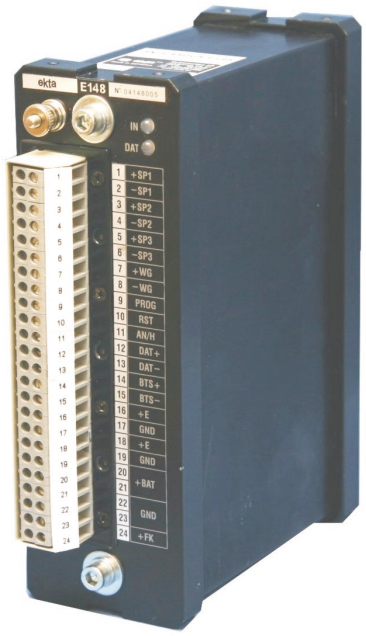
POWER SUPPLIES

Charger E148 using solar or wind energy

The lifetime and capacity of a battery used in power supply systems strongly depends on the operation conditions and on the charging process. This is particularly important when using solar and wind energy due to irregularity of them. For instance, the amount of available solar energy during the winter months is very small and one has to operate using the energy accumulated in summertime. Therefore, the charging system has to keep the batteries as full as possible while not overcharging them. Overcharging would lead to boiling out of the electrolyte and thus, to the damage to the batteries. Cybernetica AS has taken special efforts to find the most efficient methods of charging the batteries and, as a result, the optimizing battery charger E148 has been developed. The purpose of the charger is to guarantee the power supply of autonomous systems using solar and/or wind or wave energy for charging the lead or gel batteries. When optimizing the charging procedure the type, nominal voltage, capacity and the charge factor of the battery as well as temperature of the ambient air are taken into consideration. The optimization will be performed by a programmable microcontroller. The charger is ready to be integrated into a remote control and monitoring system.

Features



- charging of lead or gel batteries of nominal voltage 12 V and of capacity from 30 up to 999 Ah using solar or wind or wave energy. The voltage converter of the charger follows the voltage of the battery and optimizes the charging process.. The charge factor will be determined by the microcontroller measuring of current, voltage, and temperature of the battery

- periodical checking discharges and formation of the battery to be initialized either locally by the maintenance program, or remotely by the control and monitoring system

- heating of the battery when the temperature of it lowers below 0°C until it raises up to +3°C (in case there is enough energy in the battery)

- sending of emergency and diagnostic messages to the control and monitoring system about the voltage, temperature and charge factor of the battery and accumulated charge during the last twenty-four hours

- storing of statistical data about the last 8 changes of the state of the battery and 512 diagnostic records about mean voltage and current of the battery and energy sources.

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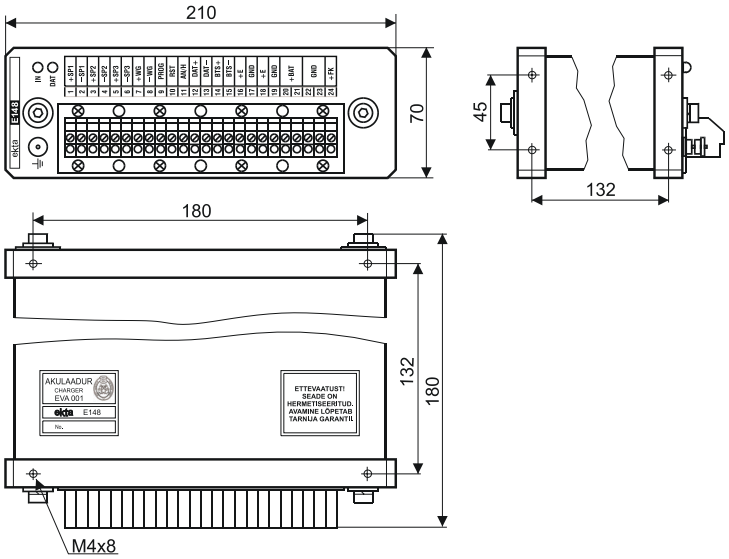
Specifications

Parameter	
Solar energy sources	from 1 up to 3 solar panels, e.g. LA361 K51
Wind energy source	wind generator, e.g. WINDSIDE W0,3
Wave energy source	any wave generator not overloading the inputs of the charger,
Nominal voltage of lead or gel battery	12 V
Current of one input	8 A maximum
Total input current	20 A maximum
Battery formation current	15 A maximum
Heating of batteries	below 0°C, up to +3°C of temperature of ambient air
Ambient air temperature	from -30°C up to +50°C (IEC 60068-2-1, IEC 60068-2-2)
Relative humidity	up to 98% at temperature +35°C (IEC 60068-2-30)
Operation in salt mist conditions	allowed (IEC 60068-2-52)
Mechanical vibration	10 – 500 Hz with acceleration 2,2 g (IEC 60945 section 8.7)
Ingress protection	charger shuld be placed into a cabinet with ingress protection to IP 64 (IEC 60529)



Layout and dimensions of the charger E148