

IES reference: CHE+0007937 CHARIS + HF 24V 35A, relay. Input 230V/16A		TECHN Read o	NICAL DATA SHEET carefully before installation and connection of charger	
			Installation and use precautions	
	The CHARIS HF 2+ on-to outlet, and therefore end Before charging, the use complies with required s	board ch Is the ne er will hav afety sta	arger can be plugged into every 2P+E 230V 16Amps ed for a charge room. ve to make sure that the chosen place for charging ndards	
 Electric wiring must be conforming to NF C 15100 standards, or must comply with standard regulation in activity inside the country to power mains supply. Presence of grounding (earth) wire and frame with proper ground-fault protection breaker is mandatory. The electric socket must be of type every 2P+E 16A outlet (230V), correctly connected and protected by proper current-fault circuit breaker. Installation must comply with standard regulation in activity inside the country to power mains supply. Before charging, the state of connections and cables must be checked, and tightened if necessary. Charge has to proceed in a room without condensation or pollution and with sufficient ventilation. 			 The casing temperature is max. 10°C higher than th e ambient temperature, the expulsed air temperature max. 25°C higher. The manufacturer of electric vehicle will take all necessary precautions regarding the charger installation so as to prevent overheating, damage to surrounding parts and all risks to employees. Wait 10 minutes once charger has stopped before touching the casing. The charger is fan cooled. Do not obstruct air input and output. A sufficient air circulation to the outside of the charger must be ensured. Charger must not be exposed to oils or similar products. Charge to be made when truck is off. 	
The CHARIS + HF charger is designed :				
To be integrated into a t	pontly to the battery	the cha	iger cannot be outside of the truck).	
To be connected permanently to the battery.				
 To function in all positions To be connected to mains when the battery powered vehicle is not being used so as to always have fully charg batteries (see "other charge parameters"). 			nicle is not being used so as to always have fully charged	
 To allow partial recharging 	ng.			
Electrical specification charger	s of Rated supply voltage: 190Vac < U < 260Vac Mains frequency: 50 / 60 Hz +/-1Hz No Inrush current Max. Output power. : 1040 W +/- 3% Max. output current : 35 A +/- 2% Rated battery voltage: 24 V Voltage tolerance at threshold U: 1%			
Battery specifications & charging time	Battery types Numbers of c Capacity: 140 Typical charg	Battery types : Open or GEL lead-acid (charging profile selection by selector) Numbers of cellules : 12 cells of 2V Capacity: 140Ah min < Capacity < 380 Ah Max		

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General operating conditions	Storage temperature : -40°C to +60°C Operating temperature : -15°C to +40°C Relative humidity : 95% Weight : 2 kg Volume : 1.4 L	
Standards	PRODUCT WITH CE MARKING When IES specifications mention one or several standards, they exclusively refer to the product and do not take into account the influence of its integration into other systems. It is the manufacturer's responsibility to make sure the complete system conforms to standards. ELIPS HF chargers comply with following standards:	
	Safety -EN1175-1 -EN60335-2-29	
	-EN60950	
	Electromagnetic -EN61000-6-2 and EN61000-6-4 compatibility -EN61000-3-2 and EN61000-3-3	
Electric safety	• Reverse polarity protection: Charger is protected with a relay. After a reverse polarity connection, the user shall connect the battery again in the right way, a new cycle will start.	
	• Mains protection: with 1 time-lag fuse 250V 10A 5x20. The mains fuse is directly mounted on the PC Board. The user is not authorized to change this fuse. In case of a defect of this fuse, charger must be returned to after-sales service.	
Mechanical characteristics	Protection index : IP 20 (CEI 529)	
	All dimensions are in millimeters	

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Charger connection	 <u>Mains supply connection</u>: mains cable to be ordered separately. 2.50m mains lead with IEC 320 connector (female) and European molded plug. Mains cable connected to charger by means of IEC C13 connector (male). Cable maintained by fixation clips <u>Wire + to battery</u>: 6 mm² red cable with ring diameter 8 mm, length 1120mm +/-30 mm 			
	• <u>Wrie – to battery</u> . C	m ² with Minifit Junior 2Pts length 2	20mm +/-30 mm	
LED Indicator	Normal Functiona	litv		
	A charger is delivered	d with a tricolor bright indicator (LED) located at the back.	
	Functionality LEDs :			
	,	Phase	LED	
	Mains supply	disconnected	OFF	
	Phases I1, P,	U1, I2, U2	YELLOW BLINKING	
	Equalization	phase	GREEN BLINKING	
*	Stop Electing phase			
	Charging time	e too long or defect		
	Reverse pola	rity battery	OFF	
	GREEN or GREE	N BLINKING means: the batter	y is charged.	
Security relay	The charger is delive when the charger is	ered with a security relay in order to connected to Mains supply. Contact	prevent any utilization of the vehicle position is:	
	Contacts	Battery connected (YES / NO)	Mains connected (YES / NO)	
	OPEN	NO	NO	
	OPEN	NO	YES	
	CLOSE	YES	NO	
	OPEN	YES	YES	
	The relay has a breaking capacity of 10A maximum.			
Charge activation	Charging is activated simply by connecting the charger to mains supply Start up is not guaranteed if the battery voltage is below 10V.			
Curve selector	The choice of the cu	rve is carried out by a selector four	positions accessible on front face of	
	the charger:			
	Position 0 = open lead battery, 210Ah < capacity < 380Ah,			
	Position 1 = open lead battery, 140Ah < capacity < 210Ah, eg T105 Trojan			
	Position 2 = GEL lead-acid battery, 140Ah < capacity < 380Ah,			
	Position 3 = open lead Battery with permanent floating, 140Ah < capacity < 380Ah.			
	CAUTION: Position 0 & 1 are restricted to Open lead-acid battery.			
	DO NOT use GEL ba	attery with selector in position) or 1	
	The charger is delivered in position 2 (GEL) by default.			
Serial connection to PC	Serial communication:			
	A specific jack connector allows to link the charger to PC. Then, by using the software PROVISTA (IES proprietary) and a specific cable (not provided in standard with charger), it is possible to control, monitor, get the history of the charger.			

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Phase I1: maximum rated current **35A** is maintained as long as battery voltage is less than **28,2V**. This phase ends when battery voltage has reached **28,2V** (2,35V / cell).

- Phase U1: voltage is stable at **28,2V**. Note: Voltage will increase slightly up to +0.3V at the end of this phase due to influence of voltage drop into cables. The phase U1 ends either when the current has decreased to **3A** or when **5h** time out is reached.

-Phase U2: it provides the finishing of the battery. Voltage remains stable at 28,2V. The current continues to decrease down to 1,5A. In any case the phase U2 is time limited to 4h.

Note (1): during phase U2, the LED turns GREEN indicating that the battery can be used normally.

- Trickle charge: when the charger remains connected to mains, a new charge cycle is triggered every 24 hours after the end of the last charge cycle in order to compensate the auto-discharge.

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- Phase I1: maximum rated current 35A is maintained as long as battery voltage is less than 29,2V. This phase ends when battery voltage has reached 29,2V (2,43V / cell).

- Phase U1: voltage is stable at 27,8V (2,43V / cell). Note: Voltage will increase slightly up to +0.3V at the end of this phase due to influence of voltage drop into cables. The phase U1 ends either when the current has decreased to 3A or when 5h time out is reached.

-Phase floating (U2): voltage remains stable at 27,8V (2,43V / cell). The current continues to decrease down to a level, which compensates the self-discharge of the battery at least. For safety reason the current is not authorized to increase during this phase.

- **Trickle charge:** After 12h running in floating phase U2, the charger will restart automatically a new charging cycle (I1-P-U1-U2). This feature is called Trickle charge. It compensates either the self-discharge of the battery or the consumption of the application during the floating.

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Other charge characteristics

Equalization (only for Open lead- Acid profile)

To eliminate the phenomenon of sulfatation of cells of the battery, this stage starts automatically 15 minutes after the end of a complete charge only if seven complete charges have been made. The equalizing current is equal to half of the I2 boost current level. The equalization stops either when battery voltage becomes stable (variation of voltage less than **120mV / hours**) or when **4h** time out is reached.

Mains power interruption

In case of temporary power cuts, all parameters of charge in progress are stored in memory for a period of 13 minutes. As soon as power is back, the charge cycle continues from the point (I, U) attained just before power cut. The number of ampere-hours already charged are stored into the memory of the microcontroller.

If the power cut lasts more than 13 minutes, the charger assumes that the vehicle has been used then parameters are reset. Charger is ready for a new charging cycle.

Protections during charge

Temperature safety facility

A self-protection facility ensures that the charger decreases output current when charger's internal temperature exceeds a nominal value. The charger continues automatically the charge cycle when temperature has decreased. If a temperature default is detected, the charger automatically stops. Then the LED turns RED blinking

Security time out & fault indication

If the security time out is reached during cycle (see indication into respective profile above), then the charging cycle will be interrupted and the LED will turn RED blinking. This problem may occur if one or several battery elements would failed (eg: short-circuit) or if ambient temperature would be too high.

It is recommended to check the battery state before to restart the charger.

The charger returns to normal state by simple disconnection / reconnection of the mains. The LED stops blinking at the next connection of the mains.

If the charger doesn't start	- The black cable is correctly connected to the negative pole of the battery and the red cable to the positive pole of the battery.
please check:	- The battery voltage is over 10V.
	- There isn' any corrosion or oxidation on the two battery terminals
	- The position of the curve selector is correct.
	- The battery type complies with the ones listed into technical specification (page 1).
	- The level Mains voltage must be in the range specified (page1).

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