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Better Design. More Power.

A screw conveyor is one of the oldest and most economical methods off handling bulk materials. Items ranging from packaging peanuts to drill cuttings are moved with conveyors. A screw conveyor consists primarily of an auger that rotates in a stationary trough or tube. Materials placed in the trough are moved along its length by rotation of the flights and is supported by trough end plates with bearings and hanger bearings to maintain proper alignment. Inlets, outlets, gates and other accessories control the material and its disposition. Screw conveyors handle almost any bulk material efficiently and economically. A system can be comprised of a single stand-alone unit or a configuration of a multitude of units with other associated components performing together.

Definitions of the three major components:

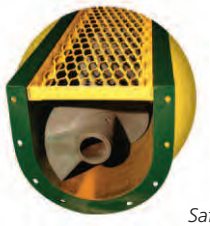
1 Drive Section: The conveyor section has the gearbox and motor mounted either directly to it, or in closest proximity. This section consists of the drive and all of its components, such as the trough endplate, screw, trough and cover. For a pulling conveyor, a discharge spout is fixed to the trough, typically close to the drive, to maximize the conveying length.

2 Midsection: The conveyor section couples to the drive section when three or more sections are joined together. The midsection consists of a trough, screw, cover, hanger frame, hanger bearing and coupling shaft. The midsection contains the least number of parts.

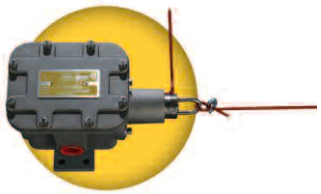
3 Tail Section: The tail section is the "terminal end" of the system. It has a discharge spout when set up as a pushing system. This section is farthest away from the drive section and follows the midsections. The tail section consists of all the same components as the midsection—plus a trough end flange, waste pack seal, tail shaft and the idle end bearing. The idle end bearing can be mounted either directly to the trough endplate, or a pillow block bearing can be used.

Conveyor Accessories

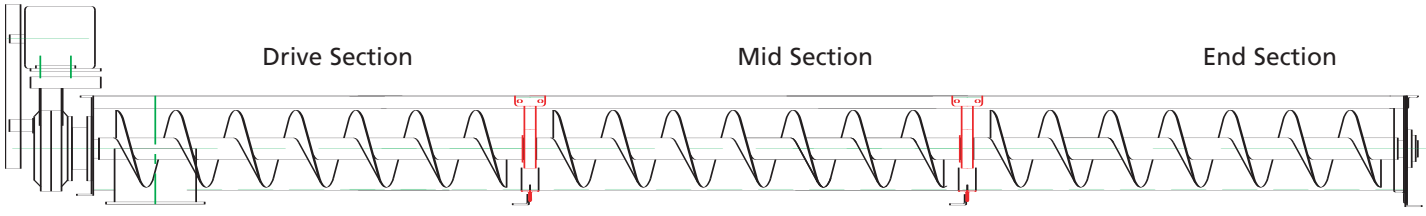
Electrical Starter



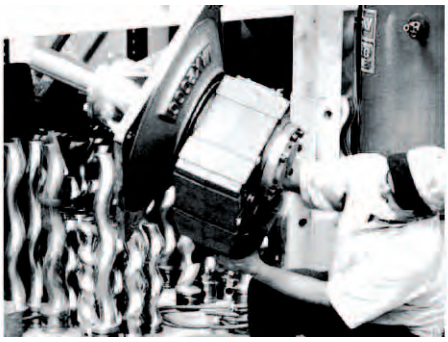
Safety Grates



Emergency Stop Device





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MAX2000®
The Exclusive Line of PSI

SCREW CONVEYOR

INSTALLATION, OPERATION & MAINTENANCE MANUAL

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Safety First!
Cautions and General Safety Rules

This manual contains important information concerning installation, operation, and proper maintenance of the PSI conveyor. To prevent injury to personnel or equipment damage, this manual should be read by those responsible for the installation and operation of the Screw Conveyor System. In addition, the safety precautions below should be followed at all times.

- **Lift the conveyor system only one section at a time** and use properly rated slings capable of handling the equipment weight.
- The structure on which the conveyor system is to be installed must be capable of supporting both the static weight and dynamic loads of the system and product being conveyed.
- **TURN OFF, LOCK OUT, AND TAG OUT** the electrical power supply to the conveyor before working on the conveyor.
- Inspect the unit regularly, and replace damaged or worn components only with parts supplied by the original equipment manufacturer.
- The gearbox on the conveyor has a pre-selected gear ratio to maximize the output torque. This gear ratio provides a great increase in torque that is transmitted to the screw. Any object that might fall into or be placed in the conveyor trough runs the risk of being caught by and wrapped up by the screw. *********NO*** **ATTEMPT SHOULD BE MADE TO STOP A ROPE OR HOSE OR ANY OTHER OBJECT ONCE IT HAS BEEN WRAPPED AROUND A MOVING SCREW!!!**
- Before making any modifications or repairs to the conveyor, for any reason, the conveyor ***must*** be locked out and tagged out. *Serious bodily injury or death can occur, if this procedure is not met.*

****Please note that the gearbox manufacturer does not provide lubrication in the gear reducer. Unless specified, at time of order, we do not fill unit with lubricant. Refer to the gearbox owners manual to obtain the correct type and quantity of lubricant required for your application and environment. ****

Table of Contents

List of Illustrations

SECTION 1- Introduction

A. Role of Screw Conveyors

A screw conveyor is one of the oldest and most economical methods of handling bulk materials. Items ranging from packaging peanuts to drill cuttings are moved with conveyors. A screw conveyor consists primarily of an auger that rotates in a stationary trough or tube. Materials placed in the trough are moved along its length by rotation of the flights and is supported by trough end plates with bearings and hanger bearings to maintain proper alignment. Inlets, outlets, gates and other accessories control the material and it's disposition. Screw conveyors handle almost any bulk material efficiently and economically. A system can be comprised of a single stand-alone unit or a configuration of a multitude of units with other associated components performing together.

B. Design Features

Screw conveyors move materials either horizontally or on an incline. They are used to distribute, collect or mix. With the proper covers and gaskets, they are easily made dust or weather tight. Screw conveyors are set up to either pull or push, depending on the relationship between the drive and discharge location. Standard augers (or screws) are a 1:1 relationship between the diameter and pitch of the flighting. For example, a standard 12" diameter conveyor has a 12" pitch on the flights. By altering the pitch of the flighting, you can increase or decrease the amount of product conveyed per revolution. In addition to merely moving product, screw conveyors can be obtained that will mix or blend. Both left and right-handed helixes are available to tailor a system to each application.

C. Sizing Conveyor

In order to design a screw conveyor, each of the listed items below, are factors that must be provided to correctly size the system.

1. Type of material being handled, size, abrasiveness.
2. Material-wet or dry
3. Pounds per cubic foot, of product
4. Overall length of distance to convey.
5. Percentage of fill, of conveyor trough
6. Capacity, in cubic feet per hour.

7. Method in which conveyor is to be feed.
8. Orientation-horizontal or incline.
9. Load and hours of operation/day, which is used to determine the gearing classification to be selected.
10. Motor classification-TEFC or Explosion-proof
11. Electrical supply: voltage and hertz.
12. Material of construction: carbon or stainless steel.
13. Any other descriptions that may be unique to this application.

While it is fairly simple to determine and calculate the components of the screw conveyor system, it is best to provide the above information and allow us to select and size the unit for your application. There are numerous factors and reference guides that must be consulted prior to the final decision of horsepower, gear ratio and speed for the conveyor system.

SECTION 2- Installation

A. Definitions of Major components
   1. Drive Section: The conveyor section, which has the gearbox and motor mounted, either directly to or in closest proximity to it. This section consists of the drive and all of its components, trough end plate, screw, trough, and cover. For a pulling conveyor, a discharge spout will be fixed to the trough, typically close to the drive to maximize conveying length.
   2. Mid Section: The conveyor section, that couples to the drive section when 3 or more sections are being joined together. It consists of a trough, screw, cover, hanger frame, hanger bearing, and coupling shaft. The mid section contains the least number of parts.
   3. Tail Section: The conveyor section, which is the "terminal end" of the system. It will have the discharge spout, when set up as a pushing system. This section is the farthest away from the drive section and will follow any mid sections. The tail section consists of all the same components as the mid section plus; a trough end flange, waste pack seal, tail shaft and the idle end bearing. The idle end bearing can be mounted either directly to the trough end plate or a pillow block bearing can be used.

B. Fixing sections together

The process by which a conveyor is put into its final length, is easy to describe, but may become tedious if attempted on an uneven surface. To begin, it is best to have all of the sections, the drive, the mids and the end section lined up in their order for final assembly. Beginning with the most distal end of the drive section, insert the coupling shaft of the mating mid section into the auger of the drive section. Making sure that you align the holes in the auger and coupling shaft so that you will be able to secure the screw together. With the augers coupled together, work around the trough end flange and secure the two sections of troughs together. This process is repeated until all of the sections are joined in sequence. It is by this process that the tail section acts like the final mid section and contains all of the same components as the mid sections. With your complete conveyor assembled and in its final place, for operation, it is time to install the belt guard along with the belts and sheaves.

1. Secure the back cover of the belt guard to the motor mount frame, with bolts and framework provided by gearbox manufacturer.
2. Place the drive sheave over the shaft of the motor. Now place the QD bushing on the motor shaft and mount the bushing and sheave together as described by the paper insert in the bushing or sheave box, provided by manufacturer.
3. Repeat step 2, with the bushing and sheave on the gearbox shaft.
4. Check alignment of the drive sheave to the driven sheave to assure that they are aligned properly and will not create excessive wear on the belts.
5. Using the studs and nuts provided by the gearbox manufacturer to lower the motor, so that you can lay the belts into their respective grooves on the sheaves.
6. With belts installed, raise the motor mounting plate to achieve the proper belt tension, as provided by belt manufacturer.
7. ***Do not stretch the belts to install them. Doing so may cause one or several of the belts to be an incorrect length. If this happens, you will not be able to transmit maximum horsepower from the motor to the gearbox and the belts can slip.
8. Tighten the entire set of bottom and top nuts on the motor mount studs to secure motor to the proper height.
9. Some manufacturers provide safety plates to cover large gaps in back frame of belt guard. If you have this design belt guard, install the safety plates at this time.
10. Attach the front cover of the belt guard and your unit will be ready to operate.
11. A qualified electrical technician must do any and all electrical wiring of the motor, prior to energizing the unit.

SECTION 3- Operation

Before proceeding, check all fasteners to make sure that they are tight and that all parts are secure prior to continuing.

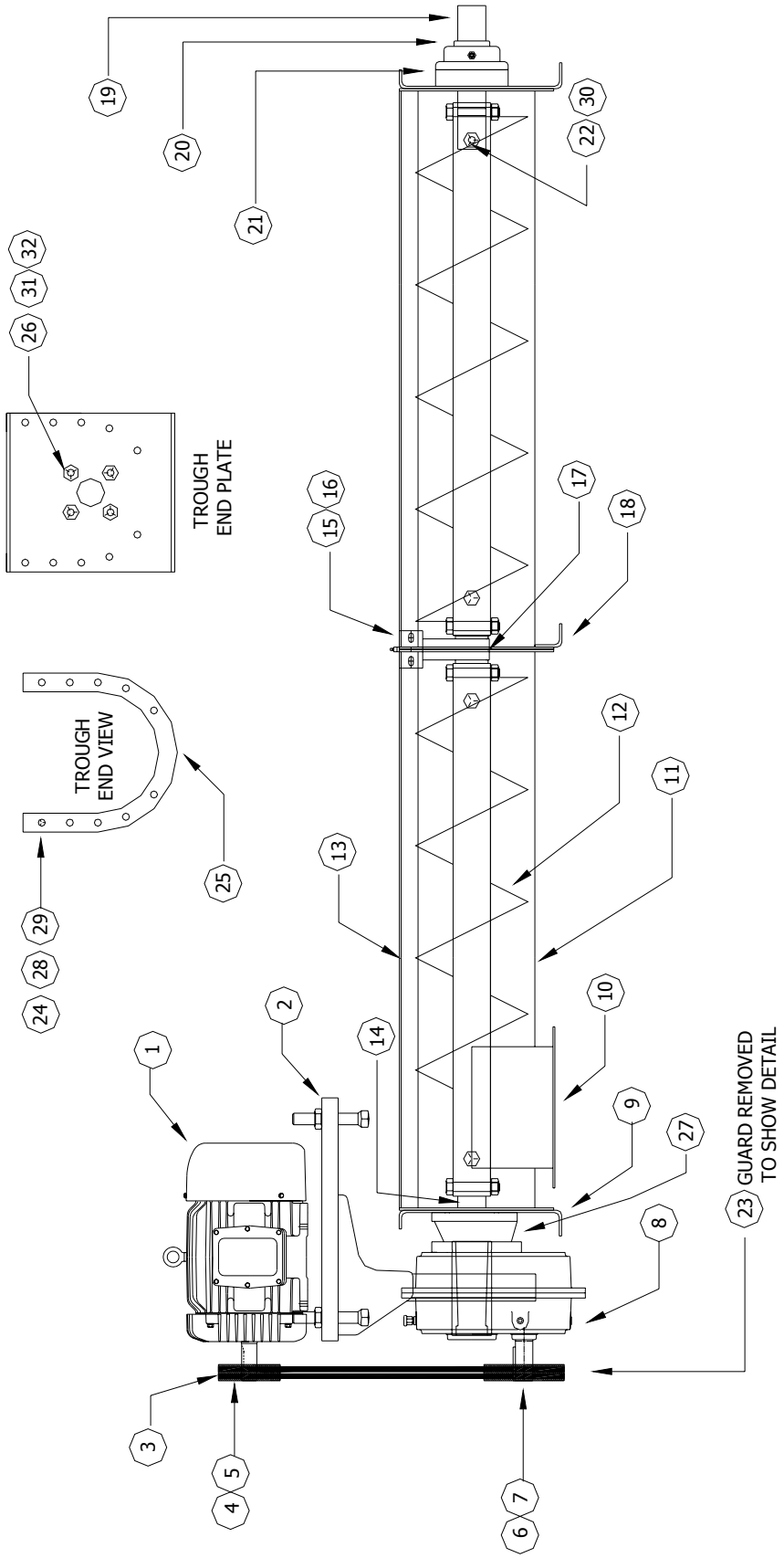
With this inspection complete, check motor rotation to assure that product will be conveyed toward the discharge point of the units.
During operation, it is recommended that the conveyor system be inspected for leaks and noises. If you discover a leak, turn off and lock out the motor, so that it cannot be turned back on during maintenance, inspect and tighten or replace any faulty fasteners. During the shut down, inspect all internal fasteners in the hangers to assure the hanger bearings are tight and are providing proper alignment of the screw. Also, inspect the hanger bearings for excessive wear. If excessive wear is present, then replace hanger bearing, to maintain proper screw alignment.

Troubleshooting Guide

Problem	Cause	Action -Solution
Motor will not start	-Power problem -Defective motor -Wrong or bad heaters/coil -Screw is locked up	-Check electrical supply -Replace motor -check heaters/starter -clean trough and screw
Motor Quits Running	-Starter tripped out -Burned out heater -Motor burned out -Screw is locked up	-Reset starter -Replace heater -Replace motor -clean trough and screw
Tripped Starter	-Bad heaters -Over amp draw -Motor/gearbox undersized -Screw is locked up	-Replace heaters -check amp draw -Check sizing of unit -clean trough and screw
Whining Noise	-Check motor bearings -Hanger bearings	-Replace motor -grease bearing -Replace bearing
Random Noise (Gearbox)	-Contamination in oil	-Drain and replace oil
Rhythmic noise (Gearbox)	-Possible bur on gear set	-See next line…

A bur on a gear set has a tendency to correct itself over time. In the event that the noise is overly obtrusive, remove gearbox and return to factory for evaluation.

Vibration	-Assembly loose	-Tighten all bolts


TROUGH
END PLATE
TROUGH
END VIEW
GUARD REMOVED
TO SHOW DETAIL

DWG. #	Description	Quantity per Section
0001	ELECTRIC MOTOR	1
0002	MOTOR MOUNT, SC DRIVE	1
0003	BELT/BELTS	VARIES
0004	DRIVE BUSHING	1
0005	DRIVE SHEAVE	1
0006	DRIVEN BUSHING	1
0007	DRIVEN SHEAVE	1
0008	GEARBOX	1
0009	TROUGH END PLATE	2
0010	DISCHARGE SPOUT	1, TYP
0011	TROUGH	VARIES
0012	SCREW/AUGER	VARIES
0013	COVER	VARIES
0014	DRIVE SHAFT	1
0015	HANGER FRAME	VARIES
0016	HANGER BEARING	VARIES
0017	COUPLING SHAFT	VARIES
0018	SUPPORT FOOT	VARIES
0019	TAIL SHAFT	1
0020	SCM BEARING	1
0021	WASTE PACK SEAL	1
0022	SCREW BOLT	8
0023	BELT GUARD	1
0024	TROUGH END BOLT	8
0025	TROUGH END GASKET	VARIES
0026	TROUGH END PLATE BOLT	VARIES
0027	GEARBOX ADAPTER	1
0028	LOCK WASHER	VARIES
0029	HEX HEAD NUT	VARIES
0030	NYLOCK NUT	4
0031	LOCK WASHER	8
0032	HEX HEAD NUT	8

A screw conveyor section is defined as one trough section. The items listed above, as variable, change as the overall length and diameter of the screw system changes.