DATASHEET - DB1-344D1FB-N2CC



Variable frequency drive, 400 V AC, 3-phase, 4.1 A, 1.5 kW, IP20/NEMA0, Radio interference suppression filter, Additional PCB protection, FS2



Part no. DB1-344D1FB-N2CC Catalog No. 197564

Delivery program

		Variable frequency drives
		DB1
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%)
l _e	Α	4.1
		Rated operational current at an operating frequency of 8 kHz and an ambient air temperature of +60°C depending on cooling
		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	1.5
I _M	Α	4.1
		at 440 - 480 V, 60 Hz
Р	HP	2
I _M	Α	4.1
		IP20/NEMA0
		OP-Bus (RS485)/Modbus RTU, CANopen®
		Radio interference suppression filter Additional PCB protection
		Keypad Fieldbus drivesConnect drivesConnect mobile (App)
		FS2
		no
	U ₂ U _{LN} I _e P	U ₂ U _{LN} V I _e A P HP

Technical data

Genera

General			
Standards			General requirements: IEC/EN 61800-2 EMV requirements: IEC/EN 61800-3 Safety requirements: IEC/EN 61800-5-1
Certifications			CE, UL, cUL, RCM
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	+ 60
operating ambient temperature max.		U	operation (with 150 % overload)
Storage	9	°C	-40 - +60
Radio interference level	Ü	· ·	10 100
Radio interference class (EMC)			C1 (for conducted emissions only), 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	C1 ≤ 1 m C2 ≤ 3 m C3 ≤ 10 m
Mechanical shock resistance		g	15 (11 m/s, EN 60068-2-27)
Vibration			EN 61800-5-1
Mounting position			As required
Althorate			depending on the cooling
Altitude		m	0 - 1000 m above sea level Above 1000 m: 1% derating for every 100 m max. 2000 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		400 V AC, 3-phase
	-6		480 V AC, 3-phase
Mains voltage (50/60Hz)	U_{LN}	V	380 (-10%) - 480 (+10%)
Input current (150% overload)	I _{LN}	Α	5.6
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)	ΙL	Α	6.15
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		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	le	Α	4.1
Note			Rated operational current at an operating frequency of 8 kHz and an ambient air temperature of +60°C depending on cooling
Efficiency	η	%	97
Maximum leakage current to ground (PE) without motor	I _{PE}	mA	3.5 (3 x 400 V)
Fan			temperature controlled Tool-less swapping
Fitted with			Radio interference suppression filter Additional PCB protection
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	Р	HP	2
maximum permissible cable length	I	m	screened: 10
Apparent power			
Apparent power at rated operation 400 V	S	kVA	1.64
Apparent power at rated operation 480 V	S	kVA	1.97
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			
External control voltage	U _c	V	24 V DC (max. 100 mA)
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®
Expansion slots			1
Assigned switching and protective elements			
Power Wiring			
Safety device (fuse or miniature circuit-breaker)			
IEC (Type B, gG), 150 %			FAZ-B10/3
UL (Class CC or J)		Α	10
Mains contactor			
150 % overload (CT/I _H , at 50 °C)			DILM7
Main choke			
150 % overload (CT/I _H , at 50 °C)			DX-LN3-006
Radio interference suppression filter (external, 150 %)			DX-EMC34-008
Radio interference suppression filter, low leakage currents (external, 150 $\%)$			DX-EMC34-008-L
DC link connection			
Braking resistance			
10 % duty factor (DF)			DX-BR100-0K2
20 % duty factor (DF)			DX-BR100-0K4
40 % duty factor (DF)			DX-BR100-0K8
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-LM3-008
Sine filter			

Design verification as per IEC/EN 61439

150 % overload (CT/I_H, at 50 °C)

Technical data for design verification			
Rated operational current for specified heat dissipation	In	Α	4.1
Heat dissipation per pole, current-dependent	P _{vid}	W	0
Static heat dissipation, non-current-dependent	P _{vs}	W	0
Heat dissipation capacity	P _{diss}	W	0

DX-SIN3-010

Operating ambient temperature min.	°C	-10
Operating ambient temperature max.	°C	60
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 switch gear must be observed. $\label{eq:constraint}$
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

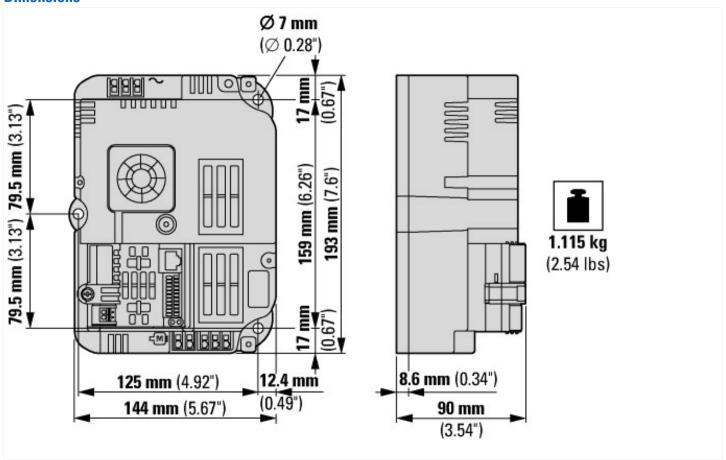
Todililoai data ETIM 7.0		
Low-voltage industrial components (EG000017) / Frequency converter =< 1 kV (EC00	01857)	
Electric engineering, automation, process control engineering / Electrical drive / Static frequency converter / Static frequency converter = < 1 kV (ecl@ss10.0.1-27-02-31-01 [AKE177014])		
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	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
Relative symmetric net frequency tolerance	%	10
Relative symmetric net voltage tolerance	%	10
Number of analogue outputs		1
Number of analogue inputs		2
Number of digital outputs		1
Number of digital inputs		4
With control unit		No
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 RASI No Supporting protocol for Data-Highway Na Supporting protocol for Data-Highway Na Supporting protocol for Data-Highway Na Supporting protocol for Device/let Na Supporting protocol for Device/let Na Supporting protocol for PROFINET DA Na Supporting protocol for Provinchita Stefaty Na Supporting protocol for Provinchita Stefaty Na Supporting protocol for PROFINET Na Supporting protocol for PROFINET Na Supporting protocol for PROFINET Na Supporting protocol for Stefaty BUS Na Supporting protocol for PROFINET Na Supporting protocol for Stefaty BUS	0		
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Supporting protocol for PROFINETOR No Supporting protocol for PROFINETORA No Supporting protocol for SERCOS No Supporting protocol for Foundation Fieldus No Supporting protocol for EtherNot/IP No Supporting protocol for EtherNot/IP No Supporting protocol for DeviceNet Safety No Supporting protocol for DeviceNet Safety No Supporting protocol for INTERBUS-Safety No Supporting protocol for SafetyBUS Safety No Number of HW-interfaces industrial Ethernet Safety Number of HW-interfaces industrial Ethernet Safety Number of HW-interfaces RS-422 Safety Number of HW-interfaces RS-45 Safety Number of HW-interfaces uses and ITY Safety Number of HW-interfaces uses and ITY Safety Number of HW-in	Supporting protocol for SUCONET		No
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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 HW-interfaces PROFINET 0 Number of HW-interfaces RS-232 0 Number of HW-interfaces RS-425 0 Number of HW-interfaces RS-485 1 Number of HW-interfaces supstance 0 Number of HW-interfaces upstance 0 Number of HW-interfaces supstance 0 Number of HW-interfaces upstance 0 Vith PC connection Yes Integrated breaking resistance Yes 4-quadrant operation possible Yes Type of converter U converter Degree of protection (IP) U converter	Supporting protocol for DeviceNet Safety		No
Supporting protocol for SACnet No Supporting protocol for BACnet 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-428 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 USB 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) U converter Degree of protection (NEMA) mm 130 Width mm 130	Supporting protocol for INTERBUS-Safety		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 parallel 0 Number of HW-interfaces parallel 0 Number of HW-interfaces other 0 With pCc onnection 0 Integrated breaking resistance Yes 4-quadrant operation possible Yes Type of converter U converter Degree of protection (IP) U converter Degree of protection (NEMA) Mm Height mm Witth DC converter C tother	Supporting protocol for PROFIsafe		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 other 0 With optical interface 0 With PC connection Yes Integrated breaking resistance Yes 4-quadrant operation possible Yes Type of converter U converter Degree of protection (IP) U converter Degree of protection (NEMA) Mm 130 Height mm 118 Witth mm 10	Supporting protocol for SafetyBUS p		No
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 uses 0 Number of HW-interfaces parallel 0 Number of HW-interfaces other 0 With optical interface No With PC connection Yes Vith 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) mm 130 Witth DC Connection mm 10	Supporting protocol for BACnet		No
Number of interfaces PR0FINET 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) P20 Degree of protection (NEMA) Mm Height mm Witth D mm Witth D mm 10 18	Supporting protocol for other bus systems		Yes
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 130 Witth mm 130 Witth mm 18	Number of HW-interfaces industrial Ethernet		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 130 Witth Other mm 11 Witth Other mm 10	Number of interfaces PROFINET		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) mm 130 Writh optical interface mm 118	Number of HW-interfaces RS-232		0
Number of HW-interfaces usb 0 Number of HW-interfaces Usb 0 Number of HW-interfaces parallel 0 Number of HW-interfaces other 0 Number of HW-interfaces other 0 With optical interface With Optical interface 0 With PC connection Ves	Number of HW-interfaces RS-422		0
Number of HW-interfaces USB Number of HW-interfaces parallel Number of HW-interfaces other O With optical interface With PC connection Integrated breaking resistance 4-quadrant operation possible Type of converter Degree of protection (IP) Degree of protection (NEMA) Width Width Width Mm Midth O O O O O O O O O O O O O	Number of HW-interfaces RS-485		1
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Number of HW-interfaces other With optical interface With PC connection With PC connection Vith Vith Vith Vith Vith Vith Vith Vith	Number of HW-interfaces USB		0
With optical interface With PC connection With PC connection Integrated breaking resistance 4-quadrant operation possible Type of converter U converter Degree of protection (IP) Degree of protection (NEMA) Height Width No Yes Yes Yes U converter U people of protection (IP) IP20 Other IP20 Other IP30 Width IP30 Width IP30 IP30 IP30 IP30 IP30 IP30 IP30 IP30	Number of HW-interfaces parallel		0
With PC connection Integrated breaking resistance 4-quadrant operation possible Type of converter Degree of protection (IP) Degree of protection (NEMA) Height Width Ves Ves U converter IP20 Other Haight mm 130 Width	Number of HW-interfaces other		0
Integrated breaking resistance 4-quadrant operation possible Type of converter U converter Degree of protection (IP) Degree of protection (NEMA) Height Width Yes U converter U converter Other IP20 Other IB20 Other	With optical interface		No
4-quadrant operation possible Type of converter Degree of protection (IP) Degree of protection (NEMA) Height Width Yes U converter IP20 Other 130 Mmm 130 Mmm 118	With PC connection		Yes
Type of converter Degree of protection (IP) Degree of protection (NEMA) Height Width U converter IP20 Other 130 mm 130 Width	Integrated breaking resistance		Yes
Degree of protection (IP) Degree of protection (NEMA) Degree of protection (NEMA) Height mm 130 Width 118	4-quadrant operation possible		Yes
Degree of protection (NEMA) Other Height mm 130 Width mm 118	Type of converter		U converter
Height mm 130 Width mm 118	Degree of protection (IP)		IP20
Width mm 118	Degree of protection (NEMA)		Other
	Height	mm	130
Depth mm 85	Width	mm	118
	Depth	mm	85

Approvals

UL 508C; CSA-C22.2 No. 274; IEC/EN61800-2; IEC/EN61800-3; IEC/EN61800-5-1; CE marking
E172143
NMMS2, NMMS8
UL report applies to both US and Canada
UL listed, certified by UL for use in Canada
No
Branch circuits
3~ 480 V AC IEC: TN-S UL/CSA: "Y" (Solidly Grounded Wey)
IEC: IP20, NEMA 0

Dimensions



Additional product information (links)

Additional product information (miks)			
IL040044ZU DB1 Frequency inverter			
IL040044ZU DB1 Frequency inverter	https://es-assets.eaton.com/DOCUMENTATION/AWA_INSTRUCTIONS/IL040044ZU2020_10.pdf		
IL040044ZU DB1 Frequency inverter	https://es-assets.eaton.com/DOCUMENTATION/AWA_INSTRUCTIONS/IL040044ZU2021_04.pdf		
MN040031 DB1 variable frequency drives, Installation manual			
MN040031 Frequenzumrichter DB1, Installationshandbuch - Deutsch	https://es-assets.eaton.com/DOCUMENTATION/AWB_MANUALS/MN040031_DE.pdf		
MN040031 DB1 variable frequency drives, Installation manual - English	https://es-assets.eaton.com/DOCUMENTATION/AWB_MANUALS/MN040031_EN.pdf		