CERTIFICATE OF CONFORMITY

1. **HAZARDOUS (CLASSIFIED) LOCATION ELECTRICAL EQUIPMENT PER US REQUIREMENTS**
2. **Certificate No:** **FM20US0150**
3. **Equipment:** **Smart Hart Melt Pressure Transmitters**
   (Type Reference and Name) **HMF, HWF Series**
4. **Name of Listing Company:** **Gefran Spa**
5. **Address of Listing Company:** **Via Sebina, 74**
   Provaglio d'Iseo (BS)
   25050 Italy
6. The examination and test results are recorded in confidential report number:

   PR457732 dated 5th February 2021

7. FM Approvals LLC, certifies that the equipment described has been found to comply with the following Approval standards and other documents:

   FM Class 3600:2018, FM Class 3615:2018, FM Class 3616:2011, FM Class 3810:2018,
   ANSI/UL 601010-1:2018, ANSI/NEMA 250:2014, ANSI/IEC 60529:2004

8. If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to specific conditions of use specified in the schedule to this certificate.
9. This certificate relates to the design, examination and testing of the products specified herein. The FM Approvals surveillance audit program has further determined that the manufacturing processes and quality control procedures in place are satisfactory to manufacture the product as examined, tested and Approved.
10. Equipment Ratings:

    Explosionproof for Class I, Division 1, Groups A, B, C and D; Dust-Ignitionproof for Class II, III, Groups E, F and G; temperature Class T6 for an ambient temperature range of Ta = -20°C to +60°C and T5 for Ta = -20°C to +85°C hazardous (classified) locations, indoor/outdoor Type 4X and IP67.

Certificate issued by:

J.E. Marquedant
VP, Manager - Electrical Systems

5 February 2021
Date

To verify the availability of the Approved product, please refer to www.approvalguide.com

THIS CERTIFICATE MAY ONLY BE REPRODUCED IN ITS ENTIRETY AND WITHOUT CHANGE

FM Approvals LLC. 1151 Boston-Providence Turnpike, Norwood, MA 02062 USA
T: +1 (1) 781 762 4300 F: +1 (1) 781 762 9375 E-mail: information@fmapprovals.com www.fmapprovals.com

11. The marking of the equipment shall include:

Class I Division 1, Groups A, B, C, D; T6 Ta = -20°C to +60°C; T5 Ta = -20°C to +85; Type 4X, IP67

Class II, III Division 1, Groups E, F, G, Division 1; T6 Ta = -20°C to +60°C; T5 Ta = -20°C to +85; Type 4X, IP67

12. **Description of Equipment:**

General Assembly:

The transmitters have a stainless steel (AISI304) housing consisting of welded or cemented flamepath joints. Inside the enclosures are plastic parts of type PA66 / PSU compatible with the temperature ranges of use of the devices. Electronic circuits for conditioning the measurement signal are inserted inside the housings. The part in contact with the process fluid, consists of a metal diaphragm with a surface coating for protection against corrosion/wear. The pressure of the process fluid is transferred by means of a fluid (HWF oil / HMF mercury) contained in a capillary that translates the deflection of the diaphragm in contact with the process to another diaphragm on which a strain gauge with 4 resistors in Wheatstone bridge configuration is bonded. The bridge signal is then transported by means of cables to the signal conditioning and amplification electronics; the transducer provides a 4...20 mA output signal proportional to the measured quantity. A digital HART (Highway Addressable Remote Transducer) signal is superimposed on the same supply/output lines by modulation. This bidirectional communication protocol provides access to the transmitter data by a process controller. The sensing element is connected via cables to the signal conditioning and amplification electronics. The transducer provides a 4...20 mA output signal proportional to the measured pressure.

Models Description:

The pressure transmitters use strain gage technology. Depending on the process connection and the signal carry-over method, the transmitters differ in the following configurations which do not affect the type of protection:
- rigid stem
- flexible rod
- with pressure measurement with exposed capillary
- with process connection designed for special applications, e.g. flanges, (not affecting type of protection).

Construction:

Housing Shell assembly.
The housing of the transducer is composed by 3 main pieces made of AISI304 stainless steel:
• A lower shell
• A main housing
• A cap for cable outlet

The lower shell acts as circuit support and is connected to the below mechanics from sensing element (base shell) through an M24x1 (4mm long) thread and laser welding joint. The capillary tubing is inserted in the lower shell and kept firmed with a brass ogive and lock nut. The lowest part of lower shell is potted with epoxy resin and allows the cable to pass into the conduit. The lower shell (circuit support) is connected to main housing through an M48x1,5 (13mm long) right thread which is also laser welded. The NPT conduit connector cap is connected on the opposite side to the main housing through an M48x1,5 (13mm long) left thread plus laser welding.

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Component Information:
The electrical connection, electronics and electronics housing components are standard for all HMF, HWF and are all contained withing the main housing. The lower section of the transmitter and (contact diaphragm, stem, flex, sensing diaphragm, etc.) only contains fluid and is customizable based on customer pressure range, configuration, and length requirements. The components, from contact diaphragm to lower shell do not constitute as XP joints and for this reason they don't affect XP/DIP type of protection.

Operation Temperature Ranges:

The ambient operating temperature range for the Smart Hart Melt Pressure Transmitters HMF and HWF is -20°C to +60°C (T6); -20°C to +85°C (T5).

Rating:

Power consumption 13 - 30Vdc with a max current absorption of 23mA (<1 VA).

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a =	Fluid Medium; W = oil fill or M = mercury fill
b =	Configuration; 0 = rigid stem, 1 = flexible armor, 3 = exposed capillary or 4 = flange
c =	Accuracy Class; H = 0.25% accuracy (for pressure ranges ≥ 100bar or 1500psi) or M = 0.50% accuracy.
dddd =	Pressure Range; First digit designates units: P = psi, B = bar or M = MPa Second & Third digits are numbers, Fourth digit designates multiplier U = x1, D = x10, C = x100, M = x1000 (Examples: P10M = 10,000 psi, B05C = 500 bar)
e =	Thread size (referred to process), 1 = 1/2-20 UNF, 2 = M10x1.0, 3 = M14x1.0, 4 = M18x1.5, 5 = other (specified in Mod) or 6 = flange.
f =	Stem Length (from snout tip to base of hex); Alphanumeric code specifying length between 1.5" and 30", For Exposed Capillary units (configuration = 3), stem code is 0
g =	Flex Length; Alphanumeric code specifying length between 3" and 60", for Rigid Stem units (configuration = 0), flex length is 0
h =	Functional Safety certification; 0 = no certification, P = Performance Level d (PL d) or S = Safety integrity level 2 (SIL 2)
i =	Autozero; 0 = magnetic autozero or E = external autozero.
j =	Temperature class; 5 = T5/Ta = -20 +85°C or 6 = T6/Ta = -20 +60°C

13. **Specific Conditions of Use:**

None

14. **Test and Assessment Procedure and Conditions:**

This Certificate has been issued in accordance with FM Approvals US Certification Requirements.

15. **Schedule Drawings**

A copy of the technical documentation has been kept by FM Approvals.

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16. **Certificate History**

Details of the supplements to this certificate are described below:

Date	Description
5th February 2021	Original Issue.