SIEMENS

Milltronics

Belt Weighing Accessories
Milltronics MWL Weight Lifter

Operating Instructions

11/2011

7ML19985CR03-03

Legal information

Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

⚠ DANGER

indicates that death or severe personal injury **will** result if proper precautions are not taken.

⚠ WARNING

indicates that death or severe personal injury **may** result if proper precautions are not taken.

⚠ CAUTION

indicates that minor personal injury can result if proper precautions are not taken.

NOTICE

indicates that property damage can result if proper precautions are not taken.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

Proper use of Siemens products

Note the following:

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Siemens products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.

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Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

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Note

Safety

- The Milltronics MWL Weight Lifter is to be used only in the manner outlined in this manual, otherwise protection provided by equipment may be impaired.
- It is your responsibility to read this manual before installing and starting up any component of the weighing system to which the weight lifter is being applied.

Note

For industrial use only

This product is intended for use in industrial areas. Operation of this equipment in a residential area may cause interference to several frequency based communications.

1.1 The manual

This manual covers only weight lifter installation, operation, and maintenance procedures. Belt scale and integrator instruction manuals are available for download from our web site:

Siemens weighing (http://www.siemens.com/weighing)

Follow these operating instructions for quick, trouble-free installation, and maximum accuracy and reliability of your weighing system.

We always welcome suggestions and comments about manual content, design, and accessibility. Please direct your comments to:

Technical Publications (techpubs.smpi@siemens.com)

Safety notes

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2.1 General safety instructions

CAUTION

Correct, reliable operation of the product requires proper transport, storage, positioning and assembly as well as careful operation and maintenance. Only qualified personnel should install or operate this instrument.

Note

Alterations to the product, including opening or improper repairs of the product, are not permitted.

If this requirement is not observed, the CE mark and the manufacturer's warranty will expire.

Description 3

3.1 Milltronics MWL Weight Lifter

Milltronics MWL Weight Lifter is a mechanical calibration weight lifter for MUS, MBS, MCS, MSI and MMI belt scales. The MWL mechanically raises and lowers the static calibration (test) weights used to calibrate Milltronics belt scales. It stores the weights securely between the belt strands, above the calibration weight support arms, and allows the operator to lower and apply the weights safely without having to lean into the conveyor.

The MWL can be manually or electronically operated, and uses a high mechanical advantage to enable weights up to 340 kg (750 lbs) to be applied with very limited effort. The manual crank handle or AC gearmotor can be attached to either the left or right crank body. The MWL uses 12 revolutions for full range of motion, and can be secured for safety when the MWL is not in use.

Two lifting arms support a base-bar weight above the calibration weight supports of the belt scale: either flat bar or round bar style calibration weights are available. Locating notches in the base-bar weight engage the calibration weights securely on the lifting arms in the stored position, and the threaded shaft drive locks the lifting arms in place. A mechanical stop secures the MWL when the calibration weights are in the stored position.

3.2 Applications

The MWL is designed to work with the following Milltronics belt scales:

- MUS-STD MIlltronics Universal Scale, Standard Duty
- MUS-HD Milltronics Universal Scale, Heavy Duty
- MBS Milltronics Base Scale
- MCS Milltronics Crusher Scale
- MSI Milltronics Single Idler Scale
- MMI Milltronics Multiple Idler Scale (combination of 2 or more MSI Scales)

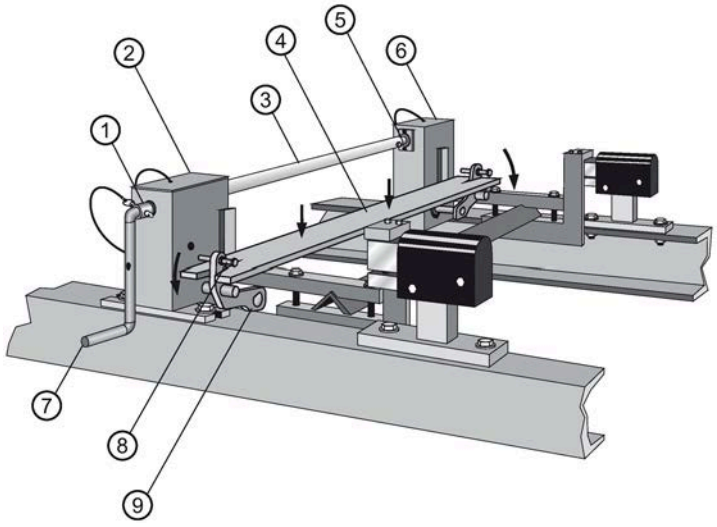
Belt scale manuals can be downloaded from

Siemens weighing (http://www.siemens.com/weighing)

3.3 MWL components

The Milltronics MWL Weight Lifter consists of the following components:

- left-handed and right-handed crank body, each connected to a lifting arm with guide-pin
- torque tube, to connect the left and right crank shafts
- crank handle, to be mounted to either the left or right input shaft (manual version only)
- optional shaft extension which adds 102 mm (4") to the handle shaft length
- base-bar weight to support other supplied calibration weights, or base-bar with integrated round bar weight
- U-brackets to secure flat bar calibration weights (not required for round bar style)



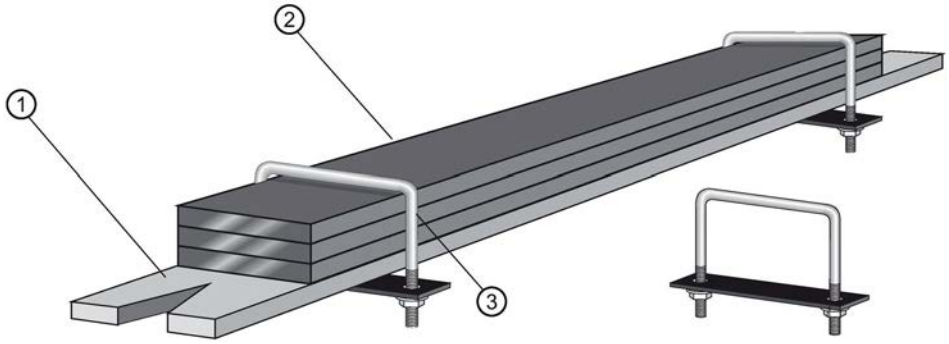
① Input shaft (2)
② Right-handed crank body
③ Torque tube
④ Base-bar weight
⑤ Connecting shaft (2)
⑥ Left-handed crank body
⑦ Crank handle
⑧ Guide-pin (2)
⑨ Lifting arm (2)

Note

Manual version shown. The electronic version features an AC gearmotor in place of the crank handle.

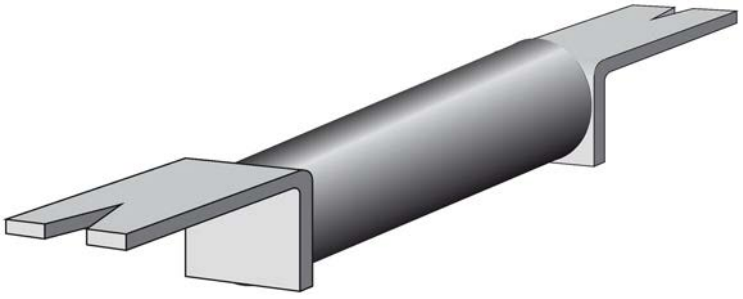
3.4 Calibration weight arrangement

Flat bar calibration weights



① flat bar base-bar weight
② flat bar calibration weights
③ U-bracket (supplied with MWL)

Round bar calibration weight



Installing/Mounting

4

4.1 Introduction

Note

Installation shall only be performed by qualified personnel and in accordance with local governing regulations.

The Milltronics belt scale must be completely installed before you install the MWL. Please refer to the belt scale operating instructions for installation details.

Note

Check that there will be sufficient clearance for the MWL. See Check clearance for conveyor belt (Page 12). Clearance can be created artificially by shimming the idlers in the scale area.

The MWL installation has eight stages:

1. Drilling the crank body mounting holes
2. Mounting the crank bodies
3. Mounting the torque shaft
4. Installing the crank handle (manual version)
5. Testing the unloaded MWL
6. Installing the calibration weights
7. Testing the loaded MWL
8. Shimming the MWL (if required)

Note

Electronic Version

- The crank handle is only required for the manual version of the MWL. The electronic version comes with an AC gearmotor already installed in place of the handle.
- The control panel for the electronic version has four mounting holes on the back which must be sealed and rigidly mounted.

4.2 Installation procedure

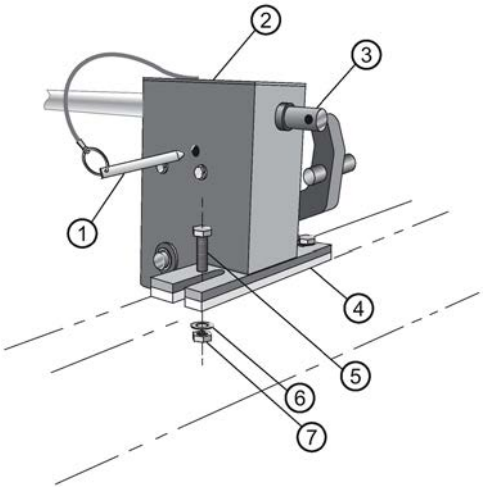
4.2.1 Drill crank body mounting holes

Refer to the appropriate MWL installation drawing (Page 41) for your Milltronics belt scale.

1. Measure and mark the locations of the mounting holes for each of the crank bodies. The left-handed unit turns clockwise to raise weights and the right-handed unit turns counter-clockwise.
2. Drill the holes as specified for 12 mm (1/2") mounting hardware.

4.2.2 Mount crank bodies

1. Refer to the shim thickness tables (Page 20) to determine whether you need to shim the MWL; shimming is not always required.
2. If necessary, select and position the appropriate size shim(s).
3. Loosely mount each crank body to the conveyor stringers using 12 mm (1/2") bolts, nuts, and washers.



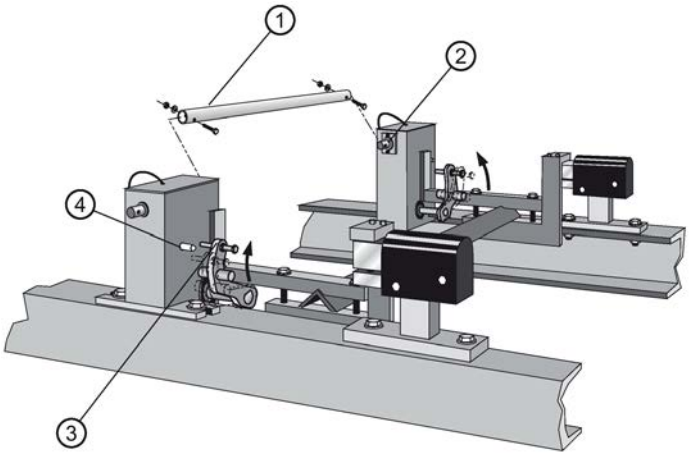
① locking ball-pin tethered to crank body
② crank body
③ input shaft
④ shim (if required)
⑤ bolt
⑥ washer
⑦ nut

Note

The crank bodies must be left loose to allow for the torque shaft installation.

4.2.3 Mount torque shaft

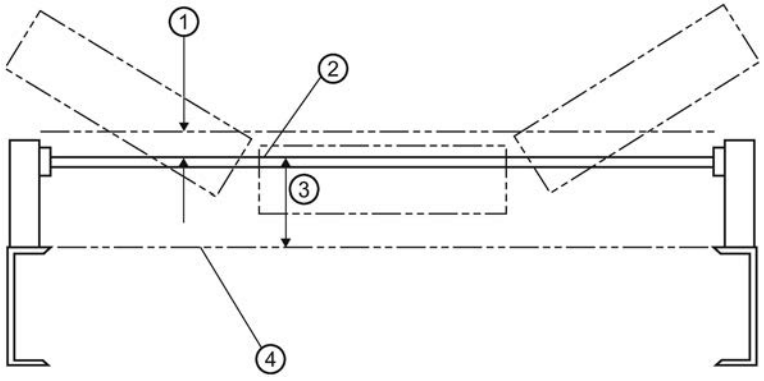
1. If lifting arms are not in the raised position, rotate the input shafts until both units have reached the mechanical stop.
2. Place the torque tube over the connecting shafts of the left and right crank bodies.
3. Loosely install the bolts, nuts, and washers that hold the torque tube onto the connecting shafts.
4. Hand tighten the bolts, nuts, and washers that mount the crank bodies to the stringers.
5. Hand tighten the bolts, nuts, and washers that hold the torque tube onto the connecting shafts.



① torque tube
② connecting shaft (2)
③ lifting arm in raised position (2)
④ locking pin installed, locking MWL in storage position

Check clearance for conveyor belt

1. Ensure there is 10 mm (0.38") minimum clearance from the top of the torque tube to the underside of the return belt: inadequate clearance will cause the belt to wear.
2. Allow additional clearance for belt sag.
3. If necessary, shim the idlers in the scale area until the clearance is adequate. (See the belt scale operating instructions for detailed shim procedures.)



① minimum 10 mm (0.38") clearance to underside of return belt + allowance for belt sag
② top of torque tube
③ 155 mm (6.11")
④ top of stringers

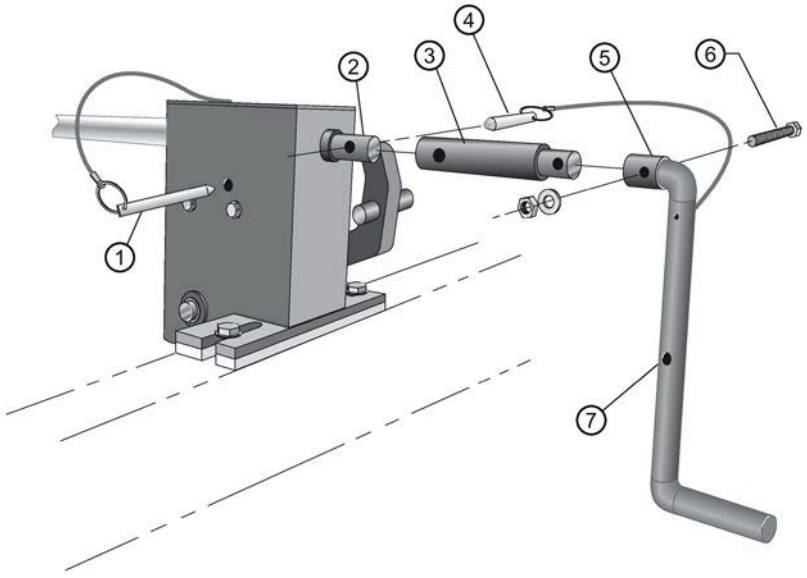
4.2.4 Install crank handle (manual version)

Note

The crank handle is only required for the manual version of the MWL. The electronic version comes with an AC gearmotor already installed in place of the handle. The motorized crank bodies allow for mounting of the electronic components on the left or right side. IF the MWL has been ordered incorrectly, these parts will need to be removed from one side and installed on the other. For mounting the proximity switches, a gap of 0.635 to 1.016 mm (0.025" to 0.04") must be maintained.

1. Determine whether it will be more convenient to have the handle attached to the left-handed or the right-handed crank body, and if the shaft extension is required.
2. Remove the plastic cap from the input shaft on the selected side.
3. If the shaft extension is required, slide the female end of the extension over the exposed input shaft, and secure the extension with a bolt, nut, and washer.

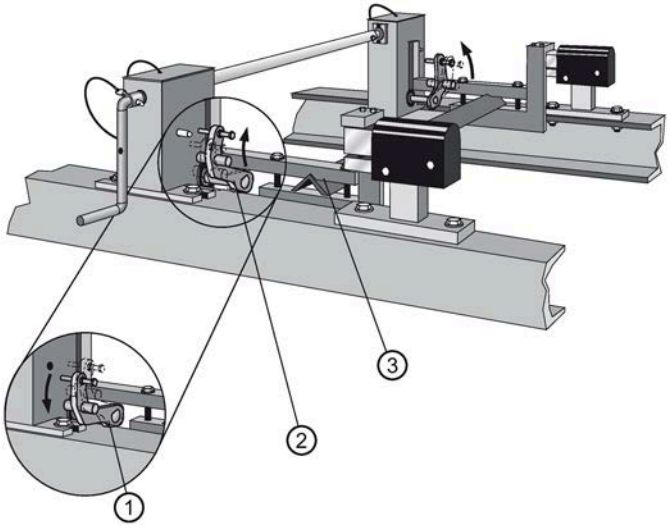
4. Slide the female end of the handle over the exposed input shaft (or shaft extension).
5. Secure the handle in place using the tethered locking ball-pin provided.



① locking ball-pin (tethered to crank body)
② input shaft
③ optional shaft extension
④ locking ball-pin (tethered to crank handle)
⑤ crank handle (female end)
⑥ bolt
⑦ hole for storage on locking ball-pin

4.2.5 Test the unloaded MWL

1. Turn the crank handle, or use the control buttons, and watch the lifting arms move up and down.
2. Check to see whether any binding occurs during the process. If there is any binding or hesitation, the crank bodies need to be aligned to each other.



① lifting arms lowered
② lifting arms raised
③ calibration weight support (2)

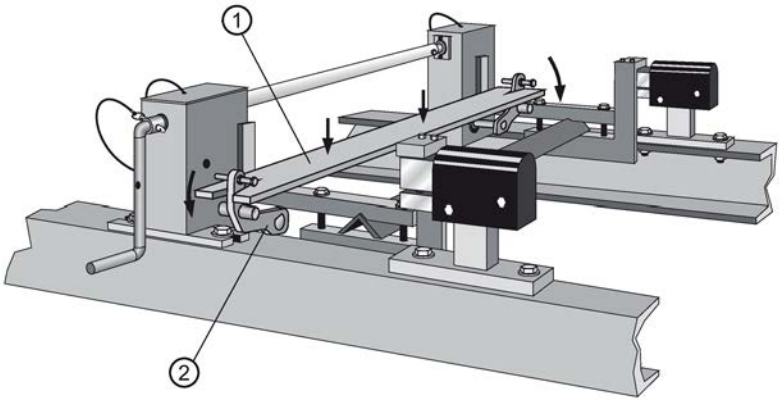
Align the crank bodies to each other, if necessary

1. Loosen the two bolts that mount each crank body.
2. Turn the crank handle, or use the control buttons, until the lifting arms have completed at least one complete cycle from a raised to a lowered position: this process should automatically align the crank bodies.
3. Retighten the bolts that mount the two crank bodies.
4. Check again, and repeat the process until the MWL operates smoothly, with no resistance.

4.2.6 Install calibration weights

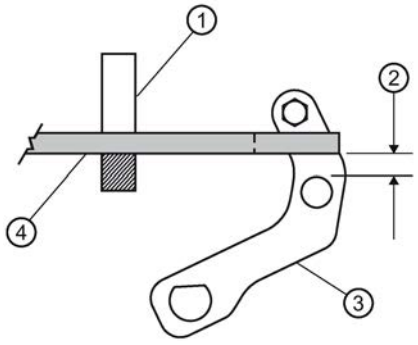
Note

When using flat bar weights, ensure adequate base-bar weight clearance before adding calibration weights. When using the round bar weight, the bar weight is an integrated part of the base-bar.



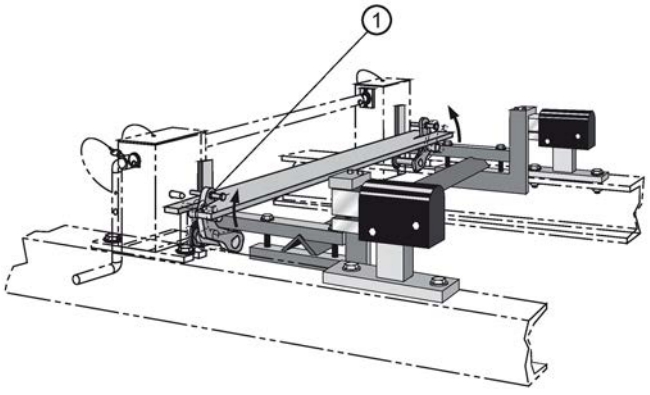
① base-bar weight applied
② lifting arms lowered

1. Turn the crank handle, or use the control buttons, until the lifting arms are fully lowered.
2. Place the base-bar weight into position on the calibration weight supports of the Milltronics belt scale.
3. Ensure there is 10 mm (0.38") minimum clearance between the underside of the base-bar weight and the top of the lowered MWL lifting arms. If necessary, shim the belt scale and adjacent idlers to achieve this clearance.



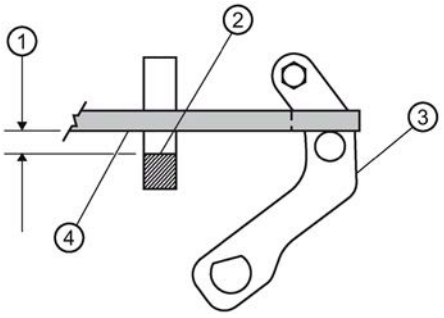
① calibration weight support
② 10 mm (0.38") minimum gap
③ lifting arm lowered
④ underside of base-bar weight

4. Gently turn the crank handle, or use the control buttons, until the lifting arms are fully raised: you may need to guide the notches in the base-bar weight in line with the lifting arms initially.



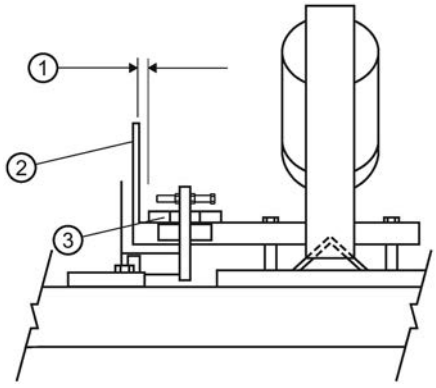
① lifting arm engages the notch on the end of the base-bar weight

5. Ensure there is 10 mm (0.38") minimum clearance between the underside of the base-bar weight and the top surface of the calibration weight support when the lifting arms are fully raised. If necessary, shim the MWL to achieve this clearance.



① 10 mm (0.38") minimum clearance
② top surface of calibration weight support
③ lifting arm raised
④ underside of base-bar weight

6. Ensure there is sufficient clearance between the side of the base-bar weight and the vertical arms of the calibration weight support arm, or support bracket: see dimensions shown below. If necessary, move the two crank bodies further from the calibration weight supports to achieve this clearance.



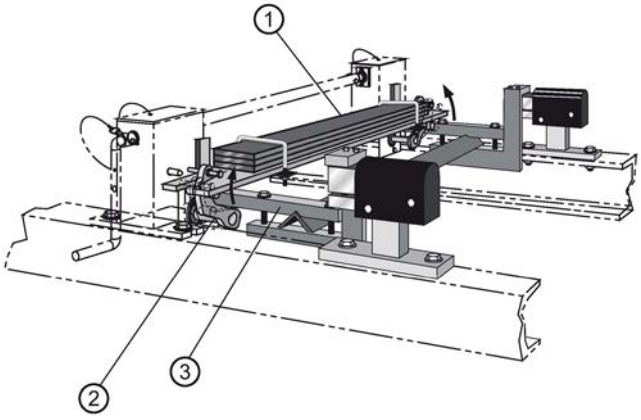
① minimum clearance
- on MUS, MBS, MCS scales: 10 mm (0.38")
- on MSI scales: 12.5 mm (0.5")

② vertical arm of calibration weight support

③ base-bar weight

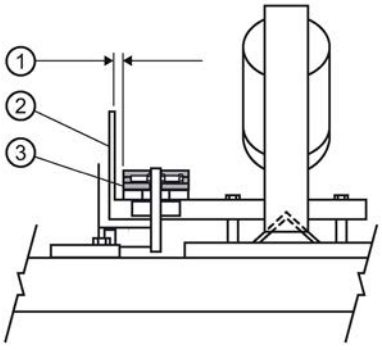
7. Recheck the crank body alignment: if necessary, see Align the crank bodies to each other (Page 15).

4.2.7 Test the loaded MWL



① calibration weights applied
② lifting arms raised
③ calibration weight support (2)

1. Keep the lifting arms raised, and add the other calibration weights
2. Check again to ensure there is 10 mm (0.38") minimum clearance [12.5 mm (0.5") on MSI scales] between the side of the stacked weights and the vertical arms of the calibration weight supports. If necessary, move the two crank bodies further from the calibration weight supports to achieve this clearance.



① minimum clearance
 - on MUS, MBS, MCS scales: 10 mm (0.38")
 - on MSI scales: 12.5 (0.5")
② vertical arm of calibration weight support
③ calibration weights

3. Recheck the crank body alignment: if necessary, see Align the crank bodies to each other (Page 15).

4.2.8 Shim the MWL

When the MWL is used with the MUS, MBS, or MCS belt scale, due to the wide variety of idler types and sizes, it may be necessary to shim the MWL for proper operation.

Note

These tables are provided as a guideline only: shimming is often not required.

Angle spine idler

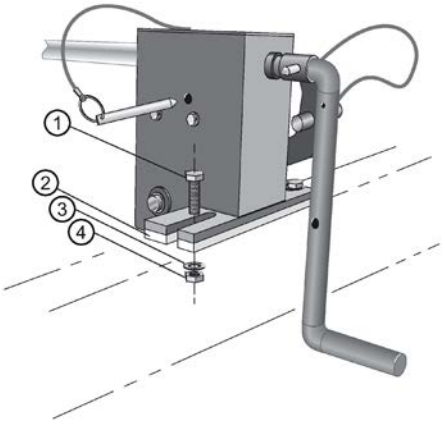
Angle size	Shim thickness	Number of shims
2" (50 mm)		none
2-1/2" (60 mm)	0.31" (8 mm)	1
3 " (75 mm)	0.31" (8 mm)	2
3-1/2" (90 mm)	0.31" (8 mm)	3
4" (100 mm)	0.31" (8 mm)	4

Channel spine idler

Channel size	Shim thickness	Number of shims
3" (75 mm)		none
4" (100 mm)	0.31" (8 mm)	1
5" (125 mm)	0.31" (8 mm)	1
6" (150 mm)	0.31" (8 mm)	2

1. Compare your idler spine to the spine type and size in the tables above, for a guide to the size of shims you may require.
2. Select shims that will allow you to adjust the MWL crank bodies to the correct level.
3. Remove the bolt, nut, and washer on one crank body and position the shim between the crank body and the conveyor stringer: it should not be necessary to loosen or remove the torque tube connecting the two crank bodies.

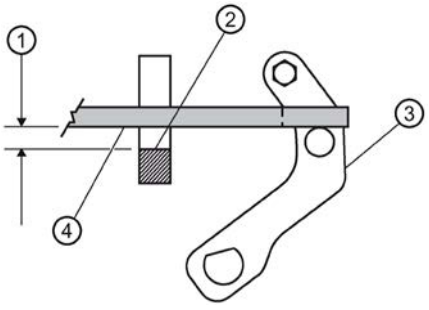
4. After the shim is in position, re-install and tighten the bolt, nut, and washer.
5. Repeat the same procedure with the other crank body, then recheck the crank body alignment. See Recheck crank body alignment (Page 20).



① bolt
② shim, if required
③ washer
④ nut

Recheck crank body alignment

1. After shimming, raise and lower the lifting arms to check whether there is any binding or hesitation. If there is, repeat the alignment procedure (Page 15).
2. Raise the lifting arms again and check the clearance between the underside of the base-bar weight and the top surface of the calibration weight support.



① 10 mm (0.38") minimum clearance
② top surface of calibration weight support
③ lifting arm raised
④ underside of base-bar weight

3. Repeat the shimming procedure until the lifting arms raise the calibration weights at least 10 mm (0.38") above the calibration weight supports.
4. Tighten the torque shaft bolts and the crank-body mounting bolts, then recheck all clearances.

The MWL installation is now complete.

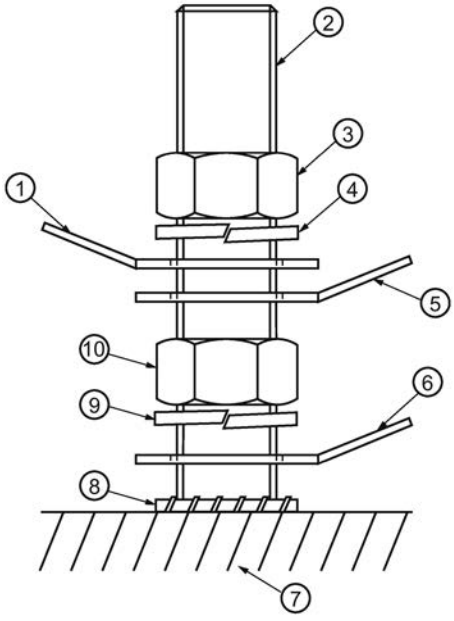
Connecting

5

5.1 Connecting the MWL (electronic version)

Note

- This chapter applies only to the electronic version of MWL. The manual version has no electrical components.
- Installation shall only be performed by qualified personnel and in accordance with local governing regulations.
- Suggested grounding/bonding wiring: ground per the following diagram.



①	secondary bond enclosure door ground wire	⑥	main bond provision "PE"
②	enclosure ground stud M8 (15MM) copper	⑦	enclosure wall
③	M8 nut	⑧	star or serrated washer
④	lockwasher	⑨	lockwasher
⑤	secondary bond back plate ground wire	⑩	M8 nut

The electronic version of the Milltronics MWL Weight Lifter comes with an AC gearmotor, two magnetic proximity sensors, and an optional electronic control panel. The motor is available in two different three-phase power configurations: 220-240/380-420/440-480 and 500-600 V AC. It can be controlled locally using the pushbuttons on the panel, or remotely by the customer's PLC or DCS.

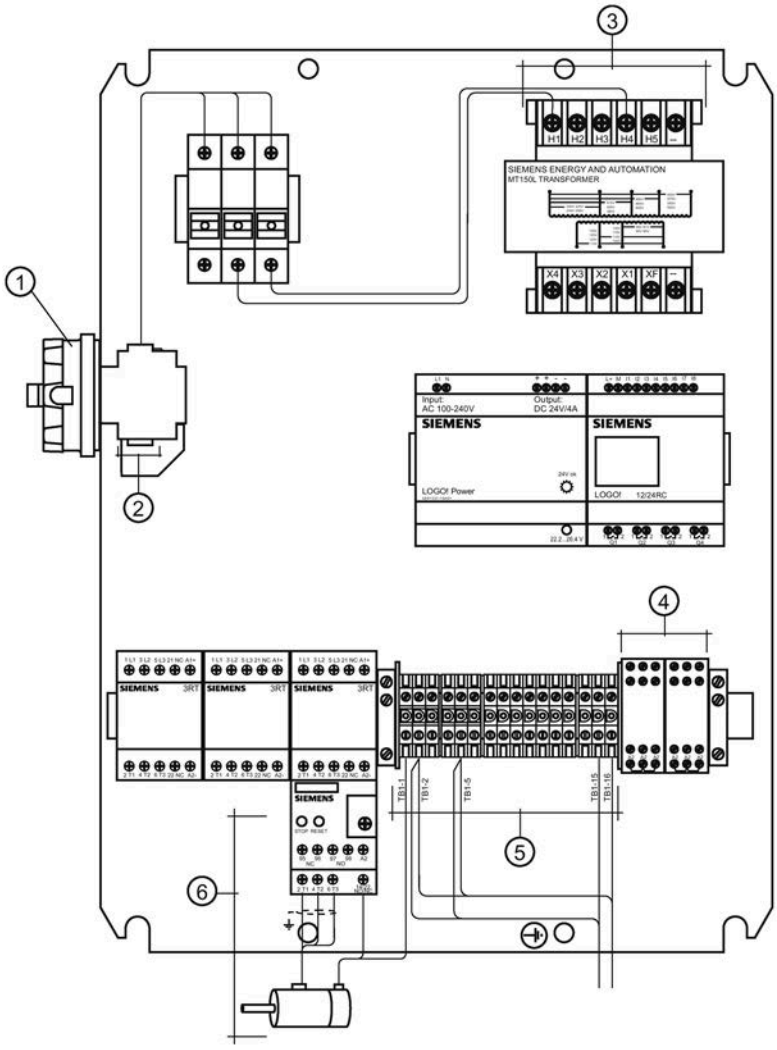
Note

Use the M10 ground stud in the backplate for secondary (outgoing) bonding to such parts as the AC gearmotor.

The following connections must be made to ensure correct operation:

- incoming power
- control transformer
- motor and brake
- proximity sensors
- remote PLC (optional)

5.2 Connection diagram



① panel mount disconnect

② 3-phase power connection terminal [See Connect input power (Page 25)]

③ control transformer voltage connection terminals [See Connect the control transformer (Page 25)]

④ remote relay connection terminals [See Connect the remote PLC (Page 28)]

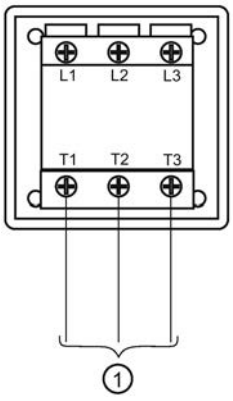
⑤ magnetic proximity sensor connection terminals [See Connect the sensor junction box (Page 27)]

⑥ motor and brake connection terminals [See Connect the motor and brake (Page 27)]

5.3 Connection procedure

5.3.1 Connect input power

Connect the input power supply to the 3-phase power connection terminal on the control panel as shown below. Refer to the connection diagram (Page 24) for more details.

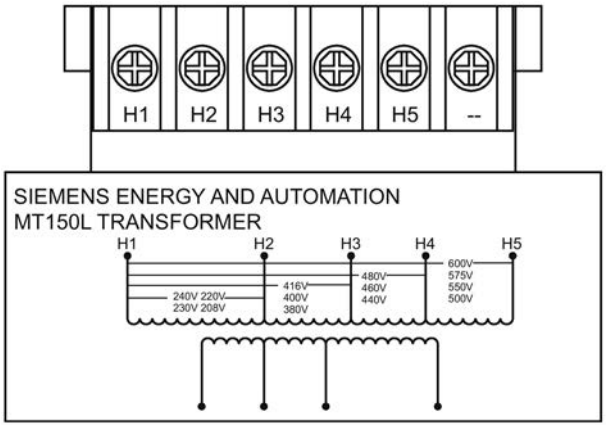


① incoming power

5.3.2 Connect the control transformer

MWL (electronic version) comes with the H1 (common) connection from the control transformer to the input fuse block already made. Refer to the table and diagram below to determine which terminal on the control transformer to connect as the second primary lead. Refer to the connection diagram (Page 24) for more details, if necessary.

NOTICE
Failure to connect the second primary lead on the control transformer correctly may result in damage to the components of the control panel.



Power supply	Control transformer connection
208 - 240 V	H2
380 - 420 V	H3
440 - 480 V	H4
500 - 600 V	H5

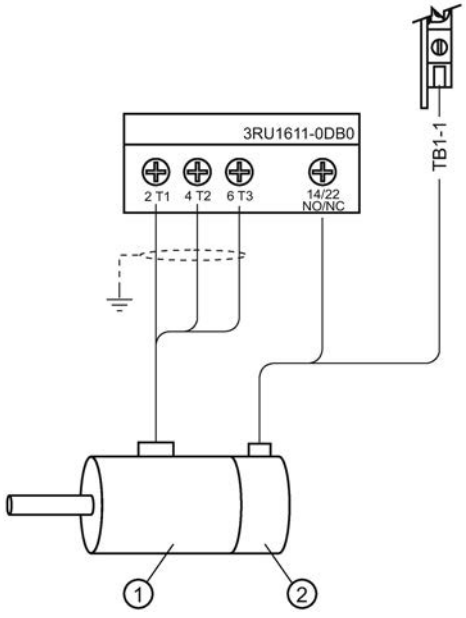
NOTICE

Fuses have been supplied with the control panel for all configurations of supply voltage. Install fuses as follows:

- Class CC ATDR1 (600 V, 1.0 A) fuse across terminals X1 - XF of the Secondary of the MT150L control transformer.
- Class CC ATDR4 (600 V, 4.0 A) fuse for 220-240/380-420/440-480 V 3-phase supply OR
- Class CC ATDR2-1/2 (600 V, 2.5 A) fuse for 500-600 V 3-phase supply.

5.3.3 Connect the motor and brake

1. Connect the motor to the control panel using an appropriate power cable (3-phase with ground), as shown in the diagram below.
2. Connect the brake release to the control panel using an appropriate 2-conductor cable, as shown in the diagram below.



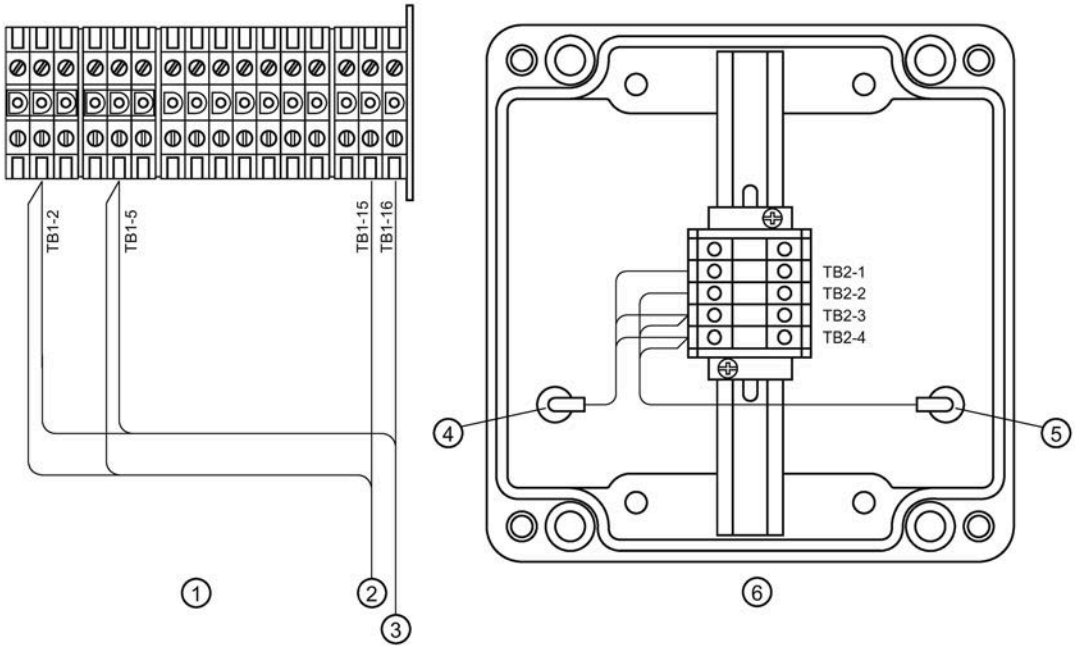
① motor
② brake coil

Refer to the connection diagram (Page 24) for more details.

5.3.4 Connect the sensor junction box

Referring to the table and diagram below, connect terminal block 2 (TB2) on the proximity sensor junction box to terminal block 1 (TB1) on the control panel, using an appropriate 4-conductor cable. Refer to the connection diagram (Page 24) for more details.

Sensor	Sensor to junction box (TB2)	Sensor junction box (TB2)	Control panel (TB1)
DOWN	BLACK	TB2-4	TB1-2
	RED	TB2-3	TB1-5
	WHITE	TB2-2	TB1-15
UP	BLACK	TB2-4	TB1-2
	RED	TB2-3	TB1-5
	WHITE	TB2-1	TB1-16



① proximity sensor connections to control panel (TB1)
② to sensor DOWN connections on TB2
③ to sensor UP connections on TB2
④ wiring from UP sensor
⑤ wiring from DOWN sensor
⑥ proximity sensor junction box

Note

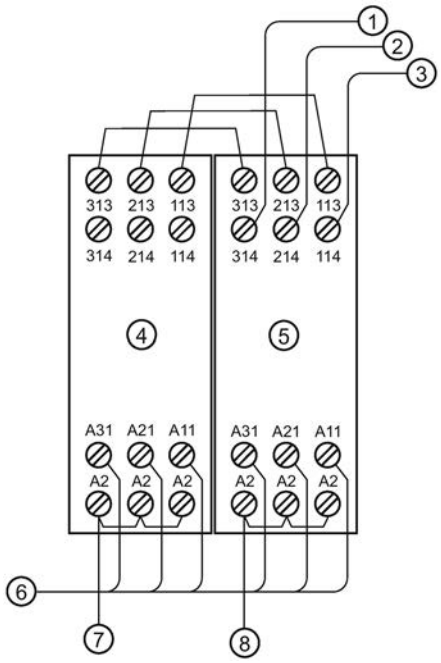
Depending on your configuration and the orientation of the sensor junction box, the sensor signals may be reversed. The input of these switches is set at the factory; check the termination of the wires to ensure the up and down switches are properly connected.

5.3.5 Connect the remote PLC (optional)

Note

The connections described in this section are only required if you will be using a remotely located PLC or DCS to run the MWL.

Connect the remote relay outputs on the MWL control panel to your remotely located PLC using the diagram below. Refer to the connection diagram (Page 24) for more details, if necessary.



①	PLC ENABLE signal (314)	⑤	remote relay
②	PLC signal DOWN (214)	⑥	to terminal block 1 (TB1-1)
③	PLC signal UP (114)	⑦	to key switch LOC
④	local relay	⑧	to key switch REM

Note

The connections between terminals labeled A2 have already been made internally.

CAUTION

If the control panel is connected for use remotely, a series circuit for emergency stop operation should be included in the system.

Commissioning 6

6.1 Verifying MWL electrical connections

Note

This chapter applies only to the electronic version of MWL. The manual version has no electrical components.

After completing the electrical connections described in the Connecting chapter (Page 22) , and prior to using the MWL in normal operation, verify that the UP and DOWN proximity sensors and the motor are connected correctly.

Verify proximity sensor connections

Verify that the proximity sensors have been connected correctly using the following procedure:

1. Remove the top cover on the MWL module that the gearmotor is installed on.
2. With power applied to the control panel, place a ferrous object (for example, a screwdriver) on the face of the UP sensor. The green UP indicator on the control panel should light.
3. Repeat for the DOWN sensor. The red DOWN indicator should light.
4. If the sensor indicator lights are incorrect, turn off the power to the control panel, and switch the TB2-1 and TB2-2 connections on the proximity sensor junction box. [See Connect the sensor junction box (Page 27)]
5. Repeat steps 2 and 3 to ensure that the sensors are now connected correctly.

Verify motor connections

Verify that the motor has been connected correctly using the following procedure:

1. With power applied to the control panel, turn the key switch to the LOC position.
2. Press the UP pushbutton and observe the direction of travel.
3. If the MWL is moving UP, the motor is connected correctly and you may now proceed to operate the MWL in a normal fashion.
4. If the motor is moving DOWN, do the following:
   - Press the EMERGENCY STOP button.
   - Remove and lock out the main power from the MWL control panel.
   - Reverse two of the motor phase wires to reverse the direction of the motor.
5. Apply main power and repeat steps 1 and 2 to ensure that the direction of motor control is now correct.

Operation

7

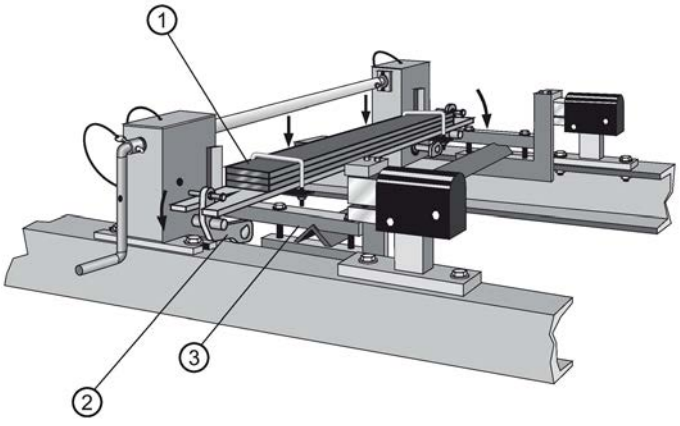
Note

To ensure accurate calibration, you must keep the area between the MWL lifting arms and the calibration weights clear of build-up during the calibration routine. See Removing material accumulation (Page 35).

7.1 Operation (manual version)

Applying calibration weights

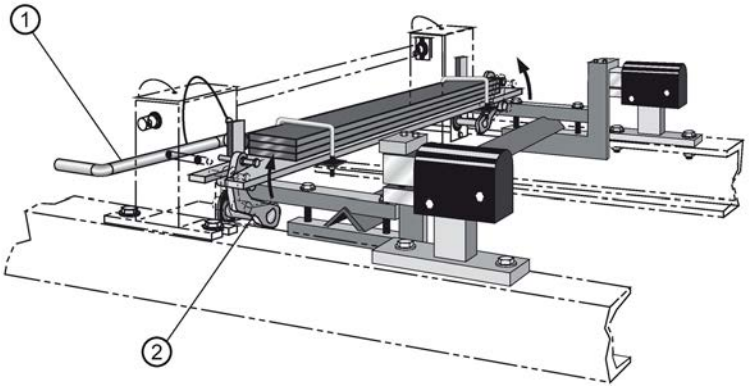
Simply turn the crank handle until the calibration weights are fully lowered onto the calibration weight supports of the belt scale. (Please see the manuals for the Milltronics Belt Scale and Integrator, for the appropriate calibration procedures.)



① flat bar calibration weights applied
② lifting arms lowered
③ calibration weight supports (2)

Storing calibration weights

After you have completed the scale calibration procedure, turn the crank handle until the lifting arms are fully raised.



① crank handle stored on far side of crank body, with locking ball-pin
② lifting arms raised

Storing crank handle

Remove the crank handle and store it to prevent it from impeding traffic or material when the conveyor is in operation.

1. Remove the locking ball-pin tethered to the crank handle, and remove the handle.
2. Use the locking ball-pin tethered to the crank body nearest to the handle to secure the MWL from unintended use and to store the crank handle.
3. Insert the locking ball-pin through the hole in the crank handle, and into the insertion point in the center of the crank body. Two clips on the side of the crank body help to hold the handle in position.
4. Cover the input shafts with a guard if they present a hazard to personnel when the MWL is not in use.

7.2 Operation (electronic version)

7.2.1 Electronic control panel

The electronic version of MWL uses an AC gearmotor to lift and lower the belt scale calibration weights. The motor is operated from an electrical panel with the following controls:

- Operator key switch: OFF, LOC (local), REM (remote)
- UP pushbutton with green indicator
- DOWN pushbutton with red indicator
- EMERGENCY STOP pushbutton

Note

Motor overload protection

- Should the motor run up against a physical stop, the internal overload relay will trip and the motor will stop, preventing damage.
- If the proximity sensor is not activated within a specified time, the motor will be deactivated and the brake applied. If this happens, check for mechanical restrictions and malfunctioning sensors.

7.2.2 Local mode

Applying calibration weights

1. Turn the key switch to the LOC position. The Local Relay coil will be energized providing an enable signal to the LOGO relay, releasing the brake and allowing the motor to move freely.
2. Push the DOWN button. The MWL will move down until the DOWN sensor activates, disabling the reversing contactor and bringing the motor to a rest position.

   While the MWL is moving, the red DOWN indicator will blink. Once it stops, the indicator will remain on.
3. Refer to the manuals for the Milltronics Belt Scale and Integrator, to perform the appropriate calibration procedures.

Storing calibration weights

1. After you have performed the scale calibration procedure, push the UP button. The MWL will move up until the UP sensor activates, disabling the reversing contactor, bringing the motor to a stop and engaging the brake.

   While the MWL is moving, the green UP indicator will blink. Once it stops, the indicator will remain on.
2. Turn the key switch to the OFF position.

NOTICE
The green UP indicator will turn off if the MWL has drifted down from the UP position.

Note

The signal from the UP proximity switch can be used as an alarm input to a remote PLC or DCS.

7.2.3 Remote mode

Remote mode provides the same control functionality as local mode, however the control functions are provided by a PLC or DCS system.

To operate the electronic version of MWL in remote mode, set the key switch to the REM position. This energizes the remote relay coil and closes the 3 contacts required for the PLC ENABLE signal and the UP and DOWN operation signals.

Note

In remote mode, the front panel pushbuttons, with the exception of the EMERGENCY STOP button, are disabled.

Service and maintenance

8

8.1 Removing material accumulation

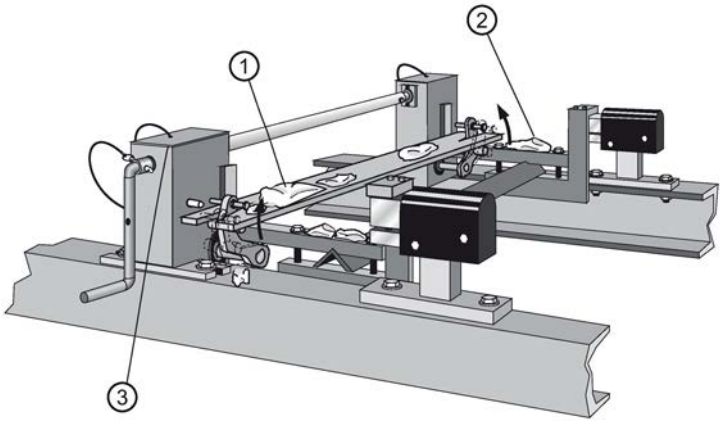
To ensure that the belt scale will provide optimal accuracy, periodically inspect the area around the calibration weights and remove any material build-up.

The calibration weights must remain consistent to calibrate the scale correctly. If material accumulates on top of them, the added weight will cause the calibration procedure to produce poor results. The top surface of the calibration weight supports must also be kept clean for the scale to produce accurate results.

Material should not accumulate inside the crank body housings under normal operating conditions, but it is a good idea to inspect them periodically.

Note

Before starting a calibration procedure, be sure to check that there is no material accumulation in the three areas described below.



① top surface of calibration weights
② top surface of calibration weight support
③ inside crank body housing

1. Remove any material build-up from the top of the calibration weights.
2. Remove any material build-up from the top surface of the calibration weight supports between the calibration weights and the conveyor scale.
3. Check inside the MWL crank body and inspect the threaded shaft drive: if material has accumulated here, remove it with an air stream or other suitable device.

Note

The threaded shaft and guide plates are normally not accessible to the human hand: do not force any foreign matter into the area during operation.

8.2 Technical support

If you have any technical questions about the device described in these Operating Instructions and do not find the right answers, you can contact Customer Support:

- Via the Internet using the **Support Request:**

Support request (http://www.siemens.com/automation/support-request)

- Via Phone:
  - Europe: +49 (0)911 895 7222
  - America: +1 423 262 5710
  - Asia-Pacific: +86 10 6475 7575

Further information about our technical support is available on the Internet at

Technical support (http://support.automation.siemens.com/WW/view/en/16604318)

Service and support on the Internet

In addition to our documentation, we offer a comprehensive knowledge base online on the Internet at:

Service and Support (http://www.siemens.com/automation/service&support)

There you will find:

- The latest product information, FAQs, downloads, tips and tricks.
- Our newsletter, providing you with the latest information about your products.
- Our bulletin board, where users and specialists share their knowledge worldwide.
- You can find your local contact partner for Industry Automation and Drives Technologies in our partner database.
- Information about field service, repairs, spare parts and lots more under "Services."

Additional support

Please contact your local Siemens representative and offices if you have additional questions about the device

Find your contact partner at:

Local contact person (http://www.siemens.com/automation/partner)

Technical data

9

9.1 Specifications

Belt width

MUS-STD Standard Duty	up to 1000 mm; CEMA width 42"
MUS-HD Heavy Duty	up to 1600 mm; CEMA width 60"
MBS	up to 1000 mm; CEMA width 42"
MCS	up to 1600 mm; CEMA width 60"
MSI	500 to 2000 mm; CEMA width 18" to 96"
MMI	consists of 2 or more MSI scales, 2 or more MWL units

Note

Some belt scales require specific order configurations for use with the MWL.

Idler spacing

minimum of 610 mm (24")

Calibration weight capacity

750 lbs. (340 kg)

Crank arm (manual version)

mechanical advantage	20:1
number of revolutions required for raising or lowering	12

AC gearmotor (electronic version)

0.55 kW (0.74 hp), TEFC with integral brake	
voltage	220-240/380-480/575 V AC, 3-phase, 50/60 Hz
degree of protection	IP55
insulation class	F

Proximity sensors (electronic version)

12 mm magnetic proximity switches, NPN

Control panel (electronic version)

local or remote interface with up, down buttons and indicators for indoor or outdoor use	
input	220-240/380-420/440-480/500-600 V AC, 3-phase, 50/60 Hz, 2 kVA
outputs	220-240/380-420/440-480/500-600 V AC, 3-phase, 50/60 Hz, 0.55 kW (0.74 hp); 24 V DC, 30 W
temperature	-20 to +40 ° C (-4 to +104 °F)
degree of protection	NEMA 4/Type 4, IP66
dimensions	15.75 x 19.68 x 8.27" (400 x 500 x 210mm)

Approvals (manual version)

General	CE, C-TICK

Approvals (electronic version)

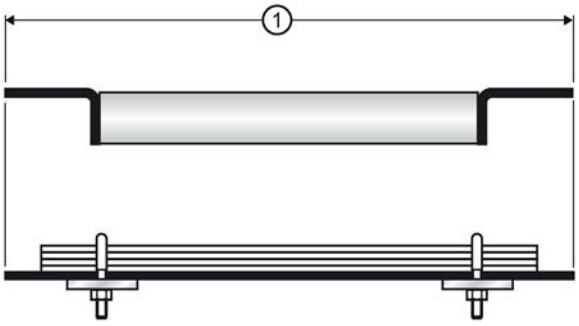
General	CE, C-TICK CSA$_{US/C}$

The Milltronics MWL Weight Lifter is in compliance with Directive 98/37/EC.

Dimension drawings

10

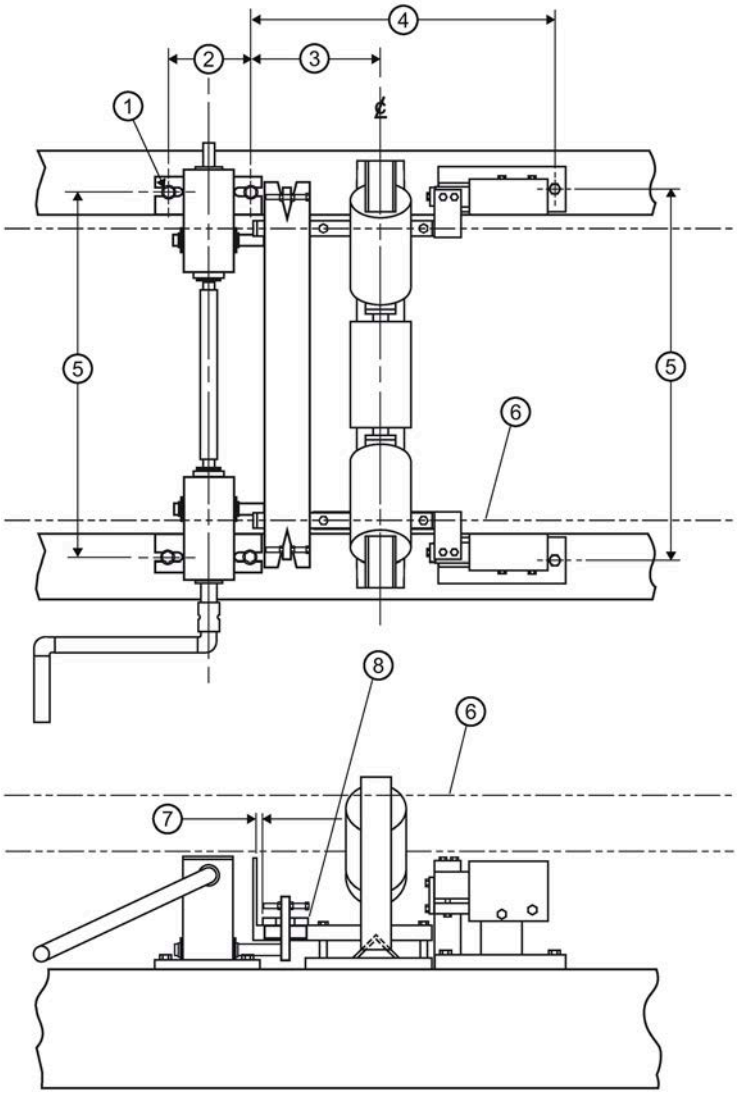
10.1 Calibration weight dimensions



① conveyor A dimension + 65 mm (2.56")

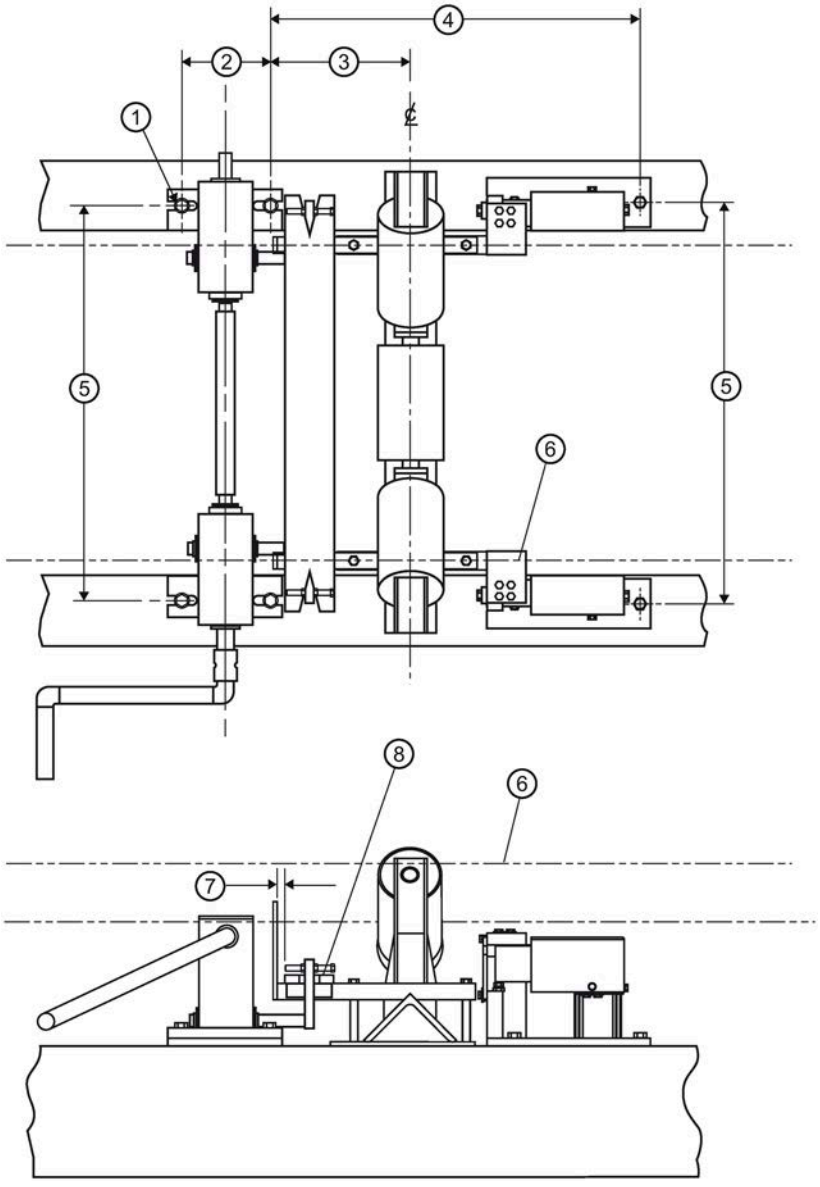
10.2 Installation drawings

10.2.1 MWL installation drawing for the MUS-STD standard duty belt scale



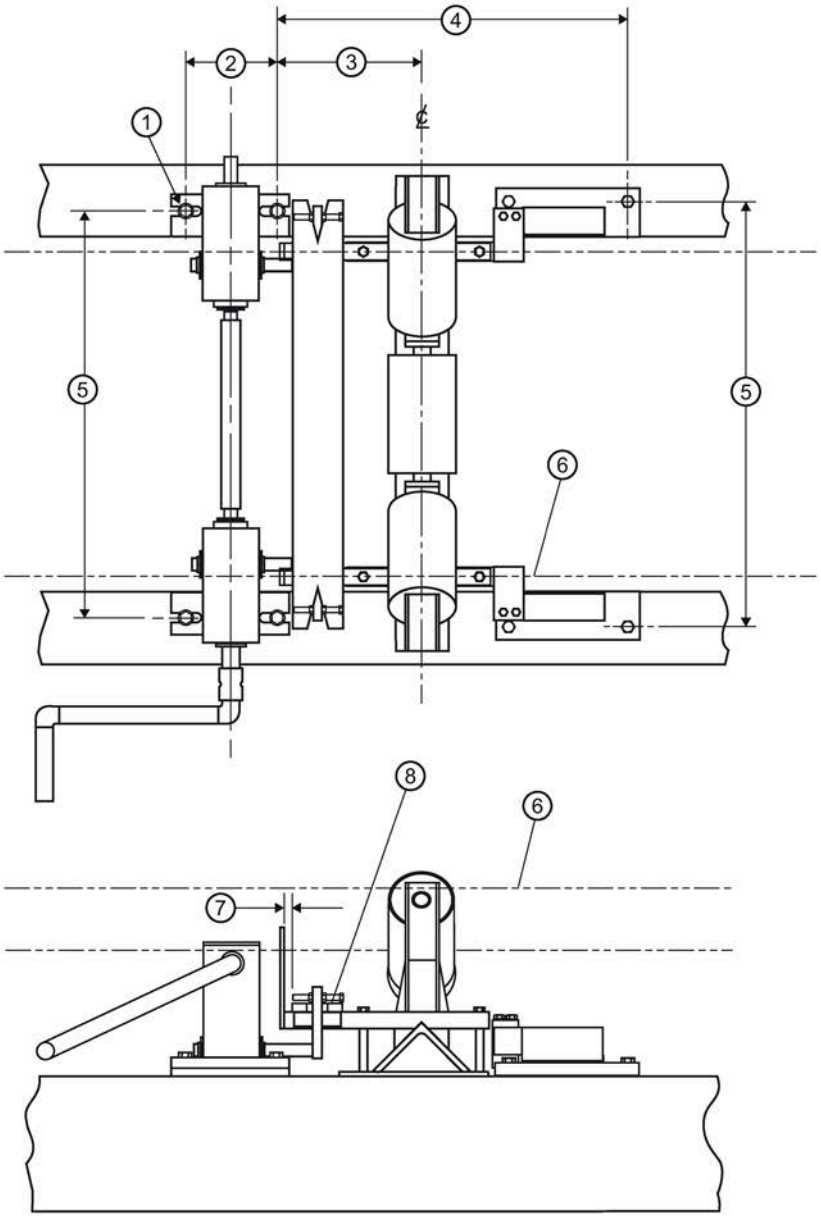
①	14 mm (0.56") diameter holes (4 places)	⑤	belt width + 229 mm (9") or to suit (A dimension)
②	133 mm (5.22")	⑥	belt
③	214 mm (8.43")	⑦	10 mm (0.38") minimum clearance from vertical arm to weights
④	522 mm (20.55")	⑧	base-bar weight centered on lifting arm

10.2.2 MWL installation drawings for the MUS-HD heavy duty belt scale



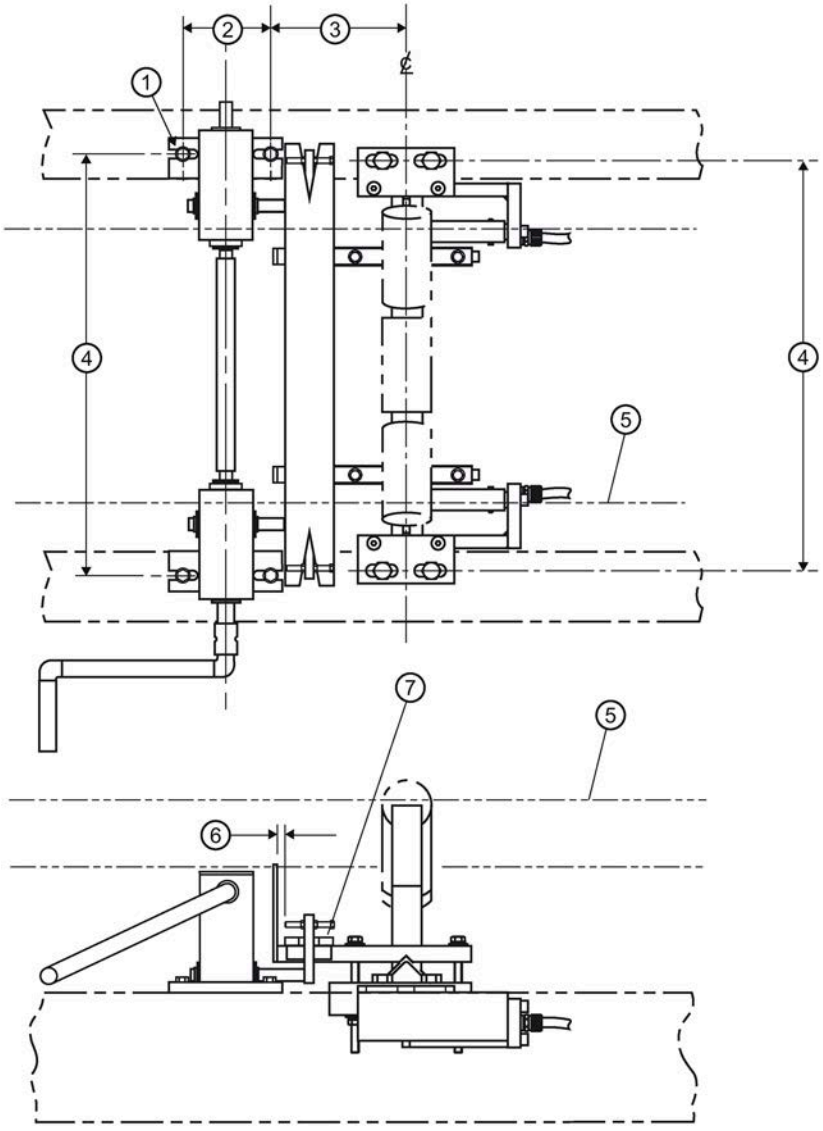
①	14 mm (0.56") diameter holes (4 places)	⑤	belt width + 229 mm (9") or to suit (A dimension)
②	133 mm (5.22")	⑥	belt
③	246 mm (9.67")	⑦	10 mm (0.38") minimum clearance from vertical arm to weights
④	608 mm (23.92)	⑧	base-bar weight centered on lifting arm

10.2.3 MWL installation drawing for the MBS belt scale



①	14 mm (0.56") diameter holes (4 places)	⑤	belt width + 229 mm (9") or to suit (A dimension)
②	133 mm (5.22")	⑥	belt
③	214 mm (8.43")	⑦	10 mm (0.38") minimum clearance from vertical arm to weights
④	525 mm (20.67")	⑧	base-bar weight centered on lifting arm

10.2.4 MWL installation drawing for the MCS belt scale



① 14 mm (0.56") diameter holes (4 places)

② 133 mm (5.22")

③ 214 mm (8.43")

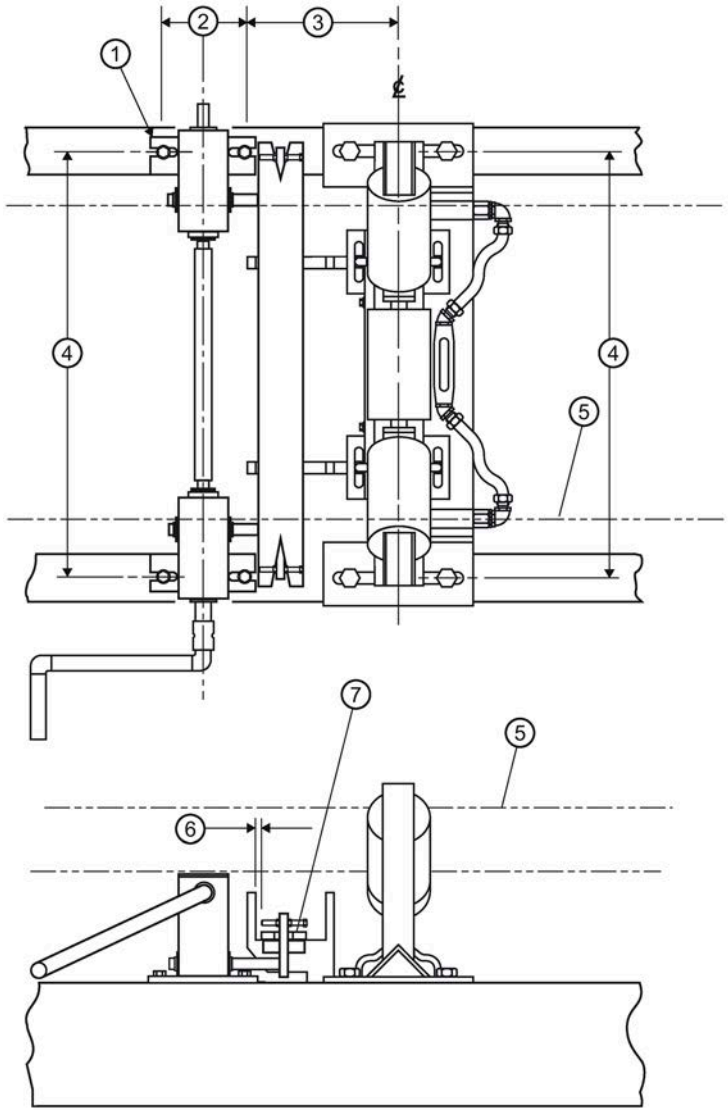
④ belt width + 229 mm (9") or to suit (A dimension)

⑤ belt

⑥ 10 mm (0.38") minimum clearance from vertical arm to weights

⑦ base-bar weight centered on lifting arm

10.2.5 MWL installation drawing for the MSI or MMI belt scale



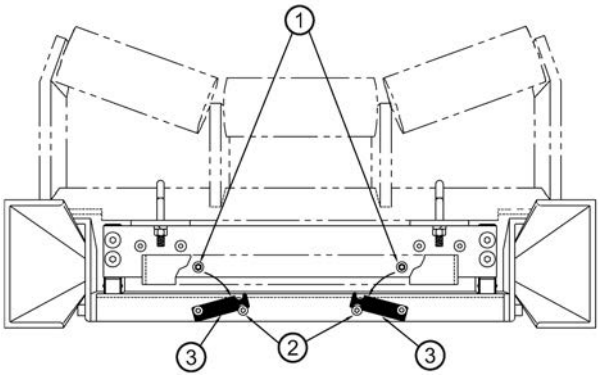
① 14 mm (0.56") diameter holes (4 places)
② 133 mm (5.22")
③ 265 mm (10.42")
④ belt width + 229 mm (9") or to suit (A dimension)
⑤ belt
⑥ 13 mm (0.5") minimum clearance from vertical arm to weights
⑦ base-bar weight centered on lifting arm

10.2.5.1 Retrofitting an MSI or MMI belt scale

Two new calibration weight brackets are required with the MWL to replace the existing calibration weight bar. New bolts are supplied, but you will also need a C-clamp, metric Allen keys, and metric wrenches.

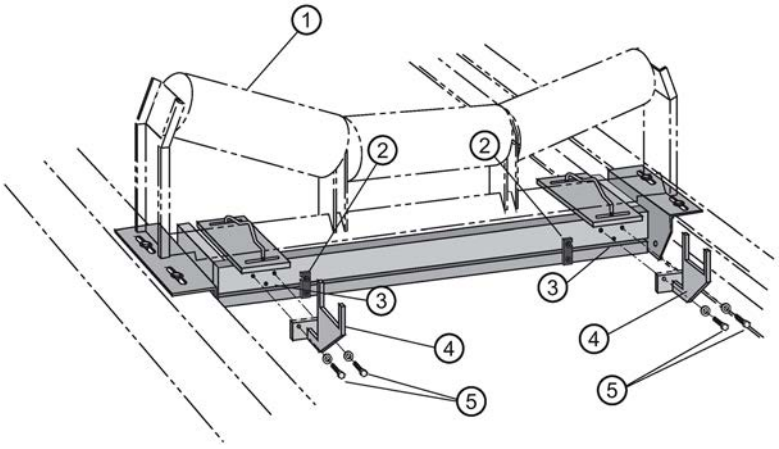
NOTICE
Take care to protect the load cells from impact or prying forces during installation of the new calibration weight brackets.

1. Rotate the shipping stops on the MSI into a vertical position, and tighten screws A to secure the stops in place. This will help to protect the load cells from damage while the calibration weight brackets are being installed.



① screws A
② screws B
③ shipping stop in free position

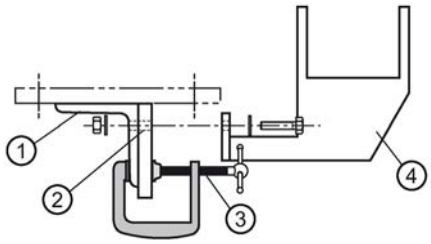
2. Remove the idler.



① idler removed
② shipping stops in vertical position
③ calibration weight bar removed
④ calibration weight brackets
⑤ bolts (step 6)

3. Remove the two socket-head cap-screws that secure the calibration weight bar, then remove the calibration weight bar from the dynamic beam of the belt scale.

4. Clamp the bottom of the idler support angle-brackets to the dynamic beam, using two C-clamps.



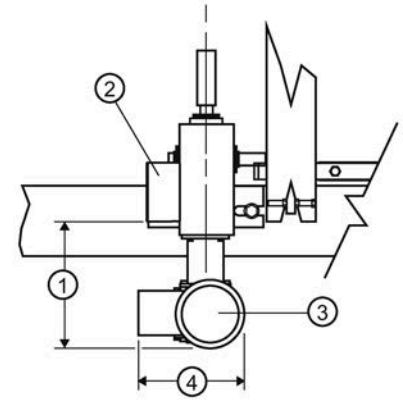
① angle-bracket
② dynamic beam
③ C-clamp (customer supplied)
④ calibration weight bracket

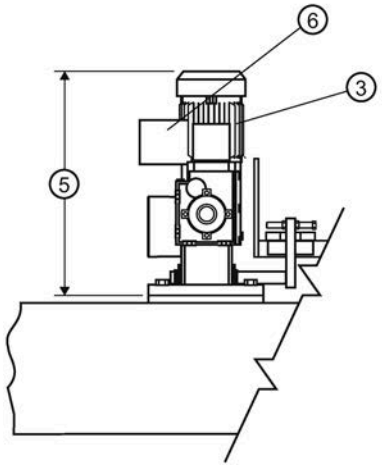
5. Remove the four socket head bolts that secure the idler support angle-brackets.
6. Mount the new calibration weight brackets using the same holes as the idler support angle brackets. Use the new bolts and nuts supplied with the calibration weight brackets, and hand-tighten the nuts.
7. Align the new calibration weight brackets with each other vertically and horizontally.
8. Tighten the nuts and bolts firmly to secure all four brackets.
   Torque value = 54.6 Nm (40 ft-lbs).
9. Remove the C-clamps.
10. Re-install the idler and check idler alignment as described in the belt scale operating instructions.
11. Free the weight mechanism: loosen screws A and rotate the 2 shipping stops inward and down, over screws B (see step 1). Tighten screws A to secure them in place.

10.2.6 MWL (electronic version) dimensions

Note

This drawing shows the dimensions unique to the electronic version of MWL. All other dimensions are as shown in previous drawings.





① 257.1 mm (10.12")
② proximity sensor junction box
③ AC gearmotor
④ 214.4 mm (8.44")
⑤ 430.9 mm (16.96")
⑥ motor junction box

Appendix A: Customer calculations

A

Calculation of total calibration weight mass

Record the value of the base-bar and weights to be attached. The weights should be recorded in either kilograms or pounds. In the case of flat bar weights, the U-brackets which secure the bars each weigh 0.43 kg (0.95 lb).

Weight of base-bar	_____ kg or lb
Mass of calibration weights	_____
	_____
	_____
	_____
	_____
	_____
	_____
	_____
	_____
	_____
	_____
	_____
	_____
	_____
	_____
	_____
	_____
	_____
	_____
Grand total _____ kg or lb	

Calculation of load reference values

Calibration reference value in kg/m =	grand total in kg
	idler spacing in m

OR

Calibration reference value in lb/ft =	grand total in lb
	idler spacing in ft

Using the factoring function of the belt scale integrator

If the belt scale system has been pre-calibrated, as in the case of an MWL retrofit, the belt scale system should be zeroed. The **Factor** function of the integrator should be used to accurately determine the value of the calibration weights in terms of the existing span calibration. (See the integrator manual for more detail.)