# Pinch Valve Assembly

Customer Product Manual
Part 768670A
Issued 05/05

**For parts and technical support, call your nearest Finishing Customer Support Centre.**
**Find your nearest centre at www.nordson.com/directory**

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**Contact Us**

Nordson Corporation welcomes requests for information, comments, and inquiries about its products. General information about Nordson can be found on the Internet using the following address: http://www.nordson.com.

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**Notice**



**Trademarks**

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# Pinch Valve Assembly

## Safety

**WARNING:** Allow only qualified personnel to perform the following tasks. Observe and follow the safety instructions in this document and all other related documentation.

Read and follow these safety instructions. Task- and equipment-specific warnings, cautions, and instructions are included in equipment documentation where appropriate.

Make sure all equipment documentation, including these instructions, is accessible to all persons operating or servicing equipment.

### *Qualified Personnel*

Equipment owners are responsible for making sure that Nordson equipment is installed, operated, and serviced by qualified personnel. Qualified personnel are those employees or contractors who are trained to safely perform their assigned tasks. They are familiar with all relevant safety rules and regulations and are physically capable of performing their assigned tasks.

### *Intended Use*

Use of Nordson equipment in ways other than those described in the documentation supplied with the equipment may result in injury to persons or damage to property.

Some examples of unintended use of equipment include

- using incompatible materials
- making unauthorized modifications
- removing or bypassing safety guards or interlocks
- using incompatible or damaged parts
- using unapproved auxiliary equipment
- operating equipment in excess of maximum ratings

## Regulations and Approvals

Make sure all equipment is rated and approved for the environment in which it is used. Any approvals obtained for Nordson equipment will be voided if instructions for installation, operation, and service are not followed.

All phases of equipment installation must comply with all federal, state, and local codes.

## Personal Safety

To prevent injury follow these instructions.

- Do not operate or service equipment unless you are qualified.
- Do not operate equipment unless safety guards, doors, or covers are intact and automatic interlocks are operating properly. Do not bypass or disarm any safety devices.
- Keep clear of moving equipment. Before adjusting or servicing any moving equipment, shut off the power supply and wait until the equipment comes to a complete stop. Lock out power and secure the equipment to prevent unexpected movement.
- Relieve (bleed off) hydraulic and pneumatic pressure before adjusting or servicing pressurized systems or components. Disconnect, lock out, and tag switches before servicing electrical equipment.
- Obtain and read Material Safety Data Sheets (MSDS) for all materials used. Follow the manufacturer's instructions for safe handling and use of materials, and use recommended personal protection devices.
- To prevent injury, be aware of less-obvious dangers in the workplace that often cannot be completely eliminated, such as hot surfaces, sharp edges, energized electrical circuits, and moving parts that cannot be enclosed or otherwise guarded for practical reasons.

## Fire Safety

To avoid a fire or explosion, follow these instructions.

- Do not smoke, weld, grind, or use open flames where flammable materials are being used or stored.
- Provide adequate ventilation to prevent dangerous concentrations of volatile materials or vapors. Refer to local codes or your material MSDS for guidance.
- Do not disconnect live electrical circuits while working with flammable materials. Shut off power at a disconnect switch first to prevent sparking.
- Know where emergency stop buttons, shutoff valves, and fire extinguishers are located. If a fire starts in a spray booth, immediately shut off the spray system and exhaust fans.
- Clean, maintain, test, and repair equipment according to the instructions in your equipment documentation.
- Use only replacement parts that are designed for use with original equipment. Contact your Nordson representative for parts information and advice.

## Grounding

**WARNING:** Operating faulty electrostatic equipment is hazardous and can cause electrocution, fire, or explosion. Make resistance checks part of your periodic maintenance program. If you receive even a slight electrical shock or notice static sparking or arcing, shut down all electrical or electrostatic equipment immediately. Do not restart the equipment until the problem has been identified and corrected.

Grounding inside and around the booth openings must comply with NFPA requirements for Class 2, Division 1 or 2 Hazardous Locations. Refer to NFPA 33, NFPA 70 (NEC articles 500, 502, and 516), and NFPA 77, latest conditions.

- All electrically conductive objects in the spray areas shall be electrically connected to ground with a resistance of not more than 1 megohm as measured with an instrument that applies at least 500 volts to the circuit being evaluated.
- Equipment to be grounded includes, but is not limited to, the floor of the spray area, operator platforms, hoppers, photoeye supports, and blow-off nozzles. Personnel working in the spray area must be grounded.
- There is a possible ignition potential from the charged human body. Personnel standing on a painted surface, such as an operator platform, or wearing non-conductive shoes, are not grounded. Personnel must wear shoes with conductive soles or use a ground strap to maintain a connection to ground when working with or around electrostatic equipment.
- Operators must maintain skin-to-handle contact between their hand and the gun handle to prevent shocks while operating manual electrostatic spray guns. If gloves must be worn, cut away the palm or fingers, wear electrically conductive gloves, or wear a grounding strap connected to the gun handle or other true earth ground.
- Shut off electrostatic power supplies and ground gun electrodes before making adjustments or cleaning powder spray guns.
- Connect all disconnected equipment, ground cables, and wires after servicing equipment.

## *Action in the Event of a Malfunction*

If a system or any equipment in a system malfunctions, shut off the system immediately and perform the following steps:

- Disconnect and lock out electrical power. Close pneumatic shutoff valves and relieve pressures.
- Identify the reason for the malfunction and correct it before restarting the equipment.

## *Disposal*

Dispose of equipment and materials used in operation and servicing according to local codes.

## *Residual Risks*

The Pinch Valve Assembly presents no particular risks to operators. The only residual risks are :

- Upper limbs of the body being trapped between the top edge of the surge hopper and the bottom edge of the cyclone when the surge hopper is being raised.
- Possible entrapment of operators fingers inside the pinch valve sleeves during operation, maintenance and cleaning.
- Risk of powder ingestion if care is not taken when cleaning the surge hopper. Operators should wear a safety mask and goggles at all times when cleaning the Pinch Valve Assembly.

# Description

The function of the Pinch Valve Assembly is to reclaim and transport powder coating materials from a conical surge hopper situated underneath a cyclone.

See Fig 1

The surge hopper (1) collects the powder which is then pumped by the Pinch Valve Assembly back to a sieve or other conditioning or storage equipment.

The assembly consists of two sleeved pinch valves (2) and (3) vertically mounted above each other in housings, a support frame (4), and a surge hopper lifting mechanism (5) which forms a seal to the cyclone during operation. As an option, a vibrator can be fitted to the cone of the surge hopper to encourage powder to enter the pinch valves.

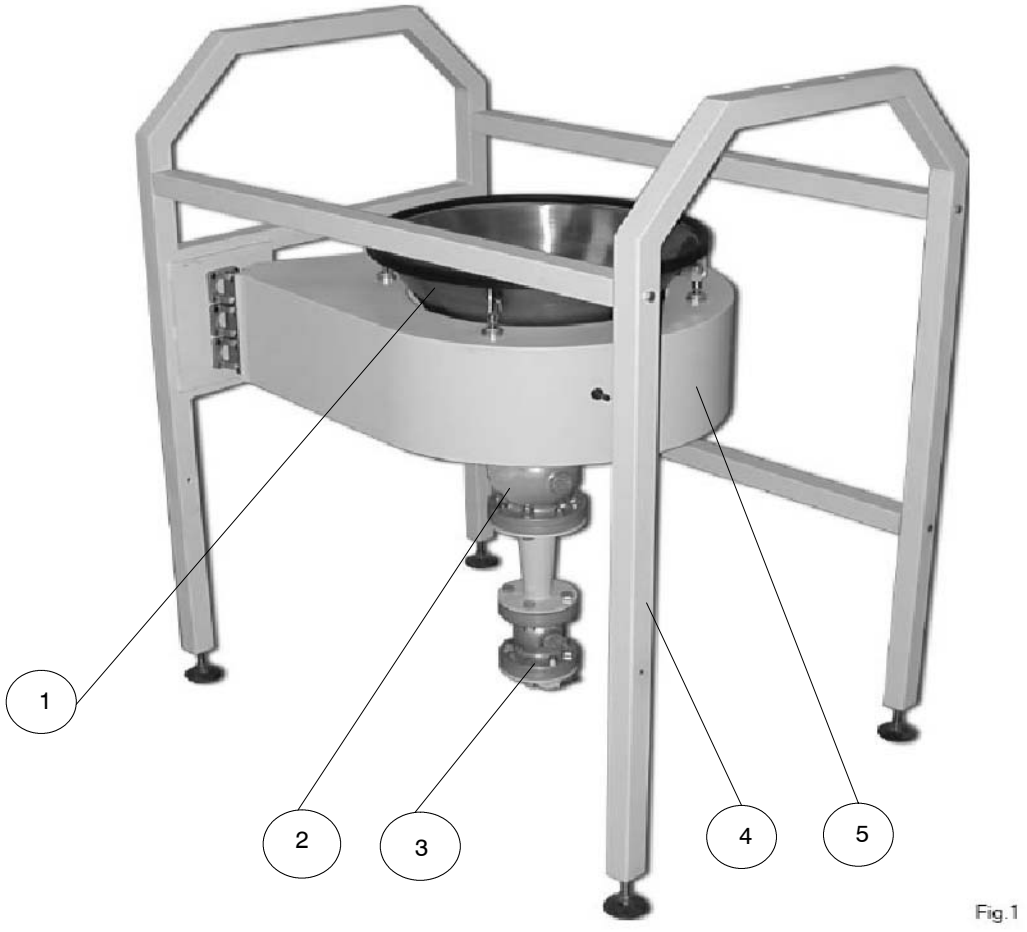


Figure 1 Pinch Valve Assembly

# Installation

**WARNING:** Allow only qualified personnel to perform the following tasks. Observe and follow the safety instructions in this document and all other related documentation.

**WARNING:** Risk of electrical shock. Disconnect and lock out input power to equipment before servicing. Failure to observe this warning may result in personal injury or death

## *Transport*

Transport the unit so as to avoid damage. Use suitable packaging materials and sturdy cartons. See Specifications section for dimensions and weights. Protect the unit from exposure to humidity, dust and vibrations.

## *Unpacking*

Carefully unpack the unit avoiding damage. Check for damage caused during transport. Save packing materials for possible later use, otherwise recycle or dispose of properly according to local regulations.

## *Removing*

Switch off the main electrical and pneumatic supplies.

## *Storage*

Pack the unit in suitable packing materials and sturdy cartons. Protect from humidity, dust and large temperature fluctuations. Add a layer of grease to all moving parts to prevent rust.

## *Disposal*

Dispose of properly according to local regulations.

## *Electrical*

- Ensure that the earth wire is connected to a suitable earthing point.
- Connect suitable power supply (220v) to optional electric vibrator.

## *Pneumatic*

- Ensure that air supply is at 6 Bar pressure.
- Connect pneumatic hoses to pinch valves.

## *Setting Up*

The Pinch Valve Assembly is to be installed below a cyclone that supports itself from the frame of the unit.

To allow safe and efficient operation ensure that the area to the front of the assembly where the surge hopper hinges out is clear from obstruction.

When positioning the unit, ensure that the bottom plate of the cyclone is no more than 40mm above the top of the surge hopper when the surge hopper is in its down position. Therefore the lower edge of the cyclone may vary in height from a minimum of 1150mm to a maximum of 1200mm.

# Operation

See Fig 2.

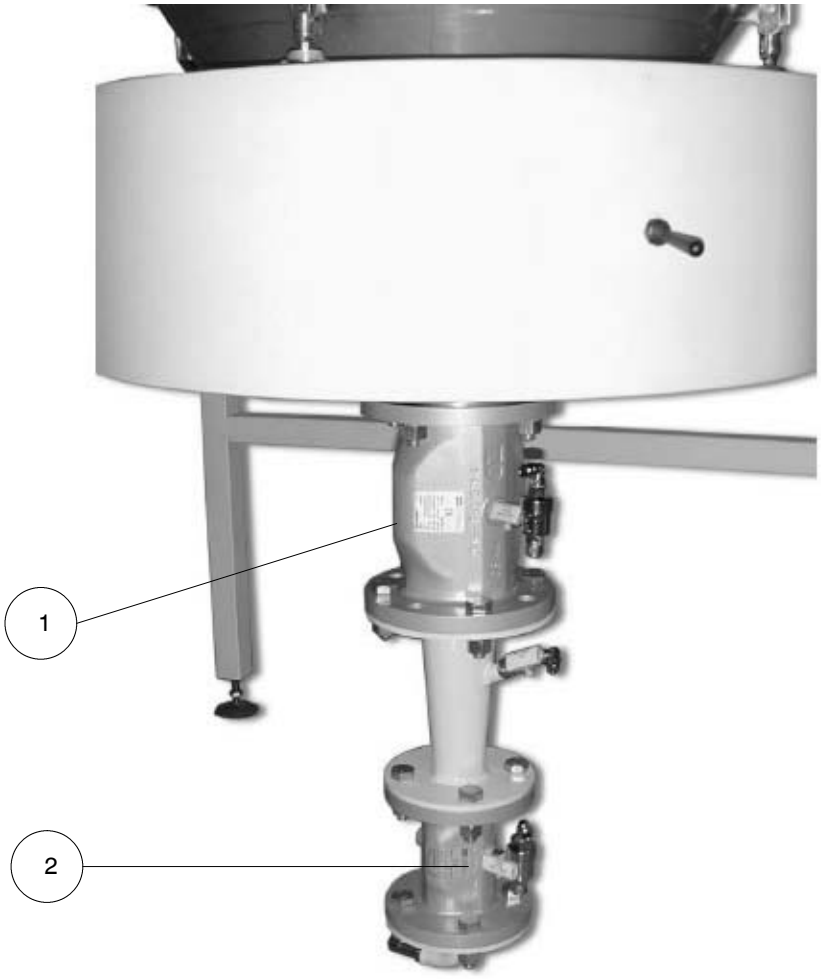


Figure 2 Pinch Valve Assembly Operation.

When in operation, the top pinch valve (1) opens for a controlled specific time causing the powder that has accumulated to flow out of the surge hopper and in to the chamber below. The top pinch valve then closes and the bottom pinch valve (2) opens. Compressed air is then automatically injected in to the chamber to push the powder out of the whole assembly and in to transfer tubing which transports the powder to a sieve or storage equipment.

The sequence of operation is controlled by the pinch valve controller situated in the booth control cabinet or the feed centre, dependent upon type of booth. These sequence settings are factory set, and should only be modified by Nordson personnel.

## *Raising And Lowering The Surge Hopper For Cleaning*

See Fig 3

A raise / lower toggle switch is situated on the side of the surge hopper lifting mechanism. Flicking the toggle switch upwards raises the lifting mechanism, flicking the toggle switch downwards lowers the mechanism.

Figure 3 Surge hopper lifting mechanism toggle switch.

Refer to control panel documentation for details on activating the pinch valve pumping sequence

# Maintenance

**WARNING:** Allow only qualified personnel to perform the following tasks. Observe and follow the safety instructions in this document and all other related documentation.

**WARNING:** Ensure electrical power and pneumatic connections are disconnected before carrying out maintenance work

## *Replacing A Pinch Valve Sleeve*

To replace a pinch valve sleeve use the following procedure.

1. Switch off the Pinch Valve Assembly and safely disconnect the electrical and pneumatic supplies
2. See Fig 4.Using a 19mm wrench disconnect the pinch valve that you would like to replace the sleeve on by loosening the bolts (1).

**CAUTION:** The top valve (2) is bigger than the bottom valve (3)


Figure 4 Disconnecting the pinch valves.

3. See Fig 4. Remove the pressure regulators and gauges (4) on the side of the pinch valve to avoid damage.
4. See Fig 5. Remove the roll pin (1) that retains the sleeve inside the pinch valve using long nosed pliers.

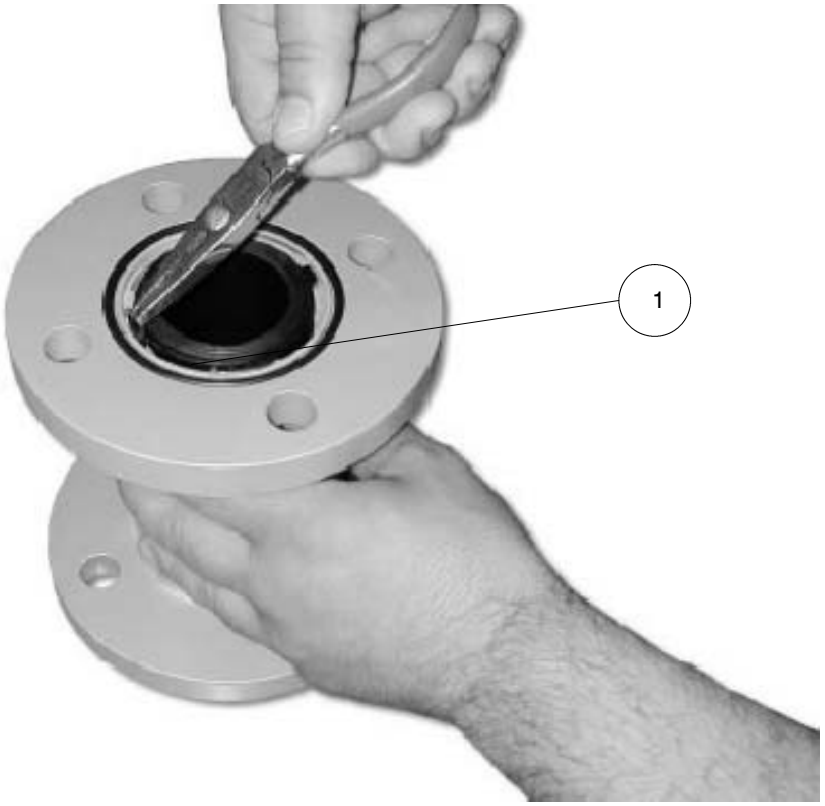


Figure 5 Removing the roll pin.

5. See Fig 6 and Fig 7. Rotate the sleeve 45 degrees anti-clockwise, when the four tabs are lined up with the slots the sleeve can be removed.

Figure 6 Lining up the four tabs.

Figure 7 Removing the sleeve.

6. Clean the valve body with compressed air.
7. Insert the new sleeve inside the body. Ensure that the side without a roll pin is facing the new sleeve. Ensure that the large tab on the sleeve is lined up with the large slot of the pinch valve body.
8. Rotate the sleeve 45 degrees to lock it in position.
9. Using long nosed pliers re-insert the roll pin.
10. Check conditions of seals and replace if damaged.
11. Re-assemble regulators and gauges to the pinch valve, and re-assemble to the surge hopper.

# Troubleshooting

**WARNING:** Allow only qualified personnel to perform the following tasks. Observe and follow the safety instructions in this document and all other related documentation.

This section contains troubleshooting procedures. These procedures cover only the most common problems that you may encounter. If you cannot solve the problem with the information given here, contact your local Nordson representative for help.

| Problem | Possible Cause | Corrective Action |
|---|---|---|
| **1. Air escaping from pinch valve in to cyclone** | Ruptured pinch valve sleeve | Replace pinch valve sleeve |
| **2. No powder returning from the pinch valve assembly to the sieve** | Obstruction in hose<br><br>Ruptured pinch valve sleeve | Check hose for obstructions<br><br>Replace pinch valve sleeve |

# Parts

To order parts, call the Nordson Customer Service Center or your local Nordson representative. Use this five-column parts list, and the accompanying illustration, to describe and locate parts correctly.

## *Using the Illustrated Parts List*

Numbers in the Item column correspond to numbers that identify parts in illustrations following each parts list. The code NS (not shown) indicates that a listed part is not illustrated. A dash (—) is used when the part number applies to all parts in the illustration.

The number in the Part column is the Nordson Corporation part number. A series of dashes in this column (- - - - - -) means the part cannot be ordered separately.

The Description column gives the part name, as well as its dimensions and other characteristics when appropriate. Indentions show the relationships between assemblies, subassemblies, and parts.

- If you order the assembly, items 1 and 2 will be included.
- If you order item 1, item 2 will be included.
- If you order item 2, you will receive item 2 only.

The number in the Quantity column is the quantity required per unit, assembly, or subassembly. The code AR (As Required) is used if the part number is a bulk item ordered in quantities or if the quantity per assembly depends on the product version or model.

Letters in the Note column refer to notes at the end of each parts list. Notes contain important information about usage and ordering. Special attention should be given to notes.

| Item | Part | Description | Quantity | Note |
|---|---|---|---|---|
| — | 0000000 | Assembly | 1 | |
| 1 | 000000 | • Subassembly | 2 | A |
| 2 | 000000 | • • Part | 1 | |

## *Pinch Valves*

See Fig 8

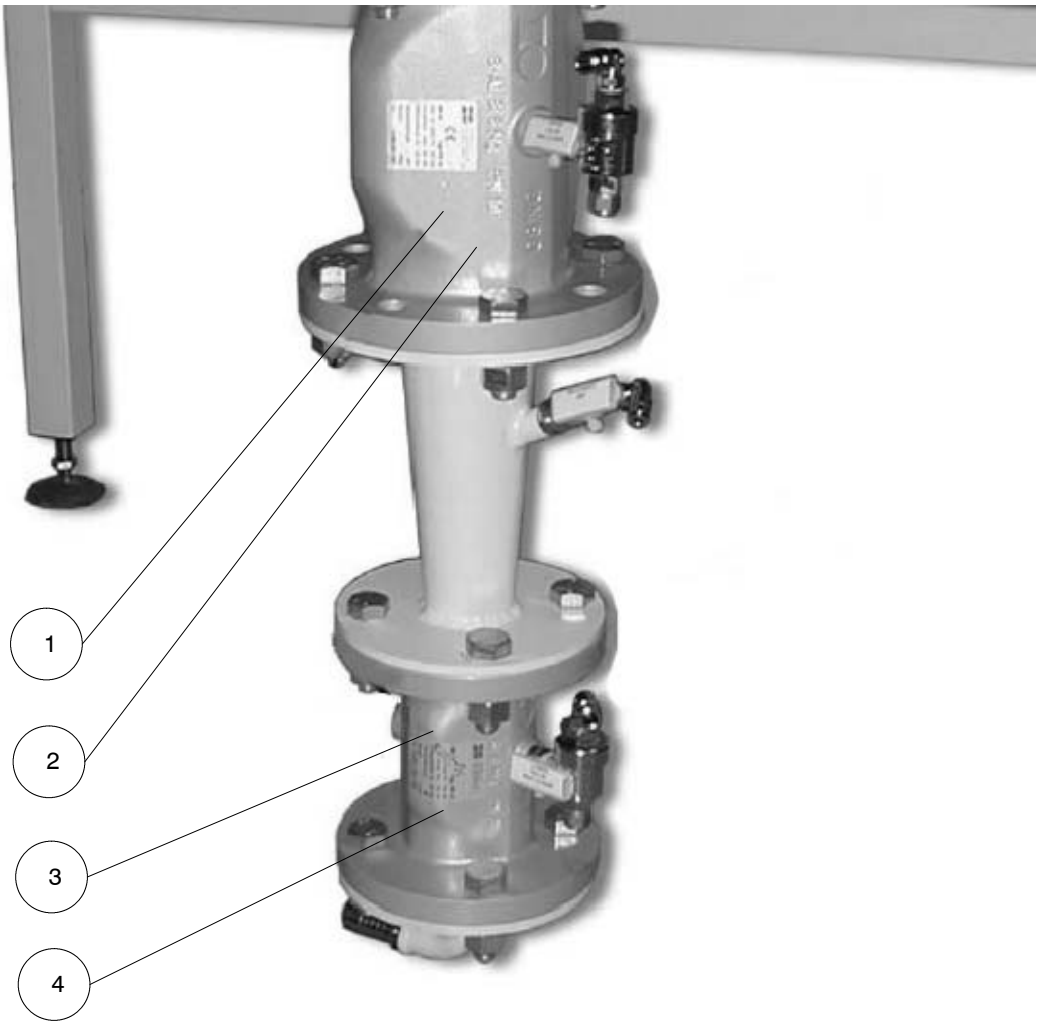


Figure 8 Pinch Valves

| Item | Part | Description | Quantity | Note |
|---|---|---|---|---|
| 1 | 768544 | Valve, pinch, flanged, 80mm | 1 | |
| 2 | 393398 | • Sleeve, inner pinch valve, 80mm | 1 | A |
| 3 | 768543 | Valve, pinch, flanged, 50mm | 1 | |
| 4 | 766251 | • Sleeve, flanged, inner pinch valve, 50mm | 1 | A |
| NOTE A: Fitted inside the pinch valve so not specifically shown in Fig 3 | | | | |

## *Pneumatic Switch*

See Fig 9

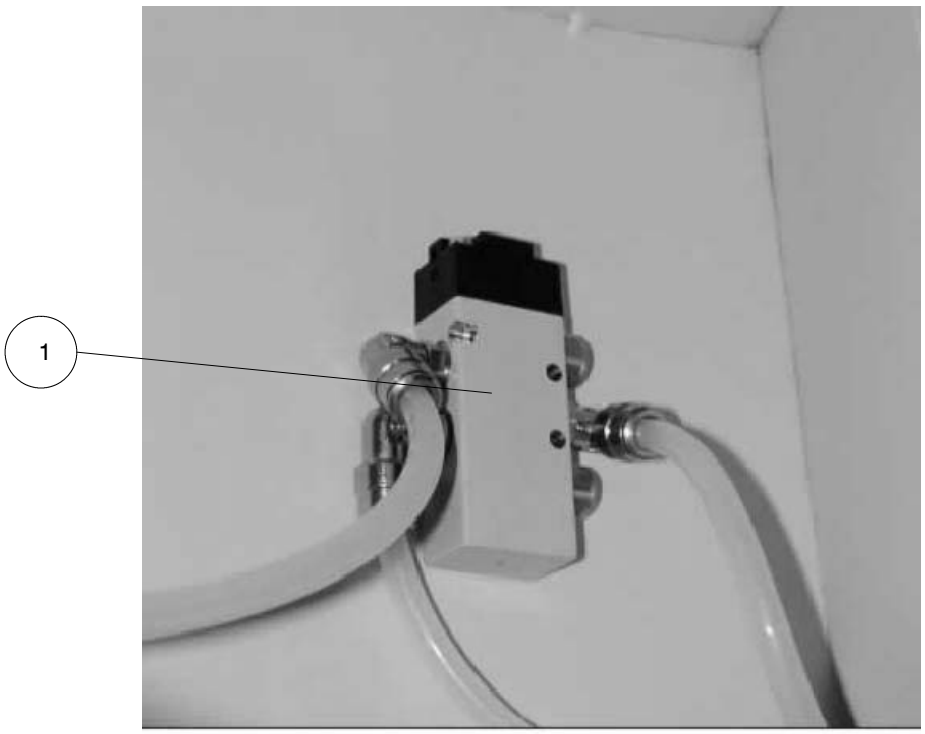


Figure 9 Pneumatic Switch

| Item | Part | Description | Quantity | Note |
|---|---|---|---|---|
| 1 | 768170 | Switch, lever, auto seal | 1 | |

## *Lifting Mechanism Cylinder*

See Fig 10


Figure 10 Lifting mechanism cylinder

| Item | Part | Description | Quantity | Note |
|---|---|---|---|---|
| 1 | 766347 | Cylinder, pneumatic, 50 stroke | 1 | |
| 2 | | Regulator, 1/8” | 2 | A |
| NOTE A: Non Saleable item | | | | |

## *Vibrator (optional)*

See Fig 11

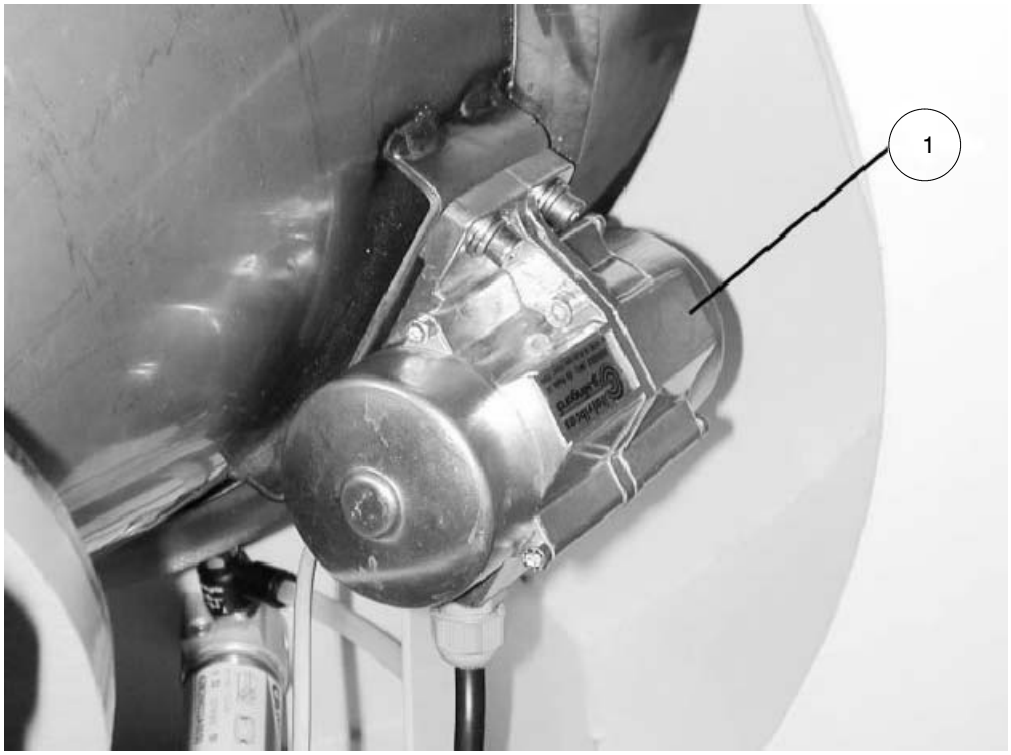


Figure 11 Vibrator

| Item | Part | Description | Quantity | Note |
|---|---|---|---|---|
| 1 | 769057 | Vibrator, 240v AC | 1 | A |
| NOTE A: This item is optional. | | | | |

# Specifications

## *Weight*

60 Kg

## *Noise*

Lower than 70 dBa in normal operation

## *Operating Conditions*

Operating area lighting

- Minimum 300 Lux

Operating temperature range

- +5 degrees C to 45 degrees C

Maximum humidity level during operation

- Maximum 50% at 40 degrees C
- Maximum 90% at 20 degrees C

## *Dimensions*

Table 1 indicates the overall dimensions of the Pinch Valve Assembly.

Table 1 General Dimensions

| General Dimensions | (mm) |
|---|---|
| Width | 1300 |
| Depth | 900 |
| Height | 1520 |

See Fig 12, and Fig 13 for individual dimensions of the Pinch Valve Assembly.

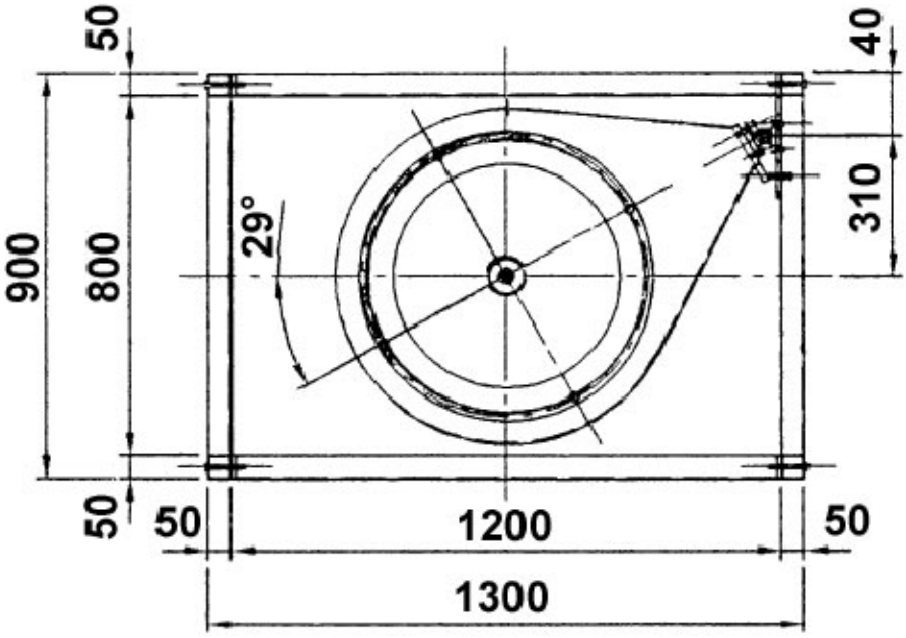


Figure 12 Plan view

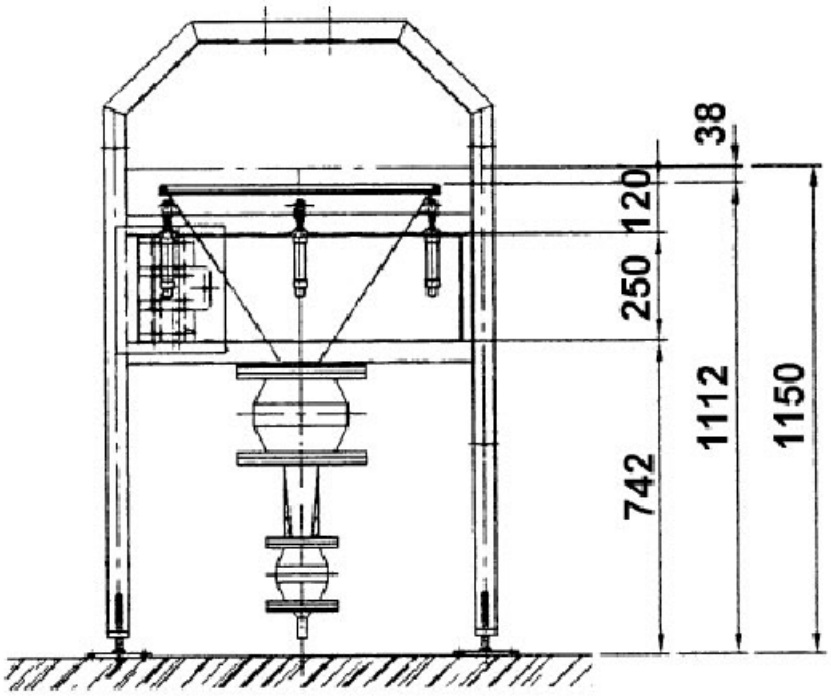


Figure 13 Side View

## *Pneumatic Requirements*

Main supply air pressure

- 6 Bar

Flow rate

- 600 nL / min.

Operating pressures of components

- Pinch valves : 2.5 Bar
- Surge hopper lifting mechanism : 4.5 bar

*Appendix A*

# Declaration Of Conformity

**PRODUCT:** Pinch Valve Assembly

Conformity has been verified following the provisions of the following directives :

**APPLICABLE DIRECTIVES:**

Directive 98/37/EC (Machinery), Annex II, Part B

**STANDARDS USED TO VERIFY COMPLIANCE:**

EN 60204–1:1993 “Safety of machinery – Electrical equipment of machines”.

EN 292: 1992 “Safety of machinery – Basic concepts, general principles for design”.

Part 1a – Basic terminology, methodology (UNI EN 292–1:1992).

Part 2a – Technical principles and sepcification (UNI EN 292–2:992/A1:1995).

EN 294:1993 “Safety of machinery – Safety distances to prevent danger zones being reached by upper limbs”.

EN349:1994 “Safety of machinery – Minimum gaps to avoid crushing of parts of the human body”.

This product has been manufactured according to good engineering practice and conforms to the specified directives and standards described above.

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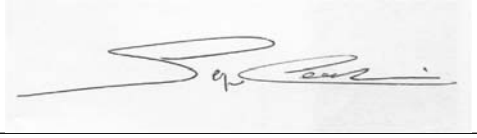

Date: 5th May 2005

Sergio Cocchi
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