

APPROVAL REPORT


LOAD STAND II
FOR USE IN
HAZARDOUS (CLASSIFIED) LOCATIONS

Prepared For:

KISTLER-MORSE
19021 120TH AVENUE NE
WASHINGTON 98011

J.I. 3D3A1.AX
(3610, 3611)

February 16, 1998

FACTORY MUTUAL | 

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from
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I INTRODUCTION

1.1 Supplemental Reports

Model SBMVS-N4 Intrinsic Safety Barrier (J.I.# 0X7A2.AX), Intrinsically Safe Interface (ISI) Model 100, (J.I.# 1N2A1.AX), Microcell Assembly Models M20, M30 and M30R (J.I. # 3V1A1.AX).

1.2 Standards

Kistler-Morse requested Approval of the apparatus listed in Section 1.3 to be in compliance with the applicable requirements of the following standards:

Title	No.	Issue Date
Intrinsically Safe Apparatus and Associated Apparatus for Use in Class I, II and III, Division 1, Hazardous (Classified) Locations	3610	October 1988
Note: Factors applied to voltage or current rather than energy.		
Electrical Equipment for Use in Class I, Division 2, Hazardous (Classified) Locations	3611	April 1986
Electrical Equipment for Use in Hazardous (Classified) Locations General Requirements	3600	March 1989
Enclosures for Electrical Equipment	ANSI/NEMA 250	Pub. 1991

- 1.3 Listing - The following was examined as intrinsically safe (system) for use in Class I,II,III Division 1, Groups C, D, E, F and G in accordance with Interconnect diagram No. TI-LS.FM-01, Rev. A. Nonincendive Class I, Division 2, Groups A, B, C and D, hazardous (classified) NEMA Type 4 outdoor locations and will appear in the Approval Guide as follows:

IS/I,II,III/1/CDEFG - TI-LS.FM-01/Rev. A
NI/1/2/ABCD

LOAD STAND II

FACTORY MUTUAL RESEARCH CORPORATION
Job Identification # 3D3A1.AX

II DESCRIPTION

2.1 General

Load Stand II is an updated version of the standard Kistler-Morse Load Stand which received FMRC Approval under J.I.# 1F6A6.AX in 1982. The Load Stand is supplied power through intrinsic safety barrier Model SBMVS-N4, which was previously Approved under J.I.# 0X7A2.AX. Interconnect Diagram No. TI-LS.FM-01, Rev.A references the Kistler-Morse Intrinsically Safe Interface (ISI-100), Approved by FMRC under J.I.# 1N2A1.AX for connection through a junction box examined as part of (J.I.# 3V1A1.AX) to the subject Load Stand. Load Stand II is a heavy weldment consisting of a thick-walled short section of steel pipe with heavy flanges welded on both ends. The flanges have mounting holes allowing them to be bolted to a concrete base and to the support structure of large industrial tanks or vessels. Four small strain gage micro-cells are bolted into pockets machined into the steel pipe section, embedded in a silicon thermal-transfer compound, and covered with a molded plastic environmental cover. The micro-cells sense the compression of the steel structure under load. The Load Stands are available in sizes rated from 25,000 pounds to 1 million pounds. All are identical in design, except for the size of the steel weldment. The smallest version of the Load Stand weighs 32 pounds.

III EXAMINATION AND TESTS

3.1 General

Representative samples of the apparatus listed in section 1.3 was examined and tested by Factory Mutual Research Corporation (FMRC) to determine the suitability of the apparatus for use in specified hazardous locations. The examination included circuit analysis, component testing, temperature evaluation, as well as a review of the manufacturer's documentation, and the equipment's physical construction. All were satisfactory and are summarized in the following sections. All data is on file at FMRC along with other documents and correspondence applicable to this program.

3.2 Intrinsic Safety Examination - Class I (System)

The following verifies the Load Stand II as intrinsically safe for Class I, Division I, Groups C, and D, hazardous (classified) locations in accordance with Interconnect Diagram No. TI-LS.FM-01, Rev.A.

3.2.1 *Resistive Assessment*

The Load Stand II is supplied power through intrinsic safety barriers. The field wiring between the power source and the Load Stand is intrinsically safe when installed in accordance with the control drawing and the National Electrical Code (ANSI-NFPA 70). Analysis of the barrier combination, as detailed on the installation drawing, determined that the worst case resistive ignition energy, assuming applicable field wire faults, would be 28.3V/296.6mA. This voltage/current combination was found to be acceptable using the comparison method and applicable ignition curve data for Groups C, D hazardous (classified) locations.

3.2.2 *Capacitive Assessment*

The Load Stand II circuit was examined to determine if there was any capacitance that could be discharged under fault conditions, at a potential high enough to ignite a Group C, D hazardous atmosphere. The maximum shunt capacitance within the cable will be limited to 0.4 μ F for group C, and 1.1 μ F for Group D. As a result, there are no capacitors or combinations of capacitors capable of igniting a Group C, D test mixture when compared to ignition curve B8 in FMRC Standard Class 3610.