Intellispec™

Vacuum Cap Conveyor System Hardware Guide

Pressco Technology Inc.

70236 Rev. 01

Original Instructions

Written and designed at:

Pressco Technology Inc. World Headquarters

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Chapter 1

HOW TO CONTACT PRESSCO

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Pressco Technology Inc. 29200 Aurora Rd. Cleveland, OH USA 44139-1847

Main Phone:

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Web Site:

www.pressco.com (***http://www.pressco.com***)

Business Hours:

Monday - Friday, 8:00am - 5:00pm Eastern Standard Time

Chapter 2

INTRODUCTION

ABOUT THIS MANUAL

This manual provides operating and maintenance instructions for the Pressco Vacuum Cap Conveyor Machine. It provides the necessary information to operate a system that is properly installed and set up.

This manual:

- Is considered an integral part of the machine and should be kept handy for future reference as long as the system is being used in your plant.
- Is your responsibility to keep in good condition, in a dry place, and ready for consultation by the ***authorized users*** (on page 23) of the system.
- Contains the technology implemented at the time of selling and supplying the system and shall not be considered inadequate in case of technological enhancements in the machine or in the manual's illustrations.

TYPOGRAPHICAL CONVENTIONS

Following is a list of typographical conventions used in this manual:

- **Bold type** indicates a topic heading or an important item or statement.
- *Italicized type* indicates emphasis.
- Names of main components and system control signals have the first letter of each word capitalized. For example: Processor Cabinet.
- Caution messages appear as shown below:

Caution

Caution messages indicate important information which must be observed to prevent: loss of data, poor system performance, or equipment damage. These messages are set off from the body text as shown here.

- Warning messages appear as shown below:

Warning

Warning messages indicate the possibility of minor injury to yourself or others. These messages are set off from the body text as shown here.

- Danger messages appear as shown below:

Danger

Danger messages alert you to specific conditions that can cause serious or fatal personal injury. Danger messages give you important information which must be observed to prevent injury. These messages are set off from the body text as shown here.

- Notes appear as shown below:

❖ *Note: Notes contain special information that warrants being set off from the body text as shown here.*

- Important Notes appear as shown below:

Important

Important notes are set off from the body text as shown here.

Chapter 3

SYSTEM OVERVIEW

The Pressco Vacuum Cap Conveyor system is used in conjunction with an Intellispec Vision Inspection system. See the Intellispec System Guide, Programming Guide, or Hardware Guide for more information about the inspection system.

The lighting, optics, camera, and strobe electronics for inspection are contained in a custom inspection module that is mounted to the Pressco Vacuum Cap Conveyor. (Model CP500E or CP750E)

The closure (plastic cap) is fed from a feeder to a Pressco vacuum conveyor so that the product side is pointing up. As the cap exits the feeding device trackwork it travels through a chicane cap guiding system located on the entrance end of the Pressco supplied conveyor for separation. Each cap is accelerated as vacuum assists in positively placing the cap during its conveyance. As the cap travels along the conveyor it triggers a part detect to signal the system to acquire an image of the cap. The image of the product side of the cap is acquired by the camera and solid-state strobe lighting module located above the conveyor.

Each image is acquired by the camera and processed by the Intellispec software. The software evaluates each part and makes a pass/fail decision based on the programmed specifications. If a part is acceptable, it is allowed to continue traveling down the conveyor. If a part is unacceptable, the electronics will give a properly timed output signal to the downstream Pressco-provided reject station, which will eject the defective part.

If a part is acceptable, it exits the end of the Pressco Vacuum Cap Conveyor to a customer-supplied conveying device. This conveying device could be a section of trackwork, a Gaylord, or an airveyor. The parts may have to be accelerated through any required transferred cages with a customer-supplied air assist device to assure there are no backups on the Vacuum Cap Conveyor.

CONVEYOR OPERATION

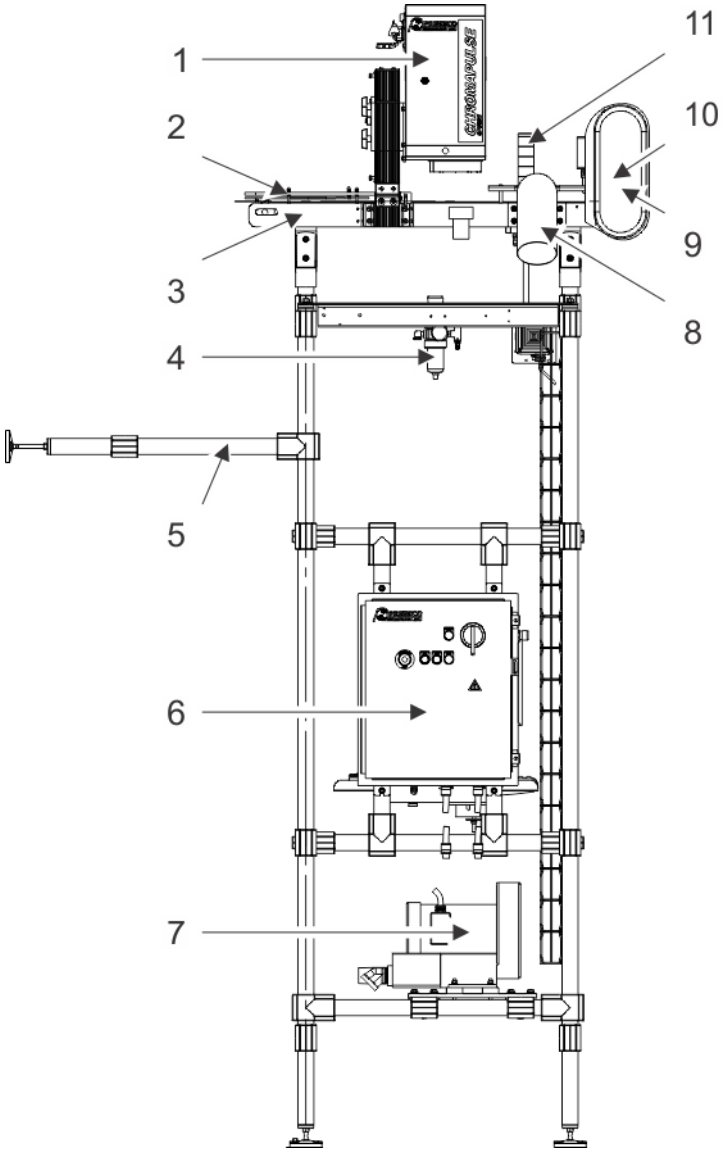
The Pressco Vacuum Cap Conveyor system is offered in two versions: 2-wire control (69617), and 3-wire control (69449). To determine your version, look at the ***Serial Tag*** (on page 17) Electrical Diagram Wiring Index on your system.

The 2-wire control version requires the connection of a customer-supplied Enable (Run) contact that will automatically start and stop the conveyor based on the opening and closing of the contact. Generally, the customer will send the condition of the line being backed up or starved, and open the contact to stop the conveyor. The control method does not require operator intervention of pressing pushbuttons to restart the line. For more information, see ***Connection of the Customer Enable Contact*** (on page 30).

The 3-wire control version does not require the connection of an Enable (Run) contact, but does require the operator to start and stop the conveyor using the pushbuttons on the enclosure door.

MAIN COMPONENTS

The main components of the Vacuum Cap Conveyor system are shown below.



Item	Vacuum Cap Conveyor component
1	CP500E or CP750E Inspection Module
2	Chicane
3	Conveyor
4	Filter/ Regulator
5	Optional outrigger (see ***Options*** (on page 9))
6	Electrical Control Enclosure
7	Regenerative Vacuum Blower
8	Reject Chute (Rejecter on other side of conveyor)
9	Drive Motor

Item	Vacuum Cap Conveyor component
10	Encoder (not shown - mounted on opposite side)
11	CPxxxx Module Light Tree (optional - Series IV mounting shown)

Options

There are system options available based on your plant's needs.

Legs

A range of leg sizes is available to accommodate your plant's height requirements. See ***System Measurements*** (on page 12) for an illustration of the height.

Leg Length millimeters (inches)	Overall Height millimeters (inches) [Part Infeed/ Outfeed height]
1778 mm (70 in)	2184.4 mm (86 in)
1803.4 mm (71 in)	2209.8 mm (87 in)
2032 mm (80 in)	2438.4 mm (96 in)
2286 mm (90 in)	2692.4 mm (106 in)
2590.8 mm (102 in)	2997.2 mm (118 in)
2692.4 mm (106 in)	3098.8 mm (122 in)
3048 mm (120 in)	3454.4 mm (136 in)
3403.6 mm (134 in)	3810 mm (150 in)
3657.6 mm (144 in)	4064 mm (160 in)

❖ *Note: Versions with Overall Height shorter than 2692.4 mm (106 in) require guarding.* **Contact Pressco** *(see "***How to Contact Pressco***" on page 3) for information.*

Outrigger

An optional outrigger is available to stabilize the tower when the height exceeds the standard measurements. Its maximum width is 1016 mm (40 inches), including the adjustable cap.

SYSTEM SPECIFICATIONS

Declaration of Conformity - Number MS3296

CE

Declaration:	Pressco Technology, Inc. Vacuum Cap Conveyor System is in conformity with Directive 2006/42/EC of the European Parliament and of the Council of 17 May 2006 on machinery, and amending Directive 95/16/EC (recast).
Other Directives:	Directive 2004/108/EC of 15 December 2004 on the harmonization of the laws of Member States relating to electromagnetic compatibility and repealing Directive 89/336/EEC
Manufacturer:	Pressco Technology Inc. 29200 Aurora Road Cleveland, Ohio 44139-1847 USA

Product Identification

Machine Name:	Vacuum Cap Conveyor
Serial Number:	8336-01
Electrical Diagram:	69449B Ver. 01 - Dated 26-Sep-2011 - 2 sheets 69449E Ver. 01 - Dated 22-Sep-2011 - 4 sheets

Standards Used (only major standards listed):

EN1200-1 (2003)	Safety of Machinery - Basic concepts, general principles for design, Part 1: Basic terminology, methodology
EN12100-2 (2003)	Safety of Machinery - Basic concepts, general principles for design, Part 2: Technical principles and specifications
EN349 + A1 (2008)	Safety of Machinery - Minimum gaps to avoid crushing of parts of the human body
EN ISO 13849-1 (2008)	Safety of machinery - Safety-related parts of control systems Part 1: General principles for design
EN983 + A1 (2008)	Safety of Machinery - Safety requirements for fluid power systems and their components - Pneumatics
EN1037 + A1 (2008)	Safety of Machinery - Prevention of unexpected startup
EN13850 (2008)	Safety of Machinery - Emergency stop - Principles for design
EN13857 (2008)	Safety of Machinery - Safety distances to prevent hazard zones being reached by upper and lower limbs
EN60204-1 (2007)	Safety of Machinery - Electrical Equipment of Machines, Part 1: General principles for design
Technical Construction File:	MS3296
Complier of the Technical File:	Safenet Ltd, Notified Body 1674 Denford Garage, Denford, Kettering, Northants., NN14 4EQ, U.K.
Signature of Manufacturer:	Fritz Awig Vice President, Customer Support Engineering

Place:	Pressco Technology Inc. 29200 Aurora Road Cleveland, Ohio 44139-1847 USA
Date:	21 December 2011

Declaration of Conformity - Number EMC3296

CE

Declaration:	Pressco Technology, Inc. Vacuum Cap Conveyor System is in conformity with Directive 2004/108/EC of the European Parliament and of the Council of 15 December 2004 on the approximation of the laws of Member States relating to electromagnetic compatibility and repealing Directive 89/336/EEC.
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Electrical Diagram:	69449B Ver. 01 - Dated 26-Sep-2011 - 2 sheets 69449E Ver. 01 - Dated 22-Sep-2011 - 4 sheets

Standards Used (only major standards listed):

EN 61000-6-2 (2005)	Electromagnetic compatibility – Part 6-2: Generic standards – Immunity for industrial environments
EN 61000-6-4 (2007)	Electromagnetic compatibility – Part 6-4: Generic standards – Emission standard for industrial environments
BSEN 55011 (2007)	Limits and methods of measurement of radio disturbance characteristics of industrial, scientific and medical (ISM) radio-frequency equipment
EN61800-3 (2004)	Adjustable speed electrical power drive systems – Part 3: EMC requirements and specific test methods
Means of Conformity:	The product is in conformity with Directive 2004/108/EC based on inspection and correct installation of previously CE marked equipment and the use of a Technical File in accordance with Article 7 of the Directive.
Signature of Manufacturer:	Fritz Awig Vice President, Customer Support Engineering
Place:	Pressco Technology Inc. 29200 Aurora Road Cleveland, Ohio 44139-1847 USA
Date:	21 December 2011

System Electrical Specifications

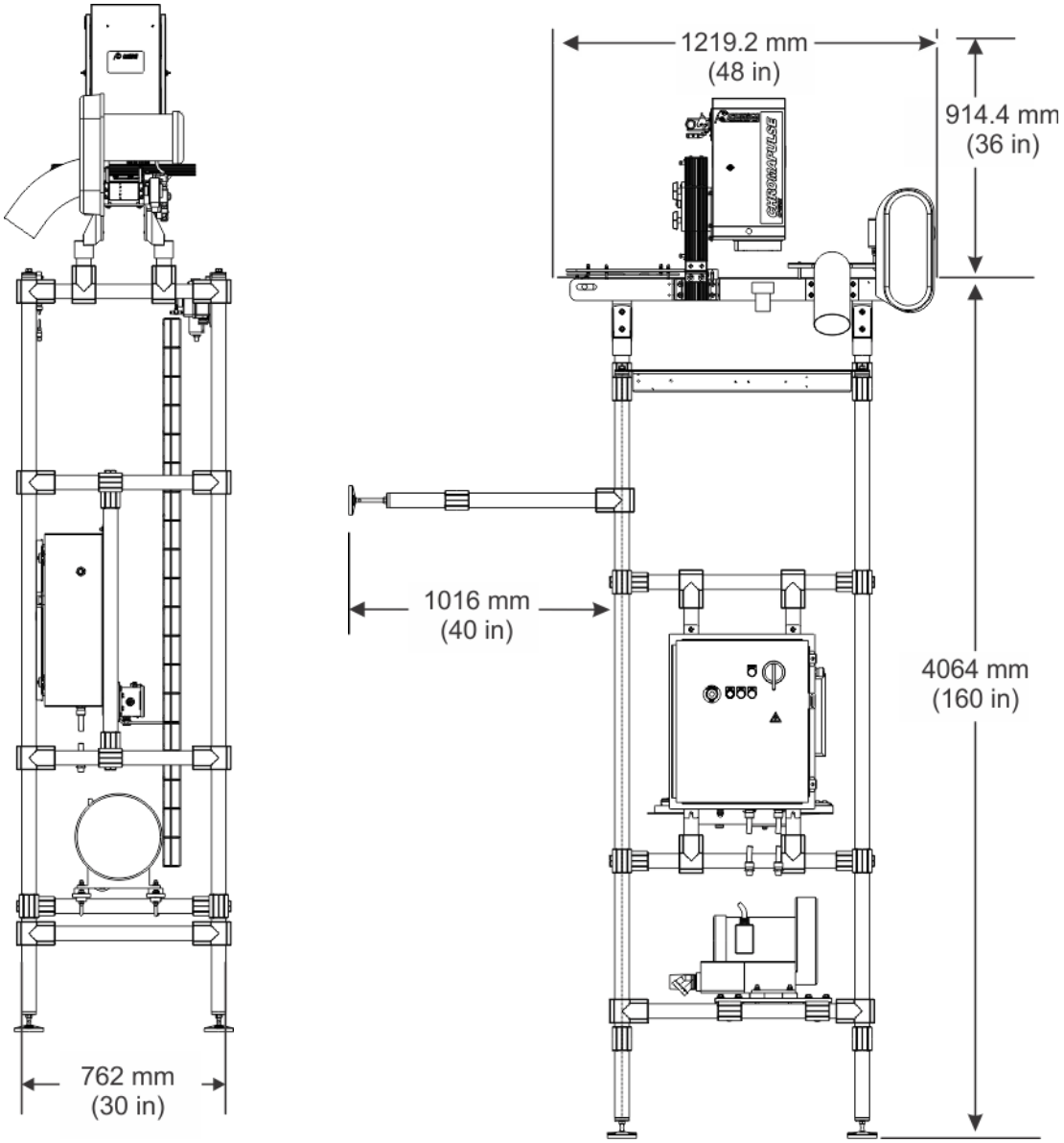
The following are electrical specifications for different configurations of the machine:

Configuration	Specification
Voltage Range	380-480 VAC
Frequency	50/60 Hz
Current	15A @ 480 VAC, 100% Load

System Measurements

The dimensions of the Vacuum Cap Conveyor are illustrated below, followed by a table of dimensions.

❖ *Note: Several height options are available. See* **Options** *(on page 9).*



Side View

Front View

The following are the maximum weight and dimensions of the Vacuum Cap Conveyor:

Measurement	Value
Weight (total machine)	182 kg (400 lbs)
Height (from top of conveyor to floor)	4064 mm (160 in)
Additional height (from optional light tree to top of conveyor)	914.4 mm (36 in)
Width (of conveyor)	1219.2 mm (48 in)
Additional width (of optional Outrigger)	1016 mm (40 in) maximum
Depth	762 mm (30 in)

Environmental Conditions

The Vacuum Cap Conveyor is designed to be safe in the following environmental conditions:

Warning

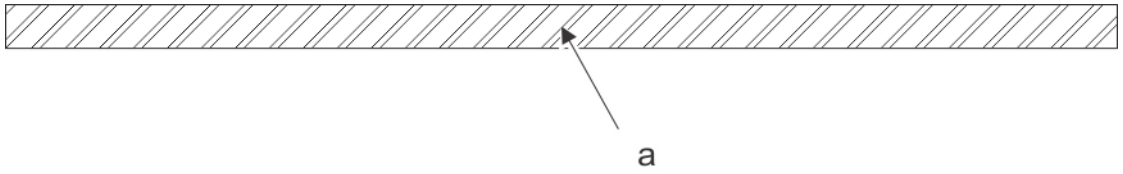
This is a Class A product. In a domestic environment, this product may cause radio interference in which case the user may be required to take adequate measures.

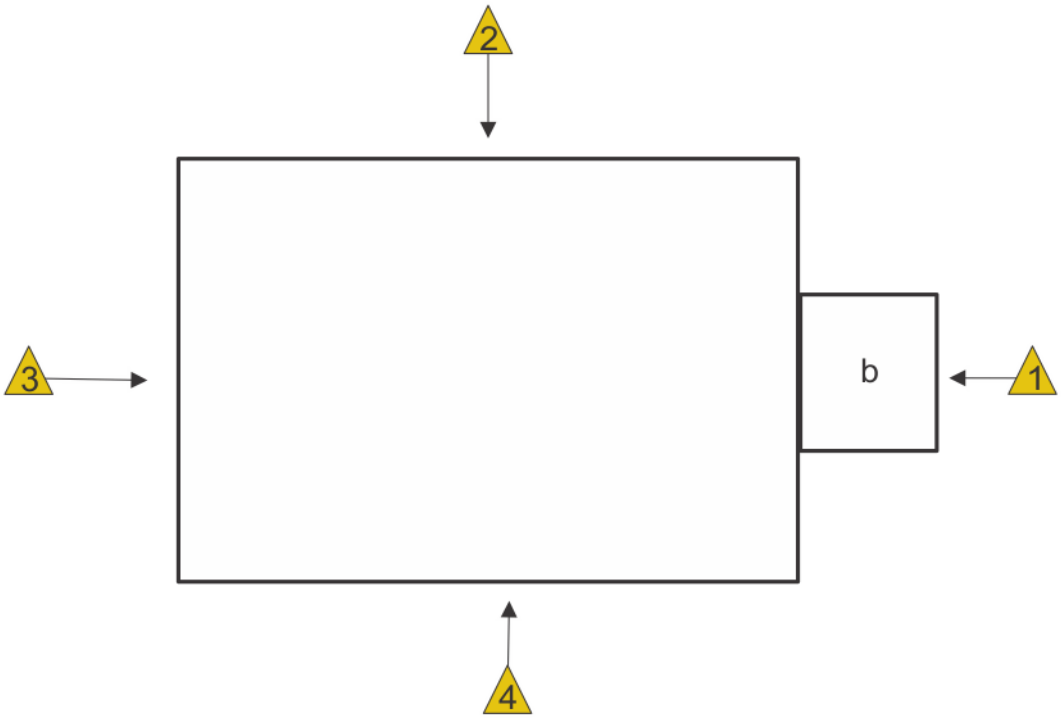
❖ *Note: Please consult* **Pressco Technology Inc.** *(see "***How to Contact Pressco***" on page 3) if your environmental conditions are outside of those listed.*

Condition	Specifications
Indoor/ outdoor use	Indoor use only
Altitude	Up to 2000 meters
Operating Temperature	5 °C to 50 °C
Storage Temperature	0 °C to 70 °C
Humidity	Maximum relative humidity 80 % for temperatures up to 31 °C decreasing linearly to 50 % relative humidity at 50 °C
Mains supply	Voltage fluctuations up to ± 10 % of the nominal voltage
Overvoltage protection rating	Transient overvoltage typically present on MAINS supply *NOTE: The normal level of transient overvoltage is impulse withstand (overvoltage) category II of IEC 60364-4-443.*
Rated pollution degree	This instrument is designed for use in Installation Category II and Pollution Degree 1 as per EN61010-1 and EN60664 respectively.

Sound Pressure Level

The Vacuum Cap Conveyor overall acoustics emissions exceed 70dB(A) level at 1 meter distance. Use proper hearing protection as specified by your plant safety instructions.





a	wall
b	Electrical cabinet

Acoustic Emissions Test Position (1m) ▲	Ambient	Emission	Limit
1	59.2	73.3	70 dBA
2	59.2	72.4	
3	59.2	73.6	
4	59.2	73.3	

Part and Part Handling Specifications

CLOSURE SIZE

The range of plastic closures that the Vacuum Cap Conveyor will handle are: 25mm - 43mm Outer Diameter.

THROUGHPUT

1700 PPM (based on 28mm closure at 38.1mm (1.5 inch) gap between parts.

BACKPRESSURE

610mm (24 inches) or 17.7g (0.63 oz).

Pneumatic Requirements

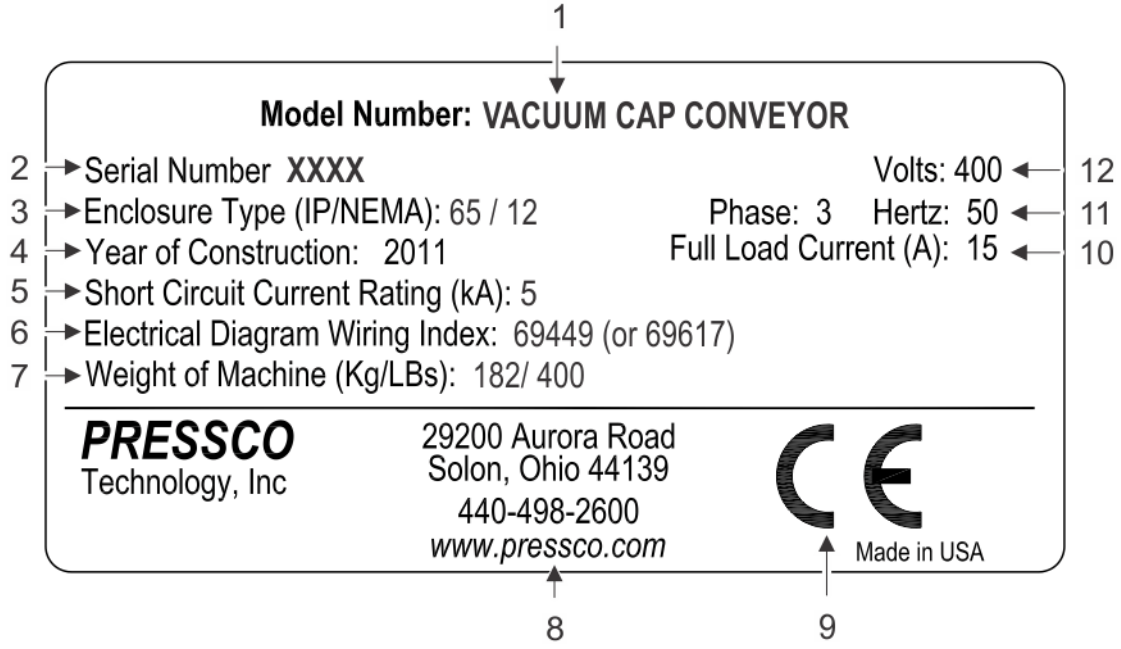
Pneumatic requirements: 60 psi, 16 CFM, 3/8 NPT Inlet, and is for the purpose of rejecting parts.

Chapter 4

SAFETY INFORMATION AND MARKINGS

SERIAL TAG

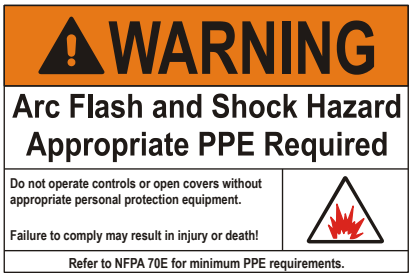
The following illustration shows the serial tag located on the Vacuum Cap Conveyor control enclosure.



1	Series tag
2	Serial number (System number)
3	Enclosure type
4	Year of construction
5	Short circuit current rating
6	Electrical diagram wiring index
7	Weight of machine
8	Pressco contact information
9	Component certification
10	Full load current
11	Phase
12	Volts

SYMBOLS

The following symbols are used on or near the Vacuum Cap Conveyor. Be aware of potential risk hazards.

	High voltage
	Arc flash
	Hand Entanglement/ Belt Drive
PE	Primary Protective Earthing Terminal (at incoming supply point)
	Protective Earthing Terminal
	Functional Earthing Terminal
	Hearing Protection Required
	No Step

WARNING DEVICES

The Vacuum Cap Conveyor system has an electrical interlock signal available for monitoring by the customer. This interlock indicates “Conveyor Running.” It is a normally open dry contact and is accessible at terminals 24 and 25 of TB2. See electrical section for details: ***Wiring Diagram - sheet 4 (69617)*** (on page 58) or ***Wiring Diagram - sheet 4 (69449)*** (on page 55).

RESIDUAL RISK

The Vacuum Cap Conveyor system has been designed to minimize any danger of personal injury. However, the system uses rejection devices to remove defective product from the production stream. Also, the electronics cabinets contain risk of shock if they are opened.

Observe the following safety warnings when operating the system or working near it:

Warning

Potential for projectiles to strike persons and cause injury. Keep clear of reject devices.

Warning

Sensitive electronics and High Voltages may be exposed. Keep Processor Cabinet door closed.

INTENDED USE

TYPE OF PROCESS

The Vacuum Cap Conveyor system is intended to monitor container and other special manufacturing processes and identify non-conforming product.

INTENDED USE

The Vacuum Cap Conveyor system is designed and constructed for use in an indoor industrial environment, always sheltered from the weather.

SPACE REQUIRED

The Vacuum Cap Conveyor machine and accompanying sensors must be installed in a place that will enable safe and easy installation, size changeover, user operation, and maintenance procedures.

NON-INTENDED USE

Warning

If this instrument is not used as specified, the protection provided by the equipment could be impaired. This instrument must only be used in a normal condition (in which all means of protection are intact).

Important

The Vacuum Cap Conveyor system should NOT be used for any purpose other than specifically indicated in the section titled ***Intended Use*** (on page 19).

The following uses are **not** intended:

- Use in an explosive environment
- Use in a flammable environment
- Use in a damp, moist, or wet environment, except where specifically indicated

PERSONAL PROTECTIVE EQUIPMENT

Important

Always follow the safety requirements of your plant in addition to the recommendations below.

We recommend, at minimum, use of the following Personal Protective Equipment (PPE):

	Protective clothing
	Protective gloves
	Protective ear plugs or headphones
	Protective eye wear
	Protective foot wear

PERSONNEL SAFETY

The following rules are recommended to ensure the safety of personnel in charge of machine operation and maintenance.

Do Not:

- Open safety guards during machine operation
- Perform maintenance and repair while the system is running
- Lean on the machine
- Sit on the machine components
- Use the machine for purposes other than those listed in this manual
- Modify parts of the machine
- Allow unqualified personnel to operate or perform maintenance procedures on the machine

During machine operation:

	Only one operator is needed to operate the machine. All others must keep at a safe distance.
	Operators must be familiar with all machinery connected to the Pressco equipment and know how to use emergency stop devices. *Note: the emergency stop devices may not be connected directly to the Pressco equipment, but it is important to know how to use them.*
	Before putting the Pressco system online, the operator must ensure that all safety devices used with all connected machinery are in place and operational.
	The operator must maintain maximum focus on his work and be alert throughout his shift. If this is not the case, immediately inform the shift supervisor.

When conducting maintenance or repair work:

	Follow the Machine Maintenance Lockout Procedure.
	Before starting the machine, ensure that no person is close to the machine.
	If maintenance or repair requires the disconnection or removal of safety or protection systems, authorized personnel who ensure the prevention of personal injury or damage to the machine must supervise this operation. All machine movements must be performed with limited speed and limited movements.

	Exclusively authorized and trained personnel must carry out maintenance or repair work on electrical components. When running tests with power connected, you must strictly comply with the rules provided.
	Personnel working on higher parts of a machine must wear a harness and hook it on to a structure and must always move with extreme caution. The harness must not be connected to Pressco equipment or structure as it cannot support body weight.
	Never perform lubrication or maintenance procedures on mechanical parts with the machine running.

LIFTING HEAVY OBJECTS

Caution

Some components are heavy. Take proper precautions to prevent personal injury or damage to equipment. If you are not capable of lifting the object alone, ask a capable person to help lift the object, or use a mechanical lifting device

The components do not have handles to lift the equipment. Be sure to:

- Lift equipment from the bottom - do not use wires, brackets, nor other protrusions
- Keep fingers away from sensor lenses to keep the equipment clean
- Proceed slowly

To safely lift equipment:

Caution

Do not twist your body when moving the load. Instead take small steps with your feet turning until you are in the correct position.

1. Stand close to the load and center yourself over it with your feet shoulder width apart.
2. Tighten your abdominal muscles.
3. Keeping your back straight, bend your knees and squat down to the floor.
4. Get a good grasp on the load with both hands.
5. Keeping the load close to your body, use your leg muscles to stand up lifting the load off the floor.
   - Your back should remain straight throughout lifting, using only the muscles in the legs to lift the load.
6. To place the load in the appropriate spot, bend at the knees using only your leg muscles to lower the load.

AUTHORIZED USERS

Trained machine operators, mechanic and electrical maintenance staff, and plant managers are considered authorized users of the Vacuum Cap Conveyor system. These users should carefully read the information contained in this manual. The plant manager must ensure that the safety recommendations included in this manual are observed.

Warning

Allowing workers who are unfamiliar with the production process to operate the Vacuum Cap Conveyor system could result in hazard risk.

If you are unclear about any part of this manual, ***contact Pressco Technical Support*** (see "***How to Contact Pressco***" on page 3).

Important

No worker should ever operate the system outside of his/ her own area of competence and responsibility.

Proper Operation:

Only one worker is to operate the system at any given time. The correct position for the operator is in front of the user interface monitor or control enclosure (if applicable).

Repairs:

Any repair on the system shall be carried out exclusively by Pressco Technology Inc. service personnel or by other service expressly authorized by Pressco Technology Inc.

SPARE PARTS USAGE

The following restrictions apply to replacing parts:

Warning

Using spare parts that are not designed to Pressco's specifications can compromise the safety and effectiveness of the Vacuum Cap Conveyor system.

- The use of parts that are not within Pressco's design specifications is prohibited. This prohibition applies in particular when the parts involved contain or are connected with safety devices.
- Before resuming production, make sure all safety devices are in working order.

Pressco Technology Inc. shall not be liable in any way if any of the above-described directions are not complied with.

To obtain a spare parts list, contact the customer service department at Pressco. ***How to Contact Pressco*** (on page 3).

Pressco's technicians are available to help customers, in their own plant, to solve any problem that might arise during use and maintenance of the Vacuum Cap Conveyor system.

Chapter 5

INSTALLATION AND SETUP

PREPARATION FOR INSTALLATION

Recommendations prior to installation

Before the machine is installed, the Pressco installer, together with the Customer (or representative) shall check the following criteria in the environment where the machine is to be installed:

- Work required by contract for the installation of the machine has been carried out
- The plant layout drawing that describes where the machine will be installed is the final drawing agreed to by Pressco Technology Inc.
- The space and height required for installation are actually available
- Only the components included in the installation layout are present in the area where the machine is to be mounted. Ensure no machines or components have been added at a later stage that might hinder mounting or make it more difficult. Should this be the case, immediately contact Pressco's Project Engineering personnel to arrange a suitable solution to the problem.

We recommend the following prior to machine installation:

- Transport the machine in its packaging to the area where it will be installed to minimize possibility of damage
- Carefully remove the packaging material and check components for damage
- Check tightness of mechanical components, as they can loosen during transport
- Prepare the compressed air mains line. Before making final connections, ensure that the pipes are clean and free from any debris.

Shipping and Handling

Warning

Only qualified personnel must be involved in the operation of unloading, handling, and lifting the machine. Pressco Technology Inc. shall not be liable for damage to components and/or personal injury resulting from the involvement of unauthorized personnel and/or failure to comply with the directions provided in this manual in relation to lifting and transport.

Important

The site supervisor will be responsible for ensuring that all the various mounting phases are carried out safely and in compliance with current regulations.

Pressco Technology Inc. ships unassembled components in packing cases designed to protect the contents during handling and from exposure to weather.

Unless otherwise specified in the contract with the machine order, the Customer shall supply Pressco Technology Inc. with the means and equipment necessary for the unloading, lifting, and handling of machine parts. Pressco Technology Inc. deems it important to have one of their technicians supervise the process of unloading, handling, and lifting the machine. The technician can give useful advice as to the logical sequence in which the components should be unpacked and positioned for ease of assembly.

After the machine is delivered, check for any damage that might have occurred during shipping. In case of damage, contact ***Pressco Technology Inc*** (see "***How to Contact Pressco***" on page 3).

In handling the machine, always keep it close to the ground.

We recommend using a forklift truck with adequate capacity and forks to suit the weight to be lifted (machine plus packaging).

The dimensions and weight of a crate are listed below. Note that this is the maximum size and weight. The size and weight of the crate may be less depending on your configuration. You may receive multiple crates depending on your configuration.

Size	1 crate, 4013.2 mm x 1143 x 1117.6 mm (158 x 45 x 44 inches inches)
Weight	454.5 kg (1000 lbs.)

Ventilation

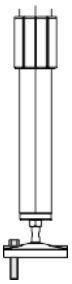
Place the Vacuum Cap Conveyor components in a position with adequate ventilation to allow proper air flow. Make sure there is room for dunnage and for part removal.

Component	Spacing
Vacuum Cap Conveyor	Leave 1 meter [39 inches] in front of machine
Intellispec cabinet	Leave 100 mm clear in front of the fan and vent
Optional Transformer	Leave 1 meter [39 inches] in back and front of machine

Securing to Floor

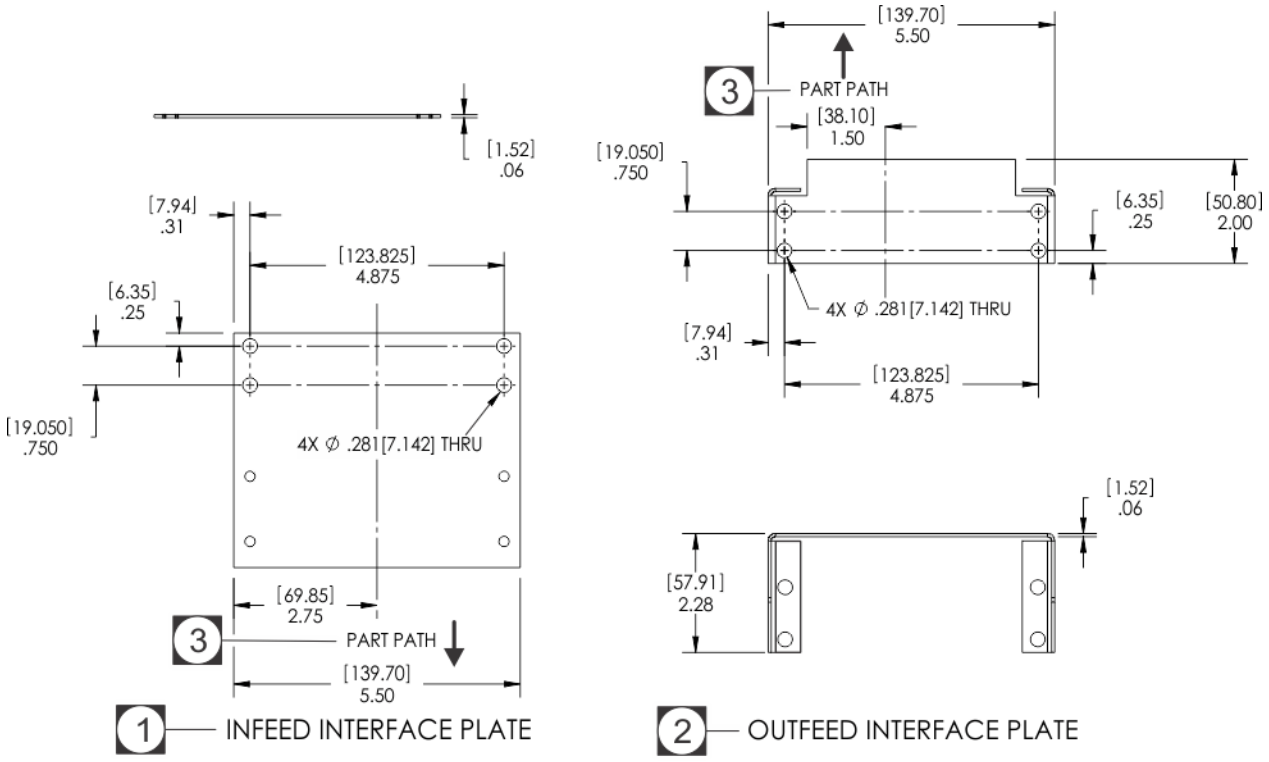
The ground under the machine must be sufficiently solid to sustain the machine mass at the support points. In addition, the floor must be free of bumps, grooves and other surface irregularities. The surface must be flat enough so that the leveling feet of the machine bear weight across their entire surface.

Attach the machine to the floor by installing M10 x 50mm (3/8 inch x 2 inch) lag bolts into the floor through the hole on the frame foot pad. Do this on one hole in each foot.



Attaching Infeed and Outfeed Plates to Trackwork

Attach the trackwork to the Infeed Interface Plate [item 1] and Outfeed Interface Plate [item 2], using the mounting dimensions shown in the illustration below. Your plant must provide a mounting flange.



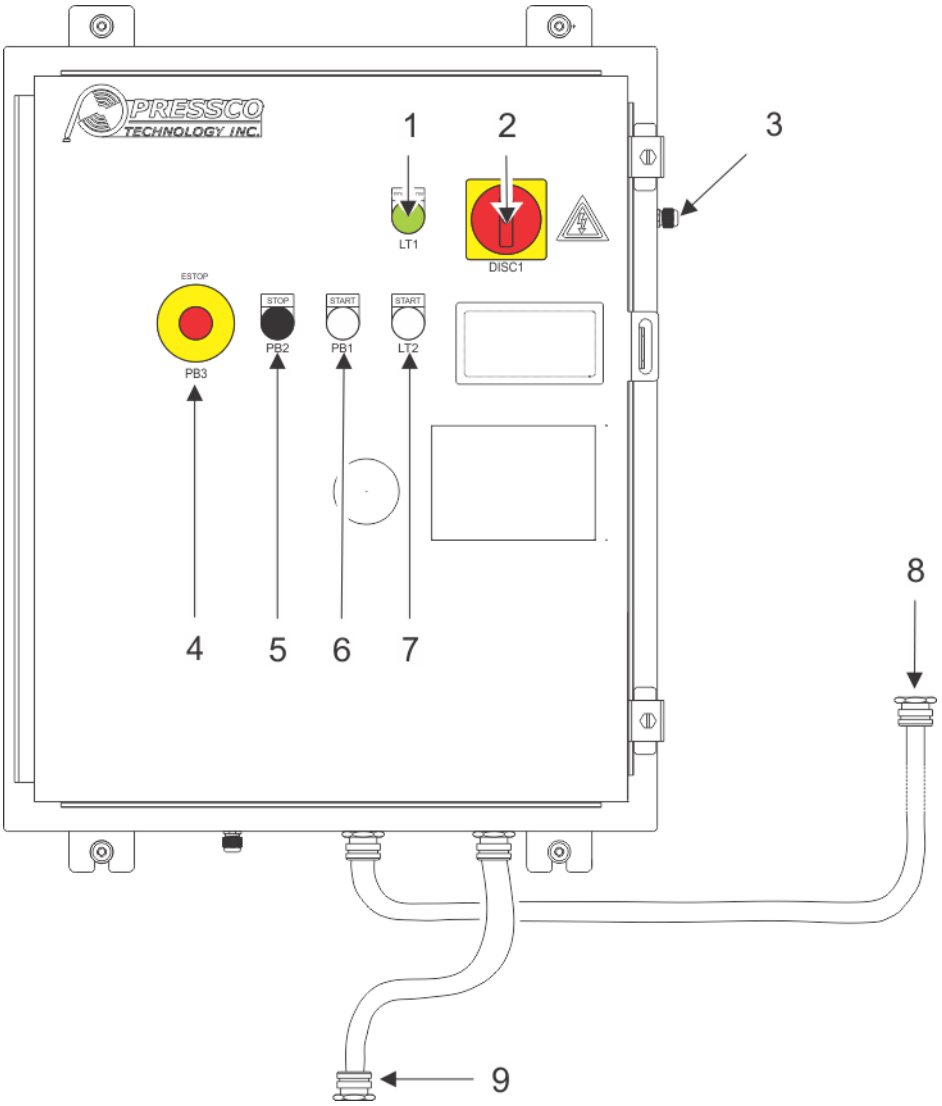
1	Infeed interface plate
2	Outfeed interface plate
3	Part path

Electrical Service

Warning

The electrical connections must meet local and national codes.

Have a qualified electrician connect the correct voltage and amperage wiring to the top right entry to the electrical enclosure. See nameplate on electrical enclosure door.



1	LT1 - Power On indicator
2	DISC1 - Rotary disconnect
3	Incoming electrical service
4	PB3 - Estop
5	PB2 - Stop push button
6	PB1 - Start push button
7	LT2 - Start indicator
8	To conveyor drive motor
9	To vacuum pump motor

For more information about the components in this enclosure, see ***Electrical System*** (on page 33).

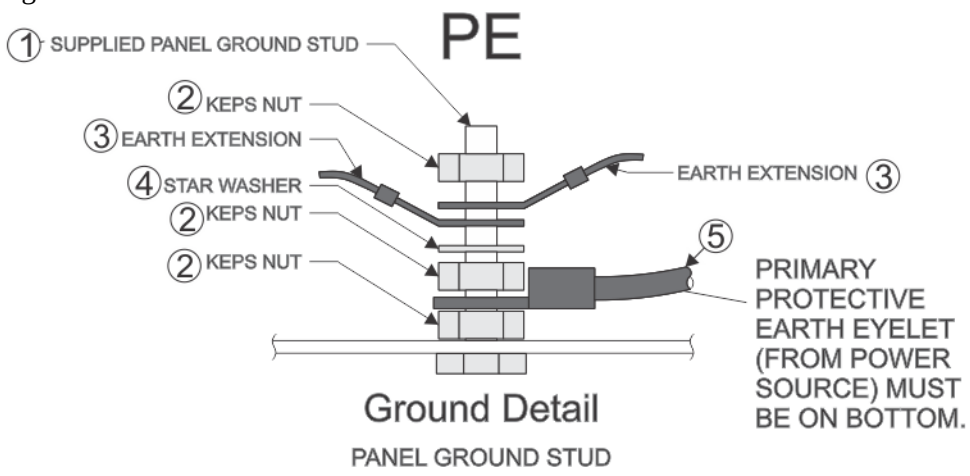
Protective Earthing

Danger

Improper connection of the equipment grounding conductor can result in a risk of electric shock. Check with a qualified electrician or service technician if you are in doubt as to whether the product is properly grounded.

This product must be grounded (earthed). If it should malfunction or break down, grounding provides a path of least resistance for electric current to reduce the risk of electric shock.

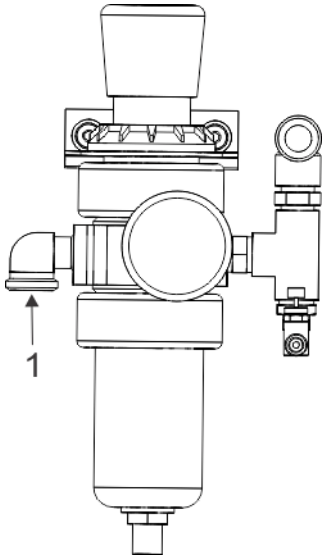
Located close to the entry of the incoming electrical supply, a terminal is provided for connection of the machine to the external protective earthing conductor. This terminal will be marked PE. Other ground conductors can connect to this same terminal, but the external protective earthing conductor (Primary) must be located on the bottom per the figure below.



1	Ground Stud
2	Keps Nut
3	Earth Extension
4	Star Washer
5	PE - Primary Protective Earth eyelet (from power source) must be on bottom

Pneumatic Service

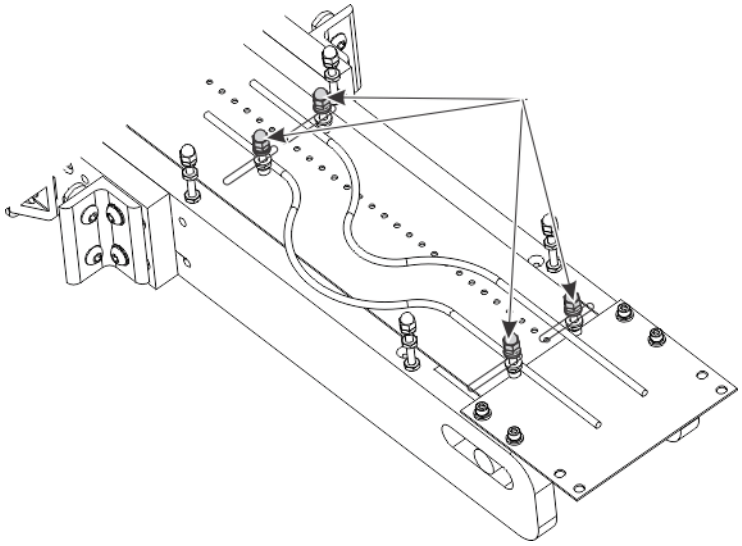
Connect plant air supply to the Filter Regulator Lubricator (FRL). Pneumatic requirements: 60 psi, 16 CFM, 3/8 NPT Inlet, and is for the purpose of rejecting parts.



1	Air supply connection

Initial Adjustments

Adjust the chicane for part size and part rate, by loosening the appropriate nuts and moving them in their slots, then tightening the nuts.



Connection of the Customer Enable Contact

See ***Conveyor Operation*** (on page 7) for a description of the two electrical control versions.

For electrical control system 69617, a 2-wire control strategy is used. This means that the conveyor will start and stop by the closure of a single contact. For this to function, the customer must connect a normally open dry contact signal to terminals 21 and 22 of TB2. See ***Wiring Diagram - sheet 4 (69617)*** (on page 58).

For electrical control system 69449, a 3-wire control strategy is used. In this system, the conveyor starts and stops by using the enclosure door push buttons. A connection of an enable contact is not required.

COMMISSIONING

Before placing the machine into operation, make sure the following checks are completed:

Completed	Yes	No
Position components with adequate ventilation, see ***Ventilation*** (on page 26)		
Secure Vacuum Cap Conveyor to floor, see ***Securing to Floor*** (on page 26)		
Verify connection of applicable electrical service and grounding, see ***Electrical Service*** (on page 27) and ***Protective Earthing*** (on page 29)		
Connection of compressed air line to machine FRL, see ***Pneumatic Service*** (on page 30)		
Adjust the chicane for proper part size and part rate, see ***Initial Adjustments*** (on page 30)		
Verify connection of the enable contact (69617 electrical system only). See ***Connection of the Customer Enable Contact*** (on page 30).		

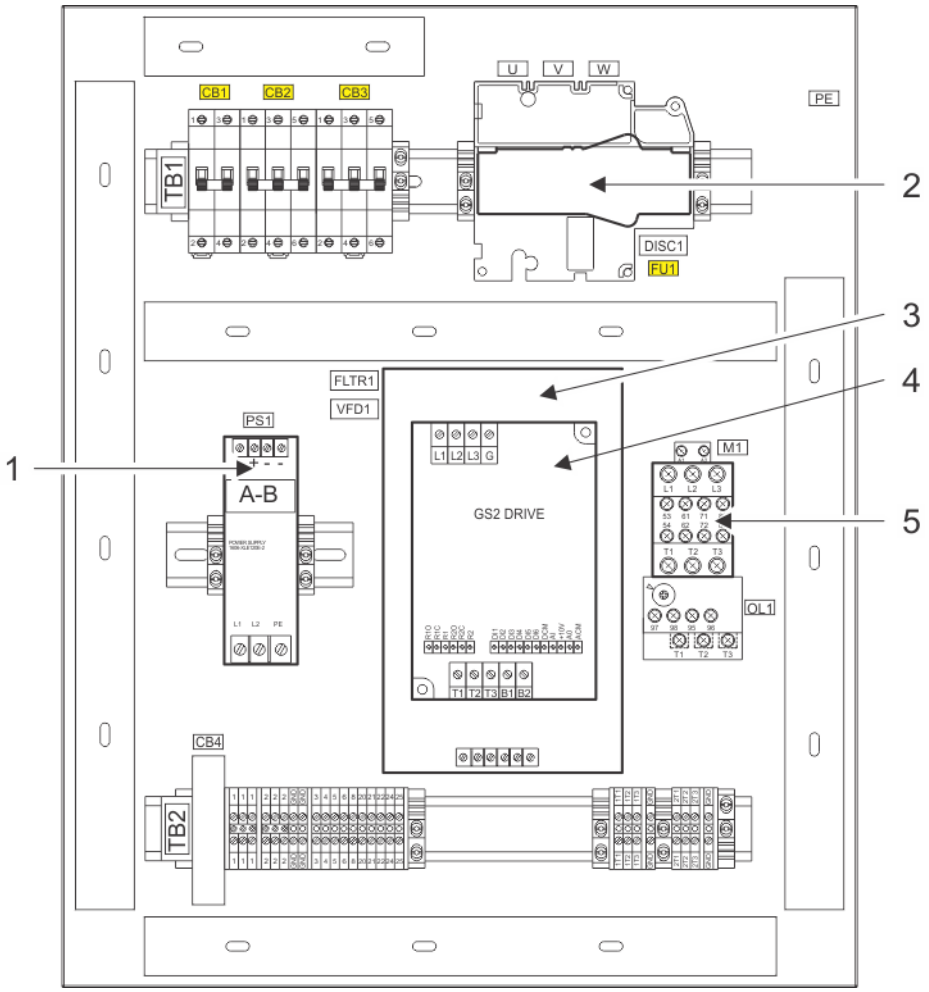
Chapter 6

MACHINE COMPONENTS AND SYSTEMS

ELECTRICAL SYSTEM

To see the switches and cables on the outside of the cabinet, see ***Operator Controls*** (on page 35).

The electrical system is primarily enclosed within a 24 H x 20 W x 8 D inch enclosure. Incoming three-phase power is supplied to the top of a fused disconnect, and then branches to two motor controllers, and to a 24 VDC power supply. The 24 VDC power is then used to power the rest of the machine.



1	24 VDC power supply (PS1)
2	Main Disconnect (DISC1)
3	EMI Filter (FLTR1)
4	Conveyor Drive (VFD1)
5	Motor contactor (M1)

Main Disconnect (DISC1)

The main disconnect is used to lock out power to allow a technician to work in the enclosure safely. It also has provisions to be locked in the closed position while the enclosure door is open. The NFPA 79 handle allows easy transitioning of power while the door is open without using pliers or a wrench.

Motor Contactor (M1)

Motor Contactor (M1) is used to power the Vacuum Blower. It is equipped with a thermal overload to shut down in the event of overheating.

Frequency Drives (VFD1)

The Variable Frequency Drive controls the speed of the vacuum cap conveyor. The speed is adjustable by turning the pot on the front of the drive. The speed is displayed in motor RPMs. The conversion from the VFD value to the belt speed is approximately 0.4281. This ratio is linear throughout the speed range of the motor. Example: 700 RPMs is equivalent to approximately 300 ft/min of conveyor travel.

The maximum belt speed is 500 ft/min.

EMI Filter (FLTR1)

The EMI filter is placed on the input to the drive. Input EMI filters reduce electromagnetic interference or noise. They are required for CE compliance and recommended for installations prone to or sensitive to electromagnetic interference.

Interlock

The Vacuum Cap Conveyor system has an electrical interlock signal available for monitoring by the customer. This interlock indicates "Conveyor Running." It is a normally open dry contact and is accessible at terminals 24 and 25 of TB2. For a detailed drawing of TB2, see ***Wiring Diagram - sheet 4 (69449)*** (on page 55) or ***Wiring Diagram - sheet 4 (69617)*** (on page 58).

MACHINE MOUNTED SAFETY COMPONENTS

There is one Emergency Stop (E-Stop) push button on the machine. It is located on the front of the enclosure. There is a provision to add an additional E-Stop push button at a desired location by the end user. It should be wired to terminals 3 and 4 of TB2. The jumper should be removed. See ***Wiring Diagram - sheet 4 (69449)*** (on page 55) or ***Wiring Diagram - sheet 4 (69617)*** (on page 58).

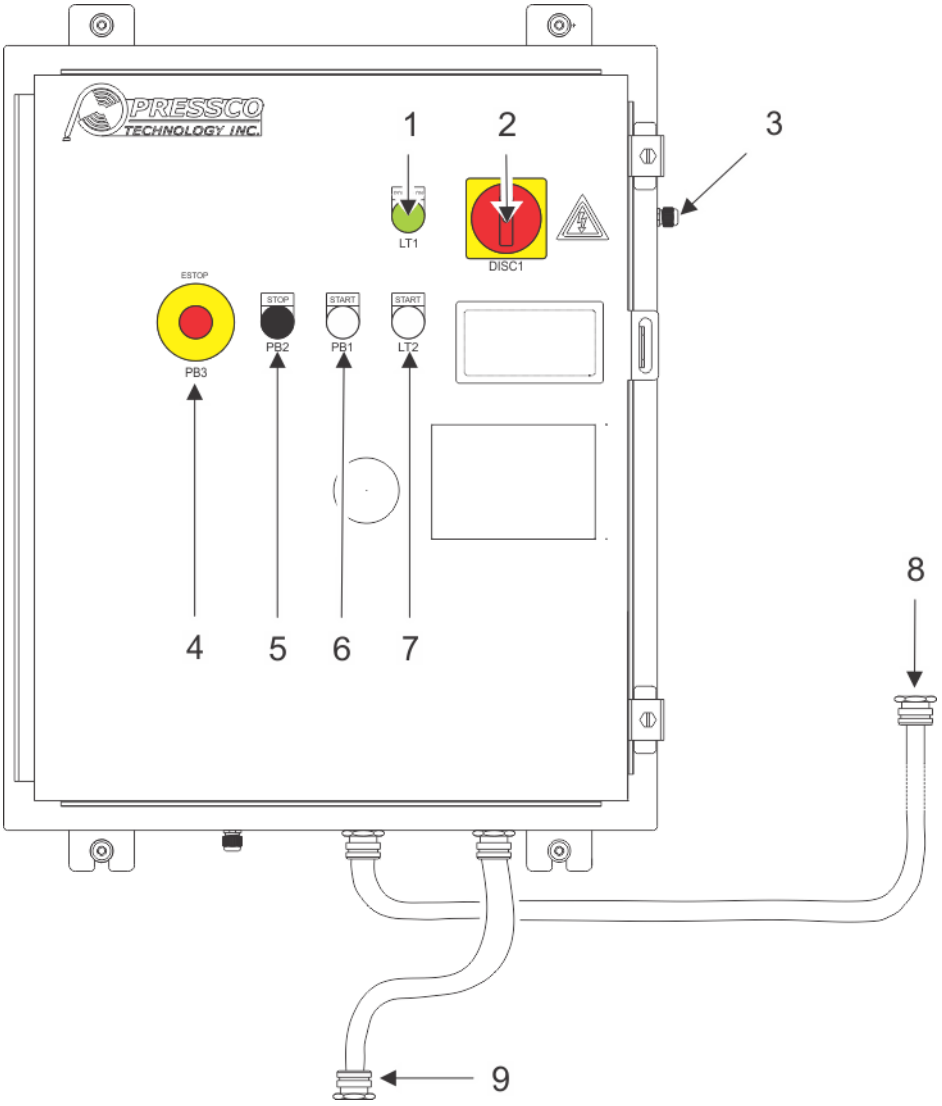
Press the push buttons to activate. Twist to release the push button.

Chapter 7

OPERATING THE VACUUM CONVEYOR SYSTEM

OPERATOR CONTROLS

Control the Vacuum Conveyor through the switches and push buttons on the outside of the electrical enclosure. Descriptions of the buttons are listed below.



1	LT1 - Power On indicator
2	DISC1 - Rotary disconnect
3	Incoming electrical service
4	PB3 - Estop

5	PB2 - Stop push button
6	PB1 - Start push button
7	LT2 - Start indicator
8	To conveyor drive motor
9	To vacuum pump motor

LT1 - Power On indicator

Indicates that main disconnect is in the on position, and power is connected.

PB3 - E-stop

Pressing the E-stop drops out the Master Start circuit which removes power from the Vacuum Conveyor and the Vacuum Blower. You must twist the button to reset.

PB2 - Stop push button

Pressing the Stop push button drops out the Master Start circuit which removes power from the Vacuum Conveyor and the Vacuum Blower.

PB1 - Start push button

Pressing the Start push button will attempt to latch in the Master Start circuit, thus starting the Vacuum Conveyor and the Vacuum Blower. There are several conditions which could prevent the circuit from latching:

- E-stop PB depressed
- Vacuum Blower Overload Tripped
- Frequency drive in fault mode

LT2 - Start indicator

Indicates that the Master Start circuit is latched in.

STARTUP SEQUENCE

To see the switch locations, see ***Operator Controls*** (on page 35).

To start the machine:

1. Verify the exit of the vacuum conveyor is not blocked or jammed in any way, and the proper parts are loaded and ready to feed.
2. Verify the Intellispec system is Online and ready to run. See Intellispec Programming Guide (or System Guide for Series V).
3. Power up the Vacuum Conveyor by rotating the disconnect switch (DISC1) to the ON position.
4. Press the Start push button (PB1). The vacuum conveyor will begin running.

❖ *Note: For electrical system 69617, it is possible that just the Vacuum Blower will start. If this is the case, then the "Customer Enable Contact" has probably opened. Check for line blockage. For more information, see* **Connection of the Customer Enable Contact** *(on page 30).*

SHUTDOWN SEQUENCE

To see the switch locations, see ***Operator Controls*** (on page 35).

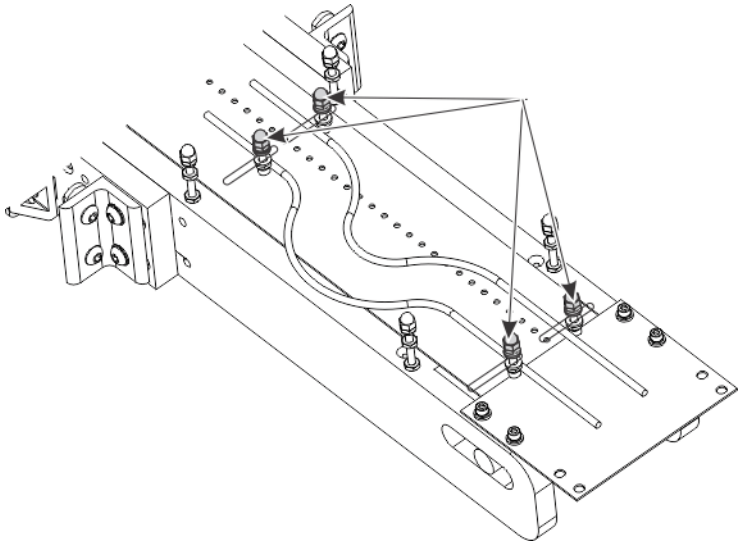
To shut down the machine:

- For extended periods of downtime or maintenance, rotate the disconnect switch (DISC1) to the OFF position.
- For short periods of downtime, press the Stop push button (PB2). This will shut off the vacuum conveyor and vacuum blower. Or, you can simply push the E-Stop button (PB3).

Chapter 8

PART CHANGEOVER PROCEDURE

Adjust the chicane for part size and part rate, by loosening the appropriate nuts and moving them in their slots, then tightening the nuts.



Chapter 9

MAINTENANCE FREQUENCY

When conducting maintenance or repair work:

	Follow the Machine Maintenance Lockout Procedure.
	Before starting the machine, ensure that no person is close to the machine.
	If maintenance or repair requires the disconnection or removal of safety or protection systems, authorized personnel who ensure the prevention of personal injury or damage to the machine must supervise this operation. All machine movements must be performed with limited speed and limited movements.
	Exclusively authorized and trained personnel must carry out maintenance or repair work on electrical components. When running tests with power connected, you must strictly comply with the rules provided.
	Personnel working on higher parts of a machine must wear a harness and hook it on to a structure and must always move with extreme caution. The harness must not be connected to Pressco equipment or structure as it cannot support body weight.
	Never perform lubrication or maintenance procedures on mechanical parts with the machine running.

Clean components and/or replace as required. The table below lists the components that need to be maintained.

Item	Description	Pressco Part Number	Maintenance Frequency
Filter/ Regulator filter ***Cleaning filters*** (on page 42)	Clean filter	70068	Monthly
Regenerative Vacuum Blower filter ***Cleaning filters*** (on page 42)	Clean or replace filter	not applicable	Monthly

Item	Description	Pressco Part Number	Maintenance Frequency
Main Belt (on page 43)	Replace belt	56885	Replace when excessive wear or stretching prevents proper performance, or when parts can no longer be handled properly
Drive Belt (on page 44) (270H100)	Replace belt	70069	Replace when excessive wear causes slipping of the drive mechanism
Idle End Bearings (on page 47)	Replace bearings	69887	Replace when wear causes excessive heat buildup or when excessive squeaking occurs - this indicates that the bearings are worn out
Drive End Bearings (on page 47)	Replace bearings	69888	Replace when wear causes excessive heat buildup or when excessive squeaking occurs - this indicates that the bearings are worn out
NOTE: if you are replacing any of the Bearings, we recommend that you replace the Main Belt at the same time. This will save on labor, as you must remove the Main Belt in order to replace the Bearings.			

CLEANING FILTERS

To see the location of the following components, see ***Main Components*** (on page 8).

Filter/ Regulator

The filter in this unit is plastic. To replace, use Pressco part number 70068.

To clean the filter:

1. Remove the filter and rinse with clean water.
2. Dry the filter completely before placing it back into the unit.

Regenerative Vacuum Blower

There is a replaceable filter inside this unit.

❖ *Note: If replacement of the filter is required, locate a filter at your local hardware store.*

To clean the filter:

1. Unscrew and remove the air intake port.
2. Remove and rinse the filter with clean water.
3. Dry the filter completely before placing it back into the unit.

REPLACING BELTS

Replace the appropriate belt when necessary.

Main Belt

The main belt of the conveyor should be replaced when excessive wear or stretching prevents proper performance of the Intellispec system, or when the parts can no longer be handled properly. Replace the Main Belt with Pressco part number 56885.

Refer to the ***Conveyor part identification*** (on page 44) to view the parts referred to in these procedures.

Warning

Never have all four mounting screws out of the conveyor at one time. This could cause serious injury or damage to the conveyor.

To remove the main belt:

1. Completely loosen the belt tensioning bolts on the idle end of the conveyor [Figure C - item 10].
2. Remove both the idle end and drive end deadplates [Figure C - item 11, idle end shown].
3. Remove the chicane by loosening the four threaded rods that support it [Figure C - item 8].
4. Remove the support leg for the module mount on the side with the rejecter, leaving the rest of the mount in place [Figure A - item 2].
5. Unplug the cables from the rejecter and the encoder.
6. Remove the dust guard from the top of the conveyor [Figure A - item 3].
7. With the belt loose, work the belt off of the drive end pulley.
8. Remove the two conveyor mounting screws from the drive end of the conveyor [Figure B - item 7].
9. Lift the drive end away from the conveyor mounting bracket and pull the belt clear of the bracket.
10. Reinstall the two mounting screws on the drive end of the conveyor [Figure B - item 7].
11. Remove the two mounting screws from the idle end of the conveyor [Figure B - item 7].
12. Pull the belt clear of the conveyor mounting bracket [Figure B - item 6].
13. If you are not installing a new belt immediately, reinstall the mounting screws on the idle end of the conveyor. Otherwise, install the new belt (described below).

To install the new belt:

1. Remove the two conveyor mounting screws from the idle end of the conveyor [Figure B - item 7].
2. Align the v-guide on the belt with the guides in the pulleys and conveyor.
3. Fit the end of the belt to the idle roller, and the begin pulling it onto the conveyor body.
4. Lift the idle end of the belt away from the conveyor mounting bracket, and work the belt into the channel on the bottom of the conveyor.
5. Once the belt is installed past the idle end mounting bracket, reinstall the two conveyor mounting screws [Figure B - item 7]
6. Remove the two conveyor mounting screws from the drive end of the conveyor [Figure B - item 7].
7. Work the belt the rest of the way into the bottom channel of the conveyor.

8. Stretch the belt over the components on the rejecter side of the conveyor and slide it onto the drive pulley.

   Note: The belt must be fully seated in the bottom channel of the conveyor before proceeding.

9. Reinstall the two drive end mounting screws into the conveyor [Figure B - item 7].
10. Tighten the belt tensioning bolts until the belt does not sag onto the channel on the bottom of the conveyor.
11. Reinstall all the removed components.
12. Fully tighten all loosened hardware, including the conveyor mounting screws.
13. Adjust the belt tracking by adjusting the belt tensioning screws one at a time until the belt tracks straight on the conveyor [Figure C - item 10].

Drive Belt

The drive belt of the conveyor should be replaced when excessive wear causes slipping of the drive mechanism. Replace the Drive belt with belt type 270H100, or Pressco part number 70069.

Refer to the ***Conveyor part identification*** (on page 44) to view the parts referred to in these procedures.

To replace the drive belt:

1. Remove the cover from the drive portion of the conveyor [Figure A - item 5].
2. Remove the tension from the drive belt by loosening the four motor mounting bolts [Figure D - item 12]. This will allow the motor to slide down in the slots.
3. Pull the drive belt over the motor pulley and then over the conveyor pulley to remove it [Figure D - item 13].
4. Pull the new belt over the conveyor pulley first, and then over the motor pulley.
5. Lift the motor until the belt is tight, then tighten the four motor mounting bolts [Figure D - item 12].
6. Check the tightness of the belt by squeezing the two sides together midway between the motor and conveyor pulleys. The belt should not move more than approximately 1.25 cm (1/2 inch).
7. Replace the drive motor cover.

CONVEYOR PART IDENTIFICATION

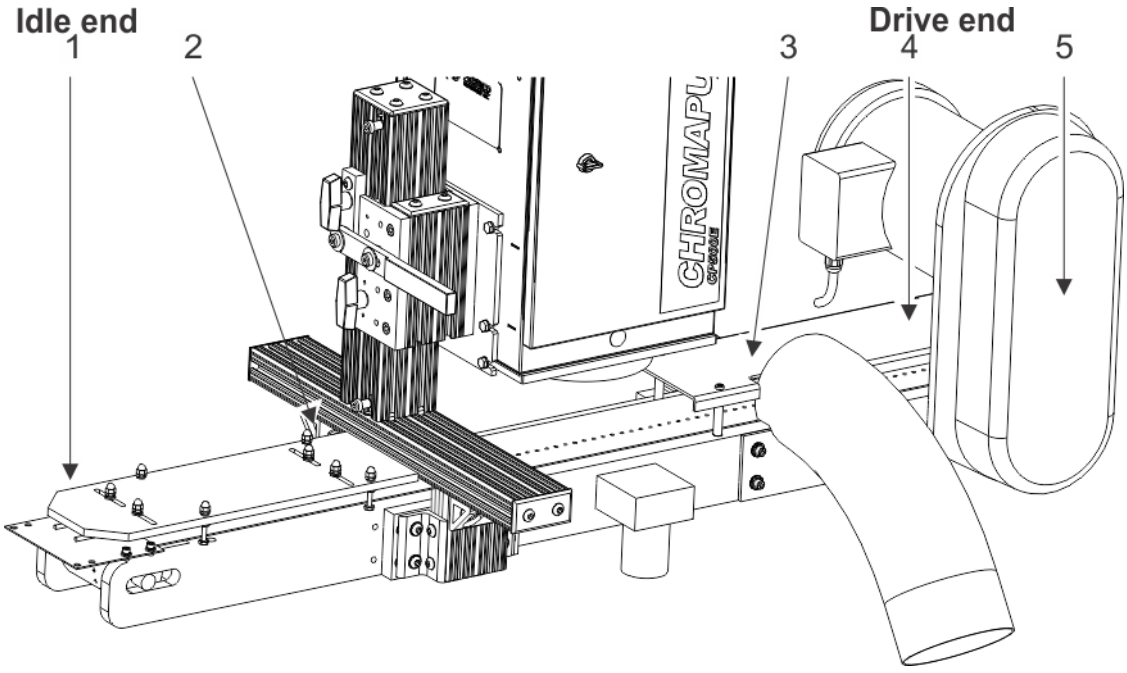


Figure A - conveyor components

1	Idle end of conveyor
2	Support leg for module mount - remove the 80/20 column and the angled bracket
3	Dust guard
4	Drive end of conveyor
5	Drive motor

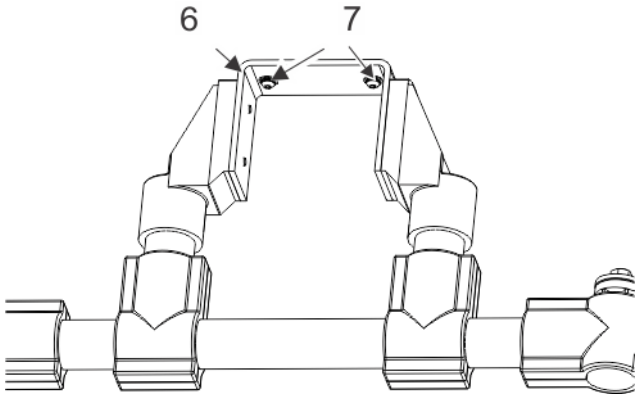


Figure B - Conveyor Mounting Bracket - shown from underneath

6	Conveyor mounting bracket - shown from underneath
7	Conveyor mounting screws - there are two screws on Idle end and two screws on Drive end of conveyor

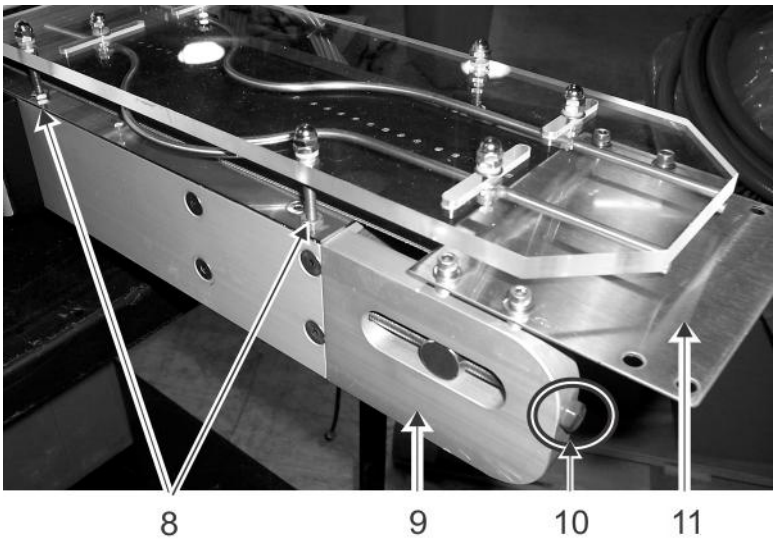


Figure C - Idle end components

8	Threaded rods that support the chicane - quantity four (4)
9	Idle end pulley mounting block
10	Belt tensioning bolts - quantity two (2) on Idle end only
11	Deadplate - one (1) on Idle end, one (1) on Drive end

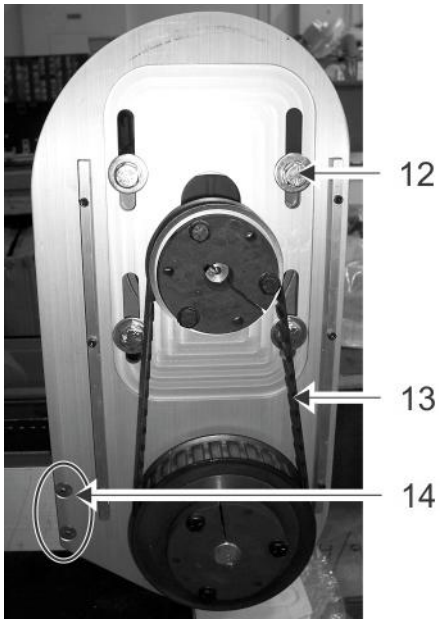


Figure D - Drive motor with cover removed

12	Motor mounting bolts - quantity four (4)
13	Drive belt
14	Screws that hold the plate to the side of the conveyor

REPLACING BEARINGS

Replace the appropriate bearings when necessary.

❖ *Note: We recommend that you replace the* **Main Belt** *(on page 43) while you are replacing bearings, since you must remove the Main Belt during bearing replacement.*

Refer to the ***Conveyor part identification*** (on page 44) to view the parts referred to in these procedures.

Idle End Bearings

The idle end bearings of the conveyor should be replaced when wear causes excessive heat build up or when excessive squeaking occurs - this indicates that the bearings are worn out. Replace the bearings with Pressco part number 69887.

To replace the idle end bearings:

1. Completely loosen the belt tensioning bolts on the idle end of the conveyor [Figure C - item 10].
2. Remove both the idle end and drive end deadplates [Figure C - item 11, idle end shown].
3. Remove the chicane by loosening the four threaded rods that support it [Figure C - item 8].
4. Pull the belt off the idle end pulley assembly and to the side.
5. Remove the idle end pulley mounting blocks by removing the four screws from each side of the conveyor [Figure C - item 9].
6. Pull the mounting block and pulley assembly out of the end of the conveyor.
7. Completely remove the belt tensioning bolts [Figure C - item 10].
8. Lift the idle end pulley assembly out of the conveyor end.
9. Replace the idle end pulley assembly with a new assembly.
10. Replace the pulley assembly and reinstall the pulley and mounting block assembly.
11. Reinstall the belt and all other parts as described in the ***Main Belt*** (on page 43) section. [use the instructions "To install the new belt."]

Drive End Bearings

The drive end bearings of the conveyor should be replaced when wear causes excessive heat build up or when excessive squeaking occurs - this indicates that the bearings are worn out. Replace the bearings with Pressco part number 69888.

To replace the drive end bearings:

1. Follow the steps to remove the Main Belt as described in the ***Main Belt*** (on page 43) section, and fully remove the belt. [follow the instructions "To remove the main belt."]
2. Remove the drive belt as described in the ***Drive Belt*** (on page 44) section. [follow steps 1-3]
3. Remove the conveyor pulley from the conveyor shaft.
4. Remove the motor mount plate and the motor by removing the screws holding the plate to the side of the conveyor. [Figure D - item 14]
5. Remove the bearing on the side of the conveyor that holds the motor, and replace the bearing.
6. Reinstall the motor mount plate and motor, and then reinstall the conveyor pulley.

7. Remove the encoder from the drive shaft of the conveyor.
8. Remove the shaft collar on the shaft as well.
9. Remove the two bearing keeper screws and then remove and replace the bearing.
10. Reinstall the shaft collar and the encoder.
11. Reinstall the drive belt as described in the ***Drive Belt*** (on page 44) section. [follow steps 4-7]
12. Reinstall the main belt as described in the ***Main Belt*** (on page 43) section. [follow the instructions "To install the new belt."]

Chapter 10

TROUBLESHOOTING

SYMPTOMS AND POSSIBLE SOLUTIONS

See the following table for a list of symptoms with possible causes and solutions. For other problems or further help, contact ***Pressco*** (see "***How to Contact Pressco***" on page 3).

For locations of components such as **VFD1**, **FU1** and **CB2**, refer to the illustration of the ***Electrical System*** (on page 33).

Symptom	Probable Cause	Solution
Conveyor not running	Frequency Drive (VFD1) has faulted	Locate fault code on Drive LCD window. Determine corrective action by looking in Maintenance and Troubleshooting section of supplied manual.
	Circuit breaker or blown fuse	Check FU1 and CB2
	E-Stop depressed	Reset E-stop
	Overload on Vacuum Blower	Determine cause and reset OL1 for Vacuum Blower
	Customer Enable Contact opened (electrical system 69617 only)	Check and clear condition that opened the contact. See ***Connection of the Customer Enable Contact*** (on page 30) or ***Conveyor Operation*** (on page 7).
Vacuum Blower not running	Frequency Drive (VFD1) has faulted	Locate fault code on Drive LCD window. Determine corrective action by looking in Maintenance and Troubleshooting section of supplied manual.
	Circuit breaker or blown fuse	Check FU1 and CB3
	E-Stop depressed	Reset E-stop
	Overload on Vacuum Blower	Determine cause and reset OL1 for Vacuum Blower

Symptom	Probable Cause	Solution
Improper part spacing	Chicane improperly adjusted	Adjust the rails of the chicane to allow for required spacing ***Initial Adjustments*** (on page 30)
Squeaking sounds	Either the idle end or drive end bearings are excessively worn	Replace either the idle end or the drive end bearings ***Replacing Bearings*** (on page 47)
Main belt shifts from side to side during operation	Main belt is excessively worn	Replace the ***main belt*** (on page 43)
Main belt slips during operation	Main belt is excessively worn	Replace the ***main belt*** (on page 43)
Main belt slips or does not turn while motor is running	Drive belt is excessively worn	Replace the ***drive belt*** (on page 44)
Parts slip on the belt during operation	Vacuum pressure has dropped	Clean or replace vacuum blower filter ***Cleaning filters*** (on page 42)

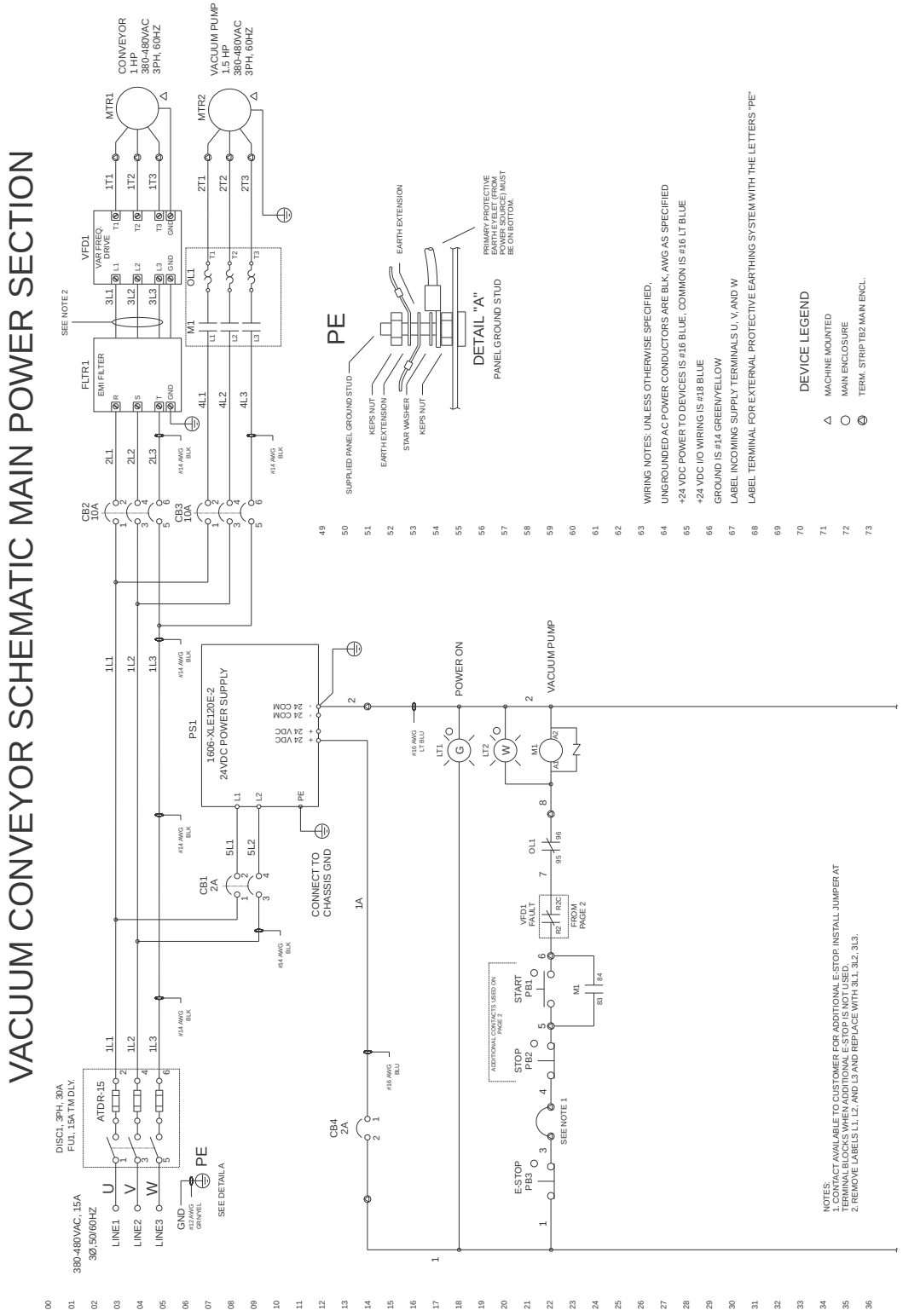
Appendix A

APPENDIX A - WIRING DIAGRAMS

WIRING DIAGRAMS FOR 3-WIRE CONTROL VERSION (69449)

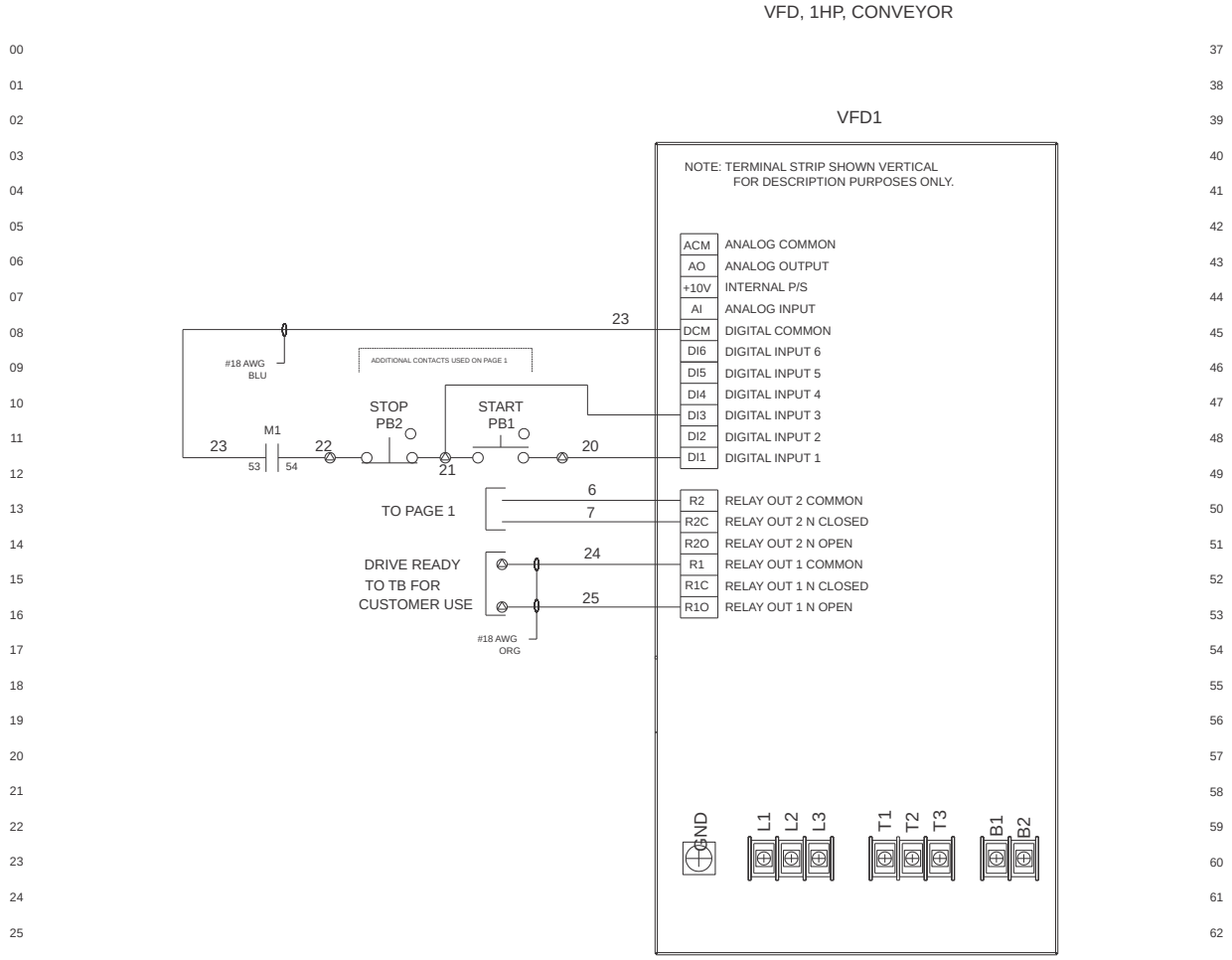
Wiring Diagram - sheet 1 (69449)

Vacuum Conveyor schematic main power section



Wiring Diagram - sheet 2 (69449)

VFD, 1HP, Conveyor



WIRING NOTES: UNLESS OTHERWISE SPECIFIED,

UNGROUNDED AC POWER CONDUCTORS ARE BLK, AWG AS SPECIFIED

+24 VDC POWER TO DEVICES IS #16 BLUE, COMMON IS #16 LT BLUE

+24 VDC I/O WIRING IS #18 BLUE

GROUND IS #14 GREEN/YELLOW

INTERLOCK WIRING TO BE #18 ORANGE

VFD1 PARAMETER SETUP

DEFAULT SETTING FOR UNLISTED PARAMETERS

PARAM.	DESCRIPTION	SETTING
P 0.00	MOTOR NAMEPLATE VOLTAGE	SEE MOTOR NAMEPLATE
P 0.01	MOTOR NAMEPLATE AMPS	SEE MOTOR NAMEPLATE
P 0.02	MOTOR BASE FREQUENCY	SEE MOTOR NAMEPLATE
P 0.03	MOTOR BASE RPM	SEE MOTOR NAMEPLATE
P 1.00	STOP METHOD	01: COAST TO STOP
P 3.00	SOURCE OF OPERATION COMMAND	01: EXTERNAL CONTROL WITH KEYPAD STOP ENABLED
P 3.01	MULTI-FUNCTION INPUT TERMINALS	02: 3-WIRE CONTROL
P 3.03	MULTI-FUNCTION DI4	99: INPUT DISABLED
P 3.04	MULTI-FUNCTION DI5	99: INPUT DISABLED
P 3.05	MULTI-FUNCTION DI6	99: INPUT DISABLED
P 6.03	REVERSE OPERATION INHIBIT	01: DISABLE REVERSE OPERATION
P 8.00	USER DEFINED DISPLAY FUNCTION	01: DISPLAY MOTOR SPEED(RPM)

DEVICE LEGEND

△ MACHINE MOUNTED

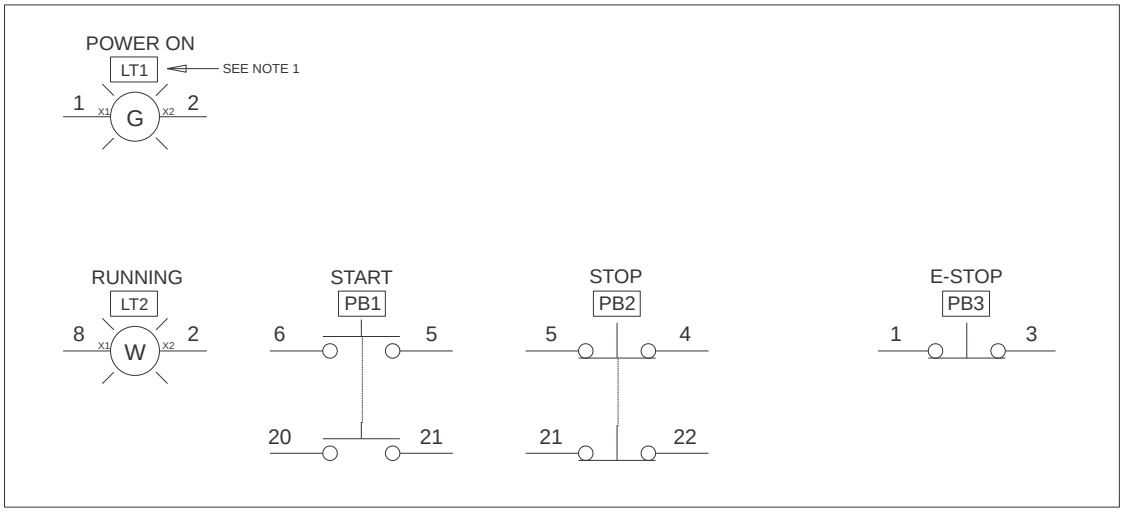
○ MAIN ENCLOSURE

⓪ TERM. STRIP TB2 MAIN ENCL.

Wiring Diagram - sheet 3 (69449)

Operator devices as viewed from inside of enclosure door

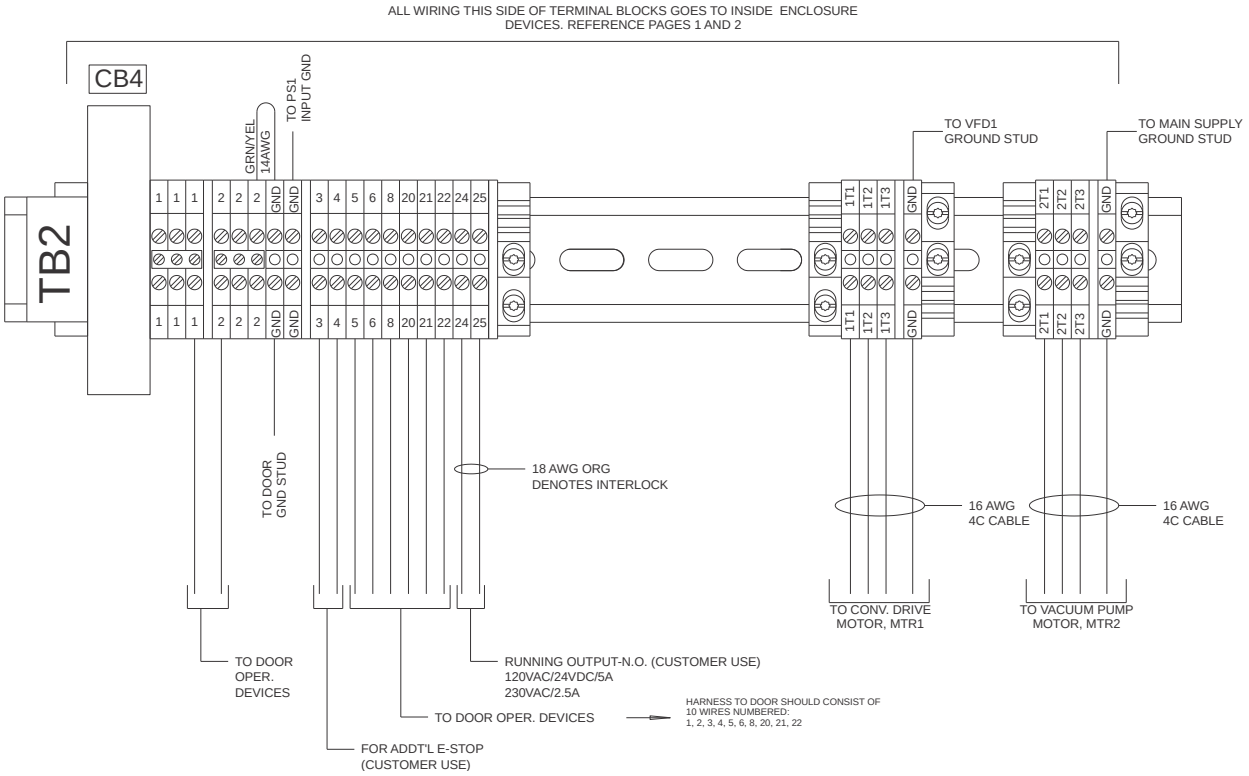
OPERATOR DEVICES AS VIEWED FROM INSIDE OF ENCLOSURE DOOR



NOTES:
1. APPLY LABELS ADJACENT TO DEVICES ON "INSIDE" OF DOOR PER TEXT INSIDE RECTANGLES.

Wiring Diagram - sheet 4 (69449)

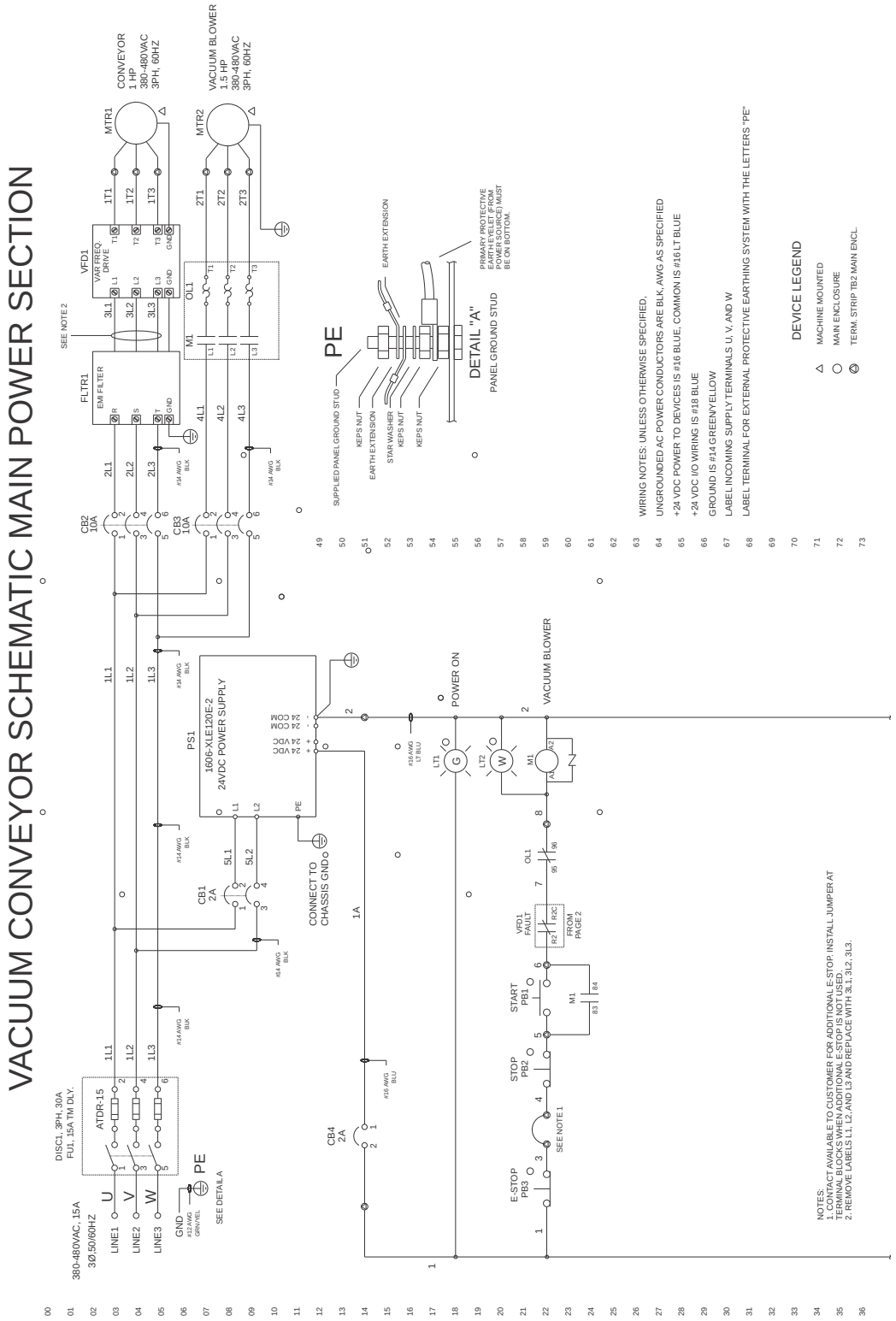
Terminal Block TB2



WIRING DIAGRAMS FOR 2-WIRE CONTROL VERSION (69617)

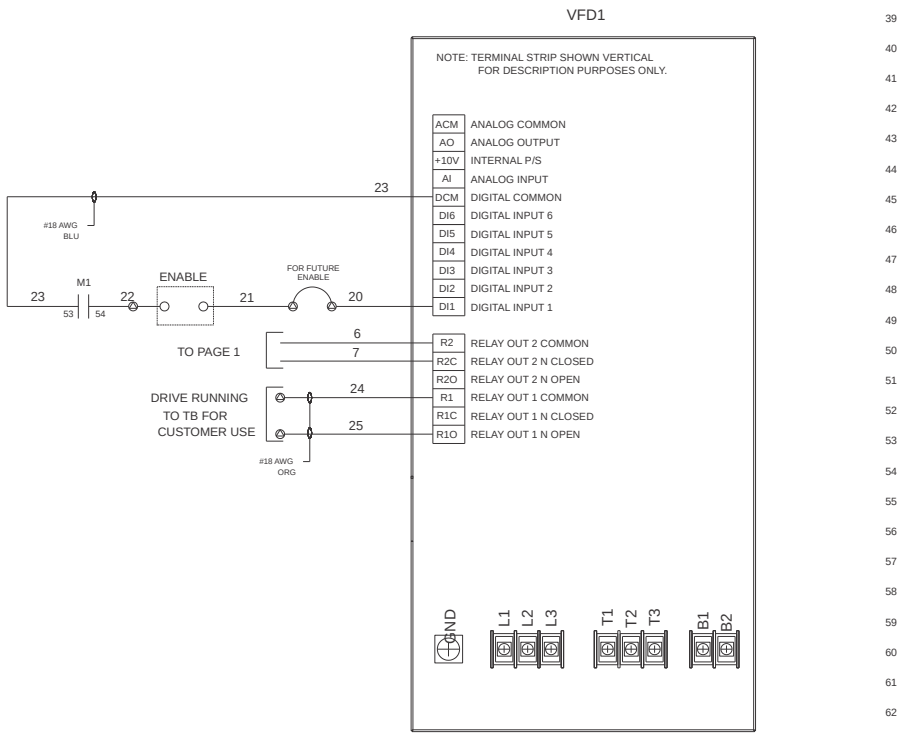
Wiring Diagram - sheet 1 (69617)

Vacuum Conveyor schematic main power section



Wiring Diagram - sheet 2 (69617)

VFD, 1HP, CONVEYOR



VFD1 PARAMETER SETUP

DEFAULT SETTING FOR UNLISTED PARAMETERS

PARAM.	DESCRIPTION	SETTING
P 0.00	MOTOR NAMEPLATE VOLTAGE	SEE MOTOR NAMEPLATE
P 0.01	MOTOR NAMEPLATE AMPS	SEE MOTOR NAMEPLATE
P 0.02	MOTOR BASE FREQUENCY	SEE MOTOR NAMEPLATE
P 0.03	MOTOR BASE RPM	SEE MOTOR NAMEPLATE
P 1.00	STOP METHOD	00: RAMP TO STOP
P 1.01	ACCELERATION TIME	10 SEC
P 1.02	DECELERATION TIME	1 SEC
P 3.00	SOURCE OF OPERATION COMMAND	01: EXTERNAL CONTROL WITH KEYPAD STOP ENABLED
P 3.01	MULTI-FUNCTION INPUT TERMINALS	00: 2-WIRE CONTROL (DEFAULT)
P 3.03	MULTI-FUNCTION DI4	99: INPUT DISABLED
P 3.04	MULTI-FUNCTION DI5	99: INPUT DISABLED
P 3.05	MULTI-FUNCTION DI6	99: INPUT DISABLED
P 6.03	REVERSE OPERATION INHIBIT	01: DISABLE REVERSE OPERATION
P 8.00	USER DEFINED DISPLAY FUNCTION	01: DISPLAY MOTOR SPEED(RPM)

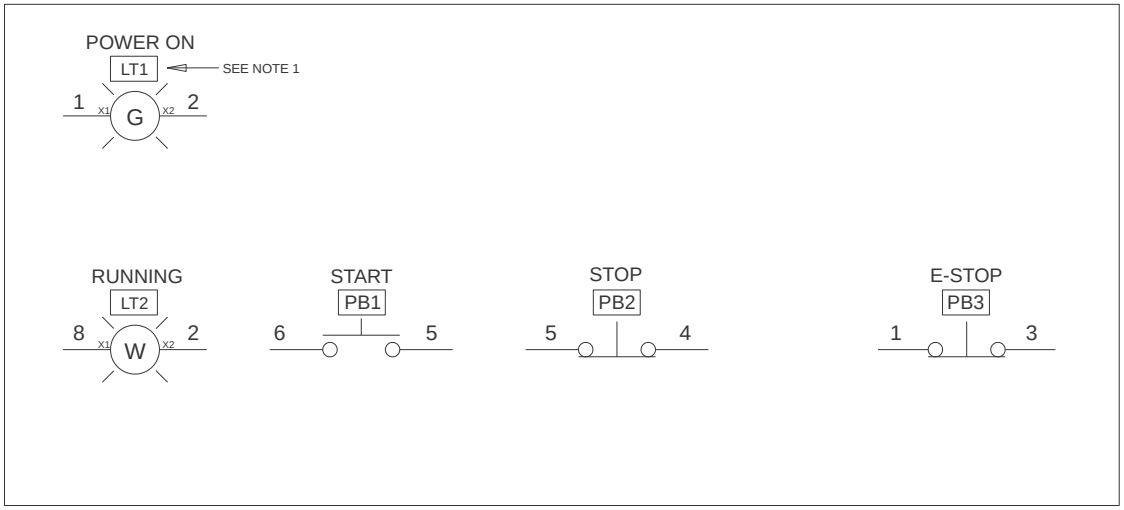
WIRING NOTES: UNLESS OTHERWISE SPECIFIED,
UNGROUNDED AC POWER CONDUCTORS ARE BLK, AWG AS SPECIFIED
+24 VDC POWER TO DEVICES IS #16 BLUE, COMMON IS #16 LT BLUE
+24 VDC I/O WIRING IS #18 BLUE
GROUND IS #14 GREEN/YELLOW
INTERLOCK WIRING TO BE #18 ORANGE

DEVICE LEGEND

△ MACHINE MOUNTED
◯ MAIN ENCLOSURE
⏢ TERM. STRIP TB2 MAIN ENCL.

Wiring Diagram - sheet 3 (69617)

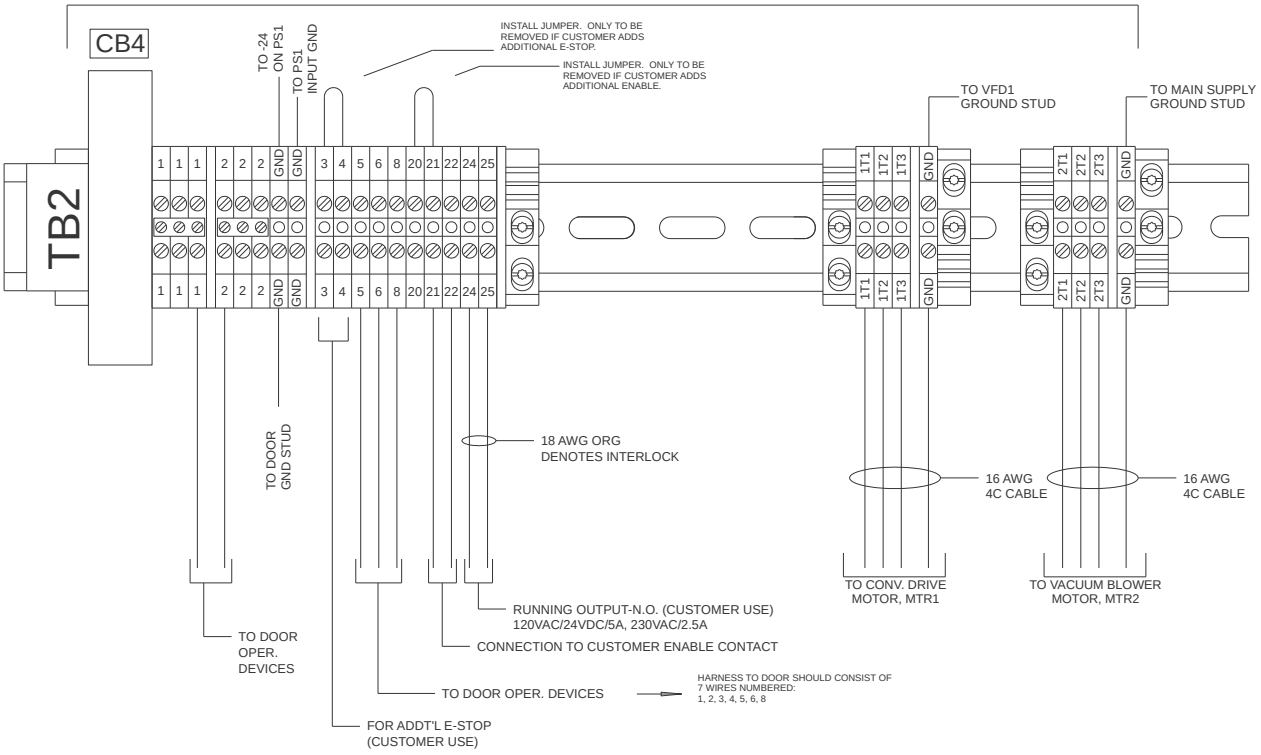
OPERATOR DEVICES AS VIEWED FROM INSIDE OF ENCLOSURE DOOR



NOTES:
1. APPLY LABELS ADJACENT TO DEVICES ON "INSIDE" OF DOOR PER TEXT INSIDE RECTANGLES.

Wiring Diagram - sheet 4 (69617)

ALL WIRING THIS SIDE OF TERMINAL BLOCKS GOES TO INSIDE ENCLOSURE DEVICES. REFERENCE PAGES 1 AND 2



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