

PowerXL Series DM1 variable frequency drive

Next-generation drives for today's demands



The DM1 and DM1 Pro microdrives are part of Eaton's next generation PowerXL™ Series of adjustable frequency drives specifically engineered for today's more demanding commercial and industrial applications. The power unit makes use of the most sophisticated semiconductor technology and a highly modular construction that can be flexibly adapted to meet the customer's needs.

Features

- Brake chopper standard
- Dual overload ratings:
 - 110% variable torque (I_L)
 - 150% constant torque (I_H)
- Drive can be powered by an external 24 Vdc supply to update firmware and parameters, and access fieldbus
- IP20 rating for base drive, NEMA® Type 1 with optional accessory kit
- Standard I/O:
 - 4x DI, 1x AI, 1x AO, 2x FC relays
- Integrated input surge protection
- On-board communication protocols:
 - DM1 and DM1 Pro: Modbus® RTU, Bluetooth
 - DM1 Pro only: EtherNet/IP, Modbus TCP, BACnet/IP, BACnet MS/TP
- EMI/RFI filters optional on all drives—meets EMC Category C2
- Seamless integration into EtherNet/IP networks via Add-On Instructions
- SNTP time clock supports internet time stamping of faults
- One expansion port for additional communication protocols as necessary
- Remote graphic LCD display and keypad supports simple menu navigation as well as on-screen diagnostics and troubleshooting
- LOCAL/REMOTE operation from keypad
- Conformal-coated control and power boards standard
- Safe Torque Off (STO) built-in with functional safety SIL2 Certification

Standards and certifications

- IEC/EN 61800-5-1, Immunity: IEC/EN 61800-3, UL-61800-5, IEC/EN 61800-5-2, Category C2
- cUL®
- UL®
- CE
- IEC 61508
- C-Tick
- EN 62061
- RoHS
- EN ISO 13849-1
- EAC
- Plenum rated

Software

- Built-in web server to update firmware, program and commission the DM1 over an Ethernet network
- Active Energy Control® minimizes energy losses in your motor, resulting in industry-leading energy efficiency for your application
- Quick Start Wizard upon initial power-up supports fast, easy installation
- Standard applications:
 - Standard
 - Fan
 - Pump
 - Multipurpose
- Copy/paste functionality on drive keypad allows for fast setup of multiple drives using remote keypad
- Preprogrammed I/O supports fast, easy installation for most applications
- Advanced PC Tool with diagnostic capabilities



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Input ratings

| Description | Specification |
|--------------------------------|--|
| Rated input voltage | 1 = 115 V (100–120 V, +10%/–15%) 2 = 230 V (200–240 V, +10%/–15%) 4 = 400 V (380–480 V, +10%/–15%) 5 = 575 V (525–600 V, +10%/–15%) |
| Voltage tolerance | –15%/10% |
| Input frequency | 50 Hz to 60 Hz (variation up to 45 Hz to 66 Hz) |
| Input THD | >120% |
| Connection to power | Once per minute or less frequent |
| Boot delay | 3 s |
| Short-circuit withstand rating | 100 kAIC (fuses and circuit breakers); 65 kAIC (Type E CMC); 14 kAIC (miniature breakers); 5 kAIC (all) |
| Power ride-through | 100 ms |
| Logic control ride-through | 0.5 s min, 2 s typical |
| Frequency tolerance | 45 Hz to 65 Hz |
| Total watts loss typical | Typical efficiency 97.5% for three-phase |

Output ratings

| Description | Specification |
|---------------------------|--|
| Continuous output current | I_L : ambient temperature maximum 40 °C, up to 60 °C with derating, overload 1.1 x I_L (1 min/10 min) I_H : ambient temperature maximum 50 °C, up to 60 °C with derating, overload 1.5 x I_H (1 min/10 min) |
| Overload current | 150% of drive rating for constant torque; 110% of drive rating for variable torque |
| Initial output current | 200% (2 sec/20 sec) |
| Output frequency | 0–400 Hz (standard) |
| Frequency resolution | 0.01 Hz |
| Maximum cable length | See EMC guidelines in Installation Manual Without EMC considerations: 328 ft (100 m) |

Ambient conditions

| Description | Specification |
|-----------------------|--|
| Operating temperature | –10 °C (no frost) to +50 °C, up to +60 °C with derating (CT) –10 °C (no frost) to +40 °C, up to +60 °C with derating (VT) |
| Storage temperature | –40 °C to +70 °C |
| Relative humidity | 0–95% RH, noncondensing, non-corrosive |
| Air quality: | Tested according to IEC 60068-2-60 test key: • Chemical vapors: Flowing mixed gas corrosion test, method 1 (H ₂ S [hydrogen sulfide] and SO ₂ [sulfur dioxide]) • Mechanical particles: Designed according to: IEC 60721-3-3, unit in operation, Class 3C2 |
| Vibration | Vibration test at operating status • EN 61800-5-1: Displacement amplitude: 0.075 mm (peak) at 10 Hz to 57 Hz • EN 60068-2-6: Maximum acceleration amplitude: 1g at 57 Hz to 150 Hz |
| Shock: | Shock test at operating status • EN 60068-2-27: Peak acceleration: 15 g Duration: 11 ms |
| Transportation | Transported as a single device in a separate package • ISTA 1 A: Vibration test and drop test per ISTA 1A |
| Overvoltage | Overvoltage Category III |
| Pollution degree | Pollution Degree 2 |
| Enclosure class | IP20 standard in entire kW/hp range; NEMA Type 1 with accessory kit |
| Immunity | EN 61800-3:2004/A1:2012, first and second environment |
| Altitude | 100% load capacity (no derating) up to 3280 ft (1000 m) 1% derating for each 328 ft (100 m) above 3280 ft (1000 m) maximum 9842 ft (3000 m) (2000 m for corner grounded earth main systems) |
| MTBF | 300,000 hours |

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