DATASHEET - DA1-32011FB-B6SC

Variable frequency drive, 230 V AC, 3-phase, 10.5 A, 2.2 kW, IP66/NEMA 4X, Radio interference suppression filter, OLED display, Local controls

Part no.	**DA1-32011FB-B6SC**
	169358
EL Number (Norway)	**4137826**

General specifications

Product name	Eaton DA1 Variable frequency drive
Part no.	DA1-32011FB-B6SC
EAN	4015081658060
Product Length/Depth	239.3 millimetre
Product height	257 millimetre
Product width	188 millimetre
Product weight	4.8 kilogram
Certifications	IEC/EN 61800-3 EAC IEC/EN61800-5 UL Category Control No.: NMMS, NMMS7 Specification for general requirements: IEC/EN 61800-2 UkrSEPRO UL 508C UL UL File No.: E172143 RCM UL report applies to both US and Canada CUL CE CSA-C22.2 No. 14 RoHS, ISO 9001 Safety: EN 61800-5-1: 2003 Certified by UL for use in Canada IEC/EN61800-3
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 C3 ≤ 25 m, Radio interference level, maximum motor cable length 150 m, unscreened, maximum permissible, Motor feeder 200 m, screened, with motor choke, maximum permissible, Motor feeder C2 ≤ 5 m, Radio interference level, maximum motor cable length 300 m, unscreened, with motor choke, maximum permissible, Motor feeder
Communication interface	Modbus RTU, built in PROFINET, optional Modbus-TCP, optional DeviceNet, optional CANopen®, built in PROFIBUS, optional Ethernet IP, optional OP-Bus (RS485), built in EtherCAT, optional
Connection to SmartWire-DT	No
Degree of protection	NEMA 4X IP66
Electromagnetic compatibility	1st and 2nd environments (according to EN 61800-3)
Fitted with:	PC connection Local controls Radio interference suppression filter Control unit Brake chopper Breaking resistance Additional PCB protection IGBT inverter OLED display Internal DC link
Frame size	FS2
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 PROFINET IO PROFIBUS EtherNet/IP MODBUS Other bus systems DeviceNet CAN
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 Max. 1000 m Above 1000 m with 1 % derating per 100 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	95.9 % (η)
Heat dissipation at current/speed	90 W at 100% current and 50% speed 74 W at 50% current and 90% speed 74 W at 100% current and 0% speed 62 W at 50% current and 50% speed 51 W at 25% current and 50% speed 43 W at 25% current and 0% speed 42 W at 50% current and 0% speed 112 W at 100% current and 90% speed
Input current ILN at 150% overload	13.2 A
Leakage current at ground IPE - max	1.73 mA
Mains switch-on frequency	Maximum of one time every 30 seconds
Mains voltage - min	200 V
Mains voltage - max	240 V
Operating mode	Optional: Vector control with feedback (CLV) Speed control with slip compensation U/f control Sensorless vector control (SLV)
Output frequency - min	0 Hz
Output frequency - max	500 Hz
Output voltage (U2)	240 V AC, 3-phase 230 V AC, 3-phase
Overload current IL at 150% overload	15.75 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	10.5 A
Rated operational power at 220/230 V, 50 Hz, 1-phase	2.2 kW
Rated operational voltage	240 V AC, 3-phase 230 V AC, 3-phase
Resolution	0.1 Hz (Frequency resolution, setpoint value)
Short-circuit protection rating	17.5 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	16 kHz, 4 - 32 kHz adjustable (audible), fPWM, Power section, Main circuit
System configuration type	AC supply systems with earthed center point
Voltage rating - max	240 V AC
Motor rating	
Assigned motor current IM at 220 - 240 V, 60 Hz, 150% overload	9.6 A
Assigned motor current IM at 230 V, 50 Hz, 150% overload	8.7 A
Assigned motor power at 230/240 V, 60 Hz, 1-phase	3 HP
Apparent power	
Apparent power at 230 V	4.18 kV·A
Apparent power at 240 V	4.36 kV·A
Braking function	
Braking resistance	35 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	390 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	90.2 W
Heat dissipation capacity Pdiss	0 W
Heat dissipation per pole, current-dependent Pvid	0 W
Rated operational current for specified heat dissipation (In)	10.5 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	200 - 240
Mains frequency		50/60 Hz
Number of phases input		3
Number of phases output		3
Max. output frequency	Hz	500
Max. output voltage	V	250
Nominal output current I2N	A	10.5
Max. output at quadratic load at rated output voltage	kW	2.2
Max. output at linear load at rated output voltage	kW	2.2
Power consumption	W	90.2
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)			IP66
Degree of protection (NEMA)			4X
Height		mm	257
Width		mm	188
Depth		mm	239.3

© 04/2023 by Eaton Industries GmbH