HPS TruWave™
Active Harmonic Filter

power to perform
HPS TruWave™ active harmonic filter (AHF) is a comprehensive and flexible solution for harmonic mitigation. It provides the advanced control and proven reliability that your facility needs to solve power quality issues.

It monitors the load current and very quickly responds to the power system distortion as it develops. A corrective current is injected to effectively cancel out the harmonics required from the upstream power source. The result is a harmonic load on the power system that is acceptable, with more balanced current and voltage waveforms.

HPS TruWave operates at one of the highest efficiencies for any AHF, ensuring that losses are minimized. HPS TruWave is a critical addition to any plant or facility requiring IEEE-519 compliance.

**POWER QUALITY & HARMONIC DISTORTION**

Power quality problems are one of the major causes of unscheduled down time, equipment malfunction and damage. The majority of power quality issues are a result of harmonic distortion.

**Causes:** Non-linear loads such as variable frequency drives (VFDs), DC drives and induction heating systems.

**Consequences:**
- Overheating of electrical equipment
- Loss of efficiency
- Nuisance tripping
- Premature equipment failure
- Interference with communication systems

**POWER QUALITY & HARMONIC DISTORTION SOLUTION**

Current harmonics generated by VFDs. + Corrective current injected by Active Filter = Line current with a minimum power losses and disturbances seen by power system.
HPS TruWave OPERATION PRINCIPLE

Each AHF unit is connected in parallel with non-linear loads that require harmonic compensation. The current sensors placed on the bus are continuously monitoring the load harmonics. The switching devices (IGBTs) inside the AHF unit inject the corrective currents to cancel out harmonic currents generated by non-linear loads. The result is an ideal line current with minimum power losses and disturbances seen by the transformer.

Example Installation

WHAT YOU GAIN

Compared to other power quality technologies HPS TruWave provides an efficient and reliable solution.

Profitability
Active harmonic filters are the world’s most flexible solution for power quality issues.

Energy Savings
Combine the most efficient active harmonic filters with proven system efficiency gains.

Improved Reliability
Increased electrical power quality results in increased uptime and reduces nuisance tripping events.

Advanced Remote Management
Scaling of different size CTs is accomplished with front LCD touchscreen.

APPLICATIONS

Critical applications require IEEE-519 compliant power systems. Below are some examples of industries with critical applications:

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

PCC - Point of Common Coupling
VFD - Variable Frequency Drive
CT - Current Transformer
LR - Line Reactor

Harmonic Generating Loads
ADDED FEATURES FOR IMPROVED PERFORMANCE

The HPS TruWave™ is a true Active Filter and is a comprehensive solution for harmonic mitigation and power factor correction.

- Actively reduces harmonic distortion to below 5% complying with IEEE-519 recommendation
- Improves power factor resulting in decreased utility cost
- Parallel system installation to accommodate large scale applications
- 98% operation efficiency to lower operational costs and increased reliability
- Balances three phase loads for increased usable system capacity
- Corrects for single/multiple loads enabling cost effective solutions

ADVANCED LCD TOUCHSCREEN DISPLAY

- Detailed power quality information for evaluation of the effectiveness of the system
- Detailed historical data
- FDR data information
- LED indicators
- Firmware update via front panel interface with flash drive
- Troubleshooting via the front display, serially over ethernet, or using flash drive
- Easy access to ethernet communication interface
- CT diagnostic and auto-correction

ACTIVE HARMONIC FILTER SIZING TOOL

HPS TruWave™ AHF can be sized using an Excel-based program. It uses your basic system data to generate accurate harmonic and power quality analysis to select the HPS TruWave unit for your unique applications.
## Specifications

### Electrical Product Characteristics

**Voltage Rating:**

- 208-480 VAC; +12%/-15%
  - (600 VAC with the use of autotransformer)
  - 3 phase, 3 wire, plus ground

**Current Rating:**

- 50A, 100A, 150A, 200A, 300A @208-480VAC
  - (40A, 80A, 120A, 160A, 240A @600VAC)

**Frequency:**

- 50Hz or 60Hz, ±5Hz

---

### Environmental Conditions

- **Ambient Operating Temperature:** 0°C to 40°C
- **Humidity:** 95% maximum non-condensating
- **Altitude:** ≤1000m, (derate 1% per 100m above)
- **Storage Temperature:** -20°C to +60°C
- **Cooling Configuration:** Internal forced air
- **Enclosure Type:** Open or Type 1

---

### Technical Product Characteristics

- **Harmonic Attenuation:** < 5% TDD as per IEEE 519-2014 (typically requires either 3% line reactor or 4% DC choke)
- **Harmonic Cancellation:** 2nd to 51st
- **Power Factor:** Up to 0.99 immediately upstream of installation point - may depend on system loading
- **Efficiency:** 98% at full load (industry-leading)
- **Control Scheme:** Full spectrum cancellation
- **Control Response Time:** 500μs (industry-leading)
- **Overload Capability:** 300% peak, 100% RMS
- **Display:** 6” by 3.5” dust tight graphic colour LCD touchscreen
- **Operator Interface:** HMI colour LCD touch screen
- **Approval:** UL & cUL Listed

---

### Approval

- **Approval:** UL & cUL Listed

---

### Technical Product Characteristics

- **Display Parameters:** Power quality information, operating parameters, operational status
- **Touchscreen Functions:** Run, stop, menus, parameter set-up
- **Communication Capability:** Ethernet (optional Ethernet/IP and Modbus TCP)
- **Parallel Operation:** Up to 10 units per set of CT
- **Protection Class:** Class T fuses rated at 200,000 AIC
- **Current Transformer (CT) Information:** Required with AHF solution
- **Current Transformer:** 5 A secondary; 400 Hz rated
  - Accuracy: 1-4%
- **Quantity of CT:** 2 for 3 phase loads (3 required when line to neutral single phase loads present)
- **CT Position:** Phase A and B of the incoming line (3 phase loads); Phase C (if single phase loads present)
- **CT Programming:** Via front LCD touch screen

---

Please consult HPS for system configuration requiring 4 wire systems.
# Part Number Guide

<table>
<thead>
<tr>
<th>Family</th>
<th>Generation</th>
<th>Voltage Rating</th>
<th>Current Rating</th>
<th>Filter Enclosure</th>
<th>OPTIONS INDICATOR¹</th>
<th>Suffix</th>
</tr>
</thead>
<tbody>
<tr>
<td>W</td>
<td>A</td>
<td>H</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>1st Generation</td>
<td>D = 240V</td>
<td>F = Open Frame</td>
<td>Communication Options:</td>
<td>E</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>K = 480V</td>
<td>A = Type 1</td>
<td>E = Ethernet⁰</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>050 = 50A</td>
<td></td>
<td>I = Ethernet/IP</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>100 = 100A</td>
<td></td>
<td>T = Modbus TCP</td>
<td>P</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>150 = 150A</td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>200 = 200A</td>
<td></td>
<td>Frequency Options:</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>300 = 300A</td>
<td></td>
<td>6 = 60Hz²</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5 = 50Hz</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Voltage Options:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>B = 208V</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>H = 400V</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>P = 600V - requires autotransformer</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Used on system greater than 480V²:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 = Autotransformer provided by HPS</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2 = Autotransformer provided by customer</td>
<td></td>
</tr>
</tbody>
</table>

¹ Options Indicator = Separate items that are either configured via software, factory installed or stand alone.
² Default options - ignore if all following characters are default values.
³ 480V units can also be used up to 690V, with an autotransformer. The current rating at higher voltage will be derated.

## We’re here to support you

No other company can offer our service and quality in a full range of products.

- **Fast On-Site Response**
  On-site technicians are available to assist with any technical problems or issues that cannot be resolved over the phone.

- **Partner Support**
  HPS is supported by a National Representative and Distributor network.

- **Power Quality Products**
  We carry an extensive inventory of other power quality solutions including Harmonic Mitigating Transformers, Drive Isolation Transformers and Reactors.

- **Live Telephone Technical Support**
  Our inside sales team is available to quickly answer your questions. They are technically trained and able to answer most questions right over the phone.

- **Online Training**
  HPS Academy has many interactive training presentations on topics such as our products, company, regulations and so much more. Short quizzes are available to ensure participants understand the information presented. www.hpsacademy.com

- **Technical Webinars**
  HPS offers interactive webinar presentations to provide customers with detailed product solutions. To schedule a webinar email: marketing@hammondpowersolutions.com
## Selection Tables

### 240V System Voltage

<table>
<thead>
<tr>
<th>Rated Current</th>
<th>Catalog Number</th>
<th>Enclosure</th>
<th>Frame</th>
<th>Overall Dimensions (Inches)</th>
<th>Approx. Weight (lbs.)</th>
<th>Watts Losses (kW)</th>
<th>Mtg Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>WAHF1D050F</td>
<td>Open</td>
<td>WF1</td>
<td>16.9 x 12.7 x 45</td>
<td>135</td>
<td>0.9</td>
<td>W</td>
</tr>
<tr>
<td>100</td>
<td>WAHF1D100F</td>
<td>Open</td>
<td>WF2</td>
<td>16.9 x 12.7 x 45</td>
<td>175</td>
<td>1.7</td>
<td>W</td>
</tr>
<tr>
<td>150</td>
<td>WAHF1D150F</td>
<td>Open</td>
<td>WF3</td>
<td>22.0 x 13.7 x 54</td>
<td>245</td>
<td>2.5</td>
<td>W</td>
</tr>
<tr>
<td>200</td>
<td>WAHF1D200F</td>
<td>Open</td>
<td>WF4</td>
<td>22.0 x 13.7 x 54</td>
<td>280</td>
<td>3.3</td>
<td>W</td>
</tr>
<tr>
<td>300</td>
<td>WAHF1D300F</td>
<td>Open</td>
<td>WF5</td>
<td>27.0 x 13.7 x 56</td>
<td>400</td>
<td>5.1</td>
<td>F</td>
</tr>
</tbody>
</table>

### 240V System Voltage

<table>
<thead>
<tr>
<th>Rated Current</th>
<th>Catalog Number</th>
<th>Enclosure</th>
<th>Frame</th>
<th>Overall Dimensions (Inches)</th>
<th>Approx. Weight (lbs.)</th>
<th>Watts Losses (kW)</th>
<th>Mtg Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>WAHF1D050A</td>
<td>Type 1</td>
<td>WA1</td>
<td>21.0 x 14.25 x 53</td>
<td>230</td>
<td>0.9</td>
<td>W</td>
</tr>
<tr>
<td>100</td>
<td>WAHF1D100A</td>
<td>Type 1</td>
<td>WA1</td>
<td>21.0 x 14.25 x 53</td>
<td>270</td>
<td>1.7</td>
<td>W</td>
</tr>
<tr>
<td>150</td>
<td>WAHF1D150A</td>
<td>Type 1</td>
<td>WA2</td>
<td>27.0 x 16.5 x 63.5</td>
<td>440</td>
<td>2.5</td>
<td>W</td>
</tr>
<tr>
<td>200</td>
<td>WAHF1D200A</td>
<td>Type 1</td>
<td>WA2</td>
<td>27.0 x 16.5 x 63.5</td>
<td>480</td>
<td>3.3</td>
<td>W</td>
</tr>
<tr>
<td>300</td>
<td>WAHF1D300A</td>
<td>Type 1</td>
<td>WA3</td>
<td>33.0 x 18.0 x 75</td>
<td>630</td>
<td>5.1</td>
<td>F</td>
</tr>
</tbody>
</table>

### 480V System Voltage

<table>
<thead>
<tr>
<th>Rated Current</th>
<th>Catalog Number</th>
<th>Enclosure</th>
<th>Frame</th>
<th>Overall Dimensions (Inches)</th>
<th>Approx. Weight (lbs.)</th>
<th>Watts Losses (kW)</th>
<th>Mtg Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>WAHF1K050F</td>
<td>Open</td>
<td>WF1</td>
<td>16.9 x 12.7 x 45</td>
<td>135</td>
<td>0.9</td>
<td>W</td>
</tr>
<tr>
<td>100</td>
<td>WAHF1K100F</td>
<td>Open</td>
<td>WF2</td>
<td>16.9 x 12.7 x 45</td>
<td>175</td>
<td>1.7</td>
<td>W</td>
</tr>
<tr>
<td>150</td>
<td>WAHF1K150F</td>
<td>Open</td>
<td>WF3</td>
<td>22.0 x 13.7 x 54</td>
<td>245</td>
<td>2.5</td>
<td>W</td>
</tr>
<tr>
<td>200</td>
<td>WAHF1K200F</td>
<td>Open</td>
<td>WF4</td>
<td>22.0 x 13.7 x 54</td>
<td>280</td>
<td>3.3</td>
<td>W</td>
</tr>
<tr>
<td>300</td>
<td>WAHF1K300F</td>
<td>Open</td>
<td>WF5</td>
<td>27.0 x 13.7 x 56</td>
<td>400</td>
<td>5.1</td>
<td>F</td>
</tr>
</tbody>
</table>

### 480V System Voltage

<table>
<thead>
<tr>
<th>Rated Current</th>
<th>Catalog Number</th>
<th>Enclosure</th>
<th>Frame</th>
<th>Overall Dimensions (Inches)</th>
<th>Approx. Weight (lbs.)</th>
<th>Watts Losses (kW)</th>
<th>Mtg Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>WAHF1K050A</td>
<td>Type 1</td>
<td>WA1</td>
<td>21.0 x 14.25 x 53</td>
<td>230</td>
<td>0.9</td>
<td>W</td>
</tr>
<tr>
<td>100</td>
<td>WAHF1K100A</td>
<td>Type 1</td>
<td>WA1</td>
<td>21.0 x 14.25 x 53</td>
<td>270</td>
<td>1.7</td>
<td>W</td>
</tr>
<tr>
<td>150</td>
<td>WAHF1K150A</td>
<td>Type 1</td>
<td>WA2</td>
<td>27.0 x 16.5 x 63.5</td>
<td>440</td>
<td>2.5</td>
<td>W</td>
</tr>
<tr>
<td>200</td>
<td>WAHF1K200A</td>
<td>Type 1</td>
<td>WA2</td>
<td>27.0 x 16.5 x 63.5</td>
<td>480</td>
<td>3.3</td>
<td>W</td>
</tr>
<tr>
<td>300</td>
<td>WAHF1K300A</td>
<td>Type 1</td>
<td>WA3</td>
<td>33.0 x 18.0 x 75</td>
<td>630</td>
<td>5.1</td>
<td>F</td>
</tr>
</tbody>
</table>
**Selection Tables**

**600V**

**600V Operation**

![Diagram of 600V Operation](image)

- **PCC** - Point of Common Coupling
- **VFD** - Variable Frequency Drive
- **CT** - Current Transformer
- **LR** - Line Reactor

---

**600V System Voltage** *(480V units with an autotransformer)*

<table>
<thead>
<tr>
<th>Rated Current with Autotransformer</th>
<th>Items Required</th>
<th>Enclosure</th>
<th>Frame</th>
<th>Overall Dimensions (Inches)</th>
<th>Approx. Weight (lbs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td>WAHF1K050F-E6P1</td>
<td>Open</td>
<td>WF1</td>
<td>Width: 16.9, Depth: 12.7, Height: 45</td>
<td>Weight: 230, 360</td>
</tr>
<tr>
<td>80</td>
<td>WAHF1K100F-E6P1</td>
<td>Open</td>
<td>WF2</td>
<td>Width: 16.9, Depth: 12.7, Height: 45</td>
<td>Weight: 175, 360</td>
</tr>
<tr>
<td>120</td>
<td>WAHF1K150F-E6P1</td>
<td>Open</td>
<td>WF3</td>
<td>Width: 22, Depth: 13.7, Height: 54</td>
<td>Weight: 245, 425</td>
</tr>
<tr>
<td>160</td>
<td>WAHF1K200F-E6P1</td>
<td>Open</td>
<td>WF4</td>
<td>Width: 22, Depth: 13.7, Height: 54</td>
<td>Weight: 280, 425</td>
</tr>
<tr>
<td>240</td>
<td>WAHF1K300F-E6P1</td>
<td>Open</td>
<td>WF5</td>
<td>Width: 27, Depth: 13.7, Height: 56</td>
<td>Weight: 400, 715</td>
</tr>
</tbody>
</table>

---

**600V System Voltage** *(480V units with an autotransformer)*

<table>
<thead>
<tr>
<th>Rated Current with Autotransformer</th>
<th>Items Required</th>
<th>Enclosure</th>
<th>Frame</th>
<th>Overall Dimensions (Inches)</th>
<th>Approx. Weight (lbs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td>WAHF1K050A-E6P1</td>
<td>Type 1</td>
<td>WA1</td>
<td>Width: 21, Depth: 14.25, Height: 53</td>
<td>Weight: 230, 360</td>
</tr>
<tr>
<td>80</td>
<td>WAHF1K100A-E6P1</td>
<td>Type 1</td>
<td>WA1</td>
<td>Width: 21, Depth: 14.25, Height: 53</td>
<td>Weight: 270, 360</td>
</tr>
<tr>
<td>120</td>
<td>WAHF1K150A-E6P1</td>
<td>Type 1</td>
<td>WA2</td>
<td>Width: 27, Depth: 16.5, Height: 63.5</td>
<td>Weight: 440, 425</td>
</tr>
<tr>
<td>160</td>
<td>WAHF1K200A-E6P1</td>
<td>Type 1</td>
<td>WA2</td>
<td>Width: 27, Depth: 16.5, Height: 63.5</td>
<td>Weight: 480, 425</td>
</tr>
<tr>
<td>240</td>
<td>WAHF1K300A-E6P1</td>
<td>Type 1</td>
<td>WA3</td>
<td>Width: 33, Depth: 18, Height: 75</td>
<td>Weight: 630, 715</td>
</tr>
</tbody>
</table>
### FIGURE 1

**Panel Style**

<table>
<thead>
<tr>
<th>Panel Style</th>
<th>Fig. #</th>
<th>Dimensions in Inches</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>WF1</td>
<td>1</td>
<td>16.90</td>
</tr>
<tr>
<td>WF2</td>
<td>1</td>
<td>16.90</td>
</tr>
<tr>
<td>WF3</td>
<td>1</td>
<td>22.00</td>
</tr>
<tr>
<td>WF4</td>
<td>1</td>
<td>22.00</td>
</tr>
<tr>
<td>WF5</td>
<td>1</td>
<td>27.00</td>
</tr>
</tbody>
</table>

**Notes:**
- PEM NUTS FOR COMPONENT MOUNTING DO NOT EXTEND MORE THAN 0.25" BEYOND PANEL SURFACE.
- MTG HOLE 0.435" DIA (6 PLCS).

Data subject to change without notice.
Enclosed Drawings

**FIGURE WA1**

- Mounting Shim 3” x 3” x 1/4” Thick, Steel Welded to Rear of Cabinet
- Air Exhaust
- Mounting Holes
- Lifting Tab
- Front Panel Display See Detail at Right of Doc.
- Lock (3 Places)

**FIGURE WA2**

- Mounting Shim 3” x 3” x 1/4” Thick, Steel Welded to Rear of Cabinet
- Air Exhaust
- Mounting Holes
- Lifting Tab
- Front Panel Display See Detail at Right of Doc.
- Lock (3 Places)

Data subject to change without notice.
FIGURE WA3

SIDE VIEW

FRONT VIEW

LOCK (3 PLACES)

MAIN DISCONNECT SWITCH

AIR INTAKE FILTER

MOUNTING HOLES LIFTING TAB

FRONT PANEL DISPLAY SEE DETAIL AT RIGHT OF DWG.
CANADA
Hammond Power Solutions
595 Southgate Drive
Guelph, Ontario N1G 3W6
Tel: (519) 822-2441
Fax: (519) 822-9701
Toll Free: 1-888-798-8882
sales@hammondpowersolutions.com

INDIA
Hammond Power Solutions Pvt. Ltd.
D. No. 5-2/222/IP/B, II-Floor, Icon Plaza
Allwyn X-Roads, Miyapur, Hyderabad 500 049
Tel: +91-994-995-0009
marketing-india@hammondpowersolutions.com

UNITED STATES
Hammond Power Solutions
1100 Lake Street
Baraboo, Wisconsin 53913-2866
Tel: (608) 356-3921
Fax: (608) 355-7623
Toll Free: 1-866-705-4684
sales@hammondpowersolutions.com

EUROPE (Sales Office)
Hammond Power Solutions SpA
Tel: +49 (152) 08800468
sales@hpseurope.eu

Distributed by:
www.hammondpowersolutions.com

TRUBRO
August 2019