ENGINEERING
TOMORROW

Data Sheet

Check valve
Type **CHV-140B** 140 bar (2030 psi) series

The new 140 bar manual valve range for Industrial CO_2 Trans-critical Systems

The new 140 bar manual valve range for Industrial CO_2 Trans-critical Systems is based on the successful modular Standard SVL platform. The same flexibility, simplicity and efficiency are features offered in this new series.

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

Laser cut V-ports provide excellent opening characteristics (CHV-140B 50-100).

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.

The valves are available as parts program.

Features

- Modular Concept:
  - Each valve housing is available with several different connection types and sizes
  - Possible to convert CHV-140B to any other product in the Flexline SVL-140B family (e.g. shut-off 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 open at a very low differential pressure of 0.04 bar (0.58 psig)
- Designed with a built-in damping chamber preventing valve flutter in case of low refrigerant velocity and/or low density
- Each valve is clearly marked with type, size and performance range
- Easy to disassemble for inspection and service
- Optimal flow characteristics ensuring quick opening to the fully open position
- Protection against pulsation by built-in damping facility
- Housing and top part material is low temperature steel according to requirements of the Pressure Equipment Directive and other international classification authorities
- Equipped with bolts in low temp steel with high tensile strength
- From DN 15 (½") to 100 (4")
- In angle or straightway
- Classification: Being UL, CRN etc. approved. To get an updated list of certification on the products please contact your local Danfoss Sales Company

Media

Refrigerants

Applicable to R744 (CO_2).

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/, or by contacting your local Danfoss representative.

Product specification

Pressure and temperature data

Table 1: Pressure and temperature data

Features	Description
Temperature range	-40 °C / +150 °C (-40 °F / +302 °F)
Max. working pressure	140 bar (2030 psi)

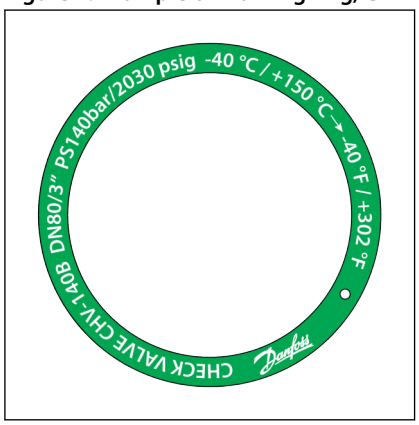
Design

Housing
The housing is made from special, cold resistant steel.

Damping chamber
The chamber is filled with refrigerants (gas or liquid), which provides a damping effect when the valve opens and closes.

Installation

Figure 1: Example of marking ring, CHV-140B



The valve must be installed with the top part vertically upwards, DN 15-40 are acceptable for horizontal installation only if the vertical installation is impossible.

The valve is designed to resist very 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 guide for CHV-140B.

If cold refrigeration oil having low viscosity enters and settles in the damping chamber, problems with the check valve may arise. Consequently, it may be necessary to modify the valve for more viscous liquids by enlarging the hole to the damping chamber.

Material specification

CHV-140B 15-40

Figure 2: CHV-140B 15-40

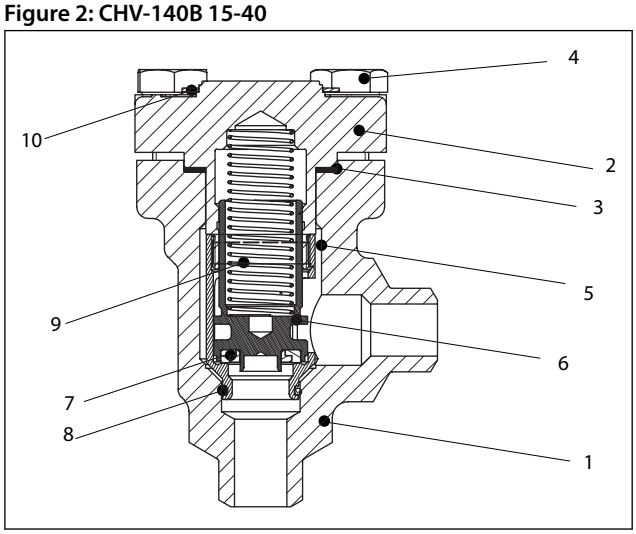


Table 2: CHV-140B 15-40

No.	Part	Material	DIN/EN	ASTM
1	Housing	Steel	P285QH EN 10222-4	LF2, A350
2	Bonnet	Steel	P285QH EN 10222-4	LF2, A350
3	Gasket	Grafilit-EM		
4	Bolts	Steel	42CrMo4+QT, 10250-3	AISI 303
5	Cylinder	Steel		
6	Piston	Steel		
7	Gasket	PTFE + carbon fiber		
8	O-ring	EPDM		
9	Spring	Steel		
10	ID ring	Aluminum		

CHV-140B 50-100

Figure 3: CHV-140B 50-100

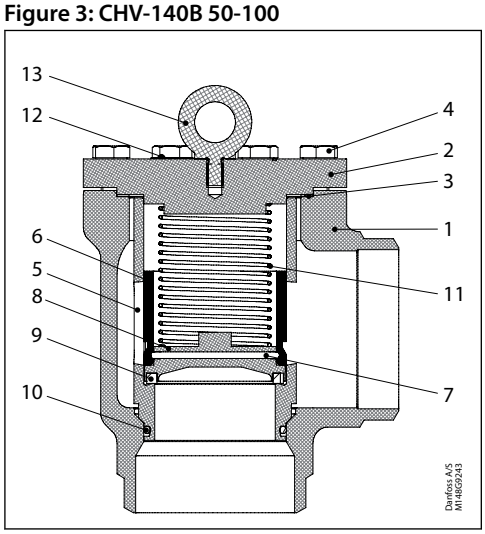


Table 3: CHV-140B 50-100

No.	Part	Material	DIN/EN	ASTM
1	Housing DN 50-65	Steel	P285QH EN 10222-4	LF2, A350
	Housing DN 80-100	Steel	G20Mn5QT, 10213-3	LCC, A352
2	Top cover DN 50-80	Steel	P275NL1&P275NL2 EN 10028-3	LF2, A350
	Top cover DN 100	Steel	P285QH EN 10222-4	LF2, A350
3	Gasket	Grafilit-EM		
4	Bolts	Steel	42CrMo4+QT, 10250-3	AISI 303
5	Cylinder	Steel		
6	Guide sleeve	Steel		
7	Spring ring	Steel		
8	Valve plate	Steel		
9	Gasket	PTFE + carbon fiber		
10	O-ring	EPDM		
11	Spring	Steel		
12	Marking label	Aluminum		
13	Eyebolt	Steel		

Computation and selection

Introduction

When dimensioning CHV-140B, it is important to select a valve that is best suited to all operating conditions. Therefore, it is necessary to consider both the nominal and part load working conditions.

Please refer to Coolselector®2 for calculation and selection of the right CHV-140B.

Connections

Available with the following connections:

- Butt-weld DIN (EN 10216-2)
- Butt-weld ANSI (B 36.10M Schedule 80)
- Brazing EN 1254-5, 54 and 64 mm
- Brazing ASME B16.50, 2⅛" and 2⅝"

Figure 4: DIN

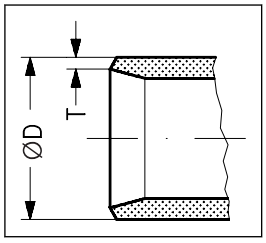


Table 4: Butt-weld DIN (EN 10216-2)

Size		ØD	T	ØD	T	k_v Angleway	C_v Angleway	k_v Straight-way	C_v Straight-way
mm	in.	mm	mm	in.	in.	m^3/h	$US_{gal/min}$	m^3/h	$US_{gal/min}$
15	½	21.3	4	0.839	0.157	8	9.3	4	4.6
20	¾	26.9	4	1.059	0.157	10	11.6	7	8.1
25	1	33.7	4.6	1.327	0.181	24	27.8	16	18.6
32	1¼	42.4	5	1.669	0.197	30	34.8	21	24.4
40	1½	48.3	5	1.902	0.197	30	34.8	21	24.4
50	2	60.3	5.6	2.37	0.22	49	56.8	36	41.8
65	2½	76.1	6.3	3.00	0.25	72	85	41	48
80	3	88.9	7.1	3.50	0.28	103	129	81	94
100	4	114.3	8.8	4.50	0.35	196	232	157	182

Figure 5: ANSI

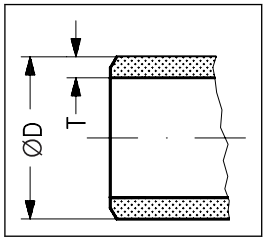


Table 5: Butt-weld ANSI (B 36.10M Schedule 80)

Size		ØD	T	ØD	T	k_v Angleway	C_v Angleway	k_v Straight-way	C_v Straight-way
mm	in.	mm	mm	in.	in.	m^3/h	$US_{gal/min}$	m^3/h	$US_{gal/min}$
15	½	21.3	4	0.839	0.157	8	9.3	4	4.6
20	¾	26.9	4	1.059	0.157	10	11.6	7	8.1
25	1	33.7	4.6	1.327	0.181	24	27.8	16	18.6
32	1¼	42.4	5	1.669	0.197	30	34.8	21	24.4
40	1½	48.3	5	1.902	0.197	30	34.8	21	24.4
50	2	60.3	5.6	2.37	0.22	49	56.8	36	41.8
65	2½	73	7	2.87	0.28	72	85	41	48
80	3	88.9	7.6	3.50	0.3	103	129	81	94
100	4	114.3	8.6	4.50	0.34	196	232	157	182

Figure 6: SD (DIN)

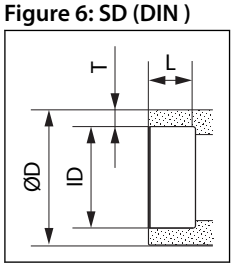


Table 6: Brazing EN 1254-5

Size		ID	L	ØD	T	ID	L	ØD	T	k_v Angle	C_v Angle	k_v Straight	C_v Straight
mm	in.	mm	mm	mm	mm	in.	in.	in.	in	m^3/h	$US_{gal/min}$	m^3/h	$US_{gal/min}$
50	2	54	13.5	60.3	3.15	2.13	0.53	2.37	0.12	49	56.8	36	41.8
65	2½	64	13.5	73	4.5	2.52	0.53	2.87	0.18	72	85	41	48

Figure 7: SA (ASME)

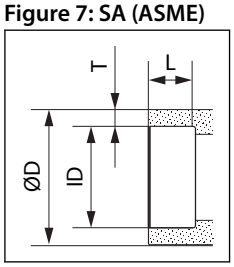


Table 7: Brazing ASME B16.50

Size		ID	L	ØD	T	ID	L	ØD	T	k_v Angle	C_v Angle	k_v Straight	C_v Straight
mm	in.	mm	mm	mm	mm	in.	in.	in.	in	m^3/h	$US_{gal/min}$	m^3/h	$US_{gal/min}$
50	2	54	13.5	60.3	3.15	2⅛	0.53	2.37	0.12	49	56.8	36	41.8
65	2½	66.7	13.5	76.1	4.7	2⅝	0.53	3.00	0.19	72	85	41	48

Dimensions and weights

CHV-140B 15-40 (½-1½ in.)

Figure 8: CHV-140B 15-40 (½-1½ in.)

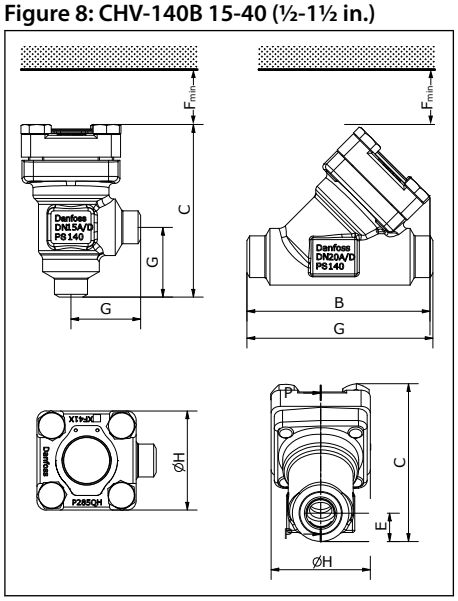


Table 8: CHV-140B 15-40 Angleway

Valve size	C		G		F_{min}		ØH		Weight	
	mm	in.	mm	in.	mm	in.	mm	in.	kg	lb
CHV-140B 15(½ in.)	111	4.37	45	1.77	60	2.36	64	2.52	2.0	4.41
CHV-140B 20(¾ in.)	111	4.37	45	1.77	60	2.36	64	2.52	1.9	4.19
CHV-140B 25(1 in.)	148	5.83	55	2.17	85	3.35	74	2.91	3.1	6.83
CHV-140B 32(1¼ in.)	148	5.83	55	2.17	85	3.35	74	2.91	3.2	7.05
CHV-140B 40(1½ in.)	148	5.83	55	2.17	85	3.35	74	2.91	3.3	7.28

Table 9: CHV-140B 15-40 Straightway

Valve size	C		B		E		G		F_{min}		ØH		Weight	
	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	kg	lb
CHV-140B 15(½ in.)	102	4.02	118	4.65	19	0.75	120	4.72	65	2.56	64	2.52	2.3	5.07
CHV-140B 20(¾ in.)	102	4.02	118	4.65	19	0.75	120	4.72	65	2.56	64	2.52	2.3	5.07
CHV-140B 25(1 in.)	140	5.51	155	6.1	26	1.02	153	6.02	95	3.74	74	2.91	4.1	9.04
CHV-140B 32(1¼ in.)	140	5.51	155	6.1	26	1.02	153	6.02	95	3.74	74	2.91	4.0	8.82
CHV-140B 40(1½ in.)	140	5.51	155	6.1	26	1.02	153	6.02	95	3.74	74	2.91	4.0	8.82

NOTE:
Specified weights are approximate values only.

CHV-140B 50-65 (2-2½ in.)

Figure 9: CHV-140B 50-65 (2-2½ in.)

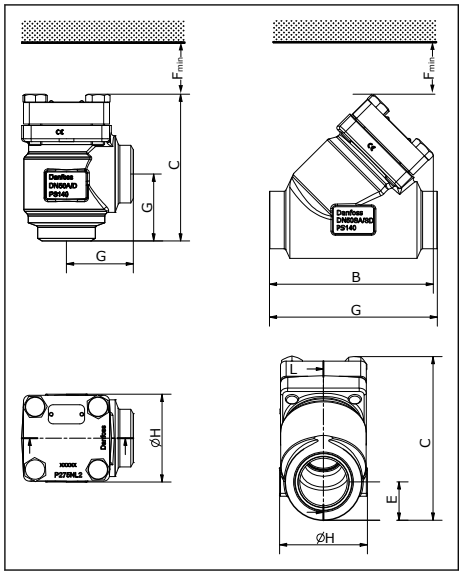


Table 10: CHV-140B 50-65 Angleway

Valve size	C		G		F_{min}		ØH		Weight	
	mm	in.	mm	in.	mm	in.	mm	in.	kg	lb
CHV-140B 50(2 in.)	154	6.06	70	2.76	107	4.21	92	3.62	5.1	11.24
CHV-140B 65(2½ in.)	154	6.06	70	2.76	107	4.21	92	3.62	5.2	11.46

Table 11: CHV-140B 50-65 Straightway

Valve size	C		B		E		G		F_{min}		ØH		Weight	
	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	kg	lb
CHV-140B 50(2 in.)	172	6.77	172	6.77	40	1.57	176	6.93	107	4.21	92	3.62	7.1	15.65
CHV-140B 65(2½ in.)	172	6.77	172	6.77	40	1.57	176	6.93	107	4.21	92	3.62	6.8	14.99

NOTE:
Specified weights are approximate values only.

CHV-140B 80-100 (3-4 in.)

Figure 10: CHV-140B 80-100 (3-4 in.)

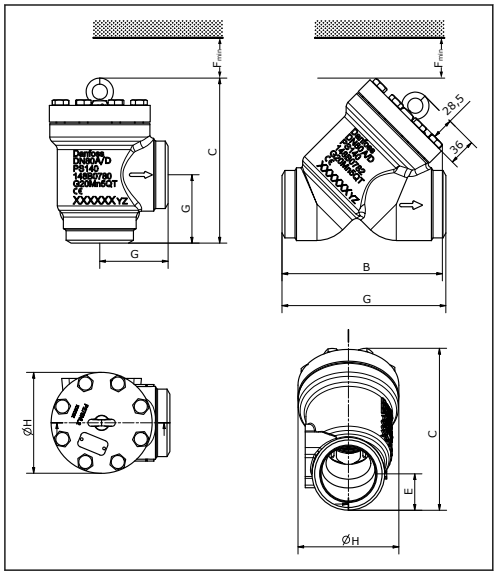


Table 12: CHV-140B 80-100 Angleway

Valve size	C		G		F_{min}		ØH		Weight	
	mm	in.	mm	in.	mm	in.	mm	in.	kg	lb
CHV-140B 80(3 in.)	218	8.58	90	3.54	123	4.84	133	5.24	9.7	21.38
CHV-140B 100(4 in.)	256	10.08	106	4.17	153	6.02	160	6.3	16.8	37.04

Table 13: CHV-140B 80-100 Straightway

Valve size	C		B		E		G		F_{min}		ØH		Weight	
	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	kg	lb
CHV-140B 80(3 in.)	214	8.42	212	8.35	48	1.89	216	8.5	140	5.51	133	5.24	11.4	25.13
CHV-140B 100(4 in.)	265	10.43	257	10.12	62	2.44	264	10.39	180	7.09	160	6.3	21.4	47.18

NOTE:
Specified weights are approximate values only.

Ordering

NOTE:
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.

Table 14: Type codes

Connection	A	Butt-weld ANSI (B 36.10M Schedule 80)
	D	Butt-weld DIN (EN 10216-2)
	SA	Brazing ASME B16.50, 2⅛" and 2⅝"
	SD	Brazing EN 1254-5, 54 and 64 mm
Valve housing	ANG	Angle flow
	STR	Straight flow

Ordering CHV-140B valves from the parts program

IMPORTANT:
Where products need to be certified according to specific certification societies then the relevant information should be included at the time of order.

Table 15: Ordering CHV-140B valves from the parts program

Size [DN]		Parts Program								
		Housing[1]								Top complete
mm	in.	ANG				STR				CHV-140B
		ANSI	DIN	SA	SD	ANSI	DIN	SA	SD	
15	½	148B6863	148B6863			148B6864	148B6864			148B6873
20	¾	148B6865	148B6865			148B6866	148B6866			148B6873
25	1	148B6867	148B6867			148B6868	148B6868			148B6874
32	1¼	148B6869	148B6869			148B6870	148B6870			148B6874
40	1½	148B6871	148B6871			148B6872	148B6872			148B6875
50	2	148B5861	148B5861	148B6861	148B6861	148B5862	148B5862	148B6862	148B6862	148B6876
65	2½	148B6908	148B6910	148B6912	148B6914	148B6909	148B6911	148B6913	148B6915	148B6876
80	3	148B5971	148B5971			148B5972	148B5972			148B6877
100	4	148B6918	148B6918			148B6919	148B6919			148B6878

[1] Code numbers may cover more connection types (e.g. A/D) where standards and tolerances allow for it.

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 or contact your local Danfoss representative if you have any questions.

Certificates, declarations and approvals

Table 16: Certificates, declarations and approvals

File name	Document type	Document topic	Approval Authority
033F0685.AX	EU Declaration	PED	Danfoss
033F0691.AI	Manufacturers Declaration	RoHS	Danfoss
033F0686.AS	Manufacturers Declaration	PED	Danfoss

Table 17: Certificates and declarations

CE	CHV-140B valves are approved according to the European standard specified in the Pressure Equipment Directive and are CE marked.

NOTE:
For further details / restrictions - see Installation guide.

Table 18: PED Categorization

Nominal bore	DN 15-32	DN 40-100
Classified for	Fluid group 2	
Category	Article 4, Paragraph 3	I

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