SHAKTI SBS-620 S
BATTERY CUM HAND OPERATED KNAPSACK SPRAYER
(FITTED WITH SOLAR PANEL)

Government of India
Ministry of Agriculture and Farmers Welfare
Department of Agriculture, Cooperation and Farmers Welfare
Northern Region Farm Machinery Training and Testing Institute

Tractor Nagar, Sirsa Road, HISAR (Haryana)-125 001

Website: http://nrfmtti.gov.in/

E-mail: fmti-nr@nic.in

Tele./FAX: 01662-276984
### SHAKTI SBS-620 S

**BATTERY CUM HAND OPERATED KNAPSACK SPRAYER**  
(FITTED WITH SOLAR PANEL) (COMMERCIAL)

<table>
<thead>
<tr>
<th>Skirt/ stand</th>
<th>Steel, plastic</th>
<th>Plastic</th>
<th>Conforms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strap buckle</td>
<td>Steel, Engg. Plastic</td>
<td>Plastic</td>
<td>Steel</td>
</tr>
<tr>
<td>Cushion</td>
<td>Foam rubber, foam plastic</td>
<td>Foam</td>
<td>Conforms</td>
</tr>
</tbody>
</table>

xxxiv) The material used for different components shall be declared by the manufacturer, all the components mentioned in the table-I may not be present in a particular sprayer.  
Declared in the specification sheet.  
Conforms

---

### 3. TEST FOR DISCHARGE RATE OF PUMP

(Vide Clause 8.3 of IS: 11313 - 2007)

1. Date of test : 05.05.2017
2. Atmospheric conditions :
   a) Temperature : 32.3 °C
   b) Relative humidity : 46.4%
   c) Pressure : 97.9 kPa
3. Data recorded

<table>
<thead>
<tr>
<th>Speed of Pump (rpm)</th>
<th>Working pressure (kg/cm²)</th>
<th>Test No.</th>
<th>Delivery from the discharge line (ml/min)</th>
<th>Overflow (ml/min)</th>
<th>Average discharge from the discharge line (ml/min)</th>
<th>Discharge rate of pump (ml/min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3628</td>
<td>1.0</td>
<td>1</td>
<td>2850</td>
<td>NIL</td>
<td>2837.5</td>
<td>2837.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2</td>
<td>2830</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
<td>2820</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td>2850</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3479</td>
<td>2.0</td>
<td>1</td>
<td>2200</td>
<td>NIL</td>
<td>2207.5</td>
<td>2207.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2</td>
<td>2200</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
<td>2220</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td>2210</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3470</td>
<td>3.0</td>
<td>1</td>
<td>1520</td>
<td>NIL</td>
<td>1492.5</td>
<td>1492.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2</td>
<td>1460</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
<td>1480</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td>1510</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3454</td>
<td>4.0</td>
<td>1</td>
<td>1290</td>
<td>NIL</td>
<td>1282.5</td>
<td>1282.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2</td>
<td>1270</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
<td>1280</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td>1290</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Minimum discharge rate = 1282.5 ml/min at 4.0 kg/cm²
Maximum discharge rate = 2837.5 ml/min at 1.0 kg/cm²
Discharge at rated pressure = 1492.5 ml/min at 3.0 kg/cm²
4. TEST FOR VOLUMETRIC EFFICIENCY
(Vide Clause 8.4 of IS : 11313 - 2007)

Rated pressure, kg/cm² : 3
Discharge of water at rated pressure l/min : 1.500
Discharge of water at no load, l/min : 3.298
Pump speed at no load, rev/min : 3761
Pump speed at rated pressure, rev/min : 3470
Volumetric efficiency of pump, % : 49.30

Remark:- The volumetric efficiency does not conform to the requirement of IS:11313-2007.

5. POWER REQUIREMENT
(Vide Clause 8.5 of IS – 11313 : 2007)

The power requirement of DC motor fitted on sprayer was observed as following.

1. Motor operating voltage : 12 V
2. Avg. current drawn by motor at no load : 0.9 A
3. Avg. current drawn by motor at load on rated pressure : 1.55 A
4. Avg. motor operating voltage at rated pressure : 12.68 V
5. Avg. observed motor power requirement at rated pressure : 19.60 Watt
6. Motor speed at no load : 3760 rpm
7. Motor speed at on load, rated pressure : 3470 rpm
8. Time required for fully discharge of battery : 7.15 to 8.30 hr.
9. No load rpm of motor after 6 hours of operation : 2970 rpm

6. PRESSURE ADJUSTMENT TEST
(Vide Clause 8.7.1 of IS – 11313 : 2007)

1. Date of test : 08.05.2017
2. Atmospheric conditions:
   a. Temperature : 31.7 °C
   b. Relative humidity : 47.7 %
   c. Pressure : 98 kPa
3. Data recorded

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Working pressure (kg/cm²)</th>
<th>Fluctuation range (kg/cm²)</th>
<th>Pressure drop (kg/cm²)</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1.0</td>
<td>NIL</td>
<td>NIL</td>
<td>--</td>
</tr>
<tr>
<td>2.</td>
<td>2.0</td>
<td>NIL</td>
<td>NIL</td>
<td>--</td>
</tr>
<tr>
<td>3.</td>
<td>3.0</td>
<td>NIL</td>
<td>NIL</td>
<td>--</td>
</tr>
<tr>
<td>4.</td>
<td>4.0</td>
<td>NIL</td>
<td>NIL</td>
<td>--</td>
</tr>
</tbody>
</table>

4. Resistance of pressure: Yes

7. TEST FOR SPRAY LANCE

Date of test : 07.04.2017
Type : Gooseneck (Type B₁)
24. CONFORMITY TO INDIAN STANDARDS

i) IS: 11313:2007 Hydraulic power sprayers- : Does not conform in toto

specification

ii) IS: 10134-1994-Method of test for manually : Does not conform in toto
operated sprayer

iii) Spray nozzle and spray gun as per IS:3652- Does not conform in toto
1995 (Reaffirmed 2011)

vi) IS: 2643-2005-Pipe threads where pressure- Does not conform in toto
tight joint are not made on the thread-
dimensions, tolerance and designation

25. COMMENTS & RECOMMENDATIONS

25.1 The sprayer serial number is not marked. It should be marked.

25.2 The motor serial number, motor power and rated speed is not specified. It should be specified.

25.3 The discharge rate of nozzle at a pressure of 300 kPa for jet spray pattern does not conform to the requirement of IS: 3652:1995. It MUST be looked into.

25.4 The battery serial number and country of origin is not specified. It should be specified.

25.5 Country of origin and serial number of battery charger is not marked. It should be marked.

25.6 The country of origin of pump is not specified. It should be specified.

25.7 The dimension of straps does not meet the requirements of Indian Standard. It MUST be looked into.

25.8 The metallic threaded connection provided on sprayer does not meet the requirement of Indian Standard. It MUST be looked into.

25.9 The batch or code number on nozzle is not provided. It MUST be looked into.

25.10 The strap cushion thickness does not meet the requirement of Indian Standard. It MUST be looked into.

25.11 The model and serial number of solar panel for battery charging is not specified. It should be specified.
25.12 The lance is not marked batch or code number. It MUST be marked.

25.13 The strainer is not provided in cut off device. It may be provided.

25.14 The trigger actuation force is observed more than as defined in Indian Standard. It MUST be examined & improved.

25.15 The strainer in nozzle is not provided. It should be provided.

25.16 Agitator is not provided in sprayer. It may be provided.

25.17 The batch or code number of cut-off device is not marked. It MUST be marked.

25.18 Time required to full charge battery with AC charger is observed as 8.25 to 9.30 hours.

25.19 The spraying operation time after fully charging the battery was observed as 7.15 to 8.30 hours.

25.20 Time required to full charge the battery with solar plate was observed as 10.30 to 12 hours.

25.21 The volumetric efficiency of sprayer on battery operated mode was observed as 49.30%, which is not within the requirement of the relevant Indian Standard.

25.22 The current drawn by motor at no load and on load was observed as 0.9 A and 1.55 A respectively which does not conform to requirement of IS: 14459-1997.

25.23 The sprayer does not conform to the relevant standard in toto. It should be looked into.

25.24 The nozzle designation marked on nozzle does not meet the requirement of Indian Standard. It MUST be looked into.

25.25 During the pump chamber hydraulic test the motor stopped at 6.0 kg/cm² pressure against the pressure requirement of 7.5 kg/cm². Thus the sprayer does not meet the requirement of Indian Standard.

25.26 A suitable labelling plate (not sticker) needs to be provided with, inter alia, following information:-
   i. Manufacturer's name
   ii. Make
   iii. Model
   iv. Month & year of manufacture
   v. Rated speed
   vi. Rated pressure
   vii. Discharge rate
   viii. Power rating
   ix. Country of origin