

## 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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## Catalog numbering system



## Input ratings

| Description                    | Specification  |
|--------------------------------|--|
| Rated input voltage            | 1 = 115 V (100–120 V, +10%/–15%)<br>2 = 230 V (200–240 V, +10%/–15%)<br>4 = 400 V (380–480 V, +10%/–15%)<br>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)<br>$I_H$ : 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<br>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)<br>–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:<br>• Chemical vapors: Flowing mixed gas corrosion test, method 1 (H2S [hydrogen sulfide] and SO2 [sulfur dioxide])<br>• Mechanical particles: Designed according to: IEC 60721-3-3, unit in operation, Class 3C2 |
| Vibration             | Vibration test at operating status<br>• EN 61800-5-1: Displacement amplitude: 0.075 mm (peak) at 10 Hz to 57 Hz<br>• EN 60068-2-6: Maximum acceleration amplitude: 1g at 57 Hz to 150 Hz  |
| Shock:                | Shock test at operating status<br>• EN 60068-2-27: Peak acceleration: 15 g<br>Duration: 11 ms   |
| Transportation        | Transported as a single device in a separate package<br>• 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)<br>1% derating for each 328 ft (100 m) above 3280 ft (1000 m)<br>maximum 9842 ft (3000 m)<br>(2000 m for corner grounded earth main systems)  |
| MTBF                  | 300,000 hours   |

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