



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



Part no. DC1-32018NB-A20CE1
 Catalog No. 185833
 Eaton Catalog No. DC1-32018NB-A20CE1
 EL-Nummer 4137016
 (Norway)

Delivery program

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/NEMA 0
Interface/field bus (built-in)			OP-Bus (RS485)/Modbus RTU, CANopen®
Fieldbus connection (optional)			SmartWire-DT
Fitted with			Brake chopper 7-digital display assembly
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, Ukr SEPRO, EAC
Production quality			RoHS, ISO 9001
Climatic proofing	ρ _w	%	< 95%, average relative humidity (RH), non-condensing, non-corrosive
Ambient temperature			
operation (150 % overload)	θ	°C	-10 - +50
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/NEMA 0
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 3.75 seconds every 600 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 sensorless vector control (SLV)
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	6.8
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 % MN
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_e 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-EMC-34-030
Radio interference suppression filter, low leakage currents (external, 150 %)			DX-EMC34-025-FS3-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-BR050-0K4
20 % duty factor (DF)			DX-BR050-0K8
40 % duty factor (DF)			DX-BR047-3K1
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

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.