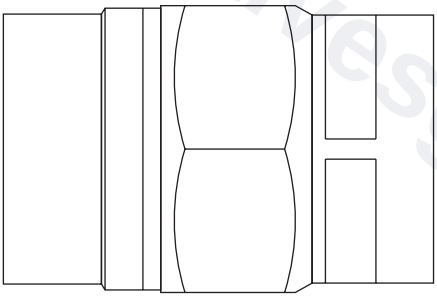
DCV41 and DCV41 Food+ Austenitic Stainless Steel Disc Check Valve

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, name-plate and Technical Information Sheet, check that the product is suitable for the intended use/application.

The product listed below complies with the requirements of the European Pressure Equipment Directive 2014/68/EU and carries the CE mark when so required.

The product falls within the following Pressure Equipment Directive category:

Product		Group 2 Gases	Group 2 Liquids
DCV41	DN15 - DN25	SEP	SEP
	DN32	SEP	SEP
	DN40 - DN50	1	SEP

i) **These products have been specifically designed for use on steam, compressed air, water and other industrial fluids that are in Group 2 of the above-mentioned Pressure Equipment Directive.**

ii) **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-limit situations.**

iii) **Determine the correct installation situation and direction of fluid flow.**

iv) **Spirax Sarco products are not intended to withstand external stresses that may be 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.**

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

vi) **Prior to use, the user shall ensure the fluid compatibility with the equipment material.**

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 safety glasses) is required.

Viton seat:

If the Viton seat has been subjected to a temperature approaching 315 °C (599 °F) or higher it may have decomposed and formed hydrofluoric acid. Avoid skin contact and inhalation of any fumes as the acid will cause deep skin burns and damage the respiratory 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 may reach temperatures of 300 °C (572 °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

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

Viton seat:

- **Waste parts can be landfilled, when in compliance with National and Local regulations.**
- **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.**
- **Parts are insoluble in aquatic media.**

Please visit the Spirax Sarco product compliance web pages:
https://www.spiraxsarco.com/product-compliance
for up to date information on any substances of concern that may be contained within this product. Where no additional information is provided on the Spirax Sarco product compliance web page, this product may be safely recycled and/or disposed providing due care is taken.
Always check your local recycling and disposal regulations.

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.

1.17 DCV41 Food+ version, safety instructions

This product is intended to be connected into a system that can operate an EC1935 compliant process. To minimise the risk of non-intentionally added substances in the system, it is essential that an appropriate CIP (cleaning in place) cycle is carried out by the end user prior to first use in a food contact application.
A list of the materials that could come directly or indirectly into contact with foodstuffs can be found in the Declaration of Compliance available for this product.

2. General product information

2.1 Description

The DCV41 is an austenitic stainless steel disc check valve with screwed or socket weld end connections. Its function is to prevent reverse flow on a wide variety of fluids for applications in process lines, hot water systems, steam and condensate systems. For oils and gases, a Viton seat is available and for water an EPDM seat is available. Soft seat versions provide a zero leakage rate or bubble tight shut-off, i.e. they meet EN 12266-1 rate A, providing a differential pressure exists. Please note that the soft seat options are not available with socket weld ends.
The shut-off of the standard valve conforms to EN 12266-1 rate E. When a heavy duty spring is installed with an EPDM seat, the valve is suitable for boiler feedwater check applications.
A high temperature spring version is available to operate at 400 °C (752 °F).

Optional extras:

- Heavy duty springs (700 mbar opening pressure) for boiler feed applications.
- High temperature spring.
- Viton soft seats for oil and gas applications - screwed connections only
- EPDM soft seals for water applications-screwed connections only

Note: For further information, see the following Technical Information Sheet, TI-P601-18, which gives full details of:- Materials, sizes and pipe connections, dimensions, weights, operating ranges and capacities.

Various options are denoted by a marking on the valve body:-

'N'	High temperature spring	Standard metal seat
'W'	Without spring	Standard metal seat
'H'	Heavy duty spring	Standard metal seat
'V'	Standard spring	Viton seat
'E'	Standard spring	EPDM seat

No identification indicates a standard spring with a metal disc.

Please note: Special testing to allow lower temperature operation can be provided at extra cost. Consult Spirax Sarco.

2.2 Sizes and pipe connections:

½", ¾", 1", 1¼", 1½" and 2"
Screwed BSP T Rp (ISO 7-1)
Screwed NPT to ASME B 1.20.1
Socket weld to ASME B 16.11 Class 3000.

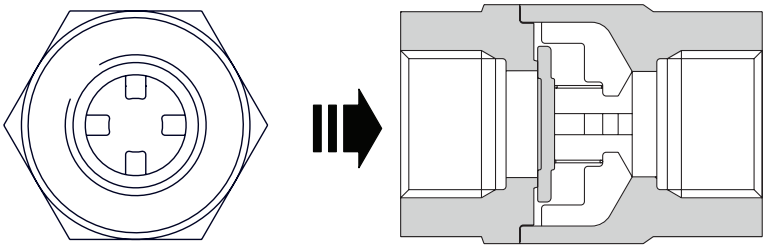


Fig. 1 DCV41

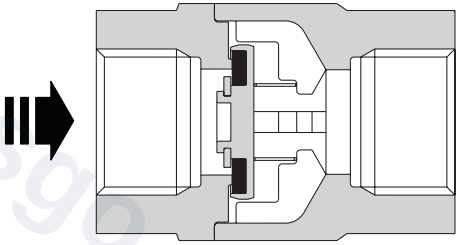
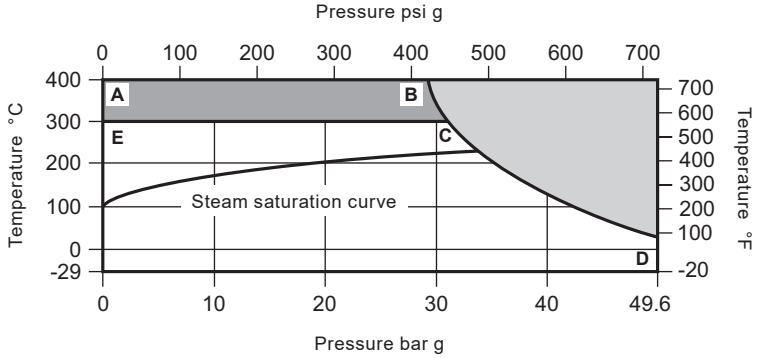


Fig. 2 Soft seat option (for screwed version only)

2.3 Pressure/temperature limits



The product **must not** be used in this region.

For use in this area use a DCV41 with high temperature spring or DCV41 without spring.

A-B-D High temperature spring and without spring.

E-C-D Standard spring.

Body design conditions				PN50
PMA	Maximum allowable pressure		49.6 barg @ 38 °C	(719 psi g @ 100 °F)
TMA	Maximum allowable temperature		400 °C @ 29.4 barg	(752 °F @ 426 psi g)
Minimum allowable temperature			-29 °C	(-20 °F)
PMO	Maximum operating pressure (bar g)		49.6 bar g @ 38 °C	(719 psi g @ 100 °F)
TMO	Maximum operating temperature	With metal seat and standard spring	300 °C	(572 °F)
		With metal seat and high temperature spring	400 °C	(752 °F)
		Without spring	400 °C	(752 °F)
		Viton seat	205 °C	(401 °F)
		EPDM seat	120 °C	(248 °F)
* Minimum operating temperature		With metal seat	-29 °C	(-20 °F)
		With viton seat	-25 °C to +205 °C	(-13 °F to +401 °F)
		With EPDM seat	-40 °C to +120 °C	(-40 °F to +248 °F)
Product is safe for use under full vacuum conditions				
Designed for a maximum cold hydraulic test pressure of:			76 bar g	(1102 psi g)

*** Note:** Special testing to allow lower temperature operation can be provided at extra cost. Consult Spirax Sarco.

3. Installation

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

Referring to the Installation and Maintenance Instructions, name-plate 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 fluid flow.

3.3 Remove protective covers from all connections.

3.4 The DCV41 must be fitted in accordance with the direction of flow arrow indicating correct fluid flow direction. When fitted with a spring they can be installed in any plane. When supplied without spring they must be fitted in a vertical flow line with the flow from bottom-to-top.

Note: Disc check valves are not suitable for use where heavily pulsating flow exists, such as close to a compressor.

3.5 Kv values

Size	½"	¾"	1"	1¼"	1½"	2"
Kv	4.4	7.5	12	30	35	35

For conversion
Cv (UK) = Kv x 0.97
Cv (US) = Kv x 1.17

3.6 Opening pressures in mbar

Differential pressures with zero flow for standard and high temperature springs.

→ Flow direction

Size	½"	¾"	1"	1¼" to 2"
↑	25	25	25	25
→	22.5	22.5	22.5	22.5
↓	20	20	20	20

Where lower opening pressures are required, valves without springs can be installed in vertical pipes with bottom-to-top flow.

Without spring

↑	3	2.5	4	6.5

4. Commissioning

After installation ensure that the system is fully functioning. Carry out tests on any alarms or protective devices. Open isolating valves slowly

5. Operation

Disc check valves are opened by the pressure of the fluid and closed by the spring as soon as the flow ceases and before reverse flow occurs.

6. Maintenance

This product is non maintainable.

7. Spare parts

This product is non maintainable.

It has a fully welded construction and therefore no spares are available.

7.1 How to order a new product

Example: 1 off DCV41 in an austenitic stainless steel body having ½" BSP T Rp (ISO 7-1) screwed connections complete with certification to EN 10204 3.1 for the body. Fitted with Viton soft seat.