DATASHEET - DC1-344D1FB-A20CE1



Variable frequency drives; 3-/3-phase 400 V; 4.1 A; 1.5 kW; EMC filters; braking transistor



Part no.DC1-344D1FB-A20CE1Catalog No.185749Eaton Catalog No.DC1-344D1FB-A20CE1EL-Nummer4137030(Norway)

Technical data

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Storage Badio interforme level Badio interforme class (EMC) Badio interforme class (EM	Ambient temperature			
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Image: Section Sectin Sectin Section Section Section Section Section Section Section	Mounting position			Vertical
Protection against direct contact Refer operational voltage	Altitude		m	Above 1000 m: 1% derating for every 100 m
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Supply Index Index <t< td=""><td></td><td></td><td></td><td>BGV A3 (VBG4, finger- and back-of-hand proof)</td></t<>				BGV A3 (VBG4, finger- and back-of-hand proof)
Bated operational voltage Ue Ve 400 V AC, 3-phase 400 V AC, 3-ph				
Mains voltage (50/60Hz) U _L N V 380 / 10%) · 480 (+ 10%) Input current (150% overload) I _L N A 5.6 Supply frequency I _L N Hz 50/60 Frequency range I _L N Hz 50/60 Mains switch-on frequency I _L N Hz 50/60 Power section I _L N Hz 48 - 62 Function I _L N A 55 Overload current (150% overload) I _L N A 56 Overload current (150% overload) I _L N A 56 Overload current (150% overload) I _L N A 56 Overload current (150% overload) I _L N A 56 Overload current (150% overload) I _L N A 56 Overload current (150% overload) I _L N A 56 Overload current (150% overload) I _L N A 56 Output requency I _L N A 56 Output voltage with V ₀ I _L N A 56 Output requency I _L N A 56 Output requency I _L N A 56 Output requency I _L N A 50 Output requency I _L N 50				
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Frequency range Function <t< td=""><td>System configuration</td><td></td><td></td><td>AC supply systems with earthed center point</td></t<>	System configuration			AC supply systems with earthed center point
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Function Icl Frequency inverter with internal DC link and IGBT inverter Overload current (150% overload) IL A 6.15 max. starting current (High Overload) IH % 175 Note about max. starting current U2 Frequency 600 seconds Output voltage with Ve U2 400 V AC, 3-phase 480 V AC, 3-phase Output Frequency f2 Hz 0-50/60 (max. 500) Switching frequency fPWM KHz fadjustable 4 - 32 (audible) Operation Mode U/f control speed control with slip compensation sensorless vector control (SLV) Frequency resolution (setpoint value) Af Hz 0.1 Rated operational current Lu Lu 1	Mains switch-on frequency			Maximum of one time every 30 seconds
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Note about max. starting current Image: Margin of an antipact of a starting current for 3.75 seconds every 600 seconds Output voltage with Ve U2 for 3.75 seconds every 600 seconds Output Frequency for 3.75 seconds every 600 seconds Output Frequency f2 Hz Switching frequency f2 Hz Operation Mode fPWM KHz Frequency resolution (setpoint value) Af Hz Rated operational current Af Hz	Overload current (150% overload)	IL	А	6.15
Output voltage with Ve U2 400 V AC, 3-phase 480 V AC, 3-phase Output Frequency f2 Hz 0 - 50/60 (max. 500) Switching frequency FPWM HZ 16 adjustable 4 - 32 (audible) Operation Mode V/f control Speed control with slip compensation sensorless vector control (SLV) V/f control Speed control (SLV) Frequency resolution (setpoint value) Af Hz 0.1 Rated operational current Hz 1 1	max. starting current (High Overload)	Ι _Η	%	175
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Operation Mode U/f control Speed control with slip compensation sensorless vector control (SLV) Frequency resolution (setpoint value) Δf Rated operational current	Output Frequency	f ₂	Hz	0 - 50/60 (max. 500)
Frequency resolution (setpoint value) Af Hz 0.1 Rated operational current Hz Hz Hz Hz	Switching frequency	f _{PWM}	kHz	
Rated operational current	Operation Mode			Speed control with slip compensation
	Frequency resolution (setpoint value)	Δf	Hz	0.1
At 150% overload Ie A 4.1	Rated operational current			
	At 150% overload	l _e	A	4.1

Note			Rated operational current at an operating frequency of 16 kHz and an ambient air temperature of +50 $^{\circ}\mathrm{C}$
Power loss			
Heat dissipation at rated operational current I _e =150 %	P _V	W	76.5
Efficiency		%	94.9
Maximum leakage current to ground (PE) without motor	η 	mA	12.6
	I _{PE}	IIIA	
Fitted with			Radio interference suppression filter Brake chopper 7-digital display assembly
Frame size			FS2
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 400 V, 50 Hz
150 % Overload	Р	kW	1.5
Note			at 440 - 480 V, 60 Hz
150 % Overload	Ρ	HP	2
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	2.84
Apparent power at rated operation 480 V	S	kVA	3.41
Braking function			
Standard braking torque			max. 30 % MN
DC braking torque			max. 100% of rated operational current l _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	100
Switch-on threshold for the braking transistor	U _{DC}	V	780 V DC
Control section			
Reference voltage	Us	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			
IEC (Type B, gG), 150 %			FAZ-B6/3
UL (Class CC or J)		A	6
150 % overload (CT/I _H , at 50 °C)			DX-LN3-006
Motor feeder			
150 % overload (CT/I _H , at 50 °C)			DX-LM3-005
150 % overload (CT/I _H , at 50 °C)			DX-SIN3-010
10 % duty factor (DF)			DX-BR100-0K8
20 % duty factor (DF)			DX-BR100-1K6
40 % duty factor (DF)			DX-BR100-6K2

Design verification as per IEC/EN 61439

Technical data for design verification			
Rated operational current for specified heat dissipation	In	А	4.1
Heat dissipation per pole, current-dependent	P _{vid}	W	0
Equipment heat dissipation, current-dependent	P _{vid}	W	76.5
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)
C/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 observed.
10.12 Electromagnetic compatibility			Is the panel builder's responsibility. The specifications for the switchgear must observed.
10.13 Mechanical function			The device meets the requirements, provided the information in the instruction leaflet (IL) is observed.

Technical data ETIM 6.0

Low-voltage industrial components (EG000017) / Frequency converter =< 1 kV (EC001857)

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Electric engineering, automation, process control engineering / Electrical drive / Static frequency converter / Static frequency converter = < 1 kv (ecl@ss8.1-27-02-31-01 [AKE177011])			
Mains voltage	V	380 - 480	
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	
Rated output current I2N	А	4.1	
Max. output at quadratic load at rated output voltage	kW	1.5	
Max. output at linear load at rated output voltage	kW	1.5	
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		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 other bus systems		Yes
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		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		No
Type of converter		U converter
Degree of protection (IP)		IP20
Height	mm	231
Width	mm	107
Depth	mm	152
Relative symmetric net frequency tolerance	%	10
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~ 480 V AC IEC: TN-S UL/CSA: "Y" (Solidly Grounded Wey)
Degree of Protection	IEC: IP20



