

## Technical Leaflet

### Regulating valves

Type REG 6 - 65



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## Introduction



REG are angle-way and straight-way 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.

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

## Features

- Applicable to all common non flammable refrigerants including R 717 and non corrosive gases/liquids dependent to sealing material compatibility
- 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
- Max. operating pressure: 40 bar g (580 psi g) (valves for higher operating pressure available on request)
- Full temperature range packing gland  $-50/+150^{\circ}\text{C}$  ( $-58/+302^{\circ}\text{F}$ )
- Act as a normal stop valve in closed position
- Material on housing and bonnet are in 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 "DIRcalc™" (Danfoss Industrial Refrigeration calculation programme)
- Classification: To get an updated list of certification on the products please contact your local Danfoss Sales Company.

**Design**

*Housing*

Made of special, cold resistant steel approved for low temperature operation.

*Connections*

Available with the following connections:

- Butt-weld DIN (2448)  
- DN 6 - 65 (1/4 - 2 1/2 in.)
- Butt-weld ANSI (B 36.10 Schedule 80)  
- DN 15 - 40 (1/2 - 1 1/2 in.)
- Butt-weld ANSI (B 36.10 Schedule 40)  
- DN 50 - 65 (2 - 2 1/2 in.)
- Socket weld (ANSI B 16.11)  
- DN 15 - 40 (1/2 - 1 1/2 in.)
- Soldering connections (ANSI B 16.22)  
- DN 10 - 22 (3/8 - 7/8 in.)
- FPT inside pipe thread, NPT (ANSI/ASME B 1.20.1)  
- DN 15 - 32 (1/2 - 1 1/4 in.)

*Valve cone*

The valve cone is designed to ensure perfect regulation. A wide programme of valves and various precision cones provide an extensive regulating area, and irrespective of the refrigerant used, it is easy to obtain the correct capacity (see fig. 1). A cone seal ring provides perfect sealing at a minimum closing momentum.

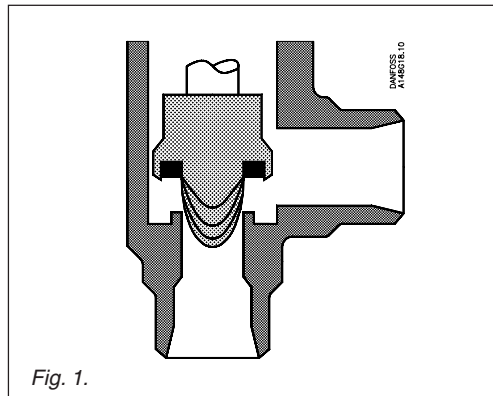


Fig. 1.

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

*Spindle*

Made of polished stainless steel, which is ideal for O-ring sealing.

*Packing gland*

The "full temperature range" packing gland ensures perfect tightness in the whole range: -50/+150°C (-58/+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 installation instruction for REG.



*Pressure Equipment Directive (PED)*

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

For further details / restrictions - see Installation Instruction.

REG valves	
Nominal bore	DN32 - 65 (1 1/4 - 2 1/2 in.)
Classified for	Fluid group I
Category	II

**Technical data**

- Refrigerants  
Applicable to all common non flammable refrigerants including R 717 and non corrosive gases/liquids dependent on sealing material compatibility. For further information please see installation instruction for REG. Flammable hydrocarbons are not recommended. For further information please contact your local Danfoss Sales Company.
- Temperature range  
-50/+150°C (-58/+302°F).

- Pressure range  
The valve is designed for:  
Max. operating pressure is 40 bar g (580 psi g).  
Strength test: 80 bar g (1450 psi g).  
Leakage test: 40 bar g (580 psi g).  
Valves for higher working pressure are available on request.
- Flow coefficients  
Flow coefficients for fully opened valves from  $k_v = 0.17$  to  $81.4 \text{ m}^3/\text{h}$  ( $C_v = 0.12$  to  $57.3 \text{ USgal}/\text{min}$ )

**Computation and selection**

*Introduction*

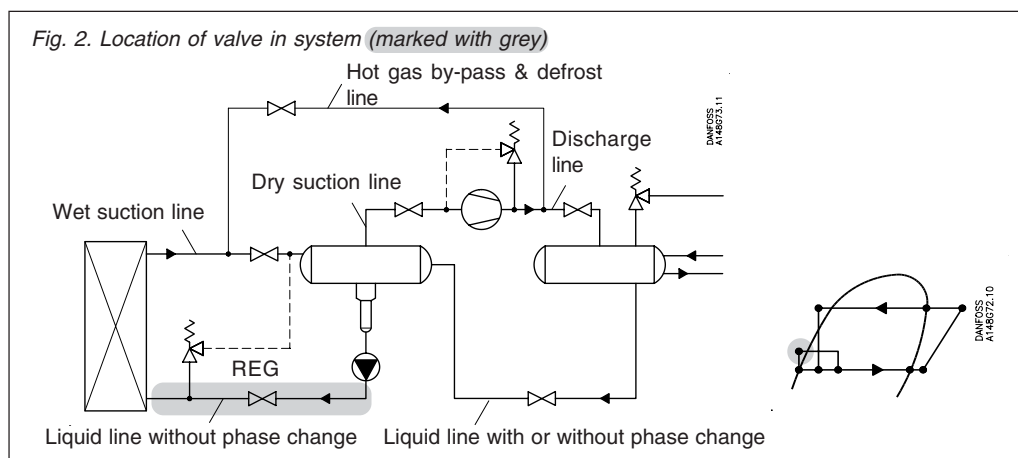
In refrigeration plants, regulating valves are primarily used in liquid lines in order to regulate the flow of refrigerant. The valves can, however, also be used as expansion valves. From a calculation point of view the two fields of application are very different.

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 (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 "DIRcalc™" (Danfoss Industrial Refrigeration calculation programme).



*Sizing regulating valve for liquid flow*

Liquid refrigerants: Use the liquid tables, fig. 8 - 17. For other refrigerants and brines, "Normal flow" (Turbulent flow); see below and use the flow coefficient tables (fig. 3 - 7).

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:

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

- $k_v$  [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).
- $P_1$  [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.
- $\dot{V}$  [m<sup>3</sup>/h] Volume flow through the valve.
- $\rho$  [kg/m<sup>3</sup>] Density of the refrigerant before the valve.
- $C_A$  Calculation factor (fig. 18).

American Units

Mass flow:

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

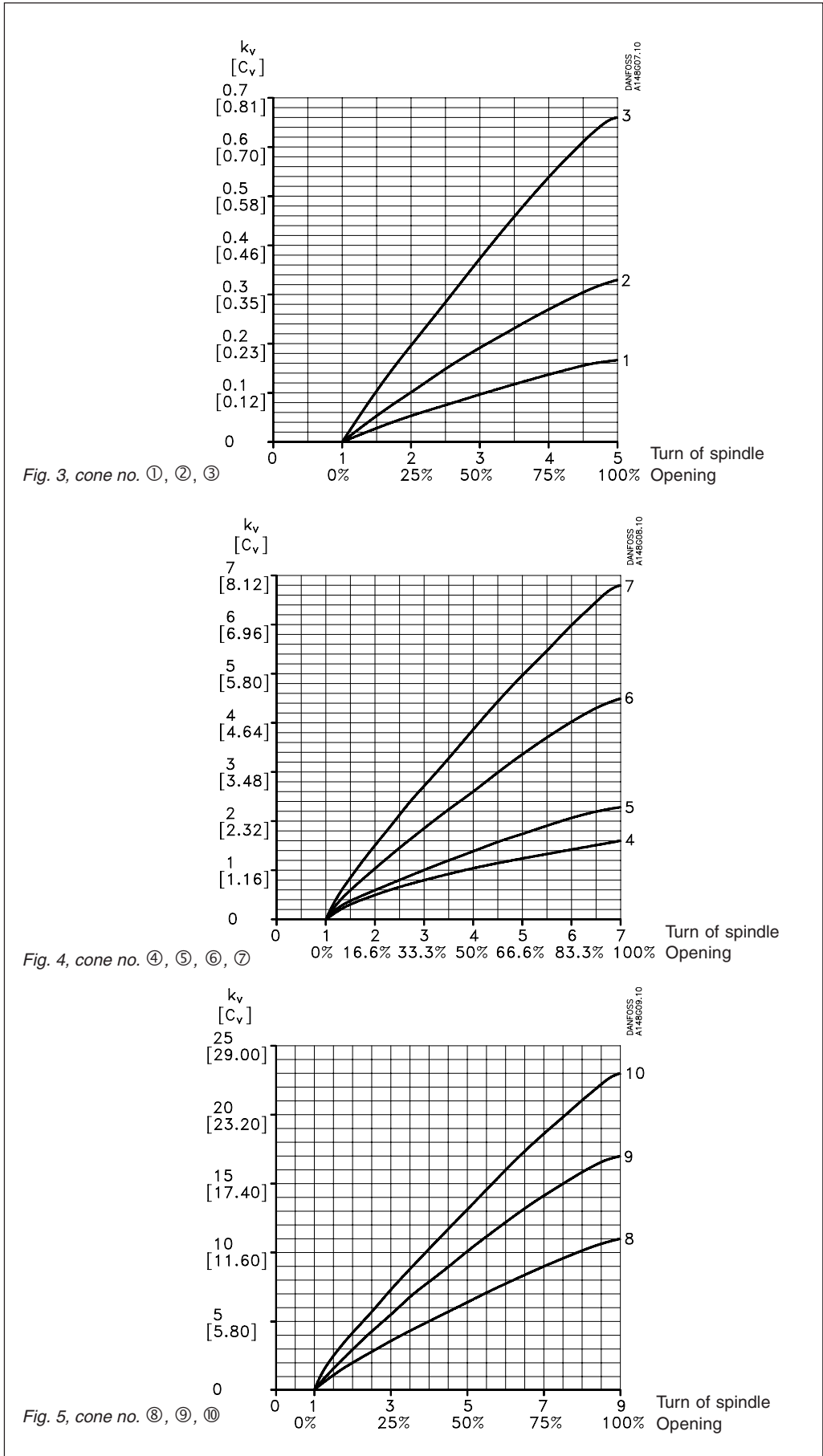
Volume flow:

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

- $C_v$  [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.
- $\dot{V}$  [US gal/min] Volume flow through the valve.
- $\rho$  [lb/ft<sup>3</sup>] Density of the refrigerant before the valve
- $C_A$  Calculation factor (fig. 18).

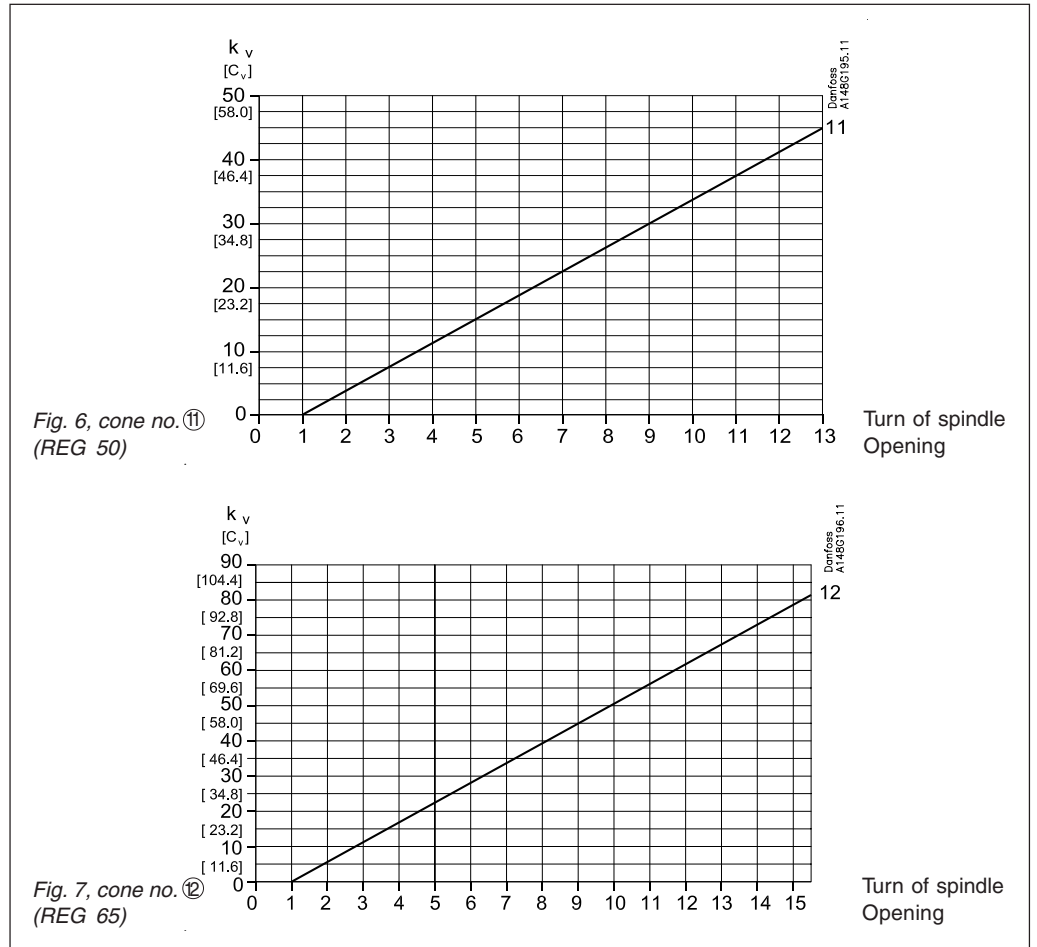
Computation and selection *Flow coefficient*

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



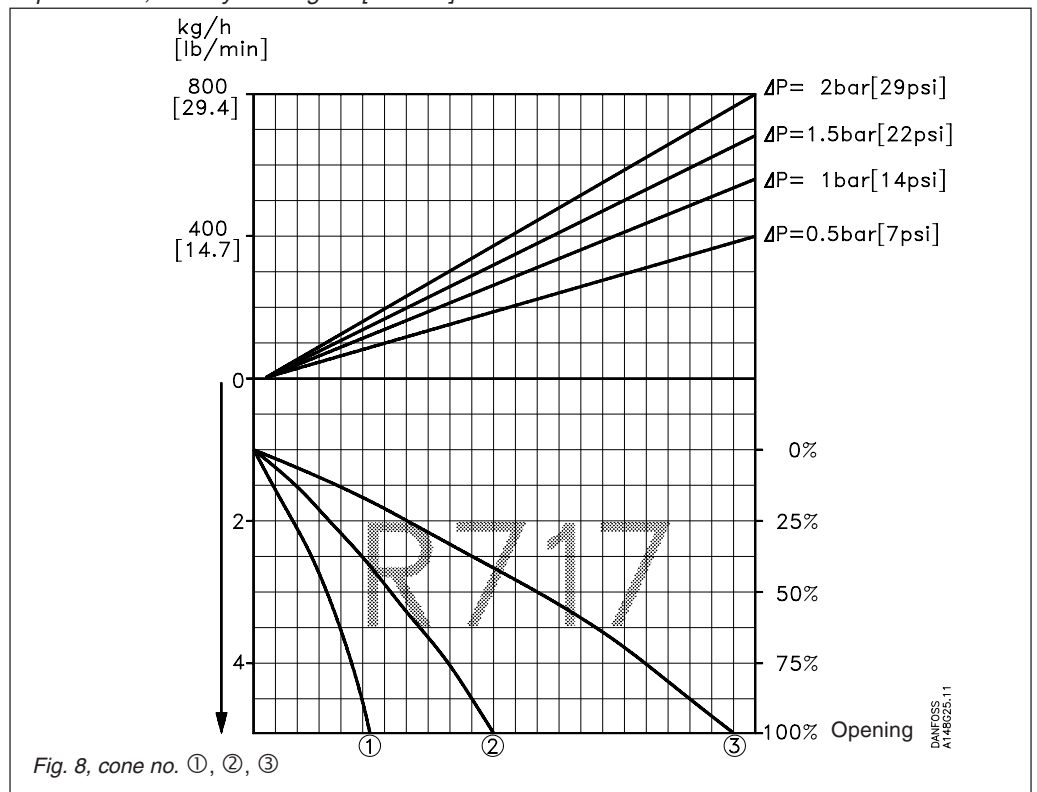
Computation and selection *Flow coefficient*

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



Computation and selection *Liquid R 717, density: 670 kg/m³ [42 lb/ft³]*

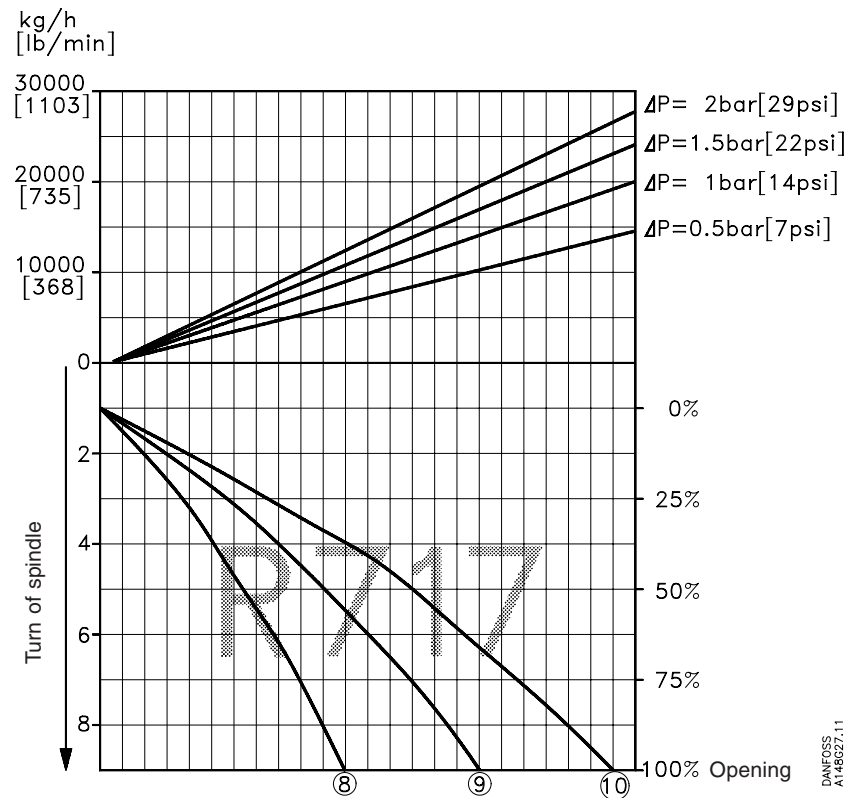
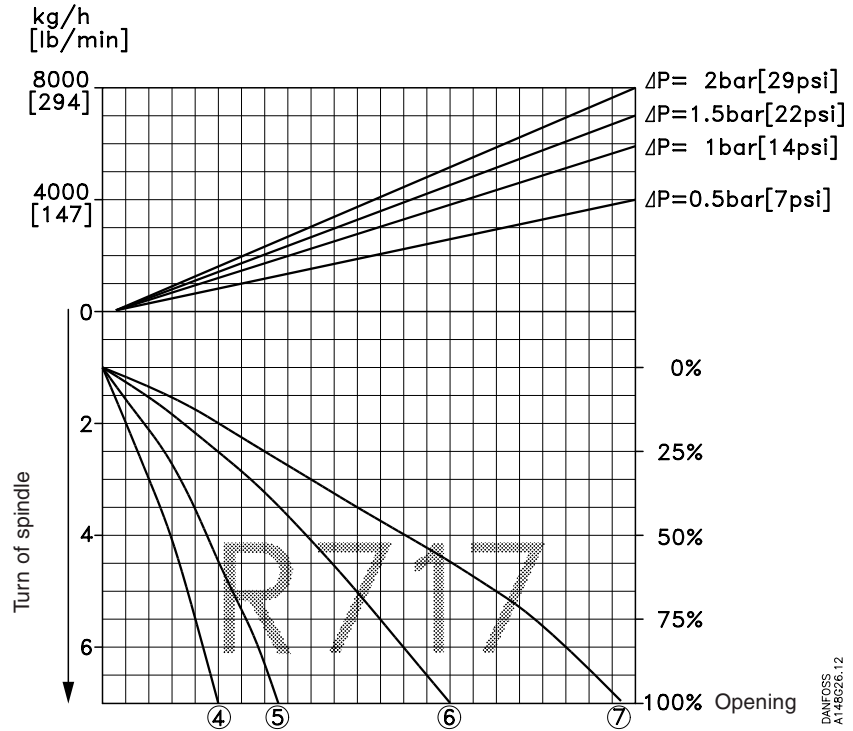
For choice of valve size and connection see "Connections".



Computation and selection

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

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".

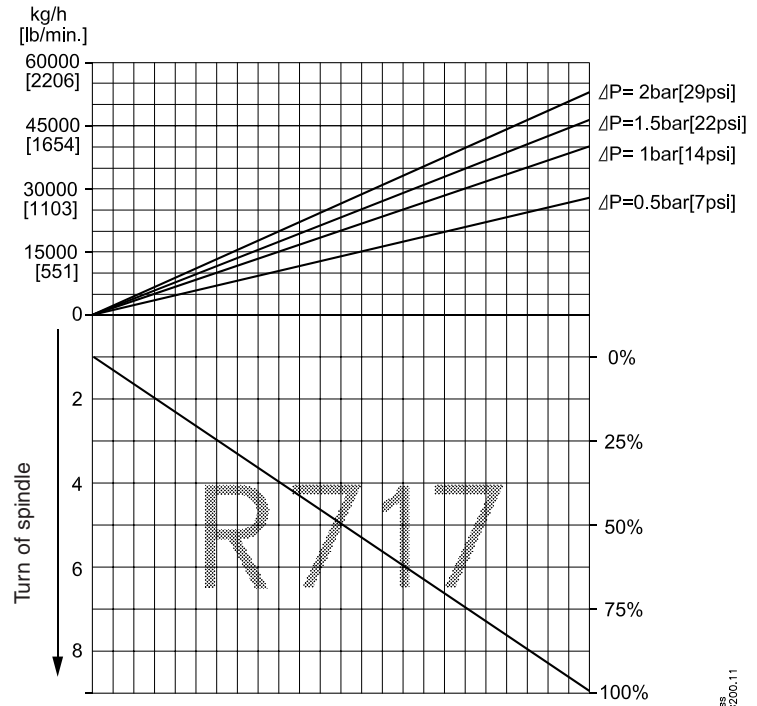


Fig. 11, cone no. ⑪

⑪ Opening

Danfoss  
A1486200.11

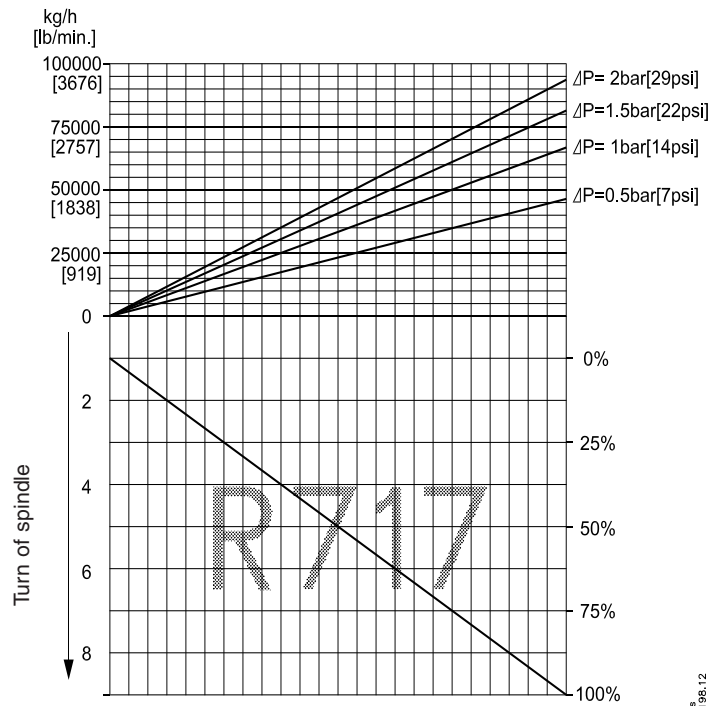


Fig. 12, cone no. ⑫

⑫ Opening

Danfoss  
A1486198.12

Computation and selection

Liquid R 22, density: 1360 kg/m<sup>3</sup> [85 lb/ft<sup>3</sup>]

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

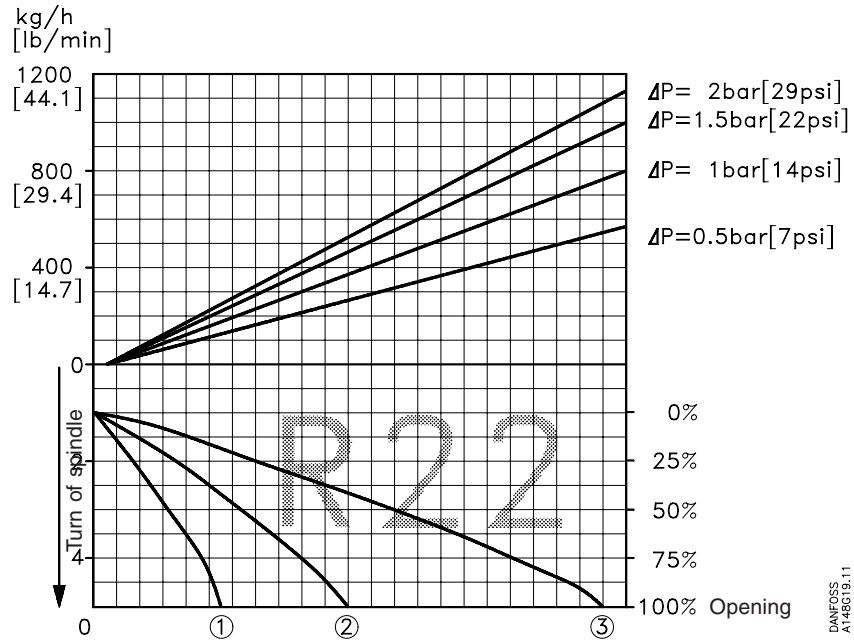


Fig. 13, cone no. ①, ②, ③

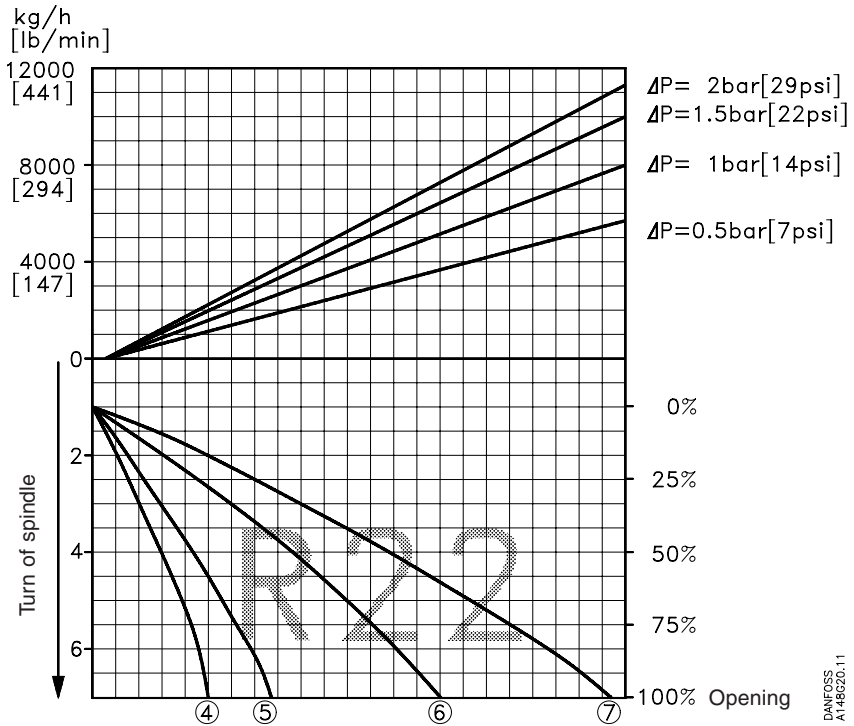


Fig. 14, cone no. ④, ⑤, ⑥, ⑦

Computation and selection

Liquid R 22, density: 1360 kg/m<sup>3</sup> [85 lb/ft<sup>3</sup>]

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

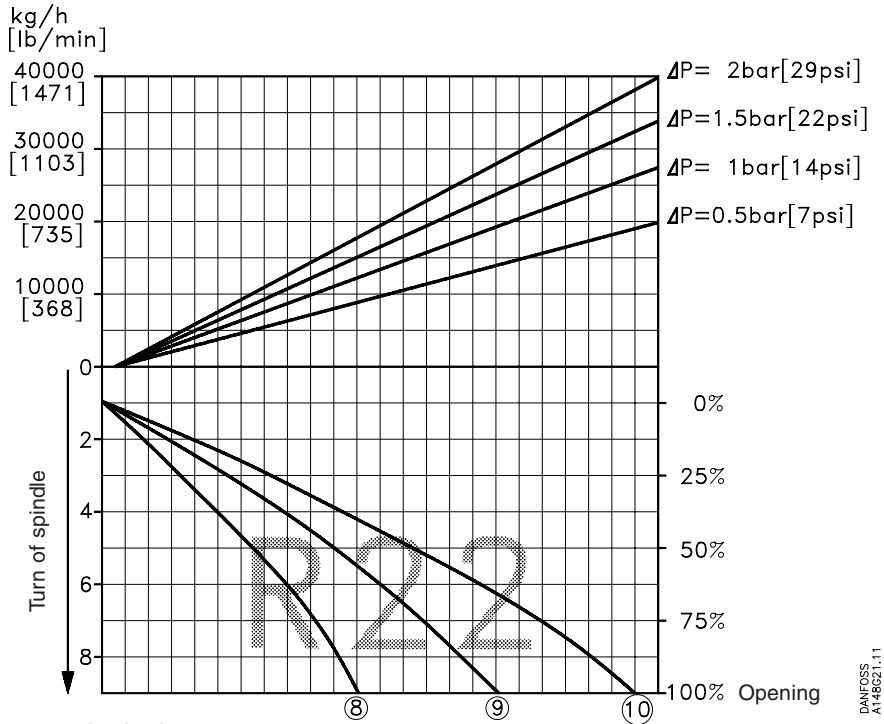


Fig. 15, cone no. ⑧, ⑨, ⑩

DANFOSS  
A148C21.11

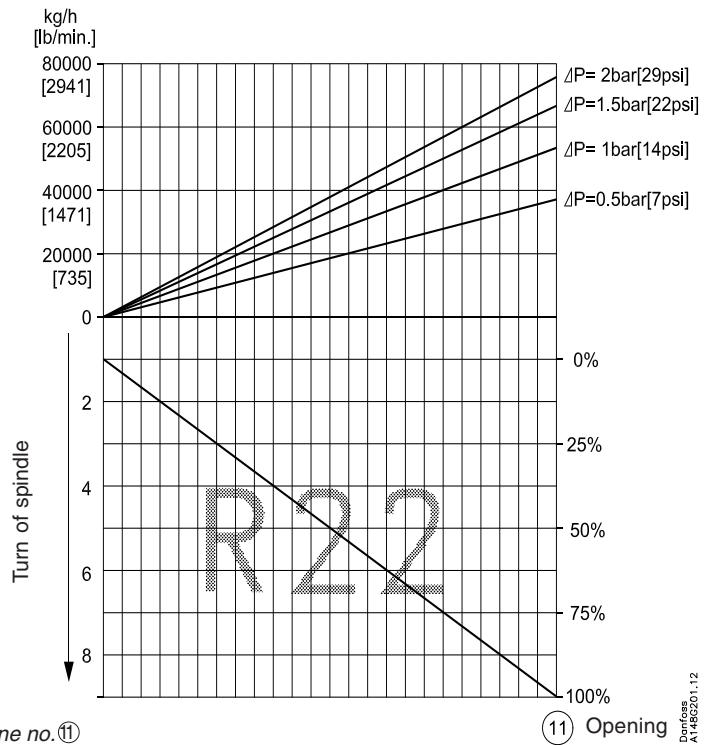


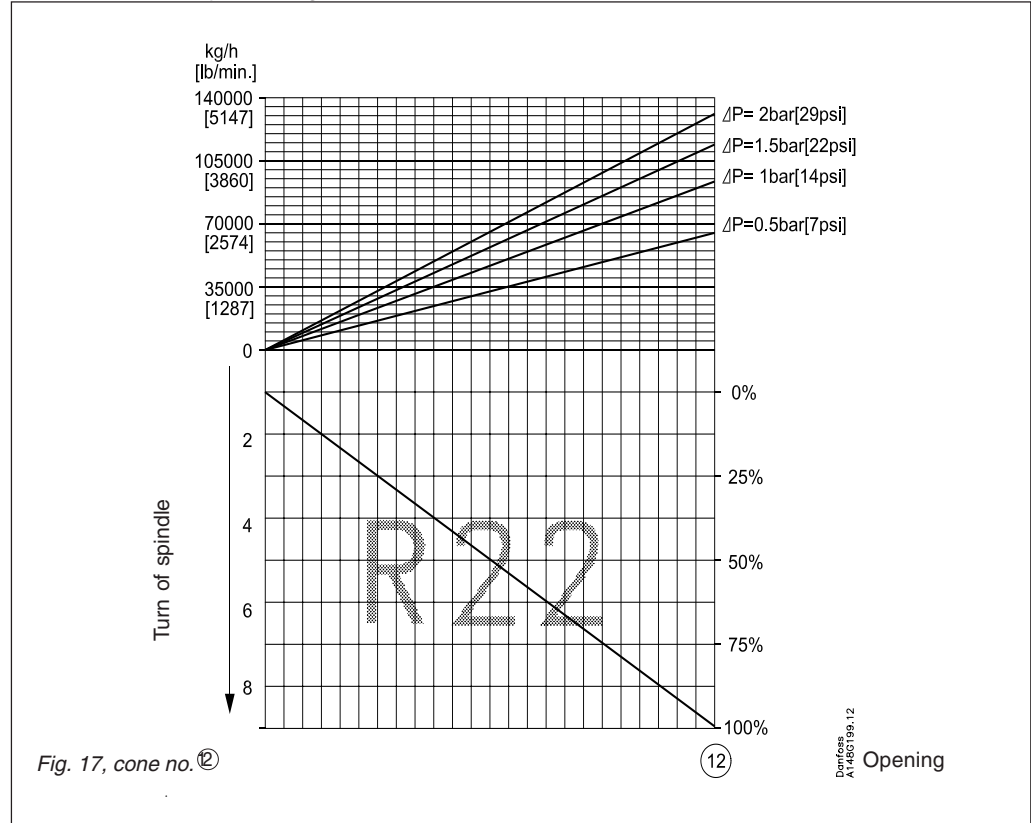
Fig. 16, cone no. ⑪

⑪ Opening DANFOSS  
A148C20.12

Computation and selection

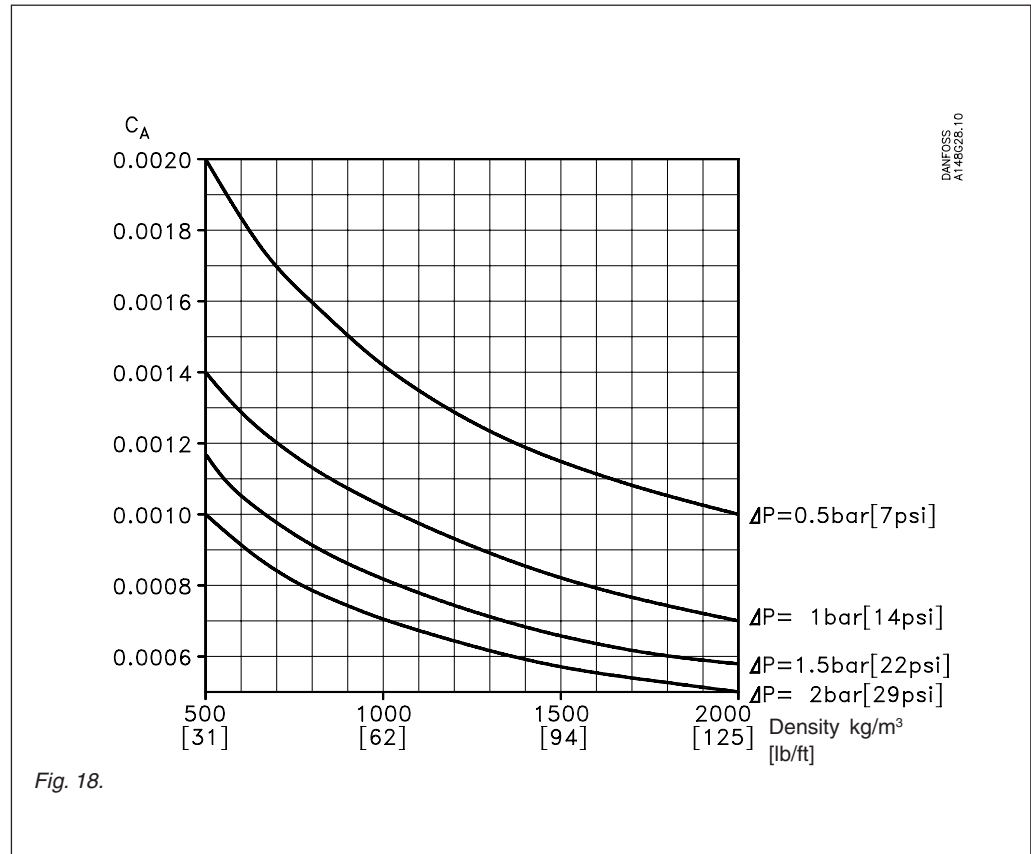
Liquid R 22, density: 1360 kg/m<sup>3</sup> [85 lb/ft<sup>3</sup>]

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



Computation and selection

Calculation factor C<sub>A</sub>



**Computation and selection**  
Example 1.

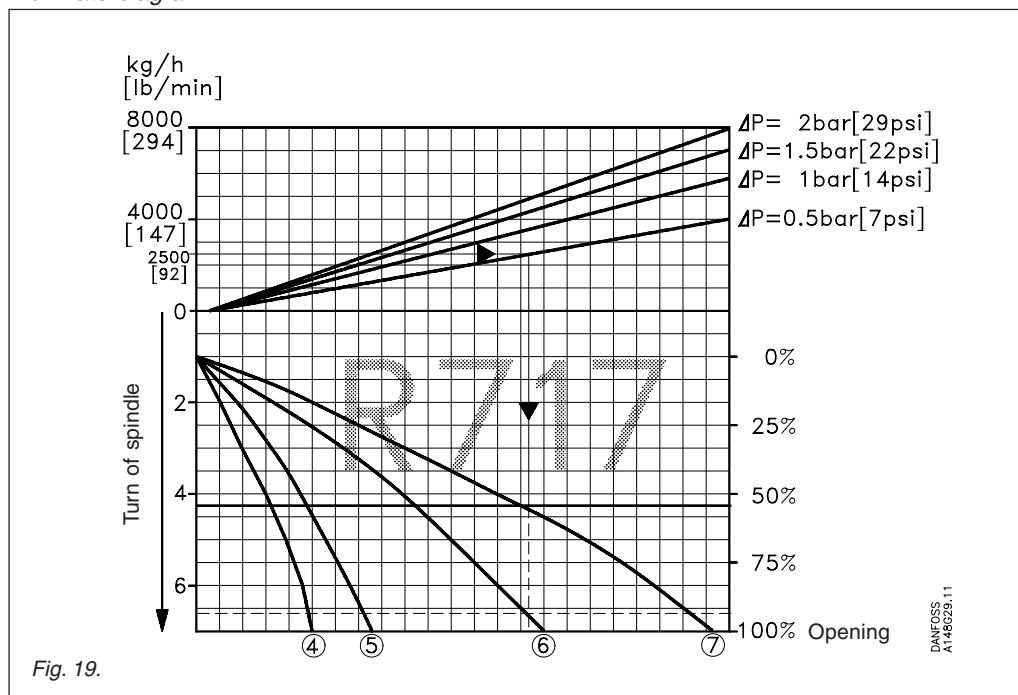
Refrigerant: R 717  
 Refrigerant flow: 2500 [kg/h]  
 Pressure drop:  $\Delta p = 0.5$  [bar]

number 6 opening degree would be  $> 85\%$ .  
 In this case cone number 7 ~ 55% is recommended.

The above mentioned example is illustrated on the following flow rate diagram and shows that cone number 6 and 7 can be used. The main rule is that the cone with the minimum flow area gives the optimum regulation. However, owing to uncertainties cone

The example is only correct if the density of the refrigerant is approx.  $670 \text{ (kg/m}^3\text{)}$ , and there must be no build-up of flash gas in the valve.

Flow rate diagram



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

**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. 8 - 17) as the refrigerant in question is not included.

Either use the curves of the  $k_v$ -values instead (fig. 3 - 7) 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. 18) and the flow rate diagram (in this example: fig. 4) 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]

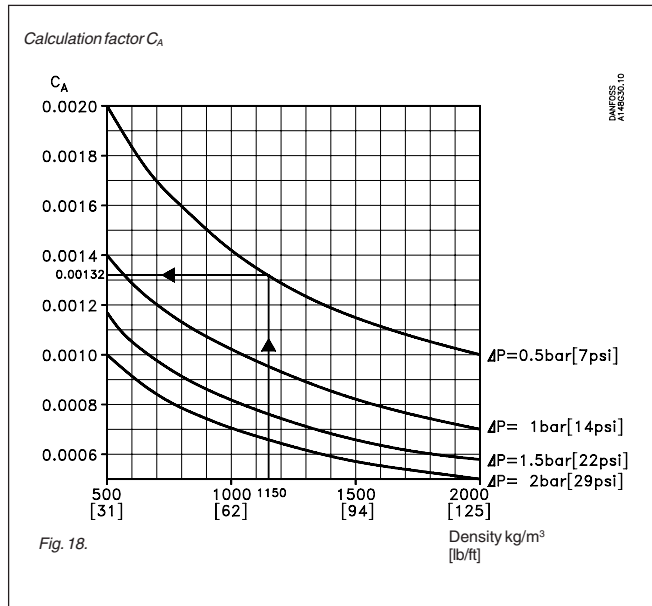


Fig. 18.

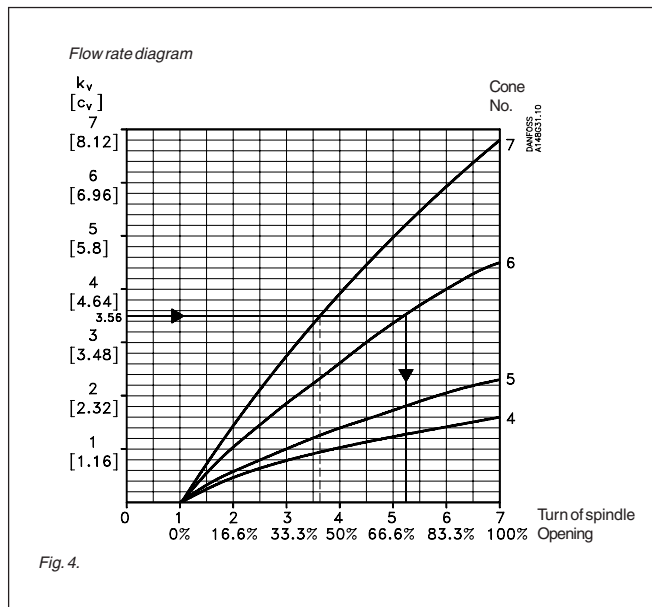
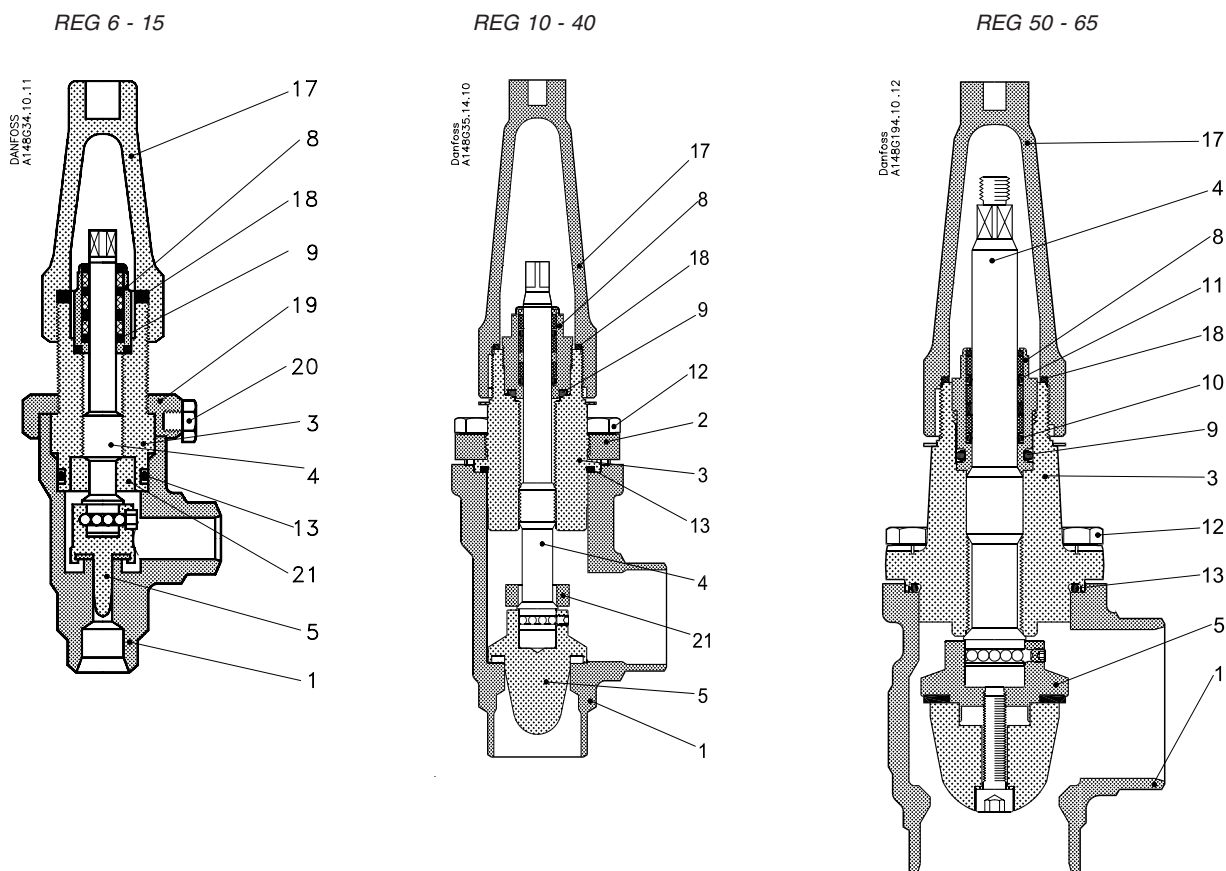


Fig. 4.

Cone no. 6 and 7 can be used. The optimum regulation is obtained if cone number 6 is used.

## Material specification

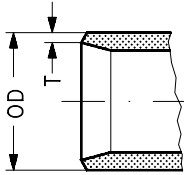


No.	Part	Material	EN	ISO	ASTM
1	Housing	Steel	P285QH EN10222-4		LF2A350
2	DN 10 - 40 (3/8 - 1 1/2 in.) - Bonnet, Flange	Steel	P275 NLI EN10028-3		
3	DN 6 - 40 (1/4 - 1 1/2 in.) - Bonnet, Insert DN 50 - 65 (2 - 2 1/2 in.) - Bonnet, Flange	Steel	P285QH EN10222-4		
4	Spindle DN 6 - 40 (1/4 - 1 1/2 in.) DN 50 - 65 (2 - 2 1/2 in.)	Stainless steel Stainless steel	X10CrNiS18-9, 17440 X8CrNiS18-9, 17440	Type 17, 683/13 Type 17, 683/13	AISI 303 AISI 303
5	Cone	Steel			
8	Packing gland	Steel			
9	DN 6 - 20 (1/4 - 3/4 in.) - Packing washer DN 25 - 65 (1 - 2 1/2 in.) - O-ring	Non-asbestos  Cloroprene (Neoprene)			
10-11	O-ring	Cloroprene (Neoprene)			
12	Bolts	Stainless steel	A2-70	A2-70	Type 308
13	O-ring	Cloroprene (Neoprene)			
17	Seal cap	Aluminium			
18	Gasket f. seal cap	Nylon			
19	Locking nut	Steel			
20	Screw	Steel			
21	Packing washer	PTFE (Teflon)			

Connections

	Size mm	Size in.	OD mm	T mm	OD in.	T in.			Cone no.
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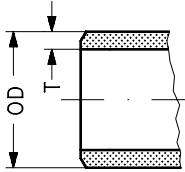
DIN



Welding DIN (2448)

Small	6	1/4	13.5	2.3	0.531	0.091			① ② ③
	10	3/8	17.2	2.3	0.677	0.091			
Medium	15	1/2	21.3	2.3	0.839	0.091			④ ⑤ ⑥ ⑦
	20	3/4	26.9	2.3	1.059	0.091			
	25	1	33.7	2.6	1.327	0.103			
Large	32	1 1/4	42.4	2.6	1.669	0.102			⑧ ⑨ ⑩
	40	1 1/2	48.3	2.6	1.902	0.103			
	50	2	60.3	2.9	2.37	0.11			⑪
	65	2 1/2	76.1	2.9	3	0.11			⑫

ANSI



Welding ANSI (B 36.10 Schedule 80)

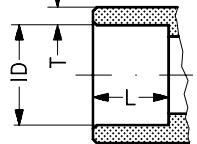
Small	6	1/4	13.5	3.0	0.531	0.118			① ② ③
	10	3/8	17.2	3.2	0.677	0.126			
Medium	15	1/2	21.3	3.7	0.839	0.146			④ ⑤ ⑥ ⑦
	20	3/4	26.9	4.0	1.059	0.158			
	25	1	33.7	4.6	1.327	0.181			
Large	32	1 1/4	42.4	4.9	1.669	0.193			⑧ ⑨ ⑩
	40	1 1/2	48.3	5.1	1.902	0.201			

Welding ANSI (B 36.10 Schedule 40)

	50	2	60.3	3.9	2.37	0.15			⑪
	65	2 1/2	73.0	5.2	2.87	0.20			⑫

	Size mm	Size in.	ID mm	T mm	ID in.	T in.	L mm	L in.		Cone no.
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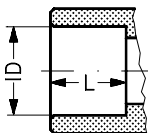
SOC



Socket welding ANSI (B 16.11)

Medium	15	1/2	21.8	6.0	0.858	0.235	10	0.39		④ ⑤ ⑥ ⑦
	20	3/4	27.2	7.6	1.071	0.299	13	0.51		
Large	25	1	33.9	7.2	1.335	0.284	13	0.51		⑧ ⑨ ⑩
	32	1 1/4	42.7	6.1	1.743	0.240	13	0.51		
	40	1 1/2	48.8	6.6	1.921	0.260	13	0.51		

SA

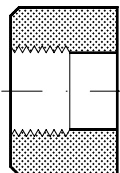


Soldering (ANSI B 16.22)

Small	10	3/8	9.60		0.378		8	0.31		① ② ③
	15	1/2	12.75		0.502		10	0.39		
Medium	22	7/8	22.30		0.878		19	0.75		④ ⑤ ⑥ ⑦

	Size mm	Size in.	Inside pipe thread	L mm	L in.		Cone no.
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FPT

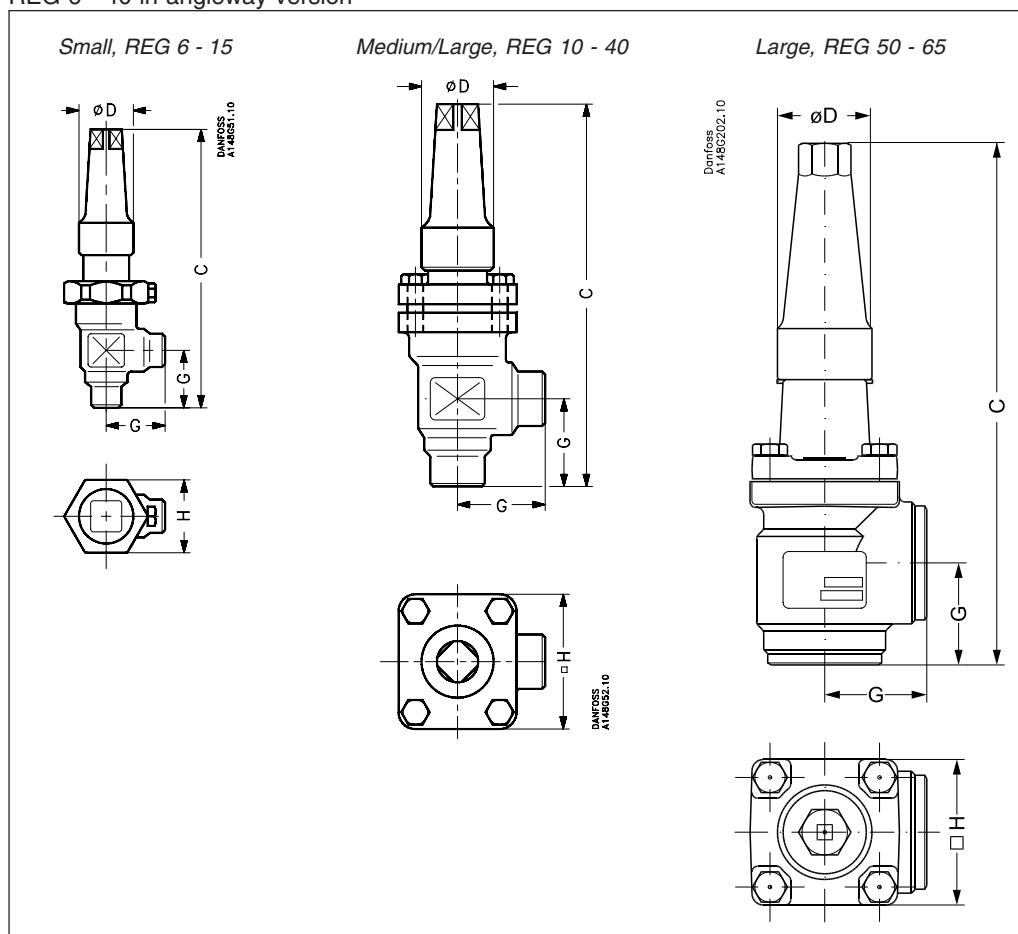


FPT inside pipe thread, NPT (ANSI/ASME B 1.20.1)

Medium	15	1/2	(1/2 x 14 NPT)				④ ⑤ ⑥ ⑦
	20	3/4	(3/4 x 14 NPT)				
Large	25	1	(1 x 11.5 NPT)				⑧ ⑨ ⑩
	32	1 1/4	(1 1/4 x 11.5 NPT)				

## Dimensions and weights

## REG 6 - 40 in angleway version

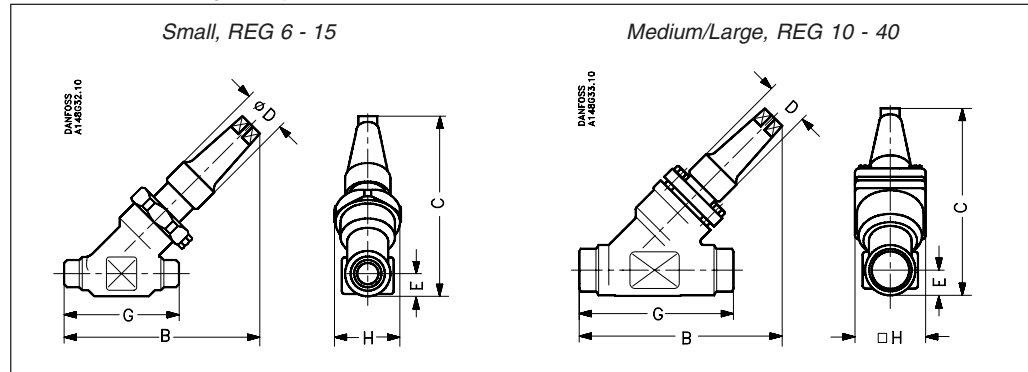


Valve size		C	G	ØD	□H	Weight
Small valve housing	mm	139	30	30	36	0.8 kg
	in.	5.47	1.18	1.18	1.42	1.8 lb
Medium valve housing	mm	182	45	38	60	1.4 kg
	in.	7.17	1.77	1.50	2.36	3.1 lb
Large valve housing	mm	237	55	50	70	2.4 kg
	in.	9.33	2.17	1.97	2.76	5.3 lb
REG 50 REG (2 in.)	mm	280	60	50	77	3.2 kg
	in.	11.02	2.36	1.97	3.03	7.1 lb
REG 65 REG (2½ in.)	mm	305	70	50	90	4.8 kg
	in.	12.01	2.76	1.97	3.54	10.6 lb
REG 32 SOC REG (1¼ in.) SOC	mm	275	62	50	70	2.9 kg
	in.	10.83	2.44	1.97	2.76	6.4 lb
REG 40 SOC REG (1½ in.) SOC	mm	275	62	50	70	2.9 kg
	in.	10.83	2.44	1.97	2.76	6.4 lb

Specified weights are approximate values only.

Dimensions and weights  
(cont.)

REG 6 - 40 in straight way version



Valve size		C	B	E	G	ØD	□H	Weight
Small valve housing	mm in.	110 4.33	120 4.72	13 0.51	70 2.76	30 1.18	36 1.42	0.8 kg 1.8 lb
Medium valve housing	mm in.	145 5.71	155 6.10	20 0.79	120 4.72	38 1.50	60 2.36	2.0 kg 4.4 lb
Large valve housing	mm in.	200 7.87	215 8.46	26 1.02	155 6.10	50 1.97	70 2.76	3.0 kg 6.6 lb
REG 32 SOC REG (1¼) SOC	mm in.	209 8.23	222 8.74	27.4 1.08	155 6.10	50 1.97	70 2.76	3.0 kg 6.6 lb
REG 40 SOC REG (1½) SOC	mm in.	213 8.39	222 8.74	31.0 1.22	155 6.10	50 1.97	70 2.76	3.0 kg 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	Regulating Valves					
Nominal size in mm (valve size measured on the connection diameter)	<b>6</b> <b>10</b> <b>15</b> <b>20</b> <b>22</b> <b>25</b> <b>32</b> <b>40</b> <b>50</b> <b>65</b>	Available connections					
			A	D	SOC	SA	FPT
		DN 6	x	x			
		DN 10	x	x		x	
		DN 15	x	x	x	x	x
		DN 20	x	x	x		x
		DN 22				x	
		DN 25	x	x	x		x
		DN 32	x	x	x		x
		DN 40	x	x	x		
		DN 50	x	x			
		DN 65	x	x			
		Connections	<b>A</b> <b>D</b> <b>SOC</b> <b>SA</b> <b>FPT</b>	Welding branches: ANSI B 36.10 Schedule 80, 15-40 (½ - 1½ in.) Welding branches: ANSI B 36.10 Schedule 40, 50-65 (2 - 2½ in.) Welding branches: DIN 2448 Socket weld: ANSI B 16.11 Soldering branches: ANSI B 16.22 NPT inside pipe thread: ANSI/ASME B1.20.1			
Valve housing	<b>ANG</b> <b>STR</b>	Angle flow Straight flow					
	Cone #	Flow area [mm <sup>2</sup> ]					
	<b>1</b>	3					
	<b>2</b>	6					
	<b>3</b>	12					
	<b>4</b>	28					
	<b>5</b>	44					
	<b>6</b>	92					
	<b>7</b>	152					
	<b>8</b>	272					
	<b>9</b>	432					
	<b>10</b>	648					
	<b>11</b>	822					
	<b>12</b>	1978					

*Verification of the combination between cone no. and valve connection*

Valve size	Small valve			Medium valve				Large valve			REG 50	REG 65
Cone no.	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫
DIN	DN 6, 10, 15*			DN 15, 20, 25				DN 32, 40			DN 50	DN 65
ANSI	DN 6, 10			DN 15, 20, 25				DN 32, 40			DN 50	DN 65
SOC				DN 15, 20				DN 25, 32, 40				
SA	DN 10, 15			DN 22								
FPT				DN 15, 20				DN 25, 32				

\*Small valve size 15 DIN is only available with cone number 3.

**Ordering**  
(continued)

Example:  
REG 15 DIN angleway with  
cone no. 7 = **148G3242**

**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.

Angleway			Code no.
Size		Type	
mm	in.		

**DIN**

6	1/4	REG 6 D ANG CONE#1	2415+426
6	1/4	REG 6 D ANG CONE#2	2415+427
6	1/4	REG 6 D ANG CONE#3	2415+428
10	3/8	REG 10 D ANG CONE#1	2415+432
10	3/8	REG 10 D ANG CONE#2	2415+433
10	3/8	REG 10 D ANG CONE#3	2415+434
15	1/2	REG 15 D ANG CONE#3	2415+883
15	1/2	REG 15 D ANG CONE#4	148G3239
15	1/2	REG 15 D ANG CONE#5	148G3240
15	1/2	REG 15 D ANG CONE#6	148G3241
15	1/2	REG 15 D ANG CONE#7	148G3242
20	3/4	REG 20 D ANG CONE#4	148G3247
20	3/4	REG 20 D ANG CONE#5	148G3248
20	3/4	REG 20 D ANG CONE#6	148G3249
20	3/4	REG 20 D ANG CONE#7	148G3250
25	1	REG 25 D ANG CONE#4	148G3255
25	1	REG 25 D ANG CONE#5	148G3256
25	1	REG 25 D ANG CONE#6	148G3257
25	1	REG 25 D ANG CONE#7	148G3258
32	1 1/4	REG 32 D ANG CONE#8	148G3263
32	1 1/4	REG 32 D ANG CONE#9	148G3264
32	1 1/4	REG 32 D ANG CONE#10	148G3265
40	1 1/2	REG 40 D ANG CONE#8	148G3269
40	1 1/2	REG 40 D ANG CONE#9	148G3270
40	1 1/2	REG 40 D ANG CONE#10	148G3271
50	2	REG 50 D ANG CONE#11	148G3485
65	2 1/2	REG 65 D ANG CONE#12	148G3486

**ANSI**

6	1/4	REG 6 A ANG CONE#1	2415+474
6	1/4	REG 6 A ANG CONE#2	2415+475
6	1/4	REG 6 A ANG CONE#3	2415+476
10	3/8	REG 10 A ANG CONE#1	2415+480
10	3/8	REG 10 A ANG CONE#2	2415+481
10	3/8	REG 10 A ANG CONE#3	2415+482
15	1/2	REG 15 A ANG CONE#4	148G3276
15	1/2	REG 15 A ANG CONE#5	148G3277
15	1/2	REG 15 A ANG CONE#6	148G3278
15	1/2	REG 15 A ANG CONE#7	148G3279
20	3/4	REG 20 A ANG CONE#4	148G3284
20	3/4	REG 20 A ANG CONE#5	148G3285
20	3/4	REG 20 A ANG CONE#6	148G3286
20	3/4	REG 20 A ANG CONE#7	148G3287
25	1	REG 25 A ANG CONE#4	148G3292
25	1	REG 25 A ANG CONE#5	148G3293
25	1	REG 25 A ANG CONE#6	148G3294
25	1	REG 25 A ANG CONE#7	148G3295
32	1 1/4	REG 32 A ANG CONE#8	148G3300
32	1 1/4	REG 32 A ANG CONE#9	148G3301
32	1 1/4	REG 32 A ANG CONE#10	148G3302
40	1 1/2	REG 40 A ANG CONE#8	148G3306
40	1 1/2	REG 40 A ANG CONE#9	148G3307
40	1 1/2	REG 40 A ANG CONE#10	148G3308
50	2	REG 50 A ANG CONE#11	148G3487
65	2 1/2	REG 65 A ANG CONE#12	148G3488

D = Butt-weld DIN  
A = Butt-weld ANSI  
SOC = Socket weld  
SA = Soldering  
FPT = Inside pipe thread

ANG = Angleway  
STR = Straightway

Ordering  
 (continued)

Angleway			
Size		Type	Code no.
mm	in.		

**SOC**

15	1/2	REG 15 SOC ANG CONE#4	148G3312
15	1/2	REG 15 SOC ANG CONE#5	148G3313
15	1/2	REG 15 SOC ANG CONE#6	148G3314
15	1/2	REG 15 SOC ANG CONE#7	148G3315
20	3/4	REG 20 SOC ANG CONE#4	148G3322
20	3/4	REG 20 SOC ANG CONE#5	148G3323
20	3/4	REG 20 SOC ANG CONE#6	148G3324
20	3/4	REG 20 SOC ANG CONE#7	148G3325
25	1	REG 25 SOC ANG CONE#8	148G3330
25	1	REG 25 SOC ANG CONE#9	148G3331
25	1	REG 25 SOC ANG CONE#10	148G3332
32	1 1/4	REG 32 SOC ANG CONE#8	148G3336
32	1 1/4	REG 32 SOC ANG CONE#9	148G3337
32	1 1/4	REG 32 SOC ANG CONE#10	148G3338
40	1 1/2	REG 40 SOC ANG CONE#8	148G3342
40	1 1/2	REG 40 SOC ANG CONE#9	148G3343
40	1 1/2	REG 40 SOC ANG CONE#10	148G3417

**FPT**

15	1/2	REG 15 FPT ANG CONE#4	148G3389
15	1/2	REG 15 FPT ANG CONE#5	148G3390
15	1/2	REG 15 FPT ANG CONE#6	148G3391
15	1/2	REG 15 FPT ANG CONE#7	148G3392
20	3/4	REG 20 FPT ANG CONE#4	148G3397
20	3/4	REG 20 FPT ANG CONE#5	148G3398
20	3/4	REG 20 FPT ANG CONE#6	148G3399
20	3/4	REG 20 FPT ANG CONE#7	148G3400
25	1	REG 25 FPT ANG CONE#8	148G3405
25	1	REG 25 FPT ANG CONE#9	148G3406
25	1	REG 25 FPT ANG CONE#10	148G3407
32	1 1/4	REG 32 FPT ANG CONE#8	148G3411
32	1 1/4	REG 32 FPT ANG CONE#9	148G3412
32	1 1/4	REG 32 FPT ANG CONE#10	148G3413

**SA**

10	3/8	REG 10 SA ANG CONE#1 CU: 3/8"	2415+559
10	3/8	REG 10 SA ANG CONE#2 CU: 3/8"	2415+560
10	3/8	REG 10 SA ANG CONE#3 CU: 3/8"	2415+561
15	1/2	REG 15 SA ANG CONE#1 CU: 1/2"	2415+565
15	1/2	REG 15 SA ANG CONE#2 CU: 1/2"	2415+566
15	1/2	REG 15 SA ANG CONE#3 CU: 1/2"	2415+567
22	7/8	REG 22 SA ANG CONE#4 CU: 7/8"	148G3363
22	7/8	REG 22 SA ANG CONE#5 CU: 7/8"	148G3364
22	7/8	REG 22 SA ANG CONE#6 CU: 7/8"	148G3365
22	7/8	REG 22 SA ANG CONE#7 CU: 7/8"	148G3366

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ANG = Angleway  
 STR = Straightway

Ordering  
 (continued)

Straightway			
Size		Type	Code no.
mm	in.		

**DIN**

6	1/4	REG 6 D STR CONE#1	2415+429
6	1/4	REG 6 D STR CONE#2	2415+430
6	1/4	REG 6 D STR CONE#3	2415+431
10	3/8	REG 10 D STR CONE#1	2415+435
10	3/8	REG 10 D STR CONE#2	2415+436
10	3/8	REG 10 D STR CONE#3	2415+437
15	1/2	REG 15 D STR CONE#4	148G3243
15	1/2	REG 15 D STR CONE#5	148G3244
15	1/2	REG 15 D STR CONE#6	148G3245
15	1/2	REG 15 D STR CONE#7	148G3246
20	3/4	REG 20 D STR CONE#4	148G3251
20	3/4	REG 20 D STR CONE#5	148G3252
20	3/4	REG 20 D STR CONE#6	148G3253
20	3/4	REG 20 D STR CONE#7	148G3254
25	1	REG 25 D STR CONE#4	148G3259
25	1	REG 25 D STR CONE#5	148G3260
25	1	REG 25 D STR CONE#6	148G3261
25	1	REG 25 D STR CONE#7	148G3262
32	1 1/4	REG 32 D STR CONE#8	148G3266
32	1 1/4	REG 32 D STR CONE#9	148G3267
32	1 1/4	REG 32 D STR CONE#10	148G3268
40	1 1/2	REG 40 D STR CONE#8	148G3273
40	1 1/2	REG 40 D STR CONE#9	148G3274
40	1 1/2	REG 40 D STR CONE#10	148G3275

**ANSI**

6	1/4	REG 6 A STR CONE#1	2415+477
6	1/4	REG 6 A STR CONE#2	2415+478
6	1/4	REG 6 A STR CONE#3	2415+479
10	3/8	REG 10 A STR CONE#1	2415+483
10	3/8	REG 10 A STR CONE#2	2415+484
10	3/8	REG 10 A STR CONE#3	2415+485
15	1/2	REG 15 A STR CONE#4	148G3280
15	1/2	REG 15 A STR CONE#5	148G3281
15	1/2	REG 15 A STR CONE#6	148G3282
15	1/2	REG 15 A STR CONE#7	148G3283
20	3/4	REG 20 A STR CONE#4	148G3288
20	3/4	REG 20 A STR CONE#5	148G3289
20	3/4	REG 20 A STR CONE#6	148G3290
20	3/4	REG 20 A STR CONE#7	148G3291
25	1	REG 25 A STR CONE#4	148G3296
25	1	REG 25 A STR CONE#5	148G3297
25	1	REG 25 A STR CONE#6	148G3298
25	1	REG 25 A STR CONE#7	148G3299
32	1 1/4	REG 32 A STR CONE#8	148G3303
32	1 1/4	REG 32 A STR CONE#9	148G3304
32	1 1/4	REG 32 A STR CONE#10	148G3305
40	1 1/2	REG 40 A STR CONE#8	148G3309
40	1 1/2	REG 40 A STR CONE#9	148G3310
40	1 1/2	REG 40 A STR CONE#10	148G3311

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Ordering  
 (continued)

Straightway			
Size		Type	Code no.
mm	in.		

**SOC**

15	1/2	REG 15 SOC STR CONE#4	148G3316
15	1/2	REG 15 SOC STR CONE#5	148G3317
15	1/2	REG 15 SOC STR CONE#6	148G3318
15	1/2	REG 15 SOC STR CONE#7	148G3319
20	3/4	REG 20 SOC STR CONE#4	148G3326
20	3/4	REG 20 SOC STR CONE#5	148G3327
20	3/4	REG 20 SOC STR CONE#6	148G3328
20	3/4	REG 20 SOC STR CONE#7	148G3329
25	1	REG 25 SOC STR CONE#8	148G3333
25	1	REG 25 SOC STR CONE#9	148G3334
25	1	REG 25 SOC STR CONE#10	148G3335
32	1 1/4	REG 32 SOC STR CONE#8	148G3339
32	1 1/4	REG 32 SOC STR CONE#9	148G3340
32	1 1/4	REG 32 SOC STR CONE#10	148G3341
40	1 1/2	REG 40 SOC STR CONE#8	148G3344
40	1 1/2	REG 40 SOC STR CONE#9	148G3345
40	1 1/2	REG 40 SOC STR CONE#10	148G3346

**FPT**

15	1/2	REG 15 FPT STR CONE#4	148G3393
15	1/2	REG 15 FPT STR CONE#5	148G3394
15	1/2	REG 15 FPT STR CONE#6	148G3395
15	1/2	REG 15 FPT STR CONE#7	148G3396
20	3/4	REG 20 FPT STR CONE#4	148G3401
20	3/4	REG 20 FPT STR CONE#5	148G3402
20	3/4	REG 20 FPT STR CONE#6	148G3403
20	3/4	REG 20 FPT STR CONE#7	148G3404
25	1	REG 25 FPT STR CONE#8	148G3408
25	1	REG 25 FPT STR CONE#9	148G3409
25	1	REG 25 FPT STR CONE#10	148G3410
32	1 1/4	REG 32 FPT STR CONE#8	148G3414
32	1 1/4	REG 32 FPT STR CONE#9	148G3415
32	1 1/4	REG 32 FPT STR CONE#10	148G3416

**SA**

10	3/8	REG 10 SA STR CONE#1 CU: 3/8"	2415+562
10	3/8	REG 10 SA STR CONE#2 CU: 3/8"	2415+563
10	3/8	REG 10 SA STR CONE#3 CU: 3/8"	2415+564
15	1/2	REG 15 SA STR CONE#1 CU: 1/2"	2415+568
15	1/2	REG 15 SA STR CONE#2 CU: 1/2"	2415+569
15	1/2	REG 15 SA STR CONE#3 CU: 1/2"	2415+570
22	7/8	REG 22 SA STR CONE#4 CU: 7/8"	148G3367
22	7/8	REG 22 SA STR CONE#5 CU: 7/8"	148G3368
22	7/8	REG 22 SA STR CONE#6 CU: 7/8"	148G3369
22	7/8	REG 22 SA STR CONE#7 CU: 7/8"	148G3370

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