KISAN KRAFT KK-33 CI3
ELECTRIC MOTOR OPERATED SPRAYER

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
[ISO 9001:2008 COMPLIANT INSTITUTION]

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Tele./FAX: 01662-276984
| Cl.5.14.2 | The metallic nut if provided shall have the internal thread size, minimum of designation G\(^{1/4}B\) IS: 2643-2005 Part I. The clamp shall consist of ferrule or clip. Other thread sizes if used shall be of standard pipe threads IS: 2643-2005. | Metallic nut of internal thread size G\(^{5/8}B\) is provided. | conforms |
| Cl.5.14.3 | The hose and hose connection shall withstand the test prescribed in 7.2 of IS:10134-1994. A minimum hydrostatic pressure of 1.5 MPa, using water as a liquid, shall be developed in the Hose assembly and the pressure shall be retained for a period of 5 minutes. | There was no leakage, crack and breakage in hose & hose connection during testing. | Conforms |
| Cl.5.15 Nozzle | Unless otherwise specified by the purchaser, the nozzle shall conform to the requirement of Annexure F of IS:3652-1995. | Fixed straight solid cone nozzle. | Conforms |
| Cl.5.16 | The electric motor shall conform to the requirements as given in IS:325-1996. | Single phase electric motor, 2.24 kW provided without BIS marked. | Does not conform |
| Cl.5.16.1 | The exhaust outlet of the engine shall be so positioned that the smoke does not directly affect the operator or crop. A guard shall be provided on or near the exhaust pipe for the protection of the operator. | Not applicable | -- |
| Cl.5.17 | The fuel and chemical discharge controls shall be in easy access of the operator. | Not applicable as chemical tank not provided. | -- |
| Cl.5.18 | Air pressure chamber shall withstand the test prescribed in 8.7 without any deformation or damage. | No damage found in air pressure chamber during test. | Conforms |

**CL6 IS 11313:2007 PERFORMANCE REQUIREMENTS**

| Cl.6.1 Discharge rate/Suction capacity | When tested in accordance with the method given in 8.3, the pump shall be capable of discharging/sucking a minimum of 8000 ml. water per minute at its rated speed and rated pressure. | The suction capacity of pump is 42621 & 37933 ml/min at 7.0 & 28 kg/cm\(^2\) pressure respectively. | Conforms |
| Cl.6.1.1 | The discharge rate/suction capacity shall be declared by the manufacturer. | Declared as on ID plate of pump 30 to 40 l/min. | Conforms |
| Cl.6.2 Volumetric Efficiency Cl6.2.1 | When determined in accordance with 8.4.1, the volumetric efficiency of the piston/plunger type pump shall minimum 80 percent. | The volumetric efficiency is 89.13% & with in specified limit. | Conforms |
| Cl.6.2.2 | The volumetric efficiency requirement for roller vane type pump shall be minimum 80 %. | Not applicable | -- |
### Cl.6.3 Power requirement

When tested in accordance with the method given in 8.5, pump shaft power requirement shall not be more than that of the value declared by the manufacturer.  
Max. pump shaft power requirement is observed as 1 & 2.8 kW at 7 & 28 kg/cm² pressure against the declared value of 2.27 to 4.47 kW.  
Conforms

### Cl.6.4 Maximum achievable pressure

When tested in accordance with the method given in 8.7, maximum achievable pressure shall not be less than that of the value declared by the manufacturer.  
Maximum achievable pressure is observed as 28 kg/cm² against the declaration of 10 to 40 kg/cm².  
Conforms

### Cl.6.5 Endurance test

Sprayer shall withstand the test endurance test specified in 8.8 and the variation in Discharge rate between first and last observation shall not be more than ± 5 Percent.  
Endurance test of 50 hrs. completed without any breakdown & the variation in pressure. Percentage variation in discharge is 0.668% with in specified limit (see annexure IV for more details).  
Conforms

### Cl. 7 IS 11313:2007 OTHER REQUIREMENTS

**Cl. 7.1**  
Each sprayer shall be provided with parts catalogue and manual giving detailed information about sprayer, engine, its rated speed along with operational and maintenance instructions and safety precautions.  
Manual and parts catalogue is provided by the manufacturer and found adequate in contents.  
Conforms

**Cl. 7.2**  
Each sprayer shall be provided with a set of necessary tools, suction strainer having aperture size of 300 μm to 425 μm and a measuring jar for lubricating oil.  
One set of gaskets & tools kit is provided with sprayer.  
Conforms

**Cl. 7.3**  
On the option of the purchaser, the following accessories shall be supplied  

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<tr>
<td>a)</td>
<td>A set of spray nozzles (conforming to Annexure E of IS:3652-1995) for different discharge rates, and</td>
<td>Not applicable</td>
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<td>b)</td>
<td>Spray gun conforming to Annexure – I of IS: 3652-1995</td>
<td>Provided</td>
<td>Conforms</td>
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**Cl. E 1 TYPES IS:3652: 1995**  
The spray guns shall be of the following two types:  

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<tr>
<td>a)</td>
<td>Trigger type</td>
<td>N.A</td>
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<tr>
<td>b)</td>
<td>Screw type</td>
<td>Screw type</td>
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**Cl. E 2 DIMENSIONS Cl. E 2.1**  
The thickness of the wall of the barrel shall be minimum of 0.63 mm.  
0.65 mm  
Conforms

**Cl. E 2.2**  
The diameter of the connecting rod shall be minimum of 5 mm.  
4.25 mm  
Does not conform
5. SUMMARY OF OBSERVATION

5.1 The discharge rate was observed as 42621 & 37933 ml/min at 7 & 28 kg/cm² pressure respectively.

5.2 Volumetric efficiency was observed as 89.13% against the minimum requirement of 80%.

5.3 Power requirement: 1.0 & 2.8 kW at 7 & 28 kg/cm² pressure against the declaration of 3 to 6 Hp (2.24 to 4.47 kW) by the applicant.

5.4 Pressure adjustment: No fluctuation of the pressure was observed during the test.

5.5 Maximum achievement pressure was observed as 28 kg/cm².

5.6 Endurance test
a) The test was conducted 50 hours the discharge rate variation is observed as 0.668% which in within the limit of ±5%.

b) No noticeable breakdown was observed during the test.

6. COMMENTS AND RECOMMENDATION

6.1 Conformity to Indian Standard
Electric motor operated sprayer Kisan Kraft, KK-33 CI3 conforms all the clauses of IS: 11313-2007 except requirement specified in the following clause. These should be rectified and incorporated at manufacturing level.

i) Pressure gauge reading scale is not as per requirements of Indian Standard. It should be improved.

ii) The electric motor provided is not BIS marked. The electric motor with BIS mark should be provided on sprayer.

iii) The spray gun is not designated by its identification mark. It should be designated as per requirement of Indian Standard.

iv) The diameter of connecting rod is not as per requirement of Indian Standard. It should be improved.

v) The gun does not conform the requirement of Indian Standard. The batch No. or code No. should be marked on marked gun.

vi) The prime mover (electric motor) power is not specified by applicant. It should be specified.

vii) Pump make & model is not specified by applicant. It should be specified.

viii) The prime mover (electric motor) model & year of manufacture is not specified. It should be specified.
ix) The labeling plate (metallic) of permanent nature should be provided on sprayer. The sticker provided as labeling plate does not serve the purpose.

x) The power requirement of sprayer is specified as 3 to 6 Hp on sticker. The exact power requirement should be mentioned on sprayer for the proper guidance of user.

6.2 The country of manufacturer/origin is not provided on labeling plate and packing. It may be provided.

6.3 Safety provisions/safety wear
i) The accessories viz mask, hand gloves and safety goggles for operator’s safety are not provided. It should be provided with sprayer for safety of user.

ii) Safety signs and hazard pictorials are not provided on the machine. It must be provided on the machine for safety of user.

iii) Safety instructions regarding handling poisonous agrochemical and first aid may also be added in operator’s manual.

7. TECHNICAL LITERATURE
The operation manual of sprayer was provided during the test which found adequate however, the literature should be updated as per IS: 8132-1999

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<td>G. R. AMBALKAR</td>
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<td>AGRICULTURAL ENGINEER</td>
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<td>R. K. NEMA</td>
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<td>SENIOR AGRICULTURAL ENGINEER</td>
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<tr>
<td>P. K. PANDEY</td>
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<td>DIRECTOR</td>
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8. APPLICANT’S COMMENTS
We agree to all comments and recommendations. We will improve in it at the production level.