



PRODUCT CATALOGUE

INDUSTRIAL BATTERY CHARGERS
WORKSHOP CHARGING DEVICES
DC-DC CONVERTERS



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FLEXIBLE CHARGING SOLUTIONS

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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
					7-8h	10-11-14h	12-14h	Current draw
HFY	12 - 24	10	1x230	HFYD 12-24/10	61-71	85-94-113	75-94	2,25
	12 - 24	15	1x230	HFYD 12-24/15	92-106	127-141-170	113-141	3,37
	12 - 24	20	1x230	HFYD 12-24/20	122-141	169-188-227	151-188	4,49
HFX	12 - 24	25	1x230	HFXD 12-24/25	153-176	212-235-283	189-235	5,58
	12 - 24	30	1x230	HFXD 12-24/30	183-212	254-282-340	226-282	6,70
	36	20	1x230	HFXD 36/20	122-141	169-188-227	151-188	6,70
	48	15	1x230	HFXD 48/15	92-106	127-141-170	113-141	6,70

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 and 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
Mains	230V (1ph) +/-10% 50-60Hz On/off switch	230V (1ph) +/-10% 50-60Hz
Visual signalling	Single LED (3 colours)	
Charger setting	By switches: voltage (12-24) and 2 charging profiles (Pb/Gel pre-set) By PC: extra editable charging profiles, capacity, output current	
Data memory	Charger gives a report of the last 25 cycles and key technical data by integrated PC port output	
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 Forced derating or safety cut off on the diodes
Protection during battery disconnection	Safety cut off by undervoltage

OPTIONALS

On board	Inhibitor cable (Vac presence relay), remote LED, curly AC cable
Stand alone/wall mounted	Cable holder
On board/stand alone/wall	Additional extra coating

MECHANICAL CHARACTERISTICS

	HFX	HFY
Dimensions	112 (w) 75 (h) 275 (l) mm	121 (w) 75 (h) 230 (l) mm
Protection degree	IP 21 (horizontal)	
Weight	3 kg	2 kg
Input cable	2,3 m +/- 10% (length) complete with Schuko plug 16A	
Output cables	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)

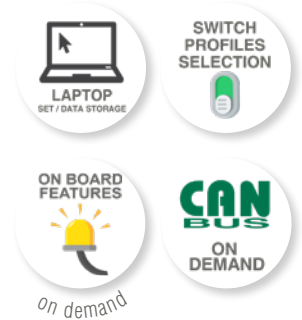
MODELS AVAILABLE

V	A	VAC	CODE	Lead acid (Ah)		Gel (Ah)	Iac
				7-8h	10-11-14h	12-14h	Current draw
24	40	1x230	HFZD 24/40	244-282	338-376-454	302-376	8,18
24	50	1x230	HFZD 24/50	305-353	423-470-567	377-470	10,23
24	60	1x230	HFZD 24/60	366-423	508-564-680	452-564	12,28
36	30	1x230	HFZD 36/30	183-212	254-282-340	226-282	9,10
36	40	1x230	HFZD 36/40	244-282	338-376-454	302-376	12,13
48	20	1x230	HFZD 48/20	122-141	169-188-227	151-188	8,00
48	30	1x230	HFZD 48/30	183-212	254-282-340	226-282	11,99

PRODUCT INTRO

HFZ is the medium range HF charger suitable for light traction application 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

Mains	230V (1ph) +/-10% 50-60Hz - On/off switch present on top side
Visual signalling	Single LED (3 colours)
Charger setting	By switches: 2 charging profiles (Pb/Gel pre-set) By PC: extra editable charging profiles, capacity, output current
Data memory	Charger gives a report of the last 25 cycles and key technical data by integrated PC port output
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	Fast AC fuse
Output protection	By relay (reverse polarity protection)
Thermal Protection	Forced derating or safety cut off on the diodes
Protection during battery disconnection	Safety cut off by undervoltage

OPTIONALS

On board	Inhibitor cable (Vac presence relay), remote LED
Stand alone/wall mounted	Cable holder
On board/stand alone/wall	Additional extra coating

MECHANICAL CHARACTERISTICS

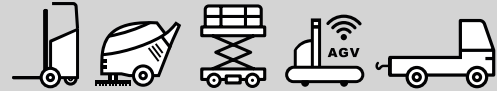
Dimensions	191 (w) 75(h) 362 (l) mm
Protection degree	IP 21 (vertical)
Weight	6 kg
Input cable	2,3 m +/- 10% (length) complete with Schuko plug 16A
Output cables	2,3 m +/- 10% (length) – DC plug on demand

HKP

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
				7-8h	10-11-14h	12-14h	Current draw
24	70	1x230	HKP 24/70	385-444	533-592-714	475-592	8,40
24	85	1x230	HKP 24/85	468-540	647-720-867	557-720	10,20
36	50	1x230	HKP 36/50	275-317	381-423-510	339-423	8,90
36	60	1x230	HKP 36/60	330-381	457-508-612	407-508	10,70
48	40	1X230	HKP 48/40	220-254	305-338-408	271-338	9,40
48	50	1x230	HKP 48/50	275-317	381-423-510	339-423	11,70
48	60	1x230	HKP 48/60	330-381	457-508-612	407-508	14,10

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

PRODUCT INTRO

HKP is the HF single phase charger equipped with PFC (Power Factor Control) reaching highest power, aimed for bigger traction applications. An integrated interface with digital display and LED visual enables a complete overview and setting of charge parameters, including delay start and easy trouble-shooting. USB interface (on request) 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 and OLED display.



GENERAL CHARACTERISTICS

Mains	230V (1ph) +/-10% 50-60Hz
Visual signalling	4 LEDs, digital Display and 4 control keys on the front side
Charger setting	By display: current, capacity, charging profiles (pre-set multiple selection)
Data memory (optional)	Charger gives a report of the last 25 cycles and key technical data (by PC)
Cool-down system	Temperature-regulated fan speed. Fan idle within 40°C internal components temperature
Efficiency	> 90%
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

OPTIONALS

On board	Inhibitor cable (Vac presence relay), remote LED
Stand alone/wall mounted	Cable holder, charger iron stand
On board/stand alone/wall	Additional extra coating, air mix pump, pilot contact, charger status lamp, thermal probe voltage adjustment, advanced display with USB port

MECHANICAL CHARACTERISTICS

Dimensions	HKP: 224 (w) 88 (h) 406 (l) mm HKP Air/special features: 549 (w) 130 (h) 416 (l) mm
Protection degree	IP 21 (vertical)
Weight	9 kg
Input cable	2,3 m +/- 10% (length) complete with Schuko plug 16A
Output cables	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)

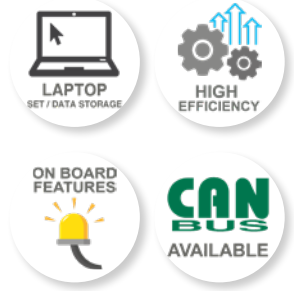
MODELS AVAILABLE

V	A	VAC	CODE	Lead acid (Ah)		Gel (Ah)	Iac
				7-8h	10-11-14h	12-14h	Current draw (230Vac)
24	30	1x110-230	HFL 24/30	183-212	254-282-340	226-282	3,50
36	20	1x110-230	HFL 36/20	122-141	169-188-227	151-188	3,50
48	15	1x110-230	HFL 48/15	92-106	127-141-170	113-141	3,50

-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

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

SAFETY FEATURES

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

MECHANICAL CHARACTERISTICS

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

HFT

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)	lac
				7-8h	10-11-14h	12-14h	Current draw
24	80	3x400	HFT 24/80	440-508	609-677-816	543-677	4,10
24	100	3x400	HFT 24/100	549-635	762-846-1020	679-846	5,10
24	120	3x400	HFT 24/120	659-762	914-1015-1224	814-1015	6,10
48	80	3x400	HFT 48/80	440-508	609-677-816	543-677	8,00
48	100	3x400	HFT 48/100	549-635	762-846-1020	679-846	10,00
48	120	3x400	HFT 48/120	659-762	914-1015-1224	814-1015	12,00
80	60	3x400	HFT 80/60	330-381	457-508-612	407-508	9,80
80	80	3x400	HFT 80/80	440-508	609-677-816	543-677	13,10
80	100	3x400	HFT80/100	549-635	762-846-1020	679-846	15,50

Special versions 36V, 72V, 96V and 120V available on demand
In between output current sizes available Air mix Ah= +10%

PRODUCT INTRO

HFT is the three phase HF charger aimed for bigger traction batteries still featuring wall mounting. An integrated interface with digital display and LEDs visual enables a complete overview and setting of charge parameters, including delay start and easy trouble-shooting. USB interface (on request) permits advanced setting and data-report. This range includes also HFT-AIR (with air mix option) and HFT DOUBLE VOLTAGE (with automatic Ah detection).



GENERAL CHARACTERISTICS

Mains	400V (3ph) +/-10% 50-60Hz
Visual signalling	4 LEDs, digital Display and 4 control keys on the front side
Charger setting	By display: current, capacity, charging profiles (pre-set multiple selection)
Data memory (optional)	Charger gives a report of the last 25 cycles and key technical data (by PC)
Cool-down system	Temperature-regulated fan speed. Fan idle within 40°C internal components temperature
Efficiency	> 90%
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	Ultrafast fuse (reverse polarity protection)
Thermal Protection	Probes on IGBT and diodes + derating
Protection during battery disconnection	Safety cut off by undervoltage

OPTIONALS

Stand alone	Charger iron stand
Stand alone/wall mounted	Cable holder
On board/stand alone/wall	Additional extra coating, air mix pump, pilot contact, charger status lamp, thermal probe voltage adjustment, advanced display with USB port

MECHANICAL CHARACTERISTICS

Dimensions	397 (w) 115 (h) 521 (l) mm
Protection degree	IP 21 (vertical)
Weight	17 kg
Input cable	2,5 m +/- 10% (length) – AC plug on demand
Output cables	2,5 m +/- 10% (length) – DC plug on demand

HFT1 & HTV

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
				7-8h	10-11-14h	12-14h	Current draw
24	80	3x400	HFT1 24/80	440-508	609-677-816	543-677	4,10
24	100	3x400	HFT1 24/100	549-635	762-846-1020	679-846	5,10
24	120	3x400	HFT1 24/120	659-762	914-1015-1224	814-1015	6,10
48	80	3x400	HFT1 48/80	440-508	609-677-816	543-677	8,00
48	100	3x400	HFT1 48/100	549-635	762-846-1020	679-846	10,00
48	120	3x400	HFT1 48/120	659-762	914-1015-1224	814-1015	12,00
80	60	3x400	HFT1 80/60	330-381	457-508-612	407-508	9,80
80	80	3x400	HFT1 80/80	440-508	609-677-816	543-677	13,10
80	100	3x400	HFT1 80/100	549-635	762-846-1020	679-846	15,50

Special versions 36V, 72V, 96V and 120V available on demand
In between output current sizes available Air mix Ah= +10%

PRODUCT INTRO

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

They are the enhanced version of our standard HFT.

This range includes also special versions with air-mix option and with CAN-bus protocol for Lithium applications.



GENERAL CHARACTERISTICS

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

SAFETY FEATURES

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

OPTIONALS

Stand alone	Charger iron stand
Stand alone/wall mounted	Cable holder
On board/stand alone/wall	Additional extra coating, air mix pump, pilot contact, charger status lamp, thermal probe voltage adjustment

MECHANICAL CHARACTERISTICS

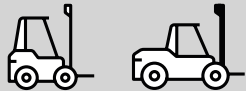
Dimensions	397 (w) 115 (h) 521 (l) mm
Protection degree	IP 21 (vertical)
Weight	18 kg
Input cable	2,5 m +/- 10% (length) – AC plug on demand
Output cables	2,5 m +/- 10% (length) – DC plug on demand

HFT2

THREE PHASE 400 Vac



MAIN APPLICATIONS



SUITABLE BATTERIES

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

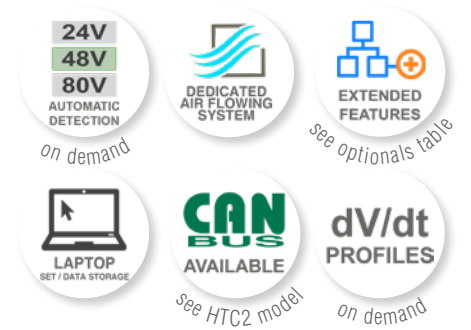
MODELS AVAILABLE

V	A	VAC	CODE	Lead acid (Ah)		Gel (Ah)	Iac
				7-8h	10-11-14h	12-14h	Current draw
48	160	3x400	HFT2 48/160	879-1016	1219-1354-1633	1086-1354	16,00
48	180	3x400	HFT2 48/180	989-1143	1371-1523-1837	1222-1523	18,00
48	200	3x400	HFT2 48/200	1099-1270	1523-1692-2041	1357-1692	20,00
80	140	3x400	HFT2 80/140	769-889	1066-1185-1429	950-1185	22,80
80	160	3x400	HFT2 80/160	879-1016	1219-1354-1633	1086-1354	26,10
96	100	3x400	HFT2 96/100	549-635	762-846-1020	679-846	19,60
96	140	3x400	HFT2 96/140	769-889	1066-1185-1429	950-1185	29,70
120	80	3x400	HFT2 120/80	440-508	609-677-816	543-677	21,20
120	100	3x400	HFT2 120/100	549-635	762-846-1020	679-846	26,50

Special versions 24V, 36V, 72V available on demand
In between output current sizes available Air mix Ah= +10%

PRODUCT INTRO

HFT2 is the three phase HF charger equipped with OLED/LCD and USB interface. It has been designed for the recharge of any battery types. It is the enhanced version of our standard HFTD. The charger is available in HFT2 AIR and HTC2 (CAN-bus) versions.



GENERAL CHARACTERISTICS

Mains	400V (3ph) +/-10% 50-60Hz
Visual signaling	OLED display, 4 LEDs and 4 control keys
Charger setting	By laptop/USB port: software upload
Data memory	Charger gives a report of the last 50 cycles and key technical data by integrated USB port
Cool-down system	Temperature-regulated fan speed. Fan idle within 40°C internal components temperature.
Efficiency	> 90%
Operating temperature	0° to +40°C
Certifications	CE in conformity with LV and EMC protocols

SAFETY FEATURES

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

OPTIONALS

Stand alone	Charger iron stand
Stand alone/wall mounted	Cable holder
On board/stand alone/wall	Additional extra coating, air mix pump, pilot contact, charger status lamp, thermal probe voltage adjustment

MECHANICAL CHARACTERISTICS

Dimensions	407 (w) 259 (h) 535 (l) mm
Protection degree	IP 21 (vertical)
Weight	26 kg
Input cable	2,5 m +/- 10% (length) – AC plug on demand
Output cables	2,5 m +/- 10% (length) – DC plug on demand

HFT3

THREE PHASE 400 Vac



MAIN APPLICATIONS



SUITABLE BATTERIES

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

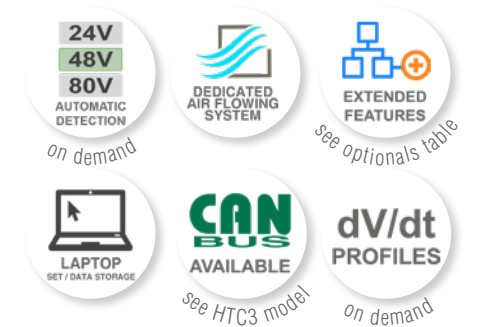
MODELS AVAILABLE

V	A	VAC	CODE	Lead acid (Ah)		Gel (Ah)	Iac
				7-8h	10-11-14h	12-14h	Current draw
24	260	3x400	HFT3 24/260	1429-1650	1980-2200-2653	1765-2200	13,30
24	300	3x400	HFT3 24/300	1648-1904	2285-2538-3061	2036-2538	15,40
48	260	3x400	HFT3 48/260	1429-1650	1980-2200-2653	1765-2200	26,00
48	300	3x400	HFT3 48/300	1648-1904	2285-2538-3061	2036-2538	30,00
80	200	3x400	HFT3 80/200	1099-1270	1523-1692-2041	1357-1692	32,60
80	240	3x400	HFT3 80/240	1319-1524	1828-2031-2449	1629-2031	39,20
80	260	3x400	HFT3 80/260	1429-1650	1980-2200-2653	1765-2200	42,40
96	160	3x400	HFT3 96/160	879-1016	1219-1354-1633	1086-1354	33,90
96	200	3x400	HFT3 96/200	1099-1270	1523-1692-2041	1357-1692	42,40
120	120	3x400	HFT3 120/120	659-762	914-1015-1224	814-1015	31,80
120	160	3x400	HFT3 120/160	879-1016	1219-1354-1633	1086-1354	42,40

Special versions 36V and 72V available on demand
In between output current sizes available Air mix Ah= +10%

PRODUCT INTRO

HFT3 is the three phase HF charger equipped with OLED/LCD display and USB interface and it is the Top of HF Range reaching the highest power sizes. It has been designed for the recharge of any battery types including lithium applications. CAN-bus communication is available to manage the profile through our private protocol (see HTC3 version).



GENERAL CHARACTERISTICS

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

SAFETY FEATURES

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

OPTIONALS

On board/stand alone/wall	Additional extra coating, air mix pump, pilot contact, charger status lamp, thermal probe voltage adjustment
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MECHANICAL CHARACTERISTICS

Dimensions	426 (w) 802 (h) 602 (l) mm
Protection degree	IP 21 (stand alone) - filter protection system ready (for higher IP: contact our technical department for more details)
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

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
				7-8h	10-11-14h	12-14h	Current draw
24	140	3x400	HTUC 24/140	769-889	1066-1185-1429	950-1185	5,70
24	160	3x400	HTUC 24/160	879-1016	1219-1354-1633	1086-1354	6,50
24	180	3x400	HTUC 24/180	989-1143	1371-1523-1837	1222-1523	7,30
24	200	3x400	HTUC 24/200	1099-1270	1523-1692-2041	1357-1692	8,10
48	140	3x400	HTUC 48/140	769-889	1066-1185-1429	950-1185	11,20
48	160	3x400	HTUC 48/160	879-1016	1219-1354-1633	1086-1354	12,80
48	180	3x400	HTUC 48/180	989-1143	1371-1523-1837	1222-1523	14,40
48	200	3x400	HTUC 48/200	1099-1270	1523-1692-2041	1357-1692	16,00
80	100	3x400	HTUC 80/100	549-635	762-846-1020	679-846	13,20
80	120	3x400	HTUC 80/120	659-762	914-1015-1224	814-1015	15,90

Special versions 36V and 72V available on demand

In between output current sizes available

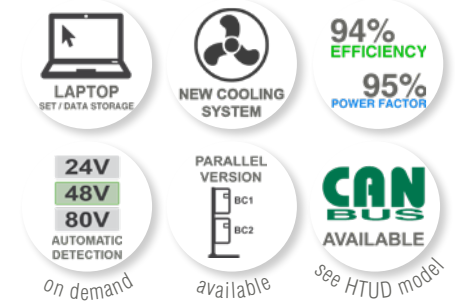
Air mix Ah= +10%

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). With the parallel setting HTUC can reach high power output ratings like 48/400A and 80/240A.



GENERAL CHARACTERISTICS

Mains	400V (3ph) +/-10% 50-60Hz
Visual signalling	OLED display, 4 LEDs and 4 control keys
Charger setting	By OLED display: current, capacity and 7 pre-set charging profiles By laptop/USB port: enhanced programming
Data memory	Charger gives a report of the last 50 cycles and key technical data by integrated USB port
Cool-down system	Dedicated air cooling direct to heatsink only. Temperature-regulated fan speed. Fan idle within 40°C internal components temperature.
Efficiency	94%
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

Stand alone	Charger iron stand
Stand alone/wall mounted	Cable holder
On board/stand alone/wall	Additional extra coating, air mix pump, pilot contact, charger status lamp, thermal probe voltage adjustment, dV/dt profiles

MECHANICAL CHARACTERISTICS

Dimensions	456 (w) 195 (h) 570 (l) mm
Protection degree	IP 21 (vertical) – additional filter protection on demand
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



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



SUITABLE BATTERIES

PzS wet lead acid

MAIN APPLICATIONS



STANDARD AVAILABLE SIZES

Output Voltage	Output Current
from 12V up to 80V	from 10A up to 200A
//	Amps depending on V ratio and max power in kVA

See technical chart for AC current draw, plugs & recommended mains fuses by 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	128	154	206	257	308
	12h	99	132	165	198	265	331	397
	13-14h	110	147	184	220	294	367	441
Output current A	>>>	80 A	100A	120A	140A	160A	180A	200A
Ah (C5)	9h	411	514	617	719	822	925	1028
	12h	529	661	794	926	1058	1190	1323
	13-14h	588	735	882	1029	1176	1322	1469

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).



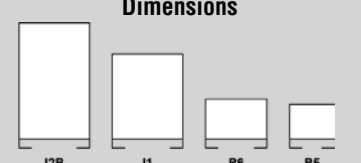
GENERAL CHARACTERISTICS

Mains	1phase 230Vac ± 5% – 3phase 400Vac ± 5% / 50Hz
Visual signalling	Basic 4 LEDs visualization with EAV (easy alarm visualization)
Main features	<ul style="list-style-type: none"> • Automatic start, charging process and shutoff • Universal Electronic Board with equalisation setting (dipswitch on PCB) • Final charging stage: temporal (3h pre-set time) • Leakage power transformer • Wa charging profile (DIN 41774)
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 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. Schuko plug included on models up to 16A current draw
Output cables	2,3 m (length) +/- 10% – DC plug on demand
Dimensions	I2B: 450 (w) 900 (h) 550 (l) mm
	I1: 390 (w) 660 (h) 550 (l) mm
	P6: 280 (w) 310 (h) 480 (l) mm
	P5: 220 (w) 270 (h) 350 (l) mm
	

SERIE 3

Advanced line - Wa



SUITABLE BATTERIES

PzS wet lead acid

MAIN APPLICATIONS



STANDARD AVAILABLE SIZES

Output Voltage	Output Current
from 12V up to 120V	from 10A up to 300A
any other V: on demand	Amps depending on V ratio and max power in kVA (SERIE 3-IP: max power in kVA = 12,8*)

*higher on demand
See technical chart for absorption, plugs & recommended mains fuses by size.

AH RECHARGE TABLE

A	>>>	15A	20A	25A	30A	40A	50A	60A	70A	80A	90A	100A	110A	120A	130A
Ah (C5)	9h	77	103	128	154	206	257	308	360	411	462	514	565	617	668
	12h	99	132	165	198	265	331	397	463	529	595	661	727	794	860
	13-14h	110	147	184	220	294	367	441	514	588	661	735	808	882	955
A	>>>	140A	150A	160A	170A	180A	190A	200A	210A	220A	230A	240A	250A	260A	280A
Ah (C5)	9h	719	771	822	873	925	976	1028	1079	1130	1182	1233	1284	1336	1439
	12h	926	992	1058	1124	1190	1256	1323	1389	1455	1521	1587	1653	1719	1852
	13-14h	1029	1102	1176	1249	1322	1396	1469	1543	1616	1690	1763	1836	1910	2057

PRODUCT INTRO

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

The **Serie 3-IP** model, with IP54 protection degree, grants highest protection from dust and water sprays.

This special cabinet is ideal for outdoor application or airport charging stations.

The feature programmable board is provided with internal memory, enhanced algorithms and USB (setting/troubleshooting/data-report). Security features involves both mechanical and software solutions.



GENERAL CHARACTERISTICS

Mains	1phase 230Vac ± 5% – 3phase 400Vac ± 5% / 50Hz (any other on demand)
Visual signalling	5 LED advanced visualization with EAV (easy alarm visualization) and data memory system
Main features	<ul style="list-style-type: none"> • Automatic start, charging process and shutoff • Universal Electronic Board with advanced digital setting (by display or keypad): profile thresholds / termination mode / equalization mode / delay start / cable compensation • Final charging stage (adjustable in respect of battery usage): temporal, capacitive (CF% and AH accumulated), derivative dv/dt • Leakage power transformer • Wa charging profile (DIN 41774)
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 Additional thermal protection based on algorithm managed by electronic board Battery detection with safety powering

MECHANICAL CHARACTERISTICS

	SERIE 3	SERIE 3-IP
Protection degree	IP 21	IP 54
Weight	Depending on model size	
Input cable	2,3 m (length) +/- 10% AC plug on demand and Schuko plug included on models up to 16A current draw	2,3 m (length) +/- 10% AC plug on demand
Output cables	2,3 m (length) +/- 10% DC plug on demand	

OPTIONALS

SERIE 3-EC	Keypad, Cable holder, USB port, Protection cage, IP54 cabinet
SERIE 3	Keypad, Delta/Star switch, Cable holder, USB port, Protection cage, IP54 cabinet, Air system, Water fill contacts, External lamp, Pilot contact
SERIE 3-IP	Keypad, Delta/Star switch, Cable holder, WOWA/Pulse, External roof, Air system, Water fill contacts, External lamp, Pilot contact

Dimensions (mm)



SERIE 3	SERIE 3-IP
I3: 550 (w) 1150 (h) 700 (l)	M 12-8-4: 400 (w) 1200 (h) 800 (l)
I3R: 550 (w) 1050 (h) 600 (l)	
I2B: 450 (w) 900 (h) 550 (l)	M 10-6-4: 400 (w) 1000 (h) 600 (l)
P6: 280 (w) 310 (h) 480 (l)	
P5: 220 (w) 270 (h) 350 (l)	

SERIE 5

Advanced line - Wa - WOWa - WO pulse



SUITABLE BATTERIES

PzS wet lead acid

STANDARD AVAILABLE SIZES

Output Voltage

from 12V up to 120V
any other V: on demand

Output Current

from 10A up to 300A
Amps depending on V ratio and max power in kVA

See technical chart for absorption, plugs and recommended mains fuses by size.

MAIN APPLICATIONS



AH RECHARGE TABLE

A	Ah (C5)						
	WA		WOWA FAST		WO PULSE		8-11h
	9h	12h	13-14h	7h	8h	6.5-8h	
30	154	198	220	148	159	129-162	162-229
40	206	265	294	197	211	173-215	215-305
50	257	331	367	246	264	216-269	269-381
60	308	397	441	296	317	259-323	323-458
70	360	463	514	345	370	302-377	377-535
80	411	529	588	394	423	345-431	431-611
90	462	595	661	444	476	388-485	485-688
100	514	661	735	493	529	431-539	539-764
110	565	727	808	542	582	475-593	593-841
120	617	794	882	591	634	518-646	646-917
130	668	860	955	641	687	561-700	700-993
140	719	926	1029	690	740	604-754	754-1069
150	771	992	1102	739	793	647-808	808-1146
160	822	1058	1176	788	846	690-862	862-1222
170	873	1124	1249	838	899	734-916	916-1299
180	925	1190	1322	887	952	777-970	970-1375
200	1028	1323	1469	986	1057	863-1077	1077-1528
220	1130	1455	1616	1084	1163	949-1185	1185-1681
240	1233	1587	1763	1183	1269	1035-1293	1293-1833

PRODUCT INTRO

Series 5 represent 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" or "WOWa" DIN 41774 charging characteristics.



GENERAL CHARACTERISTICS

Mains	1phase 230Vac ± 5% – 3phase 400Vac ± 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"> • Automatic start, charging process and shutoff • Universal Electronic Board with advanced digital setting (by display or keypad): profile thresholds / termination mode / equalization mode / delay start / cable compensation • Final charging stage (adjustable in respect of battery usage): temporal, capacitive (CF% and AH accumulated), derivative dv/dt • Leakage power transformer • Wa (DIN 41774), WOWa (DIN 41774) or WO pulse charging profile
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 Additional thermal protection based on algorithm managed by electronic board 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 Schuko plug included on models up to 16A current draw
Output cables	2,3 m (length) +/- 10% – DC plug on demand
Dimensions	I3: 550 (w) 1150 (h) 700 (l) mm I3R: 550 (w) 1050 (h) 600 (l) mm I2B: 450 (w) 900 (h) 550 (l) mm P6: 280 (w) 310 (h) 480 (l) mm P5: 220 (w) 270 (h) 350 (l) mm





NORTH AMERICA







line

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



HTUB

Compact high-efficiency chargers ideal for heavy traction applications. They are suitable for all types of batteries.

-  CALIFORNIA ENERGY COMMISSION COMPLIANT
-  OPPORTUNITY 25A / 100Ah up to Vgas
-  STANDARD 16A / 100Ah full cycle
-  24 36 V 48 TRIPLE VOLTAGE
-  LAPTOP SET / DATA STORAGE
-  94% EFFICIENCY 95% POWER FACTOR

480 and 600 Vac 3ph					
V	24	36	48	72	80
A	up to 200	up to 200	up to 200	up to 120	up to 120



HTUB MULTI & HRCB

Three-phase multi-voltage workshop charger, ideal for all purposes. Standard charging functions and constant current profiles for desulphation and battery refresh.

-  CALIFORNIA ENERGY COMMISSION COMPLIANT
-  94% EFFICIENCY 95% POWER FACTOR

480 and 600 Vac 3ph	
Multi-voltage with desulphation system/ battery refresh programs	
2-80V up to 120A	

SERIE 5

Serie 5 (Wa profile) allows the recharge of lead acid batteries, with a charging time from 8 to 14 hours. Ideal for single or multi-shift operation.

-  USB
-  DIGITAL PARAMETER SETTING
-  UNIVERSAL CONTROL BOARD
-  START RATE 15-20A 100Ah

STANDARD SIZES

V	1ph	
	120 Vac	208-240 Vac
24	from 40 to 60 A	from 80 to 160 A
36	from 25 to 40 A	from 50 to 140 A
48	from 20 to 30 A	from 50 to 120 A
V	3ph	
	208-240-440-480 Vac	600 Vac
24	from 80 to 200 A	from 80 to 200 A
36	from 80 to 200 A	from 80 to 200 A
48	from 80 to 160 A	from 80 to 160 A
72	from 80 to 140 A	from 80 to 140 A
80	from 80 to 120 A	from 80 to 120 A



SERIE 5 PULSE

Serie 5 Pulse (WOPulse profile) allows the recharge of lead acid batteries, with a charging time from 6,5 to 8 hours. Ideal for multi-shift operation.

-  USB
-  DIGITAL PARAMETER SETTING
-  UNIVERSAL CONTROL BOARD
-  START RATE 20A 100Ah

120 Vac 1ph - 208-240 1ph
208-240-440-480 3ph and 600Vac 3ph



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



MAIN APPLICATIONS



SUITABLE BATTERIES

Lithium

MODELS AVAILABLE

V	A	VAC	CODE	Iac Current draw	Lithium Recharging time
24	5	1x230	HXE-C 24/5	1,12	See battery manufacturer data requirements
24	10	1x230	HXE-C 24/10	2,25	
24	15	1x230	HXE-C 24/15	3,37	
24	20	1x230	HXE-C 24/20	4,49	
24	25	1x230	HXE-C 24/25	5,58	
24	30	1x230	HXE-C 24/30	6,70	

Special versions 12V/30A, 36V/20A and 48V/15A available on demand

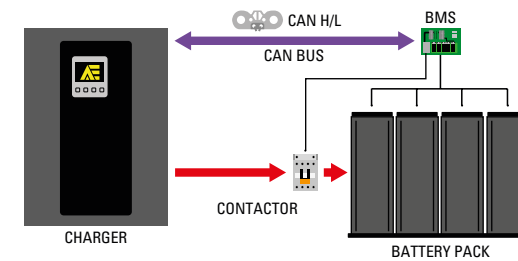
PRODUCT INTRO

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.



GENERAL CHARACTERISTICS

Mains	230V (1ph) +/-10% 50-60Hz – On/off switch
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 Forced derating or safety cut off on the diodes
Protection during battery disconnection	Safety cut off by undervoltage

OPTIONALS

On board	Inhibitor cable (Vac presence relay), remote LED, curly AC cable
Stand alone/wall mounted	Cable holder
On board/stand alone/wall	Additional extra coating

MECHANICAL CHARACTERISTICS

Dimensions	112 (w) 75 (h) 275 (l) 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 & HTC

SINGLE PHASE 230 Vac & THREE PHASE 400 Vac



MAIN APPLICATIONS



SUITABLE BATTERIES

Lithium

MODELS AVAILABLE

HKP-C				
V	A	VAC	CODE	iac
24	70	1x230	HKP-C 24/70	8,40
24	85	1x230	HKP-C 24/85	10,20
36	50	1x230	HKP-C 36/50	8,90
36	60	1x230	HKP-C 36/60	10,70
48	50	1x230	HKP-C 48/50	11,70
48	60	1x230	HKP-C 48/60	14,10

HTC				
V	A	VAC	CODE	iac
24	80	3x400	HTC 24/80	4,10
24	100	3x400	HTC 24/100	5,10
24	120	3x400	HTC 24/120	6,10
48	80	3x400	HTC 48/80	8,00
48	100	3x400	HTC 48/100	10,00
48	120	3x400	HTC 48/120	12,00
80	60	3x400	HTC 80/60	9,80
80	80	3x400	HTC 80/80	13,10
80	100	3x400	HTC 80/100	15,50

Recharging time:

See battery manufacturer data requirements

Special versions 12V, 36V, 72V, 80V, 96V and 120V available on demand

PRODUCT INTRO

HKP-C is the single phase HF charger equipped with PFC (Power Factor Control) and an OLED/LCD + USB interface.

HTC is the three phase version of the charger having same features and interfaces. They have been 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).

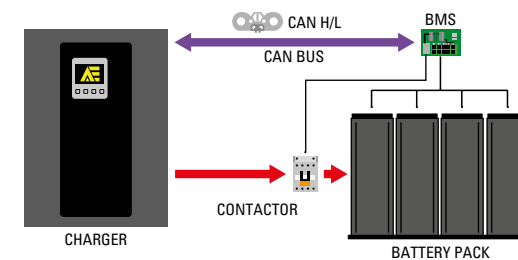
These devices are compact and ideal for wall mounting.



on demand

GENERAL CHARACTERISTICS

	HKP-C	HTC
Mains	230V (1ph) +/- 10% 50-60Hz	400V (3ph) +/-10% 50-60Hz
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%	> 90%
Operating temperature	0° to +40°C	
Certifications	CE in conformity with LV and EMC protocols	



SAFETY FEATURES

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

OPTIONALS

Stand alone	Charger stand, cable holder
--------------------	-----------------------------

MECHANICAL CHARACTERISTICS

	HKP-C	HTC
Dimensions (mm)	Standard version: 397 (w) 115 (h) 521 (l) Compact version: 224 (w) 98 (h) 406 (l)	397 (w) 115 (h) 521 (l)
Protection degree	IP 21 (vertical)	
Weight	18 kg	
Input cable	2,5 m +/- 10% (length) complete with Schuko plug 16A	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



MAIN APPLICATIONS



SUITABLE BATTERIES

Lithium

MODELS AVAILABLE

				iac	Lithium
V	A	VAC	CODE	Current draw	Recharging time
24	140	3x400	HTUD 24/140	5,70	See battery manufacturer data requirements
24	160	3x400	HTUD 24/160	6,50	
24	180	3x400	HTUD 24/180	7,30	
24	200	3x400	HTUD 24/200	8,10	
48	140	3x400	HTUD 48/140	11,20	
48	160	3x400	HTUD 48/160	12,80	
48	180	3x400	HTUD 48/180	14,40	
48	200	3x400	HTUD 48/200	16,00	
80	100	3x400	HTUD 80/100	13,20	
80	120	3x400	HTUD 80/120	15,90	

PARALLEL x2
HTUD 24/280
HTUD 24/320
HTUD 24/360
HTUD 24/400
HTUD 48/280
HTUD 48/320
HTUD 48/360
HTUD 48/400
HTUD 80/200
HTUD 80/240

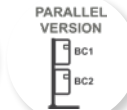
Special versions 36V available on demand

PRODUCT INTRO

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.

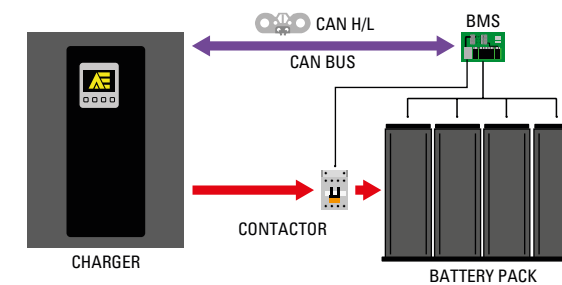
This version is specifically dedicated to lithium version with our private CAN or custom protocol (CAN open on demand).

With the parallel setting HTUD can reach high power output ratings like 48/400A and 80/240A.



GENERAL CHARACTERISTICS

Mains	400V (3ph) +/-10% 50-60Hz
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	94%
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

Stand alone	Charger iron stand
Stand alone/wall mounted	Cable holder

MECHANICAL CHARACTERISTICS

Dimensions	456 (w) 195 (h) 570 (l) 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

HTC3

THREE PHASE 400 Vac



MAIN APPLICATIONS



SUITABLE BATTERIES

Lithium

MODELS AVAILABLE

V	A	VAC	CODE	Iac Current draw	Lithium Recharging time
24	220	3x400	HTC3 24/220	11,30	See battery manufacturer data requirements
24	260	3x400	HTC3 24/260	13,30	
24	300	3x400	HTC3 24/300	15,40	
48	220	3x400	HTC3 48/220	22,00	
48	260	3x400	HTC3 48/260	26,00	
48	300	3x400	HTC3 48/300	30,00	
80	200	3x400	HTC3 80/200	32,60	
80	240	3x400	HTC3 80/240	39,20	
80	260	3x400	HTC3 80/260	42,40	

Special versions 36V, 72V, 96V and 120V available on demand

Sizes 80V/140A and 80V/160A available with HTC2 model
Contact our sales team for more information

V	A	VAC	CODE	Current draw
80	140	3x400	HTC2 80/140	22,80
80	160	3x400	HTC2 80/160	26,10

PRODUCT INTRO

HTC3 is the three phase HF charger equipped with OLED/LCD display and USB interface and it is the top of HF Range reaching the highest power. This version is designed for the recharge of any lithium applications.

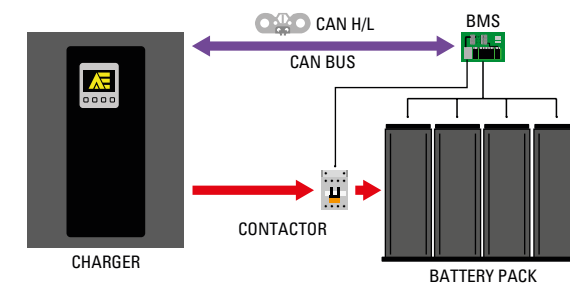
CAN-bus communication is a standard feature to manage the profile through our private CAN protocol or adjusting it following your specific needs (CAN open on demand).



on demand

GENERAL CHARACTERISTICS

Mains	Vac 400V (3ph) +/- 10% 50-60Hz
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	> 90%
Operating temperature	0° to +40°C full power
Certifications	CE in conformity with LV and EMC protocols



SAFETY FEATURES

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

OPTIONALS

Stand alone	Higher IP filter protection
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MECHANICAL CHARACTERISTICS

Dimensions	426 (w) 802 (h) 602 (l) mm
Protection degree	IP 21 (stand alone) filter protection system ready (for higher IP: contact our technical department for more details)
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.

DDL

150 USB Discharger



MAIN APPLICATIONS



SUITABLE BATTERIES

All types

MODELS AVAILABLE

VAC	CODE	DESCRIPTION
1x230	DDL150 USB	2-80V (96V) 150A
1x230	DDL-120-96V USB	2-96V (115V) 120A
1x230	DDL-065-150V USB	2-150 (180V) 65A

120 Vac input version on demand

PRODUCT INTRO

DDL discharger is aimed for workshop operations requiring discharge of batteries from 2V to 80-96-150V (depending on model).

The device works up to 150A discharging current and is capable of parallel setting (n.2 units, up to max. 300A or n.3 units up to max. 450A)

Integrated digital LCD display enables a complete overview and setting of main parameters.

USB port enables data-report available in .PDF and .XLS format.

TECHNOLOGY

AC mains: 1 phase 230Vac ± 10% / 50-60Hz

Battery voltage: from 2V to 80-96-150V (depending on model)

Discharging current: up to 150A (depending on model)

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°C

OPTIONALS

Parallel connection up to 3 modules: up to 450A discharging current - 120 Vac input version on demand

MECHANICAL CHARACTERISTICS

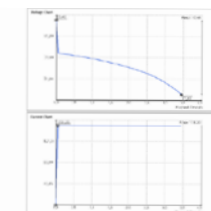
Dimensions	310 (w) 700 (h) 470 (l) mm
Weight	32 kg



EASY SETTING



USB



PARALLEL
PARALLEL
PARALLEL
SETTING
OPTION



2x = 300A

3x = 450A

HTU MULTI & HRC3

Multivoltage



SUITABLE BATTERIES

All types

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

HTU MULTI

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

Voltage selection made in single step (x2V each)



Standard charging mode

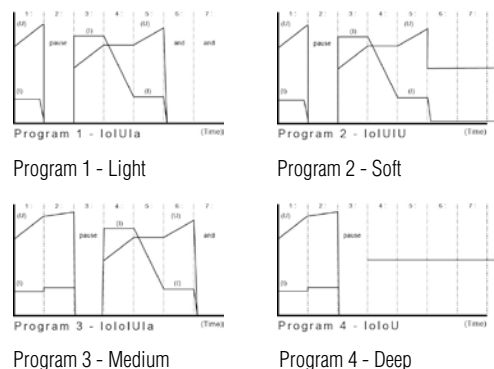


Desulphation mode

HRC3

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

HRC3 Battery refresh programs

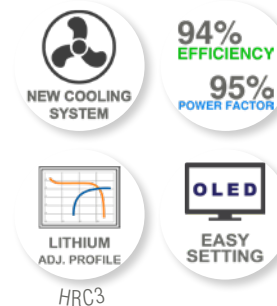


PRODUCT INTRO

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.



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, capacity and 7 pre-set charging profiles + desulphation mode	By OLED display: nom. Voltage, capacity and 4 pre-set battery refresh programs 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	
Cool-down system	Dedicated air cooling direct to heatsink only. Temperature-regulated fan speed. Fan idle within 40°C internal components temperature	
Efficiency	94%	
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

Stand alone	Charger iron stand
Stand alone/wall mounted	Cable holder

MECHANICAL CHARACTERISTICS

Dimensions	456 (w) 195 (h) 570 (l) 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

HKP MULTI

Multivoltage



V	A
6	15
12	50
24	50
36	50
48	50
72	35
80	30
96	25

MAIN APPLICATIONS



SUITABLE BATTERIES

All types

MODELS AVAILABLE

VAC	CODE	DESCRIPTION
1x230	HKP-M 96	Multivoltage 6-96V up to 50A

PRODUCT INTRO

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.



GENERAL CHARACTERISTICS

Mains	Vac 230V (1ph) +/-10% 50-60Hz
Visual signalling	OLED display, 4 LEDs and 4 control keys
Charger setting	By OLED display: current, capacity and 7 pre-set charging profiles + desulphation mode
Data memory (optional)	Charger gives a report of the last 50 cycles and key technical data by integrated USB port
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

OPTIONALS

Stand alone/wall mounted	Cable holder, charger iron stand
On board/stand alone/wall	Additional extra coating, pilot contact, charger status lamp

MECHANICAL CHARACTERISTICS

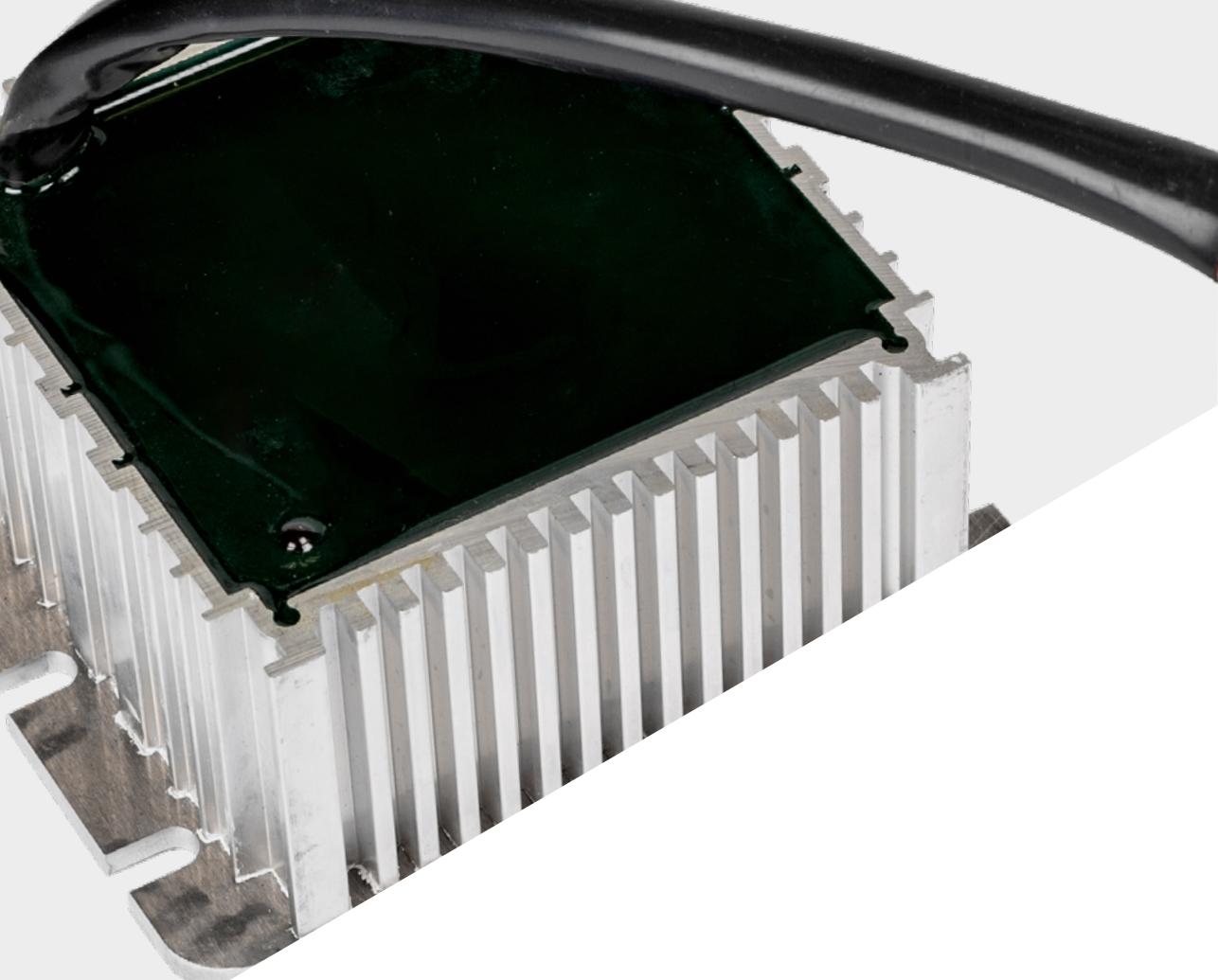
Dimensions	224 (w) 98 (h) 406 (l) mm
Protection degree	IP 21 (vertical)
Weight	9 kg
Input cable	2, 5 m +/- 10% (length) complete with Schuko plug 16A
Output cables	2, 5 m +/- 10% (length) – DC plug on demand



Standard charging mode



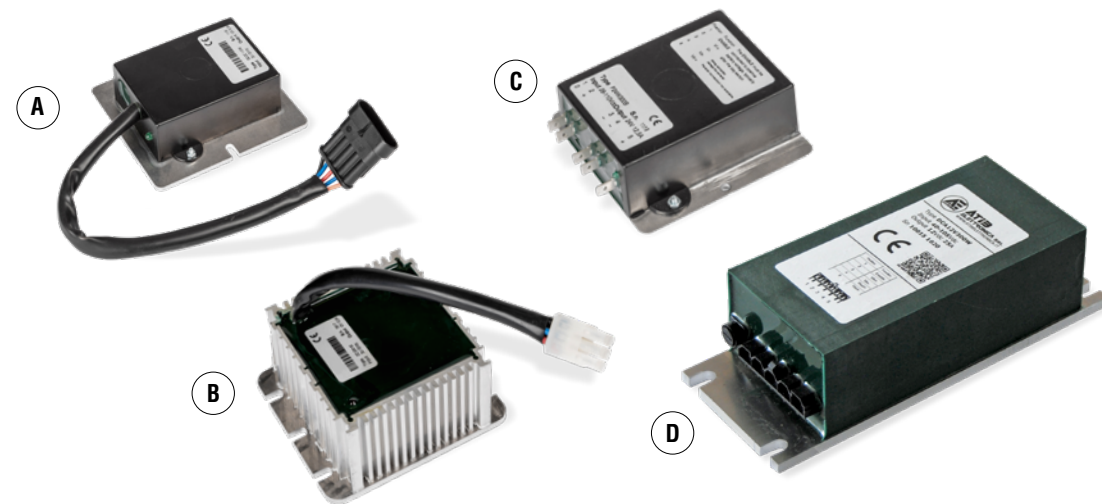
Desulphation mode



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



MODELS AVAILABLE

V	Power (W)	A	Input Voltage range	Case	CODE	Parallel connection	Galvanic isolation	Certifications
12	100	8,30	30-150	A	12V100W	✓	X	CE in conformity with LV and EMC protocols
12	150	12,50	30-130	B	12V150W	✓	X	
12	180	15,50	15-110	C	P12W180	X	X	
12	300	25,00	40-105	D	DCA12V300W	X	✓	
24	100	4,20	30-150	A	24V100W	✓	X	
24	300	12,50	30-130	B	24V300W	✓	X	
24	300	13,00	28-110	C	P24W300B	X	X	
24	300	12,50	40-105	D	DCA24V300W	X	✓	

SAFETY FEATURES

	A	B	C	D
Output crowbar protection	✓	✓	✓	internal limitation
Output short circuit protection	✓	✓	✓	✓

MECHANICAL CHARACTERISTICS

	A	B	C	D
Weight	0,5 kg	1,3 kg	0,5 kg	1,2 kg
Dimensions (mm)	100 (w) 35 (h) 110 (l)	130 (w) 55 (h) 115 (l)	91 (w) 37 (h) 90 (l)	76 (w) 50 (h) 190 (l)
Technical specification	See technical drawings			
Protection degree	IP65			

ATI3 CHARGERS

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