DNV·GL

Certificate No:
TAP000000M

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Valves for Refrigerants

with type designation(s)
BSV, SFV, SFA

Issued to
Danfoss A/S
KOLDING, Denmark

is found to comply with
DNV GL rules for classification – Ships Pt.4 Ch.6 Piping systems

Application :

Approved for use in refrigerant piping sytems containing Group 1 or Group 2 refrigerants as defined in DNV GL Ship Pt.4 Ch.6 Sec.6.

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.

Type:	Temperature range:	Sizes:	Design pressure:
BSV	**-30/+100 °C**	**DN8**	**25 bar**
SFV	**-30/+100 °C**	**DN20 - DN25**	**25 bar**
SFA	**-30/+100 °C**	**DN15**	**40 bar**

This Certificate is valid until **2020-11-17**.

Issued at **Høvik** on **2015-11-18**
DNV GL local station: **Fredericia** for **DNV GL**

Approval Engineer: **Simon Ratcliffe**

Marianne Spæren Marveng
Head of Section

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid.
The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

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Job Id: **262.1-018278-1**
Certificate No: **TAP000000M**

Product description

Safety relief valves. Discharge coefficients determined according to ISO 4126.

Designs approved according to burst test reports.

Materials – BSV8, SFA15, SFV 20-25

Part	Grade and Standard		
	BSV 8	SFA 15	SFV 20-25
Housing	P285QH EN 10222-4 A333, A334 Grade 1	P285QH EN 10222-4 A352 LCC, A350 LF2 G20Mn5QT EN 10213-3	P285QH EN 10222-4 A333, A334 Grade 1 G20Mn5QT EN 10213-3
Threaded plug	9SMn28 1.0715 EN 10087 11SMn28 ISO 683/9 1213 SAE J 403	11SMn28 1.0715 EN 10028 11SMn28 ISO 683/9 1213 SAE J 403	9SMn28 1.0715 EN 10087 A283 Grade C
Valve top	S235JRG2 EN 10025 A283 Grade C	S235JRG2 EN 10025 A284 grade C, A352 LCC, A572-50	S235JRG2 EN 10025 A283 Grade C
Spindle/bellow	X6CrNiTi18-10 EN 10088-2	X10CrNi 18 10 DIN 17440-85	X10CrNi 18 10 DIN 17440-85
Seat	X10CrNiS DIN 17440-85	X8CrNiS 18 9	X10CrNiS DIN 17440-85
Gasket/ packing	Aluminium	Aluminium	Aluminium

Application/Limitation

Model	Nominal size		Flow diameter D_o	Flow area A_0	Coefficient of discharge	
	Inlet	Outlet			ISO 4126-1 K_{dr}	AD2000 α_w
SFA 15	15 mm ½ in	20 mm ¾ in	13 mm 0,512 in	133 mm² 0,206 in²	0,73	0,73
BSV 8	15 mm ½ in	20 mm ¾ in	8 mm 0,315 in	50 mm² 0,078 in²	0,43	0,43
SFV 20	20 mm ¾ in	25 mm 1 in	18 mm 0,709 in	254 mm² 0,394 in²	0,54	0,54
SFV 25	25 mm 1 in	32 mm 1¼ in	23 mm 0,906 in	415 mm² 0,643 in²	0,48	0,48

Minimum design temperature: -30 °C
Maximum design temperature: 100 °C

Type Approval documentation

Tests carried out

Burst testing, determination of coefficient of discharge

Production testing

Each valve body shall be subjected to a hydrostatic pressure test at minimum 1.5 times the design pressure. The test pressure need not be more than 70 bar in excess of the design pressure.

Holding time: 2 min. for sizes up to 100 mm/4"
No leakage is permitted.

Each valve shall be subject to a function test to confirm the set pressure.
Each valve shall be subjected to a seat leakage test (at 90% of set pressure) after reset

Holding time: 5 min. for all sizes

No leakage

Impact testing is required for applications between -10°C and -30°C. See application/limitation above.

Certification
The valves may be delivered with a manufacturer's certificate only.

Material certificates for the valve bodies are required in line with DNV GL Ship Pt.4 Ch.6 Sec.2 Table 3. Note that the complete refrigerant circuit, including both low and high pressure sides, shall be considered as pertaining to Class II piping systems except R744 (CO_2) with design pressure above 40 bar which shall pertain to Class I (DNV GL Ship Pt.4 Ch.6 Sec.6 Para 5.1.3).

Marking of product
Each valve shall be clearly marked for identification. The identification marking may be performed on the body or on a plate of non-corrosive material. When a metallic plate is used, the plate shall be permanently fixed to the body.

Identification marking on the body shall be located to nonstressed areas and shall be clearly legible. The identification marking shall as a minimum include the following:
— manufacturer's name or trade mark
— valve type designation
— size
— set pressure

Periodical assessment
For retention of the Type Approval, a DNV GL Surveyor shall perform a survey - every second year and before the expiry date of this certificate - to verify that the conditions for the type approval are complied with.