

Safety, Installation & Service Instructions For SCREW CONVEYORS

Warning: Important information contained in this manual to be reviewed and followed by contractor, installer, owner and operator.

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SCC warrants that the equipment of its manufacture is free from defects in material and workmanship at the time of shipment and for a period of one year after shipment to the original purchaser. SCC will repair or replace, at SCC's option, any product of SCC's manufacture which is shown to SCC's satisfaction to have been defective at the time it was shipped, provided the product claimed defective is made available for Screw Conveyor Corporation's inspection within ten days after the Purchaser gains knowledge of the purported defect. Re-shipping method shall be at SCC's option. SCC shall not be responsible for the cost of disassembly or assembly at the job site if there is a claim made under this limited warranty. This warranty will terminate upon the earlier of: 1) damage or deterioration due to use or misuse, exposure, alteration, or negligence; 2) products that have been altered or repaired by others without SCC's express written consent; or (3) equipment manufactured by others and included in our proposals.

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INTRODUCTION:

This manual contains instructions for the Safety, Installation, Operation and Maintenance of screw conveyors and components as manufactured by Screw Conveyor Corporation (SCC). The reliability and good service life of this equipment depends to a very large extent on the care taken in installing and otherwise preparing this equipment for its intended use.

Read all instructions in this manual and Manufacturer's manuals shipped with equipment **BEFORE** installing, testing, operating and maintaining the equipment.

Some screw conveyors are ordered and manufactured based on catalog information and engineering drawings are not required. Many others however are provided with drawings. Some are purchased with the requirement that assembly and detailed drawings are needed in order to produce the unit to accommodate a specific application. The drawings therefore serve the purpose of describing to the buyer or installer exactly what is being furnished and this enables the buyer or installer to determine more specifically what other equipment is needed to connect to the inlet of the screw conveyor as well as connect to the discharge from it. Drawings are not however considered design drawings for the concept of a process or system.

There are several kinds of screw conveyor product lines discussed in this manual.

1. Screw Conveyors
2. Screw Feeders
3. Screw-Lifts

The instruction for erecting any of these screw conveyors is generally the same.

SAFETY RESPONSIBILITY:

Electrical controls, machinery, guards, railings, walk-ways, arrangement of installation, training of personnel, etc. are necessary ingredients for a safe working place. It is the responsibility of the contractor, installer and owner/user to supplement the materials and services furnished by SCC with these necessary items to make a safe working environment and comply with applicable laws.

SAFETY:

Most accidents involving property damage or personal injury are the result of someone's carelessness or negligence. In order to avoid such accidents, one of the many things that must be done is to make machinery that eliminates in so far as possible an unsafe or hazardous condition. Screw conveyors must be installed, maintained and operated with the following minimum provisions:

1. Screw conveyors shall not be operated unless the conveyor housing completely encloses the moving elements and all power transmission guards are in place. The following warning signs (see CEMA Safety Label Sheets SC-2 and SC-3) are attached to all conveyor housings in locations as specified. Signs should not be removed from housings or be painted over! Replacements can be ordered from the Conveyor Equipment Manufacturer's Association (CEMA).
2. Do not overload the conveyor or use it for anything but its intended use.
3. Feed openings for shovel or other manual or mechanical equipment shall be constructed in such a way that the conveyor rotating and moving parts are enclosed and restricts access to conveyor.
4. Always lock-out power before doing maintenance.

SCC does not perform electrical design services and therefore does not supply electrical devices unless specifically instructed to do so by the purchaser.

SCC will try to assist, to the best of our ability, in the selection of the devices or equipment that will aid the owner and installer in preparing a safe installation and a safe working place. Zero speed switches and other electrical devices can sense conveyor operation so that operations can be interrupted and/or alarms can be actuated.

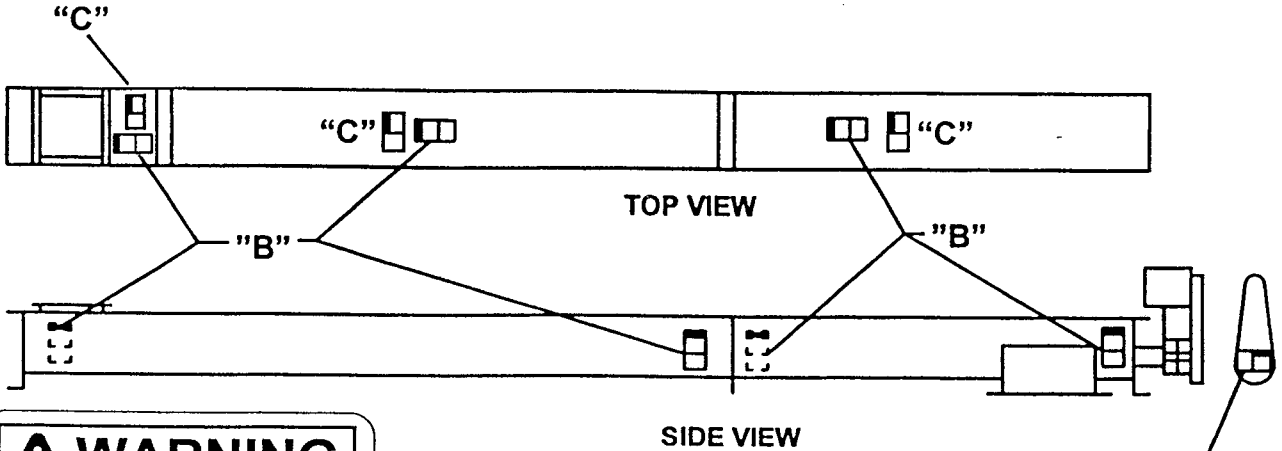
There are many kinds of electrical interlocking devices for conveyors, elevators and conveyor systems such that if one conveyor in a system or process is stopped, other equipment feeding it or following it can also be automatically stopped and thus prevent overloading at transfer points. For the safety of those that will come into the area where this equipment will be operating we recommend that you contact an electrical designer and/or supplier. Provide them with information on your operating conditions so they can best recommend and supply the appropriate devices.

CEMA Safety Labels

Placement Guidelines

Product: Screw Conveyors

Equipment: Screw Conveyor



WARNING

CVS930011

Exposed screw and moving parts can cause severe injury

LOCK OUT POWER before removing cover or servicing

OPTIONAL

"B"

WARNING

CHS930001

Exposed moving parts can cause severe injury

LOCK OUT POWER before removing guard

"A"

WARNING

CHS990026

Walking or Standing on Conveyor Covers or Gratings can cause Serious Injury or Death

STAY OFF

"C"

WARNING

CHS930011

Exposed screw and moving parts can cause severe injury

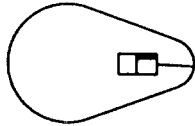
LOCK OUT POWER before removing cover or servicing

USE LABEL "A" ON BELT GUARD
 USE LABEL "B" ON ENDS OF TROUGH, MIDDLE OF COVERS AND AT INLET OPENING. (Use Vertical Or Horizontal Label Depending on Space Available)
 USE LABEL "C" ON TOP OF COVERS



Product: Screw Conveyors

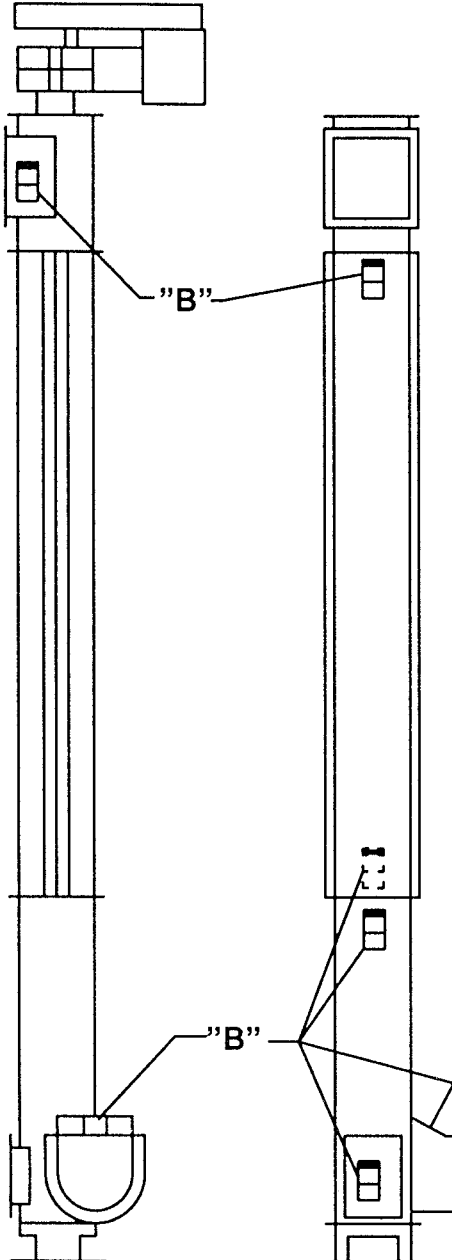
Equipment: Vertical Screw Conveyor





"A"

USE LABEL "A" ON BELT GUARD.
USE LABEL "B" ON ENDS OF TROUGH, ON INTAKE INSPECTION DOOR, AND BOTH SIDES OF DISCHARGE SPOUT.

BOTH SIDES



-  NEAR SIDE
-  FAR SIDE



"B"



SCREW CONVEYOR CORPORATION
SAFETY LABELS
INFORMATION AND PLACEMENT GUIDELINES

Safety is a prime consideration in the design, manufacture, installation, use and maintenance of conveyors. It is well recognized that in many instances, safety labels can increase operator and maintenance personnel awareness of the inherent hazards involved in conveyors or other types of moving equipment.

The process of designing and installing conveyors should be supervised by qualified personnel. The operation and maintenance of conveyors should also be performed and supervised by personnel trained to safely do so.

The purpose of this program is to provide guidelines for the selection and application of safety labels for use on conveyors and related material handling equipment. As part of the conveyor users' comprehensive safety program, the users of conveyors shall inspect and review safety labels to insure their integrity and maximize their effectiveness in injury prevention.

ANSI 535.4-1991 CEMA SAFETY LABELS

4.15 SIGNAL WORD:

The word or words that designate a degree or level of hazard seriousness. The signal words for product safety signs are DANGER, WARNING and CAUTION.

4.15.1 DANGER:

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations.

4.15.2 WARNING:

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

4.15.3 CAUTION:

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

NOTE:

DANGER or WARNING should not be considered for property damage accidents unless personal injury risk appropriate to these levels is also involved. CAUTION is permitted for property-damage-only accidents.

SAFETY LABELS CAN BE OBTAINED FROM:

**Conveyor Equipment Manufacturers Association
5672 Strand Ct., Suite 2
Naples, FL 34110
Telephone: (239) 514-3441
Web Site: www.cemanet.org**

HAZARDOUS OPERATIONS

Screw Conveyors are not normally manufactured or designed to operate handling hazardous materials or in a hazardous environment. Contact Screw Conveyor Corporation if there is any indication that a hazardous condition or material is involved.

Hazardous materials can be those that are explosive, flammable, toxic or otherwise dangerous to personnel if they are not completely and thoroughly contained in the conveyor housing. Special construction of conveyor housings with gaskets and special bolted covers and housing design can sometimes be used for handling this type of material.

Screw Conveyors are not made or designed to comply with Local, State or Federal codes for unfired pressure vessels. Where a product area is under pressure or vacuum, or the trough is provided with jackets for heating or cooling, special precautions are required.

INSTALLATION

SCC does not install conveyors. Therefore, it is the responsibility of the contractor, installer or owner/user to install, operate and maintain the conveyor and/or components in a manner so as to comply with OSHA and all State and Local laws and ordinances.

FAILURE TO PROPERLY INSTALL, OPERATE AND MAINTAIN CONVEYORS AND/OR COMPONENTS CAN CAUSE SEVERE INJURY. SEE PAGES 3, 4 & 5 FOR SPECIFIC WARNING LABELS.

INSTALLATION

STANDARD GUIDE FOR MATCH-MARKING CONVEYOR UNITS

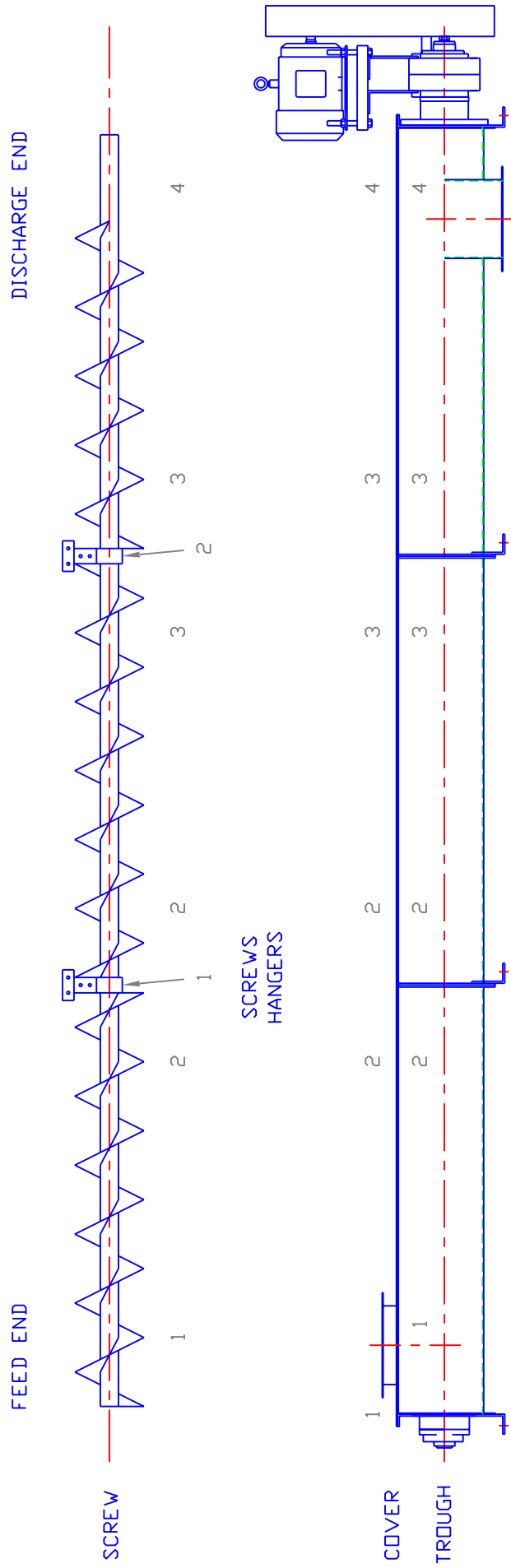


FIGURE #1

Receiving and Installation:

Check all assemblies or parts with shipping papers and inspect for damage. Specifically, check for dented or bent troughs, bent flanges, bent flighting, bent pipe or hangers or other damaged parts.

If any components are damaged in transit or as received, claims should be filed immediately with the carrier.

Place conveyor troughs in proper sequence with inlet and discharge spout properly located. Connect the trough flanges loosely. Do not tighten bolts. Align the trough bottom center-lines perfectly using piano wire (or equivalent). Tighten flange bolts. Tighten all anchor bolts. Pre-assembled conveyors are match-marked as shown above. Conveyors purchased as parts while not match-marked are field assembled in the same manner.

Use proper safe tools and methods in installation of screw conveyors to prevent injury.

After trough assembly, assembly of conveyor screws should always begin at the thrust end. Most screw conveyors can be designed with little thought given to thrust as the thrust force in an ordinary screw conveyor is moderate and commonly used screw conveyor drives will accommodate thrust in either direction. The direction of thrust in a screw conveyor or feeder is opposite to the flow of material being conveyed. If the unit does not require a thrust unit, assembly should begin at the drive end. If a thrust end is designated, assemble trough end and thrust bearing. Insert the drive shaft in the end bearing. Do not tighten set screws until conveyor assembly is completed.

Place the first screw section in the trough, slipping the drive shaft into the pipe end. Secure tightly with coupling bolts. If supporting lugs on ends or flighting are used, install so these are opposite the carrying side of the flight.

Place a coupling shaft into the opposite end of conveyor pipe. Install and tighten coupling bolts.

Insert coupling shaft into hanger bearing and clamp hanger to trough.

Receiving/Installation, cont.

Assemble, alternately, conveyor screws, couplings and hangers until all screws are installed.

1. **With Hangers:** Assemble screw sections so that flighting at each end is approximately 180° from ends of flighting adjacent sections. Also, adjust conveyor screw and thrust unit so that hangers are equally spaced between adjacent screws.
2. **Without Hangers:** (Close Coupled) Assemble screws so that flighting at adjoining ends of screw sections align to produce a continuous surface.

NOTE: If the conveyor is ordered as Shop Assembled/Disassembled for shipment, the coupling holes will have been drilled in assembly to allow for flight alignment.

Remove hanger clamps and bolt hanger to trough with the bearing centered between conveyor screws. Prior to installing inlets, trough covers, etc. make sure that all foreign material, debris, nuts, bolts, etc. are removed from the conveyor.

Final Assembly:

Install trough covers in proper sequence keeping the batten in the proper direction. Handle covers with care to avoid warping or bending. Attach covers to troughs with fasteners provided.

Install drive package at proper location and in accordance with separate drive instructions provided. NOTE: Reducers are shipped without oil. Check that all bearings are lubricated (see below).

Check screw rotation for proper direction of material travel after electrical connections have been made, but before putting product into the conveyor.

If necessary, reconnect electrical leads to reverse rotation of motor to provide proper direction of travel of product in the conveyor.

Run the conveyor dry (without product) for a period of time (as indicated in this manual). Check for alignment. Re-adjust hanger bearings if necessary and make sure all connections are fastened and tightened properly.

Bearings are normally lubricated at the factory with a Shell Aluania #2 grease for sizes up to 5" bore and above a 5" bore with Mobil Mobilux #2EP. Re-lubricate with lithium-base grease or a grease which is compatible with original lubricant and suitable for bearing service.

LUBRICATION GUIDE

(Read Preceding Paragraphs Before Establishing Lubrication Schedule)

Hours Run Per Day	Suggested Lubrication Period in Weeks				
	1 to 250 RPM	251 to 500 RPM	501 to 750 RPM	751 to 1000 RPM	1001 to 1500 RPM
8	12	12	10	7	5
16	12	7	5	4	2
24	10	5	3	2	1

Only personnel completely familiar with these precautions should be authorized to operate the conveyor(s). Failure to follow the precautions can cause severe injury and/or damage to the equipment. **ALWAYS** operate the conveyor(s) in accordance with instructions in this bulletin and the warning labels as shown and described in this bulletin.

START-UP:

After the screw conveyor has been erected and braced, if necessary, the conveyor should be run without load for approximately four to eight (4 to 8) hours. During this time, particular attention should be directed to the following:

1. Loud or unusual noise.
2. Excess vibration.
3. Bearings over-heating.
4. Drive unit over-heating.
5. Evidence of contact or scrubbing of the screw with the trough or components (hangers and etc.).

None of the previous should be present if all installation instructions in this manual were followed.

Things to look for if any of the above conditions are present:

1. Loose hanger bearings and/or coupling shafts/bolts.
2. Possibly trash material or tools present inside the conveyor.
3. Drive equipment inadequately braced.
4. Proper alignment of drive, tail and coupling shafts.
5. Bearings inadequately lubricated. Extreme shaft(s) mis-alignment. Too severe overhung on drive shaft.
6. Reducer inadequately lubricated. Improperly wired motor or incorrect voltage going to motor.

Before starting normal operation, the conveyor should be rechecked for tightness. Adjustments may have to be made. Check the structural bracing to make sure that the conveyor is secure and level under all conditions of use. All bolts should be checked and re-tightened if necessary.

STOP

SCREW CONVEYORS ARE DESIGNED TO TRAVEL TO A SPEED AND CAPACITY ADAPTABLE TO THE TYPE OF MATERIAL BEING CONVEYED. DO NOT MAKE ANY CHANGES IN MATERIAL, MATERIAL SIZE, MOISTURE CONTENT, CAPACITY OR SPEED OF TRAVEL WITHOUT FIRST CONSULTING SCREW CONVEYOR CORPORATION!

The operator(s) should become familiar with all aspects of the construction and normal operating conditions of the equipment. Operator can, therefore, immediately recognize an abnormal situation or operating condition before any serious damage occurs.

Assuming a correct and level installation of the unit, the conveyor should be started with the unit empty. Starting under load places undue strain on the components and drive machinery. It is imperative to allow the conveyor to empty before stopping the conveyor. This is particularly important when the material tends to pack, harden or become more viscous or sticky if allowed to stand for a period of time.

Material should be centrally delivered at the feed inlet and at the specified uniform rate. Avoid loading to the extent that material spills back down into the tail end.

The conveyor should be operated at its rated speed.

It may be necessary to re-center hanger bearings after running material in the conveyor.

Maintenance:

Once the unit is placed into full operation, a Preventative Maintenance Program should begin. This program should include regular inspection set up on a periodic basis.

The Preventive Maintenance Program should include a general inspection of:

- Screw flighting and hanger bearings for possible damage and/or wear.
- Loose, worn and/or damaged coupling bolts.
- Guards are all in place and properly installed.
- Re-lubrication schedule.

Other items to be routinely inspected:

1. Bearings
 - Check operating temperature, signs of wear (noise) and lubrication.
2. Drives
 - V-belts of V-belt drives for wear on belts and proper tension.
 - Roller chains of chain drives for lubrication and proper tension.
 - Oil in gearbox.

Practice good housekeeping. Keep the area around the conveyor and drive equipment clean and free of obstacles to provide easy access and to avoid interference with the function of the conveyor and drive.

To replace conveyor screw sections, follow all safety procedures and proceed as follows:

1. Removal of a section, or sections, usually must proceed from the end opposite the drive. Make sure drive and electrical power are disconnected before starting to disassemble.
2. Remove the trough end, section of screws, coupling shafts and hangers until all sections have been removed or until the damaged or worn sections are reached and removed.
3. To reassemble, follow the above steps in reverse order.
4. Redi-Change conveyor screws can be removed at intermediate locations without first removing adjacent sections. See our current Catalog.

Replacement parts can be identified from a copy of the original shipping list, invoice or drawing.