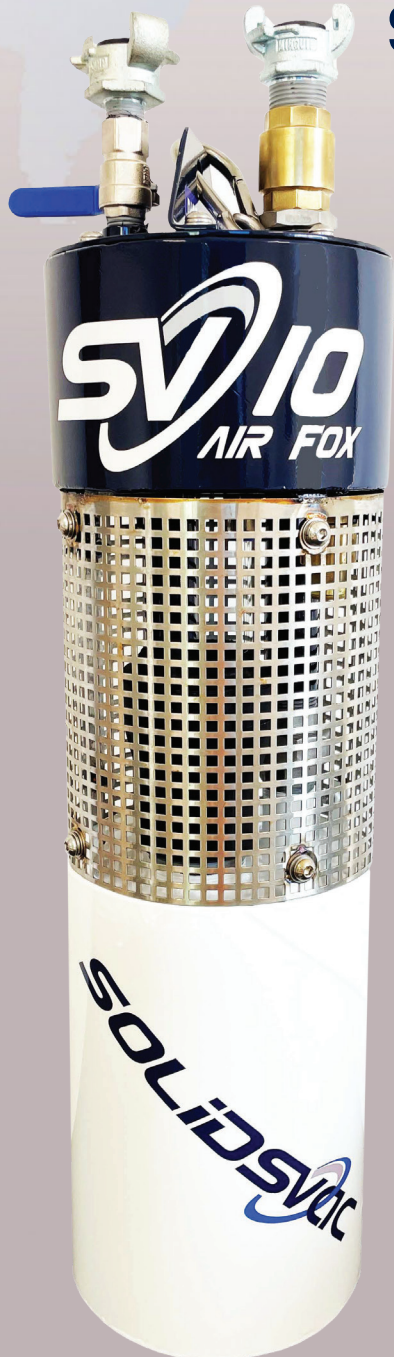


SOLIDSVAC[®]

SV10-AIR FOX Operations Manual



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Manual

SAFETY FIRST

CAUTION & GENERAL SAFETY

This manual contains important information concerning the installation, operation and maintenance of the Solidsvac Pump, Model SV10-Airfox. To prevent injury to personnel or equipment damage, this manual MUST be read and understood by those responsible for the installation, operation and maintenance of the equipment.

THIS OPERATION MANUAL MUST BE USED IN CONJUNCTION WITH BOTH SITE-SPECIFIC RA AND JSA'S.

- Isolate, tag out and disconnect the air supply to the unit prior to working on any part of the system
- Lift the equipment correctly using correct manual handling techniques and only at the lifting points provided
- The pump should be installed in a safe level area, which provides adequate access for operating the equipment
- Ensure all hoses are in good condition, correctly rated and certified for the service in which they are to be used
- Inspect the unit regularly for damaged or worn components
- All covers MUST be fitted prior and during operation
- Air pressure should NEVER exceed rated pressure
- Tie down points (if fitted) MUST NOT be used as lifting point

CAUTION: BE AWARE OF RETAINED MATERIAL IN THE TANK INCREASING WEIGHT

SOLIDSVAC PUMPS EACH HAVE SPECIFIC COMPRESSED AIR REQUIREMENTS DEPENDING ON THE JET PACK FITTED.

The operator MUST ensure that an appropriate and adequate air supply is available depending on the model and Jet Pack in use.

All Solidsvac Pumps require a minimum operating pressure of 500kPa and have a maximum operating pressure of 720kPa (105psi). It is recommended that a 25mm (1") i.d. air hose is used for compressed air supply to the pump.

The Discharge hose MUST be no smaller in diameter than the pumps outlet 25mm (1") preferably a self-supporting type and secured at regular intervals.

WARNING: THE PUMP-OUT LINE MUST BE SECURED AT THE EXIT POINT

1. OPERATIONAL OVERVIEW

The Solidsvac SV10-AIR FOX operates as a shuttle system alternately loading via vacuum and discharging via pressure a wide range of flowable and semi-flowable materials.

Operation is fully automatic and the Solidsvac SV10-AIR FOX features no internal workings with pressure discharge. Place unit in desired location and **Do not submerge over red line** unit fill as level of water rises and discharge up to 80m

WARNING

Compressed air can be dangerous. Correctly rated hoses and piping should be used in conjunction with the appropriate fittings and safety devices on all connections.

2. TECHNICAL DATA

TECHNICAL DATA	METRIC	US IMPERIAL
Height	600 mm	36"
Width	200 mm	22"
Diameter	1000 mm	40"
Weight	15 kg	99 lb
Air inlet	13 mm	1/2" BSP
Suction inlet	50 mm	2"
Discharge outlet	25 mm	1"

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3. PUMP SET-UP

Before commencing operation, Solidsvac strongly recommends each user reads the Operation Manual supplied with each unit and available on line or via the QR code on pump.

Note: No training is necessary to operate the SV10-AIR FOX however understanding the Operations Manual is essential to safe practice.

Solidsvac also recommends that a site-specific Risk Assessment (RA) of the pumping operation is undertaken. Any recommendations arising from the Risk Assessment would be additional to the following:

- The unit and all hoses and fittings are undamaged and in good working order.
- Hoses MUST be fit for purpose and appropriate for explosive atmospheres. For example bonded or FRAS hose.
- The compressor in use MUST be installed in a safe area.
- All covers are fitted in place and correctly secured.
- Clean compressed air at minimum working pressure of 500kPa (75 psi) at 100 cfm is available.
- A 25mm (1") i.d. air hose is available.
- The correct PPE is available and worn for operating compressed air equipment
 - Eye Protection
 - Hearing Protection
 - Gloves
 - Safety Boots

4 SV10- AIR FOX INSTALLATION STEPS

1. Connect compressed air line to unit (1/2-1" airline) ensure safety clips, whip checks etc. are fitted
2. Connect discharge line to unit (1" line) this line may need to be restrained due to movement during discharge
3. Attach both suction and discharge hoses along with any accessories as required and ensure safety clips are in place.
4. Lower pump into water but **DO NOT SUBMERG PAST RED LINE.**
5. Turn on air valve and pump will start operating.
6. The pump is now ready for use.



Do not submerge below red line

CONTENTS EXCLUDED FOR PUMPING

Solidsvac recommends that any contents that fall within the scope of the below class liquids should not be pumped with any Solidsvac unit. Solidsvac also recommends that a site-specific JSA should be conducted with reference to any other type of material being pumped.

7. Class IIIA liquids with a flash point equal to or greater than 140 °F (60 °C), but less than 200 °F (93 °C) have a NFPA 704 flammability rating of 2.
8. Class IIIB liquids with a flash point equal to or greater than 200 °F (93 °C) have a NFPA 704 flammability rating of 1.

OPERATING PARAMETERS

The Solidsvac SV10-AIR FOX can operate within environments ranging from 0 °C to 50 °C and all humidity. The maximum medium temperature allowable for the SV10-AIR FOX is 50 °C.

HOSES

Solidsvac recommends the hoses (Air Supply, Discharge) used in operation with the SV10-AIR FOX are to be made of anti-static material. If the hoses used in operation with the SV10-AIR FOX are not made of anti-static material, they MUST be braided to comply with requirements for Fire Resistance & Anti-Static (FRAS) to AS/NZS 2660, or other equivalent standard.

4. OPERATION

Turn the air supply valve ON at the source. Turning the pump valve to ON, the pump will now commence its cycle of operation. This involves the unit allowing water to enter a vessel till it reaches a certain level at that time the unit will dispel the water and then go back to the fill cycle. The unit will continually move between each of these cycles filling/discharging.

Important!!!!!! not to place unit in water that covers the red line on body of unit

Once pumping is completed, remove the suction from the material and allow the pump to cycle self clean. On completion of the operations, isolate the air supply and allow the pump to cycle until the supply in the line is exhausted, then turn the pump off at the supply line. SOLIDSVAC recommends checking the pump discharge to ensure it remains correctly anchored at the exit.

Lubrication is not required during operation.

Note: Dry operation will not damage the pump.

5. MAINTENANCE

In use, the Solidsvac SV10-AIR FOX requires little to no maintenance, however Solidsvac recommends that the following strict measures are taken to ensure pump remains in good working order.

Maintenance, repairs, and the disassembling of the unit can be carried out by any qualified Fitter with a basic knowledge of pneumatics.

SERVICE TIPS

- Set up a maintenance schedule and follow it diligently.
- Clean the machine areas before removing pneumatic components.
Note: When steam cleaning or using water to clean a machine, be sure that filler openings, breather caps etc are protected from possible entry of water into the system.
- Use clean plastic plugs to cover the ends of disconnected lines or to plug openings when working on a pneumatic system.
- A clean workbench is an absolute 'MUST' when servicing components. An industrial-type vacuum cleaner is a valuable aid in removing dust, dirt and tiny metal particles from the work area.
- Check the condition of your tools – they should be clean. Always use hammers made of plastic or leather, so there is no danger of metal chips getting into components.
- When removing parts for service, clean them and then store them in plastic bags or other clean containers until they are installed again.
- When cleaning pneumatic parts, use extreme care to ensure that the cleaning fluid is non-flammable and compatible with the system.
- Use common-sense precautions to prevent dirt entering components that have been temporarily removed from the circuit.

SYSTEM PERFORMANCE

Pneumatic problems that affect system flow and pressure are not always easy to locate. The system testing procedure described later in this section is based on a useful step-by-step approach to troubleshooting. Troubleshooting charts make the fault-finding process easier and faster.

EFFECTS OF A DROP IN SYSTEM FLOW RATE

- A pressure drop will affect the speed and cycle times of a pneumatic machine; actuators will not extend, retract, or rotate at the required speed. Actuator control will become jerky with inconsistencies in flow as cylinders and motors are supplied at different rates. In many complex pneumatic systems, the sequencing and positioning of component operations will be affected as cycle times become thrown out of programmed control.
- The compressor's discharge flow rate should be checked first to ensure that the drop in flow is not a problem of internal leakage or incorrect setting of compressor controls.

EFFECTS OF DROPS IN PRESSURE

The major causes of pressure drop include:

- Pipework restrictions (for example, incorrect sizing) fitting restrictions and sharp corners
- Incorrect pressure settings
- Sudden enlargement in fluid conductors
- Long lengths of fluid conductors
- Component leakage (internal and external)
- Broken valve springs
- Blocked or crimped air lines
- Loose fittings
- Valves not sealing correctly because of contaminants
- Some combination of the above causes

SYSTEM TESTING PROCEDURES

Pneumatic systems, like all machines, require routine maintenance to ensure reliability. However, there are still times when problems occur and **MUST** be located quickly and efficiently, especially in production applications. A step-by-step method has been devised as a way of finding and solving pneumatic problems quickly.

These steps are as follows:

STEP 1: KNOW THE SYSTEM –

Study the machine's technical specifications to obtain an understanding of how the system operates and the function of the machine's components. Obtain a circuit drawing and check the system through. Check the machine's maintenance records and commissioning test results if they are available.

STEP 2: ASK THE OPERATOR –

Determine the symptoms of the problem by asking the operator for a detailed description of the machine's normal operating performance.

STEP 3: INSPECT THE MACHINE –

Use your senses (touch, smell, sight, and hearing) to locate problems or damage such as noisy components, air leaks, malfunctioning components, and damaged air lines.

STEP 4: OPERATE THE MACHINE –

Operate the machine and check that the machine's gauges are reading 'normal' and that there are no unusual noises. The operation of the machine's controls should not be 'sticky' or 'spongy'. The machine's performance should not be slow, erratic – or non-existent.

STEP 5: LIST THE POSSIBLE CAUSES –

Once the fault has been located and recognised, list the possible causes – starting with the simplest.

STEP 6: REACH A CONCLUSION –

Use a troubleshooting chart to check the list of possible causes; then decide which is the most likely.

Note: 99% of all issues are air supply related.

SYSTEM MAINTENANCE

A pneumatic system is easy to maintain. However, like any other mechanism, it **MUST** be operated and maintained correctly. Pneumatic systems can be damaged by excessive pressures, fluid contamination and by high operating temperatures.

Regular maintenance will reduce your pneumatic troubles. By using a regular maintenance program (preventative maintenance) to care for a system, you can eliminate common problems and anticipate special ones. Problems can be corrected or averted before a breakdown occurs.

The following are the key problems that commonly need to be addressed in pneumatic maintenance:

- Water-contaminated air
- Poor air filtration
- Incorrect pressure settings
- Incorrect lubricator settings, resulting in sticking valves
- High air temperature
- Loose supply lines
- Faulty seals

IMPORTANCE OF CLEANLINESS

Cleanliness is of supreme importance when it comes to servicing pneumatic systems. Keep dirt and other contaminants out of the system. Small particles can score valve, cause seizing of components and clog orifices, resulting in expensive repair jobs.

When servicing a pneumatic system, always do the following to ensure cleanliness:

- Keep the compressor and machine's lubricating oil clean
- Keep the system clean
- Keep your work area clean
- Be careful when you change seal or components (take photos)
- Use caution with compressed air
- Ensure all pneumatic components supply lines are secure

SAFETY FIRST

PRIOR TO COMMENCING ANY WORK ON THE UNIT, THE AIR SUPPLY VALVE MUST BE ISOLATED AND THE CONTROL SYSTEM TESTED DEAD

PUMP PREVENTATIVE MAINTENANCE PROGRAM

The following is the work to be performed to a SV10-AIR FOX Pump during Preventative Maintenance

Check. All items, except annual checks (Tradesman), are to be carried out by a Competent Operator.

- Lock and tag out equipment
- Record equipment data
- Check all mounting bolts and clamps are secure and tight
- Check vessel support frame and wheels for soundness
- Visual inspection of pump for any damage
- Check exhaust box for cleanliness (if fitted)
- Check condition of seals
- Check 2 way ball valve for leakage
- Inspect condition of airlines and fittings
- Check operation posi-check valve (if fitted)
- Test the operation of the SV10-AIR FOX pump prior to returning to service
- Make note on the field report of any findings that may require additional work

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PUMP MAINTENANCE CHECKLIST

DESCRIPTION	COMMENT	MAINTENANCE FREQUENCY			
		DAILY	WEEKLY	MONTHLY	ANNUALLY
Pump	Check all guards are in place and valves are working.	X			
Overall visual inspection	Complete overall visual inspection to be sure all equipment is operating and guarding are in place.	X			
Check ball valve seals	Assure that all seals are in good condition and not worn, split or damaged.		X		
Check airlines and fittings	Inspect airlines for any deterioration, check fittings for cracks and leaking.		X		
Check bolts	Check and secure all clamps and bolts.		X		
Check control system	Conduct a full service on the pump				X

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JOB SAFETY ANALYSIS

Note: It is recommended that a site-specific JSA is conducted prior to operation of the unit.

JOB SAFETY ANALYSIS

SOLIDSVAC SV10-AIR FOX

Date Of Audit – June 2020.

Equipment/Task: Set-up and operate Solidsvac Solids/Slurry Pump.

Note: Site Safety requirements MUST be adhered to at all times. Personal Protective Equipment including approved safety eyewear and hearing protection are to be worn at all times whilst operating this equipment.

STEP #	JOB STEPS	HAZARDS/WHAT CAN GO WRONG	CONTROLS & RISK REDUCTION
1	Selecting the right pump.	Selecting the incorrect pump/ equipment to transfer media that is either hazardous in itself or becomes hazardous when transferring can result in delay of operating and injury.	Site-specific JSA MUST be conducted prior to operation to identify site-specific media risks & hazards.
2	Siting the pump.	The pump may be unstable.	Site the pump on a reasonably flat, level & stable surface, or on a suitable straddle frame. DO NOT SUBMERG PAST RED LINE
3	Connecting discharge hose range to pump.	(a) Use of inappropriate non pressure rated discharge hose, hose or couplers may cause discharge hose range failure.	Ensure minimum 1" discharge range is used rated to 10Bar. Hose may be rubber or poly. The pump utilises the claw coupling system. Use hose restraints (safety clips, whip checks etc.)
		(b) Sharp bends, tee pieces and valves in a discharge line can cause blockages.	Ensure discharge hose range has no sharp bends or tee pieces and is free of restrictions such as reductions in hose diameter or gate valves etc.
		(c) Discharge hose range may move particularly at discharge exit point.	Ensure discharge hose range is secured at appropriate points along its length and particularly at discharge exit point.
4	Connecting the air supply hose to the pump. Air hose should be blown clean before connection.	(a) Compressed air can be dangerous and may cause injury. Blowing air supply hose clean can cause eye, hearing or physical injury if not carried out in a controlled manner.	Ensure air hose is turned off completely and that the pump air inlet ball valve is closed before connection.
		(b) Air supply hose can 'fly off' if not properly connected.	Ensure air line couplings are correctly engaged and have safety clips fitted.

JOB SAFETY ANALYSIS

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STEP #	JOB STEPS	HAZARDS/WHAT CAN GO WRONG	CONTROLS & RISK REDUCTION
7	Pump Operation – Unblocking Discharge Hose Range Blockages.	Pressure in discharge range has potential to cause eye and physical injury.	STOP THE PUMP. DO NOT DISCONNECT ANY DISCHARGE HOSE RANGE COMPONENT WHILST PUMP IS OPERATING. Depressurise the discharge hose range by operating a manual pressure relief valve on the pump or within the hose range (if fitted) OR, using EXTREME CAUTION, loosen hose couplings upstream of the estimated blockage point (ie. between pump and blockage) to safely vent residual pressure before attempting to fully open hose joints to clear the blockage.
8	Pump Operation – Discharge Hose Range Exit Point.	Injury can be caused by high velocity material ejected from discharge point.	Ensure end of 1" discharge line is secured
9	Disconnecting Pump from Air Supply.	Injury may result from uncontrolled whipping of pressurised air hose.	Before disconnecting air hose isolate it upstream & open the Pump Air Supply Ball Valve to release residual pressure from the air line.

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Model Number

Serial Number

Date of Manufacture

Inspected by

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SOLIDSVAC SOLIDS PUMPING
SYSTEMS
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