Specifications



Eaton 185806

Eaton DC1 Variable frequency drive, 230 V AC, 1-phase, 4.3 A, 0.75 kW, IP20/NEMA 0, Radio interference suppression filter, FS1
DC1-124D3FN-A20CE1

General specifications

PRODUCT NAME	Eaton DC1 Variable frequency drive
CATALOG NUMBER	185806
MODEL CODE	DC1-124D3FN-A20CE1
EAN	4015081813056
PRODUCT LENGTH/DEPTH	124 mm
PRODUCT HEIGHT	184 mm
PRODUCT WIDTH	81 mm
PRODUCT WEIGHT	1.2 kg
CERTIFICATIONS	Specification for general requirements: IEC/EN 61800-2 Safety requirements: IEC/EN 61800-5-1 UL Category Control No.: NMMS, NMMS7 Certified by UL for use in Canada IEC/EN61800-5 CSA-C22.2 No. 14 IEC/EN61800-3 CUL RoHS, ISO 9001 UkrSEPRO CE RCM IEC/EN 61800-3 EAC UL 508C UL report applies to both US and Canada UL File No.: E172143 UL
CATALOG NOTES	• Environmental class: 3C2, 3S2 • Overload cycle for 60 s every 600 s

Powering Business Worldwide

Apparent power

APPARENT POWER AT 230 V	1.71 kVA
APPARENT POWER AT 240 V	1.79 kVA

Braking function

BRAKING TORQUE	Max. 100 % of rated operational current Ie, variable, DC - Main circuit Max. 30 % MN, Standard - Main circuit

Climatic environmental conditions

ALTITUDE	Above 1000 m with 1 % derating per 100 m Max. 4000 m
AMBIENT OPERATING TEMPERATURE - MAX	50 °C
AMBIENT STORAGE TEMPERATURE - MAX	60 °C
AMBIENT OPERATING TEMPERATURE - MIN	-10 °C
AMBIENT OPERATING TEMPERATURE AT 150% OVERLOAD - MAX	50 °C
AMBIENT OPERATING TEMPERATURE AT 150% OVERLOAD - MIN	-10 °C
AMBIENT STORAGE TEMPERATURE - MIN	-40 °C
CLIMATIC PROOFING	< 95 average relative humidity (RH), no condensation, no corrosion

Control circuit

NUMBER OF INPUTS (ANALOG)	2 (parameterizable, 0 - 10 V DC, 0/4 - 20 mA)
NUMBER OF INPUTS (DIGITAL)	4 (parameterizable, 10 - 30 V DC)
NUMBER OF OUTPUTS (ANALOG)	1
NUMBER OF OUTPUTS (DIGITAL)	1
NUMBER OF RELAY OUTPUTS	1 (parameterizable, N/O, 6 A (250 V, AC-1) / 5 A (30 V, DC-1))

Design verification

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.
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 RESIST. OF INSUL. MAT. TO ABNORMAL HEAT/FIRE BY INTERNAL ELECT. 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	Does not apply, since the

Features & functions

FEATURES	Parameterization: drivesConnect Parameterization: drivesConnect mobile (App) Parameterization: Fieldbus Parameterization: Keypad
FITTED WITH:	Control unit Internal DC link IGBT inverter Radio interference suppression filter 7-digital display assembly PC connection Additional PCB protection

AGAINST ELECTRIC SHOCK	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.
10.9.2 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.
EQUIPMENT HEAT DISSIPATION, CURRENT-DEPENDENT PVID	45.75 W
HEAT DISSIPATION CAPACITY PDISS	0 W
HEAT DISSIPATION PER POLE, CURRENT-DEPENDENT PVID	0 W
RATED OPERATIONAL CURRENT FOR SPECIFIED HEAT DISSIPATION (IN)	4.3 A
STATIC HEAT DISSIPATION, NON-CURRENT-DEPENDENT PVS	0 W

General information

CABLE LENGTH	50 m, screened, maximum permissible, Motor feeder 150 m, unscreened, with motor choke, maximum permissible, Motor feeder 100 m, screened, with motor choke, maximum permissible, Motor feeder C3 ≤ 25 m, Radio interference level, maximum motor cable length C1 ≤ 1 m, Radio interference level, maximum motor cable length C2 ≤ 5 m, Radio interference level, maximum motor cable length 75 m, unscreened, maximum permissible, Motor feeder
COMMUNICATION INTERFACE	CANopen®, built in Modbus RTU, built in SmartWire-DT, optional OP-Bus (RS485), built in
CONNECTION TO SMARTWIRE-DT	In conjunction with DX-NET-SWD3 SmartWire DT module Yes
DEGREE OF PROTECTION	IP20 NEMA Other
ELECTROMAGNETIC COMPATIBILITY	1st and 2nd environments (according to EN 61800-3)
FRAME SIZE	FS1
MOUNTING POSITION	Vertical
PRODUCT CATEGORY	Variable frequency drives
PROTECTION	Finger and back-of-hand proof, Protection against direct contact (BGV A3, VBG4)
PROTOCOL	MODBUS Other bus systems CAN EtherNet/IP
RADIO INTERFERENCE CLASS	C1: for conducted emissions only C2, C3: depending on the motor cable length, the connected load, and ambient conditions. External radio interference suppression filters

Main circuit

EFFICIENCY	93.9 % (η)
HEAT DISSIPATION AT CURRENT/SPEED	25 W at 25% current and 0% speed 26 W at 25% current and 50% speed 26 W at 50% current and 0% speed 29 W at 50% current and 50% speed 32 W at 50% current and 90% speed 33 W at 100% current and 0% speed 38 W at 100% current and 50% speed 43 W at 100% current and 90% speed
INPUT CURRENT ILN AT 150% OVERLOAD	7.5 A
LEAKAGE CURRENT AT GROUND IPE - MAX	4.8 mA
MAINS SWITCH-ON FREQUENCY	Maximum of one time every 30 seconds
MAINS VOLTAGE - MAX	240 V
MAINS VOLTAGE - MIN	200 V
OPERATING MODE	Sensorless vector control (SLV) U/f control Speed control with slip compensation BLDC motors PM motors Synchronous reluctance motors
OUTPUT FREQUENCY - MAX	500 Hz
OUTPUT FREQUENCY - MIN	0 Hz
OUTPUT VOLTAGE (U2)	240 V AC, 3-phase 230 V AC, 3-phase
OVERLOAD CURRENT IL AT 150% OVERLOAD	6.45 A
RATED CONTROL SUPPLY VOLTAGE	10 V DC (Us, max. 10 mA)
RATED FREQUENCY - MAX	62 Hz
RATED FREQUENCY - MIN	48 Hz
RATED OPERATIONAL CURRENT (IE)	4.3 A at 150% overload (at an operating frequency of 16 kHz and an ambient air temperature of +50 °C)

	(optional) may be necessary. Optional external radio interference suppression filter for longer motor cable lengths and for use in different EMC environments
SUITABLE FOR	Branch circuits, (UL/CSA)

RATED OPERATIONAL VOLTAGE	230 V AC, 1-phase 240 V AC, 1-phase
RESOLUTION	0.1 Hz (Frequency resolution, setpoint value)
SHORT-CIRCUIT PROTECTION RATING	10 A, UL (Class CC or J), Safety device (fuse or miniature circuit-breaker), Power Wiring
STARTING CURRENT - MAX	175 %, IH, max. starting current (High Overload), For 2.5 seconds every 600 seconds, Power section
SUPPLY FREQUENCY	50/60 Hz
SWITCHING FREQUENCY	8 kHz, 4 - 32 kHz adjustable (audible), fPWM, Power section, Main circuit
SYSTEM CONFIGURATION TYPE	AC supply systems with earthed center point
VOLTAGE RATING - MAX	240 V

Motor rating

ASSIGNED MOTOR CURRENT IM AT 220 - 240 V, 60 HZ, 150% OVERLOAD	4.2 A
ASSIGNED MOTOR CURRENT IM AT 230 V, 50 HZ, 150% OVERLOAD	3.2 A

Resources

APPLICATION NOTES	eaton-powerxl-dc1-motor-vf-curves-ap040049-en-us.pdf eaton-powerxl-da1-dc1-de1-conformal-coating-ap040182-en-us.pdf eaton-powerxl-dc1-accesslevel-parameterlock-ap040052-en-us.pdf eaton-powerxl-dc1-pi-controller-ap040053-en-us.pdf eaton-powerxl-vfd-dual-rating-ap040114-en-us.pdf eaton-powerxl-dc1-setpoint-setting-ap040060-en-us.pdf eaton-powerxl-da1-dc1-de1-system-bus-ap040022-en-us.pdf eaton-powerxl-dc1-fire-mode-ap040064-en-us.pdf eaton-powerxl-dc1-operating-pm-bldc-motors-ap040063-en-us.pdf

	eaton-powerxl-da1-dc1-de1-internal-motor-protection-ap040016-en-us.pdf eaton-powerxl-dc1-io-configuration-ap040057-en-us.pdf eaton-powerxl-da1-dc1-db1-de1-rapidlink5-firmware-update-ap040214-en-us.pdf eaton-powerxl-dx-com-stick-3-ap040190-en-us.pdf eaton-powerxl-dc1-starting-stopping-operation-ap040054-en-us.pdf eaton-powerxl-dc1-derating-ap040059-en-us.pdf
BROCHURES	eaton-powerxl-variable-frequency-drives-dc1-da1-brochure-br040001en-en-us.pdf
CATALOGUES	eaton-drives-soft-starter-catalog-ca04020001zen-us.pdf
DECLARATIONS OF CONFORMITY	eaton-variable-frequency-drive-declaration-of-conformity-uk251078en.pdf eaton-variable-frequency-drive-declaration-of-conformity-eu250595en.pdf
DRAWINGS	eaton-frequency-inverter-dimensions-017.eps eaton-frequency-inverter-dimensions-016.eps eaton-frequency-inverter-3d-drawing-003.eps
ECAD MODEL	DA-CE-ETN.DC1-124D3FN-A20CE1
INSTALLATION INSTRUCTIONS	IL04020009Z
INSTALLATION VIDEOS	Video PowerXL DA1 PowerXL Variable Frequency Drives DC1 and DA1 - EN

MANUALS AND USER GUIDES	MN040022_EN MN040018_EN eaton-dc1-variable-frequency-drive-mn040059en-us.pdf eaton-canopen-communication-manual-for-variable-frequency-drives-variable-speed-starters-da1-db1-dc1-de11-mn040019-en-us.pdf
MCAD MODEL	DA-CS-dc1_fs1
MULTIMEDIA	Looking for variable frequency drives DC1 and DA1 which can be used in harsh environments?
PRODUCT NOTIFICATIONS	eaton-drives-ecodesign-directive-mz040046en-en.pdf
SOFTWARE, FIRMWARE, AND APPLICATIONS	eaton-powerxl-de1-dc1-ethernetip-eds-v120.zip eaton-powerxl-dx-cbl-pc-1m5-usb-driver.zip eaton-powerxl-dc1-canopen-codesys-v3-library.zip eaton-powerxl-dx-cbl-pc-3m0-usb-driver.zip eaton-powerxl-dx-comstick3-ble-drivers.zip eaton-powerxl-pcsoftware-drivesconnect-v1501.zip eaton-powerxl-de1-dc1-profinet-gsdml-v240.zip eaton-powerxl-dc1-de1-swd-codesys-v3-library.zip eaton-powerxl-dc1-firmware-release-note-mz040040en-us.pdf eaton-powerxl-dc1-canopen-eds-v211.zip

PROJECT NAME:	
PROJECT NUMBER:	
PREPARED BY:	
DATE:	

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