0901-0148 (USA)
0901-0197 (Canada)
Intrinsic Safety Module

Installation Instructions

B11816400A
10/00.01

CUSTOMER FEEDBACK

If you have a problem with this product, or just a suggestion on how we can serve you better, please fill out this form and send it to us. Your feedback will help us to improve product performance, quality and service. If you are in the United States, you can mail this postpaid form to the address on the reverse, or fax it to (614) 438-4355. If you are outside the United States, please apply the appropriate amount of postage before mailing. You may also fax it the number above.

Your Name:	Date:	
Organization Name:	METTLER TOLEDO Order Number	
Address:	Part / Product Name:	
	Part / Model Number:	
	Serial Number:	
Phone Number: ( ) Fax Number: ( )		Company Name of Installation:
E-mail Address:	Contact Name:	
	Phone Number:	

How well did this product meet your expectations in its intended use?		Comments:
	Met and exceeded my needs	
	Met all needs	
	Met most needs	
	Met some needs	
	Did not meet my needs	

PROBLEM:

UNACCEPTABLE DELIVERY:

- ☐ Shipped late
- ☐ Shipped early
- ☐ Shipped to incorrect location
- ☐ Other (Please Specify)

OUT OF BOX ERROR:

- ☐ Wrong item
- ☐ Wrong part
- ☐ Missing equipment
- ☐ Equipment failure

- ☐ Wrong documentation
- ☐ Missing documentation
- ☐ Incorrectly calibrated
- ☐ Other (Please specify)

Comments:

DO NOT WRITE IN SPACE BELOW; FOR METTLER TOLEDO USE ONLY

☐ Retail ☐ Light Industrial ☐ Heavy Industrial ☐ Systems

RESPONSE: Include Root Cause Analysis and Corrective Action Taken.

FOLD THIS FLAP FIRST

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 414 COLUMBUS, OH

POSTAGE WILL BE PAID BY ADDRESSEE

Mettler-Toledo, Inc.
Quality Manager - MTWI
1150 Dearborn Drive
Worthington, Ohio 43085
USA

Please seal with tape.

INTRODUCTION

This publication is provided solely as a guide for individuals who have received Technical Training in servicing the METTLER TOLEDO product.

Information regarding METTLER TOLEDO Technical Training may be obtained by writing to:

METTLER TOLEDO
350 W. Wilson Bridge Road
Worthington, Ohio 43085
(614) 438-4511

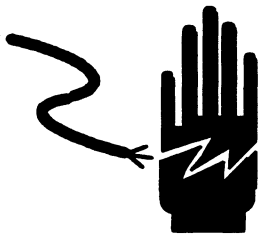
WARNING!

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used properly, i.e., in accordance with the instructions manual, may cause harmful interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

METTLER TOLEDO RESERVES THE RIGHT TO MAKE REFINEMENTS OR CHANGES WITHOUT NOTICE.

PRECAUTIONS

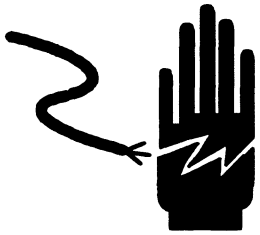
READ this manual BEFORE operating or servicing this equipment.



WARNING

ONLY PERMIT QUALIFIED PERSONNEL TO SERVICE THIS EQUIPMENT. EXERCISE CARE WHEN MAKING CHECKS, TESTS AND ADJUSTMENTS THAT MUST BE MADE WITH POWER ON. FAILING TO OBSERVE THESE PRECAUTIONS CAN RESULT IN BODILY HARM.

FOLLOW these instructions carefully.



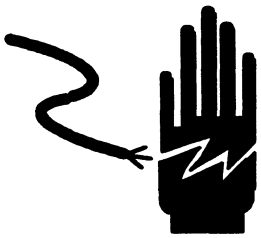
WARNING

FOR CONTINUED PROTECTION AGAINST SHOCK HAZARD CONNECT TO PROPERLY GROUNDED OUTLET ONLY.

DO NOT REMOVE THE GROUND PRONG.

SAVE this manual for future reference.

DO NOT allow untrained personnel to operate, clean, inspect, maintain, service, or tamper with this equipment.



WARNING

DISCONNECT ALL POWER TO THIS UNIT BEFORE REMOVING THE FUSE OR SERVICING.

ALWAYS DISCONNECT this equipment from the power source before cleaning or performing maintenance.

CAUTION

BEFORE CONNECTING/DISCONNECTING ANY INTERNAL ELECTRONIC COMPONENTS OR INTERCONNECTING WIRING BETWEEN ELECTRONIC EQUIPMENT ALWAYS REMOVE POWER AND WAIT AT LEAST THIRTY (30) SECONDS BEFORE ANY CONNECTIONS OR DISCONNECTIONS ARE MADE. FAILURE TO OBSERVE THESE PRECAUTIONS COULD RESULT IN DAMAGE TO OR DESTRUCTION OF THE EQUIPMENT OR BODILY HARM.

CALL METTLER TOLEDO for parts, information, and service.

CAUTION

OBSERVE PRECAUTIONS FOR HANDLING ELECTROSTATIC SENSITIVE DEVICES.

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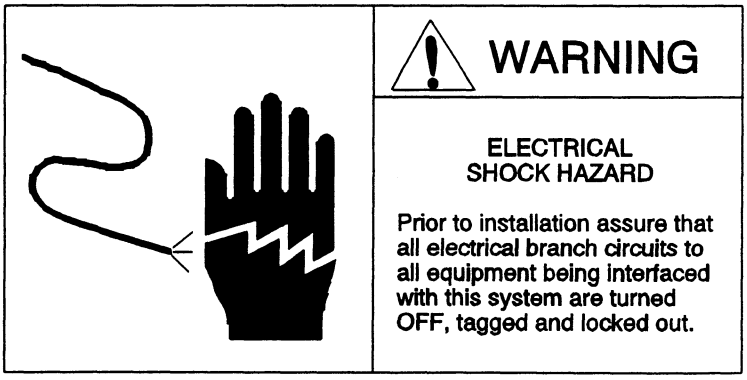
WARNING !

Do not perform any installation or servicing before the hazardous area has been secured by the responsible customer or his authorized personnel.

WARNING !

Only Mettler Toledo Inc. listed load cells and indicators are approved for use with the intrinsic safe module.



1.0 INTRODUCTION

The Mettler Toledo Intrinsic Safety Barrier Model 0901-0148 and 0901-0197 have been design to enable safe operation of Mettler Toledo approved load cell circuitry in hazardous areas. Even though the load cell circuit operates in the millivolt range the application is not considered safe unless a intrinsic safe barrier is employed. The load cells are connected to scale indicators which operate on 120 volts AC or higher circuits. If a fault would occur with in the scale indicator or scale control, or a voltage surge in the electrical system, a high energy spark or overheating of the load cell circuitry may occur creating an unsafe condition.

The Mettler Toledo intrinsic safety barrier limits the electrical and thermal energy allowed to enter the load cell(s) located in the hazardous area under normal or abnormal operating conditions. There are six separate circuits in the safety barrier to protect the plus and minus excitation lines, plus and minus sense lines, and plus and minus signal lines that enter the load cell. These circuits are protected by a replaceable fuse module. The fuse module can be easily replaced, without removing any wiring.

The Mettler Toledo Intrinsic Safety barrier Model 0901-0148 has been approved by Factory Mutual Research Corporation, and the Model 0901-0197 has been certified by the Canadian Standards Association. Both approvals are for protection of load cell(s) installation in the hazardous area with a rating of Class I, Division I, Groups C & D, Class II, Division I, Groups E, F, and G. The temperature code rating of the intrinsic safety module is T6 (85 degrees C or 185 degrees F). Both intrinsic safety modules are housed in a NEMA 7/9 enclosure which is suitable for installation in a Class I & II applicable Groups C, D, E, F, and G hazardous location.

The Mettler Toledo intrinsic safety barrier or better known as the HAP module, for Hazardous Area Protection, is Factory Mutual approved only when used with load cells which have been approved with the HAP module. These load cells are listed on Mettler Toledo drawing 122502, which is included in these installation instructions. The load cell(s) when used with the HAP module have a temperature code rating of T4 (135 degrees C 275 degrees F.) The temperature code indicates that the surface temperature of the load cells will not exceed the T4 rating.

2.0 HAZARDOUS AREA ENVIRONMENTAL CHECK

WARNING !

The Intrinsic Safety Module is designed for installation and use ONLY in hazardous locations rated Class I or II, Division 1 or 2, applicable Groups C,D,E,F or G, and NEC Temperature rating T6.

Note: METTLER TOLEDO listed load cells are rated at a temperature code of T4 (135 degrees C, 275 degrees F).

Verify with the responsible customer representative that the hazard present is rated WITHIN the Class, Division, and Group classifications shown above, and that the minimum autoignition temperature (Class I vapors and liquids) or minimum Cloud / Layer ignition temperature (Class II dust) of the hazardous material present exceeds the T4 temperature rating of the load cell(s). Reference the National Electrical Code, NFPA 70 Article 500. If the hazard rating does not fit these classifications or cannot be determined, prior to performing any installation work, refer this matter to:

METTLER-TOLEDO PRODUCT MARKETING
1 (800) 786-5123

Terminate the installation of the scale equipment until the hazardous area rating is verified to be with in the proper classification as given above.

3.00 SYSTEM EQUIPMENT REQUIREMENTS

WARNING !

The Intrinsic Safety Module may ONLY be used with those digital indicators and load cells identified below.

DO NOT CONNECT INTRINSIC SAFETY MODULE(S) TO ANY OTHER INDICATOR OR LOAD CELLS. Mettler Toledo indicators not modified for use with the intrinsic safety module WILL blow the fuse module immediately upon powering up of the indicator.If there is any doubt about compatibility of a indicator with the intrinsic safety module, call Mettler Toledo Technical service at 1 (800) 786 - 0040 before applying power to the indicator.

All indicators or printed circuit boards that are used with the Mettler Toledo Hazardous area protection module must be modified, to reduced the excitation voltage. The latest revision of the HAP compatible indicator circuit board must be used when replacing the indicator board or power supply PCB. A list of HAP compatible indicators and PC board numbers are listed below.

3.01 Model 8132-0010, (1009 Desk) or 8132-0020, (1019 Wall). These four RAMs of 8132 use 11660500A or 11881100A motherboard with a plus and minus 3 volts gated power supply specifically for the Intrinsic Safety Module. Listed below are special function 8132 indicator PC boards that have been modified from 11660500A.

KB57006800B	HAP Compatible	Averaging indicator
KA57061800B	HAP Compatible	Gross, Tare, Net Option
KA57126200B	HAP Compatible	40,000 Count Indicator
KB574220	HAP Compatible	Averaging Indicator
KA57288100B	HAP Compatible	Battery Backed Tare
KA57288200B	HAP Compatible	Battery Backed Spt.
KN571344	HAP Compatible	Averaging

CAUTION !

Check that jumpers W3, 4, 8, 9, 10 and 11 are in position on the motherboard 11660500A or 11881100A before installation.

These jumpers may be soldered in place.

3.02 Model 8130 with 11661200A Gated Power Supply

A special gated power supply board 11661200A MUST be used with the Intrinsic Safety Module to provide a plus and minus 3 volts excitation.

3.03 Model 0151-002

This 0151 RAM must use 11660900A analog board(s) to provide the plus and minus 3 volts gated power supply.

3.04 Model 0151-0002 with Multiple Build Option K.O.P. 0901-0135

This 0151 RAM must use 11660900A analog board(s) to provide the plus and minus 3 volts gated power supply. Installation of 0151 with this option must proceed according to instructions 118161, included with the kit, which modifies the 8132 by use of 11815800A main board and 11206400A multiple build option board.

3.05 Model 9000 System with 9000-0210 A/D Board

Any 9000 system used with the Intrinsic Safety Module must use 9000-0210 A/D Board 11661500A to provide the plus and minus 3 volts excitation.

3.06 Model 8140 Indicators, 5 volt DC excitation

	PC board assembly	Indicator Assembly
8140 Panel	KB575309	KB577277
8140 Desk	A12666200A	KA577077
8140 Wall	A12666200A	KA577305
8140 NEMA 7/9	KB575309	KC575980020

3.07 Model 8142 RAMS: 8142 - XXXX

0101, 1101 board number 12537800A
2101 board number 12537900A
0105, 1105, 2105 board number 12538100A
0106, 1106 and 2106 board number 12538000A

These RAMS of the Model 8142 are to be used with the Intrinsic Safety Module. On the main board in the indicator, in the upper right hand corner, R18 MUST be labeled 12535100A. This R-PAC is used to provide the plus and minus 3 volts excitation.

Model 8142 - XXXX

0107, 1107 board number 13200000A
0108, 0109 board number 13200200A
1109, 2109, 2209 board number 13200200A
2207, 2107 board number 13200300A
2208, 1108, 2108 board number 13200100A
These RAMS of the Model 8142 are to be used with the Intrinsic Safety Module. The PC board listed provides a 5 volt DC excitation supply.

3.08 Model 8146 Analog PCB 12915400A

All 8146's and systems using TSM3004 PAAM Analog Board(s) Must use board number 12915400A. These boards must be used with the intrinsic safety module. The PAAM Analog board provides a plus and minus 3 volts excitation supply.

3.09 Model 8510 RAM 2101 Power Supply PCB 13372200A

The 8510 panel mount (U. S. A. Version) power supply provides a 5 volt DC excitation supply.

3.10 Model M5000

DG-H, WM-H, WS-H, M-H, SH, PE-H, & EH
These models of the M5000 indicator use Power Supply PCB 90064500A when connected to the intrinsic safety module. The M5000 power supply board supplies a 5 volt DC excitation supply.

3.11 Model 9321 Signal Conditioner PCB A9013300A

The signal Conditioner board supplies a 5 volt excitation supply. The circuit board excitation voltage is jumper selectable, make sure that the excitation voltage is 5 volts DC before connecting to the intrinsic safety module.

3.12 Model SM200 Power Supply PCB 90064500A.

The SM 200 must use 90064500A power supply board when used with the intrinsic Safety Module. The power supply board supplies a 5 volt DC excitation supply.

3.13 Model SM100 and SM110 Power Supply PCB 90064500A

The SM 100 must use 90064500A power supply board when used with the intrinsic Safety Module. The power supply board supplies a 5 volt DC excitation supply.

3.14 Load Cells

Only the load cells listed on drawing 122502 are approved for use with the Mettler Toledo Intrinsic Safety Module. These load cells have been review by Factory Mutual Research Corp. and found to be acceptable for installation in a hazardous area when connected to the Mettler Toledo Intrinsic Safety Module.

4.0 SYSTEM INSTALLATION AND WIRING

READ THESE INSTRUCTIONS COMPLETELY BEFORE STARTING INSTALLATION

WARNING !
DO NOT PERFORM ANY INSTALLATION OR SERVICE BEFORE THE HAZARDOUS AREA HAS BEEN SECURED, (MADE SAFE), BY THE RESPONSIBLE CUSTOMER OR HIS AUTHORIZED PERSONNEL.

4.01 Proposed deviations from these installation instructions and specifications in this manual are prohibited unless written approval is obtained from Mettler Toledo, Inc. Group Engineering prior to installation.

4.02 In regards to technical problems and questions with installation, phone Mettler Toledo Inc. Technical Service.

If any deviations (modifications to the equipment, Electrical Code violations, etc.) are found with the installation or servicing of the intrinsic safety modules or other Mettler Toledo equipment refer to the Installation and Service Deviation Section 7 of this manual for notification procedure.

Mettler Toledo Technical Service
1-800-786-0040

4.03 Installation and wiring of the Intrinsic Safety Module MUST be complete as specified in these instructions and drawings listed below:

103997	Schematic Wiring Diagram, Multiple L/C HAP
103998	External Wiring Diagram, HAP
122502	Load Cell List

The drawings listed above are included with these instructions.

4.04 Up to twelve Mettler Toledo approved load cells may be utilized with the HAP module provided the bridge resistance of each cell is the same and the resistance of all load cells in parallel exceeds 58 ohms.

4.05 Do not modify the length of 4 conductor load cell cables under any circumstances. All 4 conductor load cells must have equal cable lengths.

4.06 Refer to drawing 103997 & 103998. Connect the shield of the single shielded load cell cables to the terminal marked shield (3) in the multiple load cell junction box. Use terminal (10) for single load cell junction boxes. For load cell cables with dual shield only the inner shield should be connected to terminal (3). Connect all cases, enclosures, housings, and points normally connected to ground together and to a effective ground through the outer shield of a dual shield cable. Heavy copper braid or # 14 AWG wire may be used to provide connection when a single shield load cell cable is used.

4.07 Grounding.

WARNING ! GROUNDING
Without effective grounding of the Intrinsic Safety Module (Terminal J3), the load cell system located in the hazardous area is not considered Intrinsically safe. The safety of the entire intrinsically safe installation is ensured by effectively grounding of the Intrinsic Safety Module.

4.07.1 The grounding connection to the intrinsic safety module is connected to the ground lug "J3" located next to the terminal strip inside the explosion proof enclosure. The ground path resistance from the barrier ground lug "J3", to the designated ground electrode shall be less than one ohm. It is recommended that the connection to the grounding electrode be made in the safe area to reduce the danger of arcing should the grounding connection become loose.

4.07.2 The intrinsic safety ground conductor shall be used only for grounding of lug "J3" to a intrinsic safety ground electrode. Reference The National Electrical Code (Article 250), The Canadian Electrical Code 22.1 (Section 10) and ANSI/ISA RP 12.6.

4.07.3 The grounding conductor shall be a No. 8 AWG insulated copper conductor. Aluminum shall not be used in an intrinsic safety grounding system unless precautions are taken to prevent corrosion at the connection points.

4.08 Output wiring from the intrinsic safety module is intrinsically safe. No other wires must be run in the same conduit as the load cell wiring. Conduit should be used to physically protect load cell wiring to within as close as possible to the load cell.

4.09 The conduit seal provided by Mettler Toledo must be installed and sealed by the equipment installer according to National and Local Electrical Codes.

4.10 For additional information on installation practices refer to the National Electrical Code, the Canadian Electrical Code C22.1, and "Installation of Intrinsically Safe Systems for Hazardous (Classified) Locations," - ANSI/ISA RP12.6

5.0 PRE-POWER CHECKS

WARNING !

1. When making resistance checks on the intrinsic safety module through the load cells, the hazardous area must be safe. The use of a Volt/Ohm meter (or other test equipment) may create an unsafe condition in the hazardous area.

2. MAKE ALL OF THE FOLLOWING CHECKS BEFORE APPLYING POWER TO THE SYSTEM.

3. The intrinsic Safety Module is a partially repairable safety device. Misconnection, misapplication, shorts, or opens incurred may cause the fuses to open.

5.1 Check the connection and wiring as specified on the schematics 103998 External wiring diagram, 103997 Schematic wiring diagram, Multiple load cell.

5.2 Refer to Section 3 to determine that the proper Indicator with RAM number is being used with the Intrinsic Safety Module.

5.3 Disconnect load cell cable from the indicator, power up indicator and verify the excitation voltage from the load cell output connector prior to the connecting the indicator to the HAP module input. Correct excitation voltages for the various Mettler Toledo Indicators are listed in Section 3 of this manual. Excitation voltages may vary plus or minus .5 volt from voltage stated in section 3.

5.4 Check for shorted or open load cell lines and effective grounding as follows:

5.4.1 Unplug load cell cable from digital indicator.

5.4.2 Measure the resistance between terminals 1 and 2 on the terminal strip of the Intrinsic Safety Module. RESISTANCE MEASURED MUST BE GREATER THAN 500 OHMS.

5.4.3 Measure the resistance between terminals 4 and 5 on the terminal strip of the Intrinsic Safety Module. RESISTANCE MEASURED MUST BE GREATER THAN 120 OHMS.

5.4.4 Measure the resistance between terminals 6 and 7 on the terminal strip of the Intrinsic Safety Module. RESISTANCE MEASURED MUST BE GREATER THAN 120 OHMS.

5.4.5 Measure the resistance between terminals 4 and 7 on the terminal strip of the Intrinsic Safety Module. THE RESISTANCE MEASURED MUST BE GREATER THAN 60 OHMS BUT LESS THAN 80 OHMS.

5.4.6 Measure the resistance between terminals 5 and 6 on the terminal strip of the Intrinsic Safety Module. THE RESISTANCE MEASURED MUST BE GREATER THAN 60 OHMS BUT LESS THAN 80 OHMS.

5.4.7 Assure that the indicator chassis and/or control enclosure is connected to power ground and effectively grounded.

NOTE

EFFECTIVE GROUNDING - Effective grounding means intentionally connected to earth through a ground connection or connections of sufficiently low impedance and having sufficient current-carrying capacity to prevent the build up of voltages that may result in undue hazard to connected equipment or persons.

Assure that the scale rebars, framework, and junction boxes are connected, through proper sized bonding wire, to a effective ground outside of the hazardous (classified) area.

Assure that the cable shields and ground terminals within the Intrinsic Safety Module and junction boxes are connected to effective grounds. Reference grounding instructions in Section 4.

5.5 Reconnect load cell cable to the digital indicator. Repeat the checks of in Section 5.0, if changes of connections are made to the load cell wiring before power is applied.

6.0 SYSTEM CHECKOUT AND CALIBRATION

Apply power and complete system calibration and checkout as specified in the METTLER-TOLEDO manuals for the indicator and scales applicable for your system.

CAUTION!

TAKE CARE THAT THE LOAD CELL WIRING IS NOT SHORTED OR DISCONNECTED WITH POWER APPLIED.

NOTE!

THE POTTED FUSE BOARD ASSEMBLY, 11906900A, IS MADE TO BE REPLACED SHOULD A FUSE BE BLOWN.

DO NOT ATTEMPT TO REPAIR OR MODIFY THE FUSE BOARD ASSEMBLY.

7.0 INSTALLATION AND SERVICE DEVIATIONS

7.1 Proposed deviations from the installation instructions and specifications in this manual are prohibited unless written approval is obtained from Mettler-Toledo, Inc. Engineering (Westerville Plant) prior to installation.

7.2 If any deviations from the installation drawings, provided with the intrinsic safety module, or deviations from the National Electrical code and or Local Electrical Codes are encountered, these deviations must be reported immediately to the customer / user. Any equipment condition which could render, make, or become a safety hazard must be reported to the customer/user. All installation deviations and equipment condition problems must be documented on the service report. A completed signed copy of the service report must be given to the customer/user. The customer signed service report must be passed on to the Mettler Toledo service manager for follow up.

7.3 Any known housekeeping, environment or application which could render a safety hazard must be reported to the customer/user and documented on the service report. A copy of the service report must be given to the customer/user.

7.4 All observed safety hazards, pertaining to the Scale system installation and operation, must be corrected prior to completion of the installation. Under no circumstances is the equipment to be powered up until the deviation(s) have been corrected and approved by Mettler Toledo Engineering.

7.5 If the customer decides not to have any noted safety hazards corrected, the equipment installer shall refer the matter to their supervisor or service manager for instructions. If equipment modifications are found, within the scale system, that may endanger property or plant personnel these modifications must be reported to the customer and documented on the service report. See follow up action required on the next page.

7.6 When service is denied for safety reasons, or when modifications to the scale equipment that may endanger property or plant personnel are encountered the installer / service person shall document the circumstances / facts of the incident and give a copy to the service manager. The service manager shall then send the information to:

General Counsel
Mettler Toledo Inc.
P.O. Box 658
Worthington, Ohio 43085

7.6.1 Required information is:

a. Customer Name

b. Customer Address

c. Date of service

d. Name & Title of person disallowing safety corrections.

e. Description of Equipment and Model Number(s)

f. Equipment Serial Number(s)

g. Safety discrepancies found (Describe)

h. SSN (Special Specification Number) and TON (Toledo Order Number)

DO NOT UNDER ANY CIRCUMSTANCES APPLY POWER TO THE SYSTEM WITH KNOWN DEVIATIONS PRESENT UNLESS APPROVED BY METTLER TOLEDO ENGINEERING.

8.0 LABELING (FACTORY MUTUAL - 0901-0148 ONLY)

8.1 Factory mutual approval applies only to the U.S. version of the Intrinsic Safety Module, 0901-0148, junction boxes, load cells, and Mettler Toledo digital indicators designed for use with the Intrinsic Safety Module (see Section 3.0). Intrinsic Safety Modules that are used with load cells that are not listed on drawing 122502 are NOT Factory Mutual Approved. Contact Mettler Toledo product marketing at 1 (800) 786 - 5123 for resolution. Confirm that the junction boxes, load cells, and intrinsic safety modules installed are labeled with the FM approval label.

9.0 CANADIAN INTRINSIC SAFETY MODULE (0901-0197 ONLY)

9.1 CONSTRUCTION - The Model 0901-0197 Intrinsically Safe Module is identical to the U.S. version, Model 0901-0148, except for the inclusion of the CSA label.

9.2 INSTALLATION AND TEST - All of the instructions that apply to the Model 0901-0148 also apply to the Canadian version of the Intrinsic Safety Module. These must be followed exactly. One additional test is required. Check to assure that the ground lug, J-3, is connected as indicated in Section 4.07.1 (LESS THAN 1 Ohm). This test MUST be done before making any connections to the module.

9.3 OPERATING VOLTAGE LIMITATION - Canadian Standard Association (CSA) testing requirements limit the indicator and other peripheral devices operating voltage range to 120 VAC.

WARNING !

Do not connect indicators or any other electrical devices into the Intrinsic Safety Module or Indicator that operate at voltage levels in excess of 120 VAC.

9.4 LABELING

9.4.1 There is no subsequent labeling to be applied. Check to assure that the CSA label applied by Mettler Toledo is in place. If this label is not present call:

METTLER-TOLEDO PRODUCT MARKETING
(800) 786-5123

9.4.2 FM labels must not be affixed to the Intrinsic Safety Modules installed in Canada.

10.0 INTRINSIC SAFETY MODULE PART NUMBERS

Part Numbers	Description
B10398900A	Model 0901-0148 F. M. Approved Intrinsic Safety Module (US)
12637600A	Model 0901-0197 C. S. A. Certified Intrinsic Safety Module (Canada)
11906900A	Replaceable Fuse Module (Used in both models of Intrinsic Safety Module)
B11816400A	Installation Instruction Manual (This document)
12478300A	3/4 Inch Conduit Seal

11.0 DRAWING LIST

DRAWING NUMBER	DESCRIPTION
103997	Schematic Wiring Diagram, HAP
103998	External Wiring Diagram, HAP
122502	Approved Load Cell List

Printed: 30-OCT-96

Part Number: 122502
Change Number: 20

Description: LIST,LOAD CELL,ISM APPVD ER: 50691

SUPERSEDES:

Designer: D.RENICO Appr: J.ROLLESTON Date: 10/96

RECORD OF CHANGES:

No: 20
TRANSFERRED FROM MTWO

COMPONENT		QTY	DESCRIPTION	DESIGNATOR
09708400A		0	L/C, 4#, 600 -10+40C	
10011900A		0	L/C,100000LB,COMP,(BLH)	
10014900A		0	L/C,50000LB,COMP,(BLH)	
10048600A	NOTE 6	0	L/C,500LB,TENS,(BLH)	
10048700A	NOTE 6	0	L/C,1000LB,TENS,(BLH)	
10048800A	NOTE 6	0	L/C,2000LB,TENS,(BLH)	
10048900A	NOTE 6	0	L/C,5000LB,TENS,(BLH)	
10049000A	NOTE 6	0	L/C,1000LB,COMP,(BLH)	
10049100A	NOTE 6	0	L/C,10000LB,COMP,(BLH)	
10049200A		0	L/C,20000LB,COMP,(BLH)	
10049300A		0	L/C,200000LB,COMP,(BLH)	
10479700A		0	L/C,15#, 600 -10+40C	
10479700B		0	L/C,15#, 600 -10+40C	
10479800A	NOTE 4	0	L/C,25#, 600 -10+40C	
10479800B	NOTE 4	0	L/C,25#, 600 -10+40C	
10479900A		0	L/C 600, 50# -10+40C	
10479900B		0	L/C 600, 50# -10+40C	
10480800A		0	L/C,15#,3000 -10+40C	
10480800B		0	L/C,15#,3000 -10+40C	
10481000A		0	L/C,25#,3000 -10+40C	
10481000B		0	L/C,25#,3000 -10+40C	
10481300A		0	L/C, 100# 3000 OIML	
10481300B		0	L/C, 100# 3000 OIML	
10481400A		0	L/C, 200# 3000 OIML	
10481400B		0	L/C, 200# 3000 OIML	
10711000A		0	L/C,100# GP AL 600 OIML	
10751400A		0	L/C,200# GP AL 600 OIML	
11048300A		0	L/C,20000LB,SB,(HBM)	
11048400A		0	L/C,5000LB,SB,(HBM)	
11049900A		0	L/C,15000LB,SB,(HBM)	
11424100A		0	L/C,100000LB,COMP,(HBM)	
11424200A		0	L/C,100000LB,COMP,(REV)	
11432600A		0	L/C,1000LB,SB,(HBM)	
11432700A		0	L/C,2000LB,SB,(HBM)	
11432800A		0	L/C,50000LB,SB,(HBM)	
11432900A		0	L/C,10000LB,COMP,(REV)	
11433000A		0	L/C,25000LB,COMP,(REV)	
11433100A		0	L/C,50000LB,COMP,(REV)	

Part Number: 122502
Change Number: 20

COMPONENT		QTY	DESCRIPTION	DESIGNATOR
11433200A		0	L/C,200000LB,COMP,(REV)	
11455700A		0	L/C,200LB,COMP,(REV)	
11691400A	NOTE 6	0	L/C,250LB,TENS PR,(REV)	
11691500A	NOTE 6	0	L/C,500LB,TENS PR,(REV)	
11691600A	NOTE 6	0	L/C,1000LB,TENS PR,(REV)	
11708100A	NOTE 6	0	L/C,100LB,TENS,(REV)	
11708200A	NOTE 6	0	L/C,1000LB,TENS,(REV)	
11708400A	NOTE 6	0	L/C,5000LB,TENS,(REV)	
11708800A		0	L/C,200000LB,COMP,(HBM)	
11724400A	NOTE 6	0	L/C,500LB,TENS,(REV)	
12010300A		0	L/C,200LB,USB	
12010400A		0	L/C,500LB,USB	
12010500A		0	L/C,1000LB,USB	
12010600A		0	L/C,2000LB,USB	
12010700A		0	L/C,5000LB,USB	
12010800A		0	L/C,20000LB,USB	
12563600A		0	L/C,200LB,SHEARBEAM	
12591700A		0	L/C,5000LB,SHEARBEAM,(REV)	
12623100A		0	L/C,500LB,SHEARBEAM	
13078900A		0	LOAD CELL ASSY 5K BHSB	
13079300A		0	LOAD CELL ASSY 3K BHSB	
13136900A		0	LOAD CELL ASSY 1K BHSB	
13158500A	NOTE 6	0	L/C,200LB,(TI)	
13158600A	NOTE 6	0	L/C,500LB,(TI)	
13158700A	NOTE 6	0	L/C,1000LB,(TI)	
13158800A	NOTE 6	0	L/C,2000LB,(TI)	
13158900A	NOTE 6	0	L/C,5000LB,(TI)	
13159000A	NOTE 6	0	L/C,10000LB,(TI)	
13929400A		0	LOAD CELL ASSY,45K(SS)BHSB	
A09709100A	NOTE 4	0	L/C,200# 600 -10+40C	
A09709100B	NOTE 4	0	L/C,200# 600 -10+40C	
A10616300A		0	L/C,5000LB,COMP,(TI)	
A10616400A		0	L/C,10000LB,COMP,(TI)	
A10671100A		0	L/C ASSY,500# 3000 OIML	
A10671100B		0	L/C ASSY, 500# 3000 OIML	
A10671400A		0	L/C ASSY,500# 600 OIML	
A10671400B		0	L/C ASSY, 500# 600 OIML	
A11050100A		0	L/C ASSY, 50K 3000 OIML	
A11785300A		0	L/C,NBS HB44 500# IND	
A11785700A		0	L/C,HB44 NI 500# IND	
A11786100A		0	L/C,500LB/3000/STD	
A11786500A		0	L/C,500LB/3000/NI	
A11786900A		0	L/C,NBS HB44 1000# IND	
A11787300A		0	L/C,HB44 NI 1000# IND	
A11787700A		0	L/C,1000LB/3000 STD	
A11788100A		0	L/C,1000LB/3000/NI	
A11788500A	NOTE 4	0	L/C,NBS HB44 2000# IND	
A11788900A	NOTE 4	0	L/C,HB44 NI 2000# IND	
A11789300A		0	L/C,2000LB 3000 STD	
A11789700A		0	L/C,2000LB/3000/NI	
A12744300A	NOTE 4	0	L/C,HB44 HS 500# IND	
A12744500A	NOTE 4	0	L/C,HB44 HS 1000# IND	
A12744700A	NOTE 4	0	L/C,HB44 HS 2000# IND	
A13077500A		0	L/C ASSY, BHSB	

Part Number: 122502
Change Number: 20

COMPONENT		QTY	DESCRIPTION	DESIGNATOR
A13077500B		0	L/C, NBS HB44 BHSB 20K	
A13077500C		0	L/C, NBS HB44 BHSB 20K	
A13078400A		0	L/C 10K BHSB W/10 FT	
A13078400B		0	L/C, NBS HB44 BHSB 10K	
A13078400C		0	L/C, NBS HB44 BHSB 10K	
A13117600A	NOTE 6	0	L/C,200LB,(TI)	
A13117700A	NOTE 6	0	L/C,500LB,(TI)	
A13117800A	NOTE 6	0	L/C,1000LB,(TI)	
A13117900A	NOTE 6	0	L/C,2000LB,(TI)	
A13118000A	NOTE 6	0	L/C,5000LB,(TI)	
A13118100A	NOTE 6	0	L/C,10000LB,(TI)	
B09708500A	NOTE 4	0	L/C,100#,600 -10+40C	
B09708500B	NOTE 4	0	L/C,100#,600 -10+40C	
B10049400A		0	L/C,100000LB,SB(BLH/HBM)	
B10671200A		0	L/C ASSY,1000# 3000 OIML	
B10671200B		0	L/C ASSY, 1000# 3000 OIML	
B10671300A		0	L/C ASSY,2000# 3000 OIML	
B10671300B		0	L/C ASSY, 2000# 3000 OIML	
B10671500A		0	L/C ASSY,1000# 600 OIML	
B10671500B		0	L/C ASSY, 1000# 600 OIML	
B10671600A	NOTE 4	0	L/C ASSY,2000# 600 OIML	
B10671600B	NOTE 4	0	L/C ASSY, 2000# 600 OIML	
B10883600A		0	L/C ASSY, NBS HB44 50K	
C10887700A		0	L/C ASSY, 100K NBS HB44	
C11050000A		0	L/C ASSY, 100K 3000 OIML	
C11102200A		0	L/C ASSY,100# (600) NI	
C11103500A		0	L/C ASSY,200# (600) NI	
KB200570020		0	L/C,5000LB,COMP	
KN713700020	NOTE 6	0	L/C,2000LB,COMP	
KN750666020	NOTE 6	0	L/C,10OOOLB,COMP	
TA600238		0	L/C,50LB,3000D,RSC	
TA600239		0	L/C,50LB,10000D,RSC	
TA600240		0	L/C,100LB,3000D,RSC	
TA600241		0	L/C,100LB,10000D,RSC	
TA600242		0	L/C,200LB,3000D,RSC	
TA600243		0	L/C,200LB,10000D,RSC	
TA600244		0	L/C,300LB,3000D,RSC	
TA600245		0	L/C,300LB,10000D,RSC	
TA600246		0	L/C,500LB,3000D,RSC	
TA600247		0	L/C,500LB,10000D,RSC	
TA600248		0	L/C,750LB,3000D,RSC	
TA600249		0	L/C,750LB,10000D,RSC	
TA600250		0	L/C,1000LB,3000D,RSC	
TA600251		0	L/C,1000LB,10000D,RSC	
TA600252		0	L/C,2000LB,3000D,RSC	
TA600253		0	L/C,2000LB,10000D,RSC	
TA600254		0	L/C,3000LB,3000D,RSC	
TA600255		0	L/C,3000LB,10000D,RSC	
TA600256		0	L/C,5000LB,3000D,RSC	
TA600257		0	L/C,5000LB,10000D,RSC	
TA600258		0	L/C,10000LB,3KD,25',RSC	
TA600536		0	L/C,25KG,3KD,OIML,736	
TA600537		0	L/C,50KG,3KD,OIML,736	
TA600538		0	L/C,100KG,3KD,OIML,736	

Part Number: 122502
Change Number: 20

COMPONENT	QTY	DESCRIPTION	DESIGNATOR
TA600539	0	L/C,200KG,3KD,OIML,736	
TA600540	0	L/C,500KG,3KD,OIML,736	
TA600541	0	L/C,1000KG,3KD,OIML,736	
TA600542	0	L/C,2000KG,3KD,OIML,736	
TA600543	0	L/C,5000KG,3KD,OIML,736	
TB600226	0	L/C,500LB,3KD,15',744	
TB600226-1	0	L/C,500LB,3KD,7.5',744	
TB600226-2	0	L/C,500LB,3KD,30',744	
TB600227	0	L/C,1250LB,3KD,15',744	
TB600227-1	0	L/C,1250LB,3KD,7.5',744	
TB600227-2	0	L/C,1250LB,3KD,30',744	
TB600228	0	L/C,2500LB,3KD,15',744	
TB600228-1	0	L/C,2500LB,3KD,7.5',744	
TB600228-2	0	L/C,2500LB,3KD,30',744	
TB600229	0	L/C,5000LB,3KD,15',744	
TB600229-1	0	L/C,5000LB,3KD,7.5',744	
TB600229-2	0	L/C,5000LB,3KD,30',744	
TB600230	0	L/C,500LB,5KD,15',744	
TB600230-1	0	L/C,500LB,5KD,7.5',744	
TB600230-2	0	L/C,500LB,5KD,30',744	
TB600231	0	L/C,1250LB,5KD,15',744	
TB600231-1	0	L/C,1250LB,5KD,7.5',744	
TB600231-2	0	L/C,1250LB,5KD,30',744	
TB600232	0	L/C,5000LB,5KD,15',744	
TB600232-1	0	L/C,5000LB,5KD,7.5',744	
TB600232-2	0	L/C,5000LB,5KD,30',744	
TB600260	0	L/C,2500LB,7.5'	
TB600310	0	L/C,1250LB,3KD,15'	
TB600311	0	L/C,2500LB,3KD,15'	
TB600312	0	L/C,5000LB,3KD,15'	
TB600313	0	L/C,10000LB,3KD,15'	
TB600342	0	L/C,2500LB,5KD,15'	
TB600343	0	L/C,5000LB,5KD,15'	
TB600363	0	L/C,1250LB,5KD,15'	
TB600364	0	L/C,10000LB,5KD,15'	
TB600370	0	L/C,550KG,3KD,OIML,744	
TB600370-1	0	L/C,550KG,3KD,OIML,744	
TB600370-2	0	L/C,550KG,3KD,OIML,744	
TB600371	0	L/C,1100KG,3KD,OIML,744	
TB600371-1	0	L/C,1100KG,3KD,OIML,744	
TB600371-2	0	L/C,1100KG,3KD,OIML,744	
TB600372	0	L/C,2200KG,3KD,OIML,744	
TB600372-1	0	L/C,2200KG,3KD,OIML,744	
TB600372-2	0	L/C,2200KG,3KD,OIML,744	
TB600397	0	L/C,5000LB,3KD,15',744	
TB600397-1	0	L/C,5000LB,3KD,7.5',744	
TB600397-2	0	L/C,5000LB,3KD,30',744	
TB600451	0	L/C,220KG,3KD,OIML,744	
TB600451-1	0	L/C,220KG,3KD,OIML,744	
TB600451-2	0	L/C,220KG,3KD,OIML,744	
TB600454	0	L/C,550KG,3KD,OIML,745	
TB600454-1	0	L/C,550KG,3KD,OIML,745	
TB600454-2	0	L/C,550KG,3KD,OIML,745	
TB600455	0	L/C,1100KG,3KD,OIML,745	

Part Number: 122502
Change Number: 20

COMPONENT	QTY	DESCRIPTION	DESIGNATOR
TB600455-1	0	L/C,1100KG,3KD,OIML,745	
TB600455-2	0	L/C,1100KG,3KD,OIML,745	
TB600456	0	L/C,2200KG,3KD,OIML,745	
TB600456-1	0	L/C,2200KG,3KD,OIML,745	
TB600456-2	0	L/C,2200KG,3KD,OIML,745	
TB600457	0	L/C,4400KG,3KD,OIML,745	
TB600457-1	0	L/C,4400KG,3KD,OIML,745	
TB600457-2	0	L/C,4400KG,3KD,OIML,745	
TB600488	0	L/C,250LB,5KD,744	
TB600488-1	0	L/C,250LB,5KD,744	
TB600488-2	0	L/C,250LB,5KD,744	
TB600489	0	L/C,1250LB,3KD,7.5',757	
TB600489-1	0	L/C,1250LB,3KD,15',757	
TB600489-2	0	L/C,1250LB,3KD,30',757	
TB600490	0	L/C,2500LB,3KD,7.5',757	
TB600490-1	0	L/C,2500LB,3KD,15',757	
TB600490-2	0	L/C,2500LB,3KD,30',757	
TB600510	0	L/C,75000LB,35',743	
TB600524	0	L/C,2500LB,BEAM,HERM	
TB600529-1	0	L/C,500LB,3KD,4',745	
TB600529-2	0	L/C,500LB,3KD,7.5',745	
TB600529-3	0	L/C,500LB,3KD,15',745	
TB600529-4	0	L/C,500LB,3KD,30',745	
TB600531	0	L/C,2500LB,1KD,759	

NOTES:

(1) Load Cells listed on this drawing are acceptable for use in Class I & II, Divisions 1 & 2, Groups C, D, E, F & G Locations when interfaced using Hazardous Area Protection Modules 0901-0007, 0901-0147, 0901-0148 or 0901-0197.

Load cells listed are suitable for use in Class I, II, III, Division 1 & 2, Groups A through G areas when interfaced with Models 8141 & 8525 Scale Indicators and associated accessories specified for use in Hazardous Classified) Areas.

Load Cells are rated to a T-4 Temperature Code (135 deg.C, 275 deg. F). See NFPA-70 National Electric Code and NFPA-497 for description of this rating.

(2) Do not release changes to this drawing without first obtaining Factory Mutual approval.

(3) Load Cell cable lengths may be increased up to 100 feet. Modification drawings must reference only approved Load Cells from this list. Four wire Load Cells must be modified by the manufacturer, as proper Load Cell calibration is dependent on cable length.

(4) These cells are rated for a T-6 temperature code (85 deg. C, 185 deg. F) in addition to the requirements of note (1).

(5) Load Cell strain gage resistance shall exceed 325 ohms.

(6) Rated output for these Load Cellls = 3mV/V, all others are 2mV/V.

(7) Load Cells must be labeled (marked) with the Factory Mutual mark as follows:

For use on nameplates in literature advertisements, packaging and other graphics

The FM diamond mark is acceptable to-Factory Mutual Research as an Approval mark when used with the word "Approved".

The FMRC Appoval logomark has no minimum size requirement, but should always be large enough to be readily identifiable.

Color should be black on a light background or a reverse may be used on a dark background.

For cast-on marks
Where reproductions of the mark described above is impossible because of production restrictions, modified version of the diamond is suggested. Minimum size specifications are the same as for printed marks. Use of the word "Approved" with this mark is optional.

NOTE: These Approval marks are to used only in conjuction with products or services that have been approved by Factory Mutual Research Corporation. The Factory Mutual Research approval marks should never be used in any manner (including advertising, sales or promotional purposes) that could suggest or imply Factory Mutual Research Approval or endorsement of a specific manufacturer or distributor. Nor should it be implied that Approval extends to a product or service not covered by written agreement with Factory Mutual Research. The Approval marks signify that products or services have met certain requirements as reported by the Factory Mutual Research Corporation.

Place the following statement below or close by the FM mark. "Before installing in a hazardous area see Mettler Toledo Drawing 122502 for connection information."

CONNECTIONS INFORMATION FOR LOAD CELLS TO BE USED IN HAZARDOUS (CLASSIFIED) LOCATIONS.

The following control drawings describe how the analog load cells listed on this drawing shall be connected. Digital load cells shall be connected according the the control drawings associated with the products utilizing the digital load cells. Connection according to these drawings is required by the National Electric Code (NEC) and Factory Mutual(FM). **Failure to comply with the requirements of these drawings may impair the safety of the installation with possible injury to personnel, loss of life or property.**

DRAWING		SYSTEM/INDICATOR
103998	Control drawing	HAP Module, X-Purge, JAGUAR and other indicators
103997	Schematic	HAP Module, X-Purge, JAGUAR and other indicators
TB000040	Control drawing	Intrinsic safe 8141
TB000041	Schematic	Intrinsic safe 8141
[illegible]133227	Control drawing	Intrinsic safe 8525
[illegible]133227	Control drawing	Intrinsic safe 8525
148450R	Control drawing	Intrinsic safe PUMA

LOAD CELLS THAT ARE APPROVED FOR USE WITH THE INTRINSIC SAFETY MODULE, BUT ARE **OBSOLETE.**

PART NUMBER	DESCRIPTION
049660020	5000#
049661020	5000#
049665020	10K #
049675020	20K #
10358300A	500 #
10358800A	500 #
10361000A	500 #
10361300A	500 #
10480000A	15 #
10480000B	15 #
10480200A	25 #
10480200B	25 #
10480500A	100 #
10480500B	100 #
10480600A	200 #
10480600B	200 #
10530400A	100K#
10531500A	100K#
10850200A	5000#
10850300A	10K #
10865600A	15 #
10865700A	25 #
10865800A	100 #
10865900A	200 #
10866000A	4 #
11048200A	10,000 #
11101300A	100 #
11101400A	100 #
11101500A	100 #
11101600A	100 #
11101700A	200 #
11101800A	200 #
11101900A	200 #
11102000A	200 #
11102400A	100 #
11103800A	500 #
11103900A	500 #
11104000A	500 #
11104100A	500 #
11104200A	1000#
11104300A	1000#
11104400A	1000#
11104500A	1000#
11114400A	2000#
11114500A	2000#
11114600A	2000#
11114700A	2000#
11115500A	200 #
11370400A	1000#
11370500A	2000#
11370600A	1000#
11370700A	2000#

PART NUMBER	DESCRIPTON
11390600A	500 #
11390700A	500 #
11436000A	500 #
11436100A	500 #
11436200A	1000#
11436300A	1000#
11436400A	2000#
11436500A	2000#
11436600A	500 #
11436700A	500 #
11436800A	1000#
11436900A	1000#
11437000A	2000#
11437100A	2000#
11599300A	2500#
11599300B	2500#
11599500A	1000#
11599500B	1000#
11599900A	20K #
11599900B	20K #
11785200A	500 #
11785300A	500 #
11785600A	500 #
11785700A	500 #
11786100A	500 #
11786500A	500 #
11786900A	1000#
11787300A	1000#
11787700A	1000#
11788100A	1000#
11788500A	2000#
11788900A	2000#
11789300A	2000#
11789700A	2000#
11919200A	5000#
11919400A	10K #
11962800A	5000#
12744300A	500#
12744500A	1000#
12744700A	2000#
13077500A	20K #
13077500B	20K #
13077500C	20K #
13078900B	5K #
13078900C	5K #
13079300B	3K #
13079300C	3K #
13117600A	200 #
13117700A	500 #
13117800A	1000#
13117900A	2000#
13118000A	5000#
13118100A	10K #
13136900B	1K #
13136900C	1K #

Part Number: 122502
Change Number: 20

PART NUMBER	DESCRIPTION
A049680020	50K #
A09622700A	100 #
A09622700B	200 #
A09622700C	500 #
A09622700D	1000#
A09622700E	2000#
A09622700L	500 #
A09622700M	1000#
A09622700N	2000#
A10358500A	2000#
A10358900A	1000#
A10358900B	1000#
A10359000A	2000#
A10361100A	1K #
A10361200A	2K #
A10361400A	1K #
A10361500A	2K #
A10528000A	100K#
A10530300A	50K #
A10531400A	50K #
A10980100A	50K #
A10980200A	100K#
A11102100A	100 #
A11102200A	100 #
A11102300A	100 #
A11102500A	200 #
A11103500A	200 #
A11103600A	200 #
A11103700A	200 #
A11596500A	10K #
A11596500B	10K #
A11598900A	15K #
A11598900B	15K #
A11599800A	5000#
A11599800B	5000#
A11785200A	500 #
A11785600A	500 #
A13329000B	45K #
A13329000C	45K #
B09892900A	100 #
B09892900B	200 #
B09892900C	500 #
B09892900D	1000#
B10523700A	50K #
B10525500A	100K#
B10868400A	50K #
B10887700A	100K#
B11102100A	100 #
B11102200A	100 #
B11102500A	200 #
B11103500A	200 #
C11102100A	100 #
C11102500A	200 #
KN716105020	500 #
KN716144020	5000#
KN716329020	1000#

REBARS AND/OR STRUCTURE USED IN CONJUNCTION WITH THE LOAD CELLS MUST BE GROUNDED TO A TRUE EARTH GROUND. LOAD CELLS MUST BE ELECTRICALLY CONNECTED TO FRAMEWORK THRU MOUNTING OR BONDED WIRE (SEE NOTES 9 & 12).

HAZARDOUS AREA

CLASS I, DIVISION I, GROUPS C & D
CLASS II, DIVISION I, GROUPS E, F & G

1/2 PIPE TAP IN ENCLOSURE BY T.S. CO. OTHERS TO PROVIDE APPROPRIATE SEALING FITTINGS AS REQUIRED.(TYP 6)

3/4 UNION 2 PLACES WHEN REQUIRED

SCALE FRAMEWORK

LOAD CELL 4

LOAD CELL 3

SEE NOTE 12

JUNCTION BOX NO. 1

TB-103 TB-104

TB-105 P.C.B. TB-106

TB-102 TB-101

SEE NOTE 12

OPTIONAL 12396900A J-BOX

SEE NOTE #12

GROUND ATTACH SAFETY TO BE GAGE W OTHERS

GND	10	
	9	
	8	
	7	
	6	
	5	
	4	

GND		GRN
+SIG	1	BLK
-SIG	2	ORN
SHLD	3	BLU
-EXC	4	WHT
+EXC	5	YEL
+SEN	6	RED
-SEN	7	

INTRINSIC SAFETY MODULE 0901-0148 FURNISHED BY T.S. CO., MOUNTED BY OTHERS IN EITHER HAZARDOUS OR NON-HAZARDOUS AREA.

LOAD CELL WIRING DETAILS

THE FOLLOWING SIGNALS ARE AS FOLLOWS FOR TB101-TB104

		*6 WIRE	4 WIRE
PIN 1	+SIG	GRN	WHT
PIN 2	-SIG	BLK	RED
PIN 3	SHLD	ORN	ORN
PIN 4	-EXC	BLU	BLK
PIN 5	+EXC	WHT	GRN
PIN 6	+SEN	YEL	---
PIN 7	-SEN	RED	---

(*) WHEN USING 6-WIRE LOAD CELLS REMOVE JUMPER ON:
TB101-5 & 6
TB101-4 & 7
IN J-BOX #1 ONLY.

LOAD CELL 2

LOAD CELL 1

LOAD CELL 5-8

LOAD CELL 9-12

JUNCTION BOX NO. 2

JUNCTION BOX NO. 3

3/4 CONDUIT NIPPLE W/ 16 GAGE WIRES FROM I.S. MODULE BY T.S. CO.

FIGURE 3
TWO TO TWELVE CELL INSTALLATION USING 10064200A OR 10391000A J-BOXES

PLATFORM OR SCALE BASE ASSEMBLY (SEE NOTE 9 & 12)

LOAD CELL WIRING DETAILS
1.) 6-WIRE CELLS-CONNECT AS SHOWN IN J-BOX DIAG. AT RIGHT. RED AND YEL. WIRES (SEN) ARE NOT CONNECTED.
2.) 4-WIRE CELLS-(SEE NOTE 3)
RED-1
WHT-2
GRN-6
BLK-7
SHLD-5 (SOME CELLS USE YEL. OR ORN. WIRE FOR THIS SHLD)

LOAD CELL 3

LOAD CELL 4

LOAD CELL 2

LOAD CELL 1

SEE NOTE 12

TB1 +SIG -SIG SHLD +SEN -SEN -EXC +EXC

LC2 & LC4 -EXC +EXC SHLD +SIG -SIG +SIG -SIG

LC4 LC2

TB2 TB3

LC1 & LC3 -EXC +EXC SHLD +SIG -SIG +SIG -SIG

LC3 LC1

SEE NOTE 12

GND		
ORN	10	ORN (SHLD)
BLK	9	BLK -SIG
GRN	8	GRN +SIG
RED	7	RED -SEN
BLU	6	BLU -EXC
WHT	5	WHT +EXC
YEL	4	YEL +SEN

12396900A JUNCTION BOX

CONDUIT NIPPLE OF I.S. MODULE

FIGURE 2
FOUR CELL INSTALLATION USING #11822800A J-BOX

PLATFORM OR SCALE BASE LOAD CELL (SEE NOTE 9 & 12)

LOAD CELL 1

LOAD CELL WIRING DETAILS

		6 WIRE	4 WIRE
10	SHLD	SHLD	SHLD
9	-SIG	BLK	RED
8	+SIG	GRN	WHT
7	-SEN	RED	JMP-6
6	-EXC	BLU	BLK
5	+EXC	WHT	GRN
4	+SEN	YEL	JMP-5

JUMPERS REQD FOR 4 WIRE LOAD CELL CABLES.

SEE NOTE 12

GND		
ORN	10	ORN (SHLD)
BLK	9	BLK -SIG
GRN	8	GRN +SIG
RED	7	RED -SEN
BLU	6	BLU -EXC
WHT	5	WHT +EXC
YEL	4	YEL +SEN

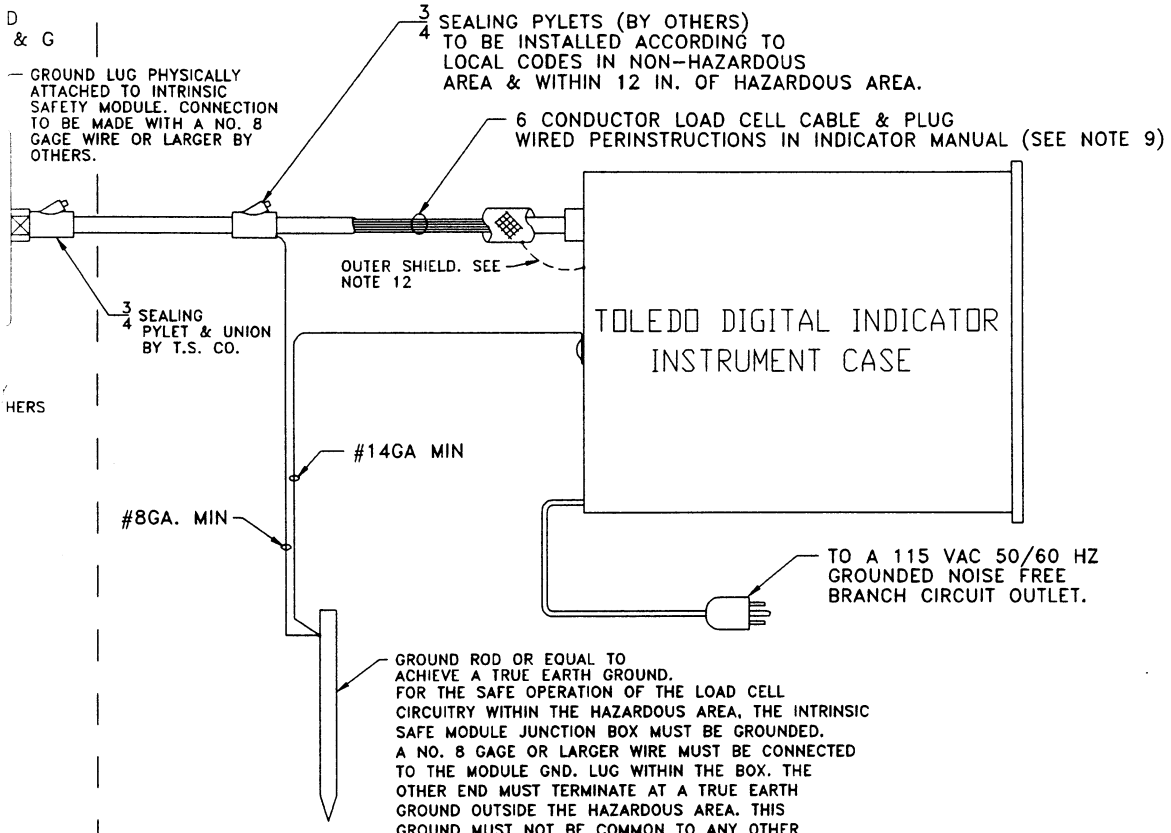
JUMPERS FOR 4 WIRE CABLE

CONDUIT NIPPLE OF I.S. MODULE

12396900A JUNCTION BOX

FIGURE 1
SINGLE CELL INSTALLATION

NON-HAZARDOUS AREA



CLASSIFICATION OF CHARACTERISTICS
(TOLERANCES, RAW MATERIAL, FINISH:)

1. CRITICAL CHARACTERISTIC: ONE THAT, IF NOT CORRECT, WILL RESULT IN A SAFETY HAZARD FOR THOSE USING OR MAINTAINING THE PRODUCT: OR WILL CAUSE PRODUCT FAILURE
2. MAJOR CHARACTERISTIC: ONE THAT COULD, IF NOT CORRECT, RESULT IN FAILURE OR MATERIALLY REDUCE LIFE OF THE PRODUCT.
3. MINOR CHARACTERISTIC: "UNMARKED" ONE THAT, IF NOT CORRECT, DOES NOT AFFECT PERSONAL SAFETY NOR PRODUCT LIFE.

NO.	ZONE	DESCRIPTION	BY	CHK'D	APPD.	C.&.ORD.	DATE
15		REV 'SAFETY CRITICAL ITEM' NOTE (#5); ADD J-BOX PCB P/N TO NOTE #11; DCP/4-92					
-		REV. NOTES 6 & 7; CONVERTED DWG FROM CV TO ACAD.	BAL	7/87	JR	41739	7-10-87
14		REDRAWN, ADD F TO HAZARDOUS AREA GROUPS					

RECORD OF CHANGES

LOAD CELL INSTALLATION NOTES:

1. ONLY TOLEDO SCALE LISTED LOAD CELLS AND CABLE LENGTH VARIATIONS SHALL BE USED WITH ARRANGEMENTS SHOWN HERE. SEE T.S. DRAWING (*)122502 FOR LIST OF ACCEPTABLE LOAD CELLS.
2. REFERENCE DRAWINGS:
   (*)103997-SCHEMATIC OF FIG. 3
   (*)104696-SCHEMATIC OF 11822800A J-BOX WIRING
   (*)103912-SCHEMATIC OF 10391000A J-BOX WIRING.
   (*)118164-INSTALLATION INSTRUCTIONS
10. WHEN USING LOAD CELL J-BOX (*)10064200A OR (*)10391000A) FOR MORE THAN 4 LOAD CELLS, TB105 IS USED TO CONNECT TO THE NEXT JUNCTION BOX. LOAD CELL CAPACITY OF THE INTRINSIC SAFETY MODULE IS 12 LOAD CELLS. SEE NOTE 1 FOR RESISTANCE LIMITATIONS. UP TO THREE J-BOXES CAN BE USED TO ACCOMMODATE 12 LOAD CELLS.
11. JUNCTION BOX ASSEMBLIES FOR INTRINSIC SAFE APPLICATIONS:
    (*)10064200A (FOUR CELL)
    SKB 532567 (OBSOLETE)
    (*)10391000A (FOUR CELL W/SURGE PROTECTION)
    (*)11822800A (FOUR CELL LOW PROFILE)
    (*)12396900A (SINGLE CELL)
    J-BOXES USING PCB 13640300A.
12. THE LINE SHOWN REPRESENTS THE OUTER SHIELD OF DUAL SHIELD CABLES ONLY. IT MUST BE TERMINATED TO THE CONNECTED DEVICE AT EACH END. AT THE LOAD CELL END CONNECT OUTER SHIELD TO CASE OR MTG. BOLT. WHEN USING A SINGLE SHIELD CABLES. RUN A HEAVY COPPER BRAID OR A #14 WIRE ALONG CABLE TO REPRESENT OUTER SHIELD. CONDUIT OR OTHER CONDUCTIVE MEMBERS MAY PROVIDE THIS CONNECTION,

(*) INDICATES DRAWING MAY HAVE LETTER PREFIX

NOTES:

1. UP TO TWELVE LOAD CELLS MAY BE UTILIZED WITH THE ARRANGEMENT IN FIGURE 3 PROVIDED THE BRIDGE RESISTANCE OF EACH CELL IS THE SAME AND THE RESISTANCE OF ALL LOAD CELLS IN PARALLEL EXCEEDS 58 OHMS.
2. THE LOAD CELLS USED WITH THIS SYSTEM WILL BE EXCITED WITH 6VDC. DESIGN SENSITIVITY MUST BE SUCH THAT AT LEAST 1/2 MICROVOLT/ GRADUATION IS MAINTAINED TO ESTABLISH AN ACCURATE WEIGHING SYSTEM.
3. DO NOT MODIFY THE LENGTH OF 4 CONDUCTOR LOAD CELL CABLES UNDER ANY CIRCUMSTANCES-ALL CELLS MUST HAVE EQUAL CABLE LENGTHS.
4. PROVIDE CONDUIT FOR THE LOAD CELL CABLE UP TO AS CLOSE TO THE LOAD CELL AS POSSIBLE.
5. ALL LOAD CELL CABLE CONDUITS SHALL ONLY CONTAIN LOADCELL WIRING SHOWN HERE; NO OTHER WIRES.
6. ALL CONDUIT SEALS SHOWN FURNISHED BY T.S.CO. ARE TO BE INSTALLED AND SEALED ACCORDING TO LOCAL CODES BY OTHERS.
7. ALL GROUNDING OF EQUIPMENT SHOWN IS TO BE DONE BY EQUIPMENT INSTALLERS IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE AND LOCAL ELECTRIC CODE.
8. LOAD CELL CABLE COLOR CODE DESIGNATION MUST BE MAINTAINED AS SHOWN FOR PROPER OPERATION.
9. CONNECT SHIELD OF SINGLE SHIELD CABLE OR INNER SHIELD OF DUAL SHIELD CABLE TO TERMINAL MARKED 3 OR 10 (SHLD) TO GROUND. CONNECT ALL CASES, ENCLOSURES, HOUSINGS, AND POINTS NORMALLY CONNECTED TO GROUND TOGETHER AND TO A TRUE EARTH GROUND THROUGH THE OUTER SHIELD OF DUAL SHIELD CABLE. HEAVY COPPER BRAID OR #14 AWG. WIRE MAY BE USED TO PROVIDE CONNECTION WHEN SINGLE SHIELD CABLE IS USED.

NOTICE
THIS ITEM USED IN AGENCY APPROVED PRODUCT. DO NOT CHANGE DRAWING WITHOUT AGENCY APPROVAL.

SUFFIX	DESCRIPTION	FINISH	CONSISTS OF
SUFFIX CODE INDEX			

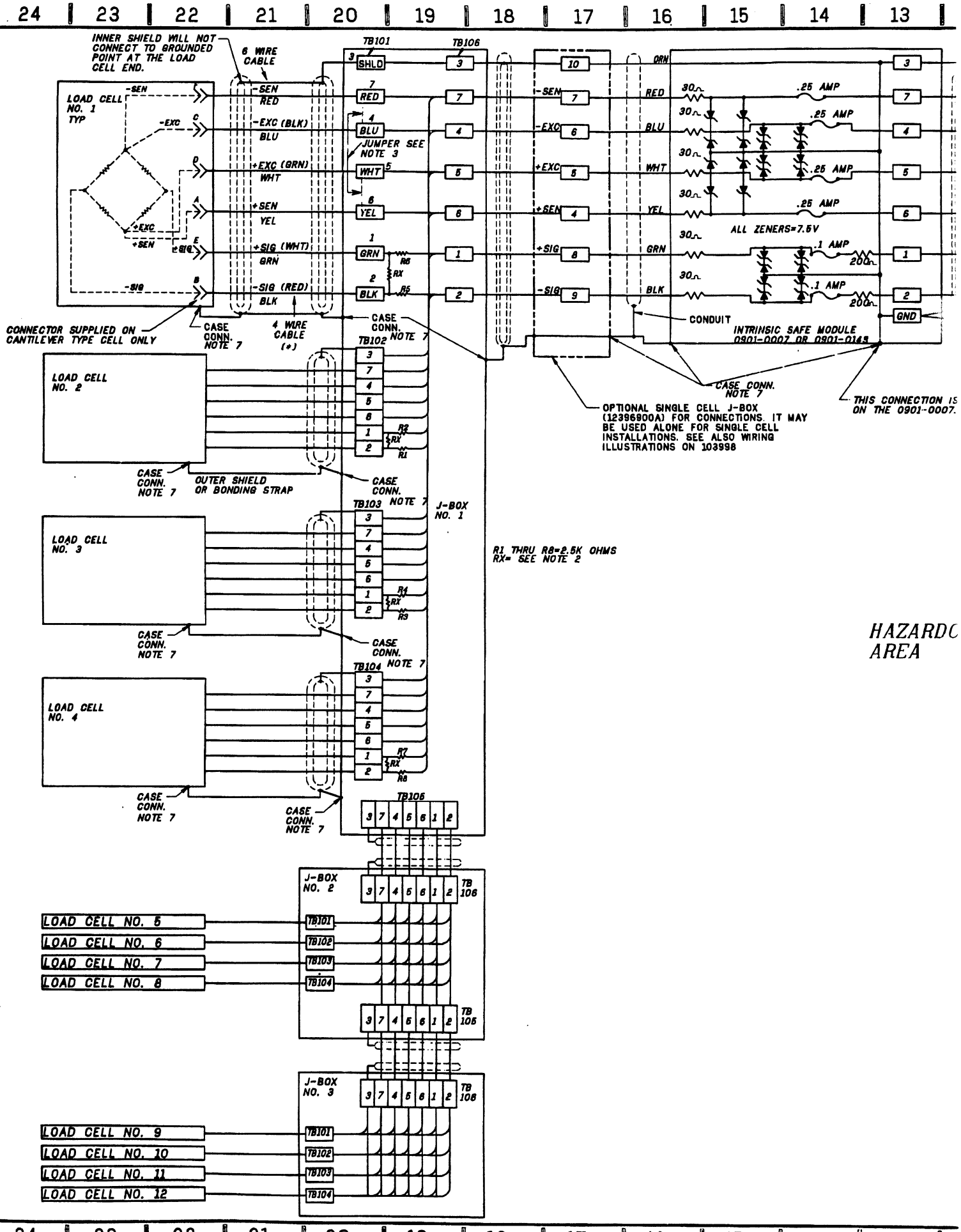
TOLEDO SCALE

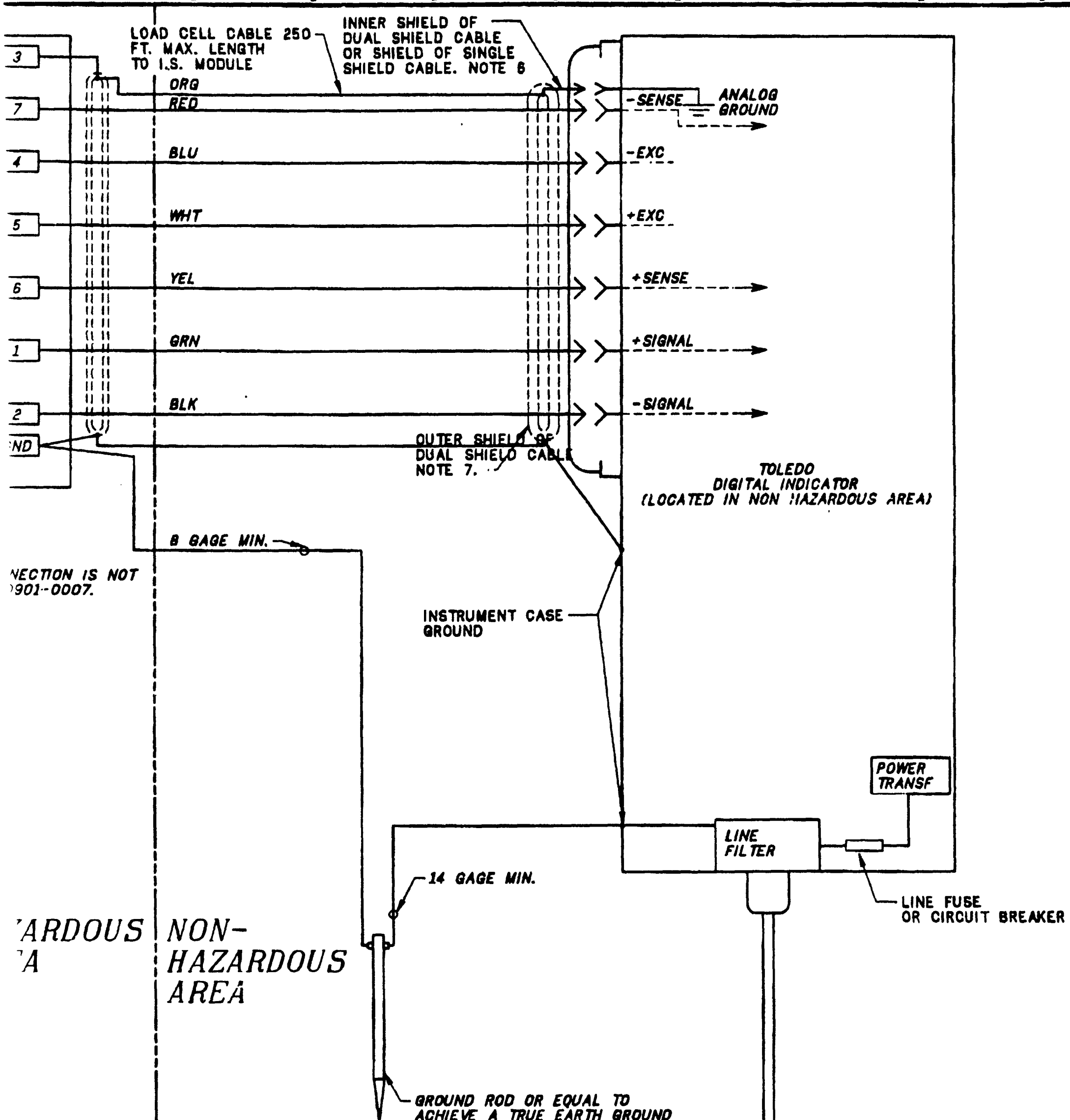
NAME	EXTERNAL WIRING DIAGRAM MULTIPLE LOAD CELL HAZARDOUS AREA
DRW	CRS 8/16/76
CHK'D	T.MORRISON 9/23/76
APP'D	

MATERIAL SPEC.
SCALE
DIMENSION TOLERANCE UNLESS OTHERWISE SPECIFIED: DECIMAL ± FRACTIONAL ± ANGULAR ±
DO NOT SCALE DRAWING
ANSI Y14.5M 1982
PROJ.NO./SPEC.NO. 5125-12
SUPERSEDES
SUPERSEDED BY
DWG. RELEASE NO. 33619 DHS 9-23-76

103998

3 12 11 10 9 8 7 6 5 4 3 2 1


INNER SHIELD WILL NOT CONNECT TO GROUNDED POINT AT THE LOAD CELL END.
6 WIRE CABLE
LOAD CELL NO. 1 TYP
-SEN
-EXC
+EXC
+SEN
+SIG
-SIG
RED
BLU
WHT
YEL
GRN
BLK
CONNECTOR SUPPLIED ON CANTILEVER TYPE CELL ONLY
CASE CONN. NOTE 7
4 WIRE CABLE (*)
TB101
TB106
SHLD
JUMPER SEE NOTE 3
R6
RX
R5
CASE CONN. NOTE 7
CONDUIT
INTRINSIC SAFE MODULE 0901-0007 OR 0901-0149
30Ω
.25 AMP
.1 AMP
200Ω
ALL ZENERS=7.5V
GND
OPTIONAL SINGLE CELL J-BOX (12396900A) FOR CONNECTIONS. IT MAY BE USED ALONE FOR SINGLE CELL INSTALLATIONS. SEE ALSO WIRING ILLUSTRATIONS ON 103998
THIS CONNECTION IS ON THE 0901-0007
LOAD CELL NO. 2
TB102
R3
R1
OUTER SHIELD OR BONDING STRAP
LOAD CELL NO. 3
TB103
R4
R9
LOAD CELL NO. 4
TB104
R7
R8
TB105
J-BOX NO. 1
R1 THRU R8=2.5K OHMS
RX= SEE NOTE 2
HAZARDO
AREA
J-BOX NO. 2
TB 106
LOAD CELL NO. 5
LOAD CELL NO. 6
LOAD CELL NO. 7
LOAD CELL NO. 8
TB 105
J-BOX NO. 3
LOAD CELL NO. 9
LOAD CELL NO. 10
LOAD CELL NO. 11
LOAD CELL NO. 12



FOR THE SAFE OPERATION OF THE LOAD CELL CIRCUITRY WITHIN THE HAZARDOUS AREA THE PROTECTION MODULE J-BOX MUST BE GROUNDED. A NO. 8 GAGE OR LARGER WIRE MUST BE CONNECTED TO THE MODULE GRD. LUG WITHIN THE BOX. THE OTHER END MUST TERMINATE AT A TRUE EARTH GROUND OUTSIDE THE HAZARDOUS ARE. THIS GROUND MUST NOT BE COMMON TO ANY OTHER POWER SYSTEM GROUNDS. THE MAIN BEAM OF A BUILDING IS NOT CONSIDERED TO BE A TRUE EARTH GROUND.

NOTICE
THIS ITEM USED IN AGENCY APPROVED PRODUCT. DO NOT CHANGE DRAWING WITHOUT AGENCY APPROVAL.

NOTES:

1. NO REVISIONS ARE TO BE MADE TO THIS DRAWING WITHOUT PRIOR APPROVAL FACTORY MUTUAL RESEARCH.
2. ALL RX RESISTORS ARE ADDED TO ATTENUATE HIGH CORNERS OF THE SCALE. THEIR INDIVIDUAL RESISTANCE VALUE MUST NOT BE LOWER THAN 50K OHMS.
3. SIX WIRE LOAD CELLS: REMOVE THE TWO JUMPERS BETWEEN TB101-5 AND TB101-6 AND BETWEEN TB101-4 AND TB101-7. J-BOX NO. 1 ONLY.
4. SEE 122602 FOR ACCEPTABLE LOADCELLS.
5. UP TO 12 LOAD CELLS AND THREE J-BOXES MAY BE USED. THE RESISTANCE OF THE LOAD CELLS CONNECTED IN PARALLEL MUST BE GREATER THAN 56 OHMS.
6. SEE DRAWING 103998 FOR CONNECTION DIAGRAM AND J-BOXES.
7. CONNECT SHIELD OF SINGLE SHIELD CABLE OR INNER SHIELD OF DUAL SHIELD CABLE TO TERMINAL MARKED SHIELD. CONNECT ALL CASES, ENCLOSURES, HOUSINGS, AND POINTS NORMALLY CONNECTED TO GROUND TOGETHER AND TO A TRUE EARTH GROUND THROUGH THE OUTER SHIELD OF DUAL SHIELD CABLE. HEAVY COPPER BRAID #14 WIRE, CONDUIT OR OTHER CONDUCTIVE MEMBERS MAY PROVIDE THIS CONNECTION.

WIRING NOTES:

1. THE SCHEMATIC RERESENTATION OF THE MULTIPLE LOAD CELL COMBINATION AT LEFT IS THAT OF FIG. 3 ON 103998. OTHER JUNCTION BOX WIRING DIFFERS.

SAFETY CRITICAL ITEM
REFER TO LATEST ISSUE OF TOP #4005 FOR REQUIREMENTS.

NO.	ZONE	DESCRIPTION	BY	CHKD.	APPD.	E.R.NO.	DATE
14		REDRAWN, ADD GND CONN. TO 0901-0148	BAL	7/87			
		ADD NOTE THIS CONNECTION IS NOT...					

RECORD OF CHANGES

TOLEDO SCALE
NAME SCHEMATIC SYS-MULTIPLE LOAD CELL-HAZARDOUS OPERATION
DRN. C.R.SMITH 7/28/76 — ENG. T.MORRISON 9/17/76
PROJ.NO./SPEC.NO. 5125-12
ENG. RELEASE NO. 33619 DHS 9-23-76
DO NOT SCALE DRAWING
103997

METTLER TOLEDO

Publication Evaluation Report

If you find a problem with our documentation, please complete and fax this form to (614) 438-4355

Publication Name: 0901-0148/0901-0197 Intrinsic Safety Module Installation Instructions

Publication Part Number: B11816400A Publication Date: 10/00.01

PROBLEM(S) TYPE:	DESCRIBE PROBLEM(S):	INTERNAL USE ONLY
☐ Technical Accuracy	☐ Text ☐ Illustration	
☐ Completeness What information is missing?	☐ Procedure/step ☐ Illustration ☐ Definition ☐ Example ☐ Guideline ☐ Feature ☐ Explanation ☐ Other (please explain below)	☐ Info. in manual ☐ Info. not in manual
☐ Clarity What is not clear?		
☐ Sequence What is not in the right order?		
☐ Other Comments Use another sheet for additional comments.		

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