ATLAS
CONTROLLER

ATLAS LEAK TEST CONTROLLER

OPERATIONS AND MAINTENANCE MANUAL

LACO TECHNOLOGIES

LACO TECHNOLOGIES

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Product Group: ATLAS Helium Charge Controller
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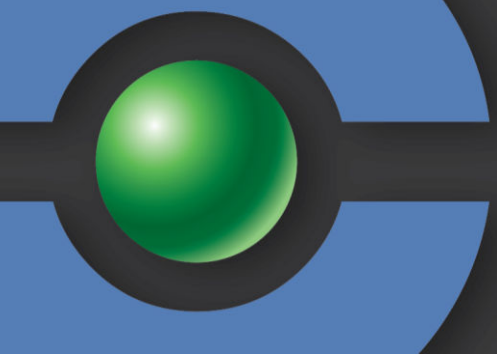

About LACO
LACO Technologies, Inc. is a leading manufacturer of vacuum and leak testing systems. Driven by innovation, service, and quality, we strive to be the best provider of standard and custom vacuum and leak testing solutions. Established in 1975, LACO Technologies is located in Salt Lake City, Utah, and serves customers across the United States and internationally. Owned by engineers, LACO is uniquely situated to provide innovative solutions for vacuum and leak testing applications. We work with diverse customer applications and are dedicated to Engineering Solutions You Can Trust.

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1. About This Manual

The *Atlas Leak Test Controller Operations and Maintenance Manual* applies to all Atlas versions. This manual is available for download at www.lacotech.com.

1.1. Target Groups

These operating instructions are intended for customers of LACO Technologies and owners of an Atlas Leak Test Controller. All information in this operating manual applies to the current state of the products development. To access previous manual versions, contact LACO Technologies.

1.2. Atlas System Manual

(Discussion of custom versions of Atlas, Like Hussmann or others)

1.3. Displaying Information

See below for the range of warning messages used in this manual. The text in these messages indicates the severity range of each warning message.

1.3.1. Warnings

DANGER: Imminent threat of danger resulting in death or severe injuries. Dangerous situation potentially resulting in death or severe injuries.

WARNING: Dangerous situation resulting in major injuries. Dangerous situation resulting in damage to property or the environment.

CAUTION: Dangerous situation resulting in minor injuries.

NOTICE: Dangerous situation resulting in damage to property or the environment.

2. Safety

2.1. Intended Use

The ATLAS controller is designed to be used as a part of a leak test system to control the test process and provide an operator interface. In this configuration, it is dependent on other components (TITAN VERSA detector, tooling, etc.)

The ATLAS can also be used as a stand-alone controller for helium charge only applications.

- ATLAS may only be used for leak testing with the gases specified in Technical Data, section 4.3
- You must install, operate and service this device only in compliance with these operating instructions.
- Adhere to the storage and usage recommendations.

2.2. Unintended Use

NOTICE: Improper use will cause all claims for liabilities and warranties to be forfeited.

Improper use is defined as usage for purposes deviating from the intended uses stated above

2.3. Owner Requirements

- Operate the device only when it is in technically perfect, working order.
- Operate the device only as specified in a safety-conscious and hazard-conscious manner, and in compliance with these operating instructions.
- Adhere to the following regulations and monitor their compliance:
  - Intended use.
  - Safety and accident prevention regulations
  - International, national, and local standards and guidelines
  - Additional provisions and regulations that are specific to the unit **Safety conscious.**
- Use only original parts or parts approved by the manufacturer.
- Keep these operating instructions available at the equipment location.

Personnel qualifications

- Allow only qualified service technicians to work with and on the device. The qualified service technicians must have received training on the device.
- Allow personnel in training to work with and on the device only under the supervision of trained qualified service technicians.
- Make sure that the authorized personnel have read and understood the operating instructions and all other applicable documents, especially the information regarding safety, maintenance, and repairs, before starting work.
- Never perform maintenance on the system with the power on.

2.4. Operator Requirements

- Read, observe, and follow the information in these operating and working instructions created by the owner, especially the safety instructions and warnings.
- Carry out any work only based on the complete operating instructions.
- If you have any questions regarding operation or maintenance that you cannot find answers to in these instructions, then please contact LACO customer Service.
    - **Phone:** 801-486-1004 | Toll Free: 800-465-1004
    - **Email:** Technical Support: techsupport@lacotech.com
- When using this equipment, be sure to follow the safety procedures outlined by your facility. These safety procedures should cover the two primary types of hazard training: (1) equipment hazards and (2) facility-related hazards.
- Never override or bypass any hardware or software interlocks.
- All safeguard devices must be in place when equipment is in operation. Operators, set-up operators, helpers or installation personnel should not alter, remove, or disable safety equipment.
- The ATLAS must be operated according to the specification in this manual, otherwise the protective measures may be impaired.

2.5. Dangers

DANGER: This device was built according to recognized safety regulations. Nevertheless, improper use or maintenance can result in danger to life and limb of the operator or other persons and damage to the device and other property. In order to prevent safety issues, follow the items listed below.

- Use the equipment only as intended (section 2.1)
- Only trained personnel should use the equipment. (section 2.2, 2.3, 2.4)
- Follow all safety labels.
- Follow all safety procedures when servicing equipment.

Below are summarized potential risks or hazards to service or operator personnel.

Electrical Dangers

WARNING: Dangers from Electrical Power

- Considerable voltages arise inside the device. Touching parts where electrical voltage is applied can result in death.
- Disconnect the device from the electrical power supply prior to any installation and maintenance work. Make sure that the electric power supply is reconnected with authorization. Testing live parts results in danger to life.
- Before starting the leak test, disconnect electrically operated test objects from the power supply. Make sure that the electric power supply is reconnected with authorization. The device contains electric components that can be damaged from high electric voltage.
- Before connecting the device to the power supply, make sure that the supply voltage specified on the device is the same as the local power supply.

Vacuum Force Dangers

WARNING: Dangers from Vacuum Forces

- If equipped with an external part evac pump, there may be considerable vacuum suction at the part charging/evac connection. Take care to not allow debris, small objects, clothing, etc. to be sucked-up by the controller.

High Pressure Gas Dangers

WARNING: Dangers from High Pressure Gases

- Never exceed the recommended pressures outlined in this document and identified on the system.
- Never adjust or remove pressure relief valves.
- Overpressure may destroy the vacuum pumps, the vacuum system, and the gaskets.
- Do not create an overpressure with the device.

2.5.1. Dangers from Liquids and Vapors

WARNING: Dangers from Liquids and Vapors

- Liquids and chemical substances can damage the device.
- Adhere to the restrictions of use.
- Do not suck up liquids with the device.
- Never contact toxic, caustic, microbiological, explosive, radioactive or other harmful substances with the device.
- Only clean the device using mild household detergents. Hydrogen and air form a highly explosive mixture.
- Do not use tracer gases with a hydrogen concentration > 5%.
- Only use the device outside potentially explosive areas.
- No smoking. Do not subject the device to open fire and avoid sparking.
- If condensable gases or vapors are measured, there is a risk of pump corrosion and damage.
- If part of a leak test system, do not test gas whose molecules contain halogens such as fluorine or chlorine. If these gases are measured with the device, the cathode layer of the ion source may be attacked. This may result in the burning out of the leak detector filament cathode.

Moving & Tooling Dangers

WARNING: Dangers from Moving Machine Parts or Tooling

- Keeps hands or other body parts clear of any moving parts.
- Test all safety devices, such as light curtains, safety gates and two hand controls (if included), at the beginning of each shift when the equipment is to be used.
- Lock out power and gases when performing service or maintenance.

2.6. Equipment Safety Practices

2.6.1. Process or System Faults

Process or System faults are monitored and controlled by the logic controller (PLC). For more information on Fault troubleshooting see section 7. When a fault occurs the system stops, displays a red light and the screen indicates the specific fault reason. The system will retain the fault until it is cleared. To clear, press the ABORT/RESET button, which will put the system into a recovery routine. If the indicator on the screen remains illuminated, then one or more faults are still active.

CAUTION: Risk of injury when carrying the Atlas controller .

Process or system faults do not remove hazardous voltage from the system. Only authorized, qualified, trained personnel should service this equipment. Do not operate the system with the enclosure open.

3. Scope of Delivery, Transport, Storage

3.1. Shipment Items

- ATLAS Controller
- ATLAS Supplementary Parts Bag:
  - ATLAS hardcopy manual
  - USB flash storage drive (2Gb) pdf Atlas manual
  - 3M RJ-45 Ethernet Cable
  - (2) 10 AMP Fuse
  - (2) 3 AMP Fuse
  - 6'7" Power Cord
  - Oil Drain Connector (Available with Wet Pump Configurations)

3.2. Storage and Usage Conditions

Store and operate the ATLAS per the table located in section 4.3.1.

3.3. Unpacking, Handling, Shipping

3.4. Decommissioning

The device can be disposed of by the user or sent to LACO Technologies for disposal. The device is made of recyclable materials. Use this option to avoid waste and to protect the environment.

➔ Please comply with the environmental and safety regulations of your country when disposing of the device.

3.5. Service for the Atlas Controller

LACO Technologies offers first-class service of your Atlas Controller and associated equipment (TITAN VERSA), including:

- On-site maintenance.
- Overhaul and repair at the Salt Lake City Service Center
- Fast device replacement with refurbished exchange products in exceptional condition
- Expert advice on cost-efficient and quick solutions to your service needs.
- Original parts on all repairs and preventive maintenance

For more information on our services, see: LACO Service Solutions, or contact LACO Technologies directly:

- **Phone:** 801-486-1004 | Toll Free: 800-465-1004 (Service Department)
- **Email:** Service and Repairs: repairs@LACOtech.com

WARNING: Danger due to harmful substances

Products sent to LACO Technologies must be free of harmful substances. Products that are contaminated with radiation, toxins, caustic, or microbiological substances cannot be sent to LACO. When sending products to LACO, a Hazardous Material Declaration must be filled out and included with the leak detector.

4. Equipment Description

4.1. Function of Equipment

The ATLAS controller is designed to be used as a part of a leak test system to control the test process and provide an operator interface. In this configuration, it is dependent on other components (TitanTest leak detector, tooling, etc.).

The ATLAS can also be used as a stand-alone controller for helium charge only applications.

4.2. Equipment Connections & Diagram

Refer to section 5 for equipment connections and diagrams.

4.3. Technical Data Tables

4.3.1. Storage and Usage Table

Storage and Usage Specifications Table	
Storage Temperature	10 °C to 55 °C (14 °F to 131 °F)
Operation Temperature	10 °C to 35 °C (14 °F to 95 °F)
Max. relative humidity up to 31 °C (88 °F)	80 %
Max. relative humidity from 31 °C (88 °F) to 35 °C (95 °F)	linearly decreasing from 80 % to 50 %
Use	only indoors
Max. altitude above sea level	2000 m a.s.l.
Noise level	< 70 dB(A) (acc. to IEC standard)
Max Acceleration During Operation	1G (horizontal)
Pollution	II (According to IEC 61010 / Part 1: "Usually, only non-conducting contamination may occur. However, temporary conductivity caused by condensation is permissible at times.")

4.3.2 Mechanical Data Table

Feature	Mechanical Specifications
Controller Size	16” H x 16” W x 6” D
Mounting	Bottom or Rear mount
Electrical	90-250 VAC, 50/60 Hz, 500 Watts*, IEC C13 connection
Control System	Remote HMI Enclosure, 7.0” color touchscreen with start and option buttons
Communication	Ethernet & USB
Air Requirements	80-120 psig CDA
Test Methods	Hard Vac, He Charge Only, HATS, Accumulation, Sniff
Software Features	Data-logging, recipe based (up to 99), remote serial control
Customizable	Yes, process, hardware, and/or software

- Configurations with an external part evac pump are rated at 1000 Watts and must be CE rated.

4.3.3 Test Performance Specifications

Feature	Performance Specifications
Test Modes	Vacuum (Ultra, Fine, Gross) and Sniff (Fine)
Detectable Gases	Helium (He), ^{3}Helium, Hydrogen (H_2)
Startup Time	< 4 minutes
Response Time	< 0.5 seconds
Min Leak Rate:	< 1 x 10-11 mbarL/sec – ultra mode
Max Inlet Pressure	18 mBar (15 Torr) – gross mode
Inlet Helium Pump Speed	5 L/s (Ultra mode), 2.5 L/s (Fine mode)

4.3.4 Test Performance Specifications

Feature	Specifications
Control System	Remote HMI Enclosure, 7” color touchscreen
Communication	Ethernet & USB (Scanners, USB Drives, and serial by converter)
Data Logging	Test Summary and Stream csv files.
Test Recipes	100 custom test recipes
Remote IO	Ethernet IP based
Test Sequences	Easily customizable to customer testing needs

5. Installation

5.1. Mechanical Setup and Mounting

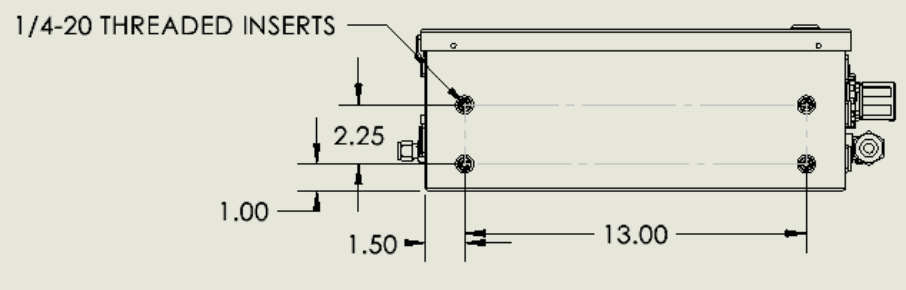
The ATLAS can be intergrading multiple ways, below are examples.

5.1.1. System Mounting

ATLAS intergrade within system will be located on the left side of the Titan Versa assembly cart (TV121015).

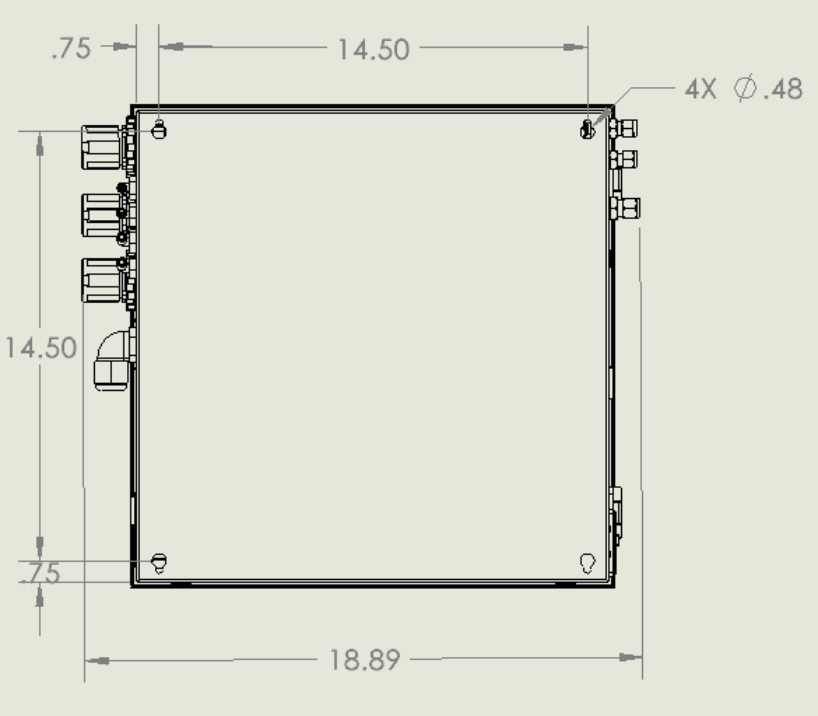
5.1.2. Bottom Mounting

The ATLAS enclosure is equipped with (4) 1/4-20 threaded inserts located on the bottom.



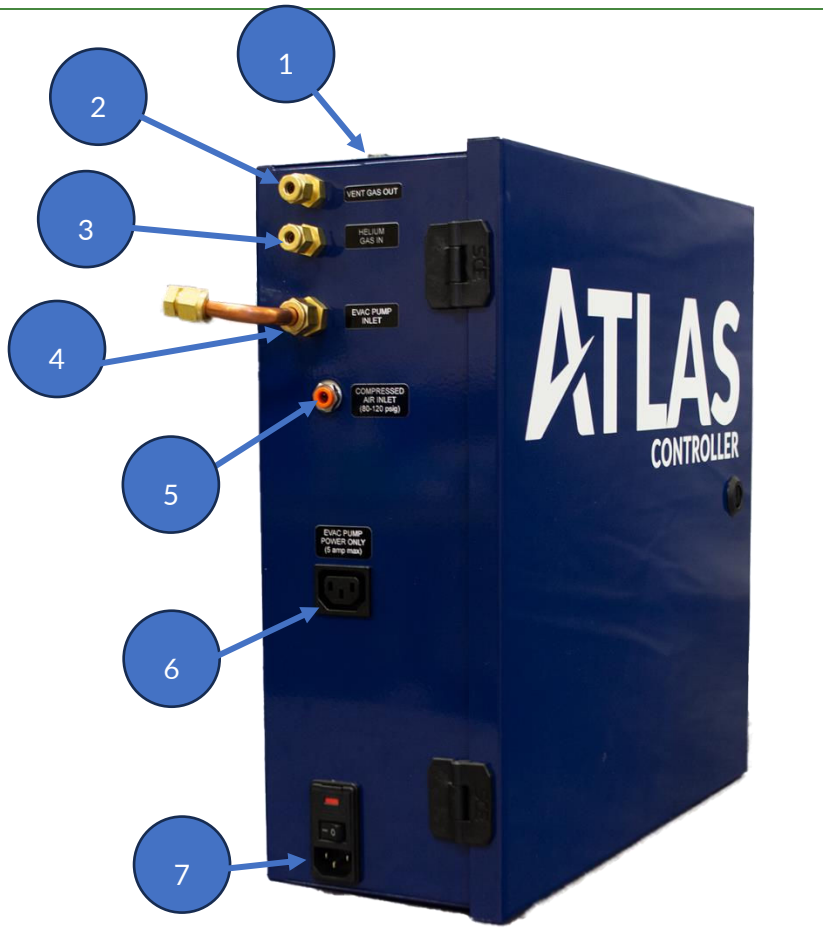
5.1.3. Back Mounting

Back of ATLAS enclosure is equipped with 4 mounting holes. Below are the dimensions for back mounting the enclosure.



5.2. Utilities Summary

ID	Equipment Feature	Size
1	Part Charging Connection	1/4 NPT
2	Part Vent Outlet Connection	1/4 OD tube
3	Part Helium Fill Supply Connection	1/4 OD tube
4	Part Evac Pump Inlet	3/8 OD tube
5	Compressed Air Inlet	1/4 Q.D.
6	Evac Pump Power Connection	N/A
7	Fused power entry module/power switch	N/A
8	Air Fill Regulator	N/A
9	Control Air Fill Regulator	N/A
10	Helium Fill Regulator	N/A
11	Tooling Pneumatic Output (Optional) (4)	5/32” OD tube
12	Electrical Wire Feedthrough (2)	1/2 CGB
13	Remote IO	DB-15
14	USB Port (2)	N/A
15	Ethernet Port (3)	RJ-45


1
2
3
4
5
6
7
VENT GAS OUT
HELIUM GAS IN
EVAC PUMP INLET
COMPRESSED AIR INLET (80-120 psig)
EVAC PUMP POWER ONLY (5 amp max)
ATLAS
CONTROLLER

8
9
11
10
12
14
13
15
AIR FILL REGULATOR
CONTROL AIR REGULATOR
HELIUM FILL REGULATOR
REMOTE IO
ATLAS
CONTROLLER

5.3. Gas Connections

5.3.1. Compressed Air Inlet

Connect clean, dry compressed air at 80-120 PSIG pressure to the ATLAS air inlet port. The tester comes with a 40-micron air filter. This filter should be changed every year or more frequently in dirty or high-use applications (See section 8). The ATLAS comes standard with standard male quick disconnect (QD) fitting. If desired, the customer can remove this fitting and attach their desired fitting to the ¼ female NPT port.

5.3.2. Helium Gas Inlet

Connect helium gas to helium inlet connection on the ATLAS. Verify that the helium source is regulated at or below the advertised maximum helium supply.

5.3.3. Part Vent Outlet

Connect a vent tube to the part vent connection on the ATLAS. This line should be plumbed away from the controller at least 15 feet (5m). Also, it is preferable to run the vent line vertical, to ensure the lighter helium gas does not increase the helium background near the test area.

5.3.4. Part Evac

If the ATLAS controller is equipped with part evacuation hardware it will have either Venturi pump or an external rotary-vane pump. The Venturi pump option will be contained within the controller enclosure. In both pumps cases ensure the pump exhaust gas is plumbed away from the test area with hose or hard plumbing. Ensure large ID hoses with minimal hose lengths are used. If pumps exhausts are restricted with small ID hoses or have very long exhaust lines, pump performance may be compromised.

5.3.5. Part Charging Connection

Ensure the part charging outlet on the ATLAS is connected to the tooling, chamber, or part to be tested. In cases where LACO provides entire test fixture or chamber, the entire test line will be provided by LACO. Otherwise, the customer will be required to provide a test line to part to be charged and leak tested.

Ensure the ID of the test line tubing matches the application needs. For example, testing a larger part or in a fast test cycle application would require a larger ID tubing to be used.

5.3.6. Control Air Regulator

5.3.7. Helium Fill Regulator

5.4. Electrical Power Connection

NOTICE: Equipment damage can occur due to incorrect supply voltage

An incorrect supply voltage may damage the device.

- Check whether the supply voltage specified on the ATLAS product label matches the supply voltage available on site. Verify the available power source matches product voltage.

Connect the device to the electric power supply using the supplied power cable.

5.5. Electrical Interfaces

Electrical interface connections are located on the right side of all ATLAS configurations. Section 5.2 utilities, all the interfaces, connection specifications, parts, and accessories used with each connection.

6. Operation

6.1. Prerequisites for Use

Refer to **Error! Reference source not found.** for information on initial settings. It is likely the operator will change the default settings to support their unique application.

> **NOTICE: Risk of seizing**
>
> Never move the controller while the unit is powered on, even if it is placed on a moveable cart.

Each time before powering on the ATLAS:

- Become familiar with the safety instructions (see
- Safety*)*.
- Check that all the connections are correct (see

- Installation).
- Ensure that controller will be operating in an environment free of tracer gas.
- Check the electrical network is properly attached to the connector using the power cable.

6.2. Power-On Process

- Connect the necessary accessories or equipment before powering on the device.

Verify proper operation voltage per the product label and switch on the device with the power entry module. The ATLAS will energize and go into startup phase. The RUN Light on the PLC will turn amber.

After startup is complete, the test screen appears, and the RUN light on the PLC turns green.

6.3. Power-Off Process

The Atlas can be powered off at any time by turning off the switch on the power entry module.

6.4. User Interface Features

6.4.1. Touchscreen Display and Buttons

The controller can be connected to a color touchscreen for software interface. If a touchscreen is not included, the controller can be connected to a virtual HMI screen through Ethernet connection using a VNC viewer.

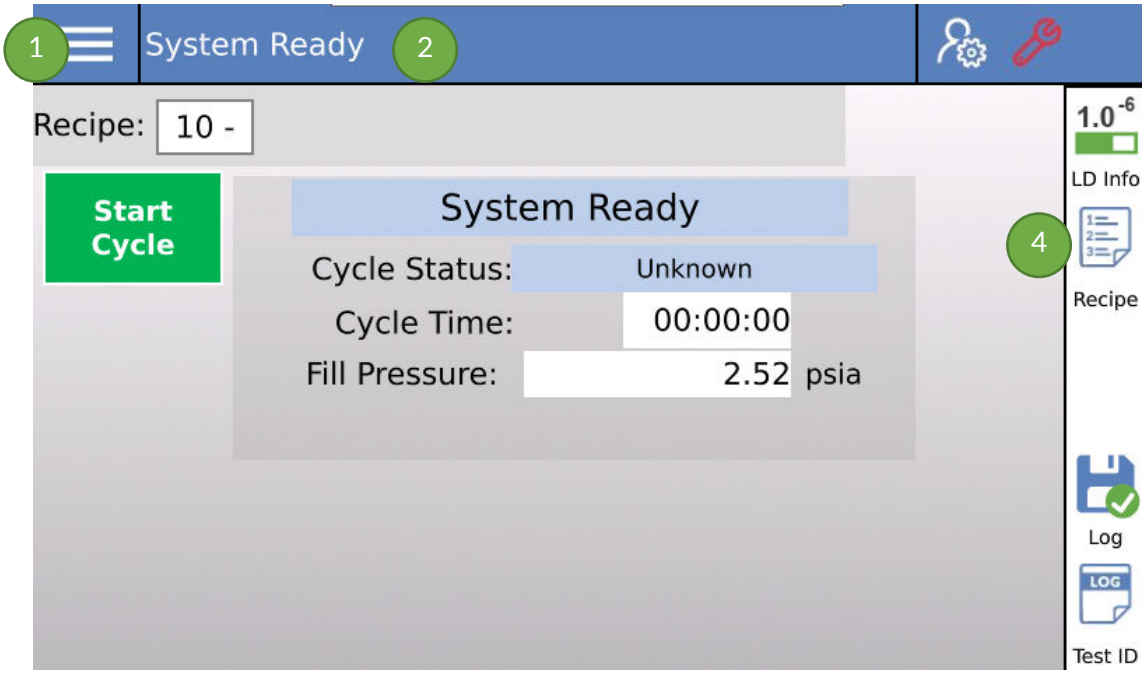
ID	Name	Function
1	Touchscreen Display	Press on the relevant area to perform the needed functions. The settings for many functions can be accessed quickly by pushing down on an icon for more than 1 second.
2	Start / Stop/ Reset	On screen button. When in standby mode, press button to start a cycle. When in test mode, press the button again to stop the test cycle. When a fault occurs and is fixed, press button to reset to standby mode.

6.4.2. Touchscreen Layout

The common areas of the touch screen are outlined below.

- Upper-left – Setting or test screen navigation icons.
- Upper-middle – Status text or screen name. Note that status text is also displayed on the bottom of the screen.
- Upper-right – Status icons.
- Right-side menu on test screens for Quick-Access features .

3



6.4.3. Screen Type Navigation

There are two main types of screens: Test or Settings. Test screens allow the user perform leak tests, while the settings screen allow the user to change device settings. In the upper-left of the screen there are two main icons that allow for access to either a settings screen or test screen.

Table 1 *Basic Screen Type Navigation*

Screen	Icon	Description
Test		Press Home icon to get to test screens.
Settings		Press Settings icon to show settings main menu.

6.4.4. Status Icons

In the upper-right section of all screens three status icons are available. These icons give the user current status information (see Table 2 below).

Table 2 *Status Icon Summary*

Function	Icon	Description
Login Level		Operator Login – Not set up by default. If configured, the base user has very limited access to change parameters.

Function	Icon	Description
		Technician Login – Access all features except advanced. (Default)
		Advanced Login – Login for service centers or advanced users.
Maintenance Items		Maintenance items due. Go to Maintenance Timers screen to check and update maintenance date.
Faults / Warnings		Fault active – Check part status on test screen for active fault.

6.4.5. User Access Levels

The ATLAS employs three user access levels: Operator, Technician, and Advanced. User levels are enabled by pressing the login level icon, then entering the correct password. Table 3 below summarizes the main features of each user level.

Table 3 *User Access Level Summary*

User Level	Icon	Description	Password
Operator		Allows user to start and stop cycles and run calibrations. Settings can only be viewed.	None
Technician		All functionality except Advanced functions	Determined by user
Advanced		All functions	5226

Operator Level

The Operator Level requires no password. This is the default level when the ATLAS is powered on.

Technician Level

To access the Technician level, press the LOG IN button and enter the password. The as-shipped password is 1234. The technician login will log out automatically after 10 minutes unless the machine is operating in manual mode. Press the CANCEL button while in Technician level to manually return to Operator level. The Technician level gives access to:

- Edit Recipe parameters

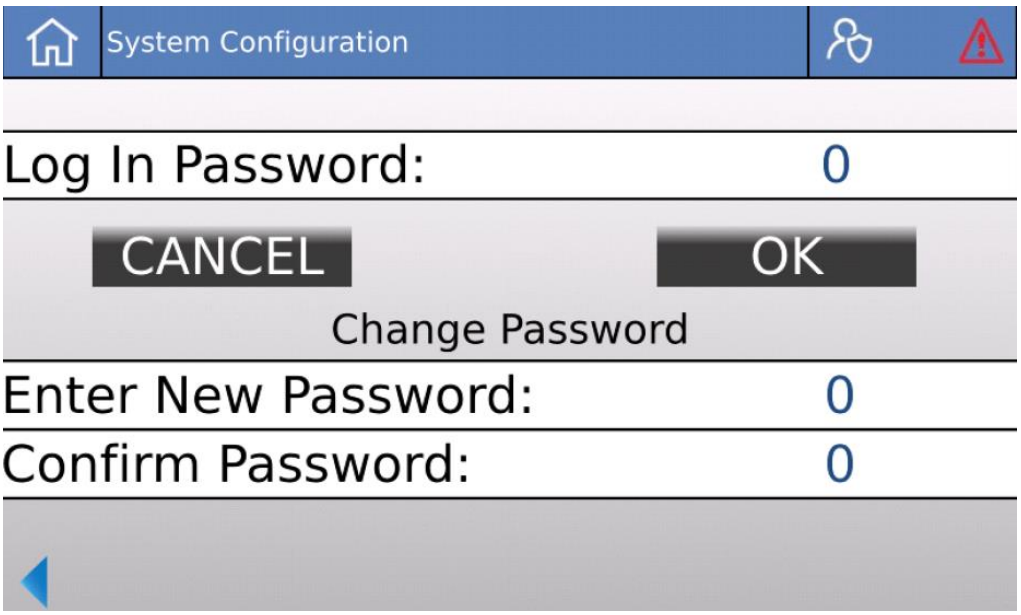
- Edit Maintenance parameters and reset intervals
- Operate the Machine in Manual Mode

Advanced Level

To access the Advanced level, press the LOG IN button and enter the password. The hard-coded password is 5226 (LACO on a key pad. The Advanced login will log out automatically after 10 minutes unless the machine is operating in manual mode. Press the LOGOUT button while in advanced level to manually return to Operator level. The Advanced level gives access to:

- All the features of the Technician Level
- Advanced settings o Calibration settings
- Change Technician level password*

*When logged on as Advanced, the Technician level password can be changed by entering 2 identical 4-digit numbers and pressing CHANGE. This option is not displayed when at Technician or Operator level.



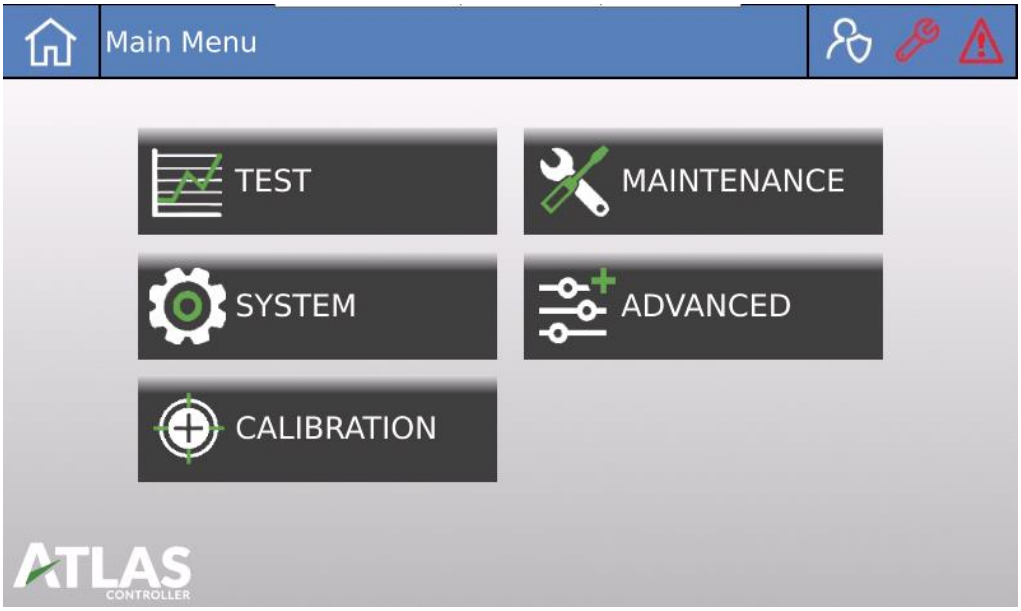
6.4.6. Screen Menu Structure

Table 4 *Screen Menu Structure*

Start Up	
Shut Down	
Test	
Test Graph	
Test ID	Test ID Setup
Settings	Test
	Calibration
	System
	Maintenance
	Advanced

6.5. Software Screens and Parameter Settings

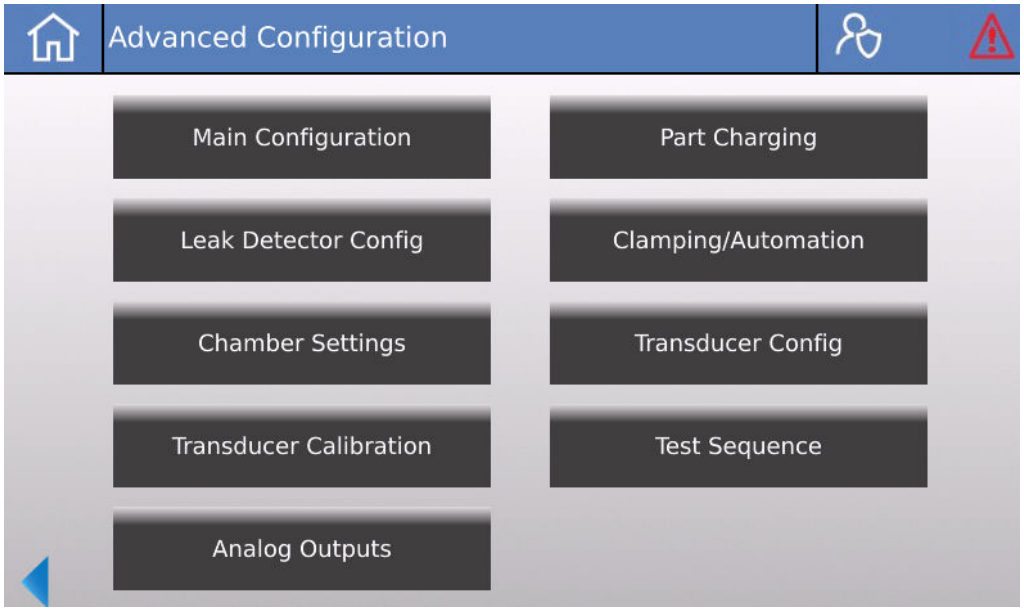
6.5.1. Main Menu



The main menu can be accessed by pressing the SETTINGS icon located on the upper-left of test screen. It provides access to four settings pages:

- Advanced
- Test
- Maintenance
- System
- Calibration

6.5.2. Advanced Settings Screen

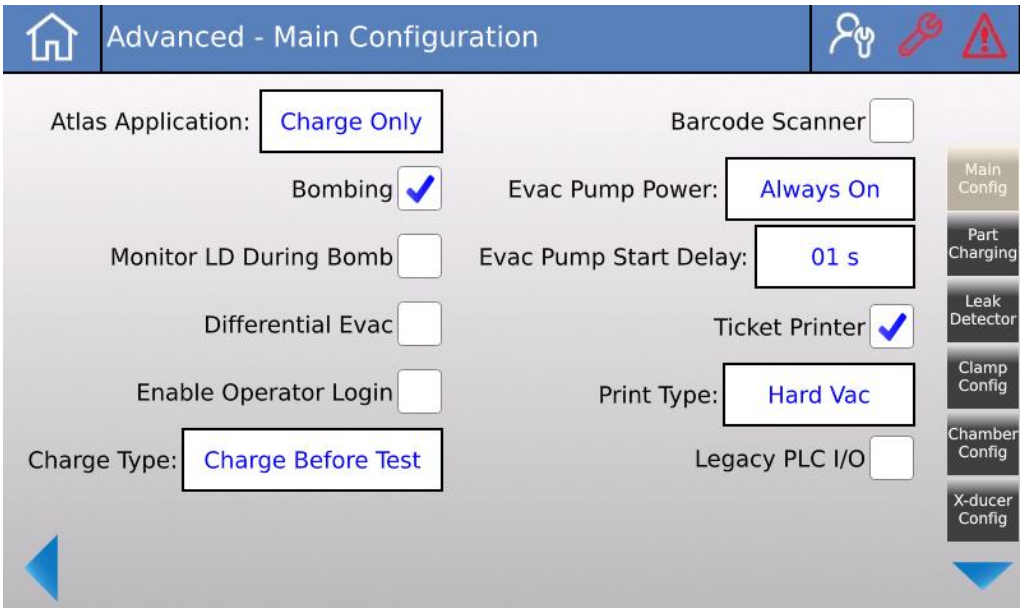


There are a total of nine advanced settings screens. They define the test type and application of the Atlas controller, as well as other operational parameters.

Use extreme caution when using advanced settings. Inadvertent changing of advanced settings can make the ATLAS controller inoperable or cause unsafe conditions.

All Advanced as-shipped settings will be recorded and provided in the accompanying As-Shipped Parameter Summary.

6.5.2.1. Main Configuration



Atlas Application Choose the correct application based on the controller's configuration and application. The available options are:

- Hard Vac
- Sniffing
- Charge Only

Bombing Indicates there is a helium bombing process.

Monitor LD During Bomb Indicates the controller will monitor the leak detector during bombing.

Differential Evac Indicates there is differential evac.

Enable Operator Login Check the box to activate operator user level.

Charge Type Choose whether to charge before or during the test when bombing.

Barcode Scanner Check the box to enable the use of USB barcode capability.

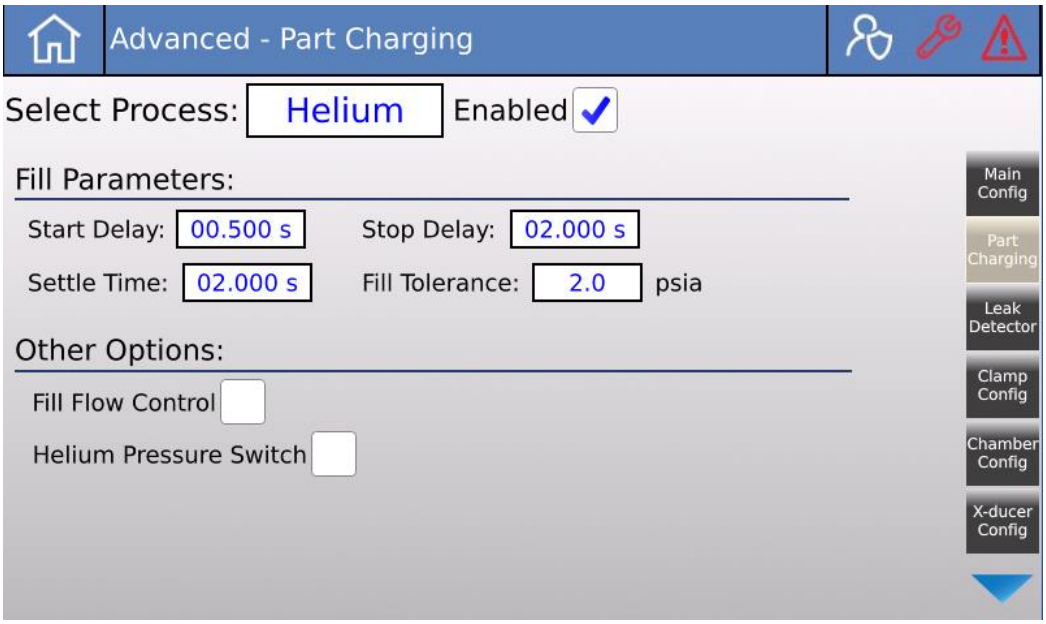
Evac Pump Power Determines when the evac pump power relay will be engaged. Choose from the following options:

- Venturi
- Always On
- Powered As Needed

Evac Pump Start Delay Delay time from when the pump is powered on to when the process continues.

Ticket Printer If a printer is included, ensure that this option is checked and that it is attached with the included USB to RS232 adapter. This cannot be on if communication is configured to RS232.

6.5.2.2. Part Charging Settings



Select Process Select the process to edit. The four available options are:

- Helium
- Evac
- Air
- Vent

Enabled Check the box to show the parameters of the selected process. Unchecking the box will also disable the process valve in manual mode.

Start Delay Delay time to allow the valve to fully open after the output is turned on.

Stop Delay Delay time to allow the valve to fully close after the output is turned off.

Settle Time After the pressure has reached the setpoint, the settle delay timer allows for the pressure to equalize before evaluating if the pressure is still in tolerance. This settle timer applies to both fill and evac operations.

Fill Tolerance This tolerance is a +/- in relation to the Recipe settings for the helium fill, air fill, evac, and part vent pressures. If the pressure is not within the setpoint +/- the tolerance during the fill step, a fault will occur.

Fill Flow Control Control the flow rate of the helium or air fill process.

Helium Pressure Switch Check the box if a pressure switch is installed at the helium inlet to monitor the helium supply pressure. The switch will cause a fault if the supply pressure is below the setpoint.

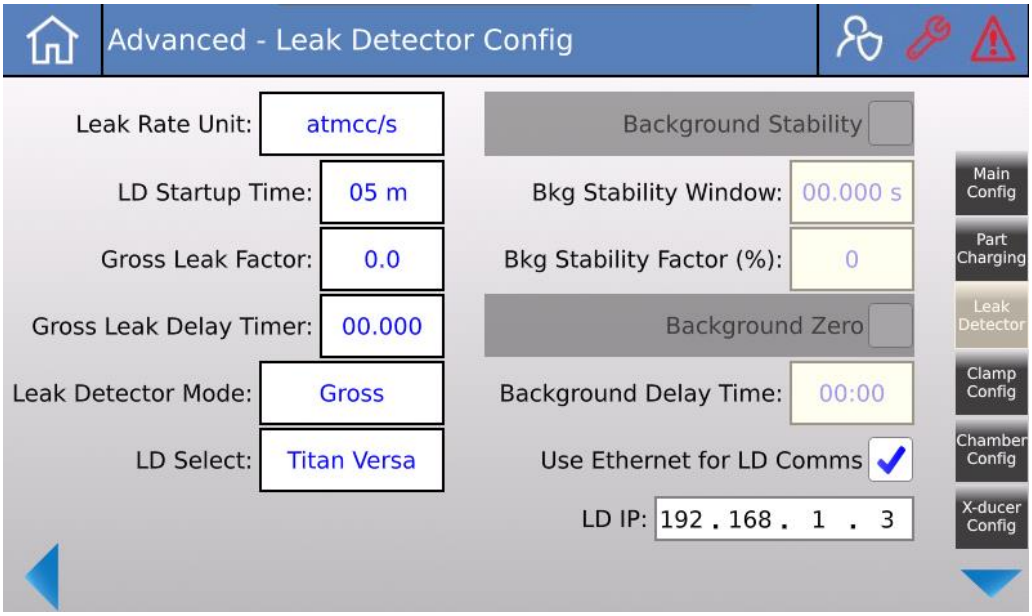
Part N2 Purge Check the box if the test sequence includes a Nitrogen purge process.

Part Decay Testing Check the box if the test sequence includes a pressure decay process.

Max Evac Pressure Maximum allowable pressure for opening the part evac valve (protects the evac pump from high pressure spikes).

Evac Rec. Setpoint Pressure that the part is evacuated to during the recovery (part clean up) sequence.

6.5.2.3. Leak Detector Configuration



Leak Rate Unit Choose the desired leak rate unit.

LD Start Up Time This timer runs while the leak detector is starting up upon power-up. If the timer expires a fault will occur.

Gross Leak Factor The gross leak factor can be used in all configurations except the charge only configuration. Enter a factor between 20 and 1000. This value is multiplied by the leak rate reject limit specification in the Recipe. If during the leak test step, the leak rate exceeds this gross leak setpoint then the test will automatically fail and immediately stop. This feature limits the exposure the leak detector helium contamination and ensure subsequent “good” parts will not give a false fail due to high helium background in the leak detector.

Gross Leak Delay Timer This is the amount of time the controller will wait once in the leak test step before monitoring the Gross Leak Setpoint. This should typically be between 1-6 seconds.

Leak Detector Mode Select the mode used for leak detection. Three options are available.

- Fine
- Gross
- Ultra

LD Select Select the leak detector mode used in the system.

Background Stability Check the box to enable background stability test. The test is run to ensure the trace gas in the background does not exceed the setpoint.

Bkg Stability Window The length of time the background must be considered stable before moving on to Helium Fill.

Bkg Stability Factor The percent of fluctuation in leak rate allowed for the background to be considered stable.

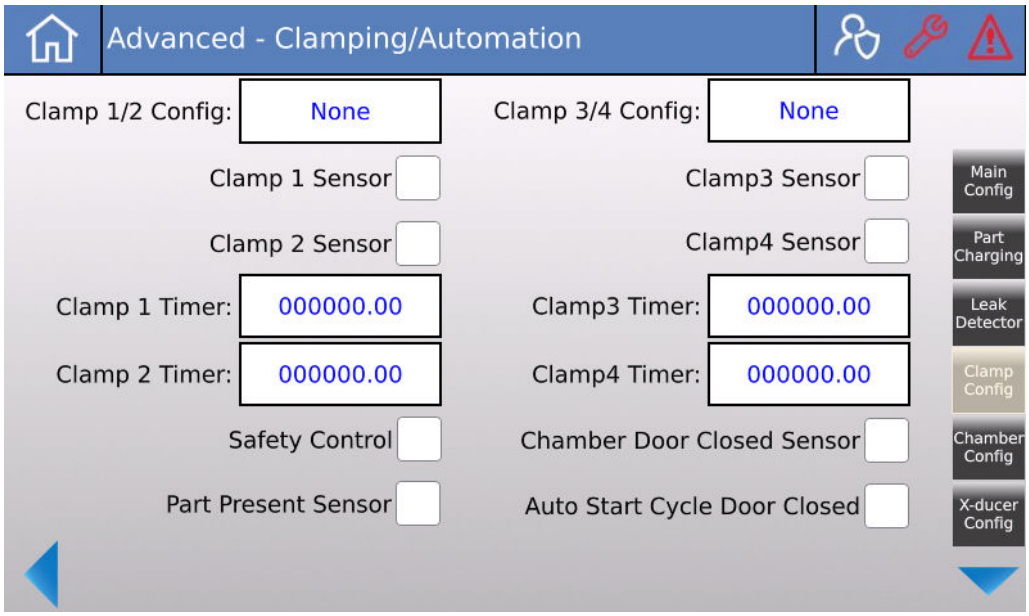
Background Zero Zero the leak detector at the end of background check before the leak test. This box is only available if Background Stability is selected.

Background Delay Time The length of time waited before setting the background to zero.

Use Ethernet for Comms Use Ethernet instead of serial cable to communicate with leak detector.

LD IP Enter the IP address of the leak detector.

6.5.2.4. Clamp/Automation Settings



Clamp Config When equipped, there are four configurations for each pair of Clamps (1/2, 3/4)

- Single Clamp
- Dual Clamp
- Extend/Retract
- None

Single clamp uses only one clamp (clamp 1 or 3). Dual clamp uses both clamps in the pair. Extent/ retract uses the first clamp in the pair (clamp 1 or clamp 3) to extent, and the second clamp in the pair (clamp 2 or clamp 4) to retract.

Clamp Sensor Select if there is a sensor for the specified clamp.

Clamp Timer Fault timer for the clamp.

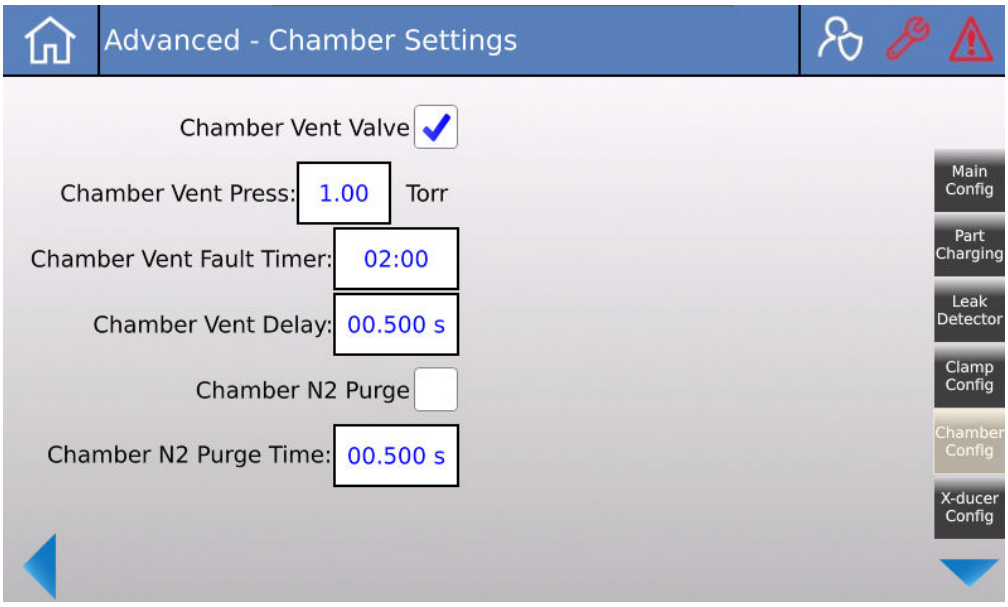
Safety Control Indicates that the system has safety control components (light curtains, emergency stop switches, etc.)

Part Present Sensor Indicates that there is a part present sensor installed and connected to the ATLAS.

Chamber Closed Sensor Indicates that there is a chamber door closed sensor installed and connected to the ATLAS.

Auto Start Cycle Select to automatically start a cycle when the chamber door is closed.

6.5.2.5. Chamber Settings



Chamber Vent Valve Select if a chamber vent valve is installed to the ATLAS.

Chamber Vent Press Maximum pressure setpoint for the chamber vent pressure.

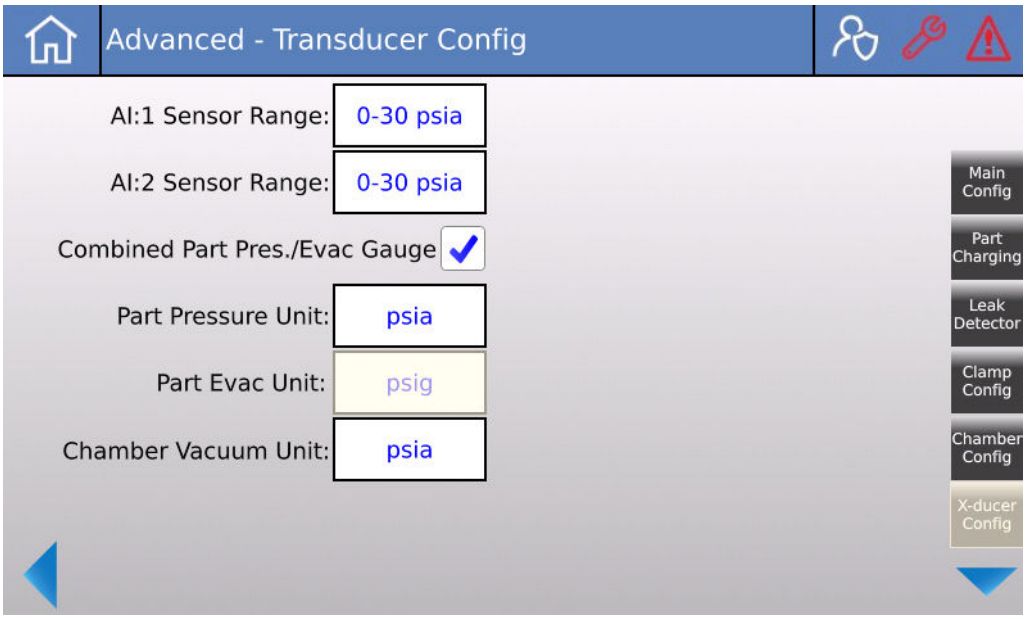
Chamber Vent Fault Time Time to vent the chamber before triggering a fault when the vent pressure does not reach vent pressure setpoint.

Chamber Vent Delay Delay time to allow the chamber vent valve to fully open after the output is turned on.

Chamber N2 Purge Check the box if the test sequence includes a Nitrogen purge process in the chamber.

Chamber N2 Purge Time The length of time for the chamber nitrogen purge process to run.

6.5.2.6. Transducer Configuration



Sensor Range Choose the sensor range for the pressure transducer connected to the corresponding analog input device.

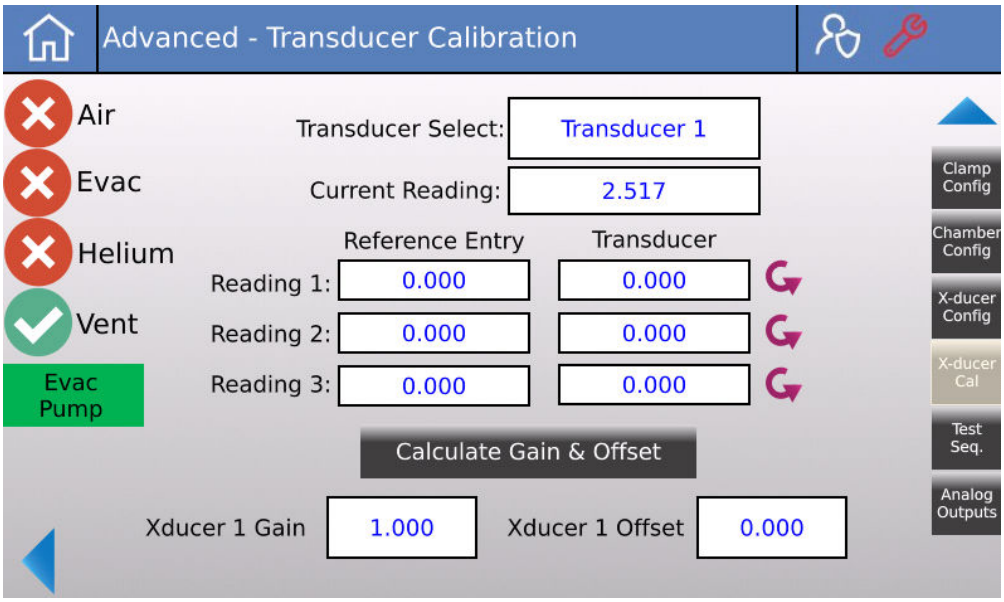
Combined pressure Select if the part pressure and part evac will be sensed with the same transducer (absolute transducer).

Part Pressure Unit Select the part pressure unit.

Part Evac Unit Select the part evac pressure unit.

Chamber Vacuum Unit Select the chamber vacuum pressure unit.

6.5.2.7. Transducer Calibration



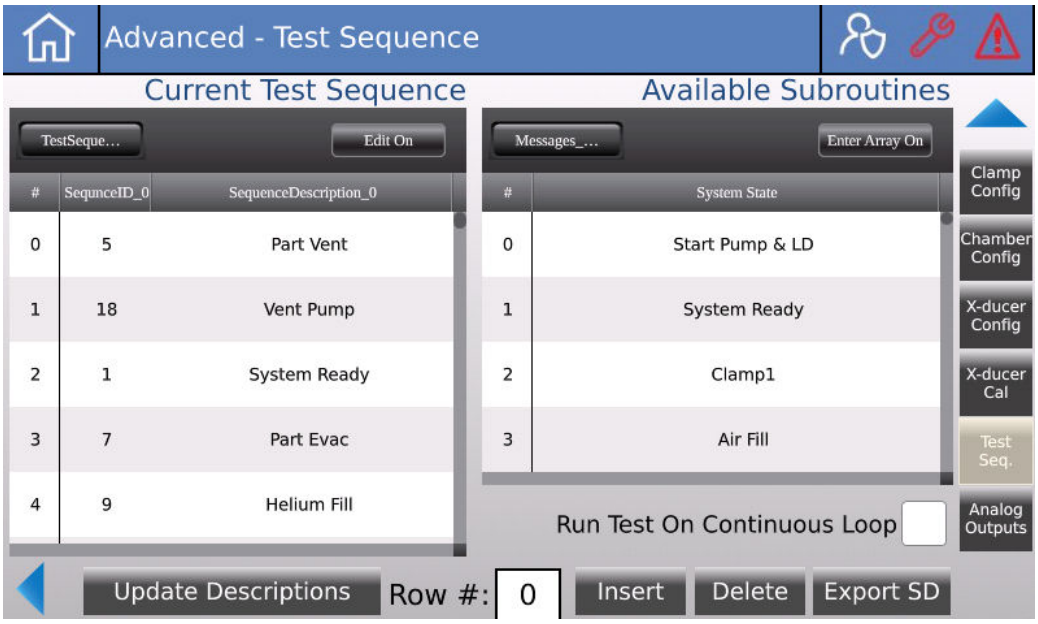
Transducer Select Select the transducer desired to calibrate.

Current Reading The current pressure reading of the selected transducer in psia.

Readings Used to record 3 different pressure readings from an external pressure transducer to calculate the gain and offset for the transducer being calibrated.

Gain/ Offset Show the calculated gain (slope) and offset (intercept) of the selected transducer.

6.5.2.8. Test Sequence



The left side of the screen contains the current test sequence. The sequence can be changed by pressing the “Edit On” button, then press the “SequenceID” of the row desire to insert the new sequence and enter the new sequence ID. The list on the right side of the screen gives a complete list of available sequence.

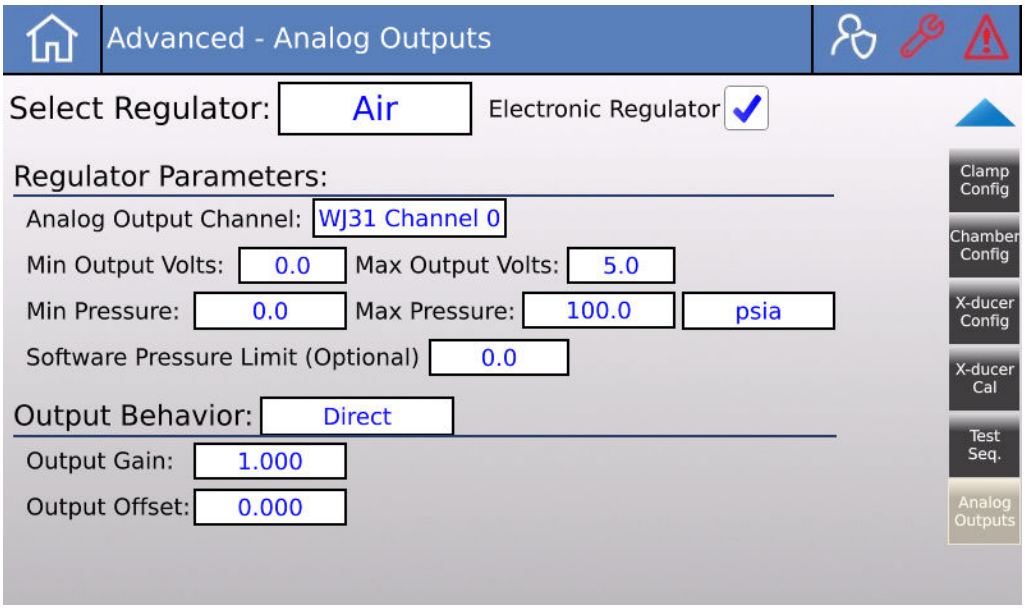
Update Descriptions Press the button after entering the new sequence ID’s. The description of each sequence will be loaded to the test sequence list.

Insert Insert a new row to the row number specified.

Delete Delete the selected row.

Export SD Export the test sequence to the SD card.

6.5.2.9. Analog Outputs Settings



Select Regulator Choose the regulator to be edited.

Electronic Regulator Check if an electronic regulator is used.

Analog Output Channel Choose which channel of the analog output device is used for the regulator.

Min Output Volts Enter the minimum voltage of the electronic regulator.

Max Output Volts Enter the maximum voltage of the electronic regulator.

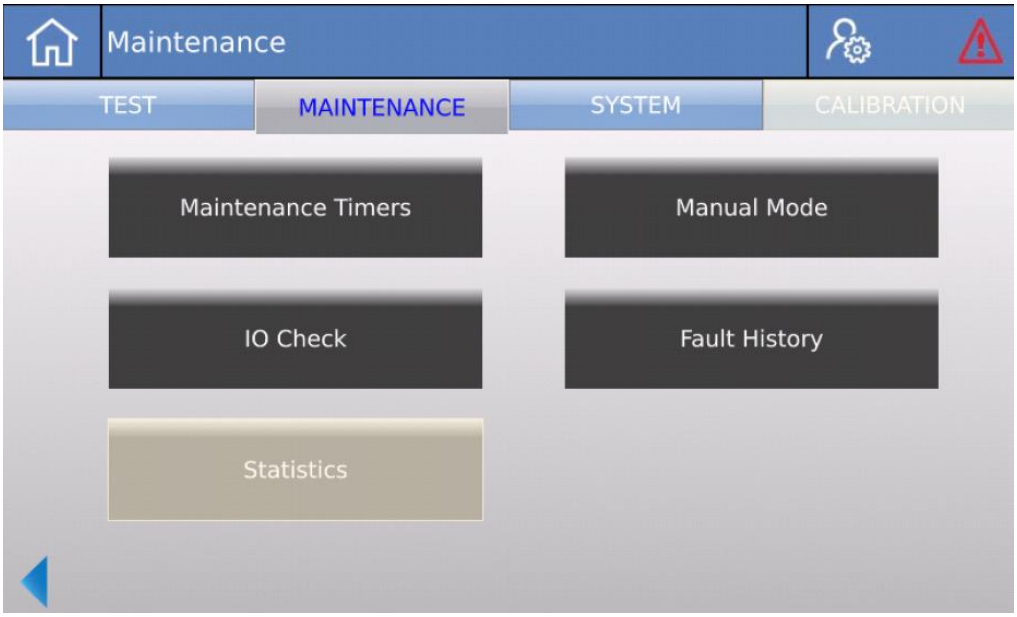
Min Pressure Enter the minimum pressure of the electronic regulator.

Max Pressure Enter the maximum pressure of the electronic regulator.

Output Behavior Choose the output behavior of the regulator from the three options:

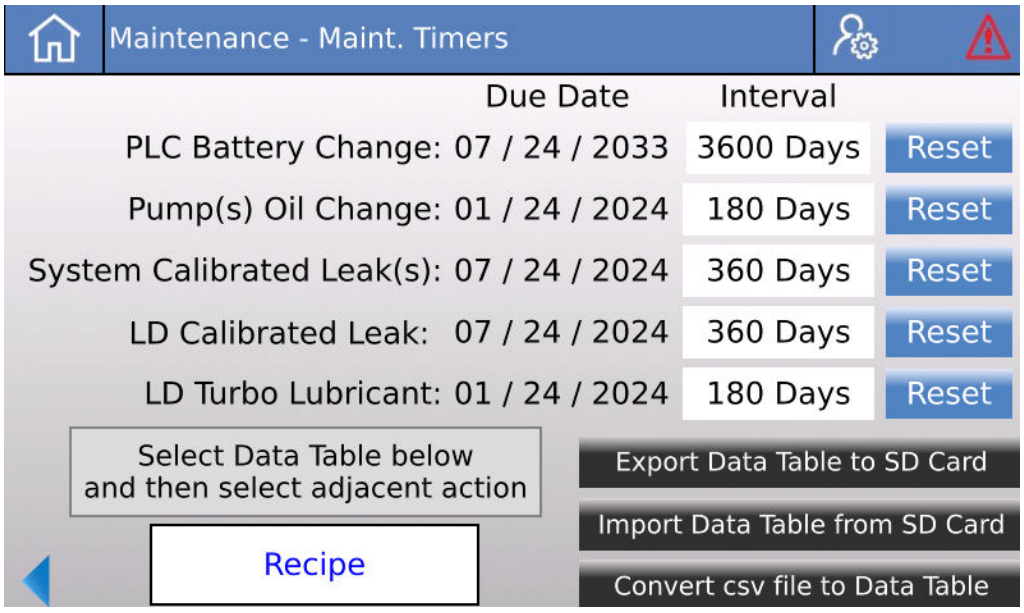
- Direct
- PID
- Custom

6.5.3. Maintenance



There are four active sub-screens under the maintenance menu.

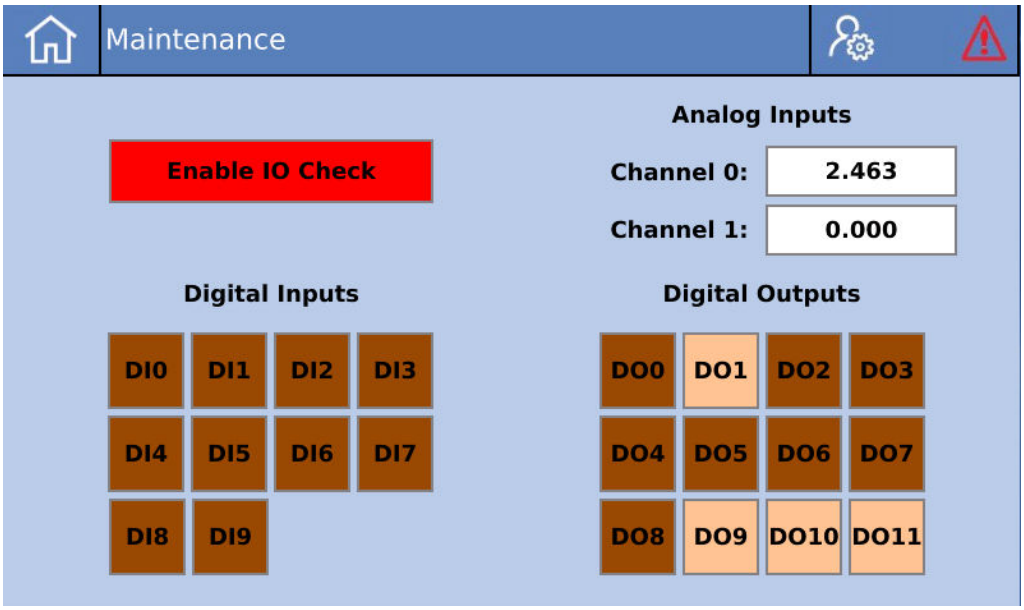
6.5.3.1. Maintenance Timers



The maintenance timers screen allow user to update the maintenance interval of each of the items required maintenance. It also keeps track of all current maintenance timers such that the warning will come up when a maintenance item is due for an update.

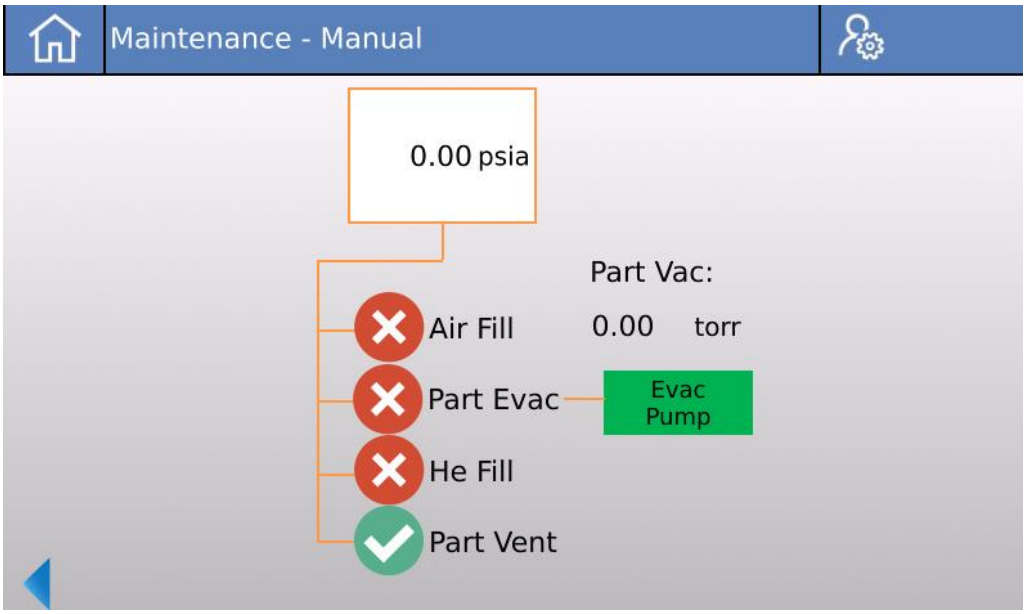
The data tables in the controller can also be exported or imported on the same screen. To do that, choose the data table wished to export/ import, then press the export or import button.

6.5.3.2. IO Check Screen



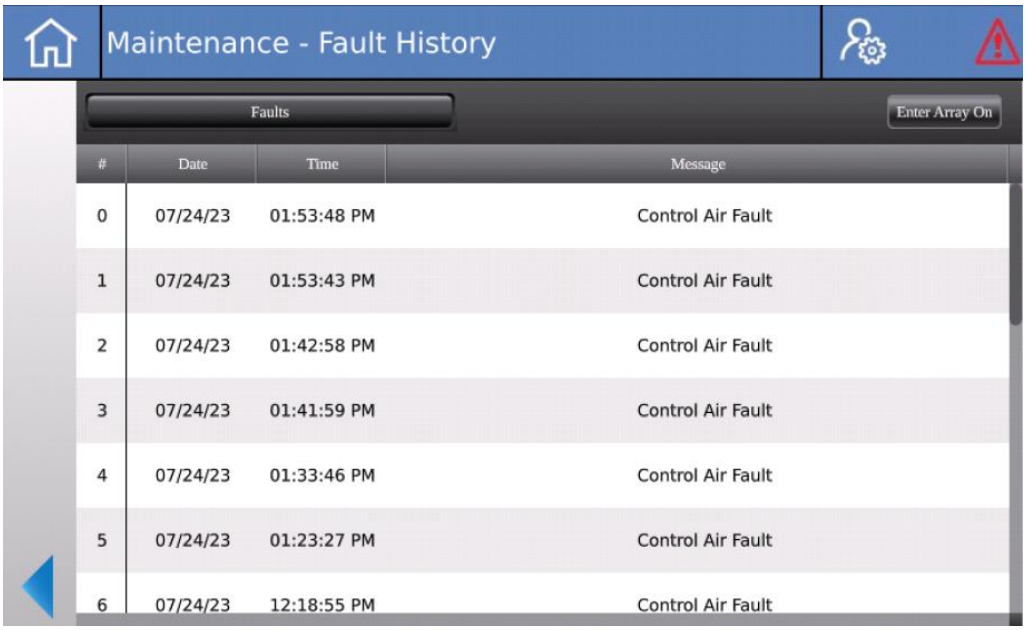
The IO check screen contains the current state of the digital inputs and outputs. It also shows the reading of the analog inputs. The Enable IO check button can be used to enable the digital output check. Note that pressing the button will disable all the interlocks between valves, therefore, it should only be used when it is safe to do so. After enabling the IO check, the user can press each of the squares to turn on/ off the corresponding digital outputs. The square turns dark when the output is in off state and turns bright when the output is in on state.

6.5.3.3. Manual Mode



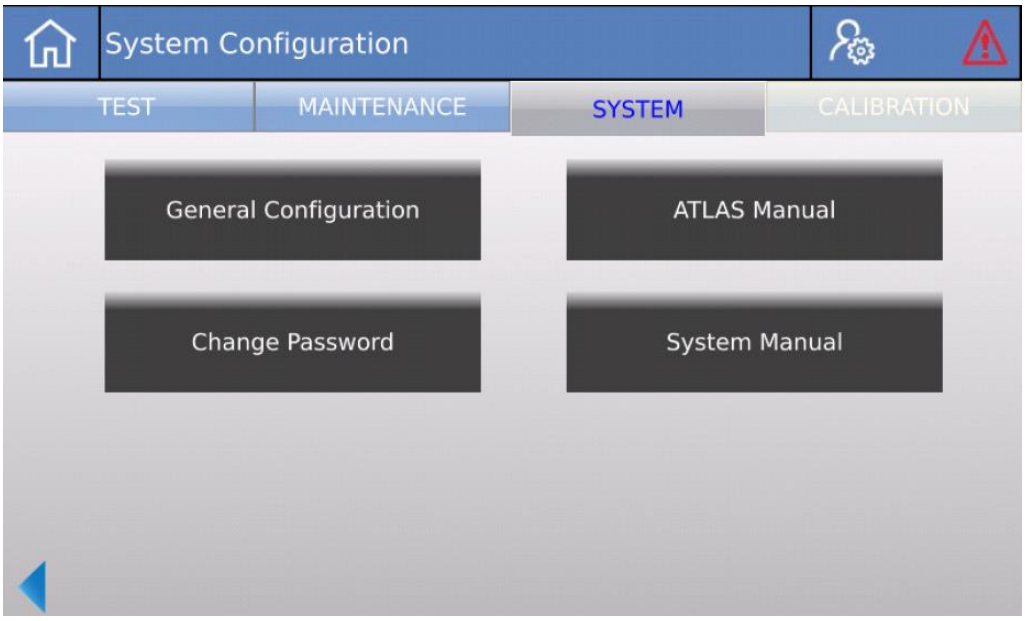
The manual mode screen allows user to manually turn on/ off each of the valves in the controller. Turn on the valve by pressing the red circle (representing a closed valve) and turn off the valve by pressing the green circle (representing an opened valve).

6.5.3.4. Fault History



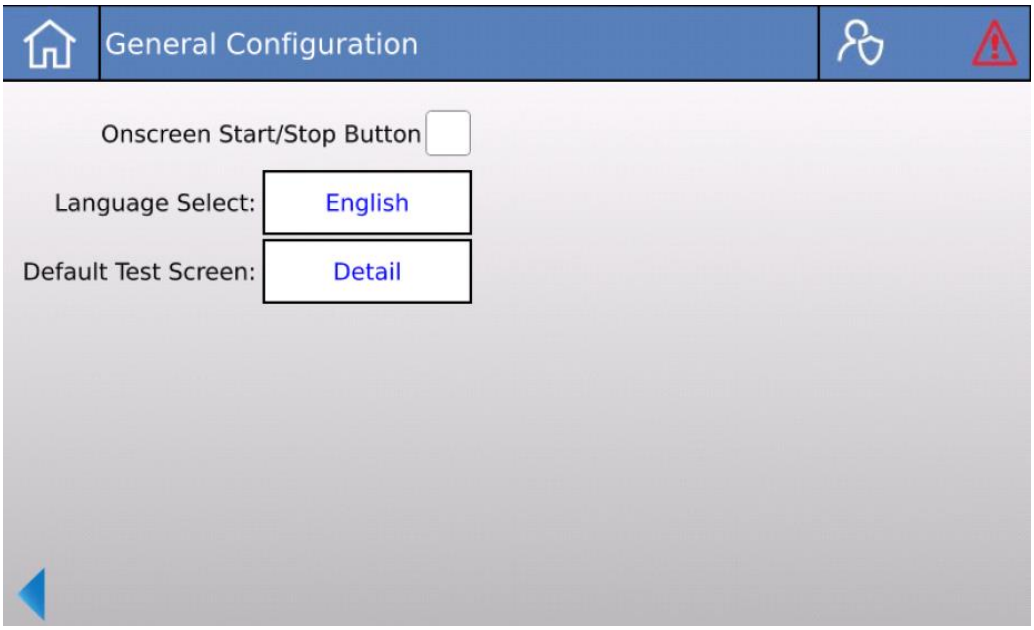
The fault history screen shows the date, time, and message of the 20 most recent faults that occur in the system. See Section 7 for a complete list of faults and fault handling.

6.5.4. System Screen



There are four sub-screens under the system configuration menu.

6.5.4.1. General Configuration



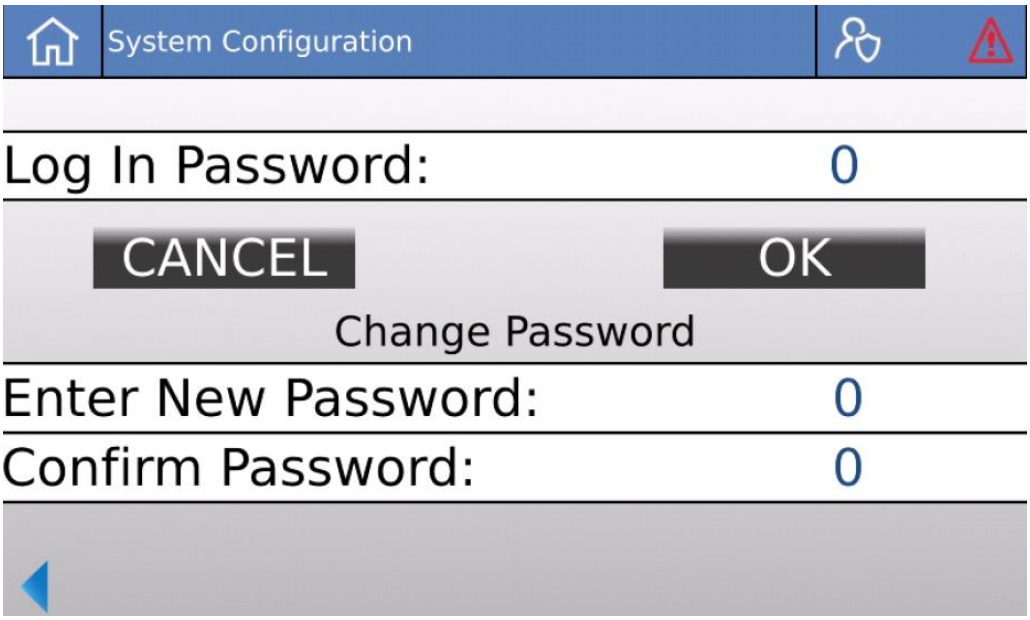
Onscreen Button Choose whether to have an onscreen start/ stop button. This should generally be on unless remote IO buttons are used in the system.

Language Select Choose the language of the controller.

Default Test Screen Choose the test screen type from the three options:

- Basic
- Detail
- Graph

6.5.4.2. Change Password



Use the change password page to create new operator password. Enter a four digits numeric new password to the “Enter New Password” and “Confirm Password” sections. If the new password entered on both sections match, a “Change” button will appear to allow for change of operator password.

The Atlas manual and system manual screens contain a pdf file viewer for user to read the respective manuals.

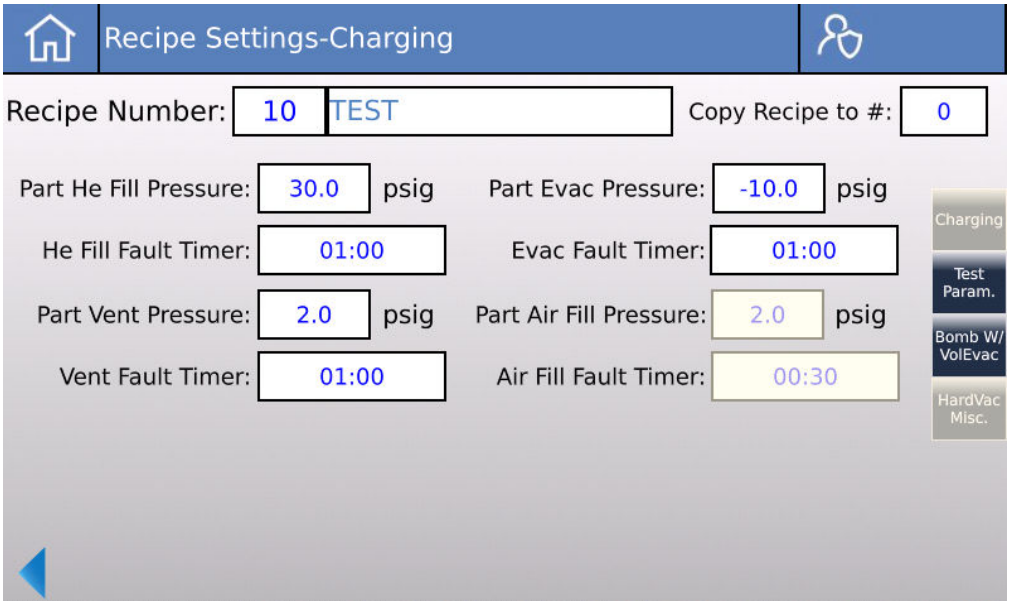
6.5.5. Recipe

There are four recipe screens. Depending on the the application of the system, some recipe screens would be disabled. The follow table shows the enabled screens per applications.

	Charging	Test Parameters	Volume Evac	Miscellaneous
Bombing	✓	✓	✓	
Sniffing	✓	✓		
Hard Vac	✓	✓		✓

The ATLAS can store up to 100 different test recipes (0-99). To choose the recipe to configure/modify press the recipe number and enter the desired number. To change the name of the displayed recipe, press the recipe name and enter the desired name. The recipe that is displayed when leaving the recipe screens will be loaded and used for subsequent test cycles, unless the user changes the recipe number from the test screen. Note that some recipe parameters may not be displayed depending on certain advanced settings.

6.5.5.1. Charging Screen



Recipe Number Enter the ID of the recipe desired to edit.

Recipe Name Enter the name of the recipe.

Copy Recipe Copy the current recipe to a recipe specified by the number entered.

Part Evac Pressure The pressure setpoint that the evacuation process must reach before continuing other steps of the test sequence.

Part Evac Fault Time The length of time to run the evacuation process before triggering a fault if the evac pressure is not met.

Part He Fill Pressure The pressure setpoint that the Helium fill process must reach before continuing other steps of the test sequence.

He Fill Fault Time The length of time to run the Helium fill process before triggering a fault if the evac pressure is not met.

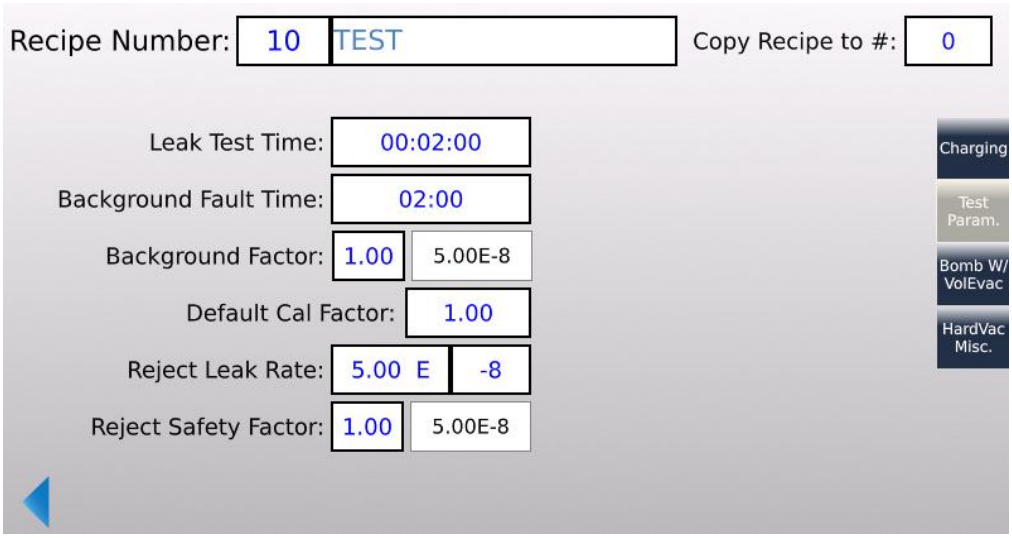
Part Vent Pressure The pressure setpoint that the vent process must reach before continuing other steps of the test sequence.

Part Vent Fault Time The length of time to run the vent process before triggering a fault if the evac pressure is not met.

Part Air Fill Pressure The pressure setpoint that the air fill process must reach before continuing other steps of the test sequence.

Air Fill Fault Time The length of time to run the air fill process before triggering a fault if the evac pressure is not met.

6.5.5.2. Test Parameters



Sniff/Test/Bombing Time The length of time to run the test.

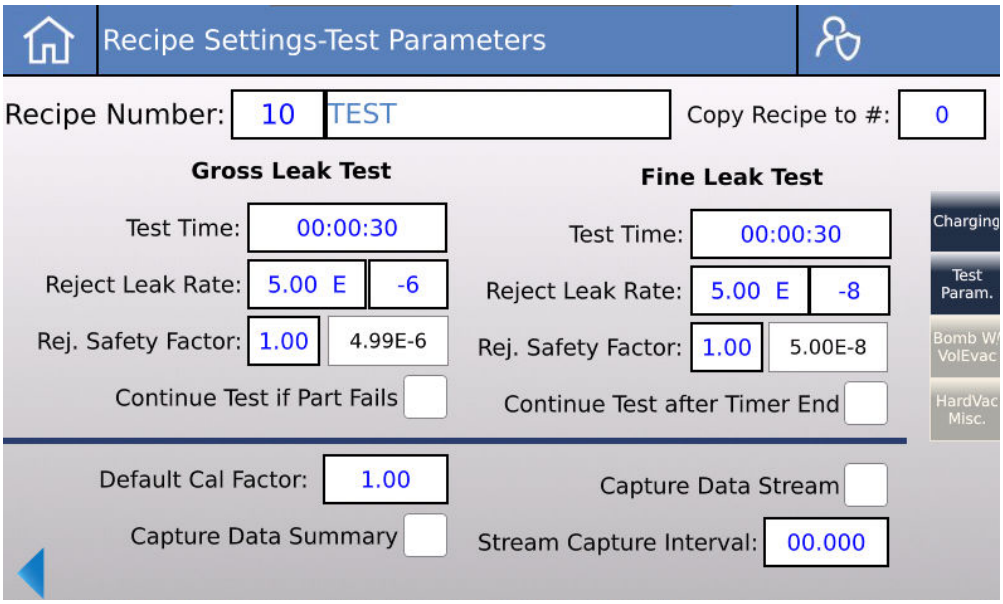
Background Fault Time Background Fault Timer: Set this time for the maximum time allowed to reach the background limit during the background check before faulting a cycle.

Background Factor This number is multiplied by the reject limit to get the maximum leak rate reading allowed during a background check. The background Helium level must be achieved before the part is filled with Helium.

Reject Leak Rate The reject leak rate limit for the part being tested.

Reject Safety Factor This number is multiplied by the reject leak rate to get the actual reject limit that is used. This allows the user to ensure that parts leaking near the reject limit are rejected. Systems are normally shipped with a safety factor of 1.

6.5.5.3. Volume Evac



The volume evac screen is split into two parts. The left side consists of parameter setting for the gross leak test and the right side the setting for the fine leak test. Note that this screen is only enabled when Vol Evac is selected in the advanced settings.

Refer to sub-section 6.5.6.2 for the definitions of test time, default cal factor, reject leak rate, and reject safety factor.

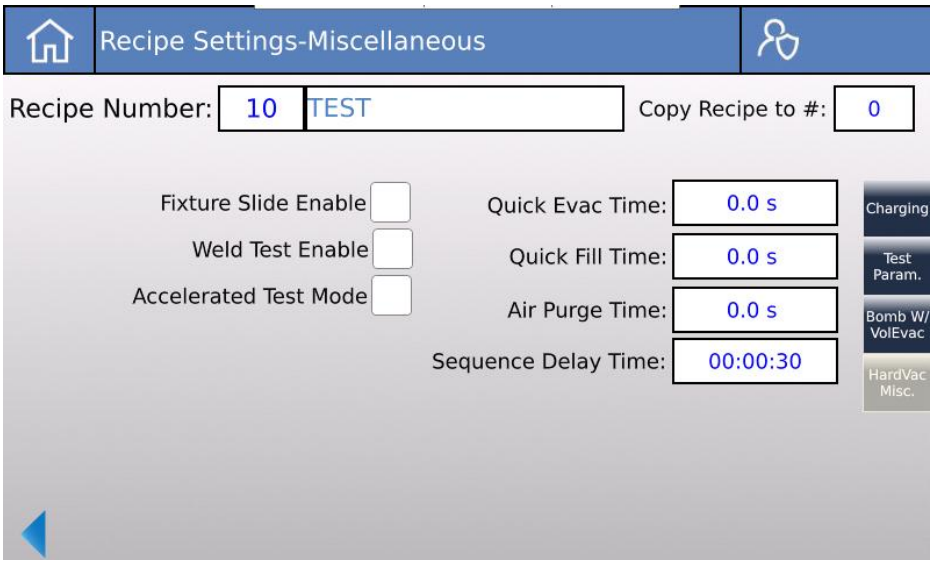
Continue if Part Fails Check the box if wish to continue to run fine leak test even if the gross leak test fails. The box is default as unchecked.

Continue after Timer End Check the box if wish to continue to let the test run even after the fine leak test is completed.

Capture Data Enable data logging features.

Capture Interval Test data sampling time.

6.5.5.4. Miscellaneous



Fixture Slide Enable Check the box if a fixture slide is used.

Weld Test Enable Check the box to enable weld test.

Accelerated Test Mode Check the box to enable accelerated test mode.

Quick Evac Time Set the quick evac sequence run time.

Quick Fill Time Set the quick fill sequence run time.

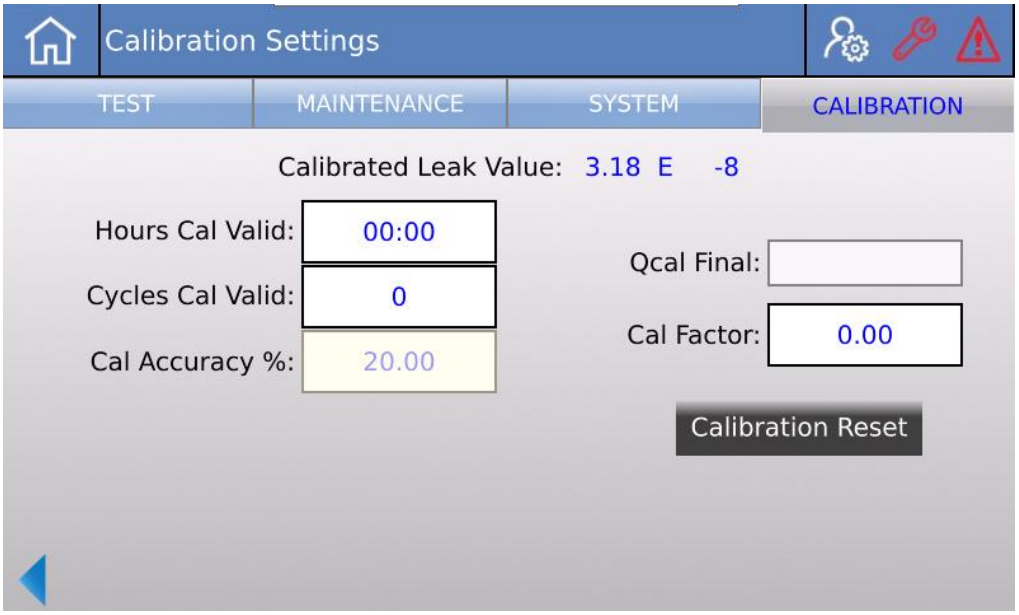
Air Purge Time Set the air purge sequence run time.

Sequence Delay Time Set the delay time before running each sequence.

6.5.6. Calibration Settings Screens

NOTICE: Calibration Frequency

All Calibrations as-shipped settings will be recorded and provided in the accompanying As-Shipped Parameter Summary.



Calibrated Leak Value — The value listed on the calibration certificate of the calibrated leak used for calibrating the system.

Hours Cal Valid — When a successful calibration is completed the timer is reset. After the timer expires the system will require a calibration.

Cycles Cal Valid — When a successful calibration is completed the counter is reset. After the counter expires the system will require a calibration. NOTE: if both the Cycles/Hours Cal Valid parameters are set to 0, the system will never require a calibration.

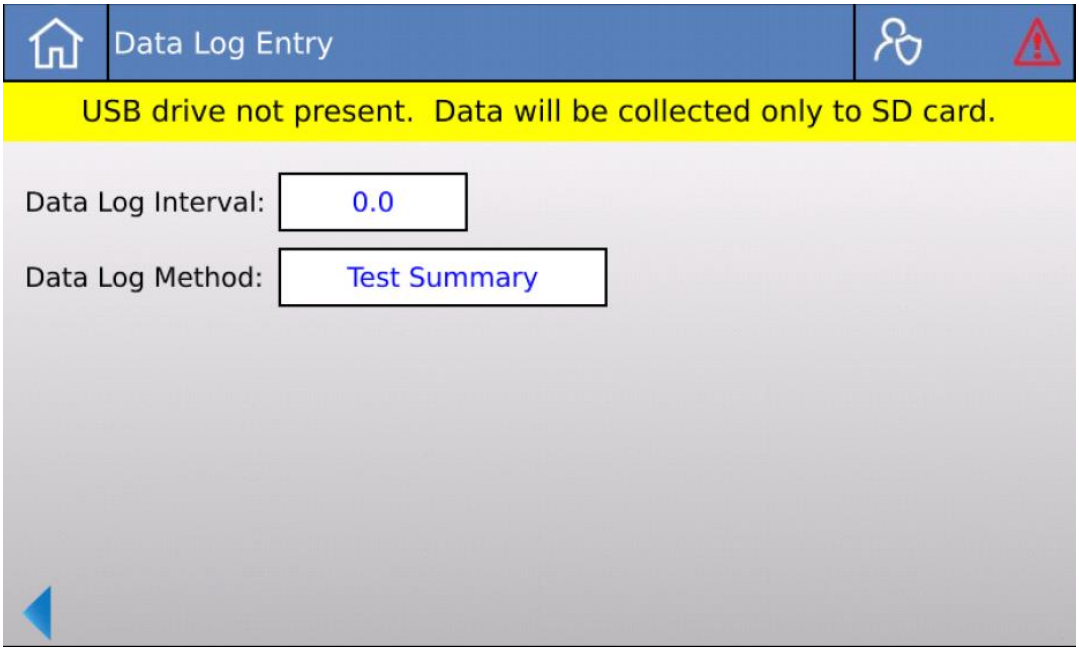
Cycles Cal Valid — This number creates a window that the calibrated leak must be between at the end of a calibration to be a good calibration.

Cal Factor — This value is calculated by taking the calibrated leak value / raw leak rate reading at the end of the calibration cycle.

QCal Final — The leak rate reading using the default Cal factor at the end of a calibration.

Cal Factor — Resets the Cal Factor to the Default Cal Factor.

6.5.7. Data Log Settings Screen



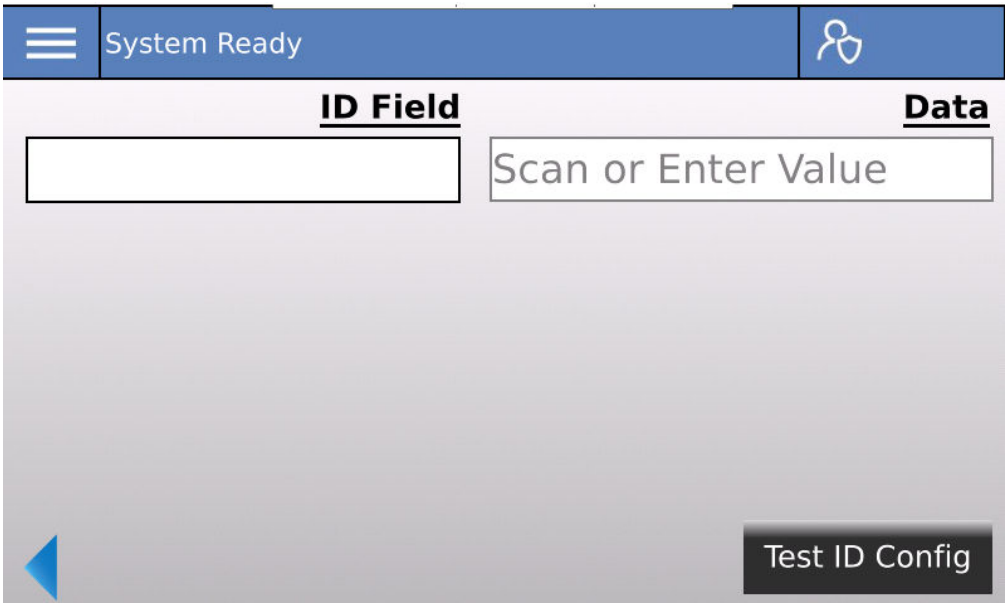
This screen allows a user to export and import key data table csv files to a SD card located in the controller, as well as a USB drive. Also, when a USB drive is connected a user can export a csv file of all test summary files from the SD card to the USB drive. An example of the test summary file structure is shown below.

Test Summary								
#	Test Date	Test Time	Recipe Number	Recipe Name	Test Time(s)	Reject Limit	Final Leak Rate	Test Result
0	11/13/2017	5:31:59 PM	1	TEST	34.1	5.00E-05	2.45E-06	Pass Leak Test
1	11/13/2017	5:33:43 PM	1	TEST	49.4	5.00E-05	8.97E-05	Fail Leak Test

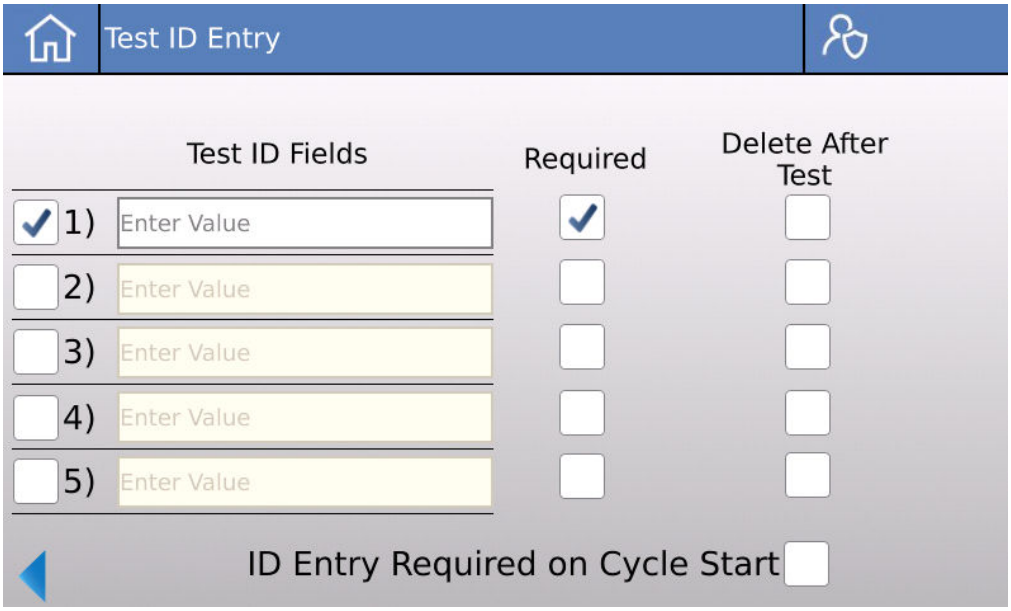
- Enable/Disable Test Results Printer – If purchased the ticket printer can be enabled. This will print the results at the end of a test.
- User Data – This allows the user to long and/or print custom data at the end of a test, such as a serial number, operator, color, lot, etc. See following section for more information.
- Data Log Method – Select one of the 3 data logging methods to log data to the SD card:
    - Test Summary – Logs a single line test summary at the end of each test.
    - Manual Test Stream – Logs data at the interval while active.
    - Test Stream & Sum – Logs data during the test and then a summary at the end of the cycle.
- Data Log Interval – Sets the log interval to write data to the SD card during the data stream options.

6.5.8. User Data Logging

End users can log additional data of their choice through this feature. Up to 5 additional categories of data can be logged, such as color, size, serial number, operator ID, etc. To set this up, on the Test Screen in Sec 6.3.2, press the Test ID Entry key and this screen will appear:



Press the Test ID Config button to edit which fields of data will be collected:



This screen allows enabling and disabling of additional data logging.

- Enable as many categories as needed by checking the box to the left of the numbered Test ID Fields.
- Enter the category NAME or description in the Test ID Fields column (e.g., Lot, S/N, Operator).
- Check the box in the Required Column if the field cannot be left blank.

- Check the box in the Delete After Test Column to clear the data after the successful completion of the test. Note that these fields will not clear on a fault or after a calibration cycle.
- Check the box ID Entry Request on Cycle Start to require the operator to enter information into these fields at the start of a cycle. If this is not set up to be required, an operator can still access these data logging fields.

On the main test screen, press the 'Test ID' button and this screen will appear:

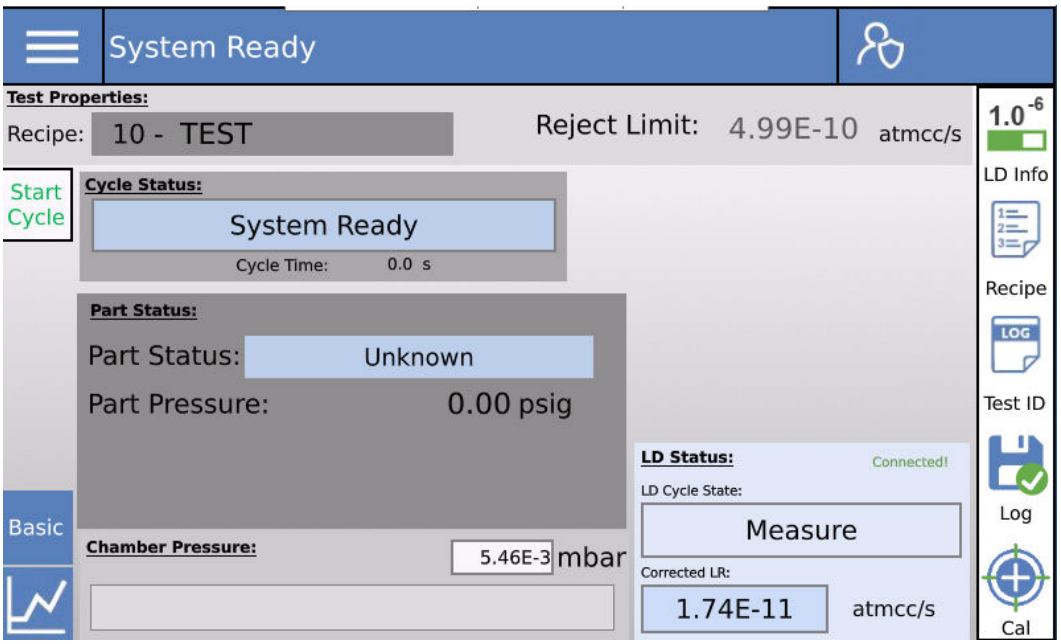
Enter the required data by selecting the proper box and using the optional barcode scanner or the onscreen keyboards. If the ATLAS controller is equipped with a barcode scanner, then scanning a barcode will enter the contents into the currently selected box. Entering data into a box will automatically set the next box to active.

This data will appear in the test summary data on the SD card/USB stick as well as be printed out on the ticket at the end of the test, if so equipped.

6.6. Operation and Calibration

There are three different test screens. Based on the application chosen in advanced settings, different test screens will be displayed.

6.6.1. Hard Vac Operation



The test screen indicates key test data to help the operator to monitor the leak test. The sidebar on the right of the screen allows the operator to enable/ disable leak detector details, change recipe, change test ID and data log settings, and perform a system calibration.

6.6.1.1. System Calibration

For hard vacuum test methods, it is recommended that the ATLAS controller performs a system calibration. The system calibrations will involve a calibrated leak standard that is used for calibration cycles, typically an open-style leak. To run calibration cycles the user must have a known good part or a machined “dummy part” that the leak can be attached to. It is recommended that this “calibration” or “golden part” be specially marked or identified and kept near the ATLAS.

The calibration settings in section 6.4.1 are used in conjunction with running a system calibration. The following conditions will require a new system calibration cycle to be performed:

- Startup of the machine.
- New test recipe loaded.
- Critical test parameters are changed.

The hours and cycles Cal valid parameters on the calibration screen determine the frequency of system calibrations. Whichever of these tow values expires first will cause the ATLAS to require a system calibration. When a calibration is required, “Calibration Required” will be displayed on the Test Screen. Normal auto test cycles cannot be initiated when a calibration is required.

Calibration Steps:

1. Press the cal button of the sidebar to change to calibration mode.
2. Install a known good part or calibration part, depending on configuration and install the calibration leak.
3. If required, make the appropriate connections to the part.
4. Press the green start cycle button to start the calibration cycle. Depending on the configuration, the cycle my start automatically when the chamber is closed.
5. The controller will run a full test cycle. If a fault occurs during the test, the sequence will immediately stop and wait for the operator to acknowledge the fault by pressing the Abort/Reset button.
6. If the leak rate signals during calibration are within the acceptable range of the calibrated leak value, then calibration is successful, and a calibration factor (CF) is stored (See section 6.5.6).

6.6.1.2. Running automated Tests

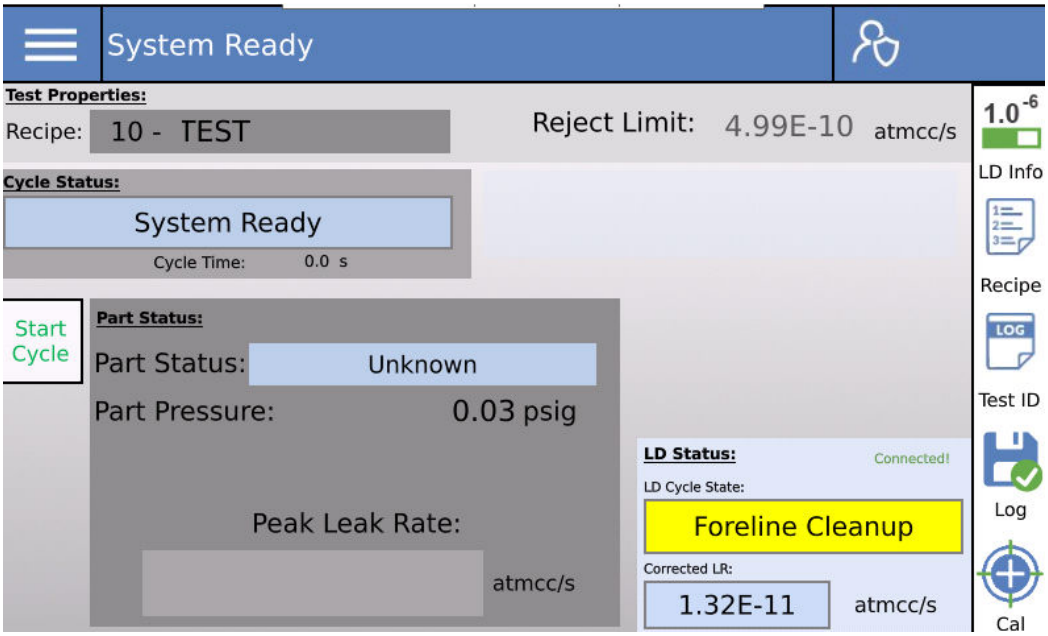
Once the ATLAS has been calibrated, part leak testing can occur. To run an automated test cycle:

1. Verify the cal button is disabled to enable auto test mode.
2. Install a test part and make all appropriate connections to the part, if required.

3. Press the green start button to start the test cycle. Depending on the configuration, the cycle may start automatically when the chamber is closed.
4. The controller will run a full test cycle. If a fault occurs during the test, the test sequence will immediately stop and wait for the operator to acknowledge the fault by pressing the Abort/Reset button.
5. At the end of cycle, the part will be classified as a pass or fail, with an accompanying red or green light.
6. Remove the part and disposition according to the test results.

6.6.2. Sniffing Operation

The main test screen shown below indicates key test data to help the operator to monitor and perform the sniffing then leak test. Note that a new test recipe can be loaded from this screen by selecting the recipe number. Normal Auto and Calibration cycles can be interrupted at any time by pressing the Abort/Reset button. Aborted cycles must be acknowledged similar to a fault by pressing the Abort/Reset button. The actual test sequence is configured in the software by LACO and will be detailed in the accompanying ATLAS System Manual.



6.6.2.1. System Calibration

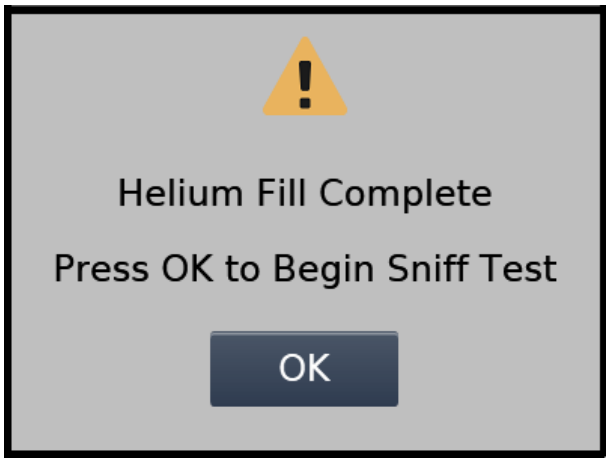
The calibration will be performed through the leak detector using an external calibrated leak. Follow the instructions on the leak detector to complete the calibration.

6.6.2.2. Running Automated Tests

Once the ATLAS system has been calibrated, part leak testing can occur. To run an automated test cycle:

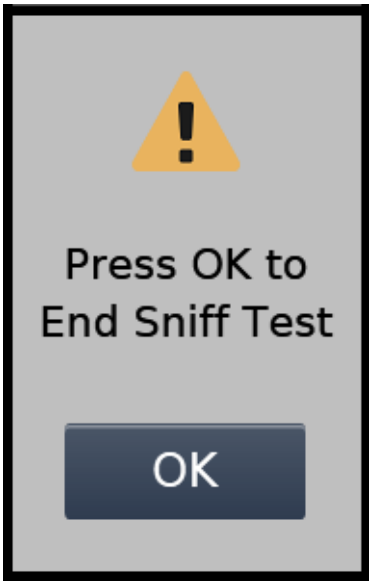
1. Make all appropriate connections from the ATLAS to the part to be tested.

2. Press green start button to start the test cycle.
3. The controller will begin stepping through the part charging sequence (Evac, He, Fill, etc. depending on configuration). Once the helium fill is complete, the message below will appear.



4. When the operator presses the Ok button the leak test will begin. At this point the operator can begin sniffing the part to be tested. During the sniff test, the ATLAS will store and display the peak leak rate value that is observed. To clear this value at any time during the test the operator can press the Clear Peak Value icon at the bottom left of the test screen.

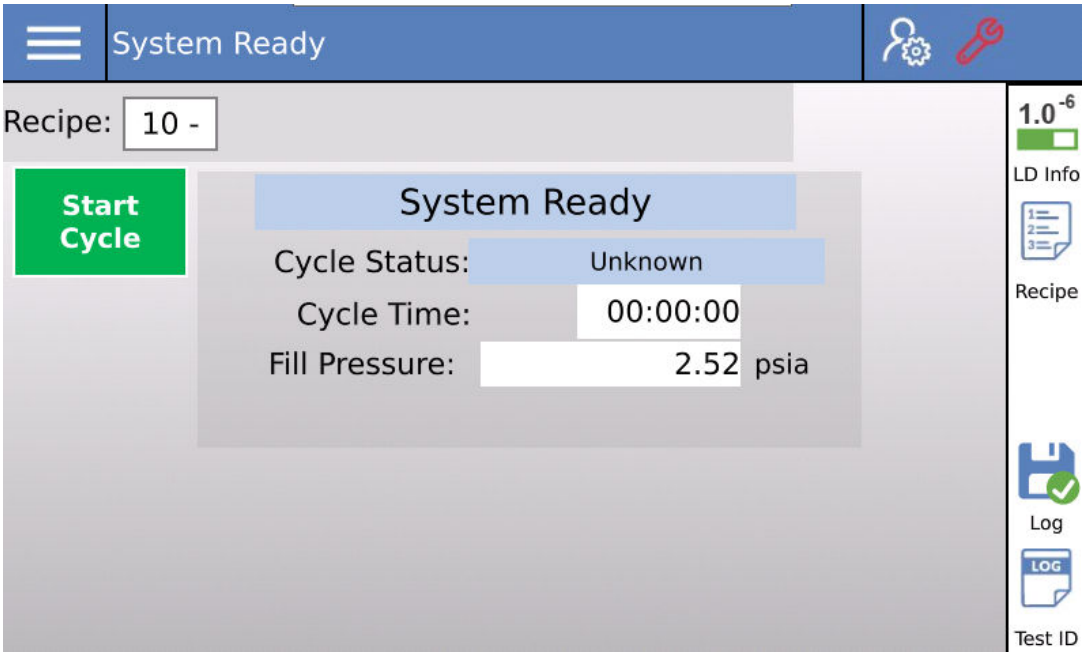
5. When the operator is finished with the sniff test, they must acknowledge it by pressing the OK button on the right side of the screen.



6. At the end of cycle, the part will be vented and classified as a pass or fail by comparing the final peak value with the reject limit, with an accompanying red or green light.
7. Disconnect the part and disposition according to the test results.

6.6.3. Helium Bombing Operation

The main test screen shown below indicates key test data to help the operator to monitor the bombing process. Note that a new test recipe can be loaded from this screen by selecting the recipe number. Cycles can be interrupted at any time by pressing the Abort/Reset button. The actual sequence is configured in the software by LACO.



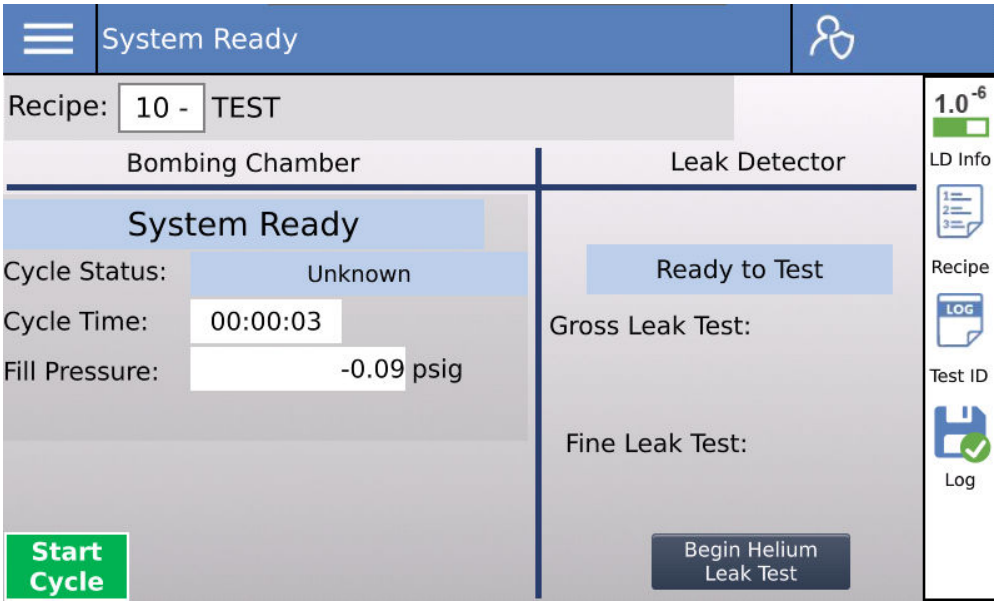
6.6.3.1. Running Bombing Cycles

1. Load parts into bombing chamber and secure lid.
2. Verify the bombing chamber is connected to the outlet of the Atlas controller.
3. Select the desired recipe number and press the green start button to start the cycle.
4. The controller will begin the automated sequence:
    a. Evacuation
    b. Helium Fill
    c. Bombing
    d. Vent

When the bombing sequence is completed the dwell time will display and continue to count up until a new cycle is started or the Abort/Reset button is pressed.

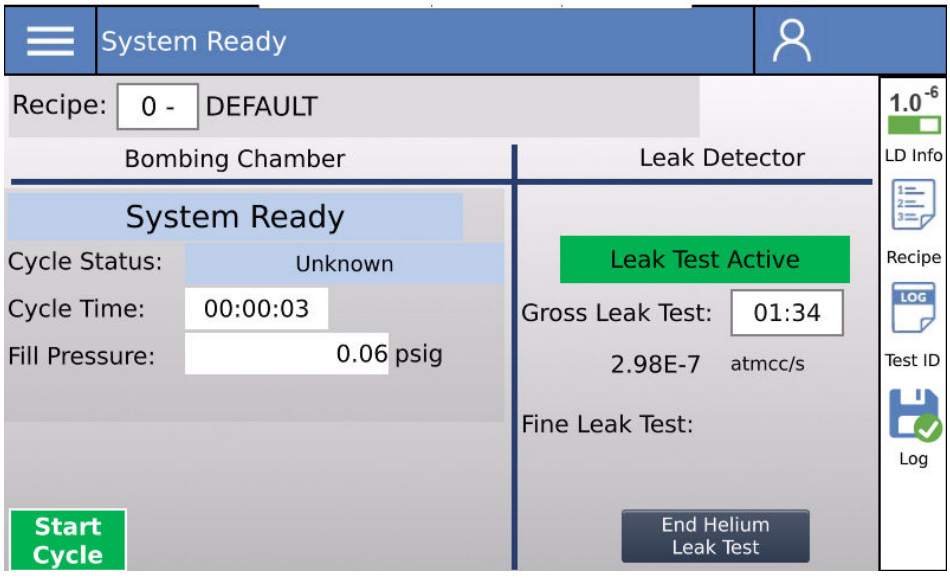
6.6.4. Volume Evac Operation

The main test screen shown below indicates key test data to help the operator to monitor the volume evac process. The left side of the screen is for a standard bombing process (refer to section 6.6.3 for operation process). The right side is for the volume evac process. The leak detector will enter test mode once the Atlas startup is completed. Once the inlet pressure reaches a the setpoint, the screen will show the “Ready to Test” message. As shown in the screen below.

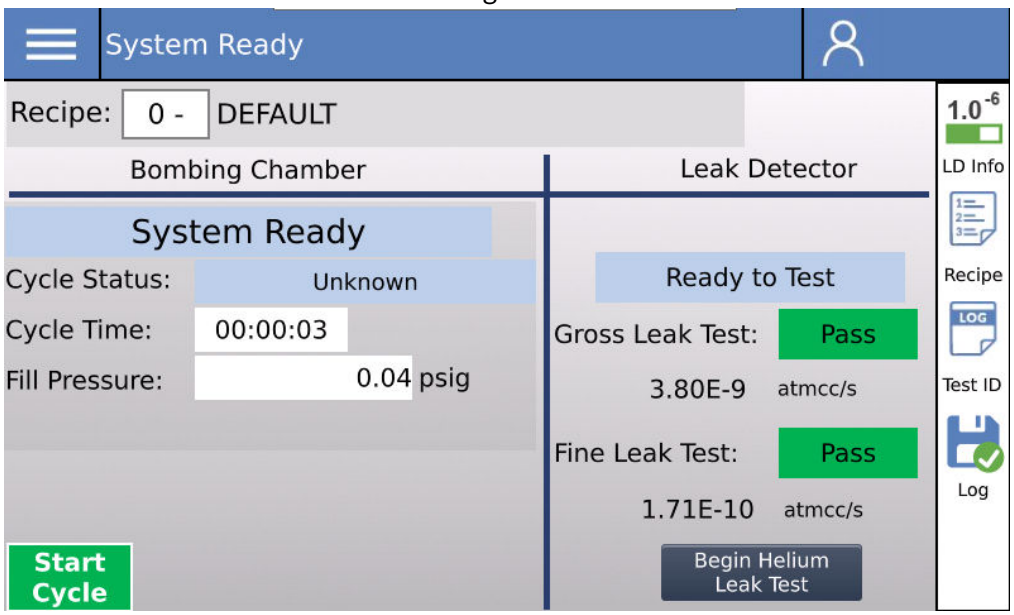


6.6.4.1. Running Volume Evac cycles

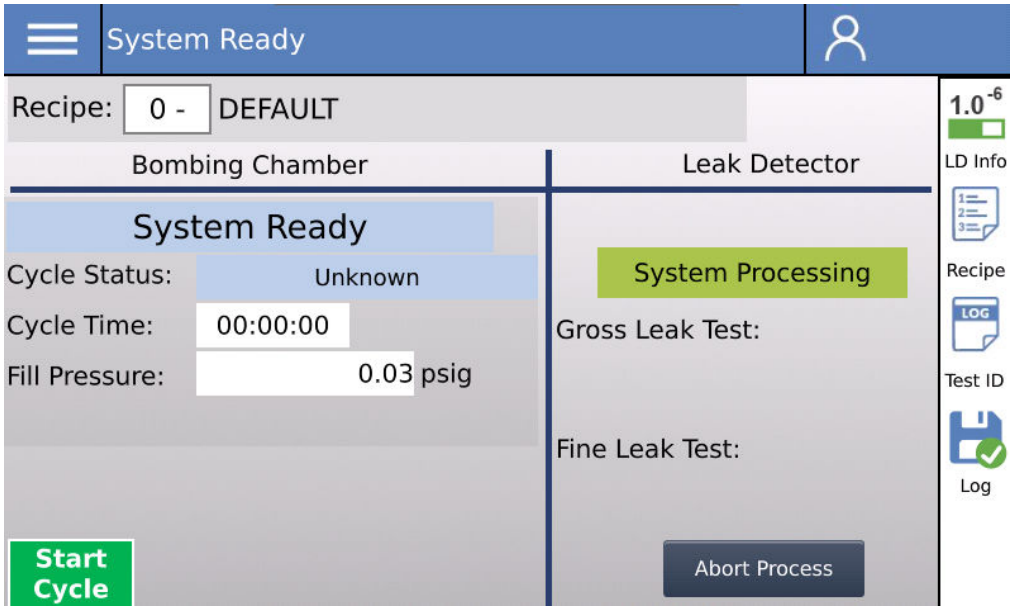
1. Load test part into test chamber and ensure chamber is closed completely.
2. Select the desire recipe number and press the “Begin Helium Leak Test” button.
3. The gross leak test is run first. The status bar on screen will change to indicate that test is active, and the remain test time and leak rate are also shown.



4. The controller will run the fine leak test if the gross leak test is passed or if the “continue when gross leak test fails” option is selected.
5. The same test data will be shown during the fine leak test.



6. The test sequence will automatically reset upon the completion of the fine leak test. Allow time for system to process.



7. Start the next test as prompted.

6.6.5. Part Status and System States

The table below outlines the possible part statuses and system states.

Part Status	System State
Unknown	Start Pump & LD
Pass Leak Test	System Ready
Fail Leak Test	Clamp/Close
Gross Leak Fail	Part Air Fill
Decay Test Fail	Part Decay Test
Calibration Pass	Part Vent
Calibration Failed	Start Titan Cycle
Calibration Required	Part Evac
Calibration In Progress	Leak Test Background
Test In Progress	Part Helium Fill
Process Complete	Leak Test
	Leak Test Calc
	Stop Titan Cycle
	Chamber Vent
	Part Cleanup
	Part Air Purge
	Unclamp/Open
	Sniff Test in Progress
	Sniffer Calibration
	Vent Pump
	Bombing in Progress

7. Troubleshooting

Whenever a fault occurs refer to the tables below for help in identifying fault causes with likely remedies to fix the fault causes. There are two kinds of faults 1) global or system faults and 2) process related faults. Global faults can occur at any time whereas process faults only occur at certain steps in the test process that do not function properly. Note that fault histories can be reviewed on the fault history page.

When a fault occurs, the controller system stops all processes. To recover from a fault, press the Abort/Reset button. The system will then proceed though the recovery process back to a ready state.

7.1. Global Faults

Fault Description	Fault Causes	Fault Troubleshooting
E-Stop Fault (If equipped)	The emergency stop button has been pressed.	• Twist the E-Stop button, to release it.
Control Air Fault	The control air pressure dropped below the setpoint on the pressure switch.	• Make sure shop air is connected. • Increase air pressure on the main control air regulator to at least 20 PSIG above the pressure switch setpoint (60 PSIG).
He Pres. Low Fault	The helium supply pressure dropped below the setpoint on the pressure switch.	• Make sure helium is connected. • Increase helium pressure on main helium regulator to at least 20 PSIG above the pressure switch setpoint.
LD Startup Fault	The leak detector failed to startup within the given amount of time.	• Make sure LD Startup Time setting is > 5 min. • Check the leak detector screen for faults/warnings and refer to the Titan Versa Operators Manual.

Fault Description	Fault Causes	Fault Troubleshooting
LD Fault	The leak detector has an internal fault.	• Observe the fault displayed on the Titan Versa screen and refer to the Titan Versa Operator Manual for information on how to resolve the issue.
LD Com Error	The ATLAS has lost RS232 communications with the Titan Versa leak detector.	• Check RS232 wiring between ATLAS and Titan Versa. • Verify the communication settings for the leak detector, see section 6.
IO Com Fault	The main control PLC in the ATLAS has lost RS485 communications with the analog input module.	• Check RS485 wiring between the PLC and the analog input module. • Check 24VDC power to the AI module

7.2. Process Faults

Fault Description	Fault Causes	Fault Troubleshooting
Test Aborted	Abort/Reset button was pressed during an active cycle.	• Press the Abort/Reset button to recover the controller back to a ready state.
LD Failed to Start	The leak detector did not start or stop a cycle when the command was sent.	• Verify communication between ATLAS and Titan Versa leak detector.
LD Failed to Stop		
Pumpdown Fault	The chamber did not get evacuated to the crossover pressure in time.	• Make sure the part inside the chamber is properly connected. • Ensure vacuum chamber is fully sealed with no O-ring leaks.

Fault Description	Fault Causes	Fault Troubleshooting
		Manual mode can help. • Increase the pumpdown time in the advanced settings. • Ensure pumping system is performing properly. • Ensure oil is changed regularly in vacuum pumps.
Part Evac Fault	The part was not evacuated to the evacuation setpoint.	• Check to make sure the evac valve is working properly. • Check for leaks in the connection to the part.
High Background Fault	The Helium background inside the chamber was too high to fill with Helium an began the test step of the cycle.	• Confirm that the part in the chamber is properly connected. • Change all O-rings on the part and fittings inside the chamber. • Increase Background Factor or Background Time in the recipe. • Check for any leaks in the part, hoses, and chamber. • Clean the test chamber.
He Fill Fault Air Fill Fault	The pressure inside the part did not reach the designated fill pressure.	• Adjust the fill regulator. • Increase the fill time in the recipe. • Verify the fill pressure in the recipe.

Fault Description	Fault Causes	Fault Troubleshooting
		• Increase the fill pressure tolerance in the advanced settings.
Part Vent Fault	When the part was vented, it did not return to the Part Vent Pressure setpoint.	• Increase the Part Vent Timer. • Verify the part valve is operating properly. • Verify the part vent pressure in the recipe.
Chamber Vent Fault	When the chamber was vented, it did not return to the Chamber Vent Pressure setpoint.	• Make sure the chamber vent valve is operating properly. • Adjust the chamber vent fault timer or pressure setpoint.
Part Clamp Fault	The automated part movements did not complete in time.	• Improperly set cylinder or position switches. • Verify pneumatic system and cylinders are functioning properly. • Inspect all sensor and switch wiring.
Part Unclamp Fault		
Chamber Open Fault		
Chamber Close Fault		
Max Sniff Time Exceeded	The end of the sniff test was not acknowledged before the time allotted in the Recipe Max Sniff Time expired.	• Extend the time in the recipe setting. • Abort the cycle before the time expires if you do not wish to resume the test.
LD Sniff Pumpdown Fault	The leak detector was not able to evacuate the sniffer probe and achieve the necessary vacuum pressure for sniffing.	• Verify that the sniffer probe is connected properly. • Inspect the sniffer probe and hose for tears/brakes.

Fault Description	Fault Causes	Fault Troubleshooting
LD Failed to Start Cal	The ATLAS was unable to initiate a calibration cycle in the Titan Versa.	• Check communication cables between ATLAS and Titan Versa.
Calibration Failed	The measured leak rate is outside the designated limits of where it is expected to read.	• Confirm that the part in the chamber is properly connected and equipped with the Calibrated Leak Standard that is entered on the Cal Settings screen. • Change the Min and/or Max Cal Leak Factors on the Cal Settings Screen. • Verify the Calibrated Leak Value entered on the Cal Settings screen. • Test the Calibrated Leak functionality in manual mode to ensure the leak is reading match the stated values.

8. Maintenance and Spare Parts

Ensure the maintenance intervals shown on the Maintenance Screen (see section 6.4.5) are followed by using the following resources.

- Maintenance section in this manual
- Titan Versa Operator's Manual
- Other required manufacturing manuals

8.1. Maintenance and Spare Parts list

The recommended maintenance items are summarized in the table below. For lists and instructions related to the Titan Versa leak detector, please refer to the Titan Versa Owner's Manual.

Part Number	Description	Replacement Interval
LMSA0439	Regulator Filter Replacement Cartridge	As Needed
LMSA3844-C	Fuse, 5x20 mm, 10 Amp, slow blow, ceramic	As Needed
LMSA3851	Fuse, 5x20 mm, 3Amp, slow blow, glass	As Needed
LOME20016S	Oil Mist Eliminator	As Needed
LVOEZUNO6	Vacuum pump oil, elite Z, UNO6	As Needed
LGL915	Oil Mist Eliminator filter cartridge	As Needed

8.2. Maintenance Documentation

Maintenance documentation for the ATLAS is contained in this manual section and on the ATLAS USB drive. The following manuals are on the USB drive, under the "Maintenance Folder".

- Pump manual, UNO 6
- Pump manual, MVP030

8.3. Maintenance Tools and Parts

Included with the product is maintenance items. The table below outlines maintenance item contents and where they are used.

Description	Part Number	Where Used
Fuse, 5 x 20 mm, 10-amp, slow blow, ceramic	LMSA3844-C	Main power entry module
Fuse, 5 x 20 mm, 3-amp, medium delay, glass	LMSA3851	Remote terminal blocks
Oil drain connector assembly	TV118495	Drain wet pump oil

8.4. Opening Enclosure

8.4.1. Enclosure Door

Enclosure door has a latch that can be opened and closed with a screwdriver.

8.5. Cleaning

8.5.1. External cleaning

Enclosure should be cleaned whenever maintenance is done or at least every six months.

- Wipe the housing with a soft damp cloth.
- Use only water to moisten. Avoid cleaners that contain alcohol or harsh chemicals. Cleaners with alcohol or harsh chemicals will strip the enclosure paint.

8.6. Electrical

DANGER: Life threatening hazard from electric shock

Incorrectly secured products may be life threatening.

- Only use fuses with the prescribed values.

DANGER: Life threatening hazard from electric shock

Considerable voltages arise inside the device. Touching parts where electrical voltage is applied can result in death.

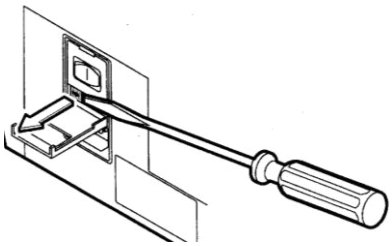
- Disconnect the device from the power supply before any cleaning or maintenance. Ensure the electric power supply is reconnected with authorization.

8.6.1. Fuses

Loc. ID	Designation	Rating	Quantity	Part Number
1	Mains Fuse	T 10.0 A	2	LMSA3844-C
2	24 V Fuse	T 3.0 A	1	LMSA3851

8.6.1.1. Replacing the main fuse

- Switch the device off at the mains plug.
- Disconnect the device from the power supply and pull out the main plug.
- Pry the cover of the fuse holder and fold it to the side.
- Remove the two fuse holders and replace the defective fuses (10.0 AT, 250 V, Ø5 x 20 mm).

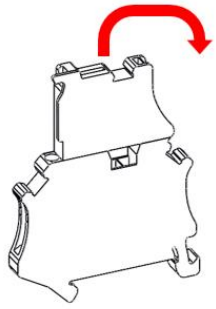


- Lock the fuse holders back into place.
- Close the cover.

8.6.1.2. Replacing terminal block fuses

- Turn off power to unit.
- Open enclosure.
- Locate fuse holder terminal bock and use hand to swing to open position.
- Open fuse terminal block fuse compartment to reveal defective use and replace (3.0 AT, 250 V, Ø5 x 20mm).

- close fuse compartment and rotate terminal block top to close position.



8.6.2. Power Cords

If new or replacement power cords are needed, order using the part number below.

Table 5 *ATLAS Power Cords*

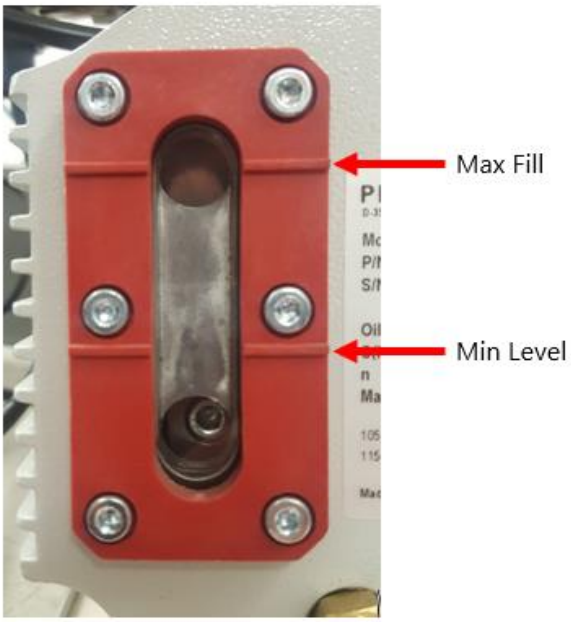
Part Number	Description
LMSA5821	Power cord, C13 right angle (down) x NEMA-5-15P, 18AWG, 6 feet
LCA069-C	Power cord, China X IEC C13, 18AWG, 6 feet
LCA069-E	Power cord, Europe X IEC C13, 18AWG, 6 feet
LCA069-P	Power cord, bare pigtail X IEC C13 18AWG, 6 feet
LCA069-U	Power cord, UK X IEC C13, 18AWG, 6 feet
LCA070-C	Power cord, China X IEC C13, 14 AWG, 6.5 feet
LCA070-E	Power cord, Europe X IEC C13, 14 AWG, 6.5 feet
LCA070-P	Power cord, bare pigtail, X IEC C13, 14 AWG, 6.5 feet
LCA070-U	Power cord, UK X IEC C13, 14 AWG, 6.5 feet

8.7. Wet Pump Maintenance

8.7.1. Check Oil Level and Color

Check the pump oil level and color monthly, or more frequently under heavy usage. Change the oil if the level is below the minimum level mark. Oil level verification is most accurate if checked while pump is off, hot, and on a horizontal plane.

LACO recommends changing the pump oil if the oil color appears to be heavily discolored or white in appearance.



8.7.2. Accessing Uno6 pump

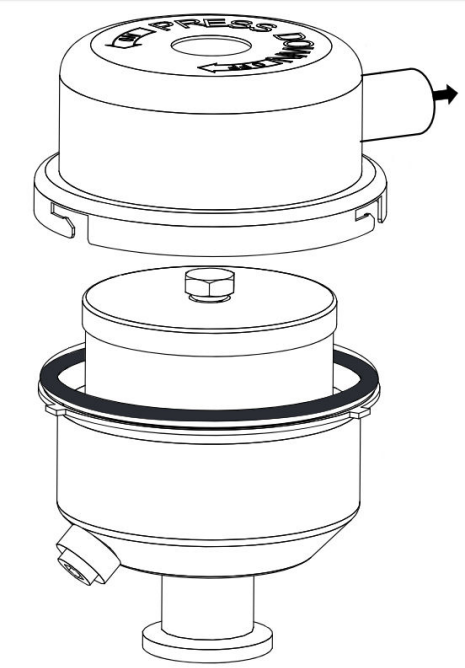
Depending on if pump is mounted onto a system frame, pump will be located in the back.

8.7.3. Oil Mist Eliminator Maintenance

Change the oil mist eliminator (OME) filter cartridge (P/N: LGL915) every 3000 hours or 18 months (whichever comes first).

- Twist top half of OME to remove cover.
- Remove bolt on top of filter. Be sure to keep O-ring under bolt attached to the bolt.
- Replace filter element.
- Lightly oil all O-rings with pump fluid.

- Assemble in reverse order.



8.7.4. Pump Repair Options

There are three pump repair options summarized below.

Maintenance Task	Part Number	Maintenance Interval	Level	Site
Change pump oil	LVOEZUNO6	1500 hours or 6 months	2	OS
Change oil mist eliminator filter	LGL915	3000 hours or 18 months	2	OS
Repair or exchange pump	LS-TVT-1 (Repair) LS-TVT-PEXC (Exchange) LS-TVT-PEXL (Exchange)	24000 hours or 48 months	2-3	OS or LS
Replace pump	PFPKD07553	36000 hours or 72 months	2-3	OS or LS

8.7.5. Other Pump Parts

Table 6

Part Number	Description
LMSA119457	UNO 6 hose assembly
LMK-TVT-7	UNO 6 oil drain line
LMK-TVT-8	UNO 6 oil fill line

Part Number	Description
LMK-TVT-6	UNO 6 oil drain-back assembly

8.8. Dry Pump Maintenance

CAUTION: Dry pumps do not typically have short term maintenance concerns but can potentially require major long-term repair if two-year maintenance is not performed.

8.8.1. Pump Maintenance and Repair Options

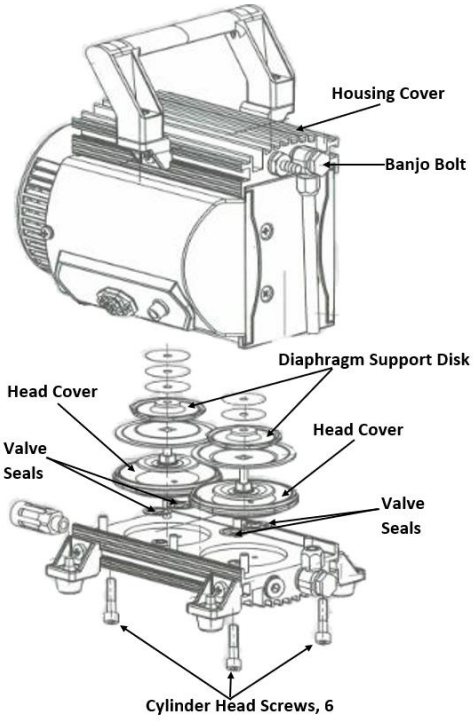
MVP030 Repair Options

Maintenance Task	Part Number	Maintenance Interval	Level	Site
Repair diaphragm and valves	LMK-TVTD-1 (Kit) LS-TVTD-1 (Repair)	12000 h or 24 months	2	OS or LS
Exchange pump	LS-TVTD-PEXC LS-TVTD-PEXL	36000 h or 72 months	2-3	OS or LS
Replace pump	PFPKT01190	36000 h or 72 months	2-3	OS or LS
Exhaust muffler	PFP0995942	12000 h or 24 months	1	OS
Diaphragm Key*	PFP0995941			

*Utilize to remove/install new diaphragms.

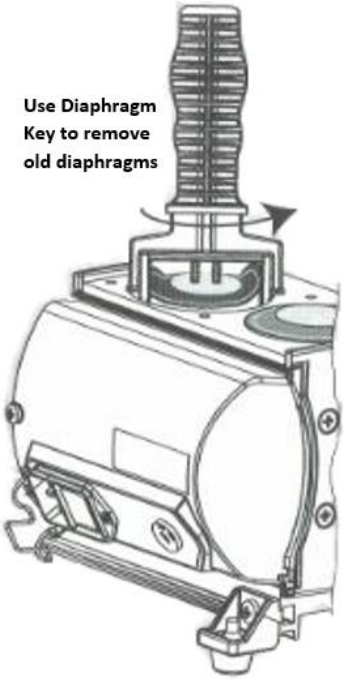
8.8.2. Diaphragm Inspection

- Unscrew banjo bolt using an open-end wrench. loosen connecting hose only from the top (see picture below).
- Unscrew cylinder head screws (six screws) at the pump head and remove housing cover; be mindful of the position of the valve seals. If necessary, take a picture of the original position of the valve seals.
- If the valve seals stick to the housing cover, carefully loosen the seals. Otherwise, remove the valve seal from the head covers.
- Replace damaged valve seals.
- Remove head cover.
- Either clean all parts and inspect for wear or install new diaphragm.


Housing Cover
Banjo Bolt
Diaphragm Support Disk
Head Cover
Head Cover
Valve
Seals
Valve
Seals
Cylinder Head Screws, 6

8.8.3. Replacing Diaphragms

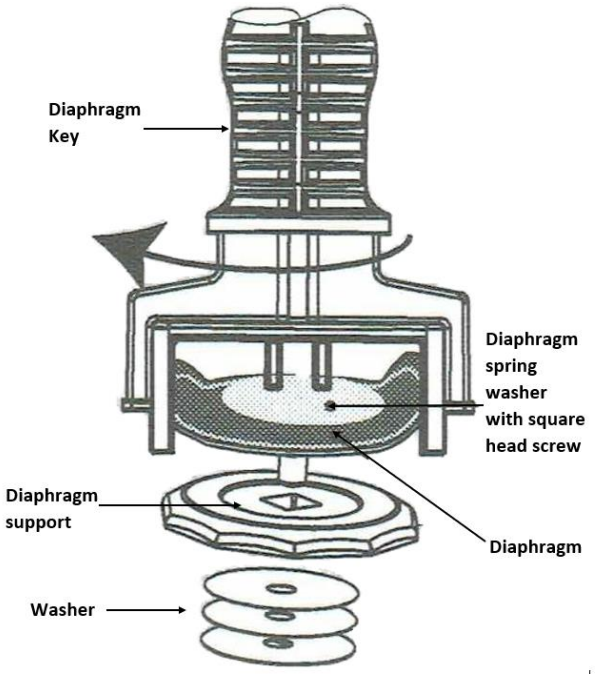
- Carefully raise the diaphragm from the side, taking care to not cause any damage. Do not use sharp-edged tools.
- Slide diaphragm key (P/N: PFP0995941) under the diaphragm until it reaches the support disk.
- Use the diaphragm key to loosen the diaphragm support disk and unscrew together with diaphragm and diaphragm clamping disk (see picture below).



- Detach diaphragm support disk and diaphragm from the square head of the connecting screw of the diaphragm clamping disk. If it is difficult to separate the old diaphragm from the diaphragm support disk, use methanol to loosen it.
- Reassemble the diaphragms in reverse order.
- Install the new diaphragm between diaphragm clamping disk with square head screw and diaphragm support disk. Ensure the square head screw of the

diaphragm clamping disk is correctly seated in the guide hole of the diaphragm support disk. See picture below.

- Reassemble pump in reverse order.



9. Appendix

9.1. Recommended Default Parameters Settings

NOTICE

All as-shipped Advanced, Calibration and recommended Recipe settings will be identified in the As-Shipped Parameter Summary.

9.2. ATLAS Remote Ethernet Protocol

The ATLAS controller also runs a TCP/IP server to handle remote communication. Connect an ethernet cable to the RJ45 port on the right side of the unit and using a TCP Client terminal such as PuTTY or Hercules, connect to the ATLAS CPU IP address (located in UniApps -> Network) on port 20263.

All send and reply commands end with a [CR]. All read commands start with a “?” (ASCII 63) and request or set commands start with a “!” (ASCI 33) character.

Command	Description	Response	Validity
!CS	Start Cycle	CS	Ready only with no fault
!CA	Abort Cycle/ acknowledge fault	CA	In-cycle or fault recovery
!MC or ?MC	Change or View Mode	AUTO or CAL	Ready only
?TC	Test or Cycle Complete	YES or NO	Test result data is overwritten once subsequent test is complete.
?SC	Read current part state & system state	TD-(Table2): (Table1)	All
?SR	Read last test part result	SR-(Table 2)	All
?TS	Read last test result	TS-(Date)-(Time)-(FinalLR)- (Test result state)	Ready only when test completed.

!TR:(O..99)/ ?TR	Set/read test recipe #	TR-(0..99)	Read: All Set: Ready only.

9.2.1. Table 1. System States

ID	State	ID	State
0	Start Pump & LD	17	Sniff Test In Progress
1	System Ready	18	Vent Pump
2	Clamp/Close	19	Bombing In Progress
3	Part Air Fill	20	Quick Fill
4	Part Decay Test	21	Delay
5	Part Vent	22	Charge Test Monitor
6	Start Titan Cycle	23	Manual Disconnect
7	Part Evac	24	Quick Evac
8	Leak Test Background	25	Lock
9	Part Helium Fill	26	Unlock
10	Leak Test	27	Diff Evac On
11	Leak Test Calc	28	Diff Evac Off
12	Stop Titan Cycle	29	Air Purge
13	Chamber Vent	30	Open Inner Weld
14	Part Cleanup	31	Close Inner Weld
15	Part Air Purge	32	Open Outer Weld
16	Unclamp/Open	33	Close Outer Weld
99	End Sequence		

9.2.2. Table 2. Part States

ID	State	ID	State
0	Unknown	27	Leak Detector Fault
1	Pass Leak Test	28	Low Control Air Pres. Fault
2	Fail Leak Test	40	LD Failed to Start
3	Gross Leak Fail	41	Pumpdown Fault
4	Decay Test Fail	42	LD Failed to Stop
6	Calibration Pass	43	Part Evac Fault
7	Calibration Failed	44	High Background Fault
8	Calibration Required	45	He Fill Fault
9	Calibration In Progress	46	Part Vent Fault
10	Test In Progress	47	Chamber Vent Fault
22	Control Air Fault	48	Part Clamp Fault
23	He Pres. Low Fault	49	Part Unclamp Fault
24	Air Fill Pres. Low Fault	52	Chamber Open Fault
25	Leak Detector Startup Fault	53	Chamber Close Fault
26	Leak Detector Not Ready Fault	57	Air Fill Fault