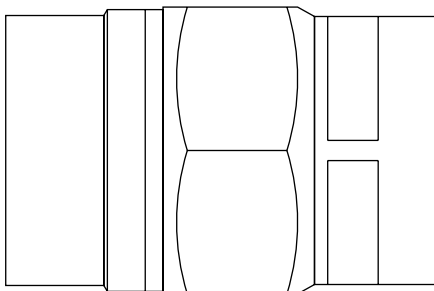

Austenitic Stainless Steel Disc Check Valve
Installation and Maintenance Instructions



- 1. *General safety information*
- 2. *General product information*
- 3. *Installation*
- 4. *Commissioning*
- 5. *Operation*
- 6. *Maintenance*
- 7. *Spare parts*

1. General safety information

Safe operation of the unit can only be guaranteed if it is properly installed, commissioned and maintained by a qualified person (see Section 11 of the attached Supplementary Safety Information) 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.

Isolation

Consider whether closing isolating valves will put any other part of the system or personnel at risk. Dangers might include; isolation of vents and protective devices or alarms. Ensure isolation valves are turned off in a gradual way to avoid system shocks.

Pressure

Before attempting any maintenance consider what is or may have been in the pipeline. Ensure that any pressure is isolated and safely vented to atmospheric pressure before attempting to maintain the product, this is easily achieved by fitting Spirax Sarco depressurisation valves type DV (see separate literature for details). Do not assume that the system is depressurised even when a pressure gauge indicates zero.

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:

If parts made from Viton have been subjected to a temperature approaching 315°C (599°F) or higher, they 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.

Disposal

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

Viton:

- Waste parts can be landfilled, when in compliance with National and Local regulations.
- Waste parts can be incinerated, but a scrubber must be used to remove Hydrogen Fluoride, which is evolved from the product and with the compliance to National and Local regulations.
- Parts are insoluble in aquatic media.

— 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 DIN 3230 BN1 and DIN 3230 BO1 provided a differential pressure exists (**Note:** Soft seat options are not available with socket weld ends). The shut-off of the standard valve conforms to DIN 3230 BN2. 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.

2.2 Sizes and pipe connections:

½", ¾" and 1"

Screwed BSP to BS 21 parallel

Screwed NPT to ANSI B 1.20.1

Socket weld to ANSI B 16.11 Class 3000.

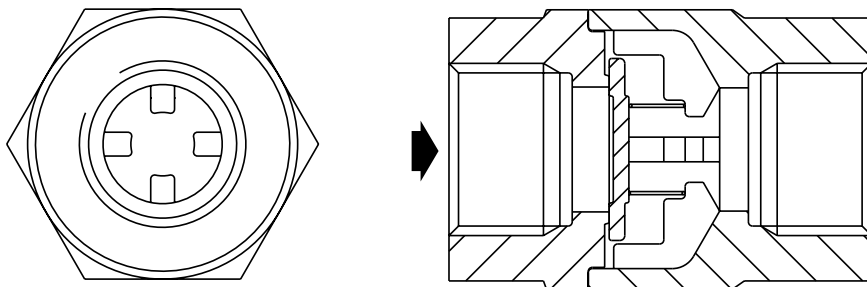


Fig. 1 DCV41

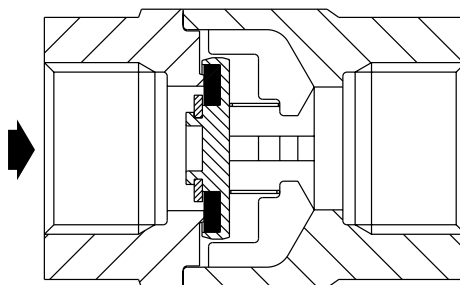


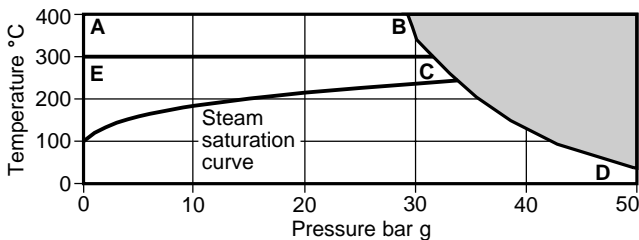
Fig. 2 Soft seat option (for screwed version only)

2.3 Limiting conditions

Maximum body design condition		PN50	
PMO - Maximum operating pressure		50 bar g	(725 psi g)
TMO - Maximum operating temperature	Metal seat and standard spring	300°C	(572°F)
	Metal seat and high temperature spring	400°C	(752°F)
	Without spring	400°C	(752°F)
	Viton seat	250°C	(482°F)
	EPDM seat	150°C	(302°F)
Minimum operating temperature	Metal seat	-29°C	(-20°F)
	Viton seat	-15°C	(5°F)
	EPDM seat	-29°C	(-20°F)
Designed for a maximum cold hydraulic test pressure of:		76 bar g	(1 102 psi g)

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

2.4 Operating range



The product must not be used in this region.

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

E-C-D Standard spring.

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.

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 K_V values

Size	½"	¾"	1"
K _V	4.4	7.5	12
For conversion	$C_V(\text{UK}) = K_V \times 0.97$		$C_V(\text{US}) = K_V \times 1.17$

3.6 Opening pressures in mbar

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

→ Flow direction

Size	½"	¾"	1"
↑	25	25	25
→	22.5	22.5	22.5
↓	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
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3.7 Welding into pipeline of socket weld variants

A universal weld procedure covering the requirements of different National and International Standards and practices is difficult to provide - specifically regarding the welding procedure, welding conditions (run number, consumable size, current, voltage, polarity), storage of consumables and make/type of consumables due to the abundance of appropriate consumable suppliers.

Therefore, the information given in Section 3.7.1, page 6, is only advice based on British Standards to be used for guidance on the essential requirements of welding socket weld disc check valves into the pipeline.

This will allow a user to select an appropriate weld procedure from those available to that user.

This advice is not intended to be a substitute for a weld procedure: it is for guidance only.

3.7.1 Welding of a disc check valve

The welding of a disc check valve ½", ¾" and 1" socket weld to a 15 mm, 20 mm or 25 mm Schedule 40 pipe

Parent materials(s)

Description

Austenitic stainless steel with minimum tensile strength up to and including 485 N/mm²

Specification(s)

ASTM A351 CF3M (DCV)

ASTM A106 Gr. B (Pipe)

Material group(s)

R

A1

Parent materials(s) dimensions

	Thickness (mm)	O/D (mm)
½"	DCV	5.15
	Pipe	2.76
¾"	DCV	5.00
	Pipe	2.87
1"	DCV	5.60
	Pipe	3.38

Pipe is to be BS 1600 Schedule 40

Joint type

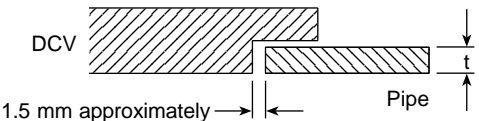
Socket joint to BS 3799 Class 3000 lb

Welding processs

Manual Metal Arc (MMA)

Weld preparation

Dimensioned sketch



Diametrical clearance 1.0 mm maximum

Reference - BS 2633: 1987: Section 3.1 and Fig. 9

Welding consumables

Filler material:

Composition - Low C: 23% Cr: 12 % Ni:

Specification - BS 2926: 1984: 23-12 L BR

Method of preparation and cleaning

Socket: As supplied and wire brushed

Pipe: Mechanically cut and wire brushed

Additional information

1. It is not possible to dismantle the DCV prior to welding.
2. Fit-up using tack welds.

Shielding gas/flux:

Not applicable

Parent material temperature

Preheat temperature

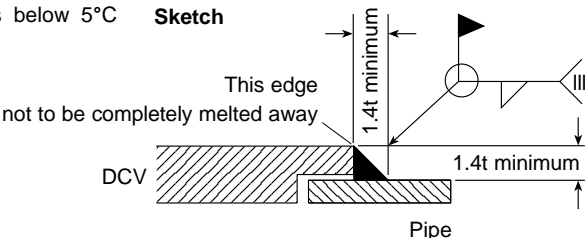
Only required when ambient is below 5°C (41°F), then "warm to touch"

Interpass temperature

Not applicable

Run sequence and completed weld dimensions

Sketch



Reference.- BS 806: 1990: Section 4: Clause 4.7.3

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 screwed connections complete with certification to EN 10204 3.1.B for body. Fitted with Viton soft seat.

