IS40™

IntelliSpray Spray Foam Proportioner

User Manual

SPECIFICATIONS		
Maximum Fluid Pressure	2500 PSI	(153 bar)
Air Pressure Range	70-130 PSI	(4.8 - 9.0 bar)
Max Fluid Temperature	200 F	94 C
Wetted Parts	Stainless Steel, Aluminum, Plated Steel, Chemically Resistant Plastic, Chemically Resistant O-Rings	

MADE IN USA

Contents

In this manual, the words **WARNING**, **CAUTION** and **NOTE** are used to emphasize important safety information as follows:

⚠WARNING
Hazards or unsafe practices which could result in severe personal injury, death or substantial property damage.

⚠CAUTION
Hazards or unsafe practices which could result in minor personal injury, product or property damage.

NOTE
Important installation, operation or maintenance information.

⚠WARNING

Read the following warnings before using this equipment

READ THE MANUAL Before operating finishing equipment, read and understand all safety, operation and maintenance information provided in the operation manual.

OPERATOR TRAINING All personnel must be trained before operating finishing equipment.

EQUIPMENT MISUSE HAZARD Equipment misuse can cause the equipment to rupture, malfunction, or start unexpectedly and result in serious injury.

LOCK OUT / TAG-OUT Failure to de-energize, disconnect, lock out and tag-out all power sources before performing equipment maintenance could cause serious injury or death.

AUTOMATIC EQUIPMENT Automatic equipment may start suddenly without warning.

PRESSURE RELIEF PROCEDURE Always follow the pressure relief procedure in the equipment instruction manual.

KEEP EQUIPMENT GUARDS IN PLACE Do not operate the equipment if the safety devices have been removed.

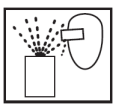
KNOW WHERE AND HOW TO SHUT OFF THE EQUIPMENT IN CASE OF AN EMERGENCY

WEAR SAFETY GLASSES Failure to wear safety glasses with side shields could result in serious eye injury or blindness.

INSPECT THE EQUIPMENT DAILY Inspect the equipment for worn or broken parts on a daily basis. Do not operate the equipment if you are uncertain about its condition.

NEVER MODIFY THE EQUIPMENT Do not modify the equipment unless the manufacturer provides written approval.

NOISE HAZARD You may be injured by loud noise. Hearing protection may be required when using this equipment.



PROJECTILE HAZARD You may be injured by venting liquids or gases that are released under pressure, or flying debris.

PINCH POINT HAZARD Moving parts can crush and cut. Pinch points are basically any areas where there are moving parts.

TIP/CRUSH HAZARD Do not tip unit. In mobile or seismic installations be sure unit is secured to floor and wall per instructions.

STATIC CHARGE Fluid may develop a static charge that must be dissipated through proper grounding of the equipment, objects to be sprayed and all other electrically conductive objects in the dispensing area. Improper grounding or sparks can cause a hazardous condition and result in fire, explosion or electric shock and other serious injury.

ELECTRICAL SHOCK HAZARD Disconnect all power sources before accessing any electrical connections in the Control Module, Fluid Modules, or Hoses. Equipment must be serviced by trained personnel only.

WEAR RESPIRATOR Toxic fumes can cause serious injury or death if inhaled. Wear a respirator as recommended by the fluid and solvent manufacturer's Safety Data Sheet.

TOXIC FLUID & FUMES Hazardous fluid or toxic fumes can cause serious injury or death if splashed in the eyes or on the skin, inhaled, injected or swallowed. LEARN and KNOW the specific hazards or the fluids you are using.

FIRE AND EXPLOSION HAZARD Improper equipment grounding, poor ventilation, open flame or sparks can cause a hazardous condition and result in fire or explosion and serious injury.

MEDICAL ALERT Any injury caused by high pressure liquid can be serious. If you are injured or even suspect an injury:

- ♦ Go to an emergency room immediately.
- ♦ Tell the doctor you suspect an injection injury.
- ♦ Show the doctor this medical information or the medical alert card provided with your airless spray equipment.

GET IMMEDIATE MEDICAL ATTENTION To prevent contact with the fluid, please note the following:

- Never point the gun/valve at anyone or any part of the body.
- Never put hand or fingers over the spray tip.
- Never attempt to stop or deflect fluid leaks with your hand, body, glove or rag.

PROP 65 WARNING WARNING: This product contains chemicals known to the State of California

It is the responsibility of the employer to provide this information to the operator of the equipment.

SAFETY PRECAUTIONS

PERSONAL PROTECTIVE EQUIPMENT

- Always wear appropriate personal protective equipment and cover all skin when spraying, servicing equipment, or when in the work area. Protective equipment helps prevent serious injury, including long-term exposure; inhalation of toxic fumes, mists or vapors; allergic reaction; burns; eye injury and hearing loss. This protective equipment includes but is not limited to:
  - ◊ A properly fitting respirator, which may include a supplied-air respirator, chemically impermeable gloves, protective clothing and foot coverings as recommended by the fluid manufacturer and local regulatory authority.
  - ◊ Protective eyewear and hearing protection.

TOXIC FLUID OR FUMES HAZARD

- Toxic fluids or fumes can cause serious injury or death if splashed in the eyes or on skin, inhaled or swallowed.
- Read Safety Data Sheet (SDS) for handling instructions and to know the specific hazards of the fluids you are using, including the effects of long-term exposure.
- When spraying, servicing equipment, or when in the work area, always keep work area well ventilated and always wear appropriate personal protective equipment. See **Personal Protective Equipment** warnings in this manual.
- Store hazardous fluid in approved containers and dispose of it according to applicable guidelines.

SKIN INJECTION HAZARD

- High-pressure fluid from gun, hose or fitting leaks, or ruptured components may pierce skin. This may look like just a cut, but it is a serious injury that can result in amputation. **Get immediate medical treatment.**
- Do not point the spray gun at anyone or at any part of the body.
- Do not put your hand or fingers over the gun fluid nozzle or any fittings in the hose or proportioner.
- Do not attempt to stop or deflect leaks with your hand, body, glove, or rag.
- Do not “blow back” fluid; this is not an air spray system.
- Relieve pressure in supply hoses, proportioner, and Quickheat hone before cleaning, checking, or servicing equipment.
- Use lowest possible pressure when purging, recirculating, or troubleshooting.
- Check hoses, couplings, and fittings daily. Service or replace leaking, worn, or damaged parts immediately. High pressure hose sections cannot be recoupled; replace the hose section.

BURN HAZARD

- Equipment surfaces and fluid can become very hot during operation. To avoid burns, do not touch hot fluid or equipment..

SAFETY PRECAUTIONS

FIRE AND EXPLOSION HAZARD

- Flammable fumes, such as solvent and paint fumes, in work area can ignite or explode. To help prevent fire and explosion:
  - ◊ Use equipment only in well ventilated area.
  - ◊ Eliminate all ignition sources, such as pilot lights, cigarettes, portable electric lamps, and plastic drop cloths (potential static arc).
  - ◊ Do not plug or unplug power cords or turn lights on or off when flammable fumes are present.
  - ◊ Keep the work area free of debris, including solvent, rags, and gasoline.
  - ◊ Ground equipment and conductive objects (install ground rod or clamp rig to known electrical ground).
  - ◊ Hold spray gun firmly to side of grounded pail when triggering into pail.
  - ◊ If there is static sparking or you feel a shock, **stop operation immediately.** Do not use equipment until you identify and correct the problem.

EQUIPMENT MISUSE HAZARD

- Misuse can cause serious injury or death.
- For professional use only.
- Use equipment only for its intended purpose. Call your Carlisle distributor for information.
- Read manuals, warnings, tags, and labels before operating equipment. Follow instructions.
- Check equipment daily. Repair or replace worn or damaged parts immediately.
- Do not alter or modify equipment. Use only Carlilse parts and accessories.
- Do not exceed the maximum working pressure or temperature rating of the lowest rated system component. See **Technical Data** in all equipment manuals.
- Use fluids and solvents that are compatible with equipment wetted parts.
- Route hoses and cables away from traffic areas, sharp edges, moving parts, and hot surfaces.
- Do not use hoses to pull equipment.
- Comply with all applicable safety regulations.

PRESSURIZED ALUMINUM PARTS HAZARD

- Do not use 1,1,1-trichloroethane, methylene chloride, other halogenated hydrocarbon solvents or fluids containing such solvents. Such use can cause serious chemical reaction and equipment rupture, and result in death, serious injury, and property damage.

IMPORTANT ISOCYANATE INFORMATION

Isocyanates (ISO) are catalysts used in two component materials.

ISOCYANATE CONDITIONS

Spraying or dispensing fluids that contain isocyanates creates potentially harmful mists, vapors, and atomized particulates. Workers exposed to isocyanates can develop a range of short and long-term health problems.

- Read and understand the fluid manufacturer's warnings and Safety Data Sheet (SDS) to know specific hazards and precautions related to isocyanates.
- Use of isocyanates involves potentially hazardous procedures. Do not spray with this equipment unless you are trained, qualified, and have read and understood the information in this manual and in the fluid manufacturer's application instructions and SDS.
- Use of incorrectly maintained or mis-adjusted equipment may result in improperly cured material.which could cause off-gassing and offensive odors. Equipment must be carefully maintained and operated according to instructions in the manual.
- To prevent inhalation of isocyanate mists, vapors and atomized particulates, everyone in the work area must wear appropriate respiratory protection. Always wear a properly fitting respirator, which may include a supplied-air respirator. Ventilate the work area according to instructions in the fluid manufacturer's SDS.
- Avoid all skin contact with isocyanates. Everyone in the work area must wear chemically impermeable gloves, protective clothing and foot coverings as recommended by the fluid manufacturer and local regulatory authority. Follow all fluid manufacturer recommendations, including those regarding handling of contaminated clothing. After spraying, wash hands and face before eating or drinking.
- Hazard from exposure to isocyanates continues after spraying. Anyone without appropriate personal protective equipment must stay out of the work area during application and after application for the time period specified by the fluid manufacturer. Generally this time period is at least 24 hours.
- Warn others who may enter work area of hazard from exposure to isocyanates. Follow the recommen- dations of the fluid manufacturer and local regulatory authority. Posting a sign such as the following outside the work area is recommended:

MATERIAL SELF IGNITION

Some materials may become self igniting if applied too thick. Read material manufactuer's warnings and Safety Data Sheet (SDS)

KEEP COMPONENTS A and B SEPARATE

Avoid cross contamination of A and B materials. Cured material in fluid lines and passages could cause serious injury or damage equipment.

Never interchange component A and component B wetted parts

Never use solvent on one side that has been contami-

MOISTURE SENSITIVITY of ISOCYANATES

Exposure to moisture, such as humidity, will cause ISO to partially cure and form small, hard, abrasive crystals. These become suspended in the fluid and can damage equipment. Eventually, a film will develop on the surface and the ISO will begin to gel and increase in viscosity.

NOTE

Partially cured ISO will reduce performance and the life of all wetted parts.

- Always use a sealed container with a desiccant dryer in the vent, or a nitrogen atmosphere in the empty headspace of the container.
- **Never** store ISO in an open container.
- Keep the ISO pump reservoir filled with appropriate lubricant. The lubricant creates a barrier between the ISO and the atmosphere.
- Use only moisture-proof hoses compatible with ISO.
- Never use reclaimed solvents, which may contain moisture. Always keep solvent containers closed when not in use.
- Always lubricate threaded parts with an appropriate lubricant when reassembling.

FOAM RESINS with 245 FA BLOWING AGENTS

Some foam blowing agents will froth at temperatures above 90°F (33°C) when not under pressure,especially if agitated. To reduce frothing, minimize preheating in a circulation system. Follow resin manufacturers guidelines.

CHANGING MATERIALS

NOTE

Avoid equipment damage and downtime when changing materials or flushing for service or storage.

- Flush equipment multiple times to make sure it is clean.
- Always clean the fluid strainers after flushing
- Check with the material manufacturer for chemical compatibility.
- When changing between epoxies and urethanes or polyureas, disassemble and clean all wetted parts, and change hoses.

GROUNDING

Check local electrical code and proportioner manual for grounding instructions.

Ground spray gun through connection to a Carlisle approved grounded fluid supply hose.

INTELLISPRAY™ SYSTEM

The Carlisle IntelliSpray Spray Polyurethane Foam (SPF) system consists of the IS40 Proportioner, QuickHeat Hose, and ST1 Spray Gun. The IntelliSpray system has been designed for ease of use, increased productivity, “best in class” process control, easy service, and real-time ratio control.

QuickHeat hose has roughly double the heating power compared to most other SPF hoses and directly heats the fluid from inside the hose, which results in fast and efficient fluid heating, even in cold climate conditions. QuickHeat hoses have embedded temperature and pressure sensors, independent A and B hose heating, and up to 6 independent heating zones to improve to improve temperature control . QuickHeat hoses provide sensor power and signal communication without cables or connectors, eliminating failure points and improving reliability. QuickHeat hoses include a snag-proof, abrasion resistant outer hose wrap that is sealed with industrial-grade Hook & Loop material to allow individual A or B side hose replacement.

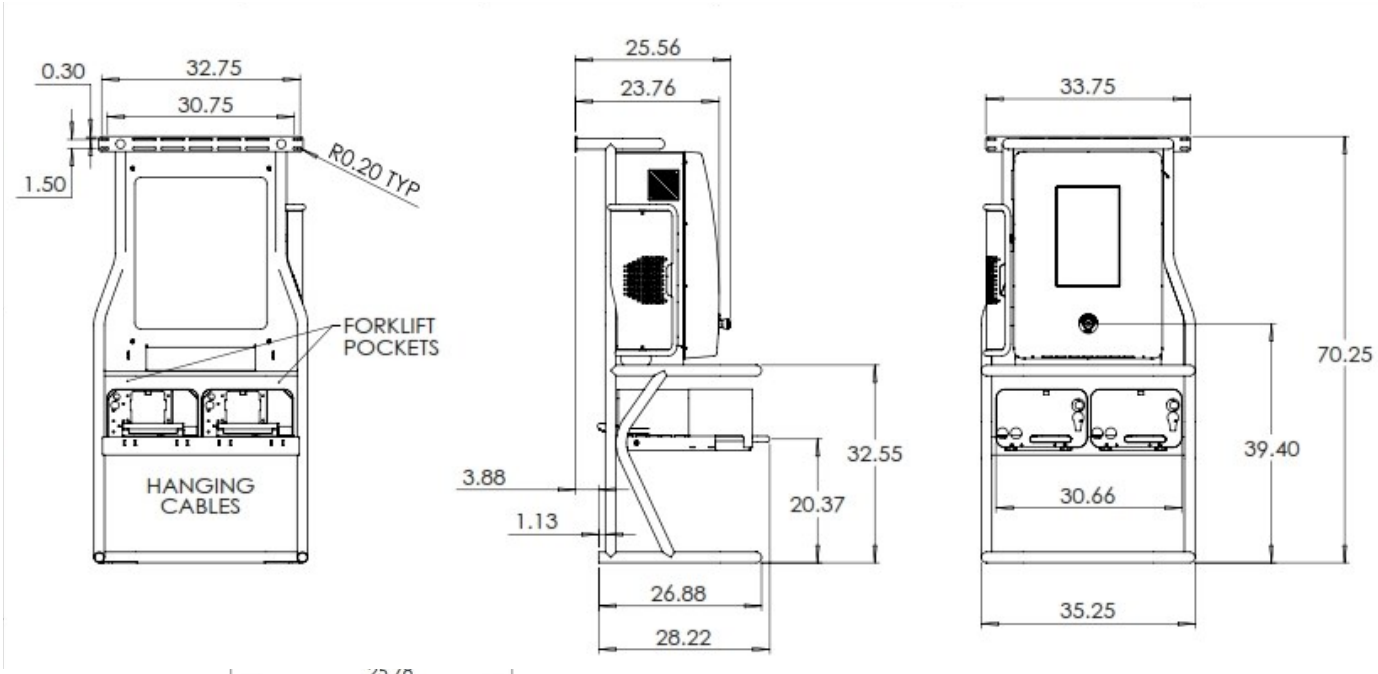
The ST1 gun has improved ergonomics, lower weight, easier service, and a wider range of output and pattern control with configurable chamber/tip combinations.

The system will work with other high pressure spray foam guns that have compatible hose manifolds.

Refer to the QuickHeat Hose manual and ST1 Gun Manual for more information on each.

IS40 - SPECIFICATIONS

The IS40 Proportioner is roughly 36” wide, 70” tall, and 32” deep. Eight separate floor mounting holes are located in the base of the unit. and a slotted wall mounting bracket is provided along the top of the unit. The IS40 must be securely attached to the a floor and wall in any mobile or seismic installation. Refer to pages 28-36 for installation instructions.



Weight	585 lbs (260 kg)
Max Fluid Pressure	2250 psi (155 Bar)
Operating Temperature	32/120° F (0-50° C)
Humidity	0-85% Non Condensing
Input Voltage	200-240V
Frequency	50/60 Hz
Phase	3
Full Load Amps	78 A
Max. Disconnect	100 A
SCCR	5 kA

IS40 Physical, Environmental, and Electrical Specifications

Other physical, operating, and electrical specifications are show in the table to the right. The electrical specifications include the maximum hose length that can be powered by the IS40 and motor current at stall load. Typical current draw in most applications is under 60 Amps (3 phase), but installers and owners should consult with their authorized Carlisle Service Provider to determine the minimum size circuit for specific installations. Generator size is left to the rig builder to determine based on these specifications along with other electrical loads in the rig.

IS40 OVERVIEW

The Carlisle IS40™ Spray Foam Proportioner is a high performance device that delivers Isocyanate (A) and Polyol Resin (B) fluids to a spray gun via Carlisle QuickHeat™ hoses. The system continuously monitors and controls A to B fluid output to a 1:1 ratio and is capable of high pressures, temperatures, and flow rates. Efficient, high power preheaters along with independent A and B multizone internal hose heating assures fluid temperatures are controlled to user settings. Pressure and temperature sensing near the spray gun provide consistent performance regardless of hose length, fluid viscosities, or environmental conditions.

The IS40 Control Module is built with components used in high duty-cycle rugged industrial environments. The heart of the control module is an industrial grade controller that senses over 30 inputs (flow, temperature, pressure) and drives over 10 outputs at up to 1000 times per second. The controller stores job data, recipes, historical performance information, user information and alarm histories. Software can be updated remotely or with a USB memory stick. A 15.4” high-strength touch-screen allows the user to monitor and control the proportioner and hoses. The IS40 Control Module provides remote system monitoring, control and service “out of the box” without any additional hardware, software, or monthly fees. The Control Module also includes power management, circuit protection, motor control, heater power, remote connectivity, internal I/O, and electrical safety systems. Diagnostics and repair are made simple via clear messages and monitoring screens. If needed, component replacement is fast and simple. The Control Module includes a thermostatically controlled cooling fan that draws in outside air through a user-cleanable filter.

The IS40 Proportioner uses independent Fluid Modules that contain temperature and pressure sensors, fluid filters, shutoff and recirculation valves, fluid preheaters, servo motors, flow meters, pressure gages, and direct-drive external gear pumps specifically designed to handle spray foam materials. This independent, compact, modular design approach allows the system to deliver material “on-ratio” whenever the gun is triggered. For ease of service, Fluid Module can be partially or fully extracted from the IS40 frame. All common service components can be accessed from the front of the module and replaced in the field if minutes.

The IS40 Proportioner is specifically designed to use Carlisle QuickHeat™ hoses. These unique hoses contain high-power internal electric heating cables, ensuring that all of the heating energy is transmitted to the fluid. QuickHeat hoses are provided in 100 and 150 foot lengths. Heated whip hoses are available in 20 and 40 foot lengths. Unheated whips are available in 6 and 10 foot lengths. Each length of heated hose begins with a fluid manifold or “modem” that contains pressure and/or temperature sensors, heater cable connectors, and electronics used to send information over the hose to the Control Module. With this approach no sensor power or communication cables are required, which are a common source of hose failures in other systems. This approach allows the IS40 to receive more information from multiple sensing locations at each hose junction. It also allows projection of information down the hose to a remote monitoring and control devices. More information about QuickHeat hoses is contained in the QuickHeat Hose Manual.

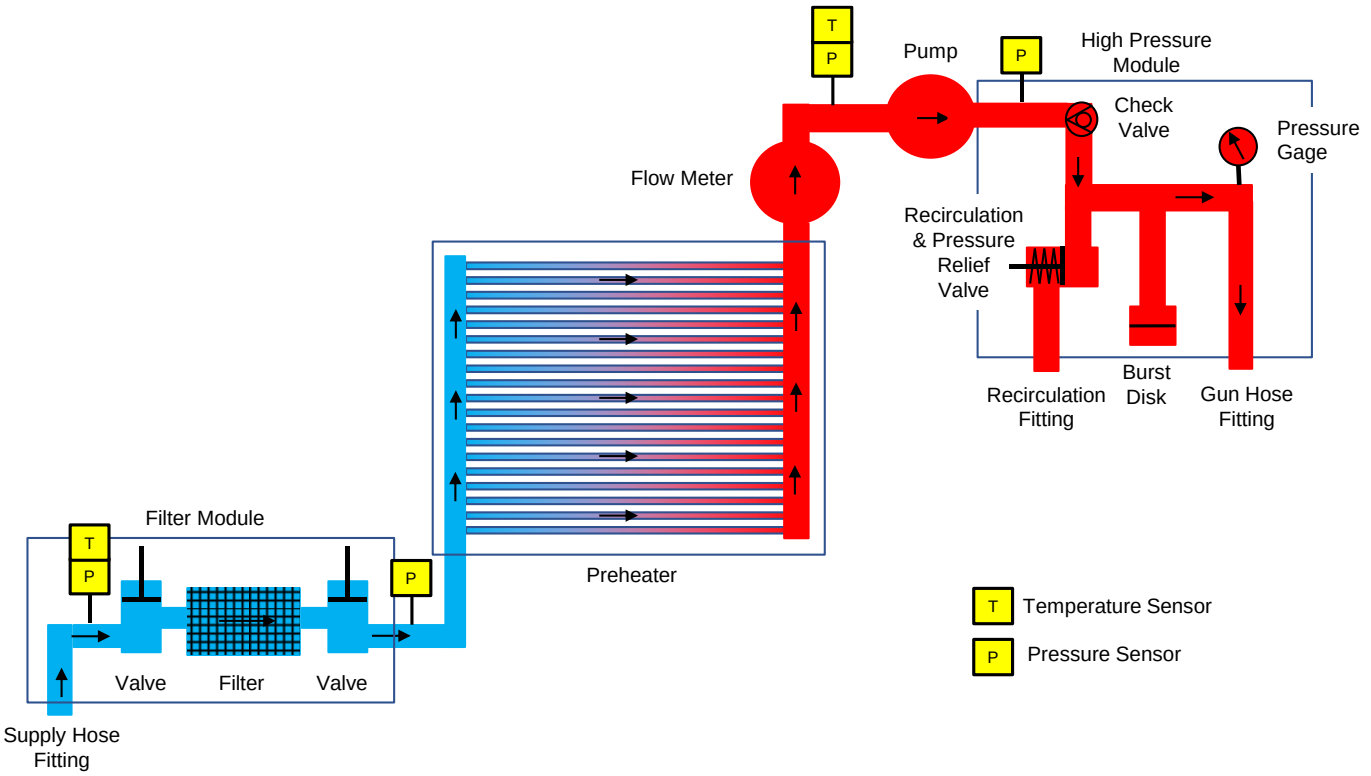
Finally, the IS40 Control and Fluid Modules are mounted in a high-strength tubular steel frame that protects the modules and provides multiple horizontal and vertical mounting points.

IS40 OVERVIEW

The IS40 is a modular system, composed of a Control Module, A and B Fluid Modules, a high strength tubular frame, and software. The frame has integral floor and wall mounting brackets. The A and B Fluid Modules are identical other than motor size, front cover labels, recirculation valve colors, and outlet fluid fittings (JIC5 for A, hose, JIC6 for B hose). The figure below and on the following pages will help the user become familiarized with the IS40 Proportioner.

FLUID MODULE OVERVIEW

The following figure shows the fluid path and major elements contained in the IS40 Fluid Module. Flow is from left to right indicated by arrows.



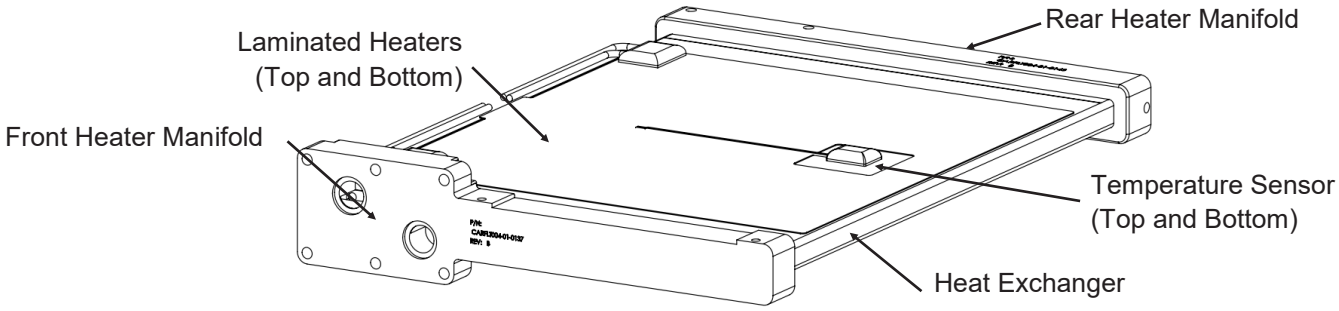
The main elements of each A and B Fluid Modules and their functions are described below and shown in the following pages.

Filter Module: The Filter Module consists the following components mounted in a machined aluminum manifold.

- Inlet and outlet valves. Two 1/4 turn cartridge “poppet” style valves are used to control the inlet and outlet flow through the filter. The valves are closed when turned counter-clockwise (CCW), and open when turned clockwise (CW). Icons on the Fluid Module covers indicate position of the valves. When both valves are in the closed position the user can service the filter elements with minimal fluid loss. The Fluid Modules are at a height that allows the User to place a bucket under the filter module to collect any drips during maintenance.
- Inlet temperature sensor. The Filter Module contains an inlet temperature sensor that indicates the temperature of incoming material. The inlet temperature for each material is displayed on drum icons shown on the Spray Screen. Warning and Error alarms can be set in the Menus Screen to prevent the User from working with fluid that is outside recommended temperature limits.
- Filter Cap. The 7/8” hex head Filter Cap holds the filter body and elements in place. This is a straight thread cap that has a sealing O-ring that should be checked and replaced if needed when servicing the filter elements.
- Filter Body: The Filter Body is held in place by the Filter Cap and holds the Filter Elements.
- Filter Elements: Each Filter Body holds two 40 mesh filter elements that can be easily cleaned or replaced.
- Pressure Sensors: The Filter Module has two sensors that measure pressure on each side of the filters. These sensors allow the IS40 to alerts the user when the filters need to be cleaned or replaced.

FLUID MODULE OVERVIEW

Preheater: The IS40 uses low mass Preheaters to warm the A and B fluids on the low pressure side of the Fluid Pumps. This allows the Preheaters to rapidly respond to variations in incoming fluid temperature, flow rates, or setpoint changes. Each Preheater has 22 individual channels for fluid flow that run down and back through the heat exchanger. Mutli-zone interleaved etched foil heaters are firmly bonded to the top and bottom of the heat exchanger. This approach eliminates direct heater element contact with fluids (as with immersion heaters) and increases heat transfer area to fluids by up to a factor of 4 (compared to other systems). This allows the heater elements to operate at lower temperatures than typical immersion heaters, increasing reliability and reducing the risk of material charring. Redundant temperature sensors are bonded to the top and bottom of the heat exchangers to control fluid temperature. A fail-safe replaceable thermal fuse is mounted on the top of each heater assembly to prevent thermal run-aways if all other control systems fails. All of these design features allow the Preheaters to come to temperature within several minutes of startup, minimizing warmup time.



Pre-pump Pressure Sensor: This pressure sensor is used to confirm the supply (e.g. drum) pump is providing enough pressure to prevent gear pump cavitation.

Pre-pump Temperature Sensor: This sensor monitors the temperature of fluid leaving the Preheater and also used to control fluid temperature when preheating drum material in Exchange mode.

Flow Meter: High precision gear flow meters continuously measure fluid flow to delver A:B fluid on-ratio.

Fluid Pump: The IS40 uses external gear pumps to pressurize and deliver fluid to the distribution (gun) hose . These pumps are specially designed for compatibility with Isocyanates and Resins used in Spray Foam insulation. They include integrated shaft lubrication housings, hardened wear plates, and specially coated journal bearings and shafts for long life.

High Pressure Module: TheHigh Pressure Module houses the following components:

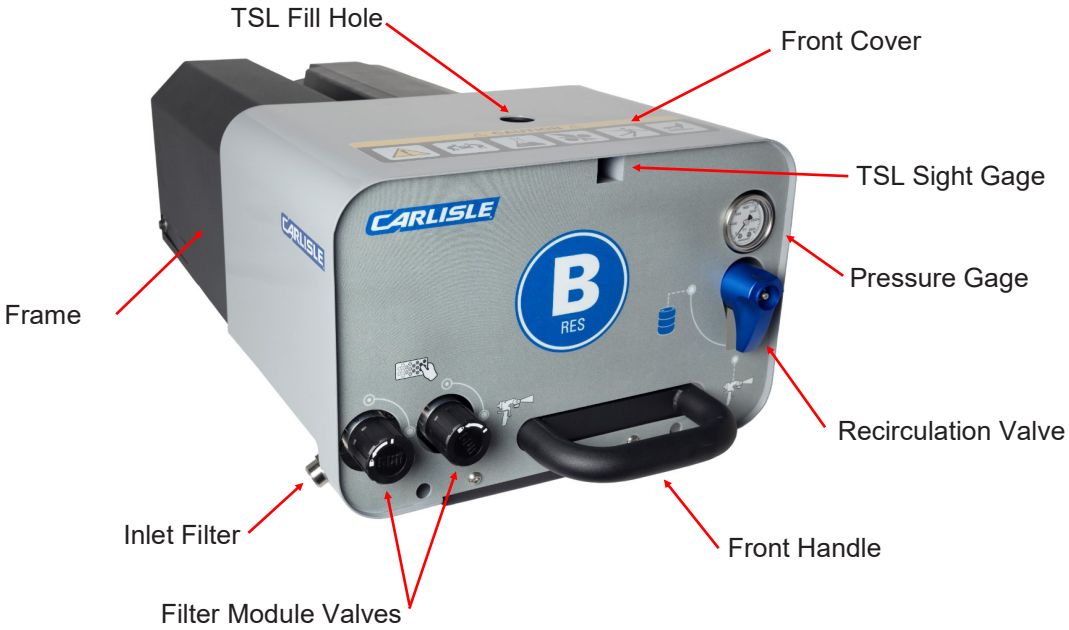
- Check Valve. The Ball Check Valve prevents fluid backflow to the low pressure side of the IS40 Fluid Modules.
- Pressure Sensor: A pressure sensor is mounted in the High Pressure Manifold and used to prevent system overpressure. It is also used for automatic hose pressure sensor calibration.
- Pressure Gage: An analog pressure gage allows the user to read pressure in the hoses even when the system in not powered.
- Recirculation and Pressure Relief Valve: The Recirculation valve controls flow to the recirculation fitting and includes a pressure relief valve that opens at approximately 3000 psi.
- Burst Disk: As an additional safety precaution, a burst disk assembly rated for 7000 psi is located in the bottom of the High Pressure Manifold,. In case of rupture high pressure fluid is contained within a well and directed downward and away from other equipment or users. The Burst Disk assembly is a service items that should be replaced annually or more often based on the properties of fluids being sprayed..
- Hose fittings. JIC fittings for both recirculation and distribution (gun) hoses are located at the bottom of the High Pressure Module. Fittings are clearing identified by embossed labels in the manifold.

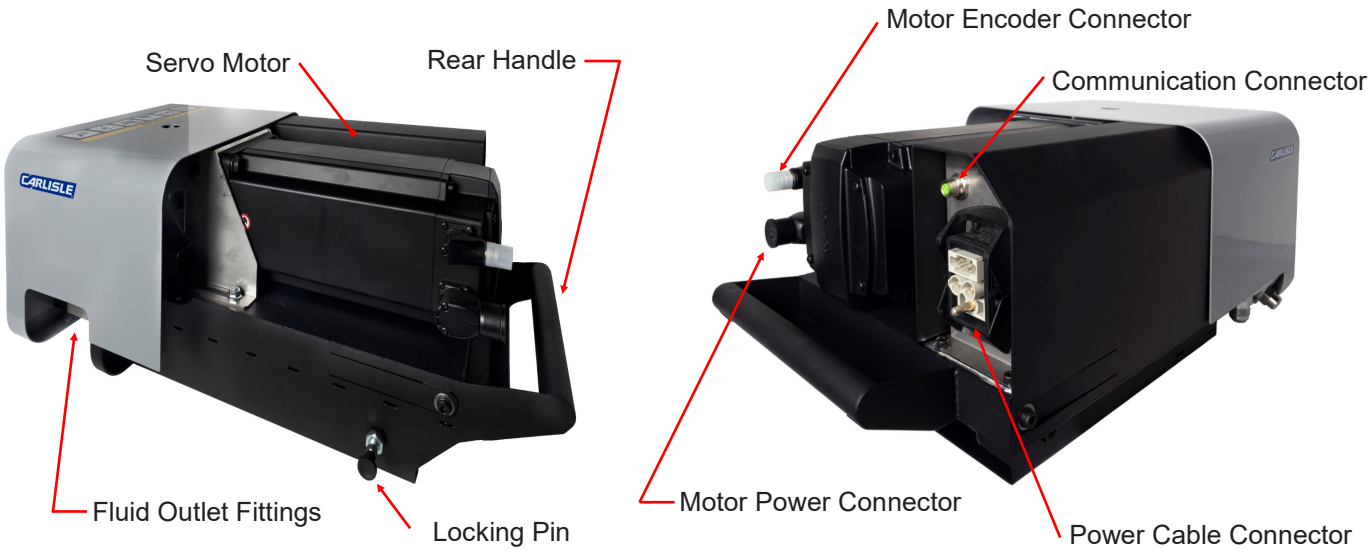
FLUID MODULE

The IS40 Fluid Modules independently filter, heat, pressurize, and deliver A and B materials to the QuickHeat hose and recirculation lines. Material is supplied to the Fluid Modules from drums, totes, or other fluid containers. To assure proper operation the IS40 requires the fluid to be provided at a pressure that avoids gear pump cavitation. Depending on the viscosity and flow rate of the fluid, the inlet pressure should be at least 25 psi at all times. To avoid gear pump cavitation supply pumps should be sized to provide at least 2 GPM continuous flow at an inlet fluid pressure of 100 psi. The IS40 will issue an error message and stop if inlet fluid pressure is either too low or too high.

The IS40 Fluid Modules are highly integrated to reduce size, complexity, and number of fluid fittings. With their modular design approach they can be easily serviced while in the proportioner or completely removed or reinstalled within minutes. With the exception of minor differences, the A and B fluid modules are identical.

The following images shows the locations of primary components and features in each Fluid Module.

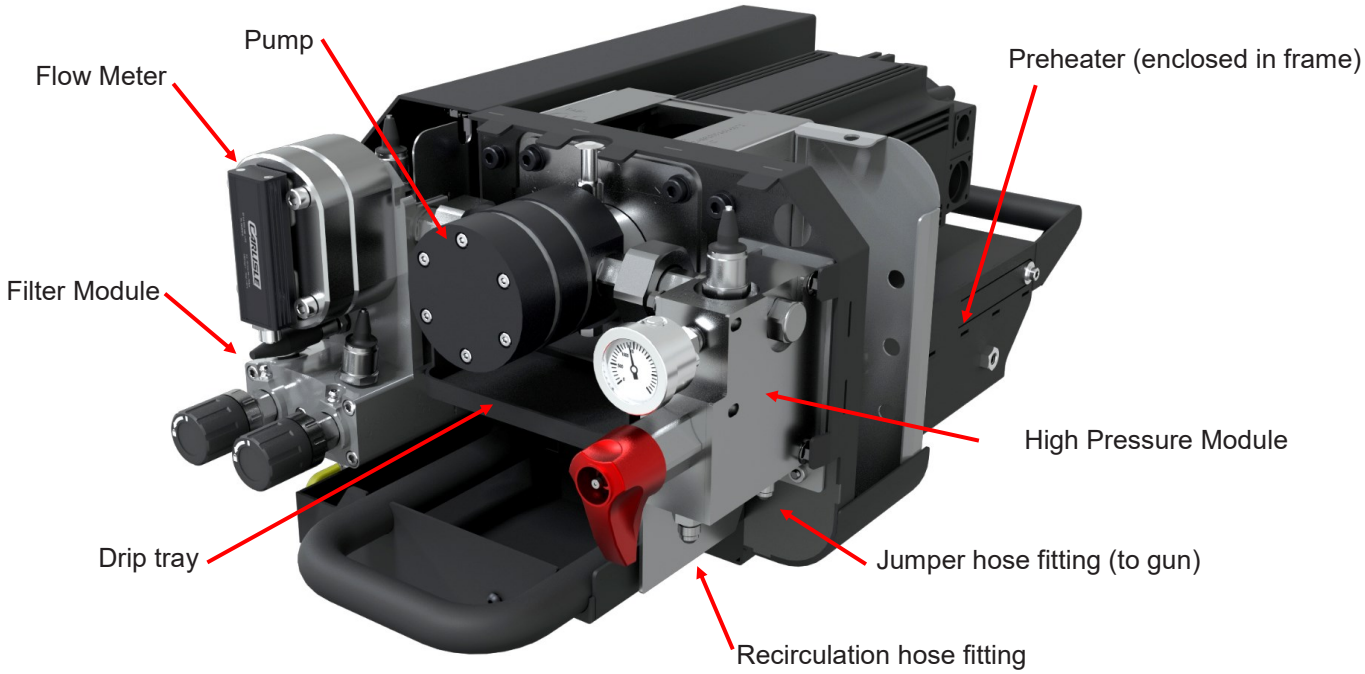


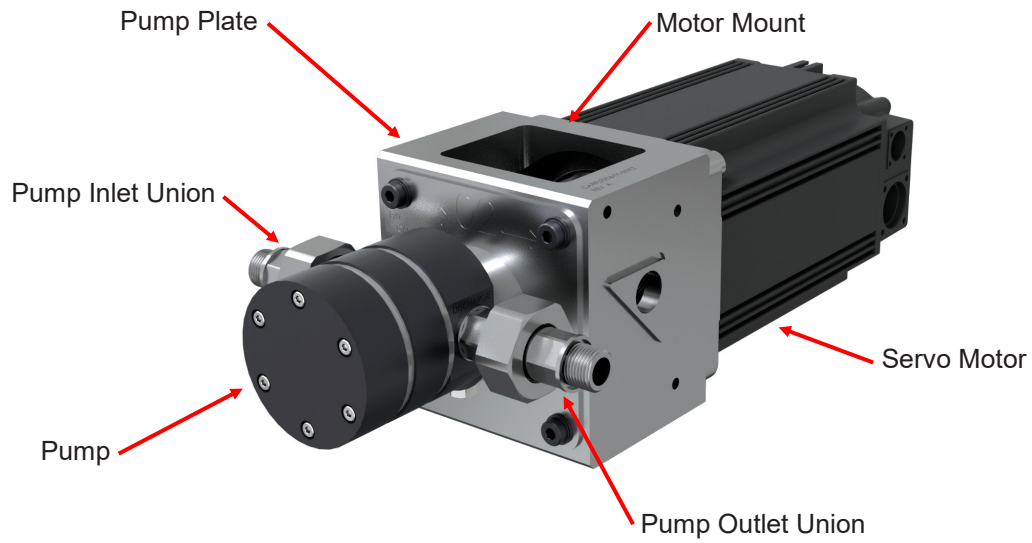


FLUID MODULE

The images below show the IS40 Fluid Module with the cover removed and the Pump Module removed from the Fluid Module. The A and B Fluid Modules are identical except for the following:

- The B Servo Motor is slightly larger than the A Servo Motor to account for higher viscosity B Resins that require more torque.
- The A and B covers have different labels on them (A and B).
- The Recirculation valve handles are different colors (red for A, blue for B)
- The outlet JIC fitting sizes are unique for A (JIC 5) and B (JIC 6) to prevent cross-contamination when installing or servicing.
- The spring loaded locking pin is located on opposite sides for easier access.





FLUID MODULE

The A and B Fluid Modules have similar controls as described and shown below.

Filter Inlet and Outlet Valves. Turn clockwise (CW) 1/4 turn to hard stop for open position. Turn counterclockwise (CCW) 1/4 turn to hard stop for closed position. When in use both valves should be in open position. For filter service set both to closed position. See page 117 for filter service instructions.

Recirculation Valve. Pointing the handle to the drum icon opens flow to the recirculation line. Note it does not stop fluid flow to the gun hoses. Pointing the handle to the spray gun icon closes flow to the recirculation line, and all flow will be through the gun hoses.

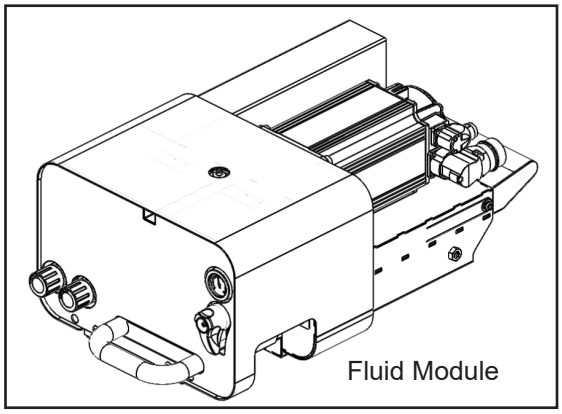
Analog Pressure Gage: This indicates fluid pressure in the high pressure manifold, including the spray gun hoses.

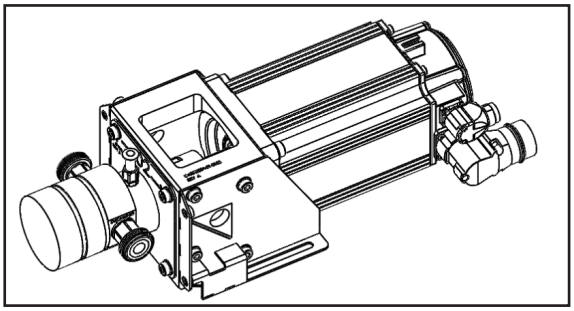
TSL Reservoir Site Gage: This allows the user to see the TSL fill tube level from the front of the machine. The gear pumps have a TSL chamber around their input shaft and shaft seals to protect the shaft seal from ISO crystallization and contamination. Once filled at the factory, the IS40 rarely requires and TSL fluid maintenance as long as the fill tube cover is in place. If the TSL fluid becomes discolored it should be drained and changed. A drain plug is provided on the bottom of the pump for this.

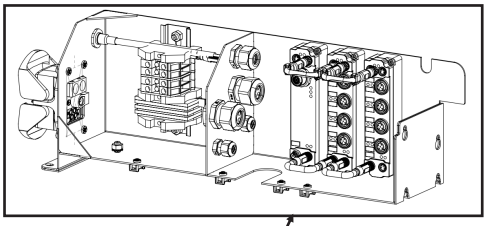
Cover Screws: Remove for cover removal. The cover should be in place when the unit is in use.

Captive Screws: These hold the module to the frame, and should always be engaged except when servicing the module.

FLUID MODULE







Pump Module

Motor Mount

Fluid Pump

Frame

Cover

I/O Module

Servo Motor

Flow Meter

Flow Meter

Heater Module

Cover

High Pressure Module

Front Cover

Pressure Sensor

Check Valve

Pressure Gage

Flow Meter

Fluid Preheater

Filter Valves

Burst Disk

Recirculation Valve

CONTROL MODULE OVERVIEW

The IS40 Control Module provides overall system control, touch-screen HMI, power management, circuit protection, motor controls, preheater and hose heater controls, remote connectivity, internal networking, and electrical safety systems. Components are contained in an enclosed sheet metal cabinet that incorporates a thermostatically controlled fan that draws in cooling air through a user serviceable filter in the bottom of the door.

The IS40 Control Module is built with components used in high duty-cycle industrial environments. The heart of the control module is an industrial grade controller that senses over 30 inputs (flow, temperature, pressure) and drives over 10 outputs at up to 1000 times per second. The controller stores job data, recipes, historical performance information, user information and alarm histories. Software can be updated remotely or with a USB memory stick. The 15.4” high-strength touch-screen allows the user to monitor and control the proportioner and hoses. The IS40 Control Module provides remote system monitoring, control and service “out of the box” without any additional hardware, software, or monthly fees.

The IS40 Control Module is designed for front-access service while in the proportioner. All components can be replaced in minutes with simple hand-tools. All items are labeled and all wiring clearly tagged.

The following pages show the location and function of primary components in the Control Module. Refer to the IS40 Service Manual for information on diagnostics, service, and component replacement.

Always be sure the rotary power switch is in the OFF position before opening the Control Module. Due to electrical shock hazards service of the Control Module must be performed by trained personnel only.

⚠ WARNING

ELECTRICAL SHOCK HAZARD Disconnect all power sources before accessing any electrical connections in the Control Module, Fluid Modules, or Hoses. Equipment must be serviced by trained personnel only.

CONTROL MODULE

The function of primary components in the Control Module are described below.

Main Panel: Most of the Control Module components are part of the Main Panel assembly. For mobile robustness additional Hook & Loop retention straps are used for DIN rail mounted components. Wiring is contained in capped Raceways. Additional information on the Main Panel is contained in the following pages.

HMI/Controller: The IS40 uses a 15.4" TFT mutiTouch HMI (Human Machine Interface) that also contains an industrial Controller, The Controller performs all machine monitoring and control functions and while the HMI acts as the interface to the User. This "all in one" device eliminates the need for a separate PLC (Programmable Logic Controller). The HMI/Controller in the IS40 is specifically designed for the wide range of environmental and mobile conditions Spray Foam equipment is subject to.

Solid State Relays (SSRs): The IS40 has individual SSRs mounted on heat sinks for all heating zones (A and B preheaters A and B hose sections). SSRs control heating power by modulating current to the respective heating zones. Indicator lights on each SSR show when current is being applied to the respective heating zone. When the light is on or flashing, current is flowing to the respective heating zone.

Cellular Modem and Antenna The Cellular Modem and Antenna allow the IS40 to connect to available cellular networks. This allows Users to monitor and/or control the IS40 from any standard web-browser on their phone, tablet, or computer. It also allows Users to email Job Reports to selected recipients, and allows Authorized Service Providers and to access the unit for remote service and software upgrades.

Cooling Fan: A thermostatically controlled cooling fan pulls external air through a user-serviceable filter in the front door of the he Control Module. This helps prevent component overheating in hot environments.

E-Stop Button: When pressed, the E(mergency)Stop Button opens the internal high-voltage disconnects that power preheaters, hoses heaters, and motors. It is provided as a safety device to stop fluid heating and pumping without pressing the STOP button on the HMI screen.

Air Filter. Cooling air is drawn through a user-serviceable air filter in the Control Module door. See page 120 for air filter cleaning instructions.

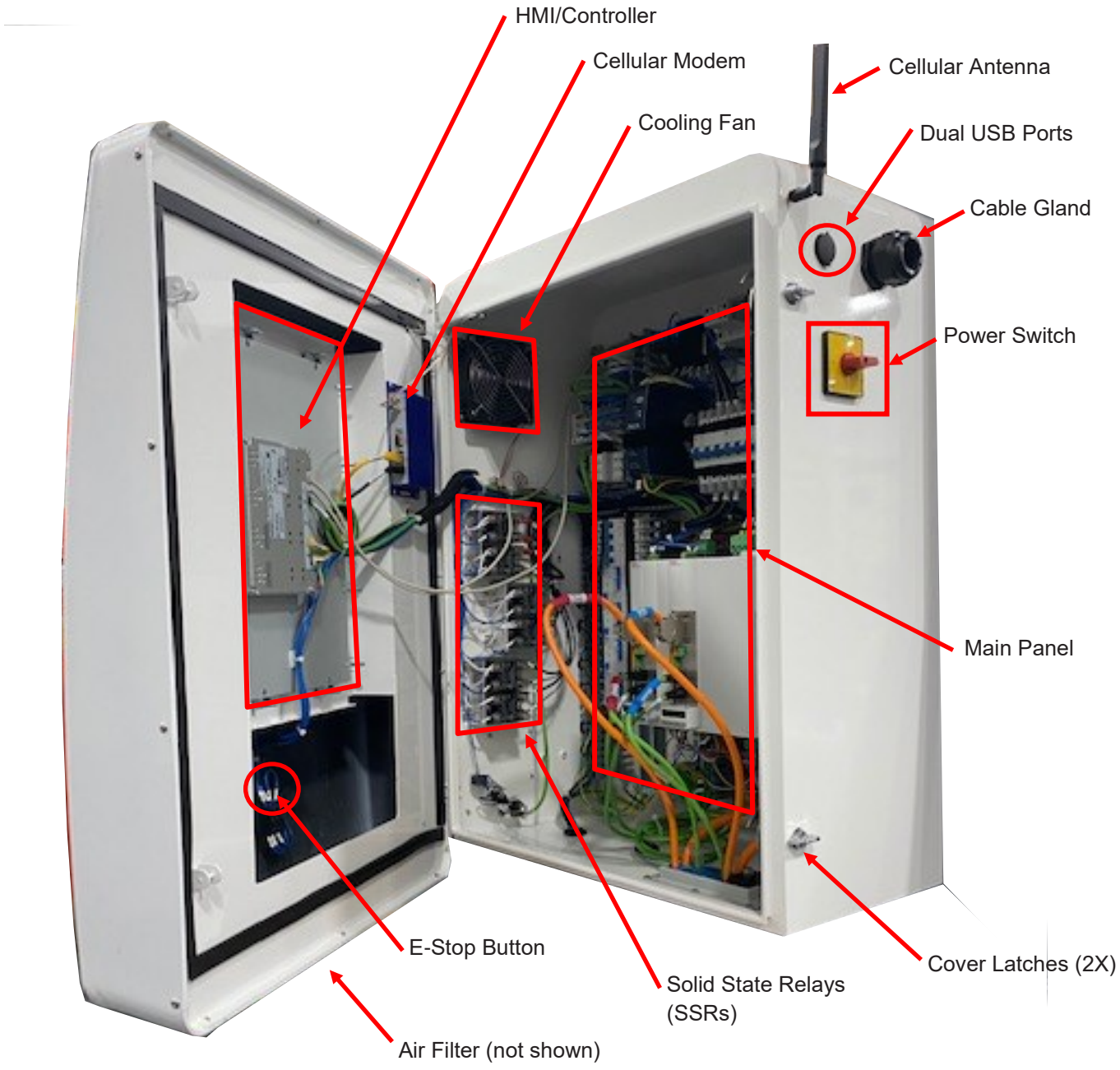
Power Switch: The IS40 rotary Power Switch disconnects all voltage to the unit. It also allows use of a-safety lock-out padlock for preventing accidentally powering on the system when servicing. The switch is on when pointed to at the I and off when pointed at the O.

USB Ports: Dual USB ports are provided on the side of the Control Module for attaching accessories (e.g. hand-held scanner for scanning drums and memory sticks used for transferring information (e.g. job reports, software updates).

Cable Gland: A M40 X 1.5 cable gland is provided with each IS40 that is suitable for 22mm to 32mm cable diameters). In most installations 2/4 SOOW power cable is suitable but installers are responsible for selecting the proper cable size and insulation based on installation configuration, cable length, and environmental conditions.

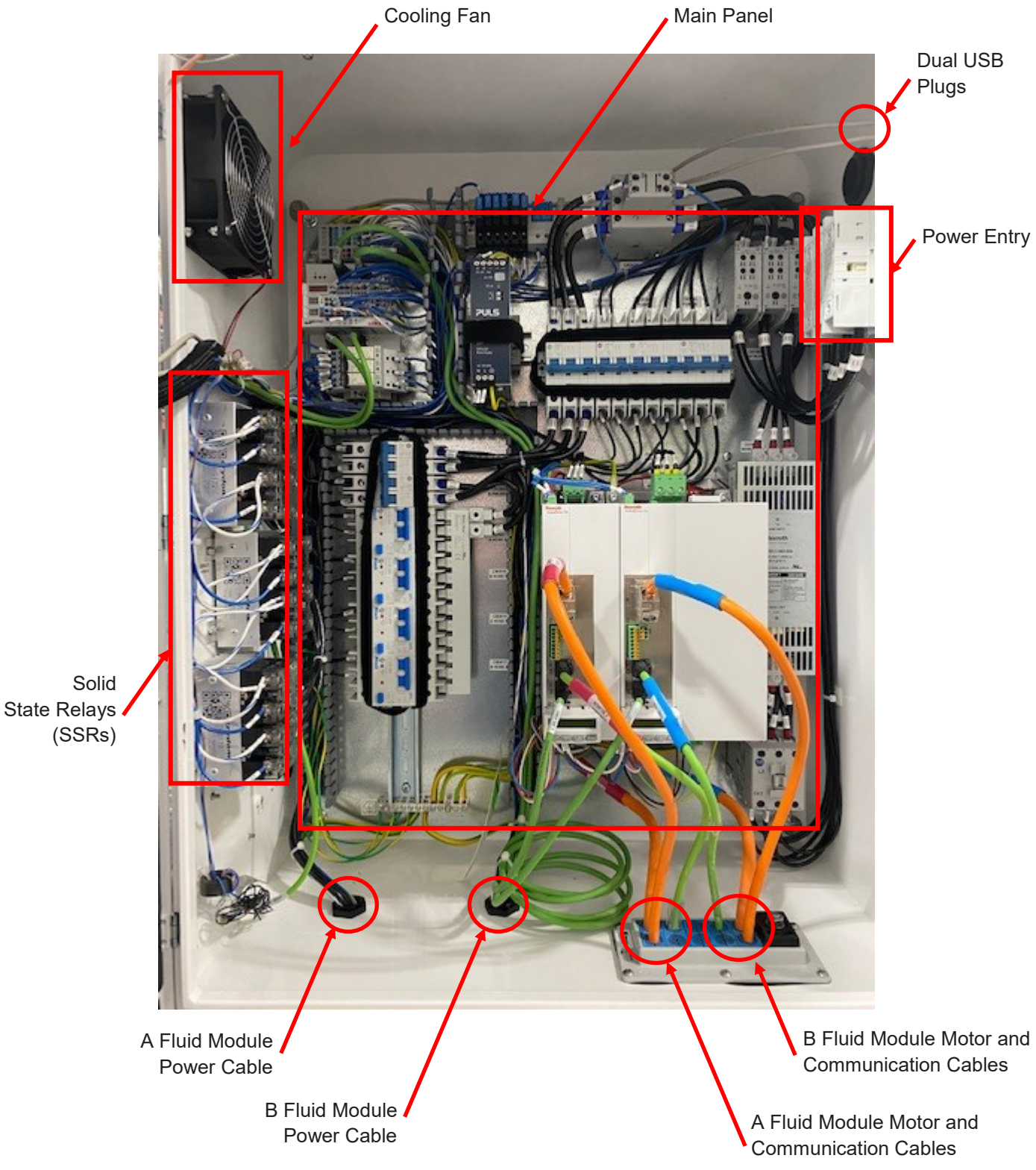
CONTROL MODULE

The main components of the Control Module are shown in the figure below and described in the following pages. All items and cables in the Control Module are clearer marked to assist in diagnostics and service.



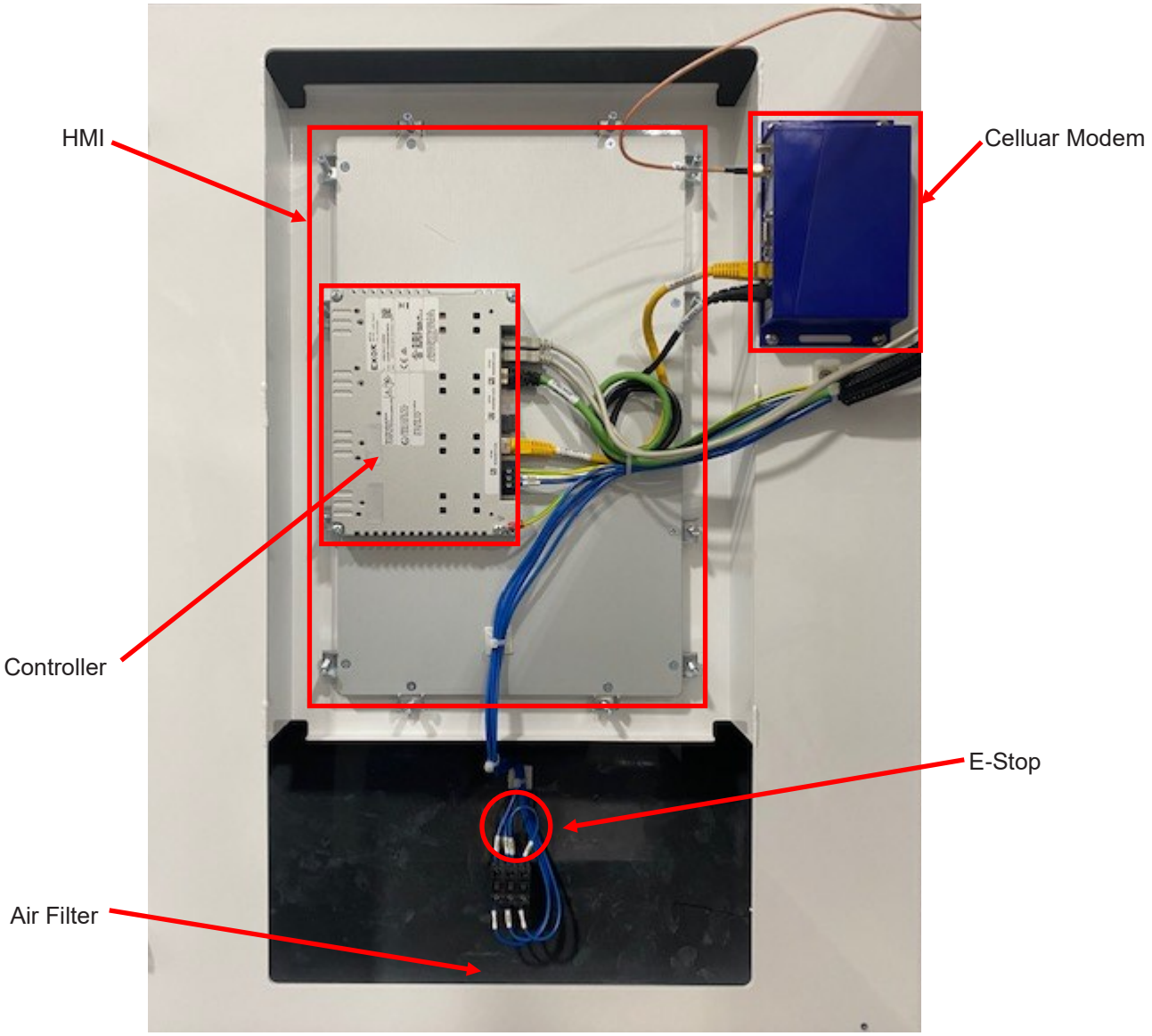
IS40 Control Module

CONTROL MODULE



IS40 Control Module, Front View

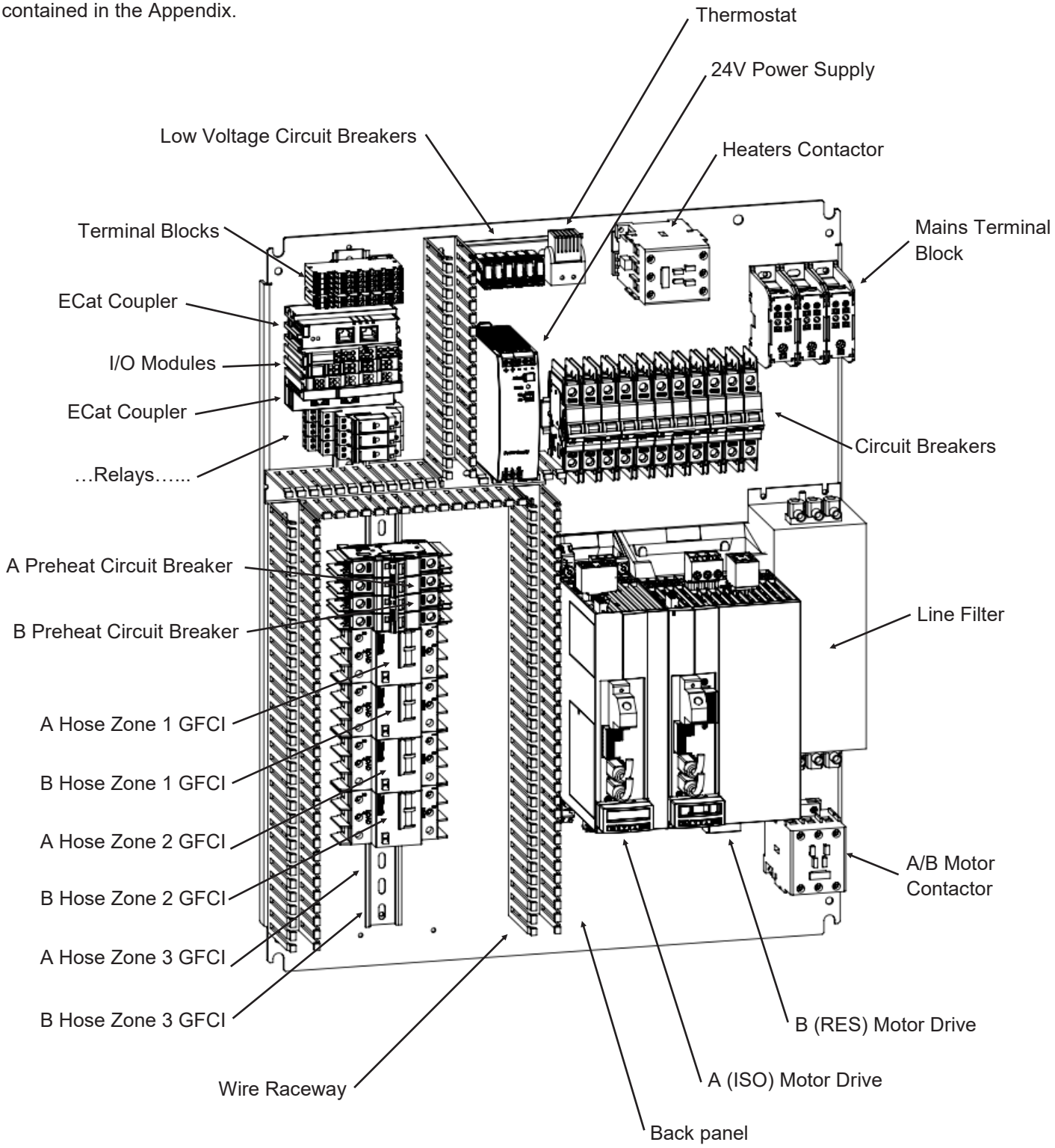
CONTROL MODULE



IS40 Control Module, Front Door

CONTROL MODULE

Most of the Control Module components are part of the Main Panel and are shown in the following figure. For mobile robustness additional Hook & Loop retention straps are used for DIN rail mounted components. Wiring is contained in capped Raceways and clearly labeled. All components are also labeled on the Main Panel. Wiring schematics are contained in the Appendix.



CONTROL MODULE - CIRCUIT BREAKERS

⚠ WARNING

ELECTRICAL SHOCK HAZARD Disconnect all power sources before accessing any electrical connections in the Control Module, Fluid Modules, or Hoses. Equipment must be serviced by trained personnel only.

A circuit breaker is a switch designed to automatically protect an electrical circuit from damage caused by overcurrent, overload, or short circuit situations. Protective relays inside the circuit breaker detect a fault and “trip” to open contacts that interrupt current flow. Circuit breakers contained in the IS40 Main Panel prevent protect all electrical circuits and components in the IS40 Proportioner and QuickHeat hoses.

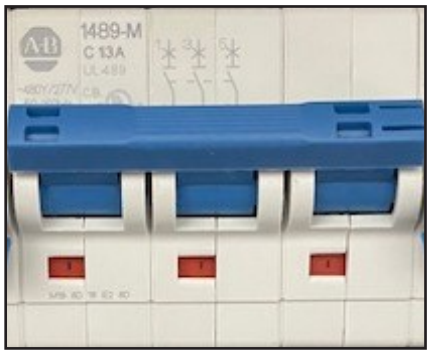
Circuit breakers and their electrical hierarchy also allow easier identification and isolation of the location or component that causes the fault.

If a circuit breaker opens (trips) there is always an underlying reason that should be investigated and resolved by a trained technician. In most cases resetting (closing) a circuit breaker will not resolve the underlying issue.

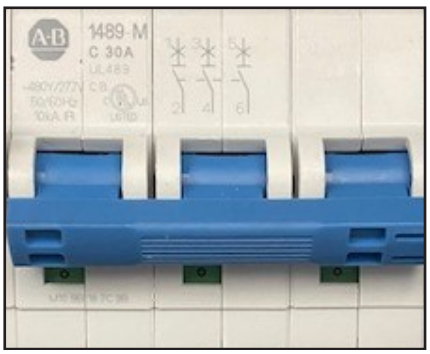
The IS40 Circuit Breakers are contained in three (3) banks as shown on the previous page. Bank 1 contains the Main circuit breakers that feed all other circuits through Bank 2 and Bank 3. Refer to the IS40 Service Manual for electrical schematics for more detail.

The purpose and status of circuit breakers in each Bank are shown and described below and in the following page

CB Bank 1: Bank 1 contains 240V main circuit breakers for Heating (preheaters and hoses), the 24V power supply, and A and B Pump Motors. Breakers are closed (“hot”) when switched upward when viewing from the front of the panel. A red indicator is also shown when the breakers are close. When open or tripped, the breaker switches are pointed down when viewing from the front, and also show green indicators.



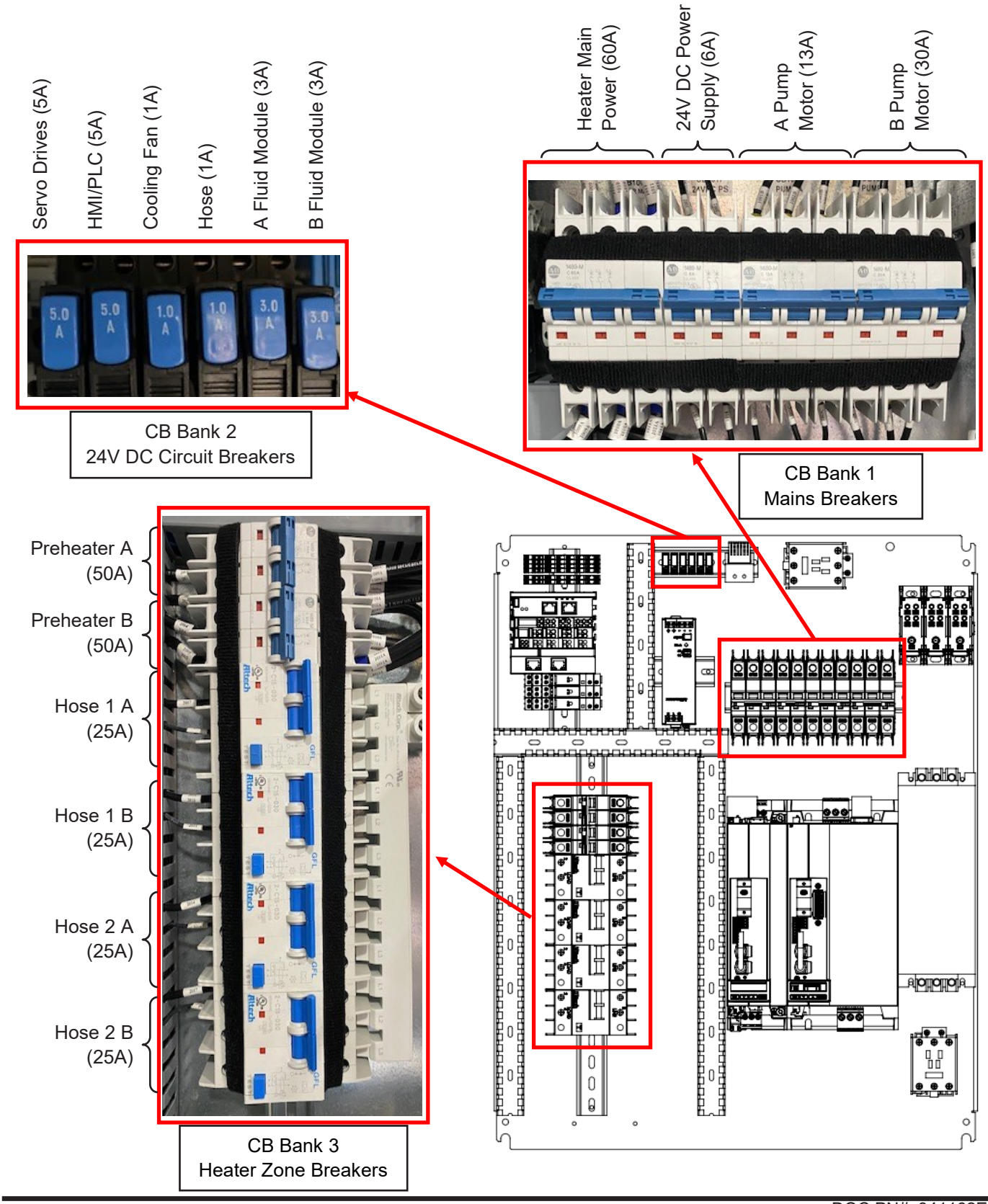
Bank 1 Breaker Closed/Hot



Bank 1 Breaker Open/Tripped

CONTROL MODULE - CIRCUIT BREAKERS

The IS40 Control Module Main Panel contains three banks of circuit breakers as shown and described below and in the following page.. .



CONTROL MODULE - CIRCUIT BREAKERS

⚠ WARNING

ELECTRICAL SHOCK HAZARD Disconnect all power sources before accessing any electrical connections in the Control Module, Fluid Modules, or Hoses. Equipment must be serviced by trained personnel only.

CB Bank 2: Banks 2 hold individual 24V circuit breakers for the Servo Drives, HMI/PLC, Cooling Fan, QuickHeat Hose Modems, and Fluid Module I/O. When tripped a breaker will pop out slightly and a red indicator LED with be shown (when the unit is under power). To reset a tripped Bank 2 circut breaker, press the breaker until it clicks and holds.

Bank 3 Breaker Tripped

Press To Reset (Close)

CB Bank 3: Bank 3 contains individual circuit breakers for the A and B Preheaters and each section of the A and B hoses (up to 2 hose sections or 4 individual hose heating zones). Hose circuit breakers also act as GFCIs (Ground Fault Circuit Interrupts) to protect personnel or property from electrical current leakage from the hose. Breakers are “hot” (closed or ON) when switched to the right (when viewing from the front). When closed a red indicator is also shown for each pole of each breaker. When open or tripped (OFF), the breaker switches are pointed to the left when viewing from the front, and also show green indicators.

Bank 3 Breaker Closed/Hot (ON)

Bank 3 Breaker Open/Tripped (OFF)

QUICKHEAT HOSE - OVERVIEW

The IS40 and IS30 proportioners are specifically designed to use Carlisle QuickHeat Hoses. These hoses contain high -power internal electric heating cables, ensuring that all of the heating energy is transmitted directly to the fluid. QuickHeat hoses are provided in 100, 150 or 200 foot (30, 45, or 60m) lengths. Heated whip hoses (Smart Ends) are available in 20 and 40 foot (6 or 12m) lengths. Insulated whips are available in 6 or 10 foot (2 or 3m) lengths. Each length of a heated hose begins with a fluid manifold or “modem” that contains pressure and/or temperature sensors, heater cable connectors, and electronics used to send information over the hose to the Proportioner Control Module. With this approach, no sensor power or communication cables are required, which are a common source of hose failures in other systems. It also provides the proprietary architecture for two way communication between the hose, proportioner and remote devices .

The QuickHeat hose has roughly double the heating power compared to most other SPF hoses and directly heats the fluid from inside the hose, which results in fast and efficient fluid heating, even in cold climate conditions. QuickHeat hoses have embedded temperature and pressure sensors, independent A & B hose heating, and up to six independent heating zones to improve temperature control. QuickHeat hoses provide sensor power and signal communication without cables or connectors, providing high reliability while reducing failure points. QuickHeat hoses include a snag and abrasion resistant outer hose wrap that is sealed with industrial-grade Hook & Loop material to allow individual A or B side hose replacement.

PRODUCT FEATURES

Fast and reliable heat

Independent A & B embedded heater wire submerged in hose fluid achieving > 100˚F (37˚C) DeltaT in under 15 minutes on average.

Real-time system control

Pressure and temperature data communicated and controlled within hose to spray gun to maximize control and accuracy.

Cut service costs

Reduced need for service with fully potted electronics/sensors and the ability to replace A & B side independently when needed.

Reduced electrical connections

Resulting in less maintenance issues.

More heat control and less risk

Independent heat sensors allow system to adjust temperature.

Lighter and more flexible hoses for less sprayer fatigue

Refer to the QuickHeat Hose Product Manual for more information and instructions on assembling and connecting QuickHeat hose to the IS30 or IS40 Proportioners.

⚠ WARNING

ELECTRICAL SHOCK HAZARD Disconnect all power sources before accessing any electrical connections in the Control Module, Fluid Modules, or Hoses. Equipment must be serviced by trained personnel only.

INSTALLATION - OVERVIEW

⚠ WARNING

Installation of the IS40 exposes installers and users to high voltages and high fluid pressures. Severe injury or death could results from improper installation or installation techniques.

NOTE

The IS40 requires QuickHeat™ hoses for operation. Do not attempt to substitute any other hose.

Note: IS40 installation requires that a QuickHeat™ hose is fully assembled and ready for connection to the IS40. See "QuickHeat Hose Manual" for more information**.**

Installation of the IS40 should only be performed by individuals with prior knowledge of installing and servicing Spray Foam equipment. Installation involves mechanical, electrical and fluid connections. Default out-of-box software settings are usually adequate for initial system use, but can be changed by the installer to meet specific needs. Every IS40 is equipped for remote support and can be accessed by authorized Carlisle service agents to assist in system installation, configuration, and/or service.

The following steps outline installation of the IS40. Additional details for each step are contained in the following pages.

1. Unpack unit and remove from shipping pallet.
2. Place unit in desired location.
3. For mobile or seismic environments make mechanical connections to floor and wall of structure.
4. Check to be sure power to the IS40 circuit is off (turn off breaker at distribution or main panel)..
5. Make 200-240V 3 Phase electrical and ground wire connection inside IS40 Control Module.
6. Connect fully assembled QuickHeat hose master modem to fluid jumper hoses.
7. Connect fluid supply and recirculation hoses to A and B fluid modules.
8. Set Fluid Module valves to spray position for purging.
9. Close gun manifold material control valves and remove spray gun from hose.
10. Open fluid supply lines and pressurize drum pumps to provide inlet fluid pressure of 150 - 200 psi
    - 2:1 drum pump air pressure of 75 - 100 psi
    - 3:1 drum pump air pressure of 50 - 70 psi
11. Energize IS40 power circuit at distribution or main panel.
12. Turn on IS40 power switch (side of control panel). Startup screen will appear in 30 - 60 seconds..
13. If the Proportioner and Hoses were configured together at the factory skip steps 13a to 13d. Otherwise configure hoses as shown on paged 83-86.
    a. From main menu, open Settings > Hose
    b. Select hose configuration
    c. Pair hose modems
    d. Scan and select hose communication frequency
14. Select Exchange Mode and purge A and B fluid sections (and hoses if new or empty) to eliminate any air.
    - See pages 55-60 for detailed instructions on first time system purging.
15. Follow Quick Start instructions (page 36-38) to begin spraying.

INSTALLATION INSTRUCTIONS

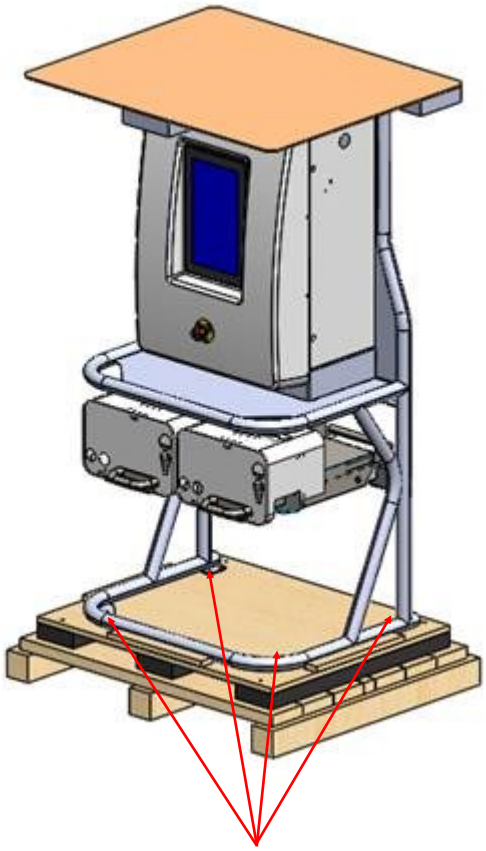
1. Unpack IS40

The IS40 Proportioner is shipped securely mounted to a shock-absorbing dual-layer pallet. Mounting screws are used to secure the base of the unit to the pallet. A dual layer carboard cover, enclosure, and heavy duty plastic bag protects the unit during shipping and storage.

After removing the carboard covers and top sheet, place the pallet with the IS40 near the desired location for installation, leaving adequate room to work around the unit when removing it from the shipping pallet.

Remove the screws holding the IS40 to the pallet.

Lifting from the tubular frame members is recommended. Use ramps or blocks as needed to slide or walk unit down to floor level. WARNING—the IS40 weighs almost 600 lbs. Extreme caution must be taken to avoid tipping the unit over and harming installers.



Remove 8 shipping lag bolts/screws from base mounting feet remove IS40 from shipping pallet.

⚠ WARNING

Use extreme caution when removing the IS40 from the shipping pallet. Equipment is heavy. Damage, personal injury or death may result if unit tips during installation.

2. Place in desired location

Slide, lift, or “walk” the unit into the desired location. Sliding on plastic sheeting or a carboard sheet works well to position the IS40. Allow adequate room behind, above, and beside the unit to run the power cable and supply hoses.

INSTALLATION INSTRUCTIONS

3. Secure IS40

If the IS40 is to be used in a mobile of seismic environment the all frame **must** be secured to a rigid floor and wall using 5/16" (or larger) grade 8 fasteners and washers. The IS40 frame has integral floor and wall mounting brackets for this purpose. Use 8 bolts or lag-screws to secure to the flooring, and 4 to secure the unit to the wall. Depending on the strength of the wall, additional supporting members or through-wall bolts and external bracing may be required.

Floor mounting brackets on frame

Wall mounting bracket on frame

⚠ WARNING

It is the installers responsibility to properly secure the IS40 in position to prevent movement or tipping in use or transportation. Severe injury or death may result if the unit is not secured in place.

4. Check that electrical power is off

Confirm that the IS40 is on a dedicated 200-240V 3 Phase protected circuit that matches system peak amperage. Before making electrical connections be sure that the supply branch circuit is turned off and appropriate lock out tag out safety measures are in place to prevent anyone from accidentally energizing the circuit during installation.

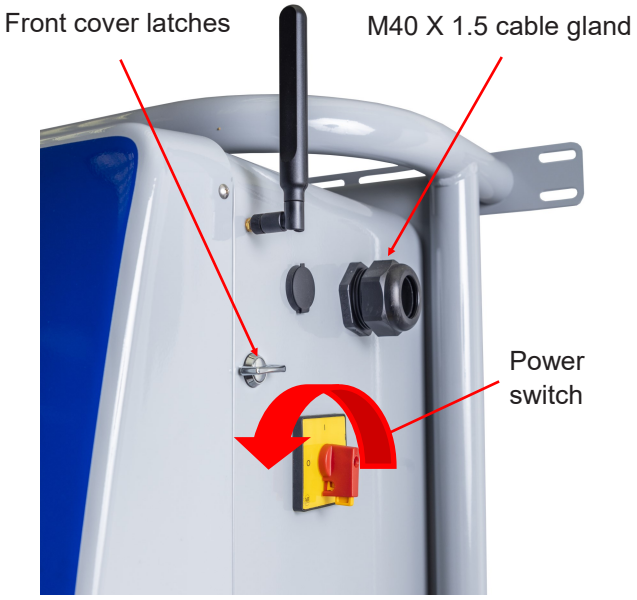
⚠ WARNING

Be sure power is off to the IS40 when making electrical connections or when the Control Module is open.

INSTALLATION INSTRUCTIONS

5. Make electrical connections inside IS40

Confirm the IS40 rotary disconnect switch is in the OFF (O) position. Open the Control Module by rotating the upper and lower front cover latches on the right side of the cabinet to the open (vertical) position. Insert appropriately rated 4 conductor power cord through the M40 X 1.5 cable gland provided with each IS40 (suitable for 22mm to 32mm cable diameters). Tighten the gland nut to secure the cable. In most installations 2/4 SOOW power cable is suitable but installers are responsible for selecting the proper cable size and insulation based on installation configuration, cable length, and environmental conditions.



⚠ WARNING

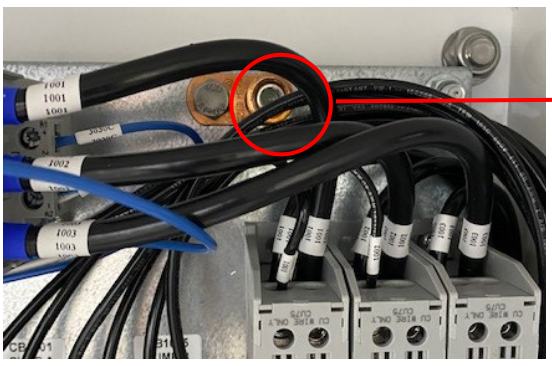
The installer is responsible for selecting power cable or wire that has the appropriate ampacity and environmental ratings for the IS40 system. Using undersized power cables or wires can result in electrical shorts and/or fire.

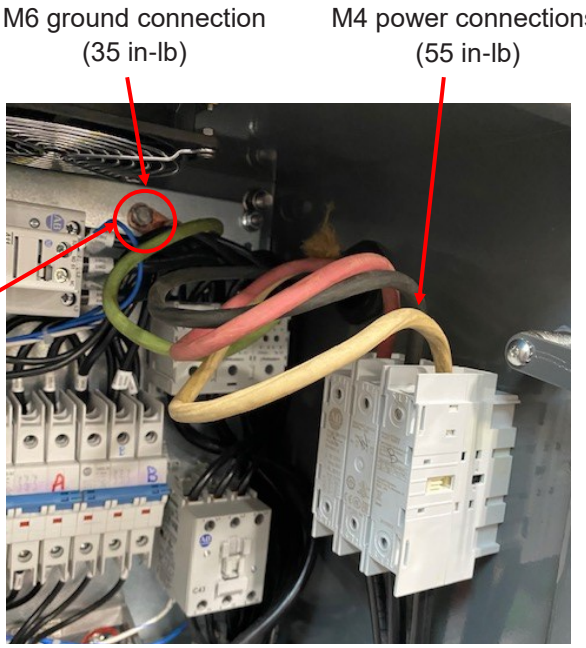
⚠ WARNING

The installer is responsible assuring power and ground connections are secure and conductors are not damaged. Loose or damaged connections can lead to fire, serious equipment and/or property damage, physical injury or death.

Connect the power cord phase wires to the power switch module inside the Control Module using an M4 hex key torqued to 55 in-lb. Connection order is arbitrary.

Connect the power cord ground wire to the panel ground lug using an M6 hex key torqued to 35 in-lb.



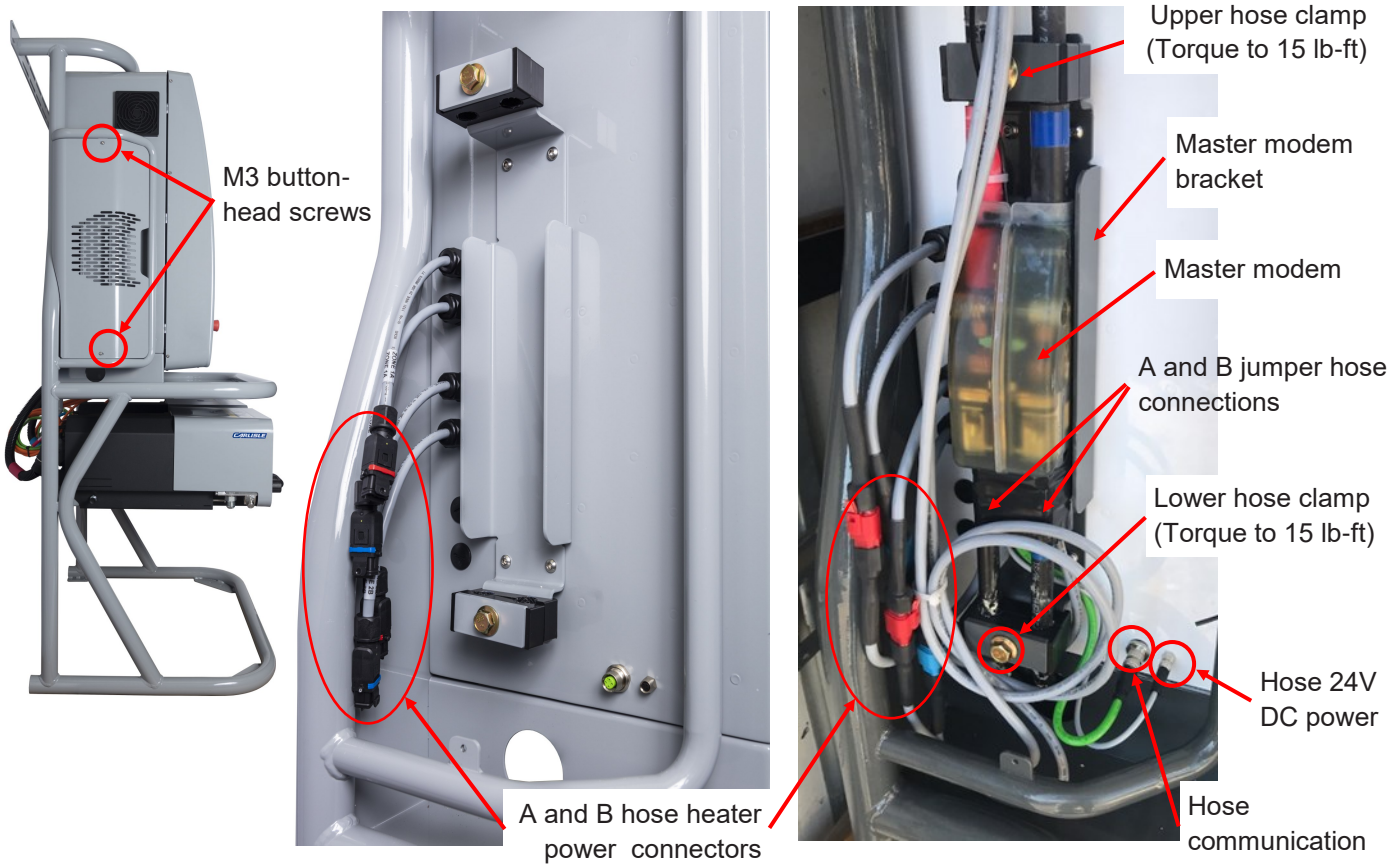


After making the electrical connections, close and latch the Control Module cover.

INSTALLATION INSTRUCTIONS

6. Connect QuickHeat Hose

Using an M3 hex key, remove the two button-head screws holding the master modem cover to the left side of the Control Module (when facing) of the IS40 frame. This will expose the fluid outlet jumper hoses and power and communication cable connectors.



Using the flats method described in the QuickHeat Hose Manual Connect the A and B jumper hoses to the respective master modem fluid connections. The A and B fluid connections use JIC 5 and JIC 6 fittings, respectively, and are color coded (A side red, B side blue) to prevent cross-connecting. Do not overtighten as damaging the fluid fittings may require a complete hose section replacement. Applying spray-gun grease to the A side JIC threads will allow easier removal for service if required. Secure the modem into it's retention bracket using the upper and lower hose clamps, tightening the retention bolts to 15 lb-ft.

Plug in the A and B heater power plugs to their respective mating connectors (each is labeled by zone and side). No tools are required.

Connect the hose DC power and communication cables to their respective sockets on the side of the IS40. Take care to align the connectors in their keyed position, insert, and then tighten retention ring. No tools are required.

Connect the gun air hose (contained in the QuickHeat Hose) to the rig air supply using a 1/4" type M QD.

Use cable zip-ties to secure electrical cables to the hoses. (This is not required, but helps keep the electrical cables under the master modem cover.)

Refer to the QuickHeat Hose Manual for more detailed installation instructions.

INSTALLATION INSTRUCTIONS

7. Connect fluid supply and recirculation hoses

Beginning with either the A or B fluid module, use use an M4 hex key or T-handle tool and remove the two button head screws holding the cover to the pump module. Remove the cover by pulling it forward and over the valve handle (be sure the recirculation valve handle is aligned with the slot in cover as shown below).

M4 cover screws
(two each module)

5/16” captive socket head cap screws
(two each module)

Loosen the two 5/16” socket head captive screws that hold the module to the IS40 frame (shown above). Pull the spring-loaded locking pin on the side of the module and slide the module forward to 1st or 2nd service position (indicated by holes for the locking pin to engage). This will allow easier access for connecting the recirculation and supply lines.

Locking pin (A side)

Locking pin (B side)

Connect the supply line to the male JIC 12 inlet fitting on the corresponding Fluid Module. Use installation kit PN 341133 with 90 3/4” sweep, swivel fittings, and ball valve for easier installation (shown on next page). **Be sure to connect the corresponding supply hose to the right module (A to A, B to B)!**

Connect the recirculation line to the corresponding module (JIC 5 on A module, JIC 6 on B module). If required, use installation kit PN 341133 to connect to 1/4” NPT recirculation hoses. See figures on the following page.

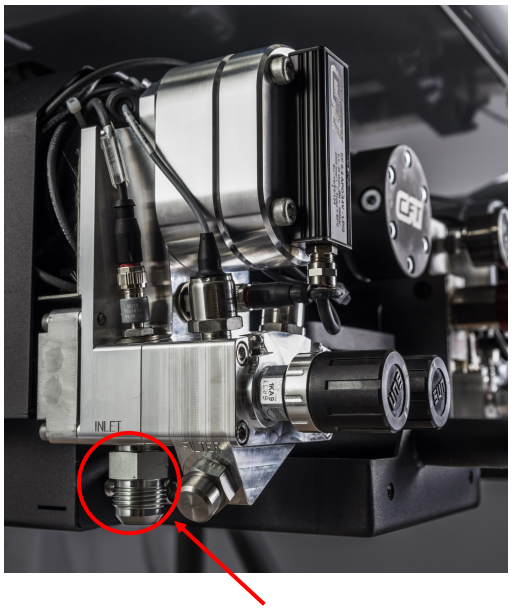
INSTALLATION INSTRUCTIONS

7. Connect fluid supply and recirculation hoses (continued)

Do not overtighten JIC ttings as this may damage and require hose or fitting replacement. Applying spray gun grease to the A side JIC threads will allow easier removal for service if required.

Pull the locking pin out, slide the module back to position, engage the locking pin, and secure retention cap screws.

Repeat the previous steps on the other module (A or B) to complete supply and recirculation hose connections.



Fluid supply hose fitting (3/4” JIC 12). Use kit PN 341133 with 90° sweep and ball valve to improve installation

Recirculation hose fitting (JIC 5 A, JIC 6 B). Use kit PN 341133 to connect to 1/4” NPT fittings if required.

Replace module covers and secure with M3 button head screws.

8. Set Fluid Module valves to position for purging

Set both filter valves and recirculation valve (for each module) in the spray position as shown in the figure.

Selector valve in spray (gun0\\) position, pointed down.

Both filter valves turned clockwise to spray position

INSTALLATION INSTRUCTIONS

9. Close the gun manifold valves and remove spray gun from the hose

In preparation for purging the system or air, check to be sure the material control valves on the gun manifold are in the closed position and remove the spray gun from the manifold.

10. Open fluid supply lines and pressurize drum pumps

Check that the drum pumps are providing fluid pressure to the IS40, and that any ball valves on the supply lines are in the open position.

The IS40 senses pressure at the inlets or each module. An inlet pressure of 150—200 psi is usually adequate to prevent cavitation of the gear pumps when supply (drum) pumps reverse direction. If low (or no) pressure is detected the system will display an error message that requires user intervention before the system can be purged. Recommended air pressure on the drum pumps (static and dynamic) should be as follows:

- 2:1 drum pump air pressure of 75 - 100 psi
- 3:1 drum pump air pressure of 50 - 70 psi

Inlet fluid pressure can be checked on the IS40 display panel after the system is turned on.

11. Energize IS40 power circuit

Close any upstream breakers and/or disconnects to provide electrical power to the IS40.

12. Turn on IS40

Rotate the power switch on the side of the Control Module to the “ON” (I) position. The IS40 will display a startup screen while it performs internal system checks. Once completed, the Spray Mode screen will be displayed (30-60 seconds after powering on).

Rotate clockwise to “I” position to start IS40

13. Configure IS40 for Hose setup

If the Proportioner and Hoses were configured together at the factory skip this step. If not, refer to the instructions starting on page 55 to set hose configuration, pair hose modems, and select hose communication frequency.

14. Purge system

To fill the IS40 and hoses with material, follow the instructions beginning on page 55 for first time system purging.

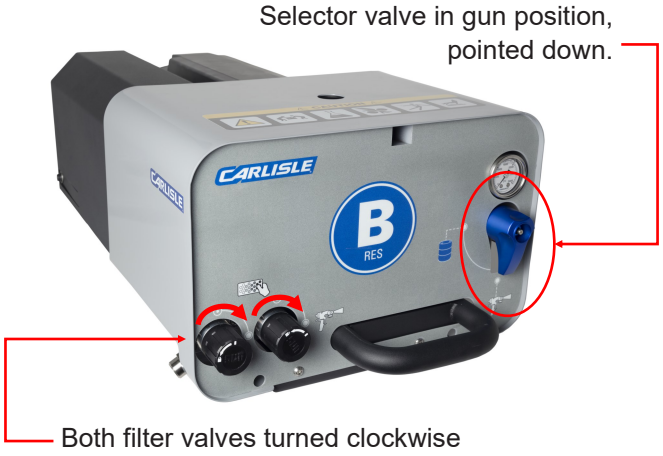
15. Begin using IS40

Refer to the quick start instructions on page 36 to begin using the IS40.

QUICK-START GUIDE

Due to the IS40's efficient heating systems and simplified startup process, operators will usually be ready to spray within 10-15 minutes from powering on the system. The following are the minimal steps involved in starting up the IS40 with Job Reporting turned off. See page 100 for additional steps required when Job Reporting is turned on.

1. Before starting the IS40, remove all hose from the rack and position for spraying. Be sure the drum pumps are on and A and B fluid module valves on are in the proper position for spraying.



2. Turn on the IS40 by rotating the power switch on the right side of the control module clockwise to the ON position (indicated by the character "I").

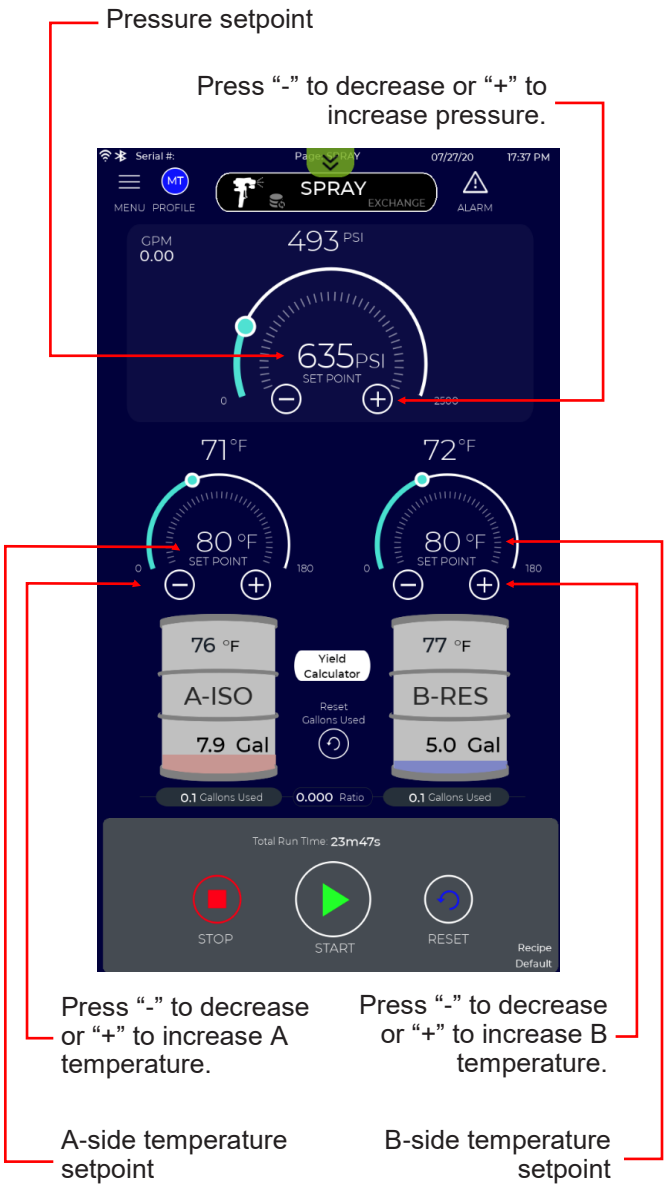
The IS40 will display a startup screen while it performs internal system checks. Once completed, the Spray Mode screen will be displayed. Note that the Exchange Mode screen can be set as the default startup screen if desired (see page 78).

3. Check the A-ISO and B-RES fluid levels using a dip-stick and enter the amount by pressing the respective drum icon on the screen.

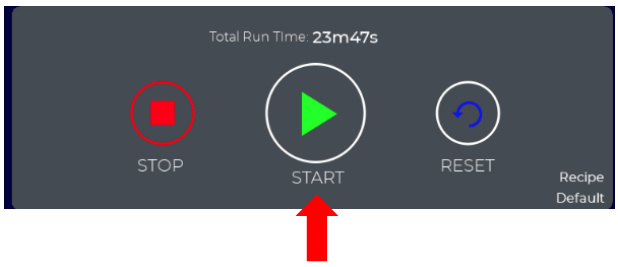
Press to enter drum level.

QUICK-START GUIDE

4. Enter the desired pressure and temperature setpoints using the on-screen “+” and “-” buttons.



5. Press the START button to begin warming up the system.



The center button will change from START to WARMING, and the button boundary will change from solid white to flashing green to indicate the system is warming up.

When the center button changes from WARMING to READY the pumps will automatically pressurize the system to the desired setpoint.

6. If required, spray out any cold material in the unheated whip, then proceed with spraying.
7. If drums are changed, enter the new fluid level and continue spraying. (see step 3).
8. If errors occur, correct the issue, press the RESET button, then the START button (see step 5).
9. When finished spraying, press the STOP button.
10. To power off the unit, rotate the power switch on the right side of the control module ot the OFF position (indicated by the character “0”).

INTELLISPRAY OPERATION TIPS

- The system should always be turned off during transportation.
- When spraying is completed, stop the system before coiling up hose on the rack (press stop on display screen). This will avoid the possibility of accidental spraying for excessive leakage if the hose is damaged.
- Always check A and B drum levels at the start of the day, or when changing drum(s), and enter the measured value in the Drum Level Widgets on the Spray Screen.
- **Never run out of fluid in the drums**. If the transfer pump(s) run out of fluid, they can inject air into the supply hoes, IS40, and possibly the hoses. If this happens the system must be purged of all air pockets from transfer pump to gun (follow instructions under Exchange Mode in this manual). Failure to purge air from system can damage the system and cause off-ratio spraying.
- **Never operate the system "dry"** unless performing a B side air-purge (follow directions starting on page 55). This will damage the pumps.
- Do not operate the system with module covers removed or unless performing diagnostics.
- All air must be purged from wetted A side module and hoses to avoid solidifying material in the lines.
- **Always remove the hose from the hose rack before turning the system on**. This avoids the possibility of overheating the hose.
- Do not drag the hose from the gun, whip, or modems. Use care when moving the hose to avoid damage or snagging of internal power cables.
- **Do not heat hose without fluid** to avoid damaging the hose and causing leaks
- Remove tight loops in hose prior to pulling hose into position to avoid hose kinking
- On initial startup, straighten sections of hose near modems to allow best temperature feedback to unit
- Do not pull on hose sections that are not in line-of-sight to prevent tight loops and kinking
- Leave hose under positive pressure when not in use to avoid reacting with the ambient environment
- If two or more IntelliSpray systems are used in close proximity (<300 ft apart, either hose or proportioner) be sure they are operating at different hose communication frequencies to avoid interference and/or cross-talk between systems.

⚠ CAUTION

System must be purged of air before spraying or recirculating material. Failure to do so may result in equipment failure

⚠ CAUTION

Remove all hose from hose rack before starting system. Excessive wraps of hose may result in overheating and damage to hose.

DISPLAY SCREENS - OVERVIEW

The IS40 Proportioner uses a 15.6 inch high resolution capacitive multi-touch color display for all user interaction. The wide-angle display is mounted on the front of the Control Module in portrait mode, similar to how a user interfaces with a mobile phone. The display has been designed for use in rugged industrial environments, is IP66 rated and visible in direct sunlight. The display screens are highly intuitive - using text, icons, pop-up windows, widgets and even hand-held bar-code scanners to provide system monitoring, control, setup, and diagnostics. If enabled, all screens can be accessed remotely via a web-browser from any device connected to the internet. See page 133 for more details about remote monitoring and control.

As delivered, the IS40 is set to English language and SI units of measurement. Refer to page 78 to change these settings.

Display	15.6” TFT LED
Resolution	1366×768, HD (2.1M pixels)
Colors	16M
Brightness	400 Cd/m^2
Touchscreen	True Glass Projected Capacitive, Multitouch
Operating Temp	-20° to +60 °C
Protection Class	IP66 (front)

IS40 Display Specifications

After the IS40 Proportioner is powered on the display will indicate the system is booting up and performing internal hardware checks. A rotating image of the Carlisle ST1™ spray gun will be shown during startup. If any hardware errors are encountered during boot up, a popup window will appear with the associated error message (see Section 65 for error messages and diagnostics).

Within 30 - 60 seconds the display will change to either the Spray Mode screen or the Exchange Mode screen. While the Spray Mode screen is the factory set startup screen, users can change this to Exchange Mode if desired (refer to page 78).

The IS40 operates in one of two **Modes**, Spray Mode or Exchange Mode. In Spray Mode the system controls all heater zones (A and B preheaters and up to 6 independent hose heaters) and A and B pumps to deliver fluids to the gun at the specified setpoints in the Spray screen. Ratio is always controlled to a 1:1 value (A:B by volume). Ratio is not adjustable by the user.

IS40 Bootup Screen

DISPLAY SCREENS - OVERVIEW

A pull-down menu icon is located in the top left corner of all display screens (similar to most mobile Apps). When this is pressed, a full menu of all first-level screens is shown. The following figure provides a summary description of each menu item, along with the manual page number for more information.

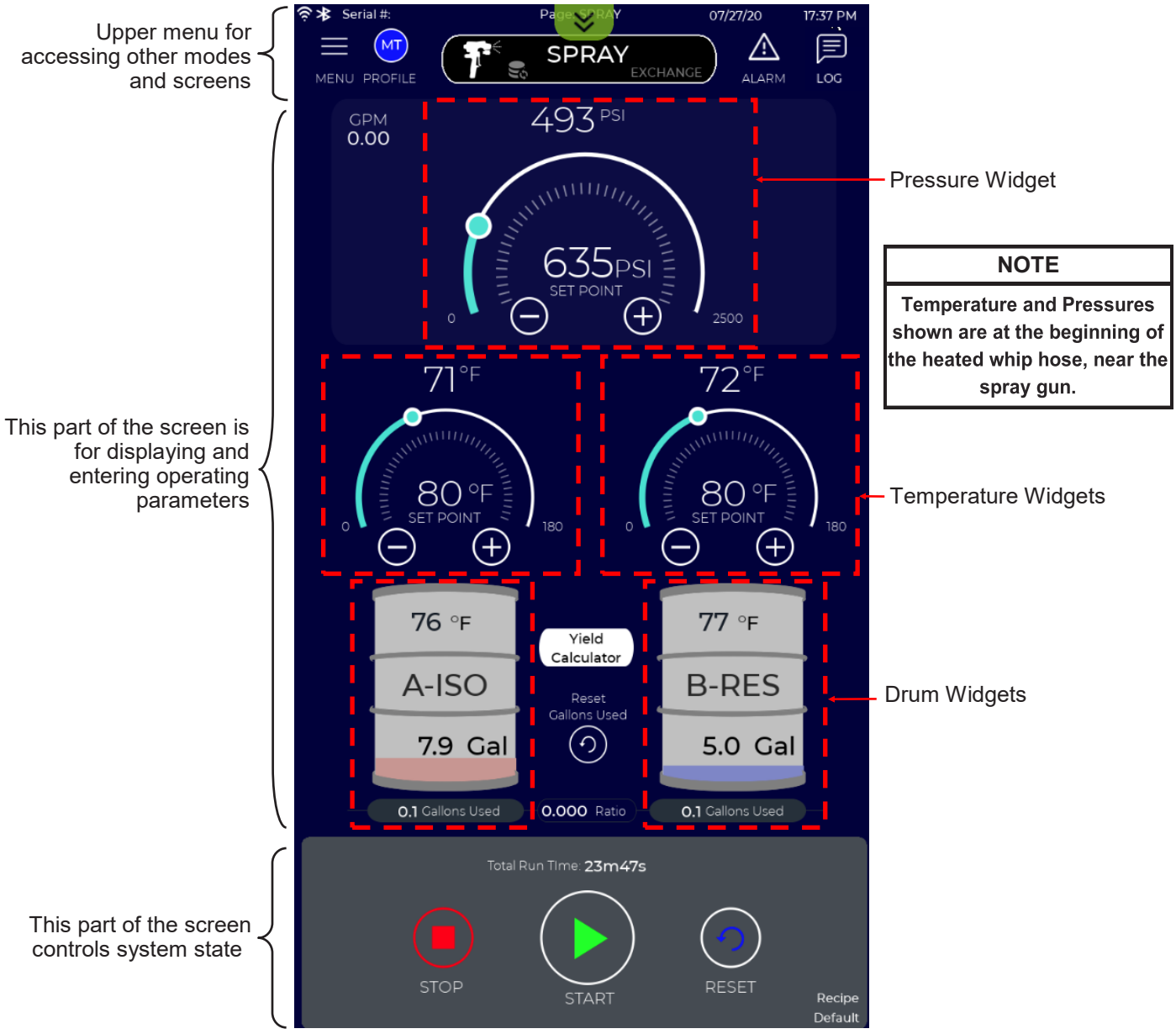
	Page
Pull-down menu icon	
Close pull-down menu	
Spray Mode (active mode)	41
Exchange Mode (grayed out means not active)	50
Alarm Screen (current and historical warnings and errors)	65
System Status and Diagnostics (in submenus)	69
System Settings	78
Recipes (for recalling, creating, saving, editing deleting recipes)	88
Reports (in submenus)	96

Double arrows indicates submenus exist for these items

SPRAY SCREEN[1] - OVERVIEW

The IS40 Spray Screen is factory set as the default start-up screen[2]. Users can enter and adjust key operating settings via screen buttons, on-screen keyboard, pulldown menus, and pop-up windows. Previous user settings are retained when power is cycled. Pressure, Temperature, and Drum Widgets are used for displaying current values and inputting setpoints and other values. NOTE: Pressure and temperature setpoint locations shown on the Spray Screen are at the end of the last distribution hose, prior to the heated whip hose. This assures that the IS40 delivers the most consistent performance regardless of material viscosity, flow rates, hose length, or environmental or work conditions.

A high level overview of the Spray Screen is shown below.



NOTE

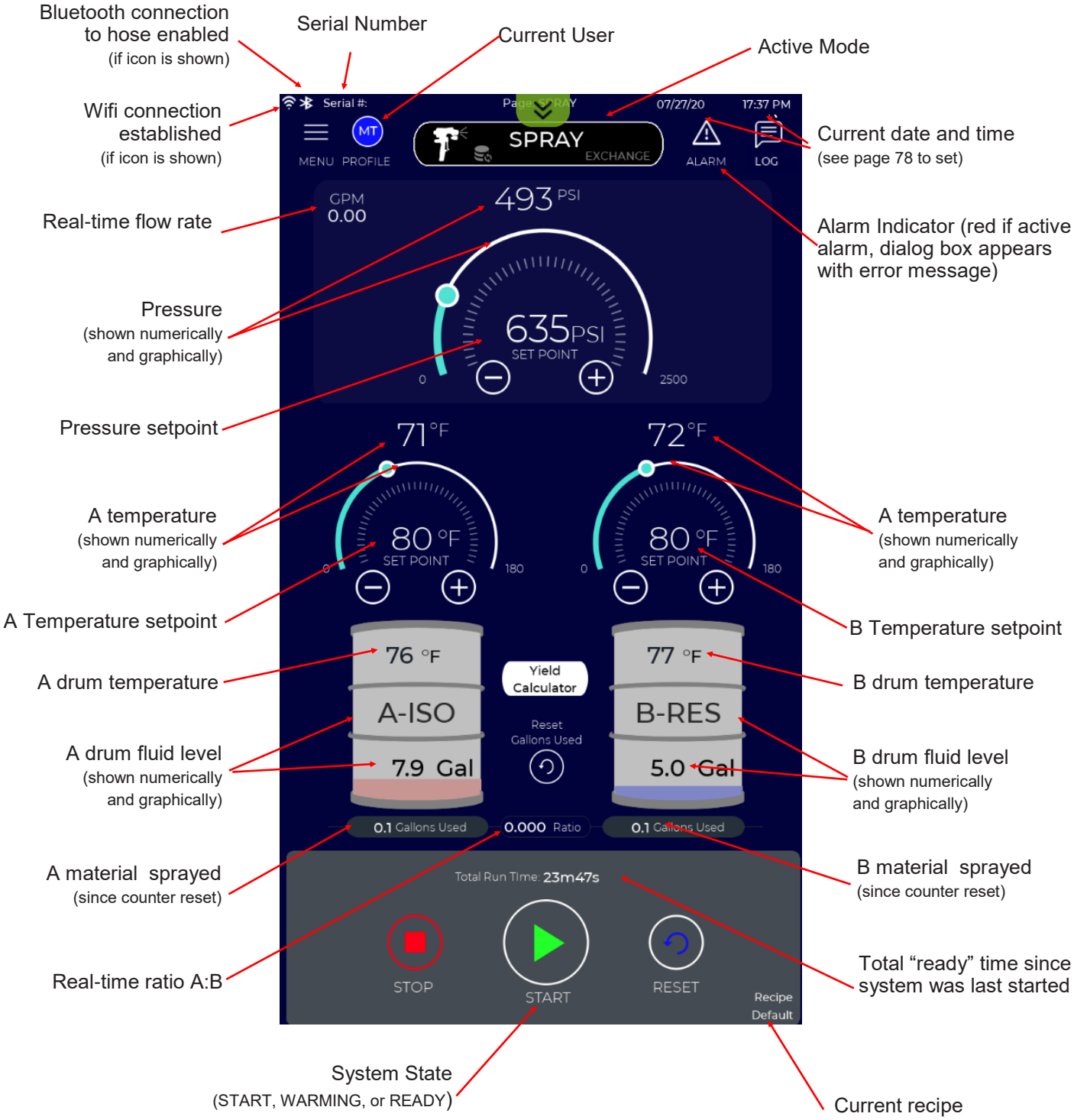
Temperature and Pressures shown are at the beginning of the heated whip hose, near the spray gun.

IS40 Spray Screen

[1]Job logging is off –see page 88 for information on Job logging screens.
[2]The default start-up screen can also be set to Exchange mode. See page 78.

SPRAY SCREEN[1] - USER INFORMATION

The IS40 Spray Screen displays current operating and system information to the user in easy to understand text and graphics. The following figure describes each information element provided to the user on the Spray Screen.. .

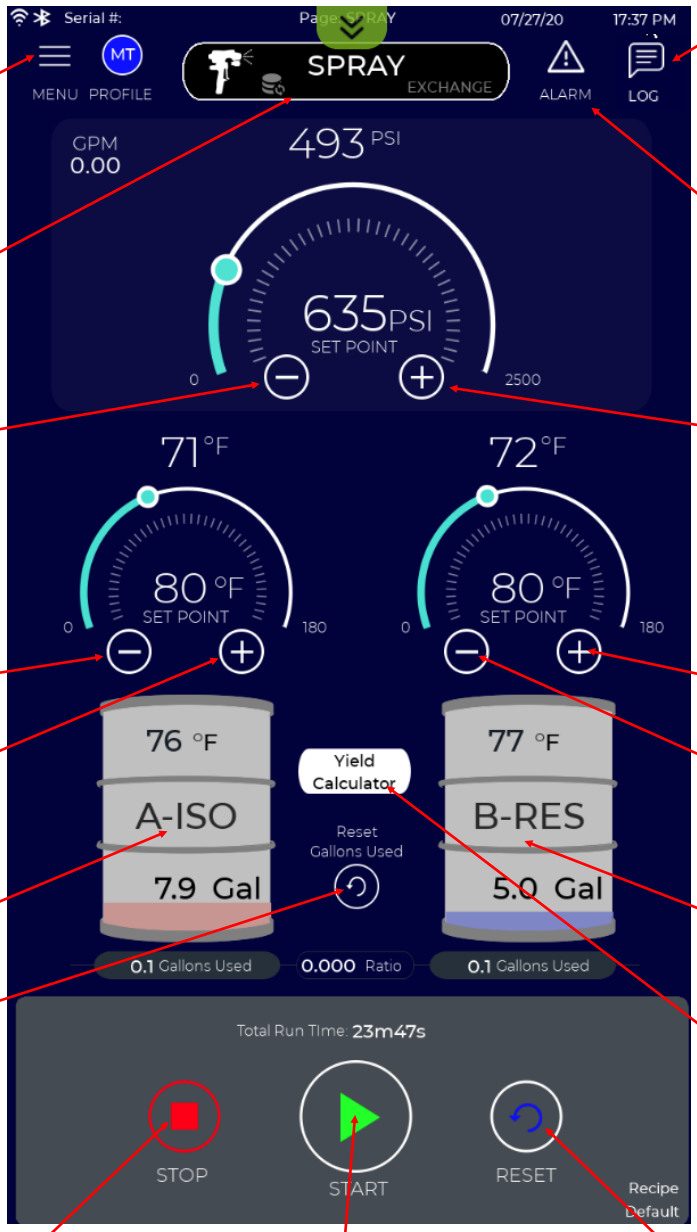


Spray Screen User Information

[1]Job logging is off –see Section 78 for information on Job logging screens

SPRAY SCREEN[1] - USER ACTIONS

The IS40 Spray Screen also contains dynamic fields for user input and actions.. These are shown in the following figure..



Pull-down menus (see page 40)

Log button (see page 96)

Home and Mode Select button

System Alarms (see page 65)

Pressure setpoint (press to decrease)

Pressure setpoint (press to increase)

A Temperature setpoint (press to decrease)

B Temperature setpoint (press to increase)

A Temperature setpoint (press to increase)

B Temperature setpoint (press to decrease)

A Drum pop-up widget (press to open see page 45)

B Drum pop-up widget (press drum to open see page 45)

Fluid counter reset

Yield calculate widget (Follow on screen instructions)

System Stop (shuts off heaters and pumps)

System Start (one button initiates heating and pressurization)

System Reset (clear error condition)

Spray Screen User Actions

[1]Job logging is off –see page 95 for information on Job logging screens

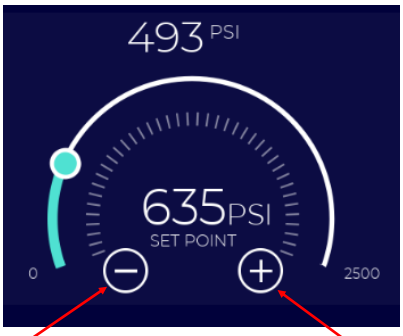
SPRAY SCREEN[1] - USE

The Spray Screen is the factory default startup screen on the IS40. Users can change the startup screen to Exchange Mode if desired (see page 78). The operator uses the Spray Screen to enter the pressure and temperature setpoints to be maintained at the beginning of the heated whip (e.g. near the gun). This close proximity to the gun assures that the IS40 delivers the most consistent performance regardless of material viscosity, flow rates, hose length, or environmental conditions. Unlike many other systems, there are no preheat temperature setpoints, static pressure controls, knobs, dials, buttons, or levers to operate. The only required settings are a single pressure and A and B temperatures, which are entered using on-screen buttons.

When using the Spray Screen, the following steps can be executed in any order.

1. Set Pressure

The pressure setpoint is retained from the last time the system was powered off. To change the setpoint, press the down (negative) or up (positive) button in the Pressure Widget. Each press of the button increments pressure by 5 psi. Holding the button down increments pressure by 25 psi. The pressure setpoint value is displayed in the middle of the gage. The actual pressure value is shown above the gage and graphically on the gage by the moving dot and circular bar. The pressure gage range defaults to 2500 psi, but can be changed in the Recipe menus (page 88).



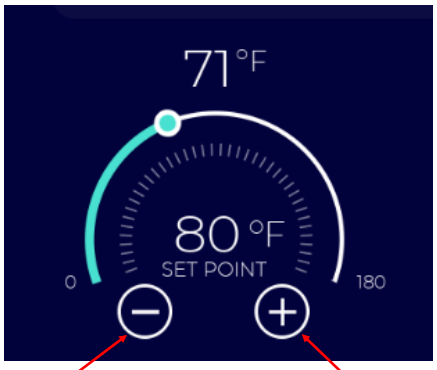
Pressure setpoint
(press to decrease)

Pressure setpoint
(press to decrease)

2. Set A and B Temperatures

The temperature setpoints are retained from the last time the system was powered off. To change the A or B temperature setpoint press the associated down (negative) or up (positive) button in the A and/or B Temperature Widget. Each press of the button increments the temperature by 1°F. Holding the button down increments temperature by 3°F. The temperature setpoint value is displayed in the middle of the gage.

The actual temperature value is shown above each gage and graphically on the gages by the moving dot and circular bar. The temperature gage min and max values default to 0 and 180F respectively, but can be set by the user in the Recipes menus (page 88).



Temperature setpoint
(press to decrease)

Temperature setpoint
(press to decrease)

NOTE

Temperature and Pressure shown on the Spray screen are at the beginning of the heated whip hose, near the spray gun. This assures that the IS40 delivers the most consistent performance regardless of material viscosity, flow rates, hose length, or environmental or work conditions. If a user is accustomed to operating a system that controls pressure at the proportioner, they will need to set pressures lower on the IS40 by 1-3 psi per foot of hose depending on viscosity and flow rate.

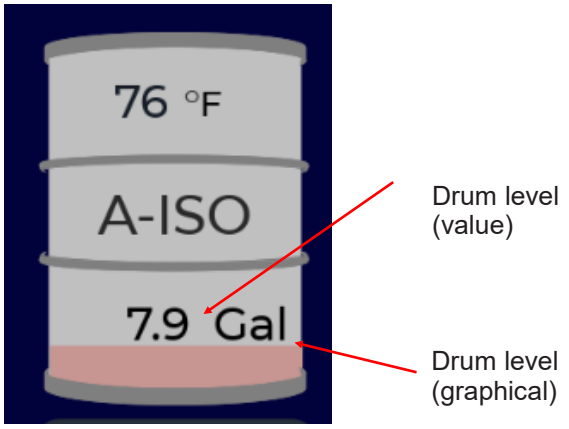
SPRAY SCREEN[1] - USE

3. Set Drum Levels

The A and B fluid levels are displayed in the respective Drum Widgets as both a numeric value and a moving colored level indicator. The system decrements the amount of material sprayed or purged if in Exchange Mode from the initial drum level entered by the user.

When the fluid levels drop to the predefined warning value the drum outline will begin to flash yellow. When the fluid level drops to the predefined alarm level the system shuts down and displays an error message. The outline of the drum icon will flash red. The warning and alarm levels are factory set to 5 and 2 gallons, respectively, but can be changed by the user in the Settings screen. (see page 75).

The drum size default is 55 gallons. This value is used to scale the fluid level on the drum icon and can be set to other values in the Setting screen depending on supply container size (e.g. 15 gal “pony” drums or 250 gal “totes”). See page 78 for more information.

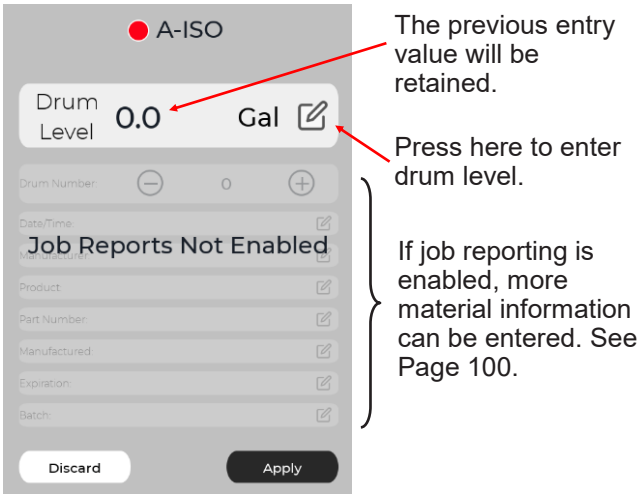


⚠ CAUTION

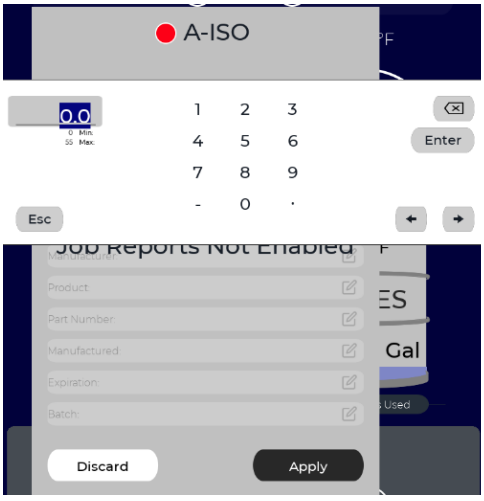
Always check A and B drum levels before spraying and enter new values if needed. Never run out of fluid. Change or refill drums before fluid is gone, as drum pumps can inject air into the Proportioner, causing damage to the Proportioner and off-ratio spraying.

To accurately track and display the fluid remaining in each drum, the user must enter the initial level. If additional material is added to the drum, the user must enter the new level. The level can be reset anytime, even during spraying.

To enter the drum level, press anywhere on the drum icon (A or B) and a pop-up window appears that for entering the amount of fluid in the drum.



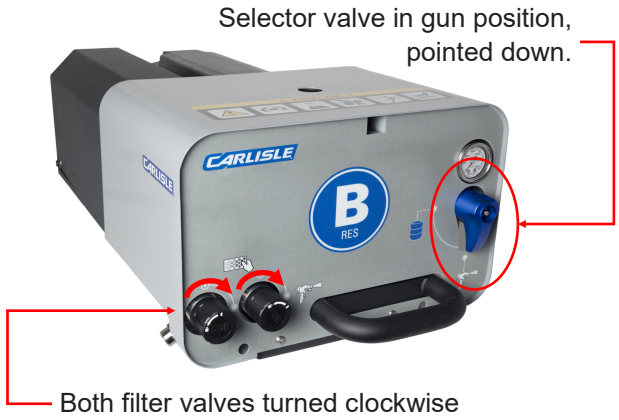
When the pop-up window appears, press the drum level and enter the value using the on-screen keypad. Press the enter button then the Apply button on the pop-up window. The new value will be displayed on the drum and the graphical level indicator will be reset.



SPRAY SCREEN[1] - USE

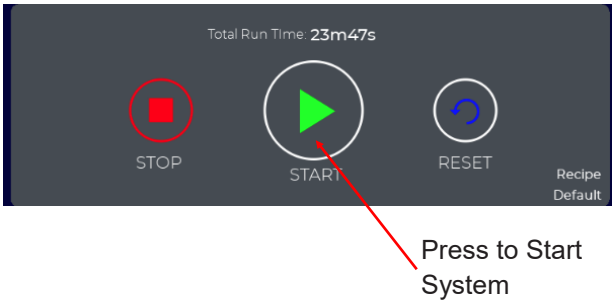
4. Check Fluid Valves

Check that inlet fluid lines are pressurized and open, filter valves are open, and recirculation valve is set to spray position.

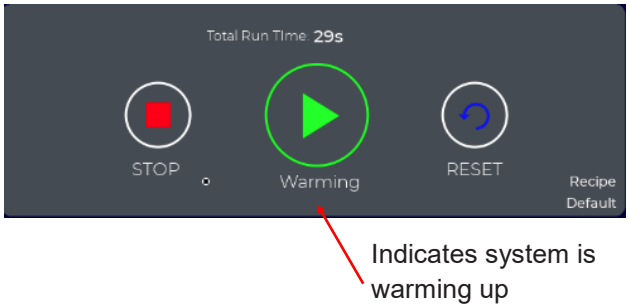


5. Start the Proportioner

Press the START button at the bottom of the spray screen. This will initiate the warmup sequence.



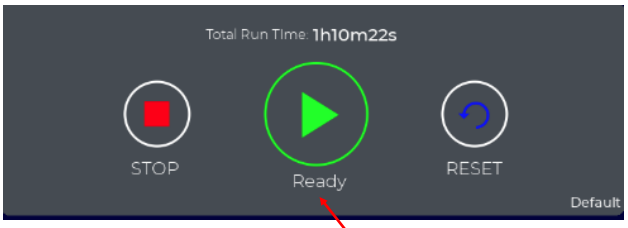
The center button will change from START to WARMING UP, and the button boundary will change from solid white to flashing green to indicate the system is warming up. Pressing the STOP button at any time turns off heaters and pumps.



NOTE

Do not start spraying until button changes to READY state.

After the IS40 reaches the temperature setpoints (usually about 10 minutes) the system will then pressurize to the user setpoint pressure and the START button will indicate the system is READY to spray.



Once the system is in READY state, spraying can begin.

6. Pause or Stop

When finished spraying, or if taking an extended work break, simply press the STOP button. This removes power from the heaters and pumps. To restart the system, simply press the start button again.

⚠ CAUTION

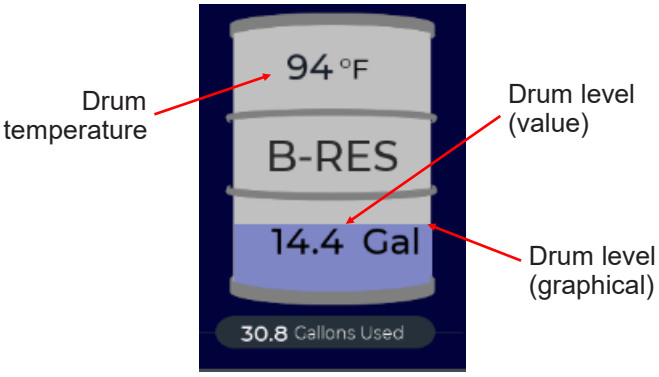
Even when the IS40 system is in STOP mode or the Proportioner is tuned off, the A and B fluids in the Proportioner and Hoses may be at elevated temperatures and pressures that could cause personal injury or property damage.

SPRAY SCREEN[1] - OTHER FUNCTIONS

The IS40 Spray Screen contains other information and functions that may be helpful to the user.

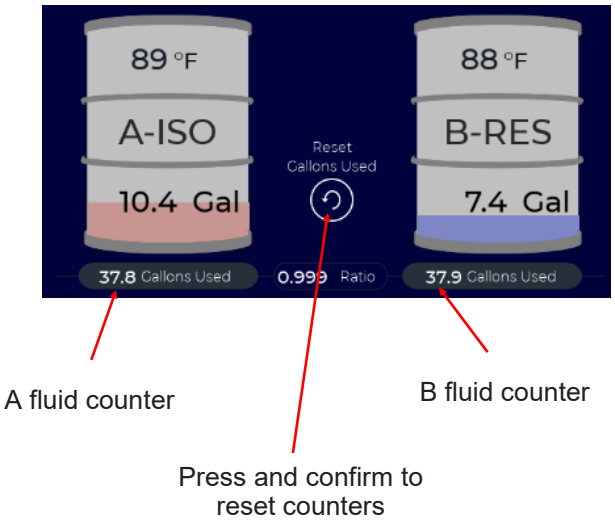
Drum Temperature

In addition to indicating remaining fluid amount, each Drum Widget shows the inlet fluid temperature. This is sensed at the inlet to the proportioner and is an indicator of drum temperature when material is flowing (e.g. during spraying, purging, or recirculating). This can be compared to material manufacturers recommendations for acceptable fluid temperature range. The IS40 can be used to independently preheat A and B fluids using Exchange Mode (see page 50).



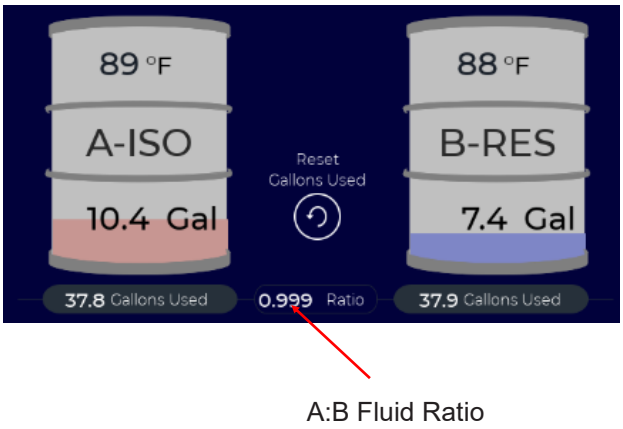
Fluid Counter

The IS40 continuously monitors fluid consumption and displays the amount under each drum icon. The total amount used is the sum of the A and B values shown on the screen. These fluid counters can be reset to 0 (zero) by pressing the Reset Gallons Used button.



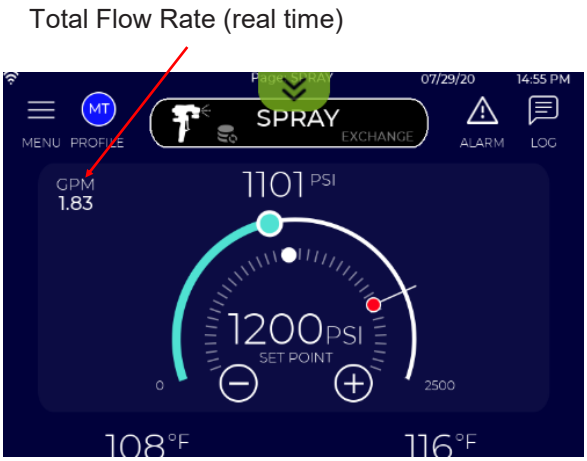
Fluid Ratio

The real-time fluid ratio (A/B) is also shown on the on the Spray Screen and updated every second.



Flow Rate

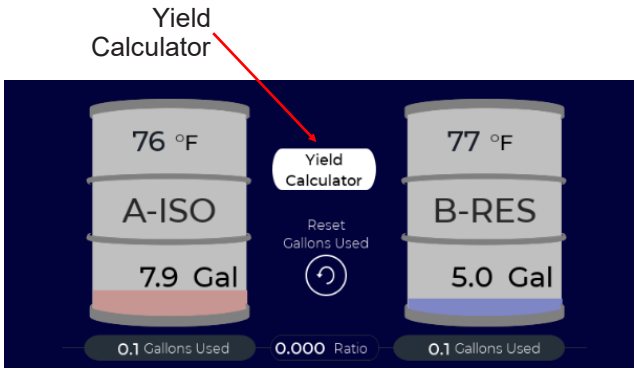
The real-time total flow rate (A+B) is shown in the upper left region of the Spray Screen.



SPRAY SCREEN[1] - OTHER FUNCTIONS

Yield Calculator

The IS40 provides a tool for calculating material yield while spraying. Simply press the button to open the Yield Calculator.



Alarms

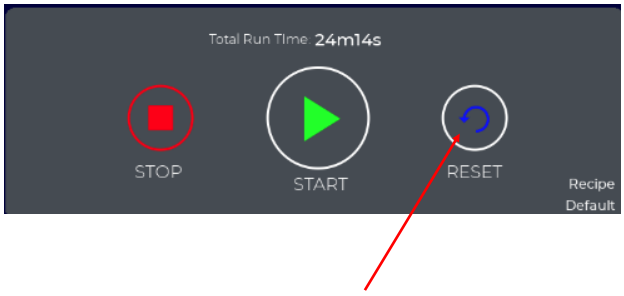
New or active errors or warnings are indicated by a flashing alarm icon and a dialogue box in the upper right section of the Spray Screen.

If an alarm is active the IS40 will automatically change from READY state to STOP state and remain in that state until the error is resolved and the system is reset. All alarms provide possible causes and recommended actions.

In the example here, the A drum level has dropped below the alarm limit level.

Reset

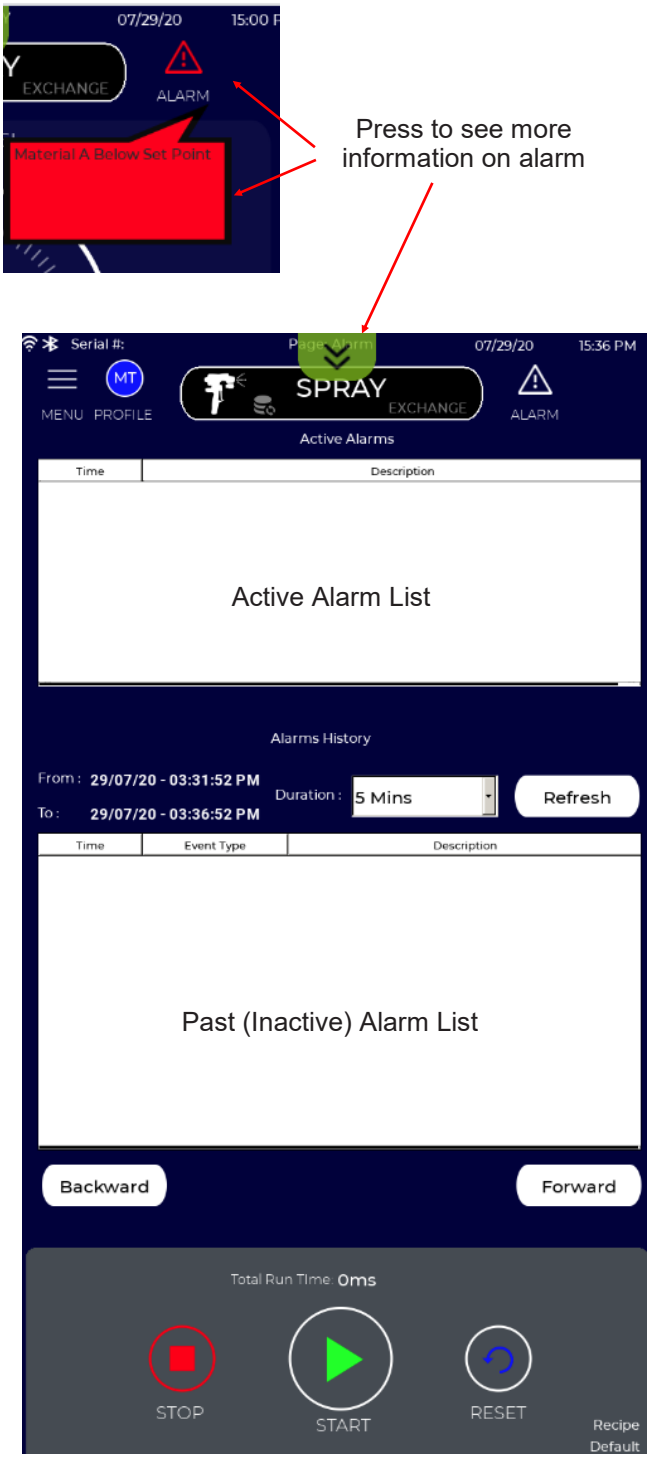
Once the source of the error is found and addressed, the user must press the RESET button at the bottom of the screen before pressing the START button.



SPRAY SCREEN[1] - OTHER FUNCTIONS

Alarm Details

The user can see more information on active and past errors or warnings by pressing the alarm icon or the alarm message window. Refer to Page 65 for more information on the Alarm Screen.



EXCHANGE SCREEN - OVERVIEW

When in Exchange Mode, the IS40 allows the user to independently Purge or Recirculate either A and/or B fluids. In this manual, the definition and difference between Purge and Recirculate functions are as follows:

Purge: Fluid is not returned to the supply drums. Drum level counters are decremented by the amount of fluid purged. Used when the operator needs to push material through the system. Commonly used during changeover between different materials. Also used to purge old material from proportioner and/or hoses and/or to flush for service or storage.

Recirculate: Fluid is returned to the supply drums. Drum level counters are not decremented by the amount of fluid recirculated. Most often used to preheat and/or mix Open Cell resins (B side).

Fluid may be purged or recirculated from the proportioner or from the end of the hoses. The IS40 includes fittings for attaching purge or recirculation hoses to the fluid modules (see page 54). Carlisle provides a recirculation manifold with all Carlisle ST1™ Spray Gun kits that can be attached to the hose manifold for recirculating from the hose end. Many users simply hang the hose manifold over a drum bung opening when recirculating or over a waste bucket when purging.

To activate Exchange Mode, the user must exit (stop) Spray Mode. If the Spray Mode is active, the system will require the user to press the Stop button before Exchange Mode can be entered.

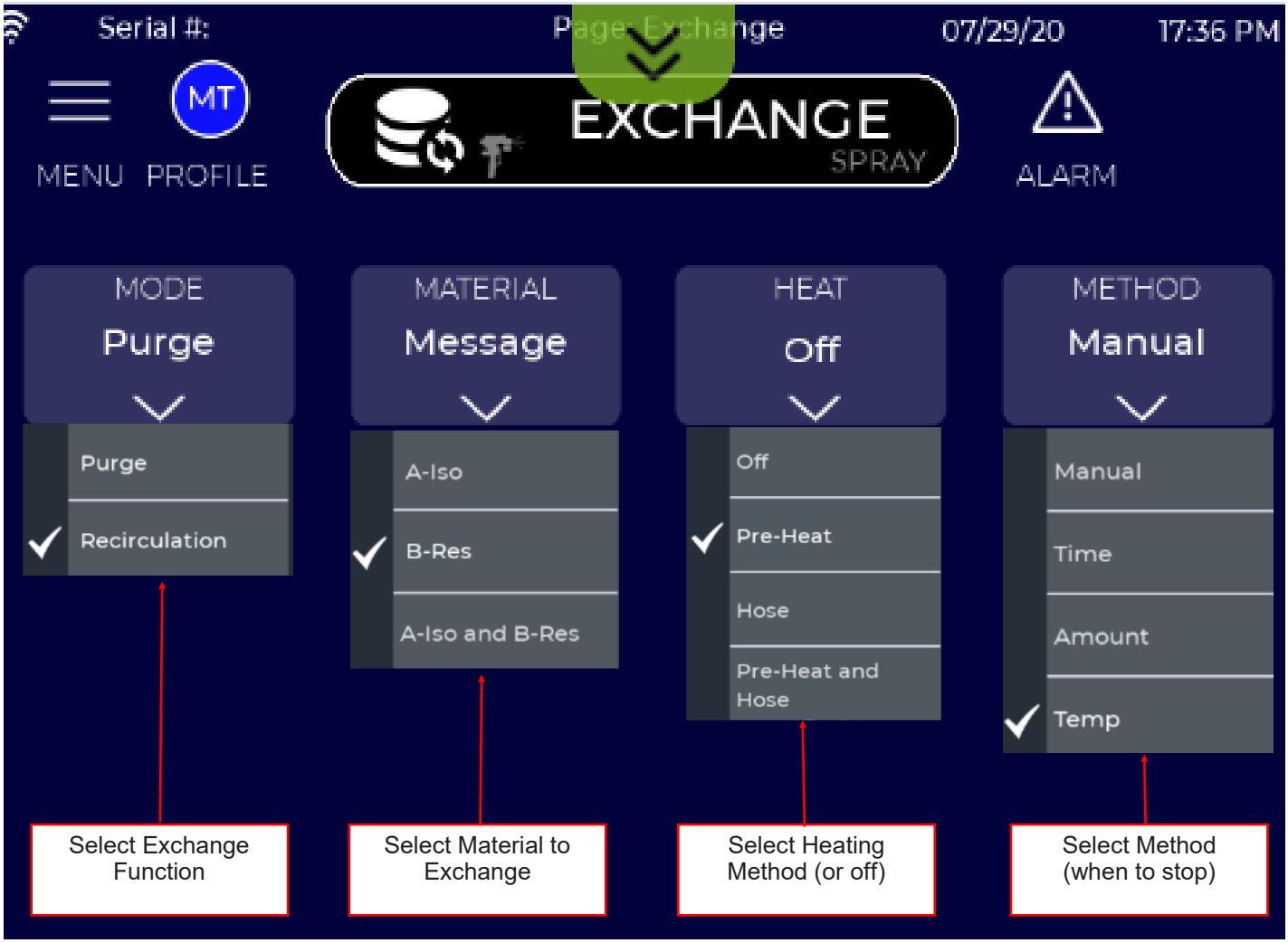
The user can activate Exchange mode by either selecting the menu item, or pressing the Mode button at the top of the screen as shown below.

EXCHANGE SCREEN - OVERVIEW

Before starting fluid exchange the user must set the following parameters:

- Function: Purge or Recirculate
- Material: A-Iso, B-Res, A-Iso and B-Res (both)
- Fluid Heating: None, Pre-heat, Hose, Pre-heat and Hose (both)
- Method: Manual, Time, Amount, Temp

These parameters are selected using the pull down menus on the Exchange Screen. The Exchange Screen is context sensitive and will adapt to the specific parameters selected. All Exchange parameters are retained from the last time entered. All possible parameter selection are shown below. Pressing on the desired parameter selects it and indicates the selection with a check mark.

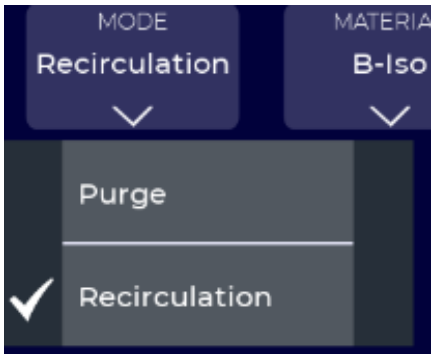


EXCHANGE SCREEN - OVERVIEW

Prior to starting fluid Exchange (Purge or Recirculation), the following parameters must be selected. Parameter settings are retained so the user may not have to select again if performing the same Exchange operation.

1. Select Function

Select desired function **Purge** or **Recirculate**.



⚠ WARNING

Never purge the proportioner or hoses with a flammable or oxidizing gas or liquid. Explosion and/or fire may result with significant injuries, loss of life, and property damage.

⚠ CAUTION

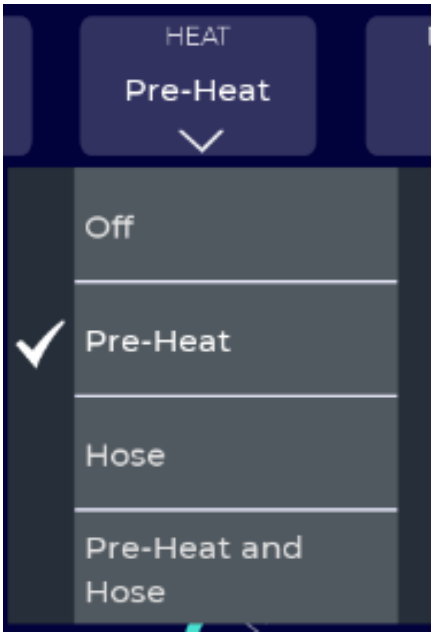
Air Purge should never be used on the A (Iso) side, as it can cause ISO to harden in the fluid passages and hoses throughout the system.

2. Select Material

Select **A-Iso**, **B-Res**, or **A-Iso and B-Res** (both).

3. Select Fluid Heating

This selection is dependent on the user's intent. If preheating a fluid through the proportioner (and not the hoses) the user would select **Pre-Heat**. If they wish to only use hose heaters, they would select **Hose**. If the user wants to activate both pre-heaters and hose heaters, they would through select Pre-**Heat and Hose**.



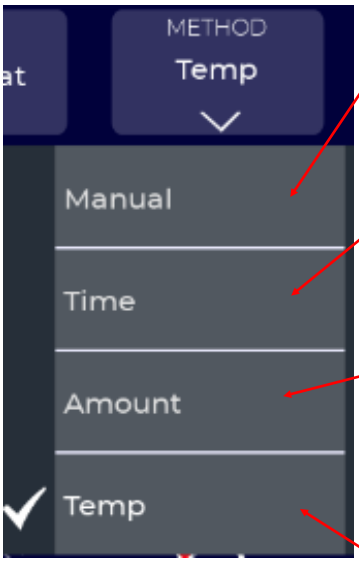
⚠ CAUTION

Never activate heating in a dry system. This will cause heater elements to fail and may create a fire hazard. Always be sure preheaters and hoses are full of fluid before starting the system in Spray of Exchange mode.

EXCHANGE SCREEN - OVERVIEW

4. Select Method

The IS40 allows the user to operate Exchange functions (Purge or Recirculate) manually. In addition, the user can select a Method parameter that will automatically stop the Exchange action when completed. The Method options are shown described and below.



User manually starts and stops fluid Exchange

Fluid Exchange continues for a set time duration (user input)

Fluid Exchange continues for a set amount of fluid (user input)

Fluid Exchange continues until fluid in drum reaches a set temperature (user input)

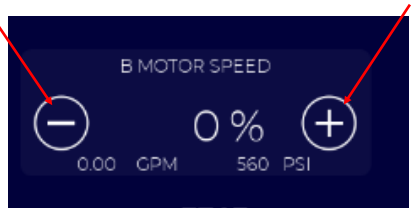
The IS40 configures the Exchange screen based on selected parameters. This is shown in the examples on the following pages.

5. Select Motor (Jog) Speed

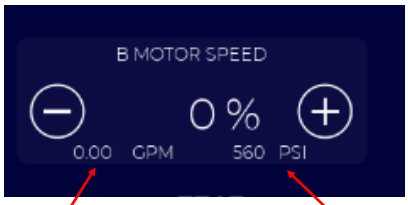
In Exchange mode the user must specify motor speed (also known as jog speed). The user sets the motor speed from 0% to 100% using the - and + buttons above the drum icons. Always start at a motor speed below 50% as higher speeds may result in an overpressure error. If the user is purging with compressed air on the B side, motor speeds should be limited to 30% or less. Instructions for performing an Air Purge are shown on page 62. Air purge should never be used on the A side, as it could cause ISO to harden in the fluid passages and hoses.

Press to decrease speed

Press to increase speed



Fluid flow rate and pump pressure are indicated below the motor speed control buttons. The user can adjust motor speed to achieve a reasonable flow rate while keeping pressure below the maximum pressure setting. (See page 78 to set system maximum pressure.) Motor speed can be adjusted while the motor is running.



Flow rate

Pressure

NOTE

Always start fluid Exchange at a motor speed below 20% as higher speeds may result in an overpressure error. In Exchange mode it is best to start slow and then increase motor speed.

EXCHANGE SCREEN - OVERVIEW

6. Check Fluid Lines

For the fluid(s) to be Exchanged (purged or recirculated) check to be sure:

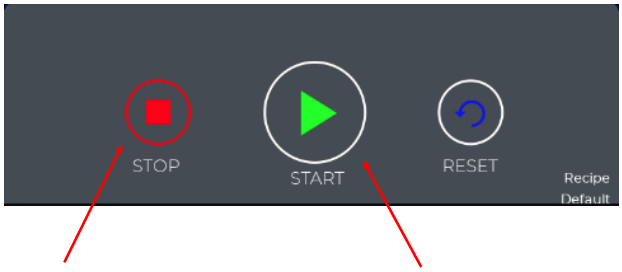
- Supply pumps are at pressure
- Supply valves are open
- Filter valves on the proportioner are open
- Recirculation valve on the proportioner is the proper position (gun or drum) depending on intent.

Output to drum or container from recirculation line.

Output through distribution hose

7. Start Fluid Exchange

Press the **Start** button to begin fluid exchange.



Press to top fluid Exchange

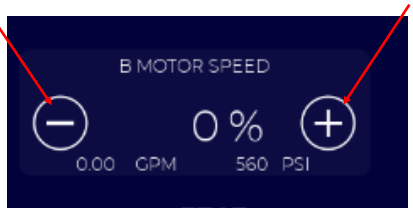
Press to start fluid Exchange

8. Adjust Motor Speed

Motor speed can be adjusted “on the fly” by pressing the - and + buttons above the drum icons. While higher jog speeds reduce the Exchange time, they can also cause an overpressure situation and/or cause material cavitation in the pump and possible pump damage. Most Exchange functions can be operated at 50% or lower motor speed settings.

Press to decrease speed

Press to increase speed



NOTE

Always start fluid Exchange at a motor speed below 50% as higher speeds may result in an overpressure error. In Exchange mode it is best to start slow and then increase motor speed.

9. Stop Fluid Exchange

The user can press the **Stop** button at any time to stop fluid exchange. Otherwise the system will automatically stop if one of the following Methods is selected:

- **Time**. The system will stop when the specified time duration is complete.
- **Temperature**. The system will stop when the inlet fluid temperature reached the specified temperature.
- **Amount**. The system will stop when the specified amount of fluid is purged or recirculated.

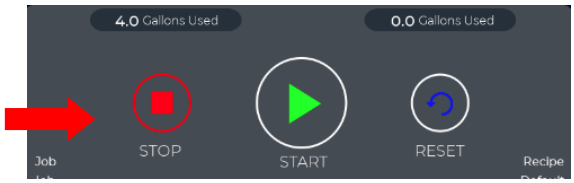
With the ability to independently purge, recirculate and heat A and B fluids, the IS40 Exchange Mode capabilities are extensive and intuitive. Several examples are shown in the following pages that will help the user become familiar with these capabilities.

EXCHANGE SCREEN EXAMPLE 1 - INITIAL SYSTEM BLEED

When the proportioner and/or hoses are installed, an initial system bleed is required to completely replace air with fluid in the supply hoses, proportioner, and distribution hoses. In addition, if air is introduced to the system (e.g. running the drum pump dry) the same procedure must be performed. If air is not removed from the system properly, the gear pumps, preheaters, and/or hose heaters can be damaged. Air pockets can also create off-ratio conditions.

In this example the operation is shown for the B side. The same procedure would also be used for the A side.

1. Be sure the system is in **STOP** state.



2. Check that supply lines, recirculation hoses, and distribution hoses are properly connected.
3. Check the analog pressure gage on the fluid module to be bled. Relieve pressure by turning the outlet valve to the recirculation position. Once pressure is relieved, turn the outlet valve back to the gun position.

⚠ WARNING

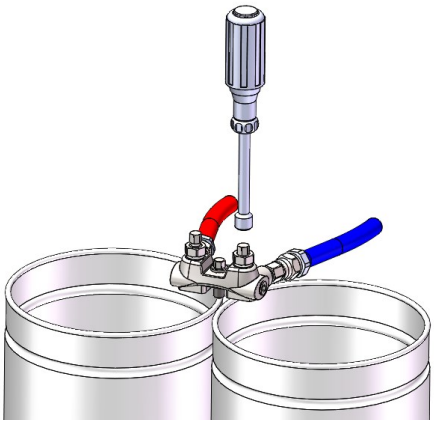
Fluid in hoses and proportioner may be under high pressure. System must be depressurized prior to performing any service function.

4. Set filter valves to open position (turn clockwise to stop) and set the output valve to spray position as shown in the following figure.

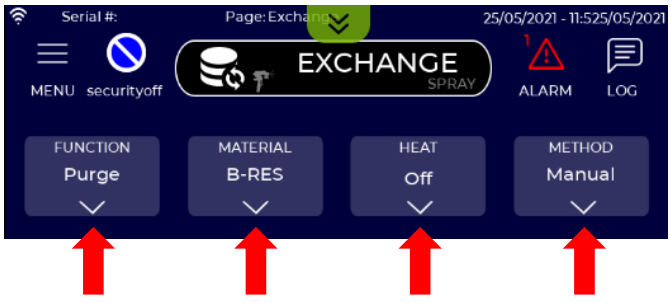
Filter inlet and outlet valves in open position

Outlet valve in spray position

5. Activate B-side transfer pump.
6. Remove the spray gun from the hose manifold. Secure or hold the manifold over a waste container and open the B-side material control valve to catch fluid. Fluid may begin flowing out of the manifold at this point. This is acceptable.



7. After selecting Exchange Mode from the main menu:
   - Select Purge from the FUNCTION menu.
   - Select B-RES from the MATERIAL menu.
   - Select Off from the HEAT menu.
   - Select Manual from the METHOD menu.

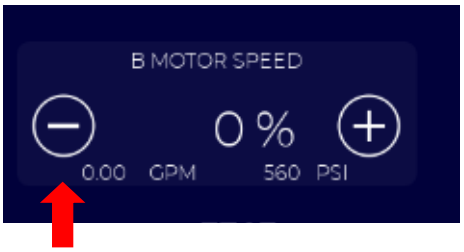


⚠ WARNING

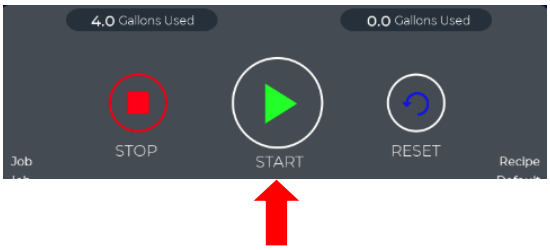
Never activate heating when air or gas is present in the Proportioner or Hoses. This can cause heater elements to fail and may create a fire hazard.

EXCHANGE SCREEN EXAMPLE 1 - INITIAL SYSTEM BLEED

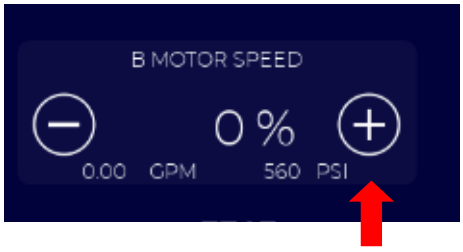
8. Set B motor speed to 0% by pressing the - button in the Motor Speed Widget.



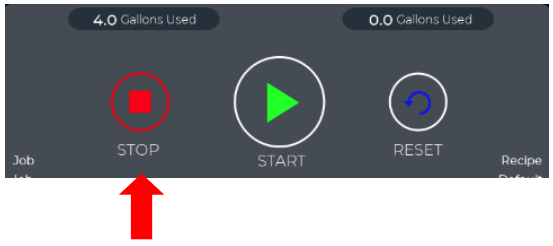
9. Press the START button.



10. Increase B motor speed by pressing the + button in the Motor Speed Widget. Motor speeds should be limited to 5% or less until fluid has filled the Fluid Modules to avoid damage to the pump bearings and internal surfaces. Once pressure starts to build motor speed can be increased but should remain below 50% until distribution hoses are filled.



11. Press STOP when a steady stream of fluid flows from the manifold and all air has been replaced with fluid.



12. Close the B-side material control valve on the gun manifold.
13. Repeat the process for the A-side if required.

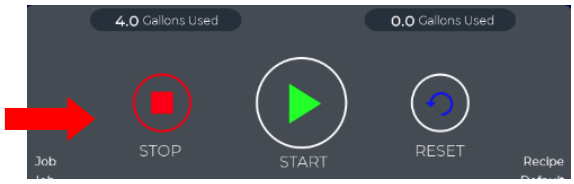
⚠ WARNING

Never run gear pumps faster than 5% speed in Exchange Mode when dry, and do not run for more than 10 seconds when dry at this speed. Presence of fluid in the pump is essential to protect bearings and seals.

EXCHANGE SCREEN EXAMPLE 2 - A-SIDE MANUAL PURGE

In this example old A side material is purged through the entire system with new A material. Since the material has become very viscous, the user has decided to heat the material at 100°F during purging.

1. Be sure the system is in **STOP** state.



2. Check that A-side supply lines, recirculation hoses, and distribution hoses are properly connected.
3. Check the pressure gage on the A fluid module. If the gage pressure is over 300 psi relieve pressure by opening the recirculation valve in STOP state.

⚠ WARNING

Fluid in hoses and proportioner may be under high pressure. Follow the pressure relief procedures in this manual.

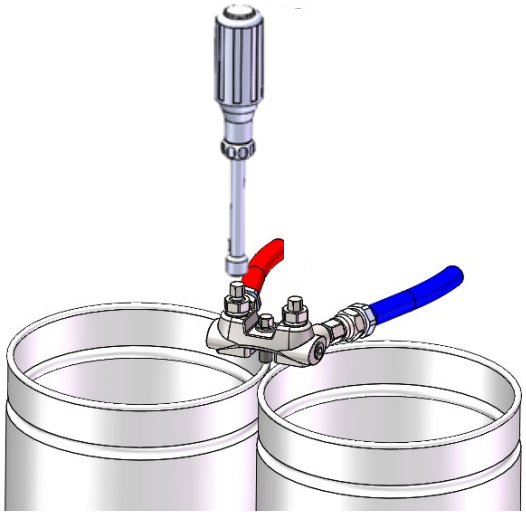
4. Open A-side filter valves and set the output valve to spray position as shown in the following figure.

Filter inlet and outlet valves in open position

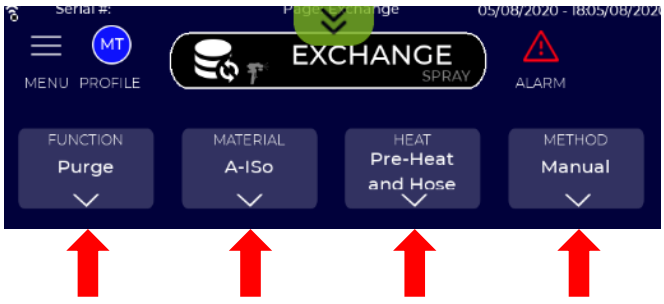
Output valve in spray position

5. Activate A-side transfer pump.

6. Remove the spray gun from the hose manifold. Secure or hold the manifold over a waste container and open the A material control valve to catch fluid. Fluid may begin flowing out of the manifold at this point. This is acceptable.

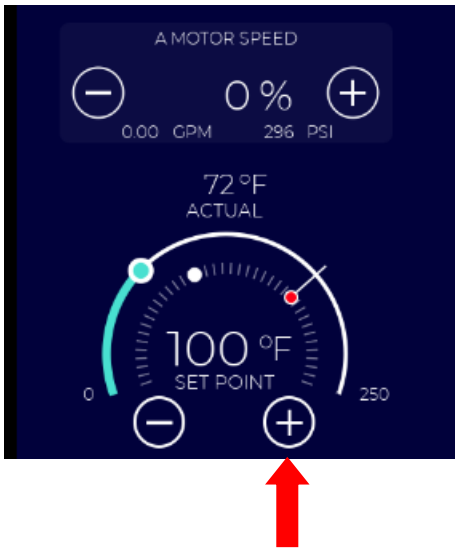


7. After selecting Exchange Mode from the main menu:
   - Select Purge from the FUNCTION menu.
   - Select A-Iso from the MATERIAL menu.
   - Select Pre-Heat and Hose from the HEAT menu.
   - Select Manual from the METHOD menu.

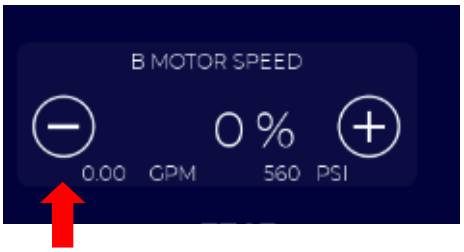


EXCHANGE SCREEN EXAMPLE 2 - A-SIDE MANUAL PURGE

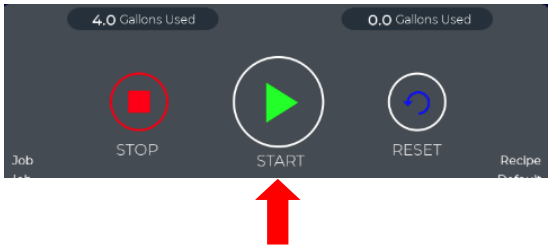
8. Set the A side temperature to 100°F by pressing the - and + buttons in the Temperature Widget.



8. Set B motor speed to 0% by pressing the - button in the Motor Speed Widget.

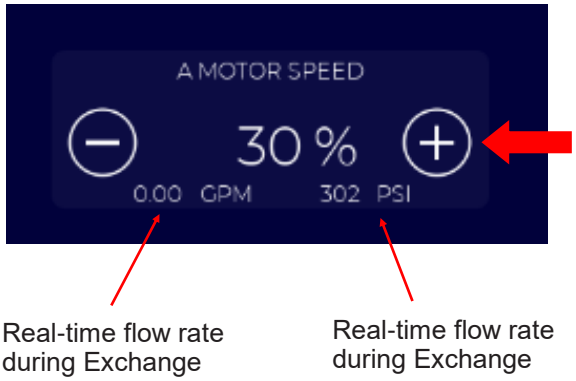


9. Press the START button to begin purging and heating. Note, there is no warmup cycle in Exchange Mode. If the material needs to be heated before turning pumps on, set motor speed to 0% or run at low speeds until fluid is warmed. Otherwise fluid will be heated during pumping.

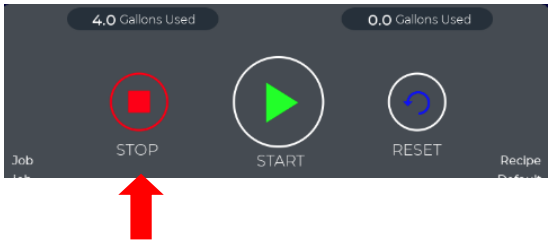


10. Increase motor speed by pressing the + button in the Motor Speed Widget. As motor (jog) speed is increased the pump pressure will rise. While higher speeds reduce the purge time, they can also cause an overpressure situation and/or cause material cavitation in the pump and possible pump damage. Most Exchange functions can be operated at 50% or lower motor speed settings.

    The user can adjust motor speed at any time while purging fluid.



11. When an adequate amount of fluid is purged press the STOP button. To restart purging, press the START button.

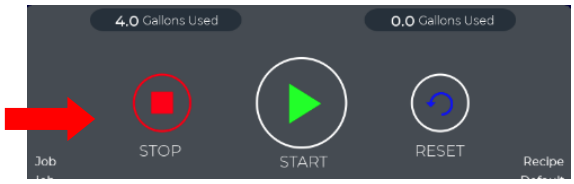


The same steps shown here can be used to bleed the B side material or to remove any injected air in the A or B side.

EXCHANGE SCREEN EXAMPLE 3 - B SIDE PURGE AMOUNT

In this example a user wants to purge 3 gallons of B material when doing a change-over from Closed Cell (CC) to Open Cell (OC) resin. The user has decided to operate the hose heaters at 100°F during the purge process.

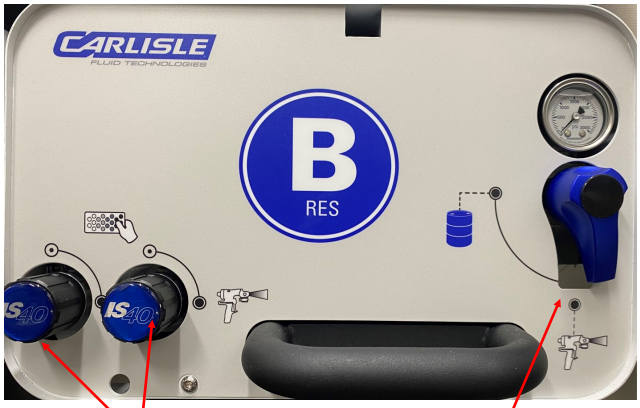
1. Be sure the system is in **STOP** state.



2. Check that B-side supply lines, recirculation hoses, and distribution hoses are properly connected.
3. Check the pressure gage on the B fluid module. If the gage pressure is over 300 psi reduce pressure by opening the recirculation valve in STOP state.

> **⚠ WARNING**
>
> **Fluid in hoses and proportioner may be under high pressure. Follow the pressure relief procedures in this manual.**

4. Open B-side filter valves and set the output valve to spray position as shown in the following figure.

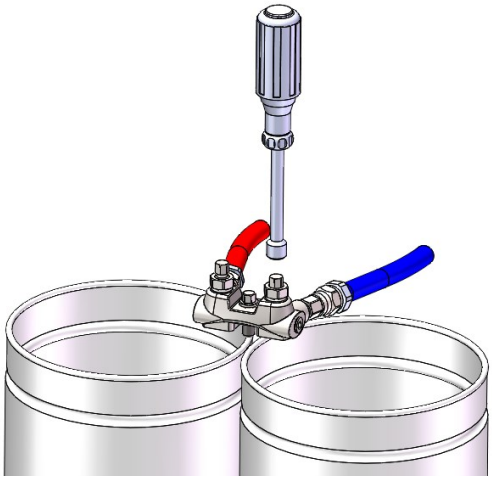


Filter inlet and outlet valves in open position

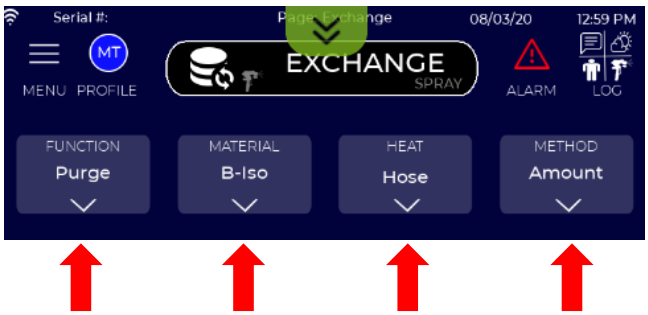
Output valve in spray position

5. Activate B-side transfer pump.

6. Remove the spray gun from the hose manifold. Secure or hold the manifold over a waste container and open the B material control valve to catch fluid. Fluid may begin flowing out of the manifold at this point. This is acceptable.

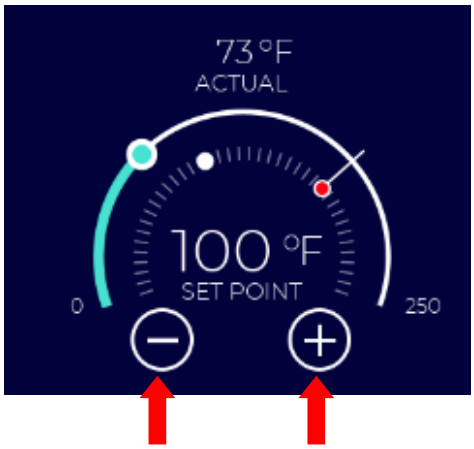


7. After selecting Exchange Mode from the main menu:
   - Select Purge from the FUNCTION menu.
   - Select B-Iso from the MATERIAL menu.
   - Select Hose from the HEAT menu.
   - Select Amount from the METHOD menu.

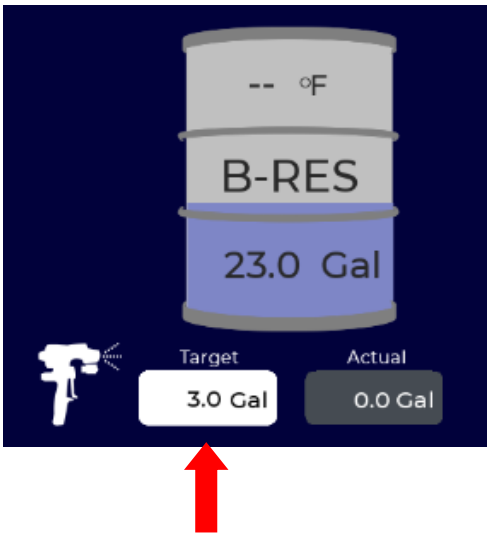


EXCHANGE SCREEN EXAMPLE 3 - B SIDE PURGE AMOUNT

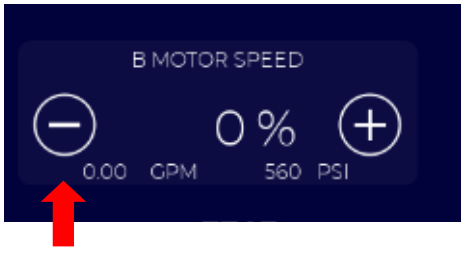
8. Set the B side temperature by pressing the - and + buttons in the Temperature Widget.



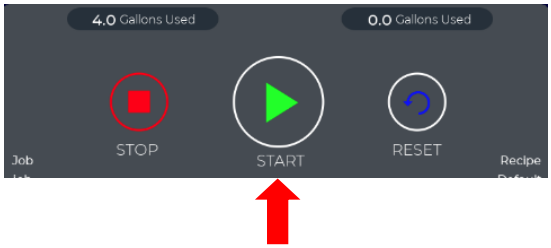
9. Note that the Target amount to purge now appears next to the B drum icon. Press on the Target window and enter the amount to purge (in this example 3 gallons). While purging, the total amount of material purged will be indicated next to the Target value.



10. Set B motor speed to 0% by pressing the - button in the Motor Speed Widget.

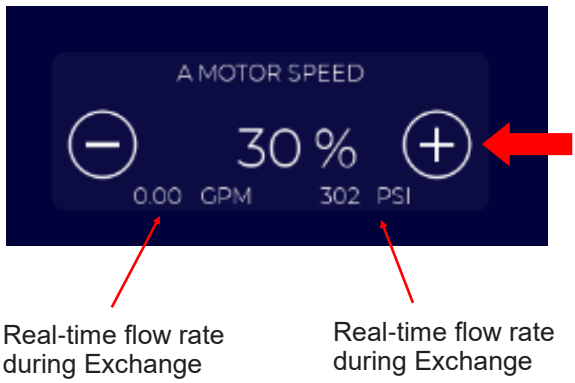


11. Press the START button to begin purging and heating. Note, there is no warmup cycle in Exchange Mode. If the material needs to be heated before turning pumps on, set motor speed to 0% or run at low speeds until fluid is warmed. Otherwise fluid will be heated during pumping.



12. Increase motor speed by pressing the + button in the Motor Speed Widget. As motor (jog) speed is increased the pump pressure will rise. While higher speeds reduce the purge time, they can also cause an overpressure situation and/or cause material cavitation in the pump and possible pump damage. Most Exchange functions can be operated at 50% or lower motor speed settings.

    The user can adjust motor speed at any time while purging fluid.



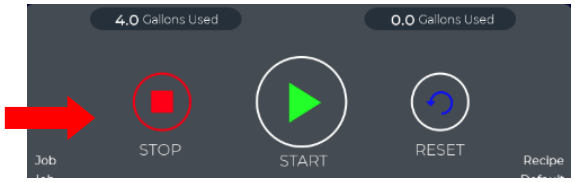
13. When the actual amount of material purged equals the target value the system will automatically go to STOP state and fluid purge will stop.

14. Close the material valve on the gun manifold and re-attach the gun.

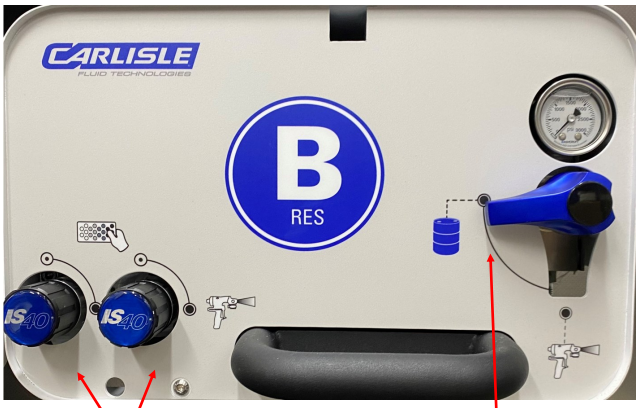
EXCHANGE SCREEN EXAMPLE 4 - PREHEAT B DRUM MATERIAL

In this example the material in the B (resin) drum will be heated to 90°F before spraying. Once the material reaches the target temperature the IS40 will automatically stop recirculation.

1. Be sure the system is in **STOP** state.



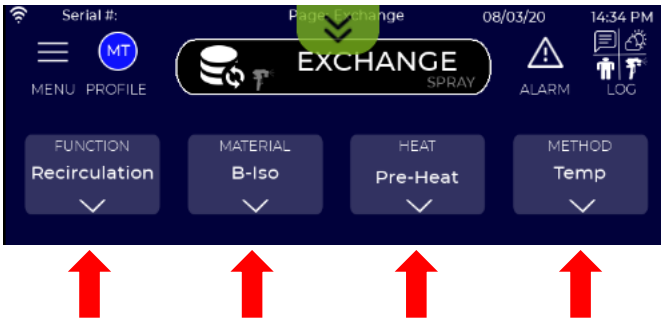
2. Check that B-side supply lines, recirculation hoses, and distribution hoses are properly connected.
3. Open B-side filter valves and set the output valve to drum position as shown in the following figure.



Filter inlet and outlet valves in open position

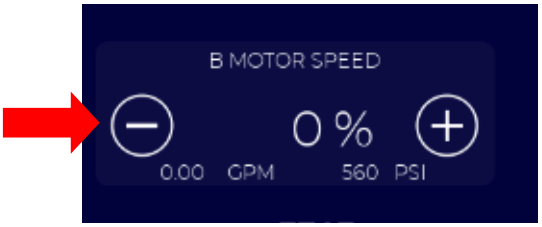
Output valve in drum position

4. Activate B-side transfer pump. B-side fluid may begin to recirculate to the drum. This is acceptable.
5. After selecting Exchange Mode from the main menu:
   - Select Recirculation from the FUNCTION menu.
   - Select B-Iso from the MATERIAL menu.
   - Select Pre-Heat from the HEAT menu.
   - Select Temp from the METHOD menu.

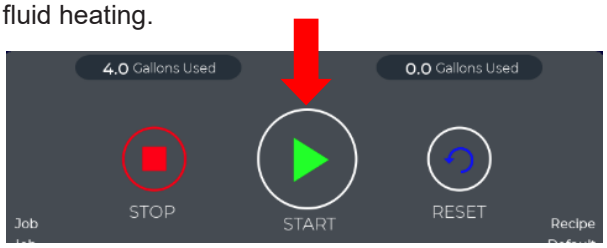


6. Enter the target drum fluid temperature of 90F in the window below the B drum icon. The actual temperature will be displayed both below and on the drum icon when fluid starts to recirculate.

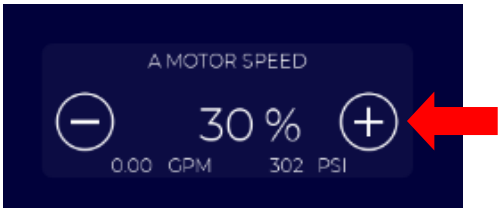
7. Set B motor speed to 0% by pressing the - button in the Motor Speed Widget.



8. Press the START button to begin recirculation and fluid heating.



9. Increase B motor speed by pressing the + button in the Motor Speed Widget. While most Exchange functions can be operated at 50% or lower motor speed settings, in recirculation mode motor speed can be increased to accelerate preheating the fluid in the drum.



10. The IS40 will automatically stop recirculation when the actual incoming fluid temperature reaches the user-specified target temperature.

EXCHANGE SCREEN EXAMPLE 5 - B SIDE AIR PURGE

When changing B-side materials it may be important to minimize mixing of materials and/or fluid waste. Changing from Open to Closed Cell resins is a good example, as is changing between some Open Cell formations. Simply pushing through a different B material is acceptable from a hardware standpoint, but it can require "spraying out" or purging a large amount of waste material.

The IS40 can use compressed air or inert gas with the Purge function. This is referred to as performing an "Air Purge", Compressed air cannot not effectively leak through the IS40 gear pumps, and they may not spin under air pressure alone. By operating the B motor at low speed Air Purge is effective at pushing material through the system.

⚠ WARNING

Never purge the proportioner or hoses with a flammable or oxidizing gas or liquid. Explosion and/or fire may result with significant injuries, loss of life, and property damage.

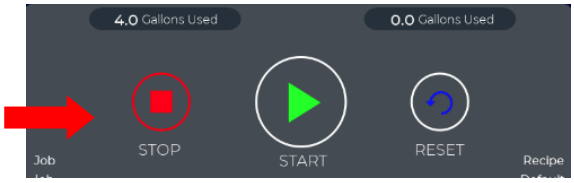
⚠ CAUTION

Air Purge should never be used on the A (Iso) side, as it can cause ISO to harden in the fluid passages and hoses throughout the system.

To perform an Air Purge, a quick-connect air fitting and check valve (or ball valve) should be installed on the B (Resin) supply line. This will prevent fluid from coming back through the air fitting. An example setup is shown in the following figure.

Air Purge Steps

1. Be sure the system is in **STOP** state.



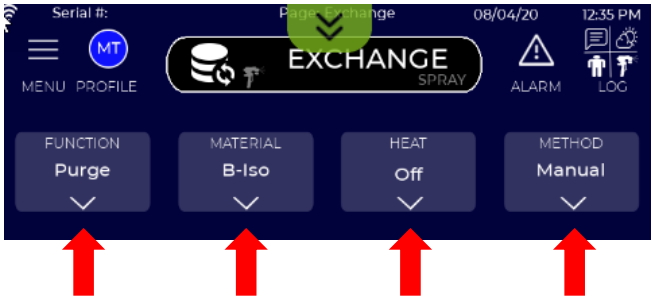
2. Shut off the B-side transfer pump and close the transfer pump outlet valve if so equipped.
3. To minimize cross-contamination remove the B-side transfer pump from the old drum and drain per manufacturer's recommendations. If some cross-contamination is acceptable this step can be skipped.
4. Confirm that the B-side recirculation hose is connected to the B drum or directed into a waste container.
5. Check that the B-side filter inlet and outlet valves are in the open position (turned CW to stop) and set the output valve to the drum position as shown in the following figure.

EXCHANGE SCREEN EXAMPLE 5 - B SIDE AIR PURGE

9. Attach the compressed air line and/or open the air valve to apply air pressure into the supply hose. The pump may start to spin under air pressure alone. This is acceptable. Air pressure should be between 70 - 150 psi. Higher inlet pressures may cause a failure of pump seals.

6. Enter Exchange Mode from the main menu and:

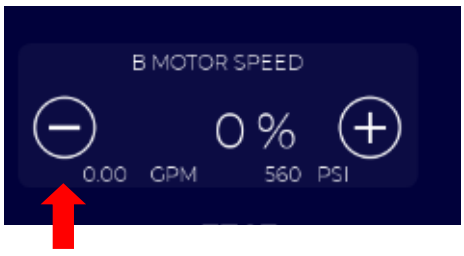
   - Select Purge from the FUNCTION menu.
   - Select B-Iso from the MATERIAL menu.
   - Select Off from the HEAT menu.
   - Select Manual from the METHOD menu.



⚠ CAUTION

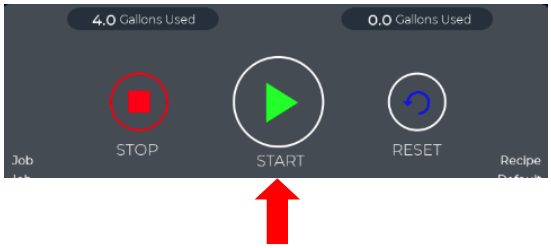
Never activate heating when performing an Air Purge. This can cause heater elements to fail and may create a fire hazard.

8. Recommended step: Set B motor speed to 0 by pressing the - button in the Motor Speed Widget.

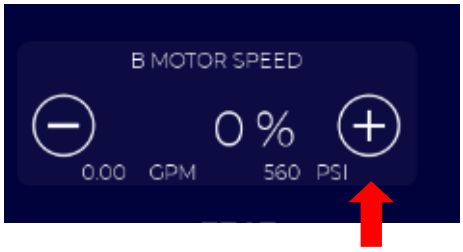


9. Attach the compressed air line and/or open the air valve. The pump may start to spin under air pressure alone. This is acceptable. Air pressure should be between 70 - 150 psi. Higher inlet pressures may cause a failure of pump seals.

10. If the system displays a low pressure alarm, press RESET. Press the START button to begin purging the B fluid and replacing with compressed air.

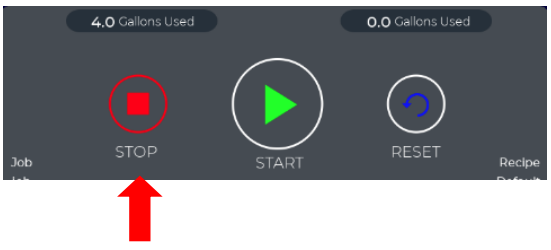


11. Increase B motor speed by pressing the + button in the Motor Speed Widget. Motor speeds should be limited to 20% or less when performing an Air Purge to avoid damage to the pump bearings and internal surfaces..



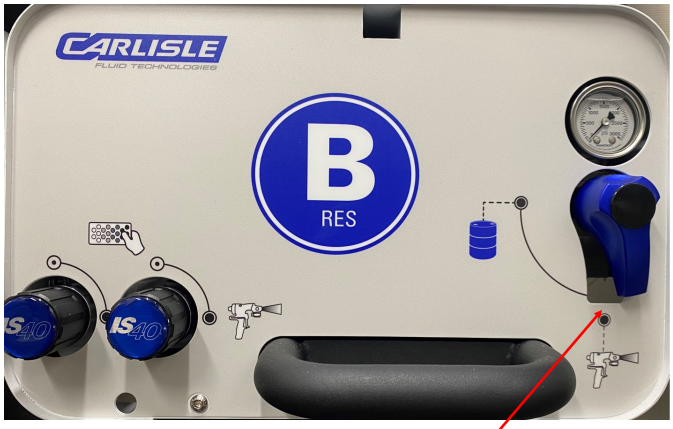
Since the recirculation valve is still in the drum position (step 5), the initial purge will push B-side material from the supply hose, proportioner, and recirculation line back into the drum or waste container. Continue purging until air is flowing steadily out of the recirculation hose.

12. Press the STOP button when air is flowing steadily out of the recirculation hose.

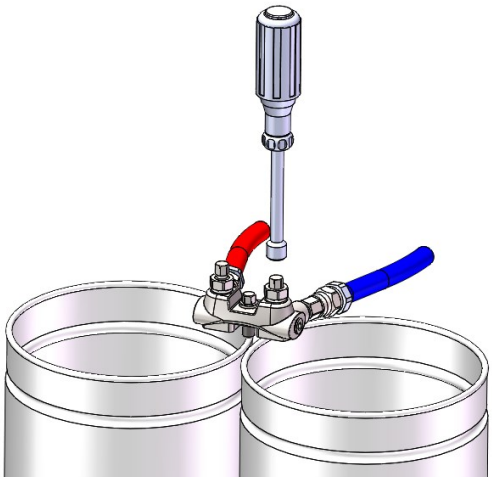


EXCHANGE SCREEN EXAMPLE 5 - B SIDE AIR PURGE

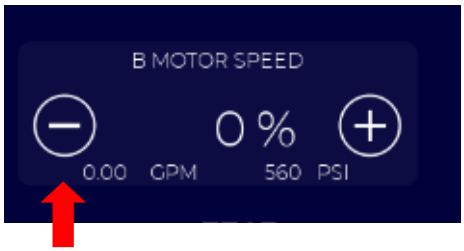
13. Turn the output valve to spray position as shown in the following figure..



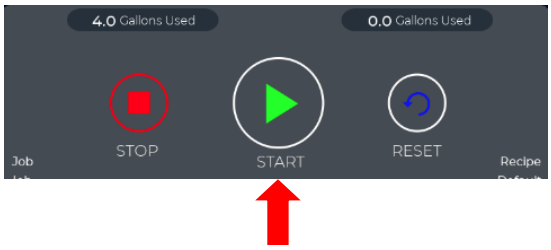
14. Remove the spray gun from the hose manifold. Secure or hold the manifold over a waste container and open the B material control valve to catch fluid.



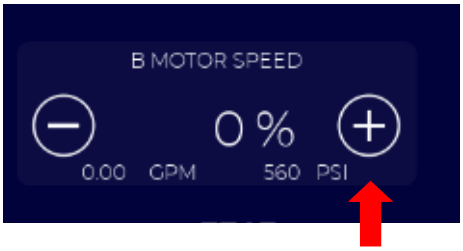
15. Recommended: Set B motor speed to 0 by pressing the - button in the Motor Speed Widget.



16. Press the START button to begin purging of the old B fluid and replacing with compressed air.

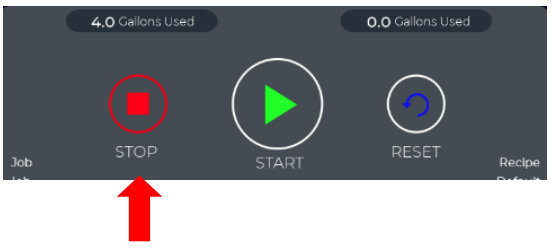


17. Increase B motor speed by pressing the + button in the Motor Speed Widget. Motor speeds should be limited to 20% or less when performing an Air Purge to avoid damage to the pump bearings and internal surfaces..



Since the output valve is in the spray position (step 13), the Air Purge will now push B-side material from the supply hose, proportioner, and recirculation line out of the gun manifold at the end of the hose. Continue purging until a steady stream of air is flowing out of the manifold.

18. Press STOP when air is flowing steady out of the manifold. The Air-Purge cycle is now complete.



19. Close the B-side material control valve on the gun manifold.
20. Shut off the compressed air valve (or disconnect air line) at the drum pump used for air purging.
21. Insert drum pump in new material drum.
22. Use Exchange mode to refill the B side with the new material (see Example 1 for reference).

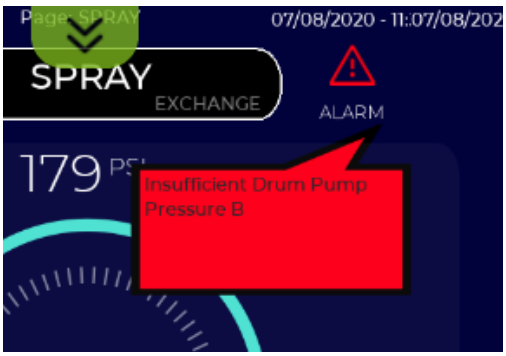
ALARM SCREEN - OVERVIEW

The IS40 displays and categorizes **Alarms** as either **Errors**, or **Warnings**.

Errors

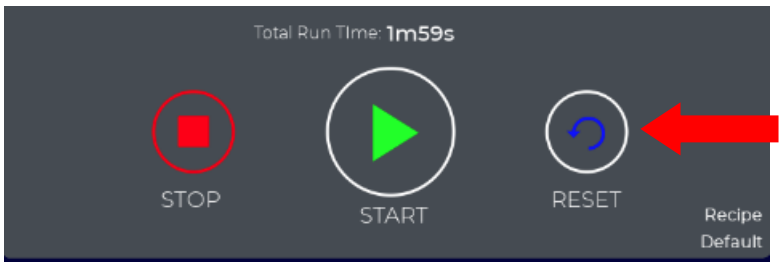
Errors occur when the IS40 detects a condition that prevents the system from operating in a safe or controlled manner. Errors are intended to prevent personal injury, equipment or property damage, or spraying outside of acceptable process limits. When an Error occurs, the IS40 automatically enters STOP state and turns off power to heaters and motors. The ALARM icon at the top of the active screen will change from white to red and a pop-up note will be displayed that shows error number and description. When the IS40 has an active Error, the RESET button at the bottom of the screen will begin flashing.

The following are examples of conditions that will trigger an error alarm.



- Insufficient material in drum
- Insufficient drum pump pressure
- Excessive drum pump pressure
- Excessive system pressures or temperatures
- Plugged filter (pressure drop across filter too high)
- Pressure difference exceeds limits
- Component or communication failure

If the system is in an error state, the user must eliminate the error condition and press the RESET button before restarting the system.



RESET button will flash blue when an error is active. After correcting the error condition press the RESET button before restarting the system.

ALARM SCREEN - OVERVIEW

If the IS40 is in an ERROR state, the ERROR icon will change to solid red and a pop-up message will appear showing ERROR number and description. Only the most recent ERROR will be displayed.

In most cases the information provided in the message window will be sufficient for the user to address and resolve the error prior to restarting the system.

More information on the active or prior alarms can be obtained by entering the Alarm Screen. This can be accessed by pressing on the alarm icon, the alarm message, or from the main menu as shown below.

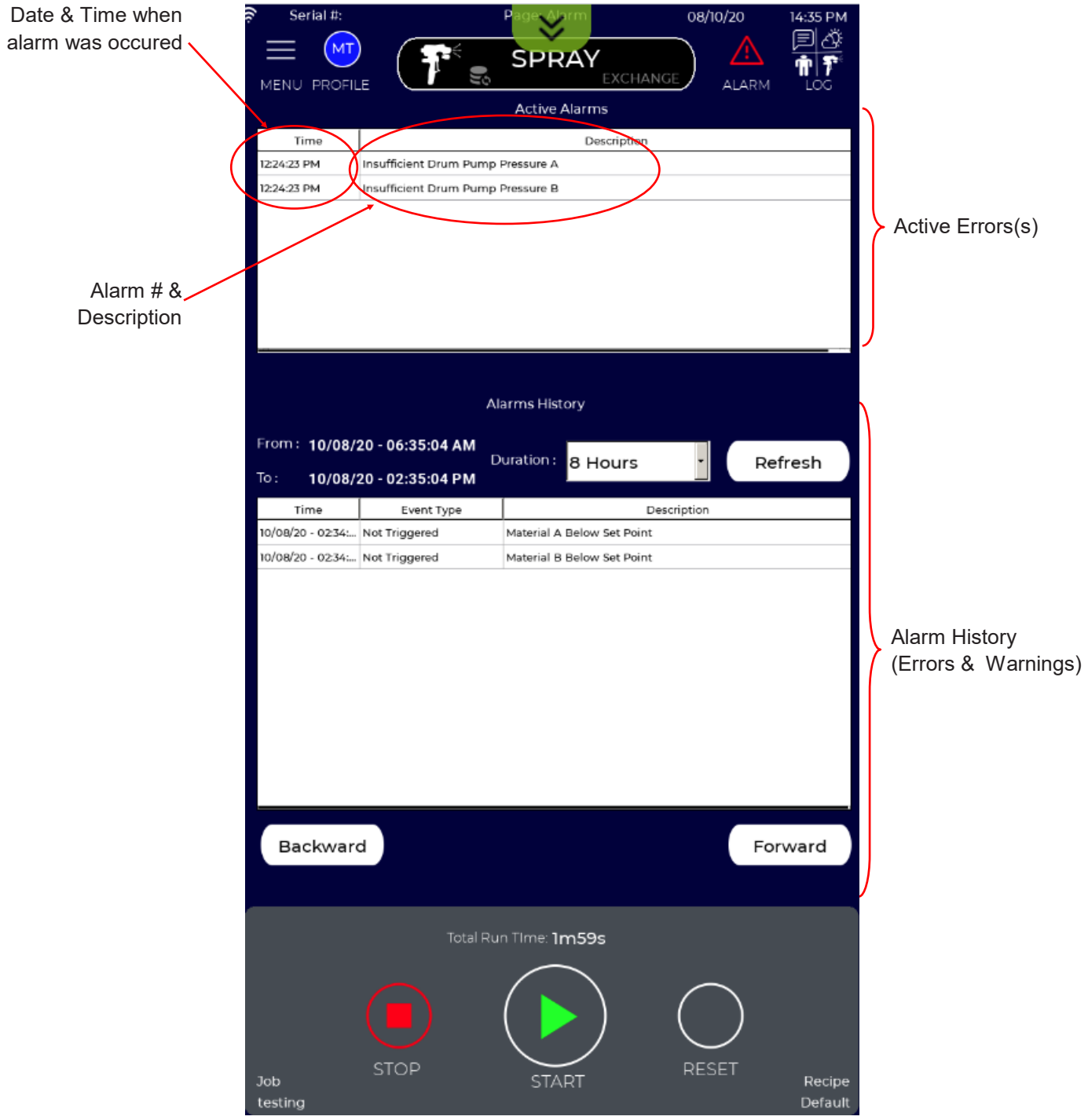
Pull down main menu and select to access ALARM screen

Press icon or pop-up message to access ALARM screen.

ALARM SCREEN

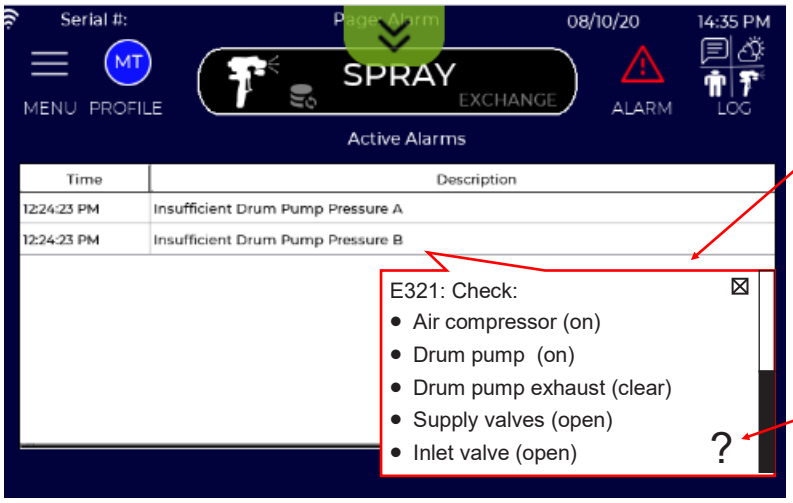
The Alarm Screen contains two tables. The upper table displays any active errors that are preventing the system from operating. Warnings are not displayed in the upper table. The lower table shows previous Errors and Warnings. When an error is addressed and the reset button is pressed, the active error will clear and be displayed in the lower window with other past Alarms.

Warnings are only displayed in the lower table, as they do not cause the system to stop.



ALARM SCREEN

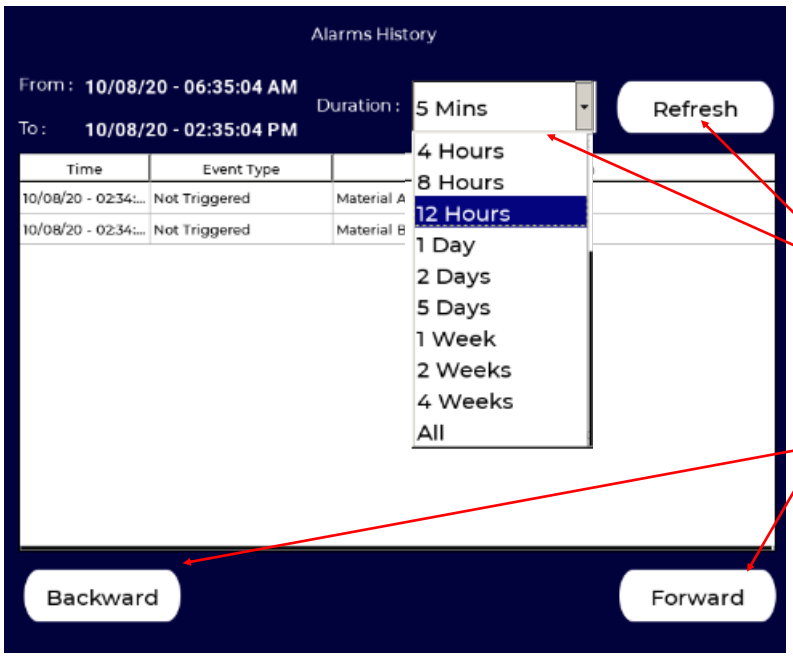
Additional information can be obtained for any active Alarm by pressing anywhere in the Active Alarm (upper) table. A scrollable pop-up will show suggested trouble-shooting actions. For even more detail, pressing the ? Symbol within the pop-up window will open the Operators Manual to the section that corresponds with the displayed Error.



Pop-up window provides trouble shooting help.

Press ? Symbol to open Operators Manual to trouble shooting section that corresponds to Error.

The Alarm History table displays previous Alarms (Errors and Warnings) that have occurred over a selected "look-back" time frame, which can be set from the Duration pull-down menu. Press Refresh to update the Alarm History Window when changing the Duration selection. Use the Forward and Backward buttons to scroll through the Alarm History table.



Select lookback duration from the dropdown menu and press "Refresh" to display a different range of alarms.

Press "Backward" or "Forward" button to scroll through Alarm History window.

SYSTEM STATUS SCREENS

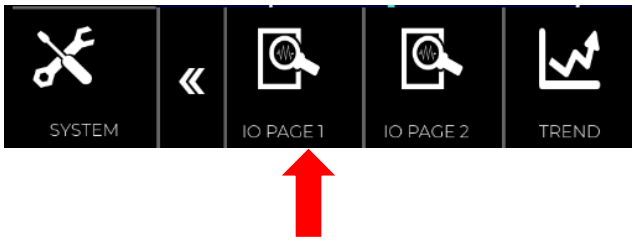
The IS40 System Status Screens can be used for system monitoring and diagnostics. The IS40 has three System Status Screens that can be selected from the Main Menu as shown below. The first two Status Screens provide real-time status and performance measurements. The third Status Screen provides real-time graphing capabilities of any sensor, set-point, machine State or performance metric. Each Status Screen is described in detail in the following pages.

Select System from the main menu, then select one of the three System Status screens.

SYSTEM STATUS SCREENS - IO PAGE 1

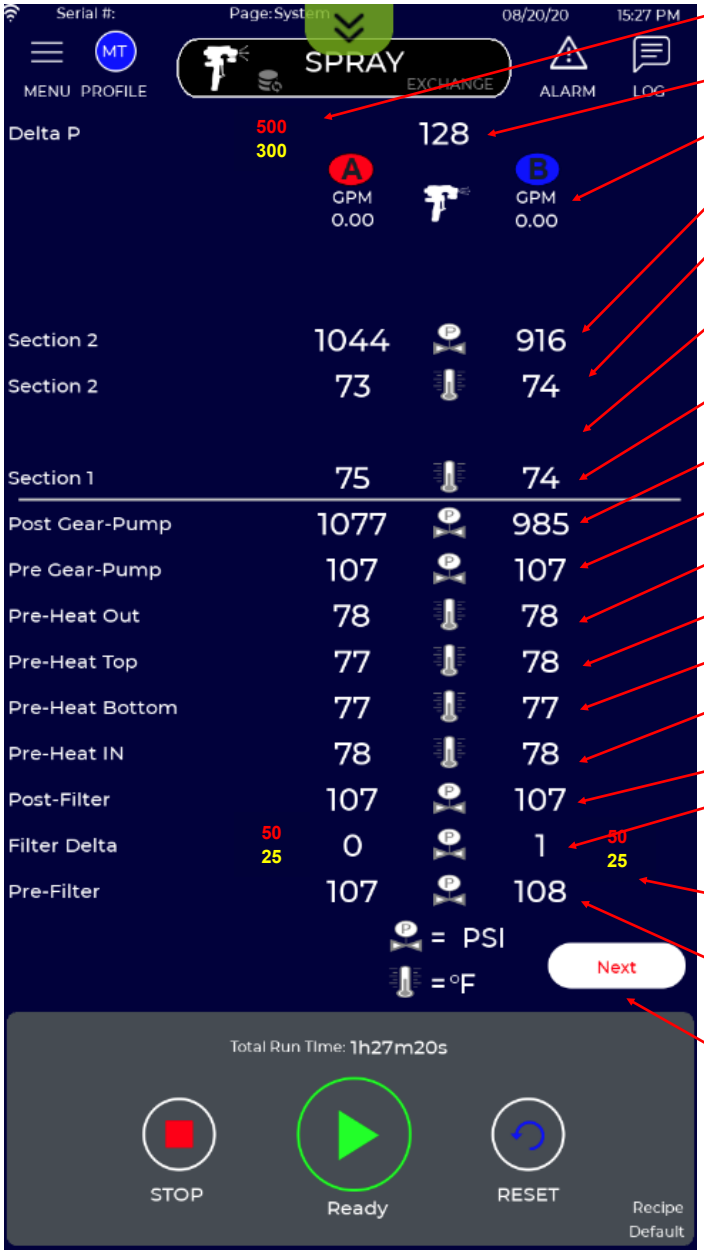
The first System Status Screen (IO PAGE 1) displays real-time temperature and pressure outputs of all A-side and B-side Sensors in the fluid path, from inlet to the end of the hose. The A-side values are shown in the left column, and the B-side values are shown in the right column. Fluid flow is represented from bottom (fluid iinlet) to top (gun). Descriptions of all output values is shown in the following figure.

To display IO PAGE 1 System Screen, select it from the System main menu.



Indicates Pressure Value

Indicates Temperature Value



Pressure difference error (red) and warning (yellow) settings

Pressure difference at end of hose

Fluid flow rate

Fluid pressure at the end of last hose zone

Fluid temperatures at the end of last hose zone

Fluid temperature of middle hose would be shown if 3 sections were installed (not in this example).

Fluid temperatures at the end of first hose zone

Post-pump fluid pressures

Pre-pump fluid pressures

Pre-heater output fluid temperatures

Pre-heat manifold top temperatures

Pre-heat manifold bottom temperatures

Inlet fluid temperatures

Post-filter fluid pressures

Fluid pressure drop across filters

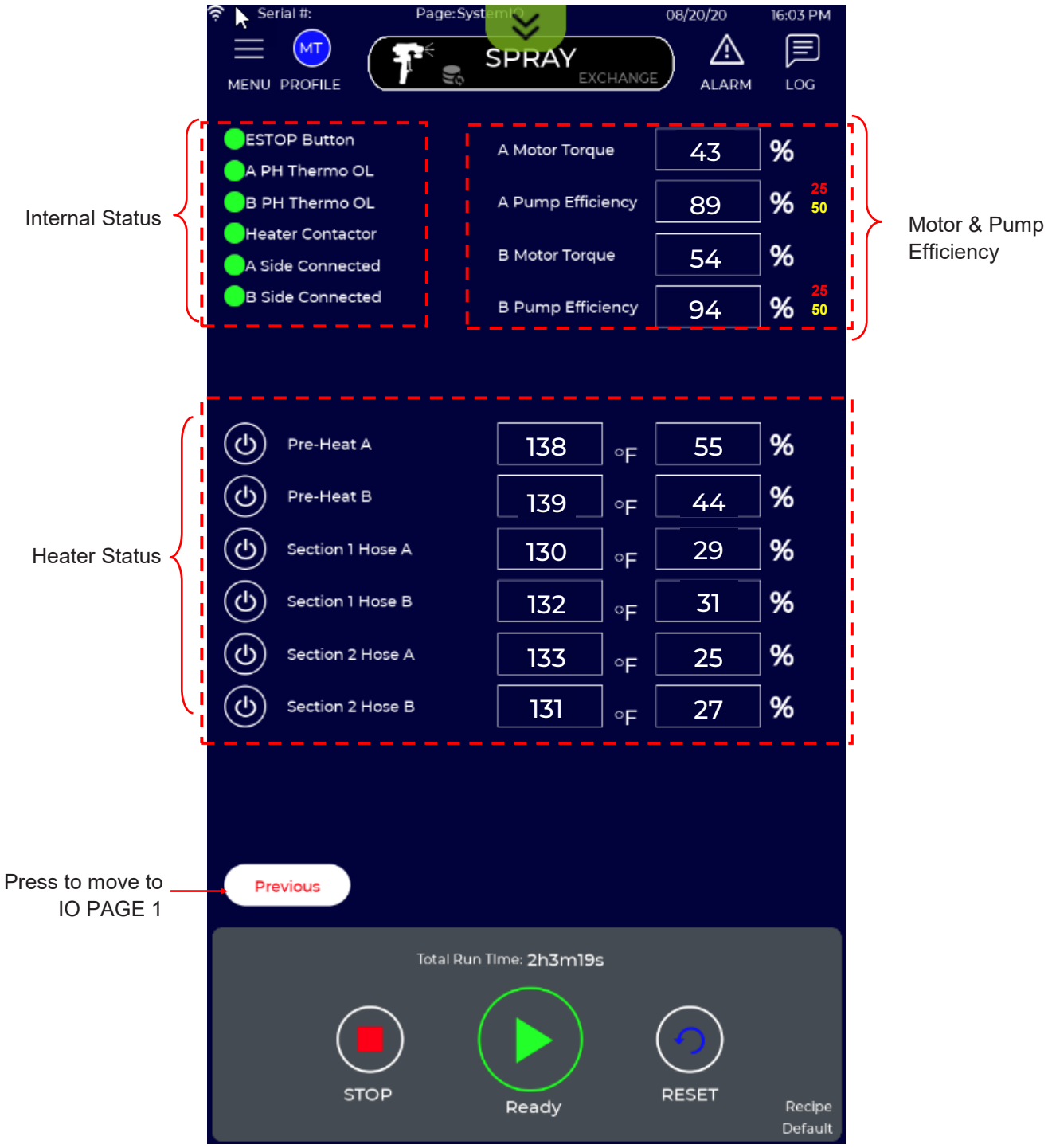
Filter pressure drop error (red) and warning (yellow) settings

Pre-filter fluid pressures

Press to move to IO PAGE 2

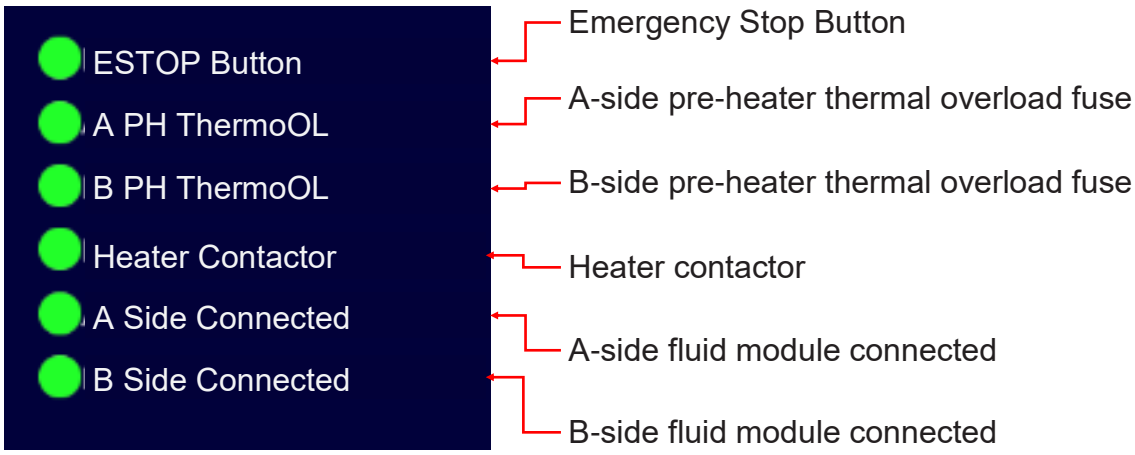
SYSTEM STATUS SCREENS - IO PAGE 2

IO Page 2 of the System Status screens displays real-time machine status and allows the user to perform diagnostic tests on individual heaters. The three sections to the screen are shown below, and additional details are provided in the following pages.



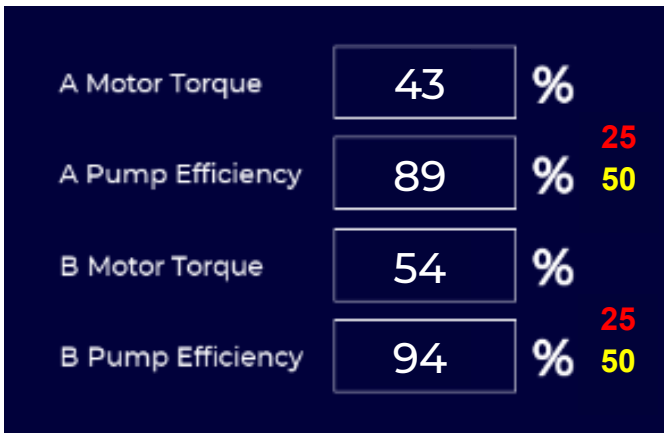
SYSTEM STATUS SCREENS - IO PAGE 2

The IS40 monitors connection status between internal systems and displays status in the upper left portion of IO Page 2 (see previous page). A red or green status light is displayed showing connection status of each subsystem. All lights must be green for the IS40 to enter a START state. A red light indicates a connection problem that must be addressed by the user or service technician.



The IS40 provides real-time A and B-side motor and pump performance data in the upper right section of IO Page 2. This information can be useful for diagnostics, system tuning, and checking motor and pump health.

Motor torque is expressed in the percent (%) of continuous rated torque. The IS40 motors can operate indefinitely at 100% of rated torque, but can also handle short-duration peak loads up to 300% before causing an error state. Higher torques are required when spraying higher viscosity fluids at higher flow rates (e.g. larger gun chamber/tip sizes).

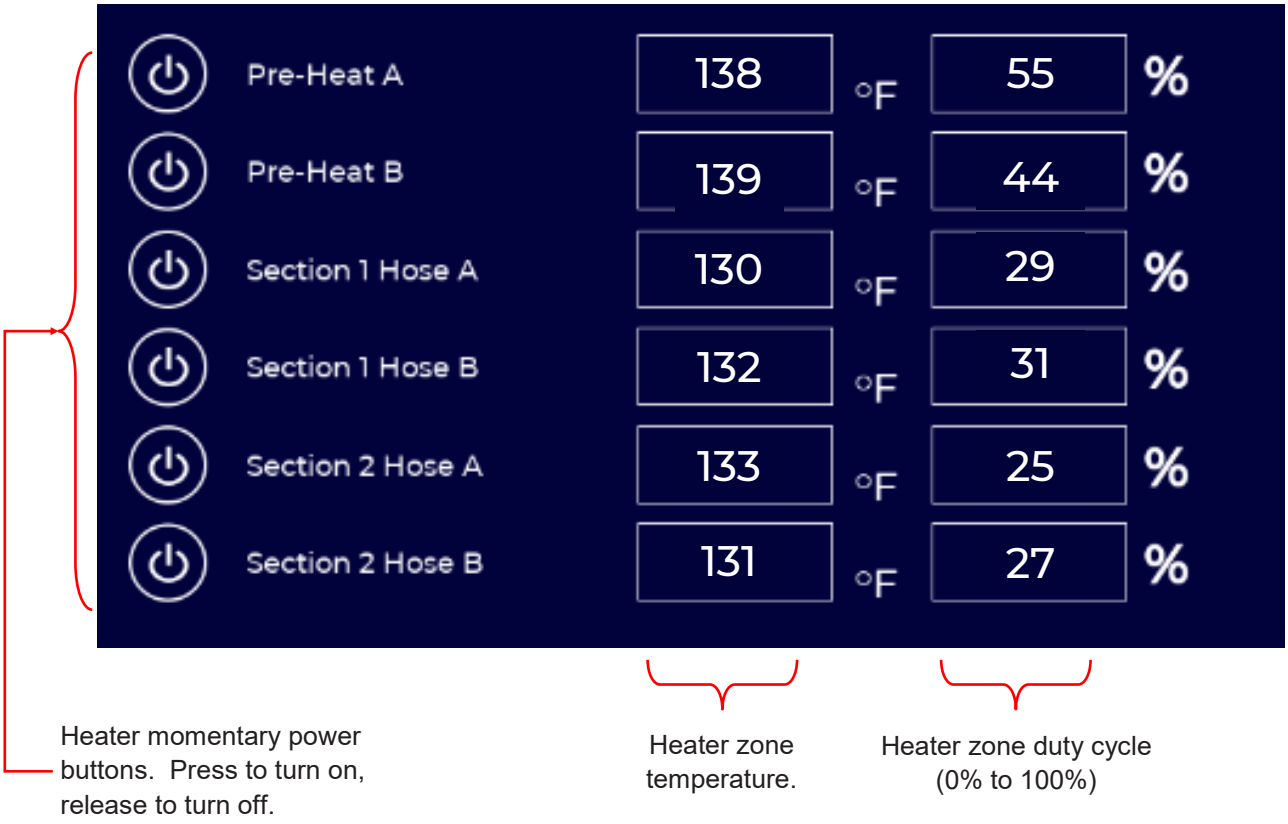


Pump efficiency is the ratio of actual flow rate to theoretical flow rate. The IS40 positive displacement gear pumps have inherent slip that reduces efficiency below 100%. Slip refers to the small amount of fluid that can leak back from the outlet side of the pump to the inlet side (a check valve prevents fluid backflow from the high pressure side of the IS40). The IS40 continuously measures and compensates for any differential slip between the A and B pumps to assure fluid ratio is maintained. Pump efficiencies vary during a trigger cycle, with lower efficiency (i.e. higher slip) occurring when the gun is first triggered and with materials of very low viscosity. As pumps age efficiency may drop but the IS40 will automatically compensate for this. Pump efficiency warning and error limits can be set in the Recipe Screens. If set, these values are shown to the right of the pump efficiency vales. The upper red number shown in the figure above indicates the efficiency error level (when the system will stop) and the yellow lower number indicates the efficiency warning level (when the system will indicate a warning). When pump efficiency drops below 50% service may be require, or temperatures changed to reduce slip.

SYSTEM STATUS SCREENS - IO PAGE 2

Page 2 of the System Status screens contains a section for monitoring individual heater zone performance. The temperature and duty cycle for A and B-side heating zones are displayed in the lower part of the screen. Heater power ranges from 0% (off) to 100% (full on). Each heater zone can be turned on or off by pressing the power switch symbol to the left of each heater zone.

If power is already being supplied to the heater zones, their respective power switch symbol will be solid green. If the system is in an error state, or if heaters are off, the power switch symbol acts as a momentary switch. Pressing it will power the respective zone so the user can see if power is being applied and temperature is rising. This function is intended for use by trained service personnel. More information on using this capability is contained in the IS40 Service manual..



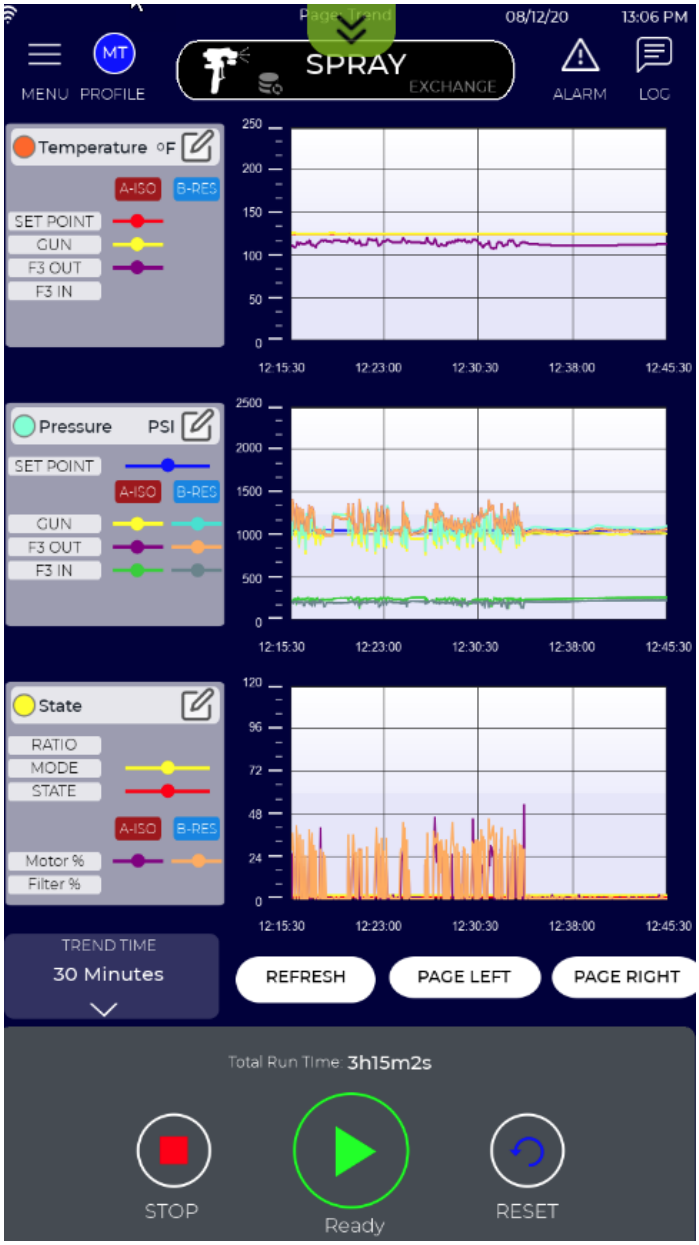
SYSTEM STATUS SCREENS - TRENDS

The System Status screens also provide real-time graphing capabilities of any sensor, set-point, machine State or performance parameter selected by the user. Trend charts are updated every second. Alll selections and settings are retained, so once defined the same charts will be available any time the TREND screen is opened. To re-center the current time, press REFRESH. TREND TIME can be changed to expand or compress the chart scale.

Trend charts can be very helpful in performing system diagnostics and performance optimization. More information on how to use Trend charts is contained in the IS40 Service Manual.

Selecting the Trend icon opens a screen that allows the user to select the parameters to plot against a user-defined time scale.

The three sections to the screen are shown below, and additional An details are provided on the following pages.



Temperature plotting (selection and display)

Pressure plotting (selection and display)

Performance plotting (selection and display)

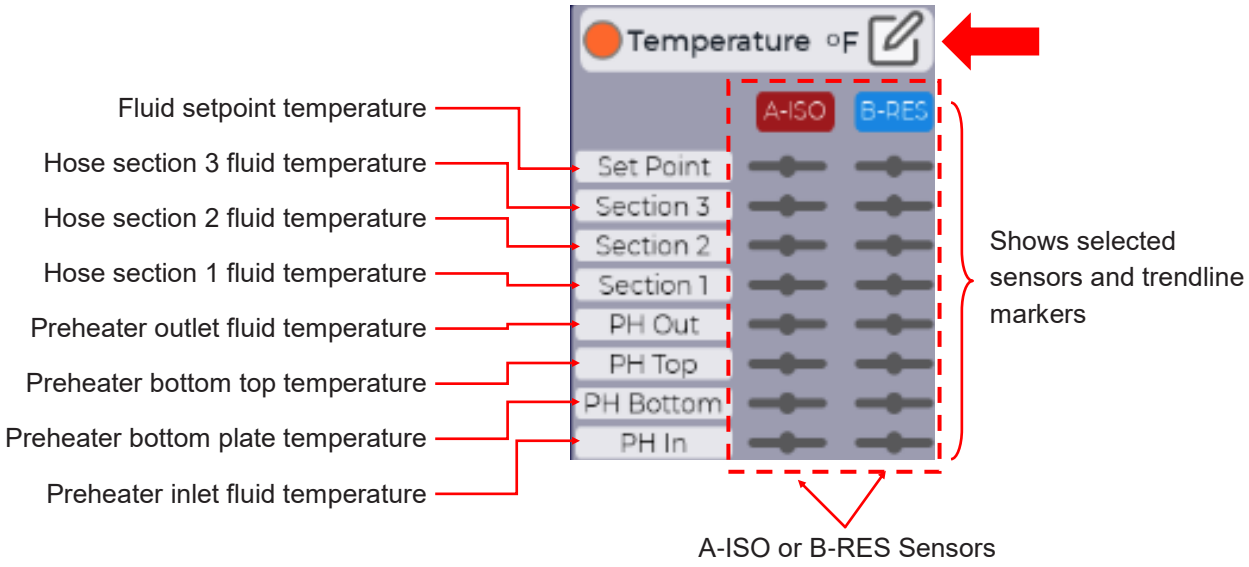
Trend plot viewing controls

SYSTEM STATUS SCREENS - TRENDS

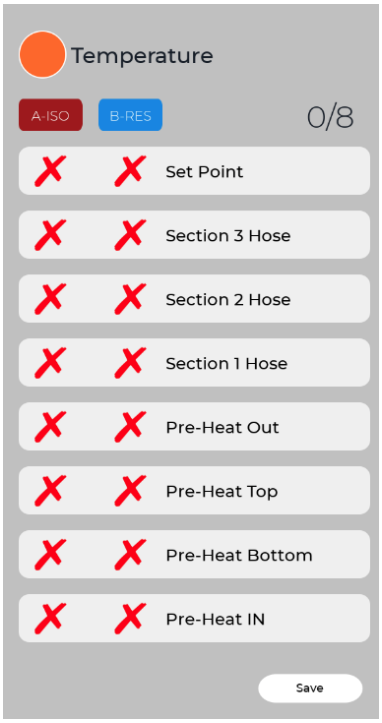
The Trend screen allows the user to select the parameters to be plotted and the timescale to plot against. Selections and settings are retained variables so previous settings are always active. The following example is provided to demonstrate the features and functions of the Trend screen.

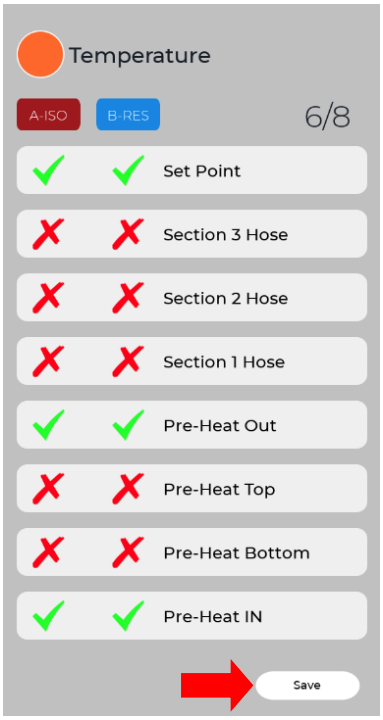
Select parameters to plot

To create a Temperature Trend chart begin by selecting up to 8 temperatures to plot. Press on the Temperature Legend header as shown below to open the selection tool.



The selection tool is used to select up to 8 parameters to plot. A red **X** indicates a parameter is not selected to be plotted. A green check mark ✓ indicates a parameter is selected to be plotted. Press on the **X** or check-mark ✓ to toggle between selected and unselected state. In the example below, 6 temperatures have been selected to chart.



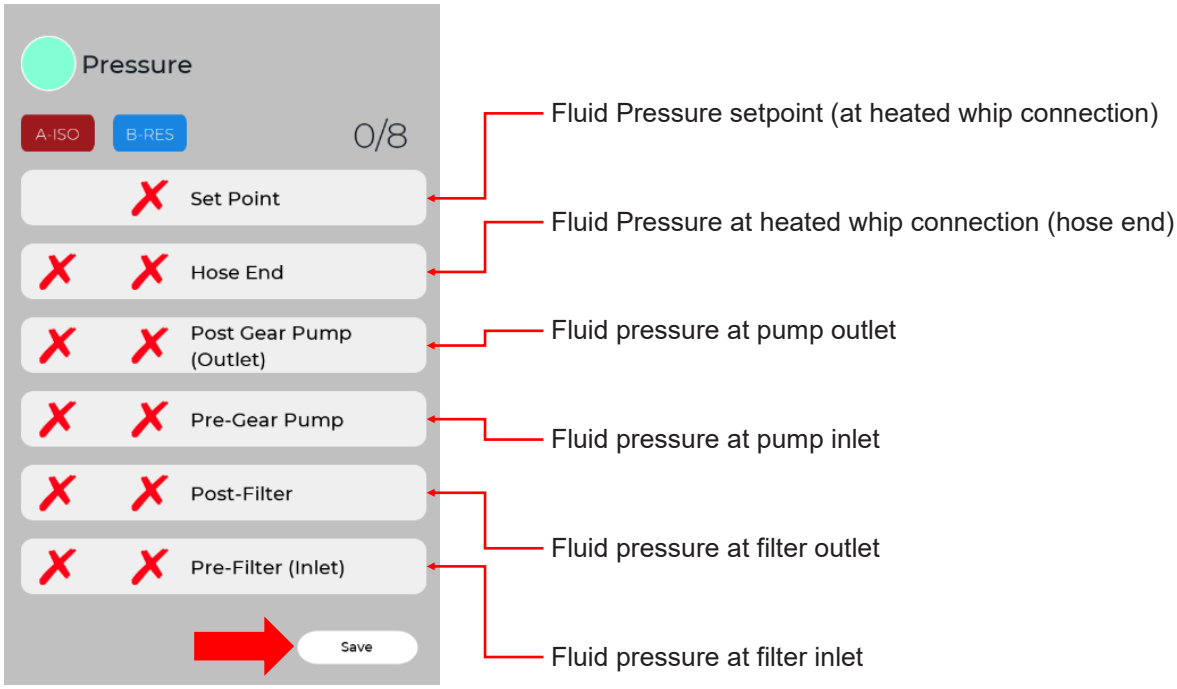


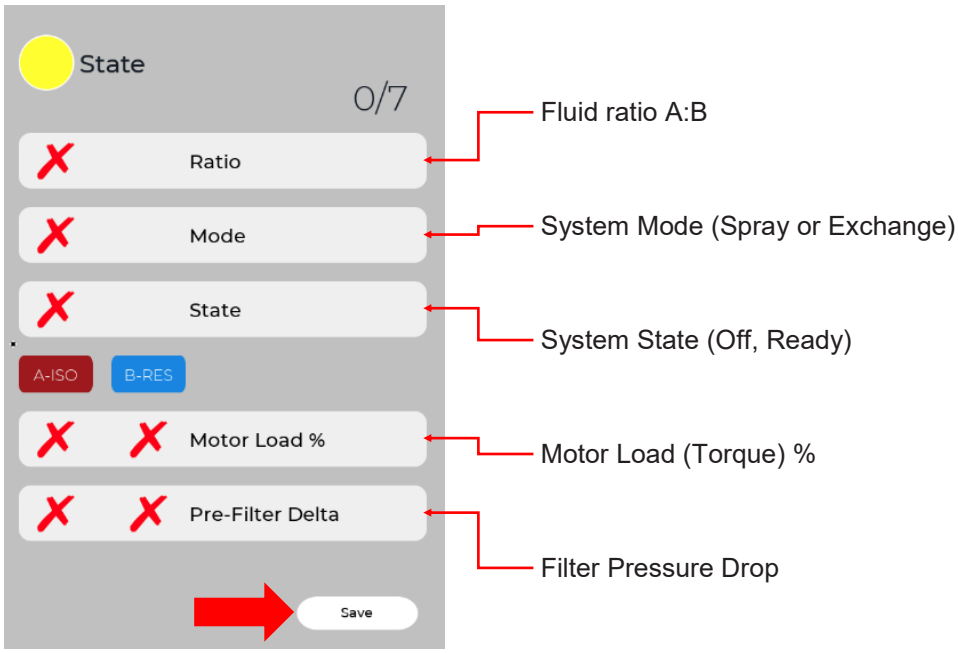
After selecting temperature parameters press the Save button. The selected parameters will now be shown in the Temperate Legend along with their corresponding trendline markers.

SYSTEM STATUS SCREENS - TRENDS

Select parameters to plot

Continue selecting pressure and/or performance parameters to plot using their respective selection tools. Press the save button when selections are completed.

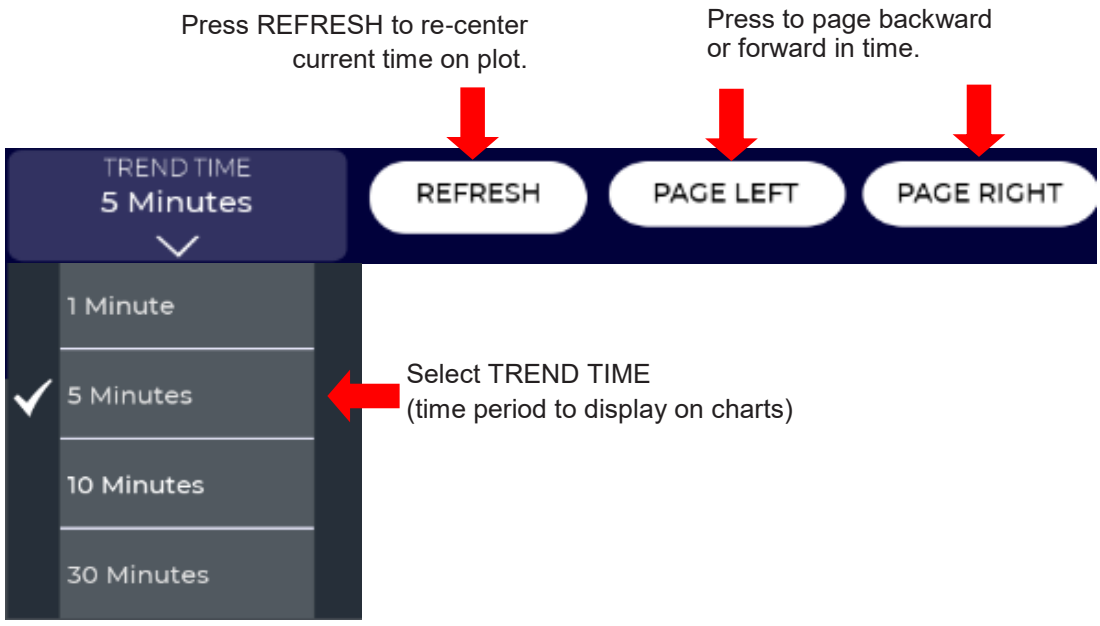




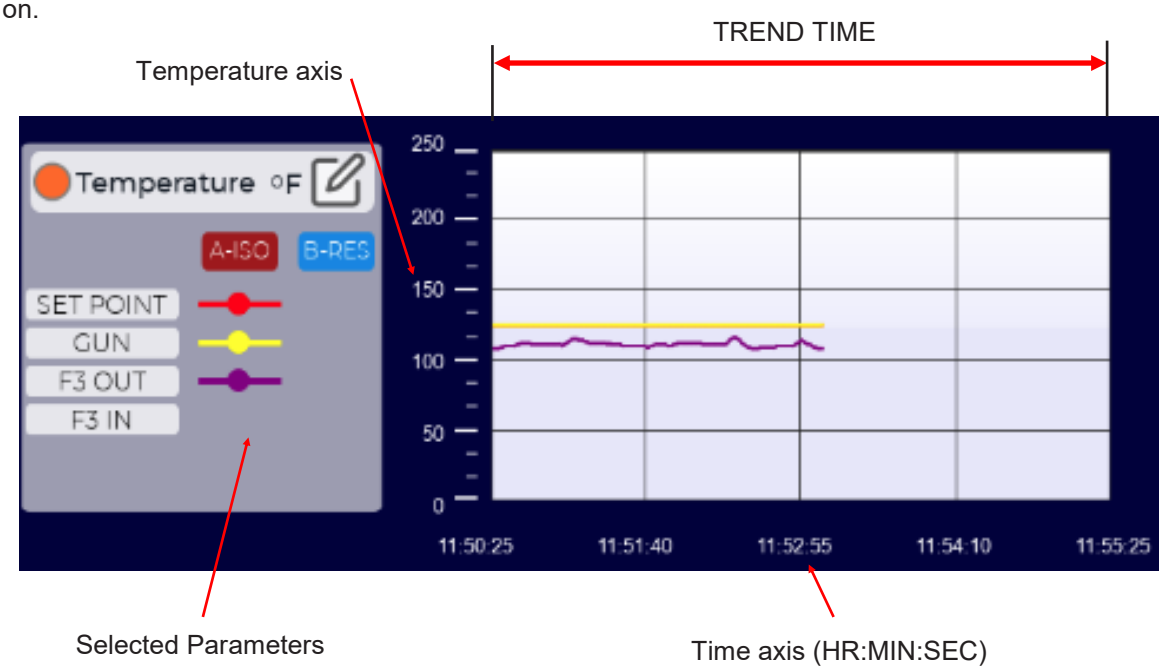
SYSTEM STATUS SCREENS - TRENDS

Select time scale (TREND TIME)

After selecting the parameters to plot, select the TREND TIME to use from the pull-down menu and press REFRESH to update the time-scale. This sets the trend chart horizontal axis (in the example below, to 5 minutes). Pressing REFRESH places the current time in the center of the chart. The chart can be moved backwards or forwards in time by pressing the PAGE LEFT or PAGE RIGHT button, or by swiping the chart to the right or left with a finger.

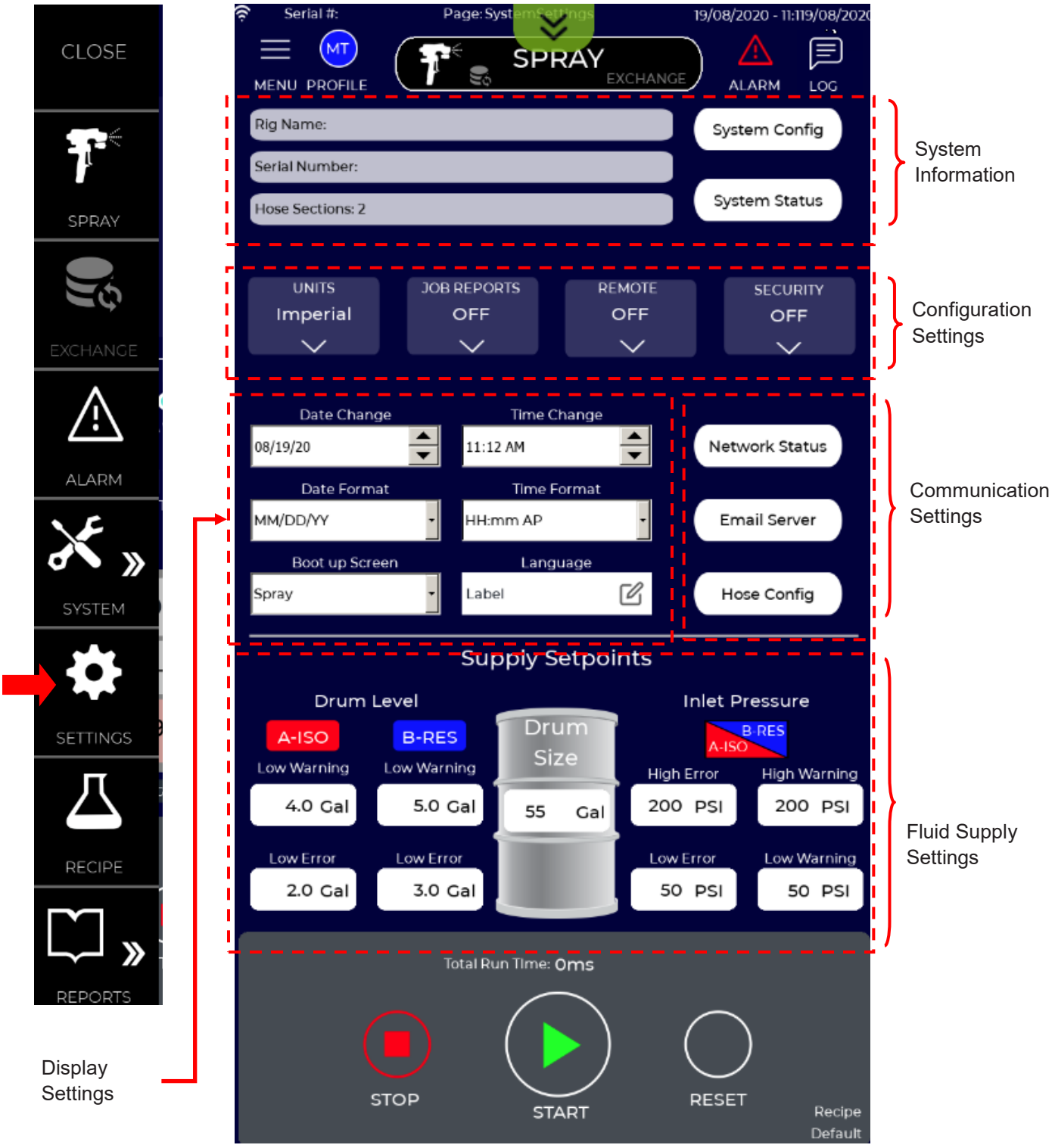


An example temperature chart is shown below (on a 5 minute trend time). Pressing PAGE LEFT of swiping the screen allows the user to look back in time. The look back period extends to the time the machine was last powered on.



SETTINGS SCREENS - OVERVIEW

The IS40 **Settings** Screen is accessed from the main menu and has five sections that are described below and in the following pages. Users must have Administrative rights to change any parameter in the Settings Screen.

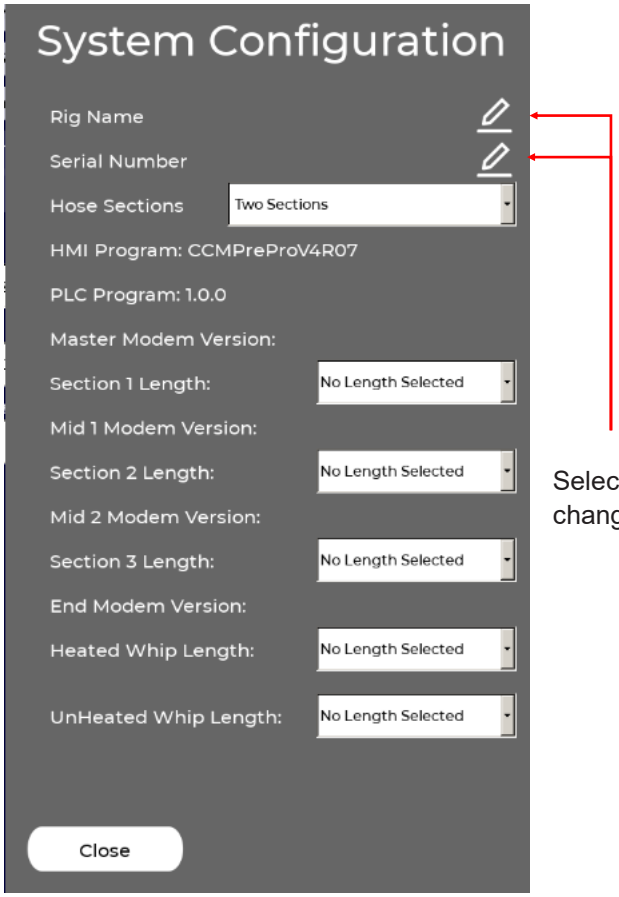


SETTINGS SCREENS - SYSTEM INFORMATION

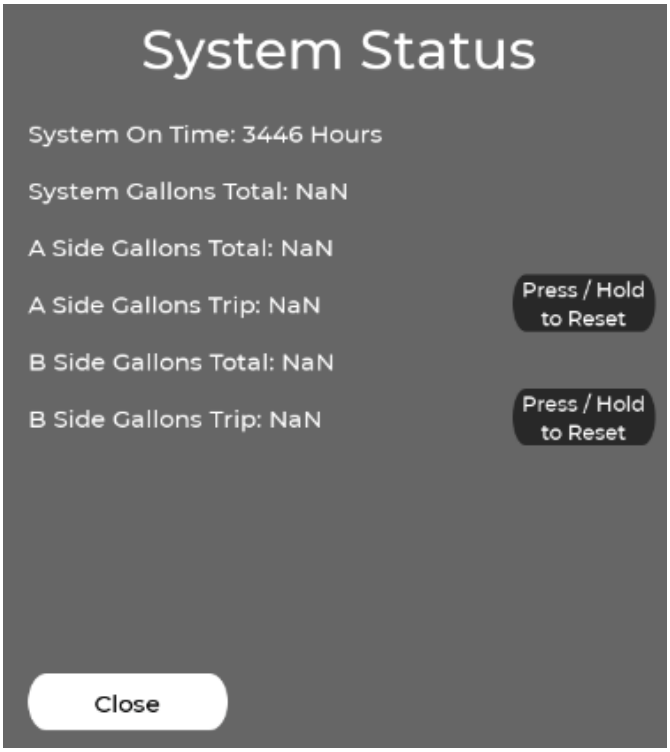
The System Information section of the Settings screen displays a user defined Rig Name, the Proportioner Serial Number, and the number of hose sections. The Rig Name is left to the user with administrative privileges to define. The Serial Number is set at the factory to match the Serial number on the label inside the Control Module but can be changed by Users with Administrative privileges. The Hose Section information is determined by the IS40 and cannot be changed by the User.

Pressing System Config button brings up a window that will allow the user to change Rig Name or Serial Number and see more information about the installed software and attached hose sections.

Pressing System Status button displays total run-time and fluid output metrics over the life of the IS40.



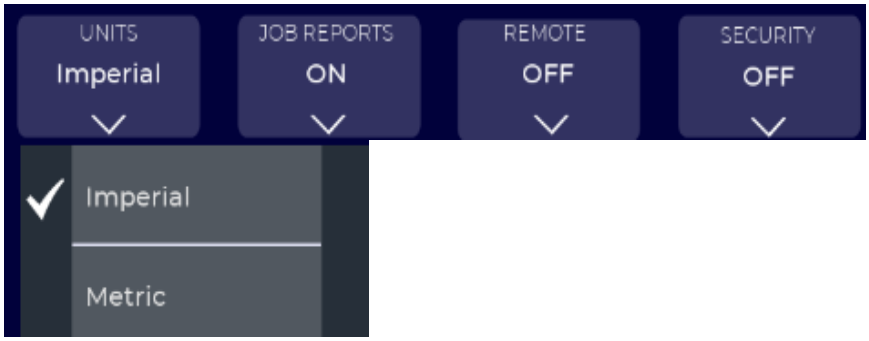
Select to change



SETTINGS SCREENS - CONFIGURATION SETTINGS

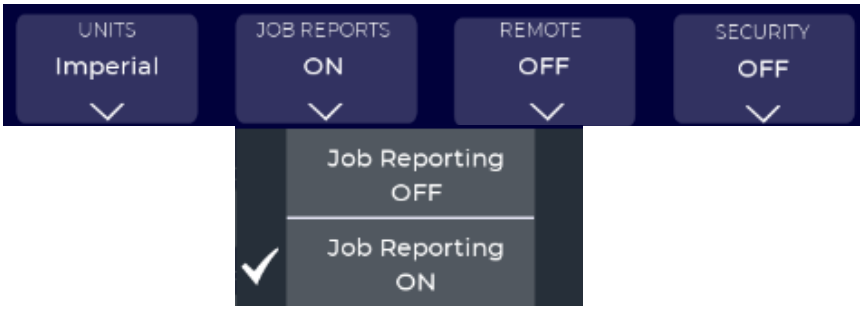
The Configuration section of the Setting Screen allows a user to define units and activate job reporting, remote access, and security controls as shown and defined below.

UNITS: Select Imperial (factory default) or Metric units for settings and display.

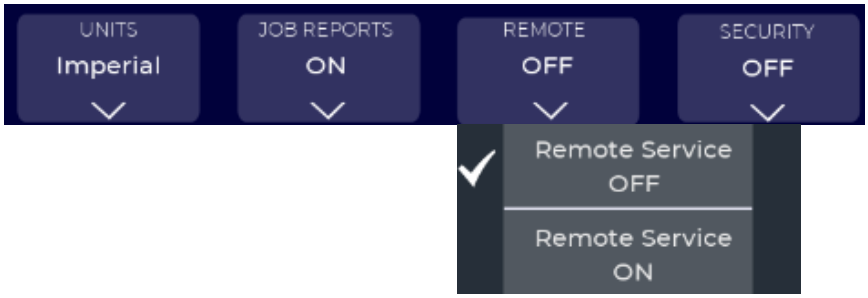


Unit	Imperial	Metric
Temperature	F (Fahrenheit)	C (Centigrade)
Pressure	PSI (Pound per Square Inch)	MPa (Mega-Pascals)
Volume	G (Gallon)	L (Liter)
Flow Rate	GPM (Gallons Per Minute)	Liters per Minute (LPM)

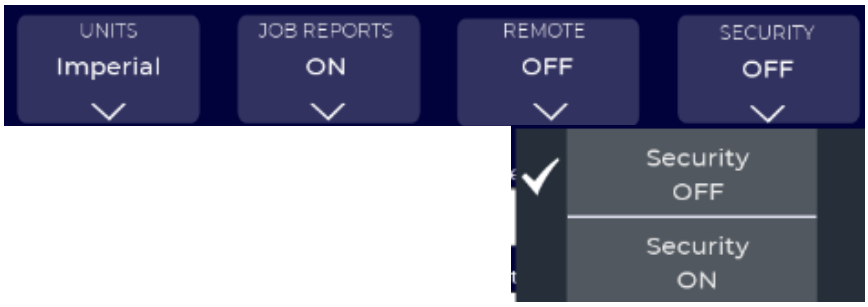
JOB REPORTING: Job Reporting can be toggled ON or OFF (factory default). Refer to page 100 for more information on Job Reports.



REMOTE SERVICE: This allows remote access by authorized persons for monitoring and/or control of the IS40. This must be ON to perform remote service operations. See page 132 for more information on Remote Service.

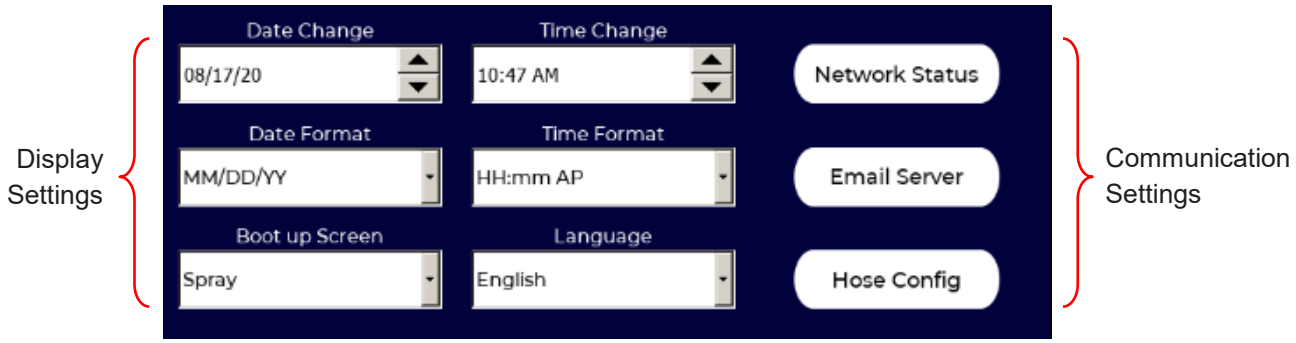


SECURITY: This activates user security controls.



SETTINGS SCREENS - DISPLAY SETTINGS

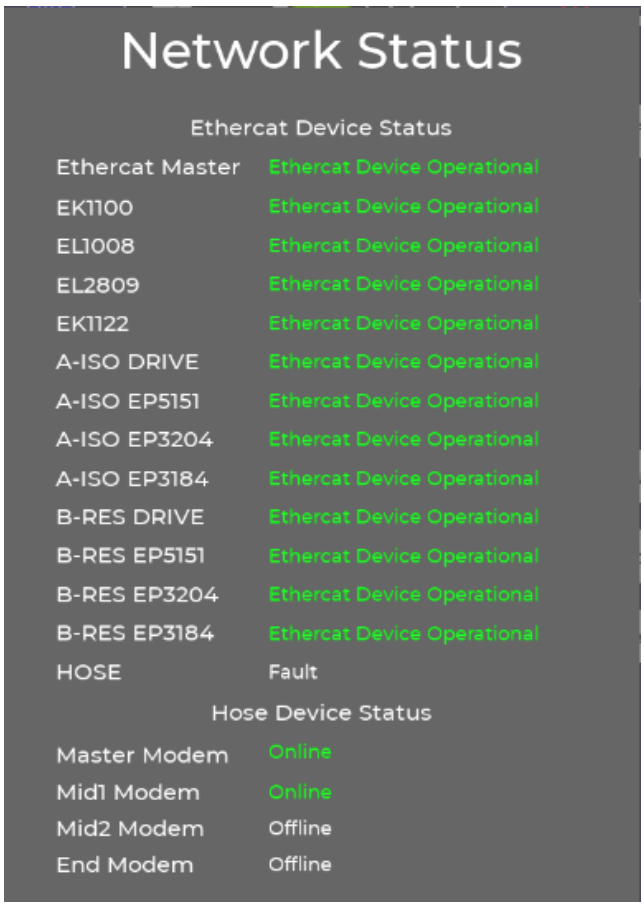
The Display section of the Setting Screen allows a user with Administrative rights to set date and time values and format, default startup screen, and language. Spray screen and English language are factory set defaults.



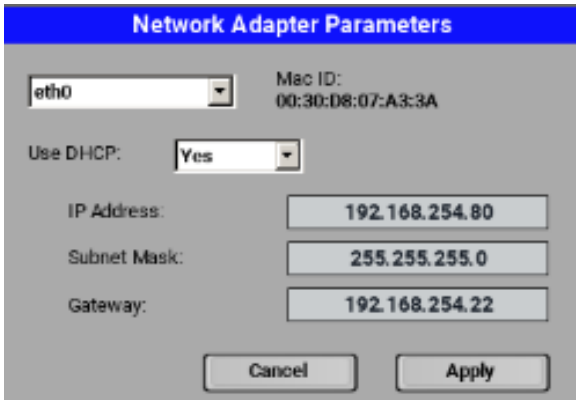
SETTINGS SCREENS - COMMUNICATION SETTINGS

Communication settings are provided to show internal network status and for configuring both internal and external network services. Also included are hose configuration and communication settings. **Only trained service personnel should make changes to these settings.**

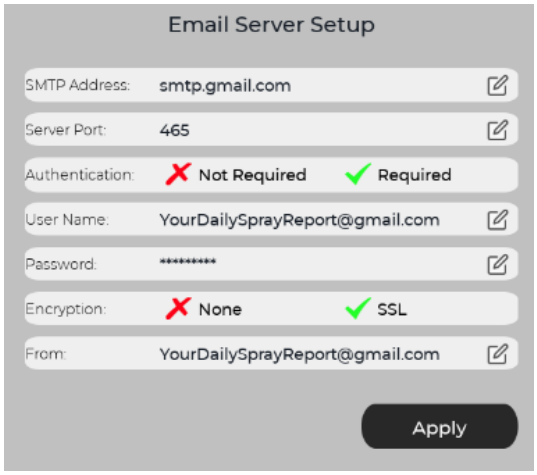
The Network Status window shows the status of all subsystems that are attached to the internal communication network within the proportioner. This window can be used by service personnel to see what subsystem is not communicating. This is helpful when performing local or remote diagnostics.



The Network Adapter Parameter window provides information on how the proportioner is communicating over wireless or connected networks. These parameters are set at the factory and should not be changed without assistance from trained service personnel.



The Email Server Setup window is used to configure the IS40 for sending Job Reports. Most systems are preconfigured using a generic SMTP email server managed by Carlisle Fluid Technologies. Users can change the parameters to use their own SMTP server if desired.

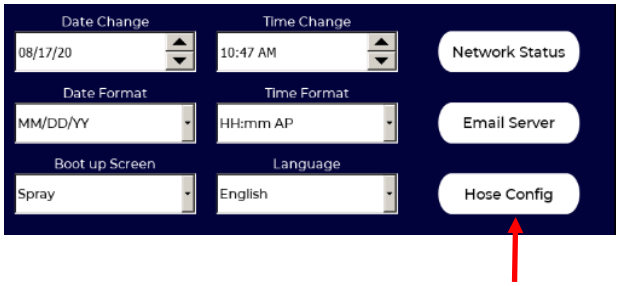


SETTINGS SCREENS - HOSE CONFIGURATION

Hose communication parameters are set at the factory when the Proportioner and Hoses are ordered together but can be changed as required during installation, repair, or operating.

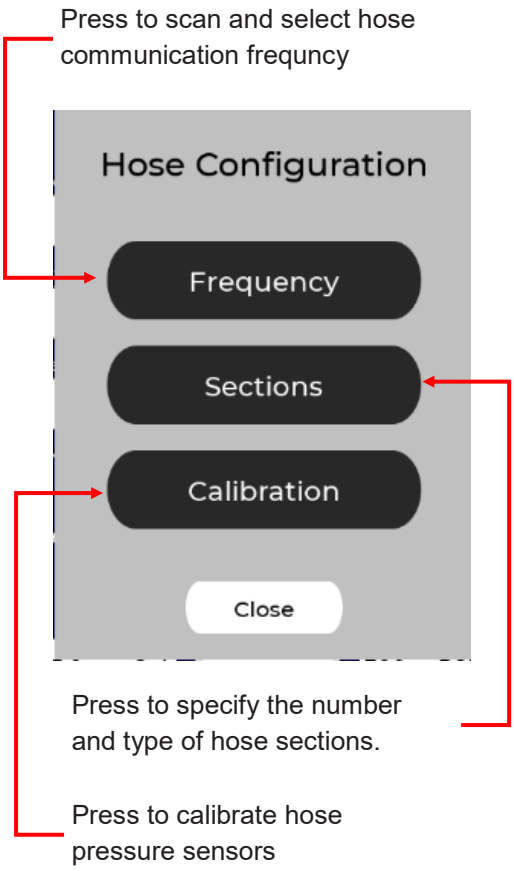
The following section describe Hose Configuration settings available to the installer or operator.

To access Hose Configuration Parameters, press the Hose Config button (shown below):



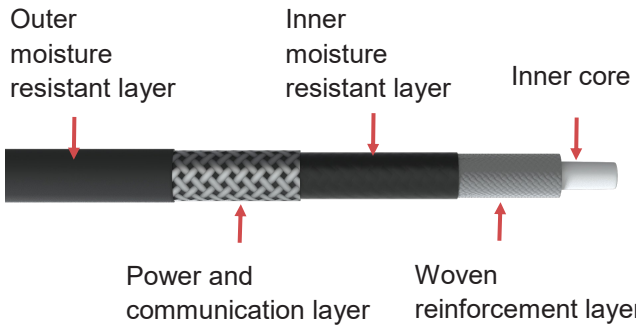
Press to open Hose Configuration Menu

Pressing the **Hose Config** button will open a menu of Configuration setting tools. Press the corresponding button to access each Hose Configuration function.



The **Frequency** button opens the Hose Frequency scan and select function (shown below).

Pressure, sensor, and other signals are transmitted at high frequency between mid, end, and master modems over the hose power and communication layer (shown in the following figure).



QuickHeat hoses can operate at one of 15 different frequencies to avoid interference with other systems and interference produced in the work area. Think of each Frequency as a radio channel. Some channels may have better reception than others. The IS40 allows the user to select the best Frequency (channel) for their particular system configuration and environment. A default frequency is set in the factory, but may need to be changed during installation, hose replacement, or if interference is detected while in use.

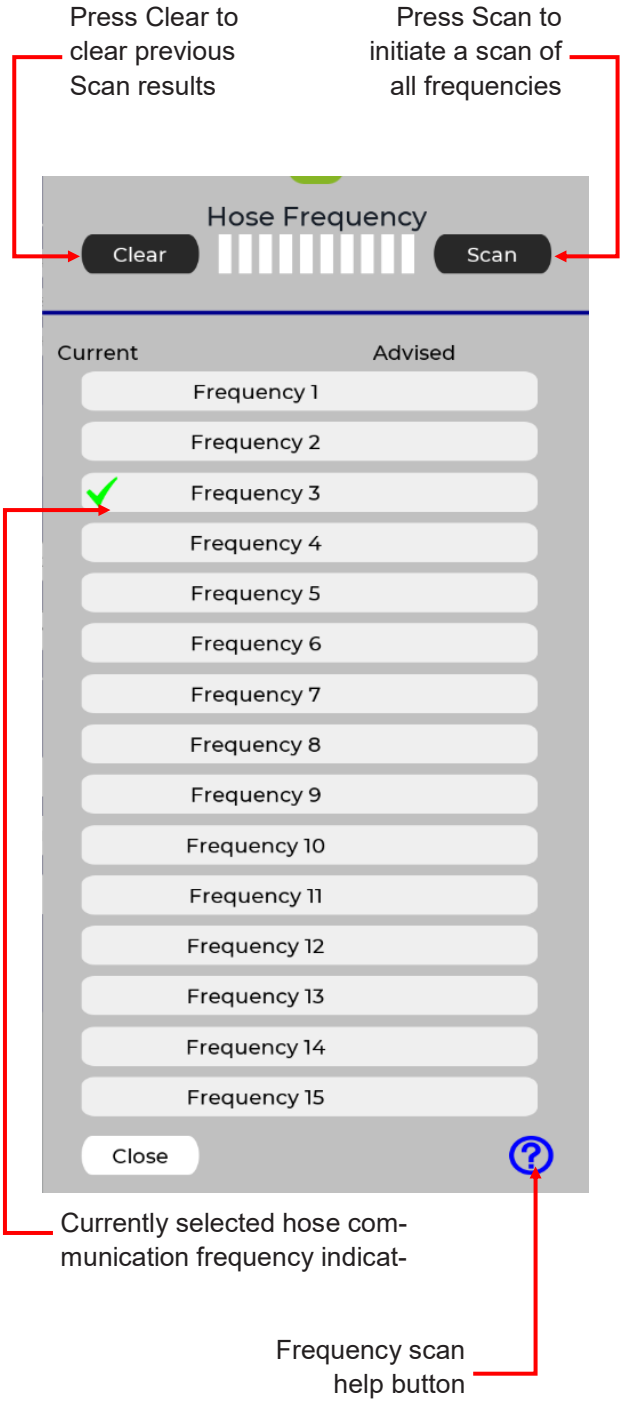
If a system is detecting poor hose communication an error message is displayed and the IS40 automatically moves to a STOP state. This is to prevent an overpressure or overtemperature hose situation. Any hose communication error begins with “SMOSE—Mx”. SMOSE is derived from the term “Smart HOSE”, and x indicates which hose modem is reporting the error, e.g. MM—Master Modem, M1 = Middle Modem, ME = End Modem).

Pressing the RESET and START buttons on the main screen may eliminate the hose error(s), but if they persist a different hose frequency is likely required.

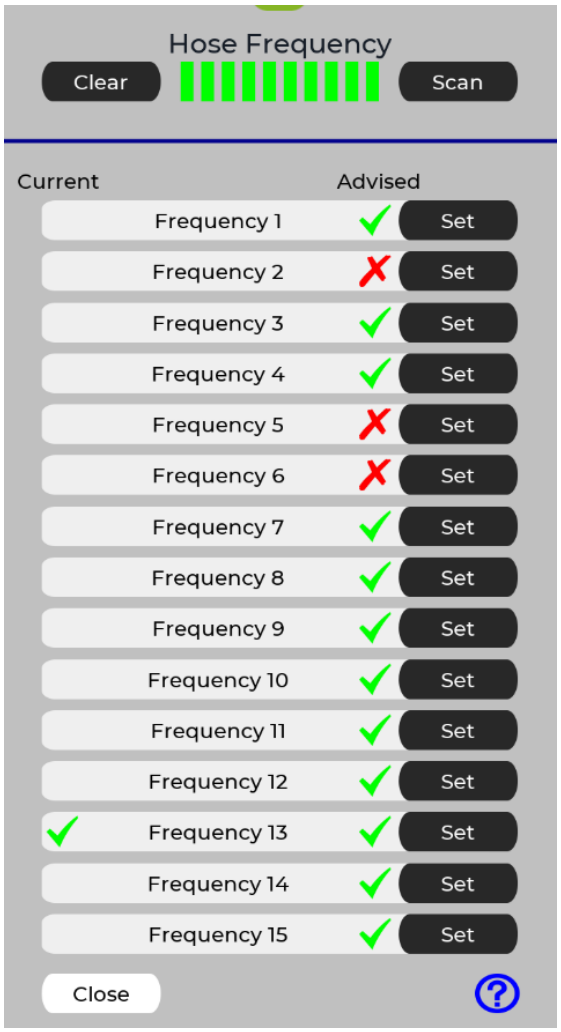
SETTINGS SCREENS - HOSE CONFIGURATION

Before changing any Hose Configurations, the system must be in STOP state. A warning will appear if changes are attempted when not in STOP state.

Pressing the Hose Configuration Frequency button will open the Hose Frequency menu, shown below.



To initiate a scan press the Scan button. Scanning all frequencies takes about 45 seconds. As the scan progresses Advised (good) Frequencies will be indicated by a green checkmark to the right of the Frequency. Frequencies with poor communication will be indicated by a red X mark.. The following image shows the results of a scan.



To change to a different Advised Frequency, press the Set button next to that Frequency.

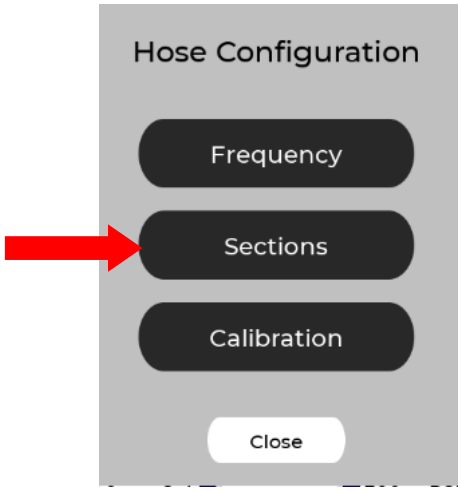
Before initiating another scan press Clear.

When finished, press the Close button.

If there are no Advised frequencies, press the help button at the bottom of the screen. This will provide instructions on how to reset the frequencies to factory defaults.

SETTINGS SCREENS - HOSE CONFIGURATION

Pressing the **Sections** button opens a submenu that is used to select the configuration of the hoses connected to the Proportioner.



The hose configuration is set at the factory for Proportioners that are preconfigured with the hose assembly. If an existing hose assembly is changed in the field (e.g. a mid-section added or removed) the corresponding configuration must be set. The current configuration is indicated by a green checkmark as shown in the previous figure.

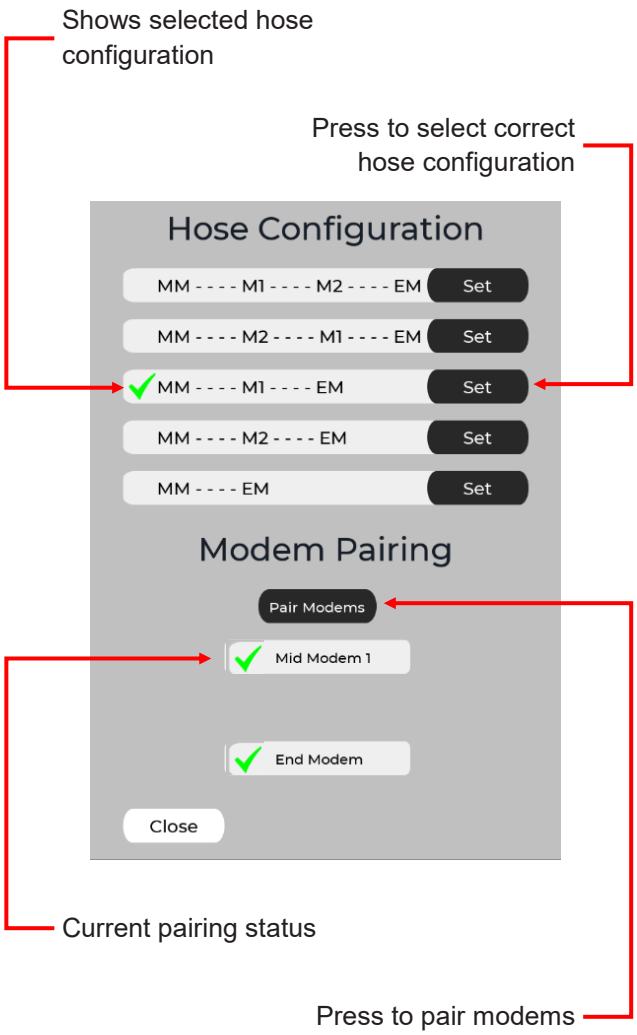
Hose configuration terminology:

MM = Master section (nearest the Proportioner)

M1 = First Mid hose section

M2 = Second Mid hose section (currently not available)

EM = End section (also known as smart end)



The Hose Configuration menu also contains modem pairing status and a pairing action function. Pairing of modems is performed at the factory prior to shipping when the Proportioner and hoses are ordered together. If hoses or hose sections are replaced in the field, the modems will need to be paired in-situ.

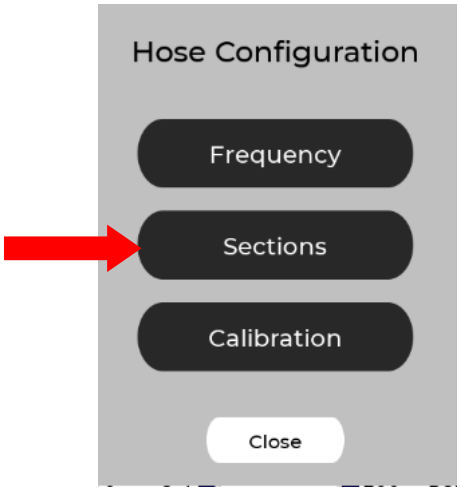
Pairing of the individual hose modems helps avoid cross-talk with other QuickHeat hoses and Proportioners in the area. Paired modems are indicated by a green checkmark. If a modem is not paired a red X will be shown next to the modem. Pressing the Pair Modems button will initiate the pairing operation. **Only pair modems when the system is already communicating on a valid frequency and all other IntelliSpray systems in the area are shut off.**

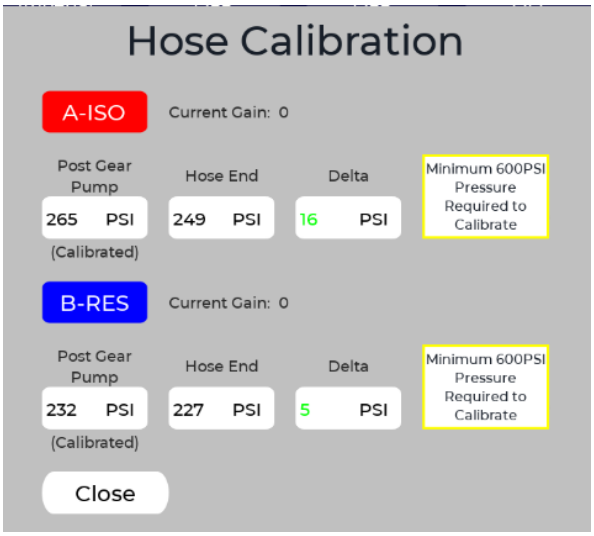
After performing hose pairing, perform a frequency scan to be sure the selected frequency is an Advised frequency.

SETTINGS SCREENS - HOSE CONFIGURATION

The Hose Configuration **Calibration** function is used to check and/or calibrate the Hose and Proportioner pressure sensors. This calibration is preformed prior to shipment on systems that are ordered together. If a hose Smart End is changed in the field, or if drift is detected between the pressure sensors, they can be recalibrated in the field with this function.

Pressing the Calibration button opens the Hose Calibration tool shown below.

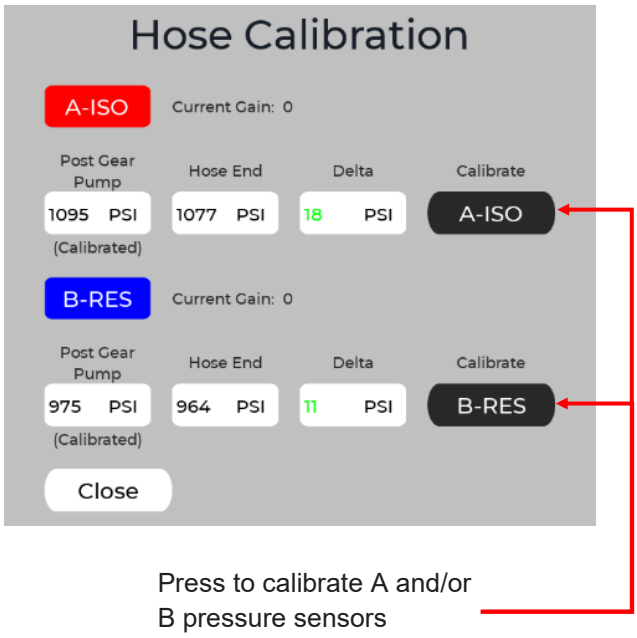




The Hose Calibration window shows the measured pressure values at the outlet of the gear pumps (post gear pump) and at the Smart End hose modem (hose end). The difference (delta) between the two sensors is also shown for A and B materials, respectively.

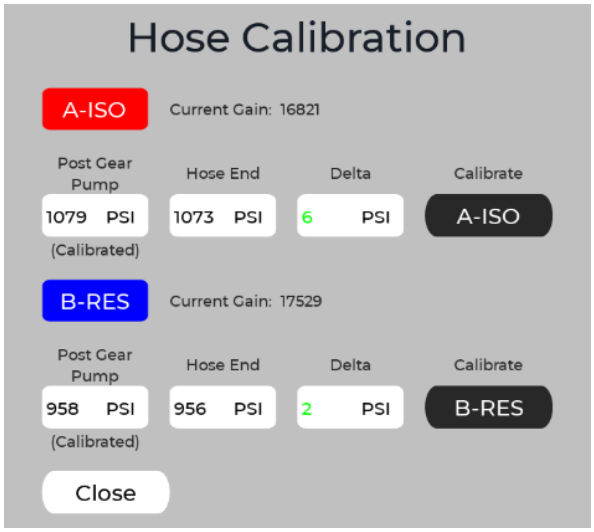
When no fluid is flowing, the difference should be less than +/- 50 psi. To perform a recalibration, the post gear pump and hose pressure must be at least 600 psi. In the previous figure this condition has not been satisfied and calibration is prevented.

Once pressure is established, and the system is in STOP state, calibration of the A or B side(s) can be performed by pressing the corresponding Calibration button.



Press to calibrate A and/or B pressure sensors

After calibration the difference between the sensors will be very close to 0 (as shown below after calibration).



SETTINGS SCREENS - FLUID SUPPLY SETTINGS

Fluid Supply Settings

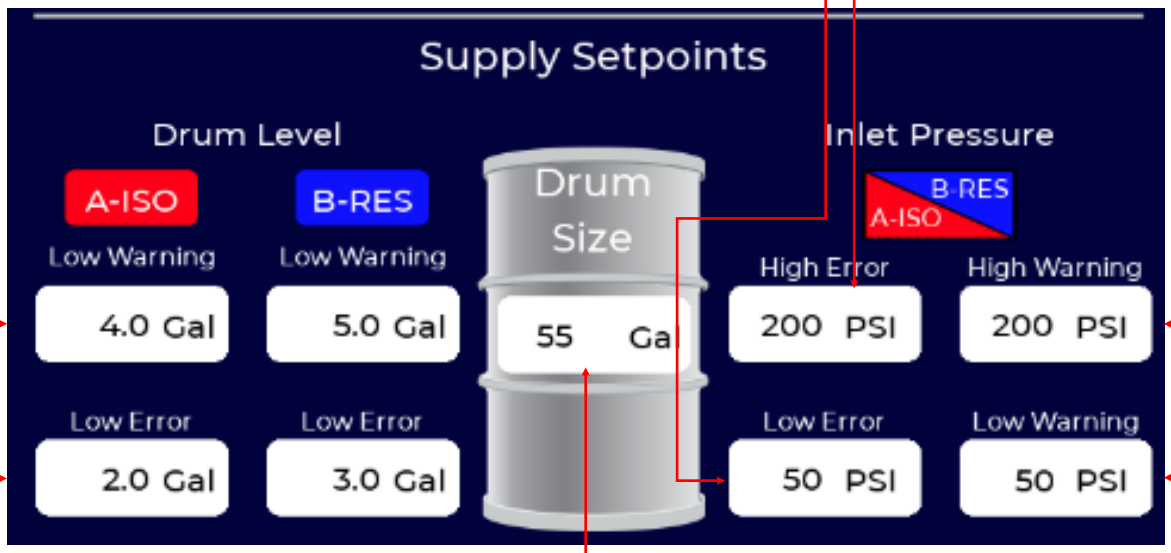
The lower section of the IS40 **Settings** Screen is used to define A and B-side warning and error limits related to fluid inlet pressure and drum levels. These settings protect the IS40 from situations that could damage the equipment and/or inject air into the proportioner and hoses. Values can be changed from factory default settings using a pop-up keyboard. The following figure describes these parameters.

Inlet low pressure warning limit. Applies to both A and B materials. System generates warning message if pressure drops below setting. Factory setting is 50 psi. Minimum settable value is 5 psi.

Inlet high pressure warning limit. Applies to both A and B materials. System generates warning message if exceeded. Factory setting is 150 psi. Maximum settable value is 200 psi.

Inlet high pressure error limit. Applies to both A and B materials. System generates error message and shuts down if exceeded . Factory setting is 200 psi. Maximum settable value is 250 psi.

Inlet low pressure error limit. Applies to both A and B materials. System generates error message and shuts down if inlet pressure is below this value . Factory setting is 25 psi. Minimum settable value is 5 psi.



Standard drum size. Press to enter value. This is used for scaling fluid level on drum icons. Factory setting is 55 gal.

Low drum error level. A and B materials are set separately. Press to enter value. Drum icon flashes red and system shuts down when fluid drops to error level. Factory setting is 2 gallons.

Low drum warning level. A and B materials are set separately. Press to enter value. Drum icon flashes yellow when fluid drops to warning level. Factory setting is 5 gallons. If set to 0 gallons warning is turned off.

RECIPE SCREENS - OVERVIEW

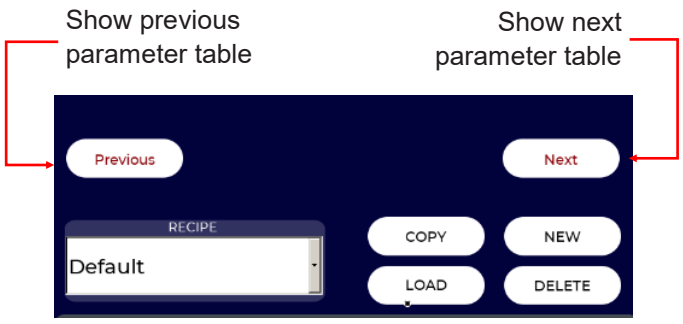
Recipes are collections of system parameter settings that can be created, saved, copied, edited, loaded, and deleted by the user. Recipes allow users to quickly configure the IS40 for different materials, job conditions, or user preferences. The IS40 Recipe capability is an optional feature and not required to operate the system.

The Recipe screen is accessed from the Main Menu and contains several sections as shown below and described in the following pages. Recipe parameters are displayed and edited using five parameter tables.

RECIPE SCREENS

Each Recipe is defined by five tables. These tables are used to enable or disable parameters, set their respective values, and toggle parameter display markers on or off. While this may seem excessive, having full access to all parameters allows users to tailor their IS40 to their specific needs.

Two parameter tables are shown at any time on the Recipe screen. To move to the next table press the Next button on the Recipe screen. To move to the previous table press the Previous button on the Recipe screen.

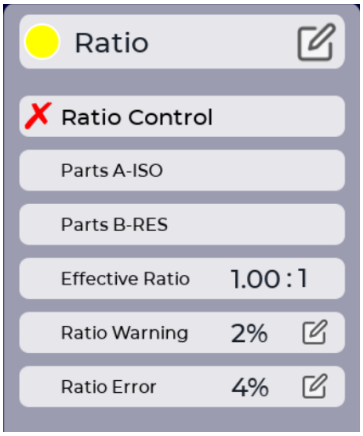


The parameter tables make use of icons and labels to indicate parameter status. A legend of these icons is shown below.

Parameter Table Legend

Enable	Enable or disable parameter
View	View or hide parameter icon on screen
	Parameter is always on
	Parameter is on
	Parameter is off
	Select to change setting or value
	Parameter is enabled but not viewed
	Parameter is disabled and not viewed

Parameters are categorized in Pressure, Temperature, Ratio, and Miscellaneous tables. Each table indicates which parameters are enabled, what their value is, and if they are graphically displayed on the Spray Screen (or elsewhere). Further descriptions of parameter tables are provided in the following pages.



RECIPE SCREENS - PRESSURE TABLE

The Recipe Screen has one table for setting both A and B pressure parameters. Further description of each table parameter field is shown below. Factory default settings are shown in the figure.

Press to toggle parameter enable/view settings.

Displays error and stops system if value is exceeded anywhere in the system

Displays warning if value is exceeded anywhere in the system

Setpoint maximzum. Always enabled and viewed.

Setpoint. Always enabled and viewed.

Setpoint minimum, Always enabled and viewed.

Displays warning if fluid pressure drops below value at the end hose sensor.

Displays error and stops system if fluid pressure drops below value at the end hose sensor.

Maximum pressure dial value (for dial scaling purposes only).

Displays error and stops system if inlet filter pressure drop exceeds vale. Used to indicate plugged inlet filter.

Displays warning if inlet filter pressure drop exceeds vale.

Displays error and stops system if pressure difference at end of hose exceeds value.

Displays warning if pressure difference at end of hose exceeds value.

RECIPE SCREENS - TEMPERATURE TABLES

The Recipe Screen has identical but separate tables for A and B Temperature parameters. Further description of each Temperature table parameter field is shown below. Factory default settings are shown in the figure.

Press to toggle parameter enable/view settings.

Displays error and stops system if fluid temperature exceeds value anywhere in the system. Parameter is always enabled.

Displays warning if fluid temperature exceeds value anywhere in the system.

Setpoint maximzum. Always enabled and viewed.

Setpoint. Always enabled and viewed.

Setpoint minimum, Always enabled and viewed.

Displays warning if fluid temperature drops below value at the end hose sensor.

Displays error and stops system if fluid temperature drops below value at the end hose sensor.

Displays warning if incoming fluid temperature drops below value.

Displays error and stops system if incoming fluid temperature drops below value.

Maximum settable recirculation temperature in Exchange Mode.

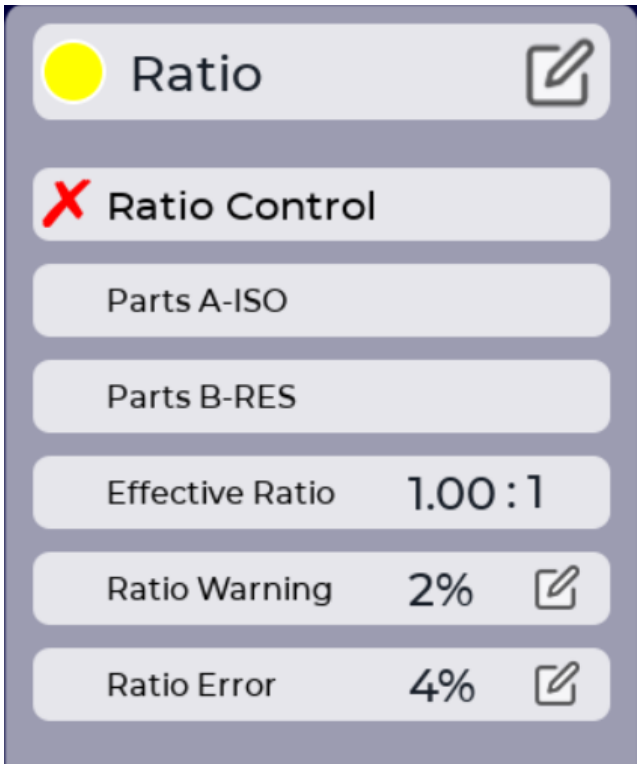
Preheat offset temp (positive or negative) up to 50F. May be required with low viscosity B-side materials.

Maximum temperature displayed on temperature gage widget.

Minimum temperature displayed on temperature gage widget.

RECIPE SCREENS - RATIO AND MISC TABLES

The Recipe Screen also contains tables for Ratio and Miscellaneous parameter settings. Further description of reach table and their respective parameter fields is shown below.



Press to toggle parameter enable/view settings.

Ratio control is always enabled and displayed on the Spray Screen.

Reserved for future use. User cannot change.

Reserved for future use. User cannot change.

Ratio setting is 1:1 and not adjustable by the user.

Warning is displayed if ratio error exceeds +/- value.

Error is displayed and system shuts down if is ratio error exceeds +/- value.

Press to toggle parameter enable/view settings.

Error is displayed and system shuts down if A pump efficiency drops below value.

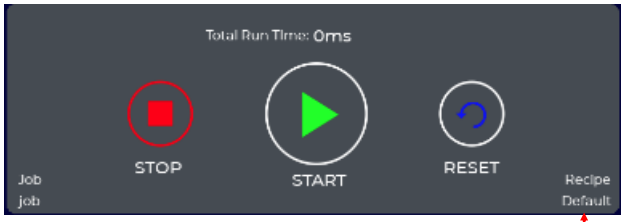
Warning is displayed if A pump efficiency drops below value.

Error is displayed and system shuts down if B pump efficiency drops below value.

Warning is displayed if B pump efficiency drops below value.

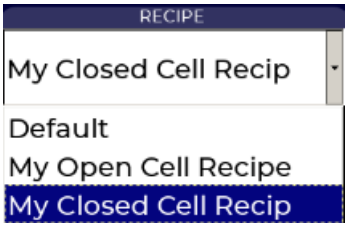
RECIPE SCREENS - RECIPE MANAGEMENT

The current Recipe selection is shown at the bottom right corner of each screen. If no Recipes have been defined the IS40 selects and displays the Default Recipe. The Default Recipe can be modified, but never deleted. Note that simply selecting a Recipe does not make it active.



Currently selected Recipe

Within the Recipe Screen, use the drop-down menu to select an existing Recipe. NOTE: Selecting a Recipe does not activate it..



The parameters associated with the selected Recipe will now be shown in the Recipe tables and the selected Recipe name will be shown at the bottom of each screen. To activate the selected Recipe press the LOAD button.

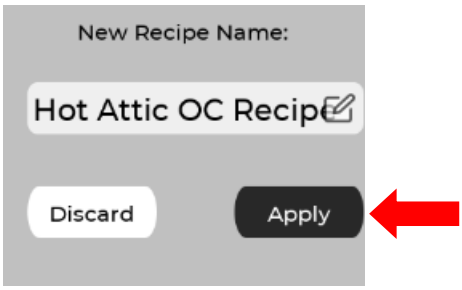
Press LOAD to activate selected Recipe

To make a copy of an existing Recipe, press the COPY button, then select the Recipe to copy from, enter a new Recipe name, and press the Apply button.

The new Recipe will be displayed in the Recipe selection window. The Recipe tables can be edited as needed (per next pages) and the new Recipe activated by pressing the LOAD button.

Press LOAD to activate selected Recipe

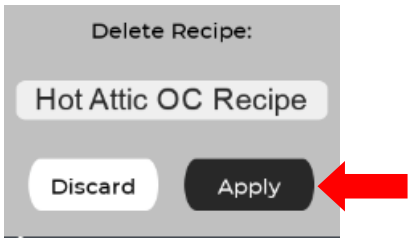
Use the NEW button to create a new Recipe. Enter the new Recipe name and press Apply.



The new Recipe will be displayed in the Recipe selection window. The Recipe tables can be edited as needed (per next pages) and the new Recipe activated by pressing the LOAD button.

Press LOAD to activate selected Recipe

To delete Recipe, first select it then press the DELETE button and then confirm the action by pressing the Apply button.



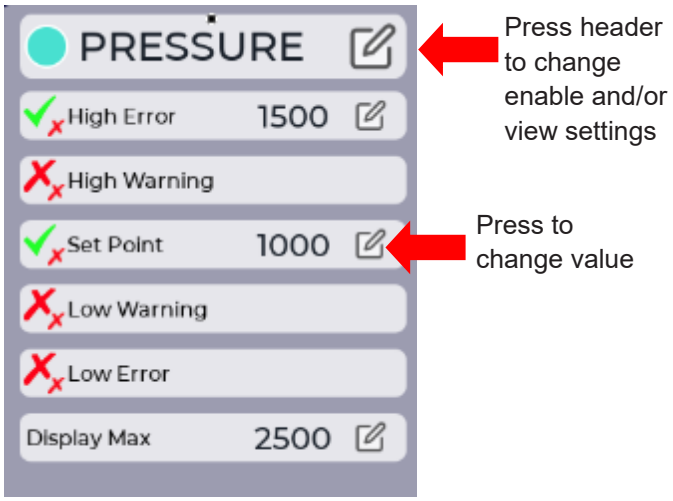
RECIPE SCREENS - EDITING

Parameters in the Recipe Tables can be enabled or disabled, viewed or hidden, and values changed using icons and popup keyboards. Parameter status is indicated by icons as shown in the following legend.

Recipe Legend

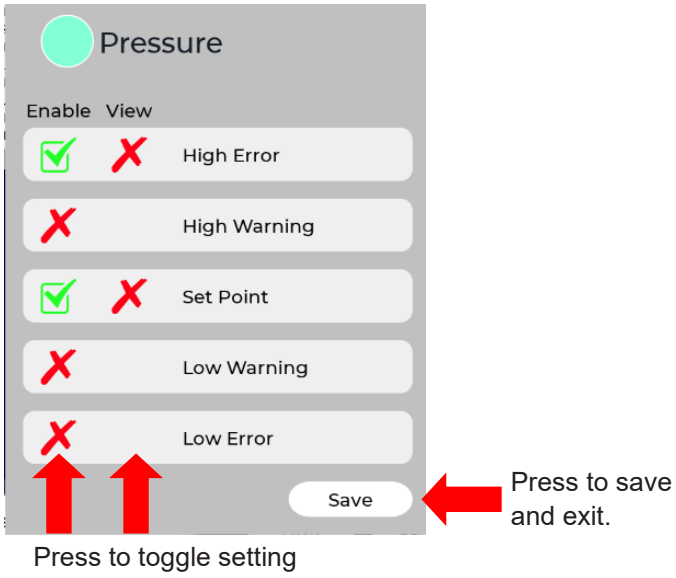
Enable	Enable or disable parameter
View	View or hide parameter icon on screen
	Parameter is always on (enabled)
	Parameter is on (enabled)
	Parameter is off (disabled)
	Select to change setting or value
	Parameter is enabled but not viewed
	Parameter is disabled and not viewed

To enable, disable, view, or hide parameters, press anywhere in the header section of the Parameter Table. Press the notepad icon to edit values of enabled parameters.

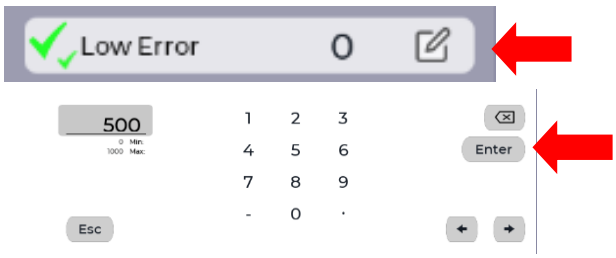


Pressing the header of a table opens the parameter control window. This allows the user to enable or disable and view or hide parameters. The following figures show an example of enabling the Low Error parameter and making it viewable on the Spray Screen.

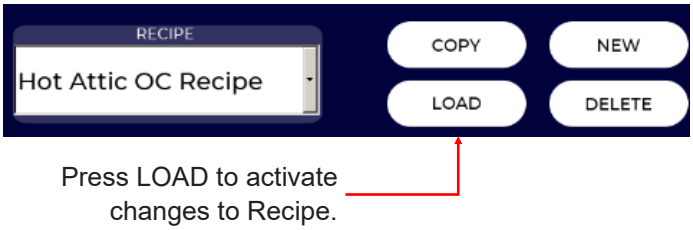
Pressing the header of the Pressure Parameter table opens the control window shown below. Pressing the Enable column in the Low Error row toggles the parameter on/off. Pressing the View column in the same row toggles parameter viewing on/off.



The Recipe Pressure table now shows the Low Pressure Error parameter as being both enabled and viewable. To assign a value for the Low Pressure Error parameter press the notepad icon and enter the desired value (in this case 500 psi).

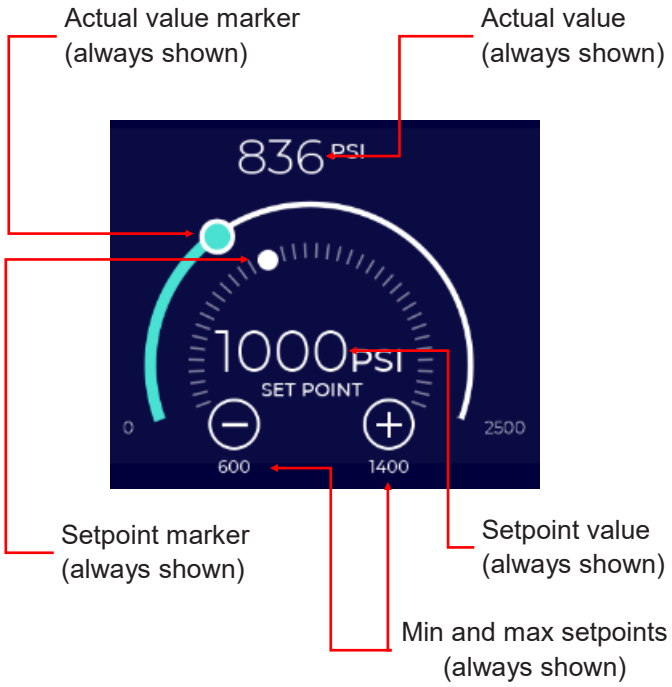


After entering these changes, the Pressure Parameter Table for the selected Recipe will show the new value of 500 psi. To activate this change, the press the LOAD button.



RECIPE SCREENS - EDITING

The following figure shows the pressure gage in its most basic form as displayed on the Spray Screen.



High and low alarm parameters are enabled in this example but are not indicated on the gage. The current Recipe table is shown below.

To enable viewing the high and low pressure alarm limits on the pressure gage (both warning and error indicators). The user would toggle their respective view settings to on (green check mark) as shown below.

After pressing the LOAD button (to activate the Recipe changes) the alarm limit indicators are now shown as red (error) and yellow (earning) symbols on the pressure gage.

REPORTS SCREEN - OVERVIEW

The IS40 has extensive reporting capabilities. These are divided into two areas - Job Reports and Audit Reports. Job Reporting capabilities can be turned on or off in the Settings Screen (see page 78). The factory default setting for Job Reports is OFF. Job Reports are described starting on page 100.

Audit Reports are always enabled, even with Job Reporting is disabled. Audit Reports contain a record of all user interactions with the IS40 screens, all system alarms, and any Log Notes entered by the user.

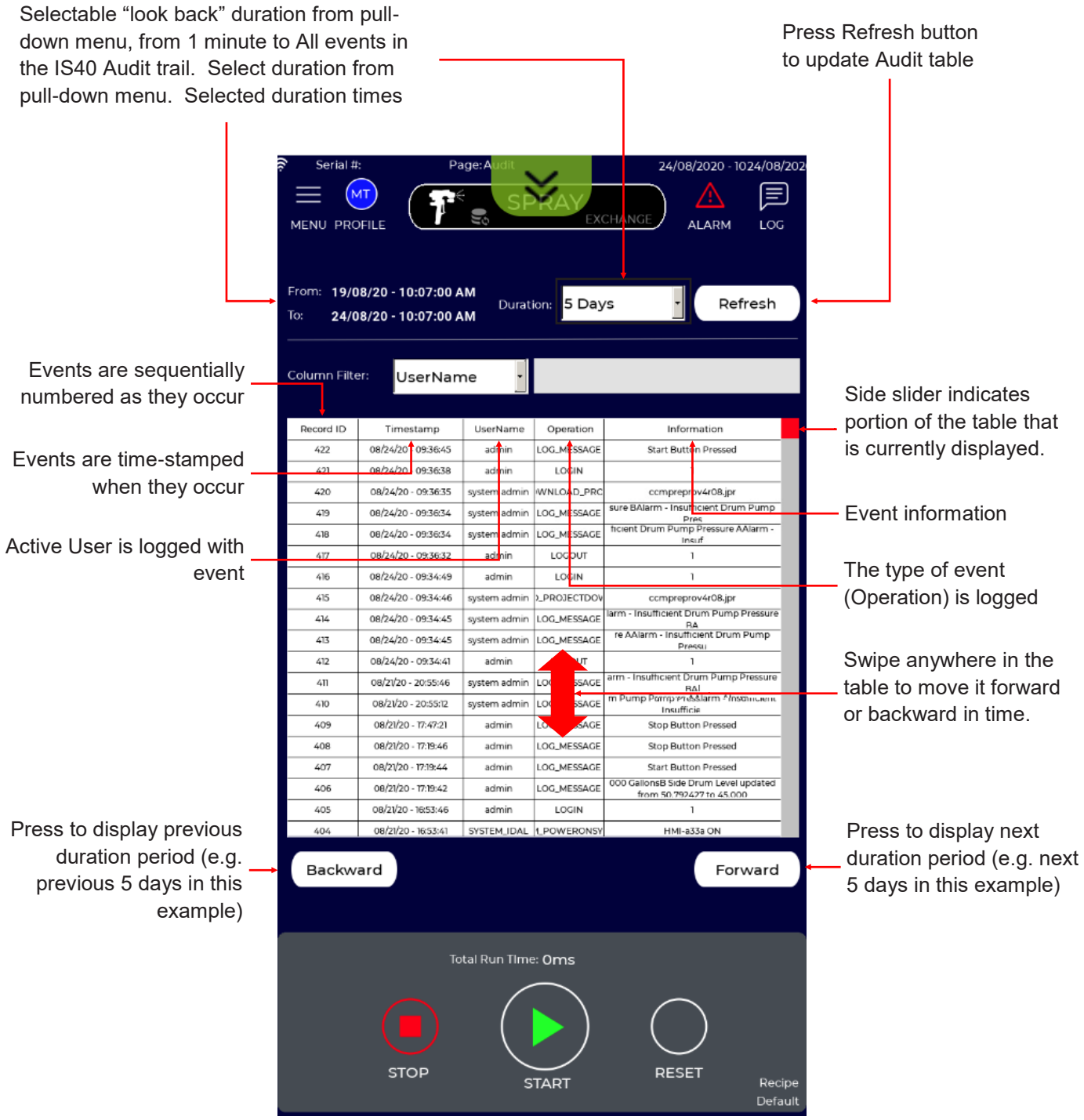
Reports are accessed from the Main Menu. Select Reports and the specific Report Screen of interest. In the Figure below, the Job Reports Screen is grayed out, indicating Job Reporting is not currently enabled. Job Reporting can be turned on or off in the Settings Screen (see page 78).

To access Report Screens, select REPORTS from the Main Menu.

Then select Report Screen

REPORTS SCREEN - AUDIT REPORT

The Audit Report screen shows a time-stamped event table containing all user interactions with the IS40 screens, all alarms, and any notes entered by the user. Events are shown in descending time (most recent at the top). The table can be navigated using the slider at the right of the table or by pressing the Forward and Backward buttons below the table. The IS40 retains up to 63,999 events before deleting the oldest events. When Job Reporting is turned on the Audit table is included in any Job Report export.



REPORTS SCREEN - AUDIT REPORT

The Audit table can be very large, making it difficult to search for specific events of interest. To make searching easier, the following functions are provided on the Audit Report screen.

Select Duration

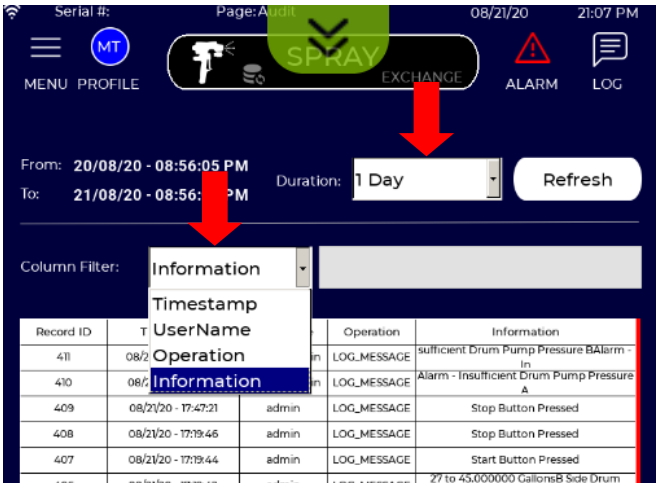
The user can select a “look-back” duration using the Duration drop down menu. After selecting a different duration, press the Refresh button to update the Audit table to shown events that occurred only within the specified time frame.

Filter Audit Events

Audit events can be filtered using the Column Filter section of the Audit screen. To use this feature, select the column to be filtered using the drop-down menu, then enter a filter value in the adjacent window. Press the Refresh button and only those entries that match the Filter parameters will be shown in the table.

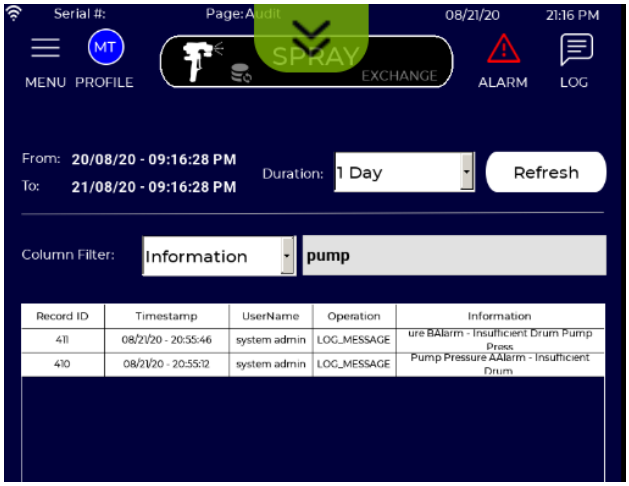
In the following example, we will find any pump related events in the Audit table that have occurred in the last 24 hours.

First, select “1 Day” from the Duration drop-down window. Then select the Information column using the Column Filter drop-down window.



Enter the word “pump” in the Filter target window (this will be the target word to filter all events with). Press the target window to open the keypad. Type in “pump” (without the quotation marks) and press the Enter key.

Only those Audit events showing the word “pump” in the Information column will now be shown.



Delete the Filter target word to clear the filter and show all entries.

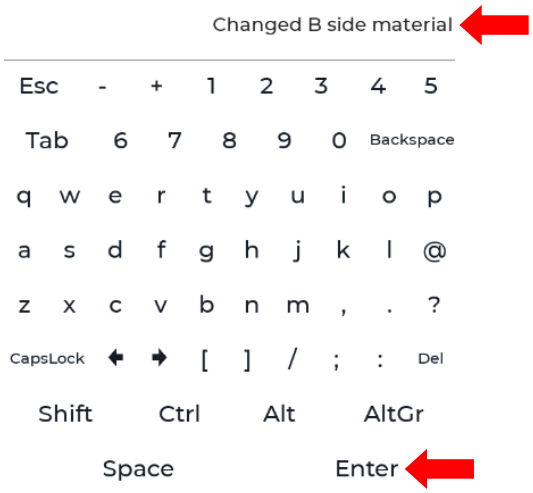
REPORTS SCREEN - JOB NOTES

The IS40 allows users to enter and save notes in the Audit table. These notes can be used to record information that may be of interest in the Audit Report or the Job Report. A LOG icon is shown in the upper right corner of every screen. Users can open and enter job notes anytime the IS40 is powered on.

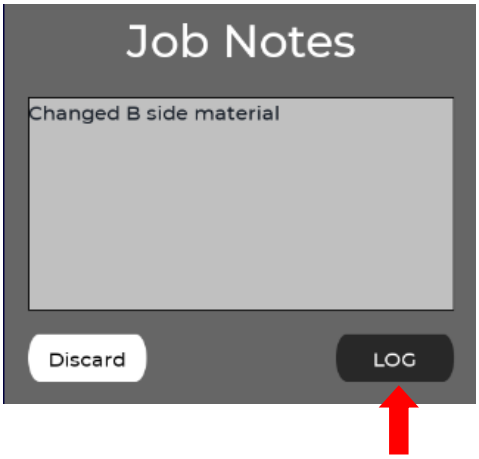
To create a note. Press the LOG icon icon in the upper right corner of any screen.

A window ill open to record the note. Press anywhere in the text window to activate the on-screen keyboard.

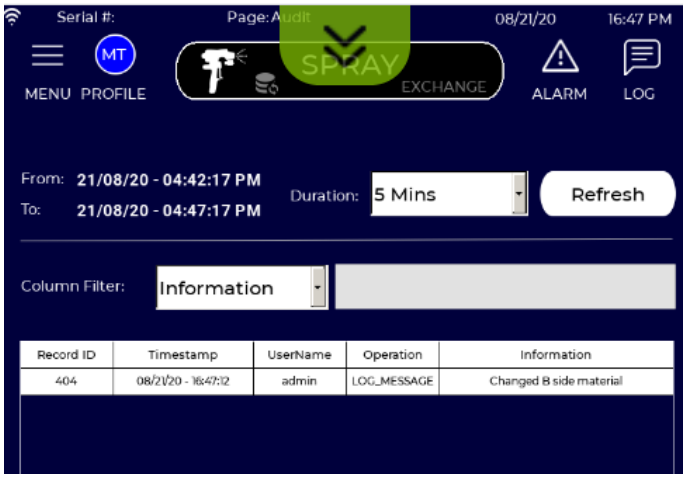
Enter the note using the on-screen keyboard. In this example the user wishes to record when a drum was changed, so enters “Changed B side material” then presses the Enter key.



After entering the note text, press the LOG button to enter it into the Audit table. This will also time-stamp the note.



The note will appear in the Audit Table as a “LOG-MESSAGE” Operation.



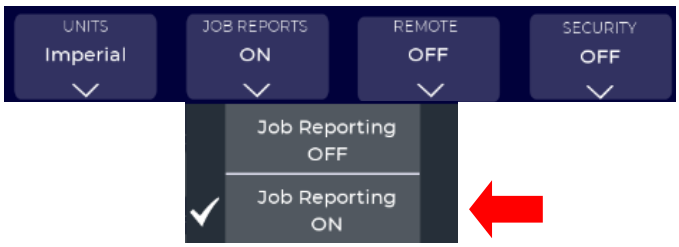
REPORTS SCREEN - JOB REPORTS

The IS40 has built-in reporting capabilities that provide users, contractors, and owners the ability to create, save, append and distribute comprehensive Job Reports that include:

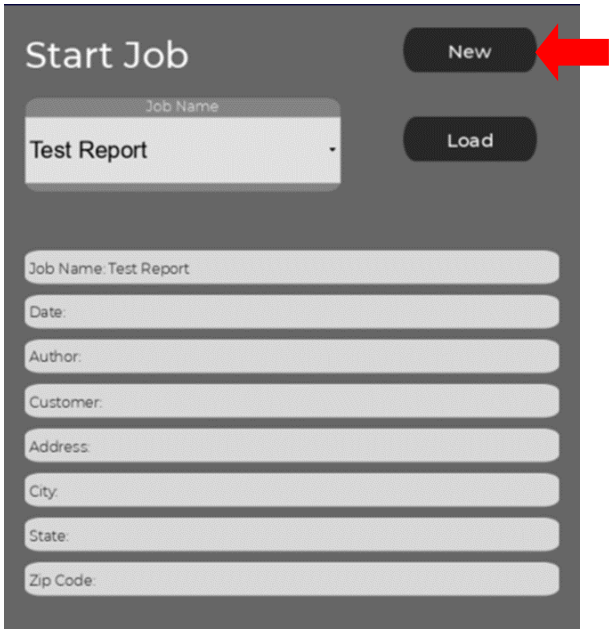
- Job Information
- Job Conditions
- System Settings and Performance (including Ratio)
- Material Supply and Usage
- Yield Calculations

Reports are stored on the IS40 and can be viewed locally, exported to USB, or emailed to any recipient. When exported, users can include additional detailed data files (in CSV format) containing machine performance data, alarms, and audit tables. These are suitable for uploading to Excel or other spreadsheet, database, or analysis programs.

Job Reporting is toggled ON or OFF in the System Setting screen (see page 78). Job Reporting is “OFF” as shipped from the factory.



If Job Logging is activated a job dialog window (shown below) will be displayed at system startup or after any Job is stopped. The user cannot proceed until they either select an existing Job from the drop-down menu or create a new Job.

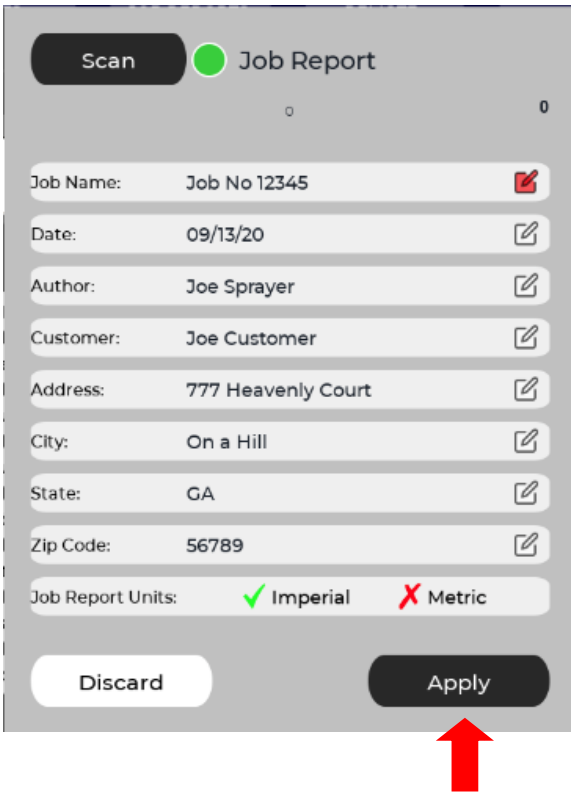


To create a new Job Report, press the NEW button. An input window will open to enter Job Information. Only those fields with a red notepad icon are mandatory to proceed. Press the desired field to enter information, or press the SCAN button to use the optional QR code reader and capabilities of the IS40 (see page 100 for more information). Note that the report can be presented created in with either Imperial or Metric values.

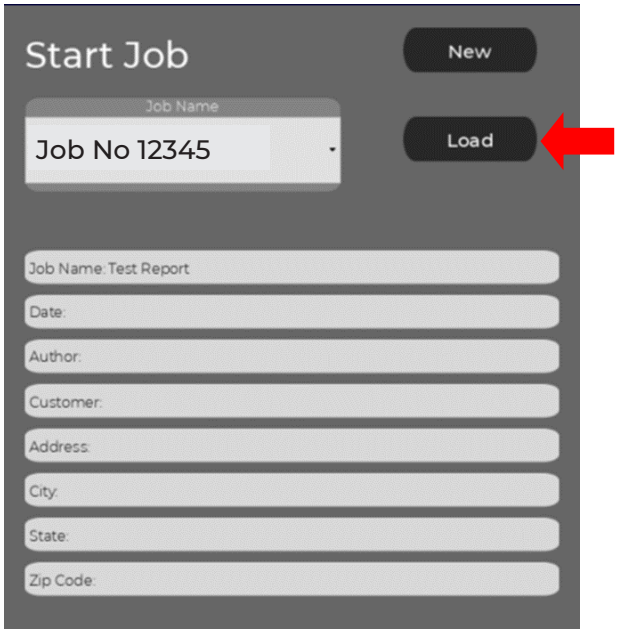

Indicates mandatory field entry

REPORTS SCREEN - JOB REPORTS

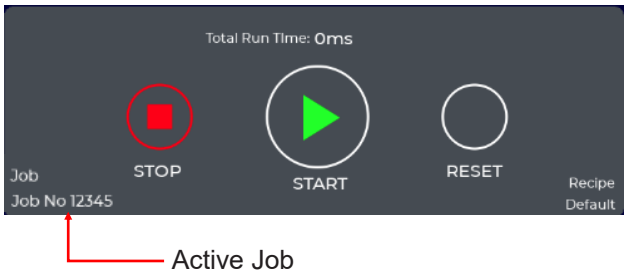
To enter Job Information press the notepad icon and enter information using the on-screen keypad. After the desired information is entered, press the APPLY button.



Finally, press the LOAD button to start the new Job.

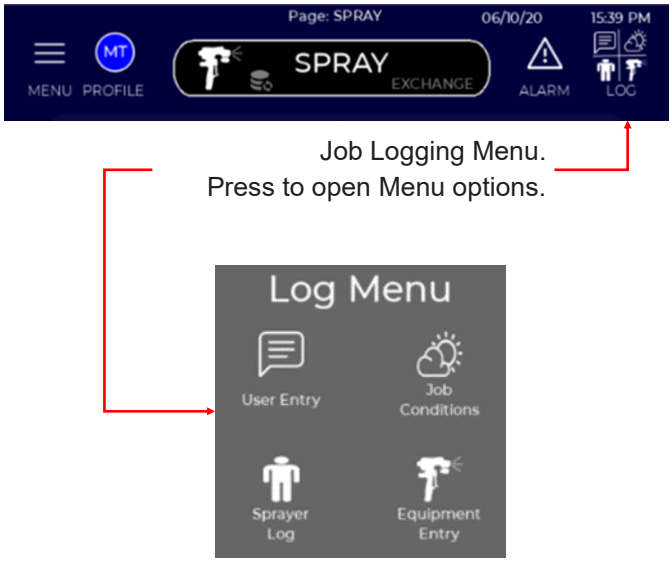


The IS40 continuously saves all system data and dynamically creates the Job Report for the active (loaded) Job. The active Job is always shown in the lower right corner of the IS40 screens.



When Job Reports are OFF, the Job Note icon is displayed in the upper right corner of the IS40 screens (as shown in the figure below). See page 96 for instructions on Job Notes.

When Job Reports are ON, the icon in the upper right corner of the IS40 screen changes to provide more options to enter Job related information. Pressing this icon opens a meu of options as shown below.



REPORTS SCREEN - JOB REPORTS (LOG ENTRIES)

The Job Logging menu consists of 4 selections that allow a user to enter information about the Job. This information is not mandatory for a Job Report.

Press on the specific menu item to open a data entry window.

User Entry: Job Notes that will be included in the Job Report (see page 100).

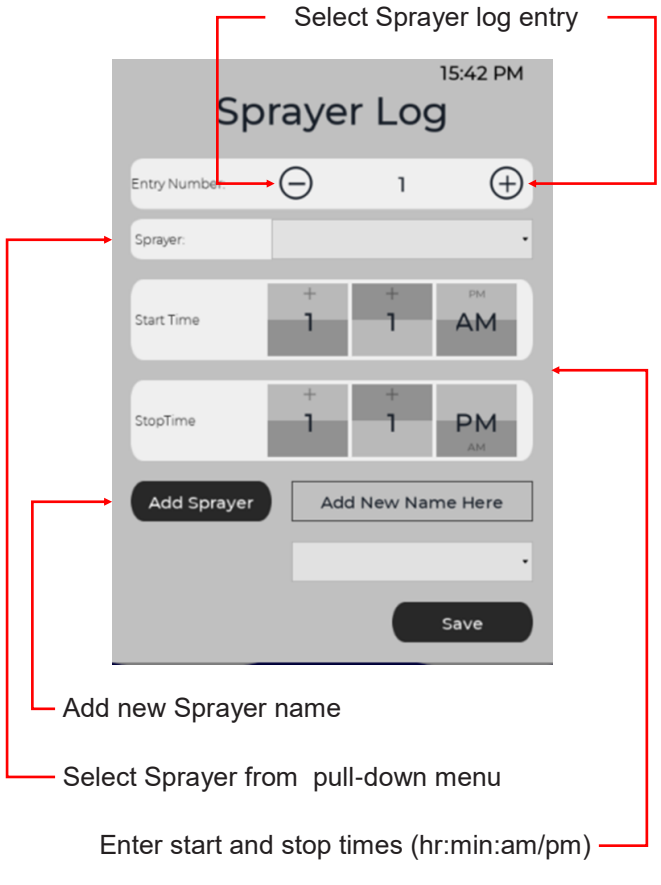
Job Conditions: Environmental and substrate conditions, which will be included in the Job Report.

Sprayer Log: Start and stop time for any Sprayer (in the event there are different Sprayers on the same Job).

Equipment Entry: Used to record information about the Spray gun used.

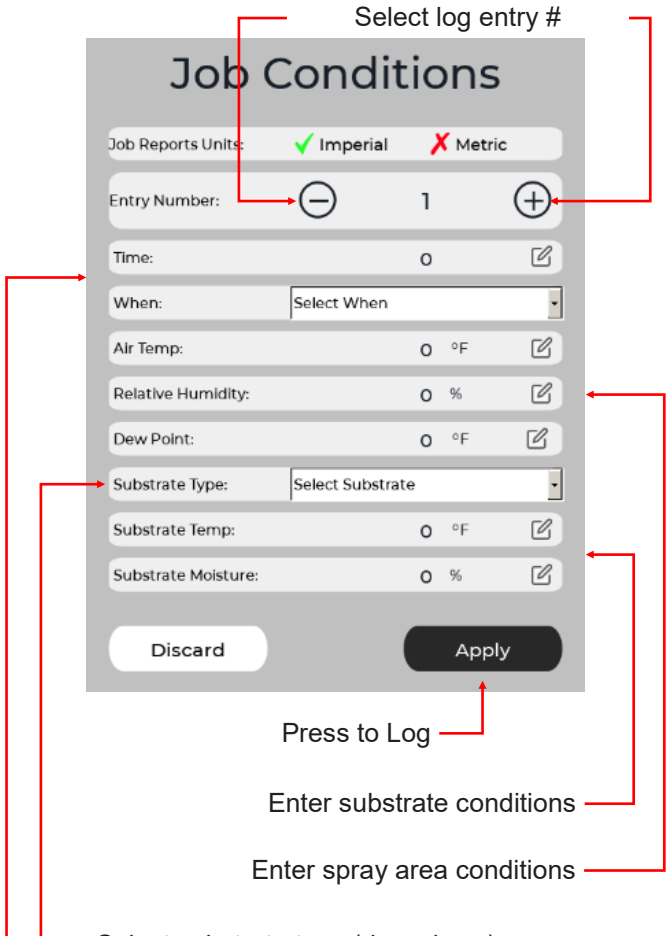
User Entry: This function allows a user to enter any information they want to associate with the job. The message is time stamped and entered in the Audit Trail that is provided with the job report. When selected, a dialogue window appears that allows the user to enter free-form text information with the on-screen keypad. Examples of notes the user may want to enter include job conditions, gun setup, breakdown or service issues, recommendation for their boss, lunch break times, etc. Any information a user wants to connect to the job report can be entered. When they press the LOG button, the message is time stamped and added to the Audit Trail. They can also press “Discard” if they want to cancel the entry. See page 96 for more information.

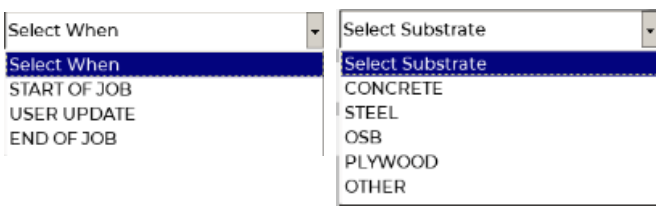
Sprayer Log: This function allows entry of sprayers and their start/stop times associated with the Job. This information will be displayed in the Job Report. A single job can have up to 15 different sprayer entries. Sprayer names are stored and can be accessed in the pull-down menu, or a new sprayer can be entered on this screen. (Once entered, the system will add that sprayer name to the pull-down menu.) The sprayer can enter this information any time to the active job (e.g. even at the end of the day).



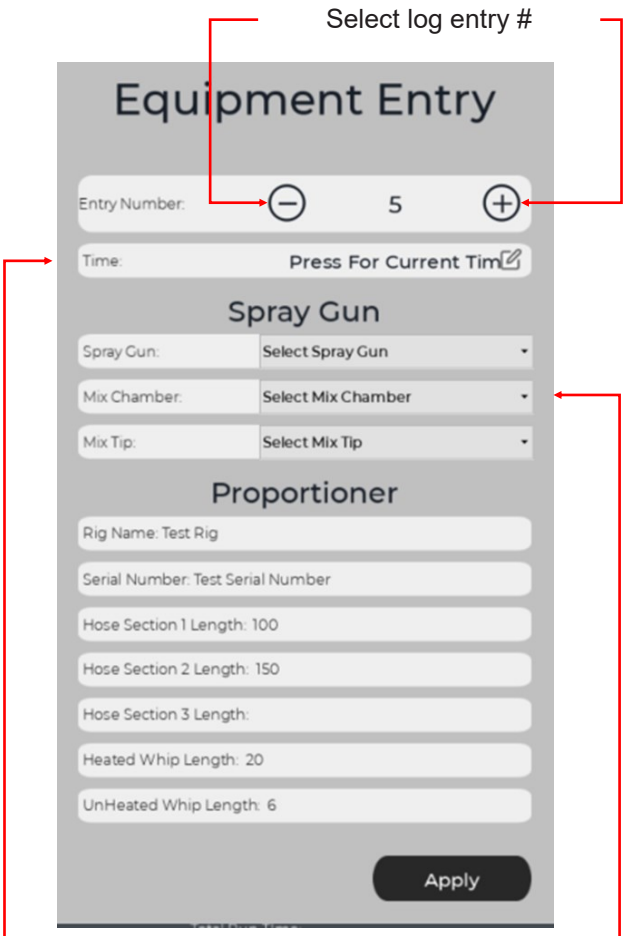
REPORTS SCREEN - JOB REPORTS (LOG ENTRIES)

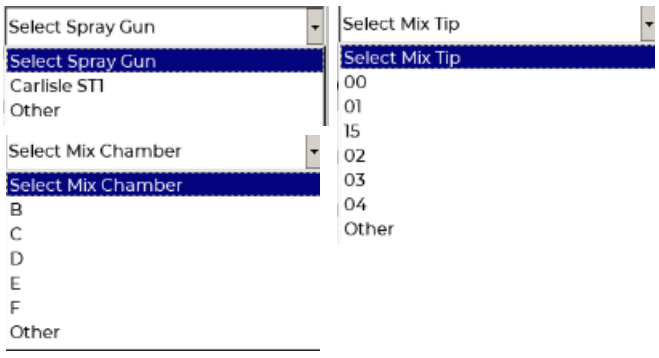
Job Conditions. This feature allows the user to enter up to 20 different environmental and substate measurements for a given job report. The time the conditions are measured can be automatically time stamped or the time can be manually entered by the user. The user selects when the conditions were measured by selecting a value from the Tigger pull-down menu. Substrate types are selected from a pull-down menu.





Equipment Entry. The Equipment log allows users to enter up to 10 different spray gun types and configurations used on a job. Users can select the time the spray gun was put into service on the job or enter it manually. Gun information is selected via pull-down

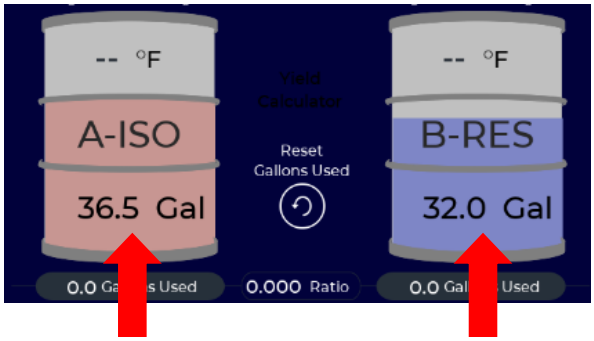




REPORTS SCREEN - JOB REPORTS (MATERIAL INFO)

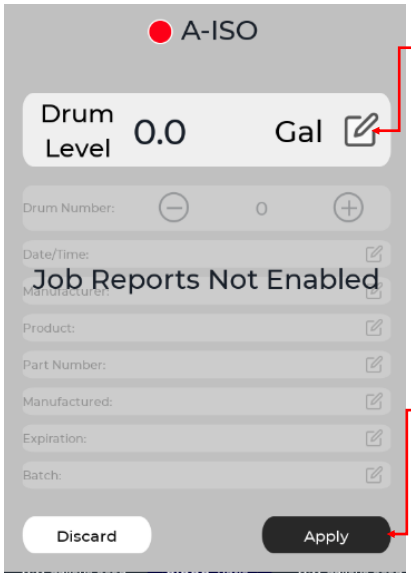
To include A and B material information on Job Reports, users can enter up to 7 items describing each drum of material used on the job. Entering material information is not mandatory for Job Reports but is hghy recommended for traceability and confirmation of materials used.

Material information is entered by pressing the A or B drum icon on the Spray Screen. This opens a material input window for collecting information.



Press on A or B drum icon to open material input window

When Job Reporting is OFF the material information window only allows entry of the fluid level in the drums. Use a Carlisle (or similar) drum level dip stick to measure fluid level before entering. If fluid is added to the drum its level should be rechecked and updated.

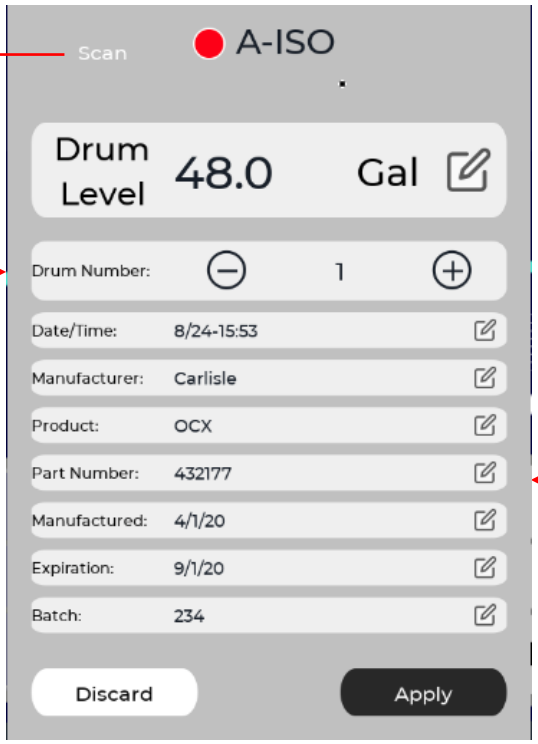


Press to open keypad to enter drum level.

Press to apply and save value.

When Job Reporting is ON the material information window displays additional fields for entering data. Data is retained for all fields to make subsequent entries easier.

The SCAN button can be used with some drums to auto-fill information fields.

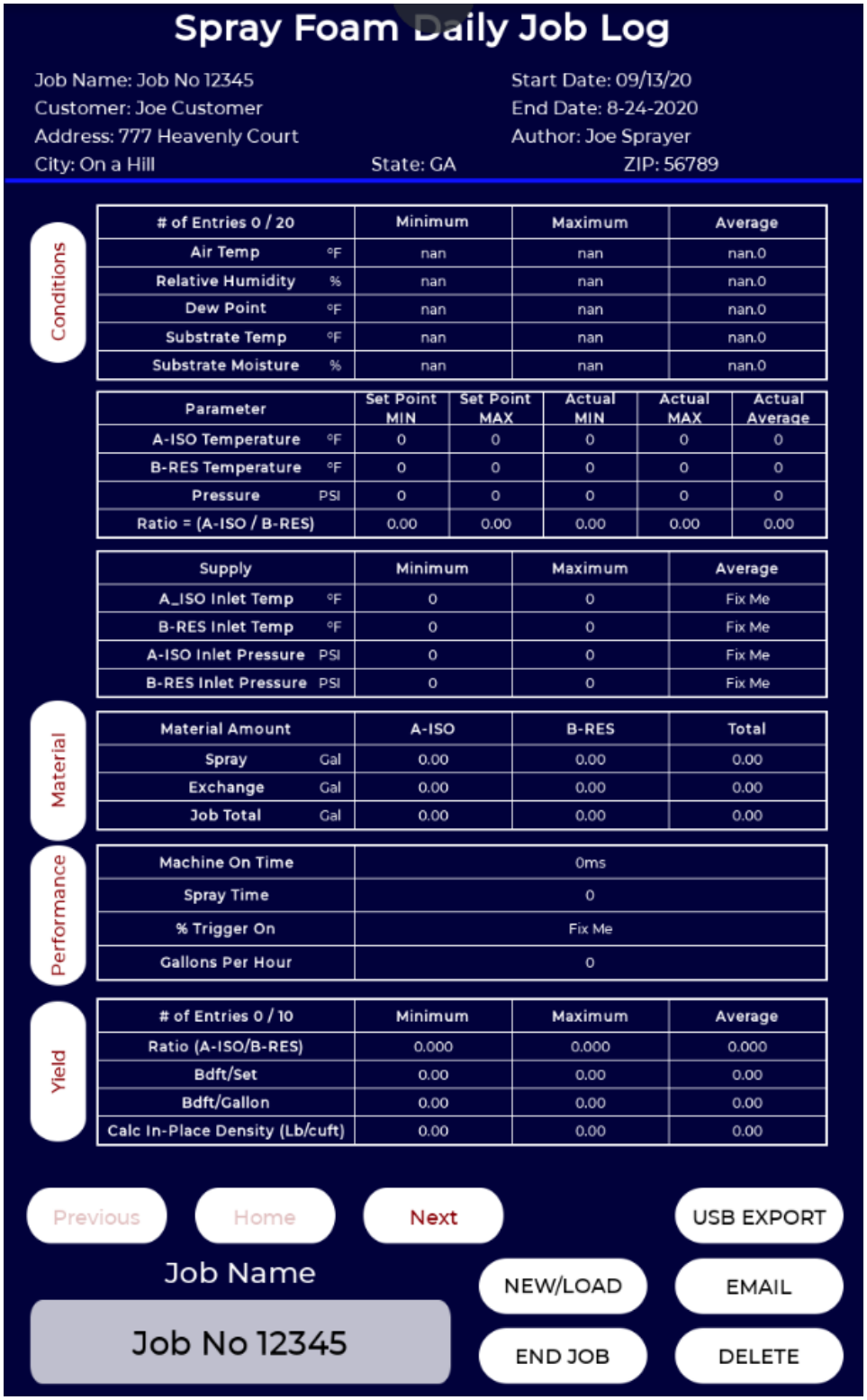


To enter information for a new drum, increment the drum number using the + button (use - button to view or edit previoss drum entries).

To enter product information, select notepad icon to use on-screen keyboard.

REPORTS SCREEN - JOB REPORTS

When Job Reporting is ON (see page 75) the IS40 is continuously updating the current Job Report, which can be viewed on-screen by selecting REPORTS > JOB REPORTS from the Main Menu. The Job Report has a main summary page (Page 1) followed by detail pages as shown in the following figures.



Job Header (printed on every page)

Job conditions summary (min, max, average)

Process parameter summary (max, min, average)

Material conditions summary (max, min, average)

Material usage summary

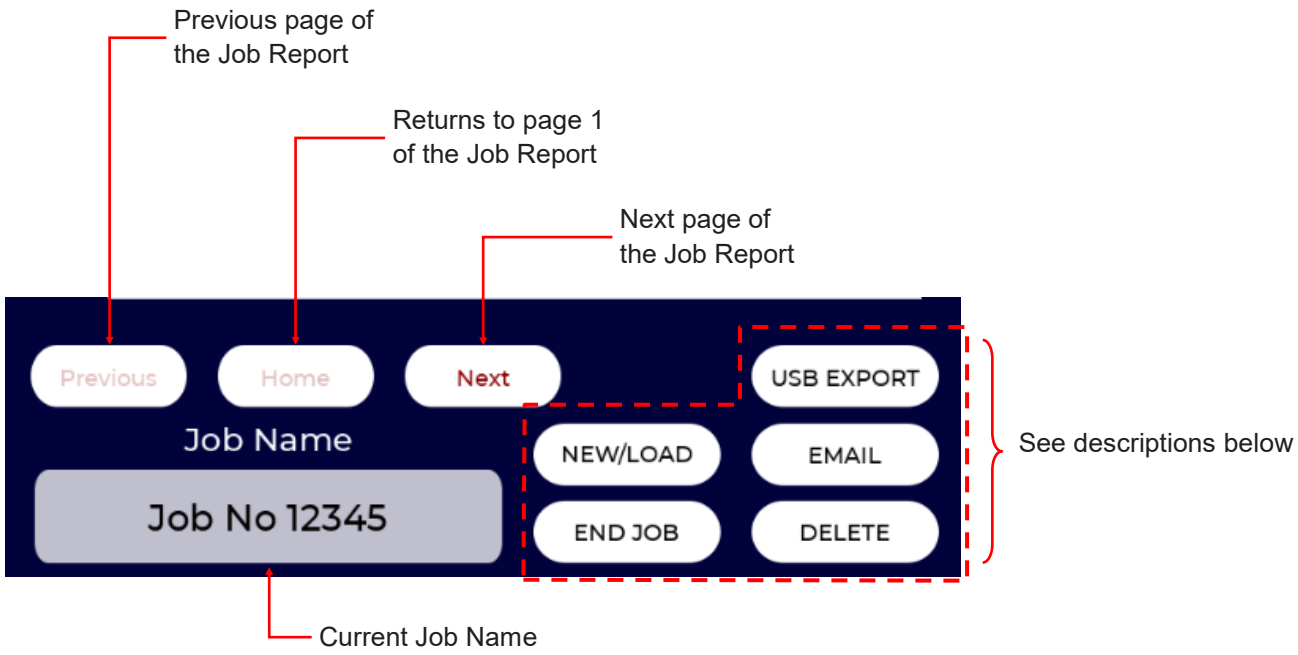
System performance summary

Yield calculation summary (if performed by user)

Report Management

JOB REPORTS - REPORT MANAGEMENT

When Job Reports are enabled, each page of the on-screen Job Report contains a section for Report Management. This is found at the bottom of each screen when viewing a Job Report. This section contains buttons for navigating, exporting, ending, creating, and deleting Job Reports.



NEW/LOAD Creates a new Job, or loads (continues) an existing Job. Loading an existing Job allows the user to continue logging information from a prior incomplete Jobs. See page 100 for information in creating or loading a Job.

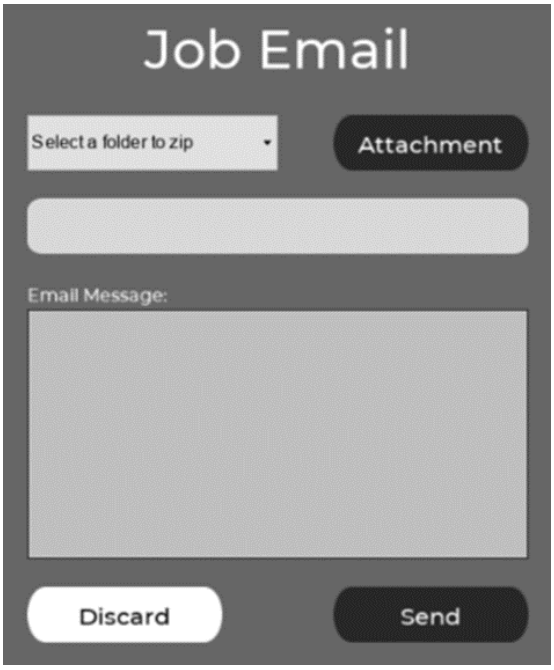
END JOB The END JOB button is used at the end of Job. The The system will also prompt the user when they hit the stop button:

If the user chooses to end a job the following dialogue box appears, which allows the user to email the job report and associated files.

JOB REPORTS - REPORT MANAGEMENT

DELETE Deletes a Job and all related Job information. When the Delete button is pressed, a window will open that allows the user to review and select the Job Report to delete. Since this is a non-recoverable action, a confirmation is required. The IS40 can store up to 100 Job Reports. Once this limit is reached it will delete the oldest Job Report automatically to create space for the next Job Report.

EMAIL If the EMAIL button is pressed the following dialogue box appears:



To email a job report, select the Job to email from the drop-down window.

The attachment button allows the user to select other files associated with the job to be sent (along with the job report). Attachments are:

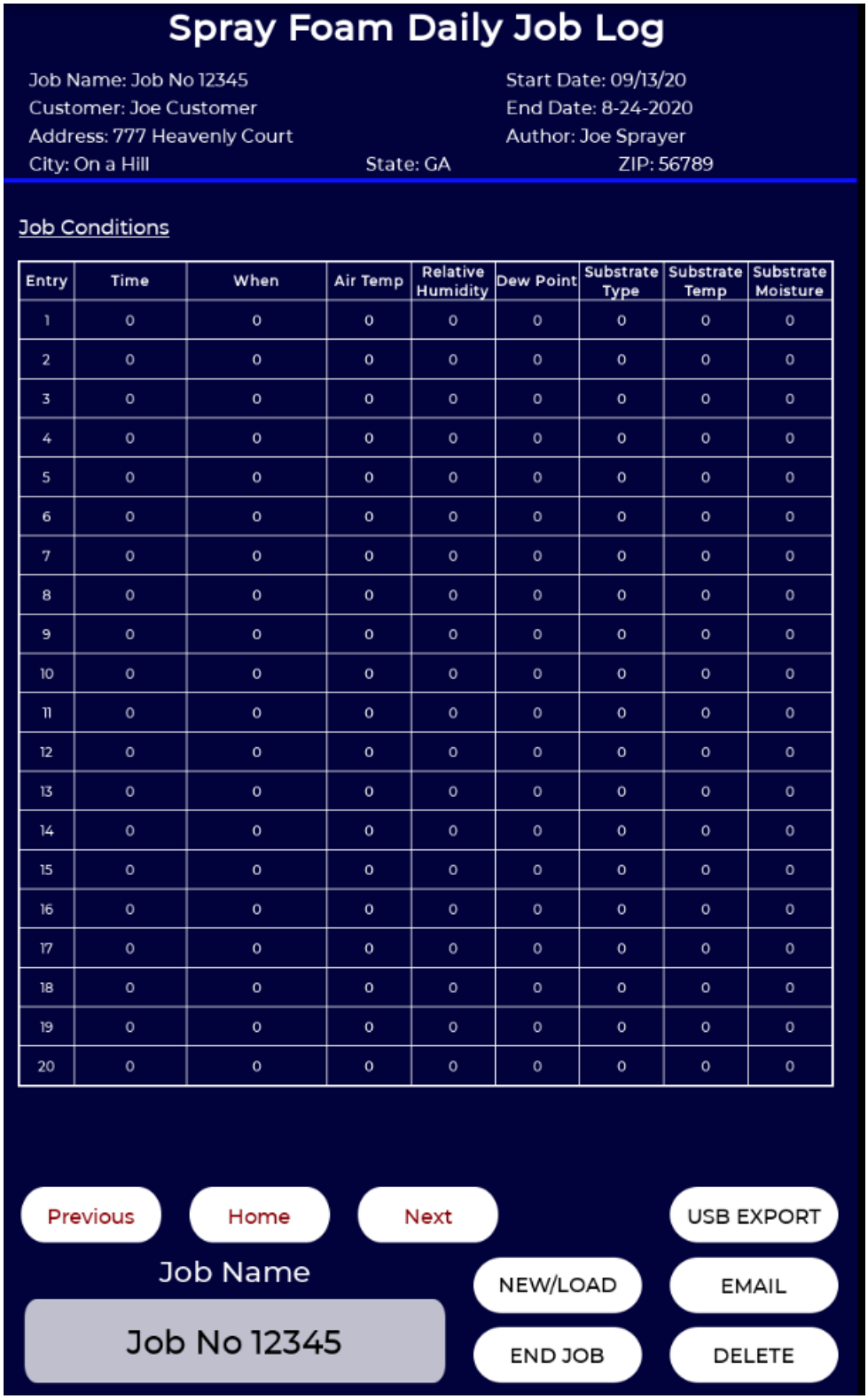
Job Audit Trail file. All user-initiated events and comments for the job, time stamped and in CSV format).

Error Logs. A log of any warnings or errors, time stamped in CSV format).

All sensor values and time data for the job, suitable for plotting in Excel.

REPORTS SCREEN - JOB REPORTS

When Job Reporting is ON (see page 75) the IS40 is continuously updating the current Job Report, which can be viewed on-screen by selecting REPORTS > JOB REPORTS from the Main Menu. The Job Report has a main summary page (Page 1) followed by detail pages as shown in the following figures.



Entry	Time	When	Air Temp	Relative Humidity	Dew Point	Substrate Type	Substrate Temp	Substrate Moisture
1	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0

REPORTS SCREEN - JOB REPORTS

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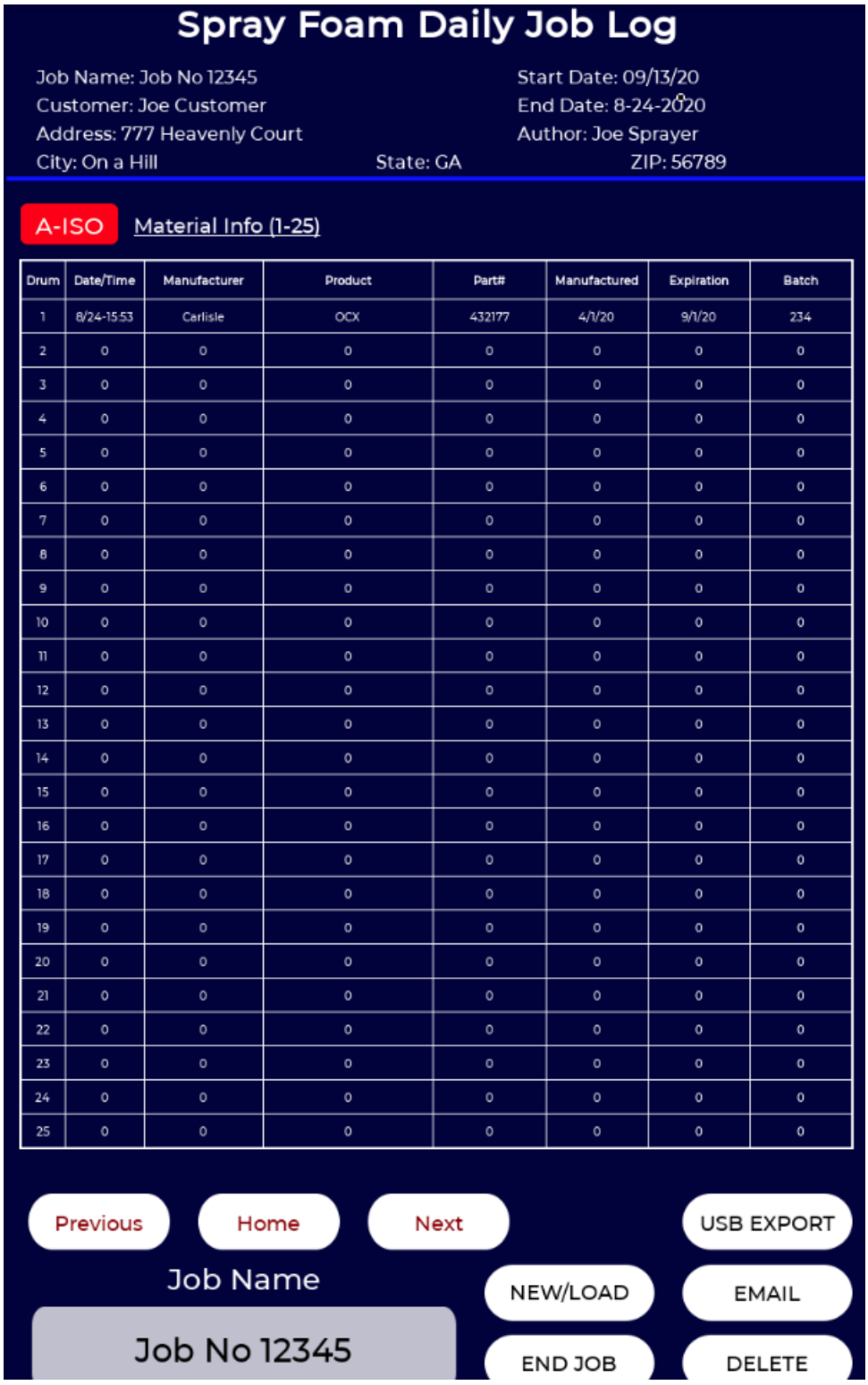

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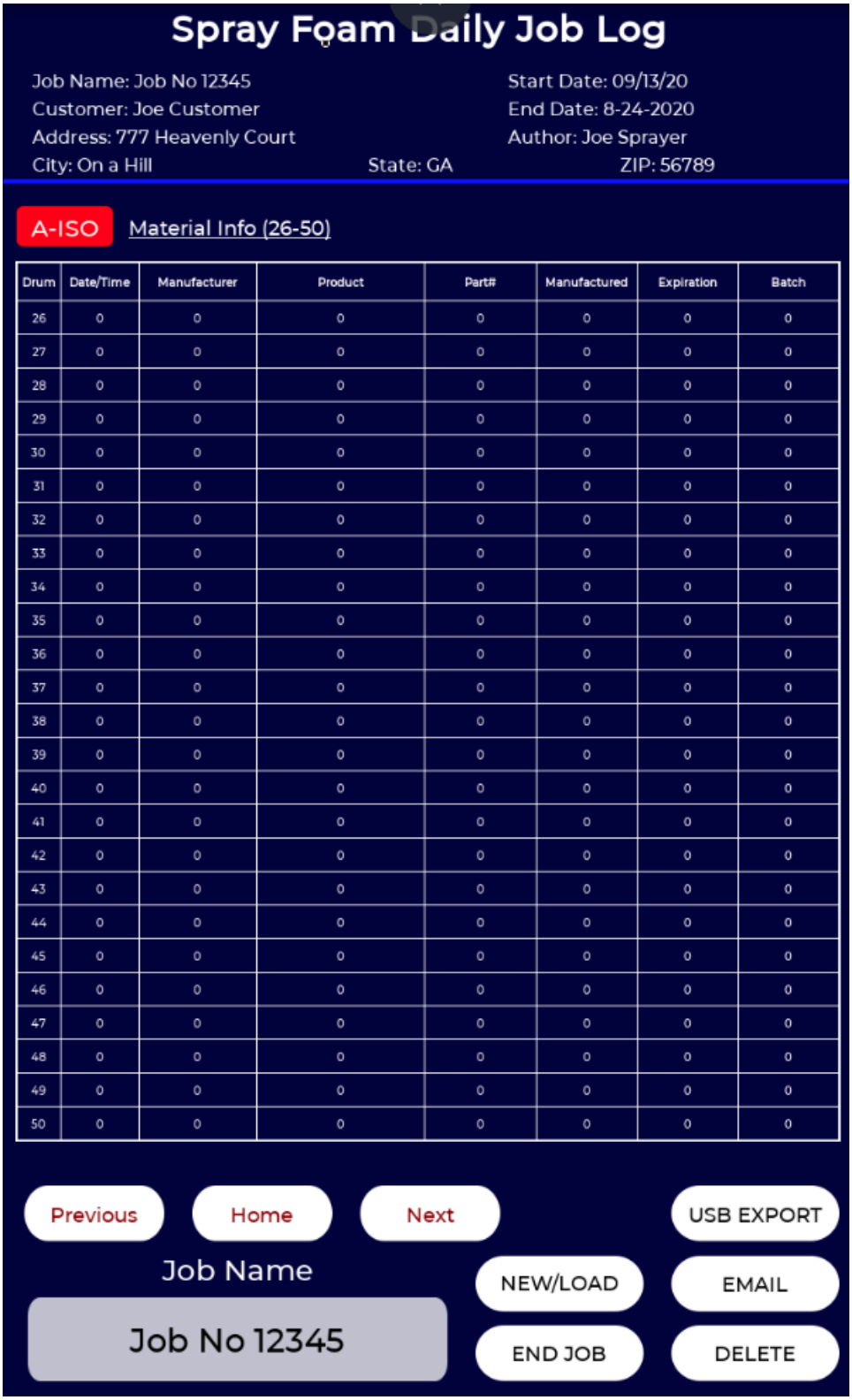

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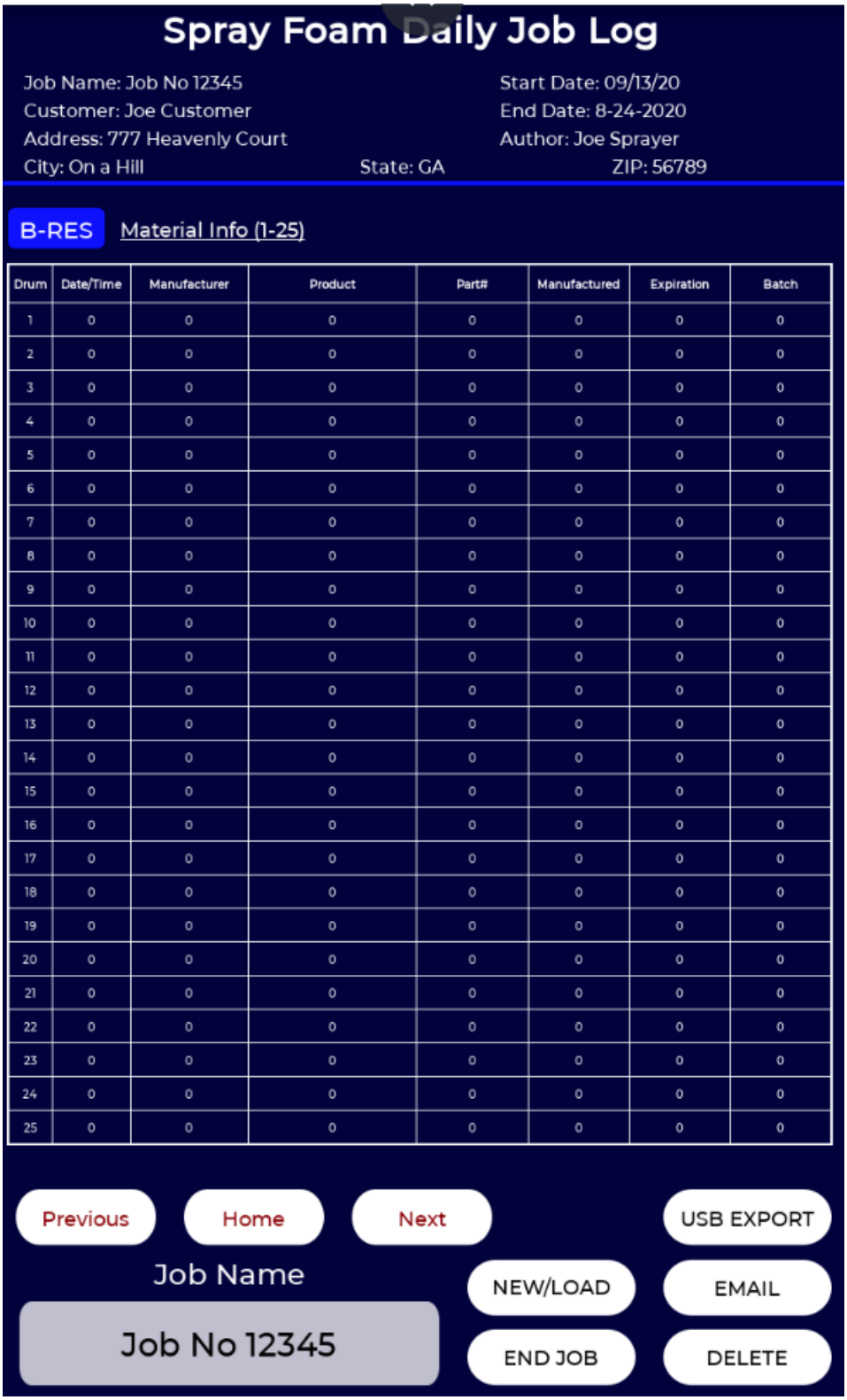

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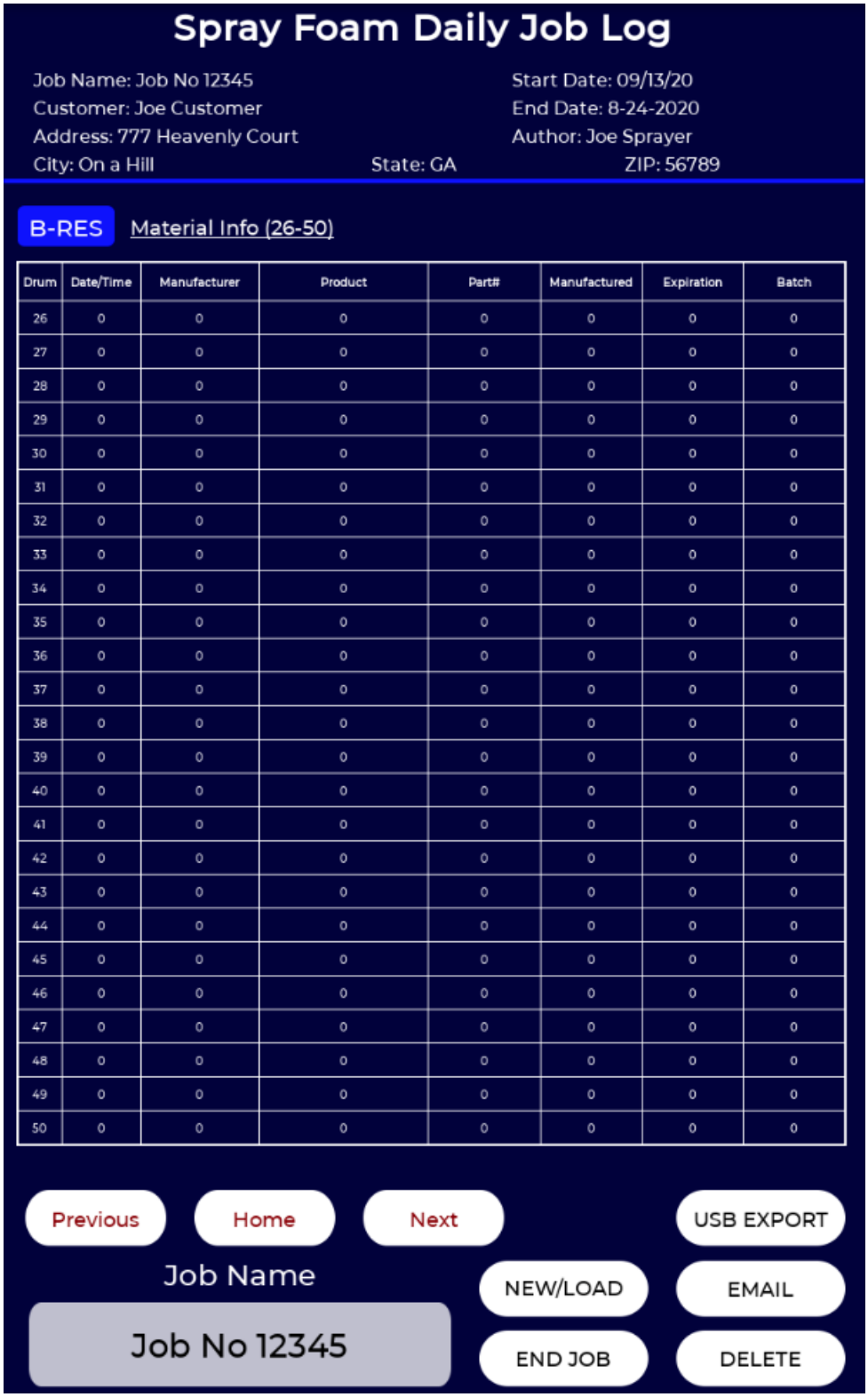

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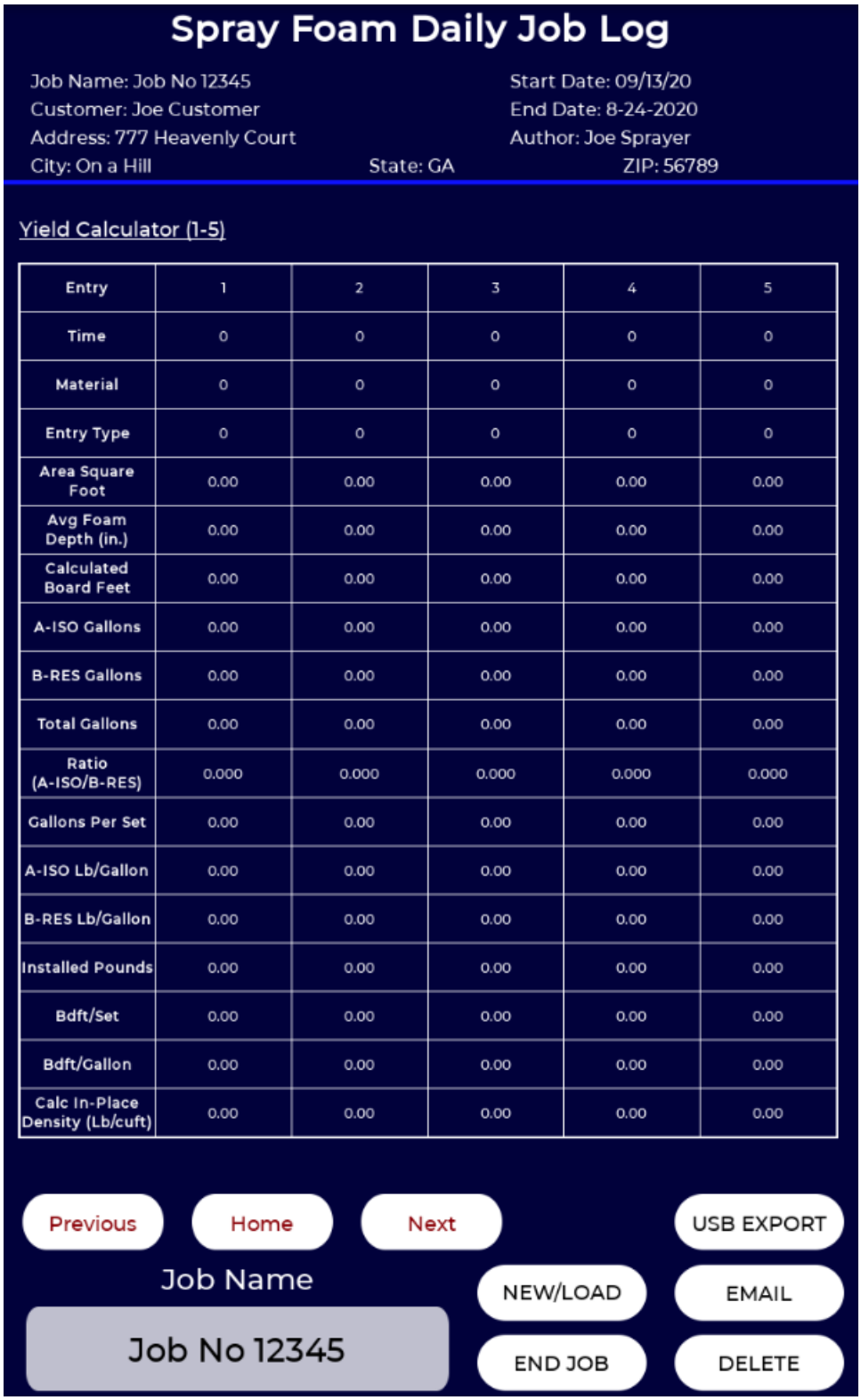

Entry	1	2	3	4	5
Time	0	0	0	0	0
Material	0	0	0	0	0
Entry Type	0	0	0	0	0
Area Square Foot	0.00	0.00	0.00	0.00	0.00
Avg Foam Depth (in.)	0.00	0.00	0.00	0.00	0.00
Calculated Board Feet	0.00	0.00	0.00	0.00	0.00
A-ISO Gallons	0.00	0.00	0.00	0.00	0.00
B-RES Gallons	0.00	0.00	0.00	0.00	0.00
Total Gallons	0.00	0.00	0.00	0.00	0.00
Ratio (A-ISO/B-RES)	0.000	0.000	0.000	0.000	0.000
Gallons Per Set	0.00	0.00	0.00	0.00	0.00
A-ISO Lb/Gallon	0.00	0.00	0.00	0.00	0.00
B-RES Lb/Gallon	0.00	0.00	0.00	0.00	0.00
Installed Pounds	0.00	0.00	0.00	0.00	0.00
Bdft/Set	0.00	0.00	0.00	0.00	0.00
Bdft/Gallon	0.00	0.00	0.00	0.00	0.00
Calc In-Place Density (Lb/cuft)	0.00	0.00	0.00	0.00	0.00

REPORTS SCREEN - JOB REPORTS

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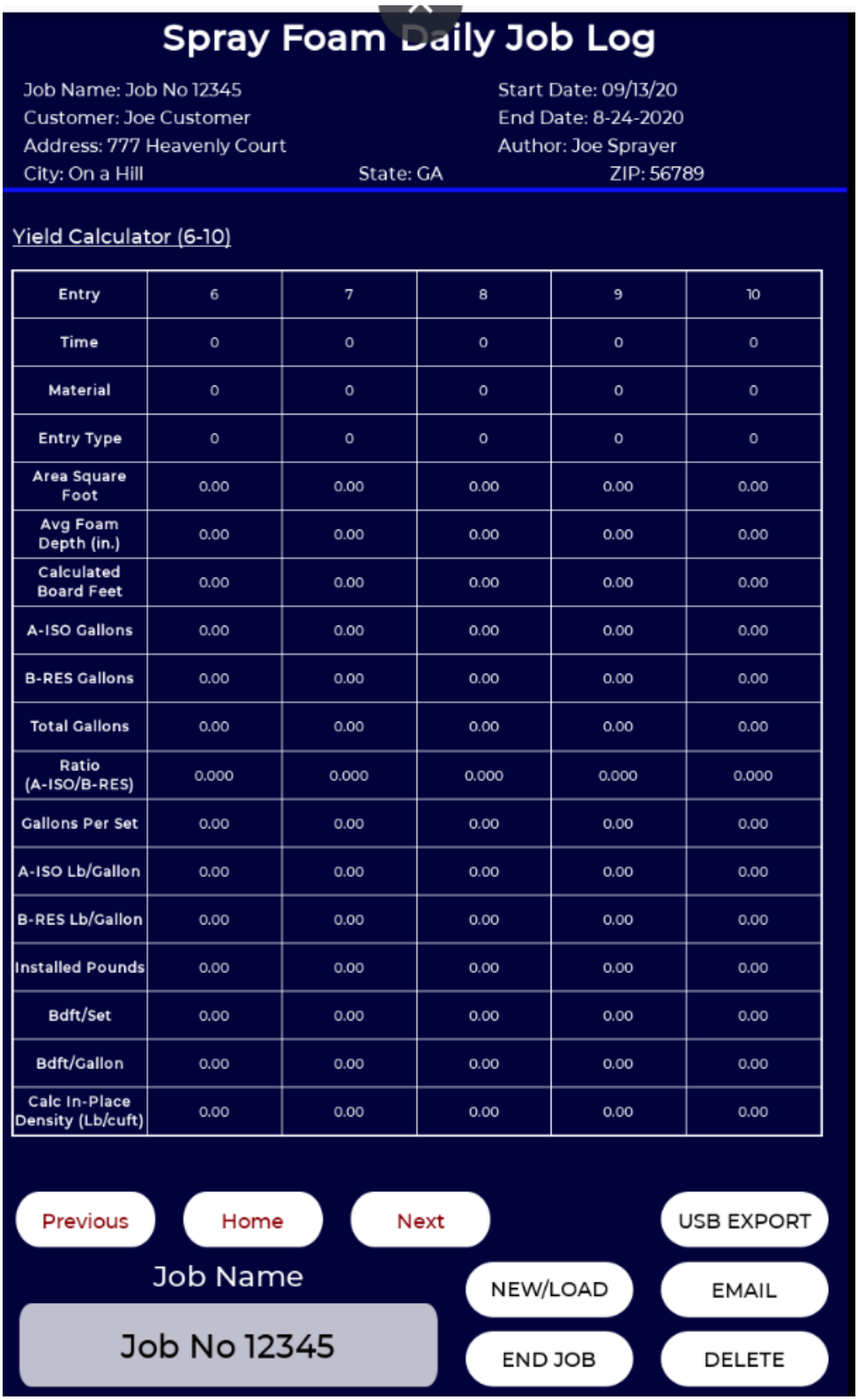
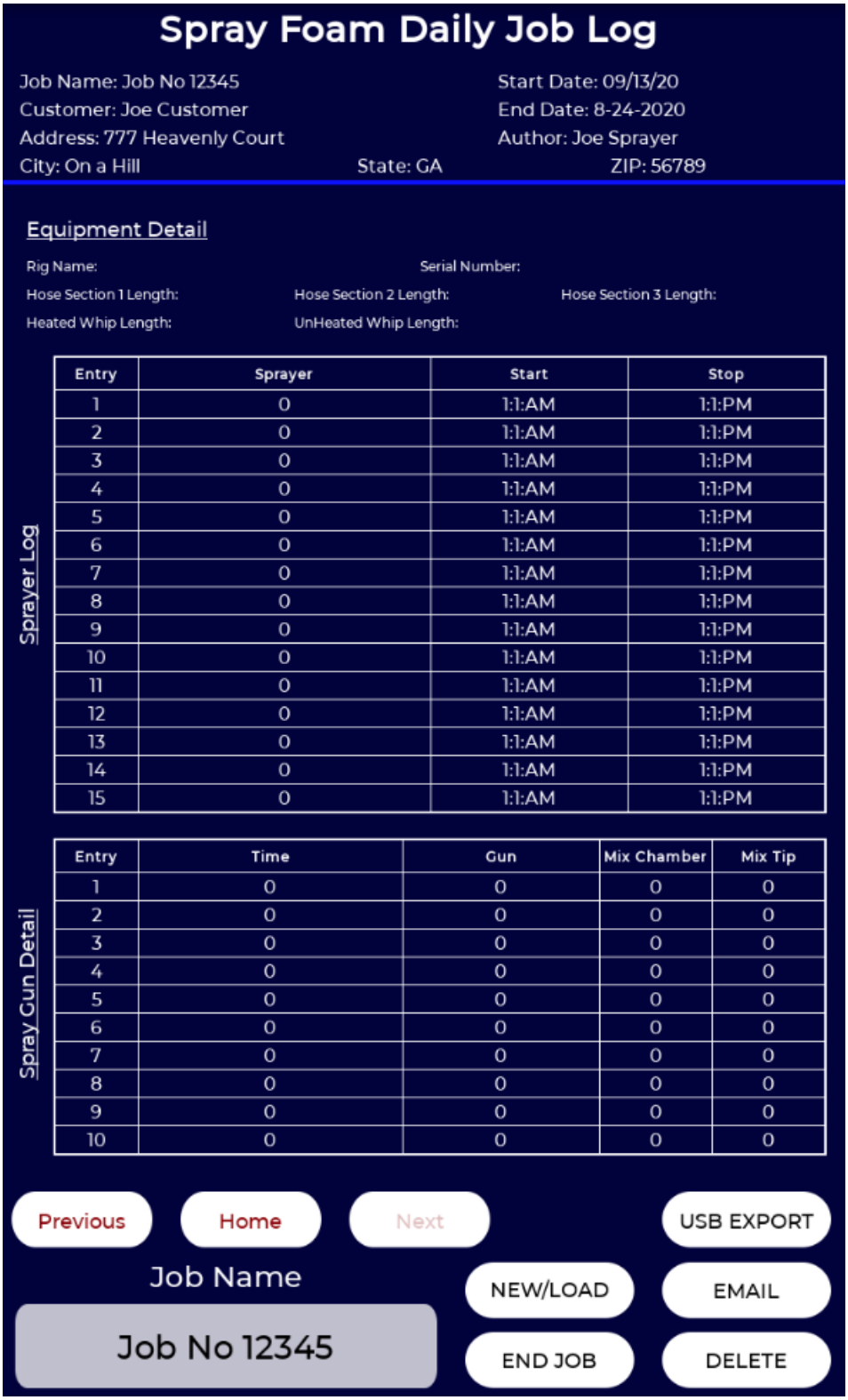


Entry	6	7	8	9	10
Time	0	0	0	0	0
Material	0	0	0	0	0
Entry Type	0	0	0	0	0
Area Square Foot	0.00	0.00	0.00	0.00	0.00
Avg Foam Depth (in.)	0.00	0.00	0.00	0.00	0.00
Calculated Board Feet	0.00	0.00	0.00	0.00	0.00
A-ISO Gallons	0.00	0.00	0.00	0.00	0.00
B-RES Gallons	0.00	0.00	0.00	0.00	0.00
Total Gallons	0.00	0.00	0.00	0.00	0.00
Ratio (A-ISO/B-RES)	0.000	0.000	0.000	0.000	0.000
Gallons Per Set	0.00	0.00	0.00	0.00	0.00
A-ISO Lb/Gallon	0.00	0.00	0.00	0.00	0.00
B-RES Lb/Gallon	0.00	0.00	0.00	0.00	0.00
Installed Pounds	0.00	0.00	0.00	0.00	0.00
Bdft/Set	0.00	0.00	0.00	0.00	0.00
Bdft/Gallon	0.00	0.00	0.00	0.00	0.00
Calc In-Place Density (Lb/cuft)	0.00	0.00	0.00	0.00	0.00

REPORTS SCREEN - JOB REPORTS

When Job Reporting is ON (see page 75) the IS40 is continuously updating the current Job Report, which can be viewed on-screen by selecting REPORTS > JOB REPORTS from the Main Menu. The Job Report has a main summary page (Page 1) followed by detail pages as shown in the following figures.



Spray Foam Daily Job Log

Job Name: Job No 12345
Customer: Joe Customer
Address: 777 Heavenly Court
City: On a Hill State: GA ZIP: 56789

Start Date: 09/13/20
End Date: 8-24-2020
Author: Joe Sprayer

Equipment Detail

Rig Name: Serial Number:
Hose Section 1 Length: Hose Section 2 Length: Hose Section 3 Length:
Heated Whip Length: UnHeated Whip Length:

Sprayer Log

Entry	Sprayer	Start	Stop
1	0	1:1:AM	1:1:PM
2	0	1:1:AM	1:1:PM
3	0	1:1:AM	1:1:PM
4	0	1:1:AM	1:1:PM
5	0	1:1:AM	1:1:PM
6	0	1:1:AM	1:1:PM
7	0	1:1:AM	1:1:PM
8	0	1:1:AM	1:1:PM
9	0	1:1:AM	1:1:PM
10	0	1:1:AM	1:1:PM
11	0	1:1:AM	1:1:PM
12	0	1:1:AM	1:1:PM
13	0	1:1:AM	1:1:PM
14	0	1:1:AM	1:1:PM
15	0	1:1:AM	1:1:PM

Spray Gun Detail

Entry	Time	Gun	Mix Chamber	Mix Tip
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0

Previous Home Next USB EXPORT

Job Name

Job No 12345

NEW/LOAD EMAIL

END JOB DELETE

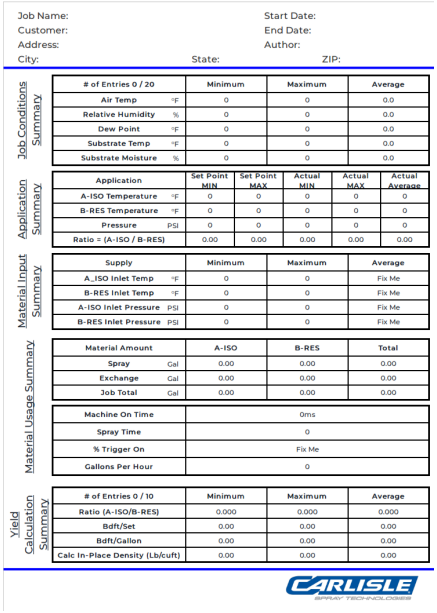
REPORTS SCREEN - JOB REPORTS

When a Job Report is emailed or output to a USB storage device, the IS40 converts the report to pdf format. The report consists of the same pages as shown in the previous Job Report screens. The only differences are the pdf format, white background and dark text (suitable for printing), and an additional front page and footer logos that can be customized for the user by Carlisle service staff at installation.


08/11/2020 - 08:36:08 AM

CARLISLE SPRAY TECHNOLOGIES

Job Name:


Job Name: Start Date:
Customer: End Date:
Address: Author:
City: State: ZIP:

Job Conditions Summary

# of Entries 0 / 20	Minimum	Maximum	Average
Air Temp °F	0	0	0.0
Relative Humidity %	0	0	0.0
Dew Point °F	0	0	0.0
Substrate Temp °F	0	0	0.0
Substrate Moisture %	0	0	0.0

Application Summary

Application	Set Point MIN	Set Point MAX	Actual MIN	Actual MAX	Actual Average
A-ISO Temperature °F	0	0	0	0	0
B-RES Temperature °F	0	0	0	0	0
Pressure PSI	0	0	0	0	0
Ratio = (A-ISO / B-RES)	0.00	0.00	0.00	0.00	0.00

Material Input Summary

Supply	Minimum	Maximum	Average
A_ISO Inlet Temp °F	0	0	Fix Me
B-RES Inlet Temp °F	0	0	Fix Me
A-ISO Inlet Pressure PSI	0	0	Fix Me
B-RES Inlet Pressure PSI	0	0	Fix Me

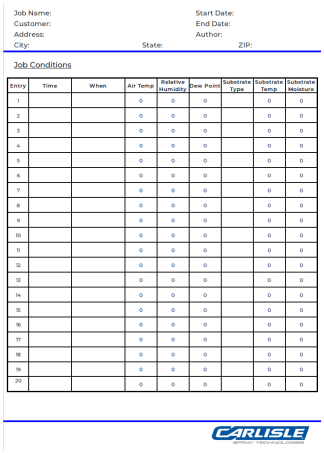
Material Usage Summary

Material Amount	A-ISO	B-RES	Total
Spray Gal	0.00	0.00	0.00
Exchange Gal	0.00	0.00	0.00
Job Total Gal	0.00	0.00	0.00

Machine On Time	0ms
Spray Time	0
% Trigger On	Fix Me
Gallons Per Hour	0

Yield Calculation Summary

# of Entries 0 / 10	Minimum	Maximum	Average
Ratio (A-ISO/B-RES)	0.000	0.000	0.000
Bdft/Set	0.00	0.00	0.00
Bdft/Gallon	0.00	0.00	0.00
Calc In-Place Density (Lb/cuft)	0.00	0.00	0.00


Job Name: Start Date:
Customer: End Date:
Address: Author:
City: State: ZIP:

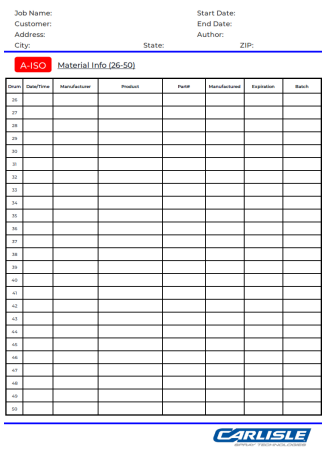
Job Conditions

Entry	Time	When	Air Temp	Relative Humidity	Dew Point	Substrate Type	Substrate Temp	Substrate Moisture
1			0	0	0		0	0
2			0	0	0		0	0
3			0	0	0		0	0
4			0	0	0		0	0
5			0	0	0		0	0
6			0	0	0		0	0
7			0	0	0		0	0
8			0	0	0		0	0
9			0	0	0		0	0
10			0	0	0		0	0
11			0	0	0		0	0
12			0	0	0		0	0
13			0	0	0		0	0
14			0	0	0		0	0
15			0	0	0		0	0
16			0	0	0		0	0
17			0	0	0		0	0
18			0	0	0		0	0
19			0	0	0		0	0
20			0	0	0		0	0


Job Name: Start Date:
Customer: End Date:
Address: Author:
City: State: ZIP:

A-ISO Material Info (1-25)

Drum	Date/Time	Manufacturer	Product	Part#	Manufactured	Expiration	Batch
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							


Job Name: Start Date:
Customer: End Date:
Address: Author:
City: State: ZIP:

A-ISO Material Info (26-50)

Drum	Date/Time	Manufacturer	Product	Part#	Manufactured	Expiration	Batch
26							
27							
28							
29							
30							
31							
32							
33							
34							
35							
36							
37							
38							
39							
40							
41							
42							
43							
44							
45							
46							
47							
48							
49							
50							


Job Name: Start Date:
Customer: End Date:
Address: Author:
City: State: ZIP:

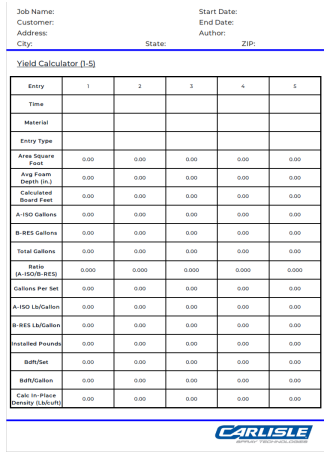
B-RES Material Info (1-25)

Drum	Date/Time	Manufacturer	Product	Part#	Manufactured	Expiration	Batch
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							


Job Name: Start Date:
Customer: End Date:
Address: Author:
City: State: ZIP:

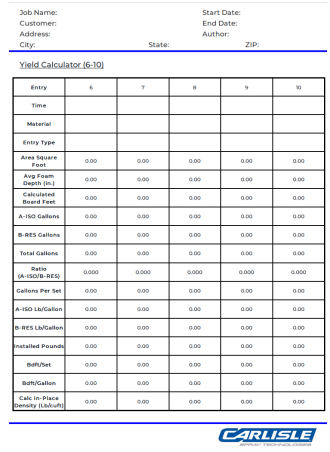
B-RES Material Info (26-50)

Drum	Date/Time	Manufacturer	Product	Part#	Manufactured	Expiration	Batch
26							
27							
28							
29							
30							
31							
32							
33							
34							
35							
36							
37							
38							
39							
40							
41							
42							
43							
44							
45							
46							
47							
48							
49							
50							


Job Name: Start Date:
Customer: End Date:
Address: Author:
City: State: ZIP:

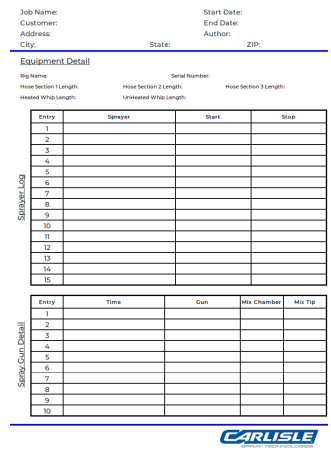
Yield Calculator (1-5)

Entry	1	2	3	4	5
Time					
Material					
Entry Type					
Area Square Foot	0.00	0.00	0.00	0.00	0.00
Avg Foam Depth (in.)	0.00	0.00	0.00	0.00	0.00
Calculated Board Feet	0.00	0.00	0.00	0.00	0.00
A-ISO Gallons	0.00	0.00	0.00	0.00	0.00
B-RES Gallons	0.00	0.00	0.00	0.00	0.00
Total Gallons	0.00	0.00	0.00	0.00	0.00
Ratio (A-ISO/B-RES)	0.000	0.000	0.000	0.000	0.000
Gallons Per Set	0.00	0.00	0.00	0.00	0.00
A-ISO Lb/Gallon	0.00	0.00	0.00	0.00	0.00
B-RES Lb/Gallon	0.00	0.00	0.00	0.00	0.00
Installed Pounds	0.00	0.00	0.00	0.00	0.00
Bdft/Set	0.00	0.00	0.00	0.00	0.00
Bdft/Gallon	0.00	0.00	0.00	0.00	0.00
Calc In-Place Density (Lb/cuft)	0.00	0.00	0.00	0.00	0.00


Job Name: Start Date:
Customer: End Date:
Address: Author:
City: State: ZIP:

Yield Calculator (6-10)

Entry	6	7	8	9	10
Time					
Material					
Entry Type					
Area Square Foot	0.00	0.00	0.00	0.00	0.00
Avg Foam Depth (in.)	0.00	0.00	0.00	0.00	0.00
Calculated Board Feet	0.00	0.00	0.00	0.00	0.00
A-ISO Gallons	0.00	0.00	0.00	0.00	0.00
B-RES Gallons	0.00	0.00	0.00	0.00	0.00
Total Gallons	0.00	0.00	0.00	0.00	0.00
Ratio (A-ISO/B-RES)	0.000	0.000	0.000	0.000	0.000
Gallons Per Set	0.00	0.00	0.00	0.00	0.00
A-ISO Lb/Gallon	0.00	0.00	0.00	0.00	0.00
B-RES Lb/Gallon	0.00	0.00	0.00	0.00	0.00
Installed Pounds	0.00	0.00	0.00	0.00	0.00
Bdft/Set	0.00	0.00	0.00	0.00	0.00
Bdft/Gallon	0.00	0.00	0.00	0.00	0.00
Calc In-Place Density (Lb/cuft)	0.00	0.00	0.00	0.00	0.00


Job Name: Start Date:
Customer: End Date:
Address: Author:
City: State: ZIP:

Equipment Detail

Rig Name: Serial Number:
Hose Section 1 Length: Hose Section 2 Length: Hose Section 3 Length:
Heated Whip Length: UnHeated Whip Length:

Sprayer Log

Entry	Sprayer	Start	Stop
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			

Spray Gun Detail

Entry	Time	Gun	Mix Chamber	Mix Tip
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

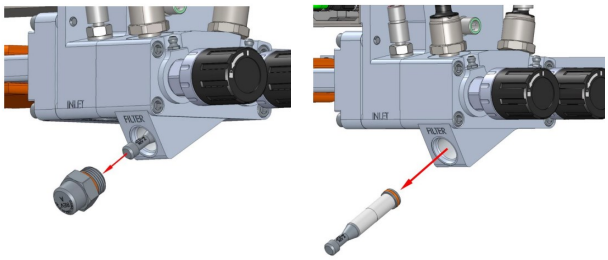
REGULAR SERVICE—FLUID MODULE

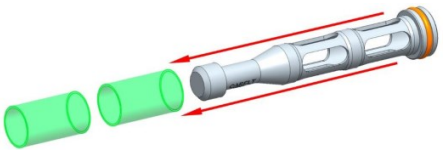
The IS40 Fluid Modules are designed for easy service. Most components and assemblies are easily accessed from the front of the Fluid Module and can be replaced in several minutes if required with minimum tools and fluid loss. Refer to the IS40 Technical Service Manual for instructions on specific component diagnostics, repair, or replacement.

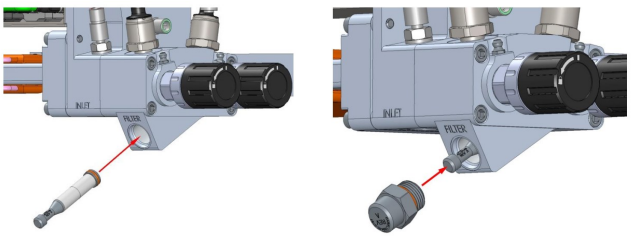
Normal service of the Fluid Modules consists of the following:

Inlet Filter Service: The inlet filters on the IS40 prevent solids from entering the Fluid Modules, hoses, and spray gun. Unlike other systems, the IS40 alerts users when the inlet filters require service, taking the "guesswork" out of filter maintenance. Pressure drop across each filter module can be seen in the I/O screen. The following steps are taken when filter maintenance is required.

1. Press the Stop button on the IS40 screen and turn off power by rotating the power switch to the Off (O) position.
2. Turn off the supply pump(s) and close upstream supply valves.
3. For easier access, loosen the Fluid Module captive retention screws, pull the spring loaded locking pin, and slide the Fluid Module out until the locking pin engages with the first stop.
4. Place a pail or bucket under the filter cap to collect drips.
5. Close both Filter Module valves by turning them 1/4 turn counter-clockwise (CCW) to the filter position.
6. Use a 7/8" socket or box head wrench and loosen the filter cap 2 turns. Allow pressurized fluid to drip into the bucket or pail.
7. Remove the filter cap and O-ring. Clean with a compatible solvent (e.g. Brake Cleaner, TSL, Dynasol, DPM, etc.). Inspect the cap O-ring for any tears, permanent set, or damage and replace if necessary. Apply ST1 gun grease (or equivalent) to the O-ring to aid in reassembly.
8. Pull the filter assembly out of the filter manifold.
9. After any residual material has drained from the filter manifold, clean the internal threads with a compatible solvent and apply a light coat of ST1 gun grease to the threads.
10. Remove filter elements and O-ring from the filter body.
11. Clean the filter body with a compatible solvent. Inspect the O-ring for any tears, permanent set, or damage and replace if necessary. Apply ST1 gun grease (or equivalent) to the O-ring to aid in reassembly.
12. Replace or clean filter elements using compatible solvent. Slide elements onto filter body.
13. Insert filter body with elements into the filter manifold.
14. Reinstall the filter cap and tighten to 40 ft-lb.
15. Open Filter Module valves by turning 1/4 turn clockwise (CW).
16. Return Fluid Module to normal use position and tighten captive retention screws.







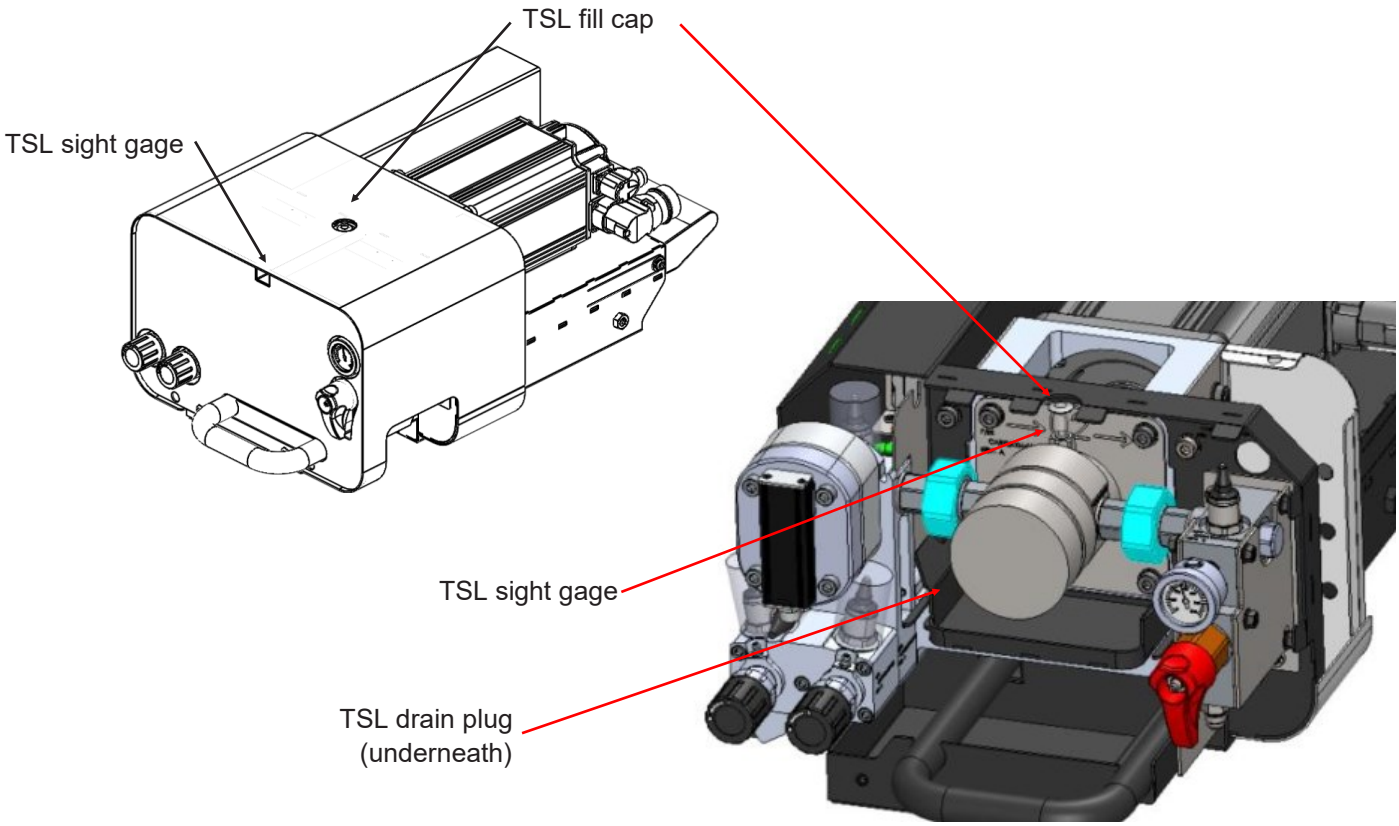
REGULAR SERVICE—FLUID MODULE

Check Pump TSL Level: The gear pumps in each Fluid Module include a chamber around the drive shafts that is filled with TSL (Throat Seal Liquid) at the factory. This prevents atmospheric moisture from migrating into the shaft seals where it could react with Isocyanate in the A-side pump, causing abrasive crystalline material to form that could damage the shaft seal. The fluid also lubricates the shaft seals on both A and B pumps and prevents dust and debris from damaging the shaft seals. Since the TSL and pump shaft are not exposed to the environment (as in a piston pumps) loss of fluid is unlikely, However, regular checking of TSL level should be performed as follows:

1. Observe TSL level from the front of each Fluid Module through the sight gage hole in the front cover. Fluid should be visible in the fill tube with roughly 1/2” of air space between the level and the cap.
2. If fluid is not seen, loosen the Fluid Module captive retention screws, pull the locking pin on the side of the module frame, and slide the module to the first or second service position or until the fill cap is accessible.
3. Remove the TSL fill tube cap and fill with TSL, leaving about 1/2” air space.
4. Replace cap, return Fluid Module to use position, and secure captive retention screws.

Note: If the TSL fluid is discolored (e.g. brown) it may indicate shaft seal leaking. Before servicing the pump drain the TSL and replace with fresh fluid per the following additional steps.

5. Remove Fluid Module cover.
6. Place an absorbent pad or rags under the pump and remove the lower plug to drain the TSL chamber.
7. Replace plug and refill the TSL chamber with fresh TSL.
8. Replace Fluid Module cover, return Fluid Module to use position, and secure captive retention screws.

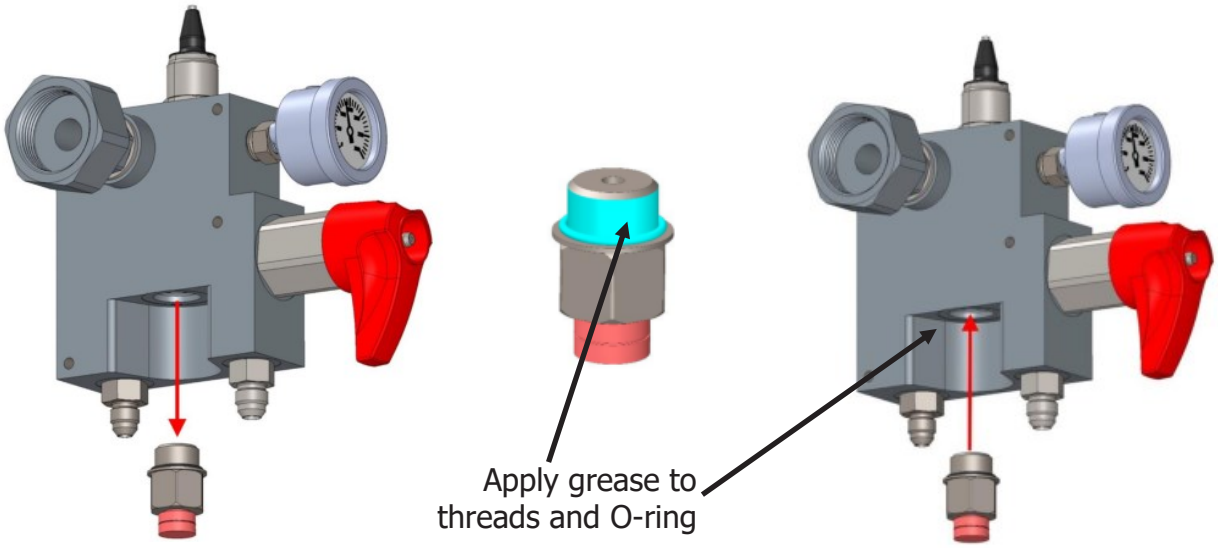


REGULAR SERVICE—FLUID MODULE

Burst Disk Replacement: As an additional safety precaution, a Burst Disk assembly rated for 7000 psi is located in the bottom of the A and B High Pressure Manifolds. In case of rupture high pressure fluid is contained within a well and directed downward and away from other equipment or users. Most fluids will not harm the Burst Disk, but some B-side resins can be very caustic (pH above 10) and over time degrade the stainless-steel element contained in the burst disk assembly and cause failure at much lower fluid pressures. For this reason, the burst disk assembly should be replaced annually. If high pH B-side resins are used replacement may be required more often.

The following steps describe replacement the Burst Disk assembly.

1. Press the Stop button on the IS40 screen and turn off power by rotating the power switch to the Off (O) position.
2. Turn off supply pump(s) and close upstream supply valves.
3. Relieve pressure in the High Pressure Module and distribution (gun) hoses by opening the recirculation valve and/or opening gun manifold material valve(s). Confirm pressure has been relieved by observing the pressure gage on the High Pressure Module.
4. Remove the Fluid Module cover.
5. For easier access, loosen the Fluid Module captive retention screws, pull the spring loaded locking pin, and slide the Fluid Module out until the locking pin engages with the first stop.
6. Place a pail or bucket under the High Pressure Module to collect fluid.
7. Using a 7/8” deep well socket loosen the Burst Disk assembly 2 turns and allow any remaining high pressure fluid to drip into the collection container.
8. Fully remove the Burst Disk assembly with its O-ring.
9. After the High Pressure Manifold has drained, clean the internal threads and apply ST1 gun grease or equivalent to prevent seizing.
10. Apply grease to the theads and R-ring on the new Burst Disk assembly (which includes a new O-ring).
11. Thread the new Burst Disk assembly into the manifold and tighten to 30-35 ft-lbs.
12. Install Fluid Module cover and secure captive retention screws.
13. Since some air will have entered the High Pressure module, purge using Exchange mode through the recirculation line.

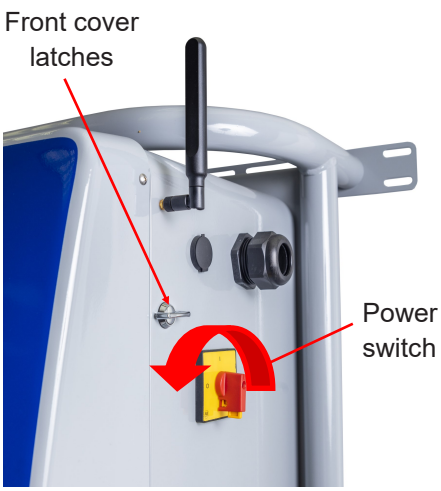


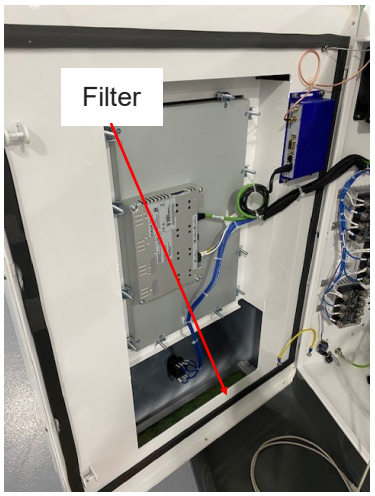
REGULAR SERVICE - CONTROL MODULE

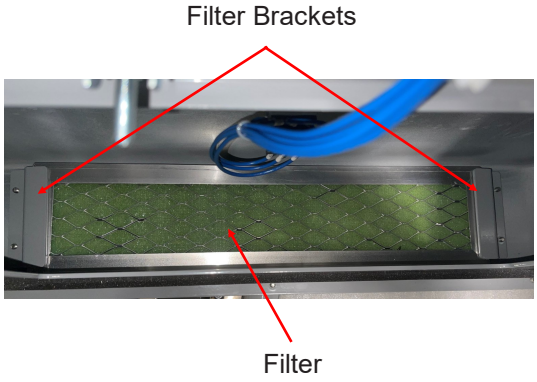
Air Filter Cleaning: A thermostatically controlled fan in the IS40 Control Module pulls in outside cooling air as needed through a reusable air filter in the bottom of the front door. In typical use removal, cleaning, and reinstallation is recommended every 3 months of use. If the IS40 is exposed to particularly dusty environments service should happen monthly.

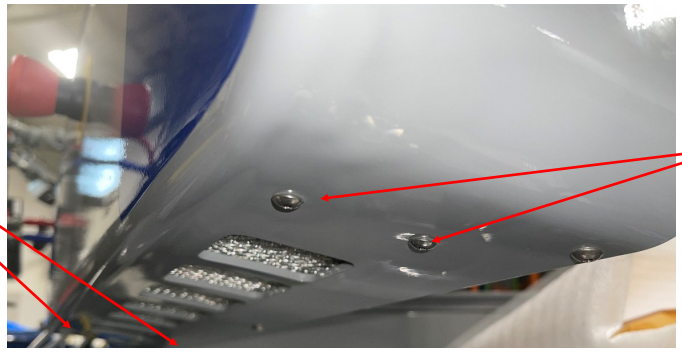
The following steps describe removal, cleaning, and installation of the reusable air filter.

1. Press the Stop button on the IS40 screen and turn off power by rotating the power switch to the Off (O) position.
2. Open the Control Module by rotating the door locks to the open position.
3. Locate the air filter in the bottom of the Control Module door and remove the two (2) right side (facing the door) socket head M3 button screws and bracket holding the filter in place. Loosen left side (facing the door) button screws enough to allow the filter to be removed without removing the inner bracket.
4. Remove the filter.
5. Use a shop vac or compressed air to remove dust and debris from the filter, counter to the flow direction.
6. Soak the filter in warm soapy water, agitating regularly. Rinse with warm water and repeat until the wash water is clean.
7. Shake excess water off the filter and allow to dry thoroughly. ‘
8. Reinstall the filter in reverse order.
9. Close the Control Module door and secure door locks in closed position.

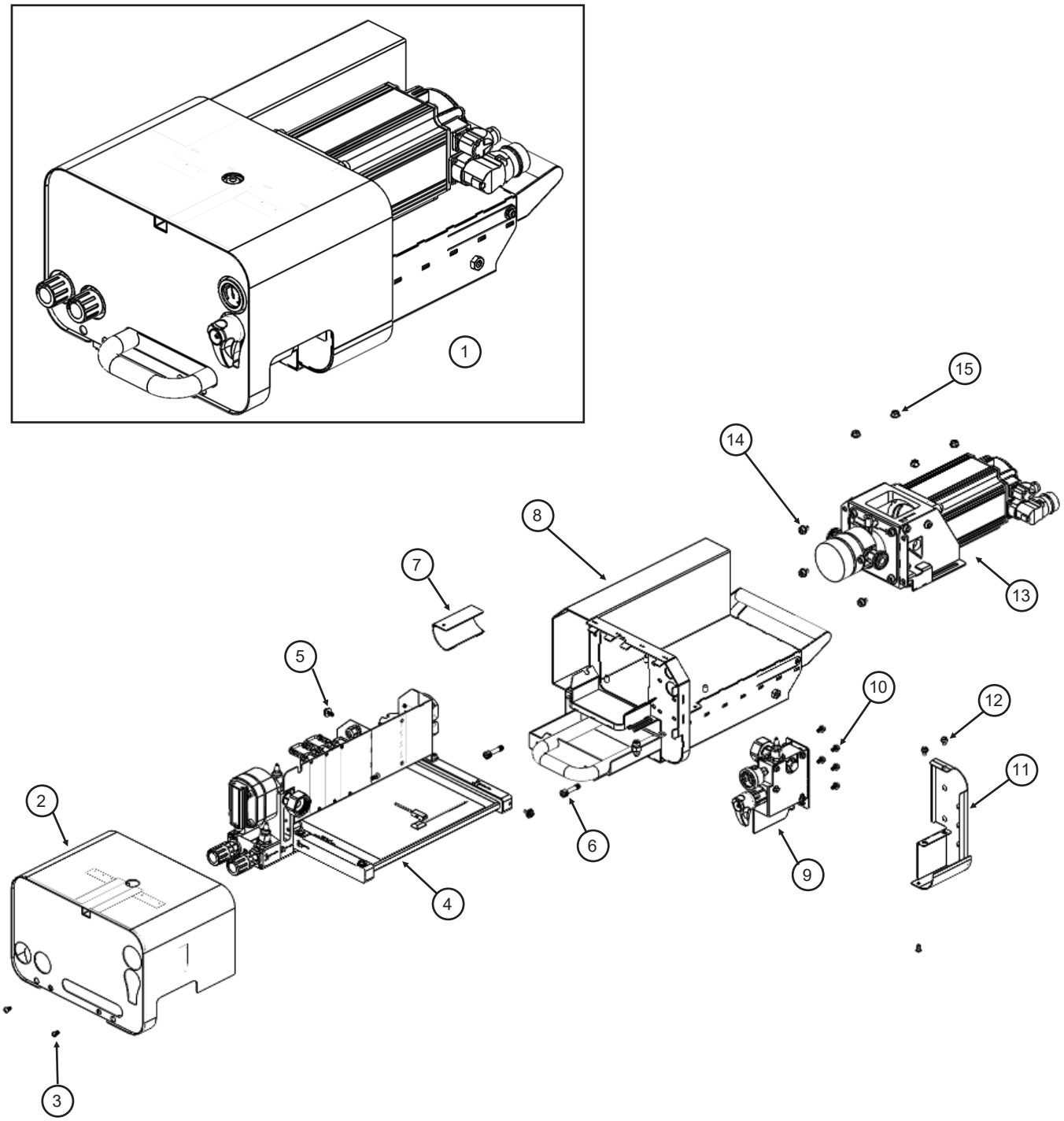




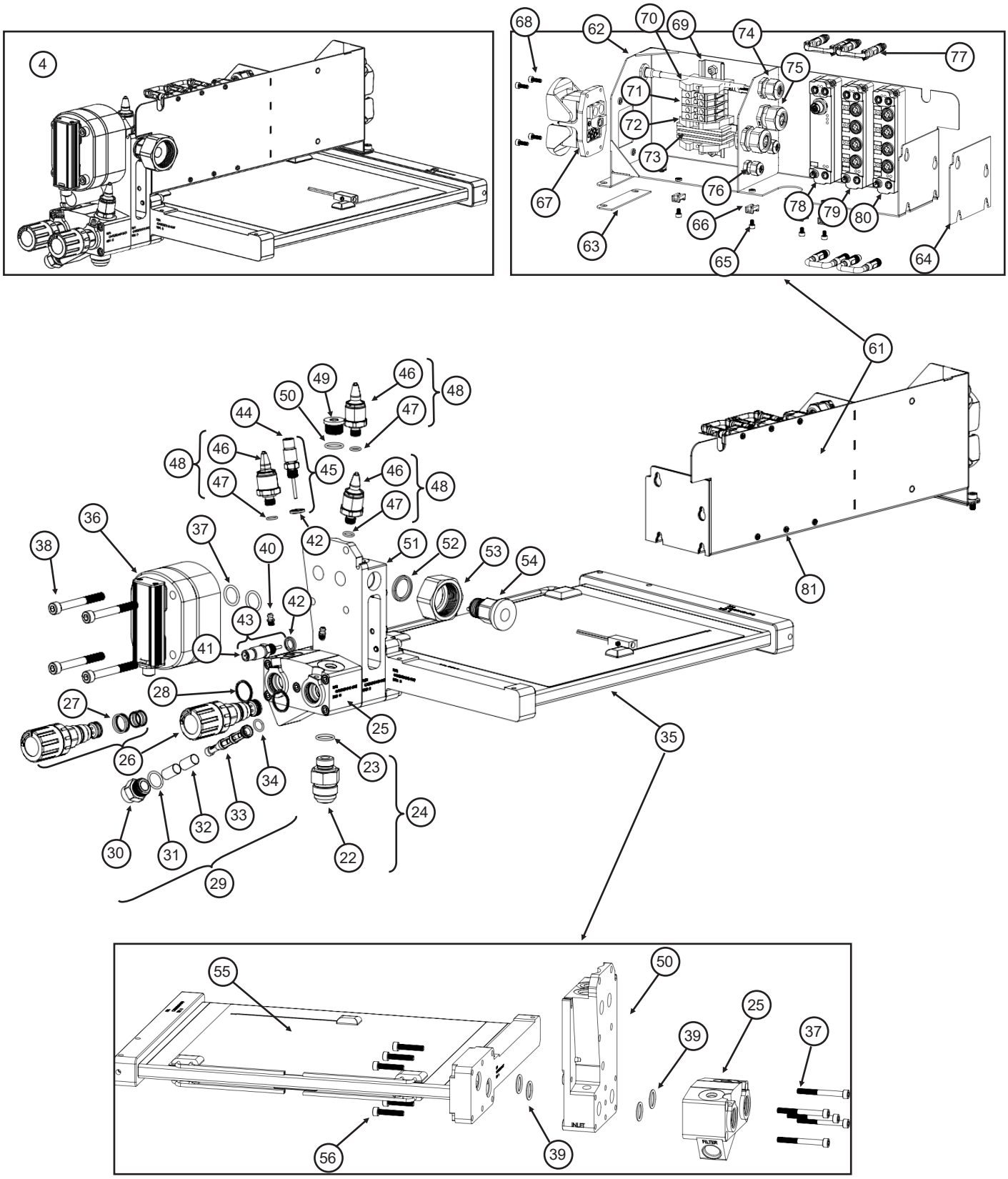




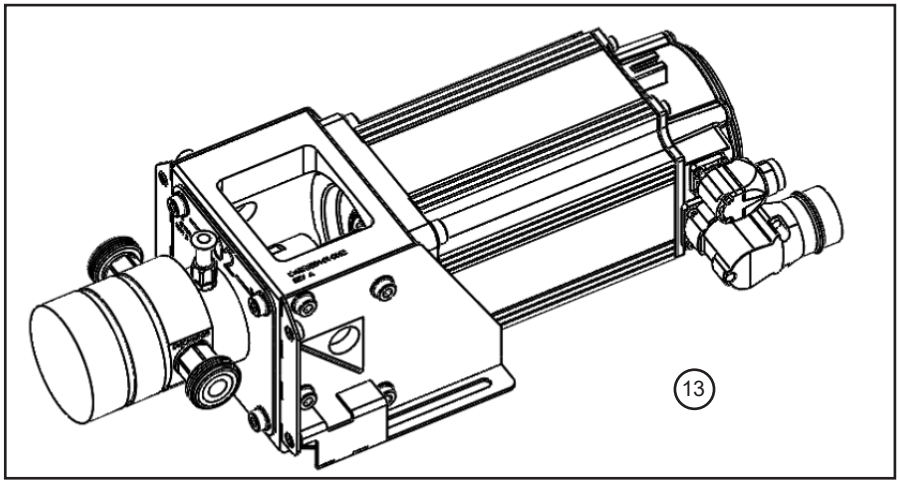
FLUID MODULE - ITEM NUMBERS

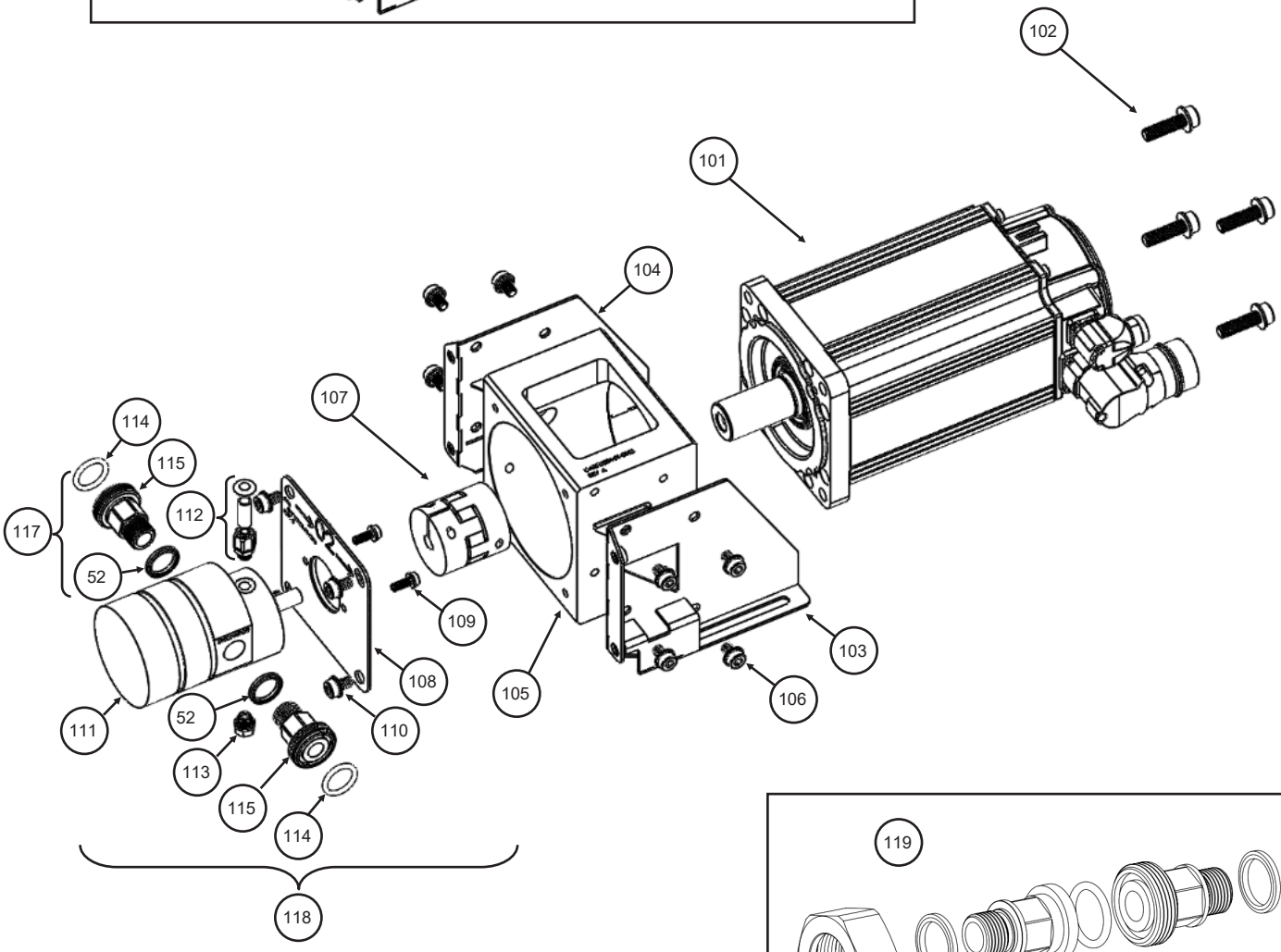


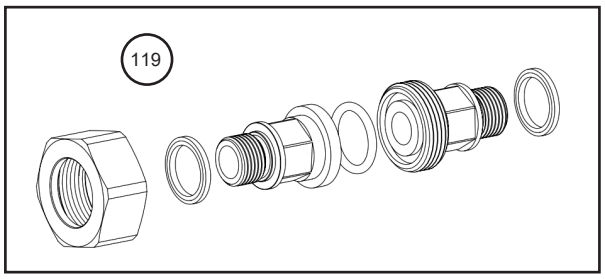
FLUID MODULE - ITEM NUMBERS



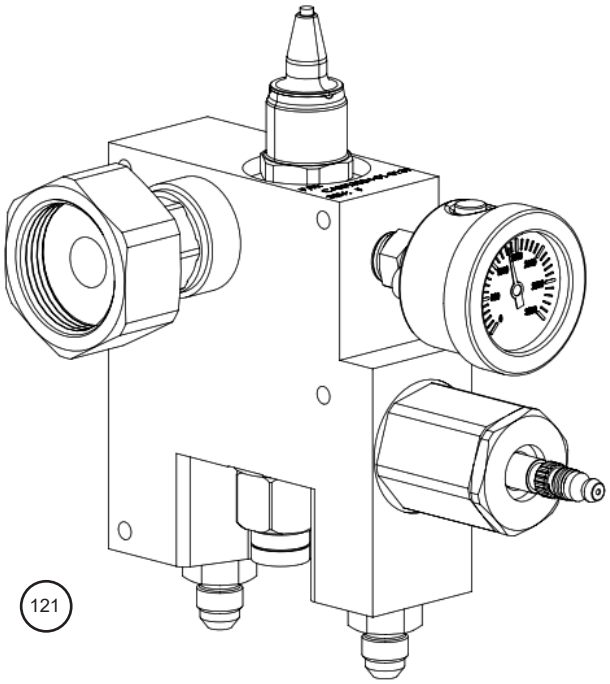
FLUID MODULE - ITEM NUMBERS

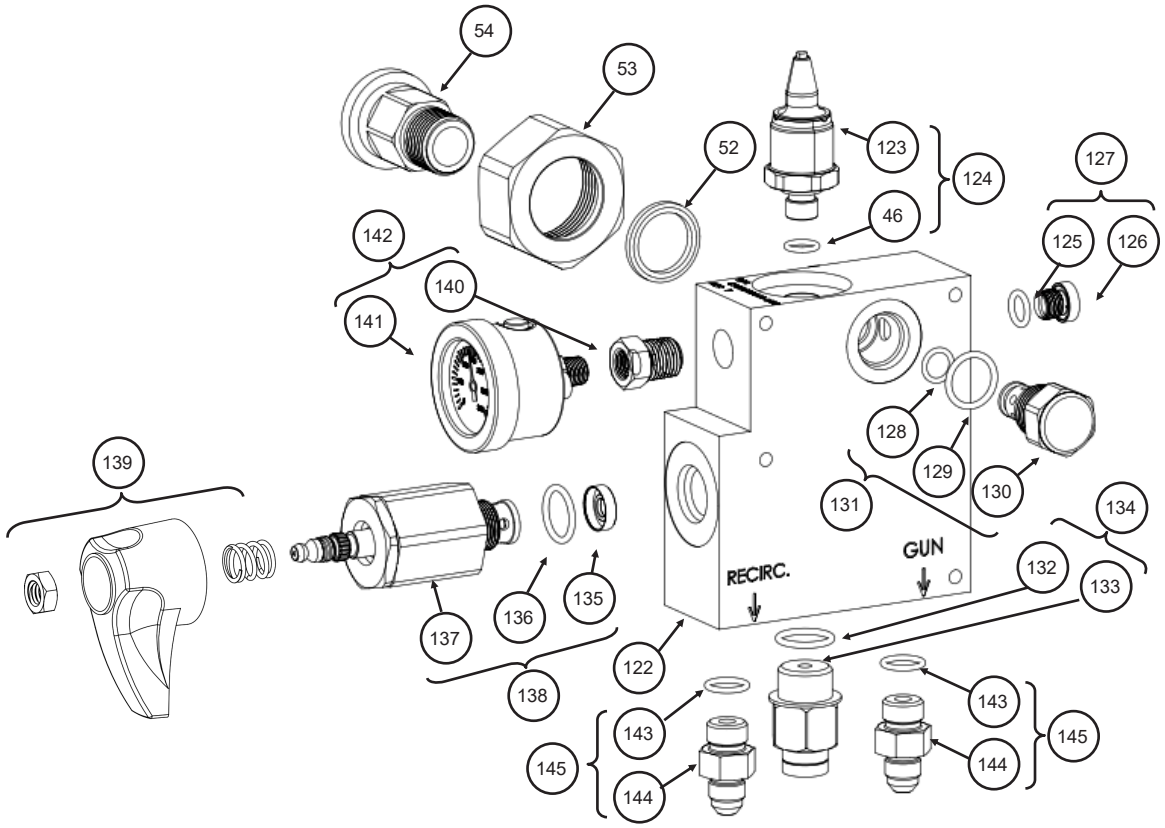






FLUID MODULE - ITEM NUMBERS





FLUID MODULE - PARTS LIST

ITEM	PN	DESCRIPTION	QTY
1	341000 341001	ASSEMBLY, 7D A FLUID MODULE ASSEMBLY, 7E B FLUID MODULE	1
2	341005 341019	COVER, FRONT, FLUID MODULE A COVER, FRONT, FLUID MODULE B	1
3	NA	SCREW, BUTTON HEAD	2
4	341007	ASSEMBLY, HEATER MODULE POPULATED	1
5	NA	SCREW, SOCKET HEAD	4
6	NA	SCREW, CAPTIVE, SOCKET HEAD	2
7	341052	COVER, LOWER, FLUID MODULE	1
8	NA	FRAME, FLUID MODULE	1
9	NA	ASSEMBLY, HIGH PRESSURE	1
10	NA	SCREW, SOCKET HEAD	5
11	341092	COVER, SIDE, FLUID MODULE	1
12	NA	SCREW, SOCKET HEAD	4
13	NA	ASSEMBLY, PUMP MODULE A ASSEMBLY, PUMP MODULE B	1
14	NA	SCREW, SOCKET HEAD	4
15	NA	SCREW, SOCKET HEAD	4
16-21	UNUSED		
22	NA	FITTING, INLET, JIC 12	1
23	341093	O-RING, INLET FITTING	1
24	341094	ASSEMBLY, INLET FITTING (INCL 22, 23)	1
25	341047	KIT, MANIFOLD, FILTER (INCL 28,39, 40)	1
26	341016	VALVE, CARTRIDGE (INCL 27)	2
27	341031	KIT, CARTRIDGE VALVE SEALS 2 PK	2
28	340981	O-RING, X-PROFILE, CARTRIDGE VALVE 4PK	2
29	341051	ASSEMBLY, INLET FILTER (INCL 30-34)	1
30	341050	CAP, FILTER (INCL 31)	1
31	340992	O-RING, FILTER CAP, 2PK	1
32	341027 341028	SCREEN, FILTER, 40 MESH 10 PK SCREEN, FILTER, 40 MESH, 50 PK	2

NOTE: Items showing NA for part number are not offered as a standard spare part. These items are not expected to fail, or can be acquired from local hardware outlets. If needed, they can be special ordered from Carlisle through authorized Carlisle Distributors.

FLUID MODULE - PARTS LIST

ITEM	PN	DESCRIPTION	QTY
33	341045	BODY, FILTER	1
34	340991 341029	O-RING, FILTER BODY, 2 PK O-RING, FILTER BODY, 10 PK	1
35	341006	ASSEMBLY, HEATER MODULE NOT POPULATED (INCL 25, 50, 54)	1
36	341078	FLOW METER (INCL. CABLE, AND QTY 2 TEM 37)	1
37	341095	O-RING, FLOW METER, 2PK	
38	NA	SCREW, CAPTIVE, SOCKET HEAD	2
39	341096	O-RING, FILTER AND FLOW METER MANIFOLDS, 4 PK	4
40	341030	FITTING, ZERK, 2 PK	2
41	NA	SENSOR, TEMP SHORT	1
42	341097	SEAL KIT, TEMP SENSOR 3 PK	2
43	341098	KIT, SENSOR, TEMP, SHORT (INCL 41 & QTY 1 42)	1
44	NA	SENSOR, TEMP LONG	1
45	341099	KIT, SENSOR, TEMP, LONG (INCL 44 & QTY 1 42)	1
46	NA	SENSOR, PRESSURE 500 PSI	3
47	341100	O-RING, PRESSURE SENSOR 4 PK	3
48	341057	KIT, PRESSURE SENSOR 500 PSI (INCL, 47)	3
49	NA	PLUG	1
50	341101	O-RING, PLUG	1
51	341102	MANIFOLD, FLOW METER	1
52	341103	SEAL, PUMP UNION NIPPLE	1
53	341104	NUT, UNION	1
54	341002	UNION END, FLAT	1
55	341049	ASSEMBLY, HEATER MODULE	1
56	NA	SCREW, CAPTIVE, SOCKET HEAD	6
57-60	UNUSED		
61	341048	ASSEMBLY, FLUID MODULE I/O	1
62	NA	WELDMENT, FLUID MODULE I/O	1
63	NA	INSULATION, PUMP MODULE REAR	1
64	NA	INSULATION, PUMP MODULE FRONT	1
65	NA	SCREW, SHCS M4X0.7X6	4
66	NA	MOUNT, CABLE TIE	4
67	NA	CONNECTOR, PUMP MODULE POWER	1

NOTE: Items showing NA for part number are not offered as a standard spare part. These items are not expected to fail, or can be acquired from local hardware outlets. If needed, they can be special ordered from Carlisle through authorized Carlisle Distributors.

FLUID MODULE - PARTS LIST

ITEM	PN	DESCRIPTION	QTY
68	NA	SCREW, SHCS M4X0.7X16	4
69	NA	DIN RAIL	1
70	NA	DIN END ANCHOR	3
71	NA	TERMINAL BLOCK	1
72	NA	TERMINAL BLOCK	1
73	NA	TERMINAL BLOCK	1
74	NA	ASSY, CABLE GLAND PG11	2
75	NA	ASSY, CABLE GLAND PG16	2
76	NA	ASSY, CABLE GLAND PG7	2
77	NA	CABLE,	1
78	341024	MODULE, INPUT, ENCODER 24V	1
79	341023	MODULE, INPUT TEMPERATURE, 4 CH	1
80	341022	MODULE, INPUT PRESSURE, 4 CH	1
81	NA	SCREW, SHCS M3X0.5X16	6
82-100	UNUSED		
101	341034 341035	KIT, MOTOR, A SIDE (INCL 102) KIT, MOTOR, B SIDE (INCL 102)	1
102	NA	SCREW, SHCS	4
103	NA	BRACKET,	
104	NA	BRACKET,	
105	NA	MOUNT,	
106	NA	SCREW, SHCS	8
107	341040	KIT, COUPLING MOTOR TO PUMP	1
108	NA	PLATE, PUMP MOUNT	1
109	NA	SCREW, SHCS	2
110	NA	SCREW, SHCS	4
111	340999	PUMP, GEAR	1
112	341043	KIT, TSL FILLER	1
113	341105	PLUG, TSL RESERVOIR	1
114	341003	O-RING, PUMP UNION, 2PK	2
115	341106	UNION END, SLOTTED FACE	2
116	341107	SEAL	2
117	341046	KIT, PUMP UNION (INCL, 51, 52, 53, 114,115)	2
118	341033	KIT, PUMP ASSY (INCL, 51, 108, 108, 111, 112, 113, 114,115)	2

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FLUID MODULE - PARTS LIST

ITEM	PN	DESCRIPTION	QTY
119	341004	ASSY, PUMP UNION (INCL 2X52, 53, 54, 115, 2X114)	2
120	UNUSED		
121	NA	ASSY, HIGH PRESSURE MANIFOLD	1
122	341108	HIGH PRESSURE MANIFOLD	1
123	NA	HIGH PRESSURE SENSOR 0-5000 PSI	1
124	341058	KIT, HIGH PRESSURE SENSOR 0-5000 PSI (INCL 46)	1
125	341109	PLUG, HP MANIFOLD	1
126	341110	O-RING, PLUG	1
127	341111	KIT, HP MANIFOLD PLUG (INCL 126)	1
128	341112	O-RING, SMALL, CHECK VALVE (2 PK)	2
129	341113	O-RING, LARGE, CHECK VALVE	1
130	341114	CHECK VALVE	1
131	341037	KIT, CHECK VALVE (INCL 128, 129, 130)	1
132	341115	O-RING, BURST DISK	1
133	NA	BURST DISK, 7000 PSI	1
134	341011	ASSY, BURST DISK (INCL 132, 133)	1
135	341116	SEAL, RECIRC VALVE	1
136	341117	O-RING, RECIRC VALVE	1
137	NA	RECIRC VALVE	1
138	341118	KIT, RECIRC VALVE (INC. 135, 136, 137)	1
139	341053 341054	RECIRC HANDLE, BLUE RECIRC HANDLE, RED	1
140	341119	FITTING, NPT, 1/4”X1/8” BUSHING	1
141	340989	GAUGE, PRESSURE, 3000 PSI 1/4” NPT	1
142	341036	KIT, PRESSURE GAUGE (INCL. 139, 140)	1
143	341120	O-RING, ORB 5/6 JIC	2
144	NA	FITTING, JIC 5 FOR A SIDE MODULE FITTING, JIC 6 FOR B SIDE MODULE	2
145	341121 341122	KIT, FITTING, JIC 5 FOR A SIDE MODULE (INCL 142) KIT, FITTING, JIC 6 FOR B SIDE MODULE (INCL 142)	2

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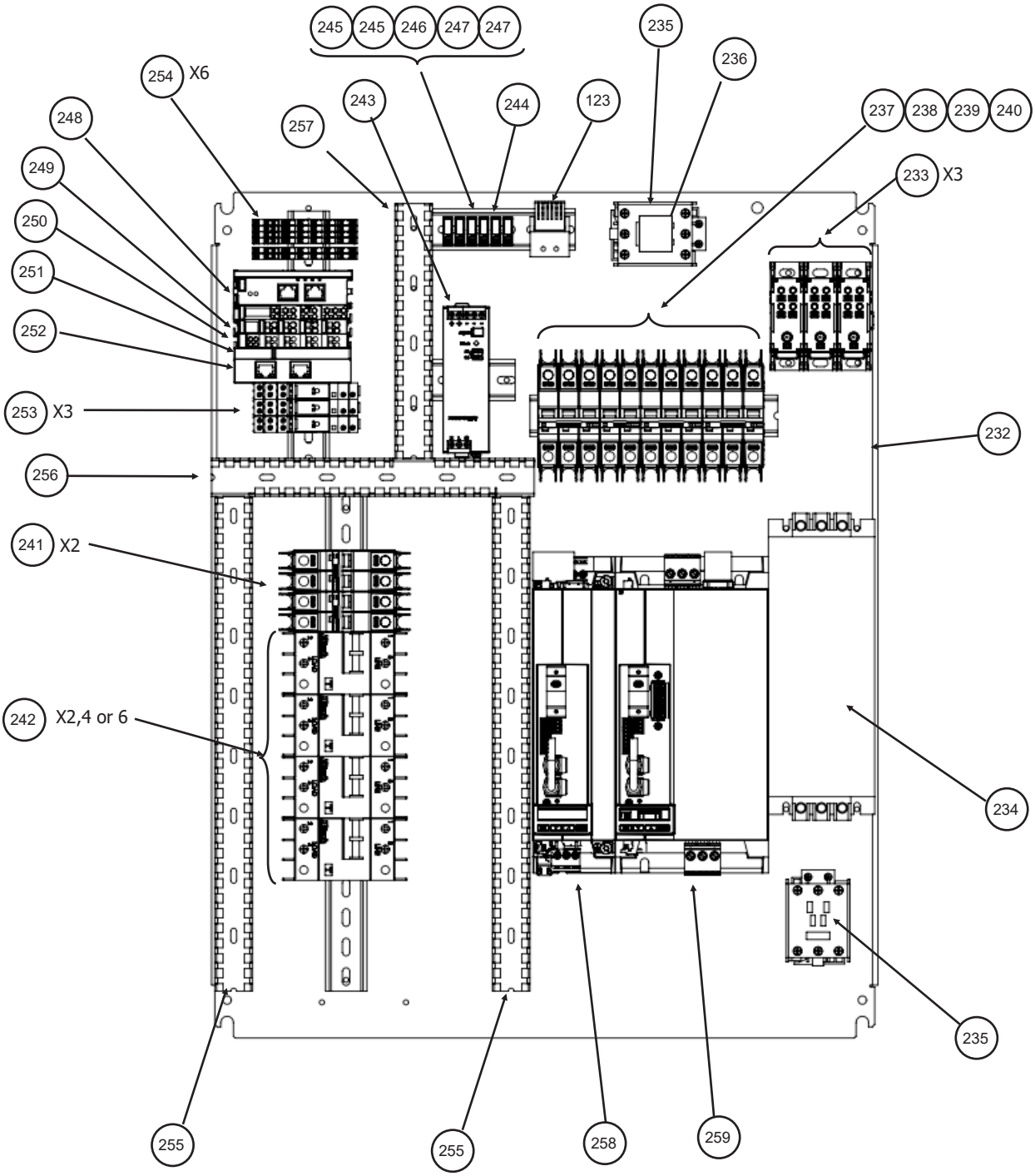
MAIN PANEL - ITEM NUMBERS



CONTROL MODULE - PARTS LIST

ITEM	PN	DESCRIPTION	QTY
231	NA	ASSY, MAIN PANEL	1
232	NA	BACK PANEL	1
233	NA	BLOCK, DISTRIBUTION	3
234	341072	LINE FILTER, EMC	1
235	341235	CONTACTOR, MAINS	2
236	341236	HEATER MAINS CONTACTOR	1
237	341237	CIRCUIT BREAKER, HEATERS, 60A	1
238	341238	CIRCUIT BREAKER, 24V POWER SUPPLY, 6A	1
239	341239	CIRCUIT BREAKER, A PUMP MOTOR, 13A	1
240	341240	CIRCUIT BREAKER, B PUMP MOTOR, 30A	1
241	341241	CIRCUIT BREAKER, A AND B PREHEAT, 50A	2
242	341242	CIRCUIT BREAKER & GFCI, A AND B HOSE SECTIONS 15A	2,4, or 6
243	341243	POWER SUPPLY, 24VDC	1
244	NA	BUSSBAR, 24VDC	1
245	341245	CIRCUIT BREAKER, 24VDC TO SERVO OR HMI, 5A	2
246	341246	CIRCUIT BREAKER, 24VDC TO COOLING FAN, 1A	1
247	341247	CIRCUIT BREAKER, 24VDC TO A OR B MODULE, 3A	2
248	341018	ETHERCAT JUNCTION, 2 PORT, EK1122	1
249	341020	DIGITAL INPUT MODULE, 8CH, EL1008	1
250	341021	DIGITAL OUTPUT MODULE, 16CH, EL2809	1
251	NA	NOT USED	0
252	341017	ETHERCAT COUPLER, EK1100	1
253	341253	RELAY, DPDT 24VDC	3
254	NA	TERMINAL BLOCK	6
255	NA	CABLE TRACK	1
256	NA	CABLE TRACK	1
257	NA	CABLE TRACK	1
258	341055	DRIVE MODULE, A SIDE PUMP MOTOR	1
259	341056	DRIVE MODULE, B SIDE PUMP MOTOR	1
260	NA	NOT USED	0

NOTE: Items showing NA for part number are not offered as a standard spare part. These items are not expected to fail, or can be acquired from local hardware outlets. If needed, they can be special ordered from Carlisle through authorized Carlisle Distributors.

CONTROL MODULE - PARTS LIST

ITEM	PN	DESCRIPTION	QTY
201	341025	15IN HMI WITH CODESYS	1
202	341026	FILTER CUSTOM 4X16 7/8X1/2E	1
203	341027	FAN FILTER	1
204	341255	FAN, 120MMX38MM, 24V, 200CFM	1
205	341256	FAN, FILTER GUARD 120MM	1
206	341257	FAN, GRILL 120MM	1
207	341015	50AMP SSR W/THERMO PAD	4 or 6
208	341258	HEAT SNC, 1.7C/W, 2 POS	2 or 4
209	341259	CELLULAR MODEM (US, CA, MEX ONLY)	1
210	341260	ANTENNA	1

NOTE: Items showing NA for part number are not offered as a standard spare part. These items are not expected to fail, or can be acquired from local hardware outlets. If needed, they can be special ordered from Carlisle through authorized Carlisle Distributors.

REMOTE ACCESS

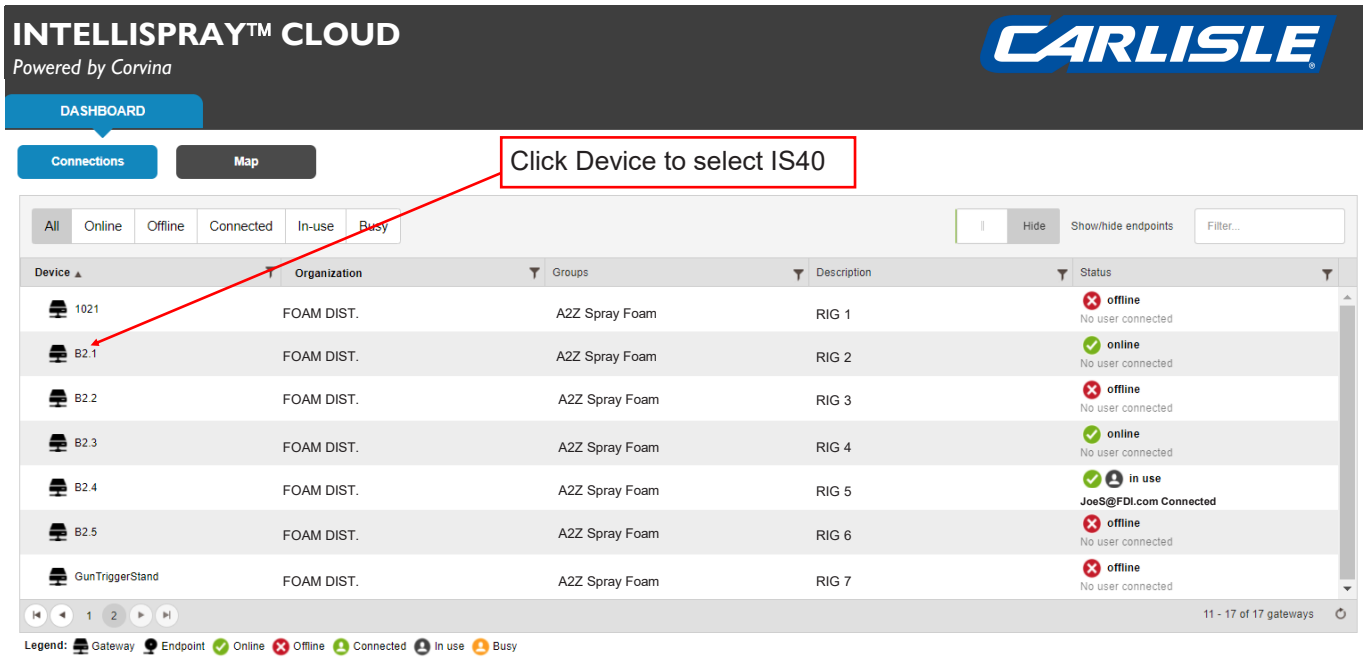
Remote access to IS40 systems is via the IntelliSpray Cloud (ISC) which acts as a virtual gateway to all systems accessible to registered users. The ISC URL (web address) is provided when purchasing an IS40. Remote access to IS40 systems is a simple two step process that requires a computer, tablet, or phone equipped with a web browser. Carlisle Authorized Service Providers and/or trained Rig Administrators provide username and password access to both the ISC and individual IS40s. Users or Rig Owners can also disable or enable Remote Access from the System Settings screen on the IS40. Instructions for ISC Administrators is contained in the document "IntelliSpray Cloud Administrator Instructions".

Note: To support remote service (including remote software upgrades), all IS40 systems are factory configured to allow access by Carlisle Service Engineers and/or Authorized Service Providers.

Step 1. Select IS40 From IntelliSpray Cloud

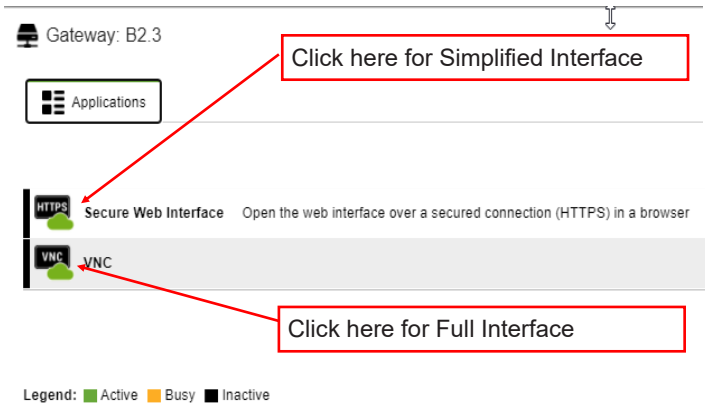
An example of the ISC gateway shown in a standard browser is shown in the following figure. Each device has a unique Serial Number (SN) that is loaded at the factory and corresponds to the serial tag inside the Control Module and the SN shown at the top of all display screens and in the System Status screen. The Organization column shows the primary service provider (generally a Distributor). The Group column generally refers to the rig owner and the Description column is a free-form field to identify a specific IS40 (e.g. by rig name as shown below).

The Status column indicates which systems are online, and if any remote users are connected to the machine.



2. Open Connection to IS40

Clicking on a Device in the first column creates a secure connection to that system, and allows the user to select either a full interface or a simplified interface. When using the full interface, the remote user is seeing and using the actual IS40 screens via a Virtual Network Connection (VNC icon). The simplified interface (HTTPS icon) is a direct peer-to-peer interface that allows monitoring and/or controlling the primary functions of the system.

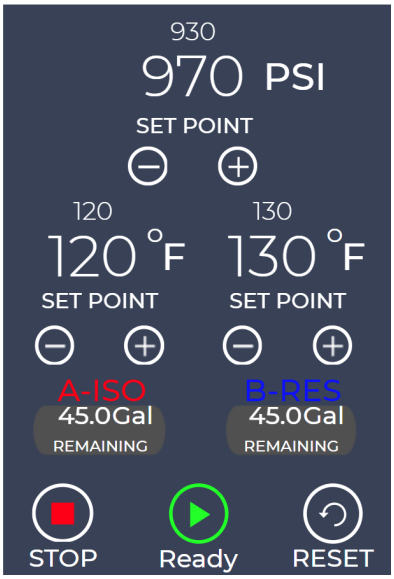


REMOTE ACCESS - OVERVIEW

Each IS40 Proportioner is factory equipped with an internal cellular modem that enables remote access for operating, monitoring, updating, and/or servicing the system. Access by registered users (see previous page) is via any computer, phone, or tablet equipped with a standard browser (e.g. IE, Chrome, Safari). The cellular modem also allows users to email Job Reports and performance data to selected recipients. The IS40 automatically connects to the internet when it is powered on and within cell coverage. No user interaction is required to connect the IS40 to the internet. Initial cellular fees (up to 12 months) are included in the purchase price, with ongoing rates subject to purchase and /or service agreements.

IS40 Cellular Modem Antenna

Full Interface (VNC) access on phone

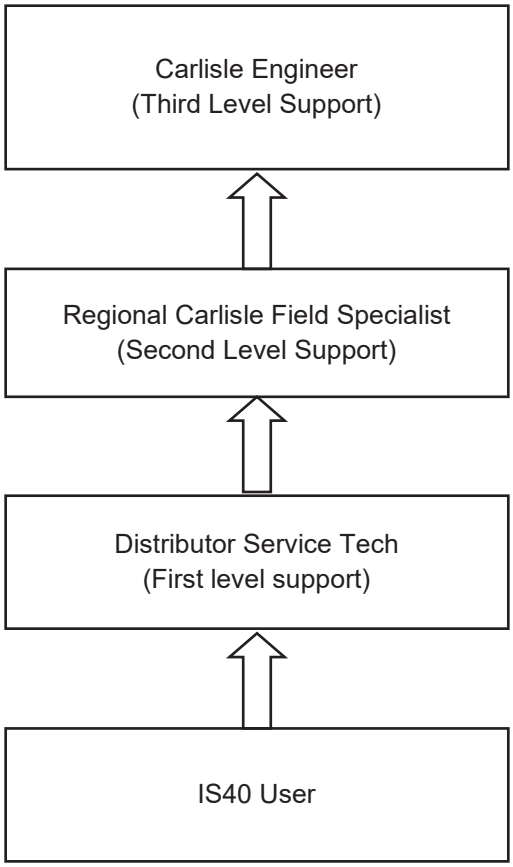


Simplified Interface (HTTPS) remote access on computer, phone, or tablet

Full Interface (VNC) access on computer

REMOTE SERVICE - OVERVIEW

The remote access capabilities of the IS40 enables service providers to connect to any system and provide assistance in the form of remote diagnostics, application optimization, remote software upgrades, and training on system use. Users can call or text their authorized support contact to initiate a remote support session. If escalation to second and third level support staff is required, those individuals can also connect to the IS40. All parties can be connected to an IS40 simultaneously if required to resolve issues or answer questions.



Note that a user does not have to be in the spray rig to initiate a remote service event, but the IS40 must be powered on and within cell-range to establish a remote connection. When they call or text their authorized service provider, that provider can remotely access the IS40 and in some cases resolve the issue without the user having to leave the spray environment.

SYSTEM ERRORS AND ACTIONS

When an error occurs, the IS40 automatically enters STOP state and turns off power to heaters and motors. If the system is in an error state, the user must eliminate the error condition and press the RESET button before restarting the system. The Alarm Screen provides users more information on the error condition and recommended actions. The following tables contain the same information that is displayed for each error.

Error Number	Alarm Description	Condition	Action
1	Emergency Push Button Enabled	Emergency stop button pressed	Pull out emergancy stop button on front of machine
2	Drive A Error	Drive Error "FXXXX"	Cycle system power. If condition continues contact technical support.
3	Drive B Error	Drive Error "FXXXX"	Cycle system power. If condition continues contact technical support.
4	Pressure Imbalance	1. A/B pressure difference exceeds max setpoint 2. Gun filter clog 3. Gun manifold closed 4. Material viscosity difference	1. Check gun manifold valves are open 2. Check and clean/replace gun filters 3. Adjust material temp setpoints to balance pressure difference 4. Enable AVC mode 5. Increase allowable pressure different in Recipes Menu
5	Material A Below Set Point	A material level below error setpoint	1. Add material or change drum 2. Update Gallon Amount
6	Material B Below Set Point	B material level below error setpoint	1. Add material or change drum 2. Update Gallon Amount
7	Ethercat Bus Error	Device communication lost	1. Verify all ethernet (green) cables are propertly connected to each port
8	Drive A Overload Shutdown	Drive Overloaded	Reduce system pressure
9	Drive B Overload Shutdown	Drive Overloaded	Reduce system pressure
10	Drive A Amplifier Over Temperature Shutdown	Drive Overheating	Reduce system pressure
11	Drive B Amplifier Over Temperature Shutdown	Drive Overheating	Reduce system pressure
12	Drive A Motor Shutdown Temperature	Motor Overheating	Reduce system pressure
13	Drive B Motor Shutdown Temperature	Motor Overheating	Reduce system pressure
14	Drive A Control Voltage Error	Incorrect DC voltage supply	Verify cabinet DC voltage supply is providing ~12VDC, adjust output if required
15	Drive B Control Voltage Error	Incorrect DC voltage supply	Verify cabinet DC voltage supply is providing ~12VDC, adjust output if required
16	Drive A Encoder Error	Motor Encoder Error	Check encoder cable connection at drive and fluid module. Power cycle system, contact tech service is problem persists
17	Drive B Encoder Error	Motor Encoder Error	Check encoder cable connection at drive and fluid module. Power cycle system, contact tech service is problem persists
18	Drive A Over Current Error	Drive Overloaded	Reduce system pressure
19	Drive B Over Current Error	Drive Overloaded	Reduce system pressure
20	Drive A Over Voltage Error	Incorrect AC supply voltage	Verifly correct supply voltage (200-240V)
21	Drive B Over Voltage Error	Incorrect AC supply voltage	Verifly correct supply voltage (200-240V)
22	Drive A Under Voltage Error	Incorrect AC supply voltage	Verifly correct supply voltage (200-240V)
23	Drive B Under Voltage Error	Incorrect AC supply voltage	Verifly correct supply voltage (200-240V)
24	Drive A Excessive Deviation	Pump and motor position position error	Verify the coupling is properly installed with correct torque settings
25	Drive B Excessive Deviation	Pump and motor position position error	Verify the coupling is properly installed with correct torque settings
26	Drive A Communication Error	Lost communication with Drive A	Verify system ethernet cables are connected to the correct ports
27	Drive B Communication Error	Lost communication with Drive B	Verify system ethernet cables are connected to the correct ports
28	Drive A Position Limit Value Excedded	Drive A limit exceded	Power cycle system, contact tech service is problem persists
29	Drive B Position Limit Value Excedded	Drive B limit exceded	Power cycle system, contact tech service is problem persists
30	System Ratio Error	1. Air in the lines 2. Pump Failure	1. Purge all air from supply lines, proportioner, and hoses 2. Check pump efficiency and replace pump if necessary

SYSTEM ERRORS AND ACTIONS (continued)

Error Number	Alarm Description	Condition	Action
100	Insufficient Drum Pump Pressure A	1. A drum pump off 2. A drum pump pressure too low 3. A inlet valve stuck or closed 4. Insufficient A material Level 5. Cold A material 6. Minimum pressure setting too low 7. A inlet pressure sensor failure	1. Verify A drum pump is providing 100 -300 psi at proportioner 2. Verify A supply line valves are open 3. Check A drum material level 4. Warm A material to manufacturers recommendations 5. Lower minimum pressure setting in Settings screen 6. Check A inlet pressure sensor connectors, contact tech service
101	Excessive System Pressure A Post Gear Pump	1. A side pressure exceeds maximum system setpoint 2. A side gun manifold valve turned off 3. A side gun filter clogged 4. A post gear pump pressure sensor failure 5. B recirc valve open or stuck	1. Lower system pressure set point 2. Raise pressure error limit in Recipes screen 3. Verify A side gun manifold is in the open position 4. Clean or replace A side gun filter 5. Check A side outlet pressure sensor connector 6. Check B side recirc valve is not stuck and is in the gun position
102	Hose UnderTemp A End Modem	1. Heater cable disconnected or connected to the incorrect section 2. Hose heater wire failure	1. Check hose power connections 2. If problem continues, contact tech sevice
103	Hose OverTemp A End Modem	1. Hose overheat due to ambient condtions 2. Heater cable connected to the incorrect section	1. Allow hose to cool (and/or purge fluid through hose) 2. Check hose power connections
104	PreHeat Overtemp A	1. Preheater A too hot 2. Temperature sensor faiure	1. Allow preheater to cool (and/or purge fluid through preheater) 2. Check temperature sensor connector
105	Filter Clog A	1. Filter clogged 2. Pressure drop error settting too low 3. Pressure sensor failure	1. Clean or replace filter element 2. Increase maximum allowable pressure drop in Recipes screen 3. Check inlet and outlet pressure sensor connectors
106	Insufficient Preheater Pressure A	1. A drum pump off 2. A drum pump pressure too low 3. A supply line, pre filter, and/or post filter valve closed 4. Insufficient A material Level 5. Cold A material 6. Minimum pressure setting too low 7. A inlet pressure sensor failure 8. Pressure sensor failure 9. A pre-filter or inlet valve logged 10. A flow meter stuck	1. Verify A drum pump is providing 100 -300 psi at proportioner 2. Verify A inlet and filter valves are open 3. Check A drum material level 4. Warm A material to manufacturers recommendations 5. Lower minimum pressure error setting in Settings screen 6. Check A pressure sensor connectors 7. Clean or replace A inlet filter 8. Remove A filter inlet valve and check for debris 9. Remove A flow meter and check for solids of debris
107	Insufficient Filter Pressure A	1. A drum pump off 2. A drum pump pressure too low 3. A supply line or pre filter valve closed 4. Insufficient A material Level 5. Cold A material 6. Minimum pressure setting too low 7. Pressure sensor failure 8. A pre-filter or inlet valve logged	1. Verify A drum pump is providing 100 -300 psi at proportioner 2. Verify A inlet and filter valves are open 3. Check A drum material level 4. Warm A material to manufacturers recommendations 5. Lower minimum pressure error setting in Settings screen 6. Check A pressure sensor connectors 7. Clean or replace A inlet filter 8. Remove A filter inlet valve and check for debris
108	Excessive Drum Pump Pressure A	1. A drum pump pressure too high 2. Pressure sensor failure 3. A check valve leak	1. Verify A drum pump is providing 100 -300 psi at proportioner 2. Increase maximum inlet pressure setting in Settings screen 3. Check A inlet pressure sensor connector 4. Check or replace A side high pressure check valve
109	Excessive System Pressure A SMOSE	1. A side pressure exceeds maximum system setpoint 2. A side gun manifold valve turned off 3. A side gun filter clogged 4. B side recirc valve in open (recirc) position 5. Hose pressure sensor not calibrated 6. Hose pressure sensor failure	1. Lower pressure set point 2. Raise pressure error limit in Recipes Screen 3. Verify A side gun manifold is in the open position 4. Clean or replace A side gun filter 5. Check B side recirc valve is in hose (gun) position 6. Check hose calibration (see Hose Calibration in System Screen)
110	A Flow Meter Error	Flow meter failure	Check A flow meter and connector

SYSTEM ERRORS AND ACTIONS (continued)

Error Number	Alarm Description	Condition	Action
111	A Pre Heat RTD Body Top Error	Sensor failure	Check RTD sensor and connector
112	A Pre Heat RTD Body Bottom Error	Sensor failure	Check RTD sensor and connector
113	A Pre Heat RTD In Error	Sensor failure	Check RTD sensor and connector
114	A Pre Heat RTD Out Error	Sensor failure	Check RTD sensor and connector
115	A Pre Filter Pressure Sensor Error	1. Excessive Pressure 2. Pressure below zero 3. Sensor failure	1. Replace check valve if leaking back 2. Check for cavitation 3. Check connector 4. Replace sensor
116	A Post Filter Pressure Sensor Error	1. Excessive Pressure 2. Pressure below zero 3. Sensor failure	1. Replace check valve if leaking back 2. Check for cavitation 3. Check connector 4. Replace sensor
117	A Pre Gear Pump Pressure Sensor Error	1. Excessive Pressure 2. Pressure below zero 3. Sensor failure	1. Replace check valve if leaking back 2. Check for cavitation 3. Check connector 4. Replace sensor
118	A Post Gear Pump Pressure Sensor Error	Sensor failure	Check pressure sensor and connector
119	Hose UnderTemp A Middle 1 Modem	1. Heater cable disconnected or connected to the incorrect section 2. Hose heater wire failure	1. Check hose power connections
120	Hose OverTemp A Middle 1 Modem	1. Hose overheat due to ambient condtions 2. Heater cable connected to the incorrect section	1. Let system cool and/or purge material 2. Check heater cable connections
200	Insufficient Drum Pump Pressure B	1. B drum pump off 2. B drum pump pressure too low 3. B inlet valve stuck or closed 4. Insufficient B material Level 5. Cold B material 6. Minimum pressure setting too low 7. B inlet pressure sensor failure	1. Verify B drum pump is providing 100 -300 psi at proportioner 2. Verify B supply line valves are open 3. Check B drum material level 4. Warm B material to manufacturers recommendations 5. Lower minimum pressure setting in Settings screen 6. Check B inlet pressure sensor connectors, contact tech service
201	Excessive System Pressure B Post Gear Pump	1. B side pressure exceeds maximum system setpoint 2. A post gear pump pressure sensor failure	1. Lower system pressure set point 2. Raise system pressure error limit in Recipes screen 3. Check B side outlet pressure sensor connector
202	Hose Under Temp B End Modem	1. Heater cable disconnected or connected to the incorrect section 2. Hose heater wire failure	1. Check hose power connections 2. If problem continues, contact tech sevice
203	Hose OverTemp B End Modem	1. Hose overheat due to ambient condtions 2. Heater cable connected to the incorrect section	1. Allow hose to cool (and/or purge fluid through hose) 2. Check hose power connections
204	PreHeat Overtemp B	1. Preheater B too hot 2. Temperature sensor faiure	1. Allow preheater to cool (and/or purge fluid through preheater) 2. Check temperature sensor connector
205	Filter Clog B	1. Filter clogged 2. Pressure drop error settting too low 3. Pressure sensor failure	1. Clean or replace filter element 2. Increase maximum allowable pressure drop in Recipes screen 3. Check inlet and outlet pressure sensor connectors
206	Insufficient Preheater Pressure B	1. B drum pump off 2. B drum pump pressure too low 3. B supply line, pre filter, and/or post filter valve closed 4. Insufficient B material Level 5. Cold B material 6. Minimum pressure setting too low 7. B inlet pressure sensor failure 8. Pressure sensor failure 9. B pre-filter or inlet valve logged 10. B flow meter stuck	1. Verify B drum pump is providing 100 -300 psi at proportioner 2. Verify B inlet and filter valves are open 3. Check B drum material level 4. Warm B material to manufacturers recommendations 5. Lower minimum pressure error setting in Settings screen 6. Check B pressure sensor connectors 7. Clean or replace B inlet filter 8. Remove B filter inlet valve and check for debris 9. Remove B flow meter and check for solids of debris

SYSTEM ERRORS AND ACTIONS (continued)

Error Number	Alarm Description	Condition	Action
207	Insufficient Filter Pressure B	1. B drum pump off 2. B drum pump pressure too low 3. B supply line or pre filter valve closed 4. Insufficient B material Level 5. Cold B material 6. Minimum pressure setting too low 7. Pressure sensor failure 8. B pre-filter or inlet valve logged	1. Verify B drum pump is providing 100 -300 psi at proportioner 2. Verify B inlet and filter valves are open 3. Check B drum material level 4. Warm B material to manufacturers recommendations 5. Lower minimum pressure error setting in Settings screen 6. Check B pressure sensor connectors 7. Clean or replace B inlet filter 8. Remove B filter inlet valve and check for debris
208	Excessive Drum Pump Pressure B	B drum pump pressure too high Pressure sensor failure B high pressure check valve leak	Check that B pump is pressurized to provide 100-150 psi at system Check B inlet pressure sensor connector Check or replace B side high pressure check valve
209	Excessive System Pressure B SMOSE	1. B drum pump pressure too high 2. Pressure sensor failure 3. B check valve leak	1. Verify B drum pump is providing 100 -300 psi at proportioner 2. Increase maximum inlet pressure setting in Settings screen 3. Check B inlet pressure sensor connector 4. Check or replace B side high pressure check valve
210	B Flow Meter Error	Flow meter failure	Check A flow meter and connector
211	B Pre Heat RTD Body Top Error	Sensor failure	Check RTD sensor and connector
212	B Pre Heat RTD Body Bottom Error	Sensor failure	Check RTD sensor and connector
213	B Pre Heat RTD In Error	1. Excessive Pressure 2. Pressure below zero 3. Sensor failure	1. Replace check valve if leaking back 2. Check for cavitation 3. Check connector 4. Replace sensor
214	B Pre Heat RTD Out Error	Sensor failure	Check RTD sensor and connector
215	B Pre Filter Pressure Sensor Error	1. Excessive Pressure 2. Pressure below zero 3. Sensor failure	1. Replace check valve if leaking back 2. Check for cavitation 3. Check connector 4. Replace sensor
216	B Post Filter Pressure Sensor Error	1. Excessive Pressure 2. Pressure below zero 3. Sensor failure	1. Replace check valve if leaking back 2. Check for cavitation 3. Check connector 4. Replace sensor
217	B Pre Gear Pump Pressure Sensor Error	1. Excessive Pressure 2. Pressure below zero 3. Sensor failure	1. Replace check valve if leaking back 2. Check for cavitation 3. Check connector 4. Replace sensor
218	B Post Gear Pump Pressure Sensor Error	Sensor failure	Check pressure sensor and connector
219	Hose Under Temp B Middle 1 Modem	1. Heater cable disconnected or connected to the incorrect section 2. Hose heater wire failure	1. Check hose power connections
220	Hose OverTemp B Middle 1 Modem	1. Hose overheat due to ambient condtions 2. Heater cable connected to the incorrect section	1. Let system cool and/or purge material 2. Check heater cable connections
300	SMOSE MM - Yamar chip failed to initialize	Hardware failure	Cycle power
301	SMOSE MM - No PLC packets received	1. Frequency setting not optimal 2. Interference from other nearby systems 3. Modems not paired correctly 4. Incorrect hose configuration setting 4. Hardware failure.	1. Reposition hose (uncoil fully) 2. Check hose configuration (see Hose Configuration screen) 3. Pair, scan, set hose frequencies (see Hose Configuration screen)
302	SMOSE MM - Timeout waiting for Tx complete Interrupt	Hardware failure	Cycle power
303	SMOSE MM - Multiple master modems detected on RF link	1. Multiple systems in close proximity operating on the same frequency. 2. Modems not paired correctly	1. Move one system to a different frequency (see Hose Configuration screen) 2. Pair modems (see Hose Configuration screen)
304	SMOSE MM - Arbitration lost (bus may be shorted to GND or VDD	Bad connection between modem A and B sides	1. Check modem connection cable 2. Cycle power
305	SMOSE MM - No ACK from device (Verify I2C address for device is set correctly).	Bad connection between modem A and B sides	1. Check modem connection cable 2. Cycle power

SYSTEM ERRORS AND ACTIONS (continued)

Error Number	Alarm Description	Condition	Action
306	SMOSE MM - Timeout during I2C data transfer	Bad connection between modem A and B sides	1. Check modem connection cable 2. Cycle power
307	SMOSE MM - Other errors: OverUnderRun, DMA Error or Bus Error	Bad connection between modem A and B sides	1. Check modem connection cable 2. Cycle power
308	SMOSE MM - No pressure data from sensor (i2C read failure)	Bad connection between modem A and B sides	1. Check modem connection cable 2. Cycle power
309	SMOSE MM - Hose A pressure out of range	Pressure sensor out of calibration	Calibrate sensor (see Hose Configuration screen)
310	SMOSE MM - Hose B pressure out of range	Pressure sensor out of calibration	Calibrate sensor (see Hose Configuration screen)
311	SMOSE MM - No Temperature data from sensor (i2C read failure).	Bad connection between modem A and B sides	1. Check modem connection cable 2. Cycle power
312	SMOSE MM - Hose A temperature out of range	Hardware failure	Cycle power
313	SMOSE MM - Hose B temperature out of range	Hardware failure	Cycle power
314	SMOSE MM - Event Memory Pool is empty	Firmware error	Cycle power. Contact service and enable limp mode.
315	SMOSE MM - Flash Parameter Storage system error	Bad connection between modem A and B sides	1. Check modem connection cable 2. Cycle power
316	SMOSE MM - Error during DMA transfer	Bad connection between modem A and B sides	1. Check modem connection cable 2. Cycle power
317	SMOSE MM - EtherCAT chip failed to initialize End and Mid Modems: Not Applicable	Hardware failure	Cycle power
318	SMOSE MM - EtherCAT no Network link End and Mid Modems Not Applicable	1. No network connection between HMI and Main modem 2. Hardware Failure	1. Check network connection to main modem. Power Cycle.
319	SMOSE MM - Other uncategorized error condition	Hardware failure	Cycle power
320	SMOSE MM - Arbitration lost (bus may be shorted to GND or VDD	Bad connection between modem A and B sides	1. Check modem connection cable 2. Cycle power
321	SMOSE MM - No ACK from device (Verify I2C address for device is set correctly	1. Bad connection between modem A and B sides 2. Hardware failure	1. Check connection contacts are clean and secure between A and B sides of modem.
322	SMOSE MM - Timeout during I2C data transfer	Bad connection between modem A and B sides	1. Check modem connection cable 2. Cycle power
323	SMOSE MM - Other errors: OverUnderRun, DMA Error or Bus Error	Bad connection between modem A and B sides	1. Check modem connection cable 2. Cycle power
324	SMOSE MM - Arbitration lost (bus may be shorted to GND or VDD	Bad connection between modem A and B sides	1. Check modem connection cable 2. Cycle power
325	SMOSE MM - No ACK from device (Verify I2C address is correct	1. Bad connection between modem A and B sides 2. Hardware failure	1. Check connection contacts are clean and secure between A and B sides of modem.
326	SMOSE MM - Timeout during I2C data transfer	Bad connection between modem A and B sides	1. Check modem connection cable 2. Cycle power
327	SMOSE MM - Other errors: OverUnderRun, DMA Error or Bus Error	Bad connection between modem A and B sides	1. Check modem connection cable 2. Cycle power
400	SMOSE M1 - Yamar chip failed to initialize	Hardware failure	Cycle power
401	SMOSE M1 - No PLC packets received	1. Frequency setting not optimal 2. Interference from other nearby systems 3. Modems not paired correctly 4. Incorrect hose configuration setting 5. Hardware failure.	1. Reposition hose (uncoil fully) 2. Check hose configuration (see Hose Configuration screen) 3. Pair, scan, set hose frequencies (see Hose Configuration screen)
402	SMOSE M1 - Timeout waiting for Tx complete Interrupt	Hardware failure	Cycle power
403	SMOSE M1 - Multiple master modems detected on RF link	Bad connection between modem A and B sides	1. Check modem connection cable 2. Cycle power
404	SMOSE M1 - Arbitration lost (bus may be shorted to GND or VDD	Bad connection between modem A and B sides	1. Check modem connection cable 2. Cycle power
405	SMOSE M1 - No ACK from device (Verify I2C address for device is set correctly).	Bad connection between modem A and B sides	1. Check modem connection cable 2. Cycle power

SYSTEM ERRORS AND ACTIONS (continued)

Error Number	Alarm Description	Condition	Action
406	SMOSE M1 - Timeout during I2C data transfer	Bad connection between modem A and B sides	1. Check modem connection cable 2. Cycle power
407	SMOSE M1 - Other errors: OverUnderRun, DMA Error or Bus Error	Bad connection between modem A and B sides	1. Check modem connection cable 2. Cycle power
408	SMOSE M1 - No pressure data from sensor	Bad connection between modem A and B sides	1. Check modem connection cable 2. Cycle power
409	SMOSE M1 - Hose A pressure out of range	Pressure sensor out of calibration	Calibrate sensor
410	SMOSE M1 - Hose B pressure out of range	Pressure sensor out of calibration	Calibrate sensor
411	SMOSE M1 - No Temperature data from sensor	Bad connection between modem A and B sides	1. Check modem connection cable 2. Cycle power
412	SMOSE M1 - Hose A temperature out of range	Hardware failure	Cycle power
413	SMOSE M1 - Hose B temperature out of range	Hardware failure	Cycle power
414	SMOSE M1 - Event Memory Pool is empty	Firmware issue	Cycle power
415	SMOSE M1 - Flash Parameter Storage system error	Bad connection between modem A and B sides	1. Check modem connection cable 2. Cycle power
416	SMOSE M1 - Error during DMA transfer	Bad connection between modem A and B sides	1. Check modem connection cable 2. Cycle power
417	SMOSE M1 - EtherCAT chip failed to initialize. End and Mid Modems: Not Applicable	Hardware failure	Cycle power
418	SMOSE M1 - EtherCAT no Network link. End and Mid Modems Not Applicable	1. No network connection between HMI and Main modem 2. Hardware Failure	1. Check network connection to main modem. Power Cycle.
419	SMOSE M1 - Other uncategorized error condition	Hardware failure	Cycle power
420	SMOSE M1 - Arbitration lost (bus may be shorted to GND or VDD	Bad connection between modem A and B sides	1. Check modem connection cable 2. Cycle power
421	SMOSE M1 - No ACK from device	Bad connection between modem A and B sides	1. Check modem connection cable 2. Cycle power
422	SMOSE M1 - Timeout during I2C data transfer	Bad connection between modem A and B sides	1. Check modem connection cable 2. Cycle power
423	SMOSE M1 - Other errors: OverUnderRun, DMA Error or Bus Error	Bad connection between modem A and B sides	1. Check modem connection cable 2. Cycle power
424	SMOSE M1 - Arbitration lost (bus may be shorted to GND or VDD	Bad connection between modem A and B sides	1. Check modem connection cable 2. Cycle power
425	SMOSE M1 - No ACK from device	Bad connection between modem A and B sides	1. Check modem connection cable 2. Cycle power
426	SMOSE M1 - Timeout during I2C data transfer	Bad connection between modem A and B sides	1. Check modem connection cable 2. Cycle power
427	SMOSE M1 - Other errors: OverUnderRun, DMA Error or Bus Error	Bad connection between modem A and B sides	1. Check modem connection cable 2. Cycle power
600	SMOSE ME - Yamar chip failed to initialize	Hardware failure	Cycle power
601	SMOSE ME - No PLC packets received	1. Frequency setting not optimal 2. Interference from other nearby systems 3. Modems not paired correctly 4. Incorrect hose configuration setting 5. Hardware failure.	1. Reposition hose (uncoil fully) 2. Check hose configuration (see Hose Configuration screen) 3. Pair, scan, set hose frequencies (see Hose Configuration screen)
602	SMOSE ME - Timeout waiting for Tx complete Interrupt	Hardware failure	Cycle power
603	SMOSE ME - Multiple master modems detected on RF link	1. Multiple systems in close proximity operating on the same frequency. 2. Modems not paired correctly	1. Move one system to a different frequency. 2. Pair modems
604	SMOSE ME - Arbitration lost (bus may be shorted to GND or VDD	Bad connection between modem A and B sides	1. Check modem connection cable 2. Cycle power
605	SMOSE ME - No ACK from device (Verify I2C address for device is set correctly).	Bad connection between modem A and B sides	1. Check modem connection cable 2. Cycle power

SYSTEM ERRORS AND ACTIONS (continued)

Error Number	Alarm Description	Condition	Action
606	SMOSE ME - Timeout during I2C data transfer	Bad connection between modem A and B sides	1. Check modem connection cable 2. Cycle power
607	SMOSE ME - Other errors: OverUnderRun, DMA Error or Bus Error	Bad connection between modem A and B sides	1. Check modem connection cable 2. Cycle power
608	SMOSE ME - No pressure data from sensor (i2C read failure)	Bad connection between modem A and B sides	1. Check modem connection cable 2. Cycle power
609	SMOSE ME - Hose A pressure out of range	Pressure sensor out of calibration	Calibrate sensor
610	SMOSE ME - Hose B pressure out of range	Pressure sensor out of calibration	Calibrate sensor
611	SMOSE ME - No Temperature data from sensor (i2C read failure).	1. Bad connection between modem A and B sides	1. Check connection contacts are clean and secure between A and B sides of modem.
612	SMOSE ME - Hose A temperature out of range	Hardware Failure	Cycle power
613	SMOSE ME - Hose B temperature out of range	Hardware Failure	Cycle power
614	SMOSE ME - Event Memory Pool is empty	Firmware Failure	Cycle power
615	SMOSE ME - Flash Parameter Storage system error	Bad connection between modem A and B sides	1. Check modem connection cable 2. Cycle power
616	SMOSE ME - Error during DMA transfer	Bad connection between modem A and B sides	1. Check modem connection cable 2. Cycle power
617	SMOSE ME - EtherCAT chip failed to initialize End and Mid Modems: Not Applicable	Hardware failure	Cycle power
618	SMOSE ME - EtherCAT no Network link End and Mid Modems Not Applicable	Bad connection between modem A and B sides	1. Check modem connection cable 2. Cycle power
619	SMOSE ME - Other uncategorized error condition	Hardware failure	Cycle power
620	SMOSE ME - Arbitration lost (bus may be shorted to GND or VDD	Bad connection between modem A and B sides	1. Check modem connection cable 2. Cycle power
621	SMOSE ME - No ACK from device (Verify I2C address for device is set correctly	Bad connection between modem A and B sides	1. Check modem connection cable 2. Cycle power
622	SMOSE ME - Timeout during I2C data transfer	Bad connection between modem A and B sides	1. Check modem connection cable 2. Cycle power
623	SMOSE ME - Other errors: OverUnderRun, DMA Error or Bus Error	Bad connection between modem A and B sides	1. Check modem connection cable 2. Cycle power
624	SMOSE ME - Arbitration lost (bus may be shorted to GND or VDD	Bad connection between modem A and B sides	1. Check modem connection cable 2. Cycle power
625	SMOSE ME - No ACK from device (Verify I2C address is correct	Bad connection between modem A and B sides	1. Check modem connection cable 2. Cycle power
626	SMOSE ME - Timeout during I2C data transfer	Bad connection between modem A and B sides	1. Check modem connection cable 2. Cycle power
627	SMOSE ME - Other errors: OverUnderRun, DMA Error or Bus Error	Bad connection between modem A and B sides	1. Check modem connection cable 2. Cycle power

LIMITED WARRANTY

CARLISLE SPRAY TECHNOLOGIES (CST) / CARLISLE SPRAY FOAM INSULATION (CSFI) or CARLISLE FLUID TECHNOLOGIES will replace or repair without charge any part/or equipment that fails within the specified time (see below) because of faulty workmanship or material, provided that the equipment has been used and maintained in accordance with our written safety and operating instructions, and has been used under normal operating conditions. Normal wear items are excluded.

THE USE OF OTHER THAN CARLISLE APPROVED PARTS VOIDS ALL WARRANTIES.

EQUIPMENT: When purchased as a complete unit, (i.e. guns), is one (1) year from date of purchase.

NOTE:

WRAPPING THE APPLICATOR IN PLASTIC WILL VOID THIS WARRANTY.

CST'S ONLY OBLIGATION UNDER THIS WARRANTY IS TO REPLACE PARTS THAT HAVE FAILED BECAUSE OF FAULTY WORKMANSHIP OR MATERIALS. THERE ARE NO IMPLIED WARRANTIES NOR WARRANTIES OF EITHER MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. CST ASSUMES NO LIABILITY FOR INJURY, DAMAGE TO PROPERTY OR FOR CONSEQUENTIAL DAMAGES FOR LOSS OF GOODWILL OR PRODUCTION OR INCOME, WHICH RESULT FROM USE OR MISUSE OF THE EQUIPMENT BY PURCHASER OR OTHERS.

EXCLUSIONS:

If, in CST's opinion the warranty item in question, or other items damaged by this part was improperly installed, operated, or maintained, CST will assume NO responsibility for repair or replacement of the item or items. The purchaser, therefore, will assume all responsibility for any cost of repair or replacement and service-related costs if applicable.

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