MS

Scale Base Technical Manual and User's Guide

A15713300A
3/00

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 U.S. please mail this form to the address on the reverse, or fax to (614) 438-4355. For customers outside the U.S., please affix proper postage if mailing this form. Or, you may fax it to 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:

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☐ Retail ☐ Light Industrial ☐ Heavy Industrial ☐ Systems

RESPONSE: Include Root Cause Analysis and Corrective Action Taken.

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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
1900 Polaris Parkway
Columbus, Ohio 43240
(US and Canada) 614- 438-4511
(All Others) 614-438-4888

FCC Notice

This device complies with Part 15 of the FCC Rules and the Radio Interference Requirements of the Canadian Department of Communications. Operation is subject to the following conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

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

PRECAUTIONS

READ this manual BEFORE operating or servicing this equipment.

FOLLOW these instructions carefully.

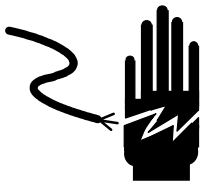
SAVE this manual for future reference.

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.

Note: If the unit has been stored or transported in below freezing temperatures, allow the unit to warm up to room temperature before turning on AC power.

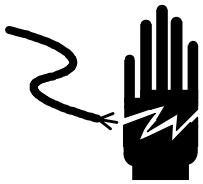


⚠ WARNING

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.

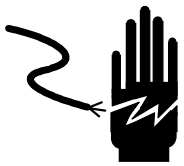
⚠ CAUTION

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.

⚠ CAUTION

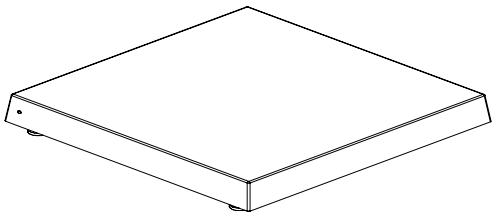
BEFORE CONNECTING OR DISCONNECTING ANY INTERNAL ELECTRONIC COMPONENTS OR INTERCONNECTING WIRING BETWEEN ELECTRONIC EQUIPMENT, ALWAYS REMOVE POWER AND WAIT AT LEAST THIRTY (30) SECONDS BEFORE ANY CONNECTIONS OR DISCONNECTION'S ARE MADE. FAILURE TO OBSERVE THESE PRECAUTIONS COULD RESULT IN DAMAGE TO OR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

CONTENTS

1

Introduction

The MS scale base is a rugged, reliable scale base designed for industrial and commercial applications in a variety of environments. It can be connected with a variety of METTLER TOLEDO terminals, providing maximum flexibility for customizing a system.



Please review the material contained in this manual carefully. It provides information for installing, adjusting, and trouble-shooting the MS scale base. Additional information may be found in the manual(s) for the terminal which you are connecting to the MS scale base.

If you encounter problems not covered in the manual, please return the **Publication Evaluation Form** found in the back of this manual. Should you need further assistance, please contact your authorized METTLER TOLEDO representative.

Model Specifications

The MS scale base has the following specifications:

MODEL	MS010P	MS025P	MS050P	MS075P	MS150P	MS250P
Maximum Capacity	20 lb (10 kg)	50 lb (25 kg)	100 lb (50 kg)	150 lb (75 kg)	300 lb (150 kg)	500 lb (250 kg)
Minimum Approved Divisions (eMin)	0.01 lb (0.005 kg)	0.02 lb (0.01 kg)	0.05 lb (0.02 kg)	0.05 lb (0.02 kg)	0.1 lb (0.05 kg)	0.2 lb (0.1 kg)
Maximum Number of Divisions (nMAX)	2000	2500	2500	3000	2500	2500
Recommended Build	20 x 0.01 lb 10 x 0.005 kg	50 x 0.02 lb 25 x 0.01 kg	100 x 0.05 lb 50 x 0.02 kg	150 x 0.1 lb 75 x 0.05 kg	250 x 0.1 lb 125 x 0.05 kg	500 x 0.2 lb 250 x 0.1 kg
Dimensions Top of Platter	12.2 x 12.3 x (3.4 – 3.9*) in 310 x 315 x (85 – 100*) mm		18.1 x 18.3 x (3.6 – 4.3*) in 460 x 465 x (90 – 110*) mm		24.2 x 24.3 x (6.0 – 6.6*) in 615 x 615 x (150 – 170*) mm	
Dimensions Bottom of Platter	The bottom of the platter slopes out from the top dimensions. Add approximately 0.4 in (10 mm) to the width and length for the bottom of platter dimensions.				The bottom of the platter slopes out from the top dimensions. Add approximately 0.7 in (15 mm) to the width and length for the bottom of platter dimensions.	
Construction	Mild steel painted base; Stainless steel platter					
Operating Temperature	14°F to 113°F (-10°C to 40°C) with 10 to 95% relative humidity, non-condensing					
Storage Temperature	-4°F to 140°F (-20°C to 60°C) with 10 to 95% relative humidity, non-condensing					
Shipping Weight	13 lb (6 kg)		42 lb (19 kg)		82 lb (37 kg)	
Weights and Measures Approvals	NTEP COC 99-044 Canadian Approval #AM-5338					

NOTE: The load cell cables for all models are approximately 80 inches (two meters).

*Height varies depending on height of leveling feet.

Table 1-1

2 Installation Procedures

Preparation

The MS base is a scale base only and does not include a terminal or accessories. The MS scale base should remain in its shipping carton until it reaches the location where it is to be installed for maximum protection during transit.

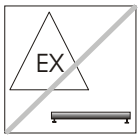
Inspection and Setup

The following general instructions apply in terms of unpacking and assembling any of the MS scale bases:

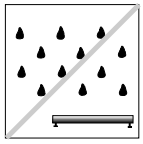
1. If the shipping container showed signs of damage at delivery, file a freight claim with the carrier if necessary.
2. If you have not already done so, remove the scale base from the packing material. Use care not to drop the MS base. Store the packaging and carton for future use should you need to transport or ship the MS base.
3. Inspect the base for damage. Never install an MS base if damage is apparent.
4. Make sure all components are included. The MS scale base should contain:
   - The weighing platform and platter.
   - MS Scale Base Technical Manual and User's Guide
5. Contact your authorized METTLER TOLEDO representative if the MS base is damaged or missing parts.
6. Remove the Phillips pan head shipping screws located on the top and bottom of the scale base.

Selecting the Location

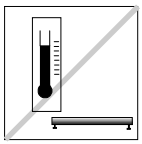
For optimum weighing performance and safety, please keep the following in mind when selecting a location for the MS scale base:



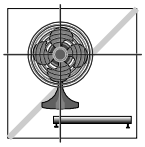
Never operate the MS base in a hazardous environment.



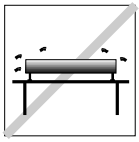
Never use the MS base in wet areas or in environments subjected to washdown with high pressure water.



Maintain a temperature range of -10° C to 40° C (-18° F to 104° F). Avoid areas where the temperature is rapidly changing.



Avoid excessive drafts, such as from fans and open windows.

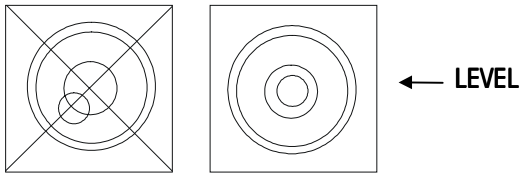


Select a firm, level, and vibration-free surface on which to place the MS scale base.

Level the Base

Once the MS scale base is in place, level it by performing these steps:

- Turn the leveling feet of the weighing platform until the scale is horizontal. The leveling feet should each touch the surface on which the MS scale base is placed, and the MS scale base should not rock or teeter.
- Remove the platform from the top of the scale base to expose the circular spirit level mounted in the top of the frame.
- If the bubble is not centered in the scribed circle of the spirit level (see below), loosen the locking nuts and adjust the leveling feet, either by hand or using an open-ended wrench, until the bubble is centered.



Note: The MS base is equipped with leveling feet which have provisions for using a wrench. This allows the scale base to be leveled without raising it to gain access to the leveling feet.

- Tighten the locking nuts and replace the platform.
- You must re-level the MS base after every location change.

Wiring Connections

To connect the MS base to a terminal, please refer to the technical manual provided with the specific terminal with which you are working. If the terminal does not have sense capability, connect the +sense to +excitation and the –sense to –excitation.

The wiring color code for the base may vary, depending on which load cell is used. Refer to the label on the load cell or the cable for signal description and wire colors. A reference is shown below.

	Tedea L/C	HBM L/C
+Sig	Red	White
-Sig	White	Red
+Excit	Green	Green
-Excit	Black	Black
+Sense	Blue	Orange
-Sense	Brown	Blue
Shield	Clear or Yellow	Yellow

Calibration

Refer to the calibration procedure outlined in the technical manual for the terminal you are using.

To guarantee reliable service from the MS base, a regular calibration schedule should be implemented. In addition, the base should always be calibrated after repairs of any type are performed. Contact your authorized METTLER TOLEDO representative for more information.

3 Operating Instructions

The operating instructions for the MS base depend on the terminal with which it is used, as well as on the specific application for which it is being used. Refer to the operating instructions or technical manual for the terminal being used with the MS base.

However, the following general instructions should be followed for all applications and terminals to ensure the best weighing performance for the scale.

Location.

- The MS base should be placed on a solid surface that is free of excessive vibration and in an area free of drafts and sudden temperature changes.
- The area should be clear of cables, boxes, or anything else that could come in contact with the scale platter.
- Never use the MS base in wet areas or in environments that are subjected to washdown with water.

Accuracy.

For optimum weighing performance, place objects to be weighed towards the center of the platform.

Calibration.

Contact your authorized METTLER TOLEDO representative to arrange scheduled calibration visits by factory-trained service technicians. You may also purchase certified weights from METTLER TOLEDO to perform your own calibration checks.

Large Temperature Fluctuations.

When connected to a METTLER TOLEDO terminal, the MS base automatically compensates for normal changes in ambient temperature. If the scale base is used in areas where large or fast temperature changes occur, weighing accuracy may be affected. In these situations, wait approximately 30 minutes to allow the MS base to adjust to temperature changes before weighing anything.

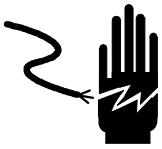
Weighing Practices.

- Avoid sliding heavy items across the platter to help prevent scuffing.
- Always use proper lifting devices and practices for loading and unloading the scale. Avoid moving heavy items to the edge of the platter to get a better grip for lifting. Edge loading can tip the platter and lead to personal injury.
- When using the Tare function to remove a container's weight from the total weight on the scale, tare each container separately. Variations in materials thickness and other factors can affect the containers' weight.

NOTES

4 Service and Maintenance

Cleaning and Maintenance



⚠ WARNING

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Cleaning Instructions

Wipe the MS base with a clean, soft cloth that has been dampened with a mild glass cleaner. Do not use any type of industrial solvent such as toluene or isopropanol (IPA) on the frame. Do not use high pressure water.

To clean the terminal or counting scale used with the MS base, refer to the service manual for that specific product.

Maintenance Reminders

Calibration tests should be performed any time major mechanical components are replaced or adjusted. The MS base must be re-leveled after any move.

Load Cell Replacement

1. Remove power from the terminal or scale connected to the MS base.

⚠WARNING

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

⚠CAUTION

BEFORE CONNECTING OR 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.

2. Refer to the technical manual of the terminal or scale connected to the MS base and follow the procedure to disconnect the load cell cable.
3. Remove the stainless steel platform from the base.
4. Loosen and remove the top load cell mounting bolts and washers that secure the top frame to the load cell.
5. Set the top frame and the load cell spacer aside.
6. Turn the MS base on its side to access the bottom load cell bolts.
7. Loosen and remove the bottom load cell mounting bolts and washers.
8. Remove the load cell from the base and pull the excess cable out through the base.
9. Reinstall a new load cell by following the steps above in reverse order.

NOTE: Lubricate the threads and under the head of the load cell mounting bolts before reinstalling.

10. Using a torque wrench, tighten the load cell mounting bolts to the specifications shown in Table 4-1.

MODEL	ENGLISH	METRIC
MS010P, MS025P, MS050P, MS075P	100 in•lbs	11.3 N•m
MS150P, MS250P	125•in lbs	14.1 N•m

Table 4-1

11. After replacing a load cell, the overload stops must be checked and adjusted (if needed). Refer to the next section for the overload stop adjustment procedure.
12. Thread the load cell cable through the base like it was originally.
13. Connect the load cell cable to the terminal or scale used per the technical manual for that product. Refer to the color code on the load cell or the cable. Or, refer to Chapter 2 of this manual.
14. Apply power to the terminal or scale.
15. Recalibrate and test the operation of the new load cell.

Overload Stop Adjustment

1. The overload stops must be checked and reset if the top or bottom frame or the load cell has been replaced.
2. Remove the stainless steel platform from the base.
3. Using the proper size feeler gauge, check all five overload stops as shown in Figures 4-1 and 4-2 on the next page. The correct gap measurements can be in Table 4-2.
4. If the gaps are not set properly, proceed to the following steps.

5. If the center overload step is out of adjustment, simply adjust the set screw under the load cell until you feel a slight drag on the feeler gauge. Refer to Figure 4-1.

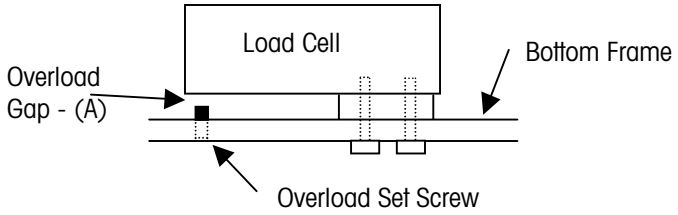


Figure 4-1: Center Overload Stop Position (1 Only)

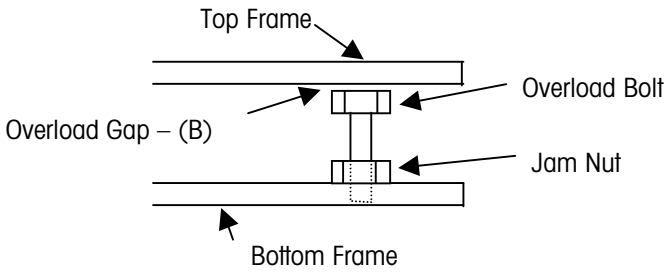


Figure 4-2: Corner Overload Stop Positions (1 Each Corner)

6. If the corner overload stops are out of adjustment, loosen the overload bolt jam nuts. Refer to Figure 4-2.
7. Using the proper size feeler gauge, turn the bolt until you feel a slight drag on the feeler gauge.
8. Tighten the jam nut and recheck the gap. Readjust as necessary.
9. Adjust all four corner overload stops using this procedure.
10. After adjustment, reinstall the platform and make sure the scale weighs to full capacity.

Model	Center Overload Stop Setting	Corner Overload Stop Setting
MS010P	0.026″	0.080″
MS025P	0.030″	0.160″
MS050P	0.030″	0.413″
MS075P	0.040″	0.500″
MS150P	0.015″	0.250″
MS250P	0.015″	0.250″

Table 4-2

Shift Test

A shift test verifies that all sections of the scale platter weigh within tolerance. If the scale does not pass the shift test, verify the overload stop gaps before replacing the load cell. No adjustment for the shift is possible. If the MS scale base does not pass the shift test, the load cell must be replaced.

For NTEP and Canadian Weights and Measures tests, use weights equal to one half the scale's capacity. Place the test weight sequentially at each of the positions A, B, C, D, and E as shown in Figure 4-3. Positions A, B, C, and D are centered halfway between the edges of the platform and the center of the platform. Note the terminal's reading of the weight at each position. The difference between any two positions in the shift test cannot exceed the tolerance shown in Table 4-3.

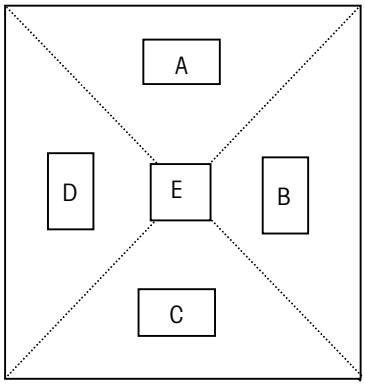


Figure 4-3

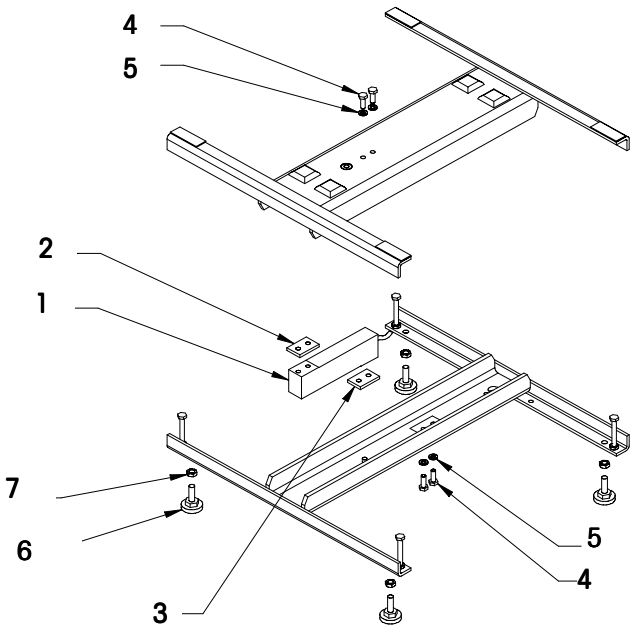
Shift Tolerance Table*					
Model	**Capacity**	**Division**	**Test Weight**	**Tolerance (New)**	**Tolerance (In Service)**
MS010P	20 lb/10 kg	0.01 lb/0.005 kg	10 lb/5 kg	+/-0.01 lb/ +/-0.005 kg	+/-0.02 lb / +/-0.01 kg
MS025P	50 lb/25 kg	0.02 lb/0.01 kg	25 lb/12.5 kg	+/-0.02 lb / +/-0.01 kg	+/-0.04 lb / +/-0.02 kg
MS050P	100 lb/50 kg	0.05 lb/0.02 kg	50 lb/25 kg	+/-0.05 lb / +/-0.02 kg	+/-0.1 lb / +/-0.04 kg
MS075P	150 lb/75 kg	0.1 lb/0.05 kg	75 lb/37.5 kg	+/-0.1 lb / +/-0.05 kg	+/-0.2 lb / +/-0.1 kg
MS150P	300 lb/150 kg	0.1 lb/0.05 kg	150 lb/75 kg	+/-0.1 lb / +/-0.05 kg	+/-0.2 lb / +/-0.1 kg
MS250P	500 lb/250 kg	0.2 lb/0.1 kg	250 lb/125 kg	+/-0.02 lb / +/-0.1 kg	+/-0.4 lb / +/-0.2 kg

*These values and tolerances were derived using the "Recommended Build" values from Table 1-1. If different values for capacity and division are used, these weight values will also change.

Table 4-3

5 Parts List

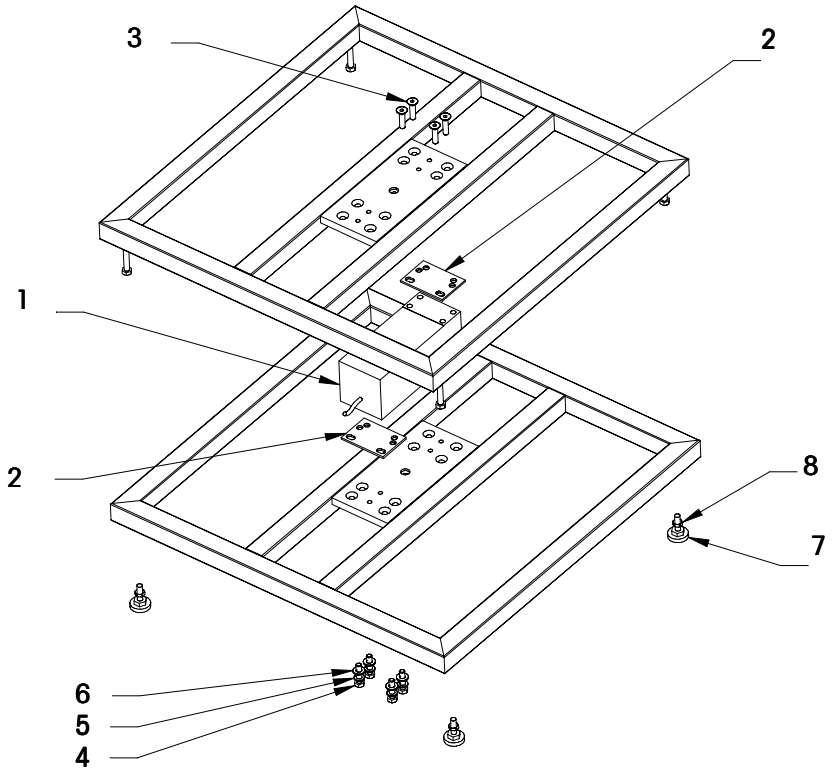
MS Scale Base (MS010P, MS025P, MS050P, MS075P)



MS010P and MS025P			
Item	Part Number	Description	Quantity
1	15253000A	Load Cell, 15 kg (MS010P)	1
1	15253100A	Load Cell, 30 kg (MS025P)	1
2	15252400A	Spacer, Load Cell	1
3	15252400A	Spacer, Load Cell	1
4	R0364900A	Screw, 1/4-20 x 3/4 Hex HD	4
5	R0233400A	Washer, Lock	4
6	15253700A	Foot, Adjusting, 5/16-18	4
7	R0365600A	Nut, Hex 5/16-18	4

MS050P and MS075P			
Item	Part Number	Description	Quantity
1	15253200A	Load Cell, 75 kg (MS050P)	1
1	15253100A	Load Cell, 100 kg (MS075P)	1
2	13510500A	Spacer, Load Cell	1
3	12259100A	Spacer, Load Cell	1
4	R0364900A	Screw, 1/4-2 x 3/4 Hex HD	4
5	R0233400A	Washer, Lock	4
6	15253700A	Foot, Adjusting, 5/16-18	4
7	R0365600A	Nut, Hex 5/16-18	4

MS Scale Base (MS150P, MS250P)



MS150P and MS250P			
Item	Part Number	Description	Quantity
1	15253400A	Load Cell, 200 kg (MS150P)	1
1	15253500A	Load Cell, 300 kg (MS250P)	1
2	15252500A	Spacer, Load Cell	2
3	R0537100A	Screw, FL HD, HS, 5/16-18 x 1.25	4
4	R0221500A	Screw, Hex Head, 5/16 – 18 x 1 1/4	4
5	R0233500A	Washer, Lock	4
6	R0537200A	Washer, Plain, 5/16	4
7	15253700A	Foot, Adjusting, 5/16-18	4
8	R0365600A	Nut, Hex 5/16-18	4

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: METTLER TOLEDO MS Scale Base Technical Manual and User's Guide

Publication Part Number: A15713300A Publication Date: 3/00

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.		

Your Name: _____ Location: _____

Phone Number: ( ) _____

Fax this completed form to Light Capacity Industrial Marketing at (614) 438-4355

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

P/N: A15713300A

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