Specifications

Eaton 9701-5107-00P

Catalog Number: 9701-5107-00P

Eaton DG1 Variable frequency drive, 230 V AC, 3-phase, 143 A, 45 kW, IP54/NEMA12, DC link choke



General specifications

Product Name
Eaton DG1 variable frequency drive

Catalog Number
9701-5107-00P

EAN
4015081734962

Product Length/Depth
340.7 mm

Product Height
888.5 mm

Product Width
288 mm

Product Weight
68.3 kg

Certifications
UL report applies to both US and Canada
IEC/EN61800-5
C-Tick
UkrSEPRO
UL File No.: E134360
CUL
UL508
RoHS, ISO 9001
CE
Specification for general requirements: IEC/EN 61800-2
IEC/EN61800-3
UL Category Control No.: NMMS, NMMS7
IEC/EN 61800-3
CSA-C22.2 No. 274-13
UL
Safety requirements: IEC/EN 61800-5
Certified by UL for use in Canada
EAC

Powering Business Worldwide

Features & Functions

Features

Temperature-controlled fan

Externally accessible fan

Parameterization: Fieldbus

Parameterization: Keypad

Parameterization: Power Xpert inControl

General

Air volume capacity

395 m³/h

Cable length

C3 ≤ 50 m, Radio interference level, maximum motor cable length

200 m, screened, maximum permissible, Motor feeder

C2 ≤ 10 m, Radio interference level, maximum motor cable length

Degree of protection

IP54

NEMA 12

Electromagnetic compatibility

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

Environmental class

3C2, 3S2 (Air quality)

Fitted with:

Control unit

Radio interference suppression filter

DC link choke

Multi-line graphic display

IGBT inverter

Internal DC link

Additional PCB protection

PC connection

Frame size

FS5

Mounting position

Vertical

Number of slots

2 (expansion)

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

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.
C1: with external filter, for conducted emissions only

Safety function/level

STO (Safe Torque Off, SIL1, PLc Cat 1)

Shock resistance

UPS drop test (for weights inside the UPS frame)
Storage and transportation: maximum 15 g, 11 ms (inside the packaging)
Mechanical, According to EN 61800-5-1, IEC/EN 60068-2-27

Suitable for

Branch circuits, (UL/CSA)

Vibration

Resistance: 5 - 15.8 Hz, Amplitude 1 mm (peak)
Resistance: 15.8 – 150 Hz, 1 g, Maximum acceleration amplitude
Resistance: 5 - 150 Hz, According to EN 61800-5-1, IEC/EN 60068-2-6

Climatic environmental conditions

Altitude

Above 1000 m with 1 % derating per 100 m
Max. 2000 m for Corner Grounded TN Systems
Max. 3000 m
Max. 1000 m

Ambient operating temperature - min

-10 °C

Ambient operating temperature - max

50 °C

Ambient operating temperature at 150% overload - min

-30 °C

Ambient operating temperature at 150% overload - 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

Efficiency

98.2 % (η)

Heat dissipation at current/speed

1243 W at 50% current and 0% speed
1455 W at 100% current and 90% speed
403 W at 25% current and 0% speed
527 W at 25% current and 50% speed
531 W at 100% current and 50% speed
707 W at 50% current and 50% speed
792 W at 50% current and 90% speed
925 W at 100% current and 0% speed

Input current ILN at 110% overload

157 A

Motor rating

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

130 A

Assigned motor current IM at 230 V, 50 Hz, 110% overload

141 A

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

141 A

Assigned motor current IM at 230 V, 60 Hz, 110% overload

154 A

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

50 HP

Assigned motor power at 230/240 V, 60 Hz, 3-phase, 110 % overload

60 HP

Input current ILN at 150% overload

132.2 A

Leakage current at ground IPE - max

5.4 mA

Mains current distortion

25 %

Mains switch-on frequency

Maximum of one time every 60 seconds

Mains voltage - min

208 V

Mains voltage - max

240 V

Operating mode

Sensorless vector control (SLV)
Speed control with slip compensation
U/f control
Torque regulation

Output frequency - min

0 Hz

Output frequency - max

400 Hz

Output voltage (U2)

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

Overload current IL at 110% overload

187 A

Overload current IL at 150% overload

214.5 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

170 A

Apparent power

Apparent power at 230 V

67.7 kVA

Apparent power at 240 V

70.7 kVA

Braking function

Braking resistance

1.4 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
Adjustable to 150 % (I/Ie), DC - Main circuit

Switch-on threshold for the braking transistor

425 VDC

Control circuit

Number of inputs (analog)

2

Number of inputs (digital)

8

Number of outputs (analog)

2

Number of outputs (digital)

1

Number of relay outputs

3 (parameterizable, 2 changeover contacts and 1 N/O, 6 A (240 V AC) / 6 A (24 V DC))

Rated control voltage (Uc)

24 V DC (external, max. 250 mA options incl.)

Communication

Communication interface

BACnet MS/TP, built in

Rated operational current (Ie) at 150% overload

143 A

Rated operational power at 220/230 V, 50 Hz, 1-phase

45 kW

Rated operational power at 220/230 V, 50 Hz, 3-phase, 110% overload

45 kW

Rated operational voltage

230 V AC, 3-phase

240 V AC, 3-phase

Resolution

0.01 Hz (Frequency resolution, setpoint value)

Short-circuit protection rating

200 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 - 10 kHz adjustable, fPWM, Power section, Main circuit

System configuration type

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

Voltage rating - max

240 VAC

Ethernet IP, built in

DeviceNet, optional

PROFIBUS, optional

SmartWire-DT, optional

Modbus RTU, built in

Modbus TCP, built in

CANopen®, optional

Connection to SmartWire-DT

Yes

In conjunction with DXG-NET-SWD SmartWire DT module

Protocol

PROFIBUS

CAN

DeviceNet

Other bus systems

BACnet

TCP/IP

PROFINET IO

EtherNet/IP

MODBUS

Design verification

Equipment heat dissipation, current-dependent Pvid

1336 W

Heat dissipation capacity Pdiss

0 W

Heat dissipation per pole, current-dependent Pvid

0 W

Rated operational current for specified heat dissipation (In)

143 A

Static heat dissipation, non-current-dependent Pvs

19.32 W

Heat dissipation details

Operation (with 150 % overload), allow for derating

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

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

Resources

Application notes

Real time clock and use of the timers

Torque control

Analog I/Os

Connecting drives to generator supplies

Smoke Mode and fire mode

PID controller

Operating at low temperatures

Motor data and V/f curves

Load balancing in multi motor applications

Starting, stopping and operation

Dual Rating What exactly does that mean?

DG1 in pump and fan applications

Electromagnetic compatibility (EMC)

Digital I/Os

Catalogs

Product Range Catalog Drives Engineering

Declarations of conformity

DA-DC-00004861.pdf

DA-DC-00004676

Drawings

eaton-frequency-inverter-dg1-dimensions-005.eps

eaton-frequency-inverter-dg1-3d-drawing-005.eps

eCAD model

DA-CE-ETN.DG1-32143FN-C54C

Manuals and user guides

MN040002_EN

mCAD model

DA-CD-dg1_fs5

DA-CS-dg1_fs5

Multimedia

Power XL General Purpose Drives

PowerXL DG1 Variable Frequency Drive - Setup via WebUI

Product notifications

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

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.

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