

व्यावसायिक परीक्षण रिपोर्ट
COMMERCIAL TEST REPORT

संख्या/ No.: PS-447/2564/2020
माह/Month : November, 2020

THIS TEST REPORT VALID UP TO : 30th November, 2027



**XTRA POWER, XPS-201
ENGINE OPERATED PORTABLE SPRAYER**



भारत सरकार

Government of India

कृषि एवं किसान कल्याण मंत्रालय

Ministry of Agriculture and Farmers Welfare

कृषि, सहकारिता एवं किसान कल्याण विभाग

Department of Agriculture, Cooperation and Farmers Welfare

उत्तरी क्षेत्र कृषि मशीनरी प्रशिक्षण एवं परीक्षण संस्थान

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PS-447/2564/2020	XTRA POWER, XPS-201 ENGINE OPERATED PORTABLE SPRAYER (COMMERCIAL)
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xxvii)	Pipe for agitator	Galvanized iron, Brass, PVC	PVC	Conforms
xxviii)	Piston (bucket) screw	Brass, stainless steel	Not applicable	--
xix)	Crank case	Aluminum alloy	Not applicable	--
xx)	Roller pump body	Nickel resistant cast iron	Not applicable	--
xxi)	Roller pump and plate	Nickel resistant cast iron	Not applicable	--
xxii)	Roller pump rotor	Nickel resistant cast iron	Not applicable	--
xxiii)	Piston pump crank shaft	Carbon steel	A quadrant gear driven by drive shaft of gear box mounted on plunger rod.	--
xxiv)	Pump inlet port end fitting	Brass	Brass	Conforms
xxv)	Piston rod guide	Brass, Aluminum alloy, Gunmetal, Nylon	Not applicable	--
xxvi)	Connecting rod	Carbon steel	Not applicable	--
xxvii)	Gudgeon pin	Carbon steel	Not applicable	--
xxviii)	Big end bearing	Steel coated with tin base white metal	Not applicable	--
xxix)	Small end bush	Gunmetal	Not applicable	--
xxx)	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 by the applicant	Conforms

3. RUNNING-IN

Having regard to applicant request dated 15.10.2020, the sprayer was run-in for one hour.

4. TEST FOR DISCHARGE RATE OF PUMP [vide Clause 8.3 of IS- 11313: 2007]

1. Date of test : 09.11.2020
2. Atmospheric conditions :
 - a) Temperature : 23.8 ° C
 - b) Relative humidity : 43.3 %
 - c) Pressure : 98.7 kPa

3. Data recorded

Speed of engine (rpm)	Working pressure (kg/cm ²)	Test No.	Delivery from the discharge line (ml/min)	Overflow (ml/min)	Average delivery from the discharge line (ml/min)	Discharge rate of pump (ml/min)	Hydraulic Power (kW)
6120	8.0	1	6460	NIL	6470	6470	0.09
		2	6470				
		3	6450				
		4	6500				

5770	10.0	1	6280	NIL	6270	6270	0.10
		2	6300				
		3	6240				
		4	6260				
5650	12.0	1	6130	NIL	6125	6125	0.12
		2	6150				
		3	6120				
		4	6100				
5503	14.0	1	5800	NIL	5890	5890	0.14
		2	5930				
		3	5880				
		4	5950				

Minimum discharge rate = 5890.0 ml/min at 14 kg/cm²
 Maximum discharge rate = 6470.0 ml/min at 8 kg/cm²
 Discharge at rated pressure = 6470.0 ml/min at 8 kg/cm²

5. TEST FOR VOLUMETRIC EFFICIENCY OF PUMP [vide clause 8.4 of IS: 11313-2007]

Date : 09.11.2020
 Rated pressure, kg/cm² : 8
 Engine speed corresponding to rated pressure (rpm) : 6263
 Theoretical cubic capacity of pump, ml : 7157.12
 Actual volume at rated pressure, ml : 6500.00
 Volumetric efficiency, % : 90.8 %

6. POWER REQUIREMENT

During the pump operation from minimum to maximum pressure range, the max. hydraulic power was observed as 0.14 kW against the declared net power output of engine as 1.2 kW.

7. ENGINE PERFORMANCE TEST

In pursuance of Ministry's order No. 7-23/2011-M&T (I&P) dated 20.04.2011 the engine performance test has not been conducted and the specifications/performance as specified by the applicant/ declared in the manual have been endorsed.

S.No.	Parameter	Declaration
i	Engine Type	: Single cylinder, 4 stroke, air cooled, Petrol engine.
ii	Bore,(mm)	: 43
iii	Stroke (mm)	: 33
iv	Displacement,(cc)	: 47.9
v	Net power out put	: 1.2 kW @ 6500 rpm
vi	Max Torque	: 1.8 Nm @ 5500 rpm
Vii	Compression ratio	: 8.4:1

8. PRESSURE ADJUSTMENT TEST
(Vide clause 8.7.1 of IS: 11313-2007)

1. Date of test : 21.10.2020
2. Atmospheric conditions :
 - a. Temperature : 24.0 °C
 - b. Relative humidity : 45.6 %
 - c. Pressure : 98.7 kPa
3. Data recorded

S. No.	Working pressure(kg/cm ²)	Fluctuation range (kg/cm ²)	Pressure drop (kg/cm ²)	Ratio
1.	8	NIL	NIL	--
2.	10	NIL	NIL	--
3.	12	NIL	NIL	--
4.	14	NIL	NIL	--

4. Resistance of pressure: Yes

9. TEST FOR HYDRAULIC SPRAY GUN

[vide Clause 7.3(b) of IS- 11313: 2007 & Annex E of IS- 3652; 1995]

Date of test : 07.11.2020
Type of gun : Screw type

9.1 TEST FOR DISCHARGE RATE OF SPRAY GUN

The discharge rate for fine cone spray & jet spray pattern as 3500 ml/min & 4000 ml/min at the pressure of 600 kPa was declared by the applicant. The discharge rate corresponding to 600 kPa pressure was observed as under

- For fine cone spray pattern : 1622.5 ml/min
- For jet spray pattern : 4232.5 ml/min

Remarks: The observed discharge rate for fine cone spray pattern and Jet spray pattern at the pressure of 600 kpa was observed not within the limit specified by the relevant Code/Standards.

9.2 TEST FOR SPRAY ANGLE OF SPRAY GUN

The spray angle for fine cone spray pattern at a pressure of 600 kPa was declared as 60 degree by the applicant. The spray angle corresponding to 600 kPa pressure was observed as 73.9 degree.

Remarks: The observed spray angle for fine cone spray pattern at the pressure of 600 kpa was observed not within the limit specified by the relevant Code/Standards.

9.3 STRENGTH OF GUN

Sr. No	Details	Condition
1	Condition of nozzle tip	Closed
2	Hydraulic pressure	1500 kPa
3	Duration of pressure	5 Minute
4	Result	No leak, crack or burst of gun was observed during test

18. COMMENTS AND RECOMMENDATIONS

- 18.1 The manufacturing year and serial number of sprayer is not marked. It **MUST** be looked into.
- 18.2 The serial number of engine is not specified. It **MUST** be looked into.
- 18.3 The spray nozzle is not designated and marked by its identification marked. The identification mark as specified by relevant Indian standard **MUST** be looked into.
- 18.4 The make, model, manufacturing year, serial number and country of origin of pump is not specified. It **MUST** be looked into.
- 18.5 The spray gun is not designated and marked by its identification mark. The identification mark as per specified by Indian standard. It **MUST** be looked into.
- 18.6 The spray angle for fine cone spray pattern of gun at a pressure of 600 kpa does not conform to as per relevant code/standard. It **MUST** be looked into.
- 18.7 The spray angle for fine cone spray pattern of nozzle at a pressure of 300 kpa does not conform to the requirement of IS: 3652-1995. It **MUST** be looked into for further improvement.
- 18.8 Though a pressure regulator provided but that was not in the working condition therefore its conformity IS: 11313-2007 could not be ascertained. It **MUST** be looked into for corrective action.
- 18.9 The necessary tools are not provided. It **MUST** be provided.
- 18.10 The strainer in nozzle is not provided. It may be considered for providing.
- 18.11 The discharge rate for fine cone spray pattern of gun at a pressure of 600 kPa does not conform to the requirement of IS:3652-1995. It **MUST** be looked into.
- 18.12 The discharge rate for fine cone spray pattern and Jet spray pattern of nozzle at a pressure of 300 kPa does not conform to the requirement of IS: 3652-1995. It **MUST** be looked into.
- 18.13 The pressure gauge with full scale reading of 100 bar is provided, thus it does not conform to requirement of IS: 11313-2007. It **MUST** be looked into.
- 18.14 At rated pressure of 8 Kg/cm², the pump discharge was observed as 6470 ml/min. against the minimum requirement of 8000.0 ml/min. This **MUST** be examined.
- 18.15 The thickness of the wall of barrel of the gun does not meet the requirements of Indian Standard. It **MUST** be looked into.
- 18.16 The diameter of connecting rod of the gun does not meet the requirement of Indian Standard. It **MUST** be looked into.
- 18.17 A suitable labeling 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 of engine
 - ix) SPC of engine

18.18 Safety provision / safety wear

- i) The safety instructions before, during and after spraying operation **MUST** be provided on sprayer.
- ii) Apron, gum boots and Ear protector **MUST** be added on safety wear.


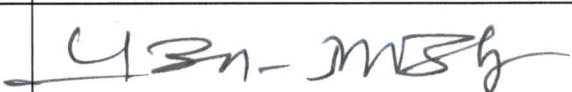
19. TECHNICAL LITERATURE

The following literatures are provided with sprayer for guidance to the user.

- i) Instruction manual.

However, the manual of sprayer should be updated as per IS: 8132-1999.

TESTING AUTHORITY

MAAN SINGH SENIOR TECHNICAL ASSISTANT	
P. K. PANDEY DIRECTOR	

20. APPLICANT'S COMMENTS

Para No.	Our reference	Applicant's Comments
20.1	18.1, 18.2, 18.3, 18.4, 18.5, 18.6, & 18.11	The manufacturing year, Serial no. of sprayer, Serial No. of engine, details of pump, Spray gun, Spray nozzle will be provided.
20.2	18.13	Pressure gauge conforming to the requirement of IS:11313-2007 will be provided.
20.3	18.8	A working pressure regulator in conformity to IS:11313-2007 will be provided.
20.4	18.7, 18.12, & 18.14	Suitable modifications will be made to meet the requirement of discharge rate of pump and discharge rate and Spray angle for fine cone spray pattern and Jet spray pattern of nozzle at a pressure of 300 kPa conforms to the requirement of IS:3652-1995.
20.5	18.15 & 18.16	The thickness of the wall of barrel of the gun and diameter of connecting rod as required in the Indian Standard will be provided.
20.6	18.19	Required tools will be provided.
20.7	18.10	The Strainer in the nozzle will be provided.
20.8	18.17	A Suitable labeling plate will be provided with required information.
20.9	18.18 (i)	The safety instruction before, during and after spraying operation will be provided on the sprayer.
20.10	18.18 (ii)	Apron, gum boots and ear protector will be supplied with sprayer on optional basis.

