Industry Application: Fans & Pumps
The MotorShield™ is designed to extend motor life in variable torque applications, such as fans and pumps with lead lengths up to 15,000 feet. Motors on these systems typically produce a large amount of heat as they run. The MotorShield™ is the perfect solution to prevent overheating and motor failure.

Typical Applications
- Wastewater Treatment Plants
- Mining
- Material Handling
- Oil & Gas
- HVAC Systems
- Chemical Processing
- Power Plants
- Data Centers
- Renewable Energy
- Pulp & Paper

MotorShield™ Sine Wave Output Filter
As Pulse Width Modulated (PWM) Drives are incorporated into various applications and processes, the increased energy savings and decreased maintenance on drives can be offset by increases in motor failures.

High voltage spikes caused by a phenomenon known as reflected wave (dv/dt) occur when there are long cable runs between the drive and the motor. The impedance on either end of the cable run does not match, causing voltage pulses to be reflected back in the direction from which it arrived. As these reflected waves encounter other waves, their values add, causing higher peak voltage.

Peak voltages on a 480V system can reach 1,600V, and on a 600V system can reach 2,100V. These high peak voltages will cause a rapid breakdown of motor insulation, leading to motor failure.

TCI’s MotorShield™ improves system performance by protecting the motor from the harmful effects of reflected waves and preventing motor failure associated with insulation failure, overheating, and noise.
**Technical Specifications**

| Current Ratings | 480V: 9 to 1080 amps  
|                 | 600V: 8 to 500 amps  
|                 | Intermittent current: 150% for 1 minute out of every 60 minutes  
| VFD Output Voltage | 480V and 600V, 3-phase, at fundamental base frequency configured to Volts per Hz  
| VFD Output Frequency | Up to 80 Hz  
| VFD Carrier Frequency | 2 kHz to 16 kHz  
| Filter Performance | Maximum peak voltage of output waveform - 480V models: 1000V, 600V models: 1,500V  
|                   | Maximum dv/dt of output waveform - 480V models: 500V/μs, 600V models: 1,500V/μs  

**Environmental Conditions**

| Maximum Elevation | 3,300 ft (1,000 m), derating required for operation above this level  
| Ambient Operating Temperature Range | -30 °C (32 °F) to 40 °C (104 °F)  
|                                    | Cooling provisions required for operation above this temperature  
| Ambient Storage Temperature Range  | -40 °C (-40 °F) to 50 °C (122 °F)  
| Maximum Humidity, Operating or Storage | 95%, non-condensing  

**Reference Technical Standards**

- Enclosure Options: NEMA 1/3R enclosure  
- Insertion Impedance: 6.5% nominally at 60 Hz & full load current  
- Capacitors: High endurance design (no PCBs)  
- Agency Approvals: UL & cUL Listed (up to 480 amps)

**Part Numbering System**

| Series: | 0  
| UL Rating: | 1  
| Current Rating: | 6  
| Voltage Rating: | 0  
| Enclosure: | 0  
| Option: | M  
| MSD | 160 | A | 3 | 00

**Performance Guarantee**

Properly sized and applied, the addition of a MotorShield™ Sine Wave Output Filter is guaranteed to bring the application into compliance with NEMA Standards Publication No. MG-1. If the system fails to meet MG-1 standards with the addition of a MotorShield™ filter, TCI will take back the output filter and pay shipping both ways. This offer is valid for 60 days from the installation date.