



CERTIFICATE NUMBER	23-00T2485232-1-PDA
EFFECTIVE DATE	27-Oct-2025
EXPIRY DATE	24-Dec-2028
ABS TECHNICAL OFFICE	Houston ESD - Electrical

CERTIFICATE OF

Product Design Assessment

This is to certify that a representative of this Bureau did, at the request of

FLOW MANAGEMENT DEVICES LLC

located at

5225 SOUTH 37TH STREET SUITE 5, PHOENIX, AZ, United
States, 85040

assess design plans and data for the below listed product. This assessment is a representation by the Bureau as to the degree of compliance the design exhibits with applicable sections of the Rules. This assessment does not waive unit certification or classification procedures required by ABS Rules for products to be installed in ABS classed vessels or facilities. This certificate, by itself, does not reflect that the product is Type Approved. The scope and limitations of this assessment are detailed on the pages attached to this certificate.

Product: Meter, Flowmeter

Model: FMD-001, -003, -007, -015, -025, -C25, -035, -A35, -045, -060, -090, -130, -200, -245, -060EV, -090EV & -200EV

Endorsements:

Tier: 2 - PDA Issued

This Product Design Assessment (PDA) Certificate remains valid until 24/Dec/2028 or until the Rules and/or Standards used in the assessment are revised or until there is a design modification warranting design reassessment (whichever occurs first).

Acceptance of product is limited to the "Intended Service" details prescribed in the certificate and as per applicable Rules and Standards.

This Certificate is valid for installation of the listed product on ABS units which exist or are under contract for construction on or previous to the effective date of the ABS Rules and standards applied at the time of PDA issuance. Use of the Product for non-ABS units is subject to agreement between the manufacturer and intended client.

American Bureau Of Shipping

Soheni Haque, Sr. Managing Principal Engineer

NOTE: This certificate evidences compliance with one or more of the Rules, Guides, standards or other criteria of ABS or a statutory, industrial or manufacturer's standards. It is issued solely for the use of ABS, its committees, its clients or other authorized entities. Any significant changes to the aforementioned product without approval from ABS will result in this certificate becoming null and void. This certificate is governed by ABS Rules 1-1-A3/5.9 Terms and Conditions of the Request for Product Type Approval and Agreement (2010)

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Endorsements:

Intended Service:

Marine and Offshore Application: A flow rate measuring instrument for proving liquid flow meters in process piping systems on Offshore Oil Platforms and Floating Production Storage and Offloading Vessels.

Description:

The FMD-XXX Prover (small volume Unidirectional Captive Displacement Prover) is a flow rate measuring instrument for proving liquid flow meters in piping systems.

The flow rate is calculated based on measured fluid traveling distance in a controlled volume device over a period of time.

The prover consists of a cylindrical flow tube (with a known verified diameter), control system PIM (Prover interface Module housed in explosion-proof enclosure) with software, drive train including electric motor for moving the piston and shuttle assembly in the tube.

The system consists of an electrical panel which houses up to two I. S. barriers and power supply. The PIM is powered by the end user in the field.

Rating:

Media to be measured: Liquid fluids

Maximum Flow Rate: 23 m³/hr (100 gpm) to 5,565 m³/hr (24,500 gpm)*

Pressure Rating Range: 19.6 bar to 255.3 bar (285 psi to 3705 psi)*

Power: Prover Interface Module (PIM): 11 to 26 VDC

Motor: 24 VDC, 110-120 VAC 1 phase, 220/230/240 VAC 1 phase, 190/208-230/240 VAC 3 phase, 380/400/415 VAC 3phase, 440/460/480 VAC 3 phase, 690 VAC 3 phase*

Hydraulic motor drive train option is available

Ambient Temperature: -20°C to 54°C (-4°F to +129°F)

Hazardous Areas: USA/Canada (CSA): Class I, Div.1, Group D; Class I, Div. 2 Group D;

IECEx (Intertek): Ex d mb [ia] IIB T3 Gb

* See attached "pdf" for Technical Specification Details.

Service Restriction:

1. Unit Certification is required for this product if it is installed on offshore installations are classed for FPS or FPSO or Hydrocarbon Processing/production.

a) The following specific test, are to be witnessed by the Surveyor in accordance with Chapter 5, Section 1/3.3.3 i) of ABS Guide for Hydrocarbon Production Facilities on Offshore Units.

i) Each vessel is to be subjected to a hydrostatic test which at every point in the vessel is at least equal to 1.3 times the maximum allowable working pressure or in accordance with the appropriate pressure vessel code.

b) Other tests required by project specifications may also be witnessed and reported on by the Surveyor in accordance with Chapter 5, Section 1/3.3.3 of the ABS Guide for Hydrocarbon Production Facilities on Offshore Units.

2. Unit certification is not required for this product if it is not installed on offshore installations are classed for FPS or FPSO or Hydrocarbon Processing/production.

3. If the manufacturer or purchaser request an ABS Certificate for compliance with a specification or standard, the specification or standard, including inspection standards and tolerances, must be clearly defined.

4. Where a host flow computer is used in association with the Prover, it must be either certified for the intended hazardous area classification or used in non-classified location.

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Comments:

1. Materials used for load bearing and/or pressure containing components are to be traceable and the certified material test reports showing that they meet or exceed the required specifications are to be made available upon request.
2. The Prover Installation and calibration are to be in accordance with the manufacturer's procedures specified in the manuals.
- 3 The internal software is outside the scope of this PDA certification.
4. Hydraulic motors are outside the scope of this PDA certification.
5. The manufacturer has provided a declaration about the control of, or the lack of Asbestos in this product.

Notes/Drawing/Documentation:

Identify Data from WO0407409;

Document FMD SVP Overview DS 5.0 08-25, Revision: -, Pages: 2,

Drawing No. IECEx CSA 25.0009X Iss 1, CSANe 25ATEX1007X iss 1, Revision: 1, Pages: 4,

Drawing No. CSANe 25ATEX1007X iss 1, IECEx CSA 25.0009X Iss 1, Revision: 1, Pages: 5,

Supporting Data from previous WO00T2485232;

Document No: CSA certificate: 2137671, Small Volume Prover for Hazardous Area Locations, Issued Date 2022-07-29, Pages: 7

Drawing No. 000-113786-DOC, Outline GEN 4, Revision: A, Date: 1 June 2018

Drawing No. 000-113846-DOC, Overview FMD 015-200, Revision A, date 11 July 2018 Pages: 2

Document No.: 000-112680-DOC, Compact Prover 4th Generation - Operating and Maintenance Manual, Rev. C, date: 5 September 2018, Pages: 36

Document No. 000-112821-DOC, 4th Generation Prover Configuration, Revision: C, Pages: 1

Document No. 000-101491-DOC, Flow Prover Pressure Vessel Design Calculations, Revision: D, Date 29 March 2017, Pages: 51

Drawing No. 000-111416-DOC, PROVER POWER 2 PH 220V, Revision: B, Pages: 1

Drawing No. 000-111417-DOC, PROVER POWER 3 PH 380 460V, Revision: D, Pages: 1

Drawing No. 000-111414-DOC, PROVER POWER DC, Revision: C, Pages: 1

Drawing No. 000-111415-DOC, PROVER SYSTEM WIRING POWER 1PH 115V, Revision: B, Pages: 1

Drawing No. 000-111418-DOC, SYSTEM WIRING SENSORS STD, Revision: C Pages: 1

Drawing No. 000-111413-DOC, SYSTEM WIRING CUSTOMER CONNECTIONS, Revision: D, Pages: 1

Drawing No. 000-111432-DOC, SYSTEM WIRING POWER DC-HYDRAULIC, Revision: A, Pages: 1

Drawing No. 000-113944-DOC, PROVER POWER 3 PH 380 460V, Revision: A

Document No: CSA certificate: 2137671, Small Volume Prover for Hazardous Area Locations, Revision: -, Issued Date 11 June 2018, Pages: 5

Document No. IECEx ETL 14.0037X, Unidirectional Captive Displacement Prover-Series, Issued by Intertek, 15 February 2016, Pages: 5

Document: EC Declaration for Unidirectional Captive Displacement Prover-Series, Issued by Flow Management Devices, LLC, date: 6 June 2013, Pages: 3

Terms of Validity:

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STANDARDS

ABS Rules:

2025 Rules for Conditions of Classification, Part 1A, 1A-1-4/7, 1A-1-A3, and 1A-1-A4, which cover the following:
2025 Marine Vessel Rules: 4-8-3/1.7, 4-8-3/1.9, 4-8-3/1.11, 4-8-4/27.5.1

2025 Rules for Conditions of Classification, Part 1B - Offshore Units and Structures 1B-1-4/7, 1B-1-A2, and 1B-1-A3, which cover the following:

2025 Offshore Units Rules: 4-3-3/2.5, 4-3-3/9.3

2025 Facilities on Offshore Units: 3-3/9.1, 3-3/11.1, 3-6/15.3, 4-3/1, 5-1/3.3.3

National:

ASME B31.3-2022, ASME SECTION VIII DIV. 1

EN IEC 60079-0:2018, EN 60079-1: 2014, EN 60079-11:2012, EN 60079-18:2015+A1:2017

CSA Certificate 2137671 Issued Date: 2022-07-29 certifies the equipment meeting the requirements of the following standards:

CAN/CSA-C22.2 No. 30-M1986 (R2016) - Explosion-proof enclosures for use in class I hazardous locations - Third Edition

CAN/CSA-C22.2 No. 213-M1987 (R2013) - Non-incendive electrical equipment for use in class I, division 2 hazardous locations - First Edition

UL Standard 913, 8th Ed. Intrinsically Safe Apparatus and Associated Apparatus for Use in Class I, II, and III, Division 1, Hazardous (Classified) Locations

International:

IECEX Certificate ETL 14.0037X, Issue No:1 certifies the equipment meeting the requirements of the following IEC standards:

IEC 60079-1: Edition: 6.0: 2007 Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d"

IEC 60079-25: Edition: 2.0: 2010 Explosive atmospheres - Part 25: Intrinsically safe electrical systems

IECEX Certificate CSA 25.0009X, Issue No:1 certifies the equipment meeting the requirements of the following IEC standards:

IEC 60079-0: Edition: 7.0: 2017 Explosive atmospheres - Part 0: Equipment - General requirements

IEC 60079-1: Edition: 7.0: 2014 Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d"

IEC 60079-11: Edition: 6.0: 2011 Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"

IEC 60079-18: Edition: 4.1: 2017 Explosive atmospheres - Part 18: Protection by encapsulation "m"

Government:

N/A

EUMED:

N/A

OTHERS:

N/A