

# Harmonics & Power Quality

## HARMONICGUARD<sup>®</sup> **ACTIVE**

Poor power quality can be a result of variable frequency drives or other types of non-linear loads using a power conversion process that causes current and voltage distortion. This resulting distortion is known as harmonics.

Issues caused by harmonics may include:

- Transformer and distribution equipment overheating
- Random breaker tripping
- Sensitive equipment failure
- Poor power factor

### HarmonicGuard Active Filter

The HarmonicGuard Active (HGA) filter monitors the load current and reacts to changes almost instantaneously. A counter current is injected by the unit to cancel out harmonics and synchronize the current and voltage waveforms. True power factor will be returned to near unity if power factor correction is enabled on the filter. The HGA meets even the most stringent IEEE 519-1992 requirements with its advanced technology.

A large, built-in, 65 k color touchscreen HMI display with LED backlight is included, along with the communication options of Modbus RTU over RS485, Modbus TCP/IP, EtherNet/IP, HGA-HMI and DeviceNet.



Large, 65K Color HMI



### HGA Filters vs. Other Harmonic Solutions

In comparison to 18-pulse drives, the HarmonicGuard Active filter is superior in many aspects and features including:

- A single bus-applied HGA can connect to multiple drives
- Has the ability to be connected in an MCC section
- Processes will continue even in the event that the filter is offline
- The HGA can be less expensive than multi-pulse and AFE (active front-end) variable frequency drives
- Has the capability to select master or slave configuration options (only available on 200 amp)
- With a more compact design, the unit has a smaller footprint than other solutions
- Optional add-ons: (contact factory for more details)
  - Ready to assemble wall mount or floor stand
  - Portable HMI unit (HGA-HMI) for 3R units

### Advantages of the HarmonicGuard Active Filter

- The state-of-the-art HMI Operator Interface allows users to quickly and easily setup, monitor performance, and remotely control the active filter
- Up to 20 HGA filters can be connected in parallel to increase correction capability
- Automatic harmonic cancellation
- Remaining capacity, after harmonic target is achieved, can be applied towards power factor correction

### Bus-Applied Configuration for MCC or Switchboard

The HGA can be directly connected to the power bus in standard MCC and Switchboard configurations.

### Typical Applications

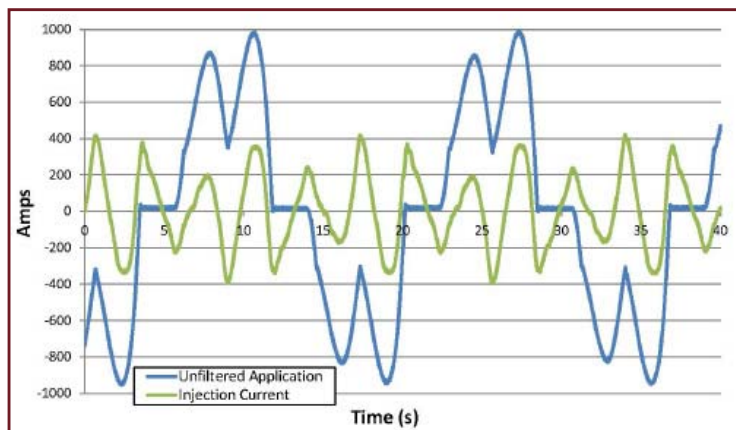
- Wastewater Treatment Plants
- Mining
- Material Handling
- Oil & Gas
- HVAC Systems
- Chemical Processing
- Data Centers
- Renewable Energy
- Pulp & Paper



# Technical Specifications

Compensation Capacity (Parallel for High Capacity)	480V: 50 amp, 100 amp, 150 amp, 200 amp, 300 amp; 3-phase, 60 Hz 600V: 39 amp, 78 amp, 150 amp; 3-phase; 60 Hz
<b>Technical Characteristics</b>	
Power Factor Correction	Up to 0.98 lagging
Response Time	Less than 8 ms to step load changes
Harmonic Cancellation Spectrum	To the 50th harmonic - auto-selecting
RMS Current Attenuation	Less than 10:1
Parallel Configuration	Up to 20 active filters can be connected in parallel to increase correction capability
Display	High quality 6" 65 k color touchscreen with LED backlight
Communications	Modbus RTU over RS485, Modbus TCP/IP, EtherNet/IP®, DeviceNet, HGA-HMI
<b>Environmental Conditions</b>	
Operating Temperature	Open Chassis: 0°C (32°F) to 40°C (104°F) Derating above 40°C
	UL Type I: 0°C (32°F) to 40°C (104°F) Derating above 40°C
	UL Type I2: 0°C (32°F) to 40°C (104°F) Derating above 40°C
	UL Type 3R: -20°C (-4°F) to 40°C (104°F) Derating above 40°C
Relative Humidity	95%, non-condensing
Operating Altitude	1,000 m (3,300 ft)
Storage Temperature	Open Chassis, UL Type I & UL Type I2: -20°C (-4°F) to 60°C (140°F)
	UL Type 3R: -40°C (-40°F) to 60°C (140°F)
<b>Reference Technical Standards</b>	
Agency Approvals	UL & cUL Listed
Protection (Enclosure)	Open Chassis, UL Type I, UL Type I2, UL Type 3R
Over Current Protection	Molded Case Circuit Breaker
HMI Languages	English, French, Spanish
Surge Protection	ANSI C62.42
Warranty	One year of useful service, or 18 months from shipment

## Non-linear Load Waveform



## Resulting Line Current Waveform

