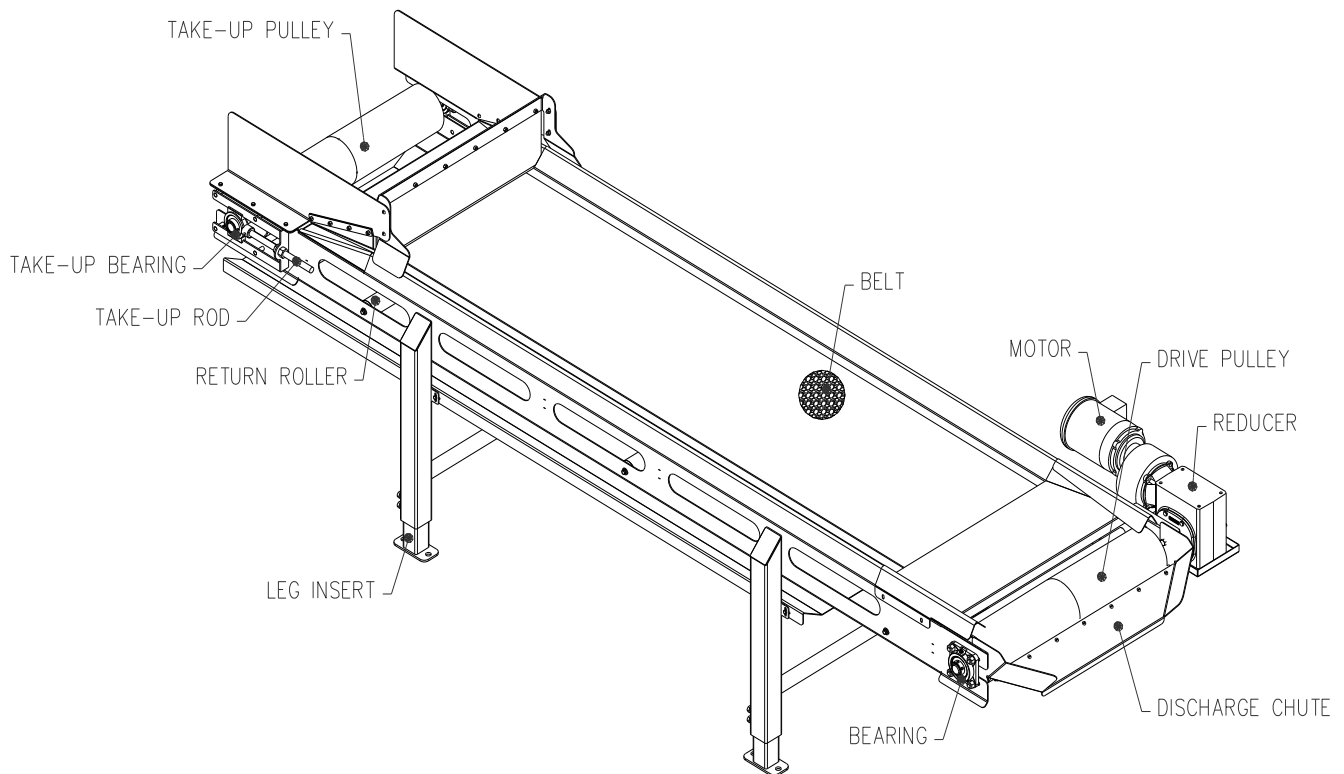


OPERATING AND MAINTENANCE MANUAL FOR PPM TECHNOLOGIES PVC BELT CONVEYORS



PPM Contact information:

AMERICAS

PPM TECHNOLOGIES
TECHNOLOGIES
500 E. Illinois St.
Newberg, OR 97132 | USA
(800) 523-8123 toll free in the US
113-0033
(503) 538-8575 fax

EUROPE|MIDDLE EAST|AFRICA

PPM AB

Box 288 | SE-291 23
Kristianstad, SWEDEN
+46 44 20 40 00

+46 44 20 44 20 fax

ASIA

PPM

3/F Taiseido Bldg
2-4-7 Hongo
Bunkyo-ku | Tokyo

JAPAN
+81 3 5842 3031
+81 3 5842 3030 fax

Webpage: www.ppmtech.com
Email: Parts.na@ppmtech.com

Printed in the USA

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PPM Technologies reserves the right to alter at any time, without notice and without liability or other obligations on its part, materials, equipment specifications, and models. PPM Technologies also reserves the right to discontinue the manufacture of models, parts, and components thereof.

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PPM Technologies reserves the right to make changes to the design, materials, and specification of the equipment described in this document without obligation to notify any person or organization of the revision of change. PPM Technologies further reserves the right to discontinue the manufacture and sale of any components described in this document.

1 PVC BELT CONVEYOR

1.1 INTRODUCTION

The PPM PVC belt conveyor is driven by means of an electrical motor coupled to an appropriate gear reducer, through a simple chain drive to the drive shaft, to achieve the desired belt speed.

The PVC belt is driven by means of a pulley (drum) situated at the head end of the conveyor.

When designing equipment PPM Technologies has taken into consideration product density, conveyor length/incline, and operating speed. If any of these parameters are changed from the original, consult our factory and the project manager to confirm the operation and capacities are still valid.

This manual contains operating instructions and preferred maintenance procedures for PPM PVC Belt Conveyors. Read it completely before attempting to operate an PPM PVC Belt Conveyor.

WARNING

Failure to follow the operation and maintenance procedures contained in this manual could result in unsatisfactory conveyor performance or serious personal injury.

WARNING

In the event that repair to the conveyor is necessary, take immediate corrective action to avoid possible injury to personnel, the machine, and to guard against product contamination..

Engineering Staff	(503) 538-3141
Parts department	(800) 523-8123
Field service	(800) 523-8123

PPM Technologies
Customer Service Department
500 E. Illinois Street
Newberg, Oregon 97132

1.2 Safety

Safety must be considered a basic factor in machinery operation at all times. Maintain a safety training and safety equipment operation/maintenance program for all employees. Most accidents are the result of carelessness or negligence.

The following safety instructions are basic guidelines and should be considered as minimum provisions. Additional information shall be obtained by the purchaser from other sources including the latest editions of American Society of Mechanical Engineers. Refer to Standards ANSI B20.1 ANSI B15.1 ANSI A12.1 ANSI B20-1A1985.

It is the responsibility of the contractor, installer, owner, and user to install, maintain, and operate the conveyor components and conveyor assemblies manufactured and supplied by PPM TECHNOLOGIES in such a manner as to comply with the Williams-Steiger Occupational Safety and Health Act, and with all state and local laws and ordinances and the American National Standard Institute Safety code.

SAFETY DEVICES AND CONTROLS must be purchased and provided by the purchaser/owner as required by applicable laws, standards, and good practice.

1.3 General precautions

Before working on any part of the conveyor, always ensure that the electric power supply is disconnected and locked out. Before connecting the power supply, make sure that the supply voltage and frequency corresponds to the equipment nameplate ratings, the equipment is properly grounded, and all conductors are adequately sized to carry the nameplate voltage and current.

Before operating the PVC belt conveyor, make sure the following list and programs are completed:

- Emergency stop switches are installed, working and are clearly visible.
- All of the guards and covers are in place.
- Correct motor rotation has been achieved, check chain drive for proper tension..
- The machine is clear of obstructions, shipping blocks, supports, and tools.
- All bolted connections are tightened properly, replace any missing bolts (refer to Appendix A).
- All personnel are at a safe distance from machine and have been advised of the location and operation of all emergency controls and devices. Clear access to these controls and devices must be maintained at all times.
- Area of operation must be clean with proper lighting.
- Do not walk or stand on any part of the conveyor at any time.
- Do not poke or prod material in the conveyor.
- Do not place hands, feet, or any part of the body or clothing near any type of machinery.
- Do not overload conveyor or attempt to use it for other than its intended use.

- 1) Investigate any new noises that may develop during operation and correct any abnormal condition promptly.
- 2) Follow a regular maintenance routine as shown in the maintenance section.
- 3) Never lift any conveyor by the bed. Always lift the conveyor from the frame.

Carefully read this entire manual before operating this machine.

1.4 Warranty Information

PPM Technologies' warranty is available only to the original purchaser of this equipment and applies only to defects in material and workmanship for a period of one (1) year from the date of shipment. There are no other warranties, which extend beyond the description of the goods at the time of sale, and no other warranties may be deemed made by or implied against PPM Technologies.

In addition, PPM Technologies' liability is limited to the repair or replacement, at its option, of any defective goods F.O.B. its place of business at Newberg, Oregon. PPM Technologies shall in no event be liable for any special, incidental or consequential damages, or loss of product/production resulting from any defect in goods sold by it.

Unauthorized modifications or the use of unauthorized replacement parts may damage the machine. Use only PPM Technologies approved replacement parts. PPM Technologies will not assume responsibilities for

equipment performance subsequent to unauthorized modifications or the use of unauthorized replacement parts. When ordering replacement parts, include all information shown on conveyor nameplate.

2 INSTALLATION

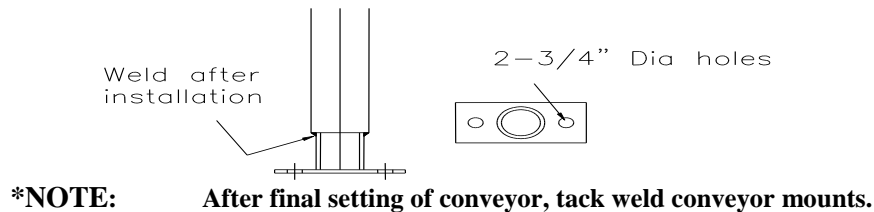
2.1 Uncrating

Inspect shipping crate prior to opening for visible damage. Document any damage on the bill of lading and notify both the Freight Company and PPM Technologies. Care should be taken as you open/remove the shipping crate and the equipment should be thoroughly examined for any damage that may have occurred during shipment. Check to ensure that there are no small parts left in the crate, such as belts, bolts, support members, etc. Freight damaged goods are the responsibility of the customer and the shipping company. Equipment manuals are attached to the frame of the machine, or located inside the electrical control panels.

ALWAYS LIFT CONVEYOR EVENLY FROM INTENDED SUPPORT POINTS IN FRAME.

2.2 Assembly

The PPM PVC belt conveyor is shipped to you fully assembled whenever possible. Should size or other factors require it to be shipped in sections, it will have been tested at the factory and each section clearly marked for assembly on location. A drawing of the belt conveyor is supplied as a reference to assist in the assembly of the unit. Place in desired location and anchor loosely to floor with shims if necessary to level and plumb the machine. Carefully observe match marks, if applicable. In some cases all or part of the conveyor may need to be attached to the building or other support. After assembling the belt conveyor, check to ensure that vertical and horizontal alignment is correct as you firmly tighten all anchor and support bolts. The system must be squared and plumbed to achieve satisfactory performance.



2.3 Electrical Requirements

The standard motor used on PPM equipment operates at 1200 RPM or 1800 RPM, 230/460V, 3 phase, and 60 hertz. In some cases motors with different power requirements are supplied at the customer's request. Before connecting the power supply, make sure that the supply voltage and frequency correspond to the equipment nameplate ratings, the equipment is properly grounded, and all conductors are adequately sized to carry the nameplate voltage and current.

If the prewire option was purchased with the unit, the system will be supplied with emergency stop switches or devices. These emergency stop devices are mounted and prewired to a common junction box on or near the conveyor. Upon installation, the emergency stop devices are to be integrated into the existing control system. Make sure that all emergency stop devices are functional before operating the machine.

It is the responsibility of the contractor, installer, owner and user to install, maintain and operate the conveyor components and conveyor assemblies manufactured and supplied by PPM TECHNOLOGIES, INC., in such a manner as to comply the WilliamsSteiger Occupational Safety and Health Act and with all state and local laws

and ordinances and the American National Standard Institute Safety Code.

SAFETY DEVICES AND CONTROLS must be purchased and provided by the purchaser/owner as required by applicable laws, standards and good practice.

2.4 Wiring

There may be more than one motor requiring a power connection. The actual drive location(s) may vary depending on the application. Be sure to install all wiring and conduit in accordance with applicable standards and codes. Install proper sized wires, a proper sized starter with start/stop controls, and motor protection fuses for the amps shown on the motor nameplate. **The motor(s) must be wired so that the output shaft of the gear reducer rotates in the proper direction.** If it becomes necessary to work on the power connection, always lock the power off at the control panel. The drive chain should also be disconnected from the drive before doing any work on the system. Before reapplying power to the system make sure the rotation of the motor is correct.

2.5 Start Up

Before startup, all guards must be in place, all emergency stop devices working, and all moving parts must be free to move. With all personnel, tools, and debris clear, the storage conveyor system can now be turned on.

At the initial startup, operate system for several hours empty as a break in period. Observe all components for bearing heat up, unusual noises or belt misalignment. Should any of these occur, check the following and take necessary corrective steps.

Check chain drive for proper tension and ensure chain is not skipping during startup.

Check for proper lubrication, insufficient or excess lubricant will cause high operating temperatures.

Check for the cause of any noises and correct promptly (loose drive chains, fasteners, clamps, etc.). Check for misalignment of components and/or incorrect belt tracking.

After (8) hours of operation, check all bolted connections for correct torque settings as shown in the Recommended torque values chart (Appendix B).

PPM Technologies should be consulted prior to performing any modifications to any part of the conveyor.

2.6 Adjusting Belt Tension & Tracking

Belt tension and tracking is critical to the proper operation of the belt conveyor(s) in your storage system. The belt tension and tracking is done by turning the nuts on the threaded take-up rods located on each side of the infeed end of the belt conveyor. When adjusting be sure tension is as even as possible on both sides. The belt should be tensioned enough to prevent sagging in the middle without stretching the belt excessively. At the same time the belt tracking should be adjusted so that the belt runs centered in the conveyor bed/frame. The pulleys are crowned in the center to facilitate belt tracking. Be sure lock nuts on take-up assembly are tightened after adjusting. This setting should be monitored monthly and readjusted as necessary to keep correct tension and tracking.

IMPORTANT: DO NOT over tension belts. Proper belt tension and tracking is essential to the successful long-term operation of your belt conveyor.

2.7 Installing Additional Components

After your PPM conveyor is properly assembled and aligned, you will need to install covers or guards if applicable. After initial installation, additional guarding or safety switches may be needed to meet applicable safety codes, regulations, etc. at your facility. PPM Technologies provides guarding to meet safety codes and

guide lines for normal access to our equipment. Once the system is positioned in the facility, it is the customers and/or the installation contractor's responsibility to review and verify that all safety codes for personnel around the system have been met.

3 OPERATION

Operators should be trained to watch for and avoid any unexpected changes in product flow, both at intake and discharge. If an unusual condition occurs, the power should immediately be turned off to avoid unnecessary wear on the components. The situation must be corrected before continuing operation. Maintenance should be done at the first sign of any abnormal condition such as unusual sounds, or improper belt tracking which may cause excessive belt wear. Frequently check belt tension and tracking. Correct as necessary as described in the Installation section.

Do not operate the belt conveyor at speeds greater than the design perimeters. Small changes in speed may be accomplished by a change of drive sprockets. If increasing speed substantially, consult PPM Technologies prior to making changes.

CAUTION: **DO NOT** exceed amp reading on motor nameplate. Greater increase in speed may require replacing the speed reducer and a higher horsepower motor. Please consult the PPM Technologies.

4 MAINTENANCE

A regular maintenance schedule should be implemented to prolong the life of the conveyor. The schedule should include daily cleaning of the conveyor and regular inspection of all safety guards, chain sprocket alignment, belt tension, air hoses (if applicable), loose bolts, chutes, and any abnormal noises. Any abnormal conditions should be corrected before running machine.

Proper maintenance of your PPM belt conveyor is essential to maintain long service and the dependability you expect. Preventive maintenance can avoid production breakdown repairs.

4.1 Cleaning

Set up a regular cleaning schedule and follow it. Product can build up of on the under side of the belt and/or the pulley face. This can create belt tracking problems, which can cause excessive belt wear. Product can also build up around the ends of the return rollers bearing surfaces. They must be kept clean and free rolling or the belt will wear a flat spot in the roller. The system may be steam cleaned at no more than 220 degrees. Consult with PPM Technologies before using caustic cleaners on the belt conveyor. Never spray water directly at any type of electrical component. Keep the area around equipment cleaned up. Serious conveyor damage can occur from brooms, squeegees, or hoses, left leaning on or against the belt conveyor.

4.2 Lubrication

I Shaft Bearings

The shaft support bearings are greased during assembly at the factory and should require no additional grease prior to startup.

Grease every 1000 hours, which computes to every six months at 8 hours daily operation or two months at 24 hours daily operation. Harsh daily wash-down areas may require bearing lubrication more frequently (once a week).

DO NOT OVER GREASE. Too much grease or under too much pressure will rupture the seals, reducing the life of the bearings. Use any good quality gun type grease. Apply until a very **slight** bead appears around the bearing seal.

II Chain

Lubricate every 500 hours, which computes to every 3 months at 8 hours daily operation and every month at 24 hours daily operation. To extend chain life, apply two drops of oil between the link side plates on each side of the chain at each roller using a good quality food grade mineral oil.

III Speed Reducer & Motor

Speed reducers used by PPM Technologies are properly filled at the factory with sufficient lubrication. Most gear manufactures recommend that the oil be changed using good quality gear oil after the initial 250 hours of operation, and thereafter at regular intervals of 2500 hours or every 6 months. If synthetic oil is being used, it is recommended that the oil be changed after the initial 1500 hours of operation, and thereafter at regular intervals of 5000 hours. Change the oil when performing maintenance that requires gearbox disassembly

If your machine is equipped with a Dodge/Reliance/Boston/Sterling gear reducer with the Relialube system, the break-in period and subsequent oil change ordinarily experienced with conventional reducers has been eliminated. No oil needs to be added at installation. The oil needs to be changed only after the unit has been put into service at regular intervals of 5000 hours.

PPM Technologies recommends using synthetic oil Mobil SHC634. If lubrication of the input bore is required use FelPro CSA Antisize or Mobiltemp 78 grease in the bore and on the motor shaft. A food grade lubricant may be supplied at customer's request. If you need assistance determining the correct lubricants to use in a particular application, contact the PPM Technologies customer service department.

The bearings in the motor are greased during manufacturing, but require periodic maintenance. Motor manufactures usually recommend that the bearings be lubricated with grease at regular intervals of 12,000 hours or every 12 months of operation.

5 RECOMMENDED SPARE PARTS

We recommend that you carry in stock a minimum quantity of spare parts for your PPM conveyor. Please be sure to **specify Model Number** of conveyor when ordering parts. It is recommended that you stock the following parts for every **THREE** machines on site.

PART	QUANTITY
Motor & gearbox	(1) Per Machine
Head Roll Flanged bearing	(1) Set Per Machine
Take-up Hanger bearing	(1) Set Per Machine
PVC belting	(1) Complete belt
Belting splice or lacing	(1) Per belt

There may be included with this manual, a **custom recommended spare parts list** and drawings specific to your PPM equipment. When ordering parts for any machine, please specify model number shown on serial number tag when ordering parts.

ADD YOUR CONVEYOR INFORMATION HERE FOR FUTURE REFERENCE

NOTE: THE PPM TECHNOLOGIES MODEL NUMBER IS THE MOST HELPFUL INFORMATION FOR IDENTIFICATION

MODEL NO: BCD_____

SERIAL NO: SPC_____

DESCRIPTION: _____PVC BELT CONVEYOR

6 GENERAL NOTES

The information in this publication is intended to cover a variety of installations and requirements. Situations may arise that have not been adequately covered by this manual. Should difficulties arise, please contact PPM Technologies to assist you in obtaining a satisfactory installation.

PPM Technologies would also appreciate any comments on the documentation received.

Addresses and phone numbers are in the Introduction section toward the beginning of this manual.

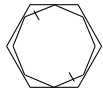
To protect your warranty contact our factory prior to any modifications.

APPENDIX A

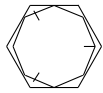
CAPSCREW IDENTIFICATION



SAE Grade 1 / SAE Grade 2 / ASTM A307 (unacceptable)



SAE Grade 3 (unacceptable)



SAE Grade 5 / ASTM A449 (acceptable)



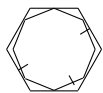
ASTM A325 (acceptable)



ASTM A354 Grade BB (acceptable)



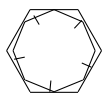
ASTM A354 Grade BC (acceptable)



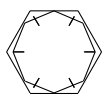
SAE Grade 5.1 (acceptable)



ASTM A193 Grade B7 (acceptable)



SAE Grade 7 (acceptable)



SAE Grade 8 (acceptable)



ASTM A490 (acceptable)

APPENDIX B

RECOMMENDED TORQUE VALUES

S.A.E. GRADE 5

S.A.E. GRADE 8

TORQUE

TORQUE

BOLT SIZE	DRY (FT. LBS.)	LUBRICATED OR PLATED (FT. LBS.)	DRY (FT. LBS.)	LUBRICATED OR PLATED (FT. LBS.)
1/420	8	6	12	9
1/428	10	8	14	10
5/1618	17	13	24	18
5/1624	19	15	27	20
3/816	30	23	45	34
3/824	35	27	50	38
7/1614	50	38	70	53
7/1620	55	42	80	61
1/213	75	57	105	80
1/220	85	65	120	91
9/1612	110	84	155	118
9/1618	120	91	170	129
5/811	150	114	210	160
5/818	170	129	240	182
3/410	270	205	375	285
3/416	300	228	420	320
7/89	430	327	610	464
7/814	475	361	670	509
1”8	645	490	910	692
1”12	705	535	1000	760
1”14	720	547	1015	771

7 RETURN MERCHANDISE PROCEDURE:

- 1) Have part number and purchase order ready.
- 2) **Call PPM Parts Department @ (800) 5238123, obtain a RMA#.**
 - a. PPM Parts Department will not be able to tell you if the parts are under warranty, as they need to inspect the parts.
 - b. Although your parts may be less than one year old, it depends on the type or cause of failure and may not be under warranty.
 - c. PPM Technologies reviews failures and determines if the parts are under warranty.
- 3) Send parts back to: **PPM Technologies, LLC.**
500 E. Illinois St.
Newberg, Oregon 97132
RMA#
 - a. Items returned w/o RMA # will NOT BE ACCEPTED and will be sent back to customer.
- 3) Once parts are repaired they will be sent back to our customer VIA:
 - a. **UPS ground (5 days) unless otherwise arranged.**

The information in this publication is intended to cover a variety of installations and requirements. It is to be expected that situations will arise that have not been adequately covered by the foregoing data and should difficulties arise please contact your local representative of PPM Technologies who will assist you to obtain a satisfactory installation or contact the PPM Service Department at the above number.

8 LOST OR DAMAGED GOODS:

THOROUGHLY INSPECT AND COUNT ALL SHIPMENTS IMMEDIATELY UPON ARRIVAL. OUR RESPONSIBILITY FOR ALL SHIPMENTS IS CEASED WHEN THE CARRIER SIGNED THE BILL OF LADING.

If goods are received short or in a damaged condition, it is important that you notify the carrier and insist on a notation of the loss or damage across the face of the freight bill; otherwise no claim can be enforced against the transportation company.

If concealed loss or damage is discovered, notify your carrier at once and request an inspection. This is absolutely necessary. A concealed damage report must be made within 15 days of delivery of shipment. Unless you do this, the carrier will not entertain any claim for loss or damage. The agent will make an inspection and grant a concealed damage notation. If you give the Transportation Company a clear receipt for goods that have been lost in transit, you do so at your own risk and expense.

We are willing to assist you to collect claims for loss or damage, but this willingness on our part does not make us responsible for collection of claims or replacement of material. The actual filing and processing of claims is your responsibility.

* If your shipment is crated or wrapped, you should sign the Bill of Lading noting "subject to Concealed Damages".