

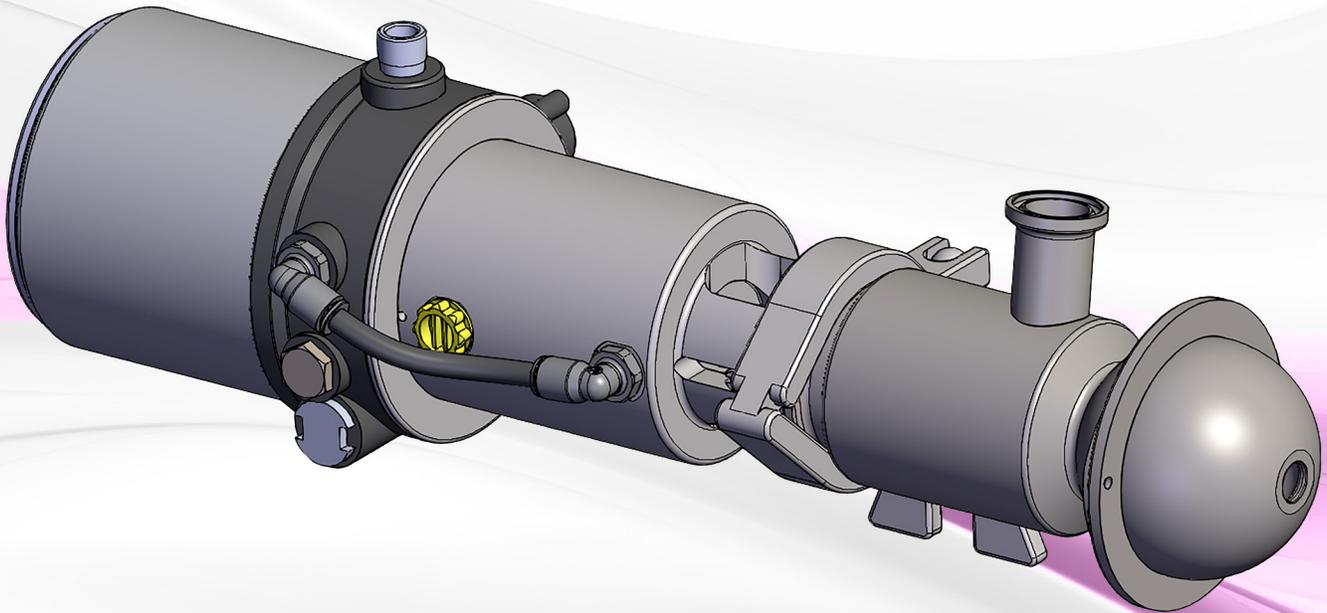
PROCESSTEC

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VISCOCLEAN V-SHAPE SPRAY PNEUMATIC

OPERATION & MAINTENANCE MANUAL

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1. SAFETY INFORMATION

1.1 Designated Use

The **ViscoClean V-Shape Spray Pneumatic** is a pneumatically operated spray device that can act as a valve when not actuated, sealing off the tank from the supply line. The **ViscoClean V-Shape Spray Pneumatic** was initially designed to clean the ViscoMix cones and was later adapted for additional uses, including steam injection. If it is mounted with the **MultiFlange**, the housing can be adjusted to the preferred spray angle during startup. Once the ideal angle is found, the housing can be fixed in its permanent position.

It is to be used exclusively for the purposes described below. Using the **ViscoClean V-Shape Spray Pneumatic** for purposes other than those mentioned is considered contrary to its designated use. **NOTE:** *In some areas we could exchange the word "Valve" with "ViscoClean". The ViscoClean is ultimately a valve and a spray device in one.*

1.2 Personnel

Personnel entrusted with the operation and maintenance of the **ViscoClean V-Shape Spray Pneumatic** must have the suitable qualification to carry out their tasks. They must be informed about possible dangers and must understand and observe the safety instructions given in the relevant manual. Only allow qualified personnel to make electrical connections.

1.3 Modifications, Spare Parts & Accessories

Unauthorized modifications, additions or conversions which affect the safety of the **ViscoClean V-Shape Spray Pneumatic** are not permitted. Safety devices must not be bypassed, removed or made inactive. Only use original spare parts and accessories recommended by the manufacturer.

1.4 General Instructions

The user is obliged to operate the **ViscoClean V-Shape Spray Pneumatic** only when it is in good working order. In addition to the instructions given in the operating manual, please observe the following:

- Relevant accident prevention regulations
- Generally accepted safety regulations
- Regulations effective in the country of installation
- Working and safety instructions effective in the user's plant.

1.5 Marking of Safety Instructions in the Operating Manual

Special safety instructions are given directly before the operating instructions. They are marked by the following symbols and associated signal words.

It is essential that you read and observe the texts belonging to these symbols before you continue reading the instructions and handling the **ViscoClean V-Shape Spray Pneumatic**.

SYMBOL	SIGNAL WORD	WORD MEANING
	DANGER!	Imminent Danger, which may cause severe bodily injury or death.
	CAUTION!	Dangerous situation, which may cause slight injury or damage to material.
•		Process / operating steps which must be performed in the specified order.
		Information as to the optimum use of the valve.

2. SYSTEM OVERVIEW



DANGER!

In the event of malfunctions, set the **ViscoClean V-Shape Spray Pneumatic** out of operation (disconnect from power and the air supply) and secure it against reactivation. Immediately rectify the fault.



CRUSHING PARTS!

Never put your hand into the lantern or into the valve housing.

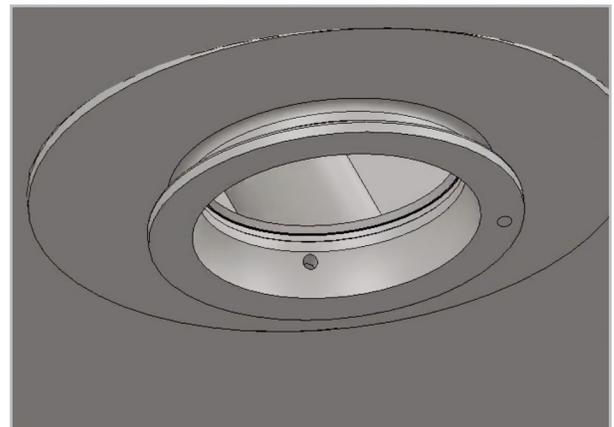
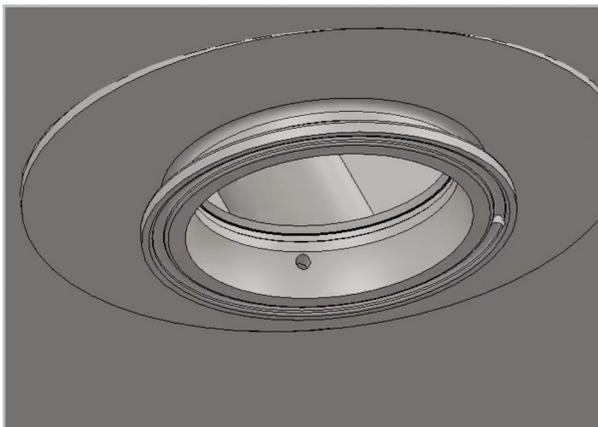


DANGER!

When the clamps are detached, there is danger of injury since the released spring pressure suddenly lifts the actuator. Therefore, prior to detaching the valve housing, release the spring tension by pressurizing the actuator with compressed air through the control module.

ViscoClean V-Shape Spray Pneumatic components are pressure keeping equipment parts (without safety function) in the sense of the pressure equipment guideline 97/23/EC. They are classified according to Appendix II in Article 3, Section 3. In case of deviations thereof, a separate Declaration of Conformity will be handed out together with the equipment.

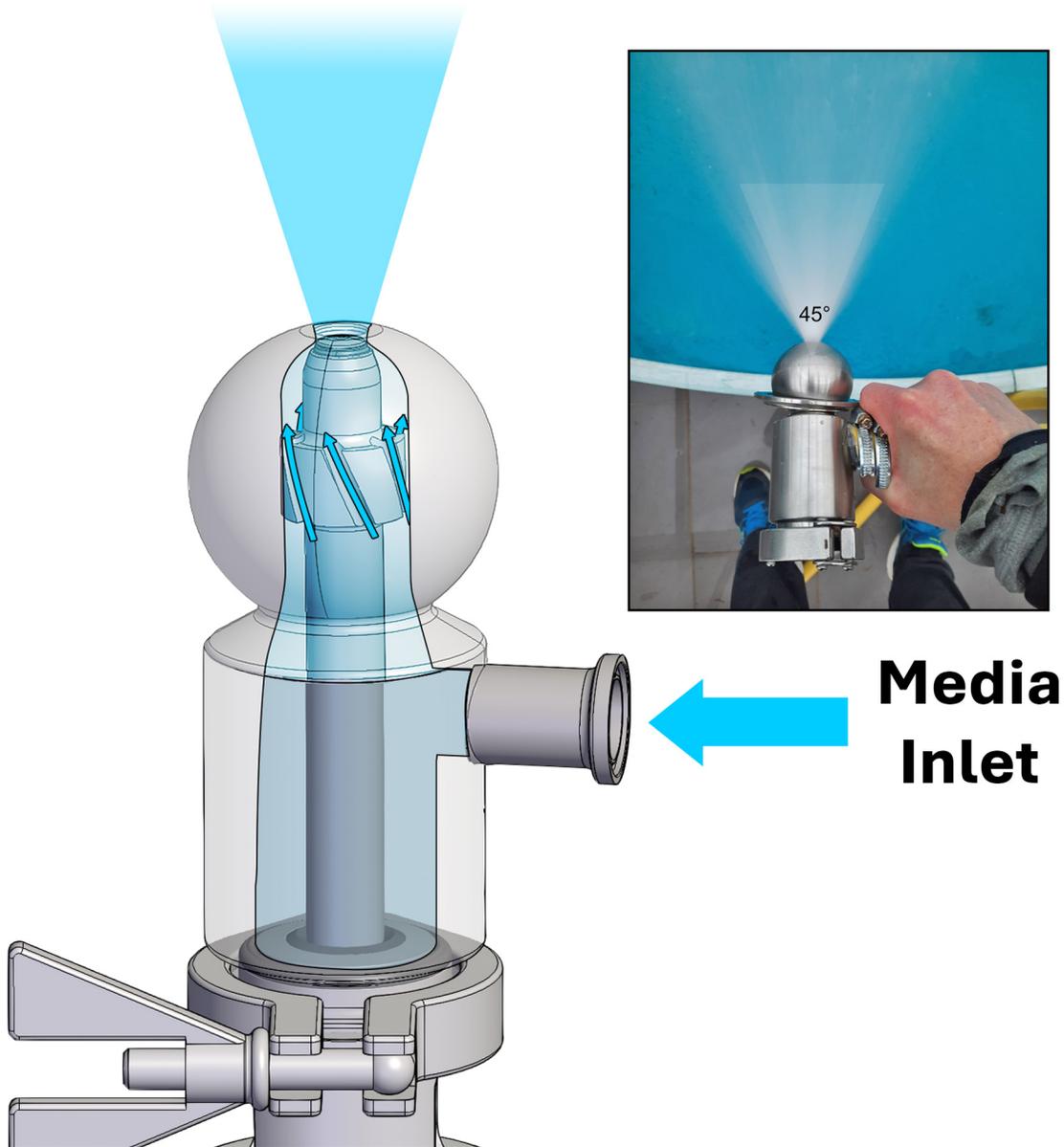
The difference between the earlier versions of the **ViscoClean V-Shape Spray Pneumatic** and the current version is that the former used a Grooved Flange that required a Lipped Tri-Clamp Gasket, and the latter uses a flat-faced flange, which eliminates the Lipped Tri-Clamp Gasket.



2.1 Working Principle

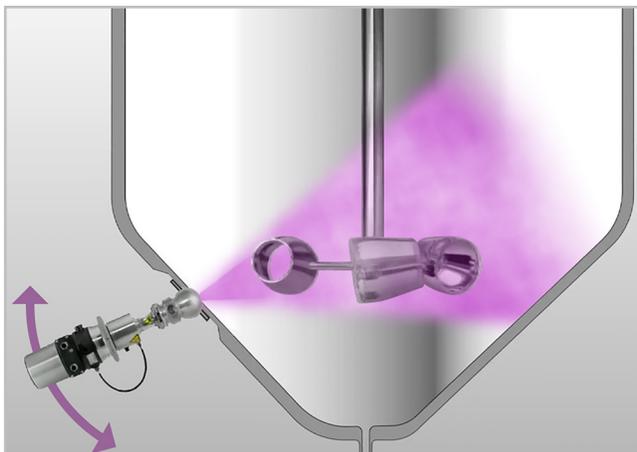
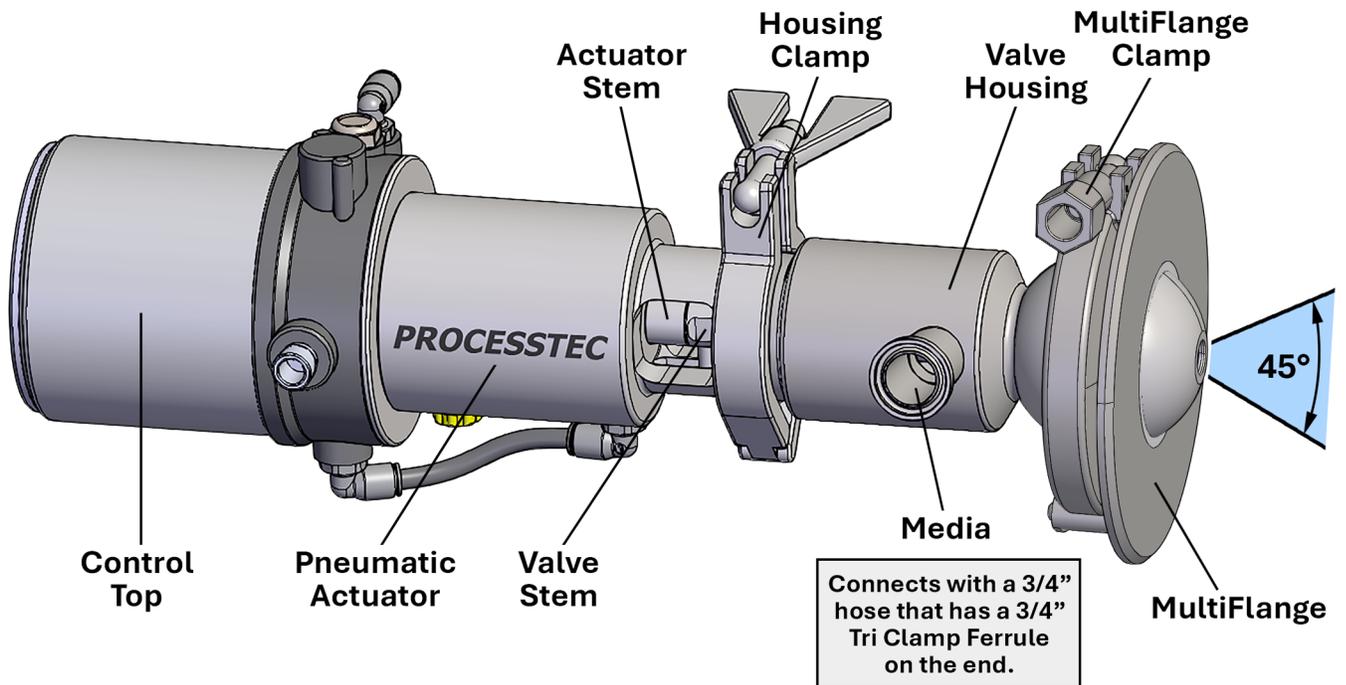
While activating the **ViscoClean V-Shape Spray Pneumatic**, the main stem retracts from the Ball Head allowing the media to pass into the interior of the tank. Before exiting the ball head, the angled channels on the valve stem spin the fluid as it passes, helping to form a 45 degree solid cone of spray. Depending on supply pressure, the spray cone can shoot up to 20 feet!

One of the unique features of the **ViscoClean V-Shape Spray Pneumatic** is that the Valve Stem retracts into the Ball Head, instead of protruding, staying protected from debris and possible product accumulation (strawberry seeds, for example).



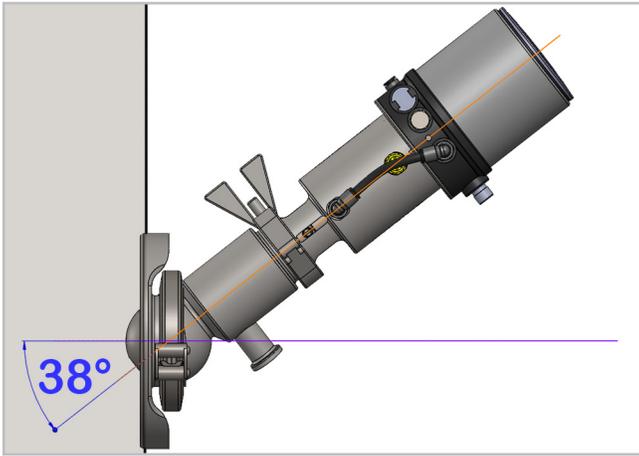
2.2 Terminology

The following graphic shows the terminology used to describe the **ViscoClean V-Shape Spray Pneumatic**.

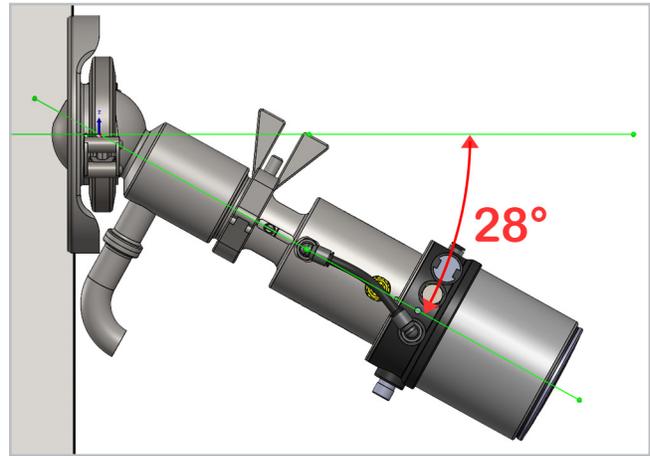


When mounted with the **MultiFlange**, the housings can be adjusted to the preferred spray angle during startup.

Once the ideal angle is found, the housings can be fixed in their permanent position by completely tightening the Hex Nut on the **MultiFlange Clamp**.



The maximum spray angle that the **ViscoClean V-Shape Spray Pneumatic** can be adjusted to is 38° degrees off of perpendicular, or any angle in between.



NOTE: If the **ViscoClean V-Shape Spray Pneumatic** is angled towards the Media Inlet, this maximum angle is only 28°. To get a more extreme angle, simply rotate the **ViscoClean V-Shape Spray Pneumatic** so the media inlet is not interfering with the Tank Wall or **MultiFlange**.

3. TRANSPORT AND STORAGE

3.1 Checking the Consignment

On receipt of the **ViscoClean V-Shape Spray Pneumatic**, check whether the:

- Model and Size on the type plate correspond to the data in the order and delivery documents and,
- The equipment is complete and all components are in good order. The forwarding agent must immediately be notified of any transport damage detectable from the outside and/or missing packages (confirmation on the consignment note). The consignee shall take recourse against the forwarding agent immediately in writing and inform **PROCESSTEC** accordingly.

Transport damages which cannot be recognized immediately shall be brought to the forwarder's notice within 6 days. Later claims on damages shall be born by the consignee.

3.2 Transport



DANGER!

Observe the instruction symbols on the package and on the ViscoClean V-Shape Spray. Handle the valve with care to avoid damage caused by shock. The synthetic materials of the control modules are sensitive to breaking.

3.3 Storage

In the case that during transport or storage the **ViscoClean V-Shape Spray Pneumatic** was exposed to temperatures $\leq 0^{\circ}$ C, it must be stored in a dry place to protect against damages.

We recommend, prior to any handling (dismounting the housings / activation of actuators), an intermediate storage of 24 hours at a temperature of $\geq 5^{\circ}$ C, so that any ice crystals formed by condensed water may melt.

4. PRODUCT OVERVIEW

4.1 Explosion Drawing & Recommended Spare Parts

#	Description
1	CONTROL TOP (Part# 889 (ASI), Part# 4802 (24VDC))
2	CONTROL TOP SET SCREWS
3	AIR CONNECTION (EXTERNAL AIR SUPPLY)
4	FEEDBACK PUCK
5	SWITCH SPINDLE
6	O-RING (Part# 23059)
7	MOUNTING ADAPTOR
8	PNEUMATIC ACTUATOR W/LANTERN
9	SHAFT CONNECTING SCREW
10	HOUSING CLAMP
11	HOUSING O-RING (Part# 23062)
12	VALVE ROD SEAL (Part# 23060)
13	VALVE HEAD SCREW
14	VALVE STEM
15	SEAL O-RING (Part# 23061)
16	VALVE HEAD
17	VALVE HOUSING / BALL HOLDING FLANGE
18	MULTIFLANGE CLAMP WITH HEX NUT
19	ASEPTIC SEALING GASKET (Part# XXXXXX) *ONLY ON ASEPTIC VERSION OF VC-VSS*
20	MULTIFLANGE PROFILE GASKET (Part# 23067)
21	MULTIFLANGE - FLAT WELD-IN FLANGE FOR LARGE VESSELS - 316L (Part# 23822)
22	MULTIFLANGE - CURVED WELD-IN FLANGE FOR SMALLER VESSELS - 316L (Part# 23119)
22	MULTIFLANGE - CURVED WELD-IN FLANGE FOR SMALLER VESSELS - 2205 DUPLEX (Part# 23604)
22	MULTIFLANGE - CURVED WELD-IN FLANGE FOR SMALLER VESSELS - AL-6XN ALLOY (Part# 23605)
23	POSITIONING PIN FOR BALL HOLDING FLANGE (Part# XXXXXX)

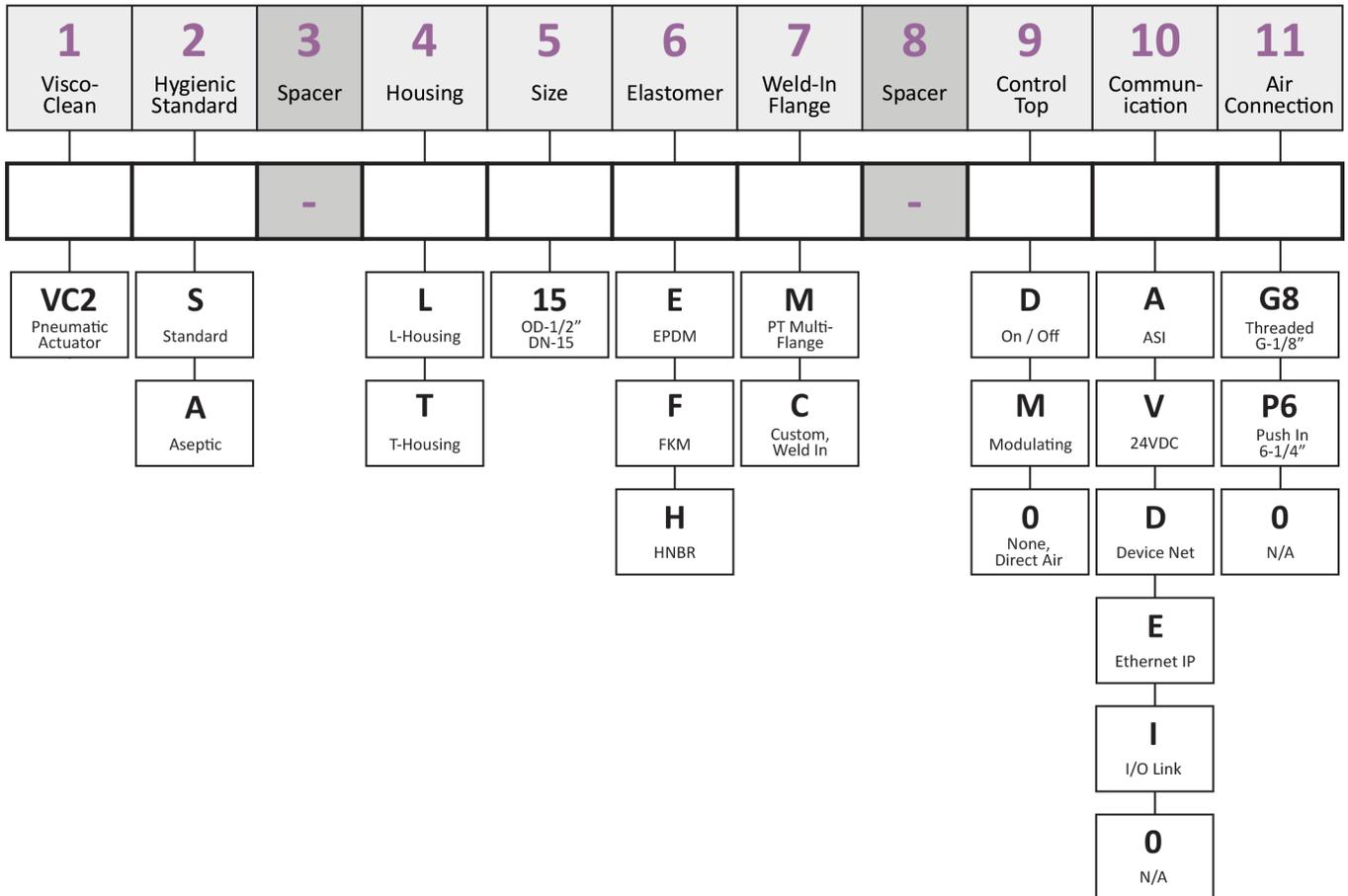
5. CONFIGURATION KEY

Below is a Configuration Chart showing all the available options for the **ViscoClean V-Shape Spray Pneumatic**. It is formatted in such a way that each unique configuration can be identified by the specific code on the part using this chart as a quick reference guide.

An example of the number formatting would be as follows:

VC2S-L15EM-DAG8

VC2A-L15EM-0000



6. INSTALLATION AND SETUP

6.1 Checking the Consignment

Make sure that...

- The **ViscoClean V-Shape Spray Pneumatic** is installed free of stress and the spray direction remains adjustable

and

- No foreign materials (e. g. tools, bolts) are enclosed in the system.

The installation position of the **ViscoClean V-Shape Spray Pneumatic** remains adjustable if connected with a hose. Ensure that the valve housing, the pipe system and the isolation chamber can drain properly.

6.1.1 Valve with Detachable Housing Connections



DANGER!

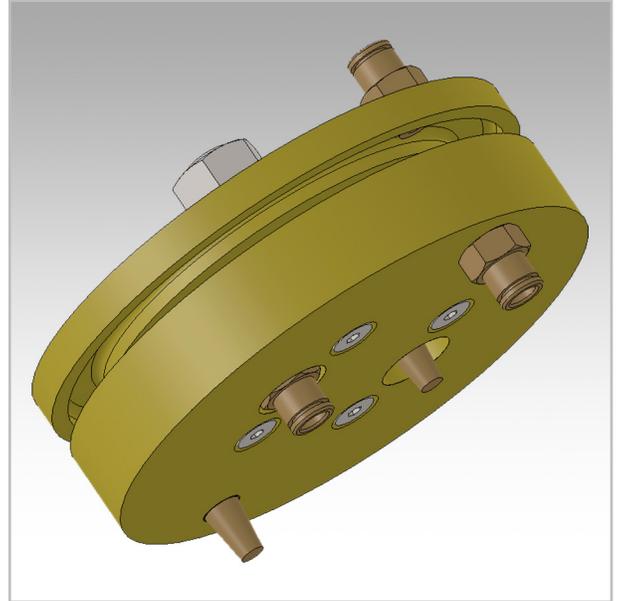
If liquids are running in the pipe system, they can gush out when the line is opened and cause injury to people. Therefore, prior to detaching pipe connection fittings or clamp connections:

- Drain and, if necessary, rinse or clean the pipe.
- Disconnect the pipe segment with the valve to be mounted from the rest of the pipe system to secure the pipe against incoming product

Valves with detachable housing connections can be installed directly into the open pipe system, if suitable connection fittings are used.

6.2 MultiFlange Installation with Weld Jig

For welding operations, a Weld Jig to dissipate the heat must be used in order to prevent warping of the sealing line, tank walls, and ball seat.



INSTALLATION STEPS

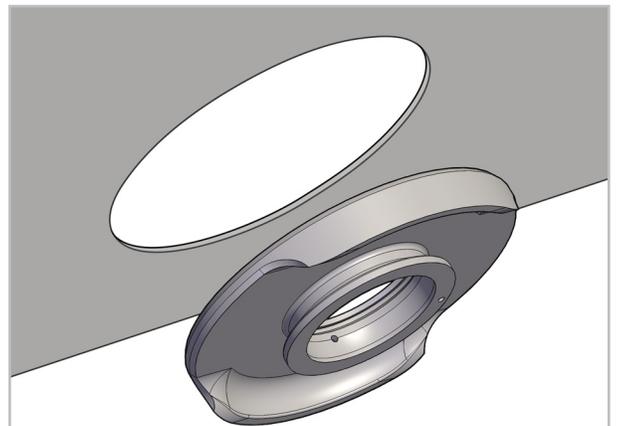


QR CODE - VISCOCLEAN V-SHAPE SPRAY PNEUMATIC INSTALLATION

A video showing this step by step procedure can be accessed online by using the QR Code provided here.

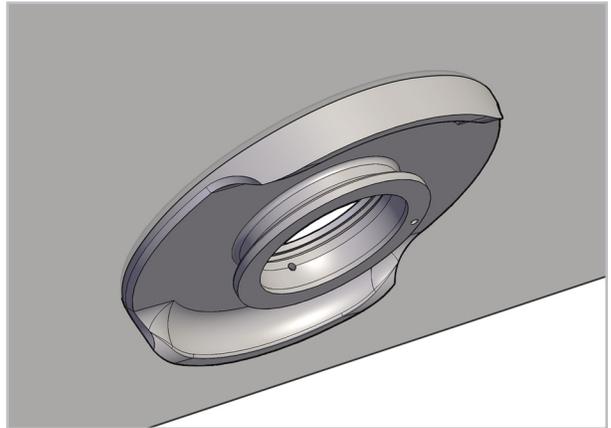
STEP 1)

Drill a hole in the tank at the proper location, in the exact outer diameter of the Weld-In Flange.



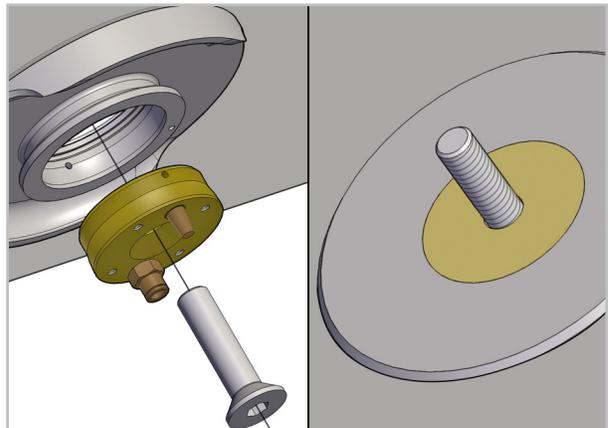
STEP 2)

Tack weld the Weld-In Flange in place, with the drainage hole in the lip of the Weld-In Flange at the lowest point to facilitate proper drainage.



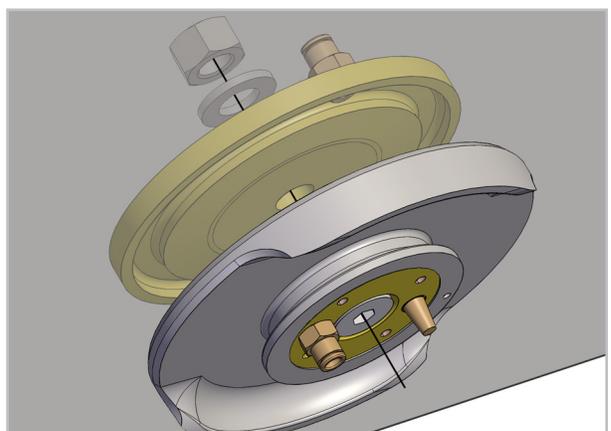
STEP 3)

Insert the Center Piece of the Weld Jig through the center of the Weld-In Flange along with the Allen Head Bolt. It is important to check that the surface of the plug is flush with the inner flange lip to insure that warping is prevented.



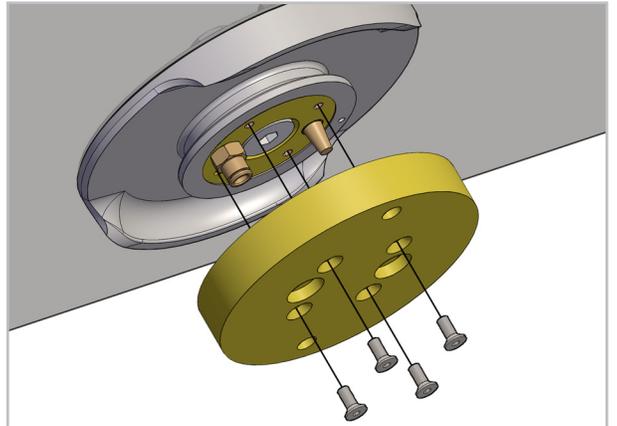
STEP 4)

Use the Allen Head Bolt to secure the Interior face of the Weld Jig, and secure with a washer and nut from the inside of the tank. The Interior Face should have two fittings already installed.



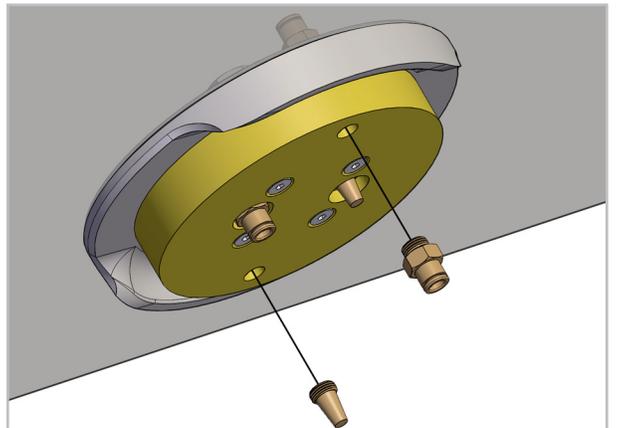
STEP 5)

Attach the Exterior portion of the Weld Jig to the Center Piece of the Weld Jig, and secure with the FOUR (4) small Allen Head Bolts, and then tighten them with a Hex Key.



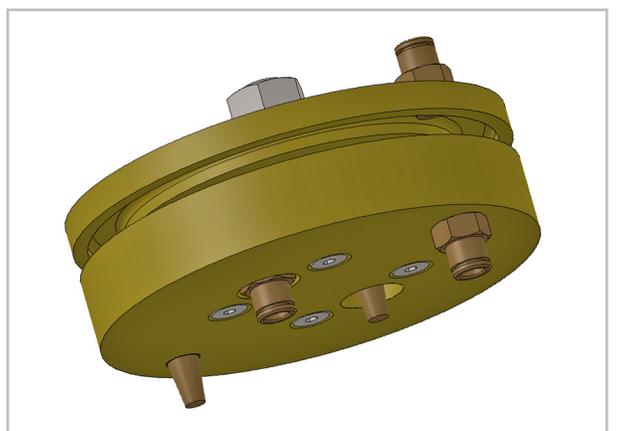
STEP 6)

Attach one of each type of fitting to the Exterior portion of the Weld Jig, and connect to the Freon Gas Tubes before beginning to weld.



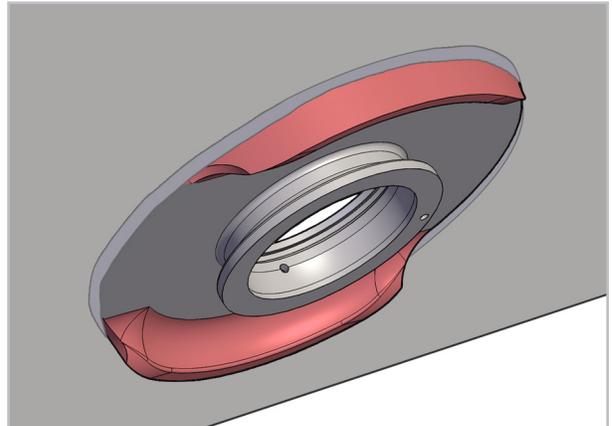
STEP 7)

Once everything is welded properly and cools down, disassemble the Weld Jig and package it carefully for return to **PROCESSTEC**.



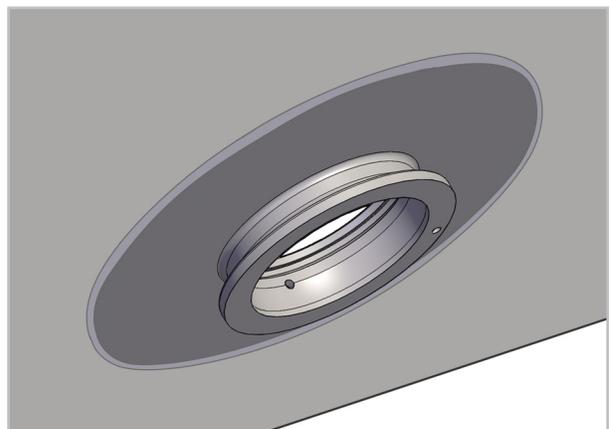
STEP 8)

The excess lips on the MultiFlange that still protrude from the side of the tank can now be ground down until flush with the sides of the tank.



STEP 9)

Polish all welds, both inside and outside of the tank, making sure that the final seams are smooth, and do not have any pitting or cavities where product can collect.



6.3 Insert ViscoClean V-Shape Spray Pneumatic Into MultiFlange

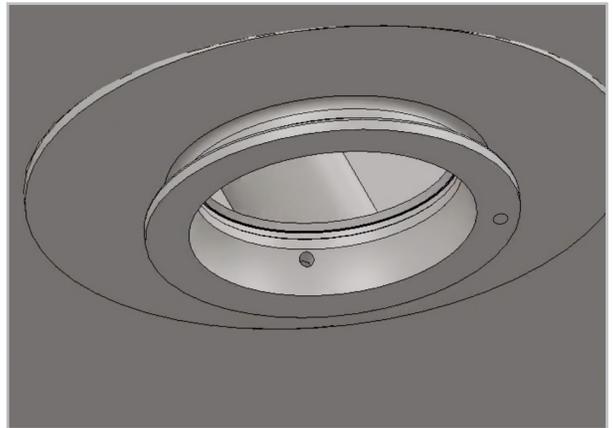


QR CODE - VISCOCLEAN V-SHAPE SPRAY PNEUMATIC INSTALLATION

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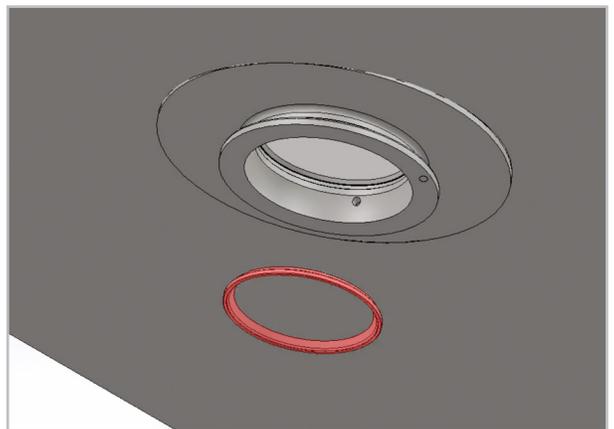
STEP 1)

Make sure the MultiFlange drainage hole is at the lower end. Check that the inside of the flange is undamaged and free of dirt.



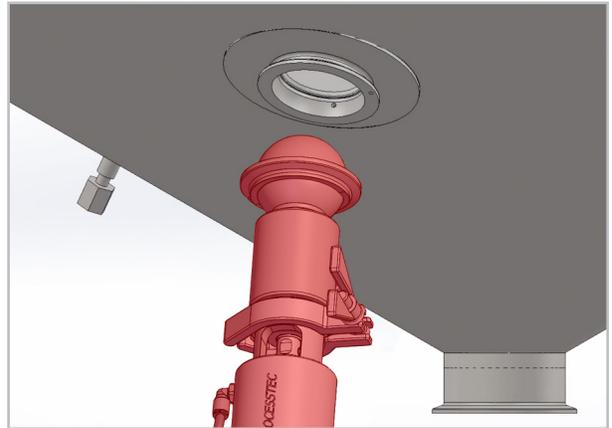
STEP 2)

Install the front seal. Make sure that the seal is correctly positioned in the groove.



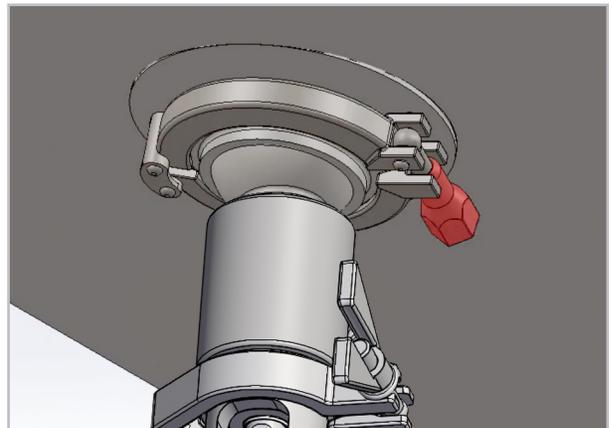
STEP 3)

Grease the front part of the Valve Housing ball to minimize friction. Otherwise, the seal can be pulled out when aligning the ViscoClean. Insert the ViscoClean onto the MultiFlange.



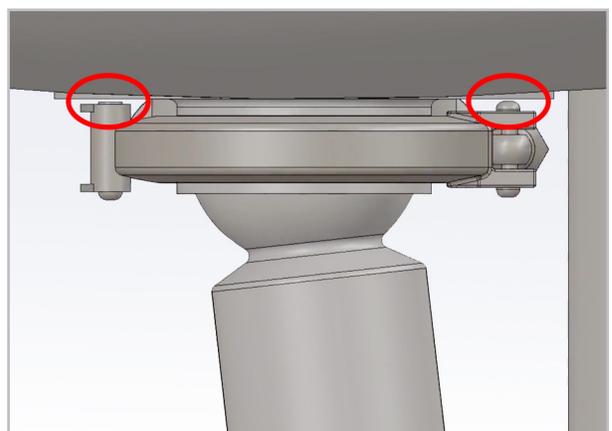
STEP 4)

Only slightly tighten the hex nut of the MultiFlange Clamp so that the ViscoClean can still be moved.



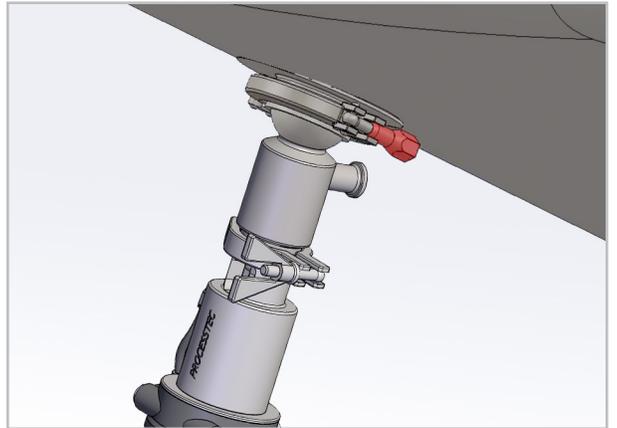
STEP 5)

Make sure that there is an air gap between the clamp and the MultiFlange, otherwise leaks can occur. If the clamp does make contact with the tank, flip the clamp around so the side with the hinge rivet is away from the tank, providing the necessary clearance.



STEP 6)

Align the ViscoClean and tighten the Hex Nut on the MultiFlange.



6.4 Pneumatic Connection Air Requirement

ACTUATOR TYPE	ACTUATOR DIAMETER (mm)	AIR PRESSURE MAX. (bar)	AIR PRESSURE MIN. (bar)	AIR REQUIREMENT (dm ³ n/stroke)
H50	65	8	6	0.04 dm ³ n

6.5 Installing the Air Hose

To ensure optimum fit in the air connector, the pneumatic hoses must be cut square with a hose cutter.

- Shut off the compressed air supply.
- Push the air hose into the air connector in the control module.
- Reopen the compressed air supply.

7. COMMISSIONING

7.1 Commissioning

***The following only applies to the ViscoClean V-Shape Spray Pneumatic and only when equipped with a Control Top.**

- Make sure that no foreign materials are entrapped in the valve housing.
- Make sure that there is only dry and dust-free air to protect the solenoid valve seat.
- Actuate the valve once by applying compressed air.
- Prior to the first product run, clean the pipe system.
- During commissioning, regularly check the seals for leakage. Replace defective seals.



CAUTION!

In case of malfunction, deactivate the **ViscoClean V-Shape Spray Pneumatic** and remove the air supply before further maintenance. Defects may only be rectified by qualified personnel observing proper safety precautions.

MALFUNCTION	CAUSE	REMEDY
Valve does not work	Error in the control system	Check the plant configuration
	No compressed air	Check the air supply
	Air pressure too low	Check the air hoses for free passage and leaks
	Error in the electrical system	Check actuation / external controller and routing of electrical lines
Valve does not close	Dirt / Foreign materials between valve seat and valve disk	Clean the valve housing and the valve seat
Valve closes too slowly	O-rings dry in the actuator and in the control module (friction losses)	Grease the O-rings
Leakage at	O-rings in the housing defective	Dismantle the valve housing, replace the O-rings
Leakage in the lantern	Sealing ring defective	Replace the sealing ring

8. INSPECTIONS

Between the maintenance periods, the **ViscoClean V-Shape Spray Pneumatic** must be checked for leakage and proper function.

8.1 Product Contact Seals

- Check the O-rings at regular intervals.

8.2 Pneumatic Connection

- Check the operating pressure
- Insure the air supply is dry and dust-free, by checking the compressed air filter at regular intervals.
- Check whether the compressed air hose sits firmly in the air connector.
- Check the air hoses for bends and leaks.

8.3 Electrical Connection

- Check whether the cap nut on the cable gland is tight.
- Check the cable connections at the Cluster Terminal.

8.4 Inspection Intervals

To ensure the highest operational reliability of the **ViscoClean V-Shape Spray Pneumatic**, all wearing parts should be replaced at regular intervals.

The actual maintenance intervals can only be determined by the system operators. It depends on the operating conditions, for instance:

- Operating Hours
- Stroking Frequency
- Type and Temperature of the Product
- Type and Temperature of the Cleaning Solution
- Ambient Conditions

APPLICATION	MAINTENANCE INTERVAL (RECOMMENDATIONS)
Media at temperatures of 60° C to 130° C (140° F to 266° F)	Every 3 months
Media at temperatures of < 60° C (< 140° F)	Every 12 months

9. STARTUP & OPERATION

9.1 Pre-Startup

- Set the desired Spray Angle of the **ViscoClean V-Shape Spray Pneumatic** and tighten the Hex Nut Clamp to secure in the desired position.
- In the case of the **ViscoClean V-Shape Spray Pneumatic** with Control Top, one needs to do the autotune procedure (follow the Burkert Control Top manual for the precise steps).

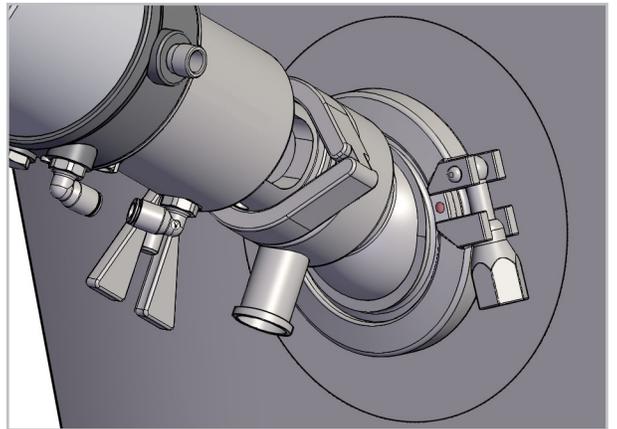
9.2 Startup

- Check to make sure that you have full flow reaching the **ViscoClean V-Shape Spray Pneumatic**.
- Observe that the spray angle set in Pre-Setup is accurate, and adjust if necessary.

To permanently fixate the final angle of the ViscoClean V-Shape Spray Pneumatic in position:

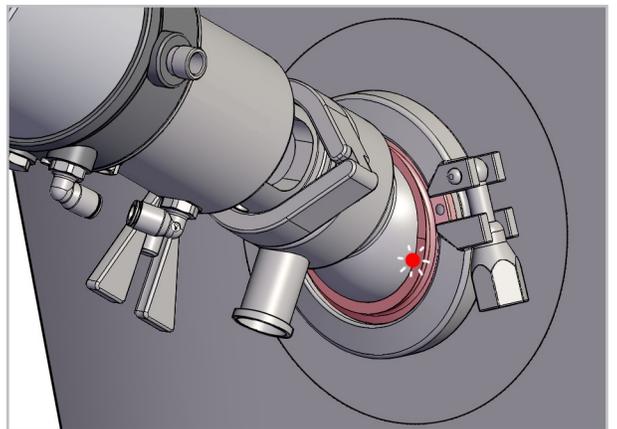
STEP 1)

Ensure that the Positioning Pin (Pos. 23) of the Ball Positioning Flange is installed.



STEP 2)

Fixate the ball to the Ball Positioning Flange (Pos. 17) with a small weld tack.



10. MAINTENANCE

10.1 Preparation for Maintenance



DANGER!

Before detaching the pipe connection and the semiannular connections on the ViscoClean V-Shape Spray housing, always take the following preparatory measures:

- Make sure that during maintenance and repair work no process is in operation in the area concerned.
- All pipe system elements attached to the valve must be drained and, if necessary, cleaned or rinsed.
- Shut off the control air supply, unless it is required for dismantling the valve. Disconnect the power supply.
- Disconnect the inlet the pipe from the **ViscoClean V-Shape Spray Pneumatic**.

10.2 ViscoClean V-Shape Spray Gasket Exchange



QR CODE

VISCOCLEAN V-SHAPE SPRAY PNEUMATIC GASKET EXCHANGE

An animated video showing this step by step procedure can be accessed online by using the QR Code provided here.



CAUTION!

Ensure that no solenoid valve is actuated electrically or manually.



NOTE:

The equipment side pneumatic and electrical connections can remain at the control module.

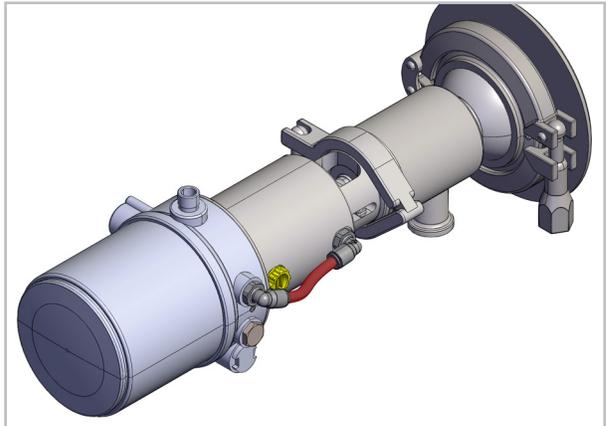


NOTE:

Replace defective seals. Always replace the housing O-rings to ensure the tightness of the valve. Always use original spare parts.

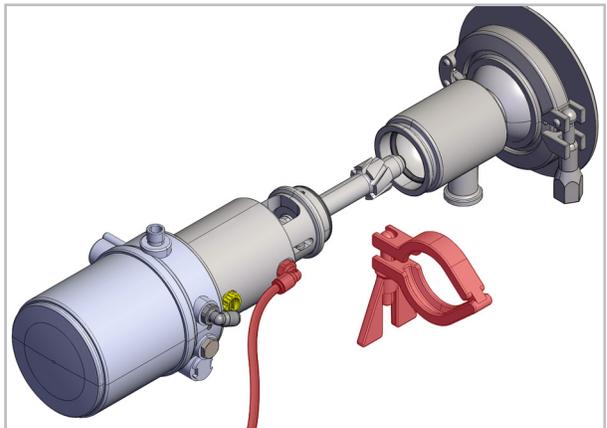
STEP 1)

Remove the Air Connection hose between the Pneumatic Actuator and the Control Top.



STEP 2)

Connect compressed air to the actuator inlet port on the Pneumatic Actuator. After that, loosen the Housing Clamp and pull the valve insert out of the Valve Housing.

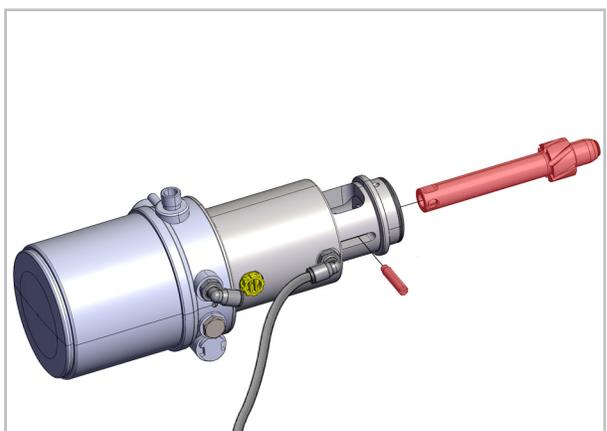


STEP 3)

Remove the Shaft Connecting Screw and pull out the Valve Stem.

Required Tools:

- Screwdriver (3mm)

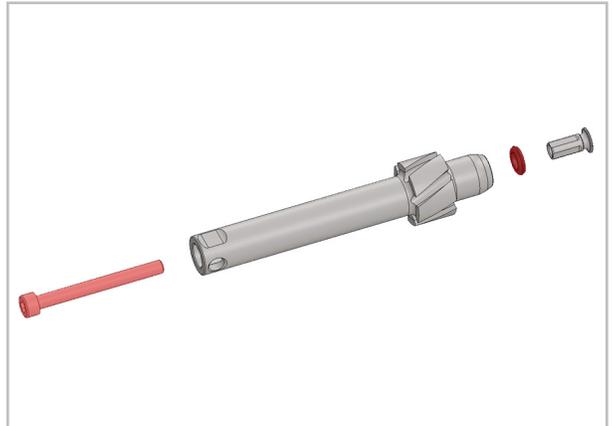


STEP 4)

Disassemble the Valve Stem by removing the Valve Head Screw and change the Seal O-ring.

Required Tools:

- Open-end wrench (13mm)
- Allen Key (4mm)

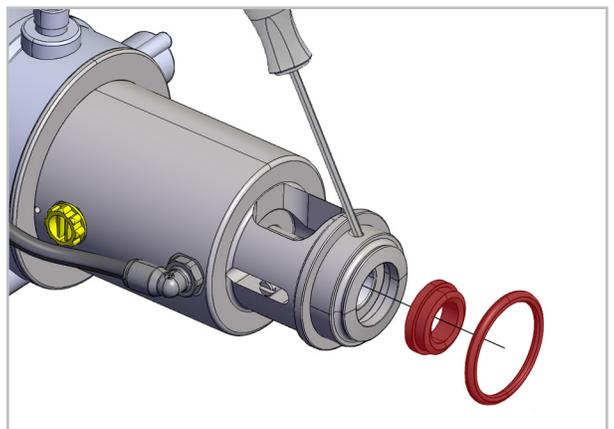


STEP 5)

Replace the Housing O-ring and Valve Rod Seal of the Pneumatic Actuator.

Required Tool:

- Pin Punch (3mm)

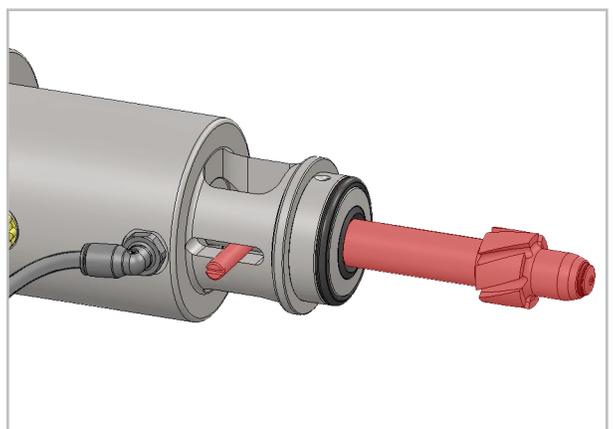


STEP 6)

Insert the Valve Stem into the Pneumatic Actuator and screw the Shaft Connecting Screw back in.

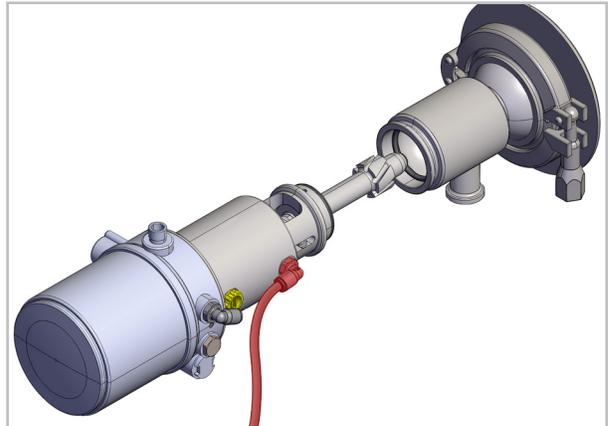
Required Tools:

- Screwdriver (3mm)



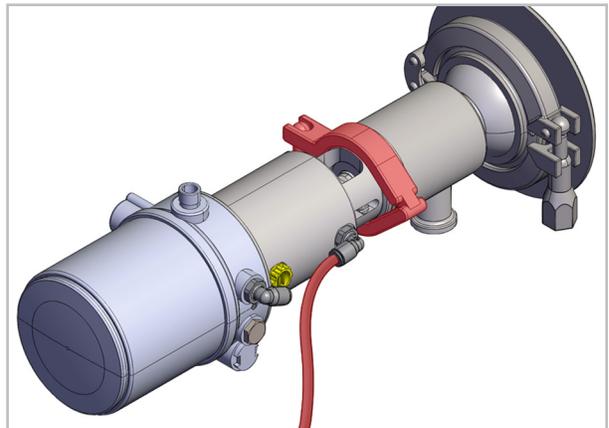
STEP 7)

Connect a temporary air hose that supplies compressed air into the 1/4" push-in fitting that is mounted to the Pneumatic Actuator, and stroke (retract) the valve.



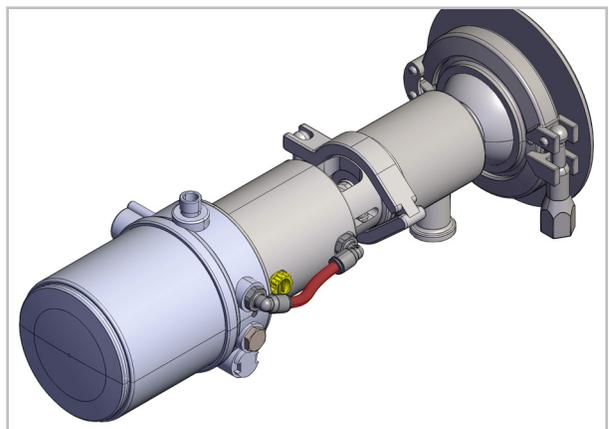
STEP 8)

Now you can insert the assembly into the valve housing, and then reattach the Housing Clamp. Once it is firmly attached, release the compressed air.



STEP 9)

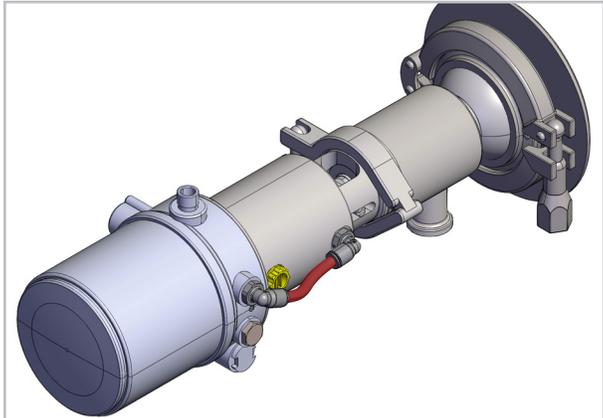
Reconnect the Air Connection hose between the Pneumatic Actuator and the Control Top.



10.3 ViscoClean V-Shape Spray Pneumatic Control Top Exchange

STEP 1)

Remove the connection hose between the Actuator and the Control Top.

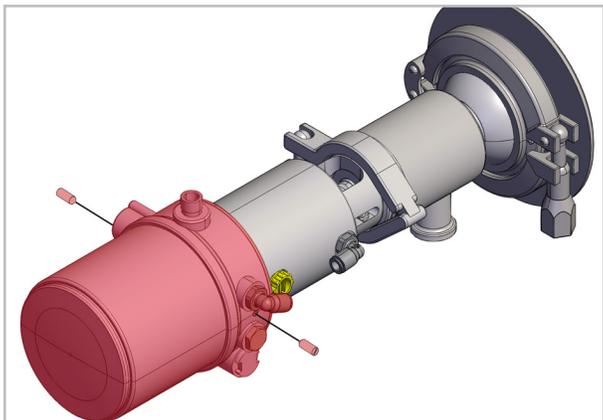


STEP 2)

Loosen the set screws and pull off the Control Top.

Required Tools:

- Allen Key (3mm)

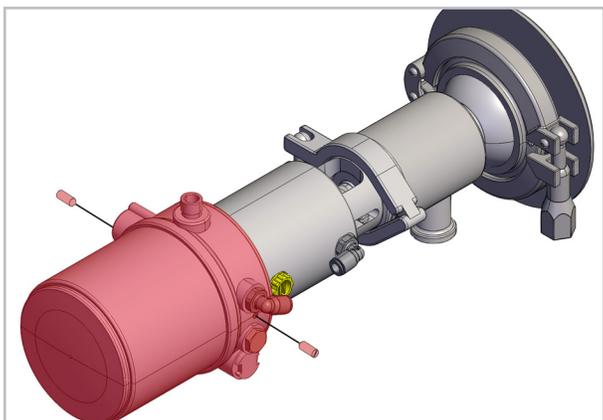


STEP 3)

Put the new Control Top on and secure it with the two set screws.

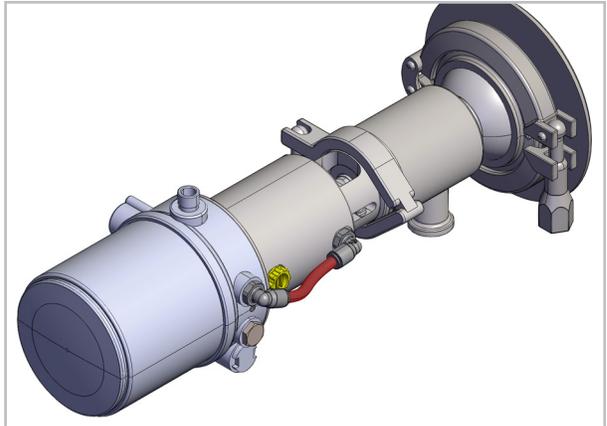
Required Tools:

- Allen Key (3mm)



STEP 4)

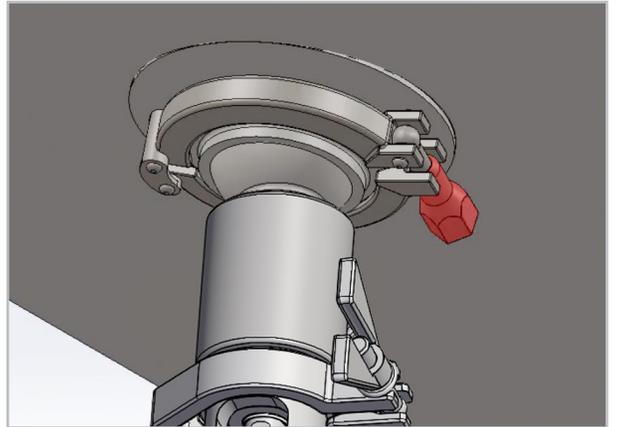
Reconnect the connection hose between the Actuator and the Control Top.



10.4 Exchanging the MultiFlange Lip Seal

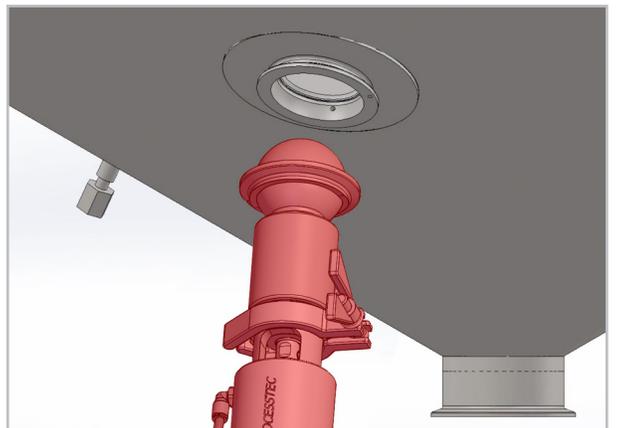
STEP 1)

Loosen the hex nut of the Multiflange Clamp and remove it so that the ViscoClean can be removed.



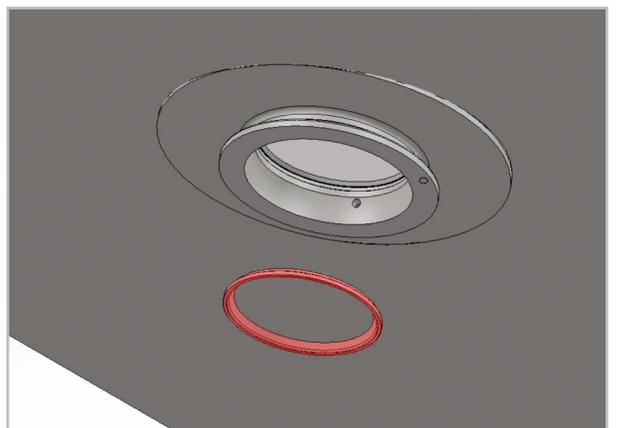
STEP 2)

Remove the ViscoClean from the Multiflange, taking care to not lose the Positioning Pin.



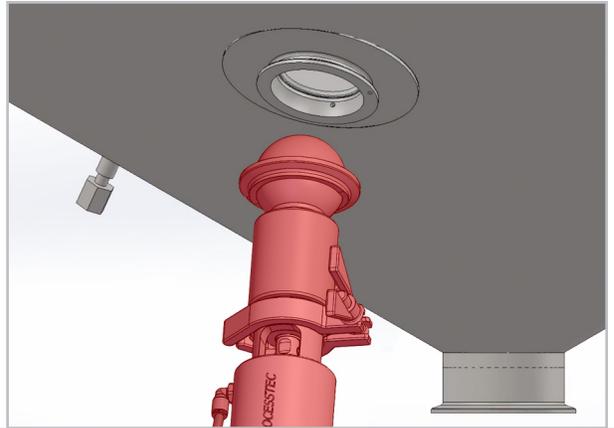
STEP 3)

Remove the old Lip Seal from the MultiFlange. Install the new Lip Seal into the MultiFlange, making sure that it is fully seated.



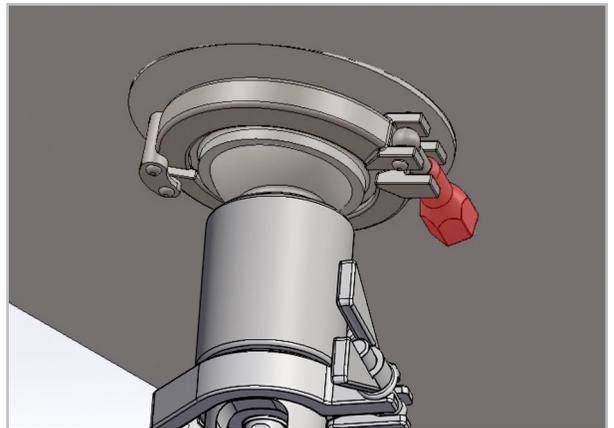
STEP 4)

Grease the front part of the Valve Housing ball to minimize friction. Otherwise, the seal can be pulled out when aligning the ViscoClean. Reattach the ViscoClean to the MultiFlange.



STEP 5)

Secure the ViscoClean to the Multiflange using the Clamp, and tighten the Hex Nut once the angle of the ViscoClean is in the proper position.



11. TECHNICAL DATA

ViscoClean V-Shape Spray Pneumatic Product Area Data	
Size	DN-15 (OD 3/4")
Operating Flow Rate	kVs = 1.4 cV = 1.21 Flowrates at: 1 bar (14.5psi) 1.40 m3/h (6.16 GPM) 2 bar (29.0 psi) 1.97 m3/h (8.67 GPM) 3 bar (43.51psi) 2.42 m3/h (10.65 GPM) 4 bar (58.0 psi) 2.79 m3/h (12.27 GPM) 5 bar (72.52psi) 3.12 m3/h (13.73 GPM)
Horizontal Spray Range	1 bar (14.5psi) 3.5m (11.5 feet) 1.7 bar (24.65 psi) 5m (16.4 feet)
Material of Product Contact Parts	Stainless Steel 1.4404/316L
Elastomer of Product Contact	EPDM
Installation Position	At the user's discretion
Product Pressure Max.	10 bar (145 psi)
Product Temperature and Operating Temperature	Max 130° C (266° F)

*The following only applies to the ViscoClean V-Shape Spray Pneumatic and only when equipped with a Control Top.

Pneumatic Actuator & Control Top Data	
Ambient Temperature Valve	0° up to 60° C standard (32° up to 140° F) < 0° C: use control air with low dew point. Protect valve stems against freezing.
Proximity Switch	-20° to +80° C (-4° to + 176° F)
Control Air Pressure	minimum: 4 bar maximum: 10 bar
Control Air (Solid Particle Content)	Acc. to ISO 8573-1:2001 quality class 6 particle size max. 5 µm part. density max. 5 mg/m3
Control Air (Water Content)	quality class 4 max. dew point +3° C If the valve is used at higher altitudes or at low ambient temperatures, the dew point must be adapted accordingly.
Control Air (Oil Content)	quality class 3 preferably oil free max. 5 mg oil in 1m3 air
Air Hose (Metric)	material PE-LD outside diameter 6mm inside diameter 4mm
Weight	Approximately 3 to 4 kg.

12. RESISTANCE OF THE SEALING MATERIALS

The resistance of the sealing material depends on the type and temperature of the medium conveyed.

HNBR can tolerate temperatures up to 140° C (284° F). This is the ideal material for use with Food Products (with and without oils), as well as for use with CIP.

FFKM sealing materials can also be used where higher temperatures are required.

For additional chemical requirements, more information is available upon request.

13. TOOLS AND LUBRICANTS

TOOL	PART #
Screwdriver (3mm)	--
Allen Key (3mm)	--
Allen Key (4mm)	--
Open End Wrench (13mm)	--
Pin Punch (T1) 3mm dia.	--