Specifications

Eaton 9701-5105-00P

Catalog Number: 9701-5105-00P

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



General specifications

Product Name
Eaton DG1 variable frequency drive

Catalog Number
9701-5105-00P

EAN
4015081734924

Product Length/Depth
340.7 mm

Product Height
888.5 mm

Product Width
288 mm

Product Weight
73.6 kg

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

Powering Business Worldwide

Catalog Notes

Features & Functions

Features

Externally accessible fan

Temperature-controlled fan

Parameterization: Fieldbus

Parameterization: Keypad

Parameterization: Power Xpert inControl

Functions

4-quadrant operation possible

General

Air volume capacity

395 m³/h

Cable length

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

200 m, screened, maximum permissible, Motor feeder

`C3 ≤ 50 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:

DC link choke

PC connection

Internal DC link

Multi-line graphic display

IGBT inverter

Radio interference suppression filter

Breaking resistance

Additional PCB protection

Control unit

Brake chopper

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

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

Safety function/level

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

Shock resistance

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

Suitable for

Branch circuits, (UL/CSA)

Vibration

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
Resistance: 5 - 15.8 Hz, Amplitude 1 mm (peak)

Climatic environmental conditions

Altitude

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

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

U/f control

Speed control with slip compensation

Torque regulation

Sensorless vector control (SLV)

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

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

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

Adjustable to 150 %, DC - Main circuit

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

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

Max. 30 % MN, Standard - Main circuit

Switch-on threshold for the braking transistor

425 VDC

Control circuit

Number of inputs (analog)

2

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

240 V AC, 3-phase

230 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

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

PROFIBUS, optional

Modbus TCP, built in

SmartWire-DT, optional

CANopen®, optional

Modbus RTU, built in

BACnet MS/TP, built in

Ethernet IP, built in

DeviceNet, optional

Connection to SmartWire-DT

Yes

In conjunction with DXG-NET-SWD SmartWire DT module

Protocol

PROFIBUS

PROFINET IO

BACnet

DeviceNet

Other bus systems

CAN

TCP/IP

EtherNet/IP

MODBUS

Design verification

Equipment heat dissipation, current-dependent Pvid

1336 W

Heat dissipation capacity Pdiss

Resources

Application notes

Real time clock and use of the timers

Connecting drives to generator supplies

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.

Torque control

Motor data and V/f curves

Operating at low temperatures

Dual Rating What exactly does that mean?

Load balancing in multi motor applications

Analog I/Os

Smoke Mode and fire mode

DG1 in pump and fan applications

Digital I/Os

Electromagnetic compatibility (EMC)

Starting, stopping and operation

PID controller

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.DG1-32143FB-C54C

Manuals and user guides

MN040002_EN

mCAD model

DA-CD-dg1_fs5

DA-CS-dg1_fs5

Multimedia

PowerXL DG1 Variable Frequency Drive - Setup via WebUI

Power XL General Purpose Drives

Product notifications

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

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.

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