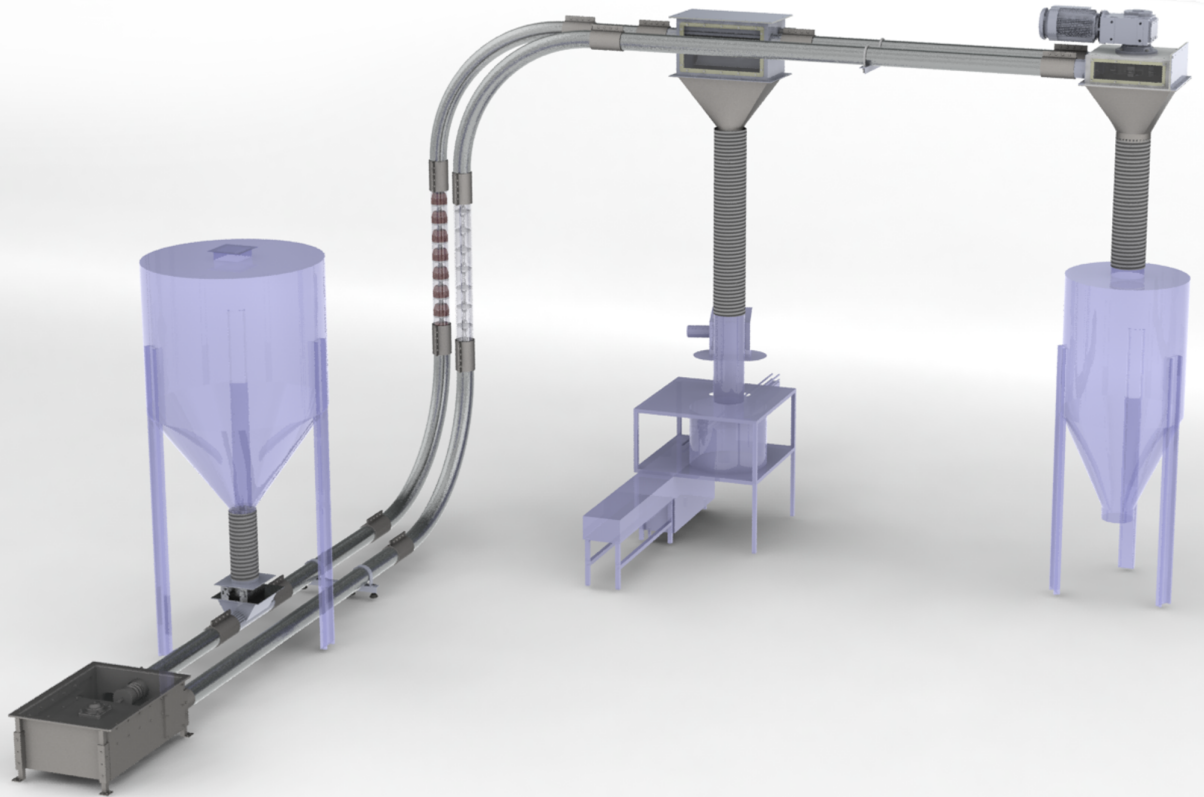
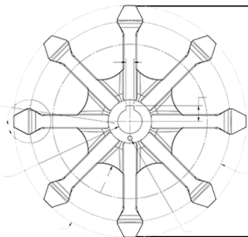


# CHAIN-VEY™



## 5" TUBULAR DRAG CONVEYOR

### INSTALLATION & OPERATION MANUAL



MODERN PROCESS EQUIPMENT

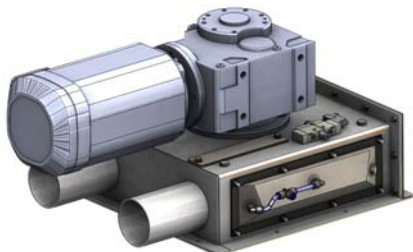
3125 S KOLIN AVE, CHICAGO, IL 60623 USA

T: 773.254.3929 W: [WWW.MPECHICAGO.COM](http://WWW.MPECHICAGO.COM)

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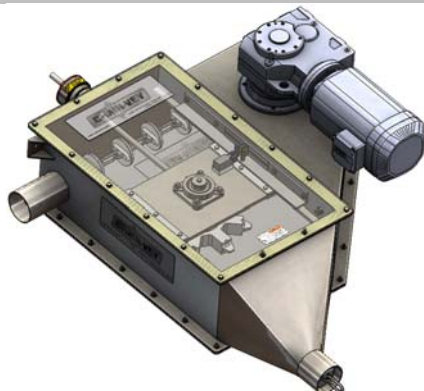
## **180° DRIVE UNIT** pg. 4-5



## **180° TURNAROUND UNIT** pg. 6



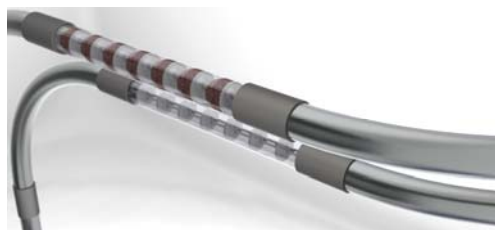
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## **General Information:**

### **Safety Recommendations and Warnings**

MPE Chain-Vey conveyors are built and tested to comply with current safety regulations and laws. To continue this practice of safety, MPE requires that the following is noted:

Before installing, operating, or servicing the conveyor, it is necessary to completely understand the information found in this manual.

The tubular drag conveyor is designed to be operated only as specifically stated in this manual. MPE can only warrant safety and proper performance of equipment that is used in accordance with this manual.

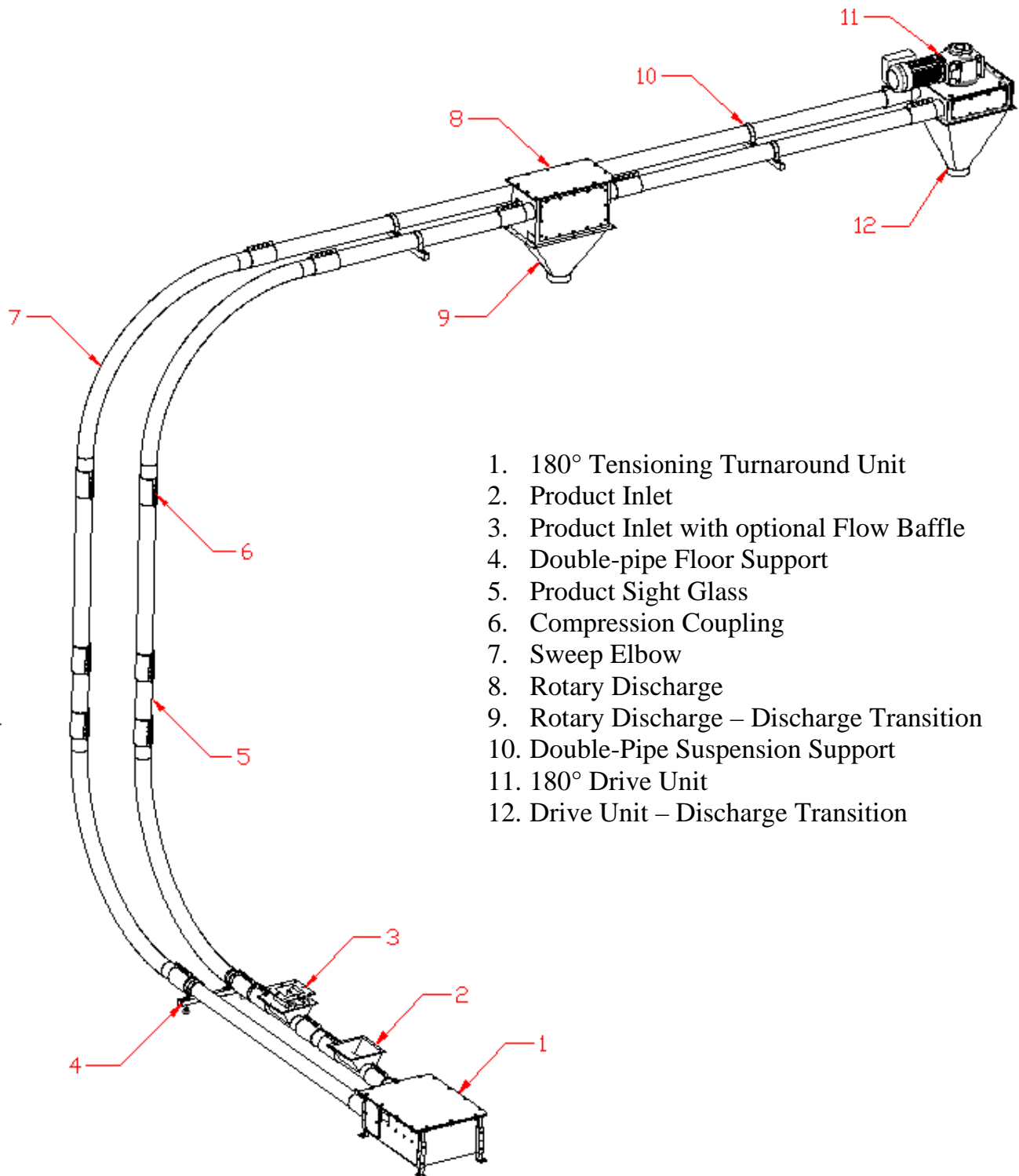
All planning, installation, transport, assembly, commissioning, maintenance and repair (mechanical and/or electrical) may only be completed by qualified personnel.

### **Safety Instructions**

1. Do not attempt to install, connect power to, operate or service Chain-Vey equipment without proper instructions, or until you have been thoroughly trained in its use.
2. Do not attempt to work on, clean, or service the conveyor until the power has been turned off and locked out. If and when it is necessary to momentarily start and stop (jog) the conveyor, use extreme caution and ensure that all personnel are clear of the conveyor chain.
3. Do not manually override or electrically bypass any protective device.
4. Do not connect power to, or operate the conveyor unless all moving parts are covered and all covers, guards, safety grids and maintenance panels are in place and securely fastened.
5. Do not place any part of your body or loose clothing within the feed hoppers, discharge hoppers, or any other access point on the conveyor while it is in operation.
6. All conveyor inlet and discharge openings and access panels must be completely enclosed to prevent human access when the conveyor is running and remain enclosed until power has been turned off and locked out.
7. All protective covers, guards, grates, maintenance panels and warning decals must be kept in place. Any equipment with damaged, defective, or missing protective devices must be taken out of service until such protective devices can be repaired or replaced.

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## Equipment Identification

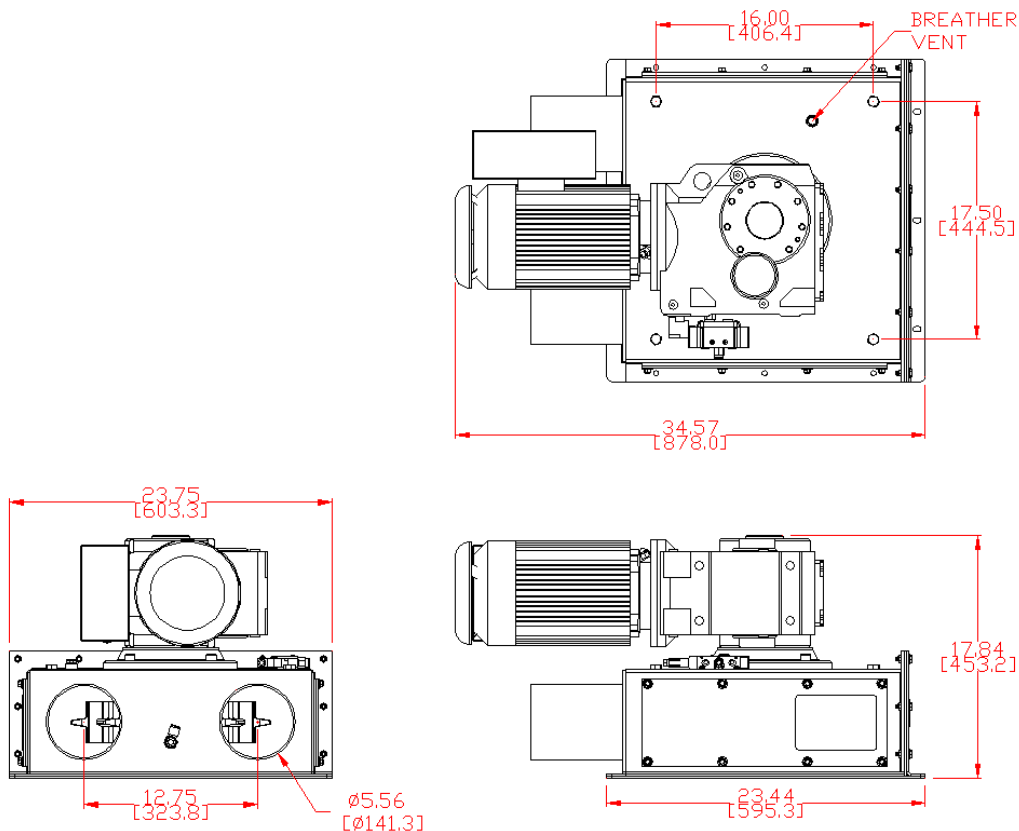


1. 180° Tensioning Turnaround Unit
2. Product Inlet
3. Product Inlet with optional Flow Baffle
4. Double-pipe Floor Support
5. Product Sight Glass
6. Compression Coupling
7. Sweep Elbow
8. Rotary Discharge
9. Rotary Discharge – Discharge Transition
10. Double-Pipe Suspension Support
11. 180° Drive Unit
12. Drive Unit – Discharge Transition

*Note: Equipment layout is shown only as an example. The component numerical designations are shown for reference purposes only.*

## 180° Drive Unit:

Used in conjunction with the 180° turnaround unit, the 180° drive unit is the mechanism that pulls the chain through the system. The chain is pulled through the drive unit by a sprocket which is powered by an electric gearmotor. The drive unit may be run in either direction, and the chain can enter or exit through either of the two ports. The drive unit is installed at the end of the circuit system. Typically, the drive unit is used as the final or single discharge point.



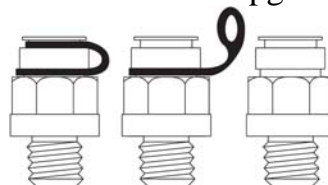
The drive unit is to be ceiling suspended or base mounted. The unit may be oriented horizontally or vertically. For ceiling suspension, (4) 1/2"-13 thru holes are located at the top of the drive unit. These mounting holes may be used for running through threaded rod or placing eye-bolts.

\*the unit weighs app. 360 lbs (163.3 kg)

Note:

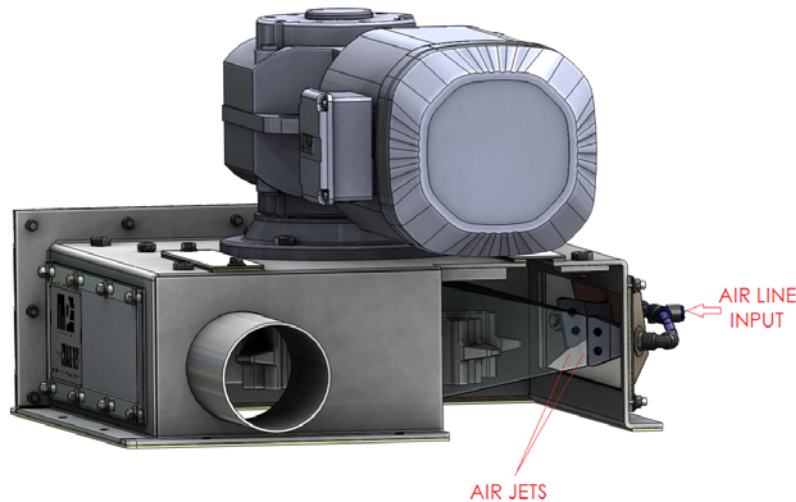


The Drive unit is shipped with a breather plug already mounted on the gearmotor. Once the unit is installed, the black rubber seal located on the breather **MUST BE REMOVED**. In addition, the oil level should be checked. (see *Equipment Lubrication* pg. 16)





When the drive is used as a discharge point, the unit may be equipped with adjustable air jets. The air jets aid the discharge of product and keep the chain/discs clean of any residue. The air jets are adjusted by using the air flow controller to reduce and increase air flow to the jets. To allow for pressure relief, all units are supplied with a low-profile breather vent. In applications where the breather vent is not desired, the port can be plugged with any 3/8" NPT plug.



Note:

- For best results, a filter separator should be used on all compressed air supplies.
- Each air jet assembly uses a total of 44 SCFM of air at 80 PSI [5.5 bars].

Adjusting the Speed:



The conveyor speed is controlled by the drive unit gearmotor. Units equipped with the optional integrated VFD (variable frequency drive), are designed for speed adjustment. To adjust the speed, remove the dial cover and adjust the dial between 2 and 10. The suggested running rate is slightly above that which is required to maintain 80% product fill in the conveyor (see *Flow Control* pg.13). For units that have been configured to have their speed remotely

controlled via HMI or PLC, the speed dial should be set to 6. When remotely controlled, the speed dial sets the maximum value from 10hz to 100hz, so a setting of 6 allows the remote control to vary the speed up to 60hz.

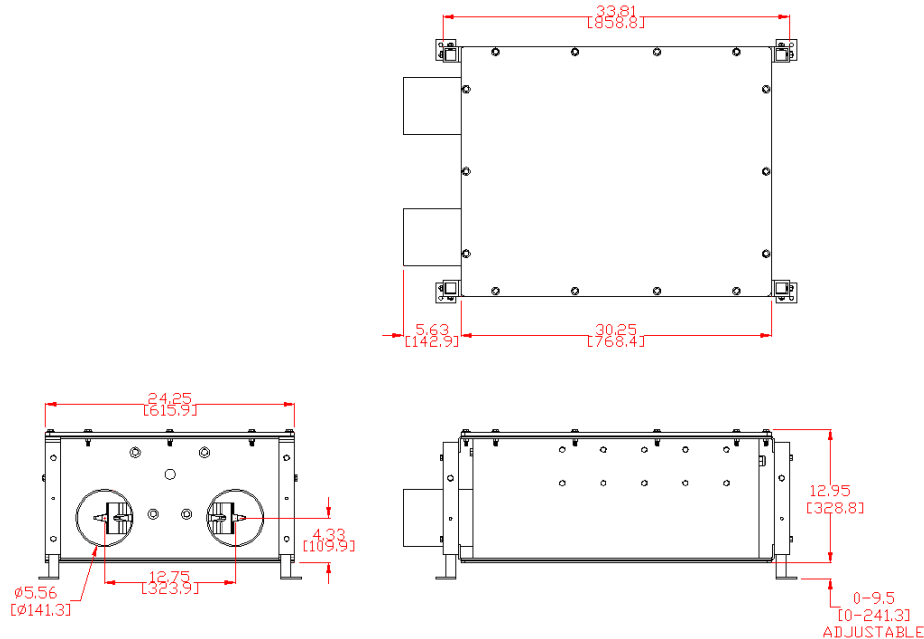
Manual Rotation:



A notable feature of the drive unit gearmotor is that it can be used to manually rotate the drive sprocket. This is often helpful during chain installation and other maintenance events. To manually rotate the drive sprocket, simply remove the motor fan cover and slowly turn the fan in the desired direction. Note that before removing any guards that the machine should be powered off and secured against unauthorized activation

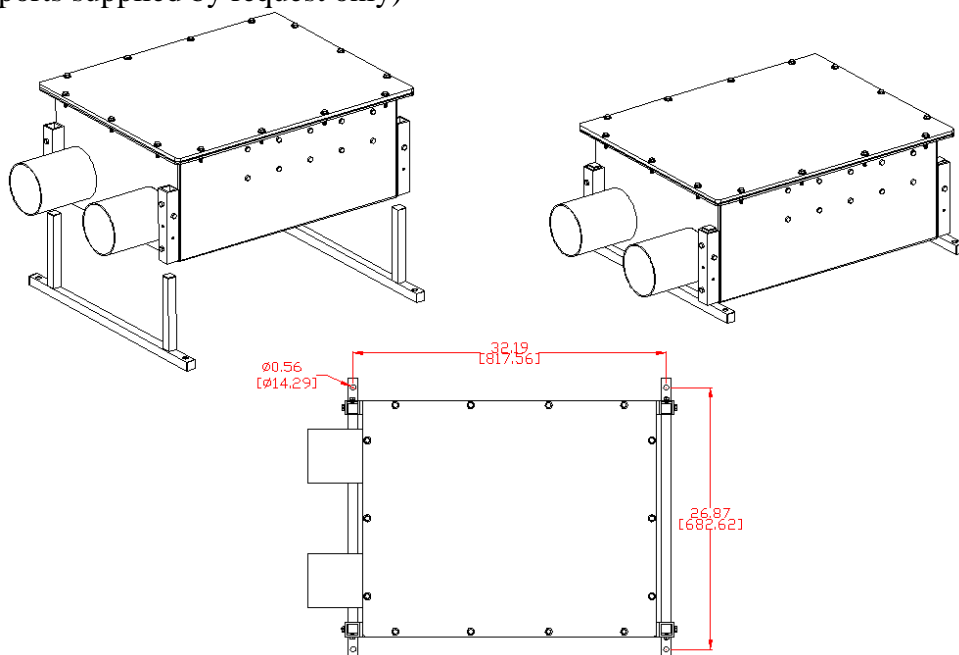
## 180° Turnaround Unit:

Used in conjunction with the 180° drive unit, the 180° turnaround unit is the mechanism that keeps the chain tensioned within the system. The turnaround unit may be run in either direction, and the chain can enter or exit through either of the two ports, but must correspond with the direction of travel on the drive unit.



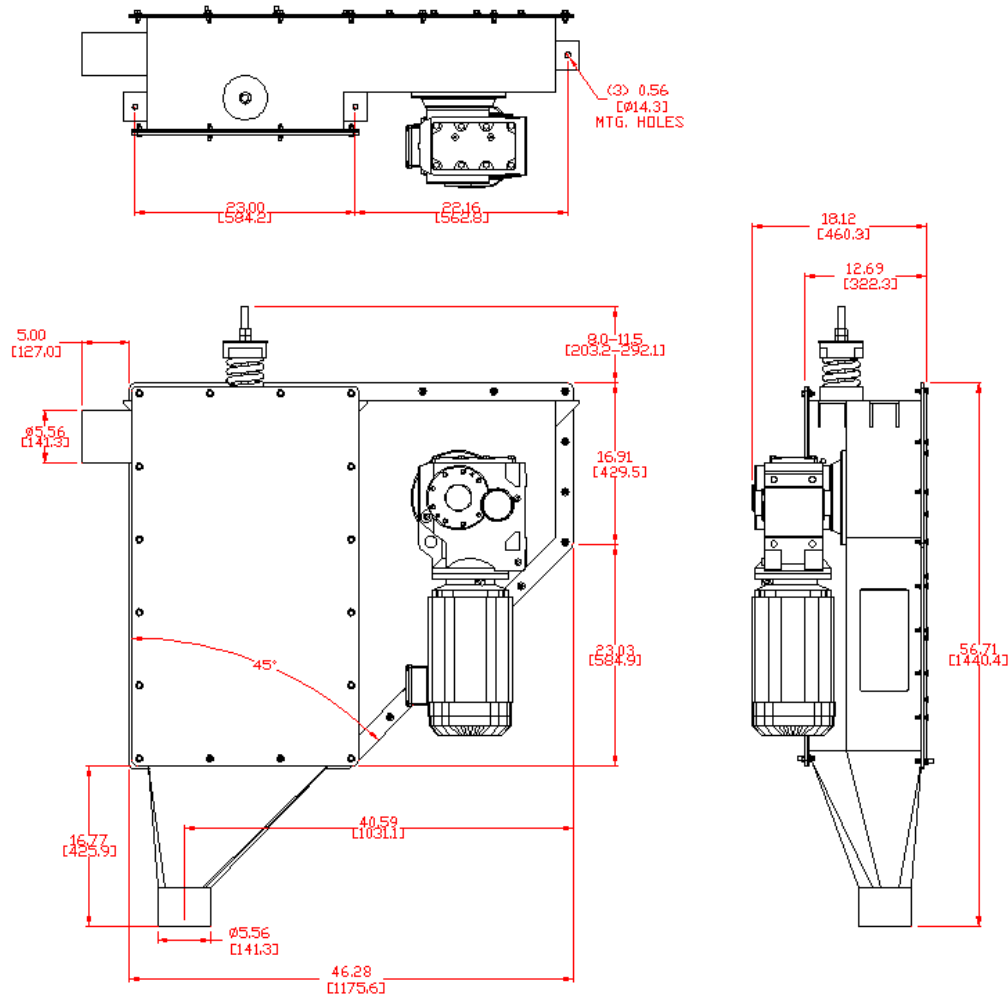
The 180° turnaround unit is to be ceiling suspended or base mounted. The unit may be oriented horizontally or vertically. \*the unit weighs app. 260 lbs (117.9 kg)

In instances where the 180° Turnaround is to be ceiling suspended, the standard mounting legs are replaced with two suspension supports which allow for suspending the unit at four points by 1/2" threaded rod. (Suspension supports supplied by request only)



## 90° Integrated Drive/Tensioner:

In instances where layouts don't work best with the 180° drive unit and 180° turnaround combination, an integrated 90° drive/tensioner is often a better fit. The integrated drive/tensioner is a single unit which combines the functions of both the drive unit and the turnaround. The unit has one sprocket which is powered by an electric gearmotor and pulls the chain through the system. A second sprocket is positioned by spring tension and keeps the chain tensioned within the system. The 90° integrated drive/tensioner may be run in either direction, and the chain can enter or exit through either of the two ports.

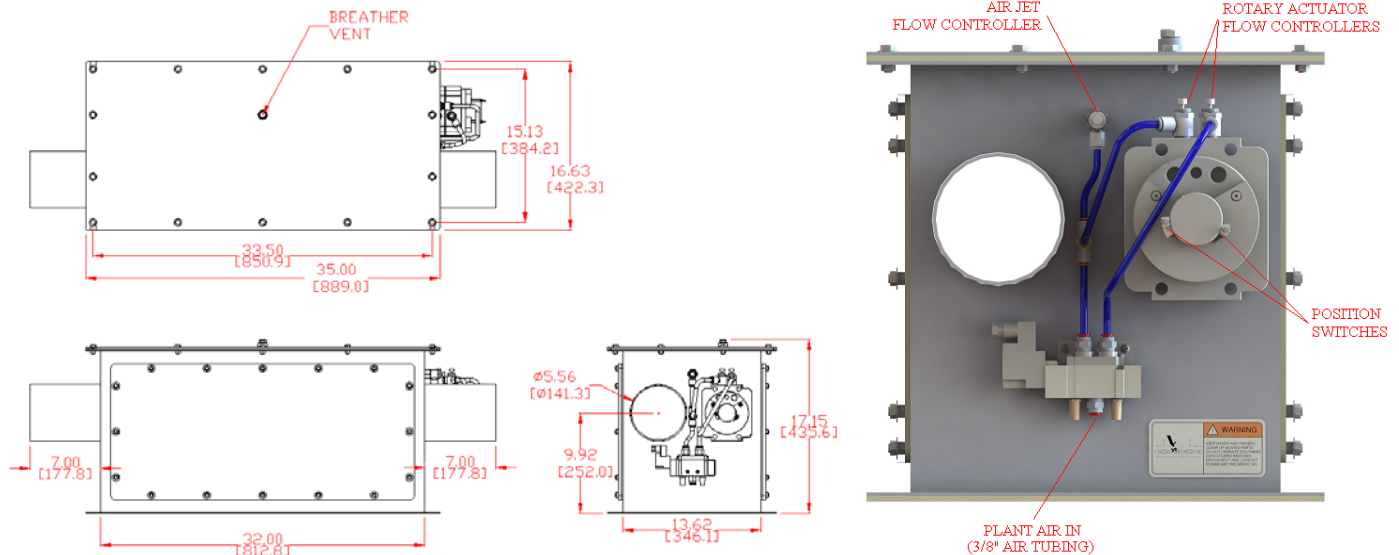


The 90° integrated drive/tensioner is to be ceiling suspended or base mounted. The unit may be oriented horizontally or vertically. \*the unit weighs app. 470 lbs (213.2 kg)



## Discharge Unit:

The discharge unit is placed in the conveyor system at any location of desired product discharge. The discharge unit has a pneumatic rotary actuated drop-door which allows for remotely opening and closing the discharge. Multiple discharge units may be placed in a system when multiple discharge points are required.

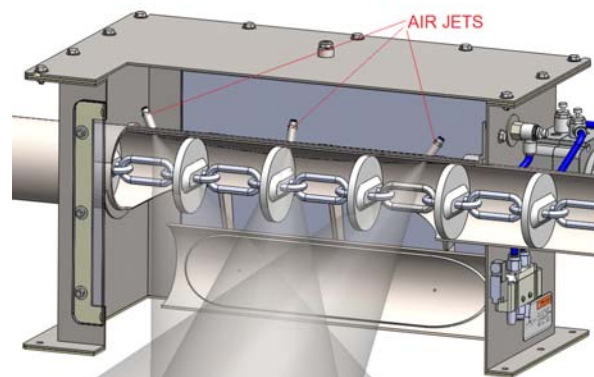


The discharge unit is to be ceiling suspended or base mounted. \*unit weighs app. 140 lbs (63.5 kg)

Note:

- Air pressure to the rotary actuator should not exceed 120 PSI.
- Air flow controllers are used to control the speed of the door actuation by controlling the air flow into and out of the rotary actuator. Adjust the air flow so that the door does not slam closed, or swing open too quickly.
- The rotary actuator uses app. 6.5 in<sup>3</sup> [10 liters] of air at 87 PSI [6 bars] to cycle one time (open & close).
- For best results, a filter separator should be used on all compressed air supplies.

To aid in discharge of product and to keep the chain/discs clean of any residue, each discharge unit is equipped with adjustable air jets. The air jets are adjusted by using the air flow controller to reduce and increase air flow to the jets. To allow for pressure relief, all units are supplied with a low-profile breather vent. In applications where the breather vent is not desired, the port can be plugged with any 3/8" NPT plug.

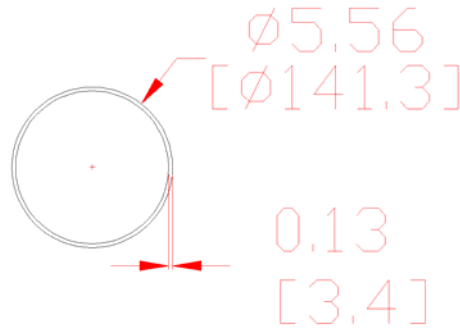


- The air jets of each Discharge Valve use a total of 44 SCFM of air at 80 PSI [5.5 bars].

## Conveyor Piping:

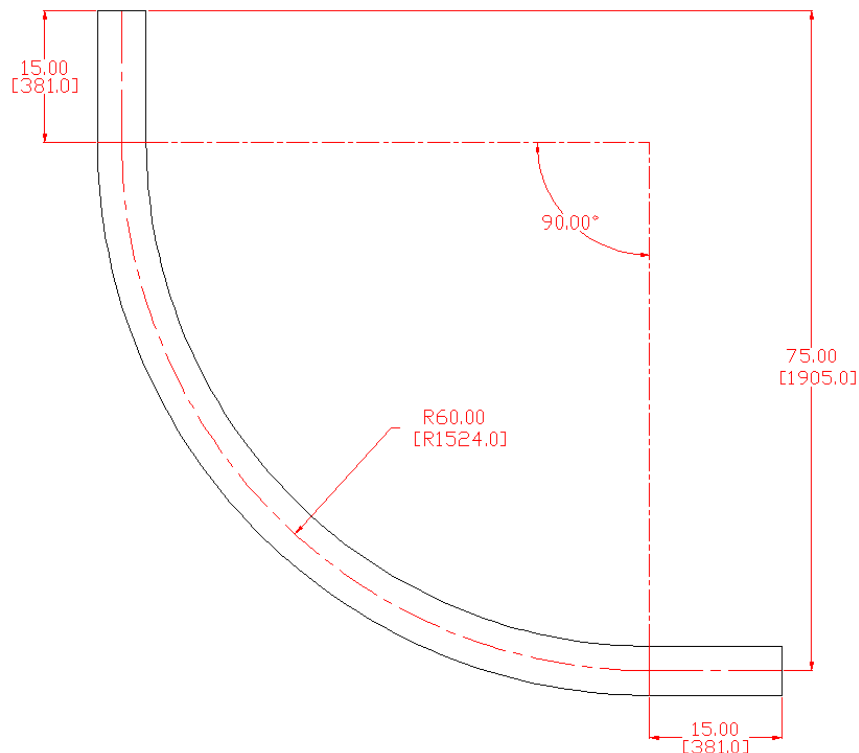
### Piping:

Chain-Vey conveying pipe is seamless 5" sch10 stainless steel pipe. The pipe OD is 5.56" [14.13cm] with a wall thickness of 0.13" [0.34cm]. The weight of the pipe is approximately 7.77 lbs/ft [11.56 kg/m]



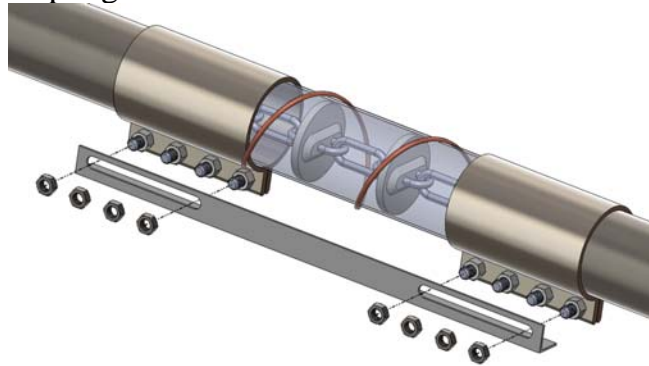
### Elbows:

Conveying elbows are used for gradual transitions in the direction of chain travel. The elbows are bent seamless 5" sch10 stainless steel pipe. The pipe O.D. is 5.56" [14.13cm] with a wall thickness of 0.13" [0.34cm]. The pipe is bent uniformly to keep the pipe I.D. concentric, and avoid any ovality. The standard pipe elbow is 90° with a centerline radius of 60" [152.4cm]. Elbows are also available with bends between 5°-90° and a centerline radius of 36"-72" [91.44-182.88cm]. The weight of the standard elbow is approximately 82 lbs [37.2 kg].



## Sightglass:

The sightglass has the same dimensions as the stainless steel conveying piping, and is installed to enable viewing the product as it is being conveyed, as well as permit inspection of the chain and discs. The sightglass is made from durable polycarbonate, but can be scratched or dented if not handled properly. When cleaning the sightglass, use a mild soap or detergent and wash with lukewarm water and a clean sponge or soft cloth.



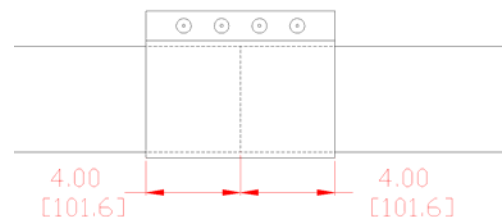
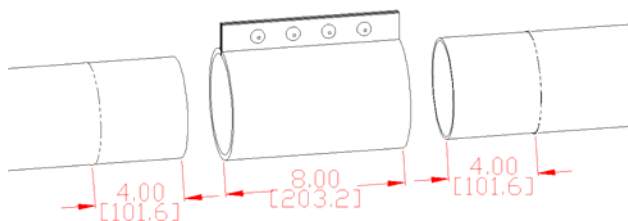
To avoid buildup of static electricity at the sightglass, it is important to ground the piping. Wrap the supplied copper grounding wire around a sightglass to create a “bridge” reaching from the bolts of the compression couplings at each end of the sightglass. Approximately 3ft [1m] of wire is needed to accommodate a standard 20" [51cm] long sightglass. In some cases, the weight of the surrounding conveying pipe may cause the sightglass to bend or bow. To avoid this, the supplied structural support bar should also be installed as shown above.

## Installation:

Before installing any pipe section, elbow, sightglass, etc... first assure that all cuts are square, and that both pipe ends are free of dents, sharp edges, or burrs.

The tube ends are to be joined together with 4-bolt (8" [20.32cm] long) compression couplings. The pipe connection point should be centered within the coupling, with equal lengths grasping each pipe section. For best results, each pipe end should be marked at 4 inches (half of coupling length) from its end. When tightening the coupling, assure that the pipe ends are held together squarely, and that the ends do not separate when tightened.

Note: For better likelihood of keeping the pipe ends square and together, first partially tighten all bolts and then go back and apply a final torque, always tightening the outer bolts first, then inner bolts.



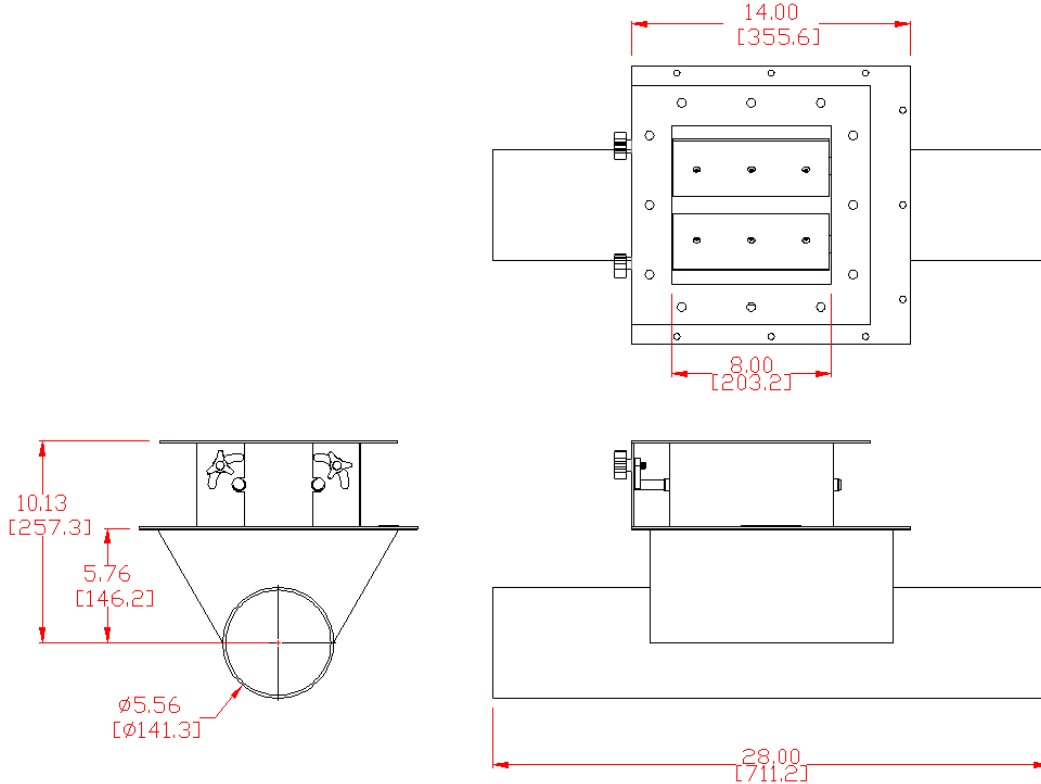
\* Shorter 3-bolt (6" [15.24] long) compression couplings may be used if space is limited, but the 4-bolt compression coupling is recommended for ideal support and straighter connections.



For the least amount of wear on the discs, the ERW line of the pipe should be oriented at the top of the tube.

## Inlets:

Inlets are the entry point of product into the conveying system. Systems using the 180° drive and turnaround units should be configured having a “product side” and a “clean side”. Accordingly, all inlets should be placed on the “product side”. For head loaded applications, such as under a storage hopper without a metering device, a flow control baffle is used. This device is used to set the product fill level and prevent product shear reducing product breakage and minimizing excessive pull on the chain. (see *Flow Control* pg.15)



## Chain / Disc:

Chain-Vey chain is custom made and is rated for a minimum breaking load of 9,000 lbs [4,082 kg]. Conveying discs are molded from FDA compliant, ultra low friction UHMW. The weight of the chain and molded discs is approximately 2.11 lbs/ft [3.14 kg/m].



### Installation:

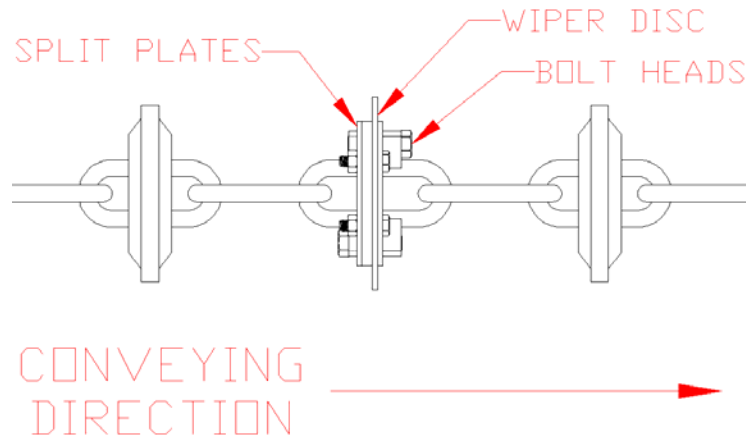
After the tubing circuit is installed, use a cable-puller or wire snake, equipped with a steel cable to route through the conveying tube. Connect the chain to the cable and pull or winch the chain through the tube. It is very important to avoid twists in the chain. One method to ensure the chain is not twisted is to mark a point, for example the “top” of each disc with a marker. When the chain is fed into the system, be sure to always feed the discs with the mark oriented in the same direction. Such as the “top” always up.



Once the chain is pulled through the system, cut off any excess chain links with a grinder/cutting wheel or large bolt cutter. When cutting the chain, always error on the conservative side by leaving a few more links than will probably be needed. Be sure that the connector link is spaced between two empty links so it is spaced where a puck should be located. The chain ends can then be connected using the provided chain connector.



The chain connector link joins the two ends of the chain together to complete the loop. The clean-out disc is a 1/8" [.32cm] thick FDA compliant polyurethane disc used for wiping the inside walls of the conveyor piping. Because the OD of the clean-out disc is larger than the ID of the piping, it is able to collect any product that is left behind by the conveyor discs.

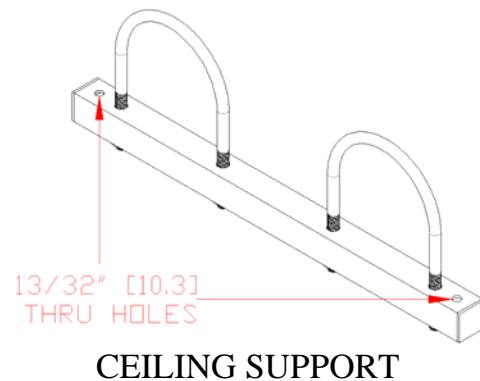
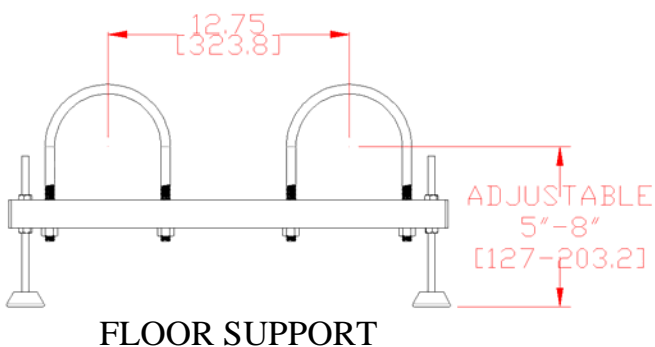


\*Installation of the connector link in accordance with the direction of travel is important for reducing the wear on the cleanout disc.

\*It is very important to avoid stripping the threads of the connector link. A stainless steel anti-seize lubricant is recommended during install. The bolts should be fastened with the suggested torque of 268.4 in-lb [30.3 N-m]

## Ceiling / Floor Supports:

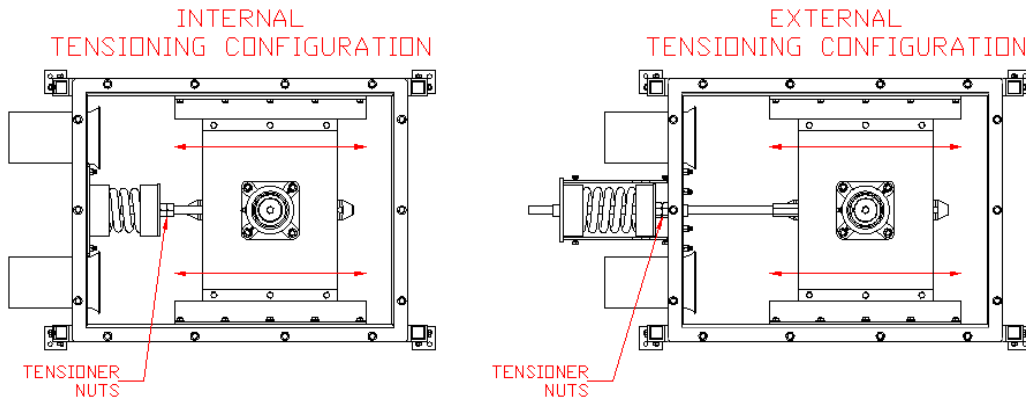
Ceiling and floor supports are used to support the conveyor pipe and keep them at the set distance of 12.75" [32.39cm]. The floor support stand is design to utilize leveling mounts that allow for vertical adjustment of horizontal piping. The ceiling support is designed to allow for suspension from the ceiling using 3/8" [10mm] threaded rod or cable. The ceiling support may also be used on vertical piping, to keep the piping at the set distance of 12.75" [32.39cm]. A ceiling support or floor support should be used to support the piping approximately every 8ft [2.44m].





## Operations:

### 1. Setting the Tension

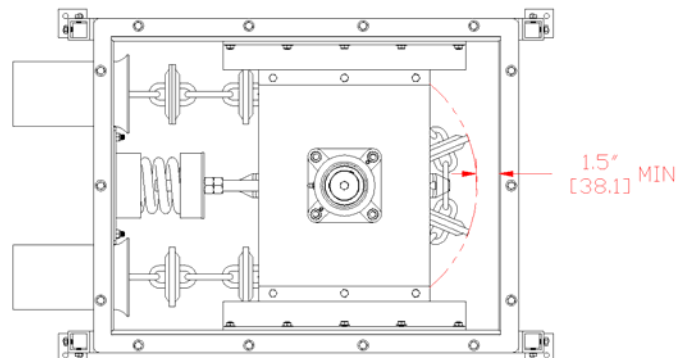
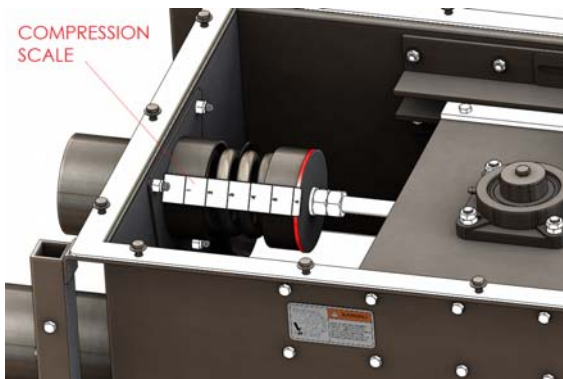


When rotated clockwise or counter-clockwise, the tensioner nuts move the tensioner plate towards or away from the inlet/outlet ports, placing more or less tension on the chain. Once the desired tension is obtained, it is important to tighten the nuts against each other to ensure that the tension is locked. The tension is correct when the chain is taut, but will allow for approximately 1/16" [1.6mm] of movement (1/8" deflection) when the chain is tugged on by hand. If the discs touch the bottom of the tube when entering the return path, the tension is too low and needs to be adjusted.



To help with tracking the tension setpoint, a scale is provided next to the tensioning spring so that the amount of compression applied can be noted. At zero tension (zero compression) the spring should measure approximately 6" [15.2 cm]

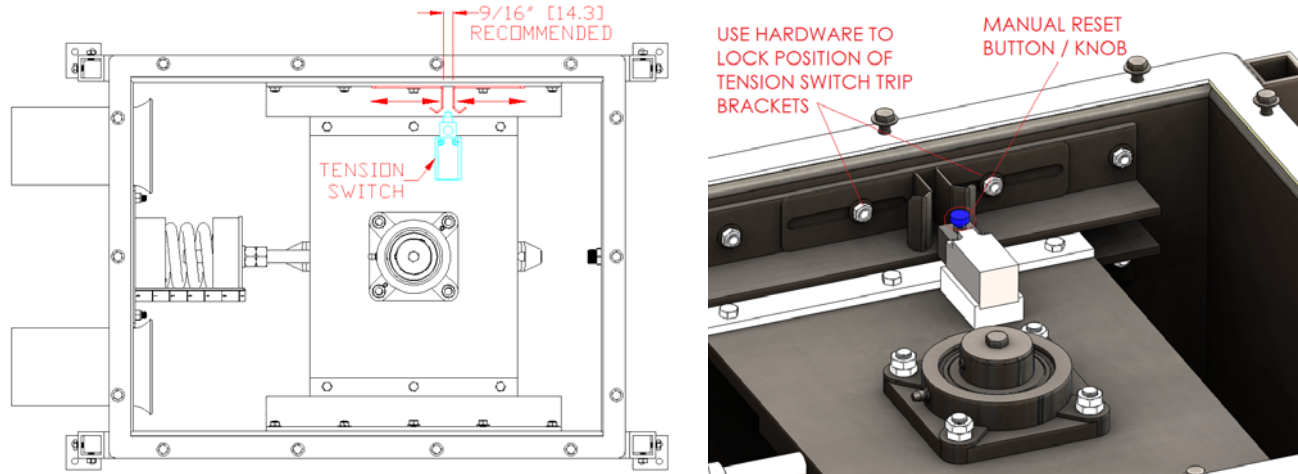
When adjusting the tension, it is also very important to allow for at least 1.5" [38.1mm] of clearance between the rotation of the pucks and the back wall of the 180° turnaround unit. It may be necessary to shorten the chain to obtain this clearance.



#### Note:

If the tension of the chain is too high it will cause excessive wear on the conveyor.

## 2. Setting the Tension Switch



To control any undesirable fluctuations in the tension of the system, each 180° turnaround unit is equipped with a tension limit switch. Any adverse changes in the tension (+ or -) will "trip" the switch which in-turn cuts power to the conveyor. This allows the operator the opportunity to examine the tensioning issue prior to damaging the equipment or causing disengagement from the sprocket.

To set the limit switch, first tension the system the appropriate amount. Once the tension is set, adjust the placement of the trip brackets so that the roller plunger of the limit switch is centered between them. The trip brackets should be spaced away from the roller-plunger to allow for some movement, but not drastic fluctuations. Typically a spacing of about  $\frac{9}{16}$ " [14.3mm] is recommended between the trip brackets, but individual systems may vary.

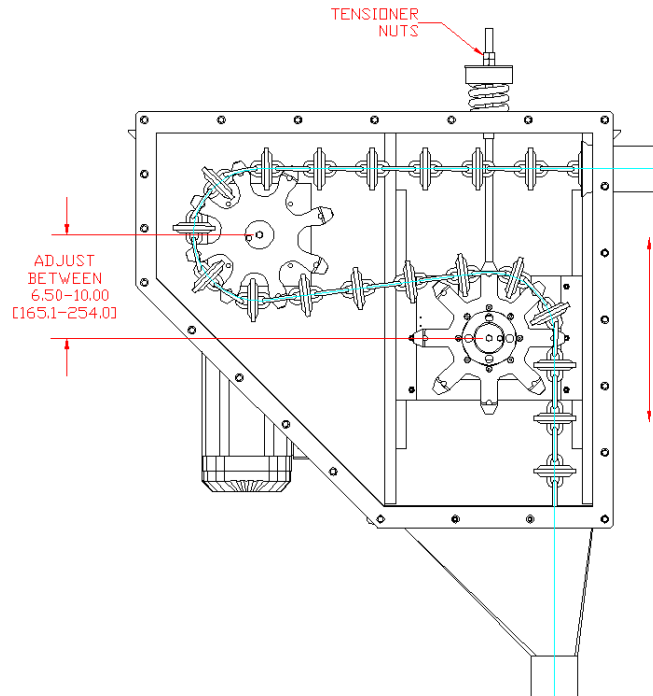
If the tension switch trips, investigate to determine the cause and correct the issue prior to restarting the conveyor. To re-set the switch, the switch must be manual reset by pulling up on the blue reset knob.

### **Note:**

For maximum life, periodically put a drop or two of lightweight oil on the roller. Specific application conditions will determine lubricating frequency.

## 90° Integrated Drive/Tensioner Settings

Setting the tension and tension switch of the 90° integrated drive/tensioner is essentially the same as on the standard 180° turnaround unit. The chain should be run through the unit as shown below, and the tensioning spring should then be compressed until the desired tension is met.



## 3. Testing

Check the conveyor thoroughly before first turning it on.

- check that all covers and safety features are installed and function properly
- check that all tools have been removed from the conveyor
- before running for a long period of time, check that the conveyor runs in the intended direction.

During the first hour of running, the equipment should be watched closely so that it may be stopped immediately if necessary. While running, each pipe connection point should be checked for any “clicking”. Clicking is a good indicator that the pipe connection is not square or that a gap is between the two pipes. Following the first hour of running, turn the conveyor off and again inspect all connections, the tension of the chain and the proper installation of the chain connectors. Now the conveyor can be run loaded for a day shift before checking everything again. After testing the equipment and a thorough inspection, the conveyor is ready for operation.

## 4. Operation

The conveyor should only be operated by authorized personnel who are familiar with the specific features of the equipment and have read and understood the contents of this manual.

It is important to feed the conveyor at a rate less than the capacity stated in the technical specifications. Otherwise damage to the sprockets and chain and all moving parts may result.

The chain should be checked regularly for the correct tension and length.

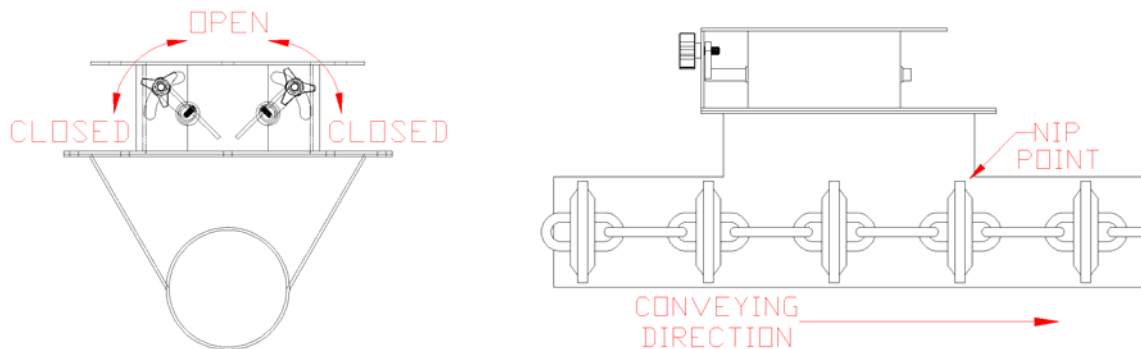
If the motor starter, fuse, or shock relay trips, the conveyor may only be turned back on after the origin of this malfunction is detected and has been properly addressed.

Let the machine run empty before turning it off. Any product left within the system could harden or become gummy over an extended period of time, therefore potentially hindering restarting the conveyor.

E-stop buttons should only be used when immediate safety is impaired, and should not be used for regular operation. After an E-stop has been used, be sure that the cause of the emergency is established and resolved before putting the conveyor back into service.

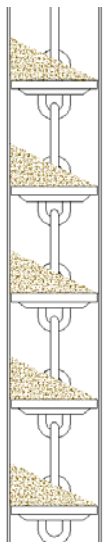
## 4. Flow Control

When there is a bulk source or direct head-load of product feeding the Chain-Vey conveyor, the inlet flow control baffle is very important. The flow control baffle utilizes two plates on a pivot which increase or decrease the opening of the inlet. Two hand knobs are used to adjust and also lock the plates' position once the desired feed rate is attained. If desired, a tamper-resistant, tooled adjustment is an available alternative to the hand knobs.



### Note:

To prevent product shear and reduce excessive pull on the chain, the inlet and baffle must be installed in accordance with the conveying direction as shown above.



Low Fill  
( $< 50\%$ )



Standard Fill  
( $70\% - 80\%$ )



Maximum Fill  
( $90\%$ )

To achieve desired fill level, adjust the baffles of the inlet flow control, and make adjustments to the conveyor speed and feed rate.

## Maintenance:

Maintenance should be carried out by trained personnel in order to avoid personal injury or damage to equipment. Deviations from normal performance (higher power input, higher temperatures, vibration, unusual noises or odors, etc.) indicate that functionality of the unit is impaired. The frequency of inspections is dependent on several variables, but the should be routinely addressed.

### 1. Routine Equipment Inspections

Drive Unit		
1		Ensure that all hardware on the sprocket is present and tightly fastened.
2		Inspect the sprocket teeth for wear
3		Check the gearbox oil level, and add oil if needed
4		Test the air-jets for proper pressure and flow
5		Clean the fins of the motor fan to optimize cooling
6		Verify the motor and gearbox mounting bolts are tightly fastened
7		Inspect the shaft oil seal for wear or damage
8		Remove any product build-up from all internal surfaces
Turnaround Unit		
1		Check for proper tensioning, and note any changes since last inspection
2		Ensure that all hardware on the sprocket and tensioning plate is present and tightly fastened
3		Inspect the sprocket teeth for wear
4		Inspect the sliding plates for excessive wear
5		Check the position and functionality of the tension switch
6		Remove any product build-up from all internal surfaces
Discharge Valve		
1		Inspect the alignment and open/close of the drop-tube
2		Verify the proper functioning of the open/close reed switches on the rotary actuator
3		Remove any product build-up from all internal surfaces
4		Test the air-jets for proper pressure and flow
Pipe / Elbows		
1		Inspect all floor and ceiling supports for misalignment and verify that all hardware is present and tightly fastened
2		Check for any dents or damage which may affect the inner diameter of the pipe
3		Inspect the inner walls for excessive wear or abnormal build-up of material
Chain / Disc		
1		Inspect the discs for wear and/or damage on the outer edges
2		Examine the chain for any excessive wear
3		Check the welds on the chain links for any sign of potential failure
4		Confirm that connector link wiper disc is fully intact
5		Confirm that the connector link hardware is present and tightly fastened
Sight-Glass		
1		Check for any discoloration or any other obstruction of visual clarity
2		Inspect for any scratches or cracks
3		Confirm that the grounding wire is intact and in good condition
Inlets		
1		Remove any product build-up from all internal surfaces
2		Check the inlet baffles (if present) for the proper flow control settings



## 2. Troubleshooting

*If in doubt, switch off the equipment immediately!!*

ISSUE	PROBABLE CAUSE
Chain "jumps" Sprocket	Tension Too Low
	Tension Too High
	Product Build-Up on Sprocket
	Wear on Chain
	Wear on Sprocket
	Twisted Chain
Chain / Connector Breaks	Foreign Object in Conveyor
	Product Build-Up in Conveyor
	Conveyor is Overloaded
	Chain is Worn
Conveyor Won't Start	No Electricity
	Defective Motor
	Product Build-UP in Conveyor
	Check Shock Relay
	Reset Tension Switch

ITEM	REQUIRES REPLACEMENT WHEN...
Chain / Chain Connector	Diameter of link is less than 5/16" (8mm) at point of contact with next link
Conveying Disc	Diameter of disc is less than 4-7/8" (123.8mm)
Cleanout Disc	Disc becomes torn, worn, or excessively discolored
Sprocket	Point of contact with chain is worn more than 3/32" (2mm)
Tubing	Wall thickness is less than 1/32" (1mm) note; tubing may be rotated up to 7 times, because majority of wear occurs on bottom of tube

**When working on the machine, make sure the equipment is off, and secured against unauthorized activation.**

### 3. Equipment Lubrication

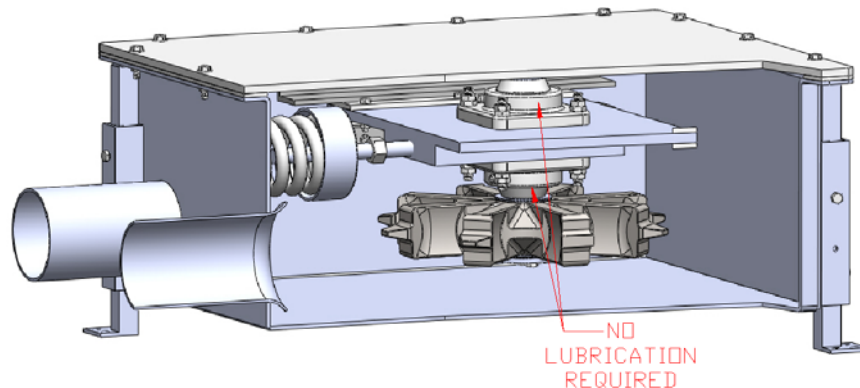
#### Drive Unit:

Unless otherwise specified, Drive Unit gearmotors are supplied with food grade Klüberoil UH1-6-460 lubricant. The gearmotor requires that this oil be changed every 10,000 operating hours or every two years, whichever comes first. In applications where hostile operating conditions exist, such as high humidity, corrosive environment, or large temperature changes, the oil should be changed at more frequent intervals. To check the oil level, remove the plated (non-painted) oil level plug. The oil level is correct when the surface of the oil is level with the lowest point of that tapped hole.



For units installed in the standard upright position (nameplate should state “Mount Pos. M5A”) the recommended amount of oil is 1.16 gallons [4.4 liters]. For any other mounting position, contact MPE for recommended oil amounts.

#### Turnaround Unit:



The two flange bearings located on the Turnaround unit are double sealed and are permanently pre-lubricated with USDA approved H1 grease. These bearings require no relubrication, even in washdown environments.

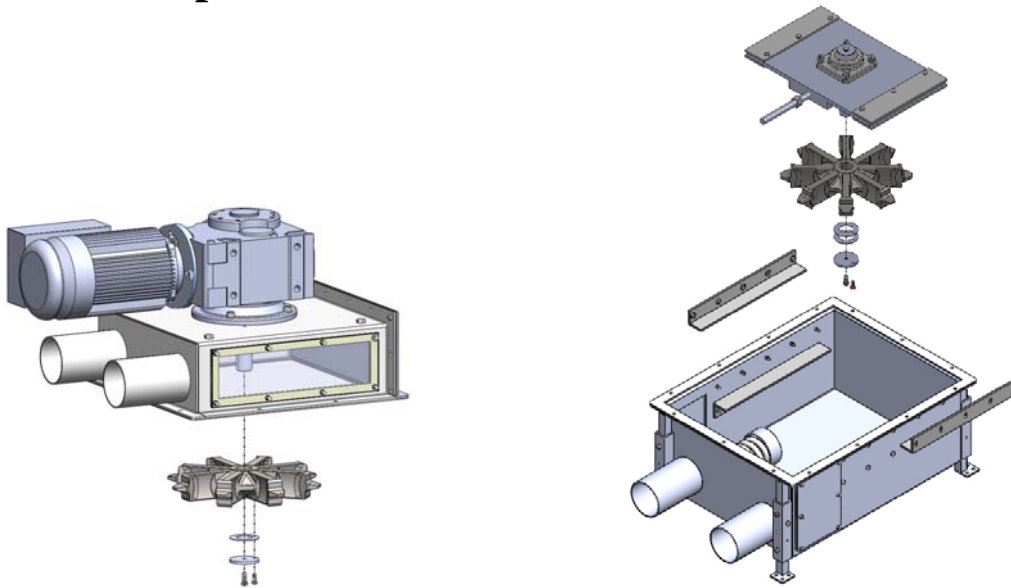
## 4. Replacement of Chain

Before removing the chain, the conveyor must first be run until empty. The conveyor should then be run at low speed to allow for stopping the conveyor at the point when the chain connector link is easily accessible through the turnaround unit. The tension on the chain can now be released by turning the nut on the spindle, bringing the tensioner towards the inlet/outlet ports.

Once the connector link has been located, and the tension has been released from the chain, the chain may be removed as follows:

- remove chain connector
- pull the chain slowly with a chain block or winch through either the rear door of the drive unit or the top of the turnaround unit.

## 5. Replacement of Sprocket

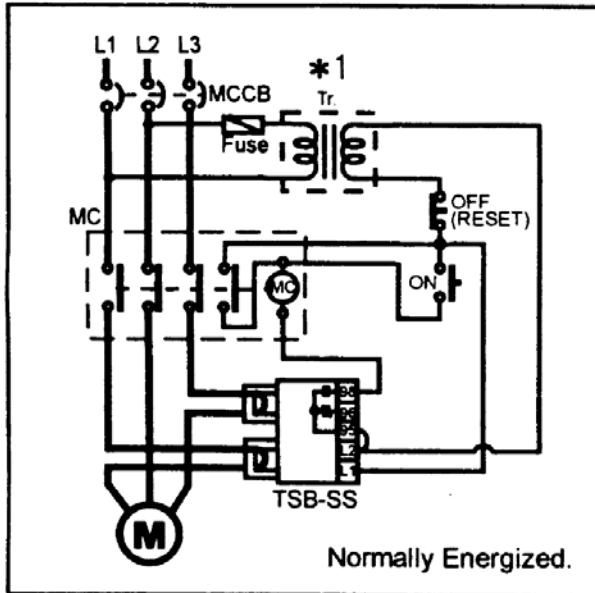


# ELECTRICAL INSTALL:

## 1. Drive Unit Wiring

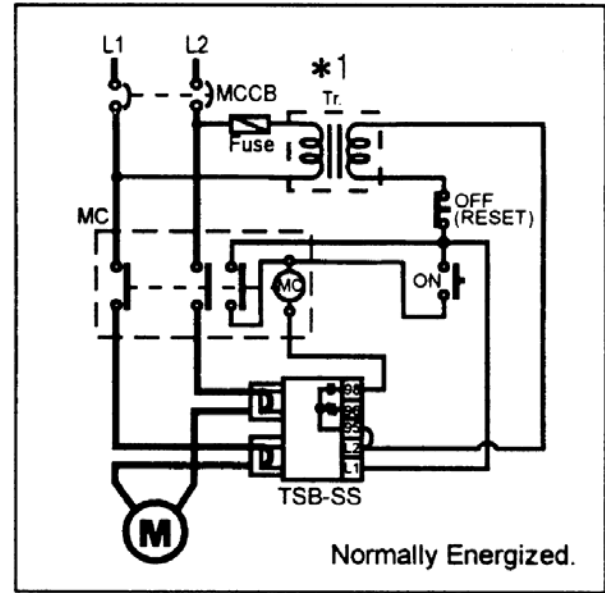
### THREE PHASE MOTOR

Two of the three phases of the motor are passed through the shock relay's CT in the same direction.



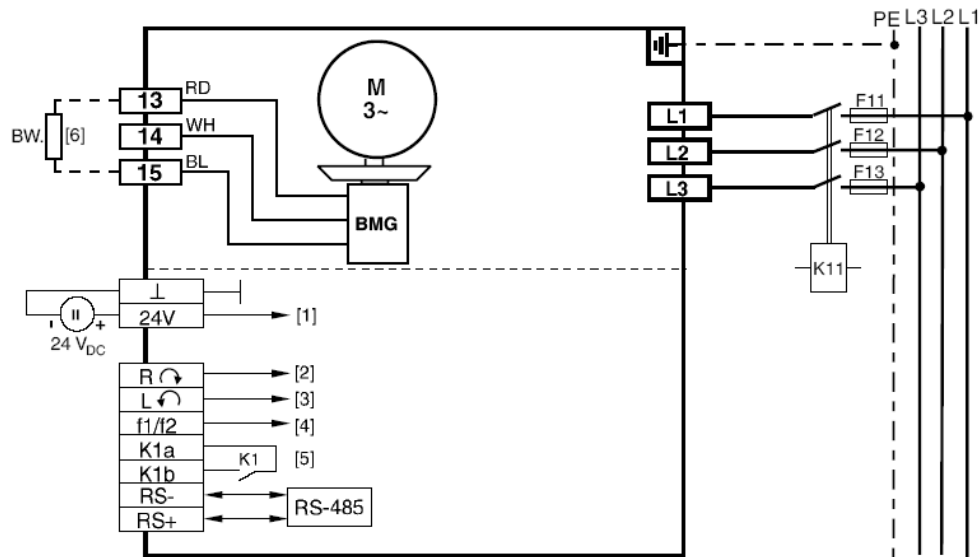
### SINGLE PHASE MOTOR

Each motor wire is passed through the shock relay's CT in the same direction.





### 3. Drive Unit – VFD Wiring



[1] DC 24V supply (external or MLU../MLG.. option)

[2] CW/stop

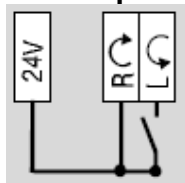
[3] CCW/stop

[4] Setpoint switch mode f1/f2

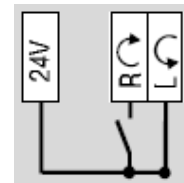
[5] Ready signal (contact closed = ready for operation)

[6] BW braking resistor (only on units without mechanical brake)

#### Functions of the CW/stop and CCW/stop terminals with binary control:

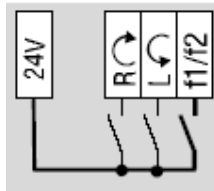


Direction of rotation CW active

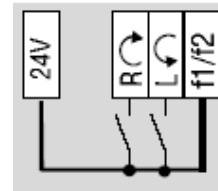


Direction of rotation CCW active

#### Functions of the f1/f2 terminals:

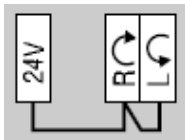


Setpoint f1 active

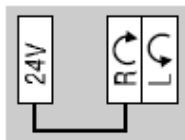


Setpoint f2 active

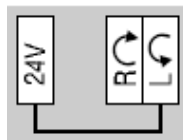
#### Functions of the CW/stop and CCW/stop terminals with control via RS-485 interface/fieldbus:



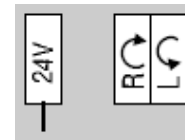
Both directions of rotation are enabled



Only CW direction of rotation is enabled, setpoint specifications for CCW operation result in standstill of drive



Only CCW direction of rotation is enabled, setpoint specifications for CW operation result in standstill of drive

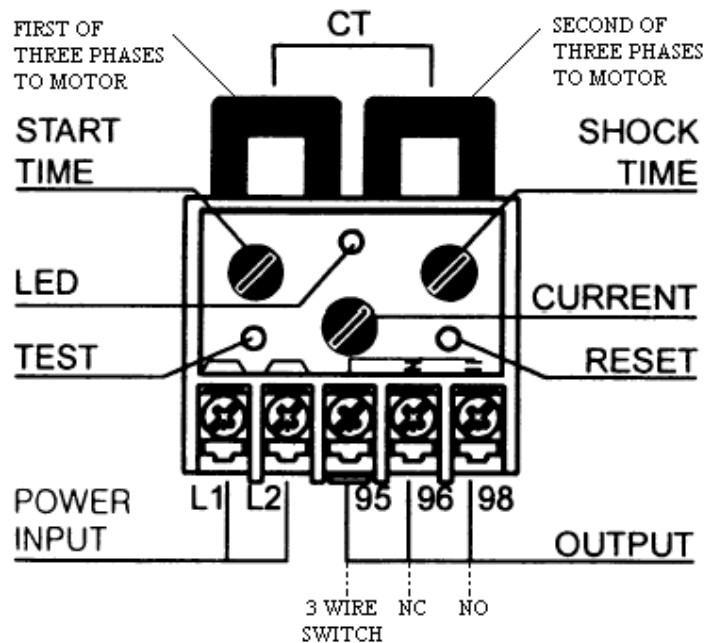


Drive is blocked or brought to a stop



## 4. Drive Overload – Shock Relay

The shock relay is mounted in the system control panel and is used to monitor the motor current and indicate when a motor overload has been detected. If the overload lasts for longer than a preset amount of time, the shock relay will act as an electric shear pin and interrupt the supply of power to the motor.



### Note:

If the shock-relay trips, investigate to determine the cause and correct the issue prior to restarting the conveyor.

### Set-Up:

- 1) Set the start delay timer (START TIME) to the known motor run-up time (20 - 30 sec).
- 2) Set the trip delay timer (SHOCK TIME) to the desired trip time. (8 - 10 sec)
- 3) Set the load current (CURRENT) at the rated full load or 25% above the normal operating amperage.
- 4) Test the unit by holding the TEST button depressed. Verify that the red LED illuminates and the internal relay should switch contacts after the sum of the start time and shock time. Once verified, reset by depressing the RESET button.
- 5) Start the equipment and notice the run-up time. Then slowly turn the CURRENT knob counter clock-wise until the LED flashes. This indicates 100% of the load current. Set the CURRENT knob to the desired trip setting. A setting of 110% of the running current is commonly used.
- 6) Reset the START TIME knob to match the normal run-up time.

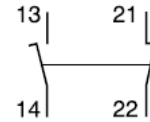
\*Periodic testing by using the TEST button is suggested to ensure the full protection through preventive maintenance.

## 5. Tension Switch

The tension/limit switch...

Operating voltage: 24 - 400V AC/DC

**T11 (1NO+1NC)**  
Non overlapping  
Slow action



## 6. Solenoid Valves

The solenoid valves are used to control the pneumatically operated components.

The solenoid valves are supplied in either 24VDC or 110VAC depending on customer requirements.



Type	5 Port 2 Position
Flow	Cv 1.39 [Kv 1.63]
Port Size	1/4" NPT
Lubrication	Not Required
Pressure Range	22-120 PSI [1.5-8.3 bar]
Temperature Range	23-140°F [-5 to 60 °C]
Voltage Range	±10%
Power Consumption	24VDC:2.5W 110VAC:8.5VA
Insulation	F Class
Ingress Protection	IP65 (DIN 40050)
Connection	DIN/LED Connector or Grommet
Max Frequency	4 cycles/sec
Min. Activate Time	0.05 sec