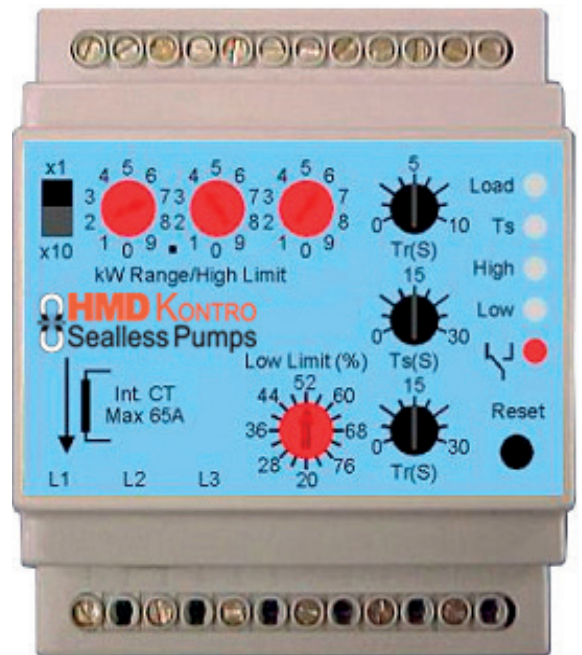


Power Control Monitors

Power Monitoring — Protecting Your Pump

Power Monitoring represents one of the best ways to protect your pump from system upset damage and avoid costly shutdowns, unexpected repair costs, and premature equipment failure.

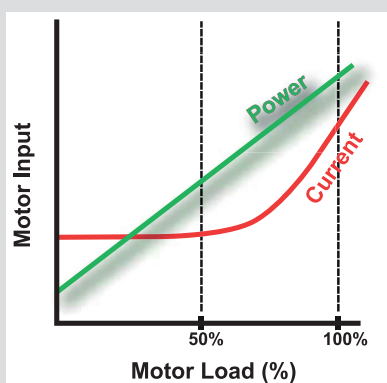
A Power Control Monitor (PCM) is a simple electronic device that is easily installed in the electric motor control circuit of any given pump or other rotating equipment. The PCM monitors true power input and can be set to alarm or shut off if pre-set power limits are reduced or exceeded. By sensing the actual power demand of the electric motor, virtually all upset pumping conditions can be detected and damage to the pump and electric motor can be avoided.



These include:

- Dry-running
- High Flow / End-of-Curve
- Low Flow / Back-on-Curve
- Jammed Impeller
- Increased Viscosity / Precipitation
- Severe Cavitation
- Deadhead / Closed Discharged Valve
- Decoupling (on Magnetic Drive Pumps)

The Power Control Monitor Advantage



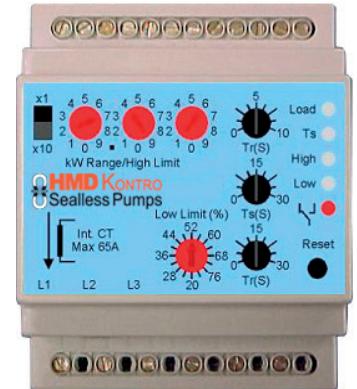
Power Monitoring has distinct advantages over common current monitoring, also known as amperage monitoring. The current is almost constant up to 50% of the motor load range and because of this, it is very difficult to detect changes below 50%. In contrast, because the input power varies linearly across the entire motor load range, it is an extremely reliable and accurate detector of system changes. As such, most pumping condition changes will be seen in input power fluctuations.

PM-1000 and PM-2000 are modular devices designed to fit your individual requirements.

Power Control Monitor Features

PM-1000 Power Control Monitor

The PM-1000 Power Control Monitor is a modular device designed to fit your individual requirements. The analogue PM-1000 is extremely compact and is at the heart of the system and is designed to fit inside a standard motor starter box. With its integral current transformer and standard DIN rail mount, the PM-1000 is the basic system to protect your pump. The PM-1000 is easily programmed to sense both high and low power upset conditions and send a signal that can be used to either sound an alarm or automatically shut down the pump before significant damage can occur.



PM-2000 Interface Module

The PM-2000 is a digital interface device designed to expand the functionality of the PM-1000. It is powered by a 10V power supply and allows the user easy remote access to the PM-1000 controls outside the motor starter box away from high voltage connections. This arrangement is safe and eliminates the need for the presence of a licensed electrician to make simple setting changes. The PM-2000 also has industry standard 4-20mA output for remote data readings, expanded trip delay range for added flexibility, kW/HP/%kW unit display, remote reset, NEMA 4X option, DIN rail mounting options, and both hardware and software locking options to discourage unauthorised changes to settings.

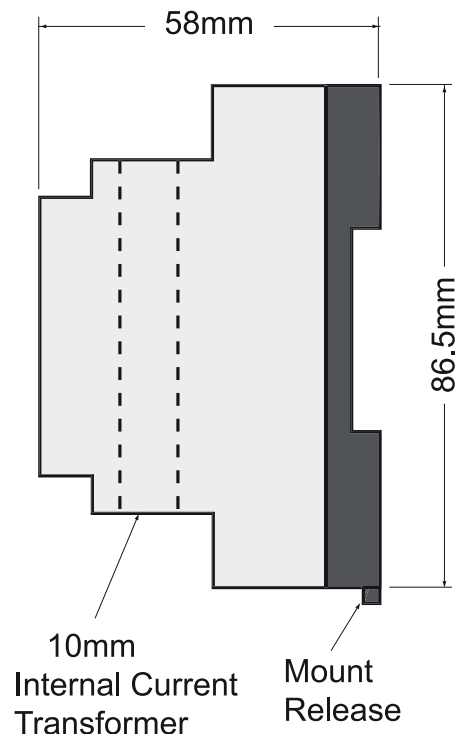
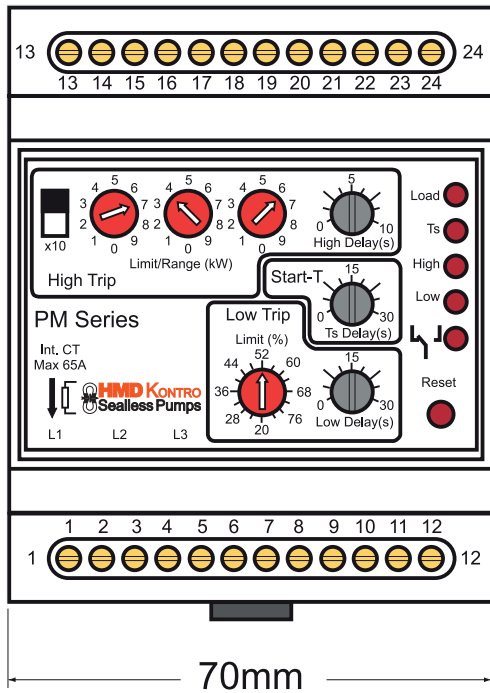
Feature	Model PM-1000	Model PM-2000
Display	Static Panel w/knobs	Dynamic 3-Digit LED
Low Trip Delay	1-30 Seconds	1-99 Seconds
High Trip Delay	1-10 Seconds	1-99 Seconds
Start-up Delay	1-30 Seconds	1-999 Seconds
Power Setting Units	Kilowatts only	kW or HP
Display Units	Kilowatts only	kW, HP or %kW
Trip Range (% Of Max Power)	20-80%	5-100%
Low Voltage Supply	No	Yes — 10V Only
Remote Reset	Yes	Yes
Analog Output	0-10VDC	4-20 mA Output for PLC
Programme Lockout	--	Yes
User Friendly Input	--	Yes
NEMA 4X Option	--	Yes

NOTE: The PM-2000 interface only operates in conjunction with the PM-1000 Power Control Monitor.

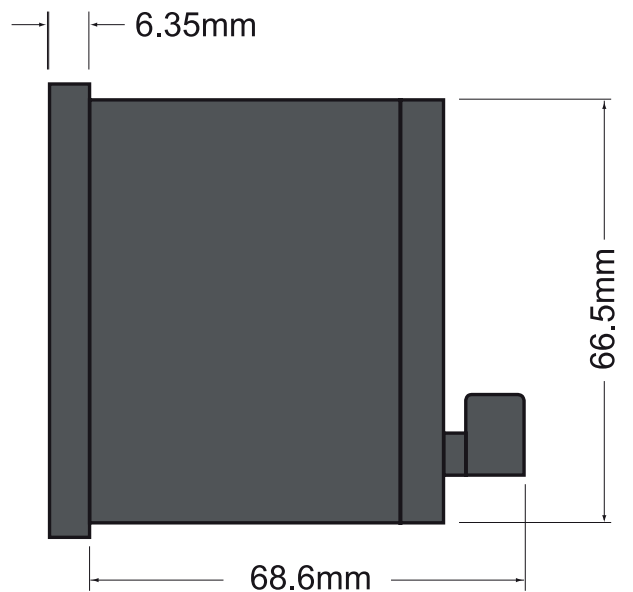
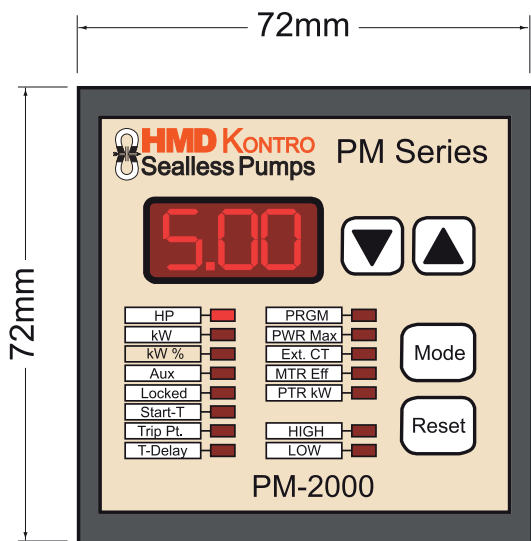
- Virtually eliminates pump damage due to system upsets
- Significantly reduces spare parts costs
- Reduces downtime and service costs
- Integral current transformer eliminates extra component and installation costs
- PM-1000 has a compact design and neatly fits inside a standard motor start box
- PM-2000 greatly expands features and accessibility
- PM-2000 isolates all dangerous high voltage exposure from workers
- Provides valuable feedback to troubleshoot operational problems
- Protects your rotating equipment investment!



PM-1000 Dimensions



PM-2000 Dimensions



PM-1000 Specifications

Normal Motor Voltage Range (3 Phase)	208 to 575 VAC or 600 to 660 VAC
Internal CT	0-65 Amp (up to 500 amps with external CT, 500:5)
High Trip Limit	High Trip = kW range set
Low Trip Limit Range	20 to 80% of kW power range
Start-Up/Low Trip Delay	1 - 30 seconds
High Trip Delay	1 - 10 seconds
Frequency Range	45 - 65 Hz
Control Supply	115/230 VAC ± 10%, 50/60 Hz, 1-Ph
Relay Output Rating Type	5 Amp @ 250 VAC (non-inductive) SPDT, Normally Close
Analogue Output	0 - 10 VDC source (directly proportional to kW range selected)
Operating Temperature	+5 to +122°F (-15 to +50°C)
Enclosure Material Mounting Rating Dimensions	Upper: White Lexan (UL94-V0), Lower: Black Noryl (UL94-V0) 35 mm DIN Rail NEMA 1 Type (IP 20) 2.76" x 3.38" x 2.28" (70mm x 86mm x 58mm)
Third Party Approvals	CE (UL and C-UL pending)

PM-2000 Specifications

Power Requirements	10 VDC / 50mA (provided from PM-1000)
Digital Display	LED, 3 digit, 0.3" (7.62mm) High
Analogue Output Range Input Voltage Range Maximum Load Resistance Short Circuit Protection Reverse Voltage Protection	4-20 mA source (proportional to maximum power range) 15 to 30 VDC 136 Ohms @ 15V/818 Ohms @ 30 V Yes Yes
Start-Up Timer	1 - 999 seconds
High and Low Trip Delays	1 - 99 seconds
Trip Range	5% to 100% of maximum power value
Display Power Units	HP, kW, or %kW
Parameter Programme Lock: Software Hardware	Embedded command entered from keypad Closed connection between terminals 6 and 7
Communication Distance	Maximum wire distance between the Power Control Monitor and the Display Panel is 25 ft. (7.62 m). A twisted wire pair is recommended for distances between 1 ft. (.3 m) to 6 ft. (1.82 m), and shielded wire for distance over 6 ft. (1.82 m).
Operating Temperature	+5 to +122°F (-15 to +50°C)
Enclosure Material Mounting Dimensions Rating	Flame resistant Noryl Panel 2.83" x 2.83" x 2.70" (72mm x 72mm x 68.6mm) NEMA 12 Type (IP 54) NEMA 4 with optional translucent, plastic hood
Third Party Approvals	CE (UL and C-UL is not required if supply is under 30 VDC)

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Power Monitor 1.0 1/20 A4 Eng.