Reference Manual
00809-200-4245, Rev AA
April 2022

HMC - C01 Compression Sample Head

ROSEMOUNT™

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Published by Emerson.

If you require additional technical assistance, request help from cascade.support@emerson.com or Emerson distribution partners. Send general inquiries to cascade.support@emerson.com.

Important information

Important

Users must read, understand, and comply with the following information before proceeding.

All users, installers, operators, and maintainers must be familiar with operating the leak detection system. To install, start up, operate, maintain, and service the detector in a safe manner, it is MANDATORY to read all additional instruction manuals shipped with the unit.

User information

Important

All users must read this page before proceeding!

Emerson designs, manufactures, and tests its products to meet national and international standards. To ensure the product, continues to operate as designed and within normal specifications, it **MUST** be installed, used, and maintained correctly.

The following instructions **MUST** be adhered to and integrated into your safety program when installing, operating, and maintaining the detector

- Failure to follow the proper instructions may cause:
  - Loss of life
  - Personal injury
  - Damage to property
  - Damage to this instrument
  - Warranty invalidation
- Read all instructions prior to installing, operating, and servicing the product.
- If you do not understand the instructions, contact **cascade.support@emerson.com** for additional clarification.
- Follow all warnings, cautions, and instructions marked on and supplied with the product.
- Inform and educate your personnel in the proper installation, operation, and maintenance of the product.
- Install your equipment as specified in the installation instructions of the appropriate manual and in accordance with applicable local and national codes.
- Connect all products to the correct electrical and pressure sources.
- To ensure proper performance, use qualified personnel to install, operate, update, program, and maintain the product.
- When replacement parts are required, ensure that qualified people use replacement parts specified by Emerson.
- Unauthorized parts and procedures can affect the product's performance, place the safe operation of your process at risk, and **VOID YOUR WARRANTY**. Look-alike substitutions may result in fire, electrical hazards, or improper operation.
- To prevent electrical shock and personal injury, all equipment doors must be closed and protective covers in place, except when maintenance is being performed by qualified personnel.
- The information contained in this document is subject to change without notice.

General safety notice/residual risk

Installation, operation, and maintenance of the leak detection system must be in accordance with these instructions.

Authorized personnel

Personnel installing, operating, servicing, and maintaining the leak detection system must be instructed, trained and qualified with the operating company and the manufacturer.

It is the operating company's responsibility to:

- Train staff
- Observe safety regulations
- Follow the safety instructions and procedures in the product manual

Operators must:

- Be trained
- Read and understand all relevant sections of the product manual before commencing work
- Know the safety mechanisms and regulations

Regulations and Standards

Regulation/standards	Description
IEC 61010-1:2010 +AMD1:2016 CSV UL Std.No. 61010-1 (3rd edition)	Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 1: General requirements.
IEC 61326-1: 2020	Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements.
2012/19/EU	Waste Electrical and Electronic Equipment (WEEE) Directive.
2014/30/EU	The Electromagnetic Compatibility Directive.
2014/35/EU	The Low Voltage Directive.
FDA 21 CFR 1040.10	Performance standards for light-emitting products – Sec. 10 :Laser products.
NFPA 70 (2021)	National Electrical Code (issued by ANSI: American National Standards Institute and NFPA 70: National Fire Protection Association).

Compliance approvals

Important

The analyzer is designed for use in Non Hazardous areas **ONLY**.

Waste disposal

Do not dispose of in household waste. Only for EC countries:

In accordance with European Directive 2012/19/EU for Waste Electrical and Electronic Equipment and its implementation into national right, measuring tools that are no longer usable must be collected separately and disposed of in an environmentally correct manner.

In accordance with the European Directive 2012/19/EU for Waste Electrical and Electronic Equipment (WEEE) disposal of the leak detection system when no longer serviceable must be collected separately and disposed of in an environmentally correct manner

Hazard messages

This document uses the following criteria for hazard messages based on ANSI standards Z535.6-2011 (R2017).

⚠ DANGER

Serious injury or death will occur if a hazardous situation is not avoided.

⚠ WARNING

Serious injury or death could occur if a hazardous situation is not avoided.

⚠ CAUTION

Minor or moderate injury will or could occur if a hazardous situation is not avoided.

NOTICE

Data loss, property damage, hardware damage, or software damage can occur if a situation is not avoided. There is no credible risk of physical injury.

Physical access

NOTICE

Unauthorized personnel can potentially cause significant damage and/or misconfiguration of end users' equipment. Protect against all intentional or unintentional unauthorized use.

Physical security is an important part of any security program and fundamental to protecting your system. Restrict physical access to protect users' assets. This is true for all systems used within the facility.

Safety precautions

The precautions in this manual MUST NOT be changed amended or removed. All authorized users, installation, operation and maintenance personnel, must observe the safety precautions and warnings.

The system is NOT designed for use in Hazardous areas.

⚠ DANGER

ELECTRIC SHOCK.

Serious injury or death will occur.

The leak detection system operates using mains voltage and must be switched off and the power cable removed before opening the analyzer.

⚠ WARNING

HEAVY ITEM

Serious injury or death could occur.

The leak detection system weighs 1250 kg (2756 lb) and should only be lifted or moved by a minimum of two people using suitably rated lifting/moving equipment .

To prevent crushing of hands, feet, or other body parts always wear suitable protective gloves and footwear when handling.

The selected installation site must be suitable to support the weight of the leak detection system, cabling and gas sample lines when installed

⚠ WARNING

HIGH PRESSURE AIR

Serious injury or death could occur.

The compressed air supply operate at pressures that can cause injury.

⚠ WARNING

HAZARD BY WRONG SUPPLY VOLTAGE

Serious injury or death could occur.

The rated voltage for the leak detector is fixed during the manufacture and defined on the ratings label fitted to the unit.

The voltage at the installation site must meet the rated voltage required.

⚠ WARNING

MAINTENANCE

Serious injury or death could occur.

Only authorized maintenance personnel can carry out repair work on the leak detection system.

On completion verify:

- All tools and equipment are removed.
- No contamination (water/dust) is in the compartments. Leak detector is wiped clean.
- Vents are clear and free from obstruction.
- Verify that system is in a safe state for operation.

⚠ CAUTION

EQUIPMENT DAMAGE

Minor or moderate injury will or could occur

Always follow the procedures detailed in the manual otherwise damage to the leak detector may result.

Only authorized personnel can operate the leak detection system.

Do not operate the leak detection system unless it is physically secured in position and all electrical and sample gas connections are in place.

⚠ CAUTION

AIR SUPPLY

Minor or moderate injury will or could occur

Air provided must be connected from a pressure regulated clean, filtered and moisture free supply source.

Safety and system labels and annotation

Labels are applied to the system in the positions shown below.

Location	Label Type	Label Fitted
		
		
		
		

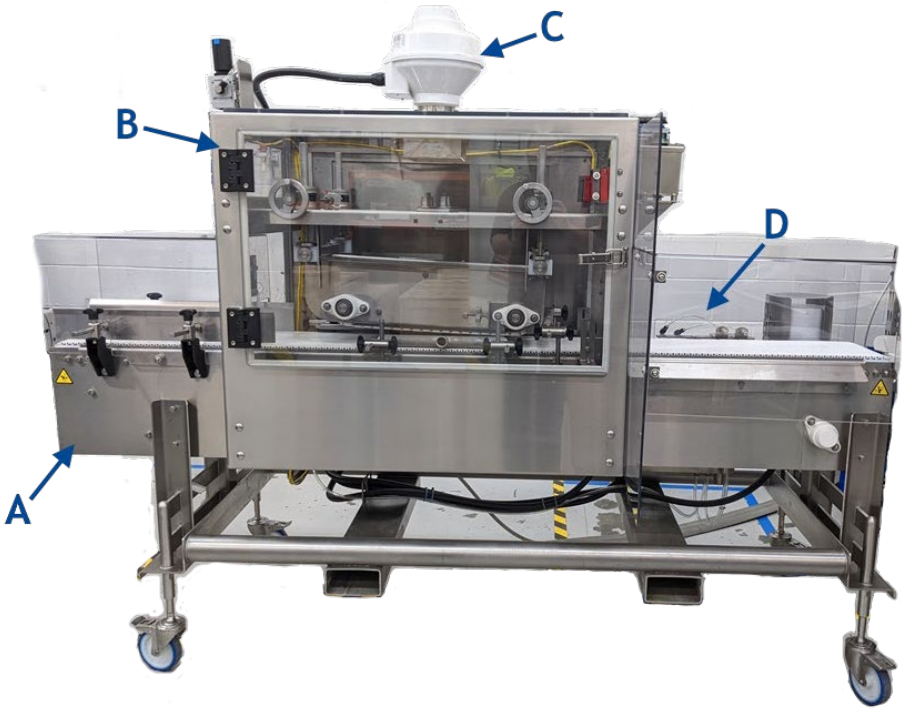
Contents

1 System overview

The HMC-C01 compression sample head is a system which uses 2 conveyors to compress MAP filled packages in order to squeeze the MAP gas out of any defect in the package. The MAP gas is then sampled through sampling points placed at the sides, top, and/or bottom of the package depending on the specific application.

The compression head is designed to be installed alongside the CM-01 base leak detection system. Please refer to reference manual 00809-0100-4245 for details on the base unit installation. This document is intended for the personnel who install, operate, and maintain the detector.

The compression head is designed to be installed as a slot in solution on an existing or new production line. The main components of the system are summarized below.



A. Base Conveyor

B. System Enclosure Containing Compression Conveyor

C. Enclosure Purge Fan

D. Reject Station

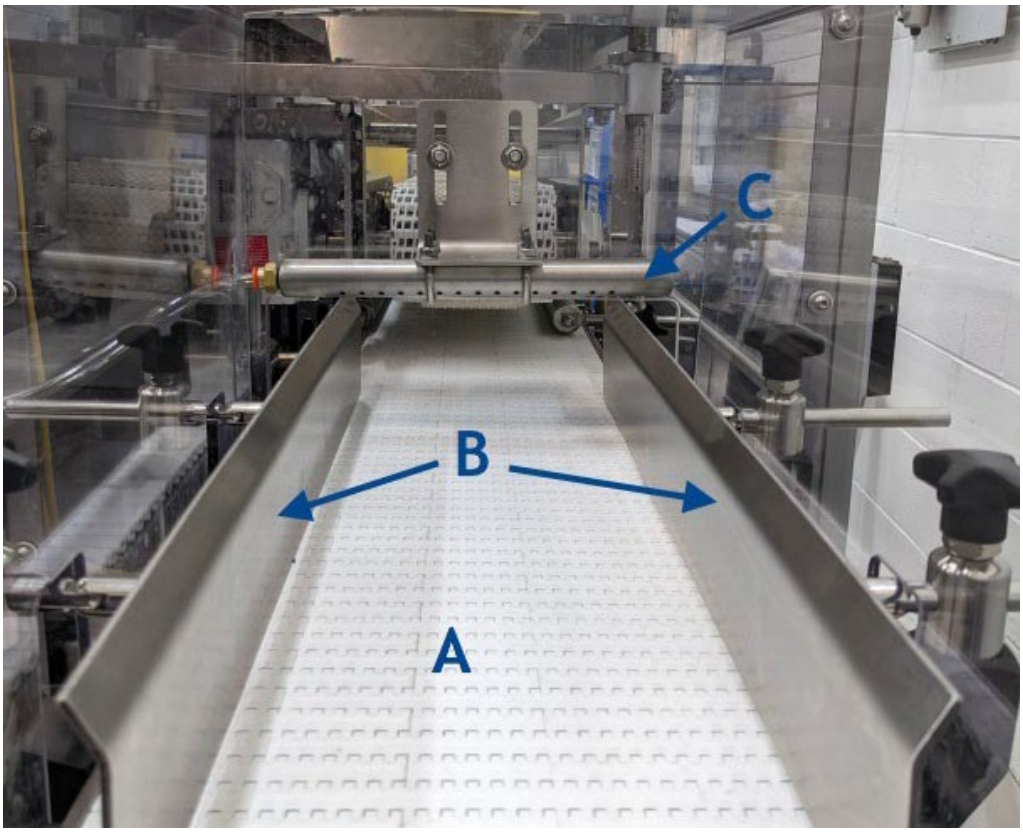
E. Electrical Panel

F. Control Station

G. Compressed Air Preparation

2 Equipment and Accessories

2.1 Base Conveyor



A. Flat top conveyor surface

B. Guide rails – adjustable for different package sizes

C. Package purge point – compressed air knife directed at the surface of the packages.

2.2 Enclosure Internals

A. Compression Conveyor

B. Upstream and downstream height adjustment

C. Sampling points

2.3 Enclosure Purge

The enclosure purge fan is located at the top of the system enclosure. When in use it can direct up to 120 CFM of air into the enclosure. Inside the enclosure 2 deflection plates direct the airflow to the upstream and downstream side of the system.

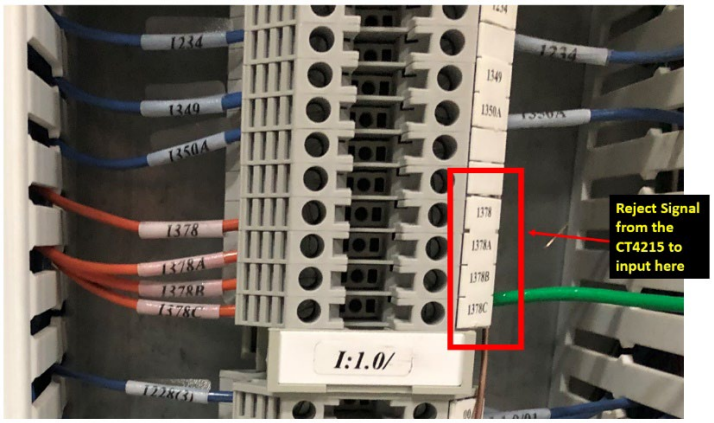
The net effect is a slight positive pressure is created inside the enclosure which prevents ingress of contaminated air. If uncontaminated air needs to be ducted in from another source then this can be done with the 100mm duct fitting on top of the purge fan.

2.4 Reject Station

The reject station is located after the compression conveyor and has 3 modes of operation:

1. Normal – in this mode any packs identified as a reject will be automatically rejected at this point with a blast of compressed air.
2. Clean – in this cleaning mode the system rejects all packs detected. (As nominally no packs should be present during cleaning procedures)

3. Disabled – The reject station can be disabled by not providing reject signal from the CT4215 base system.

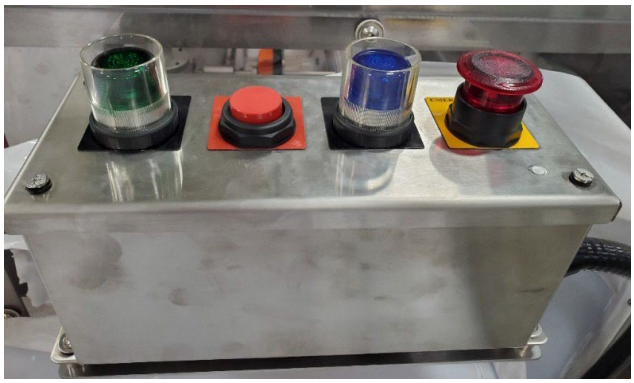


2.6 Electrical Panel

The system electrical panel is shown below

The panel contains the following key components: Safety control circuit, network hub, isolation switch, PLC, 3 phase to single phase transformer, Power supplies, and conveyor drives.

2.7 System Controls



From left to right:

A. Start

B. Stop

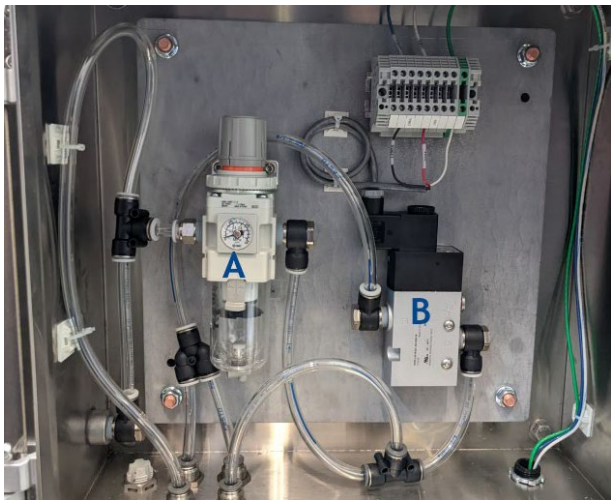
C. Reset

D. Emergency Stop

These controls will be covered in more detail in the statup/shutdown section

2.8 Compressed Air Preparation

The components inside the compressed air preparation box are



A. Regulator

B. Solenoid – This solenoid connects to the reject signal

3 Installation

3.1 Unloading/Unpacking

⚠ WARNING

HEAVY ITEM

Serious injury or death could occur.

The leak detection system weighs 1250 kg (2756 lb) and should only be lifted or moved by a minimum of two people using suitably rated lifting/moving equipment.

To prevent crushing of hands, feet, or other body parts always wear suitable protective gloves and footwear when handling.

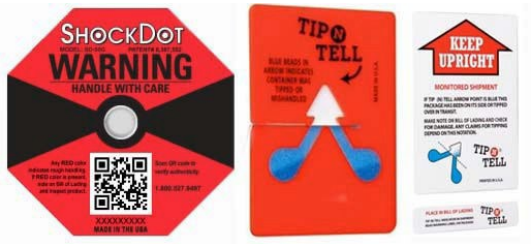
The selected installation site must be suitable to support the weight of the leak detection system, cabling and gas sample lines when installed.

On receipt of goods, inspect the Tip N Tell and ShockDot labels fitted to the outside of the shipping container.

Tip N Tell White arrow becomes blue when tilted 80° from vertical.

Shock Dot indicator turns red when a potentially damaging impact has occurred.

The labels will alert the customer to any mishandling of the analyzer when in transit.



3.1.1 Unloading

Make sure that unloading personnel are qualified and properly equipped for your particular unloading situation. Don't attempt to use a forklift truck if you really require a crane! Twisted frames are difficult to repair. Use the correct rigging slings and lifting equipment to avoid any frame twisting. Use lifting sling and chain spreaders to avoid compressing or bending portions of the conveyor.

Immediately upon arrival of your shipment, inspect the outside carton or skid for damage. Open the box and inspect for missing items. If your shipment is flawed, stop unloading and request immediate inspection by the carrier. Take exception on the delivery receipt by including damage description words; for example, "2 cartons gouged" or "corners crushed". Take photos and keep any original containers on hand for carrier inspection, or it becomes very difficult to get your damages reimbursed.

Start a document file for each short or damaged shipment, and don't delay in filing a claim against the carrier once the amount of damage or loss is known. The time limit is less than nine months for domestic truck shipments. Claim forms are available from the delivering carrier.

Plan to have enough room to temporarily store all of the pieces out of the weather. If the conveyor will not be installed immediately take all necessary precautions to protect your investment. Lubricate unpainted parts (like shafts), cover the conveyor, and protect it from

being bumped, and store copies of the instructions manual where you can find them later. Check your shipment to verify that all operating components have arrived safely and that all parts have been shipped.

3.1.3 Unpacking

Your conveyor will have been shipped on a wooden skid or completely boxed. The drive components are mounted to the drive section.

Cross-reference your packing slip and/or approval drawings.

In the event, you find a part that you feel you do not need or is not correct for your conveyor, please contact our Customer Service Department

3.2 Installation

⚠ WARNING

HEAVY ITEM

Serious injury or death could occur.

The leak detection system weighs 1250 kg (2756 lb) and should only be lifted or moved by a minimum of two people using suitably rated lifting/moving equipment.

To prevent crushing of hands, feet, or other body parts always wear suitable protective gloves and footwear when handling.

The selected installation site must be suitable to support the weight of the leak detection system, cabling and gas sample lines when installed.

3.2.1 Installation Requirements

Use experienced and trained riggers, millwrights, installers, and licensed electricians.

Supports should be securely added as soon as each section is put into place. Use as many installers as required for safety. Check machine leveling and adjust it frequently during the installation. Belt tracking later depends heavily on the levelness of the conveyor.

Support anchors and customer-supplied supports must be adequate for all foreseeable loads, including any offset drive weight

Hardware tends to loosen during shipment, and should be tightened correctly. Tighten all bearings and sprocket set screw; they are especially important for dependable operation of your unit. As sections are assembled into place, check all hardware for tightness. You are responsible for any damage caused by loose hardware that was not tightened at this time. Recheck hardware regularly, to protect your investment and your workers.

Check the access to operator positions. There must be room around the various parts of the conveyor both for its operation and for maintenance procedures. Add any guardrails or safety devices now, before the unit is ever put into service.

3.2.2 Electrical Installation

National Electrical Codes are laws for safety. They must be followed, under the guidance of your local electrician, inspector or licensed journeyman electrician. Here is how this helps you:

- It allows good machine control, protecting operators from mechanical accidents when material jams.
- It safeguards personnel from electrical shock injuries.
- It safeguards the machine and its connecting wires from major short circuit current damage.
- It also safeguards the machine from slight amounts of over-current that can slowly overheat motors, wire, and cause fires.

- **⚠ WARNING**

ELECTRICAL CODE REQUIREMENTS

Serious injury or death could occur.

Many conveyors can be electrically reversed, but check that they are not able to jam with loaded material when doing so. Controls must be clearly labeled which direction is which, for safety.

Do not install this machine without a lockable electrical disconnect switch.

Variable Speed Controls can be included on any installation. Most of these are DC-type, requiring DC motors. **ALWAYS** disconnect and lock out electrical power before working on these controls. It is very easy to accidentally short out the solid state components inside these controls.

All electrical options require additional operator and maintenance personnel training. The customer must do this as soon as possible. Operator confusion about how to control, stop, slow down, or otherwise operate the machine can result in a dangerous and costly accident. Maintenance confusion can result in ruined controls unless the directions are read and understood. Always keep copies of these directions in a clean location where they

can be found and referred to.

3.3 Flat Top & Friction Top Installation

3.3.1 Identify chain and sprockets

- Chain identification can be found on the underside of the link/top plate. Sprocket identification can be found on the face of the sprocket. Detailed information on each sprocket and chain can also be found in the product catalog.
- Check sprocket and wear strip position
- Ensure that sprockets, carry and return wear strips are properly positioned.

3.3.2 Sprockets and wear strip position

- The distance from the end of the wear strip to the sprocket shaft centerline should equal 1.50, otherwise the wear strip will interfere with the free articulation of the chain as it enters the sprocket.
- The leading edges of the wear strips should be beveled.

3.3.3 Align drive and idler sprockets

- Make sure that the drive and idler sprockets are aligned axially with the center of the chain. Lock the sprockets in place using the keyway and setscrews.
- If multiple strands share a tail shaft, key only one sprocket and allow others to rotate. Collars should be utilized to prevent axial floating.

3.3.4 Idler Wheel and Sprocket Locations

- The idler wheels can only be used in place of tail shaft sprockets on Rex® TableTop® one piece unit link chains.
- Idler wheels should not be used with roller base chains
- For proper location and smooth operation, the idler wheels should be mounted below the top of the wear strips.

3.3.5 Inspect guide clearance in both straight and corner sections

- Check the carry and return wear strips at several locations to ensure proper guide clearance. Check the corner tracks and discs for proper thickness. Make sure there is adequate clearance for chain TABs. Ensure straight and curved sections are lined up properly with smooth transitions. Adjust all items as required.

3.3.6 Insert section of chain

- Run a short section of chain by hand through each conveyor and over each sprocket. Make sure there are not tight spots or obstructions such as sharp edges, uneven wear strips, protruding bolts or screws or misaligned sprockets. Adjust all items as required.
- Transfers are very critical! Check all transfer locations by laying chain in the tracks and sliding products through the transfer by hand. Adjust wear strips, sprockets, corner tracks, deadplates, and guide rails as required.

3.4 Inspect Conveyor

Clean the entire conveyor and remove any abrasive such as welding splatter, construction debris, dirt or metal chips that are present on the conveyor frame or embedded in the wear strips. If wear strips are damaged or embedded with debris, replace them as necessary.

⚠ CAUTION

Minor or moderate injury will or could occur

All machinery must be turned off and locked out, prior to chain installation, inspection, maintenance or removal.

Care should be used when handling the chain to avoid crushed or pinched fingers. Keep the chain under control at all time.

The chain can easily be twisted, causing permanent deformation. Make all chain connections on the conveyor frame.

3.4.1 Installation-Chain

- For side-flexing applications requiring lubrication, apply a light coating of mineral oil or grease to the inside corner wear strips before installing chain.
- If reinstalling used chain it is recommended to oil any roller base chain.
- Tread the chain onto each conveyor in 10 ft sections as shipped from the factory
- Be careful to avoid twisting and damaging the chain. Make all connections on the frame at either the drive or idler sprockets locations.
- Install chains hand tight. The catenary sag of each conveyor needs to be checked later.

3.4.2 Installation- the Catenary Sag

- The function of the catenary is to allow a place for excess chain to accumulate. Rex® TableTop® chains should never be run tight.
- The catenary sag should be measured when running with product.
- If the catenary sag is excessive or increased due to normal wear, it should be adjusted by removing links to obtain the proper sag.

3.4.3 Installation/Disassembly-Chain

Connect the chain/One piece Chains with Round Pins

- To connect each 10 ft. section, start by positioning the connecting pin into either one of the double eyes in the appropriate end link. Position the single eye of the other end link between the double eyes. Then drive pin through the single eye and into the adjacent double eye, using a drift punch and hammer, until connecting pin is centered in the link.

⚠ CAUTION

Minor or moderate injury will or could occur

The chain should be hand tight when installed. Chain should never be over tensioned.

- When installing the last section, separate the chain to required length using a drift punch and hammer to drive appropriate connecting pin out of chain. Make final connection to complete the chain loop.

3.4.4 Connect the chain / One Piece Chains with Style D Pins.

- To connect each 10 ft. section, start by positioning the connection pin into either one of the double eyes in the appropriate end link. Take care in positioning the flat of the pin to match up with the flat on the link hole. Position the single eye of the other end link between the double eyes. Then drive pin through the single eye and into the adjacent double eye, using a drift punch and hammer, until connecting pin is centered in the link. When installing the last section, separate the chain to required length using a drift punch and hammer to drive appropriate connecting pin out of chain. Make final connection to complete the chain loop.

3.4.5 Connect the chain/ One Piece Chains with Knurled Style Pins.

- To connect each 10 ft. section, start by positioning the connecting pin into the correct side of the chain.
- Always smooth end of pin first. Position the links together then drive pin into the hinge using a drift punch and hammer until connecting pin is recessed into the link like adjacent pins.

3.4.6 Connect the chain/ For Two Piece Chains.

- Connect each 10 ft. section using the included connecting link. Position the male portion of the connecting link through the corresponding end roller links of the two sections which are being connected. Position the female portion of the connecting link over the male portion. Ensure that the connecting link “flats” are in the down position. Snap the white top plate in place over the extended pin ends to secure the connecting link.

3.4.7 Connection style may vary by chain series.

- To install the last section of chain, separate the chain to require length using a chain breaker to push the appropriate connecting pins out of the roller base chain. Make final connection to complete the chain loop.
- For plastic two piece chains, white top plates are provided to aid in the location of the connecting links in assembled chain loops. The connecting link may contain a “flat” portion on the MO pin plate to aid in identification of the connecting link. While 866 chain is a two piece design, it contains a cotter pin and therefore, cotter pins must be removed to disassemble the chain. This also means every link is a connecting link.

4 Start Up Procedure

⚠ WARNING

HIGH PRESSURE AIR

Serious injury or death could occur.

The compressed air supply operate at pressures that can cause injury.

⚠ CAUTION

AIR SUPPLY

Minor or moderate injury will or could occur

Air provided must be connected from a pressure regulated clean, filtered and moisture free supply source.

NOTICE

HEAVY ITEM

To stop the start-up procedure at any time, set the main circuit breaker to OFF.

4.1 Before You Begin

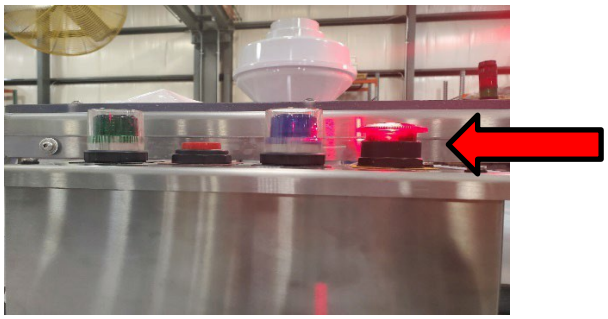
Remove all outside encumbrances from the area around the conveyor Secure the conveyor to its location

4.1.1 Prior To Startup

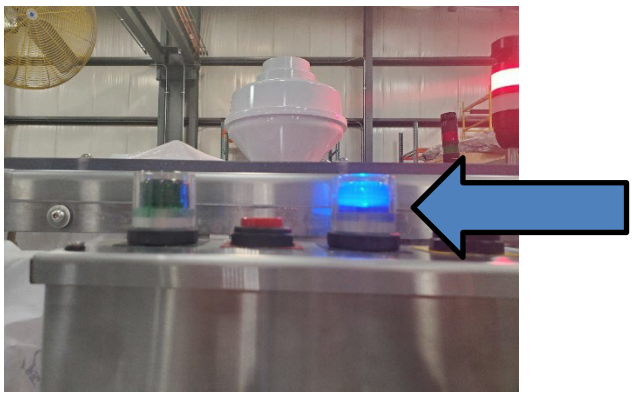
All guard doors must be closed and latched. There are two guard doors, one on either side of the conveyor. The conveyor will not start if the doors are not latched properly.

4.1.2 Startup

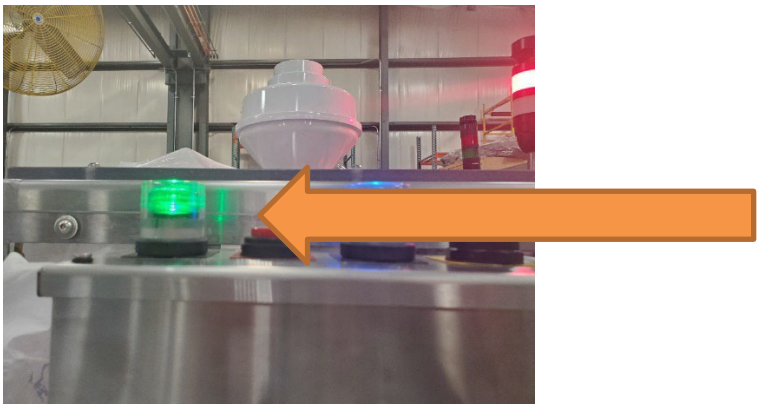
Pull the E-STOP button (solid red) UP



Press the BLUE flashing light until solid blue; the green light will flash



Press and Hold the Green Button until no longer flashing (approximately 3-5 seconds). An alarm will sound, the status indicator light will go green and the conveyor will start.



4.1.3 Operation

The conveyor starts after the Green Button is no longer flashing.

When the system is in Auto mode – it is using the leak detector system in reject mode
When the system is in Clean Mode – it will reject all product and slows down the conveyor

4.1.4 Shutdown

Remove all product from conveyor Push the RED stop button

Safety Information

If product sticks in the compression area of the conveyor, press the EMERGENCY STOP button.

NEVER stick your hand or any part of your body or any other object into any area of the conveyor while it is in operation. Wait for the conveyor belt/chain to stop moving before removing stuck product.

Electrical Panel – Open by Authorized Personnel only. Tool Entry required. Red/yellow button should be in the OFF position.

5 Maintenance

In general, provided the following section is followed the leak detector is a reliable system requiring limited maintenance or intervention by the customer.

Note
There is no need for a customers to access components not covered in this document.

For further assistance contact cascade.support@emerson.com.

6 Scheduled Maintenance

⚠ WARNING

MAINTENANCE

Serious injury or death could occur.

Only authorized maintenance personnel can carry out repair work on the leak detection system.

- On completion verify:
- All tools and equipment are removed.
- No contamination (water/dust) is in the compartments. Leak detector is wiped clean.
- Vents are clear and free from obstruction.
- Verify that system is in a safe state for operation.

General Inspection and Maintenance	Frequency
Inspect Conveyor for damages	At Delivery
Inspect Shipment for missing parts	At Delivery
Locate, read and protect your instruction manual	At Delivery
Check conveyor levelness and true-ness	At Installation
Clean around operator areas, infeed, and discharge	Daily
Check inside the frame for material build-up	Weekly
Clean off motor and reducer	Monthly
Check and adjust belting take up tension	Monthly
Check frame for corrosion, cleanliness, and damage	Monthly
Check drive chain tension	BI-Monthly
Check drives tire air pressure	Quarterly
Retighten setscrews and drive mounts	Semi-Annually
Check electrical amperages and connections	Annually
Lubrication Maintenance	**Frequency**
Lubricate the main drive chain	Monthly
Carefully lube the bearings	Quarterly
Check reducers lube levels	Quarterly

Belt Tracking Maintenance	Frequency
Track the belting at both ends of the conveyor	Monthly
Check the belt splice for any damage	Monthly
Check the snub and any return rollers for build-up	Monthly
Safety Requirements	**Frequency**
Make extra copies of this manual	Immediately
Train new employees in all safety areas	At Hiring
Check that all safety guards are in place	Weekly
Check that all warning stickers are readable	Monthly
Conduct regular Operation and Safety Training	BI-Monthly
Update all safety regulations and literature	Annual

6.1 GENERAL MAINTENANCE

6.1.1 Flat Top and Friction Top Maintenance

The effective and useful life of the equipment in a conveyor system are influenced by the care of servicing it receives. Each piece of equipment should be thoroughly inspected and serviced at regular intervals for maximum performance. Keep a record to show the equipment serviced, the date of inspections, the results, the parts required or replaced and the cause of the trouble. If possible, keep a log sheet on each conveyor so the proper servicing may be easily maintained.

- Qualified and trained personnel shall perform maintenance, such as lubrication and adjustment.
- Where a lack of maintenance would cause a hazardous condition, the user shall establish a maintenance program to insure that conveyor components are maintained in a condition, which does not constitute a hazard to personnel.

6.1.2 Inspection

A general inspection of all equipment should be made at regular intervals of three to six months. Inspections uncover trouble spots, which permit correction before serious breakdown results. Prepare inspection checklist to assure that all parts are carefully checked.

- No maintenance shall be performed when a conveyor is in operation
- Routine inspections and preventive and corrective maintenance programs shall be conducted to insure that all safety features and drives are retained and function properly.

6.1.3 Chain and Sprockets

Check sprocket alignment periodically and correct misalignment immediately. Wear on the inside sidebars or on one side of a sprocket is a definite indication of misalignment. On indexing Gear Motor drives or Gear Motor drives equipped with brakes, special attention must be given to drive sprocket mountings to prevent them from becoming loose and shifting. After the initial startup inspection, make a careful check at 100 hours and another at 500 hours. Set up a periodic inspection schedule thereafter based on operating conditions. Indexing and braking drives require more frequent inspection than conventional drive. Most conveyor drive chains operate in a semi-protected condition: it is good practice to remove them periodically for cleaning and re-lubrication. Tight chains are just as harmful as loose chains. For correct chain tension, the deflection on the slack side should measure 2% to 3% of the sprocket center distance. For sprocket realignment see “Drive Chain” under installation.

6.1.4 Flat Top & Friction Top Chain

In many application, rapid build-up of grease, dirt, grit, sand, spilled syrup and beverage can occur.

Some Tabletop applications require continuous lubrication. (i.e., Stainless Steel Tops-Roller Based Chain, etc.) This is of the most importance on the thrust faces at the entrance of conveyor turns. A lubrication system that provides continuous

and uniform lubrication is recommended. If lubrication is not acceptable or

compatible with the application, a short break in lubrication application is beneficial. The service life of side flexing chains and wear strips can be improved if sliding surfaces are lubricated with a light material oil prior to installation. In the case of side flexing roller chain, the base chain should also be oiled prior to installation.

Oil Base Lubricants-these are vegetable oil or mineral oils, which offer levels of protection and lubrication to exposed chain parts. These should be used whenever practical on all metal chains.

Water soluble Lubricants and soaps- these are excellent lubricants with many desirable

properties. Since water is a conveying medium, they are primarily suited for chain having corrosion resistant parts or those with corrosion resistant top plates.

Water can be used as a lubricant, however, it is not considered as effective. If water is used on plastic chains sliding on stainless steel pans, then drag on the chain may be increased. A thin film of water must constantly be sheared as the chain slides over the pan and overcomes the surface tension. Soap helps to overcome friction.

Applying the lubricant directly to the chin thrust face, directly below the flight just as it enters the turn, may lubricate side-flexing chains. The lubricant can be applied under pressure directly to the chain surface. Running the chain through a pan of lubrication on the return strand can also lubricate the chain. The lubricant can drip on the chain from an overhead storage tank.

6.1.5 Bearing Lubrication

Many conveyors come equipped with permanently lubricated bearings, which have no grease zerks. These include 2 and 3-Bolt Flange Bearings with shaft sizes through 7-7/16". This prevents injecting improper or contaminated grease, and leaves the seals tighter due to elimination of grease purging. Lubricate other bearings regularly with approved lubricants from the list below.

Avoid over lubrication, especially when shafts are not turning, as this can blow out the seals and lead to contamination and failure of the bearing. Exercise extreme caution around all moving equipment when working close to them, for lubrication. Proper intervals of bearing lubrication depend on the speed, temperature and working conditions. In normal applications of 16 hours a day or less, a three month interval is adequate (in clean conditions). Lock off equipment before attempting to wipe or touch movable equipment of any kind. Clean off grease zerk fittings before lubrication and wipe excess lube from the shaft seals so you can observe the amount of newly expelled grease. Remember to tighten the bearing set screws BI-annually while doing the greasing.

6.1.6 Acceptable lubricants include:

Socony Mobil Oil Company	Armvac No. 781
Keystone Lubricant Company	84 H Light
Standard Oil Company of Indiana	Stanolith No. 57
Sinclair Oil Company	Litholene
Texas Oil Company	Multi Fak No. 2
Mobil	SHC-PM

6.1.7 Motor Maintenance

At regular intervals, check that the motor electrical connections are tight and not corroded. Blow clean any open frame motors, and clean off any dust or debris so proper amounts of heat may be radiated. If motors consistently become covered with debris, construct a guard above the, which does not hinder heat radiation.

Lubricate any motors with grease fittings every two years unless conditions are extremely dirty or damp. Lubricate any motors with sleeve bearings with 10- 15drops of SAE # 20 non-detergent or motor oil every year (more often if dirty or damp).

New motors are more efficient, but run at higher temperatures that you may be used to. Do not become alarmed unless the ambient temperatures at your drive section are >104 ^{o}F. At these high temperatures, normal motors may overheat at full loads, and special high-temperature motors may be required.

6.1.8 Reducer Maintenance

Most conveyors come equipped with standard Gear Reducer made by Dodge Gear. This is a trouble free reducer with normal applications and maintenance. To keep it that way, make sure you know how to check it over, then do it regularly as shown below.

Try to keep the reducer sprocket installed as close to the reducer as possible to reduce any overhung loads. Keep the reducer clean so it can dissipate excess heat better. All mounting bolts should be tightened securely. Check the lube level regularly. Change the lubricant every six months or 2500 hours, whichever comes first. Gearmotors require no lubrication change under most conditions.

6.1.9 Manufacturers Recommended Lubricants

Manufacturer	AGMA Compound#7 (15-60 °F Ambient Temp)	AGMA Compound #8 (50-125°F Ambient Temp)
Amoco Oil Company	Worm Gear Oil	Cylinder Oil # 680
Chevron USA, Inc.	Cylinder Oil #460	Cylinder Oil #680X
Exxon Co., USA	Cylesstic TK-460	Cylesstic TK-680
Gulf Oil Co.	Senate 460	Senate 680D
Mobil Oil Corp.	600W Super	Extra Helca Super
Shell Oil Co.	Valvata Oil J460	Valvata Oil J680
Sun Oil Co.	Gear Oil 7C	Gear Oil 8C
Texaco	Honor Cylinder Oil	650T Cylinder Oil
Union Oil Co., of CA	Steaval A Worm Gear Lube 140	

Inspect your reducer vent plug often to make sure it is clear and operating. It is the upper plug on the reducer. The next lower plug is the level plug and the lowest plug is the drain plug. The oil level should be kept at the bottom of the threaded hole of the level plug. However, if the conveyor and reducer are inclined above horizontal, extra oil may be required for optimum reducer life. Synthetic oil, if used, should not be intermixed with regular oil.

7 Troubleshooting

Trouble shooting for flat top & friction top

Problem	Possible Cause	Possible Solution
Sprockets don't slide on shaft with expanding chain.	Debris on shaft restricts movement. Limit device improperly located.	Clean shaft. Determine max expansion & locate limit device accordingly.
Chain tracks crooked.	Shafts are misaligned. Return rollers skewed.	Align head & tail shaft to be parallel & horizontal. Adjust return rollers to be parallel & level.
Chain jumps sprocket teeth.	No provision for catenary Improper catenary moves from head to tail. Improper shaft drop. Improper sprocket positioning.	Provide for catenary per Rex recommendations. Set shaft per Rex. Sprockets must be positioned to engage tooth pocket on chain.
Chain breakage.	Impact loading. Over back-flexing. Jam up. Pins coming out.	Don't drop load. Return roller to small dia. Clear cause of jam. End plugs missing, check or replace.
Transfer plate problem. Finger breakage. Finger climb top of chain ribs. Product tippage. Cracks thru mounting holes. Transfer plates don't move w/chain.	Screws too tight to allow plates to move. Fingers don't properly engage. Debris in-between chain ribs. Plates are too loose. "Strictly" mounting surface, restricts plate movement.	Adjust screw tension. Use proper screw Positioning transfer plates correctly. Clean off chain & remove. Secure properly w/correct fastener to keep plate from "rocking". This rocking can cause failure thru mounting holes & product tippage. Clean mounting surface & check for level.

Problem	Possible Cause	Possible Solution
Rapid or unusual chain wear.	Wear tracks.	Don’t use plastic wear tracks on glass lines where breakage occurs. Don’t use a dead soft stainless steel.
Rapid sprocket tooth wear.	Abrasive debris.	Most commonly a problem when using plastic sprockets.

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