# Specifications

Photo is representative

## Eaton EP-400018

Eaton DA1 Variable frequency drive, 230 V AC, 1-phase, 7 A, 1.5 kW, IP66/NEMA 4X, Radio interference suppression filter, OLED display, Local controls, UV resistant

### General specifications

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| **PRODUCT NAME** | Eaton DA1 Variable frequency drive |
| **CATALOG NUMBER** | EP-400018 |
| **MODEL CODE** | DA1-127D0FB-B6SO |
| **EAN** | 4015082950620 |
| **PRODUCT LENGTH/DEPTH** | 182 mm |
| **PRODUCT HEIGHT** | 257 mm |
| **PRODUCT WIDTH** | 188 mm |
| **PRODUCT WEIGHT** | 3.5 kg |
| **CERTIFICATIONS** | CE<br>Certified by UL for use in Canada<br>CSA-C22.2 No. 14<br>CUL<br>EAC<br>IEC/EN 61800-3<br>IEC/EN61800-3<br>IEC/EN61800-5<br>RCM<br>RoHS, ISO 9001<br>Safety: EN 61800-5-1: 2003<br><br>Specification for general requirements: IEC/EN 61800-2<br>UkrSEPRO<br>UL<br>UL 508C<br>UL Category Control No.: NMMS, NMMS7<br>UL File No.: E172143<br>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

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| **CABLE LENGTH** | 100 m, screened, maximum permissible, Motor feeder<br>150 m, unscreened, maximum permissible, Motor feeder<br>200 m, screened, with motor choke, maximum permissible, Motor feeder<br>300 m, unscreened, with motor choke, maximum permissible, Motor feeder<br>C1 ≤ 1 m, Radio interference level, maximum motor cable length<br>C2 ≤ 5 m, Radio interference level, maximum motor cable length<br>C3 ≤ 25 m, Radio interference level, maximum motor cable length |
| **COMMUNICATION INTERFACE** | CANopen®, built in<br>EtherCAT, optional<br>Ethernet IP, optional<br>Modbus RTU, built in<br>Modbus-TCP, optional<br>OP-Bus (RS485), built in<br>PROFIBUS, optional<br>PROFINET, optional<br>BACnet/IP, optional |
| **CONNECTION TO SMARTWIRE-DT** | No |
| **DEGREE OF PROTECTION** | IP66<br>NEMA 4X |
| **ELECTROMAGNETIC COMPATIBILITY** | 1st and 2nd environments (according to EN 61800-3) |
| **FITTED WITH:** | PC connection<br>Control unit<br>Breaking resistance<br>Additional PCB protection<br>Brake chopper<br>IGBT inverter<br>Internal DC link<br>OLED display<br>Radio interference suppression filter<br>Local controls |
| **FRAME SIZE** | FS2 |
| **FUNCTIONS** | 4-quadrant operation possible |
| **MOUNTING POSITION** | Vertical |

## Climatic environmental conditions

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| **ALTITUDE** | Max. 1000 m<br>Above 1000 m with 1 % derating per 100 m<br>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 |

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| **PRODUCT CATEGORY** | Variable frequency drives |
| **PROTECTION** | Finger and back-of-hand proof, Protection against direct contact (BGV A3, VBG4) |
| **PROTOCOL** | CAN<br>EtherNet/IP<br>MODBUS<br>Other bus systems<br>PROFIBUS<br>PROFINET IO<br>TCP/IP<br>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<br>Optional external radio interference suppression filter for longer motor cable lengths and for use in different EMC environments<br>C2, C3: depending on the motor cable length, the connected load, and ambient conditions. |

## Main circuit

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| **EFFICIENCY** | 95.8 % (η) |
| **HEAT DISSIPATION AT CURRENT/SPEED** | 55 W at 100% current and 0% speed<br>66 W at 100% current and 50% speed<br>77 W at 100% current and 90% speed<br>39 W at 50% current and 0% speed<br>46 W at 50% current and 50% speed<br>54 W at 50% current and 90% speed<br>38 W at 25% current and 50% speed<br>30 W at 25% current and 0% speed |
| **INPUT CURRENT ILN AT 150% OVERLOAD** | 12.9 A |
| **LEAKAGE CURRENT AT GROUND IPE - MAX** | 2.49 mA |
| **MAINS SWITCH-ON FREQUENCY** | Maximum of one time every 30 seconds |
| **MAINS VOLTAGE - MIN** | 180 V |
| **MAINS VOLTAGE - MAX** | 264 V |
| **OPERATING MODE** | Optional: Vector control with feedback (CLV)<br>Sensorless vector control (SLV)<br>Speed control with slip compensation<br>U/f control |
| **OUTPUT FREQUENCY - MIN** | 0 Hz |
| **OUTPUT FREQUENCY - MAX** | 500 Hz |
| **OUTPUT VOLTAGE (U2)** | 240 V AC, 3-phase<br>230 V AC, 3-phase |
| **OVERLOAD CURRENT IL AT 150% OVERLOAD** | 10.5 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 220/230 V, 50 HZ, 1-PHASE** | 1.5 kW |
| **RATED OPERATIONAL VOLTAGE** | 230 V AC, 1-phase<br>240 V AC, 1-phase |
| **RESOLUTION** | 0.1 Hz (Frequency |

## Motor rating

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| **ASSIGNED MOTOR CURRENT IM AT 220 - 240 V, 60 HZ, 150% OVERLOAD** | 6.8 A |
| **ASSIGNED MOTOR CURRENT IM AT 230 V, 50 HZ, 150% OVERLOAD** | 6.3 A |
| **ASSIGNED MOTOR POWER AT 230/240 V, 60 HZ, 1-PHASE** | 2 HP |

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| | 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** | 16 kHz, 4 - 32 kHz adjustable (audible), fPWM, Power section, Main circuit |
| **SYSTEM CONFIGURATION TYPE** | AC supply systems with earthed center point |
| **VOLTAGE RATING - MAX** | 240 VAC |

## Apparent power

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| **APPARENT POWER AT 230 V** | 2.79 kVA |
| **APPARENT POWER AT 240 V** | 2.91 kVA |

## Braking function

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| **BRAKING RESISTANCE** | 50 Ω |
| **BRAKING TORQUE** | Max. 30 % MN, Standard - Main circuit<br>Max. 100 % of rated operational current Ie, variable, DC - Main circuit<br>Max. 100 % of rated operational current Ie with external braking resistor - Main circuit |
| **SWITCH-ON THRESHOLD FOR THE BRAKING TRANSISTOR** | 390 VDC |

## Control circuit

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| **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

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| **EQUIPMENT HEAT DISSIPATION, CURRENT-DEPENDENT PVID** | 63 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 | |
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| **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. |

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| **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<br>eaton-EP-400016-drawing.dwg |
| APPLICATION NOTES | eaton-powerxl-da1-dc1-db1-de1-rapidlink5-firmware-update-ap040214-en-us.pdf<br>eaton-powerxl-da1-dc1-de1-system-bus-ap040022-en-us.pdf<br>eaton-powerxl-da1-pointer-to-parameter-ap040133-en-us.pdf<br>eaton-powerxl-da1-pid-controller-ap040025-en-us.pdf<br>eaton-powerxl-da1-droop-function-ap040023-en-us.pdf<br>eaton-powerxl-da1-starting-stopping-operation-ap040030-en-us.pdf<br>eaton-powerxl-da1-dc1-de1-internal-motor-protection-ap040016-en-us.pdf<br>Start, Stopp und Betrieb<br>eaton-powerxl-da1-vector-control-induction-motors-ap040028-en-us.pdf<br>eaton-powerxl-vfd-dual-rating-ap040114-en-us.pdf<br>eaton-powerxl-da1-hoist-applications-ap040032-en-us.pdf<br>eaton-powerxl-da1-i-o-configuration-ap040034-en-us.pdf<br>eaton-powerxl-da1-dc1-de1-conformal-coating-ap040182-en-us.pdf<br>eaton-powerxl-da1-use-of-multiple-ramps-ap040031-en-us.pdf |

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|---|---|
| | eaton-powerxl-da1-set-point-setting-ap040040-en-us.pdf<br><br>eaton-powerxl-da1-motor-vf-curves-induction-motors-ap040018-en-us.pdf<br><br>eaton-powerxl-da1-operating-pm-bldc-motors-ap040051-en-us.pdf<br><br>eaton-powerxl-dx-com-stick-3-ap040190-en-us.pdf<br><br>eaton-powerxl-da1-derating-ap040039-en-us.pdf<br><br>Electromagnetic compatibility (EMC)<br><br>eaton-powerxl-da1-master-slave-operation-ap040026-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-eu250651en.pdf<br><br>eaton-variable-frequency-drive-declaration-of-conformity-uk251134en.pdf |
| INSTALLATION INSTRUCTIONS | eaton-da1-variable-frequency-drive-il040061zu.pdf |
| INSTALLATION VIDEOS | PowerXL Variable Frequency Drives DC1 and DA1 - EN<br><br>Video PowerXL DA1 |
| MANUALS AND USER GUIDES | eaton-da1-variable-frequency-drive-mn040063-en-us.pdf |
| MULTIMEDIA | System solutions based on EtherCAT |

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| | Looking for variable frequency drives DC1 and DA1 which can be used in harsh environments? |
| SOFTWARE, FIRMWARE, AND APPLICATIONS | eaton-powerxl-da1-swd-codesys-v3-library.zip<br><br>eaton-powerxl-da1-canopen-eds-v250.zip<br><br>eaton-powerxl-da1-ethernetip-eds-v150.zip<br><br>eaton-powerxl-da1-firmware-release-note-mz040041en-us.pdf<br><br>eaton-powerxl-da1-canopen-codesys-v3-library.zip<br><br>eaton-powerxl-dx-cbl-pc-3m0-usb-driver.zip<br><br>eaton-powerxl-da1-profibus-gsd-v216.zip<br><br>eaton-powerxl-da1-ethercat-esi-v310.zip<br><br>eaton-powerxl-da1-profinet-gsdml-v226.zip<br><br>eaton-powerxl-pcsoftware-drivesconnect-v1501.zip<br><br>eaton-powerxl-da1-ethercat-esi-for-omron-v311.zip<br><br>eaton-powerxl-dx-cbl-pc-1m5-usb-driver.zip<br><br>eaton-powerxl-da1-profinet-tia-v12-library.zip<br><br>eaton-powerxl-dx-comstick3-ble-drivers.zip<br><br>eaton-powerxl-da1-devicenet-eds-v100.zip |

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|---|---|
| **PROJECT NAME:** | |
| **PROJECT NUMBER:** | |
| **PREPARED BY:** | |
| **DATE:** | |

**Eaton Corporation plc**
Eaton House
30 Pembroke Road
Dublin 4, Ireland
Eaton.com



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