

Data Sheet

# Hand operated regulating valve Type **REG-SA** and **REG-SB 65**

Designed for regulation purposes in liquid and expansion lines, suitable for MWP up to 65 bar



REG-SA and REG-SB are angleway and straightway hand regulating valves, which act as normal stop valves in closed position.

The valves are available in two different versions – REG-SA and REG-SB designed for regulation purposes in liquid and expansion lines.

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

REG-SA and REG-SB are equipped with vented cap and internal backseating enables replacement of the spindle seal whilst the valve is active, i.e. under pressure.

## Features

- Modular Concept:
  - Each valve housing is available with DIN and ANSI butt weld connection and in several different sizes.
  - Possible to convert REG-SA or REG-SB to any other product in the Flexline™ SVL family (shut-off valve, check & stop valve, check valve or strainer) just by replacing the complete top part.
- Fast and easy valve overhaul service. It is easy to replace the top part and no welding is needed.
- Designed to ensure perfect regulation
- Internal backseating enables replacement of the spindle seal whilst the valve is active, i.e. under pressure.
- Easy to disassemble for inspection and possible repair.
- Acts as a normal stop valve in closed position.
- Housing and bonnet material is low temperature steel according to requirements of the Pressure Equipment Directive and other international classification authorities.
- Exact capacity and setting of the valve can be calculated for all refrigerants by means of Coolselector™.
- Classification: DNV, CRN, BV, EAC etc. To get an updated list of certification on the products please contact your local Danfoss Sales Company.
- Equipped with 42CrMo4 bolts to withstand high pressure.
- Service kits with replacement O-rings for R717 Heat Pump and R1270 Propylene include separate ID-ring for ID of application

## Media

### **Refrigerants**

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

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

### **New refrigerants**

Danfoss products are continually evaluated for use with new refrigerants depending on market requirements.

When a refrigerant is approved for use by Danfoss, it is added to the relevant portfolio, and the R number of the refrigerant (e.g. R513A) will be added to the technical data of the code number. Therefore, products for specific refrigerants are best checked at [store.danfoss.com/en/](https://store.danfoss.com/en/), or by contacting your local Danfoss representative.

## Product specification

### Design

#### Housing

Housing is Standard SVA angleway or straightway housing allowing other inserts from the SVL platform to be installed. Material is special, cold resistant steel

#### The cone

The valves are available in two different versions – REG-SA with an A cone and REG-SB 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

The spindle is made of polished stainless steel, which is ideal for O-ring sealing.

#### Packing gland - REG-SA and REG-SB

The "full temperature range" packing gland ensures perfect tightness in the whole range: -60 °C / +150 °C (-76 °F / +302 °F). The packing glands are equipped with a scraper ring to prevent penetration of dirt and ice.

For special and/or high demanding applications/conditions which run with high constant temperatures, it is recommended to replace the packing gland with "HL Packing Gland" as spare part. For more information, please, contact your local Danfoss sales representative

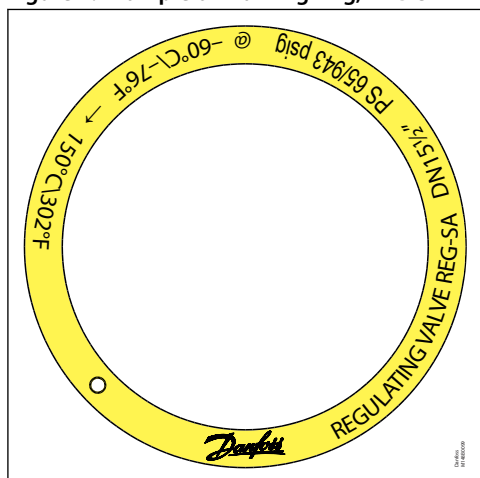
#### Installation

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 and REG-SB.

Figure 1: Example of marking ring, REG-SA

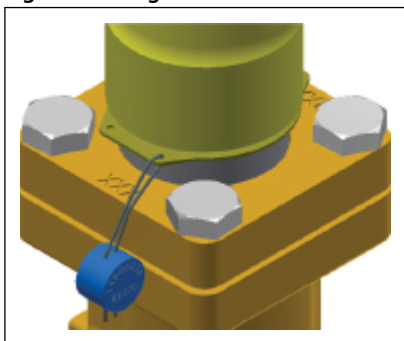


#### ID ring for special application

After converting a REG-SA/SB (DN 10-40) valve for Heat Pump/Propylene applications (replacing O-ring) the color marked ID tag included in the service kit must be fixed to the valve as shown in figure to the right.

The ID tag indicates the special application and identifies the installed O-ring.

Figure 2: ID tag



## Pressure and temperature data

Table 1: Temperature and pressure

Description	Values
Temperature range	-60 °C / +150 °C (-76 °F / +302 °F).
Max. working pressure	65 bar (943 psig).

With O-ring replaced for valves up to DN40 (Service kit):

- Heat pump configuration: R717 - 65 bar (943 psi) @ +100 °C to +150 °C (+212 °F to +302 °F) continuous.
- Propylene configuration: R1270 - 65 bar (943 psi) @ -60 °C to 150 °C (-76 °F to 302 °F).

## Connections

Figure 3: DIN

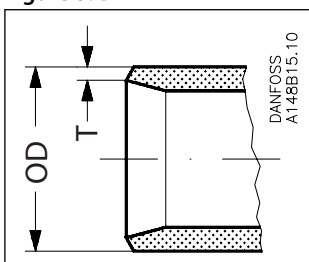


Table 2: Butt-weld DIN (EN 10220)

Size		OD	T	OD	T
mm	in.	mm	mm	in.	in.
6	¼	13.5	2.3	0.531	0.091
10	¾	17.2	2.3	0.677	0.091
15	½	21.3	2.3	0.839	0.091
20	¾	26.9	2.3	1.059	0.091
25	1	33.7	2.6	1.327	0.103
32	1¼	42.4	2.6	1.669	0.102
40	1½	48.3	2.6	1.902	0.103
50	2	60.3	2.9	2.37	0.11
65	2½	76.1	2.9	3	0.11
80	3	88.9	3.2	3.50	0.13
100	4	114.3	3.6	4.50	0.14
125	5	139.7	4.0	5.50	0.16
150	6	168.3	4.5	6.63	0.18
200	8	219.1	6.3	8.63	0.25

Figure 4: ANSI

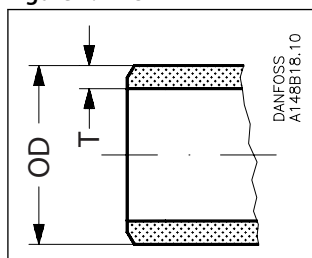


Table 3: Butt-weld ANSI (B 36.10 Schedule 80)

Size		OD	T	OD	T
mm	in.	mm	mm	in.	in.
6	¼	13.5	3.0	0.531	0.118
10	⅜	17.2	3.2	0.677	0.126
15	½	21.3	3.7	0.839	0.146
20	¾	26.9	4.0	1.059	0.158
25	1	33.7	4.6	1.327	0.181
32	1¼	42.4	4.9	1.669	0.193
40	1½	48.3	5.1	1.902	0.201

Table 4: Butt-weld ANSI (B 36.10 Schedule 40)

Size		OD	T	OD	T
mm	in.	mm	mm	in.	in.
50	2	60.3	3.9	2.37	0.15
65	2½	73.0	5.2	2.87	0.20
80	3	88.9	5.5	3.50	0.22
100	4	114.3	6.0	4.50	0.24
125	5	141.3	6.6	5.56	0.26
150	6	168.3	7.1	6.63	0.28
200	8	219.1	8.2	8.63	0.32

Figure 5: SD (DIN )

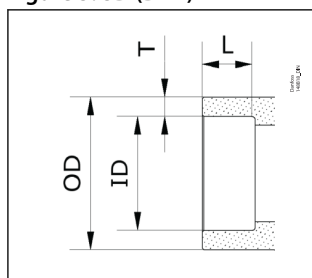


Table 5: Socket-Brazing DIN ( EN 1254-5)

Size		ID	L	OD	T
mm	in.	mm	mm	mm	mm
6	¼	6	7.7	12.7	3.35
10	⅜	10	8	15.88	2.94
15	½	16	8	21.3	2.65
20	¾	22	11	26.9	2.45
25	1	28	11	33.7	2.85
32	1¼	35	15	42.4	3.7
40	1½	42	15	48.3	3.15
50	2	54	13.5	60.3	3.15
65	2½	64	13.5	73	4.5
80	3	76.1	15	88.9	6.4
100	4	108	17.5	118	5

Figure 6: SA (ASME)

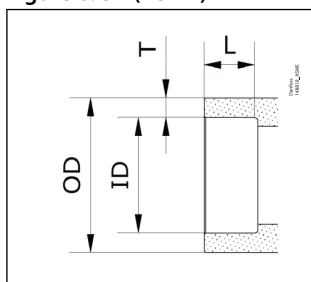


Table 6: Socket-Brazing ASME (ASME B16.50)

Size	ID	L	OD	T
in.	mm	mm	mm	mm
¼	6.35	7.7	12.7	3.18
¾	9.53	8	15.88	3.18
¾	15.88	8	21.3	2.71
7/8	22.23	11	26.9	2.34
1 1/8	28.58	11	33.7	2.56
1 1/2	34.93	15	42.4	3.74
1 3/4	41.28	15	48.3	3.51
2 1/2	54	13.5	60.3	3.15
2 3/4	66.7	13.5	76.1	4.70
3 1/2	79.38	15	88.9	4.76
4 1/2	104.78	17.5	114.3	4.76

The design fits with all copper pipes having following tolerance to the nominal diameter.

Table 7: Tolerance for nominal diameter

Copper pipe diameter	Tolerance
≥3mm up to ≤18 mm	±0,04 mm
Over 18 mm up to ≤28 mm	±0,05 mm
Over 28 mm up to ≤54 mm	±0,06 mm
Over 54 mm up to ≤76,1 mm	±0,07 mm
Over 76,1 mm up to ≤88,9 mm	±0,07 mm
Over 88,9 mm up to ≤108 mm	±0,07 mm

Table 8: Available SVL products for 65 bar (943 psi)

Size [DN]	Parts program																Service kit <sup>(1)</sup>	Complete valve							
	Housing								Top complete								O-ring kit for	SVA (cap)				FIA			
	ANG				STR				SVA-S (cap)	SVA-L (cap)	SCA-X	CHV-X	REG-SA	REG-SB	FIA	R717 Heat Pump	R127 Pro-pylene	ANG		STR		ANG		STR	
	DIN	AN-SI	SD	SA	DIN	AN-SI	SD	SA										DIN	AN-SI	DIN	AN-SI	DIN	AN-SI	DIN	AN-SI
6	x	x	x	x	x	x	x	x	x										x		x				
10	x	x	x	x	x	x	x	x	x				x	x		x	x		x		x				
15	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x		x				
20	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x		x				
25	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x		x				
32	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x		x				
40	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x		x				
50	x	x	x	x	x	x	x	x	x		x	x		x	x	x	x		x		x				
65	x	x	x	x	x	x	x	x	x		x	x		x	x	x	x		x		x				
80	x	x	x	x	x	x	x	x	x		x	x			x	x	x		x		x				
100	x	x	x	x	x	x	x	x	x		x	x			x	x	x		x		x				
125	x	x			x	x			x		x	x			x	x	x		x		x				
150																		x	x	x	x	x	x	x	x
200																		x	x	x	x	x	x	x	x

<sup>(1)</sup> To be used for SCA-X, CHV-X (all sizes) and REG-SA/SB (sizes 10 to 40).

x = Available

## Computation and selection

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.

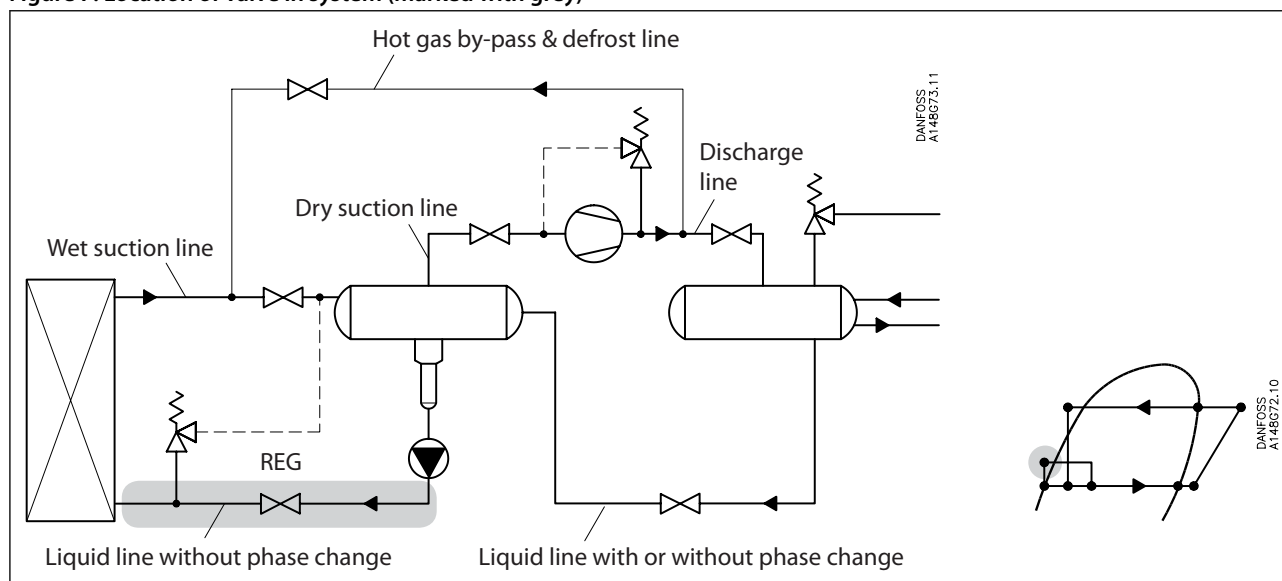
Normal flow is the term used to describe the general case where the flow through the valve is proportional to the square root of the pressure drop across it and inversely proportional to the density of the refrigerant (Bernouillis equation).

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 Coolselector®2.

**Figure 7: Location of valve in system (marked with grey)**



## Sizing regulating valve for liquid flow

Liquid refrigerants: Use the liquid tables, [Figure 13](#), [Figure 14](#), [Figure 15](#), [Figure 16](#), [Figure 17](#). For other refrigerants and brines, "Normal flow" (Turbulent flow); see below and use the flow coefficient tables ([Figure 8](#), [Figure 9](#), [Figure 10](#), [Figure 11](#), [Figure 12](#)).

### 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:

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



## Hand operated regulating valve, type REG-SA and REG-SB 65

$k_v$	[m³/h]	Quantity [m³/h] of water flowing through a valve at a pressure loss of 1 bar (according to VDE/VDI Norm 2173).
$P_1$	[bar]	Pressure before the valve (upstream).
$P_2$	[bar]	Pressure after the valve (downstream).
$\Delta p$	[bar]	Actual pressure loss across the valve ( $P_1 - P_2$ ).
$G$	[kg/h]	Mass flow through the valve.
$V$	[m³/h]	Volume flow through the valve.
$\rho$	[kg/m³]	Density of the refrigerant before the valve.
$C_A$		Calculation factor (See <a href="#">Figure 18</a> ).

### 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:

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

$C_v$	[US gal/min]	Quantity [US gal/min] of water flowing through a valve at a pressure loss of 1 psi.
$P_1$	[psi]	Pressure before the valve (upstream).
$P_2$	[psi]	Pressure after the valve (downstream).
$\Delta p$	[psi]	Actual pressure loss across the valve ( $P_1 - P_2$ ).
$G$	[lb/min]	Mass flow through the valve.
$V$	[US gal/min]	Volume flow through the valve.
$\rho$	[lb/ft³]	Density of the refrigerant before the valve.
$C_A$		Calculation factor (See <a href="#">Figure 18: Calculation factor <math>C_A</math></a> ).

Figure 8: REG-SA 15-20 and REG-SB 15-20

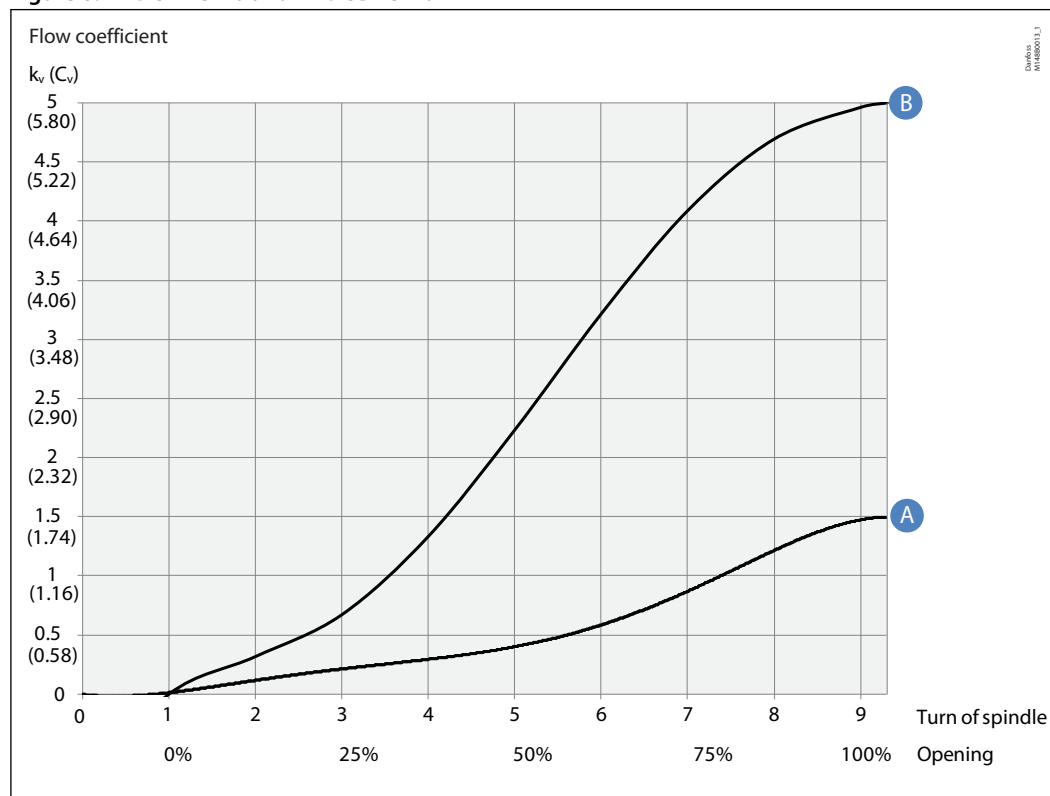


Figure 9: REG-SA 25-40 and REG-SB 25-40

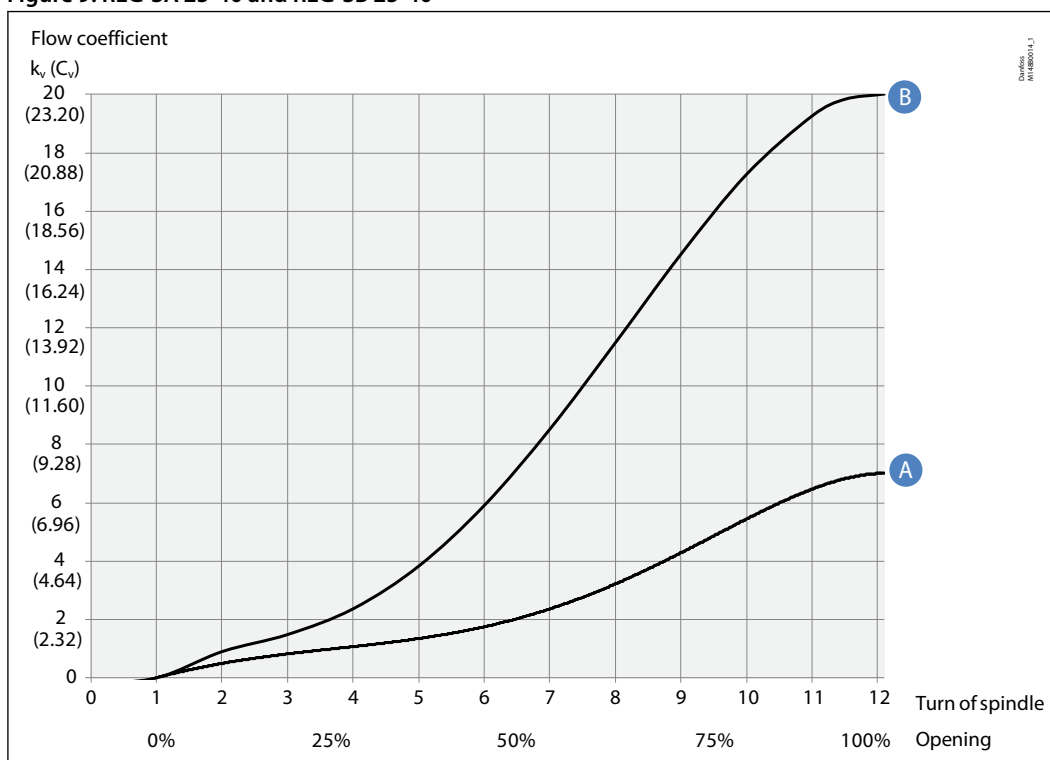


Figure 10: REG-SB 50

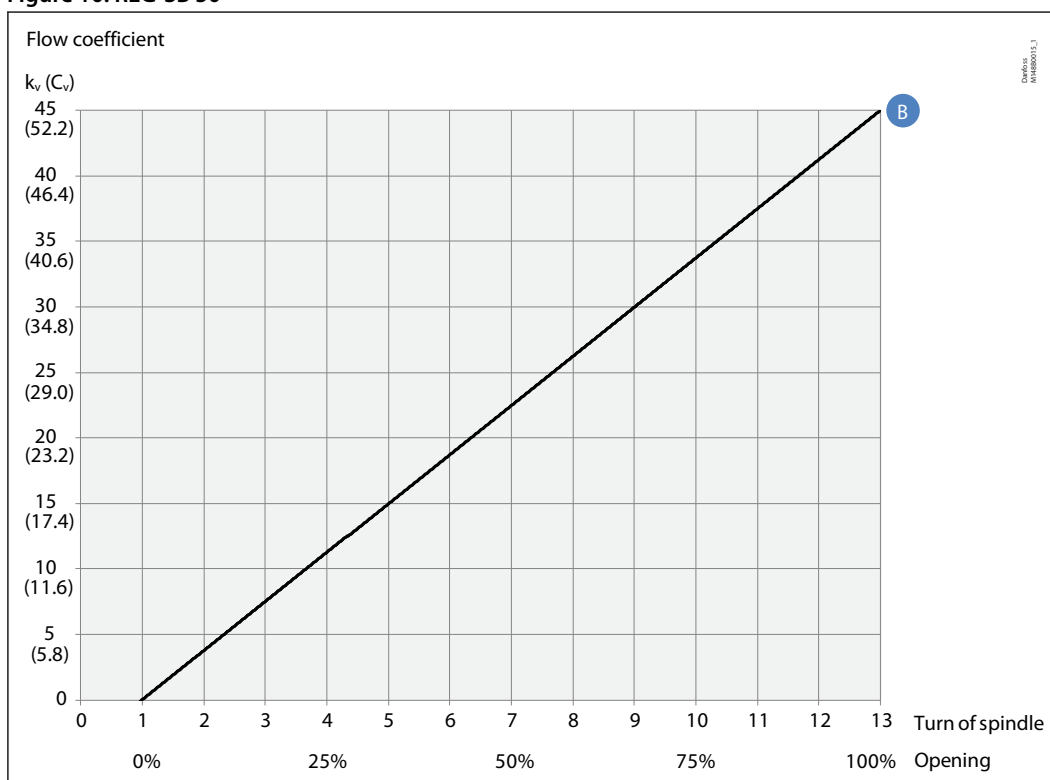
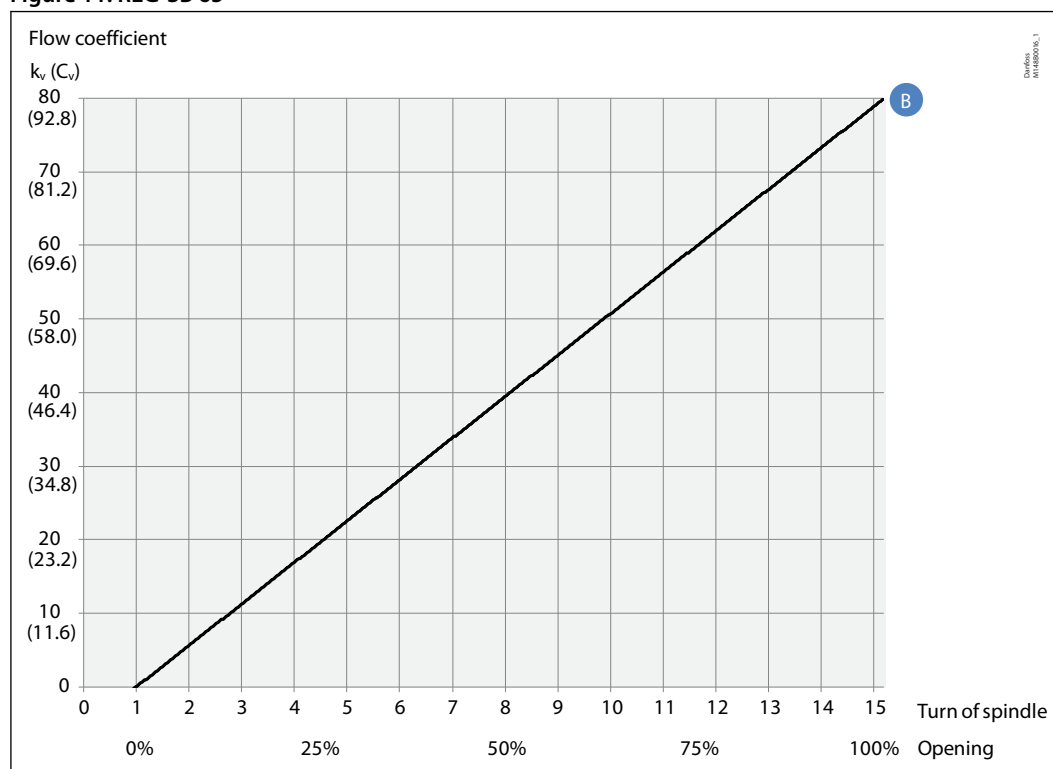


Figure 11: REG-SB 65



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

Figure 12: REG-SA 15-20 and REG-SB 15-20

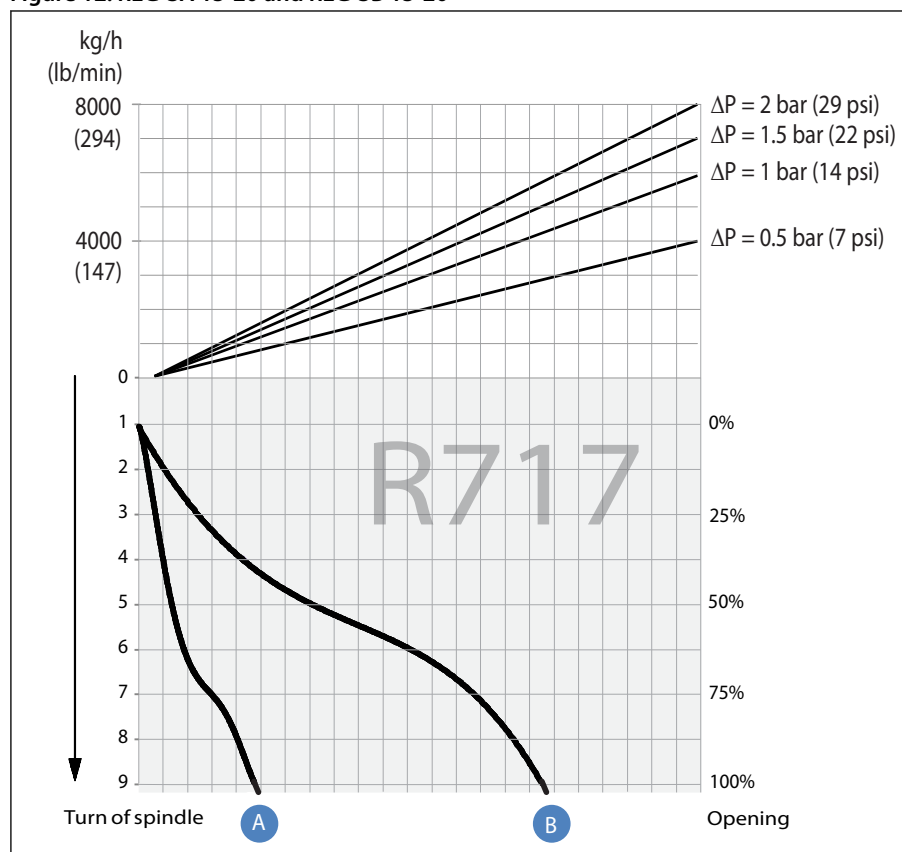
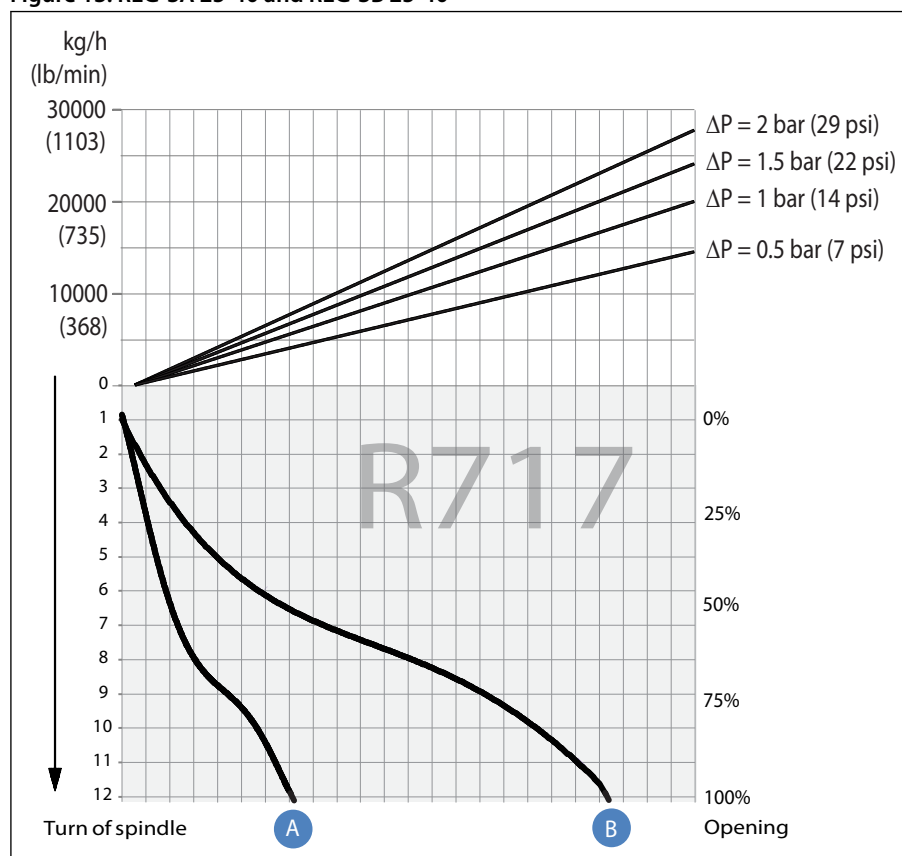


Figure 13: REG-SA 25-40 and REG-SB 25-40



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

Figure 14: REG-SB 50

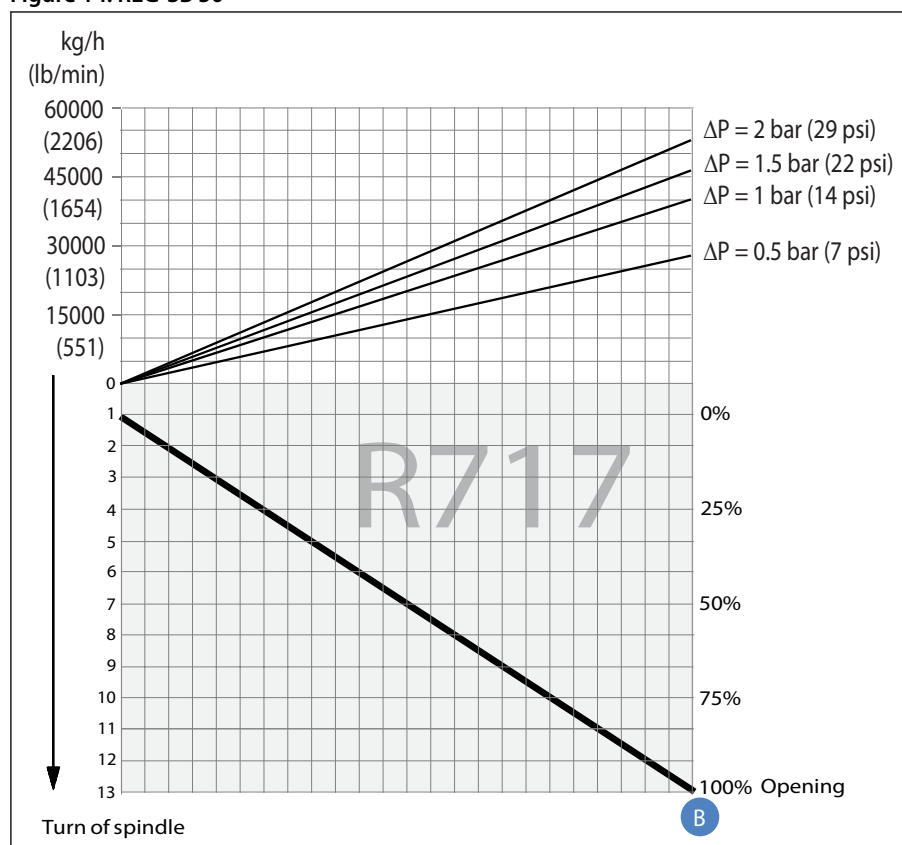
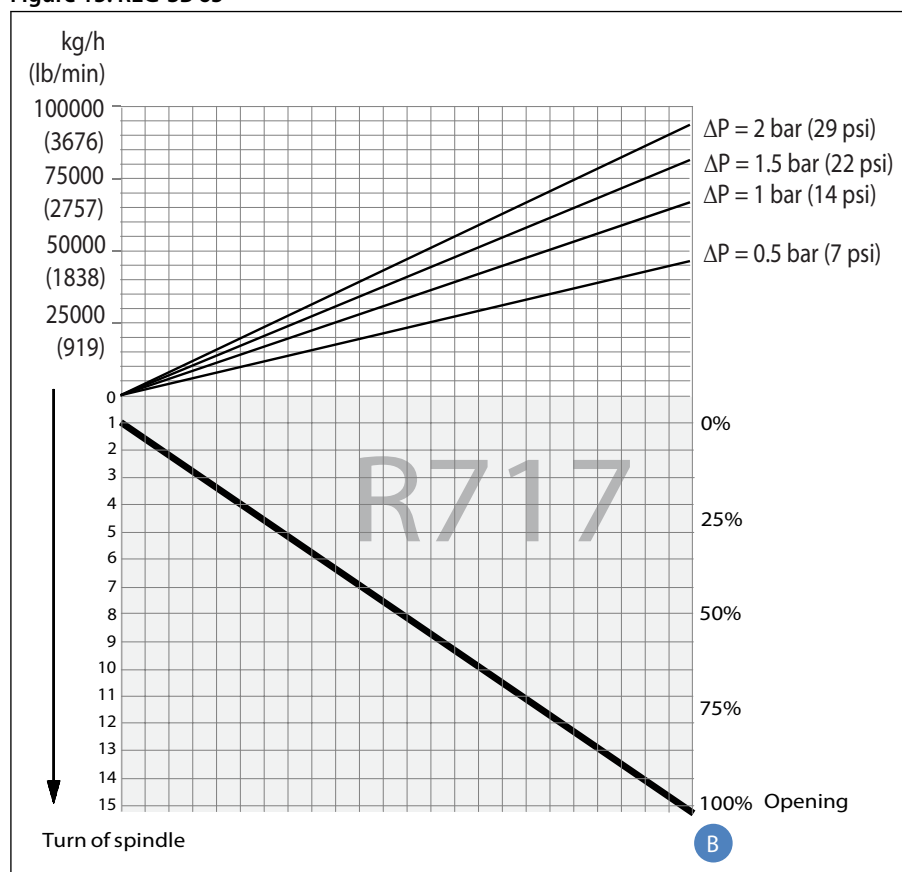
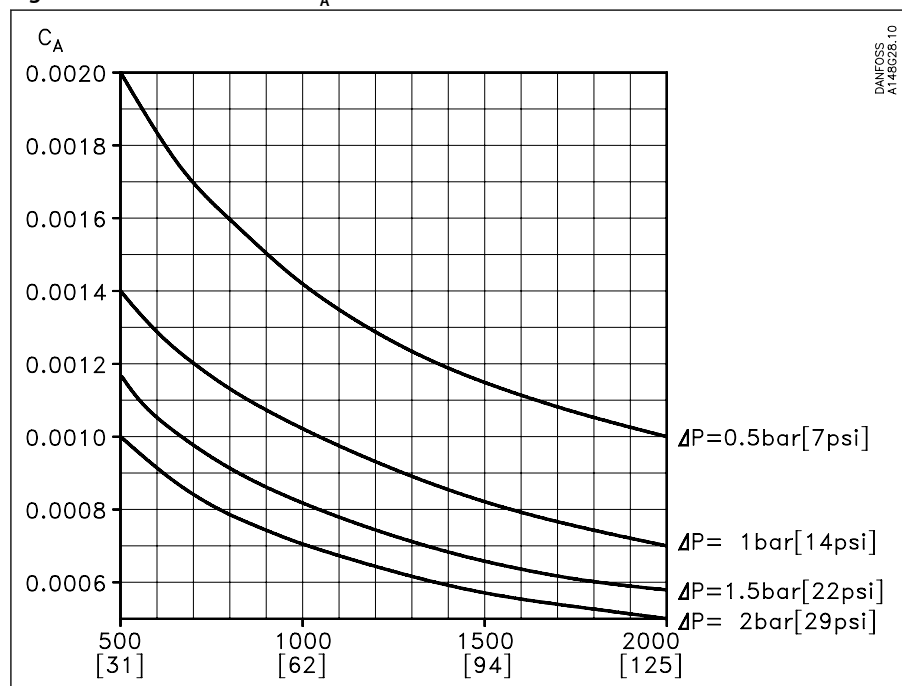


Figure 15: REG-SB 65



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

Figure 16: Calculation factor  $C_A$



**NOTE:**

For choice of valve size and connection see "".

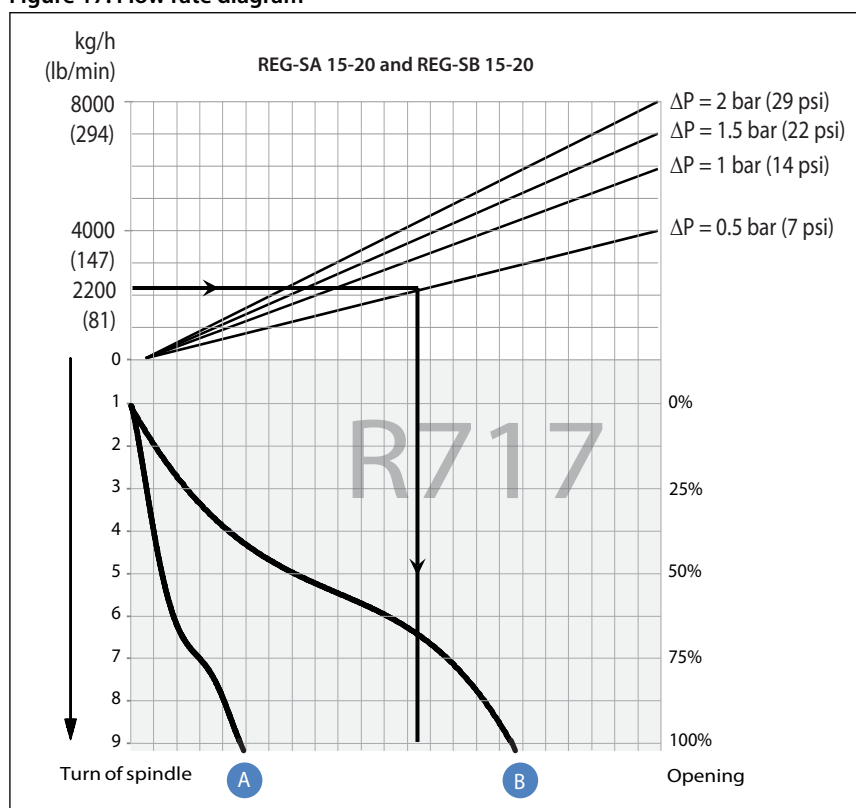
## Computation and selection Example 1

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 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.

Figure 17: 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 (Figure 12, Figure 13, Figure 14, Figure 15) as the refrigerant in question is not included.

Use the curves of the  $k_v$ -values instead (Figure 8, Figure 9, Figure 10, Figure 11) 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  $C_A$  (Figure 18) and the flow rate diagram (in this example: Figure 19) as per the following calculation example.

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

Calculation example:

Figure 18: Calculation factor  $C_A$

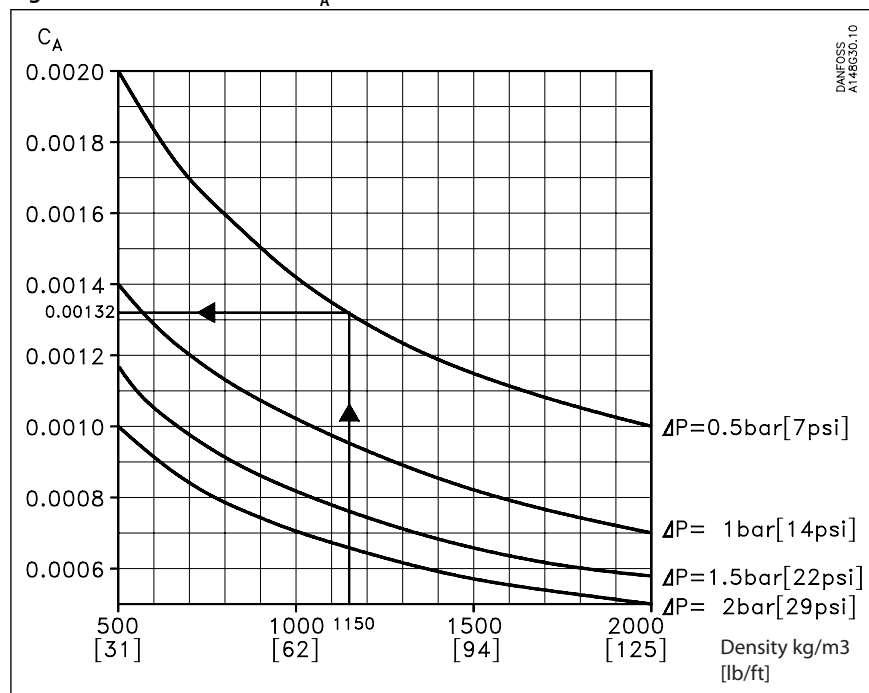
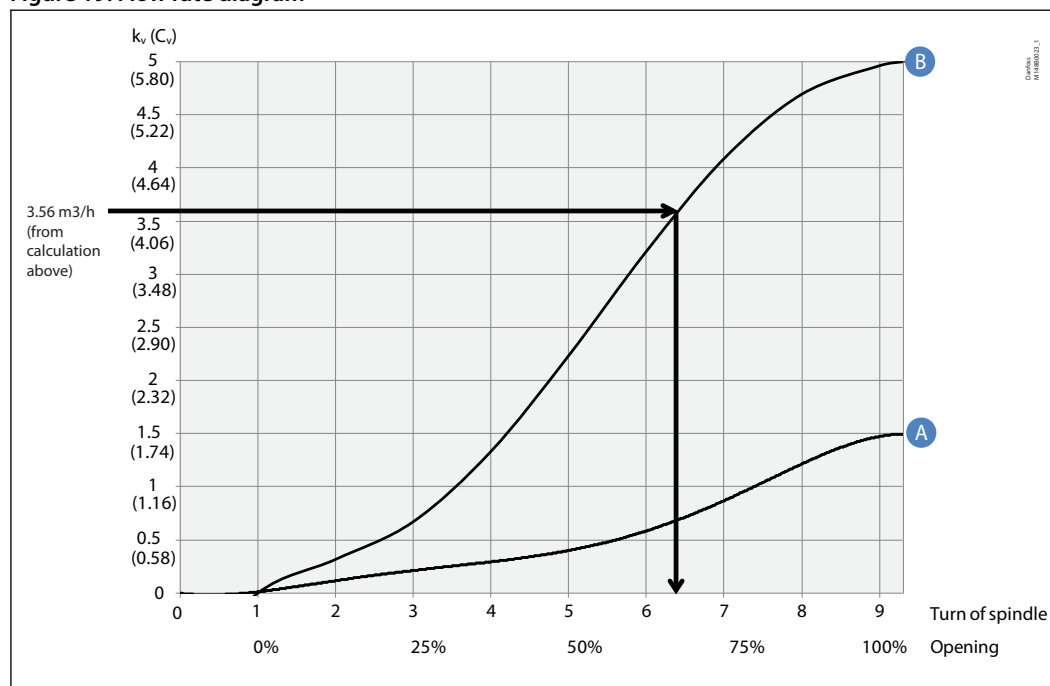


Figure 19: Flow rate diagram



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

## Material specification

Figure 20: REG-SA and REG-SB 10 - 65

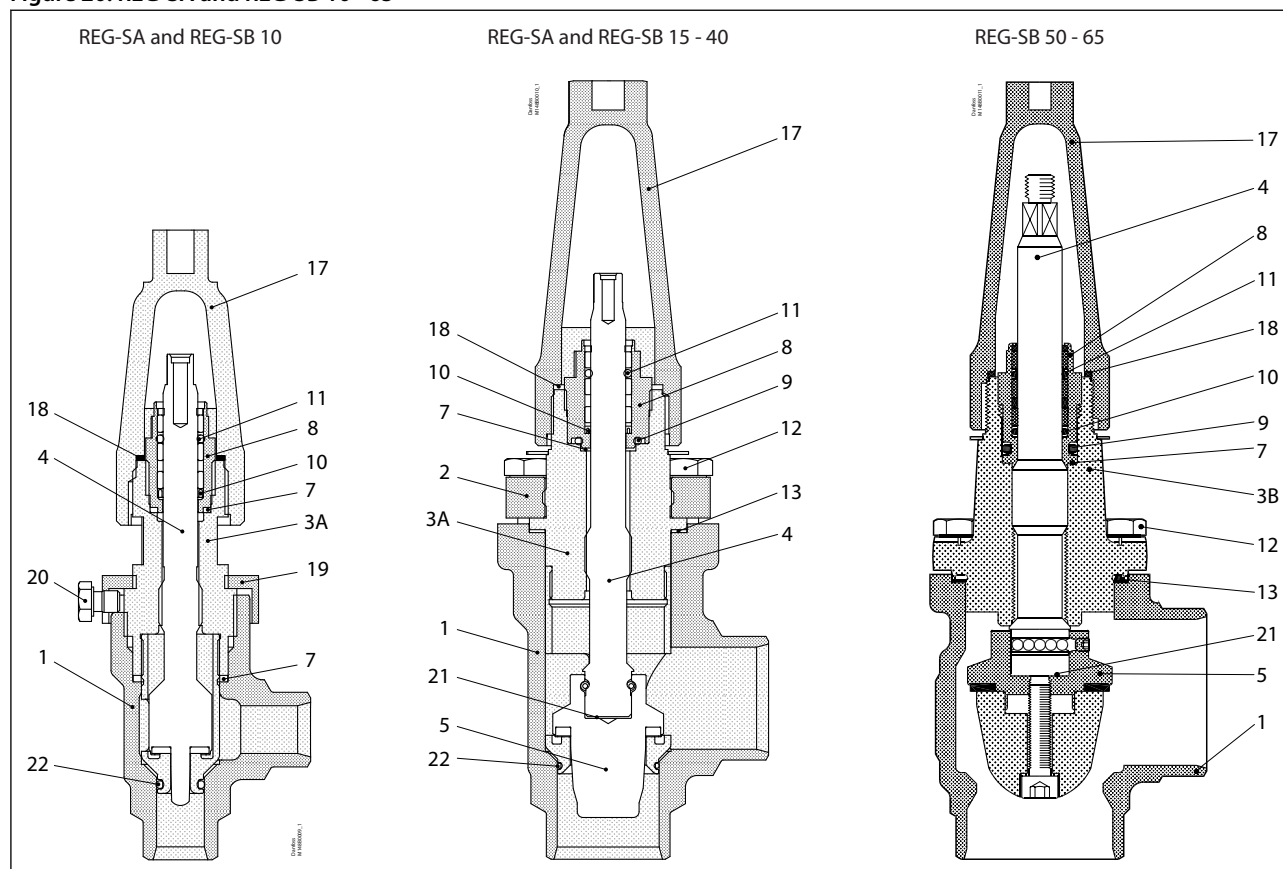


Table 9: Material and part list

No.	Part	Material	EN	ISO	ASTM
1	Housing	Steel	G20Mn5QT, 10213-3 P285QH+QT, 10222-4		LCC, A352 LF2, A350
2	DN 15 - 40 (½ - 1½ in.) – Bonnet, Flange	Steel	P275NL1 or 2 EN10028-3		A, A662
3A	DN 15 - 40 (¾ - 1½ in.) – Bonnet, Insert	Steel	11SMn30 10087	Type 2, R 683-9	1213 SAE J403
3B	DN 50 - 65 (2 - 2½ in.) – Bonnet, Flange	Steel	P285QH+QT 10222-4		LF2 A350
4	Spindle - DN 15 - 65 (¼ - 2½ in.)	Stainless steel	X8CrNiS 18-9, 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	Chloroprene (Neoprene)			
10	Spring loaded Teflon ring	PTFE			
11	O-ring	Chloroprene (Neoprene)			
12	Bolts	High temperature steel	42CrMo4 10269		A193
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			
22	O-ring	Chloroprene (Neoprene) <sup>(1)</sup>			

<sup>(1)</sup> To be replaced in R717 Heat Pump and R1270 Propylene applications.



## Dimensions and weights

Figure 21: REG-SA and REG-SB 15 - 65 in angleway version

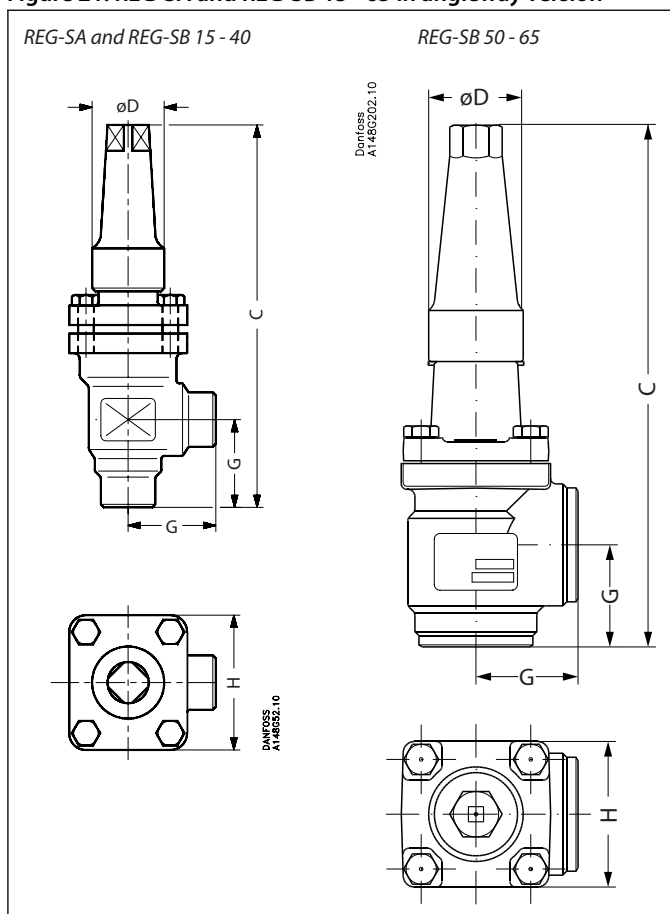


Table 10: REG-SA and REG-SB 15 - 65 in angleway version

Valve size		C	G	ØD	H	Weight
REG-SA/SB 15-20	mm	182	45	38	60	1.4 kg
REG-SA/SB (½-¾)	in.	7.17	1.77	1.50	2.36	3.1 lb
REG-SA/SB 25-40	mm	237	55	50	70	2.4 kg
REG-SA/SB (1-1½)	in.	9.33	2.17	1.97	2.76	5.3 lb
REG-SB 50	mm	315	60	50	77	3.2 kg
REG-SB (2 in.)	in.	12.4	2.36	1.97	3.03	7.1 lb
REG-SB 65	mm	335	70	50	90	4.8 kg
REG-SB (2½ in.)	in.	13.19	2.76	1.97	3.54	10.6 lb

**NOTE:**

Specified weights are approximate values only.

Figure 22: REG-SA and REG-SB 15 - 40 in straightway version

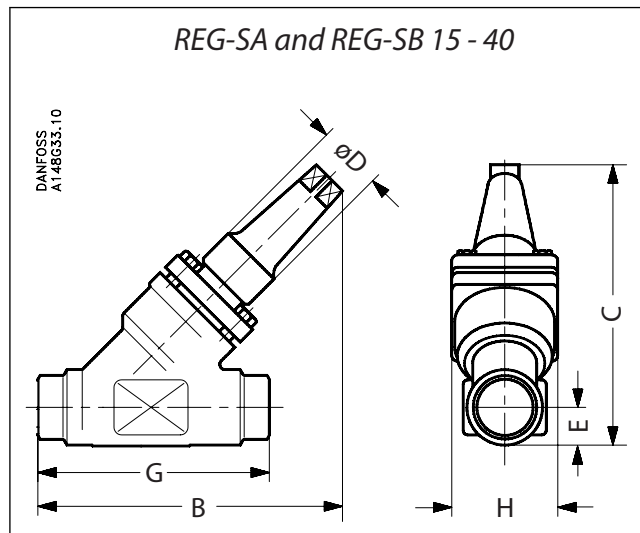


Figure 23: REG-SB 50-65 in straightway version

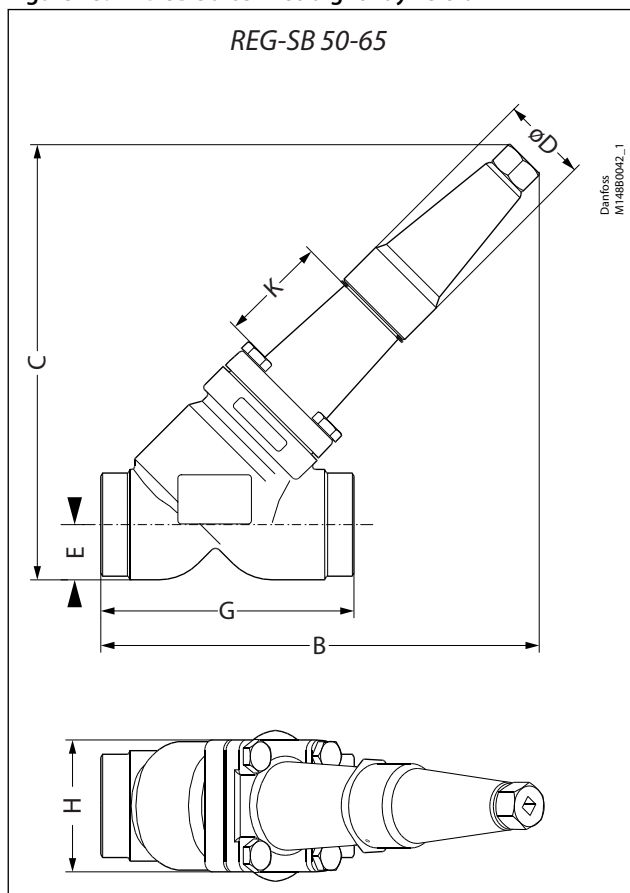


Table 11: REG-SA and REG-SB 15 - 65 in straightway version

Valve size		C	B	E	G	ØD	H	Weight
REG-SA/SB 15-20	mm	145	155	20	120	38	60	2.0 kg
REG-SA/SB (½-¾)	in.	5.71	6.10	0.79	4.72	1.50	2.36	4.4 lb
REG-SA/SB 25-40	mm	200	215	26	155	50	70	3.0 kg
REG-SA/SB (1-1½)	in.	7.87	8.46	1.02	6.10	1.97	2.76	6.6 lb
REG-SB 50	mm	257	250	32	148	50	77	4.2 kg
REG-SB (2 in.)	in.	10.12	10.20	1.26	5.83	1.97	3.03	9.3 lb
REG-SB 65	mm	280	284	40	176	50	90	6.3 kg
REG-SB (2½ in.)	in.	11.02	11.18	1.57	6.93	1.97	3.54	13.9 lb

**NOTE:**

Specified weights are approximate values only.

## Ordering

Table 12: Ordering for REG-SA and REG-SB 65 bar (943 psi) series

Size [DN]	Parts Program										Service kit <sup>(1)</sup>	
	Housing								Top complete		O-ring kit for	
	ANG				STR				REG-SA	REG-SB	R717 Heat Pump	R1270 Propylene
	DIN	ANSI	SD	SA	DIN	ANSI	SD	SA				
6	148B6689	148B6687	148B6722	148B6711	148B6693	148B6691	148B6743	148B6732				
10	148B6690	148B6688	148B6723	148B6712	148B6694	148B6692	148B6744	148B6733	148B5761	148B5764	148B6084	148B6085
15	148B6622	148B6612	148B6724	148B6713	148B6642	148B6632	148B6745	148B6734	148B5762	148B5765	148B6070	148B6077
20	148B6623	148B6613	148B6725	148B6714	148B6643	148B6633	148B6746	148B6735	148B5762	148B5765		
25	148B6624	148B6614	148B6726	148B6715	148B6644	148B6634	148B6747	148B6736	148B5763	148B5766		
32	148B6625	148B6615	148B6727	148B6716	148B6645	148B6635	148B6748	148B6737	148B5763	148B5766	148B6071 148B6096 <sup>(2)</sup>	148B6078 148B6097 <sup>(2)</sup>
40	148B6626	148B6616	148B6728	148B6717	148B6646	148B6636	148B6749	148B6738	148B5763	148B5766		
50	148B6627	148B6617	148B6718		148B6647	148B6637	148B6739			148B5767	148B6072	148B6079
65	148B6628	148B6618	148B6729	148B6719	148B6648	148B6638	148B6750	148B6740		148B5768	148B6073	148B6080
80	148B6629	148B6619	148B6730	148B6720	148B6649	148B6639	148B6751	148B6741			148B6074	148B6081
100	148B6630	148B6620	148B6731	148B6721	148B6650	148B6640	148B6752	148B6742			148B6075	148B6082
125	148B6631	148B6621			148B6651	148B6641					148B6076	148B6083
150												
200												

<sup>(1)</sup> To be used for REG SA/SB (all sizes)


<sup>(2)</sup> To be used for REG SA/SB, 25-40

## Certificates, declarations, and approvals

The list contains all certificates, declarations, and approvals for this product type. Individual code number may have some or all of these approvals, and certain local approvals may not appear on the list.

Some approvals may change over time. You can check the most current status at [danfoss.com](https://danfoss.com) or contact your local Danfoss representative if you have any questions.

**Table 13: Pressure Equipment Directive (PED)**

	SVL valves are approved according to the European standard specified in the Pressure Equipment Directive and are CE marked.
---	---

For further details / restrictions - see Installation guide.

**Table 14: REG-SA and REG-SB**

REG-SA and REG-SB			
Nominal bore	DN≤ 25 mm (1 in.)	DN32-80 mm (1¼ - 3 in.)	DN100 - 200 mm (4-8 in.)
Classified for	Fluid group I		
Category	Article 3, paragraph 3	II	III

**Table 15: Certificates and declarations**

File name	Document type	Approval authority
03709-F0 BV	Marine - Safety Certificate	BV
TAP0000002 Rev. 2	Marine - Safety Certificate	DNV GL
EU 033F0685.AK	EU Declaration	Danfoss
MD 033F0691.AE	Manufacturers Declaration	Danfoss
19.10048.266	Marine - Safety Certificate	RMRS

## Online support

Danfoss offers a wide range of support along with our products, including digital product information, software, mobile apps, and expert guidance. See the possibilities below.

### The Danfoss Product Store



The Danfoss Product Store is your one-stop shop for everything product related—no matter where you are in the world or what area of the cooling industry you work in. Get quick access to essential information like product specs, code numbers, technical documentation, certifications, accessories, and more.

Start browsing at [store.danfoss.com](https://store.danfoss.com).

### Find technical documentation



Find the technical documentation you need to get your project up and running. Get direct access to our official collection of data sheets, certificates and declarations, manuals and guides, 3D models and drawings, case stories, brochures, and much more.

Start searching now at [www.danfoss.com/en/service-and-support/documentation](https://www.danfoss.com/en/service-and-support/documentation).

### Danfoss Learning



Danfoss Learning is a free online learning platform. It features courses and materials specifically designed to help engineers, installers, service technicians, and wholesalers better understand the products, applications, industry topics, and trends that will help you do your job better.

Create your Danfoss Learning account for free at [www.danfoss.com/en/service-and-support/learning](https://www.danfoss.com/en/service-and-support/learning).

### Get local information and support



Local Danfoss websites are the main sources for help and information about our company and products. Find product availability, get the latest regional news, or connect with a nearby expert—all in your own language.

Find your local Danfoss website here: [www.danfoss.com/en/choose-region](https://www.danfoss.com/en/choose-region).

### Spare Parts



Get access to the Danfoss spare parts and service kit catalog right from your smartphone. The app contains a wide range of components for air conditioning and refrigeration applications, such as valves, strainers, pressure switches, and sensors.

Download the Spare Parts app for free at [www.danfoss.com/en/service-and-support/downloads](https://www.danfoss.com/en/service-and-support/downloads).

### Coolselector®2 - find the best components for you HVAC/R system



Coolselector®2 makes it easy for engineers, consultants, and designers to find and order the best components for refrigeration and air conditioning systems. Run calculations based on your operating conditions and then choose the best setup for your system design.

Download Coolselector®2 for free at [coolselector.danfoss.com](https://coolselector.danfoss.com).

### Danfoss A/S

Climate Solutions • [danfoss.com](https://danfoss.com) • +45 7488 2222

Any information, including, but not limited to information on selection of product, its application or use, product design, weight, dimensions, capacity or any other technical data in product manuals, catalogues descriptions, advertisements, etc. and whether made available in writing, orally, electronically, online or via download, shall be considered informative, and is only binding if and to the extent, explicit reference is made in a quotation or order confirmation. Danfoss cannot accept any responsibility for possible errors in catalogues, brochures, videos and other material. Danfoss reserves the right to alter its products without notice. This also applies to products ordered but not delivered provided that such alterations can be made without changes to form, fit or function of the product.

All trademarks in this material are property of Danfoss A/S or Danfoss group companies. Danfoss and the Danfoss logo are trademarks of Danfoss A/S. All rights reserved.