IS40™

USER MANUAL EN

341162 C

CARLISLE FLUID TECHNOLOGIES

IntelliSpray™ IS40

For additional information or copies for your IntelliSpray IS40 Proportioner, please visit us online at:

https://carlisleft.com/product/IntelliSpray-is40-proportioner/

Or use this QR code with your mobile device:

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SAFETY

SAFETY PRECAUTIONS

Before the operation, maintainance, or servicing of this Carlisle Fluid Technologies system, fully read and understand all technical and safety literature for your IntelliSpray products. This manual contains information that is important for you to know and understand.

This information relates to USER SAFETY and the PREVENTION OF EQUIPMENT PROBLEMS.

To help you understand this information, we use recognizable ANSI Z535 and ISO warning boxes and symbols throughout this manual. Please obey these safety sections.

⚠ DANGER

DANGER!: Indicates a hazardous situation that, if not avoided, will result in death or serious injury.

⚠ WARNING

WARNING!: Indicates a hazardous situation that, if not avoided, could result in death or serious injury.

⚠ CAUTION

Caution!: Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury or equipment damage.

NOTICE

Notice: Indicates information considered important but not hazard related.

SAFETY

Safety: Indicates a type of safety instruction, or a separate panel on a safety, where specific safety-related instructions or procedures are described.

This manual lists standard specifications and service procedures. Minor differences can occur between this literature and your equipment. Differences in local or municipal codes, manufacturer or plant requirements, material delivery requirements, and more can make variations unpreventable. Compare this manual to your system installation drawings and other applicable IntelliSpray equipment manuals to find these differences.

Careful study and continued use of this manual will provide a better understanding of the equipment functions and procedures.

This will result in improved operation, efficiency, and longer, trouble-free service with faster and easier troubleshooting. If you need manuals and safety literature for your IntelliSpray system, contact your local representative or IntelliSpray directly.

⚠ WARNING

The user **MUST** read and be familiar with the Safety Section in this manual and the safety literature therein identified.

This equipment is intended to be used by trained personnel **ONLY.**

This manual **MUST** be read and thoroughly understood by **ALL** personnel who operate, clean or maintain this equipment! Special care should be taken to ensure that the **WARNINGS** and safety requirements for operating and servicing the equipment are followed.

The user should be aware of and adhere to **ALL** local building and fire codes and ordinances as well as **NFPA 33 AND EN 16985 SAFETY STANDARDS, LATEST EDITION,** or applicable country safety standards, prior to installing, operating, and/or servicing this equipment.

⚠ WARNING

The hazards shown on the following pages may occur during the normal use of this equipment.

Repairs may only be performed by personnel authorized by Carlisle Fluid Technologies.

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 irration, 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.

⚠ 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

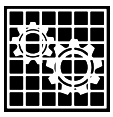
AUTOMATIC EQUIPMENT Automatic equipment may start suddenly without warning.

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 A 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.



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:

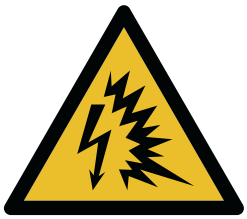
- Go to an emergency room immediately.
- Tell the doctor you suspect an injection injury.
- Show the doctor this medical information or the medical alert card provided with your spray equipment.
- Tell the doctor what kind of fluid you were spraying or dispensing.
- Refer to the Material Safety Data 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.

AREAS Indicates possible hazard occurences.	**HAZARDS** Indicates possible hazards.	**SAFEGUARDS** Prevention of possible hazards.
Spray Areas  	**Fire Hazards** Improper or unsatisfactory operation and maintenance procedures will cause a fire hazard. If the safety interlocks are disabled during operation, protection against accidental arcing is shut off and can cause a fire or explosion. Frequent Power Supply or Controller shutdown identifies a problem in the system. If this occurs, a correction will be necessary.	Fire extinguishing equipment must be present in the spray area. Periodically run a test to make sure the equipment stays usable. Spray areas must be kept clean to prevent the build-up of combustible residues. Do not smoke in the spray area. The high voltage supplied to the atomizer must be turned off before the equipment is cleaned, flushed or maintained. Spray booth ventilation must be kept at the rates as set by NFPA-33, OSHA, country, local, and municipal codes. The area must be ventilated if flammable or combustible solvents will be used to clean the equipment. Prevent electrostatic arcing. Spark-safe work distance must be maintained between the parts to get coated and the applicator. A span of 1 inch for every 10KV of output voltage is necessary. Do an equipment test only in areas free of combustible material. The test may necessitate the high voltage to be on, but only as instructed. Non-factory replacement parts or unauthorized equipment modifications can cause a fire or injury. The key switch bypass is used only during setup operations. Do no production work with disabled safety interlocks. The paint procedure and equipment must be set up and operated in accordance with NFPA-33, NEC, OSHA, local, municipal, country, and European Health and Safety Norms.

AREAS Indicates possible hazard occurences.	**HAZARDS** Indicates possible hazards.	**SAFEGUARDS** Prevention of possible hazards.
Spray Areas  	**Explosion Hazard** Improper or unsatisfactory operation and maintenance procedures will cause a fire hazard. If the safety interlocks are disabled during operation, protection against accidental arcing is shut off and can cause a fire or explosion. Frequent Power Supply or Controller shutdown identifies a problem in the system. If this occurs, a correction will be necessary.	Prevent electrostatic arcing. Spark-safe work distance must be maintained between the applicator and the parts to get coated. A span of 1 inch for every 10KV of output voltage is necessary. Unless specifically approved for use in hazardous locations, put all electrical equipment outside Class I or II, Division 1 or 2 hazardous areas in accordance with NFPA-33. If equipped, the current overload sensitivity must get set as described in the related section of the equipment manual. Protection against accidental arcing that can cause a fire or explosion is off if the current overload sensitivity is incorrectly set. Frequent power supply shutdown indicates a problem in the system which requires correction. Always turn off the control panel power before the system is flushed, cleaned, or servicing the spray system equipment. Before the high voltage is turned on, make sure no objects are within the spark-safe work distance. The control panel is to interlock with the ventilation system and conveyor in accordance with NFPA-33, EN 50176. Fire extinguishing equipment must be present in the spray area. Periodically run a test to make sure the equipment stays usable. Do an equipment test only in areas free of combustible material.
General Use and Maintenance 	Improper or unsatisfactory operation and maintenance procedures will cause a fire hazard. Personnel must be correctly trained in the operation and maintenance of this equipment.	Train all personnel in accordance with the requirements of NFPA-33, EN 60079-0. Personnel must read and understand these instructions and safety precautions before this equipment is operated. Obey appropriate local, municipal, state, and national codes governing ventilation, fire protection, operation maintenance, and housekeeping. Reference OSHA, NFPA-33, EN Norms, and your insurance company requirements.

AREAS Indicates possible hazard occurences.	HAZARDS Indicates possible hazards.	SAFEGUARDS Prevention of possible hazards.
Spray Area High Voltage Equipment    	**Electrical Discharge** This equipment contains a high-voltage device that can cause an electrostatic induction on ungrounded objects. This electrical charge is capable of igniting coating materials. An insufficient ground will cause a spark hazard. A spark can cause the ignition of many coating materials and cause a fire or explosion.	Operators in the spray area and the parts to be sprayed must be sufficiently grounded. The parts that get sprayed must be held on conveyors or hangers that are correctly grounded. The resistance between the parts and the earth-ground must not be more than 1 MΩ. Refer to: NFPA-33. Ground all operators before the equipment is operated. They cannot wear rubber-soled insulated shoes. Wear ground straps on wrists or legs for sufficient ground contact. Operators must not wear or carry ungrounded metal objects. Operators must make complete contact with the applicator handle when they use an electrostatic gun. Use conductive gloves or gloves with the palm section cut out. Operators must not wear grounded footware. **NOTE: REFER TO NFPA-33 OR SPECIFIC COUNTRY SAFETY CODES FOR GUIDANCE TO CORRECTLY GROUND THE OPERATOR.** Except for objects needed for the high-voltage process, all electrically conductive objects in the spray area are to be grounded. Supply a grounded conductive floor in the spray area. Always turn off the power supply before the system is flushed, cleaned, or when the spray system equipment is serviced. Unless specifically approved for use in hazardous locations, put all electrical equipment outside Class I or II, Division 1 or 2 hazardous areas in accordance with NFPA-33. Do not install an applicator into a fluid system if the solvent supply is ungrounded. Do not touch an energized applicator electrode.

AREAS Indicates possible hazard occurences.	HAZARDS Indicates possible hazards.	SAFEGUARDS Prevention of possible hazards.
Spray Areas 	**Toxic Fluid or Fumes** 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 instructions to know and enderstand the ghow to correctly handle specific hazards of the fluids to be used, to include the effects of long-term exposure. During the spray, clean, or servicing of equipment, or when in the work area, keep the work area fully ventilated. Always wear personal protective equipment (PPE) when in the work area or during equipment operation. Refer to the **Personal Protective Equipment** warnings in this manual. Store hazardous fluid in approved containers, and refer to local, municipal, state, and national codes governing disposal of hazardous fluids.
Spray Area and Equipment Use 	High pressure fluid sprayed from the gun, hose fittings, or ruptured/damaged components can pierce the skin. While this injury can appear as cut skin, this is a serious injury that can result in amputation of the affected area.	Do not point or operate the spray gun at any body part of person. Do not put your hand or fingers over the gun fluid nozzle or fittings in the hose or Proportioner. Do not try to stop or deflect leaks with your hand, glove, body, or shop rag. Do not “blow back” fluid as the equipment is not an air spray system. Relieve pressure in the supply hoses, Proportioner, and QuickHeat™ hose before the equipment is inspected, cleaned, or serviced. Use the lowest possible pressure to purge, recirculate, or troubleshoot the equipment. Examine the hoses, couplings, and fittings every day. Service or immediately replace parts that leak, are worn, or damaged. High pressure hose sections cannot be recoupled or serviced, and must be replaced.

AREAS Indicates possible hazard occurences.	**HAZARDS** Indicates possible hazards.	**SAFEGUARDS** Prevention of possible hazards.
Equipment and Fluids 	**Skin and Clothing Burns** Equipment surfaces and fluids can become very hot during operation.	Do not touch hot fluid or equipment during operation. Do not let clothing touch the equipment during operation or immediately after the equipment is stopped. Let the equipment fully cool before component examination or servicing.
Pressurized Aluminum Parts    	The use of certain solvents and chemicals can cause equipment damage and serious personal injury.	Do not use 1,1,1-trichloroethane, methylene chloride, or other halogenated hydrocarbon solvents or fluids that contain such solvents. These solvents can cause a serious chemical reaction and equipment rupture that results in equipment and property damage, serious bodily injury, or death.

⚠ CAUTION

Do not operate the IS40 before this section is read.

ADDITIONAL SAFETY INFORMATION

The IntelliSpray has an emergency stop (E-Stop) pushbutton on the main operator panel. During an emergency, all operations for the IntelliSpray will halt when the E-Stop is engaged. The operator must disengage the E-Stop and reset the system to recover from this state.

Observe all local or municipal safety measures and wear approved protective equipment when servicing this equipment. Clean all spilled chemicals and materials and work in a clean and organized environment to prevent personal injury and equipment damage.

⚠ DANGER

To prevent injury or electrocution, do not contact, disconnect, or manipulate electrical connections or devices while the system is under power. The main disconnect on the right side of the controller can be locked out, and proper Lockout–Tagout (LOTO) procedures must be used for electrical work internal to the controller.

If this is not possible for the purpose of diagnosis and troubleshooting during working conditions, then only qualified electrical personnel are to perform the work.

⚠ WARNING

To prevent possible chemical spillage when personnel are not on site, air and fluid supplies for the equipment must be disabled when the equipment is idled for an extended period of time such as end-of-day shutdown, etc.

NOTICE

During the initial commission of the equipment, and at periodic times throughout the life of the equipment, all fluid fittings must be visually inspected for leaks.

Periodically, all pieces of this equipment must be visually inspected for signs of obvious degradation due to chemicals or other conditions present in the environment where the equipment is installed.

SAFETY

Local regulations may require fire suppression equipment to be installed where the equipment is operated.

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EU DECLARATION OF CONFORMITY

Product Description / Object of Declaration:	**IS 30, IS 40**
This Product is designed for use with:	**Non Flammable Materials Only**
Suitable for use in hazardous area:	
Protection Level:	**Not Applicable**
Notified body details and role:	**TUV SUD America Inc** **141 14th St NW** **New Brighton** **MN 55112 USA**
	Low Voltage and EMC Assessment
This Declaration of Conformity / Incorporation is issued under the sole responsibility of the manufacturer:	**Carlisle Fluid Technologies Inc** **7166 4th St. N.** **Oakdale, MN 55128 USA**

EU Declaration of Conformity

CE

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

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 61000-6-2:2005/AC:2005 Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments
EN 61000-6-4:2007/A1:2011 Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments.
EN 61000-3-11:2000 (>16A) Electromagnetic compatibility (EMC) - Part 3-11: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems
EN 61000-3-12:2011 (>16A) Electromagnetic compatibility (EMC) - Part 3-12: Limits - Limits for harmonic currents produced by equipment connected to public low-voltage systems with input current.
EN 63000: 2018 Technical documentation for the assessment according to REACH
EN 60204-1:2018 Safety of Machinery. Electrical equipment of machines
FCC 47 CFR Part 15-Radio Frequency Devices, Subpart B – Unintentional Radiators
ICES-001, Issue 5:2020 Class A Industrial, Scientific, and Medical (ISM) Equipment

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 09/11/2023	Executive President: Engineering and Operations, Scottsdale, AZ, 85254. USA
Document Part No. EN		

CB TEST CERTIFICATE

	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

IMPORTANT ISOCYANATE INFORMATION

GENERAL HANDLING GUIDELINES

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

Fluids with isocyanates that are sprayed or dispensed 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) for 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 adjusted equipment may result in unsatisfactory cured material which can off-gas and make offensive odors. Refer to the instruction in the manual to correctly maintain and operate the equipment.
- To prevent inhalation of isocyanate mists, vapors and atomized particulates, everyone in the work area must wear applicable respiratory protection. Always wear a correctly fitted respirator that includes a supplied-air respirator. Refer to the instructions in the fluid manufacturer's SDS for correct work area airflow.
- Avoid all skin contact with isocyanates. Everyone in the work area must wear chemically impermeable gloves, protective clothing, and foot cover recommended by the fluid manufacturer and local regulatory authorities. Follow all fluid manufacturer recommendations, to include the discard of contaminated clothing. Do not eat or drink after equipment use until hands and face have been washed.
- Hazard from exposure to isocyanates continues after spray use. Anyone without correct personal protective equipment must stay out of the work area during and after the application, and for the time period specified by the fluid manufacturer. This time period is usually a minimum of 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.
- It is recommended to post a sign outside the work as the one shown below:

⚠ 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: _____	

MATERIAL SELF IGNITION

Some materials may become self-igniting if applied too thick. Read material manufacturer's warnings and Safety Data Sheet.

KEEP COMPONENTS A & B SEPARATE

Prevent cross-contamination of A and B materials. Cured material in fluid lines and passages can cause serious personal injury or equipment damage.

Never interchange the wetted parts of components A and B.

Never use solvent on one side that is contaminated with fluid from the other side.

EXPOSURE TO MOISTURE

ISO will start to cure and form small, hard, abrasive crystals when exposed to moisture and humidity.

These crystals become suspended in the fluid and can cause equipment damage. Over time, a film will form on the surface and the ISO will get thicker with increased viscosity.

NOTICE

ISO that has started to cure will reduce the life and performance of all wetted parts.

A sealed container with a desiccant dryer in the vent, or a nitrogen atmosphere in the empty head space of the container must be used.

ISO must not be stored in an open container.

The ISO pump reservoir must be kept filled with applicable lubricant. The lubricant creates a barrier between the ISO and the atmosphere.

Only ISO compatible moisture-proof hoses must be used.

Reclaimed solvents, which may contain moisture, must not be used.

Solvent containers must be closed when not in use.

Assemble threaded parts only with the correct lubricant.

FOAM RESINS W/245 FA BLOWING AGENTS

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

CHANGING MATERIALS

Prevent equipment damage and downtime during material changes and flushes for service or storage.

- Flush equipment multiple times to make sure it is fully clean.
- The fluid strainers must be cleaned after all flushes. Speak with the material manufacturer for information on chemical compatibility.
- When there is a change between epoxies, urethanes, or polyureas, all wetted parts must be disassembled and cleaned, and the hoses changed.

ELECTRICAL GROUND

Examine the local electrical code and Proportioner manual for instructions on how to ground the equipment.

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

SYSTEM OVERVIEW

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

QuickHeat hoses have approximately double the heat power compared to most other SPF hoses. QuickHeat hoses directly heat the fluid from inside the hose, for fast and efficient fluid heating, even in cold climate conditions. QuickHeat hoses have embedded temperature and pressure sensors, independent A and B heated hoses and up to 4 separate heating zones to improve temperature control.

QuickHeat hoses supply sensor power and signal communication without cables or connectors, eliminate failure points, and improve reliability. QuickHeat hoses include a snag-proof, abrasion-resistant outer hose wrap sealed with industrial-grade Hook & Loop material for individual A or B-side hose replacement.

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

The system will also work with high-pressure spray foam guns with compatible hose manifolds.

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

⚠ WARNING

For professional use only. Not for use in explosive environments or atmospheres. Equipment must not be installed in outdoor locations.

IntelliSpray™ Spray Foam Proportioners are high-performance devices that deliver Isocyanate (A) and Polyol Resin (B) fluids to a spray gun via QuickHeat™ hoses.

The Proportioner 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 multi-zone internal hose heating ensures user settings control fluid temperatures.

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 has 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 ten outputs up to 1000 times per second.

The controller stores job data, recipes, historical performance information, user information, and alarm histories. The software can be updated remotely or with a USB memory stick. A 15.6” (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 additional hardware or software. The Control Module includes power management, circuit protection, motor control, heater power, remote connectivity, internal I/O, and electrical safety systems. The Control Module includes a thermostatically controlled cooling fan that draws in outside air through a user-cleanable filter.

Diagnostics and repair are made simple via clear messages and monitoring screens, while Component replacement is fast and simple.

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 gauges, 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.

The Fluid Module can be partially or fully extracted from the Proportioner frame, for ease of service. 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 Fluid Technologies 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 50, 100, 150 and 200ft lengths (main hose lengths). The Smart Ends (connected as extensions to the main hose sections) are provided in 20, 25, and 40ft lengths, with the 25ft version having increased flexibility. Connected to the end of the Smart End is an unheated, insulated whip. This comes in 3, 4, 6, and 10ft lengths, with the 4ft version having increased flexibility.

Each length of heated hose begins with a fluid manifold or "modem" that may contain 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 the projection of information down the hose to remote monitoring and control devices. More information about QuickHeat hoses is contained in the QuickHeat Hose Manual.

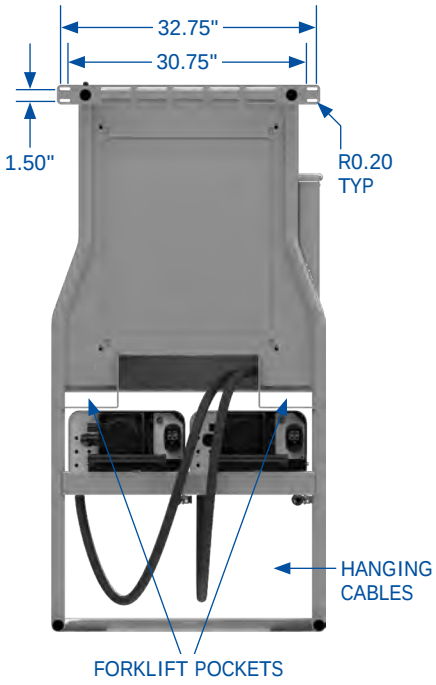
Finally, IntelliSpray Control and Fluid Modules are mounted in a high-strength tubular steel frame that protects the modules from damage and provides multiple horizontal and vertical mounting points.

IS40 SPECIFICATIONS

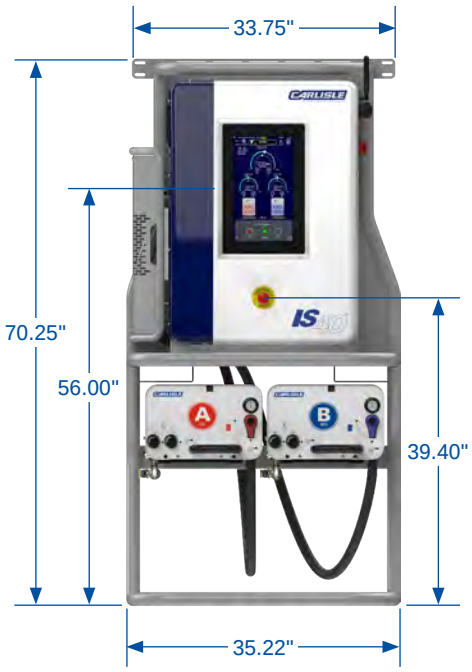
The IS40 Proportioner is roughly 36” wide, 70” tall, and 32″ deep. Eight separate floor mounting holes are located in the base of the unit and a slotted wall mounting bracket is provided along the top of the unit.

The IS40 must be securely attached to the a floor and wall in any mobile or seismic installation. For more information, refer to the "Installation" section.

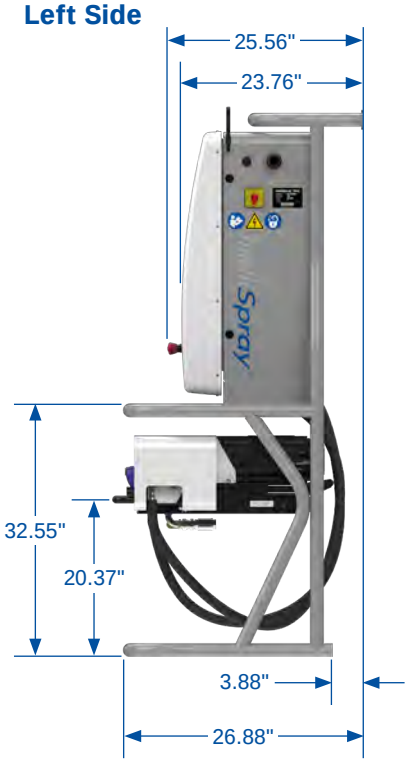
Back Side



Front



Left Side



Top

Bottom

The table to the right shows other physical, operating, and electrical specifications. The electrical specifications include the maximum hose length that can be powered by the IS40 and motor current at stall load.

Typical current draw in most applications is under 60 Amps (3 phase), but installers and owners should consult with their authorized IntelliSpray 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.

Physical, Environmental, and Electrical Specifications	
Weight	585 lbs (260 kg)
Maximum Fluid Pressure	2500 psi (172 Bar)
Operating Temperature	32/120° F (0-50° C)
Humidity	0-85% Non Condensing
Input Voltage	200-240V or 380-415V
Frequency	50/60 Hz
Phase	3PH or 3PH+N
Full Load Amps	78A or 56A
Maximum Disconnect	100 A
SCCR	5 kA

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IS40 OVERVIEW

The IS40 is a modular system, composed of a Control Module, A and B Fluid Modules, a high strength tubular frame, and software. The frame 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 (JIC 5 for A, hose, JIC 6 for B hose). The figure below and the following Sections will help the user become familiarized with the IS40 Proportioner.

IS40

1. Wall Mounting Bracket
2. Cellular Antenna
3. Power Cord Inlet
4. Cover Latches (x2)
5. On/Off Switch
6. Control Module
7. HMI
8. Emergency stop button
9. B Fluid Module
10. Floor Mounting Brackets
11. A Fluid Module
12. Frame
13. Hose Power
14. Hose Communication
15. QuickHeat™ Hose Connection Cover

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FLUID MODULE

The IS40 Fluid Modules independently filter, heat, pressurize, and deliver A and B materials to the QuickHeat hose and recirculation lines.

Material is supplied to the Fluid Modules from drums, totes, or other fluid containers. To assure proper operation the IS40 requires the fluid to be provided at a pressure that avoids cavitation. Depending on the viscosity and flow rate of the fluid, the inlet pressure should be at least 25 psi at all times.

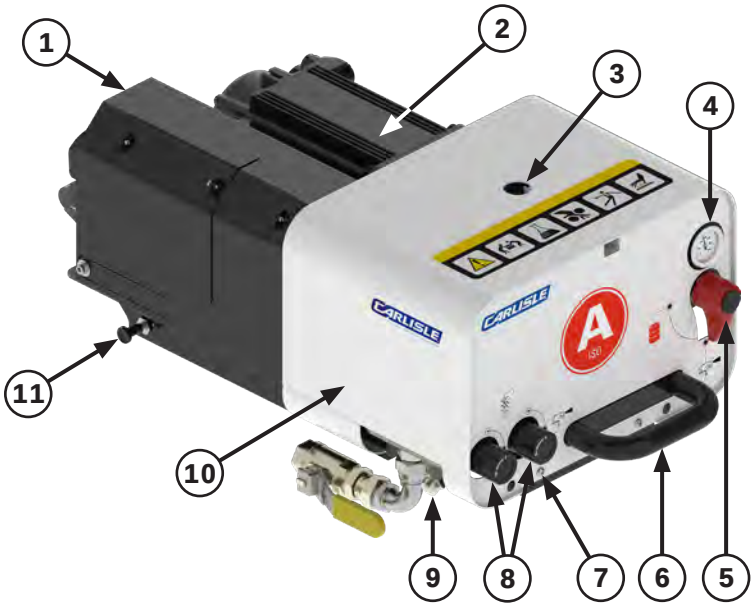
To avoid cavitation supply pumps should be sized to provide at least 2 GPM continuous flow at an inlet fluid pressure of 100 psi. The IS40 will issue an error message and stop if inlet fluid pressure is either too low or too high.

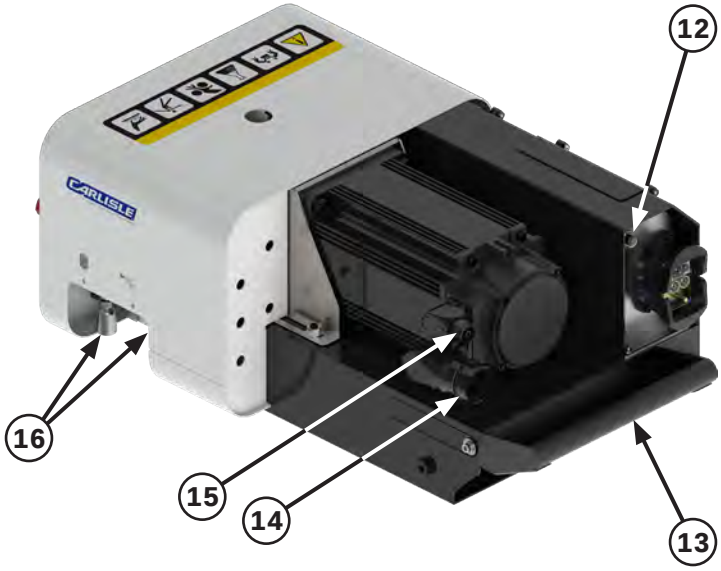
The IS40 Fluid Modules are highly integrated to reduce size, complexity, and number of fluid fittings. With their modular design approach they can be easily serviced while in the proportioner or completely removed and reinstalled within minutes. With the exception of minor differences, the A and B fluid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

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

MODULE DESCRIPTION– GENERAL

1. Frame
2. Servo Motor
3. TSL Fill Hole
4. Pressure Gauge
5. Recirculation Valve
6. Front Handle
7. Cover Retainer Screw
8. Filter Module Valves
9. Inlet Filter
10. Front Cover
11. Release Pin
12. Communication Connector
13. Rear Handle
14. Motor Power Connector
15. Motor Encoder Connector
16. Fluid Outlet Fittings





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

Filter Outlet Valve: The IS40 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 Section 17 (Servicing) 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.

MODULE DESCRIPTION–FRONT (A MODULE SHOWN)

1. Cover
2. TSL Sight Gauge
3. Pressure Gauge
4. Recirculation Valve
5. Cover Retainer Screw
6. Handle
7. Filter Module Valves
8. Inlet Filter
9. Release Pin

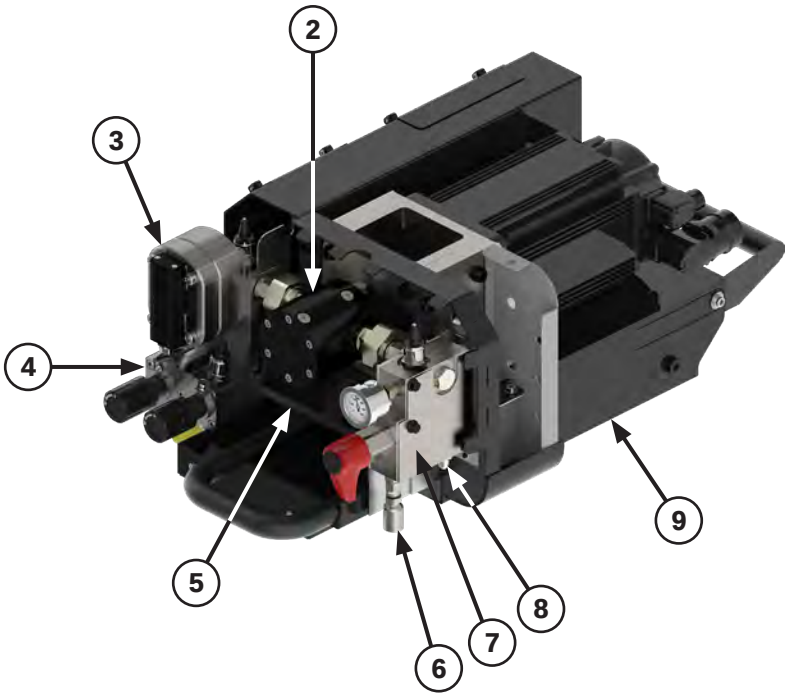
The images below show the IS40 Fluid Module with the covers removed.

The A and B Fluid Modules are identical except for the following:

- The B Servo Motor is slighter larger than the A Servo Motor due to the higher viscosity B Resins that require more pump torque.
- The A and B covers have different labels attached to 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.

MODULE DESCRIPTION– W/O COVER

1. I/O Module (inside frame)
2. Pump
3. Flow Meter
4. Filter Module
5. Drip Tray
6. Recirculation Hose Fitting
7. High Pressure Module
8. Jumper Hose Fitting (to gun)
9. Fluid Preheater Module (enclosed in frame)

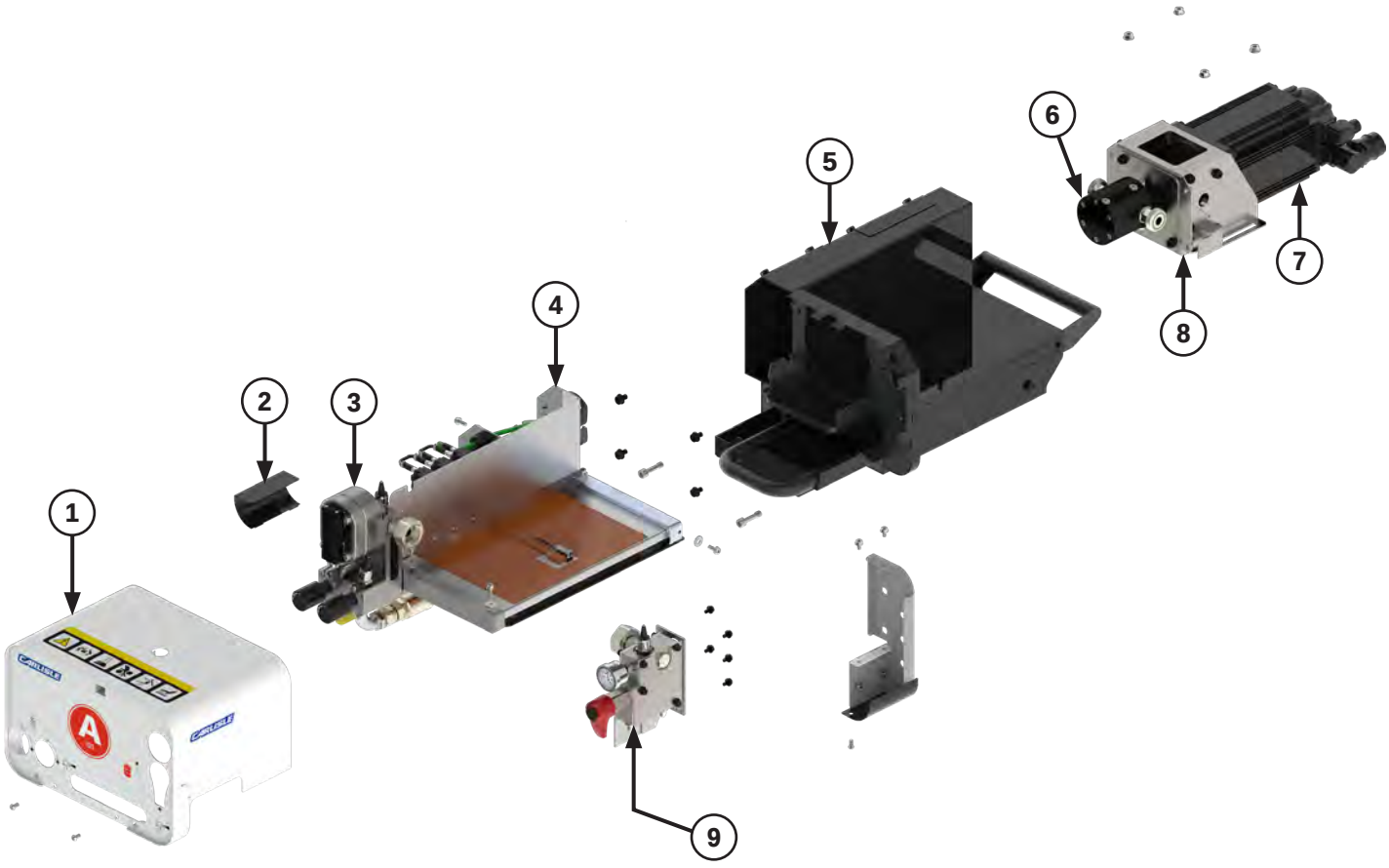


MODULE ASSEMBLIES-OVERVIEW

The following figure shows the major IS40 Fluid Module components. Additional breakdowns and parts lists are contained in the "MAINTENANCE" chapter.

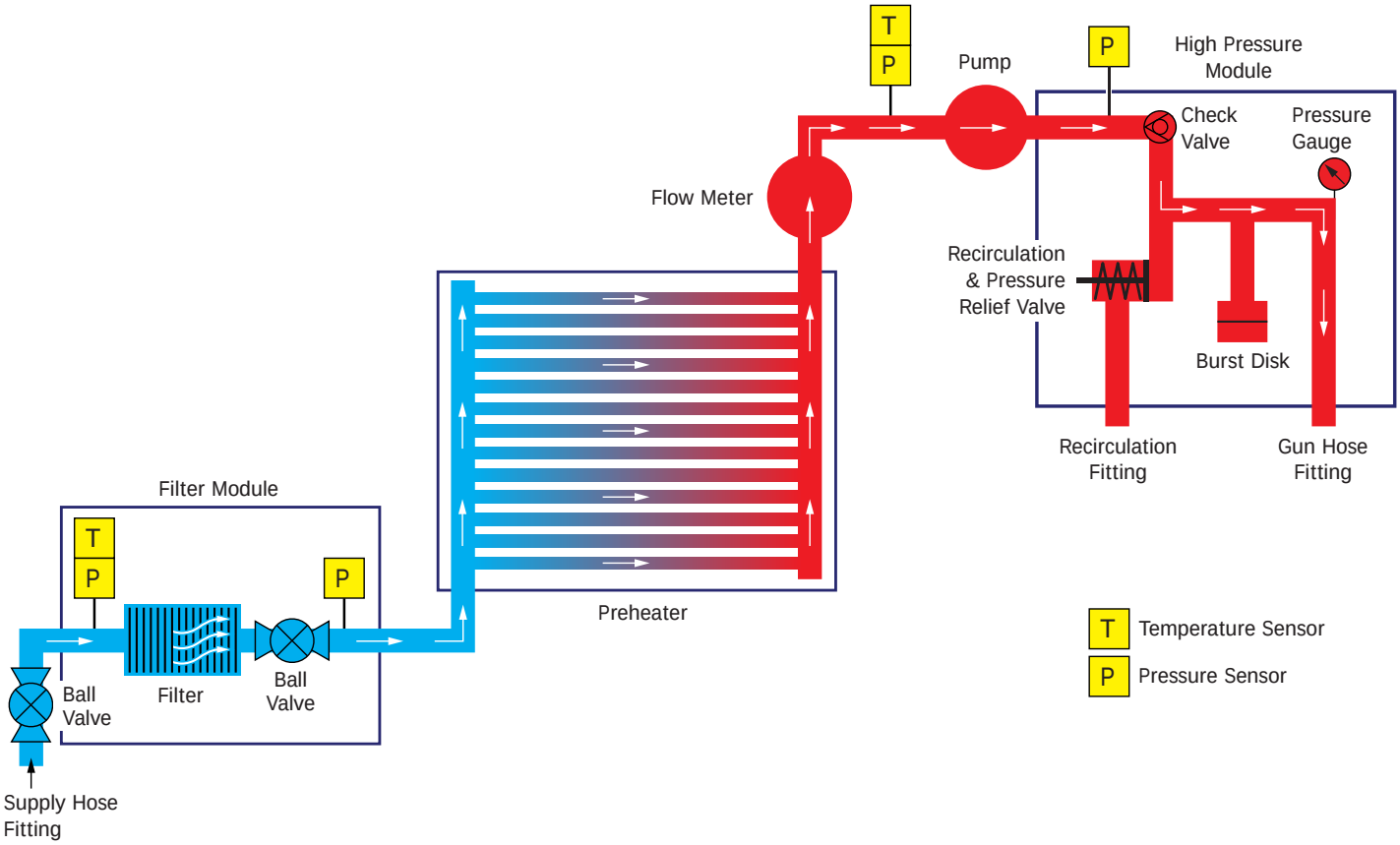
MODULE ASSEMBLIES DESCRIPTION

1. Front Cover
2. Filter Module
3. Flow Meter
4. Low Pressure Module
5. Frame
6. Fluid Pump
7. Servo Motor
8. Motor Mount
9. High Pressure Module



MODULE FLUID PATHWAYS

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



FILTER MODULE

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

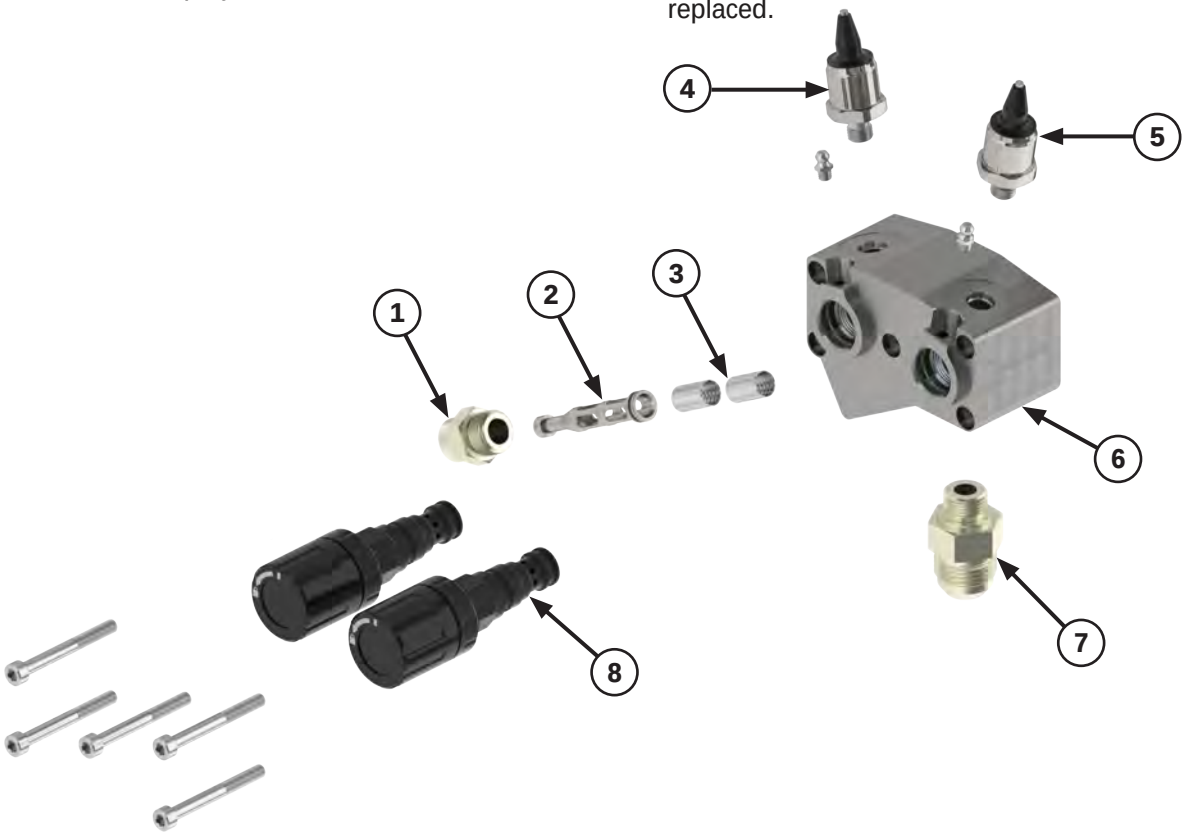
Filter Module: The Filter Module consists the following components mounted in a machined aluminum manifold.

- Inlet and Outlet valves: Inlet and outlet 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 Menus 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 two 40 mesh filter elements that can be easily cleaned or replaced.
- **Pressure Sensors:** The Filter Module has two sensors that measure pressure on each side of the filter element. These sensors allow the IS40 to alert the user when the filters need to be cleaned or replaced.



FILTER MODULE DESCRIPTION

1. Inlet Filter Cap
2. Filter Body
3. Filter Element (40 Mesh)
4. Pre Filter Inlet Pressure Sensor
5. Post Filter Pressure Sensor
6. Filter Manifold
7. JIC M12 Inlet Fitting
8. Filter Module Valves

LOW PRESSURE MODULE

Preheater Module: The IS40 uses low mass preheaters to warm the A and B fluids on the low pressure side of the Fluid Pumps. This allows the preheaters to rapidly respond to variations in incoming fluid temperature, flow rates, or setpoint changes.

Each preheater has 22 individual channels for fluid flow that run down and back through the heat exchanger. An etched multi-zone interleaved foil heaters are firmly bonded to the top and bottom of the heat exchanger. This approach eliminates direct heater element contact with fluids (as with immersion heaters) and increases heat transfer area to fluids by up to a factor of 4 (compared to other systems). This lets the heater elements to operate at lower temperatures than typical immersion heaters, increasing reliability and reducing the risk of material charring.

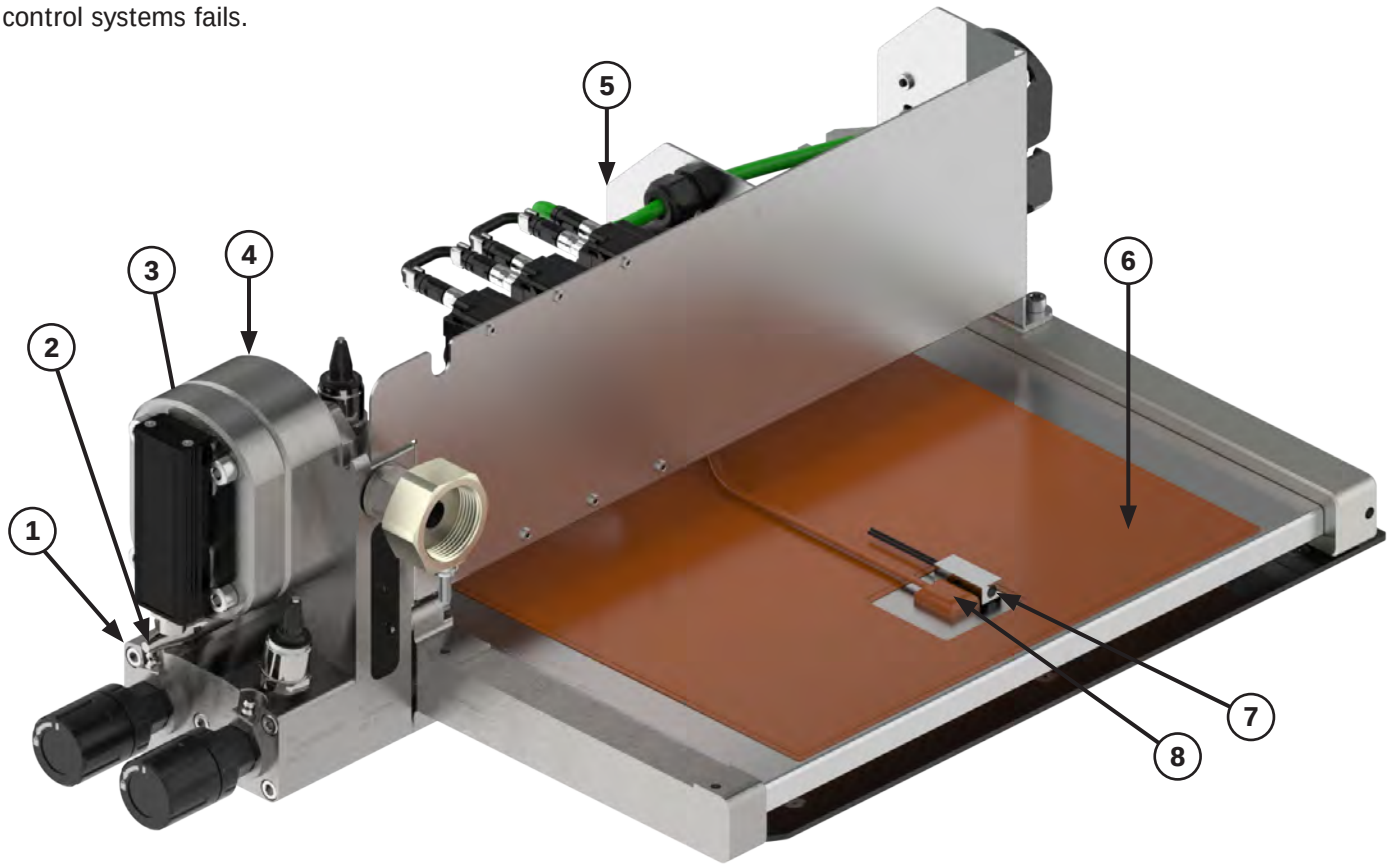
A fail-safe replaceable thermal fuse is mounted on each heater assembly to prevent thermal run-aways if all other control systems fails.

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 delver A:B fluid on-ratio.



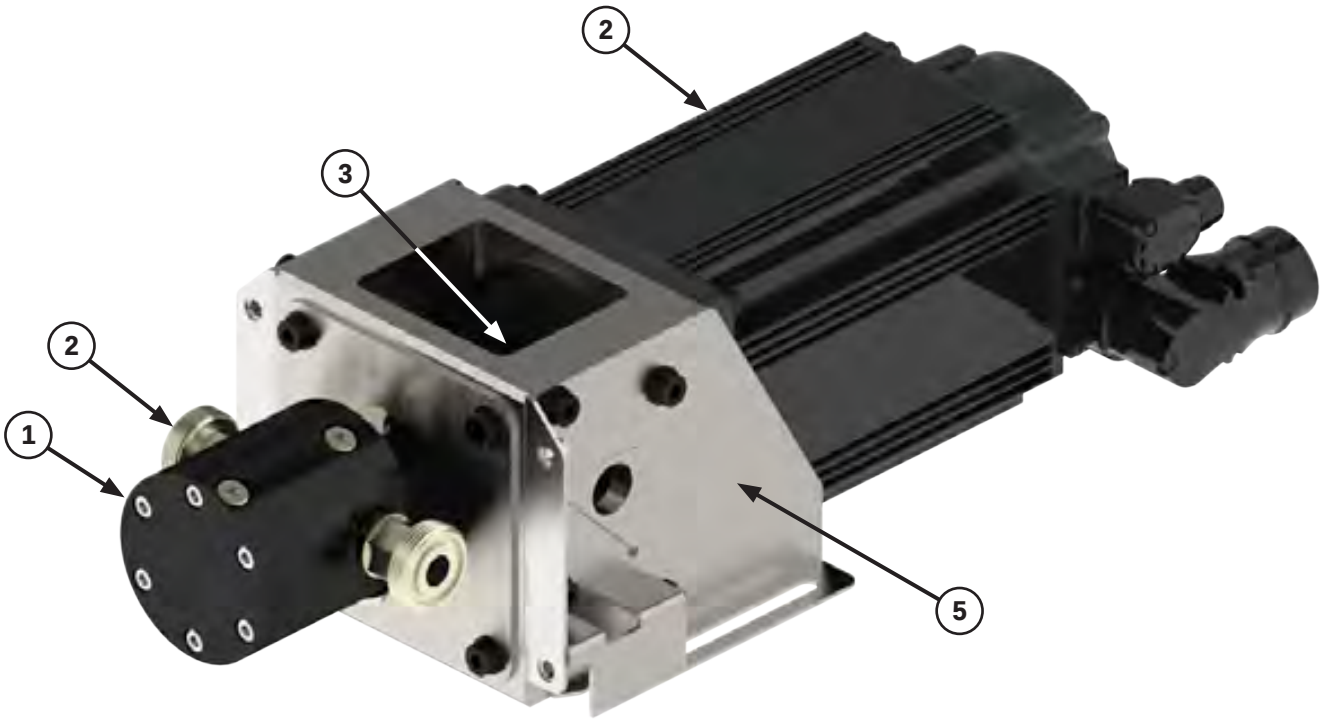
LOW PRESSURE MODULE DESCRIPTION

1. Filter Module
2. Pre-pump Temperature Sensor
3. Pre-pump Pressure Sensor
4. Flow Meter
5. I/O Electronics
6. Preheater Module
7. Thermal Fuse
8. Temperature Sensor

PUMP MODULE

Pump Module: The IS40 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.

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



PUMP MODULE DESCRIPTION

1. Fluid Pump
2. Fluid Union (M) x2
3. Shaft Coupler
4. DC Servo Motor
5. Pump Mount

HIGH PRESSURE MODULE

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 IS40 Fluid Modules.

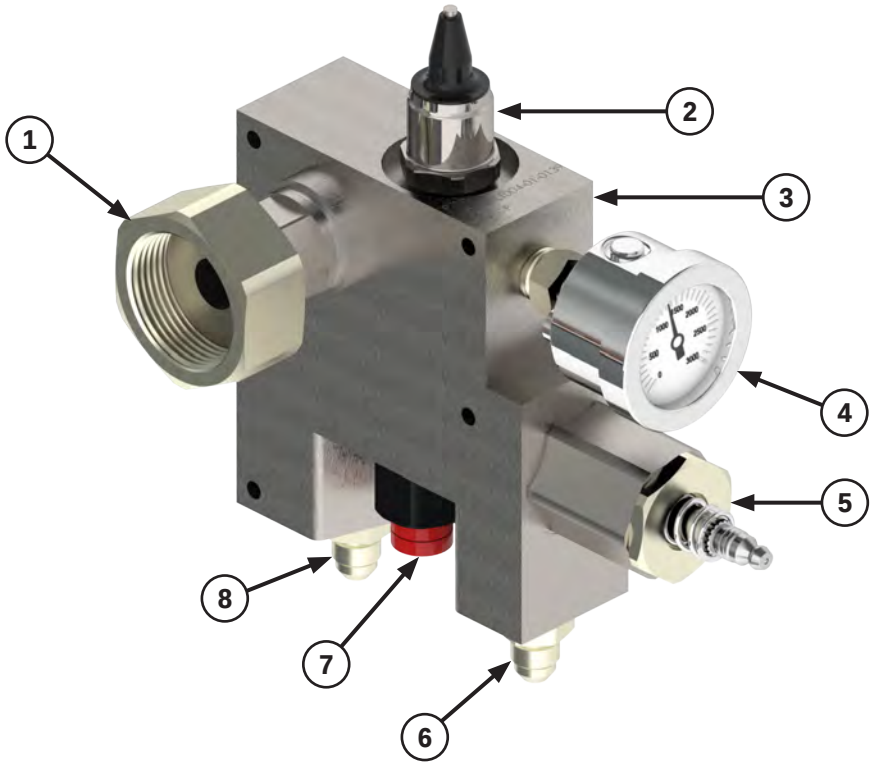
Pressure Sensor: A pressure sensor is mounted in the High Pressure Manifold and used to prevent system overpressure. It is also used for automatic hose pressure sensor calibration (see DISPLAY SCREENS "SETTINGS SCREENS–HOSE CONFIGURATION") and when hose sensor bypass mode is enabled (DISPLAY SCREENS "SYSTEM STATUS SCREENS–SENSOR BYPASS").

Pressure Gage: An analog pressure gage allows the user to read pressure in the distribution hoses even when the system in 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 "SERVICING").

Hose fittings: JIC fittings for both recirculation and distribution (gun) hoses are located at the bottom of the High Pressure Module. Fittings are clearing identified by embossed labels on the manifold.



HIGH PRESSURE MODULE DESCRIPTION

1. Fluid Union (F)
2. Pressure Sensor
3. Check Valve (not shown)
4. Pressure Gauge
5. Recirculation Valve
6. Recirculation: JIC 5M (ISO) or JIC 6M (RES) Hose Fittings
7. Burst Disk
8. Gun Hose: JIC 5M (ISO) or JIC 6M (RES) Hose Fittings

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CONTROL MODULE

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

The IS40 Control Module is 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 15.6" high-strength touch-screen allows the user to monitor and control the proportioner and hoses.

The IS40 Control Module provides remote system monitoring, control, and service “out of the box” without any additional hardware, software, or monthly fees.

The IS40 Control Module is designed for front-access service while in the proportioner. All components can be replaced in minutes with simple hand-tools. All items are labeled and all wiring clearly tagged. 200-240V and 380-415V wiring diagrams are provided in the "SCHEMATICS" chapter.

The following pages show the location and function of primary components in the Control Module. For additional views and parts list, see the "MAINTENANCE" chapter.

Always be sure the rotary power switch is in the "OFF" position before opening the Control Module. Due to electrical shock hazards, the servicing of the Control Module must be done 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 only be serviced by qualified persons.

⚠ WARNING

ELECTRICAL SHOCK HAZARD: Motor drives contain capacitors that have stored electrical energy for up to 15 minutes after power is shut off. Wait 15 minutes before you disconnect the power cables between the motor drives and the motors.

CONTROL MODULE–OVERVIEW

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 IS40 uses a 15.6" TFT muti-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 IS40 is specifically designed for the wide range of environmental and mobile conditions Spray Foam equipment is subject to.

Solid State Relays (SSRs): The IS40 has individual SSRs mounted on 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 IS40 to connect to available cellular networks. This allows users to monitor and/or control the IS40 from any standard web-browser on their phone, tablet, or computer. It also 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 fexternal air through a user-serviceable filter. This helps prevent component overheating in hot environments.

E-Stop Button: When pressed, the E-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 the "SERVICING" chapter for air filter cleaning instructions.

Power Switch: The IS40 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 IS40 that is suitable for 22mm to 32mm cable diameters). A 2/4 SOOW power cable is suitable for most installations, but installers are responsible for selecting the proper cable size and insulation based on installation configuration, cable length, and environmental conditions.

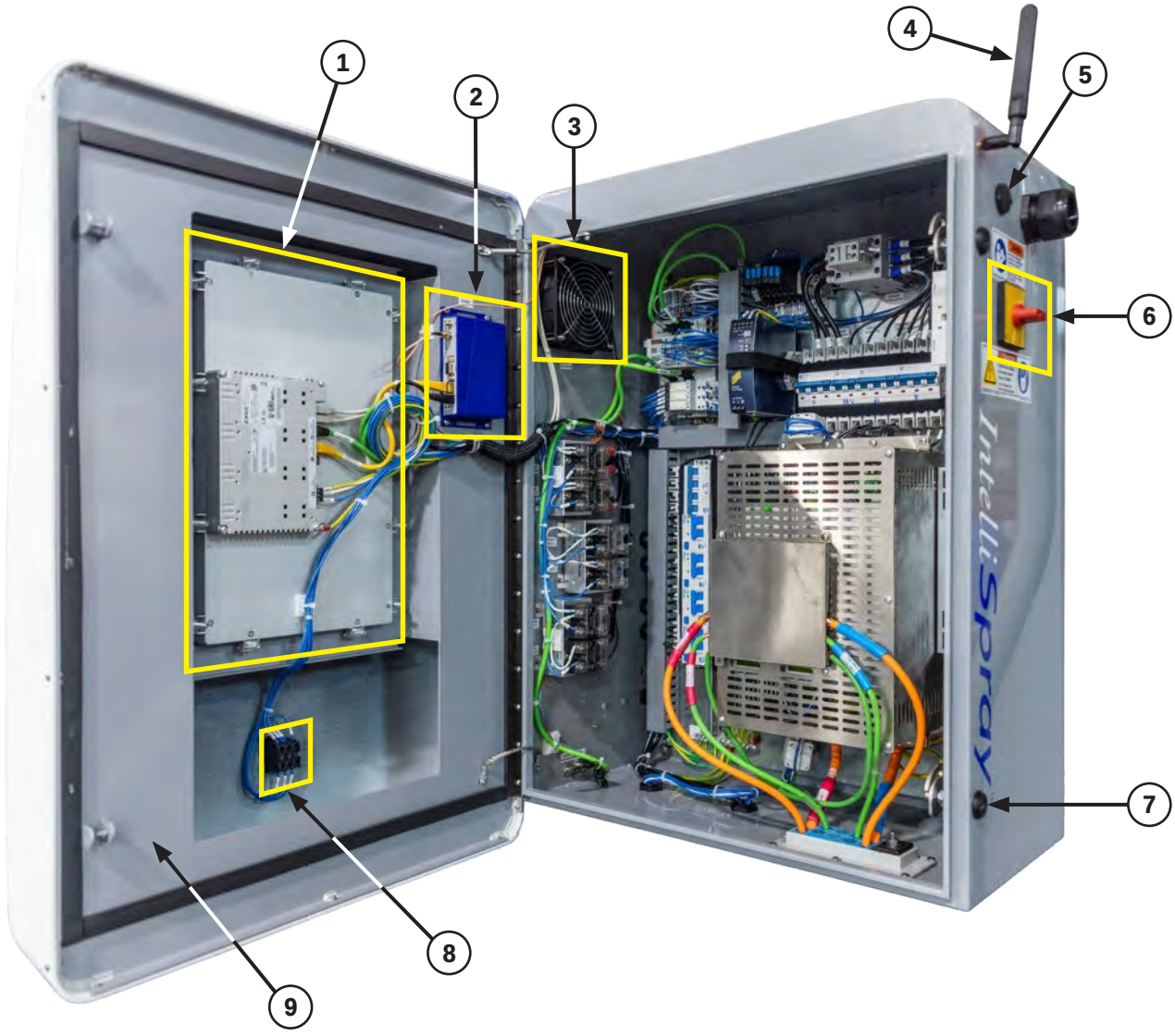
CONTROL MODULE–ENCLOSURE

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.

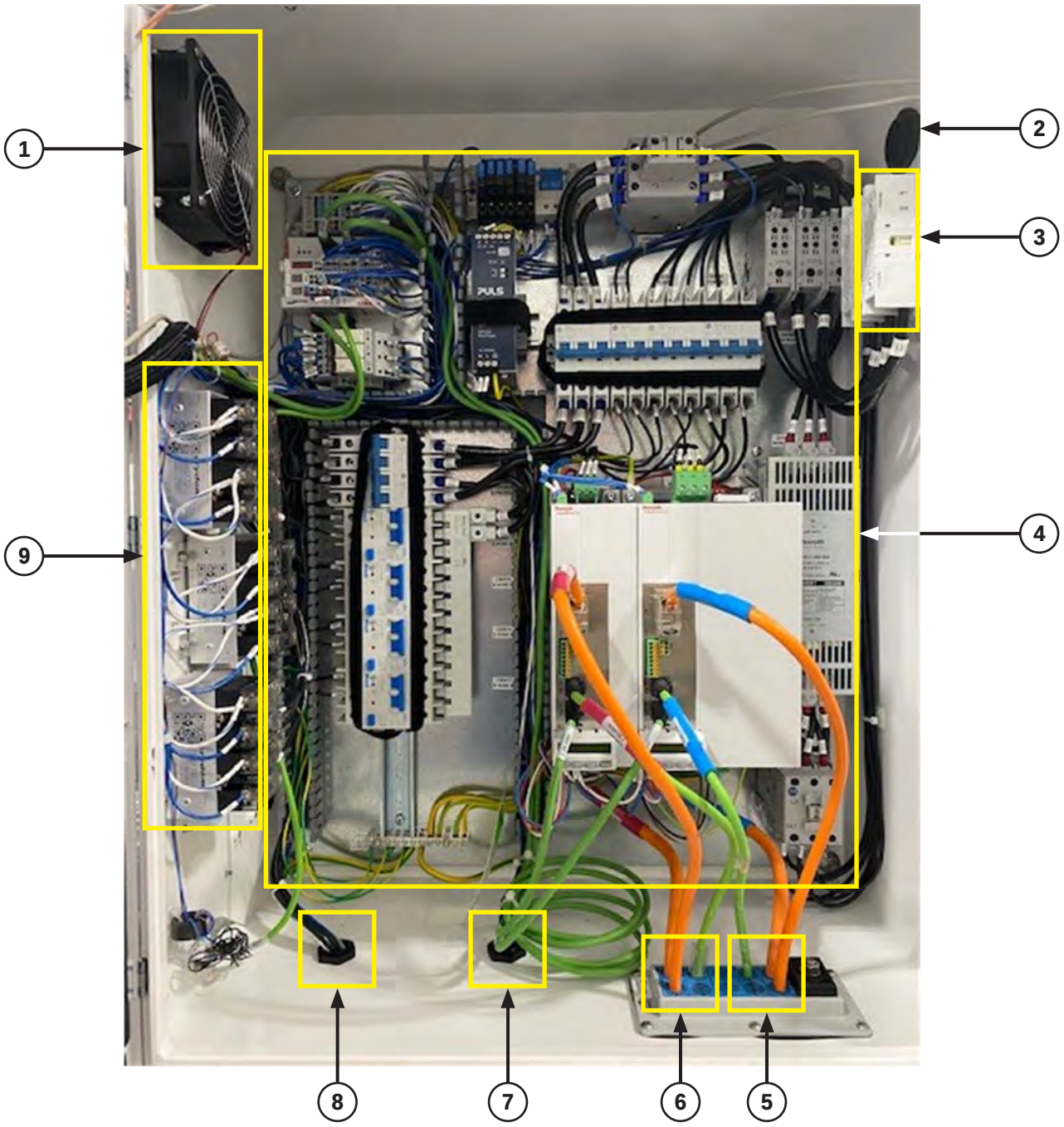
CONTROL MODULE DESCRIPTION

1. HMI/Controller
2. Cellular Modem
3. Cooling fan
4. Cellular Antenna
5. Dual USB Ports
6. Power Switch
7. Cover Latches (x2)
8. Emergency Stop Button
9. Air Filter (behind door flange)



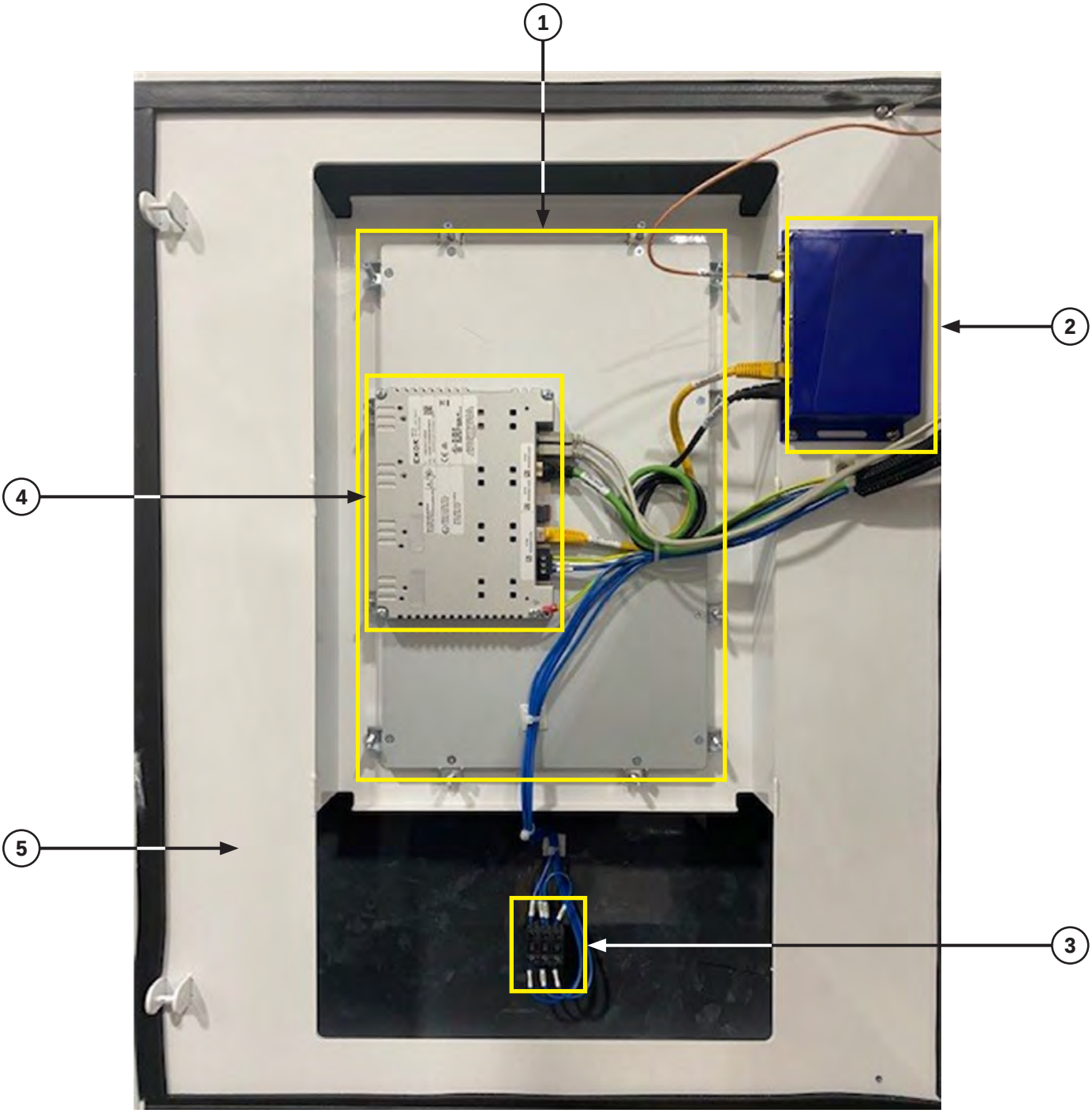
INTERIOR DESCRIPTION

1. Cooling Fan
2. Main Power Cable Gland
3. Power Switch
4. Main Panel
5. B Fluid Module Motor/Communication Cables
6. A Fluid Module Motor/Communication Cables
7. B Fluid Module Power Cable
8. A Fluid Module Power Cable
9. Solid State Relays (SSRs)



DOOR DESCRIPTION

1. HMI
2. Cellular Modem
3. Emergency Stop Switch
4. HMI Controller
5. Filter Assembly (behind door flange)



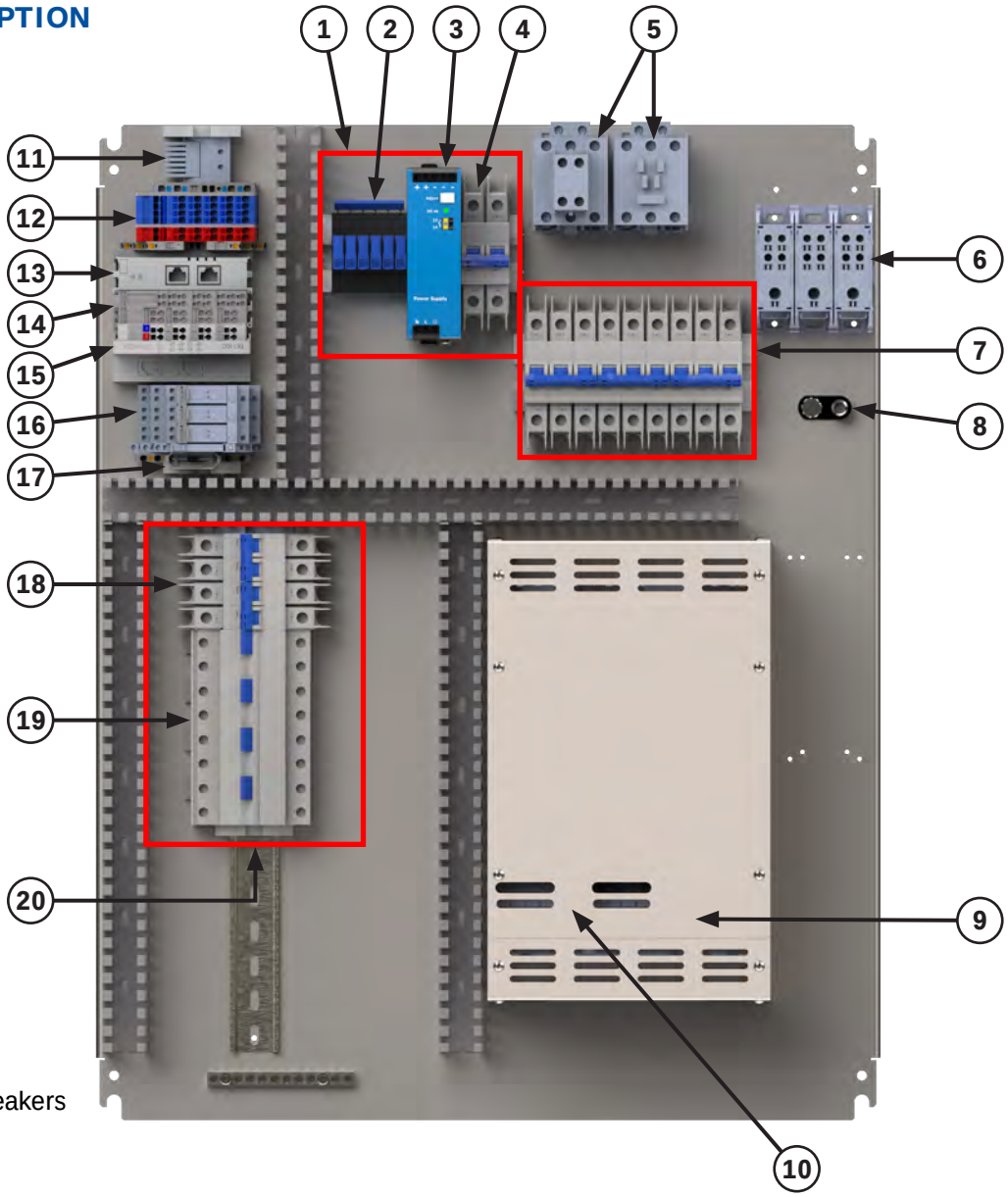
CONTROL BOARD – 200-240V

Most Control Module components are part of the Main Panel and are shown in the following figure. Additional Hook & Loop retention straps are used for DIN rail mounted components for mobile robustness.

Wiring is contained in capped Raceways and clearly labeled. All components are clearly labeled on the Main Panel. Wiring schematics are contained in Section 20 SCHEMATICS.

CONTROL BOARD DESCRIPTION

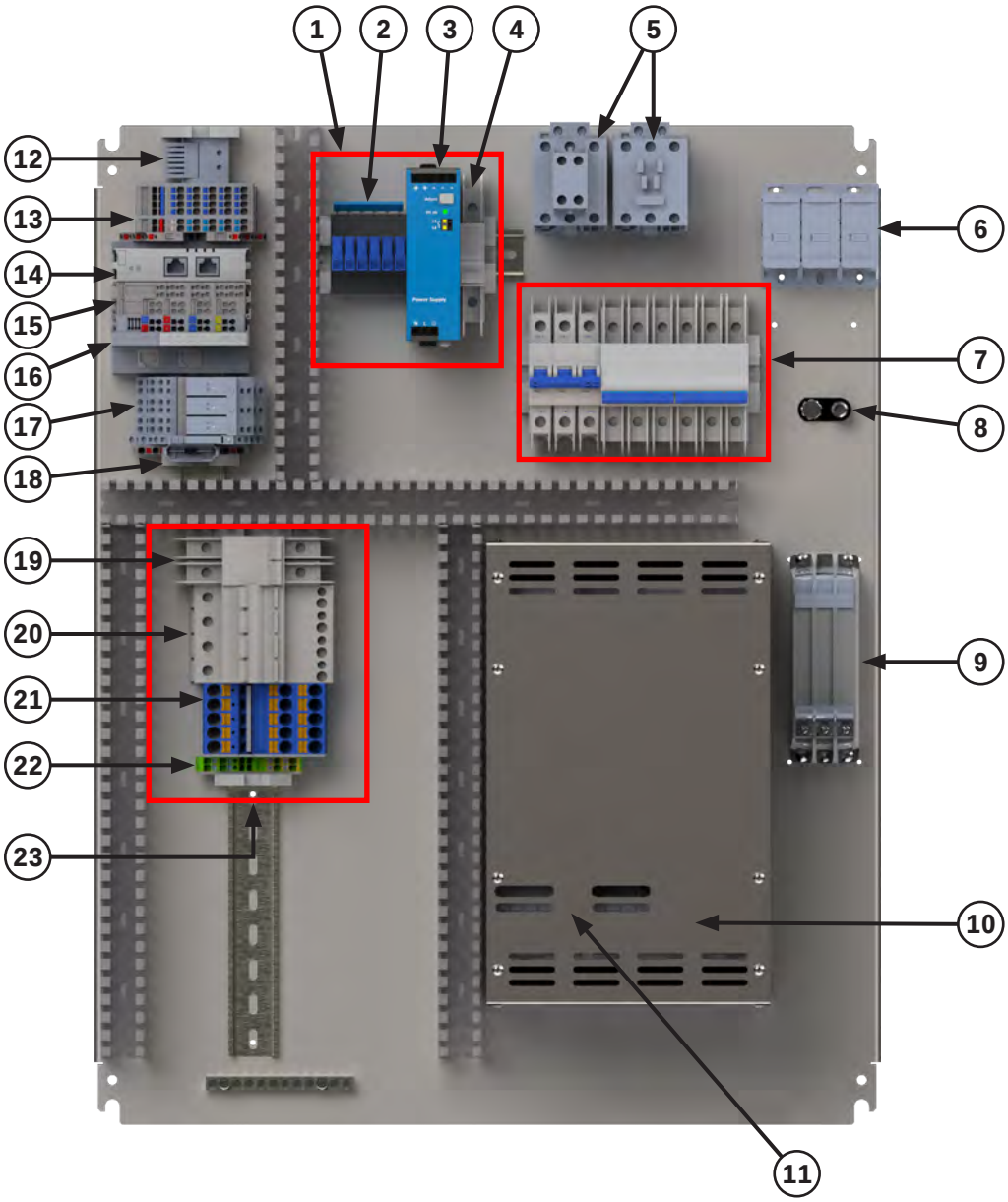
1. Bank 2 Circuit Breakers (Low Voltage Systems)
2. Low Voltage Circuit Breakers
3. 24V Power Supply
4. Power Supply Circuit Breaker
5. Contactors
6. Main Terminal Blocks
7. Bank 1 Circuit Breakers (Heating and Motors)
8. Panel Ground
9. B (RES) Motor Drive
10. A (ISO) Motor Drive
11. Thermostat
12. Terminal Blocks
13. EtherCat Coupler
14. I/O Modules
15. EtherCat Modules
16. Relays
17. Diode Zener
18. Fluid Module Heat Circuit Breakers
19. Hose Heat GFI
20. Bank 3 Circuit Breakers (Heating Zones)



CONTROL BOARD – 380-415V

CONTROL BOARD DESCRIPTION

1. Bank 2 Circuit Breaker (Low Voltage Systems)
2. Low Voltage Circuit Breakers
3. 24V Power Supply
4. Power Supply Circuit Breakers
5. Contactors
6. Main Terminal Blocks
7. Bank 1 Circuit Breakers (Heating and Motors)
8. Panel Ground
9. Power Line Filter
10. B (RES) Motor Drive
11. A (ISO) Motor Drive
12. Thermostat
13. Terminal Blocks
14. EtherCat Coupler
15. I/O Modules
16. EtherCat Modules
17. Relays
18. Diode Zener
19. Pre Heat Circuit Breakers
20. Hose Heat GFIs
21. Neutral Distribution Block
22. Terminal Block, Ground
23. Bank 3 Circuit Breakers (Heating Zones)



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CIRCUIT BREAKERS

A circuit breaker is a switch designed to automatically protect an electrical circuit from damage caused by overcurrent, overload, or short circuit situations.

Protective relays inside the circuit breaker detect a fault and "trip" to open contacts that interrupt current flow.

Circuit breakers contained in the IS40 Main Panel prevent protect all electrical circuits and components in the IS40 Proportioner and QuickHeat hoses.

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

If a circuit breaker opens (trips) there is always an underlying reason that should be investigated and resolved by a trained technician.

In most cases resetting (closing) a circuit breaker will not resolve the underlying issue.

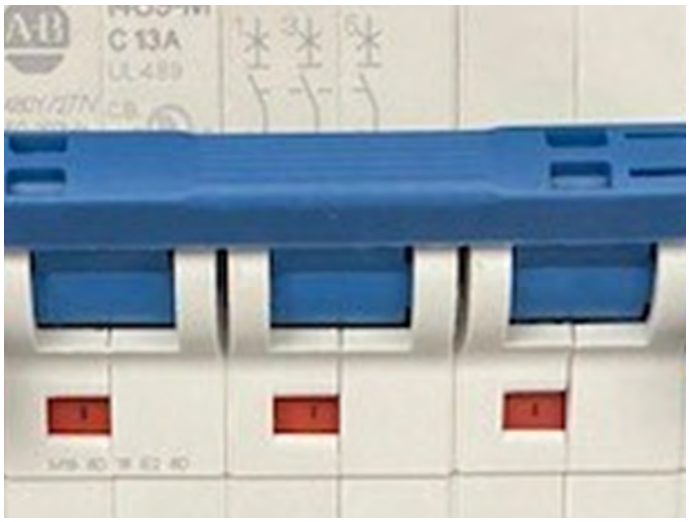
The IS40 Circuit Breakers are contained in several banks as shown on the previous page.

Bank 1 (shown below) contains the Main circuit breakers that feed circuits through Bank 3 shown on the next page. Circuit Breakers are clearly labeled on the panel.

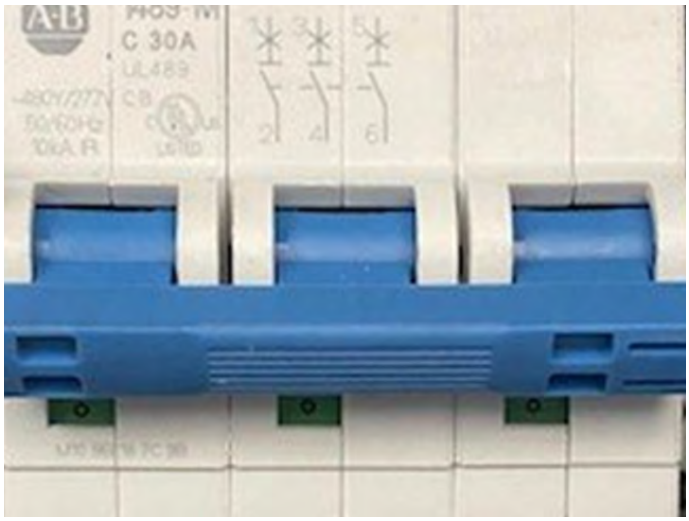
The purpose and status of circuit breakers in each Bank are shown and described below and in the following page

CB Bank 1: Bank 1 contains either 200 or 400V 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 closed. When open or tripped, the breaker switches are pointed down when viewing from the front, and green indicators are visible.



Bank 1 Breaker Closed/Hot



Bank 1 Breaker Open/Tripped

⚠ WARNING

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

CB Bank 2: Bank 2 contains an AC circuit breaker for the 24V DC Power Supply. It also has 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.

When tripped, a breaker will pop outward slightly and a red indicator LED will show when the unit is powered on.

Bank 3 Breaker Tripped

Press to Reset (Close)

CB Bank 3: Bank 3 contains individual circuit breakers for the A and B Preheaters and each section of the A and B hoses (up to 2 hose sections or 4 individual hose heating zones).

Hose circuit breakers also act as GFIs (Ground Fault 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 Open/ Closed/Hot (ON)

⚠ WARNING

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

QUICKHEAT™ HOSE

The IS30 and IS40 proportioners are specifically designed to use Carlisle QuickHeat™ Hoses. These hoses contain high-power internal electric heating cables, ensuring all heating energy is transmitted directly to the fluid.

QuickHeat hoses are provided in 50, 100, 150, and 200ft lengths (main hose lengths). The Smart Ends (connected as extensions to the main hose sections) are provided in 20, 25, and 40ft lengths, with the 25ft version having increased flexibility. Connected to the end of the Smart End is an unheated, insulated whip. This comes in 3, 4, 6, and 10ft lengths, with the 4ft version having increased flexibility.

Each length of a heated hose begins with a fluid manifold or “modem” that may contain 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. It 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 the 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 fewer maintenance issues.

• More heat control and less risk. Independent heat sensors allow the 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 only be serviced by qualified persons.

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INSTALLATION

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

Installation of the IS40 should only be performed by individuals with prior knowledge of installing and servicing Spray Foam equipment.

Installation involves mechanical, electrical and fluid connections. Default out-of-box software settings are usually adequate for initial system use, but can be changed by the installer to meet specific needs.

Every IS40 is equipped for remote support and can be accessed by authorized IntelliSpray service agents to assist in system installation, configuration, and/or service.

The following steps outline installation of the IS40.

1. Unpack unit and remove from shipping pallet.
2. Place unit in desired location.
3. For mobile or seismic environments make mechanical connections to floor and wall of structure.
4. Check to be sure power to the IS40 circuit is off (turn off breaker at distribution or main panel). Verify if the IS40 is on a dedicated 80A 200-240V 3 phase protected circuit or 60A 380-415V 3 Phase + Neutral protected circuit.
5. Make electrical connections inside IS40 Control Module:
   - For 200-240V system, make electrical and ground connections inside IS40 Control Module.
   - For 380-415V system, make electrical, neutral and ground connections inside IS40 Control Module.
6. Connect fully assembled QuickHeat™ hose master modem to fluid jumper hoses.
7. Connect fluid supply and recirculation hoses to A and B fluid modules.
8. Set Fluid Module valves to spray position for purging.
9. Close gun manifold material control valves and remove spray gun from hose.
10. Open fluid supply lines and pressurize drum pumps to provide inlet fluid pressure of 150-200 psi:
    - 2:1 drum pump air pressure of 75-100 psi.
    - 3:1 drum pump air pressure of 50-70 psi.
11. Energize IS40 power circuit at distribution or main panel.
12. Turn on IS40 power switch (side of control panel). Startup screen will appear in 30-60 seconds.
13. If the Proportioner and Hoses were configured together at the factory skip steps 13a to 13d. If the Proportioner was not configured at the factory, then configure hoses as shown as shown in DISPLAY SCREENS "SETTINGS SCREENS-DISPLAY SETTINGS."
    - From main menu, open Settings > Hose.
    - Select hose configuration.
    - Press Unpair Modems - Once completed press Pair Modems - Ensure no other IntelliSpray Machines are On when pairing modems.
    - 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 DISPLAY SCREENS "EXAMPLE 1-INITIAL SYSTEM BLEED" for detailed instructions on first time system purging.
15. Follow the quick start instructions in chapter "QUICK START GUIDE" to begin spraying.

⚠ WARNING

Installation of the IS40 exposes installers to high voltages and high fluid pressures. Sever injury or death can result from incorrect installation or installation techniques.

NOTICE

The IS40 requires QuickHeat™ hoses for operation. Do not substitute QuickHeat™ hoses with other hose brands.

INSTALLATION PROCEDURE

STEP 1. UNPACK THE UNIT

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

After the carboard covers and top sheet are removed, put the pallet with the IS40 near the desired location for installation. Leave adequate room to work around the unit when it is removed from the shipping pallet.

Remove the four screws (1) that keep the IS40 attached to the pallet. Lift the unit off the pallet by the tubular frame members, and use ramps or blocks to slide or walk unit down to floor level as needed.

STEP 2. PUT IN PREFERRED LOCATION

Slide, lift, or “walk” the unit into the desired location. Slide the unit on plastic or carboard sheets to position the IS40. Keep adequate room behind, above, and beside the unit to route the power cable and supply hoses.

⚠ WARNING

The IS40 weighs approximately 585 lbs. Use caution to prevent unit tip-over and injury to the installers.

STEP 3. SECURE THE UNIT

If the IS40 is to be used in a mobile of seismic environment, the frame must be secured to a rigid floor and wall using 5/16” (or larger) grade 8 fasteners and washers.

The IS40 frame has integral floor and wall mounting brackets for this purpose.

Use eight bolts or lag screws to secure to the flooring, and four to secure the unit to the wall. Additional support members, through-wall bolts, and external braces may be required depending on the wall's strength.

⚠ WARNING

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

Floor mounting brackets on frame

STEP 4. TURN OFF ELECTRICAL POWER

Verify the IS40 is on a dedicated 80A 200-240V 3-Phase or 60A 380-415V 3-Phase + Neutral protected circuit.

Make sure that the supply branch circuit is turned off and appropriate lock-out-tag-out safety measures are in place. This prevents personnel from accidentally energizing the circuit during installation.

⚠ WARNING

Make sure the electric power is turned off to the IS40 before the electrical connections are made, or when the Control Module is open.

Wall mounting bracket on frame

STEP 5. MAKE ELECTRICAL CONNECTIONS

Confirm the IS40 rotary disconnect switch is in the "OFF" (O) position.

Open the Control Module by rotating the upper and lower front cover latches on the 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 IS40 (suitable for 22mm to 32mm cable diameters).

Tighten the gland nut to secure the cable. A 2/4 SOOW power cable is suitable for most installations, 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 with an M6 hex key torqued to 35 in-lb. Note: From SN 1094 and after, the ground lug was moved below the main terminal block and is labeled.

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

⚠ WARNING

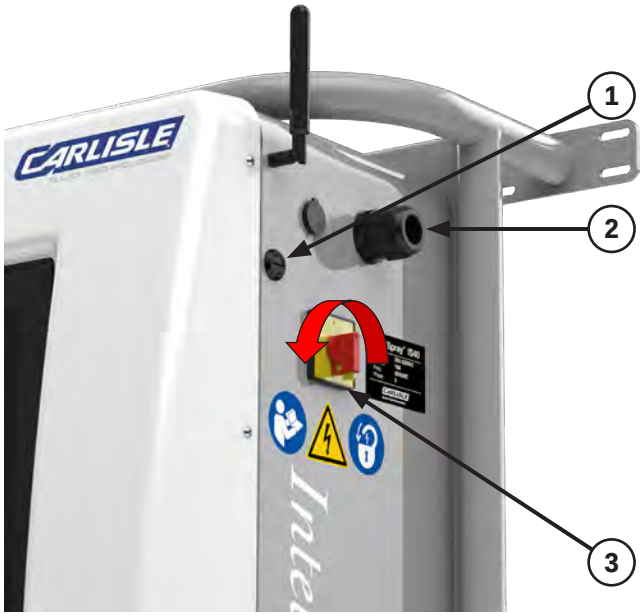
The installer is responsible for selecting the power cable or wire that has the appropriate ampacity and environmental ratings for the IS40 system. The use of undersized power cables or wires can result in electrical shorts and/or fire.

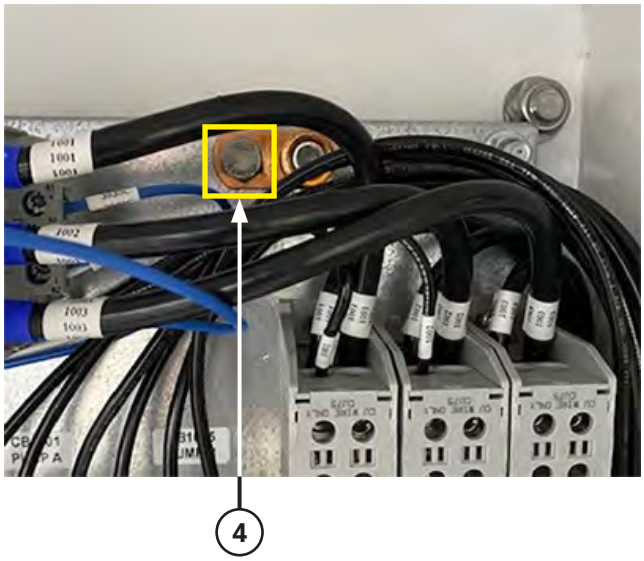
⚠ WARNING

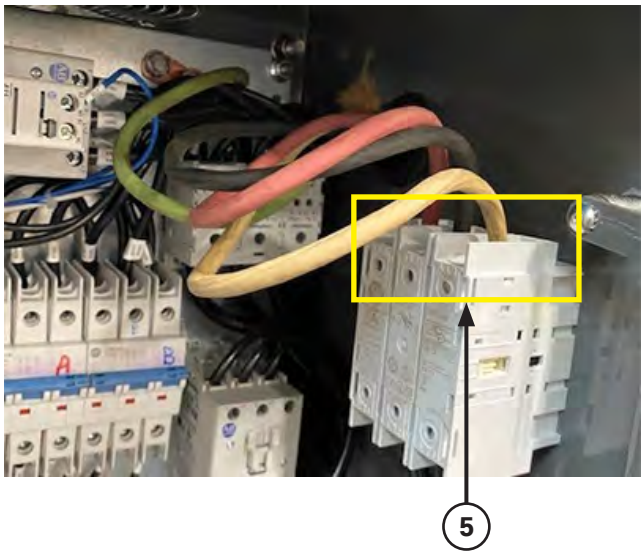
The installer is responsible assuring power and ground connections are secure and conductors are not damaged. Loose or damaged connections can lead to fire, serious equipment and/or property damage, physical injury or death.

INTERIOR CONNECTION DESCRIPTION

1. Front Cover Latches
2. M40 x 1.5 Cable Gland
3. Power Switch
4. Ground Wire Lug (35 in-lb)
5. Power Connections (55 in-lb)







STEP 6. QUICKHEAT™ HOSE CONNECTION

Remove Master Modem cover by removing x2 M5 screws (Item 1). 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 damaged fluid fittings may require a complete hose section replacement. Apply spray-gun grease to the A side JIC threads for easier removal if service is required.

Secure the modem into its retention bracket with the upper and lower hose clamps. Tighten the retention bolts to 15 lb-ft. Plug in the A and B heater power plugs to their respective mating connectors (each is labeled by zone and side). No tools are required.

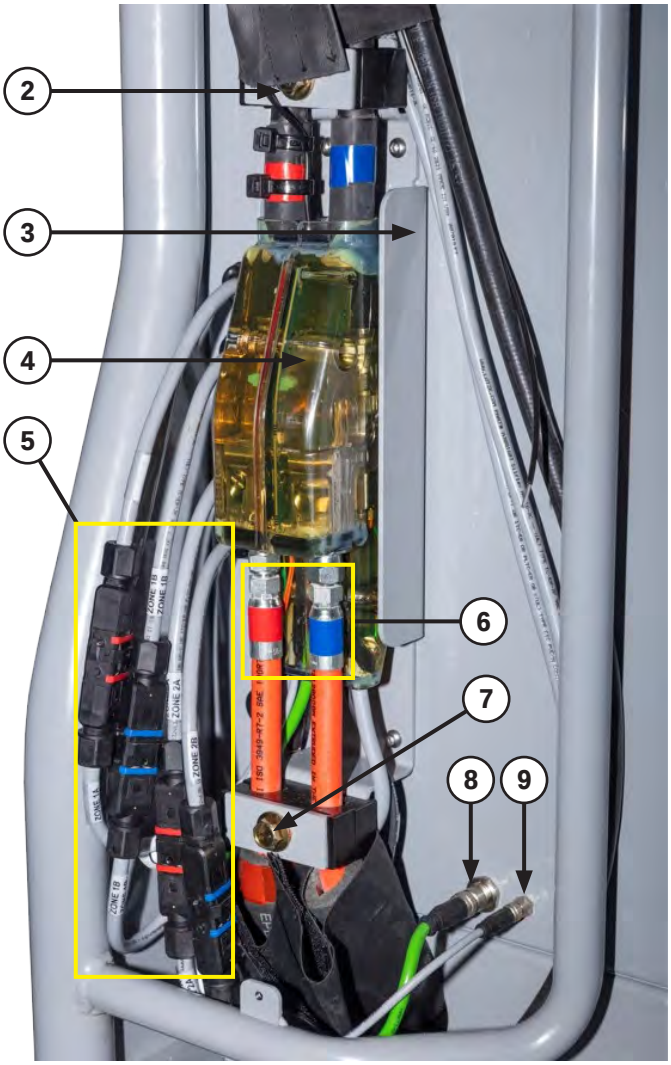
Connect the hose DC power and communication cables to their respective sockets on the side of the IS40. Take care to align the connectors in their keyed position, insert, and then tighten the retention ring. No tools are required.

Connect the gun air hose (contained in the QuickHeat™ Hose assembly) to the rig air supply with a 1/4” type M quick disconnect. 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.

QUICKHEAT™ HOSE CONNECTION DESCRIPTION

1. Master Modem Cover M5 Screws
2. Upper Hose Clamp (torque to 15 lb-ft)
3. Master Modem Bracket
4. Master Modem
5. A/B Hose Heater Power Connectors
6. A/B Jumper Hose Connectors
7. Lower Hose Clamp (torque top 15 lb-ft)
8. Hose Communication
9. Hose 24V DC Power



STEP 7. FLUID SUPPLY AND RECIRCULATION CONNECTIONS

Begin with either the A or B fluid module, and loosen the M4" button head screws that holds the module cover to the pump module.

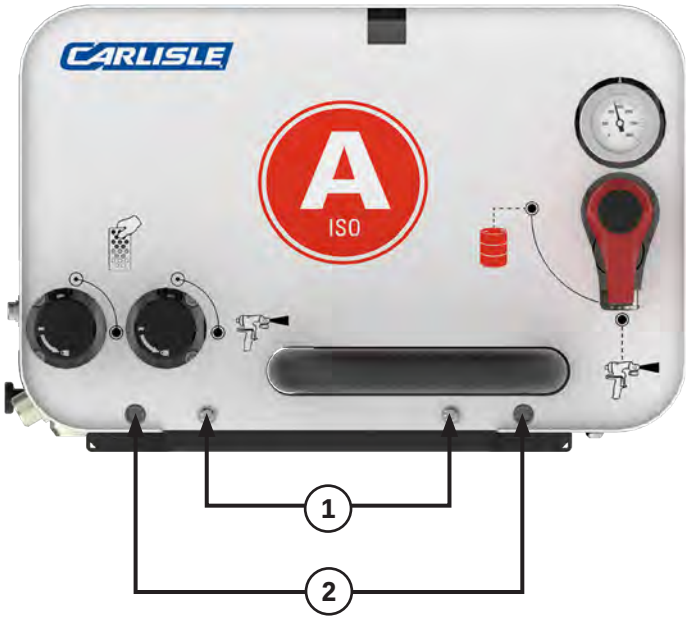
Pull the cover forward and over the valve handle to remove. Make sure the recirculation handle is fully down and aligned to the slot in the cover.

Loosen the two 5/16" socket head captive screws as shown. Pull the spring-loaded locking pin on the outside of the module.

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 gives easier access to connect the recirculation and supply lines.

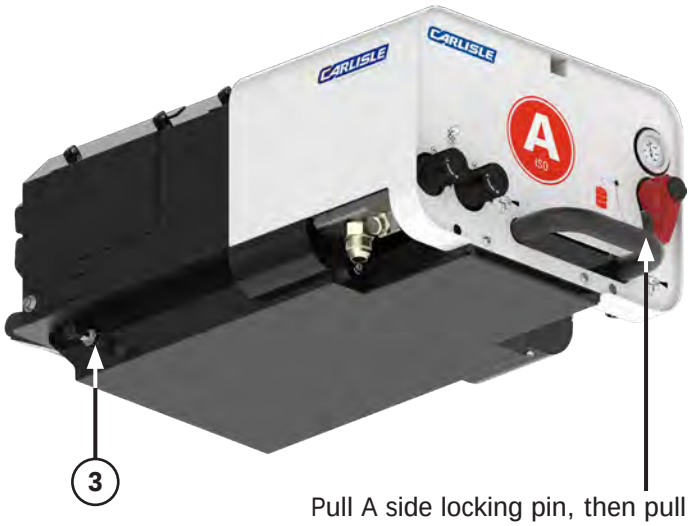
Connect the supply line to the male JIC 12 inlet fitting on the corresponding Fluid Module. Use installation kit PN 341133 (included with IS40) with 90° 3/4" sweep, swivel fittings, and ball valve for easier installation (shown on next page).

Make sure to connect the corresponding supply hose to the right module (A to A, B to B)!



CONNECTION DESCRIPTION

1. M6 Cover Screws (two per module)
2. 5/16" Captive Socket Head Cap Screw
3. A Side Locking Pin (pull to release)
4. Fluid Supply Hose Fitting (3/4" JIC 12)
5. Recirculation Hose Fitting (JIC 5 A, JIC 6 B)



Pull A side locking pin, then pull on front handle to slide module into servicing position.

Connect the recirculation line to the corresponding module (JIC 5 on A module, JIC 6 on B module).

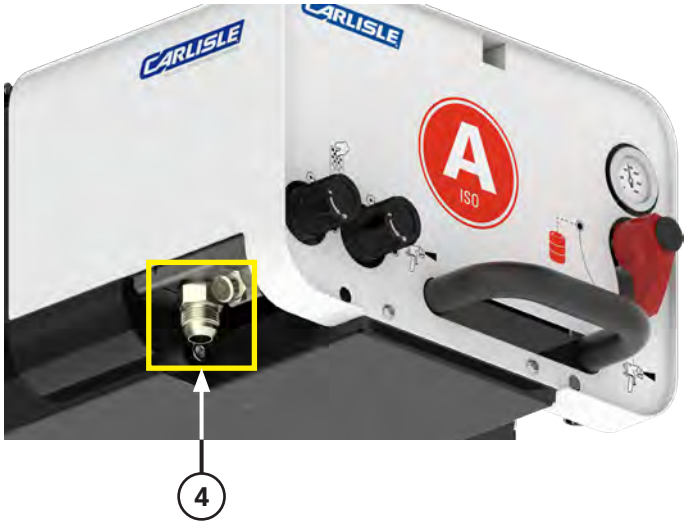
If required, use installation kit PN 341133 to connect to 1/4" NPT recirculation hoses.

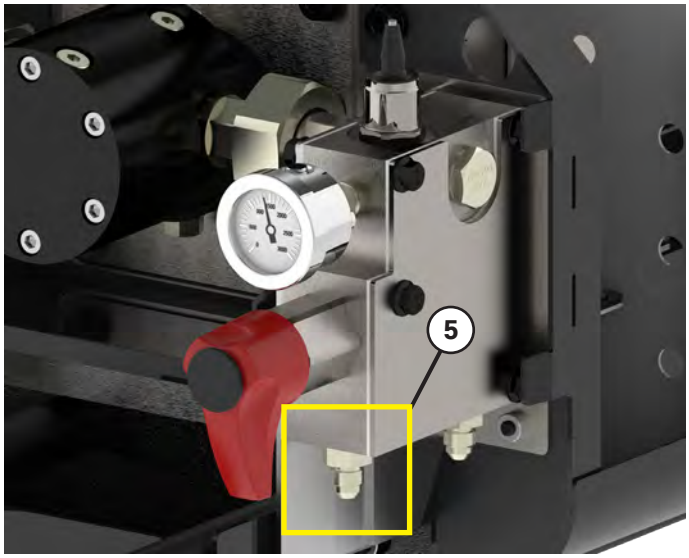
Do not overtighten JIC fittings as this may damage and require hose or fitting replacement. Applying spray gun grease to the A side JIC threads will allow easier removal for service if required.

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.

Replace module covers if removed and secure with M6 button head screws.

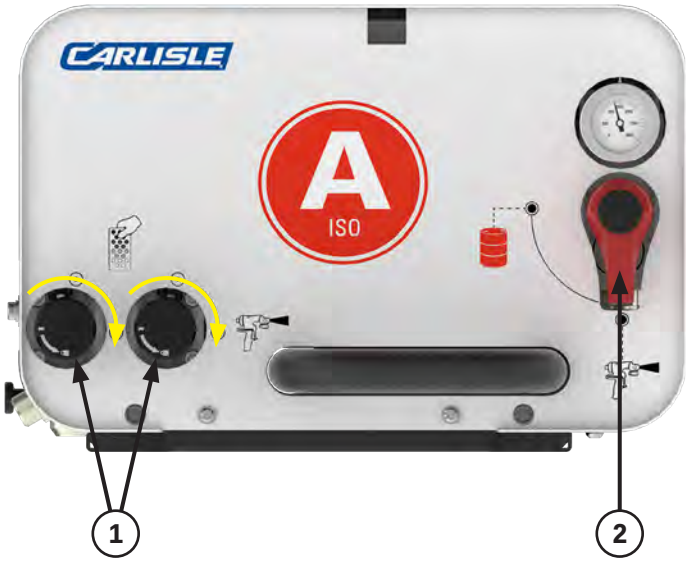




STEP 8. SET FLUID MODULE VALVES FOR MATERIAL PURGE

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

1. Filter Valve Open (turn clockwise to spray position)
2. Spray (Gun) Position (valve points down)



STEP 9. CLOSE GUN MANIFOLD VALVE AND SPRAY GUN REMOVAL

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.

STEP 10. FLUID SUPPLY LINES AND DRUM PUMP PRESSURIZATION

Examine the drum pumps are verify they provide fluid pressure to the IS40. Make sure that all ball valves on the supply lines are in the open position.

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

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

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

STEP 11. ENERGIZE THE POWER CIRCUIT

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

STEP 12. TURN ON THE IS40

Rotate the power switch on the side of the Control Module to the “ON” (I) position. The IS40 will display a startup screen while it performs internal system checks.

Once completed, the Spray Mode screen will be displayed (30-60 seconds after powering on).

STEP 13. CONFIGURE 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 DISPLAY SCREENS "SETTING SCREENS-HOSE CONFIGURATION" to set hose configuration, pair hose modems, and select communication frequency.

STEP 14. PURGE SYSTEM

To fill the IS40 and hoses with material, follow the instructions in DISPLAY SCREENS "EXCHANGE SCREEN" for first time system purging.

STEP 15. START THE IS40

Refer to the quick start instructions in the "QUICK START GUIDE" chapter to begin using the IS40.

QUICK-START GUIDE

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

STEP 1. PRIOR TO START-UP

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

CONNECTION DESCRIPTIONS

1. Filter Valve Open (turn clockwise to spray position)
2. Spray (Gun) Position (pointed down)

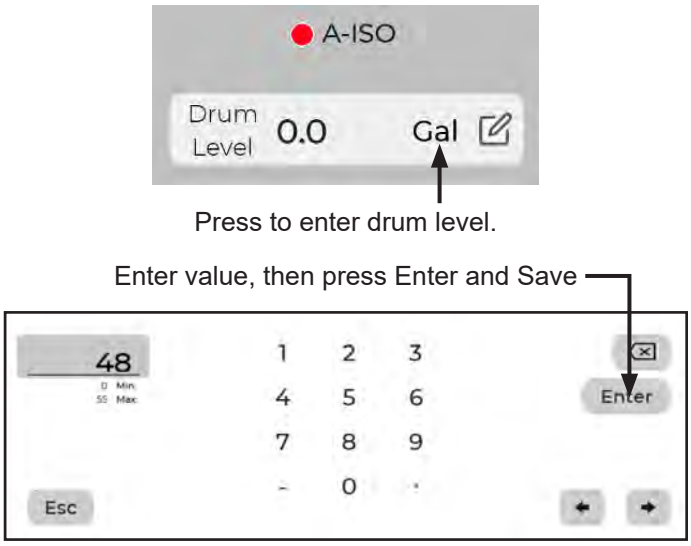
STEP 2. START THE UNIT

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

The IS40 will display a startup screen while it performs internal system checks. Once completed, the Spray Mode screen will be displayed. Note that the Exchange Mode screen can be set as the default startup screen if desired. See DISPLAY SCREENS "SETTINGS SCREENS-SYSTEM STATUS".

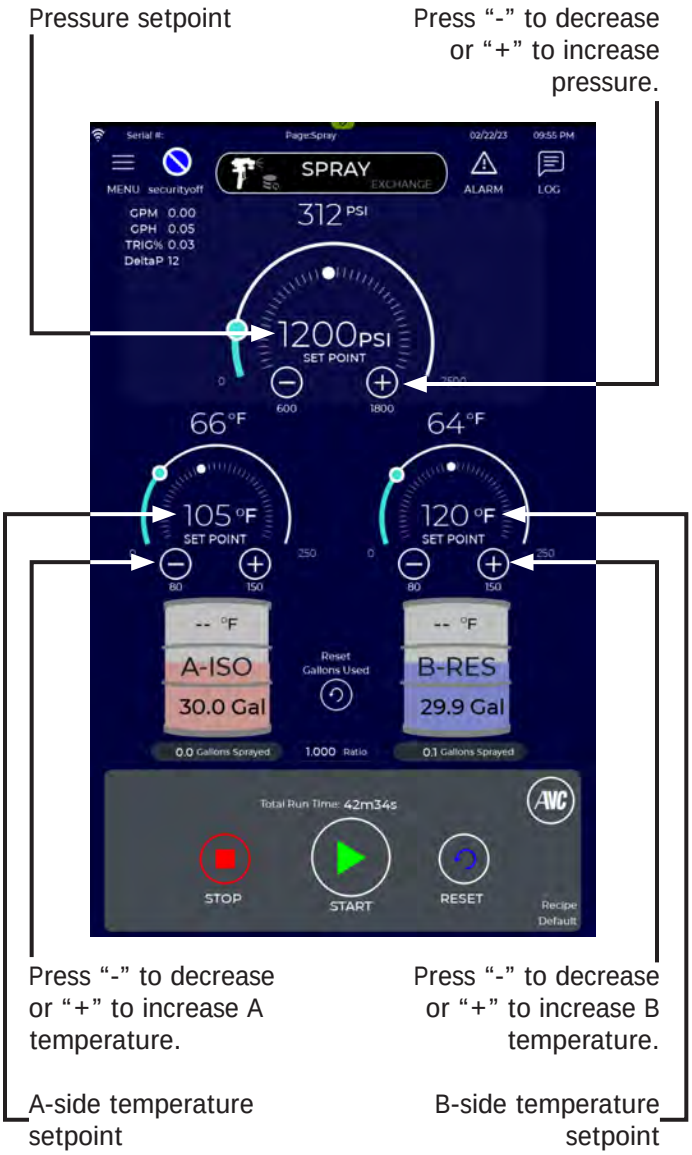
STEP 3. A-ISO AND B-RES FLUID LEVELS

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



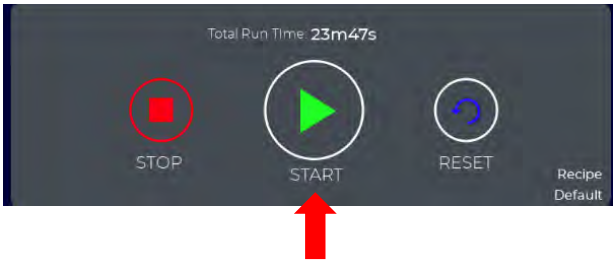
STEP 4. PRESSURE AND TEMPERATURE SETPOINTS

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

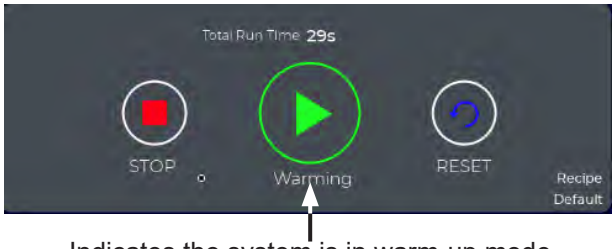


STEP 5. UNIT WARM UP

Press the "START" button to begin system warm-up.



After the button has been pressed, it will change from **START** to **WARMING,** then the button boundary will change from solid white to flashing green to indicate the system is in warm-up mode.



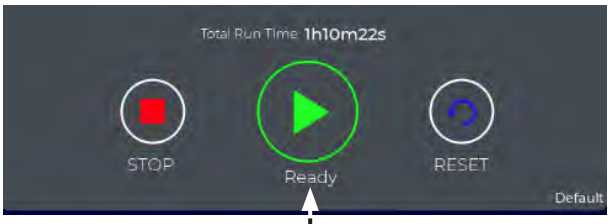
Indicates the system is in warm-up mode

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

NOTICE

If the IS40 detects a slow warmup in one of the hose temperature sensors, the "START" button will change to a flashing yellow “WARMUP BYPASS” button.

A button press will put the system into "READY" mode. See Section 16 "STEP 5. START THE PROPORTIONER" for more information about the WARMUP BYPASS feature.



Indicates the system is ready to spray

STEP 6. GENERAL UNIT OPERATION

If required, spray out any cold material in the unheated whip, then start spraying.

If drums are changed, enter the new fluid level and continue spraying. (refer to STEP 3).

If errors occur, correct the issue, press the "RESET" button, then the "START" button (refer to STEP 5).

When finished spraying, press the "STOP" button.

To power off the unit, rotate the power switch on the right side of the control module ot the "OFF" position (indicated by the character “0”).

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) make 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 (see DISPLAY SCREENS "EXAMPLE 5-B SIDE AIR PURGE"). Dry system operation 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, IS40, 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.

⚠ CAUTION

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

⚠ CAUTION

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

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DISPLAY SCREENS

DISPLAY SCREENS–OVERVIEW

The IS40 Proportioner uses a 15.6 inch high resolution capacitive multi-touch color display for all user interaction.

The wide-angle display is mounted on the front of the Control Module in portrait mode, similar to how a user interfaces with a mobile phone. The display is designed to 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 the "REMOTE ACCESS" chapter for more details about remote monitoring and control. As delivered, the IS40 is set to English language and SI units of measurement. Refer to the "LANGUAGES" chapter to change these settings.

DISPLAY SCREEN OVERVIEW	
Specification	IS40
Display	15.6” TFT LED
Resolution	1920 x 1080 WXGA
Colors	16M
Brightness	500 Cd/m^2
Touchscreen	True Glass Projected Capacitive, Multitouch
Operating Temperature	-20° to +60 °C
Protection Class	IP66 (front)

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 IntelliSpray 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 the "TROUBLESHOOTING" chapter for error messages and diagnostics).

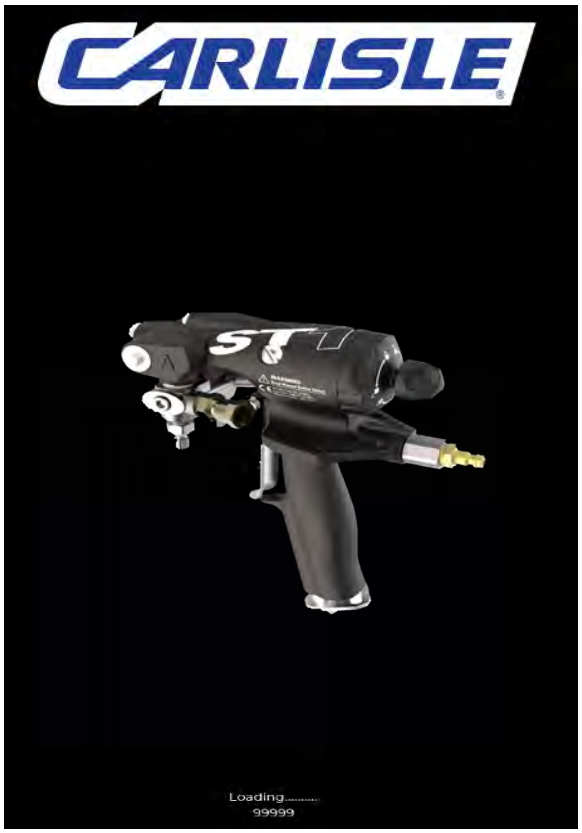
Within 30 - 60 seconds the display will change to either the Spray Mode screen or the Exchange Mode screen. While the Spray Mode screen is the factory set startup screen, users can change this to Exchange Mode if desired (see DISPLAY SCREENS "SETTINGS SCREENS-DISPLAY SETTINGS").

The IS40 operates in one of two **Modes**, Spray Mode or Exchange Mode.

In Spray Mode the system controls all heater zones (A and B preheaters and up to 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). **The ratio is adjustable using the Variable Ratio Key.**

BOOTUP SCREEN



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.

Close pull-down menu		
Close pull-down menu		56
Spray Mode (active mode)		57
Exchange Mode (grayed out means not active)		70
Alarm Screen (current and historical warnings and errors)		86
System Status and Diagnostics (in submenus)		91
System Settings		105
Recipes (for recalling, creating, saving, editing deleting recipes)		128
Reports (in submenus)		139
Languages (in submenus)		151
Double arrows indicates submenus exist for these items		

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.

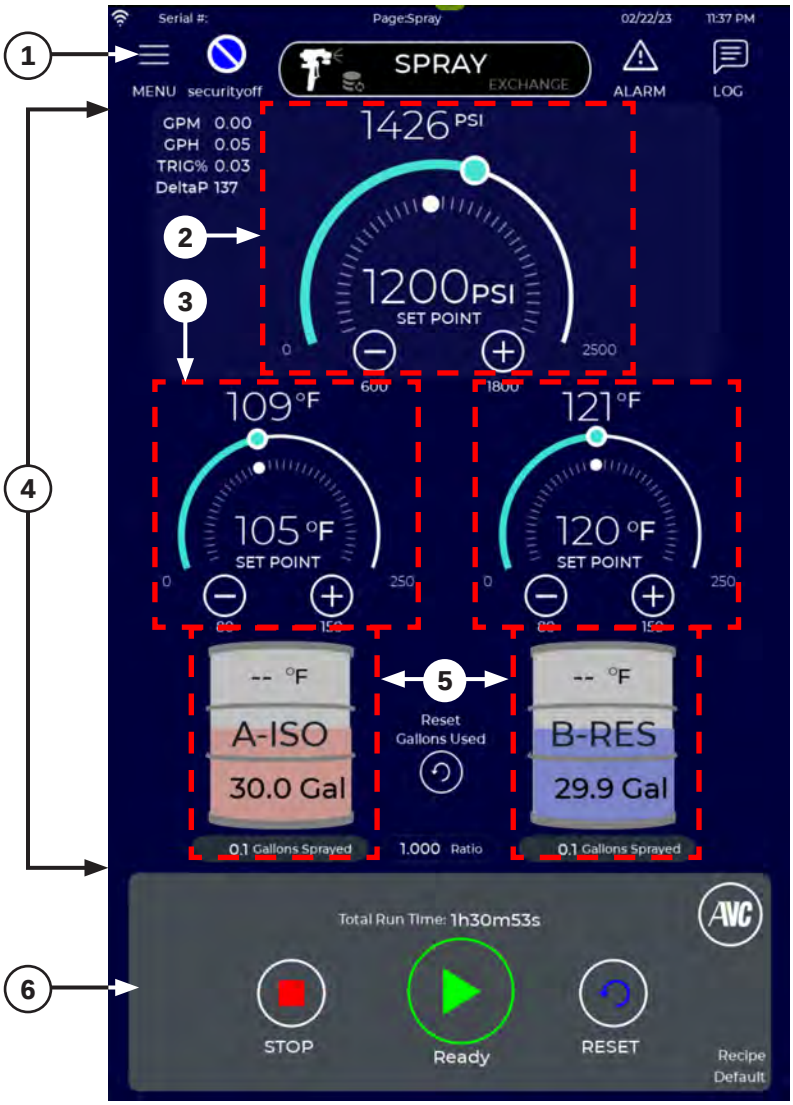
NOTE: Pressure and temperature setpoint locations shown on the Spray Screen are at the end of the last distribution hose located at the smart end.

1. Modes & Screens Access Menu
2. Pressure Widget
3. Temperature Widgets
4. Display & Enter System Operating Parameters
5. Drum Widgets
6. Screen Control System State

This makes sure that the IS40 delivers the most consistent performance regardless of material flow rates, viscosity, hose length, elevation changes, or environmental and other work conditions. A high level overview of the Spray Screen is shown below.

NOTICE

Temperatures and Pressures are measured at the last hose modem section and spray gun.

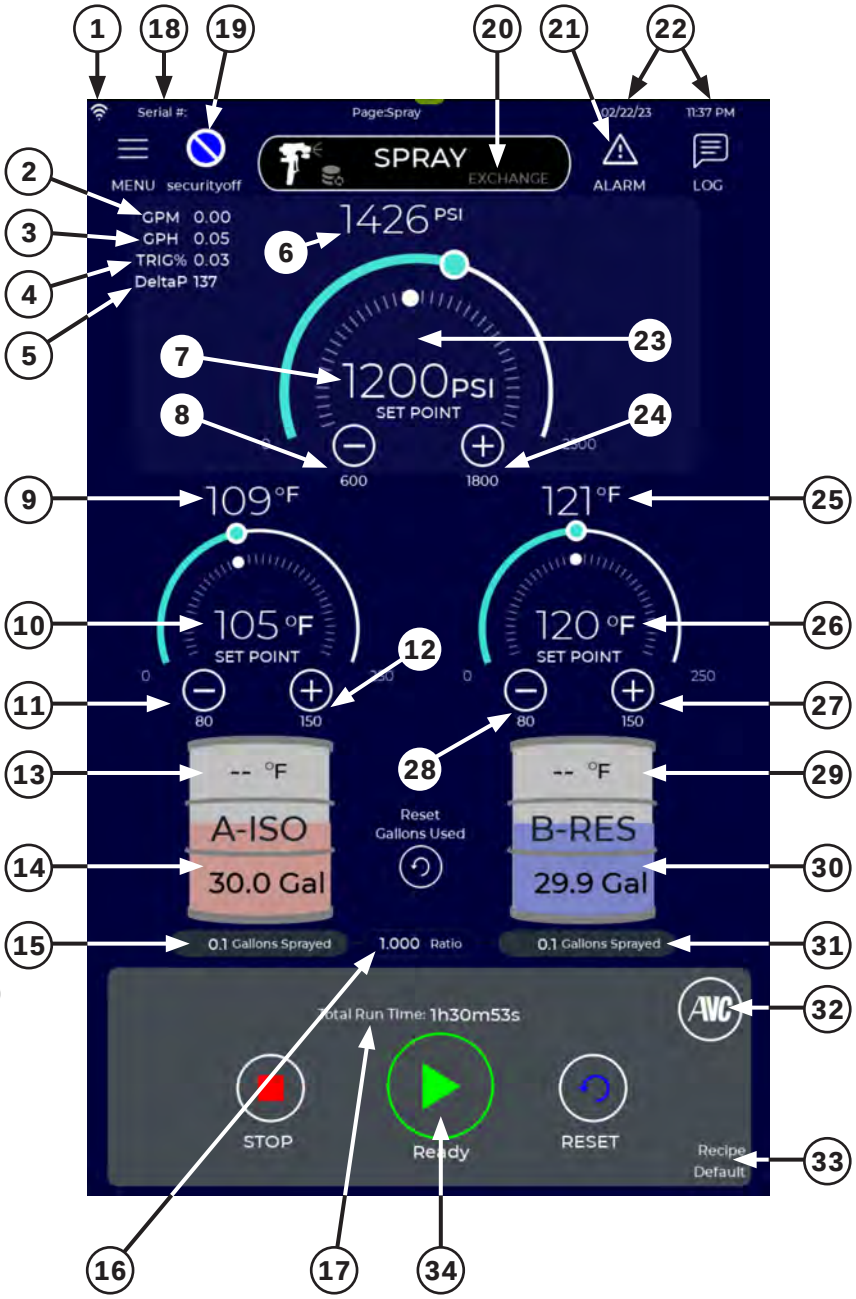


[1]Job logging and Security are disabled. See "SETTINGS SCREENS-SYSTEM STATUS" and "REPORTS-OVERVIEW" for more information on Job logging and Security.

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.

1. Remote Connection Established (if icon shown)
2. Real-Time Flow Rate
3. Average Flow rate
4. Trigger On %
5. Pressure Difference
6. Pressure
7. Pressure Setpoint
8. Minimum Setting
9. A-Temperature
10. A-Temperature Setpoint
11. Minimum Setting
12. Maximum Setting
13. A-Drum Temperature
14. A-Drum Fluid Level
15. A-Material Sprayed (since counter reset)
16. Real-Time Ratio A:B
17. Total "Ready" Time (since system was last started)
18. Serial Number
19. Current User (if Security is enabled)
20. Active Mode
21. Alarm Indicator (red if there is an active alarm and a dialog box appears with errors)
22. Current Date and Time
23. Gauge Icons (shown here to indicate the inlet compensation is enabled)
24. Maximum Setting
25. B-Temperature
26. B-Temperature Setpoint
27. Maximum Setting
28. Minimum Setting
29. B-Drum Temperature
30. B-Drum Fluid Level
31. B-Material Sprayed (since counter reset)
32. AVC™ Status (White=Off, Green=On)
33. Current Recipe
34. System State

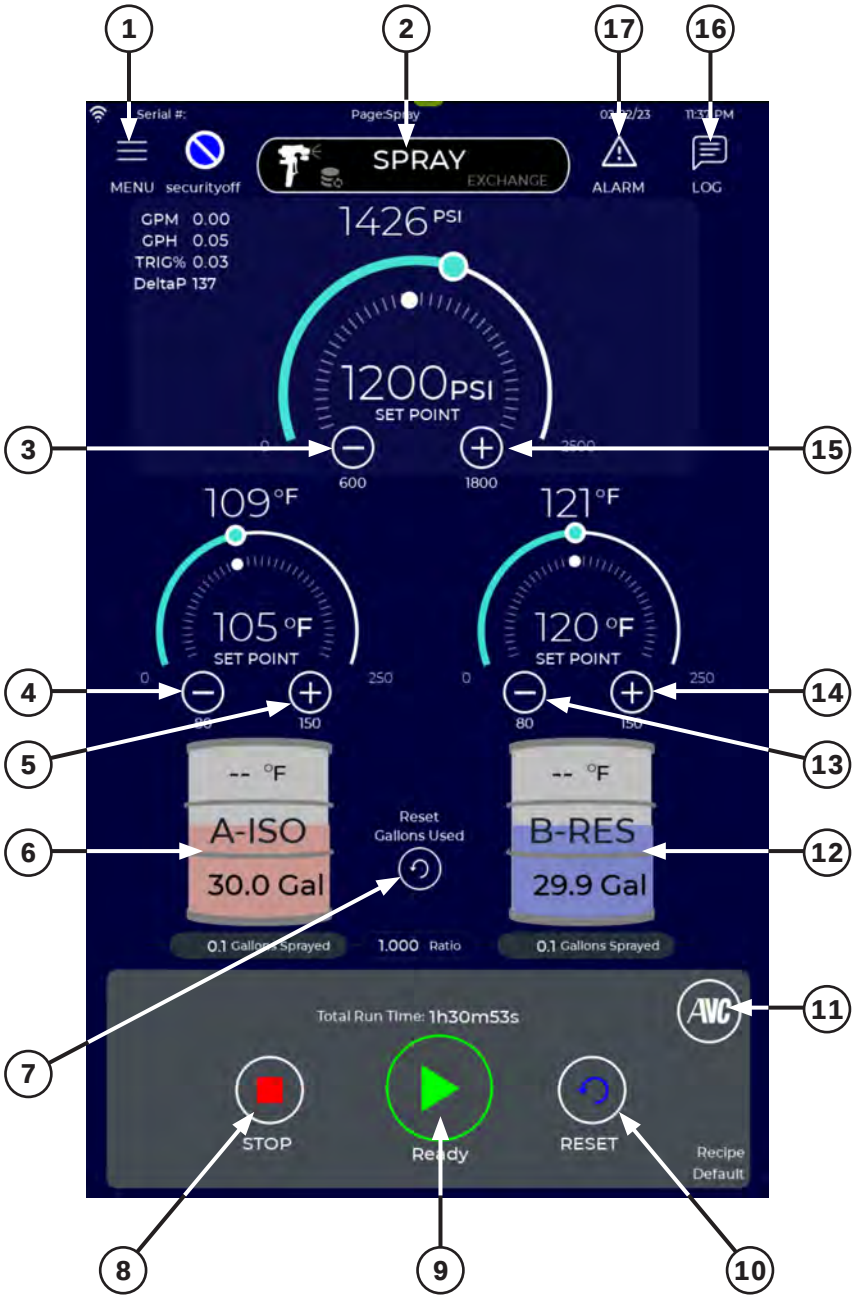


[1]Job logging and Security are disabled. See "SETTINGS SCREENS-SYSTEM STATUS" and "REPORTS-OVERVIEW" for more information on Job logging and Security.

SPRAY SCREEN1–USER ACTIONS

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

1. Pull-Down Menus (see "DISPLAY SCREENS-OVERVIEW")
2. Home and Mode Select Button
3. Pressure Setpoint (press to decrease)
4. A-Temperature Setpoint (press to decrease)
5. A-Temperature Setpoint (press to increase)
6. A-Drum Pop-Up Widget (press to open)
7. Fluid Counter Rest (shown when "JOB REPORTING" is disabled)
8. System Stop (shuts off heaters and pumps)
9. System Start (initiates heating and pressurization)
10. System Reset (clear error condition)
11. AVC™ Button (press to toggle on/off)
12. B-Drum Pop-Up Widget (press to open)
13. B-Temperature Setpoint (press to decrease)
14. B-Temperature Setpoint (press to increase)
15. Pressure Setpoint (press to increase)
16. Log Buttons (see "REPORTS-JOB NOTES")
17. System Alarms (see "ALARM SCREEN-OVERVIEW")



[1]Job logging and Security are disabled. See "SETTINGS SCREENS-SYSTEM STATUS" and "REPORTS-OVERVIEW" for more information on Job logging and Security.

SPRAY SCREEN–USE

The Spray Screen is the factory default startup screen. Users can change the startup screen to Exchange Mode if desired (see "SETTINGS SCREENS-DISPLAY SETTINGS").

The operator uses the Spray Screen to enter the pressure and temperature setpoints to be maintained at the beginning of the Smart End (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 temvperatures, which are entered using on-screen buttons. If AVC™ is enabled only a single temperature setpoint is required (see DISPLAY SCREENS "SPRAY SCREEN-AUTOMATIC VISCOSITY COMPENSATION").

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

STEP 1. SET PRESSURE

The pressure setpoint is retained from the last time the system was powered off. To decrease, press the down (negative) button.

Press the up (positive) button in the Pressure Widget to increase. 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 gauge.

The actual pressure value is shown above the gauge and by the moving dot and circular bar. The maximum and minimum settable pressure is shown below the setpoint buttons. The default maximum gauge range is 2500 psi. These settings can be changed in the Recipe menus (see "RECIPES SCREEN-OVERVIEW").

Press to decrease pressure

Press to increase pressure

STEP 2. SET A & 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 gauge. The actual temperature value is shown above each gauge and graphically on the gauges by the moving dot and circular bar.

The maximum and minimum settable temperatures are shown below the setpoint buttons. The default maximum gauge range is 2500 psi. These settings can be changed in the Recipe menus (see "RECIPES SCREEN-OVERVIEW").

Temperature setpoint (press to decrease)

Temperature setpoint (press to decrease)

NOTICE

Temperature and Pressure shown on the Spray screen are shown at the start of the heated hose whip near the spray gun. If a user is accustomed to system operation control at the Proportioner, the user will need to set lower pressures by 1-3 psi per foot of hose. This is dependent on viscosity and flow rate.

STEP 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 "SETTING SCREENS-PREHEATERS").

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 "SETTING SCREENS-PREHEATERS" for information.

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

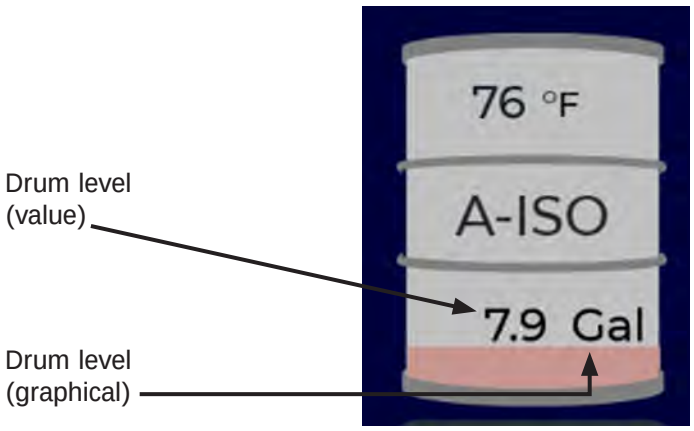
To enter the drum level, press anywhere on the drum icon (A or B) and a pop-up window appears that for entering the amount of fluid in the drum.

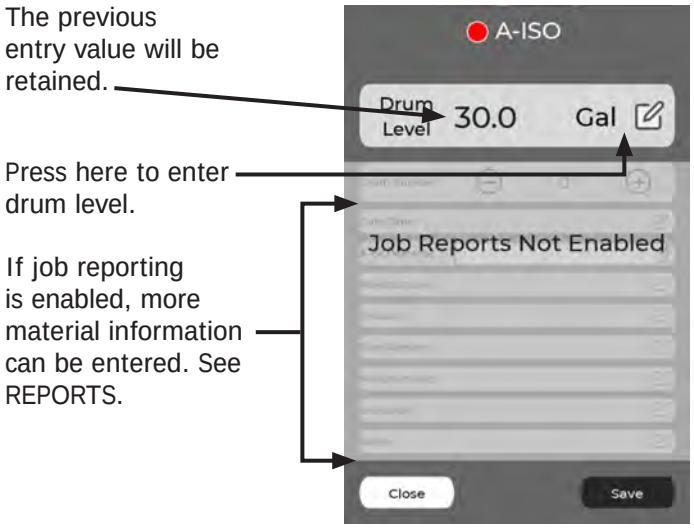
When the pop-up window appears, press the drum level and enter the value using the on-screen keypad. Press the Enter button then the Save button on the pop-up window. The new value will be displayed on the drum and the graphical level indicator on the drum icon will be reset.

⚠ CAUTION

Always verify A and B drum levels before the spray operation. Enter new values if needed. Do not let the drums empty of fluid during operation.

Change or refill drums before the fluid is empty as drum pumps can inject air into the Proportioner. Air that is injected into the Proportioner can damage it and cause off-ratio spray operation.





STEP 4. CHECK FLUID VALVES

Make sure the fluid lines are pressurized and open, then turn the filter valves clockwise and make sure the recirculation valve is set to the spray position as shown.

Spray (Gun) Position

STEP 5. START THE PROPORTIONER

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

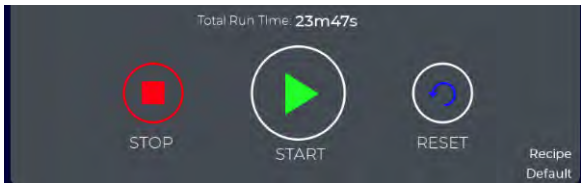
The center button will change from "START" to "WARMING", and the button boundary will change from solid white to flashing green to indicate the system is warming up. Pressing the "STOP" button at any time turns off heaters and pumps.

If the IS40 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. Fluid spray operation will usually correct this issue by moving the heating element within the hose.

Spray (Gun) Position

After the IntelliSpray Proportioner reaches the temperature setpoints (usually about 10 minutes from a cold start) the system will pressurize to the user setpoint pressure and the "START" button will indicate the system is "READY" to spray. Once the system is in "READY" state, the spray operation can begin.



Press to Start System

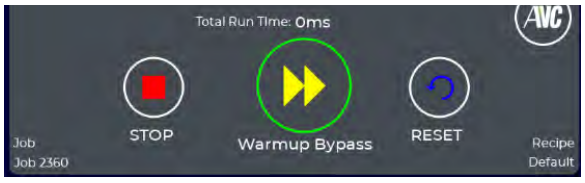
NOTICE

Do not start the spray operation until the button changes to the "READY" state.

Indicates system is warming up

STEP 6. PAUSE OR STOP

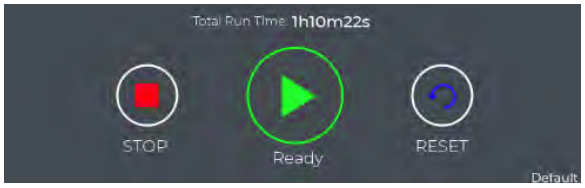
When finished spraying, or if taking an extended work break, simply press the "STOP" button. This removes power from the heaters and pumps. To restart the system, simply press the start button again.



Indicates system is warming up

⚠ CAUTION

When the system is in the STOP mode or the Proportioner is turned off, the A and B fluids in the Proportioner and Hoses will be at higher temperatures and pressures. This condition can cause personal injury or property damage.



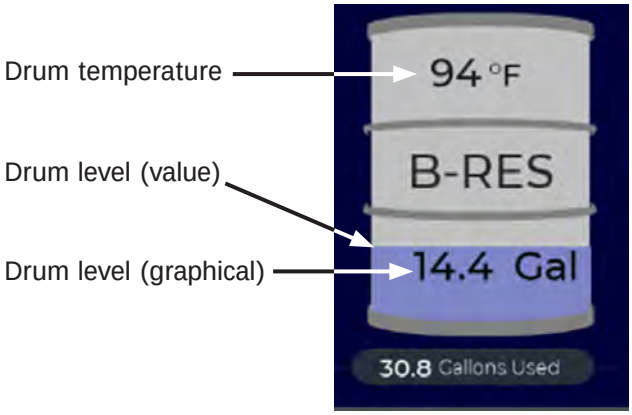
Indicates system is ready to spray

SPRAY SCREEN–OTHER FUNCTIONS

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

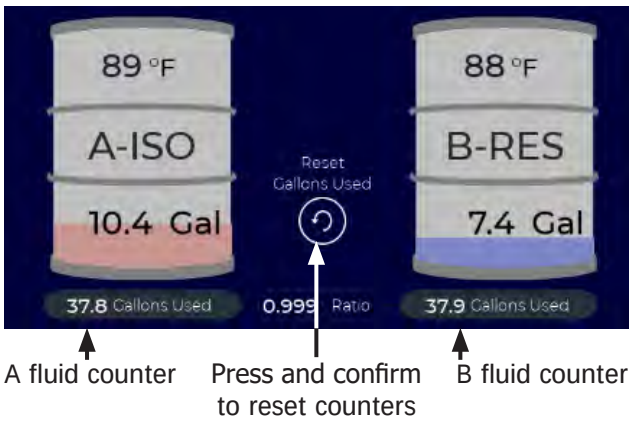
DRUM TEMPERATURE

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 "EXAMPLE 4-PREHEAT B DRUM MATERIAL").



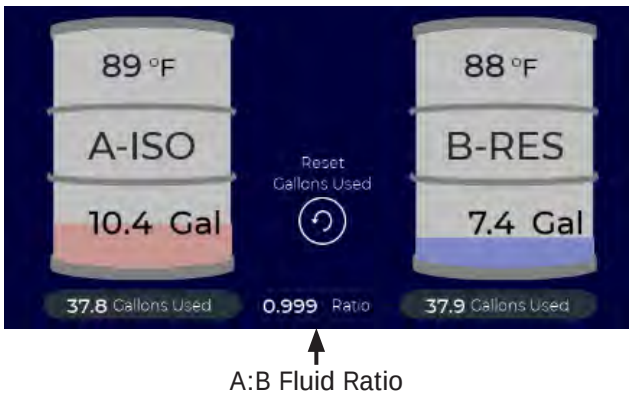
FLUID COUNTER

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

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

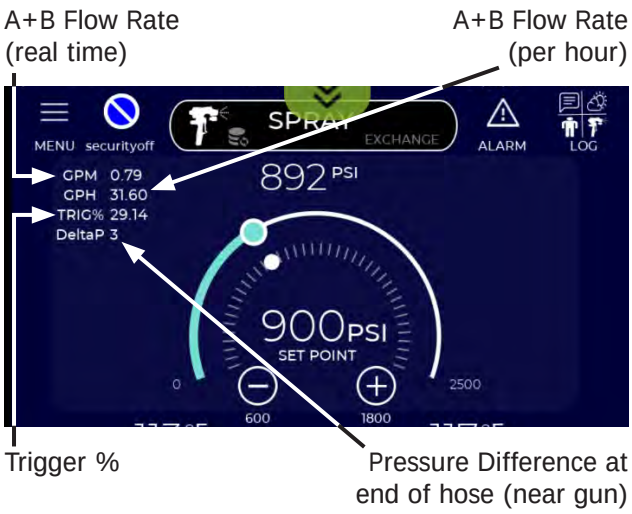


FLOW RATE AND TRIGGER %

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.



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.

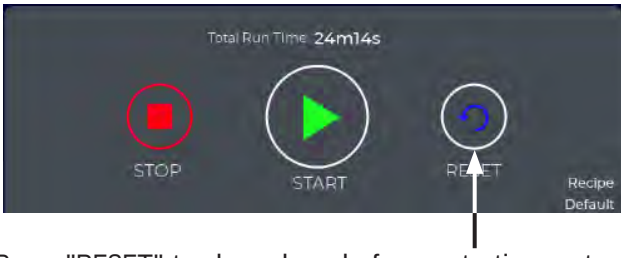
Alarms can be either Warnings or Errors. Warning Alarms do not stop the system, but must be addressed before they create an Error condition. Warnings are indicated by a Yellow Alarm Icon and a dialog box.

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 "ALARM SCREEN" in this manual for more information).

In the example shown at the right, the A Drum level has dropped below the error limit level to cause the system to "STOP" and the alarm to activate. Additionally, the corresponding material icon will flash 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 the "START" button is pressed to continue the spray operation.



PREHEATER TEMPERATURE OFFSET

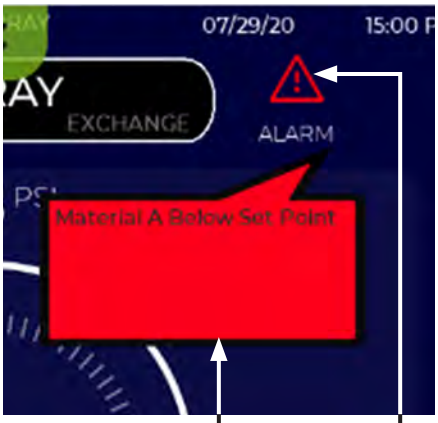
In some cases, it may be desirable to run the A and/or B preheaters at a temperature offset from the setpoint.

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, keep the temperature of the B material cool as it will result in a higher viscosity in the gear pumps.

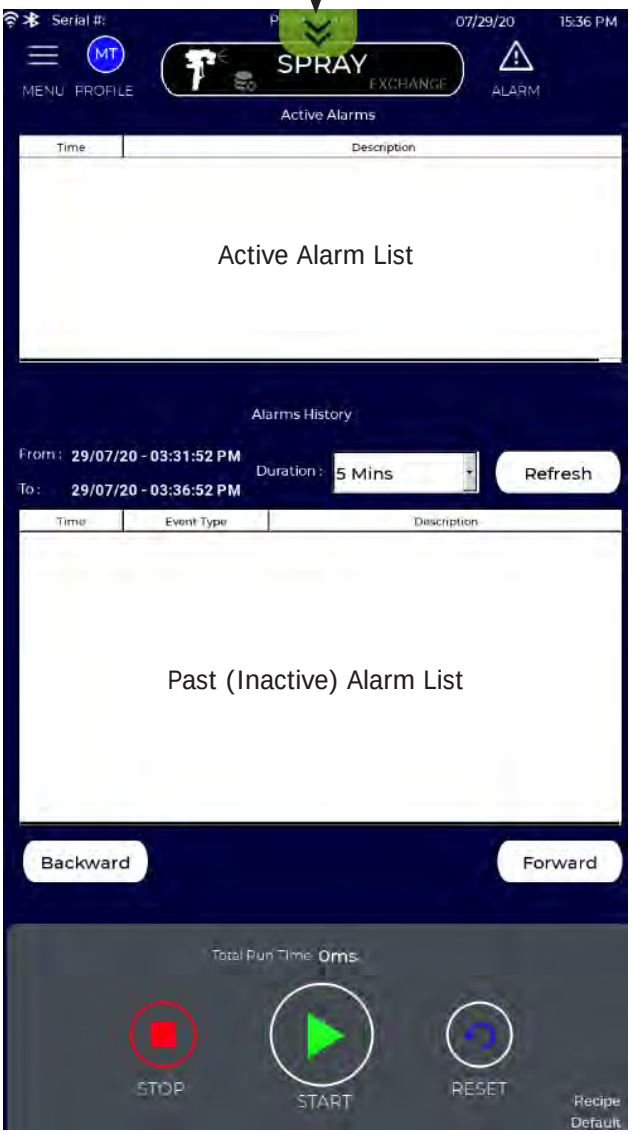
The hose heaters may have to work harder to elevate the temperature to the setpoint, but in most cases that is not a problem. A preheater offset can be entered in the active Recipe (see "RECIPE SCREENS"). If a preheater offset is entered it will show in the temperature widget as shown below.

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 "ALARM SCREENS" for more information on the Alarm Screen.



Press to see more information on alarm



INLET COMPENSATION

When Inlet Compensation is enabled, a small dial icon is shown within the Pressure Widget (as shown).

Inlet Compensation is disabled from the factory, but can be enabled in the Recipe Pressure Table (see "RECIPE SCREENS").

"SPRAY SCREEN-AUTOMATIC INLET COMPENSATION" provides more information about the Automatic Inlet Compensation mode.

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 is either: undersized, lacks adequate air pressure or flow, or leaks.

Reducing the pressure setpoint and/or gun chamber/ tip size can also be used to compensate for material starvation.

Icon indicates Inlet Compensation is enabled.

AUTOMATIC VISCOSITY COMPENSATION (AVC™)

IS40 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 "RESET" 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 to the 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 just 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

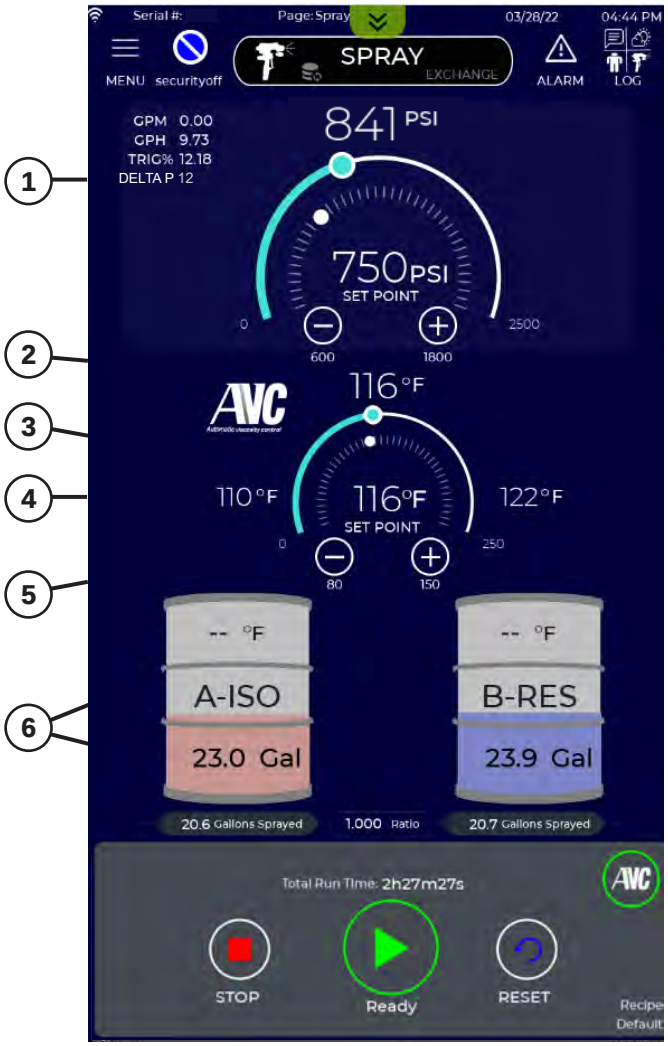
When AVC™ is active the dynamic pressure difference (Delta P) is shown in the upper left portion of the Spray Screen. Delta P is the actual pressure difference between the A and B fluids at the end of the distribution hose (nearest the gun).

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™.

Press the + or - buttons under the single temperature widget to increase or decrease the fluid mix temperature. 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.



1. Dynamic Pressure Difference (between A and B fluids at the end of the distribution hose).
2. Mix Fluid Temperature (actual).
3. User Temperature Setpoint (of the fluid “mix”).
4. A Side Temperature Setpoint (determined by AVC™).
5. B Side Temperature Setpoint (determined by AVC™).
6. AVC™ Enabled
   (green border with one temperature widget).

AUTOMATIC INLET COMPENSATION (AIC)

IS40 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.

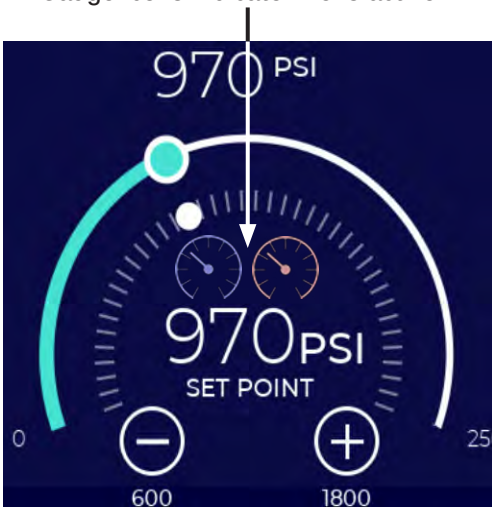
Fluid cavitation occurs when transfer pumps are unable to maintain adequate flow to the proportioner. Cavitation creates gaseous bubbles (frothing) in the fluid that can damage gear pumps, cause off-ratio spraying, and create cross-overs at the spray gun.

AIC is enabled by default, but it can be disabled in the active Recipe (see "RECIPE SCREENS"). **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 gauge icons will appear inside the Pressure Widget on the Spray screen. A red gauge icon indicates which side (left = A, right = B) low inlet pressure is sensed on. This is shown in the left-hand figure below.

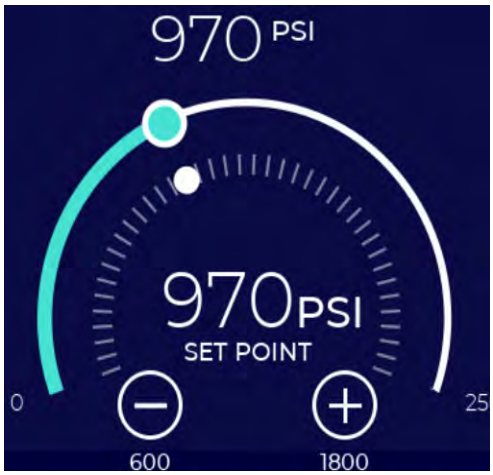
When AIC is active, the user will notice a slight pulsation or reduction in output. The fluid ratio will not be affected. If AIC is disabled in the active Recipe, the system will display a low pressure alarm and move to Stop state when the A or B pressure drops below 25 psi (1.7 bar).

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 table provides several possible causes and actions related to low inlet pressure.

Gauge icons indicate AIC is active.



AIC Active



AIC Inactive

AUTOMATIC INLET COMPENSATION ALARMS	
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

EXCHANGE SCREEN–OVERVIEW

When in Exchange Mode, the IS40 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).

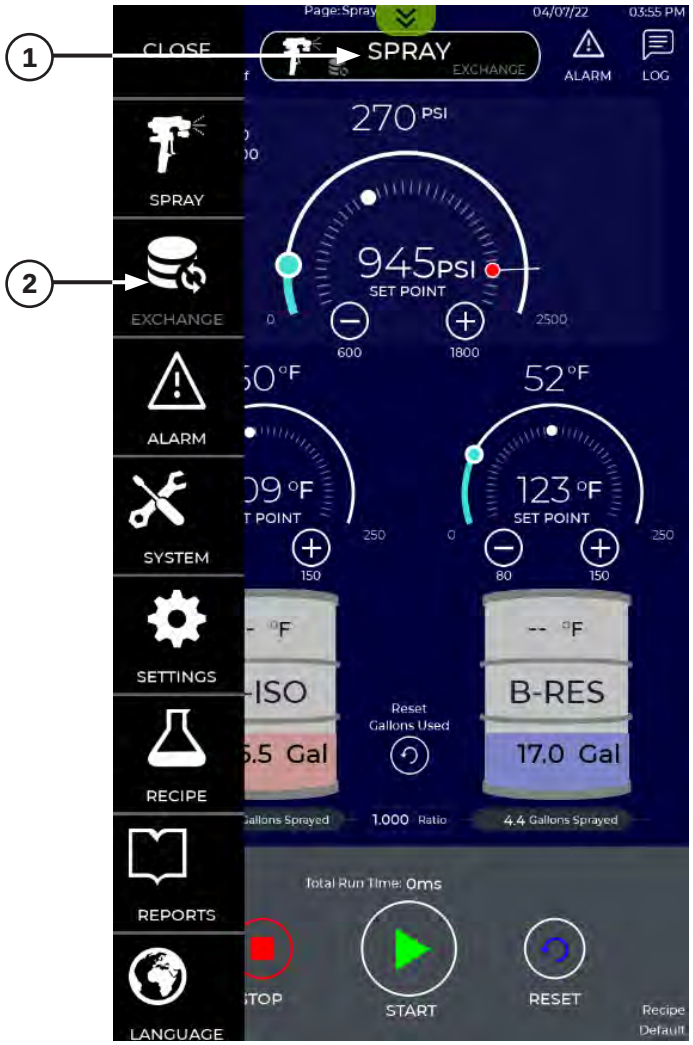
Fluid may be purged or recirculated from the proportioner or from the end of the hoses. The proportioner includes fittings for attaching purge or recirculation hoses to the fluid modules (see "FLUID MODULE").

Carlisle Fluid Technology provides a recirculation manifold with all IntelliSpray 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 re-quire 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.

1. Press Exchange Mode (shown in pull-down menu).
2. Press "MODE" Button (toggles to Exchange Mode).



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, Preheat, Hose, Preheat and Hose (both)

Method: Manual, Time, Amount, Temperature

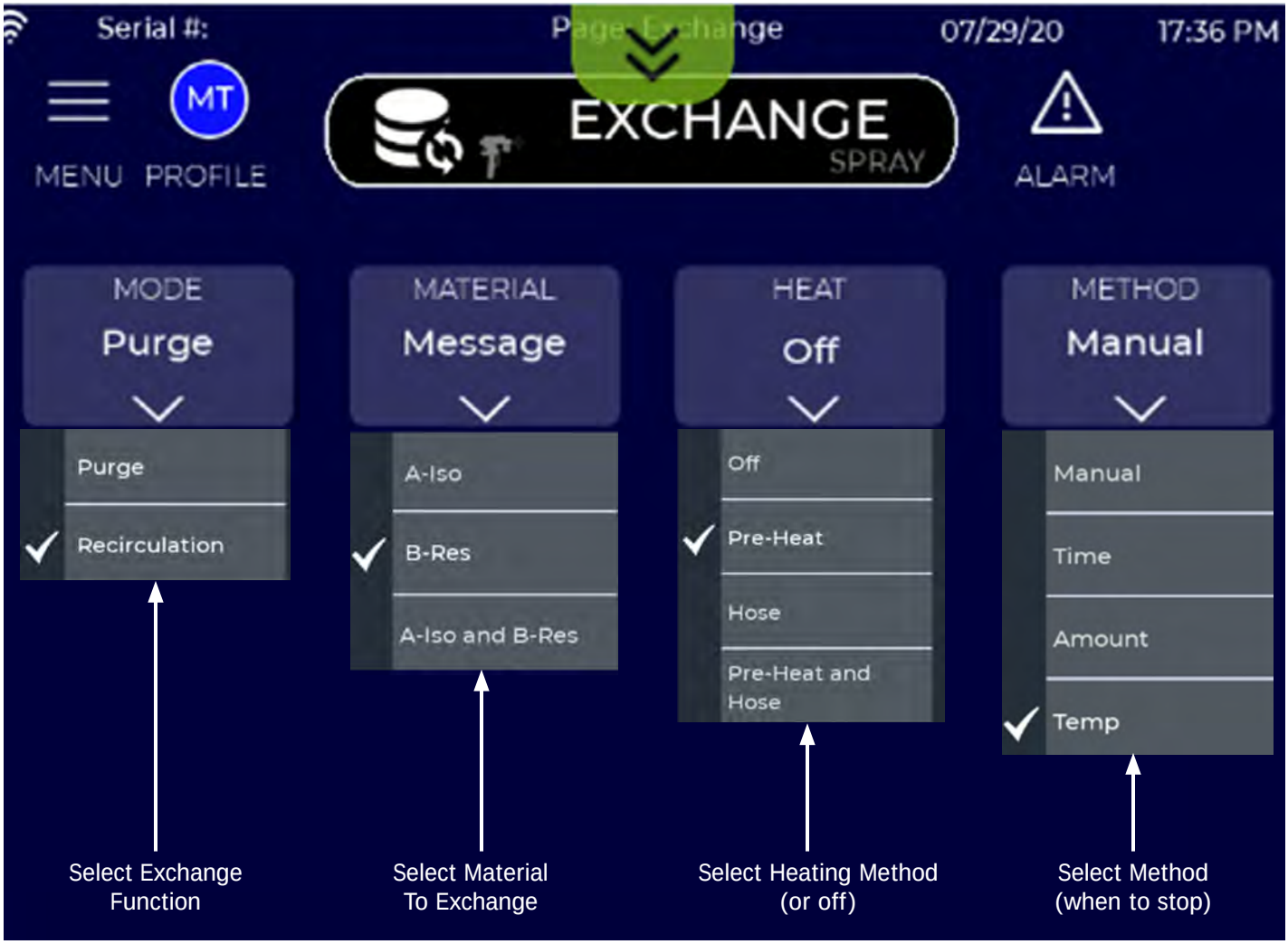
These parameters are selected using the pull down menus on the Exchange Screen.

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.



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.

STEP 1. SELECT FUNCTION

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

STEP 2. SELECT MATERIAL

Select **A-ISO**, **B-RES**, or **A-ISO and B-RES** (both).

STEP 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 **Preheat**. If they wish to only use hose heaters, they would select **Hose**. If the user wants to activate both preheaters and hose heaters, they would through select **Preheat and Hose**.

⚠ WARNING

Do not 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.

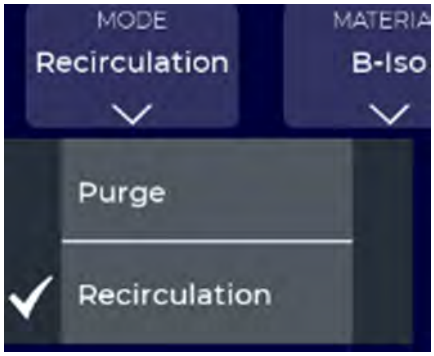
⚠ CAUTION

Air purge must not be used on the A (ISO) side. This will cause the ISO to harden in the system's fluid passages and hoses.

⚠ CAUTION

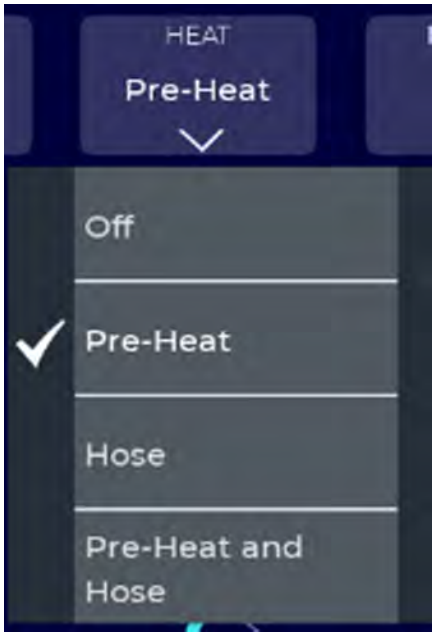
Do not activate heat in the dry system. This will cause the heater elements to fail and can cause a fire.

Be sure the preheaters and hoses are full of fluid before the system is started in Spray of Exchange mode.



Select Function

Select Material



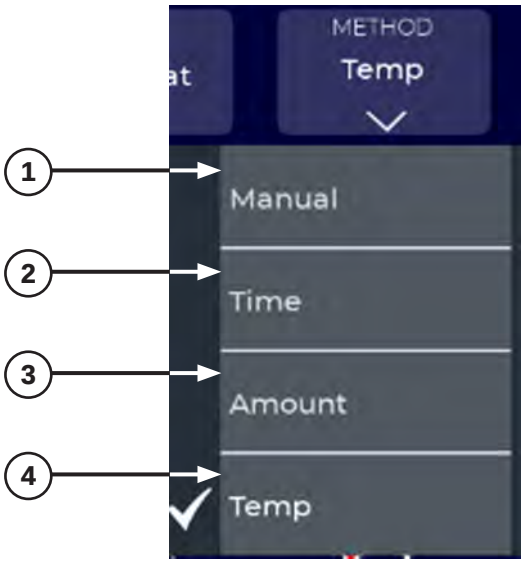
Select Fluid Heating

STEP 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.

1. MANUAL: Manually starts/stops the Fluid Exchange.
2. TIME: Fluid Exchange continues for a user-defined amount of fluid.
3. AMOUNT: Fluid Exchange continues for a user-defined fluid volume.
4. TEMP: Fluid Exchange continues until fluid in drum reaches a user-defined set temperature (user input).

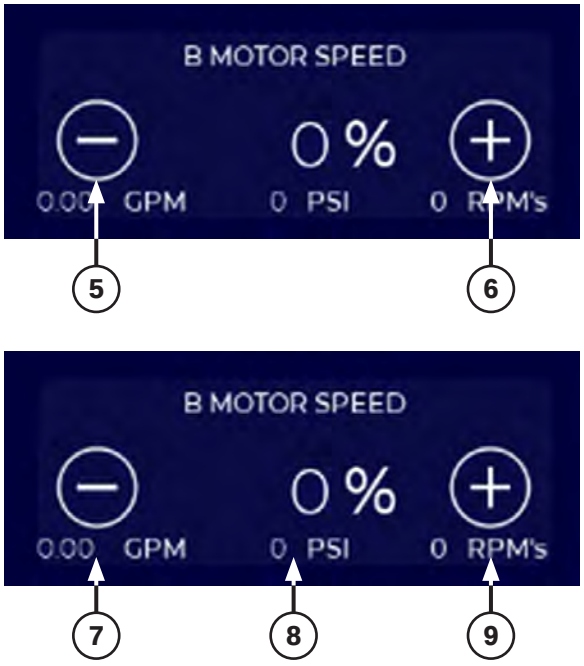


STEP 5. SELECT MOTOR (JOG) SPEED

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 10% or less.

Instructions for performing an Air Purge are shown in "EXAMPLE 5: B SIDE AIR PURGE" (Page 83). 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 "RECIPE SCREENS" to set system maximum pressure). Motor speed can be adjusted while the motor is running.



5. Decrease Speed (press to change).
6. Increase Speed (press to change).
7. Flow Rate
8. Pump Pressure
9. Motor Speed

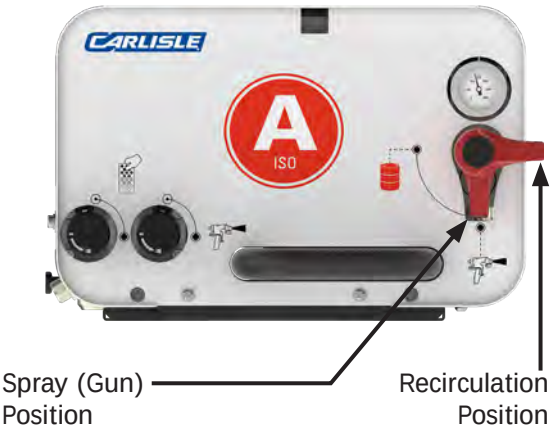
NOTICE

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

STEP 6. EXAMINE FLUID LINES

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

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



STEP 7. START FLUID EXCHANGE

Press the Start button to begin fluid exchange.

STEP 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.

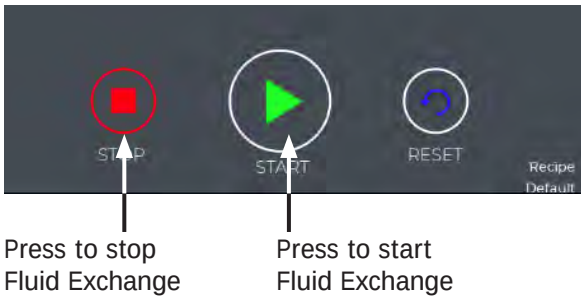
Note that the real-time fluid flow rate, pump pressure, and motor RPM values are shown below the motor speed.

IS40 Fluid Valve Settings

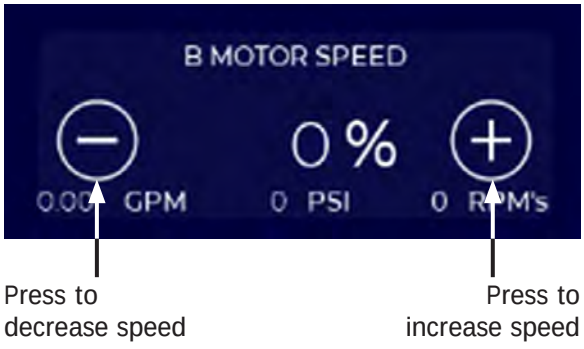
STEP 9. STOP FLUID EXCHANGE

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.



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



NOTICE

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.

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.

STEP 1. SYSTEM MODE

Be sure the system is in STOP state as shown.

⚠ WARNING

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

STEP 2. SUPPLY LINES AND HOSE

Make sure that the supply lines, recirculation hoses, and distribution hoses are correctly connected.

STEP 3. ANALOG PRESSURE GAUGE

Make sure the analog pressure gauge 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.

STEP 4. FILTER VALVES

Set the filter valves (4a) to open position (horizontal). Set the recirculation valve (4b) to spray position (pointed down).

STEP 5. B SIDE PUMP

Activate the B-side transfer pump.

STEP 6. HOSE MANIFOLD

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.

STEP 7. EXCHANGE MODE

After selecting Exchange Mode from the main menu:

7a. Select **Purge** from the "FUNCTION" menu.

7b. Select **B-RES** from the "MATERIAL" menu.

7c. Select **Off** from the "HEAT" menu.

7d. Select **Manual** from the "METHOD" menu.

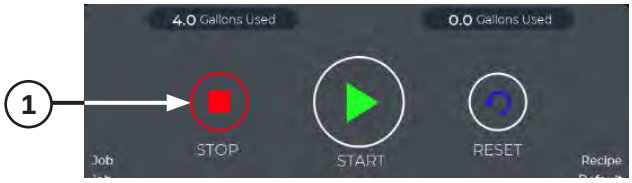
⚠ WARNING

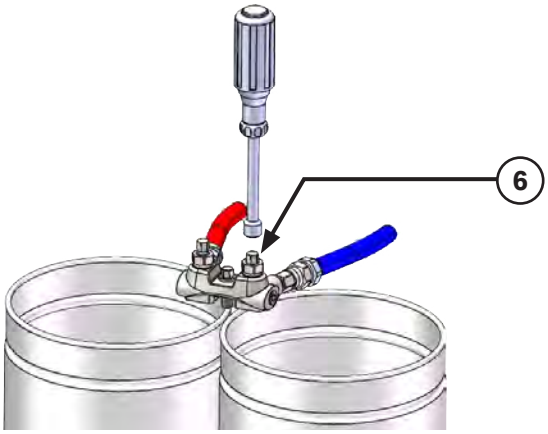
Do not activate the heating mode when air or gas is present in the Proportioner or Hoses. This can cause the heater elements to fail and can create a fire hazard.

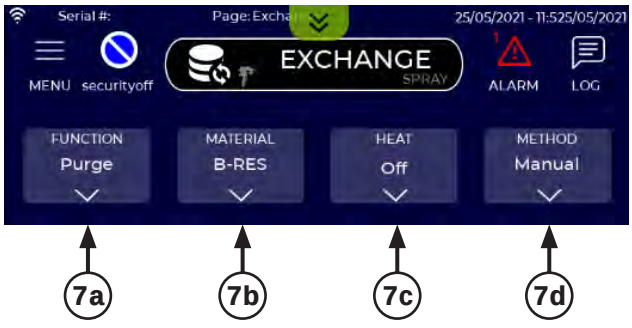
If air is not removed from the system properly, the gear pumps, preheaters, and/or hose heaters can be damaged. Air pockets can also create off-ratio conditions.

In this example the operation is shown for the B-side.

The same procedure would also be used for the A-side.

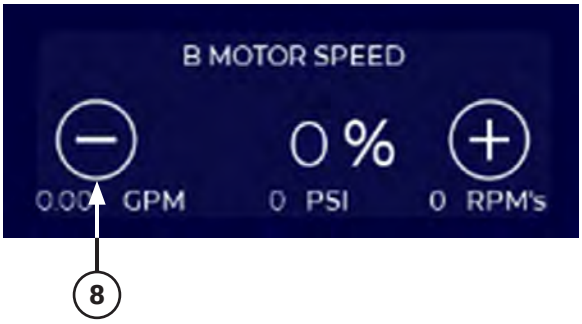






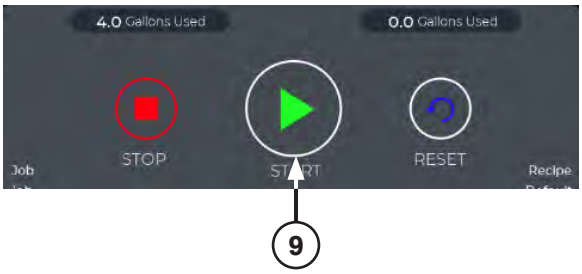
STEP 8. SET B MOTOR SPEED

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



STEP 9. SYSTEM MODE

Press the "START" button to turn on the B Motor.



STEP 10. INCREASE B MOTOR SPEED

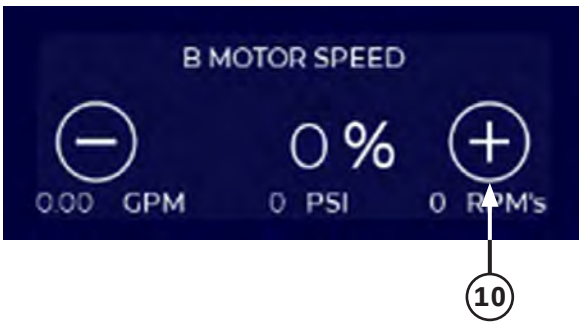
Increase B motor speed by pressing the + button in the Motor Speed Widget.

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.

STEP 11. FLUID FLOW

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

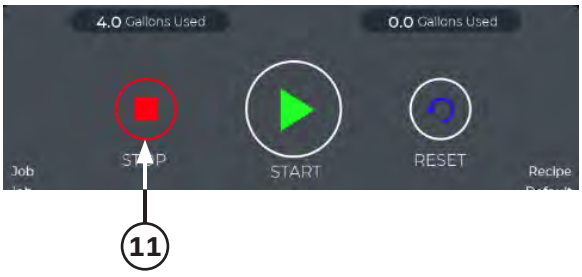


STEP 12. B SIDE MATERIAL CONTROL

Close the B-side material control valve on the gun manifold.

STEP 13. A SIDE

Repeat the process for the A-side if required.

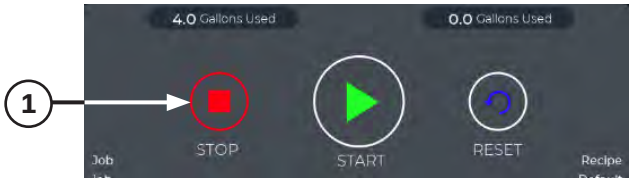


⚠ WARNING

Never run gear pumps faster than 5% speed in Exchange Mode when dry. 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.

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.



STEP 1. SYSTEM MODE

Be sure the system is in "STOP" state as shown.

⚠ WARNING

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

STEP 2. SUPPLY LINES AND HOSE

Make sure that the A-side supply lines, recirculation hoses, and distribution hoses are correctly connected.

STEP 3. ANALOG PRESSURE GAUGE

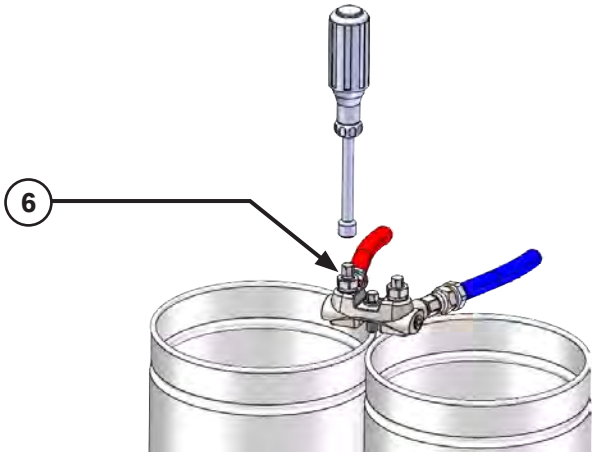
Examine the pressure gauge on the A fluid module. If the gauge pressure is over 300 psi (20.4 bar) relieve pressure by opening the recirculation valve in the STOP position.

STEP 4. FILTER VALVES

Set the filter valves (4a) to open position (horizontal). Set the recirculation valve (4b) to spray position (pointed down).

STEP 5. A SIDE PUMP

Activate the A-side transfer pump.



STEP 6. HOSE MANIFOLD

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

STEP 7. EXCHANGE MODE

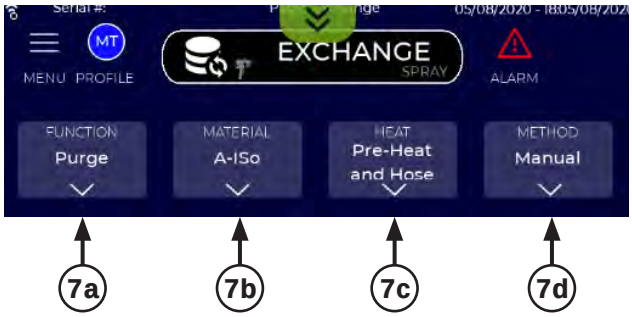
After selecting Exchange Mode from the main menu:

7a. Select **Purge** from the "FUNCTION" menu.

7b. Select **A-ISO** from the "MATERIAL" menu.

7c. Select **Preheat and Hose** from the "HEAT" menu.

7d. Select **Manual** from the "METHOD" menu.



⚠ WARNING

Do not activate the heating mode when air or gas is present in the Proportioner or Hoses. This can cause the heater elements to fail and can create a fire hazard.

STEP 8. SET A SIDE TEMPERATURE

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

STEP 9. SET B MOTOR SPEED

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

STEP 10. SYSTEM MODE

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.

STEP 11. INCREASE B MOTOR SPEED

Increase motor speed by pressing the + button in the Motor Speed Widget.

As the 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.

11a. Real Time Material Flow

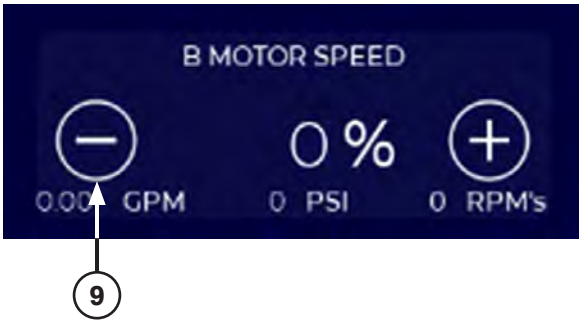
11b. Real Time Pump Pressure

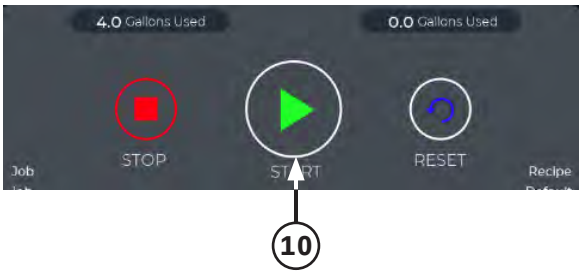
11c. Real Time B Motor Speed

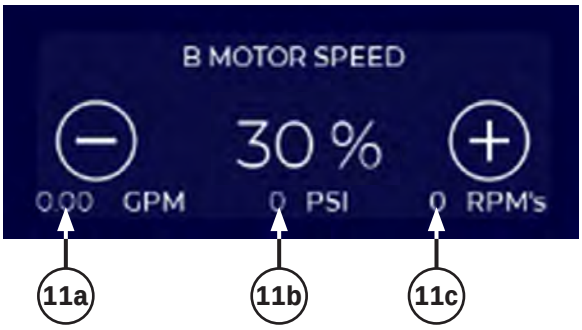
STEP 12. FLUID FLOW

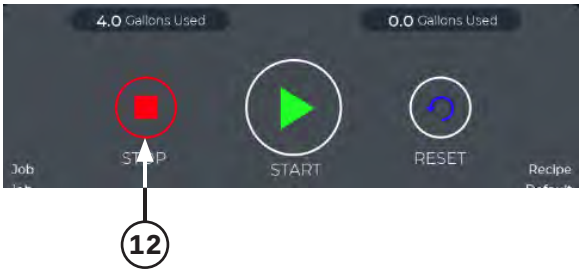
When an adequate amount of fluid is purged press the "STOP" button. To restart purging, press the "START" button.

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



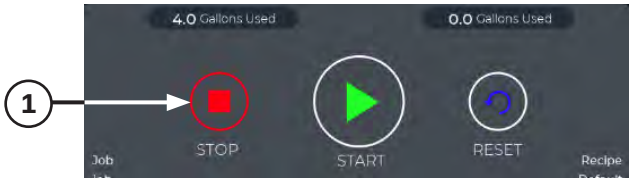






EXAMPLE 3–B SIDE PURGE AMOUNT

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.



STEP 1. SYSTEM MODE

Be sure the system is in "STOP" state as shown.

⚠ WARNING

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

STEP 2. SUPPLY LINES AND HOSE

Make sure that the B-side supply lines, recirculation hoses, and distribution hoses are correctly connected.

STEP 3. ANALOG PRESSURE GAUGE

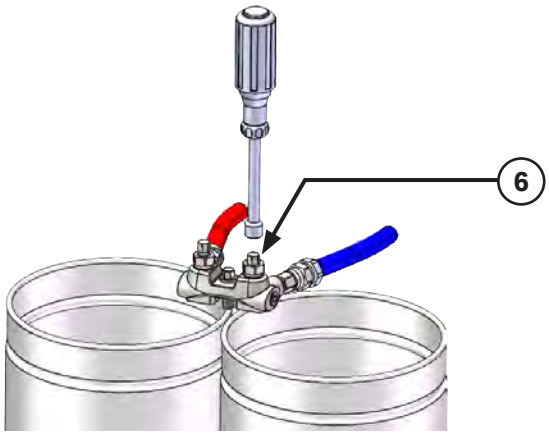
Verify the pressure gauge on the B fluid module. If the gauge pressure is over 300 psi (20.4 bar) relieve pressure by opening the recirculation valve in the "STOP" position.

STEP 4. FILTER VALVES

Set the filter valves (4a) to open position (horizontal). Set the recirculation valve (4b) to spray position (pointed down).

STEP 5. B SIDE PUMP

Activate the B-side transfer pump.



STEP 6. HOSE MANIFOLD

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.

STEP 7. EXCHANGE MODE

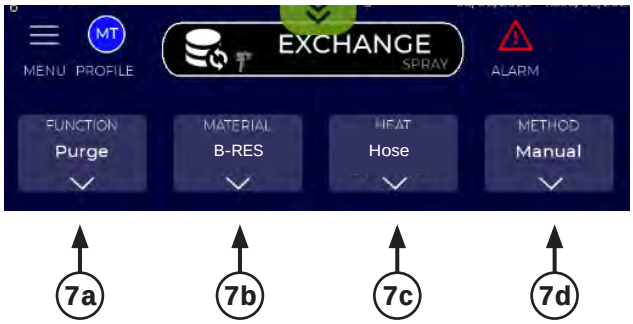
After selecting Exchange Mode from the main menu:

7a. Select **Purge** from the "FUNCTION" menu.

7b. Select **B-RES** from the "MATERIAL" menu.

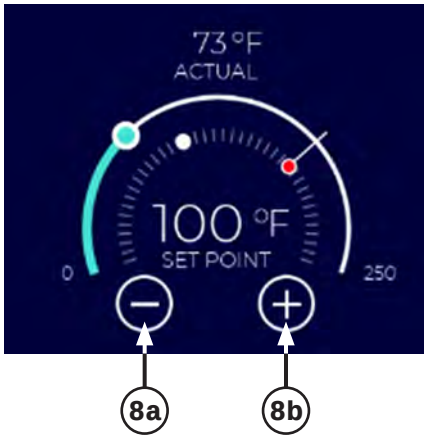
7c. Select **Hose** from the "HEAT" menu.

7d. Select **Amount** from the "METHOD" menu.



STEP 8. SET B SIDE TEMPERATURE

Set the B-side temperature. Press the – (8a) and + (8b) buttons in the Temperature Widget.



STEP 9. SET PURGE AMOUNT

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.

STEP 10. SET B MOTOR SPEED

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

STEP 11. SYSTEM MODE

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.

STEP 12. INCREASE B MOTOR SPEED

Increase motor speed by pressing the + button in the Motor Speed Widget.

As the 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.

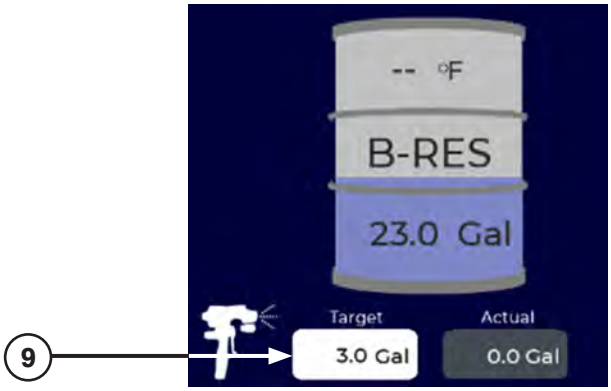
The user can adjust motor speed at any time while purging fluid.

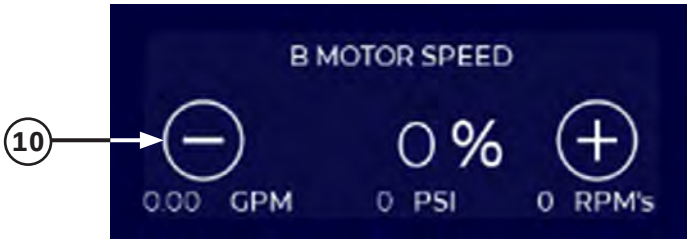
12a. Real Time Material Flow

12b. Real Time Pump Pressure

12c. Real Time B Motor Speed

12d. Motor Speed Increase



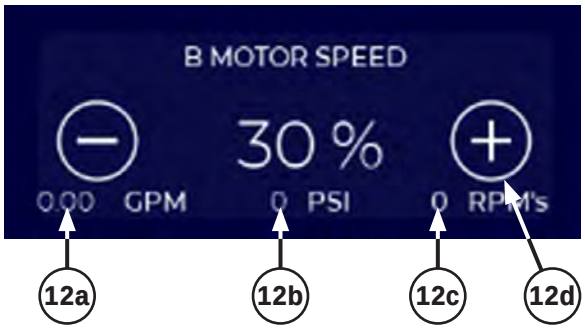


STEP 13. FLUID FLOW

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

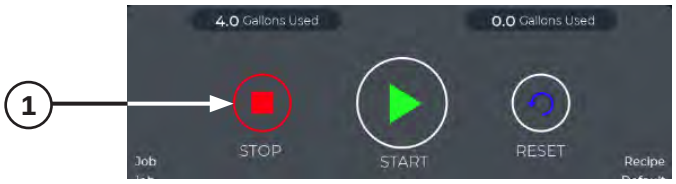
STEP 14. B SIDE MATERIAL CONTROL

Close the B-side material control valve on the gun manifold and reattach the gun.



EXAMPLE 4–PREHEAT B DRUM MATERIAL

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



STEP 1. SYSTEM MODE

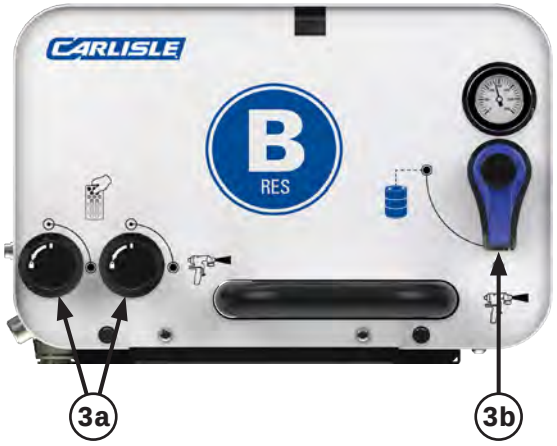
Be sure the system is in "STOP" state as shown.

STEP 2. SUPPLY LINES AND HOSE

Make sure that the B-side supply lines, recirculation hoses, and distribution hoses are correctly connected.

STEP 3. FILTER VALVES

Open the filter valves (3a) and set the recirculation valve (3b) to drum position as shown in the following figure.



STEP 4. TRANSFER PUMP

Activate B-side transfer pump. B-side fluid may begin to recirculate to the drum. This is acceptable.

STEP 5. EXCHANGE MODE

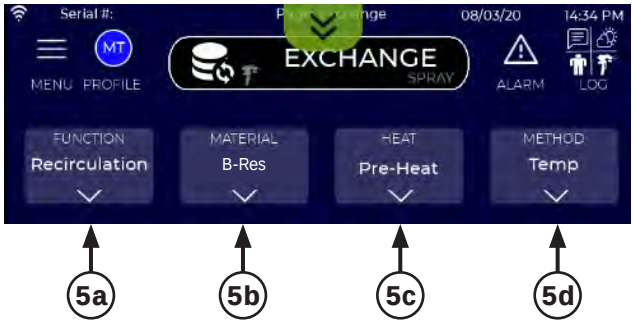
After selecting Exchange Mode from the main menu:

5a. Select **Recirculation** from the "FUNCTION" menu.

5b. Select **B-RES** from the "MATERIAL" menu.

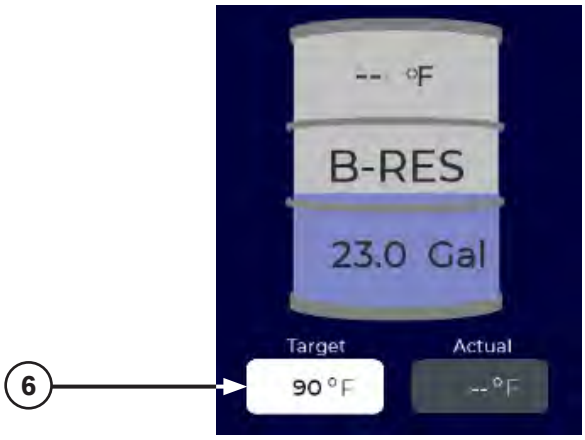
5c. Select **Preheat** from the "HEAT" menu.

5d. Select **Temp** from the "METHOD" menu.



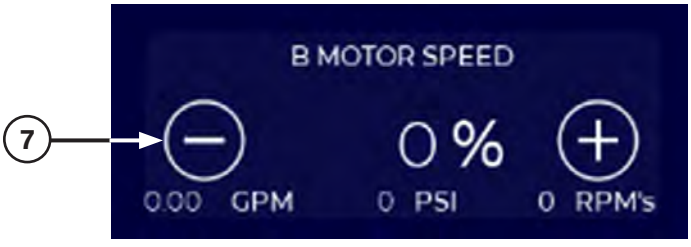
STEP 6. DRUM FLUID TEMPERATURE

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



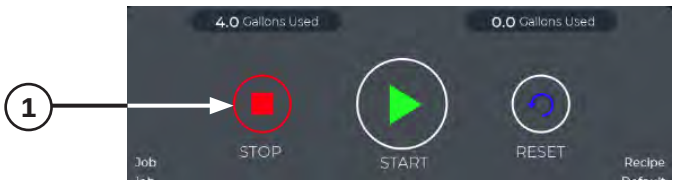
STEP 7. SET B MOTOR SPEED

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



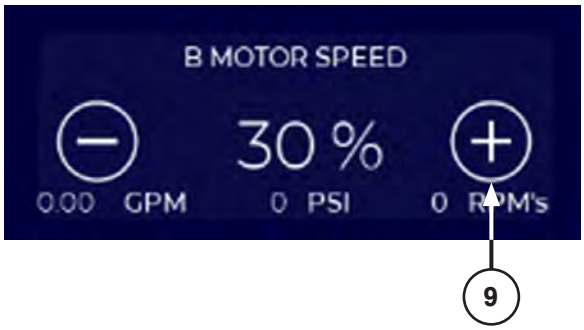
STEP 8. SYSTEM MODE

Press the "START" button to begin the recirculation and fluid heating operation.



STEP 9. INCREASE B MOTOR SPEED

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.



STEP 10. RECIRCULATION AUTO-STOP

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

EXAMPLE 5–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 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

Do not purge the proportioner or hoses with a flammable or oxidizing gas or liquid. An explosion and/or fire can result with significant personal injuries, loss of life, and property damage.

⚠ CAUTION

Air purge must not be used on the A (ISO) side. This will cause the ISO to harden in the system's fluid passages and hoses.

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.

STEP 1. SYSTEM MODE

Be sure the system is in "STOP" state as shown.

STEP 2. SUPPLY LINES AND HOSE

Shut off the B-side transfer pump and close the transfer pump outlet valve if so equipped.

STEP 3. B SIDE TRANSFER PUMP

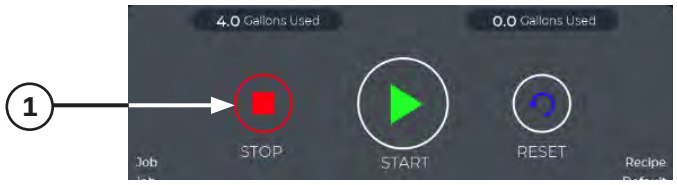
To minimize cross-contamination remove the B-side transfer pump from the old drum and drain per manufacturer’s recommendations. If some cross-contamination is acceptable this step can be skipped.

STEP 4. B SIDE RECIRCULATION

Confirm that the B-side recirculation hose is connected to the B drum or directed into a waste container.

STEP 5. B SIDE FILTER INLET

Verify that the B-side filter inlet and outlet valves are in the open position (turned CW to stop) and set the recirculation valve to the drum position.



STEP 6. EXCHANGE MODE

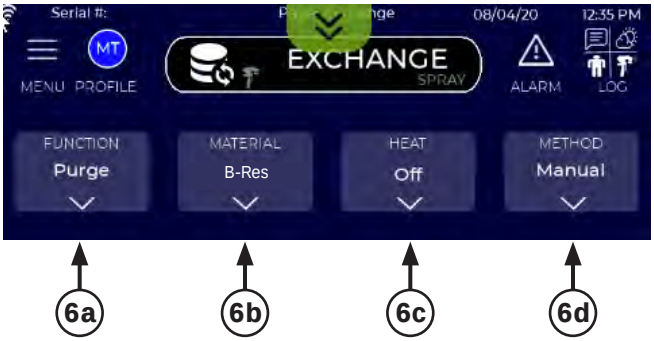
After selecting Exchange Mode from the main menu:

6a. Select **Purge** from the "FUNCTION" menu.

6b. Select **B-RES** from the "MATERIAL" menu.

6c. Select **OFF** from the "HEAT" menu.

6d. Select **Manual** from the "METHOD" menu.

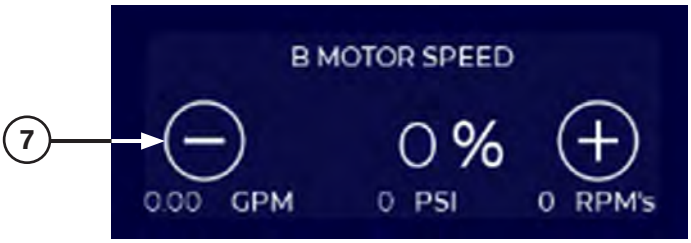


⚠ WARNING

Do not activate the heat mode during an air purge operation. This can cause the heater elements to fail and can create a fire hazard.

STEP 7. SET B MOTOR SPEED

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



STEP 8. AIR VALVE

Attach the compressed air line and/or open the air valve to apply air pressure into the supply line. The pump may start to spin from this air pressure. This is acceptable.

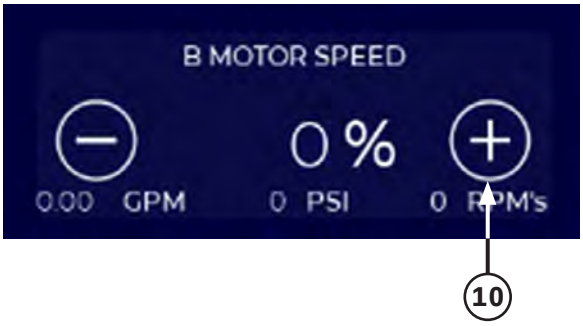
Air pressure should be between 70-150 psi. Inlet air pressure above 150 psi can cause pump seal failure.

STEP 9. LOW PRESSURE ALARM RESET

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.

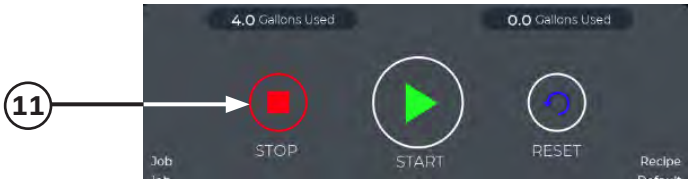
STEP 10. INCREASE B MOTOR SPEED

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.



STEP 11. B SIDE MATERIAL CONTROL

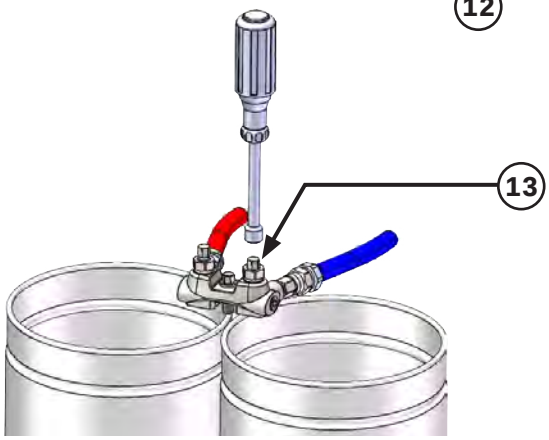
Press the "STOP" button when air is flowing steadily out of the recirculation hose.

STEP 12. RECIRCULATION VALVE

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

STEP 13. B SIDE MATERIAL CONTROL

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.



STEP 14. SET B MOTOR SPEED

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

STEP 15. SYSTEM MODE

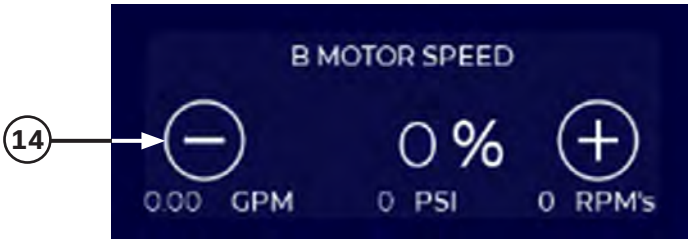
Press the "START" button to begin purging of the old B fluid and replacing with compressed air.

STEP 16. INCREASE B MOTOR SPEED

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 12), 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.



STEP 17. MANIFOLD AIR FLOW

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

STEP 18. B SIDE MATERIAL CONTROL

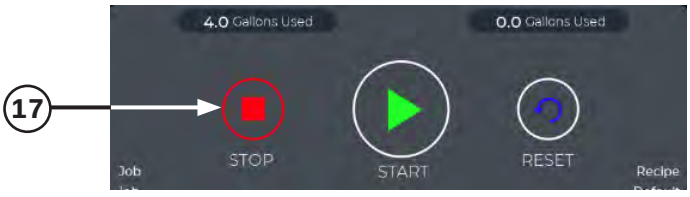
Close the B-side material control valve on the gun manifold.

STEP 19. AIR VALVE

Shut off the compressed air valve (or disconnect air line) at the drum pump used for air purging.

STEP 20. DRUM PUMP

Insert drum pump in new material drum.



STEP 21. DRUM PUMP

Use Exchange mode to refill the B-side with the new material (see Example 1 - Initial System Bleed for reference).

ALARM SCREEN–OVERVIEW

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

ERRORS

Errors (1) 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.

The "RESET" button (2) will flash blue when an error is active. After correcting the error condition press the "RESET" button before restarting the system.

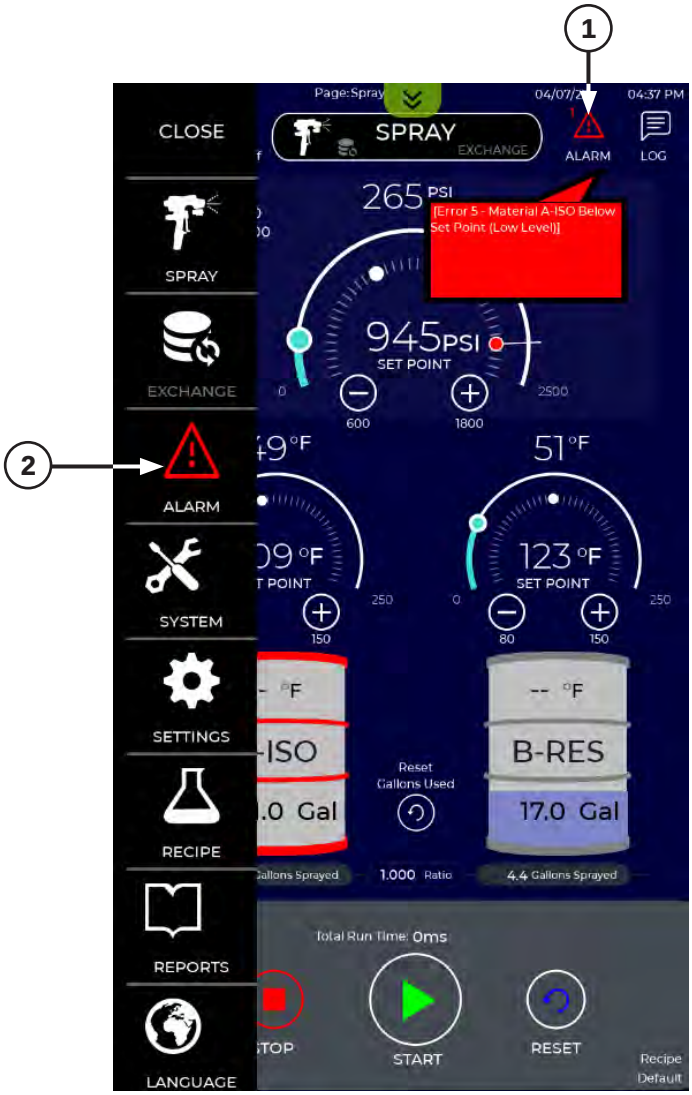
ALARM SCREEN–USE

If the proportioner is in an "ERROR" state, the "ERROR" icon (1) 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 (2). This can be accessed by pressing on the alarm icon, the alarm message, or from the main menu as shown below.



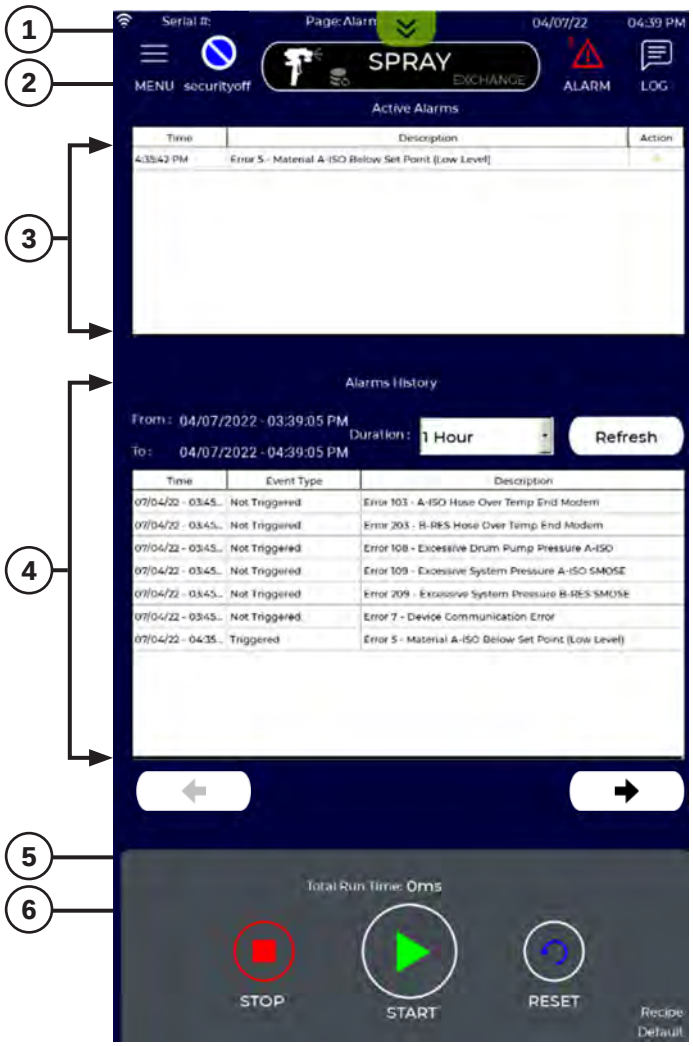
The Alarm Screen contains two tables:

The upper table displays any active errors that prevent 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.

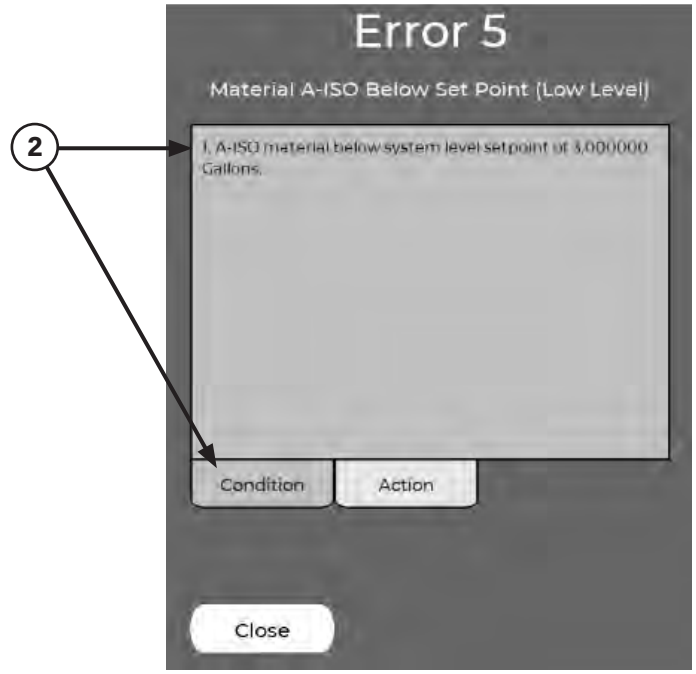
1. Error # and Description
2. Date and Time (when the alarm occurred).
3. Active Error(s)
4. Alarm History (Errors and Warnings)
5. Previous Alarm Screen
6. Next Alarm Screen

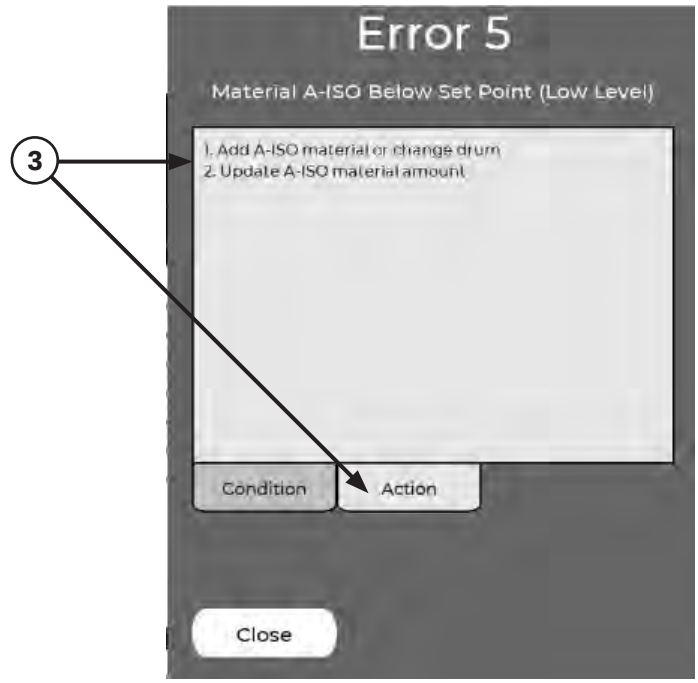


Additional information can be obtained for any active Error by pressing in the Action box (1).

A pop-up window (2) will show more information on the Error Condition and also provide recommended Actions (3) to resolve the Error.

All Errors and Actions are also contained in tables at the end of this manual for reference.

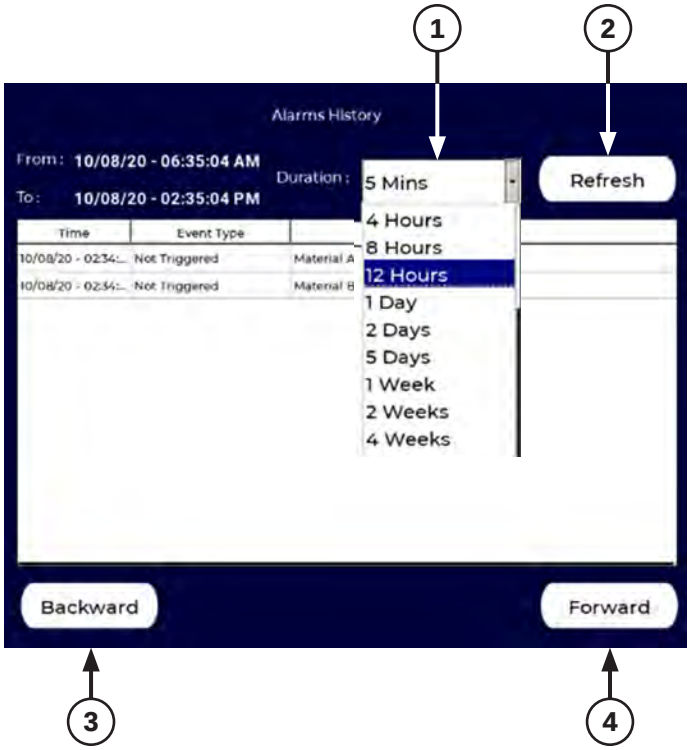




The Alarm History table displays previous Alarms (Errors and Warnings) that have occurred over a selected “look-back” time frame, which can be set from the Duration pull-down menu (1).

Press Refresh (2) to update the Alarm History Window when changing the Duration selection.

Use the Backward (3) and Forward (4) buttons to scroll through the Alarm History table.



SYSTEM STATUS SCREENS–OVERVIEW

The System Status Screens can be used for system monitoring and diagnostics.

The IS40 has three System Status Screens that can be selected from the Main Menu as 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 IS40.

Inlet Health: Provides high resolution real-time plots of selected inlet pressures.

Trend: This is uses to plot selected sensor and system performance data.

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

SYSTEM STATUS SCREENS–IO PAGE 1

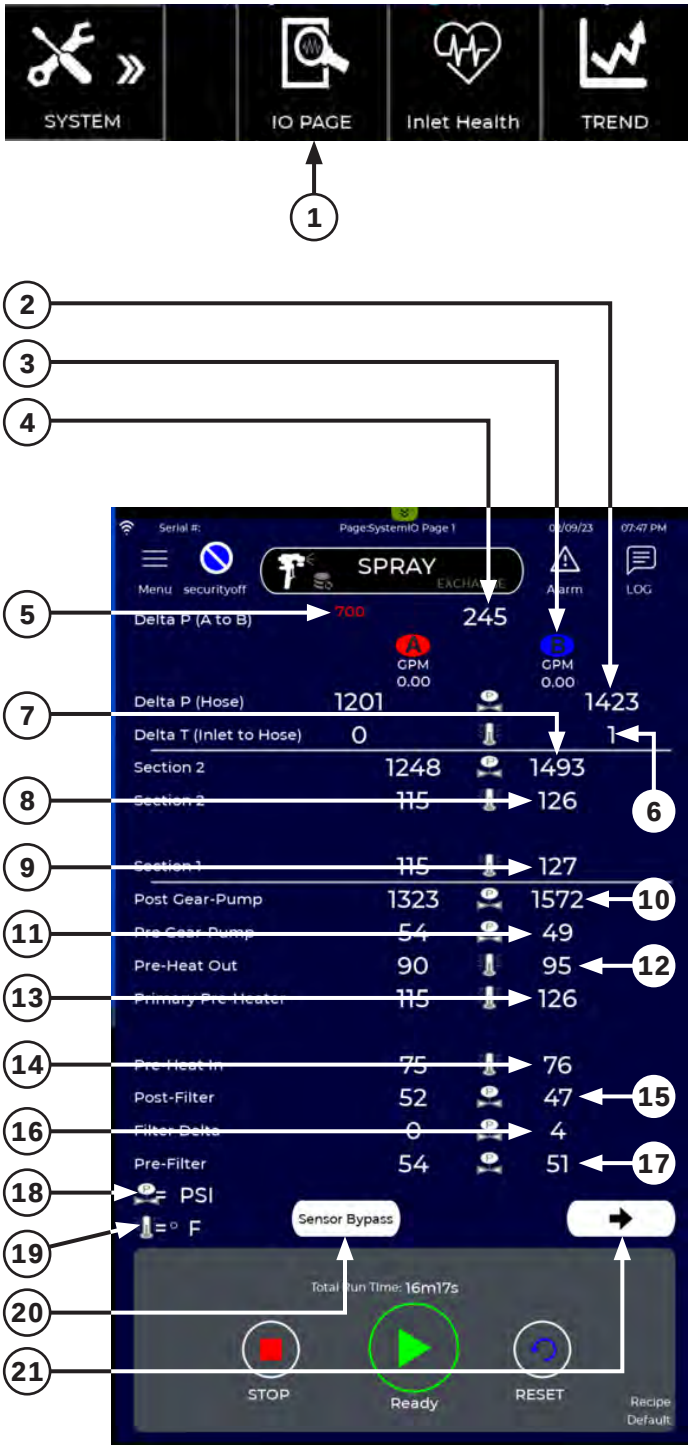
To access the IO Page 1, select "IO PAGE" (1) from the SYSTEM main menu shown.

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.



1. IO Page
2. Hose Fluid Pressure Drop (pump to hose end).
3. Fluid Flow Rate
4. Hose End A-B fluid Pressure Difference
5. A-B Fluid Pressure Difference Error Setting (set in Recipes).
6. Hose Fluid Temperature Change (pump to hose end).
7. Hose End Fluid Pressure
8. Hose End Fluid Temperature
9. First Section Hose End Fluid Temperature
10. Post-Pump Fluid Pressure
11. Pre-Pump Fluid Pressure
12. Preheater Output Fluid Temperature
13. Primary Preheater Temperature (if installed, secondary heater temperature would be shown).
14. Inlet Fluid Temperature
15. Post-Filter Fluid Pressure
16. Fluid Pressure Drop Across Filters
17. Pre-Filter Fluid Pressure
18. Pressure Valve Indicator
19. Temperature Value Indicator
20. Sensor Bypass Screen (press to access).
21. IO PAGE 2 (press to access).

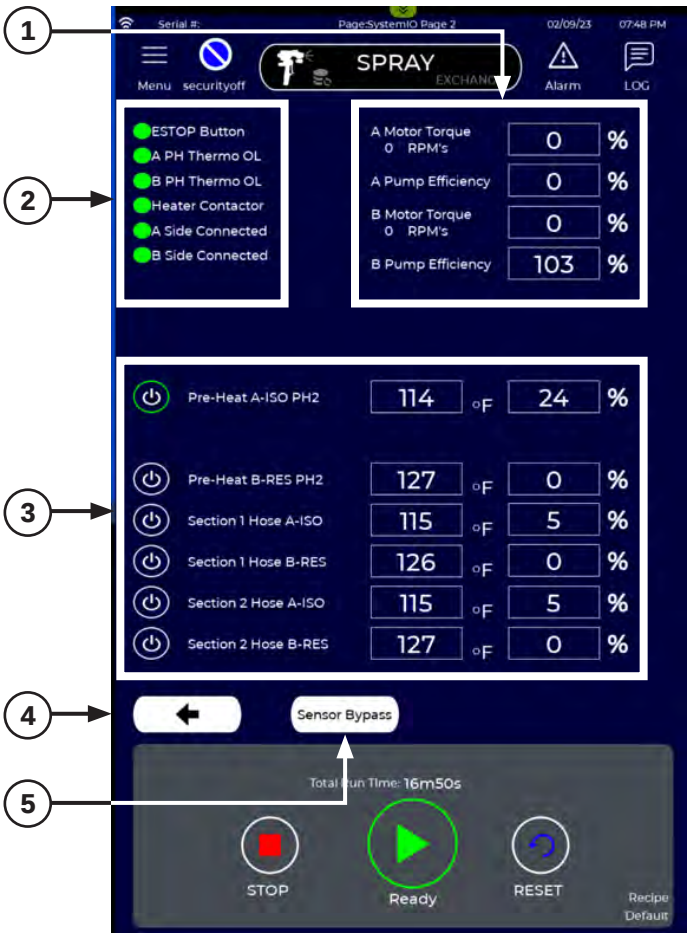
SYSTEM STATUS SCREENS–IO PAGE 2

IO Page 2 of the System Status screens displays real-time machine performance.

The three sections of the screen are shown, and additional details are provided in the following pages.

All Errors and Actions are also contained in tables at the end of this manual for reference.

1. Motor and Pump Efficiency
2. Internal Status
3. Heater Status
4. IO PAGE 2 (press to access).
5. Sensor Bypass Screen (press to access).



The IS40 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 to show the connection status of each subsystem.

All lights must be green for the Proportioner to enter the "START" state.

A red light indicates a connection problem that must be addressed by the user or service technician.

1. Emergency Stop Button
2. A-Side Preheater Thermal Overload Fuse
3. B-Side Preheater Thermal Overload Fuse
4. Heater Contactor
5. A-Side Fluid Module (connected)
6. B-Side Fluid Module (connected)

Real-time A and B-side motor and pump performance data (7) 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.

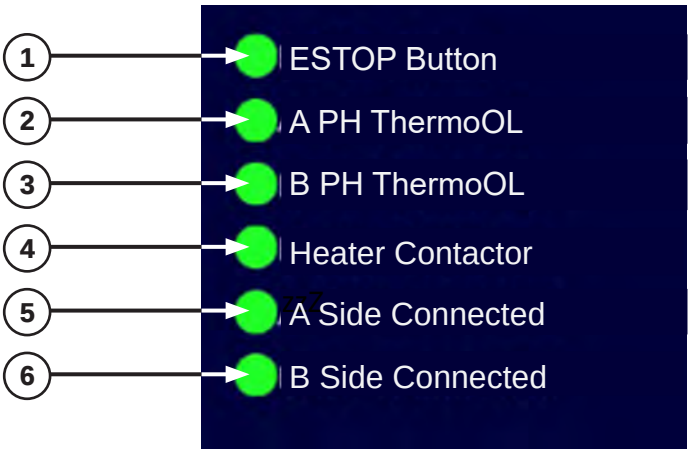
Pump efficiencies vary during a trigger cycle, with lower efficiency (i.e. higher slip) occurring when the gun is first triggered and with materials of very low viscosity. As pumps age efficiency may drop but the Proportioner will automatically compensate for this.

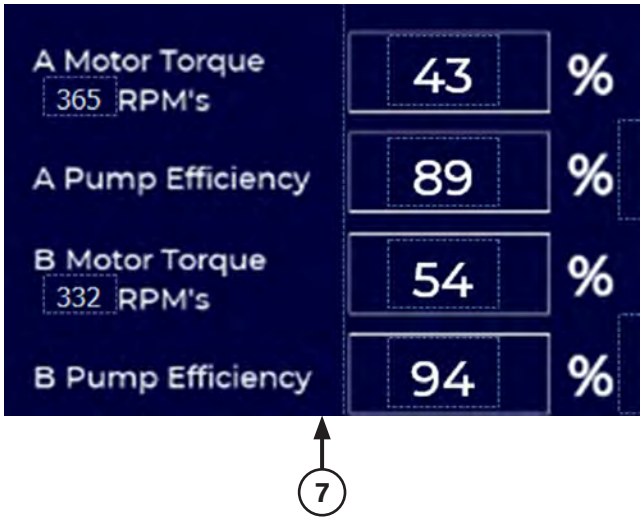
Pump efficiency warning and error limits can be set in the Recipe Screens. If set, these values are shown to the right of the pump efficiency vales.

The upper red number shown in the figure below indicates the efficiency error level (when the system will stop).

The yellow lower number indicates the efficiency warning level (when the system will indicate a warning).

When pump efficiency drops below 50%, pump servicing may be require, or temperatures changed to reduce slip.



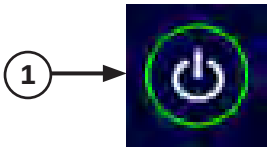


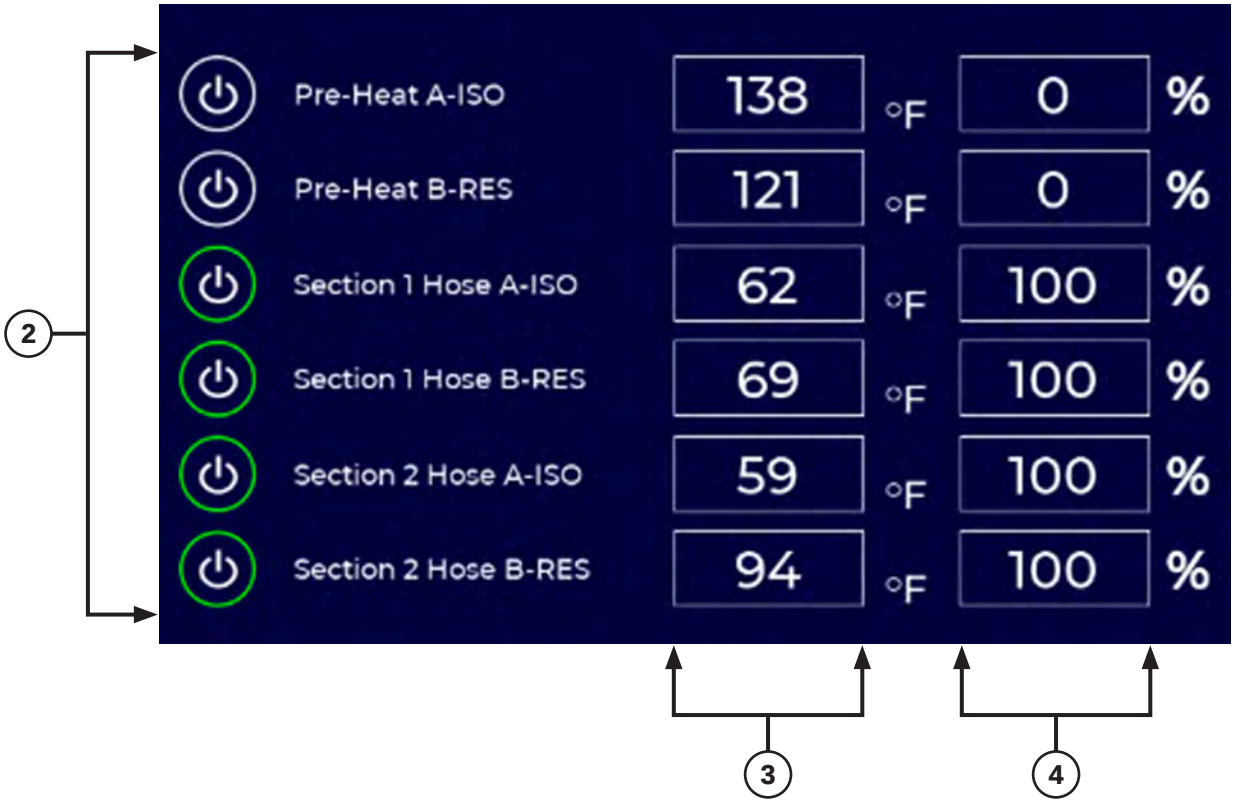
IO Page 2 of the System Status screens also shows a section for monitoring individual heater zone performance.

The temperature and duty cycle for A and B-side heating zones are displayed in the lower part of the screen. The heater duty cycle ranges from 0% (off) to 100% (full on).

With power supplied to the heater zones, their respective power switch symbol will show a green border.

1. Solid State Relay status (On)
2. Heater Zone Power Indicators (green border = power on)
3. Heater Zone Temperature
4. Heater Zone Duty Cycle (0% to 100%)





SYSTEM STATUS SCREENS –SENSOR BYPASS

In the rare event of a temperature and/or pressure sensor failure, the IS40 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.

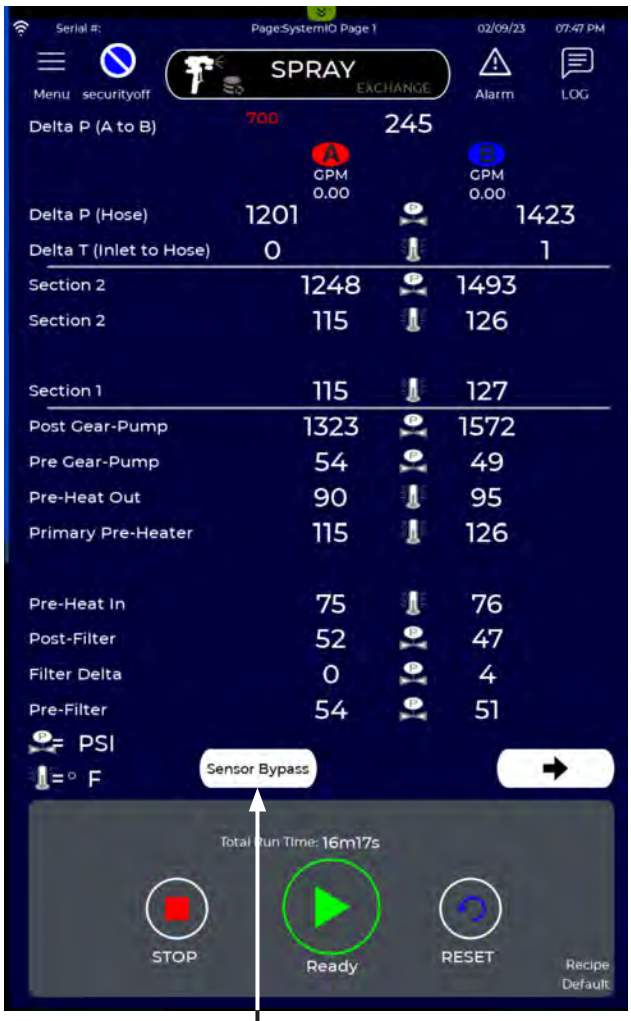
The Sensor Bypass Screen is accessed from IO Page 1 or IO Page 2, as shown.

1. IO Page 1
2. Hose Fluid Pressure Drop (pump to hose end)
3. Fluid Flow Rate
4. Hose End A-B fluid Pressure Difference

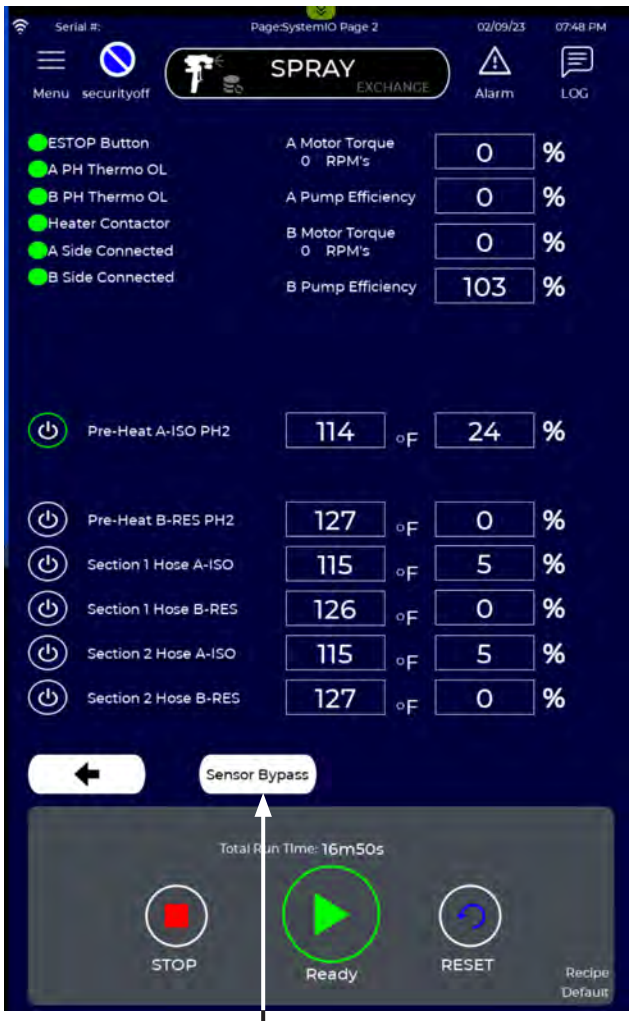
NOTICE

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

IO Page 1



IO Page 2



Press to access Sensor Bypass Screen

When a sensor error occurs, it will be logged in the Alarm Screen as an active error (see "ALARM SCREEN-USE").

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.

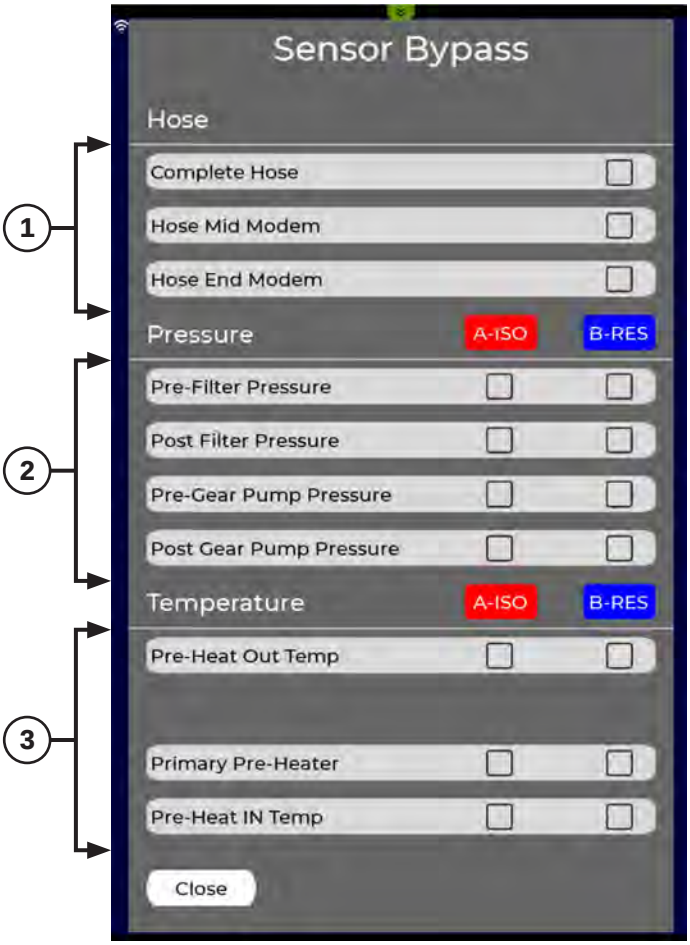
After the system indicates it in Ready State, continue with the spray operation.

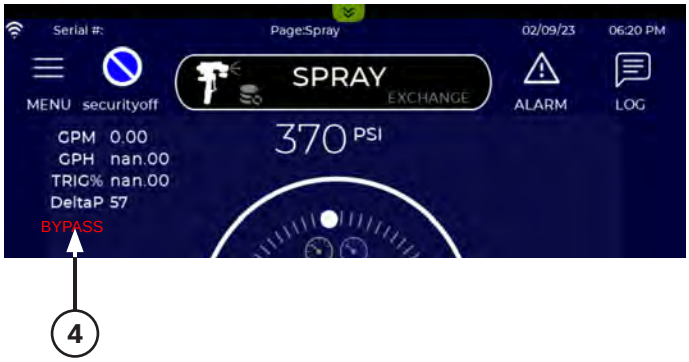
1. Used to bypass hose temperature or pressure sensors.This feature only works if a mid hose section is installed.
2. Used to bypass pressure sensors that are internal to the proportioner. User can select up to two pre-pump pressure sensors on A and/or B-sides.

   Note: B-side Pre-Filter pressure sensor has been selected in this figure.
3. Used to bypass temperature sensors that are internal to the proportioner.
4. It is possible to select multiple sensors to bypass, but some combination of selections will be invalid and prevented by the IS40.

   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.





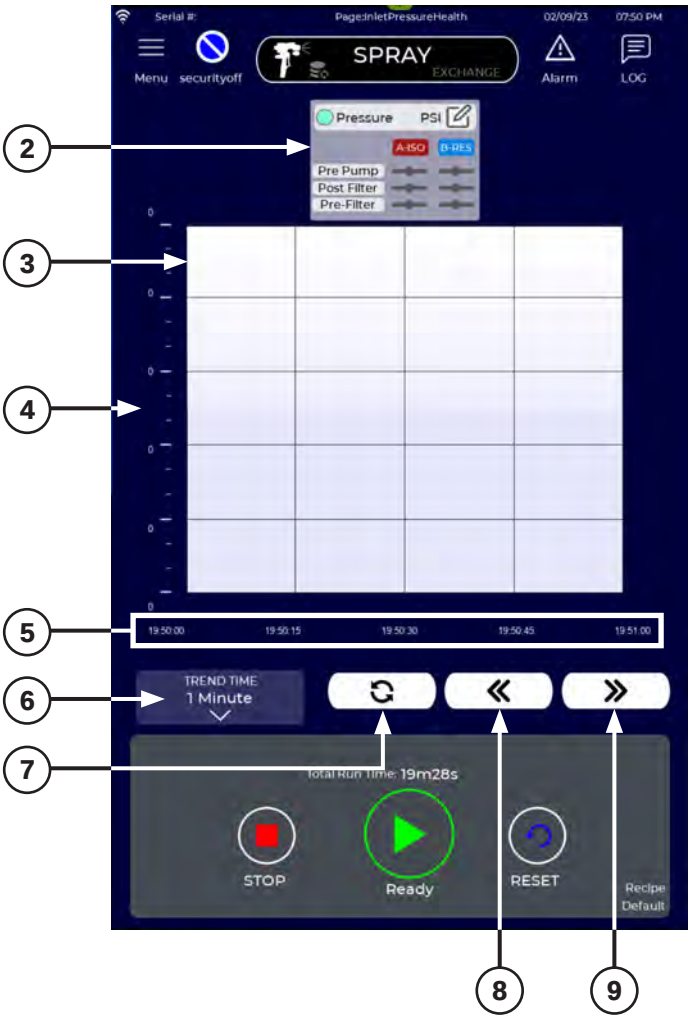
SYSTEM STATUS SCREENS–INLET HEALTH

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 Heath screen is opened.



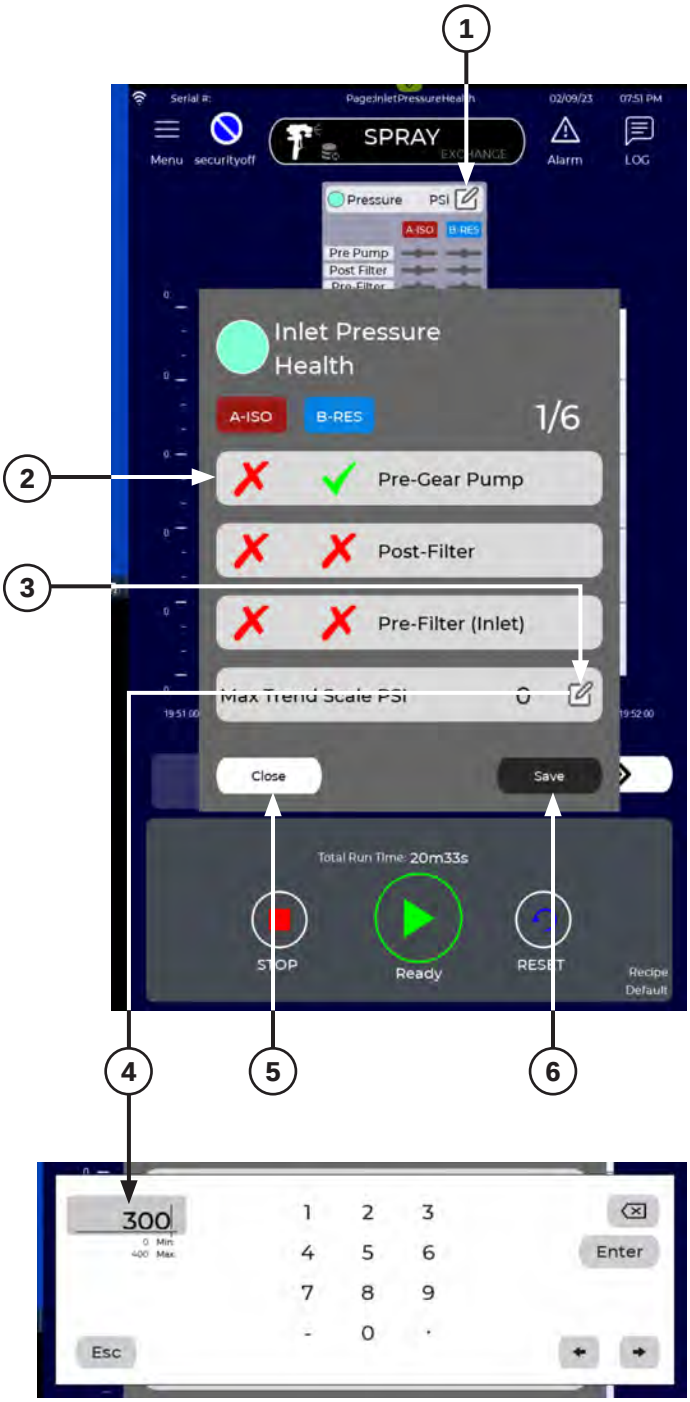
1. Inlet Health Screen (describes details as shown).
2. Selection Tool (selects data to be plotted, and full scale pressure readings).
3. Plot Window (swipe left or right to move plot forward of backward in time).
4. Pressure Axis
5. Time Axis
6. Trend Time (pull-down menu to select trend screen duration in minutes).
7. Refresh Button (press to update screen after trend time changes and pressure selections).

   Note: Also recenters current time to middle of plot.
8. Forward button. Press to move plot forward in time.
9. Backward button. Press to move plot backward in time.

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.

1. Selection Menu (press to open).
2. Selection Tool (up to 6 pressure value(s) to plot and indicated by a green check mark).
3. Max Trend Scale (opens menu (4) for input).
4. Enter the maximum PSI scale reading on the pressure axis.
5. Selection Menu (press to close).
6. Selection Menu (press to save).



After closing the selection tool, pressure traces will be displayed. The figure 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).

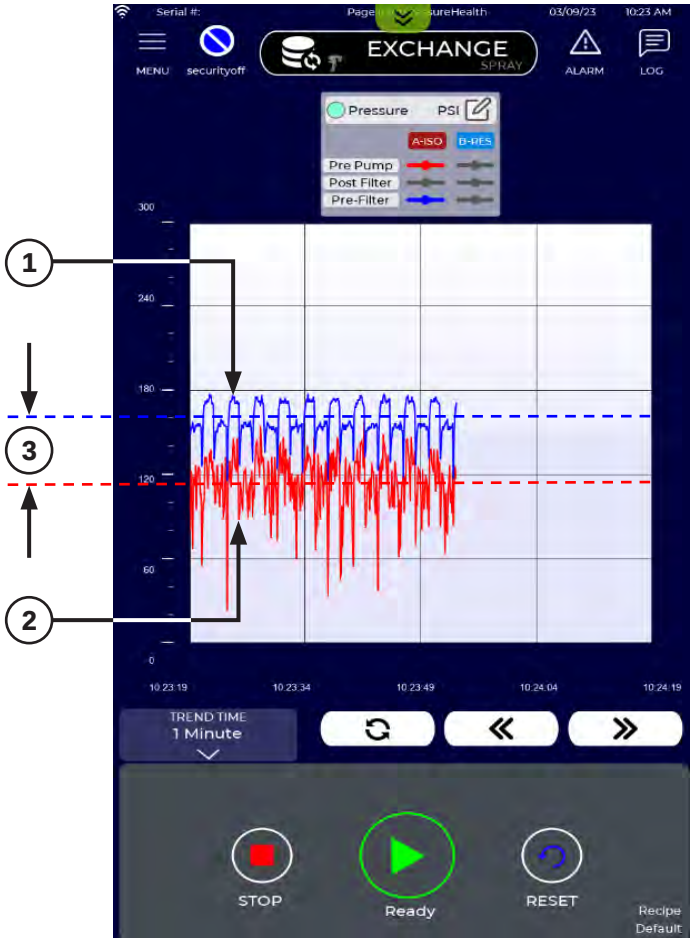
The pressure pulsation in the blue line is caused by the cyclic motion of the pneumatic two-ball piston transfer pump.

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, the 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 "SPRAY SCREEN-AUTOMATIC INLET COMPENSATION").

Increasing transfer pump air pressure and/or warming the fluid would alleviate this condition.



1. Pre-Filter Inlet Pressure (blue trace)
2. Pre-Gear Pump Pressure (red trace)
3. Average Pressure Difference (approximate)

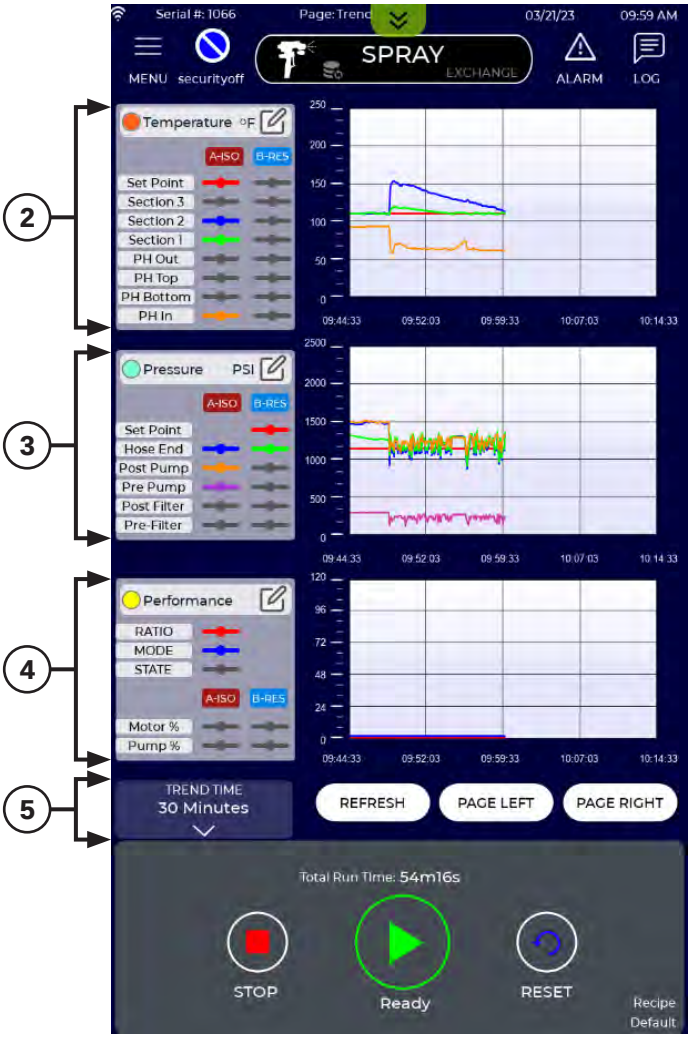
SYSTEM STATUS SCREENS –TREND CHARTS

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 Heath 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.

1. Trend Chart Screen (four sections to describe the details in the following pages).
2. Temperature Plotting (selection and display).
3. Pressure Plotting (selection and display).
4. Performance Plotting (selection and display).
5. Trend Plot (controls views).



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 PLOT PARAMETERS

To create a Temperature Trend chart begin by selecting temperatures to plot.

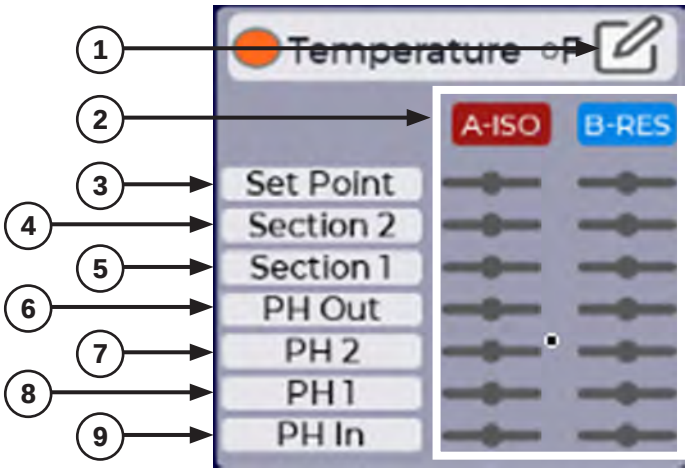
1. Selection Tool (press to open).
2. A-ISO or B-RES Sensors (sensors and trendline markers to show selected choices).
3. Fluid Setpoint Temperature
4. Hose Section 2 Fluid Temperature
5. Hose Section 1 Fluid Temperature
6. Preheater Outlet Fluid Temperature
7. Secondary Preheater Temperature (if installed).
8. Primary Preheater Temperature
9. Preheater Inlet Fluid Temperature

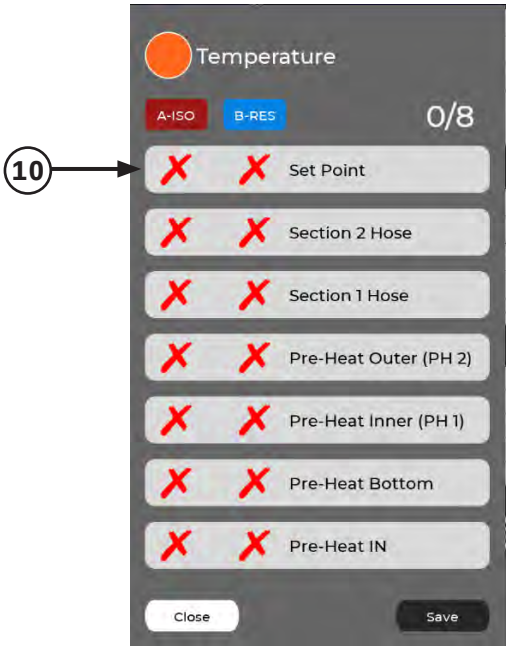
The selection tool allows up to 8 parameters to plot.

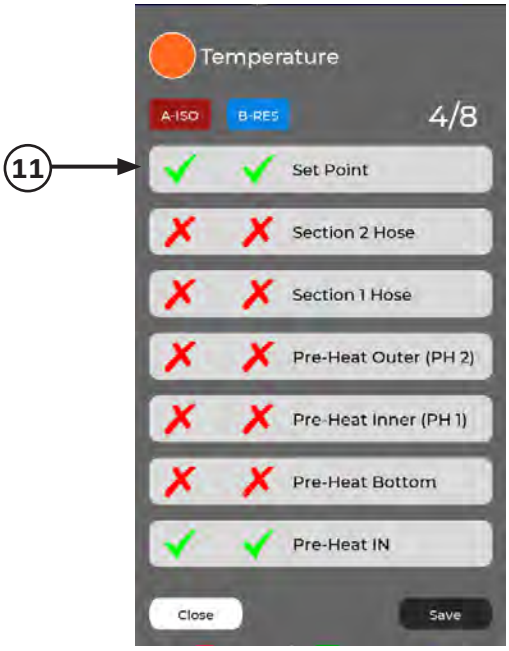
A red ✘(10) indicates a parameter is not selected to be plotted. A green check mark ✓(11) indicates a parameter is selected to be plotted.

Press on the ✘ or check-mark ✓to toggle between selected and unselected state. In the example, four temperatures have been selected to plot.

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

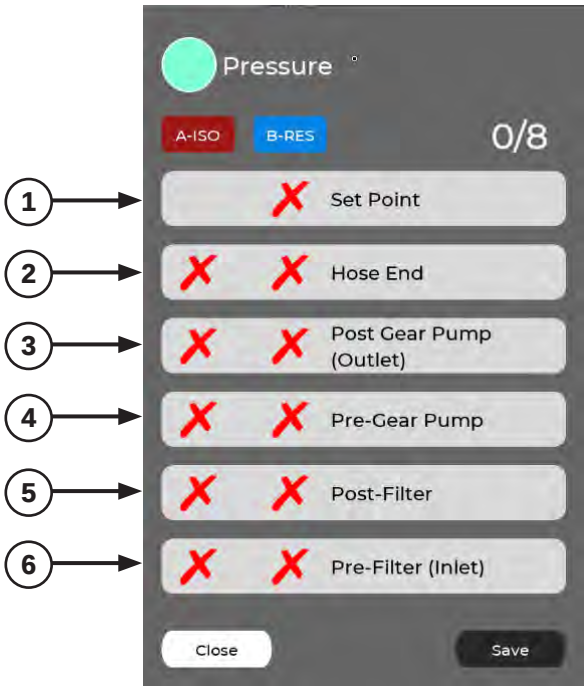


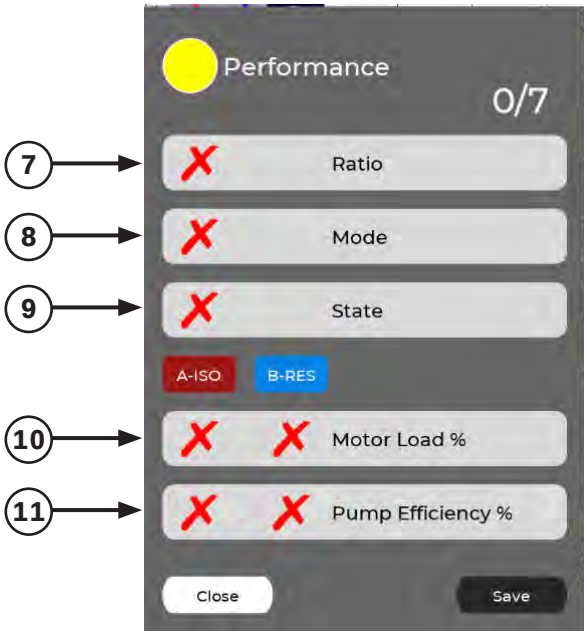




Continue selecting pressure and/or performance parameters to plot using their respective selection tools. Press the Save button when selections are completed.

1. Set Point (fluid pressure at last hose modem).
2. Hose End (fluid pressure at last hose modem).
3. Post Gear Pump (fluid pressure at pump outlet).
4. Pre-Gear Pump (fluid pressure at pump inlet).
5. Post-Filter (fluid pressure at filter outlet).
6. Pre-Filter (fluid pressure at filter inlet).
7. Ratio (fluid A:B)
8. System Mode (Spray or Exchange).
9. System State (Off, Ready)
10. Motor Load (Torque) %
11. Pump Efficiency





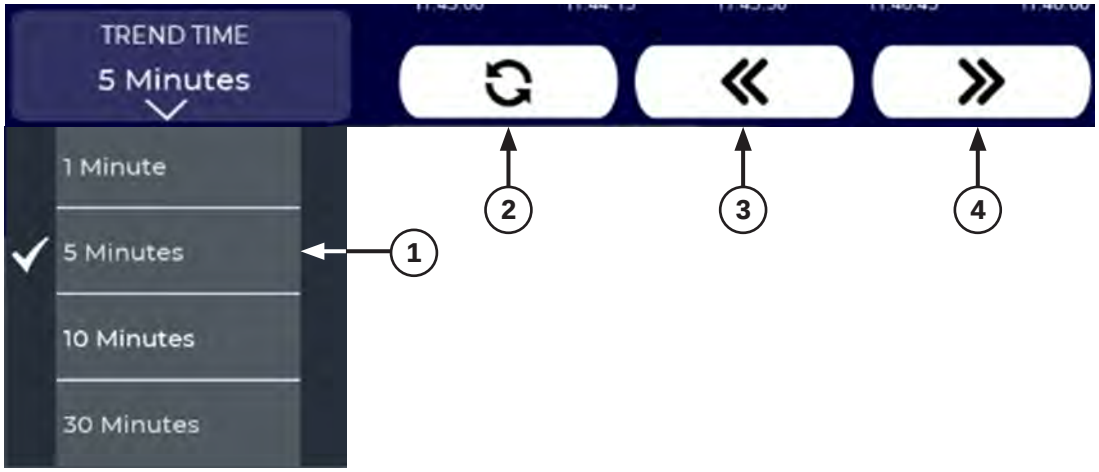
SELECT TIME SCALE (TREND TIME)

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.

1. Select "TREND TIME" (displays on time period charts).
2. Press to refresh and center current time on plot.
3. Press to page backward in time.
4. Press to page forward in time.

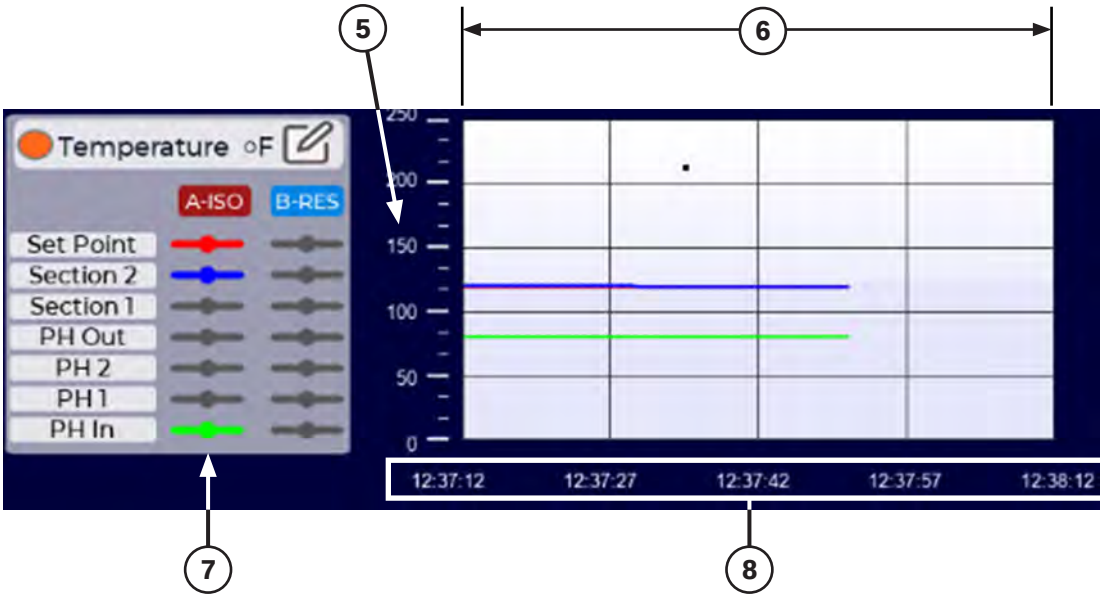


The temperature chart example shown below is displayed at 5-minute trend time (as chosen in the above screen).

To access the Lookback feature, press "PAGE LEFT" and swipe the screen to look back in time.

Note: The lookback period for charting is 24 hours of system "ON" time.

5. Temperature Axis
6. Trend Time
7. Selected Parameters
8. Time Axis (HR:MIN:SEC)



SETTINGS SCREENS–OVERVIEW

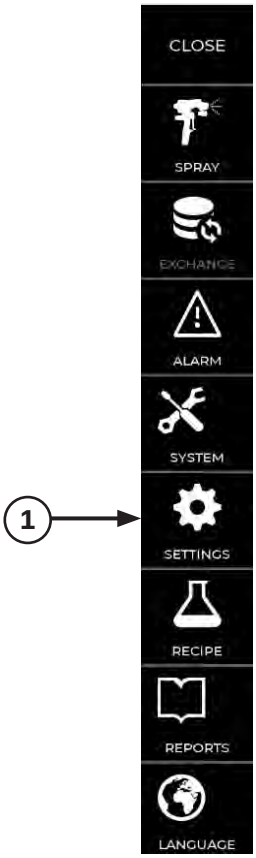
The Settings Menu is used to access and define various systems settings.

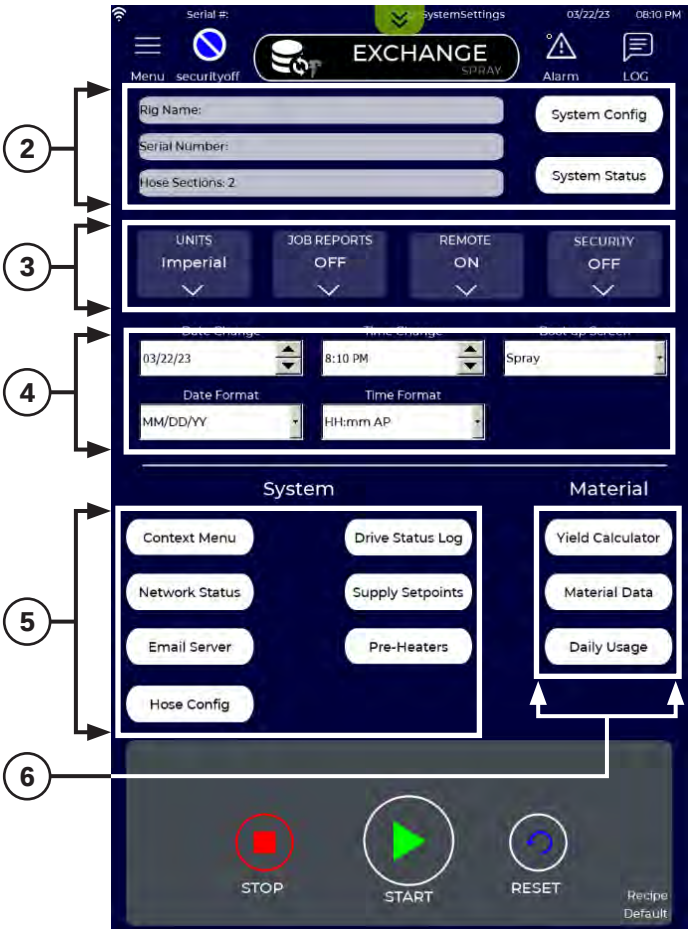
These system settings are frequently defined at installation and not usually accessed during normal operation.

The Settings Screen is accessed from the main menu and has five sections described in the following pages.

Users must have Administrative rights to change most parameters in the Settings Screen.

1. Settings (press to open).
2. System Information
3. Configuration Settings
4. Display Settings
5. Material Functions
6. System Settings





SETTINGS SCREENS –SYSTEM INFORMATION

The System Information section of the Settings screen displays a user defined Rig Name, the Proportioner Serial Number, and the number of hose sections. The Rig Name is left to the user with administrative privileges to define.

The Serial Number is set at the factory to match the Serial number on the label inside the Control Module but can be changed by Users with Administrative privileges.

The Hose Section information is determined by the IS40 and cannot be changed by the User.

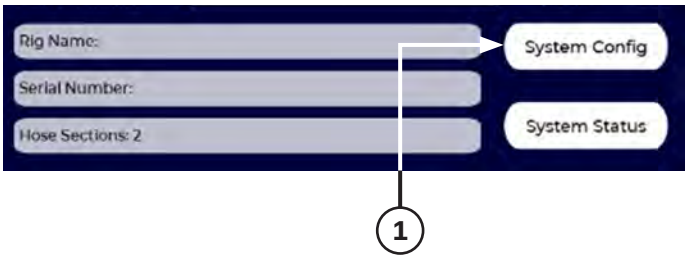
Pressing the System Config button opens a window that allows a user with administrative privileges to change Rig Name, Serial Number, and Unheated Whip Length.

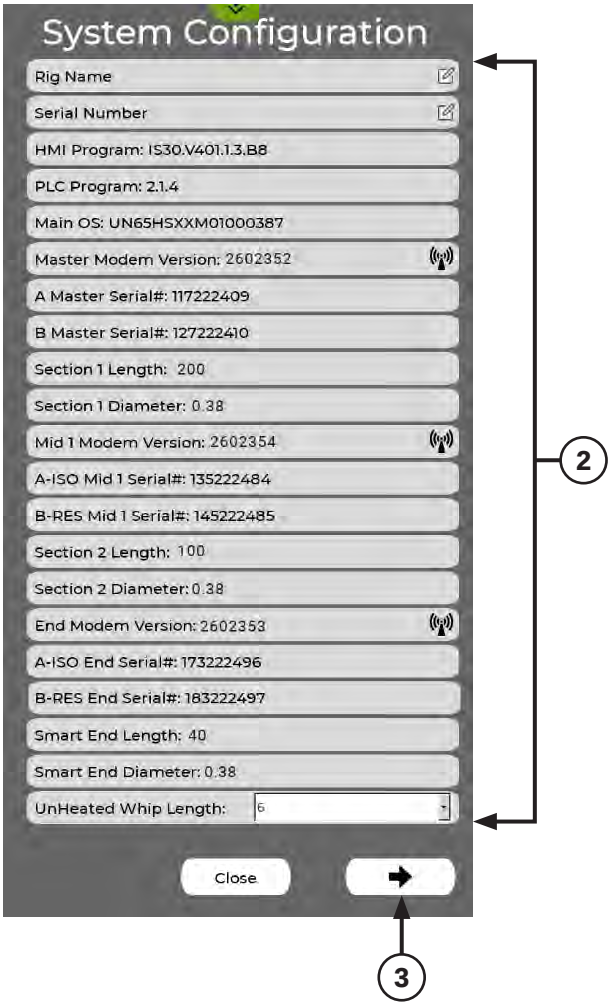
Other pertinent system information (firmware versions, hose lengths, serial numbers) is shown, but cannot be changed.

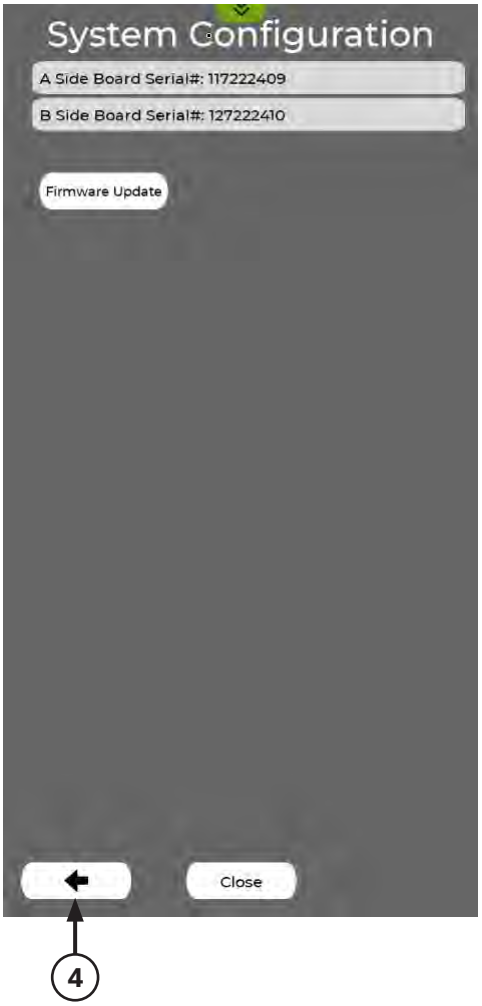
Use the arrow buttons to move between pages. Firmware can be updated from a USB memory stick using the Firmware Update feature on the second page.

1. SYSTEM CONFIG (press to open).
2. System Information (press to change).

   Note: Requires administrator privileges to change settings.
3. Press for next page.
4. Press for previous page.







SETTINGS SCREENS –FIRMWARE UPDATES

From time-to-time, updates are released to the IS40 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 "SETTINGS SCREENS-SYSTEM INFORMATION"). 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 following "No USB Detected" dialog box will appear as shown in the figure below:

SETTINGS SCREENS–SYSTEM STATUS

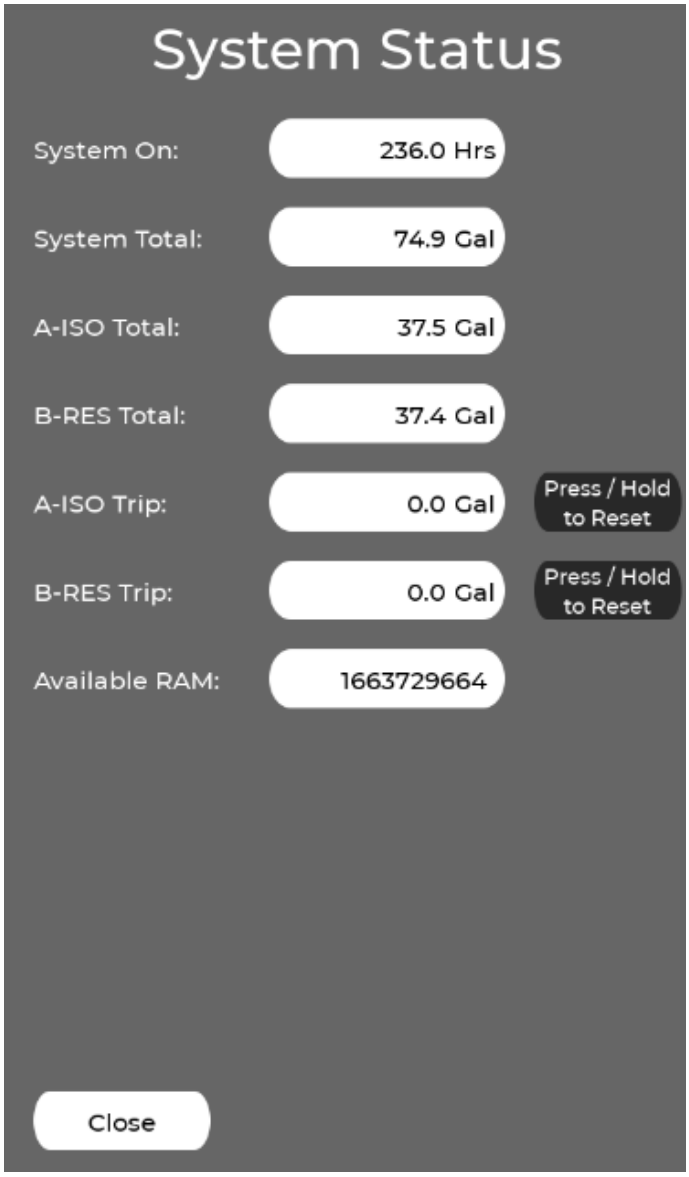
Pressing the System Status displays total System On time and A (Isocyanate) and B (Resin) fluid used over the life of the IS40.

A and B fluid trip counters are also shown.

Available RAM (Random Access Memory) is also shown in Bytes. The IS40 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.



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.

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

2. JOB REPORTING: Job Reporting can be toggled "ON" or "OFF" (factory default).

   Refer to "SYSTEM ERRORS AND ACTIONS" for more information on Job Reports.

3. REMOTE SERVICE: This allows remote access by authorized persons for monitoring and/or control of the IS40.

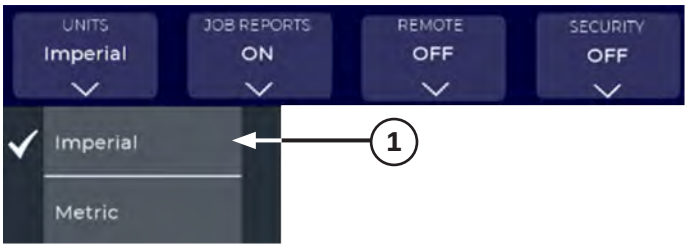
   This must be "ON" to perform remote service and/or remove control.

   See "REMOTE ACCESS" for more information on Remote Service.

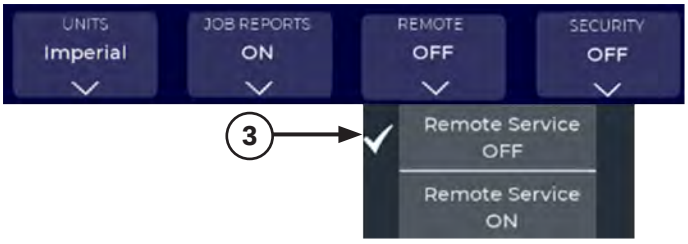
4. SECURITY: This activates user security controls. When Security is "OFF", any uses can change settings on the proportioner.

   When Security is "ON", users must log into the proportioner and access to some actions is restricted to users with administrative privileges.

   See "SECURITY" for instructions on managing.



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



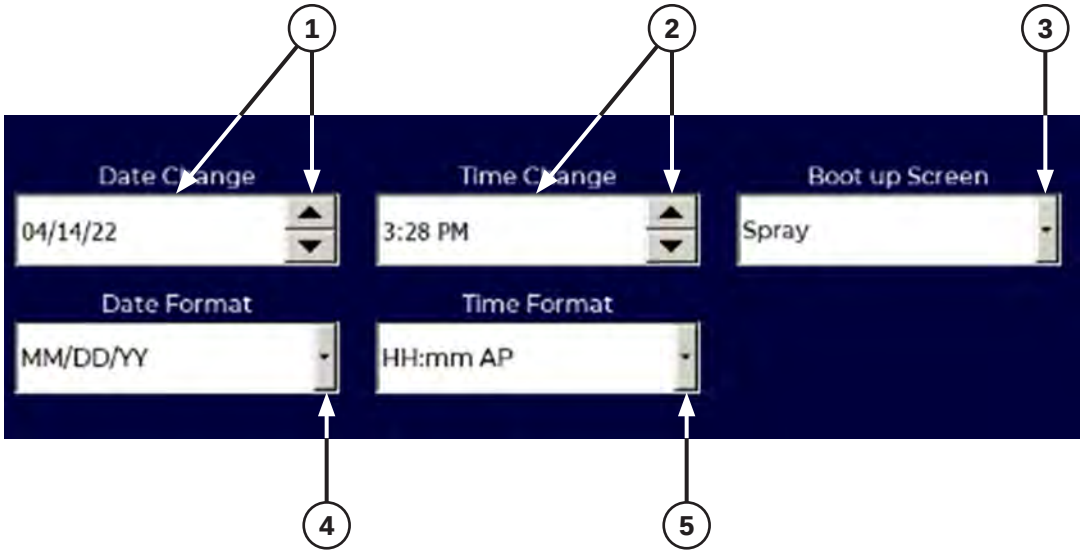
SETTINGS SCREENS–DISPLAY SETTINGS

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.

1. Change Date (click box or use arrows to enter or change).
2. Change Time (click box or use arrows to enter or change).
3. Boot Screen (pull down to select Spray or Exchange boot up screen).
4. Date Format (pull down to select).
5. Time Format (pull down to select).



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.**

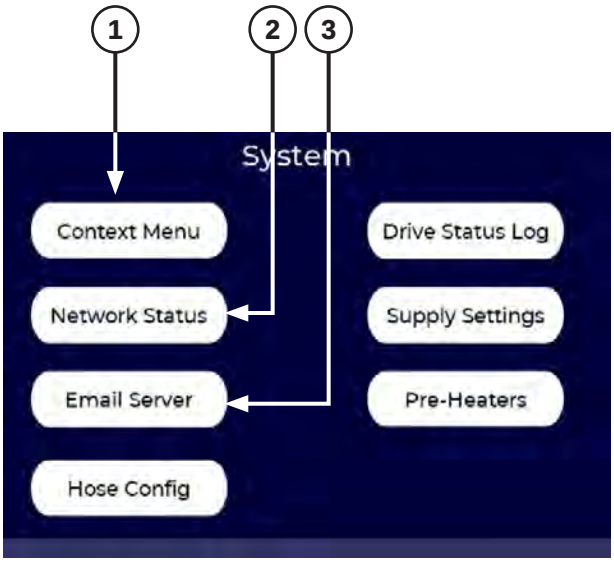
The Network Status window shows the internal connection status of all subsystems in the Proportioner and Hose. This can helpful when performing local or remote diagnostics.

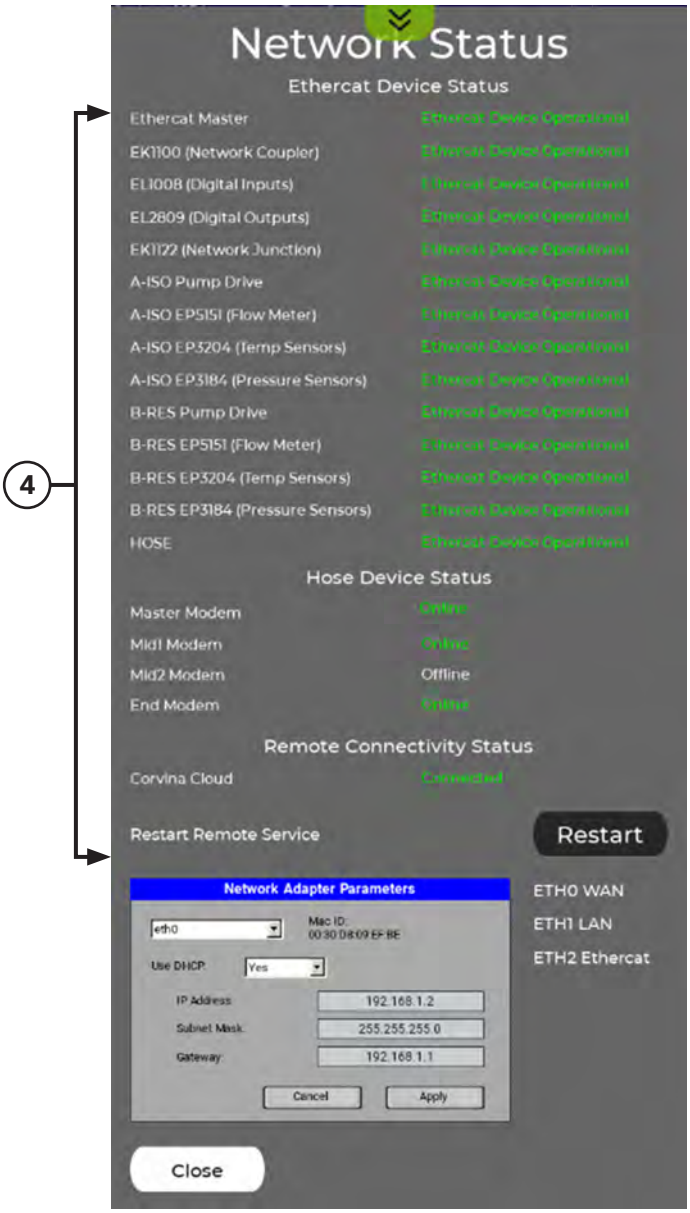
The Network Adapter Parameter window provides information on how the proportioner is communicating over wireless or connected networks. These parameters are set at the factory and should not be changed without assistance from trained service personnel.

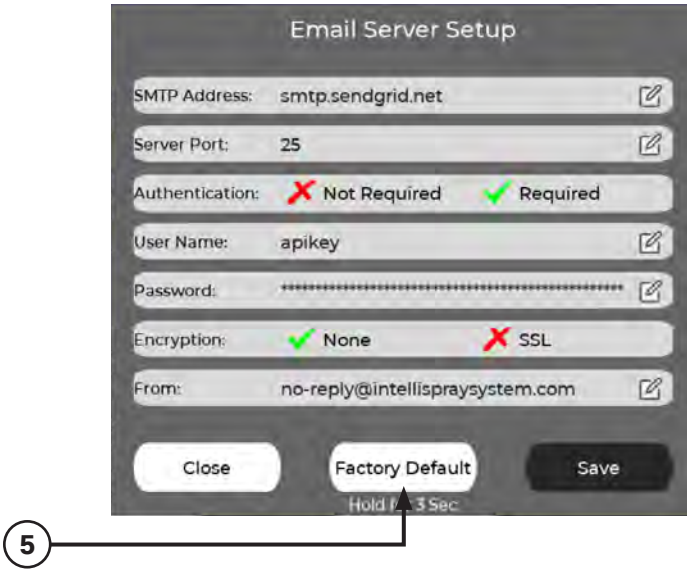
The Email Server Setup window (shown below) is used to configure the IS40 for emailing Job Reports. Most systems are preconfigured using a generic SMTP email server managed by Carlisle Fluid Technologies. Users can change the parameters to use their own SMTP server.

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

1. Context Menu (press to open).
2. Network Status (press to open).
3. Email Server (press to open).
4. Network Status
5. Factory Default (press to reset).







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).

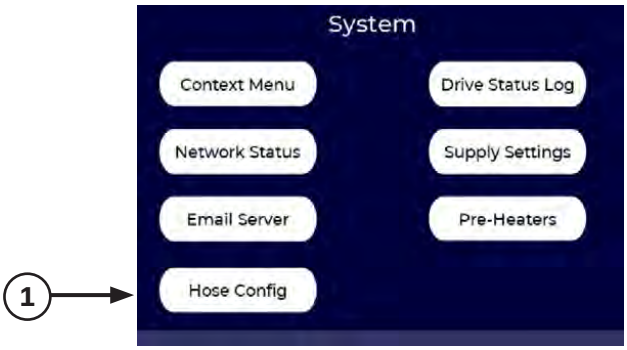
QuickHeat hoses can operate at one of 15 different frequencies to avoid interference with other systems and interference produced in the work area. Think of each Frequency as a radio channel. Some channels may have better reception than others.

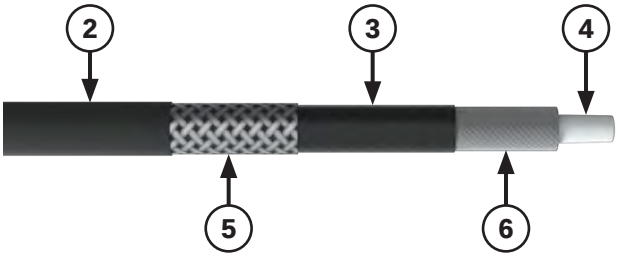
The IS40 allows the user to select the best Frequency (channel) for their particular system configuration and environment. A default frequency is set in the factory, but may need to be changed during installation, hose replacement, or if interference is detected while in use.

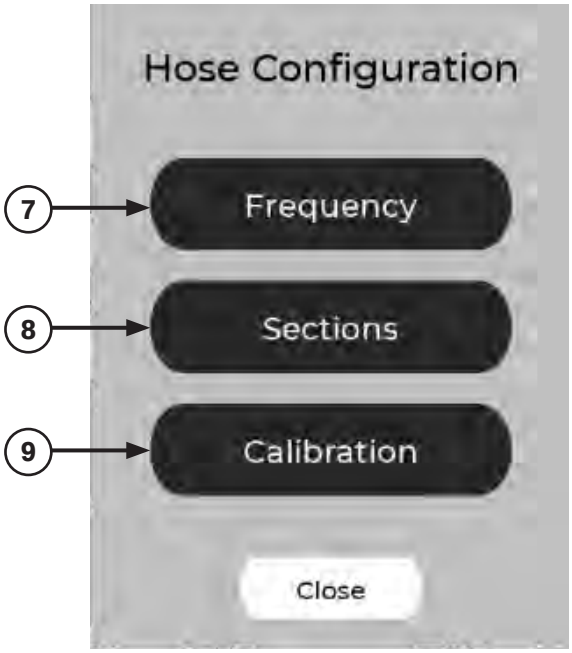
If a system is detecting poor hose communication an error message is displayed and the IS40 automatically moves to a STOP state. This is to prevent an overpressure or overtemperature hose situation. Any hose communication error begins with “SMOSE—Mx”. SMOSE is derived from the term “Smart HOSE”, and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

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

1. Hose Config (press to open).
2. Outer Moisture Resistant Layer
3. Inner Moisture Resistant Layer
4. Inner Core
5. Power and Communication Layer
6. Woven Reinforcement Layer
7. Hose Communication Frequency (press to scan and select hose communication frequency).
8. Hose Sections (press to specify the number and type of hose sections).
9. Hose Pressure Calibration (press to calibrate sensor).







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.

To initiate a scan, press the Scan button. Scanning all frequencies takes approximately 45 seconds. As the scan progresses, Advised (good) Frequencies will be indicated by a green checkmark ✓ to the right of the Frequency.

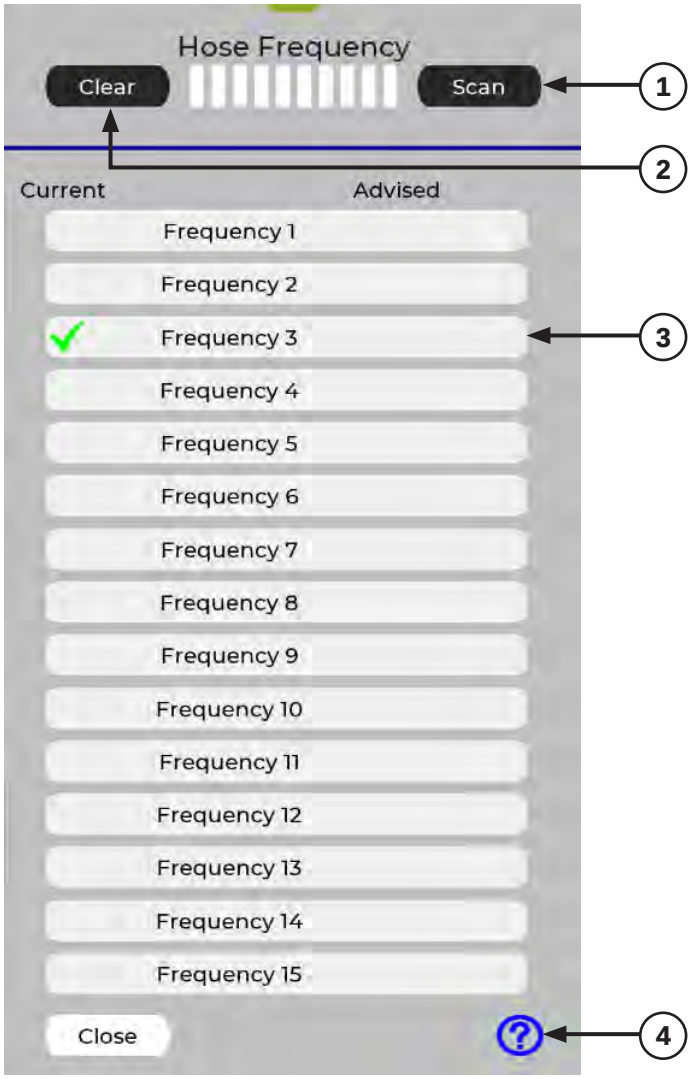
Frequencies with poor communication will be indicated by a red ✘ mark. See the example of the completed scan results in the figure at the right.

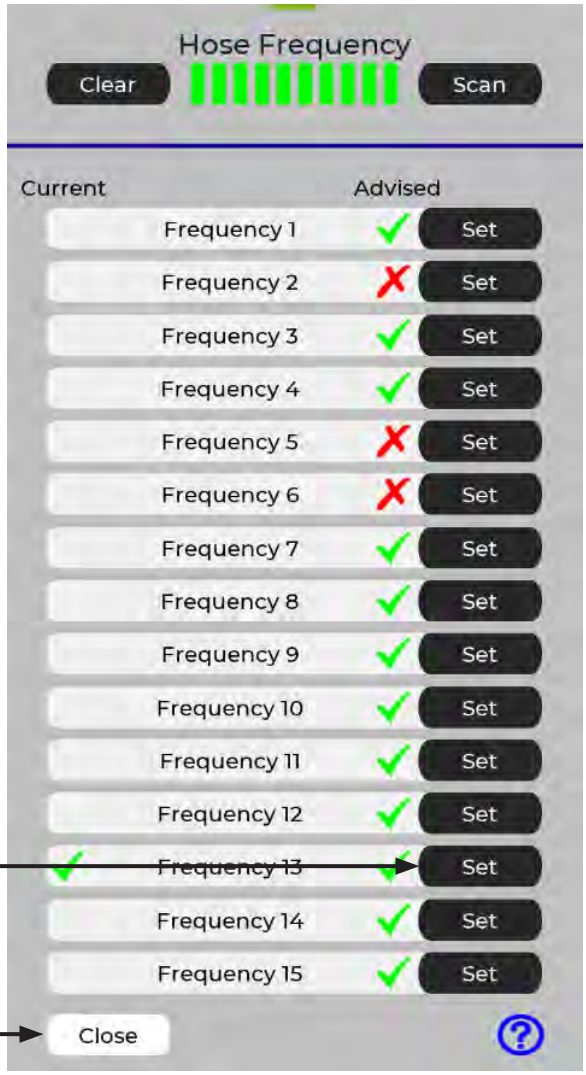
To change to a different Advised Frequency, press the Set button next to that Frequency.

Before initiating another scan press Clear, and 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.

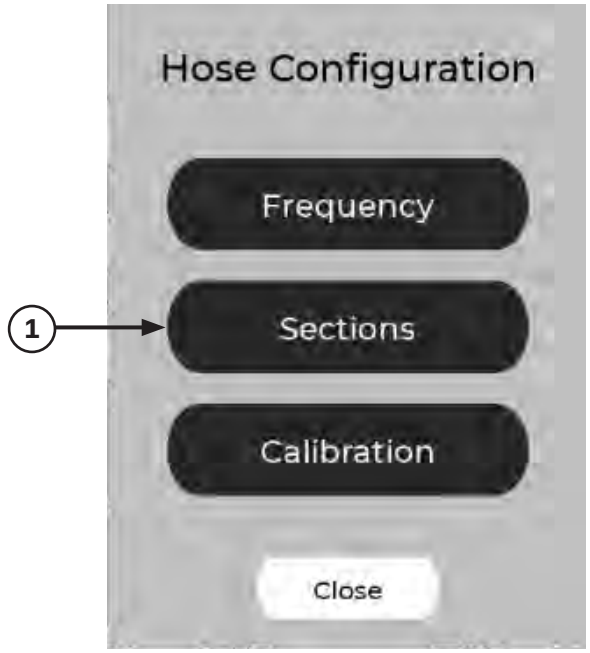
1. Scan Frequencies (press to initiate).
2. Clear Button (press to clear).
3. Selected Hose (indicated with a green checkmark).
4. Factory Default Reset Information
5. Set Button (press to set new frequency).
6. Close Button (press to close).





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)

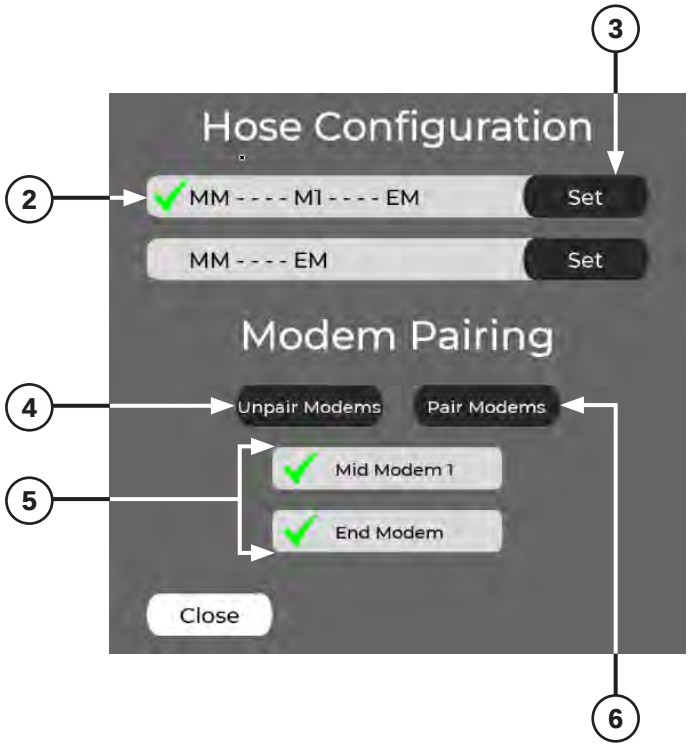
M1 = First Mid hose section

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.

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 ✘ 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.

1. Sections Button (press to open hose configuration).
2. Hose Config (displays selected hose).
3. Hose Config Set (press to set new hose).
4. Unpair Modems (press to unpair).
5. Pairing Status (displays current status).
6. Pair Modems (press to pair modems).

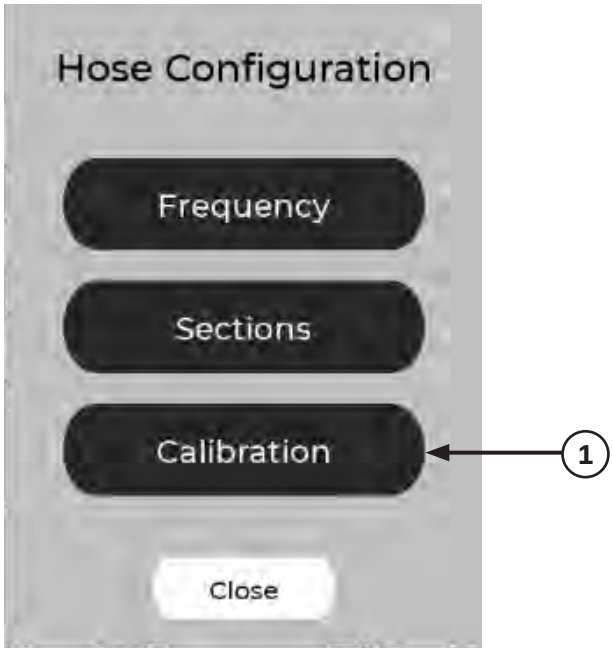
The Hose Configuration Calibration function is used to check and/or calibrate the Hose and Proportioner pressure sensors. This calibration is preformed prior to shipment on systems that are ordered together. If a hose Smart End is changed in the field, or if drift is detected between the pressure sensors,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

Pressing the Calibration button opens the Hose Calibration tool shown below. The Hose Calibration window shows the measured pressure values at the outlet of the gear pumps (post gear pump) and at the Smart End hose modem (hose end).

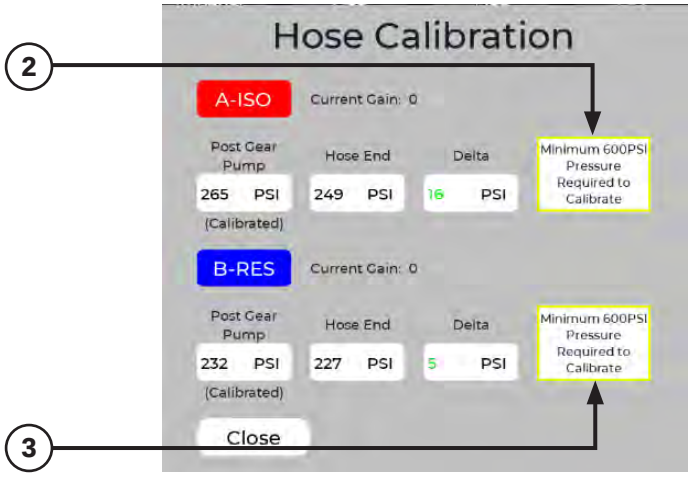
The difference (delta) between the two sensors is also shown for A and B materials, respectively. When no fluid is flowing, the difference should be less than +/- 50 psi at pressures above 600 psi.

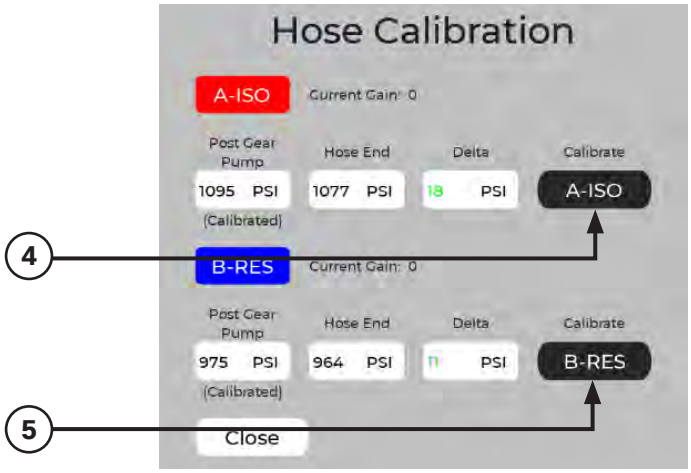
To perform a recalibration, the post gear pump and hose pressure must be at least 600 psi. In the previous figure this condition has not been satisfied and calibration is prevented. Once pressure is established, and the system is in STOP state, calibration of the A or B-side can be performed by pressing the corresponding Calibration button. After calibration the difference between the sensors will be very close to 0.

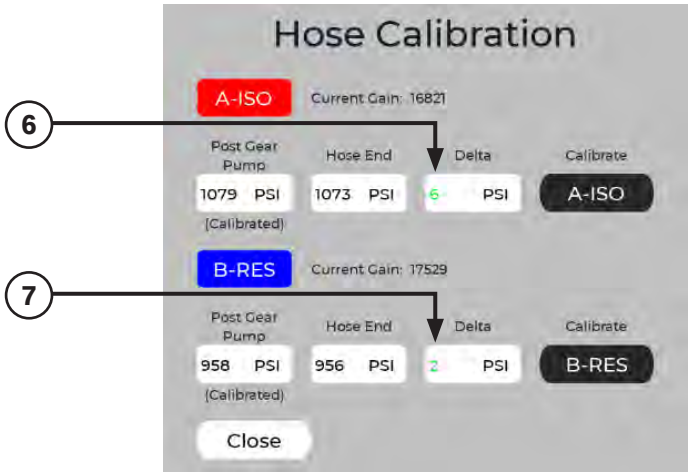
1. Calibration Button (press to open calibration).
2. A-ISO Pressure Calibration Pressure Display
3. B-RES Pressure Calibration Pressure Display



4. A-ISO Pressure Calibration (press to open).
5. B-RES Pressure Calibration (press to open).
6. A-ISO Delta Pressure
7. B-RES Delta Pressure







SETTINGS SCREENS–DRIVE STATUS LOG

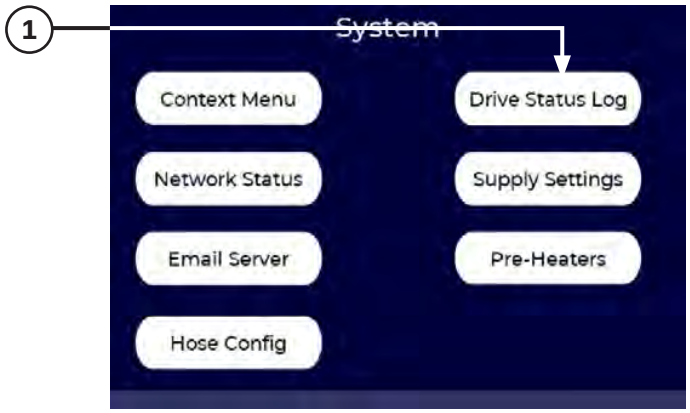
The Drive Status Log button provides detailed information about the A or B motor drive controllers. This Log is a history of motor drive states, errors, and actions.

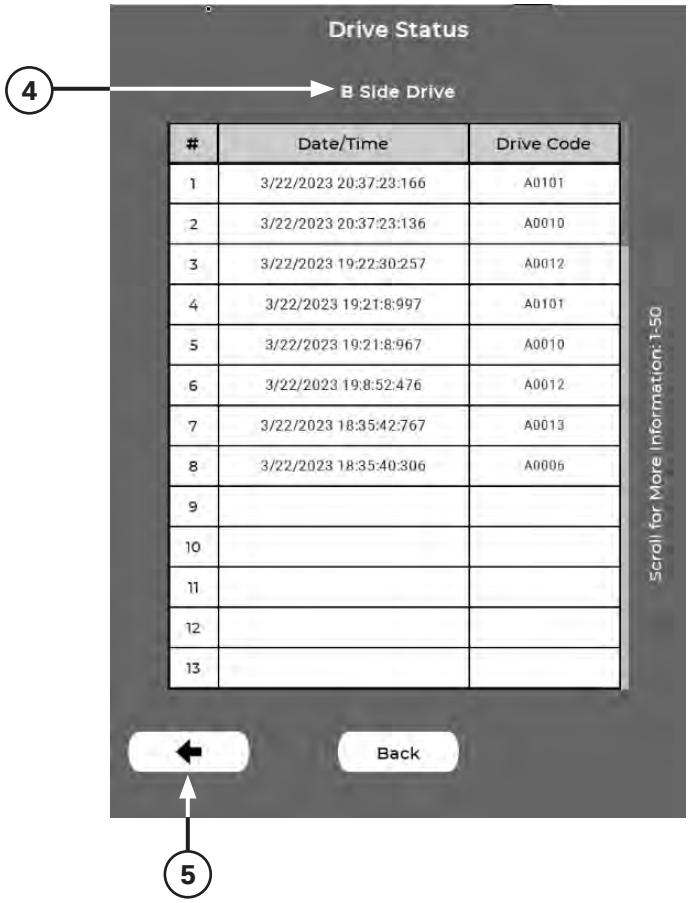
If a driver error occurs, a generic message will be presented to the user on the active screen, and logged in the active errors in the Alarm screen (see "ALARM SCREEN").

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.

1. Drive Status Log (press to open).
2. A Drive Status Display
3. To B Side Motor Drive Log (press to open).
4. B Drive Status Display
5. To A Side Motor Drive Log (press to open).





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 IS40 from situations that could damage the equipment and/or inject air into the proportioner and hoses. Values can be changed from factory default settings using a pop-up keyboard.

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.

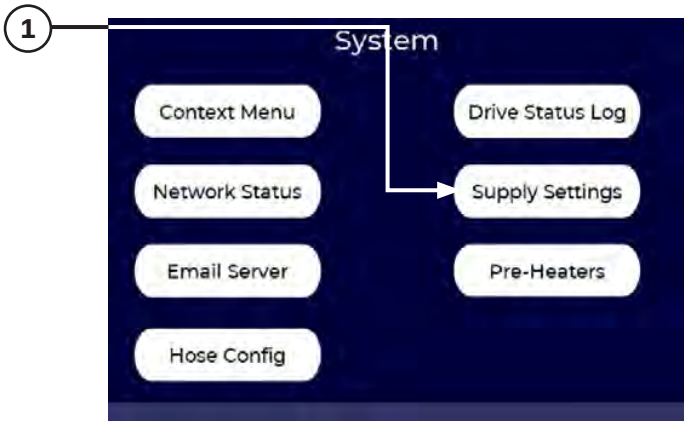
Standard drum size. Press to enter value. This is used for scaling fluid level on drum icons. Factory setting is 55 gallons (208 liters).

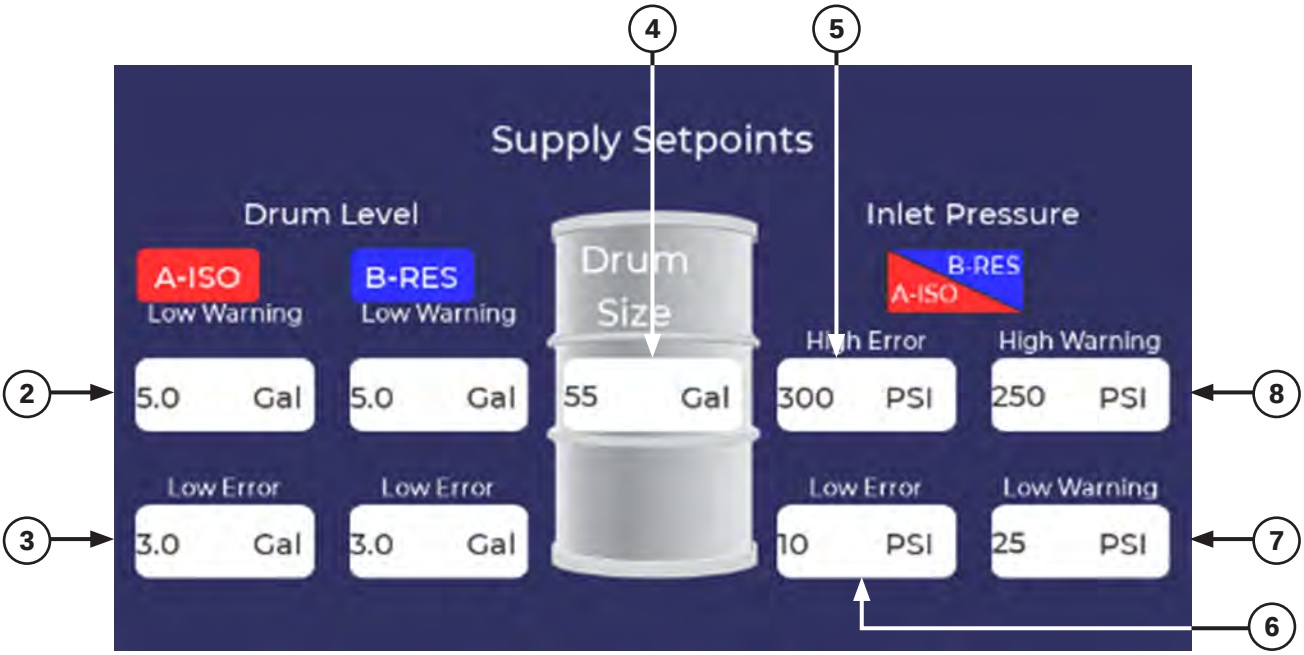
Inlet low pressure error limit. Applies to A and B sensors before the gear pumps.

The system generates an error message and stops if pressure drops below setting. The minimum pressure setting is 25 psi (1.7 bar).

Inlet low pressure warning limit. Applies to A and B sensors before the gear pumps. The system generates a warning message if the pressure drops below a setting. The minimum pressure setting is 0 psi (0 bar).

1. Supply Settings (press to open).
2. Low Drum Warning Level
3. Low Drum Error Level
4. Standard Drum Size
5. Inlet High Pressure Error Limit
6. Inlet Low Pressure Error Limit
7. Inlet Low Pressure Warning Limit
8. Inlet High Pressure Warning Limit





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 (RES) information.

These optional features can be helpful when preparing comprehensive Job Reports.

The system generates an error message and stops if pressure drops below setting. The minimum pressure setting is 25 psi (1.7 bar).

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.

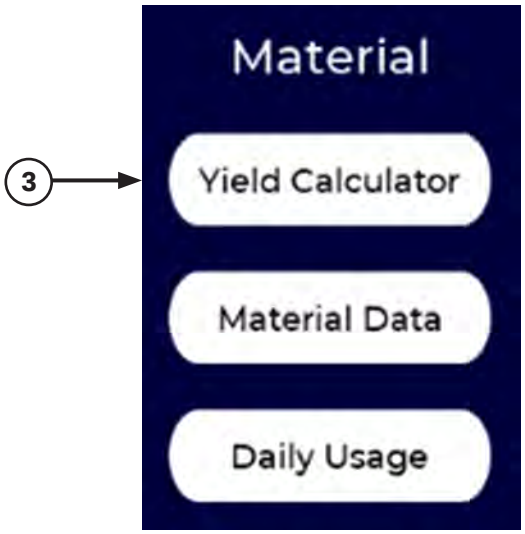
Note: The next page shows the Yield Calculator User inputs and system outputs.

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

1. Make sure the material data information has been entered and saved using the **Material Data** menu (see "SCREEN SETTINGS-MATERIAL DATA").
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 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).



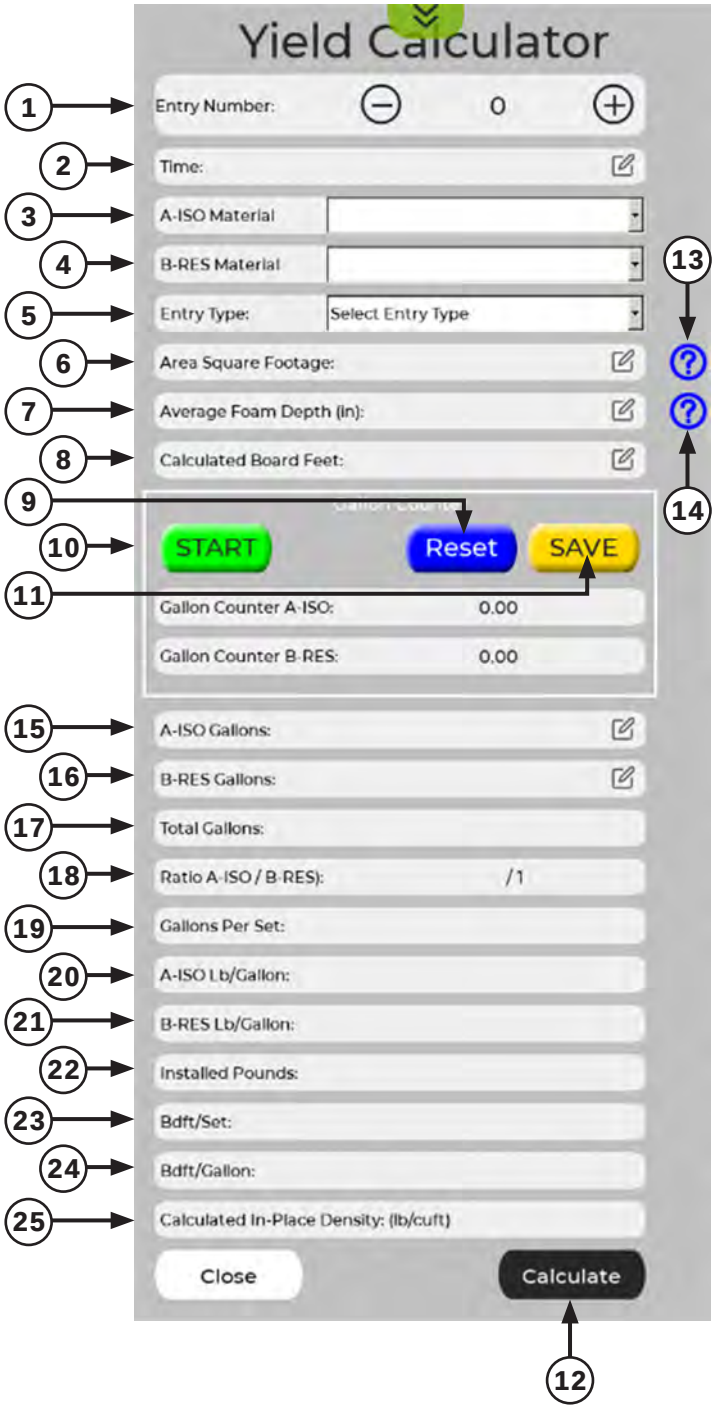
Note: Green items must be entered to perform a yield calculation, other input fields are optional.

User Inputs

1. Entry Number (press - and + buttons to select the entry number).
2. Time (press to apply the optional date and time-stamp test entry).
3. A-ISO Material (press to select).
4. B-RES Material (press to select).
5. Entry Type (press to select this option).
6. Area Square Footage (enter test area).
7. Average Foam Depth (enter average foam depth)
8. Calculated Board Feet (directly enter test area volume option).
9. START (press to initiate Gallons counters).
10. RESET (press to zero counters).
11. SAVE (press to retain counters if test is not continued in one test session).
12. Calculate (press to calculate the outputs).

Outputs

13. Area Calculator (press to open).
14. Depth Calculator (press to open next page).
15. A-ISO Sprayed (gal).
16. B-RES Sprayed (gal).
17. Total Sprayed (gal).
18. A:B Ratio Sprayed
19. Total Volume/Set (gal/set).
20. A Density (Lb/Gal).
21. B Density (Lb/Gal).
22. Installed Foam (Lb).
23. Yield (Bdft/Set).
24. Yield (Bdft/Gal).
25. Density (Lb/cuft).



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.

The area calculator 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.

The Average Depth calculator allows the user to enter up to 28 depth measurements taken within the test area.

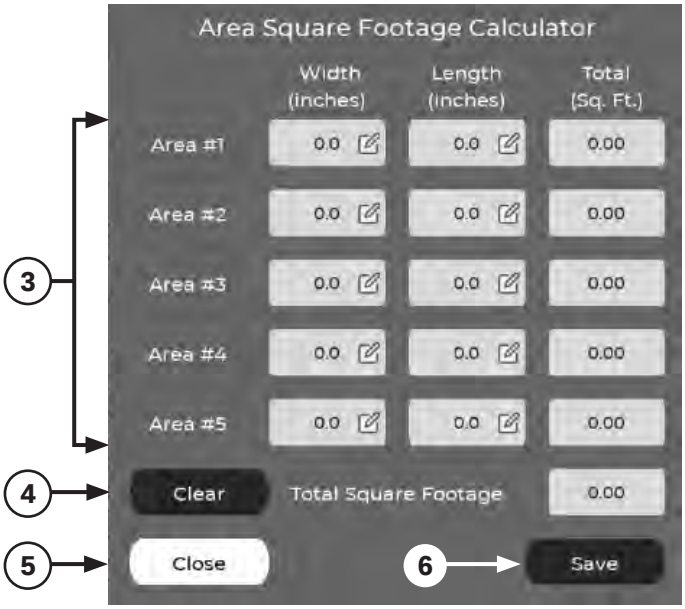
Press on each cell to enter the depth values.

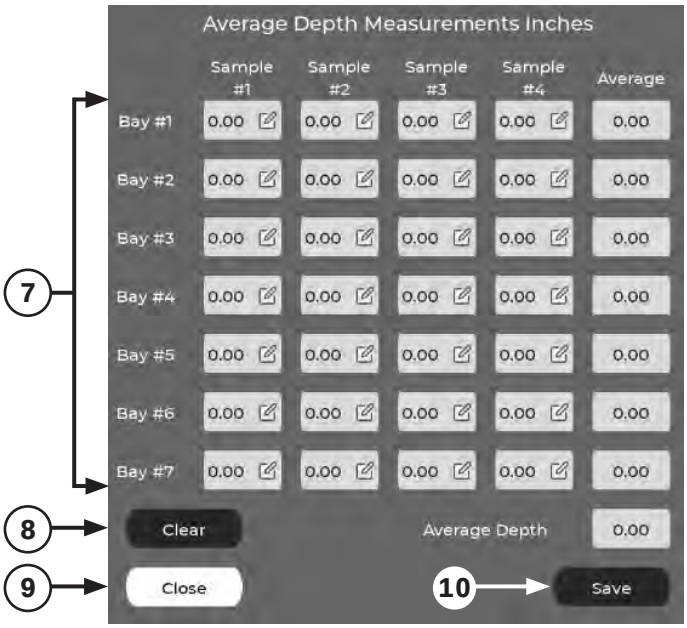
Press Clear to clear all cells.

Press Save to complete the calculation.

Close to return to the Yield Calculator and automatically populate the average depth value.

1. Area Calculator (press to open).
2. Depth Calculator (press to open next page).
3. Area Dimension Cells (enter numeric values).
4. Clear (press to clear).
5. Close (press to close)
6. Save (press to save).
7. Average Depth Cells (enter numeric values).
8. Clear (press to clear).
9. Close (press to close).
10. Save (press to save).





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.

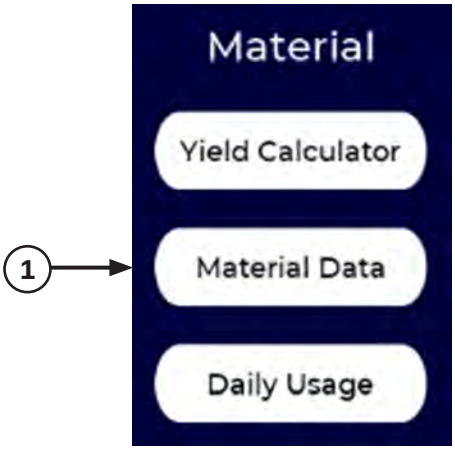
To access the Material Library select **Material Data** from the Material Settings men, then select either A-ISO or B-RES material.

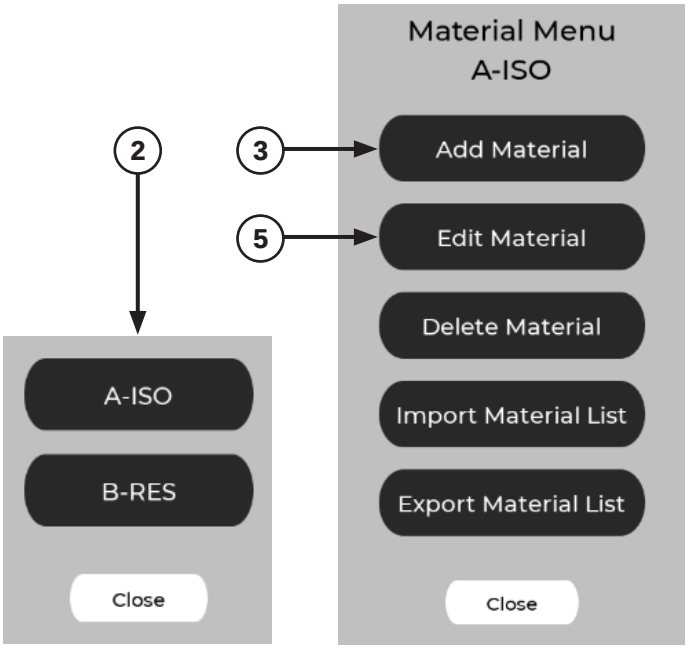
After selection of **A-ISO** or **B-RES** material, the user can then select the desired operation—Add a new material, Edit information about an existing material, Delete a material, and Import or Export material information via a USB storage device.

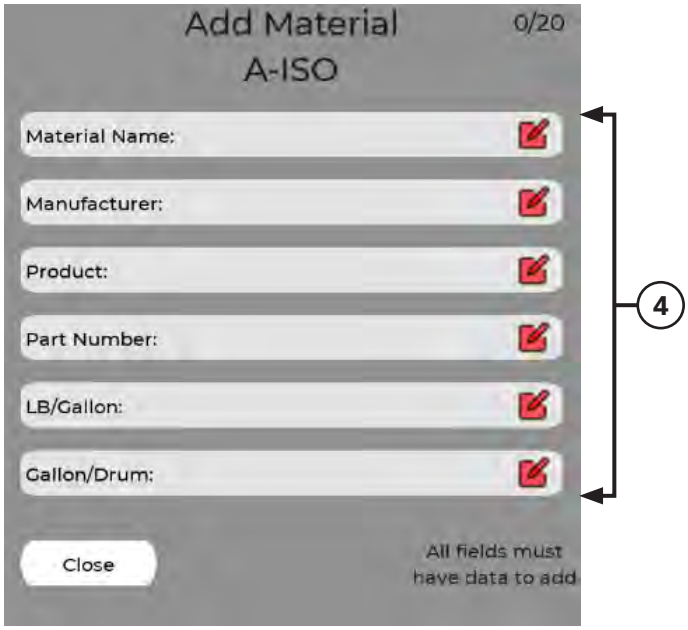
To add a new material, select **Add Material** and use the popup keypad to enter information in the fields shown below. This data can be obtained from the drum label, Product Data Sheet, or Material Data Sheet.

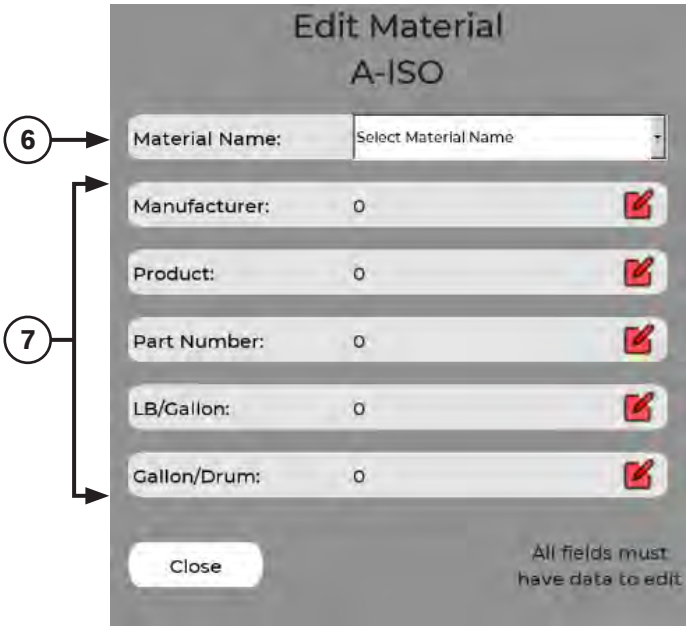
To edit an existing material select **Edit Material**, select the material to edit from the drop-down menu, and enter new values as required.

1. Material Data (press to open).
2. A/B Material Selection (press to select).
3. Add Material (press to open).
4. Field Selection Menu (press each to open).
5. Edit Material (press to open).
6. Material Menu (press to open menu).
7. Field Selection Menu (press each to open).









Select **Delete Material** and select from the drop-down menu to delete a material.

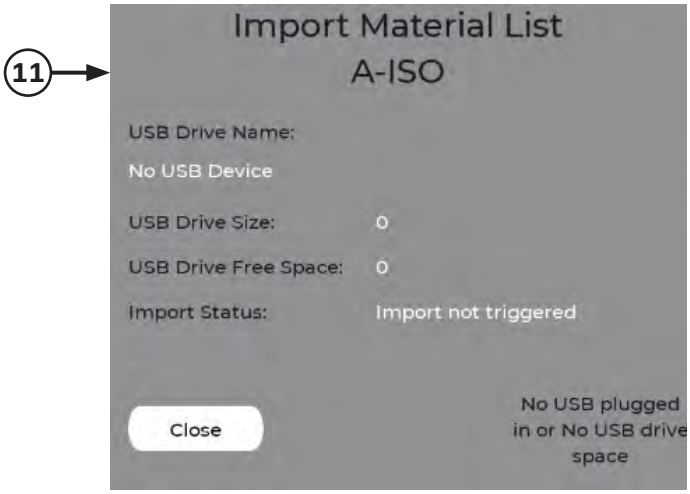
Select **Import Material List** to import a material or materials from a USB device attached to the unit.

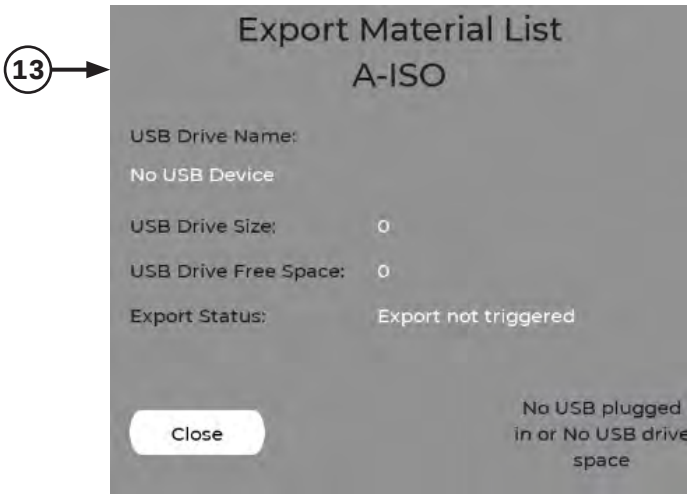
Select **Export Material List** to export all materials in the material library to a USB device attached to the proportioner. This feature allows sharing information between systems.

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.

8. Delete Material (press to delete).
9. Material Menu (press to open menu).
10. Import Material List (press to import list).
11. Import Material List Display
12. Export Material List (press to export list).
13. Export Material List Display





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. Only users with administration permissions can change the setting and/or create, edit, or delete users.

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.

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.

User Name: Admin. Password = admin (all lower case).

This predefined "Admin" user can be edited or deleted by an end-user with administrative privileges.

User Name: CFT. Password is hidden.

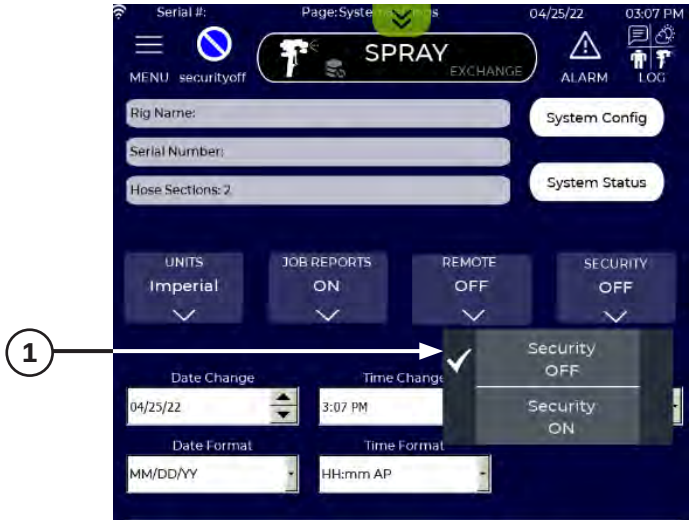
Used only by CFT service staff for performing remote diagnostics if/when required. It cannot be edited or deleted.

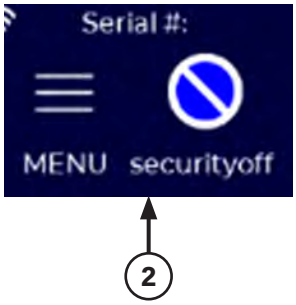
User Name: Security OFF. Password is hidden.

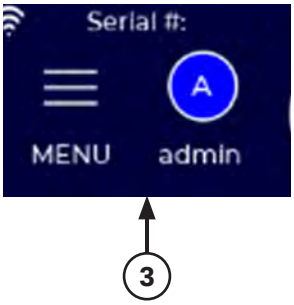
This is the default user for logging purposes when Security is turned off. It cannot be edited or deleted.

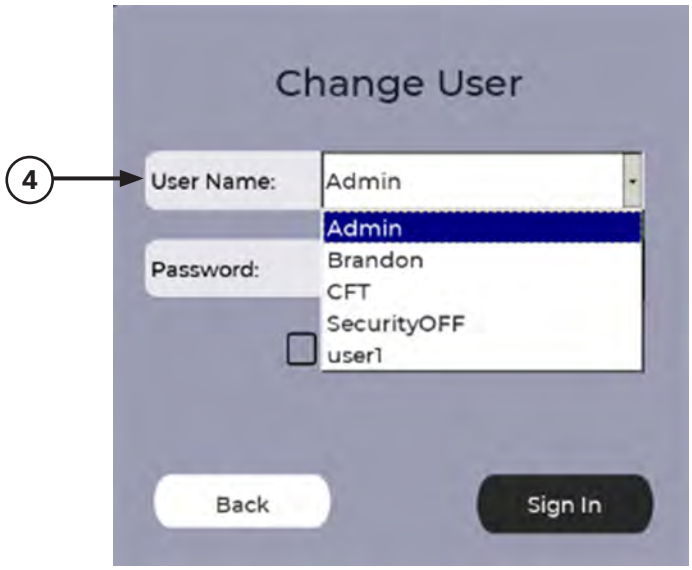
When Security is "ON", press the User Icon to access the User Management menu as shown.

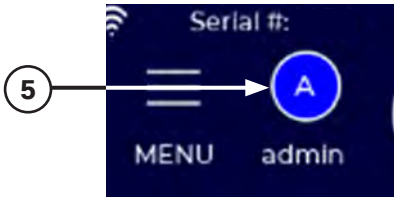
1. Security Setting (press to open menu).
2. Security OFF
3. Security ON
4. User Name (press to open menu and select choice).
5. Management Menu (press to open).











Pressing the User Icon will open the User Management menu.

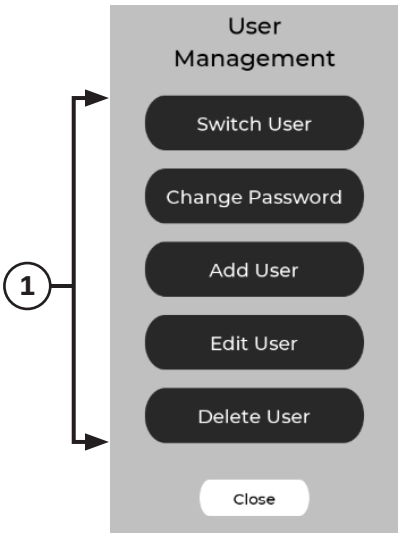
A user with an Administrative role can switch users, change passwords, and add, edit, or delete users.

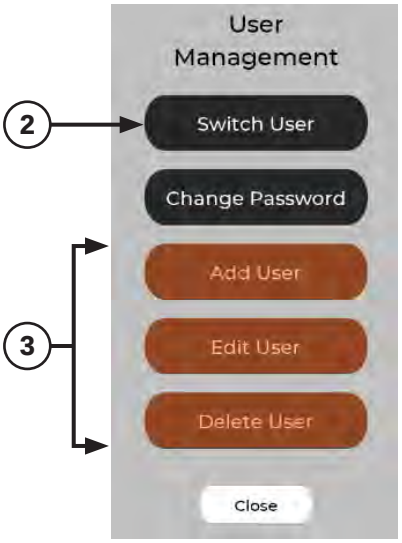
A user with a Sprayer role will only have the ability to switch user or change their own password. Other functions will be highlighted to indicate they are not accessible.

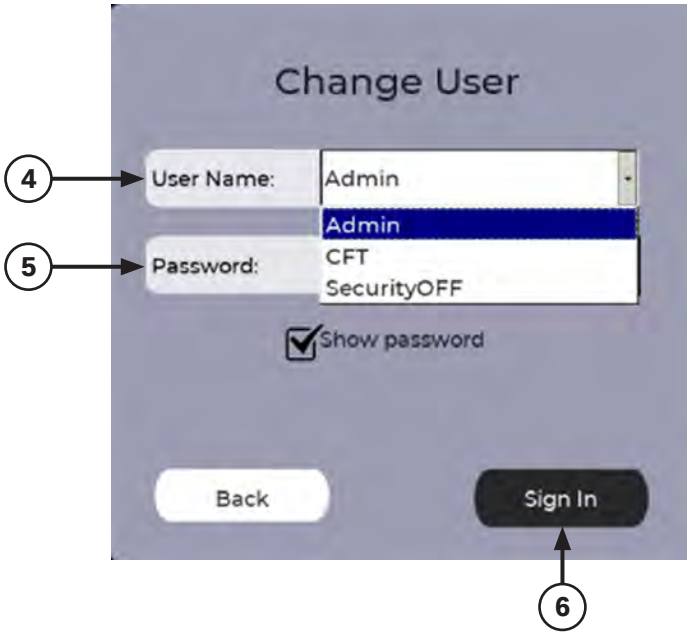
To change users, select Switch User from the menu, then select the new user to login under from the drop-down menu.

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.

1. Administrator-Only Functions (press each to open).
2. Sprayer-Accessible Functions (press to open menu).
3. Sprayer-Inaccessible Functions
4. User Name (press to open menu and select choice).
5. Password (enter user or new password).
6. Sign In (press to open).







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

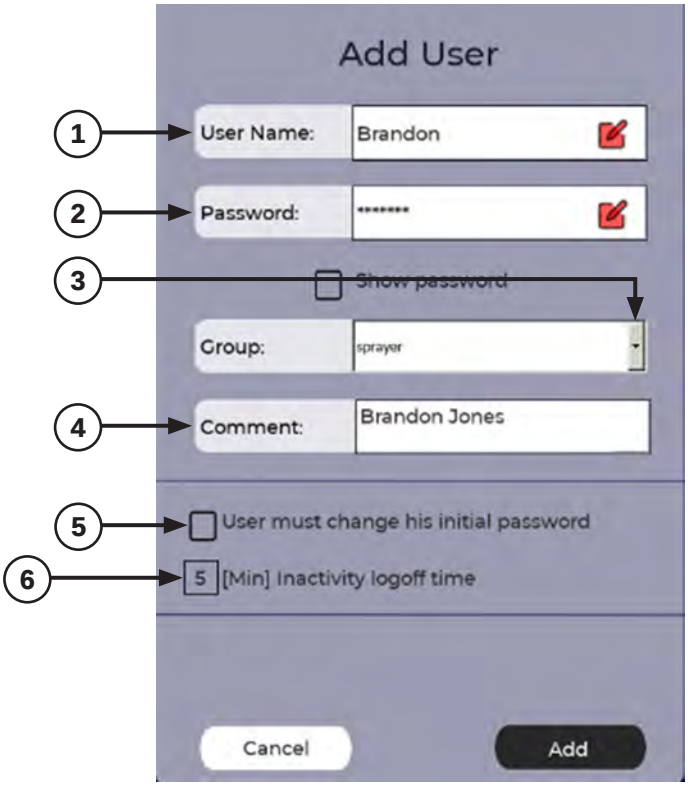
After entering the User name and password, select the Group the User is assigned to. Groups are either Administrators or Sprayers.

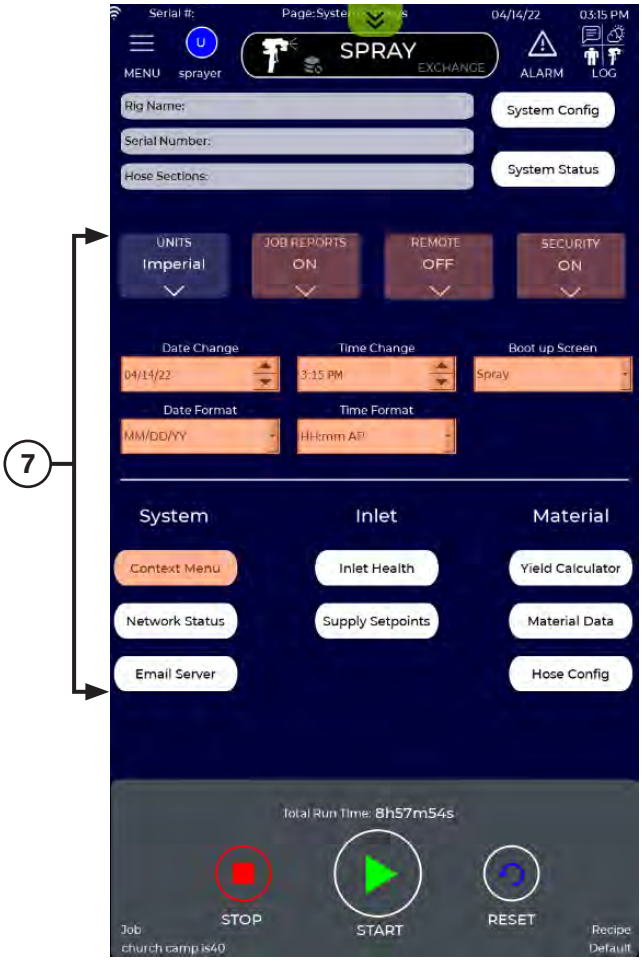
Administrators have access to change all system settings, recipes, and material data. Administrators can also add, delete, and edit users.

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.

1. User Name (press to open menu and select choice).
2. Group (select from menu).
3. Password is case sensitive, alphanumeric characters and normal special characters allowed (press to open menu and select choice).
4. Comment (optional free-form).
5. Mandatory First-Time Login Password Change (optional check box).
6. Inactivity Logout Time (enter optional timeout in minutes).
7. Sprayer-Inaccessible (three examples that are highlighted in orange).






Serial #:
Page: Recip
04/14/22
03:16 PM
MENU
sprayer
SPRAY
EXCHANGE
ALARM
LOG
A-ISO °F
High Error 180
High Warning
Setpoint Max 150
Setpoint 100
Setpoint Min 80
Low Warning
Low Error
Low Drum Temp Warning
Low Drum Temp Error
Recirc Max Temp 105
PreHeat Offset 0
Display Max 250
Display Min 0
B-RES °F
High Error 180
High Warning
Setpoint Max 150
Setpoint 100
Setpoint Min 80
Low Warning
Low Error
Low Drum Temp Warning
Low Drum Temp Error
Recirc Max Temp 105
PreHeat Offset 0
Display Max 250
Display Min 0
Ratio
License Key
Ratio Control
Parts A-ISO
Parts B-RES
Effective Ratio 1.00 : 1
Ratio Error
AVC °F
Max Temp A-Side 155
Min Temp A-Side 95
Max Temp B-Side 155
Min Temp B-Side 95
Previous
Next
RECIPE
Default
COPY
NEW
LOAD
DELETE
Total Run Time: 8h57m54s
STOP
START
RESET
Job
church camp is40
Recipe
Default
7
7

RECIPE SCREENS–OVERVIEW

Recipes are collections of system parameter settings that can be created, saved, copied, edited, loaded, and deleted by the user.

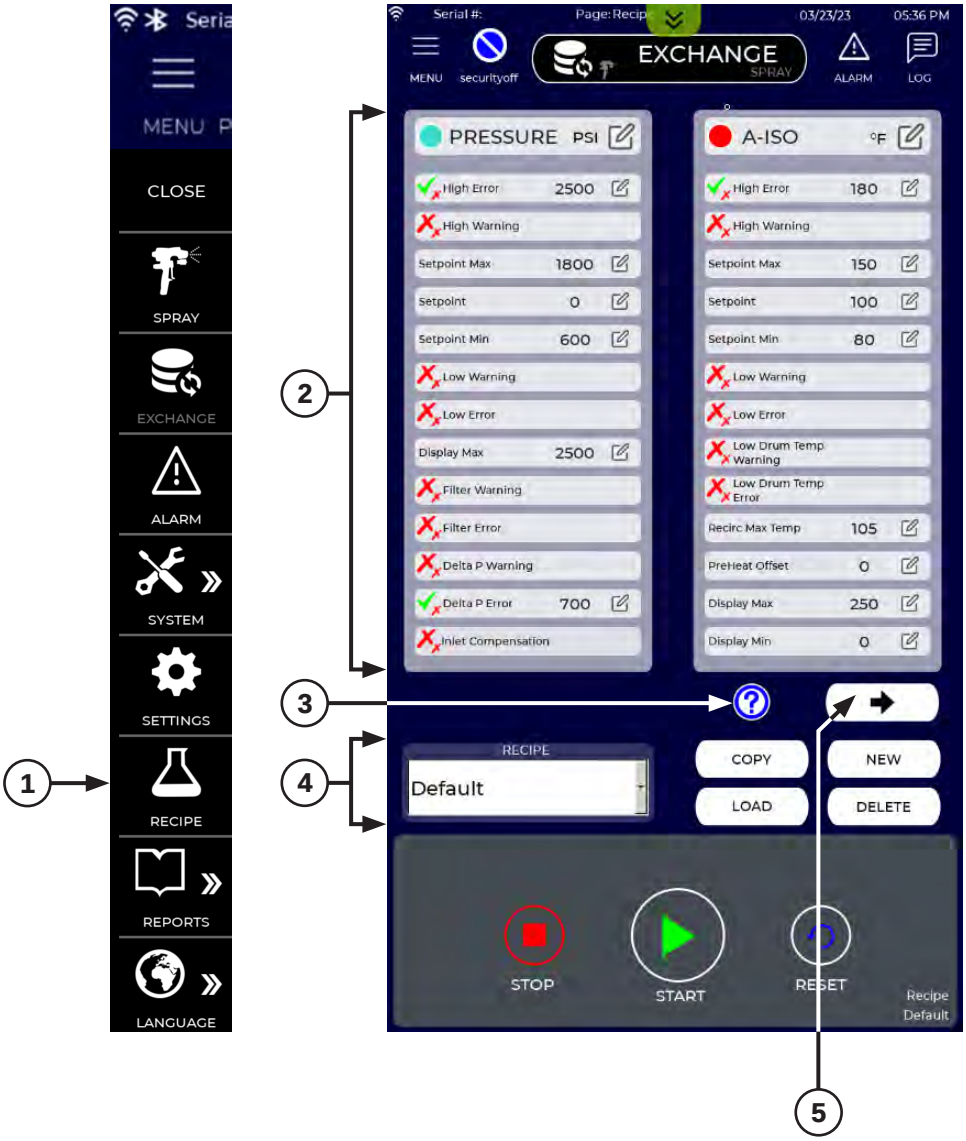
Recipes allow users to quickly configure the system for different materials, job conditions, or user preferences.

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.

1. Recipe Help
2. Parameters Tables (5)
3. Show Next Table (press to open).
4. Recipe Tables
5. Show Next Table (press to open).



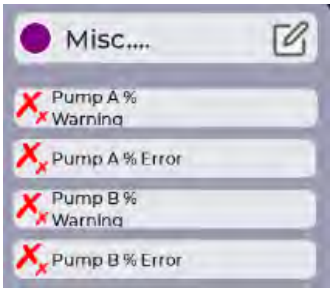
Each Recipe is defined by five tables. These tables are used to enable or disable parameters, set their respective values, and toggle parameter display markers on or off. While this may seem excessive, having full access to all parameters allows users to tailor their IS40 to their specific needs.

Two parameter tables are shown at any time on the Recipe screen. To move 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. 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.

1. Show Previous Parameter Table (press to open).
2. Show Next Parameter Table (press open menu).

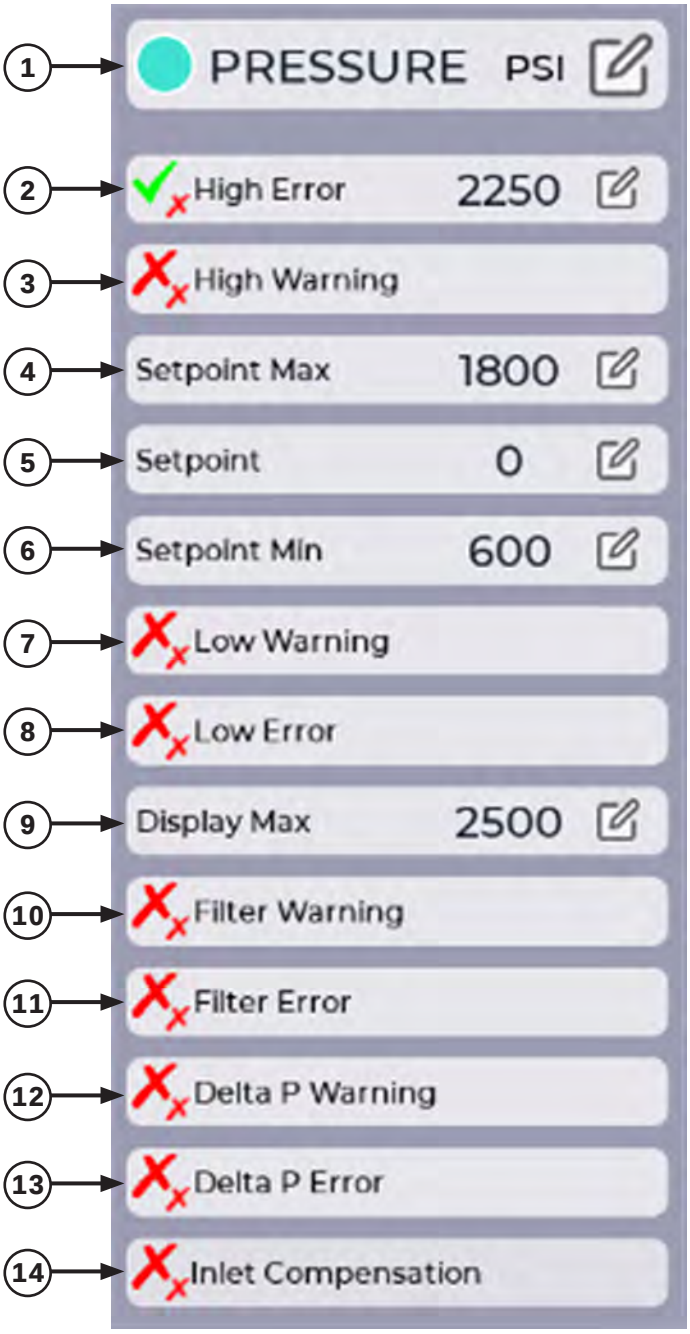
PARAMETER TABLE LEGEND	
Enable	Enable or Disable Parameter
View	View or Hide Parameter Screen Icon
☑	Parameter is always on
✓	Parameter is on
✗	Parameter is off
✎	Select or change setting or value
✓✗	Parameter is enabled but not viewed
✗✗	Parameter is disabled and not viewed



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.

1. Press to toggle parameter enable/view settings.
2. 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).
3. Displays warning if this fluid pressure value is exceeded anywhere in the system.
4. Fluid pressure setpoint maximum. Always enabled and viewed.
5. Fluid pressure setpoint. Always enabled and viewed.
6. Fluid pressure setpoint minimum, Always enabled and viewed.
7. Displays warning if fluid pressure drops below this value at the end hose end sensor.
8. Displays error and stops the systems if fluid pressure drops below this value at the end hose end sensor
9. Maximum fluid pressure dial value (for dial scaling purposes only).
10. Displays error and stops system if inlet filter pressure drop exceeds vale. Used to indicate plugged inlet filter.
11. Displays warning if inlet filter pressure drops.
12. Displays error and stops system if pressure difference at end of hose exceeds value.
13. Displays warning if pressure difference at end of hose exceeds value.
14. Enables Low Inlet Pressure Compensation (useful when transfer pumps cannot keep up with Proportioner).

    See "SPRAY SCREEN-AUTOMATIC INLET COMPENSATION" for more information on Inlet Compensation.



The Recipe Screen has identical but separate tables for A and B Temperature parameters.

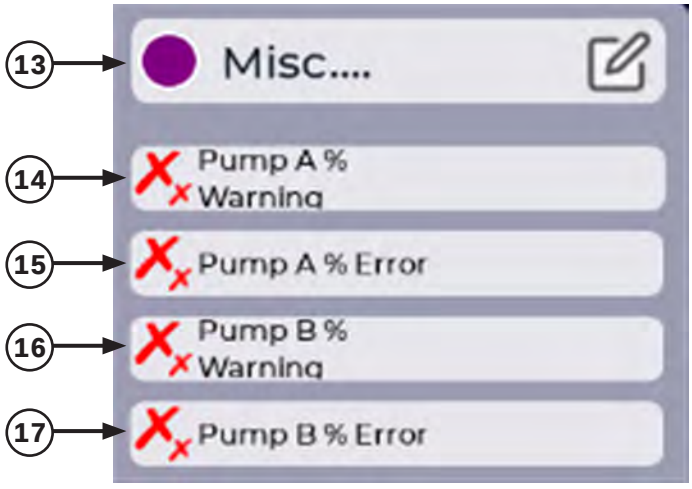
Further description of each Temperature table parameter field is shown below.

Factory default settings are shown in the figure.

1. Press to toggle parameter enable/view settings.
2. Displays error and stops system if fluid temperature exceeds value anywhere in the system. Parameter is always enabled.
3. Displays warning if fluid temperature exceeds value anywhere in the system.
4. Setpoint maximum. Always enabled and viewed.
5. Setpoint. Always enabled and viewed.
6. Setpoint minimum, Always enabled and viewed.
7. Displays warning if fluid temperature drops below value at the end hose sensor.
8. Displays error and stops system if fluid temperature drops below value at the end hose sensor.
9. Displays warning if incoming fluid temperature drops below value.
10. Displays error and stops system if incoming fluid temperature drops below value.
11. Maximum recirculation temperature in Exchange Mode
12. Preheat offset (positive or negative). May be required with low viscosity B-side materials. See "SPRAY SCREENS-OTHER FUNCTIONS".
13. Maximum temperature displayed on temperature gauge widget.
14. Minimum temperature displayed on temperature gauge widget.

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.

1. Press to toggle parameter enable/view settings.
2. Press to enable License Key.
3. Ratio control is always enabled and displayed on the Spray Screen.
4. Reserved for future use. User cannot change.
5. Reserved for future use. User cannot change.
6. Ratio setting is 1:1 and not adjustable by the user.
7. Warning is displayed if ratio error exceeds +/- value. Error is displayed and system shuts down if is ratio error exceeds +/- value.
8. Press to toggle parameter enable/view settings.
9. Maximum A AVC™ offset from setpoint.
10. Minimum A AVC™offset from setpoint.
11. Maximum B AVC™ offset from setpoint.
10. Minimum B AVC™offset from setpoint.
12. Convergence pressure difference between A and B when AVC™ is enabled.
13. Press to toggle parameter enable/view settings.
14. Warning is displayed and system shuts down if A pump efficiency drops below value.
15. Error is displayed if A pump efficiency drops below value.
16. Warning is displayed and system shuts down if B pump efficiency drops below value.
17. Error is displayed if B pump efficiency drops.



RECIPE SCREENS–RECIPE MANAGEMENT

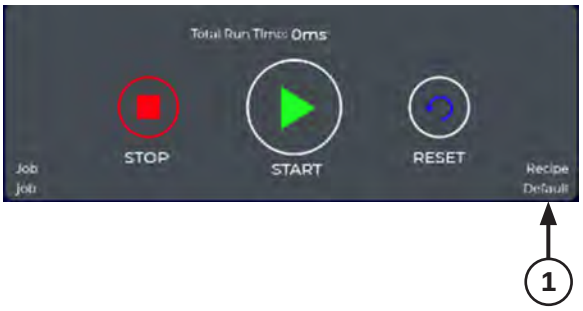
Load a recipe: The current Recipe selection is shown at the bottom right corner of each screen. If no Recipes have been defined the Proportioner selects and displays the Default Recipe.The Default Recipe can be modified, but never deleted.

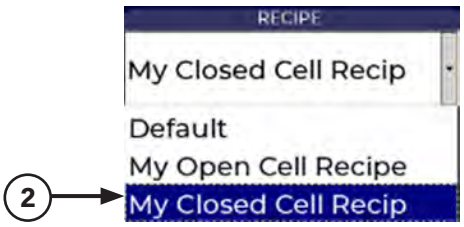
Within the Recipe Screen, use the drop-down menu to select an existing Recipe.

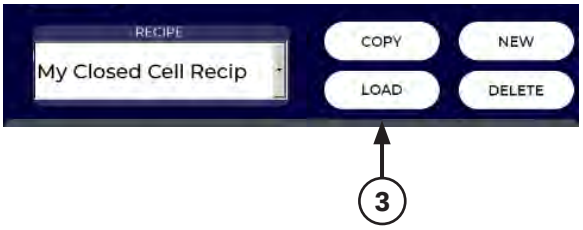
NOTE: Selecting a Recipe does not activate it.

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, then press the Apply button.

1. Currently Selected Recipe
2. Recipe Menu (press to open menu and select choice).
3. Recipe Load (press "LOAD" to activate the selection for use).



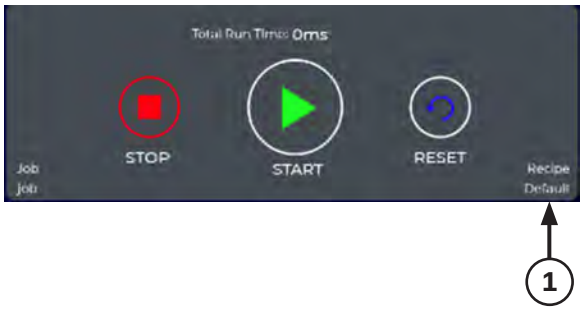


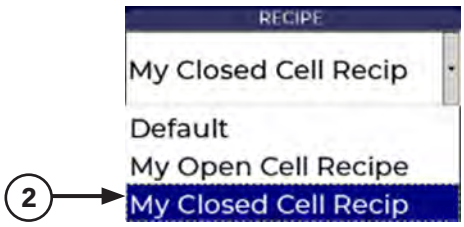


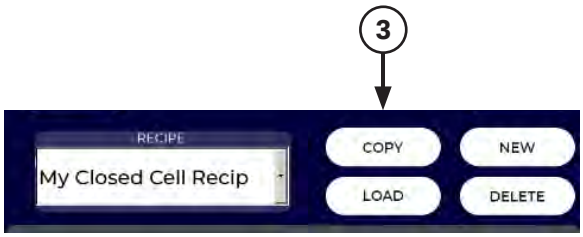
Copy a recipe: Press the "COPY" button, then select the Recipe to copy from, enter a new Recipe name, and press the Apply button.

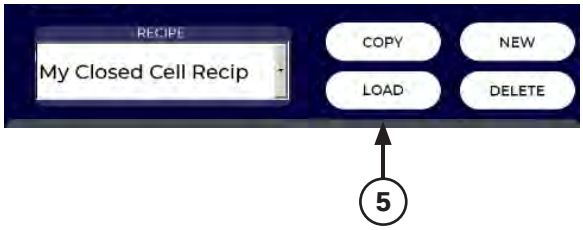
The new Recipe will be displayed in the Recipe selection window. The Recipe tables can be edited as needed (per next pages) and the new Recipe activated by pressing the "LOAD" button.

1. Currently Selected Recipe
2. Recipe Menu (press to open menu and select choice).
3. Recipe Copy (press "COPY" to duplicate the selection).
4. Apply Button (press to save the duplicated selection).
5. Recipe Load (press "LOAD" to activate the new selection for use).





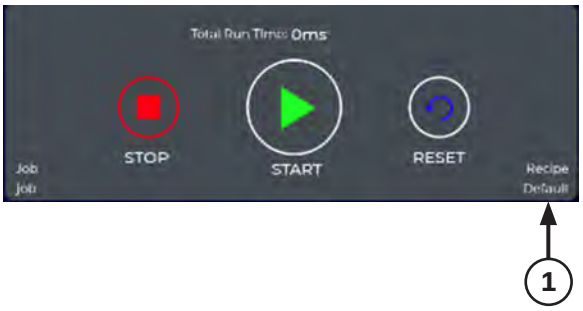


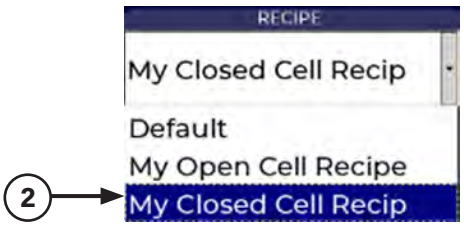


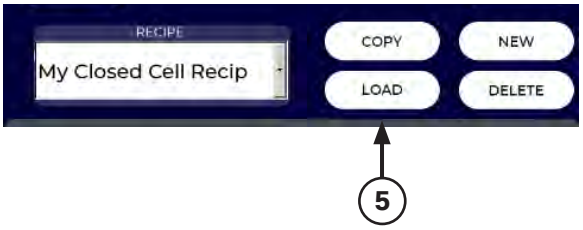
Make a new recipe: The new Recipe will be displayed in the Recipe selection window. The Recipe tables can be edited as needed (per next pages) and the new Recipe activated by pressing the "LOAD" button.

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.

1. Currently Selected Recipe
2. Recipe Menu (press to open menu and select choice).
3. Recipe New (press "NEW" to make a new selection).
4. Apply Button (press to save the new selection).
5. Recipe Load (press "LOAD" to activate the new selection for use).

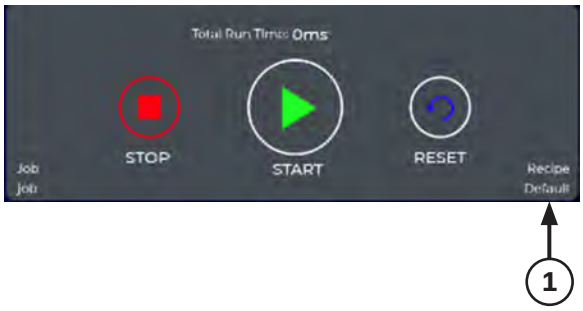


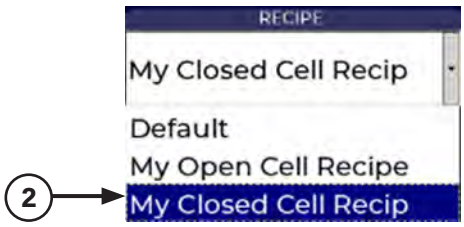




Delete a recipe: To delete the Recipe, first select it then press the "DELETE" button and then confirm the action by pressing the Apply button.

1. Currently Selected Recipe
2. Recipe Menu (press to open menu and select the recipe to be deleted).
3. Recipe Delete (press Delete the selected recipe).
4. Apply Button (press to confirm deletion).





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.

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 examples show the enabling the Low Error parameter and making it viewable on the Spray Screen.

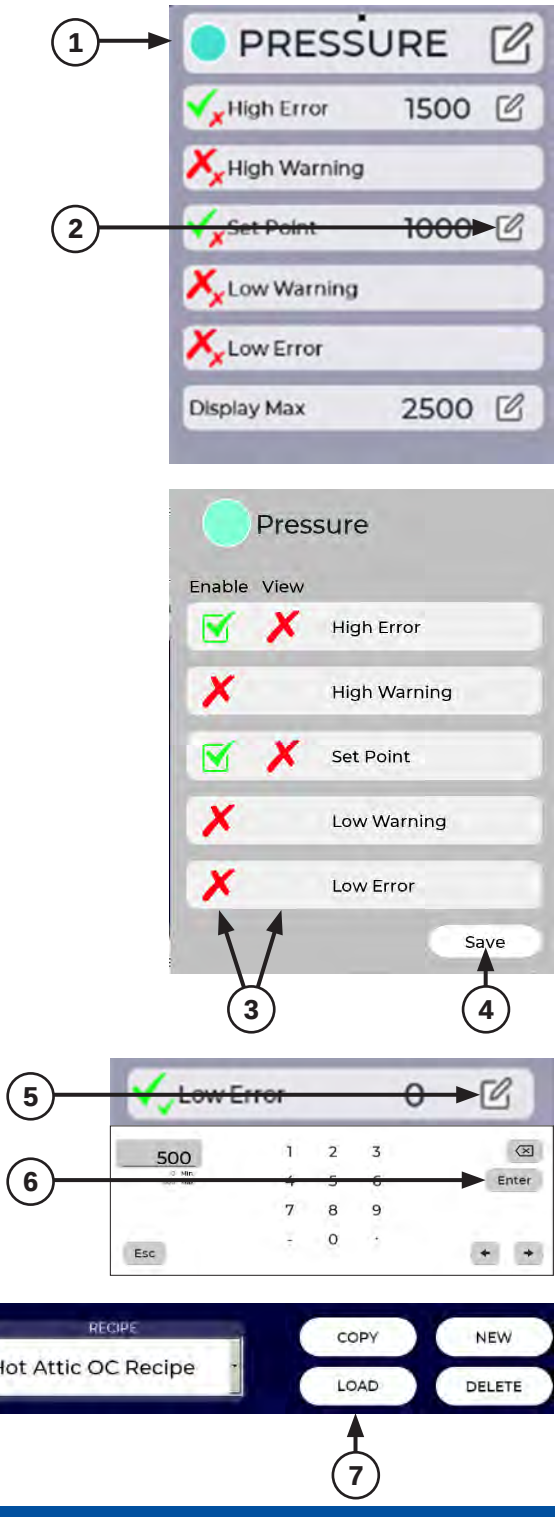
Pressing the header of the Pressure Parameter table opens the control window shown below. Pressing the Enable column in the Low Error row toggles the parameter on/off. Pressing the View column in the same row toggles parameter viewing on/off.

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.

PARAMETER TABLE LEGEND	
Enable	Enable or Disable Parameter
View	View or Hide Parameter Screen Icon
☑	Parameter is always on
✓	Parameter is on
✗	Parameter is off
☑	Select or change setting or value
✓✗	Parameter is enabled but not viewed
✗✗	Parameter is disabled and not viewed

1. Pressure (press to change, enable, or view settings).
2. Press to change value.
3. Press to toggle setting.
4. Press to save and exit.
5. Low Pressure Error
6. Pressure Value
7. Press "LOAD" to activate changes to Recipe.



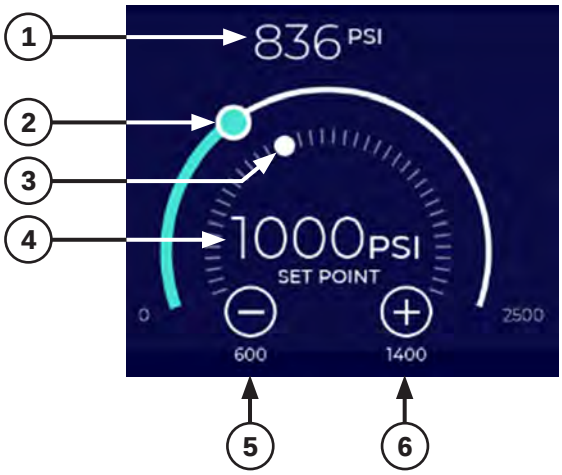
The following figure shows the pressure gauge in its most basic form as displayed on the Spray Screen.

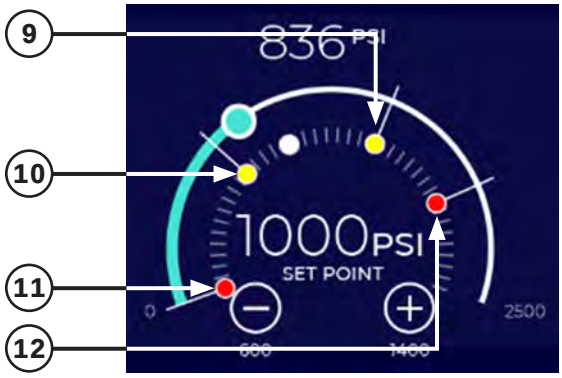
High and low alarm parameters are enabled in this example but are not indicated on the gauge. The current Recipe table is shown below.

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

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

1. Actual Value Marker (always shown).
2. Actual Value (always shown).
3. Setpoint Marker (always shown).
4. Setpoint Value (always shown).
5. Minimum Setpoints (always shown).
6. Maximum Setpoints (always shown).
7. High/Low Alarm Parameters (example).
8. High/Low Alarm Limits (example).
9. High Pressure Warning Symbol
10. Low Pressure Warning Symbol
11. Low Prerssure Error Symbol
12. High Pressure Error Symbol





REPORTS–OVERVIEW

The IS40 Proportioner has extensive reporting capabilities. These capabilities are divided into two areas: Job Reports and Audit Reports.

Job Reporting capabilities can be turned on or off in the Settings Screen (see "SETTINGS SCREENS"). The factory default setting for Job Reports is OFF.

Job Reports are described in "JOB REPORTS-OVERVIEW".

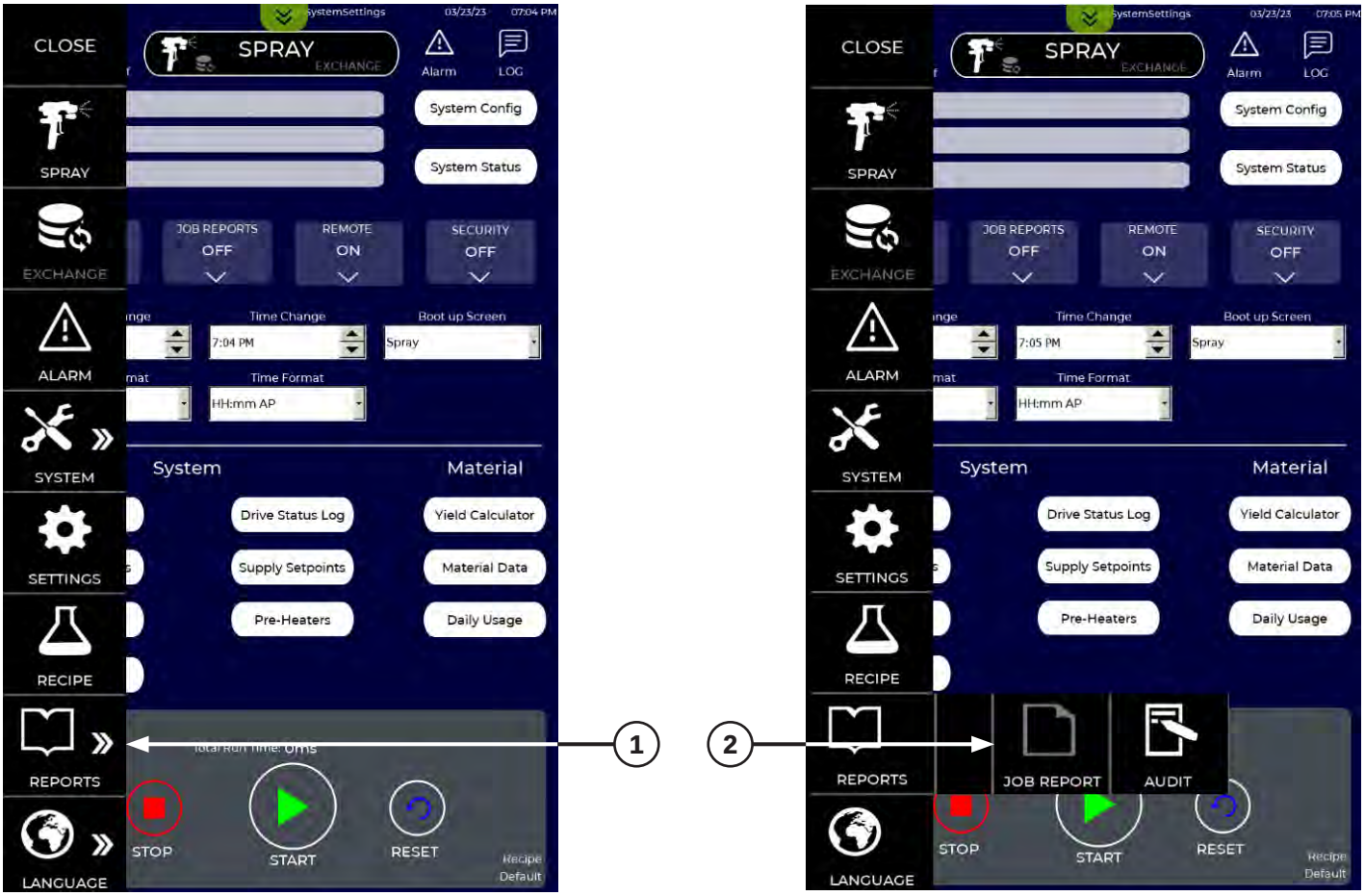
Audit Reports are always enabled, even when Job Reporting is disabled.

Audit Reports contain a record of user interactions with the IS40 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.

The figure below shows the Job Reports Screen is grayed out. This indicates that Job Reporting is not currently enabled.

1. Report Screens (press to access and select).
2. Report (press to select desired report).



REPORTS–AUDIT REPORT

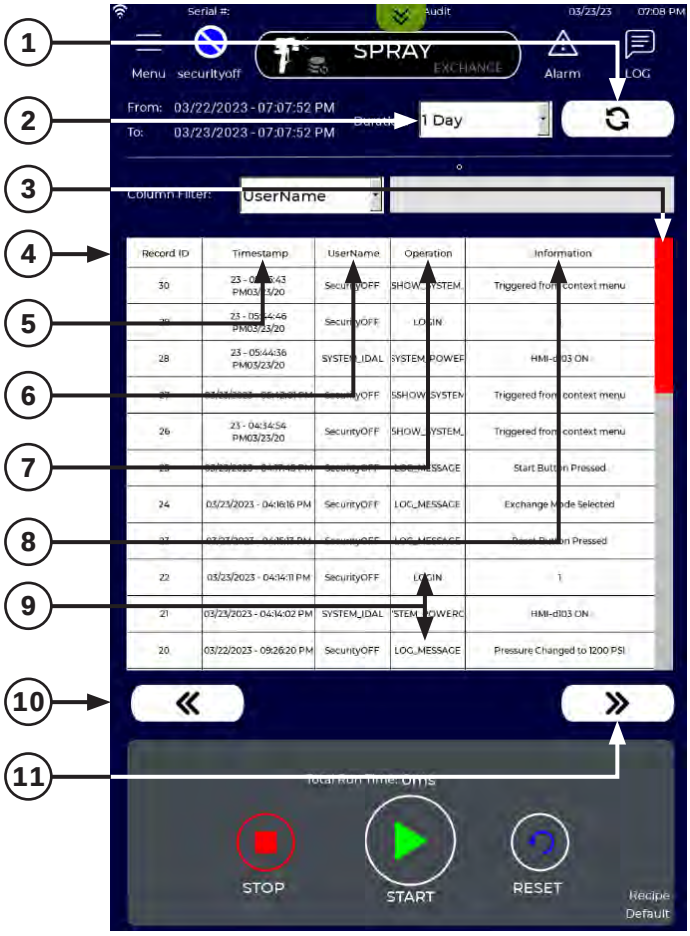
The Audit Report screen shows a time-stamped event table containing user interactions with the IS40 screens, system alarms, and any notes entered by the user.

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.



1. Refresh (press to update Audit table).
2. Duration (press to select lookback duration).
3. Slider (moves forward or backward in time).
4. Recorded ID (sequentially numbered events as they occur).
5. Timestamp (events are time-stamped).
6. User Name (active user logged with the event).
7. Operation (event type).
8. Information (of event).
9. Scrolling (swipe anywhere to move the table forward or backward in time).
10. Previous Events (press to see earlier entries).
11. Later Events (press to see later entries).

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.

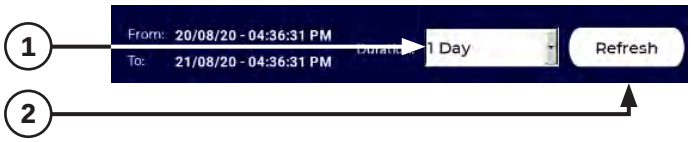
Then select the Information column using the Column Filter drop-down window.

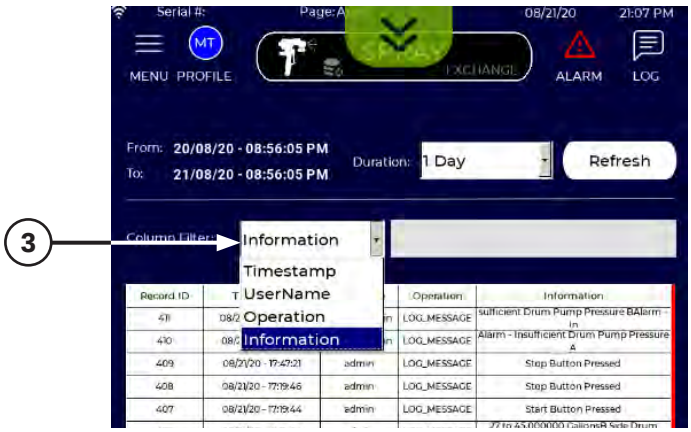
Press the target window to open the keypad. Type in “pump” (without quotation marks) and press the Enter key.

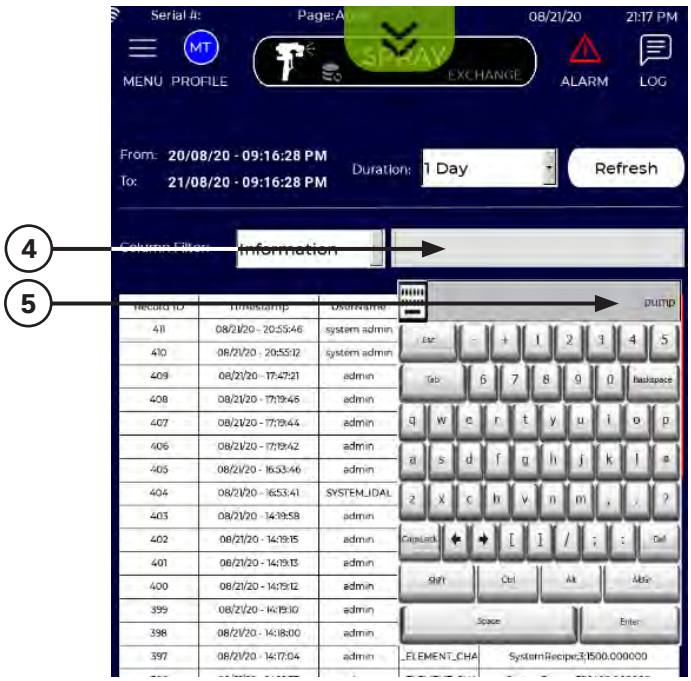
Only those Audit events showing the word “pump” in the Information column will now be shown.

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

1. Duration (press to select lookback duration).
2. Refresh (press to update Audit table).
3. Column Filter (event audit drop-down menu).
4. Target (press to open keyboard).
5. Type Window (enter "pump").
6. Audit Events (shows all events of "pump" operation).
7. Delete Filter Target (shows all entries).







REPORTS–JOB NOTES

The IS40 allows users to enter and save notes in the Audit table.

These notes can be used to record information that may be of interest in the Audit Report or the Job Report.

A "LOG" icon is shown in the upper right corner of every screen. Users can open and enter job notes anytime the Proportioner is powered on.

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

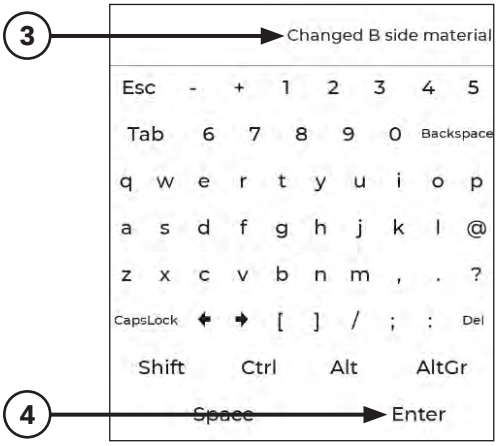
A window will open to record the note. Press anywhere in the text window to activate the on-screen keyboard.

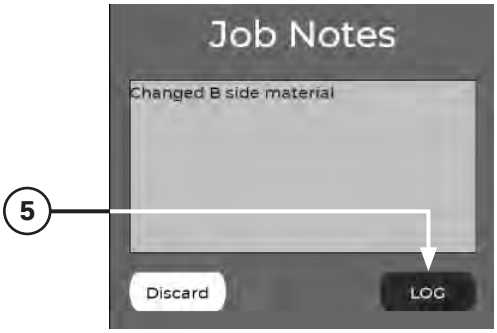
Enter the note using the on-screen keyboard. In this example the user wishes to record when a drum was changed, so enters "Changed B-side material" then presses the Enter key.

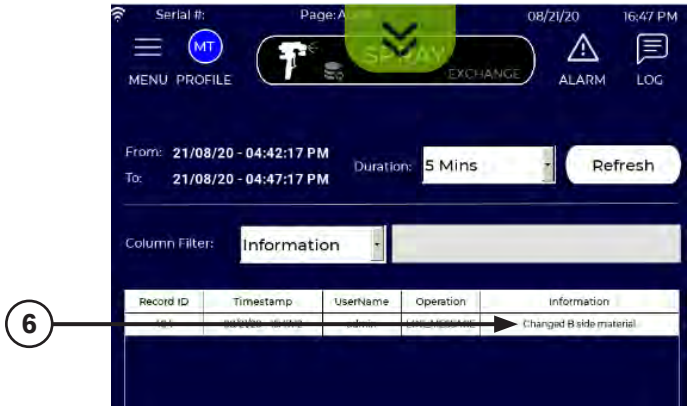
After entering the note text, press the "LOG" button to enter it into the Audit table. This will also time-stamp the note.

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

1. LOG Icon (press to open note).
2. Job Notes (text entry box).
3. Keyboard Entry (note entered).
4. Enter (press to enter).
5. LOG (enters note into Audit Table).
6. Audit Table (user-entered note).







JOB REPORTS–OVERVIEW

The IS40 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.

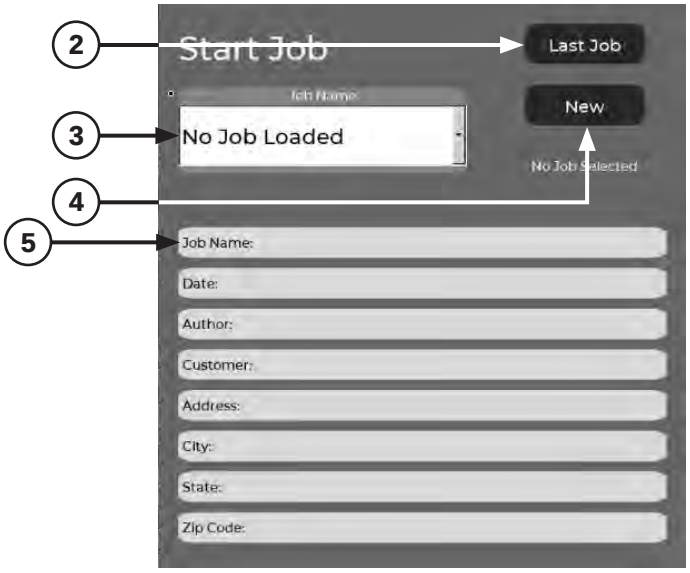
Job Reporting is toggled "ON" or "OFF" in the System Setting screen (see SETTINGS SCREENS-CONFIGURATION SETTINGS). Job Reporting is “OFF” as shipped from the factory. If Job Reports are "ON" a dialog window (as shown) will be displayed at system startup or after any Job is stopped. The user cannot proceed until they either select an existing Job from the pull-down menu, select Last Job, or create a New Job.

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: The report can be presented with either Imperial or Metric values.

1. Job Reporting: Job Reporting can be toggled "ON" or "OFF" (factory default).
2. Last Job (press to accept).
3. Job Name (press to open menu).
4. New (press to create a new job)
5. Job Name (press to enter new job name).
6. Scan (press to scan QR code).



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

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

The 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.

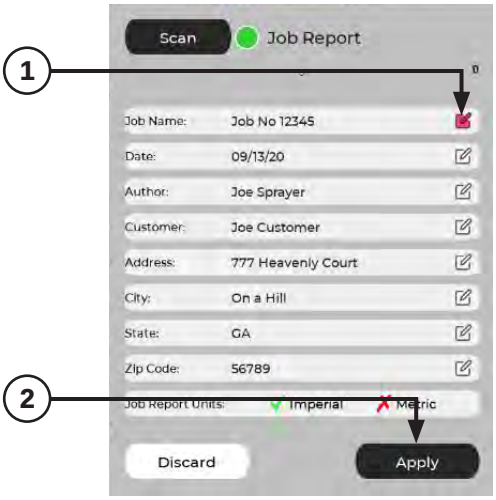
When Job Reports are "OFF", the Job Note icon is displayed in the upper right corner of the screens (as shown in the figure below).

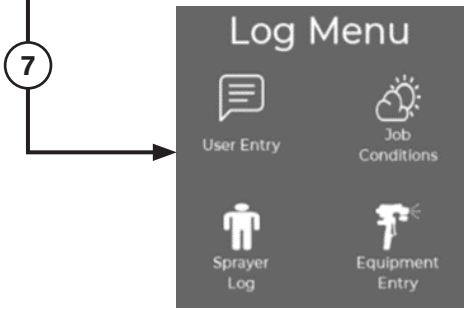
See "REPORT–JOB NOTES" for instructions on Job Notes.

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.

1. Job Information (press to open note).
2. Apply (press to accept).
3. NEW (press to create job).
4. Active Job
5. Job Log Icon
6. Job Logging Menu
7. Log Menu (press each to open).





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.

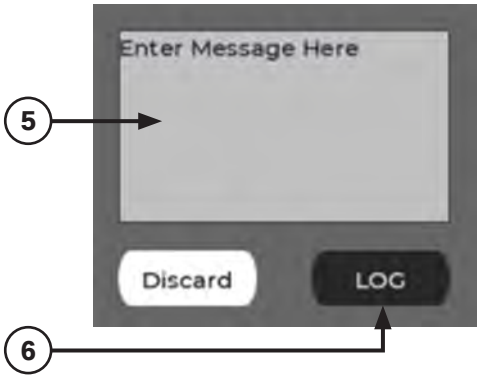
Job Conditions: Environmental and substrate conditions, which will be included in the Job Report.

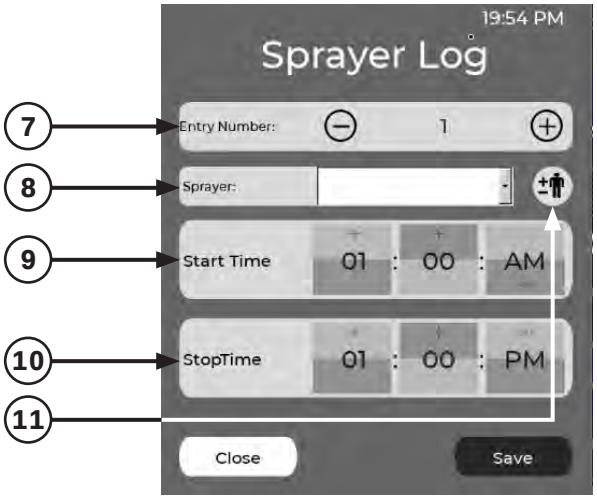
Sprayer Log: Start and stop time for any Sprayer (if there are different Sprayers on the same Job).

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).





1. User Entry
2. Job Conditions
3. Sprayer Log
4. Equipment Entry
5. User Entry
6. Sprayer Log
7. Entry Number
8. Sprayer
9. Start Times
10. Stop Times
11. New Sprayer Name

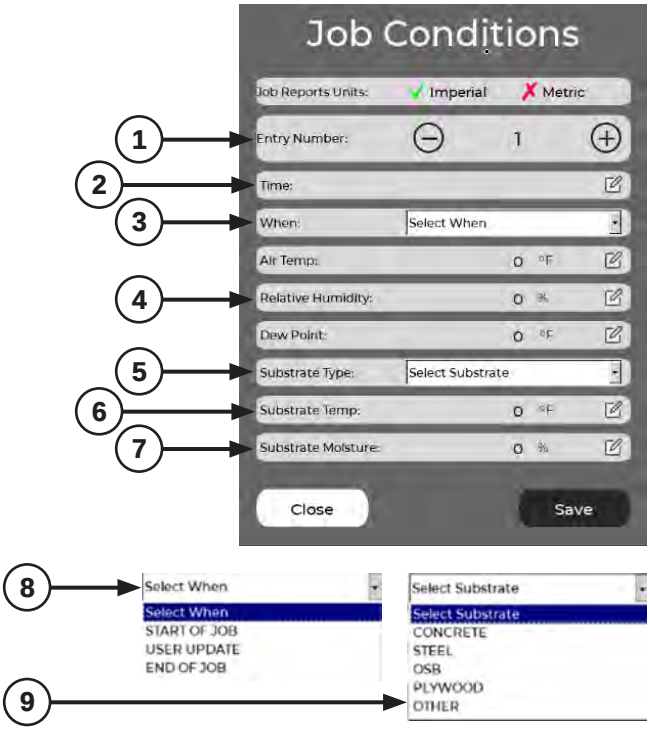
JOB REPORTS–LOG ENTRIES

Job Conditions: This feature allows the user to enter up to 20 different environmental and substate measurements for a given Job Report.

The time the conditions are measured can be automatically time stamped or the time can be manually entered by the user.

The user selects when the conditions were measured by selecting a value from the Tigger pull-down menu. Substrate types are selected from a pull-down menu.

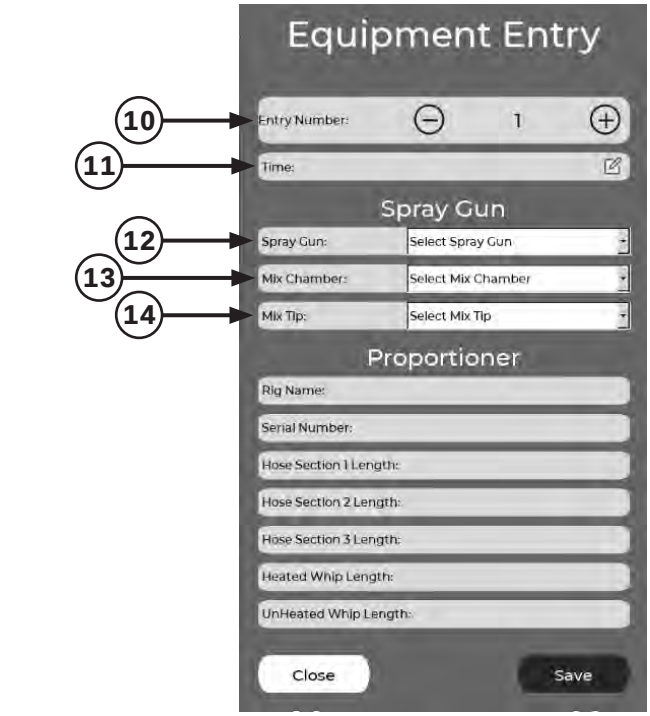
1. Entry Number (press to enter).
2. Time (press to open note).
3. When (press to select occurence time).
3. Relative Humidity (press to open note).
4. Substrate Type (press to open menu).
5. Substrate Temp (press to open menu).
6. Substrate Moisture (press to open note).
7. Save (press to save settings).
8. Select When ("When" pull-down menu).
9. Select Substrate ("Substrate Type" pull-down menu).

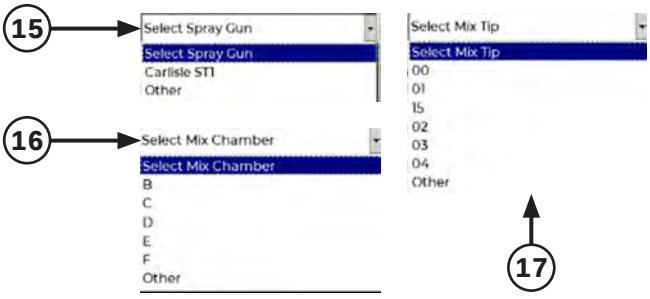


Equipment Entry: The Equipment log allows users to enter up to 10 different spray gun types and configurations used on a Job.

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.

10. Entry Number (press to enter).
11. Time (press to open).
12. Spray Gun (press to open menu).
13. Mix Chamber (press to open menu).
14. Mix Tip (press to open menu).
15. Select Spray Gun ("Spray Gun" pull-down menu).
16. Select Mix Chamber ("Mix Chamber" pull-down menu).
17. Select Mix Tip ("Mix Tip" pull-down menu).





JOB REPORTS–MATERIAL DATA

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.

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

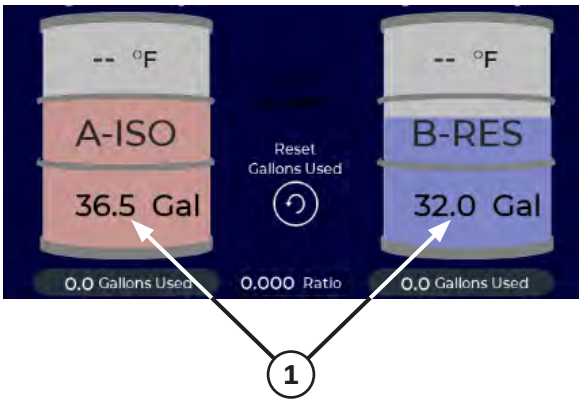
When Job Reporting is "ON" the material information window displays additional fields for entering material data.

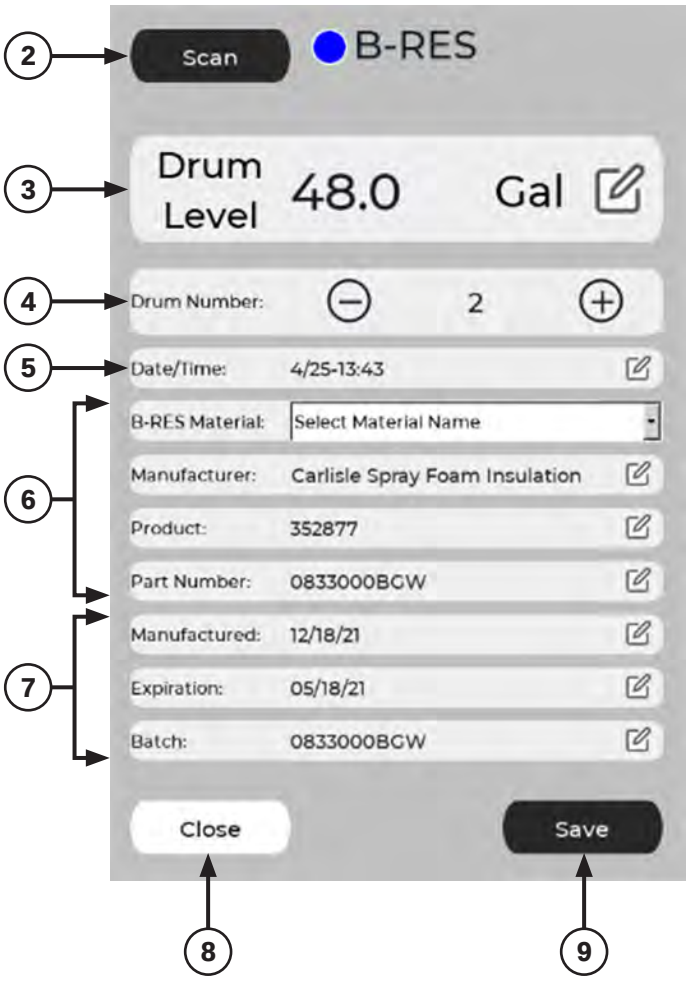
Material data can be entered through the Drum icon, or via the Material Library. Data is retained and stored in the Material Data library to make subsequent entries easier.

When changing drums:

2. Scan (press to scan).
3. Drum Level (enter the fluid level using the keypad icon). Use a Carlisle drum dip stick or equivalent to accurately measure the fluid level before entering.
4. Drum Number (increment the drum number by pressing the + button).
5. Date/Time (time-stamp the entry by pressing on the keypad icon).
6. B-RES Material (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.
7. Manufactured Information (enter the Manufactured Date, Expiration Date, and Batch number for each drum of material).
8. Close (press to close)
9. Save (press to save settings).

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



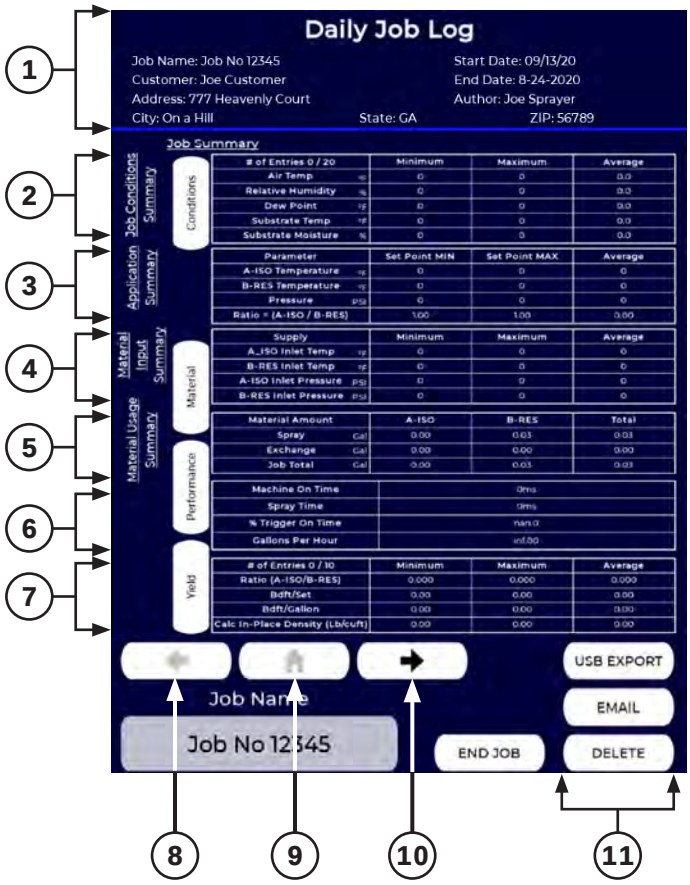


JOB REPORTS–REPORT CONTENT

When Job Reporting is "ON" the unit 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 is followed by 8 additional pages containing detailed information about ambient conditions, materials, yield calculations, sprayers, and equipment used on the job.

1. Job Header (printed on every page)
2. Job Conditions Summary (job conditions summary including minimum, maximum, and average).
3. Application Summary (process parameters summary including minimum, maximum, and average).
4. Material Input Summary (material conditions summary including minimum, maximum, and average).
5. Material Usage Summary
6. System performance summary
7. Yield calculation summary (if performed by user)
8. Previous (to view earlier reports).
9. Home (to return to the home screen).
10. Next (to move to the next screen).
11. Report Management (includes USB export, email, and delete).



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.

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.

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".

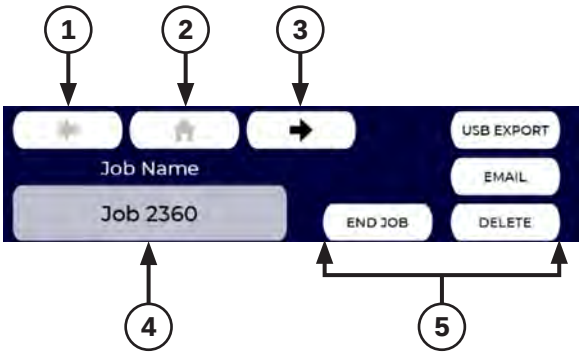
Ending a Job prevent additional information to be added to that Job Report.

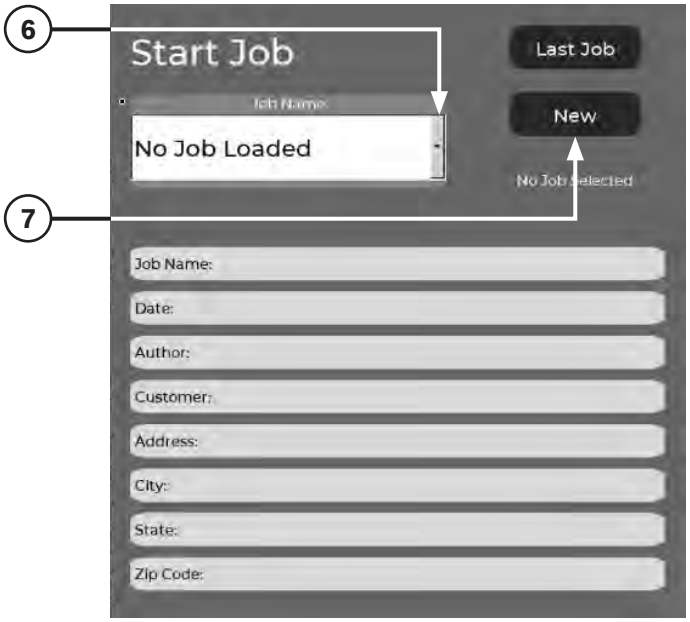
The system will also prompt the user when they hit the stop button.

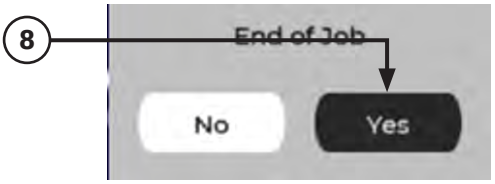
If the user chooses to end a job the following dialogue box appears, which allows the user to email the Job Report and associated files.

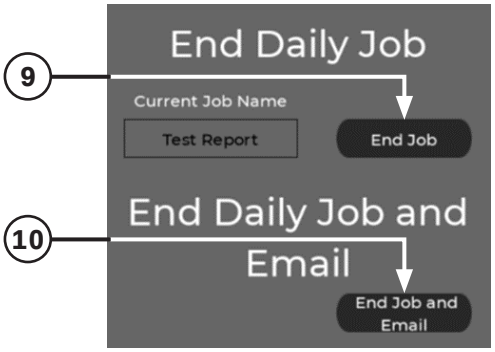
See the next page for instructions on emailing or exporting Job Reports.

1. Previous (to view previous Job Report page).
2. Home (returns to page 1 of the Job Report).
3. Next (to view the next page of the Job Report).
4. Job Name
5. Report Management (includes end job, USB export, email, and delete).
6. Job Name (load a job from the menu).
7. New/Load (to create a new or load an existing job).
8. End of Job (ends job reporting).
9. End Job (to end job).
10. End Job and Email (to email job reports).









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. This unit 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.

EMAIL: If the "EMAIL" button is pressed the following dialogue box appears. To email a job report, select the Job to email from the drop-down window and press the Attach Report button. Select the email recipient from the pull down menu or enter it using the "email icon" button. Add text to the email (optional) and press "Send".

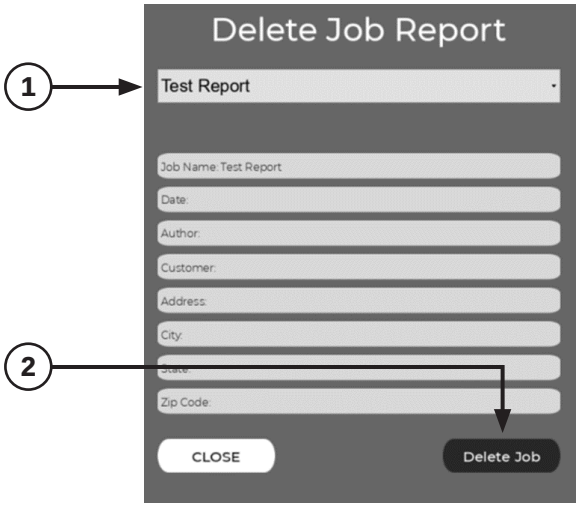
To enter a new email recipient, press the the "email icon" button. Press “Add New Email Here” and use the onscreen keyboard to enter the address. Press "Add", then "Close". The new email recipient will now be retained for future use. Up to 20 email addresses can be stored.

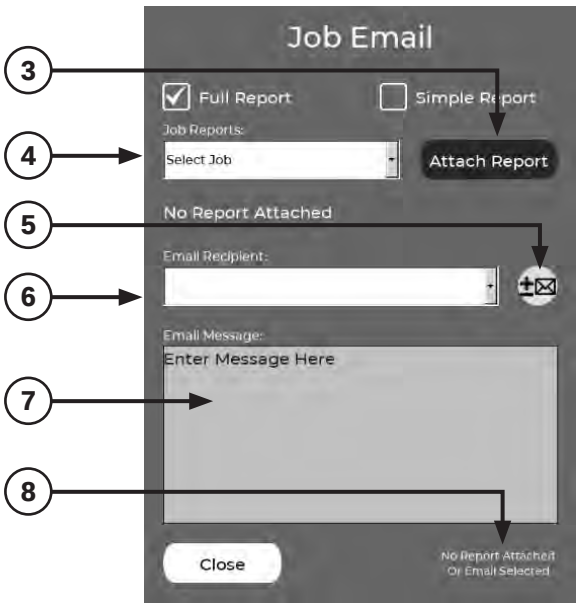
Note: For email to work the Proportioner must be equipped with a cellular modem (standard in North America) and have an active SIM card with cellular data plan. Email settings must also be properly configured (see "SETTINGS SCREENS–SYSTEM INFORMATION").

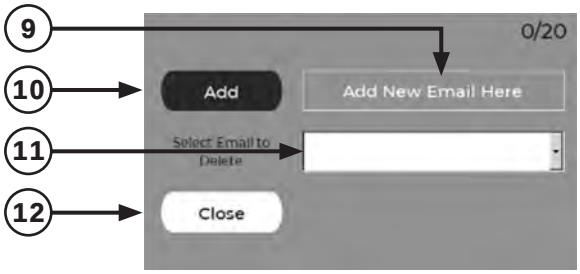
EXPORT PDF: The "EXPORT PDF" function copies Job Reports to a USB memory stick inserted in the IntelliSpray’s USB port on the side of the Control Module.

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".

1. Job Report (select to delete).
2. Delete Job (press to delete selected job).
3. Attach Report (press to attach selected report).
4. Job Reports (select from menu).
5. Email Call-Up (press to select from menu).
6. Email Recipient (select from menu).
7. Email Message Text Box
8. Send (press to send report).
9. Add New Email Address
10. Add (add email address).
11. Select Email To Delete (select from menu).
12. Close (press to close the window).
13. Attach (attach files to send to USB drive).
14. USB Drive (select the USB drive).
15. Attach All (press to attach all files to the USB drive).







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.

1. LANGUAGE (press to display available languages).
2. LANGUAGE ICONS (select the desired language icon from the menu).

VARIABLE RATIO OPERATION (OPTIONAL FEATURE PN 347682)

ENABLE VARIABLE RATIO

To enable variable ratio, complete the following steps:

1. Plug in the Variable Ratio dongle (not shown).
2. Navigate to the Recipe screen: Menu –> Recipe (not shown).
3. Navigate from there to the column that is labeled "RATIO" and contains the arrow buttons.
4. License Key (click in the check box).
5. Variable Ratio will be enabled if the Variable Ratio key is detected.

AUTOMATIC KEY DETECTION

Automatic detection of the key:

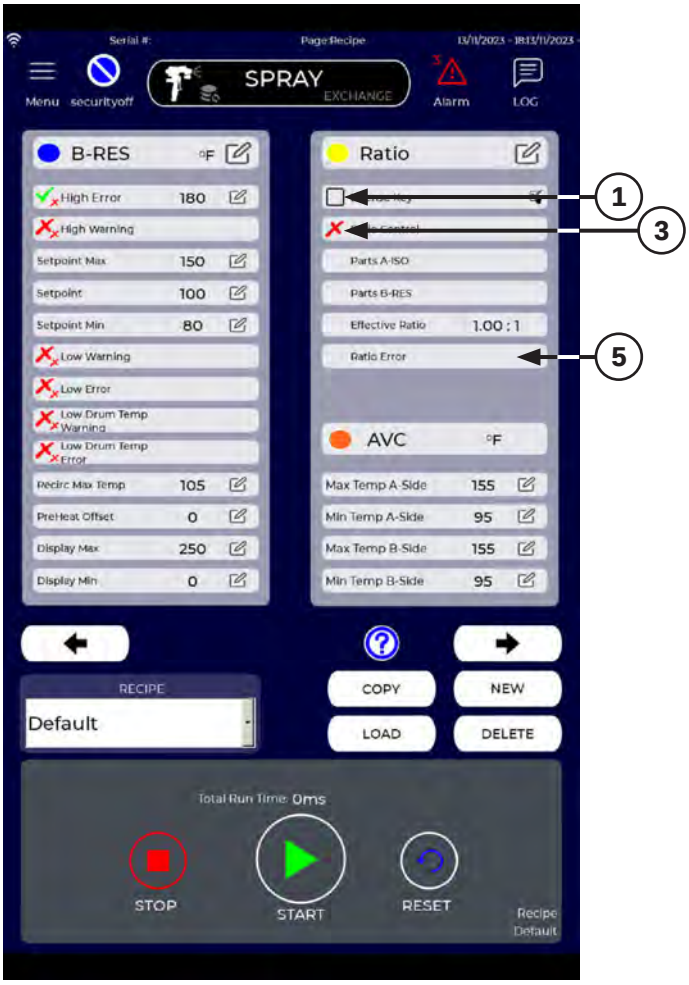
Every 5 minutes the system scans if the key is detected.

Due to the system programming, if you use this method to initially activate the Variable Ratio key it can take as long as 7.5 minutes to be enabled, and depends on when the key was plugged into the port.

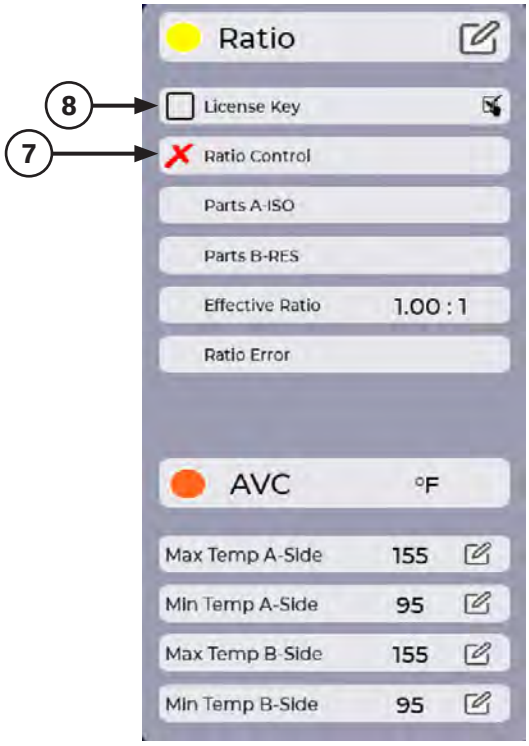
ENABLE FIRST TIME

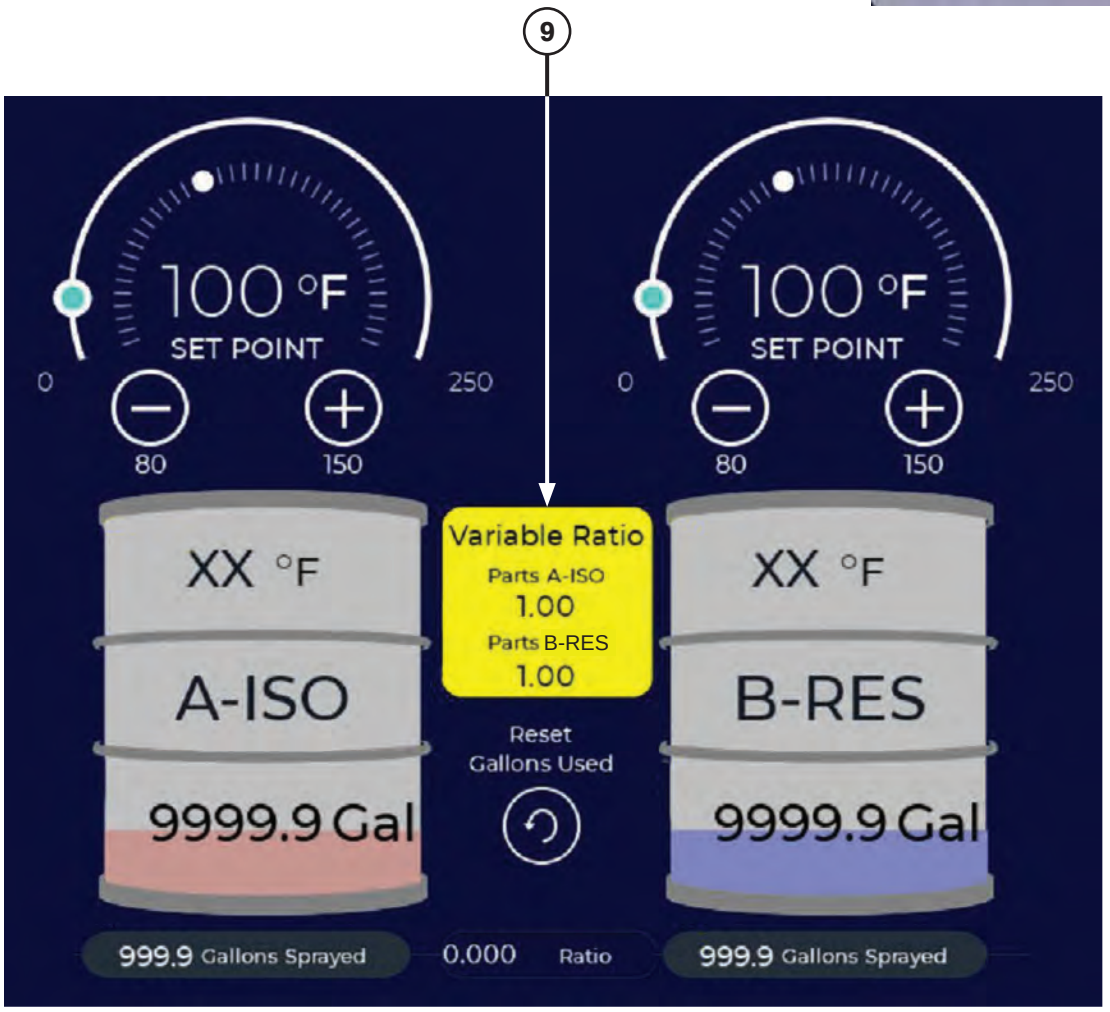
The events that will occcur once Variable Ratio is enabled for the first time:

1. The “License Key” check box on the Recipe screen will change from unchecked...
2. ... to checked.
3. The Ratio Control indicator on the Recipe screen will change from a red ✘...
4. ... to a green checkmark ✓.
5. The Ratio Error will change from a blank state (disabled)...
6. ... to a populated state (enabled).



7. If the Ratio Control field is disabled, it can only be turned back on using the Ratio Control field.
8. To enable the Ratio Control, check the box next to "License Key", then press the License Key option to reactivate the license key.
9. A dialog box will open on the Spray screen. It will indicate if the Variable Ratio is on, and the A-ISO and B-RES drums interfaces.
10. If there is anything other than a 1:1 ratio, disable the ratio control (7) by unchecking the License Key box (5). The system will automatically be reset to show the 1:1 ratio.



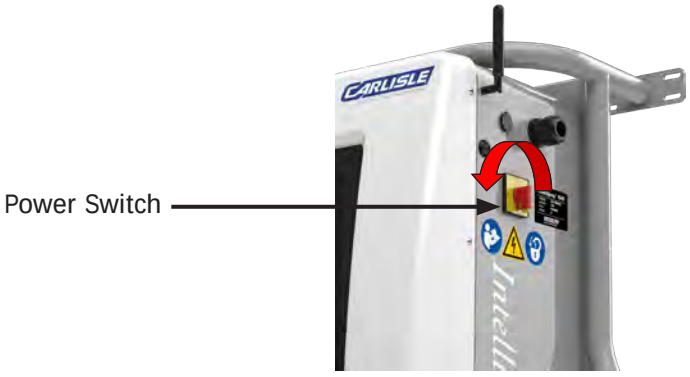


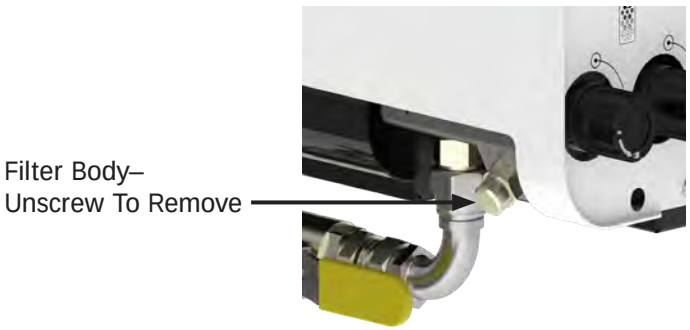
SERVICING

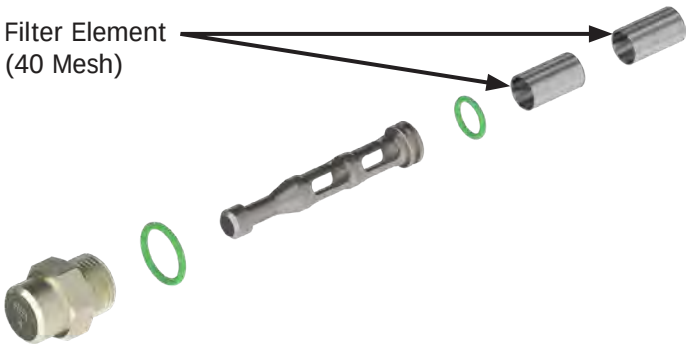
The IS40 Fluid Modules are designed for easy service. Most components and assemblies are easily accessed from the front of the Fluid Module and can be replaced in several minutes if required with minimum tools and fluid loss. Normal service of the Fluid Modules consists of the following:

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

1. Press the Stop button on the IS40 screen.
2. Turn the power switch to the OFF (O) position to turn off the power.
3. Turn off the supply pump(s) to close the upstream supply valves.
4. Put a bucket under the filter cap to collect drips.
5. Close the inlet ball valve and filter isolation valves.
6. Use a 7/8” socket or box head wrench and loosen the filter cap 2 turns.
7. Let the pressurized fluid drip into the bucket.
8. Pull the filter assembly out of the filter manifold.
9. Slide the filter element off the filter body.
10. Clean the filter and filter body with a compatible solvent (e.g. Brake Cleaner, TSL, Dynasol, DPM, etc.).
11. Examine the O-ring for any tears, permanent set, or damage and replace if necessary.
12. Apply ST1 gun grease (or equivalent) to the O-ring for reassembly.
13. Reinstall the filter element, but replace if damaged.
14. After residual material has drained from the filter manifold, clean the internal threads with a compatible solvent.
15. Put a light coat of ST1 gun grease (or equivalent) on the internal manifold and filter body threads.
16. Insert the filter body and element into the filter manifold.
17. Torque the filter body to the manifold at 40 ft-lb.
18. Open the inlet ball valve and the filter isolation valve.
19. Open upstream supply valves and turn on the supply pumps.
20. Resume spray operation.







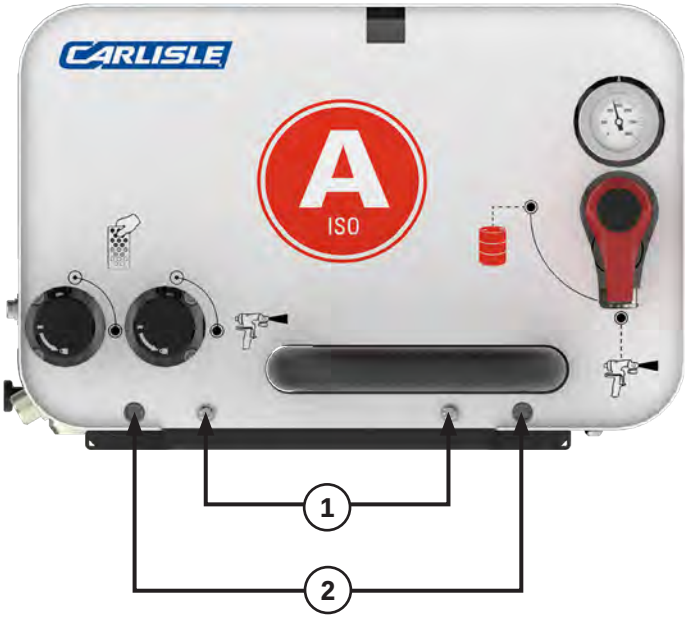
CHECK PUMP TSL LEVEL

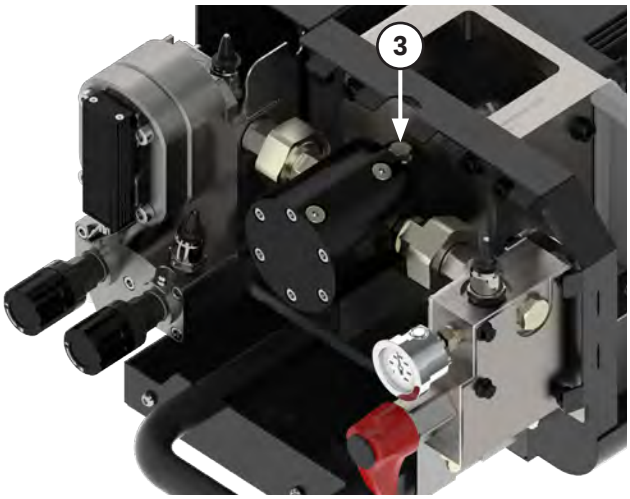
Check Pump TSL Level: The gear pumps in each Fluid Module include a chamber around the drive shafts that is filled with TSL (Throat Seal Liquid) at the factory.

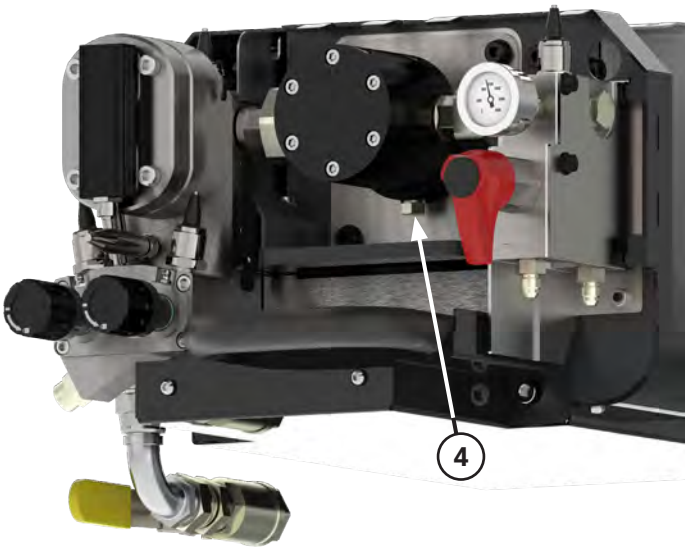
This prevents atmospheric moisture from migrating into the shaft seals where it could react with Isocyanate in the A-side pump, causing abrasive crystalline material to form that may damage the shaft seal. The fluid also lubricates the shaft seals on both A and B pumps.

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. Remove 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.







NOTICE

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

TSL SERVICING COMPONENTS

1. Cover Screws (x2)
2. Retention Screw
3. TSL Fill Plug (upper)
4. TSL Drain Plug (lower)

BURST DISK REPLACEMENT

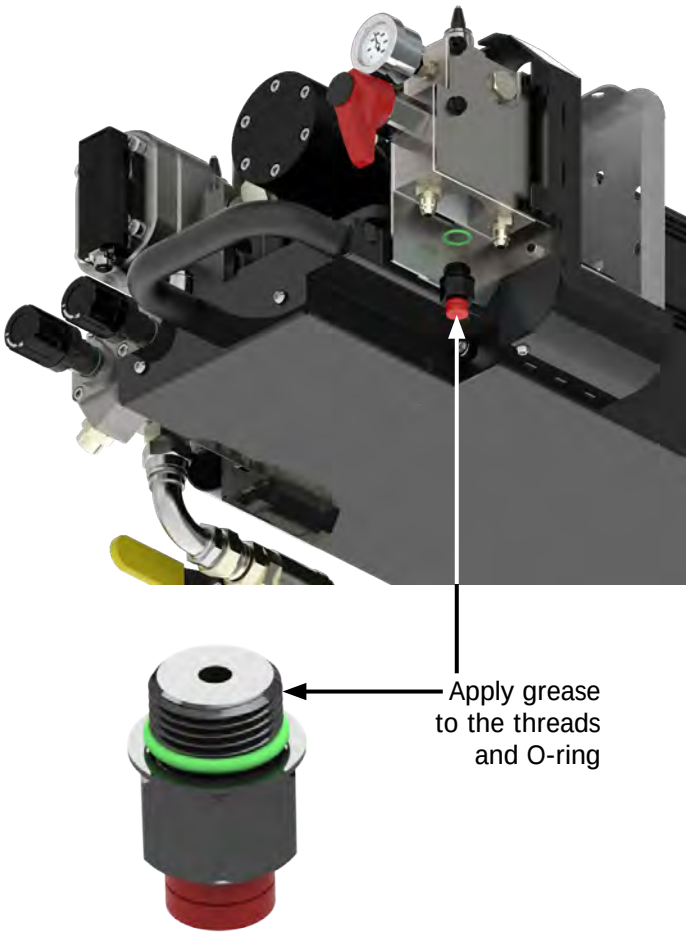
Burst Disk Replacement: As an additional safety precaution against over-pressure conditions, Burst Disk assemblies rated for 7000 psi are located on the back of the A and B High Pressure Manifolds.

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 can, 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 must be replaced annually.

If high pH B-side resins are used, replacement is required monthly or quarterly.

The following steps describe the replacement procedure for the Burst Disk assembly.

1. Press the Stop button on the IS40 screen and turn off the power by rotating the power switch to the Off (O) position.
2. Turn off the supply pump(s) and close the upstream supply valves.
3. Relieve the pressure in the High Pressure Module and distribution (gun) hoses by opening the recirculation valve and/or opening gun manifold material valve(s). Confirm the pressure has been relieved by observing the pressure gauge on the High Pressure Module.
4. For easier access (but not required), 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 second stop. (See previous section for instruction).
6. Place a pail or bucket under the High Pressure Module to collect fluid.
7. Use a 7/8” socket wrench to loosen the Burst Disk assembly two turns and let the remaining high pressure fluid to drip into the collection container.
8. Fully remove the Burst Disk assembly with its O-ring.
9. After the High Pressure Manifold has drained, clean the internal threads and apply ST1 gun grease (or equivalent) to prevent seizing.
10. Apply grease to the threads and O-ring on the new Burst Disk assembly (which includes a new O-ring).
11. Thread the new Burst Disk assembly into the manifold and tighten to 25 ft-lbs.
12. Install the Fluid Module cover and secure the captive retention screws.
13. Since some air will have entered the High Pressure module, purge the system by using the Exchange mode through the recirculation line.



FILTER MAINTENANCE

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

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

Press the Stop button on the IS40 screen and turn off power by rotating the power switch to the Off (O) position.

Open the Control Module by rotating the door locks to the open position.

Locate the air filter in the bottom of the Control Module door and remove the two right side (viewed when facing the door) socket head M3 button screws and bracket holding the filter in place.

Remove the filter.

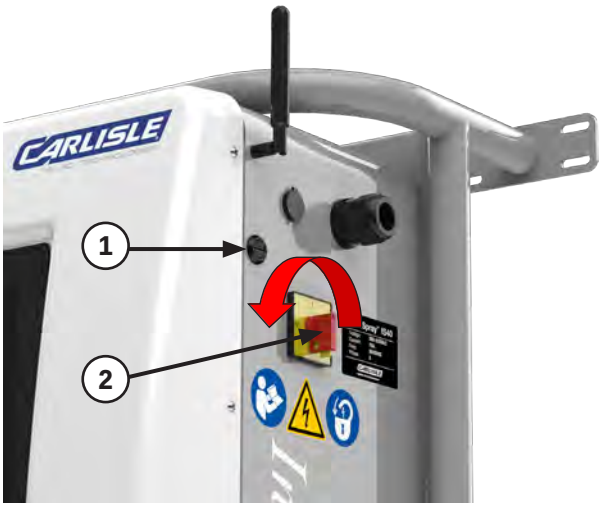
Use a shop vac or compressed air to remove dust and debris from the filter, counter to the flow direction.

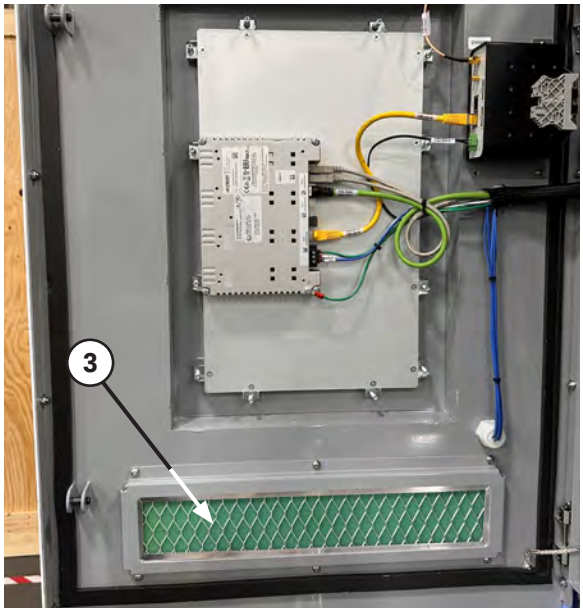
Soak the filter in warm soapy water, agitating regularly. Rinse with warm water and repeat until the wash water is clean.

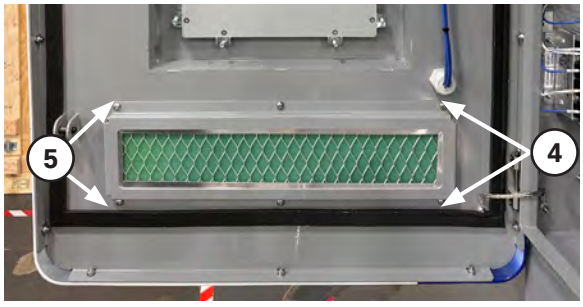
Shake excess water off the filter and allow to dry thoroughly.

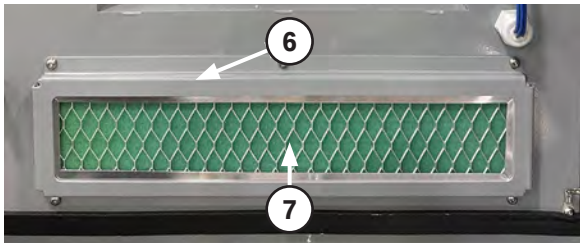
Reinstall the filter in reverse order.

Close the Control Module door and secure door locks in closed position.









FILTER MAINTENANCE DESCRIPTION

1. Door Locks (x2)
2. Power Switch (shown in Off position)
3. Air Filter and Bracket (behind door flange)
4. M4 Filter Screws (right side)
5. M4 Filter Screws (left side)
6. Filter Bracket
7. Filter

SYSTEM ERRORS AND ACTION

When an error occurs, the IS40 automatically enters the "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 with more information on the error condition and recommended actions. The following tables contain the same information that is displayed for each error.

SYSTEM ERRORS			
Error No.	Alarm Description	Condition	Action
1	Emergency push button is enabled.	Emergency stop button is pressed.	Pull out emergency stop button on front of machine.
2	Drive A Error.	Drive Error “FXXXX.”	Power cycle the system, and contact technical service if the problem persists.
3	Drive B Error.	Drive Error “FXXXX.”	Power cycle the system, and contact technical service if the problem persists.
4	Pressure Imbalance.	1. A/B pressure difference exceeds the max setpoint. 2. Gun filter is clogged. 3. Gun manifold is closed. 4. Material viscosity is different.	1. Verify that the gun manifold valves are open. 2. Examine and clean/replace the gun filters. 3. Adjust the material temp setpoints to balance any pressure differences. 4. Enable the AVC mode. 5. Increase the permitted pressure difference in the Recipes Menu.
5	Material A Below Set Point.	A material level below error setpoint.	Add material or change drum. Update the Gallon Amount.
6	Material B Below Set Point.	B material level below error setpoint.	Add material or change drum. Update the Gallon Amount.
7	Ethercat Bus Error.	Device communication is lost.	Verify that all ethernet (green) cables are properly connected to each port.
8	Drive A Overload Shutdown.	Drive is overloaded.	Reduce the system pressure.
9	Drive B Overload Shutdown.	Drive is overloaded.	Reduce the system pressure.
10	Drive A Amplifier Over Temperature Shutdown.	Drive is overheating.	Reduce the system pressure.
11	Drive B Amplifier Over Temperature Shutdown.	Drive is overheating.	Reduce the system pressure.
12	Drive A Motor Shutdown Temperature.	Motor is overheating.	Reduce the system pressure.
13	Drive B Motor Shutdown Temperature.	Motor is overheating.	Reduce the system pressure.
14	Drive A Control Voltage Error.	Incorrect DC voltage supply.	Verify if the cabinet DC voltage supply is providing 24VDC, and adjust the output if required.
15	Drive B Control Voltage Error.	Incorrect DC voltage supply.	Verify if the cabinet DC voltage supply is providing 24VDC, and adjust the output if required.
16	Drive A Encoder Error.	Motor Encoder Error.	Verify the encoder cable connection at drive and fluid module. Power cycle the system, and contact technical service if the problem persists.
17	Drive B Encoder Error.	Motor Encoder Error.	Verify the encoder cable connection at drive and fluid module. Power cycle the system, and contact technical service if the problem persists.

SYSTEM ERRORS			
Error No.	Alarm Description	Condition	Action
18	Drive A Over Current Error.	Drive is overloaded.	Reduce the system pressure.
19	Drive B Over Current Error.	Drive is overloaded.	Reduce the system pressure.
20	Drive A Over Voltage Error.	Incorrect AC supply voltage.	Verifly for correct supply voltage per configuration.
21	Drive B Over Voltage Error.	Incorrect AC supply voltage.	Verifly for correct supply voltage per configuration.
22	Drive A Under Voltage Error.	Incorrect AC supply voltage.	Verifly for correct supply voltage per configuration.
23	Drive B Under Voltage Error.	Incorrect AC supply voltage.	Verifly for correct supply voltage per configuration.
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 that the system ethernet cables are connected to the correct ports.
27	Drive B Communication Error.	Lost communication with Drive B.	Verify that the system ethernet cables are connected to the correct ports.
28	Drive A Position Limit Value Exceeded.	Drive A limit exceeded.	Power cycle the system, and contact technical service if the problem persists.
29	Drive B Position Limit Value Exceeded.	Drive B limit exceeded.	Power cycle the system, and contact technical service if the problem persists.
30	System Ratio Error.	1. Air in the lines. 2. Pump Failure.	1. Purge all the air from the supply lines, proportioner, and hoses. 2. Verify the pump's efficiency and replace the pump if necessary.
100	Insufficient Drum Pump Pressure A.	1. A drum pump off. 2. A drum pump pressure too low. 3. A inlet valve stuck or closed. 4. Insufficient A material Level. 5. Cold A material. 6. Minimum pressure setting too low. 7. A inlet pressure sensor failure.	1. Verify that the A drum pump is providing 100 -300 psi at the proportioner. 2. Verify the A supply line valves are open. 3. Examine the A drum material level. 4. Warm the A material to the manufacturer's recommendations. 5. Lower the minimum pressure setting in the Settings screen. 6. Examine the A inlet pressure sensor connectors, and contact technical service if the problem persists.
101	Excessive System Pressure A Post-Gear Pump.	1. A side pressure exceeds maximum system setpoint. 2. A side gun manifold valve turned off. 3. A side gun filter clogged. 4. A post gear pump pressure sensor failure. 5. B recirculation valve is open or stuck.	1. Lower the system pressure set point. 2. Raise the pressure error limit in the Recipes screen. 3. Verify the A side gun manifold is in the open position. 4. Clean or replace the A side gun filter. 5. Examine the A side outlet pressure sensor connector. 6. Verify that the B side recirculation valve is not stuck and is in the gun position.
103	Hose OverTemp A End Modem.	1. Hose overheat due to ambient conditions. 2. Heater cable connected to the incorrect section.	1. Let the hose cool (and/or purge fluid through the hose). 2. Examine the hose power connections.

SYSTEM ERRORS			
Error No.	Alarm Description	Condition	Action
104	PreHeat OverTemp A.	1. Preheater A is too hot. 2. Temperature sensor failure.	1. Let the preheater (and/or purge fluid through the preheater). 2. Examine the temperature sensor connector.
105	Filter Clog A.	1. Filter clogged. 2. Pressure drop error settting too low. 3. Pressure sensor failure.	1. Clean or replace the filter element. 2. Increase the maximum permitted pressure drop in the Recipes screen. 3. Examine the inlet and outlet pressure sensor connectors.
106	Insufficient Preheat Pressure A.	1. A drum pump off. 2. A drum pump pressure too low. 3. A supply line, pre-filter, and/or post-filter valve closed. 4. Insufficient A material Level. 5. Cold A material. 6. Minimum pressure setting too low. 7. A inlet pressure sensor failure. 8. Pressure sensor failure. 9. A pre-filter or inlet valve clogged. 10. A flow meter stuck.	1. Verify that the A drum pump is providing 100 -300 psi at the proportioner. 2. Verify that the A inlet and filter valves are open. 3. Examine the A drum material level. 4. Warm the A material to the manufacturer's recommendations. 5. Lower the minimum pressure error setting in the Settings screen. 6. Examine the A pressure sensor connectors. 7. Clean or replace the A inlet filter. 8. Remove the A filter inlet valve and examine it for debris. 9. Remove A flow meter and check for solids of debris.
107	Insufficient Filter Pressure A.	1. A drum pump off. 2. A drum pump pressure too low. 3. A supply line or pre-filter valve closed. 4. Insufficient A material Level. 5. Cold A material. 6. Minimum pressure setting too low. 7. Pressure sensor failure. 8. A pre-filter or inlet valve logged.	1. Verify that the A drum pump is providing 100 -300 psi at the proportioner. 2. Verify that the A inlet and filter valves are open. 3. Examine the A drum material level. 4. Warm the A material to the manufacturer's recommendations. 5. Lower the minimum pressure error setting in the Settings screen. 6. Examine the A pressure sensor connectors. 7. Clean or replace the A inlet filter. 8. Remove the A filter inlet valve and examine it for debris.
108	Excessive Drum Pump Pressure A.	1. A drum pump pressure too high. 2. Pressure sensor failure. 3. A check valve leak.	1. Verify that the A drum pump is providing 100 -300 psi at the proportioner. 2. Increase the maximum inlet pressure setting in the Settings screen. 3. Examine the A inlet pressure sensor connector. 4. Examine the A side high-pressure check valve and replace if necessary.

SYSTEM ERRORS			
Error No.	Alarm Description	Condition	Action
109	Excessive System Pressure A SMOSE.	1. A side pressure exceeds maximum system setpoint. 2. A side gun manifold valve turned off. 3. A side gun filter clogged. 4. B side recirculation valve in open (recirculation) position. 5. Hose pressure sensor not calibrated. 6. Hose pressure sensor failure.	1. Lower the pressure set point. 2. Raise the pressure error limit in the Recipes screen. 3. Verify the A side gun manifold is in the open position. 4. Clean or replace the A side gun filter. 5. Examine that the B side recirculation valve is in the hose (gun) position. 6. Verify the hose calibration (see Hose Calibration in the System Screen).
110	A Flow Meter Error.	Flow meter failure.	Examine the A flow meter and the connector.
111	A TRTD Body Top Error.	Sensor failure.	Examine the RTD sensor and connector.
112	A PreHeat RTD Body Bottom Error.	Sensor failure.	Examine the RTD sensor and connector.
113	A PreHeat RTD In Error.	Sensor failure.	Examine the RTD sensor and connector.
114	A PreHeat RTD Out Error.	Sensor failure.	Examine the RTD sensor and connector.
115	A Pre-Filter Pressure Sensor Error.	1. Excessive Pressure. 2. Pressure below zero. 3. Sensor failure.	1. Examine the check valve and replace if not holding pressure. 2. Examine for cavitation. 3. Examine the connector. 4. Replace the sensor.
116	A Post-Filter Pressure Sensor Error.	1. Excessive Pressure. 2. Pressure below zero. 3. Sensor failure.	1. Examine the check valve and replace if not holding pressure. 2. Examine for cavitation. 3. Examine the connector. 4. Replace the sensor.
117	A Pre-Gear Pump Pressure Sensor Error.	Sensor failure.	1. Examine the check valve and pressure sensor and replace if not holding pressure. 2. Examine for cavitation. 3. Examine the connector. 4. Replace the sensor.
118	A Post-Gear Pump Pressure Sensor Error.	Sensor failure.	1. Verify pressure reading matches the analog pressure gauge 2. Examine for cavitation. 3. Examine the connector. 4. Replace the sensor.
119	Hose UnderTemp A Middle 1 Modem.	1. Heater cable disconnected or connected to the incorrect section. 2. Hose heater wire failure.	Examine the hose power connections.
120	Hose OverTemp A Middle 1 Modem.	1. Hose overheat due to ambient conditions. 2. Heater cable connected to the incorrect section.	1. Let the system cool and/or purge the material. 2. Examine the heater cable connections.

SYSTEM ERRORS			
Error No.	Alarm Description	Condition	Action
200	Insufficient Drum Pump Pressure B.	1. B drum pump off. 2. B drum pump pressure too low. 3. B inlet valve stuck or closed. 4. Insufficient B material Level. 5. Cold B material. 6. Minimum pressure setting too low. 7. B inlet pressure sensor failure.	1. Verify that the B drum pump is providing 100 -300 psi at the proportioner. 2. Verify that the B supply line valves are open. 3. Examine the B drum material level. 4. Warm the B material to the manufacturer's recommendations. 5. Lower the minimum pressure setting in the Settings screen. 6. Examine the B inlet pressure sensor connectors, and contact technical service if the problem persists.
201	Excessive System Pressure B Post-Gear Pump.	1. B side pressure exceeds maximum system setpoint. 2. B post gear pump pressure sensor failure.	1. Lower the system pressure set point. 2. Raise the system pressure error limit in the Recipes screen. 3. Examine the B side outlet pressure sensor connector.
202	Hose UnderTemp B End Modem.	1. Heater cable disconnected or connected to the incorrect section. 2. Hose heater wire failure.	1. Examine the hose power connections. Contact technical service if the problem persists.
203	Hose OverTemp B End Modem.	1. Hose overheat due to ambient conditions. 2. Heater cable connected to the incorrect section.	1. Let the hose cool (and/or purge fluid through the hose). 2. Examine the hose power connections.
204	PreHeat OverTemp B.	1. Preheater B too hot. 2. Temperature sensor failure.	1. Let the preheater cool (and/or purge fluid through preheater). 2. Examine the temperature sensor connector.
205	Filter Clog B.	1. Filter clogged. 2. Pressure drop error settting too low. 3. Pressure sensor failure.	1. Clean or replace the filter element. 2. Increase the maximum permitted pressure drop in the Recipes screen. 3. Examine the inlet and outlet pressure sensor connectors.
206	Insufficient Preheater Pressure B.	1. B drum pump off. 2. B drum pump pressure too low. 3. B supply line, pre-filter, and/or post-filter valve closed. 4. Insufficient B material Level. 5. Cold B material. 6. Minimum pressure setting too low. 7. B inlet pressure sensor failure. 8. Pressure sensor failure. 9. B pre-filter or inlet valve logged. 10. B flow meter stuck.	1. Verify that the B drum pump is providing 100 -300 psi at the proportioner. 2. Verify the B inlet and filter valves are open. 3. Examine the B drum material level. 4. Warm the B material to the manufacturer's recommendations. 5. Lower the minimum pressure error setting in the Settings screen. 6. Examine the B pressure sensor connectors. 7. Clean or replace the B inlet filter. 8. Remove the B filter inlet valve and examine it for debris. 9. Remove the B flow meter and examine it for solids of debris.

SYSTEM ERRORS			
Error No.	Alarm Description	Condition	Action
207	Insufficient Filter Pressure B.	1. B drum pump off. 2. B drum pump pressure too low. 3. B supply line or pre-filter valve closed. 4. Insufficient B material Level. 5. Cold B material. 6. Minimum pressure setting too low. 7. Pressure sensor failure. 8. B pre-filter or inlet valve logged.	1. Verify that the B drum pump is providing 100 -300 psi at the proportioner. 2. Verify the B inlet and filter valves are open. 3. Examine the B drum material level. 4. Warm the B material to the manufacturer's recommendations. 5. Lower the minimum pressure error setting in the Settings screen. 6. Examine the B pressure sensor connectors. 7. Clean or replace the B inlet filter. 8. Remove the B filter inlet valve and examine it for debris.
208	Excessive Drum Pump Pressure B.	1. B drum pump pressure too high. 2. Pressure sensor failure. 3. B high-pressure check valve leak.	1. Examine that the B pump is pressurized to provide 100-300 psi at the system. 2. Examine the B inlet pressure sensor connector. 3. Verify or replace the B side high-pressure check valve.
209	Excessive System Pressure B SMOSE.	1. B drum pump pressure too high. 2. Pressure sensor failure. 3. B check valve leak.	1. Verify that the B drum pump is providing 100 -300 psi at the proportioner. 2. Increase the maximum inlet pressure setting in the Settings screen. 3. Examine the B inlet pressure sensor connector. 4. Verify or replace the B side high-pressure check valve. 5. Examine that the B side recirculation valve is in the hose (gun) position. 6. Verify the hose calibration (see Hose Calibration in the System Screen).
210	B Flow Meter Error.	Flow meter failure.	Examine the B flow meter and the connector.
211	B PreHeat RTD Body Top Error.	Sensor failure.	Examine the RTD sensor and connector.
212	B PreHeat RTD Body Bottom Error.	Sensor failure.	Examine the RTD sensor and connector.
213	B PreHeat RTD In Error.	Sensor failure.	Examine the RTD sensor and connector.
214	B PreHeat RTD Out Error.	Sensor failure.	Examine the RTD sensor and connector.
215	B Pre-Filter Pressure Sensor Error.	1. Excessive Pressure. 2. Pressure below zero. 3. Sensor failure.	1. Examine the check valve and replace if not holding pressure. 2. Examine for cavitation. 3. Examine the connector. 4. Replace the sensor.
216	B Post-Filter Pressure Sensor Error.	1. Excessive Pressure. 2. Pressure below zero. 3. Sensor failure.	1. Examine the check valve and replace if not holding pressure. 2. Examine for cavitation. 3. Examine the connector. 4. Replace the sensor.
217	B Pre-Gear Pump Pressure Sensor Error.	1. Excessive Pressure. 2. Pressure below zero. 3. Sensor failure.	1. Examine the check valve and replace if not holding pressure. 2. Examine for cavitation. 3. Examine the connector. 4. Replace the sensor.

SYSTEM ERRORS			
Error No.	Alarm Description	Condition	Action
218	B Post-Gear Pump Pressure Sensor Error.	Sensor failure.	1. Verify pressure reading matches the analog pressure gauge 2. Examine for cavitation. 3. Examine the connector. 4. Replace the sensor.
219	Hose UnderTemp B Middle 1 Modem.	1. Heater cable disconnected or connected to the incorrect section. 2. Hose heater wire failure.	Examine the hose power connections.
220	Hose OverTemp B Middle 1 Modem.	1. Hose overheat due to ambient conditions. 2. Heater cable connected to the incorrect section.	1. Let the system cool and/or purge the material. 2. Examine the heater cable connections.
300	SMOSE MM - Yamar chip failed to initialize.	Hardware failure.	Cycle the power.
301	SMOSE MM - No PLC packets received.	1. Frequency setting not optimal. 2. Interference from other nearby systems. 3. Modems not paired correctly. 4. Incorrect hose configuration setting. 4. Hardware failure.	1. Reposition the hose (uncoil fully). 2. Examine the hose configuration (see the Hose Configuration screen). 3. Pair, scan, and set the hose frequencies (see the Hose Configuration screen).
302	SMOSE MM - Timeout waiting for Tx complete Interrupt.	Hardware failure.	Cycle the power.
303	SMOSE MM - Multiple master modems detected on RF link.	1. Multiple systems in close proximity operating on the same frequency. 2. Modems not paired correctly.	1. Move one system to a different frequency (see the Hose Configuration screen). 2. Pair the modems (see the Hose Configuration screen).
304	SMOSE MM - Arbitration lost (bus may be shorted to GND or VDD.	Bad connection between modem A and B sides.	1. Examine the modem connection cable. 2. Cycle the power.
305	SMOSE MM - No ACK from device (Verify I2C address for device is set correctly).	Bad connection between modem A and B sides.	1. Examine the modem connection cable. 2. Cycle the power.
306	SMOSE MM - Timeout during I2C data transfer.	Bad connection between modem A and B sides.	1. Examine the modem connection cable. 2. Cycle the power.
307	SMOSE MM - Other errors: OverUnderRun, DMA Error or Bus Error.	Bad connection between modem A and B sides.	1. Examine the modem connection cable. 2. Cycle the power.
308	SMOSE MM - No pressure data from sensor (I2C read failure).	Bad connection between modem A and B sides.	1. Examine the modem connection cable. 2. Cycle the power.
309	SMOSE MM - Hose A pressure out of range.	Pressure sensor out of calibration.	Calibrate the sensor (see the Hose Configuration screen).
310	SMOSE MM - Hose B pressure out of range.	Pressure sensor out of calibration.	Calibrate the sensor (see the Hose Configuration screen).
311	SMOSE MM - No Temperature data from sensor (I2C read failure).	Bad connection between modem A and B sides.	1. Examine the modem connection cable. 2. Cycle the power.
312	SMOSE MM - Hose A temperature out of range.	Hardware failure.	Cycle the power.
313	SMOSE MM - Hose B temperature out of range	Hardware failure.	Cycle the power.

SYSTEM ERRORS			
Error No.	Alarm Description	Condition	Action
314	SMOSE MM - Event Memory Pool is empty.	Firmware error.	Cycle the power. Contact technical service and enable limp mode.
315	SMOSE MM - Flash Parameter Storage system error.	Bad connection between modem A and B sides.	1. Examine the modem connection cable. 2. Cycle the power.
316	SMOSE MM - Error during DMA transfer.	Bad connection between modem A and B sides.	1. Examine the modem connection cable. 2. Cycle the power.
317	SMOSE MM - EtherCAT chip failed to initialize End and Mid Modems: Not Applicable.	Hardware failure.	Cycle the 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. Examine the network connection to the main modem. 2. Cycle the power.
319	SMOSE MM - Other uncategorized error condition.	Hardware failure.	Cycle the power.
320	SMOSE MM - Arbitration lost (bus may be shorted to GND or VDD).	Bad connection between modem A and B sides.	1. Examine the modem connection cable. 2. Cycle the 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. Verify that the connection contacts are clean and secure between the A and B sides of the modem. 2. Cycle the power.
322	SMOSE MM - Timeout during I2C data transfer.	Bad connection between modem A and B sides.	1. Examine the modem connection cable. 2. Cycle the power.
323	SMOSE MM - Other errors: OverUnderRun, DMA Error or Bus Error.	Bad connection between modem A and B sides.	1. Examine the modem connection cable. 2. Cycle the power.
324	SMOSE MM - Arbitration lost (bus may be shorted to GND or VDD).	Bad connection between modem A and B sides.	1. Examine the modem connection cable. 2. Cycle the 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. Verify that the connection contacts are clean and secure between the A and B sides of the modem.
326	SMOSE MM - Timeout during I2C data transfer.	Bad connection between modem A and B sides.	1. Examine the modem connection cable. 2. Cycle the power.
327	SMOSE MM - Other errors: OverUnderRun, DMA Error or Bus Error.	Bad connection between modem A and B sides.	1. Examine the modem connection cable. 2. Cycle the power.
400	SMOSE M1 - Yamar chip failed to initialize.	Hardware failure.	Cycle the 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 the hose (uncoil fully). 2. Examine the hose configuration (see the Hose Configuration screen). 3. Pair, scan, and set the hose frequencies (see the Hose Configuration screen).
402	SMOSE M1 - Timeout waiting for Tx complete Interrupt.	Hardware failure.	Cycle the power.

SYSTEM ERRORS			
Error No.	Alarm Description	Condition	Action
403	SMOSE M1 - Multiple master modems detected on RF link.	Bad connection between modem A and B sides.	1. Examine the modem connection cable. 2. Cycle the power.
404	SMOSE M1 - Arbitration lost (bus may be shorted to GND or VDD).	Bad connection between modem A and B sides.	1. Examine the modem connection cable. 2. Cycle the 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. Examine the modem connection cable. 2. Cycle the power.
406	SMOSE M1 - Timeout during I2C data transfer.	Bad connection between modem A and B sides.	1. Examine the modem connection cable. 2. Cycle the power.
407	SMOSE M1 - Other errors: OverUnderRun, DMA Error or Bus Error.	Bad connection between modem A and B sides.	1. Examine the modem connection cable. 2. Cycle the power.
408	SMOSE M1 - No pressure data from sensor.	Bad connection between modem A and B sides.	1. Examine the modem connection cable. 2. Cycle the power.
409	SMOSE M1 - Hose A pressure out of range.	Pressure sensor out of calibration.	Calibrate the sensor.
410	SMOSE M1 - Hose B pressure out of range.	Pressure sensor out of calibration.	Calibrate the sensor.
411	SMOSE M1 - No Temperature data from sensor.	Bad connection between modem A and B sides.	1. Examine the modem connection cable. 2. Cycle the power.
412	SMOSE M1 - Hose A temperature out of range.	Hardware failure.	Cycle the power.
413	SMOSE M1 - Hose B temperature out of range.	Hardware failure.	Cycle the power.
414	SMOSE M1 - Event Memory Pool is empty.	Firmware issue.	Cycle the power.
415	SMOSE M1 - Flash Parameter Storage system error.	Bad connection between modem A and B sides.	1. Examine the modem connection cable. 2. Cycle the power.
416	SMOSE M1 - Error during DMA transfer.	Bad connection between modem A and B sides.	1. Examine the modem connection cable. 2. Cycle the power.
417	SMOSE M1 - EtherCAT chip failed to initialize. End and Mid Modems: Not Applicable.	Hardware failure.	Cycle the 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. Examine the network connection to the main modem. 2. Cycle the power.
419	SMOSE M1 - Other uncategorized error condition.	Hardware failure.	Cycle the power.
420	SMOSE M1 - Arbitration lost (bus may be shorted to GND or VDD).	Bad connection between modem A and B sides	1. Examine the modem connection cable. 2. Cycle the power.
421	SMOSE M1 - No ACK from device.	Bad connection between modem A and B sides	1. Examine the modem connection cable. 2. Cycle the power.
422	SMOSE M1 - Timeout during I2C data transfer.	Bad connection between modem A and B sides	1. Examine the modem connection cable. 2. Cycle the power.

SYSTEM ERRORS			
Error No.	Alarm Description	Condition	Action
423	SMOSE M1 - Other errors: OverUnderRun, DMA Error or Bus Error.	Bad connection between modem A and B sides.	1. Examine the modem connection cable. 2. Cycle the power.
424	SMOSE M1 - Arbitration lost (bus may be shorted to GND or VDD).	Bad connection between modem A and B sides.	1. Examine the modem connection cable. 2. Cycle the power.
425	SMOSE M1 - No ACK from device.	Bad connection between modem A and B sides.	1. Examine the modem connection cable. 2. Cycle the power.
426	SMOSE M1 - Timeout during I2C data transfer.	Bad connection between modem A and B sides.	1. Examine the modem connection cable. 2. Cycle the power.
427	SMOSE M1 - Other errors: OverUnderRun, DMA Error or Bus Error.	Bad connection between modem A and B sides.	1. Examine the modem connection cable. 2. Cycle the power.
600	SMOSE ME - Yamar chip failed to initialize.	Hardware failure.	Cycle the 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 the hose (uncoil fully). 2. Examine the hose configuration (see the Hose Configuration screen). 3. Pair, scan, and set the hose frequencies (see the Hose Configuration screen).
602	SMOSE ME - Timeout waiting for Tx complete Interrupt.	Hardware failure.	Cycle the 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 the modems.
604	SMOSE ME - Arbitration lost (bus may be shorted to GND or VDD).	Bad connection between modem A and B sides.	1. Examine the modem connection cable. 2. Cycle the 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. Examine the modem connection cable. 2. Cycle the power.
606	SMOSE ME - Timeout during I2C data transfer.	Bad connection between modem A and B sides.	1. Examine the modem connection cable. 2. Cycle the power.
607	SMOSE ME - Other errors: OverUnderRun, DMA Error or Bus Error.	Bad connection between modem A and B sides.	1. Examine the modem connection cable. 2. Cycle the power.
608	SMOSE ME - No pressure data from sensor (I2C read failure).	Bad connection between modem A and B sides.	1. Examine the modem connection cable. 2. Cycle the power.
609	SMOSE ME - Hose A pressure out of range.	Pressure sensor out of calibration.	Calibrate the sensor.
610	SMOSE ME - Hose B pressure out of range.	Pressure sensor out of calibration.	Calibrate the 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. Verify that the connection contacts are clean and secure between the A and B sides of the modem.

SYSTEM ERRORS			
Error No.	Alarm Description	Condition	Action
612	SMOSE ME - Hose A temperature out of range.	Hardware Failure.	Cycle the power.
613	SMOSE ME - Hose B temperature out of range.	Hardware Failure.	Cycle the power.
614	SMOSE ME - Event Memory Pool is empty.	Firmware Failure.	Cycle the power.
615	SMOSE ME - Flash Parameter Storage system error.	Bad connection between modem A and B sides.	1. Examine the modem connection cable. 2. Cycle the power.
616	SMOSE ME - Error during DMA transfer.	Bad connection between modem A and B sides.	1. Examine the modem connection cable. 2. Cycle the power.
617	SMOSE ME - EtherCAT chip failed to initialize End and Mid Modems: Not Applicable.	Hardware failure.	Cycle the power.
618	SMOSE ME - EtherCAT no Network link End and Mid Modems Not Applicable.	Bad connection between modem A and B sides.	1. Examine the modem connection cable. 2. Cycle the power.
619	SMOSE ME - Other uncategorized error condition.	Hardware failure.	Cycle the power.
620	SMOSE ME - Arbitration lost (bus may be shorted to GND or VDD).	Bad connection between modem A and B sides.	1. Examine the modem connection cable. 2. Cycle the 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. Examine the modem connection cable. 2. Cycle the power.
622	SMOSE ME - Timeout during I2C data transfer.	Bad connection between modem A and B sides.	1. Examine the modem connection cable. 2. Cycle the power.
623	SMOSE ME - Other errors: OverUnderRun, DMA Error or Bus Error.	Bad connection between modem A and B sides.	1. Examine the modem connection cable. 2. Cycle the power.
624	SMOSE ME - Arbitration lost (bus may be shorted to GND or VDD).	Bad connection between modem A and B sides.	1. Examine the modem connection cable. 2. Cycle the power.
625	SMOSE ME - No ACK from device (Verify I2C address is correct).	Bad connection between modem A and B sides.	1. Examine the modem connection cable. 2. Cycle the power.
626	SMOSE ME - Timeout during I2C data transfer.	Bad connection between modem A and B sides.	1. Examine the modem connection cable. 2. Cycle the power.
627	SMOSE ME - Other errors: OverUnderRun, DMA Error or Bus Error.	Bad connection between modem A and B sides.	1. Examine the modem connection cable. 2. Cycle the power.

MAINTENANCE

REGULAR MAINTENANCE PROCEDURES AND RECOMMENDATIONS

Material Purge

After a job is completed, remember to thoroughly purge the system. Failure to do so can cause clogs, leaks, or cross-contamination of materials when the system is disassembled for servicing.

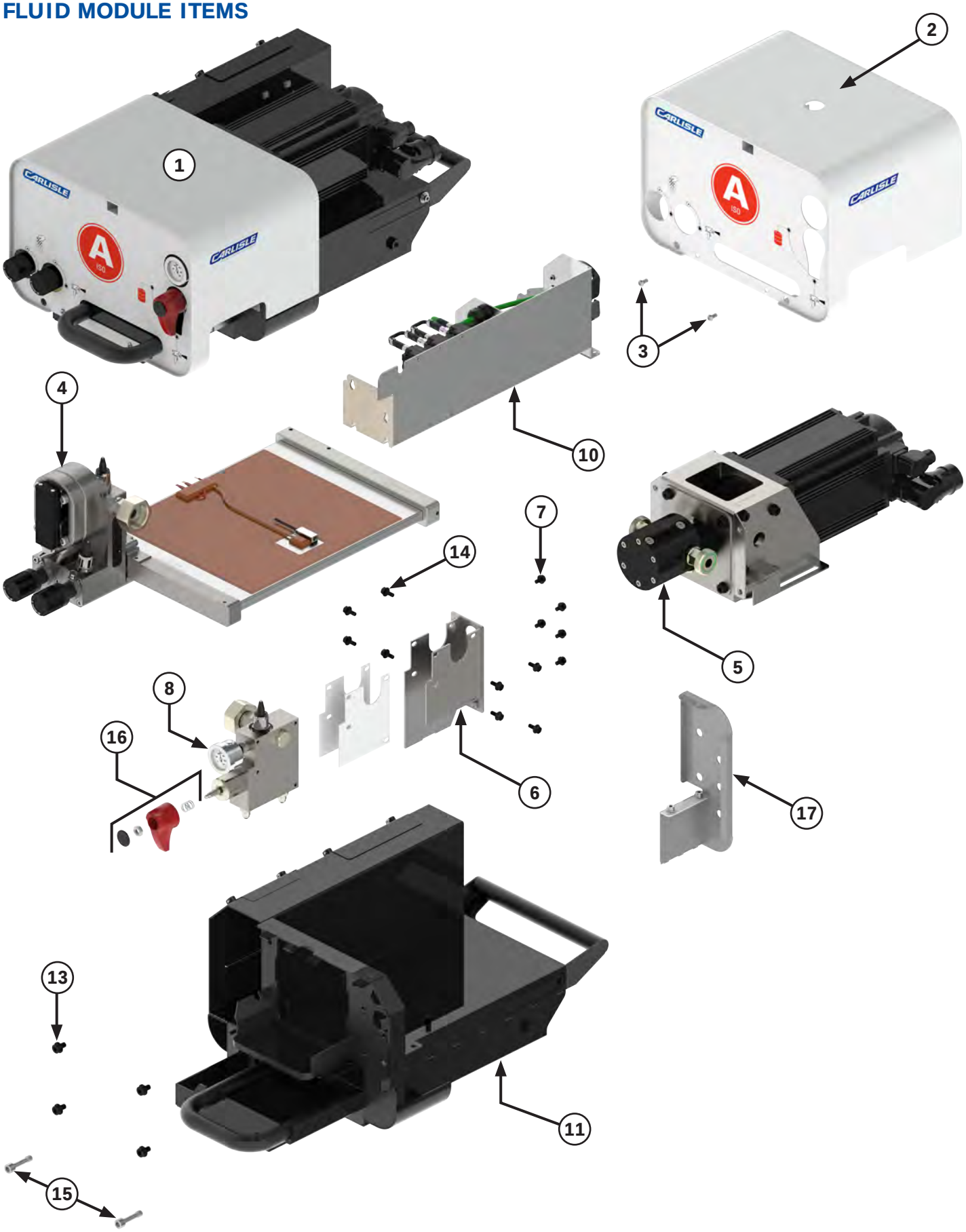
Regular Inspection

Continuous use or lack of use of the system can cause a system malfunction. Do regular interval system inspections as shown at the table below.

MAINTENANCE INTERVALS

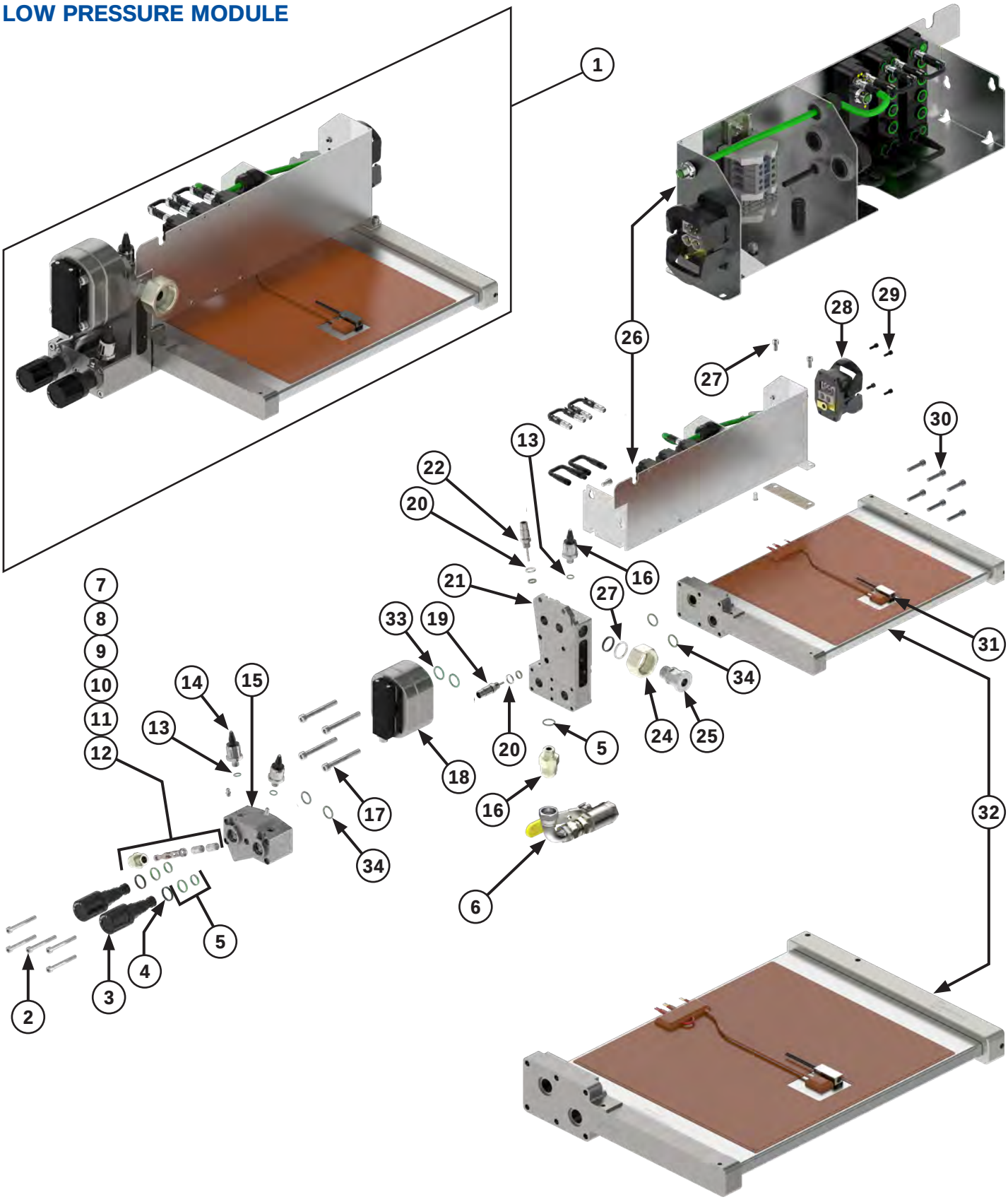
Frequency	Description	Inspection Method
DAILY	SYSTEM FLUSHED WITH SOLVENT	VISUAL
DAILY	CHECK FOR LEAKS	VISUAL
DAILY	CLEAN SPRAY GUNS	VISUAL
DAILY	CHECK ALARM HISTORY	VISUAL
DAILY	CHECK FOR MATERIAL SUPPLY	VISUAL
MONTHLY	CHECK FILTER BODY AND MESH SCREEN FOR CLOGS	VISUAL
MONTHLY	CHECK ALL HOSES FOR KINKS AND WEAR	VISUAL
MONTHLY	PERFORM LOW PRESSURE MODULE CALIBRATION CHECK	COMPARE THE ANALOG PRESSURE INDICATOR WITH THE HMI PRESSURE INDICATION
MONTHLY	PERFORM HIGH PRESSURE MODULE CALIBRATION CHECK	COMPARE THE ANALOG PRESSURE INDICATOR WITH THE HMI PRESSURE INDICATION
MONTHLY	PERFORM PUMP MODULE CALIBRATION CHECK	COMPARE THE ANALOG PRESSURE INDICATOR WITH THE HMI PRESSURE INDICATION
MONTHLY	PERFORM PUMP I/O MODULE CALIBRATION CHECK	COMPARE THE ANALOG PRESSURE INDICATOR WITH THE HMI PRESSURE INDICATION
MONTHLY	CHECK FLUID MODULE OPERATION	TRIGGER MANUALLY OR FROM HMI
MONTHLY	CHECK RECIRCULATION VALVE OPERATION	CHECK MANUALLY
MONTHLY	CLEAN FLUID MODULES AND CHECK VALVES & SEALS	DISASSEMBLE
MONTHLY	CHECK A/B FLUID HOSES FOR MATERIAL BUILDUP	DISASSEMBLE
AS NEEDED	REBUILD FLUID MODULES	DISASSEMBLE

FLUID MODULE ITEMS



FLUID MODULE ITEMS			
Item	P/N	Description	Qty (Per Module)
1	341000 341001	A SIDE FLUID MODULE B SIDE FLUID MODULE	1
2	341005 341019	KIT, A FLUID MOD COVER KIT, B FLUID MOD COVER	1
3	NA	SCREW, BHCS, M6 x 1.0 x 12 LG, SS	2
4	341007	ASSEMBLY, HEATER, MODULAR, POPULATED	1
5	NA	ASSEMBLY, MOTOR & PUMP MOUNT, SIDE A ASSEMBLY, MOTOR & PUMP MOUNT, SIDE B	1
6	NA	WELDMENT, BRACKET, MANIFOLD, HP	1
7	NA	SCREW SHCS M6 x 1.0 x 10 LG SS	5
8	347705 347697	A SIDE HIGH PRESSURE MODULE B SIDE HIGH PRESSURE MODULE	1
9	NA	SOCKET HEAD CAP SCREW, M6 x 1.0 x 30 LG, SST	2
10	341048	ASSEMBLY, ELECTRIC ENCLOSURE	1
11	NA	A SIDE PUMP MODULE FRAME (INCLUDES 15) B SIDE PUMP MODULE FRAME (INCLUDES 15)	1
12	NA	SOCKET HEAD CAP SCREW, M6 x 1.0 x 8 LG, FLANGE, BO	2
13	NA	SOCKET HEAD CAP SCREW. M8 x 12 LG, FLANGE. BO	2
14	NA	SCREW, HEX M6 x 1.0 x 14 LG	8
15	NA	CAPTIVE SCREW. M10 x 1.5 x 40 mm, SST	2
16	347593 347664	HANDLE KIT, RED RECIRCULATION A VALVE HANDLE KIT, BLUE RECIRCULATION B VALVE	1
17	NA	SKIN, PUMP MODULE, SHORT	1

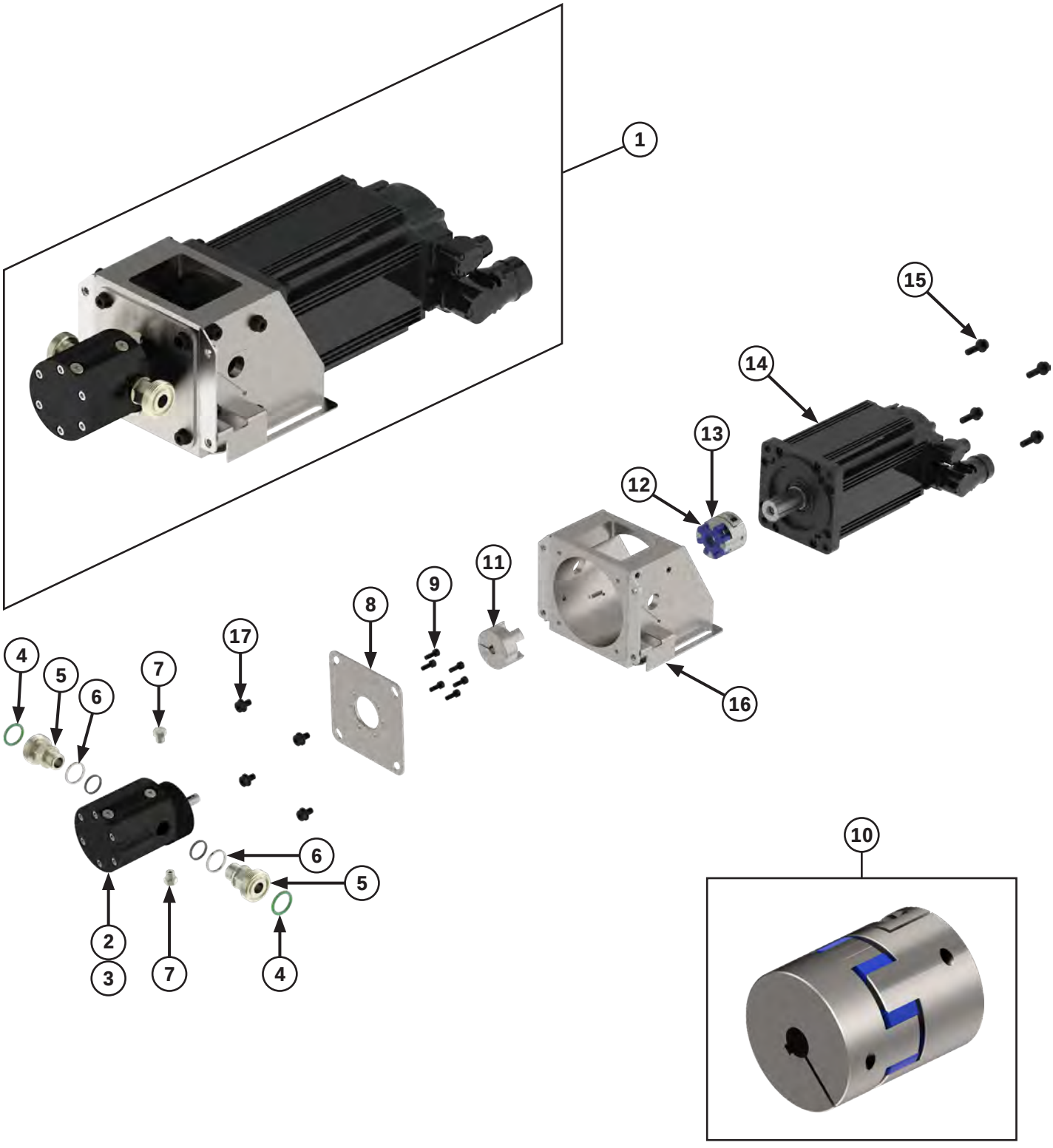
LOW PRESSURE MODULE



Note: Installation kit PN 341133 includes 90° sweeps (x2), ball valves (x2), and JIC to NPT fittings for recirculation line fittings on high pressure manifolds.

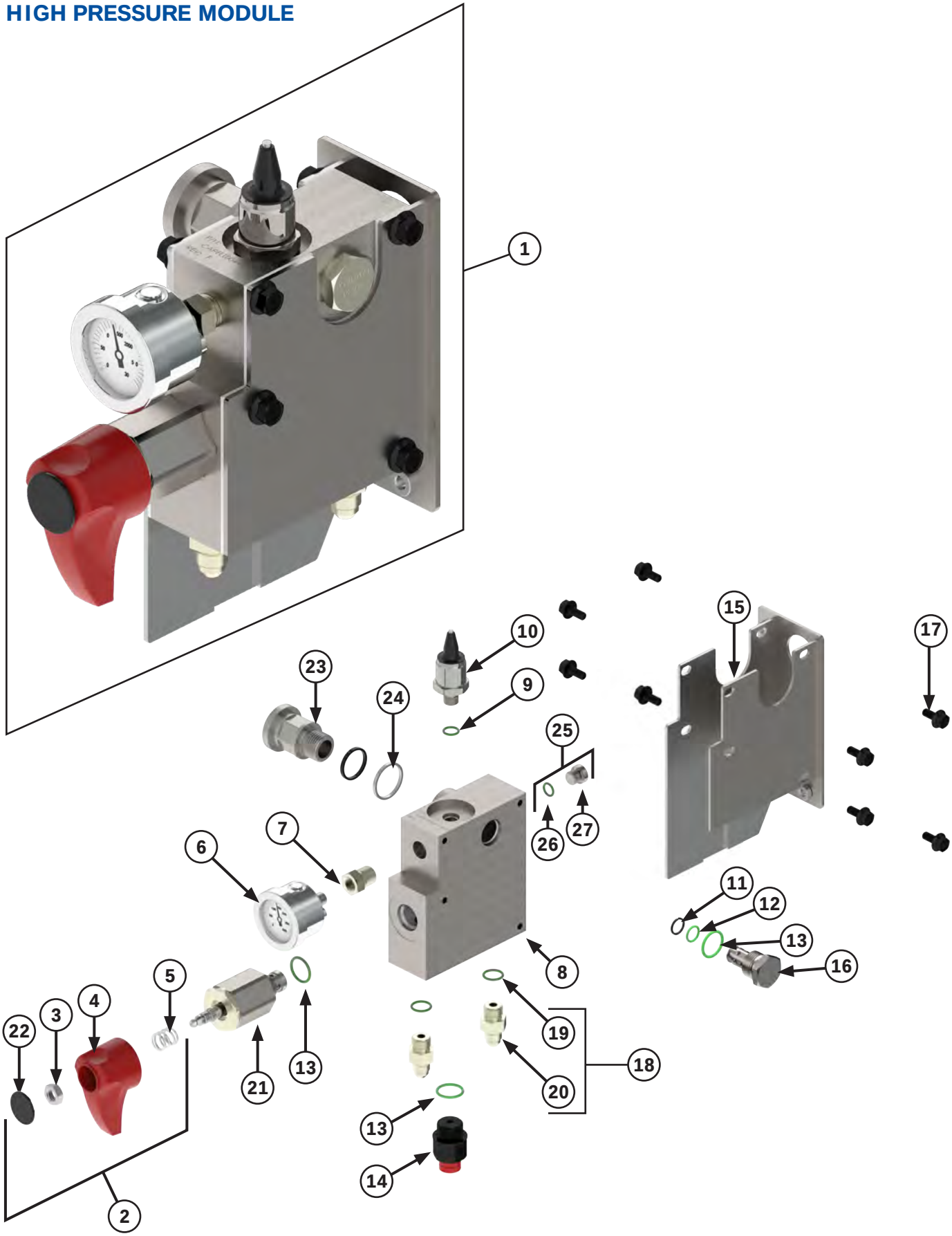
LOW PRESSURE MODULE			
Item	P/N	Description	Qty (Per Module)
1	341007	ASSEMBLY, HEATER MODULE POPULATED	1
2	NA	SCREW, M6 x 55MM, SCHS, SS	5
3	341016	VALVE, CARTRIDGE, POPPET, 2-WA	2
4	340981	O-RING, X-PROFILE	2
5	341031	O-RING, CARTRIDGE VALVE SEAL O-RING	2
6	341133	INSTALLATION KIT (INCL, 7, 9 x1, 10, and 11 x2)	1
7	341050	FILTER, CAP (INCLUDES 9)	1
8	341051	ASSEMBLY, INLET FILTER	1
9	340992	O-RING, FILTER CAP (2PK)	6
10	341045	FILTER, BODY	1
11	341027 341028	SCREEN, FILTER, 40 MESH (10PK) SCREEN, FILTER, 40 MESH (50PK)	2
12	340991 341029	O-RING, FILTER BODY (2PK) O-RING, FILTER BODY (10PK)	1
13	347507	O-RING, PRESSURE SENSOR (4PK)	4
14	341057	KIT, SENSOR, PRESSURE, 500 PSI (INCLUDES 13)	3
15	341047	KIT, MANIFOLD FILTER (INCLUDES 4 AND 34)	1
16	347504	ASSEMBLY, INLET FITTING	1
17	NA	SCREW, SCHS, M8 x 70 mm, SS	4
18	341078	FLOW METER, (INCLUDES 33 QTY 2, AND CABLE)	1
19	347477	SENSOR TEMPERATURE, VITON EXT, SHORT	1
20	347506	SEAL KIT, TEMP SENSOR (2PK)	2
21	341102	MANIFOLD, FLOWMETER	1
22	341099	KIT SENSOR, TEMP, LONG (INCLUDES 20 QTY 1)	1
23	341103	SEAL, PUMP UNION NIPPLE	4
24	347574	NUT, UNION	2
25	341002	UNION BSPP, END FACE, FLAT	2
26	341048	ASSEMBLY, FLUID MODULE I/O	1
27	NA	SCREW, SHCS, M6 x 12,THREADLOK	6
28	NA	CONNECTOR, POWER, HARTING, MALE	1
29	NA	M4 x 0.7 mm - 12 mm, SHCS	4
30	NA	18-8 SOCKET SCREW 30MM LONG	6
31	347569	THERMAL FUSE	1
32	341006	ASSEMBLY, HEATER MODULE	1
33	341095	O-RING, FLOW METER (2PK)	2
34	341096	O-RING, FILTER AND FLUID MODULE MANIFOLDS (4PK)	4

PUMP MODULE



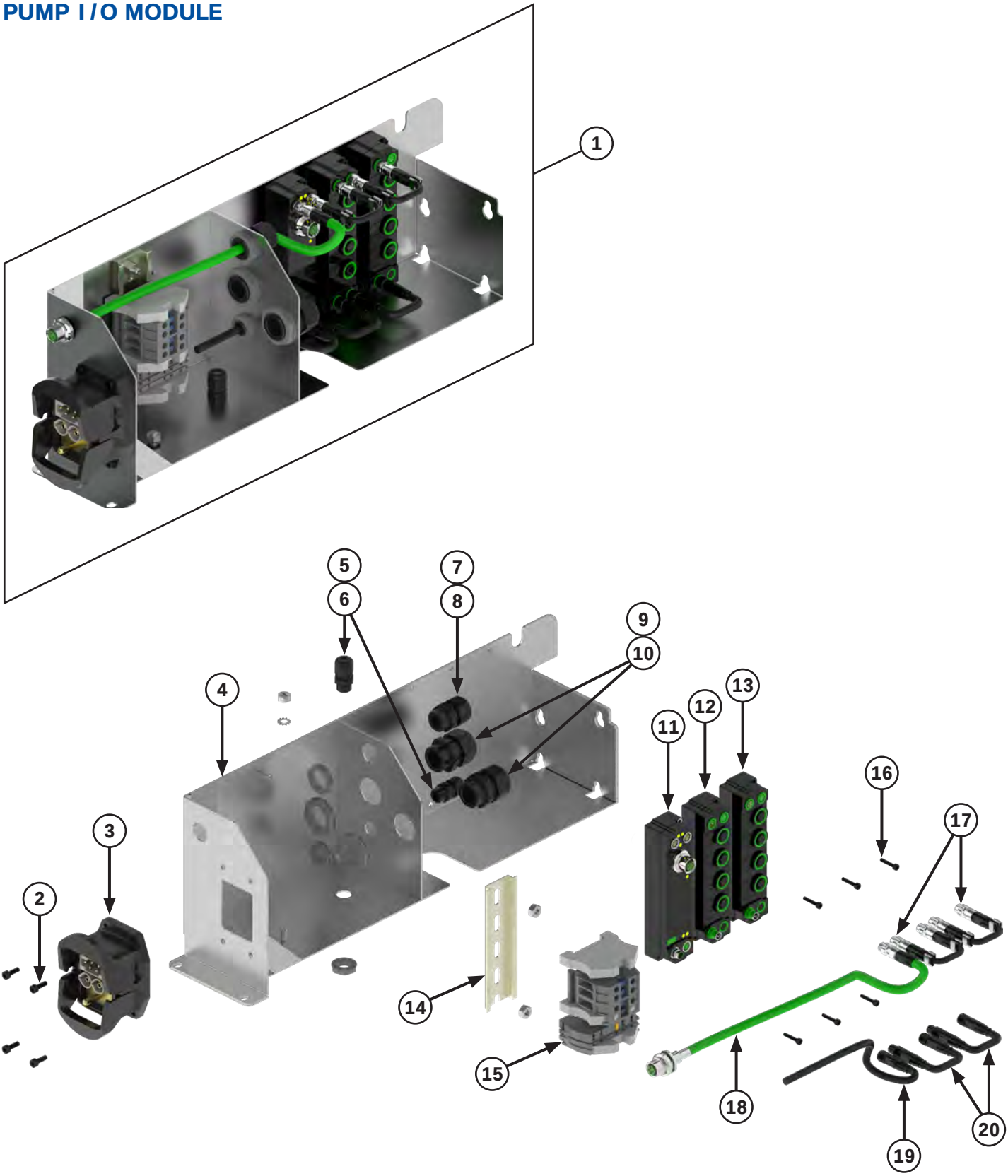
PUMP MODULE			
Item	P/N	Description	Qty (Per Module)
1	NA NA	ASSEMBLY, PUMP AND MOTOR A SIDE ASSEMBLY, PUMP AND MOTOR B SIDE	1
2	347666	KIT, PUMP ASSEMBLY (INCL 3, 4 x2, 5 x2, 6 x2, 7 x2, 8, 9 x6, and 10)	1
3	347545	GEAR, DOSING PUMP, 7.3 PTFE KIN	1
4	347572	O-RING, PUMP UNIONS (2PK)	2
5	341196	UNION END, SLOTTED FACE	2
6	341103	SEAL, PUMP UNION NIPPLE	2
7	347571	PLUG, TSL CHAMBER, LOWER OR UPPER	2
8	NA	PLATE, PUMP MOUNT	1
9	NA	M6 x 1.0 x 16 mm THRD LOCK SHCSB	6
10	341040	KIT COUPLING MOTOR PUMP (INCL 11, 12, 13)	1
11	NA	SHAFT COUPLER, PUMP	1
12	NA	SHAFT COUPLER, SPIDER	1
13	NA	SHAFT COUPLER, MOTOR	1
14	341034 341035	KIT, MOTOR, A SIDE (INCLUDES 15) KIT, MOTOR, B SIDE (INCLUDES 15)	1
15	NA	SOCKET HEAD CAP SCREW, M10 x 1.5 x 35 LG, FLANGE, BO	4
16	NA	ASSEMBLY, MACHINED MOTOR & PUMP MOUNT	1
17	NA	SOCKET HEAD CAP SCREW, M8 x 12 LG, FLANGE, BO	4

HIGH PRESSURE MODULE



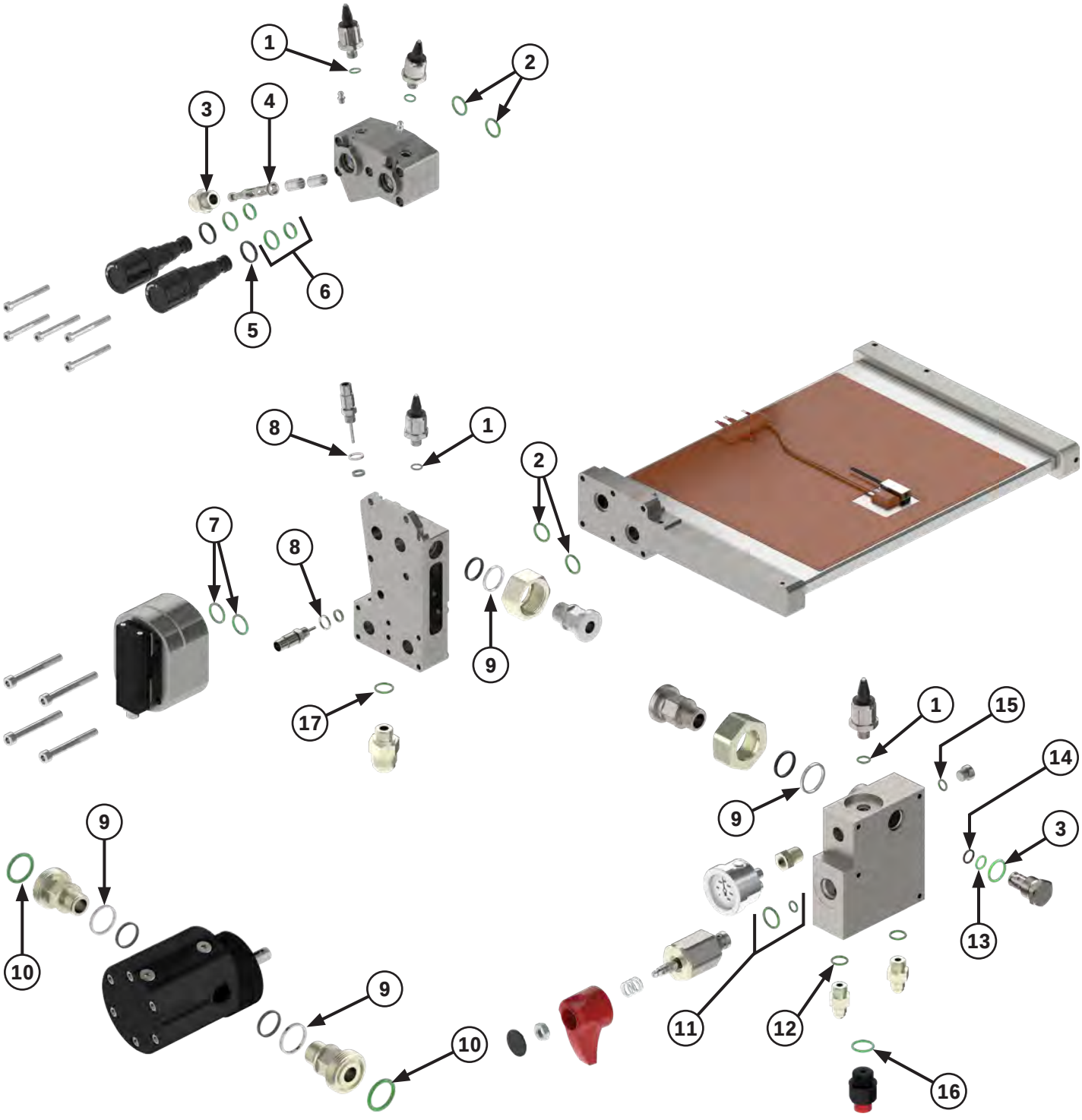
HIGH PRESSURE MODULE			
Item	P/N	Description	Qty (Per Module)
1	347705 347697	A SIDE HIGH PRESSURE MANIFOLD ASSEMBLY B SIDE HIGH PRESSURE MANIFOLD ASSEMBLY	1
2	347593 347664	HANDLE KIT, RED RECIRCULATION A VALVE (INCLUDES 3, 4, 5, 22) HANDLE KIT, BLUE RECIRCULATION B VALVE (INCLUDES 3, 4, 5, 22)	1
3	347592	NUT, RECIRCULATION VALVE	1
4	NA	HANDLE, RED RECIRC VALVE (A SIDE) HANDLE, BLUE RECIRC VALVE (B SIDE)	1
5	347590	SPRING, RECIRCULATION VALVE	1
6	347581	GAUGE, PRESSURE 0-3000 PSI	1
7	347582	BUSHING	1
8	NA	MANIFOLD, HIGH PRESSURE	1
9	347507	O-RING, PRESSURE SENSOR (4PK)	4
10	341058	KIT, HP SENSOR, 0-5000 PSI (INCLUDES 9 QTY 1)	1
11	347587	SPACER, CHECK VALVE NOSE (1PK)	1
12	347586	O-RING, CHECK VALVE NOSE (1PK)	1
13	347505	O-RING, INLET FITTING, FILTER MODULE, FLOWMETER, PREHEATER, BURST DISK, CHECK VALVE, RECIRCULATION VALVE (8PK)	1
14	347584	BURST DISK (INCLUDES 13 QTY 1)	1
15	NA	WELDMENT BRACKET, MANIFOLD, PUMP OUTLET	1
16	341037	KIT, CHECK VALVE (INCLUDES 11, 12, 13)	1
17	NA	SCREW, HEX M6 x 1.0 x 14 LG	8
18	347589 347663	JIC 5 MALE TO 3/8 NPT MALE, A SIDE (INCLUDES 19 QTY 1) JIC 6 MALE TO 3/8 NPT MALE, B SIDE (INCLUDES 19 QTY 1)	2
19	347588	O-RING, HOSE AND RECIRCULATION JIC S & JIC 6 (2PK)	2
20	NA	JIC 5 MALE TO 3/8 NPT MALE, A SIDE JIC 6 MALE TO 3/8 NPT MALE, B SIDE	2
21	347580	VALVE, RECIRCULATION (INCLUDES 13 QTY 1, 29)	1
22	NA	CAP, RECIRCULATION HANDLE	1
23	341002	UNION END, FLAT	1
24	341003	SEAL, PUMP UNION NIPPLE	1
25	341111	KIT, HP MANIFOLD PLUG (INCLUDES 26, 27)	1
26	341110	O-RING, HIGH PRESSURE PLUG (2PK)	1
27	341109	PLUG, HP MANIFOLD	1
28	341038 341039	KIT, VALVE RECIRCULATION ASSEMBLY, RED (INCLUDES 2, 3, 4, 21, AND 29) KIT, VALVE RECIRCULATION ASSEMBLY, BLUE (INCLUDES 2, 3, 4, 21, AND 29)	1
29	341041	KIT, RECIRCULATION VALVE, O-RING	1

PUMP I/O MODULE



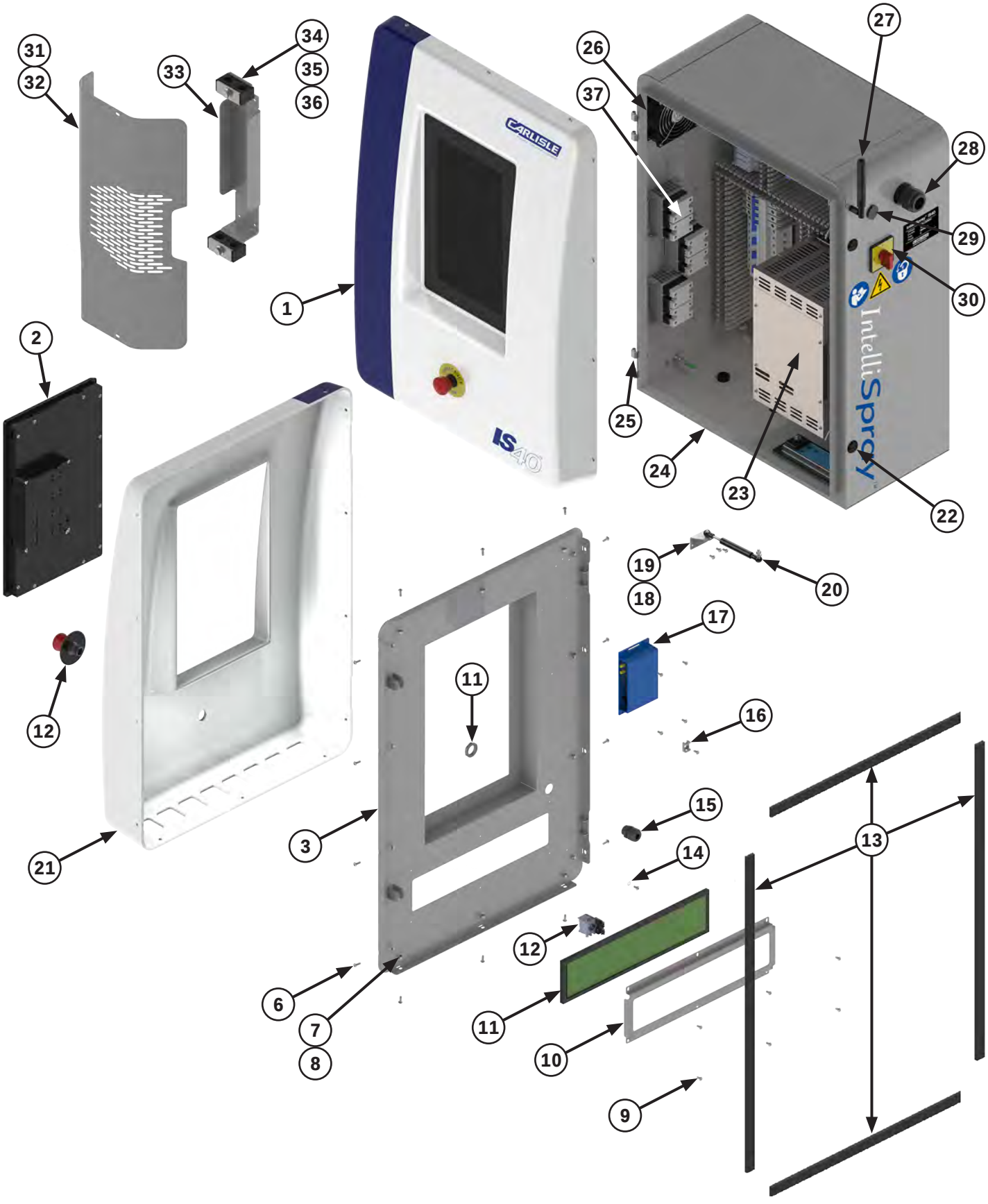
PUMP I/O MODULE			
Item	P/N	Description	Qty (Per Module)
1	341048	ASSEMBLY, FLUID MODULE I/O	1
2	NA	M4 x 0.7 mm - 12 mm, SHCS	4
3	NA	CONNECTOR, POWER, HARTING, MALE	1
4	NA	WELDMENT, PANEL PUMP MODULE	1
5	NA	SEALCON GLAND, PG7, GREY	2
6	NA	SEALCON PG7 NUT, GREY	2
7	NA	SEALCON GLAND, PG11, GREY	1
8	NA	SEALCON PG11 NUT, GREY	1
9	NA	SEALCON GLAND, PG16, 4 x 4	2
10	NA	SEALCON PG16 NUT, GREY	2
11	341024	24V ENCODER	1
12	341023	4 CHANNEL RTD INPUT	1
13	341022	ETHERCAT 4 CHANNEL ANALOG INPUT	1
14	NA	DIN RAIL	1
15	NA	TERMINAL BLOCK ASSEMBLY	1
16	NA	SCREW, SHCS, M3 x 0.5 x 16 BA	6
17	341082	CABLE M8-M8 0.2M CAT	2
18	341084	CABLE M12-M8 0.4M ECAT	1
19	341091	CABLE M8-FL 0.5M PWR	1
20	NA	CABLE M8-M8 STRAIGHT 0.2M	2

FLUID MODULE O-RINGS AND SEALS



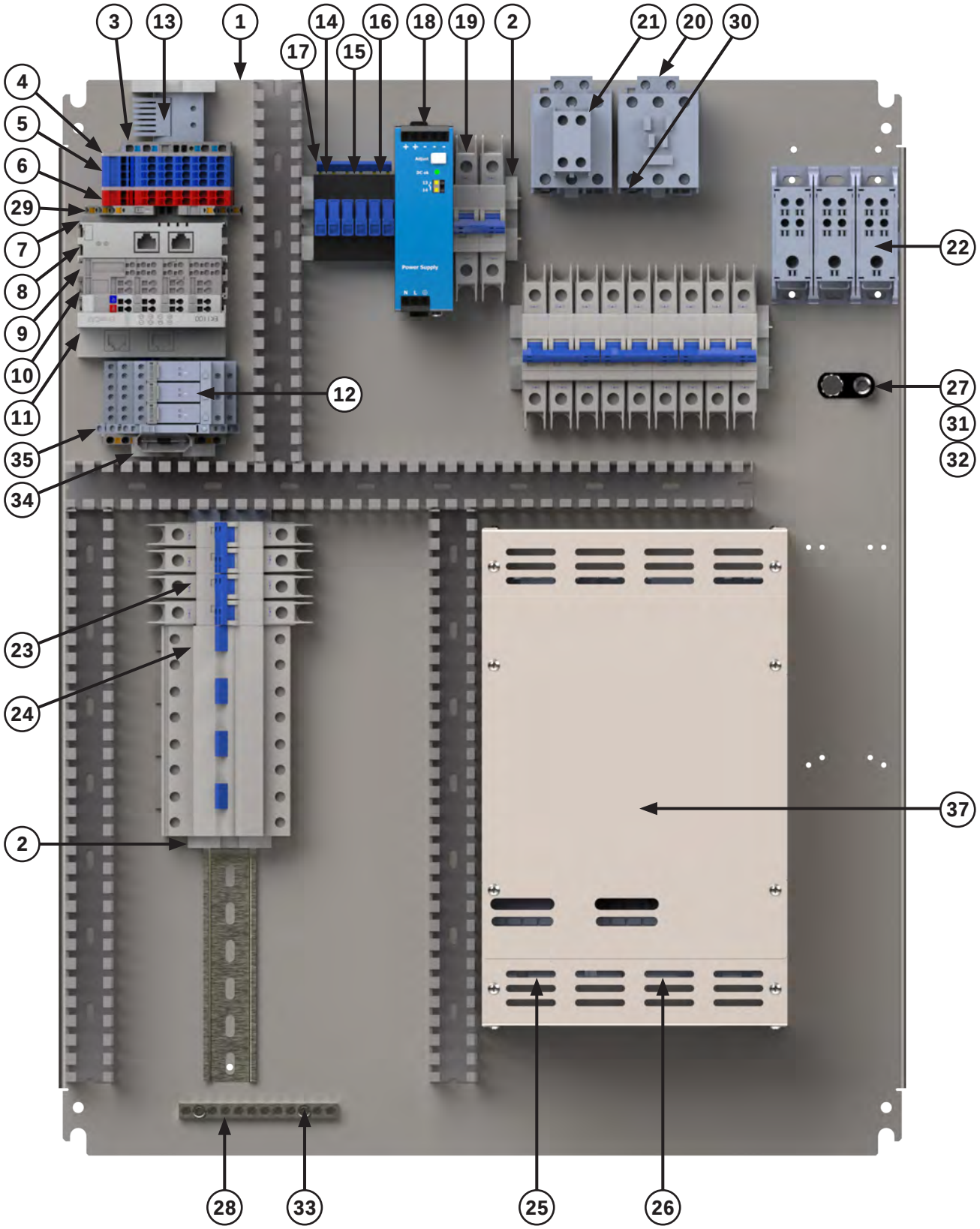
FLUID MODULE O-RINGS AND SEALS			
Item	P/N	Description	Qty (Per Module)
1	347507	O-RING, PRESSURE SENSOR (4PK)	4
2	341096	O-RING, FILTER AND FLOW METER MANIFOLDS (4 PK)	4
3	347505	O-RING, VARIOUS LOCATIONS (8 PK)	6
4	340991 341029	O-RING, FILTER BODY (2PK) O-RING, FILTER BODY (10PK)	1
5	340981	O-RING X PROF 2 mm x 21mm BUNA-N	2
6	341031	KIT SEAL CART VALVE (2PK)	2
7	341095	O-RING, FLOW METER (2PK)	2
8	347506	SEAL, TEMPERATURE SENSOR (2PK)	2
9	341103	SEAL, PUMP UNION NIPPLE	4
10	347572	O-RING, PUMP UNION (2PK)	2
11	341041	KIT VALVE RECIRCULATION O-RING	1
12	347588	O-RING, HOSE AND RECIRCULATION JIC 5 & JIC 6 (2PK)	2
13	347586	O-RING CHECK VALVE NOSE (1PK)	1
14	347587	SPACER, CHECK VALVE NOSE (1PK)	1
15	341110	O-RING, PLUG	1
16	341115	O-RING, BURST DISK	1
17	341093	O-RING, INLET FITTING	1

IS40 CONTROL MODULE ENCLOSURE



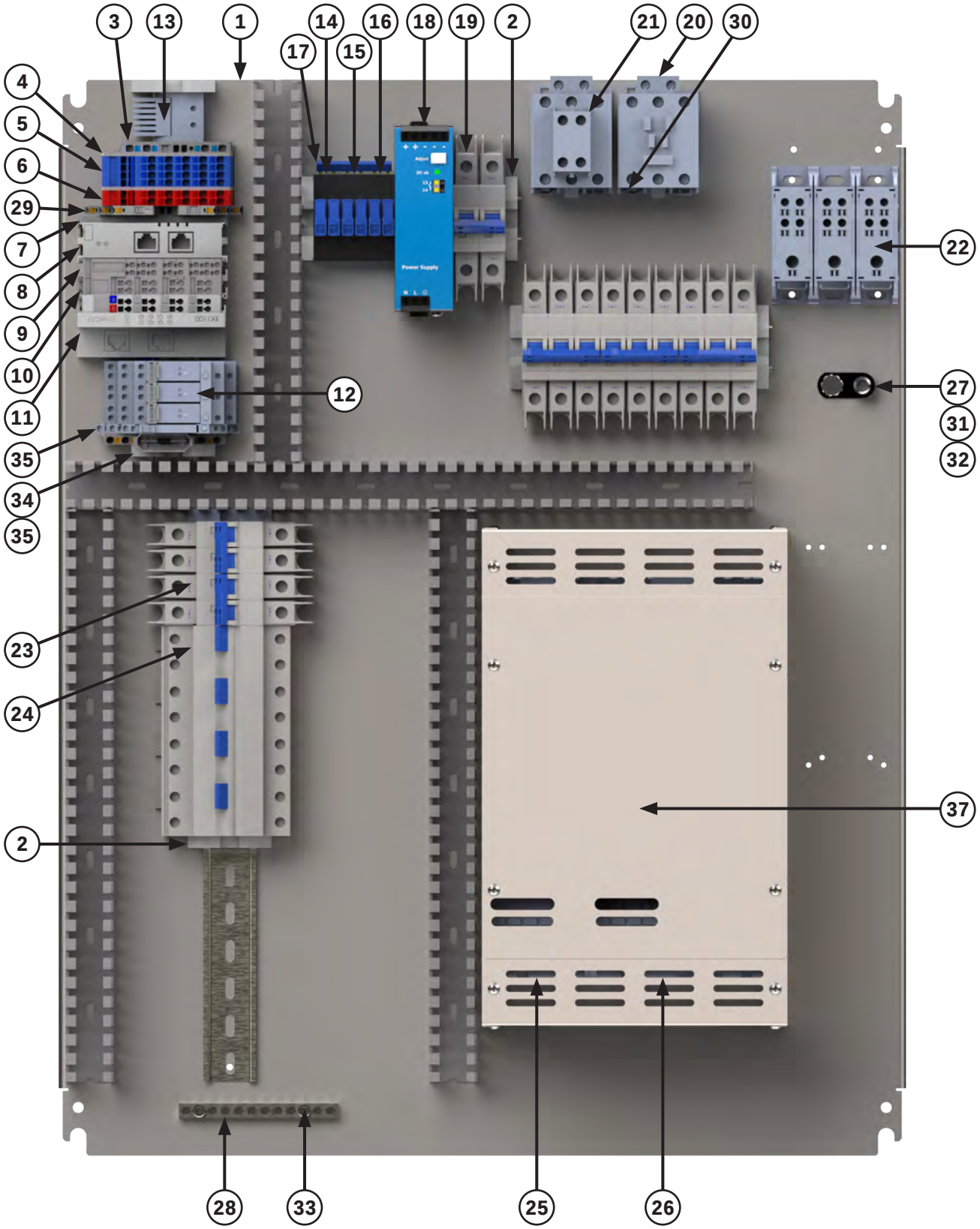
IS40 CONTROL MODULE-ENCLOSURE			
Item	P/N	Description	Qty (Per Module)
1	NA	CONTROL MODULE COVER ASSEMBLY	1
2	341025	15IN HMI WITH CODESYS	1
3	NA	IS40 DOOR - WELDMENT ASSY	1
6	NA	M5 x 0.8 x 14MM BHCS 316 SS	14
7	NA	M5, 18-8 SS WASHER	14
8	NA	M6X0.8 18-8 SS NYLON LOCK NUT	14
9	NA	BUTTON HEAD CAP SCREWS, SST	10
10	NA	IS40 ENCLOSURE - FILTER BRACKET	1
11	341026	FILTER CUSTOM 4 x 6 7/8 x 1/2	1
12	347598	E-STOP KIT (INCL. CONTACTORS)	1
13	NA	LOW DENSITY PVC BLK 1/4 x 3/4 x 50FT	105.4 IN
14	NA	M5 EXTERNAL TOOTH LOCK WASHER	1
15	NA	POWER CORD GLAND	1
16	NA	SUPER GRIP CABLE TIE MOUNT 0.91 NYLON 6.6	1
17	NA	CELLULAR MODEM	1
18	NA	BALL STUD MOUNTING BRACKET FOR GAS SPRING	1
19	NA	M5 x 0.8 x 10MM BHCS	11
20	NA	GAS SPRING, #15	1
21	NA	IS40 ENCLOSURE - THERMO COVER	1
22	NA	COVER LOCK ASSEMBLY	2
23	NA	EMI CAGE	1
24	NA	CONTROL MODULE FRAME	1
25	347609	DOOR HINGE ASSY	2
26	347615	CONTROL MODULE FAN ASSY	1
27	347613	CELLULAR ANTENNA	1
28	347612	POWER CORD GLAND	1
29	347611	USB KIT	1
30	341059	KIT ROTARY AC DISCONNECT	1
31	NA	IS40 SMOSE COVER	1
32	NA	SCREW, SMOSE COVER	2
33	NA	IS40 SMOSE CLAMP (INCL. BRACKET)	1
34	NA	IS40 SMOSE CLAMP TOP PLATE	2
35	NA	M10 FLANGE HEAD CAP SCREW	2
36	NA	SMOSE CLAMP BLOCK	4
37	341015	50AMP SSR WITH THERMOPAD	3

IS40 CONTROL MODULE
CONTROL PANEL 200V-240V



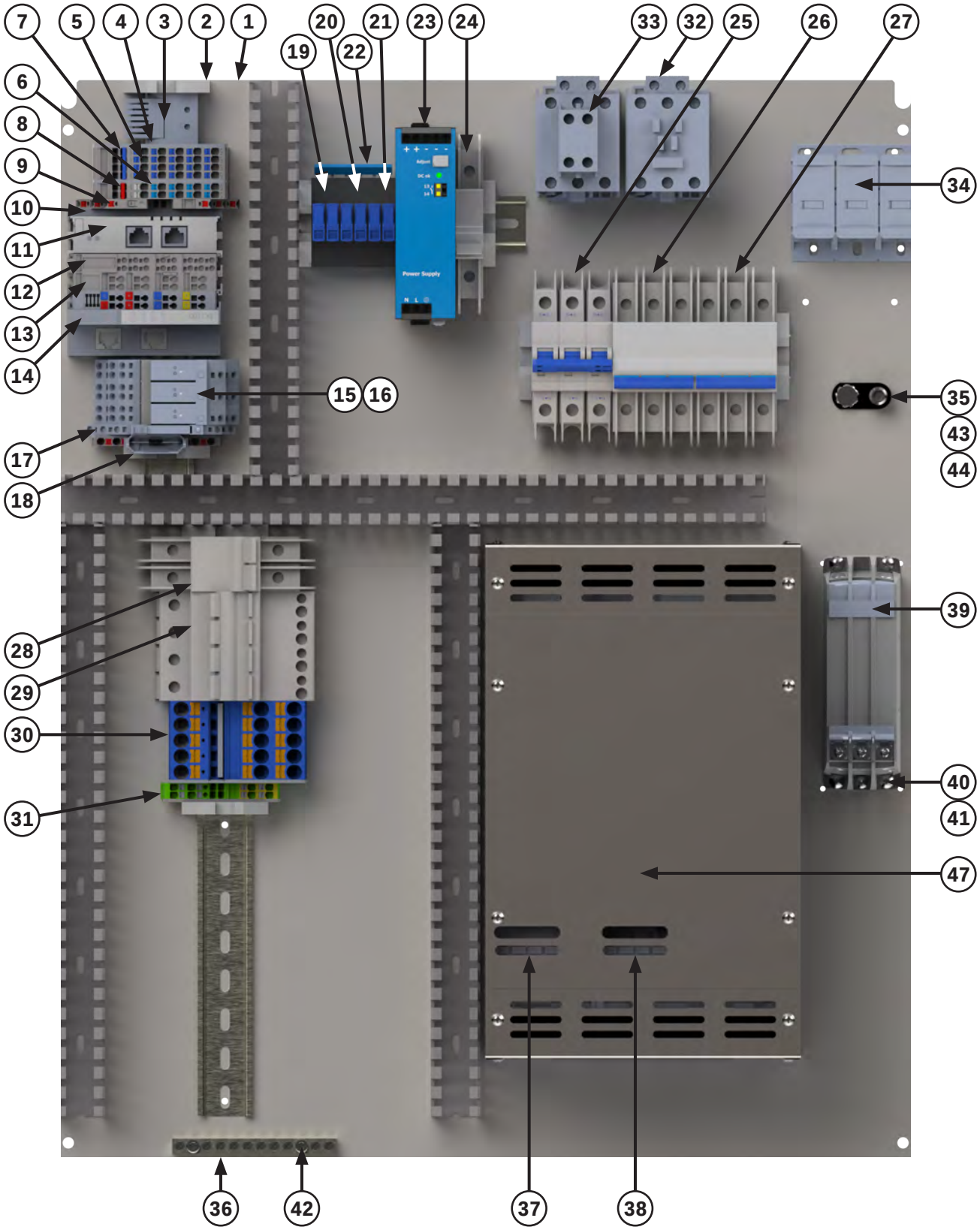
IS40 CONTROL MODULE 200V-240V CONTROL PANEL			
Item	P/N	Description	Qty (Per Module)
1	NA	BACKPANEL - ELECTRICAL MAIN	1
2	NA	AB TERMINAL END ANCHOR	8
3	347600	TERMINAL BLOCK GROUND AND BARRIER	1
4	NA	A/B TERMINAL END BLOCK	2
5	NA	PUSH IN TERMINAL BLOCK, 5 POLE	4
6	NA	A/B DIST BLOCK, 5PL, RED	2
7	NA	BUS END CAP	1
8	341018	ECAT JUNCTION 2CH	1
9	341021	ECAT DIGITAL OUTPUT 16CH	1
10	341020	ECAT DIGITAL INPUT 8CH	1
11	341017	ECAT COUPLER	1
12	340993	TERMINAL BLOCK RELAY	1
13	340979	THERMOSTAT	1
14	341081	ETA CB WITH TB 5AMP	2
15	341079	ETA CB WITH TB 1AMP	2
16	341080	ETA CB WITH TB 3AMP	2
17	NA	ETA 10PLUS TB BUSBAR 12P	5
18	347623	24V POWER SUPPLY	1
19	340982	CIRCUIT BREAKER 6A/2P C TRIP	1
20	340980	CONTACTOR, 24V COIL, 43AMP	2
21	NA	AB CONTACT FRONT MOUNT	1
22	NA	A/B PWR DIST BLOCK 1 IN 4 OUT	3
23	340983	2PH CB 50AMP C CURVE	2
24	347631	HOSE HEAT GFCI 15A	4
25	341055	KIT 18A DRIVE WITH FIRMWARE	1
26	341056	KIT 54A DRIVE WITH FIRMWARE	1
27	NA	GROUND LUG 1/0-8AWG	1
28	NA	GROUND BAR	1
29	347714	CIRCUIT BREAKER ELECTRONIC 1P	1
30	NA	M4 SPLIT WASHER, 18-8 SS	4
31	NA	M8 EXTERNAL TOOTH LOCKWASHER	1
32	NA	M8 x 1.25 x 15 mm HEX HEAD BOLT	1
33	NA	SHCS, M5 x 20, 18-8	2
34	347678	HOSE COMM RESET REPLACEMENT KIT	1

IS40 CONTROL MODULE
CONTROL PANEL 200V-240V



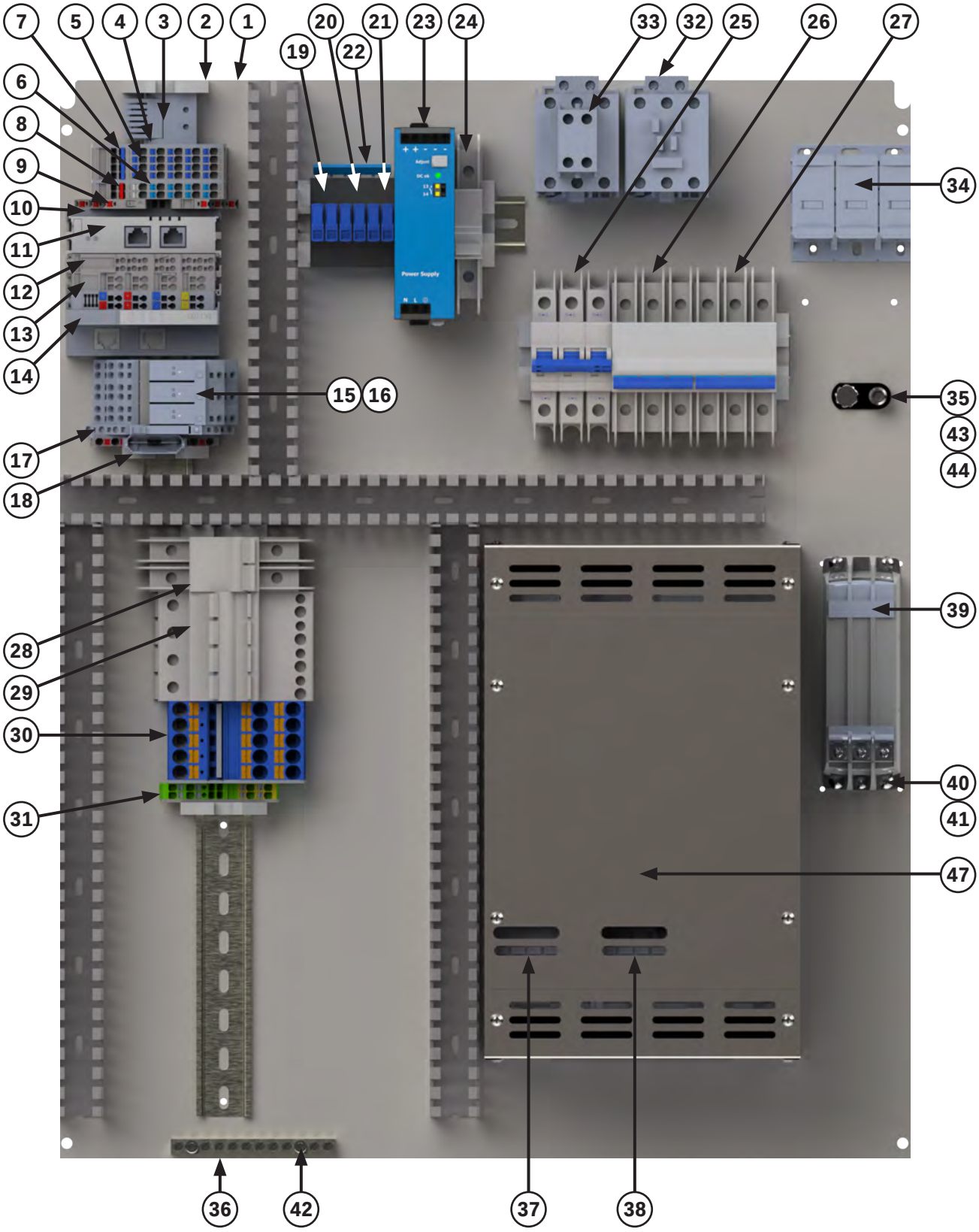
IS40 CONTROL MODULE 200V-240V CONTROL PANEL			
Item	P/N	Description	Qty (Per Module)
35	347645	HOSE RESET RELAY	1
36	347688	FERRITE 260 OHM	2
37	NA	IS40 CE CAGE - ASSEMBLY	1

IS40 CONTROL MODULE
CONTROL PANEL 380V-415V



IS40 CONTROL MODULE 380V-415V CONTROL PANEL			
Item	P/N	Description	Qty (Per Module)
1	NA	BACKPANEL - ELECTRICAL MAIN	1
2	NA	TERMINAL END BLOCK	8
3	340979	THERMOSTAT NO 77-95 DEG F	1
4	NA	A/B TERMINAL END BLOCK	2
5	NA	PUSH IN TERMINAL BLOCK, 5 POLE	4
6	NA	A/B DIST BLOCK, 5PL, RED	2
7	NA	A/B JUMPER, 4 PLACE, BLUE	1
8	NA	AB JUMPER 2 PLACE RED	1
9	347714	CIRCUIT BREAKER ELECTRONIC 1P	1
10	NA	BECKHOFF BUS END CAP	1
11	341018	2 PORT ETHERCAT JUNCTION	1
12	341021	16 CHANNEL OUTPUT MODULE	1
13	341020	8 CHANNEL INPUT MODULE	1
14	341017	ETHERCAT COUPLER	1
15	340993	RELAY DPDT 24VDC COIL	3
16	NA	TERMINAL BLOCK JUMPER, 8 POLE, BLUE	.5
17	347645	HOSE RESET RELAY	1
18	347678	HOSE COMM RESET REPLACEMENT KIT	1
19	NA	ETA 10PLUS TB BUSBAR, 12P	2
20	341081	ETA CB WITH TB, 5A	2
21	341079	ETA CB WITH TB, 1AMP	2
22	341080	ETA CB WITH TB, 3AMP	1
23	347623	24V POWER SUPPLY	1
24	347679	CIRCUIT BREAKER, 6A, 1P	1
25	340987	CIRCUIT BREAKER 60A/3P C TRIP	1
26	347685	CIRCUIT BREAKER, 10A, 3 POLE	1
27	347706	CIRCUIT BREAKER, 20A, 3 POLE	1
28	347707	CIRCUIT BREAKER, 1 POLE, 50A	2
29	347683	GFCI 16A 1P	4
30	347681	NEUTRAL DISTRIBUTION BLOCKS	5
31	347704	GROUND TERMINAL BLOCKS	2
32	340980	CONTACTOR, 24V COIL 43AMP	2
33	NA	AB CONTACT FRONT MOUNT	1
34	347703	DISTRIBUTION BLOCK, 1P, 115A, 8POS	3
35	NA	GROUND LUG 1/0-8AWG	1

IS40 CONTROL MODULE
CONTROL PANEL 380V-415V



IS40 CONTROL MODULE 380V-415V CONTROL PANEL			
Item	P/N	Description	Qty (Per Module)
36	NA	GROUND BAR	1
37	347687	SERVO DRIVE, 18AMP 400V	1
38	341056	KIT 54A DRIVE WITH FIRMWARE	1
39	347686	LINE FILTER, 30A, CHASSIS MOUNT	1
40	NA	M4 x .7 x 10 mm EW TRUSS PHIL SCREW	4
41	NA	M4 SPLIT WASHER, 18-8 SS	8
42	NA	SHCS, M5 x 20, 18-8	2
43	NA	M8 x 1.25 x 20 mm HEX BOLT	1
44	NA	M8 EXTERNAL TOOTH LOCKWASHER	1
45	347688	FERRITE 260 OHM (Not Shown)	4
46	NA	SCREW SHC, M4 x 16, SST (Not Shown)	4
47	NA	IS40 CE CAGE - ASSEMBLY	1

IS40 CABLES

REFER TO WIRING DIAGRAMS FOR CBL NUMBER

IS40 CONTROL MODULE			
Cable No.	P/N	Description	Qty
CBL2007	347633	A-ISO ZONE 1 HOSE HEAT	1
CBL2010	347634	B-RES ZONE 1 HOSE HEAT	1
CBL2014	347635	A-ISO ZONE 2 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	341084	CABLE M12-M8 0.4M ECAT	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	PREHEATER 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

ELECTRICAL DIAGRAMS 200V-240V

WIRE GAUGE (UNLESS NOTED) USE MIN 75 DEGREE C COPPER WIRE			
American Wire Gauge (AWG)	Diameter (Inches)	Cross Sectional Area (mm^2)	Ampacity (75° C Copper)
3	0.2292	26.65	100
4	0.2043	21.14	85
6	0.162	13.29	65
8	0.1285	8.36	52
10	0.1019	5.26	30
12	0.0808	3.31	20
14	0.0641	2.08	15
16	0.0508	1.31	10
18	0.0403	0.82	7
20	0.0320	0.52	5
22	0.0253	0.33	3

FERRULES TO BE USED ON ALL WIRES (UNLESS NOTED)	
Wire Reference	Description
BLACK	UNGROUNDED LINE VOLTAGE
WHITE	UNGROUNDED DC VOLTAGE
WHITE/BLUE	GROUNDED DC COMMON
GREEN/YELLOW	GROUND

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	GREY w/WHITE STRIPE
WHT_BRN	WHITE w/BROWN STRIPE
BRN_WHT	BROWN w/WHITE STRIPE
WHT_GRY	WHITE w/GREY STRIPE
GRY_WHT	GREY 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

DRAWING 1

LEGEND DESCRIPTIONS

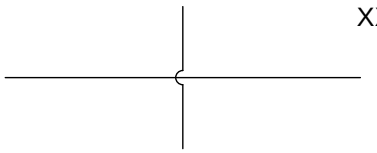
NUMBERING CODE

XX???? = COMPONENT TYPE

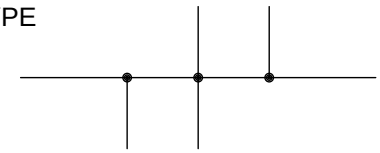
??XX?? = SHEET

????XX = COLUMN

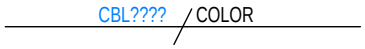
WIRE CROSS



WIRE CONNECTION

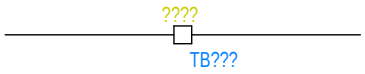


CABLE NUMBER
CORE IDENTIFIER

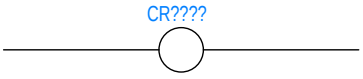


CIRCUIT BREAKER
WITH RATING

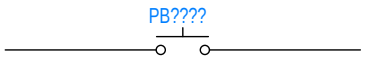
TERMINAL BLOCK
WIRE NUMBER



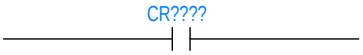
CONTROL
RELAY COIL



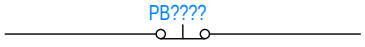
PUSHBUTTON
NORMALLY OPEN



CONTROL RELAY
NORMALLY OPEN
CONTACT

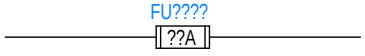


PUSHBUTTON
NORMALLY CLOSED

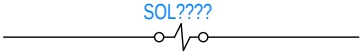


CONTROL RELAY
NORMALLY CLOSED
CONTACT

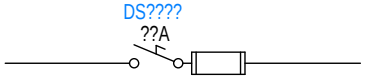
FUSE WITH
RATING



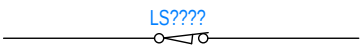
SOLENOID



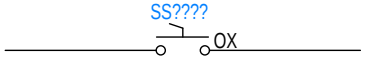
FUSED DISCONNECT
WITH RATING



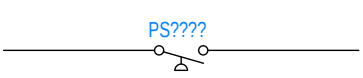
NORMALLY CLOSED
LIMIT SWITCH



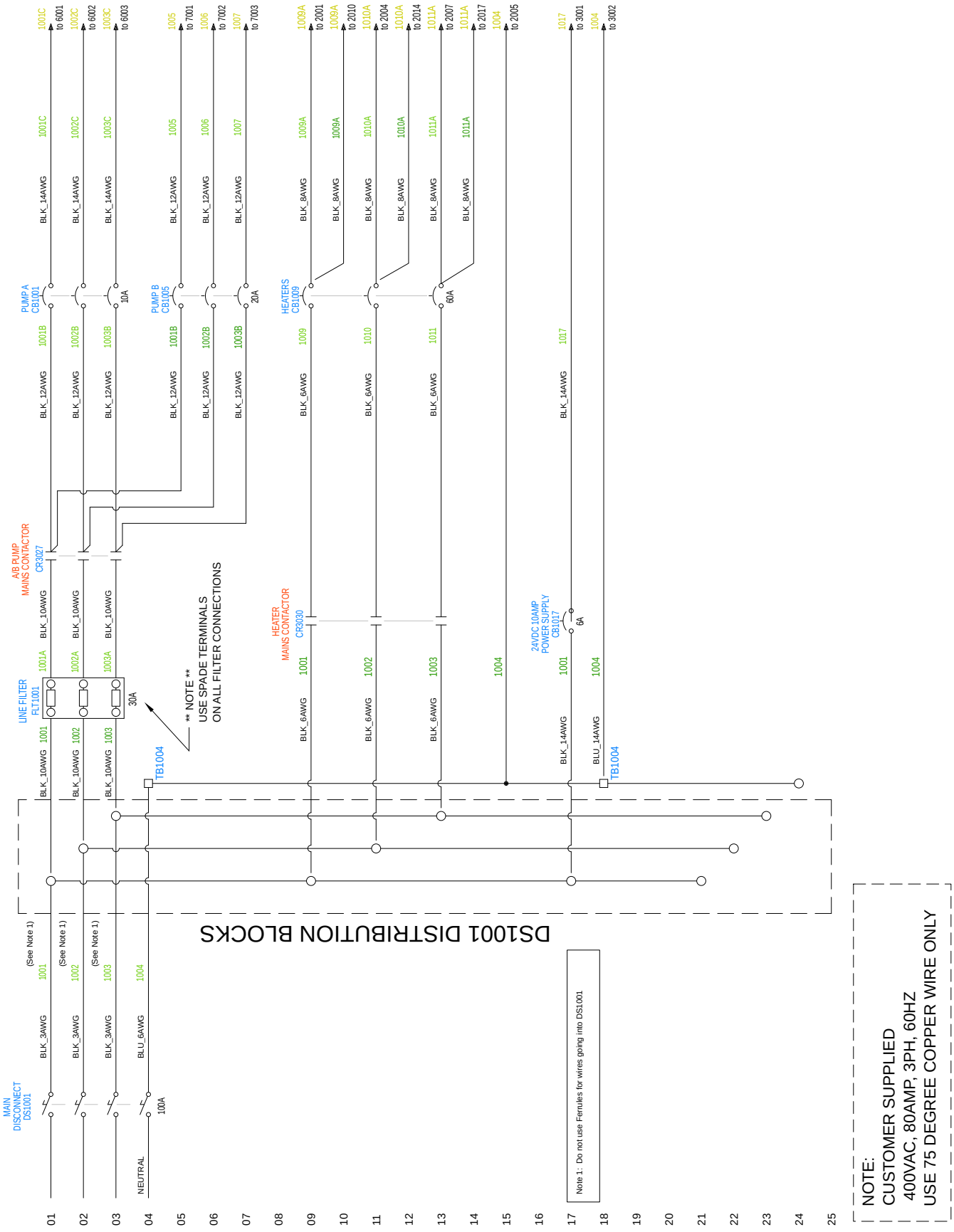
NORMALLY OPEN
SELECTOR SWITCH



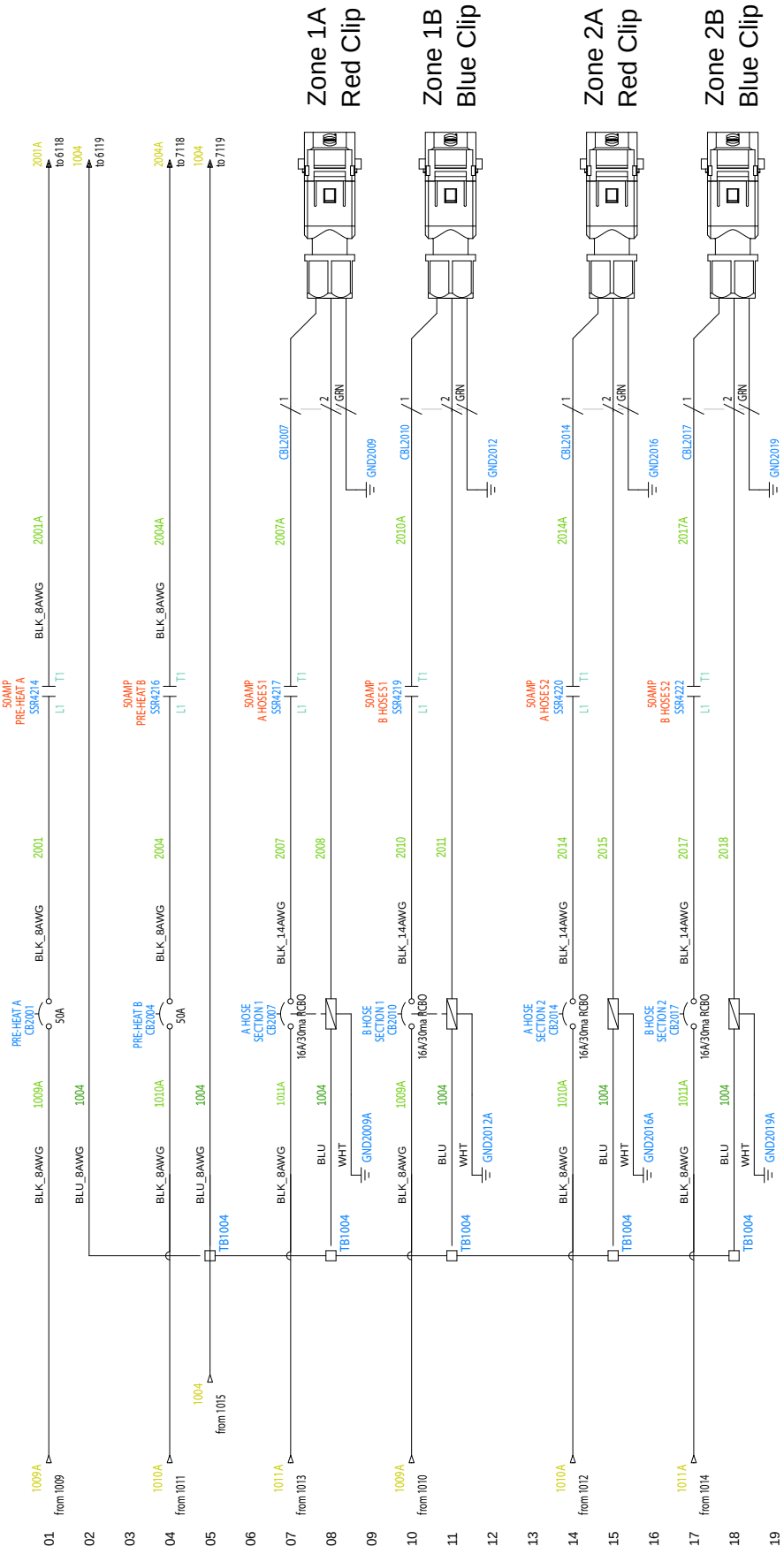
NORMALLY OPEN
PRESSURE SWITCH



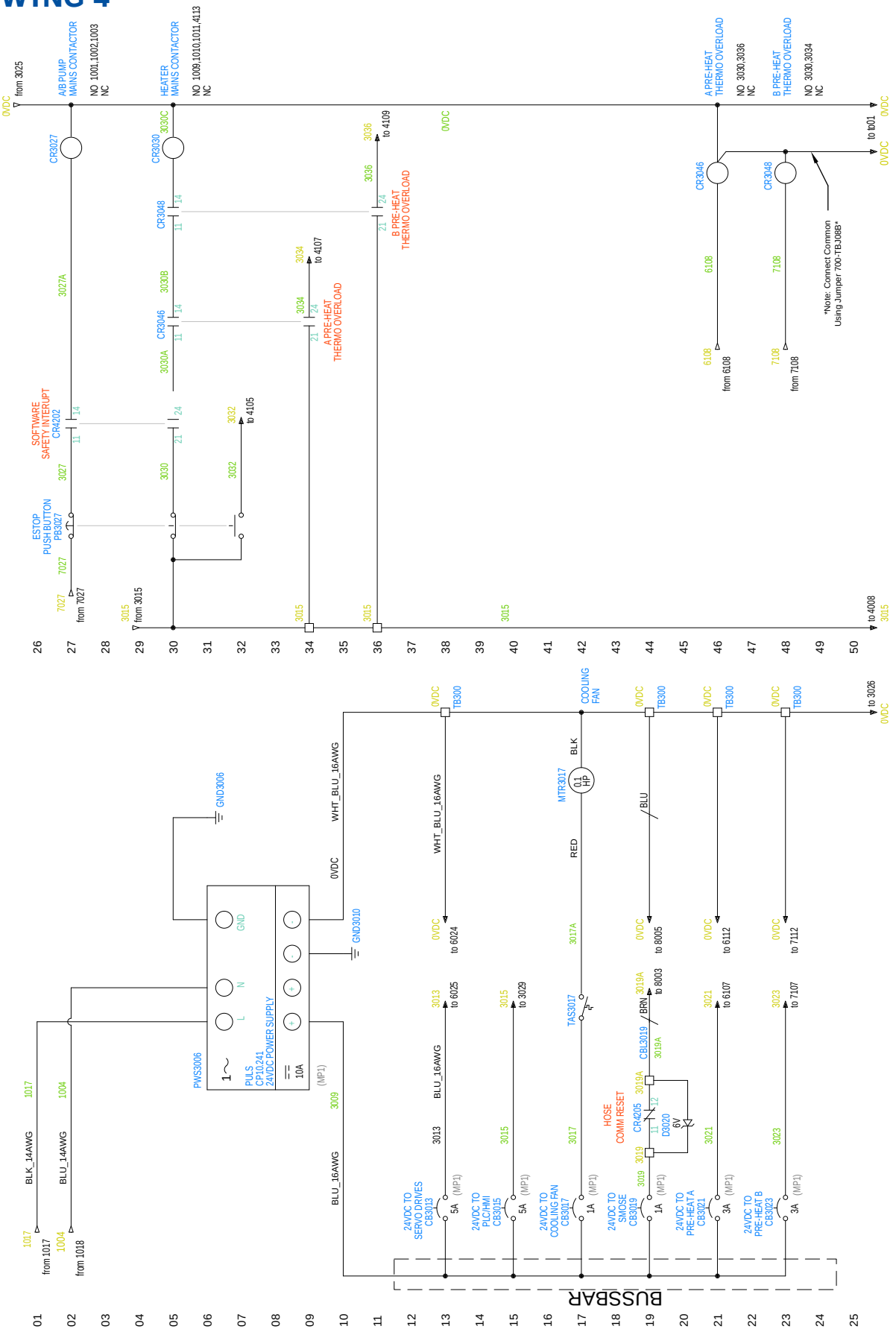
DRAWING 2


MAIN DISCONNECT DS1001
100A
NEUTRAL
BLK_3AWG
BLU_6AWG
(See Note 1)
1001
1002
1003
1004
LINE FILTER FLT1001
30A
BLK_10AWG
1001A
1002A
1003A
A/B PUMP MAINS CONTACTOR CR3027
PUMP A CB1001
10A
PUMP B CB1005
20A
BLK_12AWG
1001B
1002B
1003B
1001C
1002C
1003C
BLK_14AWG
to 6001
to 6002
to 6003
1005
1006
1007
to 7001
to 7002
to 7003
HEATER MAINS CONTACTOR CR3030
HEATERS CB1009
60A
BLK_6AWG
1009
1010
1011
BLK_8AWG
1009A
1010A
1011A
to 2001
to 2010
to 2004
to 2014
to 2007
to 2017
to 2005
24VDC 10AMP POWER SUPPLY CB1017
6A
1017
to 3001
to 3002
TB1004
** NOTE **
USE SPADE TERMINALS
ON ALL FILTER CONNECTIONS
DS1001 DISTRIBUTION BLOCKS
Note 1: Do not use Ferrules for wires going into DS1001
NOTE:
CUSTOMER SUPPLIED
400VAC, 80AMP, 3PH, 60HZ
USE 75 DEGREE COPPER WIRE ONLY

DRAWING 3

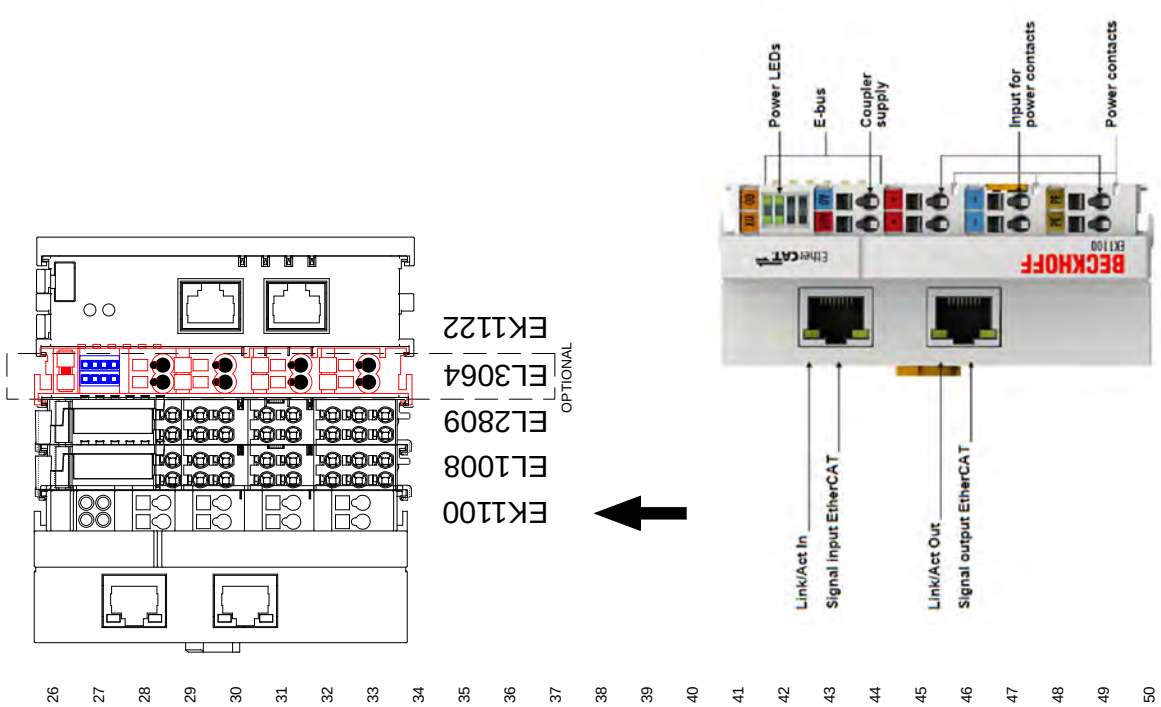

Zone 1A
Red Clip
Zone 1B
Blue Clip
Zone 2A
Red Clip
Zone 2B
Blue Clip
50AMP
PRE-HEAT A
SSR4214
50AMP
PRE-HEAT B
SSR4216
50AMP
A HOSE S1
SSR4217
50AMP
B HOSE S1
SSR4219
50AMP
A HOSE S2
SSR4220
50AMP
B HOSE S2
SSR4222
PRE-HEAT A
CB2001
PRE-HEAT B
CB2004
A HOSE
SECTION 1
CB2007
B HOSE
SECTION 1
CB2010
A HOSE
SECTION 2
CB2014
B HOSE
SECTION 2
CB2017
16A/30ma RCBO
50A
BLK_8AWG
BLU_8AWG
BLK_14AWG
BLU
WHT
GRN
TB1004
GND2009A
GND2012A
GND2016A
GND2019A
GND2009
GND2012
GND2016
GND2019
CBL2007
CBL2010
CBL2014
CBL2017
2001A
2004A
2007A
2010A
2014A
2017A
1009A
1010A
1011A
1004
from 1009
from 1011
from 1013
from 1010
from 1012
from 1014
from 1015
to 6118
to 6119
to 7118
to 7119

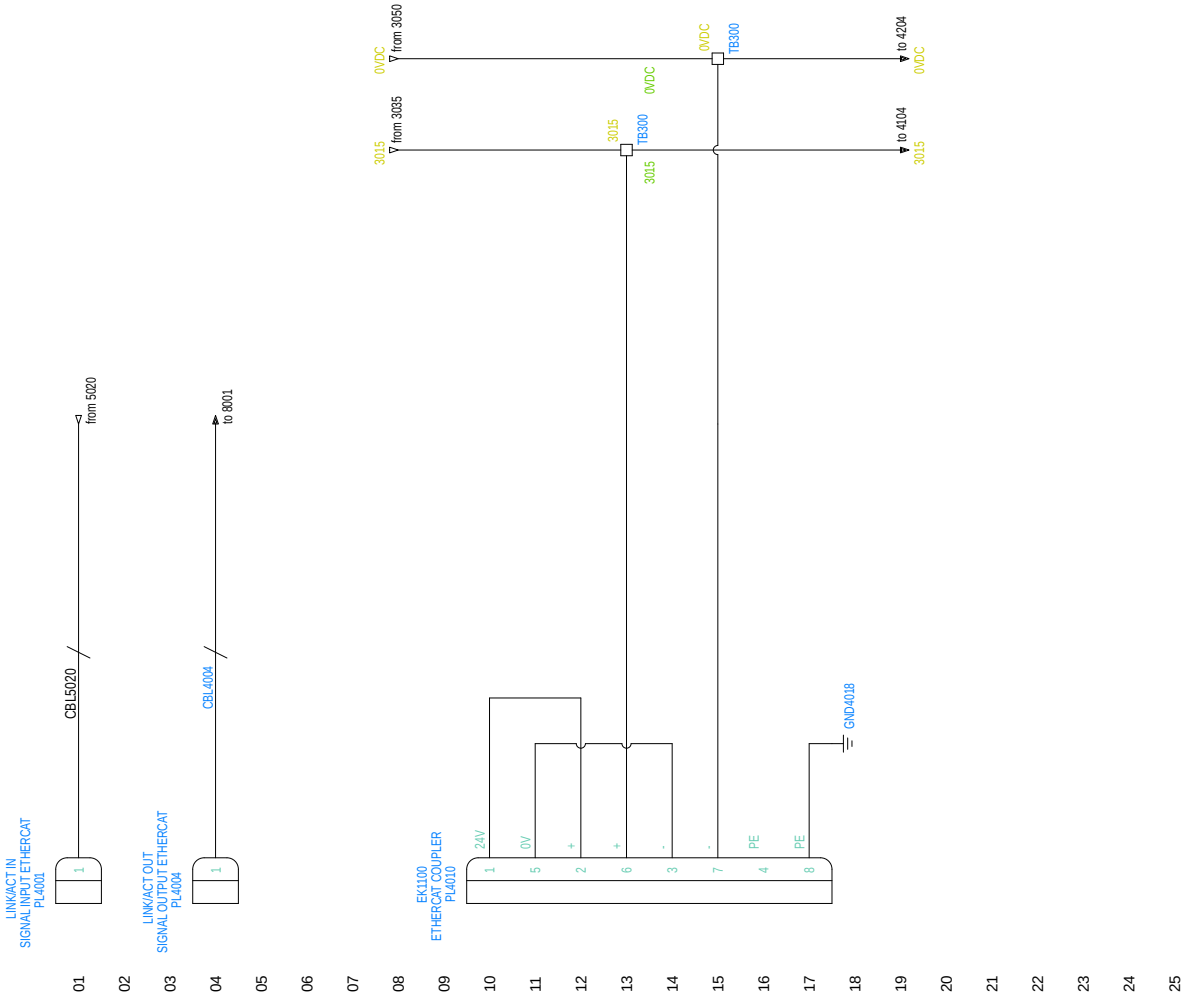
DRAWING 4



Note: All unmarked DC wires to be 18AWG

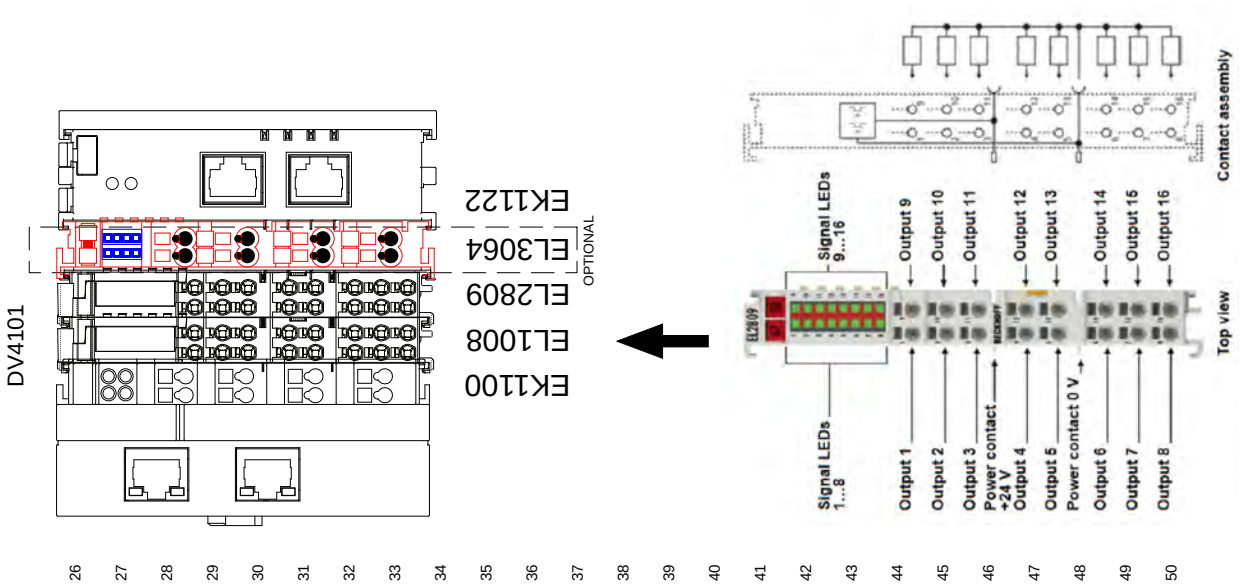
DRAWING 5

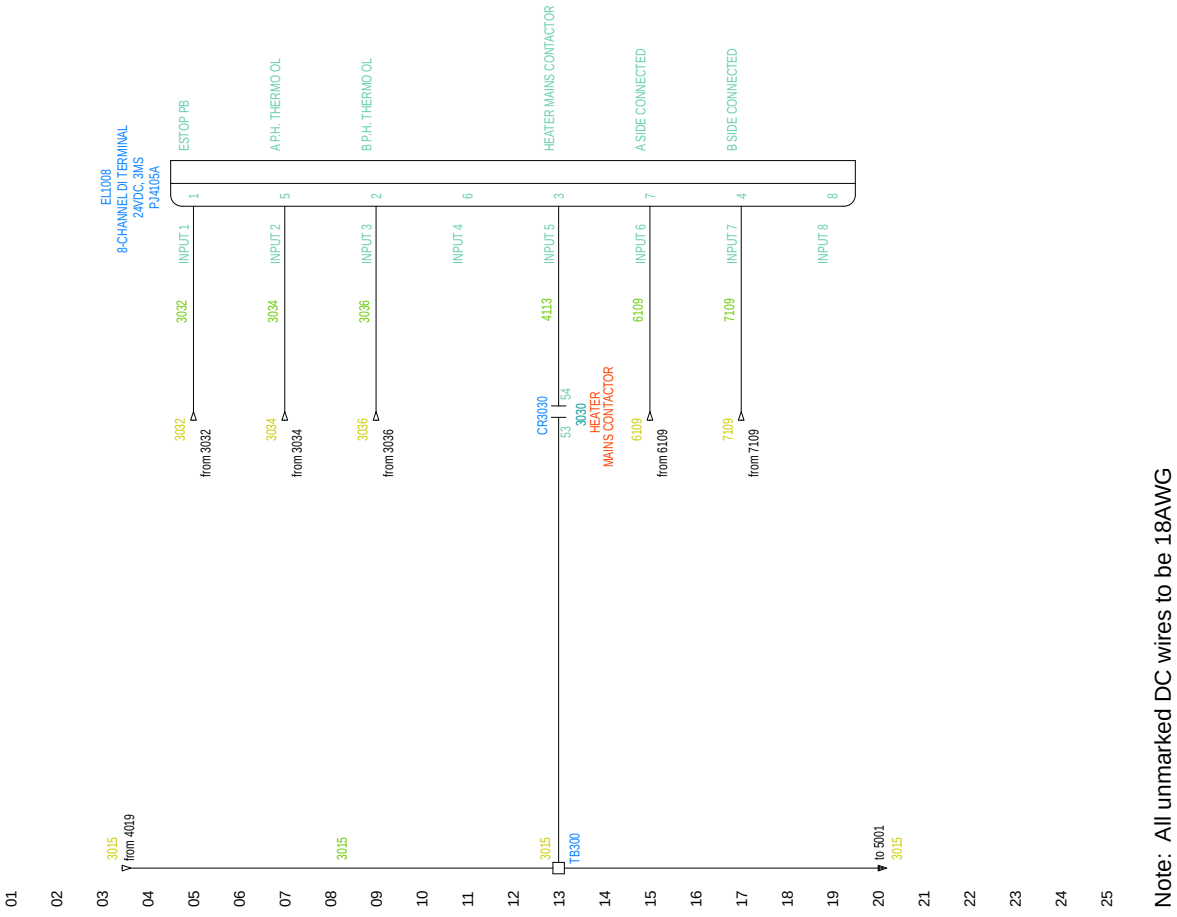




Note: All unmarked DC wires to be 18AWG

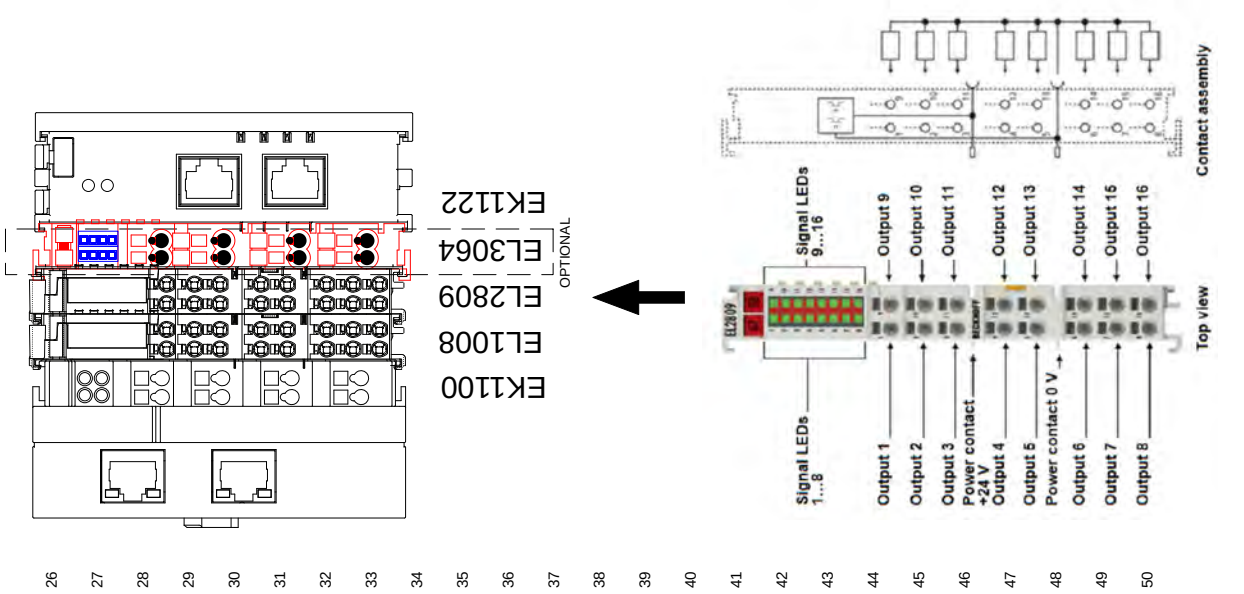
DRAWING 6

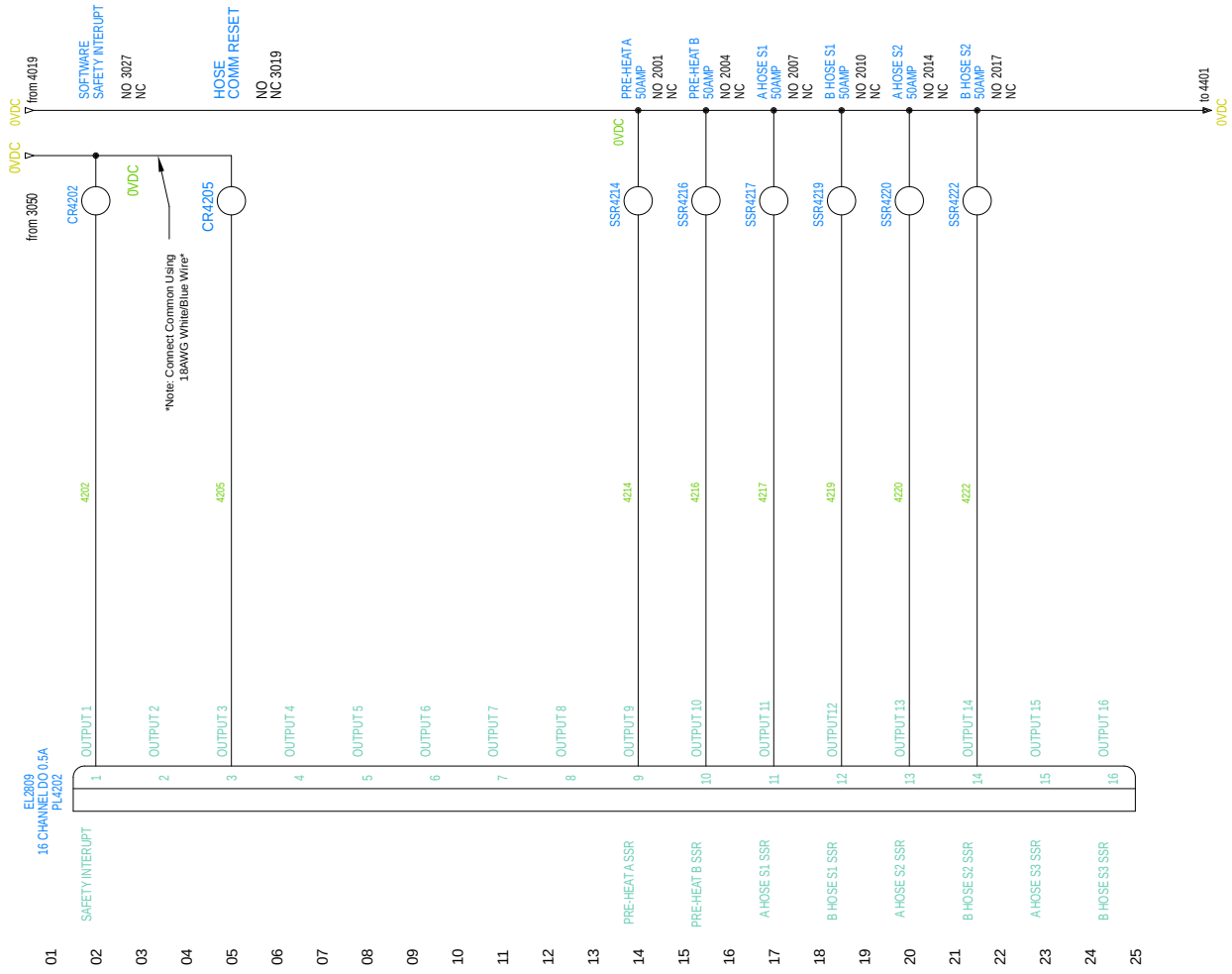




Note: All unmarked DC wires to be 18AWG

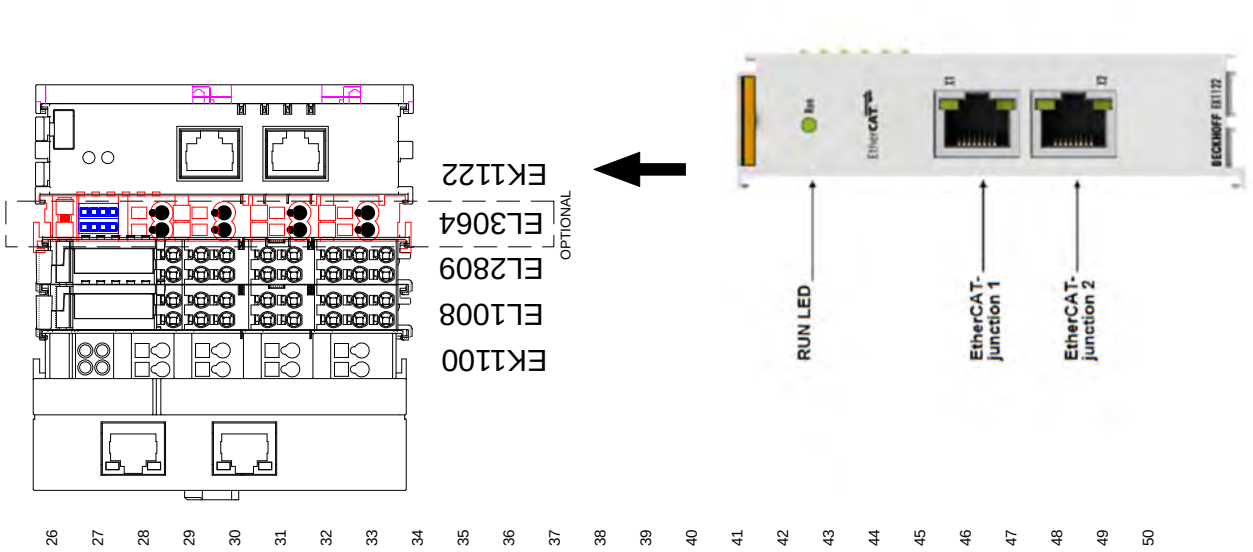
DRAWING 7





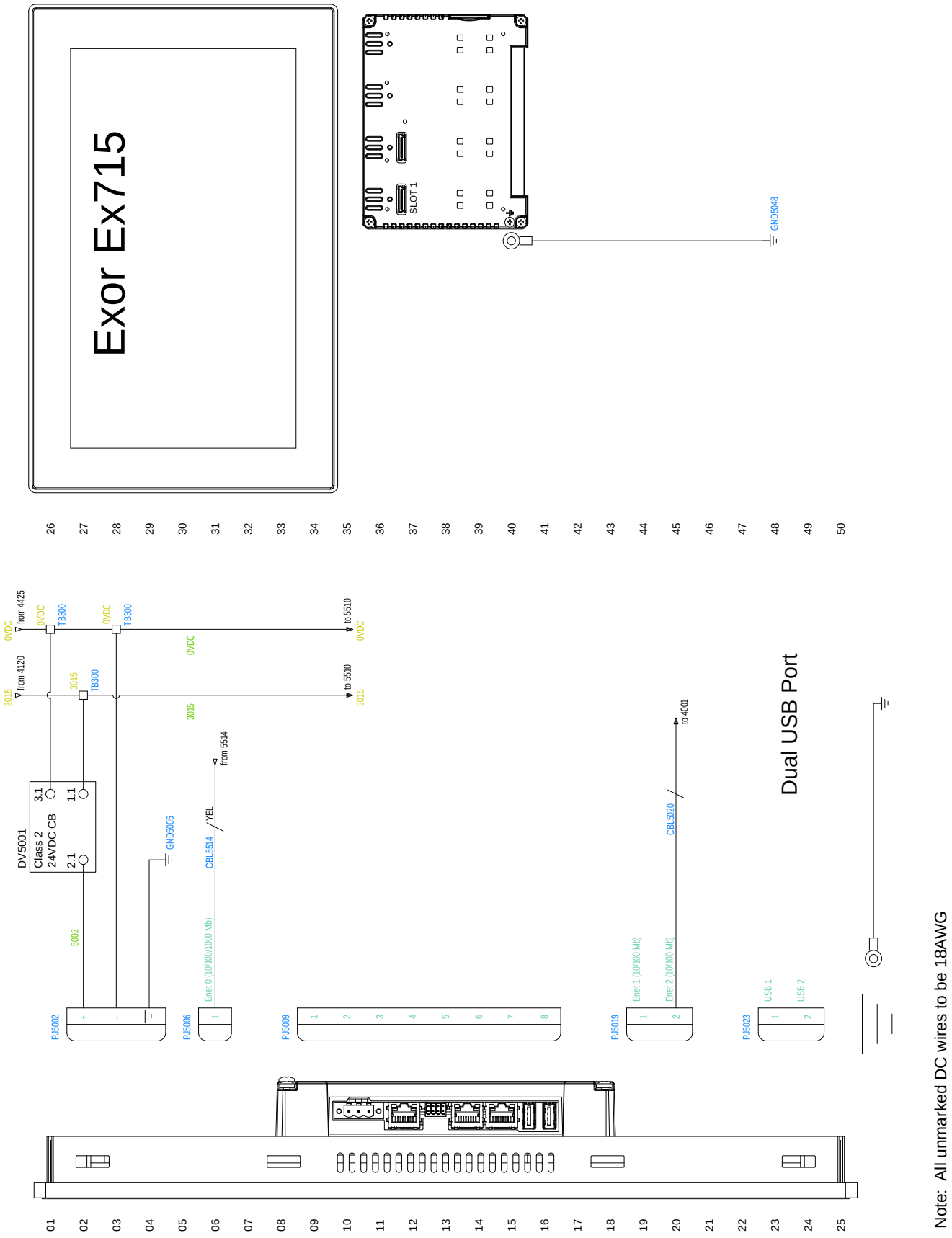
Note: All unmarked DC wires to be 18AWG

DRAWING 8

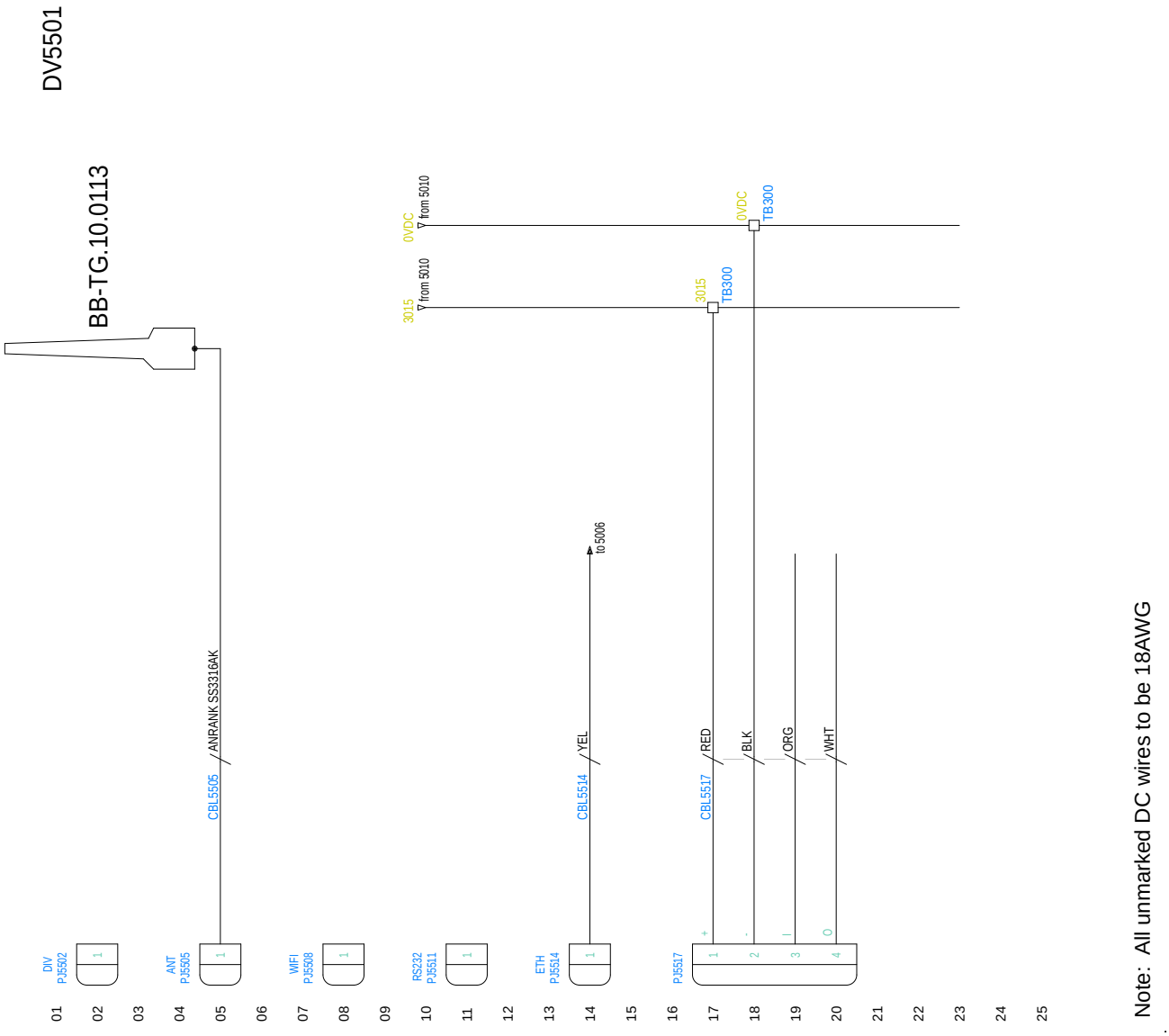


Note: All unmarked DC wires to be 18AWG

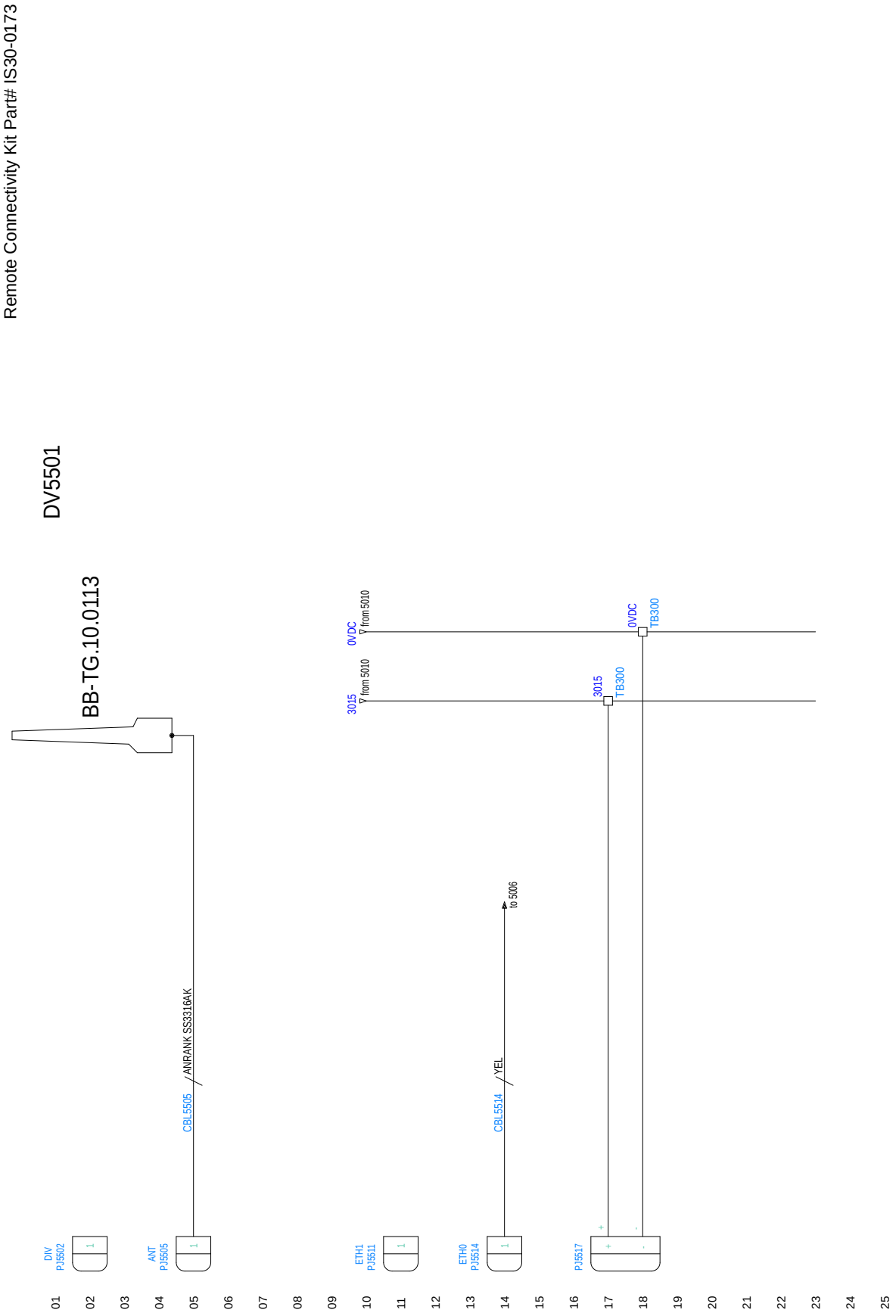
DRAWING 9


Exor Ex715
SLOT 1
GND5048
0VDC
from 4425
TB300
to 5510
from 4120
3015
DV5001
Class 2
24VDC CB
3.1
1.1
2.1
5002
GND5005
CBL5514
YEL
from 5514
P.J5002
P.J5006
P.J5009
Enet 0 (10/100/1000 Mb)
CBL5020
to 4001
P.J5019
Enet 1 (10/100 Mb)
Enet 2 (10/100 Mb)
Dual USB Port
P.J5023
USB 1
USB 2
Note: All unmarked DC wires to be 18AWG

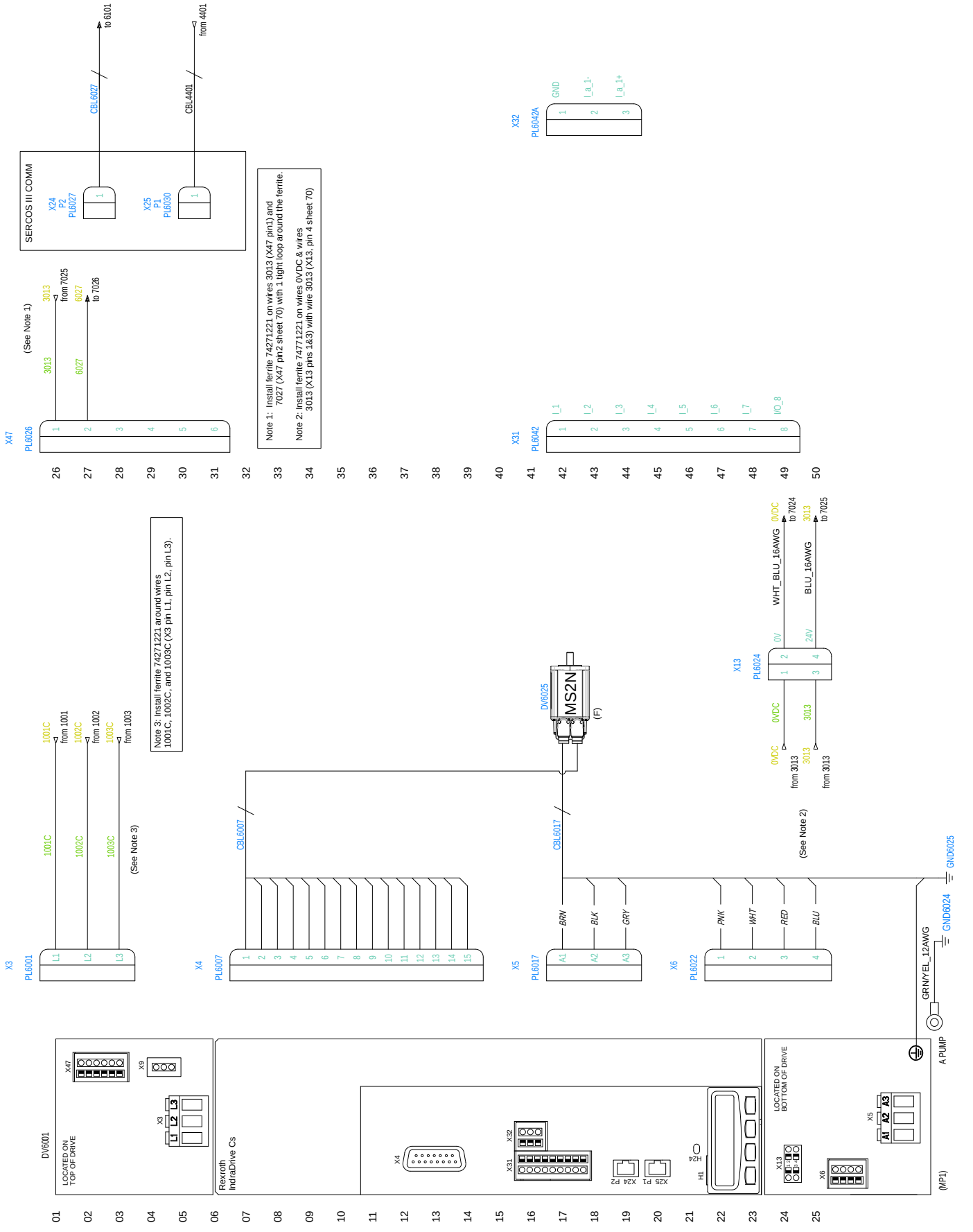
DRAWING 10


DV5501
BB-TG.10.0113
0VDC
from 5010
3015
from 5010
0VDC
TB300
3015
TB300
to 5006
CBL5505
ANRANK SS3316AK
CBL5514
YEL
CBL5517
RED
BLK
ORG
WHT
DIV P.35502
ANT P.35505
WIFI P.35508
RS232 P.35511
ETH P.35514
P.35517
Note: All unmarked DC wires to be 18AWG

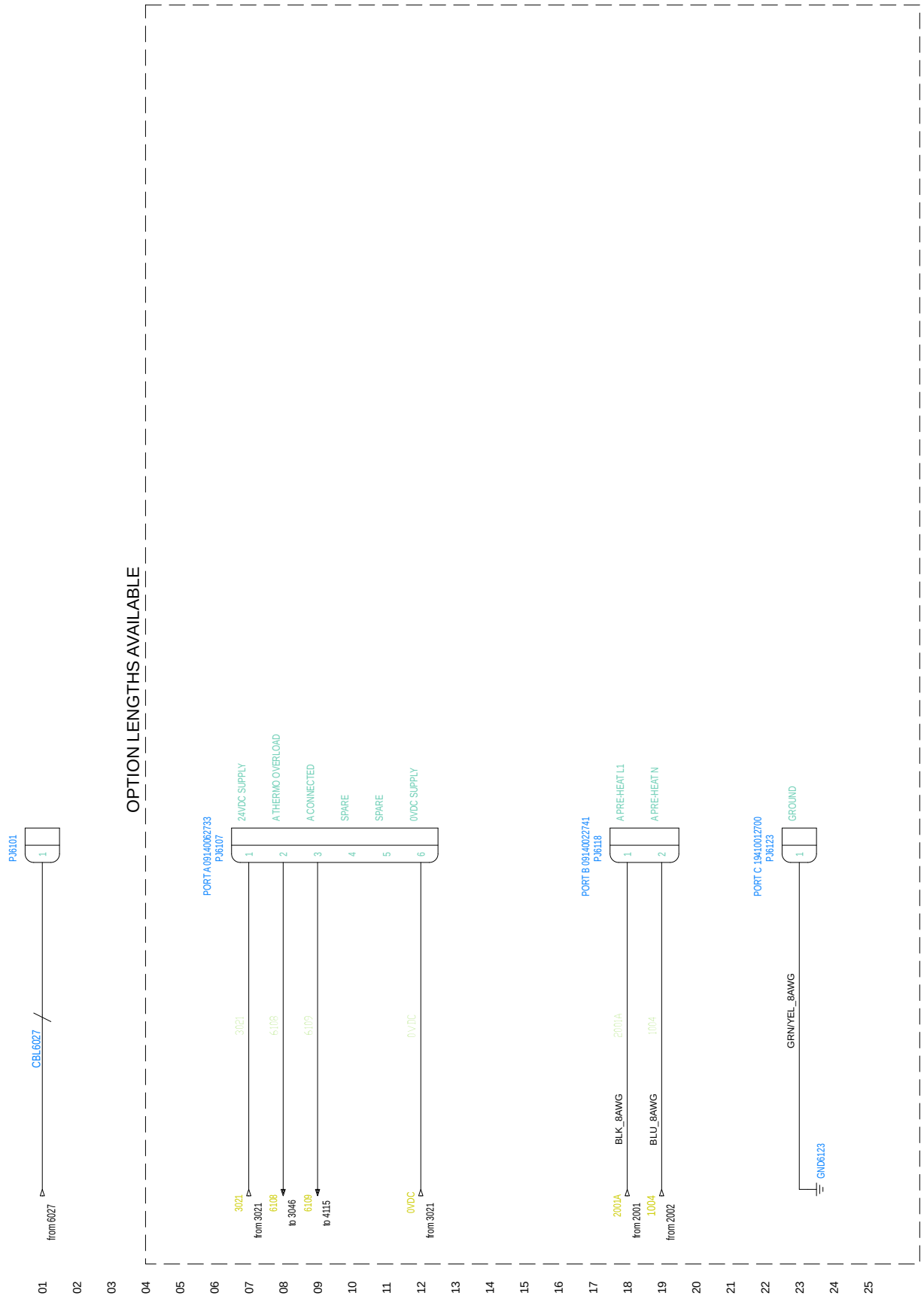
DRAWING 11


Remote Connectivity Kit Part# IS30-0173
DV5501
BB-TG.10.0113
0VDC
from 5010
3015
from 5010
0VDC
TB300
3015
TB300
CBL5505
ANRANK SS3316AK
CBL5514
YEL
to 5006
DIV
PJ5502
ANT
PJ5505
ETH1
PJ5511
ETH0
PJ5514
PJ5517
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

DRAWING 12

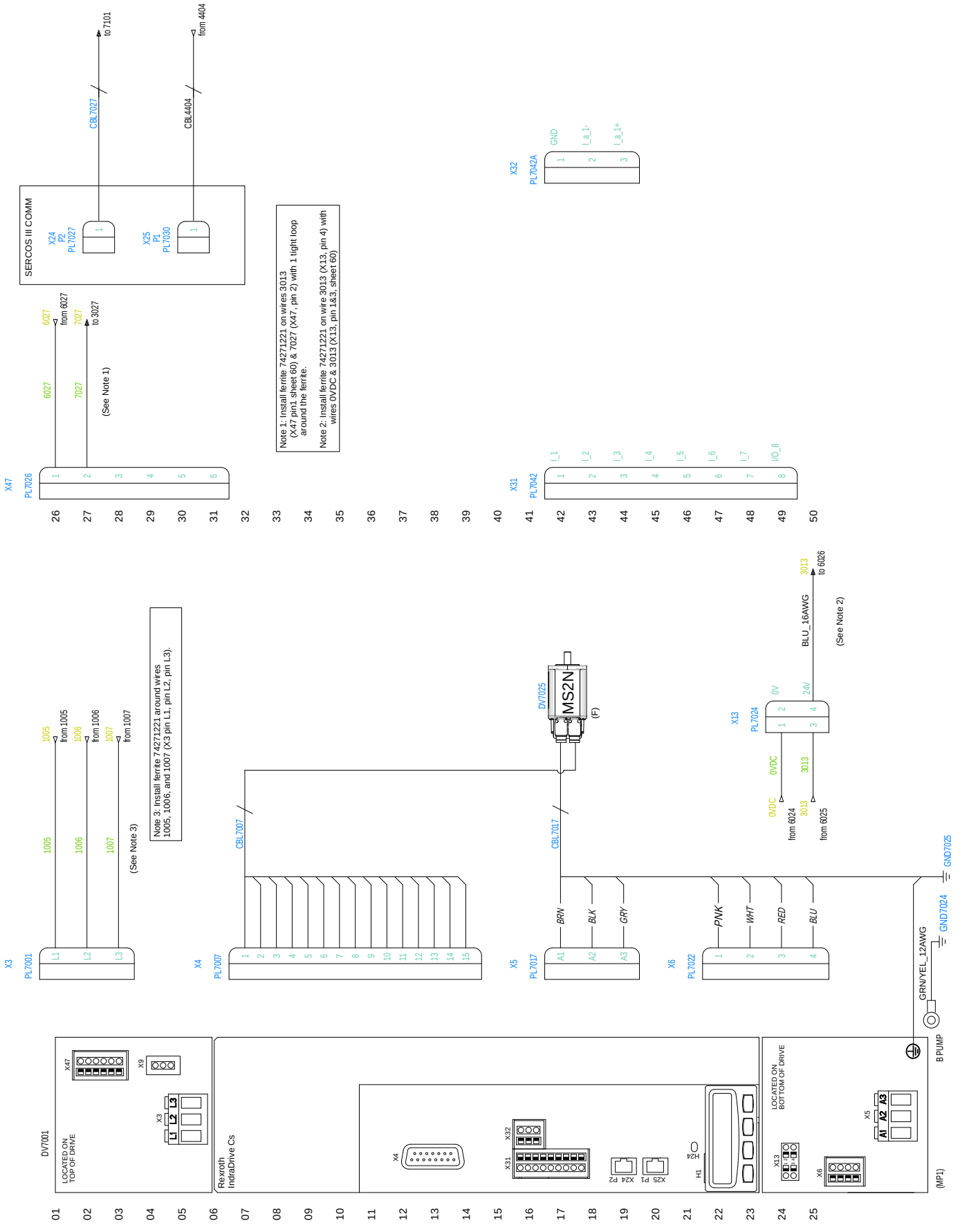

SERCOS III COMM
X24 P2 PL6027
X25 P1 PL6030
CBL6027
CBL4401
to 6101
from 4401
(See Note 1)
from 7025
to 7026
Note 1: Install ferrite 74271221 on wires 3013 (X47 pin1) and 7027 (X47 pin2 sheet 70) with 1 tight loop around the ferrite.
Note 2: Install ferrite 74771221 on wires 0VDC & wires 3013 (X13 pins 1&3) with wire 3013 (X13, pin 4 sheet 70)
Note 3: Install ferrite 74271221 around wires 1001C, 1002C, and 1003C (X3 pin L1, pin L2, pin L3).
X47 PL6026
X31 PL6042
X32 PL6042A
X3 PL6001
X4 PL6007
X5 PL6017
X6 PL6022
X13 PL6024
DV6025
MS2N
(F)
CBL6007
CBL6017
BRN
BLK
GRY
PNK
WHT
RED
BLU
WHT_BLU_16AWG
BLU_16AWG
0VDC
24V
from 3013
(See Note 2)
(See Note 3)
GND6025
GND6024
GRN/YEL_12AWG
A PUMP
(MP1)
DV6001
LOCATED ON TOP OF DRIVE
Rexroth IndraDrive Cs
LOCATED ON BOTTOM OF DRIVE

DRAWING 13

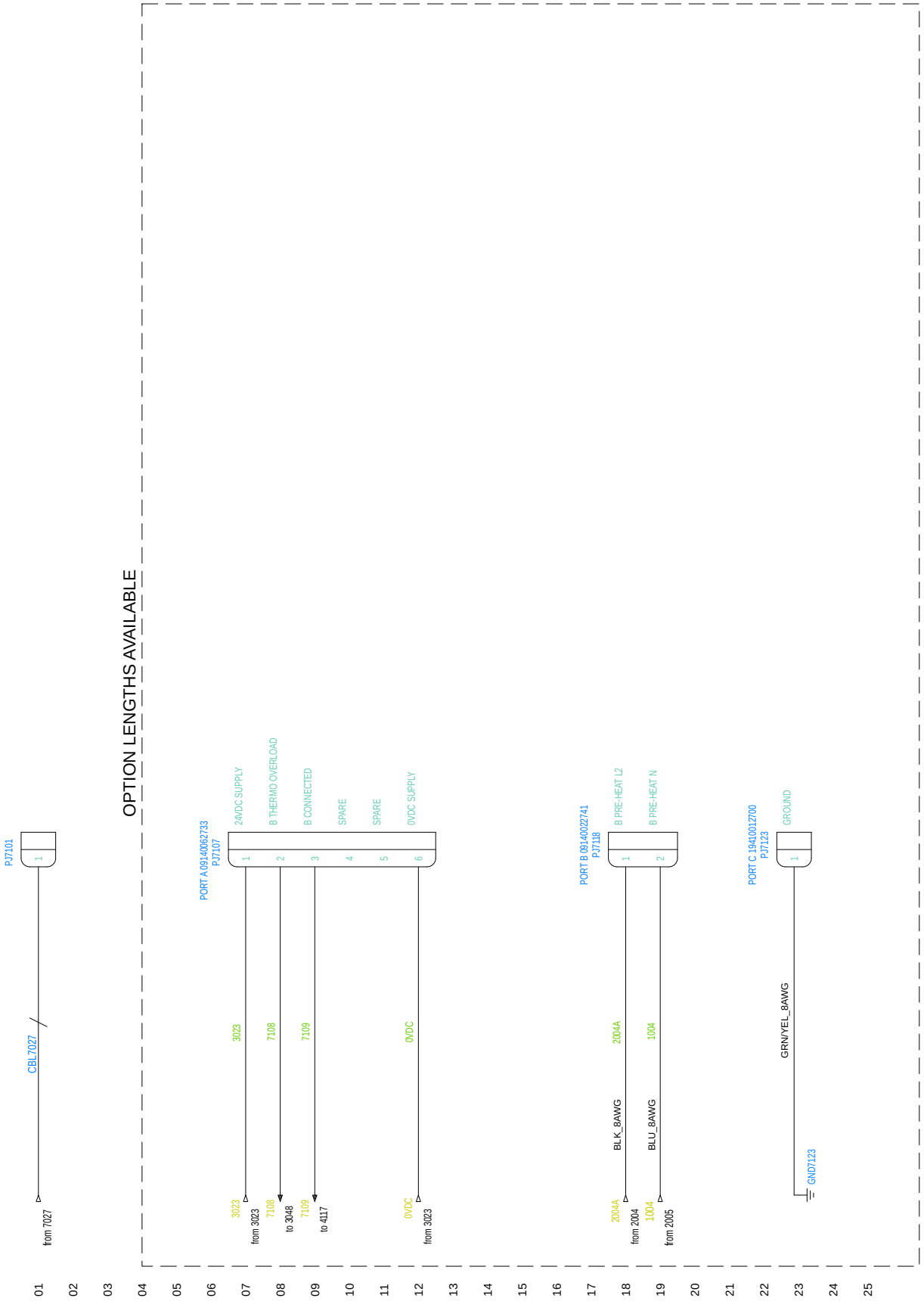


Note: All unmarked DC wires to be 18AWG

DRAWING 14

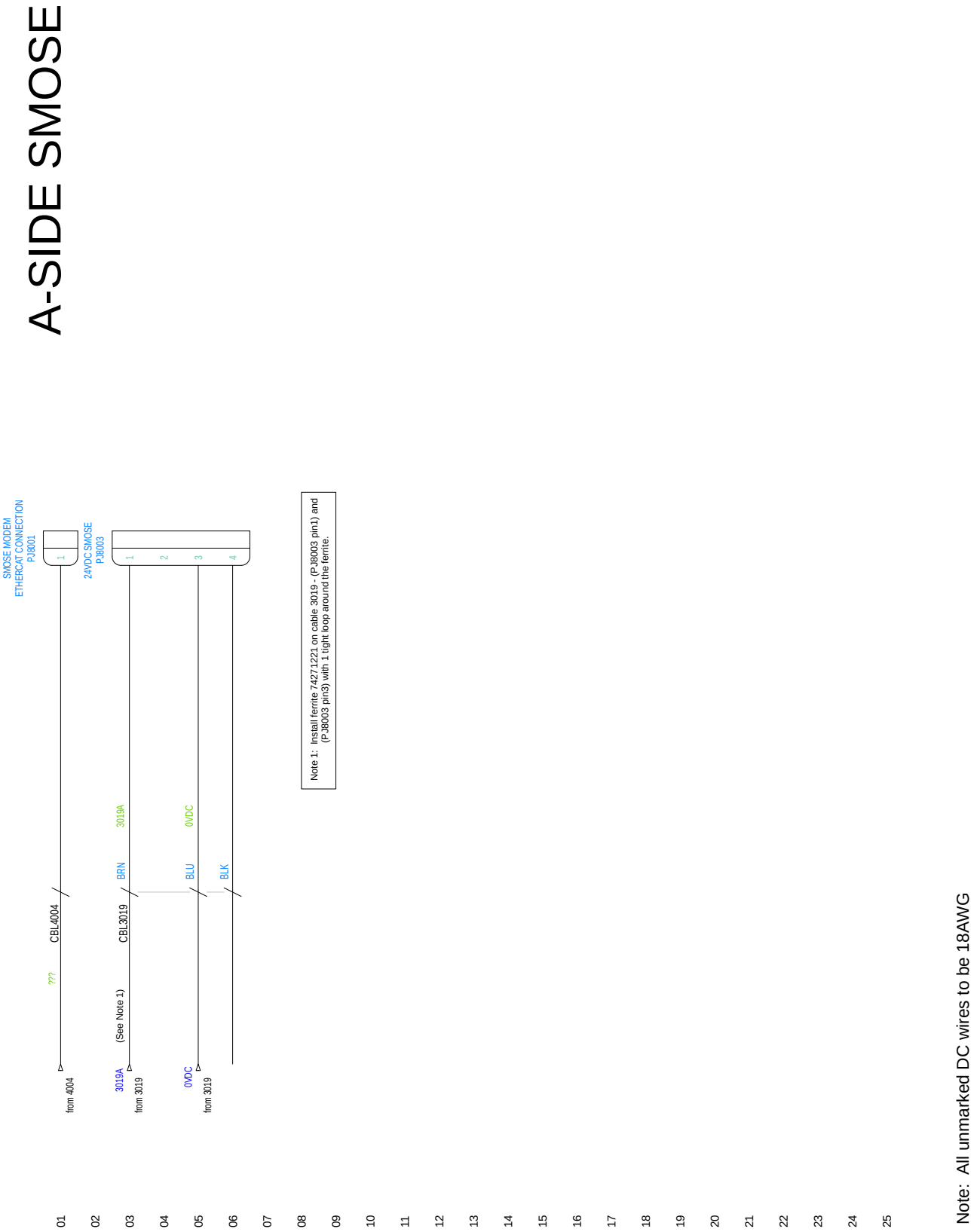

SERCOS III COMM
X24
P2
PL7027
X25
P1
PL7030
CBL7027
CBL4404
to 7101
from 4404
X47
PL7026
X31
PL7042
X32
PL7042A
GND
I_a_1-
I_a_1+
I_1
I_2
I_3
I_4
I_5
I_6
I_7
I/O_8
6027
7027
from 8027
to 3027
(See Note 1)
Note 1: Install ferrite 74271221 on wires 3013 (X47 pin1 sheet 60) & 7027 (X47, pin 2) with 1 tight loop around the ferrite.
Note 2: Install ferrite 74271221 on wire 3013 (X13, pin 4) with wires 0VDC & 3013 (X13, pin 1&3, sheet 60)
X3
PL7001
L1
L2
L3
1005
1006
1007
from 1005
from 1006
from 1007
(See Note 3)
Note 3: Install ferrite 74271221 around wires 1005, 1006, and 1007 (X3 pin L1, pin L2, pin L3).
X4
PL7007
CBL7007
DV7025
MS2N
(F)
CBL7017
X5
PL7017
A1
A2
A3
BRN
BLK
GRY
X6
PL7022
PNK
WHT
RED
BLU
X13
PL7024
0V
24V
0VDC
3013
BLU_16AWG
to 6026
(See Note 2)
from 6024
from 6025
GND7025
GND7024
GRN/YEL_12AWG
B PUMP
(MP1)
DV7001
LOCATED ON TOP OF DRIVE
X47
X9
X3
L1
L2
L3
Rexroth
IndraDrive Cs
X4
X31
X32
X25 P1
X24 P2
H1
H2A
LOCATED ON BOTTOM OF DRIVE
X13
X6
X5
A1
A2
A3

DRAWING 15

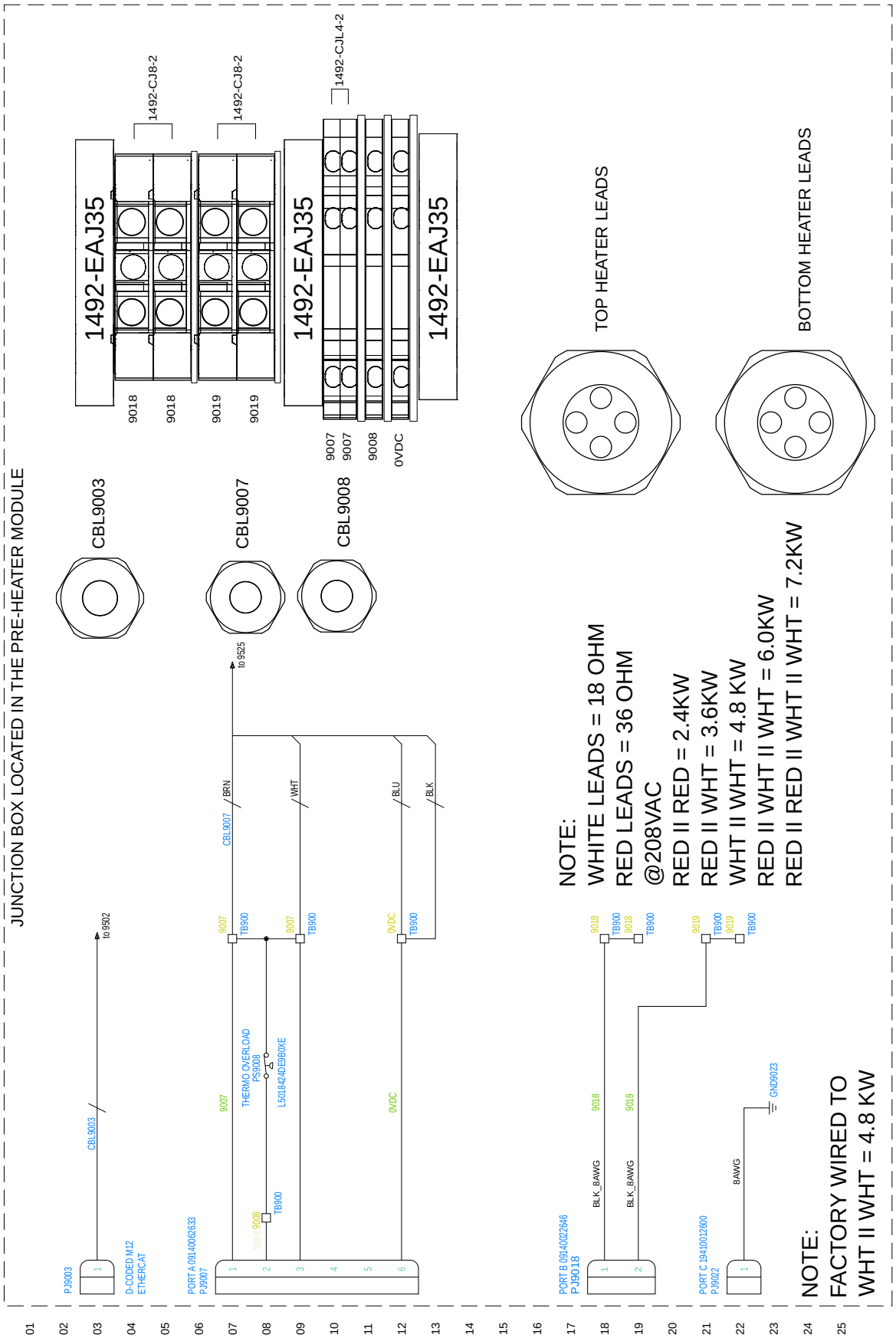


Note: All unmarked DC wires to be 18AWG

DRAWING 16

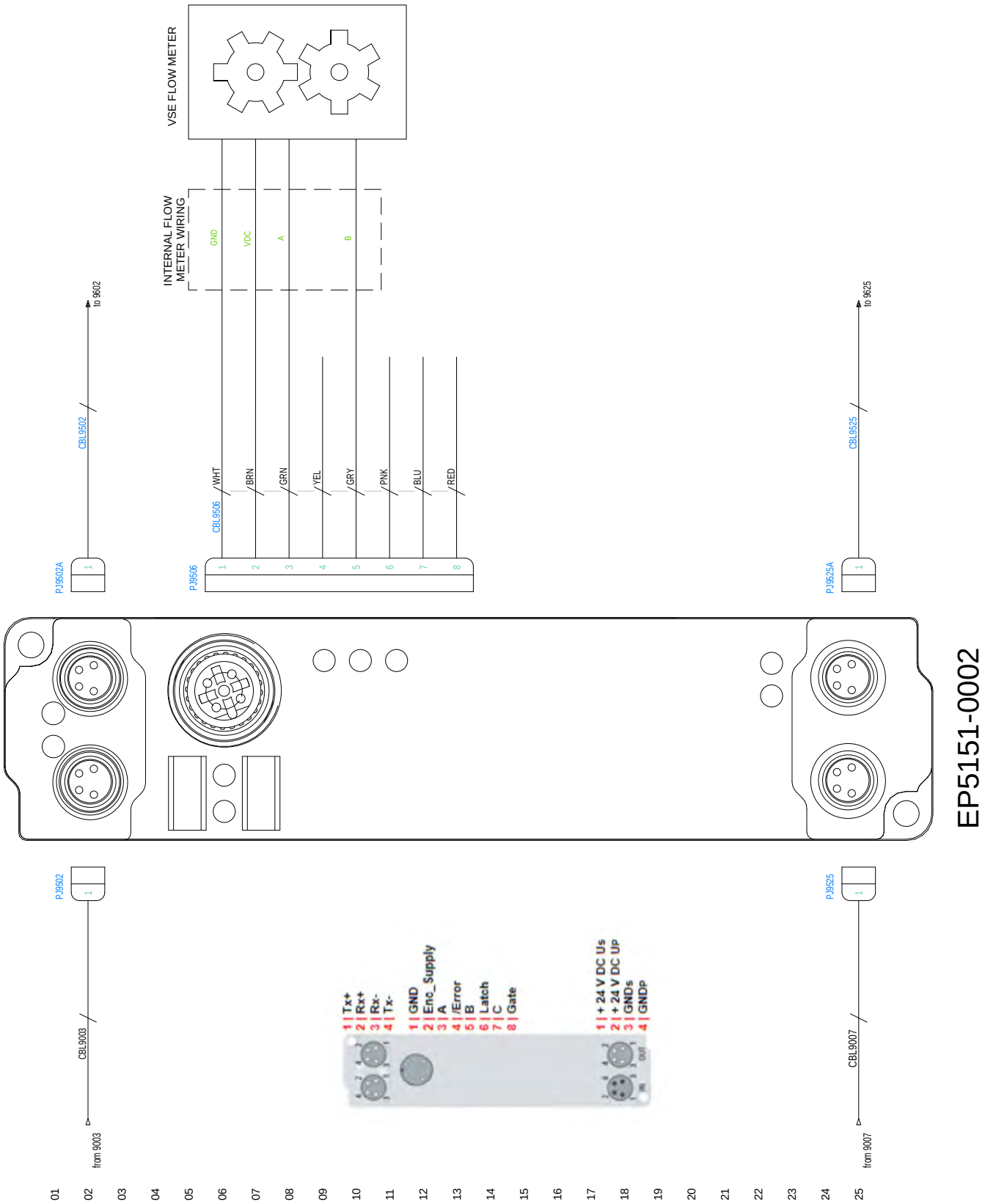

A-SIDE SMOSE
SMOSE MODEM
ETHERCAT CONNECTION
PJ8001
24VDC SMOSE
PJ8003
1
2
3
4
???
CBL4004
(See Note 1)
CBL3019
3019A
BRN
BLU
0VDC
BLK
from 4004
from 3019
from 3019
Note 1: Install ferrite 74271221 on cable 3019 - (PJ8003 pin1) and (PJ8003 pin3) with 1 tight loop around the ferrite.
Note: All unmarked DC wires to be 18AWG

DRAWING 17

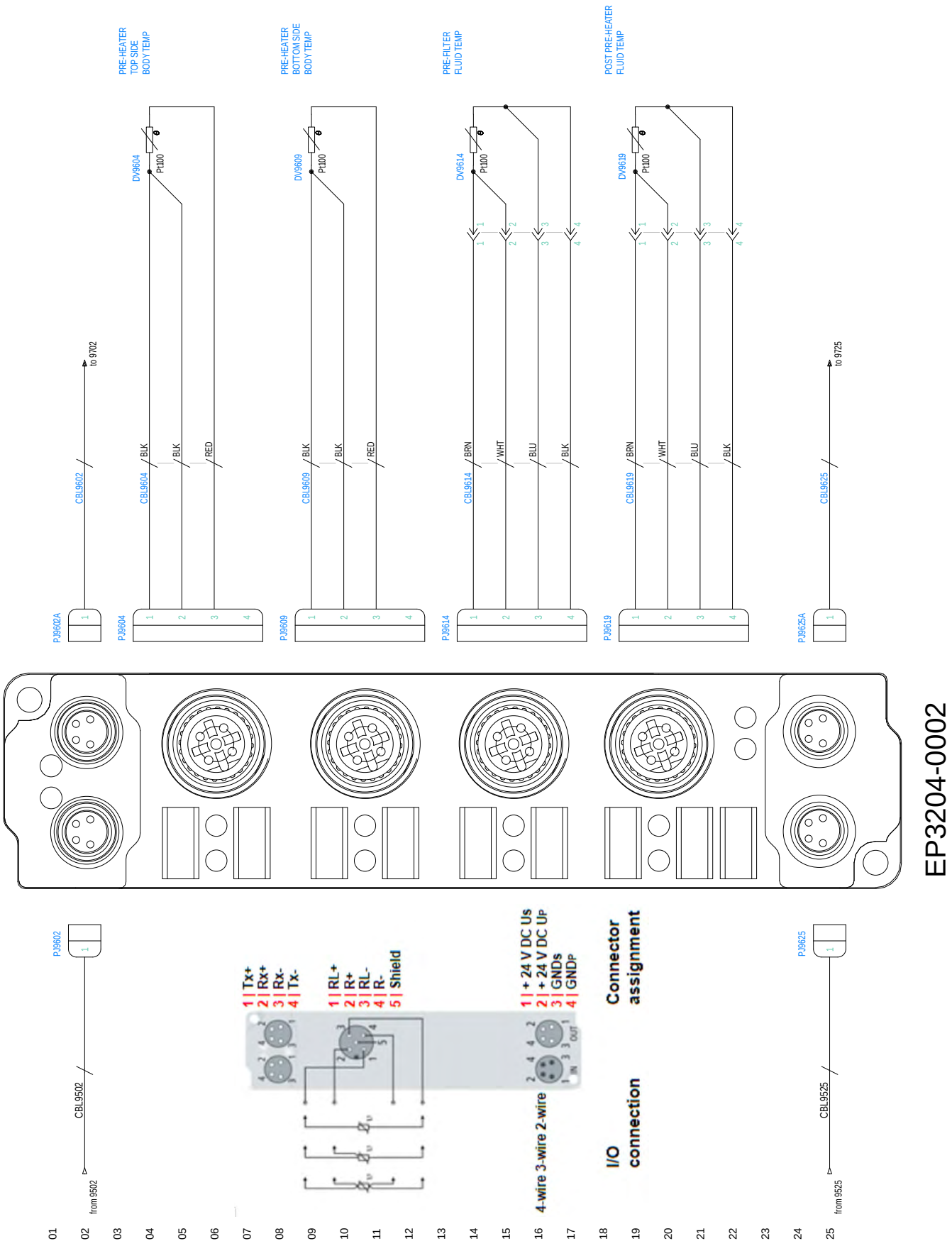


Note: All unmarked DC wires to be 18AWG

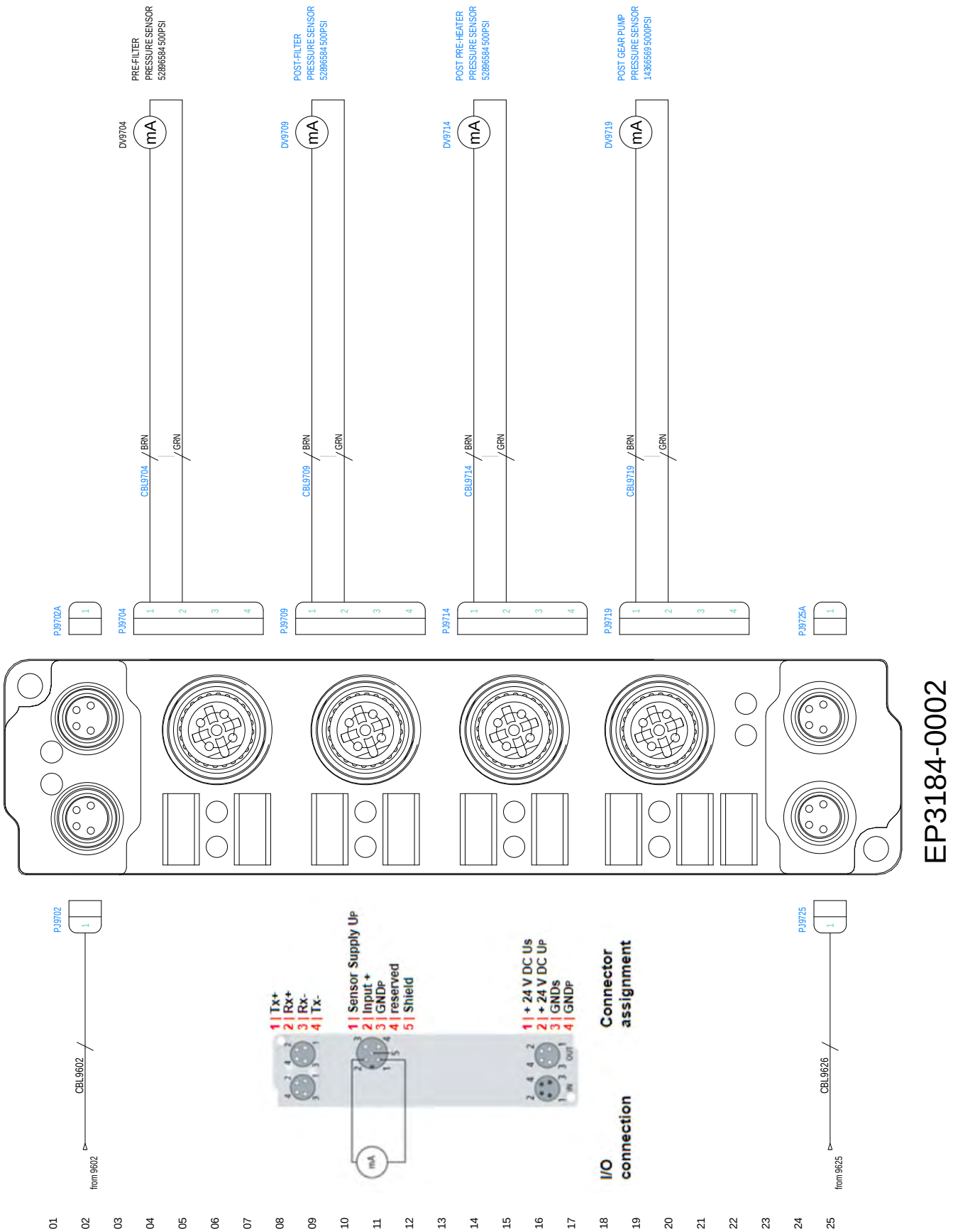
DRAWING 18


VSE FLOW METER
INTERNAL FLOW METER WIRING
GND
VDC
A
B
WHT
BRN
GRN
YEL
GRY
PNK
BLU
RED
CBL9506
PJ9506
PJ9502A
CBL9502
to 9602
PJ9625A
CBL9525
to 9625
EP5151-0002
PJ9502
CBL9003
from 9003
PJ9525
CBL9007
from 9007
1 | Tx+
2 | Rx+
3 | Rx-
4 | Tx-
1 | GND
2 | Enc_Supply
3 | A
4 | /Error
5 | B
6 | Latch
7 | C
8 | Gate
1 | + 24 V DC Us
2 | + 24 V DC UP
3 | GNDs
4 | GNDP
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

DRAWING 19


PRE-HEATER TOP SIDE BODY TEMP
PRE-HEATER BOTTOM SIDE BODY TEMP
PRE-FILTER FLUID TEMP
POST PRE-HEATER FLUID TEMP
DV9604
DV9609
DV9614
DV9619
Pt100
CBL9602
CBL9604
CBL9609
CBL9614
CBL9619
CBL9625
BLK
RED
BRN
WHT
BLU
P.J9602A
P.J9604
P.J9609
P.J9614
P.J9619
P.J9625A
to 9702
to 9725
P.J9602
P.J9625
CBL9502
CBL9525
from 9502
from 9525
1 Tx+
2 Rx+
3 Rx-
4 Tx-
1 RL+
2 R+
3 RL-
4 R-
5 Shield
1 + 24 V DC Us
2 + 24 V DC Up
3 GNDs
4 GNDp
4-wire 3-wire 2-wire
I/O connection
Connector assignment
EP3204-0002

DRAWING 20


PRE-FILTER PRESSURE SENSOR 52896584 5000PSI
POST-FILTER PRESSURE SENSOR 52896584 5000PSI
POST PRE-HEATER PRESSURE SENSOR 52896584 5000PSI
POST GEAR PUMP PRESSURE SENSOR 143665695000PSI
DV9704
DV9709
DV9714
DV9719
mA
CBL9704
CBL9709
CBL9714
CBL9719
BRN
GRN
P.J9702A
P.J9704
P.J9709
P.J9714
P.J9719
P.J9725A
EP3184-0002
P.J9702
CBL9602
from 9602
1 | Tx+
2 | Rx+
3 | Rx-
4 | Tx-
1 | Sensor Supply UP
2 | Input +
3 | GNDP
4 | reserved
5 | Shield
1 | + 24 V DC Us
2 | + 24 V DC UP
3 | GNDs
4 | GNDP
Connector assignment
I/O connection
P.J9725
CBL9626
from 9625
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

ELECTRICAL DIAGRAMS 380V-400V

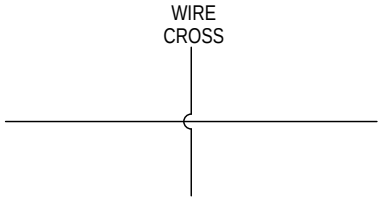
WIRE GAUGE (UNLESS NOTED) USE MIN 75 DEGREE C COPPER WIRE			
American Wire Gauge (AWG)	Diameter (Inches)	Cross Sectional Area (mm^2)	Ampacity (75° C Copper)
3	0.2292	26.65	100
4	0.2043	21.14	85
6	0.162	13.29	65
8	0.1285	8.36	52
10	0.1019	5.26	30
12	0.0808	3.31	20
14	0.0641	2.08	15
16	0.0508	1.31	10
18	0.0403	0.82	7
20	0.0320	0.52	5
22	0.0253	0.33	3

FERRULES TO BE USED ON ALL WIRES (UNLESS NOTED)	
Wire Reference	Description
BLACK	UNGROUNDED LINE VOLTAGE
WHITE	UNGROUNDED DC VOLTAGE
WHITE/BLUE	GROUNDED DC COMMON
GREEN/YELLOW	GROUND

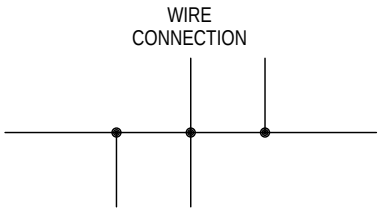
WIRE REFERENCE	COLOR
BLK	Black
WHT	White
BLU	Blue
RED	Red
GRN	Green
ORG	Orange
BRN	Brown
YLW	Yellow

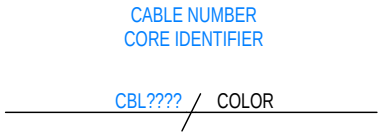
WIRE REFERENCE	COLOR
RED_GRY	RED w/GREY STRIPE
GRY_RED	GREY w/WHITE STRIPE
WHT_BRN	WHITE w/BROWN STRIPE
BRN_WHT	BROWN w/WHITE STRIPE
WHT_GRY	WHITE w/GREY STRIPE
GRY_WHT	GREY w/WHITE STRIPE
RED_BLU	RED w/BLUE STRIPE
BLU/RED	BLUE w/RED STRIPE
RED/ORG	RED w/ORANGE STRIPE
ORG/RED	ORANGE w/RED STRIPE
RED/GRN	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

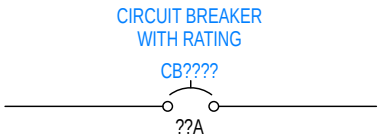
DRAWING 1

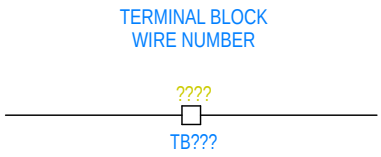


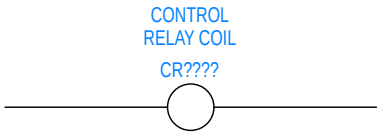
LEGEND DESCRIPTIONS
NUMBERING CODE
XX???? = COMPONENT TYPE
??XX?? = SHEET
????XX = COLUMN

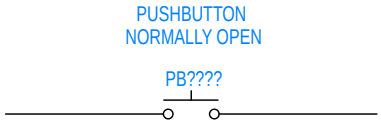


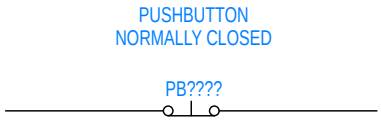


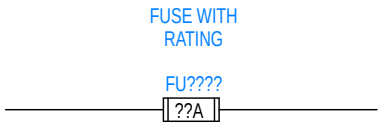


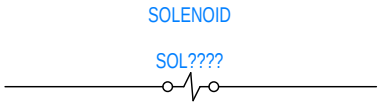


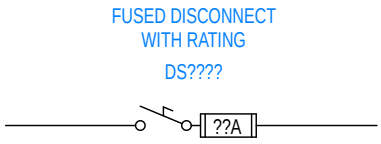


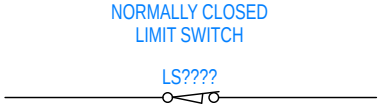


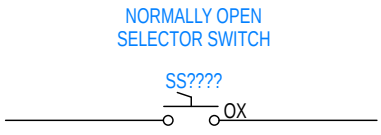


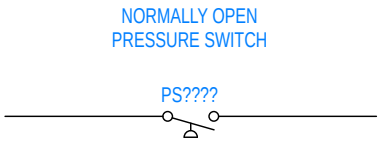




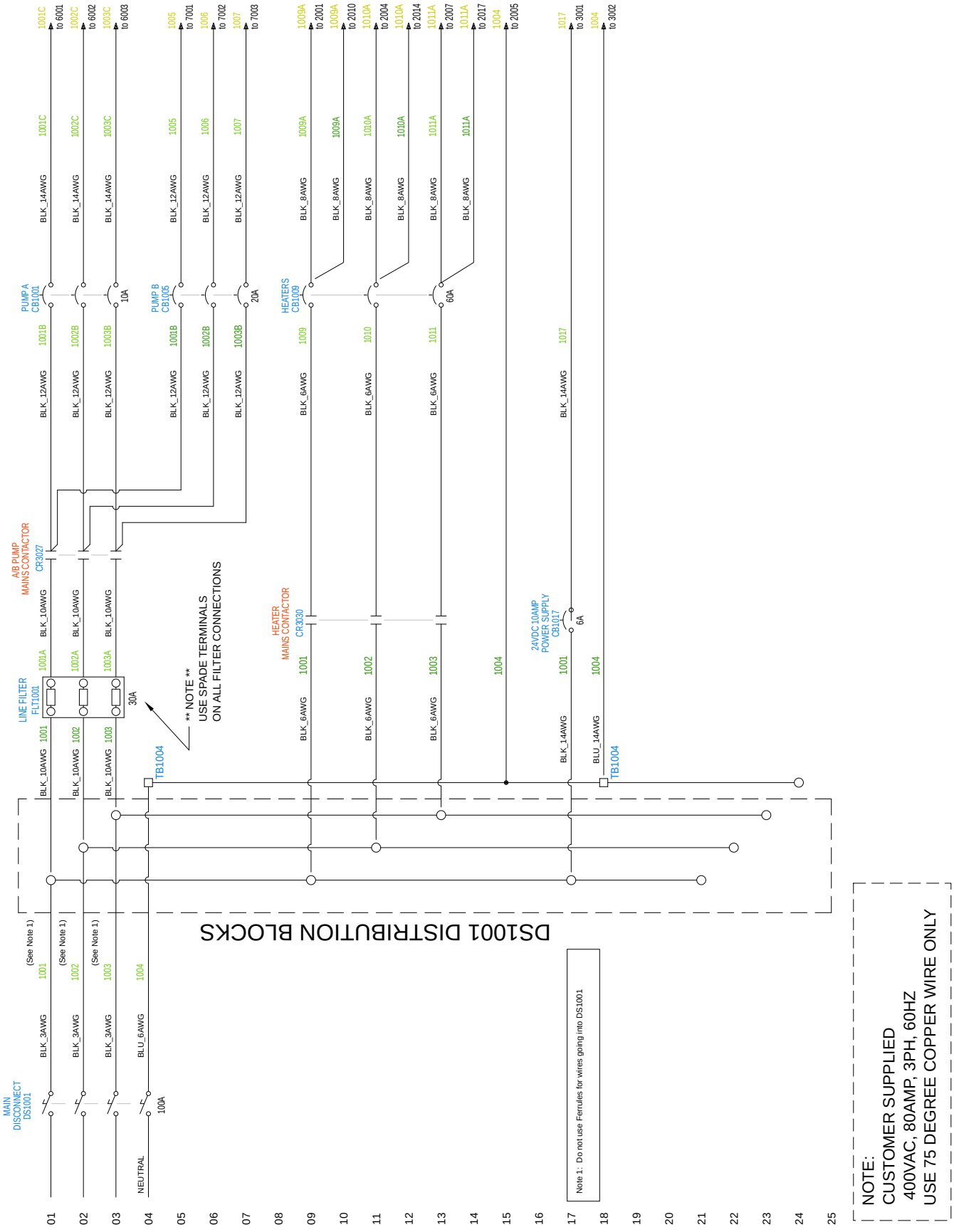




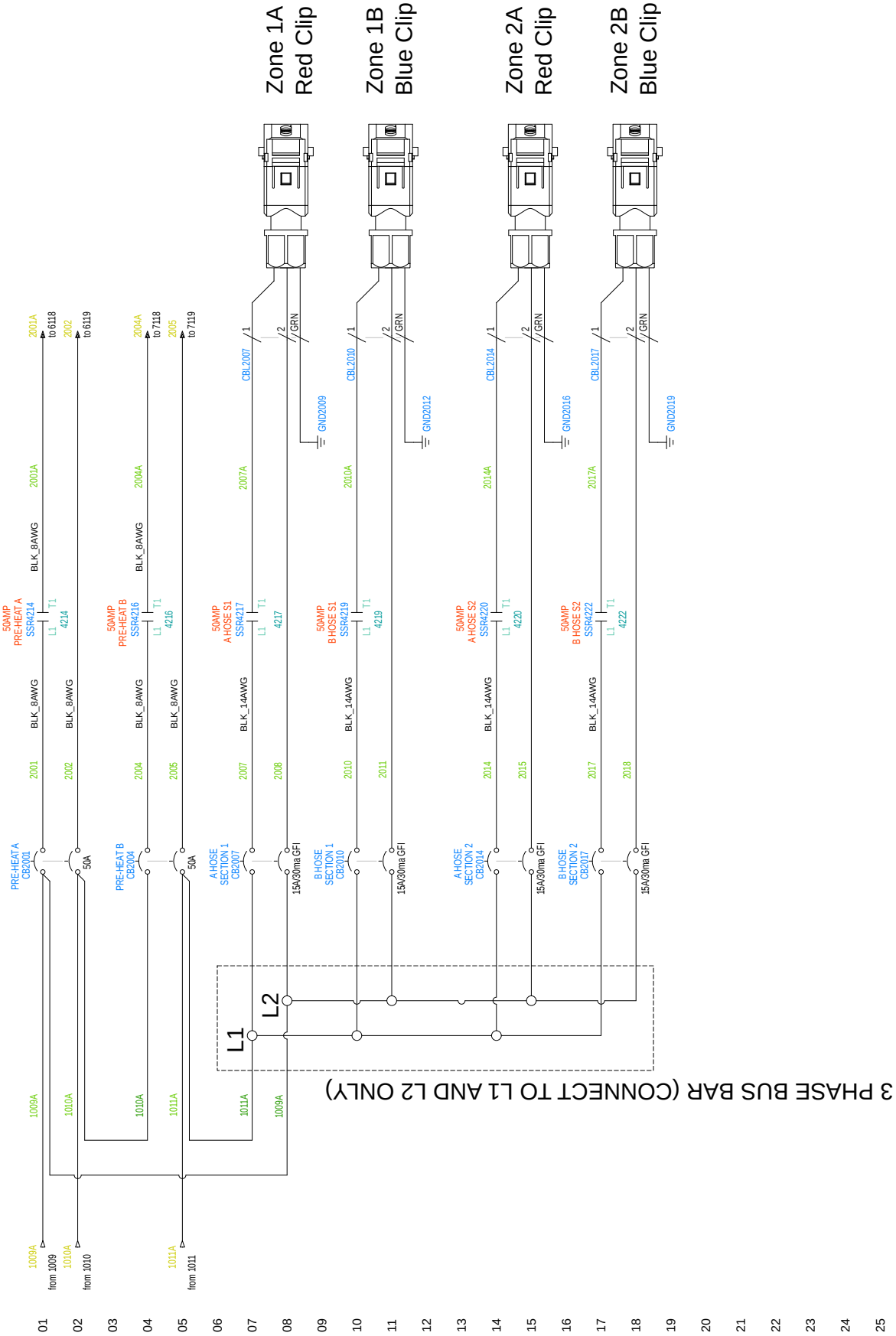




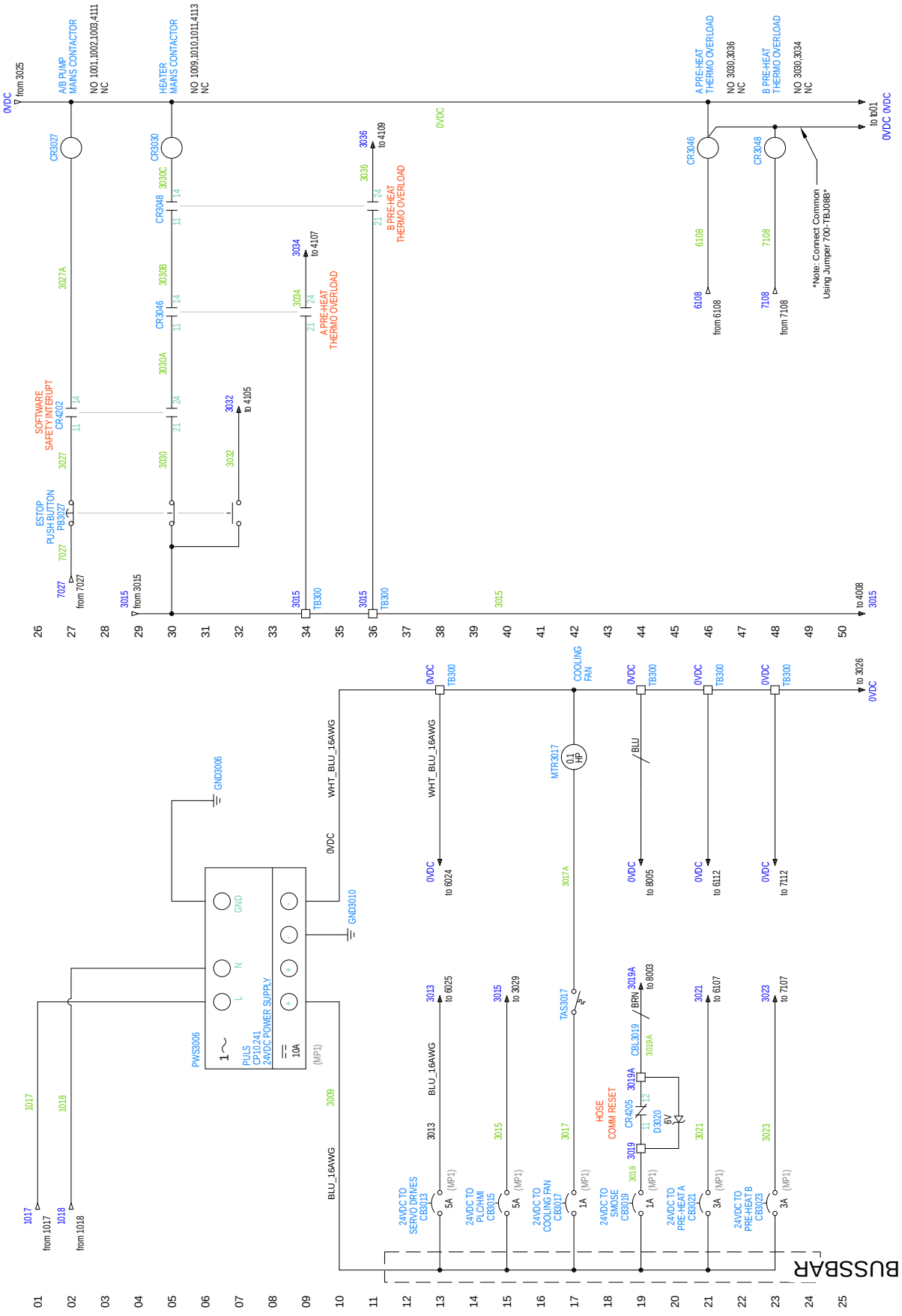
DRAWING 2


MAIN DISCONNECT DS1001
100A
NEUTRAL
BLK_3AWG
BLU_6AWG
(See Note 1)
1001
1002
1003
1004
LINE FILTER FLT1001
30A
BLK_10AWG
1001A
1002A
1003A
A/B PUMP MAINS CONTACTOR CR3027
** NOTE **
USE SPADE TERMINALS
ON ALL FILTER CONNECTIONS
TB1004
DS1001 DISTRIBUTION BLOCKS
PUMP A CB1001
10A
BLK_12AWG
1001B
1002B
1003B
1001C
1002C
1003C
BLK_14AWG
to 6001
to 6002
to 6003
PUMP B CB1005
20A
1005
1006
1007
to 7001
to 7002
to 7003
HEATER MAINS CONTACTOR CR3330
HEATERS CB1009
60A
BLK_6AWG
BLK_8AWG
1009
1010
1011
1009A
1010A
1011A
to 2001
to 2010
to 2004
to 2014
to 2007
to 2017
to 2005
24VDC 10AMP POWER SUPPLY CB1017
6A
1017
to 3001
to 3002
Note 1: Do not use Ferrules for wires going into DS1001
NOTE:
CUSTOMER SUPPLIED
400VAC, 80AMP, 3PH, 60HZ
USE 75 DEGREE COPPER WIRE ONLY

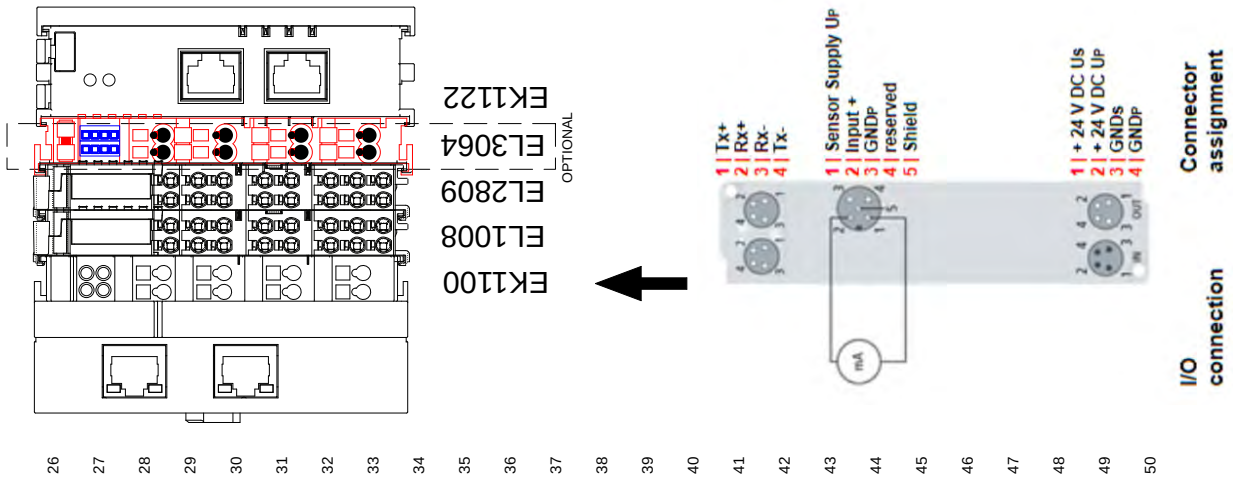
DRAWING 3

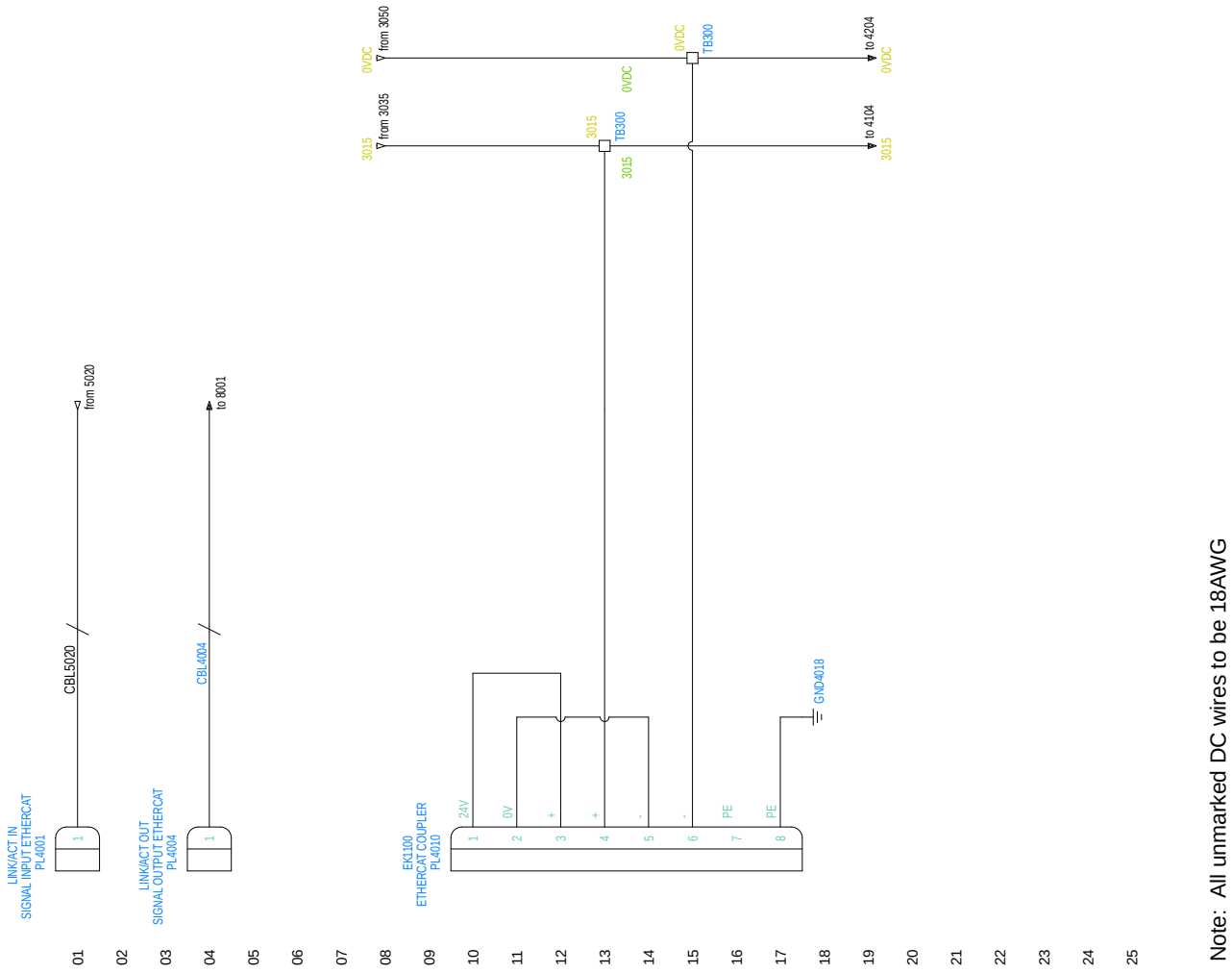

Zone 1A
Red Clip
Zone 1B
Blue Clip
Zone 2A
Red Clip
Zone 2B
Blue Clip
3 PHASE BUS BAR (CONNECT TO L1 AND L2 ONLY)
L1
L2
PRE-HEAT A CB2001
PRE-HEAT B CB2004
A HOSE SECTION 1 CB2007
B HOSE SECTION 1 CB2010
A HOSE SECTION 2 CB2014
B HOSE SECTION 2 CB2017
50A
15A/30ma GFI
50AMP PRE-HEAT A SSR4214
50AMP PRE-HEAT B SSR4216
50AMP A HOSE S1 SSR4217
50AMP B HOSE S1 SSR4219
50AMP A HOSE S2 SSR4220
50AMP B HOSE S2 SSR4222
BLK_8AWG
BLK_144AWG
GRN
GND2009
GND2012
GND2016
GND2019
from 1009
from 1010
from 1011
to 6118
to 6119
to 7118
to 7119

DRAWING 4


0VDC
from 3025
A/B PUMP MAINS CONTACTOR
NO 1001,1002,1003,4111
NC
HEATER MAINS CONTACTOR
NO 1009,1010,1011,4113
NC
A PRE-HEAT THERMO OVERLOAD
NO 3030,3036
NC
B PRE-HEAT THERMO OVERLOAD
NO 3030,3034
NC
CR3027
CR3030
CR3046
CR3048
to tb01
0VDC 0VDC
*Note: Connect Common
Using Jumper 700-TBJ08B*
from 6108
from 7108
SOFTWARE SAFETY INTERUPT CR4202
ESTOP PUSH BUTTON PB3027
A PRE-HEAT THERMO OVERLOAD
B PRE-HEAT THERMO OVERLOAD
from 7027
from 3015
to 4105
to 4107
to 4109
to 4008
TB300
COOLING FAN
MTR3017
to 3026
WHT_BLU_16AWG
BLU_16AWG
GND3006
GND3010
PWS3006
PULS CP10.241 24VDC POWER SUPPLY
from 1017
from 1018
24VDC TO SERVO DRIVES CB3013
24VDC TO PLC/HMI CB3015
24VDC TO COOLING FAN CB3017
24VDC TO SMOSE CB3019
24VDC TO PRE-HEAT A CB3021
24VDC TO PRE-HEAT B CB3023
HOSE COMM RESET
CR4205
D3020
CBL3019
TAS3017
to 6025
to 3029
to 8003
to 6107
to 7107
to 8024
to 8005
to 6112
to 7112
BUSSBAR
Note: All unmarked DC wires to be 18AWG

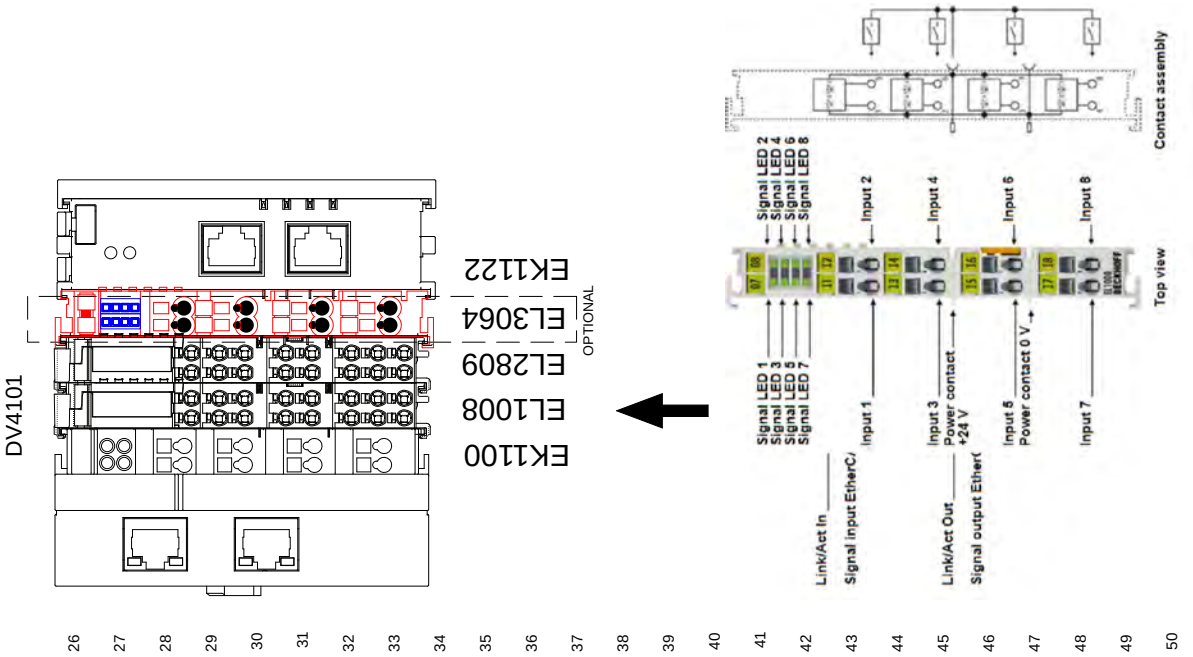
DRAWING 5

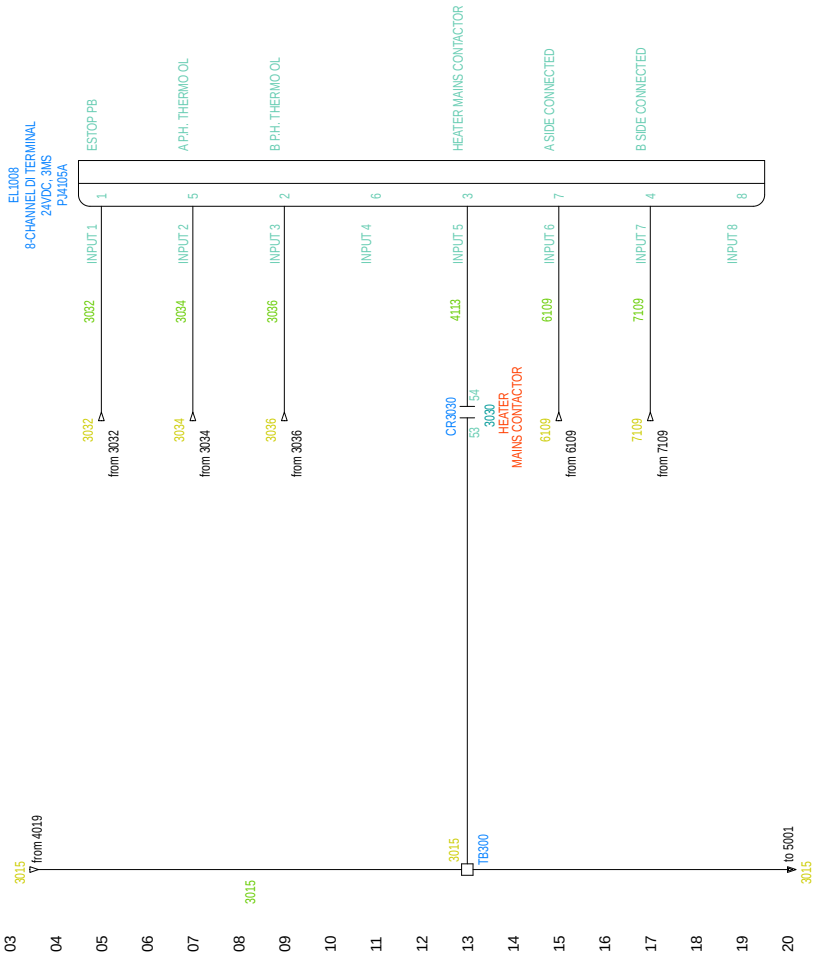




Note: All unmarked DC wires to be 18AWG

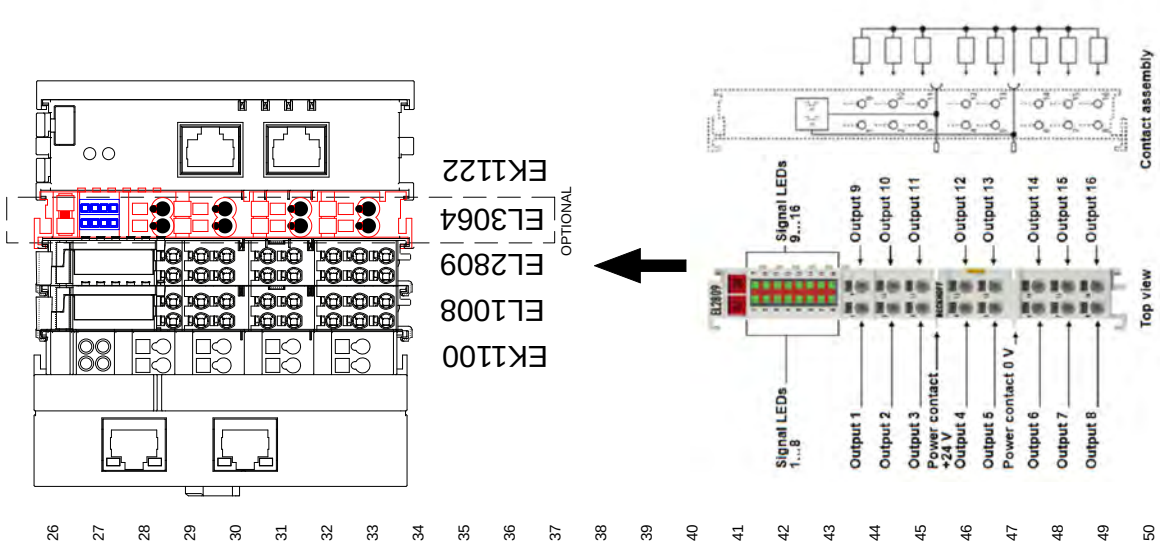
DRAWING 6

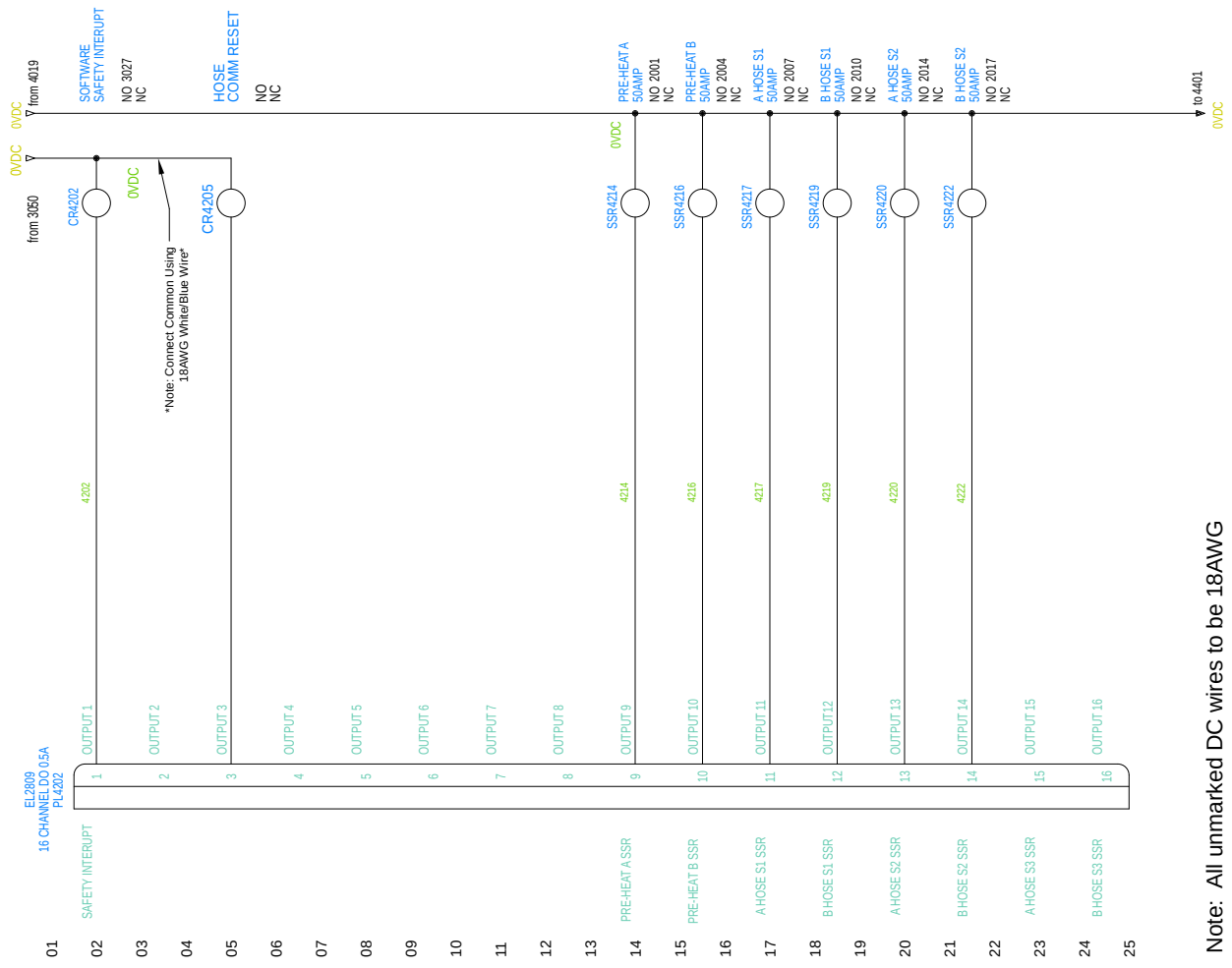




Note: All unmarked DC wires to be 18AWG

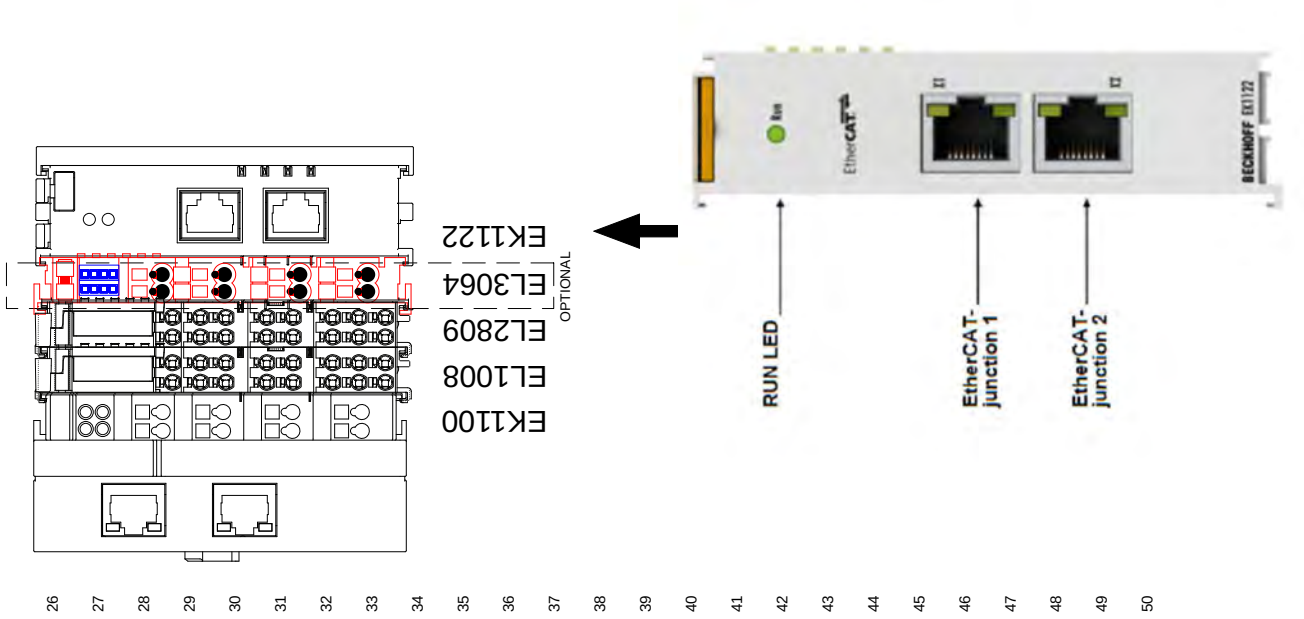
DRAWING 7

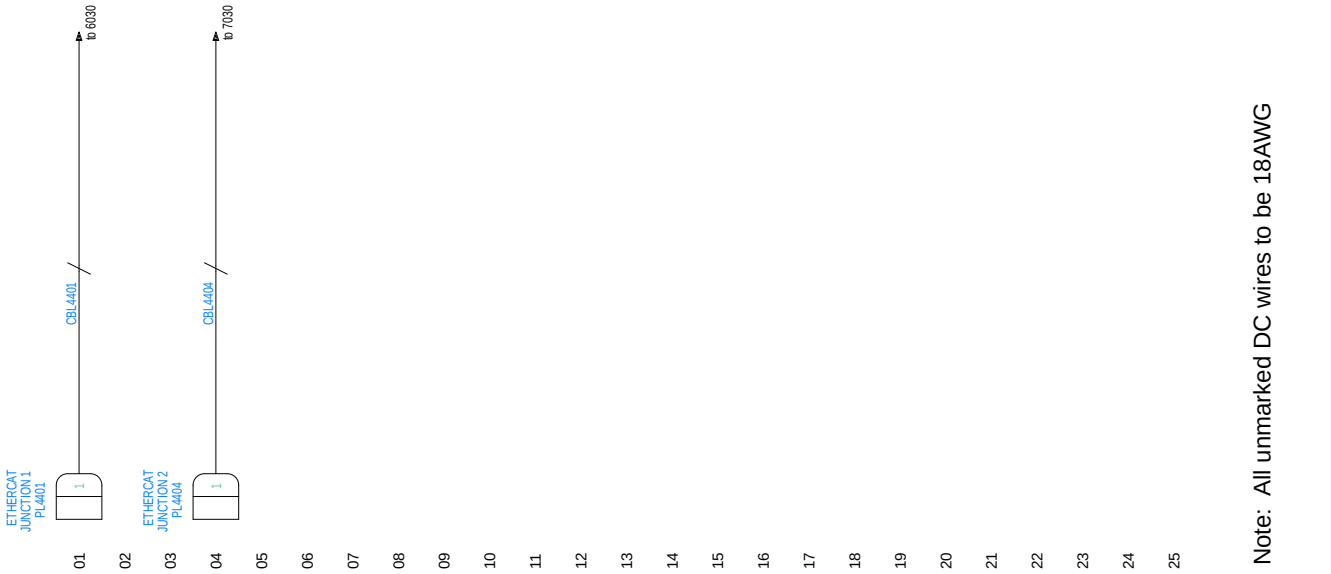




Note: All unmarked DC wires to be 18AWG

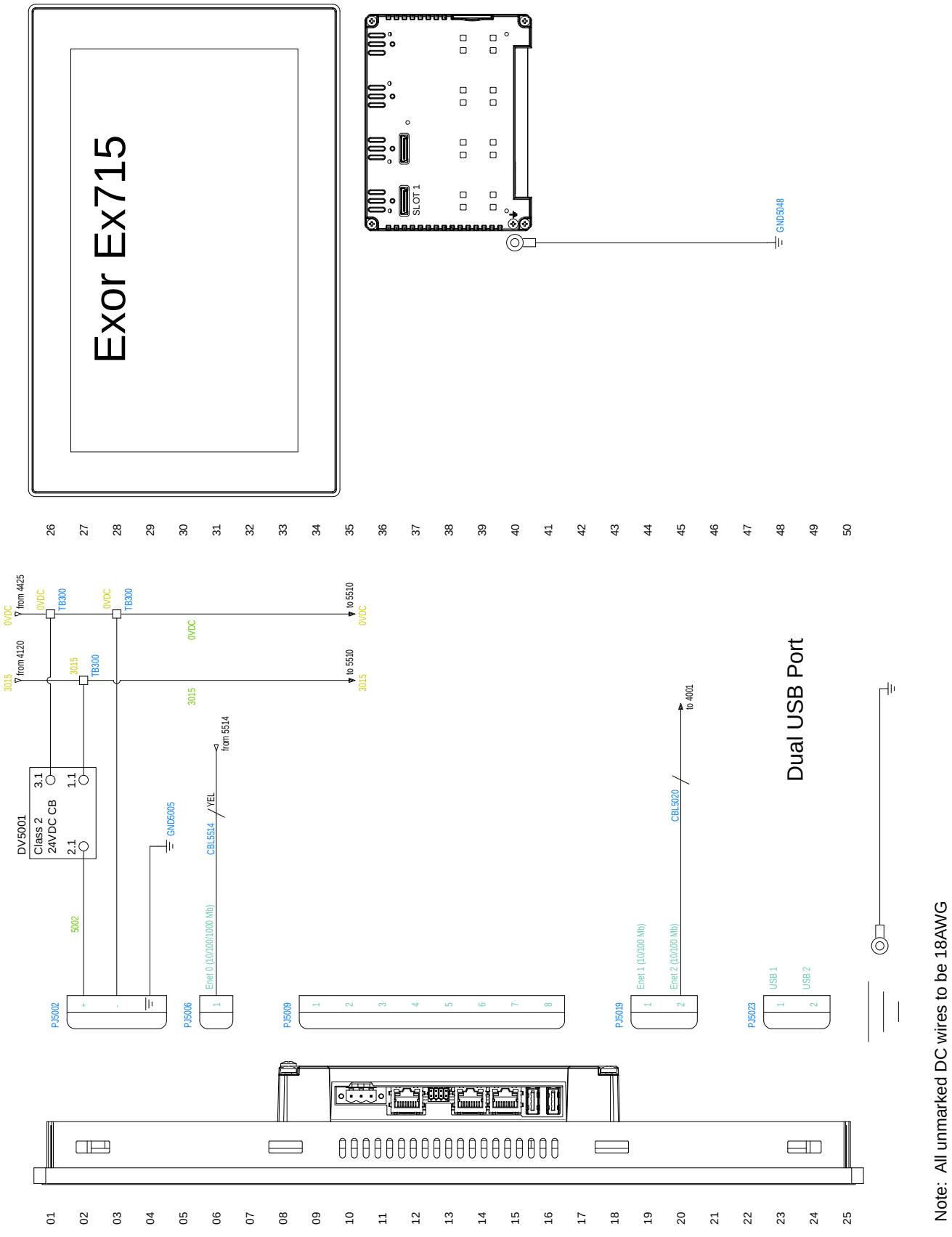
DRAWING 8





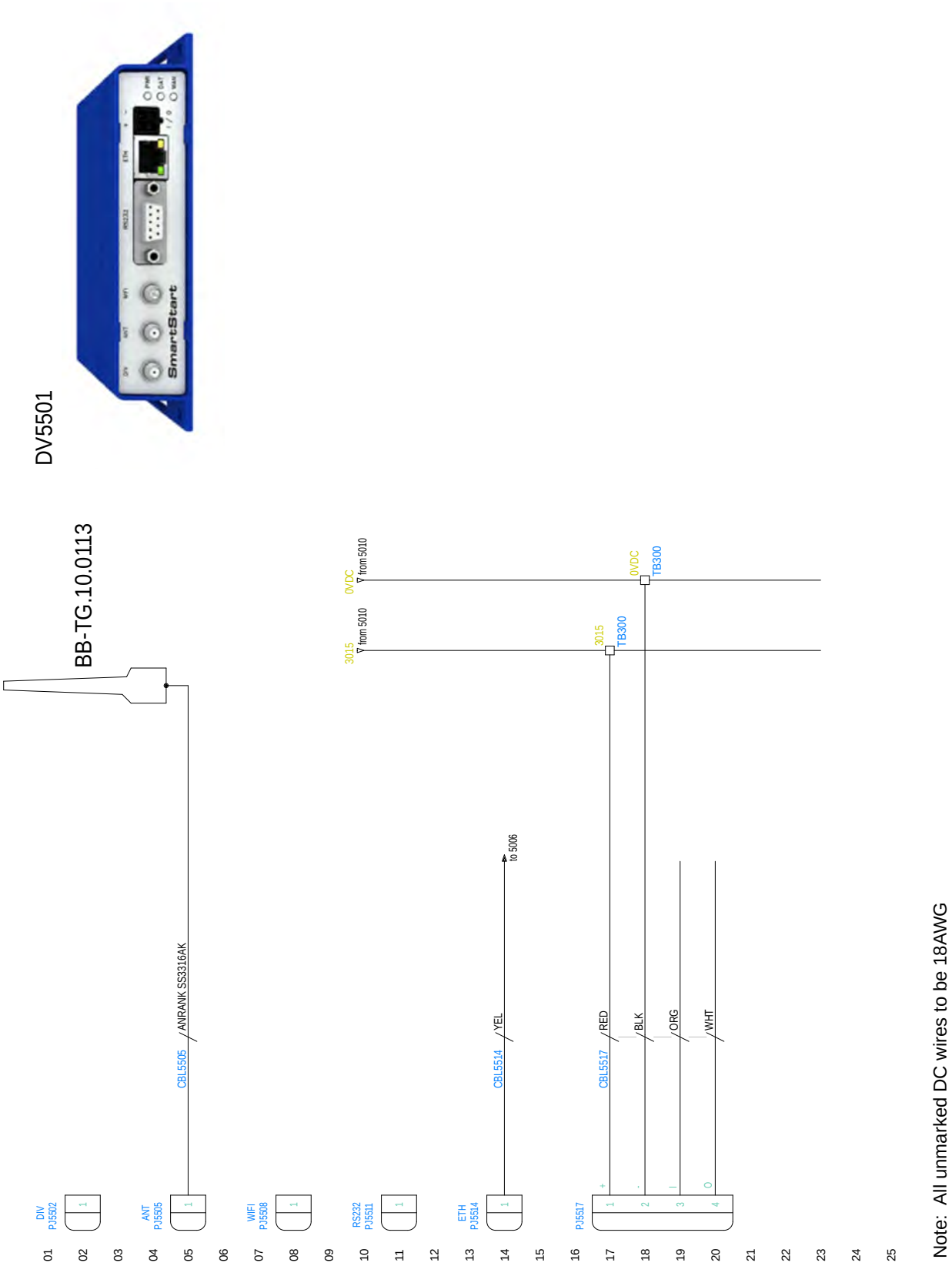
Note: All unmarked DC wires to be 18AWG

DRAWING 9

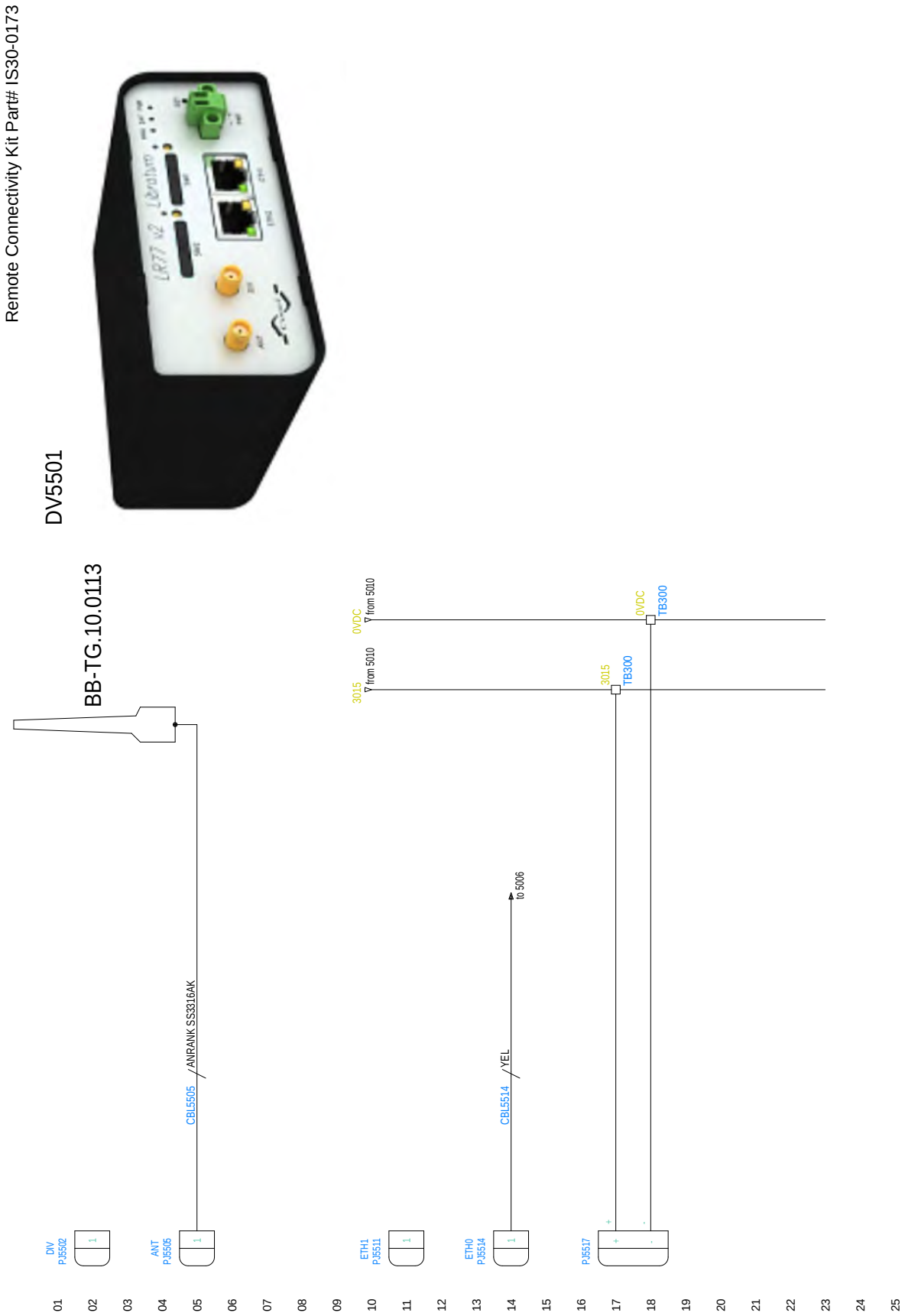


Note: All unmarked DC wires to be 18AWG

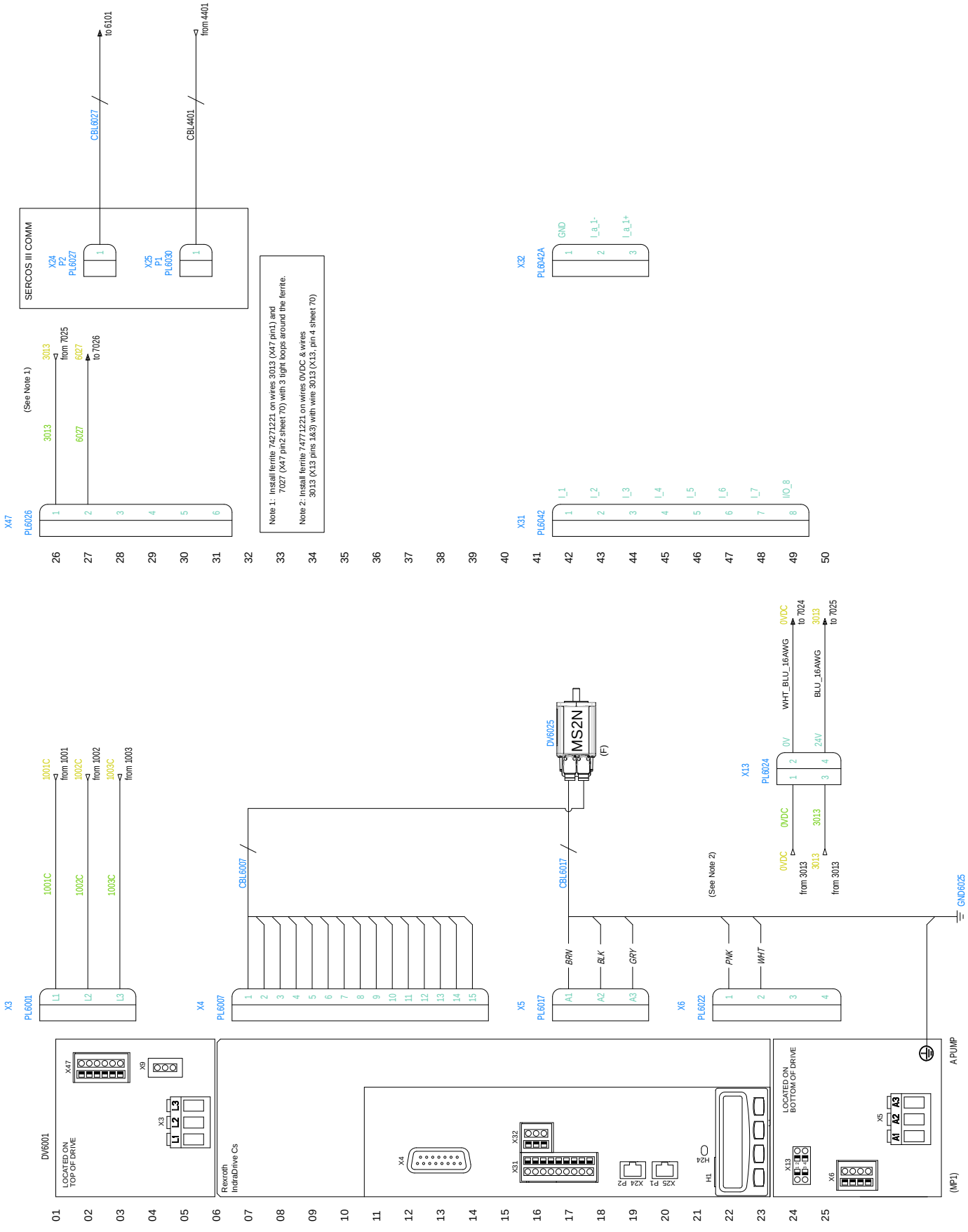
DRAWING 10


DV5501
SmartStart
BB-TG.10.0113
0VDC
from 5010
3015
from 5010
0VDC
TB300
3015
TB300
CBL5505
ANRANK SS3316AK
CBL5514
YEL
to 5006
CBL5517
RED
BLK
ORG
WHT
DIV
PJ5502
ANT
PJ5505
WIFI
PJ5508
RS232
PJ5511
ETH
PJ5514
PJ5517
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: All unmarked DC wires to be 18AWG

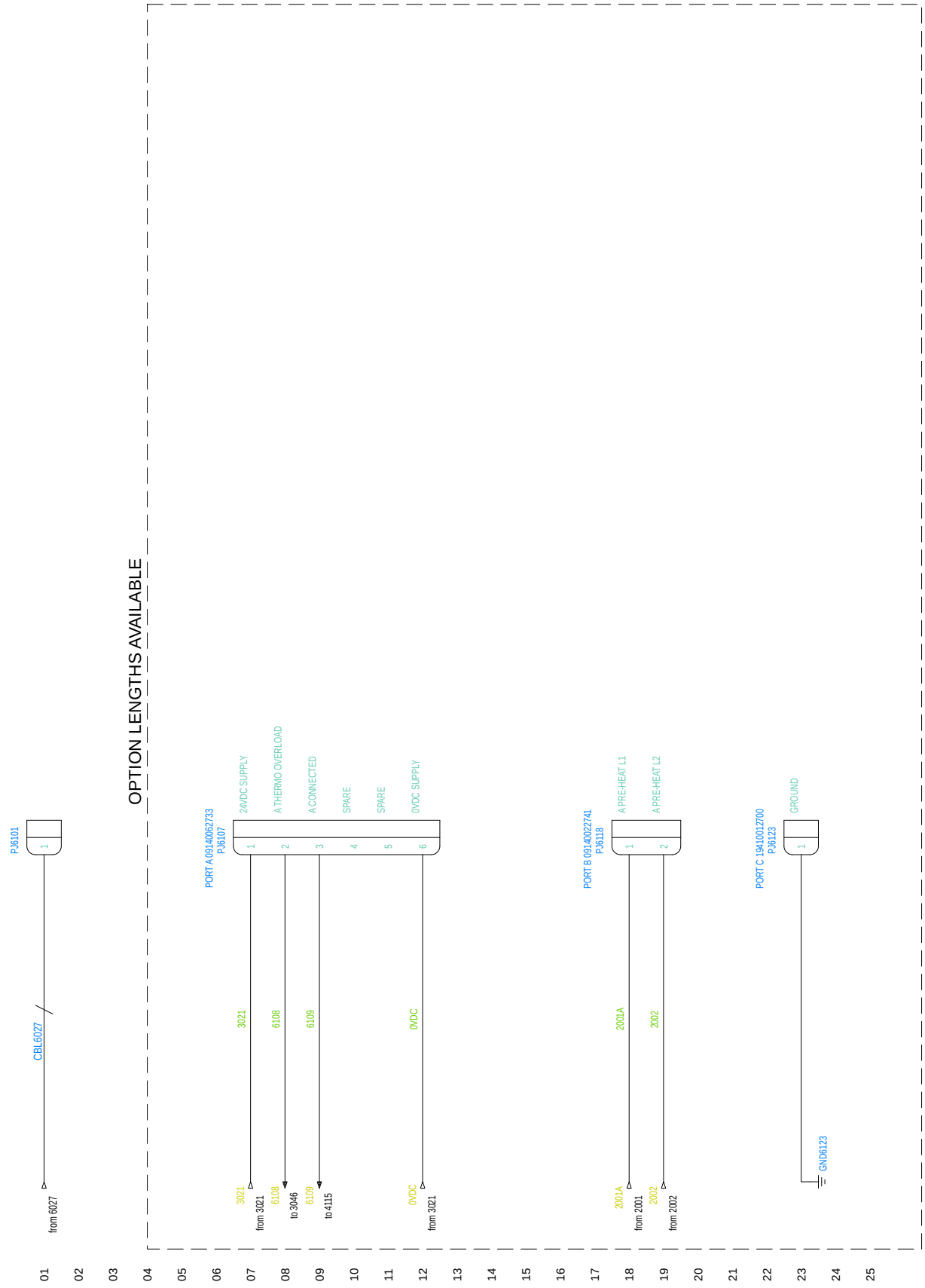
DRAWING 11


Remote Connectivity Kit Part# IS30-0173
DV5501
BB-TG.10.0113
0VDC
from 5010
3015
from 5010
0VDC
TB300
3015
TB300
ANRANK SS3316AK
CBL5505
YEL
CBL5514
to 5006
DIV
PJ5502
ANT
PJ5505
ETH1
PJ5511
ETH0
PJ5514
PJ5517
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

DRAWING 12

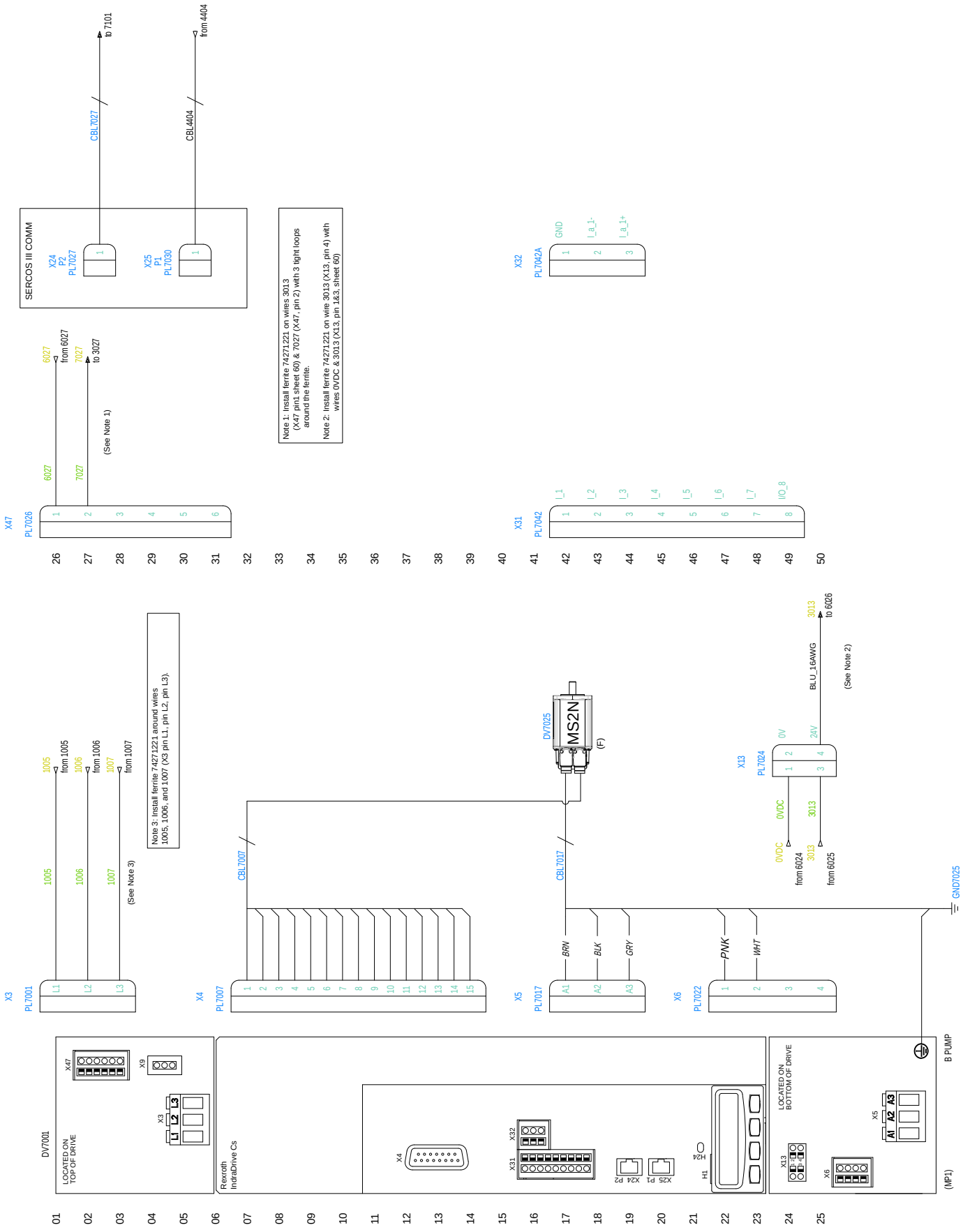

SERCOS III COMM
X24 P2 PL6027
X25 P1 PL6030
CBL6027
CBL4401
to 6101
from 4401
(See Note 1)
3013
6027
from 7025
to 7026
X47 PL6026
Note 1: Install ferrite 74271221 on wires 3013 (X47 pin1) and 7027 (X47 pin2 sheet 70) with 3 tight loops around the ferrite.
Note 2: Install ferrite 74771221 on wires 0VDC & wires 3013 (X13 pins 1&3) with wire 3013 (X13, pin 4 sheet 70)
X32 PL6042A
GND
I_a_1-
I_a_1+
X31 PL6042
I_1
I_2
I_3
I_4
I_5
I_6
I_7
I/O_8
X3 PL6001
L1
L2
L3
1001C
1002C
1003C
from 1001
from 1002
from 1003
X4 PL6007
CBL6007
DV6025
MS2N
(F)
X5 PL6017
CBL6017
A1
A2
A3
BRN
BLK
GRY
X6 PL6022
PNK
WHT
(See Note 2)
X13 PL6024
0V
24V
WHT_BLU_16AWG
BLU_16AWG
0VDC
3013
to 7024
to 7025
from 3013
GNDG025
DV6001
LOCATED ON TOP OF DRIVE
X47
X9
X3
Rexroth IndraDrive Cs
X4
X31
X32
X25 P1
X24 P2
H1
LOCATED ON BOTTOM OF DRIVE
X13
X6
X5
A PUMP
(MP1)

DRAWING 13

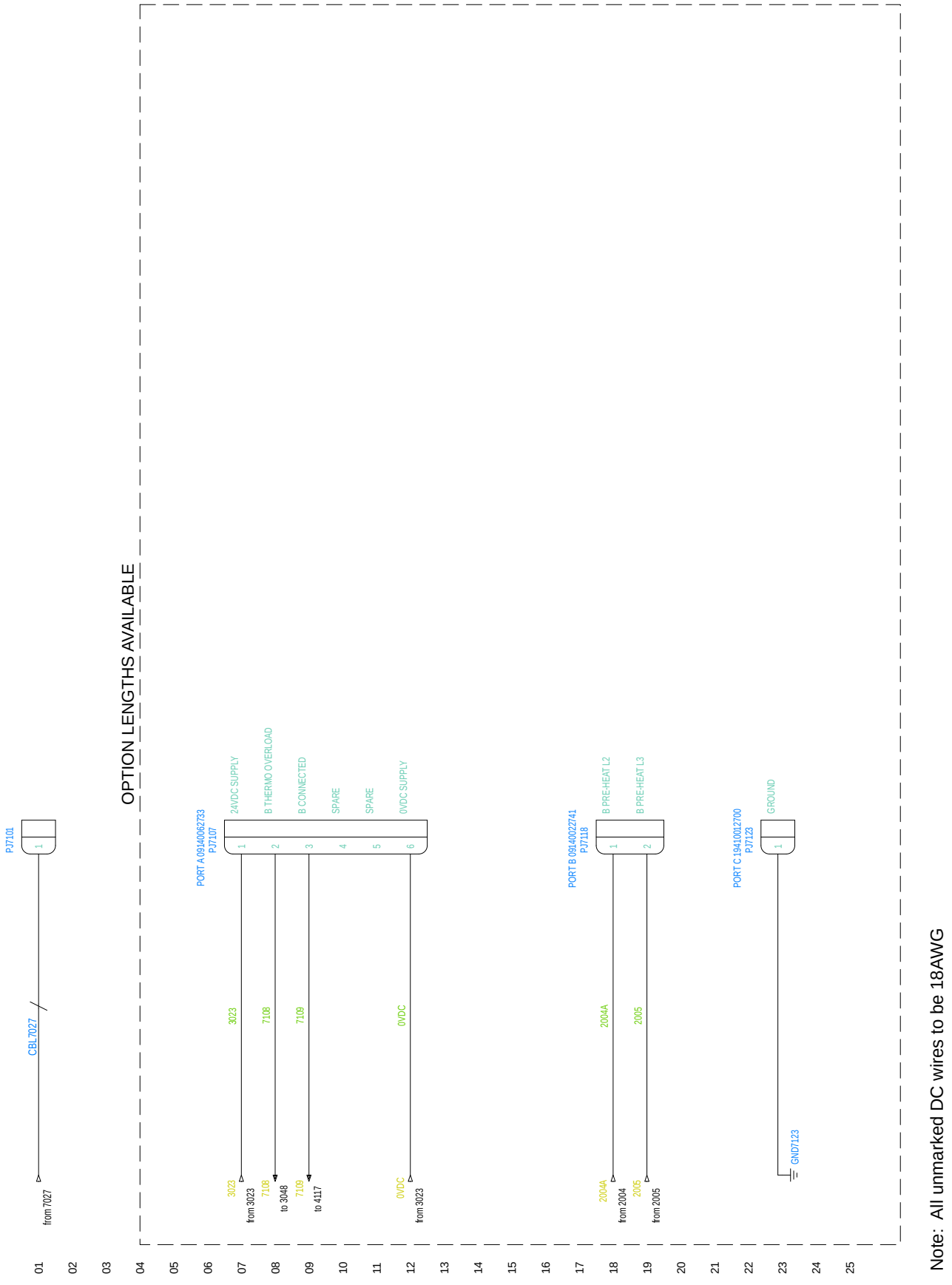


Note: All unmarked DC wires to be 18AWG

DRAWING 14


SERCOS III COMM
X24
P2
PL7027
X25
P1
PL7030
CBL7027
CBL4404
to 7101
from 4404
Note 1: Install ferrite 74271221 on wires 3013 (X47 pin1 sheet 60) & 7027 (X47, pin 2) with 3 tight loops around the ferrite.
Note 2: Install ferrite 74271221 on wire 3013 (X13, pin 4) with wires 0VDC & 3013 (X13, pin 1&3, sheet 60)
X32
PL7042A
GND
I_a_1-
I_a_1+
X47
PL7026
6027
7027
from 6027
to 3027
(See Note 1)
X31
PL7042
I_1
I_2
I_3
I_4
I_5
I_6
I_7
IO_8
Note 3: Install ferrite 74271221 around wires 1005, 1006, and 1007 (X3 pin L1, pin L2, pin L3).
X3
PL7001
1005
1006
1007
from 1005
from 1006
from 1007
(See Note 3)
X4
PL7007
CBL7007
DV7025
MS2N
(F)
CBL7017
X5
PL7017
BRN
BLK
GRY
X6
PL7022
PNK
WHT
X13
PL7024
0V
24V
0VDC
3013
BLU_16AWG
to 6026
(See Note 2)
from 6024
from 6025
GND7025
DV7001
LOCATED ON TOP OF DRIVE
Rexroth
IndraDrive Cs
LOCATED ON BOTTOM OF DRIVE
B PUMP
(MP1)

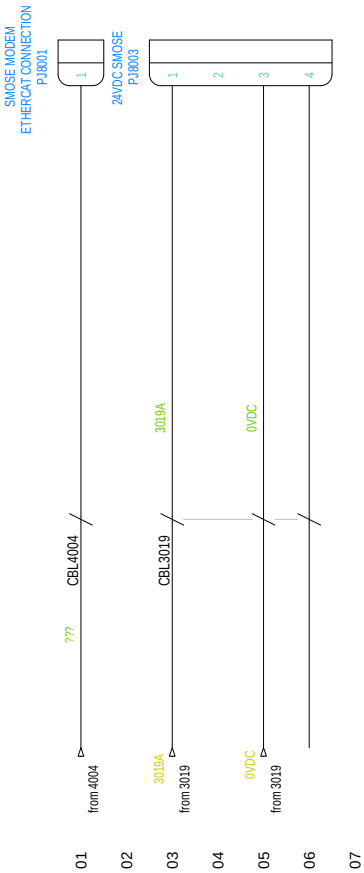
DRAWING 15



Note: All unmarked DC wires to be 18AWG

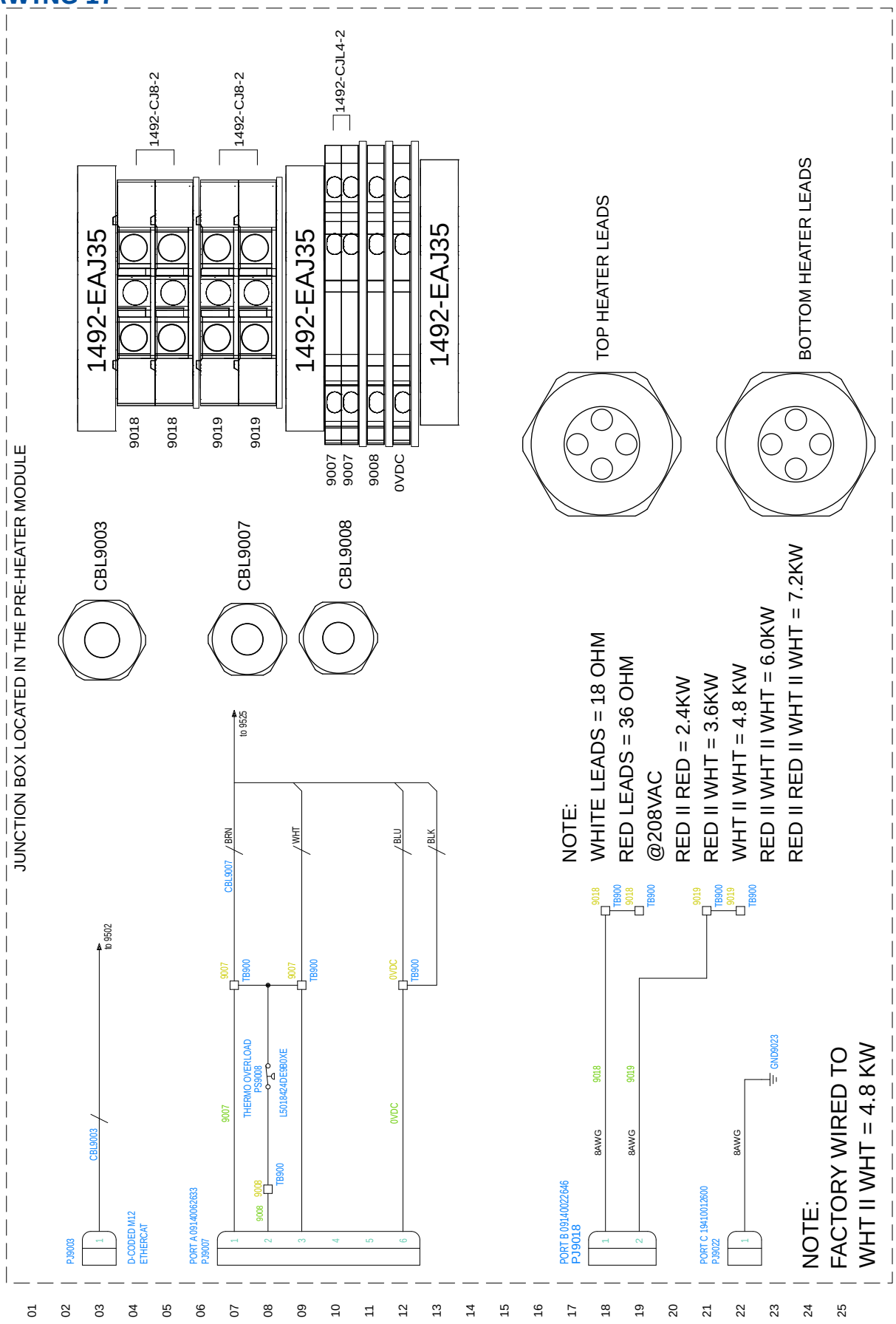
DRAWING 16

A-SIDE SMOSE



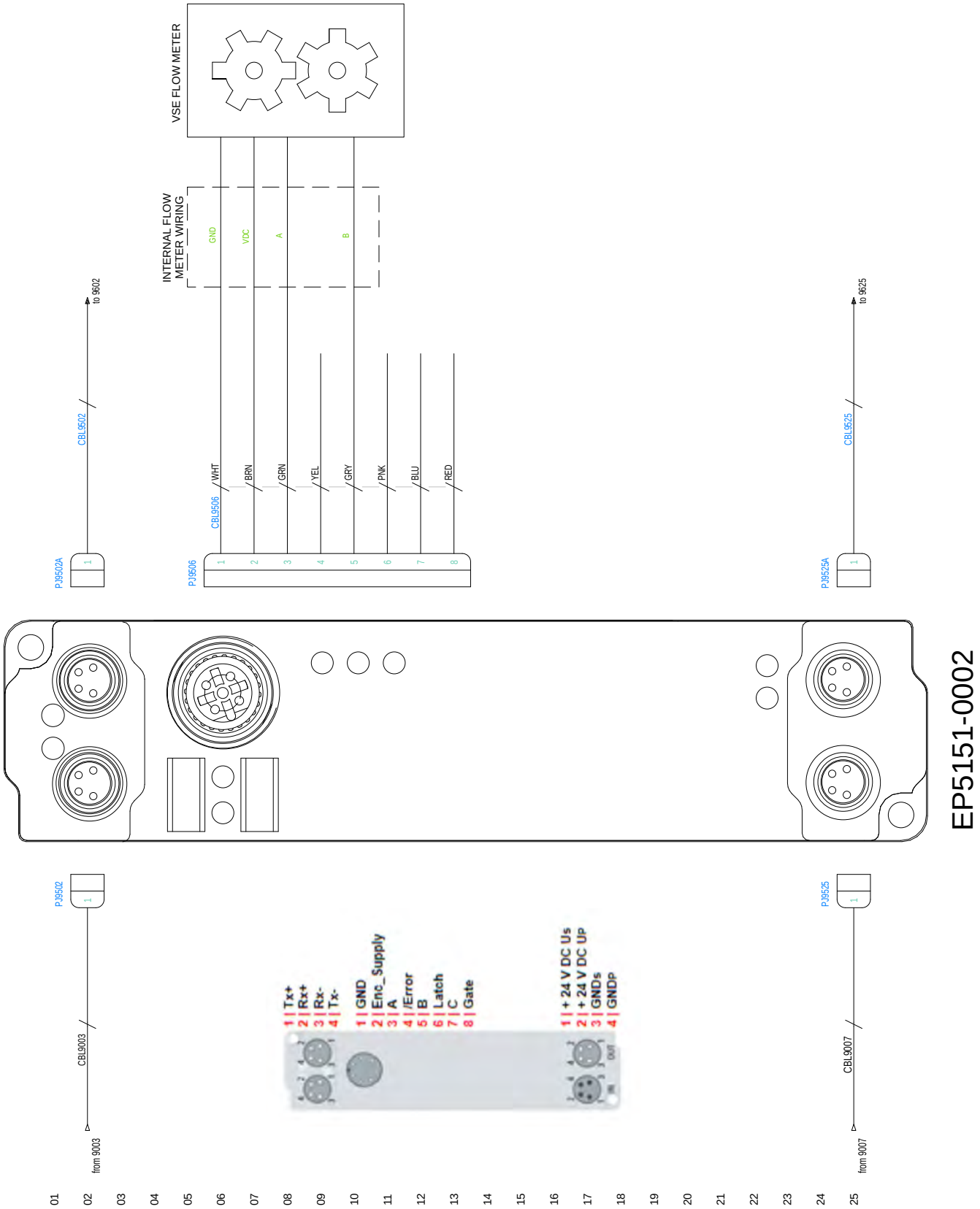
Note: All unmarked DC wires to be 18AWG

DRAWING 17

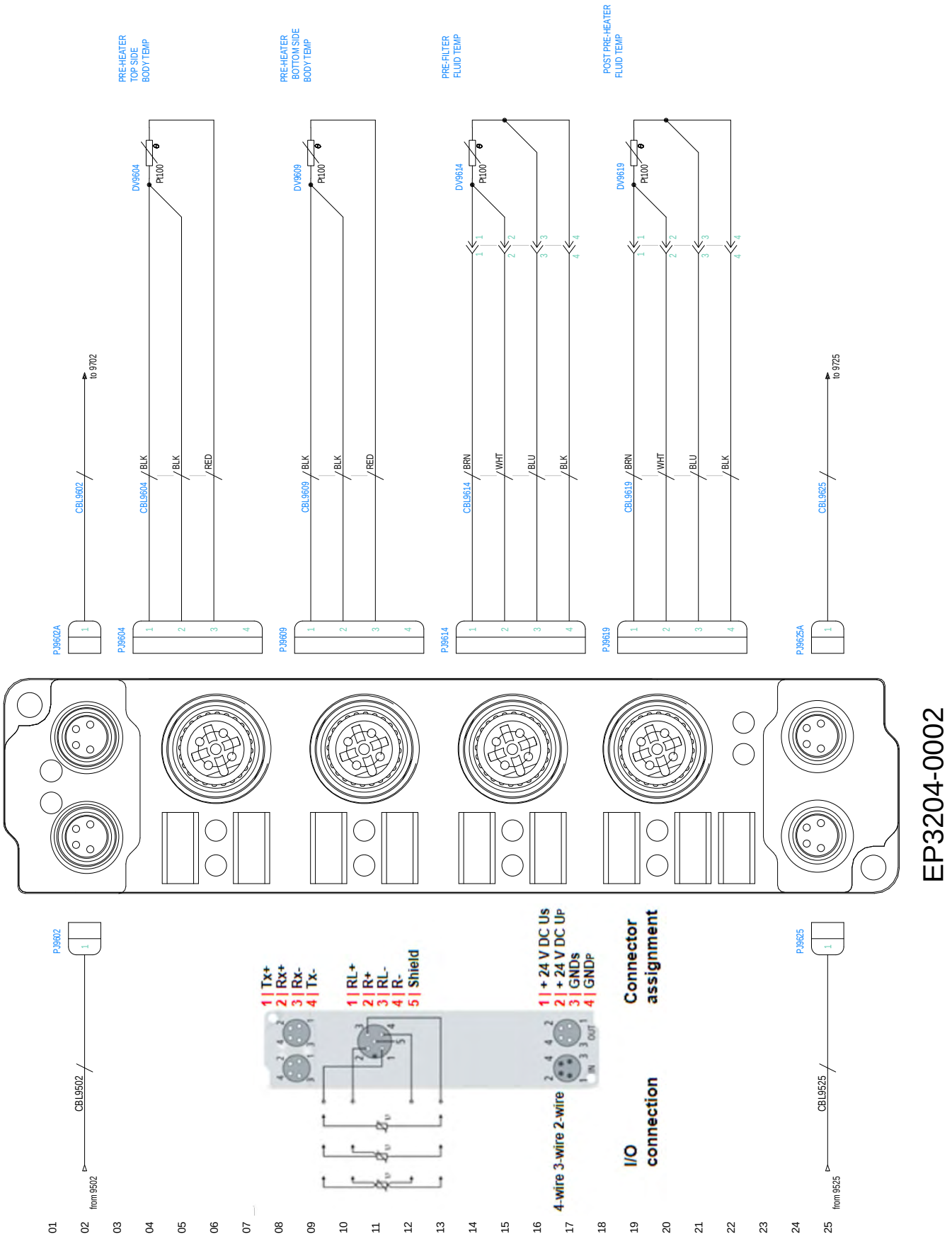


Note: All unmarked DC wires to be 18AWG

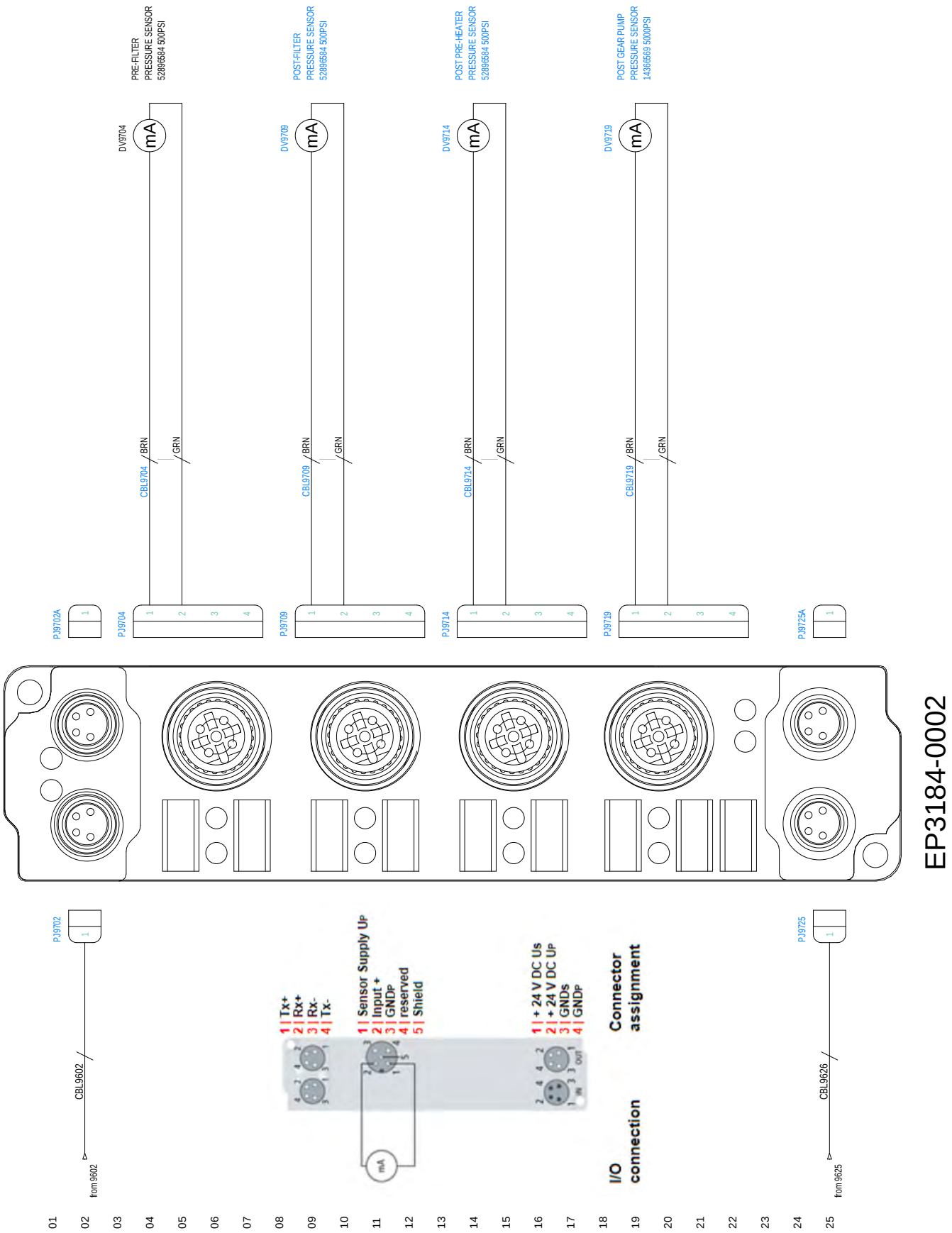
DRAWING 18


VSE FLOW METER
INTERNAL FLOW METER WIRING
GND
VDC
A
B
WHT
BRN
GRN
YEL
GRY
PNK
BLU
RED
CBL9506
PJ9506
CBL9502
PJ9502A
to 9602
CBL9525
PJ9525A
to 9625
EP5151-0002
PJ9502
CBL9003
from 9003
Tx+
Rx+
Rx-
Tx-
GND
Enc_Supply
A
/Error
B
Latch
C
Gate
+ 24 V DC Us
+ 24 V DC UP
GNDs
GNDP
out
PJ9525
CBL9007
from 9007
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

DRAWING 19


PRE-HEATER TOP SIDE BODY TEMP
PRE-HEATER BOTTOM SIDE BODY TEMP
PRE-FILTER FLUID TEMP
POST PRE-HEATER FLUID TEMP
DV9604
DV9609
DV9614
DV9619
Pt100
CBL9602
CBL9604
CBL9609
CBL9614
CBL9619
CBL9625
P.J9602A
P.J9604
P.J9609
P.J9614
P.J9619
P.J9625A
to 9702
to 9725
BLK
RED
BRN
WHT
BLU
P.J9602
P.J9625
CBL9502
CBL9525
from 9502
from 9525
1 | Tx+
2 | Rx+
3 | Rx-
4 | Tx-
1 | RL+
2 | R+
3 | RL-
4 | R-
5 | Shield
1 | + 24 V DC Us
2 | + 24 V DC Up
3 | GNDs
4 | GNDp
4-wire 3-wire 2-wire
I/O connection
Connector assignment
EP3204-0002

DRAWING 20


PRE-FILTER PRESSURE SENSOR 52896584 500PSI
POST-FILTER PRESSURE SENSOR 52896584 500PSI
POST PRE-HEATER PRESSURE SENSOR 52896584 500PSI
POST GEAR PUMP PRESSURE SENSOR 14366569 5000PSI
DV9704
DV9709
DV9714
DV9719
mA
CBL9704
CBL9709
CBL9714
CBL9719
BRN
GRN
PJ9702A
PJ9704
PJ9709
PJ9714
PJ9719
PJ9725A
EP3184-0002
PJ9702
CBL9602
from 9602
1 | Tx+
2 | Rx+
3 | Rx-
4 | Tx-
1 | Sensor Supply UP
2 | Input +
3 | GNDP
4 | reserved
5 | Shield
1 | + 24 V DC Us
2 | + 24 V DC UP
3 | GNDs
4 | GNDP
I/O connection
Connector assignment
PJ9725
CBL9626
from 9625
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

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.

IntelliSpray 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 IntelliSpray Service Engineers and/or Authorized Service Providers.

STEP 1. Select IS40 IntelliSpray Cloud

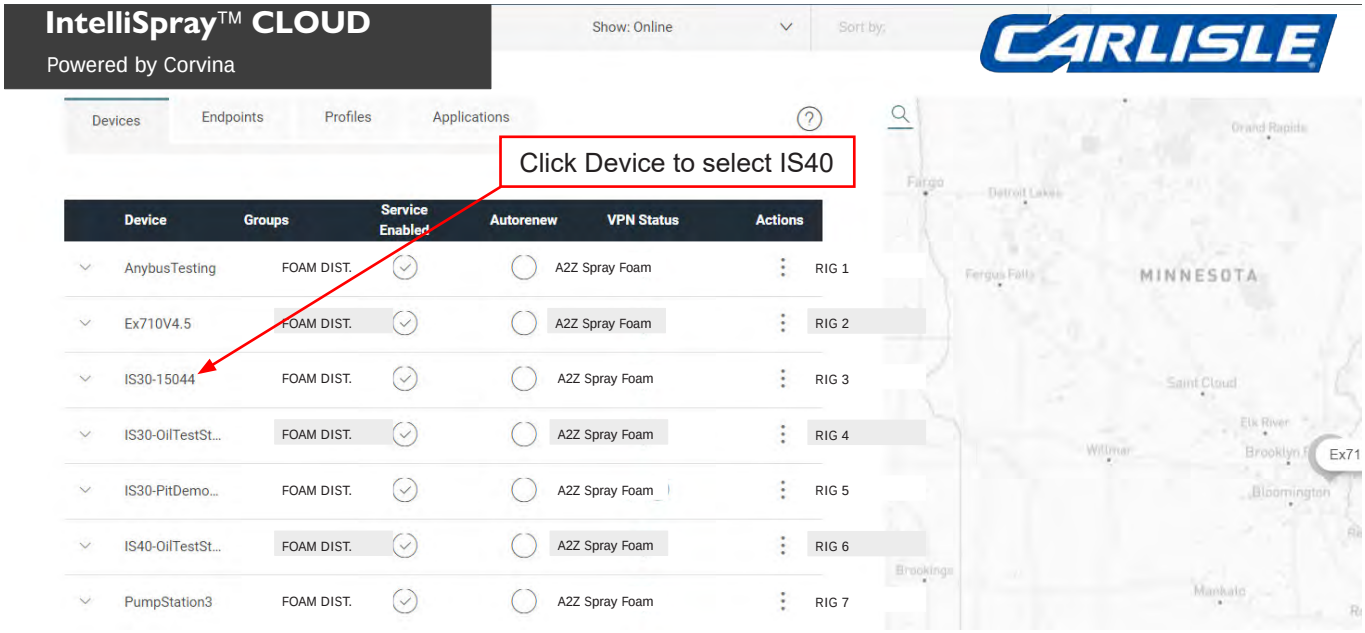
An example of the ISC gateway shown in a standard browser is shown in the following figure.

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.



STEP 2. Open IS40 Connection

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.

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.

Full Interface (VNC) access on the phone

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.

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

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.

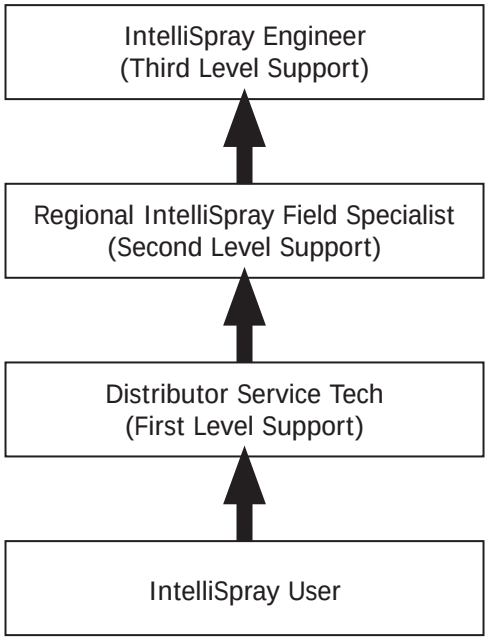
Full Interface (VNC) access on the computer

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: A user does not have to be in the spray rig to initiate a remote service event, but the IS40 must be powered on and within cell-range to establish a remote connection.

When a user calls or texts 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.



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MANUAL CHANGE SUMMARY		
Date	Description	Version
02/12/2021	Initial release.	A
06/08/2022	Additional screen functions, Automatic Viscosity Control (AVC), Added alarm tables, changes to electronics for CE compliance (starting S/N 1094)	B
07/15/2024	Formatting changes to the document. Added 400V model configuration.	C

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WARRANTY POLICY

This product is covered by Carlisle Fluid Technologies' materials and workmanship limited warranty.

The use of parts or accessories from sources other than Carlisle Fluid Technologies will void all warranties. Failure to follow reasonable maintenance guidance provided can invalidate the warranty.

For specific warranty information, please contact Carlisle Fluid Technologies.

For technical assistance or to locate an authorized distributor, contact one of our international sales and customer support locations listed below.

REGION	INDUSTRIAL/ AUTOMOTIVE	AUTOMOTIVE REFINISHING
Americas	Tel: 1-800-992-4657	Tel: 1-800-445-3988
Europe, Africa Middle East, India	Tel: +44 (0)1202 571 111	
China	Tel: +8621-3373 0108	
Japan	Tel: +81 45 785 6421	
Australia	Tel: +61 (0) 2 8525 7555	

SCAN ME

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