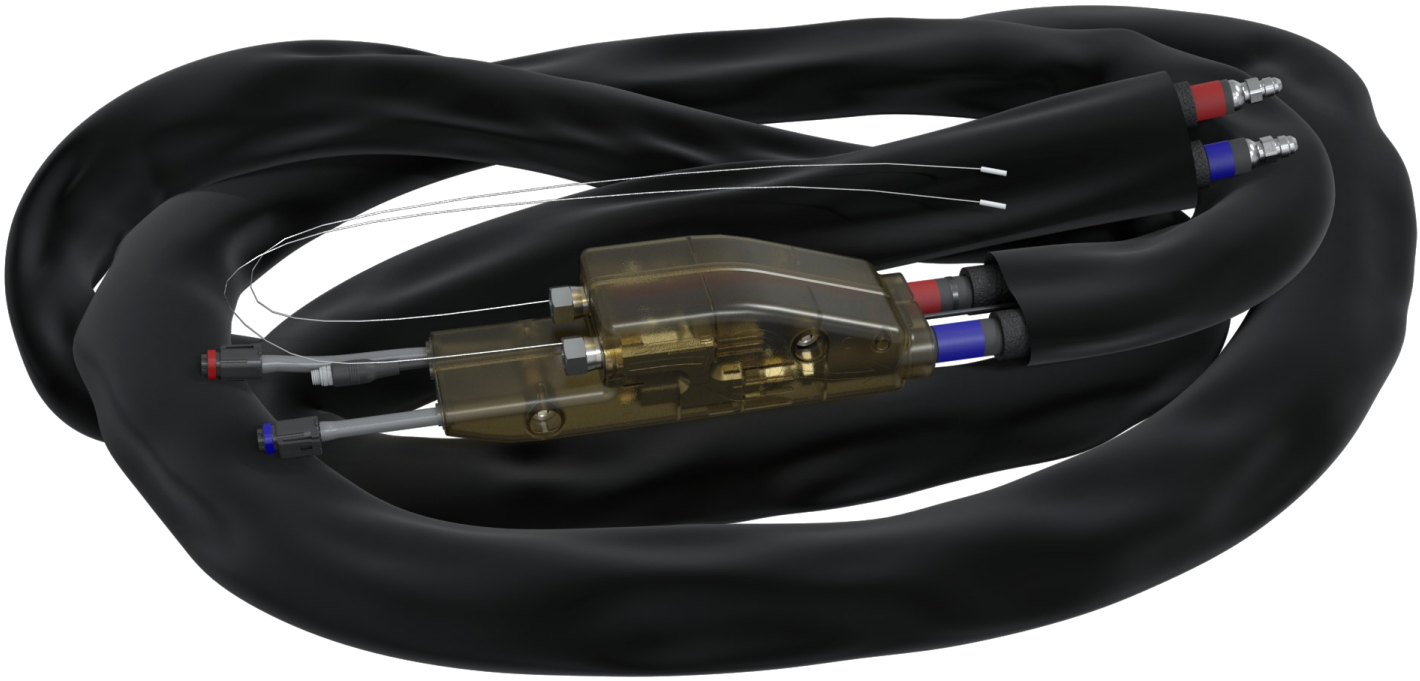
PRODUCT MANUAL

EN

QUICKHEAT HOSE



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COMPLIANCE

Compliance to the following standards is indicated by the corresponding mark on the product.

COMPLIANCE PENDING

2006/42/EC	Machinery Directive
2014/35/EU	Low Voltage Directives
2011/65/EU	RoHS Directive with Amendment 2015/863

EC Directives

ISO 12100	Machinery Safety
EN60204-1	Safety of Machinery – Electrical Equipment
IEC 63000	New Harmonized Standard to Demonstrate RoHS Compliance

Safety Standards

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CONTENTS

SAFETY

SAFETY PRECAUTIONS

Before operating, maintaining or servicing any Carlisle system, read and understand all of the technical and safety literature for your products. This manual contains information that is important for you to know and understand. This information relates to USER SAFETY and PREVENTING EQUIPMENT PROBLEMS.

To help you recognize this information, we use the following symbols. Please pay particular attention to these sections.

WARNING

A WARNING! states information to alert you to a situation that might cause serious injury if instructions are not followed.

CAUTION

A CAUTION! states information that tells how to prevent damage to equipment or how to avoid a situation that might cause minor injury.

NOTE

A NOTE is information which is relevant to the procedure in progress.

While this manual lists standard specifications and service procedures, some minor deviations may be found between this literature and your equipment. Differences in local codes and plant requirements, material delivery requirements, etc., make such variations inevitable. Compare this manual with your system installation drawings and appropriate equipment manuals to reconcile such differences.

WARNING

The user MUST read and be familiar with the Safety Section in this manual and the Ransburg 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 any 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.

WARNING

Read the following warnings before using this equipment

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

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

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

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

AUTOMATIC EQUIPMENT Automatic equipment may start suddenly without warning.

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

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

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

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

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

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

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

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

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

WEAR RESPIRATOR Toxic fumes can cause serious injury or death if inhaled. Wear a respirator as recommended by the fluid and solvent

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

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

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

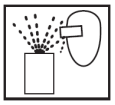
- Go to an emergency room immediately.
- Tell the doctor you suspect an injection injury.
- Show the doctor this medical information or the medical alert card provided with your airless spray equipment.
- Tell the doctor what kind of fluid you were spraying or dispensing.
- Refer to the Material Safety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

Continued in next page...

WARNING

Read the following warnings before using this equipment

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



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

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

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

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.

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

AREA Tells where hazards may occur	HAZARD Tells what the hazard is	SAFEGUARDS Tells how to avoid the hazard
Spray Area High Voltage Equipment	Electrical Discharge There is a high voltage device that can induce an electrical charge on ungrounded objects which is capable of igniting coating materials. Inadequate grounding will cause a spark hazard. A spark can ignite many coating materials and cause a fire or explosion.	Parts being sprayed and operators in the spray area must be properly grounded. Parts being sprayed must be supported on conveyors or hangers that are properly grounded. The resistance between the part and earth ground must not exceed 1 meg ohm. (Refer to NFPA-33.) Operators must be grounded. Rubber soled insulating shoes should not be worn. Grounding straps on wrists or legs may be used to assure adequate ground contact. Operators must not be wearing or carrying any ungrounded metal objects. When using an electrostatic handgun, opera- tors must assure contact with the handle of the applicator via conductive gloves or gloves with the palm section cut out. NOTE: REFER TO NFPA-33 OR SPECIFIC COUNTRY SAFETY CODES REGARDING PROPER OPERATOR GROUNDING. All electrically conductive objects in the spray area, with the exception of those objects re- quired by the process to be at high voltage, must be grounded. Grounded conductive flooring must be provided in the spray area. Always turn off the power supply prior to flushing, cleaning, or working on spray system equipment. Unless specifically approved for use in hazardous locations, all electrical equipment must be located outside Class I or II, Division 1 or 2 hazardous areas, in accordance with NFPA-33. Avoid installing an applicator into a fluid system where the solvent supply is ungrounded. Do not touch the applicator electrode while it is energized.

AREA Tells where hazards may occur	HAZARD Tells what the hazard is	SAFEGUARDS Tells how to avoid the hazard
Electrical Equipment	Electrical Discharge High voltage equipment is utilized in the process. Arcing in the vicinity of flammable or combustible materials may occur. Personnel are exposed to high voltage during operation and maintenance. Protection against inadvertent arcing that may cause a fire or explosion is lost if safety circuits are disabled during operation. Frequent power supply shutdown indicates a problem in the system which requires correction. An electrical arc can ignite coating materials and cause a fire or explosion.	Unless specifically approved for use in hazardous locations, the power supply, control cabinet, and all other electrical equipment must be located outside Class I or II, Division 1 and 2 hazardous areas in accordance with NFPA-33 and EN 50176. Turn the power supply OFF before working on the equipment. Test only in areas free of flammable or combustible material. Testing may require high voltage to be on, but only as instructed. Production should never be done with the safety circuits disabled. Before turning the high voltage on, make sure no objects are within the sparking distance.
Toxic Substances	Chemical Hazard Certain materials may be harmful if inhaled, or if there is contact with the skin.	Follow the requirements of the Safety Data Sheet supplied by coating material manufacturer. Adequate exhaust must be provided to keep the air free of accumulations of toxic materials. Use a mask or respirator whenever there is a chance of inhaling sprayed materials. The mask must be compatible with the material being sprayed and its concentration. Equipment must be as prescribed by an industrial hygienist or safety expert, and be NIOSH approved.
Spray Area	Explosion Hazard — Incompatible Materials Halogenated hydrocarbon solvents for example: methylene chloride and 1,1,1, - Trichloroethane are not chemically compatible with the aluminum that might be used in many system components. The chemical reaction caused by these solvents reacting with aluminum can become violent and lead to an equipment explosion.	Spray applicators require that aluminum inlet fittings be replaced with stainless steel. Aluminum is widely used in other spray application equipment - such as material pumps, regulators, triggering valves, etc. Halogenated hydrocarbon solvents must never be used with aluminum equipment during spraying, flushing, or cleaning. Read the label or data sheet for the material you intend to spray. If in doubt as to whether or not a coating or cleaning material is compatible, contact your coating supplier. Any other type of solvent may be used with aluminum equipment.

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

AREA Tells where hazards may occur	HAZARD Tells what the hazard is	SAFEGUARDS Tells how to avoid the hazard
Personal Protective Equipment	Always wear appropriate personal protective equipment and cover all skin when spraying, servicing equipment, or when in the work area	Protective equipment helps prevent serious injury, including long-term exposure; inhalation of toxic fumes, mists or vapors; allergic reaction; burns; eye injury and hearing loss. This protective equipment includes but is not limited to: • A properly fitting respirator, which may include a supplied-air respirator • Chemically impermeable gloves • Protective clothing and foot coverings as recommended by the fluid manufacturer and local regulatory authority • Protective eyewear • Hearing protection.
Toxic Substances	Toxic Fluid or Fumes Hazard	Toxic fluids or fumes can cause serious injury or death if splashed in the eyes or on skin, inhaled or swallowed. Read Safety Data Sheet (SDS) for handling instructions and to know the specific hazards of the fluids you are using, including the effects of long-term exposure. When spraying, servicing equipment, or when in the work area, always keep work area well ventilated and always wear appropriate personal protective equipment. See Personal Protective Equipment warnings in this manual. Store hazardous fluid in approved containers and dispose of it according to applicable guidelines.

AREA Tells where hazards may occur	HAZARD Tells what the hazard is	SAFEGUARDS Tells how to avoid the hazard
Spray Area	Skin Injection Hazard	High-pressure fluid from gun, hose or fitting leaks, or ruptured components may pierce skin. This may look like just a cut, but it is a serious injury that can result in amputation. Get immediate medical treatment. Do not point the spray gun at anyone or at any part of the body. Do not put your hand or fingers over the gun fluid nozzle or any fittings in the hose or proportioner. Do not attempt to stop or deflect leaks with your hand, body, glove, or rag. Do not “blow back” fluid; this is not an air spray system. Follow Pressure Relief Procedure, before cleaning, checking, or servicing equipment. Use lowest possible pressure when purging, recirculating, or troubleshooting. Check hoses, couplings, and fittings daily. Service or replace leaking, worn, or damaged parts immediately. High pressure hose sections cannot be recoupled; replace the hose section.
Equipment	Equipment Misuse Hazard	Misuse can cause serious injury or death. For professional use only. Use equipment only for its intended purpose. Call your Carlisle distributor for information. Read manuals, warnings, tags, and labels before operating equipment. Follow instructions. Check equipment daily. Repair or replace worn or damaged parts immediately. Do not alter or modify equipment. Use only Carlisle parts and accessories. Do not exceed the maximum working pressure or temperature rating of the lowest rated system component. See Technical Data in all equipment manuals. Use fluids and solvents that are compatible with equipment wetted parts. Route hoses and cables away from traffic areas, sharp edges, moving parts, and hot surfaces. Do not use hoses to pull equipment. Comply with all applicable safety regulations.

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INTRODUCTION

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

The QuickHeat hose has roughly double the heating power compared to most other SPF hoses and directly heats the fluid from inside the hose, which results in fast and efficient fluid heating, even in cold climate conditions. QuickHeat hoses have embedded temperature and pressure sensors, independent A & B hose heating, and up to six independent heating zones to improve temperature control. QuickHeat hoses provide sensor power and signal communication without cables or connectors, providing reliability and reducing failure options. 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.

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

PRODUCT FEATURES

Fast and reliable heat

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

Real-time system control

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

Cut service costs

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

Reduced electrical connections

Resulting in less maintenance issues.

More heat control and less risk

Independent heat sensors allow system to adjust temperature.

Lighter and more flexible hoses for less sprayer fatigue

SYSTEM COMPONENTS

The QuickHeat hose has the following components:

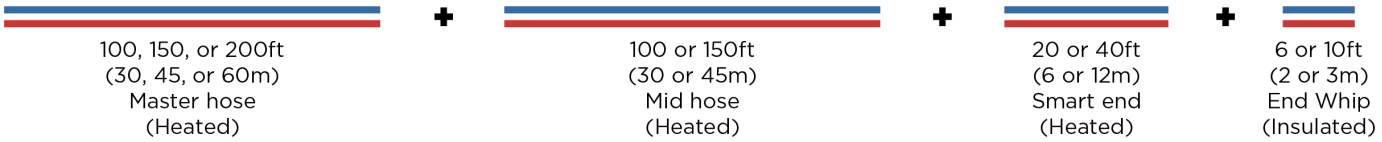
- Potted modem (1 per hose segment)
- Material Hoses (1 per material and per segment)
- Heater wires (1 per material and per segment)
- Heater power cables (1 per material and per segment)
- Master hose low voltage (24 VDC) power cable
- Master hose EtherCAT cable
- Fiber Optic status light cable
- Air hose (one per hose segment)

Hose Configurations

Depending on the length needed for the entire hose system, you can set it up in 2 different configurations. The hose length cannot exceed 350ft for either the IS30 or IS40 systems.

4-zone configuration

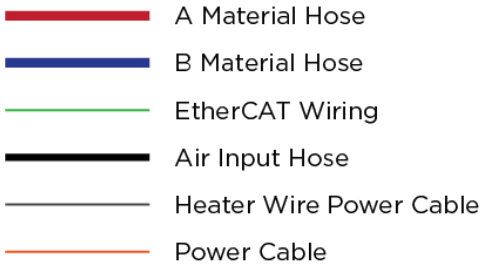
6-zone configuration



Hose Pneumatic, Hydraulic and Power connections

The QuickHeat hose structure and connections vary depending on the configuration selected.

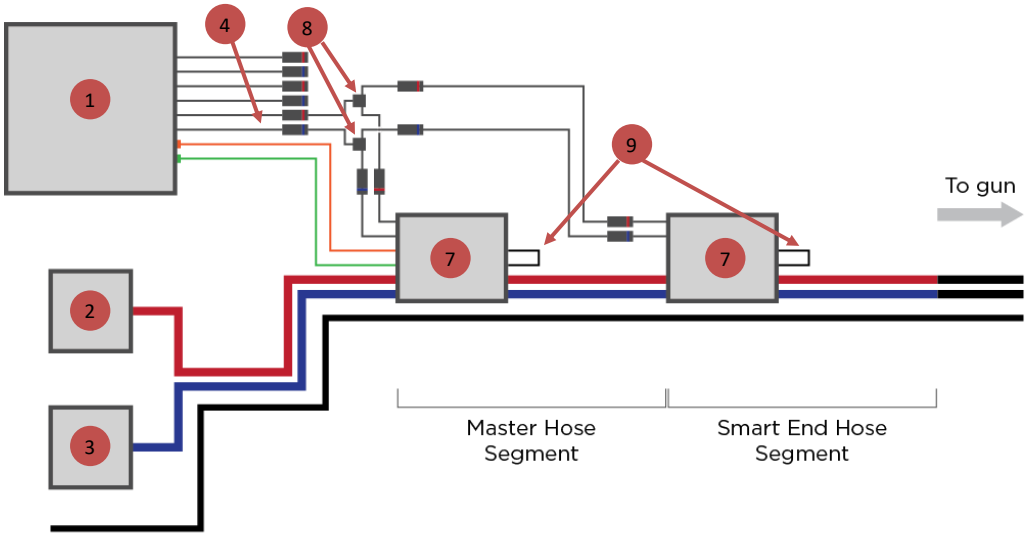
1. Proportioner Control Module
2. Material A Fluid Module
3. Material B Fluid Module
4. Zone 1, 2, 3 & 4 Heater Wire Power Cable
5. Zone 1 & 2 Heater Wire Power Cable
6. Zone 3, 4, 5 & 6 Heater Wire Power Cable
7. Hose Segment Modem
8. Power Cable Splitter
9. Material A & B Circuit board Power Cable



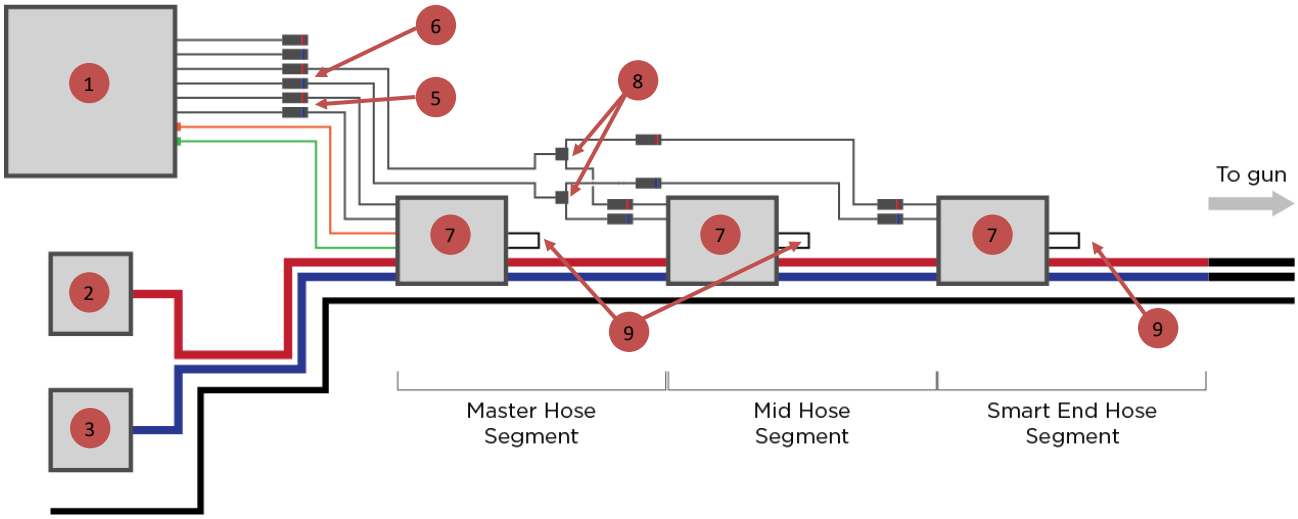
NOTE

Communication from modem to modem (after the Master) travels through the communication layer in the hose (referenced in the "Hose Layer" section).

4-Zone Configuration (You may use a 4 or 6-Zone proportioner)



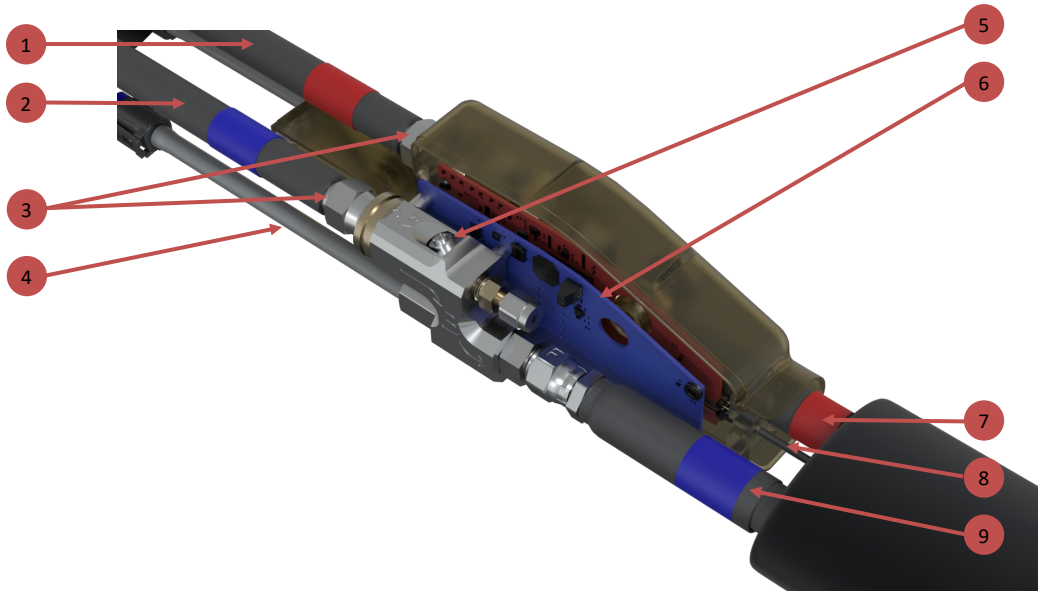
6-Zone Configuration (Requires a 6-Zone proportioner)



Potted Modem Structure

Each hose segment has a potted modem at the start of the segment. The modems may differ depending on whether they are part of a master, mid or smart-end segment. The differences are included in the installation section of this manual. The B-side of the modem below is shown

1. Material A input
2. Material B input
3. Material temperature probes (A & B) (not shown in diagram below)
4. Fluid heater cables
5. Fluid pressure sensors
6. Circuit boards
7. Material A output
8. Fiber optic status cable



without a cover for reference.

Benefits

- Fully ruggedized potted electronics
- Fully sealed set of fluid fittings
- Built-in multi-colored LED and fiberoptic feedback for system status
- High-resolution process control and communication electronics
- Independently-replaceable A and B side design
- Minimized connections

- Independent pressure and temperature sensing control

1. Santoprene
2. Proprietary communication layer
3. Thermoplastic Urethane (TPU)
4. Fiber braid
5. Nylon core

Hose Layers

Dimensions (Length)	Master hose: 100, 150, or 200ft length (30, 45, or 60m) Mid hose: 100 or 150ft length (30 or 45m) Smart-end: 20 or 40ft length (6 or 12m) Whip: 6 or 10ft length (2 or 3m)
Dimensions (Diameter)	The hose has an internal diameter of 3/8 in (Master, Mid, and Smart-end) and 1/4 in ID on the insulated whip
Weight	150-250lb (68-113kg) (depending on added components and configuration) without any
Temperature differential	>100℉ (37℃) DeltaT (over full length of hose system)
Maximum working pressure	2,250 PSI (155 BAR)
Maximum operating temperature	200℉ (93℃)
Minimum bend radius	8 in (20cm) (entire hose bundle)

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INSTALLATION

Before unpacking, note the configuration labels on the proportioner and hose packaging.

See IS40 manual for instructions on pairing modems and selecting communication frequency.

WARNING

You should only disconnect and reconnect hoses for maintenance or replacement procedures. Please refer to the Hose Replacement section in Maintenance

Before operating the QuickHeat Hose, ensure all the following installation steps have been completed.

REQUIRED TOOLS AND HARDWARE

- Open ended wrenches: two 11/16 in, two 5/8 in, one 9/16 in, and one 15mm wrench
- 3 mm Allen wrench
- Utility knife and/or scissors
- Roll of 2 in wide black vinyl tape (provided)
- Recommended four stainless steel caps and plugs (JIC5 and JIC6)
- Spare insulation and wrap material (provided)
- Black permanent marker (For installation)

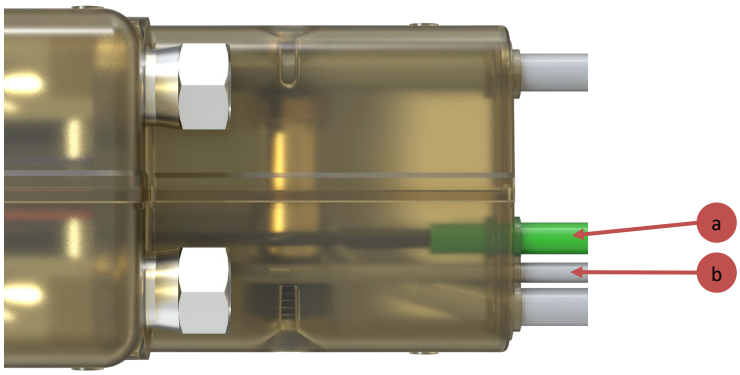
Also required supplies for depressurized wetted systems:

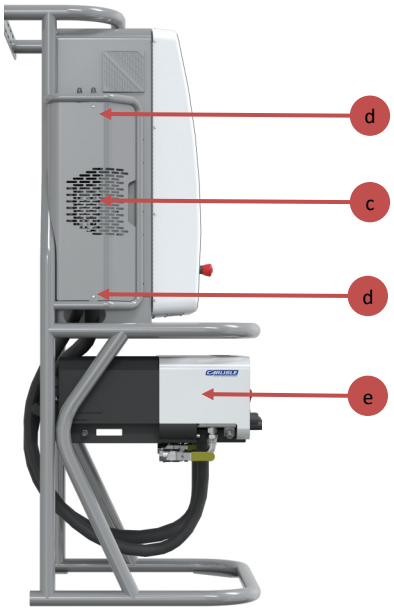
- Safety glasses and/or face shield
- Nitrile gloves
- Plastic sheeting 10x10ft minimum recommended
- Absorbent pads and/or paper shop towels

PROPORTIONER-TO-HOSE CONNECTIONS

The first phase of the installation is connecting the master hose modem to the proportioner system. To achieve this:

1. Identify the Master Hose module through the serial number on the product. The master module is the only one that contains a green EtherCAT cable (a) and a thin grey low voltage (24 VDC) power cable (b).
2. Remove the modem area guard from the proportioner system (c) by removing



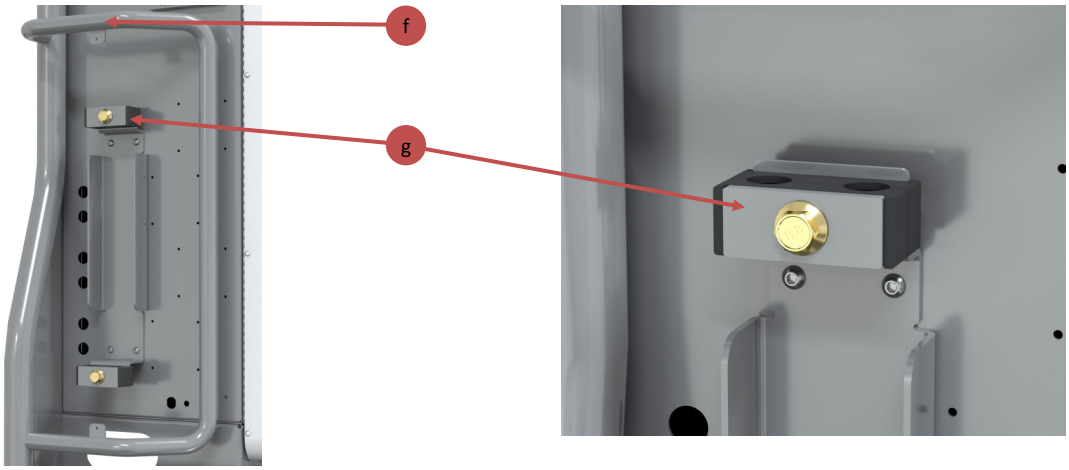


NOTE

The QuickHeat Hose assembly is compatible **only** with the IntelliSpray System.

the two screws (d) using a 3mm Allen wrench. Be careful not to drop the screws into the fluid modules below (e).

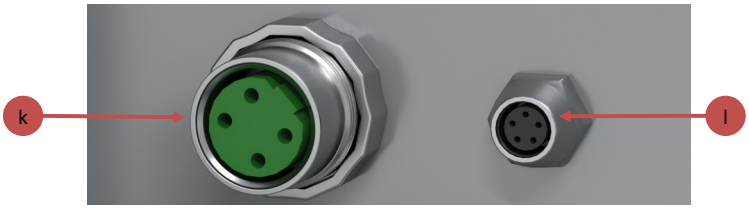
3. For easier installation and to minimize tension, place the hose on top of the proportioner system and feed the modem into the guarded area through the top of the hose guard bar (f). Loosen the screws using a 14mm wrench if needed.
4. Position the modem and place into the top clamp (g) loosely, while being careful to leave the fiber optic cable away from clamp (do not



pinch the cable).

5. Connect the jumper hose fittings (h) to the bottom modem inputs (i) and tighten using the Flats method (discussed in the “Flats Method” maintenance section).
6. Locate the heater power cables (j) on the left of the guarded area.
7. Connect each heater power cable to their corresponding connectors. Be careful to match material colors (A: Red, B: Blue) and zones for each connection (i.e. red Zone 1A to red Zone 1A). For the 4-Zone configuration, first connect a Y-Splitter to the proportioner cables before

connecting to the Master hose (see 4-Zone Configuration diagram in Pg. 17). The resulting pairs will connect to the Master Hose and the



Smart-end hose.

8. Connect the etherCAT and low voltage power cables to their corresponding inputs (k) & (l), respectively.
9. Connect the air hose to main air supply (quick disconnect).
10. Tighten both the bottom and top clamps (referenced in step 4) using a 15mm wrench.
11. Reinstall the modem area guard while feeding the fiber optic cable through one of the mesh holes in the guard.

HOSE-TO-HOSE CONNECTIONS

Depending on the configuration purchased, a hose-to-hose installation may be required. For the installation procedure, please refer to the details below:

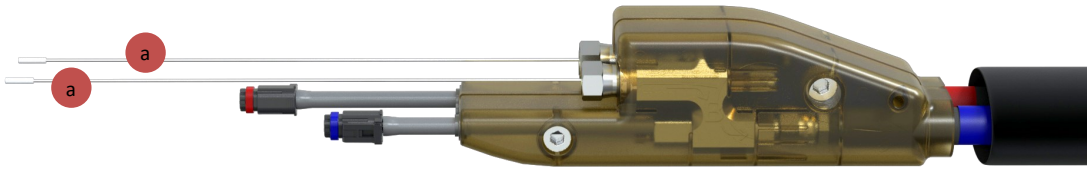
CAUTION

Ensure that the system is powered down before continuing. Allowing fittings (A&B) to touch while the system is energized (SELV 24vdc) will cause a fault condition that will require a system reboot. Bridging fittings with a metal tool will also generate the same fault .

- **4-Zone configuration**—No hose-to-hose installation required. Hoses will arrive connected within the box.
- **6-Zone configuration**—There is one hose-to-hose connection needed. Master Segment will arrive in Box 1 out of 2 and Mid-Hose will arrive connected to the Smart End in box 2. To connect Master to Mid, please follow the steps detailed below.

Master Hose to Mid Hose Connection

1. Tip the last 3ft of the Master Hose (male fitting end) towards the ground and gently shake it. This allows the Isolator to drop to the closest fitting for an easier probe install.



WARNING

DO NOT REMOVE the temperature probe tips

NOTE

The entire IS40 Proportioner and hose system are factory tested using an inert oil and subsequently blown out. Some residual oil may be noticed in the lines once the caps and plugs are removed, but there are no chemical interaction concerns upon the initial installation.

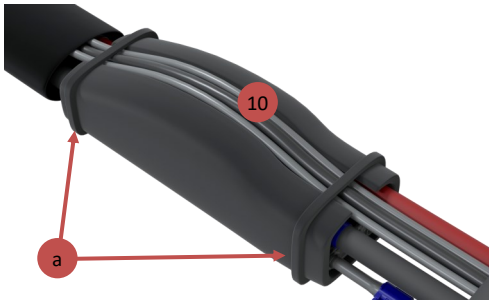
NOTE

The Mid hose sections come with temp probe sheaths installed on the modem, to protect them from damage. You need to remove those in order to install any mid to a master segment. Keep the temperature probe sheaths, caps and plugs in case it is ever necessary to seal that section separately.

NOTE

When inserting the probes, if you encounter resistance that is causing them to bend, back up a few inches, straighten the hoses and the probes and try again. The probes are tip sensitive and will not be damaged by light bends.

2. Lay the last 3ft of the Master Hose (male fitting end) and the first 3ft of the Smart End (female fitting end) including the modem in a straight line in front of each other.
3. Lightly straighten the temperature probe wires coming from the Smart End Modem (a).
4. Carefully, slide the temperature probes into the A and B hoses of the Master Hose simultaneously
5. Tighten the fittings using the Flats method (discussed in the “Flats Method” maintenance section).
6. Lay out the heater wire power cables from both the Master and Mid hoses.
7. Connect the cables to their matching labels (ensure connectors have fully clipped into place).



NOTE

DO NOT TAPE POWER CABLES inside the bundle. Allow the cables and air hose to move as freely as possible for strain relief. Flex the tension isolation zone to a approximately 8in (20cm) radius to ensure enough slack.

8. Lay the air hoses coming from the Master and the Mid separate from the power cables and make the swivel connection using a 1x5/8 open end wrench, and a 1x9/16 open end wrench to tighten.
9. Insert the Mid hose modem into the protective boot (provided) and close using the vinyl tape.

10. Insert the air hose and the heater wire power cables into the protective modem boot through the outside center gap and tape (a).
11. Add insulation (provided) to any exposed hose sections for both thermal and consistent bending.
12. Close up the hose wrap from each section and cover the modem boot with the provided joint wrap piece. Secure with 2” wide electrical tape for 4” on both sides of the joint. DO NOT cover the entire modem with tape (4” inches from the seam in both directions on both ends) and only pull tape as tight as required to remove it from the roll.

HOSE-TO-GUN CONNECTIONS

Once all connections between the hoses are completed, the final step is to connect the final hose to the spray gun. To install:

1. Identify the insulated hose whip.

NOTE

The QuickHeat Hose is specially designed for use with the Carlisle ST1 Air Purge Spray Gun. If you need to use other equipment, we recommend

HOSE USAGE

KEY OPERATIONAL REQUIREMENTS

- All air must be purged from system before use to avoid solidifying material in the lines (see proportioner manual).
- Do not heat hose without fluid to avoid damaging the hose and causing leaks
- Remove entire hose from hose rack in rig before heating to avoid overheating and temperature variations
- Remove tight loops in hose prior to pulling hose into position to avoid hose kinking
- On initial startup, straighten sections of hose near modems to allow best temperature feedback to unit
- Do not pull on hose sections that are not in line-of-sight to prevent tight loops and kinking
- Leave hose under positive pressure when not in use to avoid reacting with the ambient environment

FIBER OPTIC CABLE LED INDICATORS (STATUS LIGHTS)

Fiber optic status lights (5Hz Frequency) are provided at the inlet end of each heated hose section. Each light color and state reflects on a different status.:

- Flashing Green = Hose status OK, but no color status setting from HMI
- Flashing Yellow = HoseLink communication is marginal - warning level
- Flashing Purple = Hose pairing error or possible crosstalk - warning level
- Flashing White = Hose firmware updating (informational)
- Flashing Blue = Bluetooth connection to modem (informational)
- Flashing Red = Hose internal error

PRODUCT TROUBLESHOOTING

Leak between hose sections at JIC fitting	A or B material leaking out of jacket or loss of pressure	Power down the system. Trace down source of leak. Start by opening jacket 3ft (1m) before and after joint to determine direction and extent. If wet, open joint, clean up residual fluid and inspect fittings. Tighten (1.0 to 1.25 flats for JIC5) on A side, (1.25 to 1.5 flats for JIC6) on B side. Check that clamps are tight enough to constrain hose. Make sure insulation is taped into position while still allowing power cable slack loops to move freely. Close up hose wrap. Check the clamps for tightness.
Loss of communication between A & B side on a particular modem	Error message on panel and yellow light at a modem	Inspect modem optical fiber lights. If any of the lights are flashing yellow or red, open that joint section. Power down the system. Inspect the jumper connection between the two halves. Remove any debris or chemical residue from the connection with IPA. Allow to dry. Put the connection back together. Power up the unit. Confirm green light at the modem. Put insulation and joint wrap back in place. An additional step for the master modem is to unroll the hose at least one full zone (not just the Smart End). If there is still no green light at master modem, run a frequency scan (on the HMI) and try selecting a new frequency channel.
A or B Side Hose run over, cut or kinked	Known incident or evident damage	Remove damaged section. Cap and plug off good ends. Record date when incident occurred with details in case other subsystems are affected and to start clock on A side material vs. allowable storage time. Flush if necessary. Replace A or B hose section affected (new hose section required)
Leak from inside the potted section of the modem	Leak not coming from JIC fittings. Watch for a leak from a modem connection	Inspect the system. Tracing the source of a leak is not always easy. Dry off areas, inspect for source. Very minor 'wicking' A-side leaks may seal on their own if allowed to dry. If the leak is major, replace A or B hose section.
No heat	Front Panel	Inspect material hose and power cables and connectors for damage. Check heater wire breakers. Check for system error codes. Make sure power cable clamps, strain relief loops and slack loops are in the correct locations and that tape is not impeding the ability of cables to pull from slack loops when under tension.
Fluid temperature over setpoint upon startup	As given on control panel or observed at spray gun	Remove all hose from hose rack. Lay house straight for a three feet upstream of modem. Spray for a few seconds to move fluid past probes as the fluid temp is within 15F degrees of setpoint.
Fluid temperature variation while spraying	As given on control panel or observed at spray gun	Remove all hose from hose rack

No air pressure	Insufficient flow at gun or audible air leak	Inspect hose. Open section near modem (on the downstream side of the joint). Inspect swivel fitting. Reconnect or tighten fitting as required. A cut air hose can be spliced with a 1/4in barb to barb fitting.
Hose insulation separation	Exposed hose or notably thin section inside wrap	Splice in replacement insulation with 2in wide black electrical tape.
Cut hose wrap	Evident tear	Close up with 2 or 3in wide black electrical tape. Wrap as loosely as possible to not compress insulation or impede power cables from moving freely inside the bundle.

PRODUCT MAINTENANCE

WARNING

Shut off power and depressurize system before servicing

REGULAR MAINTENANCE PROCEDURES AND RECOMMENDATIONS

After completing a job, power down the system and allow positive pressure to remain in the fluid lines to minimize the chance of the chemistry interacting with the ambient environment .

Regular Inspection

Continuous use or lack of use of the system may both lead to system malfunctioning. Please conduct regular inspections to the system according to the frequency table below.

After every use	Leak inspection in hose fittings and hose modules.
After every use	Visual inspection of damage to each hose section (excessive bending, breaks or scratches on the external hosing).
Weekly	If unit has not been used, bleed A side of system from gun manifold to remove any residual/crystalizing Isocyanate from hose. Bleed until fluid appears normal. Doing so will eliminate possibility of clogging hose due to Isocyanate crystallization. If in climate of high humidity, conduct step more often.
Monthly	With system powered down, remove proportioner guard cover and visually inspect cable for any connection issues. To minimize stress on pins, do not pull apart any electrical connectors if they appear to be properly protected and there are no error codes.
Yearly	Remove Modem boots and inspect modems for excessive wear, wire damage, and/or damaged/cracked shell. Replace as necessary. If unit is used frequently, conduct step more often.

Storage

To maximize the life of the material and hoses, please store the unused equipment in spaces where the ambient temperature is 60℉ and 100℉ (15 to 37℃)

For storage, wrap hoses in a minimum of a 3ft (1m) diameter to avoid tight bends that may damage the equipment.

340970	KIT MODEM JACKET
340971	6ft 1/4 INSULATED WHIP
341295	10ft 1/4 INSULATED WHIP
347412	3/8ni 150ft Master A Segment
347413	3/8in 150ft Master B Segment
347414	3/8in 100ft Master A Segment
347415	3/8in 100ft Master B Segment
347416	3/8in 150ft Mid A Segment
347417	3/8in 150ft Mid B Segment
347418	3/8in 100ft Mid A Segment
347419	3/8in 100ft Mid B Segment
341069	3/8in 20ft SMART END A SEG OPT
341070	3/8in 20ft SMART END B SEG OPT
341559	3/8in 40ft SMART END A SEG OPT
341570	3/8in 40ft SMART END B SEG OPT
347420	A HOSE CABLE 155ft
347421	B HOSE CABLE 155ft
347422	A HOSE CABLE 105ft
347423	B HOSE CABLE 105ft
341062	100ft AIR HOSE
347424	100ft AIR HOSE - MID
341063	150ft AIR HOSE
347425	150ft AIR HOSE - MID
341064	20ft AIR HOSE
341556	40ft AIR HOSE
347426	10ft AIR HOSE
347427	6ft AIR HOSE
341067	100ft BLACK SCUFF JACKET
341068	150ft BLACK SCUFF JACKET
347428	50ft SCUFF JACKET
347429	HOSE CLAMP ASSEMBLY
347430	HOSE CABLE CLAMP ASSEMBLY
347431	HOSE CLAMP ASSEMBLY
347432	SUPPLY AB JUMPER HOSE KIT
347433	MODEM BOLT (SHCS 3/8-16 X 1.5)

HOSE SECTION REPLACEMENT

The following procedure is only needed in the case a hose section needs to be replaced due to maintenance procedures or damage. Please refrain from disconnecting and reconnecting the hose segments unless required.

Hose structure varies depending on the configuration of the system and the process is different whether connecting a Master, Mid or Smart End hose. Read the following instructions thoroughly without skipping any step to guarantee the system functions correctly.

Each hose section can be removed and replaced independently. To do so, follow the next steps.

Single Hose Section Side Removal

1. Make sure the system is powered off and depressurized.
2. Identify the hose segment you wish to replace.
3. Remove the hose wrap from the entire section, remove modem jacket section and modem boot. From the previous modem until right

WARNING

DO NOT REMOVE the temperature probe tips

   before the next modem connections.
4. Have the following items ready to use:
   - Confirmed correct replacement hose section
   - Hand tools, PPE
   - Plastic sheeting and absorbent materials
   - Caps and plugs as noted above in the “Installation” section
5. Take pictures of existing configuration for reference. Position plastic sheeting and paper towels to contain dripping fluid. Slowly crack open fittings to release any residual pressure. Disconnect the hose fittings on the furthest side of the hose (next modem connection). Plug and cap fittings when exposed to minimize dripping. Be careful not to damage the temperature probes. Re-use probe covers to seal that end.
6. Disconnect m8 cable between modem halves
7. Separate modem halves by using a 5/16" Allen key to remove modem bolts.
8. Identify the power cable and hose clamps installed in that hose section. It is recommended to mark down on the hose the exact location and the type of each clamp. Please refer to the “Clamp Location Mapping” section in maintenance for a full map of clamp locations.
9. Using a 3/16” Allen key, remove the screw located in the lower portion of the clamp(s). Most times, the clamps will leave a mark on the hose that will help identify the original location of the clamp when reinstalling.
10. Remove the hose section.

11. Follow safety precautions for handling chemistry as given in in material SDS.

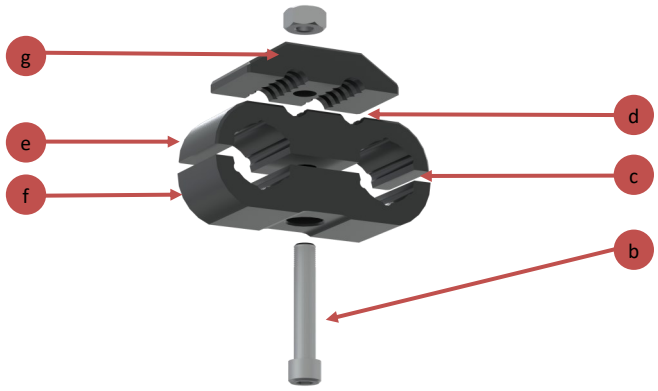
Hose Section Removal (Two Sides)

If changing both sides of the hose (two people are recommended for this operation), to prevent cross-contamination:

1. Use plastic sheets to separate both sides.
2. Use separate gloves and wrenches for each side, or thoroughly wash before contact with other material.
3. This would not require clamp removal and jacket removal (length-wise)
4. Take pictures of existing configuration for reference. Remove the jacket over modem, modem boot, air hose connections, fluid connections, and power connections for the hose segment.
5. Separate one side at a time and clean chemistry between steps.
6. If easier to manage, remove necessary clamps to splay hoses apart (keeping chemistry separate).
7. Have plugs and caps ready to plug hoses upon removal.
8. If necessary to seal prior to scrapping, cut off temperature probes on the hose section to be removed to install plugs into modem. Otherwise, a capped sheath is required to cover the length of the temp probe.
9. Follow safety precautions of handling chemistry by following material MSDS.

Single Hose Section Side Reinstallation

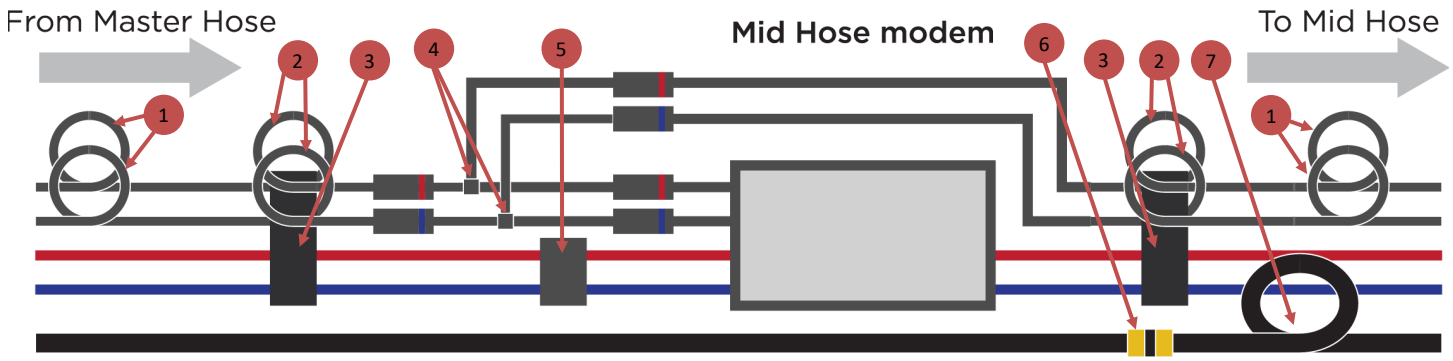
1. Position the new hose segment next to the other material hose within the hose section.
2. Reconnect the fluid fittings and tighten using the “Flats Method” discussed further into the maintenance section.
3. Identify the clamp locations through the “Clamp Location Mapping” section in maintenance, or using the marks on the hoses left when removing the old segment.
4. Loop the power cable around the clamp to prevent direct axial tension (tension relief) and lay an additional slack loop upstream of the clamp. Slack should be directed towards nearest modem.



NOTE

Do not route the fiber optic cable through the clamp.

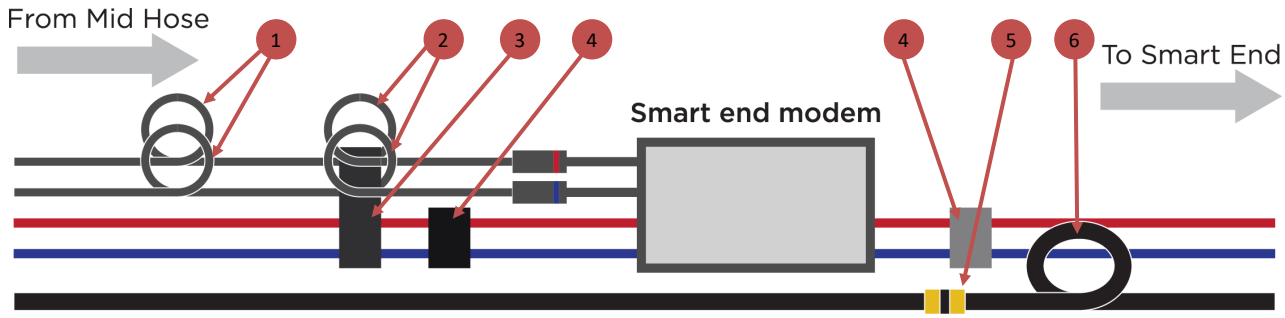
5. Loosen the screw (b) and insert the material hoses in the lower spaces (c) and the power cables in the upper spaces (d).
6. Tighten the screws while making sure that no spacing remains between the middle (e) and lower (f) sections of the clamp (material hose spaces). A gap should remain between the top (g) and middle sections of the clamp (power cable spaces).
7. Move new fluid through the entire hose section to bleed out any air pockets immediately after assembly. Check for leaks before covering fittings with wrap.



A Material Hose
B Material Hose
Heater Wire Power Cable
Air Input Hose

1. Power cable slack
2. Power cable tension relief
3. Hose/Power cable clamp
4. Power cable splitter
5. Hose clamp
6. Air connection
7. Air hose slack

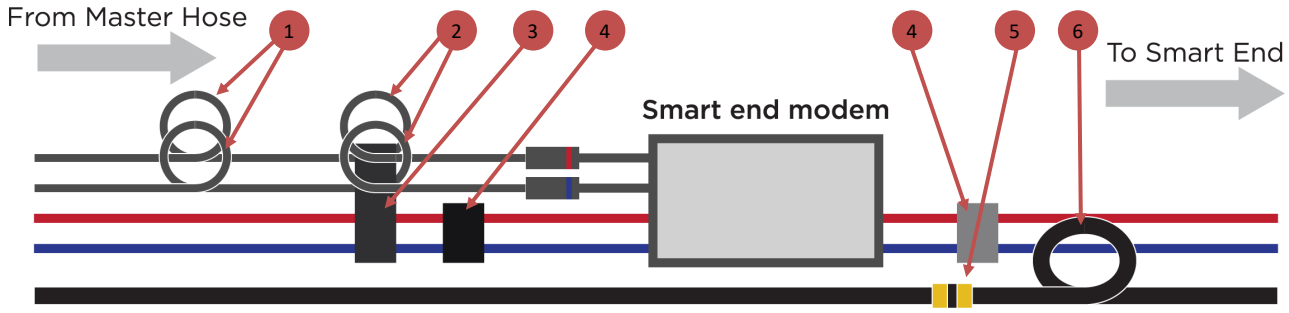
8. Follow the instructions in the “Wrapping new hose sections” section in Maintenance to reinstall the hose wrap.



A Material Hose
B Material Hose
Heater Wire Power Cable
Air Input Hose

1. Power cable slack
2. Power cable strain relief
3. Hose/Power cable clamp
4. Hose clamp
5. Air connection
6. Air hose slack

9. The final connections vary depending on what section you are connecting. A diagram for each section is included below.



A Material Hose
B Material Hose
Heater Wire Power Cable
Air Input Hose

1. Power cable slack
2. Power cable tension relief
3. Hose/Power cable clamp
4. Hose clamp

Master Hose to Mid hose (6-Zone Configuration)

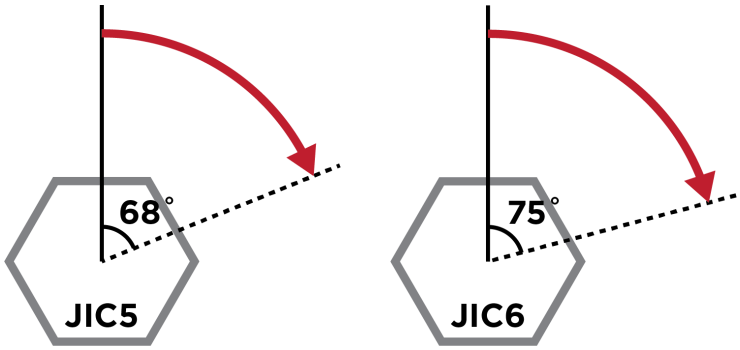
Mid hose to Smart End (6-Zone Configuration)

Master hose to Smart End (4-Zone Configuration)

Wrapping New Hose Sections

After completing the hose section replacement, wrap the hose section at the fittings and modem. Hose jacket should be re-installed around entire hose length with coated side out. Make sure the Velcro along the hose jacket is fully secured. If the jacket is excessively worn, replace jacket section.

Cover boot with hose jacket section, making sure it overlaps both jacket sections on distal and proximal hose sections. Secure seams of jacket with 2in electrical tape. Apply tape with light tension to allow inside cables to move as freely as possible.

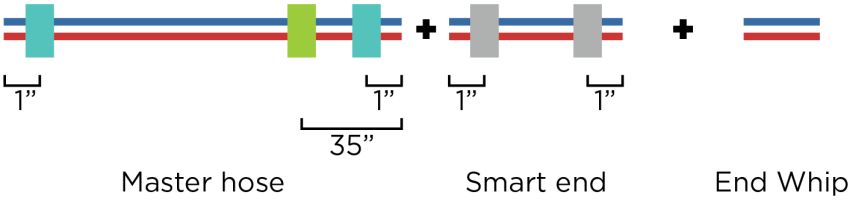


Flats Method

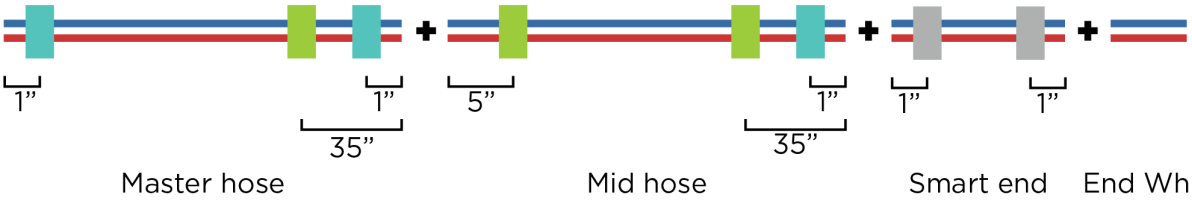
To tighten the fittings using the Flats method:

- Mark starting position on the fitting with black permanent marker to use as reference.

4-zone configuration



6-zone configuration



Power cable and hose clamp (a)

Hose clamp (b)

Hose clamp (insulated whip) (c)

LIMITED WARRANTY

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

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

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

NOTE:

WRAPPING THE APPLICATOR IN PLASTIC WILL VOID THIS WARRANTY.

CFT'S ONLY OBLIGATION UNDER THIS WARRANTY IS TO REPLACE PARTS THAT HAVE FAILED BECAUSE OF FAULTY WORKMANSHIP OR MATERIALS. THERE ARE NO IMPLIED WARRANTIES NOR WARRANTIES OF EITHER MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

CFT ASSUMES NO LIABILITY FOR INJURY, DAMAGE TO PROPERTY OR FOR CONSEQUENTIAL DAMAGES FOR LOSS OF GOODWILL OR PRODUCTION OR INCOME, WHICH RESULT FROM USE OR MISUSE OF THE EQUIPMENT BY PURCHASER OR OTHERS.

EXCLUSIONS

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

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