INTERNATIONAL STANDARD

ISO 8849

Second edition
2003-10-01

Small craft — Electrically operated direct-current bilge pumps

Petits navires — Pompes de cale à moteur électrique en courant continu

Reference number
ISO 8849:2003(E)

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 8849 was prepared by Technical Committee ISO/TC 188, *Small craft*.

This second edition cancels and replaces the first edition (ISO 8849:1990), which has been technically revised.

Small craft — Electrically operated direct-current bilge pumps

1 Scope

This International Standard specifies requirements for electrically operated direct-current bilge pumps intended for use in removing bilge water from small craft with a hull length up to 24 m. It applies to electrically operated bilge pumps rated for less than 50 V direct current (d.c.).

This International Standard does not cover pumps intended for damage control.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 8846:1990, *Small craft — Electrical devices — Protection against ignition of surrounding flammable gases.*

ISO 10133:2000, *Small craft — Electrical systems — Extra-low-voltage d.c. installations*

IEC 60529:2001, *Degrees of protection provided by enclosures (IP Code)*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
automatic pump
pump that is equipped with a sensing means that activates and deactivates the pump at predetermined liquid levels

3.2
ignition-protected device
device that complies with the requirements of ISO 8846

3.3
nominal voltages
voltages that are commonly used on small craft with direct current, such as 6 V, 12 V and 24 V

3.4
non-submersible pump
pump designed to be operated above water

3.5
submersible pump
pump designed to be operated completely immersed in water

3.6
design voltage
113 % of nominal voltage

4 General requirements

4.1 Bilge pumps shall be designed to operate continuously at 87,5 % of nominal voltage, i.e. 10,5 V for a 12 V system, 21 V for a 24 V system, up to their design voltage at the point within the range of performance recommended for the pump that results in the highest power consumption

4.2 Bilge pumps and devices used to convert bilge pumps to automatic operation shall be ignition-protected in accordance with the requirements of ISO 8846 and shall meet the electrical requirements of ISO 10133.

4.3 Bilge pumps shall be rated in litres of water flow per minute or per hour at nominal voltage, at static pressures of 0 kPa, 10 kPa and 20 kPa, i.e. 0 m, 1 m and 2 m output lift, with 1,5 times the lift in a smooth-bore hose length of an inside diameter equal to the pump-outlet outside diameter fixed to the pump-outlet.

The pump rating and capacities shall be stated in the installation and operating instructions provided with the pump.

The pump rating shall include the maximum output pressure and lift at which the pump ceases operation, i.e. the discharge of water.

4.4 Bilge pumps shall be provided with means of fastening them to the craft independently and securely.

4.5 Materials used in the construction of bilge pumps, which can be expected to come in contact with sea water, shall be

— selected or coated to be resistant to corrosion,

— galvanically compatible, and

— resistant to deterioration by bilge-cleaning agents and intermittent exposure to petrol (gasoline), oil and diesel fuel.

4.6 Submersible pumps shall be provided with a strainer or other means of preventing debris entering the pump inlet. Inlet strainers and screens shall be designed such that they can be cleaned.

4.7 Installation and operating instructions shall be available for each bilge pump. An electrical diagram shall be provided. It shall identify each conductor and shall include the proper location of the control switch(es) in the circuit and the bonding connection, if applicable. The recommended overcurrent protection for non-integrally protected bilge pumps shall be stated.

Installation instructions shall require remote-mounted pumps to be fitted with a strainer or other means of preventing debris from entering the pump inlet.

4.8 Centrifugal and axial flow pumps shall be capable of operating dry at their design voltage for at least 7 h without creating a fire hazard. Alternatively, a means integral with the pumps shall be provided to shut the pump off automatically to prevent a fire hazard.

4.9 Positive or semi-positive displacement pumps, i.e. those in which the impeller may be in continuous contact with the housing when operating dry, shall be capable of operating dry for at least 5 min without damage to the impeller or housing and for at least 1 h without creating a fire hazard. Alternatively, a means integral with the pumps shall be provided to shut the pump off automatically to prevent a fire hazard. A label shall be provided cautioning against operating the pump dry for more than 1 min.

5 Electrical requirements

5.1 Bilge pumps shall be of the two-wire type or three-wire type if for manual or automatic operation, with both power (positive) and return (negative) conductors insulated from the motor housing and the pump housing.

5.2 Conductors used for connection to the power supply shall be of stranded copper meeting the size, current capacity and insulation requirements of ISO 10133.

5.3 Submersible pumps shall have watertight electrical connections, IP 56 in accordance with IEC 60529. The use of a length of watertight electrical cable sealed at the pump connection is recommended, so that connections to the power supply may be made above the normal bilge-water level.

5.4 Metallic parts of the pump housing that could be exposed to contact with bilge water and may become a source of stray current leakage shall have provisions for bonding conductor connections.

Exception: pumps designed with a double-insulated electrical system, requiring a break in two distinct insulation systems before electrical leakage can reach exposed metallic parts, do not require a bonding connection.

5.5 Bilge pumps shall be protected against continuously locked rotor conditions by

— integral overcurrent protection, or

— overcurrent protection in the circuit of a size to protect the bilge-pump motor, or

— being capable of sustaining operation with a locked rotor for 7 h without generating surface temperatures in excess of 150 ºC, at an ambient temperature of 60 ºC, and without evidence of charring, burning or melting.

5.6 Bilge pumps shall be capable of withstanding a d.c. voltage of 500 V for 1 min without leakage in excess of 1 mA. The test voltage shall be applied between the current-carrying parts and the non-current-carrying metal parts. If the pump is internally earthed, the earth connection shall be broken in order to carry out this test.

5.7 Bilge pumps designed for automatic operation shall be provided with an override switch to permit manual operation if the automatic operation fails.

6 Marking

Each bilge pump shall be marked as follows by a name-plate or other equally permanent means with at least the following information:

— manufacturer’s name or identification;

— model and/or serial number;

— electrical rating in volts and amperes;

— ISO 8849;

— output rating at 10 kPa (1 m lift) (see 4.3).

ICS 47.080

Price based on 3 pages