

# SOLIDSVAC<sup>®</sup>

SOLIDS PUMPiNG SYSTEMS



## SV-VP VAC-PACK Operations Manual



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## SAFETY FIRST

### CAUTION & GENERAL SAFETY

This manual contains important information concerning the installation, operation and maintenance of the Solidsvac Vac-Pack. 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 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 Jetpack in use. All Solidsvac equipment require a minimum operating pressure of 689kPa and have a maximum operating pressure of 758kPa (110psi). The recommended size for the air supply hose is dependent on the Jetpack configuration, below is a guide for each.

50-230CFM – 1"

380-600CFM – 2"

900-1200CFM – 3"

**Note: An 18mm (¾") i.d. Air hose contains HALF the volume of the recommended 25mm (1") hose.**

The Discharge hose MUST be no smaller in diameter than the pumps outlet, preferably a self-supporting type and secured at regular intervals.

## 1. OPERATIONAL OVERVIEW

The Solidsvac range is a compressed air driven and controlled pumping system which utilises a compressed air venturi to vacuum and convey material through a pressure vessel (AS1210). This is achieved with a range of airflows from 50 CFM (84.95m<sup>3</sup>/hr)- 1200 CFM (2038.8m<sup>3</sup>/hr) @ 100psi (6.89bar). During the suction phase the venturi creates vacuum that allows any flowable material with solids ranging up to 75mm to be drawn into the vessel. Then during the discharge phase, compressed air is exerted into the vessel and the material, is pressure discharged. These 2 phases are repeated to allow the pump to convey material, with the duration of each phase being controlled by timers.

With the Solidsvac range of Constant Vacuum/ Constant Discharge units (CVCD) a dual system unit is utilised, with one system having a vacuum exerted on it whilst the second has pressure exerted on it. This results in a near continuous flow of material at both ports.

A Solidsvac Vac-Pack uses a compressed air powered venturi system to only generate a vacuum. The Vac-Pack can turn any appropriately rated container into a recovery vessel.

### 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.

The unit is not designed to operate above 758kPa (114psi) and the PRV will relieve at 758 +/- 35kPa (110psi +/- 5psi).

## 2. PNEUMATIC CONVEYING

A Solidsvac Voe-Pack generates vacuum via 100% compressed air powered venturi system. The Vac-Pack can turn any appropriately rated container into a powerful vacuum recovery system.

The Vac-Pack operates in two phases: Lean Phase, where the material is conveyed within the air stream and Dense Phase, where the material is conveyed by the air stream.

The below items should be considered if you are to optimise the performance of a Solidsvac Vac-Pack.

**NOTE: For the suction hose recovering material to reach full flow/vacuum, the Vac-Pack must evacuate the air from the vacuum tank or skip the unit is connected to. The time required for this is determined solely by the size of skip or tank and may take several seconds or significantly longer in the case of a 20,000 litre ISO vessel.**

### CORRECT AIR SUPPLY

Available air (Both volume - CFM/m<sup>3</sup> and pressure - Psi/kPa) and using the correct nominal bore (ID) supply hose is crucial. The loss of pressure brought about by either distance or insufficient hose ID, is somewhat equivalent to that of voltage drop experienced in electrical equipment.

**NOTE: A larger diameter supply line can act as an accumulator, often saving a significant amount of energy when employed correctly.**

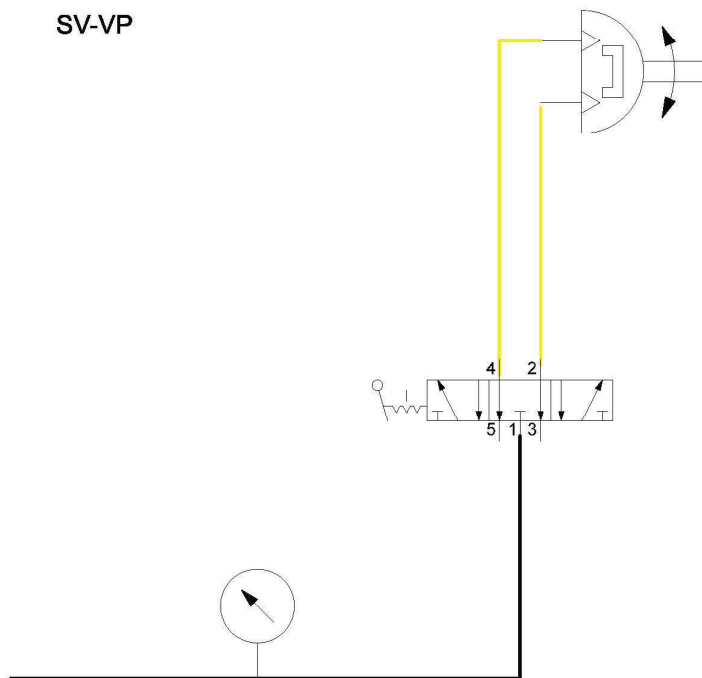
### APPRECIATE THE ENERGY REQUIRED

At 1 Sg of a material to be conveyed in every 100mm of 100mm (4") hose, equates to approximately 1 Kg or 2.2lb and as such a 5 metre (20') hose will carry around 60 Kg (130lb) of material. It is worth keeping in mind that it takes far more energy to vacuum convey a material vertically or over substantial distances.

## 3. TECHNICAL SPECIFICATIONS

TECHNICAL DATA	US IMPERIAL	METRIC
Height	1350 mm	53"
Width	890 mm	35"
Length	960 mm	37.7"
Weight	280 kg	617 lb
Air Connection	50 mm	2"
Suction Inlet	100 mm	4"
Operating Pressure	689 kPa	100 psi
Air Consumption Options	10.7 m <sup>3</sup> /min 16.9 m <sup>3</sup> /min 25.4 m <sup>3</sup> /min 33.9 m <sup>3</sup> /min	380 cfm 600 cfm 900 cfm 1200 cfm

#### 4. SV-VAC PACK SCHEMATIC



## 4.DESIGN REGISTRATION

### TECHNICAL STANDARDS

- AS4343-2005 Pressure Equipment – Hazard Levels
- ISO 80079-36:2016
- ISO 80079-37:2016
- ISO 80079-38:2016
- IEC 60079-0:2017

The requirements of ISO 80079-36 and IEC 60079-0 have been applied to this equipment.

Temperatures are continuously rated and deterioration of the equipment during use will not compromise the Ex properties.

An ignition hazard assessment has been performed in accordance with ISO 80079-36.

**Certificate: IECEx ExTC 24.0008X**

**Code: Ex h I Ma (0 °C ≤ Tamb ≤ +50 °C)**

**Ex h IIB T4 Gb (0 °C ≤ Tamb ≤ +50 °C)**

### CONTENTS EXCLUDED FOR PUMPING

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

- 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.
- 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 SV70-SPDK can operate within environments ranging from 0 °C to 50 °C and all humidity.

The maximum medium temperature allowable for the SV70-SPDK is 50 °C.

### HOSES

Solidsvac recommends the hoses (Air Supply, Suction, Discharge) used in operation with the Solidsvac Pumps are to be made of anti-static material to ISO 6805:2020.

### EARTHING POINT

All Solidsvac models are fitted with an Earthing Point which is mandatory requirement prior to operation. Solidsvac strongly recommends that the operator takes the necessary measures to earth the unit prior to operation.

### CONDITION OF USE

It is a condition of use that the equipment is to be earthed according to the user manual prior to operation.

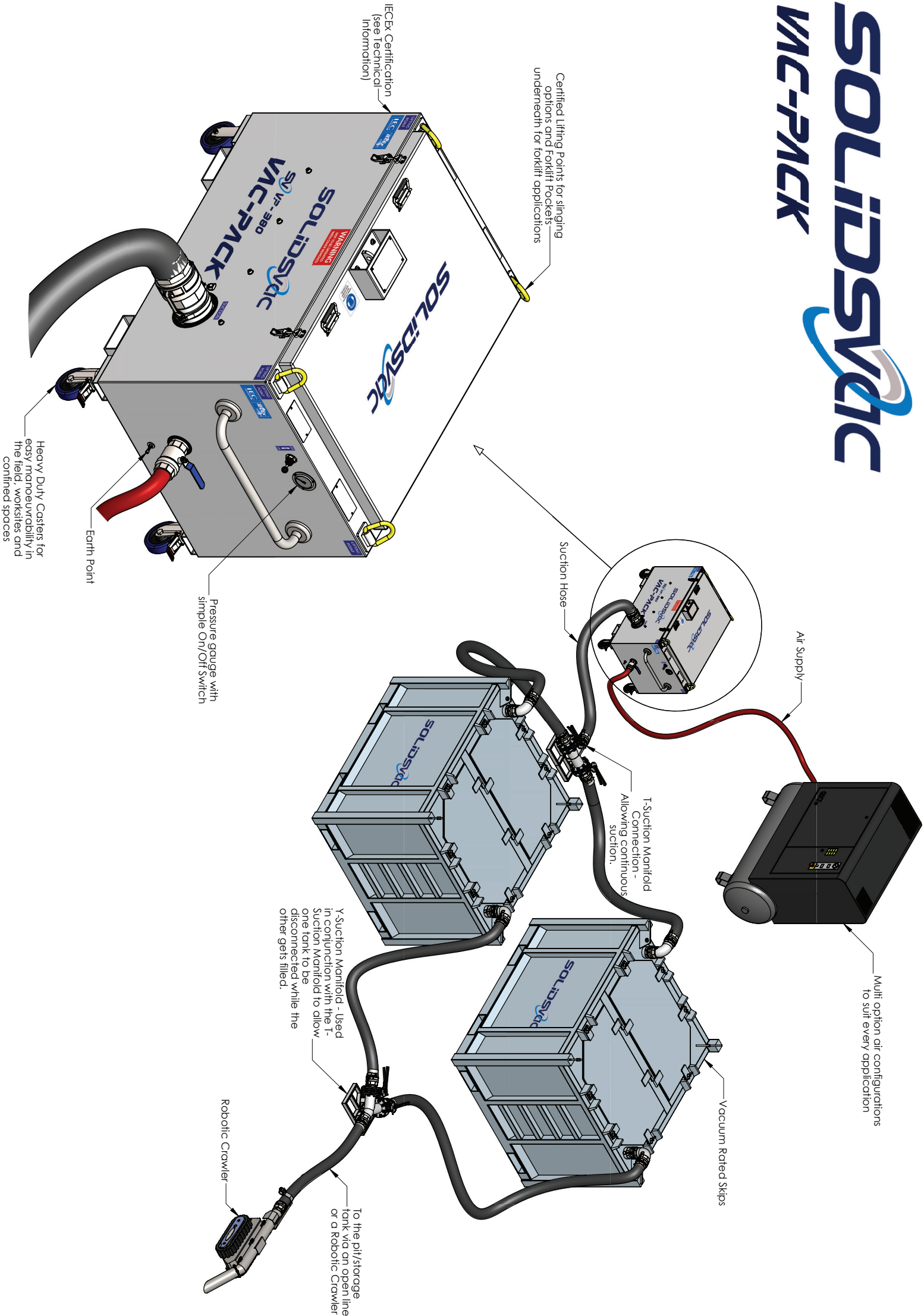
It is a condition of use that the equipment is to be supplied compressed air from a clean source.

### WARNING:

**TO AVOID POSSIBLE ELECTROSTATIC CHARGES PRODUCED BY THE MATERIAL CONVEYED  
THE OPERATOR MUST EARTH THE UNIT PRIOR TO OPERATION**

# SOLIDSVAC

## VAC-PACK



## 7. SET UP

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

**Note: No training is necessary to operate the SV-VP, however understanding the Operations Manual is essential to safe practice.**

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

- The Vac-Pack and all hose fittings are undamaged and in good working order.
- Ensure the compressor in use MUST be installed in a safe area and is in good working condition.
- All covers and fittings are in place and correctly secured
- Clean compressed air at minimum working pressure of 689kpa (100psi) is available.
- A correctly sized air hose is available (see page 3).
- The correct PPE is available and worn for operating compressed air equipment.

Complete the Set Up of the Vac-Pack by doing the following:

- Set the Solidsvac Vac-Pack in a safe level location and ensure wheels are locked.
- Ensure the main air valve is closed and the control switch is in the OFF position.
- Attach the correctly sized air hose (see page 3) to the Vac-Pack & fit safety clips.
- Connect a 4" (100mm) suction hose from the outlet of rated container to the Vac-Pack & fit safety clips/whipchecks
- Connect a 4" (100mm) suction hose from the inlet of the rated container to any accessories (if required) & fit safety clips/whipchecks
- Ensure the unit is adequately earthed.
- The Vac-Pack is now ready for use.

**TO MAINTAIN OPTIMAL PERFORMANCE, THE VAC-PACK SHOULD BE LOCATED NO FURTHER THAN 50 METRES FROM THE SUCTION POINT**

## 8. OPERATION

Commence operation of the Vac-Pack by doing the following:

- Ensure top lid is closed and securely locked.
- With all correct hoses safely secured and suction hoses removed from the material, open the air compressor supply valve.
- Open the Vac-Pack air supply valve.
- Turn the Vac-Pack switch to ON.
- The unit will automatically begin continuously vacuuming.

**THE OPERATOR MUST REMAIN AWARE OF THE MATERIAL LEVEL IN THE RATED CONTAINER.**

**IF MATERIAL APPEARS INSIDE THE VAC-PACK, OVERFILLING MAY BE OCCURRING.**



## 9.SHUTDOWN

Complete operation of the Voe-Pack by doing the following:

- Once suction is complete, close the compressor air supply valve.
- Ensure the air supply line is bled and system is free of compressed air prior to disconnecting any hoses.
- Operation has finished.

**LID SHOULD BE OPENED, INTERNALS INSPECTED AND ANY CARRY OVER REMOVED AFTER EACH APPLICATION.**

## 10.HIGH LIFT APPLICATIONS

The Voe-Pack can perform high vertical suction lifts in excess of 25 metres (80 feet), however recovering material from this distance cannot be achieved via vacuum alone, this needs to be pneumatically conveyed. The material must share the suction line with a volume of air and Solidsvac recommends the use of SV-In Line Annulars to aerate and fluidize high Sg or dense material during high vertical lifts or applications where the material to be conveyed is heavy and non viscous.

It is important to remember that although lifts in excess of 25 metres are achievable, there can be a drop in the recovery rates.

**NOTE: When using the SV-In Line Annulars, follow the below order of operations.**

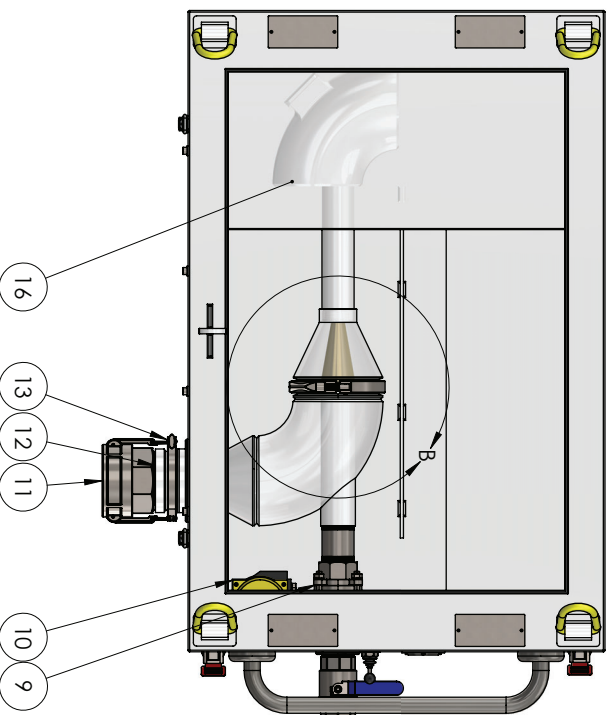
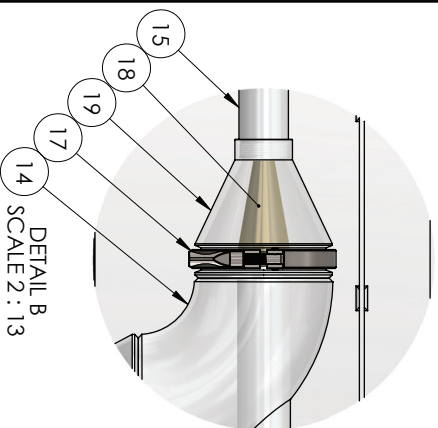
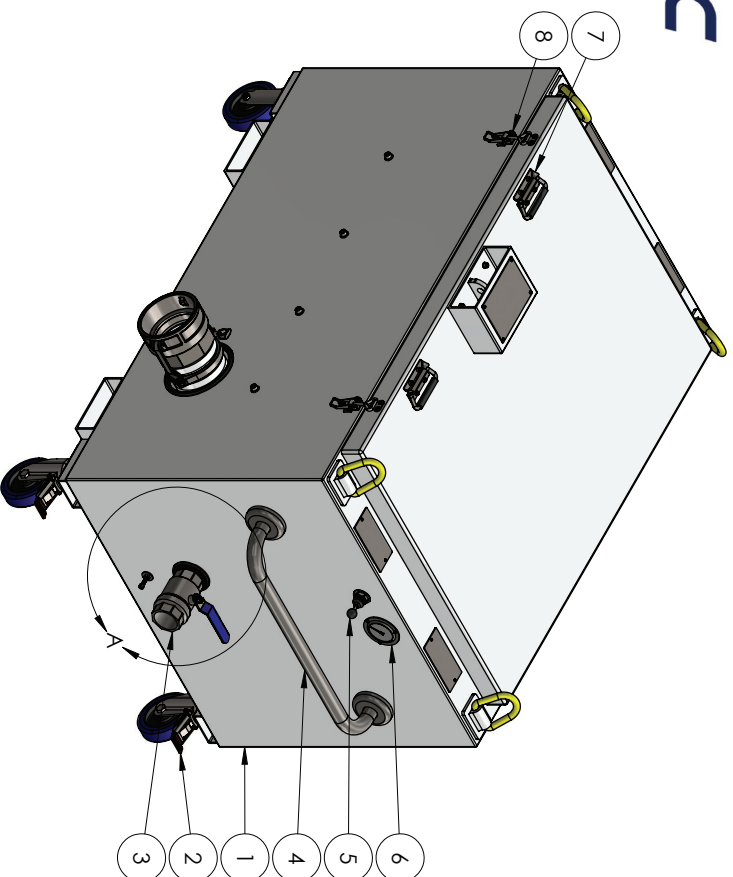
1. Ensure the In Line Annulars are closed, the Voe-Pack switch is in the 'OFF' position and supply valve is closed.
2. Turn on air supply and open the air supply valve.
3. Move the Voe-Pack switch to the 'ON' position. The Voe-Pack will begin vacuuming via the rated container.
4. Once vacuum is achieved, the Annulars can be opened to assist with conveying.



**SV-IN LINE ANNULAR**

### WARNING

**THE TOP LID MUST REMAIN CLOSED & LOCKED AT ALL TIMES DURING OPERATION. FAILURE TO DO SO CAN RESULT IN SERIOUS INJURY.**



ITEM No.	DESCRIPTION	PART No.
1	Vac-Pack Box	SV-VP-1
2	100mm Casters	NPN
3	2" Ball Valve (Lockable)	SV906
4	SV-VP Container Handle	NPN
5	1/4 HLV Solenoid	SV910-3
6	Pressure Gauge	SV905-2
7	Trunk Handle	NPN
8	Latch	NPN
9	2" Ball Valve	SV20-38
10	2" Actuator Rotary	SV20-39
11	4" Camlock Type 'B'	SV927-B
12	4" T/C to 4" BSP Adaptor	SV440-10B
13	4" Tri-Clover Clamp	SV914
14	Vac Pack Venturi Housing 380/600/900CFM	SV-VP-2
15	380CFM-VP Diffuser Stem 600CFM-VP Diffuser Stem 900CFM-VP Diffuser Stem	SV-VP-4-2 SV-VP-5-2 SV-VP-6-2
16	Vac-Pack Exhaust Bend 6" Tri-Clover Clamp	SV-VP-12 SV916
18	230CFM-VP Nozzle 380CFM-VP Nozzle 600CFM-VP Nozzle 900CFM-VP Nozzle	SV-VP-10 SV-VP-10-1 SV-VP-10-2 SV-VP-10-3
19	380CFM-VP Diffuser Cone 600CFM-VP Diffuser Cone 900CFM-VP Diffuser Cone	SV-VP-4-1 SV-VP-5-1 SV-VP-6-1
20	Earthing Point	N/A

<b>TITLE</b>	SV-VP Vac-Pack 230/380/600/900CFM	
<b>DWG No.</b>	SV-VP	
<b>PAINT TYPE</b>	DUUX - DURALLOY® - PEARL WHITE - GLOSS - 272114G	
<b>PAINT THICKNESS</b>	80µm	
<b>IECEX MARKING LABEL</b>	Ex h I Ma: 0 °C < Tamb 50°C	
<b>IECEX CERTIFICATION No.</b>	IECEX Code: IECEX EXTC 24.0008X	
<b>UNIT DIMENSIONS (LxWxH)</b>	1350mm x 890mm x 1600mm	
<b>SCALE</b>	1 : 11	<b>SIZE</b> A3
<b>SHEET</b>	1 OF 1	<b>REV No.</b> 1
<b>DRAWN BY</b>	T.WALBANK	<b>DATE</b> 27/05/24

Model Number

Serial Number

Date of Manufacture

Inspected by



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