

Data sheet

# Industrial Refrigeration Stainless Steel Valves

Shut-off valves SVA-S/L SS  
 Hand-operated regulating valves REG-SA/SB SS  
 Check & stop valves SCA-X SS  
 Check Valves CHV-X SS  
 Strainers FIA SS  
 Pressure regulating valves OFV-SS  
 Gauge valves SNV-SS  
 Solenoid valves EVRS/EVRST



Danfoss Industrial Refrigeration extends a range of stainless steel valves for special application requirements.

The valve range includes for valve sizes DN 15 mm (1/2 in.) to DN 125 mm (5 in.) in angleway and straight execution and includes:

The range has been extended to meet the increased demand brought about by

1. the need for higher protection of external surfaces on valves and fittings
2. the need to meet developments in the way that plants are being designed.

In certain specific areas such as outdoor applications and corrosive atmospheres, such as coastal installations, there is a need for high surface protection to prevent failure due to corrosion.

Today's food safety standards often call for daily treatment with detergents to protect against bacteria growth, again producing a need for high surface protection.

## Features

- Optional accessories:

	Vented cap	Handwheel
SVA-S/L SS	X	X
REG-SA/SB SS	X	
SCA-X SS	X	
CHV-X SS		
FIA SS		
OFV-SS	X	

- Designed to give favourable flow conditions.
- Internal backseating enables replacement of the spindle seal whilst the valve is active, i.e. under pressure (SVA-S/L SS, REG-SA/SB SS, SCA-X SS, OFV-SS).

- Housing is made of special cold resistant stainless steel approved for low temperature operations.
- Easy to disassemble for inspection and service.
- SVA-S/L SS Shut-off valves can accept flow in either direction.
- Compact and light valves for easy handling and installation.
- Classification: DNV, CRN, BV, EAC etc. To get an updated list of certification on the products please contact your local Danfoss Sales Company.

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**Shut-off valves  
SVA-S/L SS**

In certain specific areas such as outdoor applications and corrosive atmospheres, such as coastal installations, there is a need for high surface protection to prevent failure due to corrosion.

Today's food safety standards often call for daily treatment with detergents to protect against bacteria growth, again producing a need for high surface protection.

SVA-S/L SS are angleway and straightway stainless steel shut-off valves, which are designed to meet all industrial refrigeration application requirements.

The valves are designed to give favourable flow characteristics and are easy to dismantle and repair when necessary. The valve cone is designed to ensure perfect closing.

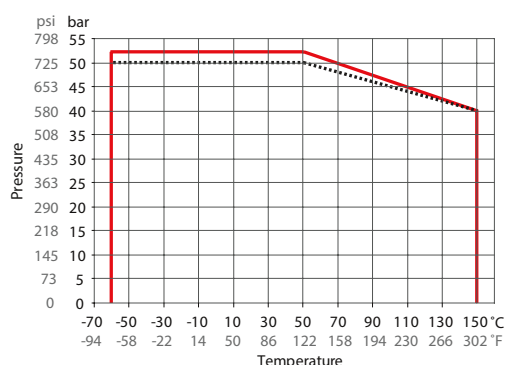


**Features  
SVA-S/L SS**

- Applicable to HCFC, HFC, R717 (Ammonia), R744 (CO<sub>2</sub>) and all flammable refrigerants.
- Optional accessories:
  - Heavy duty industrial hand wheel for frequent operation.
  - Cap for infrequent operation.
- Available in angleway and straightway versions with Standard neck or Long neck (DN 15 to DN 40) for insulated systems.
- Designed to give favourable flow conditions.
- Internal backseating enables replacement of the spindle seal whilst the valve is active, i.e. under pressure.
- Housing is made of stainless steel approved for low temperature operations.
- Easy to disassemble for inspection and service.
- SVA-S/L SS shut-off valves can accept flow in either direction.
- Butt-weld DIN and ANSI connections.
- Maximum allowable working pressure and temperature range:
 

DN 15 – 65	52 bar / 754 psi at -60 – 50 °C / -76 – 122 °F
DN 80 – 125	50 bar / 725 psi at -60 – 50 °C / -76 – 122 °F
- For SVA-S/L SS see the relation between PS and temperature in the below curve.
- Temperature range: -60 – 150 °C / 76 – 302°F.
- Compact and light valves for easy handling and installation.
- Classification: DNV, CRN, BV, EAC etc. To get an updated list of certification on the products please contact your local Danfoss Sales Company.

**Pressure and temperature range**



— SVA-S/L SS DN15-DN65  
 ..... SVA-S SS DN80 - DN125

**Technical data**

- **Refrigerants**  
Applicable to HCFC, HFC, R717 (Ammonia), R744 (CO<sub>2</sub>) and all flammable refrigerants. For further information please contact your local Danfoss Sales Company.
- **Temperature Range**  
-60 – 150 °C / -76 – 302 °F.
- **Pressure range**  
The valves are designed for max. working pressure 52 bar g / 754 psi g.

**Design**
**Connections**

Available with the following connections:

- Butt-weld DIN (EN 10220)  
DN 15 – 125 (½ – 5 in.)
- Butt-weld ANSI (B 36.19M)  
DN 15 – 100 (½ – 4 in.)

**Housing**

Made of stainless steel approved for low temperature operations.

**Valve cone**

The valve cone can be turned on the spindle, thus there will be no friction between the cone and the seat, when the valve is opened and closed. A teflon tightening ring provides perfect sealing at a minimum closing momentum.

**Spindle**

Made of polished stainless steel, ideal for O-ring sealing. Furthermore, parts of the spindle are heat treated to obtain anti-abrasive/adhesive properties.

**Packing gland**

The stainless steel packing gland comprises a spring loaded seal packing gland which ensures a perfect tightness in the range: -60 – 150 °C / -76 – 302 °F.

The packing glands are equipped with a scraper ring to prevent penetration of dirt and ice into the packing gland.

**Pressure Equipment Directive (PED)**

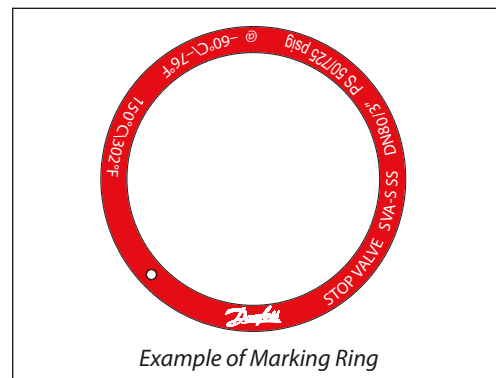
The stainless steel valves are approved and CE marked in accordance with the Pressure Equipment Directive - 97/23/EC.

**Installation**

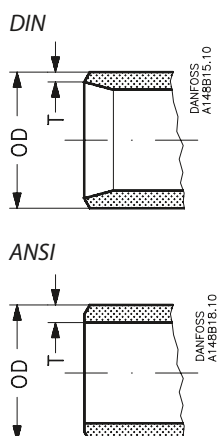
It is recommended that the valves be installed in the direction of flow indicated by the arrow on the valve body. The valve can be installed in the opposite direction but this slightly reduces the  $k_v$ -value ( $C_v$ -value).

The valve is designed to withstand high internal pressure. However, the piping system in general should be designed to avoid liquid traps and reduce the risk of hydraulic pressure caused by thermal expansion.

For further information refer to installation instructions for SVA-S/L SS.



SVA-S/L SS			
<b>Nominal bore</b>	DN ≤ 25 mm (1 in.)	DN 32-80 mm (1 ¼ – 3 in.)	DN 100 – 125 mm (4 – 5 in.)
<b>Classified for</b>	Fluid group I		
<b>Category</b>	Article 3, paragraph 3	II	III

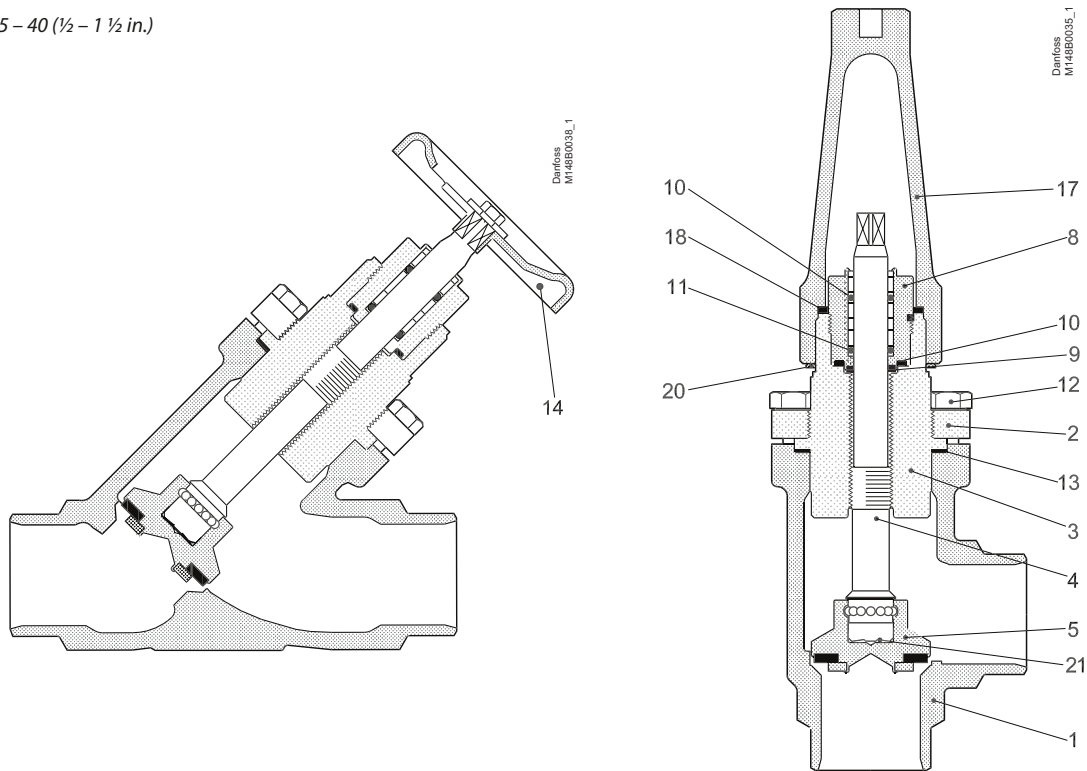
**Connections**


Size	OD	T
<b>Butt-weld DIN (EN 10220)</b>		
15	mm	21.3
½	in.	0.839
20	mm	26.9
¾	in.	1.059
25	mm	33.7
1	in.	1.327
32	mm	42.4
1 ¼	in.	1.669
40	mm	48.3
1 ½	in.	1.902
50	mm	60.3
2	in.	2.37
65	mm	76.1
2 ½	in.	3
80	mm	88.9
3	in.	3.50
100	mm	114.3
4	in.	4.50
125	mm	139.7
5	in.	5.50

Size	OD	T
<b>Butt-weld ANSI B 36.19M, SCHEDULE 40</b>		
15	mm	21.3
½	in.	0.839
20	mm	26.9
¾	in.	1.06
25	mm	33.7
1	in.	1.33
32	mm	42.4
1 ¼	in.	1.67
40	mm	48.3
1 ½	in.	1.9
<b>Butt-weld ANSI B 36.19M, SCHEDULE 10</b>		
50	mm	60.3
2	in.	2.37
65	mm	73
2 ½	in.	2.87
80	mm	88.9
3	in.	3.5
100	mm	114.3
4	in.	4.5

Material specification

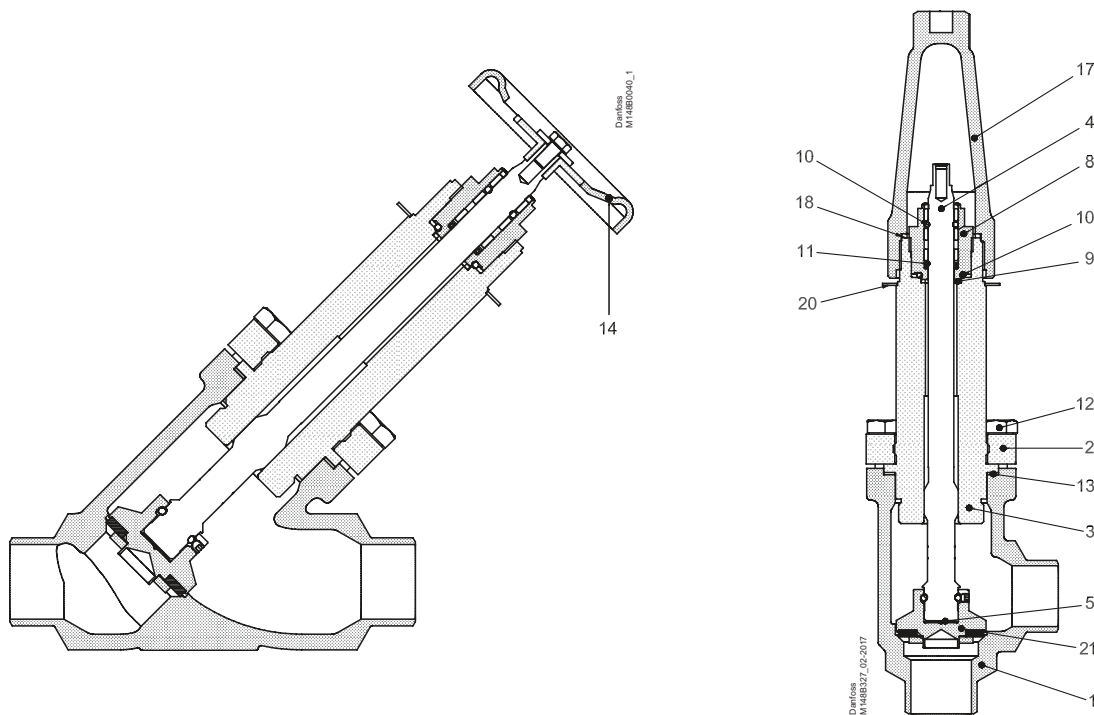
SVA-SS 15 – 40 (½ – 1 ½ in.)



No.	Part	Material	EN	ISO	ASTM
1	Housing	Stainless steel	GX5CrNi19-10 EN10213-4		AISI 304
2	Bonnet, Flange	Stainless steel	X5CrNi18-10 EN10088		AISI 304
3	Bonnet, Insert	Stainless steel	X8CrNiS18-9 DIN 17440		AISI 303
4	Spindle	Stainless steel	X8CrNiS18-9 DIN 17440	Type 17, 683/13	AISI 303
5	Cone	Steel			
8	Packing gland	Stainless steel	X8CrNiS18-9 10088	Type 17 683/13	AISI 303
9	Packing washer	Aluminium			
10	O-ring	Cloroprene (Neoprene)			
11	Spring loaded Teflon ring	PTFE			
12	Bolts	Stainless steel	A2-70	A2-70	Type 308
13	Gasket	Fiber, Non-asbestos			
14	Handwheel	Steel			
17	Cap	Aluminium			
18	Gasket for cap	Nylon			
20	Identification ring	Stainless steel			
21	Disk spring	Steel			

Material specification

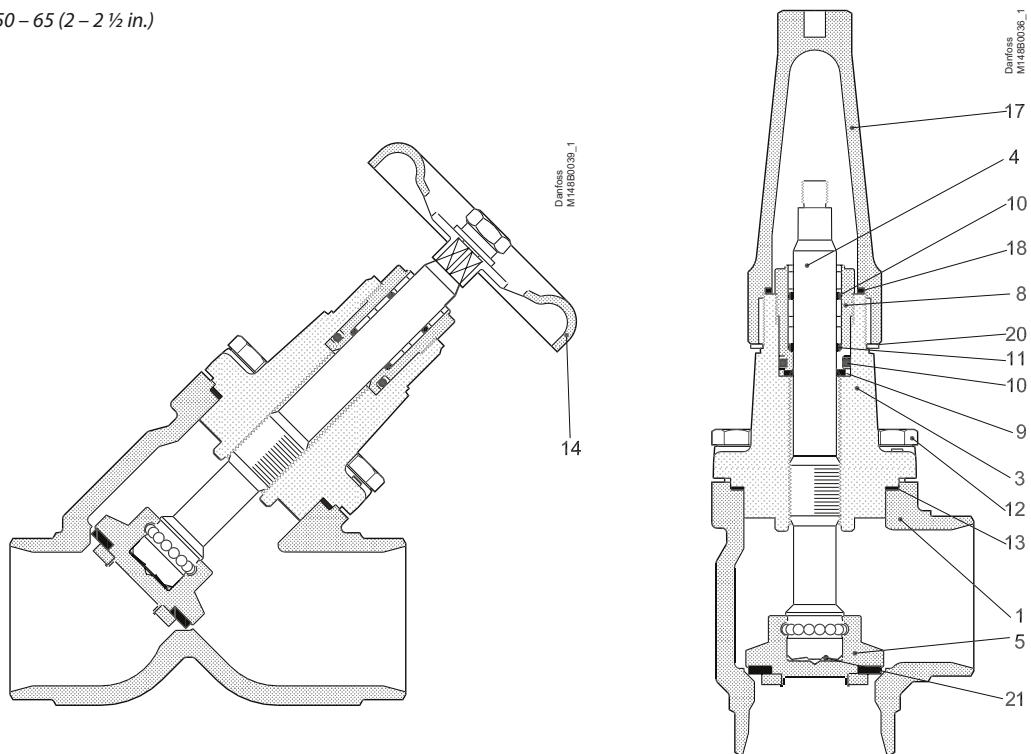
SVA-L SS 15 – 40 (½ – 1 ½ in.)



No.	Part	Material	EN	ISO	ASTM
1	Housing	Stainless steel	GX5CrNi19-10 EN10213-4		AISI 304
2	Bonnet, Flange	Stainless steel	X5CrNi18-10 EN10088		AISI 304
3	Bonnet, Insert	Stainless steel	X8CrNiS18-9 DIN 17440		AISI 303
4	Spindle	Stainless steel	X8CrNiS18-9 DIN 17440	Type 17, 683/13	AISI 303
5	Cone	Steel			
8	Packing gland	Stainless steel	X8CrNiS18-9 10088	Type 17 683/13	AISI 303
9	Packing washer	Aluminium			
10	O-ring	Cloroprene (Neoprene)			
11	Spring loaded Teflon ring	PTFE			
12	Bolts	Stainless steel	A2-70	A2-70	Type 308
13	Gasket	Fiber, Non-asbestos			
14	Handwheel	Steel			
17	Cap	Aluminium			
18	Gasket for cap	Nylon			
20	Identification ring	Stainless steel			
21	Disk spring	Steel			

Material specification

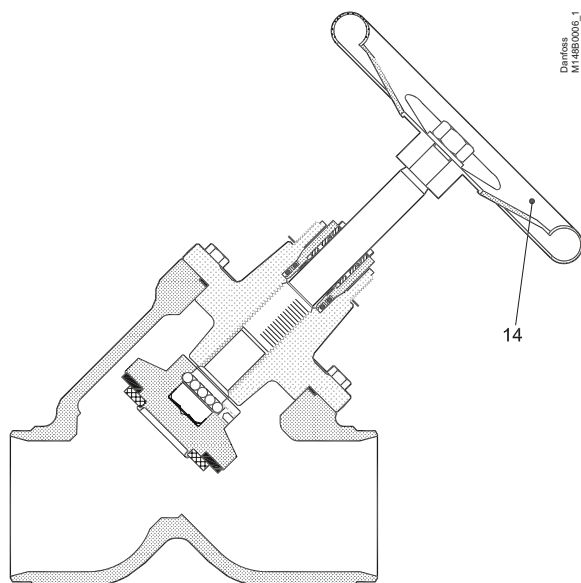
SVA-S SS 50 – 65 (2 – 2 ½ in.)



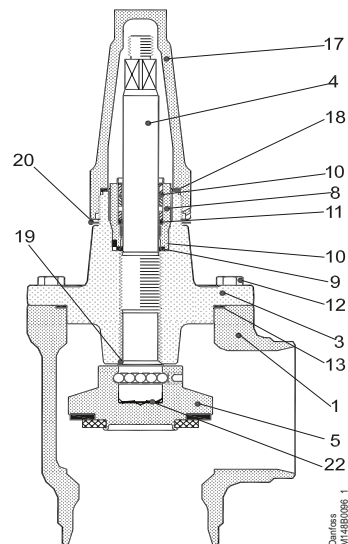
No.	Part	Material	EN	ISO	ASTM
1	Housing	Stainless steel	GX5CrNi19-10 EN10213-4		AISI 304
3	Valve bonnet	Stainless steel	GX5CrNi19-10 EN10213-4		AISI 304
4	Spindle	Stainless steel	X8CrNiS18-9 DIN 17440	Type 17, 683/13	AISI 303
5	Cone	Steel			
8	Packing gland	Stainless steel	X8CrNiS18-9 10088	Type 17 683/13	AISI 303
9	Packing washer	Aluminium			
10	O-ring	Cloroprene (Neoprene)			
11	Spring loaded Teflon ring	PTFE			
12	Bolts	Stainless steel	A2-70	A2-70	Type 308
13	Gasket	Fiber, Non-asbestos			
14	Handwheel	Steel			
17	Cap	Aluminium			
18	Gasket for cap	Nylon			
19	Locking nut	Steel			
20	Identification ring	Stainless steel			
21	Disk spring	Steel			

Material specification

SVA-S SS 80 – 125 (3 – 5 in.)



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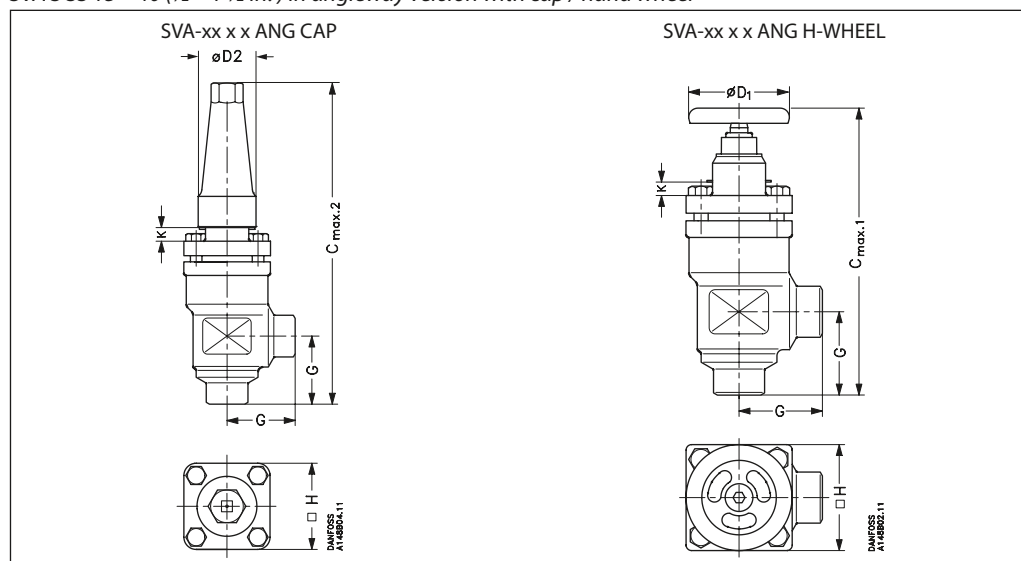
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No.	Part	Material	EN	ISO	ASTM
1	Housing	Stainless steel	GX5CrNi19-10 EN10213-4		AISI 304
3	Valve bonnet	Stainless steel	GX5CrNiMo19-11-2 EN10213-4		AISI 304
4	Spindle	Stainless steel	X5CrNi18-10 DIN 17440	Type 17, 683/13	AISI 303
5	Cone Cone seal	Steel Teflon (PTFE)			
8	Packing gland	Stainless steel	X8CrNiS18-9 10088	Type 17 R 683/13	AISI 303
9	Packing washer	Aluminium			
10	O-ring	Cloroprene (Neoprene)			
11	Spring loaded Teflon ring	PTFE			
12	Bolts	Stainless steel	A2-70	A2-70	Type 308
13	Gasket	Fiber, Non-asbestos			
14	Hand wheel	Steel			
17	Cap	Aluminium			
18	Gasket for cap	Nylon (PA 6)			
19	Soft backseat	Teflon (PTFE)			
20	Identification ring	Stainless steel			
22	Disk spring	Steel			



Dimensions and weights

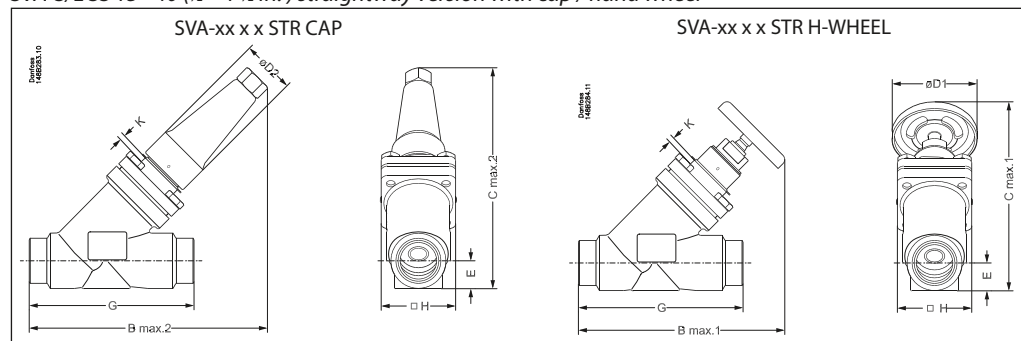
SVA S SS 15 – 40 (½ – 1 ½ in.) in angleway version with cap / hand wheel



Valve size	K	C <sub>max.1</sub>	C <sub>max.2</sub>	G	ØD <sub>1</sub>	ØD <sub>2</sub>	□H	Weight	
<b>SVA-S SS</b>									
SVA-S SS 15 – 20	mm	4	178	189	45	60	38	60	1.4 kg
SVA-S SS ½ – ¾"	in.	0.16	7.00	7.44	1.77	2.36	1.5	2.36	3.1 lbs
SVA-S SS 25 – 40	mm	12	234	268	55	80	50	70	2.4 kg
SVA-S SS 1 – 1 ½"	in.	0.47	9.21	10.55	2.17	3.15	1.97	2.76	5.3 lbs

Specified weights are approximate values only.

SVA-S/L SS 15 - 40 (½ – 1 ½ in.) straightway version with cap / hand wheel

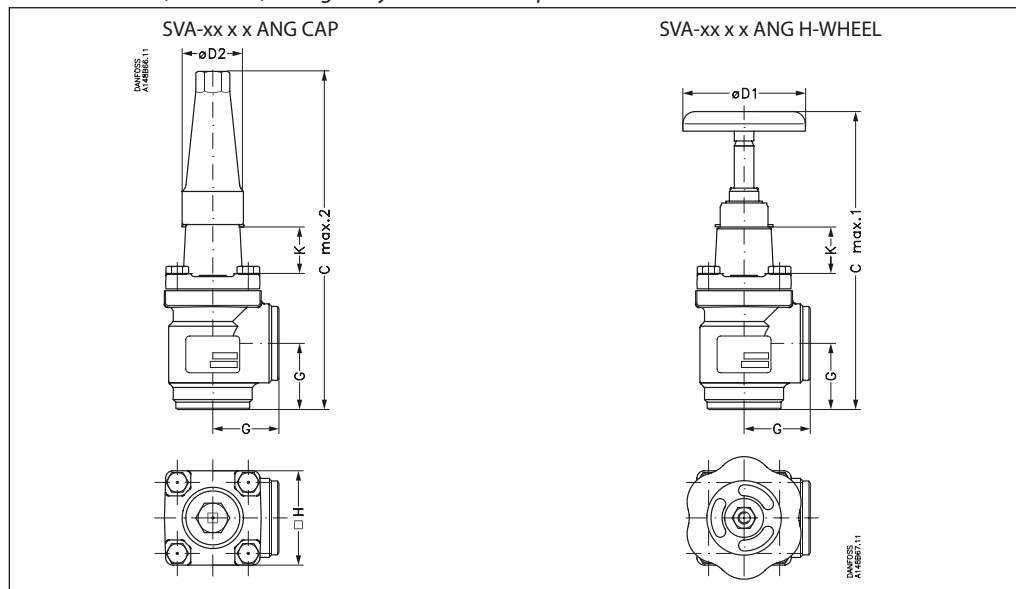


Valve size	K	C <sub>max.1</sub>	C <sub>max.2</sub>	B <sub>max.1</sub>	B <sub>max.2</sub>	E	G	ØD <sub>1</sub>	ØD <sub>2</sub>	□H	Weight	
<b>SVA-S SS</b>												
SVA-S SS 15 – 20	mm	4	146	141	160	156	20	120	60	38	60	2.0 kg
SVA-S SS (½ – ¾)"	in.	0.16	5.74	5.55	6.30	6.14	0.79	4.72	2.36	1.50	2.36	4.4 lb
SVA-S SS 25 – 40	mm	12	199	208	212	222	26	155	80	50	70	3.0 kg
SVA-S SS (1 – 1 ½)"	in.	0.47	7.83	8.19	8.35	8.74	1.02	6.10	3.15	1.97	2.76	6.6 lb
<b>SVA-L SS</b>												
SVA-L SS 15 – 20	mm	63	188	184	202	198	20	120	60	38	60	2.0 kg
SVA-L SS (½ – ¾)"	in.	2.48	7.40	7.24	7.95	7.80	0.79	4.72	2.36	1.50	2.36	4.4 lb
SVA-L SS 25 – 40	mm	74	243	252	256	265	26	155	80	50	70	3.0 kg
SVA-L SS (1 – 1 ½)"	in.	2.91	9.57	9.92	10.08	10.43	1.02	6.10	3.15	1.97	2.76	6.6 lb

Specified weights are approximate values only.

Dimensions and weights

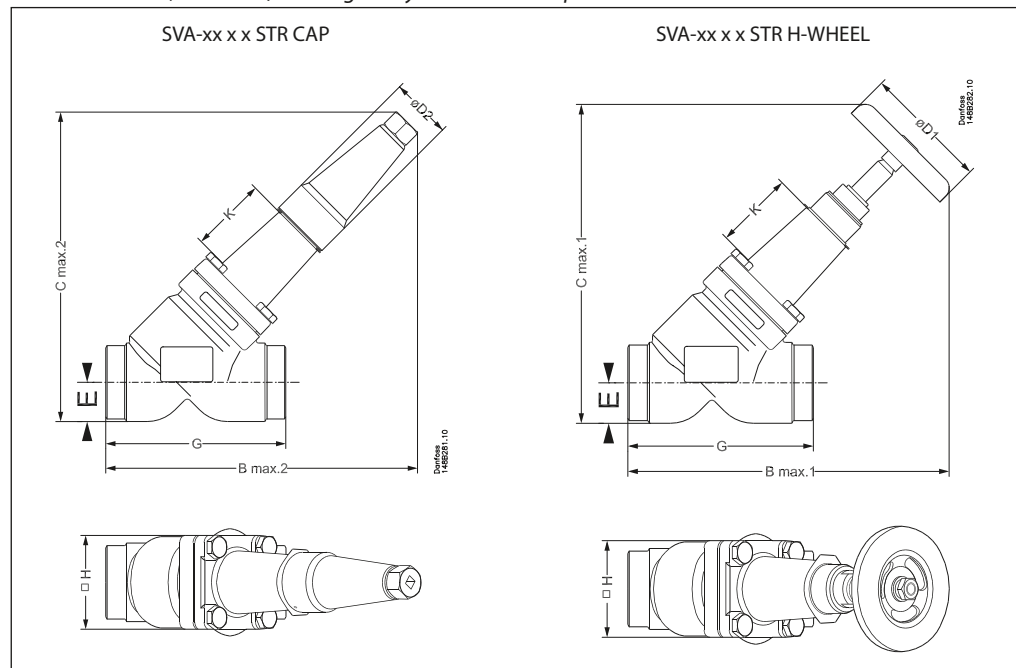
SVA-S SS 50 - 65 (2 - 2 ½ in.) in angleway version with cap / hand wheel



Valve size		K	C <sub>max.1</sub>	C <sub>max.2</sub>	G	ØD <sub>1</sub>	ØD <sub>2</sub>	□H	Weight
<b>SVA-S SS</b>									
SVA-S SS 50	mm	70	284	315	60	100	50	77	3.2 kg
SVA-S SS (2)	in.	2.76	11.18	12.40	2.36	3.94	1.97	3.03	7.1 lb
SVA-S SS 65	mm	70	310	335	70	100	50	90	4.8 kg
SVA-S SS (2 ½)	in.	2.76	12.20	13.19	2.76	3.94	1.97	3.54	10.6 lb

Specified weights are approximate values only.

SVA-S SS 50 - 65 (2 - 2 ½ in.) in straightway version with cap / hand wheel

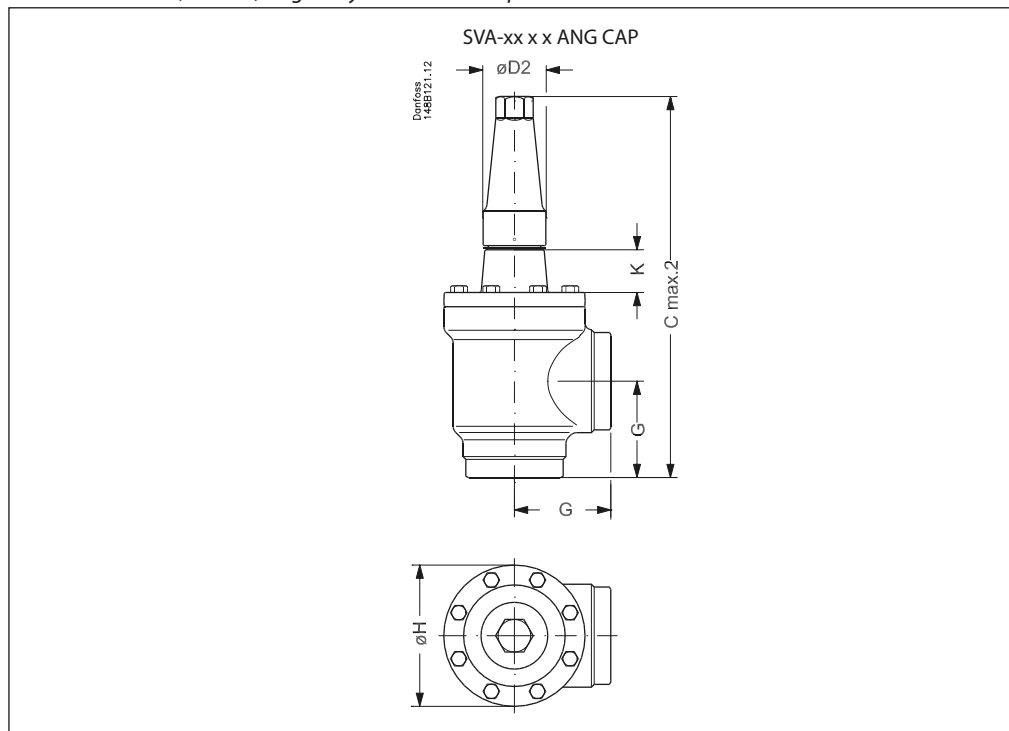


Valve size		K	B <sub>max.1</sub>	B <sub>max.2</sub>	C <sub>max.1</sub>	C <sub>max.2</sub>	E	G	ØD <sub>1</sub>	ØD <sub>2</sub>	□H	Weight
<b>SVA-S SS</b>												
SVA-S SS 50	mm	70	259	259	257	257	32	148	100	50	77	4.2 kg
SVA-S SS (2)	in.	2.76	10.20	10.20	10.12	10.12	1.26	5.83	3.94	1.97	3.03	9.3 lb
SVA-S SS 65	mm	70	284	280	284	280	40	176	100	50	90	6.3 kg
SVA-S SS (2 ½)	in.	2.76	11.18	11.02	11.18	11.02	1.57	6.93	3.94	1.97	3.54	13.9 lb

Specified weights are approximate values only.

Dimensions and weights

SVA-S SS 80 – 125 (3 – 5 in.) angleway version with cap / hand wheel



Valve size		K	C <sub>max.2</sub>	G	ØD <sub>1</sub>	ØD <sub>2</sub>		ØH	Weight
<b>SVA-S SS</b>									
SVA-S SS 80	mm	76	388	90	200	58		129	9.7 kg
SVA-S SS (3)	in.	3.00	15.28	3.54	7.87	2.28		5.08	21.4 lb
SVA-S SS 100	mm	90	437	106	250	58		156	15.3 kg
SVA-S SS (4)	in.	3.54	17.20	4.17	9.84	2.28		6.14	33.7 lb
SVA-S SS 125	mm	90	533	128	315	74		193	28.1 kg
SVA-S SS (5)	in.	3.54	20.98	5.04	12.40	2.91		7.60	61.9 lb

Specified weights are approximate values only.

**Ordering**

Please note that the type codes only serve to identify the valves, some of which may not form part of the standard product range. For further information please contact your local Danfoss Sales Company.

**Type codes**

Valve type	SVA-S/L SS	Shut-off valve	Available connections	
Nominal size in mm			D	A
(valve size measured on the connection diameter)	<b>15</b>	DN 15 (½)	x	x
	<b>20</b>	DN 20 (¾)	x	x
	<b>25</b>	DN 25 (1)	x	x
	<b>32</b>	DN 32 (1 ¼)	x	x
	<b>40</b>	DN 40 (1 ½)	x	x
	<b>50</b>	DN 50 (2)	x	x
	<b>65</b>	DN 65 (2 ½)	x	x
	<b>80</b>	DN 80 (3)	x	x
	<b>100</b>	DN 100 (4)	x	x
	<b>125</b>	DN 125 (5)	x	
Connections	<b>D</b> <b>A</b>	Butt-weld connection: DIN EN 10220 Butt-weld connection: ANSI B 36.19M		
Valve housing	<b>ANG</b> <b>STR</b>	Angle flow Straight flow		
Other equipment	<b>H-WHEEL</b> <b>CAP</b>	Hand wheel Cap		

**Important!**

Where products need to be certified according to specific certification societies or where higher pressures are required, the relevant information should be included at the time of order.

**Ordering SVA-S/L SS**

Example:  
SVA-S SS 20 DIN angleway with hand wheel = **148B5377**

**Important!**

Where products need to be certified according to specific certification societies or where higher pressures are required, the relevant information should be included at the time of order.

**SVA-S SS Angleway**

Size		Type	MWP		Code number
mm	in.		bar	psi	
<b>Butt-weld DIN (EN 10220)</b>					
15	½	SVA-S SS 15 D ANG H-WHEEL	52	754	<b>148B5289</b>
15	½	SVA-S SS 15 D ANG CAP	52	754	<b>148B5290</b>
20	¾	SVA-S SS 20 D ANG H-WHEEL	52	754	<b>148B5377</b>
20	¾	SVA-S SS 20 D ANG CAP	52	754	<b>148B5378</b>
25	1	SVA-S SS 25 D ANG H-WHEEL	52	754	<b>148B5486</b>
25	1	SVA-S SS 25 D ANG CAP	52	754	<b>148B5487</b>
32	1 ¼	SVA-S SS 32 D ANG H-WHEEL	52	754	<b>148B5566</b>
32	1 ¼	SVA-S SS 32 D ANG CAP	52	754	<b>148B5567</b>
40	1 ½	SVA-S SS 40 D ANG H-WHEEL	52	754	<b>148B5646</b>
40	1 ½	SVA-S SS 40 D ANG CAP	52	754	<b>148B5647</b>
50	2	SVA-S SS 50 D ANG H-WHEEL	52	754	<b>148B5753</b>
50	2	SVA-S SS 50 D ANG CAP	52	754	<b>148B5754</b>
65	2 ½	SVA-S SS 65 D ANG H-WHEEL	52	754	<b>148B5847</b>
65	2 ½	SVA-S SS 65 D ANG CAP	52	754	<b>148B5848</b>
80	3	SVA-S SS 80 D ANG CAP	50	725	<b>148B5928</b>
100	4	SVA-S SS 100 D ANG CAP	50	725	<b>148B6032</b>
125	5	SVA-S SS 125 D ANG CAP	50	725	<b>148B6126</b>

Size		Type	MWP		Code number
mm	in.		bar	psi	
<b>Butt-weld ANSI (B 36.19M SCHEDULE 40)</b>					
15	½	SVA-S SS 15 A40 ANG CAP	52	754	<b>148B5396</b>
20	¾	SVA-S SS 20 A40 ANG CAP	52	754	<b>148B5395</b>
25	1	SVA-S SS 25 A40 ANG CAP	52	754	<b>148B6477</b>
32	1 ¼	SVA-S SS 32 A40 ANG CAP	52	754	<b>148B5595</b>
40	1 ½	SVA-S SS 40 A40 ANG CAP	52	754	<b>148B5683</b>

Size		Type	MWP		Code number
mm	in.		bar	psi	
<b>Butt-weld ANSI (B 36.19M SCHEDULE 10)</b>					
50	2	SVA-S SS 50 D/A10 ANG CAP	52	754	<b>148B5754</b>
65	2 ½	SVA-S SS 65 A10 ANG CAP	52	754	<b>148B6448</b>
80	3	SVA-S SS 80 D/A10 ANG CAP	52	754	<b>148B5928</b>
100	4	SVA-S SS 100 A10 ANG CAP	52	754	<b>148B6035</b>

ANG = Angleway  
STR = Straightway  
  
CAP = Cap  
H-WHEEL = Hand wheel

**SVA-S SS Straightway**

Size		Type	MWP		Code number
mm	in.		bar	psi	
<b>Butt-weld DIN (EN 10220)</b>					
15	½	SVA-S SS 15 D STR H-WHEEL	52	754	<b>148B5291</b>
15	½	SVA-S SS 15 D STR CAP	52	754	<b>148B5292</b>
20	¾	SVA-S SS 20 D STR H-WHEEL	52	754	<b>148B5379</b>
20	¾	SVA-S SS 20 D STR CAP	52	754	<b>148B5380</b>
25	1	SVA-S SS 25 D STR H-WHEEL	52	754	<b>148B5488</b>
25	1	SVA-S SS 25 D STR CAP	52	754	<b>148B5489</b>
32	1 ¼	SVA-S SS 32 D STR H-WHEEL	52	754	<b>148B5568</b>
32	1 ¼	SVA-S SS 32 D STR CAP	52	754	<b>148B5569</b>
40	1 ½	SVA-S SS 40 D STR H-WHEEL	52	754	<b>148B5648</b>
40	1 ½	SVA-S SS 40 D STR CAP	52	754	<b>148B5649</b>
50	2	SVA-S SS 50 D STR H-WHEEL	52	754	<b>148B5755</b>
50	2	SVA-S SS 50 D STR CAP	52	754	<b>148B5756</b>
65	2 ½	SVA-S SS 65 D STR H-WHEEL	52	754	<b>148B5849</b>
65	2 ½	SVA-S SS 65 D STR CAP	52	754	<b>148B5850</b>

Size		Type	MWP		Code number
mm	in.		bar	psi	
<b>Butt-weld ANSI (B 36.19M SCHEDULE 40)</b>					
15	½	SVA-S SS 15 A40 STR CAP	52	754	<b>148B5397</b>
20	¾	SVA-S SS 20 A40 STR CAP	52	754	<b>148B5398</b>
25	1	SVA-S SS 25 A40 STR CAP	52	754	<b>148B5399</b>
32	1 ¼	SVA-S SS 32 A40 STR CAP	52	754	<b>148B5596</b>
40	1 ½	SVA-S SS 40 A40 STR CAP	52	754	<b>148B5684</b>

Size		Type	MWP		Code number
mm	in.		bar	psi	
<b>Butt-weld ANSI (B 36.19M SCHEDULE 10)</b>					
50	2	SVA-S SS 50 D/A10 STR CAP	52	754	<b>148B5756</b>
65	2 ½	SVA-S SS 65 A10 STR CAP	52	754	<b>148B6449</b>

**Ordering**
**SVA-L SS Angleway**

Size		Type	MWP		Code number
mm	in.		bar	psi	

**Butt-weld DIN (EN 10220)**

15	½	SVA-L SS 15 D ANG H-WHEEL	52	754	<b>148B6546</b>
15	½	SVA-L SS 15 D ANG CAP	52	754	<b>148B6547</b>
20	¾	SVA-L SS 20 D ANG H-WHEEL	52	754	<b>148B6550</b>
20	¾	SVA-L SS 20 D ANG CAP	52	754	<b>148B6551</b>
25	1	SVA-L SS 25 D ANG H-WHEEL	52	754	<b>148B6554</b>
25	1	SVA-L SS 25 D ANG CAP	52	754	<b>148B6555</b>
32	1 ¼	SVA-L SS 32 D ANG H-WHEEL	52	754	<b>148B6558</b>
32	1 ¼	SVA-L SS 32 D ANG CAP	52	754	<b>148B6559</b>
40	1 ½	SVA-L SS 40 D ANG H-WHEEL	52	754	<b>148B6562</b>
40	1 ½	SVA-L SS 40 D ANG CAP	52	754	<b>148B6563</b>

ANG = Angleway  
STR = Straightway

CAP = Cap  
H-WHEEL = Hand wheel

**SVA-L SS Straightway**

Size		Type	MWP		Code number
mm	in.		bar	psi	

**Butt-weld DIN (EN 10220)**

15	½	SVA-L SS 15 D STR H-WHEEL	52	754	<b>148B6548</b>
15	½	SVA-L SS 15 D STR CAP	52	754	<b>148B6549</b>
20	¾	SVA-L SS 20 D STR H-WHEEL	52	754	<b>148B6552</b>
20	¾	SVA-L SS 20 D STR CAP	52	754	<b>148B6553</b>
25	1	SVA-L SS 25 D STR H-WHEEL	52	754	<b>148B6556</b>
25	1	SVA-L SS 25 D STR CAP	52	754	<b>148B6557</b>
32	1 ¼	SVA-L SS 32 D STR H-WHEEL	52	754	<b>148B6560</b>
32	1 ¼	SVA-L SS 32 D STR CAP	52	754	<b>148B6561</b>
40	1 ½	SVA-L SS 40 D STR H-WHEEL	52	754	<b>148B6564</b>
40	1 ½	SVA-L SS 40 D STR CAP	52	754	<b>148B6565</b>

**Hand-operated regulating valves  
REG-SA SS and REG-SB SS**

In certain specific areas such as outdoor applications and corrosive atmospheres, such as coastal installations, there is a need for high surface protection to prevent failure due to corrosion.

Today's food safety standards often call for daily treatment with detergents to protect against bacteria growth, again producing a need for high surface protection.

REG-SA SS and REG-SB SS are angle-way and straight-way hand-operated regulating valves, which act as normal stop valves in closed position.

The valves are designed to meet the strict quality requirements on refrigerating installations specified by the international classification societies and are carefully designed to present favourable flow conditions and accurate linear characteristics.

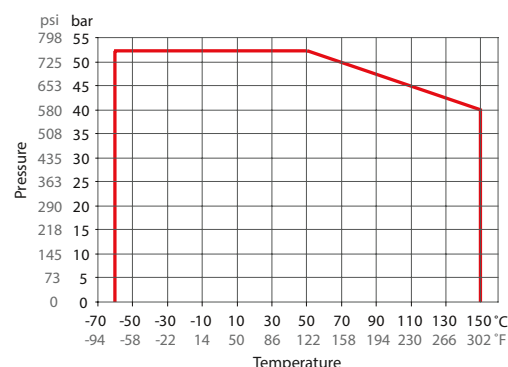
The valves are equipped with vented cap and have internal backseating enabling the spindle seal to be replaced with the valve still under pressure.



**Features  
REG-SA SS and REG-SB SS**

- Applicable to HCFC, HFC, R717 (Ammonia), R744 (CO<sub>2</sub>), Propane, Butane, Iso-Butane and Ethane.
- Designed to give favourable flow conditions.
- Internal backseating enables replacement of the spindle seal whilst the valve is active, i.e. under pressure
- Housing is made of special cold resistant stainless steel approved for low temperature operations.
- Easy to disassemble for inspection and service.
- Butt-weld DIN and ANSI connections.
- Max. operating pressure: 52 bar g / 754 psig
- Temperature range: -60 – 150 °C / -76 – 302 °F.
- Compact and light valves for easy handling and installation.
- Classification: DNV, CRN, BV, EAC etc. To get an updated list of certification on the products please contact your local Danfoss Sales Company.

**Pressure and temperature range**



REG-SA SS/REG-SB SS DN15-DN40

**Technical data**

- **Refrigerants**  
Applicable to HCFC, HFC, R717 (Ammonia), R744 (CO<sub>2</sub>), Propane, Butane, Iso-Butane and Ethane.  
For further information please contact your local Danfoss Sales Company.
- **Temperature range**  
-60 – 150 °C / -76 – 302 °F
- **Max working pressure**  
52 bar g / 754 psi g
- **Flow coefficients**  
Flow coefficients for fully opened valves from  $k_v = 0.15$  to  $80 \text{ m}^3/\text{h}$  ( $C_v = 0.17$  to  $92.5 \text{ USgal}/\text{min}$ ).

**Design**
**Housing**

Made of stainless steel approved for low temperature operations.

**Connections**

Available with the following connections:

- Butt-weld DIN (EN 10220)  
DN 15 - 40 (½ – 1 ½ in.)
- Butt-weld ANSI (B 36.19M)  
DN 15 - 40 (½ – 1 ½ in.)

**The cone**

The valves are available in two different versions – REG-SA SS with an A cone and REG-SB SS with a B cone. The A cone is designed for expansion lines, while the B cone is designed for regulating purposes e.g. liquid lines.

The valve cone is designed to ensure perfect regulation and provide an extensive regulating area. Irrespective of the refrigerant used, it is easy to obtain the correct capacity. A cone seal ring provides perfect sealing at a minimum closing momentum.

The valve cone can be turned on the spindle, thus there will be no friction between the cone and the seat when the valve is opened and closed.

**Spindle**

Made of polished stainless steel, ideal for O-ring sealing. Furthermore, parts of the spindle are heat treated to obtain anti-abrasive/adhesive properties.

**Packing gland - REG-SA SS and REG-SB SS**

The stainless steel packing gland comprises a spring loaded seal packing gland which

ensures a perfect tightness in the range: -60 – 150 °C / -76 – 302 °F.

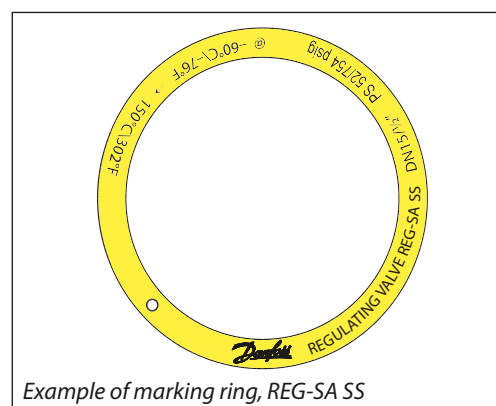
The packing glands are equipped with a scraper ring to prevent penetration of dirt and ice into the packing gland.

**Installation**

Install the valve with the spindle up or in horizontal position. The flow must be directed towards the cone.

The valve is designed to withstand high internal pressure. However, the piping system in general should be designed to avoid liquid traps and reduce the risk of hydraulic pressure caused by thermal expansion.

For further information refer to product instruction for REG-SA SS and REG-SB SS.



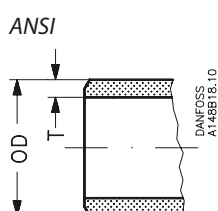
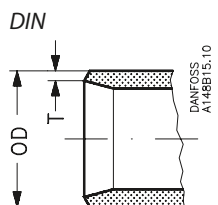
Example of marking ring, REG-SA SS

**Pressure Equipment Directive (PED)**

REG-SA/SB SS valves are approved according to the European standard specified in the Pressure Equipment Directive and are CE marked.



REG-SA SS and REG-SB SS valves		
Nominal bore	DN = < 25 mm (1 in.)	DN32-40 mm (1 ¼ – 1 ½ in.)
Classified for	Fluid group I	
Category	Article 3, paragraph 3	II

**Connections**


Size	OD	T
Butt-weld DIN (EN 10220)		
15	mm	21.3
½	in.	0.839
20	mm	26.9
¾	in.	1.059
25	mm	33.7
1	in.	1.327
32	mm	42.4
1 ¼	in.	1.669
40	mm	48.3
1 ½	in.	1.902

Size	OD	T
Butt-weld ANSI B 36.19M, SCHEDULE 40		
15	mm	21.3
½	in.	0.839
20	mm	26.9
¾	in.	1.06
25	mm	33.7
1	in.	1.33
32	mm	42.4
1 ¼	in.	1.67
40	mm	48.3
1 ½	in.	1.9

**Computation and selection**

*Introduction*

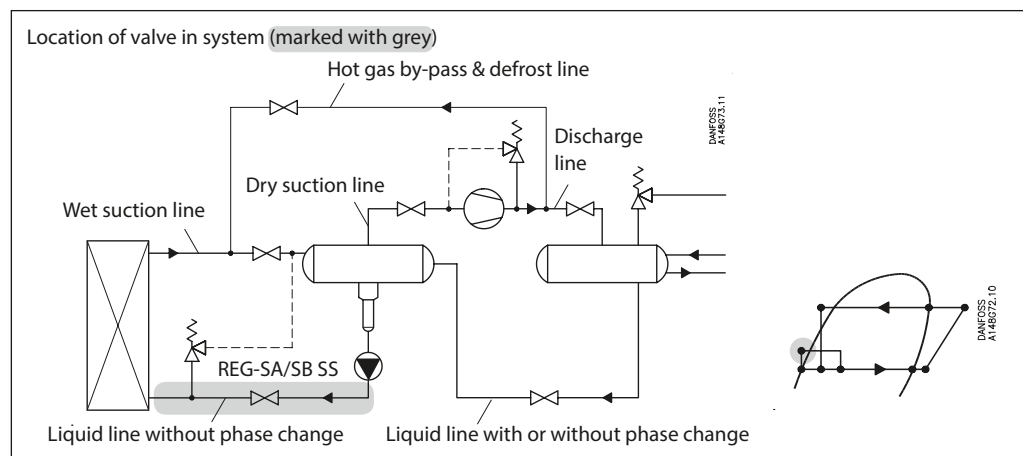
In refrigeration plants, regulating valves are primarily used in liquid lines in order to regulate the flow of refrigerant. The valves can, however, also be used as expansion valves. From a calculation point of view the two fields of application are very different.

Normal flow is the term used to describe the general case where the flow through the valve is proportional to the square root of the pressure drop across it and inversely proportional to the density of the refrigerant (Bernoullis equation).

This relationship between mass flow, pressure drop and density satisfies the majority of all valve applications with refrigerants and brines.

Normal flow is characterised by turbulent flow through the valve without any phase change. The following capacity curves are based on the above mentioned assumption.

Application of the regulating valves outside the normal flow area will reduce the capacity of the valve considerably. In such cases it is recommended to use "DIRcalc™" (Danfoss Industrial Refrigeration calculation programme).



*Sizing regulating valve for liquid flow*  
Liquid refrigerants: Use the liquid tables, fig. 6 - 10. For other refrigerants and brines, "Normal flow" (Turbulent flow); see below and use the flow coefficient tables (fig. 1 - 2).

**SI-units**

Mass flow:

$$k_v = \frac{G}{\sqrt{\rho \times 1000 \times \Delta p}} = G \times C_A \text{ [m}^3/\text{h]}$$

Volume flow:

$$k_v = \frac{\dot{V}}{\sqrt{\frac{1000 \times \Delta p}{\rho}}} \text{ [m}^3/\text{h]}$$

**Imperial units**

Mass flow:

$$C_v = \frac{0.95 \times G}{\sqrt{\rho \times \Delta p}} = 31.6 \times G \times C_A \text{ [USgal/min.]}$$

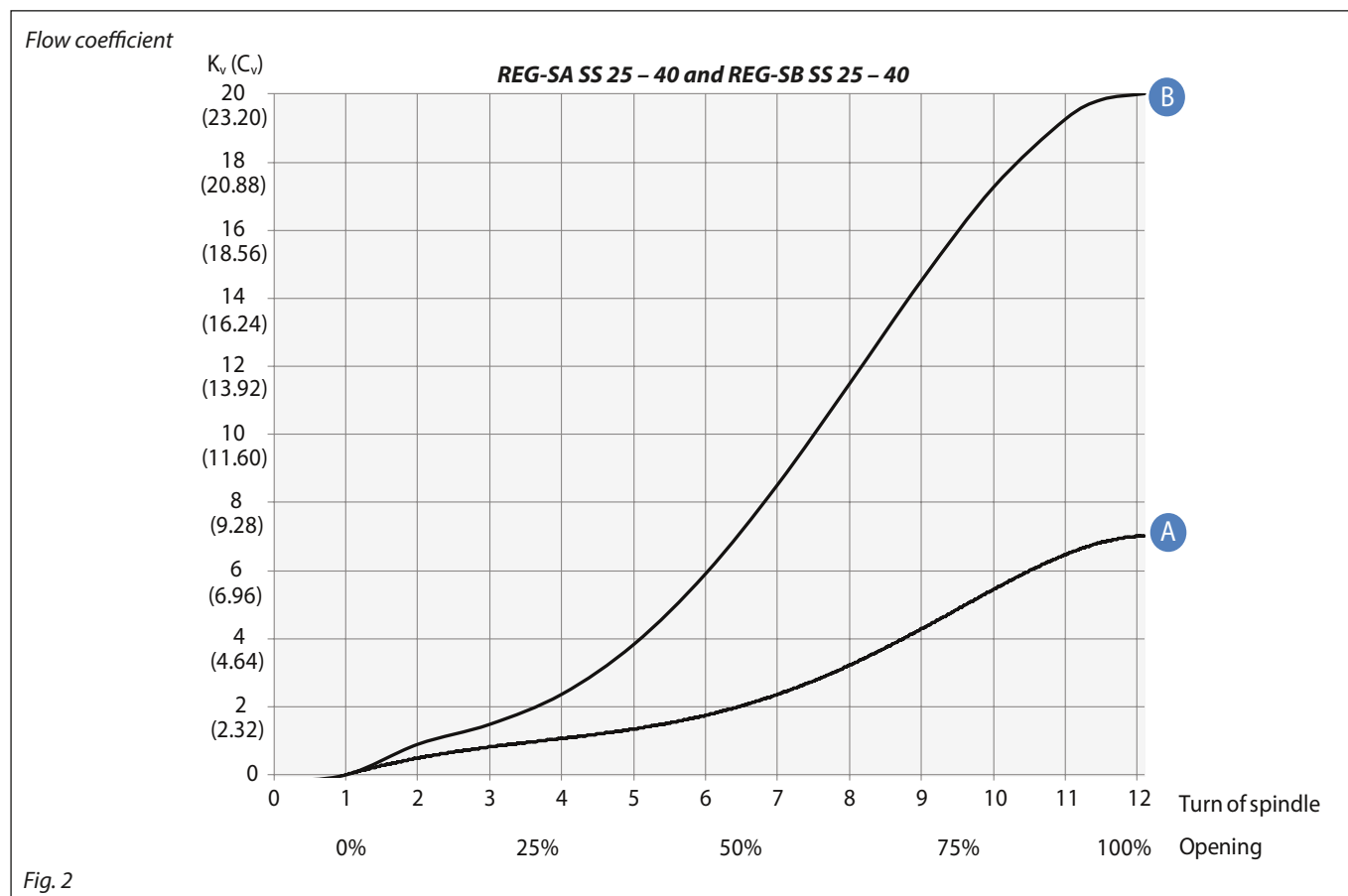
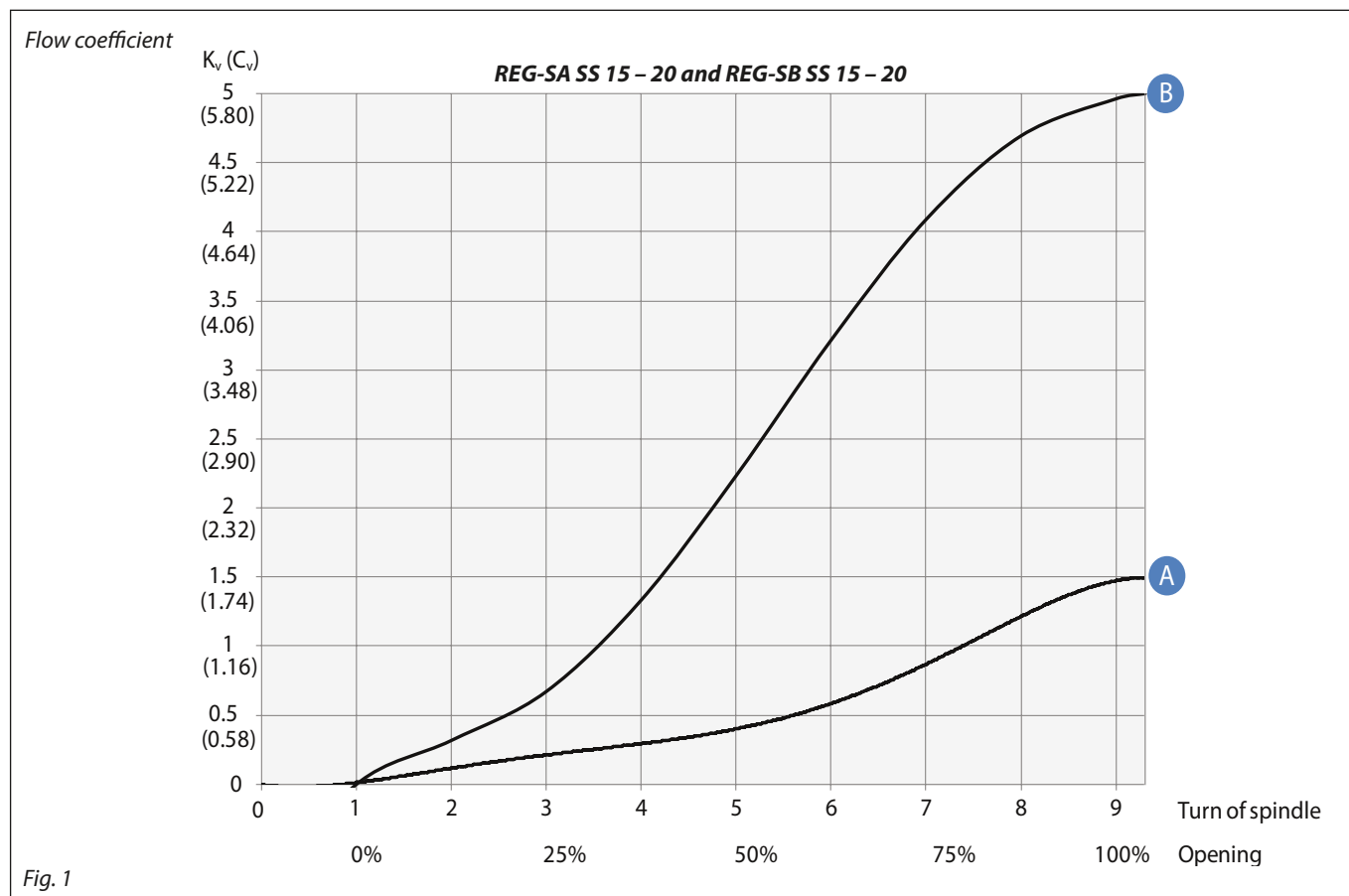
Volume flow:

$$C_v = \frac{0.127 \times \dot{V}}{\sqrt{\frac{\Delta p}{\rho}}} \text{ [USgal/min.]}$$

$k_v$	[m <sup>3</sup> /h]	Quantity [m <sup>3</sup> /h] of water flowing through a valve at a pressure loss of 1 bar (according to VDE/VDI Norm 2173).	$C_v$	[US gal/min]	Quantity [US gal/min] of water flowing through a valve at a pressure loss of 1 psi.
$P_1$	[bar]	Pressure before the valve (upstream).	$P_1$	[psi]	Pressure before the valve (upstream).
$P_2$	[bar]	Pressure after the valve (downstream).	$P_2$	[psi]	Pressure after the valve (downstream).
$\Delta p$	[bar]	Actual pressure loss across the valve ( $P_1 - P_2$ ).	$\Delta p$	[psi]	Actual pressure loss across the valve ( $P_1 - P_2$ ).
$G$	[kg/h]	Mass flow through the valve.	$G$	[lb/min]	Mass flow through the valve.
$\dot{V}$	[m <sup>3</sup> /h]	Volume flow through the valve.	$\dot{V}$	[US gal/min]	Volume flow through the valve.
$\rho$	[kg/m <sup>3</sup> ]	Density of the refrigerant before the valve.	$\rho$	[lb/ft <sup>3</sup> ]	Density of the refrigerant before the valve.
$C_A$		Calculation factor (fig. 5).	$C_A$		Calculation factor (fig. 5).

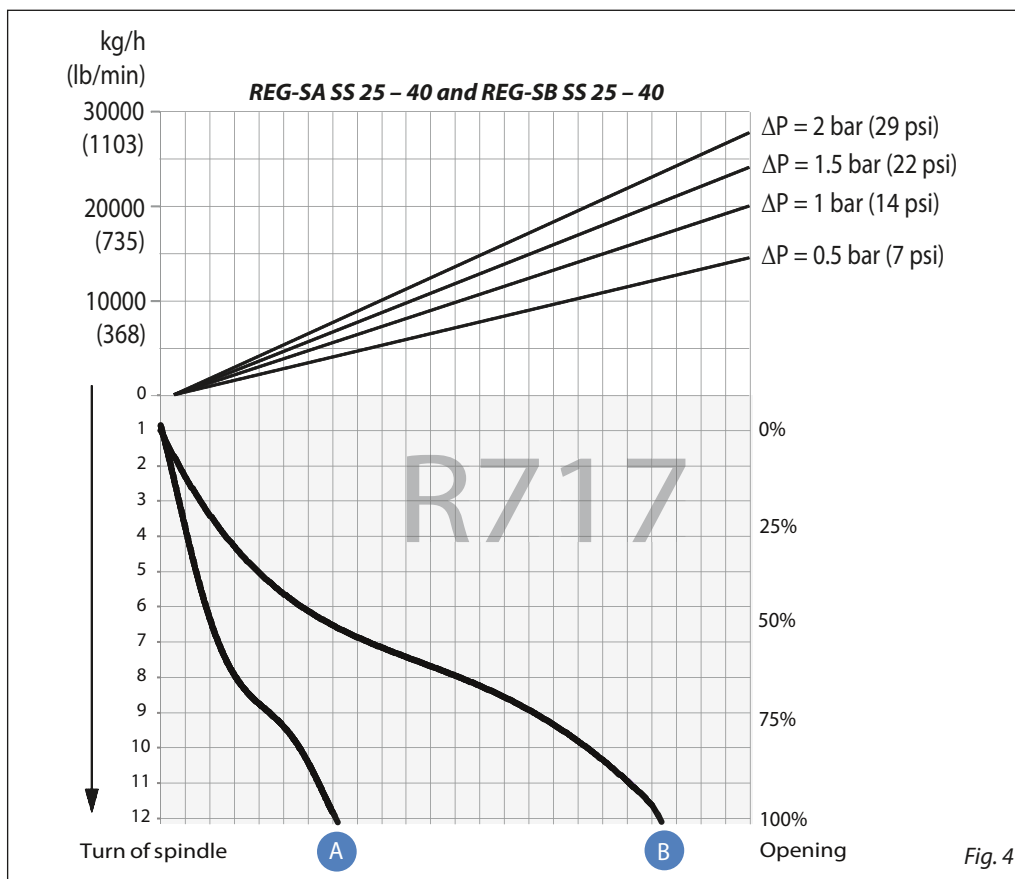
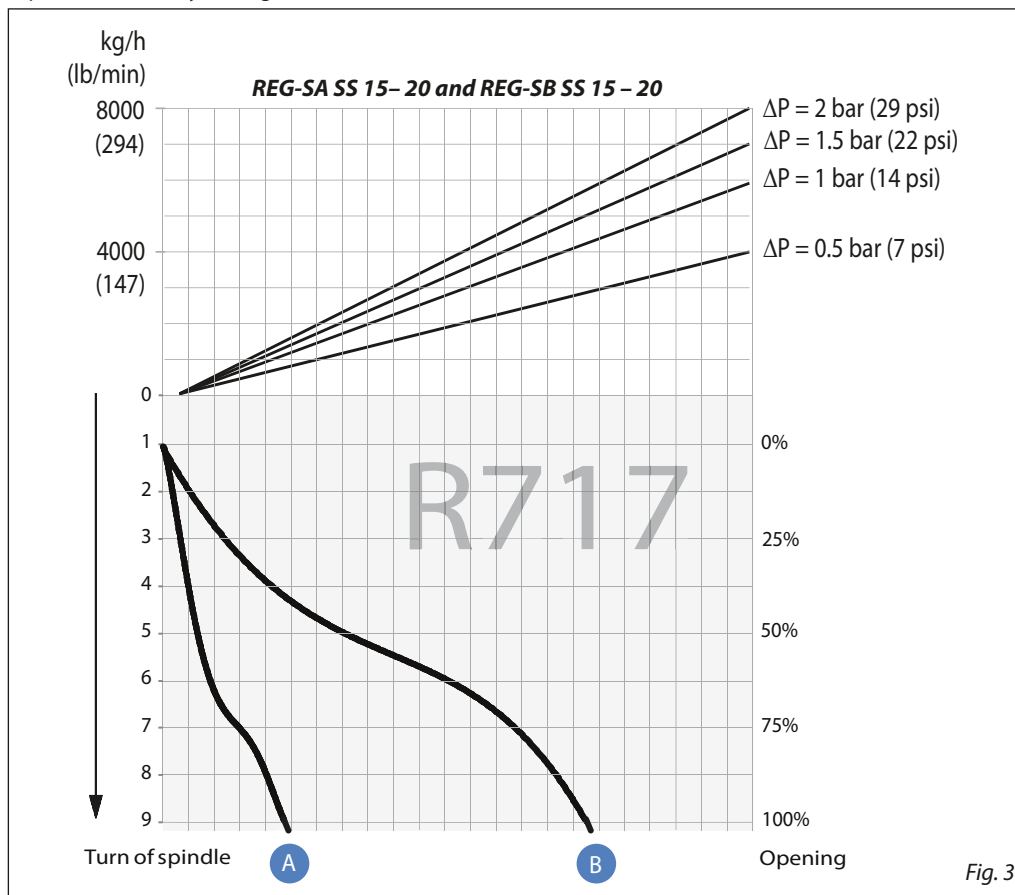


Computation and selection



**Computation and selection**  
(Continued)

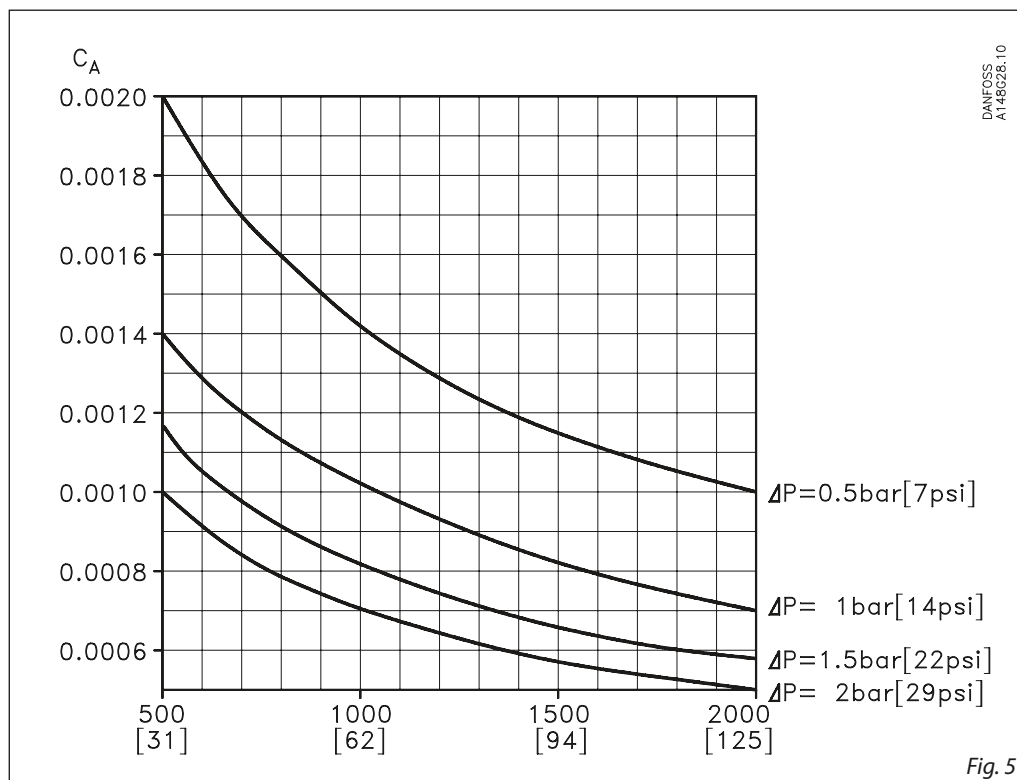
Liquid R 717, density: 670 kg/m<sup>3</sup> [42 lb/ft<sup>3</sup>]



For choice of valve size and connection see "Connections".

**Computation and selection**  
(Continued)

Calculation factor  $C_A$



**Computation and selection**

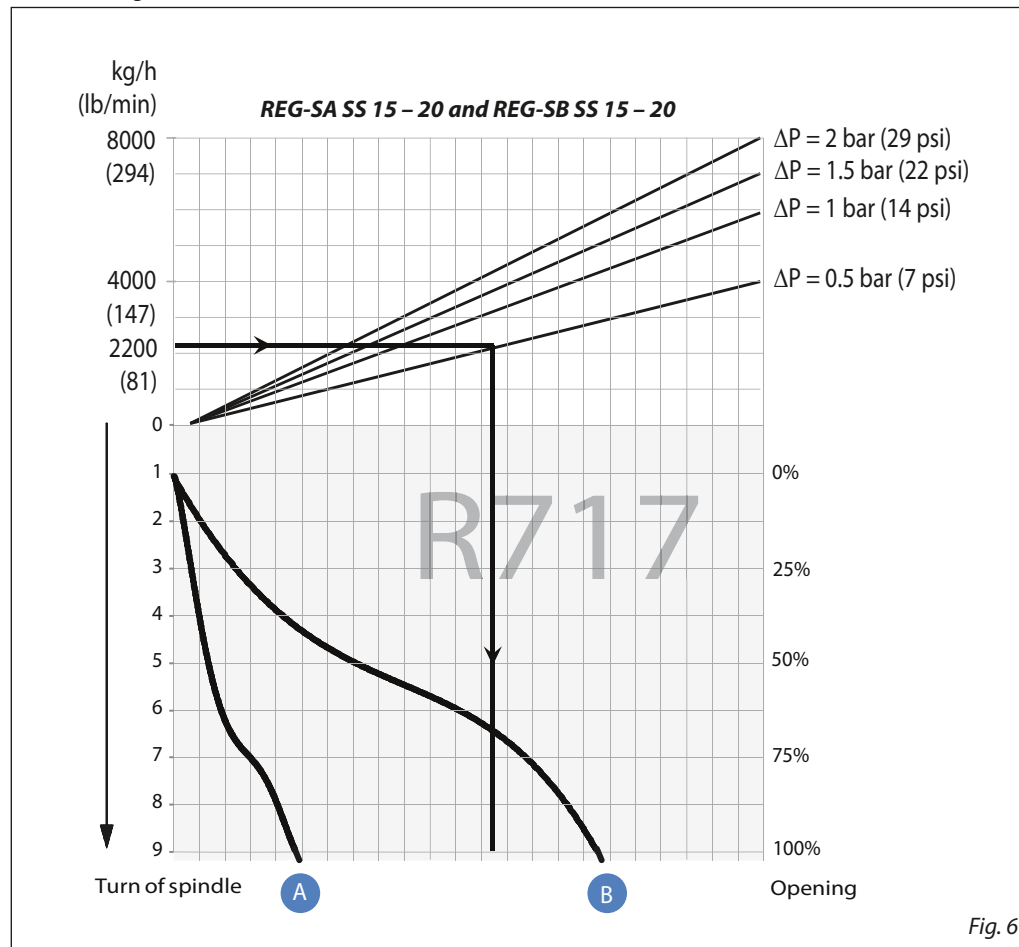
Example 1.

Refrigerant: R 717  
 Refrigerant flow: 2200 kg/h  
 Pressure drop:  $\Delta p = 0.5$  bar

The above mentioned example is illustrated on the following flow rate diagram and shows that REG-SB SS 15 and 20 with cone B can be used. The main rule is that nominal regulation range should be below 85% opening degree. If the arrowline is crossing 2 cone curves, the smaller cone should be selected if opening degree < 85%.

The example is only correct if the density of the refrigerant is approx. 670 (kg/m<sup>3</sup>), and there must be no build-up of flash gas in the valve.

Flow rate diagram



**Computation and selection**  
Example 2.

Brine, density  $\rho$ : 1150 [kg/m<sup>3</sup>]  
 Brine flow  $G$ : 2,700 [kg/h]  
 Pressure drop  $\Delta p$ : 0.5 [bar]

In this example it is not possible to use the selection diagrams (fig. 3 and 4) as the refrigerant in question is not included.

Use the curves of the  $k_v$ -values instead (fig. 1 - 2) and calculate the required  $k_v$  by means of the formulas in the "Introduction" passage at the beginning of this chapter. Alternatively calculate the  $k_v$ -values by means of the calculation factor  $C_A$  (fig. 7) and the flow rate diagram (in this example: fig. 8) as per the following calculation example.

*Calculation example:*

Required  $k_v$ -value  
 $C_A = 0.00132$  (from fig. 18)  
 $k_v = C_A \times G$   
 $k_v = 0.00132 \times 2,700$  [kg/h]  
 $= 3.56$  [m<sup>3</sup>/h]

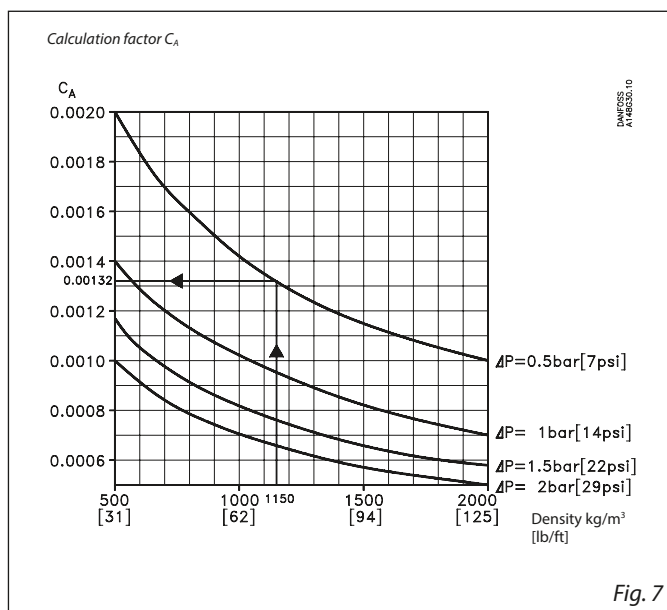


Fig. 7

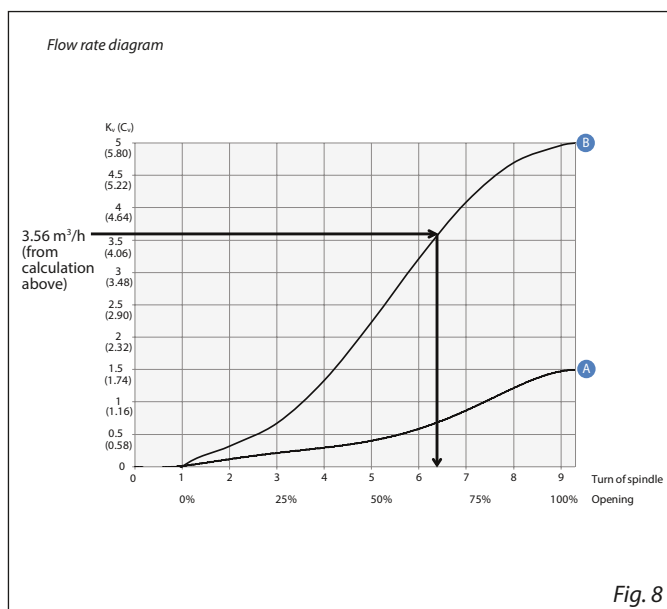
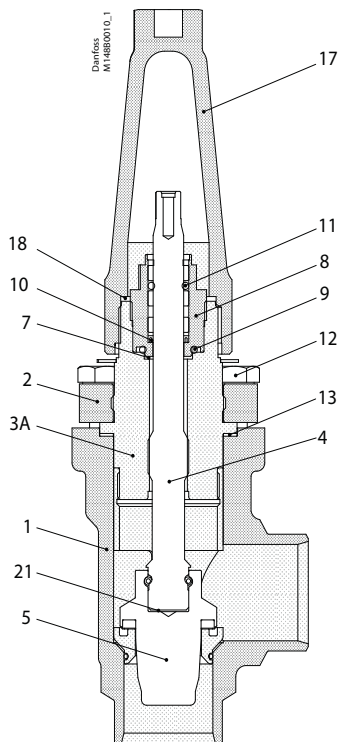


Fig. 8

REG-SB SS 15 and REG-SB SS 20 with cone B can be used.

**Material specification**

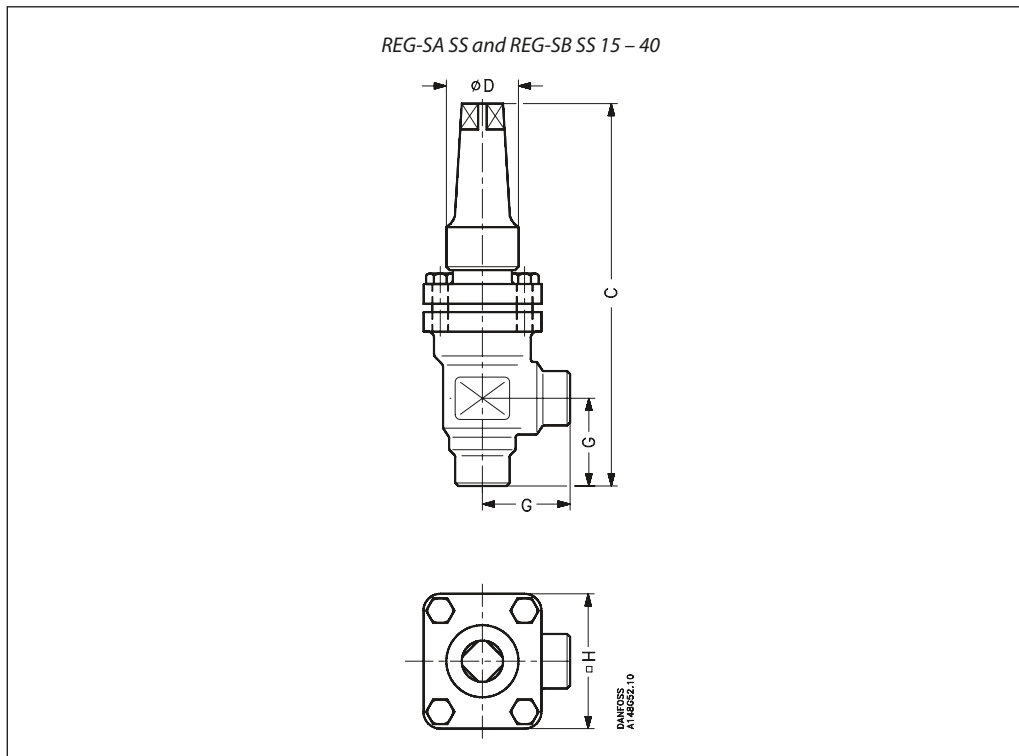
REG-SA SS and REG-SB SS 15 – 40



No.	Part	Material	EN	ISO	ASTM
1	Housing	Stainless steel	GX5CrNi19-10 EN10213-4		AISI 304
2	Bonnet, Flange	Stainless steel	X5CrNi18-10 EN10088		AISI 304
3A	Bonnet, Insert	Stainless steel	X8CrNiS18-9 DIN 17440		AISI 303
4	Spindle	Stainless steel	X8CrNiS 18-9, DIN 17440	Type 17, 683/13	AISI 303
5	Cone	Steel			
7	Packing washer	Aluminium			
8	Packing gland	Stainless Steel	X8CrNiS 18-9, 10088	Type 17, 683/13	AISI 303
9	O-ring	Cloroprene (Neoprene)			
10	Spring loaded Teflon ring	PTFE			
11	O-ring	Cloroprene (Neoprene)			
12	Bolts	Stainless steel	A2-70	A2-70	Type 308
13	Gasket	Fiber, non asbestos			
14	Bottom insert	Steel			
17	Seal cap	Aluminium			
18	Gasket f. seal cap	Nylon			
19	Locking nut	Steel			
20	Screw	Steel			
21	Disk spring	Steel			

Dimensions and weights

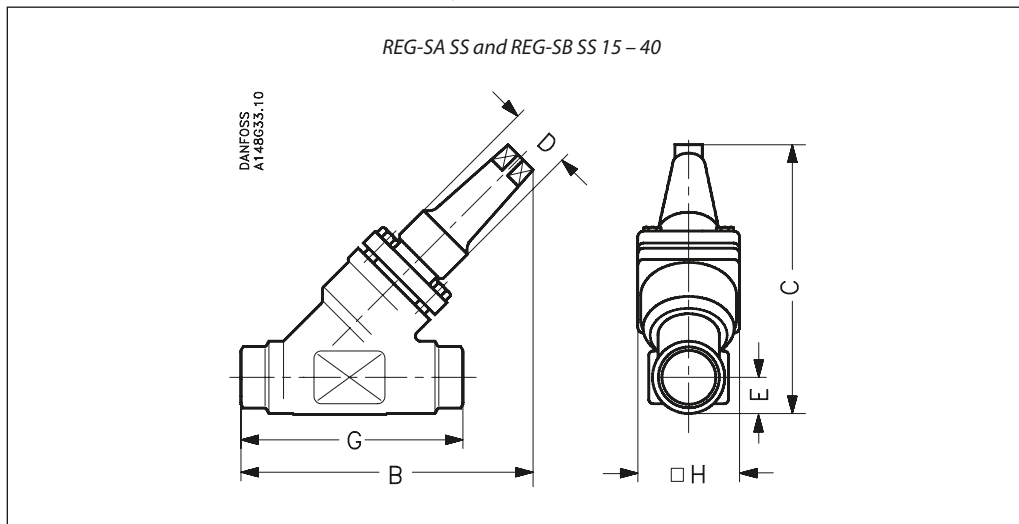
REG-SA SS and REG-SB SS 15 – 40 in angleway version



Valve size		C	G	$\varnothing D$	$\square H$	Weight
REG-SA SS/SB SS 15 – 20	mm	182	45	38	60	1.4 kg
REG-SA SS/SB SS (½ – ¾)	in.	7.17	1.77	1.50	2.36	3.1 lb
REG-SA SS/SB SS 25 – 40	mm	237	55	50	70	2.4 kg
REG-SA SS/SB SS (1 – 1½)	in.	9.33	2.17	1.97	2.76	5.3 lb

Specified weights are approximate values only.

REG-SA SS and REG-SB SS 10 – 65 in straightway version



Valve size		C	B	E	G	$\varnothing D$	$\square H$	Weight
REG-SA SS/SB SS 15 – 20	mm	145	155	20	120	38	60	2.0 kg
REG-SA SS/SB SS (½ – ¾)	in.	5.71	6.10	0.79	4.72	1.50	2.36	4.4 lb
REG-SA SS/SB SS 25 – 40	mm	200	215	26	155	50	70	3.0 kg
REG-SA SS/SB SS (1 – 1½)	in.	7.87	8.46	1.02	6.10	1.97	2.76	6.6 lb

Specified weights are approximate values only.

**Ordering**
*How to order*

The table below is used to identify the valve required.

Please note that the type codes only serve to identify the valves, some of which may not form part of the standard product range. For further information please contact your local Danfoss Sales Company.

*Type codes*

Valve type	REG SA SS REG-SB SS	Regulating Valves	
Nominal size in mm (Valve size measured on the connection diameter)	<b>15</b> <b>20</b> <b>25</b> <b>32</b> <b>40</b>	DN 15 DN 20 DN 25 DN 32 DN 40	Available connection types D      A x      x x      x x      x x      x x      x
Connections	<b>D</b> <b>A</b>	Butt-weld connection: DIN EN 10220 Butt-weld connection: ANSI B 36.19M	
Valve housing	<b>ANG</b> <b>STR</b>	Angle flow Straight flow	
Cone A	Size: DN 15 DN 20 DN 25 DN 32 DN 40	Flow area [mm <sup>2</sup> ] 36.5 36.5 178 178 178	
Cone B	Size: DN 15 DN 20 DN 25 DN 32 DN 40	Flow area [mm <sup>2</sup> ] 115 115 531 531 531	

**Complete REG-SA SS (Cone type A)**
*Example:*

REG-SA SS (Cone B) 15 DIN angleway = **148B5387**

**Important!**

Where products need to be certified according to specific certification societies or where higher pressures are required, the relevant information should be included at the time of order.

**Butt-weld DIN (EN 10220)**

Size		Type	Code no.
mm	in.		
15	½	REG-SA SS 15 D ANG	<b>148B5297</b>
20	¾	REG-SA SS 20 D ANG	<b>148B5385</b>
25	1	REG-SA SS 25 D ANG	<b>148B5494</b>
32	1 ¼	REG-SA SS 32 D ANG	<b>148B5589</b>
40	1 ½	REG-SA SS 40 D ANG	<b>148B5674</b>

**Angleway - REG-SA SS with cone type A**

15	½	REG-SA SS 15 D ANG	<b>148B5297</b>
20	¾	REG-SA SS 20 D ANG	<b>148B5385</b>
25	1	REG-SA SS 25 D ANG	<b>148B5494</b>
32	1 ¼	REG-SA SS 32 D ANG	<b>148B5589</b>
40	1 ½	REG-SA SS 40 D ANG	<b>148B5674</b>

**Butt-weld DIN (EN 10220)**

Size		Type	Code no.
mm	in.		
15	½	REG-SA SS 15 D STR	<b>148B5298</b>
20	¾	REG-SA SS 20 D STR	<b>148B5386</b>
25	1	REG-SA SS 25 D STR	<b>148B5495</b>
32	1 ¼	REG-SA SS 32 D STR	<b>148B5590</b>
40	1 ½	REG-SA SS 40 D STR	<b>148B5675</b>

**Straightway - REG-SA SS with cone type A**

15	½	REG-SA SS 15 D STR	<b>148B5298</b>
20	¾	REG-SA SS 20 D STR	<b>148B5386</b>
25	1	REG-SA SS 25 D STR	<b>148B5495</b>
32	1 ¼	REG-SA SS 32 D STR	<b>148B5590</b>
40	1 ½	REG-SA SS 40 D STR	<b>148B5675</b>

**Butt-weld ANSI (B 36.19M SCHEDULE 40)**

Size		Type	Code no.
mm	in.		
15	½	REG-SA SS 15 A40 ANG	<b>148B6482</b>
25	1	REG-SA SS 25 A40 ANG	<b>148B6483</b>
32	1 ¼	REG-SA SS 32 A40 ANG	<b>148B6484</b>

**Angleway - REG-SA SS with cone type A**

15	½	REG-SA SS 15 A40 ANG	<b>148B6482</b>
25	1	REG-SA SS 25 A40 ANG	<b>148B6483</b>
32	1 ¼	REG-SA SS 32 A40 ANG	<b>148B6484</b>

**Butt-weld ANSI (B 36.19M SCHEDULE 40)**

Size		Type	Code no.
mm	in.		
15	½	REG-SA SS 15 A40 STR	<b>148B5299</b>
25	1	REG-SA SS 25 A40 STR	<b>148B6485</b>
32	1 ¼	REG-SA SS 32 A40 STR	<b>148B6486</b>

**Straightway - REG-SA SS with cone type A**

15	½	REG-SA SS 15 A40 STR	<b>148B5299</b>
25	1	REG-SA SS 25 A40 STR	<b>148B6485</b>
32	1 ¼	REG-SA SS 32 A40 STR	<b>148B6486</b>

D = Butt-weld DIN  
A = Butt-weld ANSI  
ANG = Angleway  
STR = Straightway



Ordering

**Complete REG-SB SS (Cone type B)**

**Butt-weld DIN (EN 10220)**

Size		Type	Code no.
mm	in.		

**Angleway - REG-SB SS with cone type B**

15	½	REG-SB SS 15 D ANG	<b>148B5387</b>
20	¾	REG-SB SS 20 D ANG	<b>148B5389</b>
25	1	REG-SB SS 25 D ANG	<b>148B5496</b>
32	1 ¼	REG-SB SS 32 D ANG	<b>148B5591</b>
40	1 ½	REG-SB SS 40 D ANG	<b>148B5676</b>

**Butt-weld DIN (EN 10220)**

Size		Type	Code no.
mm	in.		

**Straightway - REG-SB SS with cone type B**

15	½	REG-SB SS 15 D STR	<b>148B5388</b>
20	¾	REG-SB SS 20 D STR	<b>148B5390</b>
25	1	REG-SB SS 25 D STR	<b>148B5497</b>
32	1 ¼	REG-SB SS 32 D STR	<b>148B5592</b>
40	1 ½	REG-SB SS 40 D STR	<b>148B5677</b>

**Butt-weld ANSI (B 36.19M SCHEDULE 40)**

Size		Type	Code no.
mm	in.		

**Angleway - REG-SB SS with cone type B**

20	¾	REG-SB SS 20 A40 ANG	<b>148B6487</b>
40	1 ½	REG-SB SS 40 A40 ANG	<b>148B5686</b>

**Butt-weld ANSI (B 36.19M SCHEDULE 40)**

Size		Type	Code no.
mm	in.		

**Straightway - REG-SB SS with cone type B**

20	¾	REG-SB SS 20 A40 STR	<b>148B6488</b>
25	1	REG-SB SS 25 A40 STR	<b>148B6479</b>
40	1 ½	REG-SB SS 40 A40 STR	<b>148B5685</b>

- D = Butt-weld DIN
- A = Butt-weld ANSI
- ANG = Angleway
- STR = Straightway

**Check & stop valves and check valves  
SCA-X SS and CHV-X SS**

In certain specific areas such as outdoor applications and corrosive atmospheres, such as coastal installations, there is a need for high surface protection to prevent failure due to corrosion.

Today's food safety standards often call for daily treatment with detergents to protect against bacteria growth, again producing a need for high surface protection.

SCA-X SS are check valves with a built-in stop valve function. CHV-X SS are check valves only.

The valves are designed to open at very low differential pressures, allow favourable flow conditions and are easy to disassemble for inspection and service.

The valve cone has a built-in flexibility to ensure a precise and tight closing towards the valve seat.

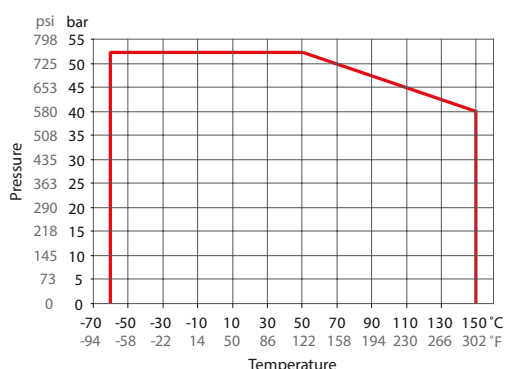
A well balanced dampening effect between the piston and the cylinder gives an optimal protection during low loads and against pulsations.



**Features  
SCA-X SS and CHV-X SS**

- Applicable to HCFC, HFC, R717 (Ammonia), R744 (CO<sub>2</sub>), Propane, Butane, Iso-Butane and Ethane.
- Designed to give favourable flow conditions.
- Internal backseating enables replacement of the spindle seal whilst the valve is active, i.e. under pressure (SCA-SS)
- Housing is made of special cold resistant stainless steel approved for low temperature operations.
- Easy to disassemble for inspection and service.
- Butt-weld DIN and ANSI connections.
- Max. operating pressure: 52 bar g / 754 psig
- Temperature range: -60 – 150 °C / -76 – 302 °F.
- Compact and light valves for easy handling and installation.
- Classification: DNV, CRN, BV, EAC etc. To get an updated list of certification on the products please contact your local Danfoss Sales Company.

**Pressure and temperature range**



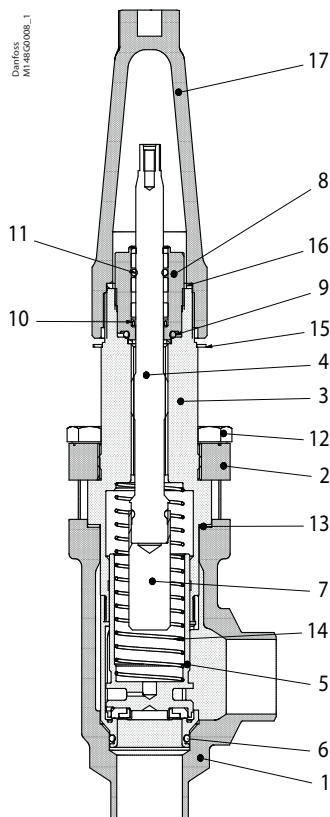
— SCA-X SS/CHV-X SS DN15-DN40

**Technical data**

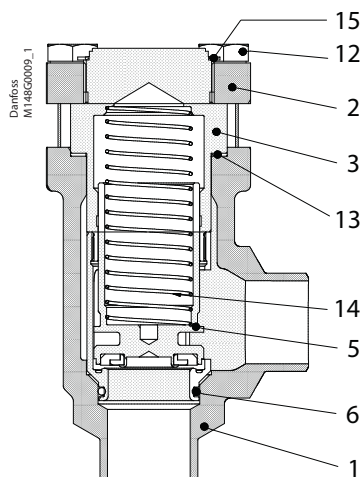
- *Refrigerants*  
Applicable to HCFC, HFC, R717 (Ammonia), R744 (CO<sub>2</sub>), Propane, Butane, Iso-Butane and Ethane.  
For further information refer to the product instruction for SCA-X SS/CHV-X SS.
- *Temperature range*  
-60 – 150 °C / -76 – 302 °F.
- *Max. working pressure*  
52 bar g / 754 psig.



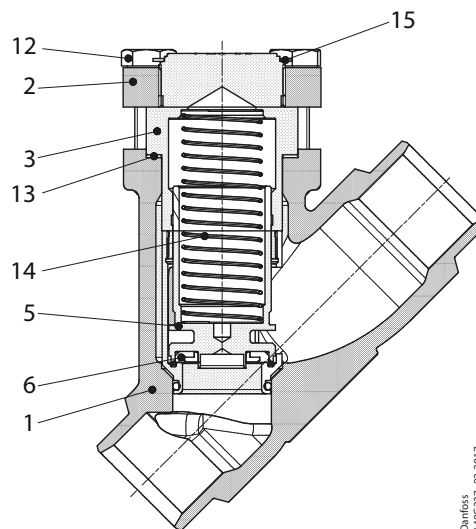
Material specification



SCA-X SS 15 - 40



CHV-X SS 15 - 40

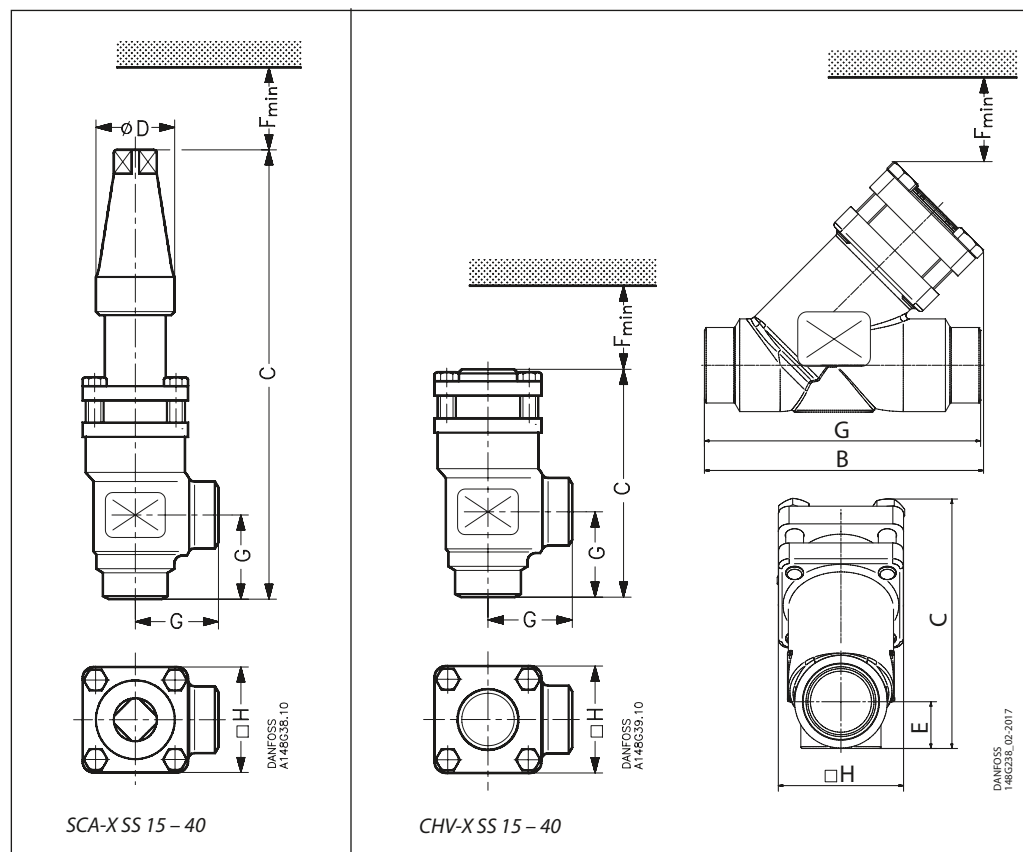


CHV-X SS 15 - 40

No.	Part	Material	DIN/EN	ISO	ASTM
1	Housing	Stainless steel	GX5CrNi19-10 EN10213-4		AISI 304
2	Bonnet, Flange	Stainless steel	X5CrNi18-10 EN10088		AISI 304
3	Bonnet, Insert	Stainless steel	X8CrNiS18-9 DIN 17440		
4	Spindle	Stainless steel	X8CrNiS18-9 DIN 17440	Type 17, 17440	AISI 303
5	Cone	Steel Teflon (PTFE)			
6	O-ring	Cloroprene (Neoprene)			
7	Spindle extension	Steel			
8	Packing gland O-rings	Stainless steel Cloroprene (Neoprene)			
9	Packing washer	Aluminium			
10	Spring loaded seal	Teflon (PTFE)			
11	O-ring	Cloroprene (Neoprene)			
12	Bolts	Stainless steel	A2-70	A2-70	Type 308
13	Gasket	Fiber, non-asbestos			
14	Spring	Steel			
15	Identification ring	Stainless steel			
16	Seal cap gasket	Nylon			
17	Spindle seal cap	Aluminium			

Dimensions and weights

SCA-X SS/CHV-X SS 15 – 40 (½ – 1 ½ in.)



Valve size	C	G	ØD	F <sub>min</sub>	□H	Weight
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SCA-X SS 15 – 40

SCA-X SS 15 (½ in.)	mm in.	212 8.35	45 1.77	38 1.50	60 2.36	60 2.36	1.6 kg 3.53 lb
SCA-X SS 20 (¾ in.)	mm in.	212 8.35	45 1.77	38 1.50	60 2.36	60 2.36	1.6 kg 3.53 lb
SCA-X SS 25 (1 in.)	mm in.	295 11.61	55 2.17	50 1.97	85 3.35	70 2.76	3.2 kg 7.05 lb
SCA-X SS 32 (1 ¼ in.)	mm in.	295 11.61	55 2.17	50 1.97	85 3.35	70 2.76	3.2 kg 7.05 lb
SCA-X SS 40 (1 ½ in.)	mm in.	295 11.61	55 2.17	50 1.97	85 3.35	70 2.76	3.2 kg 7.05 lb

CHV-X SS 15 – 40 Angleway

CHV-X SS 15 (½ in.)	mm in.	103 4.06	45 1.77		60 2.36	60 2.36	1.2 kg 2.65 lb
CHV-X SS 20 (¾ in.)	mm in.	103 4.06	45 1.77		60 2.36	60 2.36	1.2 kg 2.65 lb
CHV-X SS 25 (1 in.)	mm in.	143 5.63	55 2.17		85 3.35	70 2.76	2.3 kg 5.07 lb
CHV-X SS 32 (1 ¼ in.)	mm in.	143 5.63	55 2.17		85 3.35	70 2.76	2.3 kg 5.07 lb
CHV-X SS 40 (1 ½ in.)	mm in.	143 5.63	55 2.17		85 3.35	70 2.76	2.3 kg 5.07 lb

Valve size	C	B	E	G	F <sub>min</sub>	□H	Weight
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CHV-X SS 15 – 40 Straightway

CHV-X SS 15 (½ in.)	mm in.	99 3.90	114 4.49	19 0.75	120 4.72	60 2.36	60 2.36	1.3kg 2.87lb
CHV-X SS 20 (¾ in.)	mm in.	99 3.90	114 4.49	19 0.75	120 4.72	60 2.36	60 2.36	1.3kg 2.87lb
CHV-X SS 25 (1 in.)	mm in.	141 5.55	157 6.18	26 1.02	155 6.10	85 3.35	70 2.76	2.6kg 5.73lb
CHV-X SS 32 (1 ¼ in.)	mm in.	141 5.55	157 6.18	26 1.02	155 6.10	85 3.35	70 2.76	2.6kg 5.73lb
CHV-X SS 40 (1 ½ in.)	mm in.	141 5.55	157 6.18	26 1.02	155 6.10	85 3.35	70 2.76	2.6kg 5.73lb

Specified weights are approximate values only.

**Ordering complete valves**
*How to order*

The table below is used to identify the valve required.

For further information please contact your local Danfoss Sales Company.

Please note that the type codes only serve to identify the valves, some of which may not form part of the standard product range.

Valve type	<b>SCA-X SS</b> <b>CHV-X SS</b>	Stop Check Valve Check Valve
(valve size measured on the connection diameter)	<b>15</b> <b>20</b> <b>25</b> <b>32</b> <b>40</b>	<b>D</b> <b>A</b> DN 15      x DN 20      x      x DN 25      x      x DN 32      x      x DN 40      x      x
Connections	<b>D</b> <b>A</b>	Butt-weld connection: DIN EN 10220 Butt-weld connection: ANSI B 36.19M
Valve housing	<b>ANG</b> <b>STR</b>	Angle flow Straight flow

**Important!**

Where products need to be certified according to specific certification societies, or where higher pressures are required, the relevant information should be included at the time of order.

**SCA-X SS Angleway**
**Butt-weld DIN (EN 10220)**

Size		Type	Code No.
mm	in.		
15	½	SCA-X SS 15 D ANG	<b>148B5293</b>
20	¾	SCA-X SS 20 D ANG	<b>148B5381</b>
25	1	SCA-X SS 25 D ANG	<b>148B5490</b>
32	1 ¼	SCA-X SS 32 D ANG	<b>148B5585</b>
40	1 ½	SCA-X SS 40 D ANG	<b>148B5664</b>

**Butt-weld ANSI (B 36.19M SCHEDULE 40)**

Size		Type	Code No.
mm	in.		
20	¾	SCA-X SS 20 A40 ANG	<b>148B6489</b>
25	1	SCA-X SS 25 A40 ANG	<b>148B6480</b>
32	1 ¼	SCA-X SS 32 A40 ANG	<b>148B6490</b>
40	1 ½	SCA-X SS 40 A40 ANG	<b>148B5687</b>

**CHV-X SS Angleway**
**Butt-weld DIN (EN 10220)**

Size		Type	Code No.
mm	in.		
15	½	CHV-X SS 15 D ANG	<b>148B5294</b>
20	¾	CHV-X SS 20 D ANG	<b>148B5382</b>
25	1	CHV-X SS 25 D ANG	<b>148B5491</b>
32	1 ¼	CHV-X SS 32 D ANG	<b>148B5586</b>
40	1 ½	CHV-X SS 40 D ANG	<b>148B5665</b>

**Butt-weld ANSI (B 36.19M SCHEDULE 40)**

Size		Type	Code No.
mm	in.		
20	¾	CHV-X SS 20 A40 ANG	<b>148B6491</b>
25	1	CHV-X SS 25 A40 ANG	<b>148B6481</b>
32	1 ¼	CHV-X SS 32 A40 ANG	<b>148B6492</b>
40	1 ½	CHV-X SS 40 A40 ANG	<b>148B5688</b>

**CHV-X SS Straightway**
**Butt-weld DIN (EN 10220)**

Size		Type	Code No.
mm	in.		
15	½	CHV-X SS 15 D STR	<b>148B5678</b>
20	¾	CHV-X SS 20 D STR	<b>148B5679</b>
25	1	CHV-X SS 25 D STR	<b>148B5680</b>
32	1 ¼	CHV-X SS 32 D STR	<b>148B6544</b>
40	1 ½	CHV-X SS 40 D STR	<b>148B6566</b>

**Butt-weld ANSI (B 36.19M SCHEDULE 40)**

Size		Type	Code No.
mm	in.		
20	¾	CHV-X SS 20 A40 STR	<b>148B6608</b>
25	1	CHV-X SS 25 A40 STR	<b>148B6609</b>
32	1 ¼	CHV-X SS 32 A40 STR	<b>148B6610</b>
40	1 ½	CHV-X SS 40 A40 STR	<b>148B6611</b>

ANG = Angleway  
STR = Straightway

**Strainers**  
**FIA SS**

In certain specific areas such as outdoor applications and corrosive atmospheres, such as coastal installations, there is a need for high surface protection to prevent failure due to corrosion.

Today's food safety standards often call for daily treatment with detergents to protect against bacteria growth, again producing a need for high surface protection.

FIA SS strainers are a range of angle-way and straight-way strainers which are carefully designed to give favourable flow conditions.

The design makes the strainer easy to install, and ensures quick strainer inspection and cleaning.

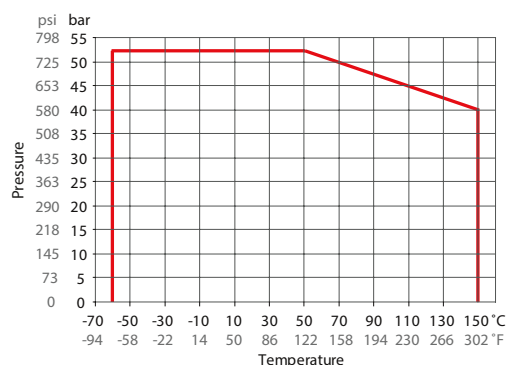
FIA SS strainers are used ahead of automatic controls, pumps, compressors etc., for initial plant start-up and where permanent filtration of the refrigerant is required. The strainer reduces the risk of undesirable system breakdowns and reduces wear and tear on plant components.



**Features**  
**FIA SS**

- Applicable to HCFC, HFC, R717 (Ammonia), R744 (CO<sub>2</sub>) and all flammable refrigerants.
- Designed to give favourable flow conditions.
- Housing is made of special cold resistant stainless steel approved for low temperature operations.
- Easy to disassemble for inspection and service.
- Butt-weld DIN and ANSI connections.
- Max. operating pressure: 52 bar g / 754 psig
- Temperature range: -60 – 150 °C / -76 – 302 °F.
- Compact and light valves for easy handling and installation.
- Classification: DNV, CRN, BV, EAC etc. To get an updated list of certification on the products please contact your local Danfoss Sales Company.

**Pressure and temperature range**



FIA SS DN15-DN65

**Technical data**

- *Refrigerants*  
Applicable to HCFC, HFC, R717 (Ammonia), R744 (CO<sub>2</sub>) and all flammable refrigerants. For further information please see installation guide for FIA SS.
- *Temperature range*  
-60 °C – 150 °C / -76 °F – 302 °F.
- *Max. working pressure:*  
52 bar g / 754 psi g.





**Data sheet | Stainless Steel Valves 15 (½ in.) - 125 (5 in.)**

**Selection of strainer size**

The mesh aperture size of the strainer must satisfy the requirements stated by the suppliers of the equipment to be protected.

The following recommendations of aperture size apply in general to refrigeration installations:

*All lines*

First start up:..... **50μ**  
 (Use filter element with removable insert for FIA SS DN15-40 or separate filter bag for FIA SS DN 50-65. 50μ insert should normally be removed after the first 24 hours of operation)

*Liquid Lines*

Ahead of pumps:..... **500μ** [38 mesh]  
 After pumps:..... **150μ** [100 mesh] / 250μ [72 mesh]  
 In front of AKVA valves ..... **100μ** [150 mesh]

*Protection of automatic regulation equipment*

Generally ..... **150μ** [100 mesh] / 250μ [72 mesh]  
 Sensitive equipment, e.g.  
 suction regulators with low temperature ..... **250μ** [72 mesh]

*Definition*

Mesh is the number of threads per inch. μ (microns) is the distance between two threads (1μ = 1 /1000 mm).

*Suction Lines*

Ahead of screw compressor ..... **250μ** [72 mesh]  
 Ahead of piston compressor ..... **150μ** [100 mesh]

*Flow coefficient (DIN/ANSI)*

Connection size (DN)	μ	mesh	wire mm	wire in.	free space %	screen area			
						Plain elements		Pleated elements	
						cm <sup>2</sup>	in <sup>2</sup>	cm <sup>2</sup>	in <sup>2</sup>
<b>FIA SS</b> 15 – 20 (½" – ¾")	100		0.068	0.003	35	25	3.9	45	7.0
	150	100	0.10	0.004	36	25	3.9	45	7.0
	250	72	0.10	0.004	51	25	3.9	45	7.0
	500	38	0.16	0.006	57.6	25	3.9	45	7.0
25 - 40 (1" – 1 ½")	100		0.068	0.003	35	71	11	160	25.0
	150	100	0.10	0.004	36	71	11	160	25.0
	250	72	0.10	0.004	51	71	11	160	25.0
	500	38	0.16	0.006	57.6	71	11	160	25.0
50 (2")	100		0.068	0.003	35	71	11	200	31.2
	150	100	0.10	0.004	36	87	13.5	200	31.2
	250	72	0.10	0.004	51	87	13.5	200	31.2
	500	38	0.16	0.006	57.6	87	13.5	200	31.2
65 (2 ½")	150	100	0.10	0.004	36	127	19.7	305	47.6
	250	72	0.10	0.004	51	127	19.7	305	47.6
	500	38	0.16	0.006	57.6	127	19.7	305	47.6

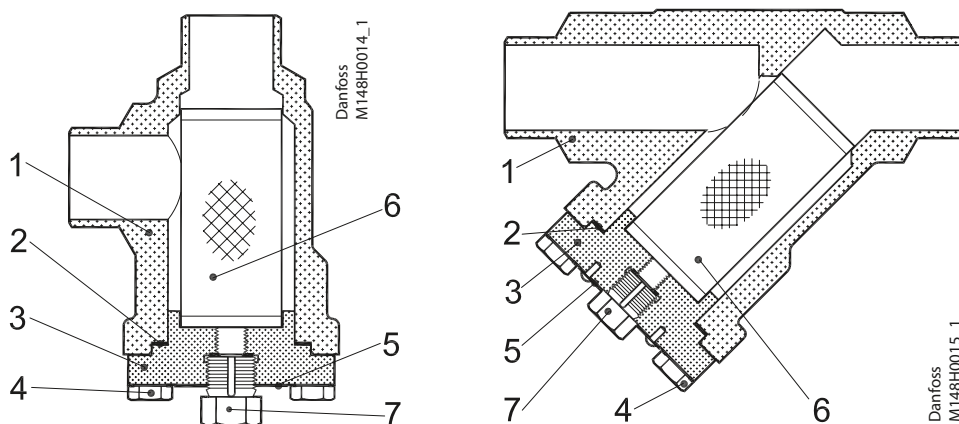
*K<sub>v</sub> values*

DN	FIA SS angle - plain filter net				FIA SS angle - pleated filter net		
	μ100	μ150	μ250	μ500	μ150	μ250	μ500
15	3.3	3.4	3.5	3.7	4.2		
20	6.9	7.1	7.3	7.7	8.8		
25	13.8	14.0	14.5	15.2	17.2	17.9	
32	23.0	23.8	24.7	25.5	29.2	30.5	
40	25.1	25.5	26.4	28.1	31.4	32.6	
50	45.1	45.9	47.6	50.2	56.7	58.8	62.0
65		56.1	57.8	60.4	69.3	71.4	74.6

DN	FIA SS straight - plain filter net				FIA SS straight - pleated filter net		
	μ100	μ150	μ250	μ500	μ150	μ250	μ500
15	2.5	2.6	2.7	2.8	3.3		
20	5.3	5.4	5.6	5.9	6.9		
25	10.5	10.7	11.1	11.6	13.8	14.5	
32	17.6	18.2	18.9	19.5	23.9	24.7	
40	19.2	19.5	20.2	21.5	25.5	26.4	
50	34.5	35.1	36.4	38.4	45.9	47.6	50.2
65		42.9	44.2	46.2	56.1	57.8	60.4

**Material specification**

FIA SS 15 – 65 (1/2 in. – 2 1/2 in.)

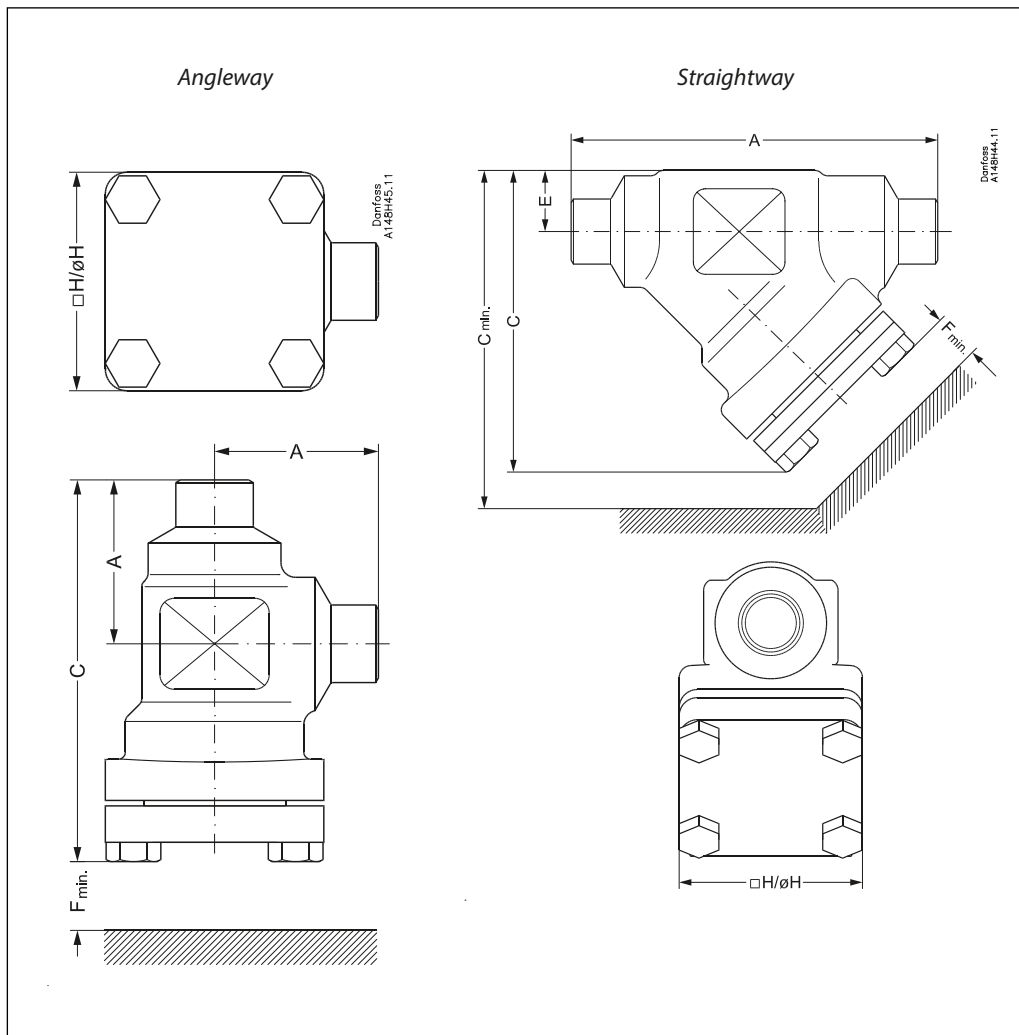


**FIA SS 15 – 65 (1/2 in. – 2 1/2 in.)**

No.	Part	Material	DIN	ISO	ASTM
1	Housing	Stainless steel (FIA SS only)	GX5CrNi19-10 EN10213-4		AISI 304
2	Gasket	Fibre, Non-asbestos			
3	Cover	Stainless steel (FIA SS only)	GX5CrNi19-10 EN10213-4		AISI 304
4	Bolts	Stainless steel	A2-70	A2-70	Type 308
5	Marking label	Aluminium			
6	Filter element	Stainless steel			
7	Pressure relief (screw)	Stainless steel			

Dimensions and weights

FIA SS 15 – 65



Angleway

Strainer size		A	C	H	F <sub>min.</sub>	Weight
FIA SS 15 – 20	mm	45	105	60	68	1.1 kg
(½" – ¾")	in.	1.77	4.13	2.36	2.68	2.4 lbs
FIA SS 25 – 40	mm	55	132	70	95	1.7 kg
(1" – 1 ½")	in.	2.17	5.20	2.76	3.74	3.7 lbs
FIA SS 50	mm	60	132	77	92	2.8 kg
(2")	in.	2.36	5.20	3.03	3.62	6.2 lbs
FIA SS 65	mm	70	152	90	107	3.8 kg
(2 ½")	in.	2.76	5.98	3.54	4.21	8.4 lbs

Straightway

Valve size		A	C	C <sub>min.</sub>	H	E	F <sub>min.</sub>	Weight
FIA SS 15 – 20	mm	120	99	133	60	20	68	1.4 kg
(½" – ¾")	in.	4.72	3.90	5.24	2.36	0.79	2.68	3.1 lbs
FIA SS 25-40	mm	155	129	177	70	26	95	2.4 kg
(1" – 1 ½")	in.	6.10	5.08	6.97	2.76	1.02	3.74	5.3 lbs
FIA SS 50	mm	148	138	184	77	32	92	3.5 kg
(2")	in.	5.83	5.43	7.24	3.03	1.26	3.62	7.7 lbs
FIA SS 65	mm	176	165	219	90	40	107	5.3 kg
(2 ½")	in.	6.93	6.50	8.62	3.54	1.57	4.21	11.7 lbs

**Data sheet | Stainless Steel Valves 15 (½ in.) - 125 (5 in.)**
**Ordering**

The table below is used to identify the strainer required. Please note that you have to order **FIA SS strainer without element, a strainer element and accessories.**

*Example:*

FIA SS 50 D ANG + FIA-X 50 150µ Strainer Element + Filter Bag = **148H5757 + 148H3130 + 148H3150**

Size		Type	FIA SS Without Filter Element	Filter Element 100µ	Filter Element 150µ	Filter Element 250µ	Filter Element 500µ	Pleated filter element 150µ	Pleated filter element 250µ	Pleated filter element 500µ
mm	in.			150 mesh	100 mesh	72 mesh	38 mesh	100 mesh	72 mesh	38 mesh

**Butt-weld DIN (EN 10220) - Angleway**

Size (mm)	Size (in.)	Type	Code	148H3122	148H3124	148H3126	148H3128	148H3303	148H3363	
15	½	FIA SS 15 D ANG	<b>148B5295</b>							-
20	¾	FIA SS 20 D ANG	<b>148B5383</b>							
25	1	FIA SS 25 D ANG	<b>148B5492</b>							
32	1¼	FIA SS 32 D ANG	<b>148B5587</b>	<b>148H3123</b>	<b>148H3125</b>	<b>148H3127</b>	<b>148H3129</b>	<b>148H3304</b>	<b>148H3269</b>	-
40	1½	FIA SS 40 D ANG	<b>148B5666</b>							
50	2	FIA SS 50 D ANG	<b>148B5757</b>	<b>148H3157</b>	<b>148H3130</b>	<b>148H3138</b>	<b>148H3144</b>	<b>148H3179</b>	<b>148H3184</b>	<b>148H3189</b>
65	2½	FIA SS 65 D ANG	<b>148B5851</b>	-	<b>148H3131</b>	<b>148H3139</b>	<b>148H3145</b>	<b>148H3180</b>	<b>148H3185</b>	<b>148H3190</b>

**Butt-weld ANSI (B 36.19M SCHEDULE 10) - Angleway**

Size (mm)	Size (in.)	Type	Code		148H3131	148H3139	148H3145	148H3180	148H3185	148H3190
65	2½	FIA SS 65 A10 ANG	<b>148B6498</b>	-						

**Butt-weld DIN (EN 10220) - Straightway**

Size (mm)	Size (in.)	Type	Code	148H3122	148H3124	148H3126	148H3128	148H3303	148H3363	
15	½	FIA SS 15 D STR	<b>148B5296</b>							-
20	¾	FIA SS 20 D STR	<b>148B5384</b>							
25	1	FIA SS 25 D STR	<b>148B5493</b>							
32	1¼	FIA SS 32 D STR	<b>148B5588</b>	<b>148H3123</b>	<b>148H3125</b>	<b>148H3127</b>	<b>148H3129</b>	<b>148H3304</b>	<b>148H3269</b>	-
40	1½	FIA SS 40 D STR	<b>148B5667</b>							
50	2	FIA SS 50 D STR	<b>148B5758</b>	<b>148H3157</b>	<b>148H3130</b>	<b>148H3138</b>	<b>148H3144</b>	<b>148H3179</b>	<b>148H3184</b>	<b>148H3189</b>
65	2½	FIA SS 65 D STR	<b>148B5852</b>	-	<b>148H3131</b>	<b>148H3139</b>	<b>148H3145</b>	<b>148H3180</b>	<b>148H3185</b>	<b>148H3190</b>

**Butt-weld ANSI (B 36.19M SCHEDULE 40) - Straightway**

Size (mm)	Size (in.)	Type	Code	148H3122	148H3124	148H3126	148H3128	148H3303	148H3363	
15	½	FIA SS 15 A40 STR	<b>148B6493</b>							-
20	¾	FIA SS 20 A40 STR	<b>148B6494</b>							
25	1	FIA SS 25 A40 STR	<b>148B6495</b>							
32	1¼	FIA SS 32 A40 STR	<b>148B6496</b>	<b>148H3123</b>	<b>148H3125</b>	<b>148H3127</b>	<b>148H3129</b>	<b>148H3304</b>	<b>148H3269</b>	-
40	1½	FIA SS 40 A40 STR	<b>148B6497</b>							

**Butt-weld ANSI (B 36.19M SCHEDULE 10) - Straightway**

Size (mm)	Size (in.)	Type	Code	148H3157	148H3130	148H3138	148H3144	148H3179	148H3184	148H3189
50	2	FIA SS 50 A10 STR	<b>148B5758</b>							
65	2½	FIA SS 65 A10 STR	<b>148B6499</b>	-	<b>148H3131</b>	<b>148H3139</b>	<b>148H3145</b>	<b>148H3180</b>	<b>148H3185</b>	<b>148H3190</b>

- D = Butt-weld DIN
- A = Butt-weld ANSI
- ANG = Angleway
- STR = Straightway

**Accessories**

Part	Accessory for	Code number
Filter element µ150 with removable element µ50 for the first start up	FIA SS 15 – 20	<b>148H3301</b>
	FIA SS 25 – 40	<b>148H3302</b>
Part	Accessory for	Code number
Filter bag	FIA SS 50	<b>148H3150</b>
	FIA SS 65	<b>148H3151</b>
Part	Accessory for	Code number
Blind nut with gasket	FIA SS 50 – 65	<b>148H3450</b>

**Pressure regulating valves  
OFV-SS**

OFV-SS are angle-way over flow valves, which have adjustable opening pressure and cover the differential pressure range ( $\Delta P$ ): 2 – 8 bar / 29 – 116 psi. The valve can be closed manually, e.g. during plant service and have backseating, enabling the spindle seal to be replaced with the valve still under pressure.

The valves are especially designed to prevent fluttering due to low velocity and/or low density. In consequence it is possible to apply the valves with wide fluctuations in capacity demands, i.e. from maximum performance to part load. A flexible O-ring provides perfect sealing over the seat.



**Features  
OFV-SS**

- Applicable to HCFC, HFC, R717(Ammonia) and R744 (CO<sub>2</sub>).
- Full temperature range packing gland -50 – 150 °C / -58 – 302 °F
- Maximum operating pressure 52 bar / 754 psi g
- Three functions in one valve. The OFV valve combines the functions of an overflow valve, a check valve and a stop valve
- Low temperature stainless steel housing and bonnet
- Low temperature packing gland -60 – 150 °C / -76 – 302 °F
- Classification: DNV, CRN, BV, EAC etc. To get an updated list of certification on the products please contact your local Danfoss Sales Company.

**Technical data**

- Refrigerants Applicable to HCFC, HFC, R717(Ammonia) and R744 (CO<sub>2</sub>). Flammable hydrocarbons are not recommended. For further information please contact your local Danfoss Sales Company.
- Temperature range -60 – 150 °C / -76 – 302 °F
- Pressure range Maximum operating pressure: 52 bar / 754 psi g
- Set pressure ( $\Delta p$ ): 2 – 8 bar / 29 – 116 psi.

**Design**

*Connections*

Available with the following connections:

- Welding DIN (EN 10220)
- Welding ANSI (B 36.19M)

*Packing gland OFV-SS*

The stainless steel packing gland comprises a spring loaded seal packing gland which ensures a perfect tightness in the range:

-60 – 150 °C / -76 – 302 °F.

The packing glands are equipped with a scraper ring to prevent penetration of dirt and ice into the packing gland.

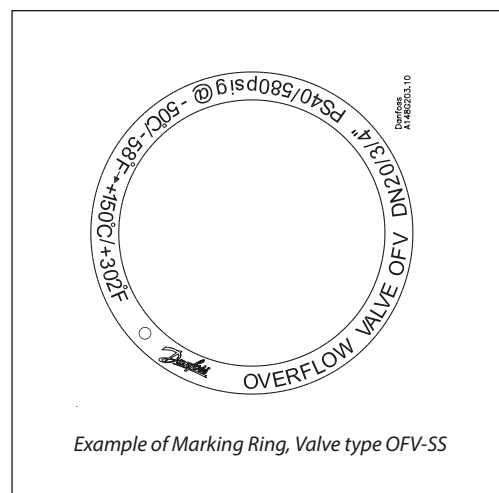
*Pressure Equipment Directive (PED)*

OFV valves are approved and CE-marked in accordance with the Pressure Equipment Directive - 97/23/EC.

For further details / restrictions - see Installation Instruction

*Installation*

The valve is designed to resist very high internal pressure, but as to the pipe system in general, hydraulic pressure caused by thermal expansions in entrapped refrigerants should be avoided. For further information please see OFV installation instruction.

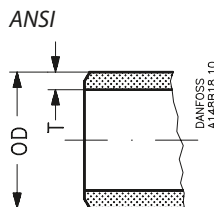
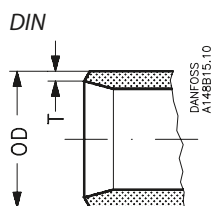


Example of Marking Ring, Valve type OFV-SS



	OFV-SS
<b>Nominal bore</b>	DN≤ 25 mm (1 in.)
<b>Classified for</b>	Fluid group I
<b>Category</b>	Article 3, paragraph 3

**Connections**



Size mm	Size in.	OD mm	T mm	OD in.	T in.
---------	----------	-------	------	--------	-------

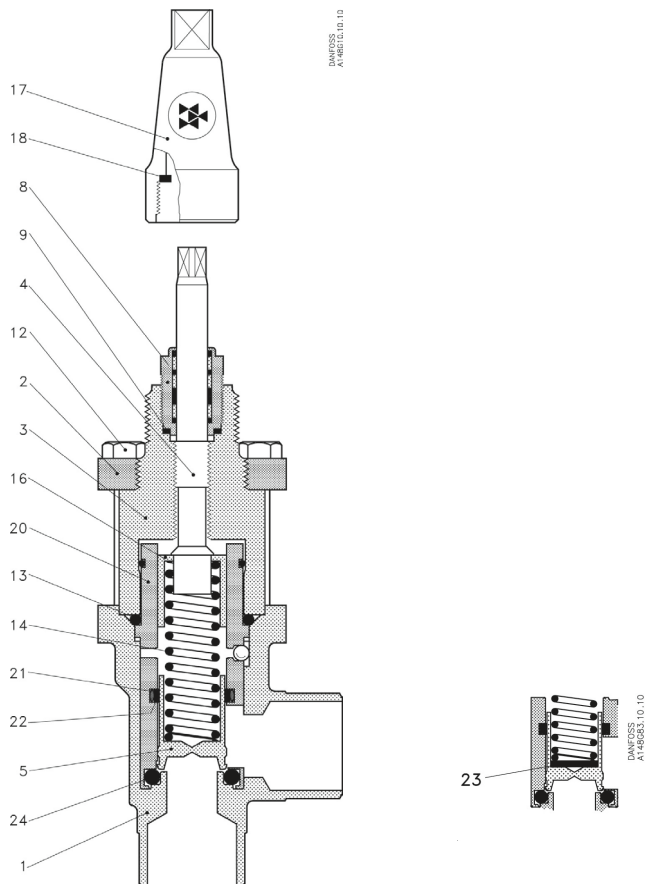
**Butt-weld DIN (EN 10220)**

20	¾	26.9	2.3	1.059	0.091
25	1	33.7	2.6	1.327	0.103

**Butt-weld ANSI (B 36.19M)**

20	¾	26.9	2.9	1.06	0.11
25	1	33.7	3.5	1.33	0.14

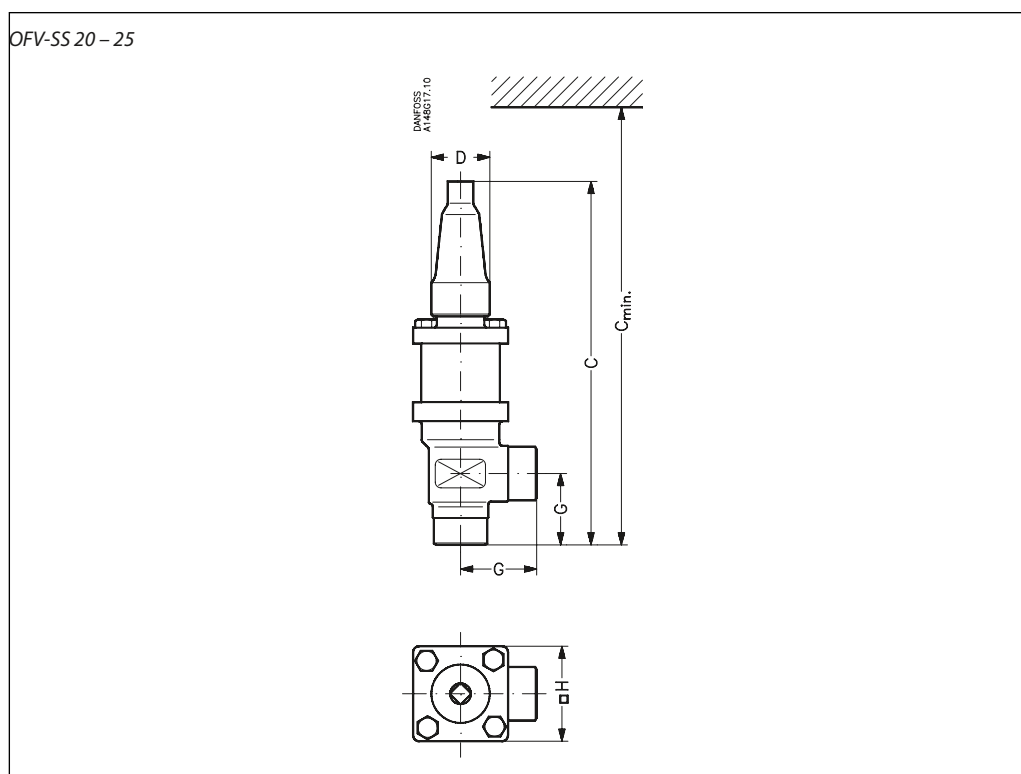
Material specification



OFV-SS 20 - 25 (¾ - 1")

No.	Part	Material	DIN/EN	ISO	ASTM
1	Housing	Stainless steel	X5CrNi18-10 EN10088		AISI 304
2	Bonnet, Flange	Stainless steel	X5CrNi18-10 EN10088		AISI 304
3	Bonnet, Insert	Stainless steel			
4	Spindle	Stainless steel	X8CrNiS18-9 DIN 17440	Type 17, 683/13	AISI 303
5	Cone	Steel	9SMn28	Type 2	1213
8	Packing gland	Stainless steel			
9	Packing washer	Non asbestos			
12	Bolts	Stainless steel	A2-70	A2-70	Type 308
13	O-ring	Cloroprene (Neoprene)			
14	Spring	Steel			
16	Spring washer	Steel	Steel		
17	Spindle seal cap	Aluminium			
18	Seal cap gasket	Nylon			
20	Guide piece	Steel			
21	O-ring	Cloroprene (Neoprene)			
22	Sealing ring	PTFE (Teflon)			
23	Distance piece	Steel			
24	O-ring	Cloroprene (Neoprene)			

Dimensions and weights



Valve size		G	C	C <sub>min</sub>		∅D	□H		Weight
<b>OFV 20 - 25</b>									
OFV 20 (¾ in.)	mm	45	230	290		38	60		2.0 kg
	in.	1.77	9.1	11.4		1.5	2.4		
OFV 25 (1 in.)	mm	45	230	290		38	60		2.0 kg
	in.	1.77	9.1	11.4		1.5	2.4		

Specified weights are approximate values only.



**Ordering**
*How to order*

The table below is used to identify the valve required.

Please note that the type codes only serve to identify the valves, some of which may not form part of the standard product range.

For further information please contact your local Danfoss Sales Company.

*Type codes*

Valve type	<b>OFV-SS</b>	Over Flow Valve
Nominal size in mm	<b>20</b> <b>25</b>	DN 20 DN 25
Connections	<b>D</b> <b>A</b>	Butt-weld connection: DIN EN 10220 Butt-weld connection: ANSI B 36.19M
Valve housing	<b>ANG</b>	Angle flow

**Important!**

Where products need to be certified according to specific certification societies or where higher pressures are required, the relevant information should be included at the time of order.

*Opening differential pressure*

2 – 8 bar / 29 – 116 psi:

Size		Type	Code No.
mm	in		
20	¾	OFV-SS 20 D ANG OVER FLOW VALVE 52BAR	<b>148G3194</b>
25	1	OFV-SS 25 D ANG OVER FLOW VALVE 52BAR	<b>148G3195</b>
25	1	OFV-SS 25 A ANG OVER FLOW VALVE 52BAR	<b>148G3843</b>

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**Gauge valve  
SNV-SS**

SNV-SS valves are designed to meet all industrial refrigeration application requirements.

Designed as service valves they provide favourable flow characteristics.



**Features  
SNV-SS**

- Applicable to HCFC, non flammable HFC, R717 (Ammonia) and R744 (CO<sub>2</sub>).
- Suitable for "heavy duty" industrial applications having a very sturdy and safe design including high pressures and wide temperature range.
- SNV-SS valves have backseating (metal to metal).
- Compact and light valve for easy handling and installation
- No special flow direction required.
- Provide high flow characteristics.
- Each valve type is clearly marked with type and size.
- Housing and bonnet material is (stainless steel according to requirements of the Pressure Equipment Directive and other international classification authorities.
- Valve safety is enhanced with the spindle being secured such that it cannot be unscrewed.
- Max. operating pressure: 52 bar g / 754 psig  
Valves for higher operating pressure available on request
- Full temperature range: -60 – 150 °C / -76 – 302 °F
- Classification: DNV, CRN, BV, EAC etc.  
To get an updated list of certification on the products please contact your local Danfoss Sales Company.

**Technical data**

- *Refrigerants*  
Applicable to HCFC, non flammable HFC, R717 (Ammonia) and R744 (CO<sub>2</sub>). For further information please see installation instruction for SNV-SS.
  - *Temperature range*  
-60 – 150 °C / -76 – 302 °F.
  - *Maximum working pressure*  
The valve is designed for: Maximum operating pressure of 52 bar g / 754 psig.  
Valves for higher operating pressure available on request.
- For further information please contact your local Danfoss Sales Company.

**Design**

*Connections*  
Available with the following connections:

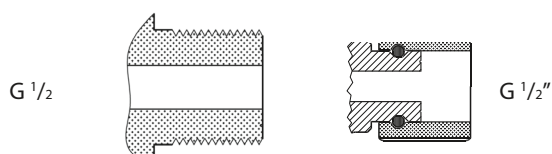
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*Housing*  
Made of stainless steel, approved for low temperature operations.

*Spindle*  
Equipped with stainless steel spindle, which is ideal for O-ring sealing.

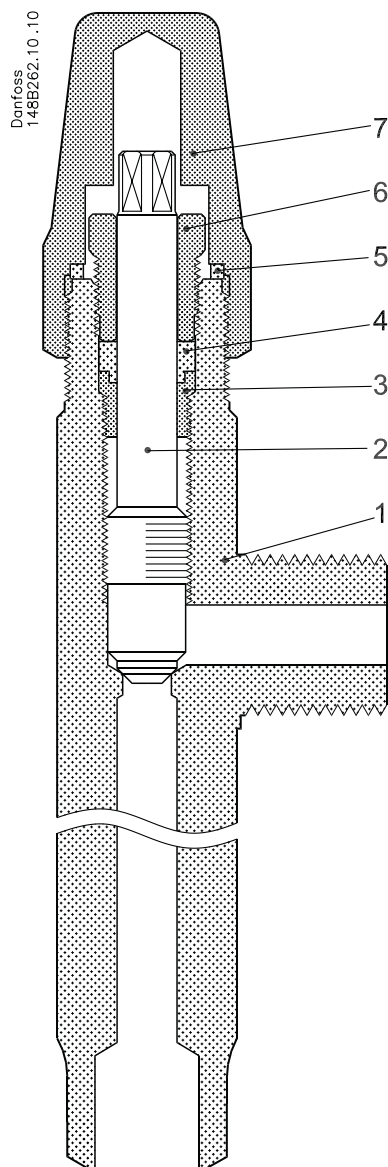
*Installation*  
No special flow direction is required. The valve is designed to withstand high internal pressures. However, the piping system in general should be designed to avoid liquid traps and reduce the risk of hydraulic pressure caused by thermal expansion. For further information refer to installation instruction for SNV-SS.

**Connections**

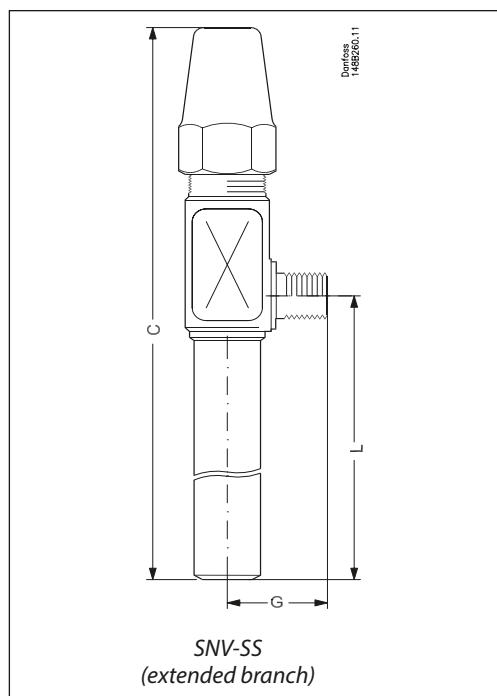


**Material specification**

SNV-SS (extended branch)



No.	Part	Material	EN	JIS	ASTM
1	Housing	Stainless steel (SNV-SS)	X5CrNi18-10, 10088		AISI 304
2	Spindle	Stainless steel	X8CrNiS 18-9 EN 10088* DIN 17440 (SNV-SS only)	SUS 303	AISI 303
3	Locking ring	Steel			
4	Sealing ring	Teflon			
5	Seal cap gasket	Nylon			
6	Gland nut	Steel			
7	Seal cap	Steel			

**Dimensions and weights**


Type	C	G	L	Weight
------	---	---	---	--------

SNV-SS	mm	131	32	50	0.60 kg
	in.	5.16	1.26	1.97	1.32 lb
SNV-SS Ext.branch	mm	231	32	150	0.60 kg
	in.	9.09	1.26	5.91	1.32 lb

Specified weights are approximate values only.

**Ordering**
**SNV-SS Angle flow**

Size		Type designation	Code number
G ½	W½L50	SNV-SS G1/2-W1/2 L50	<b>148B4265</b>
G ½	W½L150	SNV-SS G1/2-W1/2 L150	<b>148B4266</b>
G ½	W½L50	SNV-SS G1/2-W1/2 L50 - 65 bar	<b>148B4581</b>
G ½	W½L150	SNV-SS G1/2-W1/2 L150 - 65 bar	<b>148B4582</b>
3/8 FTP	3/8 MPT	SNV-SS 3/8 FTP-3/8 MPT	<b>148B3750</b>
G ½	-	SNV-SS G1/2 Manometer	<b>148B6545</b>
G ½	-	Blind nut SS incl. gasket	<b>148B4317</b>

**Solenoid valves  
EVR3 and EVRST**

EVR3 and EVRST are valves made of stainless steel.

EVR3 is direct operated.  
EVR3 10, 15 and 20 are servo operated.  
EVRST 10,15 and 20 are forced servo operated valves used in liquid, suction, hot gas and oil return lines with ammonia or fluorinated refrigerants.

EVR3 and EVRST are designed for keeping open at a pressure drop of 0 bar.

EVR3/EVRST 10, 15 and 20 are equipped with spindle for manual opening.

EVR3 and EVRST are supplied as components, i.e. valve body and coil must be separately ordered.


**Features  
EVR3 and EVRST**

- Stainless steel valve body and connections
- Max. working pressure 50 barg
- Applicable to HCFC, HFC, R717 (Ammonia) and R744 (CO<sub>2</sub>).
- MOPD up to 38 bar with 20 watt a.c. coil
- Wide choice of a.c. and d.c. coils
- Designed for temperatures of media up to 105 °C
- Manual stem on EVR3 and EVRST 10, EVRST 15 and EVRST 20
- Classification: DNV, CRN, BV, EAC etc. To get an updated list of certification on the products please contact your local Danfoss Sales Company.

**Technical data**

*Refrigerants*  
Applicable to HCFC, HFC, R717 (Ammonia) and R744 (CO<sub>2</sub>).

*Temperature of medium*  
-40 – 105 °C for 10 or 12 watt coil. Max. 130 °C during defrosting.  
-40 – 80 °C for 20 watt coil.

*Ambient temperature and enclosure for coil: See "Coils for solenoid valves", lit.no. DKRCC.PD.B50.A*

Type	Opening differential pressure Δp bar					k <sub>v</sub> value <sup>2)</sup> m <sup>3</sup> /h	Max. working pressure Ps
	Min.	Max. (MOPD) liquid <sup>1)</sup>					
		10 W a.c.	12 W a.c.	20 W a.c.	20 W d.c.		
EVR3	0.0	21	25	38	14	0.23	50 barg
EVR3 10	0.05	21	25	38	18	1.5	
EVRST 10	0.0	14	21	38	16	1.5	
EVR3 15	0.05	21	25	38	18	2.7	
EVRST 15	0.0	14	21	38	18	2.7	
EVR3 20	0.05	21	25	38	13	4.5	
EVRST 20	0.0	14	21	38	13	4.5	

<sup>1)</sup> MOPD for media in gas form is approx. 1 bar greater.

<sup>2)</sup> The k<sub>v</sub> value is the water flow in m<sup>3</sup>/h at a pressure drop in the valve of 1 bar, ρ = 1000 kg/m<sup>3</sup>.

**Technical data**
*(Continued)*

Type	Rated capacity <sup>1)</sup> kW														
	Liquid					Suction vapour					Hot gas				
	R717	R22	R134a	R404A	R410A	R717	R22	R134a	R404A	R410A	R717	R22	R134a	R404A	R410A
EVRS 3	21.8	4.6	4.3	3.2	4.5						6.5	2.1	1.7	1.7	2.3
EVRS/EVRST 10	142.0	30.2	27.8	21.1	29.7	9.0	3.4	2.5	3.1	4.3	42.6	13.9	11.0	11.3	14.9
EVRS/EVRST 15	256.0	54.4	50.1	38.0	53.5	16.1	6.2	4.4	5.5	7.7	76.7	24.9	19.8	20.3	26.7
EVRS/EVRST 20	426.0	90.6	83.5	63.3	89.1	26.9	10.3	7.3	9.2	12.0	128.0	41.5	32.9	33.9	44.5

<sup>1)</sup> Rated liquid and suction vapour capacity is based on evaporating temperature  $t_e = -10^\circ\text{C}$ , liquid temperature ahead of valve  $t_l = 25^\circ\text{C}$ , and pressure drop across valve  $\Delta p = 0.15$  bar.

Rated hot gas capacity is based on condensing temperature  $t_c = 40^\circ\text{C}$ , pressure drop across valve  $\Delta p = 0.8$  bar, hot gas temperature  $t_h = 60^\circ\text{C}$ , and subcooling of refrigerant  $\Delta t_{\text{sub}} = 4$  K.

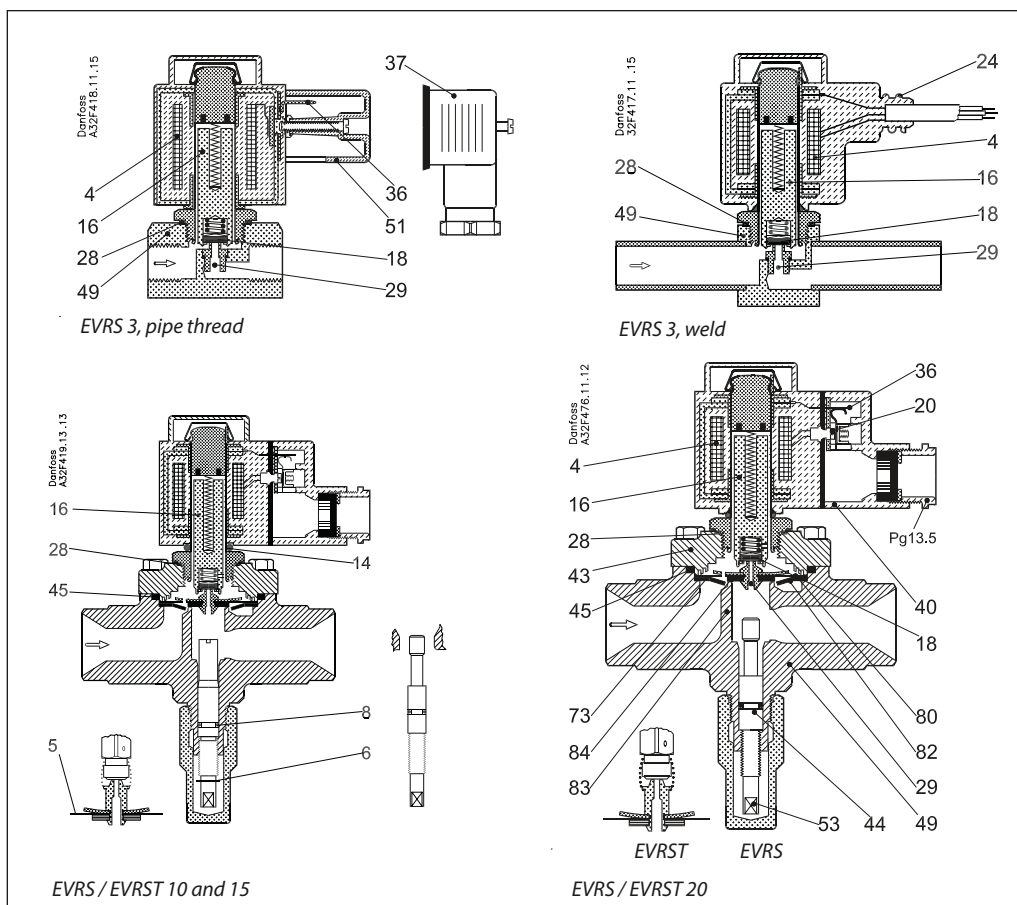
Type	R 744 Rated capacity kW <sup>2)</sup>	
	Liquid	Suction
EVRS 3	6.65	-
EVRS / EVRST 10	43.3	6.9
EVRS / EVRST 15	78.0	12.4
EVRS / EVRST 20	130.0	20.7

<sup>2)</sup> Rated liquid and suction vapour capacity is based on evaporating temperature  $t_e = -40^\circ\text{C}$ , liquid temperature ahead of the valve  $t_l = -8^\circ\text{C}$  and pressure drop across the valve  $\Delta p = 0.15$  bar

For other condition please refer to DIR-Calc or contact your local Danfoss office.

Design / Function

- 4. Coil
- 16. Armature
- 18. Pilot valve plate
- 20. Earth terminal
- 24. Connection for flexible steel hose
- 28. Gasket
- 29. Pilot orifice
- 36. DIN plug
- 40. Terminal box
- 43. Valve cover
- 44. O-ring
- 45. Valve cover gasket
- 49. Valve body
- 51. Cover
- 53. Manual operating spindle
- 73. Equalization hole
- 80. Diaphragm
- 82. Support washer
- 83. Valve seat
- 84. Main valve plate



The solenoid valve design is based on three different principles:

1. Direct operation
2. Servo operation
3. Forced servo operation

1. Direct operation

EVRS3 is directly operated. The valve opens direct for full flow when the armature (16) moves up into the magnetic field of the coil. This means that the valve operates with a min. differential pressure of 0 bar. The valve plate (18) made of teflon and is fitted direct to the armature (16). Inlet pressure acts from above on the armature and with it the valve plate. Thus, inlet pressure, spring force and the weight of the armature act to close the valve when the coil is currentless.

2. Servo operation

EVRS 10, 15 and 20 are servo operated with a "floating" diaphragm (80). The pilot orifice (29), which is of stainless steel, is placed in the centre of the diaphragm. The teflon pilot valve plate (18) is fitted direct to the armature (16). With the coil currentless, the main orifice and pilot orifice are closed. The pilot orifice and main orifice are held closed by the weight of the armature, the armature spring force and the differential pressure between inlet and outlet sides.

When current is applied to the coil the armature is drawn up into the magnetic field and opens the pilot orifice. This relieves the pressure above the diaphragm because the space above the diaphragm becomes connected to the outlet side of the valve. The differential pressure between inlet and outlet sides then presses the diaphragm away from the main orifice which opens to full flow.

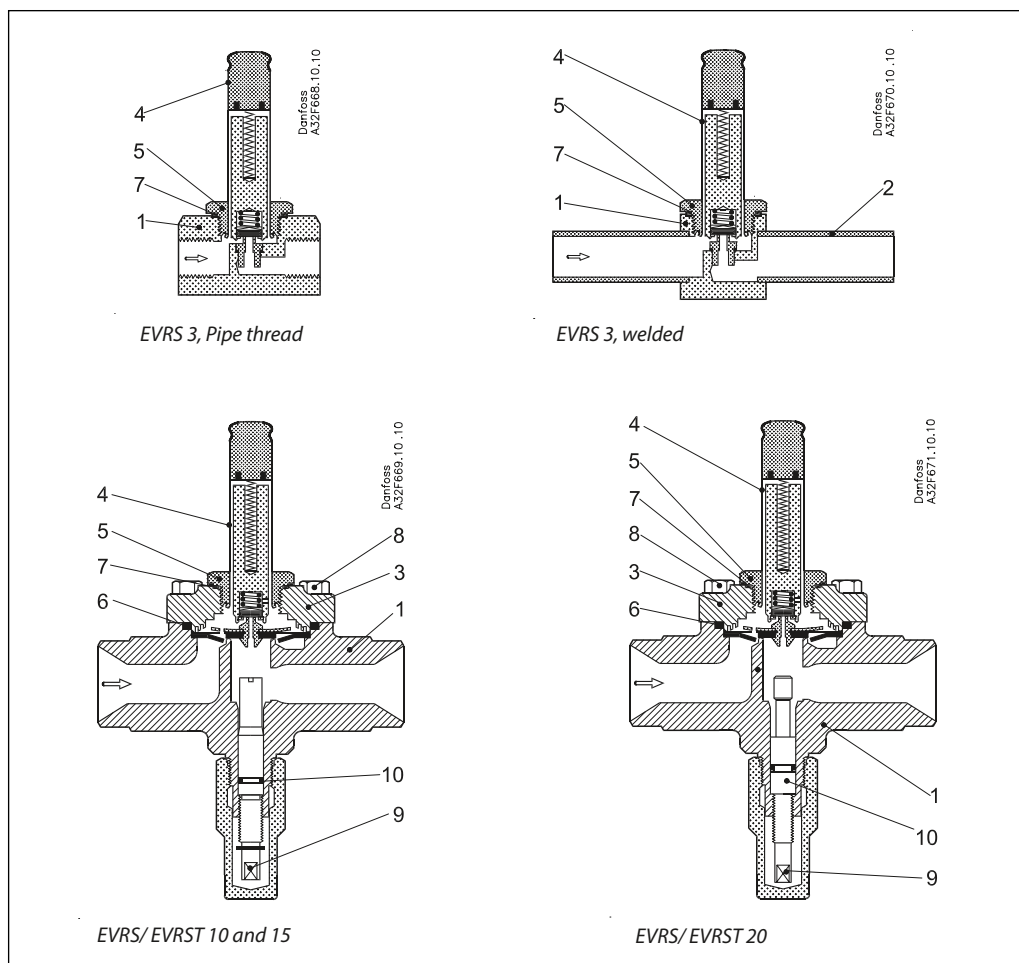
Thus a certain minimum differential pressure is necessary to open the valve and keep it open. For EVRS 10, 15 and 20 valves this differential pressure is 0.05 bar.

When current is switched off, the pilot orifice closes. Then the pressure above the diaphragm rises, via the equalization holes (73) in the diaphragm, to the inlet pressure and causes the diaphragm to close the main orifice.

3. Forced servo operation

EVRST 10, 15 and 20 are forced servo operated solenoid valves. Forced servo operation differs from servo operation in that in a forced servo operated valve the armature and the diaphragm are connected by a spring. Thus the armature helps to lift the diaphragm (80) and keep it lifted so that the pressure drop in the open valve is the least possible. These types of valves therefore require no differential pressure to keep them open.

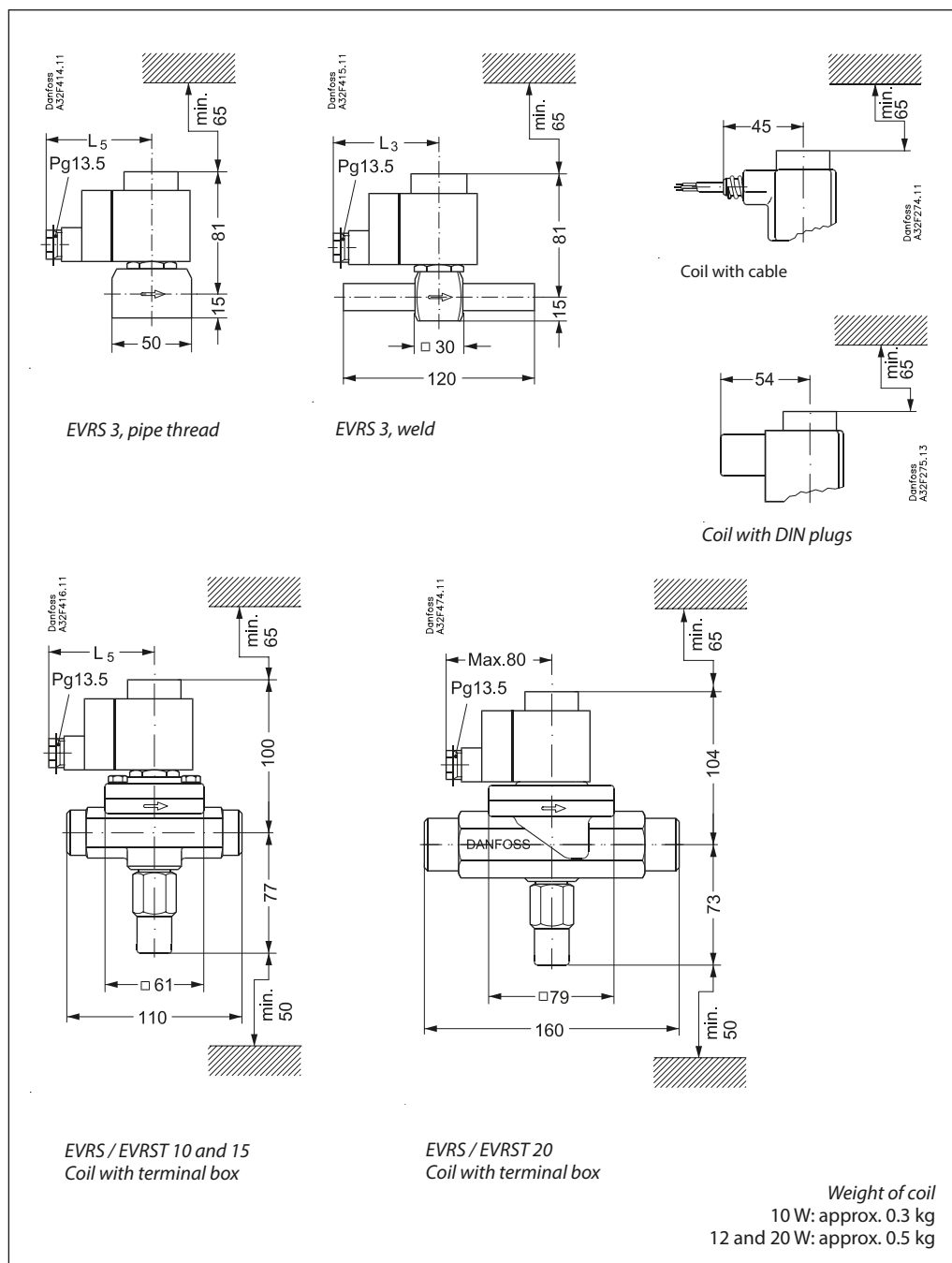
Material specification



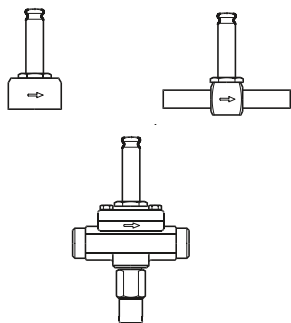
		Solenoid valves				Standard		
No.	Description	Type	Material	Analysis	Mat.no.	W.no.	DIN	EN
1	Valve housing	EVRS 3	Stainless steel	X8 CrNiS 18-9		1.4305		10088
		EVRS (T) 10/15/20	Stainless steel	X6 CrNi 18-9		1.4308	17455	
2	Welding tube	EVRS 3	Stainless steel	X2 CrNiMo 17-12-2		1.4404	17455	
3	Cover	EVRS (T) 10/15/20	Stainless steel	X6 CrNi 18-9		1.4308	17455	
4	Armature tube	EVRS(T) 3/10/15/20	Stainless steel	X2 CrNi 19-11		1.4306		10088
5	Armature tube nut	EVRS(T) 3/10/15/20	Stainless steel	X8 CrNi 19-11		1.4305		10088
6	Gasket	EVRS(T) 3/10/15/20	Rubber	Cr				
7	Gasket armature tube	EVRS(T) 10/15/20	Al gasket	Al 99.5		3.0255		10210
8	Screws	EVRS(T) 10/15/20	Stainless steel	A2-70			3506	
9	Spindle for man. oper.	EVRS(T) 10/15/20	Stainless steel	X8 CrNiS 18-9		1.4305		10088
10	Gasket	EVRS(T) 10/15/20	Rubber	Cr				



Dimensions and weights



Type	L <sub>5</sub> max.		Weight with coil kg
	10 W mm	12 W 20 W mm	
EVRS 3, pipe thread	75	85	0.7
EVRS 3, weld	75	85	0.6
EVRS/EVRST 10	75	85	1.2
EVRS/EVRST 15	75	85	1.3
EVRS/EVRST 20	75	85	2.0

**Ordering**

*Separate valve bodies*

Type	Max. working pressure Ps barg	Connection		Code no.	
		Weld in.	Pipe thread ISO 228/1	With manual stem	Without manual stem
EVRS 3	50	3/8			<b>032F3080</b>
EVRS 3	50		G 1/4		<b>032F3081</b>
EVRS 10	50	1/2		<b>032F3082</b>	
EVRST 10	50	1/2		<b>032F3083</b>	
EVRS 15	50	3/4		<b>032F3084</b>	
EVRST 15	50	3/4		<b>032F3085</b>	
EVRS 20	50	1		<b>032F5437</b>	
EVRST 20	50	1		<b>032F5438</b>	

 Coils See "Coils for solenoid valves", lit.no. *DKRCC.PD.BS0.A*



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