1992

Technical Manual

INTRODUCTION

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

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

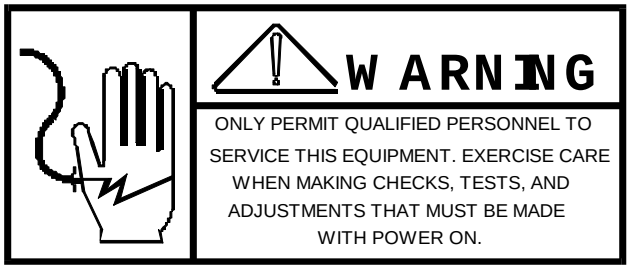
METTLER TOLEDO
Training Center
P.O. Box 1705
Columbus, Ohio 43216
(614) 438-4400

PRECAUTIONS

- **READ** this manual before operating or servicing this equipment.

- **ALWAYS REMOVE POWER** and wait at least 30 seconds **BEFORE** connecting or disconnecting any internal harnesses. Failure to observe these precautions may result in damage to, or destruction of the equipment.

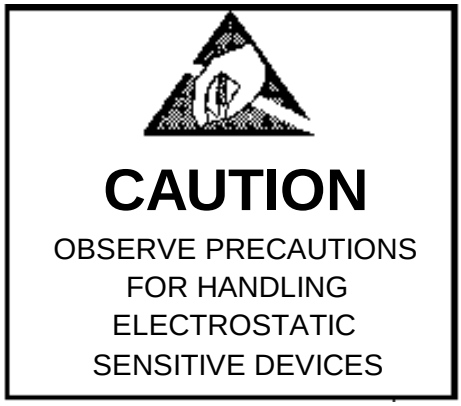
- **ALWAYS** take proper precautions when handling static sensitive devices.



- **DO NOT** connect or disconnect a load cell scale base to the equipment with power connected or damage will result.

- **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 servicing.

- **CALL** METTLER TOLEDO for parts, information, and service.

CONTENTS

1. GENERAL DESCRIPTION

The Model 1992 is a high resolution digital scale base for general purpose industrial applications ranging to 100 lb (50kg) capacity. The 1992 base is intended for use with the Models 8520 and 8530 digital indicators. The unit is also compatible with the Model 8582 parts counter as a high resolution remote scale for sampling or bulk counting.

The Model 1992 is available in a 50 lb (20kg) or 100 lb (50 kg) capacity. The scale provides internal weight resolution of 1 part in 500,000 over the full weighing range.

2. SPECIFICATIONS

2.1 PHYSICAL DESCRIPTION

The 1992 scale is comprised of the following major components:

1). Die Cast Base Assembly

The 12.1" (307 mm X 13.5" (345 mm) X 4" (102 mm) die cast aluminum base, is fog white in color. four, screw attached, top adjustable mounting feet are included.

2). Die Cast Platter Support (Spider)

The spider is provided with rubber tips (for friction platter mount) and rubber center support. It mounts directly to digital load cell with two socket head cap screws. The level bubble is located in the platter support casting.

3). Digital Load Cell

The weight sensor is a 30 kg or 60 kg digital load cell. The digital load cell module utilizes a moment insensitive counterforce combined with analog and digital electronics to provide weight information to the indicator.

4). Stainless Steel Platter

The 12.5" (317 mm) X 14" (356 mm) platter is removable for cleaning and for viewing the level bubble.

2.2 ELECTRICAL SPECIFICATIONS

The power to operate the digital load cell is provided by the indicator or scale connected to the Model 1992 base. The power requirement of the Model 1992 is:

18 - 24 volts DC at 100 milliamps maximum

2.3 ENVIRONMENTAL SPECIFICATIONS

2.3.1 TEMPERATURE AND HUMIDITY

1). Operating Range
The scale is designed to meet specifications over a temperature range 50 degrees F to 104 degrees F (+10 to 40 degrees C) with a humidity range from 5 to 90% non-condensing.

2). Shipping Range
The scale is designed to withstand without damage to temperature range of -4 degrees F to 140 degrees F (-20 to 60 degrees C) with a humidity range from 5 to 95% non-condensing.

2.3.2 APPLICATION

1). The Model 1992 is intended for use in a general purpose atmosphere. It is intended for indoor applications where dirt, oil or water is not present.

2). The Model 1992 is not designed for hose-down applications. Typical examples of mis-application of the scale include, but are not limited to:
a. Immersions
b. Hosedown *
c. Splashing liquids
d. Corrosive chemical environments
* Toledo Scale manufactures other scales that are suitable for “hosedown” applications.

3). The maximum allowable cable length between the Model 1992 base and the scale or indicator is 50 feet (16 mm). The cable specified for use is the Toledo Scale 20 gauge load cell cable.

2.3.3 HAZARDOUS AREAS

WARNING
In locations classified as hazardous by the National Electrical Code (NEC) because of combustible or explosive atmospheres, special precautions are required. DO NOT USE THE MODEL 1992 IN THESE LOCATIONS.

2.4 FACTORY NUMBER GUIDE

Factory Number	Load Cell Capacity	Suggested Scale Indication
1992-0002	30 kg	50 X 0.005 lb (20 X 0.0002 kg)
1992-0003	60 kg	100 X 0.01 lb (50 X 0.005 kg)

3. INSTALLATION PROCEDURE

3.2 UNPACKING INSTRUCTIONS

1). Examine the shipping box for any signs of damage. IF SHIPPING DAMAGE IS FOUND, MAKE A CLAIM WITH THE CARRIER IMMEDIATELY.

2). Open the shipping carton and remove the platter from the top of the packing shell.

3). Remove the top packing shell and ift the Model 1992 from the box.

CAUTION: GRASP THE MODEL 1992 BY THE BASE NOT THE SUB-PLATTER FOR LIFTING OR DAMAGE TO THE LOAD CELL MAY RESULT.

4). Remove and retain the ten foot interconnecting cable (#130115 00A) packed with the unit.

5). Place the Model 1992 on a level, stable surface. Retain the packing material for future transport of the scale.

3.2 INPUT AND OUTPUT CONNECTIONS

The only external connection required to the Model 1992 Base is the interconnecting cable to the indicator or scale. This cable is used to provide power to the digital load cell and also to transmit the wieght information from the digital load cell. The Model 1992 utilizes a 9 pin plug on the bottom of the base for this connection. A ten foot cable (#130115 00a) is packed with the digital base for this purpose. Attach the cable using the following instructions.

1). Turn the Model 1992 upside down on a flat surface.

2). Remove the metal cover plate (item A) shown in Figure 1 by twisting the two plastic locks (item B) 1/4 turn counterclockwise then lifting the plate.

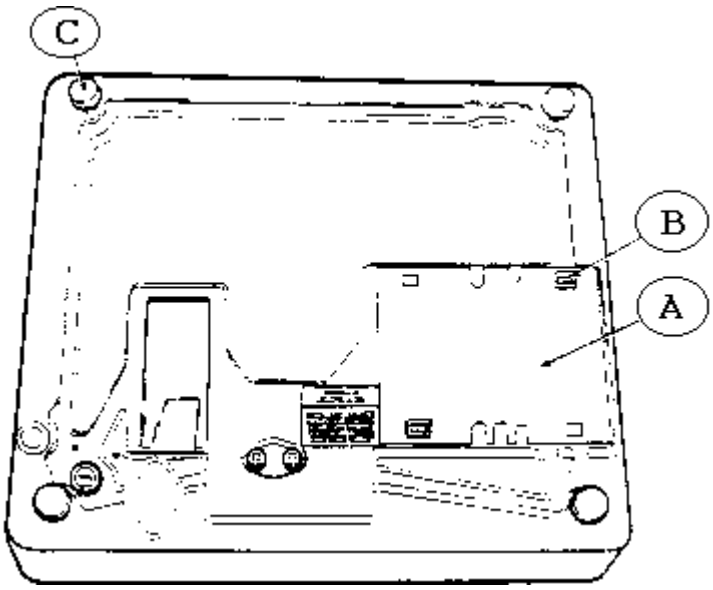


Figure 1

3). Loosen the two knurled-head screws (item D) holding the cable clamp bar (item E). Remove one screw completely. See Figure 2.

4). Attach the 9 pin connector end of the enclosed cable (#130115 00A) to the 9-pin plug (item F) shown in Figure 2. Secure with the two screws included with the connector. Section 5 of this manual shows the pin configuration of the 9 pin connector J2 if a cable longer than 10 feet (3 m) must be made.

Note: The maximum allowable cable length between the Model 1992 base and the scale or indicator is 50 feet (16 m). The cable specified for use is the Toledo Scale 20 gauge load cell cable.

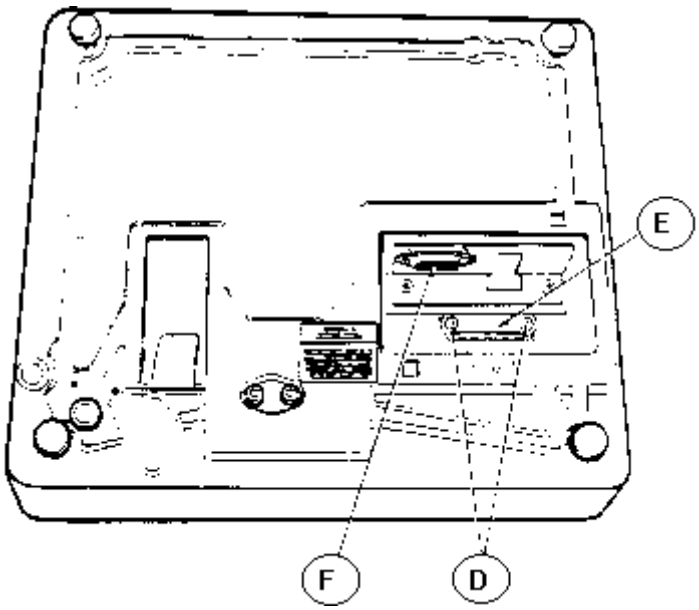


Figure 2

5). Run the cable through the center groove of the cable strain relief and reattach the clamp bar (E) and knurled screws (D) that were removed in step 3 previously. Tighten securely.

6). Reinstall the metal cover plate (A) that was removed in step 2. Secure the plate by twisting the two plastic locks (B) 1/4 turn clockwise. Refer toFigure 1.

7). Invert the Model 1992 to its normal operating position.

8). Attach the remaining end of the interonnecting cable to the indicator to scale with which the Model 1992 base will be used. Refer to the interconnecting information in the technical manual of the indicator or scale used for termination instructions.

3.3 SET-UP

1). Place the Model 1992 Base in the location where it will be used.

2). Refer to Figure 1. Level the scale by turning the adjustable feet (item C) on the bottom of the base in or out. The feet should be adjusted so the scale does not rock. The correct position of the level bubble (located on the sub-platter) when the Model 1992 is level as shown in Figure 3.

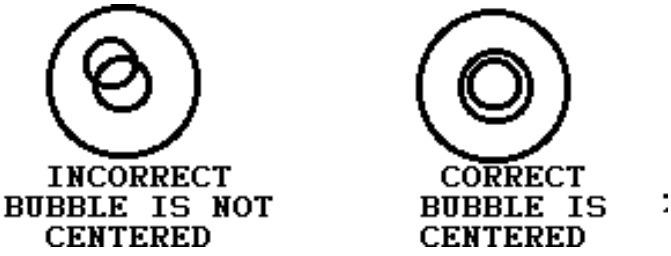


Figure 3

3). Place the platter on top of the sub-platter. The base is now ready to use.

4. MECHANICAL ADJUSTMENTS

Before making any adjustments to the Model 1992, the base must be exercised two times by placing a full capacity test weight load on the platform.

4.1 OVERLOAD STOP ADJUSTMENT

There are a total of six overload stops to protect the load cell. These overload stops are factory adjusted and do not require readjustment unless the load cell or sub-platter had been replaced. If an adjustment is necessary, follow these steps. Remove the platter to access the overload stops.

1). Use round wire gauges. DO NOT USE FLAT GAUGES.

2). Adjust the overload screws to the correct gap setting shown in Chart 1 (following) referencing the positions shown in Figure 4. Follow these steps:

1. Tighten the screw (by turning clockwise) until the gap is smaller than the wire gauge
2. Hold the wire gauge against the gap with a slight pressure.
3. Slowly loosen the screw (by turning counter/clockwire) until the wire gauge fits through the gap.

(*) - Indicates overload stop position.

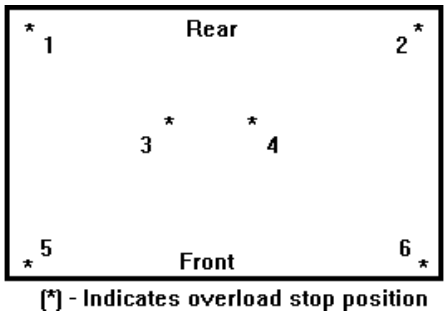


Figure 4

CHART 1

Overload Stop Position	1992-0002 Gap		1992-0003 Gap	
	inches	mm	inches	mm
1	0.056	1.42	0.088	2.24
2	0.077	1.96	0.111	2.82
3	0.019	0.48	0.018	0.46
4	0.028	0.71	0.027	0.69
5	0.065	1.65	0.116	2.95
6	0.093	2.36	0.156	3.96

4.2. SHIFT TEST

A shift test is required to verify that all sections of the scale platform weight within tolerance. If the Model 1992 does not pass the shift test, verify overload stop settings before replacing the load cell. No shift adjustment is possible.

1). Bench or Counter Scale

Place test weights equal to one-half scale capacity sequentially at positions A, B, C and D as shown in Figure 5.

Positions A, B, C and D are centered halfway between the center and the edges of the platform.

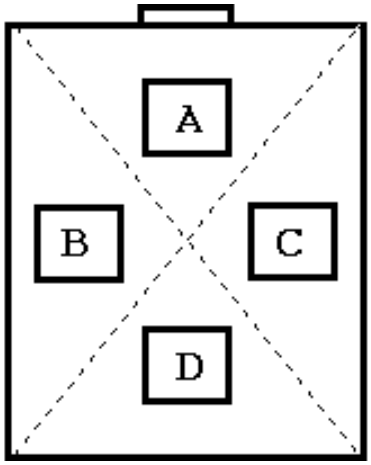


Figure 5

2). Tolerance Table

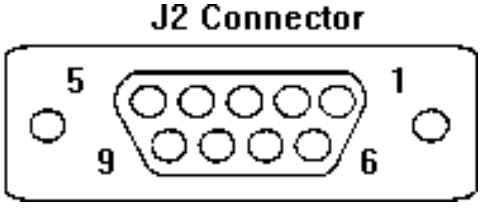
The following table shows the tolerances in d (divisions) for the shift test.

TOLERANCE TABLE

Scale Capabity	Shift Test Weight	New Scale Tolerance	In Service Tolerance
10,000d	5000d	+/- 2.5d	+/- 5d

5. INPUT/OUTPUT CONNECTIONS

The 9 pin connector (J2) on the bottom of the Model 1992 base is used as the input and output connector. Communications to and from the Model 1992 are via RS-422. This 9-pin connector has the following pin assignments:



J2 Pin	Signal Description
1	RxD A
4	RxD B
5	+ 20 V
6	TxD B
7	GND
8	TxD A

Note: When connecting the Model 1992 Base to the Model 8582 Counting Scale or the Model 8530 Digital Scale Indicator, the cable between the base and scale should be wired pin to pin for the pin numbers listed above.

Note: The maximum allowable cable length between the Model 1992 base and the scale or indicator is 50 feet (16 m). The cable specified for use is the Toledo Scale 20 gauge load cell cable, part number 510620 370.

6. MAINTENANCE AND TROUBLESHOOTING

6.1 CLEANING

WARNING
DO NOT SPRAY LIQUIDS OR FLUIDS DIRECTLY ONTO THE UNIT.
HAZARD OF ELECTRICAL SHOCK OR BURN.

1). Unplug power cord fromthe indicator or scale to which teh odel 1992 is connected to remove power to the scale base.

2). Spray a mild cleaner onto a cloth and wipe all exterior surfaces.

CAUTION:
DO NOT USE INDUSTRIAL STRENGTH SOLVENTS OR CORROSIVE CHEMICALS ON THE PAINTED SURFACES. THESE MAY HARM THE SURFACES.

3). Reapply AC power to the scale or indicator.

6.2 TROUBLESHOOTING

6.2.1 GENERAL

1). If operational difficulties are encountered, obtain as much information as possible regarding the particular trouble, as this may eliminate a lengthy, detailed checkout procedure.

2). Check external circuit elements and related wiring for possible defects. Failures and malfunctions often may be traces to simple causes such as loose or improper power supply connections.

6.2.2 SEQUENCE OF COMMUNICATION

The following short summary of the sequence of communication for the Model 1992 base may help in diagnosing a problem. Refer to Figure 6 for interconnecting details.

Step1: The indicator or scale provides a 20VDC supply to the Model 1992 Interface PCB.

Step 2: the Interface PCB regulates a 5VDC supply from this 20VDC voltage for its own use and also sends the same 20VDC to the digital load cell.

Step 3: After the digital load cell receives its power, it initiates an analog cycle.

Step 4: Next, the digital load cell performs an analog to digital conversion of the weight information.

Step 5: The digital load cell then sets the RTS line to indicate it has data to send.
Note: This RTS line is not monitored in the communication sequence of the Model 1992.

Step 6: The digital load cell checks for OVDC on the CTS line before sending the data.
Note: The CTS line is jumpered to logic ground (OVDC) on the Interface PCB.

Step 7: When the digital load cell sees the proper CTS signal, it will transmit the digital weight data at 9600 baud to the Interface PCB.

Step 8: The Interface PCB converts this TTL level signal to RS-422 communications and transmits it to the scale or indicator to which it is connected.

Step 9: After sending the data, the digital load cell waits approximately 2 ms for a response from the scale or indicator then initiates the complete cycle again.
Note: Any response to the Model 1992 will be via RS-422 which will be converted to TTL on the Interface PCB and sent to the digital load cell.

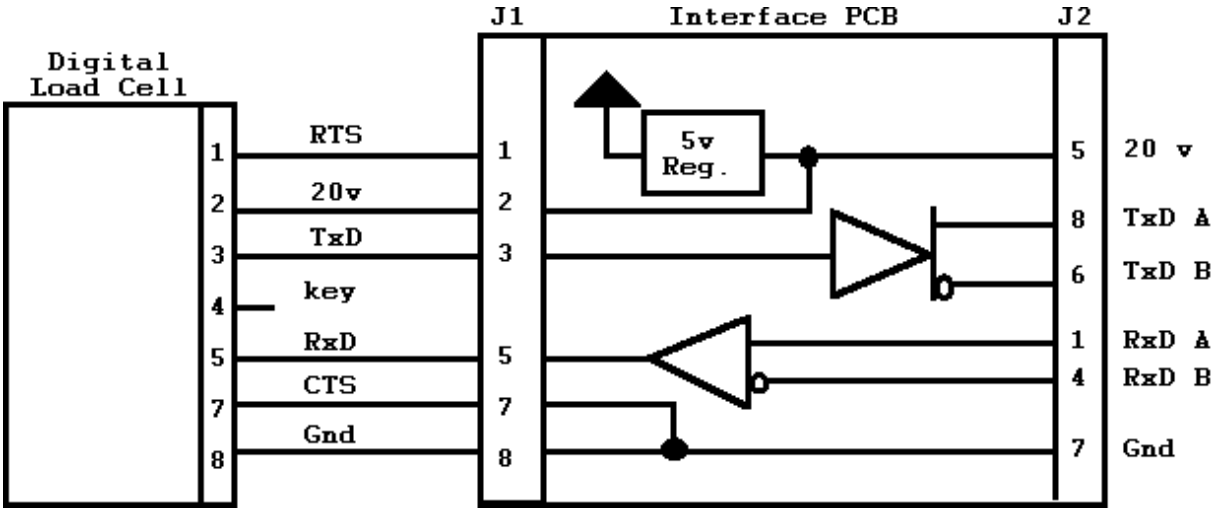


Figure 6

6.3 LOAD CELL REPLACEMENT

The digital load cell is secured to the base by two allen-head screws. To remove the cell, follow these steps:

1). Remove AC power from the base by unplugging the line cord from the scale or indicator to which the Model 1992 is connected.

CAUTION: Before connecting or disconnecting the load cell harness in the Model 1992, you MUST wait at least 30 seconds after removing AC power from the unit.

2). Remove the platter by lifting up gently at opposite ends.

3). Loosen and remove the two allen head bolts that secure the platter support (spider) to the top of the load cell.

4). Turn the scale on its side to access the load cell bolts on the bottom of the base.

5). Remove the two allen head bolts that secure the load cell to the base while holding the load cell in place with one hand.

6). Disconnect the load cell harness and remove the load cell. Refer to the CAUTION note after step 1.

To reinstall a digital load cell, follow these same six steps in reverse order. When tightening the allen head bolts, refer to the tightness specificaion label on the Model 1992.

7.GENERAL INFORMATION

7.1 SPARE PARTS LISTING

It is recommended that these spare parts be kept in stock to keep down time to a minimum. The items are available through your local Authorized Toledo Scale Service representative.

Part Number	Description	Qty.
(*) 130090 00A	Interface PCB	1
(*) 129838 00A	30 kg Digital Load Cell	AR
(*) 134793 00A	60 kg Digital Load Cell	AR
(*) - May have letter prefix AR - As required depending upon factory number		

7.2 ACCESSORIES

1). Interconnecting Cable - 10 feet (3 m) open ended one end

Part Number - 130115 00A
Factory Number- 0900-0245

2). 9-Pin Mating Connector
Part Number - 125819 00A
Factory Number- 0917-0117