Specifications



Eaton 185781

Eaton DC1 Variable frequency drive, 400 V AC, 3-phase, 39 A, 18.5 kW, IP20/NEMA 0, Radio interference suppression filter, Brake chopper, FS4 DC1-34039FB-A20CE1

General specifications	
PRODUCT NAME	Eaton DC1 Variable frequency drive
CATALOG NUMBER	185781
MODEL CODE	DC1-34039FB-A20CE1
EAN	4015081812806
PRODUCT LENGTH/DEPTH	211 mm
PRODUCT HEIGHT	418.5 mm
PRODUCT WIDTH	173 mm
PRODUCT WEIGHT	8.4 kg
CERTIFICATIONS	UL Category Control No.: NMMS, NMMS7 IEC/EN 61800-3 Safety requirements: IEC/EN 61800-5-1 EAC UL 508C RCM IEC/EN61800-3 UL Certified by UL for use in Canada CSA-C22.2 No. 14 RoHS, ISO 9001 UkrSEPRO IEC/EN61800-5 CUL CE UL report applies to both US and Canada Specification for general requirements: IEC/EN 61800-2 UL File No.: E172143
CATALOG NOTES	• Environmental class: 3C2, 3S2 • Overload cycle for 60 s every 600 s

Powering Business Worldwide

Apparent power

APPARENT POWER AT 400 V	15.6 kVA
APPARENT POWER AT 480 V	18.72 kVA

Braking function

BRAKING RESISTANCE	22 Ω
BRAKING TORQUE	Max. 100 % of rated operational current Ie, variable, DC - Main circuit
SWITCH-ON THRESHOLD FOR THE BRAKING TRANSISTOR	780 VDC

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:	IGBT inverter Control unit Brake chopper Internal DC link PC connection Breaking resistance 7-digital display assembly Radio interference suppression filter Additional PCB protection
FUNCTIONS	4-quadrant operation possible

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	728 W
HEAT DISSIPATION CAPACITY PDISS	0 W
HEAT DISSIPATION DETAILS	Operation (with 150 % overload)
HEAT DISSIPATION PER POLE, CURRENT-DEPENDENT PVID	0 W
RATED OPERATIONAL CURRENT FOR SPECIFIED HEAT DISSIPATION (IN)	39 A
STATIC HEAT DISSIPATION, NON-CURRENT-DEPENDENT PVS	0 W

General information

CABLE LENGTH	300 m, unscreened, with motor choke, maximum permissible, Motor feeder 200 m, screened, with motor choke, maximum permissible, Motor feeder 150 m, unscreened, maximum permissible, Motor feeder C3 ≤ 25 m, Radio interference level, maximum motor cable length 100 m, screened, maximum permissible, Motor feeder C2 ≤ 5 m, Radio interference level, maximum motor cable length
COMMUNICATION INTERFACE	CANopen®, built in SmartWire-DT, optional OP-Bus (RS485), built in Modbus RTU, 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	FS4
MOUNTING POSITION	Vertical
PRODUCT CATEGORY	Variable frequency drives
PROTECTION	Finger and back-of-hand proof, Protection against direct contact (BGV A3, VBG4)
PROTOCOL	CAN MODBUS Other bus systems EtherNet/IP
RADIO INTERFERENCE CLASS	C2, C3: depending on the motor cable length, the connected load, and ambient conditions. External radio interference suppression filters (optional) may be necessary. Optional external radio interference suppression filter for longer motor

Main circuit

HEAT DISSIPATION AT CURRENT/SPEED	198 W at 25% current and 0% speed 198 W at 25% current and 50% speed 198 W at 50% current and 0% speed 214 W at 50% current and 50% speed 227 W at 50% current and 90% speed 363 W at 100% current and 0% speed 413 W at 100% current and 50% speed 460 W at 100% current and 90% speed
INPUT CURRENT ILN AT 150% OVERLOAD	44.1 A
LEAKAGE CURRENT AT GROUND IPE - MAX	12.9 mA
MAINS SWITCH-ON FREQUENCY	Maximum of one time every 30 seconds
MAINS VOLTAGE - MAX	480 V
MAINS VOLTAGE - MIN	380 V
OPERATING MODE	U/f control Sensorless vector control (SLV) 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)	480 V AC, 3-phase 400 V AC, 3-phase
OVERLOAD CURRENT IL AT 150% OVERLOAD	58.5 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)	39 A at 150% overload (at an operating frequency of 16 kHz and an ambient air temperature of +50 °C)
RATED OPERATIONAL	18.5 kW

	cable lengths and for use in different EMC environments
SUITABLE FOR	Branch circuits, (UL/CSA)

POWER AT 380/400 V, 50 HZ, 3-PHASE	
RATED OPERATIONAL VOLTAGE	480 V AC, 3-phase 400 V AC, 3-phase
RESOLUTION	0.1 Hz (Frequency resolution, setpoint value)
SHORT-CIRCUIT PROTECTION RATING	60 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 - 24 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 400 V, 50 HZ, 150% OVERLOAD	39 A
ASSIGNED MOTOR CURRENT IM AT 440 - 480 V, 60 HZ, 150% OVERLOAD	39 A
ASSIGNED MOTOR POWER AT 460/480 V, 60 HZ, 3-PHASE	25 HP

Resources

APPLICATION NOTES	eaton-powerxl-vfd-dual-rating-ap040114-en-us.pdf eaton-powerxl-dc1-operating-pm-bldc-motors-ap040063-en-us.pdf eaton-powerxl-da1-dc1-de1-conformal-coating-ap040182-en-us.pdf eaton-powerxl-dc1-setpoint-setting-ap040060-en-us.pdf eaton-powerxl-dc1-fire-mode-ap040064-en-us.pdf eaton-powerxl-dx-com-stick-3-ap040190-en-us.pdf eaton-powerxl-dc1-motor-vf-curves-ap040049-en-us.pdf eaton-powerxl-dc1-derating-ap040059-en-us.pdf

	eaton-powerxl-dc1-io-configuration-ap040057-en-us.pdf eaton-powerxl-da1-dc1-de1-internal-motor-protection-ap040016-en-us.pdf eaton-powerxl-da1-dc1-de1-system-bus-ap040022-en-us.pdf eaton-powerxl-da1-dc1-db1-de1-rapidlink5-firmware-update-ap040214-en-us.pdf eaton-powerxl-dc1-accesslevel-parameterlock-ap040052-en-us.pdf eaton-powerxl-dc1-starting-stopping-operation-ap040054-en-us.pdf eaton-powerxl-dc1-pi-controller-ap040053-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-eu250595en.pdf eaton-variable-frequency-drive-declaration-of-conformity-uk251078en.pdf
DRAWINGS	eaton-frequency-inverter-dimensions-011.eps eaton-frequency-inverter-3d-drawing-019.eps
ECAD MODEL	DA-CE-ETN.DC1-34039FB-A20CE1
INSTALLATION INSTRUCTIONS	IL040024ZU

INSTALLATION VIDEOS	PowerXL Variable Frequency Drives DC1 and DA1 - EN Video PowerXL DA1
MANUALS AND USER GUIDES	eaton-dc1-variable-frequency-drive-mn040059en-us.pdf MN040022_EN MN040018_EN eaton-canopen-communication-manual-for-variable-frequency-drives-variable-speed-starters-da1-db1-dc1-de11-mn040019-en-us.pdf MN040023_EN
MCAD MODEL	DA-CS-dc1_fs4_ip20
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-dc1-de1-swd-codesys-v3-library.zip eaton-powerxl-pcsoftware-drivesconnect-v1501.zip eaton-powerxl-de1-dc1-ethernetip-eds-v120.zip eaton-powerxl-dx-cbl-pc-3m0-usb-driver.zip eaton-powerxl-de1-dc1-profinet-gsdml-v240.zip eaton-powerxl-dc1-canopen-eds-v211.zip eaton-powerxl-dx-comstick3-ble-drivers.zip eaton-powerxl-dc1-firmware-release-note-mz040040en-us.pdf eaton-powerxl-dx-cbl-pc-1m5-usb-driver.zip eaton-powerxl-dc1-canopen-codesys-v3-library.zip

PROJECT NAME:	
PROJECT NUMBER:	
PREPARED BY:	
DATE:	

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