

Specifications



Photo is representative



Eaton EP-400059

Eaton DA1 Variable frequency drive, 500 V AC, 3-phase, 4.1 A, 2.2 kW, IP66/NEMA 4X, OLED display, UV resistant

General specifications

PRODUCT NAME	Eaton DA1 Variable frequency drive
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CATALOG NUMBER	EP-400059
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MODEL CODE	DA1-354D1NB-B66O
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EAN	4015082950415
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PRODUCT LENGTH/DEPTH	171.5 mm
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PRODUCT HEIGHT	257 mm
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PRODUCT WIDTH	188 mm
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PRODUCT WEIGHT	3.5 kg
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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

CERTIFICATIONS

Specification for general requirements: IEC/EN 61800-2
UkrSEPRO
UL
UL 508C
UL Category Control No.: NMMS, NMMS7
UL File No.: E172143
UL report applies to both US and Canada

CATALOG NOTES

The brake resistors are assigned based on the maximum rated power of the variable frequency drive. Additional brake resistors and designs (e.g.

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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
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
FITTED WITH:	PC connection Control unit Breaking resistance Additional PCB protection Brake chopper IGBT inverter Internal DC link OLED display
FRAME SIZE	FS2
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	CAN EtherNet/IP MODBUS Other bus systems PROFIBUS PROFINET IO TCP/IP BACnet/IP
SAFETY FUNCTION/LEVEL	STO (Safe Torque Off, SIL3, PLe Cat 3)
SUITABLE FOR	Branch circuits, (UL/CSA)

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	97 % (η)
HEAT DISSIPATION AT CURRENT/SPEED	116 W at 100% current and 0% speed 134 W at 100% current and 50% speed 153 W at 100% current and 90% speed 77 W at 50% current and 0% speed 95 W at 50% current and 50% speed 94 W at 50% current and 90% speed 76 W at 25% current and 50% speed 76 W at 25% current and 0% speed
INPUT CURRENT I_{LN} AT 150% OVERLOAD	4.9 A
LEAKAGE CURRENT AT GROUND I_{PE} - MAX	4.1 mA
MAINS SWITCH-ON FREQUENCY	Maximum of one time every 30 seconds
MAINS VOLTAGE - MIN	450 V
MAINS VOLTAGE - MAX	660 V
OPERATING MODE	Optional: Vector control with feedback (CLV) Sensorless vector control (SLV) Speed control with slip compensation U/f control
OUTPUT FREQUENCY - MIN	0 Hz
OUTPUT FREQUENCY - MAX	500 Hz
OUTPUT VOLTAGE (U₂)	500 V AC, 3-phase 600 V AC, 3-phase
OVERLOAD CURRENT I_L AT 150% OVERLOAD	13.5 A
RATED CONTROL SUPPLY VOLTAGE	10 V DC (U _s , max. 10 mA)
RATED FREQUENCY - MIN	48 Hz
RATED FREQUENCY - MAX	62 Hz
RATED OPERATIONAL POWER AT 500 V, 50 HZ, 3-PHASE	5.5 kW
RATED OPERATIONAL POWER AT 525 V, 50 HZ, 3-PHASE	2.2 kW

Motor rating

ASSIGNED MOTOR CURRENT I_M AT 500 V, 50 HZ, 150% OVERLOAD	4 A
ASSIGNED MOTOR CURRENT I_M AT 525 V, 50 HZ, 150% OVERLOAD	3.8 A
ASSIGNED MOTOR CURRENT I_M AT 550 - 600 V, 60 HZ, 150% OVERLOAD	3.9 A
ASSIGNED MOTOR POWER AT 575/600 V, 60 HZ, 3-PHASE	3 HP

RATED OPERATIONAL VOLTAGE	500 V AC, 3-phase 600 V AC, 3-phase
RESOLUTION	0.1 Hz (Frequency resolution, setpoint value)
SHORT-CIRCUIT PROTECTION RATING	20 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 - 24 kHz adjustable (audible), fPWM, Power section, Main circuit
SYSTEM CONFIGURATION TYPE	AC supply systems with earthed center point
VOLTAGE RATING - MAX	600 VAC

Apparent power

APPARENT POWER AT 600 V	4.26 kVA
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Braking function

BRAKING RESISTANCE	200 Ω
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	975 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	66 W
HEAT DISSIPATION CAPACITY PDISS	0 W
HEAT DISSIPATION PER POLE, CURRENT-DEPENDENT PVID	0 W
STATIC HEAT DISSIPATION, NON-CURRENT-DEPENDENT PVS	0 W
HEAT DISSIPATION DETAILS	Operation (with 150 % overload)
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	Is the panel builder's

EXTERNAL CONDUCTORS	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

3D MODELS

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

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

APPLICATION NOTES

[eaton-powerxl-da1-i-o-configuration-ap040034-en-us.pdf](#)

[eaton-powerxl-da1-dc1-de1-conformal-coating-ap040182-en-us.pdf](#)

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BROCHURES	eaton-powerxl-variable-frequency-drives-dc1-da1-brochure-br040001en-en-us.pdf
CATALOGUES	Product Range Catalog Drives Engineering
DECLARATIONS OF CONFORMITY	eaton-variable-frequency-drive-declaration-of-conformity-eu250651en.pdf eaton-variable-frequency-drive-declaration-of-conformity-uk251134en.pdf
INSTALLATION INSTRUCTIONS	eaton-da1-variable-frequency-drive-il040061zu.pdf
INSTALLATION VIDEOS	Video PowerXL DA1 PowerXL Variable Frequency Drives DC1 and DA1 - EN
MANUALS AND USER GUIDES	eaton-da1-variable-frequency-drive-mn040063-en-us.pdf
MULTIMEDIA	System solutions based on EtherCAT

[Looking for variable frequency drives DC1 and DA1 which can be used in harsh environments?](#)

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

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SOFTWARE, FIRMWARE,
AND APPLICATIONS

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PROJECT NAME:

PROJECT NUMBER:

PREPARED BY:

DATE:



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