



Variable frequency drive, 230 V AC, 3-phase, 18 A, 4 kW, IP20/NEMA 0, Brake chopper, FS3



Part no. DC1-32018NB-A20N
Catalog No. 169441
Alternate Catalog No. DC1-32018NB-A20N

Delivery program

				This item will continue to be available for a limited time only and is being replaced by the following item: 185833, DC1-32018NB-A20CE1
Product range				Variable frequency drives
Part group reference (e.g. DIL)				DC1
Rated operational voltage	U_e			230 V AC, 3-phase 240 V AC, 3-phase
Output voltage with V_e	U_2			230 V AC, 3-phase 240 V AC, 3-phase
Mains voltage (50/60Hz)	U_{LN}	V		200 (-10%) - 240 (+10%)
Rated operational current				
At 150% overload	I_e	A		18
Note				Rated operational current at a switching frequency of 8 kHz and an ambient air temperature of +50 °C
Assigned motor rating				
Note				for normal internally and externally ventilated 4 pole, three-phase asynchronous motors with 1500 rpm ⁻¹ at 50 Hz or 1800 min ⁻¹ at 60 Hz
Note				Overload cycle for 60 s every 600 s
Note				at 230 V, 50 Hz
150 % Overload	P	kW		4
150 % Overload	I_M	A		14.8
Note				at 220 - 240 V, 60 Hz
150 % Overload	P	HP		5
150 % Overload	I_M	A		15.2
Degree of Protection				IP20/NEMA0
Interface/field bus (built-in)				OP-Bus (RS485)/Modbus RTU, CANopen®
Fieldbus connection (optional)				SmartWire-DT
Fitted with				Brake chopper 7-digital display assembly
Parameterization				Keypad Fieldbus drivesConnect drivesConnect mobile (App)
Frame size				FS3
Connection to SmartWire-DT				yes in conjunction with DX-NET-SWD3 SmartWire DT module

Technical data

General

Standards				Specification for general requirements: IEC/EN 61800-2 EMC requirements: IEC/EN 61800-3 Safety requirements: IEC/EN 61800-5-1
Certifications				CE, UL, cUL, RCM, UkrSEPRO, EAC
Production quality				RoHS, ISO 9001
Climatic proofing	ρ_w	%		< 95%, average relative humidity (RH), non-condensing, non-corrosive
Ambient temperature				
Operating ambient temperature min.		°C		-10
Operating ambient temperature max.		°C		+ 50
				operation (with 150 % overload)

Storage	θ	°C	-40 - +60
Mounting position			Vertical
Altitude		m	0 - 1000 m above sea level Above 1000 m: 1% derating for every 100 m max. 4000 m
Degree of Protection			IP20/NEMA0
Protection against direct contact			BGV A3 (VBG4, finger- and back-of-hand proof)

Main circuit

Supply			
Rated operational voltage	U_e		230 V AC, 3-phase 240 V AC, 3-phase
Mains voltage (50/60Hz)	U_{LN}	V	200 (-10%) - 240 (+10%)
Input current (150% overload)	I_{LN}	A	20.9
System configuration			AC supply systems with earthed center point
Supply frequency	f_{LN}	Hz	50/60
Frequency range	f_{LN}	Hz	48 - 62
Mains switch-on frequency			Maximum of one time every 30 seconds
Power section			
Function			Variable frequency drive with internal DC link and IGBT inverter
Overload current (150% overload)	I_L	A	27
max. starting current (High Overload)	I_H	%	175
Note about max. starting current			for 2 seconds every 20 seconds
Output voltage with V_e	U_2		230 V AC, 3-phase 240 V AC, 3-phase
Output Frequency	f_2	Hz	0 - 50/60 (max. 500)
Switching frequency	f_{PWM}	kHz	8 adjustable 4 - 24 (audible)
Operation Mode			U/f control Speed control with slip compensation
Frequency resolution (setpoint value)	Δf	Hz	0.1
Rated operational current			
At 150% overload	I_e	A	18
Note			Rated operational current at a switching frequency of 8 kHz and an ambient air temperature of +50 °C
Power loss			
Heat dissipation at rated operational current $I_e = 150\%$	P_V	W	160
Efficiency	η	%	96
Maximum leakage current to ground (PE) without motor	I_{PE}	mA	< 1
Fitted with			Brake chopper 7-digital display assembly
Frame size			FS3
Motor feeder			
Note			for normal internally and externally ventilated 4 pole, three-phase asynchronous motors with 1500 rpm^{-1} at 50 Hz or 1800 min^{-1} at 60 Hz
Note			Overload cycle for 60 s every 600 s
Note			at 230 V, 50 Hz
150 % Overload	P	kW	4
Note			at 220 - 240 V, 60 Hz
150 % Overload	P	HP	5
maximum permissible cable length	l	m	screened: 100 screened, with motor choke: 200 unscreened: 150 unscreened, with motor choke: 300
Apparent power			
Apparent power at rated operation 230 V	S	kVA	7.17
Apparent power at rated operation 240 V	S	kVA	7.48
Braking function			
Standard braking torque			max. 30 % M_N
DC braking torque			max. 100% of rated operational current I_e , variable

Braking torque with external braking resistance			Max. 100% of rated operational current I_b with external braking resistor
minimum external braking resistance	R_{min}	Ω	25
Switch-on threshold for the braking transistor	U_{DC}	V	390 V DC

Control section

Reference voltage	U_s	V	10 V DC (max. 10 mA)
Analog inputs			2, parameterizable, 0 - 10 V DC, 0/4 - 20 mA
Analog outputs			1, parameterizable, 0 - 10 V
Digital inputs			4, parameterizable, max. 30 V DC
Digital outputs			1, parameterizable, 24 V DC
Relay outputs			1, parameterizable, N/O, 6 A (250 V, AC-1) / 5 A (30 V, DC-1)
Interface/field bus (built-in)			OP-Bus (RS485)/Modbus RTU, CANopen®

Assigned switching and protective elements

Power Wiring			
Safety device (fuse or miniature circuit-breaker)			
IEC (Type B, gG), 150 %			FAZ-B20/3
UL (Class CC or J)		A	20
Mains contactor			
150 % overload (CT/ I_H , at 50 °C)			DILM7 DILM7-...
Main choke			
150 % overload (CT/ I_H , at 50 °C)			DX-LN3-025
Radio interference suppression filter (external, 150 %)			DX-EMC34-030
Radio interference suppression filter, low leakage currents (external, 150 %)			DX-EMC34-030-L
Note regarding radio interference suppression filter			Optional external radio interference suppression filter for longer motor cable lengths and for use in different EMC environments
DC link connection			
Braking resistance			
10 % duty factor (DF)			DX-BR035-1K1
20 % duty factor (DF)			DX-BR035-1K1
40 % duty factor (DF)			DX-BR040-3K1
Notes concerning braking resistances:			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.
Motor feeder			
motor choke			
150 % overload (CT/ I_H , at 50 °C)			DX-LM3-035
Sine filter			
150 % overload (CT/ I_H , at 50 °C)			DX-SIN3-023
All-pole sine filter			
150 % overload (CT/ I_H , at 50 °C)			DX-SIN3-024-A

Design verification as per IEC/EN 61439

Technical data for design verification			
Rated operational current for specified heat dissipation	I_n	A	18
Heat dissipation per pole, current-dependent	P_{vid}	W	0
Equipment heat dissipation, current-dependent	P_{vid}	W	160
Static heat dissipation, non-current-dependent	P_{vs}	W	0
Heat dissipation capacity	P_{diss}	W	0
Operating ambient temperature min.		°C	-10
Operating ambient temperature max.		°C	50
IEC/EN 61439 design verification			
10.2 Strength of materials and parts			
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 Verification of resistance of insulating materials to abnormal heat and fire due to internal electric 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 Insulation properties		
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 5.0

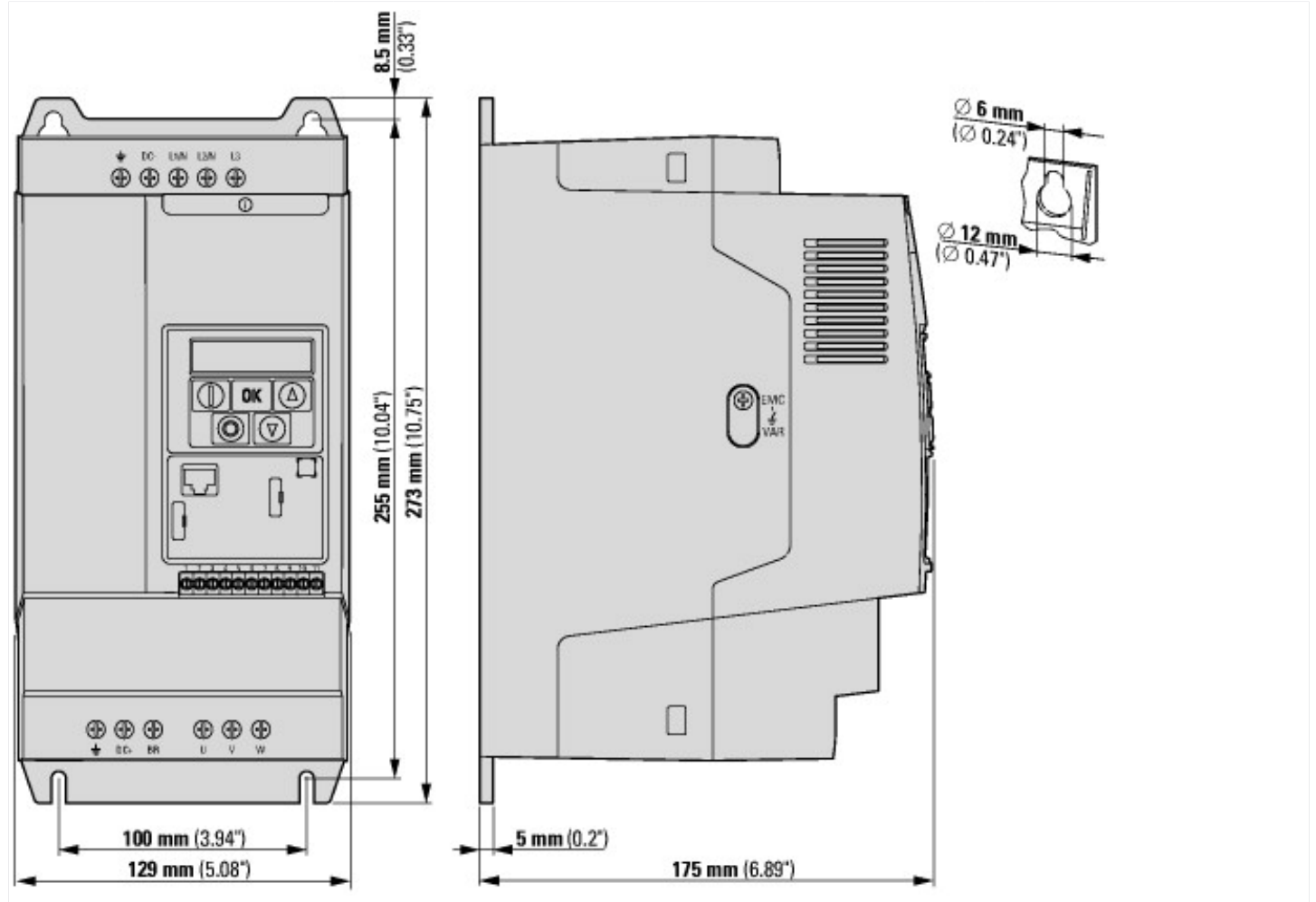
Low-voltage industrial components (EG000017) / Frequency controller =< 1 kV (EC001857)		
Electric engineering, automation, process control engineering / Electrical drive / Static frequency converter / Static frequency converter = < 1 kv (ecl@ss8-27-02-31-01 [AKE177010])		
Mains voltage	V	200 - 240
Mains frequency		50/60 Hz
Number of phases input		3
Number of phases output		3
Max. output frequency	Hz	500
Rated output voltage	V	230
Measuring output current	A	18
Output power at rated output voltage	kW	4
Max. output at quadratic load at rated output voltage	kW	4
Max. output at linear load at rated output voltage	kW	4
With control unit		Yes
Application in industrial area permitted		Yes
Application in domestic- and commercial area permitted		Yes
Supporting protocol for TCP/IP		No
Supporting protocol for PROFIBUS		No
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		No
Supporting protocol for SUCONET		No
Supporting protocol for LON		No
Supporting protocol for PROFINET IO		No
Supporting protocol for PROFINET CBA		No
Supporting protocol for SERCOS		No
Supporting protocol for Foundation Fieldbus		No
Supporting protocol for EtherNet/IP		No
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 other bus systems			No
Number of HW-interfaces industrial Ethernet			0
Number of HW-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			1
Number of HW-interfaces parallel			0
Number of HW-interfaces other			0
With optical interface			No
With PC connection			Yes
Integrated braking resistance			Yes
4-quadrant operation possible			No
Type of converter			U converter
Degree of protection (IP)			IP20
Height		mm	273
Width		mm	131
Depth		mm	175
Relative symmetric net frequency tolerance		%	5
Relative symmetric net current tolerance		%	10

Approvals

Product Standards			UL 508C; CSA-C22.2 No. 14; IEC/EN61800-3; IEC/EN61800-5; CE marking
UL File No.			E172143
UL Category Control No.			NMMS, NMMS7
CSA File No.			UL report applies to both US and Canada
North America Certification			UL listed, certified by UL for use in Canada
Specially designed for North America			No
Suitable for			Branch circuits
Max. Voltage Rating			3~ 240 V AC IEC: TN-S UL/CSA: "Y" (Solidly Grounded Wey)
Degree of Protection			IEC: IP20

Dimensions



Additional product information (links)

CA04020001Z-EN Product Range Catalog: Efficient Engineering for Starting and Controlling Motors

http://www.eaton.eu/DE/ecm/groups/public/@pub/@europe/@electrical/documents/content/pct_1095238.pdf