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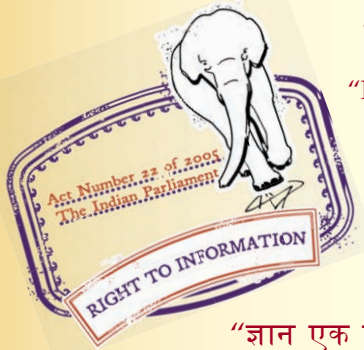
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IS 12717 (1989): Functional requirements of fire fighting equipment - High capacity portable pumpset (1100-1600 1/min) [CED 22: Fire Fighting]



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Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”



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IS 12717: 1989
REAFFIRMED 2010

Indian Standard

**FIRE FIGHTING EQUIPMENT — HIGH
CAPACITY PORTABLE PUMP SET
(1100-1600 l/min) — FUNCTIONAL
REQUIREMENTS**

UDC 614:8463

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BUREAU OF INDIAN STANDARDS
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NEW DELHI 110002

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Price Group 2

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards on 20 June 1989, after the draft finalized by the Fire Fighting Sectional Committee had been approved by the Civil Engineering Division Council.

Portable pump set is one of the essential equipments for fire fighting. In view of its lighter weight and portability, it can be carried almost anywhere. It is specially used in small factories, railways, dockyards/arcas where there are narrow lanes, rural areas and towns where water is scarce.

Based on the indigenous development so far, an Indian Standard covering the capacity up to 275 l/min was formulate (*see* IS 942 : 1982 'Functional requirements for 275 l/min portable pump set for fire fighting (*second revision*)'. However, this capacity was not found sufficient for fighting big fires and based on knowhow available in other countries, it has been possible to develop higher capacity of portable pump sets which are covered in this standard.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

FIRE FIGHTING EQUIPMENT — HIGH CAPACITY PORTABLE PUMP SET (1 100-1 600 1/min) — FUNCTIONAL REQUIREMENTS

1 SCOPE

1.1 This standard lays down requirements for materials, design and construction, workmanship and finish of high capacity portable pump set (between 1100 to 1600 1/min) for fire fighting purposes.

2 REFERENCES

2.1 The Indian Standards listed in Annex A are necessary adjuncts to this standard.

3 GENERAL REQUIREMENTS

3.1 The unit shall consist of a pump, an internal combustion engine mounted on a tubular steel cradle.

4 MATERIALS

4.1 Pump Casing, Delivery Outlets and Impeller

Aluminium alloy Grade 4600, 4450, 4223 or 4923 of IS 617 : 1975 or leaded tin bronze Grade II of IS 318 : 1962 or of stainless steel Grade 04 Cr Ni 10 of IS 6603 : 1972.

4.2 Pump Shaft, Delivery Valve, Spindle and Wear Rings, Stainless steel Grade VII Cr 13 Ni 9 of IS 6603 : 1972.

4.3 Fuel Tank, mild steel sheet conforming to IS 513 : 1986.

4.4 Tubular Frame, mild steel tubes conforming to IS 3601 : 1984.

4.5 Exhaust Gas Ejector Primer

4.5.1 Valve Body, same as in 4.1 in respect to aluminium alloy and leaded tin bronze.

4.5.2 Priming Lever, same as in 4.1 in respect to aluminium alloy.

4.5.3 Priming Pipe, brass conforming to IS 407 : 1981.

4.5.4 Ejector Nozzle, same as in 4.2 in respect of stainless steel.

5 DESIGN AND CONSTRUCTION

5.1 Engine

The engine shall have not less than 3 cylinders and shall conform to IS 10004 : 1981 and shall have sufficient power to give the required out-

put. The engine shall be electric start with 12 V battery of 92 A capacity and be provided with a well designed hand starting back up device, preferably of the recoil rope type. The engine shall be fitted with generator/alternator for charging 12 volt battery.

5.2 The engine shall be water cooled. Indirect cooling system, if provided, shall be of the closed circuit type filled with adequate capacity heat exchanger to prevent overheating and to maintain engine temperature in range recommended for the engine. The heat exchanger shall incorporate copper coils and shall be provided with a drain plug to ensure drainage of cooling water.

5.3 The engine fuel tank shall have the capacity to allow running of pump for minimum one hour continuously at the rated output. It shall be provided with an opening of size 35 mm in diameter (minimum) located at a suitable position for easy refilling and checking the contents.

5.4 The engine exhaust shall be so arranged as to discharge on the opposite side of pump suction/operating side.

5.5 Pump

5.5.1 The pump shall be single stage centrifugal type directly mounted to the engine and driven preferably through a flexible coupling. The pump shall be designed to have easy access to the impeller with the outer face carrying suction/delivery, priming device, etc. The shaft shall be supported on antifriction bearing external to the casing. Pump shall be fitted with a self adjusting mechanical seal which consists of a carbon ring running on stainless steel face. A drain plug shall be provided at the bottom of the pump casing/volute. The pump suction shall have round threads (*see* IS 902 : 1974). The delivery shall be fitted with two numbers of instantaneous couplings (*see* IS 902 : 1974) with screwdown valves. The pump suction and delivery outlets shall be provided with blank caps.

5.5.2 The impeller shall be dynamically balanced and the pump shall be hydraulically tested to a pressure of 16.5 kgf/cm² for a period of 2 minutes.

5.5.3 The pump shall be tested for its performance duties with only internal and suction strainer fitted at suction lift of 3 m.

Sl No.	Output	At pressure
1	The rated value, (that is value between 1 100 to 1 600 l/min)	7 kgf/cm ²
2	70 percent of rated value	Min 8.5 kgf/cm ²

5.5.4 The pump shall be tested for the performance duties given in 5.5.3 at the water temperature of $27 \pm 2^\circ\text{C}$ and at a pressure of 760 mm of mercury to give its rated output for 4 hours continuously. The following allowances (deductions) shall be made:

a) Allowance for output:

- 1) One percent for every 2.5°C rise in water temperature,
- 2) Four percent for every 300 m above mean sea level, and
- 3) No allowance shall be made for humidity up to 75 percent. However, an allowance at the rate of 1 percent for every 3 percent change in humidity shall be made when humidity ranges from 75 to 95 percent.

b) Allowance for lift:

- 1) 300 mm for every 300 m above mean sea level, and
- 2) One percent for 2.5°C rise in water temperature.

5.6 Primer

5.6.1 Primer Test

Primer should be capable of lifting water from a depth of 7.0 m in 30 seconds when connected by 4 lengths of suction hose of 2.5 m each (100 mm dia) (the depth measurable from the eye of the impeller).

5.6.2 The primer shall be preferably exhaust gas ejector type operated by the priming lever.

5.7 Control Panel

The control panel shall include the following:

- a) Throttle control.
- b) Cold start control-choke,
- c) Primer control (lever),
- d) Ignition interrupter switch,
- e) Pump suction compound gauge,
- f) Pump delivery pressure gauge,
- g) Engine oil pressure gauge,
- h) Flood light,
- j) Engine water temperature gauge, and
- k) Engine battery condition indicator/meter.

The above controls and gauges shall be grouped conveniently and the panel shall be mounted adjacent to pump suction/delivery.

5.8 Frame

It shall be fitted with 4 numbers (two forward and two rear) spring loaded lifting handle capable of folding inside when not in use. A pair of detachable wheels may be provided.

6 WORKMANSHIP AND FINISH

6.1 All parts of the unit shall have good workmanship.

6.2 The frame and fuel tank shall be painted in fire red colour except the parts built of stainless steel namely, fuel tank, tubular frame work, etc.

7 INSTRUCTION BOOK AND EQUIPMENT

7.1 Instruction book including both operating and normal maintenance procedures shall be provided for the guidance of the user. The book shall include an itemized and illustrated spare parts giving reference numbers of all the parts.

7.2 Equipment

The following equipment shall be provided along with the pump unit:

- a) 100 mm suction hose in 4.5 or 2.5 m length with 100 mm suction hose couplings (see IS 902 : 1974) — 2 Nos/4 Nos;
- b) Suction wrenches for 100 mm suction hose couplings (see IS 4643 : 1968) — 2 Nos.;
- c) Suction strainer for 100 mm suction hose (see IS 907 : 1955);
- d) Basket stainer suitable for 100 mm suction hose;
- e) Adapter of size 65 mm (male) instantaneous coupling \times 100 mm female suitable for RT (right hand threads); and
- f) Tools

A tool kit comprising all essential tools required for normal maintenance.

8 MARKING

8.1 Each pump unit shall be clearly and permanently marked with the following information:

- a) Manufacturer's name and trade name,
- b) The output capacity of pump in l/min,
- c) Weight of the pump set,
- d) Year of manufacture,
- e) Serial nos. and type of engine and pump, and
- f) Short instructions for operation of the pump set.

ANNEX A
(*Clause 2.1*)

LIST OF REFERRED INDIAN STANDARDS

<i>IS No.</i>	<i>Title</i>	<i>IS No.</i>	<i>Title</i>
IS 407 : 1981	Specification for brass tubes for general purposes (<i>third revision</i>)	IS 907 : 1884	Specification for suction strainers, cylindrical type for fire fighting purposes (<i>second revision</i>)
IS 513 : 1986	Specification for cold-rolled low carbon steel sheets and strips (<i>third revision</i>)	IS 3601 : 1984	Specification for steel tubes for mechanical and general engineering purposes (<i>first revision</i>)
IS 617 : 1975	Specification for aluminium and aluminium alloy ingots and castings for general engineering purposes (<i>second revision</i>)	IS 4643 : 1984	Specification for suction wrenches for fire brigade use (<i>first revision</i>)
IS 902 : 1974	Specification for suction hose couplings for fire fighting purposes (<i>second revision</i>)	IS 6603 : 1972	Specification for stainless steel bars and flats
		IS 10004 : 1981	Performance requirements for spark ignition engines for automotive purposes

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