

# ProcessDefender™

Power Monitors



UNPARALLELED PROTECTION  
FOR MOTOR DRIVEN  
EQUIPMENT



[www.h2flow.net](http://www.h2flow.net)

*When it comes to protecting machines and processes from abnormal conditions, our products have developed a reputation as the best in the business. For over 20 years, our power monitoring solutions have been used to eliminate costly equipment failure and its associated downtime.*

## STOP DAMAGE & DOWNTIME BEFORE IT OCCURS

Process, Reliability and Maintenance Engineers are often confronted with the consequences of unscheduled downtime and expensive repair costs associated with the unexpected failure of motor driven equipment. The event may have been caused by an operator error, equipment failure, upstream process problems or a myriad of other unexpected events.

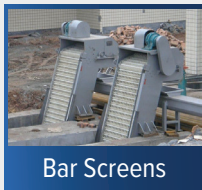
Protecting motor driven equipment with ProcessDefender™ can alert the operator to events such as pump run dry, dead head, cavitation, or a closed suction valve. An alert can be as simple as a visual operator alarm, a signal to a plant DCS, or a direct local shut down of the motor. Either way, ProcessDefender™ will react quickly enough to protect the equipment from damage and downtime.



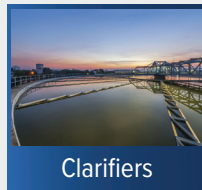
### TYPICAL APPLICATIONS



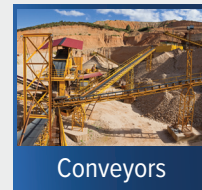
Pumps



Bar Screens



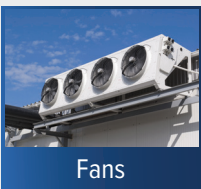
Clarifiers



Conveyors



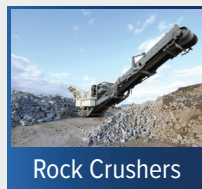
Cranes & Hoists



Fans

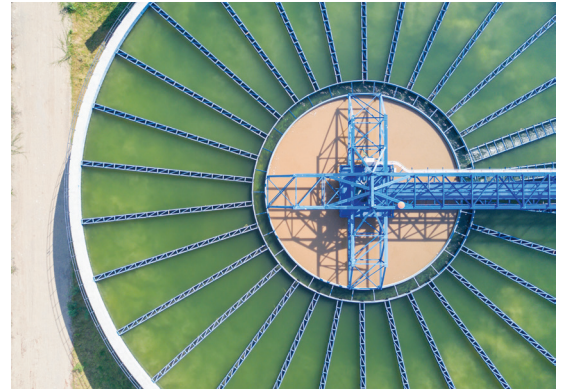


Mixers



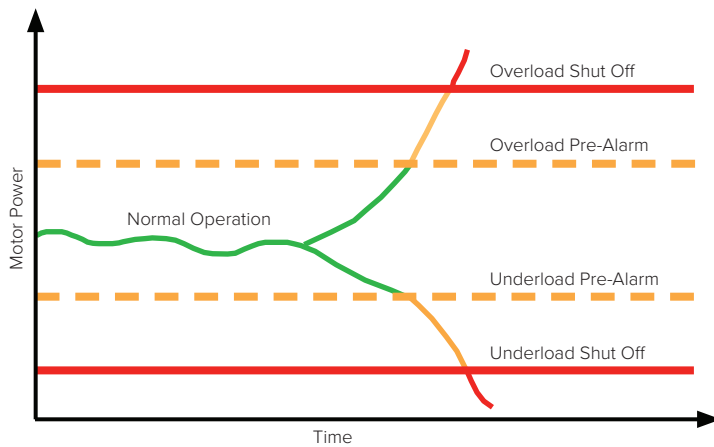
Rock Crushers

In addition to the applications shown, ProcessDefender™ is also capable of reliably protecting blowers, aerators, centrifuges, grain legs, and more. A variety of pump types can be protected, perhaps most notably mag drive pumps, where dry run conditions can be catastrophic.

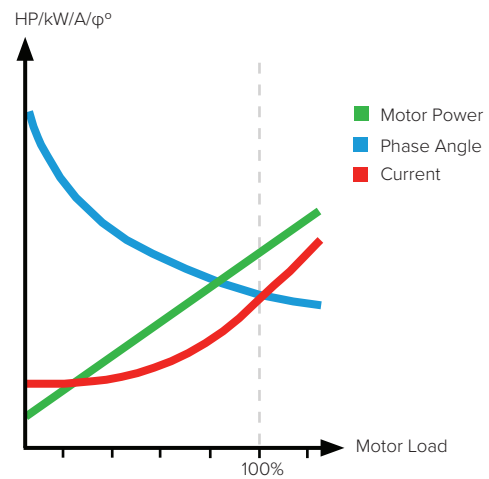


## KEY FEATURES & BENEFITS

- Arc Flash protection for the user
- Motor Load monitoring uses the motor as a sensor
- Externally mounted HMI
- Display motor load as either HP, kW, % of Motor Power
- Four levels of protection for over and underload
- Single model for all voltages
- Real Time Clock
- Logging of alarms including time and date stamp
- Auto setting of protection parameters
- Over-and-under-voltage protection
- With use of additional Current Transducers, available monitoring of:
  - Current in each phase
  - Phase Angle Voltage
  - Phase Angle Current
  - Power Factor
  - Line-to-line Voltage
- Programmable via external HMI or Modbus
- Accumulated motor run time
- Free firmware updates applied by user
- Certified to UL, cUL, CE, and UKCA



ProcessDefender™ provides early warnings of overload and underload conditions. If necessary, the product will take preventative action against the abnormal condition by shutting down the driven equipment before damage and downtime occur.



Input Power is a far more accurate and reliable method of protecting machines and processes than relying on Current. Unlike Input Power, Current does not have a linear profile, meaning it is unable to provide reliable protection at certain loads.

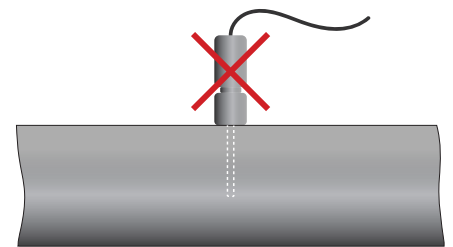
# SIMPLE INSTALLATION AND ZERO MAINTENANCE

ProcessDefender™ comprises a motor power sensor installed in the motor starter panel or MCC, and an HMI installed in the control panel door. Installation is quick, simple and can be entrusted to a plant electrician for existing equipment or a panel builder for new equipment.

ProcessDefender™ has no long-term maintenance requirements, and the plant can expect many years of trouble-free operation.

## USING THE MOTOR AS A SENSOR

ProcessDefender™ uses the motor as a sensor! By accurately measuring motor power, ProcessDefender ensures that abnormal conditions such as pump run dry or a closed suction valve are reliably detected prior to pump damage - both critical demands when using Mag-Drive pumps.



ProcessDefender™ does not require external sensors or cabling.



## SAFE PROGRAMMING

Programming the ProcessDefender does not expose the Engineer to the dangers of Arc Flash. The panel door remains completely closed during programming, thereby protecting facility staff from the high voltages within motor controls. Many facilities will not allow their staff to work on live equipment such as programming a device within the motor control panel or MCC. ProcessDefender can be programmed via either the HMI or Modbus communication.

# With ProcessDefender™ protecting your machines & processes, you can stay focused on the task at hand!

Scan to learn more about ProcessDefender™ power monitors



## BENEFITS OF THE PD100

ProcessDefender™ offers complete monitoring and protection for all motor driven equipment, with user-friendliness and functionality that is unparalleled amongst power monitoring devices.



ProcessDefender HMI and sensor

Feature	PD100
Process Overload Protection	✓
Process Underload Protection	✓
Process Overload Pre-Alarm with dedicated independent relay	✓
Process Underload Pre-Alarm with dedicated independent relay	✓
Three independent alarm relays	✓
Single model for all voltages of 100 - 500 VAC	✓
Split core CT's to aid installation	✓
Line-to-line Voltage measurement*	✓
Measurement of Current in each phase*	✓
Measurement of phase angle Voltage*	✓
Measurement of phase angle Current*	✓
Measurement of power factor*	✓
Over- and Under-Voltage protection with independent relay	✓
Ability to apply hysteresis to all unlatched alarm relays	✓
Programmable via external HMI	✓
Ability to latch or unlatch alarm relays	✓
Event Logging with time and date stamp	✓
Real time clock	✓
Lockable program settings	✓
Phase Angle Monitored over Modbus	✓
Modbus Parameters / Addresses displayed on HMI	✓
Logging of equipment Run Time	✓

\* Requires use of three Current Transducers

# Peace-of-mind for every application

Application	Challenge	ProcessDefender Solution	Value
All pump types	Dry-running, cavitation and other types of pump failure.	Detects over- and underload conditions. Provides warning and then stops the pump.	Prevents damage and downtime. Increased reliability. Extended equipment lifetime.
	Inefficiency due to low flow, a closed valve, a blocked pipe or impeller, etc.	Detects over- and underload. Sends warning or stops the pump.	Optimized operation. Increased reliability. Reduced equipment wear.
	Mechanical flow switches and temperature sensors are expensive and fail frequently.	Using pump motor as sensor eliminates need for external sensors. No moving parts increases reliability.	Increased reliability. Reduced maintenance, investment and installation costs. Extended equipment lifetime.
	Temperature sensors and flow switches do not register dry-running or no-flow during low load conditions.	Detects over- and underload in low load range. Using pump motor as sensor eliminates need for external sensors.	Increased reliability. Reduced maintenance and installation costs. Extended equipment lifetime.
	Sensors need cleaning and mechanical adjustment.	Using pump motor as sensor eliminates need for external sensors.	Reduced maintenance and installation costs. Easy installation and set up.
Centrifugal pumps	Frequent dry-running causes damage and downtime.	Shuts pump off before it runs dry.	Reduced maintenance costs. Less downtime.
Magnetic pumps	Current monitoring is unreliable. Underload is not detected in low load range.	Detects underload in low load range.	Increased reliability. Reduced maintenance costs. Less downtime.
Screw and impeller pumps	Dry-running is detected too late. Sensors do not register short period of lower motor load as remaining liquid still lubricates the pump.	Detects short period of lower motor load. Sends warning or stops the pump.	Reduced maintenance costs. Extended equipment lifetime. Less downtime.
Mixers	Mixer blade is damaged or has fallen off.	Detects over- and underload. Sends warning or stops the mixer.	Optimized operation.
	Difficult to determine when viscosity is right.	Controls viscosity according to motor load using the analog output.	Optimized operation. Improved product quality.
	Shaft oscillation occurs.	Detects abnormal load variations. Sends warning or stops the mixer.	Reduced maintenance costs and downtime.
Scrapers	Jamming occurs.	Detects overload. Sends warning or stops the scraper.	Reduced maintenance costs and downtime.
	Scraper blade is damaged or has fallen off.	Detects over- and underload. Sends warning or stops the scraper.	Optimized operation.
Conveyor systems, crushers, etc.	Jamming occurs.	Detects overload. Sends warning or stops the process.	Reduced maintenance costs and downtime.
	Material runs out, causing unnecessary idling.	Detects underload. Sends warning or stops the process.	Optimized operation.



## TECHNICAL DATA

The ProcessDefender load monitor features advanced multi-function monitoring with two output relays, an analog output and a digital display for load indication and parameter settings.

<b>Supply voltage<sup>1</sup></b>	1 x 100-240 VAC & 3 x 100-480 VAC
<b>Frequency</b>	45 Hz to 65 Hz
<b>Rated current</b>	Up to 999 A via current transformer
<b>Output Relays</b>	3
<b>Accuracy</b>	≥98%
<b>Repeatability</b>	≥99%
<b>Protection class</b>	NEMA 4 / IP65 (HMI only)
<b>Approvals</b>	UL, cUL, CE, UKCA

1) ProcessDefender requires one of the following types of 3-phase networks:

- 3-phase, 4-wire, ungrounded wye
- 3-phase, 3-wire, resistance grounded wye
- 3-phase, 3-wire, grounded wye
- 3-phase, 4-wire, resistance grounded wye
- 3-phase, 4-wire, grounded wye

## *Progress through Innovation™*

Our innovative solutions are developed with a focus on controlling, monitoring and measuring flow.

Contact your authorized H2flow Controls solutions provider to find out how our products can help you and your customers.

Find an authorized partner at [www.h2flow.net/locate-a-partner](http://www.h2flow.net/locate-a-partner)

FLOW METERS | POWER MONITORS | AC DRIVES | SOFT STARTERS

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ProcessDefender brochure Rev.1.4

