

## LiteStream

## **Operations Manual**



Ingersoll Rand 1872 Enterprise Drive Rochester Hills MI 48309

Phone Tech Support (248) 293-5700 (866) 284-5509







#### Ingersoll Rand LiteStream Systems

Ingersoll Rand's LiteStream System Packages are designed to support pneumatic dispensing configurations. They can be easily applied to almost any application for dispensing. The LiteStream systems are easy to order and configure. Simply choose the controller with a communication package (Discrete or Device Net), the dispense head (flow meter or shot meter) and your corresponding dress-out packages.

Our unique packages are designed for easy step-by-step ordering and configuration at any facility. The kits will arrive individually packaged with instructions for set-up and installation. There are primary kits that are required for all systems, as well as an abundance of accessories and optional kits that are available.

#### Included in this manual:

- Packages/Kits for customization
- Installation instructions
- LiteStream control (user) instructions
- Pump and temperature controls.
- Layout drawings
- Kit numbers and spare parts

For Safety Information refer to Dispensing Systems Product Safety Information Manual Form 04581930.

Manuals can be downloaded from www.irtools.com.

#### **Abbreviations & Definitions**

VAC Volts AC VDC Volts DC

GND Electrical ground (earth)

msec millisecond

Psi pressure; pounds per square inch

L Liters

cc Cubic Centimeters

S Seconds

#### LiteStream Components:

1K Shot Meter Dispense Head1R Flow Meter Dispense HeadTCU Temperature Conditioning Unit

RTD Resistive Thermal Device (used for measuring the temperature of the dispense head)

MLDT Magnetostrictive Linear Displacement Transducer (determines how much volume a shot meter has dispensed)



## **INDEX**

KITS NUMBER IDENTIFICATION	7
LITESTREAM SHOT METER DISPENSE HEAD OVERVIEW	7
LITESTREAM SHOT METER DISPENSE HEAD OVERVIEW	8
TYPICAL LITESTREAM SHOT METER DISPENSE HEAD PEDESTAL CONFIGURATION	8
TYPICAL LITESTREAM SHOT METER DISPENSE HEAD PEDESTAL CONFIGURATION	9
TYPICAL LITESTREAM SHOT METER DISPENSE HEAD ROBOT REMOTE CONFIGURATION	10
SHOT METER DISPENSE HEAD ASSEMBLY	11
LITESTREAM FLOW METER DISPENSE HEAD OVERVIEW	12
TYPICAL LITESTREAM FLOW METER DISPENSE HEAD ROBOT REMOTE CONFIGURATION	14
FLOW METER DISPENSE HEAD ASSEMBLY	15
INSTALLATION - GENERAL OVERVIEW	16
INSTALLING A SHOT METER DISPENSE HEAD	18
INSTALLING A FLOW METER DISPENSE HEAD	18
INSTALLING A FLOW METER DISPENSE HEAD	19
INSTALLING CABLE ASSEMBLIES	19
INSTALLING CABLE ASSEMBLIES	20
CONNECTION TO POWER	21
LITESTREAM CONTROLLER	22
System Modes	
Modesstates	
Auto	
Active Cycle	25
Active CyclePurge Enable	25 25
Active Cycle	25 25
Active CyclePurge Enable	25 25 26
Active Cycle Purge Enable  LITESTREAM CONTROL METHODS  Pressure and Flow Control	25 26 26 26
Active Cycle Purge Enable  LITESTREAM CONTROL METHODS  Pressure and Flow Control  Temperature control  USER INTERFACE	25 26 26 26
Active Cycle Purge Enable  LITESTREAM CONTROL METHODS  Pressure and Flow Control  Temperature control	25 26 26 26 27
Active Cycle Purge Enable  LITESTREAM CONTROL METHODS  Pressure and Flow Control  Temperature control  USER INTERFACE  Main Menu System Menu Set Up Menus	25 26 26 27 27 28 29
Active Cycle Purge Enable  LITESTREAM CONTROL METHODS  Pressure and Flow Control Temperature control  USER INTERFACE  Main Menu System Menu System Menu Set Up Menus Set Up 1 - General Information	25 26 26 27 27 29 30
Active Cycle Purge Enable  LITESTREAM CONTROL METHODS  Pressure and Flow Control  Temperature control  USER INTERFACE  Main Menu System Menu Set Up Menus	25 26 26 27 27 29 29 30 31



Set Up 4 Purge Request	
Set Up 5 TCU Control	
Material Supply Controls	
Single Pump Pneumatic Package (stand-alone) 900-200	
Single Pump Interface Package (stand-alone) 110-650	
Dual Pump Pneumatic Package 900-201	
Standard Dual Pump Interface Package 110-651	
Deluxe Dual Pump Interface Package 110-652	
Set Up 7 Language Menu	
Set Up 8 LiteStream Internal	
Style Menu	
Logs Menu	
Alarm Menu and Alarm/Warning Information	
Volume Log menu	
Control Menu	
Control Menu – 1R Flow Meter	
Control Menu – Shot Meter (1K)	42
DIGITAL INPUTS DEFINITIONS	40
DIGITAL INPUTS DEFINITIONS	43
DIGITAL INPUTS DEFINITIONS	44
DIGITAL INFO 13 DEFINITIONS	44
DIGITAL OUTPUTS DEFINITIONS	45
DIGITAL OUTPUTS DEFINITIONS	46
ANALOG INPUT DEFINITIONS	46
ANALOG OUTPUT DEFINITIONS	46
DEVICE NET I/O	47
DEVICE NET CARD INDICATORS	48
DEVICE NET NODE MAP INPUTS	40
DEVICE NET NODE MAP INPUTS	
DEVICE NET NODE MAP OUTPUTS	51
DEVICE NET NODE MAP OUTPUTS	31
SEQUENCE OF I/O	53
SEQUENCE OF I/O TIMING CHART	54
365-075 LITESTREAM SHOT METER WIRING HARNESS	55
365-076 LITESTREAM FLOW METER WIRING HARNESS	56
365-090 TEMPERATURE CONDITIONING INTERFACE CABLE 2 FEET	57
365-099 PUMP INTERFACE CABLE 20 FEET	57
365-099 PUMP INTERFACE CABLE 20 FEET	58
365-100 PUMP INTERFACE CABLE 100 FEET	58
365-079-50 DISPENSE HEAD INTERFACE CABLE 50 FEET	58
365-079-50 DISPENSE HEAD INTERFACE CABLE 50 FEET	59



365-079-100 DISPENSE HEAD INTERFACE CABLE 100 FEET	59
365-077 DISPENSE HEAD INTERFACE WHIP CABLE 15 FEET	60
365-077 DISPENSE HEAD INTERFACE WHIP CABLE 15 FEET	60
365-078 DISPENSE HEAD INTERFACE WHIP CABLE 15 FEET – HIGH FLEX	60
365-093 AUTOMATION DIGITAL INTERFACE CABLE 30 FEET	61
365-095 AUTOMATION DIGITAL INTERFACE CABLE 60 FEET	61
365-094 AUTOMATION ANALOG INTERFACE CABLE 30 FEET	62
365-096 AUTOMATION ANALOG INTERFACE CABLE 60 FEET	62
PUMP OPTIONS	63
Stand along Duman Control Ontions	6.4
Stand-alone Pump Control Options:	
Single Pump Pneumatic Package (stand-alone) 900-200	
Single Pump Interface Package (stand-alone) 110-650	
Dual Pump Control Options:	
Dual Pump Pneumatic Package 900-201	
Standard Dual Pump Interface Package 110-651	
Deluxe Dual Pump Interface Package 110-652	65
TEMPERATURE CONDITIONING	66
Temperature Conditioning Mechanical Installation	67
Temperature Conditioning Mechanical Installation Temperature Conditioning Electrical	69
AIR INTENSIFIER	72
361T538FXX HIGH PRESSURE MATERIAL FILTER 1 ¼ INCH NPT	73
START UP AND SHUT DOWN PROCEDURES	73
START UP AND SHUT DOWN PROCEDURES	74
Start up procedure:	74
Shut down procedure:	
MAINTENANCE SCHEDULE	76
SHOT METER SYSTEM RECORD DIAGRAM	77
REGULATED FLOW METER SYSTEM RECORD DIAGRAM	78
FAULT AND SYSTEM RECOVERY	78
FAULT AND SYSTEM RECOVERY	79
Low Volume Faults	
High Volume, Refill and Network faults	
Dispense Head	
Material Pump	
Temperature Conditioning Unit	



TECHNICAL DATA	84
ADDITIONAL PARTS	85
Streaming vs Extruding Extruding Nozzle Selection	85 85
ADAPTORS	86
MATERIAL HOSES	87
TRACED HOSE SHOT METER:	88
TRACED HOSE STANDARD NPT	89
TRACED HOSE REMOTE DISPENSE	90
SPARE PARTS:	90
SPARE PARTS:	91
SHOT METER PEDESTAL LAYOUT EXAMPLE:	93
SHOT METER PEDESTAL LAYOUT EXAMPLE:	94
SHOT METER ROBOT LAYOUT EXAMPLE:	95
FLOW METER PEDESTAL LAYOUT EXAMPLE:	96
ELOW METER POROT LAYOUT EYAMRI E-	97



## KITS NUMBER IDENTIFICATION

The table below outlines many of the kits the make up the LiteStream system. More kits are identified in the pump and temperature sections of this manual.

	Deales as Madel Neurolean Communication		
Dookogo #	Package Model Number Summary ackage # Description		
Package #	Description		
Control Units			
	Lita Chronin Controller with Discrete Communication		
110-726 110-727LS	LiteStream Controller with Discrete Communication		
	LiteStream Controller with DeviceNet Communication		
Dispense Head Mo			
115-175LS	Shot-Meter Dispense Head Kit		
110-670LS	Flow-Meter Dispense Head Kit		
Dress-out Model N			
440.700	20' Robot Dressout Kit		
110-720	(need to choose from remote mounting bracket below) 20' Pedestal Dressout Kit		
440 7001 0			
110-723LS	(includes dispense head mounting bracket)		
	Kits Model Numbers		
410-333	Flow-Meter Robot Mounting Brackets		
410-334	Shot-Meter Robot Mounting Bracket		
120-726LS	Remote Dispense Valve for Non-Temperature Conditioned System		
120-727LS	Remote Dispense Valve / Temperature conditioning for Shot-Metel		
120-728LS	Remote Dispense Valve / Temperature conditioning for Flow-Mete		
	Connects Controller to Dispense Head Wiring Harness)		
110-700	50' Discrete Cable Kit		
110-701	100' Discrete Cable Kit		
Robot Interface Ca			
110-728LS	30' Discrete Robot Interface Cable		
110-729	60' Discrete Robot Interface Cable		
110-730	30' DeviceNet Robot Interface Cable		
110-731	60' DeviceNet Robot Interface Cable		
Temperature Cond			
110-702	Shot-Meter TCU Package - for 50' Dressout		
110-703	Shot-Meter TCU Package - for 100' Dressout		
110-738	Flow-Meter TCU Package - for 50' Dressout		
110-739	Flow-Meter TCU Package - for 100' Dressout		
110-755	Robot Extension for additional 5' of conditioning (Optional)		
110-747	Pedestal Extension for additional 5' of conditioning (Optional)		
Pump Controls	100: 100 8		
900-200	LS Single Pump Pneumatics		
900-201	LS Dual Pump Pneumatics		
110-650	LS Single Pump Interface		
110-651	LS Dual Pump Interface		
110-652	LS Dual Pump Deluxe Interface		
	able (needed for any interface package above)		
110-736LS	20' Pump Interface Cable		
110-737LS	50' Pump Interface Cable		
Pedestals and Sta			
410-301	LiteStream Controller Stand		
410-332LS	LiteStream Pedestal		
410-302	Universal Stand <b>only</b> , for filters, ball valves,Y pipes, etc.		
110-907	Std. Filter Assembly		
100-400LS	Y Pipe w/ Single Ball Valve		



## LITESTREAM SHOT METER DISPENSE HEAD OVERVIEW

The Diagram shown below is an example of the I/O communication between the automation controller, the LiteStream controller and Shot Meter dispense head.

The shot meter dispense head creates the material flow at the point of application and controls volume of material being dispensed via command signals from the robot. The dispense head can be mounted on a pedestal or robot (automation) assembly.

The LiteStream controller communicates with the robot – automation controller via discrete or device net communication.

The LiteStream Controller receives signals from the Automation controller which determine the signals being sent to the Shot Meter dispense head and feedback signals to the Automation controller. The Automation controller determines the body style for volume checking, Dispense Valve On/Off Flow command –flow rate and Dispense complete.

The LiteStream controller sends signals to the Automation controller such as Dispenser Ready, Fault Major and Minor, In Process and Volume OK

The Shot Meter Dispense head is electrically controlled by the LiteStream controller. Material flow is controlled in a closed loop environment using a linear transducer and a pressure transducer as feed back. A Servo Valve signal controls the direction and force of the air cylinder, which creates the material force/flow. The servo signals in conjunction with the feedback signals allow quick accurate response of flow volume and rates. The dispense head has a refill and dispense mode and is limited to 70 cc per dispense.

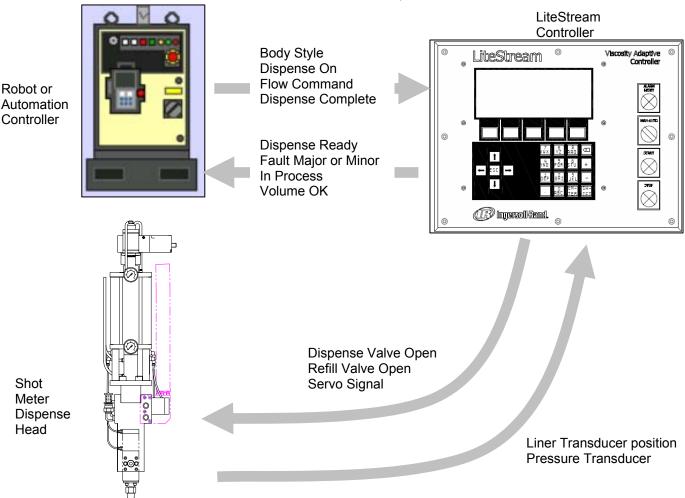


Fig 1



# TYPICAL LITESTREAM SHOT METER DISPENSE HEAD PEDESTAL CONFIGURATION

Only major components. See system layout drawing for actual configuration.

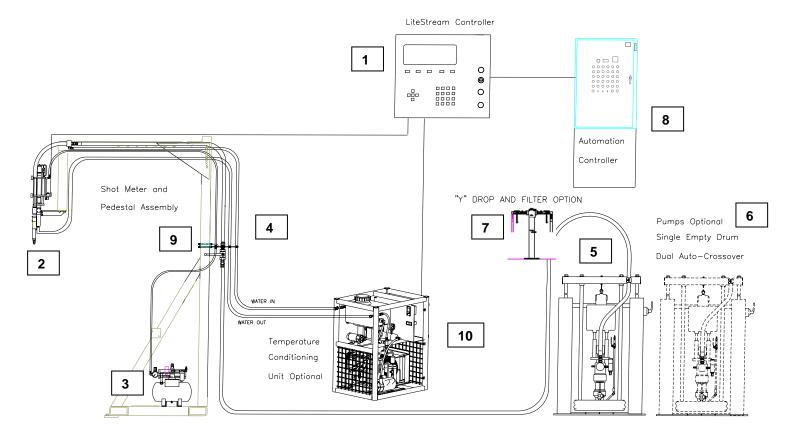


Fig 2

Detail#	Description
1	LiteStream Controller
2	Shot Meter Dispense Head 115-175LS
3	Air Intensifier
4	Material and Pneumatic plumbing
5	Material Pump
6	Material Pump Automatic Crossover (Optional)
7	Material Filter (Optional)
8	Automation Controller
9	Pedestal
10	Temperature Condition Unit (Optional)



# TYPICAL LITESTREAM SHOT METER DISPENSE HEAD ROBOT REMOTE CONFIGURATION

Only major components. See system layout drawing for actual configuration.

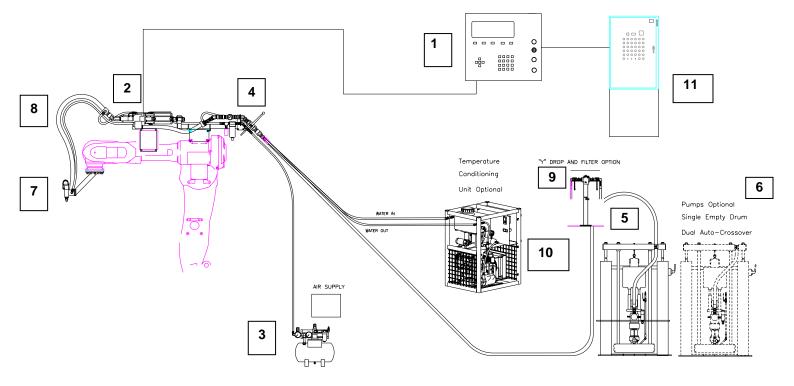


Fig 3

Detail#	Description
1	LiteStream Controller
2	Shot Meter Dispense Head 115-175LS
3	Air Intensifier
4	Material and Pneumatic plumbing
5	Material Pump
6	Material Pump Automatic Crossover (Optional)
7	Remote Dispense Valve
8	Remote Dispense Hose
9	Material Filter (Optional)
10	Temperature Conditioner (optional)
11	Automation Controller



### SHOT METER DISPENSE HEAD ASSEMBLY

The dispense head is a 70 cc shot-meter for single-component applications. The dispenser pre-fills with material and pressurized the material chamber with a metering rod attached to a larger air piston. The air cylinder is controlled by a Servo Valve. The Servo Valve uses air pressure to control the fluid flow of material. The Servo Valve responds rapidly to the electronic command signals, providing precision material flow control.

#### **COMPONENTS AND WHAT THEY DO:**

- Linear Transducer: Is used to determine flow rates and report total volume for faults
- **2. Air Servo Valve:** Controls the up and down direction of the air cylinder.
- **3. Air Cylinder**: Used to displace the material in the Material Chamber.
- Refill solenoid Valve: When energized opens the refill valve.
- **5. Dispense Solenoid Valve**: When energized opens the Dispense Valve.
- **6. Oil Reservoir**: Used to keep the polyseals wet results in longer seal life.
- Seal Cartridge: Has three seals for long life – prevents material from leaking out of the material chamber.
- **8. Refill Valve**: Uses air to operate. When opened allows the material to flow into the material chamber.
- **9. RTD:** Resistive Thermal Device PT 100 ohm sensor used to report temperature.
- **10. Pressure Transducer:** Is used to determine how much pressure is in the material chamber.
- **11. Material Chamber:** Holds material that will be dispensed.
- **12. Dispense Valve:** When open allows material out of the material chamber. Uses air to operate
- **13. Nozzle:** Orifice used to determine the bead size or pattern. (user specific)

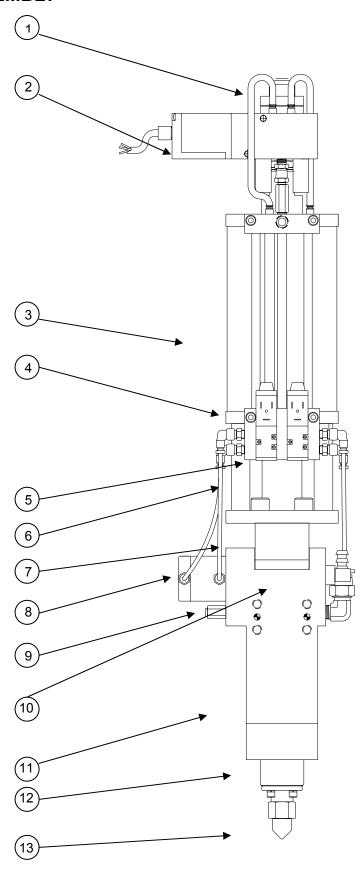


Fig 4

04581971 ed1 11



#### LITESTREAM FLOW METER DISPENSE HEAD OVERVIEW

The diagram shown below is an example of the I/O communication between the automation controller, LiteStream controller and the flow meter dispense head.

The flow meter dispense head uses the pump pressure in conjunction with a material regulator to control volume and flow. The Regulator dispense system has an unlimited volume range. The material being dispensed is controlled by a flow command signal from the robot. The dispense head can be mounted on a pedestal or robot (automation) assembly.

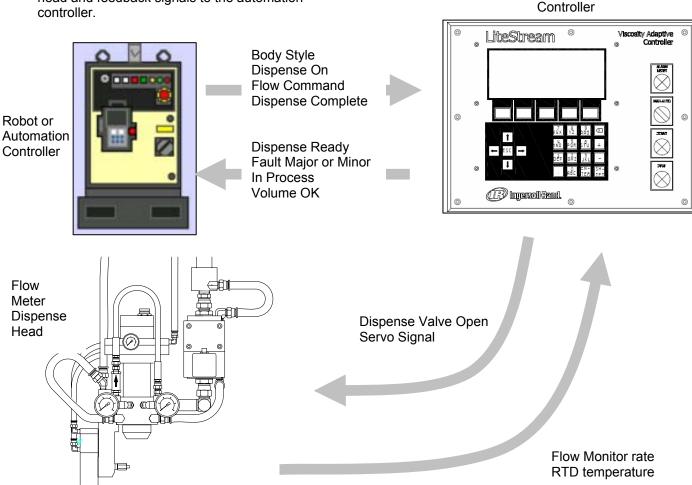
The LiteStream controller communicates with the robot – automation controller via discrete or device net communication.

The LiteStream controller receives signals from the automation controller which determine the signals being sent to the flow meter dispense head and feedback signals to the automation controller. The Automation controller determines the body style for volume checking, dispense valve On/Off, flow rate and dispense complete.

The LiteStream controller sends signals to the automation controller such as Dispenser Ready, fault Major and Miner, In Process and Volume OK.

The Flow Meter Dispense head is electrically controlled by the LiteStream controller. Material flow is controlled in a closed loop environment, using the Flow Monitor signal as feed back to drive a Servo Regulator. The servo valve controls the material flow rate which creates the material force/Flow. The Servo signals, in conjunction with the flow monitor feedback signal, allow quick accurate response of flow volume and rates.

LiteStream



12 04581971 ed1

Fig 5



# TYPICAL LITESTREAM FLOW METER DISPENSE HEAD PEDESTAL CONFIGURATION

Only Major components. See system layout drawing for actual configuration.

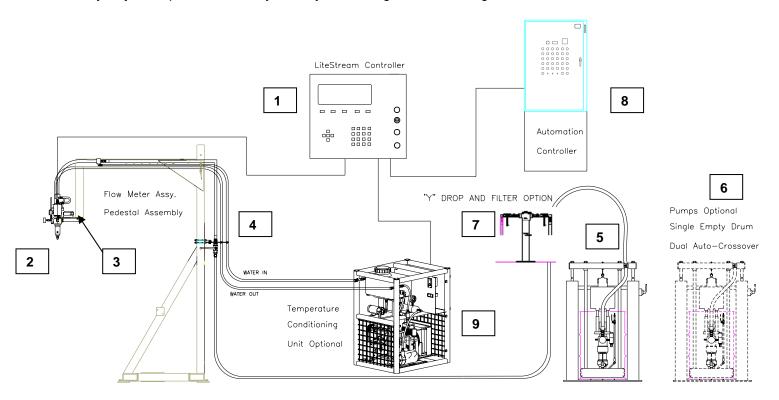


Fig 6

Detail#	Description
1	LiteStream Controller
2	Flow Meter Dispense Head Assembly
3	Dispense Solenoid Valve
4	Material and Pneumatic plumbing
5	Material Pump
6	Material Pump Automatic Crossover (Optional)
7	Material Filter (Optional)
8	Automation Controller
9	Temperature Conditioner (Optional)



# TYPICAL LITESTREAM FLOW METER DISPENSE HEAD ROBOT REMOTE CONFIGURATION

Only major components. Refer to system layout drawing for actual configuration.

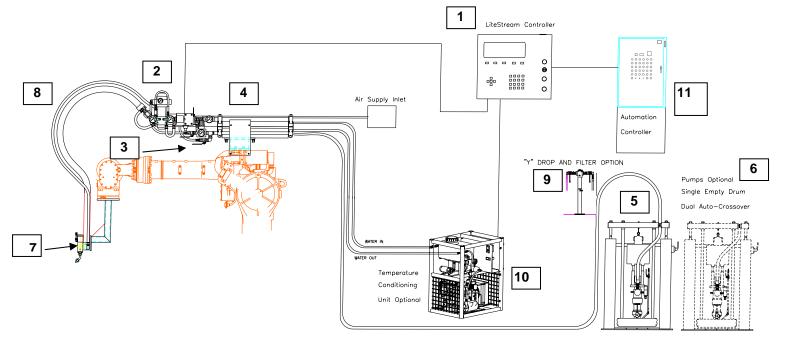


Fig 7

Detail#	Description	Detail#	Description
1 2	LiteStream Controller Flow Meter Dispense Head Assembly	8 9 10	Remote Dispense Hose Material Filter (Optional) Temperature Conditioner
3 4 5 6	Dispense Solenoid Valve Material and Pneumatic Plumbing Material Pump	11	Optional Automation Controller
7	Material Pump Automatic Crossover (Optional) Remote Dispense Valve		

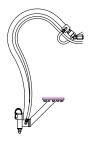


#### FLOW METER DISPENSE HEAD ASSEMBLY

The Flow Meter Dispense Head regulator is designed for single-component applications dispensing from 1 cc – 9999 cc per application. The 1R dispense head can be mounted to a robot or a pedestal. The main components are:

- 1. Material Inlet Supply Hose: Supplies material and return water on temperature condition system.
- 2. Flow Monitor: Outputs a pulse train that is used to determine flow rates and report volume faults.
- **Material Regulator:** Controls the material flow and volume with a variable input air pressure.
- 4. Air Servo Valve: interface between electrical and mechanical control of the material regulator. Allows variable air pressure control of the material regulator.
- **Transition block:** Close coupled adaptor that allows the transfer of material from the regulator to the dispense valve.
- 6. **Dispense Valve:** Two position valve open or closed, pneumatically controlled. Allows the material to flow out of the regulator. (offered with tip orientation).
- 7. Dispense Solenoid Valve: Electrical valve the opens and closes the dispense valve. (spring return) (shown out of position)
- **8. RTD:** Resistive Thermal Device PT 100 ohm sensor used to report temperature.
- **9. Nozzle:** Orifice used to determine the bead size or patter. (user specific)

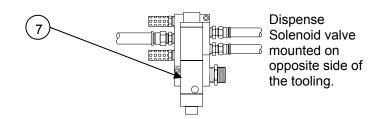
Note: Below are the parts required to adapt a Remote system; include a nozzle adaptor, swivel, material hose and second dispense valve. (optional)



The Flow Meter Dispense Head is a proportional regulator. Thereby the pump pressure setting will affect the maximum flow rate that the system will deliver. The command signal can be referenced on the air gauge of the material regulator.

0 flow command = 0 bar (0 psi)

Maximum flow command = 5.52 bar (80 psi)



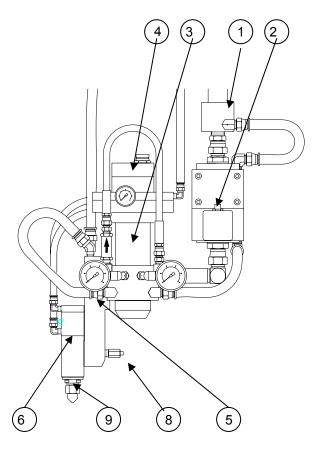


Fig 9



## **INSTALLATION - GENERAL OVERVIEW**

**Read and understand all instructions.** Failure to follow all instructions listed below, may result in electric shock, fire and/or serious personal injury.

Install the dispense system including the control cabinet and dispense head to a stable structure capable of safely supporting their weight. Improper installation can result in personal injury.



Locate operator controls in an area where the operator is not endangered, has easy ingress and egress and can readily access all emergency shutdown controls. Considering operator safety in system layout can eliminate many operator risks.

Avoid any rubbing or extreme twisting of hoses to prevent fatigue wear. Do not use damaged, frayed or deteriorated air hoses and fittings. Worn or damaged hoses may burst or leak resulting in personal injury.

Be sure all hoses & fittings are the correct size & are tightly secured. Loose hoses may leak or disconnect and whip and cause injury.

The Basic steps should be used to install a LiteStream system.

- 1. Install the LiteStream controller. If a frame is ordered with controller, ensure frame is bolted securely to the floor.
  - a. If no frame is ordered, the control panel should be mounted so that the monitor is at the operator's eye-height (~1650mm.).
- 2. Ground the LiteStream controller.
- 3. If pedestal mounted locate pedestal so robot (machinery) can access the dispense nozzle. Secure pedestal to floor so there is no movement of the dispense head.
- 4. If robot mounted bolt the tooling (with dispense head) to robot.
- 5. Locate pumps and secure to floor.
  - a. Pumps should be close to the dispense head, within the limits of the supply hose.
- 6. Locate filter stand and secure to floor. (optional)
- 7. Install material hoses from pumps to the filter (optional) and then to the dispense head.
  - a. A JIC fitting connects the hoses to the dispense head.
  - b. If hoses are installed on a robot, a swivel is normally used to prevent hose bind (twist).
  - c. Verify hose routings are out of the way of the robot (machinery) path.
  - d. The hose should be supported and not stretched, kinked or rubbing against any equipment.
- 8. Connect air supply to the shot meter system using a ½ inch NPT minimum air pressure hose. A shut off ball valve is recommended so maintenance can be performed at any time. The air source must be clean and dry.
  - a. For Flow Meter systems, the air supply is connected to the dispense solenoid valve and Material regulator.
  - b. For Shot Meter systems, the air supply is connected to the Air Intensifier filter inlet. The regulated outlet (140 Psi) of the intensifier is connected to the dispense head.
  - b. Verify hose routings are out of the way of the robot (machinery) path.
  - c. The hose should be supported and not stretched, kinked or rubbing against any equipment.
- 9. Connect the air supply to the pumps using a ¾ inch NPT minimum size air pressure hose. A shut off ball valve is recommended so maintenance may be performed. The air source must be clean and dry.
- 10. Locate and secure temperature conditioning unit to the floor. (Optional)



- a. Connect to and from water lines to dispense unit. The hoses should not be kinked or stretched.
- b. Connect interface cable to LiteStream controller
- c. Connect the temperature controller to power source. See Electrical schematics for correct voltages.
  d. Fill water reservoir with distilled water and anti-corrosive chemicals.
- e. Check for water leaks. Normal water pressure is 25-28 Psi.
- 10. Connect air, water or any other fluid to additional systems.
- 11. Connect interface cables between robot and LiteStream controller.
- 12. Connect interface cables between LiteStream controller and the wiring harnesses on the dispense heads.
- 13. Connect LiteStream main control cabinet to power sources. Refer to electrical schematics for correct voltages.

04581971\_ed1 17



#### **INSTALLING A SHOT METER DISPENSE HEAD**

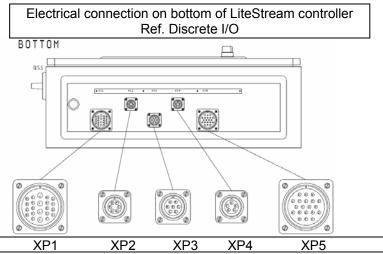
This label Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

**▲** WARNING

**Read and understand all instructions.** Failure to follow all instructions listed below, may result in electric shock, fire and/or serious personal injury.

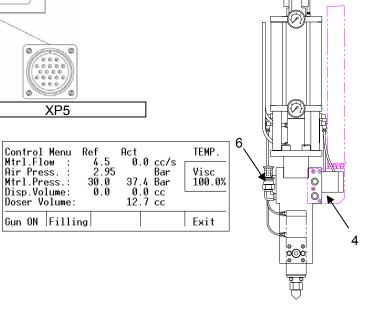
Avoid any rubbing or extreme twisting of hoses to prevent fatigue wear. Do not use damaged, frayed or deteriorated air hoses and fittings. Worn or damaged hoses may burst or leak resulting in personal injury.

- 1. Mount dispense head to the end effect bracket.
  - Four 3/8-16 screws bolt the 1K dispense head to the end effect bracket
- 2. Connect air supply to air intensifier. Minimum ½ inch hose.
- 3. Connect air intensifier regulated outlet hose to the 1K dispense head.
- 4. Install the material supply (temperature optional) hose to the dispense head.
  - Install the (2) 361-734 O-rings on the dispense head and install the supply hose block by tightening the (4) 10-24 screws.
- 5. Connect pump supply hose to the dispense head supply hose.
- 6. Connect "To Process" water hose (located on dispense head).
- 7. Connect "From Process" water hose (located at end of conditioned dispense supply hose).
- 8. Connect electrical connections from LiteStream controller XP1 connector to the wiring harness. (located by dispense head air inlet). The connectors are Ampthenol type connectors.



#### Purging air from the material system.

- 1. Remove nozzle from the dispense valve.
- 2. Turn on supply pumps.
- 3. Rotate selector switch on LiteStream Control Panel, to MANUAL setting
- 4. Depress Gun ON button until dispense head is empty.
- 5. Refill the dispense head by depressing the FILLING button and repeat Gun ON and fill.





#### **INSTALLING A FLOW METER DISPENSE HEAD**

This label Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

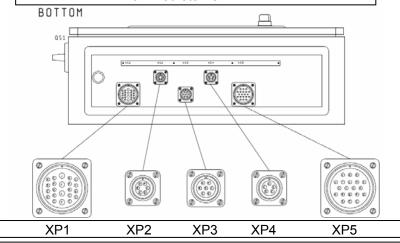


**Read and understand all instructions.** Failure to follow all instructions listed below, may result in electric shock, fire and/or serious personal injury.

Avoid any rubbing or extreme twisting of hoses to prevent fatigue wear. Do not use damaged, frayed or deteriorated air hoses and fittings. Worn or damaged hoses may burst or leak resulting in personal injury.

- 1. Mount the dispense head to the end effect bracket.
  - a. Four 3/8-16 screws bolt the material regulator to the end effect bracket.
- 2. Install the dispense solenoid as close to the dispense valve as possible.
- 3. Connect the air supply to the Dispense solenoid valve and Material regulator.
- 4. Install the material supply (temperature optional) hose to the Flow Monitor. JIC fittings connect the hoses.
- 5. Connect the Pump supply hose to the dispense head supply hose.
- 6. Connect the "To Process" Water hose (located on transition block).
- 7. Connect the "From Process" Water hose (located at end of conditioned dispense supply hose).
- Connect electrical connections from LiteStream controller XP1 connector to the wiring harness. (located by the flow monitor). The connectors are Ampthenol type connectors.

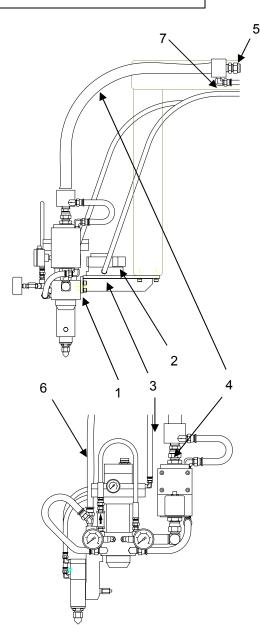
#### Electrical connection on bottom of LiteStream controller Ref. Discrete I/O



### Purging air from the material system.

- 1. Remove nozzle from dispense valve.
- 2. Turn on supply pumps.
- 3. Rotate selector switch, on LiteStream Control Panel, to MANUAL
- 4. Depress Gun On button until dispense head is empty.

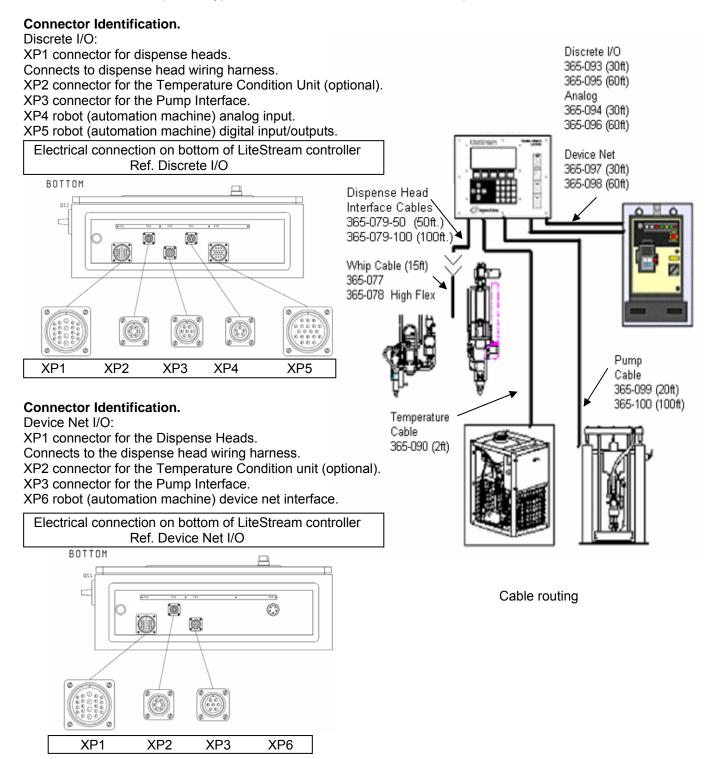
Control Menu Mtrl.Flow :	Ref Act 5.0 0.0	MANUAL
Air Press. : Mtrl.Press.: Disp.Volume:	2.02	Bar Visc Bar 100.0%
Gun ON	-Decr +	Incr Exit





#### **INSTALLING CABLE ASSEMBLIES**

The connectors are Ampthenol type connectors, all have different sizes or pin-outs.



#### **CAUTION:**

Avoid small bend radius, pinch points, pulling or stretching when routing cable. Do not let cables rub against any equipment. leave sufficient cable length to allow for motion. Verify cable routings are not in robot (automation machine) path. Check connections to ensure they are securely tightened.



#### **CONNECTION TO POWER**

If an emergency electric power shut off is installed, ensure it is accessible and make others aware of its location. In the event of an accident, this shut off may minimize personal injury.

Always use specified supply voltage. Incorrect voltage can cause electrical shock, fire, abnormal operation and may result in personal injury.

Grounded products must be plugged into an outlet properly installed and grounded in accordance with all codes and ordinances. Never remove the grounding prong or modify the plug in any way. Do not use any adapter plugs. Check with a qualified electrician if you are in doubt as to whether the outlet is properly grounded. If this product should electrically malfunction or break down, grounding provides a low resistance path to carry electricity away from the user.

All components of the Dispense System must be grounded. Use hoses incorporating a static wire or use groundable piping. Static electricity may build up in the dispense system during normal operation if not grounded. Sparks from static discharge can ignite flammable material and vapors.



- Use the pump ground lug provided on metallic pumps for connection of a ground wire to a good earth ground source. Use Ingersoll Rand part no. 66885-1 ground kit or a suitable ground wire (12 ga. min.).
- Consult local building codes and electrical codes for specific grounding requirements..
- After grounding, periodically verify continuity of electrical path to ground. Test with an ohmmeter from each component (e.g., hoses, pump, clamps, container, spray gun, etc.) to ground to insure continuity. Ohmmeter should show 0.1 ohms or less.
- Use hoses incorporating a static wire or use groundable piping.

Be sure all electric cords & cables are the correct size & all plugs & connectors are tightly secured. Under-sized wire and loose connections can cause electrical shock, fire and may result in personal injury.

To reduce the risk of fire, explosion, or electric shock, the Resistance between the LiteStream controller, Temperature Control cabinet and unit components and true earth ground must be less the 0.25 ohms. See warnings.

Have a certified (qualified) electrician connect the LiteStream controller and the temperature control panel to power outlets that have the correct service ratings. Reference the electrical documentation.

To connect the control cabinets to a power source:

- 1. Remove hole plug in cabinet or create an opening in enclosure.
  - a. Prevent interior components from metal chips when cutting or drilling.
  - b. Clean cabinet must be free from cutting oils, chips, dust and knock out plugs.
- 2. Use appropriate gauge wire refer to electrical documentation.
  - a. Use a NEMA 4 type cord grim to seal and protect the wires that enter the enclosure.
- 3. Connect power to main disconnect L1, N and PE (110-220VAC +PE 10A). Refer to electrical documentation.
  - a. Connect ground wire to ground terminal on back plane of the cabinet

**CAUTION:** If power and grounding connections are not made properly, equipment may be damaged.

- 4. Have a certified (qualified) electrician test incoming power.
- 5. Power on Main Disconnect.



#### LITESTREAM CONTROLLER

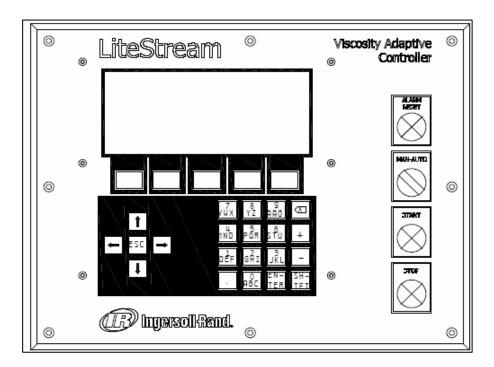
The LiteStream controller is a high-speed controller designed to control flow and pressure in many different types of dispensing processes, such as extruding, spraying, streaming and coating. This system can effectively be applied to an unlimited number of applications for sealing, gasketing, reinforcing and bonding. The controller includes discrete I/O and can interface with DeviceNet bus systems.

The LiteStream controller runs in automatic (AUTO) or manual modes (MAN). When the LiteStream system is in 'AUTO', the robot sends commands for 'Gun On – Off' signals, and the reference bead value (flow command). When the LiteStream system is in 'MAN' all basic functions may be controlled manually directly from the Controller.

If any fault occurs, the controller sends a signal to the robot and displays an alarm. A text message is displayed in the alarm menu and a brief instruction on actions to be taken on the condition.

The controller has the flexibility to control various materials and viscosities.

Material temperature is controlled from the stand alone temperature conditioning unit (TCU). The reference temperature is set in the LiteStream controller and communicated to the TCU. The controller has the following configuration:



The display is a graphical color-LCD-screen with 8 lines x 40 characters and industrial grade push-buttons and keyboard. Active display area: 148 x 55 mm.

Supply voltage: 24VDC ±20%

Current consumption: 0,4...1,5 A, depending on used option boards.

Dust/damp resistance: IP40 Ambient temperature: 0..+50°C



## **System Modes**

The LiteStream application has five system modes:

Switching between 'Manual' and 'Auto' is done with the MAN/AUTO switch on the Controller.



#### Manual

Manual mode is activated when the green 'Start' button is pressed and the 'MAN-AUTO' selector switch is in the MAN position. All functions are controlled from the operator panel...

Auto

When the 'MAN-AUTO' selector switch is in the AUTO position, the system is activated by the 'Remote-Start' input received from the robot (automation). All functions are controlled from the robot.

- Active Cycle
- Purge
- System Stopped

**Note:** 'System Stopped' is entered manually when the yellow 'Stop-button' on the controller is pushed, or remotely by deactivation of the 'Remote Start' input from the robot.

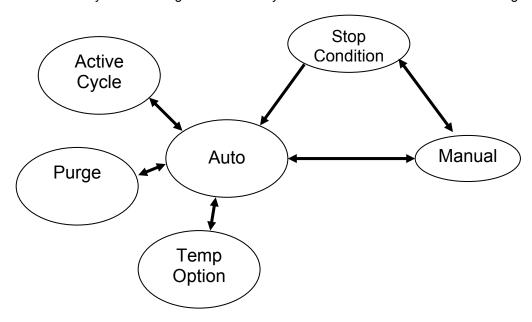
Temperature Conditioning (Optional):

 Temperature (waiting for the temperature conditioner on power up) is deactivated in the 'System Stopped' mode.



#### **Modes states**

The 'Active Cycle' and 'Purge' state can only be entered from the 'Auto'-state. See figure 2



Note: The 'Gun\_On' signal from the robot is only acknowledged in the 'Active Cycle' and 'Purge' states.

If the system has the TCU enabled at start of controller, the system performs 'Pre-heating' until the defined operating material temperature has been reached.

As long as the system has not detected any problems, the LiteStream controller will set the general status-signal 'System\_OK'.

#### **Manual**

The LiteStream Controller will enter the 'Manual' state by setting the 'MAN/AUTO' switch on the Controller to 'MAN'. The system will ignore any command from the robot system and only react on manual commands entered from the Controller. From this state the 'Gun\_On' can be manually activated. When the system is in 'Manual' state, the I/O-signal 'System\_OK' is not activated.

#### **Auto**

The LiteStream controller will enter the 'Auto'-state by positioning the 'MAN/AUTO'-switch on the Controller to 'AUTO'. The system will ignore any manual commands entered from the controller and only react on commands from the robot, except for manual Start and Stop.

As soon as the operational temperature has been reached, and there are no alarms, the 'System\_OK' signal is activated. This signal indicates that the system is ready to enter the 'Active Cycle' or 'Purge' state when requested by inputs from the robot.



## **Active Cycle**

The robot should request the 'Active Cycle' state at the start of a new job at least 100ms before the first 'Gun On'.

The controller will open the gun in accordance to the robot signals for 'Gun\_On'. When in 'Active Cycle' state, the system will also measure the accumulated material consumption.

## Material consumption

The LiteStream controller measures the amount of material dispensed when 'Active Cycle' state is activated. The dispensed volume status is then reported to the robot. The results from the last 100 jobs are also displayed on controller display.

The procedure for a complete job is as follows:

- 1. Robot activates one of the Style ID's (1-7).
- Robot activates the 'Active\_Cycle' signal.
- 3. Target and Actual volumes are reset.
- 4. Job/Application begins.
- 5. Material consumption is continuously measured during application.
- 6. Robot deactivates the 'Active\_Cycle' signal.
- 7. Material consumption measurement is completed; the target and actual volume are saved in the volume log.
- 8. The actual volume is compared to the 'Style preset volume'. If it outside of the limits a minor or a major alarm is set.

The system calculates both a target volume and actual volume. The target volume is the 'Flow Reference' multiplied with the 'Gun\_ On' time. This value is only shown in the volume log. The volume alarm is result of the actual volume compared to the Style preset volume.

## **Purge Enable**

If there is a long standing/idle time, the material should be purged before the next job. Purge flow is controlled from robot or by Style 0.

The Purge parameters are accessed in the Set Up 4 menu.

## **Purge in Manual mode**

When the LiteStream Controller is in 'Manual' mode, purging can be done with the normal 'Gun\_On' selection in the control menu.

## **Purge in Automatic mode**

In 'Auto', the dispense head can be purged by sending a 'Gun On" and flow command signal.

The body style of zero (0) is used and the system will dispense and there will be NO volume faults or data recorded.

04581971 ed1 25



## **Request to Purge**

If the time since last 'Gun\_Off' has exceeded the time-out, the LiteStream system will set a 'Request to Purge' signal to the robot.

When the 'Request\_to\_Purge' signal is set, the system expects the following procedure to start (when the next job enters the station and not before):

- 1. The robot moves to the purge position and sets the 'Purge' signal together with Style ID 0.
- 2. Robot sets Style ID to 0 and also 'Active Cycle'.
- 3. The robot gives the 'Gun\_On' signal.
- 4. The LiteStream system opens the gun and purges at the defined flow-rate.
- 5. When the defined purge time has elapsed, the LiteStream system resets the 'Request to Purge' signal to the robot.
- 6. The robot gives the 'Gun Off' signal.
- 7. When finished, the robot should reset the 'Active Cycle' signal and then return from the purge position.

**Note:** The 'Request to Purge' output and the purge timer are immediately reset by 'Gun On' with a normal Body Style ID (1-7) active.

### LITESTREAM CONTROL METHODS

## **Pressure and Flow Control**

All processes supported by the LiteStream system are flow-rate dependent.

The flow-rate is material pressure and viscosity dependent.

During normal production the following input-signals from the robot will affect material flow-rate and pressure:

- Actual TCP-Speed at speed proportional control (Set by robot).
- The Bead Reference Value (If Robot Reference is selected in Set Up menu 2.
- Gun-On signal

The process is automatically adjusted to the material viscosity and therefore also the material temperature.

The LiteStream system uses a patented method for continuous material viscosity compensation. This method provides an accurate bead within just a few percent of the target. The material viscosity varies from batch to batch and with temperature.

Continuous monitoring of the process ensures that material is dispensed at a consistent flow-rate. If flow-rate exceeds a tolerance settings, the LiteStream controller will immediately acknowledge this by sending a warning or alarm to the robot.

## **Temperature control**

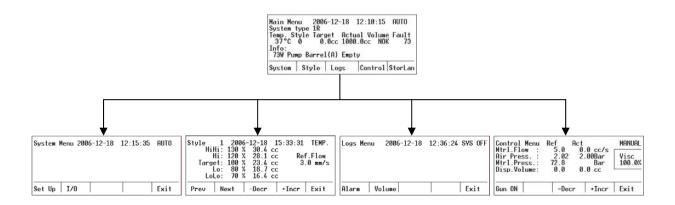
The temperature of the material may be controlled from the external temperature conditioning device, TCU. The LiteStream controller monitors upper and lower temperature limits. These limits are set in the menu Set Up 5, 'TCU Control'. When material temperature has reached this temperature setting, the Controller displays an 'OK' on the Main menu.

The reference temperature is set in menu Set up 5, 'TCU Control'.



### **USER INTERFACE**

Navigating though menus is done using soft keys located along the bottom of the controller display. The main menu has four sub-menus, and these have additional submenus. In some submenus it is possible to change variables that control the system. By using the arrows, (Up, Down, Left, Right) the cursor is moved around to the parameters that are possible to change. All sub-menus also have an exit soft key (far right). If the exit soft key is used, the controller displays the menu one step up in the menu tree. Common for all menus, are the name of the active menu shown in the upper left corner. System status is shown in the upper right corner. Date, time are also displayed on the upper-most line.





#### Main Menu

Main menu is available when the system is powered up. This menu shows the current status of the system and the results of the last operation that was run. The majority of the production time is spent in this screen.

Main Menu 2006-12-18 12:10:15 AUTO System type 1R Temp. Style Target Actual Volume Fault 37°C 0 0.0cc 1000.0cc NOK 73 Info: 73W Pump Barrel(A) Empty System Style Logs Control StorLan

Headline: Date and Time YYYY-MM-DD HH:MM:SS

System Status Sys Off System Stopped

Manual Manual Mode selected on LiteStream front panel Auto Auto Mode selected on LiteStream front panel Temp. Temperature conditioning is progressing.

Heating or cooling to desired temperature set in Set Up menu 5

Active Cy. Active cycle. Strobe signal is high indicating an active job. At

end of job volume check will be done.

Line2: System Type [1R- Flow Meter or 1K Shot Meter)

Line3/4: Temperature Information

If TCU is Enabled only OK/NOK is displayed. If Actual material temperature is within min/max temperature selected in Set Up menu 5, the Temp info will indicate OK. If temperature is lower than Min limit or higher than High limit, NOK

is showed.

If TCU is disabled in Set Up menu 5, no temperature information is displayed.

Style ID Style ID is 0-7. Style 0 is "Purge". Style 1-7 is production jobs. Style ID is

selected when Strobe input goes high (on).

Target Volume Target Volume. Each Style has a Target volume value. Set in Style menu.

Actual Dispensed volume

Accumulated dispensed volume since last Style Strobe set.

Volume Check At Strobe (Active Cycle) signal reset, the Actual dispensed volume is

compared with the Style Target volume. If within limits volume is OK, or NOK.

Fault ID If volume is out of range, a fault is set and the fault ID number is shown.

Line 5/6: Fault Information Fault ID number plus W/A (Warning/Alarm) and the Fault text.

Warning is a Minor Fault and does not stop the production.

Alarm is a Major Fault and results in stopped production. (If robot program

is enabled).

The Fault text is the same information as the first line in the Fault Log. (See

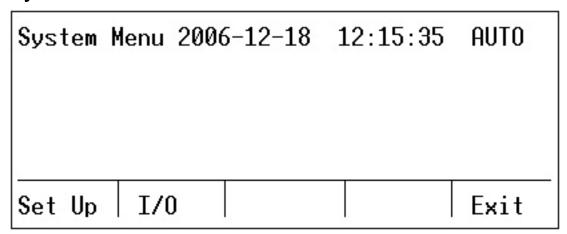
Menu Logs\Alarm\Log)

Soft keys: System Go to System Menu (4.2)

Style Go to Style Menu (4.4)
Logs Go to Logs Menu (4.5)
Control Go to Control Menu (4.6)



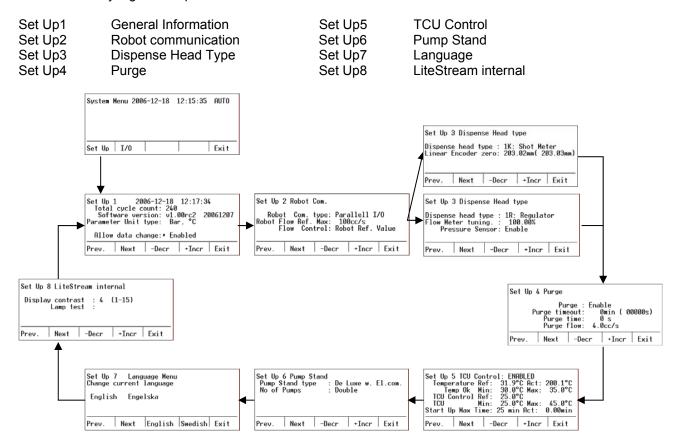
## **System Menu**



Soft keys: Set Up Go to Set Up Menu I/O menu Go to I/O Menu

## **Set Up Menus**

There are totally eight Set Up menus in the LiteStream Controller:



When entering the Set Up menu, Set Up1 is shown. All changes are disabled until Enable is set in menu Set Up1. Enable option is reset after 15 min.

Navigation inside a Set Up menu is done with the Arrows (Up, Down, Left, Right). A cursor moves around to the parameters available for change. Changes are done with the soft keys –Decr and +Incr. For parameters with only "set" "reset" normally both –Decr and +Incr keys will do the same toggling of the function. Up and Left arrow has the same function and the same for Left and Down.

Use the Prev. and Next soft keys to switch between the eight Set Up menus.



## **Set Up 1 - General Information**

Set Up 1 2006-12-18 12:16:39

Total cycle count: 240

Software version: v1.00rc2 20061207

Parameter Unit type: Bar, °C

Allow data change: Disabled

Prev. | Next | -Decr | +Incr | Exit

Set Up 1 2006-12-18 12:17:34

Total cycle count: 240

Software version: v1.00rc2 20061207

Parameter Unit type: Bar, °C

Allow data change: • Enabled

Prev. | Next | -Decr | +Incr | Exit

Time Set Values will scroll around Month 1-12, Day 28-31 Hour 0-23, Minutes and

Seconds 0-59. Lowest year value: 2007. No check is done to month max value.

has received the signal 'Active Cycle' from robot). Not changeable.

Software version This information states the software version running in the system and the

data when the latest of the sound to the data

date when the latest software update was done.

Parameter Unit type select [Bar, °C/ Psi °F]

It is Possible to switch between two sets of parameters:

- SI types: Pressure in **Bar** and temperature in **Celsius**.

- Non SI types: Pressure in Psi and temperature in Fahrenheit.

All menus values will be displayed in the selected value. Flow values is always cc/s (=ml/s) and volume in cc (ml). (cc means cubic centimeter and

ml is milli-liter.

Allow data change [Disable/Enable]

Before any data change, you must first Enable "Allow data change". Move

cursor with arrow keys to Allow Data Change. Press –Decr or +Incr to

enable.



## **Set Up 2 Robot Communication**

Set Up 2 Robot Com.

Robot Com. type: Parallell I/O Robot Flow Ref. Max: 100cc/s Flow Control: Robot Ref. Value

+Incr Next -Decr Exit Prev.

Type of communication Parallel/Discrete The system is using discrete communication between the robot and the LiteStream controller. Device Net The system is using DeviceNet communication between the robot and the LiteStream controller. Robot Max flow level [10, 20, 50, 100cc/s] The maximum flow for the system. A low maximum flow has the advantage of higher resolution which gives the system better performance for low flows. Flow Control Robot Ref. value The flow is controlled from the analog reference value set by the Internal LiteStream The flow is controlled from the LiteStream controller. The flow is set to the pre-charge value of the seven styles in the Style menu. It is possible to have a different flow rate for each style.

31 04581971\_ed1



## Set Up 3 Dispense Head Type

Depending on the dispense head the menu Set Up 3 has different contents. Set up is done in this menu.

Dispense head type

1R - Flow Meter

1K - Shot Meter

## **Dispense Head Type 1R Flow Meter**

Set Up 3 Dispense Head type

Dispense head type : 1R: Regulator Flow Meter tuning. : 100.00% Pressure Sensor: Enable

+Incr Prev. Next -Decr Exit

This dispense head has an impulse flow meter giving a fixed number of impulses per cc. Different material characteristics might change the ratio. Therefore, it is possible to adjust the flow (and volume) measurement.

Flow Meter Tuning Pressure Sensor

[0.00%-200.00%] [Enable/Disable]

When pressure sensor is enabled the controller is able to measure the pressure very close to the nozzle, increasing system performance.

Leave disabled (future use).

32 04581971\_ed1



## **Dispense Head Type 1K Shot Meter**

Linear Encoder Zero [0-300 mm] Shows

Shows the actual position of the linear position sensor (MLDT).

To calibrate the MLTD for the zero volume:

Open the Control menu and empty the doser by dispensing manually. Go to the Set Up menu 3. Set the linear Encoder zero value equal to the actual value to the right. Now the empty doser is equal to the zero volume.

## **Set Up 4 Purge Request**

Set Up 4 Purge
Purge : Enable
Purge timeout: Omin ( 00000s)
Purge time: O s
Purge flow: 4.0cc/s
Prev. Next -Decr +Incr Exit

Purge Enables/Disables the purge function.

Purge timeout Set the time before the controller send the 'Purge

request' signal to the robot.

The time since the last 'Active Cycle' is counting from 0

up to the purge timeout time.

Purge time Preset the time for how long every purge will progress.

Purge flow Preset a specific flow for purge.



## **Set Up 5 TCU Control**

In the menu Set Up 5 TCU Control, the primary set up is to enable or disable the external temperature conditioning unit (TCU). The reference temperature is set and limits within the TCU are allowed to function. Information about the actual material temperature in the system, is also shown.

Set Up 5 TCU Control: ENABLED Temperature Ref: 31.9°C Act: 200.1°C Temp Ok Min: 30.0°C Max: 35.0°C TCU Control Ref: 25.0°C				
TCU Min: 25.0°C Max: 45.0°C Start Up Max Time: 25 min Act: 0.00min				
Prev.	Next	-Decr	+Incr	Exit

TCU Control	[Enable/Disable]	Enables/Disables the TCU.
Temperature	Reference	Sets reference material temperature in
		the system
	Actual	Shows actual material temperature at the dispense head
Temperature OK	Min	Sets the low limit of the material
romporataro ort		temperature parameter.
	Max	Sets the high limit of the material
		temperature parameter.
TCU Control	Reference	Displays the reference temperature for
		the TCU.
TCU	Min	Sets lowest temperature on the TCU.
		Set to 32F or 0c.
		(Must match TCU controller settings)
	Max	Sets highest temperature on the TCU.
		Set to 122.5F or 50c
		(Must match TCU controller settings)
Start Up Max Time	Time	Sets the longest time for the system to
		reach working temperature before setting
		a fault is generated.
	Actual	Shows actual time since system started.



Enables communication with the pump set.

(Only available for Deluxe Set up)

## Set Up 6 Pump

The LiteStream dispense system has 5 different pump solutions available. Standard or Deluxe Pump set with single or double configuration. For standard pump set there is no communication between LiteStream controller and pump. The DeLuxe pump set makes it possible for pump to determine when barrels are low or empty.

Set Up 6 Pump Stand
Pump Stand type : De Luxe w. El.com.
No of Pumps : Double

Prev. Next -Decr +Incr Exit

Pump Stand type Standard No communication with the pump.

No of Pumps

**Material Supply Controls** 

Single or Double

Deluxe

In the menu Set Up 6 the type of pump stand is selected. The controller supports single and double pump system with three levels of communication.

#### Single Pump Pneumatic Package (stand-alone) 900-200

This kit is a pneumatic package that will operate the elevator and the air motor only. It includes an empty drum shut-off feature. There is no communication between the pumps and the LiteStream controller.

## Single Pump Interface Package (stand-alone) 110-650

This is a single pump interfaced add on kit. It includes a low level signal for "material low" warning, a pump active signal and a single beacon light that indicates a low level fault. This Kit does not include a drum empty warning. There is a single communication cable between the pump control box and the LiteStream controller. Requires single pump pneumatic package 900-200.

## **Dual Pump Pneumatic Package 900-201**

This kit is a pneumatic package that will operate the elevators and the air motors, will pneumatically cross-over from pump A to pump B and vice versa when drum is empty. There is no communication between the pump controls and the LiteStream controller.

### Standard Dual Pump Interface Package 110-651

This is a dual pump interface add on kit. It includes a drum "A" empty signal, a drum "B" empty signal, a pump active signal (high if either pump "A" or "B" are on) and a single beacon light to indicate an empty drum warning/fault. This package does not include low-level warning signal. There is a single communication cable between the pump control box and the LiteStream controller.

Requires dual pump pneumatic package 900-201.

#### **Deluxe Dual Pump Interface Package 110-652**

This is a dual pump interface add on kit. It includes a drum "A" empty signal, a drum "B" empty signal, a pump active signal (high if ether pump "A" or "B" are on), a single beacon light to indicate an empty drum warning/fault, a solenoid valve that will turn the pumps on or off (controlled by the LiteStream controller). This package does not include a drum low warning. There is a single communication cable between the pump control box and the LiteStream controller. Requires dual pump pneumatic package 900-201.



## Set Up 7 Language Menu

In Menu Set Up 7, Language, it is possible to choose between two predefined languages. Use the soft key to make the selection.

Set Up 7 Language Menu Change current language English Engelska Prev. Next English Swedish Exit

## Set Up 8 LiteStream Internal

Next

This menu is to test and set up the controller display.

Set Up 8 LiteStream internal

Display contrast : 4 (1-15) Lamp test :

-Decr

Display contrast

Prev.

Lamp test

Set the contrast on the display. The scale is from 1 to 15.

Exit

+Incr

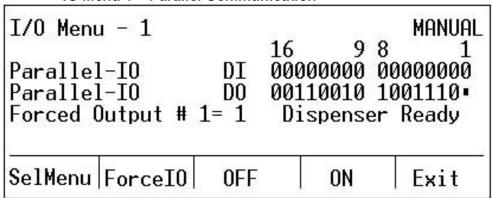
Illuminates the lamps in the Alarm, Start and Stop buttons on the controller to check for burned light bulbs.



#### I/O Menu

Two types of communication to Robot are available in the LiteStream controller, Discrete communication and Device Net communication. The I/O-menu consists of two menus. I/O-Menu 1 shows the Discrete interface to the robot. When DeviceNet interface is activated in menu Set Up 2, I/O-Menu 2 is available by pressing the soft key 'SelMenu'. Pressing 'SelManu' again will return the display to I/O-menus 1.

IO Menu 1 - Parallel Communication



Digital Outlet Bit		Digital Input Bit	
1	Dispenser Ready	1	Style Strobe/Active Cycle
2	Dispensing	2	Gun On/Off
3	Purge Request	3	Gun inhibit
4	Start in Progress	4	Remote Start/Stop
5	Manuel Mode	5	Remote Fault Reset
6	Volume OK	6	Style ID (LSB)
7	Major Fault/Alarm	7	Style ID
8	Minor Fault/Alarm	8	Style ID (MSB)
9	Dispense Valve	9	Flow Meter
10	Refill Valve (1K)	10	
11	, ,	11	
12		12	
13	TCU On/Off	13	TCU Temp OK
14	Pump On/Off	14	Pump Pressurized
15	•	15	Pump Low/A Empty
16		16	Pump B Empty

It is possible to force digital outputs by using the 'Force I/O' soft key. Information about the temporary forced IO-signal is found on the display. This function is only available in Manual mode.

#### To Force an output:

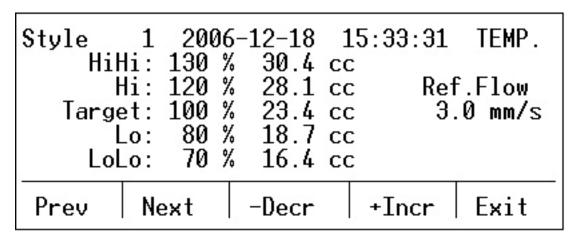
- 1. Scroll to desired output.
- 2. Press "Force IO".
- 3. Select OFF to turn the output OFF (low).
- 4. Select ON to turn the output ON (high).
- 5. To cancel forces, press "force IO", or scrolling to another IO point will cancel the previous force.

04581971 ed1 37



### Style Menu

The LiteStream controller can display seven different styles. Each style allows target value inputs from 0.1 cc up to 9999 cc. The target volume is set to define the actual dispensed volume for a specific application. If the applied volume deviates from the target for any reason, it is possible to set up high and low volume limits for warning and alarm to the robot.



Reference Flow

Sets the pre-charge for the specific style.

(This value is also used for flow reference when Internal LiteStream reference is selected in the Set Up menu 2)

Hi Hi

Alarm level for too high volume. (Major Fault)

Warning level for too high volume. (Minor Fault)

Lo

Warning level for too low volume. (Minor Fault)

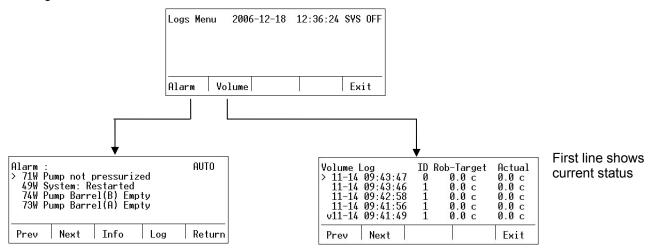
Lo Lo

Alarm level for too low volume. (Major Fault)

Sets the target volume for the style.

### Logs Menu

The Logs Menu contains the same headline as the main menu. It has two submenus – Alarm and Volume.





## **Alarm Menu and Alarm/Warning Information**

Also accessible by pressing the alarm pushbutton when not in setup menu.

The **Alarm** menu contains all active Alarms and Warnings. The list is limited to a maximum of 20 events. It is possible to scroll the list up and down. Each Alarm/Warning has an information text in the **Info** menu. Entering sub-menu **Log** shows the last 100 events. There is also a timestamp shown at the top of the screen and in the **Info** menu.

There are two levels of faults utilized in the LiteStream system (warning and alarm). **Warnings** are considered **minor** and are noted as "Lo" or "Hi" volumes. **Alarms** are considered **major** and noted as "Lo Lo" and "Hi Hi" volumes.

Number	Text Message On The Display Screen	Туре
1	A In/Output +24V Fuse: Tripped	Alarm
8	A FieldBus: Communication error	Warning
11	W Operator error: AUTO/MAN switched	Warning
12	W Operator error: STOP pressed	Warning
13	A Robot Gun On (Dispense) and no Job	Alarm
16	Doser.FuncError	Alarm
19	A Pressure Transd: Func. Error	Alarm
22	W Nozzle: High viscosity	Alarm
23	A Nozzle : Max viscosity	Alarm
24	W Nozzle: Low viscosity	Alarm
25	A Nozzle : Min viscosity	Alarm
49	W System: Restarted	Warning
64	W Volume sprayed: Insufficient	Warning
65	W Volume sprayed: Too much	Warning
66	A Volume sprayed: Insufficient	Alarm
67	A Volume sprayed: Too much	Alarm
68	A Temperature Conditioning Timeout	Warning
69	A Temperature out of Range	Alarm
70	W TCU Not Ready	Alarm
71	W Pump not pressurized	Alarm
72	W Pump Barrel Low Level	Warning
73	W Pump Barrel(A) Empty	Warning
74	W Pump Barrel(B) Empty	Warning

**Note:** If the red fault light/pushbutton flashes it indicates a minor fault. If the red fault is solid it indicates a major fault.



AUTO Alarm > 71W Pump not pressurized 49W System: Restarted 74W Pump Barrel(B) Empty 73W Pump Barrel(A) Empty Next Info Return Prev Log Info Menu 2006-12-18 12:09:03 MANUA > 71W Pump not pressurized The Pump pressure switch is not active Check pump air pressure. Exit

## Volume Log menu

Volume Log > 11-14 09:43:47 11-14 09:43:46 11-14 09:42:58 11-14 09:41:56 v11-14 09:41:49	ID Rob-Target 0 0.0 c 1 0.0 c	Actual 0.0 c 0.0 c 0.0 c 0.0 c 0.0 c
Prev Next		Exit



#### **Control Menu**

The 1K and 1R has a little different Control menu

Decrease and Increase is only showed in Manual mode. They apply to the Material flow Reference in Manual mode. The Air pressure and Material Pressure is automatically calculated in the system, using the viscosity adaptation.

In Manual mode it is possible to Turn the Gun On and Off from the screen by pushing the **Gun On** button. In Auto mode the 'Gun On' button is disabled, but the display continues to show the status of the 'Gun On' signal.

#### Control Menu – 1R Flow Meter

Control Menu		lct	MANUAL
Mtrl.Flow : Air Press. : Mtrl.Press.: Disp.Volume:	5.0 0.0 cc/s 2.02 2.00Bar 72.8 Bar 0.0 0.0 cc		Visc 100.0%
Gun ON	-Decr	+Incr	Exit

Material Flow In Automatic:

Dispense Volume

Reference and actual flow. The reference flow is set from the

robot or in the style Set Up menu.

In Manual:

Reference flow is settable by the –Decr and +Incr buttons.

Air Pressure The reference air pressure calculated to reach the desired

material pressure.

Material Pressure The reference material pressure is calculated to reach the reference material flow.

The reference and actual applied volume during latest or ongoing Active Cycle or manual dispense. The values are

reset when switching between Manual and Auto.

Viscosity The actual relative viscosity of the material.



## Control Menu - Shot Meter (1K)

The 1K shot meter is filled automatically after each job. In Manual mode it is possible to fill manually (by menu), also contains the actual Doser volume information and a **Filling** button.

For the 1K the shot meter is filled automatically after each job. In manual mode it is possible to fill manually by selecting 'Filling", a second time stops the process. The filling sequence stops automatically when the doser is full.

Warning: It is possible to have both 'Gun On' and 'Filling' valves open at the same time. This will result in material flowing out directly from the pump and should be avoided.

Control Menu	Ref	Act	MANUAL
Mtrl.Flow : Mtrl.Press.: Disp.Volume: Doser Volume:	24.7 0.0		Visc 100.0%
Gun ON Filli		cr +Incr	Exit

Material Flow The reference and actual flow. The reference flow is set

from the robot or in the style set up menu.

Air Pressure The reference air pressure calculated to reach the

desired material pressure.

Material Pressure The reference material pressure displayed from the

pressure transducer

Dispense Volume The reference and actual applied volume during latest or

ongoing Active Cycle or manual dispense. The values are reset when switching between Manual and Auto.

Doser Volume The actual volume of material in the doser. Viscosity The actual relative viscosity of the material.



#### **DIGITAL INPUTS DEFINITIONS**

#### Digital Input 1 Style Strobe / Robot in Cycle

Style Strobe signifies that the robot body style ID code (BCD) is set and the dispenser is to read data, and to start the dispensing cycle (The dispenser will pre-charge and is to get ready for the gun-on signal). The dispenser will respond with the "Dispenser in Process" signal. The signal will stay on until the robot is finished with the dispense cycle. When the signal is turned off, the dispenser calculates the volume and will issue a "fault(s") or "volume OK", and refill the doser (if applicable).

#### Digital Input 2 Gun On/Off

Robot will request dispense valve to open, valve will stay open for the duration of the signal. This can be operated multiple times during a dispense cycle.

Input 'Gun\_On' to output 'open gun' delay will be fixed at 100 msec, allow process of the analog signal, setting up of pre-charge values, and mechanical delay.

#### Digital Input 3 Gun Inhibit

The inhibit signal will prevent the dispense valve from opening. A style will not be acknowledged or started. This Gun Inhibit signal is used as a dry run. Automated equipment will move, no material will be dispensed.

#### **Digital Input 4 Remote Start/Stop**

When this signal is received the result is the same as manually pushing the green push button light "Power On", on the front panel and sending a signal on to the TCU, if appropriate. The system will power up and when the temperature is ready (if applicable) and will go into "Automatic Mode" if the Auto/Manual selector switch is in the 'Auto' position.

If the signal is reset, the system will stop and disable the TCU and pumps, if appropriate. This is equivalent to pushing the Stop pushbutton on the front panel.

#### Digital Input 5 Remote Fault Reset

The fault reset shall be invoked during fault recovery to attempt to reset a fault condition. If the cause of the fault has not been removed, the fault is re-reported after the release of the 'Fault Reset' signal. The LiteStream controller will also use this signal to cancel an abandoned style sequence and reinitialize itself for the next cycle.

#### Digital Input 6-8 Style ID bits.

The Style Bit indicates which Body ID is to be run (which part the system is dispensing material on). The BCD is a Binary Coded Decimal signal (BCD1 LSB). The BCD value tells the LiteStream system which *Volume Limit*(s) it is to use to generate *Dispenser Faults* and/or *Volume OK* when the Style Strobe goes high. Zero (0) shall be the default for purging, for no volume limits assigned or tested and for no volume "OK." This operation is logged as a "purge" with actual volume. A total of seven (7) body styles are available. The value is read only when the Style strobe is on.

#### Digital Input 9 Flow Monitor

Used in 1R systems only. The flow monitor sends a pulse train input that represents the material volume/flow. The LiteStream controller uses this signal to calculate the flow rate and to adjust servo signals, and determine volume related faults.

#### Digital Input10-12 Not Used

04581971 ed1 43



#### DIGITAL INPUTS DEFINITIONS

#### Digital Input 13 Temperature Conditioning Unit Temperature is OK

The signal notifies the LiteStream controller that the temperature conditioning unit (TCU) is turned on, within local temperature range and does not have any fault conditions. Option - only used if there is a temperature conditioning unit and the TCU option is enabled in the setup screen.

#### Digital Input 14 Pump Pressurized

The signal indicates that the material pumps have air on the air motors. Option – only used if there is a pump monitoring system and the deluxe pumps are selected in the set up screen.

#### Digital Input 15 Pump Low / A empty.

A signal from the material pumps. On a single pump system it indicates that the material drum is low on material – Minor fault (warning). On a dual (auto crossover) system, it indicates that the A pump is out of material. Minor fault (warning) **Note:** can be a Major (alarm), if both pumps are empty. Option - only used if there is a pump monitoring system.

#### Digital Input 16 Pump B empty

A signal for the material pumps. Only used on dual (auto crossover) systems. Indicates that the B pump is out of material. Minor fault (warning) **Note:** can be a Major (alarm) if both pumps are empty. Option – only used if there is a pump monitoring system.



#### DIGITAL OUTPUTS DEFINITIONS

#### Digital Output 1 Dispenser Ready

System is ready to dispense.

- Temperature conditioning subsystem on and within temperature range, if applicable.
   The system is in AUTOMATIC Mode.
- 3. At least one supply pump not empty, when option installed.
- 4. All systems are turned on and have No Major (alarm) faults.

Having a volume fault shall not turn off dispense ready signal, unless the severity is set to major (alarm).

#### Digital Output 2 Dispensing

The dispensing signal goes high in response to the "Style Strobe" input. The dispensing signal turns off when the dispensing cycle is complete.

- 1. For a Flow Meter System the dispensing cycle shall be complete when the volume faults are calculated.
- 2. For a Shot Meter System the dispensing cycle shall be complete at the end of the refill sequence.

#### **Digital Output 3 Purge Request**

A signal requesting a purge due to dispense inactivity based on a user-definable time within the dispense LiteStream controller Set Up Menu 4.

#### Digital Output 4 Remote Start in Progress

The LiteStream controller's answer to "Remote Start" input shall be ON until the "Dispenser Ready" condition is met or "Major Fault" prevents "Dispenser Ready" condition.

#### **Digital Output 5**

Indicates that the LiteStream controller is in the Manual mode. The selector switch is in the Manual position.

#### Digital Output 6 Volume OK

Volume OK shall be turned on after the "Style Strobe" turns off, if the volume dispensed in the previous dispense cycle is within the limits set on the "Body ID" page. Signal shall be reset on the next cycle when "Style Strobe" is received.

#### Digital Output 7 Major Fault/Alarm

The LiteStream controller detected a major problem that will stop production or when the dispensed volume is beyond the HiHi or LoLo fault limit. When a major fault occurs the "Dispense Ready" signal is turned off.

#### **Digital Output 8 Minor Fault/Alarm**

LiteStream controller detected a minor problem that caused a warning. The system shall not stop.

#### Digital Output 9 Dispense Valve

Opens the dispense valve on the dispense heads.

#### Digital Output 10 Refill Valve 1K

Opens the Refill valve only on the Shot Meter dispense head.

45 04581971 ed1



#### **DIGITAL OUTPUTS DEFINITIONS**

Digital Output 11-12 Not Used.

#### Digital Output 13 Temperature Conditioner On/Off

Turns on the Temperature Conditioner unit when the signal is high. The TCU will start-up, start the water pumps and heat or cool the water until material temperature is within set parameters. If the signal is low, the TCU is shut down. Only used if there is a TCU connected to the system and the TCU option is enabled on menu Set Up 5.

#### Digital Output 14 Pump On/ Off

The LiteStream controller can turn on the pumps by energizing a solenoid valve in the pump controls. Then air flows to the air motor and allows the pumps to run. (deluxe-1 Pump system). This signal must remain high for the pumps to run. Only used if there is a pump monitoring system.

On deluxe-3 pump system – the system will also pressurize the pump air system.

**Digital Output 15-16 Not Used** 

#### ANALOG INPUT DEFINITIONS

Analog Input Signal 1 MLDT – Linear Transducer position 0-10V DC (1K)

Analog Input Signal 2 Actual Air Pressure (1R)

Analog Input Signal 3 Robot Flow Command 0-10 VDC

Analog Input Signal 4 Pressure Transducer 0-10V DC (1K)

Analog Input Signal 5 RDT input

### **ANALOG OUTPUT DEFINITIONS**

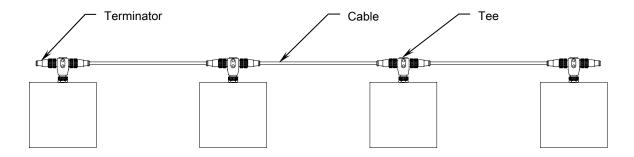
Analog Output Signal 1 Dispense servo valve / regulator flow command 0-10V DC

Analog Output Signal 2 Temperature Conditioning Set- Point 0-5V DC



#### **DEVICE NET I/O**

Ingersoll Rand uses DeviceNet as a way of communicating from the robot to the LiteStream controller. The robot is the master and the LiteStream is the slave. DeviceNet uses a 5 wire connector that contains a 24V DC power, a high – low CAN signal and a shield (similar to a PLC cable). The cables are all shielded twisted pair wiring that resists noise. Each DeviceNet network (bus) must be set up as a "single-file" string of devices (trunk) connected by special DeviceNet cables. Each DeviceNet network must have terminating resistors (Terminators) at each end. Devices are dropped off the trunk by Tees and smaller cables (branches). DeviceNet cable is available in ThickNet and ThinNet sizes. Maximum trunk (bus) length for Ingersoll Rand equipment is 250m for ThickNet cables and 100m for ThinNet cables. Ingersoll Rand uses ThinNet cable as a standard because it is much more flexible and compact. Maximum branch length for Ingersoll Rand is 6m, however, this constraint does not apply as Ingersoll Rand equipment is always attached to the trunk line.

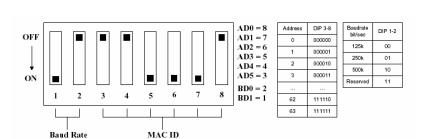


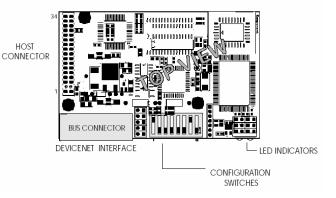
The LiteStream controller can be configured with DeviceNet communication cards. The communication between the robot and the LiteStream controller has the following configuration:

**DeviceNet Card Communication settings** 

Vendor ID = 90 Device Type = 12 Product code = 14
Digital input = 64 Digital output = 64

The Mac ID and baud rate can be set using DIP switches that are located on the LiteStream controller's DeviceNet card.





Mac ID (Node address) and Baud Rate are configured by a dip switch at the front of the module.

The range for Mac ID is between 0-63 and baud rate is between 0 and 2 (0=125kb, 1=250kb, 2=500kb). Default configuration for the LiteStream controller is: Mac Id = 14, Baud Rate = 500kb.

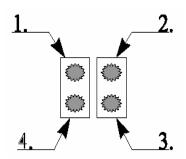
04581971 ed1 47



#### **DEVICE NET CARD INDICATORS**

The module is equipped with four LED's mounted at the front and one LED on the board, used for debugging purposes. The function of LED's are described in the table and figure below.

- 1. Reserved
- 2. Network Status
- 3. Module Network Status
- 4. Reserved



Of the four LED's at the front of the module, two of them are indicating net and module status, and the other two are reserved for future use.

Module errors are indicated with the Module status LED and Network status LED.

LED's	Description
Module _Status, steady off:	No Power
Module _Status, steady red:	Unrecoverable fault
Module _Status, steady green:	Device Operational
Module _Status, flashing red:	Minor fault
NetWork _Status, steady off:	Not Powered/Not on line
NetWork _Status, steady green:	Link OK on line, Connected
NetWork _Status, steady red:	Critical Link failure
NetWork _Status, flashing green:	On line not connected
NetWork _Status, flashing red:	Connection Time Out



## **DEVICE NET NODE MAP INPUTS**

First 32 bits are analog values. Bit 33-40 are digital input 1-8 if DeviceNet is selected. I/O definitions are the same as the Discrete I/O.

LiteStream-Controller		Serial-Bus	Comment	
Function	I/O	DeviceNet	LS=LiteStream Controller	
Name	/	Direction		
	phys. Number			
	, ,			
TCP_Speed01	Di 1		LSB	
TCP Speed02	Di 2			
TCP_Speed03	Di 3			
TCP_Speed04	Di 4	<b>\</b>		
TCP_Speed05	Di 5			
TCP_Speed06	Di 6			
TCP_Speed07	Di 7			
TCP_Speed08	Di 8		Option Not Used	
TCP_Speed09	Di 9		Not Osed	
TCP_Speed10	Di 10			
TCP_Speed11	Di 11		-	
TCP_Speed12	Di 12		-	
TCP_Speed13	Di 13		_	
TCP_Speed14	Di 14			
TCP_Speed15	Di 15		- /	
TCP_Speed16	Di 16		<i>J</i> MSB	
D ID . 0 / . 10.4	D: 47		1.00	
BeadRefVal01	Di 17		LSB	
BeadRefVal02	Di 18		-	
BeadRefVal03	Di 19		-	
BeadRefVal04	Di 20		-	
BeadRefVal05	Di 21		-	
BeadRefVal06 BeadRefVal07	Di 22 Di 23		BeadRefValue/Flow Command	
BeadRefVal08	Di 24		Bead 0 - 10"V"	
BeadRefVal09	Di 25		Scalefactor 32767	
BeadRefVal10	Di 26		Bead value (ml/sx10 x20 x50 x100)	
BeadRefVal11	Di 27		Beau value (IIII/3X 10 X20 X30 X 100)	
BeadRefVal12	Di 28		Note: Normally sent as a group output	
BeadRefVal13	Di 29		from the robot	
BeadRefVal14	Di 30		- Hom the ropot	
BeadRefVal15	Di 31		-	
BeadRefVal16	Di 32		<i>)</i> MSB	
Style Strobe/ActiveCycle	Di 33		Each job represents one ActiveCycle. After each	
	2.00		ActiveCycle the LS-system reports the material	
			used. Style ID is strobed	
GunOn	Di 34			
InhibitGunOn	Di 35	<b>\</b>	Makes it possible to do a Dry Run e.i. a complete	
			cycle without open the gun.	
			Inhibits gun on if set to 1	
Remote Start/Stop	Di 36		Start=1 Stop=0	
Fault Reset	Di 37		Fault Reset on positive flank	
Style ID Bit0	Di 38	<b>\</b>	Style ID value 1	
Style ID Bit1	Di 39		Style ID value 2	
Style ID Bit2	Di 40		Style ID value 4	



## **DEVICE NET NODE MAP INPUTS CONTINUED**

First 32 bits are analog values. Bit 33-40 are digital input 1-8 if DeviceNet is selected. I/O definitions are the same as the Discrete I/O.

Spare	Di 41		
Spare	Di 42	<b>\</b>	
Spare	Di 43	<b>\</b>	
Spare	Di 44		
Spare	Di 45		
Spare	Di 46	V	
Spare	Di 47		
Spare	Di 48		
Spare	Di 49		
Spare	Di 50		
Spare	Di 51	<b>[</b>	
Spare	Di 52	<b>[</b>	
Spare	Di 53	<b>[</b>	
Spare	Di 54	<b>[</b>	
Spare	Di 55	<b> </b>	
Spare	Di 56	<b>U</b>	
Spare	Di 57	<b>[</b>	
Spare	Di 58	<b>[</b>	
Spare	Di 59	<b>[</b>	
Spare	Di 60		
Spare	Di 61		
Spare	Di 62		
Spare	Di 63		
Spare	Di 64		



## **DEVICE NET NODE MAP OUTPUTS**

First 32 bits are analog values. Bit 33-40 are digital output 1-8 if DeviceNet is selected. I/O definitions are the same as the Discrete I/O.

LiteStream-Co	ntroller	Serial-Bus	Comment
Function	I/O	DeviceNet	LS=LiteStream Controller
Name	/	Direction	
	phys. Number	Direction	
Consumption_Bit_1	Do 1		LSB
Consumption Bit 2	Do 2		LOB
Consumption Bit 3	Do 3		
Consumption Bit 4	Do 4		
Consumption Bit 5	Do 5		
Consumption_Bit_6	Do 6		
Consumption_Bit_7	Do 7		Consumption
Consumption_Bit_8	Do 8		1bit=0.1cc
Consumption_Bit_9	Do 9		Max value 6553.5cc
Consumption_Bit_10	Do 10		
Consumption_Bit_11	Do 11		
Consumption_Bit_12	Do 12		
Consumption_Bit_13	Do 13		
Consumption_Bit_14	Do 14		
Consumption_Bit_15	Do 15		
Consumption_Bit_16	Do 16		MSB
Spare	Do 17		LSB
Spare	Do 18		
Spare	Do 19		Material Temperature (option)
Spare	Do 20		1bit=0.25degC
Spare	Do 21		Max value 255=63,75degC
Spare	Do 22		
Spare	Do 23		
Spare	Do 24		MSB
Spare	Do 25		LSB
Spare	Do 26		
Spare	Do 27		Pressure (option)
Spare	Do 28		1bit=1 Bar
Spare	Do 29		Max value 255Bar
Spare	Do 30		
Spare	Do 31		1400
Spare	Do 32		) MSB
LiteStream_OK	Do 33		Dispenser Ready/LS Ok
<u>Dispensing</u>	Do 34		Gun On Not Empty Doser (for1K)
Purge_Request	Do 35		Purge request if enabled in LS
Start in Progress	Do 36		Heating up (if TCU Enabled in LS)
AFC_Man/Auto	Do 37		Man-Autol Mode switch on LS in Man
Volume_Ok	Do 38		Last Job Dispensed volume within limits
Major Fault/Alarm	Do 39		Alarm. Robot shall normally stop Dispensing
Minor Fault/Warning	Do 40		Warning. Operator warning. Do not stop job cycle



## **DEVICE NET NODE MAP OUTPUTS CONTINUED**

First 32 bits are analog values. Bit 33-40 are digital output 1-8 if DeviceNet is selected. I/O definitions are the same as the Discrete I/O.

Spare	Do 41	
Spare	Do 42	
Spare	Do 43	
Spare	Do 44	
Spare	Do 45	
Spare	Do 46	
Spare	Do 47	
Spare	Do 48	
Spare	Do 49	
Spare	Do 50	
Spare	Do 51	
Spare	Do 52	
Spare	Do 53	
Spare	Do 54	
Spare	Do 55	
Spare	Do 56	
Spare	Do 57	
Spare	Do 58	
Spare	Do 59	
Spare	Do 60	
Spare	Do 61	
Spare	Do 62	
Spare	Do 63	
Spare	Do 64	



#### **SEQUENCE OF I/O**

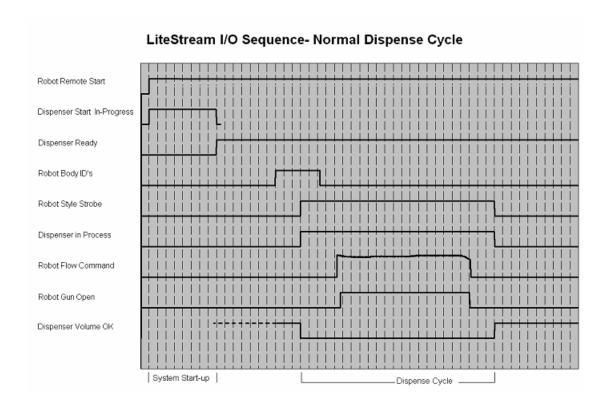
- 1. The LiteStream controller Manual/AUTO switch is set to Auto.
- 2. The Automation machinery turns on Remote Start Input. This signal shall stay high until Stop is desired.
  - a. The LiteStream computer Starts and turns ON Temperature conditioner (option).
  - b. The LiteStream computer Turns On Pumps (deluxe only).
- 3. The LiteStream computer outputs *Dispenser Start In-Progress* until "Dispenser Ready" condition is met or a "Major Fault" prevents "Dispenser Ready" condition.
- 4. *Dispense Ready* output goes High and Dispenser *Start In-Progress* goes low. If there are any faults they will be reset.
- 5. The Automation machinery waits for *Dispenser in Process* signal to go low. This signal prevents the purge cycle and automated dispensing from occurring at the same time.
- 6. The Automation machinery sends the *Body BCD ID* (1, 2 or 4), These bits are used to tell the LiteStream system which volume limits are to be used (ref. body styles 1-7). If no body style (0) is sent, it will default to the purge mode. No volume limits are assigned for purging.
- 7. The Automation machinery sends Style Strobe. This signal must stay high for the complete cycle.
  - a. Body Style ID is latched in. The Dispense cycle is started.
  - b. Pre-charge is enabled and dispense head pressurizes.
  - c. Dispenser In-Process signal goes high.
  - d. Body Style ID bits can go low.
- 8. The Automation machinery sends the *Gun\_On and Flow Command* Signal (If Robot Reference flow is selected).
  - a. The Gun On can be turned on/off or maintained as required by the application.
  - b. The flow command is read continuously and may change as required by the application.
- 9. The dispense pattern is complete. (*Gun\_On* signal goes low).
- 10. The Automation machinery verifies that the *Volume OK* signal is Low.
  - a. If the signal is high the Automation controller must fault out. The LiteStream may not be responding.
- 11. The Automation machinery drops the *Style Strobe* signal.
  - a. The volume is calculated and shall issue a *fault(s)* or '*Volume OK'* signal if the volume was within range.
  - b. If the volume is out of range a Major (alarm) or Minor (warning) will go high and the Dispense Ready signal will go Low.
  - c. The LiteStream controller refills the dispense head on a 1K system.
  - d. The LiteStream controller records the last job dispense information for statistical process control (SPC).
- 12. The Automation machinery waits until the *Volume OK* signal goes high. This ensures that the correct volume of material has been applied.
  - a. If the Volume OK signal or the Major fault do not go high the Automation Machinery should fault out. The LiteStream controller may not be responding.
- 13. The *Dispenser in Process* will stay high until the dispense head is refilled (1K). After it is refilled the *Dispenser in Process* will go low.
- 14. The dispense cycle is complete ready for the next application.

**Note:** See Sequence of I/O timing chart on the next page.

04581971 ed1 53

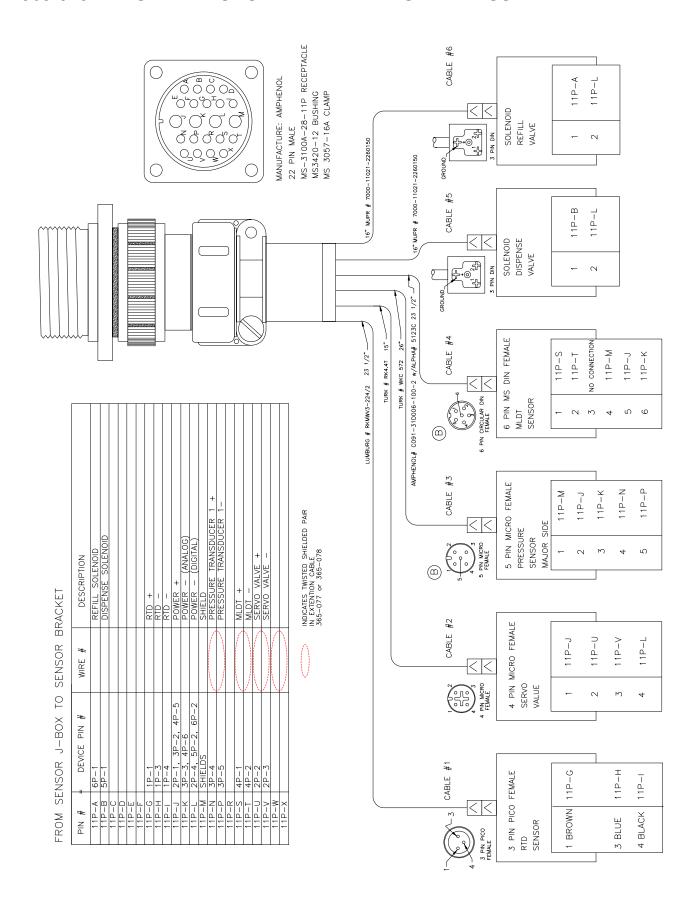


## **SEQUENCE OF I/O TIMING CHART**



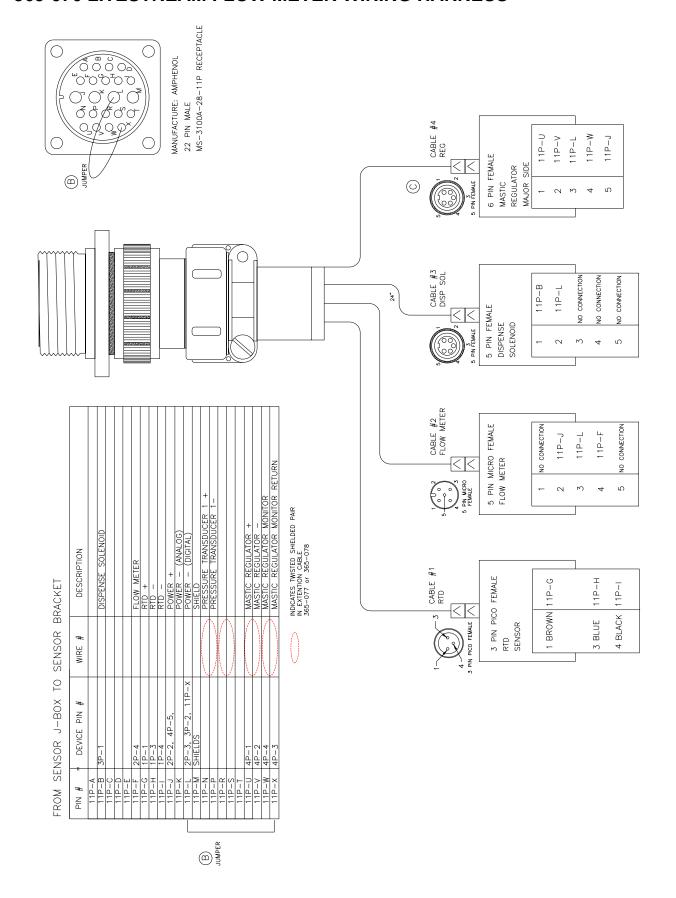


### 365-075 LITESTREAM SHOT METER WIRING HARNESS



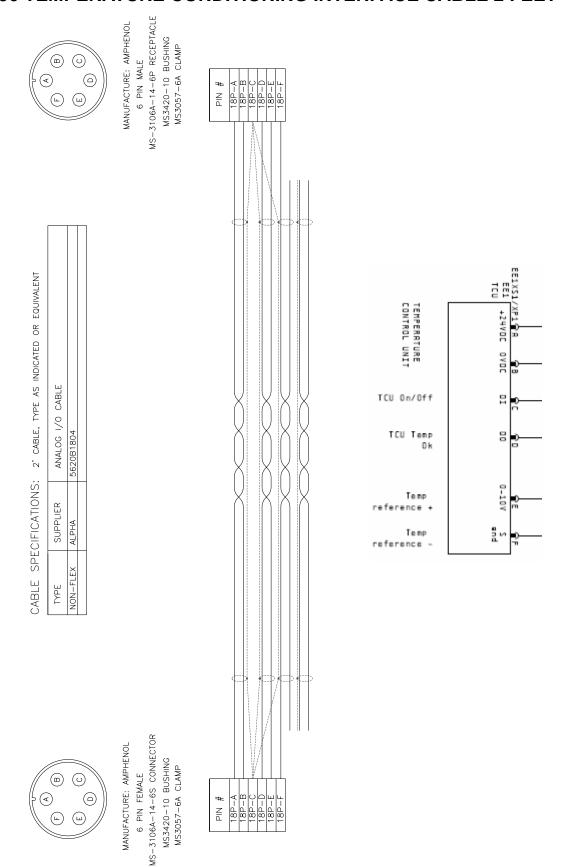


## 365-076 LITESTREAM FLOW METER WIRING HARNESS



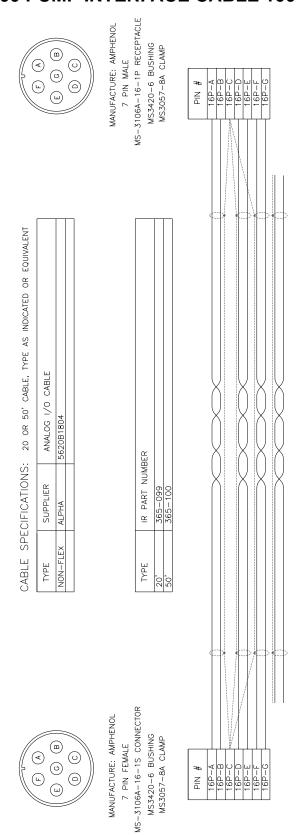


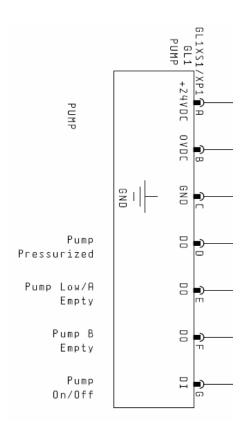
## 365-090 TEMPERATURE CONDITIONING INTERFACE CABLE 2 FEET





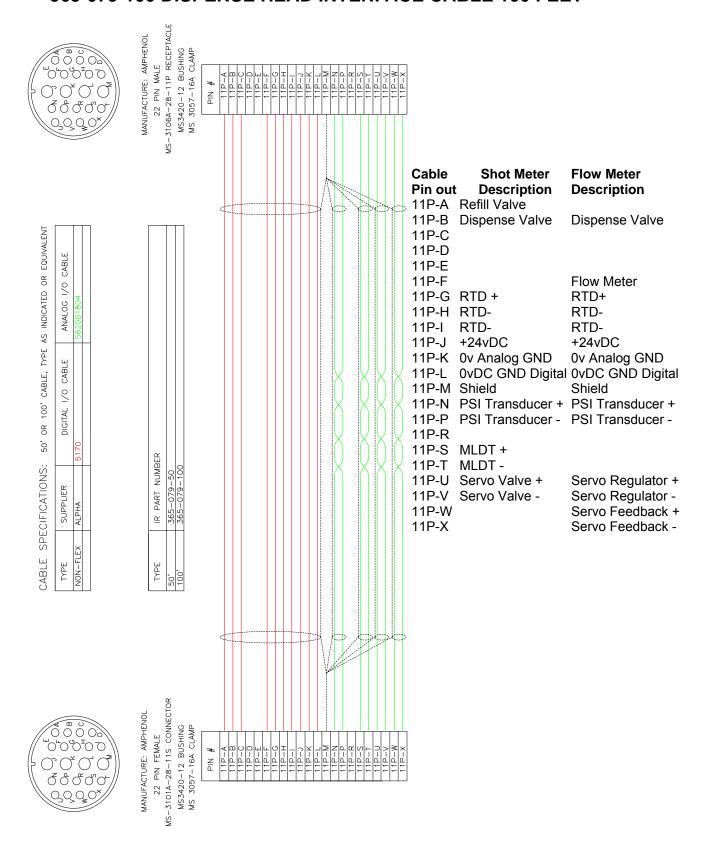
# 365-099 PUMP INTERFACE CABLE 20 FEET 365-100 PUMP INTERFACE CABLE 100 FEET





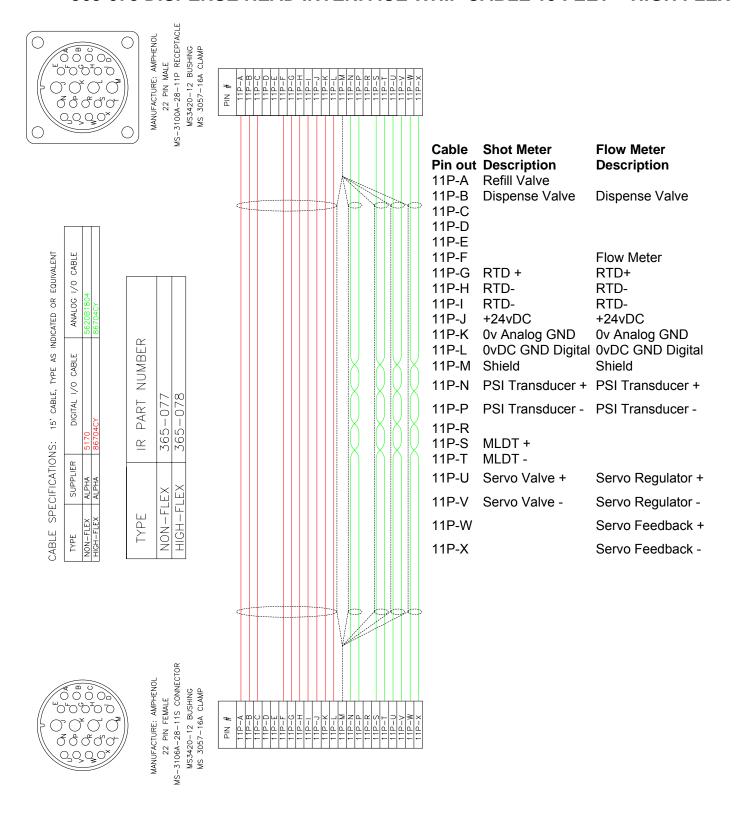


## 365-079-50 DISPENSE HEAD INTERFACE CABLE 50 FEET 365-079-100 DISPENSE HEAD INTERFACE CABLE 100 FEET



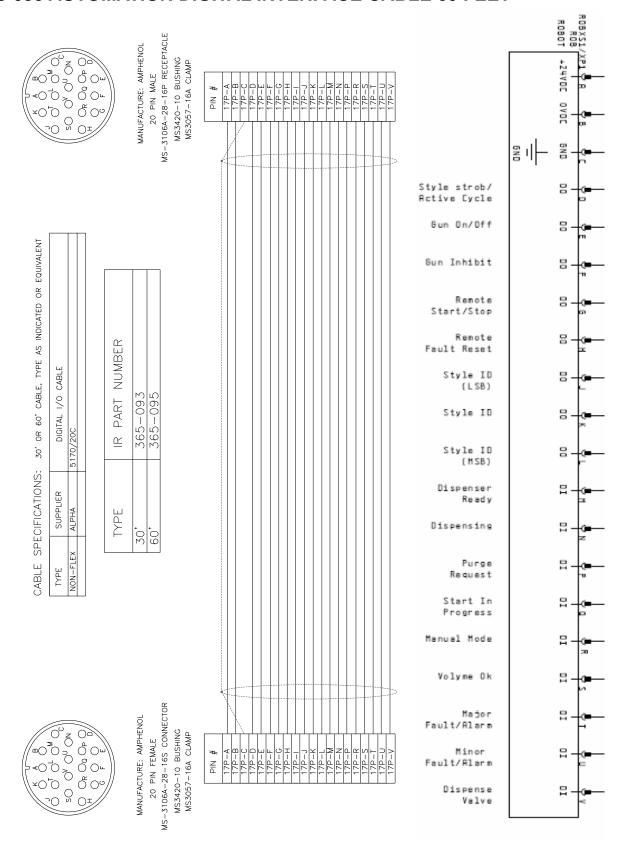


## 365-077 DISPENSE HEAD INTERFACE WHIP CABLE 15 FEET – HIGH FLEX



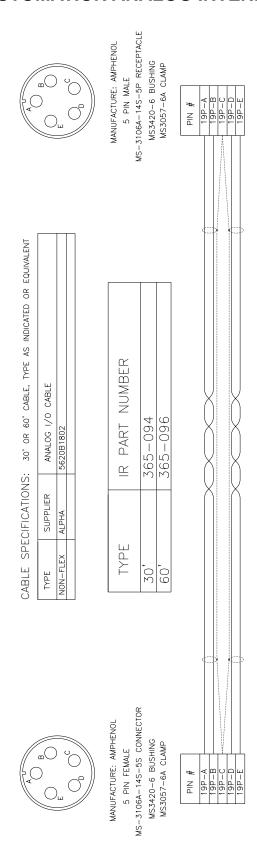


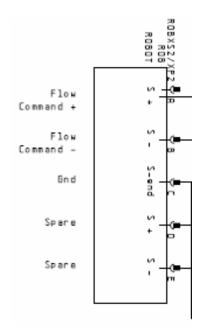
# 365-093 AUTOMATION DIGITAL INTERFACE CABLE 30 FEET 365-095 AUTOMATION DIGITAL INTERFACE CABLE 60 FEET





# 365-094 AUTOMATION ANALOG INTERFACE CABLE 30 FEET 365-096 AUTOMATION ANALOG INTERFACE CABLE 60 FEET







#### **PUMP OPTIONS**

There are several types of pump options available to cover a wide array of applications. Different kits have been made available to cover different models and interface options. See LiteStream Pump Kits Chart below.

The kits include the pump assembly controls and interface cable – required to connect pump to the LiteStream system. Refer to our standard pump catalog for more options.

For most applications of sealants and adhesives, use either:

The ARO S1 series pump for lower volumes and highly viscous material with 65:1 ratio.

The ARO high volume series pump for low to medium viscosity material with 65:1 ratio.

Both pumps are offered in 5 gallon (20L) or 55 gallon (200L) configurations.

See Pump Packages and Control Kits for more information.

ARO High Volume Pump Packages and Control Kits		S1 P	ARO Low Volume ump Packages and Control Kits
	Single ARO 5 Gallon Package w/		Single S1 5 Gallon Package w/
110-706	Pneumatics	110-708	Pneumatics
	Single ARO 5 Gallon Package w/		Single S1 5 Gallon Package w/
110-707	Pneumatics and Pump Interface	110-711	Pneumatics and Pump Interface
	Single ARO 55 Gallon Package w/		Single S1 55 Gallon Package w/
110-709	Pneumatics	110-717	Pneumatics
	Single ARO 55 Gallon Package w/		Single S1 55 Gallon Package w/
110-710	Pneumatics and Pump Interface	110-750	Pneumatics and Pump Interface
	Duel ADO 5 Celler Deckers w/		Duel C4 5 Celler Deckers w/
110-712	Dual ARO 5 Gallon Package w/ Pneumatics	110-719	Dual S1 5 Gallon Package w/ Pneumatics
110-712	Filedifiatics	110-719	Fileumatics
	Dual ARO 5 Gallon Package w/		Dual S1 5 Gallon Package w/
110-713	Pneumatics and Pump Interface	110-742	Pneumatics and Pump Interface
	Dual ARO 5 Gallon Package w/		Dual S1 5 Gallon Package w/
	Pneumatics and Deluxe Pump		Pneumatics and Deluxe Pump
110-714	Interface	110-743	Interface
	Dual ARO 55 Gallon Package w/		Dual S1 55 Gallon Package w/
110-715	Pneumatics	110-744	Pneumatics
	Dual ARO 55 Gallon Package w/		Dual S1 55 Gallon Package w/
110-716	Pneumatics and Pump Interface	110-745	Pneumatics and Pump Interface
	Dual ARO 55 Gallon Package w/		Dual S1 55 Gallon Package w/
110-718	Pneumatics and Deluxe Pump	110-746	Pneumatics and Deluxe Pump
Pump Interfac	Interface		Interface
rump interfac	e Caples	-	
110-736LS	20' Pump Interface Cable		
110-737LS	50' Pump Interface Cable		



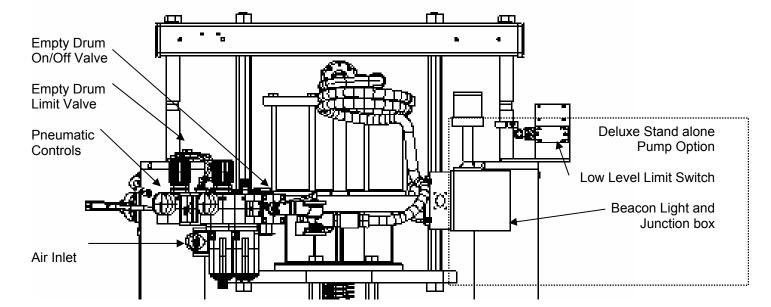
#### **Stand-alone Pump Control Options:**

**Read and understand all instructions.** Failure to follow all instructions listed below, may result in electric shock, fire and/or serious personal injury.

Install the dispense system including the control cabinet and dispense head to a stable structure capable of safely supporting their weight. Improper installation can result in personal injury.

**▲** WARNING

Always turn off the air and material supply & depressurize the entire system before installing, removing or adjusting any accessory on this product, or before performing any maintenance on this product or any accessory. Failure to follow these instructions can result in personal injury.



#### Single Pump Pneumatic Package (stand-alone) 900-200

This kit is a pneumatic package that will operate the elevator and the air motor only. It includes an empty drum shut-off feature. There is no communication between the pumps and the LiteStream controller.

#### Single Pump Interface Package (stand-alone) 110-650

This is a single pump interfaced add on kit. It includes a low level signal for "material low" warning, a pump active signal and a single beacon light that indicates a low level fault. This Kit does not include a drum empty warning. There is a single communication cable between the pump control box and the LiteStream controller. Requires single pump pneumatic package 900-200.

#### Installation:

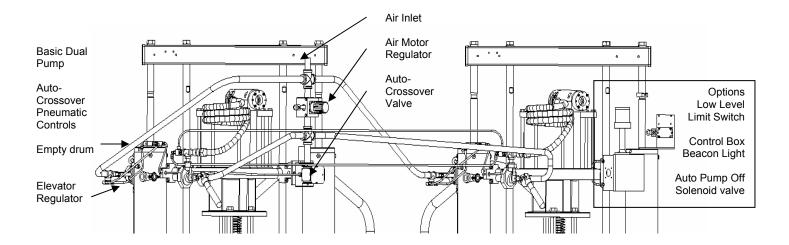
- 1. Bolt pneumatic controls to the elevator crossbar
- 2. Connect tube fitting to the elevator hand valve.
- 3. Connect coiled hose assembly to the air motor.
- 4. Bolt the empty drum limit switch to the elevator.
- 5. Connect a 3/4NPT air line to the air line port. The air supply should be clean and dry.

#### **Deluxe Options.**

- 6. Bolt the control box and limit switch bracket to the elevator (opposite hand valve).
- 7. Locate the low level trip collar on the elevator rod and tighten.
- 8. Connect the interface cord from the LiteStream Controller to the Pump junction box.
- 9. Adjust elevator and air motor regulator pressures.



#### **Dual Pump Control Options:**



#### **Dual Pump Pneumatic Package 900-201**

This kit is a pneumatic package that will operate the elevators and the air motors, will pneumatically crossover from pump A to pump B and vice versa when drum is empty. There is no communication between the pump controls and the LiteStream controller.

#### Standard Dual Pump Interface Package 110-651

This is a dual pump interface add on kit. It includes a drum "A" empty signal, a drum "B" empty signal, a pump active signal (high if either pump "A" or "B" are on) and a single beacon light to indicate an empty drum warning/fault. This package does not include low-level warning signal. There is a single communication cable between the pump control box and the LiteStream controller. Requires dual pump pneumatic package 900-201.

#### **Deluxe Dual Pump Interface Package 110-652**

This is a dual pump interface add on kit. It includes a drum "A" empty signal, a drum "B" empty signal, a pump active signal (high if ether pump "A" or "B" are on), a single beacon light to indicate an empty drum warning/fault, a solenoid valve that will turn the pumps on or off (controlled by the LiteStream controller). This package does not include a drum low warning. There is a single communication cable between the pump control box and the LiteStream controller. Requires dual pump pneumatic package 900-201.

#### Installation:

- 1. Bolt air motor and elevator controls to the elevator crossbar (both pumps).
- 2. Bolt the Auto-Crossover controls to the elevator crossbar.
- 3. Connect Tube fitting to elevator hand valve (both pumps).
- 4. Connect coiled hose assembly to air motor (both pumps).
- 5. Bolt the empty drum limit switch to the elevator.
- 6. Connect the air lines from the elevator controls to the Auto-Crossover controls (they are tagged).
- 7. Connect a 3/4NPT air line to the air line port. The air supply should be clean and dry.

#### **Deluxe Options.**

- 8. Bolt the control box and limit switch bracket to the elevator (opposite hand valve-both pumps).
- 9. Locate the low level trip collar on the elevator rod and tighten (both pumps).
- 10. Connect the interface cord from the LiteStream Controller to the Pump junction box.
- 11. Adjust elevator and air motor regulator pressures.

04581971 ed1 65



#### TEMPERATURE CONDITIONING

Temperature conditioning is used to create a stable environment so the viscosity of a material remains consistent. This will improve job to job repeatability.

Temperature can be used to make a high viscosity material dispensable without using excessive pump pressure. Some materials can adhere to an oily panel better if the temperature is elevated. **Ingersoll Rand** uses water as a medium to condition the material. A closed loop system pumps water through the dispense valve (point of application), dispense head, conditioned hoses and header. The system has an electric heater and a chiller to condition the water. A RTD resistive thermal device is used to measure the material as close to the nozzle as possible. The RTD feeds back to the LiteStream controller which in turn controls the temperature of the water. The temperature range is 59.9 – 149.9 deg F (15.5 – 65.5 deg. C).



The 100 OHM RTD Part No. 364-330

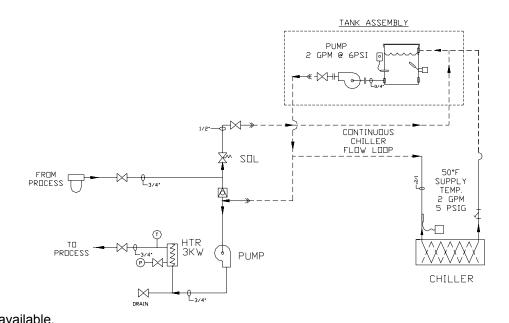
	LiteStream Temperature Conditioning Kits			
110-702	Shot-Meter TCU Package - for 50' Dressout			
110-703	Shot-Meter TCU Package - for 100' Dressout			
110-738	Flow-Meter TCU Package - for 50' Dressout			
110-739	Flow-Meter TCU Package - for 100' Dressout			
110-740	Robot Extension for additional 3' of conditioning			
110-747	Pedestal Extension for additional 4' of conditioning			

#### **Water Circuits**

Temperature Control Unit (TCU) is made up of 2 separate water circuits. There is a process control loop and a cool water loop. The process control loop continuously re-circulates water from the TCU to the process and back to the TCU. The chilled water loop generates and stores cool water for use when the control water in the process loop requires cooling.

## Process Water Circuit with Heater

A water circulation pump maintains a continuous flow of control water to and from the process. There is a water heater in the process circulation loop so if the process is calling for heat, warm water will be available.



#### **Chilled Water Circuit**

Chilled water, 55°F (12.8 °C), is generated in a self contained refrigeration unit by re-circulating water through a braze plate evaporator and cool water storage reservoir. The sealed refrigeration system removes heat from the refrigerant side of the evaporator and transfers it to the ambient air by the use of an air-cooled condenser.

When cooling of the process water is required, small amounts of water coming back from the process is redirected into the cool water reservoir. This forces small amounts of water from the chilled water circuit into the process water loop to gently drop the temperature of the control water in the process water loop.



### **Temperature Conditioning Mechanical Installation**

**Read and understand all instructions.** Failure to follow all instructions listed below, may result in electric shock, fire and/or serious personal injury.

Install the dispense system including the control cabinet and dispense head to a stable structure capable of safely supporting their weight. Improper installation can result in personal injury.

Locate operator controls in an area where the operator is not endangered, has easy ingress and egress and can readily access all emergency shutdown controls. Considering operator safety in system layout can eliminate many operator risks.

Grounded products must be plugged into an outlet properly installed and grounded in accordance with all codes and ordinances. Never remove the grounding prong or modify the plug in any way. Do not use any adapter plugs. Check with a qualified electrician if you are in doubt as to whether the outlet is properly grounded. If this product should electrically malfunction or break down, grounding provides a low resistance path to carry electricity away from the user.



All components of the Dispense System must be grounded. Use hoses incorporating a static wire or use grounded piping. Static electricity may build up in the dispense system during normal operation if not grounded. Sparks from static discharge can ignite flammable material and vapors.

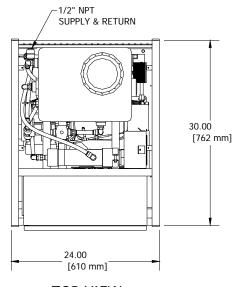
- Use the pump ground lug provided on metallic pumps for connection of a ground wire to a good earth ground source. Use Ingersoll Rand part no. 66885-1 ground kit or a suitable ground wire (12 gal. min.).
- Consult local building codes and electrical codes for specific grounding requirements.
- After grounding, periodically verify continuity of electrical path to ground. Test
  with an ohmmeter from each component (e.g., hoses, pump, clamps, container,
  spray gun, etc.) to ground to insure continuity. Ohmmeter should show 0.1
  ohms or less.
- Use hoses incorporating a static wire or use grounded piping.

**Always use specified supply voltage.** Incorrect voltage can cause electrical shock, fire, abnormal operation and may result in personal injury.

#### Use only Distilled Water - No Glycol - Bleach - Chlorine

Locate and secure the temperature conditioning unit to the floor.

- 1. Connect the 'to' and 'from' water lines to dispense unit. (The hoses should not be kinked or stretched.)
- 2. Connect interface cable from the LiteStream controller too the temperature control panel.
- 3. Connect Temperature controller to power source. See Electrical schematics for correct voltages.
- Fill water reservoir with distilled water and anti-corrosive chemicals.
- Turn on the TCU, the Main disconnect is on the front door of the panel, and turn the selector switch to Local. (The water pumps will start)
- 6. To purge air out of the system. Wait 60 seconds for the system to stabilize. Normal water pressure is 25 28 Psi.
- 7. Top off the water reservoir with clean distilled water.

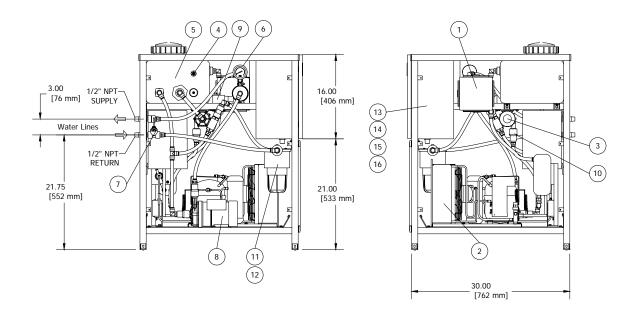


**TOP VIEW** 

04581971 ed1 67



- 8. When the system is full and running, add 1 pint of GE BETZ. 405 Corrshield corrosion inhibitor. Part No. 362-736.
- 10. Check for water leaks.



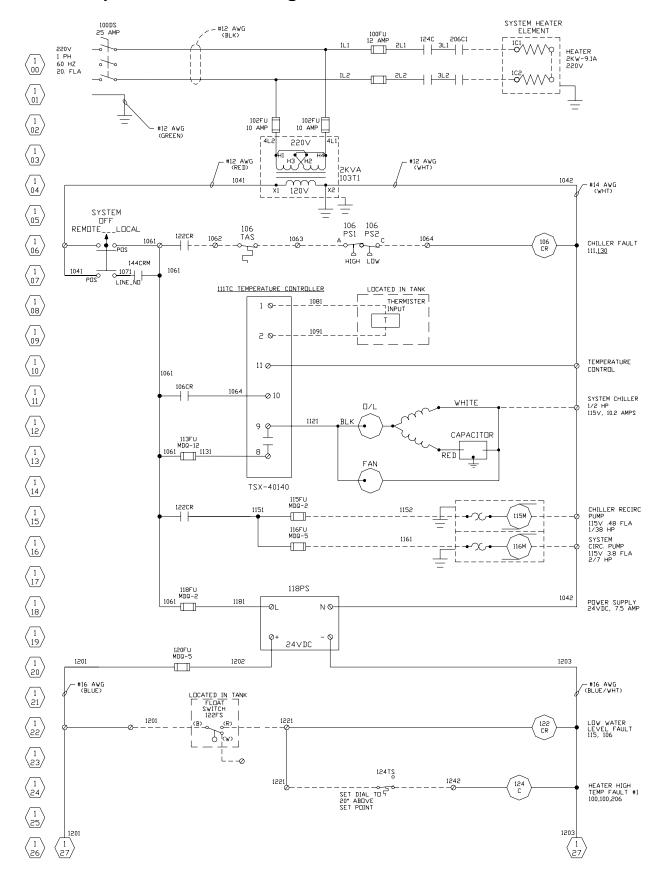
LEFT SIDE VIEW

**RIGHT SIDE VIEW** 

Temperature Conditioning Parts		
Detail #	Part Number	Description
1	365-141	Heater 2KW / 120-240V/ 1ph
2	365-142	Refrigeration Assembly
3	365-143	Circulation pump (Reservoir)
4	363-402	Float Switch with cable
5	365-144	Reservoir Strainer 3/4 20 mesh
6	365-145	Pressure Gauge 0-60 PSI bottom mount
7	365-146	RTD 1/4in. NPT
8	365-147	Water Pump - Main
9	363-400	Solenoid Valve 24VDC
10	365-148	Check Valve
11	364-466	Water Filter – Housing
12	364-431	Filter Element 5 Micron.
13	365-149	Heater Relay - Control Panel
14	365-150	Ice Cube Relay – Control Panel
15	365-151	Controller Omron – Main temperature – Control Panel
16	365-152	Temperature Switch – Chiller on/off – Control Panel
	362-736	Coreshield – Corrosion inhibitor
	363-704	Coreshield / PH test kit



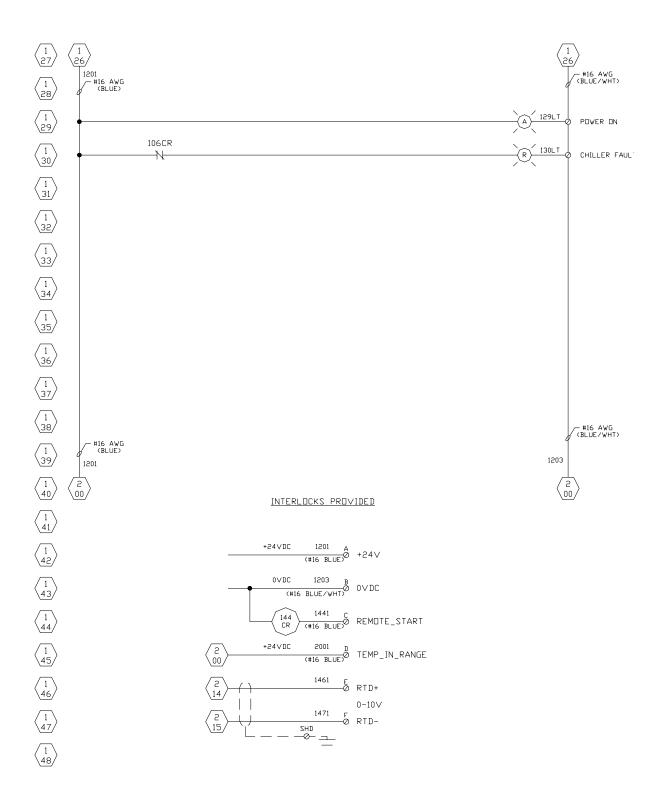
## **Temperature Conditioning Electrical**





## **Temperature Conditioning Electrical continued**

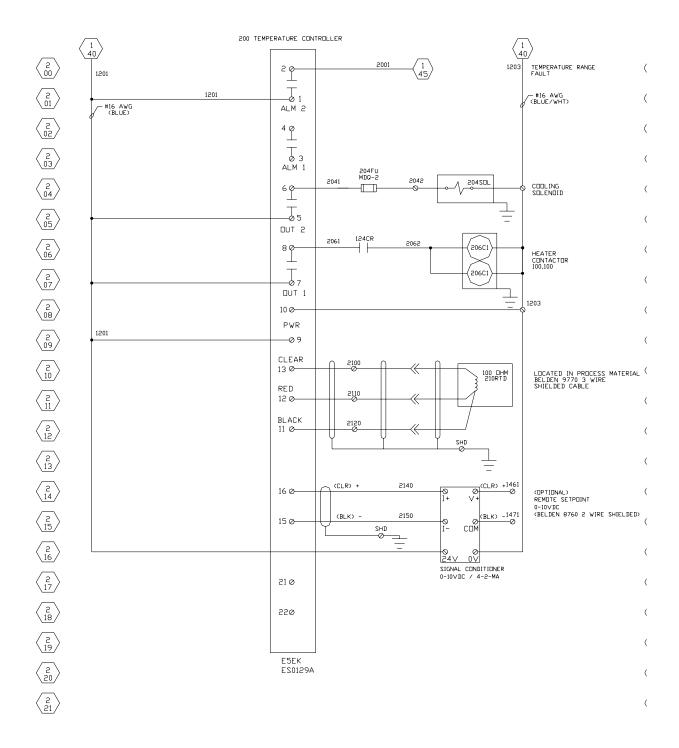
#### Inputs and Outputs To LiteStream Controller





## **Temperature Conditioning Electrical continued**

#### **Remote Temperature Controller**





#### **AIR INTENSIFIER**

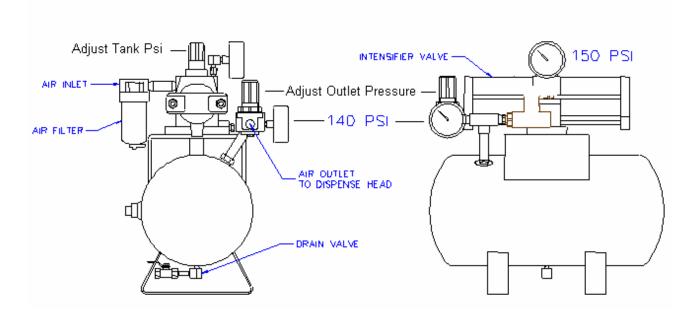
**Read and understand all instructions.** Failure to follow all instructions listed below, may result in electric shock, fire and/or serious personal injury.



Always turn off the air and material supply & depressurize the entire system before installing, removing or adjusting any accessory on this product, or before performing any maintenance on this product or any accessory. Failure to follow these instructions can result in personal injury.

Part No. 364-661

An air intensifier is used to increase the dispense pressure of a Shot Meter dispensing head. This allows the size of the control valves and air cylinder to be smaller and have a quicker reaction time. The Air Intensifier assures that the Dispenser is getting 140 Psi constantly even though the plant air supply may only be 80 Psi. The Intensifier has a pneumatic cylinder pump that boosts the air pressure.



#### To Adjust the Air intensifier:

- 1. The Air supply must be clean and dry. A 5 micron filter (coalescing) is supplied with the air intensifier.
- The inlet air supply must be above 65 Psi.
- 3. Adjust the tank pressure regulator until the tank pressure is 150 Psi.
- 4. Adjust the outlet pressure regulator to 140 Psi.

#### Maintenance:

#### Weekly:

- 1. Verify that the pressure settings are correct.
- 2. Check for leaks.

#### Monthly:

1. Open Drain to expel water or contaminates. Repair Kit Available 363-385RK-1

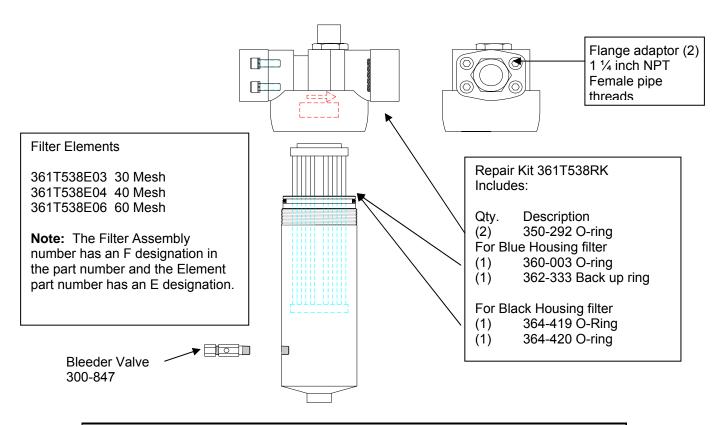


### 361T538FXX HIGH PRESSURE MATERIAL FILTER 1 1/4 INCH NPT

**Read and understand all instructions.** Failure to follow all instructions listed below, may result in electric shock, fire and/or serious personal injury.



Always turn off the air and material supply & depressurize the entire system before installing, removing or adjusting any accessory on this product, or before performing any maintenance on this product or any accessory. Failure to follow these instructions can result in personal injury.



Filter Assembly Part Numbers		
361T538F03	30 Mesh Element	.022 in. orifice
361T538F04	40 Mesh Element	.015 in. orifice
361T538F06	60 Mesh Element	.010 in. orifice

WHEN REPAIRING THE FILTER TURN OFF THE PUMP SUPPLY PRESSURE AND BLEED THE MATERIAL PRESSURE FROM THE PUMPING SYSTEM AND FILTER BOWL.

#### MAINTENANCE:

Replace the Filter element when there is a 500 PSI pressure drop across it.

**Note:** Material must be flowing to check the pressure drop

#### **REBUILDING INSTRUCTIONS:**

- 1. Close the ball valves and depressurize the filter by opening the bleeder valve.
- 2. Unscrew the Filter Bowl and remove the Element. It helps to spin the element from the bowl.
- 3. Clean the Filter Bowl and Housing.
- 4. Replace the O-ring and Back-up Ring and Lubricate with Synthetic grease.
- 5. Install new Element in the Filter Housing.
- 6. Thread on the Bowl and tighten to 50 Ft/Lbs.



#### START UP AND SHUT DOWN PROCEDURES

Read and understand all instructions and all safety warnings supplied with all accessories, optional components and integrated hardware before installing and operating this product. A Dispense System will often contain other components, accessories and robots whose hazards are not covered by this manual.

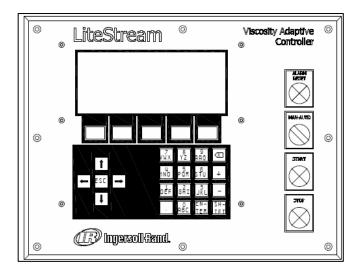


Always install, operate, inspect and maintain this product in accordance with all applicable standards and regulations (local, state, country, federal, etc.). Compliance is your responsibility. Failure to follow standards and regulations can cause personal injury.

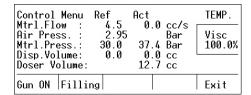
**High pressure, never aim a material outlet towards yourself or others.** Do not stop or deflect dispensing material with your hand, body, glove, or a rag.

## Start up procedure:

- 1. Depress the Master Start Pushbutton located on the front control panel.
- 2. Verify that the Temperature conditioning selector switch is in the ON position.
- 3. Wait for the material temperature to reach the set value.



- 4. If the system has deluxe 3 pump kits, the pumps will automatically start.
- 5. If the system does not have deluxe 3 pump kits: Turn on the supply pumps Manually.
- Turn on the air to the air intensifier (1K-Shot Meter).
- 7. Go to the fault screen and reset each fault.
- 8. Turn the Manual/Automatic selector switch to the Manual position.
- 9. Go to the control screen to start dispensing material (purge).
  - a. Depress the Gun\_On button until the system has been adequately purged. See graphic below.
  - b. Shot meter systems need to be filled after the meter is emptied –press the Filling button.



- 10. Turn the Manual/Automatic selector switch to the Automatic Position.
- 11. The system is ready for Automatic Dispensing.



# Shut down procedure:

- 1. Turn the Manual/Automatic selector switch to the Manual position.
- 2. De-pressurize the material system.

  - a. Turn off the air to the pumps close manual ball valve.
    b. Open the material ball valve and purge the material into the purge bucket. (Material pressure should be at zero bar/psi).
  - c. Put the LiteStream controller into Manual and depress the Gun On button until material stop
- 3. Depress the LiteStream controller Stop button. The dispense system, TCU and pumps (if applicable) will shut down.
- 4. The system is in a safe shut down mode.

75 04581971\_ed1



### MAINTENANCE SCHEDULE

**DISPENSE SYSTEM** 

**DAILY**: Verify that the Dispense bead or pattern is correct.

Verify the Temperature setting is correct.

Depressurize Material and Water every shutdown.

**WEEKLY:** Check the Dispense & Refill valves to ensure that they are not leaking.

Check the Dispense Head to ensure that it is not leaking.

Check all of the regulator settings, Pump, Air Intensifier, Dispense Head and

Check water system for correct operation and settings. Check the Electric cables for wear and tightness.

MONTHLY: Lubricate the Dispense Head with Wet Sol Oil #66334-B. (Shot Meter)

Check water level in the reservoir.
Check hoses for tightness and damage.
Check Air Filters for contamination.

Open Air Intensifier to expel water or contaminates. Purge the Mastic Regulator body with material.

(Remove the 1/8 in. pipe plug from body and expel old material)

SEMI

**ANNUALLY:** Replace Material Filter Element.

(Subject to the material-may require more maintenance)

Clean the Water Strainer. Change the water if necessary.

Add Water Treatment & check PH balance.

Check the Reservoir Float Switch to ensure it is functioning.

Clean the chiller evaporator and replace water filter.

**ANNUALLY:** Rebuild the dispense heads

(Subject to the material – may require more maintenance)

**PUMPS** 

**DAILY:** Fill the packing oil cup with Wet Sol oil #66334-B Every barrel Change.

Clean material from packing cut if necessary.
Assure hand valve for elevator is in down position.
Lubricate Follower Plate wiper ring every barrel change.
Bleed Air from Follower Plate every barrel change.
Bleed Air from Foot Valve every barrel change.

**WEEKLY:** Fill the airline lubricators, above the pump are filled with #10 oil.

Check for loose gaskets on air valve and air motor, tighten or replace.

**MONTHLY:** Check airline filters.

Clean or replace filter element as required.

Check follower plate wiper ring and replace if damaged.

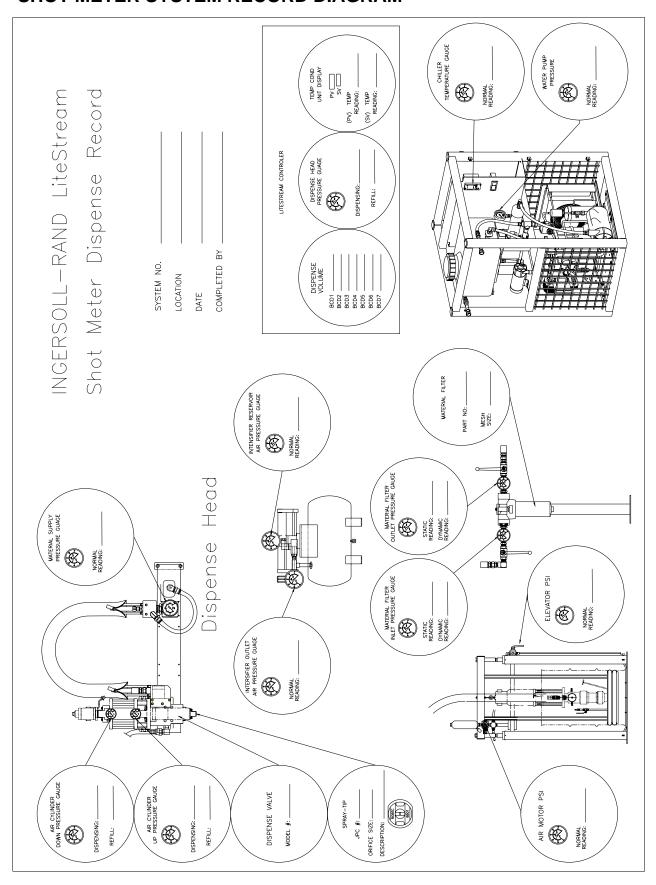
SEMI

**ANNUALLY:** Purge water from elevator.

(Open valve at base of elevator tube)

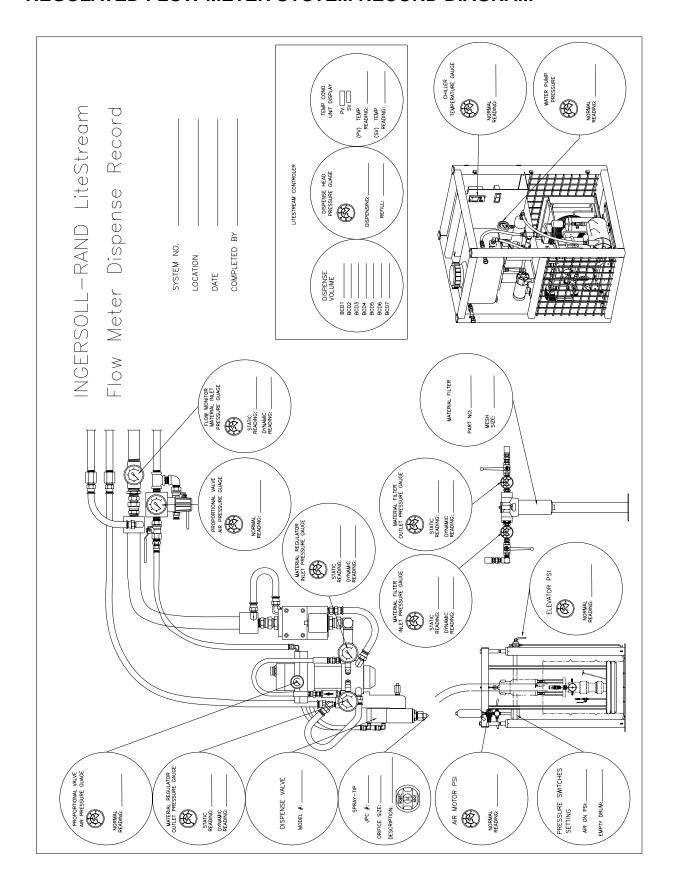


## SHOT METER SYSTEM RECORD DIAGRAM





## REGULATED FLOW METER SYSTEM RECORD DIAGRAM

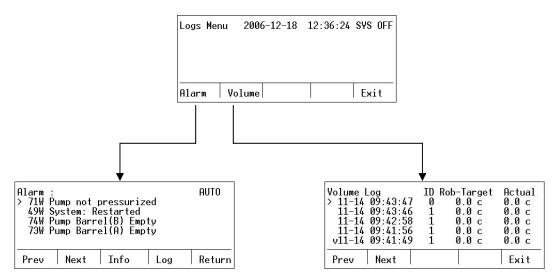




## **FAULT AND SYSTEM RECOVERY**

Go to the Alarm menu to verify the fault.

The Logs Menu contains the same headline as the main menu. It has two submenus – Alarm and Volume.



### **Low Volume Faults**

Fault	Problem	Solution
Low Volume	Plugged tip	Replace tip and Purge
Visually Verified not enough	Expired Material	2, Change Material and Purge
material	3. Low Dispense Pressures	3, Check operation of Dispense head
	4. Plugged Material Filter	4. Change Material Filter Element
	5. Pump Pressure to Low	5. Reset Pump PSI to Specifications
	Plug in material path	6. Use pressure gauges to locate pressure
	7 Material not at to see eveture	drop in system
	7. Material not at temperature	7. Check Temperature system
	8. Air Intensifier not working (1K)	Check operation of Intensifier tank PSI=     Outlet =140 PSI
	O. Saaling or Companagion out of	
	<ol><li>Scaling or Compensation out of range</li></ol>	Reset Scaling or Batch Compensation
	10. Body ID target changed	10. Reset Body ID Target
	11. Defective PSI Transducer	11. Test or Replace PSI Transducer
	12. Dispense head not working	12. Check operation of dispense head
		(Seized Polyseals & check solenoid
		valves)
	13, Robot Command signals to Low	13. Check Robot Variables
Low Volume	1K - MLDT Linear transducer	Replace MLDT and check wiring
Visually Verified Good Bead	not functioning correctly	
	2. 1R- Flow Monitor Tuning not set	2, Reset the Flow Monitor tuning factor in
	correctly	the set up 3 screen



# High Volume, Refill and Network faults.

Fault	Problem	Solution
too much material	<ol> <li>Worn or not tip</li> <li>Material too thin</li> <li>Refill valve leaking</li> <li>Material temperature to High</li> <li>Robot Command Voltage to High</li> <li>Body ID target value inaccurate</li> </ol>	<ol> <li>Replace tip and Purge</li> <li>Change Material and Purge</li> <li>Check valve for leakage-replace</li> <li>Check Temperature system and reset the material temperature</li> <li>Reset Variables in robot controller</li> <li>Reset body ID target value</li> </ol>
Good Bead	<ol> <li>Worn or not tip</li> <li>Material too thin</li> <li>Pump pressure to High</li> <li>Material temperature to High</li> <li>Robot Command Voltage to         High or speed to slow</li> <li>Body ID target value Inaccurate</li> </ol>	<ol> <li>Replace tip and Purge</li> <li>Change Material and Purge</li> <li>Check and reset pump pressure</li> <li>Check Temperature system and reset the material temperature</li> <li>Reset Variables in robot controller</li> <li>Reset body ID target value</li> </ol>
	<ol> <li>Plugged material filters</li> <li>Air pressure not on</li> <li>Pump Pressure to low</li> <li>Temperature system not on and up to temp</li> <li>Refill Solenoid/Valve not working</li> <li>Pressure transducer not reading</li> <li>MLDT not working</li> <li>Dispense head seized</li> <li>Refill time set to short</li> </ol>	<ol> <li>Change Material Filters</li> <li>Turn on Air pressure to dispense head</li> <li>Check pump PSI and reset to specifications</li> <li>Start temp system and wait for pumps to pressurize</li> <li>Replace Refill or Solenoid Valve</li> <li>Replace pressure transducer</li> <li>Replace MLDT</li> <li>Replace dispense head</li> <li>Reset the Refill time in the setup screen</li> </ol>
I/O Error LiteStream Panel	<ol> <li>Communication has stopped between the robot and LiteStream system</li> <li>Check for terminating resistors</li> <li>Controller/Robot locked up</li> <li>Device net card not working</li> <li>Cable or wiring disconnected</li> <li>Node not reading correctly</li> </ol>	<ol> <li>Check for 24V at the device net terminals and reset robot Controller and LiteStream panel</li> <li>There should be 2 terminating resistors per device net network</li> <li>Reboot robot then LiteStream Controller</li> <li>Replace device net card</li> <li>Check for 24VDC and nodes and check the cables, tees and terminators</li> <li>Reboot system if not working</li> </ol>
No Material Dispensed NO Fault	<ol> <li>The robot did not send the Robot Style bit and the Job was Ignored (In dry cycle)</li> <li>Gun inhibit signal may be on</li> </ol>	<ol> <li>LiteSoftware is operating correctly. The robot needs to send the robot Style bit. And style strobe signal</li> <li>Disable Gun inhibit signal</li> </ol>
	<ol> <li>Does not have power</li> <li>Software not loaded</li> <li>Device net cards not working</li> <li>Hard-drive failed</li> <li>Blue Screen only</li> </ol>	<ol> <li>Turn on the power PC has an on/off switch on it</li> <li>Load Files (software)</li> <li>Check jumper setting on Device Net cards or replace</li> <li>Replace Controller</li> <li>Replace Controller</li> </ol>



# **Dispense Head**

PROBLEM	CAUSE	SOLUTION
Material Leakage Past	Seals are worn	Replace Seals in Seal Cartridge
Rod Seals	Rod is worn or scored	Clean off or replace rod
	Cured Material on rod	Clean off or replace rod
Material Leakage from Seal Cartridge	Loose Connecting Parts	Tighten four Hex Head Bolts to Body
	Cut or missing O-Ring	Disassemble using directions in this manual and replace O-Ring
	Cracked Body	DISCONTINUE USE OF DISPENSER
Material Leakage from Refill Valve Bleeder hole	Valve Seals are worn	Replace Seals in Refill Valve
	Valve Rod is worn or scored	Clean off or replace rod
	Cured Material on Valve Rod	Clean off or replace rod
Material Leakage from Transducer Well	Transducer is loose	Tighten BUT DO NOT OVER TIGHTEN the Transducer
	Cut or missing O-Ring	Replace O-Ring
Dispenser Not Refilling Properly	Low Air Pressure to Intensifier	Make sure air to the Intensifier is above 60psig
	Low Material Pressure from Pumps	Make sure there is at least 200 psig of material pressure at the Dispenser
	Refill Valve malfunctioning	Rebuild or replace Refill Valve
Low Volume Faults	Material has changed viscosity	Change system parameters to account for change
	Tip is plugging	Clean out or replace Dispense Tip
	Position Transducer is out of calibration or malfunctioning	Replace Position Transducer
High Volume Faults	Material has changed viscosity	Change system parameters to account for change
	Tip is worn	Replace Dispense Tip
System Lagging on Refill or Dispense	Servo Valve contaminated	Clean out or replace the Servo Valve. Assure that air is properly filtered (coalescing-type)
	Air Leakage past Piston	Clean out the Air Section and replace Quad Ring if necessary
Bead is too large at the start of the Dispense	Feed Pump pressure is too high	Reduce Feed Pump pressure to be at or lower than the Dispense Pressure



# **Material Pump**

PUMP AIR MOTOR	
Problem	Solution
Air Leakage out of the Main Exhaust	Check for worn or damaged O-rings on Spool #18 Check for worn or damaged "U" cup Packing #14 Check for worn or damaged Spool #20 Check for worn or damaged O-ring on Piston Assembly #50
Air Leakage around Piston Assembly	Check for worn or damaged "U" cup Packing #12
Air Leakage out of the pilot exhaust hole	Check for worn or damaged "O-ring #3 Check for worn or damaged inside diameter of Cylinder #6 Check for worn or damaged O-ring #1 Check for worn or damaged "U" cup packing #24 Check for worn or damaged "U" cup Packing #12 on Piston #11
MATERIAL LOWER PUMP	
No Material at Outlet (pump continually cycles)	Check material supply, disconnect or shut off the air supply and replenish the material, reconnect
Material on one stroke only (fast down stroke)	The foot valve body may not be seating in the lower check valve seat. Remove the foot valve body from the check valve seat, clean and inspect the check valve seat area. If the foot valve or seat is damaged, replace.
Material on one stroke only (fast upstroke)	The valve seat may not be seating in the upper valve seat. Remove the valve seat, clean and inspect. If the valve seat is damaged, replace. Check for worn or damaged packing and seals. Replace the packing and seals as necessary.
Material leakage out of the solvent cup or material appears on the pump plunger rod	Relieve the pressure in the pump and tighten the solvent cup until leakage discontinues. If this procedure does not aid in stopping the leakage problem, the upper packing may be worn. Replace the packings as necessary.
Pump running freely in both directions	Air in Foot Valve – Open bleeder valve on foot valve and run pump until all of the air is expelled Verify the position of the elevator hand valve – it should be in the down position
Elevator not going up (leaking air from exhaust)	The elevator cylinder piston O-rings are leaking and should be changed The elevator air pressure is set to low – raise PSI (40 PSI normal)



# **Temperature Conditioning Unit**

Problem:	Solutions:
Unit will not start.	Verify that the main disconnect is in the "on" position
	Verify that a water level fault is not present
	<ul> <li>Verify that the fuses or breakers for the transformer and pump have not</li> </ul>
	blown
Unit has power but the pump	Make sure that there is not a low water level fault
is not running	Verify that the fuses or breakers for the pump have not blown. Set breaker
Pump is running but there is	Verify that the pump is rotating in the proper direction
no flow	Verify that all valves are open
	Clean the Y-strainer
	Make sure that the tubing or water hose lines are pinched
	J
The unit is running but not heating	<ul> <li>Verify that the controller is calling for heat. Output indicator light should be lit/pulsing.</li> </ul>
	Verify that the fuses or breakers for the heater have not blown
	<ul> <li>Verify that the SCR is receiving a heat signal from the controller. The signal light on the SCR should be flashing green.</li> </ul>
	If there is not signal to the SCR, verify that the controller is providing a DC
	output
The unit is not cooling with	Verify that the controller is calling for cool. Output indicator light should be
the chiller running	lit.
	Verify that the fuses or breakers for the Solenoid Valve have not blown
Low Water Level Fault is	<ul> <li>Verify that the water level in the reservoir is below the level switch. If it</li> </ul>
present	isn't, replace the level switch as it is faulty.
'	"Walk" the water flow path for the entire circulation loop looking for a leak in
	any tubing, hoses, or manifolds. Repair or replace as needed.
Material Temperature Deviation Fault is	<ul> <li>If the process temperature is below the set point temperature, check for flow restriction</li> </ul>
present	<ul> <li>If the process temperature is above the set point temperature, check for flow restriction and chiller operation</li> </ul>
	Check to pressure gauge for an abnormally high system pressure
	Verify that all manual ball valves are open
	<ul> <li>Verify that there is water flow through any tubing and hose correct any pinched lines</li> </ul>
	Clean the Y-Strainer or change filter
High Water Temperature	Check the pressure gauge for an abnormally high system pressure
Fault is present	<ul> <li>Verify that there is water flow through any tubing and hose, correct any pinched lines</li> </ul>
	Clean the Y-Strainer or change filter



### **TECHNICAL DATA**

#### **LiteStream Control Computer**

Graphical color-LCD-screen with 8 lines x 40 characters and industrial grade pushbuttons and keyboard.

Active display area: 148 x 55 mm.

Based on the mc68hc16 processor with 512kb of flash memory and 256kb of nvram.

16 digital inputs 24V DC and 16 digital outputs 24V DC 1.5A.

Analog inputs: 1 differential pressure sensor input

4 general purpose analog 0-10V DC inputs 1 linear potentiometer 0...5V / 0..10V DC input

Analog outputs: 2 analog – 10...+10V DC outputs.

Serial I/O: 2 Port RS485 for communication

1 Port RS232 for communication

Option boards available for Device Net field-bus systems.

Supply voltage: 24VDC +/- 20%

Current consumption: 0.4 -1.5A, depending on used option boards.

Dust/damp resistance: IP40

Ambient temperature: 0 – 50 degrees Celsius

Main controller

**power:** 90V - 230V AC 1P

Pneumatics Plant air (80-90 Psi)

**Dispense Heads:** LiteStream Shot Meter Air Intensifier outlet 9.6 bar (140 Psi)

½ inch Minimum air tubing required.
5 Micron filtration recommended

Shot Meter Dispense inlet pressure Maximum 200 bar (3000 Psi) Shot Meter Dispense outlet Pressure Maximum 170 bar (2500 Psi) Flow Meter Dispense inlet Pressure Maximum 350 bar (5000 Psi) Flow Meter Dispense outlet Pressure Maximum 310 bar (4500 Psi)

**Pneumatics** 

**Pumps** Maximum Inlet pressure 6.2 bar (90 Psi).

Maximum Material outlet pressure 400 bar (5850 Psi)

3/4 inch Minimum air tubing required.5 Micron filtration recommended

**Temperature** 

Conditioner: 230vAC

Conditioning Range 15.5 – 65.5 degrees Celsius

Refrigerant R134A



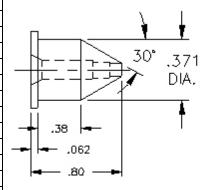
## **ADDITIONAL PARTS**

## Streaming vs Extruding

Streaming involves faster robot speeds (150-1500mm/s) and slightly higher pressures than extruding. The dispense system creates pressure behind a small orifice. The material is forced out of the nozzle in the form of a small stream. The larger the nozzle the less force the stream has and the closer the nozzle needs to be programmed to the part. Streaming works in the horizontal, vertical or overhead direction. Streaming is the preferred method of dispensing.



Part #	Description	Orifice
362-853	Streaming/carbide insert	.030
362-853A	Streaming/carbide insert	,035
362-853B	Streaming/carbide insert	.040
362-853C	Streaming/carbide insert	.045
362-853D	Streaming/carbide insert	.050
362-853E	Streaming/carbide insert	.060
362-853F	Streaming/carbide insert	.018
362-853G	Streaming/carbide insert	.021
362-853H	Streaming/carbide insert	.026
362-853L	Streaming/carbide insert	.075
364-224	Streaming tip	.187
403-800-115	Streaming tip	.115



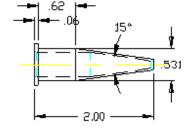


## **Extruding Nozzle Selection**

When using a extruding nozzle the bead size is normally larger (10mm) then streaming. To create a 10-20mm bead with a streaming tip it would take slow robot speeds and very high pressures. With the extruding nozzle the robot speeds can increase, but the bead can only be dispensed in a horizontal (down) direction. There are many ways to misuse an extrude nozzle so we will use the following statement as our guide. The diameter of the opening of the nozzle is equal to the diameter of the bead that you want to apply.



Part No.	Description	Orifice
400-723	Extruding Tip	.093
400-724	Extruding Tip	.125
400-725	Extruding Tip	.187
400-726	Extruding Tip	.250



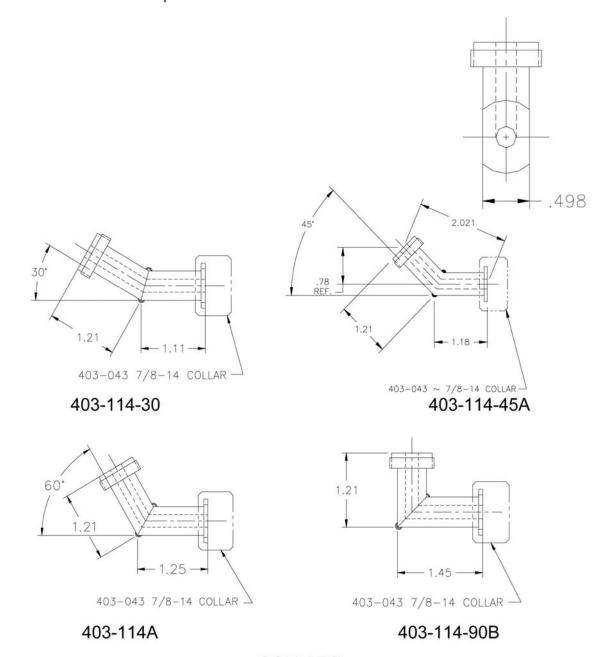




### **ADAPTORS**

Sometimes it is necessary to install an angle offset adaptor to help make the robotic programming easier. All of the angle adaptors have tip orientations so that they can be installed on the dispense valve in 90 deg. Rotations.

Adaptors can only be installed on special dispensed valves such as a 105B038D dispense valve or a 105B038xD 4 or 6 inch extended dispense valve.



## **COLLARS**



400-667 3/4 in. x 16 thd. .550 opening Used with Extrusion Nozzles



400-667A 3/4 in. x 16 thd. .494 opening Used with Standard Spray Tips



3/4 in. x 16 thd. .191 opening Used with HV Type Spray Tips



403-043 7/8 in. x 14 thd. .500 opening Used with Orientated Spray Tips.

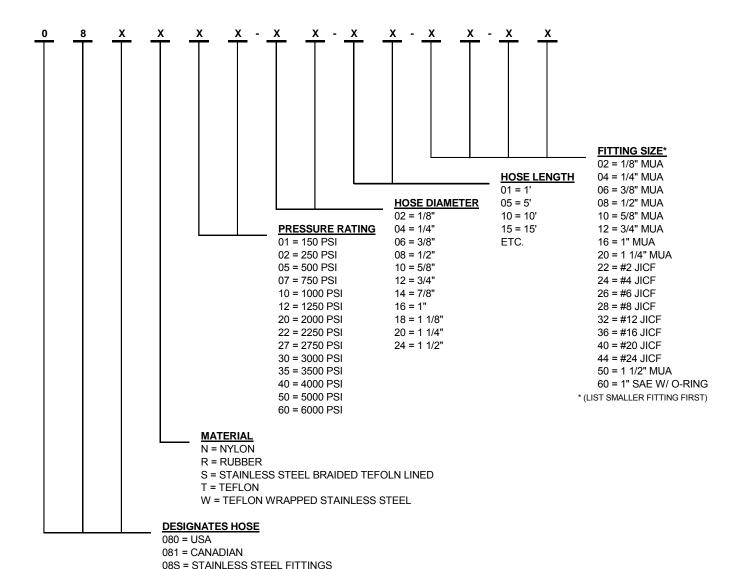


### **MATERIAL HOSES**

Fill out the chart below to order a hose assembly.

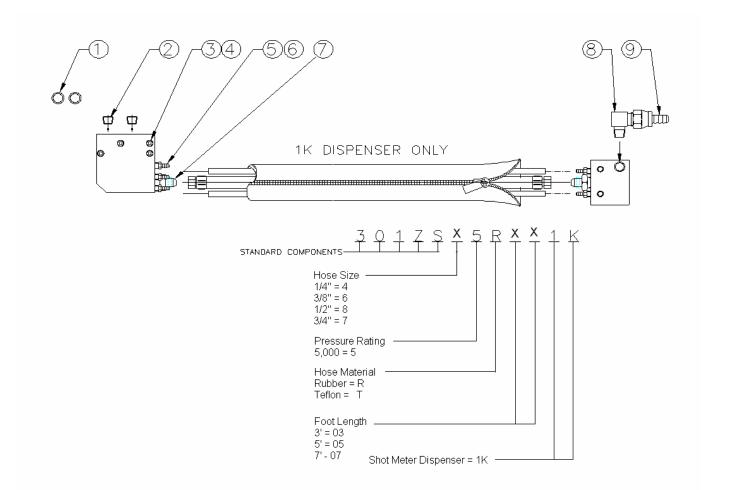
Example: 080R50-16-10-40-40 is a USA Rubber 5000 PSI that is 1 inch in diameter and 10 feet long

with #20 JIC fittings on both ends.





### TRACED HOSE SHOT METER:

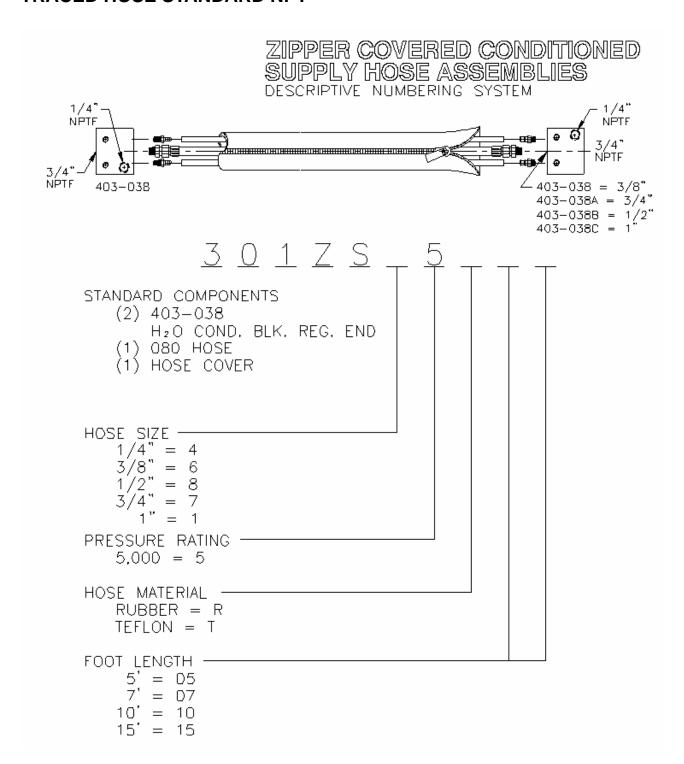


- (1) 361-734 O-RING
- (2) 350-341 PIPE PLUG 1/4" NPT
- (3) 350-448 S.H.C.S. 10-24 X 2"
- (4) 361-904SS #10 HIGH COLLAR LOCK WASHER
- (5) 362-055 BARB FITTING STR, 1/16" NPT
- (6) 362-795 HOSE BARB LOCK
- (7) CONNECTOR 9/16"JICM X 3/8" NPT
- (8) 8-4CTX-B MALE ELBOW #8 JICM X 1/4" NPT
- (9) 30682-8-8B HOSE ADAPTOR #8 JICF X 1/2" HOSE (10) 350-919 S.H.C.S. 5/16"-18 X 2" (11) 361-756 5/16" HIGH COLLAR LOCK WASHER

88 04581971\_ed1

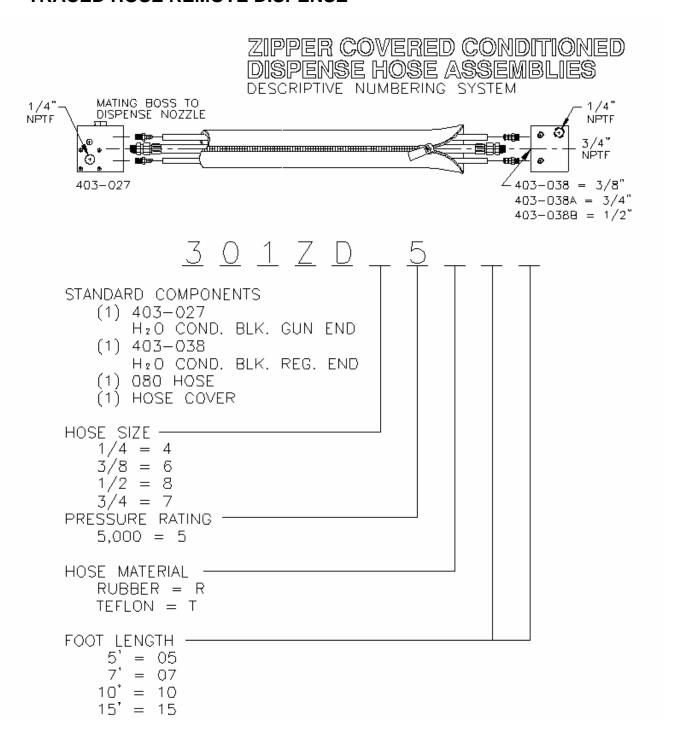


## TRACED HOSE STANDARD NPT





### TRACED HOSE REMOTE DISPENSE



# **SPARE PARTS:**

CHOT METER			
115 175DF	SHOT METER		
115-175RF 115-175SRRK	Dispense Head Assembly –		
105B038A	Dispense Head Repair Kit.		
	Dispense Valve – 3/4in16 Nozzle		
120-304 120-304 120-304 120-304	Refill Valve Pages Kit		
120-304RK	Refill Valve Repair Kit		
364-861	Servo Valve		
364-650	Linear Transducer		
363-161	Solenoid Valves		
363-314	Linear Transducer		
365-075	Wiring Harness – Shot Meter		
361-734	O-rings – Attach Dispense hose to dispense head		
403-987	Wiring Harness Bracket		
110-575P	Air Intensifier		
363-385RK-1	Air Intensifier Repair Kit		
363-330	RTD Resistive Thermal Detector – Temperature package only		
301ZS75R051K	5' Water Jacketed Traced Hose From Dispense Head		
	FLOW METER		
300-911LS			
	Material Regulator /W servo valve and water jacketed		
300-911BRK	Material Regulator Repair Kit		
362-256	Flow Monitor		
362-256RK	Flow Monitor Repair Kit		
120-311	Flow Monitor Sensor with Connector		
365-133	Servo Valve - Material Regulator		
120-402	Valve, Solenoid		
120-407	Transition Block – Long		
362-172	Gauge, 0-5,000 PSI 1/4in. NPT		
403-987	Wiring Harness Bracket.		
365-076	Wiring Harness – Flow Meter		
363-330	RTD Resistive Thermal Detector – Temperature package only		
403-150A	Temperature Conditioning Sleeve for the Flow Meter		
301ZS85R05	5' Water Jacketed Traced Hose From Dispense Head		
	BRACKETS AND TOOLING		
409-588	LS Dispense Head Bracket		
409-988	'		
	LS Pedestal Mounting Bracket		
410-282 409-279	LS Robot Bulk Head Assembly Bracket LS Robot Adapter Plate		
	LS Robot Bracket		
409-985			
410-298	LS Vertical Bracket		
410-299	Universal Bracket		
403-397	Attachment Block - LS Shot-Meter		
	CABLES		
365-077	15' Discrete Cable; 22-Pin		
365-078	15' Discrete Cable; 22-Pin, HI-Flex		
365-090	Cable - LiteStream TCU Communication Cable		



# **SPARE PARTS:**

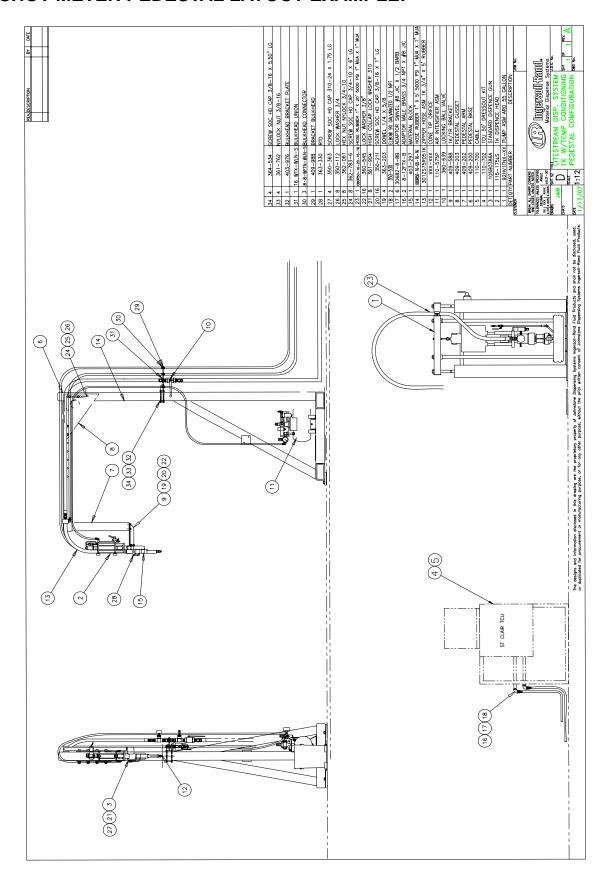
TEMPERATURE CONDITIONING		
365-089	Temperature Conditioning Unit - LiteStream	
365-141	Heater 2KW / 120-240V/ 1ph	
365-142	Refrigeration Assembly	
365-143	Circulation pump (Reservoir)	
363-402	Float Switch with cable	
365-144	Reservoir Strainer 3/4 20 mesh	
365-145	Pressure Gauge 0-60 PSI bottom mount	
365-146	RTD 1/4in. NPT	
365-147	Water Pump - Main	
363-400	Solenoid Valve 24VDC	
365-148	Check Valve	
364466	Water Filter – Housing	
364431	Filter Element 5 Micron.	
365-149	Heater Relay - Control Panel	
365-150	Ice Cube Relay – Control Panel	
365-151	Controller Omron – Main temperature – Control Panel	
365-152	Temperature Switch – Chiller on/off – Control Panel	
363-330	RTD for TCU Package	
362-736	Coreshield – Corrosion inhibitor	
363-704	Coreshield / PH test kit	
362-738WGN-65	65' 1/2" 300 PSI Green Tubing	
362-738WBK-65	65' 1/2" 300 PSI Black Tubing	
362-738WGN-115	115' 1/2" 300 PSI Green Tubing	
362-738WBK-115	115' 1/2" 300 PSI Black Tubing	
	MATERIAL FILTER	
	Material Filter Assembly 1-1/4" NPT (x x = size 03=30mesh	
361T538Fxx	04= 40 mesh 06=60 mesh)	
	Material Filter Element 1-1/4" (x x = size 03=30mesh 04= 40 mesh	
361T538Exx	06=60 mesh)	
	Material Filter Assembly 3/4" NPT (x x = size 03=30mesh	
361T815Fxx	04= 40 mesh 06=60 mesh)	
	Material Filter Assembly 3/4" NPT (x x = size 03=30mesh	
361T815Exx	04= 40 mesh 06=60 mesh)	
361-589A	Material Swivel 0-5,000 PSI high pressure	

# **SPARE PARTS:**

PUMPS		
637345	12 inch Air Motor Assembly	
637346RK	12 inch Air Motor Repair Kit.	
637347RK	Air Valve Assembly Repair Kit	
67301-J3D	Pump Tube Assembly	
637453	Pump Tube Repair Kit	
900S070N	10 inch Air Motor Assembly	
900S070RKN	10 inch Air Motor Assembly Repair Kit	
900-001	Foot Valve Assembly	
900-001RK	Foot Valve Repair Kit	
300-972F3	Packing Gland	
300-972F3RK	Packing Gland Repair Kit	
300-442S	Side Port Check Valve	
300-442RK	Side Port Check Valve Repair Kit	
900-124	Heavy Duty Elevator	
900-124RK	Heavy Duty Elevator Repair Kit	
900-135	Pail Double Elevator	
900-127RK	Pail Double Elevator Repair Kit	
360-008	55 Gallon Follower Plate Seal	
360-010	5 Gallon Follower Plate Seal.	
350-053	Gauge, Air Pressure 1-160psi	
350-878	Valve; 3-way 1/8 Ports	
360-070	Lubricator 3/4 w/ Metal Bowl Guard	
360-071	Hose Assy - Self Storing - 80psi 3/4 x 8FT	
360-093	Filter - Regulator 3/4	
360-101	Valve; 1/2 Ports SIN AIR open 2 way no	
360-132	Regulator 1/2 Basic 1/2 Ports	
362-298VC	Valve; Ball 3/4 Bank Style	
900-008	Air Hose Assy 4'	
361-194	Pump Interface Enclosure	
363-002	Limit Switch; Rotary Lever, SS Roller	
363-569	Light; Stackable Beacon w/ Red Lens	
363-570	Light; Stackable Beacon (2) - 4 VDC	
363-571	Light; Stackable Beacon 4 in Riser Tube	
363-572	Light; Stackable Beacon Base	
363-573	Light; Mounting Base for Beacon	

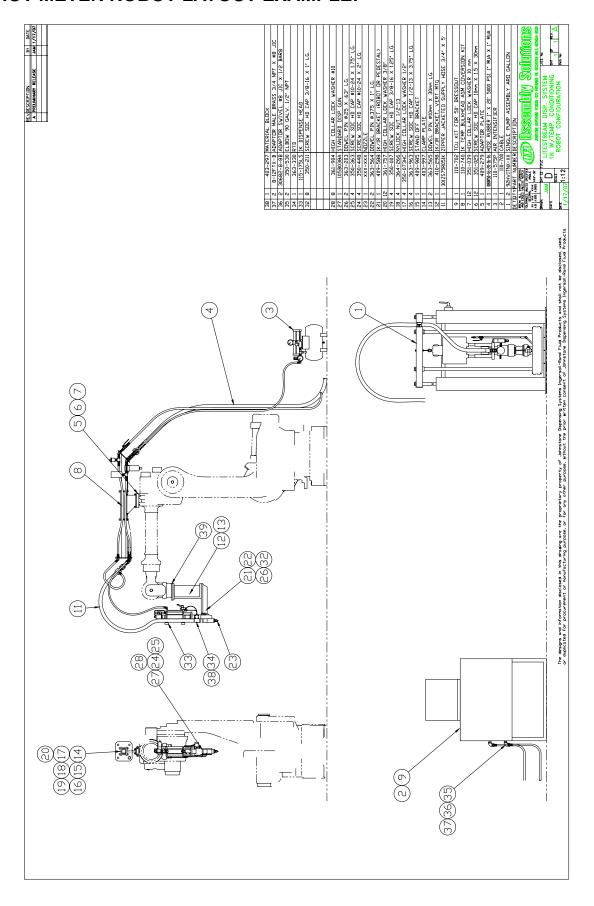


# SHOT METER PEDESTAL LAYOUT EXAMPLE:



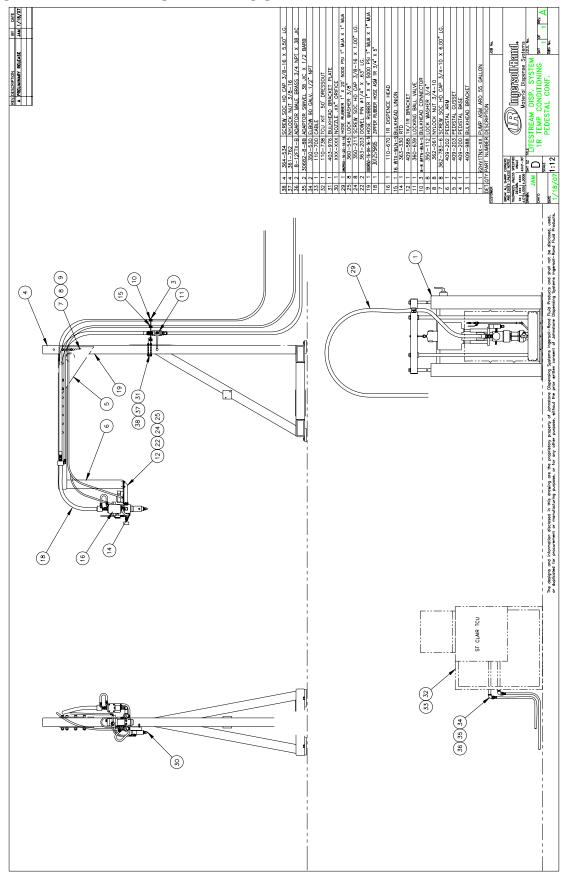


# SHOT METER ROBOT LAYOUT EXAMPLE:



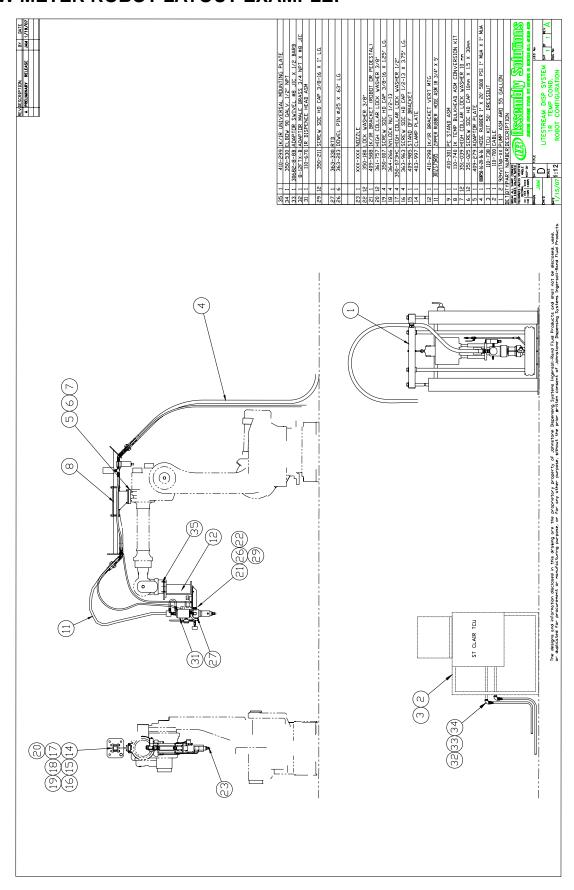


# FLOW METER PEDESTAL LAYOUT EXAMPLE:





# FLOW METER ROBOT LAYOUT EXAMPLE:





## **DECLARATION OF CONFORMITY**



(ES) DECLARACIÓN DE CONFORMIDAD (FR) CERTIFICAT DE CONFORMITÉ (IT) DICHIARAZIONE DI CONFORMITÀ (DE) KONFORMITÄTSERKLÄRUNG (NL) SCHRIFTELIJKE VERKLARING VAN CONFORMITEIT (DA) FABRIKATIONSERKLÆRING (SV) FÖRSÄKRAN OM ÖVERENSSTÄMMELSE (NO) KONFORMITETSERKLÆRING (FI) VAKUUTUS NORMIEN TÄYTTÄMISESTÄ (PT) DECLARAÇÃO DE CONFORMIDADE (EL) ΔΗΛΩΣΗ ΑΝΑΓΝΩΡΙΣΗΣ

#### **Ingersoll Rand**

Hindley Green, Wigan WN2 4EZ, UK

#### Declare under our sole responsibility that the product: LiteStream

(ES) Declaramos que, bajo nuestra responsabilidad exclusiva, el producto: (FR) Déclarons sous notre seule responsabilité que le produit: (IT) Dichiariamo sotto la nostra unica responsabilità che il prodotto: (DE) Erklären hiermit, gemäß unserer alleinigen Verantwortung, daß die Geräte: (NL) Verklaren, onder onze uitsluitende aansprakelijkheid, dat het produkt: (DA) Erklærer som eneansvarlig, at nedenstående produkt: (SV) Intygar härmed, i enlighet med vårt fullständiga ansvar, att produkten: (NO) Erklærer som eneansvarlig at produktet: (FI) Vakuutamme ja kannamme yksin täyden vastuun siitä, että tuote: (PT) Declaramos sob a nossa exclusiva responsabilidade que o produto: (EL) Δηλώνουμε ότι με δική μας ευθύνη το προϊόν:

#### Model: 110-726, 110-727LS / Serial Number Range: ALS-0001

(ES) Modelo: / Gama de No. de Serie: (FR) Modele: / No. Serie: (IT) Modello: / Numeri di Serie: (DE) Modell: / Serien-Nr.-Bereich: (NL) Model: / Serienummers: (DA) Model: / Serienr: (SV) Modell: / Serienummer, mellan: (NO) Modell: / Serienr: (FI) Mallia: / Sarjanumero: (PT) Modelo: / Gama de Nos de Série: (EL) Μοητελα: / Κλίμαχα Αύξοντος Αριθμού:

To which this declaration relates, is in compliance with provisions of Directive(s): 89/392/EEC, 92/68/EEC, 89/336/EEG, 92/31/EEG, 93/68/EEG, 73/23/EEG and 93/68/EEG

(ES) a los que se refiere la presente declaración, cumplen con todo lo establecido en las directivas: (FR) objet de ce certificat, est conforme aux prescriptions des Directives: (IT) a cui si riferisce la presente dichiarazione è conforme alle normative delle direttive: (DE) auf die sich diese Erklärung bezieht, den Richtlinien: (NL) waarop deze verklaring betrekking heeft overeenkomt met de bepalingen van directieven: (DA) som denne erklæring vedrører, overholder bestemmelserne i følgende direktiver: (SV) som detta intyg avser, uppfyller kraven i Direktiven: (NO) som denne erklæringen gjelder for, oppfyller bestemmelsene i EU-d irektivene: (FI) johon tämä vakuutus viittaa, täyttää direktiiveissä: (PT) ao qual se refere a presente declaração, está de acordo com as prescrições das Directivas: (EL) τα οποία αφορά αυτή η δήλωση, είναι σύμφωνα με τις προβλέψεις των Εντολών:

## By using the following Principle Standards: SS-EN 60 204-1

(ES) conforme a los siguientes estándares: (FR) en observant les normes de principe suivantes: (IT) secondo i seguenti standard: (DE) unter Anlehnung an die folgenden Grundnormen entsprechen: (NL) overeenkomstig de volgende hoofdstandaards: (DK) ved at være i overensstemmelse med følgende hovedstandard(er): (SV) Genom att använda följande principstandard: (NO) ved å bruke følgende prinsipielle standarder: (FI) esitetyt vaatimukset seuraavia perusnormeja käytettäessä: (PT) observando as seguintes Normas Principais: (EL) Χρησιμοποιώντας ια παρακάτω κύρια πρότυπα:

#### Date: July, 2007

(ES) Fecha: Juli, 2007: (FR) Date: Juillet, 2007: (IT) Data: Luglio, 2007: (DE) Datum: Juli, 2007: (NL) Datum: Juli, 2007: (DA) Dato: Juli, 2007: (SV) Datum: Juli, 2007: (NO) Dato: Juli, 2007: (FI) Päiväys: Heinäkuu, 2007: (PT) Data: Julho, 2007: (EL) Ημερομηνία: Ιούλιος, 2007:

#### Approved By:

(ES) Aprobado por: (IT) Approvato da: (FR) Approuvé par: (DE) Genehmigt von: (NL) Goedgekeurd door: (DA) Godkendt af: (SV) Godkänt av: (NO) Godkjent av: (FI) Hyväksytty: (PT) Aprovado por: (EL) Εγκρίθηκεαπό:

**Warren Seith** 

**Engineering Manager - Electric Products** 



# **DECLARATION OF CONFORMITY**



(SL) IZJAVA O SKLADNOSTI (SK) PREHLÁSENIE O ZHODE (CS) PROHLÁŠENÍ O SHODĚ (ET) VASTAVUSDEKLARATSIOON (HU) MEGFELELŐSÉGI NYILATKOZAT (LT) ATITIKTIES PAREIŠKIMAS (LV) ATBILSTĪBAS DEKLARĀCIJA (PL) DEKLARACJA ZGODNOŚCI

Ingersoll Rand

Hindley Green, Wigan WN2 4EZ, UK

#### Declare under our sole responsibility that the product: LiteStream

(SL) Pod polno odgovornostjo izjavljamo, da se izdelek: (SK) Prehlasujeme na svoju zodpovednost', že produkt: (CS) Prohlašujeme na svou zodpovednost, že výrobek: (ET) Deklareerime oma ainuvastutusel, et toode: (HU) Kizárólagos felelősségünk tudatában kijelentjük, hogy a termék: (LT) Prisiimdami atsakomybę pareiškiame, kad gaminys: (LV) Uzņemoties pilnīgu atbildību, apliecinām, ka ražojums: (PL) Oświadcza, że ponosi pełną odpowiedzialność za to, że produkt:

#### Model: 110-726, 110-727LS/ Serial Number Range: ALS-0001

(SL) Model: / Območje serijskih številk: (SK) Model: / Výrobné číslo (CS) Model: / Výrobní číslo (ET) Mudel: / Seerianumbrite vahemik (HU) Modell: / Gyártási szám-tartomány (LT) Modeliai: / Serijos numeriai (LV) Modelis: / Sērijas numuru diapazons (PL) Model: / O numerach seryjnych

To which this declaration relates, is in compliance with provisions of Directive(s): 89/392/EEC, 92/68/EEC, 89/336/EEG, 92/31/EEG, 93/68/EEG, 73/23/EEG and 93/68/EEG

(SL) Na katerega se ta izjava o skladnosti nanaša, sklada z določili smernic: (SK) Ku ktorému sa toto prehlásenie vzťahuje, zodpovedá ustanoveniam smerníc: (CS) Ke kterým se toto prohlášení vztahuje, odpovídají ustanovením směrnic: (ET) Mida käesolev deklaratsioon puudutab, on vastavuses järgmis(t)e direktiivi(de) sätetega: (HU) Amelyekre ezen nyilatkozat vonatkozik, megfelelnek a következő irányelv(ek) előírásainak: (LT) Kuriems taikomas šis pareiškimas, atitinka šios direktyvos nuostatas: (LV) Uz kuru šī deklarācija attiecas, atbilst direktīvas(u) nosacījumiem: (PL) Do których ta deklaracja się odnosi, są zgodne z postanowieniami Dyrektywy (Dyrektyw):

#### By using the following Principle Standards: SS-EN 60 204-1

**(SL)** Uporabljeni osnovni standardi: **(SK)** Použitím nasledujúcich zákonných noriem: **(CS)** Použitím následujících zákonných norem: **(ET)** Järgmiste põhistandardite kasutamise korral: **(HU)** A következő elvi szabványok alkalmazásával: **(LT)** Remiantis šiais pagrindiniais standartais: **(LV)** Izmantojot sekojošos galvenos standartus: **(PL)** Przy zastosowaniu następujących podstawowych norm:

#### Date: July, 2007

(SL) Datum: julij, 2007: (SK) Dátum: Júl, 2007: (CS) Datum: Červenec, 2007: (ET) Kuupäev: Juuli, 2007: (HU) Dátum: Július, 2007: (LT) Data: Liepa, 2007: (LV) Datums: Julijs, 2007: (PL) Data: lipiec, 2007:

### Approved By:

(SL) Datum: marec, 2007: (SK) Dátum: Marec, 2007: (CS) Datum: Březen, 2007: (ET) Kuupäev: Märts, 2007: (HU) Dátum: Március, 2007: (LT) Data: Kovas, 2007: (LV) Datums: Marts, 2007: (PL) Data: marzec, 2007

**Warren Seith** 

Engineering Manager - Electric Products

04581971 ed1 99

www.irtools.com
© 2007 Ingersoll Rand Company

Ingersoll Rand