



Marine &amp; Offshore

Certificate number: 55553/B0 BV

File number: ACM 145/2552/02

Product code: 73511

*This certificate is not valid when presented without the full attached schedule composed of 7 sections*

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## TYPE APPROVAL CERTIFICATE

*This certificate is issued to***Flow Safe, Inc.**

Orchard Park, NY - UNITED STATES OF AMERICA

*for the type of product*

### PRESSURE RELIEF VALVES FOR LIQUEFIED GAS PIPING SYSTEMS

Series F84/85 pressure relief valve, spring-operated, for gas and vapor services

**Requirements:**

Bureau Veritas Rules for the Classification of Steel Ships

IGC Code as amended by IMO Resolution MSC.441(99)

IGF Code &amp; NR529 Gas Fuelled Ships

*This certificate is issued to attest that Bureau Veritas Marine & Offshore did undertake the relevant approval procedures for the product identified above which was found to comply with the relevant requirements mentioned above.***This certificate will expire on: 22 Mar 2029****For Bureau Veritas Marine & Offshore,**

At BV PORT EVERGLADES CENTRE, on 29 May 2024,

Flavio Rosas

***This certificate was created electronically and is valid without signature***

This certificate remains valid until the date stated above, unless cancelled or revoked, provided the conditions indicated in the subsequent page(s) are complied with and the product remains satisfactory in service. This certificate will not be valid if the applicant makes any changes or modifications to the approved product, which have not been notified to, and agreed in writing with Bureau Veritas Marine & Offshore. Should the specified regulations or standards be amended during the validity of this certificate, the product(s) is/are to be re-approved prior to it/they being placed on board vessels to which the amended regulations or standards apply. This certificate is issued within the scope of the General Conditions of Bureau Veritas Marine & Offshore available on the internet site www.veristar.com. Any Person not a party to the contract pursuant to which this document is delivered may not assert a claim against Bureau Veritas Marine & Offshore for any liability arising out of errors or omissions which may be contained in said document, or for errors of judgement, fault or negligence committed by personnel of the Society or of its Agents in establishment or issuance of this document, and in connection with any activities for which it may provide.

The electronic version is available at: <http://www.veristarm.com/veristarnb/jsp/viewPublicPdfTypepec.jsp?id=rv32gppli>

BV Mod. Ad.E 530 June 2017

This certificate consists of 3 page(s)

## THE SCHEDULE OF APPROVAL

### **1. PRODUCT DESCRIPTION**

#### **Spring loaded pressure relief valve series F84/F85**

##### 1.1 Safety valve ratings\*

<b>Size range</b>	1/2" to 3"
<b>Pressure range*</b>	1.03 barg (15 psig) to 711 barg (10,313 psig)
<b>F84 Temperature range*</b>	-196 °C (-320°F) to 208°C (406°F)
<b>F85 Temperature range*</b>	-54 °C (-65°F) to 208°C (406°F)
<b>Discharge Coefficients</b>	Kd = 0.878

\* Depending on type, size and materials

##### 1.2 Valve body type

M: Micro

B: Medium

C, D, E: Bolted bonnet

##### 1.4 Materials

<b>Body</b>	SB-61 / SA-351 CF8M
<b>Cap / Bushing</b>	ASTM B16 / A479 316
<b>Spring</b>	302 / 304 / 17-7 SS
<b>Seals</b>	PTFE

*When other choices of materials are used per manufacturer's recommendations, the BV agreement is to be obtained.*

### **2. DOCUMENTS AND DRAWINGS**

2.1 - Catalogue N° FS801214 dated 11/2018

2.2 - Manufacturer's drawings for F85 series:

- N° F85M-1234-NPT-EXT Rev – dated 09/06/2020; N° F85B-468F-EX Rev.C dated 12/05/2021

- N° F85-468C-EX Rev.- dated 26/01/2011; N° F85-FG-D Rev.G dated 08/07/2008; N° F85-HJ-NPT Rev.- dated 02/09/2015

2.3 Manufacturer's drawings for F84 series:

- N° F84M-1234 Rev.F dated 10/02/2021; N° F84B-468M-EX Rev.B dated 13/04/2021; N° F84-468C-NPT Rev.- dated 28/08/2017

- N° F84-FG-NPT Rev.- dated 26/10/2015, N° F84-FG-15X23 Rev.A dated 16/11/2015; N° F84-HJ-E Rev.D dated 09/07/2008

- N° F84-HJFL Rev.D dated 17/07/2015; N° F84-HJFL-LL Rev.- dated 09/06/2008

- N° F84B-468-341X12 Rev – dated 29/09/2021

2.4 Design analysis Rev.3 dated 23/12/2016

*No departure from the above documents shall be made without the prior consent of the Society. The manufacturer must inform the Society of any modification or changes to these documents and drawings.*

### **3. TEST REPORTS**

Type tests witnessed by a BV Surveyor including hydrostatic test at ambient temperature & valve set pressure test at the minimum design temperature:

- Test reports for types F84 and F85 witnessed by BV surveyor on 21/02/2019

- Functional test report at ambient temperature for F84 N° 049234-1-1 dated 10/02/2021 and for F85 N° 053031-4-1 dated 31/01/2023

- Functional test report at minimum temperature for F84 N° 58168 dated 07/09/2017

- Repeatability of seat tightness test report N° Cryo-00-002 dated 10/2000

#### **4. APPLICATION / LIMITATION**

- 4.1 - The pressure relief valves may be used for steam, gases and liquids. Model F84 may be used as cargo tank vent systems on board liquefied gas carriers and Boil-off gas (BOG) application.
- 4.2 - The pressure relief valves belong to class I according to the relevant requirements stated in Part A-1, 7.3 of the BUREAU VERITAS Rules NR529 and in Part D, Ch 9, Sec 5 of the BUREAU VERITAS Rules NR467.
- 4.3 - The valves intended to be used for handling of Propylene Oxide or Ethylene Oxide/ Propylene Oxide mixtures shall be of a fire safe design.
- 4.4 - When required in Part D, Ch 9, Sec 6 of the BUREAU VERITAS Rules applicable to liquefied gas carriers, Charpy V-notch impact test shall be carried out for castings. Castings in steel grades 316 and 316L at any temperature will be impact tested at -196 °C. A reduction may be granted for design temperature above -60 °C after examination by the Society.
- 4.5 - Prior to the use on cargo tanks of liquefied gas carriers, and depending on the nature of the cargoes, the pressure relief valves shall be required by the Society to be additionally tested for their capacity in accordance with BUREAU VERITAS Rules and IGC Code.
- 4.6 - The materials for valve housing, internal and sealing are to be of a suitable type at the temperature and pressure for use with cargoes intended to be carried.
- 4.7 - The pressure relief valve is to be set, sealed and installed according to manufacturer's instructions and BUREAU VERITAS Rules requirements.
- 4.8 - The valve intended to be installed on BUREAU VERITAS classed ship have to comply with Pt D, Ch 9, Sec 5 & IGC Code and type tests reports witnessed by BUREAU VERITAS are to be available for each type and size of valve.

#### **5. PRODUCTION SURVEY REQUIREMENTS**

- 5.1 - The products are to be supplied by Flow Safe, Inc. in compliance with the type and the requirements described in this certificate.
- 5.2 - This type of product is within the category IBV of BUREAU VERITAS Rule Note NR320.
- 5.3 - BV product certificate is required.
- 5.4 - The valve material is to be subjected to Charpy impact test in accordance with BUREAU VERITAS Rules and IGC Code.
- 5.5 - BUREAU VERITAS Certificates are required for materials of valve housings of Class I (DN<sup>3</sup>50). Materials of valve housings of Class I (DN<50) and for other parts of Class I are to be with Work's certificates.
- 5.6 - Each valve is to be tested according BV Rules Pt D, Ch 9, Sec 5 item 13.3.3.
- 5.7 - For information, **Flow Safe, Inc.** has declared to Bureau Veritas the following production site:

**Flow Safe, Inc.**  
**3865 Taylor Road,**  
**14127 Orchard Park,**  
**USA**

#### **6. MARKING OF PRODUCT**

The product shall be marked with at least:

- Manufacturer's name or logo
- Type designation
- Setting pressure
- Society's brand as relevant

#### **7. OTHERS**

It is **Flow Safe, Inc.**'s responsibility to inform shipbuilders or their sub-contractors of the proper methods of fitting, use and general maintenance of the approved equipment and the conditions of this approval.

*This certificate supersedes the Type Approval Certificate No. 55553/A2 BV issued by the Society.*

\*\*\* END OF CERTIFICATE \*\*\*