Specifications

Eaton 199421

Catalog Number: 199421

Eaton DC1 Variable frequency drive, 230 V AC, 3-phase, 18 A, 4 kW, IP66/NEMA 4X, Radio interference suppression filter, Brake chopper, 7-digital display assembly, Additional PCB protection, UV resistant, FS3



General specifications

Product Name
Eaton DC1 Variable frequency drive

Catalog Number
199421

EAN
4015081978106

Product Length/Depth
238 mm

Product Height
310 mm

Product Width
210.5 mm

Product Weight
7 kg

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

Powering Business Worldwide

RoHS, ISO 9001

UkrSEPRO

U

UL Listed

Features & Functions

Features

Parameterization: Fieldbus

Parameterization: drivesConnect mobile (App)

Parameterization: drivesConnect

Parameterization: Keypad

Fitted with:

Internal DC link

PC connection

Breaking resistance

Additional PCB protection

UV resistance

7-digital display assembly

Brake chopper

Control unit

Radio interference suppression filter

IGBT inverter

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

C3 ≤ 25 m, maximum motor cable length

200 m, screened, with motor choke, maximum permissible cable length

150 m, unscreened, maximum permissible cable length

C2 ≤ 5 m, maximum motor cable length

300 m, unscreened, with motor choke, maximum permissible, Motor feeder

Communication interface

SmartWire-DT, optional

Modbus RTU, built in

OP-Bus (RS485), built in

CANopen®, built in

Connection to SmartWire-DT

No

Degree of protection

NEMA 4X

IP66

Climatic environmental conditions

Altitude

Max. 4000 m

Above 1000 m with 1 % derating per 100 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

Other bus systems
MODBUS
EtherNet/IP
CAN

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

20.9 A

Leakage current at ground IPE - max

6.8 mA

Mains switch-on frequency

Maximum of one time every 30 seconds

Mains voltage - min

200 V

Mains voltage - max

240 V

Operating mode

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

Output frequency - min

0 Hz

Output frequency - max

500 Hz

Output voltage (U2)

230 V AC, 3-phase
240 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 voltage

230 V AC, 3-phase

240 V AC, 3-phase

Resolution

0.1 Hz (Frequency resolution, setpoint value)

Short-circuit protection rating

20 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

240 V

Motor rating

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

15.2 A

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

14.8 A

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

15.2 A

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

14.8 A

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

14.8 A

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

15.2 A

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

5 HP

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

5 HP

Assigned motor power at 460/480 V, 60 Hz

5 HP

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

5 HP

Apparent power

Apparent power at 230 V

7.17 kVA

Apparent power at 240 V

7.48 kVA

Braking function

Braking resistance

25 Ω

Braking torque

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

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

Max. 30 % MN, Standard - Main circuit

Switch-on threshold for the braking transistor

390 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

Low Temperature Applications

Operating Permanent Magnet and Brushless DC Motors

I/O Configuration

PI controller

Operating Single Phase Motors

DX-COM-STICK3_Connection

The OP System Bus - Parameterizing - Control

Set Point Setting

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

Conformal Coating

Dependency of the output current on switching frequency and ambient temperature

How does the internal motor protection work?

Electromagnetic compatibility (EMC)

Starting, Stopping and Operation

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

Connecting drives to generator supplies

Update DX-COM-STICK3

Fire Mode

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-00004552.pdf

DA-DC-00003964.pdf

DA-DC-00004555.pdf

Drawings

eaton-frequency-inverter-dc1-dimensions-006.eps

Installation instructions

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

Installation videos

PowerXL Variable Frequency Drives DC1 and DA1 - EN

Video PowerXL DA1

Manuals and user guides

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

MN040022_EN

MN040059_EN

MN040018_EN

MN040003_EN

mCAD model

e3_s3_ip66_ohne_bedienelementen.stp

e3_s3_ip66_ohne_bedienelementen.dwg

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

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