

# Specifications



Photo is representative



## Eaton EP-400076

Eaton DA1 Variable frequency drive, 500 V AC, 3-phase, 43 A, 30 kW, IP66/NEMA 4X, OLED display, DC link choke, Local controls, UV resistant

### General specifications

<b>PRODUCT NAME</b>	Eaton DA1 Variable frequency drive
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<b>CATALOG NUMBER</b>	EP-400076
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<b>MODEL CODE</b>	DA1-35043NB-B6SO
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<b>EAN</b>	4015082950583
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<b>PRODUCT LENGTH/DEPTH</b>	262.5 mm
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<b>PRODUCT HEIGHT</b>	360 mm
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<b>PRODUCT WIDTH</b>	240 mm
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<b>PRODUCT WEIGHT</b>	9.5 kg
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<b>CERTIFICATIONS</b>	CE Certified by UL for use in Canada CSA-C22.2 No. 14 CUL DNV EAC IEC/EN 61800-3 IEC/EN61800-3 IEC/EN61800-5 RCM RoHS, ISO 9001 Safety: EN 61800-5-1: 2003
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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



Powering Business Worldwide

drive. Additional brake resistors and designs (e.g. different duty cycles) are available upon request.

## General

<b>CABLE LENGTH</b>	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

<b>COMMUNICATION INTERFACE</b>	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
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<b>CONNECTION TO SMARTWIRE-DT</b>	No
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<b>DEGREE OF PROTECTION</b>	IP66 NEMA 4X
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<b>FITTED WITH:</b>	Additional PCB protection Brake chopper Breaking resistance Control unit IGBT inverter Internal DC link OLED display PC connection Local controls
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<b>FRAME SIZE</b>	FS5 FS4
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<b>FUNCTIONS</b>	4-quadrant operation possible
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<b>MOUNTING POSITION</b>	Vertical
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<b>PRODUCT CATEGORY</b>	Variable frequency drives
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<b>PROTECTION</b>	Finger and back-of-hand proof, Protection against direct contact (BGV A3, VBG4)
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<b>PROTOCOL</b>	CAN EtherNet/IP MODBUS Other bus systems PROFIBUS PROFINET IO TCP/IP BACnet/IP
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<b>SAFETY FUNCTION/LEVEL</b>	STO (Safe Torque Off, SIL3,
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## Climatic environmental conditions

<b>ALTITUDE</b>	Max. 1000 m Above 1000 m with 1 % derating per 100 m Max. 4000 m
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<b>AMBIENT OPERATING TEMPERATURE - MIN</b>	-10 °C
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<b>AMBIENT OPERATING TEMPERATURE - MAX</b>	40 °C
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<b>AMBIENT OPERATING TEMPERATURE AT 150% OVERLOAD - MIN</b>	-10 °C
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<b>AMBIENT OPERATING TEMPERATURE AT 150% OVERLOAD - MAX</b>	40 °C
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<b>AMBIENT STORAGE TEMPERATURE - MIN</b>	-40 °C
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<b>AMBIENT STORAGE TEMPERATURE - MAX</b>	60 °C
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<b>CLIMATIC PROOFING</b>	< 95 average relative humidity (RH), no condensation, no corrosion
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PLe Cat 3)

**SUITABLE FOR**

Branch circuits, (UL/CSA)

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## Main circuit

<b>EFFICIENCY</b>	97 % ( $\eta$ )
<b>HEAT DISSIPATION AT CURRENT/SPEED</b>	467 W at 100% current and 0% speed 574 W at 100% current and 50% speed 675 W at 100% current and 90% speed 265 W at 50% current and 0% speed 319 W at 50% current and 50% speed 382 W at 50% current and 90% speed 237 W at 25% current and 50% speed 198 W at 25% current and 0% speed
<b>INPUT CURRENT I<sub>LN</sub> AT 150% OVERLOAD</b>	48.9 A
<b>LEAKAGE CURRENT AT GROUND I<sub>PE</sub> - MAX</b>	43 mA
<b>MAINS SWITCH-ON FREQUENCY</b>	Maximum of one time every 30 seconds
<b>MAINS VOLTAGE - MIN</b>	450 V
<b>MAINS VOLTAGE - MAX</b>	660 V
<b>OPERATING MODE</b>	Optional: Vector control with feedback (CLV) Sensorless vector control (SLV) Speed control with slip compensation U/f control
<b>OUTPUT FREQUENCY - MIN</b>	0 Hz
<b>OUTPUT FREQUENCY - MAX</b>	500 Hz
<b>OUTPUT VOLTAGE (U<sub>2</sub>)</b>	500 V AC, 3-phase 600 V AC, 3-phase
<b>OVERLOAD CURRENT I<sub>L</sub> AT 150% OVERLOAD</b>	64.5 A
<b>RATED CONTROL SUPPLY VOLTAGE</b>	10 V DC (U <sub>s</sub> , max. 10 mA)
<b>RATED FREQUENCY - MIN</b>	48 Hz
<b>RATED FREQUENCY - MAX</b>	62 Hz
<b>RATED OPERATIONAL POWER AT 500 V, 50 HZ, 3-PHASE</b>	30 kW
<b>RATED OPERATIONAL POWER AT 525 V, 50 HZ, 3-PHASE</b>	30 kW

## Motor rating

<b>ASSIGNED MOTOR CURRENT I<sub>M</sub> AT 500 V, 50 HZ, 150% OVERLOAD</b>	43 A
<b>ASSIGNED MOTOR CURRENT I<sub>M</sub> AT 525 V, 50 HZ, 150% OVERLOAD</b>	42 A
<b>ASSIGNED MOTOR CURRENT I<sub>M</sub> AT 550 - 600 V, 60 HZ, 150% OVERLOAD</b>	41 A
<b>ASSIGNED MOTOR POWER AT 575/600 V, 60 HZ, 3-PHASE</b>	40 HP

<b>RATED OPERATIONAL VOLTAGE</b>	600 V AC, 3-phase 500 V AC, 3-phase
<b>RESOLUTION</b>	0.1 Hz (Frequency resolution, setpoint value)
<b>SHORT-CIRCUIT PROTECTION RATING</b>	63 A, UL (Class CC or J), Safety device (fuse or miniature circuit-breaker), Power Wiring
<b>STARTING CURRENT - MAX</b>	200 %, IH, max. starting current (High Overload), for 4 seconds every 40 seconds, Power section
<b>SUPPLY FREQUENCY</b>	50/60 Hz
<b>SWITCHING FREQUENCY</b>	8 kHz, 4 - 24 kHz adjustable (audible), fPWM, Power section, Main circuit
<b>SYSTEM CONFIGURATION TYPE</b>	AC supply systems with earthed center point
<b>VOLTAGE RATING - MAX</b>	600 VAC

### Apparent power

<b>APPARENT POWER AT 600 V</b>	44.69 kVA
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### Braking function

<b>BRAKING RESISTANCE</b>	16 $\Omega$
<b>BRAKING TORQUE</b>	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
<b>SWITCH-ON THRESHOLD FOR THE BRAKING TRANSISTOR</b>	975 VDC

## Control circuit

<b>NUMBER OF INPUTS (ANALOG)</b>	2
<b>NUMBER OF INPUTS (DIGITAL)</b>	5
<b>NUMBER OF OUTPUTS (ANALOG)</b>	2
<b>NUMBER OF OUTPUTS (DIGITAL)</b>	2
<b>NUMBER OF RELAY OUTPUTS</b>	2 (parameterizable, 1 N/O and 1 changeover contact, 6 A (250 V, AC-1) / 5 A (30 V, DC-1))
<b>RATED CONTROL VOLTAGE (UC)</b>	24 V DC (external, max. 100 mA)

## Design verification

<b>EQUIPMENT HEAT DISSIPATION, CURRENT-DEPENDENT PVID</b>	660 W
<b>HEAT DISSIPATION CAPACITY PDISS</b>	0 W
<b>HEAT DISSIPATION PER POLE, CURRENT-DEPENDENT PVID</b>	0 W
<b>STATIC HEAT DISSIPATION, NON-CURRENT-DEPENDENT PVS</b>	0 W
<b>HEAT DISSIPATION DETAILS</b>	Operation (with 150 % overload)
<b>10.2.2 CORROSION RESISTANCE</b>	Meets the product standard's requirements.
<b>10.2.3.1 VERIFICATION OF THERMAL STABILITY OF ENCLOSURES</b>	Meets the product standard's requirements.
<b>10.2.3.2 VERIFICATION OF RESISTANCE OF INSULATING MATERIALS TO NORMAL HEAT</b>	Meets the product standard's requirements.
<b>10.2.3.3 RESIST. OF INSUL. MAT. TO ABNORMAL HEAT/FIRE BY INTERNAL ELECT. EFFECTS</b>	Meets the product standard's requirements.
<b>10.2.4 RESISTANCE TO ULTRA-VIOLET (UV) RADIATION</b>	Meets the product standard's requirements.
<b>10.2.5 LIFTING</b>	Does not apply, since the entire switchgear needs to be evaluated.
<b>10.2.6 MECHANICAL IMPACT</b>	Does not apply, since the entire switchgear needs to be evaluated.
<b>10.2.7 INSCRIPTIONS</b>	Meets the product standard's requirements.
<b>10.3 DEGREE OF PROTECTION OF ASSEMBLIES</b>	Does not apply, since the entire switchgear needs to be evaluated.
<b>10.4 CLEARANCES AND CREEPAGE DISTANCES</b>	Meets the product standard's requirements.
<b>10.6 INCORPORATION OF SWITCHING DEVICES AND COMPONENTS</b>	Does not apply, since the entire switchgear needs to be evaluated.
<b>10.7 INTERNAL ELECTRICAL CIRCUITS AND CONNECTIONS</b>	Is the panel builder's responsibility.
<b>10.8 CONNECTIONS FOR</b>	Is the panel builder's

<b>EXTERNAL CONDUCTORS</b>	responsibility.
<b>10.9.2 POWER-FREQUENCY ELECTRIC STRENGTH</b>	Is the panel builder's responsibility.
<b>10.9.3 IMPULSE WITHSTAND VOLTAGE</b>	Is the panel builder's responsibility.
<b>10.9.4 TESTING OF ENCLOSURES MADE OF INSULATING MATERIAL</b>	Is the panel builder's responsibility.
<b>10.10 TEMPERATURE RISE</b>	The panel builder is responsible for the temperature rise calculation. Eaton will provide heat dissipation data for the devices.
<b>10.11 SHORT-CIRCUIT RATING</b>	Is the panel builder's responsibility. The specifications for the switchgear must be observed.
<b>10.12 ELECTROMAGNETIC COMPATIBILITY</b>	Is the panel builder's responsibility. The specifications for the switchgear must be observed.
<b>10.13 MECHANICAL FUNCTION</b>	The device meets the requirements, provided the information in the instruction leaflet (IL) is observed.

## Resources

### 3D MODELS

[eaton-EP-400031-3d-model.stp](#)

[eaton-EP-400031-drawing.dwg](#)

### APPLICATION NOTES

[eaton-powerxl-da1-vector-control-induction-motors-ap040028-en-us.pdf](#)

[eaton-powerxl-da1-operating-pm-bldc-motors-ap040051-en-us.pdf](#)

[eaton-powerxl-dx-com-stick-3-ap040190-en-us.pdf](#)

[eaton-powerxl-da1-motor-vf-curves-induction-motors-ap040018-en-us.pdf](#)

[eaton-powerxl-da1-master-slave-operation-ap040026-en-us.pdf](#)

[eaton-powerxl-da1-derating-ap040039-en-us.pdf](#)

[Electromagnetic compatibility \(EMC\)](#)

[eaton-powerxl-vfd-dual-rating-ap040114-en-us.pdf](#)

[eaton-powerxl-da1-dc1-db1-de1-rapidlink5-firmware-update-ap040214-en-us.pdf](#)

[eaton-powerxl-da1-dc1-de1-system-bus-ap040022-en-us.pdf](#)

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

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

	<a href="#">eaton-powerxl-da1-set-point-setting-ap040040-en-us.pdf</a> <a href="#">eaton-powerxl-da1-use-of-multiple-ramps-ap040031-en-us.pdf</a> <a href="#">eaton-powerxl-da1-hoist-applications-ap040032-en-us.pdf</a> <a href="#">eaton-powerxl-da1-droop-function-ap040023-en-us.pdf</a> <a href="#">eaton-powerxl-da1-dc1-de1-internal-motor-protection-ap040016-en-us.pdf</a> <a href="#">Start, Stopp und Betrieb</a> <a href="#">eaton-powerxl-da1-starting-stopping-operation-ap040030-en-us.pdf</a>
BROCHURES	<a href="#">eaton-powerxl-variable-frequency-drives-dc1-da1-brochure-br040001en-en-us.pdf</a>
CATALOGUES	<a href="#">Product Range Catalog Drives Engineering</a>
DECLARATIONS OF CONFORMITY	<a href="#">eaton-variable-frequency-drive-declaration-of-conformity-eu250651en.pdf</a> <a href="#">eaton-variable-frequency-drive-declaration-of-conformity-uk251134en.pdf</a>
INSTALLATION INSTRUCTIONS	<a href="#">eaton-da1-variable-frequency-drive-il040061zu.pdf</a>
INSTALLATION VIDEOS	<a href="#">PowerXL Variable Frequency Drives DC1 and DA1 - EN</a> <a href="#">Video PowerXL DA1</a>
MANUALS AND USER GUIDES	<a href="#">eaton-da1-variable-frequency-drive-mn040063-en-us.pdf</a>
MULTIMEDIA	<a href="#">System solutions based on EtherCAT</a>

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

[eaton-powerxl-da1-profinet-tia-v12-library.zip](#)

[eaton-powerxl-dx-cbl-pc-1m5-usb-driver.zip](#)

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

[eaton-powerxl-dx-cbl-pc-3m0-usb-driver.zip](#)

[eaton-powerxl-da1-profibus-gsd-v216.zip](#)

[eaton-powerxl-da1-profinet-gsdml-v226.zip](#)

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SOFTWARE, FIRMWARE,  
AND APPLICATIONS

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[eaton-powerxl-da1-ethernetip-eds-v150.zip](#)

[eaton-powerxl-pcsoftware-drivesconnect-v1501.zip](#)

[eaton-powerxl-da1-firmware-release-note-mz040041en-us.pdf](#)

[eaton-powerxl-da1-ethercat-esi-for-omron-v311.zip](#)

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**PROJECT NAME:**

**PROJECT NUMBER:**

**PREPARED BY:**

**DATE:**

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