

A.T.I.B. ELETTRONICA

Battery Chargers & Electronics



MADE IN ITALY

The image features several overlapping, wavy, light green lines that create a sense of movement and fluidity across the lower half of the page. These lines vary in thickness and curvature, some peaking and others dipping, creating a layered, organic effect.

Your Flexible Solutions Partner

Profilo azienda / *Company profile*



A.T.I.B. Elettronica nasce nel 1989 in seno al Gruppo A.T.I.B. (attrezzature per carrelli elevatori) ad oggi realtà indipendente interamente a capitale proprio.

Produttore di caricabatterie per ogni tipologia di batterie focalizzandosi sulla Trazione.

Rete di distribuzione globale.

Fornitore ufficiale dei grandi produttori di batterie, carrelli elevatori, spazzatrici, piattaforme aeree e veicoli elettrici.

Produzione flessibile per soddisfare qualunque richiesta del mercato.

Utili annui reinvestiti in ricerca e sviluppo.

Independent company established in 1989, as former member of A.T.I.B. Group (forklift attachments).

Manufacturer of chargers for any battery type and technology, focusing on Motive Power.

European & Worldwide partnership network .

Official supplier of OEMs in the fields of battery/forklift/cleaning, scissor lifts and electrical vehicles.

Flexible production capability to satisfy any request of the market.

Annual profits constantly reinvested in Research & Development.



La linea di prodotti:

Caricabatterie tradizionali: resistenti e di tecnologia consolidata: Wa, Wo Pulse, WOWa, Wsa, Wa dV/dt.

Linea HF: versatile e compatta, ideale per tutti i tipi di batterie: W/UIUa, W/IUa, W/IUa, versione IP65

Convertitori Dc/Dc: versioni standard IP65 e versioni personalizzate.

Manutenzione batteria: Multitensione (HF e Tiristori), e Scaricatori.

Applicazioni più comuni: carrelli elevatori, transpallets, piattaforme aeree, spazzatrici, golfcar e veicoli elettrici.

Prodotti interamente sviluppati e testati da ATIB Elettronica.

Apparecchiature Tecniche:

- Camera Climatica
- Piattaforma Vibrante da collaudo
- Collaudo jig per PCB
- Metro LCR
- Banco automatico da collaudo.

La nostra forza

Orientamento al cliente

Consegne rapide

Reattività

Personale giovane

Lavoro di squadra e supporto reciproco



Product line:

Standard 50Hz chargers: robust and experienced technology: Wa, Wo Pulse, WOWa, Wsa, Wa, dV/dt.

High Frequency chargers: versatile and compact, ideal for any battery type: W/UIUa, W/IUa, W/IUa including IP65 versions.

DC/DC converters: standard IP65 and special versions.

Battery Service: Multivoltage chargers (HF & Thyristor) and Discharging Equipment.

Most common application: forklift trucks / warehouse trucks - scissor lifts - cleaning machines - golf cars - electrical vehicles. All products completely developed and tested by ATIB Elettronica.

Technical Equipment :

- Climatic chamber
- Vibrating testing platform
- Test jig for PCB
- LCR meter
- Automatic testing desks

Our strength

Fast deliveries

Prompt reactivity

Young motivated staff

Team-work and mutual support

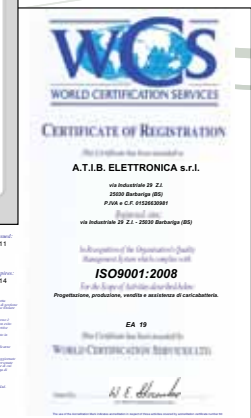
Customer-oriented philosophy

CERTIFICAZIONI:

- **ISO 9001: 2000** con **WCS** dal 1996
- Certificazione **CE** per tutti i prodotti
- Curve di carica standard **DIN**
- Protocolli **EMC**
- Certificazioni **UL/CSA** in corso di sviluppo

CERTIFICATIONS:

- **ISO 9001: 2000** with **WCS** since 1996
- **CE** certification for all products
- **DIN** standards charging curves
- **EMC** Protocols
- **UL/CSA** certification in progress





Caricabatteria alta frequenza / *HF chargers*

Versatili e compatti, ideali per ogni tipo di batteria.

Versatile and compact, ideal for any battery type.



HFY - HFX



Selettore tensione e curve
Voltage and curve selector



Porta per accesso programmazione PC
Laptop programming port



Optionals



Monofase 230Vac \pm 10% / 50-60Hz / doppia tensione 12V-24V
Programmazione diretta tramite PC (da presa seriale a presa USB)
Montaggio a parete / applicazioni a bordo macchina (da valutare)
Curve di carica I/U per qualsiasi tipologia di batteria (PzS, PzV, AGM, etc.)
Optionals: Relè presenza rete / led remoto / cavo spiralato / maniglia / storico ultime cariche effettuate.

1phase 230Vac \pm 10% / 50-60Hz / double voltage 12V-24V
Full programming through PC (from serial to USB connection)
Wall mounting / On Board application (to be approved)
I/U charging curves suitable for any battery type (PzS, PzV, AGM, etc.)
Optional: AC-Mains Voltage Presence Relay / Remote LED / Curly Cable / Handle for stand alone placing / history of last charges accomplished.

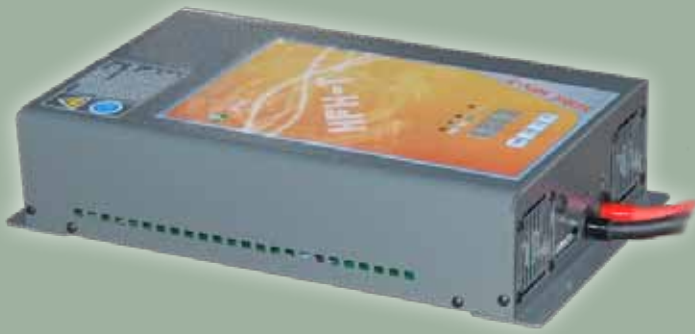
| V | A | Vac Input (*) | Code | Ah (C5) | | Cabinet Code |
|------------------------|----|---------------|-----------------------|----------------------|-------------|--------------|
| | | | | Lead Acid (Wet, PzS) | | |
| | | | | 7 - 8,5 h | 11 - 13,5 h | |
| 12 / 24 double voltage | 5 | 1 x 230 | HFY 12_24 / 5 | 23 - 35 | 48 - 56 | 1 |
| | 10 | 1 x 230 | HFY 12_24 / 10 | 46 - 68 | 92 - 111 | 1 |
| | 15 | 1 x 230 | HFY 12_24 / 15 | 71 - 105 | 143 - 171 | 1 |
| | 20 | 1 x 230 | HFY 12_24 / 20 | 91 - 136 | 185 - 222 | 1 |
| | 25 | 1 x 230 | HFX 12_24 / 25 | 116 - 173 | 235 - 282 | 2 |
| | 30 | 1 x 230 | HFX 12_24 / 30 | 137 - 203 | 277 - 332 | 2 |

(*) input tolerance +/- 10%

| Cabinet dimensions & weight | | | | |
|-----------------------------|----------------|-----|----|-------------|
| Code | L x D x H (mm) | | | Weight (kg) |
| 1 | 232 | 120 | 81 | 2,0 |
| 2 | 280 | 113 | 75 | 2,5 |



HFK - HFT



Display:
facile riconoscimento stato cb: NAVIGATOR
completo accesso alla programmazione
timer: conto alla rovescia

Easy status detection: NAVIGATOR
Full programming access
timer: countdown



Cabinet antigoccia
Speciale filtro flusso aria

Antidrop cabinet
Special air flux filter



Optionals



Monofase 230Vac \pm 10% (HFK), 50-60Hz / Trifase 400Vac \pm 10% (HFT), 50-60Hz

Programmazione diretta tramite display integrato.

Montaggio a parete / applicazioni a bordo macchina (da valutare)

Curve di carica W/U per qualsiasi tipologia di batteria (PzS, PzV, AGM, etc.). Profili di carica I/U a richiesta.

Optionals: Sonda termica / relè presenza rete / led remoto / lampada visualizzazione semaforica.

1phase 230Vac \pm 10% (HFK), 50-60Hz / 3phase 400Vac \pm 10% (HFT), 50-60Hz

Full programming through integrated Display.

Wall mounting / On Board application (to be approved)

W/U charging curves suitable for any battery type (PzS, PzV, AGM, etc.). I/U profiles on demand.

Optional: Thermal Probe / AC-Mains Voltage Presence Relay / Remote LED / Lamp.

| V | A | Vac Input (*) | Code | Ah (C5) | | Cabinet Code |
|----|-----|---------------|---------------|----------------------|-------------|--------------|
| | | | | Lead Acid (Wet, PzS) | | |
| | | | | 7 - 8,5 h | 11 - 13,5 h | |
| 24 | 40 | 1 x 230 | HFK 24 / 40** | 183 - 271 | 370 - 443 | 3 & 4 |
| | 50 | 1 x 230 | HFK 24 / 50** | 233 - 345 | 471 - 564 | 3 & 4 |
| | 60 | 1 x 230 | HFK 24 / 60** | 278 - 413 | 563 - 675 | 3 & 4 |
| | 85 | 1 x 230 | HFK 24 / 85 | 353 - 524 | 715 - 856 | 4 |
| | 100 | 3 x 400 | HFT 24 / 100 | 415 - 616 | 841 - 1007 | 5 |
| | 120 | 3 x 400 | HFT 24 / 120 | 498 - 739 | 1009 - 1209 | 5 |
| 36 | 70 | 1 x 230 | HFK 36 / 70 | 291 - 431 | 589 - 705 | 4 |
| | 80 | 3 x 400 | HFT 36 / 80 | 332 - 493 | 673 - 806 | 5 |
| | 100 | 3 x 400 | HFT 36 / 100 | 415 - 616 | 841 - 1007 | 5 |
| | 120 | 3 x 400 | HFT 36 / 120 | 498 - 739 | 1009 - 1209 | 5 |
| 48 | 30 | 1 x 230 | HFK 48 / 30 | 125 - 185 | 252 - 302 | 4 |
| | 40 | 1 x 230 | HFK 48 / 40 | 166 - 246 | 336 - 403 | 4 |
| | 50 | 1 x 230 | HFK 48 / 50 | 208 - 308 | 420 - 504 | 4 |
| | 60 | 1 x 230 | HFK 48 / 60 | 249 - 370 | 504 - 604 | 4 |
| | 80 | 3 x 400 | HFT 48 / 80 | 332 - 493 | 673 - 806 | 5 |
| | 100 | 3 x 400 | HFT 48 / 100 | 415 - 616 | 841 - 1007 | 5 |
| | 120 | 3 x 400 | HFT 48 / 120 | 498 - 739 | 1009 - 1209 | 5 |
| 72 | 35 | 1 x 230 | * | 137 - 203 | 277 - 332 | 4 |
| | 65 | 3 x 400 | HFT 72 / 65 | 278 - 413 | 563 - 675 | 5 |
| | 80 | 3 x 400 | HFT 72 / 80 | 332 - 493 | 673 - 806 | 5 |
| | 100 | 3 x 400 | HFT 72 / 100 | 415 - 616 | 841 - 1007 | 5 |
| 80 | 30 | 1 x 230 | * | 125 - 185 | 252 - 302 | 4 |
| | 65 | 3 x 400 | HFT 80 / 65 | 278 - 413 | 563 - 675 | 5 |
| | 80 | 3 x 400 | HFT 80 / 80 | 332 - 493 | 673 - 806 | 5 |
| | 100 | 3 x 400 | HFT 80 / 100 | 415 - 616 | 841 - 1007 | 5 |
| 96 | 25 | 1 x 230 | * | 104 - 154 | 210 - 252 | 4 |
| | 65 | 3 x 400 | HFT 96 / 65 | 278 - 413 | 563 - 675 | 5 |

(*) input tolerance +/- 10%

** available in smaller cabinet (type 3)

| Cabinet dimensions & weight | | | | |
|-----------------------------|----------------|-----|-----|-------------|
| Code | L x D x H (mm) | | | Weight (kg) |
| 3 | 363 | 190 | 75 | 5,0 |
| 4 | 410 | 224 | 88 | 9,0 |
| 5 | 480 | 280 | 150 | 12,0 |

* on demand

HFTD



Display:
facile riconoscimento stato cb: NAVIGATOR
completo accesso alla programmazione
timer: conto alla rovescia
Easy status detection: NAVIGATOR
Full programming access
timer: countdown



Cabinet antigoccia
Speciale filtro flusso aria
Antidrop cabinet
Special air flux filter



Optionals



Trifase 400Vac \pm 10%, 50-60Hz

Programmazione diretta tramite display integrato.

Montaggio a parete.

Curve di carica W/U per qualsiasi tipologia di batteria (PzS, PzV, AGM, etc.). Profili di carica I/U a richiesta.

Optionals: Sonda termica / relè presenza rete / led remoto / lampada visualizzazione semaforica.

3phase 400Vac \pm 10%, 50-60Hz

Full programming through integrated Display.

Wall mounting.

W/U charging curves suitable for any battery type (PzS, PzV, AGM, etc.). I/U profiles on demand.

Optional: Thermal Probe / AC-Mains Voltage Presence Relay / Remote LED / Lamp.

| V | A | Vac Input (*) | Code | Ah (C5) | | Cabinet Code |
|----|-----------|---------------|----------------------|----------------------|-------------|--------------|
| | | | | Lead Acid (Wet, PzS) | | |
| | | | | 7 - 8,5 h | 11 - 13,5 h | |
| 24 | up to 200 | 3 x 400 | * | 831 - 1232 | 1682 - 2015 | 6 |
| 36 | up to 200 | 3 x 400 | * | 831 - 1232 | 1682 - 2015 | 6 |
| 48 | 140 | 3 x 400 | HFTD 48 / 140 | 582 - 863 | 1177 - 1410 | 6 |
| | 160 | 3 x 400 | HFTD 48 / 160 | 665 - 986 | 1345 - 1612 | 6 |
| | 180 | 3 x 400 | HFTD 48 / 180 | 748 - 1109 | 1513 - 1813 | 6 |
| | 200 | 3 x 400 | HFTD 48 / 200 | 831 - 1232 | 1682 - 2015 | 6 |
| 80 | 120 | 3 x 400 | HFTD 80 / 120 | 498 - 739 | 1009 - 1209 | 6 |
| | 140 | 3 x 400 | HFTD 80 / 140 | 582 - 863 | 1177 - 1410 | 6 |
| | 160 | 3 x 400 | HFTD 80 / 160 | 665 - 986 | 1345 - 1612 | 6 |

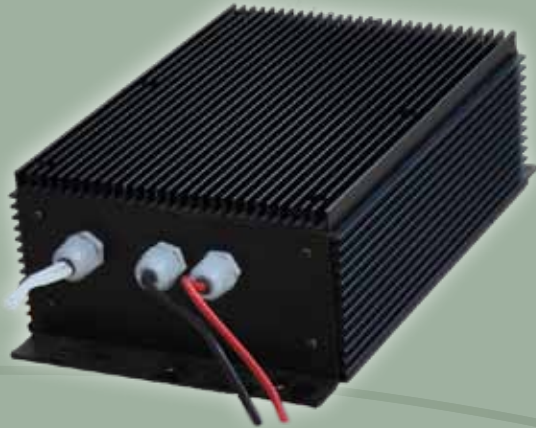
(*) input tolerance +/- 10%

| Cabinet dimensions & weight | | | | |
|-----------------------------|----------------|-----|-----|-------------|
| Code | L x D x H (mm) | | | Weight (kg) |
| 6 | 535 | 406 | 258 | 27,0 |

* on demand



Versioni Speciali / *Special Versions: IP65*



| V | A | Vac Input (*) | Code | Ah (C5) | | Cabinet Code |
|-------------|----|---------------|-------------------|----------------------|-------------|--------------|
| | | | | Lead Acid (Wet, PzS) | | |
| | | | | 7 - 8,5 h | 11 - 13,5 h | |
| IP 65 range | | | | | | |
| 24 | 30 | 1 x 230 | HE 24 / 30 | 137 - 203 | 277 - 332 | 2IP |

(*) input tolerance +/- 10%

| Cabinet dimensions & weight | | | | |
|-----------------------------|----------------|-----|-----|-------------|
| Code | L x D x H (mm) | | | Weight (kg) |
| 2IP | 345 | 212 | 105 | 6,6 |

Inclusi
Included



Monofase 230Vac \pm 10%, 50-60Hz

Protezione IP65

Applicazioni a bordo macchina.

Curve di carica I/U per qualsiasi tipologia di batteria (PzS, PzV, AGM, etc.)

Inclusi: Relè presenza rete / led remoto.

1phase 230Vac \pm 10%, 50-60Hz

IP65 protection

On Board application.

I/U charging curves suitable for any battery type (PzS, PzV, AGM, etc.)

Included: AC-Mains Voltage Presence Relay / Remote LED.

Versioni Speciali / Special Versions: AIR SYSTEM



AIR SYSTEM: Pompa integrata per ricircolo dell'elettrolita

AIR SYSTEM: Air pump for battery AIR MIX

Display:
 facile riconoscimento stato cb: NAVIGATOR
 completo accesso alla programmazione
 timer: conto alla rovescia
 Easy status detection: NAVIGATOR
 Full programming access
 timer: countdown



Cabinet antigoggia
 Speciale filtro flusso aria
 Antidrop cabinet
 Special air flux filter



Optionals



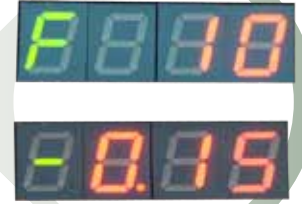
| V | A | Vac Input (*) | Code | Ah (C5) | Cabinet Code |
|---------------------|---|---------------|----------|------------------------------------|--------------|
| | | | | Lead Acid (Wet, PzS) | |
| AIR SYSTEM | | | | | |
| any V / A available | | 1 x 230 | HFK AIR | consider +10% on Ah values by size | 7 |
| any V / A available | | 3 x 400 | HFT AIR | consider +10% on Ah values by size | 7 |
| any V / A available | | 3 x 400 | HFTD AIR | consider +10% on Ah values by size | 6 |

(*) input tolerance +/- 10%

| Cabinet dimensions & weight | | | | |
|-----------------------------|----------------|-----|-----|-------------|
| Code | L x D x H (mm) | | | Weight (kg) |
| 7 | 520 | 377 | 115 | 15,0 |
| 6 | 535 | 406 | 258 | 27,0 |

Versioni Speciali / Special Versions: PWM/CAN BUS & PFC

Display:
facile riconoscimento stato cb: NAVIGATOR
completo accesso alla programmazione
timer: conto alla rovescia
Easy status detection: NAVIGATOR
Full programming access
timer: countdown



Cabinet antigoccia
Speciale filtro flusso aria
Antidrop cabinet
Special air flux filter



Optionals



Comunicazione CAN BUS / Segnale PWM per batterie LiPo, LiFe, Lilon
Versione con PFC (HFK)

CAN BUS communication / PWM signal suitable for LiPo, LiFe, Lilon, etc. batteries
PFC version (HFK)

| V | A | Vac Input (*) | Code | Ah (C5) | Cabinet Code |
|---------------------|---|---------------|----------------|-----------------------|--------------|
| | | | | Lead Acid (Wet, PzS) | |
| PFC VERSIONS | | | | | |
| any V / A available | | 1 x 230 | HFK EVO | see Ah values by size | 7 |
| PWM / CAN BUS | | | | | |
| any V / A available | | 1 x 230 | HFK LI | see Ah values by size | 7 |
| any V / A available | | 3 x 400 | HFT LI | see Ah values by size | 7 |
| any V / A available | | 3 x 400 | HFTD LI | see Ah values by size | 6 |

(*) input tolerance +/- 10%

| Cabinet dimensions & weight | | | | |
|-----------------------------|----------------|-----|-----|-------------|
| Code | L x D x H (mm) | | | Weight (kg) |
| 7 | 520 | 377 | 115 | 15,0 |
| 6 | 535 | 406 | 258 | 27 |

Caricabatterie 50Hz Convenzionali / *50Hz Conventional Chargers*

Robusti e di tecnologia consolidata

Robust and most consolidated technology



Wa BASIC

Serie 2

Scheda di controllo universale
Universal board



Intuitivo riconoscimento stato del cb
Easy status detection



Monofase 230Vac \pm 5% - Trifase 400Vac \pm 5% / 50Hz / grado protezione IP20
Curva di carica Wa (9-12h, DIN 41774) per batterie PzS/Pb-acido libero
Carica finale: Temporale
Visualizzazione base tramite 4 leds / settaggio fase di equalizzazione
Optionals: tensioni speciali Vac, modelli 60Hz / sorreggicavo.

1phase 230Vac \pm 5% - 3phase 400Vac \pm 5% / 50Hz / IP20 protection
Wa charging curve (9-12h, DIN 41774) suitable for PzS batteries
Final charge: Temporal
Basic - 4 Leds visualization / Equalization setting
Optionals: special AC-Mains input Vac, 60Hz models / cables holder.

Wa ADVANCED

Serie 3



Monofase 230Vac \pm 5% - Trifase selezionabile 400-230Vac \pm 5% / 50Hz /
grado protezione IP20

Curva di carica Wa (9-12h, DIN 41774) per batterie PzS/Pb-acido libero
Carica finale: Temporale, Capacitiva, Derivativa dV/dt

Visualizzazione avanzata tramite 5 leds / settaggio fase di equalizzazione /
memoria salvataggio dati

Optionals: tastierino esterno per identificazione anomalie, lettura dati e
programmazione / protezione IP55 / tensioni speciali Vac, modelli 60Hz / ruote e
sorreggicavo.

1phase 230Vac \pm 5% - 3phase 400-230Vac switchable \pm 5% / 50Hz / IP20 protection
Wa charging curve (9-12h, DIN 41774) suitable for PzS batteries
Final charge: Temporal, Capacitive, Derivative dV/dt
Advanced - 5 Leds visualization / Equalization setting / Data storage memory
Optionals: external Keypad for the diagnostics, data reading and programming/ IP55 protection /
special AC-Mains input Vac, 60Hz models / wheels and cables holder.

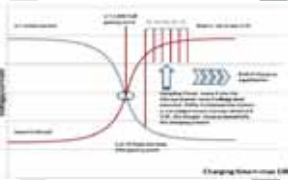
Programmazione/diagnostica
tramite tastierino esterno.

Programming/diagnostic
by external keypad.



Fine carica con controllo
dV/dt disponibile.

dV/dt termination available



Mobile IP55 disponibile
IP55 cabinet available



Wa TOP

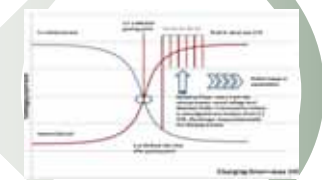
Serie 5



Display:
per diagnostica e programmazione.
For diagnostic and programming



Fine carica con controllo
dV/dt disponibile.
dV/dt termination available



Timer digitale: conto alla rovescia
Digital timer: countdown



Mobile IP55 disponibile
IP55 cabinet available



Monofase 230Vac \pm 5% - Trifase selezionabile 400-230Vac \pm 5% / 50Hz / grado protezione IP20

Tipo di carica finale (9-12h, DIN 41774) per batterie PzS/Pb-acido libero

Carica finale: Temporale, Capacitiva, Derivativa dV/dt

Visualizzazione top tramite 5 leds + Display integrato/
settaggio fase di equalizzazione / memoria salvataggio dati / timer.

Optionals: protezione IP55/ tensioni speciali Vac,
modelli 60Hz / ruote e sorreggicavo.

1phase 230Vac \pm 5% - 3phase 400-230Vac switchable \pm 5% / 50Hz / IP20 protection

Wa charging curve (9-12h, DIN 41774) suitable for PzS batteries

Final charge: Temporal, Capacitive, Derivative dV/dt

Top - 5 Leds visualization + integrated Display / Equalization setting / Data storage memory / Timer

Optionals: IP55 protection / special AC-Mains input Vac, 60Hz models / wheels and cables holder.

| V | A | Vac Input | Code | | | Ah (C5) | | | Cabinet Code |
|---------|---------|--------------|--------------|--------------|--------------|---------------------|-------|-------|--------------|
| | | | BASIC | ADVANCED | TOP | Wa -- Lead Acid PzS | | | |
| | | | | | | 9h | 12h | 13h | |
| 12 | 10 | 1 x 230 | 2SPM 12/ 10 | 3STM 12/ 10 | 5STM 12/ 10 | 50 | 67 | 72 | P5 |
| | 15 | 1 x 230 | 2SPM 12/ 15 | 3STM 12/ 15 | 5STM 12/ 15 | 74 | 100 | 107 | P5 |
| | 20 | 1 x 230 | 2SPM 12/ 20 | 3STM 12/ 20 | 5STM 12/ 20 | 99 | 133 | 143 | P5 |
| | 25 | 1 x 230 | 2SPM 12/ 25 | 3STM 12/ 25 | 5STM 12/ 25 | 124 | 167 | 179 | P5 |
| | 30 | 1 x 230 | 2SPM 12/ 30 | 3STM 12/ 30 | 5STM 12/ 30 | 149 | 200 | 215 | P5 |
| | 40 | 1 x 230 | 2SPM 12/ 40 | 3STM 12/ 40 | 5STM 12/ 40 | 198 | 267 | 286 | P5 |
| | 50 | 1 x 230 | 2SPM 12/ 50 | 3STM 12/ 50 | 5STM 12/ 50 | 248 | 333 | 358 | P6 |
| | 60 | 1 x 230 | 2SPM 12/ 60 | 3STM 12/ 60 | 5STM 12/ 60 | 297 | 400 | 430 | P6 |
| | 80 | 1 x 230 | 2SPM 12/ 80 | 3STM 12/ 80 | 5STM 12/ 80 | 396 | 533 | 573 | P6 |
| | 100 | 1 x 230 | 2SPM 12/ 100 | 3STM 12/ 100 | 5STM 12/ 100 | 495 | 667 | 716 | P6 |
| | 120 | 1 x 230 | 2SPM 12/ 120 | 3STM 12/ 120 | 5STM 12/ 120 | 594 | 800 | 859 | I2B |
| 24 | 10 | 1 x 230 | 2SPM 24/ 10 | 3STM 24/ 10 | 5STM 24/ 10 | 50 | 67 | 72 | P5 |
| | 15 | 1 x 230 | 2SPM 24/ 15 | 3STM 24/ 15 | 5STM 24/ 15 | 74 | 100 | 107 | P5 |
| | 20 | 1 x 230 | 2SPM 24/ 20 | 3STM 24/ 20 | 5STM 24/ 20 | 99 | 133 | 143 | P5 |
| | 25 | 1 x 230 | 2SPM 24/ 25 | 3STM 24/ 25 | 5STM 24/ 25 | 124 | 167 | 179 | P5 |
| | 30 | 1 x 230 | 2SPM 24/ 30 | 3STM 24/ 30 | 5STM 24/ 30 | 149 | 200 | 215 | P5 |
| | 40 | 1 x 230 | 2SPM 24/ 40 | 3STM 24/ 40 | 5STM 24/ 40 | 198 | 267 | 286 | P5 |
| | 50 | 1 x 230 | 2SPM 24/ 50 | 3STM 24/ 50 | 5STM 24/ 50 | 248 | 333 | 358 | P6 |
| | 60 | 1 x 230 | 2SPM 24/ 60 | 3STM 24/ 60 | 5STM 24/ 60 | 597 | 400 | 430 | P6 |
| | | 3 x 400 | 2SPT 24/ 60 | 3STT 24/ 60 | 5STT 24/ 60 | | | | I1 / I2B |
| | 80 | 1 x 230 | 2SPM 24/ 80 | 3STM 24/ 80 | 5STM 24/ 80 | 396 | 533 | 573 | P6 |
| | | 3 x 400 | 2SPT 24/ 80 | 3STT 24/ 80 | 5STT 24/ 80 | | | | I1 / I2B |
| | 100 | 1 x 230 | 2SPM 24/ 100 | 3STM 24/ 100 | 5STM 24/ 100 | 495 | 667 | 716 | I2B |
| | | 3 x 400 | 2SPT 24/ 100 | 3STT 24/ 100 | 5STT 24/ 100 | | | | I1 / I2B |
| | 120 | 1 x 230 | 2SPM 24/ 120 | 3STM 24/ 120 | 5STM 24/ 120 | 594 | 800 | 859 | I2B |
| | | 3 x 400 | 2SPT 24/ 120 | 3STT 24/ 120 | 5STT 24/ 120 | | | | I1 / I2B |
| | 140 | 1 x 230 | * | * | * | 693 | 933 | 1.003 | I1 / I2B |
| | | 3 x 400 | 2SPT 24/ 140 | 3STT 24/ 140 | 5STT 24/ 140 | | | | |
| | 160 | 1 x 230 | * | * | * | 792 | 1.067 | 1.146 | I1 / I2B |
| 3 x 400 | | 2SPT 24/ 160 | 3STT 24/ 160 | 5STT 24/ 160 | | | | | |
| 180 | 1 x 230 | * | * | * | 891 | 1.200 | 1.289 | I2B | |
| | 3 x 400 | 2SPT 24/ 180 | 3STT 24/ 180 | 5STT 24/ 180 | | | | | |
| 36 | 20 | 1 x 230 | 2SPM 36/ 20 | 3STM 36/ 20 | 5STM 36/ 20 | 99 | 133 | 143 | P5 |
| | 25 | 1 x 230 | 2SPM 36/ 25 | 3STM 36/ 25 | 5STM 36/ 25 | 124 | 167 | 179 | P5 |
| | 30 | 1 x 230 | 2SPM 36/ 30 | 3STM 36/ 30 | 5STM 36/ 30 | 149 | 200 | 215 | P6 |
| | 40 | 1 x 230 | 2SPM 36/ 40 | 3STM 36/ 40 | 5STM 36/ 40 | 198 | 267 | 286 | P6 |
| | 50 | 1 x 230 | 2SPM 36/ 50 | 3STM 36/ 50 | 5STM 36/ 50 | 248 | 333 | 358 | P6 |
| | 60 | 1 x 230 | 2SPM 36/ 60 | 3STM 36/ 60 | 5STM 36/ 60 | 597 | 400 | 430 | P6 |
| | | 3 x 400 | 2SPT 36/ 60 | 3STT 36/ 60 | 5STT 36/ 60 | | | | I1 / I2B |
| | 80 | 1 x 230 | 2SPM 36/ 80 | 3STM 36/ 80 | 5STM 36/ 80 | 396 | 533 | 573 | P6 |
| | | 3 x 400 | 2SPT 36/ 80 | 3STT 36/ 80 | 5STT 36/ 80 | | | | I1 / I2B |
| | 100 | 1 x 230 | 2SPM 36/ 100 | 3STM 36/ 100 | 5STM 36/ 100 | 495 | 667 | 716 | I2B |
| | | 3 x 400 | 2SPT 36/ 100 | 3STT 36/ 100 | 5STT 36/ 100 | | | | I1 / I2B |
| | 120 | 1 x 230 | 2SPM 36/ 120 | 3STM 36/ 120 | 5STM 36/ 120 | 594 | 800 | 859 | I2B |
| | | 3 x 400 | 2SPT 36/ 120 | 3STT 36/ 120 | 5STT 36/ 120 | | | | I1 / I2B |
| | 140 | 1 x 230 | * | * | * | 693 | 933 | 1.003 | I2B |
| | | 3 x 400 | 2SPT 36/ 140 | 3STT 36/ 140 | 5STT 36/ 140 | | | | |
| | 160 | 1 x 230 | * | * | * | 792 | 1.067 | 1.146 | I2B |
| | | 3 x 400 | 2SPT 36/ 160 | 3STT 36/ 160 | 5STT 36/ 160 | | | | |
| | 180 | 1 x 230 | * | * | * | 891 | 1.200 | 1.289 | I2B |
| 3 x 400 | | 2SPT 36/ 180 | 3STT 36/ 180 | 5STT 36/ 180 | | | | | |

* on demand

| V | A | Vac Input | Code | | | Ah (C5) | | | Cabinet Code | |
|---------|-----|-----------|--------------|--------------|--------------|---------------------|-------|-------|--------------|----------|
| | | | | | | Wa -- Lead Acid PzS | | | | |
| | | | BASIC | ADVANCED | TOP | 9h | 12h | 13h | | |
| 48 | 30 | 1 x 230 | 2SPM 48/ 30 | 3STM 48/ 30 | 5STM 48/ 30 | 149 | 200 | 215 | P6 | |
| | 40 | 1 x 230 | 2SPM 48/ 40 | 3STM 48/ 40 | 5STM 48/ 40 | 198 | 267 | 286 | P6 | |
| | 50 | 1 x 230 | 2SPM 48/ 50 | 3STM 48/ 50 | 5STM 48/ 50 | 248 | 333 | 358 | P6 | |
| | 60 | 1 x 230 | 2SPM 48/ 60 | 3STM 48/ 60 | 5STM 48/ 60 | 597 | 400 | 430 | P6 | |
| | | 3 x 400 | 2SPT 48/ 60 | 3STT 48/ 60 | 5STT 48/ 60 | | | | I1 / I2B | |
| | 80 | 1 x 230 | 2SPM 48/ 80 | 3STM 48/ 80 | 5STM 48/ 80 | 396 | 533 | 573 | I1 / I2B | |
| | | 3 x 400 | 2SPT 48/ 80 | 3STT 48/ 80 | 5STT 48/ 80 | | | | I1 / I2B | |
| | 100 | 1 x 230 | 2SPM 48/ 100 | 3STM 48/ 100 | 5STM 48/ 100 | 495 | 667 | 716 | I2B | |
| | | 3 x 400 | 2SPT 48/ 100 | 3STT 48/ 100 | 5STT 48/ 100 | | | | I1 / I2B | |
| | 120 | 1 x 230 | 2SPM 48/ 120 | 3STM 48/ 120 | 5STM 48/ 120 | 594 | 800 | 859 | I2B | |
| | | 3 x 400 | 2SPT 48/ 120 | 3STT 48/ 120 | 5STT 48/ 120 | | | | I1 / I2B | |
| | 140 | 1 x 230 | * | * | * | 693 | 933 | 1.003 | I2B | |
| | | 3 x 400 | 2SPT 48/ 140 | 3STT 48/ 140 | 5STT 48/ 140 | | | | | |
| | 160 | 1 x 230 | * | * | * | 792 | 1.067 | 1.146 | I2B | |
| | | 3 x 400 | 2SPT 48/ 160 | 3STT 48/ 160 | 5STT 48/ 160 | | | | | |
| | 180 | 1 x 230 | * | * | * | 891 | 1.200 | 1.289 | I2B | |
| | | 3 x 400 | 2SPT 48/ 180 | 3STT 48/ 180 | 5STT 48/ 180 | | | | | |
| | 72 | 60 | 1 x 230 | 2SPM 72/ 60 | 3STM 72/ 60 | 5STM 72/ 60 | 597 | 400 | 430 | I2B |
| 3 x 400 | | | 2SPT 72/ 60 | 3STT 72/ 60 | 5STT 72/ 60 | I1 / I2B | | | | |
| 80 | | 1 x 230 | 2SPM 72/ 80 | 3STM 72/ 80 | 5STM 72/ 80 | 396 | 533 | 573 | I2B | |
| | | 3 x 400 | 2SPT 72/ 80 | 3STT 72/ 80 | 5STT 72/ 80 | | | | I1 / I2B | |
| 100 | | 1 x 230 | 2SPM 72/ 100 | 3STM 72/ 100 | 5STM 72/ 100 | 495 | 667 | 716 | I2B | |
| | | 3 x 400 | 2SPT 72/ 100 | 3STT 72/ 100 | 5STT 72/ 100 | | | | I1 / I2B | |
| 120 | | 1 x 230 | 2SPM 72/ 120 | 3STM 72/ 120 | 5STM 72/ 120 | 594 | 800 | 859 | I2B | |
| | | 3 x 400 | 2SPT 72/ 120 | 3STT 72/ 120 | 5STT 72/ 120 | | | | | |
| 140 | | 1 x 230 | * | * | * | 693 | 933 | 1.003 | I2B | |
| | | 3 x 400 | 2SPT 72/ 140 | 3STT 72/ 140 | 5STT 72/ 140 | | | | | |
| 160 | | 1 x 230 | * | * | * | 792 | 1.067 | 1.146 | I2B | |
| | | 3 x 400 | 2SPT 72/ 160 | 3STT 72/ 160 | 5STT 72/ 160 | | | | | |
| 180 | | 1 x 230 | * | * | * | 891 | 1.200 | 1.289 | I3 | |
| | | 3 x 400 | 2SPT 72/ 180 | 3STT 72/ 180 | 5STT 72/ 180 | | | | | |
| 80 | | 60 | 1 x 230 | 2SPM 80/ 60 | 3STM 80/ 60 | 5STM 80/ 60 | 597 | 400 | 430 | I2B |
| | | | 3 x 400 | 2SPT 80/ 60 | 3STT 80/ 60 | 5STT 80/ 60 | | | | I1 / I2B |
| | | 80 | 1 x 230 | 2SPM 80/ 80 | 3STM 80/ 80 | 5STM 80/ 80 | 396 | 533 | 573 | I2B |
| | | | 3 x 400 | 2SPT 80/ 80 | 3STT 80/ 80 | 5STT 80/ 80 | | | | I1 / I2B |
| | 100 | 1 x 230 | 2SPM 80/ 100 | 3STM 80/ 100 | 5STM 80/ 100 | 495 | 667 | 716 | I2B | |
| | | 3 x 400 | 2SPT 80/ 100 | 3STT 80/ 100 | 5STT 80/ 100 | | | | I1 / I2B | |
| | 120 | 1 x 230 | 2SPM 80/ 120 | 3STM 80/ 120 | 5STM 80/ 120 | 594 | 800 | 859 | I2B | |
| | | 3 x 400 | 2SPT 80/ 120 | 3STT 80/ 120 | 5STT 80/ 120 | | | | | |
| | 140 | 1 x 230 | * | * | * | 693 | 933 | 1.003 | I3 | |
| | | 3 x 400 | 2SPT 80/ 140 | 3STT 80/ 140 | 5STT 80/ 140 | | | | | |
| | 160 | 1 x 230 | * | * | * | 792 | 1.067 | 1.146 | I3 | |
| | | 3 x 400 | 2SPT 80/ 160 | 3STT 80/ 160 | 5STT 80/ 160 | | | | | |
| | 180 | 1 x 230 | * | * | * | 891 | 1.200 | 1.289 | I3 | |
| | | 3 x 400 | 2SPT 80/ 180 | 3STT 80/ 180 | 5STT 80/ 180 | | | | | |
| | 96 | 60 | 1 x 230 | * | * | * | 597 | 400 | 430 | I1 / I2B |
| | | | 3 x 400 | 2SPT 96/ 60 | 3STT 96/ 60 | 5STT 96/ 60 | | | | |
| | | 80 | 1 x 230 | * | * | * | 396 | 533 | 573 | I1 / I2B |
| | | | 3 x 400 | 2SPT 96/ 80 | 3STT 96/ 80 | 5STT 96/ 80 | | | | |
| 100 | | 1 x 230 | * | * | * | 495 | 667 | 716 | I1 / I2B | |
| | | 3 x 400 | 2SPT 96/ 100 | 3STT 96/ 100 | 5STT 96/ 100 | | | | | |
| 120 | | 1 x 230 | * | * | * | 594 | 800 | 859 | I2B | |
| | | 3 x 400 | 2SPT 96/ 120 | 3STT 96/ 120 | 5STT 96/ 120 | | | | | |
| 140 | | 1 x 230 | * | * | * | 693 | 933 | 1.003 | I3 | |
| | | 3 x 400 | 2SPT 96/ 140 | 3STT 96/ 140 | 5STT 96/ 140 | | | | | |
| 160 | | 1 x 230 | * | * | * | 792 | 1.067 | 1.146 | I3 | |
| | | 3 x 400 | 2SPT 96/ 160 | 3STT 96/ 160 | 5STT 96/ 160 | | | | | |

| Cabinet Type & Dimensions in mm | |
|---------------------------------|---------------------|
| P5 | L350 X D220 X H270 |
| P6 | L480 X D280 X H310 |
| I1 | L550 X D390 X H660 |
| I2B | L550 X D450 X H900 |
| I3 | L700 X D550 X H1150 |

* on demand
single-phase 220(230)240 Vac
Three-phase 380(400)420 Vac (three-phase 220(230)240 Fino a / Up to 48/160, 72/100, 80/100, 96/80)

WOWa FAST TOP

Serie 5



Monofase 230Vac \pm 5% - Trifase selezionabile 400-230Vac \pm 5% / 50Hz / grado protezione IP20

Curva di carica WoWa (7-8h, DIN 41774) per batterie PzS/Pb-acido libero

Carica finale: Temporale, Capacitiva, Derivativa dV/dt

Visualizzazione top tramite 5 leds + Display integrato/ settaggio fase di equalizzazione / memoria salvataggio dati / timer

Optionals: protezione IP55/ tensioni speciali Vac, modelli 60Hz / ruote e sorreggicavo.

1phase 230Vac \pm 5% - 3phase 400-230Vac switchable \pm 5% / 50Hz / IP20 protection

WoWa charging curve (7-8h, DIN 41774) suitable for PzS batteries

Final charge: Temporal, Capacitive, Derivative dV/dt

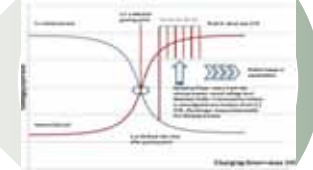
Top - 5 Leds visualization + integrated Display / Equalization setting / Data storage memory / Timer

Optionals: IP55 protection / special AC-Mains input Vac, 60Hz models / wheels and cables holder.

Display:
per diagnostica e programmazione.
For diagnostic and programming.



Fine carica con controllo
dV/dt disponibile.
dV/dt termination available



Timer digitale: conto alla rovescia
Digital timer: countdown



Mobile IP55 disponibile
IP55 cabinet available



Wo PULSE TOP

Serie 5



Monofase 230Vac \pm 5% - Trifase 400-230Vac selezionabile \pm 5% / 50Hz / grado protezione IP20

Curva di carica Wo PULSE (6,5-14h) per batterie PzS/Pb-acido libero

Carica finale: Pulse

Visualizzazione top tramite 5 leds + Display integrato/ settaggio fase di equalizzazione / memoria salvataggio dati / timer

Optionals: protezione IP55/ tensioni speciali Vac, modelli 60Hz / ruote e sorreggicavo.

1phase 230Vac \pm 5% - 3phase 400-230Vac switchable \pm 5% / 50Hz / IP20 protection

Wo PULSE charging curve (6,5-14h) suitable for PzS batteries

Final charge: Pulse

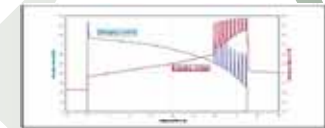
Top - 5 Leds visualization + integrated Display / Equalization setting / Data storage memory / Timer

Optionals: IP55 protection / special AC-Mains input Vac, 60Hz models / wheels and cables holder.

Display:
per diagnostica e programmazione.
For diagnostic and programming.



Seconda fase ad impulsi.
Pulsing second phase.



Timer digitale: conto alla rovescia
Digital timer: countdown



Mobile IP55 disponibile
IP55 cabinet available



| V | A | Vac Input | Code | Ah (C5) | | Cabinet Code | Code | Ah (C5) | | | Cabinet Code |
|---------|---------|--------------|--------------|----------------------|-----|--------------|--------------|--------------------------|-----------|------|--------------|
| | | | | WOWa - Lead Acid PzS | | | | WO Pulse - Lead Acid PzS | | | |
| | | | TOP-FAST | 7h | 8h | TOP-PULSE | 6,5-7,5h | 8,5-12h | 14h | | |
| 24 | 30 | 1 x 230 | 5FCM 24/ 30 | 115 | 146 | P5 | 5FBE 24/ 30 | 130-150 | 180-250 | 310 | P5 |
| | 40 | 1 x 230 | 5FCM 24/ 40 | 154 | 195 | P6 | 5FBE 24/ 40 | 170-200 | 230-340 | 410 | P6 |
| | 50 | 1 x 230 | 5FCM 24/ 50 | 192 | 244 | P6 | 5FBE 24/ 50 | 215-255 | 295-425 | 515 | P6 |
| | 60 | 1 x 230 | 5FCM 24/ 60 | 231 | 293 | P6 | 5FBE 24/ 60 | 260-310 | 360-510 | 620 | P6 |
| | | 3 x 400 | 5FCT 24/ 60 | | | | I2B | | | | |
| | 80 | 1 x 230 | 5FCM 24/ 80 | 308 | 390 | P6 | 5FBE 24/ 80 | 350-410 | 500-720 | 820 | P6 |
| | | 3 x 400 | 5FCT 24/ 80 | | | | I2B | | | | |
| | 100 | 1 x 230 | 5FCM 24/ 100 | 385 | 488 | I2B | 5FBE 24/ 100 | 430-520 | 590-850 | 1040 | I2B |
| | | 3 x 400 | 5FCT 24/ 100 | | | | 5FBD 24/ 100 | | | | |
| | 120 | 1 x 230 | * | 462 | 585 | I2B | * | 520-620 | 710-1020 | 1250 | I2B |
| | | 3 x 400 | 5FCT 24/ 120 | | | | 5FBD 24/ 120 | | | | |
| | 140 | 1 x 230 | * | 538 | 683 | I2B | * | 610-730 | 830-1190 | 1460 | I2B |
| 3 x 400 | | 5FCT 24/ 140 | 5FBD 24/ 140 | | | | | | | | |
| 36 | 30 | 1 x 230 | * | 115 | 146 | * | * | 130-150 | 180-250 | 310 | * |
| | 40 | 1 x 230 | * | 154 | 195 | * | * | 170-200 | 230-340 | 410 | * |
| | 50 | 1 x 230 | * | 192 | 244 | * | * | 215-255 | 295-425 | 515 | * |
| | 60 | 1 x 230 | 5FCM 36/ 60 | 231 | 293 | I2B | 5FBE 36/ 60 | 260-310 | 360-510 | 620 | I2B |
| | | 3 x 400 | 5FCT 36/ 60 | | | | 5FBD 36/ 60 | | | | |
| | 80 | 1 x 230 | 5FCM 36/ 80 | 308 | 390 | I2B | 5FBE 36/ 80 | 350-410 | 500-720 | 820 | I2B |
| | | 3 x 400 | 5FCT 36/ 80 | | | | 5FBD 36/ 80 | | | | |
| | 100 | 1 x 230 | 5FCM 36/ 100 | 385 | 488 | I2B | 5FBE 36/ 100 | 430-520 | 590-850 | 1040 | I2B |
| | | 3 x 400 | 5FCT 36/ 100 | | | | 5FBD 36/ 100 | | | | |
| | 120 | 1 x 230 | * | 462 | 585 | I2B | * | 520-620 | 710-1020 | 1250 | I2B |
| | | 3 x 400 | 5FCT 36/ 120 | | | | 5FBD 36/ 120 | | | | |
| | 140 | 1 x 230 | * | 538 | 683 | I2B | * | 610-730 | 830-1190 | 1460 | I2B |
| | | 3 x 400 | 5FCT 36/ 140 | | | | 5FBD 36/ 140 | | | | |
| | 160 | 1 x 230 | * | 615 | 780 | I2B | * | 700-830 | 950-1350 | 1650 | I2B |
| 3 x 400 | | 5FCT 36/ 160 | 5FBD 36/ 160 | | | | | | | | |
| 180 | 1 x 230 | * | 692 | 878 | I2B | * | 770-930 | 1050-1530 | 1850 | I2B | |
| | 3 x 400 | 5FCT 36/ 180 | | | | 5FBD 36/ 180 | | | | | |
| 200 | 1 x 230 | * | 769 | 976 | I2B | * | * | * | * | * | |
| | 3 x 400 | 5FCT 36/ 200 | | | | | | | | | |
| 48 | 30 | 1 x 230 | * | 115 | 146 | * | * | 130-150 | 180-250 | 310 | * |
| | 40 | 1 x 230 | * | 154 | 195 | * | * | 170-200 | 230-340 | 410 | * |
| | 50 | 1 x 230 | * | 192 | 244 | * | * | 215-255 | 295-425 | 515 | * |
| | 60 | 1 x 230 | 5FCM 48/ 60 | 231 | 293 | I2B | 5FBE 48/ 60 | 260-310 | 360-510 | 620 | I2B |
| | | 3 x 400 | 5FCT 48/ 60 | | | | 5FBD 48/ 60 | | | | |
| | 80 | 1 x 230 | 5FCM 48/ 80 | 308 | 390 | I2B | 5FBE 48/ 80 | 350-410 | 500-720 | 820 | I2B |
| | | 3 x 400 | 5FCT 48/ 80 | | | | 5FBD 48/ 80 | | | | |
| | 100 | 1 x 230 | 5FCM 48/ 100 | 385 | 488 | I2B | 5FBE 48/ 100 | 430-520 | 590-850 | 1040 | I2B |
| | | 3 x 400 | 5FCT 48/ 100 | | | | 5FBD 48/ 100 | | | | |
| | 120 | 1 x 230 | * | 462 | 585 | I2B | * | 520-620 | 710-1020 | 1250 | I2B |
| | | 3 x 400 | 5FCT 48/ 120 | | | | 5FBD 48/ 120 | | | | |
| | 140 | 1 x 230 | * | 538 | 683 | I2B | * | 610-730 | 830-1190 | 1460 | I2B |
| | | 3 x 400 | 5FCT 48/ 140 | | | | 5FBD 48/ 140 | | | | |
| | 160 | 1 x 230 | * | 615 | 780 | I2B | * | 700-830 | 950-1350 | 1650 | I2B |
| | | 3 x 400 | 5FCT 48/ 160 | | | | 5FBD 48/ 160 | | | | |
| | 180 | 1 x 230 | * | 692 | 878 | I2B | * | 770-930 | 1050-1530 | 1850 | I2B |
| 3 x 400 | | 5FCT 48/ 180 | 5FBD 48/ 180 | | | | | | | | |
| 200 | 1 x 230 | * | 769 | 976 | I2B | * | * | * | * | * | |
| | 3 x 400 | 5FCT 48/ 200 | | | | | | | | | |

| V | A | Vac Input | Code | Ah (C5) | | Cabinet Code | |
|-----|---------|--------------|--------------|----------------------|-----|--------------|----|
| | | | | WOWa - Lead Acid PzS | | | |
| | | | | TOP-FAST | 7h | | 8h |
| 72 | 60 | 1 x 230 | * | 231 | 293 | * | |
| | | 3 x 400 | * | | | * | |
| | 80 | 1 x 230 | * | 308 | 390 | I2B | |
| | | 3 x 400 | 5FCT 72/ 80 | | | | |
| | 100 | 1 x 230 | * | 385 | 488 | I2B | |
| | | 3 x 400 | 5FCT 72/ 100 | | | | |
| | 120 | 1 x 230 | * | 462 | 585 | I2B | |
| | | 3 x 400 | 5FCT 72/ 120 | | | | |
| | 140 | 1 x 230 | * | 538 | 683 | I2B | |
| | | 3 x 400 | 5FCT 72/ 140 | | | | |
| | 160 | 1 x 230 | * | 615 | 780 | I2B | |
| | | 3 x 400 | 5FCT 72/ 160 | | | | |
| 180 | 1 x 230 | * | 692 | 878 | I3 | | |
| | 3 x 400 | 5FCT 72/ 180 | | | | | |
| 200 | 1 x 230 | * | 769 | 976 | I3 | | |
| | 3 x 400 | 5FCT 72/ 200 | | | | | |

| Code | Ah (C5) | | | Cabinet Code |
|--------------|--------------------------|-----------|---------|--------------|
| | WO Pulse - Lead Acid PzS | | | |
| | TOP-PULSE | 6,5-7,5h | 8,5-12h | |
| * | 260-310 | 360-510 | 620 | * |
| * | | | | * |
| 5FBD 72/ 80 | 350-410 | 500-720 | 820 | I2B |
| 5FBD 72/ 100 | 430-520 | 590-850 | 1040 | I2B |
| 5FBD 72/ 120 | 520-620 | 710-1020 | 1250 | I2B |
| 5FBD 72/ 140 | 610-730 | 830-1190 | 1460 | I2B |
| 5FBD 72/ 160 | 700-830 | 950-1350 | 1650 | I2B |
| 5FBD 72/ 180 | 770-930 | 1050-1530 | 1850 | I3 |
| * | * | | | * |

| V | A | Vac Input | Code | Ah (C5) | | Cabinet Code | |
|-----|---------|--------------|--------------|----------------------|-----|--------------|----|
| | | | | WOWa - Lead Acid PzS | | | |
| | | | | TOP-FAST | 7h | | 8h |
| 80 | 60 | 1 x 230 | * | 231 | 293 | * | |
| | | 3 x 400 | * | | | * | |
| | 80 | 1 x 230 | * | 308 | 390 | I2B | |
| | | 3 x 400 | 5FCT 80/ 80 | | | | |
| | 100 | 1 x 230 | * | 385 | 488 | I2B | |
| | | 3 x 400 | 5FCT 80/ 100 | | | | |
| | 120 | 1 x 230 | * | 462 | 585 | I2B | |
| | | 3 x 400 | 5FCT 80/ 120 | | | | |
| | 140 | 1 x 230 | * | 538 | 683 | I3 | |
| | | 3 x 400 | 5FCT 80/ 140 | | | | |
| | 160 | 1 x 230 | * | 615 | 780 | I3 | |
| | | 3 x 400 | 5FCT 80/ 160 | | | | |
| 180 | 1 x 230 | * | 692 | 878 | I3 | | |
| | 3 x 400 | 5FCT 80/ 180 | | | | | |
| 200 | 1 x 230 | * | 769 | 976 | I3 | | |
| | 3 x 400 | 5FCT 80/ 200 | | | | | |

| Code | Ah (C5) | | | Cabinet Code |
|--------------|--------------------------|-----------|---------|--------------|
| | WO Pulse - Lead Acid PzS | | | |
| | TOP-PULSE | 6,5-7,5h | 8,5-12h | |
| * | 260-310 | 360-510 | 620 | * |
| * | | | | * |
| 5FBD 80/ 80 | 350-410 | 500-720 | 820 | I2B |
| 5FBD 80/ 100 | 430-520 | 590-850 | 1040 | I2B |
| 5FBD 80/ 120 | 520-620 | 710-1020 | 1250 | I2B |
| 5FBD 80/ 140 | 610-730 | 830-1190 | 1460 | I3 |
| 5FBD 80/ 160 | 700-830 | 950-1350 | 1650 | I3 |
| 5FBD 80/ 180 | 770-930 | 1050-1530 | 1850 | I3 |
| * | * | | | * |

| V | A | Vac Input | Code | Ah (C5) | | Cabinet Code | |
|-----|---------|--------------|--------------|----------------------|-----|--------------|----|
| | | | | WOWa - Lead Acid PzS | | | |
| | | | | TOP-FAST | 7h | | 8h |
| 96 | 60 | 1 x 230 | * | 231 | 293 | * | |
| | | 3 x 400 | * | | | * | |
| | 80 | 1 x 230 | * | 308 | 390 | I2B | |
| | | 3 x 400 | 5FCT 96/ 80 | | | | |
| | 100 | 1 x 230 | * | 385 | 488 | I2B | |
| | | 3 x 400 | 5FCT 96/ 100 | | | | |
| | 120 | 1 x 230 | * | 462 | 585 | I2B | |
| | | 3 x 400 | 5FCT 96/ 120 | | | | |
| | 140 | 1 x 230 | * | 538 | 683 | I3 | |
| | | 3 x 400 | 5FCT 96/ 140 | | | | |
| | 160 | 1 x 230 | * | 615 | 780 | I3 | |
| | | 3 x 400 | 5FCT 96/ 160 | | | | |
| 180 | 1 x 230 | * | 692 | 878 | I3 | | |
| | 3 x 400 | 5FCT 96/ 180 | | | | | |

| Code | Ah (C5) | | | Cabinet Code |
|--------------|--------------------------|-----------|---------|--------------|
| | WO Pulse - Lead Acid PzS | | | |
| | TOP-PULSE | 6,5-7,5h | 8,5-12h | |
| * | 260-310 | 360-510 | 620 | * |
| * | | | | * |
| 5FBD 96/ 80 | 350-410 | 500-720 | 820 | I2B |
| 5FBD 96/ 100 | 430-520 | 590-850 | 1040 | I2B |
| 5FBD 96/ 120 | 520-620 | 710-1020 | 1250 | I2B |
| 5FBD 96/ 140 | 610-730 | 830-1190 | 1460 | I3 |
| 5FBD 96/ 160 | 700-830 | 950-1350 | 1650 | I3 |
| 5FBD 96/ 180 | 770-930 | 1050-1530 | 1850 | I3 |

| Cabinet Type & Dimensions in mm | |
|---------------------------------|---------------------|
| P5 | L350 X D220 X H270 |
| P6 | L480 X D280 X H310 |
| I2B | L550 X D450 X H900 |
| I3 | L700 X D550 X H1150 |

| |
|---|
| * on demand |
| single-phase 220(230)240 Vac |
| Three-phase 380(400)420 Vac (three-phase 220(230)240) Fino a / Up to 48/160, 72/100, 80/100, 96/80 |

Convertitori DC/DC / *DC/DC Converters*



| | | | | | | | | | |
|-----------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| OUTPUT VOLTAGE (Vdc) | 12 | | | | | 24 | | | |
| AVAILABLE POWER (W) | 50 | 75 | 100 | 150 | 180 | 100 | 200 | 300 | 300 |
| OUTPUT CURRENT (A constant) | 4,16 | 6,25 | 8.3 | 12.5 | 15.5 | 4,2 | 8.3 | 12.5 | 13 |
| DIMENSIONS | A | A | A | B | C | A | B | B | C |
| PARALLEL CONNECTION | Y | Y | Y | Y | N | Y | Y | Y | N |
| INPUT VOLTAGE RANGE (Vdc) | 30-150 | 30-150 | 30-150 | 30-130 | 15-110 | 30-150 | 30-130 | 30-130 | 28-110 |
| PROTECTION DEGREE | IP65 | | | | | | | | |

| | | | |
|-----------------------------|------------------------|----------------|--------------|
| Model | A | B | C |
| Weight (kg) | 0,5 | 1,2 | 0,5 |
| Dimensions L x D x H (mm) | 110 x 100 x 35 | 115 x 130 x 55 | 90 x 91 x 37 |
| Technical specifications | see technical drawings | | |

Ampio range di tensioni d'ingresso / Tensioni di uscita 12V, 24V (tensioni speciali a richiesta).

Modelli IP65

Possibilità di connessione in parallelo (in base al modello).

Wide Input Multi Voltage / Output Voltage 12V, 24V (special V on demand)

IP65 models

Parallel connection available depending on model.

Dispositivi manutenzione batterie / *Battery servicing items*

Multitensione (HF e tiristori) e scaricatori.

Multivoltage chargers (HF & Thyristor) and Discharging Equipment.



Facile impostazione parametri tramite display LCD.
Friendly LCD display setting.

Scaricatore DDL 150 USB / Discharger

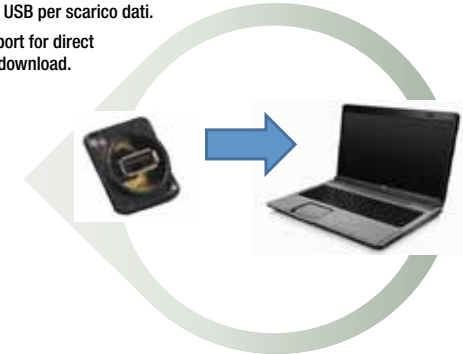


| PARAMETRI / PARAMETER SPECIFICATION | |
|-------------------------------------|--------------------------|
| Tensione / Voltage | da / from 2V a / to 80V |
| A scarica / Discharge current | da / from 2A a / to 150A |
| Ac Mains | 230 Vac \pm 10% |
| T° / Operative temperature | -10 +40°C |
| Peso / Weight | 32 Kg |
| Dimensions (h x l x p) | 700 mm x 310mm x 450 mm |

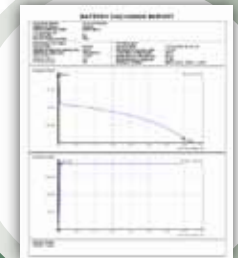
| V BATT | MAX A | NOTE / NOTES |
|------------|-------|------------------|
| 1 - 5V | 30A | V BATT \geq 2V |
| 6V | 100A | |
| >6 - <12V | 120A | V BATT \geq 8V |
| >12 - 96 V | 150A | |



Porta USB per scarico dati.
USB port for direct data download.



Report completo di grafici.
Full report complete with diagrams.



Monofase 230Vac \pm 10% / 50-60Hz

Tensione batteria da 2V a 80V / Correnti di scarica fino a 150A

Visualizzazione e settaggio tramite display LCD integrato / ruote integrate per una facile movimentazione.

Porta USB integrata per salvataggio e scarico dati e software dedicato.

Optionals: connessione in parallelo fino a 3 moduli: corrente di scarica fino a 450A

1phase 230Vac \pm 10% / 50-60Hz

Battery Voltage from 2V to 80V / Discharging Current up to 150A

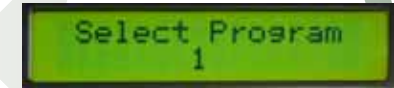
Visualization and Setting through integrated LCD Display / integrated wheels for easy transport.

Integrated USB door for data storage/downloading and dedicated software.

Optional: parallel connection up to 3 modules : up to 450A discharging current.

Stazione rigenerativa HRC-3 / *Regenerating Station*

4 programmi in memoria per desolfatazione leggera o profonda.
4 pre-set programs for desulphation (from light to deep).



Mobile robusto e facile da spostare.
Robust cabinet easy to handle.



| | HRC-3 (400Vac) |
|-----|----------------|
| 2V | 30A |
| 6V | 15A |
| 8V | 15A |
| 10V | 65A |
| 12V | 65A |
| 24V | 65A |
| 36V | 65A |
| 48V | 50A |
| 60V | 65A |
| 72V | 65A |
| 80V | 40A |
| 96V | // |

400Vac \pm 10% / 50-60Hz

Programmazione diretta tramite display integrato / ruote integrate.

Disponibili 4 programmi di desolfatazione di default (Lieve-Debole-Media-Forte)

Possibilità di creare a piacere curve di carica e cicli di desolfatazione personalizzati per qualsiasi tipologia di batteria (PzS, PzV, AGM, etc.)

3phase 400Vac \pm 10% / 50-60Hz

Full programming through integrated Display / integrated wheels

4 default desulphating programs available (Light – Soft – Medium - Deep)

Possibility to create your own charging profiles and your own desulphating cycles for any battery type (PzS, PzV, AGM, etc.)

Multitensione MTD / *Multivoltage*



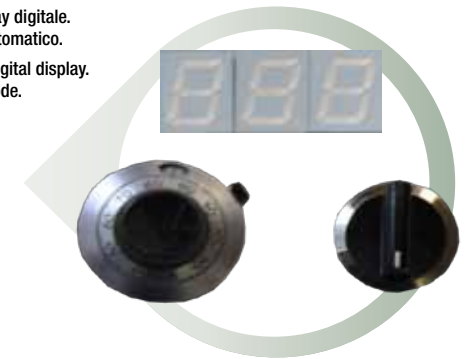
Trifase 400Vac \pm 5% / 50-60Hz

Tensioni batteria da 2V a 96V / Correnti fino a 120A (correnti più elevate a richiesta)

Programmazione diretta tramite 2 potenziometri + timer / Display integrato

Ciclo di desolfatazione a corrente costante / Curve di carica per batterie PzS, PzV, AGM

Potenziometri e display digitale.
Funzione manuale/automatico.
Potentiometers and digital display.
Automatic/manual mode.



Timer.



3phase 400Vac \pm 5% / 50-60Hz

Battery Voltage from 2V to 96V / Current up to 120A (higher currents on demand)

Full programming through 2 potentiometers + timer / Integrated Display

Desulphating cycle with constant current / Charging cycle suitable for PzS, PzV, AGM batteries.

HFK - T Multi



Display:
facile riconoscimento stato cb: NAVIGATOR
completo accesso alla programmazione
timer: conto alla rovescia.
Easy status detection: NAVIGATOR
Full programming access
timer: countdown.



Cabinet antigoccia
Speciale filtro flusso aria.
Antidrop cabinet
Special air flux filter.



| | HFK MULTI (230 Vac) | HFT MULTI (400Vac) |
|-----|---------------------|--------------------|
| 2V | // | 30A |
| 6V | 10A | 15A |
| 8V | 10A | 15A |
| 10V | 10A | 65A |
| 12V | 10A | 65A |
| 24V | 50A | 65A |
| 36V | 50A | 65A |
| 48V | 50A | 50A |
| 60V | 15A | 65A |
| 72V | 15A | 65A |
| 80V | 25A | 40A |
| 96V | 25A | // |

Optionals.



Monofase 230Vac \pm 10% (HFK), 50-60Hz / Trifase 400Vac \pm 10% (HFT), 50-60Hz

Programmazione diretta tramite display integrato

Disponibili 2 programmi di desolfatazione a corrente costante (dSa: riconoscimento automatico della V + timer;

dSM: settaggio manuale della V + timer) + 1 profilo di carica per qualsiasi tipologia di batteria (PzS, PzV, AGM, etc.)

Optionals: Supporto per posizionamento a terra.

1phase 230Vac \pm 10% (HFK), 50-60Hz / 3phase 400Vac \pm 10% (HFT), 50-60Hz

Full programming through integrated Display

2 desulphating programs with constant current available (dSa: automatic V detection + timer;

dSM: manual V setting + timer) + 1 charging profile program suitable for any battery type (PzS, PzV, AGM, etc.)

Optional: Stand-alone holder.

KIT di adattamento universali / *Universal adapating kits*

| Modello - Mod. | Descrizione e componenti - Description and components |
|----------------|--|
| KT-22A | Kit di adattamento per 50Hz tradizionali Wa - Wa universal adapting kit for 50Hz chargers. |
| | (AT22 electronic board + alluminium plate + cables) |
| KT-12 FAST | Kit di adattamento per 50Hz "fast" W0Wa - W0Wa universal adapting kit for 50Hz "fast" chargers. |
| | (AT12 electronic board + AT13 display board with buttons + alluminium plate + cables + auxiliary transformer + amperometrical transformer + relay) |



Parti di ricambio / Spare parts

Schede elettroniche di controllo - Control electronic boards (PCB)



Mobili - Cabinets



Ponti a diodi - Diode Bridges



Trasformatori di potenza - Power transformers



Trasformatori amperometrici e ausiliari - Current and auxiliary transformers



Contattori - Contactors



Fusibili - Fuses



Interruttori - Switches



Spine di rete - AC mains input plugs



Spine e connettori batteria - battery plugs and connectors



Consigli e suggerimenti / Advice and suggestions

Consigli Utili per scegliere il vostro carica batterie:

Scegliete con cura il vostro caricabatterie. Prima di sceglierlo chiedetevi:
 La batteria viene normalmente scaricata parzialmente o totalmente prima di essere rimessa in carica?
 Quanto tempo ho a disposizione per ricaricarla?
 Ho la necessità di caricare batterie con tensioni e capacità diverse?
 La tensione nominale del carica batterie deve essere uguale alla tensione nominale della batteria (Esempio: V nominale Batteria = 24 celle x 2,0V/cella = 48V)
 La corrente nominale del caricabatterie deve essere scelta in base ai dati presenti sulle tabelle prodotto.
 Contattateci per qualsiasi chiarimento necessario.

Useful Suggestions to choose your charger:

Please, be careful choosing your charger and ask yourself:
 Is the battery partially or totally discharged before putting it in charge?
 How much time do I need for a complete charge?
 Do I need to charge battery with different capacity and voltage?
 Rated Voltage of the charger must be the same of the rated battery voltage (Example: Battery rated voltage = 24 cells x 2,0V/cell = 48V)
 Rated current of the charger must be chosen in accordance with the Ah table
 Contact us for any clarification you might need.

PROCEDURE E CONSIGLI PER UNA CORRETTA MANUTENZIONE DELLE BATTERIE

Consigli pratici per una scarica corretta (DDL150)

- Non scaricate mai la vs batteria oltre 1,7V/el.
- Per ottenere i report più corretti possibili, settate la corrente in base alla corrente nominale di targa della vs batteria:
 esempio batteria 500Ah in C5 settaggio corretto 100A (500Ah/5h=100A)
 Questa non è una regola fissa, ma è sicuramente la migliore simulazione dell'energia effettivamente data dalla vs batteria.
- Durante la scarica (o la carica) controllate lo stato di ciascun elemento mediante un voltmetro per essere certi che tutti gli elementi siano correttamente bilanciati.
- Aviate un ciclo di scarica con batteria completamente carica: V/el deve essere circa 2,2V/el con batteria non connessa al carico.

Consigli pratici per una carica corretta con ns modelli MTD o HFK-T MULTI:

- Se la batteria ha perso di capacità (vd test con scaricatore DDL 150) avviate un ciclo di desolfatazione.
- Settate la corrente a circa il 1-2% della capacità della vs batteria.
- Impostate il timer per un certo arco di tempo (necessarie minimo 24h)
- Controllate il voltaggio di ciascun elemento durante la carica (attenzione: la tensione non è sottoposta a nessun limite di controllo).
- La corretta densità di una batteria carica dovrebbe essere: 1,28 - 1,30
 Caricare e scaricare completamente la batteria in cicli consecutivi porta sempre benefici.
 3/4 cicli sono solitamente necessari per ottenere buoni risultati.
 Controllate sempre il voltaggio degli elementi e la densità, è molto importante. Inoltre per equalizzare la tensione V di ogni elemento è necessario far erogare al caricabatteria una corrente costante molto bassa durante la carica.

PROCEDURES AND ADVICES TO BATTERY SERVICING

Simple advises for discharge (DDL 150)

- Never discharge below 1,7V/el
- To have the best report always set current in respect of Nominal data of your battery: with a 500Ah in C5 for example you have to set 100A (500Ah/5h=100A). This is not a rule but is the best simulation of energy your battery is supposed to give.
- During discharge (or the charge) check the status of each element using a voltmeter to be sure all are well balanced.
- Start a discharge when battery has been fully charged: V/el should be close to 2,2V/el with battery disconnected from load.

Simple advises for charging with MTD or HFK T MULTI:

- In case battery has lost some capacity (DDL 150 test) arrange a desulphating cycle.
- Set current usually at 1 - 2% of capacity
- Set timer for a spam of time (usually 24h is min required)
- Check voltage of each element during charge (v is not under any limit control)
- Correct density of a charged battery should be: 1,28 - 1,30
 Fully Charging and fully discharging a battery in sequence gives always benefits to the battery. 3/4 cycles are usually required to see good results. Check always the voltage of each elements and density.
 This is very important. Moreover to equalize the V of each elements you should give very low current.

SEDE e STABILIMENTO
HEADQUARTERS & MANUFACTURING PLANT

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