

TYPE APPROVAL CERTIFICATE

This is to certify:

That the **Vacuum Relief Valve**

with type designation(s)

PROTEGO® SV/E-S-DN-IIB3, SV/E-DN-IIB3, PROTEGO® SV/E-S-DN-IIB, SV/E-DN-IIB

Issued to

Braunschweiger Flammenfilter GmbH
Braunschweig, Niedersachsen, Germany

is found to comply with

DNV rules for classification – Ships

DNV offshore standards

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.

Type:	Design:	Sizes:
PROTEGO® SV/E-S-DN-IIB3, SV/E-DN-IIB3 PROTEGO® SV/E-S-DN-IIB, SV/E-DN-IIB	Weight loaded valve disc and lifting handle with PROTEGO® flame arrester	50, 80, 100, 150, 200, 250, 300

Issued at **Hamburg** on **2022-06-10**

This Certificate is valid until **2027-06-09**.

for **DNV**

DNV local station: **Hamburg – CMC North/East**

Approval Engineer: **Hagen Markus**

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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 deflagration-proofed PROTEGO® SV/E-S-DN-IIB3, SV/E-DN-IIB3 and PROTEGO® SV/E-S-DN-IIB, SV/E-DN-IIB Vacuum Relief Valves consists of a housing with flange connections, incorporating a weight loaded valve disc and lifting handle, fitted with single PROTEGO® flame arrester element at the inlet.

The valves enable a vacuum setting of 10% above the maximum allowable working vacuum (M.A.W.V) of the tank. After the vacuum is equalized, the valve re-seats and provides a tight seal.

Furthermore, the valves prevent flame transmission into the tank by the integrated PROTEGO® flame arrester unit in case explosive mixture with air ignites.

MATERIALS¹

Component	Material designation	PROTEGO® SV/E-S-DN-IIB3, SV/E-DN-IIB3	PROTEGO® SV/E-S-DN-IIB, SV/E-DN-IIB
Body	Globular cast iron, Carbon steel, Stainless steel	P-01-1588-E01, (DN50 – DN300)	P-16-1588-E01, (DN50 – DN300)
Cover		P-01-1588-E02, (DN50 – DN300)	P-16-1588-E02, (DN50 – DN300)
PROTEGO® flame arrester unit	Ductile Iron, Stainless Steel	P-01-1588-B01 (DN50 – DN300) P-01-1588-B02 (DN50 – DN150)	P-16-1588-B01 (DN50 – DN300) P-16-1588-B02 (DN50 – DN150)
Valve seat	Stainless steel	Material check list, rev. H, 2016-09-21	Material check list, rev. H, 2016-09-21
Gasket	WS 3822, PTFE		
Valve disc / Sealing	Material combinations	Vacuum set pressure mbar	
	Aluminum / FEP Stainless Steel / FEP	2.0 up to 3.5 >3.5 up to 14	2.0 up to 3.5 >3.5 up to 14
	Stainless Steel / Metal to Metal	>14 up to 35 >35 up to 60	>14 up to 35 >35 up to 60

Note

¹ Refer to Material Check List, Rev. H.

Documents

PROTEGO® SV/E-S-DN-IIB3 and SV/E-DN-IIB3

Details	Documents
Size range DN 50, 80, 100, 150, 200, 250, 300	P-01-1017-Z01, 2002-01-31 (DN50 – DN300) P-01-1017-Z02, 2002-02-07 (DN50 – DN300)
Flange connection EN 1092-1; Form B1; ASME B16.5; 150 lbs RFSF	Part List P-01-1017-S01, 2002-02-04 P-01-1017-S02, 2002-02-07
Setting range mbar vacuum 2.0 – 3.0, 3.5 – 14.0, 14.0 – 35.0, 35.0 – 60.0	Operational manual "Betrieb – 000054-de-01.pdf"

Flow capacities	Clean FLAMMENFILTER® refer to diagram "Leistung-000086-de-00.pdf" 30% clogging of FLAMMENFILTER®; refer to diagram "SV-E-IIB3_ADN_2017.pdf"
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PROTEGO® SV/E-S-DN-IIB, SV/E-DN-IIB

Details	Documents
Size range DN 50, 80, 100, 150, 200, 250, 300	P-16-1588-Z06, 2016-10-10 (DN50 – DN150) P-16-1588-Z05, 2016-10-10 (DN200 – DN300)
Flange connection EN 1092-1; Form B1; ASME B16.5; 150 lbs RFSF	Part List P-16-1588-S06 Part List P-16-1588-S05
Setting range mbar vacuum 2.0 – 3.0, 3.5 – 14.0, 14.0 – 35.0, 35.0 – 60.0	Operational manual "Betrieb – 000453-de.doc"

Flow capacities	Refer to product specification "000461 - de.doc"
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Application/Limitation

PROTEGO® SV/E-S-DN-IIB3 and SV/E-DN-IIB3

Flame proof vacuum relief valve in cargo tank venting systems on tankers for products of explosion group IIA and IIB3 with MESG 0.65mm or greater.

PROTEGO® SV/E-S-DN-IIB, SV/E-DN-IIB

Flame proof vacuum relief valve in cargo tank venting systems on tankers for products of explosion group IIA to IIB with MESG 0.5mm or greater.

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

Flashback test, corrosion test, pressure test

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 below (examples).

SV/E-S-150-IIB		SV/E-S-150-IIB3	
PROTEGO®			
model	SV/E-S-150-IIB		
flange	DN 150 PN 16		
serial no.	022102020-050-001	date built	2022-06
standard	EN ISO 16852		
cert.-no.	IBExU16ATEX2214X		
class.-no.	DNVGL TAP00002GU		
set pressure	[kPa]		- 3,5
flow capacity	[m³/h]		469
at design pressure	[kPa]		- 3,85
DEF	$L_0/D = n/a$	BC: c	$t_{BT} = -$
	$T_0 = 60^\circ C$	$p_0 = 110 \text{ kPa}$	(abs.)
WARNING: Flame arresters have installation and application limits			
 0637  II G IIB 			
Braunschweiger Flammenfilter GmbH 38110 Braunschweig, Made in Germany			

SV/E-S-150-IIB3		SV/E-S-150-IIB3	
PROTEGO®			
model	SV/E-S-150-IIB3		
flange	DN 150 PN 16		
serial no.	022104189-020-001	date built	2022-06
standard	EN ISO 16852		
cert.-no.	IBExU02ATEX2040X		
class.-no.	DNVGL TAP00002GU		
set pressure	[kPa]		- 3,5
flow capacity	[m³/h]		2000
at design pressure	[kPa]		- 3,85
DEF	$L_0/D = n/a$	BC: c	$t_{BT} = -$
	$T_0 = 60^\circ C$	$p_0 = 110 \text{ kPa}$	(abs.)
WARNING: Flame arresters have installation and application limits			
 0637  II G IIB3 			
Braunschweiger Flammenfilter GmbH 38110 Braunschweig, Made in Germany			

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