



# PRODUCT CATALOGUE

INDUSTRIAL BATTERY CHARGERS  
WORKSHOP CHARGING DEVICES  
DC/DC CONVERTERS

# *FLEXIBLE* CHARGING SOLUTIONS

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# THE COMPANY

## *a b o u t u s*

ATIB Elettronica was established in 1989 in the heart of Lombardy. Formerly branch of ATIB Material Handling (manufacturer of forklift attachments since 1972) ATIB Elettronica soon became one of the main international players in the battery charging industry, thanks to the efforts of the founder Mr. Fernando Orlandi and to an inspired team who followed his philosophy through the years.

As an independent manufacturer of chargers for industrial batteries (Lead Acid, GEL, VRLA, AGM and Lithium) ATIB Elettronica focuses its core-business on traction and motive power since the establishment in Barbariga 30 years ago.

The recent moving into a new headquarter (2019), based in Longhena (Brescia) of tot.10.000 sq. meters, has improved the average yearly production capability of 50.000 chargers, with an internal team of 42 employees.

A flexible R&D department enables to develop specific tailor-made products for any application required in Material Handling OEM market (on board chargers and DC-DC converters). A functional internal structure and a large stock facility allow to satisfy all clients requirements with swiftness, efficiency and competence:

The Technical Department, where the products are designed, is always ready to listen to new needs and customize our products accordingly, and the R&D Department works every day to maintain our production range to its highest level.

The Sales Department is totally available to customer inquiries, to counsel and guide through the right product selection, according to customer needs and expectations.

Our After-sale & Warehouse respond with precision and swiftness to customer inquiries and spare parts requirements.

Starting from 2019, the company approached also the world of the electric mobility and vehicles, and it has recently created a dedicated internal division called ATIB E-Mobility, that focus on EV recharging solutions.



### Distributors

A worldwide footprinted network of more than 40 countries enables to support the main players of the materials handling and logistic industry, such as OEMs and structured distributors of traction batteries, forklift trucks, electric vehicles, cleaning machines and aerial platforms, including custom applications for automotive, stationary and solar industry in: Europe (UK, Germany, France, Benelux, Spain, Poland, Greece, Italy, Portugal, Scandinavia and Russia), Middle East, South-East Asia & South Korea, North Africa, South Africa, Latin & North America and Australia.

### Values & Mission

Providing modern high-quality charging solutions to the international materials handling industry is our mission. Our engagement includes an accurate selection of raw materials and suppliers, the creative product design and the detailed care of the whole manufacturing process.

In sight of customer retention, availability, flexibility and promptness are granted to all our worldwide clients and dealers as a main engagement of our mission.

Evaluating the feasibility of any tailor-made solution is our strength, along with a daily customer support.

The commitment of the whole ATIB Elettronica team is to be your flexible solutions partner.

# our strength



## Flexibility

The in-house technical department is always available to assess any customised request and tailor-made project. In fact, in-house design is one of ATIB Elettronica's main strengths and it allows to provide customers with increasingly sophisticated and versatile systems, designed to meet the most complex and specific requirements.



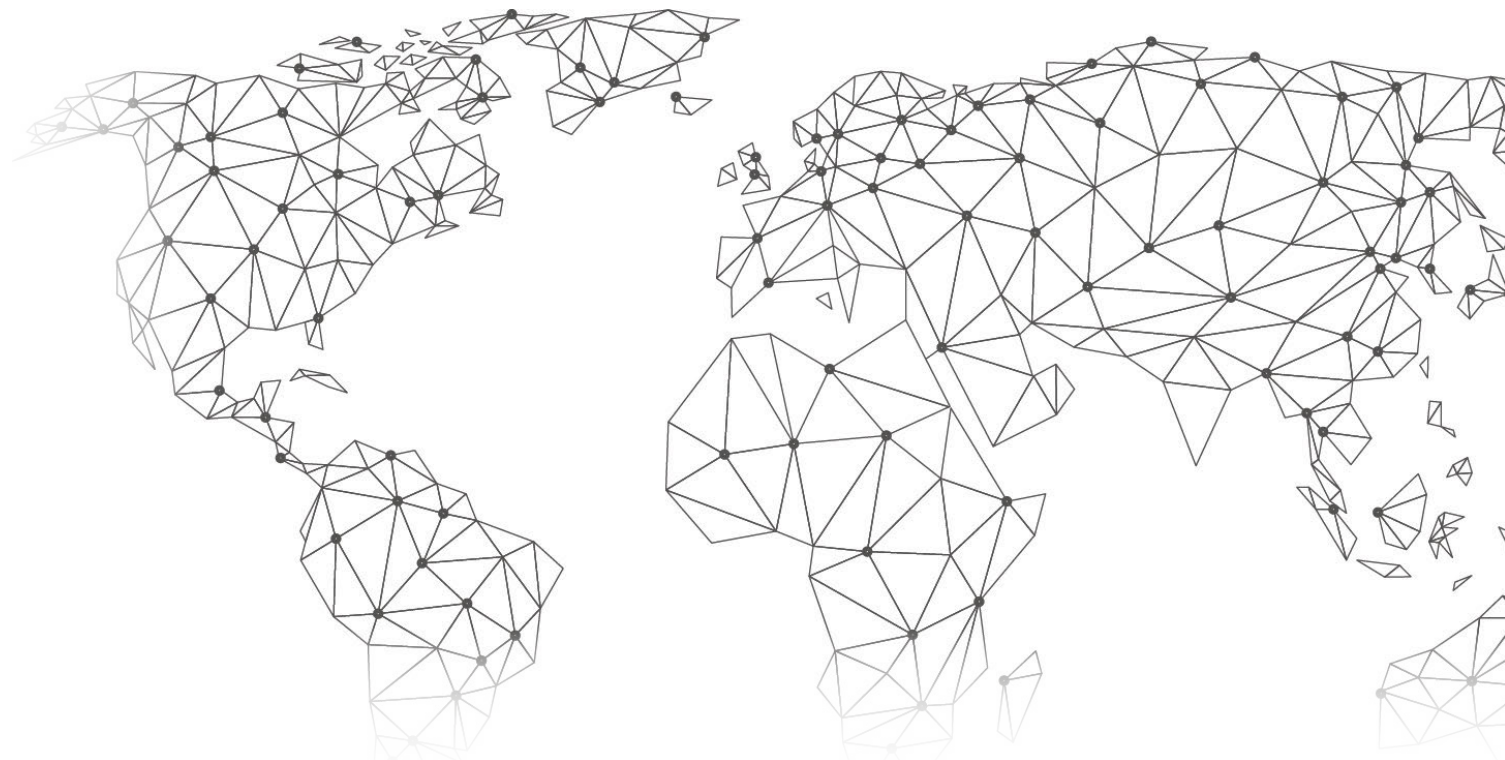
## Quality

Since its foundation in 1989, ATIB Elettronica's mission has been to design and manufacture top quality industrial traction battery chargers (light and heavy) at competitive prices, in order to provide the market with efficient and safe industrial battery chargers. Today, thanks to the constant research and development activities of the in-house technical department, ATIB Elettronica's products stand out for the best quality/price ratio available on the international market.



## Experience

Founded in 1989 thanks to the previous experience gained by its founder in the forklift truck equipment sector, ATIB Elettronica can boast in-depth technical and technological know-how as well as an in-depth knowledge of market requirements. For this reason, the company is able to understand and even anticipate customer requirements, proposing state-of-the-art solutions with excellent performance.



## Promptness

In the consultancy and feasibility study phase, as well as in the after-sales service, ATIB Elettronica always guarantees prompt and punctual responses, in order to provide each customer with efficient and timely solutions.



## Excellence

From the selection of raw materials to the design and management of the entire production process, ATIB Elettronica traction battery chargers for electric vehicles are developed in Italy in full compliance with the strictest quality protocols. Thanks to this, the company is already a partner to numerous international manufacturers.



## Global presence

Thanks to an extensive and consolidated network of international partnerships, ATIB Elettronica is currently operating worldwide, providing its solutions in more than 35 countries. The company works alongside renowned brand manufacturers supplying traction battery chargers in different fields: lifting, cleaning machines, golf-cars and AGVs, the latter being used in the field of automated logistics.



# HIGH FREQUENCY *line*

Modern, compact and efficient charging technology for any kind of batteries. Small size, on board mounting and a versatile setting enable HF chargers to meet all customer needs.

A higher performance, efficiency and a reduction of power consumption during the charge are combined with a battery longer duration.

# HFY & HFX

SINGLE PHASE 230 Vac

## MAIN APPLICATIONS



## SUITABLE BATTERIES

Wet lead acid (PzS) – GEL – AGM –  
VRLA – PzV – Lithium (on demand)

## MODELS AVAILABLE

|     | V       | A  | VAC   | CODE          | Lead acid (Ah) |             | Gel (Ah) | Iac |
|-----|---------|----|-------|---------------|----------------|-------------|----------|-----|
|     |         |    |       |               | 7,5-8,5h       | 10-12-14h   | 12-14h   |     |
| HFY | 12 - 24 | 10 | 1x230 | HFYD 12-24/10 | 61-73          | 85-104-123  | 75-94    | 2,3 |
|     | 12 - 24 | 15 | 1x230 | HFYD 12-24/15 | 92-110         | 127-155-185 | 113-141  | 3,4 |
|     | 12 - 24 | 20 | 1x230 | HFYD 12-24/20 | 122-146        | 169-207-247 | 151-188  | 4,5 |
| HFX | 12 - 24 | 25 | 1x230 | HFXD 12-24/25 | 153-183        | 212-259-308 | 189-235  | 5,6 |
|     | 12 - 24 | 30 | 1x230 | HFXD 12-24/30 | 183-219        | 254-311-370 | 226-282  | 6,7 |
|     | 36      | 20 | 1x230 | HFXD 36/20    | 122-146        | 169-207-247 | 151-188  | 6,7 |
|     | 48      | 15 | 1x230 | HFXD 48/15    | 92-110         | 127-155-185 | 113-141  | 6,7 |

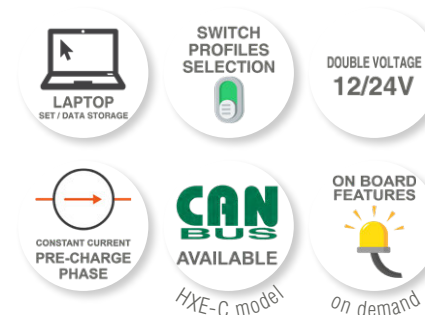
## PRODUCT INTRO

**HFY** is the smallest HF charger suitable for on-board applications with LED visual interface.

**HFX** is the small-medium sized HF charger suitable for semi-traction & on-board applications with LED visual interface.

Easy built-in jumpers enable voltage and profile selection (12-24V and two profiles). Also, PC connection allows advanced setting, data-report and diagnostic.

HFX is also available with CAN-bus communication (HXE-C version).



## GENERAL CHARACTERISTICS

|                              | HFX                                                                                                                                        | HFY                         |
|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|
| <b>Mains</b>                 | 230Vac (1ph) +/-10% 50-60Hz<br>On/off switch                                                                                               | 230Vac (1ph) +/-10% 50-60Hz |
| <b>Visual signalling</b>     | Single LED (3 colours)                                                                                                                     |                             |
| <b>Charger setting</b>       | By switches: voltage (12-24) and 2 charging profiles (Pb/Gel pre-set)<br>By PC: extra editable charging profiles, capacity, output current |                             |
| <b>Data memory</b>           | Charger gives a report of the last 25 cycles and key technical data by integrated PC port output                                           |                             |
| <b>Cool-down system</b>      | Fan idle within 40°C internal components temperature                                                                                       |                             |
| <b>Efficiency</b>            | > 85%                                                                                                                                      |                             |
| <b>Operating temperature</b> | 0° to +40°C                                                                                                                                |                             |
| <b>Certifications</b>        | CE in conformity with LV and EMC protocols                                                                                                 |                             |

## SAFETY FEATURES

|                                                |                                                                                    |
|------------------------------------------------|------------------------------------------------------------------------------------|
| <b>Input protection</b>                        | Delay AC fuse                                                                      |
| <b>Output protection</b>                       | By relay (reverse polarity protection)                                             |
| <b>Thermal Protection</b>                      | Forced derating on primary side<br>Forced derating or safety cut off on the diodes |
| <b>Protection during battery disconnection</b> | Safety cut off by undervoltage                                                     |

## OPTIONALS

|                                                                  |
|------------------------------------------------------------------|
| Cable holder                                                     |
| Inhibitor cable (Vac presence relay), remote LED, curly AC cable |

## MECHANICAL CHARACTERISTICS

|                           | HFX                                                    | HFY               |
|---------------------------|--------------------------------------------------------|-------------------|
| <b>Dimensions (LxWxH)</b> | 275 x 112 x 75 mm                                      | 230 x 121 x 75 mm |
| <b>Protection degree</b>  | IP 21 (horizontal)                                     |                   |
| <b>Weight</b>             | 3 kg                                                   | 2 kg              |
| <b>Input cable</b>        | 2,3 m +/- 10% (length) – complete with Schuko plug 16A |                   |
| <b>Output cables</b>      | 2,3 m +/- 10% (length) – DC plug on demand             |                   |

# HFZ

## SINGLE PHASE 230 Vac

### MAIN APPLICATIONS



### SUITABLE BATTERIES

Wet lead acid (PzS) – GEL – AGM –  
VRLA – PzV – Lithium (on demand)

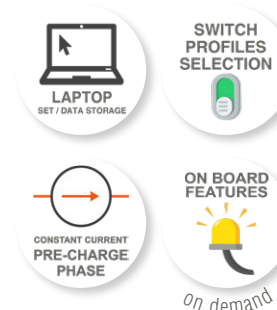
### MODELS AVAILABLE

| V  | A  | VAC   | CODE       | Lead acid (Ah) |             | Gel (Ah) | Iac  |
|----|----|-------|------------|----------------|-------------|----------|------|
|    |    |       |            | 7,5-8,5h       | 10-12-14h   | 12-14h   |      |
| 24 | 40 | 1x230 | HFZD 24/40 | 244-292        | 338-414-493 | 302-376  | 8,2  |
| 24 | 50 | 1x230 | HFZD 24/50 | 305-365        | 423-518-617 | 377-470  | 10,2 |
| 24 | 60 | 1x230 | HFZD 24/60 | 366-438        | 508-622-740 | 452-564  | 12,3 |
| 36 | 30 | 1x230 | HFZD 36/30 | 183-219        | 254-311-370 | 226-282  | 9,1  |
| 36 | 40 | 1x230 | HFZD 36/40 | 244-292        | 338-414-493 | 302-376  | 12,1 |
| 48 | 20 | 1x230 | HFZD 48/20 | 122-146        | 169-207-247 | 151-188  | 8,0  |
| 48 | 30 | 1x230 | HFZD 48/30 | 183-219        | 254-311-370 | 226-282  | 12,0 |

### PRODUCT INTRO

HFZ is the medium range HF charger suitable for light traction applications with LED visual interface.

An easy built-in jumper enables profile selection (Pb-GEL pre-set) and PC connection allows advanced setting, data-report and diagnostic.



### GENERAL CHARACTERISTICS

|                              |                                                                                                                        |
|------------------------------|------------------------------------------------------------------------------------------------------------------------|
| <b>Mains</b>                 | 230Vac (1ph) +/-10% 50-60Hz - On/off switch present on top side                                                        |
| <b>Visual signalling</b>     | Single LED (3 colours)                                                                                                 |
| <b>Charger setting</b>       | By switches: 2 charging profiles (Pb/Gel pre-set)<br>By PC: extra editable charging profiles, capacity, output current |
| <b>Data memory</b>           | Charger gives a report of the last 25 cycles and key technical data by integrated PC port output                       |
| <b>Cool-down system</b>      | Fan idle within 40°C internal components temperature.                                                                  |
| <b>Efficiency</b>            | > 85%                                                                                                                  |
| <b>Operating temperature</b> | 0° to +40°C                                                                                                            |
| <b>Certifications</b>        | CE in conformity with LV and EMC protocols                                                                             |

### SAFETY FEATURES

|                                                |                                                 |
|------------------------------------------------|-------------------------------------------------|
| <b>Input protection</b>                        | Fast AC fuse                                    |
| <b>Output protection</b>                       | By relay (reverse polarity protection)          |
| <b>Thermal Protection</b>                      | Forced derating or safety cut off on the diodes |
| <b>Protection during battery disconnection</b> | Safety cut off by undervoltage                  |

### OPTIONALS

|                                                  |
|--------------------------------------------------|
| Cable holder                                     |
| Inhibitor cable (Vac presence relay), remote LED |

### MECHANICAL CHARACTERISTICS

|                           |                                                        |
|---------------------------|--------------------------------------------------------|
| <b>Dimensions (LxWxH)</b> | 191 x 362 x 75 mm                                      |
| <b>Protection degree</b>  | IP 21 (vertical)                                       |
| <b>Weight</b>             | 6 kg                                                   |
| <b>Input cable</b>        | 2,3 m +/- 10% (length) – complete with Schuko plug 16A |
| <b>Output cables</b>      | 2,3 m +/- 10% (length) – DC plug on demand             |

# HKP3

## SINGLE PHASE 230 Vac

### MAIN APPLICATIONS



### SUITABLE BATTERIES

Wet lead acid (PzS) – GEL – AGM –  
VRLA – PzV – Lithium (on demand)

### MODELS AVAILABLE

| V  | A  | VAC   | CODE              | Lead acid (Ah) |             | Gel (Ah) | Iac  |
|----|----|-------|-------------------|----------------|-------------|----------|------|
|    |    |       |                   | 7,5-8,5h       | 10-12-14h   | 12-14h   |      |
| 24 | 70 | 1x230 | <b>HKP3 24/70</b> | 385-460        | 533-653-777 | 475-592  | 8,4  |
| 24 | 85 | 1x230 | <b>HKP3 24/85</b> | 468-558        | 647-792-943 | 557-720  | 10,3 |
| 36 | 50 | 1x230 | <b>HKP3 36/50</b> | 275-328        | 381-466-555 | 339-423  | 8,9  |
| 36 | 60 | 1x230 | <b>HKP3 36/60</b> | 330-394        | 457-559-666 | 407-508  | 10,7 |
| 48 | 40 | 1x230 | <b>HKP3 48/40</b> | 220-263        | 305-373-444 | 271-338  | 9,4  |
| 48 | 50 | 1x230 | <b>HKP3 48/50</b> | 275-328        | 381-466-555 | 339-423  | 11,7 |
| 48 | 60 | 1x230 | <b>HKP3 48/60</b> | 330-394        | 457-559-666 | 407-508  | 14,1 |

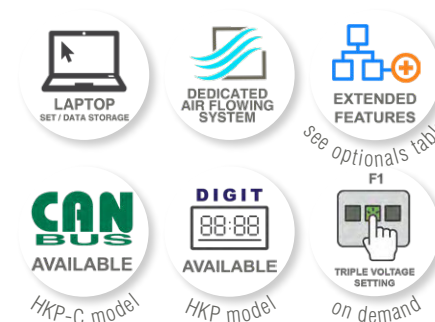
Special versions 12V, 72V, 80V and 96V available on demand  
Air mix Ah= +10%

### PRODUCT INTRO

HKP3 is the HF single phase charger equipped with PFC (Power Factor Control) reaching highest power, aimed for bigger traction applications.

An integrated interface with OLED/LCD display enables a complete overview and setting of charge parameters. USB interface permits advanced setting and data-report.

This range includes also AIR version (with air mix option) and HKP-C, which is the version for Lithium applications featuring CAN-bus protocol.



### GENERAL CHARACTERISTICS

|                               |                                                                                                                              |
|-------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| <b>Mains</b>                  | 230Vac (1ph) +/-10% 50-60Hz                                                                                                  |
| <b>Visual signalling</b>      | OLED/ LCD display, 4 LEDs and 4 control keys                                                                                 |
| <b>Charger setting</b>        | By OLED/ LCD display: current, voltage, capacity and 7 pre-set charging profiles<br>By laptop/USB port: enhanced programming |
| <b>Data memory (optional)</b> | Charger gives a report of the last 50 cycles and key technical data by integrated USB port                                   |
| <b>Cool-down system</b>       | Temperature-regulated fan speed. Fan idle within 40°C internal components temperature                                        |
| <b>Efficiency</b>             | ≥ 90%                                                                                                                        |
| <b>Operating temperature</b>  | 0° to +40°C                                                                                                                  |
| <b>Certifications</b>         | CE in conformity with LV and EMC protocols                                                                                   |

### SAFETY FEATURES

|                                                |                                        |
|------------------------------------------------|----------------------------------------|
| <b>Input protection</b>                        | AC fast fuse                           |
| <b>Output protection</b>                       | By relay (reverse polarity protection) |
| <b>Thermal Protection</b>                      | Probes on IGBT and diodes + derating   |
| <b>Protection during battery disconnection</b> | Safety cut off by undervoltage         |

### OPTIONALS

|                                                                                                                                      |
|--------------------------------------------------------------------------------------------------------------------------------------|
| Cable holder, charger iron stand                                                                                                     |
| Inhibitor cable (Vac presence relay), remote LED, air mix pump, pilot contact, charger status lamp, thermal probe voltage adjustment |

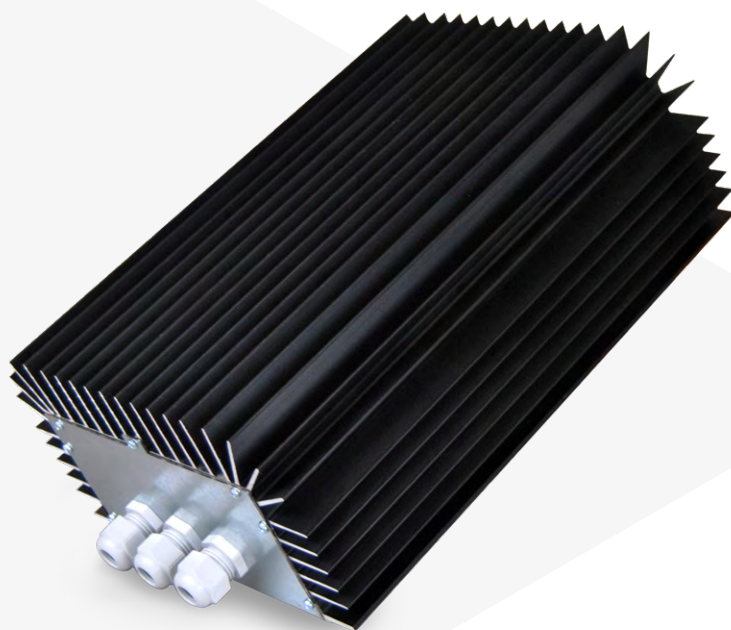
### MECHANICAL CHARACTERISTICS

|                              |                                                                                        |
|------------------------------|----------------------------------------------------------------------------------------|
| <b>Dimensions</b><br>(LxWxH) | <b>HKP3:</b> 224 x 406 x 98 mm<br><b>HKP3 Air/special features:</b> 397 x 115 x 521 mm |
| <b>Protection degree</b>     | IP 21 (vertical)                                                                       |
| <b>Weight</b>                | 9 kg                                                                                   |
| <b>Input cable</b>           | 2,3 m +/- 10% (length) – complete with Schuko plug 16A                                 |
| <b>Output cables</b>         | 2, 3 m +/- 10% (length) – DC plug on demand                                            |

# HFL

**SINGLE PHASE 110-230 Vac**

## MAIN APPLICATIONS



## SUITABLE BATTERIES

Wet lead acid (PzS) – GEL – AGM –  
VRLA – PzV – Lithium (on demand)

## MODELS AVAILABLE

| V  | A  | VAC       | CODE             | Lead acid (Ah) |             | Gel (Ah) | Iac<br>(230Vac) |
|----|----|-----------|------------------|----------------|-------------|----------|-----------------|
|    |    |           |                  | 7,5-8,5h       | 10-12-14h   | 12-14h   |                 |
| 24 | 30 | 1x110-230 | <b>HFL 24/30</b> | 165-197        | 228-280-333 | 226-282  | 3,4             |
| 36 | 20 | 1x110-230 | <b>HFL 36/20</b> | 110-132        | 152-186-222 | 151-188  | 3,4             |
| 48 | 15 | 1x110-230 | <b>HFL 48/15</b> | 82-99          | 114-140-167 | 113-141  | 3,4             |

-K1: suffix code for on-board package

## PRODUCT INTRO

HFL is our IP 65 high efficiency PFC HF charger.

The universal input 110/230Vac makes it suitable for different markets.

This advanced technology charger has a brand new hardware architecture providing an innovative power conversion capable of reducing the losses and optimizing the efficiency of the system.



## GENERAL CHARACTERISTICS

|                               |                                                                                    |
|-------------------------------|------------------------------------------------------------------------------------|
| <b>Mains</b>                  | 110-230Vac (1ph) +/-10% 50-60Hz                                                    |
| <b>Visual signalling</b>      | External single LED (3 colours)                                                    |
| <b>Charger setting</b>        | By PC/Programming port: extra editable charging profiles, capacity, output current |
| <b>Data memory (optional)</b> | Charger gives a report of the last 25 cycles and key technical data (by PC)        |
| <b>Cool-down system</b>       | Fan idle within 40°C internal components temperature.                              |
| <b>Efficiency</b>             | ≥ 90% at 230 Vac                                                                   |
| <b>Operating temperature</b>  | -10° to +40°C, humidity 95% without condensing                                     |
| <b>Certifications</b>         | CE in conformity with LV and EMC protocols                                         |

## SAFETY FEATURES

|                                                |                                       |
|------------------------------------------------|---------------------------------------|
| <b>Input protection</b>                        | Delay AC fuse                         |
| <b>Output protection</b>                       | By fuse (reverse polarity protection) |
| <b>Thermal Protection</b>                      | Forced derating on secondary side     |
| <b>Protection during battery disconnection</b> | Safety cut off by undervoltage        |

## MECHANICAL CHARACTERISTICS

|                           |                                                                                                                                                                                                                |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Dimensions (LxWxH)</b> | 320 x 210 x 112 mm                                                                                                                                                                                             |
| <b>Protection degree</b>  | IP65                                                                                                                                                                                                           |
| <b>Weight</b>             | 5 kg                                                                                                                                                                                                           |
| <b>Input cable</b>        | 2,3 m +/- 10% (length) – complete with Schuko plug 16A                                                                                                                                                         |
| <b>Output cables</b>      | 2,3 m +/- 10% (length) – DC plug on demand<br><b>HFL:</b> External LED (5 cm), serial port for programming<br><b>HFL-K1:</b> Inhibitor cable (2,3 m), external remote LED (2,3 m), serial port for programming |

# HFT1 & HVE

THREE PHASE 400 Vac

## MAIN APPLICATIONS



## SUITABLE BATTERIES

Wet lead acid (PzS) – GEL – AGM –  
VRLA – PzV – Lithium (on demand)

## MODELS AVAILABLE

| V   | A   | VAC   | CODE        | Iac  | CODE       | Iac  | Lead acid (Ah) |                | Gel (Ah) |
|-----|-----|-------|-------------|------|------------|------|----------------|----------------|----------|
|     |     |       |             |      |            |      | 7,5-8,5h       | 10-12-14h      | 12-14h   |
| 24  | 120 | 3x400 | HFT1 24/120 | 6,1  | HVE 24/120 | 4,9  | 659-788        | 914-1119-1332  | 814-1015 |
| 24  | 140 | 3x400 | --          | --   | HVE 24/140 | 5,7  | 769-920        | 1066-1305-1554 | 950-1185 |
| 48  | 80  | 3x400 | HFT1 48/ 80 | 8,0  | HVE 48/ 80 | 6,4  | 440-526        | 609-746-888    | 543-677  |
| 48  | 100 | 3x400 | HFT1 48/100 | 10,0 | HVE 48/100 | 8,0  | 549-657        | 762-932-1110   | 679-846  |
| 48  | 120 | 3x400 | HFT1 48/120 | 12,0 | HVE 48/120 | 9,6  | 659-788        | 914-1119-1332  | 814-1015 |
| 48  | 140 | 3x400 | --          | --   | HVE 48/140 | 11,2 | 769-920        | 1066-1305-1554 | 950-1185 |
| 80  | 80  | 3x400 | HFT1 80/ 80 | 13,1 | HVE 80/ 80 | 10,6 | 440-526        | 609-746-888    | 543-677  |
| 80  | 100 | 3x400 | HFT1 80/100 | 15,5 | HVE 80/100 | 12,6 | 549-657        | 762-932-1110   | 679-846  |
| 80  | 110 | 3x400 | --          | --   | HVE 80/110 | 14,5 | 604-725        | 838-1026-1221  | 747-931  |
| 96  | 80  | 3x400 | HFT1 96/ 80 | 15,7 | HVE 96/ 80 | 12,7 | 440-526        | 609-746-888    | 543-677  |
| 96  | 90  | 3x400 | --          | --   | HVE 96/ 90 | 14,3 | 495-591        | 685-839-999    | 611-762  |
| 120 | 60  | 3x400 | HFT1 120/60 | 15,4 | HVE 120/60 | 11,9 | 330-394        | 457-559-666    | 407-508  |
| 120 | 70  | 3x400 | --          | --   | HVE 120/70 | 13,9 | 385-460        | 533-653-777    | 475-592  |

Special versions 36V and 72V available on demand

In between output current sizes available

Air mix Ah= +10%

## PRODUCT INTRO

HFT1 and HVE digital are the three phase HF chargers equipped with integrated OLED/LCD display and USB interface.

The digital HVE provides bigger power solutions, the most accurate control of the profile and a higher efficiency with relevant lower input current draw.

Both HFT1 and HVE are available with air-mix option and with CAN-bus protocol for Lithium applications.



## GENERAL CHARACTERISTICS

|                              |                                                                                                                              |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| <b>Mains</b>                 | 400Vac (3ph) +/-10% 50-60Hz                                                                                                  |
| <b>Visual signalling</b>     | OLED/ LCD display, 4 LEDs and 4 control keys                                                                                 |
| <b>Charger setting</b>       | By OLED/ LCD display: current, voltage, capacity and 7 pre-set charging profiles<br>By laptop/USB port: enhanced programming |
| <b>Data memory</b>           | Charger gives a report of the last 50 cycles and key technical data by integrated USB port                                   |
| <b>Cool-down system</b>      | Temperature-regulated fan speed. Fan idle within 40°C internal components temperature                                        |
| <b>Efficiency</b>            | ≥ 90% (HFT1) / ≥ 92% (HVE)                                                                                                   |
| <b>Operating temperature</b> | 0° to +40°C full power                                                                                                       |
| <b>Certifications</b>        | CE in conformity with LV and EMC protocols                                                                                   |

## SAFETY FEATURES

|                                                |                                              |
|------------------------------------------------|----------------------------------------------|
| <b>Input protection</b>                        | 3 AC fast fuses                              |
| <b>Output protection</b>                       | Ultrafast fuse (reverse polarity protection) |
| <b>Thermal Protection</b>                      | Probes on IGBT and diodes + derating         |
| <b>Protection during battery disconnection</b> | Safety cut off by undervoltage               |

## OPTIONALS

|                                                                                                                                      |
|--------------------------------------------------------------------------------------------------------------------------------------|
| Cable holder, charger iron stand                                                                                                     |
| Inhibitor cable (Vac presence relay), remote LED, pilot contact, charger status lamp, thermal probe voltage adjustment, air mix pump |

## MECHANICAL CHARACTERISTICS

|                           |                                            |
|---------------------------|--------------------------------------------|
| <b>Dimensions (LxWxH)</b> | 397 x 115 x 521 mm                         |
| <b>Protection degree</b>  | IP 21 (vertical)                           |
| <b>Weight</b>             | 18 kg                                      |
| <b>Input cable</b>        | 2,5 m +/- 10% (length) – AC plug on demand |
| <b>Output cables</b>      | 2,5 m +/- 10% (length) – DC plug on demand |

# HFT2 & HV2

## THREE PHASE 400 Vac

### MAIN APPLICATIONS



### SUITABLE BATTERIES

Wet lead acid (PzS) – GEL – AGM –  
VRLA – PzV – Lithium (on demand)

### MODELS AVAILABLE

|     |     |       |              |      |             |      | Lead acid (Ah) |                | Gel (Ah)  |
|-----|-----|-------|--------------|------|-------------|------|----------------|----------------|-----------|
| V   | A   | VAC   | CODE         | Iac  | CODE        | Iac  | 7,5-8,5h       | 10-12-14h      | 12-14h    |
| 48  | 160 | 3x400 | HFT2 48/160  | 16,0 | HV2 48/160  | 12,8 | 879-1051       | 1219-1492-1776 | 1086-1354 |
| 48  | 180 | 3x400 | HFT2 48/180  | 18,0 | HV2 48/180  | 14,4 | 989-1183       | 1371-1678-1998 | 1222-1523 |
| 48  | 200 | 3x400 | HFT2 48/200  | 20,0 | HV2 48/200  | 16,0 | 1099-1314      | 1523-1865-2220 | 1357-1692 |
| 48  | 250 | 3x400 | --           | --   | HV2 48/250  | 20,0 | 1374-1642      | 1904-2331-2776 | 1697-2115 |
| 80  | 140 | 3x400 | HFT2 80/140  | 22,8 | HV2 80/140  | 18,5 | 769-920        | 1066-1305-1554 | 950-1185  |
| 80  | 160 | 3x400 | HFT2 80/160  | 26,1 | HV2 80/160  | 21,2 | 879-1051       | 1219-1492-1776 | 1086-1354 |
| 80  | 200 | 3x400 | --           | --   | HV2 80/200  | 26,4 | 1099-1314      | 1523-1865-2220 | 1357-1692 |
| 96  | 100 | 3x400 | HFT2 96/100  | 19,6 | HV2 96/100  | 15,9 | 549-657        | 762-932-1110   | 679-846   |
| 96  | 140 | 3x400 | HFT2 96/140  | 27,4 | HV2 96/140  | 22,2 | 769-920        | 1066-1305-1554 | 950-1185  |
| 96  | 160 | 3x400 | --           | --   | HV2 96/160  | 25,4 | 879-1051       | 1219-1492-1776 | 1086-1354 |
| 120 | 80  | 3x400 | HFT2 120/80  | 19,6 | HV2 120/80  | 15,9 | 440-526        | 609-746-888    | 543-677   |
| 120 | 100 | 3x400 | HFT2 120/100 | 24,5 | HV2 120/100 | 19,9 | 549-657        | 762-932-1110   | 679-846   |
| 120 | 130 | 3x400 | --           | --   | HV2 120/130 | 25,8 | 714-854        | 990-1212-1443  | 882-1100  |

Special versions 24V, 36V, 72V available on demand

In between output current sizes available

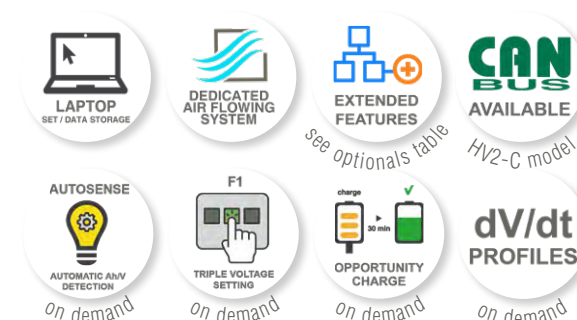
Air mix Ah= +10%

### PRODUCT INTRO

HFT2 and HV2 digital are the three phase HF charger equipped with OLED/LCD and USB interface.

They are both equipped with 2 main power boards in parallel. HV2 provides bigger power solutions, the most accurate control of the profile and a higher efficiency with relevant lower input current draw.

Both HFT2 and HV2 are available with air-mix option and with CAN-bus protocol for Lithium applications.



### GENERAL CHARACTERISTICS

|                              |                                                                                                                             |
|------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| <b>Mains</b>                 | 400Vac (3ph) +/-10% 50-60Hz                                                                                                 |
| <b>Visual signalling</b>     | OLED/LCD display, 4 LEDs and 4 control keys                                                                                 |
| <b>Charger setting</b>       | By OLED/LCD display: current, voltage, capacity and 7 pre-set charging profiles<br>By laptop/USB port: enhanced programming |
| <b>Data memory</b>           | Charger gives a report of the last 50 cycles and key technical data by integrated USB port                                  |
| <b>Cool-down system</b>      | Temperature-regulated fan speed. Fan idle within 40°C internal components temperature                                       |
| <b>Efficiency</b>            | ≥ 90% (HFT2) / ≥ 92% (HV2)                                                                                                  |
| <b>Operating temperature</b> | 0° to +40°C                                                                                                                 |
| <b>Certifications</b>        | CE in conformity with LV and EMC protocols                                                                                  |

### SAFETY FEATURES

|                                                |                                              |
|------------------------------------------------|----------------------------------------------|
| <b>Input protection</b>                        | 3 fast fuses (each main power board)         |
| <b>Output protection</b>                       | Ultrafast fuse (reverse polarity protection) |
| <b>Thermal Protection</b>                      | Probes on IGBT and diodes + derating         |
| <b>Protection during battery disconnection</b> | Safety cut off by undervoltage               |

### OPTIONALS

|                                                                                    |
|------------------------------------------------------------------------------------|
| Cable holder, charger iron stand                                                   |
| Air mix pump, pilot contact, charger status lamp, thermal probe voltage adjustment |

### MECHANICAL CHARACTERISTICS

|                           |                                            |
|---------------------------|--------------------------------------------|
| <b>Dimensions (LxWxH)</b> | 402 x 259 x 535 mm                         |
| <b>Protection degree</b>  | IP 21 (vertical)                           |
| <b>Weight</b>             | 26 kg                                      |
| <b>Input cable</b>        | 2,5 m +/- 10% (length) – AC plug on demand |
| <b>Output cables</b>      | 2,5 m +/- 10% (length) – DC plug on demand |

# HFT3 & HV3

THREE PHASE 400 Vac

## MAIN APPLICATIONS



## SUITABLE BATTERIES

Wet lead acid (PzS) – GEL – AGM –  
VRLA – PzV – Lithium (on demand)

## MODELS AVAILABLE

| V   | A   | VAC   | CODE         | Iac  | CODE        | Iac  | Lead acid (Ah) |                | Gel (Ah)  |
|-----|-----|-------|--------------|------|-------------|------|----------------|----------------|-----------|
|     |     |       |              |      |             |      | 7,5-8,5h       | 10-12-14h      | 12-14h    |
| 48  | 260 | 3x400 | HFT3 48/260  | 26,0 | HV3 48/260  | 20,9 | 1429-1708      | 1980-2424-2887 | 1765-2200 |
| 48  | 300 | 3x400 | HFT3 48/300  | 30,0 | HV3 48/300  | 24,1 | 1648-1970      | 2285-2797-3331 | 2036-2538 |
| 48  | 400 | 3x400 | --           | --   | HV3 48/400  | 32,0 | 2198-2628      | 3046-3730-4440 | 2714-3384 |
| 80  | 200 | 3x400 | HFT3 80/200  | 32,6 | HV3 80/200  | 26,4 | 1099-1314      | 1523-1865-2220 | 1357-1692 |
| 80  | 240 | 3x400 | HFT3 80/240  | 39,2 | HV3 80/240  | 31,7 | 1319-1577      | 1828-2238-2665 | 1629-2031 |
| 80  | 260 | 3x400 | HFT3 80/260  | 42,4 | HV3 80/260  | 34,4 | 1429-1708      | 1980-2424-2887 | 1765-2200 |
| 80  | 310 | 3x400 | --           | --   | HV3 80/310  | 41,0 | 1703-2036      | 2361-2890-3441 | 2104-2623 |
| 96  | 160 | 3x400 | HFT3 96/160  | 31,3 | HV3 96/160  | 25,4 | 879-1051       | 1219-1492-1776 | 1086-1354 |
| 96  | 200 | 3x400 | HFT3 96/200  | 39,2 | HV3 96/200  | 31,8 | 1099-1314      | 1523-1865-2220 | 1357-1692 |
| 96  | 260 | 3x400 | --           | --   | HV3 96/260  | 41,3 | 1429-1708      | 1980-2424-2887 | 1765-2200 |
| 120 | 120 | 3x400 | HFT3 120/120 | 29,4 | HV3 120/120 | 23,8 | 659-788        | 914-1119-1332  | 814-1015  |
| 120 | 160 | 3x400 | HFT3 120/160 | 39,2 | HV3 120/160 | 31,8 | 879-1051       | 1219-1492-1776 | 1086-1354 |
| 120 | 200 | 3x400 | --           | --   | HV3 120/200 | 39,7 | 1099-1314      | 1523-1865-2220 | 1357-1692 |

Special versions 24V, 36V, 72V available on demand

In between output current sizes available

Air mix Ah= +10%

## PRODUCT INTRO

HFT3 and HV3 digital are the three phase HF chargers equipped with OLED/LCD display and USB interface.

They are both equipped with 3 main power boards in parallel. HV3 provides bigger power solutions, the most accurate control of the profile and a higher efficiency with relevant lower input current draw.

Both HFT3 and HV3 are available with air-mix option and with CAN-bus protocol for Lithium applications.



## GENERAL CHARACTERISTICS

|                              |                                                                                                                             |
|------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| <b>Mains</b>                 | 400Vac (3ph) +/-10% 50-60Hz                                                                                                 |
| <b>Visual signalling</b>     | OLED/LCD display, 4 LEDs and 4 control keys                                                                                 |
| <b>Charger setting</b>       | By OLED/LCD display: current, voltage, capacity and 7 pre-set charging profiles<br>By laptop/USB port: enhanced programming |
| <b>Data memory</b>           | Charger gives a report of the last 50 cycles and key technical data by integrated USB port                                  |
| <b>Cool-down system</b>      | Temperature-regulated fan speed. Fan idle within 40°C internal components temperature                                       |
| <b>Efficiency</b>            | ≥ 90% (HFT3) / ≥ 92% (HV3)                                                                                                  |
| <b>Operating temperature</b> | 0° to +40°C                                                                                                                 |
| <b>Certifications</b>        | CE in conformity with LV and EMC protocols                                                                                  |

## SAFETY FEATURES

|                                                |                                              |
|------------------------------------------------|----------------------------------------------|
| <b>Input protection</b>                        | 3 AC fast fuses (each main power board)      |
| <b>Output protection</b>                       | Ultrafast fuse (reverse polarity protection) |
| <b>Thermal Protection</b>                      | Probes on IGBT and diodes + derating         |
| <b>Protection during battery disconnection</b> | Safety cut off by undervoltage               |

## OPTIONALS

Air mix pump, pilot contact, charger status lamp, thermal probe voltage adjustment

## MECHANICAL CHARACTERISTICS

|                           |                                                                                                                         |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------|
| <b>Dimensions (LxWxH)</b> | 602 x 428 x 802 mm                                                                                                      |
| <b>Protection degree</b>  | IP 21 (stand alone) – filter protection system ready (for higher IP: contact our technical department for more details) |
| <b>Weight</b>             | 69 kg                                                                                                                   |
| <b>Input cable</b>        | 2,5 m +/- 10% (length) – AC plug on demand                                                                              |
| <b>Output cables</b>      | 2,5 m +/- 10% (length) – DC plug on demand                                                                              |

# HTUC

## THREE PHASE 400 Vac

### MAIN APPLICATIONS



### SUITABLE BATTERIES

Wet lead acid (PzS) – GEL – AGM –  
VRLA – PzV – Lithium (on demand)

### MODELS AVAILABLE

| V   | A   | VAC   | CODE               | Lead acid (Ah) |                | Gel (Ah)  | Iac  |
|-----|-----|-------|--------------------|----------------|----------------|-----------|------|
|     |     |       |                    | 7,5-8,5h       | 10-12-14h      | 12-14h    |      |
| 24  | 140 | 3x400 | <b>HTUC 24/140</b> | 769-920        | 1066-1305-1554 | 950-1185  | 5,7  |
| 24  | 160 | 3x400 | <b>HTUC 24/160</b> | 879-1051       | 1219-1492-1776 | 1086-1354 | 6,5  |
| 24  | 180 | 3x400 | <b>HTUC 24/180</b> | 989-1183       | 1371-1678-1998 | 1222-1523 | 7,3  |
| 24  | 200 | 3x400 | <b>HTUC 24/200</b> | 1099-1314      | 1523-1865-2220 | 1357-1692 | 8,1  |
| 48  | 140 | 3x400 | <b>HTUC 48/140</b> | 769-920        | 1066-1305-1554 | 950-1185  | 11,2 |
| 48  | 160 | 3x400 | <b>HTUC 48/160</b> | 879-1051       | 1219-1492-1776 | 1086-1354 | 12,8 |
| 48  | 180 | 3x400 | <b>HTUC 48/180</b> | 989-1183       | 1371-1678-1998 | 1222-1523 | 14,4 |
| 48  | 200 | 3x400 | <b>HTUC 48/200</b> | 1099-1314      | 1523-1865-2220 | 1357-1692 | 16,0 |
| 80  | 120 | 3x400 | <b>HTUC 80/120</b> | 659-788        | 914-1119-1332  | 814-1015  | 15,9 |
| 96  | 100 | 3x400 | <b>HTUC 96/100</b> | 549-657        | 762-932-1110   | 679-846   | 15,9 |
| 120 | 80  | 3x400 | <b>HTUC 120/80</b> | 440-526        | 609-746-888    | 543-677   | 15,9 |

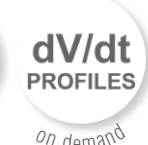
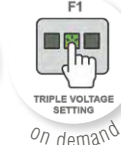
Special versions 36V and 72V available on demand  
In between output current sizes available

Air mix Ah= +10%

Parallel version available

### PRODUCT INTRO

HTUC is the top level HF charger aimed to reach the highest performances. This range gathers all top features of HF ranges in terms of efficiency, power factor, ventilation, internal structure and general flexibility. An integrated digital interface with OLED/LCD display and integrated USB enables the best and easiest overview/setting of charge parameters, diagnostic and data reports. Lithium version is available with private or custom protocol (HTUD model).



### GENERAL CHARACTERISTICS

|                              |                                                                                                                                         |
|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| <b>Mains</b>                 | 400Vac (3ph) +/-10% 50-60Hz (230Vac 3phase available on demand)                                                                         |
| <b>Visual signalling</b>     | OLED/LCD display, 4 LEDs and 4 control keys                                                                                             |
| <b>Charger setting</b>       | By OLED/LCD display: current, voltage, capacity and 7 pre-set charging profiles<br>By laptop/USB port: enhanced programming             |
| <b>Data memory</b>           | Charger gives a report of the last 50 cycles and key technical data by integrated USB port                                              |
| <b>Cool-down system</b>      | Dedicated air cooling direct to heatsink only. Temperature-regulated fan speed.<br>Fan idle within 40°C internal components temperature |
| <b>Efficiency</b>            | ≥ 92%                                                                                                                                   |
| <b>Operating temperature</b> | 0° to +40°C                                                                                                                             |
| <b>Certifications</b>        | CE in conformity with LV and EMC protocols                                                                                              |

### SAFETY FEATURES

|                                                |                                                         |
|------------------------------------------------|---------------------------------------------------------|
| <b>Input protection</b>                        | 3 fast fuses                                            |
| <b>Output protection</b>                       | By fuse (reverse polarity protection)                   |
| <b>Thermal Protection</b>                      | Probes on IGBT, diodes and power transformer + derating |
| <b>Protection during battery disconnection</b> | Safety cut off by undervoltage                          |

### OPTIONALS

|                                                                                    |
|------------------------------------------------------------------------------------|
| Cable holder, charger iron stand                                                   |
| Air mix pump, pilot contact, charger status lamp, thermal probe voltage adjustment |

### MECHANICAL CHARACTERISTICS

|                           |                                                                                                                          |
|---------------------------|--------------------------------------------------------------------------------------------------------------------------|
| <b>Dimensions (LxWxH)</b> | <b>HTUC:</b> 456 x 195 x 570 mm<br><b>HTUC 230Vac input:</b> 470 x 422 x 1257 mm<br><b>HTUC Air:</b> 470 x 422 x 1257 mm |
| <b>Protection degree</b>  | IP 21 (vertical) - Additional filter protection on demand                                                                |
| <b>Weight</b>             | 28 kg                                                                                                                    |
| <b>Input cable</b>        | 2,5 m +/- 10% (length) – AC plug on demand                                                                               |
| <b>Output cables</b>      | 2,5 m +/- 10% (length) – DC plug on demand                                                                               |

# HWP

## THREE PHASE 400 Vac

### MAIN APPLICATIONS



### SUITABLE BATTERIES

Wet lead acid (PzS) – GEL – AGM –  
VRLA – PzV – Lithium (on demand)

### MODELS AVAILABLE

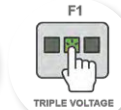
| V   | A   | VAC   | CODE               | Lead acid (Ah) |                | Gel (Ah)  | Iac  |
|-----|-----|-------|--------------------|----------------|----------------|-----------|------|
|     |     |       |                    | 7,5-8,5h       | 10-12-14h      | 12-14h    |      |
| 24  | 240 | 3x400 | <b>HWP 24/240</b>  | 1319-1577      | 1828-2238-2665 | 1629-2031 | 9,8  |
| 24  | 320 | 3x400 | <b>HWP 24/320</b>  | 1758-2102      | 2438-2984-3552 | 2172-2708 | 13,0 |
| 24  | 400 | 3x400 | <b>HWP 24/400</b>  | 2198-2628      | 3046-3730-4440 | 2714-3384 | 16,2 |
| 48  | 240 | 3x400 | <b>HWP 48/240</b>  | 1319-1577      | 1828-2238-2665 | 1629-2031 | 19,2 |
| 48  | 320 | 3x400 | <b>HWP 48/320</b>  | 1758-2102      | 2438-2984-3552 | 2172-2708 | 25,7 |
| 48  | 400 | 3x400 | <b>HWP 48/400</b>  | 2198-2628      | 3046-3730-4440 | 2714-3384 | 32,4 |
| 80  | 180 | 3x400 | <b>HWP 80/180</b>  | 989-1183       | 1371-1678-1998 | 1222-1523 | 23,8 |
| 80  | 240 | 3x400 | <b>HWP 80/240</b>  | 1319-1577      | 1828-2238-2665 | 1629-2031 | 31,8 |
| 96  | 190 | 3x400 | <b>HWP 96/190</b>  | 1044-1248      | 1447-1772-2109 | 1290-1608 | 30,2 |
| 120 | 150 | 3x400 | <b>HWP 120/150</b> | 824-985        | 1142-1399-1665 | 1018-1269 | 29,8 |

Special versions 36V and 72V available on demand

In between output current sizes available

### PRODUCT INTRO

HWP is the top level HF charger aimed to reach the highest performances and very high power sizes. This range gathers all top features of HF digit ranges in terms of efficiency, power factor, internal structure and general flexibility. HWP technically accommodates 2 HTUC chargers set in parallel integrating a digital interface with OLED/LCD display. The USB enables the best and easiest overview/setting of charge parameters, diagnostic and data reports. Lithium version is available with private or custom protocol.



### GENERAL CHARACTERISTICS

|                              |                                                                                                                                      |
|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| <b>Mains</b>                 | 400Vac (3ph) +/-10% 50-60Hz                                                                                                          |
| <b>Visual signalling</b>     | OLED/LCD display, 4 LEDs and 4 control keys                                                                                          |
| <b>Charger setting</b>       | By OLED/LCD display: current, voltage, capacity and 7 pre-set charging profiles<br>By laptop/USB port: enhanced programming          |
| <b>Data memory</b>           | Charger gives a report of the last 50 cycles and key technical data by integrated USB port                                           |
| <b>Cool-down system</b>      | Dedicated air cooling direct to heatsink only. Temperature-regulated fan speed. Fan idle within 40°C internal components temperature |
| <b>Efficiency</b>            | ≥ 92%                                                                                                                                |
| <b>Operating temperature</b> | 0° to +40°C                                                                                                                          |
| <b>Certifications</b>        | CE in conformity with LV and EMC protocols                                                                                           |

### SAFETY FEATURES

|                                                |                                                         |
|------------------------------------------------|---------------------------------------------------------|
| <b>Input protection</b>                        | 3 fast fuses                                            |
| <b>Output protection</b>                       | By fuse (reverse polarity protection)                   |
| <b>Thermal Protection</b>                      | Probes on IGBT, diodes and power transformer + derating |
| <b>Protection during battery disconnection</b> | Safety cut off by undervoltage                          |

### OPTIONALS

Air mix pump, pilot contact, charger status lamp, thermal probe voltage adjustment

### MECHANICAL CHARACTERISTICS

|                           |                                                           |
|---------------------------|-----------------------------------------------------------|
| <b>Dimensions (LxWxH)</b> | 470 x 422 x 1257 mm                                       |
| <b>Protection degree</b>  | IP 21 (vertical) - Additional filter protection on demand |
| <b>Weight</b>             | 68 kg                                                     |
| <b>Input cable</b>        | 2,5 m +/- 10% (length) – AC plug on demand                |
| <b>Output cables</b>      | 2,5 m +/- 10% (length) – DC plug on demand                |



# STANDARD *line*

Experienced and long dated technology with higher robustness against intensive usage and/or ambient factors (humidity and dust); an easy “on-site” repairing and spare parts replacement make this charging solution the best choice for the excellent balance price/performance.

# SERIE 2

## Basic Wa

### MAIN APPLICATIONS



### SUITABLE BATTERIES

Wet lead acid - PbS

### STANDARD AVAILABLE SIZES

| Output Voltage     | Output Current                                               |
|--------------------|--------------------------------------------------------------|
| from 12V up to 80V | Amps depending on V ratio, max power in kVA and cabinet size |

### AH RECHARGE TABLE

| Output current A | >>>    | 15 A | 20 A | 25 A | 30 A | 40 A | 50 A | 60 A |
|------------------|--------|------|------|------|------|------|------|------|
| Ah (C5)          | 9h     | 77   | 103  | 129  | 154  | 206  | 257  | 309  |
|                  | 12h    | 111  | 147  | 184  | 221  | 294  | 368  | 441  |
|                  | 13-14h | 121  | 162  | 202  | 242  | 323  | 404  | 484  |
| Output current A | >>>    | 80 A | 100A | 120A | 140A | 160A | 180A | 200A |
| Ah (C5)          | 9h     | 412  | 515  | 617  | 720  | 823  | 926  | 1029 |
|                  | 12h    | 588  | 735  | 882  | 1029 | 1176 | 1323 | 1470 |
|                  | 13-14h | 646  | 807  | 969  | 1130 | 1291 | 1453 | 1614 |

### PRODUCT INTRO

Serie 2 is the basic conventional Wa DIN 41774 range that grants our best balance between price and performance, aimed for markets demanding flexible products.

As entry level Serie 2 features universal 4-LED board, fix 3h temporal charge and compact casings\*.

(\*up to specific V/A sizes).



### GENERAL CHARACTERISTICS

|                       |                                                                                                                                                                                                                                                                                                                        |
|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Mains                 | 230Vac (1ph) $\pm 5\%$ 50Hz / 400Vac (3ph) $\pm 5\%$ 50Hz                                                                                                                                                                                                                                                              |
| Visual signalling     | Basic 4 LEDs visualization with EAV (easy alarm visualization)                                                                                                                                                                                                                                                         |
| Main features         | <ul style="list-style-type: none"> <li>Automatic start, charging process and shutoff</li> <li>Universal Electronic Board with equalisation setting (dipswitch on PCB)</li> <li>Final charging stage: temporal (3h pre-set time)</li> <li>Leakage power transformer</li> <li>Wa charging profile (DIN 41774)</li> </ul> |
| Efficiency            | 82/88% depending on power involved                                                                                                                                                                                                                                                                                     |
| Operating temperature | 0° to +40°C                                                                                                                                                                                                                                                                                                            |
| Certifications        | CE in conformity with LV and EMC protocols                                                                                                                                                                                                                                                                             |

### SAFETY FEATURES

|                    |                                                                                                        |
|--------------------|--------------------------------------------------------------------------------------------------------|
| Output protection  | Reverse polarity protection: fuse                                                                      |
| Thermal protection | Leakage power transformer (class F) provided with thermal probes                                       |
| General protection | Double security timer: gassing point / max charging duration<br>Battery detection with safety powering |

### MECHANICAL CHARACTERISTICS

|                    |                                                                                                      |
|--------------------|------------------------------------------------------------------------------------------------------|
| Protection degree  | IP 21                                                                                                |
| Weight             | Depending on model size                                                                              |
| Input cable        | 2,3 m (length) +/- 10% – AC plug on demand.<br>Schuko plug included on models up to 16A current draw |
| Output cables      | 2,3 m (length) +/- 10% – DC plug on demand                                                           |
| Dimensions (LxWxH) | <div> </div>                                                                                         |
|                    | I2B: 550 x 450 x 900 mm                                                                              |
|                    | I1: 524 x 395 x 660 mm                                                                               |
|                    | P6: 480 x 280 x 310 mm                                                                               |
|                    | P5: 350 x 220 x 270 mm                                                                               |

# SERIE 3

Advanced line - Wa

## MAIN APPLICATIONS



## SUITABLE BATTERIES

Wet lead acid - PbS

## STANDARD AVAILABLE SIZES

| Output Voltage      | Output Current                                               |
|---------------------|--------------------------------------------------------------|
| from 12V up to 120V | Amps depending on V ratio, max power in kVA and cabinet size |

## AH RECHARGE TABLE

| A       | >>>    | 15A  | 20A  | 25A  | 30A  | 40A  | 50A  | 60A  | 70A  | 80A  | 90A  | 100A | 110A | 120A | 130A |
|---------|--------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Ah (C5) | 9h     | 77   | 103  | 129  | 154  | 206  | 257  | 309  | 360  | 412  | 463  | 515  | 566  | 617  | 669  |
|         | 12h    | 111  | 147  | 184  | 221  | 294  | 368  | 441  | 514  | 588  | 661  | 735  | 808  | 882  | 956  |
|         | 13-14h | 121  | 162  | 202  | 242  | 323  | 404  | 484  | 565  | 646  | 726  | 807  | 887  | 969  | 1049 |
| A       | >>>    | 140A | 150A | 160A | 170A | 180A | 190A | 200A | 210A | 220A | 230A | 240A | 250A | 260A | 280A |
| Ah (C5) | 9h     | 720  | 771  | 823  | 874  | 926  | 977  | 1029 | 1080 | 1132 | 1183 | 1235 | 1286 | 1338 | 1441 |
|         | 12h    | 1029 | 1102 | 1176 | 1249 | 1323 | 1396 | 1470 | 1543 | 1617 | 1690 | 1764 | 1837 | 1911 | 2058 |
|         | 13-14h | 1130 | 1210 | 1291 | 1372 | 1453 | 1533 | 1614 | 1694 | 1775 | 1856 | 1937 | 2017 | 2098 | 2259 |

## PRODUCT INTRO

Series 3 represents the upgrade into “Advanced” conventional Wa ranges respectively, aimed for specific markets demanding structured or dedicated characteristics.

The Series feature programmable board with internal memory, enhanced algorithms and USB (setting/troubleshooting/data-report).

Security features involves both mechanical and software solutions.



## GENERAL CHARACTERISTICS

|                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Mains</b>                 | 230Vac (1ph) ± 5% 50Hz / 400Vac (3ph) ± 5% 50Hz (any other on demand)                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Visual signalling</b>     | 5 LED advanced visualization with EAV (easy alarm visualization) and data memory system                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Main features</b>         | <ul style="list-style-type: none"> <li>Automatic start, charging process and shutoff</li> <li>Universal Electronic Board with advanced digital setting (by display or keypad): profile thresholds / termination mode / equilization mode / delay start / cable compensation</li> <li>Final charging stage (adjustable in respect of battery usage): temporal, capacitive (CF% and AH accumulated), derivative dv/dt</li> <li>Leakage power transformer</li> <li>Wa charging profile (DIN 41774)</li> </ul> |
| <b>Operating temperature</b> | 0° to +40°C (heavy climate version available)                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Efficiency</b>            | 82/88% depending on power involved                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Certifications</b>        | CE in conformity with LV and EMC protocols                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

## SAFETY FEATURES

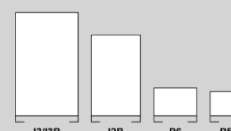
|                           |                                                                                                                                                                                        |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Output protection</b>  | Reverse polarity protection: fuse                                                                                                                                                      |
| <b>Thermal protection</b> | Leakage power transformer (class F) provided with thermal probes                                                                                                                       |
| <b>General protection</b> | Double security timer: gassing point / max charging duration<br>Additional thermal protection based on algorithm managed by electronic board<br>Battery detection with safety powering |

## OPTIONALS

|                   |                                                                                                                                                 |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>SERIE 3-EC</b> | Keypad, cable holder, USB port, protection cage, IP54 cabinet                                                                                   |
| <b>SERIE 3</b>    | Keypad, Delta/Star switch, cable holder, USB port, protection cage, IP54 cabinet, air system, water fill contacts, external lamp, pilot contact |

## MECHANICAL CHARACTERISTICS

|                           |                                                                                                                                    |
|---------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| <b>Protection degree</b>  | IP 21                                                                                                                              |
| <b>Weight</b>             | Depending on model size                                                                                                            |
| <b>Input cable</b>        | 2,3 m (length) +/- 10% – AC plug on demand<br>Schuko plug included on models up to 16A current draw                                |
| <b>Output cables</b>      | 2,3 m (length) +/- 10% – DC plug on demand                                                                                         |
| <b>Dimensions (LxWxH)</b> | I3: 700 x 550 x 1150 mm<br>I3R: 600 x 550 x 1050 mm<br>I2B: 550 x 450 x 900 mm<br>P6: 480 x 280 x 310 mm<br>P5: 350 x 220 x 270 mm |



# SERIE 3-IP

Advanced line - Wa

## MAIN APPLICATIONS



## SUITABLE BATTERIES

Wet lead acid - PbS

## STANDARD AVAILABLE SIZES

| Output Voltage      | Output Current                                               |
|---------------------|--------------------------------------------------------------|
| from 12V up to 120V | Amps depending on V ratio, max power in kVA and cabinet size |

## AH RECHARGE TABLE

| A       | >>>    | 15A  | 20A  | 25A  | 30A  | 40A  | 50A  | 60A  | 70A  | 80A  | 90A  | 100A | 110A | 120A | 130A |
|---------|--------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Ah (C5) | 9h     | 77   | 103  | 129  | 154  | 206  | 257  | 309  | 360  | 412  | 463  | 515  | 566  | 617  | 669  |
|         | 12h    | 111  | 147  | 184  | 221  | 294  | 368  | 441  | 514  | 588  | 661  | 735  | 808  | 882  | 956  |
|         | 13-14h | 121  | 162  | 202  | 242  | 323  | 404  | 484  | 565  | 646  | 726  | 807  | 887  | 969  | 1049 |
| A       | >>>    | 140A | 150A | 160A | 170A | 180A | 190A | 200A | 210A | 220A | 230A | 240A | 250A | 260A | 280A |
| Ah (C5) | 9h     | 720  | 771  | 823  | 874  | 926  | 977  | 1029 | 1080 | 1132 | 1183 | 1235 | 1286 | 1338 | 1441 |
|         | 12h    | 1029 | 1102 | 1176 | 1249 | 1323 | 1396 | 1470 | 1543 | 1617 | 1690 | 1764 | 1837 | 1911 | 2058 |
|         | 13-14h | 1130 | 1210 | 1291 | 1372 | 1453 | 1533 | 1614 | 1694 | 1775 | 1856 | 1937 | 2017 | 2098 | 2259 |

## PRODUCT INTRO

Serie 3-IP represents the upgrade into "Advanced" conventional Wa ranges. The IP54 line grants highest protection from dust and water sprays. This special cabinet is ideal for outdoor applications or airport charging stations. This series features programmable board with internal memory, enhanced algorithms and USB (setting/troubleshooting/data-report). Security features involves both mechanical and software solutions.



## GENERAL CHARACTERISTICS

|                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Mains                 | 230Vac (1ph) ± 5% 50Hz / 400Vac (1ph) ± 5% 50Hz (any other on demand)                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Visual signalling     | 5 LED advanced visualization with EAV (easy alarm visualization) and data memory system. See more details on below standard features/optionals table.                                                                                                                                                                                                                                                                                                                                                      |
| Main features         | <ul style="list-style-type: none"> <li>Automatic start, charging process and shutoff</li> <li>Universal Electronic Board with advanced digital setting (by display or keypad): profile thresholds / termination mode / equilization mode / delay start / cable compensation</li> <li>Final charging stage (adjustable in respect of battery usage): temporal, capacitive (CF% and AH accumulated), derivative dv/dt</li> <li>Leakage power transformer</li> <li>Wa charging profile (DIN 41774)</li> </ul> |
| Operating temperature | 0° to +40°C (heavy climate version available)                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Efficiency            | 82/88% depending on power involved                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Certifications        | CE in conformity with LV and EMC protocols                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

## SAFETY FEATURES

|                    |                                                                                                                                                                                        |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Output protection  | Reverse polarity protection: fuse                                                                                                                                                      |
| Thermal protection | Leakage power transformer (class F) provided with thermal probes                                                                                                                       |
| General protection | Double security timer: gassing point / max charging duration<br>Additional thermal protection based on algorithm managed by electronic board<br>Battery detection with safety powering |

## OPTIONALS

Additional extra coating on PCB, internal heating system, keypad, Delta/Star switch, WOWa Pulse curve, air system, water fill contacts, external lamp, pilot contact

## MECHANICAL CHARACTERISTICS

|                               |                                                        |
|-------------------------------|--------------------------------------------------------|
| Protection degree             | IP 54 - Dedicated cabinet and external roof integrated |
| Weight                        | Depending on model size                                |
| Input cable                   | 2,3 m (length) +/- 10% - AC plug on demand             |
| Output cables                 | 2,3 m (length) +/- 10% - DC plug on demand             |
| <b>Dimensions (LxWxH)</b><br> | M 13-8-5: 800 x 500 x 1420 mm                          |
|                               | M 12-8-4: 800 x 400 x 1300 mm                          |
|                               | M 10-6-4: 600 x 400 x 1100 mm                          |

# SERIE 5

Advanced line - Wa - WO pulse

## MAIN APPLICATIONS



## SUITABLE BATTERIES

Wet lead acid - PbS

## STANDARD AVAILABLE SIZES

| Output Voltage      | Output Current                                               |
|---------------------|--------------------------------------------------------------|
| from 12V up to 120V | Amps depending on V ratio, max power in kVA and cabinet size |

## AH RECHARGE TABLE - Wa Curve

| A       | >>>    | 30A  | 40A  | 50A  | 60A  | 70A  | 80A  | 90A  | 100A | 110A | 120A |
|---------|--------|------|------|------|------|------|------|------|------|------|------|
| Ah (C5) | 9h     | 154  | 206  | 257  | 309  | 360  | 412  | 463  | 515  | 566  | 617  |
|         | 12h    | 221  | 294  | 368  | 441  | 514  | 588  | 661  | 735  | 808  | 882  |
|         | 13-14h | 242  | 323  | 404  | 484  | 565  | 646  | 726  | 807  | 887  | 969  |
| A       | >>>    | 130A | 140A | 150A | 160A | 170A | 180A | 200A | 220A | 240A | 260A |
| Ah (C5) | 9h     | 669  | 720  | 771  | 823  | 874  | 926  | 1029 | 1132 | 1235 | 1338 |
|         | 12h    | 956  | 1029 | 1102 | 1176 | 1249 | 1323 | 1470 | 1617 | 1764 | 1911 |
|         | 13-14h | 1049 | 1130 | 1210 | 1291 | 1372 | 1453 | 1614 | 1775 | 1937 | 2098 |

## AH RECHARGE TABLE - WO PULSE Curve

| A       | >>>    | 30A     | 40A      | 50A      | 60A      | 70A      | 80A      | 90A       | 100A      | 110A      | 120A      |
|---------|--------|---------|----------|----------|----------|----------|----------|-----------|-----------|-----------|-----------|
| Ah (C5) | 6.5-8h | 129-162 | 173-215  | 216-269  | 259-323  | 302-377  | 345-431  | 388-485   | 431-539   | 475-593   | 518-646   |
|         | 8-11h  | 162-229 | 215-306  | 269-382  | 323-458  | 377-535  | 431-611  | 485-688   | 539-764   | 593-841   | 646-917   |
| A       | >>>    | 130A    | 140A     | 150A     | 160A     | 170A     | 180A     | 200A      | 220A      | 240A      | 260A      |
| Ah (C5) | 6.5-8h | 561-700 | 604-754  | 647-808  | 690-862  | 734-916  | 777-970  | 863-1077  | 949-1185  | 1035-1293 | 1123-1399 |
|         | 8-11h  | 700-993 | 754-1069 | 808-1146 | 862-1222 | 916-1299 | 970-1375 | 1077-1528 | 1185-1681 | 1293-1833 | 1399-1986 |

## PRODUCT INTRO

**Series 5** represents the upgrade into “Advanced” conventional Wa ranges respectively.

The range features programmable 5-LED board with internal memory, enhanced charging algorithms and USB (setting/troubleshooting/data-report via PC). The integrated digital display permits the complete controlling, programming and troubleshooting in real time.

**Series 5 Fast** offers our top level conventional charger specifically aimed for quick charge necessities (multiple shift operations) declined into “WO-Pulse” charging characteristics.



## GENERAL CHARACTERISTICS

|                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Mains                 | 230Vac (1ph) ± 5% 50Hz / 400Vac (3ph) ± 5% 50Hz                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Visual signalling     | 5 LED advanced visualization and integrated display for programming, diagnostic and consulting data storage                                                                                                                                                                                                                                                                                                                                                                                                      |
| Main features         | <ul style="list-style-type: none"><li>Automatic start, charging process and shutoff</li><li>Universal Electronic Board with advanced digital setting (by display or keypad): profile thresholds / termination mode / equilization mode / delay start / cable compensation</li><li>Final charging stage (adjustable in respect of battery usage): temporal, capacitive (CF% and AH accumulated), derivative dv/dt</li><li>Leakage power transformer</li><li>Wa (DIN 41774) or WO pulse charging profile</li></ul> |
| Operating temperature | 0° to +40°C (heavy climate version available)                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Efficiency            | 82/88% depending on power involved                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Certifications        | CE in conformity with LV and EMC protocols                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

## SAFETY FEATURES

|                    |                                                                                                                                                                               |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Output protection  | Reverse polarity protection: fuse                                                                                                                                             |
| Thermal protection | Leakage power transformer (class F) provided with thermal probes                                                                                                              |
| General protection | Double security timer: gassing point / max charging duration<br>Additional thermal protection based on algorithm managed by electronic board<br>Delayed start to avoid sparks |

## OPTIONALS

Protection cage, air system, water fill contacts, external lamp, pilot contact

## MECHANICAL CHARACTERISTICS

|                                                                                                             |                                                                                                     |
|-------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| Protection degree                                                                                           | IP 21                                                                                               |
| Weight                                                                                                      | Depending on model size                                                                             |
| Input cable                                                                                                 | 2,3 m (length) +/- 10% – AC plug on demand<br>Schuko plug included on models up to 16A current draw |
| Output cables                                                                                               | 2,3 m (length) +/- 10% – DC plug on demand                                                          |
| Dimensions (LxWxH)<br> | I3: 700 x 550 x 1150 mm                                                                             |
|                                                                                                             | I3R: 600 x 550 x 1050 mm                                                                            |
|                                                                                                             | I2B: 550 x 450 x 900 mm                                                                             |
|                                                                                                             | P6: 480 x 280 x 310 mm                                                                              |
|                                                                                                             | P5: 350 x 220 x 270 mm                                                                              |



# NORTH & LATIN AMERICA

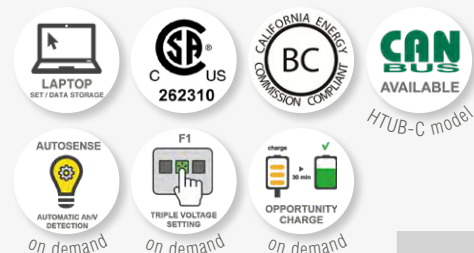
## *line*

The complete range of forklift battery chargers for the American markets, certified for charging traditional lead acid batteries as well as modern gel and lithium batteries.

# HTUB

## THREE PHASE 480/600 Vac

HTUB is the top level HF charger aimed to reach the highest performances. This range gathers all top features of HF ranges in terms of efficiency, power factor, ventilation, internal structure (dedicated 3 compartments) and general flexibility. An integrated digital interface with OLED/LCD display and integrated USB enables the best and easiest overview/setting of charge parameters, diagnostic and data reports.



480/600 Vac (3ph) 50-60Hz

|            |            |            |            |            |            |           |
|------------|------------|------------|------------|------------|------------|-----------|
| 24V        | 36V        | 48V        | 72V        | 80V        | 96V        | 120V      |
| up to 200A | up to 200A | up to 200A | up to 120A | up to 120A | up to 100A | up to 80A |

### GENERAL CHARACTERISTICS

|                       |                                                                                                                                                      |
|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| Visual signalling     | OLED/LCD display, 4 LEDs and 4 control keys                                                                                                          |
| Charger setting       | By OLED/LCD display: current, capacity and 7 pre-set charging profiles<br>By laptop/USB port: enhanced programming                                   |
| Data memory           | Charger gives a report of the last 50 cycles and key technical data by integrated USB door                                                           |
| Cool-down system      | Dedicated air cooling direct to heatsink only. Temperature-regulated fan speed.<br>Fan idle within +104° F (+40° C) internal components temperature. |
| Efficiency            | ≥ 92%                                                                                                                                                |
| Operating temperature | +32° to +104° F (0° to +40° C)                                                                                                                       |
| Certifications        | CSA                                                                                                                                                  |

### SAFETY FEATURES

|                                         |                                                         |
|-----------------------------------------|---------------------------------------------------------|
| Input protection                        | 3 fast fuses                                            |
| Output protection                       | By fuse (reverse polarity protection)                   |
| Thermal Protection                      | Probes on IGBT, diodes and power transformer + derating |
| Protection during battery disconnection | Safety cut off by undervoltage                          |

### MECHANICAL CHARACTERISTICS

|                    |                                                                                                      |
|--------------------|------------------------------------------------------------------------------------------------------|
| Dimensions (LxWxH) | 17.95 x 7.68 x 22.44 inches (456 x 195 x 570 mm)                                                     |
| Protection degree  | IP 21 (vertical) - dedicated air cooling direct to heatsink - Additional filter protection on demand |
| Weight             | 61.73 lb (28 kg)                                                                                     |
| Input cable        | Not supplied                                                                                         |
| Output cables      | 2.7 yd (2,5 m) +/- 10% (length) – DC plug on demand                                                  |

# HTUB MULTI & HRC3

## THREE PHASE 480/600 Vac

HTUB MULTI is aimed for workshop operations requiring charge and desulphation of batteries from 2 to 80V; this item is ideal in fact for the recharge and refresh of any battery type without the stress of looking for the dedicated charge.

HRC3 version, by the means of 4 dedicated programs (programmable by PC), is ideal for the recharge and refresh of all your battery portfolio.



480/600 Vac (3ph) 50-60Hz

Multi-voltage with desulphation system/ battery refresh programs  
2-80V up to 120A

### GENERAL CHARACTERISTICS

|                       |                                                                                                                                                                                                                                                                         |
|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Visual signalling     | OLED/LCD display, 4 LEDs and 4 control keys                                                                                                                                                                                                                             |
| Charger setting       | <b>HTUBM</b> - By display: current, capacity and 7 pre-set charging profiles + desulphation<br><b>HRC3</b> - By display: Nom. Voltage, capacity and 4 pre-set battery refresh programs<br>By laptop/USB port: complete adjustment of each phase details of each program |
| Data memory           | <b>HTUBM</b> - Charger gives a report of the last 50 cycles and key technical data by integrated USB door                                                                                                                                                               |
| Cool-down system      | Dedicated air cooling direct to heatsink only. Temperature-regulated fan speed.<br>Fan idle within +104° F (+40° C) internal components temperature.                                                                                                                    |
| Efficiency            | ≥ 92%                                                                                                                                                                                                                                                                   |
| Operating temperature | +32° to +104° F (0° to +40° C)                                                                                                                                                                                                                                          |
| Certifications        | CSA                                                                                                                                                                                                                                                                     |

### SAFETY FEATURES

|                                         |                                                         |
|-----------------------------------------|---------------------------------------------------------|
| Input protection                        | 3 fast fuses                                            |
| Output protection                       | By fuse (reverse polarity protection)                   |
| Thermal Protection                      | Probes on IGBT, diodes and power transformer + derating |
| Protection during battery disconnection | Safety cut off by undervoltage                          |

### MECHANICAL CHARACTERISTICS

|                    |                                                             |
|--------------------|-------------------------------------------------------------|
| Dimensions (LxWxH) | 17.95 x 7.68 x 22.44 inches (456 x 195 x 570 mm)            |
| Protection degree  | IP 21 (vertical) - Dedicated air cooling direct to heatsink |
| Weight             | 61.73 lb (28 kg)                                            |
| Input cable        | Not supplied                                                |
| Output cables      | 2.7 yd (2,5 m) +/- 10% (length) – DC plug on demand         |

# HTUB-D

THREE PHASE 480/600 Vac

HTUB-D are the HF chargers with double the power of HTUB models, designed for maximum efficiency, power factor, and flexibility. It features an OLED/LCD display, USB integration, and supports *Opportunity* and *Fast charge* options.



## MAIN CHARACTERISTICS

|                           |                                                                                                                             |
|---------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| <b>Visual signalling</b>  | OLED display, 4 LEDs and 4 control keys                                                                                     |
| <b>Charger setting</b>    | By OLED/LCD display: current, voltage, capacity and 7 pre-set charging profiles<br>By laptop/USB port: enhanced programming |
| <b>Dimensions (LxWxH)</b> | 18.5 x 16.61 x 49.49 inches (470 x 422 x 1257 mm)                                                                           |
| <b>Weight</b>             | 149.91 lb (68 kg)                                                                                                           |



480/600 Vac (3ph) 50-60Hz

|                 |            |
|-----------------|------------|
| 24V / 36V / 48V | up to 400A |
| 72V / 80V       | up to 240A |
| 96V             | up to 190A |
| 120V            | up to 150A |

# HTUB-LH

THREE PHASE 208/220/240 Vac

HTUB-LH is a high-performance HF charger designed for 208/220/240 Vac input, commonly used in the US and Latin America. This model is also available with CE (HWR version) and CSA certifications (HTUB-LH).



## MAIN CHARACTERISTICS

|                           |                                                                                                                             |
|---------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| <b>Visual signalling</b>  | OLED display, 4 LEDs and 4 control keys                                                                                     |
| <b>Charger setting</b>    | By OLED/LCD display: current, voltage, capacity and 7 pre-set charging profiles<br>By laptop/USB port: enhanced programming |
| <b>Dimensions (LxWxH)</b> | 18.5 x 16.61 x 49.49 inches (470 x 422 x 1257 mm)                                                                           |
| <b>Weight</b>             | 149.91 lb (68 kg)                                                                                                           |



208/220/240 Vac (3ph) 60Hz

|                 |            |
|-----------------|------------|
| 24V / 36V / 48V | up to 200A |
| 72V / 80V       | up to 120A |
| 96V             | up to 100A |
| 120V            | up to 80A  |

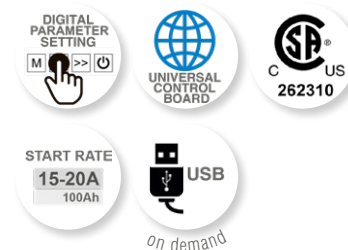
# SERIE 5 NA

Advanced line - Wa

Serie 5 represents the “Advanced” conventional Wa ranges, aimed for the North American markets.

This series features programmable board with internal memory, enhanced algorithms and USB (setting/troubleshooting/data-report).

The integrated digital display permits the complete controlling, programming and diagnostic in real time. Security features involves both mechanical and software solutions.



120Vac (1ph) 60Hz

| V | 24              | 36              | 48              |
|---|-----------------|-----------------|-----------------|
| A | from 40 to 60 A | from 25 to 40 A | from 20 to 30 A |

208-240Vac (1ph) 60Hz

| V | 24               | 36               | 48               |
|---|------------------|------------------|------------------|
| A | from 80 to 160 A | from 50 to 140 A | from 50 to 120 A |

208/240/440/480Vac (3ph) 60Hz / 600Vac (3ph) 60Hz

| V | 24               | 36               | 48               | 72               | 80               |
|---|------------------|------------------|------------------|------------------|------------------|
| A | from 80 to 200 A | from 80 to 200 A | from 80 to 160 A | from 80 to 140 A | from 80 to 120 A |

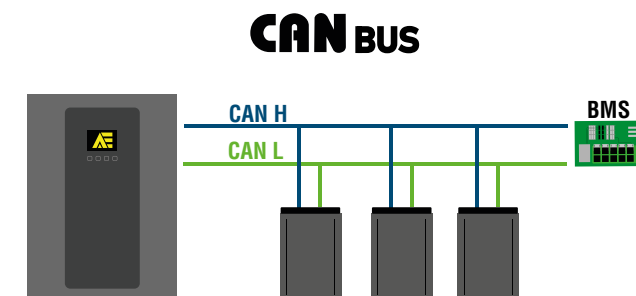
## MAIN CHARACTERISTICS

|                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|---------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Visual signalling</b>  | 5 LED advanced visualization + integrated DISPLAY for programming, diagnostic, and consulting data storage                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Main features</b>      | <ul style="list-style-type: none"> <li>Automatic start, charging process and shutoff</li> <li>Universal Electronic Board with advanced digital setting by display: profile thresholds / termination mode / equalization mode / delay start / cable compensation</li> <li>Final charging stage (adjustable in respect of battery usage): temporal, capacitive (CF% and AH accumulated), derivative dv/dt</li> <li>Leakage power transformer: taper charger</li> <li>Wa charging profile (DIN 41774)</li> </ul> |
| <b>Dimensions (LxWxH)</b> | I2C: 21.85 x 17.91 x 35.43 inches (555 x 455 x 900 mm)<br>P6C: 19.29 x 11.02 x 12.20 inches (490 x 280 x 310 mm)                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Weight</b>             | Depending on model size                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

**3**  
**Li**  
**lithium**  
**6.941**

# LITHIUM *line*

A line of products for latest generation lithium batteries:  
from single phase medium-sized versions to three phase  
versions of considerable power to provide fast charging  
solutions.



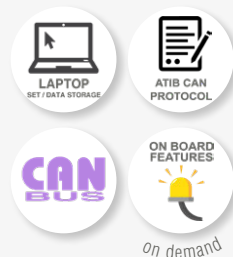
# HXE-C

## SINGLE PHASE 230 Vac

HXE-C is the small sized HF charger suitable for semi-traction & on-board lithium batteries applications.

CAN-bus communication is a standard feature to manage the profile through our private CAN protocol or adjusting it following your specific needs (CAN open on demand).

These devices are compact and ideal for on-board mounting.



| 230 Vac (1ph) 50-60Hz |           |           |           |
|-----------------------|-----------|-----------|-----------|
| 12V                   | 24V       | 36V       | 48V       |
| up to 30A             | up to 30A | up to 20A | up to 15A |

### GENERAL CHARACTERISTICS

|                       |                                                      |
|-----------------------|------------------------------------------------------|
| Visual signalling     | Single LED (3 colours)                               |
| Charger setting       | By laptop/USB port: software upload                  |
| Cool-down system      | Fan idle within 40°C internal components temperature |
| Efficiency            | > 85%                                                |
| Operating temperature | 0° to +40°C                                          |
| Certifications        | CE in conformity with LV and EMC protocols           |

### SAFETY FEATURES

|                                         |                                                                                    |
|-----------------------------------------|------------------------------------------------------------------------------------|
| Input protection                        | Delay AC fuse                                                                      |
| Output protection                       | By relay (reverse polarity protection)                                             |
| Thermal Protection                      | Forced derating on primary side<br>Forced derating or safety cut off on the diodes |
| Protection during battery disconnection | Safety cut off by undervoltage                                                     |

### MECHANICAL CHARACTERISTICS

|                    |                                                      |
|--------------------|------------------------------------------------------|
| Dimensions (LxWxH) | 275 x 112 x 75 mm                                    |
| Protection degree  | IP 21 (horizontal)                                   |
| Weight             | 3 kg                                                 |
| Input cable        | 2,3 m +/- 10% (length) complete with Schuko plug 16A |
| Output cables      | 2,3 m +/- 10% (length) – DC plug on demand           |

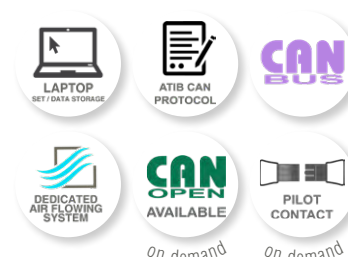
# HKP-C

## SINGLE PHASE 230 Vac

HKP-C is the single phase HF charger equipped with PFC (Power Factor Control) and an OLED/ LCD + USB interface, designed for the recharge of Lithium applications.

CAN-bus communication is a standard feature to manage the profile through our private CAN protocol or adjusting it following your specific needs (CAN open on demand).

This compact device is ideal for wall mounting.



| 230 Vac (1ph) 50-60Hz |           |           |
|-----------------------|-----------|-----------|
| 24V                   | 36V       | 48V       |
| up to 85A             | up to 60A | up to 60A |

any other V on demand (up to 120V)

### GENERAL CHARACTERISTICS

|                       |                                                                                        |
|-----------------------|----------------------------------------------------------------------------------------|
| Visual signalling     | OLED display, 4 LEDs and 4 control keys                                                |
| Charger setting       | By laptop/USB port: software upload                                                    |
| Cool-down system      | Temperature-regulated fan speed. Fan idle within 40°C internal components temperature. |
| Efficiency            | > 88%                                                                                  |
| Operating temperature | 0° to +40°C                                                                            |
| Certifications        | CE in conformity with LV and EMC protocols                                             |

### SAFETY FEATURES

|                                         |                                        |
|-----------------------------------------|----------------------------------------|
| Input protection                        | AC fast fuse                           |
| Output protection                       | By relay (reverse polarity protection) |
| Thermal Protection                      | Probes on IGBT and diodes + derating   |
| Protection during battery disconnection | Safety cut off by undervoltage         |

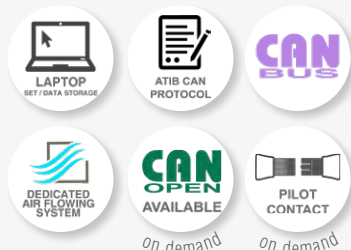
### MECHANICAL CHARACTERISTICS

|                    |                                                        |
|--------------------|--------------------------------------------------------|
| Dimensions (LxWxH) | 224 x 406 x 98 mm                                      |
| Protection degree  | IP 21 (vertical)                                       |
| Weight             | 18 kg                                                  |
| Input cable        | 2,5 m +/- 10% (length) – complete with Schuko plug 16A |
| Output cables      | 2,5 m +/- 10% (length) – DC plug on demand             |

# HVE-C

## THREE PHASE 400 Vac

HVE-C is the three phase version of the HVE charger having same features and interfaces, designed for the recharge of Lithium applications. CAN-bus communication is a standard feature to manage the profile through our private CAN protocol or adjusting it following your specific needs (CAN open on demand).



| 400 Vac (3ph) 50-60Hz |            |            |            |            |           |           |
|-----------------------|------------|------------|------------|------------|-----------|-----------|
| 24V                   | 36V        | 48V        | 72V        | 80V        | 96V       | 120V      |
| up to 140A            | up to 140A | up to 140A | up to 110A | up to 110A | up to 90A | up to 70A |

### GENERAL CHARACTERISTICS

|                       |                                                                                           |
|-----------------------|-------------------------------------------------------------------------------------------|
| Visual signalling     | OLED/LCD display, 4 LEDs and 4 control keys                                               |
| Charger setting       | By laptop/USB port: software upload                                                       |
| Cool-down system      | Temperature-regulated fan speed.<br>Fan idle within 40°C internal components temperature. |
| Efficiency            | ≥ 92%                                                                                     |
| Operating temperature | 0° to +40°C                                                                               |
| Certifications        | CE in conformity with LV and EMC protocols                                                |

### SAFETY FEATURES

|                                         |                                       |
|-----------------------------------------|---------------------------------------|
| Input protection                        | 3 AC fast fuses                       |
| Output protection                       | By fuse (reverse polarity protection) |
| Thermal Protection                      | Probes on IGBT and diodes + derating  |
| Protection during battery disconnection | Safety cut off by undervoltage        |

### MECHANICAL CHARACTERISTICS

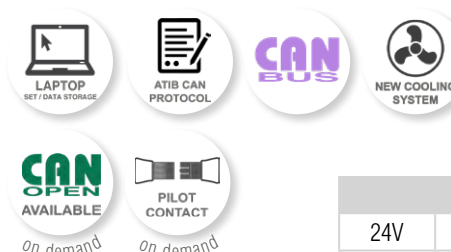
|                    |                                            |
|--------------------|--------------------------------------------|
| Dimensions (LxWxH) | 397 x 115 x 521 mm                         |
| Protection degree  | IP 21 (vertical)                           |
| Weight             | 18 kg                                      |
| Input cable        | 2,5 m +/- 10% (length) – AC plug on demand |
| Output cables      | 2,5 m +/- 10% (length) – DC plug on demand |

# HTUD

## THREE PHASE 400 Vac

HTUD is the top level HF charger aimed to reach the highest performances. This range gathers all top features of HF ranges in terms of efficiency, power factor, ventilation, internal structure and general flexibility. An integrated digital interface with OLED/LCD display and integrated USB enables the best and easiest overview of the charging operation.

This version is specifically dedicated to lithium version with our private CAN or custom protocol (CAN open on demand).



| 400 Vac (3ph) 50-60Hz |            |            |            |            |            |           |
|-----------------------|------------|------------|------------|------------|------------|-----------|
| 24V                   | 36V        | 48V        | 72V        | 80V        | 96V        | 120V      |
| up to 200A            | up to 200A | up to 200A | up to 120A | up to 120A | up to 100A | up to 80A |

### GENERAL CHARACTERISTICS

|                       |                                                                                                                                       |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| Visual signalling     | OLED display, 4 LEDs and 4 control keys                                                                                               |
| Charger setting       | By laptop/USB port: software upload                                                                                                   |
| Cool-down system      | Dedicated air cooling direct to heatsink only. Temperature-regulated fan speed. Fan idle within 40°C internal components temperature. |
| Efficiency            | ≥ 92%                                                                                                                                 |
| Operating temperature | 0° to +40°C                                                                                                                           |
| Certifications        | CE in conformity with LV and EMC protocols                                                                                            |

### SAFETY FEATURES

|                                         |                                                         |
|-----------------------------------------|---------------------------------------------------------|
| Input protection                        | 3 fast fuses                                            |
| Output protection                       | By fuse (reverse polarity protection)                   |
| Thermal Protection                      | Probes on IGBT, diodes and power transformer + derating |
| Protection during battery disconnection | Safety cut off by undervoltage                          |

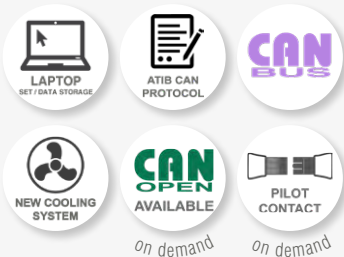
### MECHANICAL CHARACTERISTICS

|                    |                                            |
|--------------------|--------------------------------------------|
| Dimensions (LxWxH) | 456 x 195 x 570 mm                         |
| Protection degree  | IP 21 (vertical)                           |
| Weight             | 28 kg                                      |
| Input cable        | 2,5 m +/- 10% (length) – AC plug on demand |
| Output cables      | 2,5 m +/- 10% (length) – DC plug on demand |

# HWP-C

THREE PHASE 400 Vac

HWP-C is the HF charger aimed to reach the highest performances, it twice the power of the HTUD model. This range gathers all top features in terms of efficiency, power factor, internal structure and general flexibility. An integrated digital interface with OLED/LCD display and integrated USB enables the best and easiest overview of the charging operation. This version is specifically dedicated to lithium with our private CAN or custom protocol (CAN open on demand).



| 400 Vac (3ph) 50-60Hz |            |            |            |            |            |            |
|-----------------------|------------|------------|------------|------------|------------|------------|
| 24V                   | 36V        | 48V        | 72V        | 80V        | 96V        | 120V       |
| up to 400A            | up to 400A | up to 400A | up to 240A | up to 240A | up to 190A | up to 150A |

### GENERAL CHARACTERISTICS

|                       |                                                                                        |
|-----------------------|----------------------------------------------------------------------------------------|
| Visual signalling     | OLED/LCD display, 4 LEDs and 4 control keys                                            |
| Charger setting       | By laptop/USB port: software upload                                                    |
| Cool-down system      | Temperature-regulated fan speed. Fan idle within 40°C internal components temperature. |
| Efficiency            | ≥ 92%                                                                                  |
| Operating temperature | 0° to +40°C                                                                            |
| Certifications        | CE in conformity with LV and EMC protocols                                             |

### SAFETY FEATURES

|                                         |                                       |
|-----------------------------------------|---------------------------------------|
| Input protection                        | 3 AC fast fuses                       |
| Output protection                       | By fuse (reverse polarity protection) |
| Thermal Protection                      | Probes on IGBT and diodes + derating  |
| Protection during battery disconnection | Safety cut off by undervoltage        |

### MECHANICAL CHARACTERISTICS

|                    |                                            |
|--------------------|--------------------------------------------|
| Dimensions (LxWxH) | 470 x 422 x 1257 mm                        |
| Protection degree  | IP 21 (vertical)                           |
| Weight             | 60 kg (cables excluded)                    |
| Input cable        | 2,5 m +/- 10% (length) – AC plug on demand |
| Output cables      | 2,5 m +/- 10% (length) – DC plug on demand |



# HV3-C

THREE PHASE 400 Vac

HV3-C is the three phase HF charger equipped with OLED/LCD display and USB interface. It is equipped with 3 main power boards in parallel. HV3-C provides bigger power solution, the most accurate control of the profile and a higher efficiency with relevant lower input current draw. CAN-bus communication is a standard feature to manage the profile through our private CAN protocol or adjusting it following your specific needs.



| 400 Vac (3ph) 50-60Hz |            |            |            |            |            |            |
|-----------------------|------------|------------|------------|------------|------------|------------|
| 24V                   | 36V        | 48V        | 72V        | 80V        | 96V        | 120V       |
| up to 400A            | up to 400A | up to 400A | up to 310A | up to 310A | up to 260A | up to 200A |

### GENERAL CHARACTERISTICS

|                       |                                                                                                                                       |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| Visual signalling     | OLED display, 4 LEDs and 4 control keys                                                                                               |
| Charger setting       | By laptop/USB port: software upload                                                                                                   |
| Cool-down system      | Dedicated air cooling direct to heatsink only. Temperature-regulated fan speed. Fan idle within 40°C internal components temperature. |
| Efficiency            | ≥ 92%                                                                                                                                 |
| Operating temperature | 0° to +40°C                                                                                                                           |
| Certifications        | CE in conformity with LV and EMC protocols                                                                                            |

### SAFETY FEATURES

|                                         |                                                         |
|-----------------------------------------|---------------------------------------------------------|
| Input protection                        | 3 fast fuses                                            |
| Output protection                       | By fuse (reverse polarity protection)                   |
| Thermal Protection                      | Probes on IGBT, diodes and power transformer + derating |
| Protection during battery disconnection | Safety cut off by undervoltage                          |

### MECHANICAL CHARACTERISTICS

|                    |                                            |
|--------------------|--------------------------------------------|
| Dimensions (LxWxH) | 602 x 428 x 802 mm                         |
| Protection degree  | IP 21 (vertical)                           |
| Weight             | 69 kg                                      |
| Input cable        | 2,5 m +/- 10% (length) – AC plug on demand |
| Output cables      | 2,5 m +/- 10% (length) – DC plug on demand |





# DIAGNOSTIC & MAINTENANCE *systems*

A line of diagnostic systems for industrial batteries:  
multi-voltage chargers, discharging devices and  
regenerating units.

Innovative equipment to test battery functioning and  
improve battery performances.

### MAIN APPLICATIONS



### SUITABLE BATTERIES

All types

### MODELS AVAILABLE

| VAC   | CODE                    | DESCRIPTION                            |
|-------|-------------------------|----------------------------------------|
| 1x230 | <b>DDL150 USB</b>       | Nominal 2-80V (max. 96V) up to 150A    |
| 1x230 | <b>DDL-120-96V USB</b>  | Nominal 2-96V (max. 115V) up to 120A   |
| 1x230 | <b>DDL-065-150V USB</b> | Nominal 2-150V (max. 180V) up to 65A   |
| 1x230 | <b>DDL-100-120V USB</b> | Nominal 12-120V (max. 144V) up to 100A |
| 1x230 | <b>DDL-50-210V USB</b>  | Nominal 144-210V (max. 260V) up to 50A |

120 Vac input version on demand

Maxium current depends on selected voltage.  
Please refer to the manual for more details.

### PRODUCT INTRO

DDL discharger is aimed for workshop operations requiring discharge of batteries from 2 to 210 Nominal Voltage (depending on specific model). The device works up to the available discharging current set on each model. Integrated digital LCD display enables a complete overview and setting of main parameters. USB port enables data-report available in .PDF and .XLS format. Parallel setting available upon request depending on model.

### TECHNOLOGY

AC mains: 230Vac (1 ph)  $\pm$  10% 50-60Hz (120 Vac input version on demand)

Battery voltage range: see models chart

Discharging current range: see models chart

### STANDARD EQUIPMENTS / INTERFACES

Integrated USB door for data storage/downloading and dedicated software

Visualization and setting through integrated LCD display

Wheels for easy transport

### SAFETY FEATURES

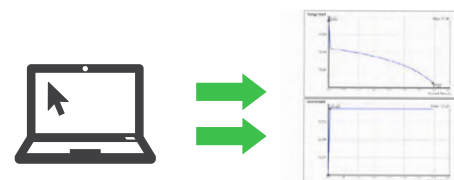
Operative temperature:  $-10$  to  $+40^{\circ}\text{C}$

### OPTIONALS

Parallel connection up to 3 modules (depending on model)

### MECHANICAL CHARACTERISTICS

|                           |                                                        |
|---------------------------|--------------------------------------------------------|
| <b>Dimensions</b> (LxWxH) | 470 x 310 x 700 mm                                     |
| <b>Weight</b>             | 32 kg                                                  |
| <b>Input cable</b>        | 1,5 m +/- 10% (length) – complete with Schuko plug 16A |
| <b>Output cables</b>      | 2 m +/- 10% (length) – DC plug on demand               |



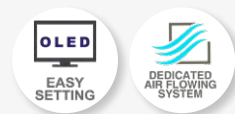
# HKP MULTI

## Multivoltage SINGLE PHASE 230 Vac

HKP MULTI is the single phase multivoltage charger, from 6 to 96V, equipped with PFC (Power Factor Control) and aimed for workshop operations requiring charge/desulphation.

The device enables a quick setting procedure of main charging parameters by an integrated interface with OLED display and LEDs.

Supplied with iron stand and cables holder on request.



### 230 Vac (1ph) 50-60Hz

| 6V        | 12V       | 24V       | 36V       | 48V       | 72V       | 80V       | 96V       |
|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| up to 15A | up to 50A | up to 50A | up to 50A | up to 50A | up to 35A | up to 30A | up to 25A |

Voltage selection made in single step x2V each  
Ampere selection made in single step x1A each



### GENERAL CHARACTERISTICS

|                              |                                                                                                          |
|------------------------------|----------------------------------------------------------------------------------------------------------|
| <b>Visual signalling</b>     | OLED/LCD display, 4 LEDs and 4 control keys                                                              |
| <b>Charger setting</b>       | By OLED display: current, voltage, capacity and 7 pre-set charging profiles, desulphation mode and timer |
| <b>Cool-down system</b>      | Temperature-regulated fan speed. Fan idle within 40°C internal components temperature.                   |
| <b>Efficiency</b>            | 88%                                                                                                      |
| <b>Operating temperature</b> | 0° to +40°C                                                                                              |
| <b>Certifications</b>        | CE in conformity with LV and EMC protocols                                                               |

### SAFETY FEATURES

|                                                |                                        |
|------------------------------------------------|----------------------------------------|
| <b>Input protection</b>                        | AC fast fuse                           |
| <b>Output protection</b>                       | By relay (reverse polarity protection) |
| <b>Thermal Protection</b>                      | Probes on IGBT and diodes + derating   |
| <b>Protection during battery disconnection</b> | Safety cut off by undervoltage         |

### MECHANICAL CHARACTERISTICS

|                           |                                                        |
|---------------------------|--------------------------------------------------------|
| <b>Dimensions (LxWxH)</b> | 224 x 98 x 406 mm                                      |
| <b>Protection degree</b>  | IP 21 (vertical)                                       |
| <b>Weight</b>             | 9 kg                                                   |
| <b>Input cable</b>        | 2,5 m +/- 10% (length) – complete with Schuko plug 16A |
| <b>Output cables</b>      | 2,5 m +/- 10% (length) – DC plug on demand             |

# HVE MULTI

## Multivoltage THREE PHASE 400 Vac

HVE MULTI is the three phase multivoltage charger, from 2 to 80V, aimed for workshop operations requiring charge/desulphation.

The device enables a quick setting procedure of main charging parameters by an integrated interface with OLED display and LEDs.

Supplied with iron stand and cables holder on request.



### HVEM 80/100 400 Vac (3ph) 50-60Hz

| 2V        | 10V       | 12V       | 24V       | 36V       | 48V       | 72V       | 80V       |
|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| up to 30A | up to 30A | up to 95A | up to 95A | up to 95A | up to 95A | up to 95A | up to 95A |

### HVEM 80/110 400 Vac (3ph) 50-60Hz

| 2V        | 10V       | 12V        | 24V        | 36V        | 48V        | 72V        | 80V        |
|-----------|-----------|------------|------------|------------|------------|------------|------------|
| up to 30A | up to 30A | up to 110A | up to 110A | up to 110A | up to 110A | up to 110A | up to 110A |

Voltage selection made in single step x2V each  
Ampere selection made in single step x1A each



### GENERAL CHARACTERISTICS

|                              |                                                                                                          |
|------------------------------|----------------------------------------------------------------------------------------------------------|
| <b>Visual signalling</b>     | OLED/LCD display, 4 LEDs and 4 control keys                                                              |
| <b>Charger setting</b>       | By OLED display: current, voltage, capacity and 7 pre-set charging profiles, desulphation mode and timer |
| <b>Cool-down system</b>      | Temperature-regulated fan speed. Fan idle within 40°C internal components temperature.                   |
| <b>Efficiency</b>            | ≥ 92%                                                                                                    |
| <b>Operating temperature</b> | 0° to +40°C                                                                                              |
| <b>Certifications</b>        | CE in conformity with LV and EMC protocols                                                               |

### SAFETY FEATURES

|                                                |                                              |
|------------------------------------------------|----------------------------------------------|
| <b>Input protection</b>                        | 3 AC fast fuses                              |
| <b>Output protection</b>                       | Ultrafast fuse (reverse polarity protection) |
| <b>Thermal Protection</b>                      | Probes on IGBT and diodes + derating         |
| <b>Protection during battery disconnection</b> | Safety cut off by undervoltage               |

### MECHANICAL CHARACTERISTICS

|                           |                                            |
|---------------------------|--------------------------------------------|
| <b>Dimensions (LxWxH)</b> | 397 x 115 x 521 mm                         |
| <b>Protection degree</b>  | IP 21 (vertical)                           |
| <b>Weight</b>             | 18 kg                                      |
| <b>Input cable</b>        | 2,5 m +/- 10% (length) – AC plug on demand |
| <b>Output cables</b>      | 2,5 m +/- 10% (length) – DC plug on demand |

# HTU MULTI & HRC3

Multivoltage

MAIN APPLICATIONS



| V  | A   |
|----|-----|
| 2  | 30  |
| 6  | 30  |
| 8  | 30  |
| 10 | 30  |
| 12 | 120 |
| 24 | 120 |
| 36 | 120 |
| 48 | 120 |
| 60 | 120 |
| 72 | 120 |
| 80 | 120 |

2V steps

1A steps

SUITABLE BATTERIES

All types



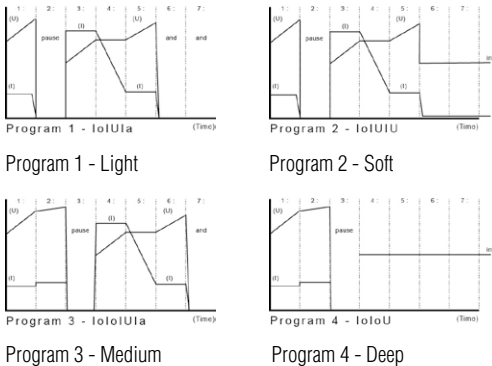
HTU MULTI

| VAC   | CODE          | DESCRIPTION                    |
|-------|---------------|--------------------------------|
| 3x400 | HTUM 80/120-8 | Multivoltage 2-80 V up to 120A |

HRC3

| VAC   | CODE          | DESCRIPTION                    |
|-------|---------------|--------------------------------|
| 3x400 | HRC3 80/120-8 | Multivoltage 2-80 V up to 120A |

HRC3 Battery refresh programs



Standard charging mode



Desulphation mode

PRODUCT INTRO

HTU MULTI is aimed for workshop operations requiring charge and desulphation of batteries from 2 to 80V; this item is ideal in fact for the recharge and refresh of any battery type without the stress of looking for the dedicated charge. The device enables an intuitive parameters setting by an integrated OLED display. Supplied with iron stand and cables holder on request.

HRC3 version, by the means of 4 dedicated programs (programmable by PC), is ideal for recharging and refreshing your entire battery portfolio.



HRC3

GENERAL CHARACTERISTICS

|                       | HTU MULTI                                                                                                                            | HRC3                                                                                                                                                                   |
|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Mains                 | 400Vac (3ph) 50-60Hz                                                                                                                 |                                                                                                                                                                        |
| Visual signalling     | OLED display, 4 LEDs and 4 control keys                                                                                              |                                                                                                                                                                        |
| Charger setting       | By OLED display: current, voltage, capacity, 7 pre-set charging <b>profiles</b> , desulphation mode and timer                        | By OLED display: nom. Voltage, capacity and 4 pre-set battery refresh <b>programs</b><br>By laptop/USB port: complete adjustment of each phase details of each program |
| Data memory           | Charger gives a report of the last 50 cycles and key technical data by integrated USB port                                           | Not available                                                                                                                                                          |
| Cool-down system      | Dedicated air cooling direct to heatsink only. Temperature-regulated fan speed. Fan idle within 40°C internal components temperature |                                                                                                                                                                        |
| Efficiency            | ≥ 92%                                                                                                                                |                                                                                                                                                                        |
| Operating temperature | 0° to +40°C                                                                                                                          |                                                                                                                                                                        |
| Certifications        | CE in conformity with LV and EMC protocols                                                                                           |                                                                                                                                                                        |

SAFETY FEATURES

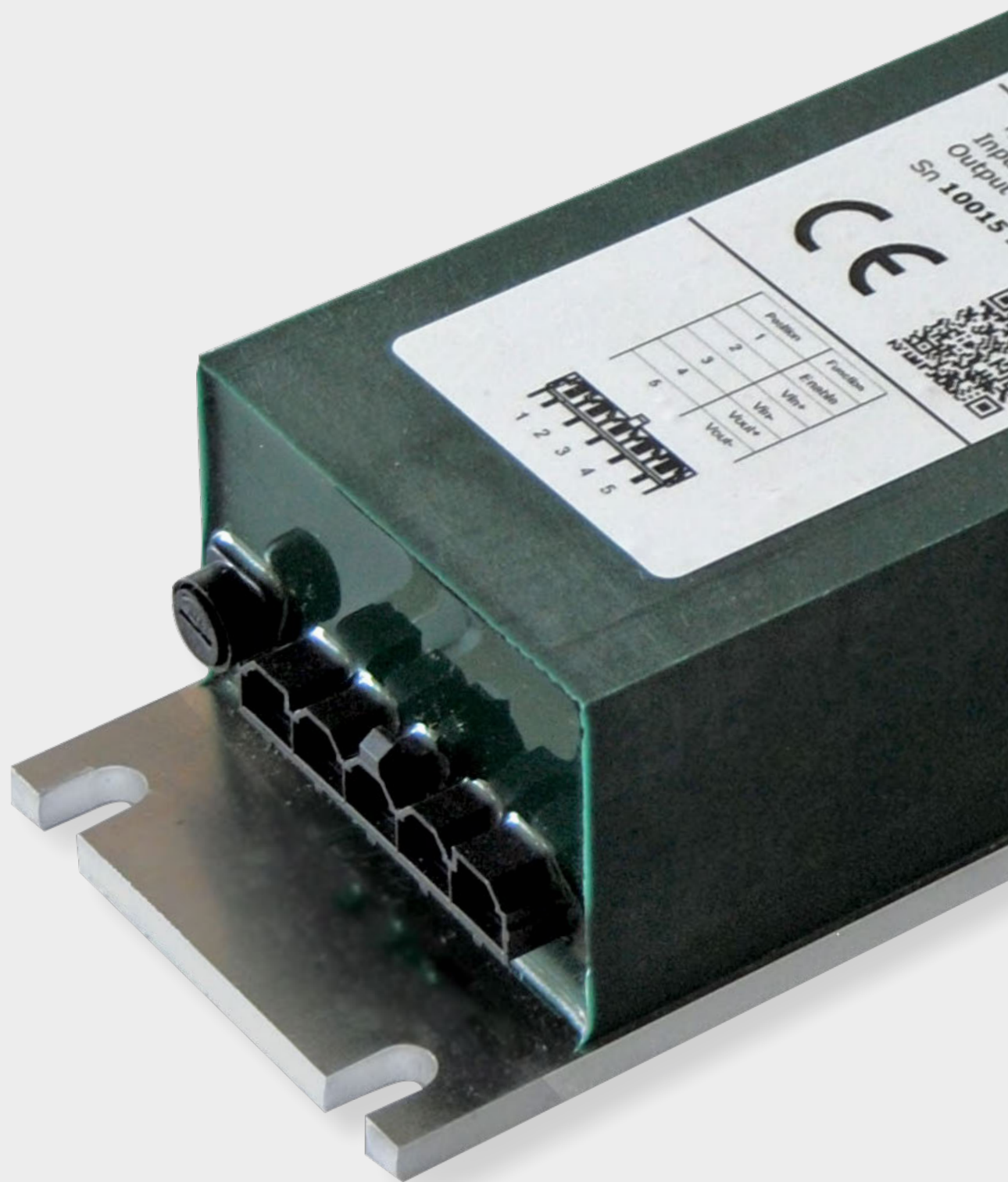
|                                         |                                                         |
|-----------------------------------------|---------------------------------------------------------|
| Input protection                        | 3 fast fuses                                            |
| Output protection                       | By fuse (reverse polarity protection)                   |
| Thermal Protection                      | Probes on IGBT, diodes and power transformer + derating |
| Protection during battery disconnection | Safety cut off by undervoltage                          |

OPTIONALS

Cable holder, charger iron stand

MECHANICAL CHARACTERISTICS

|                    |                                                             |
|--------------------|-------------------------------------------------------------|
| Dimensions (LxWxH) | 456 x 195 x 570 mm                                          |
| Protection degree  | IP 21 (vertical) – dedicated air cooling direct to heatsink |
| Weight             | 28 kg                                                       |
| Input cable        | 2,5 m +/- 10% (length) – AC plug on demand                  |
| Output cables      | 2,5 m +/- 10% (length) – DC plug on demand                  |



# DC/DC

## *converters*

Step-down voltage adapters for electric industrial vehicles, DC-DC converters reduce battery voltage to the value of your auxiliary systems. In this way they limit the inconveniences due to the intermediate socket, offering batteries a longer life expectancy.

# DC/DC CONVERTERS

A



### SAFETY FEATURES

|                                 | A | B |
|---------------------------------|---|---|
| Output crowbar protection       | ✓ | ✓ |
| Output short circuit protection | ✓ | ✓ |

B



### MECHANICAL CHARACTERISTICS

|                         | A                      | B                 |
|-------------------------|------------------------|-------------------|
| Weight                  | 0,5 kg                 | 1,3 kg            |
| Dimensions (LxWxH)      | 90 x 91 x 37 mm        | 115 x 130 x 55 mm |
| Technical specification | See technical drawings |                   |
| Protection degree       | IP65                   |                   |

### MODELS AVAILABLE

| V  | Power (W) | A    | Input Voltage range | Case | CODE    | Parallel connection | Galvanic isolation | Certifications                             |
|----|-----------|------|---------------------|------|---------|---------------------|--------------------|--------------------------------------------|
| 12 | 100       | 8,3  | 30-150              | A    | 12V100W | ✓                   | X                  | CE in conformity with LV and EMC protocols |
| 12 | 150       | 12,5 | 30-130              | B    | 12V150W | ✓                   | X                  |                                            |
| 24 | 100       | 4,2  | 30-150              | A    | 24V100W | ✓                   | X                  |                                            |
| 24 | 300       | 12,5 | 30-130              | B    | 24V300W | ✓                   | X                  |                                            |

C



### SAFETY FEATURES

|                                 |   |
|---------------------------------|---|
| Output crowbar protection       | ✓ |
| Output short circuit protection | ✓ |

### MECHANICAL CHARACTERISTICS

|                         |                        |
|-------------------------|------------------------|
| Weight                  | 0,5 kg                 |
| Dimensions (LxWxH)      | 90 x 91 x 37 mm        |
| Technical specification | See technical drawings |
| Protection degree       | IP65                   |

### MODELS AVAILABLE

| V  | Power (W) | A    | Input Voltage range | Case | CODE     | Parallel connection | Galvanic isolation | Certifications                             |
|----|-----------|------|---------------------|------|----------|---------------------|--------------------|--------------------------------------------|
| 12 | 180       | 15,5 | 15-110              | C    | P12W180  | X                   | X                  | CE in conformity with LV and EMC protocols |
| 24 | 300       | 13,0 | 28-110              | C    | P24W300B | X                   | X                  |                                            |

# DC/DC CONVERTERS

D



### SAFETY FEATURES

|                                 |                     |
|---------------------------------|---------------------|
| Output crowbar protection       | internal limitation |
| Output short circuit protection | ✓                   |

### MECHANICAL CHARACTERISTICS

|                         |                        |
|-------------------------|------------------------|
| Weight                  | 1,2 kg                 |
| Dimensions (LxWxH)      | 190 x 76 x 50 mm       |
| Technical specification | See technical drawings |
| Protection degree       | IP65                   |

### MODELS AVAILABLE

| V  | Power (W) | A    | Input Voltage range | Case | CODE       | Parallel connection | Galvanic isolation | Certifications                             |
|----|-----------|------|---------------------|------|------------|---------------------|--------------------|--------------------------------------------|
| 12 | 300       | 25,0 | 40-105              | D    | DCA12V300W | X                   | ✓                  | CE in conformity with LV and EMC protocols |
| 24 | 300       | 12,5 | 40-105              | D    | DCA24V300W | X                   | ✓                  |                                            |

E



### SAFETY FEATURES

|                                 |   |
|---------------------------------|---|
| Output crowbar protection       | ✓ |
| Output short circuit protection | ✓ |

### MECHANICAL CHARACTERISTICS

|                         |                        |
|-------------------------|------------------------|
| Weight                  | 1,2 kg                 |
| Dimensions (LxWxH)      | 190 x 76 x 50 mm       |
| Technical specification | See technical drawings |
| Protection degree       | IP65                   |

### MODELS AVAILABLE

| V  | Power (W) | A    | Input Voltage range | Case | CODE     | Parallel connection | Galvanic isolation | Certifications                             |
|----|-----------|------|---------------------|------|----------|---------------------|--------------------|--------------------------------------------|
| 24 | 400       | 16,6 | 38-110              | E    | P24V400W | X                   | X                  | CE in conformity with LV and EMC protocols |



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