

# HE UPS

10 – 20 kVA

3-phase input/3-phase output UPS

Performance, compactness and reliability  
for critical applications



## Highly flexible and smart

The HE UPS combines low input THD with almost unity power factor, all these features in a small and very easy maintenance.

## Low THDi and power factor performance

The AEG HE UPS uses a modern input IGBT rectifier and Power Factor Control (PFC) technology capable of keeping the input current Total Harmonic Distortion (THDi) at a very low level (<3 %), as well as keeping the input Power Factor very close to unit (0.99), even when only small loads are applied.

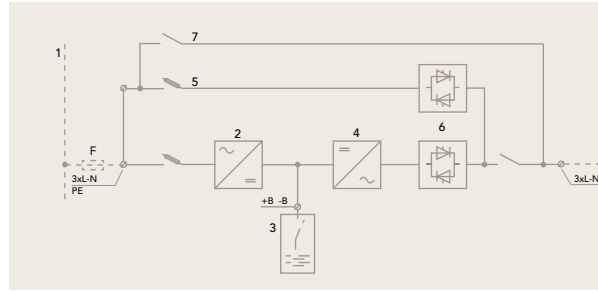
The main benefits to be gained are that the UPS is compatible with almost any input source, including generator set. Because the HE UPS works so efficiently, benefits can be gained in reduced cable sizes and significantly reduced running costs.

## Reduced overall cost of ownership through efficiency and convenient compactness

AEG HE has a new Wise ECO function which enables a total operating efficiency of between 93 % and 98 %. This mode, referred to as "Intelligent ECO mode", significantly reduces the utility costs associated with operating a device of this type. Moreover, this increase in efficiency results in the production of less waste heat, minimizing cooling/air-conditioning costs. This represents a double savings for the energy conscious user.

The Wise ECO function uses continual monitoring techniques to review the input characteristics of the supply. This means that if the supply line drops or fluctuates outside of acceptable conditions the UPS uses the internal inverter to support the load. This is achieved through a fast, fully static transition from VFD to VFI mode.

## HE 3-PHASE UPS



1. Common input rectifier and bypass
2. Rectifier and battery charger
3. External battery
4. Inverter
5. Emergency line (optional by-pass with backfeed contactor).
6. Inverter (SS) and by-pass (SSB) static switch

### Protection for every application

VFI online double conversion topology in this equipment offers built-in inverter galvanic protection, completely isolating the output power from all input power anomalies, delivering fully conditioned pure sine-wave output.

AEG Power Solutions' HE UPS unit is designed to provide excellent output voltages suited to very demanding applications with either 100 % step load, unbalanced, non-linear or modern IT loads. It also provides exceptional performance: with a power factor of up to 0.9 (lagging or leading), there is no requirement to de-rate the unit.

### Triple Intelligence

If the application requires extremely flexible and reliable UPS protection, then the HE from AEG PS is ideal. It delivers advanced features based on state-of-the-art total digital control. This control incorporates dual DSP (Digital Signal Processing) and  $\mu$ C (Micro controller) technologies.

Well-designed control architecture and a simplified two-stage power conversion topology ensure that it is almost impossible to drop the load even if a fault occurs!

The status of the most critical components is constantly monitored. This allows predictive maintenance and avoids unexpected breakdowns.

The HE's working state can be easily monitored by any Building Management System and via LAN / WAN.

### Life-prolonging Battery Management

Batteries are electro-chemical devices and as such their performance gradually decreases over time. To off-set battery degradation, the HE incorporates a battery management function, with a Battery Anti-Aging Control (BAAC), operating in accordance with the battery manufacturer's specifications.

Following a UI battery characteristic curve the charger uses a constant current appropriate for the battery type, this control prevents detrimental over charging. In addition to the float voltage a boost charge can be set; this feature optimizes the recharge time in the event of consecutive power outages over a short period of time, as it is vital that as much energy can be restored to the batteries while the power is on.

BAAC also reduces the residual current ripple which is one of the main causes of premature battery wear; the same control circuit is employed to protect batteries against damaging deep discharges.

Automatic temperature compensation can be incorporated resulting in the batteries being charged under correct thermal conditions. This feature greatly extends battery life.

Further, an integrated periodical function is also included which tests and monitors battery health providing advance notification of potential battery problems.

### Parallel systems with "hot swap" modularity

The HE UPS solution offers parallel options in both redundancy and capacity modes, providing the possibility for both extra system resilience and increased capacity.

The parallel control circuitry associated with these units is fully digital and acts on both active and reactive power on each of the three output phases. This allows accurate load current sharing among the UPS units even during transient conditions.

Parallel control is distributed between all units and communication is achieved through the use of a CAN bus connection loop. This has the effect of producing a highly reliable system with "no single points of failure".

## HE

FEATURE RICH INTELLIGENCE



The intelligent design of the UPS system connections makes future parallel upgrades easier in field and without difficulty.

In the modular arrangement, units can be added or removed "hot" without load disturbances or the need to switch to bypass.

Smart Parallel functions facilitate the automatic switching off of units where the total power requirements of the load is provided by fewer than the total number of UPS units attached. This is commonly known as "load based shutdown" and maximizes the efficiency of the complete system by keeping the load on each module at an optimum level.

Two independent paralleled systems can be synchronized (Sync Control) in order to feed downstream STS' for seamless transfers.

### Easy installation, operation and maintenance

The HE UPS has a high power to space ratio, this results in a very small footprint allowing the client to achieve maximum power in a relatively small space. The unit is fitted with wheels making it easy to move in and out of position.

The AEG HE series is based on light power modules which can be withdrawn from the front of the machine. This feature makes for incredibly easy servicing and dramatically reduces any potential down time.

### User interface and accessories

- » User-friendly Interface
- » Monitoring, managing and shutdown software
- » Removable power modules
- » Removable internal batteries
- » Positioning via wheels
- » Small footprint

### Communication

- » RS232 serial port
- » USB port
- » Remote EPO
- » External manual bypass status
- » Battery Switch status
- » Diesel Mode

### Optional

- » Web / SNMP
- » Modbus
- » Relays
- » Modem
- » Remote panel

### Options

- » Parallel capacity / redundancy
- » Isolation transformer
- » Sync control for dual feed systems
- » External bypass
- » External battery cabinets
- » Battery switch box
- » Battery thermal probe
- » Transformers / autotransformers for voltage adaption

### Information and communication technology

- » Data networks
- » Server farms
- » Communication rooms
- » Broadcast
- » Financial institutions

### Critical electrical engineering

- » Process controls
- » Manufacturing machinery
- » Office buildings
- » Healthcare systems

# HE

SPECIFICATION

<b>Model</b>	HE		
<b>Rating (kVA)</b>	10	15	20
<b>Capacity (kW)</b>	9	13.5	18
<b>Dimensions W x H x D (mm)</b>	450 x 1200 x 640		
<b>Weight (kg), without battery</b>	100	110	110
<b>Weight (kg), with battery</b>	250	260	260
<b>Input/output connection</b>	Hardwired (optional dual input)		
<b>Battery</b>	Internal or external, 360 – 372 cells		
<b>INPUT</b>			
<b>Nominal voltage</b>	380/400/415 VAC (3-phase/3-phase)		
<b>Voltage range</b>	-20 %, +15 % at 400 V nominal		
<b>Frequency</b>	50/60 Hz (45 – 65 Hz)		
<b>Power factor</b>	0.99		
<b>Current distortion (THDi)</b>	<3 %		
<b>OUTPUT</b>			
<b>Nominal voltage</b>	220/380, 230/400, 240/415 VAC 3-phase		
<b>Frequency</b>	50/60 Hz		
<b>Voltage regulation</b>	±1% static; ±5% dynamic 100% load change		
<b>PF acceptable without de-rating</b>	0.9 (both lagging and leading)		
<b>Overload capacity</b>	101 – 125% for 10 mins (on-line), 126 – 150% for 30 secs (on-line), 1000% for 1 cycle (bypass)		
<b>Efficiency; VFI, double-conversion Efficiency; Wise ECO mode</b>	≤93.1% 94% – 98%		
<b>OPTIONS</b>			
<b>General</b>	8 x parallel capacity/redundancy, sync control, isolation transformer, external bypass, external battery cabinets, battery switch box, battery thermal probe, transformers/ autotransformers for voltage adaption		
<b>USER INTERFACE</b>			
<b>Front panel</b>	Graphical LCD display, mimic with LED's and keyboard		
<b>Standard communication ports</b>	RS232 serial, USB, (Remote Emergency Power Off input, Battery Switch status monitoring, External Manual Bypass status monitoring, Diesel Mode)		
<b>Optional</b>	Web/SNMP, ModBus, relay, modem cards; remote panel; monitoring, managing and shutdown software		
<b>ENVIRONMENTAL</b>			
<b>Operating temperature</b>	0 °C – +40 °C		
<b>Storage temperature</b>	-10 °C – +70 °C		
<b>Altitude</b>	<1000m; 1% power derating each 100m above, max. 2000m		
<b>Audible noise at 1 meter dB(A)</b>	<52		
<b>STANDARDS AND CERTIFICATION</b>			
<b>Marking and certification</b>	CE		
<b>Safety</b>	IEC EN 62040-1		
<b>EMC</b>	IEC EN 62040-2		
<b>Test and Performance</b>	IEC EN 62040-3		
<b>Quality, environment, health and safety</b>	ISO 9001:2008, ISO 14001:2004, BS OHSAS 18001:2007		

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## AEG Power Solutions

Approach your local AEG Power Solutions representative for further support. Contact details can be found at:

[www.aegps.com](http://www.aegps.com)

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