

INTELLISPEC™ SV

Hardware Guide [FHCP3X EZ]

Pressco Technology Inc.

73346 Rev. 02



Original Instructions

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Chapter 1

Introduction

Welcome!

Congratulations on your purchase of an Intellispec system! The Intellispec is a high-speed machine vision system designed specifically for product and online process monitoring. It is a powerful tool that provides inspection much more reliably than the human eye or sampling methods. The latest PC technology, powerful inspection algorithms, online adjustment capability, and inspection data storage allow the Intellispec to automatically inspect parts with extreme accuracy on high-speed lines.

The Intellispec will help you provide the highest quality of products shipped to your customers.

About this manual

This is your Hardware Guide to the Pressco Intellispec Series V Vision Inspection System. This Hardware Guide covers technical information necessary to adjust and maintain the Series V Intellispec Systems.

❖ *Note: Programming and user interface operations are covered in a separate manual titled "Software Guide (5.x)" Some software references in this manual are applicable to software version 5.5.*

This guide was published: Tuesday, November 20, 2018

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.
- 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.



Caution - Caution messages indicate important information which must be observed to prevent: loss of data, poor system performance, or equipment damage.

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

Safety Considerations

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.

Static Discharge Protection



Caution - Electronic components can be damaged by static electricity discharge.

Always observe the following precautions before removing, installing or handling any electronic components within the Inspection System:

- Wear an anti-static wristband which is grounded to the Inspection System.
- Stand on an anti-static, grounded floor mat, and lay circuit boards on the mat during any board replacement.
- Keep circuit boards in static shield bags when storing and transporting. Ensure the bag is sealed.

Chapter 2

EU Declarations of Conformity

Declaration of Conformity - FHCP3X-EZ System (MS)

Declaration	Pressco Technology, Inc. FHCP3X-EZ System is in conformity with Directive 2006/42/EC of The European Parliament and of the Council of 17 May 2006.
Other Directives	Directive 2014/30/EU of the European Parliament and of the Council of 26 February 2014 on the harmonization of the laws of Member States relating to electromagnetic compatibility.
Manufacturer	Pressco Technology Inc. 29200 Aurora Road Cleveland, Ohio 44139-1847 USA This declaration of conformity is issued under the sole responsibility of the manufacturer.
Product Name	FHCP3X-EZ System
Electrical Diagram	72999W and 72999E
Standards Used (only major standards listed)	EN60204-1 (2006): Safety of machinery – Electrical equipment of machine Part 1: General requirements EN14120 (2015): Safety of machinery – Guards – General requirements for the design and construction of fixed and movable guards EN ISO 13849-1 (2015): Safety of machinery - Safety-related parts of control systems - Part 1: General principles for design EN ISO 13855 (2010): Safety of machinery - Positioning of safeguards with respect to approach speeds of parts of the human body EN1037 (2008)+A1(2008): Safety of Machinery – Prevention of unexpected startup EN ISO 14119 (2013): Safety of machinery - Interlocking devices associated with guards - Principles for design and selection EN1837 (1999)+A1(2009): Safety of machinery - Integral lighting of machines EN13850 (2015): Safety of Machinery – Emergency stop equipment, functional aspects – Principles for design EN13857 (2008): Safety of Machinery – Safety distances to prevent danger zones from being reached by upper and lower limbs EN ISO 12100 (2010): Safety of machinery - General principles for design - Risk assessment and risk reduction
Technical File	MS4113
Compiler of the Technical Files	Safenet Ltd, Notified Body 1674 Denford Garage, Denford, Kettering, Northants., NN14 4EQ, U.K.
Place	Pressco Technology Inc. 29200 Aurora Road Cleveland, Ohio 44139-1847 USA

Signed: Fredrick F. Awig

Date: 25 May 2016

Name: **Fredrick F. Awig**

Title: **VP of Engineering & Operations**

Signed for and on behalf of Pressco Technology Inc.

Declaration of Conformity - FHCP3X-EZ System (EMC)

Declaration	Pressco Technology, Inc. FHCP3X-EZ System is in conformity with Directive 2014/30/EU of the European Parliament and of the Council of 26 February.
Manufacturer	Pressco Technology Inc. 29200 Aurora Road Cleveland, Ohio 44139-1847 USA This declaration of conformity is issued under the sole responsibility of the manufacturer.
Product Name	FHCP3X-EZ System
Electrical Diagram	72999W and 72999E
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+A1:2011) Electromagnetic compatibility – Part 6-4: Generic standards – Emission standard for industrial environments BSEN 55011 (2009+A1:2010) Limits and methods of measurement of radio disturbance characteristics of industrial, scientific and medical (ISM) radio-frequency equipment
Technical File	EMC4113
Competent Body	Hursley EMC Services, Ltd. Notified Body of the U.K. 1890 Trafalgar House, Trafalgar Close Chandlers Ford, Eastleigh, Hampshire SO53 4BW, Great Britain
Assessment Certificate Number	14R538, Dated: March 18, 2015
Means of Conformity	The product is in conformity with Directive 2014/30/EU based on test results referencing harmonized standards and the use of a Technical File in accordance with Article 7 of the Directive.
Place	Pressco Technology Inc. 29200 Aurora Road Cleveland, Ohio 44139-1847 USA

Signed: Fredrick F. Awig

Date: 25 May 2016

Name: **Fredrick F. Awig**

Title: **VP of Engineering & Operations**

Signed for and on behalf of Pressco Technology Inc.

Chapter 3

Safety Information and Markings

This section contains operator safety information that must be read before operating or servicing the system.



Warning - Do not, under any circumstances, tamper with sealed machine parts or devices. This could result in the removal of protections that might create potentially hazardous conditions.



Warning - This product contains no operator serviceable parts. Refer servicing to qualified personnel. To prevent electrical shock do not open cabinet doors whilst power is connected.

Safety Considerations

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.

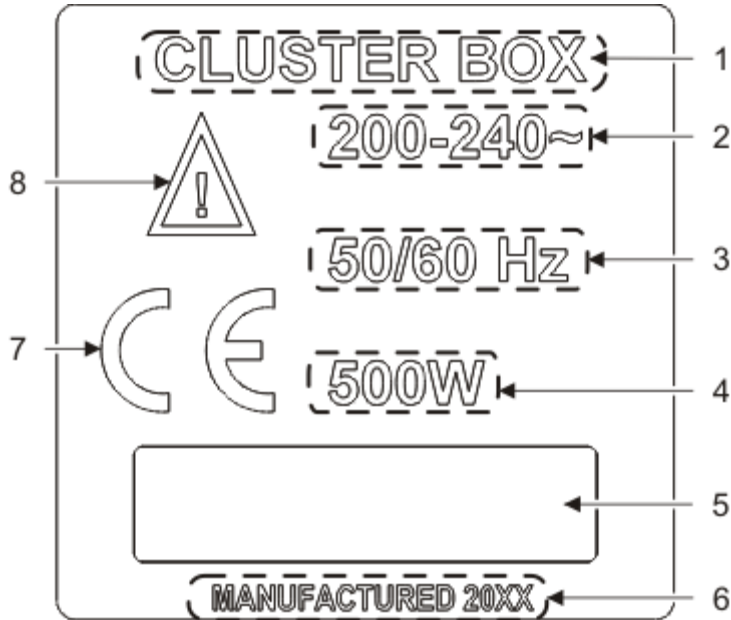
Symbols

The following symbols are used on or near the Intellispec system. Be aware of potential risk hazards.

	CAUTION Risk of danger. Refer to accompanying user documentation before use.
	WARNING Risk of electric shock
	On (supply)
	Off (supply)
	Alternating current
	Protective conductor terminal

Marking

The following illustration shows an example label that you will find on the Intellispec system components.



1 - Name of component. NOTE: Chromapulse model is listed on the front panel of the module. See example below.

2 - Voltage range in Volts AC

3 - Frequency range in Hertz (Hz)

4 - Maximum rated power in watts (W) with all accessories or plug-in modules connected

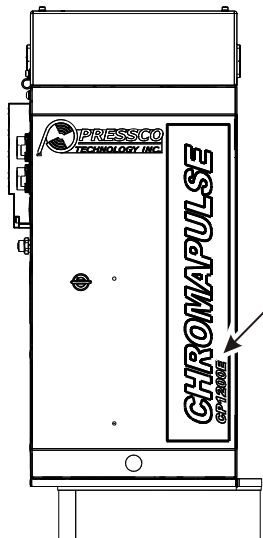
5 - Serial number is listed in this box

6 - Year of manufacture

7 - Component certification


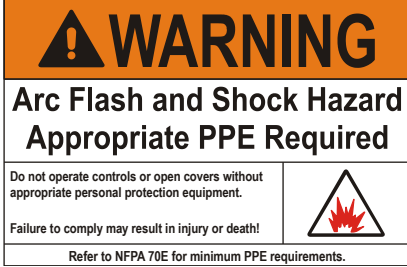
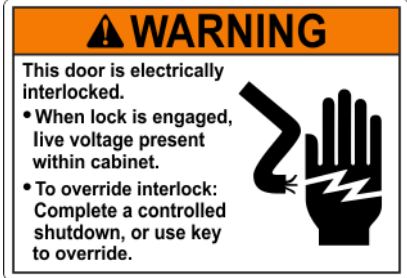
8 - Risk of danger. Refer to accompanying documentation before use.

An example of a Chromapulse module label with the model number is shown below.



Additional Symbols and Labels - FHCP

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

	High voltage
	Arc flash
	Electrical interlock

Warning Devices

The Intellispec Series V system has warning devices that indicate system failure or report excessive defects or warnings for your production line.

Alarms

User-programmable alarms allow you to set the duration of the lights in the optional light tree and the horn if certain criteria are met.

In addition to the light tree, an alarm button is displayed on screen when certain criteria are met. You can click the alarm button to clear the alarm and see more detailed information about the alarm condition.



Light Tree

The optional light tree may be mounted on or near an inspection module, or near a cluster box (if applicable). The optional horn, mounted with the light tree provides an audible warning.

For more information, refer to Light tree status.



Light Tree (optional)

- Red (Alarm)
- Amber (Warning)
- Green (Online)
- Blue (Power)

Residual Risk

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

Intended Use: The Pressco system is designed and constructed for use in an indoor industrial environment, always sheltered from the weather.

Space Required: The Pressco system and accompanying sensors must be installed in a place that will enable safe and easy installation, size changeover, user operation, and maintenance procedures.

Prohibited 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 Pressco system should NOT be used for any purpose other than specifically indicated in the section titled **Intended Use** (on page 14).

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. <i>Note: the emergency stop devices may not be connected directly to the Pressco equipment, but it is important to know how to use them.</i>
	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 Pressco 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 Pressco system could result in hazard risk.

If you are unclear about any part of this manual, **contact Pressco Technical Support** (on page 2).



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 Pressco 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 2).

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 system.

Chapter 4

System Specifications

Environmental conditions

The Intellispec Series V system is designed to be safe in the following environmental conditions:

❖ *Note: Please consult Pressco Technology Inc. (on page 2) 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 overvoltages 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.



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.

Sound Pressure Level

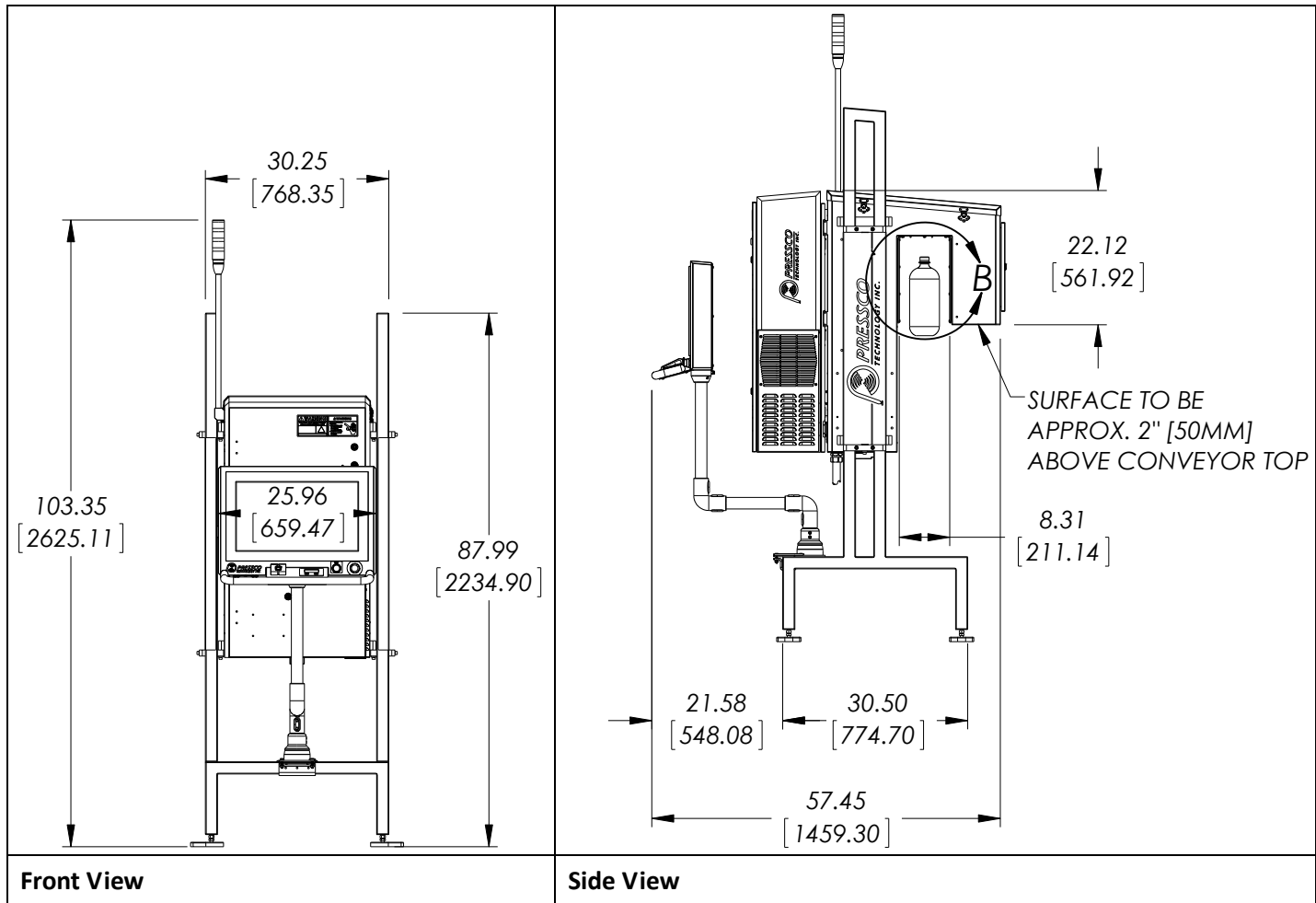
The horn on the optional *light tree* (on page 13) has a maximum 105dB level at 1 meter distance in front of the horn. Use proper hearing protection as specified by your plant safety instructions.

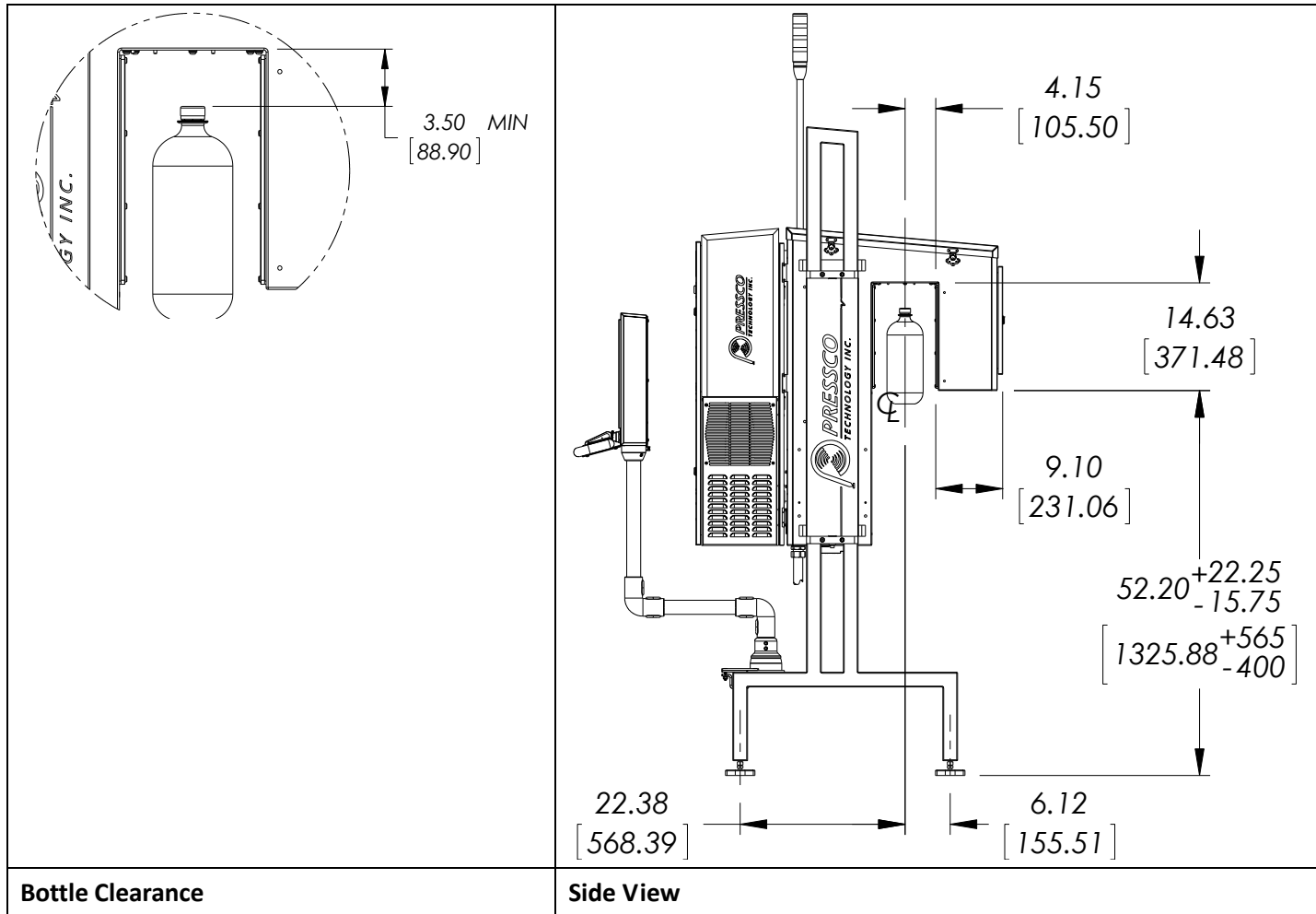
System Measurements - FHCP

The following are the maximum dimensions of the Fill Height/ Cap Placement System:

Measurement	Value
Height (overall system to top of light tree)	103.35 inches [2625.11 mm]
Height (from conveyor to top of module)	22.12 inches [561.85 mm]
Height (from floor to conveyor) Adjustable	52.20 inches +22.25/- 15.75 inches [1325.88 mm +565/- 400 mm]
Width (of User Interface)	30.25 inches [768.35 mm]
Depth	57.45 inches [1459.30 mm]
Bottle Clearance inside module	3.5 inches minimum [88.90 mm]

❖ Note (in side view): The surface is to be approximately 2 inches [50mm] above the conveyor top.





Part and Part Handling Specifications - FHCP

Closure/ Finish Size

The range of cap/finish sizes that the FHCP 3X system will handle are: **25mm to 38mm** outer diameter. Sports caps and other specialty caps must be evaluated by Pressco Technology Inc. prior to inspection.

Part inspection requirements

- Liquid droplets must be removed from the inspection area (cap and neck ring)
- The fill level inspection is based on inspecting a stable fill level that is unobstructed by the support ring or other bottle features.

Burst Rate

The maximum conveyor rate is **1100 parts per minute**, maximum. Parts will not be inspected properly above this rate.

Conveyance

Bottles must be presented such that there is no slippage between the bottle and conveyor while the bottle is between the vision inspection module part detect and rejecter.

Conveyors must have a ramp function so that upon starting and stopping, bottles do not slide on the conveyor surface.

Conveyors must have a suitable chain tension such that under normal operation, starting or stopping the conveyance surface does not stretch or compress between the vision modules and the drive wheels.

Positioning

In order to accurately measure cap application geometry, bottle must be consistently presented to the vision inspection module. Depending on the range of bottle diameters to be inspected, adjustable rails may be necessary to ensure that bottle centerlines remain consistent on the conveyor.

- Bottles should be positioned +/- 0.125 inches laterally
- Bottles should be upright and perpendicular to the conveyor +/- two degrees

Deviation from these guidelines could potentially cause bottles to be falsely rejected.

Spacing

In order to properly inspect and accurately reject bottles: Bottle Spacing on Conveyor is | **50 mm** sidewall to sidewall gap. If this spacing is not achievable, narrower spacing will be evaluated on a case by case basis by Pressco Technology Inc.

System Electrical Specifications - FPCP 3X

The following are electrical specifications for the FHCP 3X inspection module:

Configuration	Specification - 120 V system	Specification - 230 V system
Voltage Range	120 VAC	230 VAC
Frequency	50/ 60 Hz	50/ 60 Hz
Current	5.2A for Air Conditioner 3.8A for Inspection System	2.6A for Air Conditioner 1.9A for Inspection System

Chapter 5

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.

Instructions for Safe Assembly Operations



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.

The site supervisor will also be required to make sure that all the members of personnel involved in the mounting operations comply with said regulations.

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** (on page 2).

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, 241.3 cm x 132.08 cm x 162.56 cm (95 inches x 52 in. x 64 in.)
Weight	679 kg (1495 lbs.)

Hoisting

The machine is packaged in a wooden box, inside which the parts are individually packaged to prevent shock and sudden movements during transport. It is anchored onto a pallet.



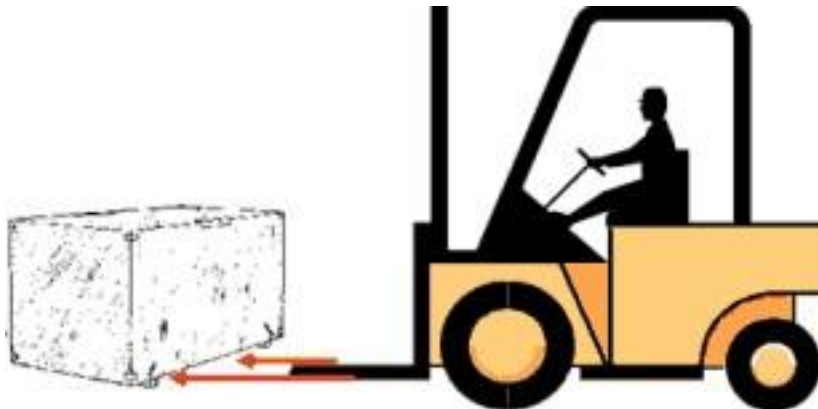
Warning

- To prevent personal injury in the event that the machine or packaging box should fall, ensure that during hoisting operations no person is standing within the range of action of the hoisting machines.
- Hoisting, transporting and placement operations should be supervised by qualified technical staff trained in these specific areas.
- Before performing any movement, you should always ensure that the hoisting means and equipment (ropes, hooks, etc.) are suitable for lifting the weight and also verify its stability.



If using a fork lift truck, ensure that the forks extend beyond the opposite side.

Before you start moving the machine, check the stability of the element to be transported.




Storing

The machine should be stored indoors, still packed. Maintain regular temperature and humidity.

Assembly, location, and mounting requirements

Installation

Pressco Technology Inc. recommends that the machine be **installed and assembled by Pressco's specialized technicians**. This is of vital importance for correct machine operation.

 Warning - Pressco Technology Inc. shall not be liable in case of failures or damage to property and/or personal injury resulting from or connected with assembly if this has been carried out by unauthorized personnel, or is not in compliance with the indications given in this manual.

To carry out production and cleaning/ servicing operations, it is important for the machine to have a minimum amount of space all around and away from walls.


Ventilation

Place the Pressco Intellispec components in a position with adequate ventilation to allow proper air flow through the air filters.

Component	Spacing
User Interface	Leave 1 meter [39 inches] clear around machine
Cluster box (not used on all systems)	Leave 100 mm clear in front of the fan and vent

Adjusting Module Height to Conveyor

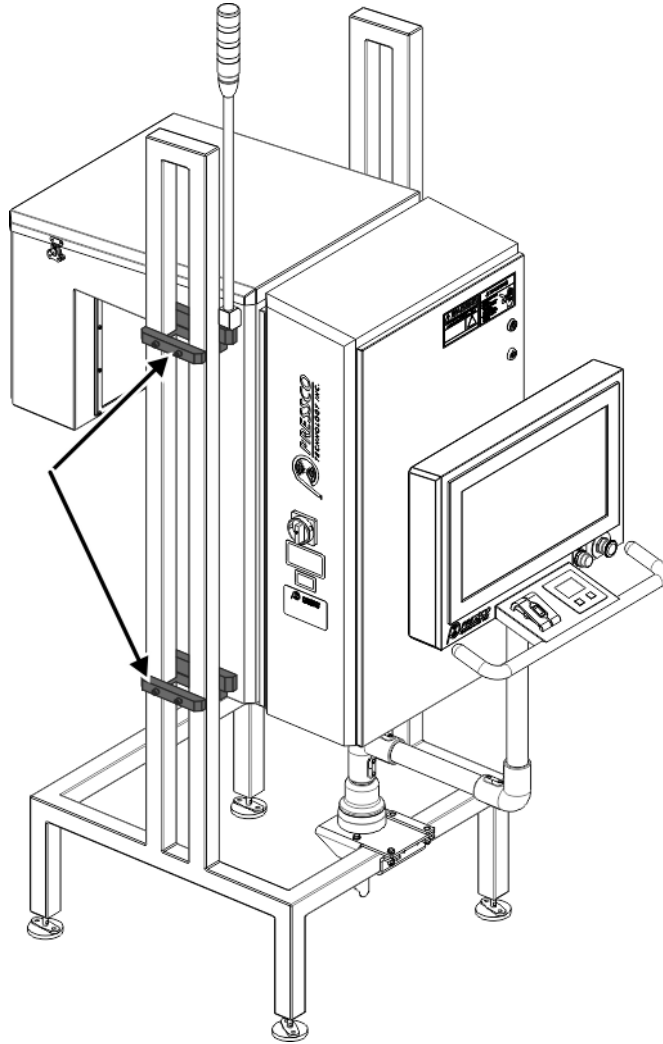
The height of the module should be set properly to the conveyor height during installation. It should not need further adjustment.

 Danger - The module is extremely heavy. Get several people to help you move it.

Use the yellow straps with the ratcheting mechanism to raise or lower the height of the module.



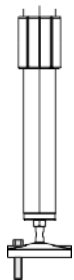
The module has brackets and bolts to make small adjustments to the overall height of the inspection module. You can also adjust it slightly forward and backward to center it over the conveyor.



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 M12 x 50mm lag bolts into the floor through the hole on the frame foot pad. Do this on one hole in each foot.



Utilities to be supplied by customer

The following utilities are required to operate the Pressco Intellispec system. Before making connection, make sure the utility matches the technical specifications. More than one connection of the utilities may be required depending on the number of modules installed. Refer to specific wiring diagrams.

Utility	Requirements
Air supply for rejection device	Pipe size must be such that there will be no pressure decrease during machine operation. Air must be dry and free of oil.
Electrical supply	Provide one each electrical socket to comply with: <ul style="list-style-type: none">▪ User interface electrical specifications (see "System Electrical Specifications - FPCP 3X" on page 22) (use the specifications that apply to your system)▪ Integrated tunnel electrical specifications (if applicable)▪ Cluster box electrical specifications (if applicable)
Internet connection (optional)	Provide a shielded ethernet cable to use Pressco's remote support through the Internet.

Electrical Connection

Pressco recommends that you run two (2) power cables to the FHCP 3X system, capable of handling power for the air conditioner and the system, as stated in the specifications below.



Warning - The electrical connections must meet local and national codes.

Have a qualified electrician connect the correct voltage and amperage wiring to the bottom of the electrical enclosure. See nameplate on electrical enclosure door.

The following are electrical specifications for the FHCP 3X inspection module:

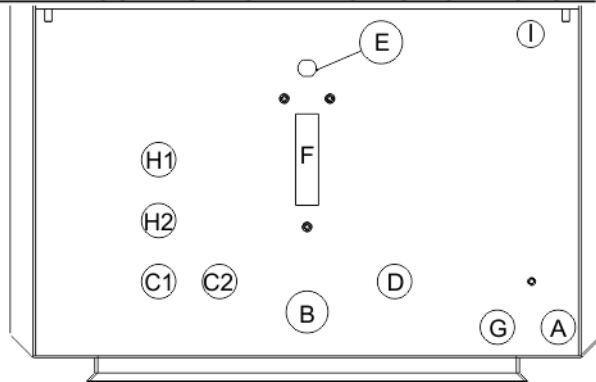
Configuration	Specification - 120 V system	Specification - 230 V system
Voltage Range	120 VAC	230 VAC
Frequency	50/ 60 Hz	50/ 60 Hz
Current	5.2A for Air Conditioner 3.8A for Inspection System	2.6A for Air Conditioner 1.9A for Inspection System

➤ To connect power:

1. Route both power circuits through Sealtite into enclosure through hole A, shown in the diagram below. This view shows the **bottom panel** looking inside the inspection module.
2. Terminate the power circuit conductors at terminal block TB-1. The location of the terminal block TB-1 is on the right-hand wall inside the inspection module.
3. Connect the power leads to terminal block TB-1.

- 120V systems: See *Electrical Diagram FHCP3X GEN3 120V (sheet 1)* (on page 53) and *Wiring Diagram FHCP3X GEN 3 120V sheet 1 of 11* (on page 55)
- 230V systems: See *Electrical Diagram FHCP3X GEN 3 230V sheet 1 of 2* (on page 68) and *Wiring Diagram FHCP3X GEN 3 230V sheet 1 of 11* (on page 70)

VIEW LOOKING INSIDE INSPECTION MODULE



- A = POWER IN
- B = TO MONITOR
- C1 = LIS IN (optional)
- C2 = LIS TO JAM BOX (optional)
- D = EXTENDED I/O (optional)
- E = ENCODER
- F = 8-PORT I/O ENTRY
- G = 120 VAC or 230 VAC JAM BOX (optional)
- H1 = DOR CAMERA (optional)
- H2 = DOR PDN (optional)
- I = REMOTE PENDANT (optional)

- A - Power in
- B - To monitor
- C1 - LIS in (optional) [LIS = line information system, a customer-proprietary communication]
- C2 - LIS to Jam Box (optional)
- D - Extended I/O (optional)
- E - Encoder
- F - 8-port I/O entry
- G - 120 VAC or 230 VAC jam box (optional)
- H1 - DOR camera (optional) [DOR = degree of rotation]
- H2 - DOR PDN (optional) [PDN = Pressco data network]
- I - Remote pendant (optional)

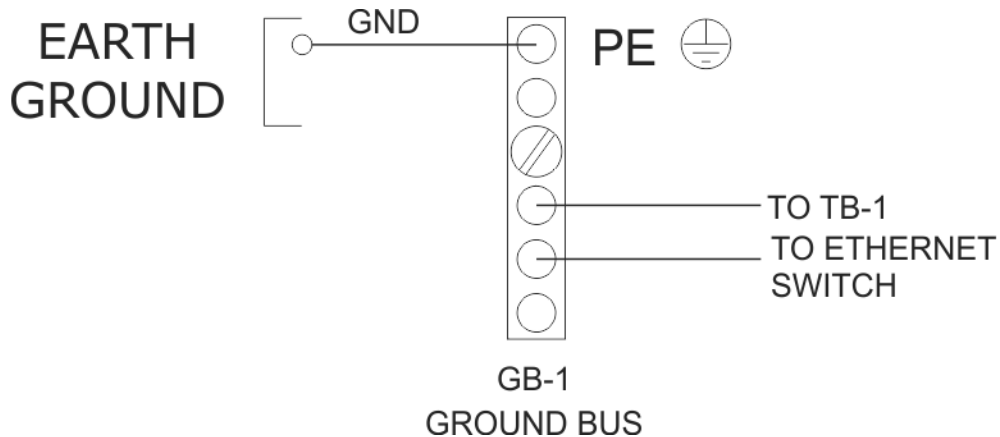
Protective earthing



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.

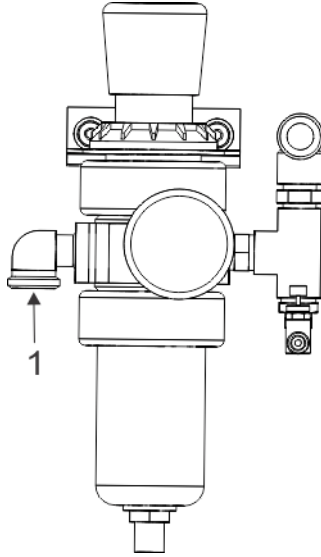
This product must be grounded (earthed). If it should malfunction or break down, grounding provides a path of least resistance for electric current to reduce the risk of electric shock.

Located close to the entry of the incoming electrical supply, a bus bar 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 the remaining terminals. See also *Wiring Diagram FHCP3X GEN 3 120V sheet 1 of 11* (on page 55) or *Wiring Diagram FHCP3X GEN 3 230V sheet 1 of 11* (on page 70)



Air Supply Connection

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

Commissioning

Before proceeding with the commissioning procedure, a general check should be performed using the table below.

❖ *Note: You must complete these checks before requesting the assistance of our staff for the startup phase.*

Check	Yes	No
Positioning and leveling of the unit		
Connection of compressed air line to connection points		
Connection of power supply to control board using the specifications from the wiring diagrams		

Chapter 6

FHCP EZ System Overview

The Fill Height Cap Inspection (FHCP) Module inspects filled plastic bottles after they exit the filler. It inspects both the fill height of the bottle and the position of the cap on the bottle.

The user interface attaches to the module through a movable arm. The arm can swing 180 degrees for your convenience.



- 1) Light tree (two types)
- 2) System power switch
- 3) Rail safety shutoff/ Reset
- 4) Safety interlock
- 5) Air conditioning unit

FHCP Additional Hardware



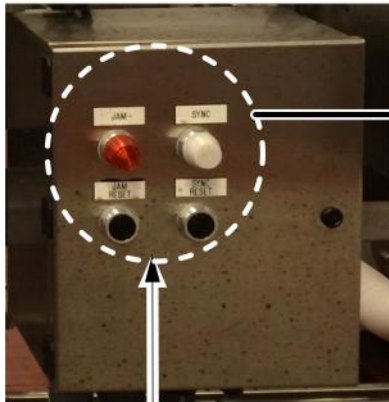
1



2



3



4

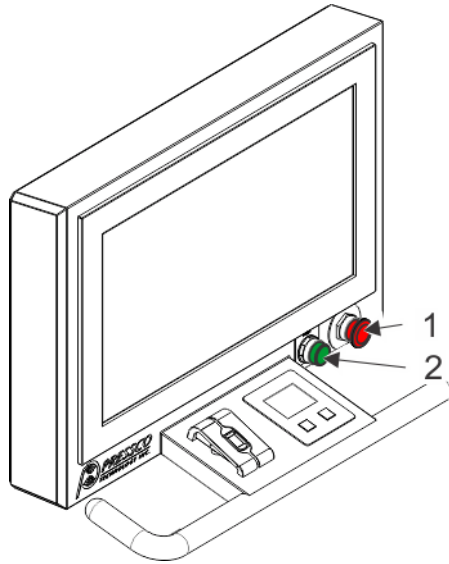


5

- 1) Part detect (filler exit and after rejecter)
- 2) System rejecter
- 3) Encoder
- 4) *Jam detect* (see "*Enclosure PLC Interface Jam Detect (Optional)*" on page 119) box (optional)
- 5) Jam detect box reset and sync buttons

Emergency E-Stop Button

The FHCP 3X has a red E-Stop button [item 1] to stop motor power. The motors are those that move the inspection module up and down, and move the guide rails within the inspection module in and out. The green reset button [item 2] returns power to the motors.



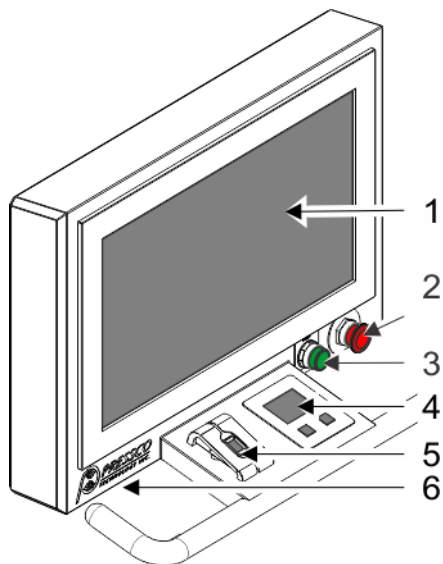
- 1 - Red E-Stop Button stops motors
- 2 - Green button restarts motors

➤ **To use the E-Stop buttons:**

1. Press the red E-Stop button [item 1] to stop the motors.
2. Perform service, or clear part jams.
3. When you have completed servicing the unit, press the green button to reset the motors.

Navigation Components

To operate the software of the FHCP 3X EZ system, use the monitor and associated components, shown below.



- 1 - Touch Screen Monitor
- 2 - **Emergency E-Stop Button** (on page 32)
- 3 - Reset button to restart motors
- 4 - Glide pad with buttons to move cursor and **select** (see "**How to select menu items**" on page 34) items on the screen.
- 5 - **Biometric login device** (on page 36)

6 - Two **USB** (see "**USB Port**" on page 35) convenience ports - underneath:

- Outside (towards left side of monitor) used for jump drive to create Support Package
- Inside (towards center of monitor) used for **Mechanical keyboard (MKB)** (see "**Mechanical keyboard (MKB)**" on page 35)

User interface input devices

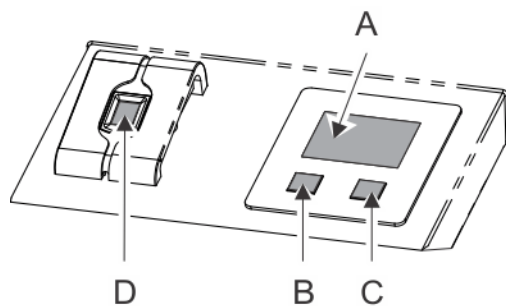
The following devices are available to input information to the Intellispec system:

- Glide pad and buttons
- On Screen Keyboard (OSK)
- Touch Screen monitor
- Temporarily connected conventional **Mechanical Keyboard (MKB)** (on page 35)
- **Biometric login device** (on page 36)

How to select menu items

Use the glide pad to select, interact with, and change active objects on the screen. The glide pad will be required for all inspection editing tasks. The glide pad [item A] is located next to the **Biometric login device** (on page 36), as shown below.

Under the glide pad are two buttons. Use the left button [item B] to select and activate objects on the screen. Use the right button [item C] to call up a context-sensitive menu related to the area or object clicked.



The following table shows the actions available for the glide pad and buttons, and the results of those actions.

Item	Action	Result
A - glide pad	Point (move pointer with the glide pad)	Display Tool Tip when hovered over active object
B	Click (Left-click)	When the pointer is over an active object, a click initiates various actions. Nothing happens when the pointer is clicked on a disabled object.
B, B	Double-click	When the pointer is over an active object, a double-click initiates various actions. For example, edit an inspection.
C	Right-click	Display a context-sensitive menu when you click on an enabled object. The context-sensitive menu often contains functions that are also available in a menu bar or other screens. For example, add a point to a polygon.
B + A	Drag (hold the left button while moving your finger on the glide pad)	Examples: move a selected Region of Interest (ROI) around an image or move an inspection in a Tree View to change the order of execution.
D (<i>Biometric login device</i> (on page 36))	Log in or out of the software.	User is logged in or out.

Mechanical keyboard (MKB)

The system supports the temporary connection of a conventional mechanical keyboard using one of the available USB ports. This keyboard will mostly be used for system level tasks such as BIOS configuration, Network configuration, and System level setup.



The keyboard:

- Is primarily used by Pressco Field Service Engineers
- Is stored inside the Vision PC chassis
- Requires a stable location when in use

USB Port

The USB port on the FHCP system is located on the left side of the user interface. A protective cover can be removed when you use the USB port, and replaced when you are finished. See the drawing with the location of the USB port: **Navigation Components** (on page 33).

Use the USB port when you are:

- Importing or Exporting Part Programs from another system How to Create, Copy, or Import a Part Program
- Exporting user accounts
- Importing user accounts
- Creating a Support Package
- Using the **Mechanical keyboard** (see "**Mechanical keyboard (MKB)**" on page 35)
- Saving images, especially to send with a support package (How to Save Images)

Biometric login device

The Biometric Identification login device is used to log in and out of the Intellispec system. This device is optional and must be purchased with the system.



To log in with this device, press your finger to the device. The following are conditions for use:

- You must use the same finger as initially set up by your administrator
- If you do not know how your account was set up (or which finger you used), contact your administrator
- If, after three tries, the Intellispec does not recognize your finger print, you must log in using the on screen keyboard (OSK)

Chapter 7

Part Changeover Adjustment

When changing parts to inspect, you only need to change the part program (if you have a part program already set up for the newly inspected part type). This will load the proper inspections, lighting, as well as proper guide rail settings (as long as these were previously set).

Part Changeover

When you change your production line from one part type to another, you can quickly change the part program.



Important

FHCP 3X EZ systems may require hardware adjustments during part changeover. Refer to **Camera Height Adjustment** (on page 38) and **Guide Rail Adjustment** (on page 39)

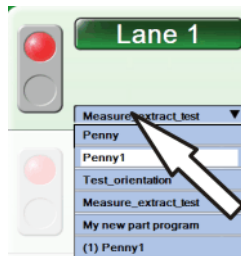
❖ *Note: Some menu items are only available to advanced level users.*

➤ **What you need:**

- User permission to Switch Part Program

➤ **To change parts:**

1. Log in.
2. Click the part drop-down menu.



3. Click the name of the new part to inspect. The new part program is loaded on the Intellispec.
4. Put the lane online to begin inspecting new parts.

Lane-specific information is contained in each Part Program. Everything you set up have previously set up is stored: camera information, lighting information, calibration information, and inspections.

Cameras (or other sensor)

All information for each camera or other sensor is contained in the Part Program.

Lighting

Each camera has different lighting settings for each part. When you load your Part Program after a Part Changeover, the lighting will be specific for that part and save any changes you make.

Calibration

Calibration setup for Part Present Delay and Reject Delay is saved for each part you will run. Part Present and Reject Delay will only need to be set up once.

Inspections

All Inspections will be contained in your Part Program. Also, parameter changes are saved for each Part Program.

Camera Height Adjustment


The camera height for the Main and Color cameras is adjusted by motors that you control through the user interface software. You only need to adjust the camera height when you set up a new part program. After you adjust the camera height, save and exit the screen, the adjustment data is saved with the current part program.

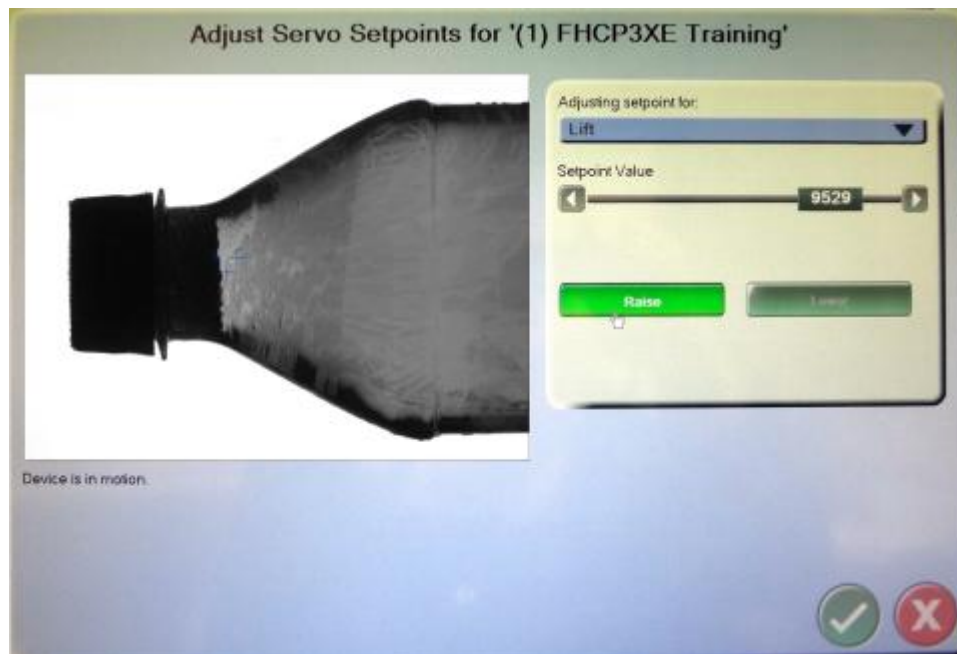
❖ *Note: you only need to adjust camera height once for the color cameras. Both cameras are on a plate and they move together. Once you save the settings for one color camera, you do not need to repeat the procedure for the other color camera. You will need to adjust height for the main camera separately.*

➤ **You will need:**

- A stopped conveyor. You need to adjust the height using a part that is not moving.
- A part that represents the part you are going to inspect and set up a part program for.

➤ **To adjust camera height:**

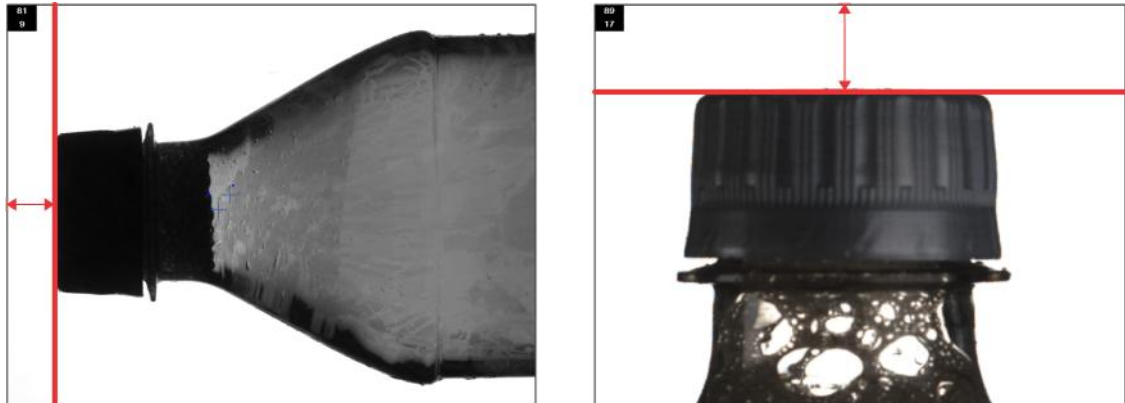
1. Make sure the system is offline.
2. Make sure the desired part program is selected.
3. Place a part in the center of the inspection tunnel.
4. From Lane Overview or Sensor Overview mode, select the Tools button  | Part Setup | Adjust Servo Setpoints.
5. If you selected the menu from Lane Overview mode, select the camera you want to adjust. This is already selected if you entered the screen from Sensor Overview mode.
6. Select "Adjust Lift" from the drop-down menu.



7. Press either the **Raise** or **Lower** button, depending which way you want to move the camera. The camera(s) will start moving inside the inspection module. You should see the lights flashing and an image on the screen.
8. Look at the image on the screen and **wait** until the part moves in the image. When the part is almost where you want it, press the **Raise** or **Lower** button again (the button you pressed in the previous step). The motor continues to run a couple seconds after you press the button.
9. Repeat steps 7 and 8 until the part image is at the desired height, as shown below.
10. If you are done adjusting the camera and guide rails, click the OK button and exit. The settings are saved with the current part program.

11. Repeat this procedure the other camera. NOTE: you only need to adjust the height once for both color cameras - they are on a plate and move together. You will adjust the main camera separately.

We recommend that the part image is approximately 100 pixels from the top of the image.



Guide Rail Adjustment

❖ *Note: Guide Rails are only installed on some systems where additional part handling control is needed.*


The **Guide Rails** (on page 40) are adjusted by a motor that you control through the user interface software. You only need to adjust the guide rails when you set up a new part program. After you adjust the guide rails, save and exit the screen, the adjustment data is saved with the current part program.

- When the system shuts down, the guide rails move to home position.
- When the system powers up, the guide rails calibrate themselves and move into the correct position for the currently selected part program.

➤ **You will need:**

- A stopped conveyor. You need to adjust the rails using a part that is not moving.
- A part that represents the part you are going to inspect and set up a part program for.

➤ **To adjust the guide rails:**

1. Make sure the system is offline.
2. Make sure the desired part program is selected.
3. Place a part in the center of the inspection tunnel.
4. From Lane Overview or Sensor Overview mode, select the Tools button  | Part Setup | Adjust Servo Setpoints.
5. If you selected the menu from Lane Overview mode, select a sensor. This is already selected if you entered the screen from Sensor Overview mode.
6. Select "Adjust Rails" from the drop-down menu.
7. Press either the **Narrower** or **Wider** button, depending which way you want to move the rails. The rails will start moving inside the inspection module.
8. Look at the bottle and rails and wait for the rails to move. When the rails are almost where you want them, press the **Narrower** or **Wider** button again (the button you pressed in the previous step). The motor continues to run a couple seconds after you press the button.
9. Repeat steps 7 and 8 until the rails are in the desired position for your part. Make sure that the bottles have enough room to pass through the rails without touching them.
10. If you are done adjusting the camera and guide rails, click the OK button and exit. The settings are saved with the current part program.

Guide Rails

The inspection tunnel contains a set of guide rails that ensure bottles are presented uniformly to the cameras. Rail width is controlled by a stepper motor system. The width adjusts automatically when changing part programs, and manually through the user interface. See **Guide Rail Adjustment** (on page 39).

The red **Emergency E-Stop Button** (on page 32) stops these rails in case you need to stop them immediately. The green button on the computer panel restores power to the guide rail motor.



Chapter 8

FHCP 3X Hardware

This section includes information and wiring diagrams for the inspection module and related components for the FHCP 3X module.

Power On/ Off

Power on

➤ **Before turning on the power:**

Make sure the following are ON. Normally you can leave these ON all the time:

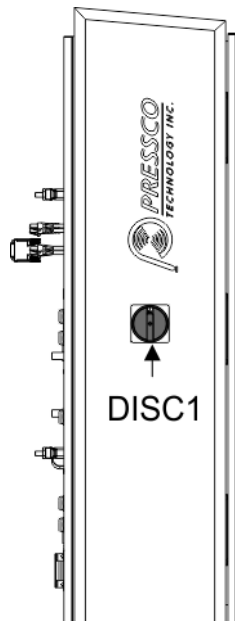
- Power switch on the UPS, located inside the **Intellispec Computer Enclosure (backpack)** (see "**Intellispec Computer Enclosure (backpack)**" on page 52)
- Circuit breakers CB1 and CB2, located inside the inspection module on TB1

➤ **To turn on the power to the Intellispec FHCP 3X system:**

1. Turn on the rotary disconnect switch (DISC 1, shown in the illustration below). The system will start, and the Intellispec software will load.
2. Verify the red E-stop button on the front panel is pulled out, and not in E-stop mode. **Emergency E-Stop Button** (on page 32)
3. Press the green reset button on the front panel until the light on the button turns green. This will ensure the guide rail and camera motors are enabled for motion. The guide rails will calibrate and move into the correct position for the currently selected part program.
4. Log in to begin using the system.

Power off

To turn the power off to the Intellispec FHCP 3X system, turn off the main power switch (DISC 1).



When you shut down the system:

- The system, including the computer, shuts down,
- The UPS shuts down

❖ *Note: there is a selectable UPS shutdown time that must expire before the computer and UPS shut down (30 seconds default) System Alarms Description*

- The software shuts down, and
- The guide rails within the inspection system go to a home position.



Warning - When you shut down power using this switch, there will still be voltage present on the UPS inside the unit until it discharges. The **interlock switch** (see "**Interlock for computer door**" on page 42) will be energized to prevent access to the inside of the unit.



Important - If you want to **restart** the system, turn off the power, let the software and components completely shut down, and leave the power off for about 40 seconds before turning it back on. This allows the electronic components to correctly reset.

Interlock for computer door

At the top of the computer backpack door is an electrical interlock that prevents the door from opening. The only way to open the door is to use a key in the defeater. This allows only **AUTHORIZED SERVICE PERSONNEL** to access the inside of the computer while the power to the FHCP 3X unit is still applied. See **Accessing the internal components** (on page 42).



Warning - The door is electrically interlocked. When lock is engaged, live voltage is present within the cabinet. To override interlock, complete a controlled **shutdown** (see "**Power On/ Off**" on page 41), or use key to override.

If the door is open, you can push it shut and the interlock switch will engage. It is spring-loaded.

Accessing the internal components

To access the components inside of the FHCP 3X computer, you will need two keys, which are supplied with the system. The standard key [item 1] opens most of the locks on the system, and the interlock key [item 2] opens the **Interlock for computer door** (on page 42).



Warning - Even when the system is powered down, there is still voltage present at the UPS. Only **AUTHORIZED PERSONNEL** should attempt to open the system. We recommend that only AUTHORIZED PERSONNEL have access to the keys.

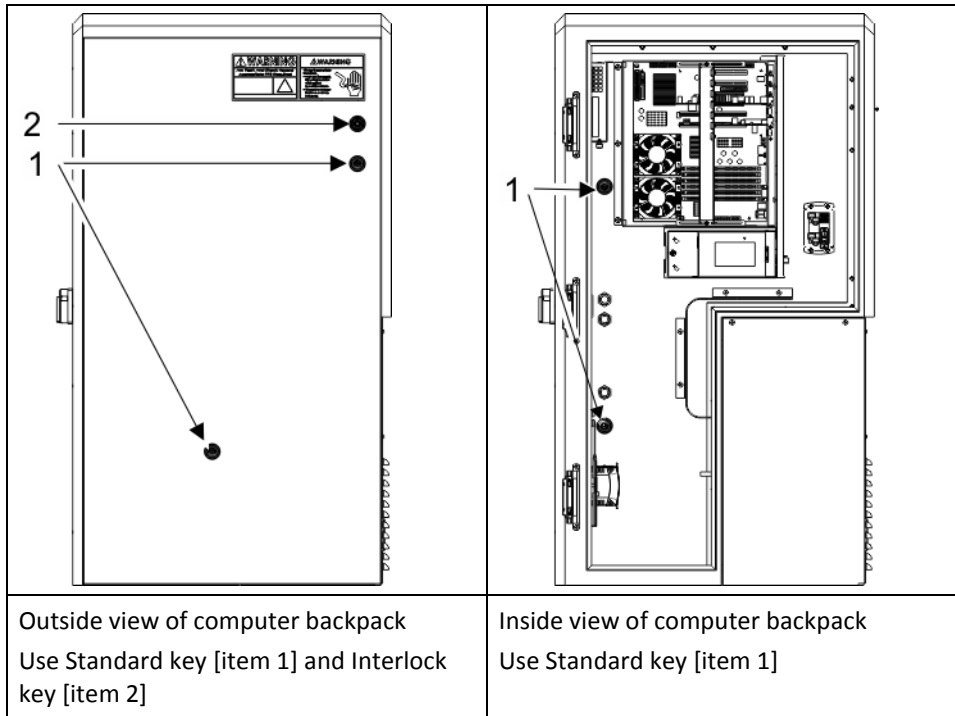
1 - Standard key



2 - Interlock key



To access the inspection module cameras and other internal components, you will need to unlock the locks shown in the Inside view with key [item 1]. The computer backpack will swing open, providing access to the inspection module components.



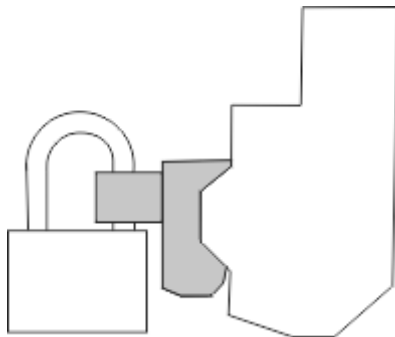
Lockout Instructions



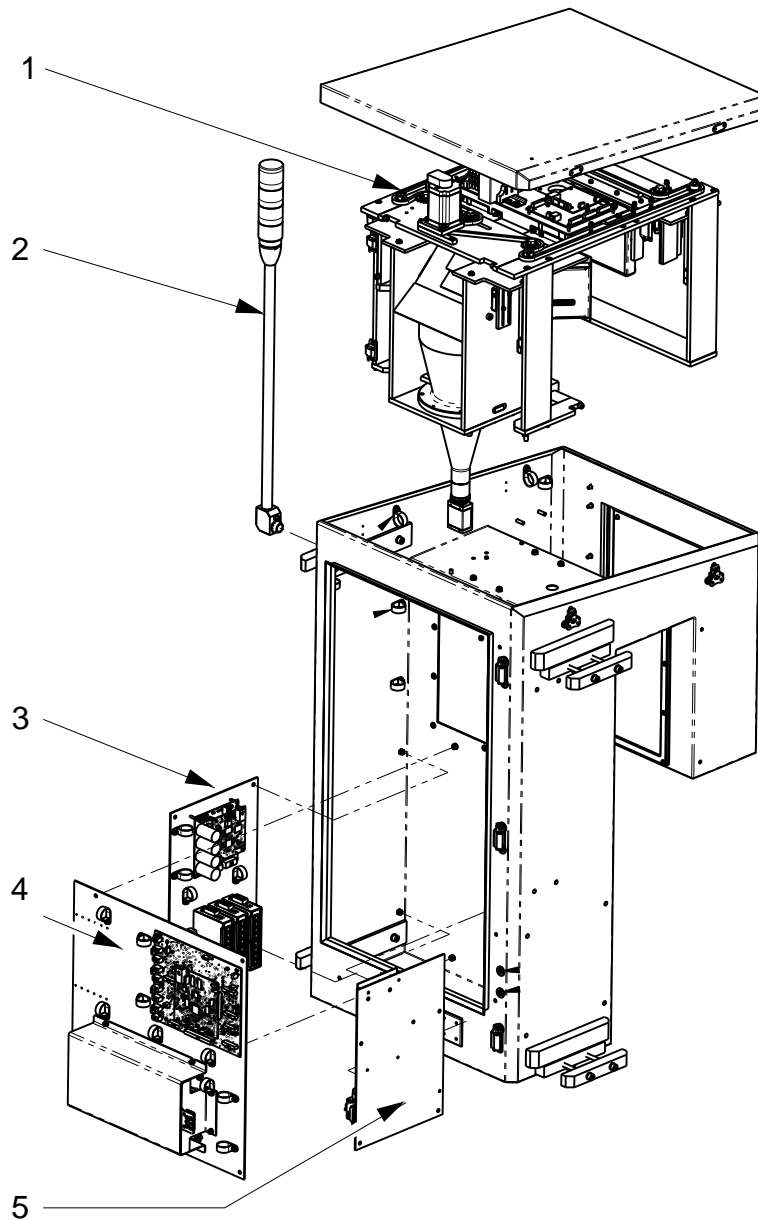
Warning - Potential hazardous voltage from the UPS. Use caution when servicing.

➤ **Before servicing any electrical or mechanical components inside the FHCP 3X system:**

1. Power off the system using power switch DISC 1. **Power On/ Off** (on page 41)
2. Carefully open the FHCP 3X computer and inspection module doors. **Accessing the internal components** (on page 42)
3. Locate the circuit breaker lockout clips. These are shipped with the system, and should be stored inside the unit.
4. Install the circuit breaker lockout clips, as shown below, and attach a lock. This will ensure that no incoming power (if applicable) will reach the unit.



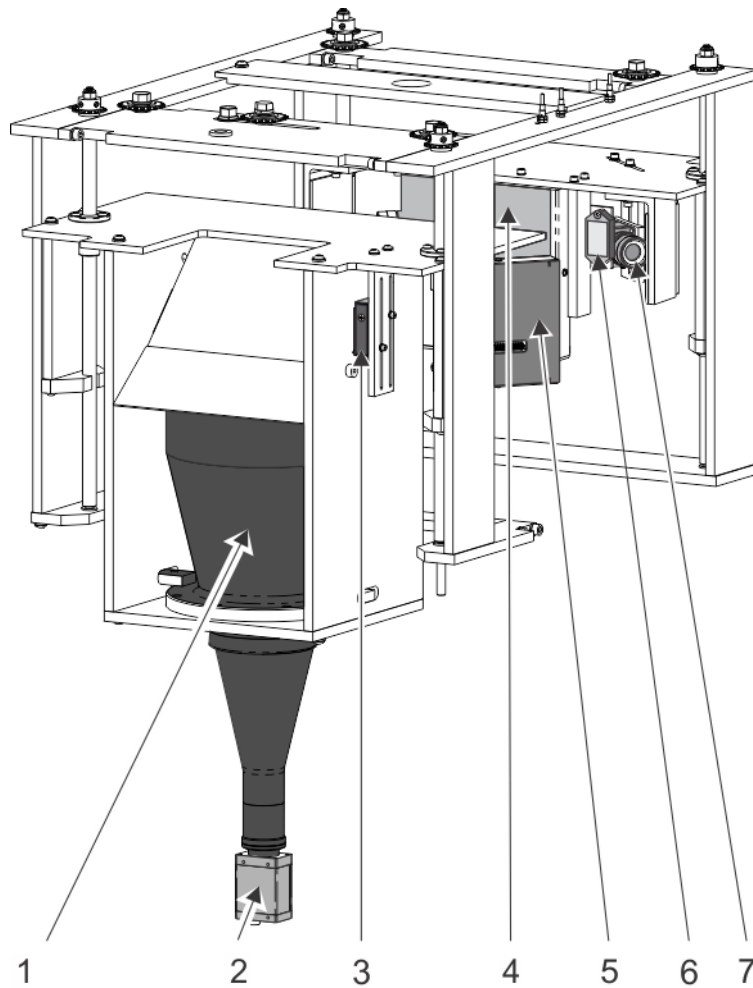
FHCP Inspection Module Internal Hardware Overview



- 1) **FHCP 3X Camera and Light sub-assembly** (on page 45)
- 2) Light tree
- 3) **Sub-assembly left panel** (on page 46)
- 4) **Sub-assembly front panel** (see "**Sub-assembly front panel (with power supplies)**") on page 47)
- 5) **Sub-assembly right panel** (on page 48)

FHCP 3X Camera and Light sub-assembly

The following illustration shows some internal components of the module.



❖ *Note: your system may be configured with one, two, or three cameras*

1 - Telecentric lens

2 - One High Resolution black and white camera, 1,360 x 1024 pixels, for fill height inspection

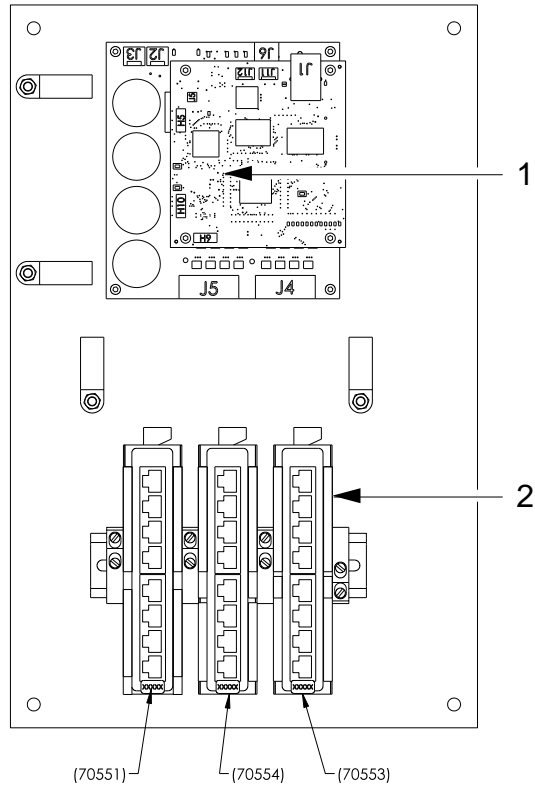
3 - Part Detect Sensor

4 and 5 - Three solid-state lighting modules with programmable multiple zone and directional control.
(one is not seen in this view)

6 - Part Detect Reflector

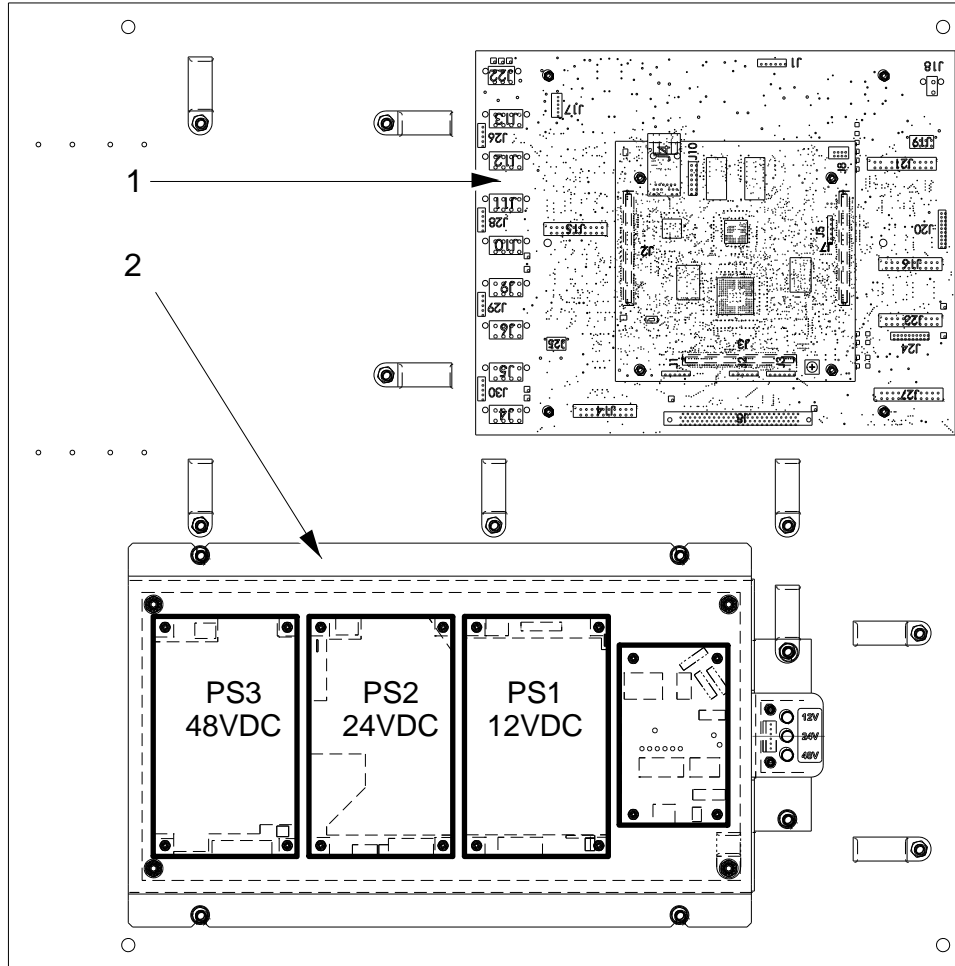
7 - Two Standard Resolution color cameras, 640 x 480 pixels, for cap inspection (one is not seen in this view)

Sub-assembly left panel



- 1) light control driver board
- 2) TB5 ethernet switches for PDN and cameras

Sub-assembly front panel (with power supplies)

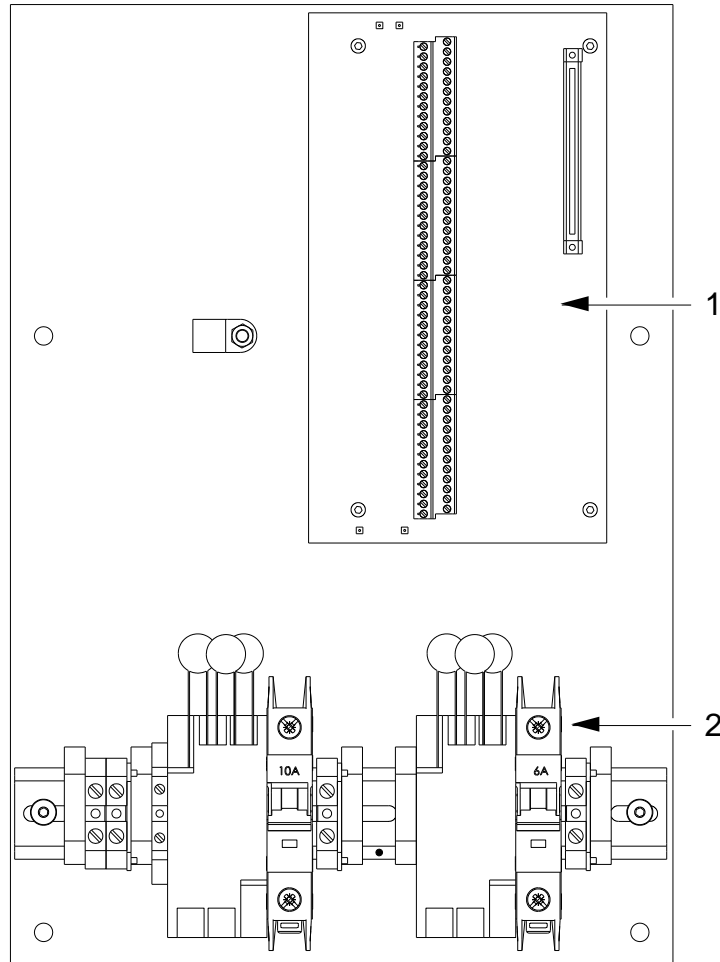


1) 8-channel part tracker board

2) Power supplies:

- PS1 – 12VDC – power supply to all electronics – Cameras, Part Tracker, Light Controller, Gateway, Ethernet switches
- PS2 – 24VDC – power supply to sensors and I/O – sensors, encoder, rejecter, Extended I/O, Embedded I/O
- PS3 – 48VDC – power supply to light arrays

Sub-assembly right panel



1) *Extended I/O board* (on page 95)

2) Sub-assembly TB1

Inspection Module Adjustments

Inspection module adjustments include the camera position, aperture, and camera focus.

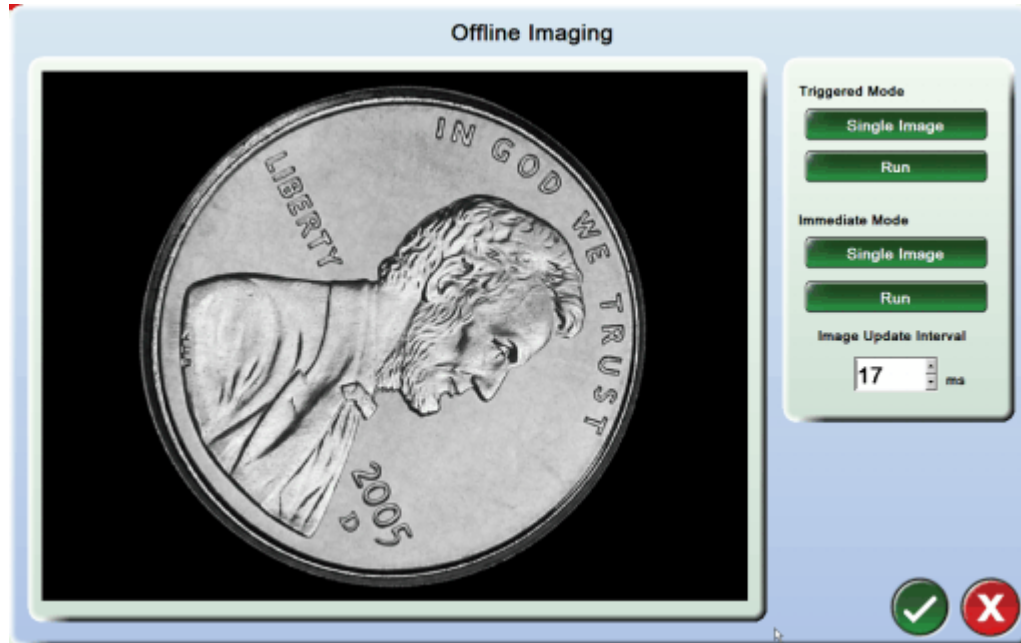
The focus adjustment controls the clarity of the image; the aperture adjustment controls the amount of light admitted by the shutter. Normally the inspection modules do not require further adjustment after initial system setup. Circumstances that might require additional adjustments are camera replacement, strobe replacement, or a substantial change in part size or color.



Danger - The inspection modules are mounted near moving machinery. Use extreme caution to avoid contact with moving machinery when servicing inspection modules as serious personal injury could result. Ensure machinery is in an emergency stop state before servicing inspection modules.

Observe the Part Image


When adjusting the focus, aperture, or height for any inspection module, it is helpful to use Offline Imaging so that you can immediately see the effect of an adjustment on the image quality.



➤ To use Run in Immediate Mode:

1. Make sure the lane is offline.



2. Select a sensor , then right-click the button.
3. Select **Offline Imaging** from the menu.
4. Click the **Run** button under Immediate Mode, then run a part through the inspection module.

While the system is in this mode, you will be able to make adjustments to focus, aperture, or camera height.

Lighting Adjustments

To adjust the lighting, use the software adjustments.

To see the image on the screen:

Observe the Part Image (on page 49)

Adjust lighting through either:

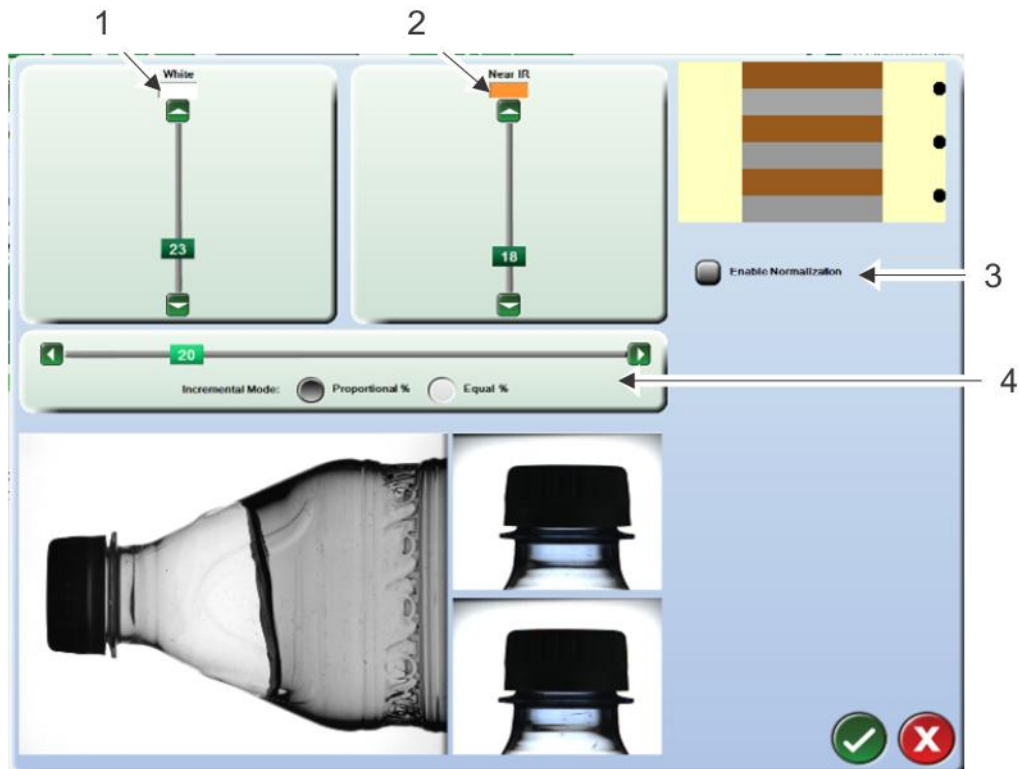
- Basic adjust lighting, or
- Advanced adjust lighting

Most often, you will use Basic Adjust Lighting.

Lighting for FHCP 3X Systems

Typically, Basic Adjust Lighting is enough to adjust the lighting for FHCP 3X systems. If there is a need for fine tuning color and / or certain lighting zones, then use Advanced Adjust Lighting.

Basic Adjust Lighting screen



The Fill Height and both Cap cameras use white and Near infrared (IR) to illuminate the part.

1 - White light enhances and sharpens features. It also defines the contrast between light and dark areas. Use the slider bar to adjust lighting individually.

2 - Near IR is used to distinguish differences in the color of bottles and penetrate the dense / dark area of the upper neck. Use the slider bar to adjust lighting individually.

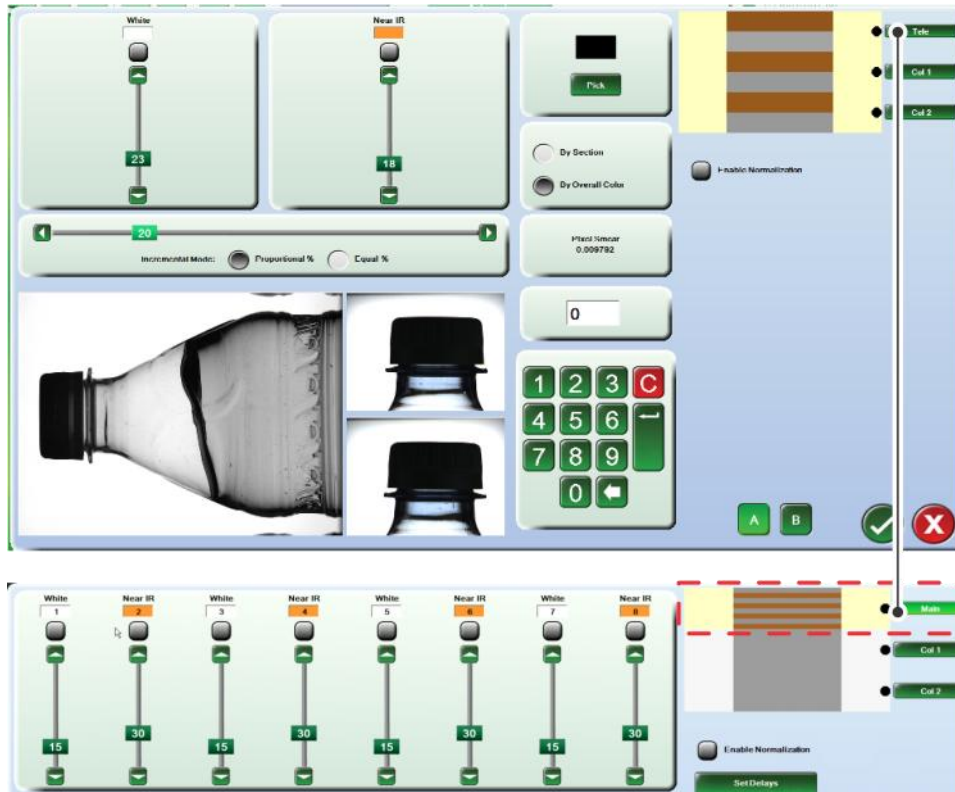
3 - Enable normalization is NOT used in FHCP applications. Leave the box un-checked

4 - Instead of using the slider bars for items 1 and 2, you can use the Proportional % mode to adjust both types of lighting at once.

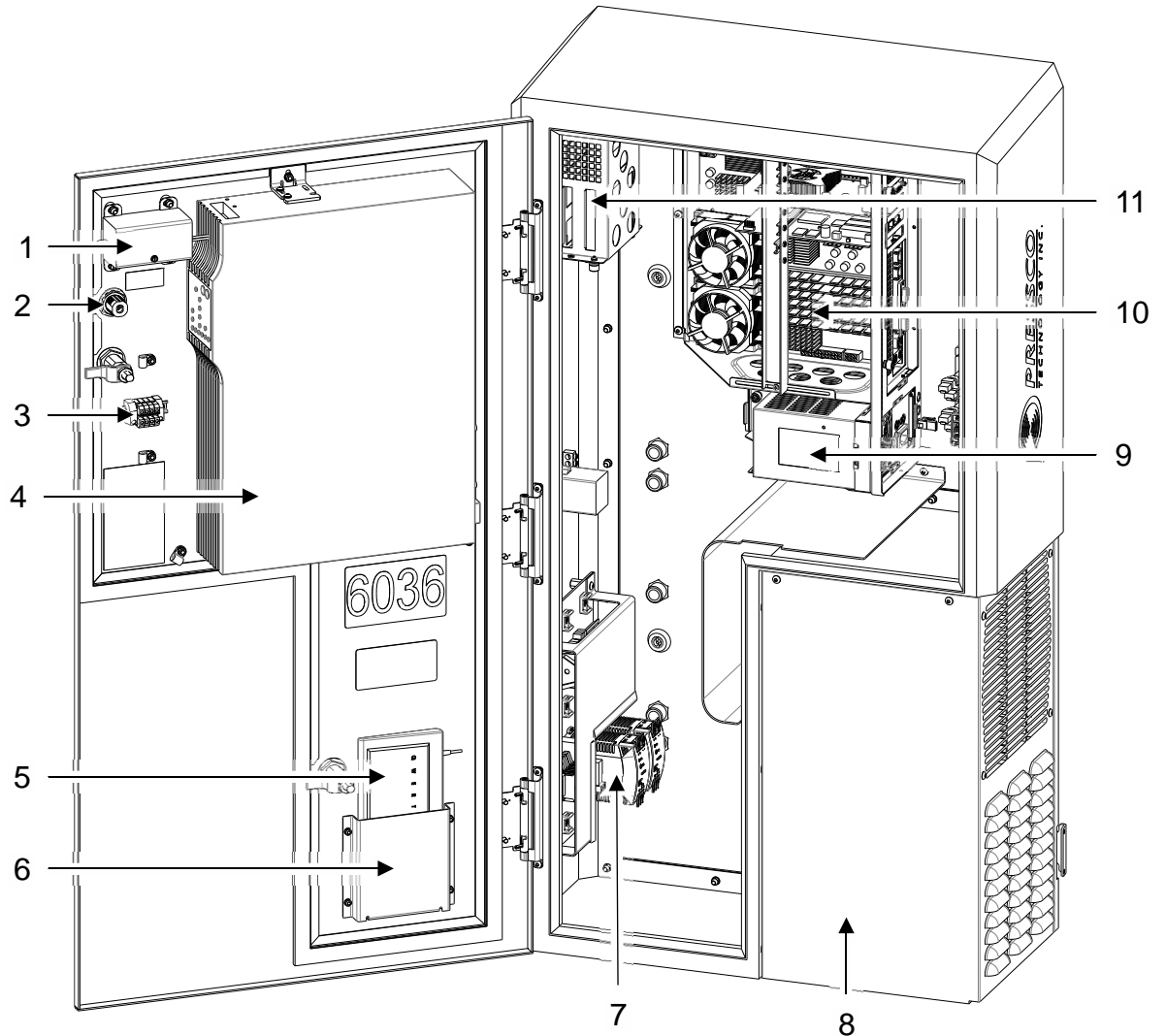
Advanced Adjust Lighting screen

Lighting adjustments depend on the part. The Cap cameras' view is front lit by the Fill camera's larger LED light array, therefore images of the cap(s) often have reflective spots that can show up in the Region of Interest and cause false rejects. When this happens, setting **Zone Delays** will lessen the contrast of the shiny spots. In those cases, use Advanced Adjust Lighting to set the delays.

Click the button for the desired camera to access the correct screen for the desired camera.



Intellispec Computer Enclosure (backpack)



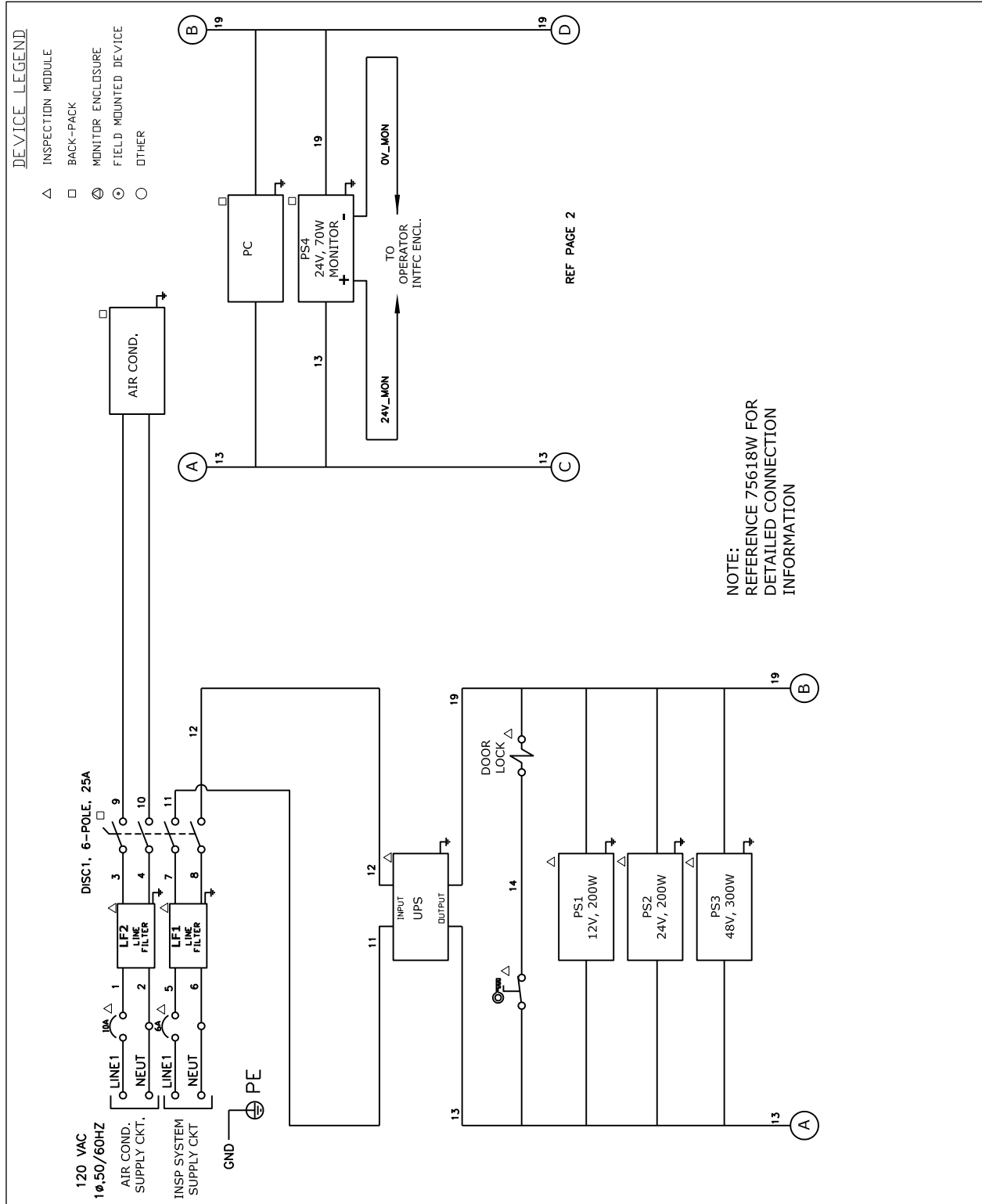
- 1 - Electrical interlock - prevents door from being opened
- 2 - Defeater switch
- 3 - Sub-assembly TB-6
- 4 - UPS
- 5 - **Mechanical keyboard** (see "**Mechanical keyboard (MKB)**" on page 35)
- 6 - Keyboard pocket
- 7 - Sub-assembly TB2/ TB3
- 8 - Air conditioner
- 9 - Computer power supply
- 10 - Computer
- 11 - Hard drives

Electrical and Wiring Diagrams for 3-camera 120V systems

The following pages contain the electrical and wiring diagrams for the FHCP3X GEN3 systems.

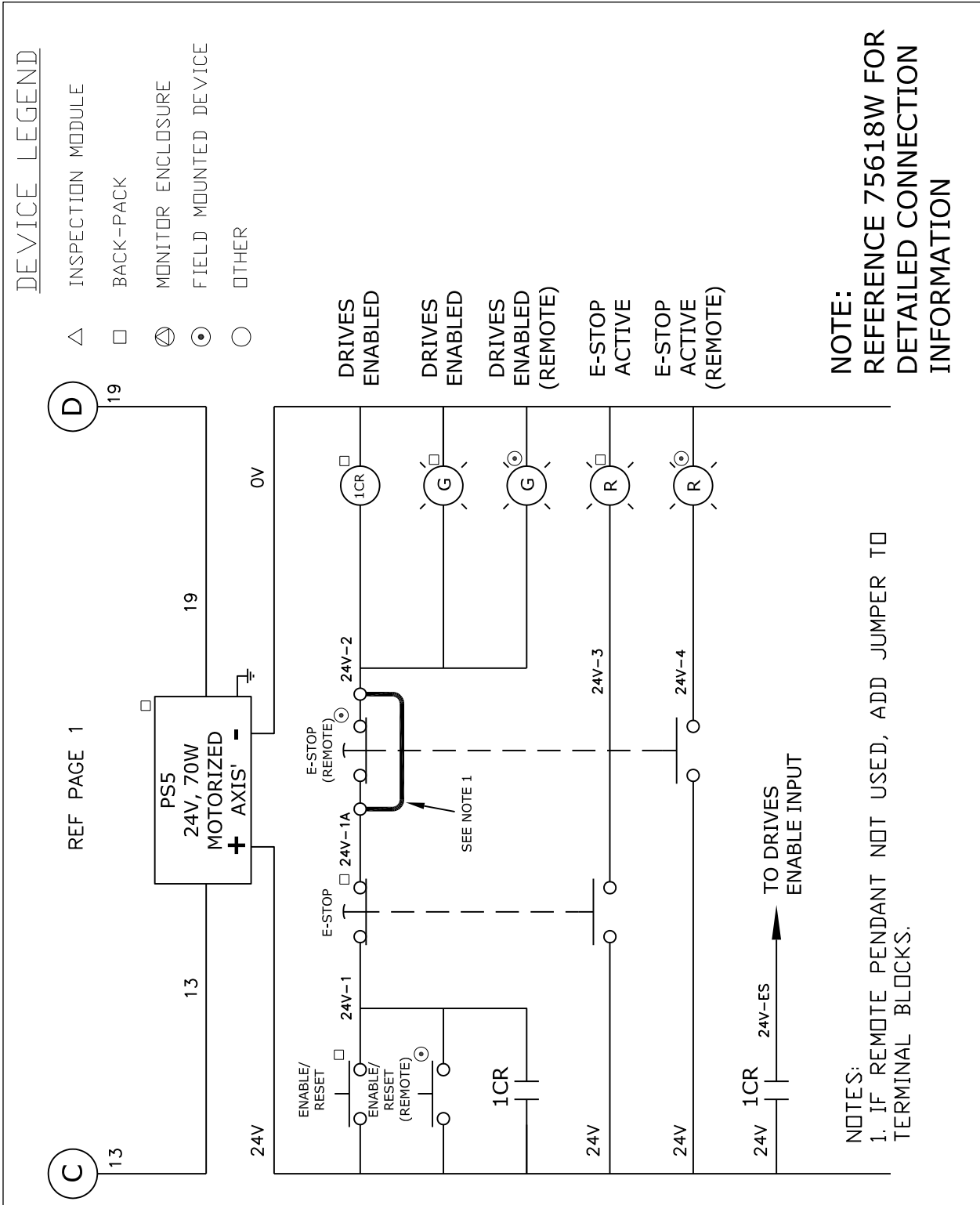
❖ Note: your system may contain one or two cameras instead of all three. In those cases, disregard the wiring to the additional cameras.

Electrical Diagram FHCP3X GEN3 120V (sheet 1)



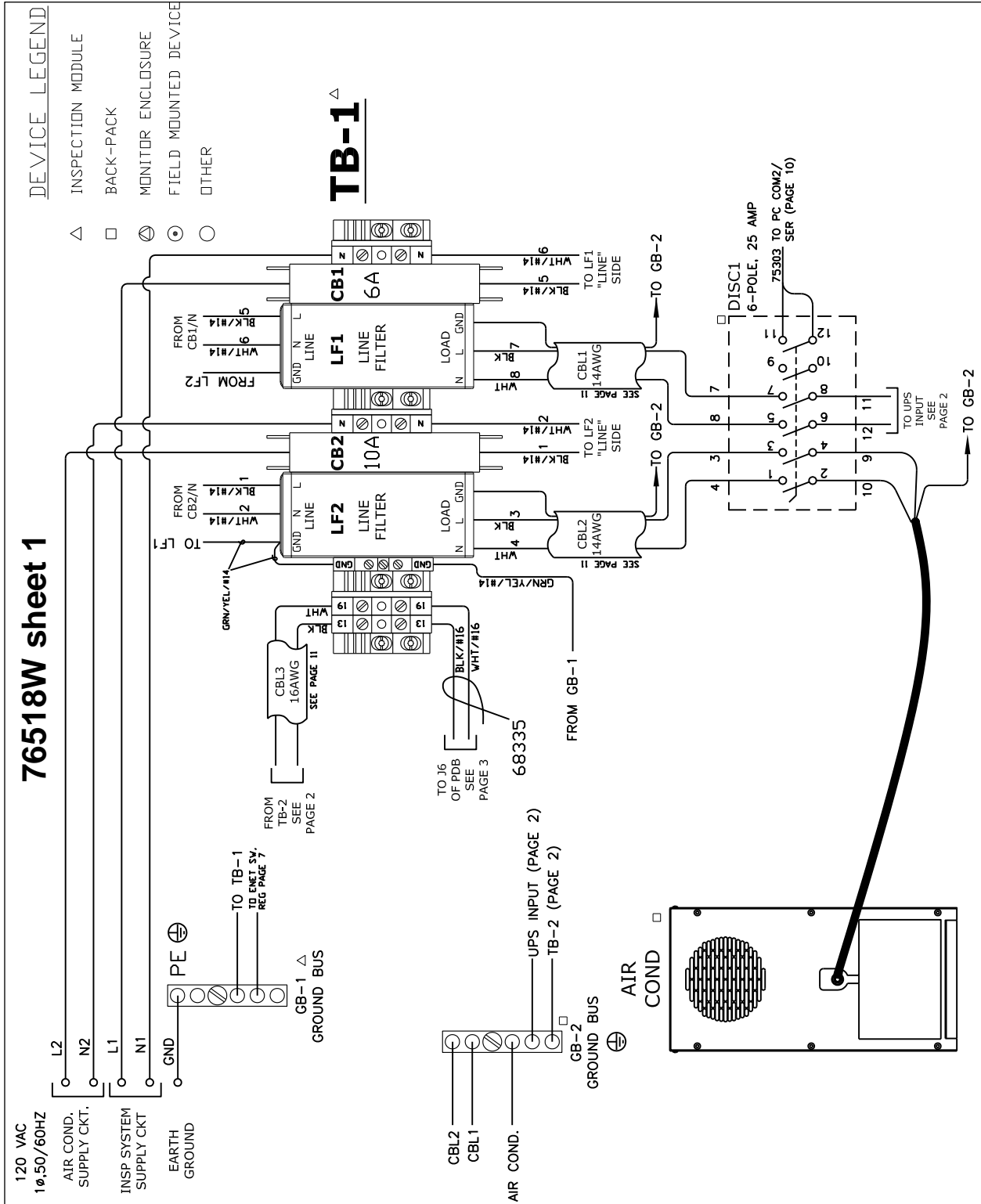
75618E sheet 1

Electrical Diagram FHCP3X GEN3 120V (sheet 2)

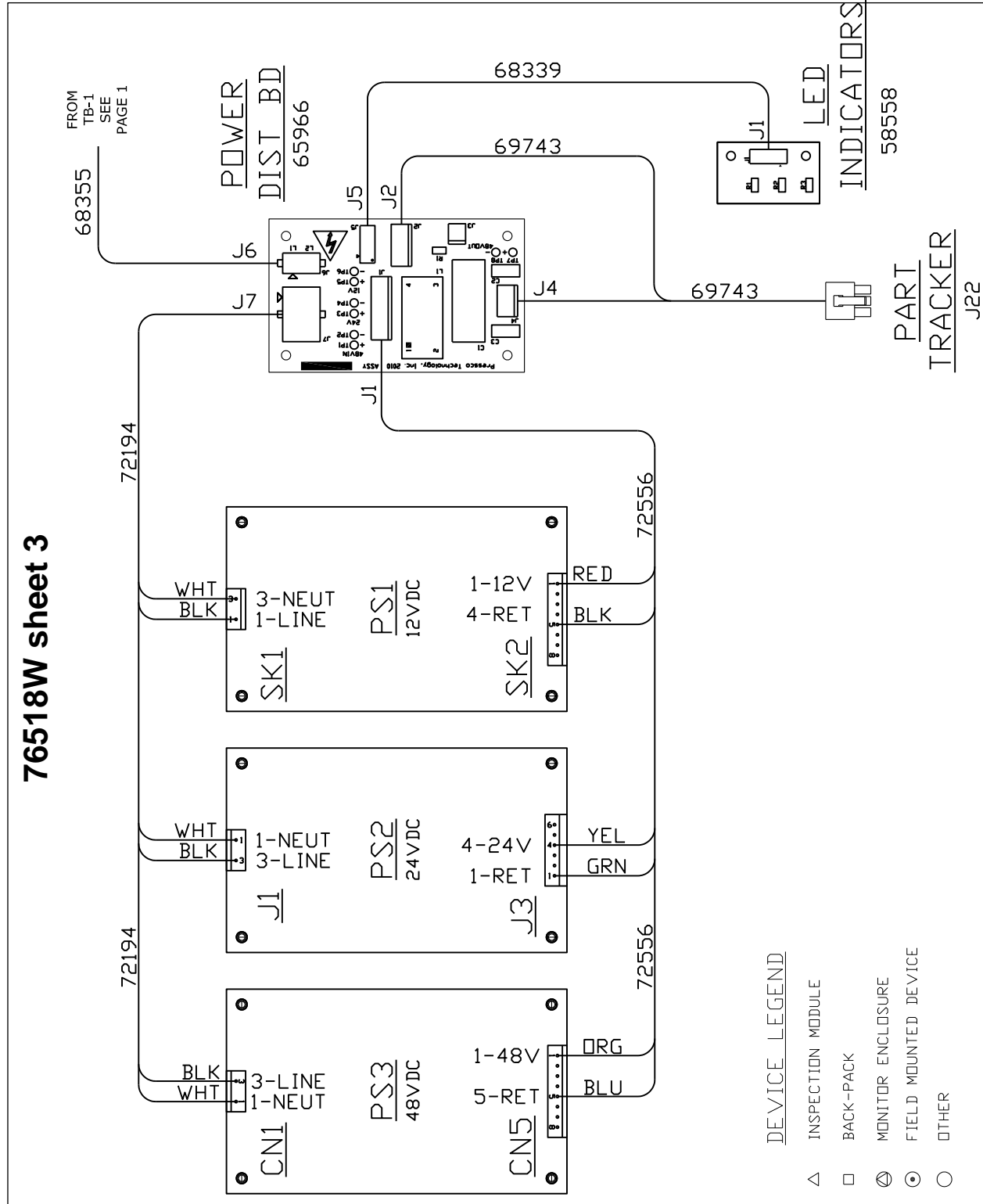


75618E sheet 2

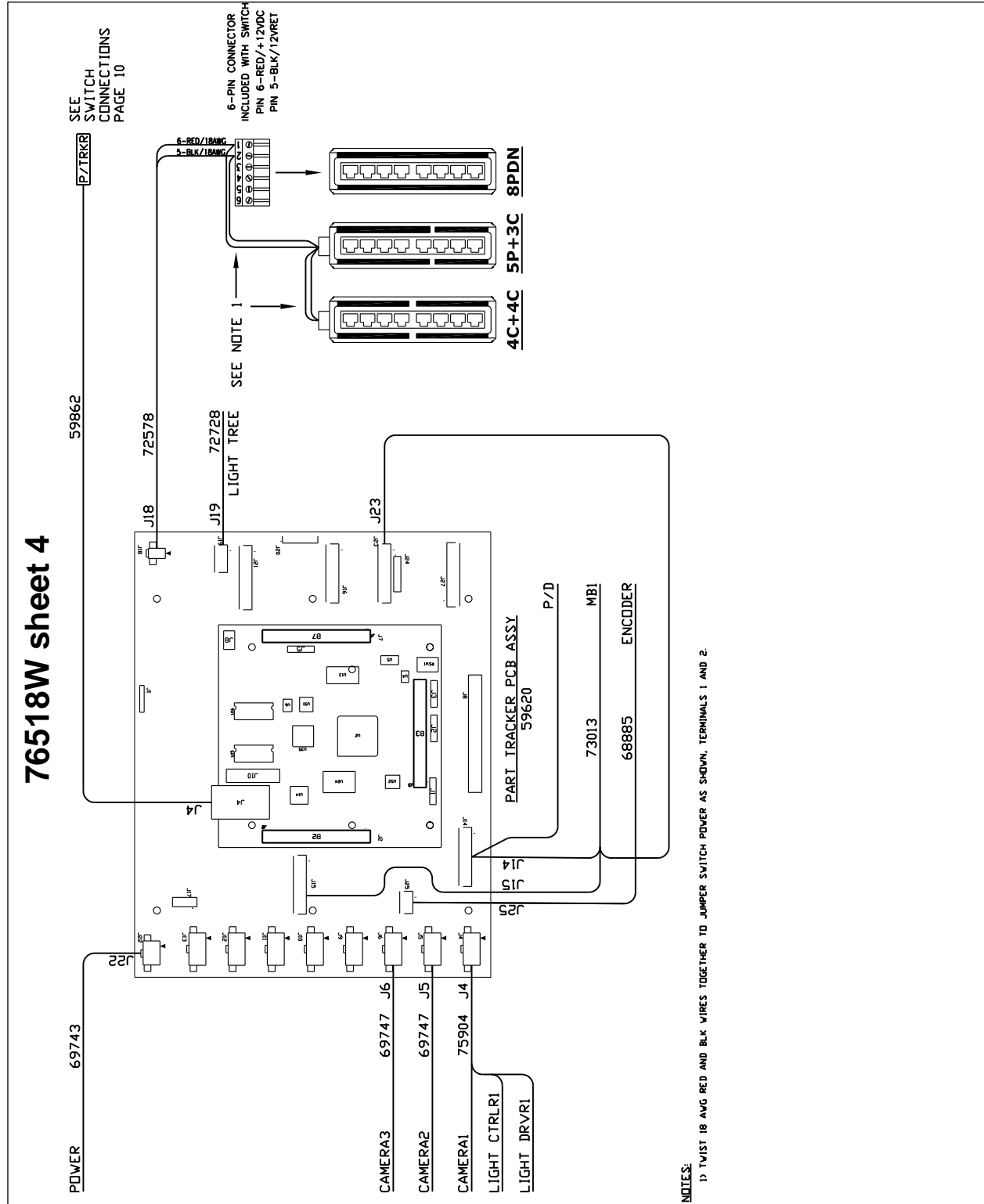
Wiring Diagram FHCP3X GEN 3 120V sheet 1 of 11



Wiring Diagram FHCP3X GEN 3 120V sheet 3 of 11

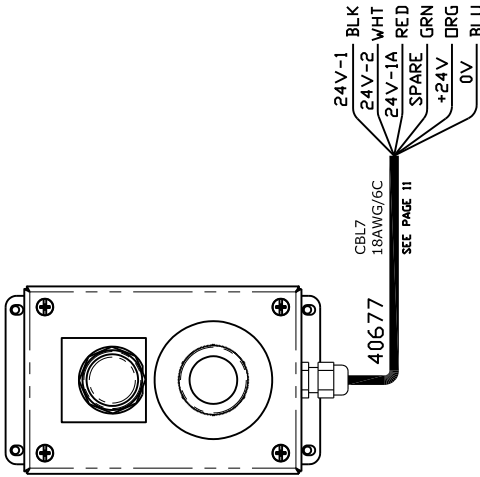
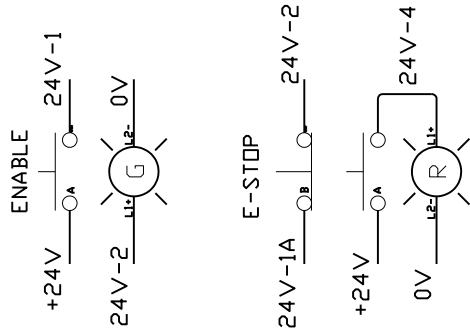


Wiring Diagram FHCP3X GEN 3 120V sheet 4 of 11

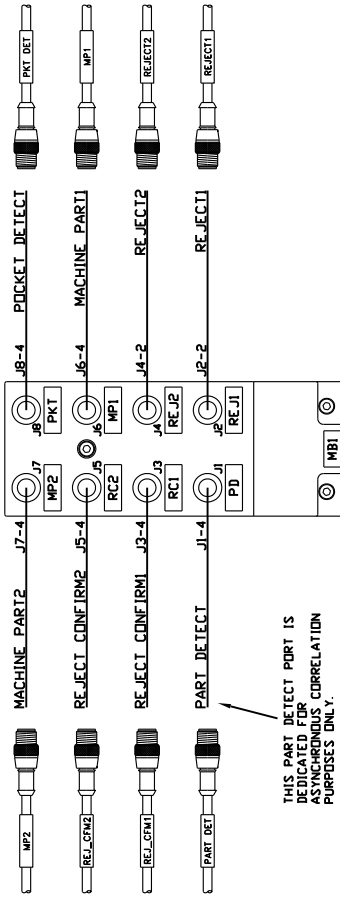


76518W sheet 7

REMOTE PENDANT (OPTIONAL)

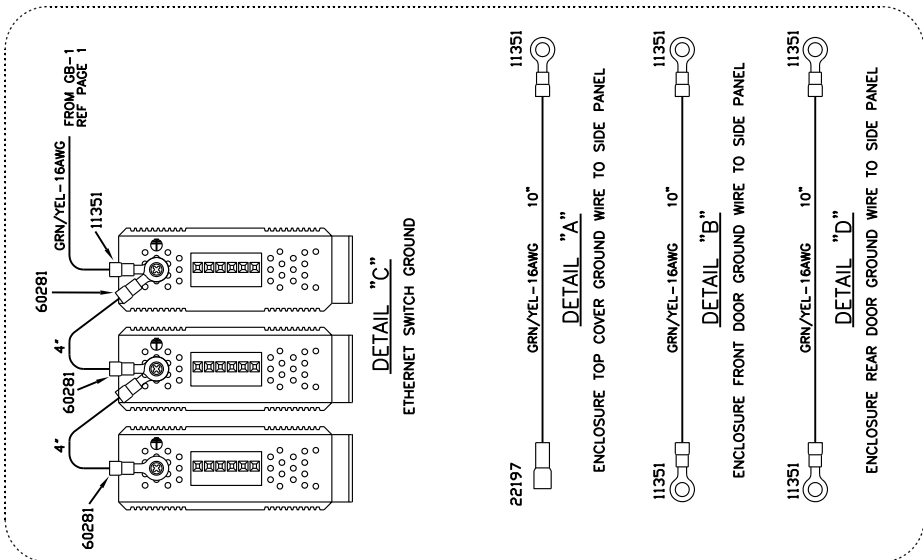


8-PORT I/O BOX-MB1
APPLY LABELS AS SHOWN



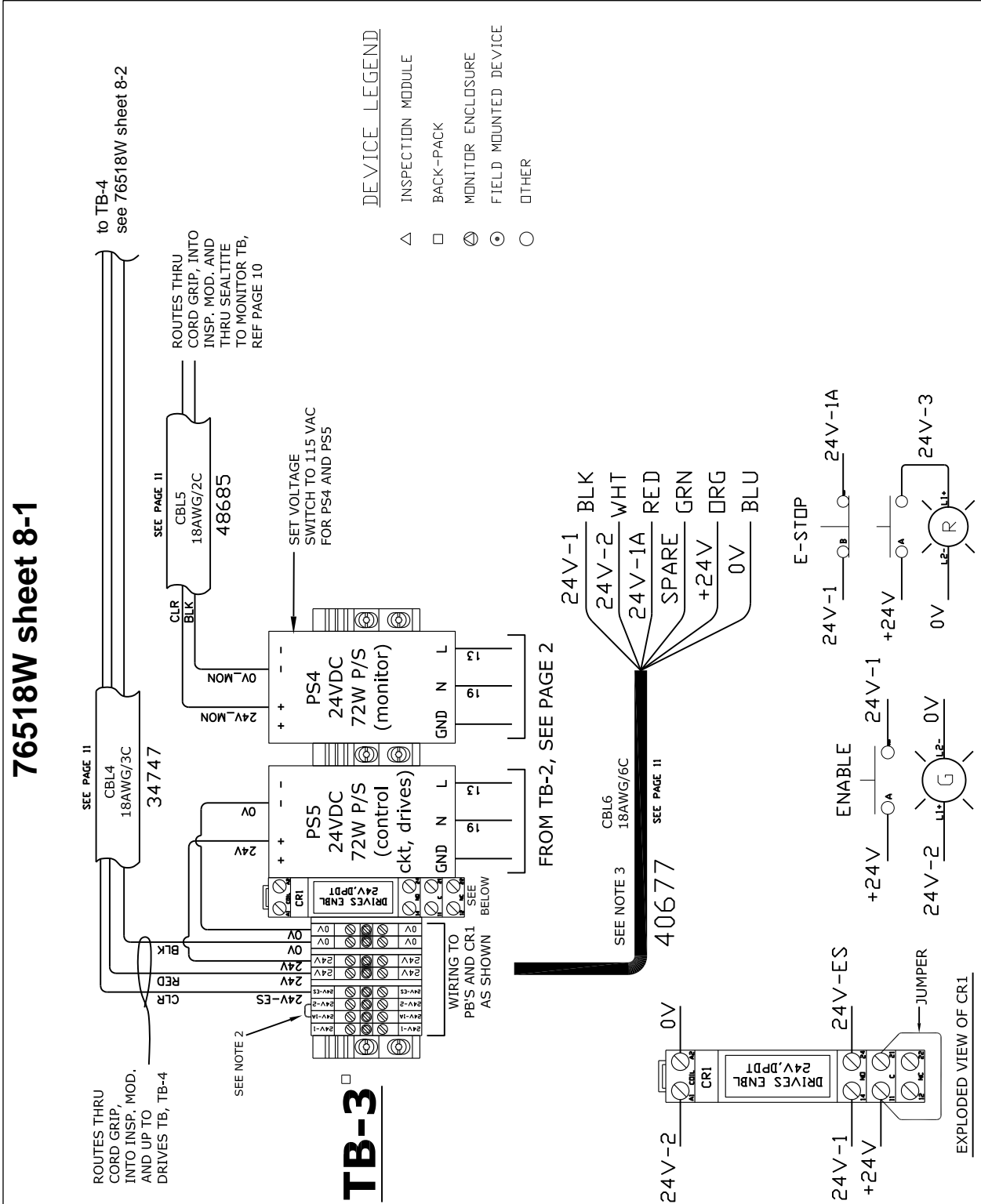
THIS PART DETECT PORT IS DEDICATED FOR ASYNCHRONOUS CORRELATION PURPOSES ONLY.

6-PIN PANEL CONNECTOR



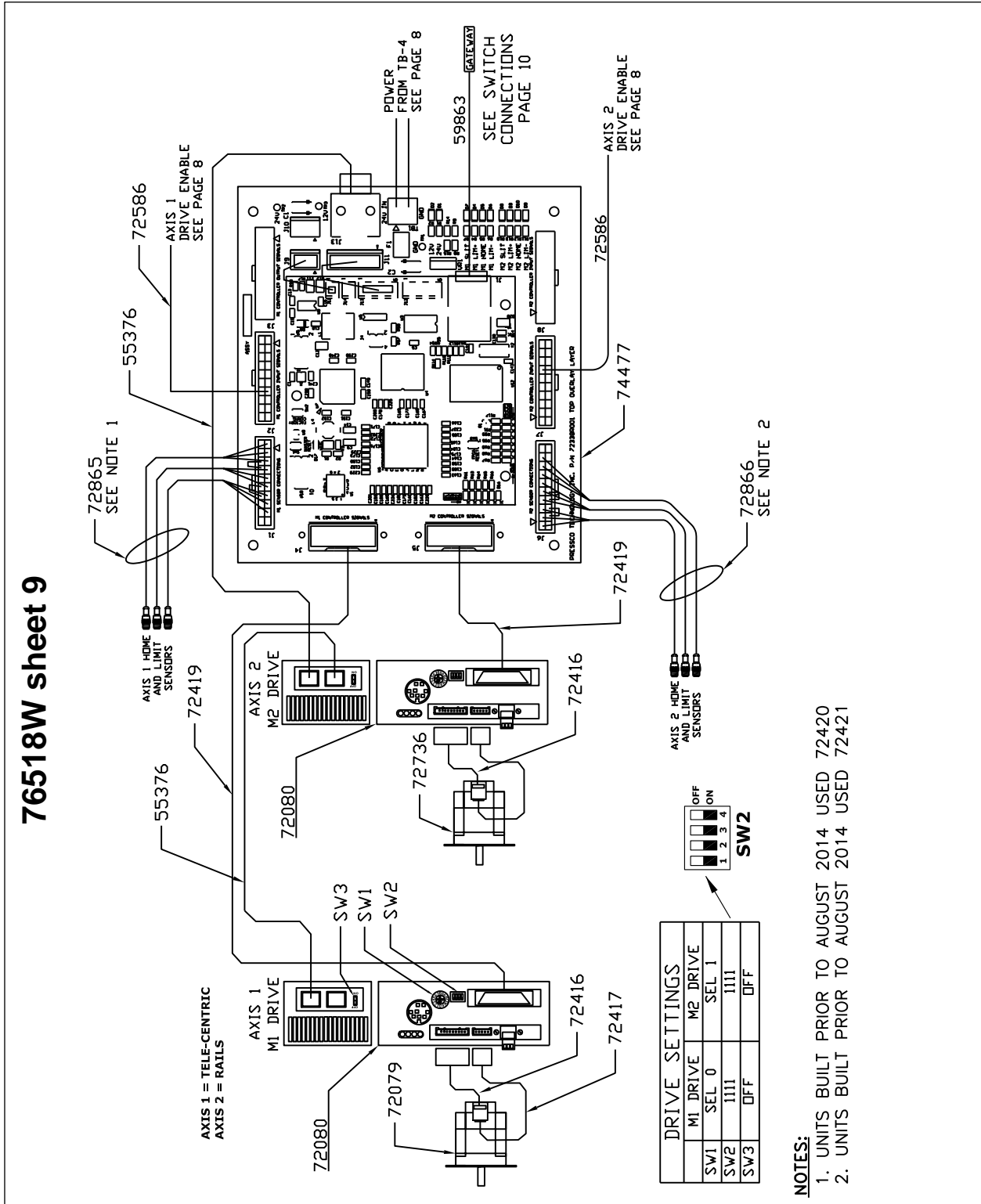
Wiring Diagram FHCP3X GEN 3 120V sheet 8 of 11 (part 1)

76518W sheet 8-1



Wiring Diagram FHCP3X GEN 3 120V sheet 9 of 11

76518W sheet 9

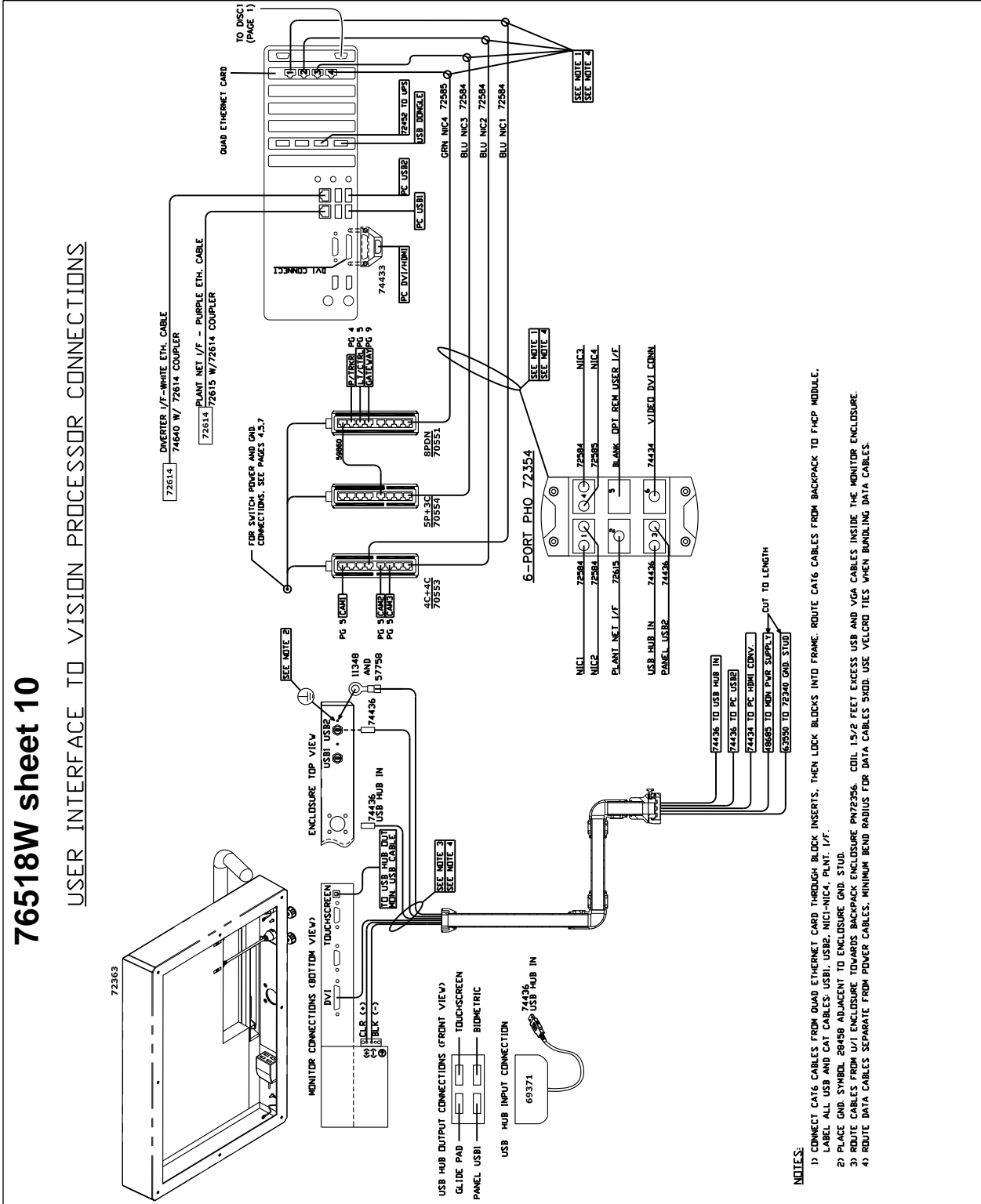


NOTES:

1. UNITS BUILT PRIOR TO AUGUST 2014 USED 72420
2. UNITS BUILT PRIOR TO AUGUST 2014 USED 72421

76518W sheet 10

USER INTERFACE TO VISION PROCESSOR CONNECTIONS

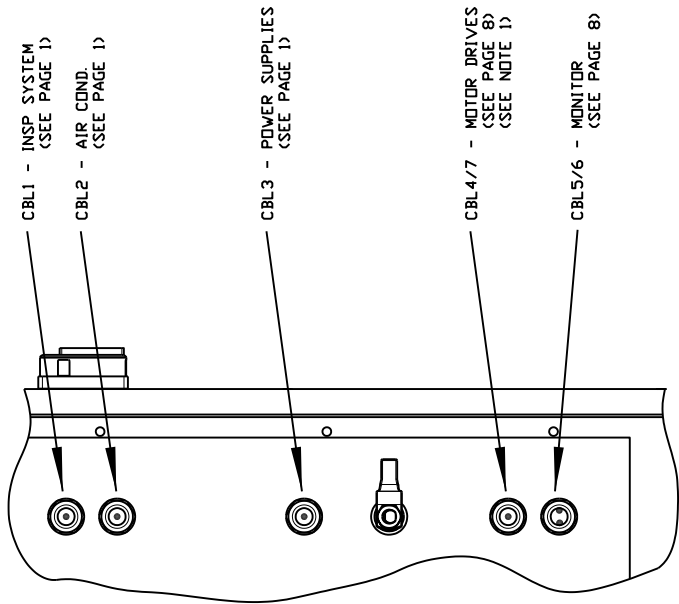
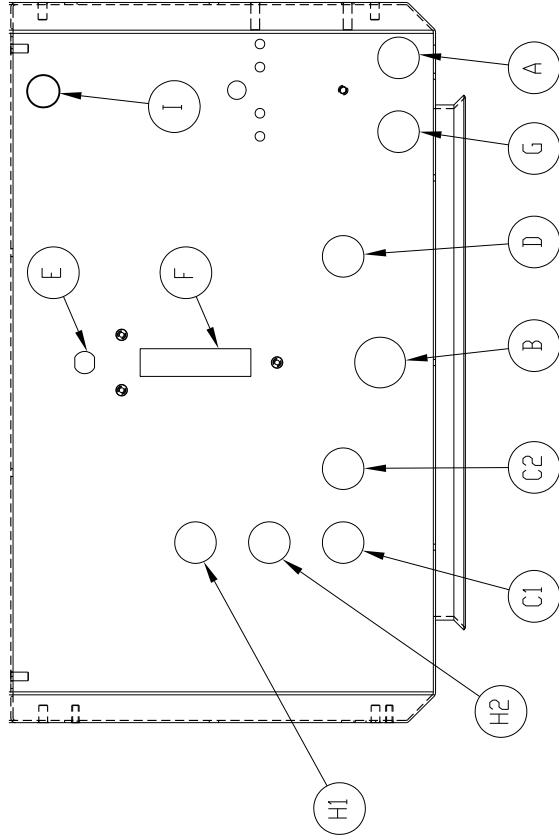


- NOTES:**
- 1) CONNECT CAT6 CABLES FROM DUAL ETHERNET CARD THROUGH BLOCK INSERTS; THEN LOCK BLOCKS INTO FRAME. ROUTE CAT6 CABLES FROM BACKPACK TO FHCP MODULE. LABEL ALL USB AND CAT CABLES: USB1, USB2, NIC1-NIC4, PLANT. I/F.
 - 2) PLACE GND. SYMBOL 28458 ADJACENT TO ENCLOSURE GND. STUD.
 - 3) ROUTE CABLES FROM I/F1 ENCLOSURE TOWARDS BACKPACK ENCLOSURE PNY2256. COIL 15/2 FEET EXCESS USB AND VGA CABLES INSIDE THE MONITOR ENCLOSURE.
 - 4) ROUTE DATA CABLES SEPARATE FROM POWER CABLES. MINIMUM BEND RADIUS FOR DATA CABLES 5XOD. USE VELCRO TIES WHEN BUNDLING DATA CABLES.

76518W sheet 11

- A = POWER IN
- B = TO MONITOR
- C1 = LIS IN (optional)
- C2 = LIS TO JAM BOX (optional)
- D = EXTENDED I/O (optional)
- E = ENCODER
- F = 8-PORT I/O ENTRY
- G = 120 VAC JAM BOX (optional)
- H1 = DDR CAMERA (optional)
- H2 = DDR PDN (optional)
- I = REMOTE PENDANT (optional)

VIEW LOOKING INSIDE INSPECTION MODULE



VIEW LOOKING AT BACK SIDE OF BACKPACK

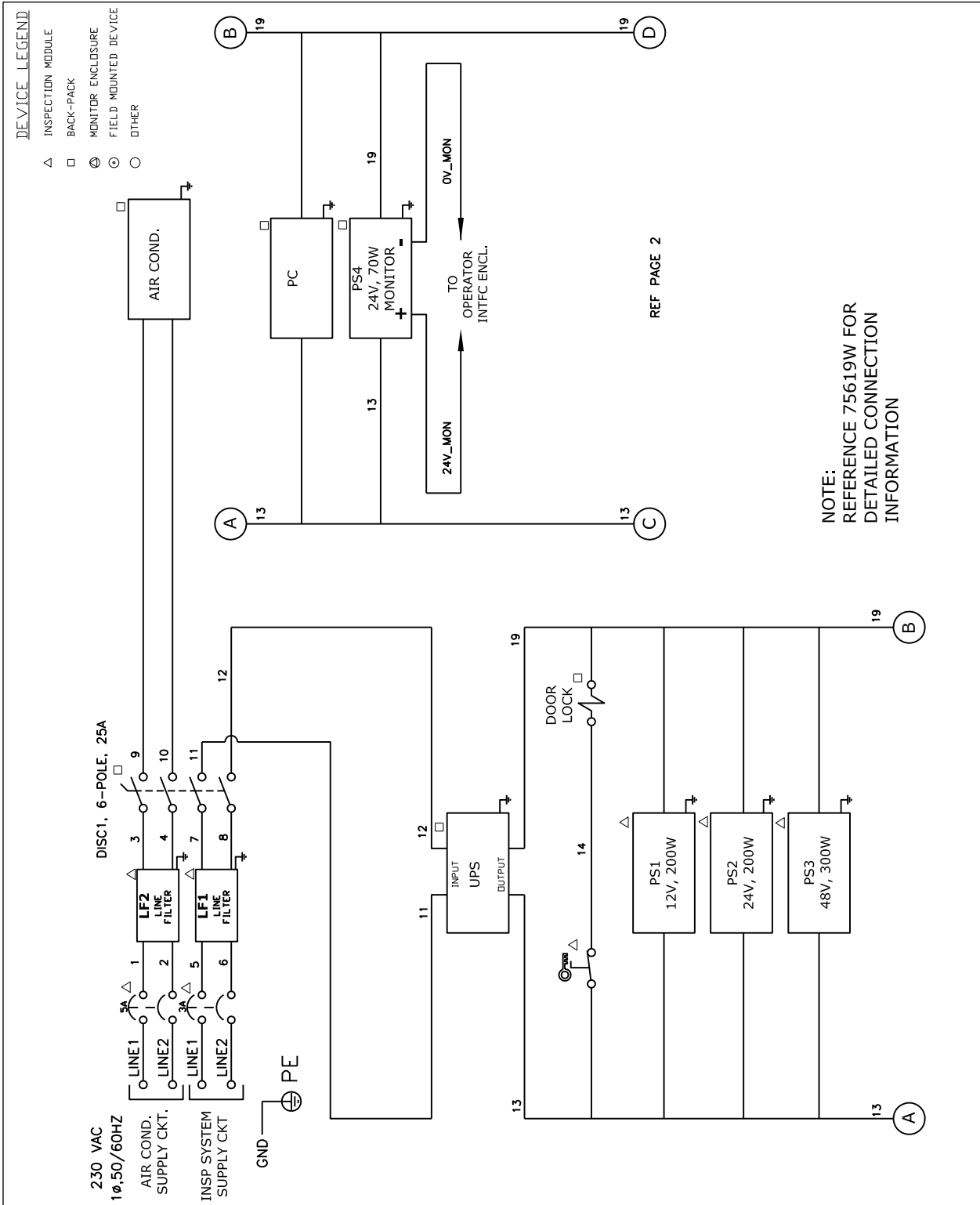
NOTES:
 1. WHEN REMOTE PENDANT IS USED, REPLACE THIS CORD GRIP WITH DUAL CORD GRIP, 72625, AND RUN BOTH CABLES 4 AND 7 THROUGH. SEE REMOTE PENDANT ON PAGE 7.

Electrical and Wiring Diagrams for 3-camera 230V systems

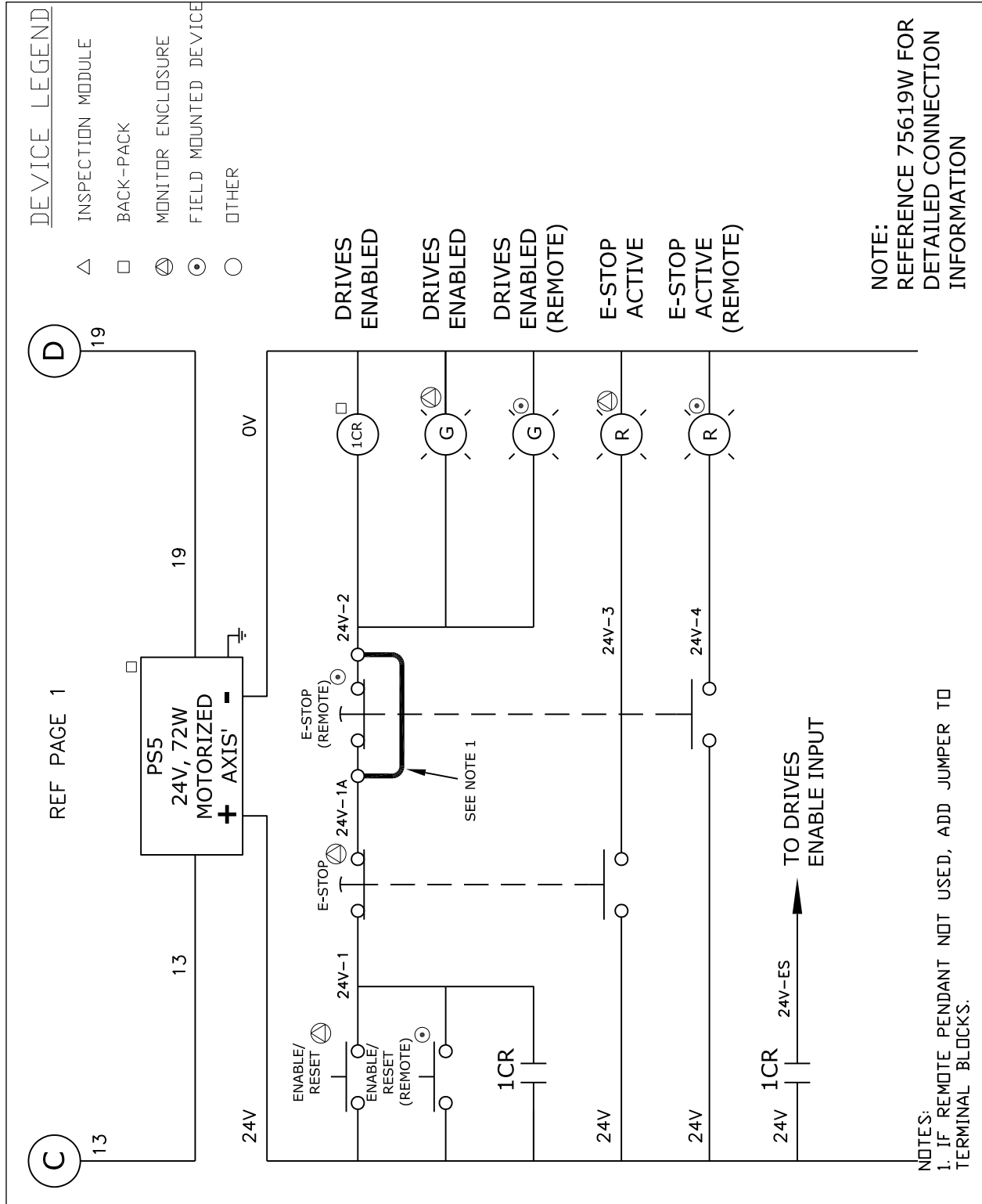
The following pages contain the electrical and wiring diagrams for the FHCP3X GEN3 systems.

❖ *Note: your system may contain one or two cameras instead of all three. In those cases, disregard the wiring to the additional cameras.*

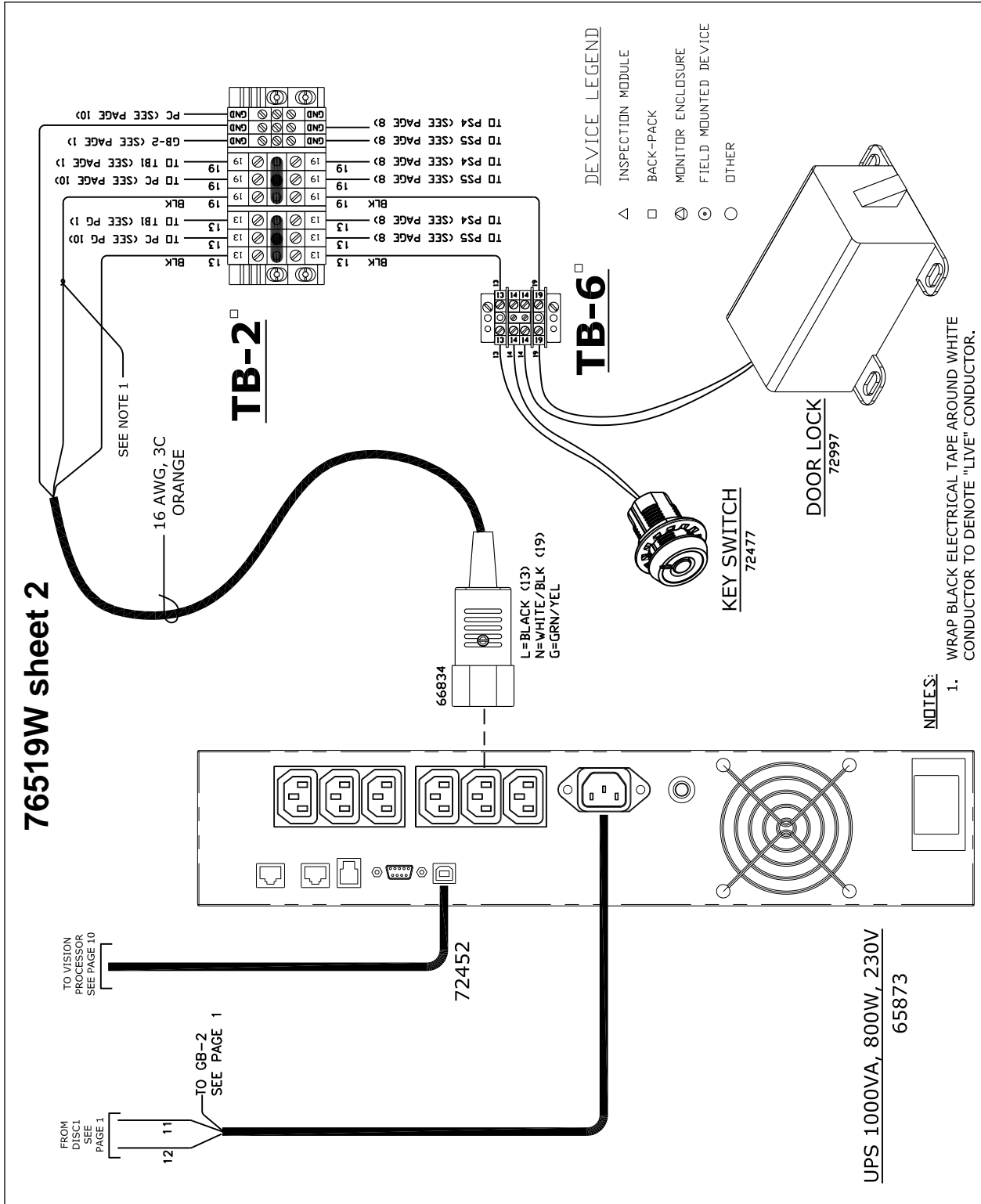
Electrical Diagram FHCP3X GEN 3 230V sheet 1 of 2



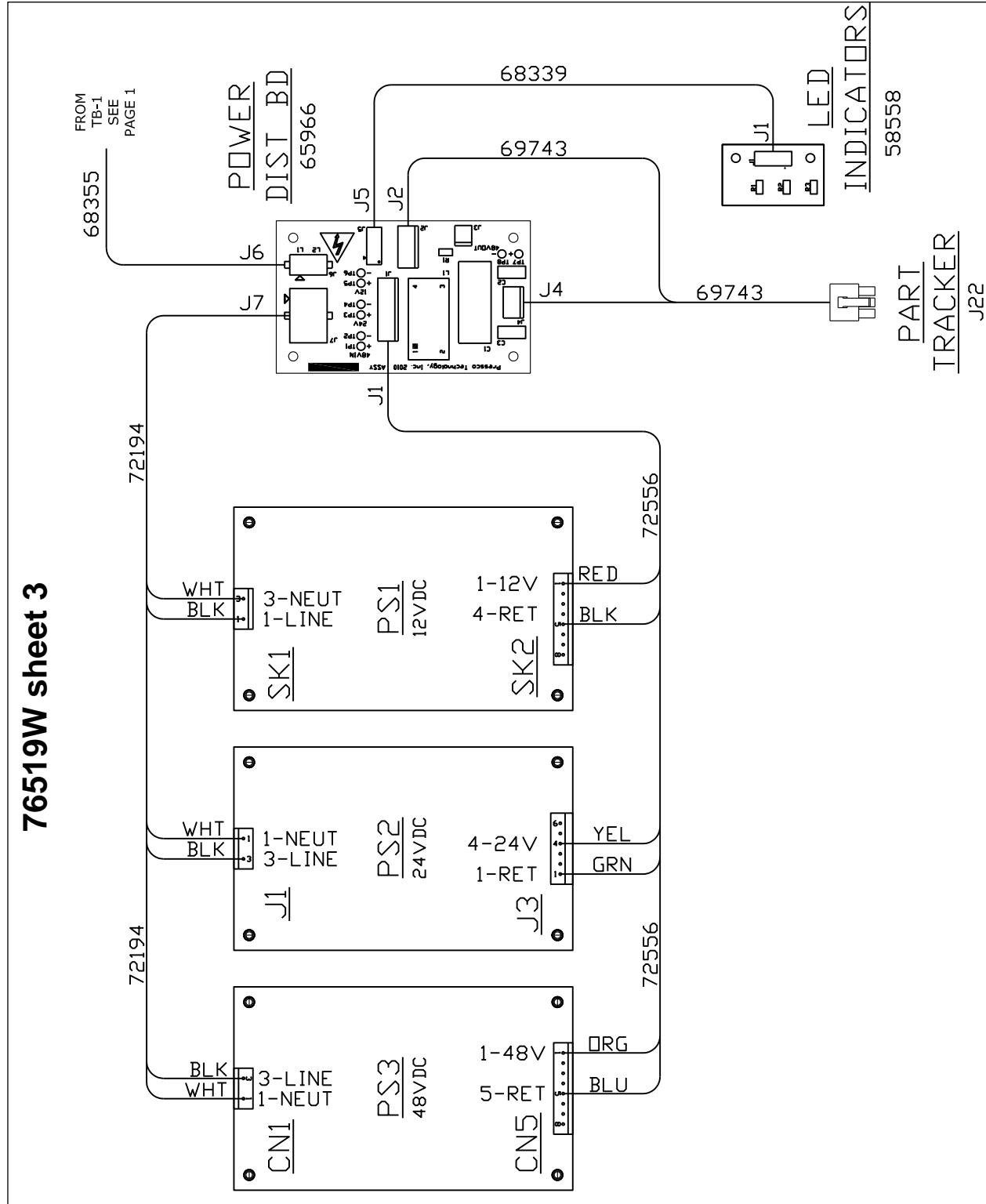
Electrical Diagram FHCP3X GEN 3 230V sheet 2 of 2



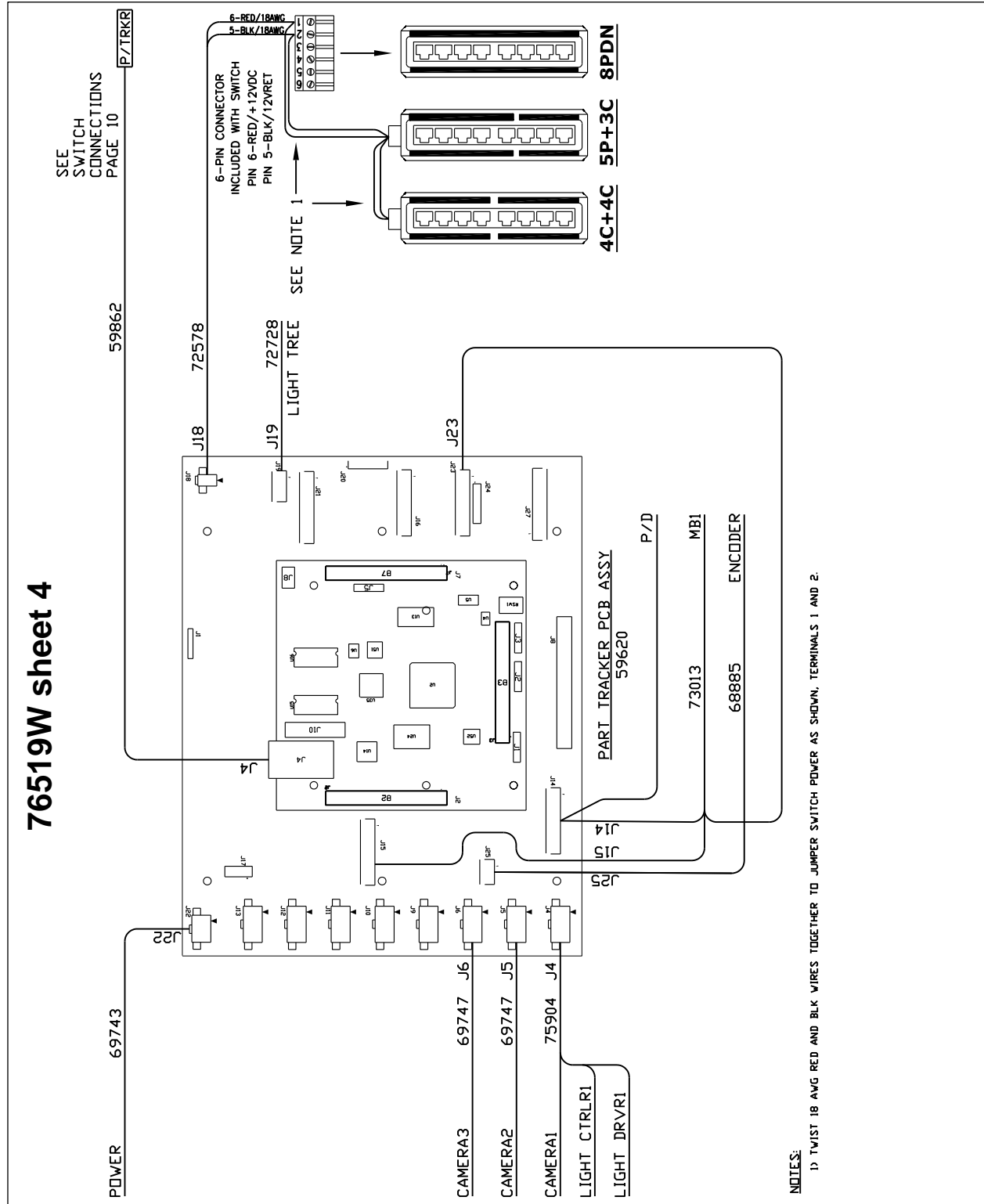
Wiring Diagram FHCP3X GEN 3 230V sheet 2 of 11



Wiring Diagram FHCP3X GEN 3 230V sheet 3 of 11

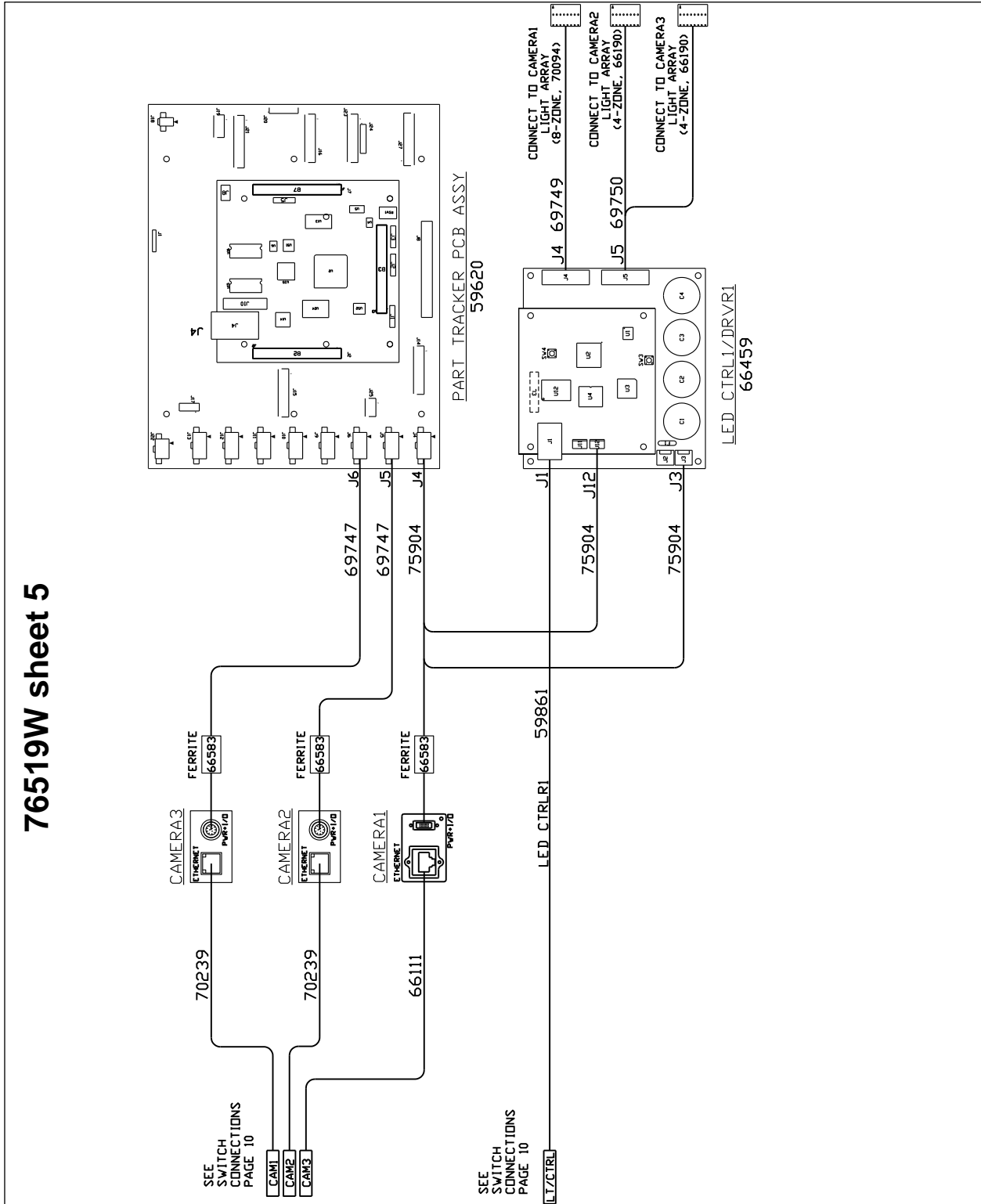


Wiring Diagram FHCP3X GEN 3 230V sheet 4 of 11



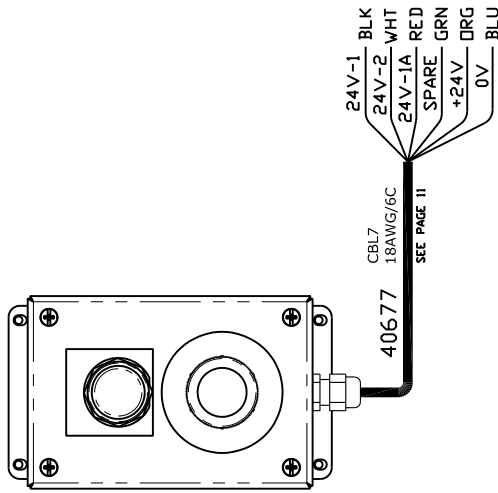
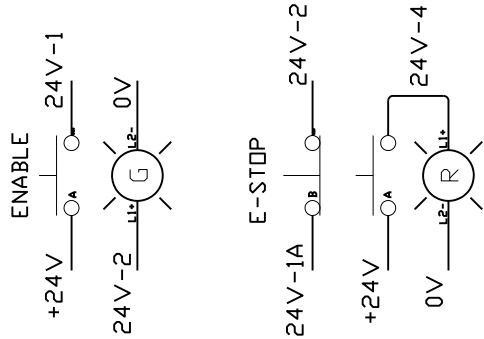
Wiring Diagram FHCP3X GEN 3 230V sheet 5 of 11

76519W sheet 5

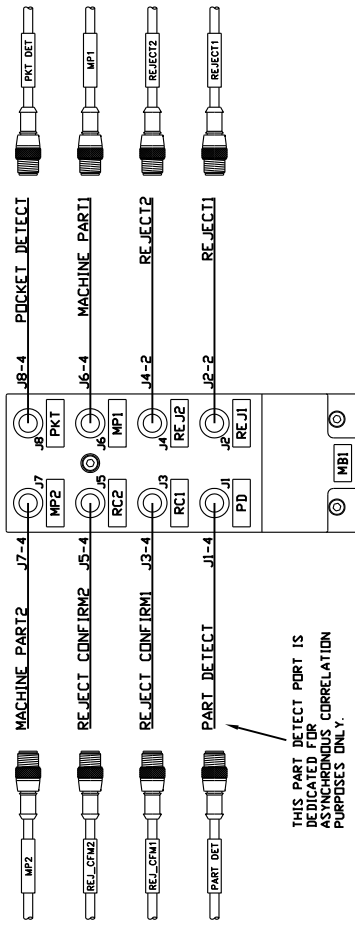


76519W sheet 7

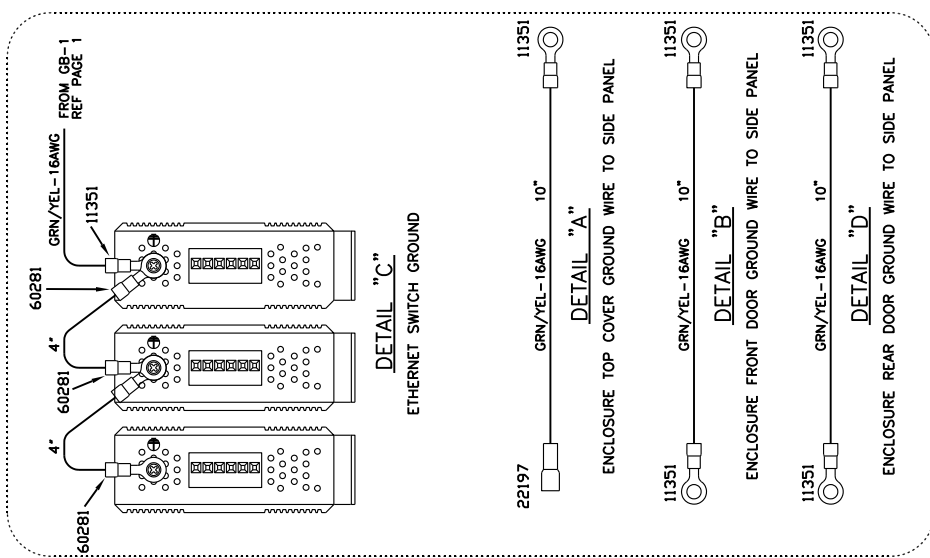
REMOTE PENDANT (OPTIONAL)



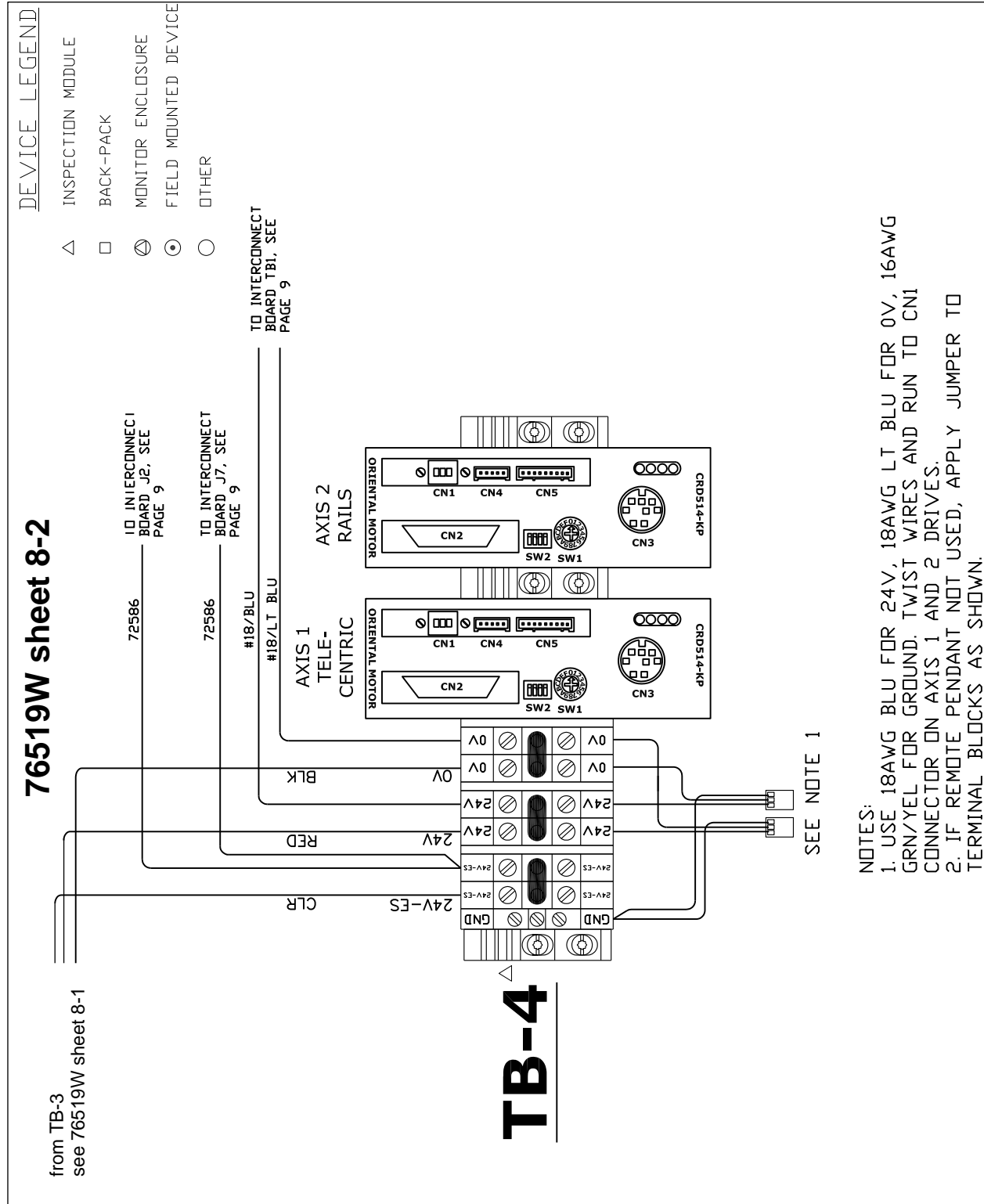
8-PORT I/O BOX-MB1
APPLY LABELS AS SHOWN



6-PIN PANEL CONNECTOR

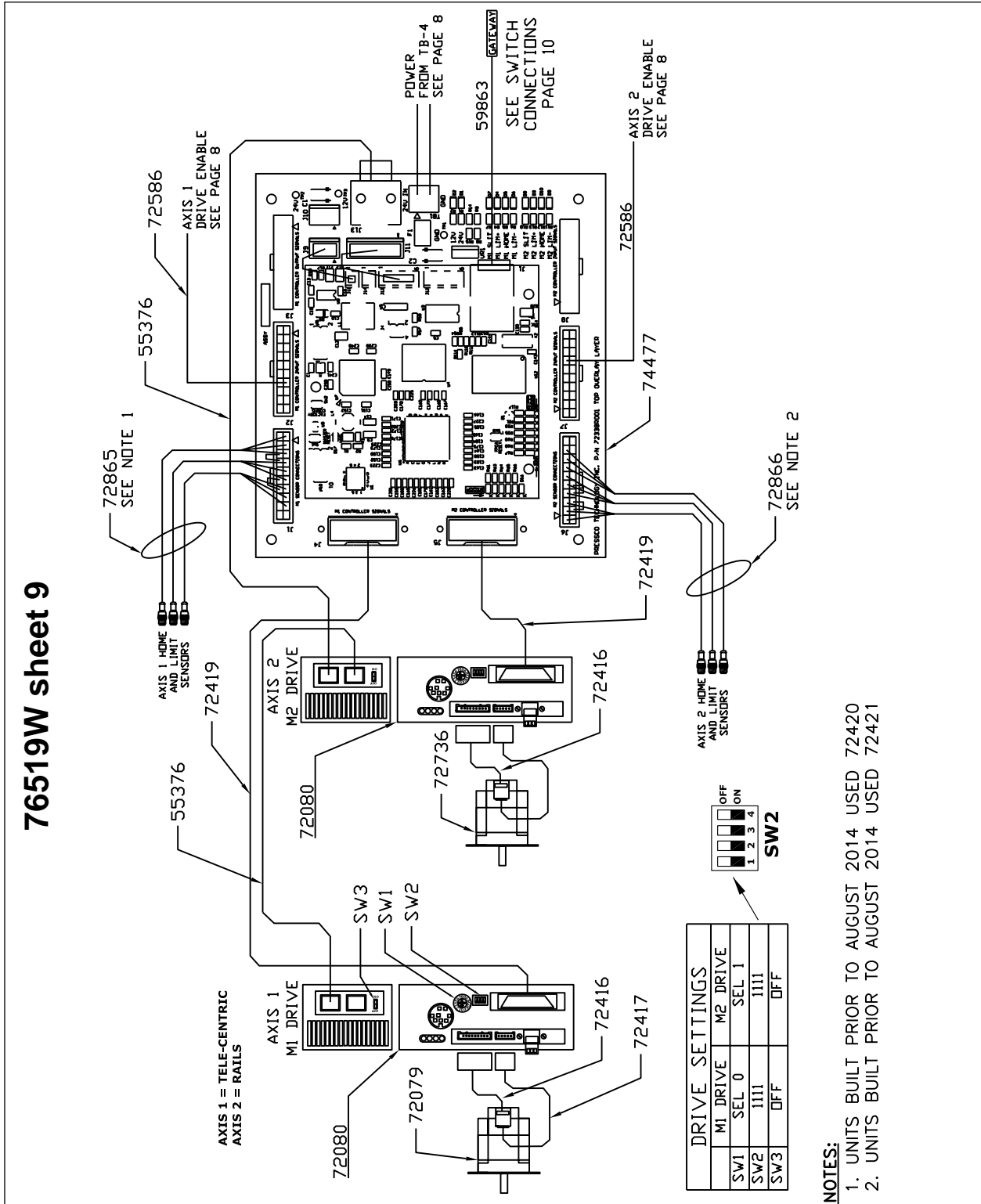


Wiring Diagram FHCP3X GEN 3 230V sheet 8 of 11 (part 2)



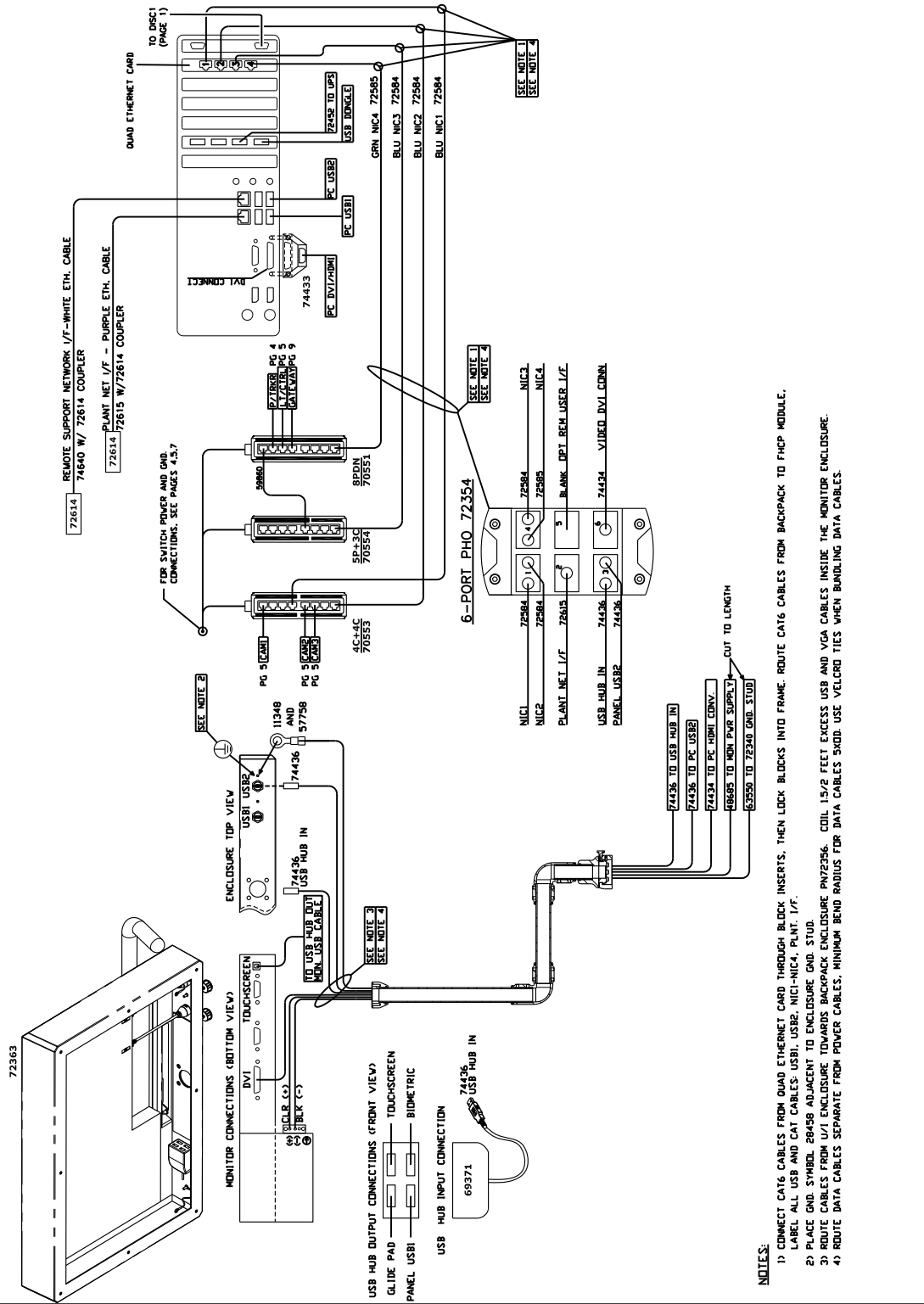
Wiring Diagram FHCP3X GEN 3 230V sheet 9 of 11

76519W sheet 9



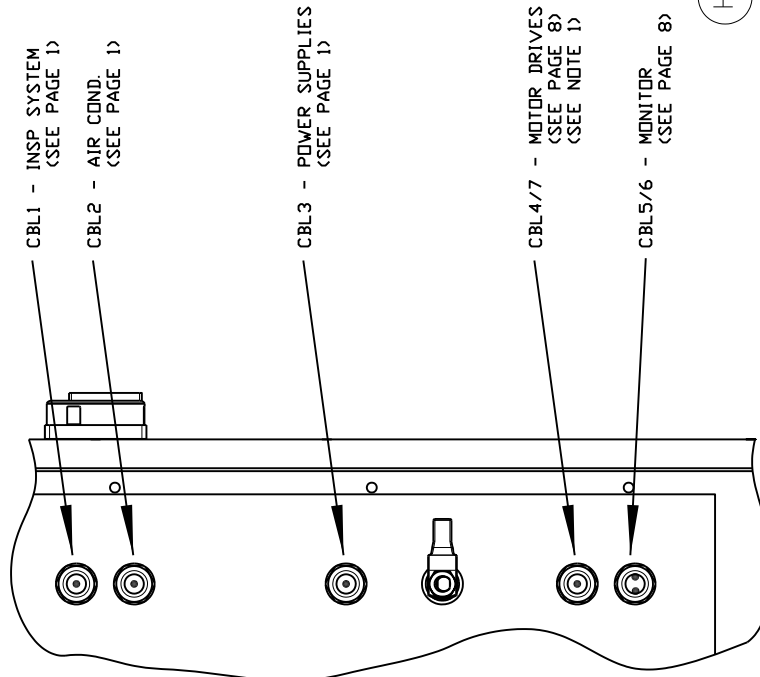
76519W sheet 10

USER INTERFACE TO VISION PROCESSOR CONNECTIONS



Wiring Diagram FHCP3X GEN 3 230V sheet 11 of 11

76519W sheet 11

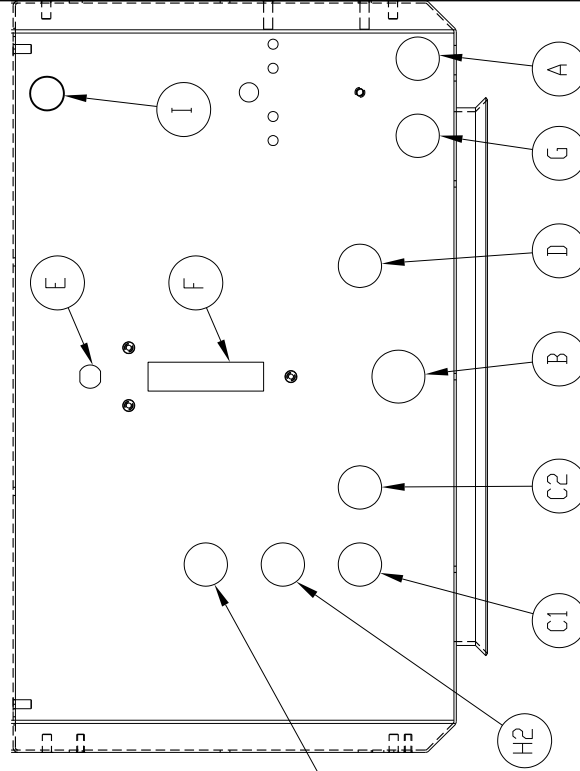


VIEW LOOKING AT BACK SIDE OF BACKPACK

NOTES:
 1. WHEN REMOTE PENDANT IS USED, REPLACE THIS CORD GRIP WITH DUAL CORD GRIP, 72625, AND RUN BOTH CABLES 4 AND 7 THROUGH. SEE REMOTE PENDANT ON PAGE 7.

- A = POWER IN
- B = TO MONITOR
- C1 = LIS IN (optional)
- C2 = LIS TO JAM BOX (optional)
- D = EXTENDED I/O (optional)
- E = ENCODER
- F = 8-PORT I/O ENTRY
- G = 230 VAC JAM BOX (optional)
- H1 = DDR CAMERA (optional)
- H2 = DDR PDN (optional)
- I = REMOTE PENDANT (optional)

VIEW LOOKING INSIDE INSPECTION MODULE



Chapter 9

Troubleshooting

See the following table for a list of symptoms with possible causes and solutions. For other problems or further help, contact **Pressco** (on page 2).

Symptom	Probable Cause	Solution
No image (image is black or solid cream color)	Part program was not changed during part changeover	Change part program to match the part you are inspecting Part Changeover (on page 37)
	Lighting not set up correctly	Set up lighting Basic Adjust Lighting or Advanced Adjust Lighting
	Part tracker board not communicating	Restart the system (Restarting the Intellispec FHCP 3X System (on page 84))
System log reads "missed acquisitions" or "Part Tracker Error" Error message on screen that reads "Part Tracker Error - Reset Part Tracker" Error message on screen: "Part Tracker Exception"	Part tracker board not communicating	Restart the system (Restarting the Intellispec FHCP 3X System (on page 84))

Lockout Instructions

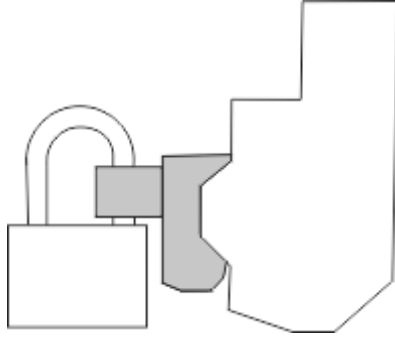


Warning - Potential hazardous voltage from the UPS. Use caution when servicing.

➤ **Before servicing any electrical or mechanical components inside the FHCP 3X system:**

1. Power off the system using power switch DISC 1. **Power On/ Off** (on page 41)
2. Carefully open the FHCP 3X computer and inspection module doors. **Accessing the internal components** (on page 42)
3. Locate the circuit breaker lockout clips. These are shipped with the system, and should be stored inside the unit.

4. Install the circuit breaker lockout clips, as shown below, and attach a lock. This will ensure that no incoming power (if applicable) will reach the unit.



Resetting the Part Tracker Board in FHCP 3X

If you get an error message about the part tracker board, you may need to reset it. To reset the Part Tracker board in the FHCP 3X system, restart the system. This will clear errors and reset the hardware. See *Restarting the Intellispec FHCP 3X System* (on page 84).

Restarting the Intellispec FHCP 3X System

You may need to restart the system if power or communication has been lost. Symptoms may include that the inspection module light has stopped flashing, and the system is no longer taking pictures. Restarting the system will reconnect the Vision Processor with the Part Tracker.

- ❖ *Note: if the power to the UPS is interrupted for more than 30 seconds, the software will automatically shut itself down and then shut down the Vision Processor PC. The software will restart. You will just need to log in and put the system back online.*

Restarting the System

If your system has stopped communicating, or the software has stopped operating, we recommend that you restart the whole system. This will reset the software, the inspection module, and all the communication devices of the system.

➤ **To restart the system:**

1. Turn off the main power switch (DISC 1). The system will shut down, including a controlled shut down of the software.
2. Wait until the software and all the components have shut down, and then wait for about 40 more seconds to allow the electronic components to reset.
3. Turn on the main power switch (DISC 1). The system will start, and the Intellispec software will load. Log in to begin using the system.
4. Verify that the red E-stop button on the front panel is pulled out.
5. Press the green reset button on the front panel until the light turns green.

- ❖ *Note: The system restart takes several minutes to complete.*

If the system restart does not fix the problem, try one of the solutions below, or contact Pressco. (**How to Contact Pressco** (on page 2))

Restarting the Software Application



You may need to restart the software if you see a software error that, for some reason, may not have been cleared by restarting the entire system.

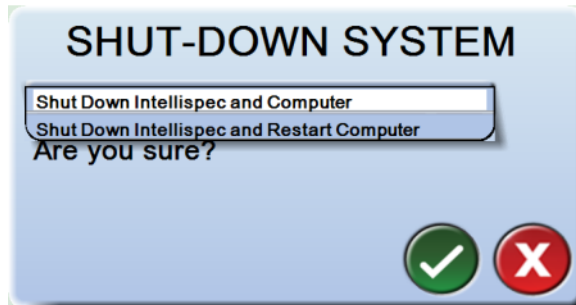
You must have proper user permissions to exit the software. This prevents unauthorized system shutdowns. Contact your system administrator if you need user permissions.




Important - When restarting the software, it is important to choose the correct option from the Shut Down System menu. Only select Shut Down Intellispec and Restart Computer as described below.

➤ **To restart the Intellispec software:**

1. Log in.
2. Make sure all lanes are offline (all lanes have the red stoplight). For more information, see Online / Offline.
3. Click the Home button .
4. Click the Tools button  to display the Tools menu.
5. Click the Exit System option.
6. A drop-down menu allows you to choose an option. Choose: "Shut down the Intellispec and restart the computer."



7. Click the OK  button. The Intellispec software and computer shuts down and restarts. The software will come up in System Overview mode where you can log in to continue operating the system.

Rebooting the computer

If restarting the software application does not clear the errors, or the software does not restart, or you see the "System in Transition" message, try rebooting the computer.

➤ **To reboot the computer:**

1. Connect the **Mechanical keyboard (MKB)** (on page 35) to the USB port under the monitor, closest to the center of the monitor. The keyboard is stored inside the **Intellispec Computer Enclosure** (see "**Intellispec Computer Enclosure (backpack)**" on page 52).
2. Press Ctrl + Alt + Delete on the mechanical keyboard.
3. Use the Log Off option to log off of Intellispec.
4. At the Windows Login Prompt, enter "pvpass" as the password for the Intellispec user account. Once login is complete the Series V application software will be launched.
5. Remove the Mechanical keyboard and properly store it.

❖ *Note: The system reboot takes several minutes to complete.*

Chapter 10

Maintenance Frequency - FHCP

Intellispec Series V Computer enclosure, FHCP 3X module, and general components				
Item	Description	Once per day or shift	Once per week	Once per month
Observe Proper inspection	Verify that defective parts are being rejected by inserting a known defective part through inspection	X		
Observe Proper inspection	Verify that no stray parts are stuck in or near the inspection module or reject station	X		
Observe Proper inspection	Verify that no buildup of dirt or contaminants has occurred on inspection module, part detector, or conveyor. Clean if necessary.	X		
Observe Proper inspection	Verify that each sensor image is properly centered, focused, and properly lit. Adjust if necessary.	X		
Plastic surfaces: Inspection tunnel windows	Clean with soft, clean, oil-free cloth dampened with mild soap and water solution. This should be cleaned each day after each system wash down. Wipe dry. Cleaning Plastic Surfaces (see " Cleaning Plastic Surfaces - FHCP3X EZ " on page 91)	X		
FHCP 3X inspection system cabinet	Clean system cabinet after wash-down, and/or as needed Cleaning the system cabinet (on page 90)		X	
Vision Processor Computer Filter	Rinse in clean water; use mild soap and water solution if oily. Use the procedure that matches the equipment in your plant. Cleaning the NEMA 4X Vision Processor filter (see " Cleaning the FHCP Vision Processor filter " on page 89)			X
Part Detect Sensor and Reflector	Clean with soft, clean, oil-free cloth dampened with mild soap and water solution. Wipe dry. Cleaning the Part Detector (on page 91)	Only if needed. These items are inside the inspection module enclosure, and should not need cleaning under normal conditions.		
Camera lens	Clean only with lens tissue and lens cleaner. Be careful not to alter focus or aperture. Cleaning the Camera Lens (on page 93)			
Glass surfaces: Mirrors	Clean with soft, clean, oil-free cloth dampened with lens cleaning solution. Cleaning Glass Surfaces (on page 93)			

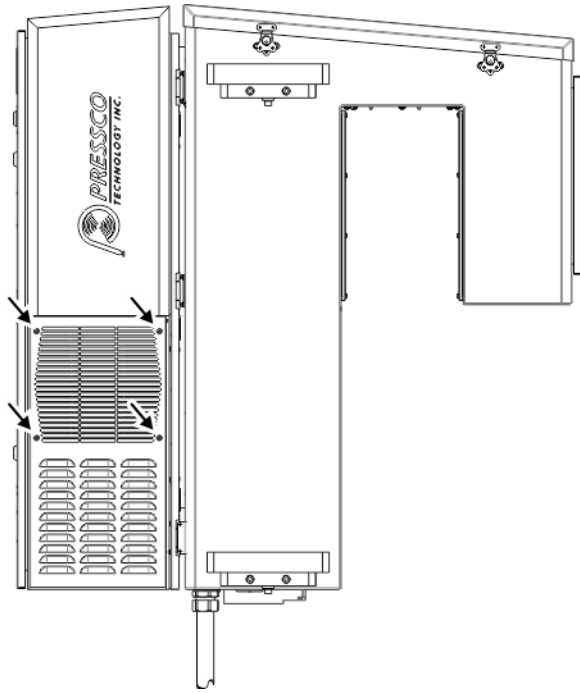
Cleaning the FHCP Vision Processor filter

The filter should be cleaned once a month for best results. The filter is located on the side of the cabinet. Replace with a new filter when necessary.

❖ *Note: You may need to clean the filters **weekly** depending on plant conditions*

➤ **To clean the filter:**

1. Remove the four screws that hold the filter cover.
2. Remove the filter and clean it.
 - If the filter contains dry dust and dirt, rinse it in plain water
 - If the filter contains oily dust and dirt, clean it in soapy water, then rinse in clear water
3. Dry the filter completely, then place it back inside the cabinet.
4. Replace the filter cover and replace the four holding screws.



Cleaning the system cabinet

This unit is NEMA 4X standard, and does not need any parts covered during plant wash-down or unit cleaning.

After a plant wash-down, or at least once per week, clean the exterior of the vision processor.

➤ **To clean:**

- Use stainless steel cleaner and clean, dry cotton rags, lint-free cloths, or soft non-abrasive paper towels
- Wipe the exterior surface of the cabinet after a wash-down, or once per week

Cleaning Optical Surfaces



Important - Debris and contamination could build up on both the glass and plastic surfaces. This dirt could appear in the inspection windows, causing false rejects of parts, or it could degrade lighting. Clean glass and plastic surfaces often to avoid false rejects.

To maintain proper image quality and system performance, the clear glass and plastic surfaces on the Inspection Modules must be cleaned on a regular basis. Dirt and debris that appear in the image can cause false rejects. An oily film on optical surfaces can cause false rejects or missed defects.

Cleaning Plastic Surfaces - FHCP3X EZ

The inspection tunnel windows on both sides are plastic. They require periodic cleaning.

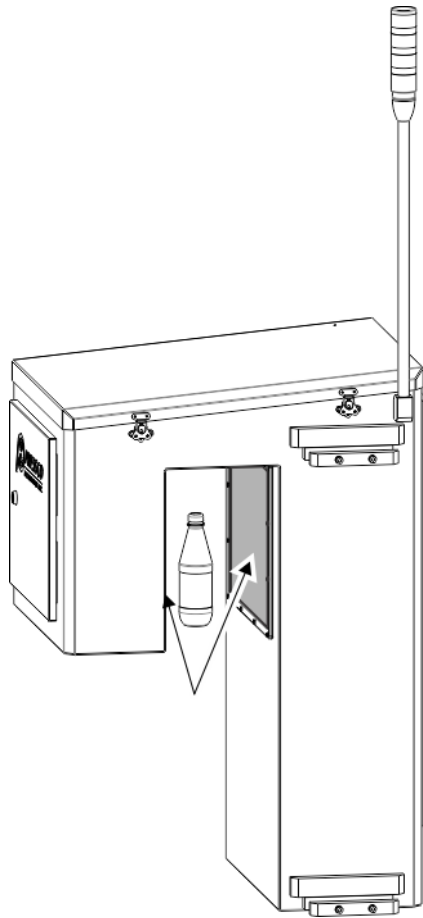
Other items, such as backlight diffusers and the part detect sensor and reflector, are located inside the tunnel enclosure, and do not need cleaning under normal conditions.

❖ *Note: Cleaning frequency will depend on plant and process conditions.*

➤ **To clean plastic surfaces:**

- Use canned compressed air to blow away dust
 - Use a clean, non-abrasive cloth dampened with mild soap and water solution. Saturate surface completely to let particles wash away.
 - Dry the surface with clean, compressed air
-

❖ *DO NOT: Use paper towels, paper napkins, or dry cloths – these may scratch surfaces*



Cleaning the Part Detector

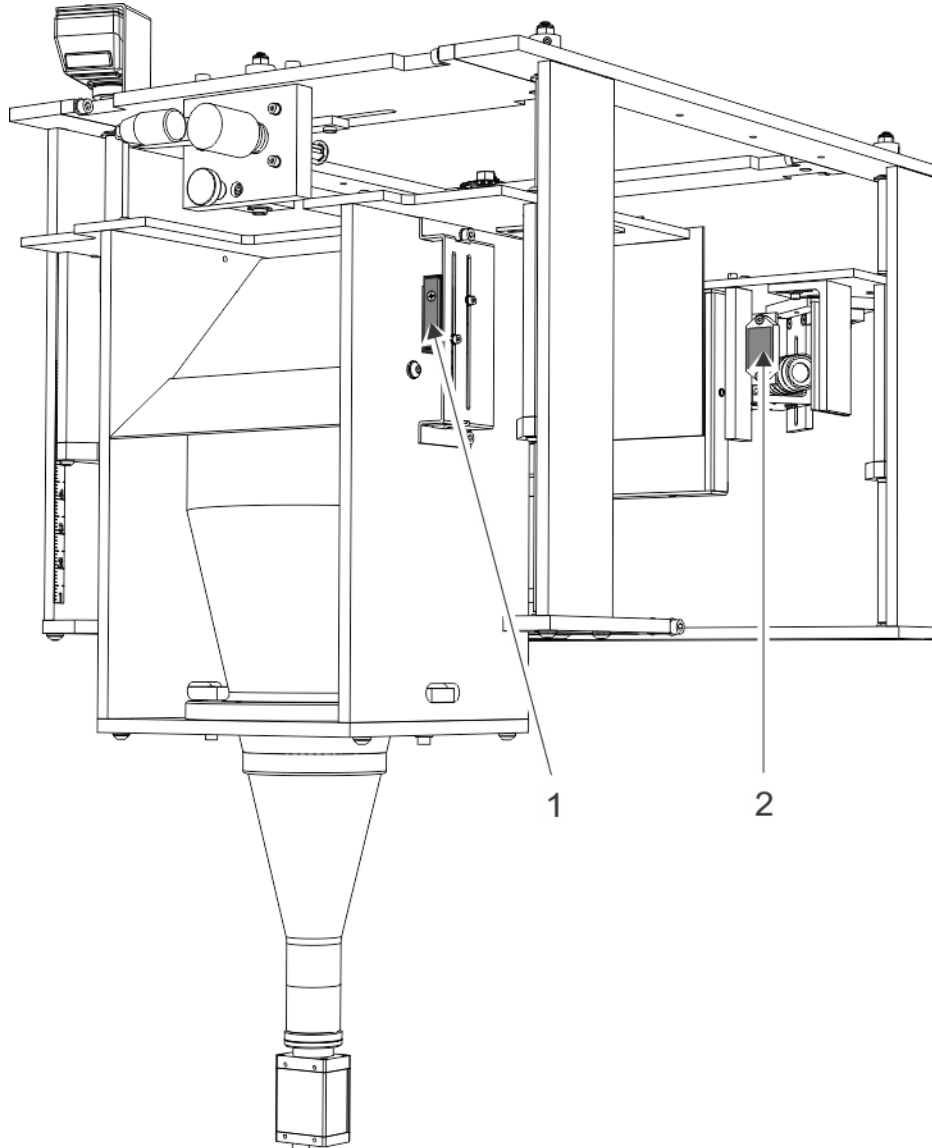
Under normal conditions, you do not need to clean these components, as they are inside the inspection module enclosure. Be sure to keep the inspection windows clean so that the optical components inside can properly detect parts and defects.

If these items need cleaning, follow the instructions below.

➤ **To clean the part detector:**

- Clean the part detector and reflector surfaces with a soft, clean, lint-free cloth dampened with a mild soap and water solution.
- Do not use a glass cleaning solution or strong solvent on the plastic surfaces as they might be damaged.

❖ *Note: The frequency of cleaning will depend on plant and process conditions.*



- 1 - Part detect sensor (lens is towards the center of the tunnel)
2 - Part detect reflector

Cleaning Glass Surfaces

Glass surfaces that may require cleaning are:

- Camera Lens
- Beam Splitter (if present)
- Secondary lens (if present)
- Secondary mirror (if present)

➤ **To clean glass surfaces:**

- Blow off dust with canned, compressed air
- Use a clean non-abrasive cloth dampened with lens cleaning solution
- Use lens tissue and lens cleaning solution on camera lenses
- If surface has compound on it, first clean with alcohol, then with lens cleaning solution

❖ *Note: Cleaning frequency will depend on plant and process conditions.*

Cleaning the Camera Lens

Under normal conditions, you do not need to clean these components, as they are inside the inspection module enclosure. Be sure to keep the inspection windows clean so that the optical components inside can properly detect parts and defects.

If these items need cleaning, follow the instructions below.

Clean all camera lenses carefully.



Caution - Do not touch the lens with fingers or oily cloths.

➤ **To clean the camera lenses:**

1. Clean all camera lenses with lens tissue and lens cleaning fluid. Be careful not to alter the focus or aperture of the cameras.
2. Re-adjust aperture and focus if needed.

Chapter 11

Extended I/O (Optional)

This section contains information about the **optional** Extended I/O board.

- ❖ *Note: In some systems, such as FHCP 3X inspection systems, the Extended I/O board is always included (not optional).*

Extended I/O in FHCP 3X Module

The Extended I/O board is located within the inspection module cabinet.



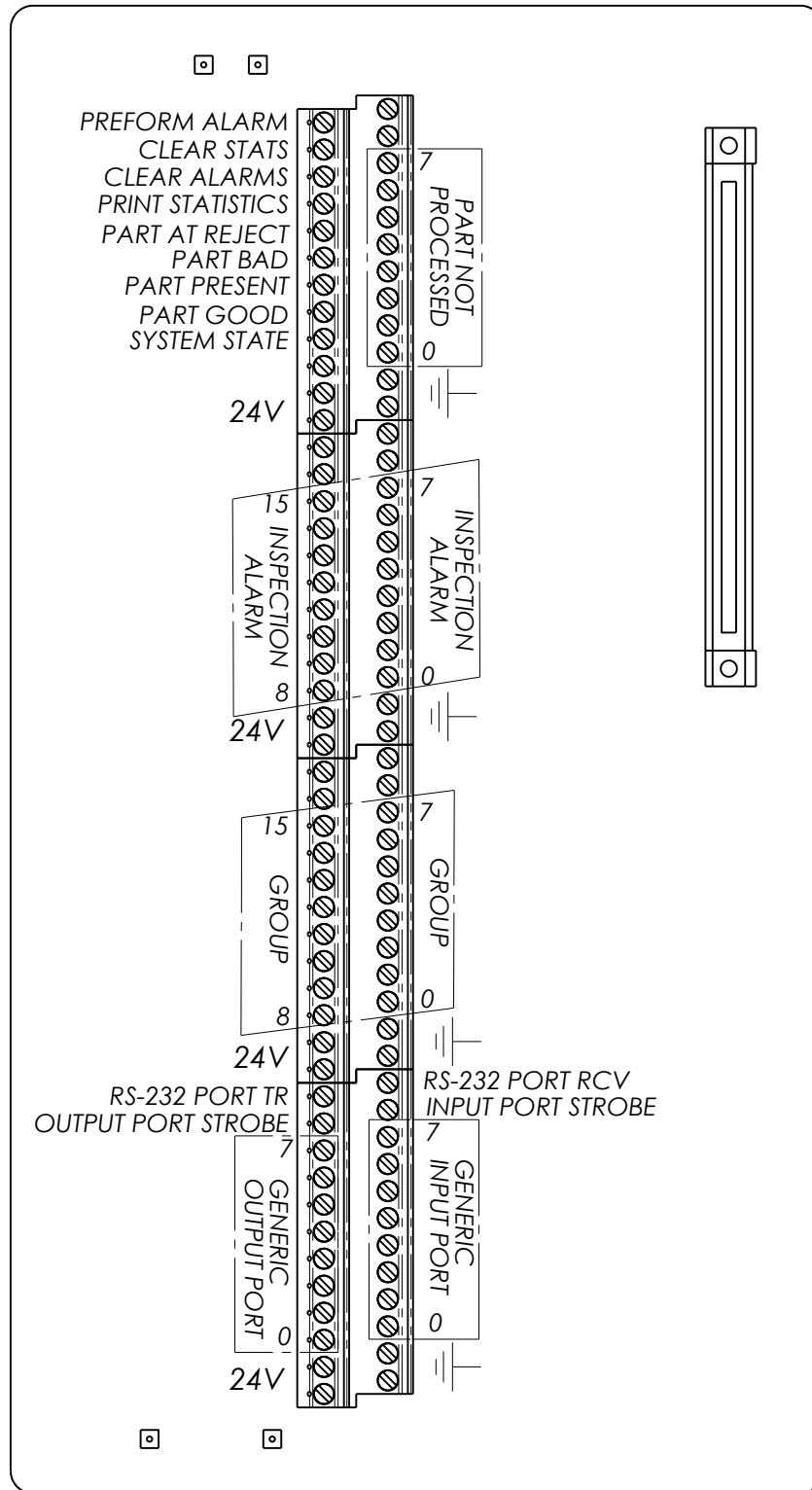
Extended I/O board

This optional module provides additional input and output ports for communicating with the Intellispec Series V system. The board may be installed within a cluster box or within an inspection module. The board is connected to the lane's Part Tracker board via a ribbon cable.

- ❖ *Note: Each Extended I/O board handles only one lane.*
- ❖ *Note: Extended I/O is not available with an Embedded Cluster Box.*

Some signals must be enabled in the software through the **Extended I/O Configuration** (on page 107).

Below is the basic layout for the Extended I/O module.



Extended I/O signals - firmware up to F259

The Series V Extended I/O signals are listed in the table below. For the location on the Extended I/O board, refer to the **Extended I/O terminal block reference** (on page 106).

Corresponding software and firmware versions:

- 5.3 – F(204 - 224)
- 5.4 – F(231 – 249)
- 5.5 – F(250 – 274)

❖ *Note: some signals are not currently used*

All Extended I/O inputs are PNP. Outputs are selectable to be either open collector or open emitter. However, that selection applies to ALL output signals.

The input and power LEDs are visual indicators. The output LEDs illuminate if the current reaches 40mA or higher, which is approaching maximum current. The maximum current output is 50mA. See also information about **Extended I/O circuits** (on page 106).

*The signals marked with an asterisk must be enabled through **Extended I/O Configuration** (on page 107) in the software.

Signal - firmware up to version F259	I/O	Connector	Indicator LED	Comments/ Reference
Clear Stats*	I	J4-P23	D2	Clears the lane statistics
Clear Alarms*	I	J4-P22	D3	Clears the lane alarms
Print Statistics*	I	J4-P21	D4	Prints the lane statistics to currently configured printer or file Schedule Reports
Preform Alarm	I	J4-P24	D1	Used only in special applications. Activated by the Preform Material Handling system.
System State*	O	J4-P16	D11	Indicates whether the lane is online or offline. Online = active. Offline = inactive.
Part Present (Part Detect)*	O	J4-P18	D9	Pulses for 12 ms when the part present sensor detects a part
Part Good* (Group A)	O	J4-P17	D7	Pulses for 12 ms for each part declared good by the inspection
Part Bad* (Group A)	O	J4-P19	D5	Pulses for 12 ms for each part declared bad by the inspection
Part at Reject* (Group A)	O	J4-P20	D13	Pulses for 12 ms for each part that crosses the reject point (online mode only)
Part Not Processed: (Rejector 0)	O	J4-P3	D109	Pulses for 12 ms when a part is not processed due to a system malfunction (online mode only)
Part Not Processed: (Rejector 1)	O	J4-P4	D113	
Part Not Processed: (Rejector 2)	O	J4-P5	D117	
Part Not Processed: (Rejector 3) Firmware versions before F225	O	J4-P6	D121	
Reject Confirm 0	O	J4-P7	D107	Output signal when reject is confirmed (from F168 to F224 firmware)
Reject Confirm 1	O	J4-P8	D111	
Part Good (Group B)* - Part Not Processed 3	O	J4-P6	D121	Group B outputs Firmware versions F225 and later (see J1-P20 through J1-P22 for firmware versions before F225)
Part Bad (Group B)* - Part Not Processed 4	O	J4-P7	D107	
Part at Reject (Group B)* - Part Not Processed 5	O	J4-P8	D111	

Signal - firmware up to version F259	I/O	Connector	Indicator LED	Comments/ Reference
Reject Confirm Sensor blocked	O	J4-P9	D115	Reject confirm sensor signal pulse width exceeding programmed limit (F168 and later DPT firmware)
Host communication lost (Firmware from F168 to F224 only)	O	J4-P10	D119	Output signal when communication to/from host is disrupted
Unassigned (Firmware versions F225 and later)		J4-P10	D119	
Inspection Alarm 0	O	J3-P3	D59	Pulses when the associated alarm condition occurs and stays active until the alarm is cleared Lane Alarm Configuration and Sensor Alarm Configuration *J3-P22 Inspection Alarm 15 supported with F168 and later DPT firmware. In earlier firmware versions, this signal is "Host Communication Lost"
Inspection Alarm 1	O	J3-P4	D67	
Inspection Alarm 2	O	J3-P5	D75	
Inspection Alarm 3	O	J3-P6	D83	
Inspection Alarm 4	O	J3-P7	D57	
Inspection Alarm 5	O	J3-P8	D65	
Inspection Alarm 6	O	J3-P9	D73	
Inspection Alarm 7	O	J3-P10	D81	
Inspection Alarm 8	O	J3-P15	D63	
Inspection Alarm 9	O	J3-P16	D71	
Inspection Alarm 10	O	J3-P17	D79	
Inspection Alarm 11	O	J3-P18	D87	
Inspection Alarm 12	O	J3-P19	D61	
Inspection Alarm 13	O	J3-P20	D69	
Inspection Alarm 14	O	J3-P21	D77	
Inspection Alarm 15*	O	J3-P22	D85	
Group 0	O	J2-P3	D17	Pulses for 12 ms when an inspection fails in the user-defined group (online mode only) Walk By Setup
Group 1	O	J2-P4	D25	
Group 2	O	J2-P5	D33	
Group 3	O	J2-P6	D41	
Group 4	O	J2-P7	D15	
Group 5	O	J2-P8	D23	
Group 6	O	J2-P9	D31	
Group 7	O	J2-P10	D39	
Group 8	O	J2-P15	D21	
Group 9	O	J2-P16	D29	
Group 10	O	J2-P17	D37	

Signal - firmware up to version F259	I/O	Connector	Indicator LED	Comments/ Reference
Group 11	O	J2-P18	D45	
Group 12	O	J2-P19	D19	
Group 13	O	J2-P20	D27	
Group 14	O	J2-P21	D35	
Group 15	O	J2-P22	D43	
Generic Input Port 0	I	J1-P3	D48	Port 0 and Port 1 used in Remote Part Program Switching Reserved for Asynchronous Correlation These bits may be used for Auto-Learn
Generic Input Port 1	I	J1-P4	D50	
Generic Input Port 2	I	J1-P5	D51	
Generic Input Port 3	I	J1-P6	D52	
Generic Input Port 4	I	J1-P7	D55	
Generic Input Port 5	I	J1-P8	D56	
Generic Input Port 6	I	J1-P9	D47	
Generic Input Port 7	I	J1-P10	D49	
Input Port Strobe	I	J1-P11	D53	Reserved for Asynchronous Correlation
Generic Output Port 0	O	J1-P15	D91	Reserved for Asynchronous Correlation
Generic Output Port 1	O	J1-P16	D95	
Generic Output Port 2	O	J1-P17	D101	
Generic Output Port 3	O	J1-P18	D105	
Generic Output Port 4	O	J1-P19	D89	Encoder Z pulse output
Generic Output Port 5	O	J1-P20	D93	Part at Reject (Group B) (Firmware versions before F225)
Generic Output Port 6	O	J1-P21	D99	Part Bad (Group B) (Firmware versions before F225)
Generic Output Port 7	O	J1-P22	D103	Part Good (Group B) (Firmware versions before F225)
Output Port Strobe	O	J1-P23	D97	Reserved for future use
RS-232 Port TR	O	J1-P24	D202	Reserved for future use
RS-232 Port RCV	I	J1-P12	D200	Reserved for future use

All Connectors

Function	Pin			
Isolated ground	J1-P1, J1-P2	J2-P1, J2-P2	J3-P1, J3-P2	J4-P1, J4-P2
24 V (isolated)	J1-P13, J1-P14	J2-P13, J2-P14	J3-P13, J3-P14	J4-P13, J4-P14

Test Points

Function	Test Point
24 V	TP2
24 V Gnd	TP3
3.3 V	TP1
3.3 V Gnd.	TP4

Extended I/O signals - firmware version F260 and later

The Series V Extended I/O signals are listed in the table below. For the location on the Extended I/O board, refer to the **Extended I/O terminal block reference** (on page 106).

Corresponding firmware/ software versions:

- 5.5 – F(250 – 274)
- 5.6 – F(275 – 299)
- 5.7 – F(300 – 324)

❖ *Note: some signals are not currently used*

All Extended I/O inputs are PNP. Outputs are selectable to be either open collector or open emitter. However, that selection applies to ALL output signals.

The input and power LEDs are visual indicators. The output LEDs illuminate if the current reaches 40mA or higher, which is approaching maximum current. The maximum current output is 50mA. See also information about **Extended I/O circuits** (on page 106).

*The signals marked with an asterisk must be enabled through **Extended I/O Configuration** (on page 107) in the software.

Signal - firmware F260 and later	I/O	Connector	Indicator LED	Comments/ Reference
Clear Stats*	I	J4-P23	D2	Clears the lane statistics
Clear Alarms*	I	J4-P22	D3	Clears the lane alarms
Print Statistics*	I	J4-P21	D4	Prints the lane statistics to currently configured printer or file Schedule Reports
Preform Alarm	I	J4-P24	D1	Used only in special applications. Activated by the Preform Material Handling system.
System State*	O	J4-P16	D11	Indicates whether the lane is online or offline. Online = active. Offline = inactive.
Part Present (Part Detect)*	O	J4-P18	D9	Pulses for 12 ms when the part present sensor detects a part
Part Good* (Group A)	O	J4-P17	D7	Pulses for 12 ms for each part declared good by the inspection
Part Bad* (Group A)	O	J4-P19	D5	Pulses for 12 ms for each part declared bad by the inspection
Part at Reject* (Group A)	O	J4-P20	D13	Pulses for 12 ms for each part that crosses the reject point (online mode only)
Part Not Processed: (Rejector 0)	O	J4-P3	D109	Pulses for 12 ms when a part is not processed due to a system malfunction (online mode only)
Part Not Processed: (Rejector 1)	O	J4-P4	D113	
Part Not Processed: (Rejector 2)	O	J4-P5	D117	
Part Good (Group B)*	O	J4-P6	D121	Group B outputs
Part Bad (Group B)*	O	J4-P7	D107	
Part at Reject (Group B)*	O	J4-P8	D111	

Signal - firmware F260 and later	I/O	Connector	Indicator LED	Comments/ Reference
Reject Confirm Sensor blocked	O	J4-P9	D115	Reject confirm sensor signal pulse width exceeding programmed limit
System OK	O	J4-P10	D119	Host is NOT lost, and system is ONLINE
Inspection Alarm 0	O	J3-P3	D59	Set when the associated alarm condition occurs and stays active until the alarm is cleared Lane Alarm Configuration and Sensor Alarm Configuration
Inspection Alarm 1	O	J3-P4	D67	
Inspection Alarm 2	O	J3-P5	D75	
Inspection Alarm 3	O	J3-P6	D83	
Inspection Alarm 4	O	J3-P7	D57	
Inspection Alarm 5	O	J3-P8	D65	
Inspection Alarm 6	O	J3-P9	D73	
Inspection Alarm 7	O	J3-P10	D81	
Inspection Alarm 8	O	J3-P15	D63	
Inspection Alarm 9	O	J3-P16	D71	
Inspection Alarm 10	O	J3-P17	D79	
Inspection Alarm 11	O	J3-P18	D87	
Inspection Alarm 12	O	J3-P19	D61	
Inspection Alarm 13	O	J3-P20	D69	
Inspection Alarm 14	O	J3-P21	D77	
Inspection Alarm 15	O	J3-P22	D85	
Group 0	O	J2-P3	D17	Pulses for 12 ms when an inspection fails in the user-defined group (online mode only) Walk By Setup
Group 1	O	J2-P4	D25	
Group 2	O	J2-P5	D33	
Group 3	O	J2-P6	D41	
Group 4	O	J2-P7	D15	
Group 5	O	J2-P8	D23	
Group 6	O	J2-P9	D31	
Group 7	O	J2-P10	D39	
Group 8	O	J2-P15	D21	
Group 9	O	J2-P16	D29	
Group 10	O	J2-P17	D37	
Group 11	O	J2-P18	D45	
Group 12	O	J2-P19	D19	
Group 13	O	J2-P20	D27	
Group 14	O	J2-P21	D35	

Signal - firmware F260 and later	I/O	Connector	Indicator LED	Comments/ Reference
Group 15	O	J2-P22	D43	
Generic Input Port 0	I	J1-P3	D48	Port 0 and Port 1 used in Remote Part Program Switching These bits may be used for Auto-Learn or Alternate Part Processing
Generic Input Port 1	I	J1-P4	D50	
Generic Input Port 2	I	J1-P5	D51	
Generic Input Port 3	I	J1-P6	D52	
Generic Input Port 4	I	J1-P7	D55	
Generic Input Port 5	I	J1-P8	D56	
Generic Input Port 6	I	J1-P9	D47	
Generic Input Port 7	I	J1-P10	D49	
Input Port Strobe	I	J1-P11	D53	
Generic Output Port 0	O	J1-P15	D91	
Generic Output Port 1	O	J1-P16	D95	
Generic Output Port 2	O	J1-P17	D101	
Generic Output Port 3	O	J1-P18	D105	
Generic Output Port 4	O	J1-P19	D89	
Generic Output Port 5	O	J1-P20	D93	
Generic Output Port 6	O	J1-P21	D99	
Generic Output Port 7	O	J1-P22	D103	
Output Port Strobe	O	J1-P23	D97	Pulsed When data of Generic Output Port (0-7) is set
RS-232 Port TR	O	J1-P24	D202	Reserved for future use
RS-232 Port RCV	I	J1-P12	D200	Reserved for future use

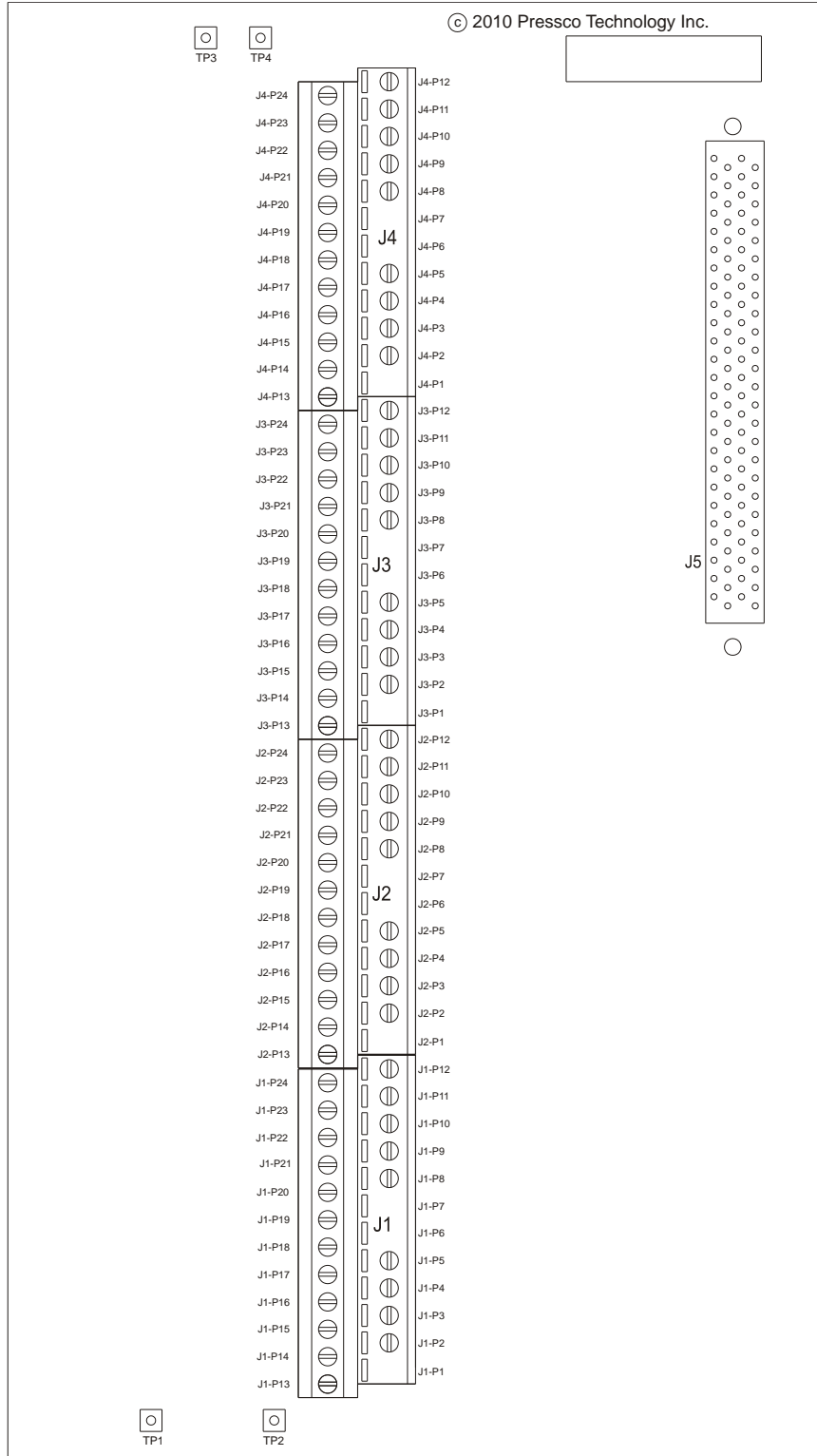
All Connectors

Function	Pin			
Isolated ground	J1-P1, J1-P2	J2-P1, J2-P2	J3-P1, J3-P2	J4-P1, J4-P2
24 V (isolated)	J1-P13, J1-P14	J2-P13, J2-P14	J3-P13, J3-P14	J4-P13, J4-P14

Test Points

Function	Test Point
24 V	TP2
24 V Gnd	TP3
3.3 V	TP1
3.3 V Gnd.	TP4

Extended I/O terminal block reference



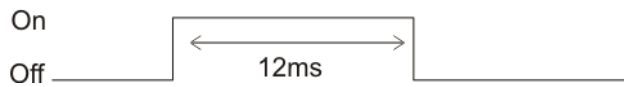
Extended I/O circuits

The following illustrations show typical input and output circuits you can use to communicate with your plant's PLC, or to connect external LEDs or light trees.

➤ **Specifications:**

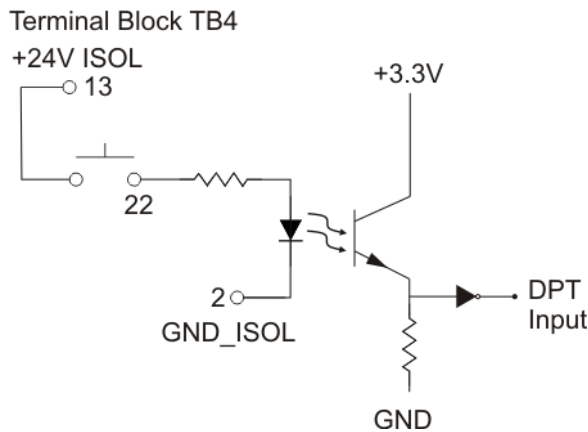
- Minimum dwell time of the **input** device is 1.1 ms
- Maximum **output** load is 50 mA
- Default value of **output** pulse is 12ms. Some output signals, such as alarms, must be cleared on the Intellispec before they turn off.

Default timing of pulsed output



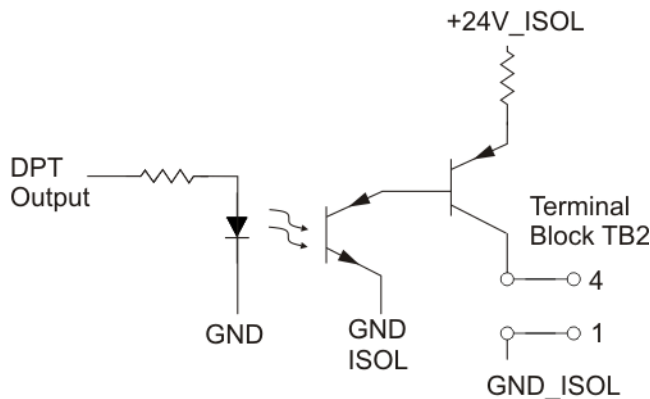
The following illustration shows a typical circuit that can be used to clear alarms.

CLEAR ALARMS - INPUT



The following illustration shows a typical circuit that can be used for a group output.


GROUP 1 - OUTPUT



Extended I/O Configuration

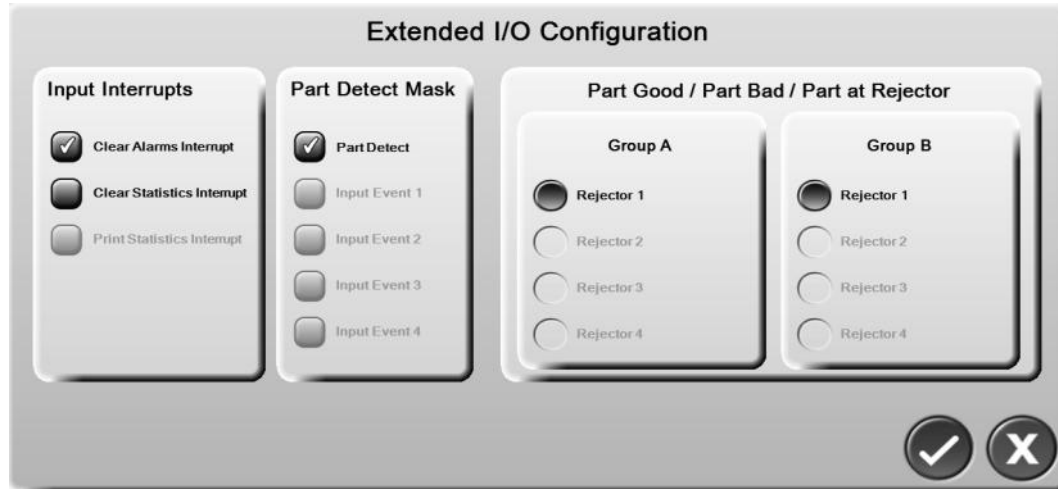
Enable input or output signals to perform a function on the Intellispec system or monitor the production lane in your plant. These settings must be done for each Extended I/O board for each lane.

See also the sections about **Extended I/O** (see "**Extended I/O board**" on page 95) and **Extended I/O Signals** (see "**Extended I/O signals - firmware up to F259**" on page 96) in the Intellispec Hardware Guide.

To get to this screen: From Lane or Sensor Overview mode, select Tools  | **Hardware Setup** | **Extended I/O Configuration**.

This screen displays some of the inputs and outputs on the optional extended I/O board.

If one of the extended I/O ports is used it must be enabled here in the software, and the hardware must be connected appropriately.



Input Interrupts

These signals produce an input pulse to the Intellispec to perform the following functions.

Clear Alarms Interrupt

Clear the lane alarms.

Clear Statistics Interrupt

Clear the lane statistics.

Print Statistics Interrupt

Print the lane statistics to the currently configured printer or file. See also Schedule Reports.

Part Detect Mask

Choose which Part Detect or other input events to trigger the Part Present output on the Extended I/O board. This is an OR function. Any enabled Part Detect signal or Input Event that goes active will activate the Extended I/O Part Present output.

Part Detect

The signal goes active when the sensor detects a part.

Input Event N

The Part Tracker board accepts up to five* input events (Part detectors or other sensors). Part tracking is always controlled by the Part Detect signal (Input Event 0). You might use other input events (1 - 4) in your system to trigger the Part Present output signal.

*Only if your system has an 8-channel Part Tracker board. If your system has a 2-channel Part Tracker board, then only one Part Detect signal is used. The other input events are not available.

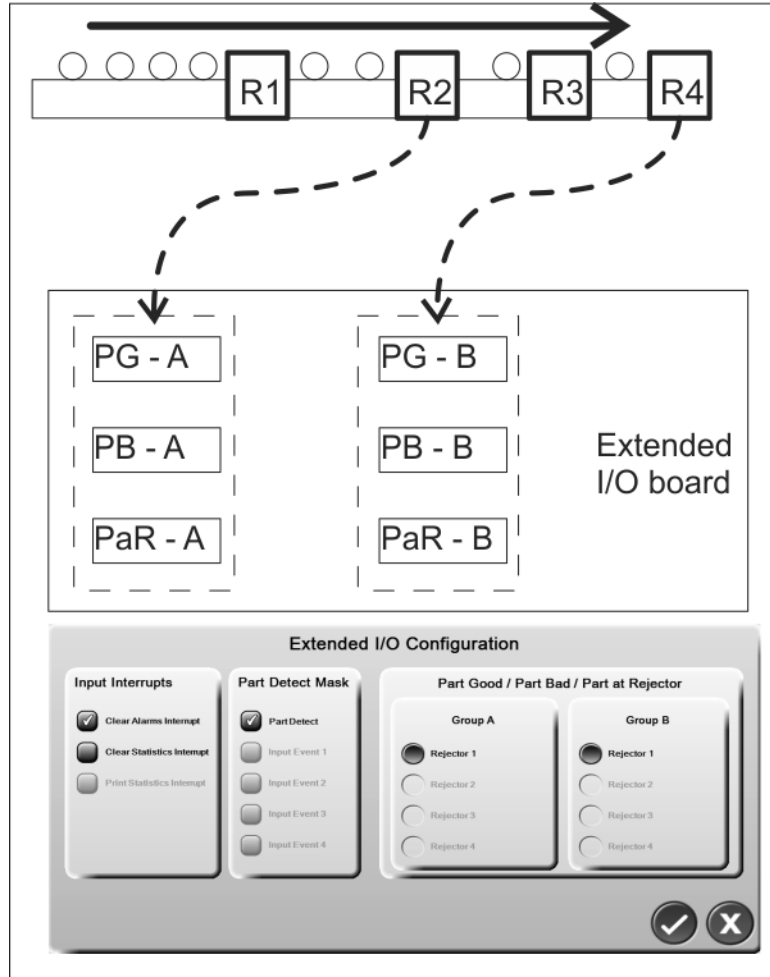
Part Good/ Part Bad/ Part at Rejector

Choose which rejector signal to activate the **Part Good**, **Part Bad**, and **Part at Rejector** signals on the Extended I/O board. After a part is inspected, the system determines whether the part is good or bad. As the part passes by Rejector 1, 2, 3, or 4, the Part Good/ Part Bad/ and Part at Rejector signals are activated on the Extended I/O board. There are two groups of Part Good/ Part Bad/ and Part at Rejector signals - Group A and Group B. You choose which rejector is associated with Group A and/or Group B. You can have both groups associated with the same rejector, if desired. See **Extended I/O signals** (see "**Extended I/O signals - firmware up to F259**" on page 96).

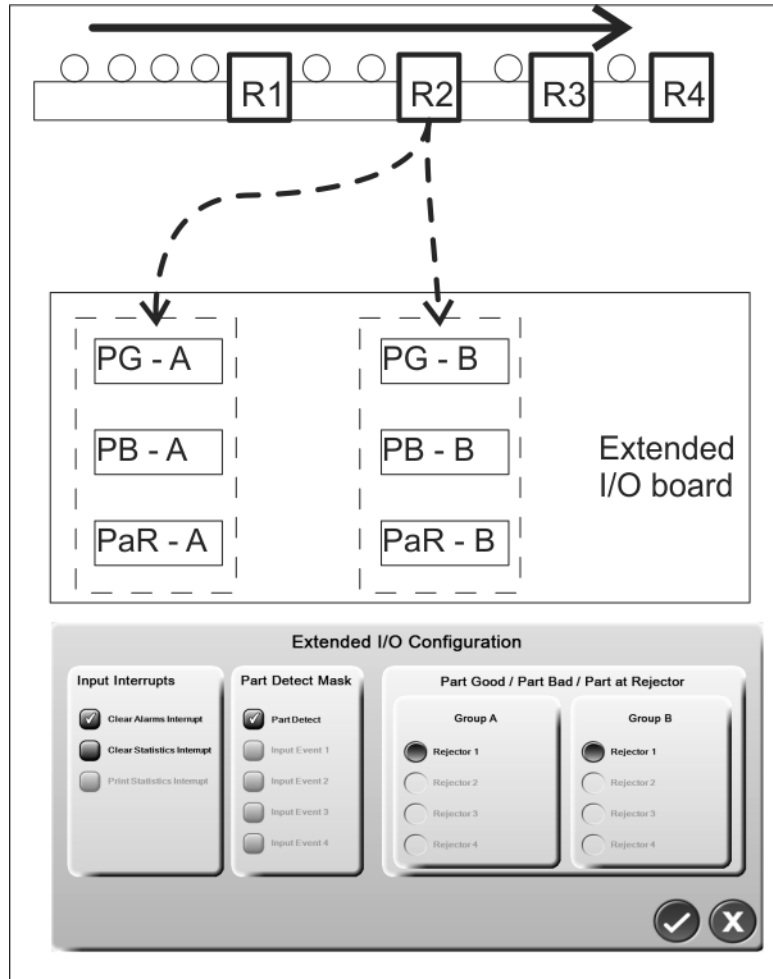
❖ *Note: If your system has a 2-channel Part Tracker board, then the lane has up to two rejectors. If your system has an 8-channel Part Tracker board, then the lane has up to four rejectors.*

Example 1 below: Group A is triggered when the part passes Rejector 2, and Group B is triggered when the part passes Rejector 4. The illustration below shows a basic block diagram with a conveyor with four rejectors. Those rejectors output a signal to the Extended I/O board, based on the Extended I/O configuration.

- **R** = Rejector
- **PG** = Part Good signal, Group A and Group B
- **PB** = Part Bad signal, Group A and Group B
- **PaR** = Part at Reject signal, Group A and Group B



Example 2 below: Group A is triggered when the part passes Rejector 2, and Group B is also triggered when the part passes Rejector 2.



Chapter 12

Asynchronous Correlation (Optional)

In FHCP 3X systems, a set of sensors (PKT, MP1, MP2, and PD1) gather correlation information from the filler and capper, and transfer it to the Intellispec via a shift register. The shift register is loaded with correlation information at the PD1 sensor. See the diagram below.

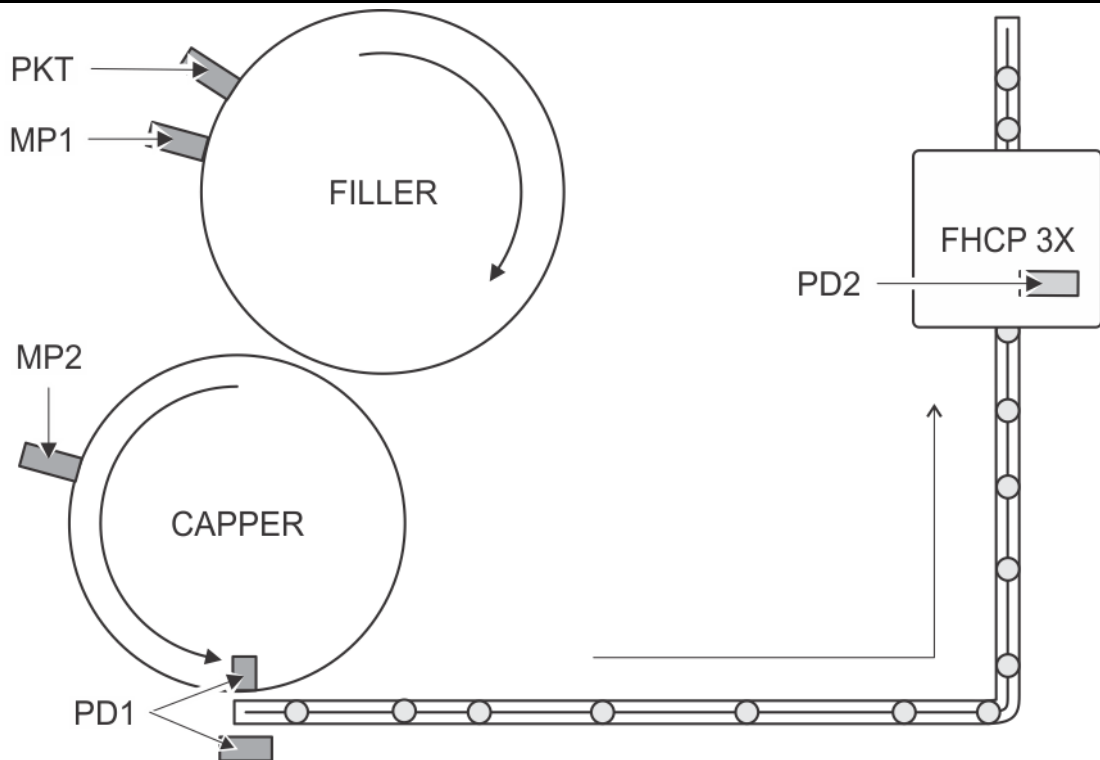
A second part detect sensor, PD2, which is located inside the FHCP 3X inspection module, unloads the information from the shift register. Parts inspected by the FHCP 3X module have the correct machine part data, so that defects can be correlated back to the machine parts.

Below is a basic system diagram showing the locations of the asynchronous correlation sensors. Your plant may be configured differently.

Some plants may choose to provide the correlation signals via their PLC. In this case, the PKT, MP1, MP2, and in some cases, the PD1 sensors would not be required. If this is done, it is important that the plant verify proper timing of their PLC generated signals.



Important - To maintain proper correlation during inspection, do not remove bottles between PD1 and PD2. Also make sure that bottles do not fall - fallen bottles between PD1 and PD2 will shift the correlation data.



Asynchronous Correlation Hardware Setup FHCP 3X EZ

Sensor Setup

There are four sensors associated with asynchronous correlation. To connect the sensor cables to the FHCP 3X system, use the 8-port I/O box located underneath the inspection module. For details, refer to this diagram: Wiring Diagram FHCP 3X module - sheet 5

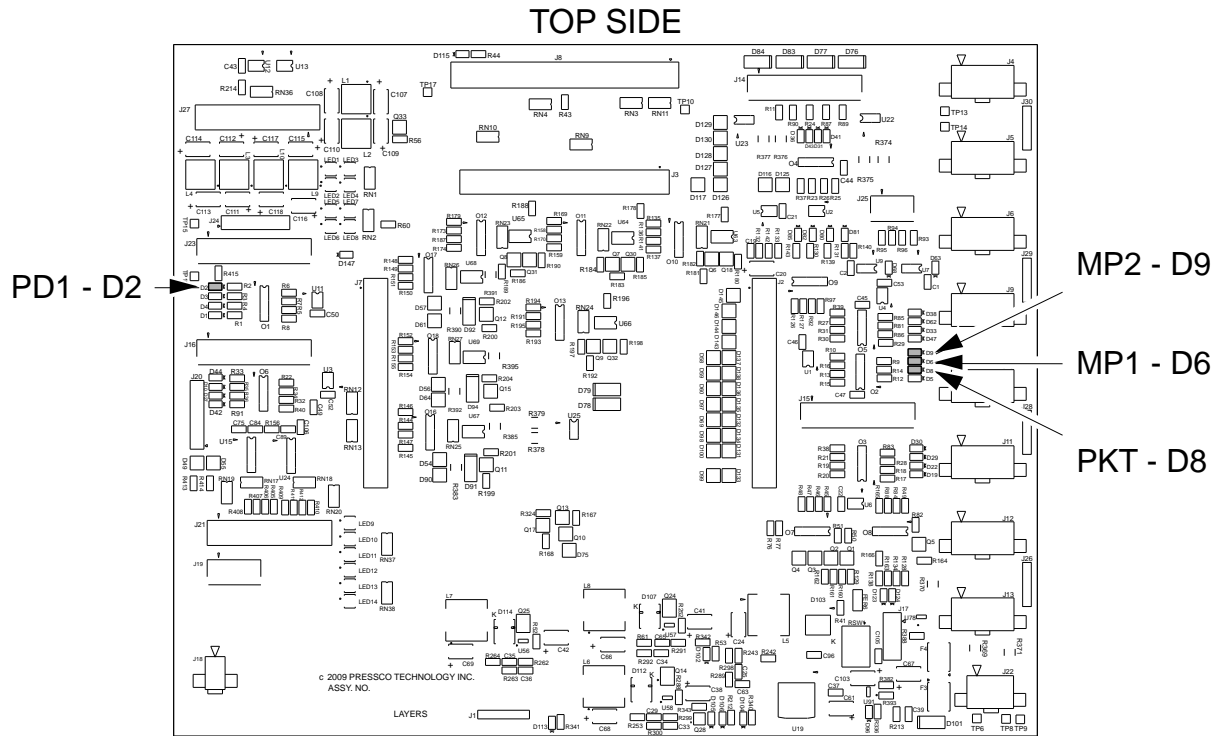
Set up the sensors as follows:

- **PKT** - can be mounted on filler or capper. It detects every pocket.
- **MP1** - triggers once per revolution of the filler wheel
- **MP2** - triggers once per revolution of the capper wheel
- **PD1** - the ultrasonic sensor mounted at the capper exit. It detects each part exiting. It is important that this sensor be positioned at a point where it is guaranteed that bottles will complete the transfer to the conveyor if the capper starwheel stops. It is also important that it be positioned where there is minimal part slippage (example of a good location: as close as possible to the exit of the starwheel pocket, without violating the preceding requirement).

Sensor Verification

Use a high speed camera and look at the LEDs on the part tracker board to verify the following:

- Make sure that **MP1** and **MP2** pulses occur in between **PKT** pulses. The pulses do not need to be exactly in the middle, but make sure there are a couple milliseconds between the leading edges.
- Make sure that the **PD1** pulse is slightly offset from the **PKT** pulse. The reason for this is that PD1 loads the shift register, and you do not want to load a value into the shift register while the value is changing.




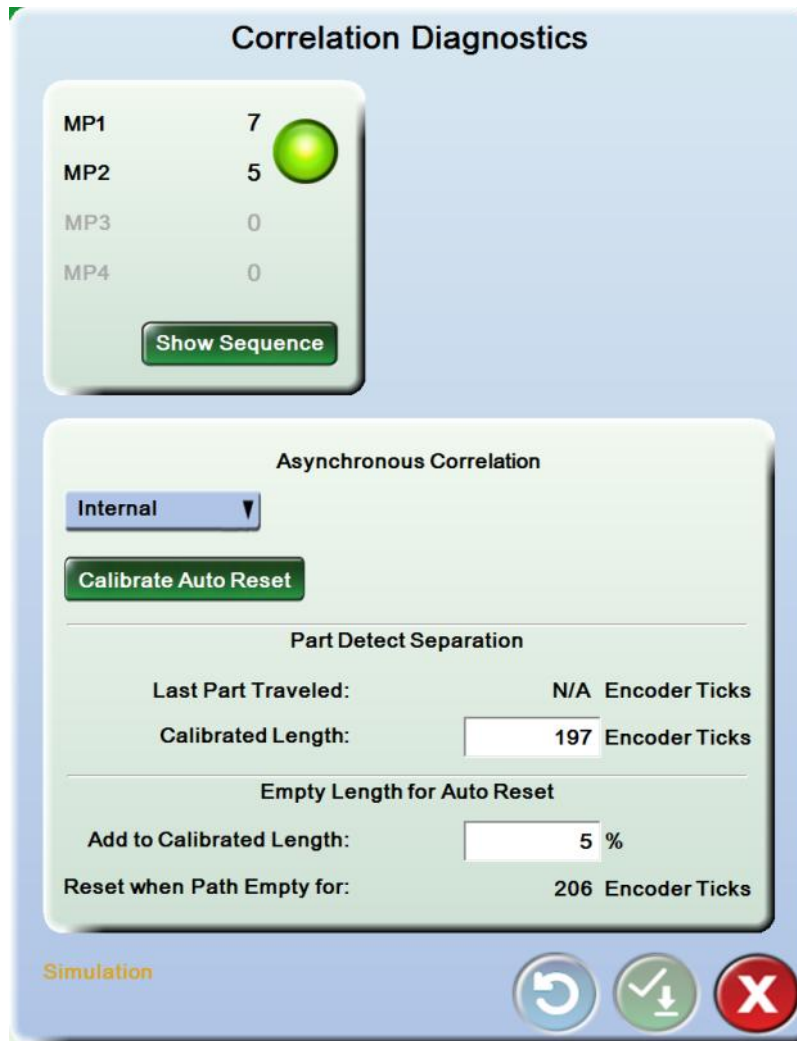
Asynchronous Correlation Software Setup FHCP 3X

(Optional) A combination of hardware and software that ensures the Intellispec system is tracking parts properly. The instructions below are for a filling/ capping operation. Assume there are 144 filling stations and 36 capping stations. For other configurations, the procedure is the same, but the numbers differ. See Asynchronous Correlation Drawing for more information.

SOFTWARE SETUP

➤ To enable Asynchronous Correlation:


From Lane or Sensor Overview mode, select  | Lane Setup | Select Features | check Asynchronous Correlation. The system will take you to the Correlation Diagnostics dialog. For information about "Show Sequence," see Correlation Diagnostics

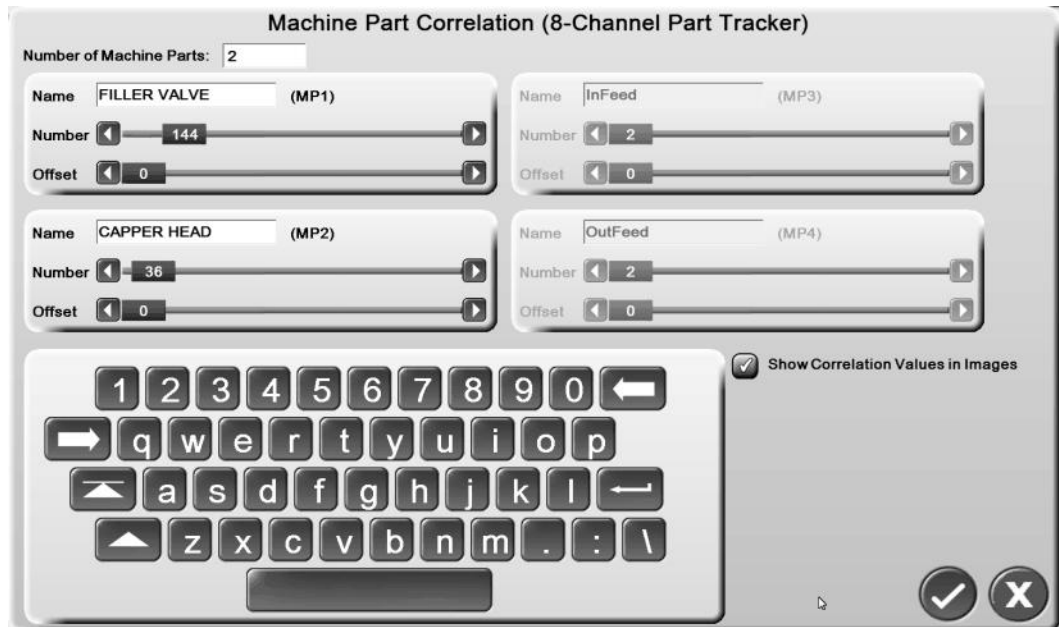


CORRELATION SETUP

Next, set up the correlation.

➤ **To set FHCP correlation:**

1. Set up the correlation machine parts: from Lane or Sensor overview mode, select  | Lane Setup | Machine Part Correlation.




2. Set MP1 as Filler Valve with 144 parts.
3. Set MP2 as Capper Head with 36 parts, as shown above. Offsets should remain at zero at this time.
4. In the above screen, check the box to Show Correlation Values in Images.
5. Click OK to accept the changes and exit.

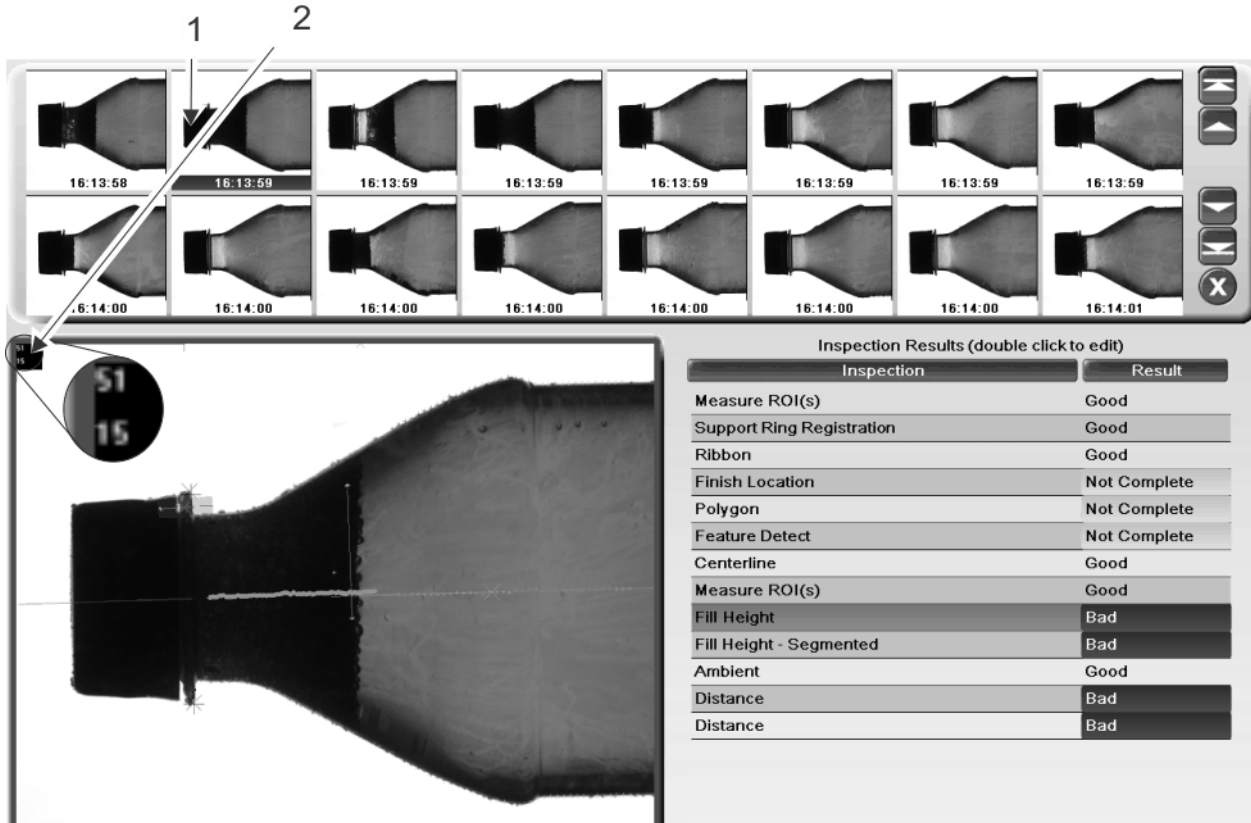
SENSOR COUNT VERIFICATION

Next, verify that the sensors are set up properly.

➤ **To verify the sensor count:**

1. Disable the rejectors for all cameras: from Lane Overview mode, select  | Lane Setup, Rejecting, then select **Sensor Reject Enable/Disable**.
2. From the Enable Reject menu, click the **None** button to disable the rejector for all cameras. Select OK to accept the changes and exit. You should see a trash can with a line through it underneath the stop light on the Intellispec screen (on the selected lane).
3. Change your inspection so that all cameras produce a reject, perhaps by inserting a sheet of paper over the tunnel inspection window.
4. Put the lane online to inspect at least 100 parts. Put the lane offline.
5. Look at the Reject Images from the last 100 parts, and verify that the correlation values tagged in the image are incrementing by one and not skipping. Skipped numbers or double counting is a sign that there is a setup problem with one of the sensors. Look at the sensor setup, or contact Pressco to determine the problem.

6. Enable the rejectors for all cameras through the Rejector Enable/ Disable menu. You should no longer see the trash can on the Intellispec screen.




- 1 - Reject Images - look at each one to verify correlation sequence
- 2 - Look at correlation values to determine correlation sequence

OFFSET SETUP

Next, set the offsets.

➤ To set the offsets:


1. Designate a station to produce a reject. This must be done for both machine parts (filler and capper head). You can do this simultaneously or one at a time. Since the offset must be verified by running more defective parts, it is best to set the station to produce a reject for the duration of this procedure.
2. Once the designated stations have been disabled (set to produce rejects), clear the Intellispec statistics, and begin to run the production line.
3. After a few revolutions of the wheels, you should see several defects logged. Stop the bottle flow and check the correlation data.
4. Set the offsets: From the Lane or Sensor overview screen, click the Tools button  | Lane Setup | Machine Part Correlation. Enter the correct offset values for both the Filler Valve and Capper Head.
 - Example 1: If station 86 on the filler was set to fail, and the system logs it as 19, then set the MP1 offset = 67. $[86-19 = 67]$
 - Example 2: If station 12 on the filler was set to fail, and the system logs it as 73, then set MP1 offset = 83. $[(144-73) + 12 = 83]$. This is because you cannot enter a negative offset. 144 is the number of filling stations.
5. Set the capper offsets in the same manner.
6. Once the offsets have been made, then continue to run the system for a few more cycles to verify that the designated reject stations are being logged in the correlation data correctly.
7. Re-enable the machine part stations to no longer produce defective parts.

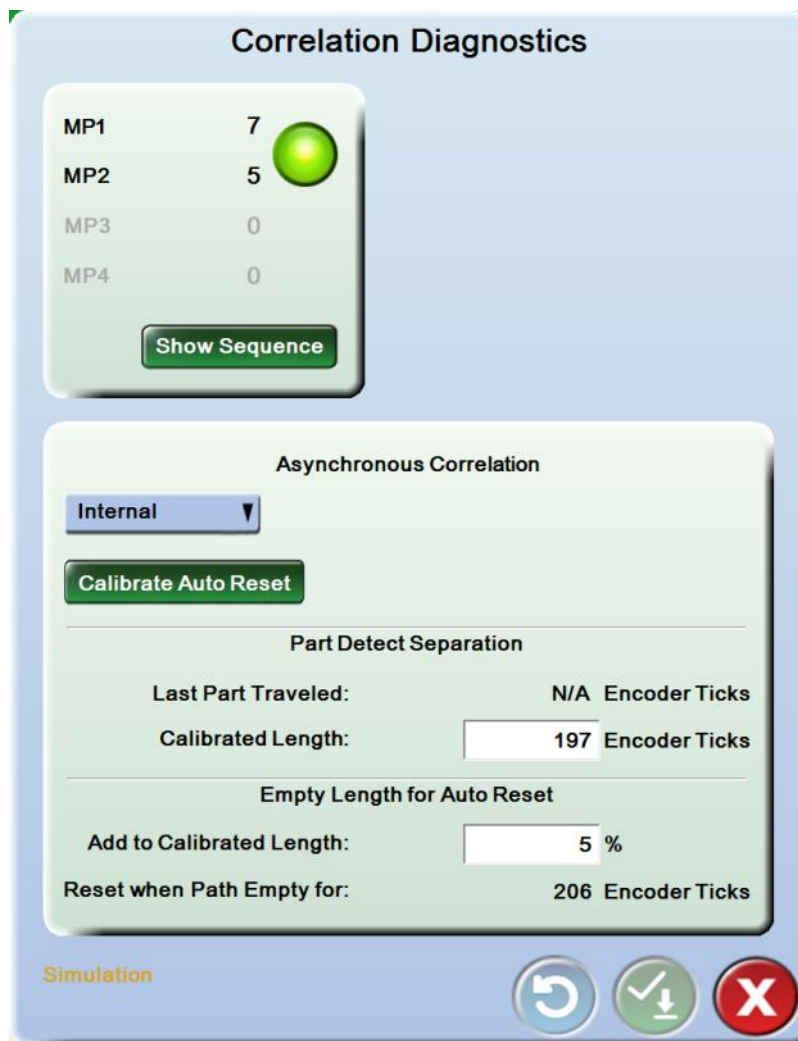
AUTO RESET SETUP

Auto Reset enables the Intellispec system to clear the FIFO shift register if it has not seen encoder ticks for a certain distance. Occasionally, correlation data can become out of sync due to the addition, or removal, or falling bottles on the conveyor. To get the system back in sync, the FIFO must be reset. The Auto Reset feature will automatically reset the correlation FIFO when it detects that bottles are clear of the zone between PD1 and PD2.

The system must first be calibrated before the Auto Reset feature will work.

➤ To calibrate Auto Reset:

1. Make sure that:
 - The capper is stopped
 - The conveyor is running
 - There are no bottles between PD1 and PD2
2. Go to the Correlation Diagnostics menu: from the Lane or Sensor Overview screen, select  | Hardware Setup | Correlation Diagnostics.



3. Click the **Calibrate Auto Reset** button.
4. Place a bottle on the line, first triggering the PD1 sensor, and allow the conveyor to carry the bottle past PD2.
5. Click the **Calibrate Auto Reset** button again to stop the count. The system learns the distance between PD1 and PD2 in encoder ticks. The value will be displayed in the **Calibrated Length** box.

Asynchronous Correlation parameters:

Last Part Traveled

This is the measured distance between PD1 and PD2, for the last part that passed PD2. It is updated for each part seen during calibration.

Calibrated Length

The distance (in encoder ticks) between part detects PD1 and PD2 to be used by the system. It is set automatically when using Calibrate Auto Reset, or can be changed manually.

Empty Length for Auto Reset - The length where no part is seen in the path. Auto Reset will happen after this length.

Add to Calibrated Length

If you want the system to perform the Auto Reset at a position AFTER the FHCP 3X module on the conveyor, then use Add to Calibrated Length.

Example: set this to 20 (%) if you want Auto Reset to occur about 20% of the conveyor length beyond the FHCP 3X module. This is 20% of the distance between PD1 and PD2.

Reset when Path Empty for:

This value is the **Calibrated Length** between PD1 and PD2 plus the **Add to Calibrated Length** value.

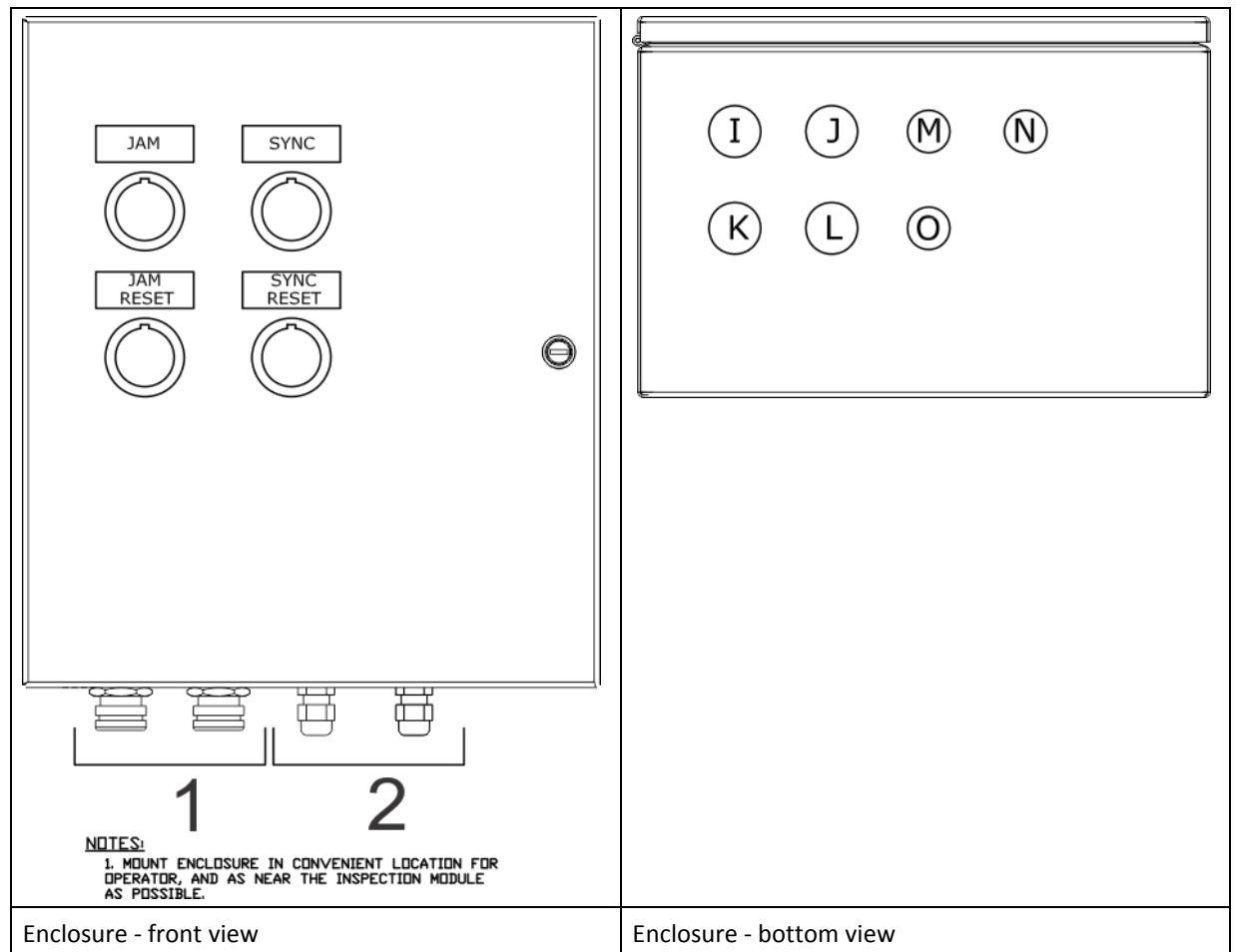
Example: if **Calibrated Length** is 3000 encoder ticks and **Add to Calibrated Length** is 10, then "**Reset when Path Empty for:**" is 3300 encoder ticks. This is sent to the Part Tracker. If the Part Tracker does not see a part detect on PD1 for 3300 encoder ticks, it triggers the **Auto Reset** logic.

Chapter 13

Enclosure PLC Interface Jam Detect (Optional)

This optional box contains a Programmable Logic Controller (PLC) interface that interfaces with the **Extended I/O** (see "**Extended I/O (Optional)**" on page 95) board and various sensors. It performs:

- jam detection
- correlation reset
- sending data to the customer Line Information System



➤ **1 - Four (4) 3/4 inch sealite fittings:**

I - Extended I/O from inspection system

J - CAT6 from inspection system

K - 120 VAC from inspection system

L - I/O from blow molder

➤ **2 - Three (3) 1/2 inch cord grip fittings:**

M - Sensor, capper exit (split)

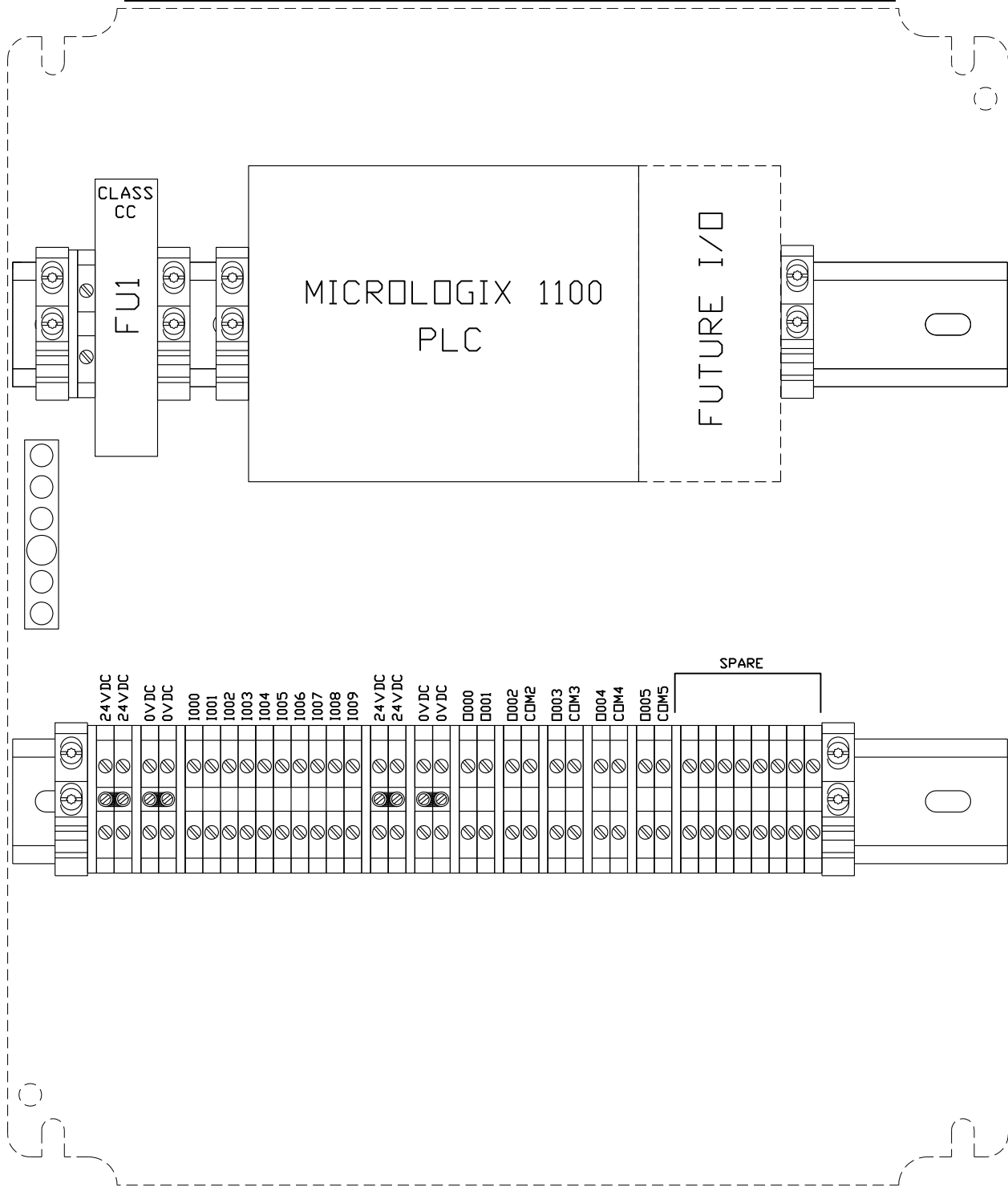
N - Sensor, reject confirm (split)

O - Sensor, reject bin

Enclosure PLC Interface Jam Detect components

The internal components of the enclosure are shown below. Replaceable fuse is:

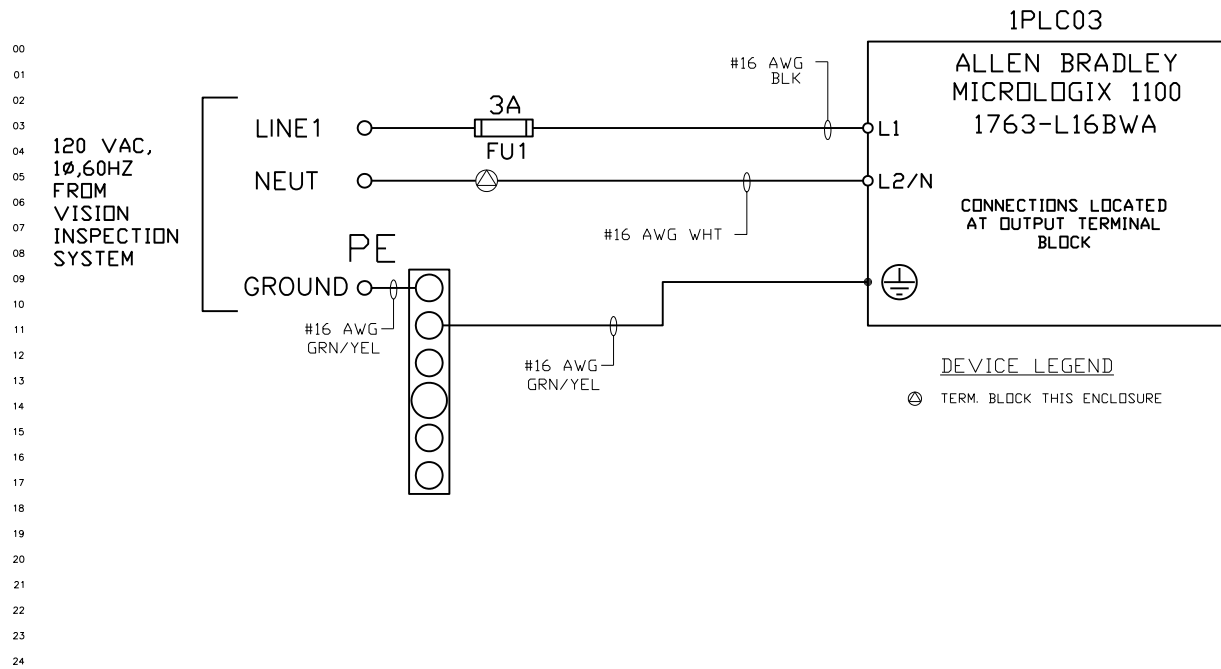
FU1	Fuse 1 - 3A 600V Class CC Time Delay. Pressco part number 54286
-----	---



Electrical Diagram Enclosure PLC Interface - sheet 1

70576E sheet 1

AC POWER SECTION



WIRING NOTES: UNLESS OTHERWISE SPECIFIED.

UNGROUND AC POWER CONDUCTORS ARE BLK, AWG AS SPECIFIED

GROUND AC POWER CONDUCTORS ARE WHT, AWG AS SPECIFIED

+24 VDC POWER TO DEVICES IS #16 BLUE, COMMON IS #16 BLU/WHT

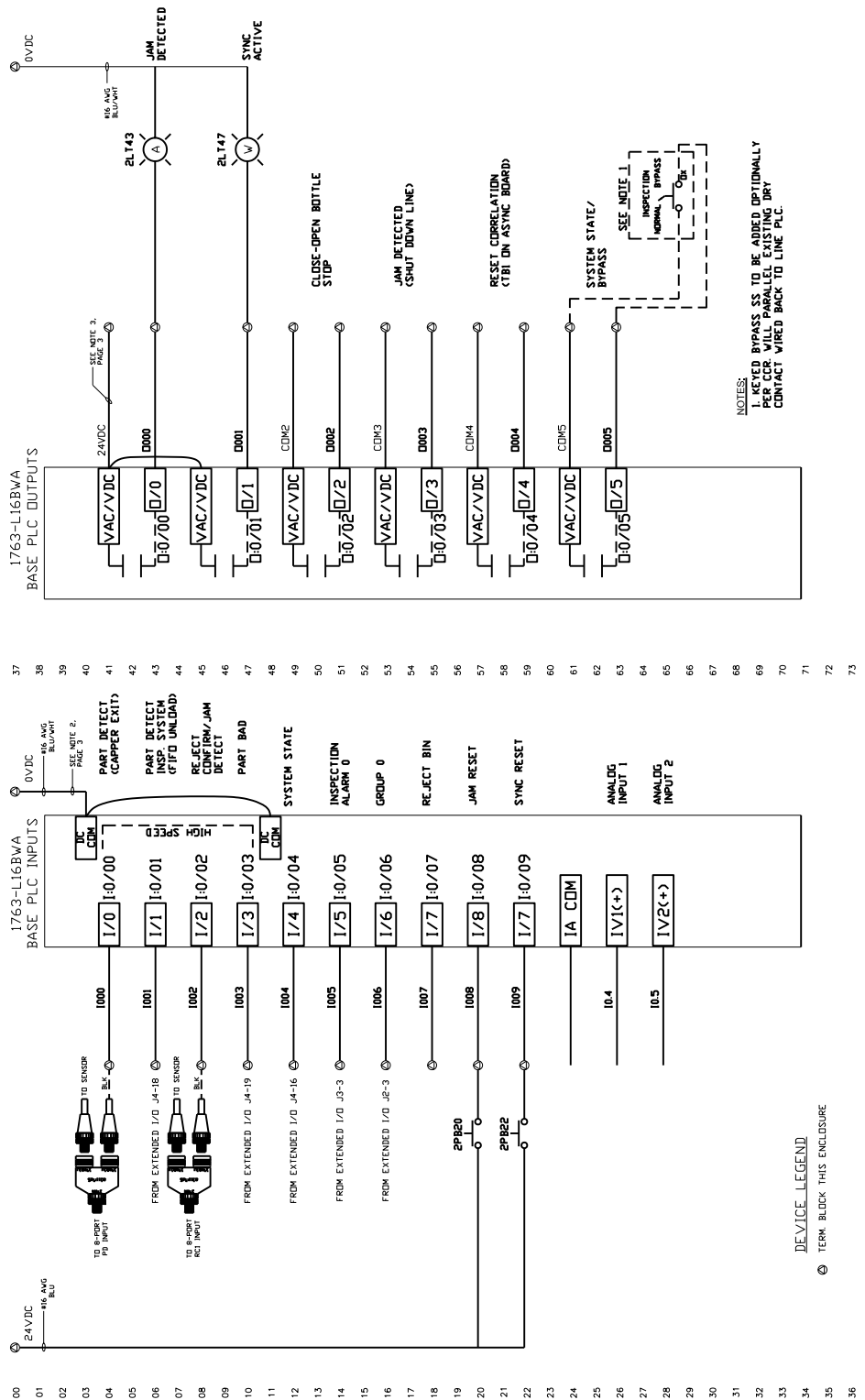
+24 VDC I/O WIRING IS #18 BLUE

GROUND IS #16 GREEN/YELLOW

Electrical Diagram Enclosure PLC Interface - sheet 2

70576E sheet 2

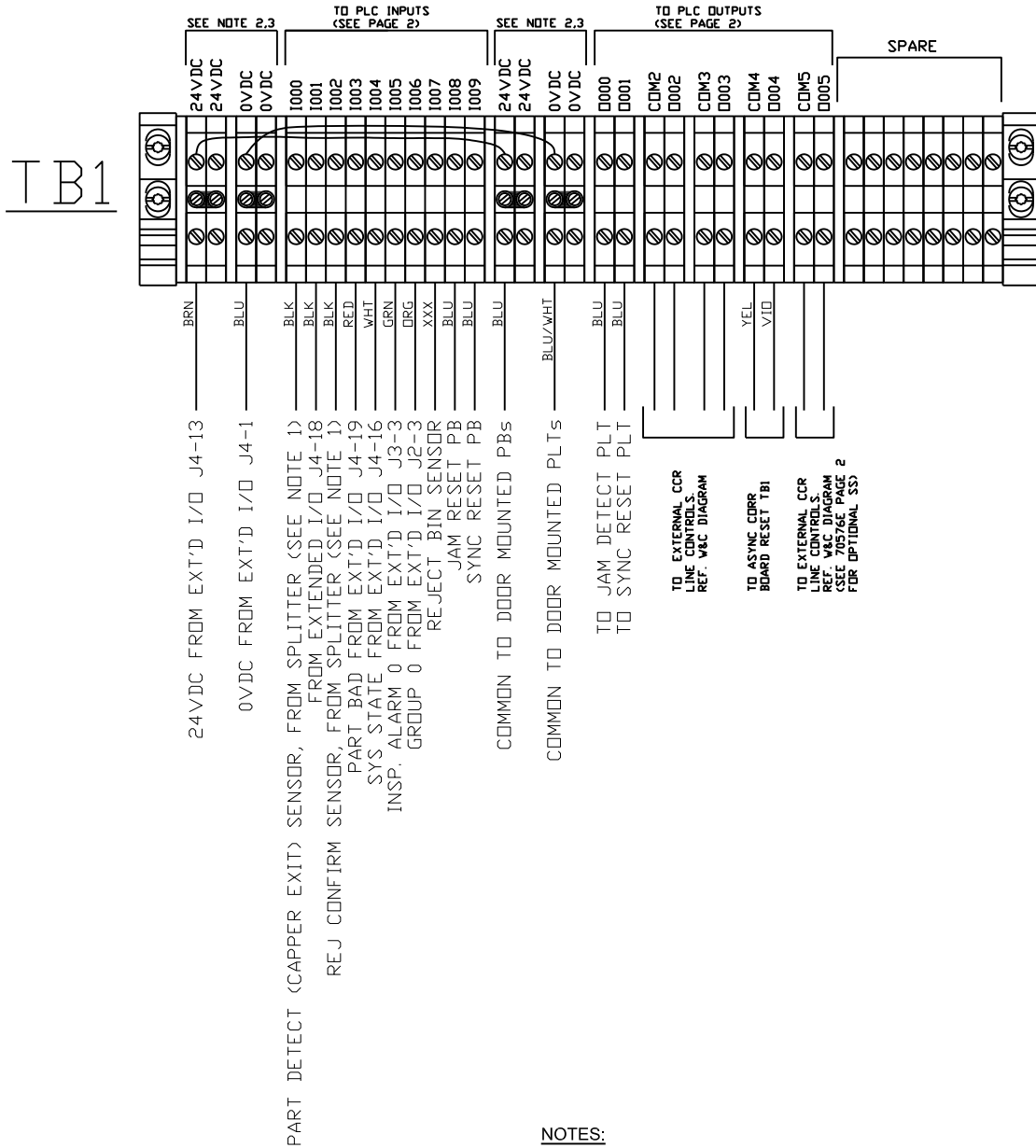
**WIRING NOTES: UNLESS OTHERWISE SPECIFIED,
 UNGROUNDED AC POWER CONDUCTORS ARE BLK. AWG AS SPECIFIED
 GROUNDED AC POWER CONDUCTORS ARE WHI, AWG AS SPECIFIED
 +24 VDC POWER TO DEVICES IS #16 BLUE, COMMON IS #16 BLUE/WHITE
 +24 VDC I/O WIRING IS #18 BLUE
 GROUND IS #16 GREEN/YELLOW**



Electrical Diagram Enclosure PLC Interface - sheet 3

70576E sheet 3

TERMINAL BLOCK WIRING DETAIL



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

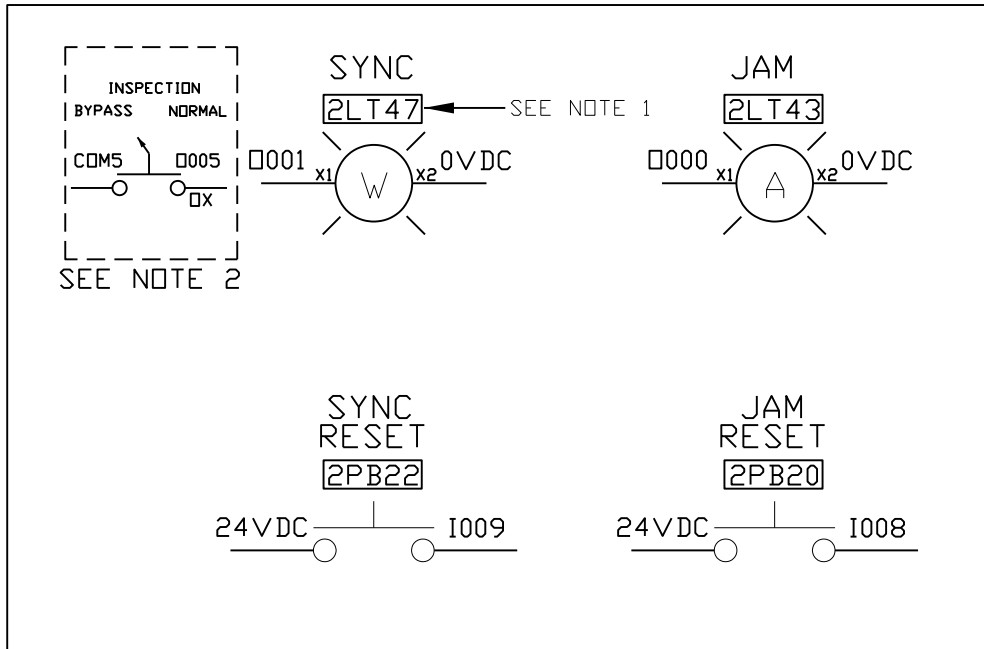
NOTES:

1. CONNECT ONLY THE BLACK WIRE OF THE M12 CABLE TO THE TERMINAL BLOCK. WHT,BRN,BLU TO BE TRIMMED BACK.
2. INSTALL JUMPERS BETWEEN COMMONS AS SHOWN. BLUE FOR 24VDC, BLU/WHT FOR 0VDC.
3. FOR PLC INPUTS, RUN 0VDC FROM TOP SIDE OF TB1 TO FIRST DC COM TERMINAL ON PLC AS SHOWN ON PAGE 2. THEN JUMPER TO SECOND DC COM TERMINAL. FOR PLC OUTPUTS, RUN 24VDC FROM TOP SIDE OF TB1 TO FIRST VAC/VDC TERMINAL ON PLC AS SHOWN ON PAGE 2, THEN JUMPER TO SECOND.

Electrical Diagram Enclosure PLC Interface - sheet 4

70576E sheet 4

OPERATOR DEVICES AS VIEWED FROM INSIDE OF ENCLOSURE DOOR



NOTES:

1. APPLY LABELS ADJACENT TO DEVICES ON "INSIDE" OF DOOR PER TEXT INSIDE RECTANGLES.
2. THIS SWITCH IS OPTIONALLY INSTALLED ON-SITE

WIRING NOTES: UNLESS OTHERWISE SPECIFIED,

- UNGROUNDING AC POWER CONDUCTORS ARE BLK, AWG AS SPECIFIED
- GROUNDING AC POWER CONDUCTORS ARE WHT, AWG AS SPECIFIED
- +24 VDC POWER TO DEVICES IS #16 BLUE, COMMON IS #16 BLUE/WHITE
- +24 VDC I/O WIRING IS #18 BLUE
- GROUND IS #16 GREEN/YELLOW

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