

## Technical Specifications

### Ice Line Refrigerator- ILR (small)

#### 1. Description of Function:

- 1.1 Ice-lined refrigerators maintain temperatures of +2°C to +8°C. Not more than 8 hrs continuous or intermittent power should be sufficient per 24 hrs. to maintain vaccine temperature below 8 deg. C.
- 1.2 Ice-lined refrigerators are required at district, regional and PHC levels, since electricity supplies are rarely perfect and standby electricity supplies may not be available.

#### 2 Operational Requirements:

- 2.1 Vaccine storage is required for RI, Campaign and new vaccine introduction.
- 2.2 Designed for tropical climates.
- 2.3 Target holdover time should be 20 hrs or more in a continuous external temperature of 43 deg C.
- 2.4 Hot and cold compressor starting at 172 volts (22% below rated voltage).
- 2.5 Manufacturing process of the product should not use or produce hazardous chemicals-gases.
- 2.6 Provision for drainage for the waste water.
- 2.7 Should have legs in the base with rotating screw type height adjustments to balance the weight on uneven floor.
- 2.8 The unit should have ground clearance of minimum 100 mm.

#### 3 Technical Specifications:

- 3.1 Net Vaccine Storage Capacity: 90 to 105 liters within basket in place.
- 3.2 Construction:
  - 3.2.1 Internal: Stainless 304 grade steel 20 guage and
  - 3.2.2 An additional special ice lining consisting of icepacks covered by strong plastic shell.
- 3.3 External: Corrosion Resistance (CR at least 1 mm thickness)
- 3.4 Chest type with CFC – free insulation
- 3.5 Should have horizontal water cool pack covering the top of the basket.
- 3.6 Solid door with lock and handle
- 3.7 Type: Compression Cycled, CFC-Free (both for refrigeration and insulation) All system tubing (suction tube, freezer tube and condensing tube) should be of minimum 99.97% of pure copper coil.
- 3.8 Temperature of a full vaccines to remain +2 deg C to +8 deg C during continuous availability of energy at ambient temperature +5 to +45 deg. C with intermittent/continuous electricity supply 8 hrs in a 24 hrs cycle. The temperature difference between any two points in the cabinet should not be more than +2 deg.C once stabilized.
- 3.9 Inlet of Capillary should be outside the PUF body.
- 3.10 ON/OFF Switch and power indicator should be available
- 3.11 A Micro-processor based control unit should be provided for setting of temperature and display following features:

- 3.11.1 3 digit digital display (to one decimal point) of cabinet temperature. The sensor should be placed 25 to 50 mm above base of storage chamber.
  - 3.11.2 Power on LED/LCD indicator
  - 3.11.3 Audio (minimum 65 dBA) and visual alarm against the violation of temperature range (less than +2 and more than +8 degree C)
  - 3.11.4 Min. & Max. cabinet temperature digital display of last 24 hrs. and breaches during last 24 hrs.
  - 3.11.5 The unit should be sealed protected from dust, moisture or condensed water falling over it.
  - 3.12 Accuracy for digital controller +/- 0.5 degree centigrade.
- 4 System Configuration
- 4.1 Programmable Micro-processor control unit with child lock facility.
  - 4.2 Should have provision to set minimum and maximum temperature at 0.1 degree Centigrade to programme the unit for continuous operation.
  - 4.3 Should have provision for defrosting program.
- 5 **Accessories, spares and warrantee:**
- 5.1 The equipment should have minimum warrantee of sixty months after installation or sixty six months after the supply whichever is less.
  - 5.2 Vaccine Storage Basket allowing free circulation of air, having the size to be able to accommodate 4 to 6 of them in the unit and suitable to match the net volume requirement. It should be minimum 5 wire basket.
  - 5.3 Stem Alcohol thermometer (specifications and standard as per MOHFW approved **Annexure-1**) - one piece per unit range of -30 to +50 degree centigrade.
  - 5.4 The supplier is required to maintain all the spare parts throughout the warrantee period and not less than ten years.
  - 5.5 The supplier should provide the following spare parts for every 10 units. All spare parts will be supplied at respective state head quarter. The actual list of the consignee will be provided at the time of NOA.
    - 5.5.1 Starting device for compressor- 10
    - 5.5.2 Capacitor for compressor -10
    - 5.5.3 Thermostat for refrigerator use -10
    - 5.5.4 Compressor-01
- 6 Environmental factors:
- 6.1 The unit shall be capable of being stored continuously in ambient temperature of 0 to 50deg C and relative humidity of 95%
  - 6.2 The unit shall be capable of operating continuously in ambient temperature of 5 to 45 deg C and relative humidity of 90%
  - 6.3 The plug should be flexible and unbreakable sealed rubber type.
- 7 Power Supply:
- 7.1 Power input to be 220-240VAC, 50Hz as appropriate fitted with Indian plug
  - 7.2 Voltage stabilizer as per the MOHFW approved specifications and standard enclosed as **Annexure-2**
- 8 Standards and Safety
- 8.1 Product should be FDA or CE approved.
  - 8.2 Should meet WHO/UNICEF Standard WHO/PQS/E03/RF03.1.for Ice Lined Refrigerators.

- 8.3 Test and inspection as per WHO procedure reference WHO/PQS/E03/RF03-VP.1  
Testing should be carried out from WHO certified lab/NABL/STQC Labs.
- 8.4 Colour code : WHITE
- 9 Documentation:
- 9.1 A paper copy of user/operator manuals to be supplied in English.
- 9.2 A paper copy of technical/wiring diagram/maintenance manuals to be supplied in English.
- 9.3 Certificate of inspection for technical compliance from an independent laboratory approved /recognized by WHO certified /National Accreditation Board for laboratories/STQC Labs is essential. Certificate of testing should be currently valid till the supply and same must be verified by inspecting authority.
- 9.4 List of important spare parts and accessories with their part number and costing.
- 10 Packing of the equipment during shipment:
- 10.1 The supplier should provide strong and sufficient packing to ensure safe arrival of goods at the destination free from loss or damage.
- 10.2 A vertical arrow should be marked at the all sides of packages to ensure transportation of equipment in vertical position. TOP and BOTTOM should also be written.
- 10.3 To put label and signage's for HANDLE WITH CARE ON ALL SIDES OF THE CRATES as per packing & shipment norms.
11. Following messages should be written at the Top of the ILR
- 11.1 Place refrigerator at least 10 cms away from the wall and 20 cms away from other equipment for free air circulation.
- 11.2 Use voltage stabilizer provided with the ILR
- 11.3 Safe temperature range +2 to +8°C
- 11.4 Store all UIP vaccines in ILR at CHC/PHC (OPV should be stored in deep freezer at State/Regional and district vaccine store)
- 11.5 Open the lid, only when needed
- 11.6 Store only UIP vaccines (at PHCs store vaccines and diluents).
- 11.7 Keep all vaccine in wire baskets provided.
- 11.8 Leave space between the vaccine boxes for air circulation.
- 11.9 Place a thermometer in the basket in between the vaccines.
- 11.10 Keep freeze sensitive and closer expiry vaccines at TOP of the basket
- 11.11 Keep heat sensitive and further expiry date vaccines in the bottom of basket.
- 11.12 Avoid removing thermometer from the unit while reading temperature.
- 11.13 Net vaccine storage capacity in Litres
- 11.14 Hold over time in hrs.

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