



भारत सरकार /GOVERNMENT OF INDIA

उत्तरी क्षेत्र कृषि मशीनरी प्रशिक्षण एवं परीक्षण संस्थान

**Northern Region Farm Machinery Training and Testing Institute**

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**TECHNICAL SPECIFICATIONS FOR HTP ENGINE OPERATED SPRAYER/  
ENGINE OPERATED KNAPSACK SPRAYER**

<b>1</b>	<b>General:</b>		
	Name of the machine	:	
	Type of machine	:	
	Make	:	
	Model	:	
	Serial No.	:	
	Name of Manufacturer	:	
	Name of Applicant/Importer	:	
	Year of manufacture	:	
	Output capacity (l/min)	:	
Country of origin	:		
<b>2</b>	<b>Prime Mover:</b>		
	Name & address of manufacturer	:	
	Name & address of importer (if any)	:	
	Type	:	
	Make	:	
	Model	:	
	Engine Sr. No.	:	
	Country of origin	:	
	Year of manufacture	:	
	<b>Recommended engine speed Setting, (rpm):</b>		
	-Low idle speed	:	
	-High idle speed	:	
	Max. power, (kW)	:	
	Speed at maximum power, (rpm)	:	
	Rated power, (kW)	:	
	Rated engine speed, (rpm)	:	
	Max. torque, (Nm)	:	
Speed at maximum torque, (rpm)	:		
Whether the prime mover has already been tested by authorized testing centre (Yes/No)	:		

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	If yes, then specify the valid test report No. and upload the copy of test report	:	
<b>2.1</b>	<b>Cylinder &amp; Cylinder Head:</b>		
	Number	:	
	Disposition	:	
	Bore / Stroke, (mm)	:	
	Capacity, (cc)	:	
	Type of valve	:	
	<b>Valve clearance, (mm):</b>		
	-Inlet	:	
	-Exhaust	:	
	Compression ratio	:	
<b>2.2</b>	<b>Fuel Supply System:</b>		
	Type of fuel feed	:	
<b>2.3</b>	<b>Fuel Tank:</b>		
	Material	:	
	Capacity of fuel tank, (l)	:	
	Location of fuel tank	:	
	Provision for draining of sediments/ water	:	
	Fuel filter	:	
	Fuel on/off	:	
<b>2.4</b>	<b>Governor:</b>		
	Make	:	
	Model	:	
	Type	:	
<b>2.5</b>	<b>Carburetor:</b>		
	Make	:	
	Type	:	
<b>2.6</b>	<b>Fuel injection pump (if applicable):</b>		
	Make	:	
	Model	:	
	Serial number/ group combination number	:	
<b>2.7</b>	<b>Injector (if applicable):</b>		
	Make	:	
	Model	:	
	Type	:	
	Serial number	:	
	Number of holes	:	
<b>2.7</b>	<b>Air Intake System:</b>		
	Pre cleaner	:	
<b>2.8</b>	<b>Air Cleaner:</b>		
	Type	:	
	Make & Model	:	
	Location	:	
	Recommended service schedule	:	
	Recommended grade of oil	:	
<b>2.9</b>	<b>Exhaust:</b>		
	Type of silencer	:	
	Location of silencer	:	
	Spark arresting device, if any	:	

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<b>2.10</b>	<b>Lubricant System:</b>		
	Type	:	
	Oil capacity, (l)	:	
	Recommended grade of lubricant oil	:	
	Oil change period, (h)	:	
<b>2.11</b>	<b>Cooling System:</b>		
	Type	:	
	Dia. of blower, mm	:	
	No. of vanes	:	
<b>2.12</b>	<b>Starting System:</b>		
	Type	:	
	Ignition system	:	
	Any other provision for easy starting	:	
	Aid for cold starting	:	
<b>2.13</b>	<b>Spark plug:</b>		
	Make	:	
	Model	:	
	Spark plug electrode gap, (mm)	:	
<b>3</b>	<b>Chemical Tank (if applicable):</b>	:	
	Material	:	
	Capacity, (l)	:	
	Strainer at filling hole	:	
	Provision of drain plug in tank	:	
	Provision of hose reel	:	
<b>3.1</b>	<b>Frame (for stationery sprayer):</b>	:	
	Type	:	
	Size of angle iron, mm	:	
	Dia. of pipe, (mm)	:	
<b>3.2</b>	<b>Agitating Device:</b>		
	Type	:	
	Method of working	:	
	Method of pressure regulation	:	
<b>3.4</b>	<b>Spray Gun:</b>		
	Make	:	
<b>3.4.1</b>	<b>Discharge rate at 600 kPa pressure, (l/min):</b>		
	-Jet spray pattern	:	
	-Fine cone spray pattern	:	
	Spray angle of gun, (°)	:	
	Spray gun designation and marking	:	
<b>3.5</b>	<b>Nozzle:</b>		
	Type	:	
<b>3.5.1</b>	<b>Discharge rate at 300 kPa pressure, (l/min):</b>		
	Jet spray pattern	:	
	Fine cone spray pattern	:	
	Spray angle of nozzle, (°)	:	
	Spray nozzle designation and marking	:	
	Number of nozzle	:	

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<b>3.6</b>	<b>Pump:</b>		
	Type	:	
	Make & model	:	
	Year of manufacture	:	
	Serial No.	:	
	Recommended Pump Speed for spraying, (rpm)	:	
	Suction volume, (l/min)		
	Volumetric efficiency, (%)		
	Working pressure, (kg/cm <sup>2</sup> )	:	
	Pump discharge at working pressure, (l/min)	:	
	Rated pressure, (kg/cm <sup>2</sup> )	:	
	Pump discharge at rated pressure, (l/min)	:	
	Rated speed, (rpm)	:	
	Maximum achievable pressure, (kg/cm <sup>2</sup> )	:	
	Plunger dia./stroke, (mm)	:	
	Method of drive	:	
	Speed reduction from engine to pump	:	
	Pressure regulator		
	Method of mounting	:	
	<b>Size of frame, (mm):</b>		
	-Length	:	
-Width	:		
-Height	:		
Country of origin	:		
<b>3.7</b>	<b>Safety wear (for operator's safety during operation)</b>	:	
<b>3.8</b>	<b>Overall Dimensions, (mm):</b>		
	Length (without hose)	:	
	Width	:	
	Height	:	
	Length of hose (m), (if applicable)	:	
<b>4</b>	<b>Total mass, (kg)</b>	:	
<b>4.1</b>	<b>Mass with all accessories and without fuel, (kg)</b>	:	
<b>4.2</b>	<b>Mass with accessories and fuel tank full, (kg)</b>	:	
<b>5</b>	<b>Details of labeling plate</b>	:	

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## MATERIAL OF CONSTRUCTION OF COMPONENTS OF SPRAYER

[As per Table No.-1 of IS: 11313-2007]

Sr. No.	Components	Materials (As per IS:11313-2007)	Material of the component
1.	2.	3.	4.
i)	Pump cylinder	Brass, stainless steel	
ii)	Pressure chamber	Brass, stainless steel	
iii)	Piston rod	Stainless steel,	
iv)	Piston or plunger	Gunmetal, stainless steel, plastics, Rubber, vegetable tanned leather, chrome tanned leather	
v)	Spreader	Brass, stainless steel, plastics	
vi)	Valve assembly	Brass, Stainless Steel, Plastics	
vii)	Roller pump shaft	Stainless steel	
viii)	Pump rollers	Nylon filled with lead	
ix)	Pressure regulators	Brass, stainless steel	
x)	Suction strainer	Brass, stainless steel, Plastics	
xi)	Strainer body	Brass, plastics	
xii)	Gasket	Rubber, PVC, fibre, Leather	
xiii)	Spray nozzles	Brass, stainless steel	
xiv)	Spray boom	Mild steel, Galvanized, iron Braided rubber	
xv)	Hose	Synthetic rubber, P.V.C	
xvi)	Tank	Galvanized iron, Brass, Fiber glass reinforced plastics, plastics	
xvii)	Pipe for agitator	Galvanized iron, Brass, PVC	
xviii)	Piston (bucket) screw	Brass, stainless steel	
xix)	Crank case	Aluminum alloy	
xx)	Roller pump body	Nickel resistant cast iron	
xxi)	Roller pump and plate	Nickel resistant cast iron	
xxii)	Roller pump rotor	Nickel resistant cast iron	
xxiii)	Piston pump crank shaft	Carbon steel	
xxiv)	Pump inlet port end fitting	Brass	
xxv)	Piston rod guide	Brass, Aluminum alloy, Gunmetal, Nylon	
xxvi)	Connecting rod	Carbon steel	
xxvii)	Gudgeon pin	Carbon steel	
xxviii)	Big end bearing	Steel coated with tin base white metal	
xxix)	Small end bush	Gunmetal	

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Sl. No	Declaration of Engine parameter and Discard limit of Engine Critical Components	
A	Engine parameter:	Declaration
i	<b>Recommended engine speed Setting (rpm):</b>	
	-Low idle speed	
	-High idle speed	
	-Rated speed	
ii	Max. power, (kW)	
iii	Speed at maximum power, (rpm)	
iv	Rated power, (kW)	
v	Specific fuel consumption corresponding to maximum power, g/kWh	
vi	Maximum equivalent crankshaft torque,( Nm)	
vii	Speed at maximum torque, (rpm):	
viii	<b>Maximum temperatures(°C):</b>	
	-Engine oil	
	-Coolant (water)/liner wall	
ix	Lubricating oil consumption (g/kWh)	
x	Coolant consumption (% of total Coolant capacity) (if applicable)	
xi	Smoke level (Bosch No.)	
B	Discard limit of Engine Critical Components:	Discard limit
i	Cylinder bore dia. (mm)	
ii	Clearance between cylinder liner and piston (mm)	
iii	Piston dia. (mm)	
iii	<b>Ring-end gap (mm):</b>	
	-Top compression ring	
	-2 <sup>nd</sup> compression ring	
	-3 <sup>rd</sup> compression ring	
	- Oil ring	
iv	<b>Ring groove clearance (mm):</b>	
	-Top compression ring	
	-2 <sup>nd</sup> compression ring	
	-3 <sup>rd</sup> compression ring	
	- Oil ring	
v	<b>Clearance of main bearings (mm):</b>	
	- Diametrical	
	<b>Clearance of big end bearings (mm):</b>	
	- Diametrical	
	- Axial	
vi	Crankshaft end float (mm)	
vii	Spring stiffness (kgf/mm)	
viii	Valve guide clearance (mm)	
	-Intake	
	-Exhaust	

Date:

Place:

Signature:

Name of signatory:

Designation:

Name & address of firm:

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