# 0917-0198

## Part# 13849100A

## CMOS* Power Cell

## Intrinsic Safe Barrier

Installation Instructions

14246300A
4/93

## 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.

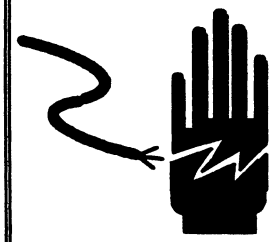
FOLLOW these instructions carefully.

SAVE this manual for future reference.

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

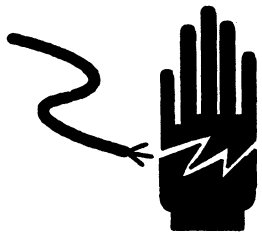
ALWAYS DISCONNECT this equipment from the power source before cleaning or performing maintenance.

CALL METTLER TOLEDO for parts, information, and service.



**⚠ WARNING**

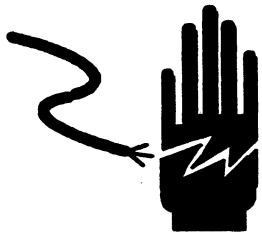
ONLY PERMIT QUALIFIED PERSONNEL TO SERVICE THIS EQUIPMENT. EXERCISE CARE WHEN MAKING CHECKS, TESTS AND ADJUSTMENTS THAT MUST BE MADE WITH POWER ON. FAILING TO OBSERVE THESE PRECAUTIONS CAN RESULT IN BODILY HARM.



**⚠ WARNING**

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

DO NOT REMOVE THE GROUND PRONG.



**⚠ WARNING**

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

**⚠ 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.

**CAUTION**

OBSERVE PRECAUTIONS FOR HANDLING ELECTROSTATIC SENSITIVE DEVICES.

# Declaration of conformity
Konformitätserklärung
Déclaration de conformité
Declaración de Conformidad
Verklaring de overeenstemming
Dichiarazione di conformitá

We/Wir/Nous/WIJ/Noi: **Mettler-Toledo, Inc.**
**1150 Dearborn Drive**
**Worthington, Ohio 43085**
**USA**

**declare under our sole responsibility that the product,**
erklären, in alleiniger Verantwortung, daß dieses Produkt,
déclarons sous notre seule responsabilité que le produit,
declaramos, bajo nuestra sola responsabilidad, que el producto,
verklaren onder onze verantwoordelijkheid, dat het product,
dichiariamo sotto nostra unica responsabilitá, che il prodotto,

**Model/Type:** **917-0198** **Power Cell Barrier Box** - as supplied by Mettler-Toledo, Inc.

**to which this declaration relates is in conformity with the following standard(s) or other normative document(s).**
auf das sich diese Erklärung bezieht, mitder/den folgenden Norm(en) oder Richtlinie(n) übereinstimmt.
Auquel se réfère cette déclaration est conforme à la (aux) norme(s) ou au(x) document(s) normatif(s).
Al que se refiere esta declaración es conforme a la(s) norma(s) u otro(s) documento(s) normativo(s).
Waarnaar deze verklaring verwijst, aan de volende norm(en) of richtlijn(en) beantwoordt.
A cui si riferisce questa dichiarazione è conforme alla/e sequente/i norma/e o documento/i normativo/i.

**CE Conformity** / CE-Konformität / Conformité CE
90/384/EU Nonautomatic Balances and Scales / Nichteselbsttätige Waagen / Balances à Functionnement non automatique
Article 1.2.a. When installed with devices listed on the T2206 and T2391 Type Approvals
89/336/EU EMC Directive / EMU-Richtlinie / Directive concernant la CEM*

| | |
|---|---|
| EN55022, A 01.04.87 | Emissions / Funkstörungen |
| EN50081-1 | Immunity |

* When install per manufactures specifications detailed in the Technical Manual

**Other Directives and Standards** / Andere Richtlinien und Normen / Autres documents
**corresponding to local requirements** / entsprechend lokalen Anforderungen / correspondant aux exigences locales

| | |
|---|---|
| FCC Part 15, class A | Emissions / Funkstörungen |
| FM3600, 3610 and 3810 | el. Safety / el. Sicherheit / sécurité el. (class, group & division as labeled) |
| EEx la IIB T4 | el. Safety / el. Sicherheit / sécurité el. |

Darrell Flocken, Manager - Weights & Measures
Office of Weights and Measures
Worthington, Ohio USA
**December, 1995**

according to EN45014

# TECHNICAL UPDATE

**NUMBER: H-01-95**
**DATE: 05-30-95**
**MODEL: 0917 - 0198 P/N 13849100A**
**SUBJECT: Modification required when 8530 / w Regulator PCB is used with the CMOS Power Cell Intrinsic Safety Barrier**

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The 8530 DigiTOL Indicator is now being shipped with a Regulator PCB, P/N 14506800A, ( mounted behind the main PCB ) to regulate the supply to the CMOS power cells. ( Ref. : The first 8530 with the Regulator PCB was shipped Dec. 6, 1994 and was S/N 4364249-5ZV )

Please note that if you are installing a new 8530 DigiTOL Indicator with the CMOS Power Cell Intrinsic Safety Barrier, **You MUST disconnect the Regulator PCB and bypass it with the Multi-cell harness, P/N A13161300A .** If the Regulator PCB is left in the indicator the output of the intrinsic safety barrier will be below the minimum voltage required to run the CMOS cells.

## To Bypass the Regulator PCB

1.) **FIRST REMOVE POWER FROM THE 8530**

2.) Remove the Main PCB

3.) Disconnect the harness from **J2** ( labeled "POWERCELL" ) on the Regulator PCB , and the load cell harness connected to **J1** connector on the back of the 8530 Deck or on the bottom of the 8530 Wall Mount.

4.) Disconnect the harness from **J7** on the Main PCB.

5.) Install the **Multi-cell Harness** from the load cell harness from **J1**, to the **J7** connector on the Main PCB.

Note :

The power cell Multi-cell Harness and installation instructions, will now be included with the CMOS Intrinsic Safety Barrier ( Model 0917-0198 ).

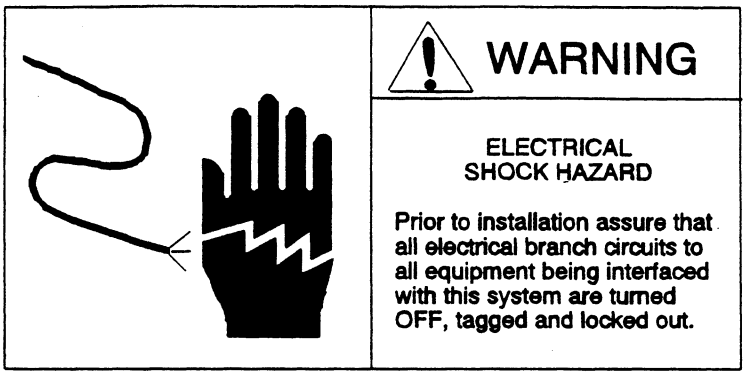
# TABLE OF CONTENTS



| **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 CMOS* Power Cell and indicators are approved for use with the intrinsic safe barrier. |

* See Chart 11.1.




## 1.0 GENERAL DESCRIPTION

The Model 0917-0198 CMOS* Power Cell Intrinsic Safe Barrier is designed to meet standards set forth in the National Electric Code (N.E.C.), and has Factory Mutual approval.

This Barrier is a safety device designed to limit the voltage and current, to safe levels, that can pass from the digital weight indicator out to the weigh scale system, i.e., (home run cable(s), pit junction boxes, and CMOS* power cells).

| **WARNING** |
| --- |
| This Barrier, the digital indicator and auxiliary power supply** must be located in a safe, unclassified area. |

Each Barrier can handle up to twelve (12) CMOS* Power Cells, and each system can have up to two (2) Barriers or a total of twenty-four (24) cells. See control drawing TC100442 for details.

The Barrier is not a repairable device.

** Auxiliary power supply for use with Model 8146 only.

## 2.0 SYSTEM COMPONENTS

2.1 Digitol® Weight Indicator. Models 8530, 8530VS, and 8146 Digital with auxiliary power supply.

2.2 A six foot interconnect cable, part number TA0000100-006, is supplied for connection between the Barrier and 8530/8530VS indicator.

2.3 An additional six foot interconnect cable, part number TA0000100-006 is supplied to connect the auxiliary power supply when using the 8146 Digitol Indicator.

2.4 Up to two (2) home run cables, six (6) power cells each, can be connected to one barrier. The system can have up to two (2) Barriers and a total of four (4) home run cables with a maximum of twenty-four (24) cells. (Home run cables must be Mettler Toledo part number TA000108 as specified on the control drawing TC100442.)

2.5 The Pit J-Boxes are passive connection boxes designed to handle up to six (6) CMOS* Power Cells and one (1) home run cable.

2.6 Load cells are Mettler Toledo CMOS* Power Cells only. See chart in Section 11.0 for approved list.

## 3.0 INSTALLER INSTRUCTIONS AND CONTACTS

READ THESE INSTRUCTIONS COMPLETELY BEFORE STARTING INSTALLATION

3.1 Deviations from the instructions and specifications in this manual are prohibited unless written approval is obtained from Mettler-Toledo, Inc. Group Engineering prior to installation.

3.2 In regard to technical problems and questions with installation, phone Mettler-Toledo, Inc. Technical Services:

1-800-786-0040

3.3 Examine the equipment being connected to the CMOS* Power Cell Intrinsic Safety Barrier (0917-0198), from a safety point of view. An equipment condition which could render, make or become 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.

3.4 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.

3.5 Safety hazards must be corrected prior to installation or completion of the installation when detected.

3.6 If the customer/user decides not to have the safety features of the equipment/hazard corrected, prior to starting the installation or prior to completing the installation when the hazard is detected during the installation, the installer/service person shall refer the matter to their supervisor/service manager for instructions. No further work shall be done.

3.7 When service is denied for safety reasons, the installer/service person shall document the circumstances/facts of the incident and send the information to:

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

(continued on next page)

3.7.1 Required information is:

a. Customer Name
b. Customer Address
c. Time & Date of Service
d. Name & Title of person disallowing safety corrections.
e. Equipment Model Number
f. Equipment Serial Number
g. Safety discrepancies found (Describe)
h. SSN (Special Specification Number) and TON (Toledo Order Number)

## 4.0 HAZARDOUS AREA ENVIRONMENTAL CHECK

**WARNING !**

The CMOS* Power Cell Intrinsic Safe Barrier (#0917-0198) must be located in a safe (unclassified) area. It is not suitable for location in the hazardous area. No connections, changes, jumpers, or alterations of any kind are to be made to this Intrinsic Safety Barrier or its associated wiring. Refer to control drawing TC100442.

NOTES:

1) Mettler-Toledo, Inc. listed CMOS* Power Cells are suitable for hazardous locations rated Class I & II, Division I & II, applicable Groups C, D, E, F, or G, and NEC temperature rating T4.

2) See Mettler-Toledo, Inc. control drawings TC100442 for equipment locations, wiring, and installation.

Verify with the responsible customer representative that the hazard present is rated within the Class, Division, and Group classifications previously detailed (ref. Note 1, Section 4.0) shown above, and that the auto-ignition temperature of the hazardous material present exceeds the T4 temperature rating, 135C (275F), as defined by NFPA 70, the National Electrical Code, 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, Inc.
Product Marketing
(800) 786-5123

## 5.0 SYSTEM EQUIPMENT REQUIREMENTS

**WARNING !**

The Power Cell Intrinsic Safety Barrier may only be used with those digital indicators and power cells identified below.

**DO NOT CONNECT INTRINSIC SAFETY BARRIER(S) TO ANY OTHER INDICATOR OR LOAD CELLS.**

5.1 Digital Indicators — The Power Cell Intrinsic Safety Barrier can only be used with the following digital indicators: Model 8530, 8530VS, or 8146 (DigiTOL) (auxiliary power supply required with 8146 DigiTol indicator).

**WARNING !**

The Power Cell Intrinsic Safety Barrier (0917-0198), digital indicator and auxiliary power supply, when used, MUST be located in a safe (unclassified) area.

5.2 CMOS* Power Cells — The Power Cell Intrinsic Safety Barrier #0917-0198 can only be used with CMOS* Power Cells listed in section 11.0. **DO NOT USE OR SUBSTITUTE ANY OTHER LOAD CELLS.**

5.3 J-Boxes — The Power Cell Intrinsic Safety Barrier #0917-0198 can only be used with approved J-Boxes listed on control drawing TC100442.

## 6.0 SYSTEM INSTALLATION AND WIRING

6.1 Installation and wiring of the Power Cell Intrinsic Safety Barrier MUST be complete as specified on the control drawing TC100442 enclosed in this manual Module

6.2 Phone Mettler Toledo Technical Services (800) 786-0040 in regard to technical problems and questions with installation.

## 7.0 PRE-POWER CHECKS (Refer to TC100442 Control Drawing.)

**WARNING !**

Hazardous classified area must be made safe and secure before using any test equipment. **DO NOT** use test equipment in hazardous area or test any wiring entering a hazardous area without having the user/customer secure the area safe.

NOTES:

1) The Power Cell Intrinsic Safety Barrier (0917-0198) is not a repairable safety device.

2) Misconnection, misapplication, shorts, or opens may cause the fuses to open.

Make all of the following checks before applying power to the system: (refer to control drawing TC100442 for proper connection).

7.1 Check all power cell wire connections at the pit junction boxes. Be sure color code matches terminal numbers and ground stud.

7.2 Check both ends of Home Run (HR) cable(s) for proper connection. See wire color/terminal numbers for pit junction box, dual barrier box, and ground drain connections.

7.3 Note, a seal must be used at entry of home run cable(s) from hazardous to safe areas.

7.4 Maximum allowable home run cable length is 400 feet.

7.5 Pit junction box jumper (W1) must be in place.

7.6 Barrier jumper (W1) to be in place for 1-6 cells and removed for a 7-12 cell system.

7.7 Model 8530/8530VS indicator connection to Barrier. Use cable part number TA0000100-006 from J1 on indicator to J1 on barrier. Use second cable from J2 of first barrier to J1 of second barrier if more than 12 cells are to be connected for a single scale application.

7.8 Connection of Model 8146 Digitol indicator with auxiliary power supply. Use cable(s) part number TA0000100-006, from Weight "1" on the Model 8146 to indicator "A" on the auxiliary supply. If a second Barrier is to be used, connect Weight "2" on the Model 8146 to indicator "B" on the auxiliary supply for cells 13-24.

Use the same part number cable for connection of the auxiliary power supply to the barrier(s). Connect the cable between Barrier connector J1 and the auxiliary power supply connector pit #1. If a second Barrier is to be used, connect it's J1 connector to auxiliary power supply pit #4.

Note: See Appendix "A" and "B" for wiring charts for pit J-box and CMOS* Power Cell Intrinsic Safety Barrier layouts. See Control Drawing TC 100442, in Print Pocket of this manual for all field connections and installation.

| **WARNING !** |
| --- |
| **DO NOT** install, connect or power up system unless control drawing TC100442 is followed. No exceptions. |

7.9 DigiTOL® Load Cell Simulators cannot be used to test this system. See warning below.

| **WARNING !** |
| --- |
| **DO NOT** attempt to use simulator at scale platform or at Intrinsic Safe Barrier. Damage to the barrier or simulator may occur.<br><br>The DigiTOL® Load Cell Simulator is not suitable for use in Hazardous Classified Areas. |

## 8.0 POWER UP CHECK

| WARNING ! |
| --- |
| **DO NOT** use test equipment in hazardous area or test any wiring entering a hazardous area without first securing the hazardous area safe. |

8.1 Pit Junction Box(es): All tests to pit junction box(es) must be made with area secured safe. With system in power up condition, test the following at the pit junction box(es).

8.1.1 Plus (+) voltages reference to ground terminals (GND) on TB1, +VA, +VB, +VC, 9.0 to 10.5 VDC.

8.1.2 Ground wires Green, Brown, and Black must be grounded (zero volts), not open.

8.1.3 COM A, COM B, RS485 2 wire 375K-Baud pulse. (See Section 8.2.3)

8.2 Power Cell Intrinsic Safety Barrier: All tests to intrinsic barrier must be made with hazardous area secured safe or with home run cable(s) disconnected from Power Cell Intrinsic Safety Barrier plugs, TB1 and TB2. If tests are to be made at the Power Cell Intrinsic Safety Barrier, TB1 and TB2 with Home Run cables attached, the hazardous area must first be secured safe.

| WARNING ! |
| --- |
| Make **NO** tests unless above procedure 8.2 is followed.<br><br>**NO EXCEPTIONS.** |

8.2.1 TB1 and TB2 checks with home run cable disconnected.

Pin 1 (+VA) 9.5 to 10.5 VDC to Pin 4
Pin 2 (+VB) 9.5 to 10.5 VDC to Pin 5
Pin 3 (+VC) 9.5 to 10.5 VDC to Pin 6

Voltages will be 0.5 to 1.0 volts lower with home run cable(s) attached. See warning 8.2 above.

8.2.2 Com A, Com B, RS485 2 wire 375K-baud pulse.

| Voltage Tests at Barrier TB1 and TB2 | |
|---|---|
| <u>With Home Run Cable(s) Connected</u> | |
| COM A to GND (Pin 8 to Pin 6) | ≈ .5 VDC |
| COM B to GND (Pin 7 to Pin 6) | ≈ .5 VDC |
| COM A to COM B | 0 VDC |
| <u>With Home Run Cable(s) Disconnected</u> | |
| COM A to GND | .1 VDC to .5 VDC *** |
| COM B to GND | .1 VDC to .5 VDC *** |
| COM A to COM B | 0 VDC |

*** Voltage readings move (change) between these two readings.

All readings were taken with a Fluke multimeter. Readings from other types of meters may vary.

8.2.3 Com A/Com B continuity test: Test with home run cable(s) disconnected and power removed from the digital indicator.

With W1 jumper installed, check resistance between
TB1 pins 7 & 8, 24 — 27 OHMS
TB2 pins 7 & 8, 30 — 35 OHMS

With W1 jumper removed, check resistance between
TB1 pins 7 & 8, 30 — 35 OHMS
TB2 pins 7 & 8, 30 — 35 OHMS

If any of the above tests are out of specification, check the system for opens, shorts, or mis-wiring. Refer to control drawing TC100442. **Be sure hazardous area is secured safe before doing any testing.**

## 9.0 SYSTEM CHECKOUT, CALIBRATION, AND COMPLETION OF INTRINSIC SAFE MODULE INSTALLATION

9.1 Apply power and complete system calibration and checkout as specified in the Mettler-Toledo, Inc. manuals for the specific weight indicator and scale weighbridge applicable for your system.

9.2 Power Cell Intrinsic Safety Barrier 0917-0198, Scale Indicator, and auxiliary power supply, when used, must be located in a safe area.

9.3 Keep cover on and all screws secured.

9.4 Load cell home run cable(s) must have seal at or near entrance to hazardous area.

9.5 Refer to control drawing TC100442 for details.

## 10.0 LABELING (FACTORY MUTUAL — 0917-0198 ONLY)

10.1 Factory Mutual approval applies only to the U.S.A. version of the CMOS* Power Cell Intrinsic Safety Barrier (0917-0198), junction boxes, CMOS* Power Cells, and METTLER TOLEDO DigiTOL® indicators. Confirm that the Junction Boxes, CMOS* Power Cell, and CMOS* Power Cell Intrinsic Safety Barriers are labeled with the FM approval label.

10.2 See Section 5.0 for approved indicators and Section 11.0 for approved CMOS* Power Cells.

## 11.0 CMOS* POWER CELLS

11.1 Approved CMOS* Power Cell for use with Mettler Toledo Model 0917-0198 (Part number 13849100A) Barrier.

| RAM NUMBER | DESCRIPTION | | PART NUMBER |
|---|---|---|---|
| 0760 1001 | 22.5K | OIML-C3 | 14002300A |
| 0760 1003 | 22.5K | NSB 3.1 LB | 14002500A |
| 0760 1004 | 45K | OIML-C3 | 14002700A |
| 0760 1006 | 45K | NSB 6.3 LB | 14002900A |

11.2 The CMOS* Power Cells listed are acceptable for use in Class I & II, Divisions I & II, applicable Groups C,D,E,F, and G locations when interfaced using CMOS* Power Cell Intrinsic Safety Barriers 0917-0198. CMOS* Power Cells are rated for a T-4 temperature code (135C, 275F). See NFPA-70 National Electric Code and NFPA-497M for description of this rating.

11.3 CMOS* Power Cell home run cable lengths may be a maximum of 400 feet.

| **WARNING !** |
|---|
| **DO NOT** use or substitute any other Power Cells, in this system. |

## 12.0 EXTERNAL WIRING DIAGRAM (TC 100442)

| Drawing Number | Description |
|---|---|
| TC100442 | CMOS* Power Cell Hazardous Area Control Drawing. |

The drawing enclosed in the pocket of this manual is critical and must be used when installing and maintaining the product described in this manual. Replacements will be provided, at no cost, upon receipt of a written request sent to:

Mettler-Toledo, Inc.
SYSTEMS DIVISION
60 Collegeview Road
Westerville, Ohio 43081

Attn: Technical Publications Department

or

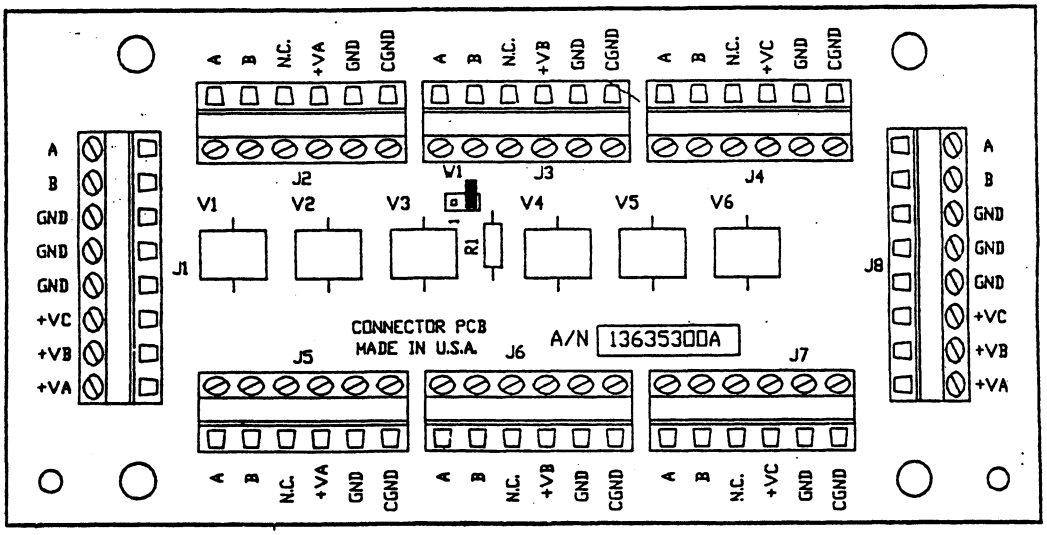
Fax your request to: (614) 841-5030

or

Call: (614) 841-5110

# C-MOS

# PIT J-BOX

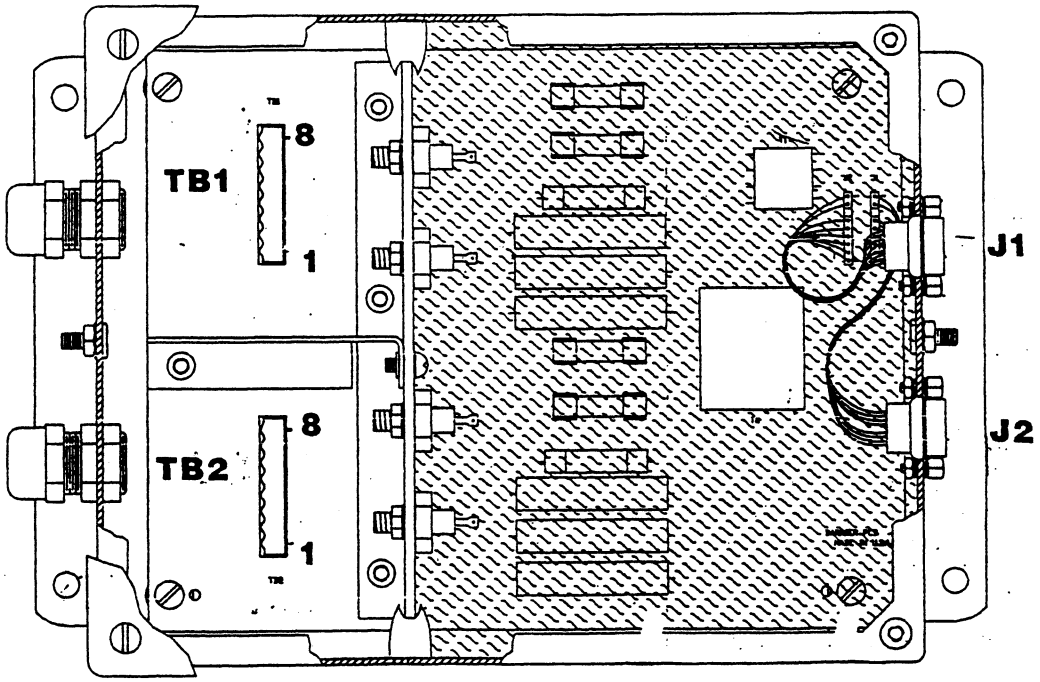



| CMOS Power Cell Wiring Chart | | | |
|---|---|---|---|
| CMOS Power Cell to Pit J-Box | | | |
| **CMOS Cell** | **Function** | **Color Code** | **Pit J-Box J2-J7** |
| B | Com A | YEL | A |
| A | Com B | BLU | B |
| | No Connection | WHT | No Connection |
| D | +V | RED | +VA/+VB/+VC |
| C | GND | GRN | GND |
| Connector Body | C.GND | ORG | C. GND |
| Ground Lug on Scale Platform | Outer Drain | GRN/YEL | External Ground Lug |

**NOTE:** · Pins E & F on load cell are not used.

· + Voltages 9.0 to 10.5 VDC

## C-MOS BARRIER
## TOP VIEW




| Home Run Cable Wiring Chart | | | |
|---|---|---|---|
| Pit J-Box to Intrinsic Safe Module | | | |
| Pit J-Box J1 or J8 | Function | Color Code | Intrinsic Safe Module TB1 or TB2 |
| +VA | +VA | WHT | 1 |
| +VB | +VB | RED | 2 |
| +VC | +VC | ORG | 3 |
| GND | GND | GRN | 4 |
| GND | GND | BRN | 5 |
| GND | GND | BLK | 6 |
| Com B | Com B | BLU | 7 |
| Com A | Com A | YEL | 8 |
| Internal PCB Mounting Screw | Shield | WHT/ORG | Internal PCB Mounting Screw |
| External Ground Lug | Outer Drain | GRN/YEL | External Ground Lug |

| Indicator/Auxiliary PS Wiring Chart | | | |
|---|---|---|---|
| Indicator to Intrinsic Safe Module | | | |
| 8530 J1/Aux. PS PS1-PS4 | Function | Color Code | Intrinsic Safe Module J1 or J2 |
| 1 | Com A | YEL | 1 |
| 4 | Com B | BLU | 4 |
| 3 | Key | | 3 |
| 5 | 24 V | WHT | 5 |
| 8 | 24 V | RED | 8 |
| 9 | 24 V | ORG | 9 |
| 2 | GND | GRN | 2 |
| 6 | GND | BRN | 6 |
| 7 | GND | BLK | 7 |
| External Ground Lug | Outer Drain | GRN/YEL | External Ground Lug |

**METTLER TOLEDO**
**Scales & Systems**
350 West Wilson Bridge Road
Worthington, Ohio 43085-2273

P/N: 14246300A

(04/93)



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