# Specifications



Photo is representative



## Eaton DX1-32025FB-C21CE

Eaton PowerXL DX1 High Performance Frequency inverter, Three-phase, 240 V, 31 A, 5.5 kW/7.5 kW, EMC Filter & DC-Choke, Brake chopper, LCD, IP21, NEMA 1

### General Specifications

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| **PRODUCT NAME** | Eaton PowerXL DX1 Variable frequency drives |
| **CATALOG NUMBER** | DX1-32025FB-C21CE |
| **PRODUCT LENGTH/DEPTH** | 281.2 mm |
| **PRODUCT HEIGHT** | 419 mm |
| **PRODUCT WIDTH** | 168 mm |
| **PRODUCT WEIGHT** | 10.6 kg |
| **CERTIFICATIONS** | CE |
| **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. different duty cycles) are available upon request. |
| **UPC** | 786689829988 |
| **MODEL CODE** | DX1-32025FB-C21CE |

Powering Business Worldwide

## Product specifications

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| **BRAKE CHOPPER** | Brake chopper |
| **FRAME SIZE** | FR2 |
| **PHASE** | Three-phase |
| **VOLTAGE RATING** | 230 V |
| **COMMUNICATION** | • Modbus RTU<br>• Modbus TCP<br>• Bluetooth |
| **ENCLOSURE** | IP21 |
| **SERIES** | P0600 |
| **KEYPAD** | Membrane Keypad |
| **DISPLAY** | LCD |
| **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** | The device meets the requirements, provided the information in the instruction leaflet (IL) is observed. |
| **10.13 MECHANICAL FUNCTION** | The device meets the requirements, provided the information in the instruction leaflet (IL) is observed. |
| **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. |

## Resources

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| BROCHURES | eaton-powerxl-dx1-vfd-brochure-br040026en-us.pdf |
| CATALOGUES | eaton-drives-soft-starter-catalog-ca04020001zen-us.pdf |
| FLYERS | eaton-powerxl-dx1-vfd-flyer-fl040007en-us.pdf |
| MANUALS AND USER GUIDES | eaton-dual-port-eip-communication-manual-mn040077en-us.pdf<br>eaton-powerxl-dx1-dxx-ext-sabz-dxx-ext-fs-mn040070en-us.pdf<br>eaton-powerxl-dx1-safety-tool-mn040074en-us.pdf<br>eaton-dx1-io-options-card-user-manual-mn040079en-us.pdf |
| SOFTWARE, FIRMWARE, AND APPLICATIONS | eaton-powerxl-dx1-profinet-gsdml-v244.zip |

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| **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. |
| **10.5 PROTECTION AGAINST ELECTRIC SHOCK** | Does not apply, since the entire switchgear needs to be evaluated. |
| **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. |
| **AMBIENT OPERATING TEMPERATURE - MAX** | 50 °C |
| **AMBIENT OPERATING TEMPERATURE - MIN** | -10 °C |
| **AMBIENT OPERATING TEMPERATURE AT 150% OVERLOAD - MAX** | 50 °C |
| **AMBIENT OPERATING TEMPERATURE AT 150% OVERLOAD - MIN** | -30 °C |
| **AMBIENT STORAGE TEMPERATURE - MAX** | 70 °C |
| **AMBIENT STORAGE TEMPERATURE - MIN** | -40 °C |
| **ASSIGNED MOTOR CURRENT IM AT 220 - 240 V, 60 HZ, 150% OVERLOAD** | 22 A |
| **ASSIGNED MOTOR CURRENT IM AT 230 V, 50** | 26.4 A |

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| **HZ, 110% OVERLOAD** | |
| **ASSIGNED MOTOR CURRENT IM AT 230 V, 50 HZ, 150% OVERLOAD** | 19.6 A |
| **ASSIGNED MOTOR CURRENT IM AT 230 V, 60 HZ, 110% OVERLOAD** | 28 A |
| **RELATIVE SYMMETRIC NET FREQUENCY TOLERANCE** | 10 % |
| **RELATIVE SYMMETRIC NET VOLTAGE TOLERANCE** | 10 % |
| **SWITCH-ON THRESHOLD FOR THE BRAKING TRANSISTOR** | 425 VDC |
| **VOLTAGE RATING - MAX** | 240 |
| **ASSIGNED MOTOR CURRENT IM AT 440 - 480 V, 60 HZ, 150% OVERLOAD** | 7.5 A |
| **ASSIGNED MOTOR CURRENT IM AT 440/480 V, 60 HZ, 110% OVERLOAD** | 10 A |
| **ASSIGNED MOTOR POWER AT 230/240 V, 60 HZ** | 7.5 HP |
| **ASSIGNED MOTOR POWER AT 230/240 V, 60 HZ, 110% OVERLOAD** | 10 HP |
| **ASSIGNED MOTOR POWER AT 230/240 V, 60 HZ, 3-PHASE, 110 % OVERLOAD** | 10 HP |
| **BRAKING RESISTANCE** | 20 Ω |
| **INPUT CURRENT ILN AT 110% OVERLOAD** | 29 A |
| **INPUT CURRENT ILN AT 150% OVERLOAD** | 23.1 A |
| **MAINS CURRENT DISTORTION** | 33.3 % |
| **MAINS VOLTAGE - MAX** | 240 V |
| **MAINS VOLTAGE - MIN** | 208 V |
| **NOMINAL OUTPUT CURRENT I2N** | 31 A |
| **NUMBER OF HW-INTERFACES (INDUSTRIAL ETHERNET)** | 1 |
| **NUMBER OF HW-INTERFACES (OTHER)** | 1 |

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| **NUMBER OF HW-INTERFACES (PARALLEL)** | 0 |
| **NUMBER OF HW-INTERFACES (RS-232)** | 0 |
| **NUMBER OF HW-INTERFACES (RS-422)** | 0 |
| **NUMBER OF HW-INTERFACES (RS-485)** | 1 |
| **NUMBER OF HW-INTERFACES (SERIAL TTY)** | 0 |
| **NUMBER OF HW-INTERFACES (USB)** | 0 |
| **NUMBER OF INTERFACES (PROFINET)** | 2 |
| **NUMBER OF OUTPUTS (ANALOG)** | 2 |
| **OUTPUT AT LINEAR LOAD AT RATED OUTPUT VOLTAGE - MAX** | 5.5 kW |
| **OUTPUT AT QUADRATIC LOAD AT RATED OUTPUT VOLTAGE - MAX** | 7.5 kW |
| **OUTPUT FREQUENCY - MAX** | 400 Hz |
| **OUTPUT VOLTAGE - MAX** | 240 V |
| **OVERLOAD CURRENT IL AT 110% OVERLOAD** | 34.1 A |
| **OVERLOAD CURRENT IL AT 150% OVERLOAD** | 37.5 A |
| **RATED FREQUENCY - MAX** | 66 Hz |
| **RATED FREQUENCY - MIN** | 45 Hz |
| **RATED OPERATIONAL CURRENT (IE) AT 110% OVERLOAD** | 31 A |
| **RATED OPERATIONAL CURRENT (IE) AT 150% OVERLOAD** | 25 A |
| **AIR VOLUME CAPACITY** | 94 $m^3/h$ |
| **ALTITUDE** | Max. 1000 m<br>Max. 3000 m<br>Above 1000 m with 1 % derating per 100 m<br>Max. 2000 m for Corner Grounded TN Systems |
| **PROTECTION** | Finger and back-of-hand proof, Protection against direct contact (BGV A3, VBG4) |
| **RESOLUTION** | 0.01 Hz (Frequency resolution, setpoint value) |

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| **APPLICATION IN DOMESTIC AND COMMERCIAL AREA PERMITTED** | Yes |
| **APPLICATION IN INDUSTRIAL AREA PERMITTED** | Yes |
| **BRAKING TORQUE** | Adjustable to 150 % (I/Ie), DC - Main circuit<br>Max. 30 % MN, Standard - Main circuit<br>Adjustable to 150 %, DC - Main circuit<br>Max. 100 % of rated operational current Ie with external braking resistor - Main circuit |
| **CABLE LENGTH** | 100 m, screened, maximum permissible, Motor feeder<br>C3 ≤ 50 m, Radio interference level, maximum motor cable length<br>C2 ≤ 10 m, Radio interference level, maximum motor cable length |
| **CLIMATIC PROOFING** | < 95 average relative humidity (RH), no condensation, no corrosion |
| **COMMUNICATION INTERFACE** | Modbus RTU, built in<br>Modbus TCP, built in<br>Ethernet IP, built in<br>Ethernet IP dual port, optional<br>PROFIBUS, optional<br>PROFINET, optional |
| **CONVERTER TYPE** | U converter |
| **DEGREE OF PROTECTION** | NEMA 1<br>IP21 |
| **EFFICIENCY** | 97.40% |
| **ELECTROMAGNETIC COMPATIBILITY** | 1st and 2nd environments (according to EN 61800-3) |
| **ENVIRONMENTAL CLASS** | 3C2, 3S2 (Air quality) |
| **FEATURES** | Parameterization: Fieldbus<br><br>Parameterization: Keypad<br>Parameterization: Power Xpert inControl<br>Tool-less swapping of fan<br>Temperature-controlled fan |
| **FITTED WITH:** | Internal DC link |

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| | Brake chopper<br>Multi-line graphic display<br>DC link choke<br>IGBT inverter<br>Radio interference suppression filter<br>Additional PCB protection<br>Breaking resistance<br>Control unit<br>PC connection |
| **FRAME SIZE** | FS2 |
| **FUNCTIONS** | 4-quadrant operation possible, Closed loop control with Encoder feedback, extended Safety functions with Option board |
| **LEAKAGE CURRENT AT GROUND IPE - MAX** | 6 mA |
| **MAINS SWITCH-ON FREQUENCY** | Maximum of one time every 60 seconds |
| **MOUNTING POSITION** | Vertical |
| **NUMBER OF INPUTS (ANALOG)** | 2 |
| **NUMBER OF INPUTS (DIGITAL)** | 6 |
| **NUMBER OF OUTPUTS (DIGITAL)** | 1 |
| **NUMBER OF PHASES (INPUT)** | 3 |
| **NUMBER OF PHASES (OUTPUT)** | 3 |
| **NUMBER OF RELAY OUTPUTS** | 2 (parameterizable, 2 changeover contacts, 6 A (240 V AC) / 6 A (30 V DC)) |
| **NUMBER OF SLOTS** | 4 (expansion) |
| **OPERATING MODE** | Closed loop speed control (CL)<br>Closed Loop Torque control (CLT)<br>Sensorless vector control (SLV)<br>Speed control with slip compensation<br>Torque regulation<br>V/f control |
| **OVERVOLTAGE CATEGORY** | III |
| **POLLUTION DEGREE** | 2 |
| **POWER CONSUMPTION** | 11553 W |
| **PROTOCOL** | Other bus systems |
| **RADIO INTERFERENCE** | C1: with external filter, for |

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| **CLASS** | conducted emissions only<br>C2, C3: depending on the motor cable length, the connected load, and ambient conditions. External radio interference suppression filters (optional) may be necessary.<br>Optional external radio interference suppression filter for longer motor cable lengths and for use in different EMC environments |
| **RATED CONDITIONAL SHORT-CIRCUIT CURRENT (IQ)** | 100 kA |
| **RATED CONTROL SUPPLY VOLTAGE** | internal, 10 V DC (Us, max. 10 mA) for analog references, 24 V DC external supply Uc |
| **RATED CONTROL VOLTAGE (UC)** | 24 V DC (external, max. 250 mA options incl.) |
| **SAFETY FUNCTION/LEVEL** | STO (Safe Torque Off, SIL3, PLe Cat 4), SS1, SBC, SLS, SSM, SLA, SSR, SAR (SIL3, PLe, Cat 3), SOS, SS2, SDI (SIL2, PLc, Cat 2) |
| **SHOCK RESISTANCE** | Mechanical, According to EN 61800-5-1, IEC/EN 60068-2-27<br>UPS drop test (for weights inside the UPS frame)<br>Storage and transportation: maximum 15 g, 11 ms (inside the packaging) |
| **SHORT-CIRCUIT PROTECTION RATING** | 35 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 |
| **SUITABLE FOR** | Branch circuits, (UL/CSA) |
| **SUPPLY FREQUENCY** | 50/60 Hz |
| **SWITCHING FREQUENCY** | 4 kHz, 1 - 12 kHz adjustable, PWM, Power section, Main circuit |
| **SYSTEM CONFIGURATION TYPE** | TN-S<br>TN-C<br>TN-C-S<br>TT |

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| **VIBRATION** | Vibration according to EN 61800-5-1, IEC/EN 60068-2-6: 10 – 150 Hz, displacement amplitute 0.075 mm at 10 Hz to 57 Hz, maximum acceleration amplitude: 1 g at 57 Hz to 150 Hz |

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

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