

# Eaton EP-400039

Catalog Number: EP-400039

Eaton DA1 Variable frequency drive, 400 V AC, 3-phase, 5.8 A, 2.2 kW, IP66/NEMA 4X, Radio interference suppression filter, OLED display, UV resistant



Photo is representative

## General specifications

**Product Name** Catalog Number

Eaton DA1 Variable frequency drive EP-400039

**Model Code** EAN

DA1-345D8FB-B66O 4015082950217

**Product Length/Depth** Product Height

171.5 mm 257 mm

**Product Width** Product Weight

188 mm 3.5 kg

**Certifications** Catalog Notes

CE  
 Certified by UL for use in Canada  
 CSA-C22.2 No. 14  
 CUL  
 EAC  
 IEC/EN 61800-3  
 IEC/EN61800-3  
 IEC/EN61800-5  
 RCM  
 RoHS, ISO 9001  
 Safety: EN 61800-5-1: 2003  
 Specification for general requirements:  
 IEC/EN 61800-2  
 UkrSEPRO  
 UL  
 UL 508C  
 UL Category Control No.: NMMS,  
 NMMS7  
 UL File No.: E172143

The brake resistors are assigned based on the maximum rated power of the variable frequency drive. Additional brake resistors and designs (e.g. different duty cycles) are available upon request.

## General

### Cable length

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

### Communication interface

CANopen®, built in  
EtherCAT, optional  
Ethernet IP, optional  
Modbus RTU, built in  
Modbus-TCP, optional  
OP-Bus (RS485), built in  
PROFIBUS, optional  
PROFINET, optional  
BACnet/IP, optional

### Connection to SmartWire-DT

No

### Degree of protection

IP66  
NEMA 4X

### Electromagnetic compatibility

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

### Fitted with:

PC connection  
Control unit  
Breaking resistance  
Additional PCB protection  
Brake chopper  
IGBT inverter  
Internal DC link  
OLED display  
Radio interference suppression filter

### Frame size

FS2

### Functions

## Climatic environmental conditions

### Altitude

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

### Ambient operating temperature - min

-10 °C

### Ambient operating temperature - max

40 °C

### Ambient operating temperature at 150% overload - min

-10 °C

### Ambient operating temperature at 150% overload - 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

### Efficiency

95.4 % (η)

### Heat dissipation at current/speed

51 W at 100% current and 0% speed  
66 W at 100% current and 50% speed  
81 W at 100% current and 90% speed  
43 W at 50% current and 0% speed  
47 W at 50% current and 50% speed  
57 W at 50% current and 90% speed  
38 W at 25% current and 50% speed  
35 W at 25% current and 0% speed

### Input current ILN at 150% overload

7.5 A

### Leakage current at ground IPE - max

4.65 mA

### Mains switch-on frequency

4-quadrant operation possible

Maximum of one time every 30 seconds

#### Mounting position

Vertical

#### Mains voltage - min

342 V

#### Product Category

Variable frequency drives

#### Mains voltage - max

528 V

#### Protection

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

#### Operating mode

Optional: Vector control with feedback (CLV)

Sensorless vector control (SLV)

Speed control with slip compensation

U/f control

#### Protocol

CAN

EtherNet/IP

MODBUS

Other bus systems

PROFIBUS

PROFINET IO

TCP/IP

BACnet/IP

#### Output frequency - min

0 Hz

#### Output frequency - max

500 Hz

#### Output voltage (U<sub>2</sub>)

480 V AC, 3-phase

400 V AC, 3-phase

#### Safety function/level

STO (Safe Torque Off, SIL3, PLe Cat 3)

#### Overload current I<sub>L</sub> at 150% overload

8.7 A

#### Suitable for

Branch circuits, (UL/CSA)

#### Rated control supply voltage

10 V DC (U<sub>s</sub>, max. 10 mA)

#### Radio interference class

C1: for conducted emissions only

Optional external radio interference suppression filter for longer motor cable lengths and for use in different EMC environments

C2, C3: depending on the motor cable length, the connected load, and ambient conditions.

#### Rated frequency - min

48 Hz

#### Rated frequency - max

62 Hz

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

2.2 kW

#### Rated operational voltage

400 V AC, 3-phase

480 V AC, 3-phase

#### Resolution

0.1 Hz (Frequency resolution, setpoint value)

#### Short-circuit protection rating

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

#### Starting current - max

200 %, I<sub>H</sub>, max. starting current (High Overload), for 4 seconds every 40 seconds, Power section

### Supply frequency

50/60 Hz

### Switching frequency

8 kHz, 4 - 32 kHz adjustable (audible), fPWM, Power section, Main circuit

### System configuration type

AC supply systems with earthed center point

### Voltage rating - max

480 VAC

## Motor rating

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

5 A

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

4.8 A

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

3 HP

## Apparent power

Apparent power at 400 V

4.02 kVA

Apparent power at 480 V

4.82 kVA

## Braking function

### Braking resistance

150  $\Omega$

### Braking torque

Max. 30 % MN, Standard - Main circuit

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

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

### Switch-on threshold for the braking transistor

780 VDC

## Control circuit

Number of inputs (analog)

2

Number of inputs (digital)

5

Number of outputs (analog)

2

Number of outputs (digital)

2

Number of relay outputs

2 (parameterizable, 1 N/O and 1 changeover contact, 6 A (250 V, AC-1) / 5 A (30 V, DC-1))

Rated control voltage ( $U_c$ )

24 V DC (external, max. 100 mA)

## Design verification

Equipment heat dissipation, current-dependent  $P_{vid}$

101.2 W

Heat dissipation capacity  $P_{diss}$

0 W

## Resources

3D models

[eaton-EP-400017-drawing.dwg](#)

[eaton-EP-400017-3d-model.stp](#)

Application notes

Heat dissipation per pole, current-dependent P<sub>vid</sub>

0 W

Static heat dissipation, non-current-dependent P<sub>vs</sub>

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.

#### 10.6 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

Start, Stopp und Betrieb

Electromagnetic compatibility (EMC)

How does the internal motor protection work?

Setpoint Setting

Update DX-COM-STICK3

Connecting drives to generator supplies

Equal load sharing with the droop function

I/O Configuration

Dual Rating What exactly does that mean?

Hoist applications

Operating Permanent Magnet and Brushless DC Motors

Use of multiple ramps

Access to Parameter Level 2 and 3 Parameter Lock RESET

PID controller

Motor data Motor Protection V/f curves for induction motors

The OP System Bus - Parameterizing - Control

Conformal Coating

Dependency of the output current on switching frequency and ambient temperature

Vector Control of Induction Motors

Starting, Stopping and Operation

Closed Loop Vector Control

Master slave operation

DX-COM-STICK3\_Connection

#### Brochures

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

#### Catalogues

[Product Range Catalog Drives Engineering](#)

[Drives - Product range catalog](#)

#### Declarations of conformity

[DA-DC-00005013.pdf](#)

[DA-DC-00005022.pdf](#)

#### Installation instructions

[eaton-da1-variable-frequency-drive-il040061zu.pdf](#)

#### Installation videos

[PowerXL Variable Frequency Drives DC1 and DA1 - EN](#)

[Video PowerXL DA1](#)

#### Manuals and user guides

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.

[eaton-da1-variable-frequency-drive-mn040063-en-us.pdf](#)

#### mCAD model

[eaton-cadenas-path-drives-p2\\_ip66\\_size2\\_non\\_switched.3db](#)

[eaton-cadenas-front\\_view-p2\\_ip66\\_size2\\_non\\_switched\\_front.pra](#)

[eaton-cadenas-side\\_view-p2\\_ip66\\_size2\\_non\\_switched\\_side.pra](#)

#### Multimedia

System solutions based on EtherCAT

Looking for variable frequency drives DC1 and DA1 which can be used in harsh environments?

#### Software, firmware, and applications

[eaton-powerxl-da1-devicenet-eds-v100.zip](#)

[eaton-powerxl-da1-canopen-codesys-v3-library.zip](#)

[eaton-powerxl-pcsoftware-drivesconnect-v1501.zip](#)

[eaton-powerxl-dx-cbl-pc-1m5-usb-driver.zip](#)

[eaton-powerxl-da1-ethercat-esi-for-omron-v311.zip](#)

[eaton-powerxl-da1-profibus-gsd-v216.zip](#)

[eaton-powerxl-da1-profinet-tia-v12-library.zip](#)

[eaton-powerxl-da1-firmware-release-note-mz040041en-us.pdf](#)

[eaton-powerxl-da1-profinet-gsdml-v226.zip](#)

[eaton-powerxl-dx-cbl-pc-3m0-usb-driver.zip](#)

[eaton-powerxl-da1-ethernetip-eds-v150.zip](#)

[eaton-powerxl-da1-ethercat-esi-v310.zip](#)

[eaton-powerxl-dx-comstick3-ble-drivers.zip](#)

[eaton-powerxl-da1-canopen-eds-v250.zip](#)

[eaton-powerxl-da1-swd-codesys-v3-library.zip](#)