Cooling Compressors

Application support for DM1 Pro

Powering Business Worldwide

Driving maximum compressor efficiency and superior reliability

Even for cooling compressors the DM1 Pro frequency inverter utilizes the 110% overload rating. Alternative to the V/f control the sensorless vector control can be used. Combined with the energy savings function optimum results are achived.

Robust	Fast	Simple	Service & support
• IP20/IP21 designs provide increased environmental protections • Short circuit protection up to 100 kA (Ic) in combination with breakers or fuses • Conformal coated boards protect against aggressive ambient • Best-in-Class ambient temperature range from -30°C to 50°C	• 14 basic parameters, Quick Start Wizard and PC Tools for simpler commissioning	• Only a few inputs are required to get DM1 operational. Usually DG1 can be used without further settings, saving time an commissioning cost • shows the most important Parameters in a compact menu for fast access. All entries are user-configurable. That saves time finding the desired information • Pre-configured applications to simplify complex parameter sets, from standard to multi-pump configurations	• Standard two-year warranty with extensions available through certified commissioning • Dedicated team of application engineers and technical resources available to provide pre-sales and after-sales support • Aftermarket program providing spare parts, service and training classes

Application control

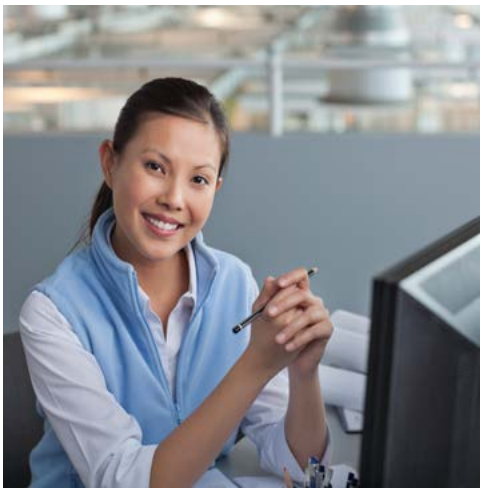
- **PID controller –** The internal PID controller makes it possible to maintain a constant pressure in the system by continuously controlling the speed based on the process value delivered by the system.
- **Process variable representation in PID controller –** Makes things easier for operators by making it possible to directly show pressure and monitor them in the motor menu.
- **I/O on-board –** Featuring 4 DI, 1AI, 1 AO, 2 RO, each I/O programmable with various functions. This I/O provides maximum flexibility when controlling the application at hand while simultaneously reducing the costs required for external controllers.
- **200% Torque –** Independently of the fact that a DM1 can work with a 150% overload for 60 seconds every 10 minutes, it also offers a peak torque of 200% for critical situations.
  This makes it possible to reliably overcome even the toughest overload requirements. And when even this is not enough to keep driving the application, the DM1 unit will detect this and shut down with a fault message before it or the motor is damaged.
- **Reduced speed operation –** Makes it possible to adjust the speed according to the requirements when there is little demand, lowering energy costs and improving system efficiency.

Application protection

- **STO –** Designed in safety typical yellow the STO input (SIL2, PLd, Cat 3), simplifies integration in the required safety system according to the machine directive.

Plant control & service

- **Resistant against dust and agressive gases –** All PCBs in DM1 variable frequency drives come with a conformal coating and are accordingly resistant to dust and aggressive gases. This eliminates the need for expensive, protected enclosures used to keep process-related dust at bay.
- **Improved fault troubleshooting -** Complete fault history utilizing real time clock to time stamp and record system parameters upon fault conditions for the last faults. Improves fault diagnosis and reduces service and down time.



Motor control

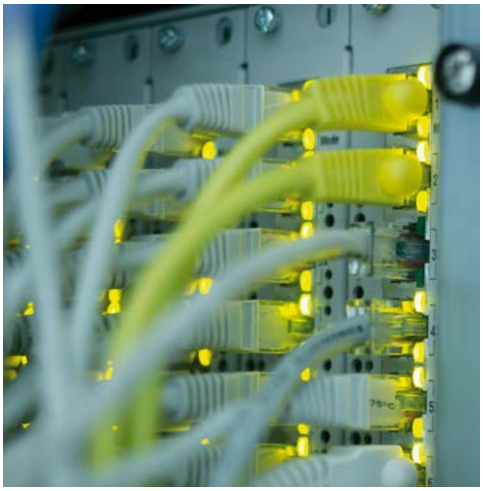
- **Smooth start –** Control algorithms, together with the motor identification function, make it possible to achieve a perfectly smooth start. This goes easy on mechanical components, effectively prevents inrush current peaks, and lowers consumption at peak load rates.

Motor protection

- **Electronic motor protection –** In order to efficiently prevent any motor damage, a perfect working motor protection is required. Accordingly, the protection function in DM1 variable frequency drives can be programmed flexibly.

Energy Efficiency

- **Energy savings function –** provides (2-10%) energy savings over competitors “out of box” mode without motor tuning.
- **Energy savings calculator –** The PC tool calculates the actual energy cost and savings compared to a conventional starter (DOL) already before buying the drive.



Management and communication

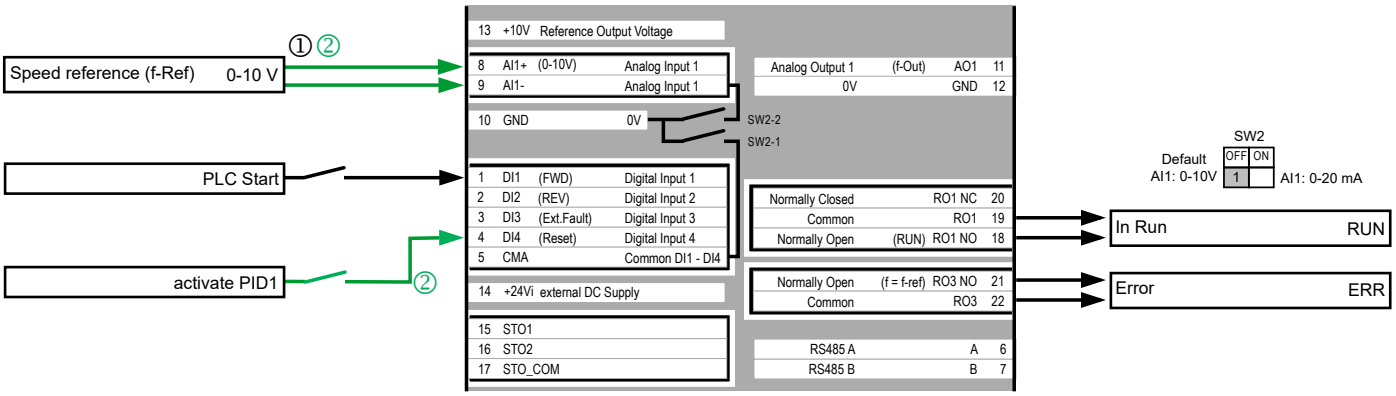
- **Communication –** Best-in-class on-board communications includes Modbus RTU, Modbus TCP to integrate into any desired network within a facility.
- **Webserver –** With the internal Webserver the drive can be parameterized without further software, only requirement is an Ethernet based connection and a web-browser.
  For the application this is a simple way without the need for additoinal software installations to access the drive. This can be a service or a commissioning. Simplifying processes this shortens time-/cost for the owner.

Wiring example compressor

The compressor can run speed controled as well as closed loop with a pressure reference:

① Via analog input a speed reference is done, the drive runs in open loop control.

② Via analog input the pressure feedback is given. Reference control is done via the internal potentiometer or via communcation. The internal PID controller will controll the closed loop pressure control.



Further application notes

Common hints	
Electromagnetic compatibility (EMC)	AP040043EN
Dual Rating – What exactly does that mean?	AP040114EN
Connecting drives to generator supplies	AP040169EN
DM1 specific hints	
Application Manual DM1	MN040049EN
Communication Manual DM1	MN040051EN
Webserver Manual	MN040055EN

Following link will show you the Application notes for DM1 Pro: Eaton.com/ap/übersicht/drives

DM1 Pro-Manuals you can find at: Eaton.com/dm1

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