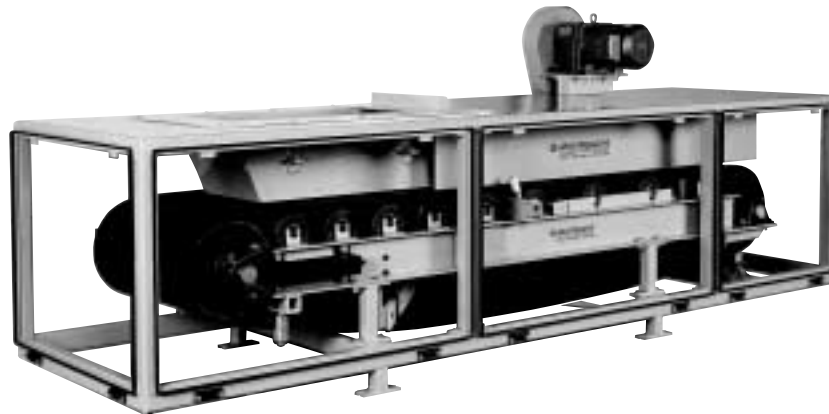


MILLTRONICS

**AUTOWEIGH FEEDER
SERIES 1200/3600**

Instruction Manual PL-588

April 2001



Safety Guidelines

Warning notices must be observed to ensure personal safety as well as that of others, and to protect the product and the connected equipment. These warning notices are accompanied by a clarification of the level of caution to be observed.

Qualified Personnel

This device/system may only be set up and operated in conjunction with this manual. Qualified personnel are only authorized to install and operate this equipment in accordance with established safety practices and standards.

Warning: This product can only function properly and safely if it is correctly transported, stored, installed, set up, operated, and maintained.

Note: Always use product in accordance with specifications.

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Table of Contents

Safety & Theory	5
Safety and General Precautions	5
Theory of Operation	6
Receiving and Unpacking.....	6
Mechanical Installation	7
Installation	7
Start Up	8
Changing the Conveyor Belt	9
Belt Tension	10
Belt Tracking	11
Telescoper Adjustment.....	11
Quick Start Up Overview	12
Troubleshooting	15
Mechanical Troubleshooting	15
Preventative Maintenance	17
General Maintenance	19
Lubrication.....	19
Feeder Storage Recommendations	19

Safety & Theory

Safety and General Precautions

The Milltronics 1200/3600 Series weigh feeder is not considered a risk to those installing, operating or maintaining them compared to other industrial machinery, however, some risks to personal safety do exist. Through the use of proper and safe techniques these hazards can be minimal.

Shock hazard

Although Milltronics electronics operate on standard 110 or 220 VAC power VAC, the equipment is often installed in wet environments and adjacent to conductive steel mounting framework. This voltage potential can be fatal under certain adverse circumstances. Always follow safe practices when working on or around the Milltronics electronics.

Turn off, lock-out, and tag the main disconnect switch "Do Not Energize" when connecting or working near the high voltage section of the integrator.

Warning!

Always follow established safe operating practices!

A weigh feeder can be dangerous. A pinch point exists between the idlers and pulleys and the conveyor belt.

ALWAYS STOP the belt, lock-out, and/or place a "Do Not Energize" tag on the main disconnect.

It takes very little additional time to secure the weigh feeder.

In particular, follow this safe practice when:

- Replacing the belt,
- Placing or removing the calibration test chain, or calibration weights,
- Working on or around the load cell,
- Working on or around the speed sensor.

Warning!

Whenever working near chain or belt drives, always be sure the guards are in place or the equipment is safely secured. The pinch points created by these drives can be dangerous.

Theory of Operation

Weighing feeders or weigh belts provide a means of weighing bulk material while being conveyed. This allows accurate rate of flow and totalized weight measurement without interrupting the flow of material in process. A weighing feeder also provides a means for controlling the rate of flow of the product being conveyed.

As in static weighing, in-motion weighing requires accurate transmission of the product load to a strain gauge load cell. The resultant voltage signal corresponding to weight is transmitted to the Integrator and becomes one of the two inputs required for integration.

Unlike static weighing, in-motion weighing requires a second input, which is a pulse signal proportional to the speed of the conveyor belt. Each belt speed sensor pulse represents a fixed distance of the travel.

Since the force measured by the load cell is represented as weight per unit length, it can be multiplied by the distance of the belt travel (one speed sensor pulse) to provide product weight for that segment of the belt.

Example: lbs/ft x ft = lbs

A summation of the samples provides total throughput weight of product across the scale. With proper scaling (calibration), the total weight takes on meaningful units of measure (pounds, short tons, long tons, metric tons, etc.).

Receiving and Unpacking

A thorough and systematic receiving inspection should be performed immediately upon receipt of the Milltronics systems.

Resolution of shipping damage claims and missing items can be made quickly and efficiently if damage or discrepancies are documented promptly on receipt of the shipment.

1. Check for possible shipping damage. Damaged boxes or crating suggests possible damage to the equipment contained therein. Notify the carrier immediately. Document all visible damage immediately with either photographs or a joint inspection with the carrier's claims representative.

Note:

Do not remove equipment from shipping crates or boxes until this has been done.

Reconcile the number of containers received against the inland bill of lading to assure shipment is complete to the container level.

2. After the considerations in Step #1 are satisfied, unpack one container at a time. Reconcile the contents against the packing slip.

Note:

Contact Milltronics immediately if discrepancies are found. Contact information is provided on the back cover of this manual.

Mechanical Installation

Your weigh feeder has been designed, assembled, and factory tested for your specific application. The following general instructions will assist you in the proper installation and operation of the machine. It is suggested that this information be given serious attention before the equipment is put into operation.

Notes:

1. Refer to the mechanical drawings sent with this manual prior to commencing with installation. These drawings will provide you with important general mounting dimensions and other specifications.
2. Do **NOT** remove the orange load cell protector until the installation is complete. Failure to follow this instruction may result in load cell damage.
3. Do **NOT** weld on or near the weigh feeder while the load cell is connected to the electronic integrator. Damage to the integrator may result if the load cell is not disconnected from the integrator.
4. Following a scheduled, preventative maintenance program will assure optimum performance and long equipment life.

Installation

Install the unit in its desired location according to the supplied mechanical drawing(s) in the following manner:

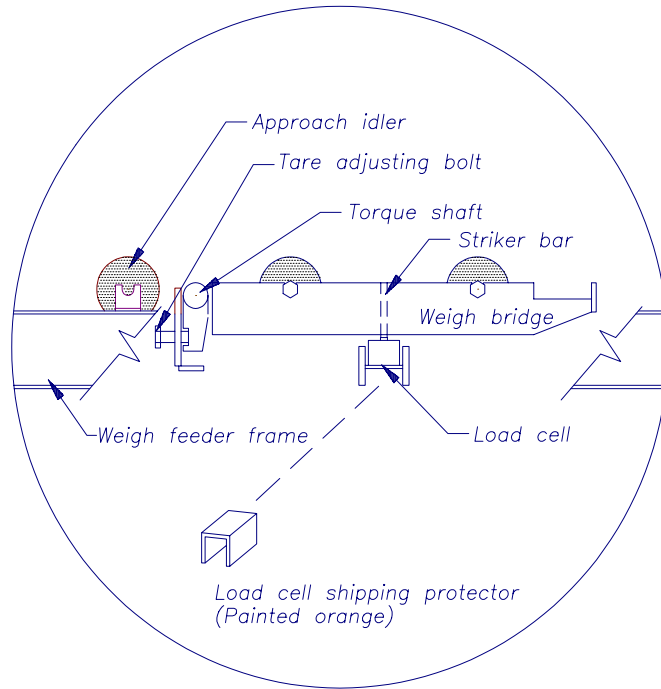
1. Align the in-feed section of the weigh feeder with the discharge of the feed device. Prevent twisting or misalignment, which may induce stress on the weigh section.
2. It is essential that the unit be securely fastened to a rigid, level structure. Use a level for installation and shim as necessary. Again, prevent any twisting of the frame, as it may affect feeder performance, and belt tracking.
3. Construct the necessary support framework to provide a sturdy, rigid base. Vibration isolators are recommended if the location is subject to moderate or heavy vibration.

Note:

If your system has a permanently lubricated gear motor, then disregard Step 4

4. Check the gear reducer oil level. See the gear reducer manual for further details on maintenance.
5. Check the chain tension to make sure the chain has been oiled.
6. Flexible in-feed connections are recommended for all applications.
7. Connect the proper electric supply to the motor and/or motor controller. Use the interwiring diagram supplied with this manual. The AC/DC motor controller (if present) must be grounded to minimize noise to the electronic integrator. Refer to the applicable wiring diagram to make all electrical connections between the electronic integrator and the weigh feeder.

8. Remove the ORANGE shipping protector which is attached to the scale and sandwiched between the load cell and the load cell striker bar. This shipping protector supports the weigh bridge during transport and installation. (See the Figure below)



9. Before starting the machine, make a final check to see that the conveyor belt is free from all tools and foreign objects.

Start Up

Your weigh feeder has been factory run-in for a minimum of four hours; thus it should require little adjustment. However, periodic inspections of the belt tracking are recommended.

Start the belt and observe rotation.

WARNING!
Turn off and lock out all power sources before correcting as required. On DC motors, reverse the armature wires. On AC motors, reverse 2 of the 3 motor wires.

Start the belt again and observe the machine as it is running. If the belt appears not to be tracking correctly, please see the "Belt Tracking" section on page 11

Shear Gate

The shear gate on the inlet of the weigh feeder has been factory set to allow up to the maximum feed rate capacity requested by the customer. No field adjustment should be necessary. Consult the factory if you have a problem.

Skirtboards

The skirtboards have also been factory set to proper specifications. Note that near the inlet, the skirtboards are very close to the belt. However, toward the discharge end of the feeder, the skirtboards are 1/8" to 3/16" higher off of the belt. This relieving effect minimizes the possibility of material becoming lodged between the skirtboard and the belt.

In addition to the previously mentioned relieving effect, note also that the distance between the skirtboards is greater at the discharge end than at the inlet end (by about 1/2"). This tapering is done also for material flow reasons--it will help the product move down the belt without "bottlenecking."

Periodic adjustments of the skirtboards should not be necessary. If adjustment is necessary, please follow the above guidelines.

Changing the Conveyor Belt

Enclosed Units:

The weigh feeder is cantilevered for belt removal only. The framework is not designed to support the operating weight of the feeder and material when the access side support legs are removed. Remove the legs only when removing the belt. Immediately re-install the legs after the belt has been changed. We recommend that you support the side of the feeder frame with a fork lift or other type of support while the access side support legs are removed.

1. Open and remove the access side doors.
2. Mark the position of the telescopers for reference. This will be handy when you re-install the belt. Loosen the telescopers to remove tension from the belt.
3. Remove the gravity (or spring) tensioner from the belt scraper arm.
4. If the feeder uses a flanged wall belt, remove the skirt boards from the unit. They are bolted to the top of the enclosure frame. If the feeder has a flat belt with no raised edges, the belt can be removed from the feeder without removing the skirtboards.
5. If the feeder uses a flanged wall belt, remove the bottom portion of the inlet. Your system may have inlet seals that also need to be removed.
6. Remove the bolts securing the access side support legs.
7. From the access side of the feeder at the discharge end, grab the edge of the belt on the top and bottom. Gently pull the belt over toward the side rail, making sure that the leading edge of the belt does not catch on the side rail.
8. Now repeat step #7 on the inlet end of the feeder. Again, be careful not to cut or scrape the belt on the side rail.
9. When both ends have been pulled to the edge of the side rail and cannot be pulled off any further because the belt is hitting the support legs, remove the support legs. The feeder bed may sag when the legs are removed.

10. Finish removing the belt by grabbing the belt in the middle and slowly remove the belt. If you intend to re-install the same belt, we recommend that you mark which direction the belt was rotating. This is to allow you to re-install the belt in the same direction. Care must be taken in storing the belt to prevent kinks or other sorts of damage.
11. With the belt removed, inspect the feeder for material build up, lodged particles, and signs of wear, paying close attention to the weigh section area. Care must be taken when cleaning the weigh section area as the load cell is a sensitive weighing instrument.
12. Reverse steps 1-11 for re-installing the same belt.

Warning:
Make sure to re-install the access side support legs!

Note:
On a new replacement belt, there may be an arrow printed on the underside of the belt. This arrow indicates what direction the belt should rotate when it is installed. If there is no arrow, rotation of the belt may be in either direction. Anytime a new belt is installed, a belt tracking procedure will need to be performed (see below).

Belt Tension

The ideal belt tension for any weigh feeder is just enough tension to prevent the belt from slipping on the drive pulley. This is done to minimize the effects that the belt may have on weighing accuracy. Often times the sole cause of an inaccurate weigh feeder is that the belt tension is too high.

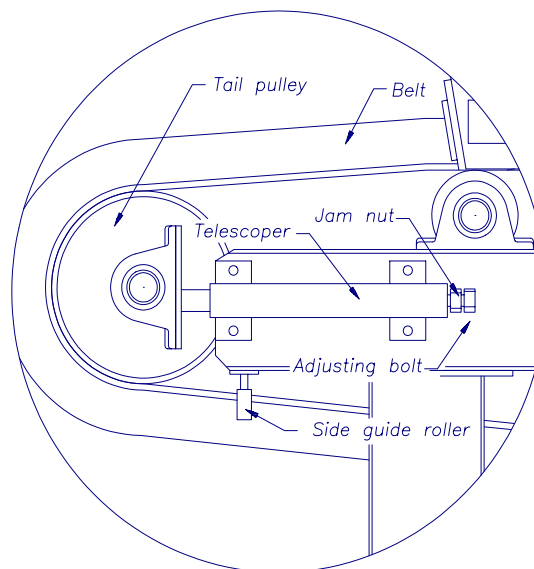
Due to varying applications, a specific measure of belt tension cannot be given. As a general guideline, the bottom of the belt should droop 1-2 inches for every four feet of horizontal length of the weigh feeder. Please note that this is only an approximate specification, as your application may require more or less tension due to varying belt loading and other operating characteristics.

Belt Tracking

1. Before attempting to track the belt, make certain that the belt scraper is in place.
2. In addition, make certain that the belt tension is near the factory recommended specifications before attempting to track the belt. See the "Belt Tension" segment on page 9 for details.
3. Finally, be sure that the feeder is level and true and that the installation has not warped or twisted the frame. Check for true and square between the head and tail pulley.
 - a. Turn on the feeder and observe its tracking line on the head and tail pulleys.
 - b. If the belt is drifting toward one side of the feeder, then telescoper adjustment on either side of the machine will be necessary (see below).

Telescoper Adjustment

1. First, determine which side of the machine you want to adjust. Compressing the telescoper on one side will cause the belt to drift toward that side of the machine. Conversely, extending the telescoper will cause the belt to drift away from that side of the machine.
2. Adjustment is done by first loosening the jam nut, and then turning the adjusting screw in the desired direction (see Figure below). Often times, only a small amount of adjustment (1 turn or less) will be required.



3. Observe the results of the adjustment and then readjust, if necessary.
4. Steps two and three may need to be repeated a number of times to obtain perfect belt tracking.
5. Please be aware that as you extend or compress the telescoper, you may be changing the belt tension. If you find that the belt tension has increased (or decreased) considerably while attempting to track the belt, then both telescopers

must be compressed (or extended) and the belt tracking process must be re-started. It is very important that the belt tension be maintained at a relatively low level. For this reason, it is a good idea to extend one telescoper while compressing the other to obtain proper belt tracking.

6. Don't forget to re-tighten the jam nut located on the telescoper to maintain the new telescoper position when the tracking procedure is complete.
7. If you are having problems tracking the belt, consult the factory.

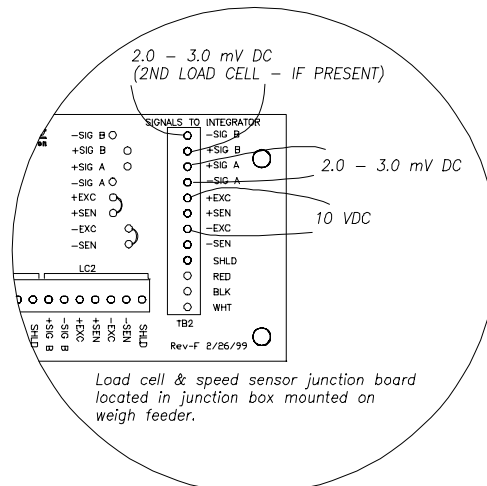
Common causes of belt tracking problems are:

- uneven or improperly distributed product loading
- twisted frame
- product build up on head or tail pulleys, etc...

Quick Start Up Overview

1. Verify that the weigh feeder is installed properly as described in the "Mechanical Installation" Section on page 7. Verify that the belt is tracking and the shear gate (if used) is properly set.
2. Verify that the data on the design data sheet included with this manual is correct and modify if required.
3. With the load cell and speed sensor connected to the integrator, check the following:
 - a. Millivolt signal from the load cell(s) at the load cell junction box mounted on the side of the feeder.
 - b. The millivolt signal should be between 10 and 15% of the load cells full scale capacity with the belt stopped, empty and sitting on the scale.

Normally, this value will be in the range of 2.0 - 3.0 mV. (See Figure below) If your weigh feeder is not in this range, check the mechanical drawing supplied with this manual to see if there are any application specific notes regarding this situation. If not, consult the factory for further instructions. It may be necessary to adjust the mechanical tare. (See Figure on page 8).



4. Verify that all related electrical devices are properly installed and wired per the supplied interwiring diagram.
5. Read the integrator/controller manual for instructions on configuring and calibrating the feeder. The feeders are calibrated at the factory. Typically, it is only necessary to check zero and span and then perform a material to test to verify the calibration.

Troubleshooting

Mechanical Troubleshooting

If operating errors are suspected to be caused by a mechanical problem, it is useful to review the mechanical installation procedures in the "Mechanical Installation" section on page 7 of this manual, followed by a thorough visual inspection of the system.

Review and check the common problems listed below.

Note:

If you have difficulty determining the cause of the problem you are experiencing, contact the Service Department at Milltronics, Inc. Be sure to have the Model Number and Serial Number of your system and all of the calibration and set up parameters available *before* calling. Your time spent trouble shooting the system will be minimized if you record and fax the information to Milltronics before calling or checking other parts of the system.

The following are some of the more common mechanical problems experienced with weigh feeder systems:

Zero Drift, non-repeatability, or non-linearity.

Check for these following conditions:

- Weigh idler alignment
Verify weigh idler alignment is as accurate as possible. Use a straight edge along the edges of the idlers to measure. Improper alignment is the most common mechanical problem affecting scale accuracy. Contact the factory if you find a problem here.
- Material build up on weigh section or pulleys.
- Belt mis-tracking.
- Belt too tight
- Load cell bolts loose.
- Speed sensor coupling, pulley, or idler slippage.
- Material build-up between the weigh idler and feeder frame.
- Load cell shipping protector (orange) never removed.
- Head or tail pulley too high or low, relative to idler alignment. The head and tail pulleys should be at least 1/8" lower than the approach and retreat idlers.

Preventative Maintenance

Periodic housekeeping and follow-up calibration on a routine schedule allows continuing high accuracy performance from the scale and weigh feeder.

Alignment of the weigh bridge with the approach and retreat idlers is of paramount importance for accurate weighing. Periodic measurement to verify alignment is recommended.

Depending on accuracy expectations and operational constraints, the frequency of routine maintenance will vary from application to application. The maintenance schedule on page 18 is recommended by Milltronics to maintain top performance and accuracy of the system. An eight (8) hour day operating schedule, moderate weather conditions, and a reasonably clean environment, are assumed for the recommended maintenance. A longer operating day, severe weather or dusty conditions will dictate a more rigorous maintenance schedule

Recommended Preventative Maintenance Schedule

Item	Requirement	Frequency	Comments
Weigh Section	Blow or brush off any material build up	Weekly	More frequently in dirty environments. Focus on load cell area.
Belt Tracking	Visually inspect to assure belt remains trained.	Daily	Contact the factory if you have on-going tracking problems.
Integrator Calibration	Span Check	Monthly	Use provided calibration weights or chain, electronic cal or material test. See integrator manual
Integrator Calibration	Zero Check	Daily or at least once a week	See the zero section of the integrator manual.
Bearings	Inspect and lubricate as required.	Every 10,000 hours of operation	Use #3 NLGI Grade lithium base grease (See notes 1 and 2)
Chain and Sprockets	Inspect, lubricate and clean as required.	Monthly	Solvent clean and lubricate drive chain with 30 weight oil. Adjust chain tension if needed.
Electric Motor	None	None	Bearings are sealed and permanently lubricated.
Gear Reducer	Check oil level	Monthly	Refer to manufacturer's maintenance manual included in the associated equipment section of this manual
Gear Reducer	Replace oil	Every 2500 hours of operation	See note above

Note #1:

In extraordinary climatic or environmental conditions, special lubricants may be required.

Note #2:

In corrosive environments, more frequent lubrication is required to purge contaminants

General Maintenance

The equipment should be cleaned periodically to maintain a high level of accuracy. Any excess accumulation of product should be removed to minimize potential damage to the mechanical components and scale accuracy.

When the belt is removed for cleaning, always check the weigh section area for material build up. Clean as required for proper performance. Always remember that this equipment is not just a conveyor, it is also a scale. Accuracy will not be maintained unless the equipment is properly maintained.

Abrasions, cuts, or ragged edges on the belt will create performance problems. Belt replacement is recommended if the belt becomes ragged or torn.

Lubrication

All head and tail pulley bearings are pre-greased at the factory. These bearings should be field greased periodically. The frequency of lubrication may vary due to specific operating conditions. Some dry, dusty applications may warrant weekly greasing, while other less harsh applications may need greasing only once or twice a year. In no case, however, should more than 10,000 hours elapse between regreasing operations.

If there is a gear reducer supplied with your weighfeeder, it has an initial break-in period. After the first 250 hours of operation, the gear box(es) should be drained and refilled to the proper level(s). Subsequent oil changes should be done every 2500 hours thereafter. See the gear reducer manual for further details.

Feeder Storage Recommendations

In the event that a feeder will be stored for a period of three months or more, it is recommended that the following guidelines be followed:

1. Load Cell Care

The load cell shipping protector should be installed anytime the feeder is moved. It may be a good idea to install these shipping protectors during the storage period as an extra safety measure. Do not forget to remove the shipping protectors upon re-installation.

2. Gear Reducer/Gear Motor

The chain tension should be removed and the chain should be coated with grease and fully wrapped in plastic.

In addition, the gear reducer should be filled completely with an appropriate gear oil. This is to prevent the formation of any oxidation that may occur. When the equipment is re-installed, this gear oil must be completely drained and then the reducer must be refilled to the appropriate level(s).

3. Electrical

To prevent oxidation, a desiccant or some type of moisture removal material should be placed in all electrical junction boxes component cabinets. This includes the load cell junction box, the integrator cabinet, and the SCR enclosure (if present).

4. Lubrication

All greaseable idler rollers should be greased.

5. Belt Care

Finally, to prevent belt damage, the belt tension should be reduced to a minimum. **DO NOT STORE THE FEEDER IN DIRECT SUNLIGHT**, as this will cause premature breakdown of the belt. Do not forget to re-adjust the belt tension at the time of re-installation.

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