

Fluxpower HPI / Protect 3M BROCHURE

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PROTECT 3.M 2.0

MODULAR UPS SYSTEM

Uninterruptible Power Supply

3-Phase Input; 3-Phase Output

20–120 kVA power supply



Networks, workstations, intranet and internet servers, telecommunications applications and other company applications must be permanently available. AEG Protect 3.M 2.0 is the modular UPS solution for IT and telecommunications. Modern data centers require the highest levels of efficiency, reliability and flexibility.

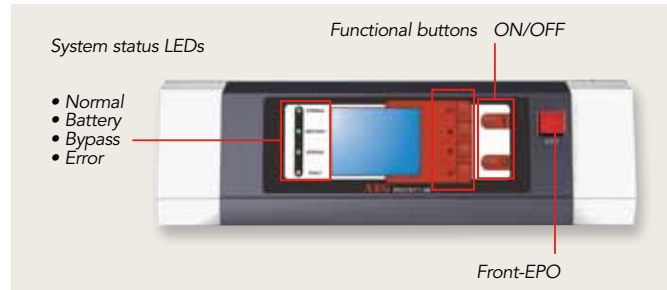
Protect 3.M 2.0 provides a technically convincing and reliable solution to this requirement that can be modularly adapted to any increasing power demand.

An extension can be made at any time during operation. The flexible redundancy concept ensures a steady power supply to any connected devices.

Lower operating costs for energy and cooling with high efficiency and fast module replacement in the event of power failure, reduce operational costs and ensure an optimal price vs. performance ratio for the Protect 3.M 2.0 UPS solution.

Key features

- » Modular design allows for flexible adaption to the current power demand
- » Up to 95% efficiency in "online double conversion" mode, up to 98% in ECO mode
- » IGBT technology, input power factor >0.99
- » Low phase effect <3%
- » Redundant control and n+x parallel redundancy for high availability
- » Parallel operation of up to 4 UPS units (max. 480kVA)
- » Module installation and removal during operation ("hot swappable")
- » Graphical LCD screen
- » Built-in manual bypass, separate input for bypass power
- » Load dependent fan speed
- » Small footprint



Power outages can lead to significant financial loss

Almost all labor and production processes today are based on high capacity data and IT infrastructure. Power outages or voltage fluctuations that lead to systems failure end almost always with disrupted operations, loss of production and, at worst, irretrievable data loss.

Your important IT infrastructure must be permanently available and protected against power disturbances of all kinds. Through the use of VFI (conversion) technology, Protect 3.M 2.0 reliably protects your systems against power outages and network disruptions and ensures the value of your business.

Modularity provides safety reserves and flexibility

Protect 3.M 2.0 is an
uninterruptible power supply
of the highest reliability.

With increasing demands on performance, the compact modular design adapts the permitted UPS power according to your current power needs. This can be done without additional installation costs since the power modules can be easily inserted and are automatically recognized by the system ("hot swappable"). No additional connections are required for this operation.

Dynamic redundancy

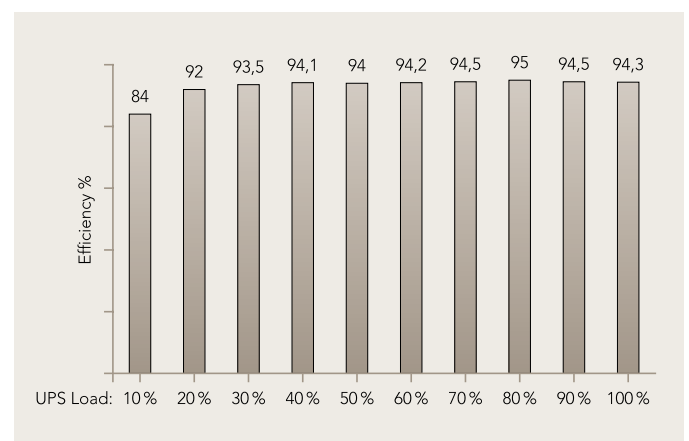
An automatic load balancing to all modules within an appropriately designed system delivers N+x redundancy without the requirement for any configuration changes or increases to load capacity.

High efficiency lowers
operating costs and
CO₂ emissions

Protect 3.M 2.0 is based on high efficiency IGBT technology. This provides an efficiency of up to 95% in double conversion mode. With a 35% loading, the UPS still maintains an efficiency of 94%. In addition to the lowering of power loss unwanted generation of heat is also reduced, thereby reducing air conditioning requirements. All of this leads to significant cost savings and a reduction in CO₂ emissions.

Input power factor 1.0

100% active power from the UPS reduces the generator specification and consequent installation cost increases.



| | | | | | | |
|---|--|------------|-----------------|-------------|------------------|-------------|
| Classification VFI SS 111 acc. to IEC 62040-3 | | | Protect 3.M 2.0 | | | |
| Power type rating | 20 kVA | 40 kVA | 60 kVA | 80 kVA | 100 kVA | 120 kVA |
| | 16 kW | 32 kW | 48 kW | 64 kW | 80 kW | 96 kW |
| SYSTEM | | | | | | |
| Nominal input current | 29 A | 59 A | 88 A | 117 A | 145 A | 172 A |
| Efficiency (typical) | 95 % | | | | | |
| Efficiency in ECO mode | 98 % | | | | | |
| Waste heat from power (typical) | 1.3 kW | 2.6 kW | 3.9 kW | 5.2 kW | 6.5 kW | 7.8 kW |
| | 4436 BTU/h | 8872 BTU/h | 13308 BTU/h | 17744 BTU/h | 22180 BTU/h | 26616 BTU/h |
| Airflow (max.) m³/h | 309 | 617 | 926 | 1234 | 1543 | 1852 |
| INPUT | | | | | | |
| Nominal voltage | 3 x 400 V (380 V, 415 V adjustable), 3 phase + neutral | | | | | |
| Input voltage range | 305 – 477 V | | | | | |
| Frequency | 50 Hz/ 60 Hz (adjustable) | | | | | |
| Total harmonic distortion (THDv) | ≤3 % ¹⁾ | | | | | |
| Power factor | >0.99 | | | | | |
| INVERTER | | | | | | |
| Nominal voltage | 3 x 400 V (380 V, 415 V adjustable), 3 phase + neutral | | | | | |
| Frequency | 50 / 60 Hz (adjustable) | | | | | |
| Precision static/dynamic | ±1 % / ±7 % | | | | | |
| Total harmonic distortion (THDv) | <3 % (linear load), <5 % (non-linear load) | | | | | |
| Max. phase displacement | ±1.5 % (balanced load), ±2 % (100 % unbalanced load) | | | | | |
| Admissible overload | 125 % for 10 min., 150 % for 60 s | | | | | |
| Crest factor | 2.7 : 1 | | | | | |
| Max. short circuit current | >270 % of the rated current | | | | | |
| Admissible power factor | 0.1 inductive to 0.1 capacitive | | | | | |
| BATTERY | | | | | | |
| Rated voltage | ±240 V DC | | | | | |
| Max. charging power | 5 A | 10 A | 15 A | 20 A | 25 A | 30 A |
| Charging principle | Load switching per power module | | | | | |
| Autonomy time | Selectable over external battery cabinet | | | | | |
| STATIC BYPASS | | | | | | |
| Nominal voltage | 3 x 400 V (380, 415 V adjustable), 3 phase + neutral | | | | | |
| Frequency | 50 Hz / 60 Hz (adjustable) | | | | | |
| Synchronization range | ±0.1 – ±5 % (adjustable) | | | | | |
| Transfer time at mains outage | 0 ms (without interruption) | | | | | |
| Admissible overload | 175 % for 10 ms | | | | | |
| GENERAL DATA | | | | | | |
| Parallel mode | Up to 4 UPS (central battery possible) | | | | | |
| Audible noise | 62 – 69 dB(A) dependent on equipment installed and load state | | | | | |
| Operating temperature range/humidity | 0 – 40 °C / <95 % (without condensation) | | | | | |
| Protection | IP20 | | | | | |
| Color | RAL 7035 | | | | | |
| Cable entry | Underside | | | | | |
| Environmental conditions | Free from corrosive air and conductive dust | | | | | |
| COMMUNICATION | | | | | | |
| Display | 320 x 240 graphical LCD display | | | | | |
| Alarm signals | Acoustic and visual | | | | | |
| Interfaces | Remote signal contact, RS232, 2 x communication slots for SNMP / Modbus / additional relay cards | | | | | |
| DIMENSIONS | | | | | | |
| Dimensions approx. D x W x H (mm) | 910 x 520 x 1165 | | | | 975 x 520 x 1655 | |
| Footprint (m²) | 0.47 | | | | 0.51 | |
| Weight approx. | 139 kg | | | | 204 kg | |
| Weight approx. (incl. module) | 169 kg | 199 kg | 229 kg | 259 kg | 354 kg | 384 kg |

1) by THDv ≤2 %

PROTECT 3.M 2.0



Intelligent communication

Protect 3.M 2.0 contains a powerful communications module that readily supplies all relevant information (measurements, alarms and error messages). All information is supplied via an easy to use LCD screen

Large multi-language LCD screen

Languages supported:

- » German
- » English
- » French
- » Spanish
- » Portuguese
- » Italian
- » Turkish
- » Russian
- » Chinese

Interfaces

- » 6 integrated remote signal contacts
- » RS232 interface
- » Two expansion slots for additional remote signal contacts, MODBUS extension card and SNMP adapter

Battery Management

Each UPS power module contains its own battery charger with intelligent charging electronics. These can be adapted to the battery in use and facilitate the use of vendor independent standard batteries.

A temperature compensated charging curve ensures an optimum charging regime. Automatic testing informs you of the charging state of charge and when charging will be complete.

Protect 3.M 2.0 Customer Benefits

Modular concept

- » The UPS output can be easily adapted to any required performance parameters.
- » Rapid expansion by insertion of new modules at any time and without additional costs.
- » N+1 redundancy module increases reliability

Low maintenance costs

- » Module replacement in case of failure within the shortest possible time.
- » For multiple UPS devices, module exchange between units is possible.

High efficiency

- » Efficiency of 94% at 35% load
- » Better efficiency means less heat and thus lower running costs for air conditioning
- » Significant reduction of CO₂ emissions

FLUXPOWER HPI

60 – 300 KVA

3-phase UPS

Performance and reliability
for any kind of critical applications



Flexible and smart

Fluxpower HPI combines management of THD and power factor, low cost of ownership and power protection in a highly reliable solution guaranteed by the most advanced technology.

Low THDi and power factor performance

The Fluxpower HPI model UPS uses a completely new IGBT input rectifier design, encompassing an advanced PFC (Power Factor Control) which is capable of keeping input current THDi (Total Harmonic Distortion) at a level of less than 3 % and input power factor within 1 % of unity, even when only small loads are applied.

The key benefits are that the UPS is compatible with the upstream source, the mains or any kind of generator and the transfer of power between source and load is more efficient. This results in a saving in terms of scale of sources, cables and protective devices.

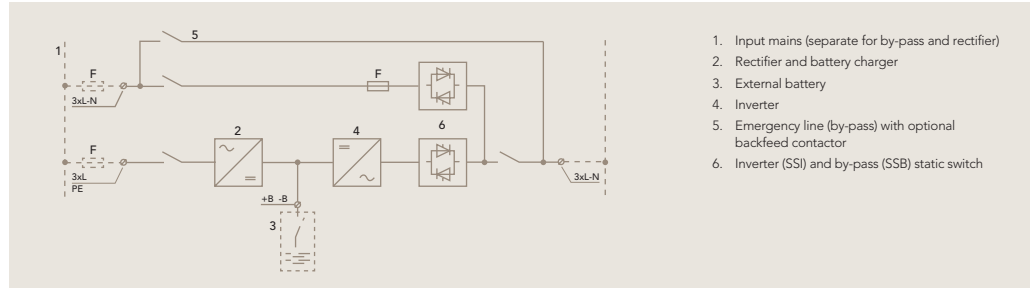
High efficiency reduces overall cost of ownership

Fluxpower HPI has a new Wise ECO function which enables a total operating efficiency of between 95 % 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 saving to the energy conscious user.

The Wise ECO mode 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.

FLUXPOWER HPI

3-PHASE UPS



"Green" double protection for every application

VFI 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.

In VFI mode (Online) the unit delivers an excellent 95 % efficiency. Because of the technology and topology used, no additional losses are generated to achieve low input harmonics or input / output galvanic isolation.

The Fluxpower HPI 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, the Fluxpower HPI is ideal. It delivers advanced features based on state-of-the-art total digital control. This control incorporates dual DSP (Digital Signal Processing) and μ C (Micro controller) technologies.

The system design ensures that auxiliary power supplies and processors are no longer single points of failure which could compromise the availability of clean power to the load.

The Fluxpower HPI is designed to overcome the limitations imposed by other older, designs. With its distributed control architecture, Fluxpower HPI will always have a UPS circuit protecting the load; furthermore, the status of most critical components is constantly monitored, allowing predictive maintenance and avoiding unexpected breakdowns.

Fluxpower HPI'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, which store charge chemically; as such their performance degrades with time. The Fluxpower HPI owns a Battery Anti-Aging Control (BAAC) according to battery manufacturers' requirements.

Following a UI characteristic curve, the charger charges at a constant current appropriate for the battery type used, preventing detrimental excess charging. In addition to the float voltage level, boost charge can be set, optimizing the recharge time when there is the possibility of consecutive power outages within a short period.

BAAC also reduces the residual ripple current (one of the causes of premature battery wear), as well as protecting the battery from damaging deep discharges.

Automatic battery temperature compensation charge voltage may be implemented, charging the battery more appropriately and increasing battery life.

By means of the DCM (Dynamic Charging Mode), very long battery autonomies can be achieved without increasing total charge time. This is achieved through the implementation of an intelligent increase in maximum battery charge current when the maximum inverter power is not being drawn by the load.

An integrated periodical battery testing function tests and monitors battery health, providing advanced warning to guide the application of preventive maintenance.

Parallel systems with "hot swap" modularity

The Fluxpower HPI 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.

FLUXPOWER HPI

FEATURE RICH INTELLIGENCE



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".

Intelligent design of the system connections allows for easy installation and easy future upgrades, this allows for upgrading the field 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 Fluxpower HPI can be installed up close to walls or other cabinets as cooling air is expelled through vents on the top of the unit.

This new design gives the user a significant saving in floor utilization. This makes the Fluxpower HPI an ideal solution where space is at a premium.

Despite this modern compact design, all critical components are accessible from the front of the unit; this improves accessibility to allow regular maintenance and reducing Mean Time to Repair (MTTR).

User interface and accessories

- » User-friendly interface
- » Monitoring, managing and shutdown software
- » Removable blowers
- » Front access

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

Information and communication technology

- » Data centers
- » Server farms
- » Communication rooms
- » Broadcast
- » Networking

Critical electrical engineering

- » Industrial controls
- » Manufacturing machinery
- » Process equipment
- » Transportation
- » Building automation

FLUXPOWER

HPI

SPECIFICATION

| | | | | | | | | |
|---|---|-----|-----|-----|-----|-------------------|------|------|
| Model (kVA) | 60 | 80 | 100 | 125 | 160 | 200 | 250 | 300 |
| Capacity rating (kVA) | 60 | 80 | 100 | 125 | 160 | 200 | 250 | 300 |
| Dimensions W x H x D (mm) | 815 x 1670 x 825 | | | | | 1200 x 1900 x 860 | | |
| Weight (kg) | 570 | 600 | 625 | 660 | 715 | 970 | 1090 | 1170 |
| Input / output connection | Hard wired (dual input) | | | | | | | |
| Battery | External, 300 – 312 cells | | | | | | | |
| INPUT | | | | | | | | |
| Nominal voltage | 220 / 380, 230 / 400, 240 / 415 VAC single / 3-phase | | | | | | | |
| Voltage range | -20 %, +15 % at 400 V nominal | | | | | | | |
| Frequency | 50 / 60 Hz (45 – 65 Hz) | | | | | | | |
| Power factor | 0.99 | | | | | | | |
| Current distortion (THDi) | <3 % | | | | | | | |
| OUTPUT | | | | | | | | |
| Nominal voltage | 220 / 380, 230 / 400, 240 / 415 VAC three phase | | | | | | | |
| Frequency | 50 /60 Hz | | | | | | | |
| Voltage regulation | ±1 % static; ±5 % dynamic 100 % load change | | | | | | | |
| PF acceptable without de-rating | Lagging to leading 0.9 | | | | | | | |
| Overload capacity | 101 – 125 % for 10 min (on-line), 126 – 150 % for 1 min (on-line), 1000 % for 1 cycle (bypass) | | | | | | | |
| Efficiency; VFI, double-conversion | ≤94.6 % | | | | | | | |
| Efficiency; Wise ECO mode | 95 – 98 % | | | | | | | |
| OPTIONS | | | | | | | | |
| General | 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, Top cable entry | | | | | | | |
| USER INTERFACE | | | | | | | | |
| Front panel | Graphical LCD display, mimic with LED's and keyboard | | | | | | | |
| Standard communication ports | RS232 serial, USB, Remote Emergency Power Off input, Battery Switch status monitoring, External Manual Bypass status monitoring, Diesel Mode | | | | | | | |
| Optional communication | Web / SNMP, ModBus, Relay, Modem cards; Remote panel; Monitoring, Managing and shutdown software | | | | | | | |
| ENVIRONMENTAL | | | | | | | | |
| Operating temperature | 0 °C – +40 °C | | | | | | | |
| Storage temperature | -10 °C – +70 °C | | | | | | | |
| Altitude | <1000 m; 1% power derating each 100 m above, max. 2000 m | | | | | | | |
| Audible noise at 1 meter dB(A) | <60 | | | | | | | |
| STANDARDS AND CERTIFICATION | | | | | | | | |
| Marking and certification | CE, GOST, ECA ETL | | | | | | | |
| Safety | IEC EN 62040-1 | | | | | | | |
| EMC | IEC EN 62040-2 | | | | | | | |
| Test and Performance | IEC EN 62040-3 | | | | | | | |
| Quality, environment, health and safety | ISO9001:2008, ISO 14001:2004, BS OHSAS 18001:2007 | | | | | | | |

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