IM-P154-09-US
Issue 1

CVS10M
Sanitary Check Valve
Installation and Maintenance Instructions

1. Safety information

Safe operation of this product can only be guaranteed if it is properly installed, commissioned, used and maintained by qualified personnel (see Section 1.11) in compliance with the operating instructions. General installation and safety instructions for pipeline and plant construction, as well as the proper use of tools and safety equipment must also be complied with.

1.1 Intended use

Referring to the Installation and Maintenance Instructions, body markings and Technical Information Sheet, check that the product is suitable for the intended use/application.

i) **Check material suitability, pressure and temperature and their maximum and minimum values. If the maximum operating limits of the product are lower than those of the system in which it is being fitted, or if malfunction of the product could result in a dangerous overpressure or overtemperature occurrence, ensure a safety device is included in the system to prevent such over.**

ii) **Determine the correct installation situation and direction of fluid flow. For applications that are self-draining they must be with the flow vertically downwards.**

iii) **Spirax Sarco products are not intended to withstand external stresses that maybe induced by any system to which they are fitted. It is the responsibility of the installer to consider these stresses and take adequate precautions to minimise them.**

iv) **Remove protective covers from all connections and protective film from all name-plates,where appropriate, before installation on steam or other high temperature applications.**

1.2 Access

Ensure safe access and if necessary a safe working platform (suitably guarded) before attempting to work on the product. Arrange suitable lifting gear if required.

1.3 Lighting

Ensure adequate lighting, particularly where detailed or intricate work is required.

1.4 Hazardous liquids or gases in the pipeline

Consider what is in the pipeline or what may have been in the pipeline at some previous time. Consider: flammable materials, substances hazardous to health, extremes of temperature.

1.5 Hazardous environment around the product

Consider: explosion risk areas, lack of oxygen (e.g. tanks, pits), dangerous gases, extremes of temperature, hot surfaces, fire hazard (e.g. during welding), excessive noise, moving machinery.

1.6 The system

Consider the effect on the complete system of the work proposed. Will any proposed action (e.g. closing isolation valves, electrical isolation) put any other part of the system or any personnel at risk?
Dangers might include isolation of vents or protective devices or the rendering ineffective of controls or alarms. Ensure isolation valves are turned on and off in a gradual way to avoid system shocks.

1.7 Pressure systems

Ensure that any pressure is isolated and safely vented to atmospheric pressure.
Consider double isolation (double block and bleed) and the locking or labelling of closed valves. Do not assume that the system has depressurised even when the pressure gauge indicates zero.

1.8 Temperature

Allow time for temperature to normalise after isolation to avoid the danger of burns and consider whether protective clothing (including saftey glasses) is required.

Viton body seal

If the Viton components have been subjected to a temperature approaching 315°C (599°F) or higher they may have decomposed and formed hydroflouric acid. Avoid skin contact and inhalation of any fumes as the acid will cause deep skin burns and damage the respitory system.

1.9 Tools and consumables

Before starting work ensure that you have suitable tools and / or consumables available. Use only genuine Spirax Sarco replacement parts.

1.10 Protective clothing

Consider whether you and / or others in the vicinity require any protective clothing to protect against the hazards of, for example, chemicals, high / low temperature, radiation, noise, falling objects, and dangers to eyes and face.

1.11 Permits to work

All work must be carried out or be supervised by a suitably competent person.
Installation and operating personnel should be trained in the correct use of the product according to the Installation and Maintenance Instructions.
Where a formal 'permit to work' system is in force it must be complied with. Where there is no such system, it is recommended that a responsible person should know what work is going on and, where necessary, arrange to have an assistant whose primary responsibility is safety. Post 'warning notices' if necessary.

1.12 Handling

Manual handling of large and / or heavy products may present a risk of injury. Lifting, pushing, pulling, carrying or supporting a load by bodily force can cause injury particularly to the back. You are advised to assess the risks taking into account the task, the individual, the load and the working environment and use the appropriate handling method depending on the circumstances of the work being done.

1.13 Residual hazards

In normal use the external surface of the product may be very hot. If used at the maximum permitted operating conditions the surface temperature of some products will exceed temperatures of 100°C (212°F).
Many products are not self-draining. Take due care when dismantling or removing the product from an installation (refer to 'Maintenance instructions').

1.14 Freezing

Provision must be made to protect products which are not self-draining against frost damage in environments where they may be exposed to temperatures below freezing point.

1.15 Disposal

The product is recyclable. No ecological hazard is anticipated with the disposal of this product providing due care is taken, EXCEPT:

Viton body seal:

- **In compliance with National and Local regulations waste parts can be landfilled.**
- **Waste parts can be incinerated, but a scrubber must be used to remove Hydrogen Fluoride, which is evolved from the product and with compliance to National and Local regulations.**
- **Is insoluble in acquatic media.**

1.16 Returning products

Customers and stockists are reminded that under EC Health, Safety and Environment Law, when returning products to Spirax Sarco they must provide information on any hazards and the precautions to be taken due to contamination residues or mechanical damage which may present a health, safety or environmental risk. This information must be provided in writing including Health and Safety data sheets relating to any substances identified as hazardous or potentially hazardous.

2. General product information

2.1 Description

The CVS10M sanitary in-line spring assisted check valve range are manufactured from 316L stainless steel and prevent reverse flow in fluid lines. They are available with either soft
seats for process gasses and liquids, or with a metal seat for use within steam systems. They are suitable for a wide range of high purity applications in the food, medical, and pharmaceutical industries. For use with other medium please consult Spirax Sarco.

Available types and surface finish:

CVS10M is available in both 25 Ra and 15 Ra internal surface finish.
CVS10M comes standard with a EPDM gasket body seal for applications under 300°F. For higher temperature applications, a Tru-Flex(R) or Viton(R) gasket body seal is available.

Standards:

- All wetted elastomers / polymers comply with FDA regulation CFR 21, paragraph 177, section 2600 for EPDM and Viton and section 1550 for FEP-Silicone and TFM PTFE.
- The CVS10M is designed in accordance with ASME-BPE.
- The CVS10M meets 3A Standand 58-01.

Certification

This product is available with the following certification:

- EN 10204 3.1 material certification as standard.
- Typical surface finish certificates.
- FDA approval certificates for elastomers.
- USP class VI approval certificates.
- ADI free certificate.

Note: All certification / inspection listed above will come as standard for the CVS10M.

Packaging

Packaging for this product is conducted in a clean environment, segregated from other non stainless steel products, and in accordance with the current edition of ASME BPE. Inlet and outlet connections are capped and the product is sealed in a plastic bag prior to boxing.
Note: For further information see TI-P154-08-US.

2.2 Sizes and pipe connections

½" to 4" to ASME BPE available as standard.

Sanitary clamp:
ASME BPE clamp.

Fig. 1 Vertical option shown

2.3 Pressure/temperature rating

Temperature (°F)	Pressure	Material Temperature Limit
100	150	
200	125	
300	115	EPDM, TufFlex® (1)
400	105	Viton®

Note:

(1) PTFE grafted to an EPDM rubber inner core. Good for steam applications.
Meets USDA, FDA and 3A Sanitary Standards and U.S. Pharmacopeia Class VI Certification.

2.4 Materials

No.	Part	
1	Body	A351 CF3M
2	Seat	A351 CF3M
3	Disc	316 SS
4	Spring	316 SS (electropolished)
5	Guide assembly	316 SS
6	Gasket body seal	EPDM (-75 °F to 300 °F)**
7	Clamp	304 SS

Notes

** Other gasket body seal materials available upon request

(2) Sizes 2½", 3", 4"

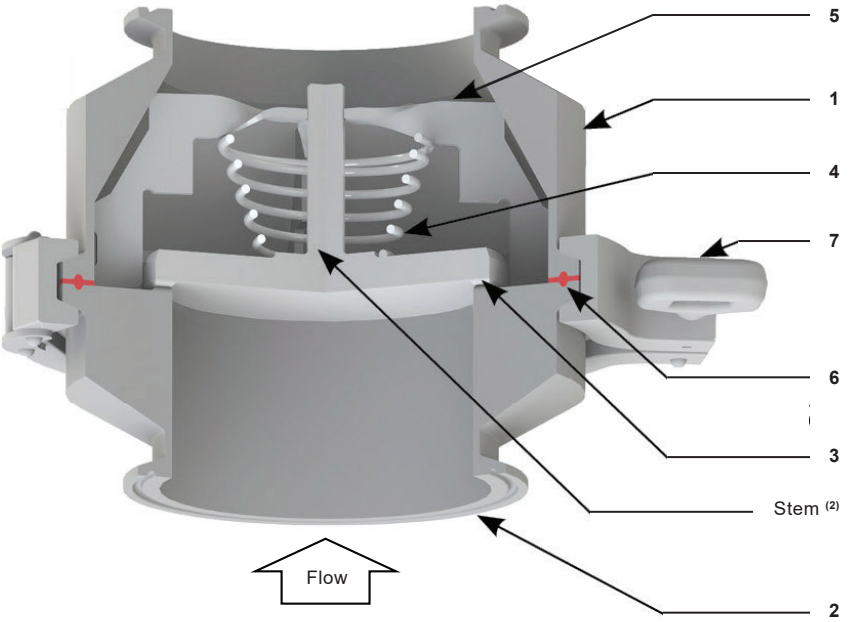


Fig. 2

3. Installation

Before actioning any installation, observe the 'Safety information' in Section 1.

Referring to the Installation and Maintenance Instructions, body markings and Technical Information Sheet, check that the product is suitable for the intended installation:

3.1 Check materials, pressure and temperature and their maximum values. If the maximum operating limit of the product is lower than that of the system in which it is being fitted, ensure that a safety device is included in the system to prevent overpressurisation.

3.2 Determine the correct installation situation and the direction of flow.

3.3 Remove protective covers from all connections and protective film from all name-plates, where appropriate, before installation on steam or other high temperature applications.

3.4 The CVS10M can be fitted in both horizontal and vertical lines. For applications that are self-draining it must be installed in such a way that the flow is vertical downwards.

3.5 Fittings, clamps and gaskets for the connecting tubing are not supplied.

Note: This product must be handled carefully to ensure that the surface finish is not damaged

4. Commissioning

After installation or maintenance ensure that the system is fully functioning. Carry out tests on any alarms or protective devices.

Note: If installed on a steam/condensate system, it is very important that the pressure is built up slowly to avoid possible damage to the unit.

5. Spare parts and Maintenance

Note: Before actioning any maintenance, observe the 'Safety information' in Section 1

Before undertaking any maintenance on this product, it must be isolated from the supply and return lines and any pressure allowed to normalise to atmosphere. The unit should then be allowed to cool.

5.1 Spare parts

The CVS10M sanitary in-line spring assisted check valve range are manufactured from 316L stainless steel and prevent reverse flow in fluid lines. They are suitable for a wide range of high purity applications in the food, medical, and biopharmaceutical industries. For use with other medium please consult Spirax Sarco.

Available spares

Repair Kit (includes spring, EPDM body seal, disc and disc guide)

How to order spares
Always order spares by using the description given in the column headed 'Available spares' and state the size and type of check valve.

Example: 1 off Seal kit for a 1" Spirax Sarco CVS10M sanitary check valve with EPDM seat having ASME BPE clamp ends.

5.2 Maintenance procedures

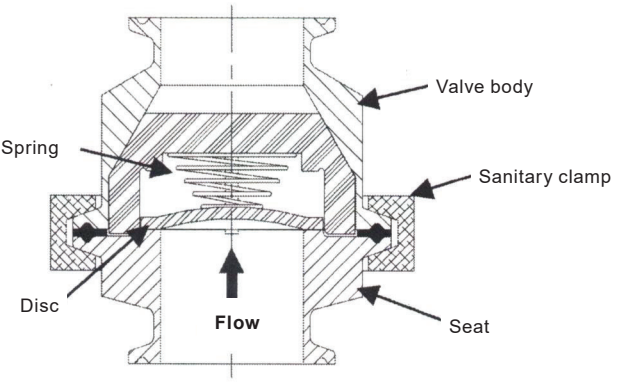
Disassembly

1. To access valve internals, loosen the wing nut of the sanitary clamp and remove the clamp from the center of the valve .
2. Carefully pull apart the valve body and seat.
   Note that once the seat has been removed from the valve body, the disc and spring are loose pieces.
3. Remove the gasket from the valve body (or seat) and inspect it carefully for signs of damage or wear. The disc, spring, and disc guide assembly may be removed from the valve body for inspection and cleaning.
4. Seating surfaces may be cleaned using a soft cloth and appropriate solvent. Avoid scratching the seating surface.

Reassembly

1. Place disc guide assembly in valve body. Orientation of the guide assembly legs is not critical. Place spring, large end first , onto guard spring hub.
2. Position the disc over the spring and between the four legs of the guide assembly. Be sure the valve disc is replaced with the "seat side" (marked on disc) against the valve seat.
3. Place the gasket into the groove in the valve body. Place the valve seat onto the valve body ensuring that the valve seat is centered up on the disc and that the gasket engages in the groove of both the valve body and the seat.
4. Reaching through the end of the valve seat, depress the disc a couple of times to check for free disc movement. Wrap the clamp around the valve making sure the valve body and seat are fully captured. Tighten the wing nut of the clamp to approximately 20 ft-lbs.
5. Re-install the valve in the line with the flow arrow on the body pointing in the direction of flow .

Vertical valve



Horizontal valve

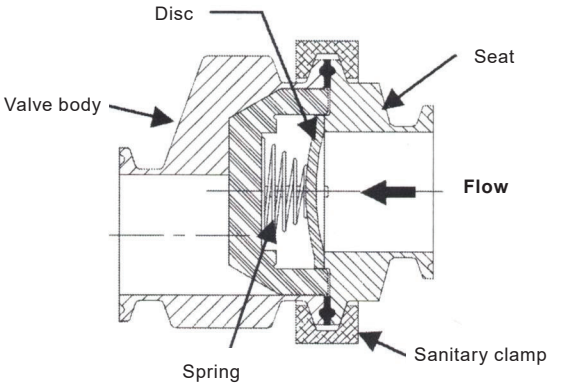


Fig. 3 Vertical and horizontal valves

Construction materials

Body	316L SS
Seat	316L SS
Disc	316 SS
Spring	316 SS (electropolished)
Guide Assembly	316 SS
Body Seal	EPDM (- 75 °F to +300° F)
Clamp	304 SS
Internal Surface Finish	25 Ra