		-10 °C
Ambient operating temperature at 150% overload - max		40 °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		97.6 % (η)
Heat dissipation at current/speed		370 W at 25% current and 0% speed 380 W at 25% current and 50% speed 460 W at 50% current and 0% speed 490 W at 50% current and 50% speed 560 W at 50% current and 90% speed 710 W at 100% current and 0% speed 870 W at 100% current and 50% speed 960 W at 100% current and 90% speed
Input current ILN at 150% overload		102.7 A
Leakage current at ground IPE - max		2.68 mA
Mains switch-on frequency		Maximum of one time every 30 seconds
Mains voltage - min		380 V
Mains voltage - max		480 V
Operating mode		Optional: Vector control with feedback (CLV) U/f control Sensorless vector control (SLV) Speed control with slip compensation
Output frequency - min		0 Hz
Output frequency - max		500 Hz
Output voltage (U2)		480 V AC, 3-phase 400 V AC, 3-phase
Overload current IL at 150% overload		135 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		90 A
Rated operational power at 380/400 V, 50 Hz, 3-phase		45 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		125 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	4 kHz, 4 - 16 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	81 A
Assigned motor current IM at 440 - 480 V, 60 Hz, 150% overload	77 A
Assigned motor power at 460/480 V, 60 Hz, 3-phase	60 HP
Apparent power	
Apparent power at 400 V	62.35 kV-A
Apparent power at 480 V	74.82 kV-A
Braking function	
Braking resistance	6 Ω
Braking torque	Max. 30 % MN, Standard - Main circuit Max. 100 % of rated operational current I _e , variable, DC - Main circuit Max. 100 % of rated operational current I _e with external braking resistor - 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 (U _c)	24 V DC (external, max. 100 mA)
Design verification	
Equipment heat dissipation, current-dependent P _{vid}	1080 W
Heat dissipation capacity P _{diss}	0 W
Heat dissipation per pole, current-dependent P _{vid}	0 W
Rated operational current for specified heat dissipation (I _n)	90 A
Static heat dissipation, non-current-dependent P _{vs}	0 W
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.

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 I _{2N}	A	90
Max. output at quadratic load at rated output voltage	kW	45
Max. output at linear load at rated output voltage	kW	45
Power consumption	W	1080
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 PROFI-safe		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)			IP55
Degree of protection (NEMA)			12
Height		mm	865
Width		mm	330
Depth		mm	313.5