

Frequency inverter, 500 V AC, 3-phase, 28 A, 18.5 kW, IP20/NEMA 0,
Additional PCB protection, FS4



Part no. **DA1-35028NB-B20C**
197499

General specifications		
Product name		Eaton DA1 Variable frequency drive
Part no.		DA1-35028NB-B20C
EAN		4015081940745
Product Length/Depth		241 millimetre
Product height		419 millimetre
Product width		173 millimetre
Product weight		9.2 kilogram
Certifications		IEC/EN61800-5 IEC/EN 61800-3 UL Safety: EN 61800-5-1: 2003 CUL RCM IEC/EN 61800-2 UkrSEPRO RoHS, ISO 9001 IEC/EN61800-3 UL 508C UL File No.: E172143 CE UL Category Control No.: NMMS, NMMS7 EAC UL report applies to both US and Canada Certified by UL for use in Canada
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 200 m, screened, with motor choke, maximum permissible cable length 100 m, screened, maximum permissible cable length 150 m, unscreened, maximum permissible cable length
Communication interface		OP-Bus (RS485) PROFIBUS, optional Modbus RTU PROFINET, optional EtherCAT, optional DeviceNet, optional Modbus-TCP, optional Ethernet IP, optional CANopen® SmartWire-DT, optional
Connection to SmartWire-DT		Yes In conjunction with DX-NET-SWD1 SmartWire DT module
Degree of protection		IP20 NEMA Other
Fitted with:		OLED display IGBT inverter Brake chopper PC connection Internal DC link Breaking resistance Additional PCB protection Control unit
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

		PROFIBUS EtherNet/IP DeviceNet CAN PROFINET IO MODBUS Other bus systems
Safety function/level		STO (Safe Torque Off, SIL2, PLc Cat 2)
Suitable for		Branch circuits, (UL/CSA)
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		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		98.1 % (η)
Heat dissipation at current/speed		160 W at 25% current and 50% speed 167 W at 25% current and 0% speed 194 W at 50% current and 0% speed 195 W at 50% current and 50% speed 240 W at 50% current and 90% speed 306 W at 100% current and 0% speed 331 W at 100% current and 50% speed 399 W at 100% current and 90% speed
Input current ILN at 150% overload		34 A
Leakage current at ground IPE - max		28 mA
Mains switch-on frequency		Maximum of one time every 30 seconds
Mains voltage - min		500 V
Mains voltage - max		600 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)		500 V AC, 3-phase 600 V AC, 3-phase
Overload current IL at 150% overload		42 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		28 A
Rated operational power at 500 V, 50 Hz, 3-phase		18.5 kW
Rated operational power at 525 V, 50 Hz, 3-phase		18.5 kW
Rated operational voltage		500 V AC, 3-phase 600 V AC, 3-phase
Resolution		0.1 Hz (Frequency resolution, setpoint value)
Short-circuit protection		LPJ fuse used together with J60060-3 fuse base, Power wiring, Assigned switching and protective elements NH fuse used together with TB00-D fuse base, Power wiring, Assigned switching and protective elements
Short-circuit protection rating		50 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		600 V AC

Motor rating		
Assigned motor current IM at 500 V, 50 Hz, 150% overload		28 A
Assigned motor current IM at 525 V, 50 Hz, 150% overload		27.6 A
Assigned motor current IM at 550 - 600 V, 60 Hz, 150% overload		27 A
Assigned motor power at 575/600 V, 60 Hz, 3-phase		25 HP
Apparent power		
Apparent power at 600 V		29.1 kV-A
Braking function		
Braking resistance		33 Ω
Braking torque		Adjustable to 100 % (DC) Max. 100 % of rated operational current I _e with external braking resistor - Main circuit Max. 30 % MN, Standard - Main circuit
Switch-on threshold for the braking transistor		975 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		
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 (ec@ss13-27-02-31-01 [AKE177019])		
Mains voltage	V	500 - 600
Mains frequency		50/60 Hz
Number of phases input		3
Number of phases output		3
Max. output frequency	Hz	500
Max. output voltage	V	600

Nominal output current I2N	A	28
Max. output at quadratic load at rated output voltage	kW	15
Max. output at linear load at rated output voltage	kW	15
Power consumption	W	555
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

