Specifications

# Eaton 3-5031-003A

## Catalog Number: 3-5031-003A

Eaton DM1 Variable frequency drive, 400 V AC, 3-phase, 31 A, 15 kW, IP20/NEMA0, Radio interference suppression filter, Brake chopper, FS4



## General specifications

**Product Name**
Eaton DM1 Variable frequency drive

**Catalog Number**
3-5031-003A

**EAN**
4015081980482

**Product Length/Depth**
195 mm

**Product Height**
300 mm

**Product Width**
184 mm

**Product Weight**
6.3 kg

**Certifications**
Certified by UL for use in Canada
UkrSEPRO
CE marking
UL File No.: E134360
UL report applies to both US and Canada
CE
IEC/EN 61800-3
IEC/EN61800-3
RoHS, ISO 9001
UL Category Control No.: NMMS, NMMS7
CSA-C22.2 No. 274-13
UL Listed
CUL
IEC/EN 61800-2
C-Tick
IEC/EN 61800-5-1
CSA-C22.2 No. 274-17
UL 508C
IEC/EN61800-5

Powering Business Worldwide

## General

### Air volume capacity

98 m³/h

### Cable length

C3 ≤ 25 m, maximum motor cable length

C2 ≤ 5 m, maximum motor cable length

### Communication interface

DeviceNet, optional

PROFIBUS, optional

SmartWire-DT, optional

Modbus RTU, built in

CANopen®, optional

### Connection to SmartWire-DT

Yes

In conjunction with DXG-NET-SWD SmartWire DT module

### Degree of protection

IP20

NEMA Other

### Electromagnetic compatibility

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

### Environmental class

3C2, 3S2 (Air quality)

### Features

Parameterization: Keypad

Temperature-controlled fan

Parameterization: Fieldbus

Parameterization: Power Xpert inControl

### Fitted with:

IGBT inverter

Brake chopper

Internal DC link

Radio interference suppression filter

Breaking resistance

PC connection

### Frame size

FS4

### Mounting position

Vertical

### Number of slots

1 (expansion)

## Climatic environmental conditions

### Altitude

Max. 2000 m for Corner Grounded TN Systems

Max. 1000 m

Above 1000 m with 1 % derating per 100 m

Max. 3000 m

### Ambient operating temperature - min

-10 °C

### Ambient operating temperature - max

50 °C

### Ambient storage temperature - min

-40 °C

### Ambient storage temperature - max

70 °C

### Climatic proofing

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

## Main circuit

### Current limitation

0.1 - 2 x IH (CT), motor, main circuit

### Heat dissipation at current/speed

169 W at 25% current and 0% speed

213.8 W at 25% current and 50% speed

231.4 W at 100% current and 50% speed

236.5 W at 50% current and 90% speed

248.5 W at 50% current and 50% speed

335.8 W at 100% current and 0% speed

485.5 W at 100% current and 90% speed

497 W at 50% current and 0% speed

### Input current ILN at 110% overload

43.7 A

### Input current ILN at 150% overload

35.7 A

### Mains current distortion

40 %

### Mains switch-on frequency

Maximum of one time every 60 seconds

Overvoltage category

III

Pollution degree

2

Product Category

Variable frequency drives

Protection

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

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
C1: with external filter, for conducted emissions only

Safety function/level

STO (Safe Torque Off, SIL2, PLc Cat 2)

Shock resistance

0.75 mm (peak) at 10 - 57 Hz, max. 1 g at 57 - 150 Hz, according to EN 61800-5-1, EN 60068-2-6: 10 - 150 Hz

Suitable for

Branch circuits, (UL/CSA)

Mains voltage - min

380 V

Mains voltage - max

480 V

Operating mode

U/f control

Output frequency - min

0 Hz

Output frequency - max

400 Hz

Output voltage (U2)

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

Overload current IL at 110% overload

41.8 A

Overload current IL at 150% overload

46.5 A

Rated conditional short-circuit current (Iq)

100 kA

Rated control supply voltage

10 V DC (Us, max. 10 mA)

Rated frequency - min

45 Hz

Rated frequency - max

66 Hz

Rated operational current (Ie) at 110% overload

38 A

Rated operational current (Ie) at 150% overload

31 A

Rated operational power at 380/400 V, 50 Hz, 110% overload

18.5 kW

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

15 kW

Rated operational power at 500 V, 50 Hz, 3-phase

18.5 kW

Rated operational power at 500 V, 50 Hz, 3-phase, 110% overload

22 kW

Rated operational voltage

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

Resolution

0.01 Hz (Frequency resolution, setpoint value)

Short-circuit protection rating

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

Starting current - max

200 %, IH, max. starting current (High Overload), For 2 seconds every 20 seconds, Power section

Supply frequency

50/60 Hz

Switching frequency

3.6 kHz, 1 - 16 kHz adjustable, fPWM, Power section, Main circuit

System configuration type

TN-S, TN-C, TN-C-S, TT, IT

Voltage rating - max

500 V

## Motor rating

Assigned motor current IM at 400 V, 50 Hz, 110% overload

36 A

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

29.3 A

Assigned motor current IM at 440/480 V, 60 Hz, 110% overload

34 A

Assigned motor current IM at 500 V, 50 Hz, 110% overload

33 A

Assigned motor current IM at 500 V, 50 Hz, 150% overload

28.9 A

Assigned motor power at 460/480 V, 60 Hz

20 HP

Assigned motor power at 460/480 V, 60 Hz, 110% overload

25 HP

## Braking function

Braking resistance

17 Ω

Braking torque

Max. 30 % MN, Standard - Main circuit
Adjustable to 150 %, DC - Main circuit
Max. 100 % of rated operational current Ie with external braking resistor - Main circuit

Switch-on threshold for the braking transistor

800 VDC

## Control circuit

Number of inputs (analog)

1

Number of inputs (digital)

4

Number of outputs (analog)

1

Number of relay outputs

2 (parameterizable, 1 changeover contact and 1 N/O, 3 A (240 V

## Design verification

Equipment heat dissipation, current-dependent Pvid

393.8 W

Rated operational current for specified heat dissipation (In)

38 A

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.

AC) / 3 A (24 V DC))

Rated control voltage (Uc)

24 V DC (external, max. 100 mA options incl.)

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

Dual Rating What exactly does that mean?

Connecting drives to generator supplies

Electromagnetic compatibility (EMC)

### Brochures

eaton-powerxl-dm1-variable-frequency-drives-brochure-br040016en-en-us.pdf

### Catalogs

Product Range Catalog Drives Engineering

### Declarations of conformity

DA-DC-00004644.pdf

DA-DC-00004863.pdf

### Installation instructions

DM1 IL PUB 53-675 TBG Change Request 12-24-21 Final (300 DPI).pdf

### Installation videos

PowerXL Variable Frequency Drive DM1

### Manuals and user guides

MN040060EN

MN040049EN

### mCAD model

fs4-89-1331.stp

fs4_89_1331.dwg

### Multimedia

PowerXL DM1 Variable Frequency Drive - PowerXpert inControl with Bluetooth

PowerXL DM1 Variable Frequency Drive - Establishing a Modbus TCP connection with software Power Xper

PowerXL DM1 Variable Frequency Drive - Configuration with keypad

PowerXL DM1 Variable Frequency Drive - Setup via Software

PowerXL DM1 Variable Frequency Drive - Setup via WebUI

### Product notifications

eaton-drives-ecodesign-directive-mz040046en-en.pdf

### Sales notes

eaton-powerxl-dm1-variable-frequency-drives-flyer-fl040006en-en-us.pdf




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

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