Specifications

Photo is representative

Eaton EP-400040

Eaton DA1 Variable frequency drive, 400 V AC, 3-phase, 5.8 A, 2.2 kW, IP66/NEMA 4X, Radio interference suppression filter, OLED display, Local controls, UV resistant

General specifications	
PRODUCT NAME	Eaton DA1 Variable frequency drive
CATALOG NUMBER	EP-400040
MODEL CODE	DA1-345D8FB-B6SO
EAN	4015082950224
PRODUCT LENGTH/DEPTH	182 mm
PRODUCT HEIGHT	257 mm
PRODUCT WIDTH	188 mm
PRODUCT WEIGHT	3.5 kg
CERTIFICATIONS	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 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

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	resistors and designs (e.g. 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 C2 ≤ 5 m, Radio interference level, maximum motor cable length C3 ≤ 25 m, Radio interference level, maximum motor cable length
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
ELECTROMAGNETIC COMPATIBILITY	1st and 2nd environments (according to EN 61800-3)
FITTED WITH:	PC connection Control unit Breaking resistance Additional PCB protection Brake chopper IGBT inverter Internal DC link OLED display Radio interference suppression filter Local controls
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,

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

	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)
RADIO INTERFERENCE CLASS	C1: for conducted emissions only 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.

Main circuit

EFFICIENCY	95.4 % (η)
HEAT DISSIPATION AT CURRENT/SPEED	51 W at 100% current and 0% speed 66 W at 100% current and 50% speed 81 W at 100% current and 90% speed 43 W at 50% current and 0% speed 47 W at 50% current and 50% speed 57 W at 50% current and 90% speed 38 W at 25% current and 50% speed 35 W at 25% current and 0% speed
INPUT CURRENT ILN AT 150% OVERLOAD	7.5 A
LEAKAGE CURRENT AT GROUND IPE - MAX	4.65 mA
MAINS SWITCH-ON FREQUENCY	Maximum of one time every 30 seconds
MAINS VOLTAGE - MIN	342 V
MAINS VOLTAGE - MAX	528 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)	480 V AC, 3-phase 400 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 POWER AT 380/400 V, 50 HZ, 3-PHASE	2.2 kW
RATED OPERATIONAL VOLTAGE	480 V AC, 3-phase 400 V AC, 3-phase
RESOLUTION	0.1 Hz (Frequency

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

	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

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, variable, DC - Main circuit Max. 100 % of rated operational current Ie with external braking resistor - 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
HEAT DISSIPATION PER POLE, CURRENT-DEPENDENT PVID	0 W
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	Meets the product standard's requirements.

ENCLOSURES	
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	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-400016-3d-model.stp eaton-EP-400016-drawing.dwg
APPLICATION NOTES	eaton-powerxl-da1-dc1-de1-system-bus-ap040022-en-us.pdf eaton-powerxl-da1-dc1-db1-de1-rapidlink5-firmware-update-ap040214-en-us.pdf eaton-powerxl-da1-starting-stopping-operation-ap040030-en-us.pdf eaton-powerxl-da1-droop-function-ap040023-en-us.pdf eaton-powerxl-da1-pid-controller-ap040025-en-us.pdf eaton-powerxl-da1-pointer-to-parameter-ap040133-en-us.pdf eaton-powerxl-da1-dc1-de1-internal-motor-protection-ap040016-en-us.pdf Start, Stopp und Betrieb eaton-powerxl-da1-use-of-multiple-ramps-ap040031-en-us.pdf eaton-powerxl-da1-set-point-setting-ap040040-en-us.pdf eaton-powerxl-vfd-dual-rating-ap040114-en-us.pdf eaton-powerxl-da1-hoist-applications-ap040032-en-us.pdf eaton-powerxl-da1-dc1-de1-conformal-coating-ap040182-en-us.pdf eaton-powerxl-da1-i-o-configuration-ap040034-en-us.pdf

	eaton-powerxl-dx-com-stick-3-ap040190-en-us.pdf eaton-powerxl-da1-master-slave-operation-ap040026-en-us.pdf eaton-powerxl-da1-operating-pm-bldc-motors-ap040051-en-us.pdf eaton-powerxl-da1-motor-vf-curves-induction-motors-ap040018-en-us.pdf eaton-powerxl-da1-vector-control-induction-motors-ap040028-en-us.pdf Electromagnetic compatibility (EMC) eaton-powerxl-da1-derating-ap040039-en-us.pdf
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-uk251134en.pdf eaton-variable-frequency-drive-declaration-of-conformity-eu250651en.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?
SOFTWARE, FIRMWARE, AND APPLICATIONS	eaton-powerxl-dx-comstick3-ble-drivers.zip eaton-powerxl-dx-cbl-pc-3m0-usb-driver.zip eaton-powerxl-da1-profinet-tia-v12-library.zip eaton-powerxl-da1-profibus-gsd-v216.zip eaton-powerxl-da1-canopen-eds-v250.zip eaton-powerxl-dx-cbl-pc-1m5-usb-driver.zip eaton-powerxl-da1-profinet-gsdml-v226.zip eaton-powerxl-da1-swd-codesys-v3-library.zip eaton-powerxl-pcsoftware-drivesconnect-v1501.zip eaton-powerxl-da1-ethercat-esi-v310.zip eaton-powerxl-da1-canopen-codesys-v3-library.zip eaton-powerxl-da1-firmware-release-note-mz040041en-us.pdf eaton-powerxl-da1-ethernetip-eds-v150.zip eaton-powerxl-da1-devicenet-eds-v100.zip eaton-powerxl-da1-ethercat-esi-for-omron-v311.zip

PROJECT NAME:	
PROJECT NUMBER:	
PREPARED BY:	
DATE:	

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