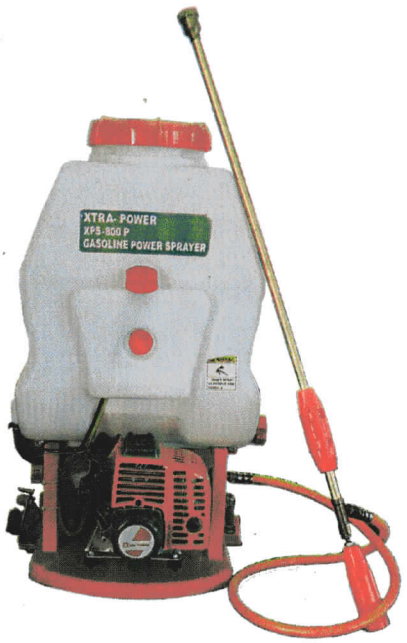
व्यावसायिक परीक्षण रिपोर्ट

COMMERCIAL TEST REPORT

संख्या/ No.: PS-451/2568/2020

माह/Month : November, 2020

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



XTRA POWER, XPS 800-P
ENGINE OPERATED KNAPSACK SPRAYER

सत्यमेव जयते

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

Northern Region Farm Machinery Training and Testing Institute

ट्रैक्टर नगर, सिरसा रोड, हिसार, (हरियाणा) - 125 001

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

[ISO 9001:2015 CERTIFIED]

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xiv)	Spray boom	Mild steel, Galvanized, iron Braided rubber	N.A.	--
xv)	Hose	Synthetic rubber, P.V.C	PVC	Conforms
xvi)	Tank	Galvanized iron, Brass, Fiber glass reinforced plastics, plastics	Plastic	Conforms
xvii)	Pipe for agitator	Galvanized iron, Brass, PVC	PVC	Conforms
xviii)	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	Plastic	**Does not conform**
xxv)	Piston rod guide	Brass, Aluminum alloy, Gunmetal, Nylon	Not applicable	--
xxvi)	Connecting rod	Carbon steel	N.A.	--
xxvii)	Gudgeon pin	Carbon steel	N.A.	--
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. TEST FOR DISCHARGE RATE OF PUMP

[vide Clause 8.3 of IS- 11313: 2007]

1. Date of test : 12.11.2020
2. Atmospheric conditions :
   a) Temperature : 24.3° C
   b) Relative humidity : 28.9 %
   c) Pressure : 98.1 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)
5805	8	1.	6000	NIL	6027.5	6027.5	0.08
		2.	6050				
		3.	6020				
		4.	6040				
5592	10	1.	5330	NIL	5337.5	5337.5	0.09
		2.	5320				
		3.	5360				
		4.	5340				
5385	12	1.	5240	NIL	5245.0	5245.0	0.10
		2.	5260				
		3.	5230				
		4.	5250				
5242	14	1.	4930	NIL	4952.5	4952.5	0.12
		2.	4980				
		3.	4940				
		4.	4960				

Minimum discharge rate = 4952.5 ml/min at 14 kg/cm^2
Maximum discharge rate = 6027.5 ml/min at 8 kg/cm^2
Discharge at rated pressure = 6027.5 ml/min at 8 kg/cm^2

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

Date	:	12.11.2020
Rated pressure, kg/cm^2	:	8
Engine speed corresponding to rated pressure (rpm)	:	5802
Theoretical cubic capacity of pump, ml	:	6633.8
Actual volume at rated pressure, ml	:	6047.5
Volumetric efficiency, %	:	91.2

5. POWER REQUIREMENT

During the pump operation from minimum to maximum pressure range, the max. hydraulic power was observed as 0.12 kW against the declared net power output of engine as 0.7 kW.

6. 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, 2 stroke, air cooled, Petrol engine.
ii	Bore,(mm)	:	33
iii	Stroke (mm)	:	30
iv	Displacement,(cc)`	:	26
v	Net power out put	:	0.7 kW @ 6500 rpm
vi	Max Torque	:	1.6 Nm @ 5600 rpm

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

1. Date of test : 27.10.2020
2. Atmospheric conditions
   a. Temperature : 24.4 °C
   b. Relative humidity : 28.1 %
   c. Pressure : 98.0 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

8. TEST FOR HYDRAULIC SPRAY GUN
[vide Clause 7.3(b) of IS- 11313: 2007 & Annex E of IS- 3652; 1995]

Date of test : 10.11.2020
Type of gun : Screw type

8.1 TEST FOR DISCHARGE RATE OF SPRAY GUN

The discharge rate for fine cone spray & jet spray pattern as 3300 ml/min & 4200 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 : 2200 ml/min
- For jet spray pattern : 5027.5 ml/min

Remarks – The observed discharge rate for fine cone spray pattern and jet spray pattern was not within limit specified by the relevant code/Standard.

8.2 TEST FOR SPRAY ANGLE OF SPRAY GUN

The spray angle for fine cone spray pattern at a pressure of 600 kPa was declared as 70 degree by the applicant. The same was observed as 77.8 degree.

Remarks:- The spray angle for fine cone spray pattern at a pressure of 600 kPa was observed not within the limit specified by the relevant code/standards.

Cl.10.	MARKING AND PACKING (Cl.10 IS:11313-2007)		
Cl.10.1 Marking	Each sprayer shall be marked with the following particulars :-		
a)	Manufacturer's name & his registered trade mark, Sl. No. and batch or code No.	Just a sticker and not proper labeling plate is provided with following information:- Knapsack Power Sprayer Make & Model : Xtra Power & XPS 800 P Engine : Air cooled, 2 Stroke, single cylinder Material : Plastic Stroke : 8 mm Working pressure : 8 to 14 kg/cm^2 Rated pressure : 8 kg/cm^2 RPM : 6500 Year of Manufacturer : 2020	**Does not conform in spirit and also in toto.**

15. CRITICAL TECHNICAL SPECIFICATIONS

(Deferred till 31.12.2020 vide Ministry's O.M. No 13-13/2020 M &T (I & P) dated 24.04.2020)

16. CONFORMITY TO INDIAN STANDARDS

i) IS:11313-2007 (Reaffirmed 2012)-Hydraulic power sprayer-specification : **Does not conform in toto**

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

iii) Hose and hose connection as per IS:10134-1994 : Conforms

iv) IS: 2643-2005-Pipe threads where pressure-tight joint are not made on the threads-dimensions, tolerance and designation : Conforms

v) IS: 7347-1974 (Reaffirmed 2006)-Specification for performance of small size spark ignition engines for agricultural water pumps, sprayers, tillers, reapers and other similar applications : **Could not be ascertained**

17. COMMENTS AND RECOMMENDATIONS

17.1 The material of Pump inlet port end fitting does not meet the requirement of relevant code/standard. It **MUST** be looked into.

17.2 The serial number of sprayer is not specified. It **MUST** be looked into.

17.3 The strainer in nozzle is not provided. It may be considered for providing.

17.4 The serial number of engine is not specified. It **MUST** be looked into.

17.5 The manufacturing year and country of origin of pump is not specified. It **MUST** be looked into.

17.6 The discharge rate for fine cone spray pattern and jet 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.

17.7 The spray angle for fine cone spray pattern of spray gun at a pressure of 600 kPa does not conform to the requirement of IS:3652-1995. It **MUST** be looked into.

17.8 The spray gun is not designated and marked by its identification marked. The identification mark as per specified by Indian Standard. It **MUST** be looked into.

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

17.10 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.

17.11 At rated pressure of 8 Kg/cm^2 the pump discharge was observed as 6027.5 ml/min. against the minimum requirement of 8000.0 ml/min. This **MUST** be examined.

17.12 The pressure gauge with full scale reading 100 bar is provided, thus it does not conform to requirement of IS: 11313-2007. It **MUST** be looked into.

18. TECHNICAL LITERATURE

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

i) Instruction manual.

However, manual of sprayer needs to be updated as per IS 8132-1999.

TESTING AUTHORITY

MAAN SINGH SENIOR TECHNICAL ASSISTANT	
P. K. PANDEY **DIRECTOR**	

19. APPLICANT'S COMMENTS

Para No.	Our reference	Applicant's Comments
19.1	17.1	The material of pump inlet port end fitting meeting the requirement of relevant code/standard will be used.
19.2	17.2 & 17.4	The Serial number of sprayer and engine will be specified.
19.3	17.3	The strainer in the nozzle will be provided.
19.4	17.5	The manufacturing year and country of origin of pump will be specified.
19.5	17.6, 17.7, 17.9 & 17.10	Necessary modifications will be done so that the discharge rate and spray angle for fine cone spray pattern and Jet spray pattern of gun & nozzle at a pressure of 600 and 300 Kpa conforms to the requirement of IS: 3652-1995.
19.6	17.8	The Spray gun will be designated as specified by Indian Standard.
19.7	17.11	Necessary modifications will be done so that at rated pressure of 8 kg/cm^2 the pump, Discharge is 8000 ml/min.
19.8	17.12	The Pressure gauge conforming to the requirement of IS:11313-2007 will be provided.
19.9	18	Manual of sprayer will be updated as per IS:8132-1999.