Specifications

Eaton 199442

Catalog Number: 199442

Eaton DC1 Variable frequency drive, 400 V AC, 3-phase, 18 A, 7.5 kW, IP66/NEMA 4X, Radio interference suppression filter, Brake chopper, 7-digital display assembly, Local controls, Additional PCB protection, UV resistant, FS3



General specifications

Product Name
Eaton DC1 Variable frequency drive

Catalog Number
199442

EAN
4015081978311

Product Length/Depth
238 mm

Product Height
310 mm

Product Width
210.5 mm

Product Weight
7 kg

Certifications
EAC
IEC/EN 61800-2
IEC/EN 61800-5-1
UL File No.: E172143
CUL
UkrSEPRO
UL 508C
UL report applies to both US and Canada
UL
RoHS, ISO 9001
CSA-C22.2 No. 14
UL Listed
RCM
IEC/EN61800-5
CE marking
CE

Powering Business Worldwide

Certified by UL for use in Canada
IEC/EN 61800-3
U
NMMS7

Features & Functions

Features

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

Fitted with:

Local controls
Brake chopper
PC connection
Internal DC link
IGBT inverter
UV resistance
Control unit
Radio interference suppression filter
Breaking resistance
7-digital display assembly
Additional PCB protection

Functions

4-quadrant operation possible

Catalog Notes

Environmental class: 3C3, 3S3
Overload cycle for 60 s every 600 s
For normal internally and externally ventilated four-pole three-phase asynchronous motors with 1500 rpm at 50 Hz and 1800 rpm at 60 Hz

General

Cable length

100 m, screened, maximum permissible cable length
300 m, unscreened, with motor choke, maximum permissible, Motor feeder
C3 ≤ 25 m, maximum motor cable length
C2 ≤ 5 m, maximum motor cable length
200 m, screened, with motor choke, maximum permissible cable length
150 m, unscreened, maximum permissible cable length

Communication interface

OP-Bus (RS485), built in
SmartWire-DT, optional
Modbus RTU, built in
CANopen®, built in

Connection to SmartWire-DT

No

Degree of protection

IP66
NEMA 4X

Climatic environmental conditions

Altitude

Above 1000 m with 1 % derating per 100 m
Max. 4000 m

Ambient operating temperature - min

-20 °C

Ambient operating temperature - max

40 °C

Ambient storage temperature - min

-40 °C

Ambient storage temperature - max

60 °C

Climatic proofing

< 95 average relative humidity (RH), no condensation, no corrosion

Main circuit

Electromagnetic compatibility

1st and 2nd environments (according to EN 61800-3)

Frame size

FS3

Mounting position

Vertical

Product category

Variable frequency drives

Protection

Finger and back-of-hand proof, Protection against direct contact (BGV A3, VBG4)

Protocol

CAN
EtherNet/IP
Other bus systems
MODBUS

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

Suitable for

Branch circuits, (UL/CSA)

Efficiency

97 % (η)

Heat dissipation capacity Pdiss

0 W

Input current ILN at 150% overload

21.2 A

Leakage current at ground IPE - max

12.7 mA

Mains switch-on frequency

Maximum of one time every 30 seconds

Mains voltage - min

380 V

Mains voltage - max

480 V

Operating mode

BLDC motors
Speed control with slip compensation
Sensorless vector control (SLV)
Synchronous reluctance motors
PM motors
U/f control

Output frequency - min

0 Hz

Output frequency - max

500 Hz

Output voltage (U2)

400 V AC, 3-phase
480 V AC, 3-phase

Overload current IL at 150% overload

27 A

Rated control supply voltage

10 V DC (Us, max. 10 mA)

Rated frequency - min

48 Hz

Rated frequency - max

62 Hz

Rated operational current (Ie)

18 A at 150% overload (at an operating frequency of 6 kHz and an ambient air temperature of +40 °C)

Rated operational power at 380/400 V, 50 Hz, 3-phase

7.5 kW

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

25 A, UL (Class CC or J), Safety device (fuse or miniature circuit-breaker), Power Wiring

Starting current - max

175 % IH

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

480 V

Motor rating

Assigned motor current IM at 110/120 V, 60 Hz, 150% overload

14 A

Assigned motor current IM at 115 V, 50 Hz, 150% overload

15.2 A

Assigned motor current IM at 220 - 240 V, 60 Hz, 150% overload

14 A

Assigned motor current IM at 230 V, 50 Hz, 150% overload

15.2 A

Assigned motor current IM at 400 V, 50 Hz, 150% overload

15.2 A

Assigned motor current IM at 440 - 480 V, 60 Hz, 150% overload

14 A

Assigned motor power at 115/120 V, 60 Hz, 1-phase

10 HP

Assigned motor power at 230/240 V, 60 Hz, 1-phase

10 HP

Assigned motor power at 460/480 V, 60 Hz

10 HP

Assigned motor power at 460/480 V, 60 Hz, 3-phase

10 HP

Apparent power

Apparent power at 400 V

12.47 kVA

Apparent power at 480 V

14.96 kVA

Braking function

Braking resistance

80 Ω

Braking torque

Max. 30 % MN, Standard - Main circuit

Max. 100 % of rated operational current Ie with external braking resistor - Main circuit

Max. 100 % of rated operational current Ie, variable, DC - Main circuit

Switch-on threshold for the braking transistor

780 VDC

Control circuit

Number of inputs (analog)

Design verification

Heat dissipation capacity Pdiss

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))

0 W

Heat dissipation per pole, current-dependent Pvid

0 W

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.

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.

Resources

Application notes

DX-COM-STICK3_Connection

The OP System Bus - Parameterizing - Control

Conformal Coating

Dependency of the output current on switching frequency and ambient temperature

Motor data - Motor Protection - V/f curves Slip Compensation

Connecting drives to generator supplies

Fire Mode

Set Point Setting

Update DX-COM-STICK3

PI controller

I/O Configuration

Operating Permanent Magnet and Brushless DC Motors

Low Temperature Applications

Operating Single Phase Motors

How does the internal motor protection work?

Electromagnetic compatibility (EMC)

Access to Parameter Levels 2 + 3 Parameter Lock - Load Default

Starting, Stopping and Operation

Brochures

eaton-powerxl-variable-frequency-drives-dc1-da1-brochure-br040001en-en-us.pdf

DA-SW-drivesConnect

Catalogs

Product Range Catalog Drives Engineering

Declarations of conformity

DA-DC-00004184.pdf

DA-DC-00003964.pdf

DA-DC-00004555.pdf

DA-DC-00004552.pdf

Drawings

eaton-frequency-inverter-dc1-dimensions-005.eps

Installation instructions

eaton-powerxl-dc1-ip66-instruction-leaflet-il040059zu.pdf

Installation videos

Video PowerXL DA1

PowerXL Variable Frequency Drives DC1 and DA1 - EN

Manuals and user guides

MN040022_EN

MN040018_EN

MN040059_EN

MN040003_EN

eaton-canopen-communication-manual-for-variable-frequency-drives-variable-speed-starters-da1-db1-dc1-de11-mn040019-en-us.pdf

mCAD model

e3_s3_ip66_mit_bedienelementen.dwg

e3_s3_ip66_mit_bedienelementen.stp

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

Eaton Corporation plc
Eaton House
30 Pembroke Road
Dublin 4, Ireland
Eaton.com

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