Specifications

Eaton 169051

Catalog Number: 169051

Eaton DA1 Variable frequency drive, 400 V AC, 3-phase, 5.8 A, 2.2 kW, IP20/NEMA 0, Radio interference suppression filter, 7-digital display assembly



General specifications

Product Name
Eaton DA1 Variable frequency drive

Catalog Number
169051

EAN
4015081655427

Product Length/Depth
186 mm

Product Height
231 mm

Product Width
107 mm

Product Weight
1.8 kg

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

Powering Business Worldwide

General

Cable length

150 m, unscreened, maximum permissible, Motor feeder

C2 ≤ 5 m, Radio interference level, maximum motor cable length

200 m, screened, with motor choke, maximum permissible, Motor feeder

100 m, screened, maximum permissible, Motor feeder

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

C3 ≤ 25 m, Radio interference level, maximum motor cable length

Communication interface

OP-Bus (RS485), built in

Modbus-TCP, optional

Ethernet IP, optional

Modbus RTU, built in

DeviceNet, optional

EtherCAT, optional

SmartWire-DT, optional

PROFIBUS, optional

CANopen®, built in

PROFINET, optional

Connection to SmartWire-DT

Yes

In conjunction with DX-NET-SWD1 SmartWire DT module

Degree of protection

IP20

NEMA Other

Electromagnetic compatibility

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

Fitted with:

Additional PCB protection

IGBT inverter

Radio interference suppression filter

Control unit

7-digital display assembly

Internal DC link

PC connection

Breaking resistance

Brake chopper

Frame size

FS2

Climatic environmental conditions

Ambient operating temperature - min

-10 °C

Altitude

Max. 4000 m

Max. 1000 m

Above 1000 m with 1 % derating per 100 m

Ambient operating temperature - max

50 °C

Ambient operating temperature at 150% overload - min

-10 °C

Ambient operating temperature at 150% overload - max

50 °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

35 W at 25% current and 0% speed

38 W at 25% current and 50% speed

43 W at 50% current and 0% speed

47 W at 50% current and 50% speed

51 W at 100% current and 0% speed

57 W at 50% current and 90% speed

66 W at 100% current and 50% speed

81 W at 100% current and 90% speed

Input current ILN at 150% overload

7.5 A

Leakage current at ground IPE - max

4.65 mA

Mains switch-on frequency

Functions

4-quadrant operation possible

Mounting position

Vertical

Product Category

Variable frequency drives

Protection

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

Protocol

EtherNet/IP
Other bus systems
DeviceNet
PROFINET IO
CAN
PROFIBUS
MODBUS
TCP/IP

Safety function/level

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

Suitable for

Branch circuits, (UL/CSA)

Radio interference class

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. External radio interference suppression filters (optional) may be necessary.

Maximum of one time every 30 seconds

Mains voltage - min

380 V

Mains voltage - max

480 V

Operating mode

U/f control
Optional: Vector control with feedback (CLV)
Sensorless vector control (SLV)
Speed control with slip compensation

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

8.7 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) at 150% overload

5.8 A

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 %, IH, 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 IM at 400 V, 50 Hz, 150% overload

5 A

Assigned motor current IM 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 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)

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 (Uc)

24 V DC (external, max. 100 mA)

Design verification

Equipment heat dissipation, current-dependent Pvid

101.2 W

Heat dissipation capacity Pdiss

0 W

Resources

Application notes

Dual Rating What exactly does that mean?

Electromagnetic compatibility (EMC)

How does the internal motor protection work?

Setpoint Setting

Heat dissipation per pole, current-dependent Pvid

0 W

Rated operational current for specified heat dissipation (In)

5.8 A

Static heat dissipation, non-current-dependent Pvs

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

Equal load sharing with the droop function

Hoist applications

Operating Permanent Magnet and Brushless DC Motors

Master slave operation

I/O Configuration

Vector Control of Induction Motors

Update DX-COM-STICK3

Connecting drives to generator supplies

Starting, Stopping and Operation

Access to Parameter Level 2 and 3 Parameter Lock RESET

Closed Loop Vector Control

PID controller

Use of multiple ramps

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

DX-COM-STICK3_Connection

Brochures

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

DA-SW-DA1 Profinet ConfigFile

DA-SW-DA1 Profinet GSDML V2.25 Config File

DA-SW-drivesConnect

DA-SW-DA1 Profinet Library

Catalogs

Product Range Catalog Drives Engineering

Declarations of conformity

DA-DC-00005021.pdf

DA-DC-00003964.pdf

DA-DC-00004184.pdf

DA-DC-00005020.pdf

Drawings

eaton-frequency-inverter-dimensions-027.eps

eaton-frequency-inverter-3d-drawing-012.eps

eCAD model

DA-CE-ETN.DA1-345D8FB-A20C

Installation instructions

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.

eaton-da1-variable-frequency-drive-il04020010z.pdf

Installation videos

PowerXL Variable Frequency Drives DC1 and DA1 - EN

Video PowerXL DA1

Manuals and user guides

eaton-da1-variable-frequency-drive-mn040063-en-us.pdf

MN04020005Z_EN

MN04020006Z_EN

MN040018_EN

MN040003_EN

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

mCAD model

DA-CD-da1_fs2_ip20

DA-CS-da1_fs2_ip20

Multimedia

System solutions based on EtherCAT

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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