

IS30™

IntelliSpray™ Spray Foam Proportioner User Manual



SPECIFICATIONS	
Maximum Fluid Pressure	2500 PSI (172 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



This Page Intentionally Blank

Contents

Section	Page	Section	Page
1.0	4	18.0	92
2.0	6	18.1	93
3.0	8	18.2	94
4.0	11	18.3	95
5.0	13	18.4	96
6.0	14	18.5	97
7.0	15	18.6	98
8.0	23	18.7	99
8.1	29	18.8	103
9.0	31	18.9	104
10.0	33	18.10	105
10.1	34	18.11	106
11.0	41	18.12	109
12.0	43	18.13	111
13.0	44	19.0	115
14.0	46	19.1	120
14.1	47	19.2	121
14.2	48	20.0	123
14.3	49	20.1	124
14.4	52	20.2	126
14.5	55	20.3	127
14.6	57	20.4	130
15.0	58	20.5	131
15.1	59	20.6	132
15.2	63	20.7	133
15.3	64	21.0	135
15.4	67	22.0	136
15.5	69	23.0	140
15.6	70	24.0	147
16.0	73	24.1	156
16.1	74	25.0	158
17.0	78	26.0	162
17.1	79	27.0	163
17.2	80	28.0	185
17.3	83	Warranty Information	188
17.4	85	CB Test Certificate	189
17.5	88	Declaration of Conformity	190

1.0 WARNINGS

Spray Foam equipment and materials operate under high pressure and temperature and should only be used by trained professionals. The fluids used to create polyurethane foam insulation are hazardous. Unprotected exposure during handling and use may cause lung, ear, and/or skin irritation, shortness of breath, sore throat, fever, and even permanent respiratory and/or skin damage and/or sensitization. Always refer to the material Safety Data Sheets for proper handling, transportation, storage, and disposal.

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

 WARNING	 CAUTION	NOTE
Hazards or unsafe practices which could result in severe personal injury, death or substantial property damage.	Hazards or unsafe practices which could result in minor personal injury, product or property damage.	Important installation, operation or maintenance information

WARNING

Read and understand all the warnings in this section and elsewhere in this manual



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



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



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



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



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



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



AUTOMATIC EQUIPMENT Automatic equipment may start suddenly without warning.



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.



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



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.



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.

1.0 WARNINGS (Continued)

WARNING

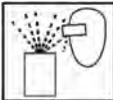
Read and understand all the warnings in this section and elsewhere in this manual



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



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.



PROJECTILE HAZARD You may be injured by venting liquids 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.



NOISE HAZARD You may be injured by loud noises from support equipment (generators, compressors, transfer pumps). Hearing protection should be used.



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.



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.



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 spray equipment.
- Tell the doctor what kind of fluid you were spraying or dispensing.
- Refer to the Material Safety Data Sheet for specific information.



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.
- Always have the tip guard on the spray gun before spraying.
- Always ensure that the gun trigger safety operates before spraying.
- Always lock the gun trigger safety when you stop spraying.



PROP 65 WARNING WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

2.0 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 hose 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..

2.0 SAFETY PRECAUTIONS (Continued)

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.

3.0 IMPORTANT ISOCYANATE INFORMATION

GENERAL HANDLING GUIDELINES

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

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 recommendations of the fluid manufacturer and local regulatory authority. Posting a sign such as the following outside the work area is recommended:

WARNING	
	TOXIC FUME HAZARD
DO NOT ENTER DURING SPRAY FOAM APPLICATION OR FOR ___ HOURS AFTER APPLICATION IS COMPLETE	
DO NOT ENTER UNTIL AFTER:	
DATE: _____ TIME: _____	

3.0 IMPORTANT ISOCYANATE INFORMATION (Continued)

MATERIAL SELF IGNITION

Some materials may become self igniting if applied too thick. Read material manufacturer'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.

This Page Intentionally Blank

4.0 INTELLISPRAY™ SYSTEM OVERVIEW

The Carlisle IntelliSpray Spray Polyurethane Foam (SPF) system consists of an IS40 or IS30 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™ hoses have roughly double the heating power compared to most other SPF hoses and directly heat 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 4 independent heating zones 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 wide range of output and pattern control with configurable chamber and tip combinations.

The system will also 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.



IS30™ Proportioner



IS40™ Proportioner



ST1™ Spray Gun



QuickHeat™ Hose

4.0 INTELLISPRAY™ SYSTEM OVERVIEW (Continued)

Carlisle IntelliSpray™ Spray Foam Proportioners are high performance devices that deliver Isocyanate (A) and Polyol Resin (B) fluids to a spray gun via Carlisle QuickHeat™ hoses. The Proportioner 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, elevation changes, or environmental conditions.

The 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" (IS40) or 10.1" (IS30) high-strength touch-screen allows the user to monitor and control the proportioner and hoses. The Control Module provides "Out Of Box" remote system monitoring and control without any additional hardware or software. 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. 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.



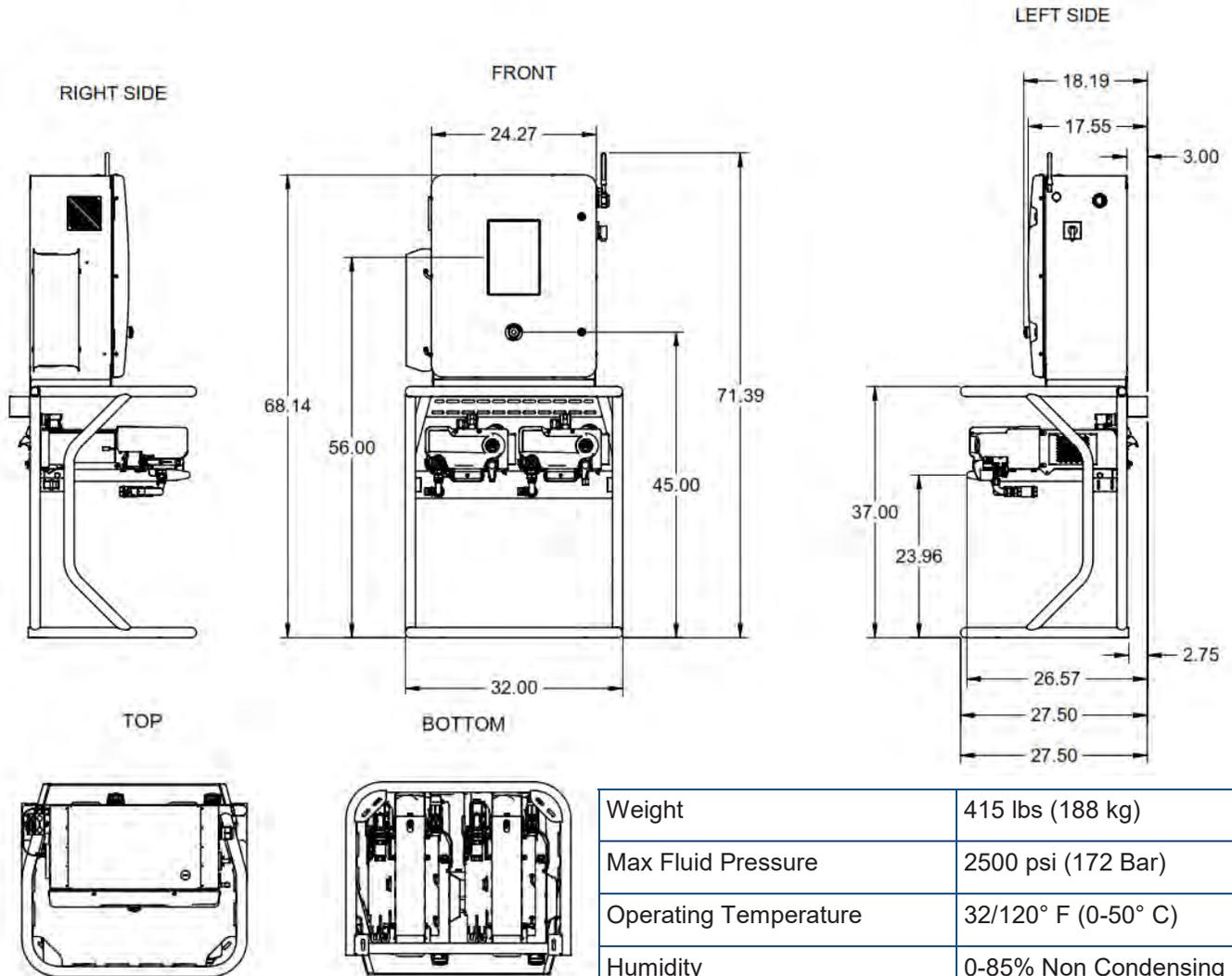
IntelliSpray Proportioners use independent Fluid Modules that contain temperature and pressure sensors, fluid filters, shutoff and recirculation valves, fluid preheaters, servo motors, flow meters, pressure gages, and direct-drive external gear pumps specifically designed to handle spray foam materials. 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 Proportioner frame. All common service components can be accessed from the front of the module and replaced on-site using simple hand tools in minutes.

IntelliSpray Proportioners are 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, 150, and 200 foot lengths. Heated whip hoses are available in 20 and 40 foot lengths. Unheated whips are available in 3, 6 and 10 foot lengths. Each length of heated hose begins with a fluid manifold or "modem" that contains temperature and/or pressure 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 IS30 and IS40 to receive more information from multiple sensing locations at each hose junction. It also allows projection of information down the hose to remote monitoring and control devices. More information about QuickHeat hoses is contained in the QuickHeat Hose Manual.

Finally, IntelliSpray Control and Fluid Modules are mounted in a high-strength tubular steel frame that protect the modules from damage and provide multiple horizontal and vertical mounting points.

5.0 IS30 - SPECIFICATIONS

The IS30 Proportioner is roughly 32" wide, 68" tall, and 27" deep. Eight separate floor mounting holes are located in the base of the unit, and a slotted wall mounting bracket is provided along the back of the unit. The IS30 must be securely attached to the a floor and wall in any mobile or seismic installation. Refer to Section 10.1 for installation instructions.



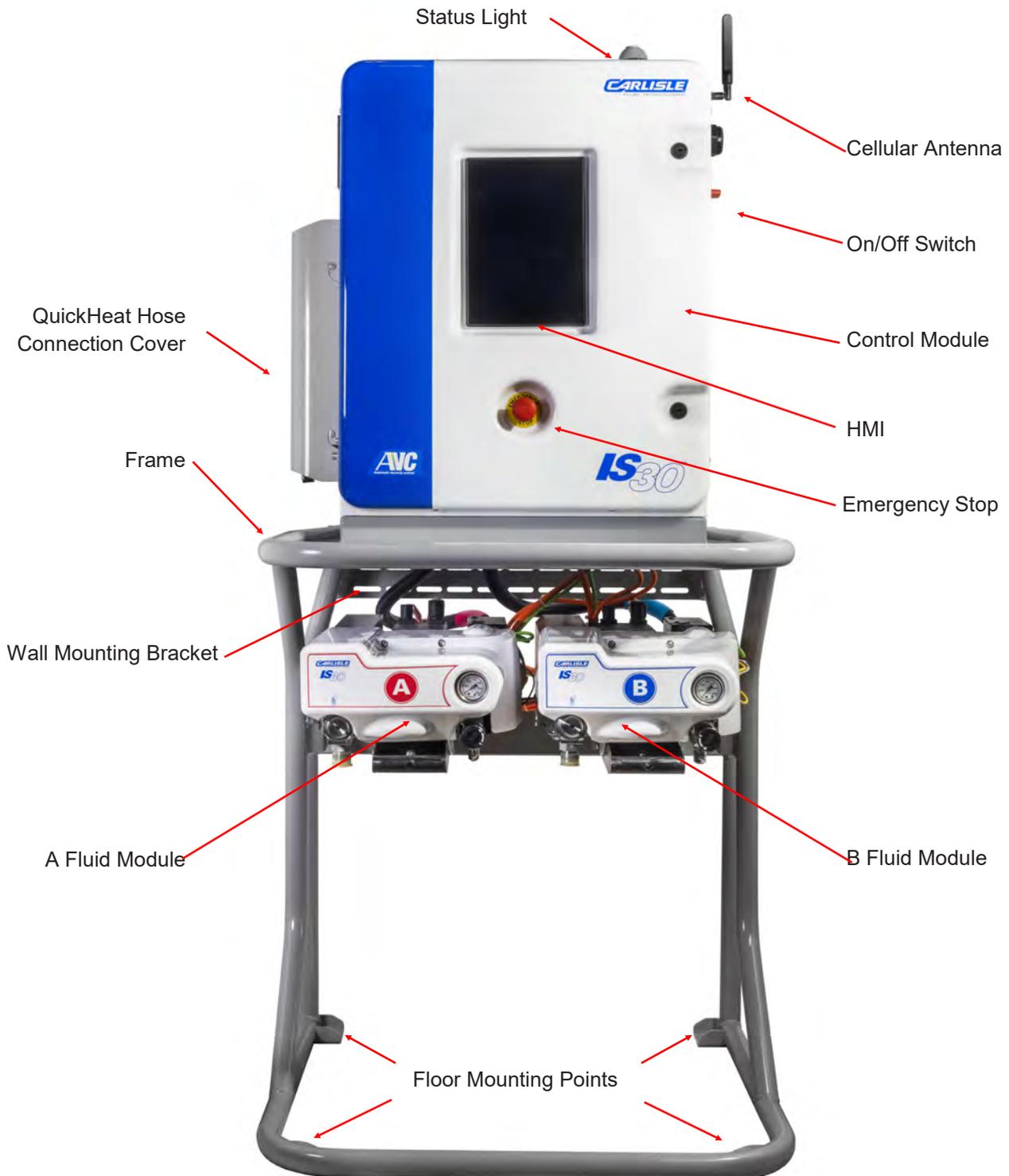
Weight	415 lbs (188 kg)
Max Fluid Pressure	2500 psi (172 Bar)
Operating Temperature	32/120° F (0-50° C)
Humidity	0-85% Non Condensing
Input Voltage	200-240V
Frequency	50/60 Hz
Phase	3
Full Load Amps	67 A
Max. Disconnect	100 A
SCCR	5 kA

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 IS30 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.

IS30 Physical, Environmental, and Electrical Specifications

6.0 IS30 OVERVIEW

The IS30 is a modular system, composed of a Control Module, A and B Fluid Modules, a high strength tubular frame, and software. The frame includes 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 the following Sections will help the user become familiarized with the IS30 Proportioner.

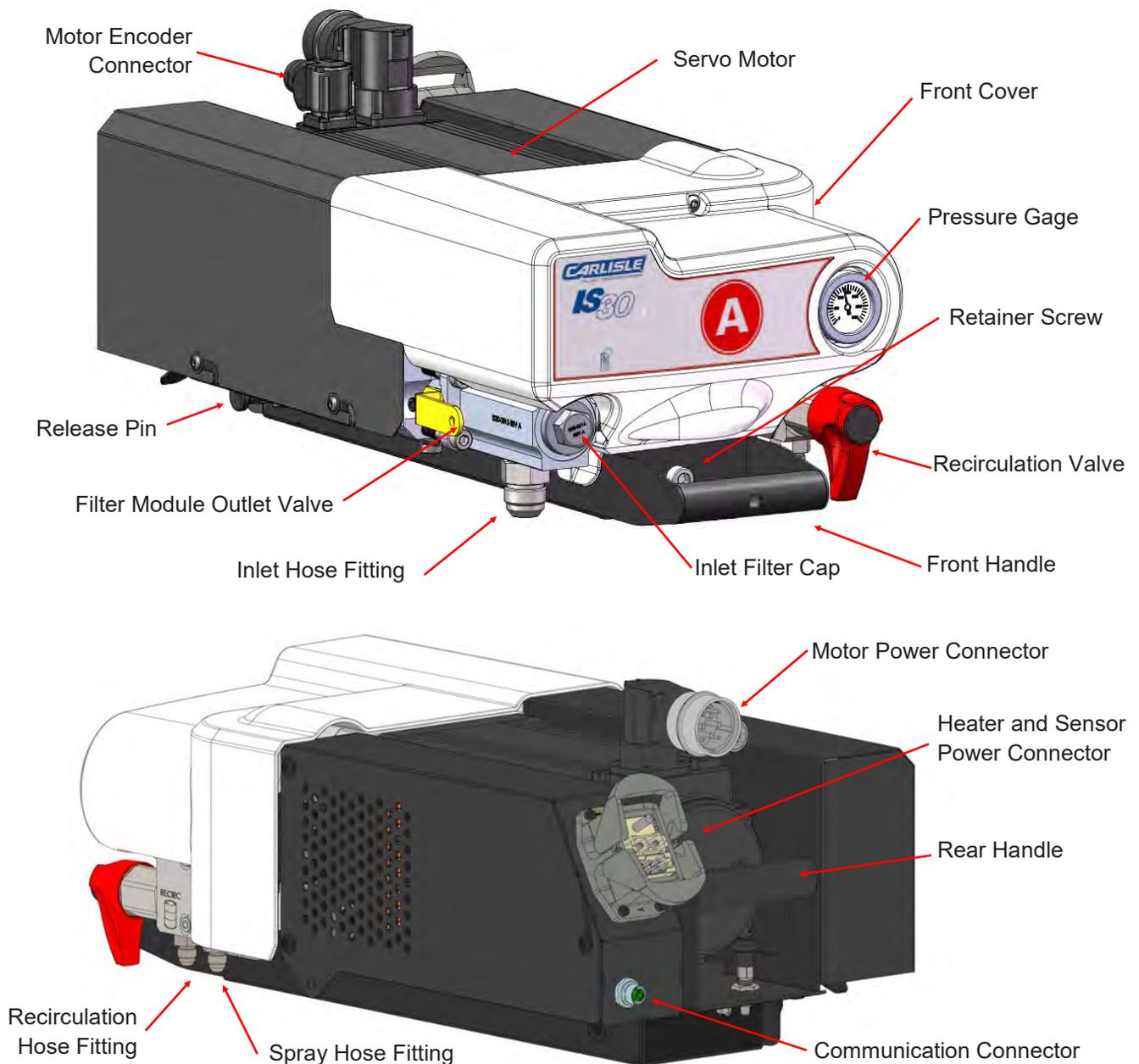


7.0 IS30 FLUID MODULE

The IS30 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 IS30 requires the fluid to be provided at a pressure that avoids 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 cavitation supply pumps should be sized to provide at least 2 GPM continuous flow at an inlet fluid pressure of 100 psi. The IS30 will issue an error message and stop if inlet fluid pressure is either too low or too high.

The IS30 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 and reinstalled within minutes. With the exception of minor differences, the A and B fluid modules are identical.

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



7.0 IS30 FLUID MODULE (Continued)

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

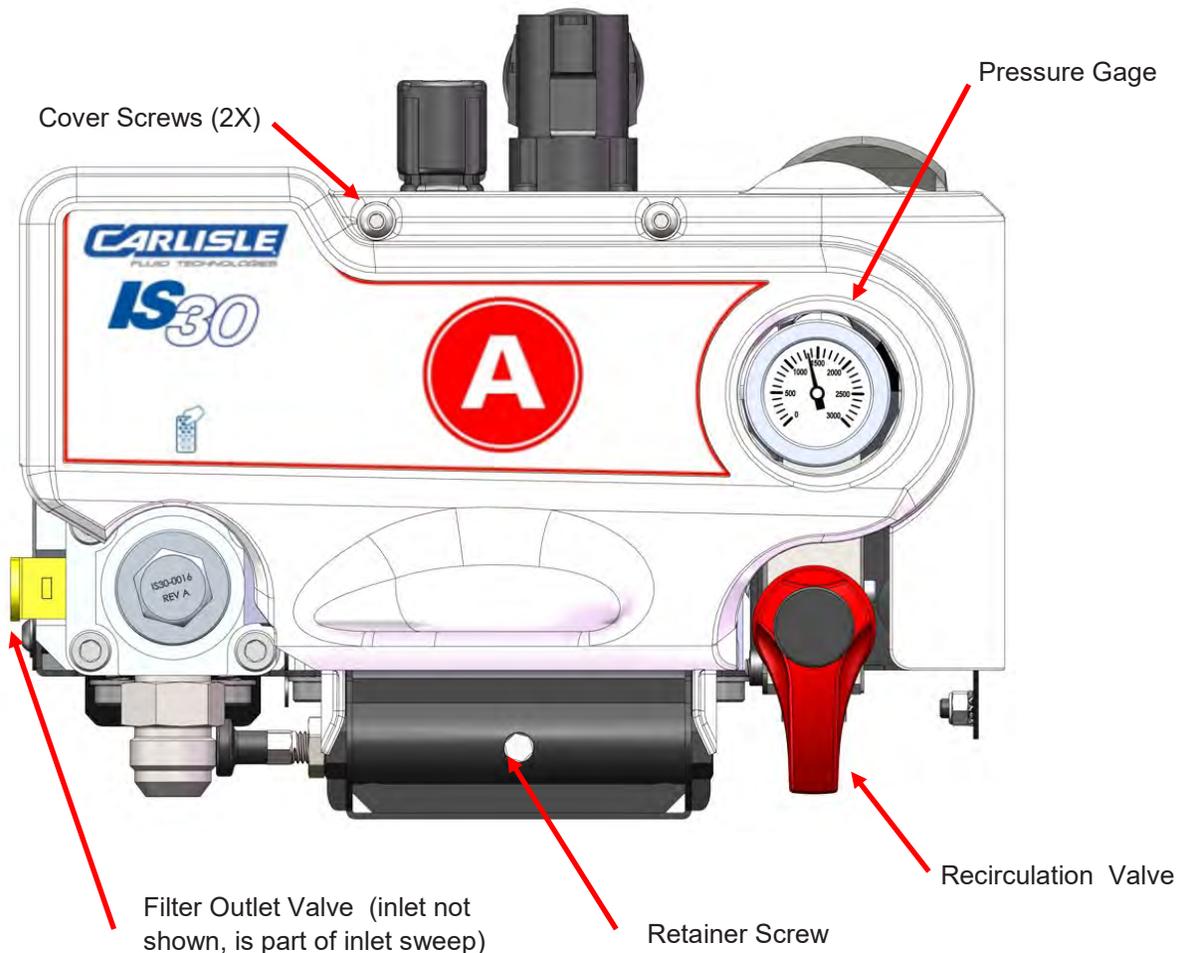
Filter Outlet Valve. The IS30 has an internal 1/4 turn ball valve that is used to prevent backflow of material when cleaning or replacing the inlet filter. By closing both the inlet ball valve and the filter outlet valve the inlet filter can be serviced with very little leakage of fluid. See page Section 22 for filter service instructions.

Recirculation Valve. When the handle is pointed down it is in the Spray position and all flow will be through the distribution (spray gun) hoses. When it is turned 90 degrees counterclockwise (CCW) fluid will also allow flow to the recirculation line. Note it does not stop fluid flow to the gun hoses when in recirculation position.

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

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

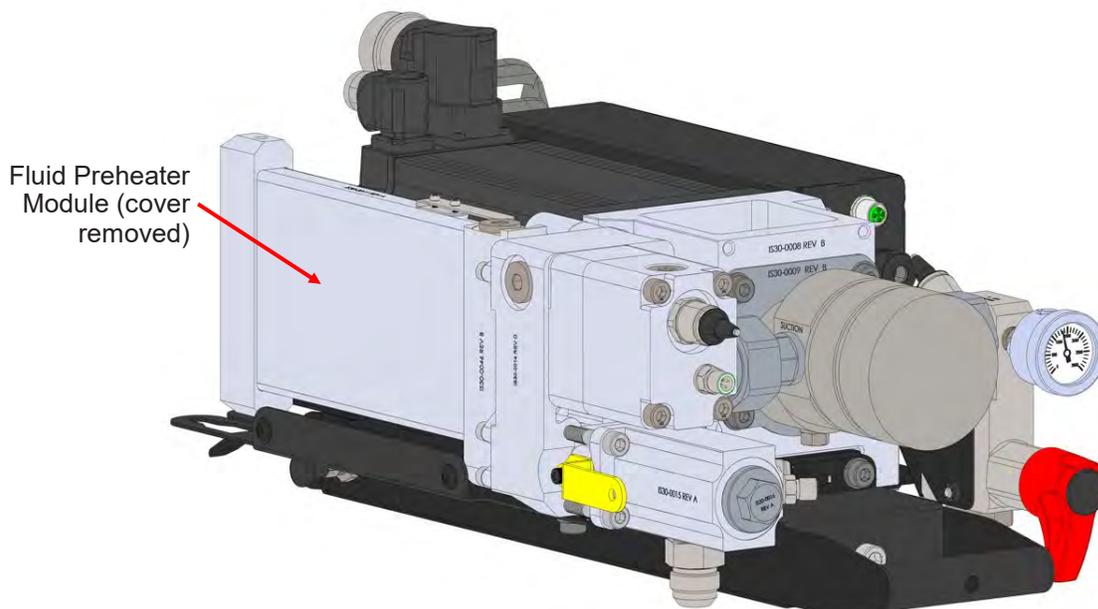
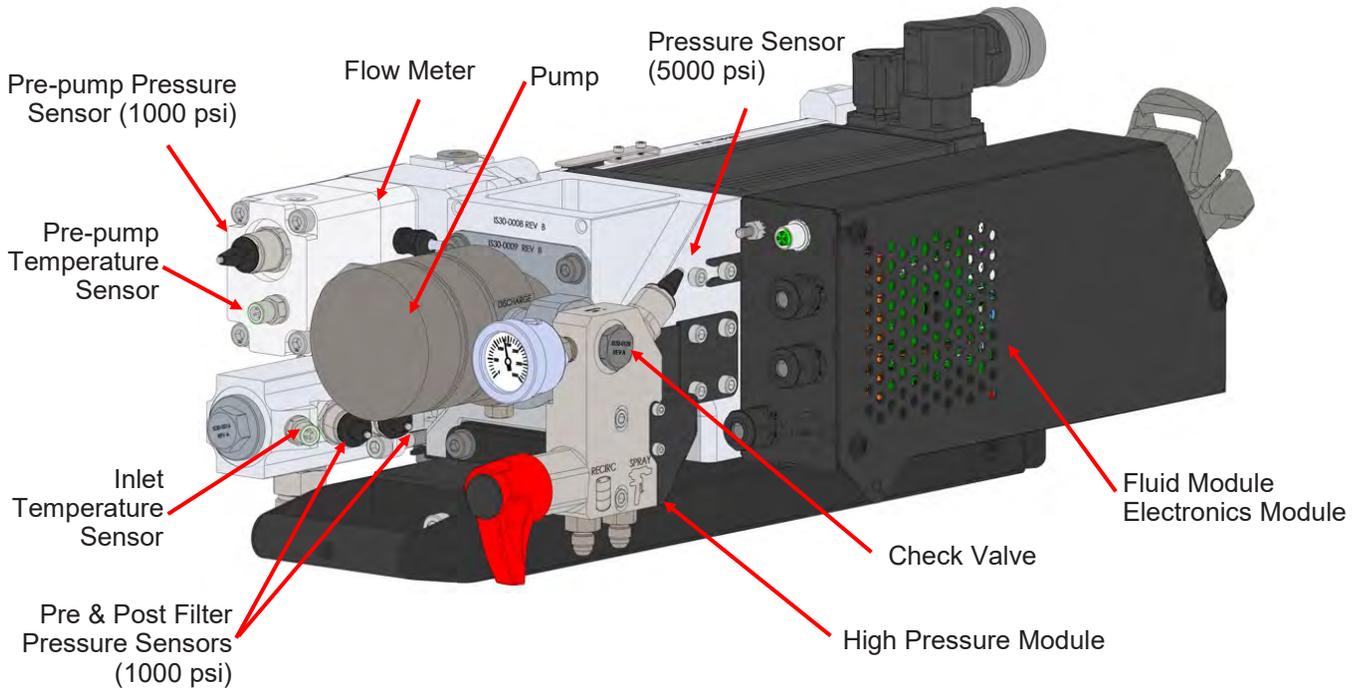
Captive Retainer Screw: This hold the module to the frame and should always be engaged except when servicing the module.



7.0 IS30 FLUID MODULE (Continued)

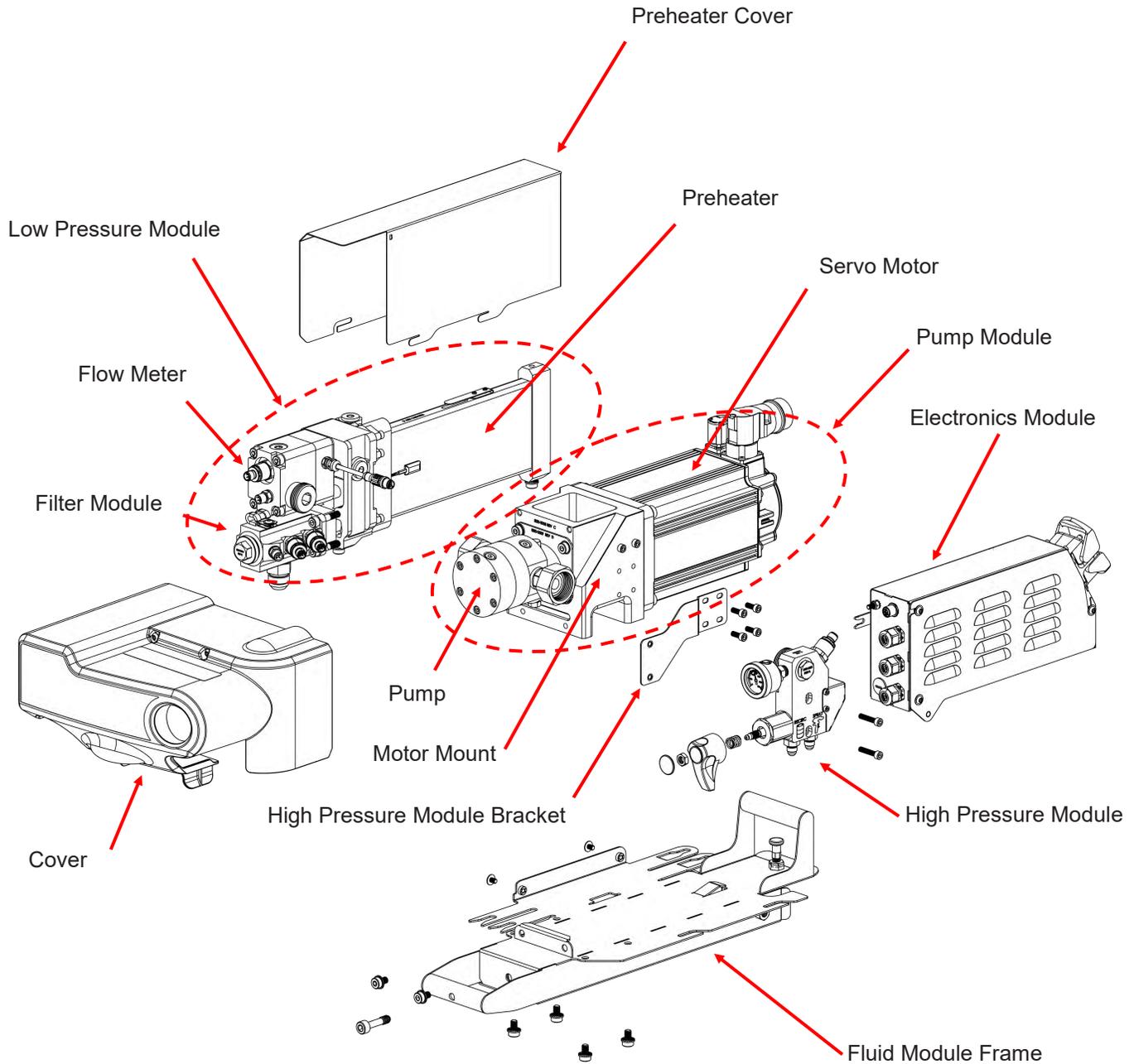
The images below show the IS30 Fluid Module with the covers removed. The A and B Fluid Modules are identical except for the following:

- 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.



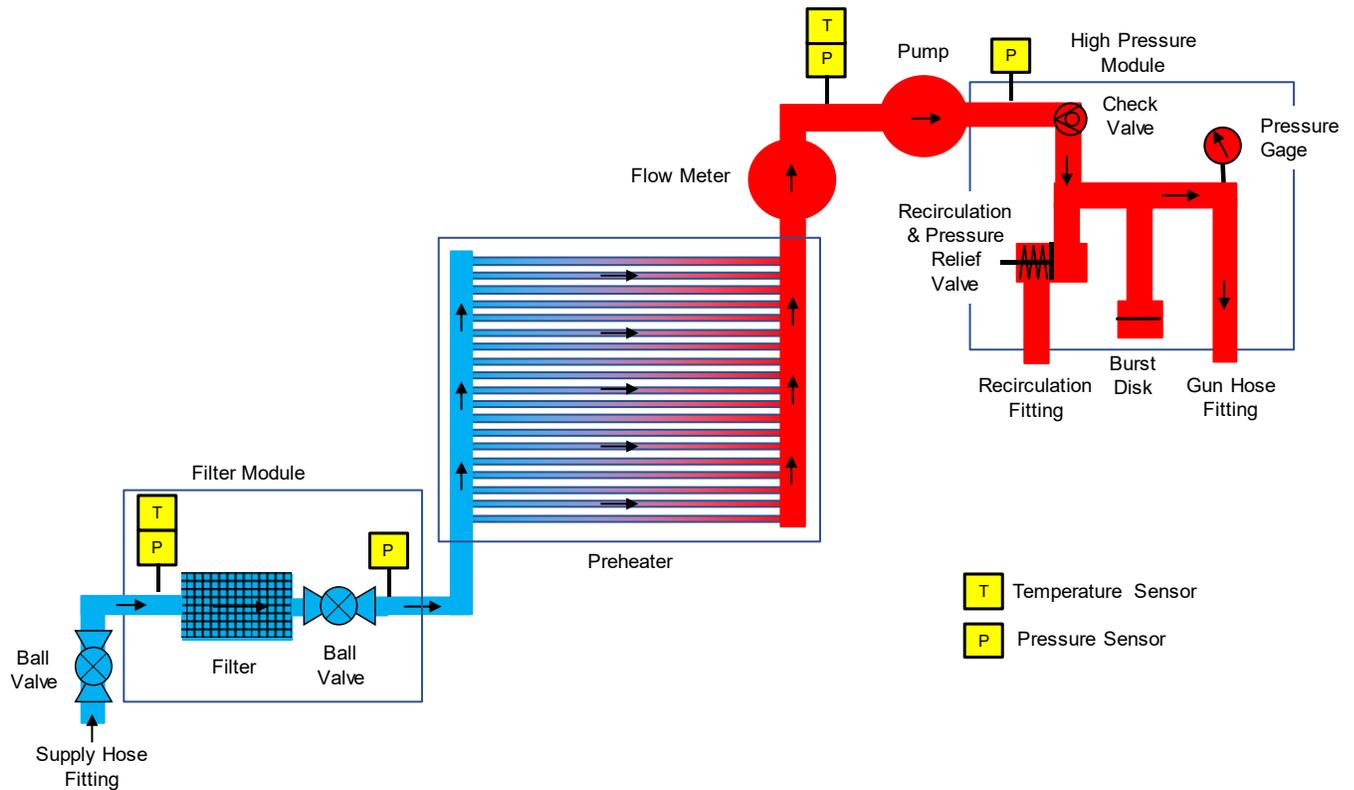
7.0 IS30 FLUID MODULE (Continued)

The following figure shows the major items in the IS30 Fluid Module. Additional breakdowns and parts lists are contained in Section 24.



7.0 IS30 FLUID MODULE (Continued)

The following figure shows the fluid path and major fluidic elements contained in the IS30 Fluid Modules. Flow is from left to right indicated by arrows.

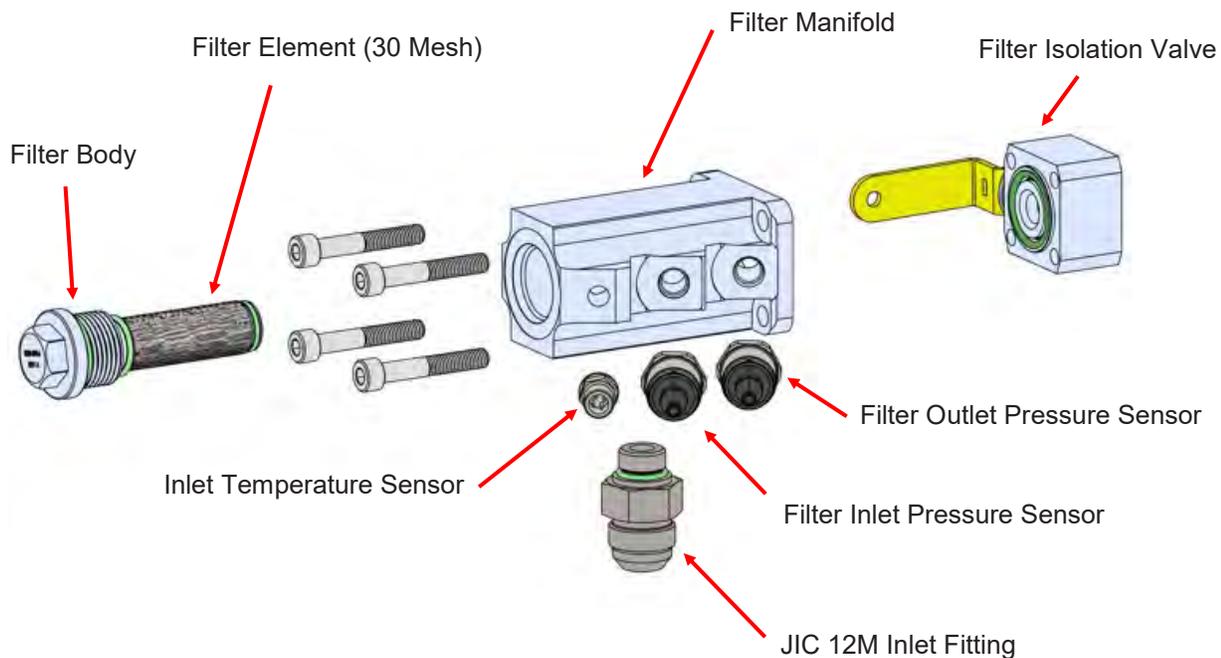


The main fluid handling elements of each A and B Fluid Modules and their functions are described below and shown in the following pages.

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

- Inlet and Outlet valves. Inlet and outlet ball valves are provided that can be used to isolate the filter element module. 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 Menu Screen to prevent the User from working with fluid that is outside recommended temperature limits.
- Filter Body. A 7/8" hex head cap holds the filter body and filter element 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. Always grease the threads (especially the A side) to prevent the filter cap threads from locking.
- Filter Elements: Each Filter Body holds one 30 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 filter element. These sensors allow the IS30 to alert the user when the filters need to be cleaned or replaced.

7.0 IS30 FLUID MODULE (Continued)



IS30 Filter Module

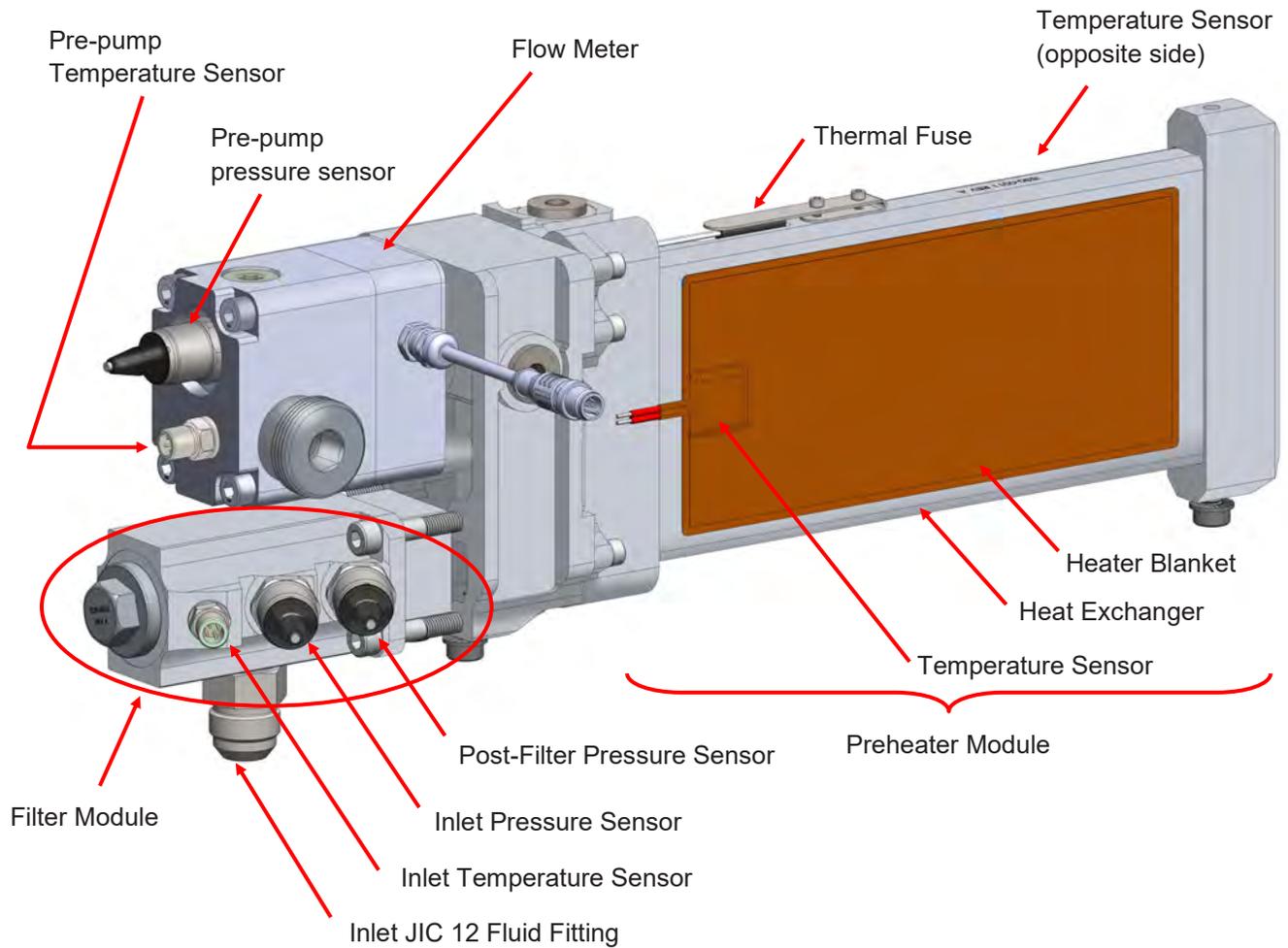
Preheater Module: The IS30 uses low mass preheaters to warm the A and B fluids on the low pressure side of the Fluid Pumps. This allows the preheaters to rapidly respond to variations in incoming fluid temperature, flow rates, or setpoint changes. Each preheater has 14 individual channels for fluid flow that run down and back through the heat exchanger. An etched foil heater blanket is firmly bonded to the outside 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. A temperature sensor is attached to the heat exchanger as part of the fluid temperature control electronics. A fail-safe replaceable thermal fuse is mounted on 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.

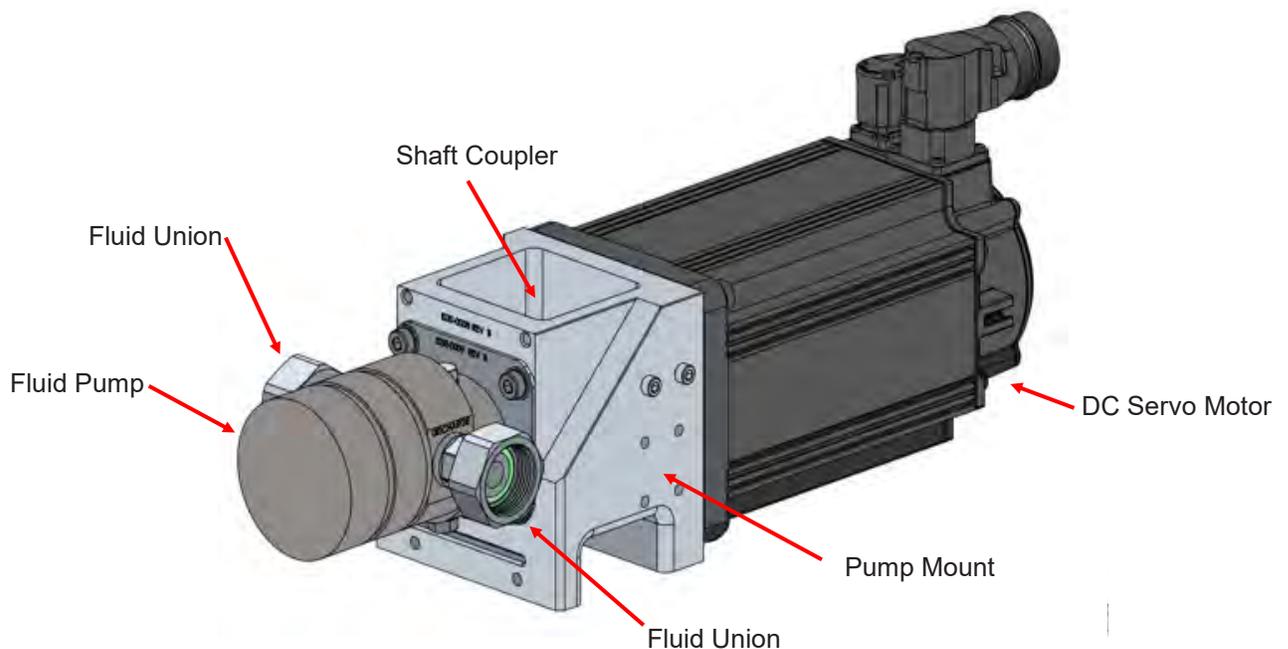
Pre-pump Temperature Sensor: This sensor monitors the temperature of fluid leaving the Preheater and also used to control fluid temperature when preheating drum material in Exchange mode.

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

7.0 IS30 FLUID MODULE (Continued)



Pump Module: The IS30 uses external gear pumps directly driven by DC Servo Motors to pressurize and deliver fluid to the distribution (spray gun) hose . This approach minimizes size and response time, while maximizing pumping efficiency..

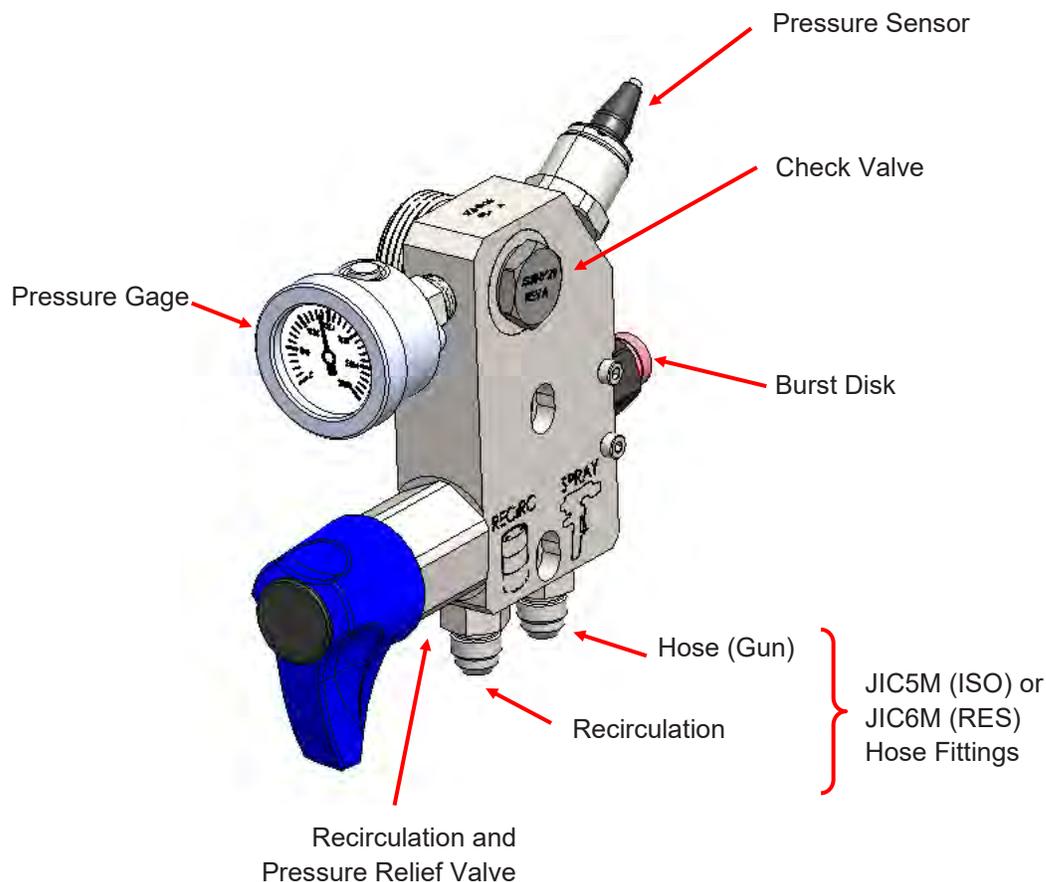


7.0 IS30 FLUID MODULE (Continued)

Fluid Pump: The IS30 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 gears and shafts, and specially coated journal and thrust bearings for long life.

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

- **Check Valve.** The Check Valve prevents fluid backflow to the low pressure side of the IS30 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 (see Section 18.7) and when hose sensor bypass mode is enabled (Section 17.3).
- **Pressure Gage:** An analog pressure gage allows the user to read pressure in the distribution hoses even when the system is not powered.
- **Recirculation and Pressure Relief Valve:** The Recirculation valve controls flow to the recirculation hose 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 at the back 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 (refer to Section 22).
- **Hose fittings.** JIC fittings for both recirculation and distribution (gun) hoses are located at the bottom of the High Pressure Module. Fittings are clearly identified by embossed labels on the manifold.



IS30 High Pressure Module

8.0 IS30 CONTROL MODULE

The IS30 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 IS30 Control Module is constructed 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 10" high-strength touch-screen allows the user to monitor and control the proportioner and hoses. The IS30 Control Module provides remote system monitoring, control, and service "out of the box" without any additional hardware, software, or monthly fees.

The IS30 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. Wiring diagrams are provided in Section 27.

The following pages show the location and function of primary components in the Control Module. Section 25 contains additional views and parts list.

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

 WARNING	
	ELECTRICAL SHOCK HAZARD Motor drives contain capacitors that may have stored electrical energy for up to 15 minutes after power is turned off. Wait 15 minutes before disconnecting power cables between motor drives and motors

8.0 IS30 CONTROL MODULE (Continued)

The functions 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 IS30 uses a 10" TFT multi-touch HMI (Human Machine Interface) that also contains an industrial Controller. The Controller performs all machine monitoring and control functions 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 IS30 is specifically designed for the wide range of environmental and mobile conditions Spray Foam equipment is subject to.

Solid State Relays (SSRs): The IS30 has individual SSRs mounted on a heat sink 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 IS30 to connect to available cellular networks. This allows users to monitor and/or control the IS30 from any standard web-browser on their phone, tablet, or computer. It also enables users to email Job Reports to selected recipients, and allows authorized IntelliSpray service providers to access the system for remote service and software upgrades.

Cooling Fan: A thermostatically controlled cooling fan pulls external air through a user-serviceable filter. 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. See Section 22 for air filter cleaning instructions.

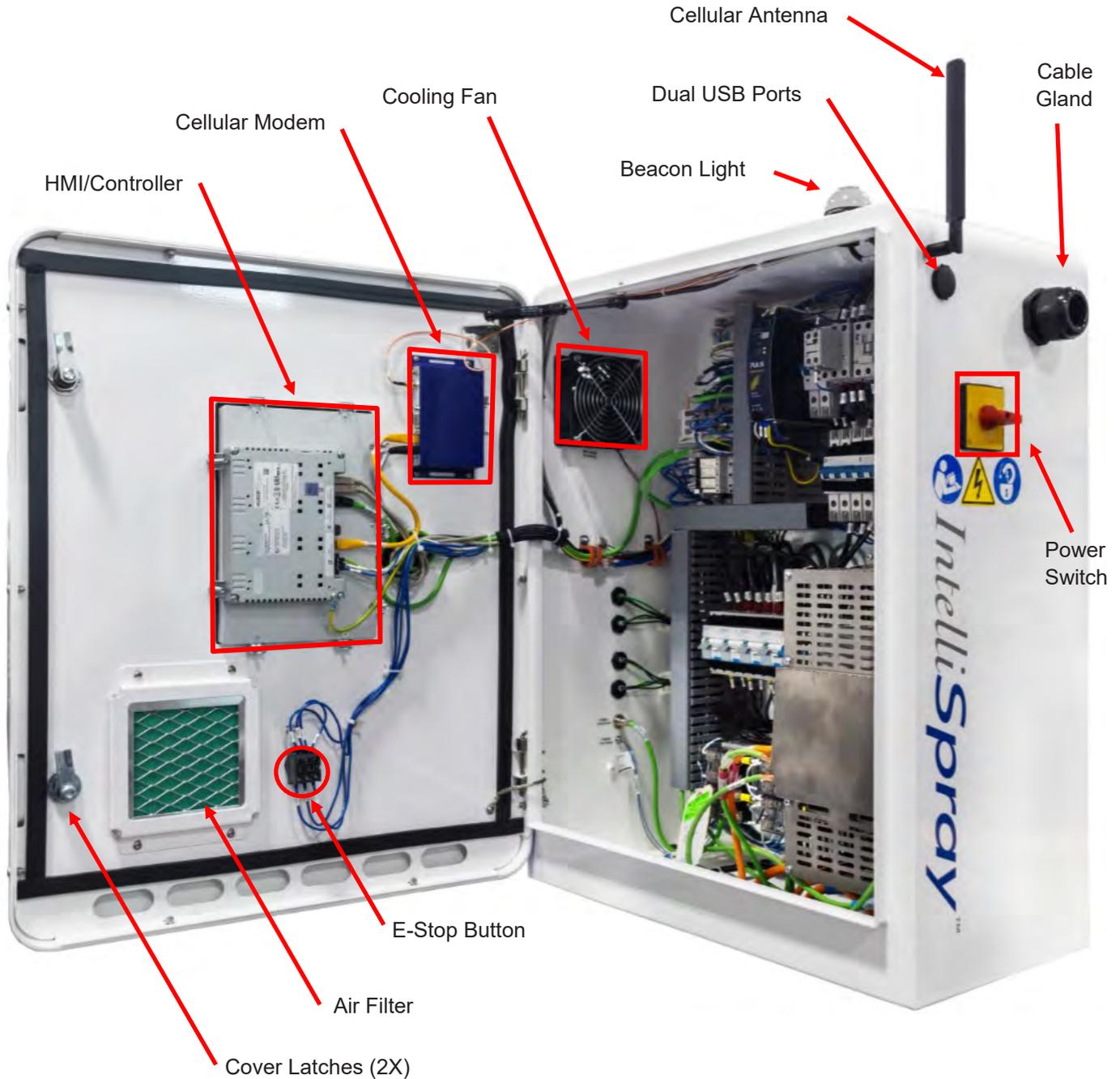
Power Switch: The IS30 rotary Power Switch disconnects all voltage to the unit. It also allows use of a lock-out padlock for preventing accidentally powering on the system when servicing. The switch is ON when pointed to at the I and OFF when pointed at the O.

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

Cable Gland: A M40 X 1.5 cable gland is provided with each IS30 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.

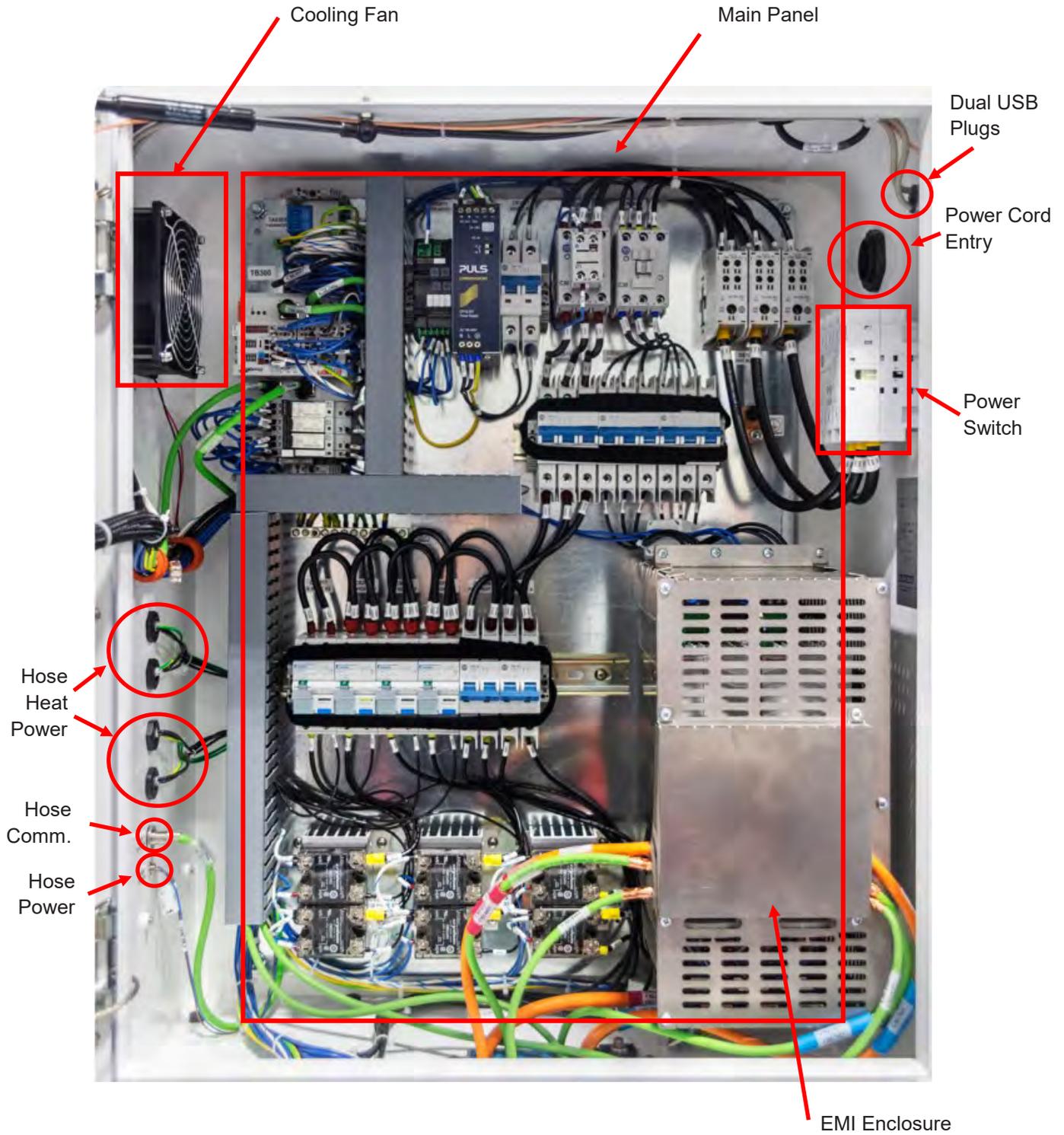
8.0 IS30 CONTROL MODULE (Continued)

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.



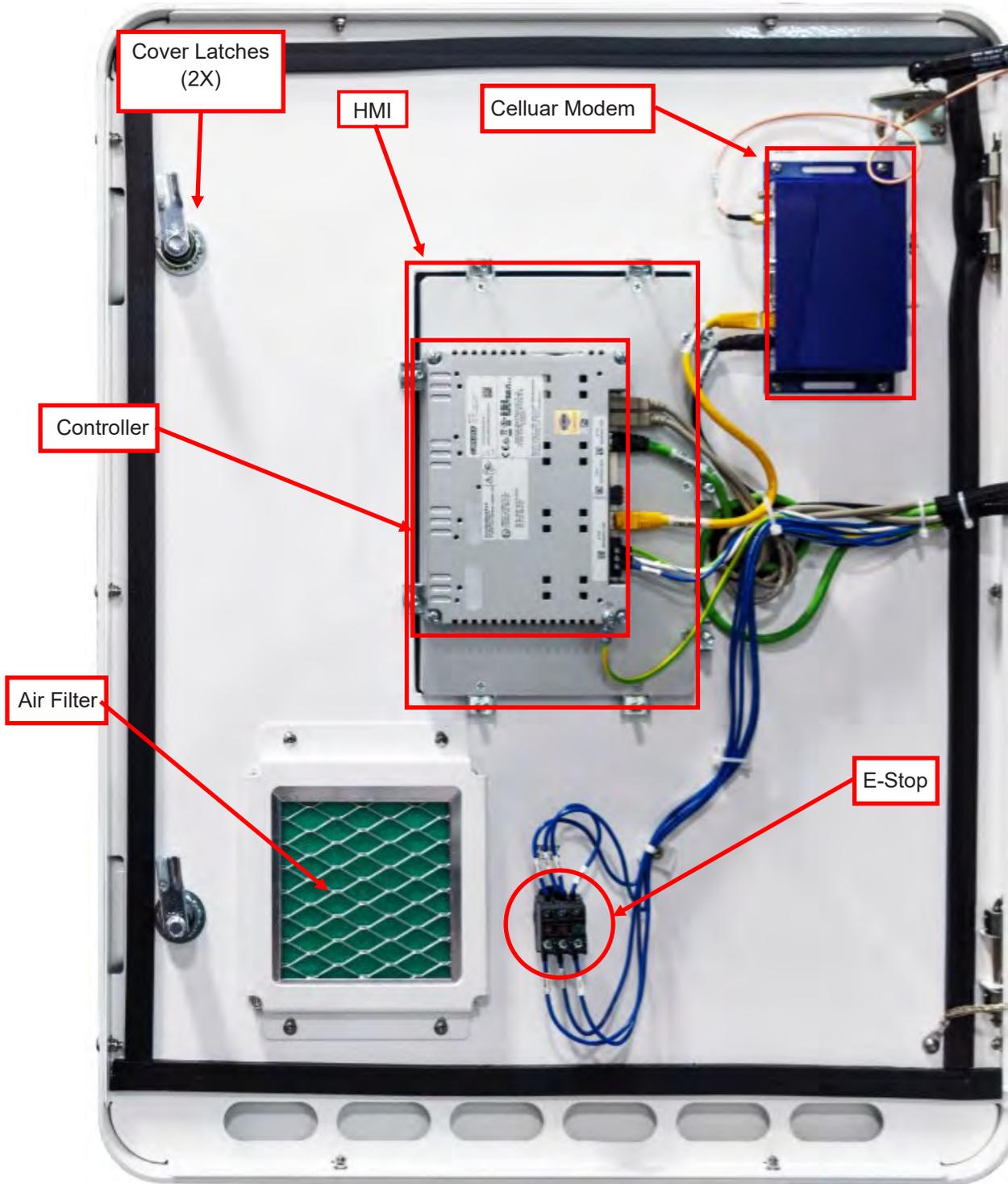
IS30 Control Module

8.0 IS30 CONTROL MODULE (Continued)



IS30 Control Module, Front View

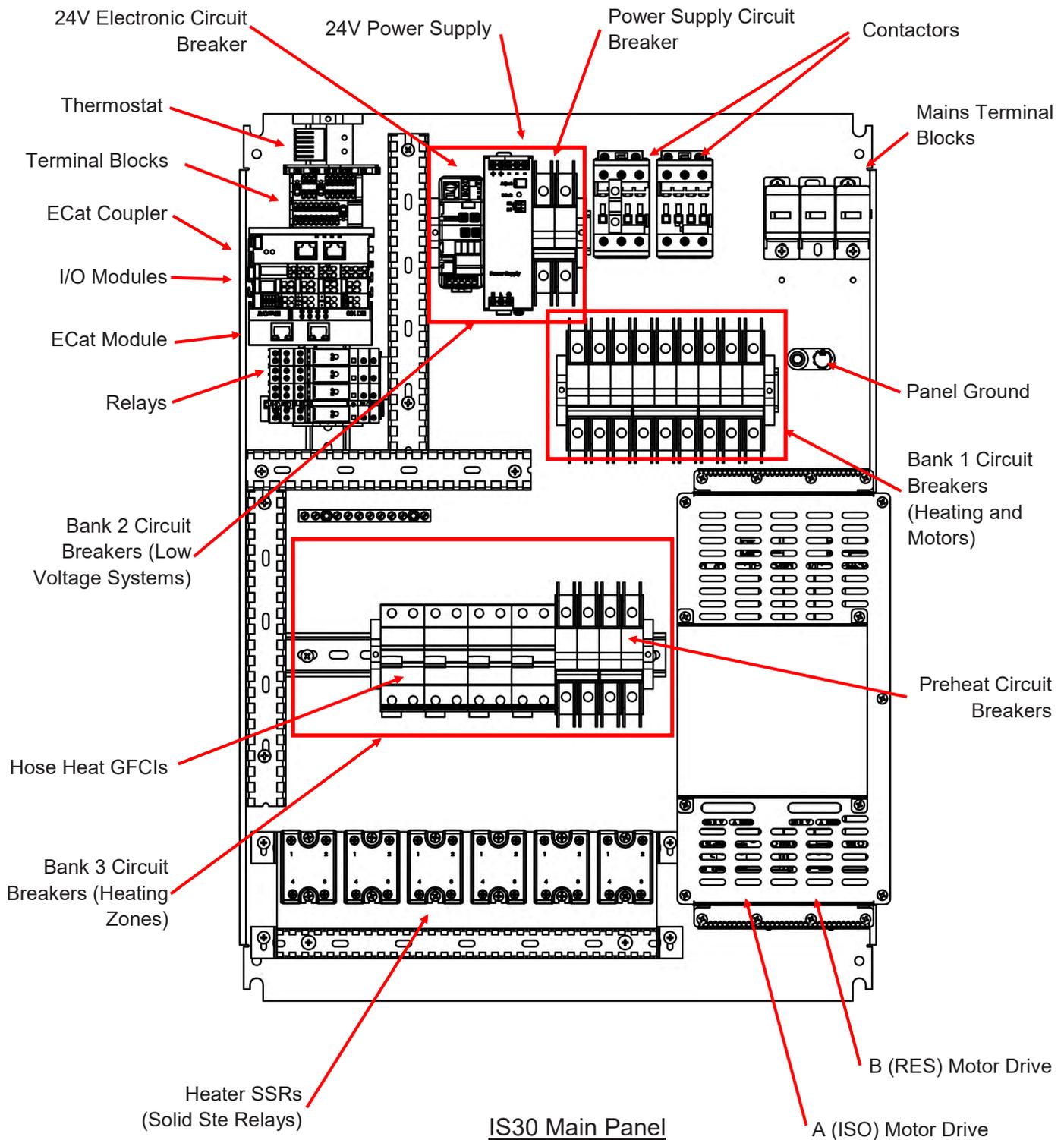
8.0 IS30 CONTROL MODULE (Continued)



IS30 Control Module, Front Door

8.0 IS30 CONTROL MODULE (Continued)

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 clearly labeled on the Main Panel. Wiring schematics are contained in the Appendix.



8.1 IS30 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 IS30 Main Panel prevent protect all electrical circuits and components in the IS30 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.

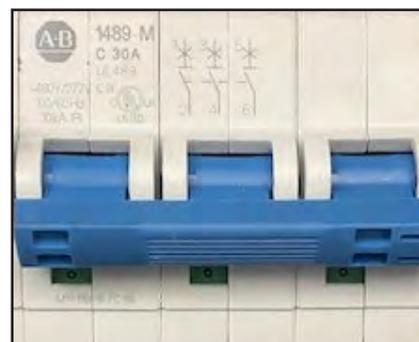
The IS30 Circuit Breakers are contained in several banks as shown on the previous page. Bank 1 contains the Main circuit breakers that feed all other circuits through Bank 2 and Bank 3. Circuit Breakers are clearly labeled on the panel.

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) 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

8.1 IS30 CIRCUIT BREAKERS (Continued)

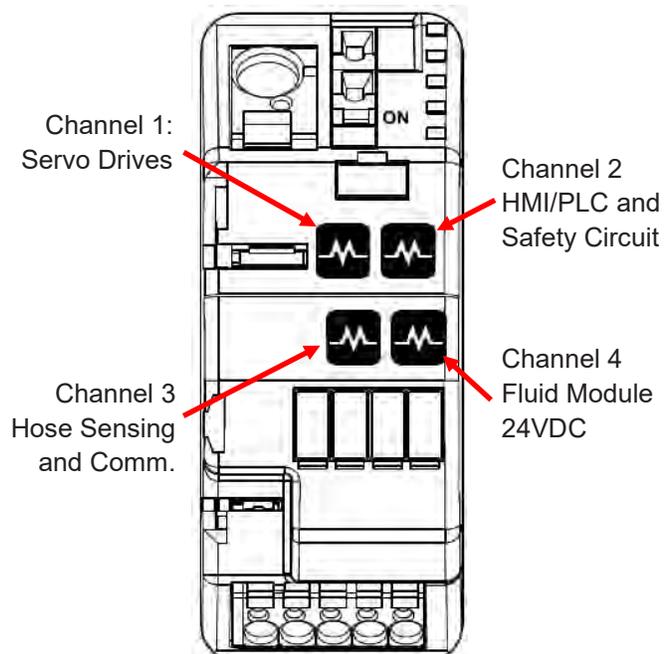

WARNING



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: Bank 2 contains a single 240V circuit breaker for the 24V DC Power Supply and an electronic circuit breaker for individual low voltage circuits for the Servo Drives, HMI/PLC, Cooling Fan, QuickHeat Hose Modems, and Fluid Module I/O. The electronic circuit breakers status is indicated as shown in the table below and figure below.

Display	State	Indication
Green	Connected	Function OK
Red	Disconnected	Manually disconnected
Green flashing	Threshold	Load above 90% of operating current limit
Red flashing @ 1 Hz	Disconnected	Over current
Red flashing @ 5 Hz	Defect	Internal fault



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 Open/Tripped (OFF)

Bank 3 Breaker Closed/Hot (ON)

9.0 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 3, 6, or 10 foot (1, 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 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 four 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

This Page Intentionally Blank

10.0 IS30 INSTALLATION - OVERVIEW



WARNING

Installation of the IS30 exposes installers to high voltages and high fluid pressures. Severe injury or death could result from improper installation or installation techniques.

NOTE

The IS30 requires QuickHeat[®] hoses for operation. Do not attempt to substitute any other hose.

Note: IS30 installation requires that a QuickHeat hose is fully assembled and ready for connection to the IS30. See “QuickHeat Hose Manual” for more information.

Installation of the IS30 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 IS30 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 IS30. Additional details for each step are contained in the IS30 Users manual.

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 IS30 circuit is off (turn off breaker at distribution or main panel).
5. Make 200-240V 3 Phase electrical and ground wire connection inside IS30 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 IS30 power circuit at distribution or main panel.
12. Turn on IS30 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 in Section 18.5.
 - a. From main menu, open Settings > Hose
 - b. Select hose configuration
 - c. Pair hose modems
 - d. Scan and select a recommended communication frequency
14. Purge A and B fluid sections (and hoses if new or empty) to eliminate any air. See Section 15.2 for detailed instructions on first time system purging.
15. Follow Quick Start instructions in Section 11.0 to begin spraying.

10.1 IS30 INSTALLATION INSTRUCTIONS

1. Unpack IS30

The IS30 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 cardboard cover, enclosure, and heavy duty plastic bag protects the unit during shipping and storage.

After removing the cardboard covers and top sheet, place the pallet with the IS30 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 IS30 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 IS30 weighs about 415 lbs. Extreme caution must be taken to avoid tipping the unit over and harming installers.



Remove 4 shipping lag bolts/screws from base mounting feet remove IS30 from shipping pallet.

 WARNING	
Use extreme caution when removing the IS30 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 cardboard sheet works well to position the IS30. Allow adequate room behind, above, and beside the unit to run the power cable and supply hoses.

10.1 IS30 INSTALLATION INSTRUCTIONS (Continued)

3. Secure IS30

If the IS30 is to be used in a mobile or seismic environment the frame **must** be secured to a rigid floor and wall using 5/16" (or larger) grade 8 fasteners and washers. The IS30 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 IS30 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 IS30 is on a dedicated 100A 200-240V 3 Phase protected circuit. 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.

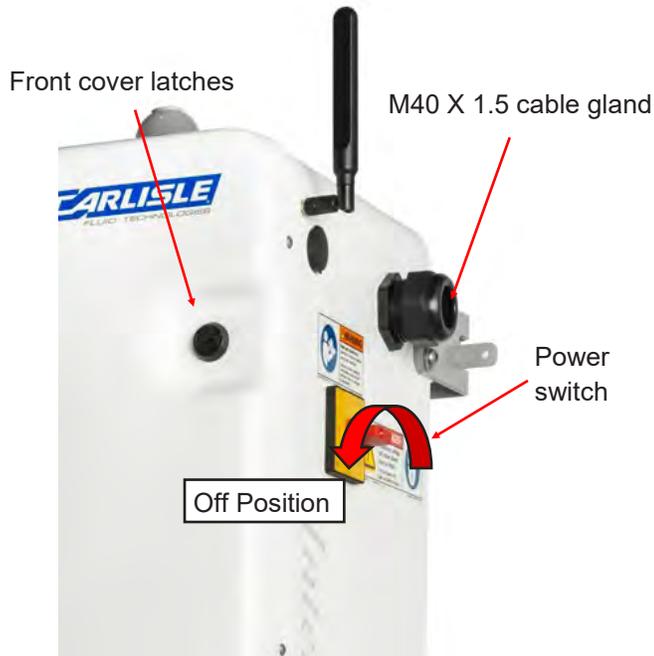
WARNING

Be sure power is off to the IS30 when making electrical connections or when the Control Module is open.

10.1 IS30 INSTALLATION INSTRUCTIONS (Continued)

5. Make electrical connections inside IS30

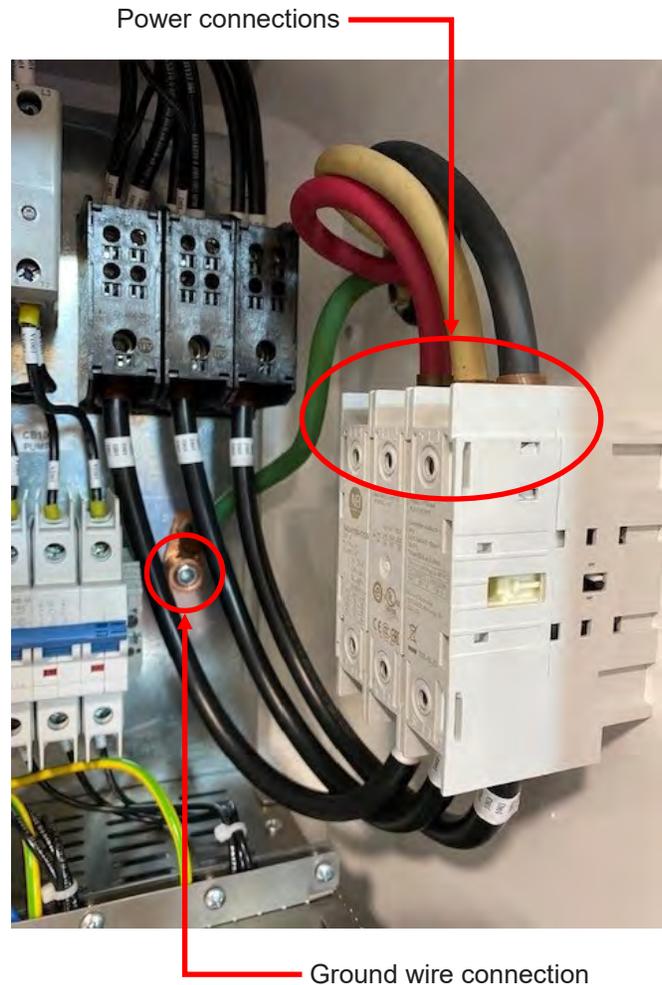
Confirm the IS30 rotary disconnect switch is in the OFF (O) position. Open the Control Module by rotating the upper and lower front cover latches on the front of the cabinet to the open (vertical) position. Insert appropriately rated 4 conductor power cord through the M40 X 1.5 cable gland provided with each IS30 (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.



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.



WARNING

The installer is responsible for selecting power cable or wire that has the appropriate ampacity and environmental ratings for the IS30 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.

10.1 IS30 INSTALLATION INSTRUCTIONS (Continued)

6. Connect QuickHeat Hoses



Lift and slide the Master Modem cover off its bracket. Remove upper and lower hose clamp bolts and outer clam shells. Set the Master modem in place in its bracket. Note: using zip-ties can help to hold the modem in place when attaching hoses.

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 IS30. 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 assembly) 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.)

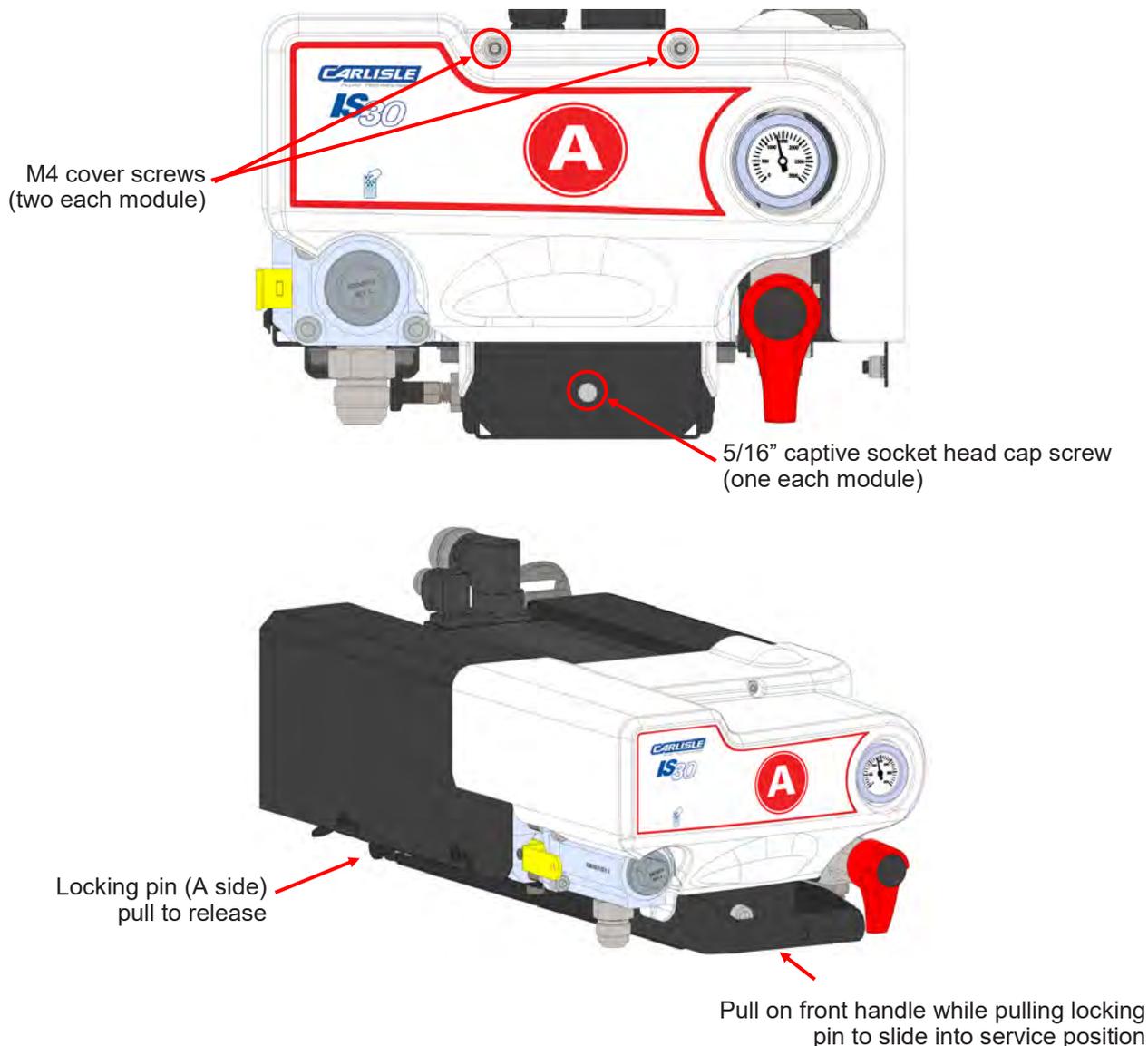
Reinstall the Master Modem cover onto its bracket.

Refer to the QuickHeat Hose manual for more detailed instructions.

10.1 IS30 INSTALLATION INSTRUCTIONS (Continued)

7. Connect fluid supply and recirculation hoses

Beginning with either the A or B fluid module, loosen the 5/16" socket head captive screw that holds the module to the IS30 frame (shown below). Pull the spring-loaded locking pin on the outside of the module and slide the module forward using the front handle to the 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. While not required for installation, the fluid module cover can be removed by loosening the two M3 socket head cover screws covers. Remove the cover by pulling it forward.



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)!**

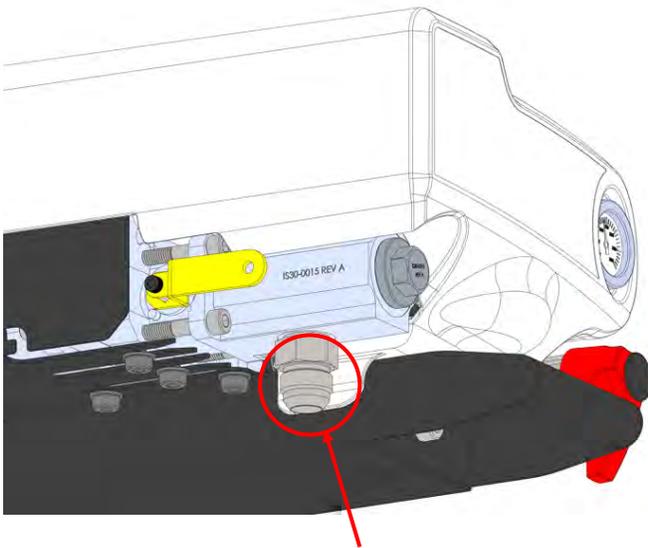
Connect the recirculation line to the corresponding module (JIC 5 on A module, JIC 6 on B module). If required, use installation kit PN 341133 to connect to 1/4" NPT recirculation hoses. See figures on the following page.

10.1 IS30 INSTALLATION INSTRUCTIONS (Continued)

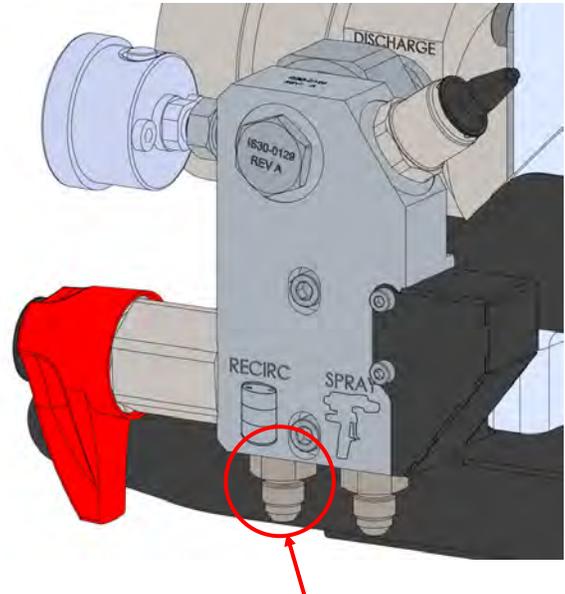
7. Connect fluid supply and recirculation hoses (continued)

Do not overtighten JIC fittings 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 screw. 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

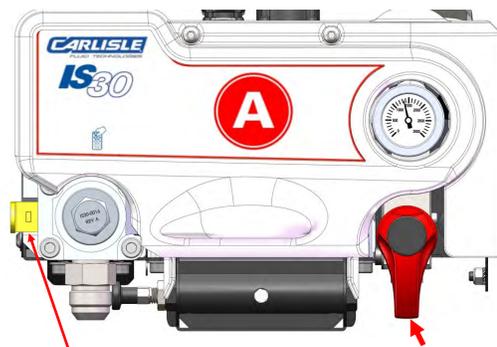


Recirculation hose fitting (JIC 5 A, JIC 6 B). Use kit PN 341133 to connect to 1/4" NPT fittings if required.

Replace module covers if removed and secure with M3 button head screws.

8. Set Fluid Module valves to position for purging

Set inlet, filter outlet, and recirculation valves (for each module) in the spray position as shown in the figure.



Filter Valve Open
(Horizontal position)

Spray (Gun) Position
(Pointed down)

10.1 IS30 INSTALLATION INSTRUCTIONS (Continued)

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 IS30, and that any ball valves on the supply lines are in the open position.

The IS30 senses pressure at the inlets on 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 IS30 display panel after the system is turned on.

11. Energize IS30 power circuit

Close any upstream breakers and/or disconnects to provide electrical power to the IS30.

12. Turn on IS30

Rotate the power switch on the side of the Control Module to the “ON” (I) position. The IS30 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).

13. Configure IS30 for Hose setup

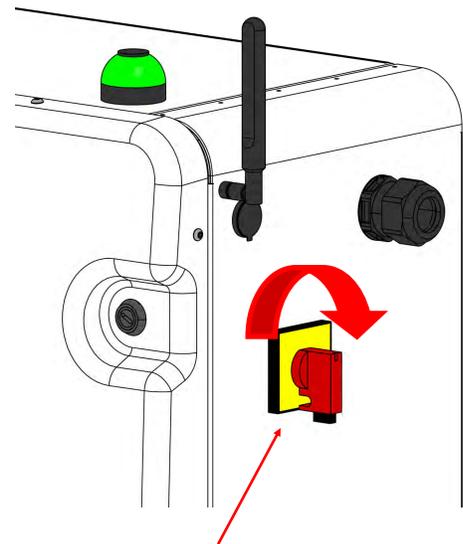
If the Proportioner and Hoses were configured together at the factory skip this step. If not, refer to the instructions starting in Section 18.7 to set hose configuration, pair hose modems, and select hose communication frequency.

14. Purge system

To fill the IS30 and hoses with material, follow the instructions in Section 15.2 for first time system purging.

15. Begin using IS30

Refer to the quick start instructions in Section 11 to begin using the IS30.

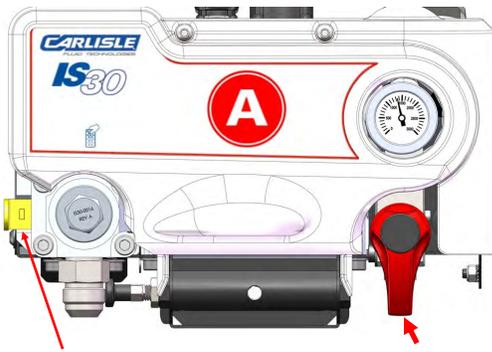


Rotate clockwise to “I” position to start IS30

11.0 IS30 QUICK-START GUIDE

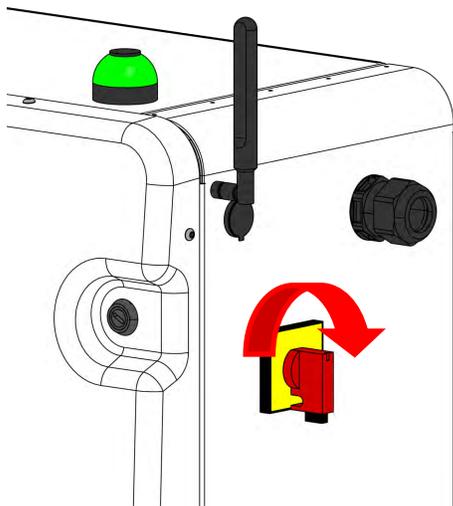
Due to the IS30's efficient heating systems and simplified startup process, operators will usually be ready to spray within 10-15 minutes from powering on the system. The following are the minimal steps involved in starting up the IS30 with Job Reporting turned off. See Section 20 for additional steps required when Job Reporting is turned on.

1. Before starting the IS30, remove all hose from the rack and position for spraying. Be sure the drum pumps are on and A and B fluid module valves are in the proper position for spraying.



Filter Valve Open (Horizontal position) Spray (Gun) Position (Pointed down)

2. Turn on the IS30 by rotating the power switch on the right side of the control module clockwise to the ON position (indicated by the character "I").



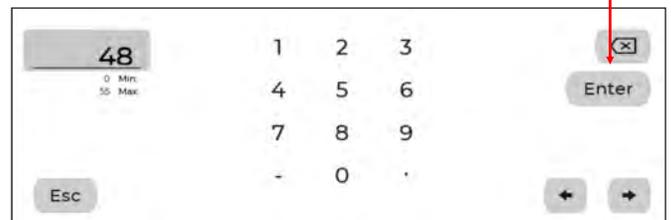
The IS30 will display a startup screen while it performs internal system checks. Once completed, the Spray Mode screen will be displayed. Note that the Exchange Mode screen can be set as the default startup screen if desired (see Section 18.3).



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



Press to enter drum level. Enter value, then press Enter and Save



11.0 IS30 QUICK-START GUIDE (Continued)

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

Pressure setpoint

Press “-” to decrease or “+” to increase pressure.



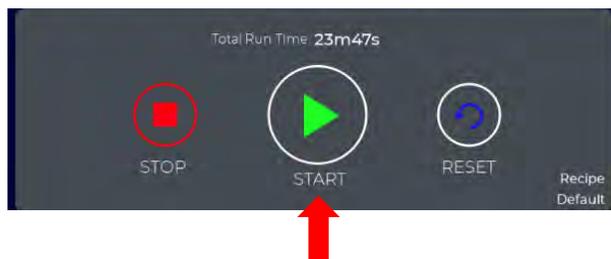
Press “-” to decrease or “+” to increase A temperature.

Press “-” to decrease or “+” to increase B temperature.

A-side temperature setpoint

B-side temperature setpoint

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



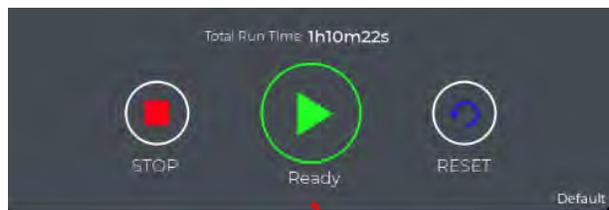
The center button will change from START to WARMING, and the button boundary will change from solid white to flashing green to indicate the system is warming up.



Indicates system is warming up

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

NOTE: If the IS30 detects a slow warmup in one of the hose temperature sensors, the START button will change to a flashing yellow “WARMUP BYPASS” button. Pressing the button will put the system in READY mode. See Section 14.3 for more information about the WARMUP BYPASS feature.

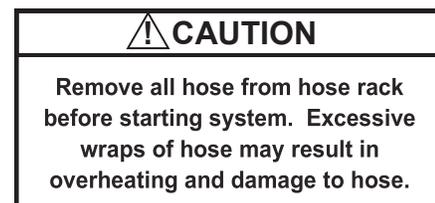


Indicates system is ready to spray

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 to the OFF position (indicated by the character “0”).

12.0 INTELLISPRAY OPERATION TIPS

- The system should always be turned off during transportation.
- **Remove and position all hose from the hose rack before turning the system on.** This avoids the possibility of overheating the hose.
- Remove tight loops in the hose prior to pulling hose into position to avoid hose kinking
- Straighten sections of hose near modems to allow best temperature feedback to unit
- 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.
- All air must be purged from wetted A side module and hoses to avoid solidifying material in the lines.
- Do not pull on hose sections that are not in line-of-sight to prevent tight loops and kinking
- **Do not heat hose without fluid** to avoid damaging the hose and causing leaks
- 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 set to operate at different hose communication frequencies to avoid interference and/or cross-talk between systems.
- **Never operate the system “dry”** unless performing a B side air-purge (follow directions in Section 15.6). This will damage the pumps.
- 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 hoses, IS30, and possibly distribution 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.
- When spraying is completed, stop the system before coiling up the 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.
- Do not operate the system with module covers removed unless performing diagnostics.



13.0 DISPLAY SCREENS - OVERVIEW

The IS30 Proportioner uses a 10.1 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 Section 28 for more details about remote monitoring and control.

As delivered, the IS30 is set to English language and SI units of measurement. Refer to Section 21 to change these settings.

Specification	IS30
Display	15.6" TFT LED
Resolution	1280 x 800 WXGA
Colors	16M
Brightness	500 Cd/m ²
Touchscreen	True Glass Projected Capacitive, Multitouch
Operating Temp	-20° to +60 °C
Protection Class	IP66 (front)

IS30 Display Specifications

After the 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 23 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 Section 18.5).

The IS30 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 4 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.



Bootup Screen

13.0 DISPLAY SCREENS - OVERVIEW (Continued)

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 menu of all first-level screens is shown. The following figure provides a summary description of each menu item, along with the page number in this manual for more information.

	Pull-down menu icon	
	Close pull-down menu	Section
	Spray Mode (active mode)	14
	Exchange Mode (grayed out means not active)	15
	Alarm Screen (current and historical warnings and errors)	16
	System Status and Diagnostics (in submenus)	17
	System Settings	18
	Recipes (for recalling, creating, saving, editing deleting recipes)	19
	Reports (in submenus)	20
	Languages (in submenus)	21
	Double arrows indicates submenus exist for these items	

14.0 SPRAY SCREEN¹ - OVERVIEW

The Spray Screen is factory set as the default start-up screen. 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 IS30 delivers the most consistent performance regardless of material viscosity, flow rates, hose length, elevation changes, or environmental and other work conditions.

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

Upper menu for accessing other modes and screens

This part of the screen is for displaying and entering operating parameters

This part of the screen controls system state

Pressure Widget

Temperature Widgets

Drum Widgets

NOTE
Temperature and Pressures are at the last hose modem section, the spray gun.

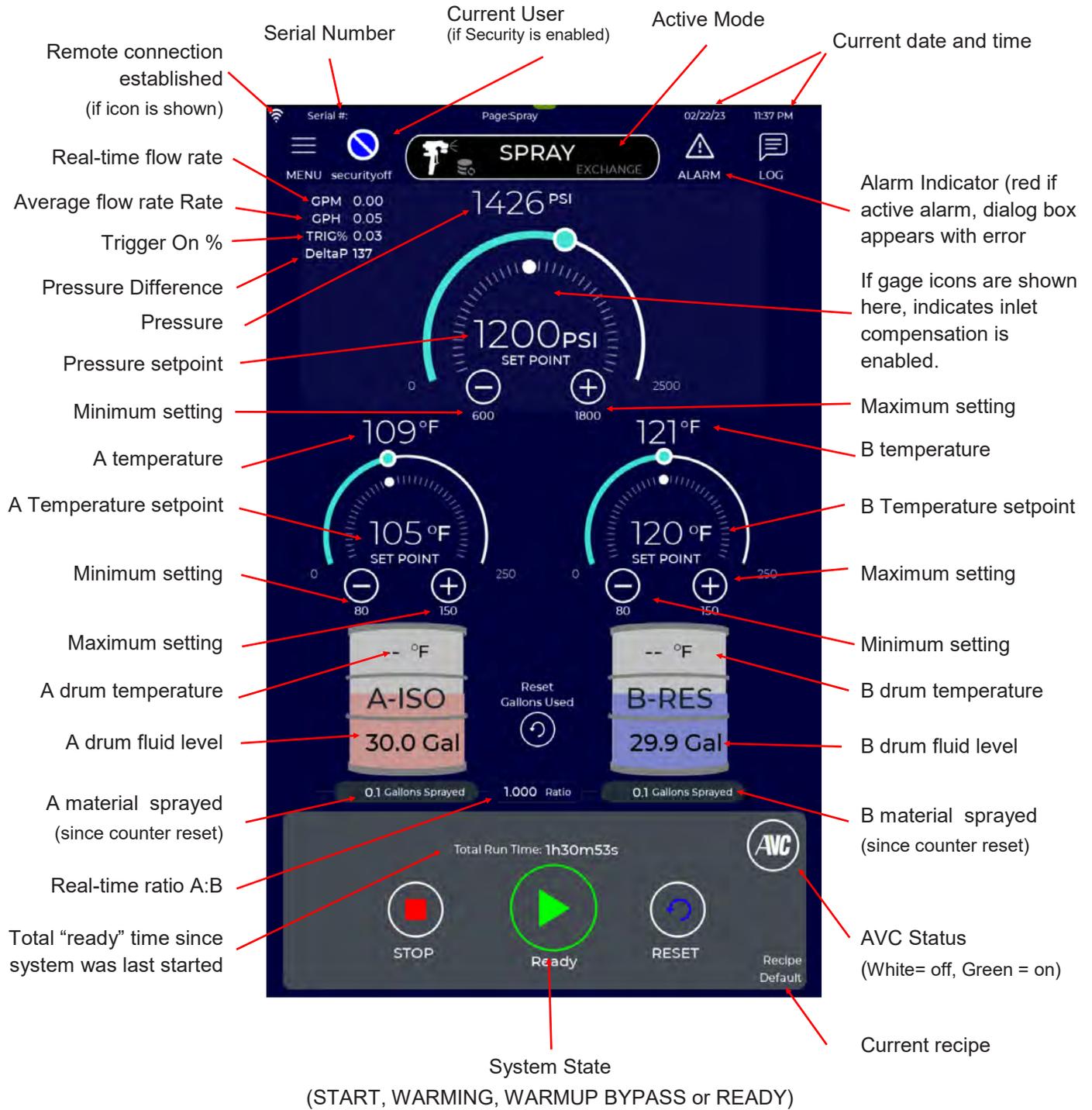
Serial #: _____ Page:Spray 02/22/23 11:37 PM
 MENU securityoff SPRAY EXCHANGE ALARM LOG
 GPM 0.00 1426 PSI
 GPH 0.05 1200 PSI SET POINT
 TRIG% 0.03
 DeltaP 137
 109 °F 121 °F
 105 °F 120 °F SET POINT
 A-ISO 30.0 Gal B-RES 29.9 Gal
 0.1 Gallons Sprayed 1.000 Ratio 0.1 Gallons Sprayed
 Total Run Time: 1h30m53s
 STOP Ready RESET
 Recipe Default

Spray Screen

¹Job logging and Security are disabled –see Sections 18.13 and 20 for more information on Job logging and Security.

14.1 SPRAY SCREEN¹ - USER INFORMATION

The 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

¹Job logging and Security are disabled –see Sections 18.13 and 20 for more information on Job logging and Security

14.2 SPRAY SCREEN¹ - USER ACTIONS

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

The screenshot shows the 'SPRAY' control interface. At the top, there are status indicators for 'Serial #', 'Page: Spray', '02/22/23', and '11:37 PM'. The main display features a large pressure gauge set to 1200 PSI with a current reading of 1426 PSI. Below this are two temperature gauges for 'A-ISO' (105°F) and 'B-RES' (120°F). At the bottom, there are two drum level indicators for 'A-ISO' (30.0 Gal) and 'B-RES' (29.9 Gal). The interface includes several control buttons: 'STOP', 'Ready', and 'RESET' at the bottom; and 'AVC' (Auto Valve Control) on the right. Annotations with red arrows point to various elements: 'Pull-down menus' (top left), 'Home and Mode Select button' (top left), 'Pressure setpoint (press to decrease)' (left of main gauge), 'Pressure setpoint (press to increase)' (right of main gauge), 'A Temperature setpoint (press to decrease)' (left of A gauge), 'A Temperature setpoint (press to increase)' (right of A gauge), 'A Drum pop-up widget (press to open)' (A-ISO drum), 'B Temperature setpoint (press to increase)' (right of B gauge), 'B Temperature setpoint (press to decrease)' (left of B gauge), 'B Drum pop-up widget (press drum to open)' (B-RES drum), 'Fluid counter reset (shown when Job Reporting is disabled)' (STOP button), 'System Stop (shuts off heaters and pumps)' (STOP button), 'System Start (one button initiates heating and pressurization)' (Ready button), 'System Reset (clear error condition)' (RESET button), 'AVC Button (Press to toggle on/off)' (AVC button), 'Log Buttons (see Section 20.2)' (LOG button), and 'System Alarms (see Section 16)' (ALARM button).

Spray Screen User Actions

¹Job logging and Security are disabled –see Sections 18.13 and 20 for more information on Job logging and Security

14.3 SPRAY SCREEN - USE

The Spray Screen is the factory default startup screen. Users can change the startup screen to Exchange Mode if desired (see Section 18.5). 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 Proportioner 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. If AVC is enabled only a single temperature setpoint is required (see Section 14.5).

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 decrease, press the down (negative) button. To increase, press the 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 by the moving dot and circular bar. The maximum and minimum settable pressure is shown below the setpoint buttons. The default maximum gage range is 2500 psi. These settings can be changed in the Recipe menus (Section 19).



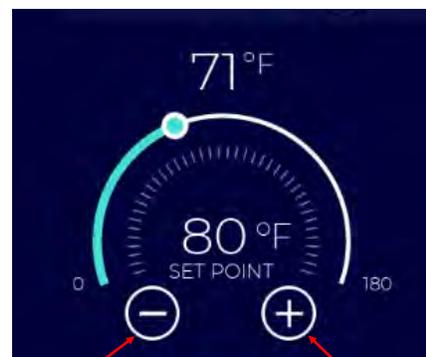
Press to decrease pressure

Press to increase pressure

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 respective decrease (negative) or increase (positive) buttons 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 maximum and minimum settable temperatures are shown below the setpoint buttons. The default maximum gage range is 2500 psi. These settings can be changed in the Recipe menus (Section 19).



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 Proportioner 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 by 1-3 psi per foot of hose depending on viscosity and flow rate.

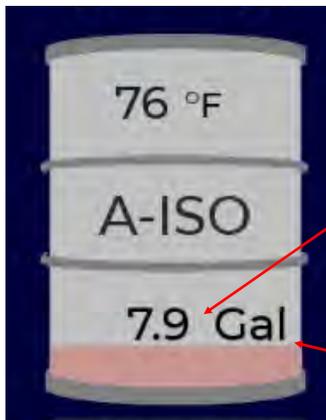
14.3 SPRAY SCREEN - USE (Continued)

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 Section 18.9).

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 gallons “pony” drums or 250 gallons “totes”). See Section 18.9 for more information.



Drum level
(value)

Drum level
(graphical)

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.



The previous entry value will be retained.

Press here to enter drum level.

If job reporting is enabled, more material information can be entered. See Section 20.

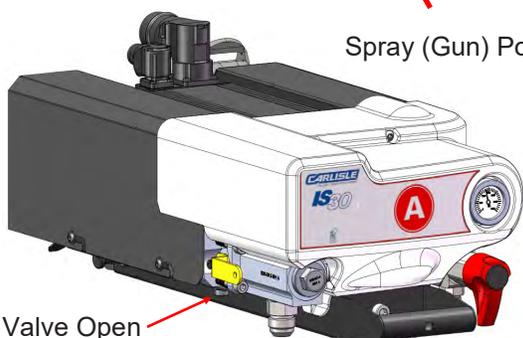
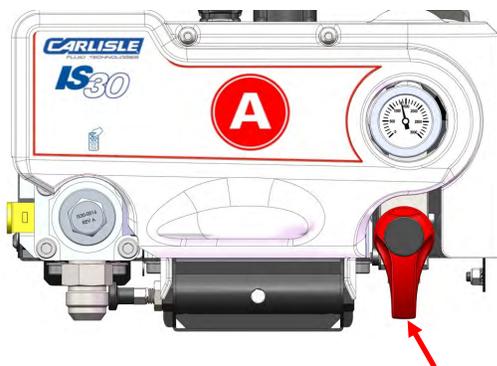
When the pop-up window appears, press the drum level and enter the value using the on-screen keypad. Press the Enter button then the Save button on the pop-up window. The new value will be displayed on the drum and the graphical level indicator on the drum icon will be reset.



14.3 SPRAY SCREEN - USE (Continued)

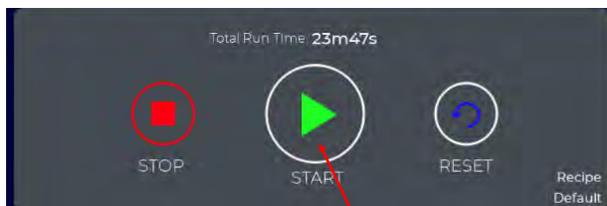
4. Check Fluid Valves

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.



Press to Start System

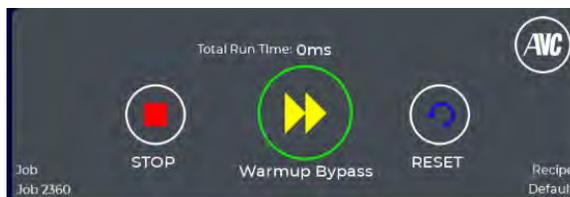
The center button will change from START to WARMING UP, and the button boundary will change from solid white to flashing green to indicate the system is warming up. Pressing the STOP button at any time turns off heaters and pumps.



Indicates system is warming up

If the IS30 detects a slow warmup, the START button will change to a flashing yellow "WARMUP BYPASS" button. Pressing the button will put the system in READY mode.

This issue may be caused by a gap between a hose temperature sensor and the internal hose heating element. Spraying fluid will usually correct this issue by moving the heating element within the hose to once



NOTE

Do not start spraying until the button changes to READY state.

After the IntelliSpray Proportioner reaches the temperature setpoints (usually about 10 minutes from a cold start) the system will then pressurize to the user setpoint pressure and the START button will indicate the system is READY to spray.



Indicates 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

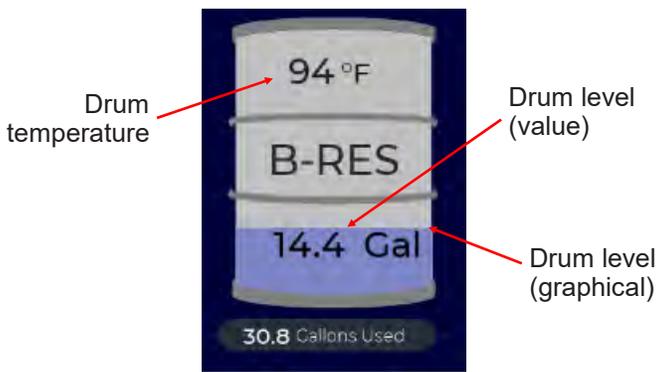
Even when the system is in STOP mode or the Proportioner is tuned off, the A and B fluids in the Proportioner and Hoses may be at elevated temperatures and pressures that could cause personal injury or property damage.

14.4 SPRAY SCREEN - OTHER FUNCTIONS

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

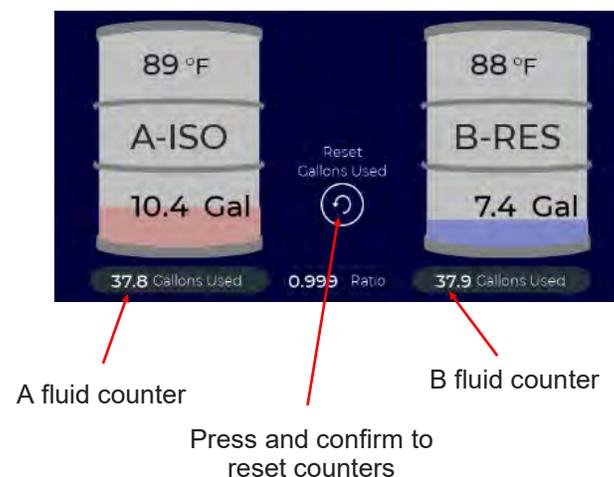
Drum Temperature

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). The drum temperature will only be displayed after a short period of sustained flow. This temperature can be compared to material manufacturers recommendations for acceptable fluid temperature range. The proportioner can be used to independently preheat A and B fluids using Exchange Mode (see Section 15.5).



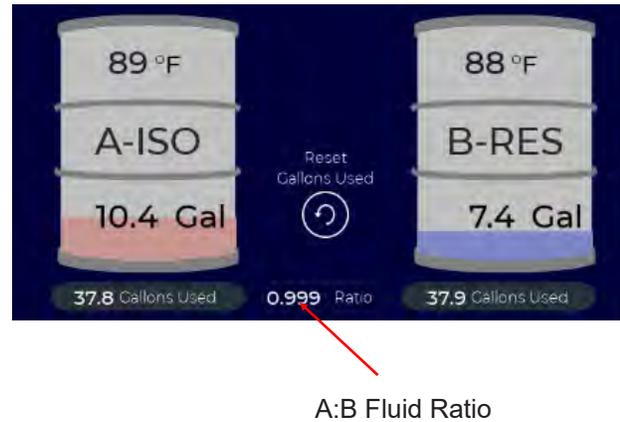
Fluid Counter

The proportioner 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.



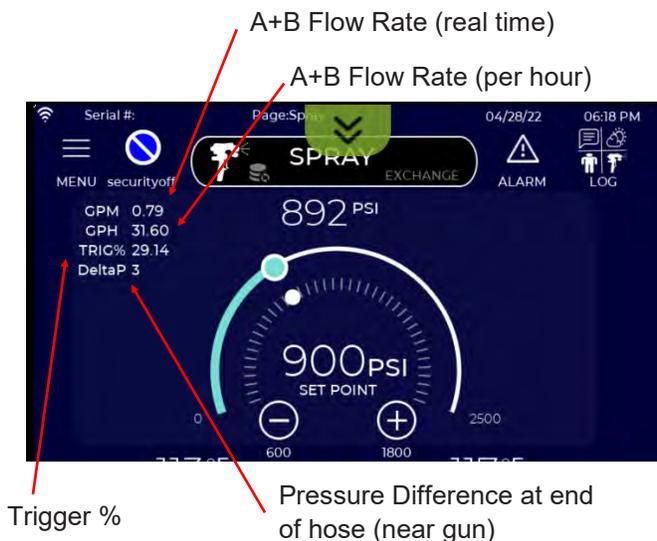
Fluid Ratio

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



Flow Rate and Trigger %

Real-time total flow rate (A+B) is shown in the upper left corner of the Spray Screen along with the output per hour since the system was in Run state. Trigger % is also shown, which is a measure of total time fluid has been sprayed divided by the total time the system has been in the Run state since the last power cycle. Higher trigger % values generally indicate higher sprayer productivity. Higher trigger % values can also improve material yield.



14.4 SPRAY SCREEN - OTHER FUNCTIONS (Continued)

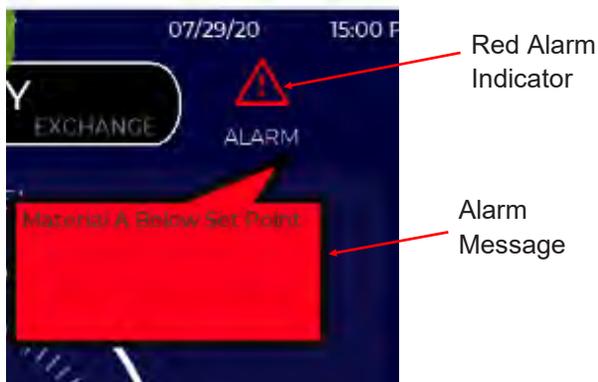
Alarms

Active alarms are indicated by a red or yellow alarm icon and a dialogue box in the upper right section of the Spray Screen. The Alarm icon is white when there are no active Alarms.

Alarms can be either Warnings or Errors. Warning Alarms do not stop the system, but should be addressed before they create an Error condition. Warnings are indicated by a Yellow Alarm Icon and dialog box.

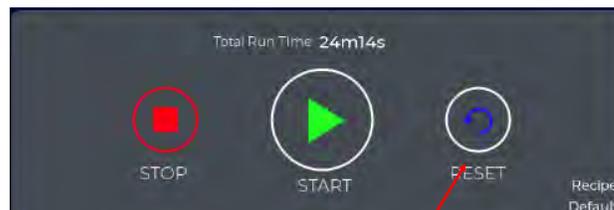
Error Alarms are conditions that automatically STOP the proportioner. The proportioner will remain in the STOP state until the error is resolved and the RESET button is pressed. All alarms provide possible causes and recommended actions. Pressing on the Alarm Icon will open the Alarm Screen (see Section 16 in this manual for more information).

In the example below, the A drum level has dropped below the error limit level, causing the system to STOP and the alarm to activate. In addition the corresponding material icon will be flashing red.



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 prior to pressing the START button to resume operation.



Press RESET to clear alarm before restarting system

Pre-Heater Temperature Offset

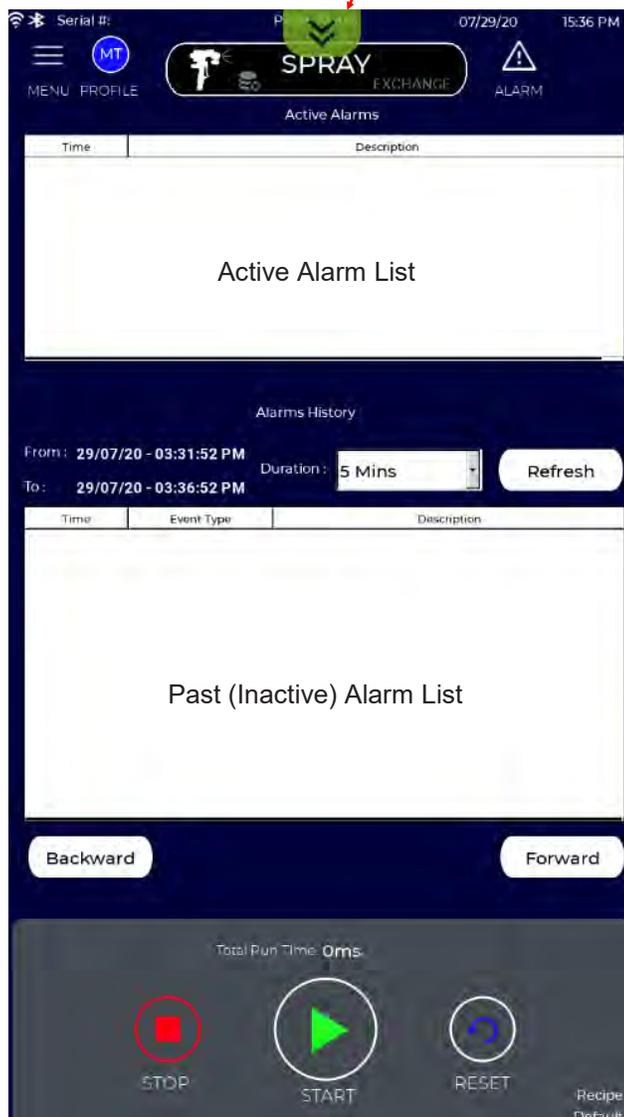
In some cases, it may be desirable to run the A and/or B preheaters at a temperature offset from the setpoint. Most often this is used when the viscosity of the B fluid is very low (as in some Open Cell materials). This can reduce the efficiency of the gear pumps or even cause premature wear of the pump bearings. In this case, keeping the temperature of the B material cooler can help, as it will result in a higher viscosity in the gear pumps. The hose heaters may have to work harder to elevate the temperature to the setpoint, but in most cases that is not a problem. A preheater offset can be entered in the active Recipe (see Section 19). If a preheater offset is entered it will show in the temperature widget as shown below.



14.4 SPRAY SCREEN - OTHER FUNCTIONS (Continued)

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 Section 16 for more information on the Alarm Screen.



Inlet Compensation

When Inlet Compensation is enabled, a small dial icon is shown within the Pressure Widget (as shown below). Inlet Compensation is disabled from the factory, but can be enabled in the Recipe Pressure Table (see section 19.0). Section 14.6 provides more information about Automatic Inlet Compensation.



When Inlet Compensation is enabled in the currently active Recipe, the IntelliSpray proportioner will automatically prevent inlet flow starvation. This prevents fluid cavitation, off-ratio issues, and pump damage. This feature may be required if drum temperatures are too low, material viscosities are too high, or transfer pumps are either undersized, lacking adequate air pressure or flow, or leaking. Reducing the pressure setpoint and/or gun chamber/tip size can also be used to compensate for material starvation.

14.5 SPRAY SCREEN - AUTOMATIC VISCOSITY COMPENSATION

IS30 Proportioners are equipped with Automatic Viscosity Control (AVC™). When enabled AVC continuously adjusts fluid temperatures throughout the system to minimize viscosity differences between the A (Isocyanate) and B (Resin) materials. At the same time AVC maintains the user-defined fluid output mix temperature and pressure. This results in better pressure balance at the spray gun, more consistent spray pattern, improved impingement mixing, and reduced potential for fluid cross-over in the spray gun.

AVC can be enabled or disabled from the Spray screen at any time during operation by pressing the AVC button located next to the STOP button.

When disabled (AVC OFF), the AVC button will be white and both A and B temperature widgets will be visible. This is shown in the figure below (left). When enabled (AVC ON), the AVC button outline will be green and the A and B temperature widgets will collapse to a single temperature widget as shown below (right). This widget now shows the average fluid “mix” temperature of the A and B fluids at the end of the distribution hose (near the spray gun). When AVC is ON, the User needs to set only one temperature rather than two, which now represents the mix temperature of the fluids. The proportioner manages the preheaters and hose heaters to provide this mix temperature while minimizing viscosity and pressure differences between the two fluids throughout the system. The pressure setpoint and control is unaffected.



AVC OFF



AVC ON

14.5 SPRAY SCREEN - AVC (Continued)

When AVC is active the dynamic pressure difference (ΔP) is shown in the upper left portion of the Spray Screen. ΔP is the actual pressure difference between the A and B fluids at the end of the distribution hose (nearest the gun). The average mix temperature is shown in the temperature widget and the temperature setpoints of the A and B fluids are shown to the left and right of the temperature widget, respectively. These setpoints are determined by AVC.

To increase or decrease the fluid mix temperature press the + or - buttons under the single temperature widget. AVC will automatically adjust temperatures of A and B materials while maintaining the specified mix temperature. The maximum allowable difference between A and B temperatures is 50F, but can be reduced in the Recipes Screen.

When the user disables AVC (by pressing the AVC button) both A and B temperature widgets will reappear, showing the temperature settings determined by AVC.

Users can return to AVC (or disable) at any time while spraying by pressing the AVC button.

The screenshot displays the following data and controls:

- Top Bar:** Serial #: 1034, Page: Spray, 03/28/22, 04:44 PM. Includes MENU, securityoff, SPRAY EXCHANGE, ALARM, and LOG icons.
- Pressure:** 841 PSI (actual), 750 PSI (SET POINT). Range: 0 to 2500.
- Temperature:** 116°F (actual mix), 116°F (SET POINT). Range: 80 to 150.
- Fluids:**
 - A-ISO: 23.0 Gal, 20.6 Gallons Sprayed
 - B-RES: 23.9 Gal, 20.7 Gallons Sprayed
 - Ratio: 1.000
- AVC Status:** Enabled (indicated by a green border around the AVC button at the bottom right).

Annotations with red arrows:

- Dynamic pressure difference between A and B fluids at the end of the distribution hose. (Points to ΔP 12)
- Actual mix fluid temperature (Points to 116°F)
- User temperature setpoint of the fluid "mix" (Points to 116°F SET POINT)
- A side temperature Setpoint (determined by AVC) (Points to 110°F)
- B side temperature Setpoint (determined by AVC) (Points to 122°F)
- AVC Enabled (green border and only one temperature widget). (Points to the AVC button)

14.6 SPRAY SCREEN - Automatic Inlet Compensation

IS30 proportioners are equipped with Automatic Inlet Compensation (AIC). AIC continuously monitors inlet fluid pressures and adjusts A and/or B gear pump speed as needed to prevent fluid cavitation in the supply lines or low pressure manifold of the proportioner. Fluid cavitation occurs when transfer pumps are unable to maintain adequate flow to the proportioner. Cavitation creates gaseous bubbles (frothing) in the fluid that can damage gear pumps, cause off-ratio spraying, and create cross-overs at the spray gun.

AIC is enabled by default, but can be disabled in the active Recipe (see Section 19). AIC becomes active when any of the inlet manifold pressure sensors detect persistent transfer pump pressure excursions below 60 psi. When AIC is active small gage icons will appear inside the Pressure Widget on the Spray screen. A red gage icon indicates which side (left = A, right = B) low inlet pressure is sensed on. This is shown in the left-hand figure below.

Gage icons indicate AIC is active.



AIC Active



AIC Inactive

When AIC is active, the sprayer may notice a slight pulsation or reduction in output, however fluid ratio will not be affected. If AIC is disabled in the active Recipe, the system will display a low pressure alarm and move to Stop state when the A or B pressure drops below 25 psi (1.7 bar).

AIC is intended to allow users to keep spraying until the cause(s) of low inlet pressure can be addressed. A user can also lower the proportioner pressure setpoint and/or spray gun chamber size to reduce the demands on the transfer pumps, however this will not address the root cause(s) of low inlet pressure. The following table provides several possible causes and actions related to low inlet pressure,

Possible Causes for Low Inlet Pressure	Actions
Undersized transfer pumps	Install transfer pumps that match proportioner flow rate.
Fluid is too cold (resulting in higher viscosity)	Make sure fluid supply is at recommended temperature
Low transfer pump air pressure	Raise air pressure
Low transfer pump air flow	Increase flow rate (larger compressor, larger diameter air lines, eliminate air line restrictions).
High pressure loss between transfer pump and proportioner	Increase fluid supply hose diameter, reduce length, eliminate any flow restrictions.
Leaking seals in transfer pump	Repair transfer pump

15.0 EXCHANGE SCREEN - OVERVIEW

When in Exchange Mode, the IS30 proportioner 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:

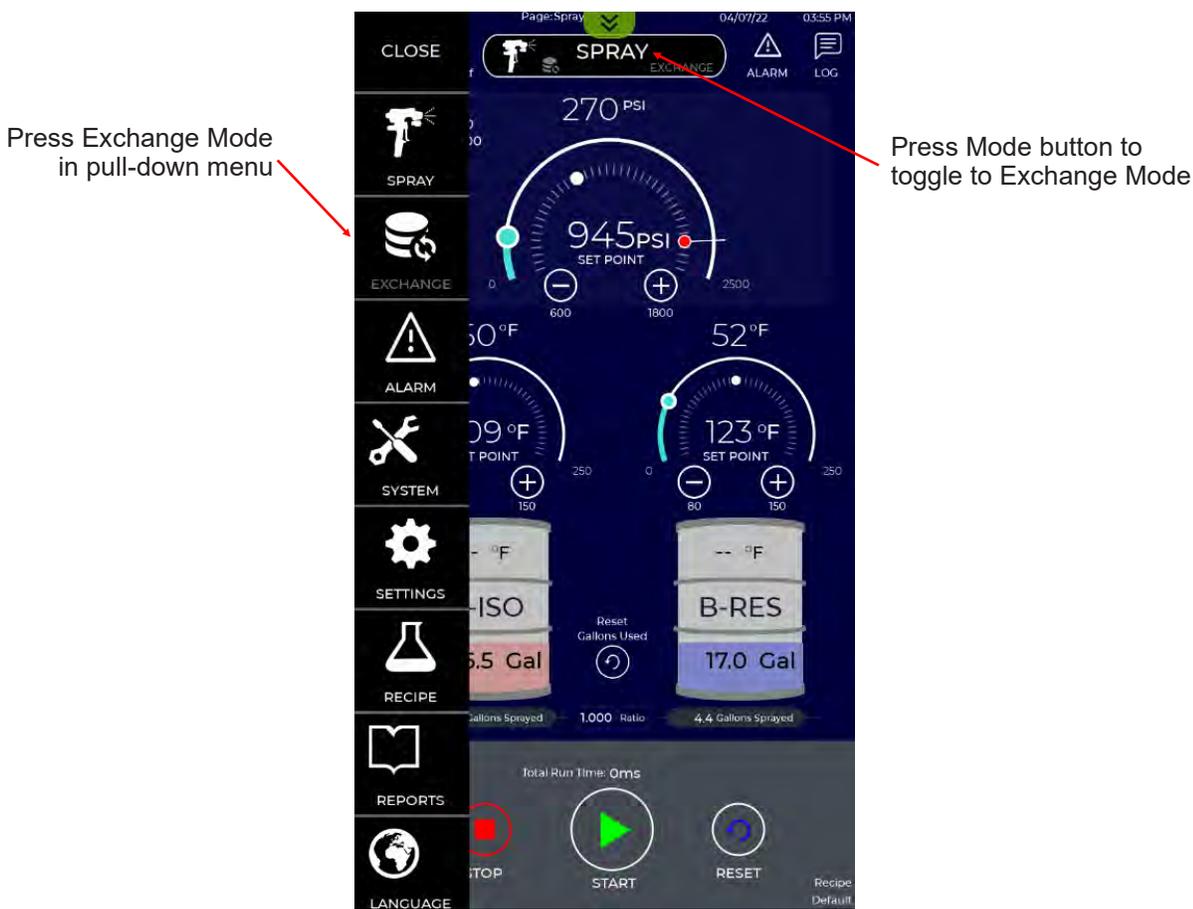
Purge: Fluid **is not** returned to the supply drums. Drum level counters **are** decremented by the amount of fluid purged. Used when the operator needs to push material through the system. Commonly used during changeover between different materials. Also used to purge old material from proportioner 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 proportioner includes fittings for attaching purge or recirculation hoses to the fluid modules (see Section 7). 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.

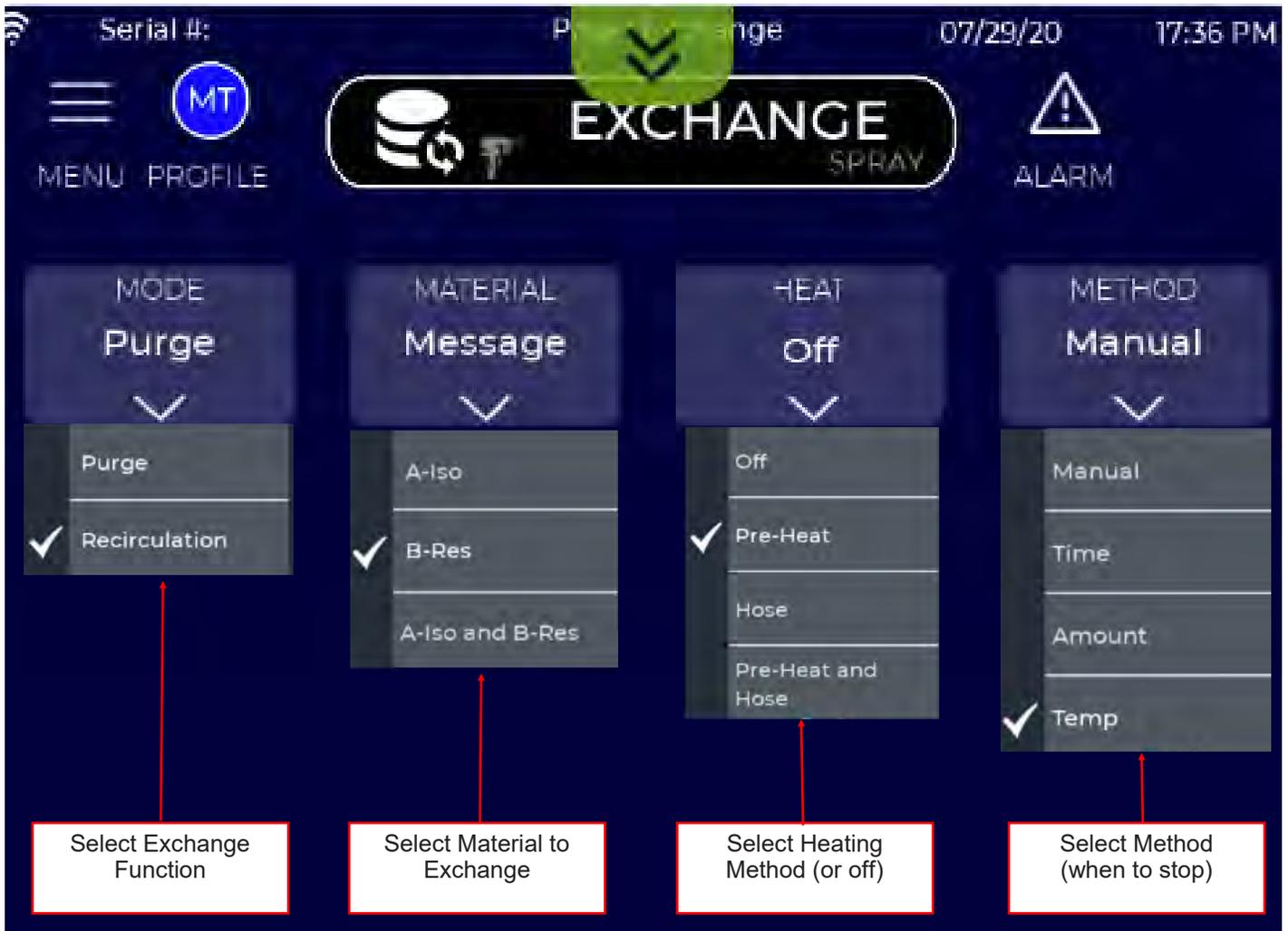


15.1 EXCHANGE SCREEN - USE

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 selections are shown below. Pressing on the desired parameter selects it and indicates the selection with a check mark.



15.1 EXCHANGE SCREEN - USE (Continued)

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

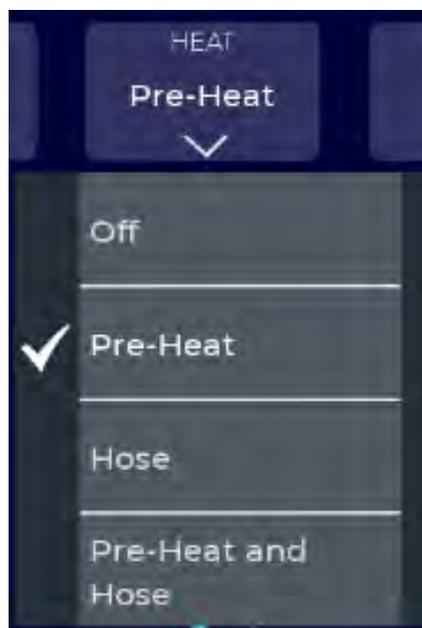
Never purge the proportioner or hoses with a flammable or oxidizing gas or liquid. Explosion and/or fire may result with significant injuries, loss of life, and property damage.

⚠ 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.

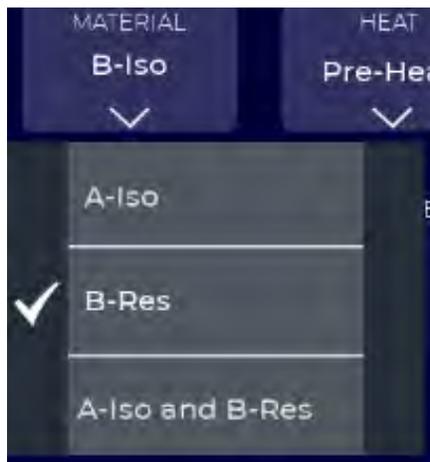
3. Select Fluid Heating

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**.



2. Select Material

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



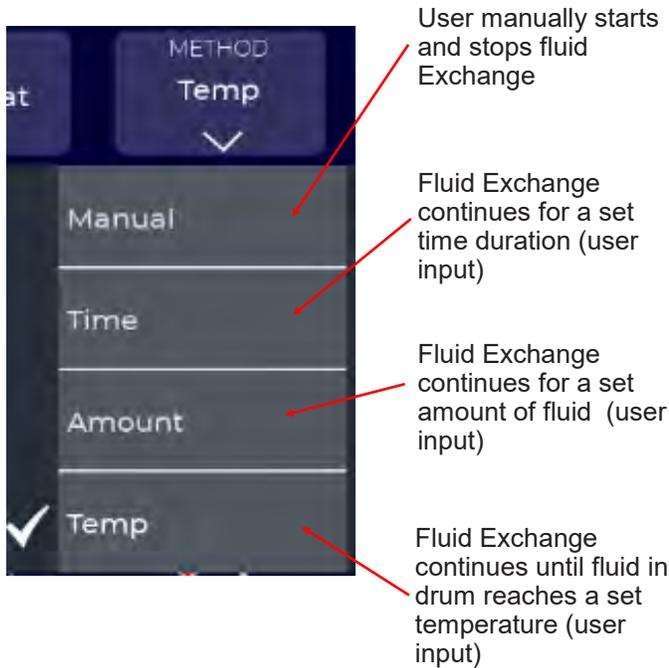
⚠ CAUTION

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 or Exchange mode.

15.1 EXCHANGE SCREEN - USE (Continued)

4. Select Method

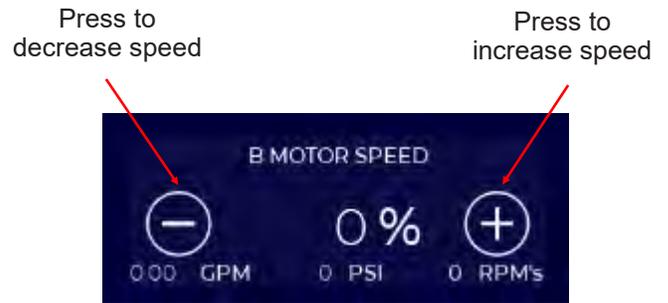
The proportioner allows the user to operate Exchange functions (Purge or Recirculate) manually. In addition, the user can select a Method parameter that will automatically stop the Exchange action when completed. The Method options are shown described and below.



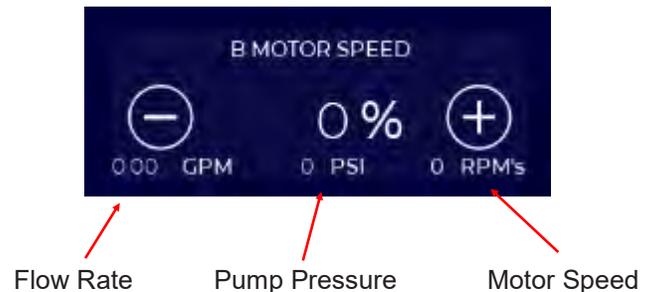
The proportioner configures the Exchange screen based on selected parameters. This is shown in the examples on the following pages.

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 10% 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 20% or less. Instructions for performing an Air Purge are shown in Section 15.6. Air purge should never be used on the A side, as it could cause ISO to harden in the fluid passages and hoses.



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 Section 19 to set system maximum pressure.) Motor speed can be adjusted while the motor is running.



NOTE

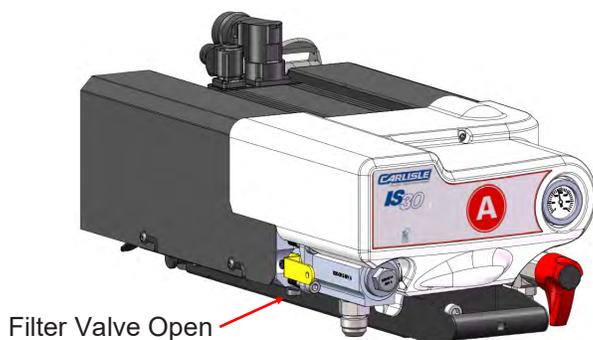
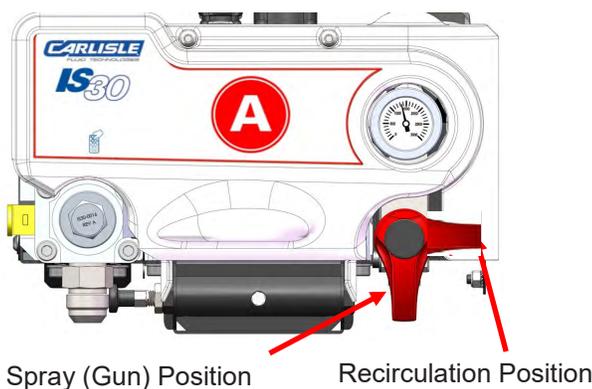
Always start fluid Exchange at a motor speed below 10% as higher speeds may result in an overpressure error. In Exchange mode it is best to start slow and then increase motor speed.

15.1 EXCHANGE SCREEN - USE (Continued)

6. Check Fluid Lines

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

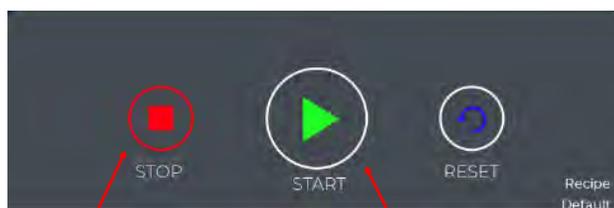
- Supply pumps are at pressure
- Supply valves are open
- Filter valve on the proportioner is open
- Recirculation valve on the proportioner is the proper position (gun or drum) depending on intent.



IS30 Fluid Valve Settings

7. Start Fluid Exchange

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

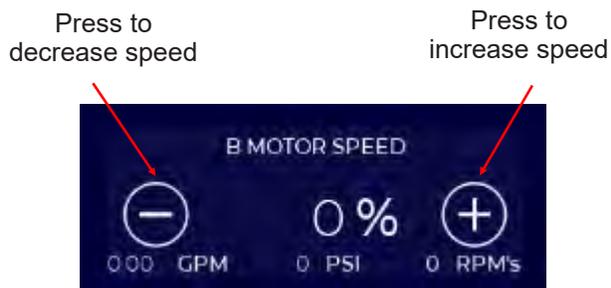


Press to stop fluid Exchange

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. Note that the real-time fluid flow rate, pump pressure, and motor RPM values are shown below the motor speed.



NOTE

Always start fluid Exchange at a motor speed below 10% 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 recirculation.

With the ability to independently purge, recirculate and heat A and B fluids, the IS30 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.

15.2 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.

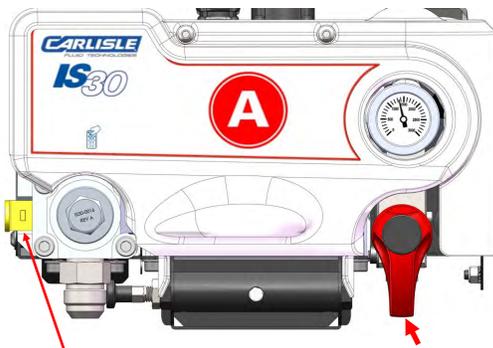


2. Check that supply lines, recirculation hoses, and distribution hoses are properly connected.
3. Check the analog pressure gage on the fluid module to be bled. Relieve pressure by turning the outlet valve to the recirculation position. Once pressure is relieved, turn the outlet valve back to the gun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

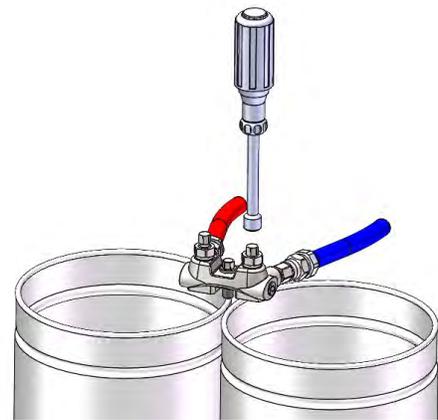


Filter Valve Open
(Horizontal position)

Spray (Gun) Position
(Pointed down)

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.

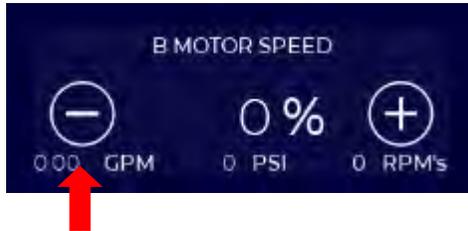


⚠ WARNING

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.

15.2 EXAMPLE 1 - INITIAL SYSTEM BLEED (Continued)

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

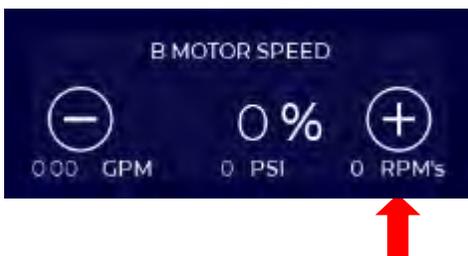


12. Close the B-side material control valve on the gun manifold.
13. Repeat the process for the A-side if required.

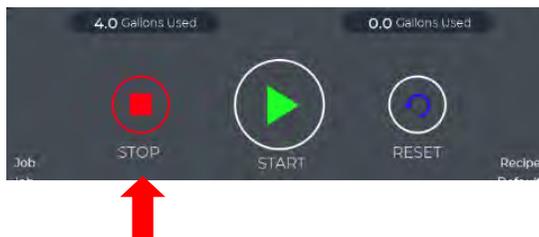
9. Press the START button.



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 gradually increased but should remain below 50% until distribution hoses are filled.



11. Press STOP when a steady stream of fluid flows from the manifold for at least 30 seconds and all air has been replaced with fluid.



⚠ 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.

15.3 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.

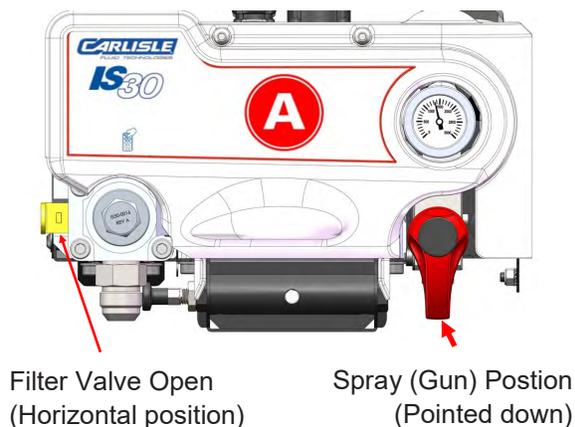
1. Be sure the system is in **STOP** state.



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 (20.4 bar) relieve pressure by opening the recirculation valve in STOP

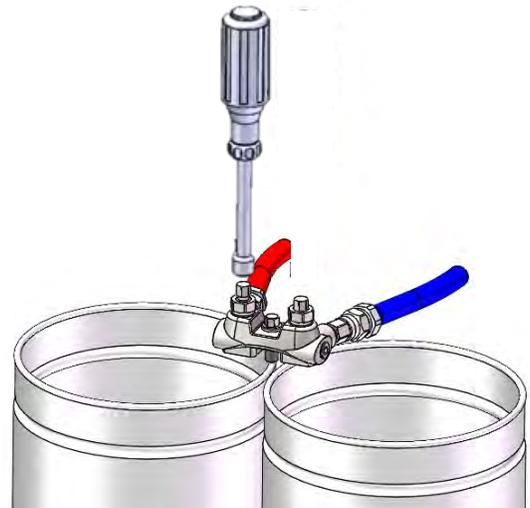


4. Open A-side filter valve and set the output valve to spray position as shown in the following figure.



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.



15.3 EXAMPLE 2 - A-SIDE MANUAL PURGE (Continued)

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



- 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.



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

Real-time flow

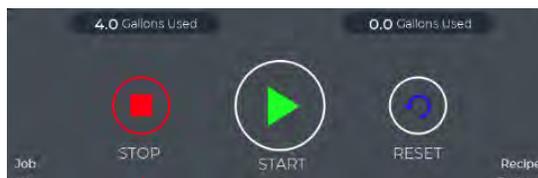
Real-time

Real-time



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

- 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.



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.



15.4 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.

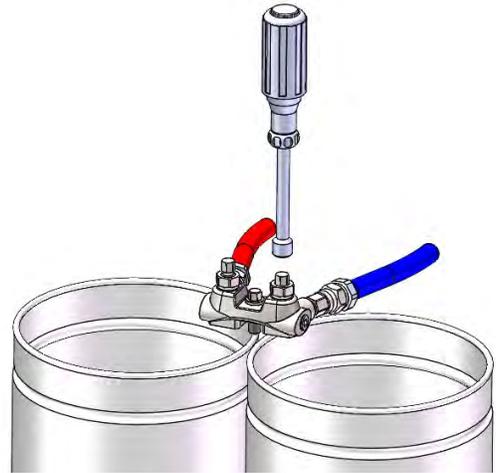


2. Check that B-side supply lines, recirculation hoses, and distribution hoses are properly connected.
3. Check the pressure gage on the B fluid module. If the gage pressure is over 300 psi reduce pressure by opening the recirculation valve in STOP state.

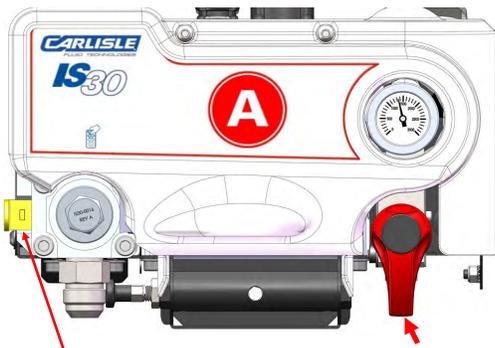
⚠ WARNING

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

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.



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



Filter Valve Open
(Horizontal position)

Spray (Gun) Position
(Pointed down)

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.



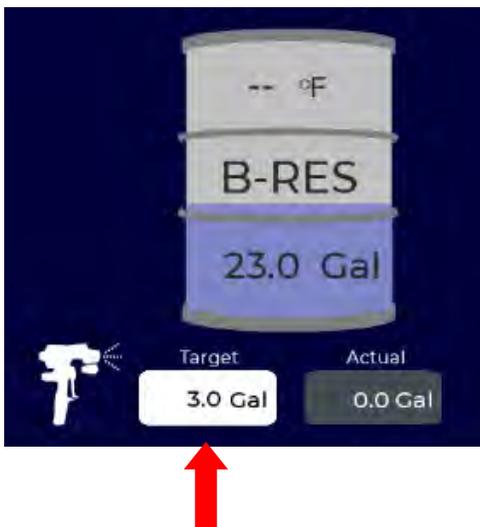
5. Activate B-side transfer pump.

15.4 EXAMPLE 3 - B SIDE PURGE AMOUNT (Continued)

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.

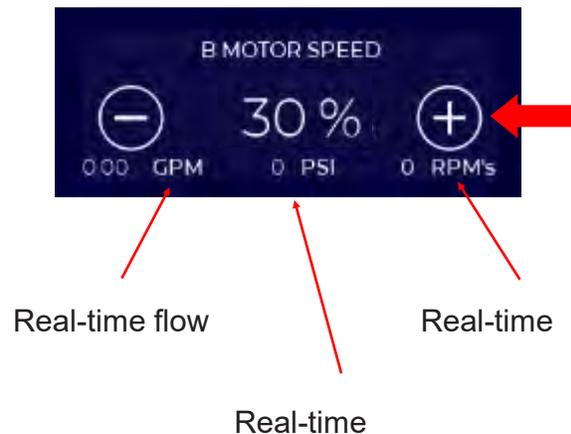


11. Press the START button to begin purging and heating. Note, there is no warmup cycle in Exchange Mode. If the material needs to be heated before turning pumps on, set motor speed to 0% or run at low speeds until fluid is warmed. Otherwise fluid will be heated during pumping.



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.

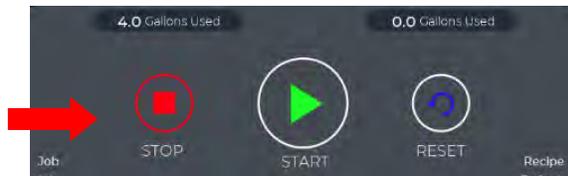


13. When the actual amount of material purged equals the target value the system will automatically go to STOP state and fluid purge will stop.
14. Close the material valve on the gun manifold and re-attach the gun.

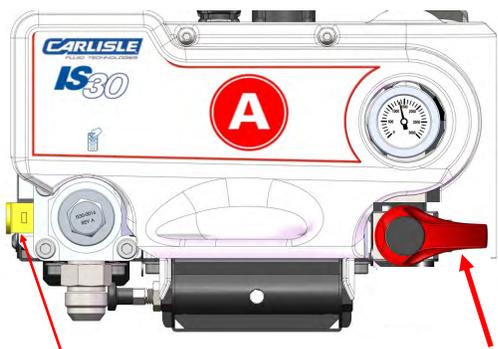
15.5 EXAMPLE 4 - PREHEAT B DRUM MATERIAL

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 IS30 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 Valve Open (Horizontal position)

Recirculation Position

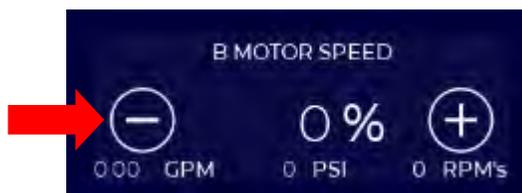
4. Activate B-side transfer pump. B-side fluid may begin to recirculate to the drum. This is acceptable.
5. After selecting Exchange Mode from the main menu:
 - Select Recirculation from the FUNCTION menu.
 - Select B-Iso from the MATERIAL menu.
 - Select Pre-Heat from the HEAT menu.
 - Select Temp from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



6. Enter the target drum fluid temperature of 90°F 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 IS30 will automatically stop recirculation when the actual incoming fluid temperature reaches the user-specified target temperature.

15.6 EXAMPLE 5 - B SIDE AIR PURGE

When changing B-side materials it may be important to minimize mixing of different 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 IntelliSpray Proportioner can use compressed air or inert gas with the Purge function on the B side. This is referred to as performing an “Air Purge”. Compressed air cannot not effectively leak through the proportioner 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.

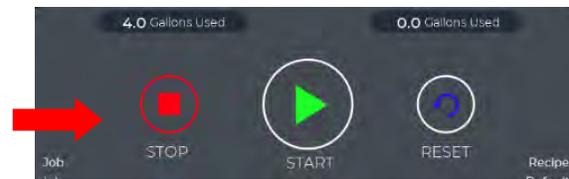
CAUTION

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.

Air Purge Steps

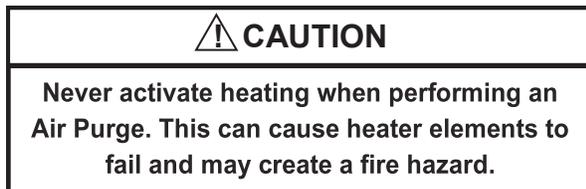
1. Be sure the system is in **STOP** state.



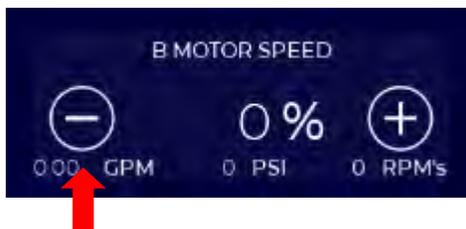
2. Shut off the B-side transfer pump and close the transfer pump outlet valve if so equipped.
3. To minimize cross-contamination remove the B-side transfer pump from the old drum and drain per manufacturer's recommendations. If some cross-contamination is acceptable this step can be skipped.
4. Confirm 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.

15.6 EXAMPLE 5 - B SIDE AIR PURGE (Continued)

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.



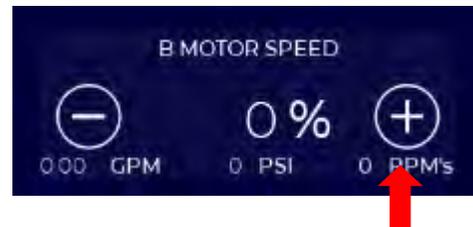
8. Recommended step: Set B motor speed to 0 by pressing the - button in the Motor Speed Widget.



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.

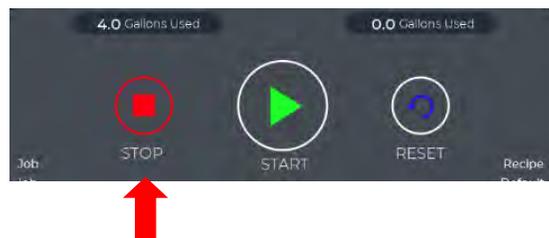


11. Increase B motor speed by pressing the + button in the Motor Speed Widget. Motor speeds should be limited to 10% or less when performing an Air Purge to avoid damage to the pump bearings and internal surfaces..



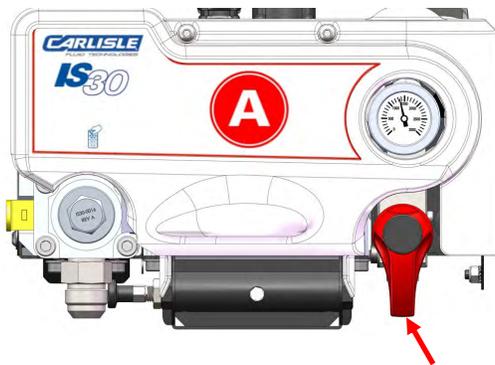
Since the recirculation valve is still in the drum position (step 5), the initial purge will push B-side material from the supply hose, proportioner, and recirculation line back into the drum or waste container. Continue purging until air is flowing steadily out of the recirculation hose.

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



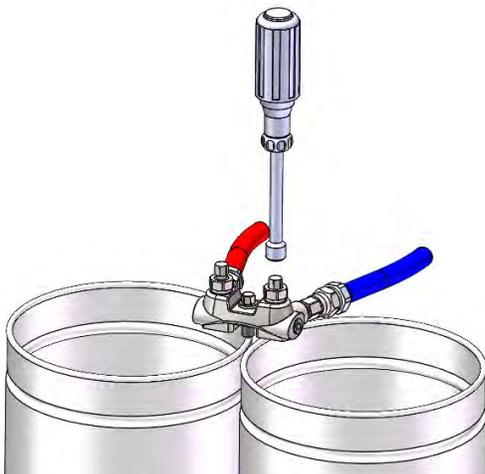
15.6 EXAMPLE 5 - B SIDE AIR PURGE (Continued)

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

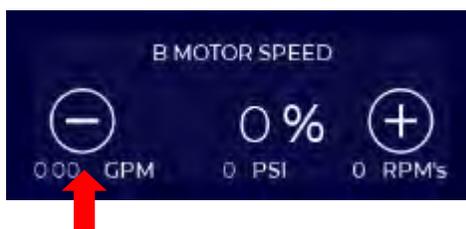


Spray (Gun) Position

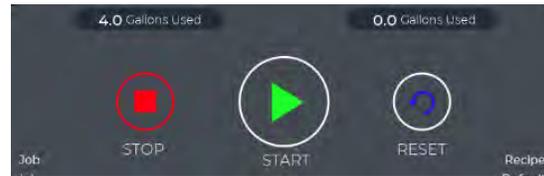
14. Remove the spray gun from the hose manifold. Secure or hold the manifold over a waste container and open the B material control valve to catch fluid.



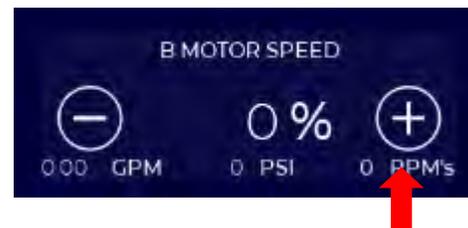
15. Recommended: Set B motor speed to 0 by pressing the - button in the Motor Speed Widget.



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 10% 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).

16.0 ALARM SCREEN - OVERVIEW

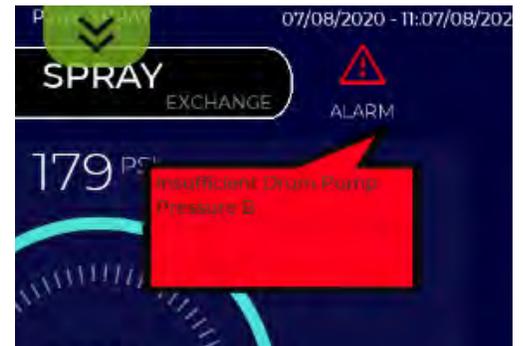
The IntelliSpray Proportioner displays and categorizes **Alarms** as either **Errors**, or **Warnings**.

Errors

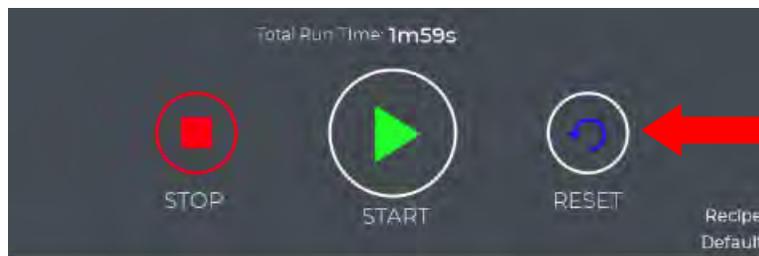
Errors occur when the proportioner detects a condition that prevents the system from operating in a safe or controlled manner. Errors are intended to prevent personal injury, equipment or property damage, or spraying outside of acceptable process limits. When an Error occurs, the proportioner automatically 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 proportioner 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.



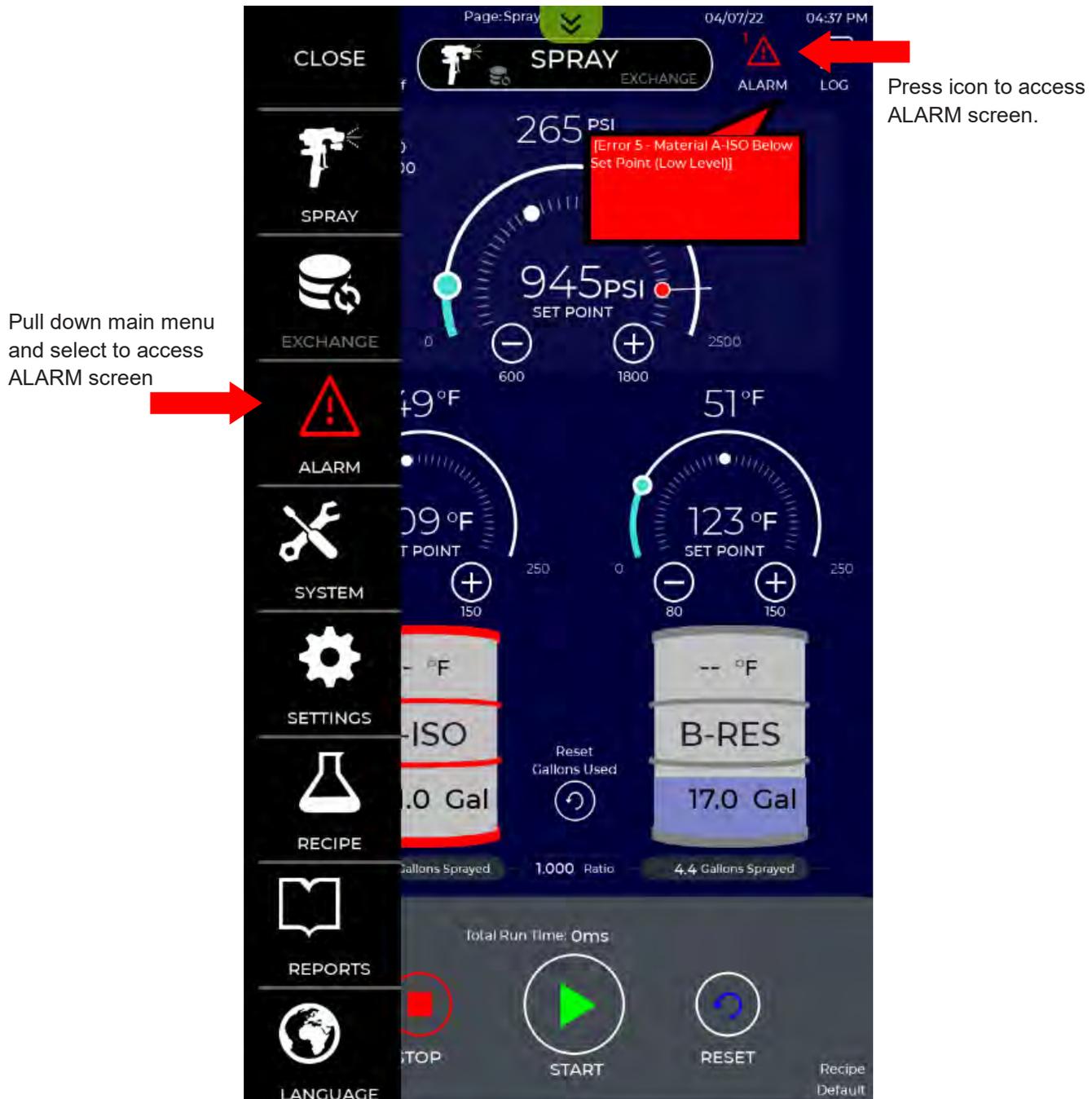
RESET button will flash blue when an error is active. After correcting the error condition press the RESET button before restarting the system.

16.1 ALARM SCREEN - USE

If the proportioner 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.



16.1 ALARM SCREEN - USE (Continued)

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.

Active Alarms Table:

Time	Description	Action
4:35:42 PM	Error 5 - Material A-ISO Below Set Point (Low Level)	

Alarms History Table:

Time	Event Type	Description
07/04/22 - 03:45...	Not Triggered	Error 103 - A-ISO Hose Over Temp End Modem
07/04/22 - 03:45...	Not Triggered	Error 203 - B-RES Hose Over Temp End Modem
07/04/22 - 03:45...	Not Triggered	Error 108 - Excessive Drum Pump Pressure A-ISO
07/04/22 - 03:45...	Not Triggered	Error 109 - Excessive System Pressure A-ISO SMOSE
07/04/22 - 03:45...	Not Triggered	Error 209 - Excessive System Pressure B-RES SMOSE
07/04/22 - 03:45...	Not Triggered	Error 7 - Device Communication Error
07/04/22 - 04:35...	Triggered	Error 5 - Material A-ISO Below Set Point (Low Level)

16.1 ALARM SCREEN - USE (Continued)

Additional information can be obtained for any active Error by pressing in the Action box. A pop-up window will show more information on the Error Condition and also provide recommended Actions to resolve the Error. All Errors and Actions are also contained in tables at the end of this manual for reference.

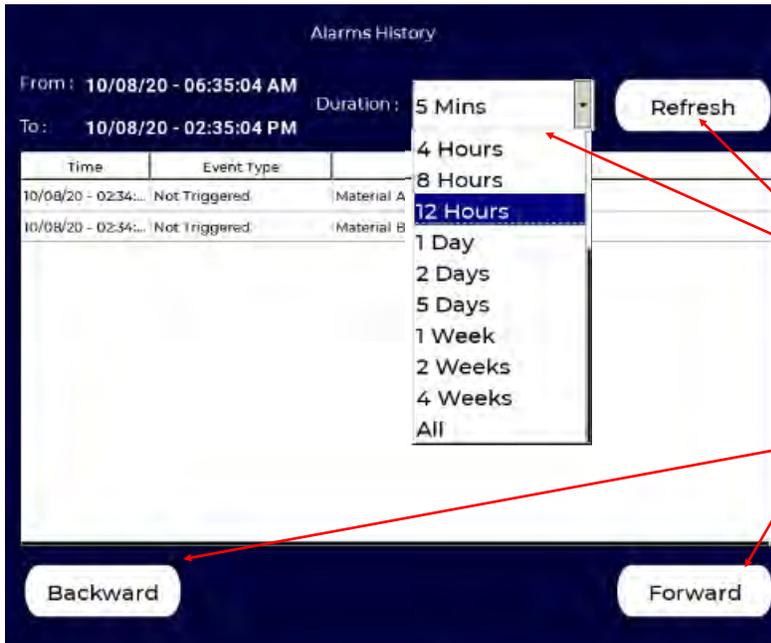


Press here to access more information about the Error condition



16.1 ALARM SCREEN - USE (Continued)

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.

17.0 SYSTEM STATUS SCREENS - OVERVIEW

The System Status Screens can be used for system monitoring and diagnostics. The IS30 has three System Status Screens that can be selected from the Main Menu as shown below. Each Status Screen is described in detail in the following pages.

- IO PAGES: Displays real-time sensor and system performance data, and accesses the Sensor Bypass capabilities of the IS30.
- Inlet Health: Provides high resolution real-time plots of selected inlet pressures.
- Trend: This is used to plot selected sensor and system performance data.



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

17.1 SYSTEM STATUS SCREENS - IO PAGE 1

The first System Status Screen accesses two pages of I/O (Input/Output) information related to system performance. The first I/O Page displays real-time temperature and pressure values of all A and B-side sensors in the fluid path from proportioner 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 direction is from bottom (fluid inlet) to top (hose). Descriptions of all output values are shown in the following figure.

To display IO Page 1 select IO PAGE from the System main menu shown below.



Indicates Pressure Value
 Indicates Temperature Value

SPRAY EXCHANGE

Delta P (A to B)	700	245
Delta P (Hose)	1201	1423
Delta T (Inlet to Hose)	0	1
Section 2	1248	1493
Section 2	115	126
Section 1	115	127
Post Gear-Pump	1323	1572
Pre Gear-Pump	54	49
Pre-Heat Out	90	95
Primary Pre-Heater	115	126
Pre-Heat In	75	76
Post-Filter	52	47
Filter Delta	0	4
Pre-Filter	54	51

PSI Sensor Bypass →

Total Run Time: 16m17s

STOP Ready RESET Recipe Default

- A-B fluid pressure difference error setting (set in Recipes)
- A-B fluid pressure difference at end of hose
- Fluid flow rate
- Fluid pressure drop in hose (pump to hose end)
- Fluid temperature change in hose (pump to hose end)
- Fluid pressure at the end of hose
- Fluid temperatures at the end of hose
- Fluid temperature at end of first those section
- Post-pump fluid pressures
- Pre-pump fluid pressures
- Pre-heater output fluid temperatures
- Primary Pre-Heater temperature (if Secondary heater is installed its temperature would also be shown)
- Inlet fluid temperatures
- Post-filter fluid pressures
- Fluid pressure drop across filters
- Pre-filter fluid pressures
- Press to move to IO PAGE 2
- Press to access Sensor Bypass Screen

17.2 SYSTEM STATUS SCREENS - IO PAGE 2

IO Page 2 of the System Status screens displays real-time machine performance. The three sections of the screen are shown below, and additional details are provided in the following pages.

The screenshot displays the IO Page 2 System Status screen for a 'SPRAY EXCHANGE' machine. The top status bar shows 'Serial #:', 'Page: SystemIO Page 2', '02/09/23', and '07:48 PM'. Navigation icons for 'Menu', 'securityoff', 'Alarm', and 'LOG' are present. The screen is divided into three main sections:

- Internal Status:** A list of six green indicator lights: ESTOP Button, A PH Thermo OL, B PH Thermo OL, Heater Contactor, A Side Connected, and B Side Connected.
- Motor & Pump Efficiency:** A table showing performance metrics for two sides (A and B):

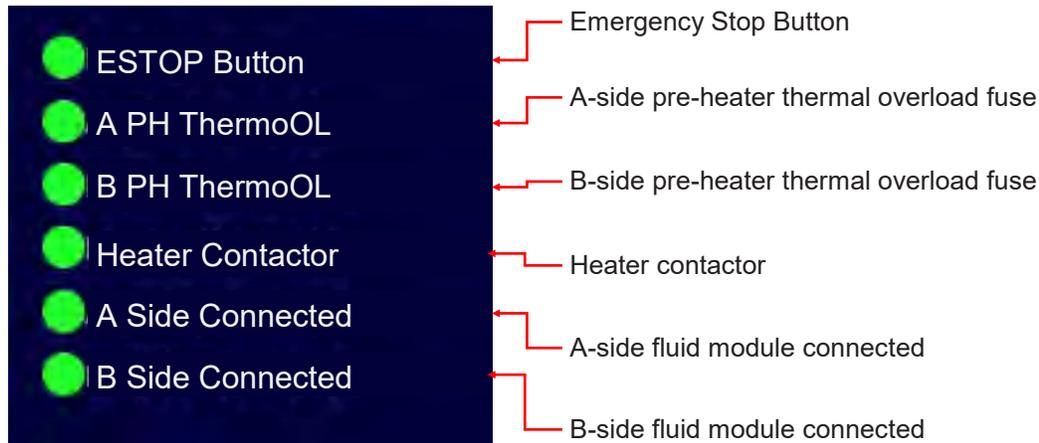
A Motor Torque	0 RPM's	0	%
A Pump Efficiency		0	%
B Motor Torque	0 RPM's	0	%
B Pump Efficiency		103	%
- Heater Status:** A list of five heaters with their current temperatures and setpoints:

Pre-Heat A-ISO PH2	114 °F	24	%
Pre-Heat B-RES PH2	127 °F	0	%
Section 1 Hose A-ISO	115 °F	5	%
Section 1 Hose B-RES	126 °F	0	%
Section 2 Hose A-ISO	115 °F	5	%
Section 2 Hose B-RES	127 °F	0	%

At the bottom, there are control buttons: a left arrow labeled 'Press to move to IO PAGE 1', a 'Sensor Bypass' button labeled 'Press to access Sensor Bypass Screen', and a 'Total Run Time: 16m50s' display. Below these are three large circular buttons: 'STOP' (red square), 'Ready' (green play button), and 'RESET' (blue refresh button). The bottom right corner shows 'Recipe Default'.

17.2 SYSTEM STATUS SCREENS - IO PAGE 2 (Continued)

The IS30 monitors connection status of all sub-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 Proportioner to enter a START state. A red light indicates a connection problem that must be addressed by the user or service technician.



Real-time A and B-side motor and pump performance data is displayed 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 motors can operate indefinitely at 100% of rated torque, but can also handle short-duration peak loads up to 300% before initiating an error. 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 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 proportioner). The proportioner 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 proportioner 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 values. 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 required, or temperatures changed to reduce slip.



17.2 SYSTEM STATUS SCREENS - IO PAGE 2 (Continued)

Page 2 of the System Status screens also 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 duty cycle ranges from 0% (off) to 100% (full on).

When power is being supplied to a heater zones, its respective power switch symbol will show a green border.



	Pre-Heat A-ISO	138	°F	0	%
	Pre-Heat B-RES	121	°F	0	%
	Section 1 Hose A-ISO	62	°F	100	%
	Section 1 Hose B-RES	69	°F	100	%
	Section 2 Hose A-ISO	59	°F	100	%
	Section 2 Hose B-RES	94	°F	100	%

Heater zone power indicators (green border = power on)

Heater zone temperature.

Heater zone duty cycle (0% to 100%)

17.3 SYSTEM STATUS SCREENS - SENSOR BYPASS

In the rare event of a temperature and/or pressure sensor failure, the IS30 Sensor Bypass feature allows the user to continue spraying until the failure cause(s) can be resolved. Activating a Sensor Bypass may cause a minor reduction in temperature and/or pressure consistency, but material ratio will not be affected. Sensor Bypass is a temporary mode and should only be activated when sensor error(s) cannot be resolved on-site with other actions.

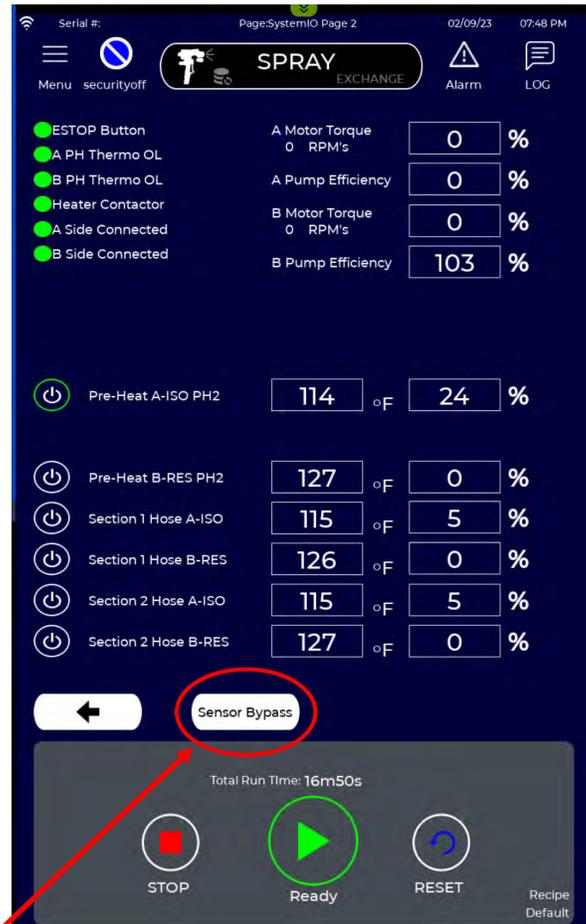
NOTE

Sensor Bypass is a temporary use mode and may result in lower temperature and/or pressure consistency. Ratio will not be affected.

The Sensor Bypass Screen is accessed from I/O Screen 1 or I/O Screen 2., as shown below.



I/O Screen 1

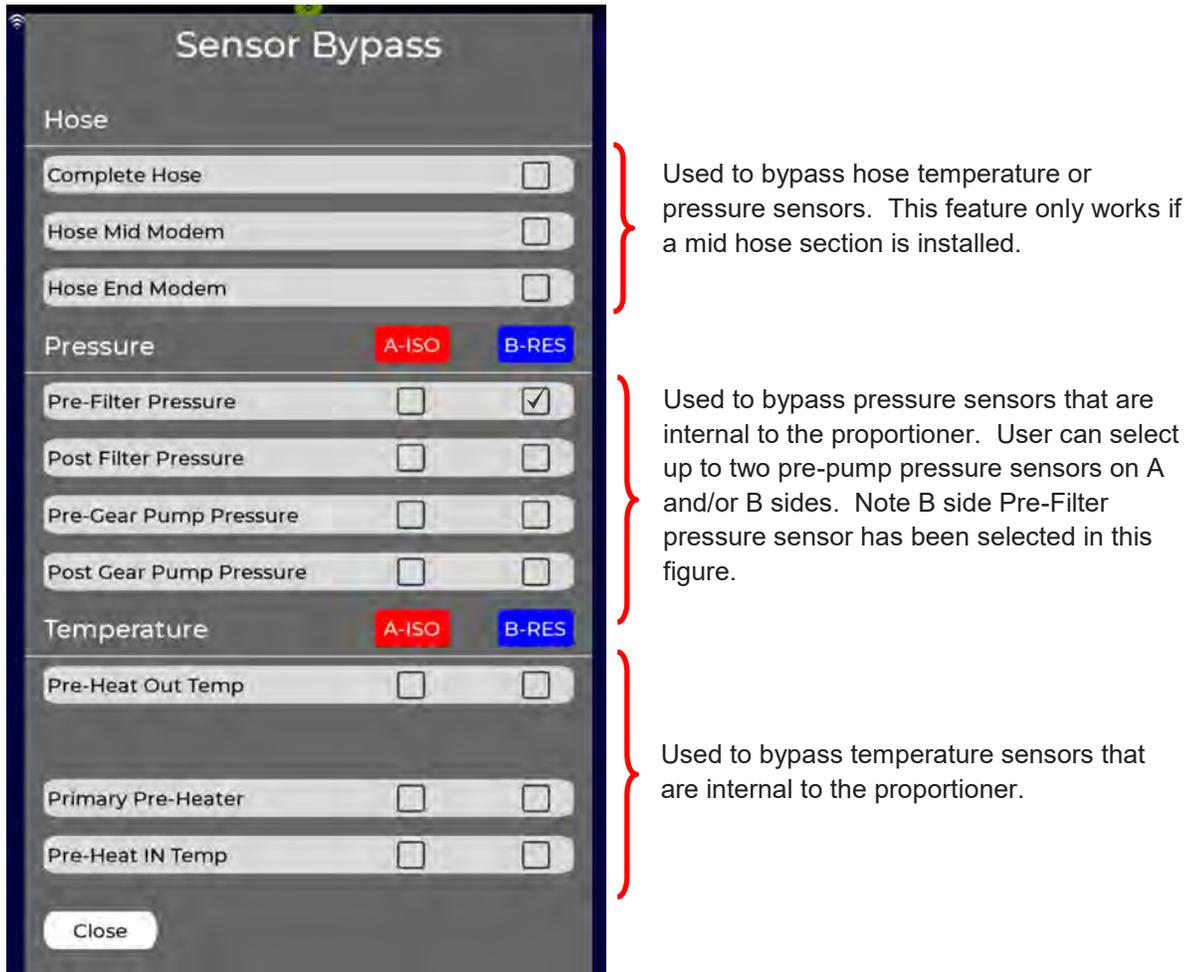


I/O Screen 2

Press to access Sensor Bypass Screen

17.3 SYSTEM STATUS SCREENS - SENSOR BYPASS (Continued)

When a sensor error occurs, it will be logged in the Alarm Screen as an active error (see Section 16.1). If the error cannot be corrected, and spraying must continue, press the box next to the sensor or hose section to bypass. Press the Close button, return to the active Mode Screen (Spray or Exchange), press Reset and Start. After the system indicates it in Ready State, continue operation.



It is possible to select multiple sensors to bypass, but some combination of selections will be invalid and prevented by the IS30. Selections are not retained on a power cycle, and must be reselected at startup if the sensor failure has not been resolved.

Note: The Spray Screen will display the word **BYPASS** in the upper left corner if a sensor is being bypassed.



17.4 SYSTEM STATUS SCREENS - INLET HEALTH

The Inlet Health screen provides high resolution real-time plots of selected inlet pressures. The data rate is 10X faster than the Trend Plot option, and can help identify and diagnose performance issues with transfer pumps (e.g. seal or check valve leakage, sticking piston, ice build up, etc.).

Press the Inlet Health icon under the System menu to access the Inlet Health screen.. All selections and settings are retained, so once defined the same chart will be available any time the Inlet Health screen is opened.



The Inlet Health screen is described in further detail below and in the following pages.

Selection tool. Used to select data to be plotted and full scale pressure reading.

Pressure axis

Trend Time. Pull down menu to select trend screen duration in minutes.

Refresh button. Press to update screen after changing trend time or pressure selections. Also recenters current time to middle of plot.

Plot window. Swipe left or right to move plot forward or backward in time.

Time axis

Backward button. Press to move plot backward in time.

Forward button. Press to move plot forward in time.

17.4 SYSTEM STATUS SCREENS - INLET HEALTH (Continued)

To input or change Inlet Health parameters press on the selection tool to open the selection menu. Refer to the following figure to select pressure values to plot and pressure scale range.

The screenshot shows the 'Inlet Pressure Health' selection menu. At the top, there are tabs for 'A-ISO' and 'B-RES', with '1/6' indicating the current selection. Below these are three rows of pressure points: 'Pre-Gear Pump', 'Post-Filter', and 'Pre-Filter (Inlet)'. Each row has a red 'X' and a green checkmark. The 'Pre-Gear Pump' row has a green checkmark on the right, while the other two rows have red 'X' marks on both sides. Below the rows is a 'Max Trend Scale PSI' field with a value of '0' and a selection tool. At the bottom of the menu are 'Close' and 'Save' buttons. The background shows a control panel with 'STOP', 'Ready', and 'RESET' buttons.

Annotations with red arrows point to the following elements:

- Press to open selection menu.** Points to the selection tool in the top right of the background screen.
- Select up to 6 pressure value(s) to plot (indicated by green check mark).** Points to the green checkmark in the 'Pre-Gear Pump' row.
- Enter full scale (maximum) reading on pressure axis.** Points to the selection tool in the 'Max Trend Scale PSI' field.
- Press to close selection menu..** Points to the 'Close' button.
- Press to save selection settings.** Points to the 'Save' button.

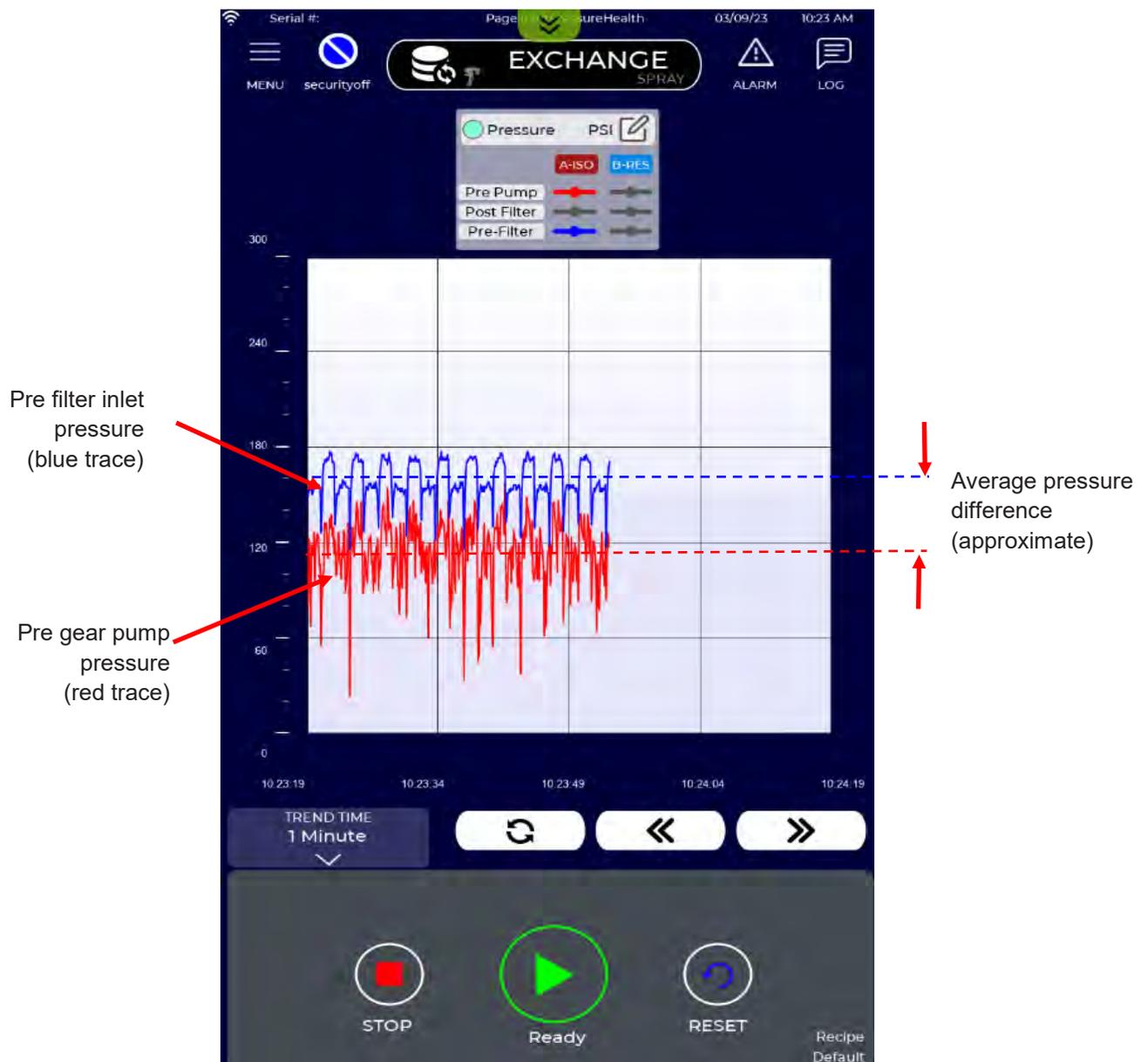
The screenshot shows a numeric keypad interface. The number '300' is displayed in a large font. Below it, '0 Min' and '100 Max' are visible. The keypad includes digits 1-9, 0, a decimal point, and an 'Enter' button. There are also 'Esc', '+', and '-' buttons.

17.4 SYSTEM STATUS SCREENS - INLET HEALTH (Continued)

After closing the selection tool, pressure traces will be displayed. The figure below shows an example plot of the A-side pre-filter pressure (blue line), and the A-side pressure at the inlet to the gear pump (red line). The pressure pulsation in the blue line is caused by the cyclic motion of the pneumatic two-ball piston transfer pump. The pump “wink” at the end of each stroke is seen as a momentary drop in inlet pressure in both the blue and red traces. This drop is caused by the reversal of the transfer pump, when flow stops momentarily. Notice the transfer pump does not produce the same pressure on the downward stroke (higher pressure) vs. the upward stroke (lower pressure). This is caused by the difference in the wetted area of the bottom vs. the top of the transfer piston.

The red trace shows the A-side fluid pressure just prior to entering the proportioner gear pump. It also shows the drop in pressure caused by the transfer pump “wink”. The higher frequency pressure fluctuations seen in the red trace are caused by the rotation of the proportioner gear pump. The average pressure difference between the two traces is due to pressure drop through the inlet filter, flow meters, and preheater.

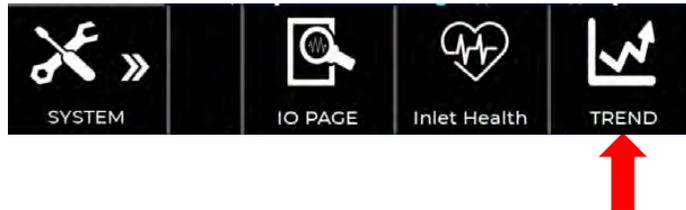
In the example below, pre-gear pump pressure momentarily drops below 60 psi (4 bar) when the transfer pump reverses direction. When this happens AIC (Automatic Inlet Compensation) will become active (see Section 14.6). Increasing transfer pump air pressure and/or warming the fluid would alleviate this condition.



17.5 SYSTEM STATUS SCREENS - TREND CHARTS

The System Status menu provides access to real-time charting of any sensor, set-point, machine state or performance parameter selected by the user. Trend charts can be helpful for performing system diagnostics or performance optimization. All selections and settings are retained, so once defined the same charts will be available any time the Inlet Health screen is opened

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



The four sections to the Trend Chart screen are shown below and described in further detail in the following pages.

Temperature plotting (selection and display)

- Temperature °F
- Set Point
- Section 3
- Section 2
- Section 1
- PH Out
- PH Top
- PH Bottom
- PH In

Pressure plotting (selection and display)

- Pressure PSI
- Set Point
- Hose End
- Post Pump
- Pre Pump
- Post Filter
- Pre-Filter

Performance plotting (selection and display)

- Performance
- RATIO
- MODE
- STATE
- Motor %
- Pump %

Trend plot viewing controls

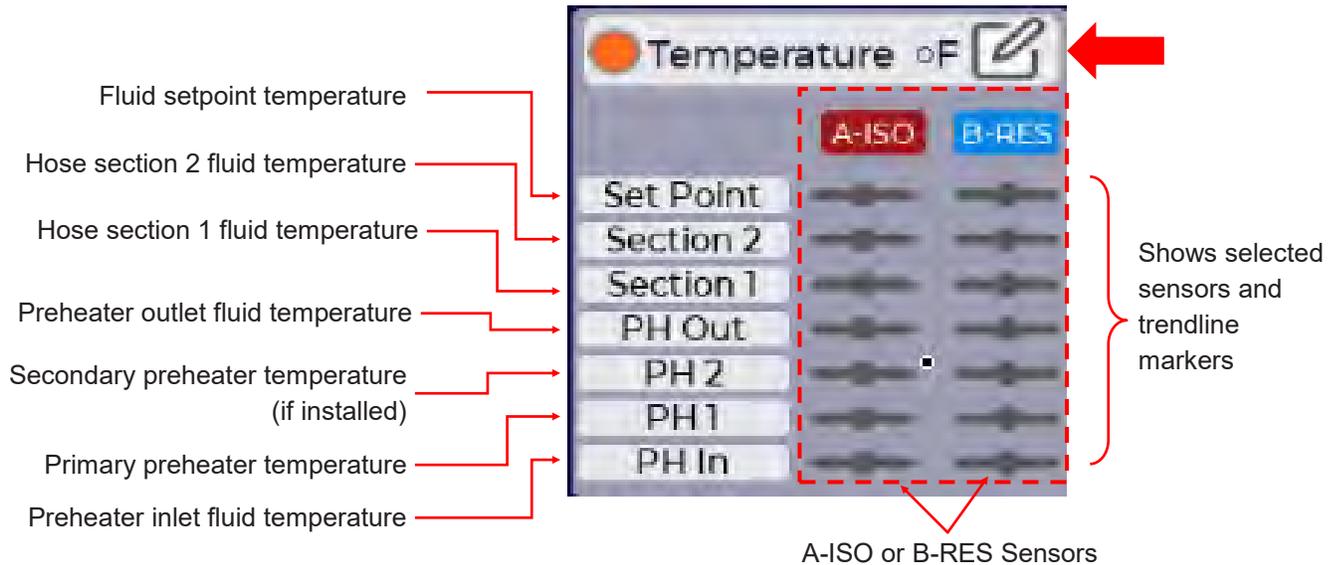
- TREND TIME: 30 Minutes
- REFRESH
- PAGE LEFT
- PAGE RIGHT
- STOP
- Ready
- RESET
- Total Run Time: 54m16s
- Recipe Default

17.5 SYSTEM STATUS SCREENS - TREND CHARTS (Continued)

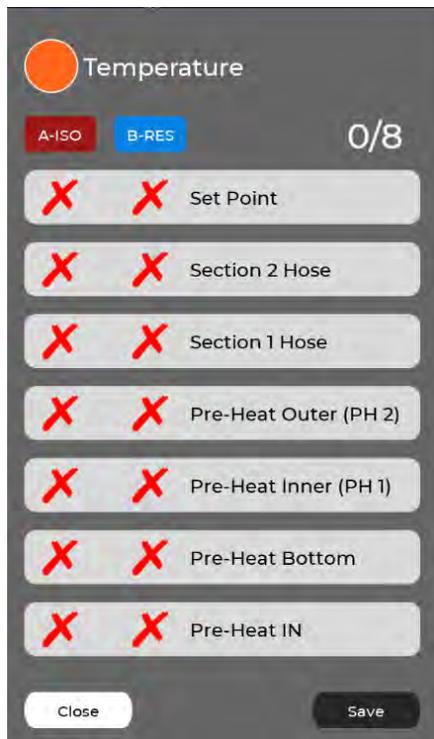
The Trend Chart screen allows the user to select the parameters to be plotted and the timescale to plot against. The following example demonstrates the features and functions of the Trend screen.

Select parameters to plot

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



The selection tool allows 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, 4 temperatures have been selected to plot.

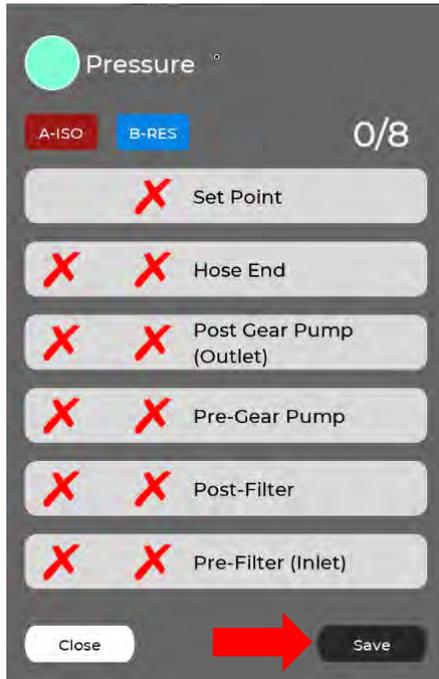


After selecting temperature parameters press the Save button. The selected parameters will now be shown in the temperature legend along with their corresponding trendline markers.

17.5 SYSTEM STATUS SCREENS - TRENDS (Continued)

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.



- ← Fluid Pressure setpoint (at last hose modem)
- ← Fluid Pressure (at last hose modem)
- ← Fluid pressure at pump outlet
- ← Fluid pressure at pump inlet
- ← Fluid pressure at filter outlet
- ← Fluid pressure at filter inlet

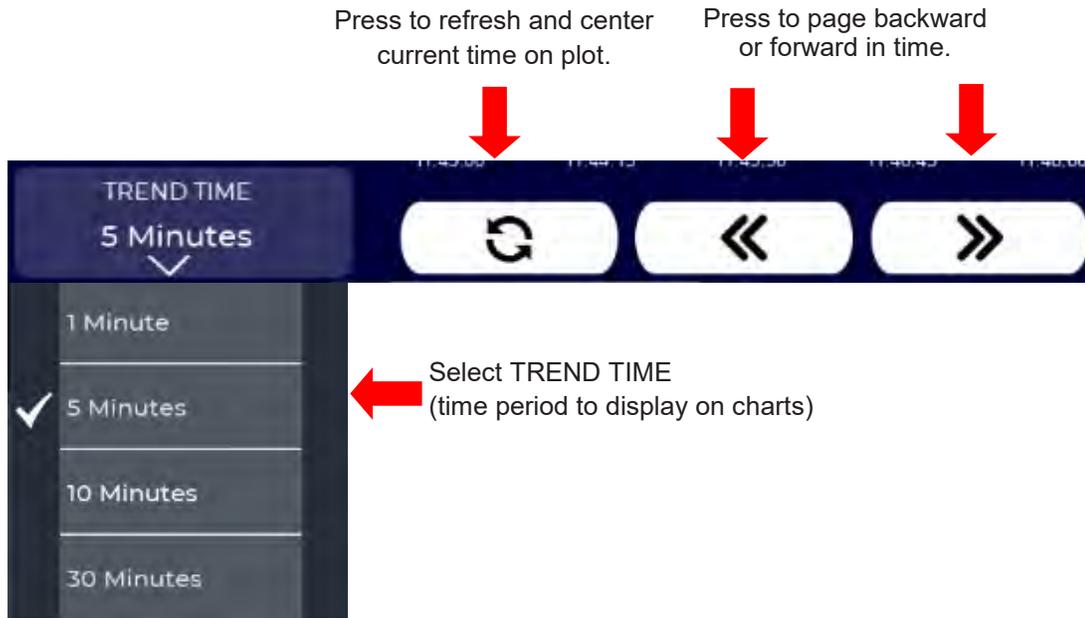


- ← Fluid ratio A:B
- ← System Mode (Spray or Exchange)
- ← System State (Off, Ready)
- ← Motor Load (Torque) %
- ← Pump Efficiency

17.5 SYSTEM STATUS SCREENS - TRENDS (Continued)

Select time scale (TREND TIME)

After selecting the parameters to plot, select the TREND TIME from the pull-down menu and press REFRESH to update the time-scale. This sets the trend chart horizontal axis. 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 (at a 5 minute trend time). Pressing PAGE LEFT or swiping the screen allows the user to look back in time. The lookback period for charting is 24 hours of system ON time.



18.0 SETTINGS SCREENS - OVERVIEW

The **Settings** Menu is used to access and define various systems settings. System Settings are usually defined at installation and rarely accessed during normal operation.

The 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 most parameters in the Settings Screen.

The screenshot shows the 'SystemSettings' screen for an 'EXCHANGE SPRAY' system. The interface is organized into five main sections, indicated by red dashed boxes and brackets on the right side:

- System Information:** Includes input fields for 'Rig Name', 'Serial Number', and 'Hose Sections: 2'. It also features 'System Config' and 'System Status' buttons.
- Configuration Settings:** Contains four toggle buttons: 'UNITS' (Imperial), 'JOB REPORTS' (OFF), 'REMOTE' (ON), and 'SECURITY' (OFF).
- Display Settings:** Includes 'Date Change' (03/22/23), 'Time Change' (8:10 PM), and 'Boot-up Screen' (Spray). Below these are 'Date Format' (MM/DD/YY) and 'Time Format' (HH:mm AP) dropdown menus.
- Material Functions:** Divided into two columns:
 - System:** Context Menu, Network Status, Email Server, Hose Config, Drive Status Log, Supply Setpoints, Pre-Heaters.
 - Material:** Yield Calculator, Material Data, Daily Usage.
- Control Panel:** At the bottom, there are three large buttons: 'STOP' (red square), 'START' (green play button), and 'RESET' (blue circular arrow). A 'Recipe Default' label is also present.

On the left side, a vertical menu contains icons for 'CLOSE', 'SPRAY', 'EXCHANGE', 'ALARM', 'SYSTEM', 'SETTINGS', 'RECIPE', 'REPORTS', and 'LANGUAGE'. A red arrow points to the 'SETTINGS' icon. Another red arrow points from the 'System Settings' label at the bottom left to the 'System' section of the main screen.

18.1 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 IS30 and cannot be changed by the User.



Pressing the **System Config** button opens a window that allows a user with administrative privileges to change Rig Name, Serial Number, and Unheated Whip Length. Other pertinent system information (firmware versions, hose lengths, serial numbers) is shown, but cannot be changed. Use the arrow buttons to move between pages. Firmware can be updated from a USB memory stick using the Firmware Update feature on the second page.



Next page



Previous page

Press to change

18.2 SETTINGS SCREENS - FIRMWARE UPDATES

From time-to-time, Carlisle Fluid Technologies releases updates to the IS30 and/or QuickHeat Hose Firmware. These updates add capabilities and fixes for have been reported by users or identified from internal testing. Firmware updates are provided on USB memory sticks and are available from authorized IntelliSpray Distributors or from Carlisle Fluid Technologies.

Before performing a Firmware update plug the USB memory stick into the port on the side of the Control Module. Next, select the option from the System Information screen (see Section 18.1). The Firmware Manager window will appear. Press the Install button to begin updating. Firmware updates by USB stick take several minutes. When completed a message will provided indicating the update was successful.

If a USB memory stick with Firmware is not plugged into the external USB port on the side of the Control Module,

The screenshot shows the 'Firmware Manager' interface. It features a table with two columns: 'Current Version' and 'Target Version'. Below the table are several rows for different components, each with an 'Update' button. At the bottom, there is a 'Close' button and a red error box that says 'No USB Detected'.

	Current Version	Target Version	
IS30:	IS30.V401.1.3.B8		
Master Modem:	2602352	2582286	Update
Mid Modem:	2602354	2582288	Update
End Modem:	2602353	2582287	Update
A Fluid Module:			
B Fluid Module:			

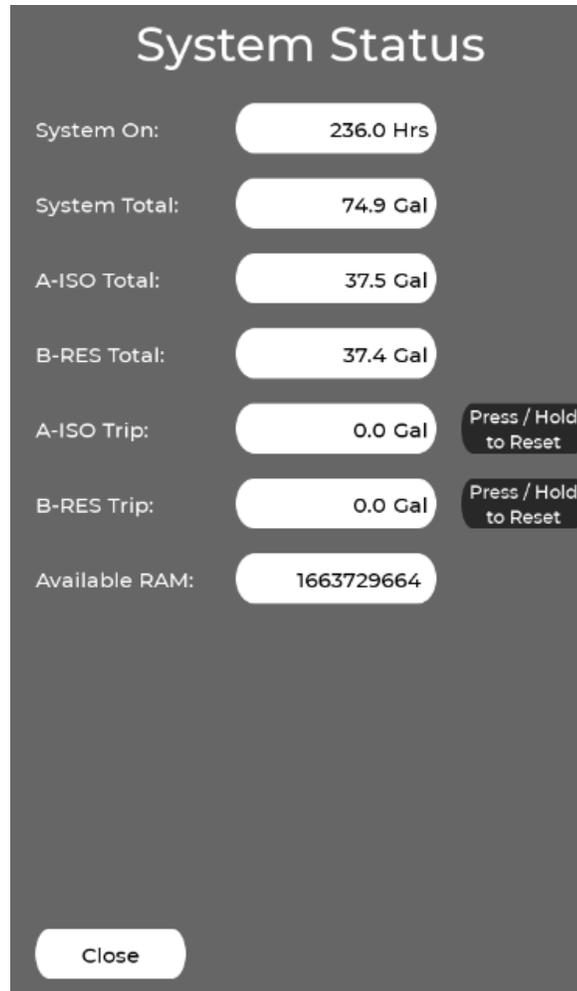
Close

No USB Detected

18.3 SETTINGS SCREENS - SYSTEM STATUS

Pressing the **System Status** displays total System On time and A (Isocyanate) and B (Resin) fluid used over the life of the IS30. A and B fluid trip counters are also shown. Available RAM (Random Access Memory) is also shown in Bytes. The IS30 has 8 GB (Gigabytes) of available memory.

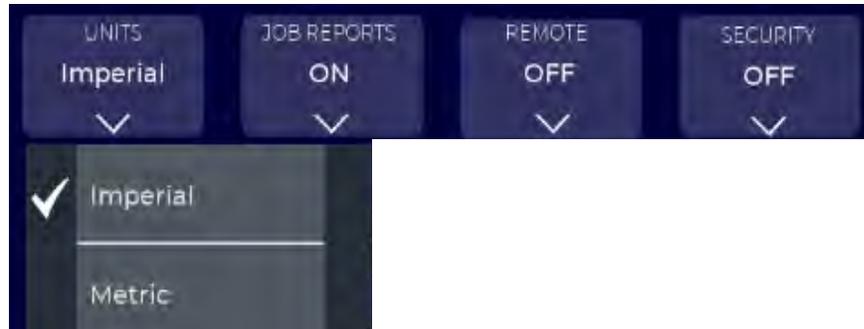
The fluid trip counters are independent from the Gallons Sprayed counters shown on the Spray Screen. Fluid Trip counters are helpful for monitoring material usage over any user-defined period (e.g. multiple jobs, yield measurements, local area material usage, etc.). The counters can be reset by pressing and holding the Reset buttons shown.



18.4 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.

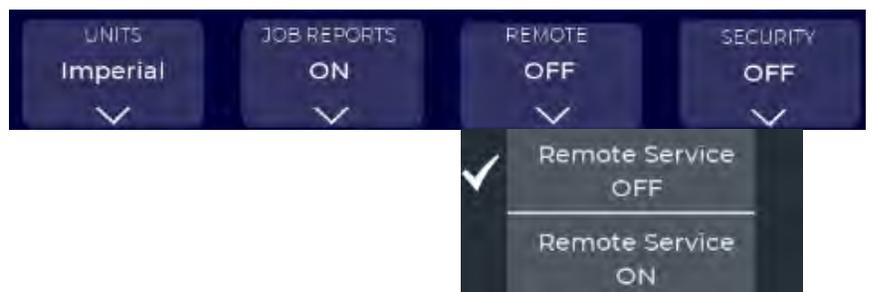


Unit	Imperial	Metric
Temperature	F (Fahrenheit)	C (Centigrade)
Pressure	PSI (Pound per Square Inch)	Bar
Volume	G (Gallon)	L (Liter)
Flow Rate	GPM (Gallons Per Minute)	Liters per Minute (LPM)

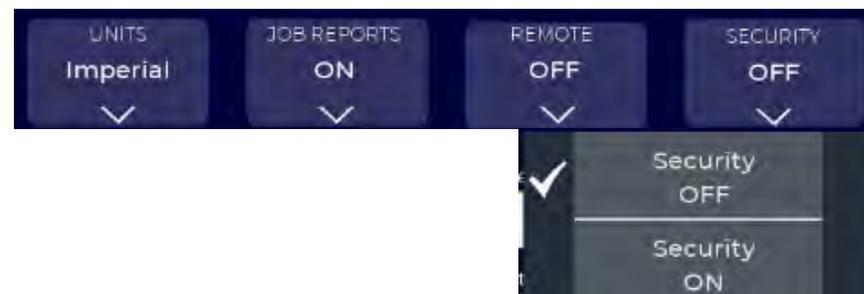
JOB REPORTING: Job Reporting can be toggled ON or OFF (factory default). Refer to Section 20.3 for more information on Job Reports.



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 and/or remove control. See page Section 28 for more information on Remote Service.

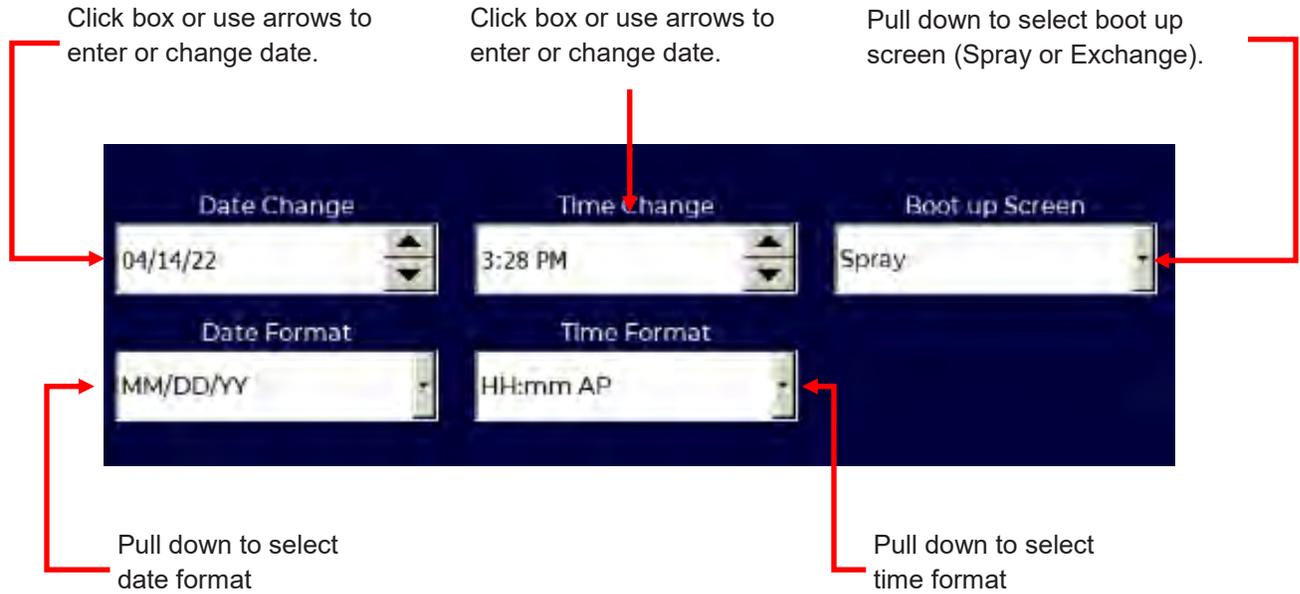


SECURITY: This activates user security controls. When Security is OFF, any uses can change settings on the proportioner. When Security is ON, users must log into the proportioner and access to some actions is restricted to users with administrative privileges. See Section 18.11 for instructions on managing



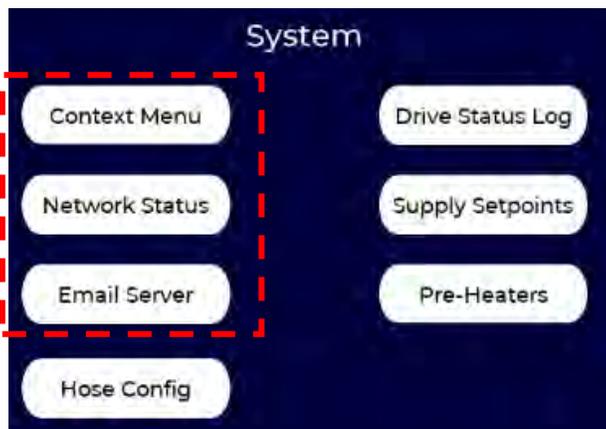
18.5 SETTINGS SCREENS - DISPLAY SETTINGS

The Display section of the Setting Screen allows a user to set date and time values and format, and default Boot up screen. The Spray screen is the factory default Boot up screen. The settings shown below are factory defaults, and time is set per Central Standard Time zone.



18.6 SETTINGS SCREENS - SYSTEM SETTINGS

System settings are provided to show internal network status and for configuring both internal and external network services. Also included are hose configuration, material supply, and communication settings.



The **Context Menu** button accesses lower level operating system settings that may be useful in performing diagnostics. **Only trained service personnel should make changes to these settings.**

The **Network Status** window shows the internal connection status of all subsystems in the Proportioner and Hose. This is shown in the adjacent figure. This can be 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.

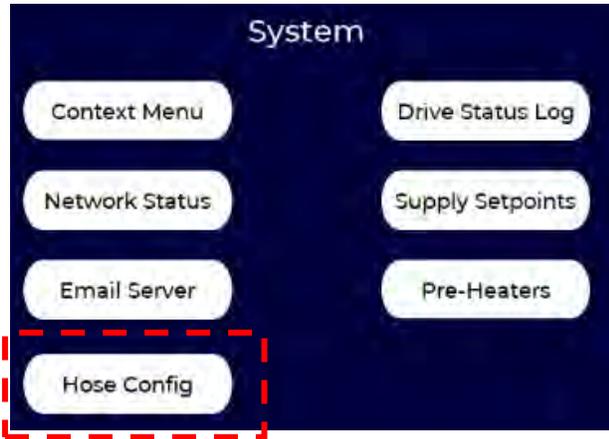
The **Email Server Setup** window (shown below) is used to configure the IS30 for emailing Job Reports. Most systems are preconfigured using a generic SMTP email server managed by Carlisle Fluid Technologies. Users can change the parameters to use their own SMTP server.

Email server parameters can be restored to factory defaults by pressing the Factory Default button for 3 or more seconds.

18.7 SETTINGS SCREENS - HOSE CONFIGURATION

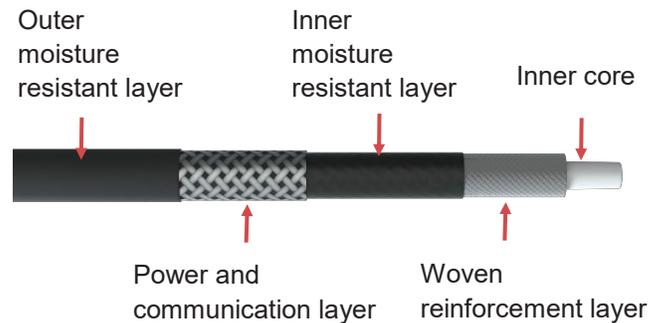
Hose Configuration parameters are set at the factory when the Proportioner and Hoses are ordered together but can be changed as required during installation, repair, or operation.

To access **Hose Configuration** Parameters, press the **Hose Config** button (shown below): Pressing the **Hose Config** button will open a menu of Configuration setting tools. Press the corresponding button to access each Hose Configuration function.

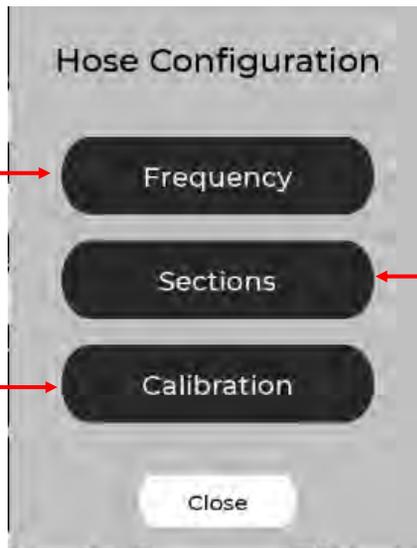


The **Frequency** button opens the Hose Frequency scan and select function (shown on the following page).

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).



Press to scan and select hose communication frequency



Press to specify the number and type of hose sections.

Press to calibrate hose pressure sensors

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 IS30 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 IS30 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).

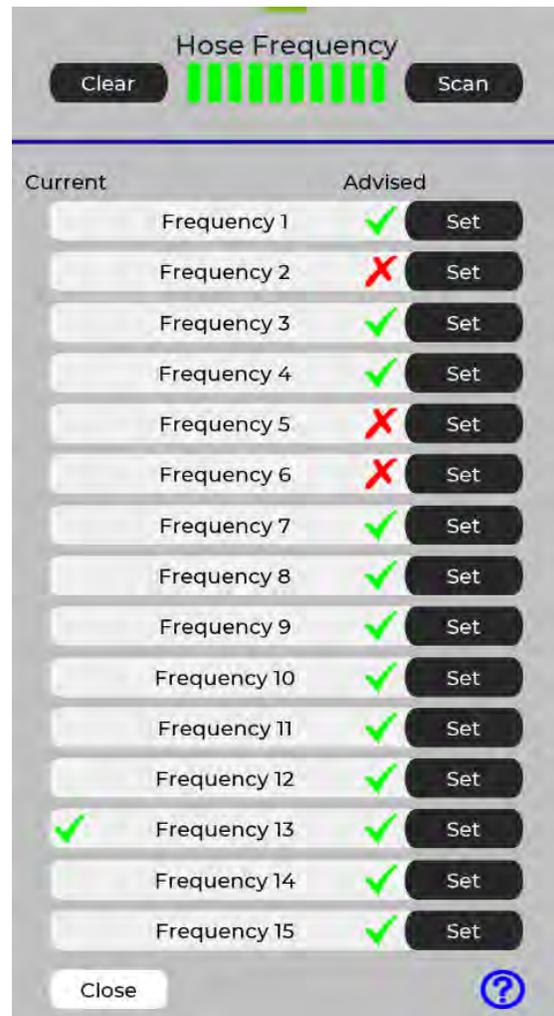
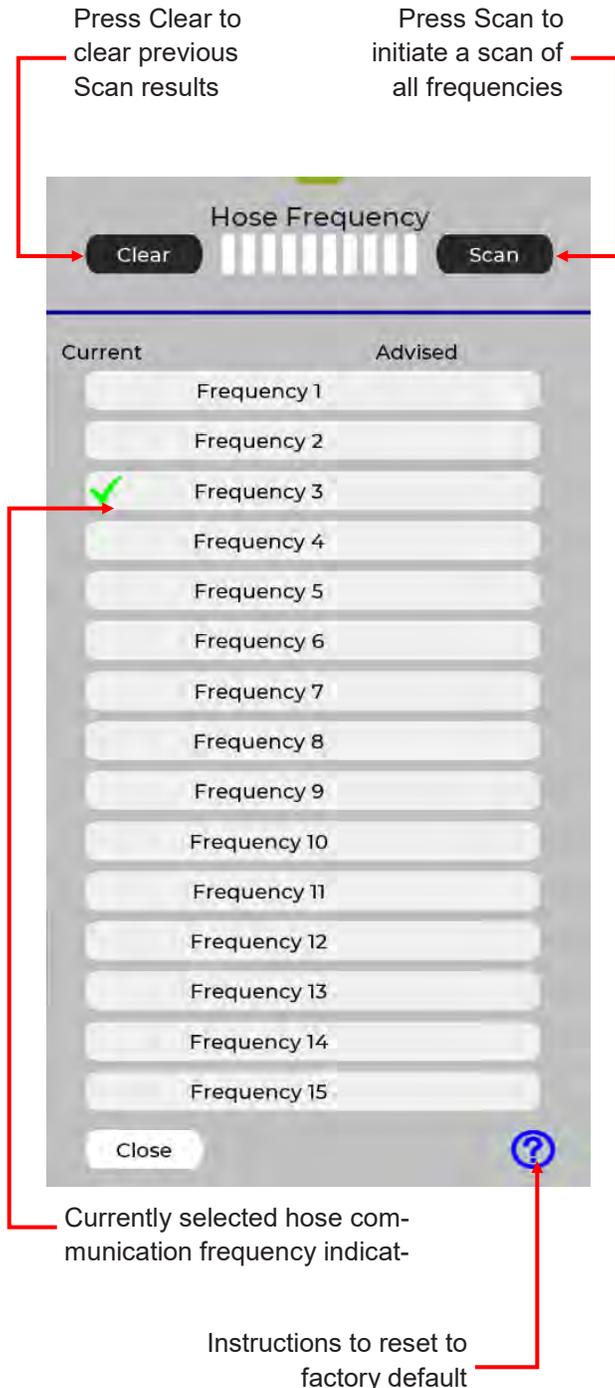
Pressing the RESET and START buttons on the main screen may eliminate the hose error(s), but if they persist a different hose frequency is likely required.

18.7 SETTINGS SCREENS - HOSE CONFIGURATION (Continued)

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.

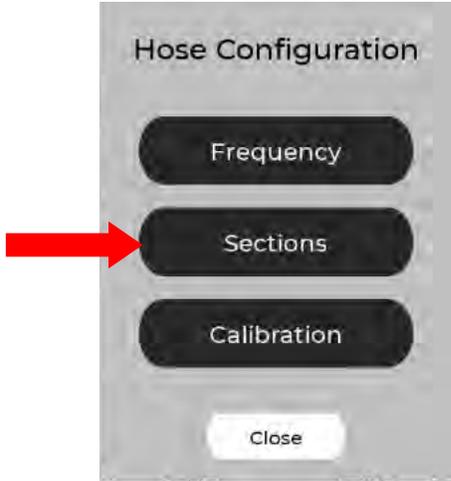
Before initiating another scan press Clear.

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 frequency to factory default.

18.7 SETTINGS SCREENS - HOSE CONFIGURATION (Continued)

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 figure.

Hose configuration terminology:

MM = Master section (nearest the Proportioner)

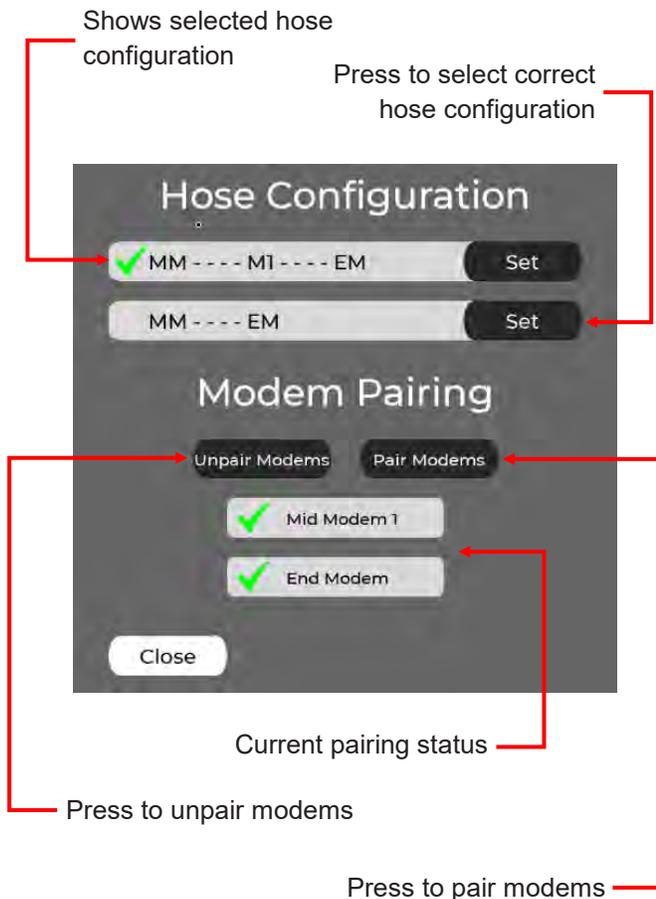
M1 = First Mid hose section

EM = End section (also known as smart end)

The Hose Configuration menu also contains modem pairing status and pairing and unpairing functions. 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.**

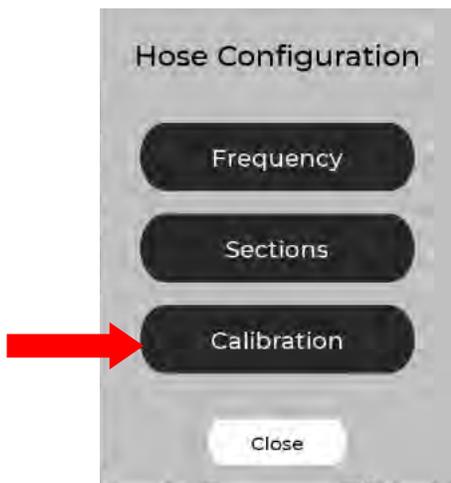
After performing hose pairing, perform a frequency scan to be sure the selected frequency is an Advised frequency.



18.7 SETTINGS SCREENS - HOSE CONFIGURATION (Continued)

The Hose Configuration **Calibration** function is used to check and/or calibrate the Hose and Proportioner pressure sensors. This calibration is performed 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.

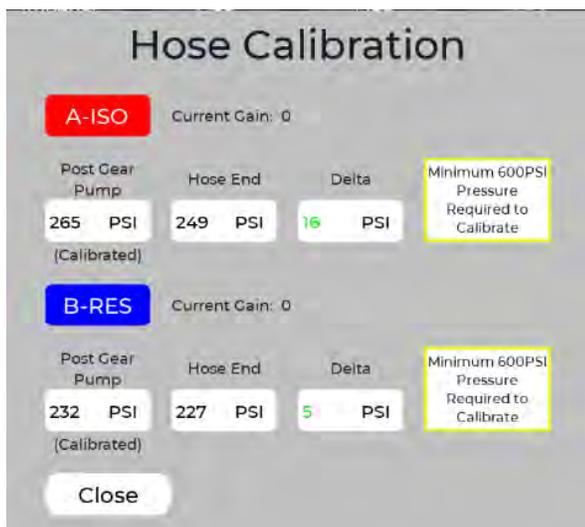


When no fluid is flowing, the difference should be less than +/- 50 psi at pressures above 600 psi. To perform a recalibration, the post gear pump and hose pressure must be at least 600 psi. In the previous figure this condition has not been satisfied and calibration is prevented.

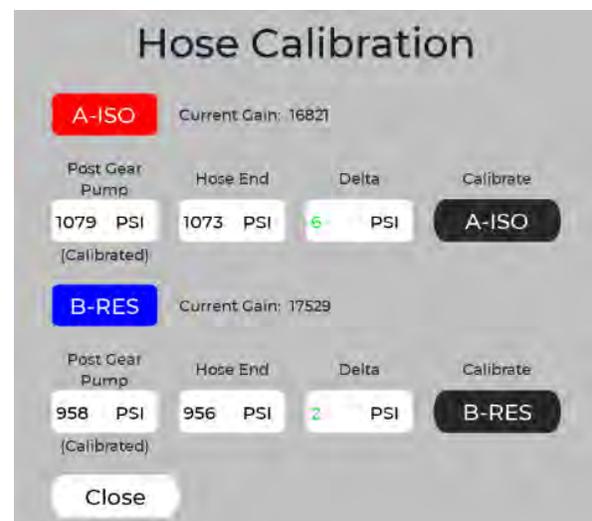
Once pressure is established, and the system is in STOP state, calibration of the A or B side(s) can be performed by pressing the corresponding Calibration button.



Press to calibrate A and/or B pressure sensors



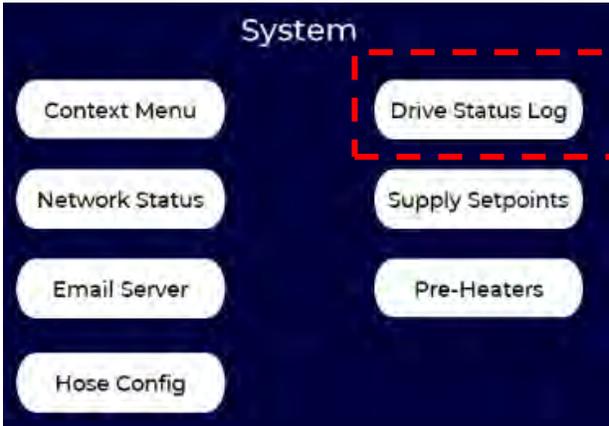
After calibration the difference between the sensors will be very close to 0 (as shown below after calibration).



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.

18.8 SETTINGS SCREENS - DRIVE STATUS LOG

The Drive Status Log button provides detailed information about the A or B motor drive controllers. This Log is a history of motor drive states, errors, and actions. If a driver error occurs, a generic message will be presented to the user on the active screen, and logged in the active errors in the Alarm screen (Section 16). The Drive Status Log provides more specific drive codes that can be useful when performing diagnostics.



The Drive Status Log retains up to 100 past log entries. Use the scroll bar, or swipe vertically to move through the entries.

Drive Status
A Side Drive

#	Date/Time	Drive Code
1	3/22/2023 19:8:52:476	A0012
2	3/22/2023 18:35:42:766	A0013
3	3/22/2023 18:35:40:306	A0006
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		

Scroll for More Information: 1-50

Back

Press to see B-side motor drive log

Drive Status
B Side Drive

#	Date/Time	Drive Code
1	3/22/2023 20:37:23:166	A0101
2	3/22/2023 20:37:23:136	A0010
3	3/22/2023 19:22:30:257	A0012
4	3/22/2023 19:21:8:997	A0101
5	3/22/2023 19:21:8:967	A0010
6	3/22/2023 19:8:52:476	A0012
7	3/22/2023 18:35:42:767	A0013
8	3/22/2023 18:35:40:306	A0006
9		
10		
11		
12		
13		

Scroll for More Information: 1-50

 Back

Press to see A-side motor drive log

18.9 SETTINGS SCREENS - SUPPLY SETTINGS

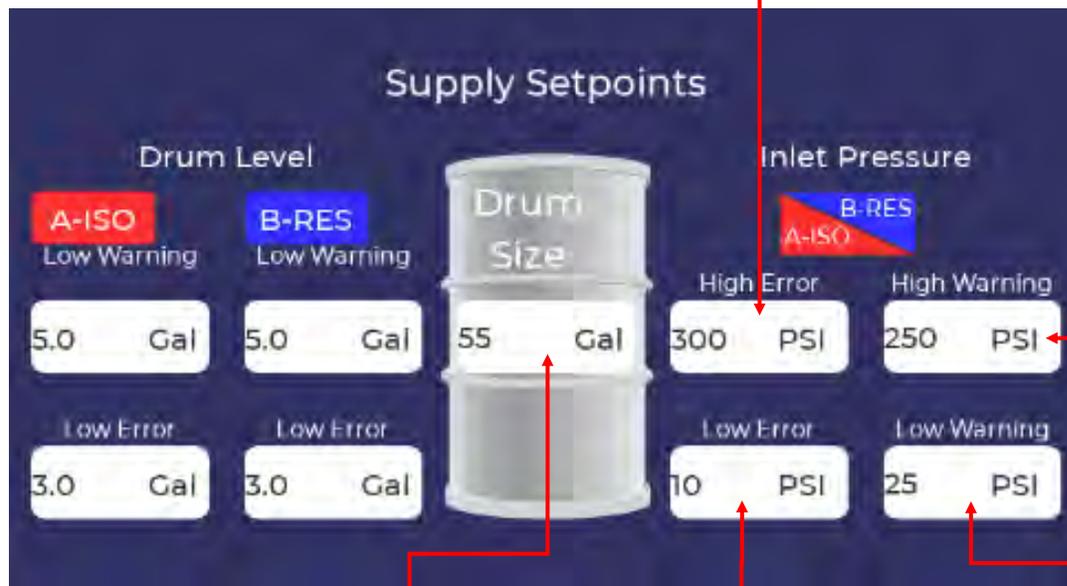
The **Supply Settings** function is used to define drum or tote size, as well as A and B-side inlet pressure warning and error limits. These settings protect the IS30 from situations that could damage the equipment and/or inject air into the proportioner and hoses. Values can be changed from factory default settings using a pop-up keyboard.



Low drum warning level. A and B materials can be 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.

Inlet high pressure error limit. Applies to both A and B materials. System generates error message and shuts down if exceeded. Maximum setting is 300 psi (20.4 bar).

Inlet high pressure warning limit. Applies to both A and B materials. System generates warning message if exceeded. Maximum setting is 300 psi (20 bar).



Low drum error level. A and B materials can be 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.

Standard drum size. Press to enter value. This is used for scaling fluid level on drum icons. Factory setting is 55 gallons (208 liters).

Inlet low pressure error limit. Applies to A and B sensors before gear pumps. System generates error message and stops if pressure drops below setting. Minimum setting is 25 psi (1.7 bar).

Inlet low pressure warning limit. Applies to A and B sensors before gear pumps. System generates warning message if pressure drops below setting. Minimums setting is 0 psi (0 bar).

18.10 SETTINGS SCREENS - PREHEATERS

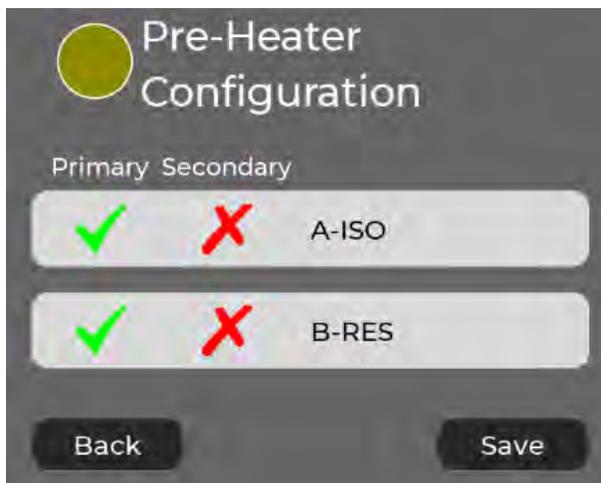
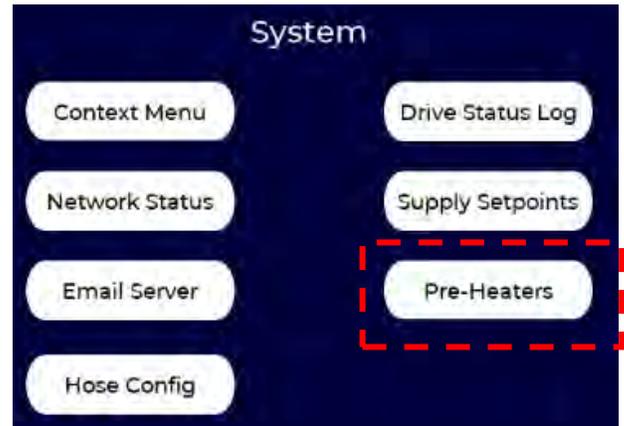
The IS30 is normally shipped with one preheater in each fluid module. The proportioner can be field upgraded from one to two preheaters, or downgraded from two to one preheater per fluid module. Adding a second preheater will increase the heating power and temperature rise through the preheaters, which can reduce drum conditioning times or provide more heating power when operating with a shorter distribution hose. Contact an authorized IntelliSpray distributor or service provider to learn more about this option.

If a second preheater is installed on the A and/or B fluid modules, the proportioner must be reconfigured to recognize the second preheater via the **Pre-Heaters** button shown in the figure to the right. Pressing the button will open the Pre-Heater Configuration menu. The normal configuration is one (primary) preheater per fluid module. This is indicated by the green check marks in the figure below (left).

If a secondary preheater has been installed, it must be enabled by pressing on the corresponding red X marks in the Pre-Heater Configuration menu. This will indicate to the Control Module that a secondary preheater has been installed. This is shown in the figure below (right).

After making changes, press the Save button before exiting the menu.

It is also possible to install a secondary preheater on only one fluid module (normally the B side), or even remove a primary preheater when not required. In that case, only activate the preheater(s) that are installed.



Single preheater per fluid module



Two preheaters per fluid module

18.11 SETTINGS SCREENS - YIELD CALCULATOR

The **Material** section of **Settings Screen** is used to access a **Yield Calculator** and a **Material** library for defining, editing, exporting and importing A (Iso) and B (Resin) information.. These optional features can be helpful when preparing comprehensive **Job Reports**.

The **Yield Calculator** is an application that automates the calculation of material yield and in-place foam density. The output is included in the currently active **Job Report**.

To perform a yield calculation the user enters the size of the spray area and the average depth of foam in that area. Material data must also have been previously entered.

The recommended procedure for performing a yield calculation is as follows:

1. Be sure the material data information has been entered and saved using the **Material Data** menu (see Section 18.12).
2. Identify a suitably large test area with regular stud, joist, or rafter spacing and little or no opening or interruptions (e.g. plumbing, electrical services, vents, etc.).
3. Open the **Yield Calculator**
4. Select or define the Entry Number in the top cell using the - or + buttons.
5. OPTIONAL. Press the Time entry icon to automatically enter the system time.
6. Select the A-ISO and B-RES materials from the drop down menu (note these are defined in **Material Data** Settings).
7. OPTIONAL. Select Entry Type (Start of Job, Yield Check, End of Day, End of Job). Yield Check is the most common selection.
8. Enter Area Square Footage for the yield calculation, or use the square footage calculator (accessed by clicking the question mark icon).
9. Enter Average Foam Depth for the yield calculation or use the Foam Depth calculator (accessed by clicking the question mark icon).
10. The total spray volume in Board Feet will be automatically calculated.
11. OPTIONAL: Skip steps 8-10 and directly enter the spray volume in Board Feet.
12. For a new Yield Calculation press the Reset button (in the Gallon Counter menu section) to clear the gallon counters if non-zero. If continuing with a previous yield test proceed to the step 11. If spraying of the test area is interrupted, press SAVE to store the current gallon counter values.
13. Press the START button and spray the test area.
14. When spraying of the test area is completed, check the total square footage and average foam depth and re-enter if it is different than the initial entry (steps 8 and 9).
15. Press the Calculate button to complete the Yield Calculation and store it in the Job Report (if Jobs function is activated)

The following page shows Yield Calculator User inputs and system outputs.



18.11 SETTINGS SCREENS - YIELD CALCULATOR (Continued)

USER INPUTS

Press - and + buttons to select Yield Calculation Entry Number

OPTIONAL: Press to apply date and time-stamp test entry

Select A (ISO) material

Select B (RES) material

OPTIONAL. Select Entry Type.

Enter test area

Enter average foam depth

OPTIONAL. Directly enter test area volume

Press START to initiate Gallons counters, RESET to zero counters, SAVE to retain counters (if test is discontinuous)

Press to Calculate outputs

Note: Green items must be entered to perform a yield calculation, other input fields are optional.

OUTPUTS

Press for area calculator (next page)

Press for Depth calculator (next page)

A and B sprayed (gal)

Total sprayed (gal)

Ratio (A:B) sprayed

Total vol/set (gal/set)

A Density (Lb/Gal)

B Density (Lb/Gal)

Installed foam (lb)

Yield (Bdft/Set)

Yield (Bdft/Gal)

Density (lb/cuft)

18.11 SETTINGS SCREENS - YIELD CALCULATOR (Continued)

For User convenience, the **Yield Calculator** includes embedded calculators for determining test area and average foam thickness. This can eliminate guesswork and/or use of external hand calculators. To access these embedded calculators press the associated question mark icon next to the respective entry (as shown below).

Yield Calculator

Entry Number:

Time:

A-ISO Material:

B-RES Material:

Entry Type:

Area Square Footage: ?

Average Foam Depth (In): ?

The Average Depth calculator allows the user to enter up to 28 depth measurements taken within the test area. Press on each cell to enter the depth values. Press **Clear** to clear all cells. Press **Save** to complete the calculation and **Close** to return to the Yield Calculator and automatically populate the average depth value.

Average Depth Measurements Inches

	Sample #1	Sample #2	Sample #3	Sample #4	Average
Bay #1	0.00	0.00	0.00	0.00	0.00
Bay #2	0.00	0.00	0.00	0.00	0.00
Bay #3	0.00	0.00	0.00	0.00	0.00
Bay #4	0.00	0.00	0.00	0.00	0.00
Bay #5	0.00	0.00	0.00	0.00	0.00
Bay #6	0.00	0.00	0.00	0.00	0.00
Bay #7	0.00	0.00	0.00	0.00	0.00

Clear Average Depth: 0.00

Close Save

The area calculator (shown below) allows the user to enter the width and length of up to 5 separate areas (e.g. stud bays). Press on each cell to enter the numeric values of width and length (using consistent units). Press **Clear** to clear all cells. Press **Save** to complete the calculation and **Close** to return to the Yield Calculator and automatically populate the Area value.

Area Square Footage Calculator

	Width (inches)	Length (inches)	Total (Sq. Ft.)
Area #1	0.0	0.0	0.00
Area #2	0.0	0.0	0.00
Area #3	0.0	0.0	0.00
Area #4	0.0	0.0	0.00
Area #5	0.0	0.0	0.00

Clear Total Square Footage: 0.00

Close Save

18.12 SETTINGS SCREENS - MATERIAL DATA

An optional **Material** library is also accessed via the **Settings** Screen. This feature allows users to define, edit, save, and delete information and properties for both A and B materials. This information is used in performing yield calculations and also simplifies information entry for Job Reporting.

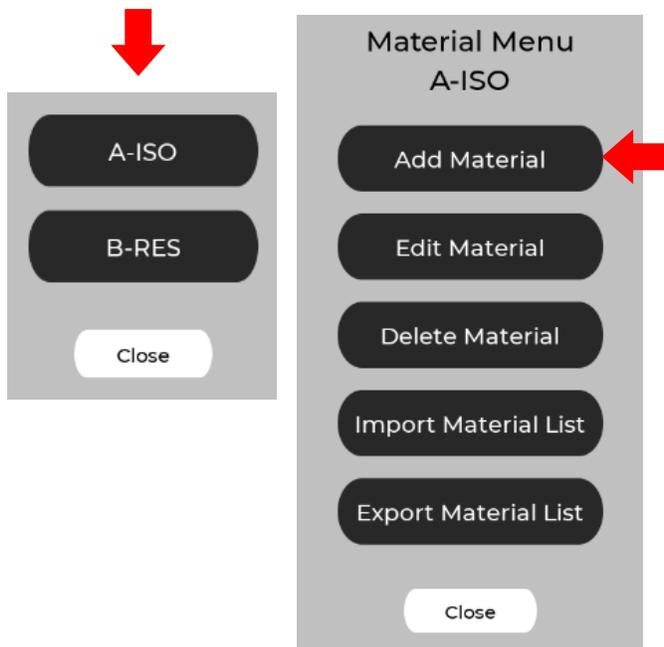
To access the Material Library select “**Material Data**” from the Material Settings men, then select either **A-ISO** or **B-RES** material.

After selection of A or B material, the user can then select the desired operation—**Add** a new material, **Edit** information about an existing material, **Delete** a material, and **Import** or **Export** material information via a USB storage device.

To add a new material, select **Add Material** and use the popup keypad to enter information in the fields shown below. This data can be obtained from the drum label, Product Data Sheet, or Material Data Sheet.



To edit an existing material select **Edit Material**, select the material to edit from the drop-down menu, and enter new values as required.



18.12 SETTINGS SCREENS - MATERIAL DATA (Continued)

To delete a material, select **Delete Material** and select the material from the drop-down menu.

Select **Export Material List** to export all materials in the material library to a USB device attached to the proportioner. This feature allows sharing information between systems.

Select **Import Material List** to import a material or materials from a USB device attached to the

Material Lists are in standard .csv format and can be edited remotely on the users computer. Many users create a “master” .csv file of all materials they commonly use and keep it stored on a PC for importing to their IntelliSpray Proportioner(s).

When materials have been previously defined, and Job Reporting is ON, a user can select a material from a drop-down menu on the drum icon instead of manually entering the information.

18.13 SECURITY

When **Security** is enabled (ON) in the Setting Screen user access and permissions will be controlled. Security is enabled or disabled in the **Settings Screen** as shown below. Only users with administration permissions can change the setting and/or create, edit, or delete users.

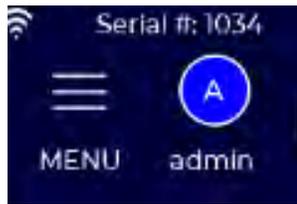


Select Security setting

When Security is OFF the User Icon in the upper left portion of the Proportioner screen will indicate “security **off**” and the User Icon will display a slash mark. When Security is enabled the User Icon will contain the initials of the currently logged on User, and the User’s role will be shown below the User Icon.



Security OFF



Security ON

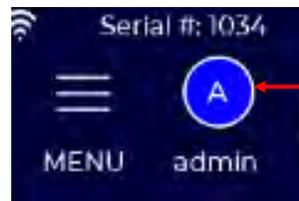
When Security is ON, the Proportioner will require the user to log-in at system start-up or after a period of inactivity, if defined.

To turn Security ON the user must log in under an administrative user name. All systems have three factory default users as shown in the following figure and described below.



1. User: **Admin**. Password = admin (all lower case). This predefined “Admin” user can be edited or deleted by an end-user with administrative privileges.
2. User: **CFT**. Password hidden. Used only by CFT service staff for performing remote diagnostics if/ when required. It cannot be edited or deleted.
3. User: **SecurityOFF**. Password hidden. This is the default user for logging purposes when Security is turned off. It cannot be edited or deleted.

When Security is ON, press the User Icon to access the User Management menu as shown below.

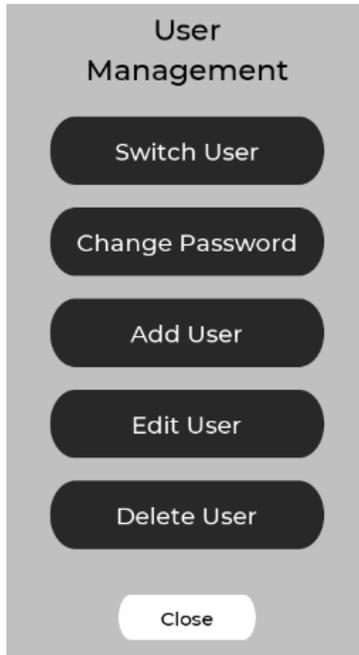


Press to access User Management Menu

18.13 SECURITY (Continued)

Pressing the User Icon will open the User Management menu. A user with an Administrative role can switch users, change passwords, and add, edit, or delete users. A user with a Sprayer role will only have the ability to switch user or change their own password. Other functions will be highlighted to indicate they are not accessible.

To change users, select Switch User from the menu, then select the new user to login under from the drop-down menu..



Functions accessible to Administrators



To Change a password select the new user from the drop-down menu and enter password (this will require dual entry for authentication) then press Sign In.



Functions accessible to Sprayers

Functions inaccessible to Sprayers

18.13 SECURITY (Continued)

To Add or Edit a user, select the corresponding item from the menu and complete the sections (shown below).

Enter User Name

Select Group from pull-down

Enter Password (case sensitive, alpha-numeric characters and normal special characters allowed)

Free-form comment (optional)

Inactivity logout time (optional)

Mandatory first time login password change (optional)

After entering the User name and password, select the Group the User is assigned to. Groups are either Administrators or Sprayers. Administrators have access to change all system settings, recipes, and material data. Administrators can also add, delete, and edit users.

Sprayers are able to access common operating settings and a reduced set of system, recipe and material settings. Parameters and settings that are inaccessible to Sprayers are highlighted in orange on all screens, as shown below and on the following page.



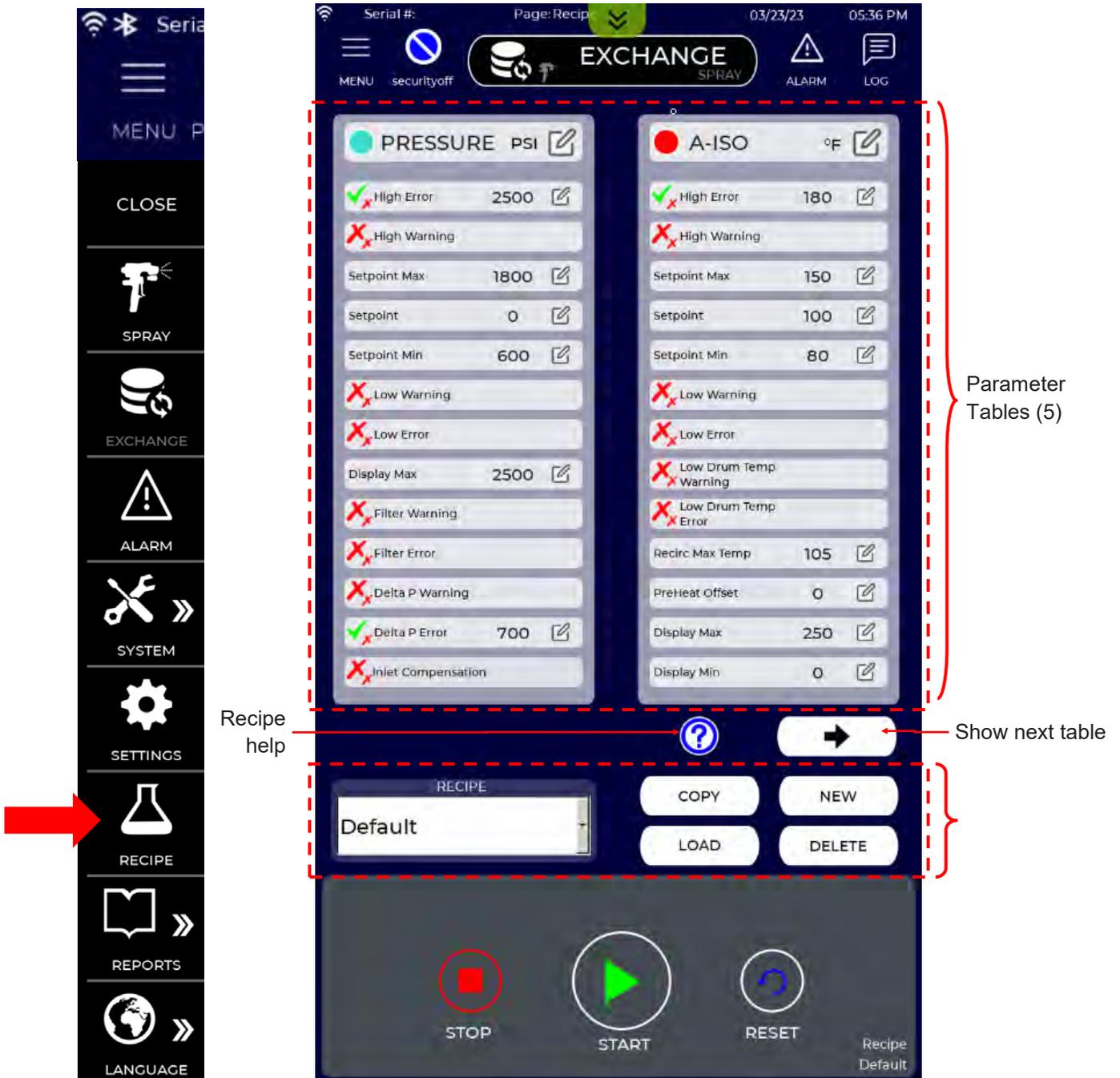
18.13 SECURITY (Continued)



19.0 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 system for different materials, job conditions, or user preferences. 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.



19.0 RECIPE SCREENS - OVERVIEW (Continued)

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 IS30 to their specific needs.

Two parameter tables are shown at any time on the Recipe screen. To move between tables press the arrow buttons on the Recipe screen shown in the following figure..



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, AVC, 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.



19.0 RECIPE SCREENS - OVERVIEW (Continued)

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 this fluid pressure value is exceeded anywhere in the system. Is always enabled. Max value is 2500 psi (172 bar).

Displays warning if this fluid pressure value is exceeded anywhere in the system.

Fluid pressure setpoint maximum. Always enabled and viewed.

Fluid pressure setpoint. Always enabled and viewed.

Fluid pressure setpoint minimum, Always enabled and viewed.

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

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

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

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

Displays warning if inlet filter pressure drop exceeds

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.

Enables Low Inlet Pressure Compensation (useful when transfer pumps cannot keep up with Proportioner). See Section 14.6 for more information on Inlet Compensation.

19.0 RECIPE SCREENS - OVERVIEW (Continued)

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 maximum. 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 recirculation temperature in Exchange Mode

Preheat offset (positive or negative). May be required with low viscosity B-side materials. See Section 14.4.

Maximum temperature displayed on temperature gage widget.

Minimum temperature displayed on temperature gage widget.

19.0 RECIPE SCREENS - OVERVIEW (Continued)

The Recipe Screen also contains tables for Ratio, AVC (Automatic Viscosity Control) 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.

Maximum A and B AVC offset from setpoint.

Convergence pressure difference between A and B when AVC is enabled..

Press to toggle parameter enable/view settings.

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

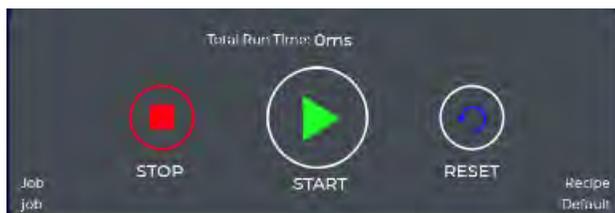
Error is displayed if A pump efficiency drops below value.

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

Error is displayed if B pump efficiency drops

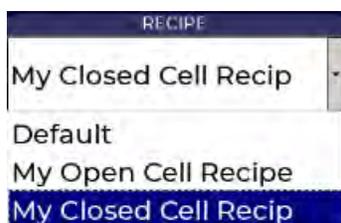
19.1 RECIPE SCREENS - RECIPE MANAGEMENT

The current Recipe selection is shown at the bottom right corner of each screen. If no Recipes have been defined the Proportioner 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.



19.2 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.

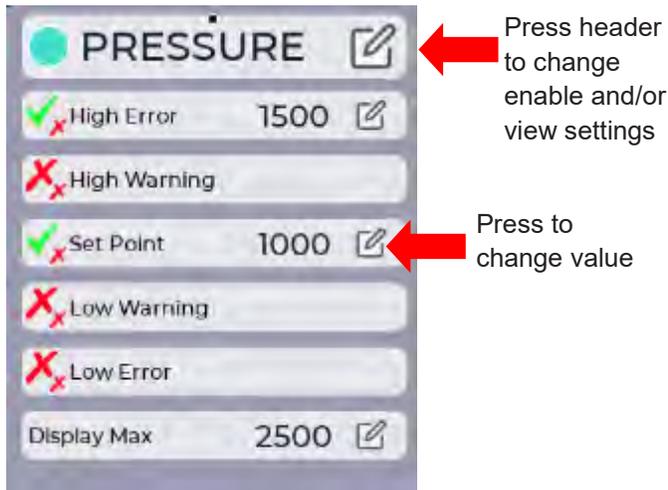
Recipe Legend

Enable Enable or disable parameter

View View or hide parameter icon on screen

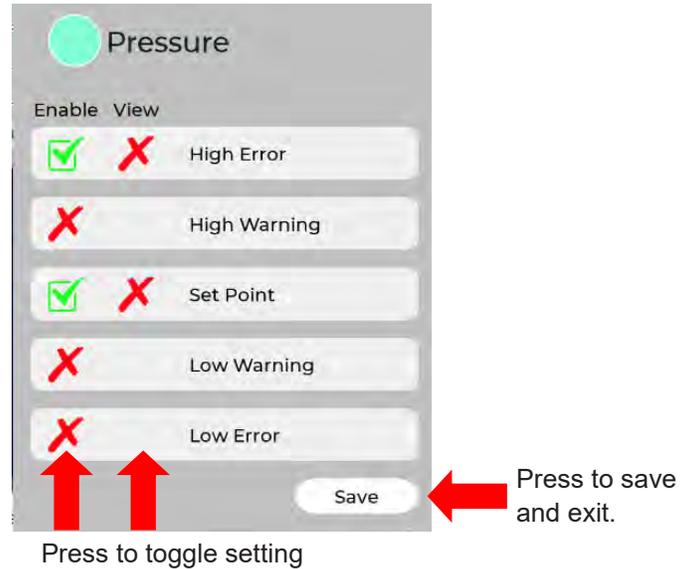
-  Parameter is always on (enabled)
-  Parameter is on (enabled)
-  Parameter is off (disabled)
-  Select to change setting or value
-  Parameter is enabled but not viewed
-  Parameter is disabled and not viewed

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.

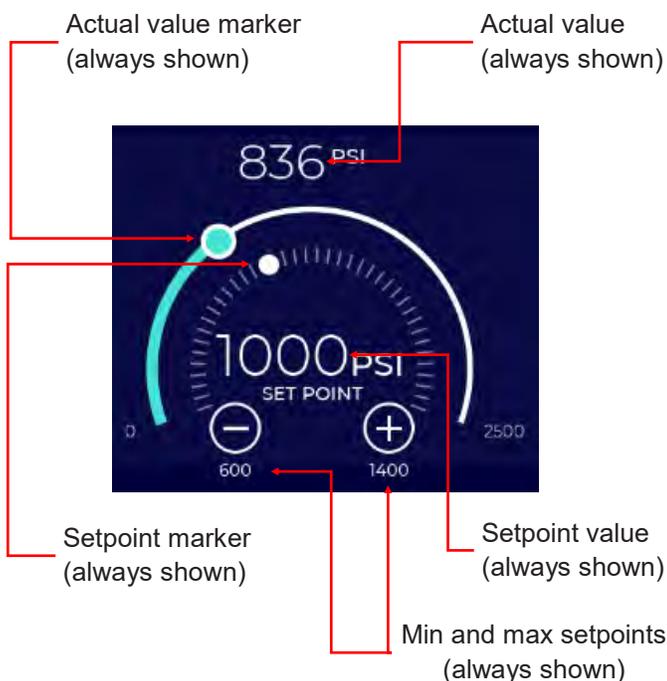


Press LOAD to activate changes to Recipe.

19.2 RECIPE SCREENS - EDITING (Continued)

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

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.

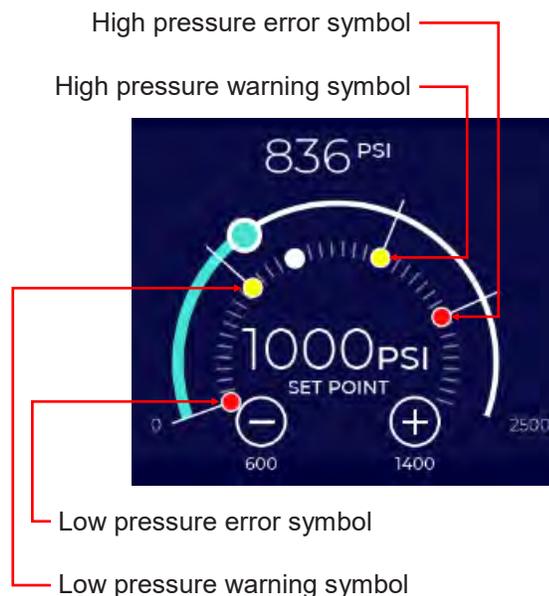


PRESSURE PSI		
<input checked="" type="checkbox"/>	High Error	2000
<input checked="" type="checkbox"/>	High Warning	1500
	Setpoint Max	1400
	Setpoint	1000
	Setpoint Min	600
<input checked="" type="checkbox"/>	Low Warning	700
<input checked="" type="checkbox"/>	Low Error	0
	Display Max	2500
<input checked="" type="checkbox"/>	Filter Error	50
<input checked="" type="checkbox"/>	Filter Warning	25
<input checked="" type="checkbox"/>	Delta P Error	500
<input checked="" type="checkbox"/>	Delta P Warning	300

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

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

PRESSURE PSI		
<input checked="" type="checkbox"/>	High Error	2000
<input checked="" type="checkbox"/>	High Warning	1500
	Setpoint Max	1400
	Setpoint	1000
	Setpoint Min	600
<input checked="" type="checkbox"/>	Low Warning	700
<input checked="" type="checkbox"/>	Low Error	0
	Display Max	2500
<input checked="" type="checkbox"/>	Filter Error	50
<input checked="" type="checkbox"/>	Filter Warning	25
<input checked="" type="checkbox"/>	Delta P Error	500
<input checked="" type="checkbox"/>	Delta P Warning	300

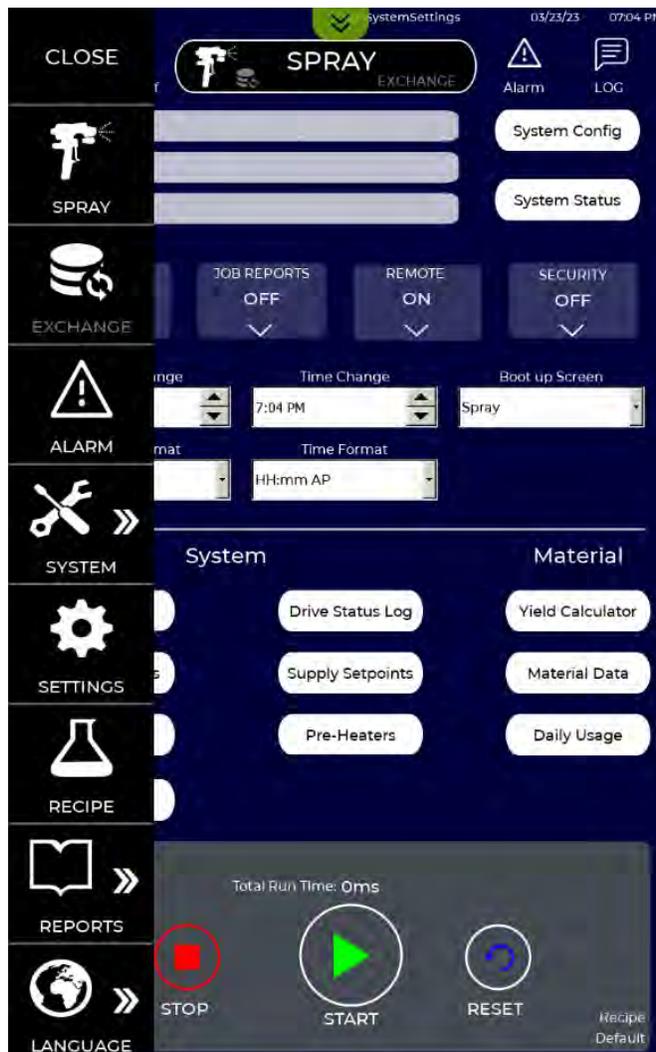


20.0 REPORTS - OVERVIEW

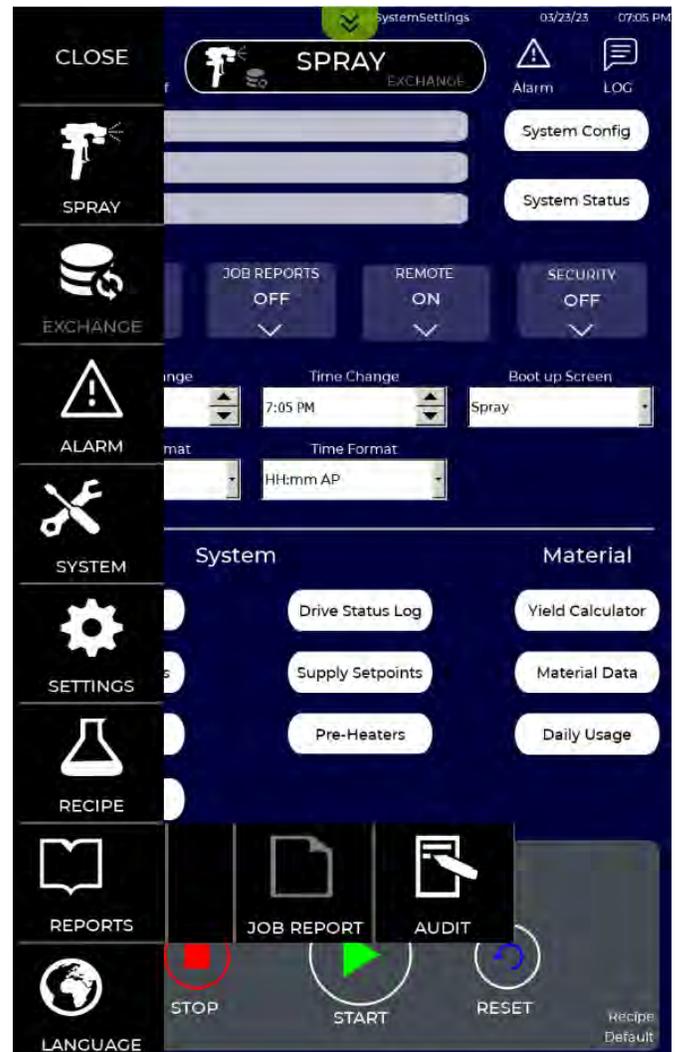
The IS30 Proportioner has extensive reporting capabilities. These are divided into two areas - **Job Reports** and **Audit Reports**. Job Reporting capabilities can be turned on or off in the Settings Screen (see Section 18). The factory default setting for Job Reports is OFF. Job Reports are described in Section 20.3.

Audit Reports are always enabled, even when Job Reporting is disabled. Audit Reports contain a record of user interactions with the IS30 screens, 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.



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



Then select desired report

20.1 REPORTS - AUDIT REPORT

The Audit Report screen shows a time-stamped event table containing user interactions with the IS30 screens, system 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 Proportioner retains up to 63,999 events before deleting the oldest events. When Job Reporting is turned on the Audit table is included in the Job Report.

Select look back duration from pull-down menu.

Press Refresh button to update Audit table

Events are sequentially numbered as they occur

Events are time-stamped

Active User is logged with event

Use slider to move forward or backward in time,

Event information

The type of event

Swipe anywhere in the table to move it forward or backward in time.

Press to see earlier entries

Press to see later entries

Record ID	Timestamp	UserName	Operation	Information
30	23 - 05:35:43 PM 03/23/20	SecurityOFF	SHOW_SYSTEM	Triggered from context menu
29	23 - 05:44:46 PM 03/23/20	SecurityOFF	LOGIN	
28	23 - 05:44:36 PM 03/23/20	SYSTEM_IDAL	SYSTEM_POWERF	HMI-d103 ON
27	03/23/2023 - 05:42:01 PM	SecurityOFF	SHOW_SYSTEM	Triggered from context menu
26	23 - 04:34:54 PM 03/23/20	SecurityOFF	SHOW_SYSTEM	Triggered from context menu
25	03/23/2023 - 04:17:45 PM	SecurityOFF	LOG_MESSAGE	Start Button Pressed
24	03/23/2023 - 04:16:16 PM	SecurityOFF	LOG_MESSAGE	Exchange Mode Selected
23	03/23/2023 - 04:15:13 PM	SecurityOFF	LOG_MESSAGE	Reset Button Pressed
22	03/23/2023 - 04:14:11 PM	SecurityOFF		
21	03/23/2023 - 04:14:02 PM	SYSTEM_IDAL	STEM_POWERC	HMI-d103 ON
20	03/22/2023 - 09:26:20 PM	SecurityOFF	LOG_MESSAGE	Pressure Changed to 1200 PSI

20.1 REPORTS - AUDIT REPORT (Continued)

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.

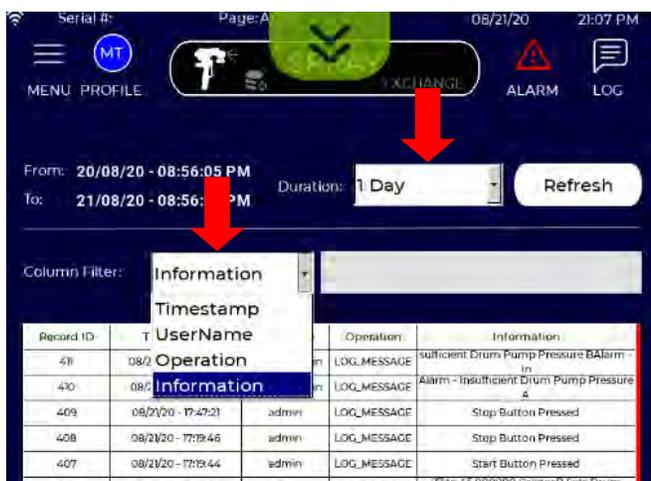


Filter Audit Events

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.



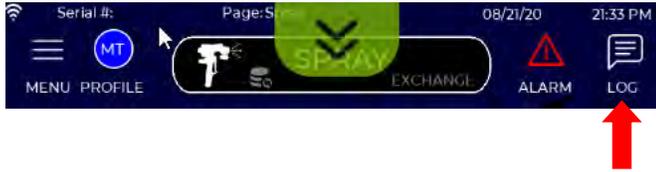
Delete the Filter target word to clear the filter and show all entries.

20.2 REPORTS - JOB NOTES

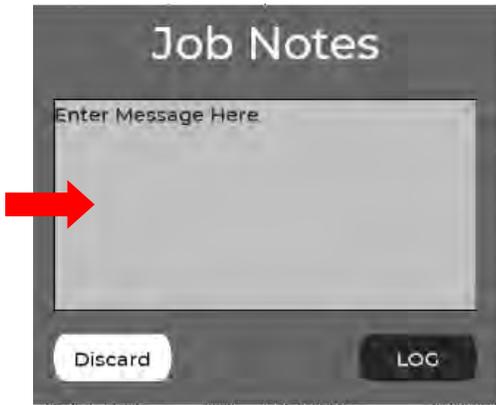
The IS30 allows users to enter and save notes in the Audit table. These notes can be used to record information that may be of interest in the Audit Report or the Job Report. A LOG icon is shown in the upper right corner of every screen. Users can open and enter job notes anytime the Proportioner is powered on.

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

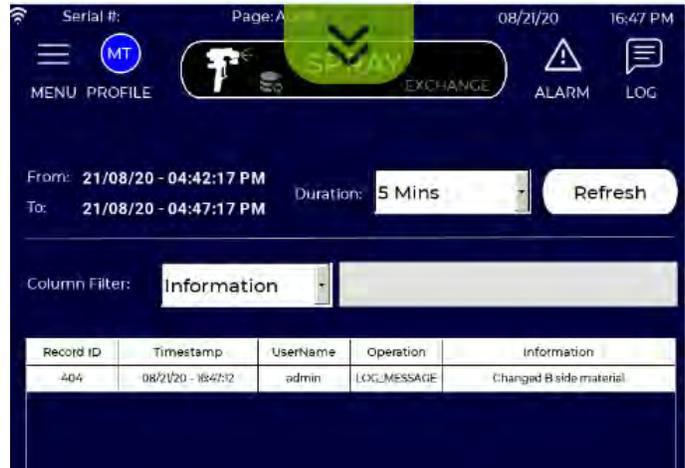
After entering the note text, press the LOG button to enter it into the Audit table. This will also time-stamp the note.



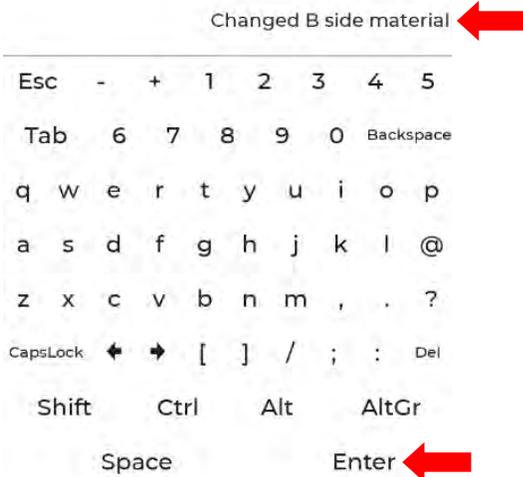
A window will open to record the note. Press anywhere in the text window to activate the on-screen keyboard.



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



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.



20.3 JOB REPORTS - OVERVIEW

The IS30 has built-in Job reporting capabilities that provides users, contractors, and/or 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 Proportioner 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.

NOTE: If power is lost to the Proportioner and Job Reporting is ON, any currently active Job will be lost. If a user needs to cycle power to the system, first STOP the proportioner and select SAVE or NO to avoid losing the Job information.

Job Reporting is toggled ON or OFF in the System Setting screen (see Section 18). Job Reporting is “OFF” as shipped from the factory.



To create a new Job Report, press the NEW button. An input window will open to enter Job Information. Only the Job Name is a mandatory field. Press the desired field to enter information, or press the SCAN button to use the optional QR code reader and capabilities of the Proportioner (for instructions on how to set this up contact your authorized IntelliSpray Distributor). Note that the report can be presented with either Imperial or Metric values.

If Job Reports are ON a 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 pull-down menu, select Last Job, or create a New Job.

20.3 JOB REPORTS - OVERVIEW (Continued)

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.



The IntelliSpray Proportioner 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 screens.



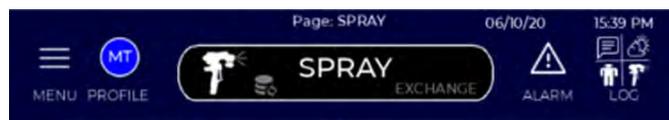
Active Job

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 Section 20.2 for instructions on Job Notes.

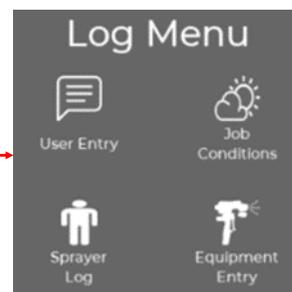


Allows logging of Job Notes when Job Reporting is OFF.

When Job Reports are ON, the Job Notes icon changes to provide more options to enter Job related information. Pressing this icon opens a menu of options as shown below.



Job Logging Menu. Press to open Menu options.



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



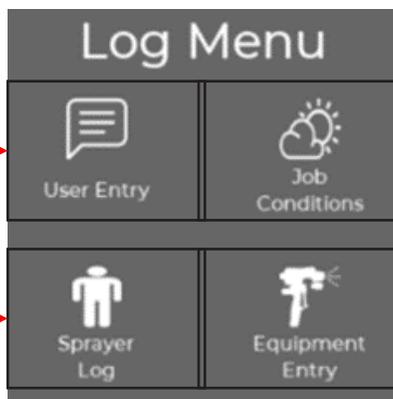
20.3 JOB REPORTS - OVERVIEW (Continued)

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.

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



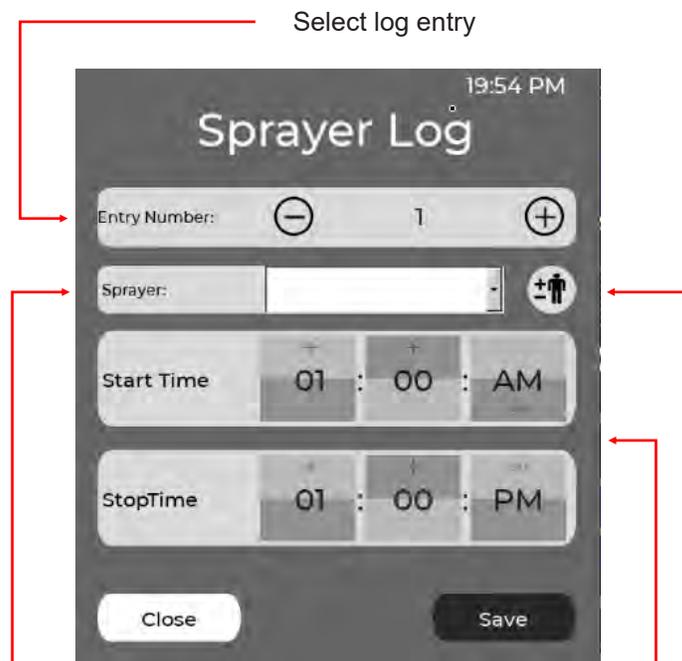
Sprayer Log: Start and stop time for any Sprayer (in the event there are different Sprayers on the same Job).

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.



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).



Select log entry

Select Sprayer from pull-down menu

Enter start and stop times (hr:min:am/pm)

Add new Sprayer name

20.4 JOB REPORTS - LOG ENTRIES

Job Conditions. This feature allows the user to enter up to 20 different environmental and substrate 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

Select log entry #

Press to Log

Enter substrate conditions

Enter spray area conditions

Select substrate type (drop-down)

Select or enter time and trigger (beginning, end, during job)

Select log entry #

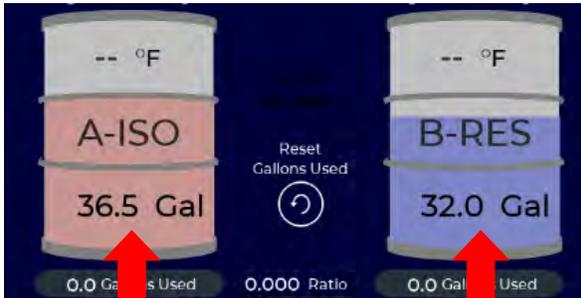
Select or enter time and trigger (beginning, end, during job)

Select spray gun, chamber, and tip size.

20.5 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 optional for Job Reports but is highly 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 **ON** the material information window displays additional fields for entering material data. Material data can be entered through the Drum icon, or via the Material Library described in Section xx. Data is retained and stored in the Material Data library to make subsequent entries easier.

When changing drums

1. Enter the fluid level using the keypad icon. Use a Carlisle drum dip stick or equivalent to accurately measure the fluid level before entering.
2. Increment the drum number by pressing the + button.
3. Time-stamp the entry by pressing on the keypad icon.
4. Use the pull down menu to select a material that has been previously defined. This will automatically populate the next three fields OR enter the information directly by selecting the keypad icon next to each field.
5. Enter the Manufactured Date, Expiration Date, and Batch number for each drum of material.
6. Press Save
7. Press Close

The SCAN button can be used with some drums to auto-fill information fields. Contact your authorized Carlisle Distributor for more information.

1. Drum Level 48.0 Gal

2. Drum Number: 2

3. Date/Time: 4/25-13:43

4. B-RES Material: Select Material Name

5. Manufacturer: Carlisle Spray Foam Insulation

6. Product: 352877

7. Part Number: 0833000BCW

8. Manufactured: 12/18/21

9. Expiration: 05/18/21

10. Batch: 0833000BCW

11. Close

12. Save

20.6 REPORTS SCREEN - REPORT CONTENT

When Job Reporting is ON the IS40 is continuously updating the currently active 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 (shown below) followed by 8 additional pages containing detailed information about ambient conditions, materials, yield calculations, sprayers, and equipment used on the job.

Daily Job Log

Job Name: Job No 12345
 Customer: Joe Customer
 Address: 777 Heavenly Court
 City: On a Hill

Start Date: 09/13/20
 End Date: 8-24-2020
 Author: Joe Sprayer
 State: GA
 ZIP: 56789

Job 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

Parameter	Set Point MIN	Set Point MAX	Average
A-ISO Temperature °F	0	0	0
B-RES Temperature °F	0	0	0
Pressure PSI	0	0	0
Ratio = (A-ISO / B-RES)	1.00	1.00	0.00

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

Material Amount	A-ISO	B-RES	Total
Spray Gal	0.00	0.03	0.03
Exchange Gal	0.00	0.00	0.00
Job Total Gal	0.00	0.03	0.03

Machine On Time	0ms
Spray Time	0ms
% Trigger On Time	nan.0
Gallons Per Hour	inf.00

# 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

Job No 12345

USB EXPORT

EMAIL

END JOB DELETE

Press to see other report pages

Job Header
(printed on every page)

Job conditions summary
(min, max, average)

Process parameters summary
(max, min, average)

Material conditions summary
(max, min, average)

Material usage summary

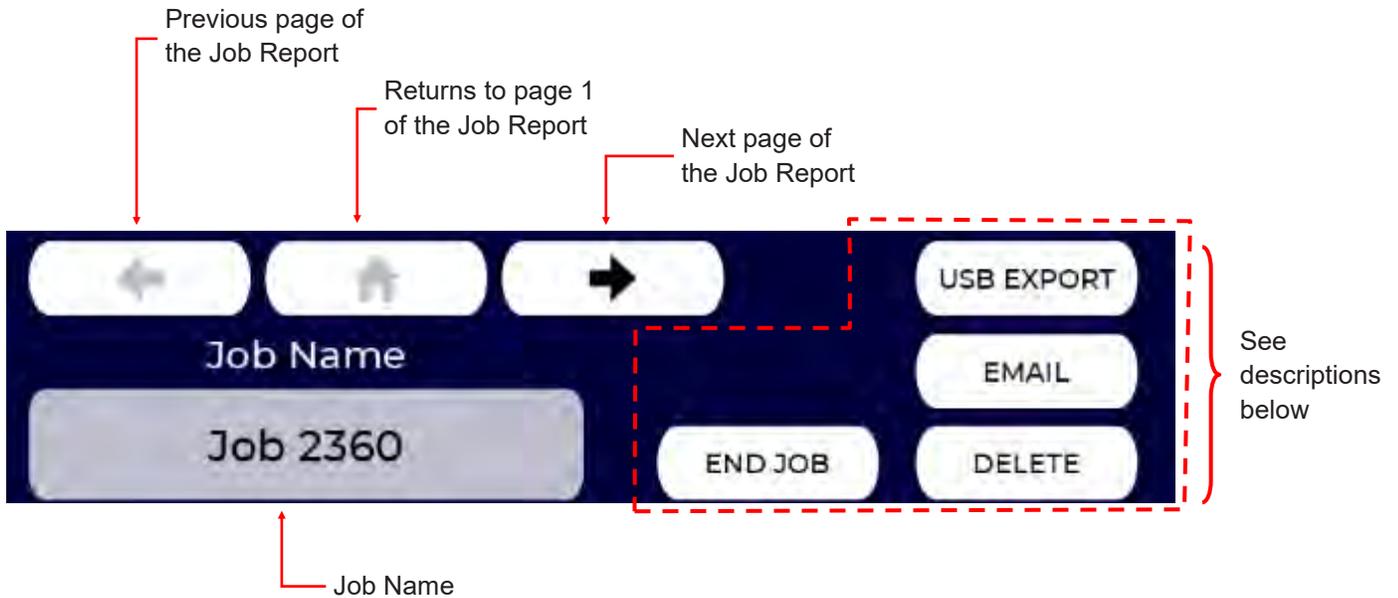
System performance summary

Yield calculation summary
(if performed by user)

Report Management

20.7 JOB REPORTS - REPORT MANAGEMENT

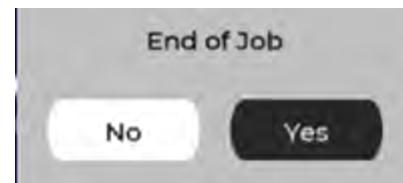
Each page of the on-screen Job Report contains a section for Report Management. This section contains buttons for navigating, exporting, ending, creating, and deleting Job Reports.



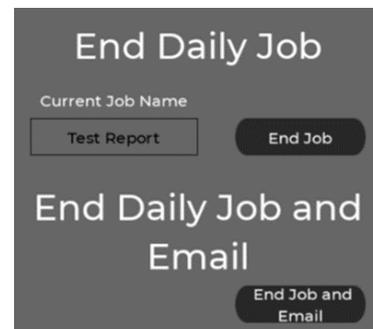
NEW/LOAD Creates a new Job, or loads (continues) an existing Job. Loading an existing Job allows the user to continue logging information from a prior incomplete Jobs. To Load an existing Job, select it from the pull-down menu, then press Load.



END JOB The END JOB button is used at the end of Job. If the user wishes to continue this job in the future they should press NO. Ending a Job prevent additional information to be added to that Job Report. 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. See the next page for instructions on emailing or exporting Job Reports.



20.7 JOB REPORTS - REPORT MANAGEMENT (Continued)

DELETE

Deletes a Job and information for that Job. 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 200 Job Reports. Once this limit is reached it will delete the oldest Job Report automatically to create space for the next Job Report.

To email a job report, select the Job to email from the drop-down window and press the **Attach Report** button. Select the email recipient from the pull down menu or enter it using the ? button. Add text to the email (optional) and press **Send**.

To enter a new email recipient, press the the ? Button. Press "Add New Email Here" and use the onscreen keyboard to enter the address. Press Add, then Close. The new email recipient will now be retained for future use. Up to 20 email addresses can be stored.

NOTE: For email to work the Proportioner must be equipped with a cellular modem (standard in North America) and have an active SIM card with cellular data plan. Email settings must also be properly configured (see Section 18.1).

EMAIL

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

EXPORT PDF

The EXPORT PDF function copies Job Reports to a USB memory stick inserted in the IntelliSpray's USB port on the side of the Control Module. After pressing the EXPORT PDF button the following menu appears. Select the Job to export from the drop-down menu and press **Attach**. To copy all Job Reports to the USB device, press **Attach All**.

21.0 LANGUAGES

IntelliSpray Proportioners can display text in any of the following languages:

- English (Factory Default)
- Spanish
- Chinese
- Greek
- German
- Polish
- Italian
- Dutch
- French
- Japanese

To change the setting, select the desired language from the drop down menu. Press on the language to change the displayed text.



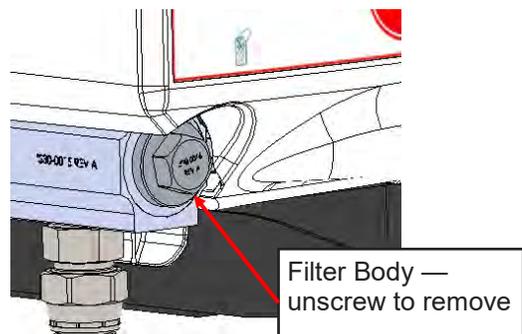
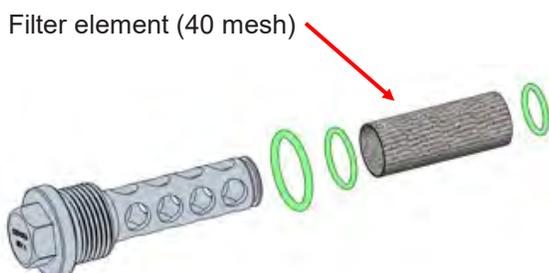
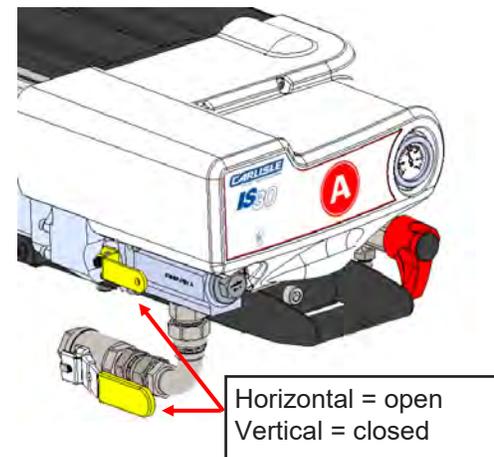
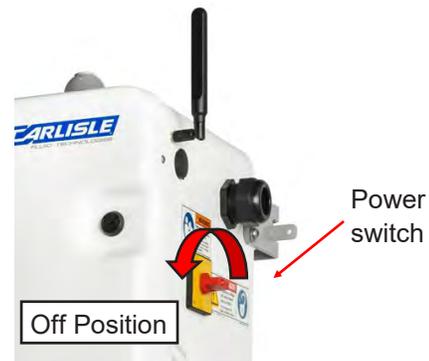
22.0 IS30 REGULAR SERVICE

The IS30 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. .

Normal service of the Fluid Modules consists of the following:

Inlet Filter Service: The inlet filters on the IS30 prevent solids from entering the Fluid Modules, hoses, and spray gun. The IS30 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 IS30 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. Place a pail or bucket under the filter cap to collect drips.
4. Close the inlet ball valve and filter isolation valve.
5. 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.
6. Pull the filter assembly out of the filter manifold.
7. Slide the filter element off the filter body and clean the filter and filter body with a compatible solvent (e.g. Brake Cleaner, TSL, Dynasol, DPM, etc.).
8. Inspect 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.
9. Reinstall the filter element (replace if damaged).
10. 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 or equivalent to the internal manifold threads and the filter body threads.
11. Insert filter body with element into the filter manifold.
12. Tighten to 30 ft-lb.
13. Open the inlet ball valve and filter isolation valve.
14. Open upstream supply valves and turn on supply pumps.
15. Resume operation.

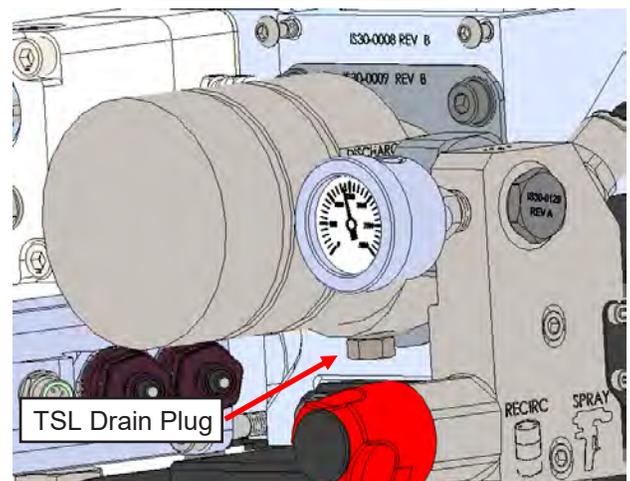
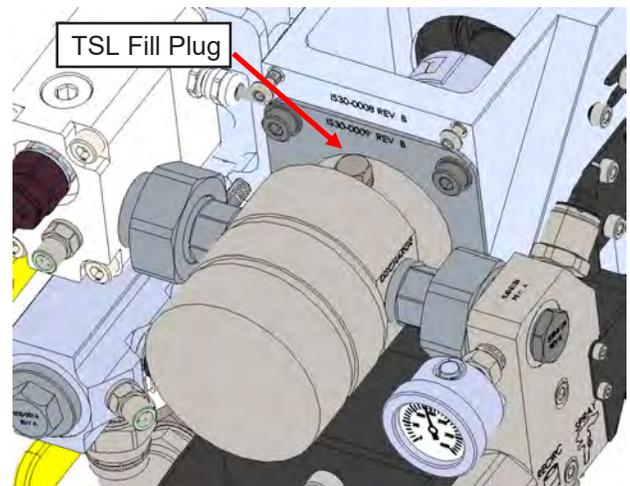
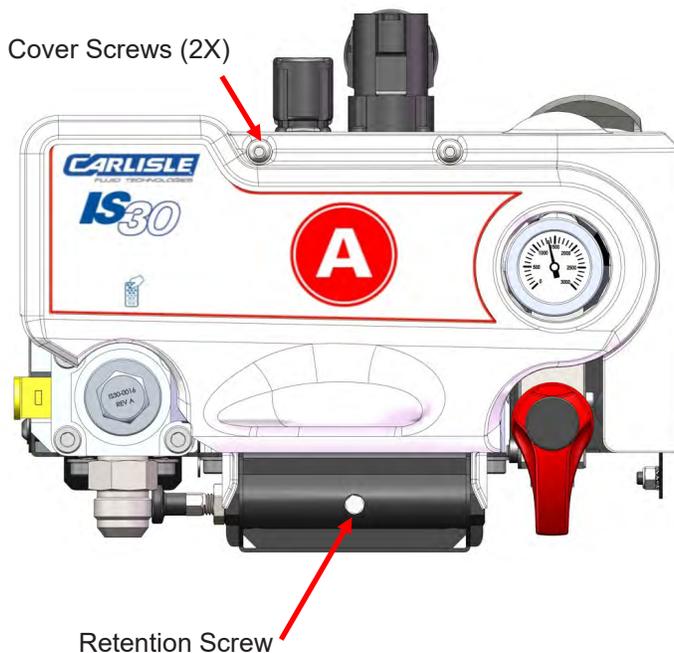


22.0 IS430 REGULAR SERVICE (Continued)

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 may damage the shaft seal. The fluid also lubricates the shaft seals on both A and B pumps. 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. Loosen the captive fluid module retention screw, pull the retention pin, and slide the module into the second service position (second detent).
2. Loosen the two module cover retention screws and slide the cover off the fluid module.
3. Locate the TSL fill port on top of the pump and remove the plug.
4. Check that the TSL fluid is up to bottom of the fill port. If not, fill with additional TSL.
5. Replace the TSL fill plug.
6. Replace and secure the module cover.
7. Slide the fluid module back to the operating position and secure the retention bolt.

Note: If the TSL fluid is discolored (e.g. brown) it may indicate a leaky shaft seal. Before servicing the pump drain the TSL from the lower port on the bpump and replace with fresh fluid. If the problem persists the pump should be replaced with a new or rebuilt unit.

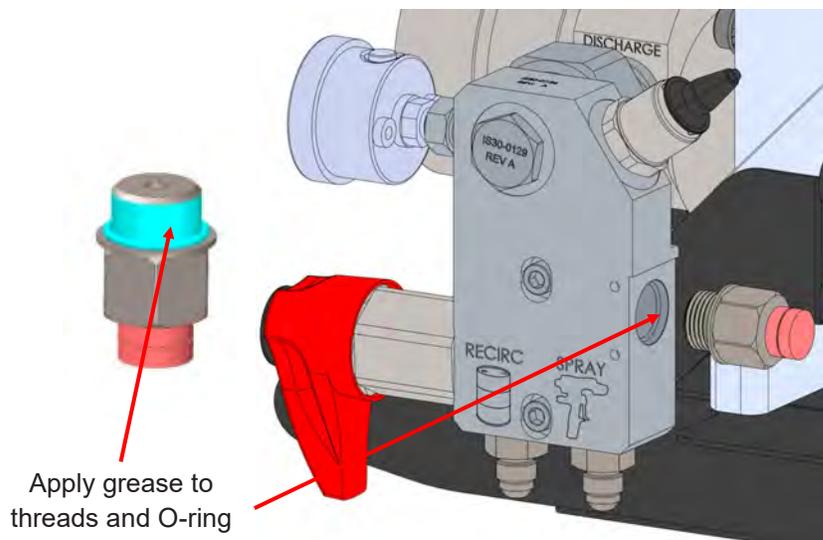
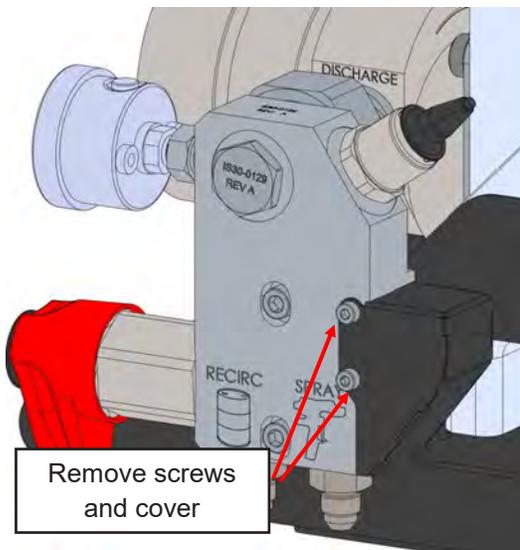


22.0 IS30 REGULAR SERVICE (Continued)

Burst Disk Replacement: As an additional safety precaution against over-pressure conditions, Burst Disk assemblies rated for 7000 psi are located on the back of the A and B High Pressure Manifolds. If the Burst Disk ruptures high pressure fluid is contained by a cover 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 9) 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 monthly or quarterly.

The following steps describe replacement the Burst Disk assembly.

1. Press the Stop button on the IS30 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. (See previous section for instruction).
5. For easier access, loosen the Fluid Module captive retention screw, pull the spring loaded locking pin, and slide the Fluid Module out until the locking pin engages with the first or second stop. (See previous section for instruction).
6. Place a pail or bucket under the High Pressure Module to collect fluid.
7. Remove the two M5 cap head screws and burst disk cover.
8. Using a 7/8" wrench loosen the Burst Disk assembly 2 turns and allow any remaining high pressure fluid to drip into the collection container.
9. Fully remove the Burst Disk assembly with its O-ring.
10. After the High Pressure Manifold has drained, clean the internal threads and apply ST1 gun grease or equivalent to prevent seizing.
11. Apply grease to the threads and O-ring on the new Burst Disk assembly (which includes a new O-ring).
12. Thread the new Burst Disk assembly into the manifold and tighten to 30-35 ft-lbs.
13. Install Fluid Module cover and secure captive retention screws.
14. Since some air will have entered the High Pressure module, purge the system by using Exchange mode through the recirculation line.



22.0 IS30 REGULAR SERVICE (Continued)

Air Filter Cleaning: A thermostatically controlled fan in the IS30 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 IS30 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 IS30 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 module on the back of the Control Module door and remove the four (4) right socket head M3 button screws and bracket holding the filter in place.
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.



23.0 SYSTEM ERRORS AND ACTIONS

When an error occurs, the IS30 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 emergency 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 properly 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	Verify correct supply voltage (200-240V)
21	Drive B Over Voltage Error	Incorrect AC supply voltage	Verify correct supply voltage (200-240V)
22	Drive A Under Voltage Error	Incorrect AC supply voltage	Verify correct supply voltage (200-240V)
23	Drive B Under Voltage Error	Incorrect AC supply voltage	Verify 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 Exceeded	Drive A limit exceeded	Power cycle system, contact tech service is problem persists
29	Drive B Position Limit Value Exceeded	Drive B limit exceeded	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

23.0 SYSTEM ERRORS AND ACTIONS (Continued)

Error Number	Alarm Description	Condition	Action
100	Insufficient Drum Pump Pressure A	<ol style="list-style-type: none"> 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 	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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 	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 1. Heater cable disconnected or connected to the incorrect section 2. Hose heater wire failure 	<ol style="list-style-type: none"> 1. Check hose power connections 2. If problem continues, contact tech service
103	Hose OverTemp A End Modem	<ol style="list-style-type: none"> 1. Hose overheat due to ambient conditions 2. Heater cable connected to the incorrect section 	<ol style="list-style-type: none"> 1. Allow hose to cool (and/or purge fluid through hose) 2. Check hose power connections
104	PreHeat Overtemp A	<ol style="list-style-type: none"> 1. Preheater A too hot 2. Temperature sensor failure 	<ol style="list-style-type: none"> 1. Allow preheater to cool (and/or purge fluid through preheater) 2. Check temperature sensor connector
105	Filter Clog A	<ol style="list-style-type: none"> 1. Filter clogged 2. Pressure drop error setting too low 3. Pressure sensor failure 	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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 	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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 	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 1. A drum pump pressure too high 2. Pressure sensor failure 3. A check valve leak 	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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 	<ol style="list-style-type: none"> 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

23.0 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	<ol style="list-style-type: none"> Excessive Pressure Pressure below zero Sensor failure 	<ol style="list-style-type: none"> Replace check valve if leaking back Check for cavitation Check connector Replace sensor
116	A Post Filter Pressure Sensor Error	<ol style="list-style-type: none"> Excessive Pressure Pressure below zero Sensor failure 	<ol style="list-style-type: none"> Replace check valve if leaking back Check for cavitation Check connector Replace sensor
117	A Pre Gear Pump Pressure Sensor Error	<ol style="list-style-type: none"> Excessive Pressure Pressure below zero Sensor failure 	<ol style="list-style-type: none"> Replace check valve if leaking back Check for cavitation Check connector Replace sensor
118	A Post Gear Pump Pressure Sensor Error	Sensor failure	Check pressure sensor and connector
119	Hose UnderTemp A Middle 1 Modem	<ol style="list-style-type: none"> Heater cable disconnected or connected to the incorrect section Hose heater wire failure 	<ol style="list-style-type: none"> Check hose power connections
120	Hose OverTemp A Middle 1 Modem	<ol style="list-style-type: none"> Hose overheat due to ambient condntions Heater cable connected to the incorrect section 	<ol style="list-style-type: none"> Let system cool and/or purge material Check heater cable connections
200	Insufficient Drum Pump Pressure B	<ol style="list-style-type: none"> B drum pump off B drum pump pressure too low B inlet valve stuck or closed Insufficient B material Level Cold B material Minimum pressure setting too low B inlet pressure sensor failure 	<ol style="list-style-type: none"> Verify B drum pump is providing 100 -300 psi at proportioner Verify B supply line valves are open Check B drum material level Warm B material to manufacturers recommendations Lower minimum pressure setting in Settings screen Check B inlet pressure sensor connectors, contact tech service
201	Excessive System Pressure B Post Gear Pump	<ol style="list-style-type: none"> B side pressure exceeds maximum system setpoint A post gear pump pressure sensor failure 	<ol style="list-style-type: none"> Lower system pressure set point Raise system pressure error limit in Recipes screen Check B side outlet pressure sensor connector
202	Hose Under Temp B End Modem	<ol style="list-style-type: none"> Heater cable disconnected or connected to the incorrect section Hose heater wire failure 	<ol style="list-style-type: none"> Check hose power connections If problem continues, contact tech sevice
203	Hose OverTemp B End Modem	<ol style="list-style-type: none"> Hose overheat due to ambient condntions Heater cable connected to the incorrect section 	<ol style="list-style-type: none"> Allow hose to cool (and/or purge fluid through hose) Check hose power connections
204	PreHeat Overtemp B	<ol style="list-style-type: none"> Preheater B too hot Temperature sensor faiure 	<ol style="list-style-type: none"> Allow preheater to cool (and/or purge fluid through preheater) Check temperature sensor connector
205	Filter Clog B	<ol style="list-style-type: none"> Filter clogged Pressure drop error setting too low Pressure sensor failure 	<ol style="list-style-type: none"> Clean or replace filter element Increase maximum allowable pressure drop in Recipes screen Check inlet and outlet pressure sensor connectors
206	Insufficient Preheater Pressure B	<ol style="list-style-type: none"> B drum pump off B drum pump pressure too low B supply line, pre filter, and/or post filter valve closed Insufficient B material Level Cold B material Minimum pressure setting too low B inlet pressure sensor failure Pressure sensor failure B pre-filter or inlet valve logged B flow meter stuck 	<ol style="list-style-type: none"> Verify B drum pump is providing 100 -300 psi at proportioner Verify B inlet and filter valves are open Check B drum material level Warm B material to manufacturers recommendations Lower minimum pressure error setting in Settings screen Check B pressure sensor connectors Clean or replace B inlet filter Remove B filter inlet valve and check for debris Remove B flow meter and check for solids of debris

23.0 SYSTEM ERRORS AND ACTIONS (Continued)

Error Number	Alarm Description	Condition	Action
207	Insufficient Filter Pressure B	<ol style="list-style-type: none"> 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 	<ol style="list-style-type: none"> 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	<p>B drum pump pressure too high</p> <p>Pressure sensor failure</p> <p>B high pressure check valve leak</p>	<p>Check that B pump is pressurized to provide 100-150 psi at system</p> <p>Check B inlet pressure sensor connector</p> <p>Check or replace B side high pressure check valve</p>
209	Excessive System Pressure B SMOSE	<ol style="list-style-type: none"> 1. B drum pump pressure too high 2. Pressure sensor failure 3. B check valve leak 	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 1. Excessive Pressure 2. Pressure below zero 3. Sensor failure 	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 1. Excessive Pressure 2. Pressure below zero 3. Sensor failure 	<ol style="list-style-type: none"> 1. Replace check valve if leaking back 2. Check for cavitation 3. Check connector 4. Replace sensor
216	B Post Filter Pressure Sensor Error	<ol style="list-style-type: none"> 1. Excessive Pressure 2. Pressure below zero 3. Sensor failure 	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 1. Excessive Pressure 2. Pressure below zero 3. Sensor failure 	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 1. Hose overheat due to ambient conditions 2. Heater cable connected to the incorrect section 	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 1. Frequency setting not optimal 2. Interference from other nearby systems 3. Modems not paired correctly 4. Incorrect hose configuration setting 4. Hardware failure. 	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 1. Multiple systems in close proximity operating on the same frequency. 2. Modems not paired correctly 	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 1. Check modem connection cable 2. Cycle power

23.0 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

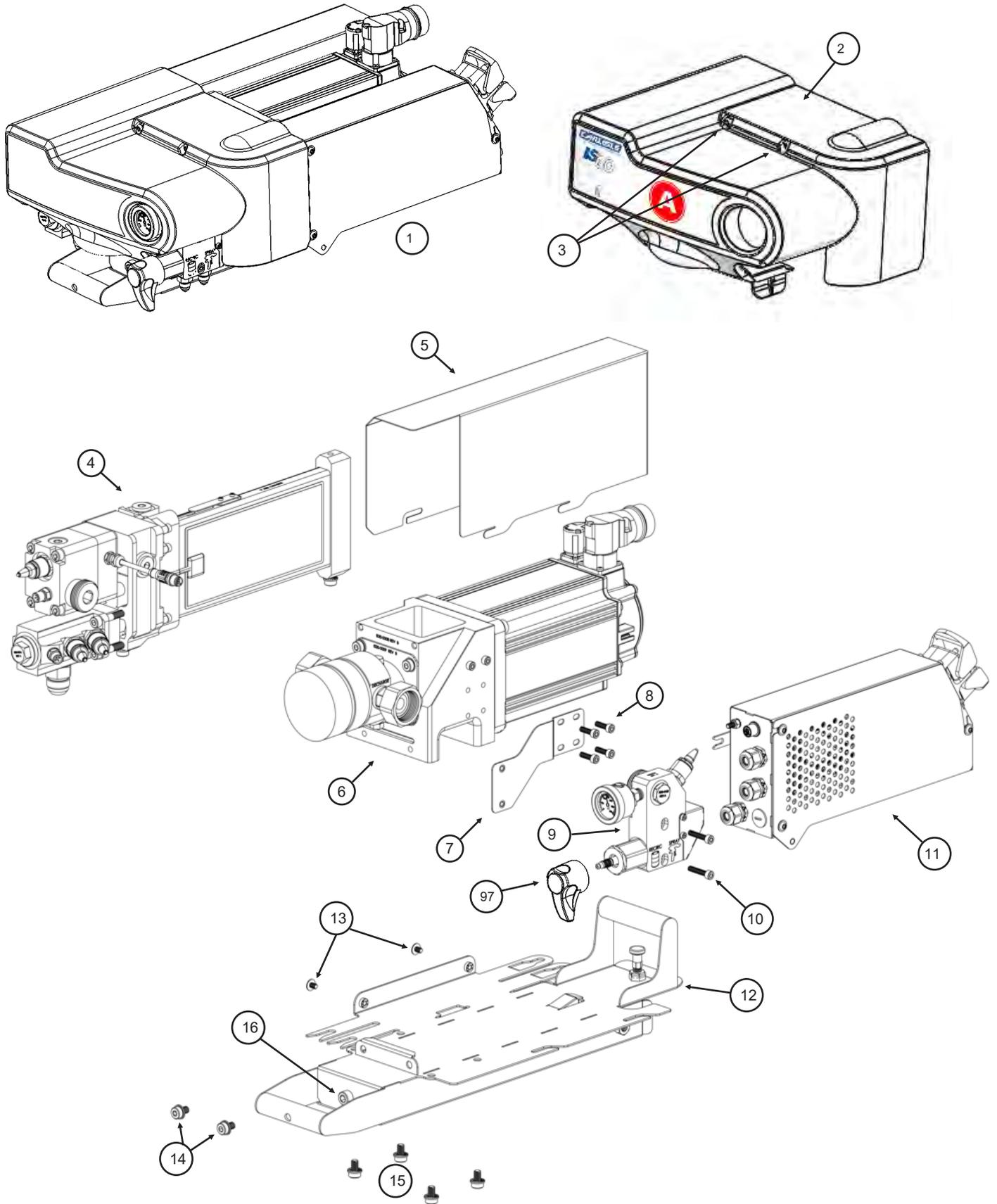
23.0 SYSTEM ERRORS AND ACTIONS (Continued)

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

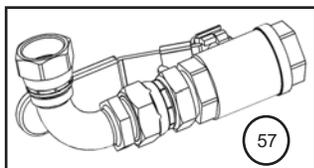
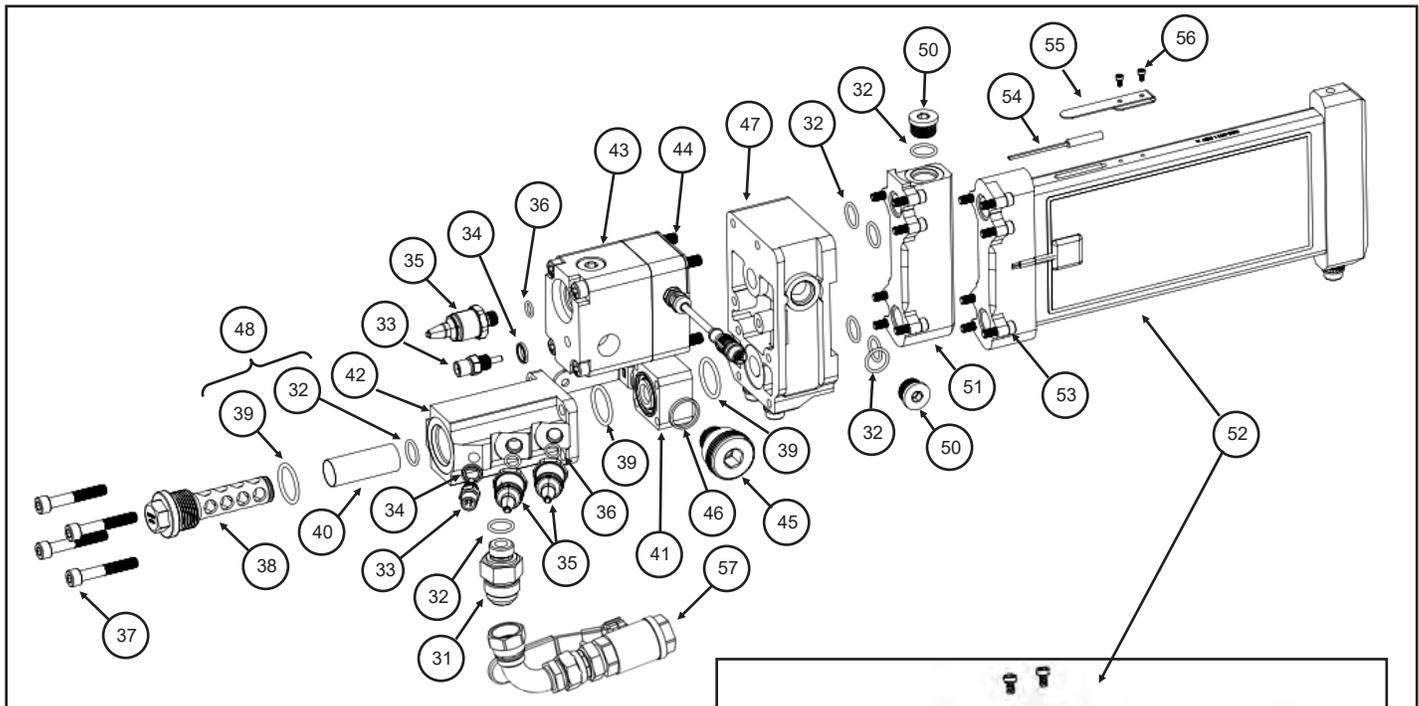
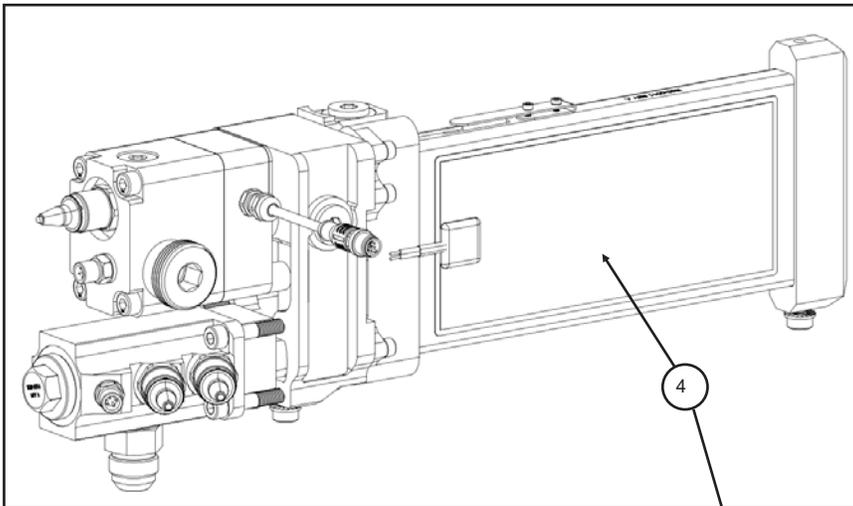
23.0 SYSTEM ERRORS AND ACTIONS (Continued)

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 2. Hardware failure	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

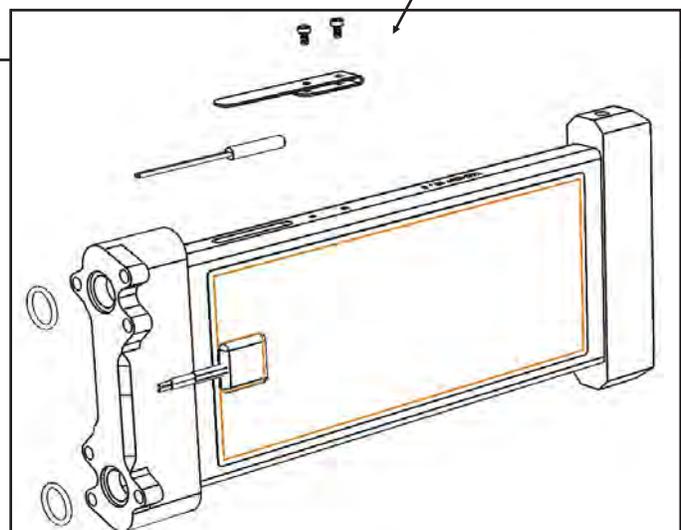
24.0 IS30 FLUID MODULE ITEMS



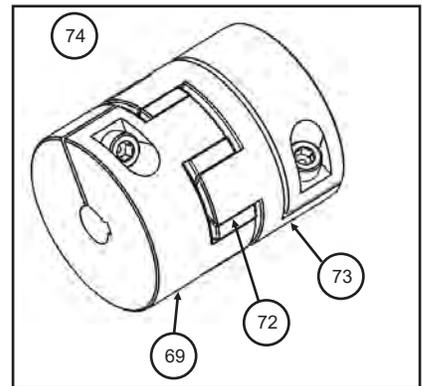
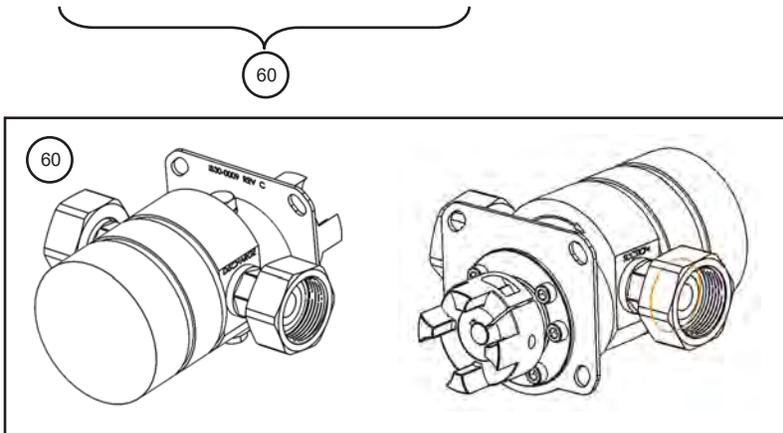
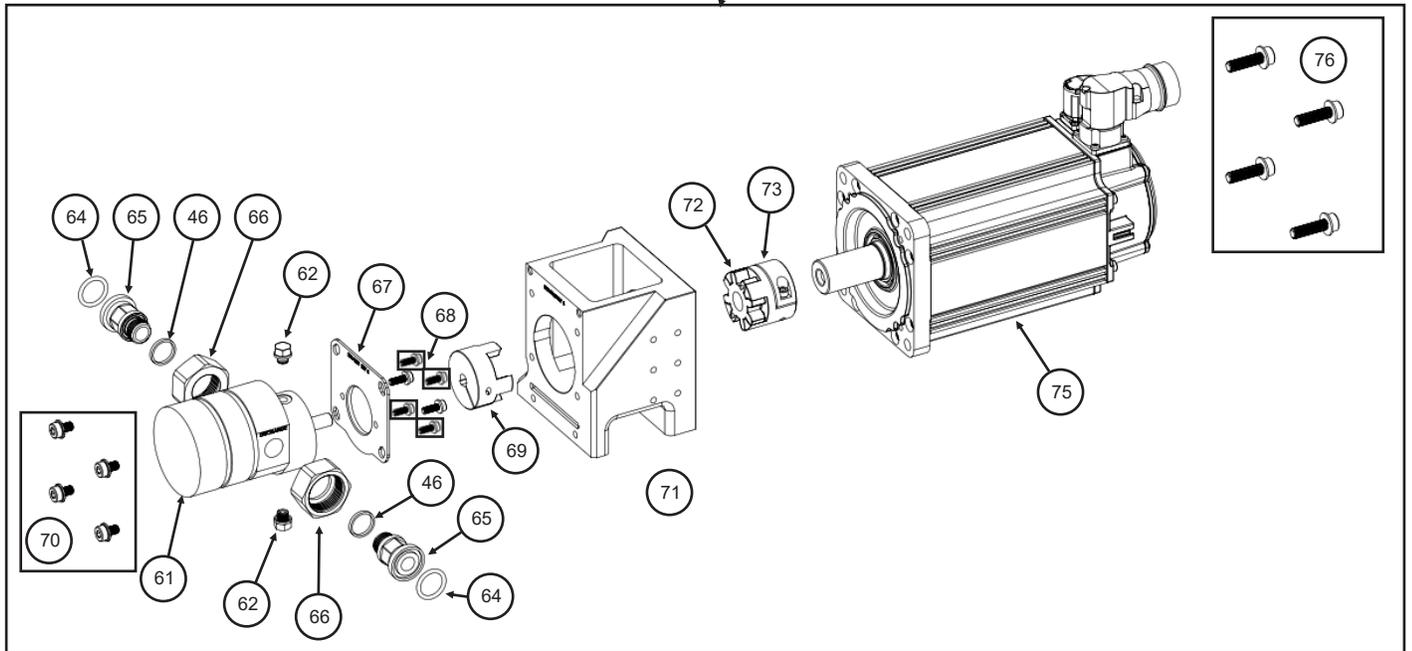
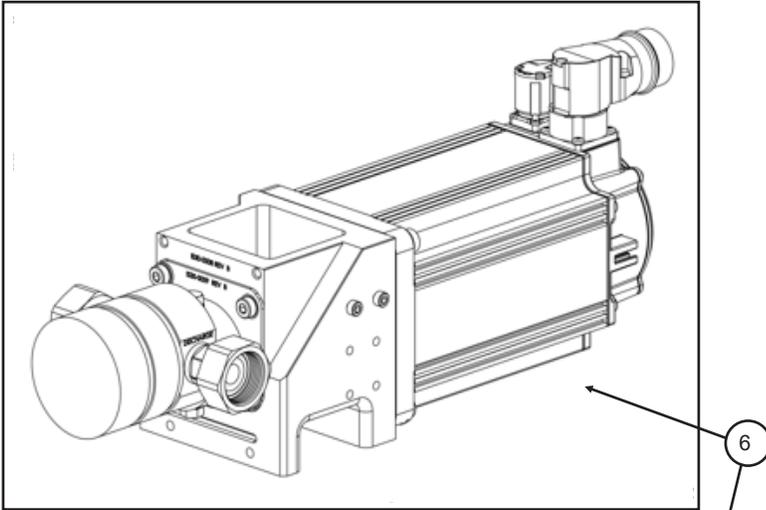
24.0 IS30 FLUID MODULE ITEMS (Continued)



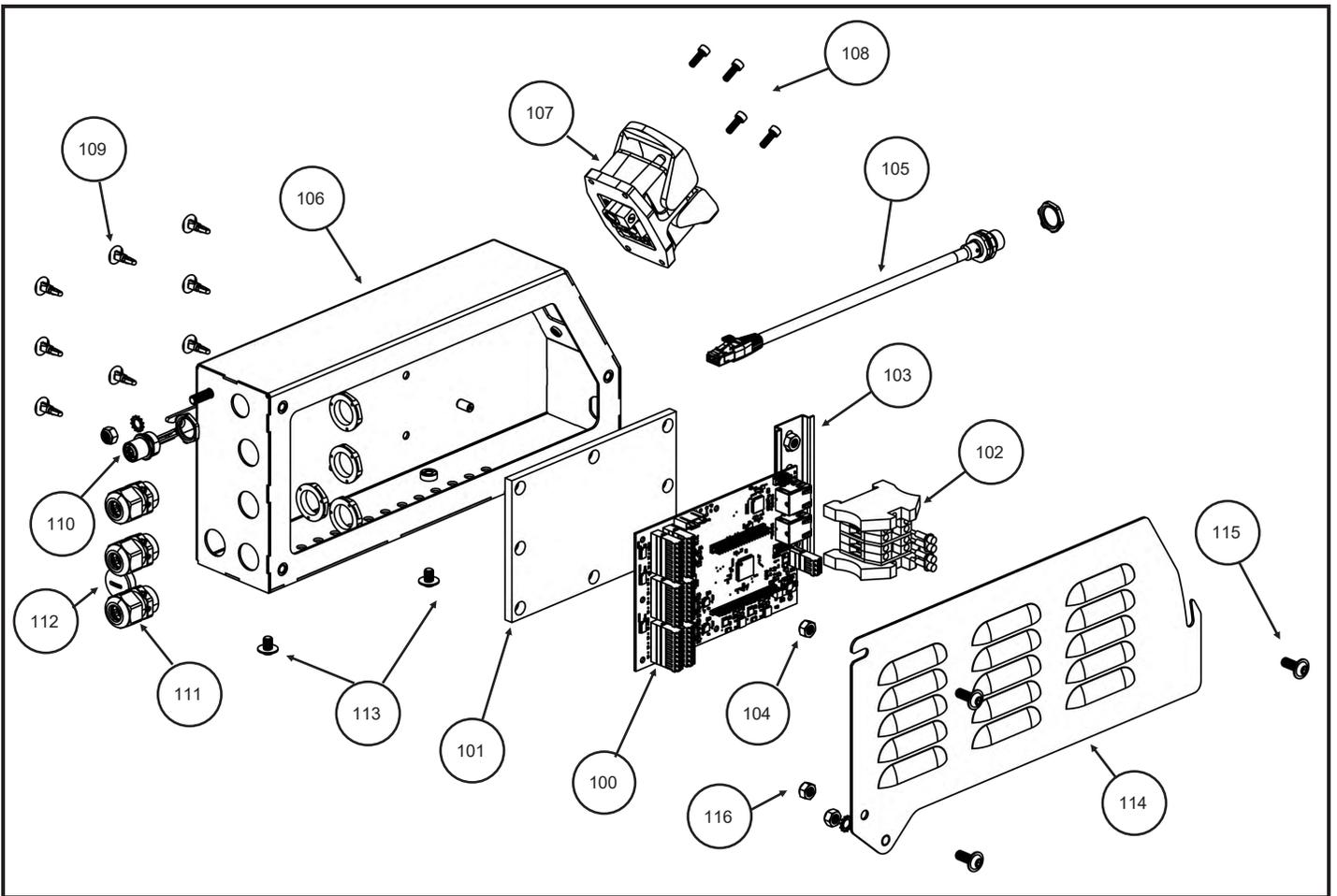
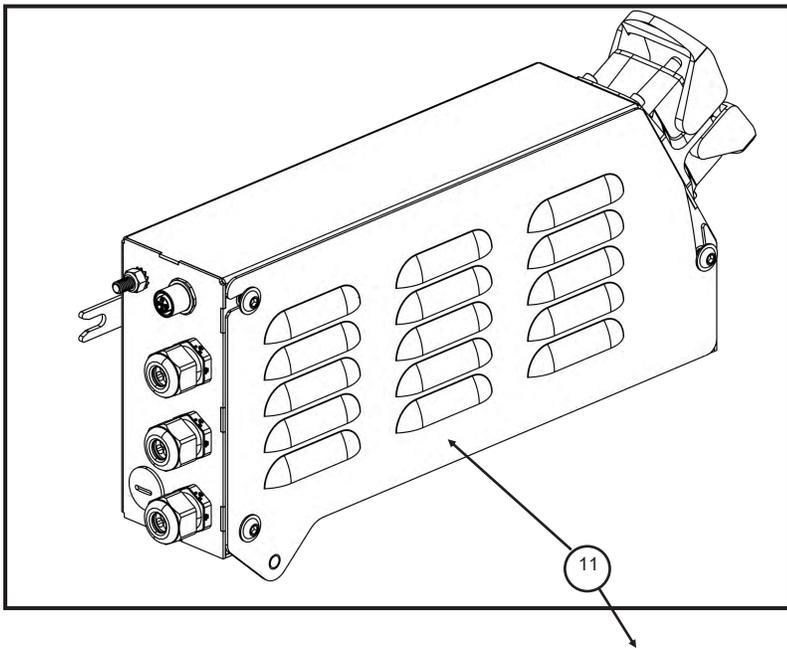
Note: Installation kit PN 341133 includes 2 90 sweeps, 2 ball valves, and JIC to NPT fittings for recirculation line fittings on high pressure manifolds.



24.0 IS30 FLUID MODULE ITEMS (Continued)



24.0 IS30 FLUID MODULE ITEMS (Continued)



24.0 IS30 FLUID MODULE ITEMS (Continued)

ITEM	PN	DESCRIPTION	QTY (PER MODULE)
1	347484 347485	A SIDE FLUID MODULE B SIDE FLUID MODULE	1
2	347494 347495	A SIDE FLUID MODULE COVER (INCL.3) B SIDE FLUID MODULE COVER (INCL.3)	1
3	NA	BUTTON HEAD SCREW, M6 X 1.0 X 12 LG, SST	2
4	347496	LOW PRESSURE MODULE POPULATED	1
5	347497	PRE-HEATER MODULE COVER	1
6	347498	PUMP MODULE	1
7	347499	HIGH PRESSURE MODULE BRACKET	1
8	NA	SOCKET HEAD CAP SCREW. M6 X 1.0 X 16 LG, SST	4
9	347489 347500	A-SIDE HIGH PRESSURE MODULE B SIDE HIGH PRESSURE MODULE	1
10	NA	SOCKET HEAD CAP SCREW, M6 X 1.0 X 30 LG, SST	2
11	347479 347480	PUMP I/O MODULE—BECKHOFF (DISTRIBUTOR ONLY) PUMP I/O MODULE—CIRCUIT BOARD (DISTRIBUTOR ONLY)	1
12	347501 347502	A SIDE PUMP MODULE FRAME (INCL. 16) B SIDE PUMP MODULE FRAME (INCL. 16)	1
13	NA	SOCKET HEAD CAP SCREW, M6 X 1.0 X 8 LG, FLANGE, BO	2
14	NA	SOCKET HEAD CAP SCREW. M8 X 1.25 X 12 LG, FLANGE. BO	2
15	NA	SOCKET HEAD CAP SCREW, M8 X 1.25 X 12 LG, FLANGE. BO	4
16	347503	CAPTIVE SCREW. M10 X 1.5 X 40MM, SST	1
17-30		NOT USED	
31	347504	FITTING, INLET (INCL. 32)	1
32	347505	O-RING, INLET FITTING, FILTER MODULE, FLOWMETER, PREHEATER, BURST DISK, CHECK VALVE, RECIRCULATION VALVE. (8 PK)	16
33	347477	SENSOR, TEMP (INCL. 34)	2
34	347506	SEAL, TEMPERATURE SENSOR (2 PK)	2
35	347476	SENSOR, PRESSURE 0-1000 PSI (INCL. 36)	3
36	347507	O-RING, PRESSURE SENSOR (4 PK)	4
37	NA	SOCKET HEAD CAP SCREW, M8 X 1.25 X 50 LG, SST	4
38	347468	FILTER BODY KIT (INCL. 32, 39, 40)	1
39	347508	O-RING, FILTER, BALL VALVE (3 PK)	3
40	347464 347465	FILTER ELEMENT, 30 MESH (10 PK) FILTER ELEMENT, 30 MESH (50 PK)	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.

24.0 IS30 FLUID MODULE ITEMS (Continued)

ITEM	PN	DESCRIPTION	QTY (PER MODULE)
41	347474	ASSY, BALL VALVE (INCL 39X2)	1
42	347509	MANIFOLD, FILTER	1
43	347460	FLOW METER (1 EA. 32, 34, 36, 46)	1
44	NA	SOCKET HEAD CAP SCREW, M8 X 1.25 X 100 LG	4
45	347510	FITTING, UNION, FLAT (INCL 46)	2
46	347566	SEAL, UNION NIPPLE (3 PK)	3
47	347567	MANIFOLD, PREHEATER	1
48	347466	FILTER O RING KIT (INCL 32, 39) 10 PK	1
48-49	NOT USED		
50	347568	PLUG	2
51	347471	MANIFOLD, PREHEAT CAP (INCK. 32X2)	1
52	347472	ASSEMBLY, PREHEATER (INCL. 32X2)	1
53	NA	SOCKET HEAD CAP SCREW, M6 X 1.0 X 20 LG, SST	6
54	347569	THERMAL FUSE	1
55	NA	BRACKET, THERMAL FUSE	1
56	NA	SOCKET HEAD CAP SCREW, M3 x 0.5 X 6 LG, SST	2
57	341133	INSTALLATION KIT	1
58-59	NOT USED		
60	347486	ASSEMBLY, PUMP (INCL. 61—69, 46)	1
61	347570	PUMP, GEAR (INCL. 62, 63 2X 46)	1
62	347571	PLUG, TSL CHAMBER, LOWER OR UPPER	2
63	NOT USED		
64	347572	O-RING, PUMP UNIONS (2PK)	2
65	347573	FITTING, UNION, GROOVED (INCL. 46, 64)	2
66	347574	NUT, UNION	2
67	347575	PLATE, PUMP MOUNT	1
68	NA	SOCKET HEAD CAP SCREW, M6 X 1.0 X 16 LG, SST	6
69	NA	SHAFT COUPLER, PUMP	1
70	NA	SOCKET HEAD CAP SCREW, M8 X 1.25 X 12 LG, FLANGE, BO	4
71	347576	MOUNTING BLOCK, PUMP AND MOTOR	1
72	NA	SHAFT COUPLER, SPIDER	1
73	NA	SHAFT COUPLER, MOTOR	1
74	347577	ASSEMBLY, COUPLER	1
75	347578	SERVO MOTOR	1
76	NA	SOCKET HEAD CAP SCREW, M10 X 1.5 X 35 LG, FLANGE, BO	4

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.

24.0 IS30 FLUID MODULE ITEMS (Continued)

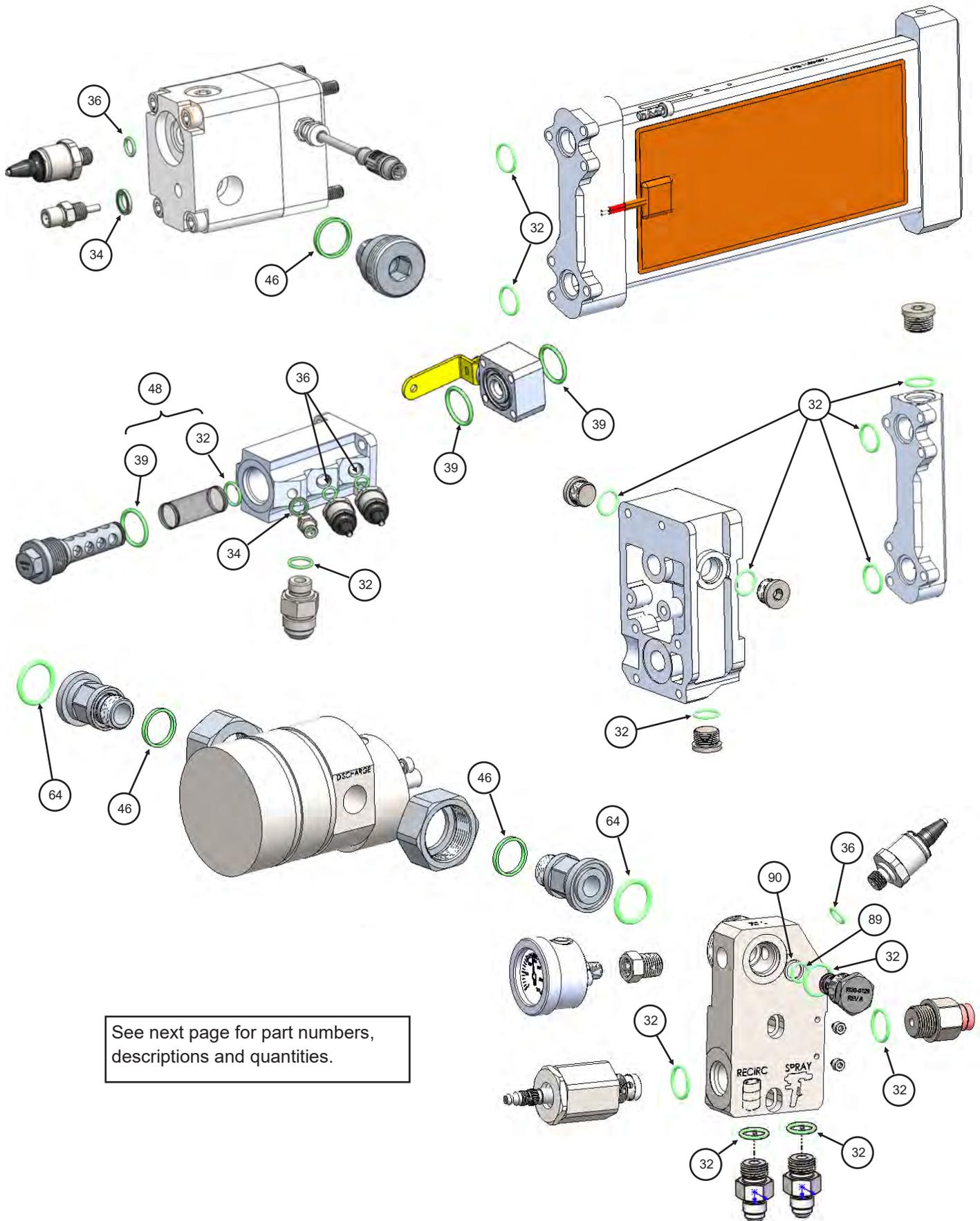
ITEM	PN	DESCRIPTION	QTY (PER MODULE)
77-79	NOT USED		
80	347579	MANIFOLD, HIGH PRESSURE	1
81	347580	VALVE, RECIRCULATION (INCL. 32)	1
82	347581	GAUGE, PRESSURE 0-3000 PSI	1
83	347582	BUSHING	1
84	347583	SENSOR, PRESSURE 0-5000 PSI	1
85	347584	BURST DISK (INCL. 32)	1
86	347585	COVER, BURST DISK	1
87	NA	SOCKET HEAD CAP SCREW, M4 X 0.7 X 4 LG, SST	2
88	341037	KIT, CHECK VALVE (INCL. 32, 89, 90)	1
89	347586	O-RING, CHECK VALVE NOSE (1 PK)	1
90	347587	SPACER, CHECK VALVE NOSE (1 PK)	1
91	347588	O-RING, HOSE AND RECIRCULATION JICS (2 PK)	2
92	NA	JIC5 MALE TO 3/8 NPT MALE (A SIDE) JIC6 MALE TO 3/8 NPT MALE (B SIDE)	2
93	347589 347663	JIC5 MALE TO 3/8 NPT MALE (A SIDE) INCL 91 JIC6 MALE TO 3/8 NPT MALE (B SIDE) INCL 91	2
94	347590	SPRING, RECIRCULATION VALVE	1
95	NA	HANDLE, RED RECIRC VALVE (A SIDE) HANDLE, BLUE RECIRC VALVE (B SIDE)	1
96	347592	NUT, RECIRCULATION VALVE	1
97	347593 347664	HANDLE KIT, RED RECIRC VALVE (A) INCL 94,95,96 HANDLE KIT, BLUE RECIRC VALVE (B) INCL 94,95,96	1
98-99	NOT USED		

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.

24.0 IS30 FLUID MODULE ITEMS (Continued)

ITEM	PN	DESCRIPTION	QTY (PER MODULE)
100	347594	I/O BOARD, FLUID MODULE	1
101	NA	I/O BOARD SUPPORT	1
102	NA	TERMINAL BLOCK ASSY	1
103	NA	DIN RAIL	1
104	NA	NUT, HEX, M6 X 1.0, ZINC	2
105	SEE CABLES	CABLE, ENCODER	1
106	NA	I/O ENCLOSURE, FLUID MODULE	1
107	NA	CONNECTOR, FLUID MODULE POWER	1
108	NA	SOCKET HEAD CAP SCREW, M4 X 0.7 X 16 LG, BO	4
109	NA	STANDOFF, KEYSTONE	8
110	NA	BULKHEAD CONNECTOR,	1
111	NA	CABLE GLAND	3
112	NA	PLUG	1
113	NA	SOCKET HEAD CAP SCREW, M6 X 1.0 X 8 LG, FLANGE, BO	2
114	347596	I/O COVER, FLUID MODULE	1
115	NA	BUTTON HEAD CAP SCREW, M6 X 1.0 X 16 LG, FLANGE, BO	3
116	NA	NUT, HEX, M6 X 1.0, NYLON INSERT	2
117-119		UNUSED	

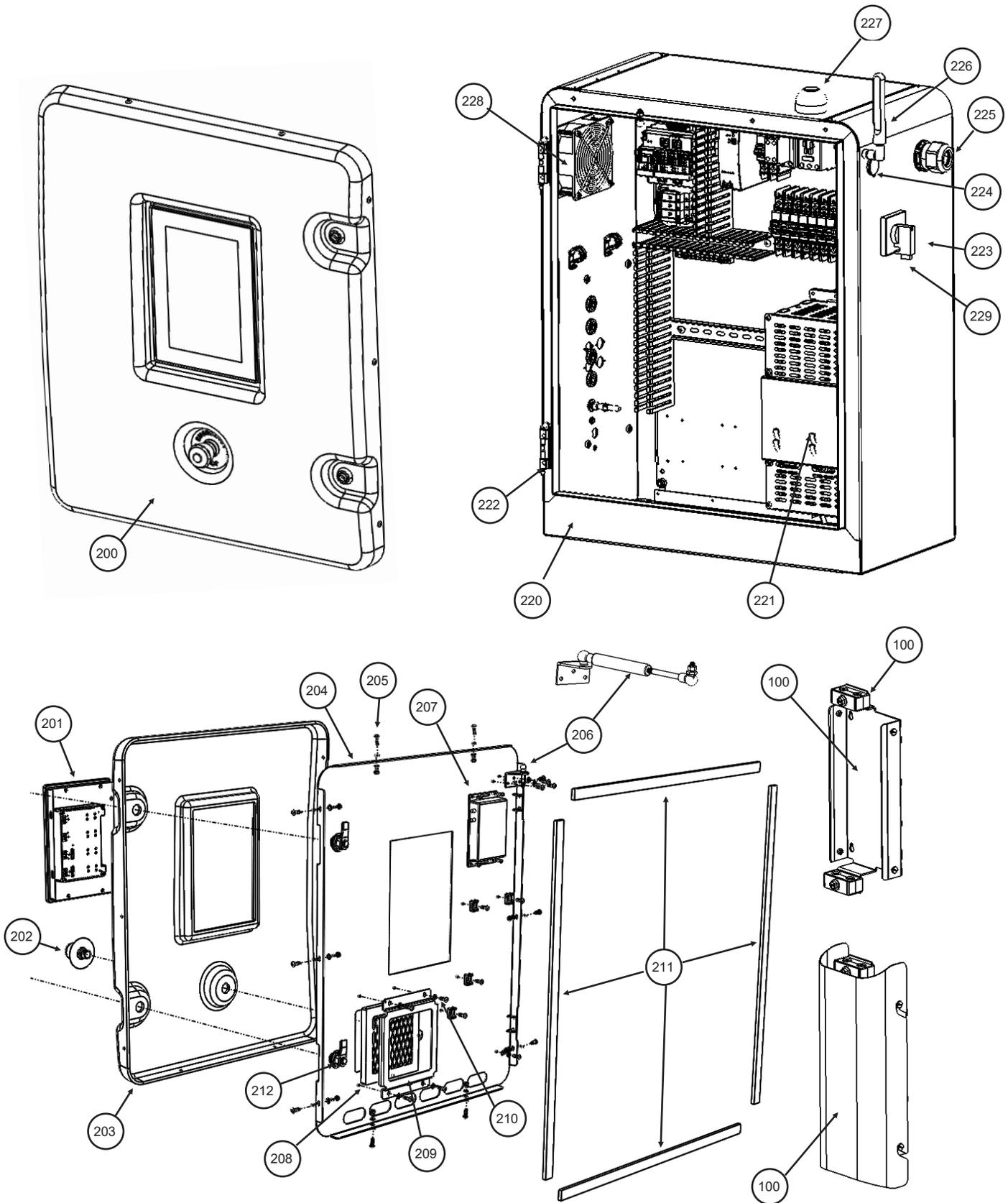
24.1 IS30 FLUID MODULE O-RINGS AND SEALS



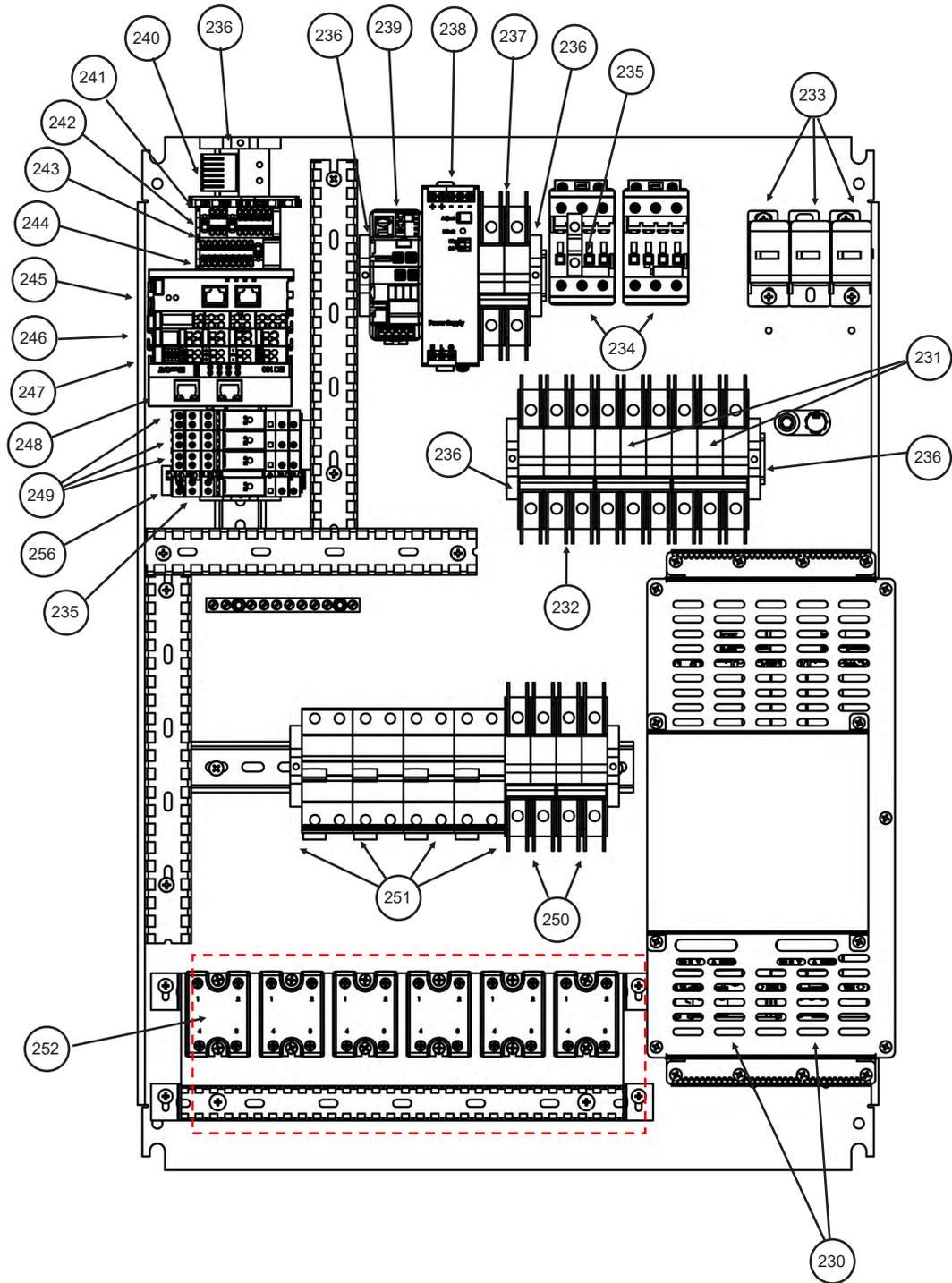
24.1 IS30 FLUID MODULE O-RINGS AND SEALS

ITEM	PN	USED ON	QTY (PER MODULE)
32	347505	O-RING, INLET FITTING, FILTER MODULE, FLOWMETER, PREHEATER, BURST DISK, CHECK VALVE, RECIRCULATION VALVE, (8 PK)	8
34	347506	SEAL, TEMPERATURE SENSOR (2 PK)	2
36	347507	O-RING, PRESSURE SENSOR (4 PK)	4
39	347508	O-RING, FILTER, BALL VALVE (3 PK)	3
46	347566	SEAL, UNION NIPPLE (3 PK)	3
48	347466	FILTER O RING KIT (INCL 32, 39) 10 PK	1
64	347572	O-RING, PUMP UNIONS (2 PK)	2
89	347586	O-RING, CHECK VALVE NOSE (1 PK)	1
90	347587	SPACER, CHECK VALVE NOSE (1 PK)	1
99	347461	KIT, IS30 O-RINGS AND SEALS (INCL ALL ITEMS FOR ONE FLUID MODULE))	1

25.0 IS30 CONTROL MODULE ITEMS



25.0 IS30 CONTROL MODULE ITEMS (Continued)



25.0 IS30 CONTROL MODULE ITEMS (Continued)

ITEM	PN	DESCRIPTION	QTY
200	NA	CONTROL MODULE COVER ASSEMBLY	1
201	347458	10IN HMI WITH CODESYS	1
202	347598	E-STOP KIT (INCL. CONTACTORS))	1
203	347665	CONTROL MODULE COVER	1
204	NA	CONTROL MODULE PLATE	1
205	NA	COVER SCREW	10
206	347607	COVER STRUT ASSEMBLY	1
207	347608 347599	CELLULAR MODEM (US, CA, MEX ONLY) CELLULAR MODEM (EU ONLY)	1
208	347459	AIR FILTER	1
209	NA	AIR FILTER BRACKET	1
210	NA	AIR FILTER BRACKET SCREWS	4
211	NA	COVER GASKET	1
212	347606	COVER LOCK ASSEMBLY	2
213-219		NOT USED	
220	NA	CONTROL MODULE FRAME	1
221	NA	EMI CAGE	1
222	347609	DOOR HINGE ASSY	2
223	347610	POWER SWITCH ASSY (INCL 229)	1
224	347611	USB KIT	1
225	347612	POWER CORD GLAND	1
226	347613	CELLULAR ANTENNA	1
227	347483	BEACON LIGHT	1
228	347615	CONTROL MODULE FAN ASSY	1
229	347597	POWER SWITCH HANDLE	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.

25.0 IS0 CONTROL MODULE ITEMS (Continued)

ITEM	PN	DESCRIPTION	QTY
230	347616	MOTOR DRIVE	2
231	347617	MOTOR DRIVE CIRCUIT BREAKER 13A	2
232	347618	HEATER MAIN CIRCUIT BREAKER 60A	1
233	347619	POWER DISTRIBUTION BLOCK hv	3
234	347620	MAINS CONTACTOR	2
235	347621	AUX CONTACTOR BLOCK	1
236	NA	TERMINAL BLOCK END ANCHOR	5
237	347622	24V POWER SUPPLY CIRCUIT BREAKER 6A	1
238	347623	24V POWER SUPPLY	1
239	347624	24V 4 CHANNEL ELECTRONIC CIRCUIT BREAKER	1
240	347625	THERMOSTAT	1
241	347600	TERMINAL BLOCK GROUND AND BARRIER	1
242	347601	DISTRIBUTION BLOCK, 4/6	1
243	347602	DISTRIBUTION BLOCK, 4/12	1
244	347603	DISTRIBUTION BLOCK, 4/18	1
245	347626	ECAT JUNCTION 2CH	1
246	347627	ECAT DIGITAL OUTPUT 16CH	1
247	347628	ECAT DIGITAL INPUT 8CH	1
248	347629	ECAT COUPLER	1
249	347604	TERMINAL BLOCK RELAY	3
250	347630	PREHEATER CIRCUIT BREAKER 30A	2
251	347631	HOSE HEAT GFCI 15A	2 or 4
252	347632	HEATER SSRS	4 or 6
253	347600	POWER DISTRIBUTION BLOCK	1
254	347601	POWER DISTRIBUTION BLOCK	1
255	347602	POWER DISTRIBUTION BLOCK	1
256	347645	HOSE COMM RELAY	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.

26.0 IS30 CABLES (Refer to wiring diagrams for CBL number)

Cable Number	PN	Description	QTY
CBL2007	347633	A -ISO ZONE 1 HOSE HEAT	1
CBL2010	347634	B-RES ZONE 1 HOSE HEAT	1
CBL2014	347635	B-RES ZONE 1 HOSE HEAT	1
CBL2017	347636	B-RES ZONE 2 HOSE HEAT	1
CBL3017	347637	HOSE MASTER MODEM POWER	1
CBL4004	347638	HOSE MASTER MODEM COMMUNICATION	1
CBL4208	NA	BEACON LIGHT (INCL IN 347483)	1
CBL4401	347640	A SIDE MASTER COMMUNICATION	1
CBL4404	347641	B SIDE MASTER COMMUNICATION	1
CBL5020	347642	HMI TO BUS COUPLER COMMUNICATION	1
CBL5505	347643	ANTENNA EXTENSION CABLE	1
CBL5514	347644	ROUTER TO HMI COMMUNICATION	1
CBL5517	NA	CELLULAR ROUTER (INCL WITH ITEM 207)	1
CBL6007	347646	A SIDE MOTOR ENCODER	1
CBL6017	347647	A SIDE MOTOR POWER	1
CBL6027	347648	A SIDE DRIVE TO PUMP COMMUNICATION	1
CBL7007	347649	B SIDE MOTOR ENCODER	1
CBL7017	347650	B SIDE MOTOR POWER	1
CBL7027	347651	B SIDE DRIVE TO PUMP COMMUNICATION	1
CBL9003	347652	PUMP MODULE COMMUNICATION	2
CBL9010	NA	THERMO-OVERLOAD	2
CBL9506	347655	ENCODER BULKHEAD	2
CBL9609	NA	HEATER TEMP SENSOR (INCL. WITH ITEM 4)	2
CBL9614	347657	INLET FLUID TEMP	2
CBL9619	347658	PRE-HEATER OUT TEMP	2
CBL9704	347659	PRE-FILTER PRESSURE	2
CBL9709	347660	POST FILTER PRESSURE	2
CBL9714	347661	PRE-GEAR PUMP PRESSURE	2
CBL9719	347662	POST GEAR PUMP PRESSURE	2

27.0 IS30 WIRING DIAGRAMS

Notes:

- 1. Wire Gauge (Unless Noted)
USE MIN 75 DEGREE C COPPER WIRE

22 AWG	3 AMPS
20 AWG	5 AMPS
18 AWG	7 AMPS
16 AWG	10 AMPS
14 AWG	15 AMPS
12 AWG	20AMPS
10 AWG	30 AMPS
8 AWG	50 AMPS
6 AWG	65 AMPS
4 AWG	85 AMPS
3 AWG	100 AMPS

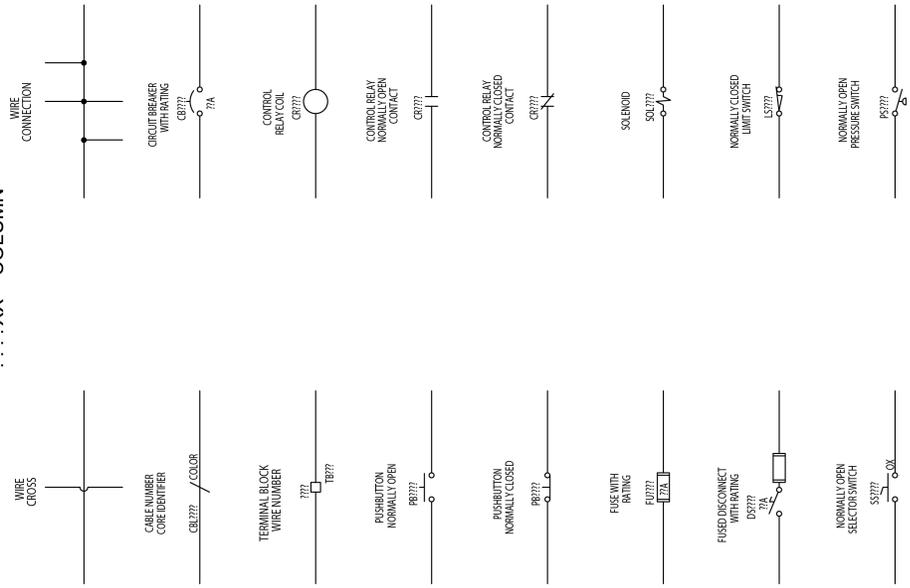
- 2. Ferrules to be used on all wires - (Unless Noted)
- 3. Wire color - (Unless Noted)
 - Black - Ungrounded line voltage
 - Blue - Ungrounded DC voltage
 - White/Blue - Grounded DC Common
 - Green/Yellow - Ground

Carlisle Fluid Technologies			
16430 N. Sacramento Rd. Suite 450 Waukegan, IL 60087-4657 www.carlisleft.com			
DRAWN BY:	DATE:	SCALE:	MACHINE DESCRIPTION:
SCP	02/14/2023	N/A	CFT IS30 PROPORTIONER
CHECKED BY:	REVISION:	SHEET:	PROJECT REF:
SCP	1	24	1530-074
			DESCRIPTION: DISTRIBUTION
			FILENAME: SOWM6.DWG
			DWG NO: 05

06

Drawing#	Description
1	Title Page
2-9	Schematic Descriptions
10-19	Power Distribution 200-240VAC
20-29	Power Distribution Heater Circuit
30-39	Power Distribution 24VDC
40-49	Machine Control
50-59	Communication/Networking
60-69	A Side
70-79	B Side
80-89	Hose
90-99	Pump Modules

LEGEND DESCRIPTIONS
NUMBERING CODE
 XX???? = COMPONENT TYPE
 ??XX?? = SHEET
 ????XX = COLUMN



Cardis Fluid Technologies 19420 N. Scottsdale Rd. Suite 450 Scottsdale, AZ 85254 www.carlisleft.com		MACHINE DESCRIPTION: PROPORTIONER PROJECT REF: IS30-0174 DESCRIPTION:
DRAWN BY: WCP CHECKED BY: SCP	DATE: 10/23 SCALE: E REVISION: 3 OF 24	FILENAME: SCHEM.DWG DWG NO.: 06

Wire Reference	Color
BLK	BLACK
WHT	WHITE
BLU	BLUE
RED	RED
GRN	GREEN
ORG	ORANGE
BRN	BROWN
YLW	YELLOW

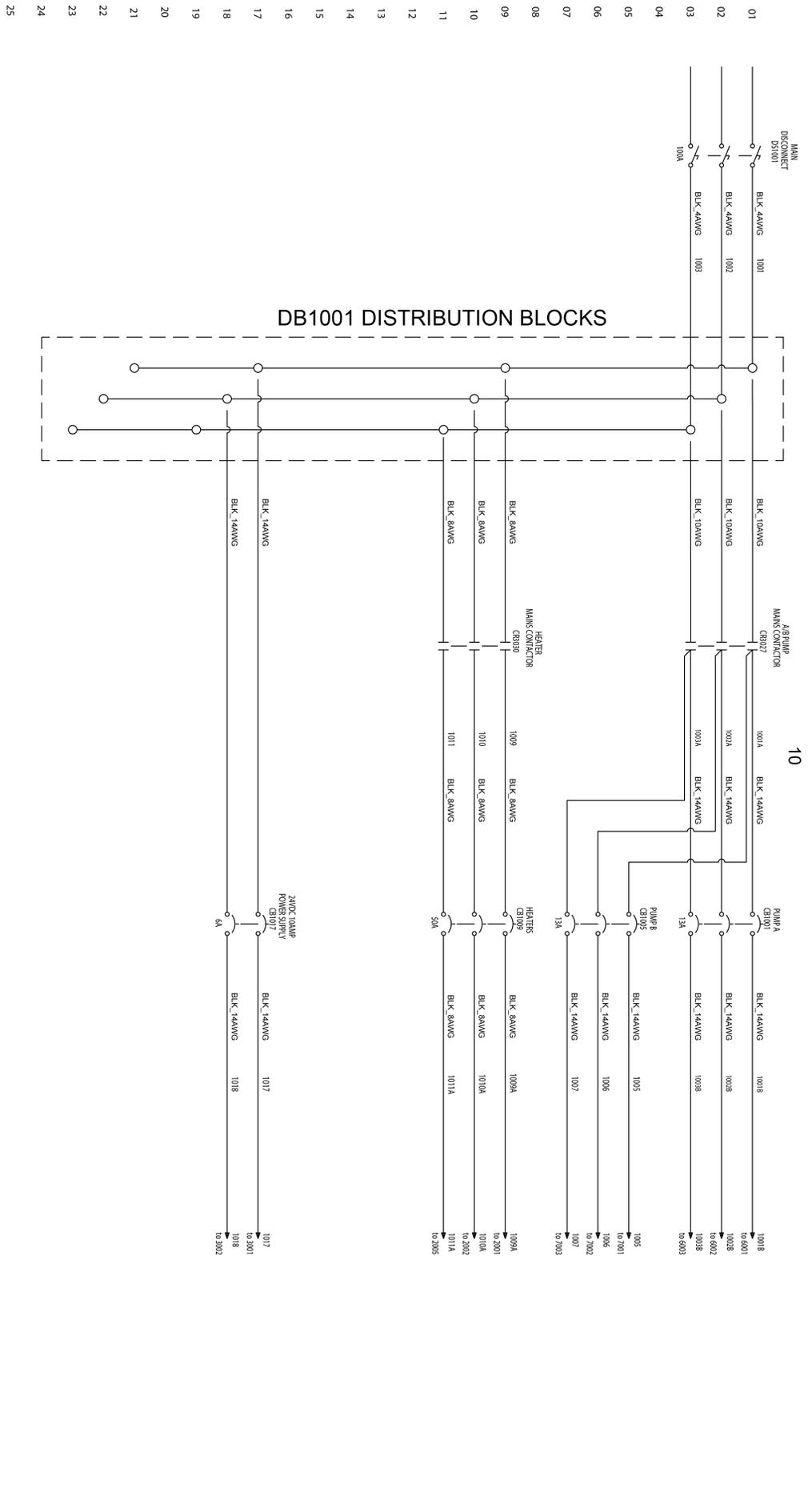
Wire Reference	Color
RED_GRY	RED w/GREY STRIPE
GRY_RED	GRAY w/RED STRIPE
WHT_BRN	WHT w/BROWN STRIPE
BRN_WHT	BROWN w/WHITE STRIPE
WHT_GRY	WHITE w/GREY STRIPE
GRY_WHT	GRY w/WHITE STRIPE
RED_BLU	RED w/BLUE STRIPE
BLU_RED	BLUE w/RED STRIPE
RED_ORG	RED w/ORANGE STRIPE
ORG_RED	ORANGE w/RED STRIPE
RED_GRN	RED w/GREEN STRIPE
GRN_RED	GREEN w/RED STRIPE
BRN_RED	BROWN w/RED STRIPE
RED_BRN	RED w/BROWN STRIPE
WHT_GRN	WHITE w/GREEN STRIPE
GRN_WHT	GREEN w/WHITE STRIPE
WHT_BLU	WHITE w/BLUE STRIPE
BLU_WHT	BLUE w/WHITE STRIPE
WHT_ORG	WHITE w/ORANGE STRIPE
ORG_WHT	ORANGE w/WHITE STRIPE

Carlisle Fluid Technologies 10000 S. Sandhills, AZ 85224 www.carlisleft.com				MACHINE DESCRIPTION: REF. NUMBER	
DRAWN BY: CHECKED BY:	DATE: REVISION:	SCALE: SHEET:	PROJECT REF: IS30-074	FILENAME:	DWG NO:
SCP	E	4 OF 24		SOUNDING	07

09

Cable Number	Description	Part Number	Assembly
CBL2007	A -ISO Zone 1 Hose Heat	IS30-0143	X
CBL2010	B-RES Zone 1 Hose Heat	IS30-0144	X
CBL2014	A -ISO Zone 2 Hose Heat	IS30-0143	X
CBL2017	B-RES Zone 2 Hose Heat	IS30-0144	X
CBL3017	Hose Master Modem Power	MFKS3-2	
CBL4004	Hose Master Modem Communication	ZK1090-6292-0010	
CBL4208	Beacon Light	IS30-0147	X
CBL4401	A Side Master Communication	CARFLT004-01-0454	X
CBL4404	B Side Master Communication	CARFLT004-01-0454	X
CBL5020	HMI to Bus Coupler Communication	ZK1090-9191-0010	
CBL5505	Antenna extension cable	SS3316AK	
CBL5514	Router to HMI Communication	CAT6-STP-01-YLW	
CBL5517	North America Cellular Router	IS30-0149	X
CBL6007	A Side Motor Encoder	CARFLT004-01-0449	X
CBL6017	A Side Motor Power	CARFLT004-01-0447	X
CBL6027	A Side Drive to Pump Communication	CARFLT004-01-0448	X
CBL7007	B Side Motor Encoder	CARFLT004-01-0449	X
CBL7017	B Side Motor Power	CARFLT004-01-0447	X
CBL7027	B Side Drive to Pump Communication	CARFLT004-01-0448	X
CBL9003	Pump Module Communication (IS30-0063-01)	ZK1090-6292-4002	
CBL9003	Pump Module Communication (IS30-0063-02)	ZK1090-3166-0004	
CBL9010	Thermo-Overload		
CBL9506	Encoder Bulkhead	7231-13541-9710050	
CBL9609	Weldment, Heater, Laminated, Temp	IS30-0027	X
CBL9614	Inlet Fluid Temp	ZK2000-6200-7010	
CBL9619	Pre-Heater Out Temp	ZK2000-6200-7010	
CBL9704	Pre-Filter Pressure	ZK2000-6200-0010	
CBL9709	Post Filter Pressure	ZK2000-6200-0010	
CBL9714	Pre-Gear Pump Pressure	ZK2000-6200-0010	
CBL9719	Post Gear Pump Pressure	ZK2000-6200-0010	

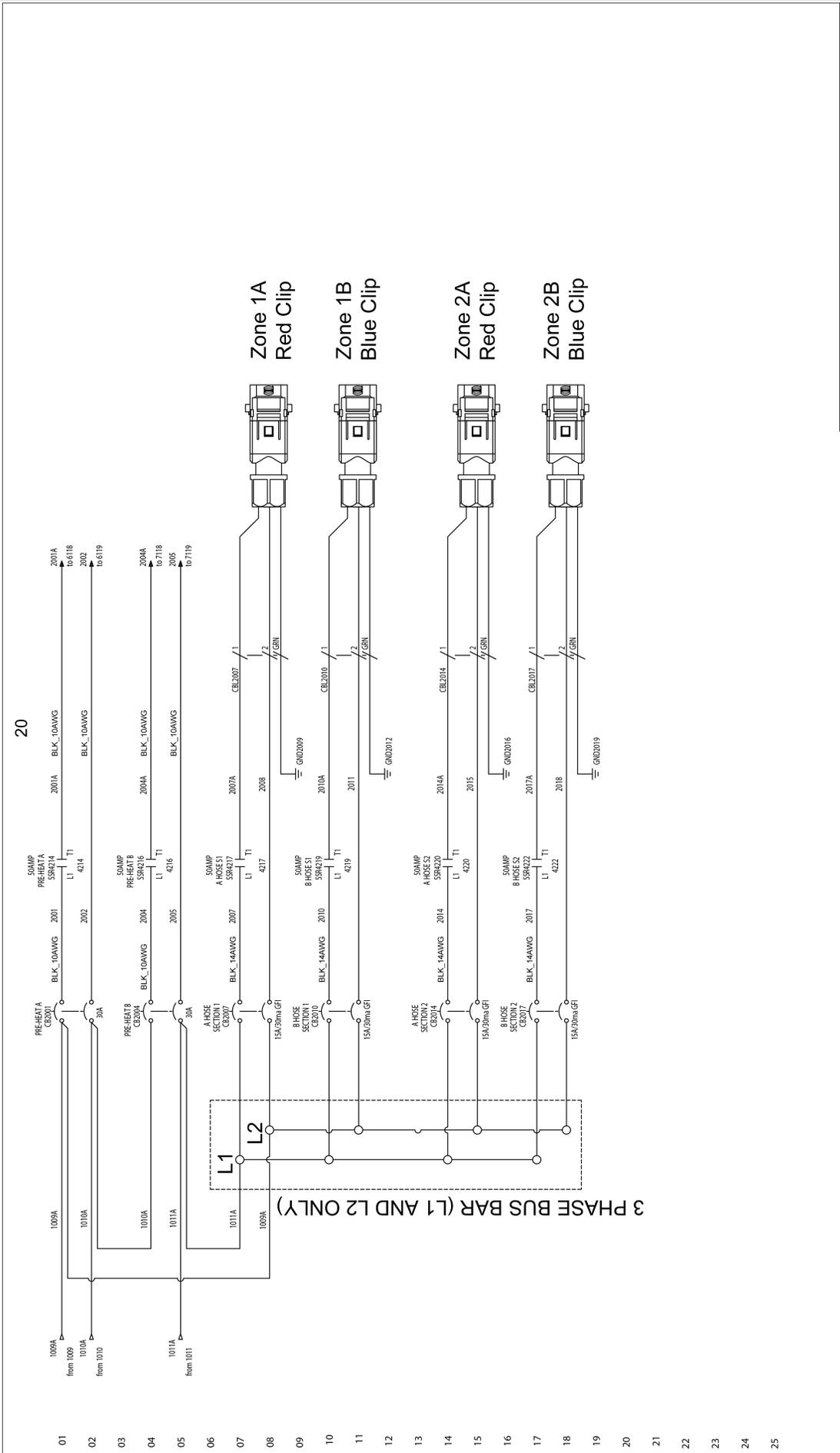
Cardisle Fluid Technologies 18420 N. Scottsdale Rd. Suite 450 Scottsdale, AZ 85254 www.cardisleft.com		MACHINE DESCRIPTION: PROPORTIONER PROJECT REF: IS30-0174 DESCRIPTION:
DRAWN BY: WCP CHECKED BY: SCP	DATE: 02/03 REVISION: E	SCALE: 1:1 SHEET: 5 OF 24 FILENAME: SCOMP.DWG DWG NO.: 09



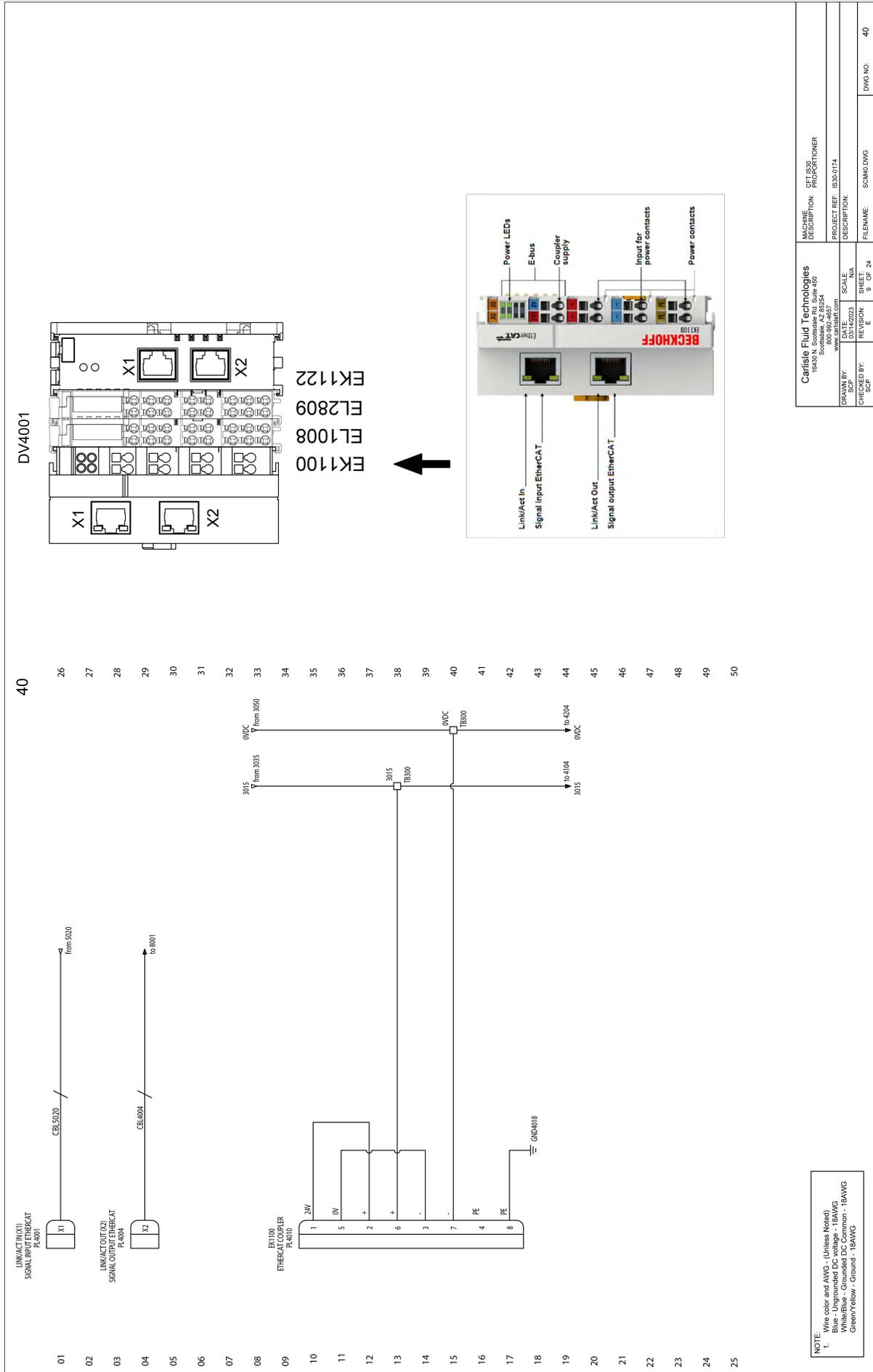
DB1001 DISTRIBUTION BLOCKS

NOTE:
 CUSTOMER SUPPLIED
 200-240VAC, 80AMP, 3PH, 60HZ
 USE 75 DEGREE COPPER WIRE ONLY

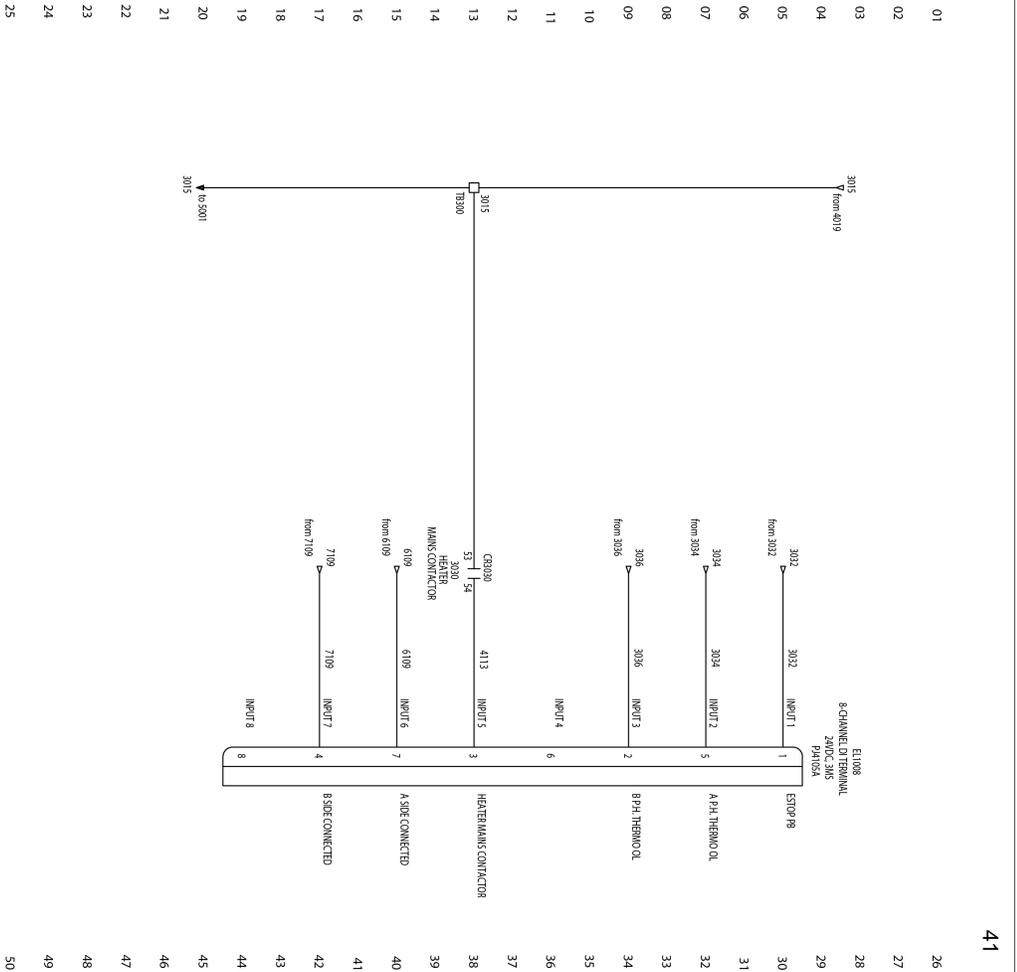
Carlisle Fluid Technologies 16401 N. Scenicline Rd. Suite 400 Scottsdale, AZ 85254 www.carlisleft.com		MACHINE: FRT1001 DESCRIPTION: FRT1001 REFRIGERATOR	
DRAWN BY: SCP CHECKED BY: SCP	DATE: 03/23/11 REVISION: E	SCALE: 1:1 SHEET: 6 OF 24	PROJECT REF: IS30.0174 DESCRIPTION: FILENAME: SCAM.DWG DWG NO: 10



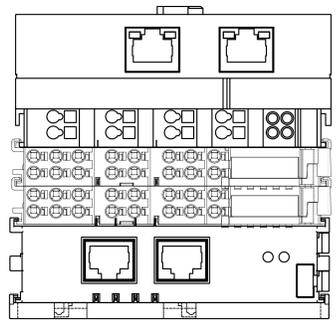
Carlisle Fluid Technologies 15430 N. Scottsdale Rd. Suite 450 Scottsdale, AZ 85254 www.carlisleft.com		MACHINE DESCRIPTION: IS30 PREPURTIONER PROJECT REF: IS30.0174 DESCRIPTION: IS30.0174 SCALE: 1:1 DATE: 01/23/24 REVISION: 7 OF 24 SHEET: E FILENAME: SOM3.DWG DWG NO.: 20
DRAWN BY: SCP CHECKED BY: SCP	DATE: 01/23/24 REVISION: 7 OF 24 SHEET: E	MACHINE DESCRIPTION: IS30 PREPURTIONER PROJECT REF: IS30.0174 DESCRIPTION: IS30.0174 SCALE: 1:1 DATE: 01/23/24 REVISION: 7 OF 24 SHEET: E FILENAME: SOM3.DWG DWG NO.: 20



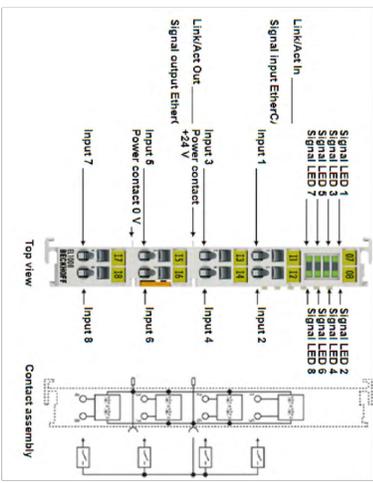
MACHINE DESCRIPTION	RTI 503 PROFIBUS
PROJECT REF.	IS30-0174
DESCRIPTION	
SCALE	1:1
DRAWN BY	DAVID COOPER
CHECKED BY	SCP
REVISION	E
SHEET	9
OF	24
FILENAME	SCHEM.DWG
DWG NO.	40



41

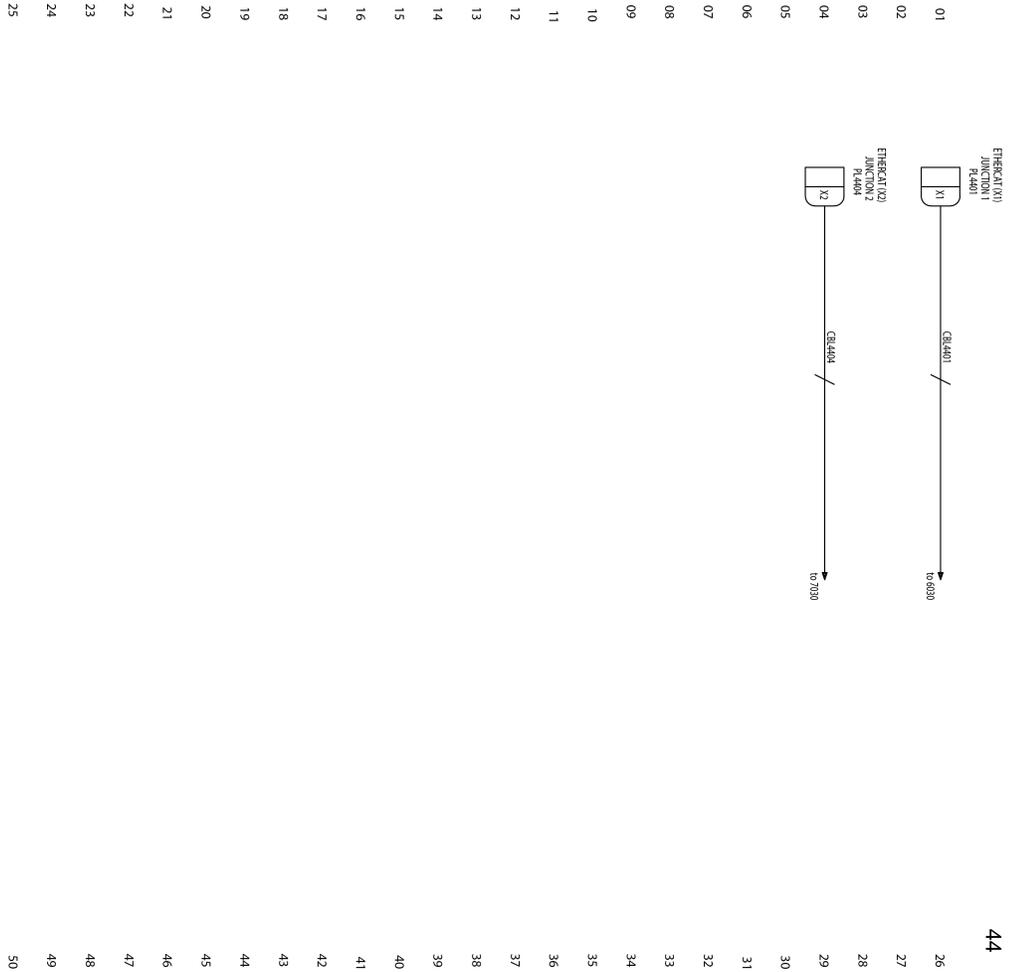


EK1100
EL1008
EL2809
EK1122



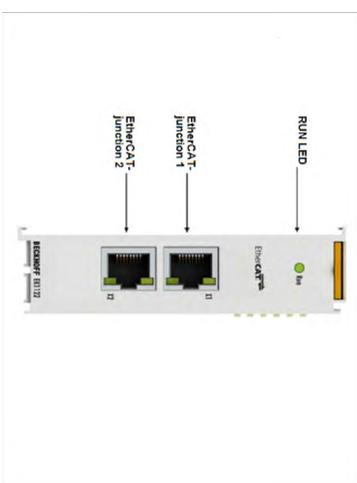
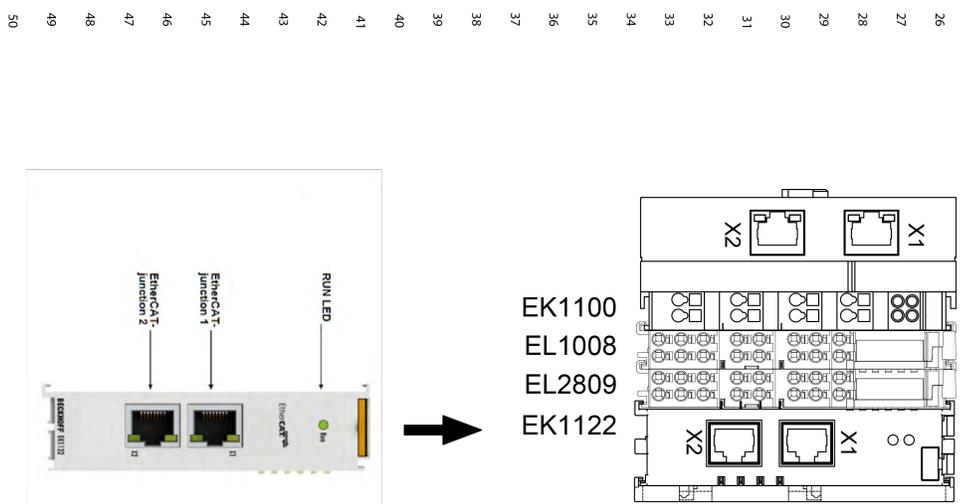
NOTE:
1. Wire color and AWG - (Unless noted)
Blue - Ungrounded DC Voltage - 18AWG
White/Blue - Grounded DC Common - 18AWG
Green/Yellow - Ground - 18AWG

<p>Carlisle Fluid Technologies 15420 N. Soudan Rd Ste 450 Soudan, AZ 85254 www.carlisle.com</p>		<p>MACHINE: FTS 501 DESCRIPTION: PROPORTIONER</p>	
<p>DRAWN BY: DATE: 10/23 CHECKED BY: SCP</p>	<p>SCALE: SHEET: 24 REVISION: E</p>	<p>PROJECT REF: IS30.0174 DESCRIPTION:</p>	<p>FILENAME: SM41.DWG DWG NO: 41</p>



NOTE:
 1. Wire color and AWG - (Unless Noted)
 Blue - Ungrounded DC Voltage - 18AWG
 White/Blue - Grounded DC Common - 18AWG
 Green/Yellow - Ground - 18AWG

44



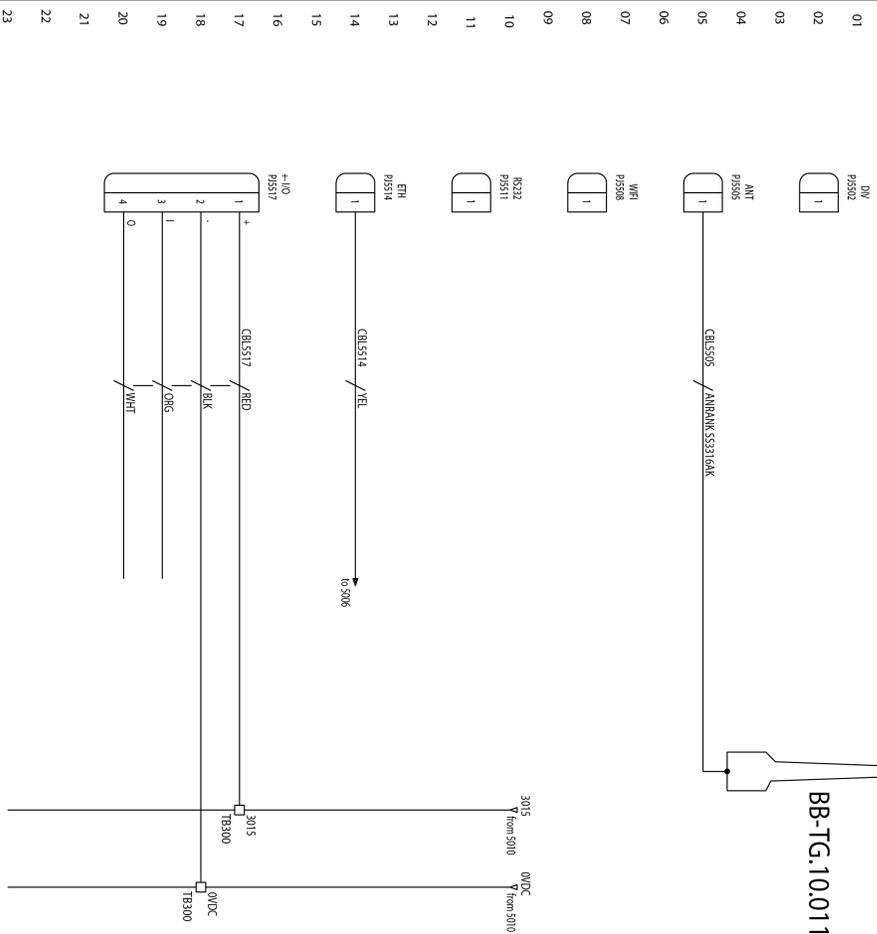
Carlisle Fluid Technologies 16401 N. Soudan Rd. Suite 450 Soudan, AZ 85254 www.carlisleft.com		MACHINE DESCRIPTION: PRT 1001 PROJECT REF: IS30.0174	
DRAWN BY: SCP DATE: 10/23/11 REVISION: E	SCALE: 1:1 SHEET: 12 OF 24	FILENAME: S044.DWG DRAWING: 44	

BB-TG.10.0113

55

DV5501

Remote Connectivity Kit Part# IS30-0149



NOTE:
 1. Wire color and AWG - (Unless Noted)
 Blue - Ungrounded DC Voltage - 18AWG
 White/Blue - Grounded DC Common - 18AWG
 Green/Yellow - Ground - 18AWG

Carlisle Fluid Technologies 10000 W. McDowell Blvd. Suite 200, Sausalito, CA 94965 www.carlisleft.com				INCH/FEET PROJECT REF: IS30-0149 DESCRIPTION: REMOTE CONNECTIVITY KIT	
DRAWN BY: SCP CHECKED BY: E	DATE: 11/11/2021 REVISION: 1	SCALE: 1:1 SHEET: 14 OF 24	FILENAME: SOMMS-01-DWG	DWG NO.: 55	

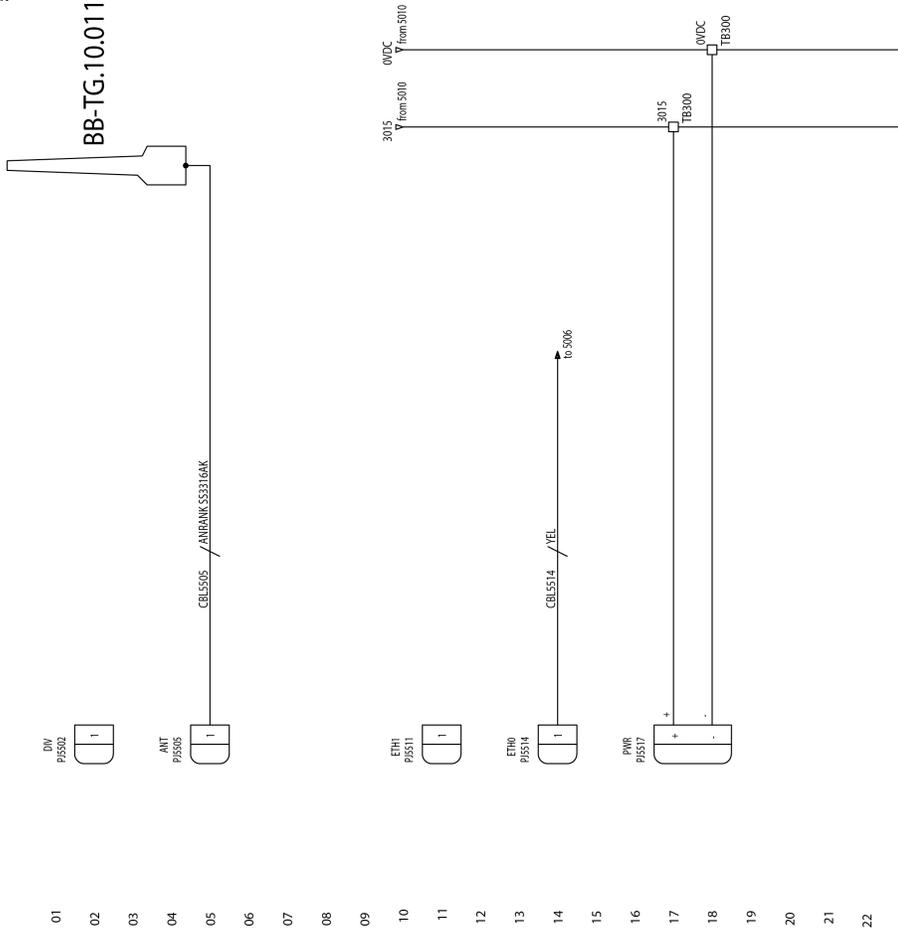
Remote Connectivity Kit Part# IS30-0173

DV5501

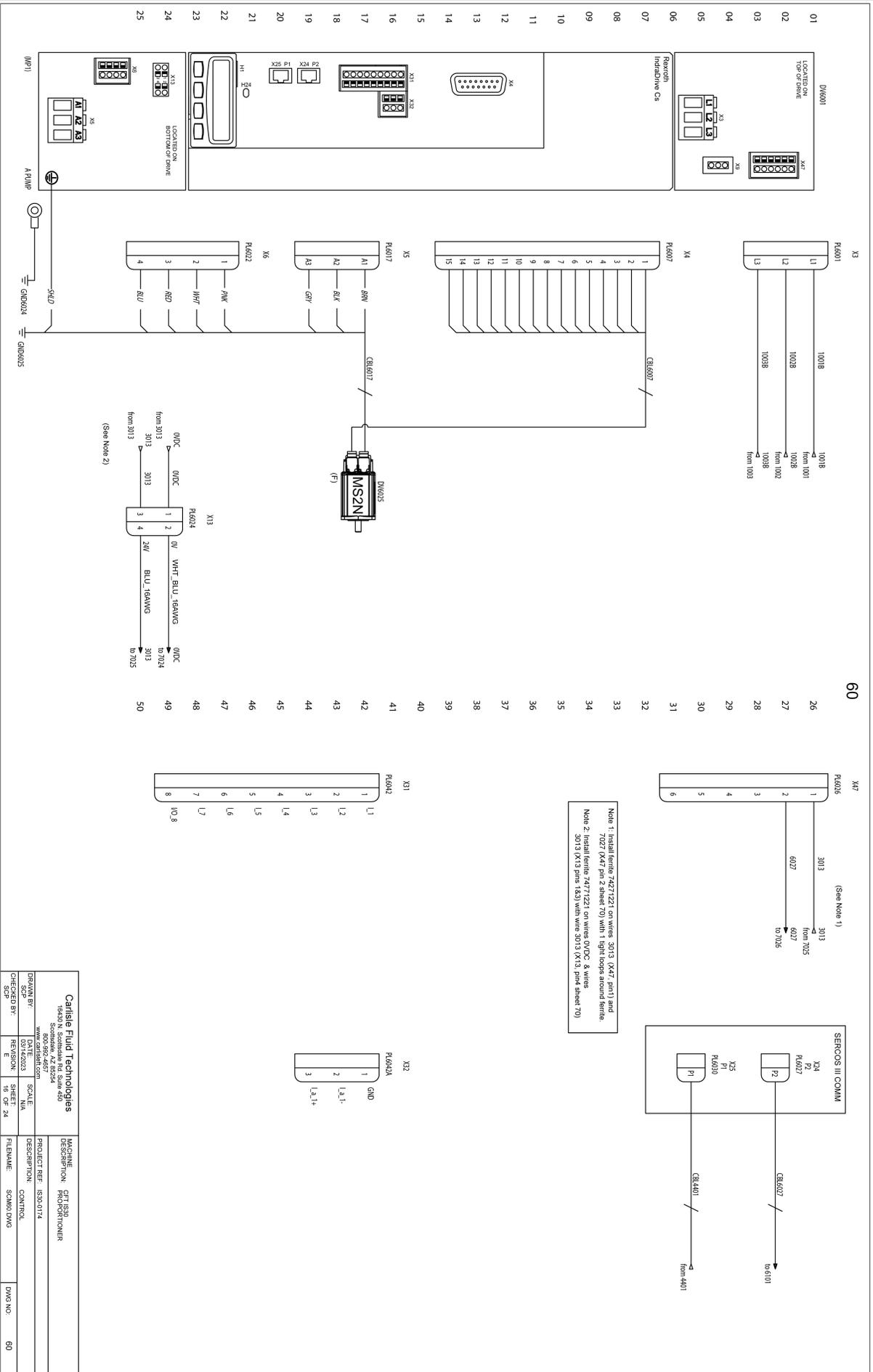


55

BB-TG.10.0113

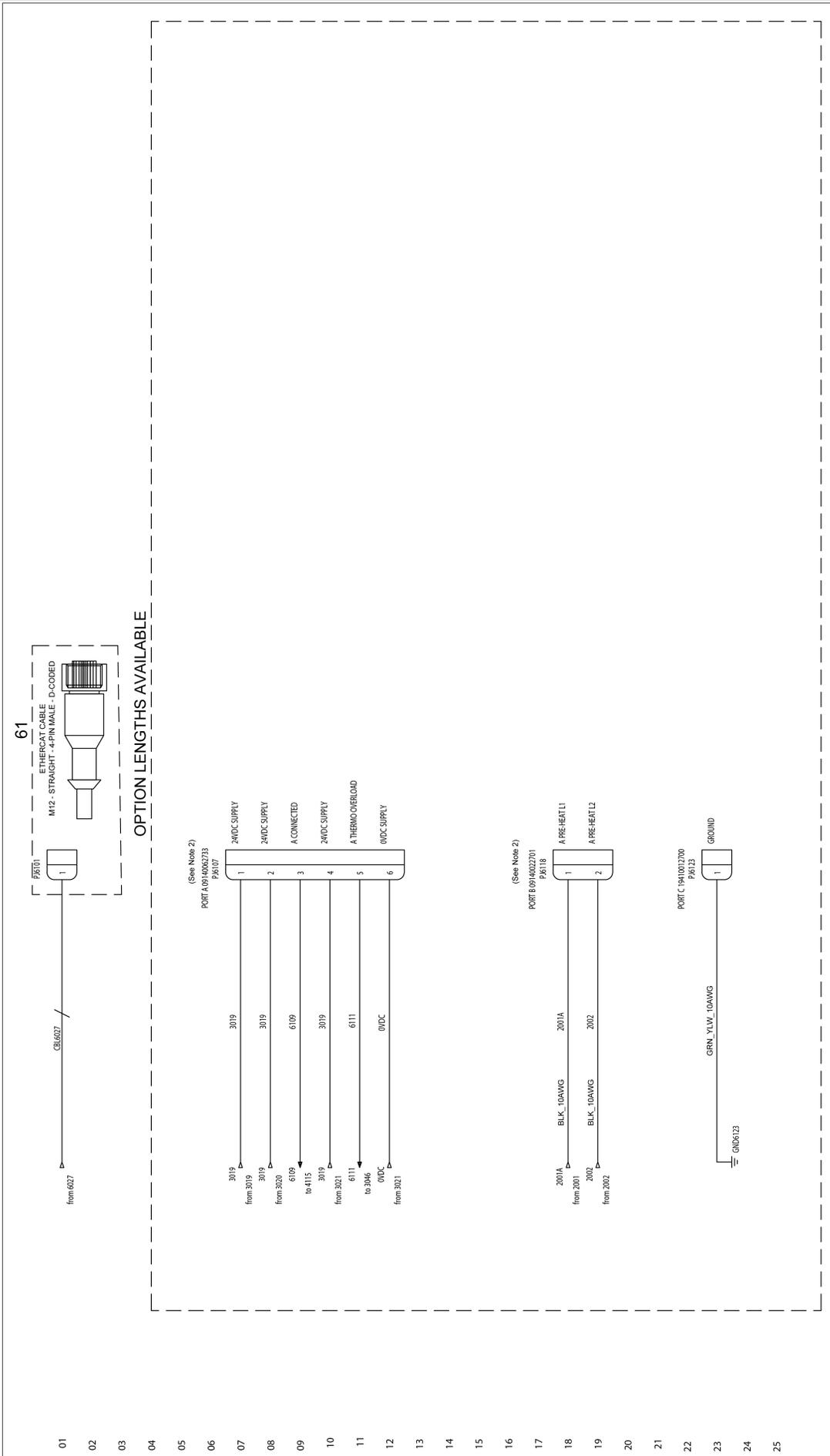


Carlisle Fluid Technologies 19430 N. Scottsdale Rd. Suite 450 Scottsdale, AZ 85254 www.carlisleleft.com		MACHINE DESCRIPTION: RFI IS30 PRECURTORNER PROJECT REF: IS30-0174
DRAWN BY: SCP CHECKED BY: SCP	DATE: 06/10/23 REVISION: E	SCALE: 1:1 SHEET: 15 OF 24 FILENAME: SOMMS-02.DWG
		DWG NO: 55



Carlisle Fluid Technologies 14000 W. Skyway Scottsdale, AZ 85254 www.carlisleft.com				MACHINE: IS30 DESCRIPTION: PUMP ASSEMBLY PROJECT REF: IS30-D174	
DRAWN BY: [Name] CHECKED BY: [Name]	DATE: [Date] REVISION: [Revision]	SCALE: [Scale] SHEET: [Sheet] OF [Total]	FILENAME: [Filename].DWG	DWG NO.: 60	CONTROL

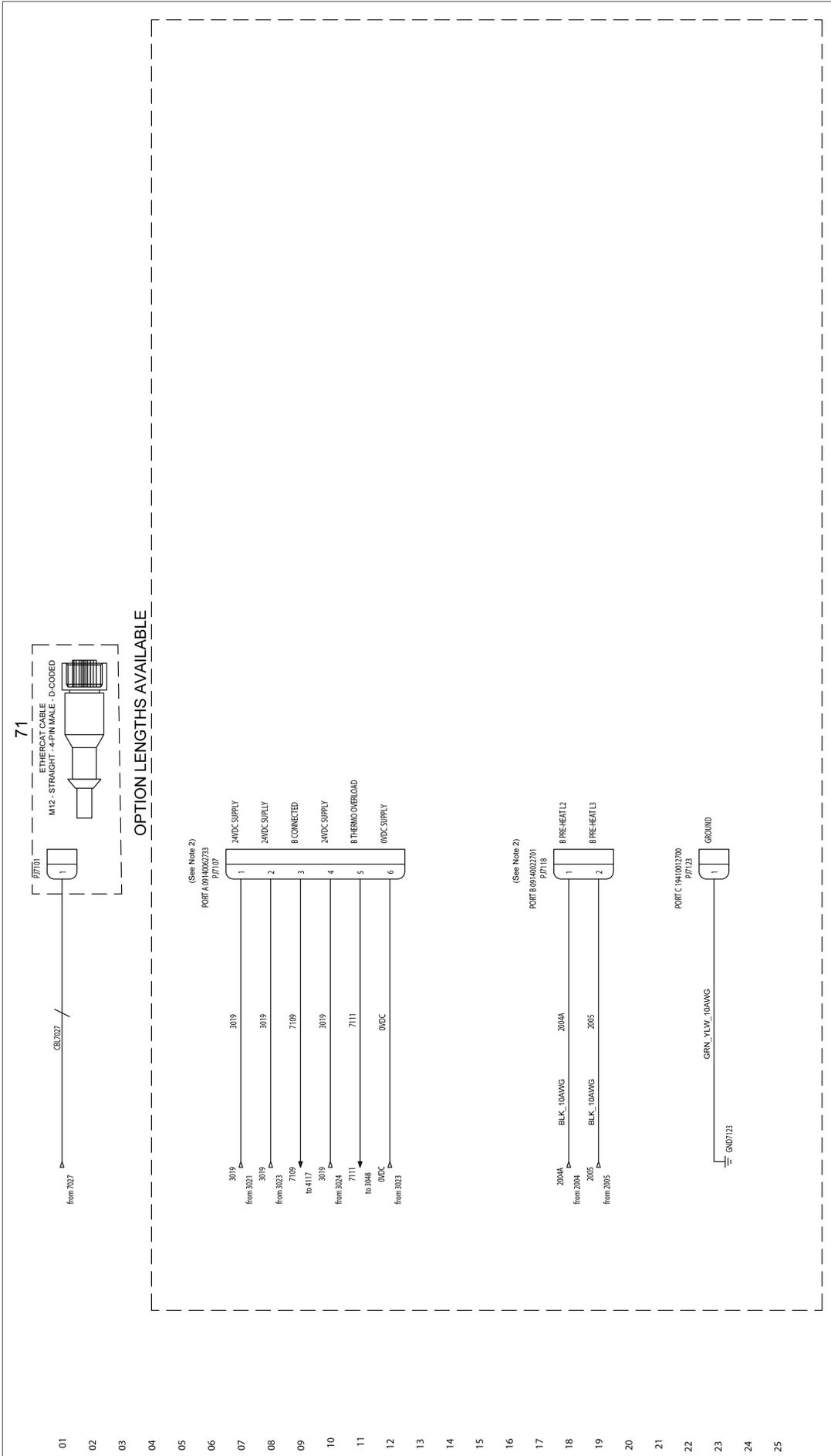
Note 1: Install ferrite 74271221 on wires 3013 (X47, pin1) and 7027 (X47, pin 2 sheet 70) with 1 right loop around ferrite.
 Note 2: Install ferrite 74271221 on wires 0VDC & wires 3013 (X13 pins 1&3) with wire 3013 (X13, pin sheet 70).



Carlisle Fluid Technologies 19430 N. Scottsdale Pk. Suite 450 Scottsdale, AZ 85254 www.carlisleft.com		MACHINE DESCRIPTION: FSI IS30 PREP/PORTNER
DRAWN BY: SCP CHECKED BY: SCP	DATE: 01/20/24 REVISION: E	PROJECT REF: IS30-0174 DESCRIPTION: DISTRIBUTION FILENAME: SCMT.DWG
SCALE: 1:1 SHEET: 17 OF 24		DWG NO.: 61

NOTE:
 1. Wire color and AWG - (Unless Noted)
 Blue - Ungrounded DC voltage - 18AWG
 White/Blue - Grounded DC Common - 18AWG
 2. Ferrules not to be installed

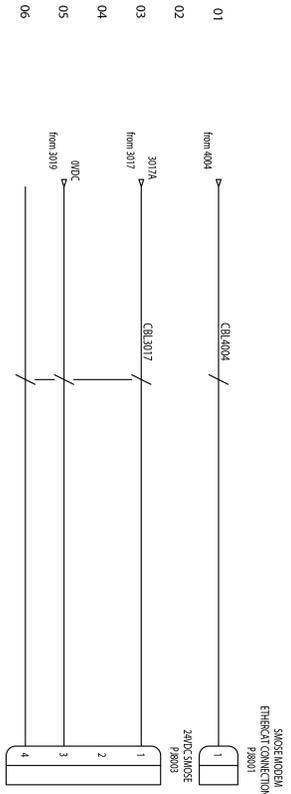
01
02
03
04
05
06
07
08
09
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25



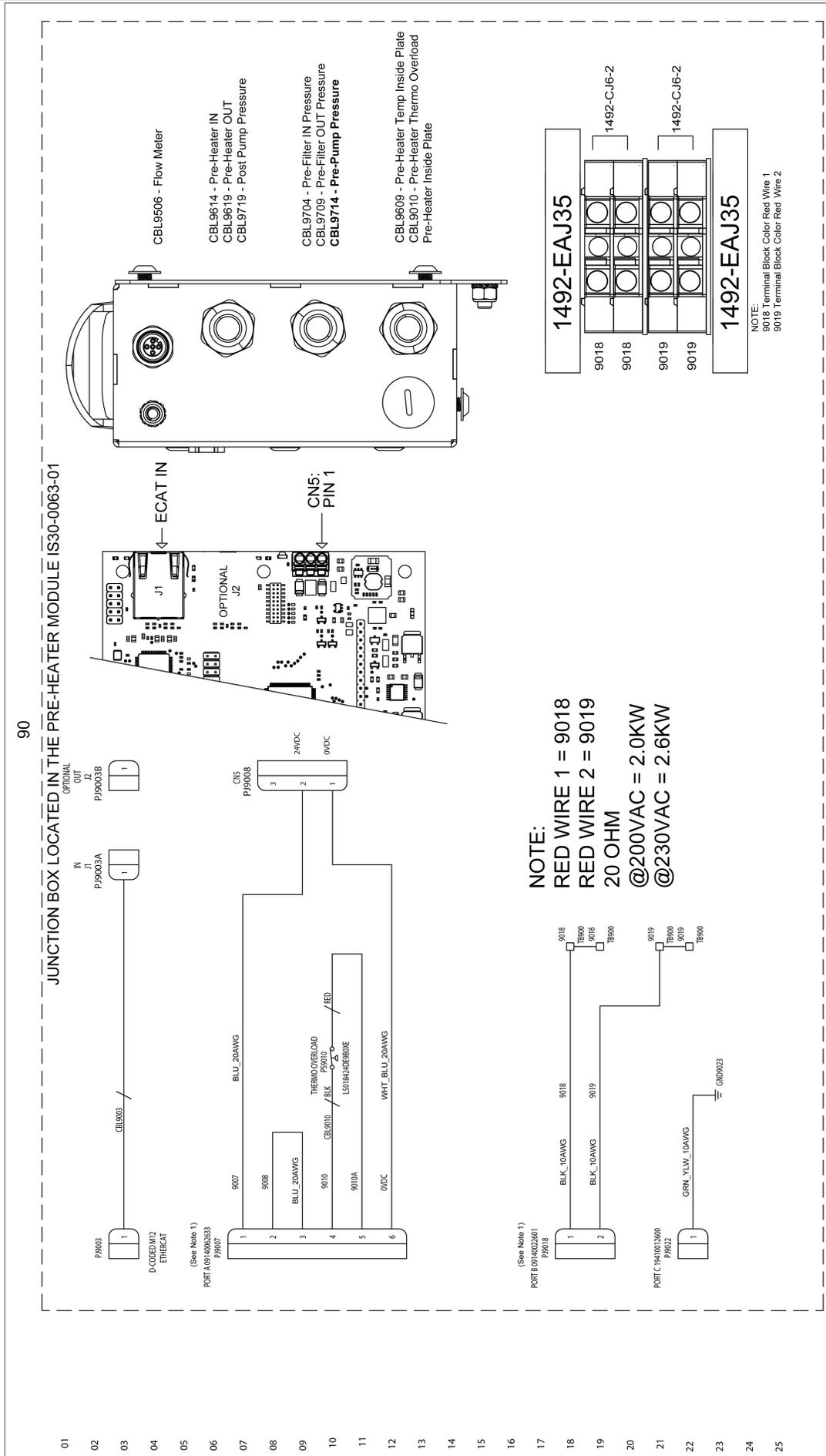
Cartisle Fluid Technologies 19430 N. Scottsdale Pk. Suite 450 Scottsdale, AZ 85254 www.cartislefluid.com		MACHINE DESCRIPTION: FLS IS30 PREPORTIONER PROJECT REF: IS30-0174 DESCRIPTION: DISTRIBUTION FILENAME: SCMT.DWG DWG NO.: 71
DRAWN BY: SCP CHECKED BY: SCP	DATE: 01/20/24 REVISION: E SCALE: 19 OF 24	PROJECT REF: IS30-0174 DESCRIPTION: DISTRIBUTION FILENAME: SCMT.DWG DWG NO.: 71

NOTE:
 1. Wire color and AWG - (Unless Noted)
 Blue - Ungrounded DC voltage - 18AWG
 White/Blue - Grounded DC Common - 18AWG
 2. Ferrules not to be installed

Smart Hose Connection



Carlisle Fluid Technologies 15401 N. Samsalah Road Suite 450 Scottsdale, AZ 85254 www.carlisleft.com		MACHINE DESCRIPTION: PRT 1001 PRT 1001 ROLLER	
DRAWN BY: SCP	DATE: 11/11/2013	SCALE: 1:1	PROJECT REF: IS30-0174
CHECKED BY: SCP	REVISION: E	SHEET: 20 OF 24	FILENAME: S046.DWG
			DWG NO: 80



90

JUNCTION BOX LOCATED IN THE PRE-HEATER MODULE IS30-0063-01

01

02

03

04

05

06

07

08

09

10

11

12

13

14

15

16

17

18

19

20

21

22

23

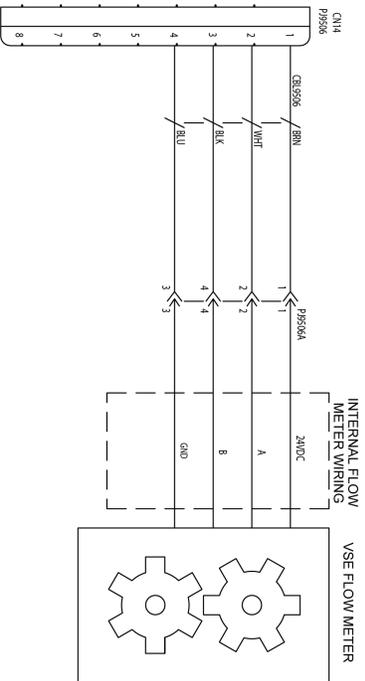
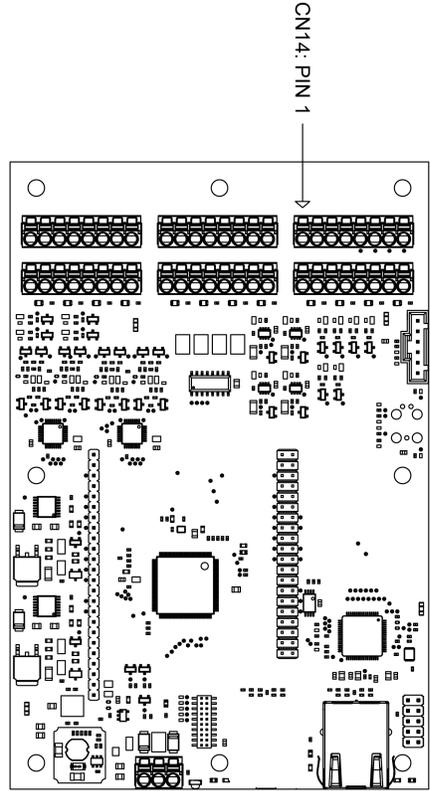
24

25

NOTE:
 RED WIRE 1 = 9018
 RED WIRE 2 = 9019
 20 OHM
 @200VAC = 2.0KW
 @230VAC = 2.6KW

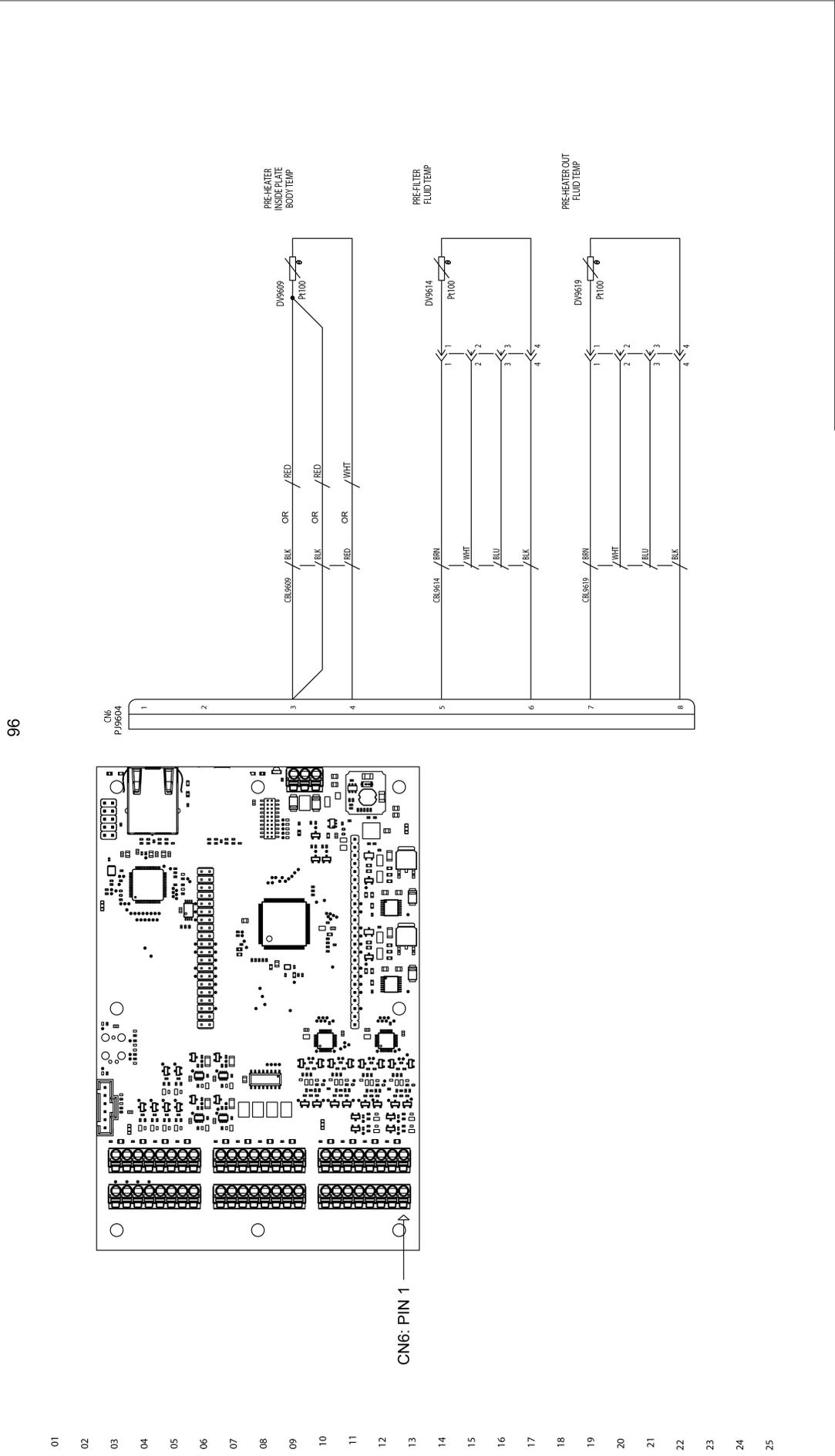
Carlisle Fluid Technologies 15430 N. Scottsdale Rd. Suite 450 Scottsdale, AZ 85254 www.carlislefluid.com		MACHINE DESCRIPTION: PRE-HEATER PROJECT REF: IS30-0174 DESCRIPTION: DISTRIBUTION PLENARY: SOMPO-D1-DWG SHEET: 21 OF 24 SCALE: E DATE: 01/20/23 REVISION: E	DWG NO.: 90
--	--	---	-------------

NOTE:
 1. Ferrulas not to be installed



01
02
03
04
05
06
07
08
09
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

Carlisle Fluid Technologies 10000 S. Scottsdale, AZ 85254 www.carlisleft.com				MACHINE: GFT 1530 DESCRIPTION: REVISIONER	
DRAWN BY: SGP CHECKED BY: SGP	DATE: 03/22/24 REVISION: E	SCALE: 1:1 SHEET: 22 OF 24	PROJECT REF: IS30-0174 DESCRIPTION: DISTRIBUTION FILENAME: SOWMS-01-DWG	DWG NO: 95	



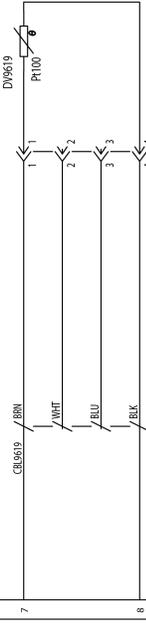
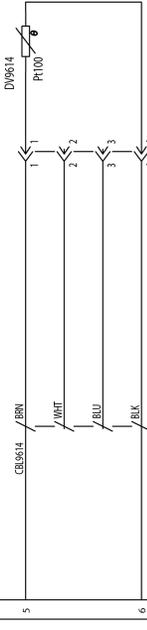
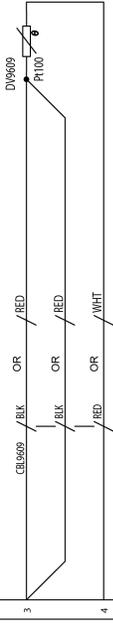
96

CHK
PJ9604

PRE-HEATER
INSIDE PLATE
BODY TEMP

PRE-FILTER
FLUID TEMP

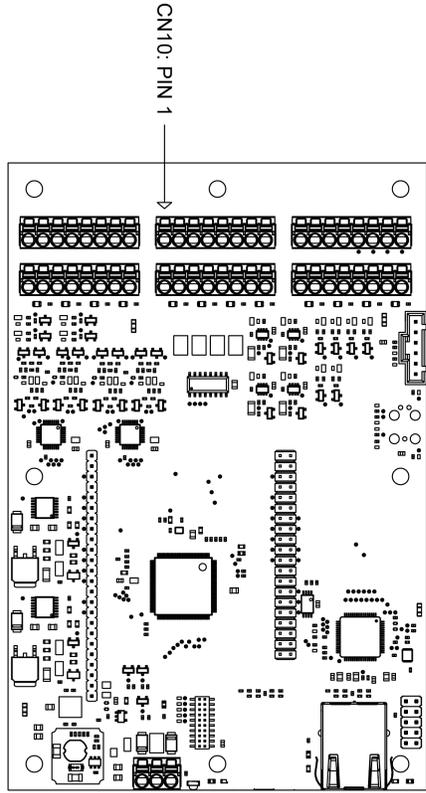
PRE-HEATER/OUT
FLUID TEMP



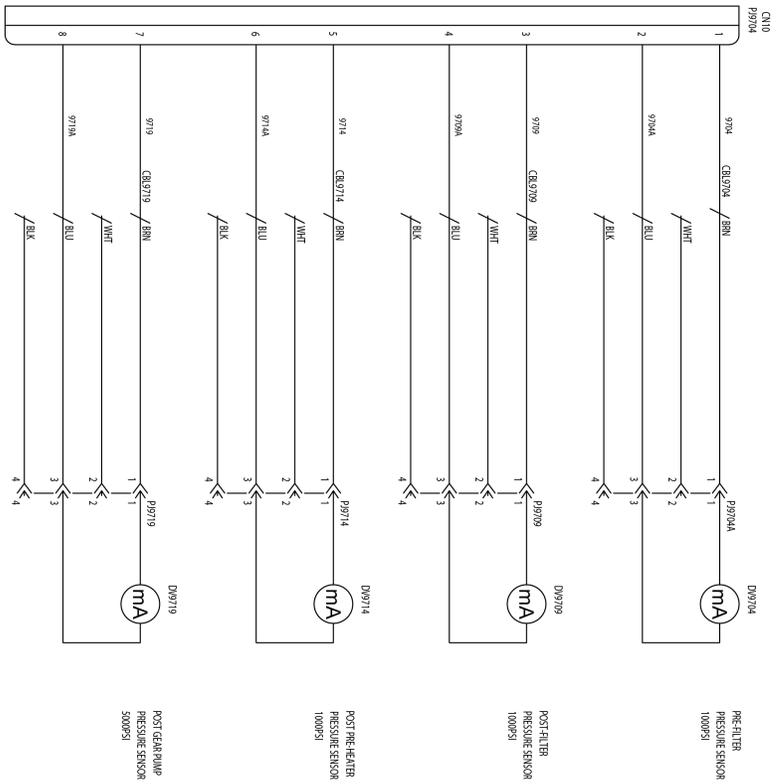
Cardis Fluid Technologies 19420 N. Scottsdale Rd. Suite 450 Scottsdale, AZ 85254 www.carlisleft.com		MACHINE DESCRIPTION: PROPORTIONER
DRAWN BY: DATE: CHECKED BY: SCP	SCALE: DISTRIBUTION SHEET: 23 OF 24 REVISION: E	PROJECT REF: IS30-0174 DESCRIPTION: DISTRIBUTION FILENAME: SCHEM-01.DWG DWG NO.: 96

- 01
- 02
- 03
- 04
- 05
- 06
- 07
- 08
- 09
- 10
- 11
- 12
- 13
- 14
- 15
- 16
- 17
- 18
- 19
- 20
- 21
- 22
- 23
- 24
- 25

01
02
03
04
05
06
07
08
09
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25



97



Carlisle Fluid Technologies 15407 N. Soudan Rd. Suite 450 Soudan, AZ 85254 www.carlisleft.com				MACHINE: FTS-801 DESCRIPTION: FLOWMETER	
DRAWN BY: DATE: SCALE: PROJECT REF: IS30-0174				DESCRIPTION: DISTRIBUTION	
CHECKED BY: REVISION: SHEET: 24 OF 24				FILENAME: S09F-0174.DWG	
SCP				DWG NO: 97	

28.0 REMOTE ACCESS

Remote access to IntelliSpray 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 IntelliSpray Proportioner. Remote access to IntelliSpray 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 IntelliSpray 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.

INTELLISPRAY™ CLOUD
Powered by Corvina

CARLISLE

DASHBOARD

Connections | **Map**

Click Device to select IS40

Device	Organization	Groups	Description	Status
1021	FOAM DIST.	A2Z Spray Foam	RIG 1	offline No user connected
B2.1	FOAM DIST.	A2Z Spray Foam	RIG 2	online No user connected
B2.2	FOAM DIST.	A2Z Spray Foam	RIG 3	offline No user connected
B2.3	FOAM DIST.	A2Z Spray Foam	RIG 4	online No user connected
B2.4	FOAM DIST.	A2Z Spray Foam	RIG 5	in use JoeS@FDI.com Connected
B2.5	FOAM DIST.	A2Z Spray Foam	RIG 6	offline No user connected
GunTriggerStand	FOAM DIST.	A2Z Spray Foam	RIG 7	offline No user connected

Legend: Gateway Endpoint Online Offline Connected In use Busy

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 IntelliSpray 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.

Gateway: B2.3

Applications

HTTPS Secure Web Interface Open the web interface over a secured connection (HTTPS) in a browser

VNC

Click here for Simplified Interface

Click here for Full Interface

Legend: Active Busy Inactive

28.0 REMOTE ACCESS (Continued)

Each IntelliSpray 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 IntelliSpray Proportioner automatically connects to the internet when it is powered on and within cell coverage. No user interaction is required to connect the Proportioner 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



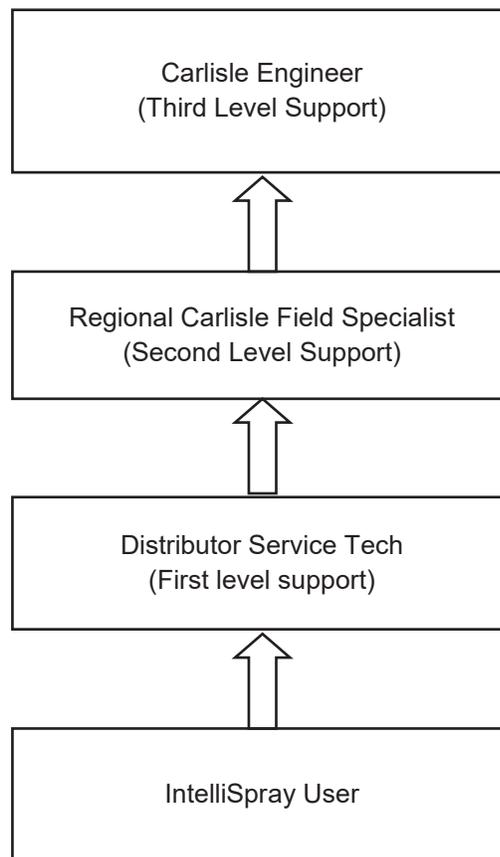
Simplified Interface (HTTPS) remote access on computer, phone, or tablet



Full Interface (VNC) access on computer

28.0 REMOTE ACCESS (Continued)

The remote access capabilities of the IntelliSpray Proportioner 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 Proportioner. All parties can be connected to a Proportioner 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 IS30 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 IntelliSpray Proportioner and in some cases resolve the issue without the user having to leave the spray environment.

LIMITED WARRANTY

CARLISLE FLUID TECHNOLOGIES standard warranty coverage is for a period of ONE YEAR, unless specified otherwise, from the date of sale from an authorized Carlisle Fluid Technologies distributor to the original end-user. Carlisle Fluid Technologies will repair or replace any part of the equipment determined by Carlisle Fluid Technologies to be defective 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.

Carlisle Fluid Technologies End User:

If you have any question on warranty concerns please contact your local Carlisle Fluid Technologies Distributor.

Carlisle Fluid Technologies Distributor:

If you have questions on the warranty policy, submitting a claim or anything else related to a warranty issue, please call Customer Service at 1-800-992-4657. For Europe, please call +44 (0) 1202 571111.

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

Carlisle Fluid Technologies

16430 N. Scottsdale Rd. Suite 450
Scottsdale, AZ 85254
(800) 992-4657

Carlisle Fluid Technologies, UK

Ringwood Road
Bournemouth, Dorset
BH11 9LH, United Kingdom
+44 (0)1202 571111



Product Description / Object of Declaration:	IS30 SPRAY FOAM PROPORTIONER
This Product is designed for use with:	QuickHeat Hoses
Suitable for use in hazardous area:	No
Protection Level:	
Notified body details and role:	TÜV SÜD America Inc. 141 14th St NW New Brighton, MN 55112
This Declaration of Conformity / Incorporation is issued under the sole responsibility of the manufacturer:	Carlisle Fluid Technologies Inc. 16430 N Scottsdale Scottsdale, AZ 85254
Representative authorised to compile the technical file	Sales and Marketing Director. CFT UK Ltd 1 Avenue de Lattre de Tassigny 94736 Nogent, Cedex. France

EU Declaration of Conformity **CE**

This Declaration of Conformity / Incorporation is issued under the sole responsibility of the manufacturer:

Machinery Directive 2006/42/EC
 EMC Directive 2014/30/EU
 Low Voltage Directive 2014/35/EU
 RoHS Directive 2011/65/EU
 by complying with the following statutory documents and harmonised standards:
 EN ISO 12100:2010 Safety of Machinery - General Principles for Design

Providing all conditions of safe use / installation stated within the product manuals have been complied with and also installed in accordance with any applicable local codes of practice.

Signed for and on behalf of
 Carlisle Fluid Technologies:



F. A. Sutter Executive President: Engineering
 and Operations, Scottsdale, AZ,
 85254. USA

3-Jun-22

4-3190R-2

	Ref. Certif. No.
	US/9719/ITS

IEC SYSTEM FOR MUTUAL RECOGNITION OF TEST CERTIFICATES FOR ELECTRICAL EQUIPMENT (IECEE) CB SCHEME

CB TEST CERTIFICATE

Product

IntelliSpray Spray Foam Proportioner

Name and address of the applicant

Carlisle Fluid Technologies, Inc.
16430 N. Scottsdale Rd.
Suite 450
Scottsdale, AZ, 85254
United States of America

Name and address of the manufacturer

Motion Tech Automation LLC
7166 4th St. N.
Oakdale, MN, 55128
United States of America

Name and address of the factory

Note: When more than one factory, please report on page 2

Motion Tech Automation LLC
7166 4th St. N.
Oakdale, MN, 55128
United States of America

Additional information on page 2

Ratings and principal characteristics

IS30: 200-240Vac, 67A, 50/60Hz, 3 Phase
IS40: 200-240Vac, 78A, 50/60Hz, 3 Phase

Trademark / Brand (if any)



CARLISLE FLUID TECHNOLOGIES // IntelliSpray

Customer's Testing Facility (CTF) Stage used

CTF Stage 1

Model / Type Ref.

IS30, IS40

Additional information (if necessary may also be reported on page 2)

Additional information on page 2

A sample of the product was tested and found to be in conformity with

IEC 61010-1:2010/AMD1:2016, IEC 61010-2-010:2019, IEC 61010-2-051:2018

Comments:

Refer to the Test Report for the Summary of Compliance with National Deviations

As shown in the Test Report Ref. No. which forms part of this Certificate

105047444MIN-001, 105047444MIN-002, 105047444MIN-003

This CB Test Certificate is issued by the National Certification Body

Intertek Testing Services NA, Inc.
545 E. Algonquin Road
Arlington Heights
IL 60005
United States of America



Date: 2022-12-14

Signature: John Quigley