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Eaton 199431

Eaton DC1 Variable frequency drive, 400 V AC, 3-phase, 4.1 A, 1.5 kW, IP66/NEMA 4X, Radio interference suppression filter, 7-digit digital display assembly, Additional PCB protection, UV resistant, FS1

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PRODUCT NAME	Eaton DC1 Variable frequency drive
CATALOG NUMBER	199431
PRODUCT LENGTH/DEPTH	162 mm
PRODUCT HEIGHT	232 mm
PRODUCT WIDTH	161 mm
PRODUCT WEIGHT	2.5 kg

CERTIFICATIONS

UL
IEC/EN 61800-2
RoHS, ISO 9001
UL Listed
RCM
UkrSEPRO
CUL
IEC/EN 61800-3
IEC/EN 61800-5-1
Certified by UL for use in Canada
CE marking
EAC
UL 508C
UL File No.: E172143
UL report applies to both US and Canada
IEC/EN61800-5
CE
UL Category Control No.: NMMS, NMMS7
CSA-C22.2 No. 14

CATALOG NOTES

- Environmental class: 3C3, 3S3
- Overload cycle for 60 s every 600 s
- For normal internally and externally



Powering Business Worldwide

ventilated four-pole
three-phase
asynchronous
motors with 1500
rpm at 50 Hz and
1800 rpm at 60 Hz

FEATURES

Parameterization: Keypad
 Parameterization:
 drivesConnect mobile
 (App)
 Parameterization:
 drivesConnect
 Parameterization: Fieldbus

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 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.
10.9.2 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.
FITTED WITH:	Radio interference suppression filter Internal DC link 7-digital display assembly Control unit PC connection IGBT inverter Additional PCB protection UV resistance
CLIMATIC PROOFING	< 95 average relative humidity (RH), no condensation, no corrosion
CONNECTION TO SMARTWIRE-DT	No
OPERATING MODE	BLDC motors Speed control with slip compensation U/f control Sensorless vector control (SLV) Synchronous reluctance motors PM motors
RATED IMPULSE WITHSTAND VOLTAGE (UIMP)	2000 V
FRAME SIZE	FS1
ALTITUDE	Above 1000 m with 1 % derating per 100 m

	Max. 4000 m
APPLICATION IN DOMESTIC AND COMMERCIAL AREA PERMITTED	Yes
MAINS SWITCH-ON FREQUENCY	Maximum of one time every 30 seconds
AMBIENT OPERATING TEMPERATURE - MAX	40 °C
AMBIENT OPERATING TEMPERATURE - MIN	-20 °C
MAINS VOLTAGE - MAX	480 V
OUTPUT VOLTAGE - MAX	500 V
RELATIVE SYMMETRIC NET FREQUENCY TOLERANCE	10 %
RELATIVE SYMMETRIC NET VOLTAGE TOLERANCE	10 %
AMBIENT STORAGE TEMPERATURE - MAX	60 °C
AMBIENT STORAGE TEMPERATURE - MIN	-40 °C
APPARENT POWER AT 400 V	2.84 kVA
APPARENT POWER AT 480 V	3.41 kVA
APPLICATION IN INDUSTRIAL AREA PERMITTED	Yes
PRODUCT CATEGORY	Variable frequency drives
PROTECTION	Finger and back-of-hand proof, Protection against direct contact (BGV A3, VBG4)
RESOLUTION	0.1 Hz (Frequency resolution, setpoint value)
VOLTAGE RATING - MAX	480 V
MOUNTING POSITION	Vertical
OVERVOLTAGE CATEGORY	III
COMMUNICATION INTERFACE	CANopen®, built in SmartWire-DT, optional OP-Bus (RS485), built in Modbus RTU, built in
CONVERTER TYPE	U converter
DEGREE OF PROTECTION	IP66 NEMA 4X
ASSIGNED MOTOR POWER AT 460/480 V, 60	2 HP

HZ, 3-PHASE	
HEAT DISSIPATION CAPACITY PDISS	0 W
HEAT DISSIPATION PER POLE, CURRENT-DEPENDENT PVID	0 W
INPUT CURRENT ILN AT 150% OVERLOAD	5.6 A
MAINS CURRENT DISTORTION	120 %
PROTOCOL	EtherNet/IP Other bus systems MODBUS CAN
OVERLOAD CURRENT IL AT 150% OVERLOAD	6.15 A
RATED FREQUENCY - MAX	62 Hz
RATED FREQUENCY - MIN	48 Hz
RATED OPERATIONAL POWER AT 380/400 V, 50 HZ, 3-PHASE	1.5 kW
ASSIGNED MOTOR CURRENT IM AT 400 V, 50 HZ, 150% OVERLOAD	3.6 A
ASSIGNED MOTOR CURRENT IM AT 440 - 480 V, 60 HZ, 150% OVERLOAD	3.4 A
SYSTEM CONFIGURATION TYPE	AC supply systems with earthed center point
BRAKING CURRENT	≤ 0.6 A (max. 6 A for 120 ms), Actuator for external motor brake
ELECTROMAGNETIC COMPATIBILITY	1st and 2nd environments (according to EN 61800-3)
BRAKING TORQUE	Max. 100 % of rated operational current Ie, variable, DC - Main circuit Max. 30 % MN, Standard - Main circuit
CABLE LENGTH	C3 ≤ 25 m, maximum motor cable length 75 m, unscreened, maximum permissible, Motor feeder 150 m, unscreened, with motor choke, maximum permissible, Motor feeder C2 ≤ 5 m, maximum motor cable length 100 m, screened, with motor choke, maximum

	permissible, Motor feeder 50 m, screened, maximum permissible, Motor feeder
OUTPUT VOLTAGE (U2)	480 V AC, 3-phase 400 V AC, 3-phase
DELAY TIME	< 10 ms, On-delay < 10 ms, Off-delay
NUMBER OF INPUTS (ANALOG)	2 (parameterizable, 0 - 10 V DC, 0/4 - 20 mA)
NUMBER OF INPUTS (DIGITAL)	4 (parameterizable, 10 - 30 V DC)
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 cable lengths and for use in different EMC environments
NUMBER OF OUTPUTS (DIGITAL)	1
STARTING CURRENT - MAX	175 % I _H
NUMBER OF PHASES (INPUT)	3
NUMBER OF RELAY OUTPUTS	1 (parameterizable, N/O, 6 A (250 V, AC-1) / 5 A (30 V, DC-1))
NUMBER OF PHASES (OUTPUT)	3
POWER CONSUMPTION	66.5 W
RATED CONTROL SUPPLY VOLTAGE	10 V DC (U _s , max. 10 mA)
EFFICIENCY	97 % (η)
SUPPLY FREQUENCY	50/60 Hz
LEAKAGE CURRENT AT GROUND IPE - MAX	13 mA
MAINS VOLTAGE - MIN	380 V
NOMINAL OUTPUT CURRENT I_{2N}	4.1 A
NUMBER OF HW- INTERFACES (INDUSTRIAL ETHERNET)	0
NUMBER OF HW- INTERFACES (OTHER)	0

NUMBER OF HW-INTERFACES (PARALLEL)	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 INTERFACES (PROFINET)	0
NUMBER OF OUTPUTS (ANALOG)	1
OUTPUT AT LINEAR LOAD AT RATED OUTPUT VOLTAGE - MAX	1.5 kW
OUTPUT AT QUADRATIC LOAD AT RATED OUTPUT VOLTAGE - MAX	1.5 kW
OUTPUT FREQUENCY - MAX	500 Hz
OUTPUT FREQUENCY - MIN	0 Hz
SHORT-CIRCUIT PROTECTION (EXTERNAL OUTPUT CIRCUITS)	Type 1 coordination via the power bus' feeder unit, Main circuit
SUITABLE FOR	Branch circuits, (UL/CSA)
SWITCHING FREQUENCY	8 kHz, 4 - 32 kHz adjustable (audible), fPWM, Power section, Main circuit
RATED OPERATIONAL CURRENT (IE)	4.1 A at 150% overload (at an operating frequency of 6 kHz and an ambient air temperature of +40 °C)
RATED OPERATIONAL VOLTAGE	400 V AC, 3-phase 480 V AC, 3-phase
SHORT-CIRCUIT PROTECTION RATING	6 A, UL (Class CC or J), Safety device (fuse or miniature circuit-breaker), Power Wiring
HEAT DISSIPATION AT CURRENT/SPEED	52 W at 25% current and 0% speed 53 W at 25% current and 50% speed 56 W at 50% current and 0% speed 61 W at 50% current and 50% speed

	62 W at 50% current and 90% speed
	68 W at 100% current and 0% speed
	73 W at 100% current and 50% speed
	78 W at 100% current and 90% speed

DECLARATIONS OF CONFORMITY

[eaton-variable-frequency-drive-declaration-of-conformity-uk251078en.pdf](#)

INSTALLATION VIDEOS

[Video PowerXL DA1](#)

MCAD MODEL

[e3_s1_ip66_ohne_bedienelementen.stp](#)
[e3_s1_ip66_ohne_bedienelementen.dwg](#)

[eaton-powerxl-variable-frequency-drives-dc1-da1-brochure-br040001en-en-us.pdf](#)

[eaton-frequency-inverter-dc1-dimensions-002.eps](#)

[How does the internal motor protection work?](#)
[DX-COM-STICK3 Connection](#)
[The OP System Bus - Parameterizing - Control](#)