9330

Technical Manual

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 can also send your feedback via email to: quality_feedback.mtwt@mt.com.

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

‖‖‖

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

I.I..I..II.II....I..I..I.I.I..I..I.II..I...II...I.II..I
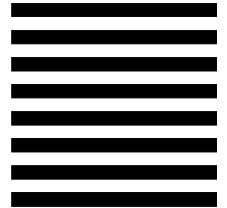
Please seal with tape.

Precautions

READ this manual BEFORE operating or servicing this equipment.
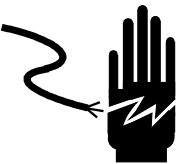
FOLLOW these instructions carefully.

SAVE this manual for future reference.
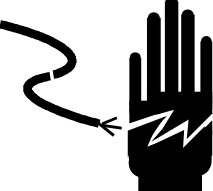
DO NOT allow untrained personnel to operate, clean, inspect, maintain, service, or tamper with this equipment.

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

CALL METTLER TOLEDO for parts, information, and service.

⚠ **WARNING**

DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, CLEANING, OR REMOVING THE FUSE. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.

⚠ **CAUTION**

OBSERVE PRECAUTIONS FOR HANDLING ELECTROSTATIC SENSITIVE DEVICES.

⚠ **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.

CONTENTS

1 Introduction

CTPZ Interface

The "CTPZ" interface is designed to serve as a remote interface for the Clear, Tare, Print and Zero keyboard commands. A contact closure representing one of these four functions is interrogated and converted into a serial ASCII equivalent character. This character is then transmitted to the destination digital indicator. The indicator, in turn, processes the character and converts it back to the local keyboard function.
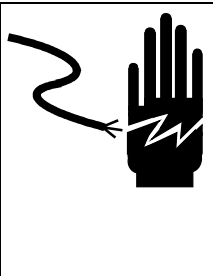
The interface PCB assembly that processes the input command works with input signal levels of 24 to 125 VAC @ 50 - 60 HZ or 24 to 50V DC. The ASCII output is selectable between 20 mA current loop, EIA (RS232), RS422, or fiber optics to provide connections between most of METTLER TOLEDO indicators. The baud rate is selectable between 300, 1200, 4800, or 9600.

The interface PCB is available in a number of forms. It can be used as a component part of a larger piece of equipment as seen in systems or applied products equipment, or as a stand-alone interface contained in a NEMA type pushbutton station.

The unit requires an outside source of electrical power to operate the electronics contained within which may be either 120 or 240 VAC 50/60 HZ. Note, however, that if the source is 240V, the inputs cannot be operated directly from the AC line. They must, instead, be operated from the internal supply via W2, or another supply limited to 120VAC. See details in the installation section.

	⚠ WARNING
	DO NOT INSTALL THIS PRODUCT IN A HAZARDOUS AREA. WHEN THE 9339 IS USED TO INTERFACE INTRINSICALLY SAFE OR EXPLOSION PROOF INDICATORS, BE CERTAIN THAT IT IS LOCATED IN THE SAFE AREA AND THE INTERFACE CONNECTIONS ARE MADE ACCORDING TO ACCEPTABLE NATIONAL AND LOCAL ELECTRICAL CODES. FAILURE TO OBSERVE THIS PRECAUTION, MAY RESULT IN BODILY INJURY AND/OR PROPERTY DAMAGE.

Options

Dust-tight mild steel module: Model 9330 - 0001

Wash-down stainless module: Model 9330 - 0011

PCB only kit of parts: Model 9330 - 0021

Optional pushbutton kit of parts: Model 0964 - 0049

Specifications

AC Power Requirements

AC Input: 120 or 240 VAC (via TB1) - 15% + 10% 49/61 Hz 5VA maximum

Fusing: The transformer is self-limiting and thermally protected. Fusing is required only if a remote power source is used for the input circuitry.

Wiring: Internal AC power connections are made to the PCB via a disconnectable plug/terminal strip (TB1) which has screw terminals to accept up to #14 gauge wires. The field wiring must be #14 gauge if conduit is used or #18 gauge type SJO service cord if the provided cord strain relief is used. It must also include a grounded (green) conductor connected to the internal ground lug.

Note: The strain relief may be removed and replaced with conduit. (The existing enclosure hole will accommodate a standard 1/2″ conduit hub).

Environmental - Temperature/Humidity

Operating Ambient: -10º C to +40º C (+14º F to + 104º F)

Storage Ambient: -40º C to +65º C (-40º F to + 150º F)

Temperature: Less than 20º C rise when operated within a mild steel painted enclosure with a volume of at least 138 cubic inches.

Humidity: 0% to 95% non-condensing

Weight: PCB only - 1/2 lb; Enclosure assembly - 5 lb

High Level Inputs

Voltage Source: Internal 120VAC ("W2" jumper in place) provides an input source voltage for dry contacts (pushbuttons) when either a 120 or 240 VAC line voltage is used. The input is rated to provide a valid input only for the following voltage range: 24VDC to 50VDC to 120VAC 50/60 Hz.

Input Current: 5 mA. maximum at 120 VAC line voltage.

Wiring: All wiring to the high level inputs to TB1. Use the #18 gauge wire provided in the pushbutton KOP if pushbutton(s) are used with the NEMA enclosure or #14 gauge wire in conduit per National and Local electrical codes if external wiring is needed to connect the remote inputs.

Minimum contact closure: 130 ms @ 120 VAC (See chart below)

External voltage input/contact closure ("W2" jumper out)					
Input Signal	Type Input Current	Typ. Input Delay	Process Delay	*Minimum Signal Time	**Repeat Cycle Time
24 VAC/DC	1 mA	300 ms	100 ms	400 ms	550 ms
50 VAC/DC	2 mA	75 ms	100 ms	175 ms	325 ms
75 VAC	3 mA	50 ms	100 ms	150 ms	300 ms
100 VAC	4 mA	40 ms	100 ms	140 ms	290 ms
120 VAC	5 mA	30 ms	100 ms	130 ms	280 ms

* The "minimum signal time" is the sum of the input delay and the 100 ms process delay. This represents the minimum time that the contact must remain closed (at the given input voltage) for guaranteed recognition by the microprocessor.

**The "repeat cycle time" represents the sum of the input delay, 100 ms process delay and the 150 ms post delay. This is the minimum time that must elapse before the microprocessor will accept another input signal. However, other factors, mainly the scale instrument, dictate longer times. For this reason, METTLER TOLEDO recommends a repeat cycle not more frequent than once per second.
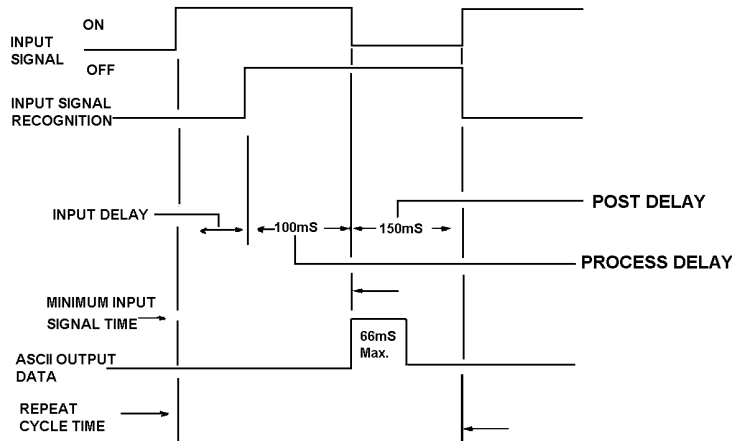

Figure 3.1 Event Timing

The Minimum Input Signal Time is the time that the input signal (contact or voltage) must be present for guaranteed microprocessor recognition.

The Input Delay is a variable hardware parameter determined by the R-C rise time constants of the opto coupler input circuitry.

The Process Delay is the fixed 100 ms microprocessor time required to recognize a valid input, process it and output ASCII data.

The Post Delay is the hardware parameter determined by the R-C fall time constants of the opto coupler input circuitry. It is the delay time between the actual loss of input signal and when the microprocessor recognizes it.

ASCII data output

The output signal is serial ASCII and may be configured as an active 20 mA current loop, EIA (RS232), RS422, OR fiber optic. These output signals are isolated from external grounding systems by floating the logic power source within the assembly. The fiber optic is additionally isolated by the nature of the light path.

The ASCII output is a 7 bit data byte + 1 even parity bit with 1 start and stop bit, selectable between the following parameters:

SWITCH S1				BAUD
1	2	3	4	RATE
OFF = CTPZ	ON=NO*CR	OFF	OFF	300
		ON	OFF	1200
ON = SPECIAL FUNCTION	OFF = *CR	OFF	ON	4800
		ON	ON	9600

(*CR = Carriage Return Character)

20 mA Loop - An active 20 ma source is provided which is current limited by a 392 ohm resistor connected to +11.5 VDC (TB-2 & 4). This is achieved only if the external load has an impedance of approximately 100 ohms.

Loop Impedance Range: 22 to 150 ohms

Communication Range: 2000 ft. maximum

Source voltage level: 11.5 VDC thru 392 ohms.

Wiring: 2 cond. 20 gauge (min) shielded cable.

RS232 - EIA voltage level; ±5 VDC (TB2-2 & 3).

Signal Polarity: -5 VDC = MARK, + 5 VDC = SPACE.

Communication Range: 50 ft. maximum.

Source Current: 10 mA maximum.

Load Resistance: 500 ohms minimum (3000 ohms typical).

Wiring: 2 cond. 20 gauge (min) shielded cable.

RS422 - Simulated RS422 differential data (TB2-2 & 3). Voltage levels are 5 VDC and may be connected to any single RS422 (RA & RB) input.

Signal Polarity: RA(R-) to TB2-2 & RB(R+) to TB2-3.

Communication Range: 2000 ft. maximum.

Wiring: 2 cond. 20 gauge (min) shielded cable.

Fiber Optic - A fiber optic output is provided where communication to an instrument located in a hazardous area is desired.

Signal Polarity: NO LIGHT = MARK; LIGHT = SPACE

Communication

Range Wiring: 250 ft. maximum. Use low loss plastic 1.0 mm core simplex cable. Hewlett Packard #HFBR-3582 or equal.

Special Function: When S1-1 is placed in the "ON" position, the ASCII output becomes continuous. The output rate is approximately 4 messages per second* with each message consisting of the status of all 4 inputs. Each message is composed of the following six characters:

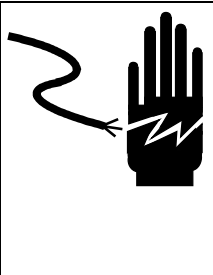|		
1ST - STX (hex 02)	fixed leading character	
2ND - TB2-5 status	ASCII 1 (hex31) for input = ON (voltage ON)	
3ND - TB2-4 status		
4TH - TB2-3 status	or	
5TH - TB2-2 status	ASCII 0 (hex30) for input = OFF (voltage OFF)	
6TH - CR (hex 0D)	fixed trailing character	

The continuous mode differs from the CTPZ mode in the following ways:

a. Data transmission is continuous.

b. Input status is only monitored - no software debounce.

c. "STX" leading character and the "CR" trailing character is not selectable - IN always.

*d. The continuous rate is dependent upon baud rate. Internally a 200mS delay is executed after each scan.

2 Installation

[hand and lightning symbol]	## ⚠ WARNING
	DO NOT INSTALL THIS PRODUCT IN A HAZARDOUS AREA. WHEN THE 9339 IS USED TO INTERFACE INTRINSICALLY SAFE OR EXPLOSION PROOF INDICATORS, BE CERTAIN THAT IT IS LOCATED IN THE SAFE AREA AND THE INTERFACE CONNECTIONS ARE MADE ACCORDING TO ACCEPTABLE NATIONAL AND LOCAL ELECTRICAL CODES. FAILURE TO OBSERVE THIS PRECAUTION MAY RESULT IN BODILY INJURY AND/OR PROPERTY DAMAGE.

Physical

PCB Only Version:

The PCB assembly is 2 1/2″ x 4 1/2″ with four mounting holes for #6 machine screws to be mounted on a panel or within an enclosure. METTLER TOLEDO provides mounting hardware as shown in the kit to be used by installer if desired. The bottom PCB surface must be at least 3/8″ above a conductive mounting surface or separate insulation between the PCB and mounting surface must be supplied by installer. If it is mounted within a sealed enclosure, at least 138 cubic inches of internal volume must be maintained for proper heat dissipation. Connectors lift off the PCB vertically. Route all wiring to these connectors with enough slack to allow servicing. Data output wiring must be #20 gauge (minimum) shielded cable.
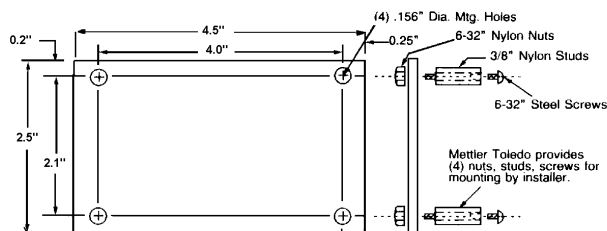

Figure 4.1 PCB Size and Mounting Hole Dimensioning

Mild Steel or Stainless Enclosure Versions:

This is a self-contained surface mount 11″ high x 4.15″ wide x 4.37″ deep box with provisions for up to 4 pushbuttons. Mount and wire according to applicable National and Local electrical codes. See the diagram on the following page for size and orientation of the enclosure. Follow these basic guidelines:

a. Mount to a grounded frame with at least #10 or #12 hardware.

b. All wiring must enter the enclosure inside rigid steel conduit if the provided cord strain reliefs are not used. If conduit is used, remove the cord strain reliefs and install proper conduit hubs for 1/2″ rigid conduit thru the existing enclosure holes.

c. The ASCII data output <u>must not</u> be in the same conduit as the power wiring.

d. The ASCII data output wiring must be #20 gauge (minimum) shielded cable. Observe the maximum lengths detailed in the specifications section of this manual.

e. The fiber optics cable if used must be installed within a protective shield (conduit or equal). Maintain a bend radius of at least 35mm (1.37″) and do not exceed 1/4 pound pull on the cable.
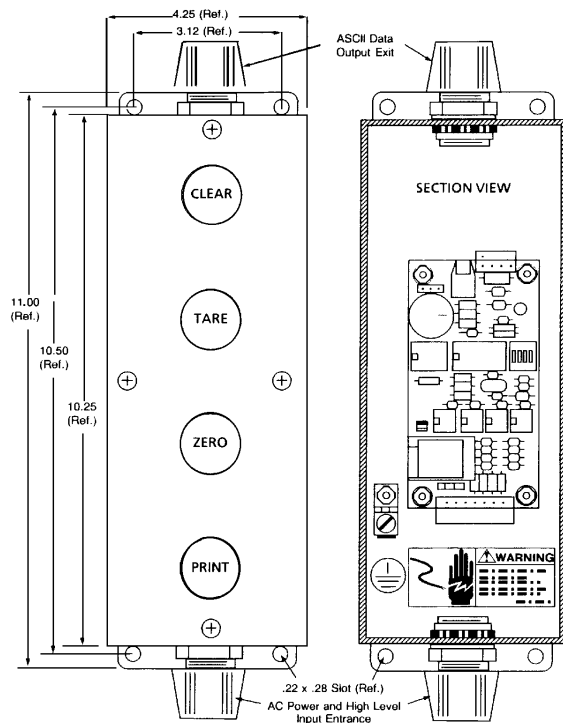

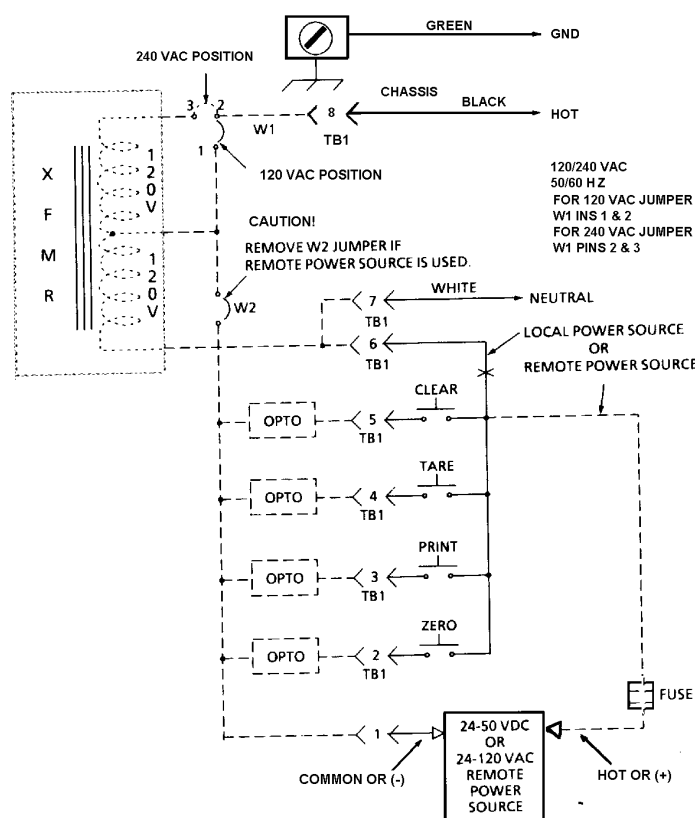**Figure 4.2 Mild Steel or Stainless Enclosure Versions**

Figure 4.3 Wiring Schematic

Pushbutton Kit of Parts: (MODEL 0964-0049)

This pushbutton kit of parts is intended to be put into the model 9330-0001 or 9330-0011 CTPZ module. Up to four of these kit of parts may be installed to give the user the maximum interface for the clear, tare, print, or zero functions. Each of the CTPZ modules are supplied with four plugged holes allowing remote input of these functions. The 0964-0049 kit of parts is added each time a single local function is added as a pushbutton on the enclosure.

NOTE: A four nameplate set is provided with the enclosure module assembly for use as required. Discard unused nameplates or save for future.

Installation:

1.   Remove AC power to the enclosure.

2.   Remove enclosure lid.

3.   Remove and discard desired hole plug(s).

4.   Install the pushbutton. To do this, move the white lock tab on the button body to the "unlock" position and remove the button from the body. Remove plastic nut from button. Install button and nameplate thru enclosure hole. Attach nut and tighten. Reassemble body to bottom and slide the lock to the "lock" position.

5.   Remove the plug from TB1 (on the PCB).

6.   Connect one wire from the contact block t pin 5 for CLEAR, 4 for TARE, 3 for PRINT or 2 for ZERO.

7.   If local power (pins 7 & 8) is used t power the inputs, connect the pushbutton common wire to pin 6 and install W2 Jumper across both pins. If a remote power source is used for the buttons, connect the pushbutton common wire to the <u>fused</u> remote power source, and make sure W2 Jumper is on Pin 2 ONLY.

8.   Replace lid.

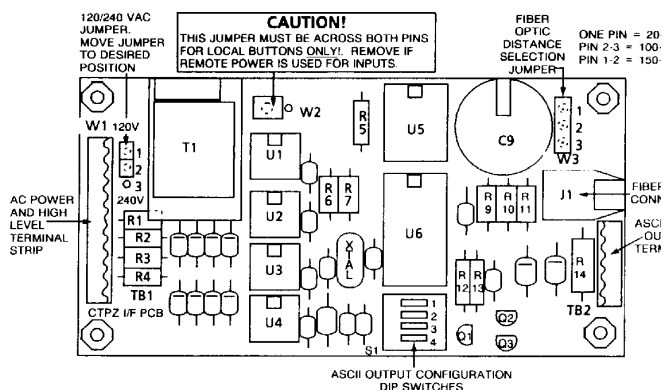9.   Reapply AC power and test. Installation is complete.

Figure 4.4 Circuit Board Identification

Electrical

AC Power Wiring
Use #14 gauge, 300 VAC Copper Wire per National and Local Codes.

Data Signal Wiring - General
The data wiring must be 2 conductor #20 gauge shielded cable for 20 mA, RS232 or RS422 operation. Fiber optic cable must be METTLER TOLEDO Material #256010 (Hewlett Packard #HFBR-3582) or equal. Observe maximum cable lengths in the specifications section. The table on the following page details the signal wiring to specific METTLER TOLEDO equipment.

Scale Instrument	Available Interface	Note 1 Baud Rate	Note 2 CR?	Signal Name	Conn Desk	& Pin# (Wall)	Notes
8140	20 mA _____ RS232 _____ RS422	300-9600	No	+ - _____ RXD COM _____ RA RB	J12-8 J12-10 _____ J12-3 J12-7 _____ J12-3 J12-12	(J7-H) (J7-K) _____ (J7-C) (J7-G) _____ (J7-L) (J7-M)	Printer Pod Required Indicator must be set for demand output. 8140's before software "E" rev. may not work
8142/8580	20 mA _____ RS2332 _____ RS422	300-9600	No	+ - _____ RXD COM _____ RA RB	JN-8 JN-10 _____ JN-3 JN-7 _____ JN-11 JN-12	(J7-H) (J7-K) _____ (J7-C) (J7-G) _____ (J7-L) (J7-M)	8142's before software "C" rev. may not work. See Section 5.0 8580 setup steps not same as 8142.
8141	Fiber	300-9600	No		Fiber Optic		Fiber Optic PCB Required
8510	RS232	300-9600	No	RXD COM	Printer-2 Printer-5		
8525	Fiber	300-9600	No		Fiber Optic		100' Max. Cable
8530	20 mA _____ RS232	300-9600	No	+ - _____ RXD COM	JN-8 Jn-10 _____ JN-3 JN-7	(JN-M) (JN-K) _____ (JN-C) (JN-G)	8530 Step 86=1 W6 = In
1938/2038/ 2138	RS2332	9600	No	RXD COM	Printer-2 Printer-5		XX38 Step 43 = 1
8571	RS232	9600	Yes	RXD COM	J10-3 J10-7		Requires 8571 Opt. Serial I/O KOP
8572	RS232	9600	Yes	RXD COM	J1-3 J1-7		8572 Step 94 = 1
8582	RS2332 _____ RS422	300-9600	Yes	RXD COM _____ RA RB	I/O 1-2 I/O 1-5 _____ I/O 1-6 I/O 1-9		I/O 1 must be configured as a host.
8581	RS232 _____ 20 mA		Yes	RXD COM _____ + -	J10-3 J10-7 _____ J10-8 J10-10		8581 Step 4.1 = 2 If RS232 is required optional RS232 KOP is required.
SS8510 Stainless	RS232		No	RXD COM	TB2-3 TB2-1		

NOTE 1:   Unless noted input baud rate must match output baud rate and have even parity.
NOTE 2:   CR = Carriage return character in ASCII data string (OD Hex)

Table 4-1 Data Connections to METTLER TOLEDO Indicators

Data Signal Wiring - Specific

Use the table in the preceding section to determine the <u>indicator</u> connection parameters. Use the following examples for connections to the CTPZ TB2 connector.
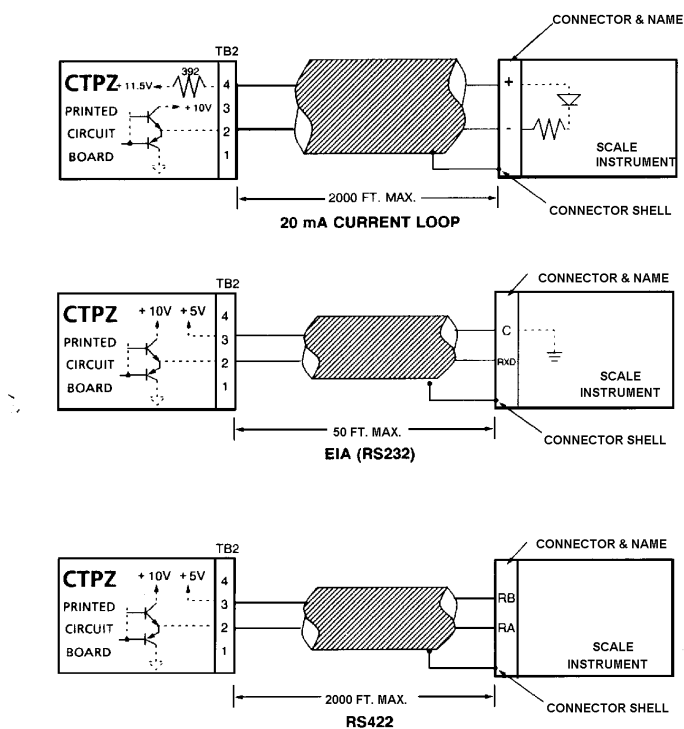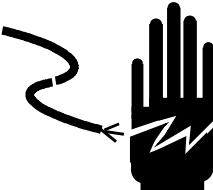

Figure 4.5 CTPZ TB2 Connections

3   Operation

This interface is intended to remotely activate the Clear, Tare, Zero or Print functions of a METTLER TOLEDO indicator. The operator simply presses the pushbutton on the enclosure or provides the required voltage pulse if the PCB version is integrated into other logic. The internal microprocessor converts this action into a serial ASCII signal that is sent to the indicator or instrument. The indicator or instrument then decodes and processes this signal as the equivalent keyboard command. The instruments known to work with this interface are tabulated in section 4.2.2.

Note: The 8142 indicators with earlier than "C" revision software will not accept CTPZ inputs if the indicator or instrument output is selected for continuous operation.

	⚠ **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.

Notes

4   Service and Maintenance

The PCB itself is not intended to be "Component Serviced." If it is defective, replace the entire PCB. However, the following list may be useful to determine if the PCB itself is at fault.

1. Check for proper AC line voltage across TB-7 & 8. Acceptable range is 102 - 132V (120V) or 204 - 264 (240V)

2. Make sure that W1 jumper is correct for the given line voltage. (Position 1-2 for 120 VAC or Position 2-3 for 240 VAC).

3. With AC power applied check for +5.1 VDC ± VDC ±.5V at TB2-3 with respect to TB2-1. (Data plug disconnected). Replace PCB if no voltage. If the voltage is okay, plug in the connector. If there is no voltage, check the external wiring.

4. Apply a momentary input command while looking at the fiber optic transmitter (W3 in any position). It will flash red while transmitting data. If so, the PCB is functioning. If not, recheck the input before replacing the PCB.

5. Make sure the W3 jumper is <u>not</u> across any two pins if the fiber optics communication is <u>not</u> used. (This unit will transmit 20 mA or RS232 or RS422 or fiber optics -- not simultaneously).

6. Apply an input signal. Measure voltage across input with respect to TB-1. Voltage must be 24-50 VDC (DC operation) or 24- 132 VAC (AC operation) for proper operation.

⚠ **CAUTION**

TB1-1 HAS HOT 120 VAC ON IT IF W2 IS INSTALLED FOR A LOCAL SOURCE OF POWER.

NOTES

5

Spare Parts

The following replacement parts are available from authorized METTLER TOLEDO representatives.

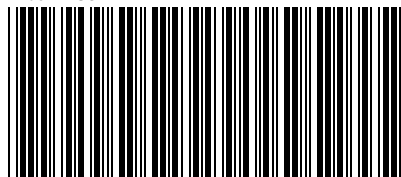| Part Number	Description
(*)90088100A	PCB assembly (programmed)
(*)13162400A	TB1 mating plug
(*)13457200A	TB2 mating plug
(*)90086400A	Pushbutton body
(*)90086100A	Pushbutton contact block

 (*) Indicates a possible alpha revision prefix.

NOTES

METTLER TOLEDO
Scales & Systems
1900 Polaris Parkway
Columbus, Ohio 43240
Phone: (US and Canada)   (800) 786-0038
                                                (614) 438-4511
(All Other Countries)   (614) 438-4888

P/N: **A90088200A**
(2/01).00

A90088200A