

3000862
 (3610)

April 16, 1999

TRANSMET I.S. DEWPOINT TRANSMITTER
 FOR
 HAZARDOUS (CLASSIFIED) LOCATIONS

from

MICHELL INSTRUMENTS LIMITED
 NUFFIELD CLOSE
 CAMBRIDGE
 UNITED KINGDOM

1. INTRODUCTION

- 1.1 Michell Instruments Limited have requested Approval of the apparatus listed in Section 1.2 to be in compliance with the applicable requirements of the following standards.

<u>Standard Title</u>	<u>Class No.</u>	<u>Issue Date</u>
Electrical Equipment for Use in Hazardous (Classified) Locations General Requirements	3600	November 1999
Intrinsically Safe Apparatus and Associated Apparatus for Use in Class I, II, and III Division 1 Hazardous (Classified) Locations	3610	October 1988

Note: 1.5 Safety Factor applied to voltage or current rather than energy

Electrical and Electronic Test, Measuring and, and Process Control Equipment	3810	March 1989
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- 1.2 The following apparatus was evaluated intrinsically safe for Class I, Division 1, Groups A, B, C, and D, temperature class T4, indoor and outdoor (NEMA Type 4) Hazardous (Classified) Locations. No listing will appear in the Approval Guide for Michell Instruments. This product will be Private Labeled for Kahn Instruments, and will appear in the Approval Guide follows;

Transmet I.S. Dewpoint Transmitter

IS / 1 / 1 / ABCD / T4 - 141-080-198/ - Entity; 141-080-199/ - System*; Type 4

* When used with Kahn Instruments part number A141-080-207

2. DESCRIPTION

- 2.1 The apparatus described in this report is a self-contained 3-wire dewpoint transmitter. The apparatus comprises a printed circuit board containing electronic components connected to a capacitive sensor and to a temperature sensor all housed in a metal enclosure. The measurement sensor and the temperature measurement thermistor are protected by a stainless steel sintered guard, which projects in to the gas stream.

Electrical connections are made via an 8-way terminal block accessible under a screw-on cover. Access for the cable is provided by a suitable cable gland fitted into the side wall of the housing. The screw on cover has an O-ring for sealing purposes.

- 2.2 The manufacturer has made available for examination all necessary component information, system specification and test procedures. Installation and operation instructions are available which adequately describe each major assembly, initial installation, testing and troubleshooting techniques.

3. EXAMINATIONS AND TESTS

- 3.1 General - Representative samples of the apparatus listed in Section 1.2 were examined and tested by EECS, under their Project Number 98(C)0148/1 to determine its acceptability for use in the specified hazardous locations. Examination and testing by EECS was conducted under the guidelines set forth in the FMRC/EECS Contract and Testing Reports Agreement. Test results compiled by EECS have been satisfactorily reviewed by FMRC and are attached to this report.

- 3.2 The system Approval requires additional current limiting to be provided. This current limiting is provided by Kahn Instruments part number A141-080-206.

- 3.3 A sample of the Transmet housing was successfully subjected to the tests required for a NEMA Type 4 enclosure.

3.4 Electrical Utilization Examination

- 3.3.1 *General* - Electrical utilization equipment acceptability is based on the ability of the equipment to minimize the risk of electrical shock, injury and fire. The input voltage, current and power are less than the limits set in ISA S82.01 and the apparatus can be considered a Limited Circuit.

- 3.3.2 *Process Pressure Test* - A representative sample of the pressure transmitter was subjected to a test pressure of 8220 p.s.i. without leakage occurring. The sample was then subjected to a test pressure of 12030 p.s.i. without rupture that would result in flying fragments. There was no leakage of any test fluid into the electrical compartment.

4. MARKING

- 4.1 The following information appears on the apparatus identified in Section 1.2 and meets Standard requirements:

FACTORY MUTUAL RESEARCH CORPORATION
J.I. 3000862

- Manufacturer's name and manufacturing location.
- Product Name and serial number.
- The Factory Mutual Research Corporation mark of Approval.

4.2 The following wording specific to hazardous locations, appears on the apparatus identified in Section 1.2 and meets Standard requirements:

Intrinsically safe CII, Div 1, Gp A, B, C, & D T4

5. REMARKS

- 5.1 Tampering and replacement with nonfactory components may adversely affect the safe use of the system.
- 5.2 Kahn Instruments part number A141-080-206 shall be used when the product is installed in accordance with Control drawing 141-080-199.

6. FACILITIES AND PROCEDURES AUDIT

Michell Instruments Limited design and manufacturing facilities in Cambridge, United Kingdom, are subject to follow-up audit inspections. The facilities and quality control procedures in place have been found satisfactory to manufacture product identical to that examined and tested as described herein.

7. MANUFACTURER'S RESPONSIBILITIES

- 7.1 Documentation that is applicable to this approval is on file at Factory Mutual Research Corporation and listed in the Documentation File, Section 8 of this report. No changes of any nature shall be made unless notice of the proposed change has been given and written authorization obtained from Factory Mutual Research Corporation. The Approved Product Revision Report, FMRC Form 797, shall be forwarded to FMRC as notice of proposed changes.

8. DOCUMENTATION

Drawing number	Revision	Description
141-080-198	-	Transmet transmitter entity
141-080-199	-	Transmet transmitter entity
61205	1	Component enclosure label
A141-080-206	-	Entity component enclosure
A141-080-207	-	Entity component enclosure label
Ex61072	01	P.C.B. details
Ex80339	01	Parts List
Ex80339/C	01	Circuit Diagram
Ex80379	1	Component enclosure
Ex80379	01	Parts list component enclosure
Ex90195	01	General Assembly

9. CONCLUSION

The apparatus listed in Section 1.2 meets Factory Mutual Research Corporation requirements. Approval is granted when the Approval Agreement is signed and received by Factory Mutual Research Corporation.

EXAMINATION AND TESTS BY: A E Deaves - EECS
N P Ludlam - FMRC
C. Mace - FMRC

ORIGINAL DATA: EECS Report No. 97(C) 0148/1

ATTACHMENTS: EECS Report No. 97(C) 0148/1
Label Drawing Ex 90195 Rev. 01
Control Drawing 141-080-198 original
141-080-199 original

WRITTEN BY:

REVIEWED BY:



Nicholas P. Ludlam
Senior Engineer
Instrumentation Section



Ralph V. Masi
Senior Engineer
Instrumentation Section