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APPROVAL REPORT

NIVOTESTER FTW325 LEVEL LIMIT SWITCH FOR USE IN HAZARDOUS (CLASSIFIED) LOCATIONS

Prepared for:

Endress + Hauser GmbH + Co. KG
Hauptstrasse 1
D-79689 Maulburg
Germany

Project ID: 3016940
Class: 3610
Date of Approval: 25 Jun 2003
Authorized by:
Robert Martell, Assistant Vice President

FM Approvals
1151 Boston-Providence Turnpike
PO Box 9102
Norwood, MA 02062

**NIVOTESTER FTW325 LEVEL LIMIT SWITCH
FOR USE
IN
HAZARDOUS (CLASSIFIED) LOCATIONS**

from

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Hauptstrasse 1
D-79689 Maulburg
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I INTRODUCTION

1.1 Endress + Hauser requested an examination of the apparatus listed in Section 1.4 for compliance with the standards listed in Section 1.3 as Associated Intrinsically Safe Apparatus for connection to Class I, II and III, Division 1, Groups A, B, C, D, E, F and G and Class I, Zone 0, Group IIC Hazardous (Classified) Locations in accordance with Entity requirements and Control Drawing 960532-0070.

1.2 This Report may be freely reproduced only in its entirety and without modification.

1.3 **Standards**

Title	Class Number	Date
Electrical Equipment for Use in Hazardous (Classified) Locations, General Requirements	3600	November 1998
Intrinsically Safe Apparatus and Associated Apparatus for Use in Class I, II and III, Division 1 and Class I, Zone 0 and 1 Hazardous (Classified) Locations	3610	October 1999
Electrical and Electronic Test, Measuring and Process Control Equipment	3810 Including Supplement #1	March 1989 July 1995

1.4 **Listing -** The product will appear in the Approval Guide as follows:

FTW325-Dabc. NIVOTESTER Level Limit Switch.
AIS / I, II, III / 1 / ABCDEFG - 960532-0070; [I/0] AEx [ia] IIC - 960532-0070; Entity
Entity Parameters:
Voc = 13.6 V, Isc = 15.5 mA, Po = 116 mW, Ca = 0.82 µF, La = 140 mH
a = Model option 2 or 9.
b = Power supply voltage range A or E.
c = Output A or Y.
Special Condition of Use:
1. The product shall be installed in compliance with the enclosure, mounting, spacing and segregation requirements of the ultimate application including access only by the use of a tool.

II DESCRIPTION

The NIVOTESTER Level Limit Switch Model FTW325 is a power supply and level limit detection device located in the non-hazardous location with connections to intrinsically safe level limit switches in the hazardous location. The Model FTW325 is essentially the same as the Model FTL325P and FTL325N Approved under FM Project ID 3010989 with the difference being that the Model FTW325 is for connection to switches located in conductive liquids and has 2 channels. The construction is essentially the same as the Model FTL325 with the difference being that there is only one printed circuit board.

III EXAMINATIONS AND TESTS

Representative samples of the apparatus, specified in Section 1.4 were examined and tested by CSA International, under their Project No. 151079-1400817, to determine their acceptability for use in the specified hazardous locations. Examination and testing by CSA was conducted under the guidelines set forth within the FM Approvals/CSA Contracts Testing and Reports Agreement. Test results compiled by CSA have been satisfactorily reviewed by FM Approvals and are attached to this report.

IV MARKING

Marking meets standard requirements as illustrated by the attachment.

V REMARKS

5.1 Installations shall comply with the relevant requirements of the National Electrical Code® (ANSI/NFPA 70).

5.2 Installations shall comply with the latest edition the manufacturer's instruction manual.

5.3 Control room equipment connected to intrinsically safe associated apparatus should not use or generate more than 250 V rms or DC.

5.4 See ANSI/ISA RP12.06.01, Installation of Intrinsically Safe Systems for Hazardous (Classified) Locations for guidance on the installation of intrinsically safe apparatus and systems.

VI FACILITIES AND PROCEDURES AUDIT

The design control and manufacturing site in Maulburg, Germany is subject to follow up audit inspections. The facilities and quality control procedures must be found satisfactory to manufacture a product identical to that examined and tested as described herein.

VII MANUFACTURERS RESPONSIBILITIES

7.1 Documentation considered critical to this Approval is on file at FM Approvals and listed in the Documentation File, Section VIII of this report. No changes of any nature shall be implemented unless notice of the proposed change has been given and written authorization obtained from FM Approvals. The Approved Product Revision Report, Form 797, shall be forwarded to FM Approvals as notice of proposed changes.

7.2 The manufacturer shall make available to users of the subject equipment installation drawing 960532-0070. The manufacturer shall make additional copies available upon request.

7.3 The manufacturer shall inform the end user of details of the equipment enclosure requirements. Further enclosure requirement details may be found in ANSI/ISA S82.01 or other applicable ordinary location standards.

7.4 As a verification of workmanship a routine dielectric test shall be successfully conducted on each fully assembled production unit. A test potential of 1,350 Vrms or 1,900 Vdc shall be applied between the input terminals and the sensor terminals and between the input terminals and the relay terminals of the AC power supply option. A test potential of 490 Vrms or 700 Vdc may be applied to the DC power supply option between the terminals described above. The test voltage shall be raised to its specified value within two seconds and maintained for at least two seconds.

VIII DOCUMENTATION

The following drawings describe the NIVOTESTER Level Limit Switch Model FTW325 and are filed under Project ID 3016940:

Drawing No.	Description	Issue
960511-0010	Isolation Transformer Construction Details (AC-Type)	B
960511-0015	Isolation Transformer Construction Details (DC-Type)	B
960532-0000	General Assembly Drawing	A
960532-0001	Block Diagram	A
960532-0020	Schematic, Power Supply/Multvibrator	A
960532-0021	Schematic, Channel Min + Max	A
960532-0022	Artwork, Main Board Component Side	A
960532-0023	Artwork, Main Board Solder Side	A
960532-0024	Artwork, Main Board Component Side (Inner Layer)	A
960532-0025	Artwork, Main Board Solder Side (Inner Layer)	A
960532-0026	Component Assembly, Main Board Component Side	A
960532-0027	Component Assembly, Main Board Solder Side	A
960532-0031	Schematic, Relay	A
960532-0052	Nameplate	A
960532-0070	FTW325 Installation Drawing	A

IX CONCLUSION

The apparatus described in Section 1.4 meets FM Approvals requirements. Since a duly signed Master Agreement is on file for this manufacturer, Approval is effective the date of this report.

EXAMINATION AND TESTING BY: Brad A. Bombardier, FM Approvals
Grant Lewis, CSA International

PROJECT DATA RECORD: 3016940

COPY OF TEST DATA: CSA Test Report No. 151079-1400817

ATTACHMENTS: CSA Test Report No. 151079-1400817, 9 shts.
Label Drawing No. 960532-0052 Rev. A
Control Drawing No. 960532-0070 Rev. A

REPORT BY:

Brad A Bombardier

Brad A. Bombardier
Engineer
Hazardous Locations

REPORT REVIEWED BY:

David Styrcula

David Styrcula
Technical Team Manager
Hazardous Locations