

Translation: Only the Danish version has legal validity.

Guidance no. 6 of 28 August 1995 issued by the Danish Maritime Authority

Guidance on the installation of valve-regulated batteries in Danish ships

As the use of valve-regulated batteries in Danish ships becomes still more widespread, this guidance has been drawn up, stipulating more detailed guidelines on the installation.

Design

1. Valve-regulated batteries contain electrolyte of the same concentration as the open types, however in a smaller quantity since there is no electrolyte reserve below and above the plates. All the acid in the battery is absorbed by partly the positive and negative plates, partly by special separators (or by a jelly) between these. Thus, there is no free-flowing electrolyte that will run out in case of leakages.
2. This type of battery will create a slight overproduction of hydrogen. This creates a slight overpressure in the battery, which will increase the effectiveness of the recombination.
3. The battery is fitted with a “pressure control valve” for adjusting this pressure. Furthermore, the valve releases surplus gas from the battery in case of heavy overload and prevents atmospheric air (oxygen) from coming in from the outside.

Installation

4. Where acid is used as electrolyte, the batteries must be placed in trays treated with a resistant material.
5. Cells and/or cell boxes must be mutually supported and stiffened by non-absorbing, insulating material so that any displacement of cells and/or cell boxes is avoided when the ship moves.
6. Batteries must be placed so that all cells or cell boxes are accessible from the termination side. It is possible to place the batteries arbitrarily provided that the battery manufacturer so recommends.
7. The signing must contain information about the type of battery and a warning NOT to replace the type by batteries of another type.

Placing

8. It is permitted to use valve-regulated batteries with different types of electrolyte in the same room.

9. It is permitted to install other electrical equipment in rooms containing valve-regulated batteries. There are no special requirements for this equipment.
10. In rooms where valve-regulated batteries are located, a “normal air change” must be ensured, which is defined as the air in a room being changed once every hour. In case of the placing of batteries of more than 10 kW and in case of boost charging, ventilation must be established as for open batteries.

Boost charging: 2.65 v/cell

Increased voltage: 2.45 v/cell

Charging facilities

11. In normal use or in other situations where a load is connected to the battery while it is being charged, the maximum battery voltage must not exceed a value for which the connected apparatus is designed. A voltage-regulated charger must always be used, operating according to the DIN standard, the IU curve.
12. Where the connected apparatus is not designed for operating at the maximum battery voltage, it must be connected to the battery via a voltage regulator or another regulating device ensuring the correct supply voltage for the apparatus.
13. Where valve-regulated batteries are installed according to items 10 and 12, a separate electronic circuit must be established sounding an alarm if the battery voltage exceeds the maximum value recommended by the battery manufacturer.
14. The charger must be fitted with a distinct warning sign with the following text:

DISCONNECT THE CHARGER BEFORE WORKING WITH BATTERY CONNECTIONS
(Danish text: AFBRYD LADEREN FØR DER UDFØRES ARBEJDE MED
BATTERIFORBINDELSER)

15. Where a low voltage battery is connected to the ship’s net installation via a series resistor, all apparatuses connected to the battery must be designed to resist the tension between the ship’s net installation and earth. A distinct warning sign with the following text must be affixed:

DISCONNECT THE CHARGER CIRCUIT BEFORE WORKING WITH A CIRCUIT
CONNECTED TO THE BATTERY
(Danish text: AFBRYD LADEKREDSLØBET FØR DER UDFØRES ARBEJDE MED
KREDSLØB FORBUNDET TIL BATTERIET)

16. The charger equipment connected must be designed so that it is possible to fully charge the totally discharged battery within a reasonable period of time in consideration of the use of the battery. Batteries with especially low nominal voltage used in shift operation for communication purposes (a battery in operation while a similar battery is being recharged)

must be charged by means of a charging current corresponding to the average discharging current in the operational phase.

17. Charging equipment must be fitted with suitable control equipment, including an ammeter and voltmeter for controlling the charging of each battery and for protecting the battery against discharging through the charger circuit. Charging equipment for valve-regulated batteries should have a temperature-compensated charging current governed by temperature sensors on the battery.

Danish Maritime Authority, 28 August 1995