

AHF

ActiveHarmonic Filter

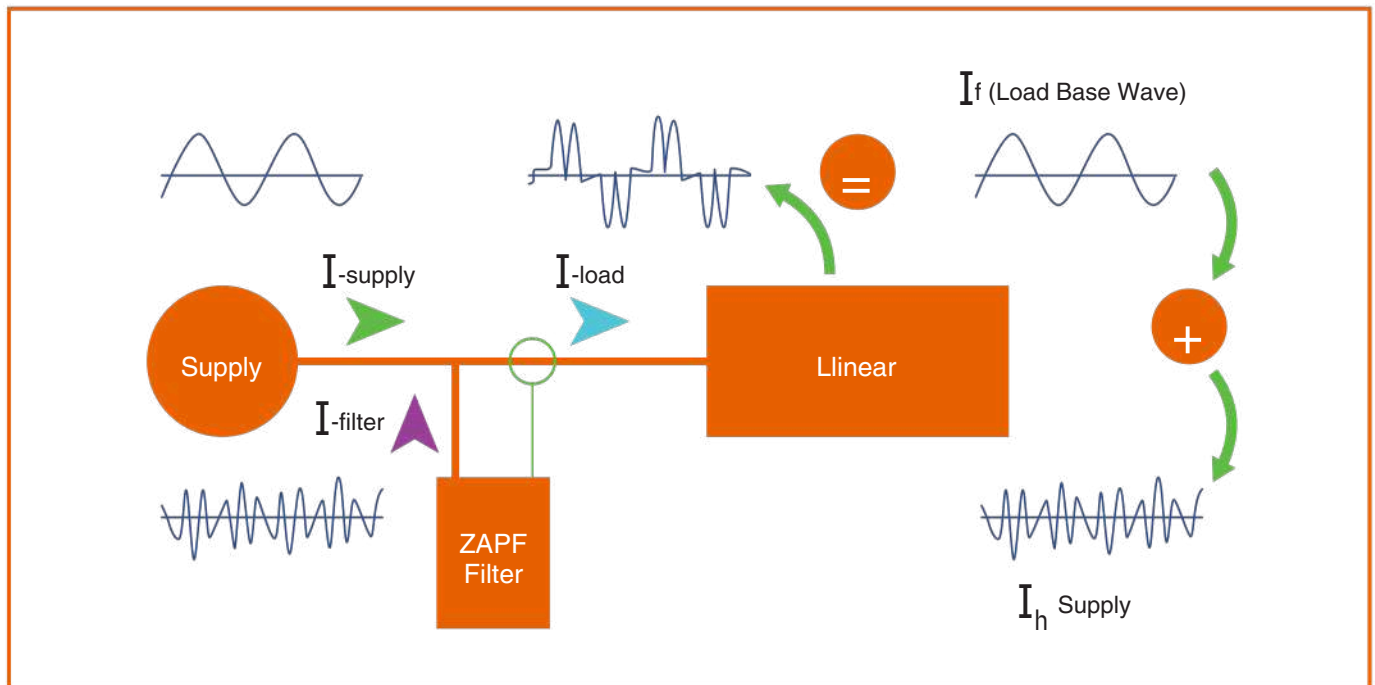
- Does the fuse or circuit breaker trip frequently?
- Does the equipment shut itself down for no apparent reason?
- Is the transformer overheating?
- Is there an electronic control failure?
- Is productivity declining due to power outages?
- Are power cables and busbars overheating?
- Are the compensation capacitors and reactors frequently damaged?
- Is there abnormal noise coming from the equipment?



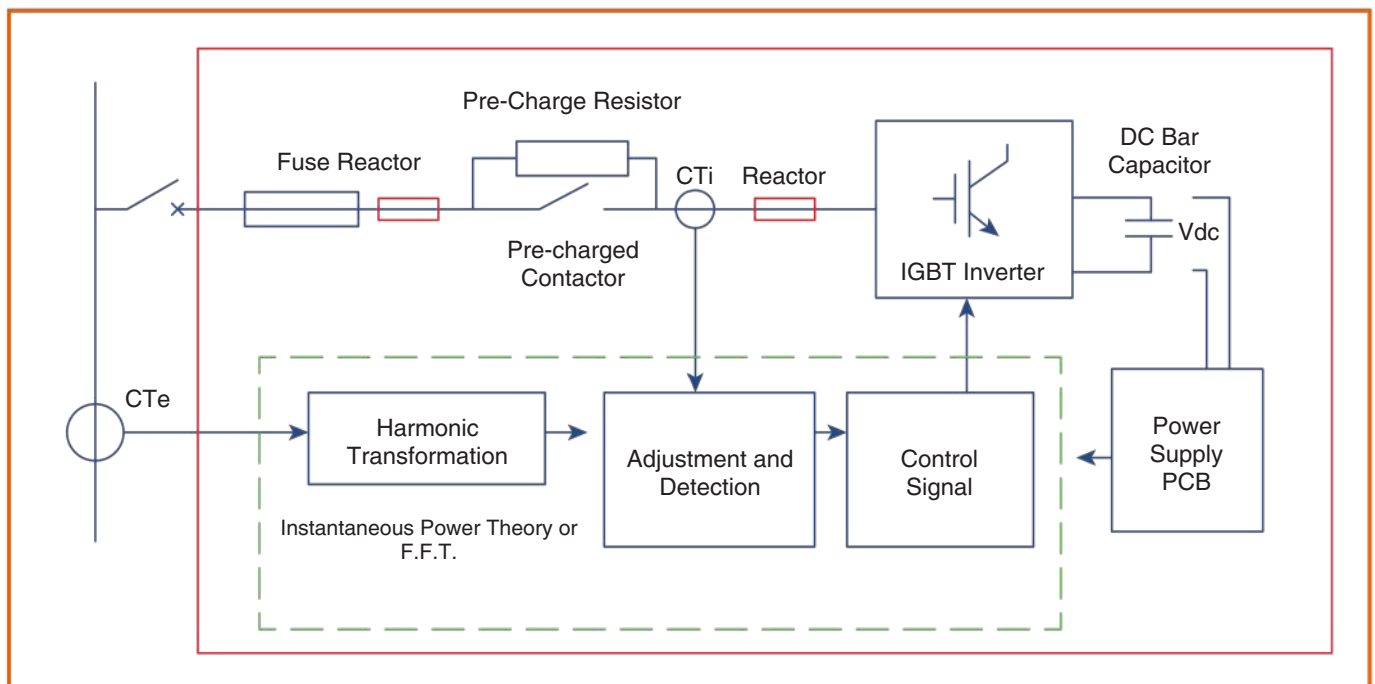
1. Working Principles

1.1 Mathematical Model

$$i_1 = (i_1 + \sum i_h) + (-\sum i_h)$$

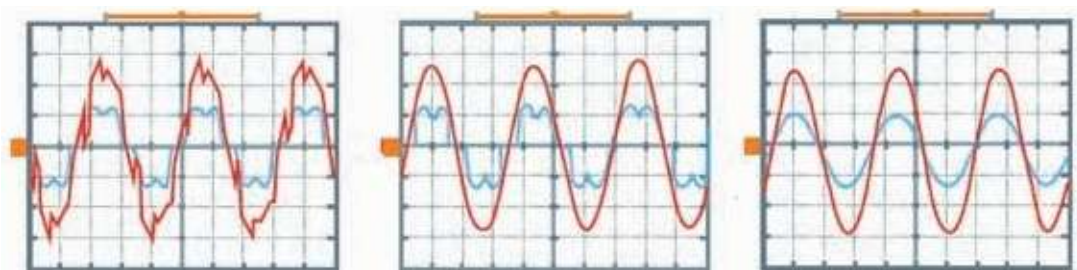


1.2 Flow Diagram



2. Performance Feature

- F.T.T. management and instantaneous power theory
- Combination of power factor correction functions (both inductive and capacitive power)
- Wide harmonic filtering range: 2nd to 51st harmonics can be filtered
- High harmonic filtering rate: Over 98.04%
- Fast response: Fast dynamic response speed. Response time is 100 us
- Unbalance correction is available: Single-phase dynamic current injection to correct unbalance in the supply system
- Resonance-free due to automatic resonance elimination
- Protected from overload thanks to automatic current limiting output
- Simultaneous Var compensation: Filtering and Var compensation are selectable
- An interface is available that can display voltage, current, and harmonics live via HMI. Logs can be recorded via USB
- Full protection includes overvoltage, undervoltage, overcurrent, overheating, low voltage of the control source, etc.
- Parallel connection operation is available: 10 sets can be connected in parallel, and up to n... modules can be controlled with the EMS option
- Can be directly applied to systems below 430 V; can be applied to systems with voltages above 400 V when a transformer is added
- Plug-and-play design and easy schematic selection eliminate the need for detailed analysis in the supply network



3. Accepted Standard

Safety Standards Low Voltage, Safety Torque Off Machinery Directive		EN IEC 61000-6-2:2019, EN IEC 61000-6-4:2019, EN 61000-4-2:2019
EMC Standards		Low Voltage Directive (LVD) 2014/35/EU Electromagnetic Compatibility (2014/30/EU)
Test Report Approval Basis		240524-01, TRM-24-255/01
Technical Report		EN 50178:1997, TRM-24-2557-01
Quality and Environmental Standards		ISO-45001:2018, ISO-14001:2015, ISO-9001:2015
Efficiency Standards		European Eco-Design Standard, 98% efficiency EN50598-2
Safety Standards (for Fans)		UL 507, EN 60950-JIS, IEC, DIN, UL, CSA, PSE

4. Work Environment



Input Voltage

380 VAC – 415 VAC
3-phase -15% / +10%



Operating Voltage Range

200 VAC ~ 480 / 440 VAC



Input Frequency Range

50 Hz ~ 60 Hz



Output Voltage Range

0 - Un, 3-phase 4-wire



Trigger Frequency

20 kHz



Current Capacity

50-100-150 Amps
Parallelable



Relative Humidity

Maximum 95%
Condensation-free



Ambient Temperature

-10°C ~ 50°C



Storage Temperature

-20°C ~ 65°C



Response Time

> 10 μ s



Elevation

1000 meters



Protections

Overvoltage, Overcurrent
Overheating

5. Functional and Technical Specifications

- The active harmonic filter has the capability to automatically adjust the ramp time in real time without exceeding the current value set instantly according to the application's needs.
- The active harmonic filter has an automatic start function when power is restored in the event of a power outage. It can be remotely controlled when desired.
- The Active Harmonic Filter is managed by DSP-based Texas Instruments chips, is three-phase or three-phase with one neutral, has a vertical EU-type aluminum casing, and can perform active harmonic filtering and reactive power compensation up to levels 2-51 simultaneously.
- The fans and capacitors used in the active harmonic filter are certified as non-flammable.
- Every component inside the active harmonic filter comes with a 2-year unconditional warranty. The control board and fan power supplies are externally used; in case of failure in any power supply, they can be easily sourced from the domestic market.
- The fans of the active harmonic filter can be easily replaced.
- The DC bus capacitors of the active harmonic filter consist of metal film capacitors with a 15-year expected lifespan.
- The active harmonic filter can be updated with firmware to operate at a different voltage level upon request by contacting the manufacturer.
- The active harmonic filter can perform reactive power compensation by referencing the medium voltage level. It can select the phase shift caused by the difference between the transformer primary and secondary.
- The active harmonic filter has customizable, encrypted user settings.

3 Phase 3 Wire AHF Module 380V/415V Series

Product Model	AHA H7-50A	AHA H7-100A	AHA H7-150A	AHA H7-300A
Nominal Compensation Current (A)	50	100	150	300
Dimensions (mm, H x W x D)	600 x 254 x 335	920 x 254 x 534	920 x 254 x 534	920 x 380 x 534
Weight (kg)	28	44	46	68
Nominal Voltage (V)	380 / 415			
Nominal Frequency (Hz)	50 / 60			
Installation	Floor / Wall / Modular			
Protection Level	IP20 (customizable)			
CT Ratio	50:5 ~ 100000:5			
Communication	RS-485 (optional Ethernet)			

6. Applicable Industries

- Oil, gas, and petrochemicals
- Textile industries
- Automotive
- Pharmaceutical industry
- Cement
- Paper mills
- Water and water treatment industry
- Steel rolling mills
- Plastic extrusion
- IT/ITE
- Shopping malls
- Banks and data centers
- Hospitals
- Hotels
- Food industry

7. Technical Specifications

Nominal Current Capacity	50A	100A	150 A	300 A
Electrical Ratings				
Nominal Voltage	3W: 200VAC-480 / 440 VAC (+100%), 4W: 200-440 VAC (+10%) higher voltages with a suitable step-up transformer			
Nominal Frequency	50 / 60 Hz			
Maximum Neutral Current	50 A	100 A	150 A	-
Wiring Method	3W / 4W			
System Specifications				
Response Time	Reaction time < 50 μs / Response time < 100 μs			
Switching Frequency	20 kHz			
Controller	Real-time digital control with Texas Instruments DSP control			
Independence	Each module has an independent controller. If one of the modules fails, the others continue to operate.			
Load Balancing Capacity	Programmable 0...100% Module Input			
Operating Mode	Harmonic suppression			
Protections	Overcurrent, overvoltage, undervoltage, overtemperature, and ripple circuit			
Parallel Module	Unlimited scalability. Load connections are evenly distributed among parallel modules.			
Links				
CT Position	Grid / Load side			
CT Numbers	3 pieces 6 pieces			
HMI	Touchscreen with HMI in Turkish and English (other languages available upon request)			

Mechanical Properties

Preservation Material

Aluminum case

Cooling Method

Temperature control by fans (Air)

Losses

< 2%

Noise Level at Full Load

74 dB No audible switching frequency noise

Dimensions (mm, H x W x D)

600 x 254 x 335

920 x 254 x 534

920 x 254 x 534

920 x 380 x 534

Weight (kg)

28

44

46

68

Installation and Operation

Required Air for a Harmonic Filter Module

450 m³/h

1200 m³/h

1300 m³/h

2800 m³/h

Air Temperature

Maximum ambient temperature 50°C

Elevation

< 1000 m

Humidity

Maximum 85% RH (operating), Maximum 95% RH (storage)

Ventilation Requirements

Minimum 300 mm clearance above and below the required module for ventilation

External Insurance (recommendation)

NH 00 gL/gG
100A

alan NH 01 gL/gGalan NH 01 gL/gG
125A

160A

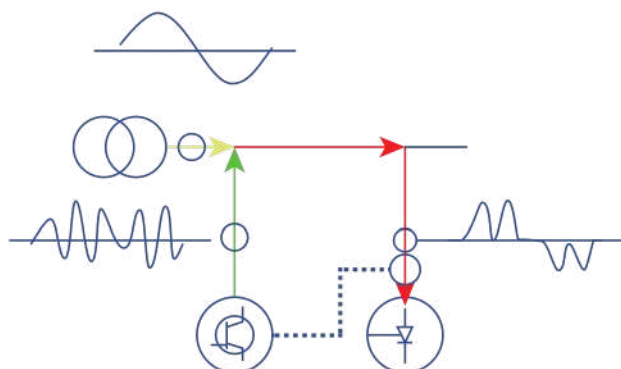
400A

Main Cable Input

Bottom

8. Technical Information

- Real-time harmonic filtering: Eliminates harmonic current generated by non-linear loads to reduce system voltage distortion.
- Consumption reduction and energy savings: Reduces line and transformer losses, reduces equipment heating, improves power factor, and extends equipment service life.
- Improves the operational stability and reliability of the connected system.

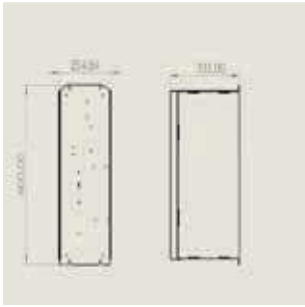
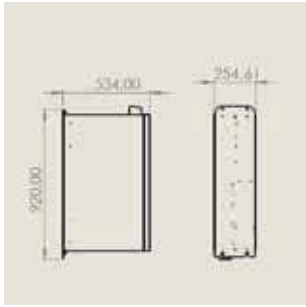
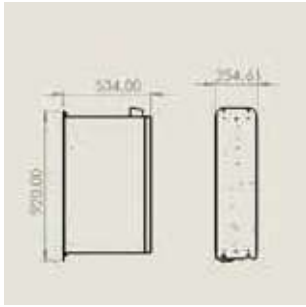
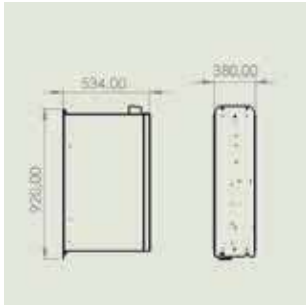


9. Advantages of the Harmonic System

State-of-the-art controller with a modern touchscreen user interface. The screen and modular technical design combine to create a fast, reliable, and compact device that is both easy to use and compatible with standard communication protocols.

The structure is based on modules. Therefore, multiple Harmonik modules can be connected in parallel to increase the total installed capacity of the system.

10. Dimensions

Harmonik 50-A dimensions of the module is as follows.	Harmonik 100-A dimensions of the module is as follows.	Harmonik 150-A dimensions of the module is as follows.	Harmonik 300-A dimensions of the module is as follows.
			
Harmonik 50-A AHF Module Weight: 28 kg	Harmonik 100-A AHF Module Weight: 44 kg	Harmonik 150-A AHF Module Weight: 46 kg	Harmonik 300-A AHF Module Weight: 68 kg

11. Screen

The AHF is equipped with a modern machine. The display panel allows the user to program various modes and parameters and monitor the waveforms shown below for both the network and load sides, as well as view their active values.

12. Benefits

The harmonic module functions as a controlled current source that provides any type of current waveform in real time. The harmonic module is equipped with an energy storage element and a system that injects the desired current into the grid. When connected in parallel with a non-linear load, the Harmonik module compensates for the harmonic currents caused by the non-linear load. As a result, only active current is drawn from the grid.