DATASHEET - DA1-34090FB-B55C

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

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

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	UL File No.: E172143 IEC/EN 61800-3 UL Category Control No.: NMMS, NMMS7 IEC/EN61800-5 DNV IEC/EN61800-3 Certified by UL for use in Canada EAC UL CUL UL report applies to both US and Canada CSA-C22.2 No. 14 Specification for general requirements: IEC/EN 61800-2 CE RoHS, ISO 9001 UkrSEPRO RCM UL 508C Safety: EN 61800-5-1: 2003
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	C3 ≤ 25 m, Radio interference level, maximum motor cable length C2 ≤ 5 m, Radio interference level, maximum motor cable length 300 m, unscreened, with motor choke, maximum permissible, Motor feeder 200 m, screened, with motor choke, maximum permissible, Motor feeder 150 m, unscreened, maximum permissible, Motor feeder 100 m, screened, maximum permissible, Motor feeder
Communication interface	DeviceNet, optional CANopen®, built in EtherCAT, optional PROFINET, optional Modbus-TCP, optional Modbus RTU, built in PROFIBUS, optional OP-Bus (RS485), built in SmartWire-DT, optional Ethernet IP, optional
Connection to SmartWire-DT	Yes In conjunction with DX-NET-SWD1 SmartWire DT module
Degree of protection	NEMA 12 IP55
Electromagnetic compatibility	1st and 2nd environments (according to EN 61800-3)
Fitted with:	Brake chopper PC connection Control unit Breaking resistance Internal DC link OLED display IGBT inverter Additional PCB protection DC link choke Radio interference suppression filter

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	TCP/IP CAN PROFIBUS DeviceNet EtherNet/IP Other bus systems MODBUS PROFINET IO
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. 4000 m Above 1000 m with 1 % derating per 100 m Max. 1000 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	960 W at 100% current and 90% speed 870 W at 100% current and 50% speed 710 W at 100% current and 0% speed 560 W at 50% current and 90% speed 490 W at 50% current and 50% speed 460 W at 50% current and 0% speed 380 W at 25% current and 50% speed 370 W at 25% current and 0% 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	Speed control with slip compensation Sensorless vector control (SLV) U/f control Optional: Vector control with feedback (CLV)
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	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	400 V AC, 3-phase 480 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. 100 % of rated operational current Ie with external braking resistor - Main circuit Max. 100 % of rated operational current Ie, variable, DC - 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	
Equipment heat dissipation, current-dependent Pvid	1080 W
Heat dissipation capacity Pdiss	0 W
Heat dissipation per pole, current-dependent Pvid	0 W
Rated operational current for specified heat dissipation (In)	90 A
Static heat dissipation, non-current-dependent Pvs	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.

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	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 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)			IP55
Degree of protection (NEMA)			12
Height		mm	865
Width		mm	330
Depth		mm	313.5

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