Certificate No:
TAP00002GU

TYPE APPROVAL CERTIFICATE

This is to certify:

That the High Velocity Pressure Relief Valve

with type designation(s)
PROTEGO DE/S-DN-IIB, PROTEGO DE/S-MKVI-Hub-DN-IIB3, PROTEGO DE/S-DN IIB3

Issued to
Braunschweiger Flammenfilter GmbH
Braunschweig, Niedersachsen, Germany

is found to comply with
DNV rules for classification – Ships
DNV rules for classification – Offshore units
DNV class programme DNV-CP-0186 – Type approval – Valves
EN ISO 16852:2016 Flame arresters – Performance requirements, test methods and limits for use
IMO MSC/Circ. 677 as amended by MSC/Circ. 1009 and MSC/Circ. 1324
ISO 15364:2016 – Ships and marine technology – Pressure/vacuum valves for cargo tanks

Application :

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV.
Design: **Weight loaded valve disc and with a non-lockable lifting handle. Opening settings and opening / closing characteristic can be adjusted by variable magnetic force.**
Sizes: **80, 100, 125, 150**

Issued at **Hamburg** on **2022-06-10**
This Certificate is valid until **2027-06-09**.
DNV local station: **Hamburg – CMC North/East**

Approval Engineer: **Hagen Markus**

for **DNV**

Olaf Drews
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.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.

Product description

The PROTEGO® DE/S-DN-IIB3 consists of a cylindrical housing with flange connections, a magnet-controlled valve cone and non-adjustable lifting handle.
Opening settings and opening/closing characteristic can be adjusted by variable magnetic force.

The PROTEGO® DE/S-DN-IIB and PROTEGO® DE/S-MKVI-Hub-DN-IIB3 consists of a cylindrical housing with flange connections, a weight loaded valve disc and with a non-lockable lifting handle.
Opening settings and opening/closing characteristic can be adjusted by variable magnetic force.

Size range DN	80, 100, 125, 150
Flange connection	- EN 1092-1; Form B1or DIN 2501, Form C, PN 16 - ASME B16.5; 150 lbs. RFSF

Materials[1]

Component	Material designation
Body, Housing	Carbon Steel, Stainless Steel, Nickel Alloy
Valve seat, Valve cone	Stainless Steel, Nickel Alloy
Bellow	PTFE electrically conductive
Gasket	PTFE, FPM75, High temperature paper

Note
[1] Refer to Material Check List, Rev. H.
[2] Further materials according to parts list P-02/1046-S05 and P-02/1046-S10 relating to the material check list.

Documents

PROTEGO® DE/S-DN-IIB3	PROTEGO® DE/S-DN-IIB	PROTEGO® DE/S-MKVI-Hub-DN-IIB3
P-02-1046-Z05, Rev. 1 P-02-1046-Z10, Rev. 0	P-16-1588-Z01, 2016-01-28 P-16-1588-Z02, 2013-06-13	P-02-1046-Z07, 2016-02-26 P-02-1046-Z12, 2016-02-26
Parts lists P-02-1046-S05, Rev. 1 P-02-1046-S10, Rev. 0	Parts lists P-16-1588-S01, Rev.0 P-16-1588-S02, Rev.0	Parts lists P-02-1046-S07, Rev. 2 P-02-1046-S12, Rev. 0

Types	PROTEGO® DE/S-DN-IIB3	PROTEGO® DE/S-DN-IIB	PROTEGO® DE/S-MKVI-Hub-DN-IIB3
Opening settings	6 to 50 kPa	1 to 50 kPa	6 to 35 kPa
Valve lift	10mm	10 mm	10 or 50mm
Closing at	4 kPa	4 kPa	4 kPa
Flow capacities see file	„Leistung-000457-de“	“Leistung-000458-de.“	“Betrieb-000409-de”

Installation instruction

Maximum pipe length (Lm) between cargo tank and high velocity vent valve	
PROTEGO® DE/S-DN-IIB3	32m for Dm ≥ DN 80 up to DN150
PROTEGO® DE/S-DN-IIB	
PROTEGO® DE/S-MKVI-Hub-DN-IIB3	7m for Dm ⩾ DN80 up to DN150.

The nominal size of the pipe shall not be smaller than DN80. The free volume in the cargo tank (freeboard) shall not be less than 4m³.

Application/Limitation

PROTEGO® DE/S-DN-IIB3

Atmospheric deflagration and endurance burning proof high velocity vent valve in cargo tank venting system on tankers for products of explosion group up to IIB3 (MESG 0.65mm and greater).

PROTEGO® DE/S-DN-IIB

Flame proof high velocity vent valve for application in cargo tank venting system on oil and chemical tankers for products of explosion group up to IIB (MESG 0.5mm and greater).

PROTEGO® DE/S-MKVI-Hub-DN-IIB3

Flame proof high velocity vent valve for application in cargo tank venting system on oil and chemical tankers for products of explosion group up to IIB3 (MESG 0.65mm and greater).

Each installation of high velocity vent valve arrangement is subject to DNV approval including pressure drop calculation considering MSC/Circ. 731 and MSC/Circ.450.

Maximum operating temperature

60°C / 140°F

Restriction of use applicable to all types

To maintain the explosion protection, materials shall resist under the respective operating condition with respect to mechanical and/or chemical effects and corrosion.

Tests carried out

PROTEGO® DE/S-DN-IIB3, PROTEGO® DE/S-DN-IIB, PROTEGO® DE/S-MKVI-Hub-DN-IIB3

Tests acc. to EN ISO 16852:2016 and IMO MSC/Circ. 677
Flashback test at opening and closing, Endurance burning test 677, Hammering test, Deflagration test

PROTEGO® DE/S-DN-IIB3, PROTEGO® DE/S-DN-IIB

Tests acc. to ISO 15364:2016 – Chapter 7 and 8
Hydraulic pressure test, Performance characteristic test, Pressure setting, Leakage rate, Corrosion test, External ice test, Flow test

Type Approval documentation

Marking of product

Each product is to be provided with a name plate as follows (examples).

DE/S-150-IIB

PROTEGO®

model	DE/S-150-IIB		
flange	DN 150 PN 16		
serial no.	022101234-010-001	date built	2022-06
standard	EN ISO 16852		
cert.-no.	IBExU16ATEX2162X		
class.-no.	DNVGL TAP00002GU		
set pressure	[kPa]	50	
flow capacity	[m³/h]	1575	
at design pressure	[kPa]	57,5	

DEF	L_u/D = n/a	BC: a t_{BT} = -
	T_0 = 60°C	p_0 = 110 kPa (abs.)

WARNING: Flame arresters have installation and application limits
CE 0637 Ex II G IIB
Braunschweiger Flammenfilter GmbH
38110 Braunschweig, Made in Germany

DE/S-MKVI-50-150-IIB3

PROTEGO®

model	DE/S-MKVI-50-150-IIB3		
flange	DN 150 PN 16		
serial no.	022101234-020-001	date built	2022-06
standard	EN ISO 16852		
cert.-no.	IBExU02ATEX2049X		
class.-no.	DNVGL TAP00002GU		
set pressure	[kPa]	6	
flow capacity	[m³/h]	1575	
at design pressure	[kPa]	6	

DEF	L_u/D = n/a	BC: a t_{BT} = -
	T_0 = 60°C	p_0 = 110 kPa (abs.)

WARNING: Flame arresters have installation and application limits
CE 0637 Ex II G IIB3
Braunschweiger Flammenfilter GmbH
38110 Braunschweig, Made in Germany

DE/S-150-IIB3

PROTEGO®

model	DE/S-150-IIB3		
flange	DN 150 PN 16		
serial no.	022101234-070-001	date built	2022-06
standard	EN ISO 16852		
cert.-no.	IBExU02ATEX2050X		
class.-no.	DNVGL TAP00002GU		
set pressure	[kPa]	50	
flow capacity	[m³/h]	1575	
at design pressure	[kPa]	57,5	

DEF	L_u/D = n/a	BC: a t_{BT} = -
	T_0 = 60°C	p_0 = 110 kPa (abs.)

WARNING: Flame arresters have installation and application limits
CE 0637 Ex II G IIB3
Braunschweiger Flammenfilter GmbH
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Periodical assessment

For retention of the Type Approval, a DNV Surveyor shall perform periodical assessment to verify that the conditions for the Type Approval are complied with. Refer to the Class Programme DNV-CP-0338, Sec.4.
To check the validity of this certificate, please look it up in https://approvalfinder.dnv.com

End of certificate