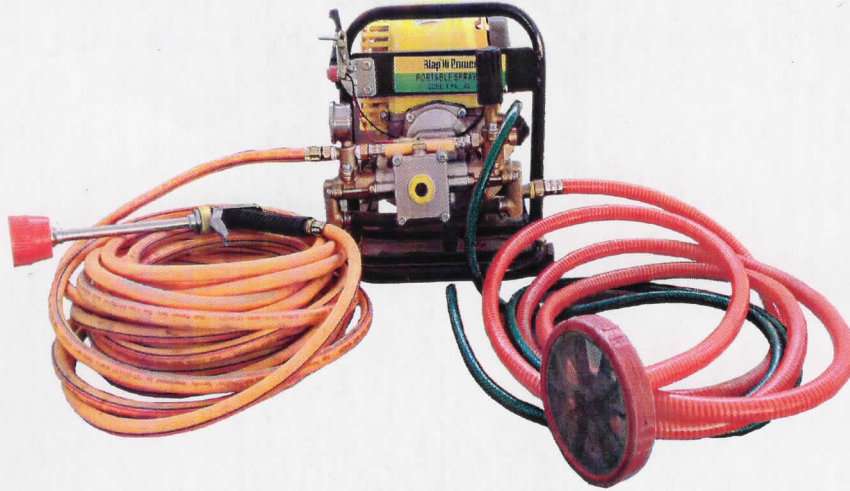


व्यावसायिक परीक्षण रिपोर्ट
COMMERCIAL TEST REPORT

संख्या/ No.: PS-395/2313/2019

माह/Month : May, 2019

THIS TEST REPORT VALID UP TO : 31st MAY, 2026



**ALAP, APH-4S
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

Northern Region Farm Machinery Training and Testing Institute

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3. TEST FOR DISCHARGE RATE OF PUMP

[vide Clause 8.3 of IS- 11313: 2007]

1. Date of test : 14.03.2019
2. Atmospheric conditions
 - a) Temperature : 24 °C
 - b) Relative humidity : 47 %
 - c) Pressure : 99.1 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)
6855	10	1	7430	Nil	7465	7465	0.12
		2	7480				
		3	7490				
		4	7460				
6690	11.7	1	7310	Nil	7295	7295	0.14
		2	7240				
		3	7350				
		4	7280				
6495	13.3	1	7000	Nil	6997.5	6997.5	0.15
		2	7000				
		3	6980				
		4	7010				
6398	15	1	6860	Nil	6865	6865	0.17
		2	6850				
		3	6880				
		4	6870				

Minimum discharge rate = 6865 ml/min at 15 kg/cm²Maximum discharge rate = 7465 ml/min at 10 kg/cm²Discharge at rated pressure = 7465 ml/min at 10 kg/cm²**4. TEST FOR VOLUMETRIC EFFICIENCY OF PUMP**

[vide clause 8.4 of IS: 11313-2007]

Rated pressure, kg/cm² : 10

Engine speed corresponding to rated : 6855

pressure, (rpm)

Theoretical cubic capacity of pump : 8040.81

Actual volume at rated pressure, ml : 7465

Volumetric efficiency, % : 93

5. POWER REQUIREMENT

During the pump operation from minimum to maximum pressure range the max. hydraulic power was observed as 0.17 kW against the declared net power output of engine as 0.72 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 have been endorsed.

S.No.	Parameter		Declaration
i	Engine Type	:	Single cylinder four stroke air cooled spark ignition engine.
ii	Bore,(mm)	:	39
iii	Stroke (mm)	:	26
iv	Displacement,(cc)	:	34
v	Net power out put	:	0.72 kW @ 7000 rpm
vi	Max Torque	:	1.0 Nm@5000

7. PRESSURE ADJUSTMENT TEST

- Date of test : 14.03.2019
- Atmospheric conditions :
 - Temperature : 24 °C
 - Relative humidity : 47 %
 - Pressure : 99.1 kPa
- Data recorded

S. No.	Working pressure(kg/cm ²)	Fluctuation range (kg/cm ²)	Pressure drop (kg/cm ²)	Ratio
1.	10	NIL	NIL	--
2.	11.7	NIL	NIL	--
3.	13.3	NIL	NIL	--
4.	15	NIL	NIL	--

- 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 : 14.03.2019
Type of gun : Trigger type

8.1 TEST FOR DISCHARGE RATE OF SPRAY GUN

The discharge rate for fine cone spray & jet spray pattern as 1300 ml/min & 3000 ml/min at the pressure of 600 ± 60 kPa was declared by the applicant.

The discharge rate corresponding to 600 kPa pressure was observed as under:-

- For fine cone spray pattern : 1832.5 ml/min
- For jet spray pattern : 3332.5 ml/min

Remark:- Discharge rate for fine cone spray pattern and jet spray pattern was observed not within the limit specified by the relevant code/standard.

7.	Marking of Nozzle	Manufacture Name/Trade name. Batch or Code Number, Nozzle designation must be provided. As per BIS code	Not marked	Does not conform
8.	Pressure gauge	Must be provided	Provided	Conforms
9.	Safety accessories	Mask, hand gloves and safety goggles, Apron, Gum boots must be provided	Mask, hand gloves and goggles is provided	Does not conform in toto
10.	Necessary tools & spares	Spanners, set of gasket, measuring jar should be provided	Necessary tool and measuring jar are provided	Conforms
11.	Marking/Labeling of sprayer	Must be riveted on the body of sprayer having name & address of manufacturer, month & Year of manufacture, Rated speed, Rated pressure, discharge rate, Power rating of engine, SFC of engine	Just a sticker provided on pump & engine with following information :- Alap Hi Power Portable Sprayer Code : A.P.H-4S	Does not conform
12.	Literature	Operator manual, Service manual & parts catalogue should be provided, One day training.	Operators service manual of sprayer and operator manual of engine with parts catalogue provided	Does not conform in toto

16. CONFORMITY TO INDIAN STANDARDS

- i) IS:11313-2007 (Reaffirmed 2012)-Hydraulic : Does not conform in toto
power sprayer-specification
- ii) Spray nozzle and spray gun as per IS:3652-1995 : Does not conform in toto
(Reaffirmed 2011)
- iii) Hose and hose connection as per IS:10134-1994 : Conforms
- iv) IS: 2643-2005-Pipe threads where pressure-tight : Conforms
joint are not made on the threads-dimensions,
tolerance and designation
- v) IS: 7347-1974 (Reaffirmed 2006)-Specification : Could not be ascertained
for performance of small size spark ignition
engines for agricultural water pumps, sprayers,
tillers, reapers and other similar applications

17. COMMENTS AND RECOMMENDATIONS

- 17.1 The manufacturing year and serial number of sprayer is not marked. It **MUST** be looked into.
- 17.2 The manufacturing year and serial number of pump is not specified. It **MUST** be looked into.
- 17.3 The thickness of barrel does not meet the requirement of relevant code/Standard. It **MUST** be looked into.

- 17.4 The diameter of connecting rod does not meet the requirement of relevant code/Standard. It **MUST** be looked into.
- 17.5 The length of spray gun does not meet the requirement of relevant code/Standard. It **MUST** be looked into.
- 17.6 The discharge rate for fine cone spray pattern and jet spray pattern of nozzle at a pressure of 600 kPa does not conform to the requirement of IS:3652-1995. It **MUST** be looked into for appropriate improvement.
- 17.7 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 for appropriate improvement.
- 17.8 The spray gun is not designated and marked by its identification mark. The identification mark as specified by relevant Indian Standard, **MUST** to be provided.
- 17.9 The spray nozzle is not designated and marked by its identification mark. The identification mark as specified by relevant Indian Standard, **MUST** to be provided.
- 17.10 The distance between the edge out side of trigger and pivot of trigger does not meet the requirement of relevant code/Standard. It **MUST** be looked into.
- 17.11 The spray angle for fine cone spray pattern of gun at a pressure 600 kPa does not conform to the requirement of IS:3652-1995. It **MUST** be looked into for further improvement.
- 17.12 The spray angle for fine cone spray pattern of nozzle at a pressure 300 kPa does not conform to the requirement of IS:3652-1995. It **MUST** be looked into for further improvement.
- 17.13 The manufacture's name or recognized trade mark and batch or code number on nozzle is not provided. It **MUST** be provided.
- 17.14 The manufacture's name or recognized trade mark and batch or code number on spray gun is not provided. It **MUST** be provided.
- 17.15 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.
- 17.16 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.
- 17.17 The strainer in nozzle is not provided. It may be considered for providing.
- 17.18 At rated pressure of 10 kg/cm² the engine speed dropped up to 6855 rpm against the rated engine speed of 7000 rpm. This **MUST** be looked into for necessary action.
- 17.19 At rated pressure of 10 kg/cm² the pump discharge was observed as 7465 ml/min against the minimum requirement of 8000 ml/min. This **MUST** be examined.
- 17.20 A suitable labeling plate (not sticker) needs to be provided with ,inter alia, following information:-
- Manufacturer's name
 - Make
 - Model
 - Month & year of manufacture
 - Rated speed



- vi. Rated pressure
- vii. Discharge rate
- viii. Power rating of engine
- ix. SFC of engine

17.21 Safety provision/safety wear

- i) The safety instructions before, during and after spraying operation **MUST** be provided on sprayer.

18. TECHNICAL LITERATURE

The following literature are provided with the sprayer

- i) Operator's service manual of sprayer with parts catalogue.
- ii) Operator's manual of engine with parts catalogue.

The following literature **MUST** be provided with the sprayer.

- iii) Operator's manual containing all the information including safety instructions before, during and spraying operation.
- iv) Service manual of engine.

TESTING AUTHORITY

R. K. NEMA SENIOR AGRICULTURAL ENGINEER	<i>Ren</i>
P. K. PANDEY DIRECTOR	<i>Libn - m586</i>

19. APPLICANT'S COMMENTS

Para No	Our reference	Applicant's comments
19.1	17.1,17.2	We will take corrective action.
19.2	17.3,17.4,17.5	We will take corrective action for thickness of barrel & also we will follow relevant code for diameter of connecting rod & length of spray gun.
19.3	17.6,17.7	We will take corrective action for discharge rate for fine cone & jet spray pattern.
19.4	17.8,17.9	We will take corrective action for identification mark.
19.5	17.10,17.15	Our manufacturing unit will look in to the same and will take corrective action.
19.6	17.11,17.12	We will take corrective action for spray angle.



19.7	17.13,17.14	We will take corrective action for trade mark, batch number or code number.
19.8	17.16,17.17	We will take corrective action.
19.9	17.18,17.19	We will take corrective action for minimum requirement.
19.10	17.20,17.21	We will take corrective action for labeling plate and safety precaution.

