

MOTOR, VFD DRIVE, SOFT STARTER & UPS SERVICES

How critical are your needs to prevent or avoid unscheduled downtime, loss of earnings, and interruption to your process, production, or services? Proactive organizations realize that the fastest repairman in the world is not as fast as the craftsman that did not allow the failure to happen in the first place.



~~“If it's not broke, don't fix it”~~

Call before it breaks. Failures can be avoided and do not have to happen.

Predictive Maintenance For Motor *plus* VFD/Soft Starter includes:

- Advanced Motor Winding Analysis
- Bearings & Vibration
- Infrared Thermography
- Terminal Electrical Connections
- SFRA
- Load Test

HOW MUCH IS ONE AMP WORTH?

$$kW = \frac{V \times I \times PF \times \sqrt{3}}{1000}$$


Conditions for this example:

480V motor drawing 40A, PF is 0.85, and electricity cost \$0.10/kWhr

$kW = (V \times A \times PF \times 1.732) / 1000$
 $kW = (480V \times 40A \times 0.85 \times 1.732) / 1000$
 $kW = 0.707$ power savings
Savings (\$) = hours x kW savings x kW cost
Savings (\$) = 8400 x 0.707 x \$0.10/kWhr
Savings (\$) = 593.88

If your plant has 80 similar motors, and if only half of them had the same amount of savings it would total $593.88 \times 40 = \mathbf{\$23,755.20!}$

HOW MUCH DOES AN INCIDENT COST?

Voltage Sag

Assume a single voltage sag causes a VFD on a conveyor system to trip offline at least once a year. No income is permanently lost, but 10 hourly workers have to work 4 hours to make shipments at \$30/hour, which includes overtime.

Added Labor:

10 people x 4 hours x \$30/hr = \$1200 annually

Voltage Unbalance

Assume the cost to replace a 50 hp motor each year is \$5000 including labor. Assume 4 hours of downtime per year with income loss of \$6000 per hour.

Total Cost:

$\$5000 + (4 \times \$6000) = \mathbf{\$29,000}$ annually

Others will guess what the problem is. Inverter Technologies will Find IT, Show IT, and Prove IT.

ONLY AVAILABLE FROM INVERTER TECHNOLOGIES

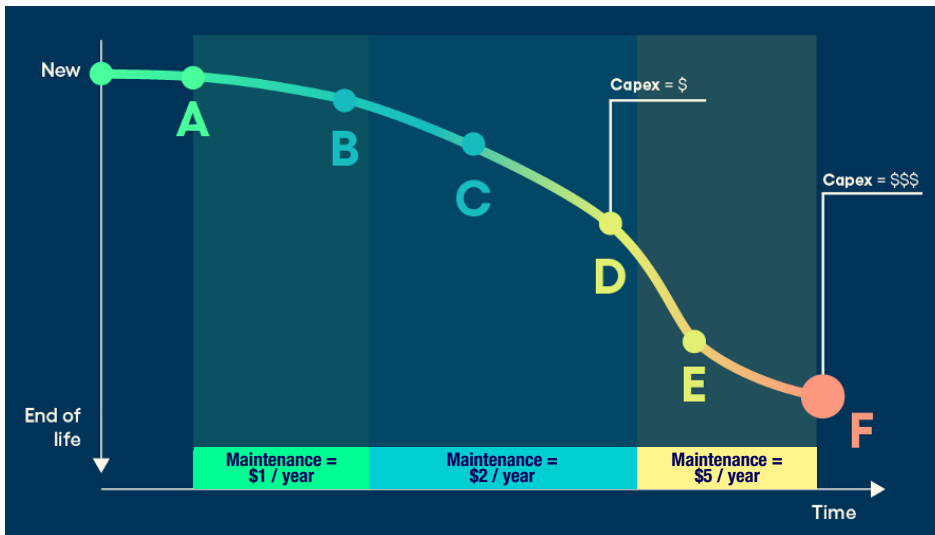
Stray Current Measurement
for Submersible Pump Motor

SWITCHIT600 for
Generator & Utility Power
Auto Transfer Switch

SFRA for Deformation and
Windings Turn-to-Turn Short

A Class Above First!

Are unplanned expenses and purchases consuming your Maintenance, Repairs, and Operations budget? Critical equipment, hard to access assets, and recurring failures need tailored solutions. Future failure will cause more Preventative and Predictive Maintenance to be deferred, resulting in another failure.



P-F CURVE

Potential Failure is the point at which the equipment is starting to deteriorate or fail.

Functional Failure is the point that the equipment has reached its useful limit and is no longer operational.

MAJOR BRANDS SERVICED

- ABB • Benshaw • Allen Bradley
- Danfoss Vacon
- Eaton Cutler-Hammer
- Mitsubishi • Schneider Electric
- Toshiba • Yaskawa

SERVICE OFFERINGS

- Motor Insulation Winding Analysis
- Motor Shaft Voltage and Leakage Current
- **SFRA**
- Bearing Protection
- Belt, Shaft, and Sprocket Alignment
- Equipment Retrofits and Upgrades
- Power Quality Analysis
- Auto Transfer Switch Transitions Reliability
- Start-Up, Troubleshooting, and Repairs
- Predictive Maintenance
- Grease and Oil Analysis
- Infrared Thermography Inspections
- Partial Discharge Testing
- Failure & Root Cause Analysis



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