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.

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

Example Installation

![Diagram of HPS TruWave operation principle]

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

Please consult HPS for system configuration requiring 4 wire systems.

**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

**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

**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
# Part Number Guide

<table>
<thead>
<tr>
<th>ACTIVE FILTER MODEL NUMBER</th>
<th>OPTIONS INDICATOR(^1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family</td>
<td>Generation</td>
</tr>
<tr>
<td>W</td>
<td>A</td>
</tr>
<tr>
<td>WAHF = TruWave Active Harmonic Filter Prefix</td>
<td>1 = 1(^{st}) Generation</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Example</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
### 240V System Voltage

#### Open Frame

<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 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 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 x 13.7 x 56</td>
<td>400</td>
<td>5.1</td>
<td>F</td>
</tr>
</tbody>
</table>

#### Type 1

<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>
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<tbody>
<tr>
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<td>WAHF1D050A</td>
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<tr>
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<td>21 x 14.25 x 53</td>
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<td>W</td>
</tr>
<tr>
<td>150</td>
<td>WAHF1D150A</td>
<td>Type 1</td>
<td>WA2</td>
<td>27 x 16.5 x 63.5</td>
<td>440</td>
<td>2.5</td>
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<td>200</td>
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<td>WA2</td>
<td>27 x 16.5 x 63.5</td>
<td>480</td>
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<td>300</td>
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<td>WA3</td>
<td>33 x 18 x 75</td>
<td>630</td>
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### 480V System Voltage

#### Open Frame

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<th>Rated Current</th>
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<th>Frame</th>
<th>Overall Dimensions (Inches)</th>
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<tr>
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<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>
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<tr>
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<td>WF2</td>
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<td>Open</td>
<td>WF3</td>
<td>22 x 13.7 x 54</td>
<td>245</td>
<td>2.5</td>
<td>W</td>
</tr>
<tr>
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<td>WAHF1K200F</td>
<td>Open</td>
<td>WF4</td>
<td>22 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 x 13.7 x 56</td>
<td>400</td>
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</table>

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<td>WA3</td>
<td>33 x 18 x 75</td>
<td>630</td>
<td>5.1</td>
<td>F</td>
</tr>
</tbody>
</table>

Data subject to change without notice.
Selection Tables
600V

600V Operation

In order for AHF to operate at 600V, an autotransformer is required. The resultant 600V current will be de-rated by a factor of 1.25.

<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></td>
<td></td>
<td></td>
<td></td>
<td>Width</td>
<td>Depth</td>
</tr>
<tr>
<td>40</td>
<td>WAHF1K050F-E6P1</td>
<td>Open</td>
<td>WF1</td>
<td>16.9</td>
<td>12.7</td>
</tr>
<tr>
<td></td>
<td>Autotransformer</td>
<td>Type 3R</td>
<td>-</td>
<td>23.9</td>
<td>25</td>
</tr>
<tr>
<td>80</td>
<td>WAHF1K100F-E6P1</td>
<td>Open</td>
<td>WF2</td>
<td>16.9</td>
<td>12.7</td>
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<td></td>
<td>Autotransformer</td>
<td>Type 3R</td>
<td>-</td>
<td>23.9</td>
<td>25</td>
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<tr>
<td>120</td>
<td>WAHF1K150F-E6P1</td>
<td>Open</td>
<td>WF3</td>
<td>22</td>
<td>13.7</td>
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<tr>
<td></td>
<td>Autotransformer</td>
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<tr>
<td>160</td>
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<tr>
<td></td>
<td>Autotransformer</td>
<td>Type 3R</td>
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<td>23.9</td>
<td>25</td>
</tr>
<tr>
<td>240</td>
<td>WAHF1K300F-E6P1</td>
<td>Open</td>
<td>WF5</td>
<td>27</td>
<td>13.7</td>
</tr>
<tr>
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<td>Autotransformer</td>
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<td>-</td>
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<td>25</td>
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</tbody>
</table>

600V System Voltage (480V units with an autotransformer) Open Frame 60 Hz

<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></td>
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<td></td>
<td></td>
<td>Width</td>
<td>Depth</td>
</tr>
<tr>
<td>40</td>
<td>WAHF1K050A-E6P1</td>
<td>Type 1</td>
<td>WA1</td>
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<td>14.25</td>
</tr>
<tr>
<td></td>
<td>Autotransformer</td>
<td>Type 3R</td>
<td>-</td>
<td>23.9</td>
<td>25</td>
</tr>
<tr>
<td>80</td>
<td>WAHF1K100A-E6P1</td>
<td>Type 1</td>
<td>WA1</td>
<td>21</td>
<td>14.25</td>
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<td></td>
<td>Autotransformer</td>
<td>Type 3R</td>
<td>-</td>
<td>23.9</td>
<td>25</td>
</tr>
<tr>
<td>120</td>
<td>WAHF1K150A-E6P1</td>
<td>Type 1</td>
<td>WA2</td>
<td>27</td>
<td>16.5</td>
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<tr>
<td></td>
<td>Autotransformer</td>
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<td>Autotransformer</td>
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<td>240</td>
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<tr>
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<td>Autotransformer</td>
<td>Type 3R</td>
<td>-</td>
<td>26</td>
<td>25</td>
</tr>
</tbody>
</table>
**Open Drawings**

**FIGURE 1**

**Panel Style** | **Fig. #** | **A** | **B** | **C** | **D** | **E** | **F** | **G**  
--- | --- | --- | --- | --- | --- | --- | --- | ---  
WF1 | 1 | 16.90 | 11.70 | 45.00 | 1.00 | 17.25 | 26.25 | 0.75  
WF2 | 1 | 16.90 | 12.82 | 45.00 | 1.00 | 17.25 | 26.25 | 0.75  
WF3 | 1 | 22.00 | 12.54 | 54.00 | 1.00 | 20.50 | 32.00 | 0.75  
WF4 | 1 | 22.00 | 13.54 | 54.00 | 1.00 | 20.50 | 32.00 | 0.75  
WF5 | 1 | 27.00 | 13.56 | 56.00 | 1.00 | 21.50 | 32.50 | 1.00  

**Data subject to change without notice.**
FIGURE WA3

SIDE VIEW

FRONT VIEW

- MOUNTING HOLES
- LIFTING TAB
- MAIN DISCONNECT SWITCH
- FRONT PANEL DISPLAY SET DETAL AT RIGHT OF DIP
- LOCK (3 PLACES)
- AIR INTAKE FILTER

Data subject to change without notice.