Specifications

# Eaton 199424

## Catalog Number: 199424

Eaton DC1 Variable frequency drive, 230 V AC, 3-phase, 24 A, 5.5 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**
199424

**EAN**
4015081978137

**Product Length/Depth**
238 mm

**Product Height**
310 mm

**Product Width**
210.5 mm

**Product Weight**
7 kg

**Certifications**
CUL
CSA-C22.2 No. 14
IEC/EN 61800-2
IEC/EN 61800-3
UL Category Control No.: NMMS, NMMS7
UL
UkrSEPRO
RCM
IEC/EN 61800-5-1
IEC/EN61800-5
CE marking
CE
UL report applies to both US and Canada
EAC
UL 508C

Powering Business Worldwide

UL File No.: E172143

RoHS, ISO 9001

U

Certified by UL for use in Canada

## Features & Functions

### Features

Parameterization: drivesConnect

Parameterization: Fieldbus

Parameterization: Keypad

Parameterization: drivesConnect mobile (App)

### Fitted with:

Local controls

IGBT inverter

Breaking resistance

7-digital display assembly

PC connection

Brake chopper

Internal DC link

Additional PCB protection

UV resistance

Control unit

Radio interference suppression filter

### 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

C2 ≤ 5 m, maximum motor cable length

C3 ≤ 25 m, maximum motor cable length

150 m, unscreened, maximum permissible cable length

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

100 m, screened, maximum permissible cable length

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

### Communication interface

CANopen®, built in

Modbus RTU, built in

SmartWire-DT, optional

OP-Bus (RS485), built in

### Connection to SmartWire-DT

No

### Degree of protection

IP66

NEMA 4X

## 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

CAN
MODBUS
EtherNet/IP
Other bus systems

### 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

26.4 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

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

### Output frequency - min

0 Hz

### Output frequency - max

500 Hz

### Output voltage (U2)

240 V AC, 3-phase
230 V AC, 3-phase

### Overload current IL at 150% overload

36 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)

24 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

32 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

24 A

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

24 A

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

24 A

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

24 A

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

24 A

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

24 A

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

7.5 HP

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

7.5 HP

Assigned motor power at 460/480 V, 60 Hz

7.5 HP

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

7.5 HP

## Apparent power

Apparent power at 230 V

5.52 kVA

Apparent power at 240 V

5.76 kVA

## Braking function

Braking resistance

20 Ω

Braking torque

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

Switch-on threshold for the braking transistor

390 VDC

## Control circuit

Number of inputs (analog)

2 (parameterizable, 0 - 10 V DC, 0/4 - 20 mA)

Number of inputs (digital)

## Design verification

Heat dissipation capacity Pdiss

0 W

Heat dissipation per pole, current-dependent Pvid

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

### 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

Starting, Stopping and Operation

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

Connecting drives to generator supplies

How does the internal motor protection work?

Electromagnetic compatibility (EMC)

Fire Mode

Update DX-COM-STICK3

I/O Configuration

PI controller

Low Temperature Applications

Operating Single Phase Motors

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

DX-COM-STICK3_Connection

Operating Permanent Magnet and Brushless DC Motors

Set Point Setting

Conformal Coating

The OP System Bus - Parameterizing - Control

Dependency of the output current on switching frequency and ambient temperature

### 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-00004555.pdf

DA-DC-00003964.pdf

### Drawings

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

MN040003_EN

MN040022_EN

MN040018_EN

MN040059_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

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