DATASHEET - DC1-349D5FB-A20CE1



Variable frequency drive, 400 V AC, 3-phase, 9.5 A, 4 kW, IP20/NEMA 0, Radio interference suppression filter, Brake chopper, FS2

Powering Business Worldwide



DC1-349D5FB-A20CE1 Part no. Catalog No. 185755

Alternate Catalog

DC1-349D5FB-A20CE1

No.

EL-Nummer 4137032

(Norway)

Del	ivery	pro	gram
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		Variable frequency drives
		DC1
U _e		400 V AC, 3-phase 480 V AC, 3-phase
U ₂		400 V AC, 3-phase 480 V AC, 3-phase
U_{LN}	V	380 (-10%) - 480 (+10%)
I _e	Α	9.5
		Rated operational current at a switching frequency of 8 kHz and an ambient air temperature of +50 $^{\circ}\text{C}$
		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
		Overload cycle for 60 s every 600 s
		at 400 V, 50 Hz
P	kW	4
I _M	Α	8.5
		at 440 - 480 V, 60 Hz
P	HP	5
I_{M}	Α	7.6
		IP20/NEMA0
		OP-Bus (RS485)/Modbus RTU, CANopen®
		SmartWire-DT
		Radio interference suppression filter Brake chopper 7-digital display assembly Additional PCB protection
		Keypad Fieldbus drivesConnect drivesConnect mobile (App)
		FS2
		yes in conjunction with DX-NET-SWD3 SmartWire DT module
	U ₂ U _{LN} I _e P I _M	U2 ULN V Ie A P kW IM A P HP

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
Air quality			3C2, 3S2
Ambient temperature			
Operating ambient temperature min.		°C	-10
Operating ambient temperature max.		°C	+ 50
			operation (with 150 % overload)

Storage	9	°C	-40 - +60
ladio interference level			
Radio interference class (EMC)			C2, C3, depending on the motor cable length, the connected load, and ambient conditions. External radio interference suppression filters (optional) may be necessary.
Environment (EMC)			1st and 2nd environments as per EN 61800-3
maximum motor cable length	I	m	C2 ≤ 5 m C3 ≤ 25 m
lounting position			Vertical
ltitude		m	0 - 1000 m above sea level Above 1000 m: 1% derating for every 100 m max. 4000 m
egree of Protection			IP20/NEMA0
otection against direct contact			BGV A3 (VBG4, finger- and back-of-hand proof)
ain circuit			
upply			700 A 0 0 A
Rated operational voltage	U _e		400 V AC, 3-phase 480 V AC, 3-phase
Mains voltage (50/60Hz)	U _{LN}	V	380 (-10%) - 480 (+10%)
Input current (150% overload)	I _{LN}	Α	11.5
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
ower section			
Function			Variable frequency drive with internal DC link and IGBT inverter
Overload current (150% overload)	IL	Α	14.25
max. starting current (High Overload)	I _H	%	175
Note about max. starting current			for 2,5 seconds every 600 seconds
Output voltage with $V_{\rm e}$	U ₂		400 V AC, 3-phase 480 V AC, 3-phase
Output Frequency	f ₂	Hz	0 - 50/60 (max. 500)
Switching frequency	f_{PWM}	kHz	8 adjustable 4 - 32 (audible)
Operation Mode			U/f control Speed control with slip compensation sensorless vector control (SLV) PM motors Synchronous reluctance motors BLDC motors
Frequency resolution (setpoint value)	Δf	Hz	0.1
Rated operational current			
At 150% overload	Ie	Α	9.5
Note			Rated operational current at a switching frequency of 8 kHz and an ambient air temperature of +50 $^{\circ}\text{C}$
Power loss			
Heat dissipation at rated operational current I $_{\rm e}$ =150 $\%$	P_V	W	136
Efficiency	η	%	96.6
Heat dissipation at current/speed [%]			
Current = 100%			
Speed = 0 %	P_V	W	97
Speed = 50 %	P_V	W	119
Speed = 90 %	P_V	W	141
Current = 50 %			
Speed = 0 %	P_V	W	61
Speed = 50 %	P_V	W	67
Speed = 90 %	P_V	W	80
Current = 50 %			
Speed = 0 %	P_V	W	50

Maximum leakage current to ground (PE) without motor	I _{PE}	mA	12.6
Fitted with			Radio interference suppression filter
Titod Will			Brake chopper
			7-digital display assembly Additional PCB protection
Frame size			FS2
Motor feeder			
Note			for normal internally and externally ventilated 4 pole, three-phase asynchronous
Note			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 400 V, 50 Hz
150 % Overload	P	kW	4
Note			at 440 - 480 V, 60 Hz
150 % Overload	P	HP	5
maximum permissible cable length	I	m	screened: 100 screened, with motor choke: 200 unscreened: 150 unscreened, with motor choke: 300
Apparent power			
Apparent power at rated operation 400 V	S	kVA	6.58
Apparent power at rated operation 480 V	S	kVA	7.9
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 le with external braking resistor
minimum external braking resistance	R _{min}	Ω	120
-			
Switch-on threshold for the braking transistor	U _{DC}	V	780 V DC
Control section Reference voltage	U_s	V	10 V DC (max. 10 mA)
•	O _S	V	
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 1, parameterizable, 24 V DC
Digital outputs Palau outputs			71
Relay outputs			1, parameterizable, N/0, 6 A (250 V, AC-1) / 5 A (30 V, DC-1)
Interface/field bus (built-in) Assigned switching and protective elements			OP-Bus (RS485)/Modbus RTU, CANopen®
Power Wiring			
Safety device (fuse or miniature circuit-breaker)			
IEC (Type B, gG), 150 %			FAZ-B16/3
UL (Class CC or J)		Α	15
Mains contactor		^	
150 % overload (CT/I _H , at 50 °C)			DILM7
Main choke			DILEM-10
			DV I N2 016
150 % overload (CT/I _H , at 50 °C)			DX-LN3-016
Radio interference suppression filter (external, 150 %)			DX-EMC34-016
Radio interference suppression filter, low leakage currents (external, 150 %)			DX-EMC34-016-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-BR150-0K5
20 % duty factor (DF)			DX-BR150-1K1
40 % duty factor (DF)			R:2 x DX-BR100-1K6
Notes concerning braking resistances:			R:m = "m" resistors connected in series
			The brake resistors are assigned based on the maximum rated power of the variable frequency drive. Additional brake resistors and designs (e.g. different dut cycles) are available upon request.
Motor feeder			
motor choke			

150 % overload (CT/I _H , at 50 °C)	DX-LM3-011
Sine filter	
150 % overload (CT/I _H , at 50 °C)	DX-SIN3-010
All-pole sine filter	
150 % overload (CT/I _H , at 50 °C)	DX-SIN3-013-A

Design verification as per IEC/EN 61439

3			
Technical data for design verification			
Rated operational current for specified heat dissipation	In	Α	9.5
Heat dissipation per pole, current-dependent	P _{vid}	W	0
Equipment heat dissipation, current-dependent	P _{vid}	W	136
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
			Operation (with 150 % overload)
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 $ \frac{1}{2} \left(\frac{1}{2} \right) = \frac{1}{2} \left(\frac{1}{2} \right) \left($			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 switch gear must be observed. $\label{eq:specifications}$
10.12 Electromagnetic compatibility			Is the panel builder's responsibility. The specifications for the switch gear must be observed. $\label{eq:constraint}$
10.13 Mechanical function			The device meets the requirements, provided the information in the instruction leaflet (IL) is observed.

Technical data ETIM 7.0

Low-voltage industrial components (EGUUUU17) / Frequency converter =< 1 kV (EGUU1857)			
Electric engineering, automation, process control engineering / Electrical drive / Static frequency converter / Static frequency converter = < 1 kV (ecl@ss10.0.1-27-02-31-01 [AKE177014])			
Mains voltage	V	342 - 528	
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	Α	9.5	
Max. output at quadratic load at rated output voltage	kW	4	

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Number of HW-interfaces RS-485 Number of HW-interfaces serial TTY Number of HW-interfaces USB Number of HW-interfaces parallel Number of HW-interfaces other Number of HW-interfaces other Number of HW-interfaces other No With optical interface No With PC connection 1 1 Number of HW-interfaces RS-485 1 0 Number of HW-interfaces USB No Yes	
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 0 Ves	
Number of HW-interfaces USB Number of HW-interfaces parallel Number of HW-interfaces other 0 With optical interface No With PC connection 0 Yes	
Number of HW-interfaces parallel Number of HW-interfaces other 0 With optical interface No With PC connection Yes	
Number of HW-interfaces other 0 With optical interface No With PC connection Yes	
With optical interface No With PC connection Yes	
With PC connection Yes	
Integrated breaking reciptores	
Integrated breaking resistance Yes	
4-quadrant operation possible Yes	
Type of converter U converter	
Degree of protection (IP)	
Degree of protection (NEMA) Other	
Height mm 231	
Width mm 107	
Depth mm 152	

Approvals

Product Standards	UL 508C; CSA-C22.2 No. 14; IEC/EN61800-3; IEC/EN61800-5; CE marking
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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~ 480 V AC IEC: TN-S UL/CSA: "Y" (Solidly Grounded Wey)
Degree of Protection	IEC: IP20

Dimensions

