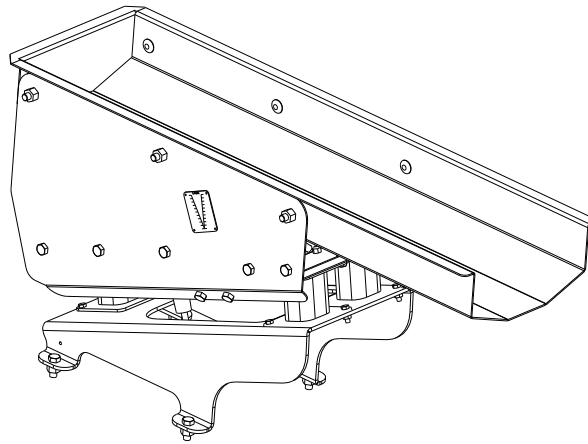


MINI VF ADVANCE Conveyor



Installation Operation and Maintenance Manual

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1 INTRODUCTION

Thank you for buying your equipment from PPM Technologies. This manual will help you to understand how your equipment operates and what is required to maintain peak performance. Please read it thoroughly and keep it on file for reference. Your satisfaction is very important to us. Please direct any comments, questions or concerns to our Service Department at 503-537-5333 or 503-538-3141.

Date Purchased: _____
Serial No.: _____
Factory Order No.: _____
General Arrangement Drawing No.: _____

1.1 SAFETY INSTRUCTIONS



WARNING: PPM Technologies is not liable for any damage or reduced performance that may occur as a result of improper equipment assembly and installation, or due to unauthorized alterations. Such actions will void any and all warranties.



WARNING: These instructions and safety precautions must be followed. There is danger of electrical shock to the operator.



WARNING: The unit must be properly grounded and verified at installation.



WARNING: The electrical power supply connection to the PPM-supplied unit must be made through a customer-supplied safety disconnect switch. Incorporation of an emergency stop may also be required, according to local codes.



CAUTION: Local safety codes and regulations must be considered when installing and/or operating this equipment.



Product safety labels must be highly visible on the equipment. Check visibility regularly. If safety labels need replaced, contact PPM Technologies for an additional supply free of charge.



Supporting information that may be attached (e.g., drawings) takes precedence over corresponding information printed in this manual.

INTRODUCTION

Safety is a basic factor in the maintenance and operation of MINI VF ADVANCE Vibrating Conveyors. Proper clothing, tools and methods of handling can prevent serious injury to you or a fellow worker. A number of safety precautions are listed throughout this manual. Please study and follow the precautions and insist that your coworkers to the same.

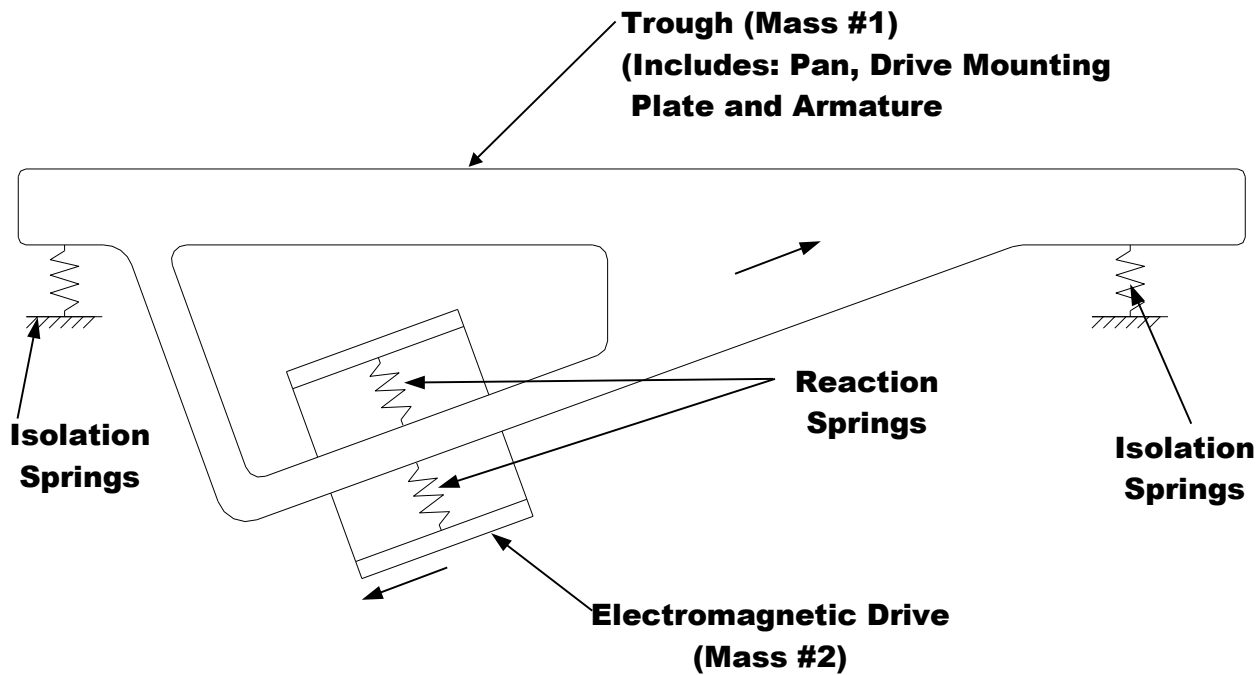
1.2 SPECIAL CONSIDERATIONS

Each conveyor by design has components or properties that may require special consideration. These items are noted here to avoid potential problems when operating or servicing MINI VF ADVANCE conveyors.

MINI VF ADVANCE conveyors are dynamically balanced, tuned machines; it is imperative that no weight be attached in any way as it may negatively affect performance and void the warranty. A one-inch (25 mm) clearance must be maintained at all points so that there is no contact while the conveyor is operating.

1.3 DESCRIPTION

The "MINI VF ADVANCE" Conveyor Drive, properly sprung and coupled with a matching trough, is a dynamically balanced, tuned, two-mass vibratory conveyor. A typical MINI VF ADVANCE Conveyor consists of two spring-connected masses and an isolation system. (Refer to **Figure 1.**) **Figure 2** illustrates the components of the "MINI VF ADVANCE" Conveyor.



1: Two-Mass Vibratory System

Figure

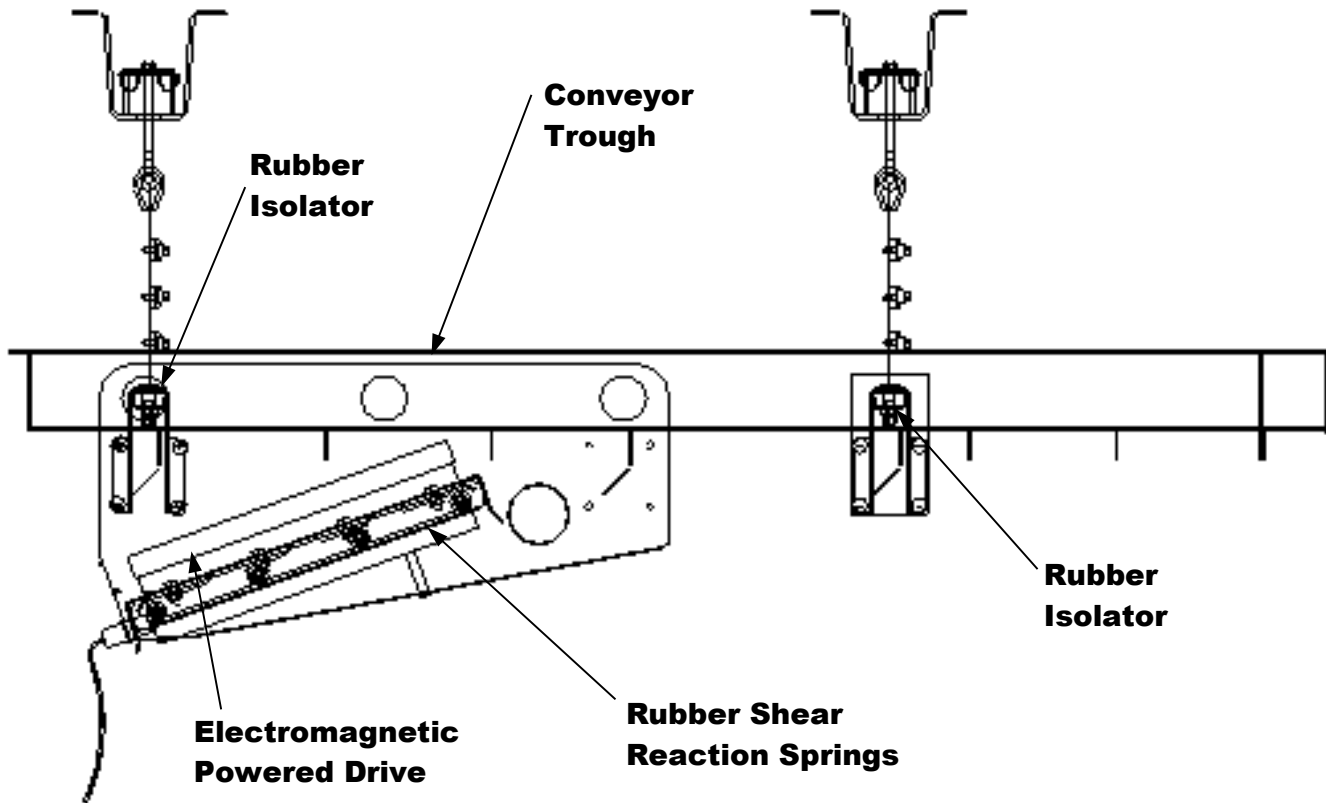


Figure 2: MINI VF ADVANCE Two-Mass Vibratory Conveyor

2 INSTALLATION

2.1 LONG TERM STORAGE

MINI VF ADVANCE Conveyors should be stored indoors. If stored off-site, place on cribbing, cover with plastic, and move drive to an inside storage area.

2.2 SITE PREPARATION

The MINI VF ADVANCE Conveyors' isolation system is designed to prevent transmission of dynamic loads to the support structure. However, the natural frequency of the support structure must not be too close to the operating speed of the conveyor. This condition results in large support structure displacements and stresses that may cause failure of the support structure. **The natural frequency of the support structure must be greater than 1 1/2 times or less than 2/3 of the operating speed of the unit. Also, the support structure design should limit the calculated dynamic deflections to ± 0.004 inches (0.1 mm) in all directions.** Static and dynamic forces for each conveyor can be obtained from the general arrangement drawing of the unit.



WARNING: PPM Technologies is not responsible for damage or personal injury resulting from improperly designed or constructed supports. Installation of the conveyor on improperly designed or constructed supports will void any and all warranties.

Regardless of whether this equipment is installed at grade level, elevated, or on upper floors, the mounting surfaces at the location of the coil spring isolators must be level or at a uniform slope. Grade 5 bolts (minimum) are recommended for connections to elevated steel work.

When designing the site layout for the conveyor system, it is important that a one-inch (25 mm) clearance be maintained at all points. It is also important to provide clearance in the layout for drive (and drive guard) removal and accessing the drive for maintenance. Avoid severe inclines that reduce the capacity of the conveyor.

MINI VF ADVANCE Conveyors are designed to operate in wet or dry environments. The ambient temperature should be between 40°F (4°C) and 110°F (43°C). **NOTE: Ambient and product temperatures must be specified when ordering a conveyor.**

The air supply (if required) must be clean, dry or slightly oily, and regulated. Normally 80 psi is more than adequate for accessory operation. (For additional information, see **ACCESSORIES**.) Refer to the drawings supplied with each order for specific air pressure recommendations.

2.3 EQUIPMENT INSTALLATION

For proper operation, all isolators must be seated in the isolation bracket retainers. Isolation cables must not come into contact with the isolation bracket or any surrounding structures.

If rubber seals are installed between the pans of in-line units, contact should not restrict the motion of the machines. This should be checked in both the loaded and unloaded conditions.



CAUTION: The conveyor must not come in contact with any rigid object or adjacent surface that could hamper its vibrating action. A 1-inch (25 mm) clearance must be maintained.



CAUTION: The rubber components of the conveyor must not come in direct contact with oil for an extended period of time or be exposed to ambient temperatures exceeding 115° F (46° C).



WARNING: The electrical power supply connection to the PPM Technologies supplied control must be made through a customer-supplied disconnect switch which must be mounted next to the control. If possible, install the control at a location where it will receive adequate ventilation. This will ensure prolonged component life.



CAUTION: The conductor, between the conveyor and control, must be of sufficient size to carry the current designated on the equipment nameplate.



CAUTION: Be certain that the equipment is properly grounded.



WARNING: PPM Technologies is not responsible for damage or personal injury resulting from improperly designed or constructed supports. Installation of the conveyor upon improperly designed or constructed supports will void any and all warranties.



CAUTION: Do not make any alterations to the conveyor without first contacting PPM Technologies. PPM Technologies will not assume any responsibility for poor conveyor performance or mechanical failure as a result of unauthorized alterations to the equipment. Such actions will void any and all warranties.



CAUTION: Local safety codes and regulations must be considered when installing and/or operating this equipment.

NOTE: The natural frequency of the support structure must be greater than 1 1/2 times or less than 2/3 of the operating speed of the unit. The support structure design should limit the calculated dynamic deflection to ± 0.004 inches (0.1 mm) in all directions. Isolation forces for each model can be obtained from the general arrangement drawing.

2.3.1 INSTALLATION EQUIPMENT AND TOOLS

The following equipment and tools are required or recommended for conveyor installation:

- Transit
- Crane or forklift and come-along
- Lifting straps
- Digital level
- Tape measure
- Plumb bob
- Chalk line
- Heavy duty drill and masonry bits

2.3.2 LIFTING INSTRUCTIONS

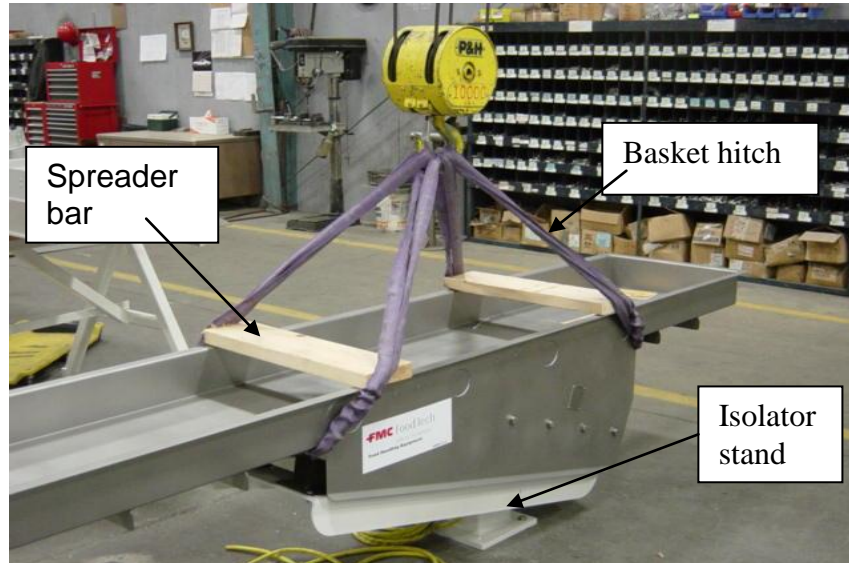


FIGURE 3a: VF CONVEYOR ATTACHED TO HOIST

To move the MINI VF ADVANCE conveyor, create a basket hitch using two soft straps or similar items rated for a minimum 2000 lbs as shown in figure 3a. To prevent damaging the isolators the trough assembly should be moved separately from the isolator stand. Make sure each strap is securely fastened at both ends of the wing plates on the conveyor. Place a spreader bar in between both straps to prevent the trough from flexing; two 2 x 6's are shown in figure 3a. Securely attach the strap to a lifting device such as a hoist or forklift. Slowly raise conveyor then move into position and attach to isolator stand.

In some cases, the wing plates are located directly at the infeed of the conveyor trough. In this case securely place the strap at the infeed end of the drive as shown in figure 3b.



Fig. 3b: VF CONVEYOR ATTACHED TO HOIST

INSTALLATION

2.4 ISOLATORS AND ISOLATOR SUPPORT BRACKETS

The isolation system can be either floor-mounted or suspended. The isolator support bracket that is furnished for a suspension-mounted isolation system is different from the floor-mounted isolation system bracket. Therefore, the type of isolation system (floor-mounted or suspended) must be specified when the conveyor is ordered from PPM Technologies.

2.5 FLOOR MOUNTED CONVEYORS

Before starting, review all equipment drawings for specific installation instructions, support loads, and dimensions. Lay out conveyor centerlines first, and then lay out support centerlines with a chalk line. Position supports on centerlines and transfer hole locations from supports to the floor. Drill holes for anchor bolts based on recommendations by the anchor bolt manufacturer. Insert the anchor bolts in the holes, and place supports into position. Using a transit, place steel shims at each anchor bolt location to raise supports to the proper elevation, making sure to allow one inch for installation of grout. (See **Figure 4b.**) Plumb the supports with shims, using a plumb bob or digital level. Tighten anchor bolts and recheck plumbness and hole centers at the top of the supports. After all bolts are tightened, install non-shrinking grout between floor and bottom of support.

The rubber isolators must be mounted with the “Top arrow” on the isolator pointing towards the discharge end of the conveyor. This can be verified by making sure that the isolator is leaning forward instead of backward or sideways (see **Figure 4a**). One pair of isolators is mounted on the trough and one pair is mounted on the counter-stroking drive to balance the dynamic forces. Refer to the general arrangement drawing of the unit to determine the proper location for each pair of isolators. To ensure that transmitted loads are balanced, it is imperative that the isolators be installed in the correct locations.

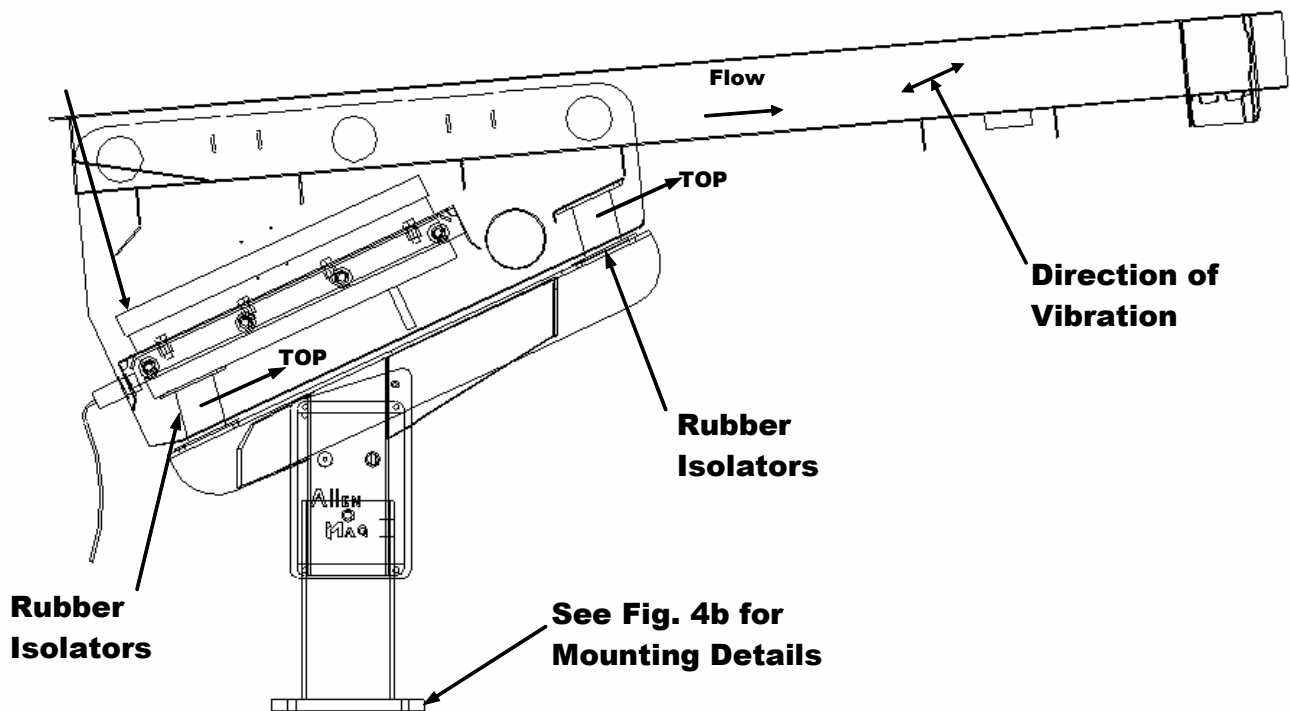
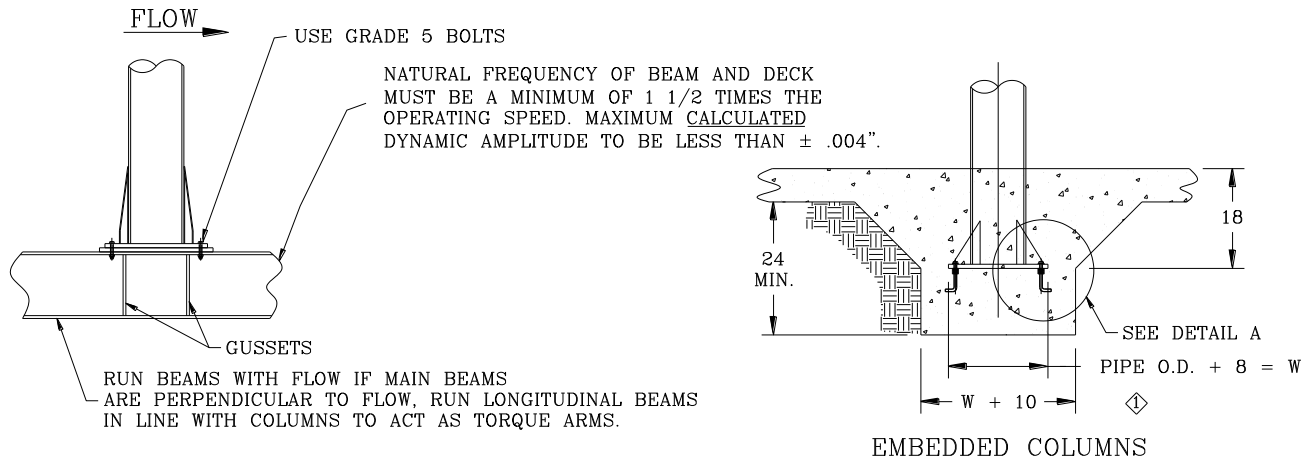


Figure 4a: Typical Floor-Mounted Conveyor

INSTALLATION



MOUNTING ON STEEL WORK

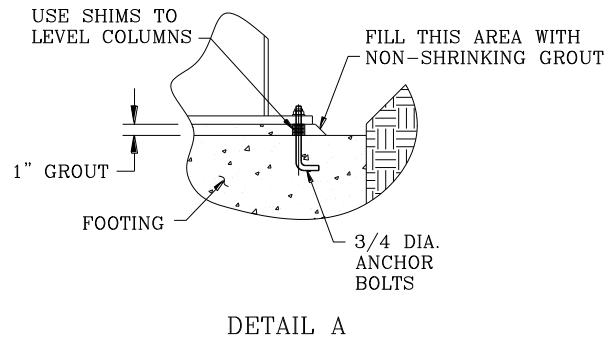
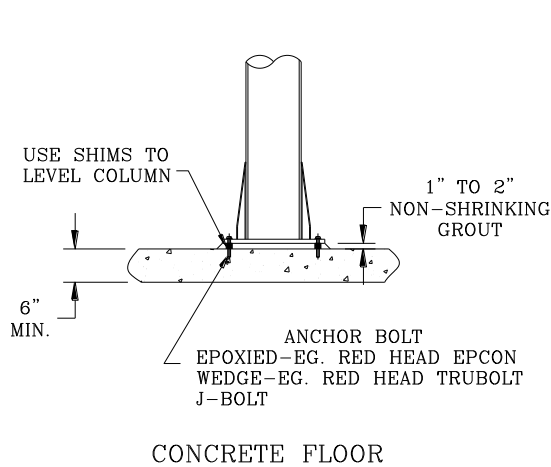


Figure 4b: Floor Mounting options

2.6 SUSPENSION MOUNTED CONVEYORS

For suspended units, the top isolator bracket must be attached to a rigid structure. Clamp the top isolator bracket tight using a Grade 5 bolt (minimum). When attaching to a concrete ceiling, a high-quality epoxy-based anchoring system such as the Red Head Epcon system is recommended. A high-quality wedge-type anchoring system such as the Red Head Trubolt is also acceptable.

When lifting the conveyor, make sure that the lifting straps straddle the center of gravity of the conveyor to ensure a safe lift. To ensure a safe lift on cable-isolated conveyors, the unit can be lifted by wrapping a chain around the isolator bracket, as long as the chain angle is within 30° of vertical. **NOTE: Use edge protectors around sharp edges, and a spreader bar above the trough to prevent bending the sheet metal.** Lift the conveyor into position and install the isolators in the proper locations.

INSTALLATION

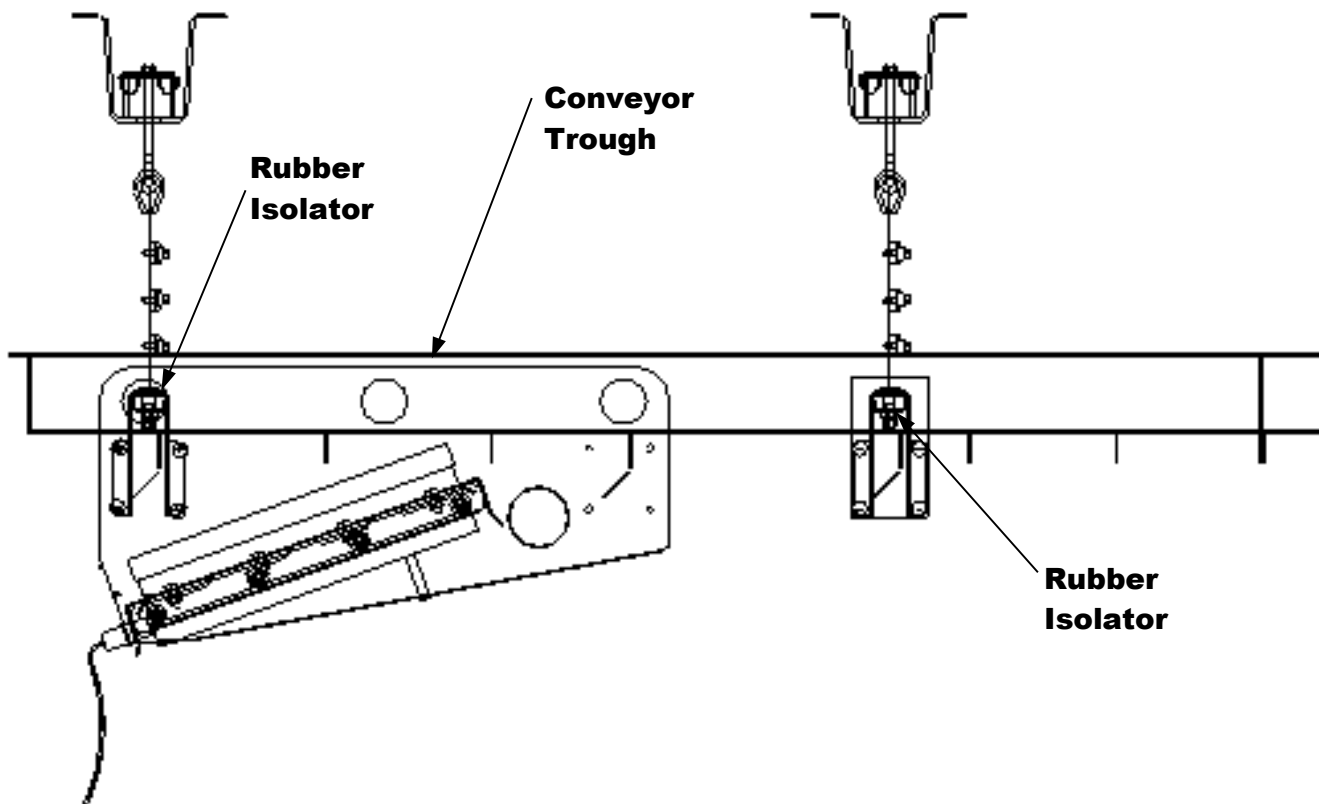
Check for even loading on the isolators by measuring the compressed height of the coil springs. The height of the coil springs should be the same from one side of the conveyor to the other within 1/8 inch (3.2 mm). For each pair of suspension cables, the left-side cable should have the same tension as the right-side cable. This can be gauged by pushing and pulling laterally on the cables. Also, check the side-to-side levelness of the conveyor with a level. If adjustment is required, lift the conveyor off of the coil springs by an inch or two (25 or 50 mm), and adjust the effective length of the cable by turning the adjusting nut at the bottom of the cable. Set the conveyor back down on the coil springs. Re-check all isolator locations and repeat the process, if required.

IMPORTANT: For conveyors located above floor level that are suspension-mounted, PPM Technologies requires that safety cables be installed around the conveyor.



WARNING: Do not use rods for suspending the conveyor. PPM Technologies is not liable for any damage or reduced performance that may occur as a result of improper equipment installation or due to unauthorized alterations. Such actions will void any and all warranties.

On most units, isolator stiffness corresponds to a specific location. The coil spring have a color-coded stripe on them and the rubber elements at the bottom are color-coded as well. Refer to the General Arrangement drawing supplied with the conveyor to determine the proper location for each pair of isolators.



5: Typical Ceiling Mounted Conveyor

Figure

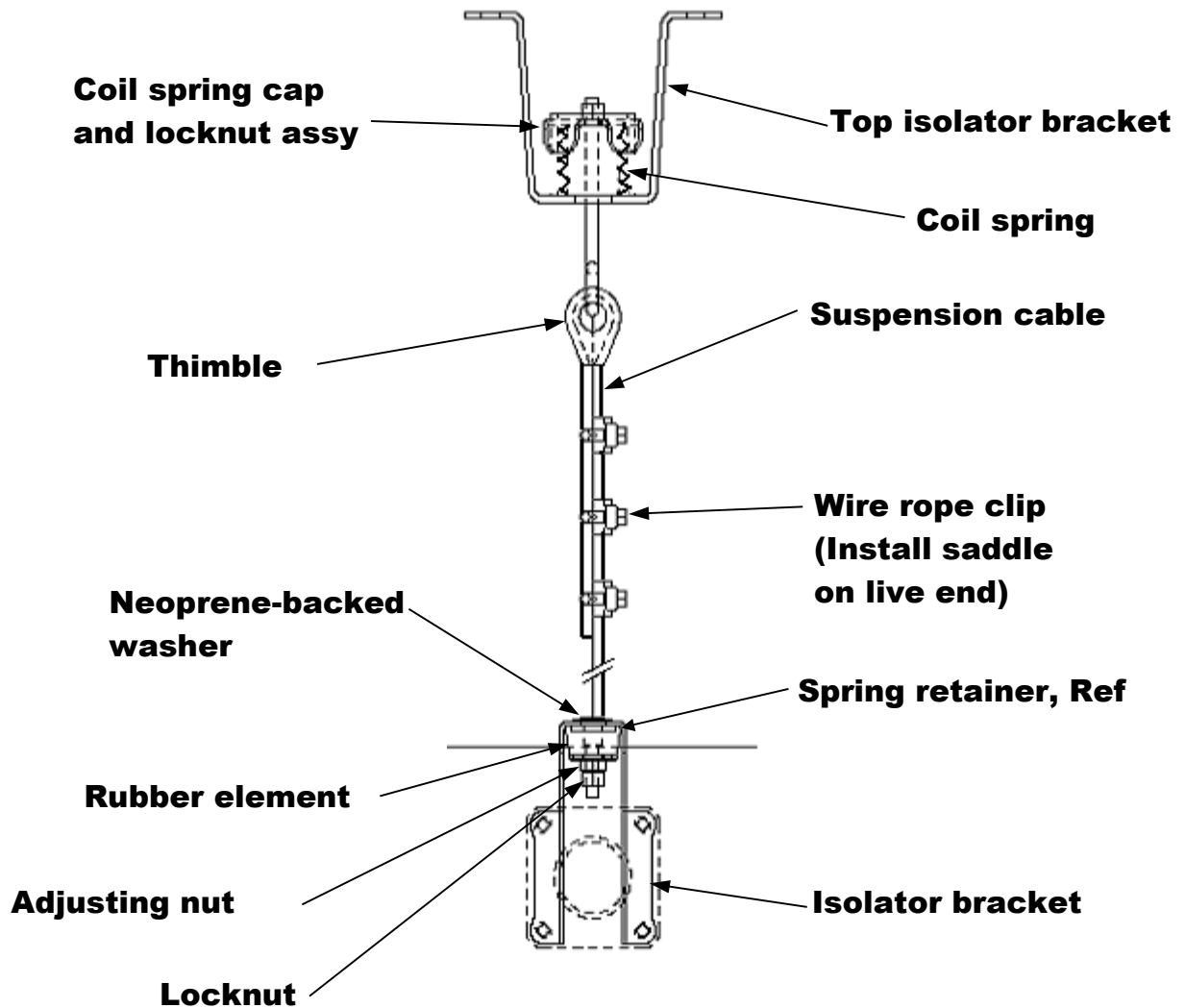


Figure 6: Typical Suspension Mounted Conveyor



CAUTION: After the isolator is assembled, at least one full thread on the cable fitting must protrude through the locknut.



For both floor-mounted and suspended isolation systems, conveyor installation must include a final adjustment to ensure that the isolators are loaded equally on the left and right sides of the conveyor.

2.7 SAFETY SLING RECOMMENDATION

- For Information Purposes Only -

Safety cables should be used on all PPM Technologies equipment that is either: (i) hung from the ceiling; or (ii) mounted in any other area that could result in bodily or physical harm should the unit become dislodged from its mounting position. Below are basic guidelines that PPM Technologies suggests for using safety cables.

1. PPM Technologies recommends installing safety cables at each conveyor support location. On short equipment use at least two (2) safety cables spread far enough apart to equally distribute the conveyor's weight.
2. Safety cables should be wrapped around the base, unless there is a chance that the cable could slip off under dynamic loading, in which case it is recommended to wrap the cable between the trough and base as close to the conveyor as possible without coming in contact with the conveyor as it vibrates.
3. On most PPM Technologies models, use at least 1/4" diameter coated wire rope (5/16" O.D.) for the safety slings, rated at a minimum breaking strength of 7000 lbs.
4. If using cable clamps, make sure that the load bearing side of the safety cable is on the nut/saddle side of the clamps. Use a minimum of three clamps on each cable end. 5/16" diameter wire rope cable clamps should be torqued to a minimum of 30 ft-lbs.
5. On PPM Technologies Models: *BL*, *LBL*, *Dynatron*, *Magnatron*, and *Vastron* use 3/8" diameter coated cables (7/16" O. D.). 7/16" diameter wire rope cable clamps should be torqued to a minimum of 65 ft-lbs.
6. Safety cables must be secured to existing building ceiling structure. Fastening must be done in the manner specified by the manufacturer(s) of the fastener and safety cable. Installation must be done only by a certified or otherwise qualified person experienced in this type of installation. Structural integrity and installation shall be the responsibility of "others" and not PPM Technologies.

REQUIREMENTS

- **Safe Work Load.** The safe working load of the wire rope slings must not exceed rated capacities. Installation by "others" should follow the wire rope sling manufacture's recommended safe working load for the specific angle of loading, provided that you maintain a safety factor of five (5).
- **Environmental Effects.** Do not expose fiber core wire rope slings to temperatures above 180 °F. Consult sling manufacturers before using slings in chemically active environments or in temperatures above 400 °F or below -60 °F.
- **A preventive maintenance program** should be established based on all applicable manufacturers' recommendations and/or experience gained from use of the equipment. The program shall include procedures and a scheduling system for normal periodic maintenance items, adjustments, replacements, and repairs. The program shall also ensure that records are kept and unsafe test and inspection discrepancies are documented and corrected. The need to repair or replace slings shall be determined by a certified or otherwise qualified person based on an evaluation of inspection results.

Disclaimer

PPM Technologies and its agents to ensure the accuracy and reliability of the information contained in this reference guide have put every reasonable effort forth. However, neither PPM Technologies, its agents, nor its consultant(s) make any effort representation, warranty, or guarantee in connection with the publication of these recommended methods and procedures. PPM Technologies hereby disclaims any reliability for loss or damage resulting from their use; for the violation of any federal, state, county, or municipal regulations with which these recommended methods and procedures may conflict; or for the infringement of any patent resulting from use of these recommended methods and procedures. These handling and installation instructions are not intended to preclude normal safety procedures, which should be followed to prevent injury to personnel. SAFE INSTALLATION PROCEDURES SHALL BE ENTIRELY THE RESPONSIBILITY OF THE INSTALLER.

IN NO EVENT SHALL PPM TECHNOLOGIES BE LIABLE FOR CLAIMS OF PERSONAL INJURY OR FOR SPECIAL, INCIDENTAL, INDIRECT OR CONSEQUENTIAL DAMAGES, INCLUDING, BUT NOT LIMITED TO, LOSS OF PROFITS OR REVENUE, LOSS OF USE OF THE CONVEYOR OR ANY ASSOCIATED EQUIPMENT, COST OF CAPITAL, COST OF THE SUBSTITUTE EQUIPMENT, FACILITIES OR SERVICES, DOWNTIME COST, CLAIMS OF CUSTOMERS OF THE OWNER FOR SUCH DAMAGES, OR FOR DAMAGE TO PROPERTY, WHETHER SUCH CLAIM SHALL BE FOR BREACH OF CONTRACT, BREACH OF WARRANTY, NEGLIGENCE OR STRICT LIABILITY, AND WHETHER SUCH CLAIM ARISES OUT OF OR RESULTS FROM THIS LIMITED WARRANTY, OR EXPRESS OR IMPLIED WARRANTIES, OR FROM THE DESIGN, MANUFACTURE, SALE, DELIVERY, RESALE, INSTALLATION, TECHNICAL DIRECTION OF INSTALLATION, INSPECTION, REPAIR, OPERATION OR USE OF THE CONVEYOR OR SAFETY CABLES.

All specifications are subject to change without notice.

3 OPERATION

3.1 MINI VF ADVANCE CONVEYOR OPERATION

Vibration in the MINI VF ADVANCE drive is produced by an electromagnet and armature. Current is applied to the electromagnet, and the armature is pulled, along with the entire trough assembly, toward the electromagnet. The trough assembly moves forward and up during this portion of the stroke. Then power is shut off, and the drive springs pull the trough assembly down and rearward. Then the coil is re-energized and the cycle repeats. (Refer to **Figure 1.**)

Through rectification of the AC supply voltage, the MINI VF ADVANCE control supplies power to the drive at the proper voltage and frequency. The MINI VF ADVANCE control and drive unit will operate on either 50-Hz or 60-Hz line frequency.



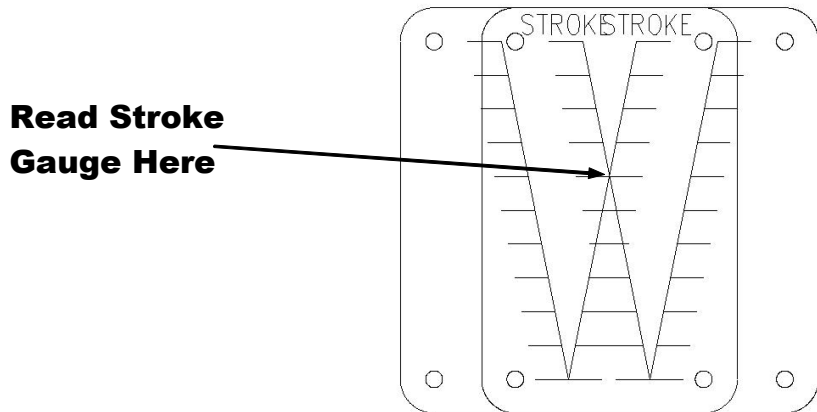
CAUTION: Do not operate the MINI VF ADVANCE conveyor and control on a supply voltage other than the designated voltage.

Using the pulsating action described above, the trough assembly moves the particles being conveyed forward, then pulls back and allows them to land downstream. Repeating this action causes the material to convey smoothly along the entire length of the trough to the discharge.

An analog position sensor is installed between the trough and the drive assembly to provide stroke and frequency information to the controller. The controller varies the power to maintain a constant trough stroke.

3.2 MEASURING THE STROKE

The stroke of a MINI VF ADVANCE conveyor can be easily measured on the stroke gauge mounted on the trough. When the conveyor is running, the stroke of the unit is determined by the intersection of the inner lines, as indicated in **Figure 7.** When the inner lines appear as an “X”, the stroke should be read at the intersection of the “X”. The maximum stroke for a MINI VF ADVANCE conveyor is .25 inches (6.3mm). Position and quality of the individual stroke gauge may cause a variance of as much as 0.010 (0.25 mm); this is generally an acceptable reading.



e 7: Reading the Stroke Gauge

Figur

3.3 CHECKING THE SPEED

OPERATION

To check the speed of the conveyor, aim the light beam of a digital tachometer at a vertical or near-vertical edge of the trough while the conveyor is running. (See **Figure 8.**) Hold the tachometer steady until a consistent readout is obtained.

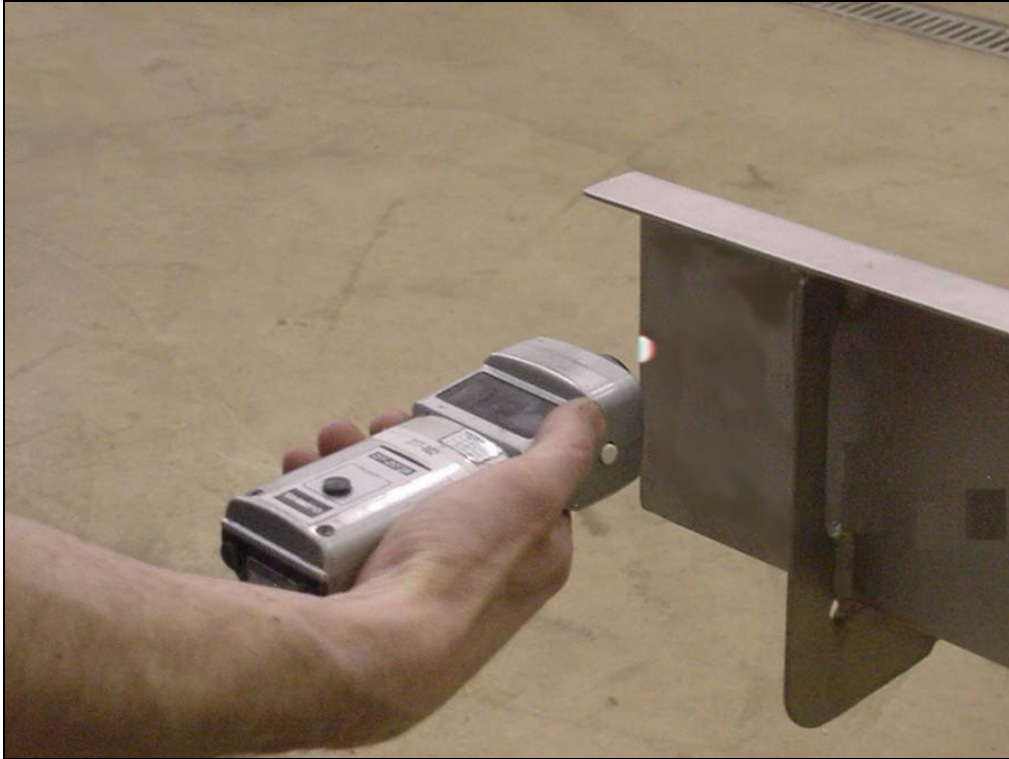


Figure 8: Checking Conveyor Speed with a Digital Tachometer

4 MAINTENANCE

4.1 CONVEYOR MAINTENANCE



WARNING: Before performing any maintenance, the electrical power supply must be disconnected at the safety disconnect switch.

The MINI VF ADVANCE Conveyor is basically maintenance free. Some materials may adhere to the trough surface and will require periodic cleaning. Inspect the unit regularly, and clean as required to avoid losing conveyor performance.

The MINI VF ADVANCE drive is a modular design. The drive must be returned to PPM Technologies Systems to be repaired. (Refer to instructions for removing and replacing the drive.)

4.2 TUNING WEIGHTS

CD 30/35 CONTROL

On most CD 30/35 controlled units, tuning weights are not required. Occasionally, tuning weights are used to adjust the operating frequency of the unit. They have no direct effect on the stroke of these units.

4.3 REMOVAL AND REPLACEMENT OF DRIVES

Caution! MINI VF ADVANCE drives can weigh up to 150 pounds. When removing the drives, proper lifting equipment is required to handle this much weight.

1. Disconnect the power to the control and then disconnect the drive cable from the control.
2. Remove any ballast weights from the drive, noting size and location.
3. Bolt two pieces of angle to the bottom of the drive that extend beyond the sides of the drive to aid in handling.
4. Install a 5/8-11 eye bolt to the top of the drive. Attach a lifting device to the eye bolt. Remove the eight ½-13, grade 5 capscrews that secure the drive to the drive mounting plate.

MAINTENANCE

- Replace the drive in the reverse order of steps 1 through 4. The MINI VF ADVANCE drive must be oriented correctly to avoid an excessively high current draw by the coil. When replacing a MINI VF ADVANCE drive unit, the drive must be oriented so that the sensor flag is at the top, infeed end of the drive, and the cable exits the drive unit at the lower, middle end of the drive (See Figure 9).

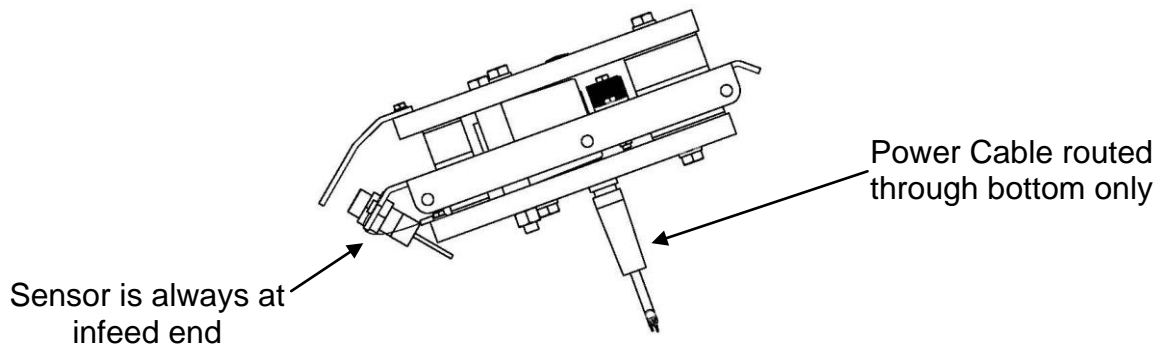


Fig. 9 Drive sensor & magnet orientation



CAUTION: Each unit is factory tuned. Consult PPM Technologies prior to adding or subtracting weight to the conveyor trough or drive unit.

PPM Technologies is not responsible for conveyor performance as the result of unauthorized modifications.

4.4 MAINTENANCE SCHEDULE

Frequency	Maintenance Check	Action required
Daily	Check stroke of machine on stroke sticker	Ensure stroke is at or below the design stroke for the unit shown on the nameplate.
Monthly	Inspect isolation system for wear, damage or fatigue.	If isolation cables or springs show signs of wear, replace components and adjust cables to ensure cables are equally loaded from side to side.

4.5 CONVEYOR ACCESSORIES

The MINI VF ADVANCE Conveyor is a tuned machine; it is imperative that no weight be attached in any way, as it will negatively affect the performance of the machine and void the warranty. One inch (25 mm) of clearance must be maintained at all points, so that the accessories do not contact the conveyor while it is operating.

When a cover is required, it can be floor mounted, base mounted or suspension mounted.

4.6 TROUBLESHOOTING - For Operation with CD30/35 Control

NOTE: Refer to the required control manual for proper controller setup.

PROBLEM	CAUSE	CORRECTION
Overstroking (high amplitude)	Max pot. set too high.	Turn down the max pot.
	Torn or broken isolation springs.	Replace.
	Torn or degraded rubber reaction springs.	Replace drive. See MAINTENANCE .
	Sensor gap too large.	Decrease sensor gap.
	No sensor signal.	Replace sensor and wire.
Understroking (low amplitude)	Max pot set too low.	Turn up the max pot.
	Broken or modified isolation springs.	Replace.
	Excessive motion of support structure.	Modify support structure to eliminate resonance.
	Incorrectly adjusted control.	See page 18.
	Burned out magnet coil.	Check for continuity at power terminal on the drive If open, consult factory.
	Torn or degraded rubber reaction springs.	Replace drive.
	Defective or cracked trough.	Repair or replace Consult PPM Technologies.
	Restricted motion.	Increase clearance with adjacent equipment.
	Low line voltage.	Retune the unit.
	Sensor gap too small.	Increase sensor gap.
Stroke wanders	Loose sensor	Tighten sensor
High amp draw	Incorrect power source.	Check power source at line side of control; correct if required.
	Restricted motion.	Increase clearance with adjacent equipment.
	Drive installed backwards.	Reverse drive. (See fig. 9)
Speed (cpm) is low	Weight added to trough	Remove weight.
Speed (cpm) is high	Weight removed from trough	Re-install component(s).
Erratic motion	Isolators installed incorrectly.	Install isolators per G/A dwg.
	Torn or broken isolators.	Replace,
	Cable tension uneven side to side.	Adjust cable tension to be equal on the left and right sides.
	Conveyor hitting adjacent equipment.	Increase clearance with adjacent equipment.
	Weight added or removed from trough.	Restore trough to original configuration.
	Excessive motion of support structure.	Modify support structure to eliminate resonance.

Replace parts only with those supplied or recommended by PPM Technologies.

NOTES