



POLYURETHANE MACHINERY CORPORATION



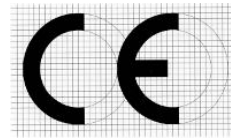
Heated Hose

For use with Plural Component
Proportioners

Not for use in Explosive Atmospheres

Manual

Ref. # MN-01000



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Before installing the PMC Heated Hose and start-up, carefully read all the technical and safety documentation included in this manual. Pay special attention to the information in order to know and understand the operation and the conditions of use of the PMC Heated Hose. All of the information is aimed at improving user safety and avoiding possible breakdowns from the incorrect use of the PMC Heated Hose.



Heated Hose Manual

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Heated Hose Manual

WARRANTY

Polyurethane Machinery USA, Inc. (hereinafter “PMC”) provides this **LIMITED WARRANTY** (hereinafter “Warranty”) to the original purchaser (hereinafter “Customer”) covering this equipment and the original manufactured accessories delivered with the equipment (hereinafter “Product”) against defects in material or workmanship of the Product (hereinafter “Defect” or “Defective”) for a period of one (1) year from the date of first purchase as shown on the original PMC invoice (hereinafter “Warranty Period”).

If during the Warranty Period under normal use, the Product is suspected by Customer to be Defective in material or workmanship, it is Customer’s responsibility to contact PMC and return the Product to PMC as directed by PMC, freight prepaid. If PMC determines that the Product is Defective and that such Defect is covered by this Warranty, PMC will credit Customer for the reasonable freight charges incurred by Customer in returning the Defective Product to PMC, and PMC (or its authorized agent) will, at PMC’s option, repair or replace the Product, subject to the following:

Original Invoice: The original invoice must be kept as proof of the date of first sale and the Product serial number. The Warranty does not cover any Product if the Original Invoice appears to have been modified or altered, or when the serial number on the Product appears to have been altered or defaced.

Product Maintenance: It is the Customer’s responsibility to maintain the Product properly. See your maintenance schedule and owner’s manual for details. The Warranty does not cover an improperly maintained Product.

Non-PMC Components and Accessories: Non-PMC manufactured components and accessories that are used in the operation of the Product are not covered by this Warranty. Such components and accessories shall be subject to the warranty offered to the Customer, if any, by the original manufacturer of such component or accessory.

Other Warranty Exclusions: The Warranty does not cover any Product that PMC determines has been damaged or fails to operate properly due to misuse, negligence, abuse, carelessness, neglect, or accident. By way of example only, this includes:

- Normal wear and tear.

- Improper or unauthorized installation, repair, alteration, adjustment or modification of the Product.

- Use of heating devices, pumping equipment, dispensers, or other parts or accessories with the Product that have not been approved or manufactured by PMC.

- Failure to follow the operating instructions and recommendations provided by PMC.

- Cosmetic damage.

- Fire, flood, “acts of God,” or other contingencies beyond the control of PMC.



Heated Hose Manual

WARRANTY (cont)

THE WARRANTY DESCRIBED HEREIN IS THE EXCLUSIVE REMEDY FOR THE CUSTOMER AND IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS, IMPLIED, STATUTORY OR OTHERWISE, AND THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE AND ALL OTHER WARRANTIES ARE HEREBY DISCLAIMED. TO THE FULLEST EXTENT PERMITTED BY LAW, PMC SHALL NOT BE RESPONSIBLE, WHETHER BASED IN CONTRACT, TORT (INCLUDING, WITHOUT LIMITATION, NEGLIGENCE), WARRANTY OR ANY OTHER LEGAL OR EQUITABLE GROUNDS, FOR ANY CONSEQUENTIAL, INDIRECT, INCIDENTAL, LOST PROFITS, SPECIAL, PUNITIVE OR EXEMPLARY DAMAGES, WHETHER TO PERSON OR PROPERTY, ARISING FROM OR RELATING TO THE PRODUCT, EVEN IF PMC HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH LOSSES OR DAMAGES.

Non-Warranty Service by PMC: If PMC determines that the suspected Defect of the Product is not covered by this Warranty, disposition of the Product will be made pursuant to the terms and conditions of PMC's written estimate on a time and materials basis.

Continuing Warranty for Products Repaired or Replaced under Warranty: Following the repair or replacement of a Product covered by this Warranty, such Product will continue to be subject to the original Warranty for the remainder of original Warranty Period or for three (3) months from the repair or replacement date, whichever is longer.

No Rights Implied: Nothing in the sale, lease or rental of any Product by PMC shall be construed to grant any right, interest or license in or under any patent, trademark, copyright, trade secret or other proprietary right or material owned by anyone; nor does PMC encourage the infringement of same.

Exclusive Warranty: This writing is the final, complete, and exclusive expression of the Warranty covering the Product. Any statements made by PMC, its employees or agents that differ from the terms of this Warranty shall have no effect. It is expressly understood that Customer's acceptance of this Warranty, by performance or otherwise, is upon and subject solely to the terms and conditions hereof, and any additional or different terms and conditions proposed or expressed by Customer or anyone, whether in writing or otherwise, are null and void unless specifically agreed to in writing by an Officer of PMC.



Heated Hose Manual

SAFETY AND HANDLING

This chapter contains important information on the safety, handling and use of your PMC Heated Hose.



Before installing the PMC Heated Hose and start-up, carefully read all the technical and safety documentation included in this manual. Pay special attention to the information to know and understand the operation and the conditions of use of the PMC Heated Hose. All of the information is aimed at enhancing User Safety and avoiding possible breakdowns derived from the incorrect use of the PMC Heated Hose.

WARNING! presents information to alert of a situation that might cause serious injuries if the instructions are not followed.

CAUTION! presents information that indicates how to avoid damage to the Proportioner or how to avoid a situation that could cause minor injuries.

NOTE: is relevant information of a procedure being carried out.

Careful study of this manual will enable the operator to know the characteristics of the PMC Heated Hose and the operating procedures. By following the instructions and recommendations contained herein, you will reduce the potential risk of accidents in the installation, use or maintenance of the PMC Heated Hose; you will provide a better opportunity for incident-free operation for a longer time, greater output and the possibility of detecting and resolving problems fast and simply.

Keep this Operations Manual for future consultation of useful information at all times. If you lose this manual, ask for a new copy from your PMC Service Center, directly contact PMC on line at our web site (www.polymac-usa.com).



Heated Hose Manual

SAFETY AND HANDLING (cont)

The PMC Heated Hose has been designed and built for the application of polyurea chemical systems, polyurethane foam chemical systems and some two-component epoxy systems.

WARNING! *The design and configuration of the PMC Heated Hose does not allow its use in potentially explosive atmospheres or the pressure and temperature limits described in the technical specifications of this manual to be exceeded.*

Always use liquids and solvents that are compatible with the hose. If in doubt, consult PMC Technical Service.

When working with the PMC Heated Hose, it is recommended that the operator wear suitable clothing and elements of personal protection, including, without limitation, gloves, protective goggles, safety footwear and face masks. The introduction and follow-up of safety measures must not be limited to those described in this manual. Before starting up the PMC Heated Hose, a comprehensive analysis must be made of the risks derived from the products to be dispensed, the type of application and the working environment.



To prevent possible injury caused by incorrect handling of the raw materials and solvents used in the process, carefully read the Material Safety Data Sheet (MSDS) provided by your supplier.

Deal with the waste caused according to current regulations.

To avoid damage caused by the impact of pressurized fluids, do not open any connection or perform maintenance work on components subject to pressure until the pressure has been completely eliminated.

Use suitable protection when operating, maintaining or being present in the area where the equipment is functioning. This includes, but is not limited to, the use of protective goggles, gloves, shoes and safety clothing and breathing equipment.

The equipment includes components that reach high temperatures and can cause burns. Hot parts of the equipment must not be handled or touched until they have cooled completely.



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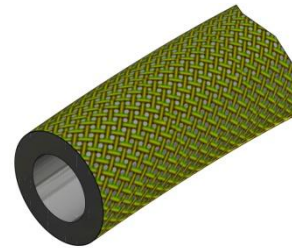
CHARACTERISTICS

The PMC Heated Hose has been designed and built for the application of polyurea chemical systems, polyurethane foam chemical systems and some specific two-component epoxy systems.

Heated Hose System

The system is designed with a variety of transformers to accommodate different maximum hose lengths. A 2 KVA Isolation Transformer that enables effective heating of up to a total hose length of 210 feet (63 m), a 3 KVA Isolation Transformer that enables effective heating of up to a total hose length of 310 feet or the 5 KVA Isolation Transformer that enables effective heating of up to a total hose length of 410 feet. The system includes an innovative hose heating concept in which the continuous braid tinned-copper jacket is distributed evenly around the circumference of the hose providing a uniform heating watt density and precise control of the material application temperature. This hose heating element design is extremely resistant to fatigue failure.

100% circumferential coverage produces the most uniform distribution of heat available.



To set up your PMC Heated Hose System you will require at least one 50' length of main heated hose with TC wire, one TSU assembly and one whip hose assembly. Be sure that the hose you select meets your maximum pressure requirements.

Each PMC Heated Hose configuration contains an A component heated hose covered with Insulex, a B component heated hose also covered in Insulex and a ¼" air hose. The Hose configuration is then spun into a bundle and secured with lacing. Hoses are also provided with a TC (temperature control) cable or without a TC (Non/TC). The TC cable allows for connection to the TSU (Temperature Sensing Unit) that report actual chemical temperature back to the proportioner to provide automatic hose heat while spraying.

The fluid hoses are marked at each end with red tape for the ISO and blue tape for the Polyol. Fittings are different on the ISO and Polyol side hoses to prevent incorrect connection which can result in fluid crossover and permanent damage to the hose.



Heated Hose Manual

Transformer Tap Settings

Each PMC plural component proportioner is equipped with a transformer to provide current to the heated hose. The transformer is designed to provide the proper amount of **voltage** based on hose length and matched to the resistance of the heated hose to provide safe and efficient hose heat. Each transformer is clearly marked with tap settings on a terminal block corresponding to the length of hose being used.

2 KVA TRANSFORMER								
HOSE LENGTH IN FEET	60'	110'	160'	210'				
TAP SETTING	60	110	160	210				
3 KVA TRANSFORMER								
HOSE LENGTH IN FEET	60'	110'	160'	210'	260'	310'		
TAP SETTING	60	110	160	210	260	310		
5 KVA TRANSFORMER								
HOSE LENGTH IN FEET	60'	110'	160'	210'	260'	310'	360'	410'
TAP SETTING	60	110	160	210	260	310	360	410



Heated Hose Manual

Technical Specifications

PART NUMBER	DESCRIPTION	WORKING PRESSURE
MA-00014A	3/8" x 50' Assembly	2250 psi
MA-00014-TC	3/8" x 50' Assembly w/ TC wire	2250 psi
MA-00014A-25	3/8" x 25' Assembly	2250 psi
MA-00014A-TC-25	3/8" x 25' Assembly w/ TC wire	2250 psi
MA-00014A-35	3/8" x 35' Assembly	2250 psi
MA-00014A-TC-35	3/8" x 35' Assembly w/ TC wire	2250 psi
MA-00039A	3/8" x 50' Assembly	3500 psi
MA-00039A-TC	3/8" x 50' Assembly w/ TC wire	3500 psi
MA-00039A-25	3/8" x 25' Assembly	3500 psi
MA-00039A-25-TC	3/8" x 25' Assembly w/ TC wire	3500 psi
MA-00039A-35	3/8" x 35' Assembly	3500 psi
MA-00039A-35-TC	3/8" x 35' Assembly w/ TC wire	3500 psi
MA-00040A	3/8" x 10' Assembly	3500 psi
MA-00040A-25	3/8" x 25' Assembly	3500 psi



Heated Hose Manual

Heated Hose Installation

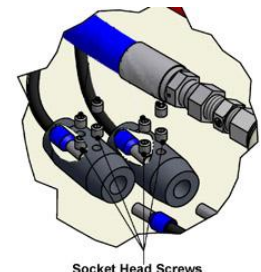
CAUTION! The material delivery Heated Hoses are color coded Red and Blue allowing the user to recognize them. The Red corresponds to the Isocyanate (Iso, A) and the Blue to the Polyol (Poly, R). To avoid connection errors the Coupling Connections of the Iso (A) and Poly (R) Heated Hoses are also different sizes, which makes it difficult to swap connections.

NOTE: The material delivery Heated Hoses are capped at the ends to prevent absorbing moisture. Do not remove caps until the Heated Hoses are going to be installed on the proportioner.

1. Lay out all the Heated Hose assemblies end to end aligning the Iso (red) and Poly (blue) and connect the respective Coupling Connections using the appropriate sized open-end wrench after ensuring Heated Hose assemblies lay flat.

CAUTION! Take care to not cross-thread or over-tighten the Coupling Connections. Thread seal tape or compound is not required for this tapered seat Coupling Connections.

2. Connect the material Heated Hoses to the outlets of the respective Heaters (i.e. Iso (A) Heated Hose to the Iso (A) Heater and the Poly (R) Heated Hose to the Poly (R) Heater) ensuring Heated Hose assemblies lay flat.
3. Connect Air Hose Coupling Connections.
4. Connect the Heated Hose power wires to the “Fast-Lock” Connector coming from the Hose Heat Transformer as follows:
 - a. Loosen the Socket Head Set Screw to allow insertion of the Heated Hose electrical wire Terminal.
 - b. Insert the Terminal into the “Fast-Lock” Connector Body.
 - c. Securely tighten the Socket Head Set Screw.
 - d. Tape the body of the connector with electric tape.



Fast-Lock Connection

NOTE: A good practice is to add some dielectric grease (Permatex 67VR or =) to the outside of the Terminal prior to insertion.



Heated Hose Manual

Heated Hose Installation (cont)

Repeat the above steps to connect the “Fast-Lock” Connectors that you will find on all Heated Hose power wire.

CAUTION! *Ensure the proper mechanical and electrical connections of the Heated Hoses are made to avoid possible material leakage and Hose heat problems.*

5. It is recommended the TSU be installed between the last section of Heated Hose and the Gun Whip. Carefully straighten the sensing wire, inserting it in the Iso (A) Heated Hose and tighten fluid fittings with appropriate sized open-end wrenches.



CAUTION! *To protect the TSU sensor, you must pay special attention not to kink or excessively bend the Heated Hoses. Do not coil the Heated Hoses with a diameter of less than 4 feet.*

CAUTION! *Connecting the TSU between the first and second section of Heated Hose results in the TSU sensing the material temperature exiting the Heater and not the inside of the Heated Hose near the Spray Gun.*



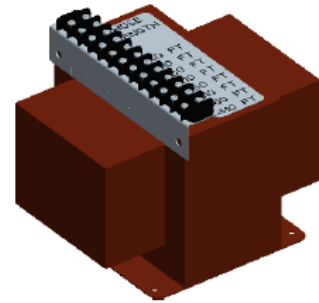
Heated Hose Manual

Hose Heat Transformer

The Hose Heat Transformer offers the ability of connecting to different output voltages depending on the total length of the Heated Hose in use, maximizing the heating ability of the Heated Hose. The factory setting is 18 volts for use with 60 feet of Heated Hose.

Before starting the Proportioner, ensure the setting matches the Heated Hose length installed. If Heated Hose sections are added or removed, the Tap setting should be changed to a setting which will limit the maximum amperage in the Heated Hose to 52 amps. **The suggested settings are on page 8.**

Hose Heater
Transformer





Heated Hose Manual

TROUBLESHOOTING

The heated hoses has been designed and built to withstand severe working conditions with a high degree of reliability, provided that it is used in a suitable application by a properly trained operator. This chapter contains information on possible faults that may interrupt the operation of the heated hoses. The information provided will serve as a guideline to detect and resolve problems. In any case, feel free to contact the Technical Service group of PMC, where a qualified technician will advise you.

CAUTION! All repairs performed by unqualified personnel or the use of spares other than originals may cause damage to the unit and put the operator at risk.

PROBLEM

Heated hose does not heat and the display on the controller shows ambient temperature.

SOLUTIONS

1. Check that the light on the on/off switch is lit when the hose is turned on, if not replace the switch.

If the light is on move on to the next step.

2. Check the Hose Heat breaker in the main console reset the breaker. If it continues to trip wrap an Amp Clamp around one of the wires coming off the breaker. If it does not draw more than the rated value of the breaker, the breaker needs to be replaced.

If the breaker is not tripped move on to the next step.

3. Check the circuit breaker mounted on the transformer; reset the breaker if it continues to trip wrap an Amp Clamp around one of the wires from the transformer going to the heated hose if it does not draw more than the rated value of the breaker, the breaker needs to be replaced.

If the AMP draw is less than the rated value move on to the next step.

4. Check that the tap setting on the transformer is set for the proper hose length.

If it is set correctly move to the next step.

5. Look at the two lights located on the front of the transformer. If the voltage light is lit and the AMP light is off the problem could in the heated hoses. If the voltage light is on there is power to the primary side of the transformer. To check the secondary side of the transformer you must take an AC volt reading across the two leads coming out of the transformer that are connected to the "A" and "R" hose leads. If you are reading voltage (your volt reading will vary depending on what tap setting is used) most likely the problem is in the heated hose. Either a connector has come loose or there is a broken wire.



Heated Hose Manual

TROUBLESHOOTING (cont'd)

Because the gun whip takes the most abuse it is most likely that the whip has failed. Disconnect the crossover wires on the machine end of the whip hose and connect the two wires together coming off the 50' section, turn on the hose heat and see if the hose heat circuit is operating, if so replace the whip. To take a continuity reading through the heated hose one of the leads from the transformer to the "A" or "R" heated hose must be disconnected.

If no voltage is coming out of the transformer to the heated hose move on to the next step.

6. Open the console top and locate the solid state relay for the hose circuit, looking over the console top (front of machine) it is the relay to the right. With the hose turned on and there is a LED light lit on the relay take a volt meter set on DC and measure across position A1 and A2 your Reading should be 24 volts, then take an AC volts measurement across position L1 and L2 (heavy wires). With the relay functioning properly you should have a 1 volt Reading, if the Reading is 18 to 90 volts AC the relay has malfunctioned and needs to be replaced. If the AC Reading across L1 and L2 is .025 volts check the over temperature switches in the heaters. A defective over temperature switch will open a contactor disabling both Heaters and the Hose.

If there is no light on the solid state relay move to the next step.

7. Using a DC volt meter measure across position 5 and 6 on the back of the hose controller this is the output of the controller and sends power to the solid state relay, your reading will be **4-6 volts DC** if there is no voltage check to make sure that the set temperature of the controller is above ambient temperature. Before replacing the controller read across position 1 and 2 to make sure that the controller is powered up, your reading will be 208 to 230 volts AC.

If there is no DC voltage to the relay move to the next step.

PROBLEM

Hose does not heat and the display on the controller shows an error message (EEEE) or SbEr..

SOLUTIONS

1. Check position 6 and 7 on the heater controller for loose wires.

If the wires are tight move to the next step.

2. Remove the transformer cover and check that the thermocouple wires are secure to the harness going up to the controller. If there are no loose connections disconnect the wire from the TSU and connect it directly to the thermocouple harness coming out of the hose transformer.

If the controller still shows the error code replace the hose thermocouple.



Heated Hose Manual

TROUBLESHOOTING (cont'd)

If the error code goes away and temperature is now shown on the display of the controller then all the TSU harnesses from the TSU to the transformer need to be checked for loose connectors or one or more of the harnesses are defective.

PROBLEM

Heated hose controller shows excessive temperature

SOLUTIONS

1. Set the controller set point at least 20 degrees lower than the temperature shown on the controller. Briefly turn on the hose and look for the led light on the solid state relay to be on.

If the light is on replace the controller.

If the light is off replace the solid state relay.

PROBLEM

Hose will heat but does not come up to set temperature.

SOLUTIONS

1. Check the tap setting on the transformer to ensure that the correct position has been selected for the length of hose being used. Depending on the machines incoming voltage you may have to move the tap setting higher (up one).

CAUTION! Do not exceed the trip value of the transformer hose breaker.

WARNING! Before correcting any kind of defect, make sure the Main Power Switch is OFF and incoming power is locked OFF. NEVER access the inside of the Control Panel with the Proportioner power supply ON.



Heated Hose Manual

HEATED HOSES and REPLACEMENTS

PART NUMBER	DESCRIPTION	QTY
MA-00014A	3/8 x 50' LOW PRESSURE HOSE,2250 psi	1
MA-00014-TC	3/8 x 50' LOW PRESSURE HOSE,2250 psi W/TC WIRE	1
MA-00040A	1/4 x 10" GUN HOSE ASSY W/SCUFF JACKET 3500psi	1
MA-00039A	3/8 x 50' HIGH PRESSURE HOSE,3500 psi	1
MA-00039A-TC	3/8 x 50' HIGH PRESSURE HOSE,3500 psi W/TC WIRE	1
MA-00014A-TC-35	3/8 x 35' LOW PRESSURE HOSE,2250 psi W/TC WIRE	1
MA-00039A-TC-35	3/8 x 35' HIGH PRESSURE HOSE,3500 psi W/TC WIRE	1
MA-00014A-A-50	3/8 x 50' "A" SIDE LOW PRESSURE HOSE,2250 psi	1
MA-00014A-R-50	3/8 x 50' "R" SIDE LOW PRESSURE HOSE,2250 psi	1
MA-00040A-A	1/4 x 10" "A" SIDE GUN HOSE, 3500psi	1
MA-00040A-R	1/4 x 10" "R" SIDE GUN HOSE, 3500psi	1
MA-00005A-50	50' SCUFF JACKET	1
MA-00005A-35	35' SCUFF JACKET	1
MA-00005A-10	10' SCUFF JACKET	1
MA-00006A	TSU WIRE, 50'	1
MA-00006 ^a -35	TSU WIRE, 35'	1

HOSE TEMPERATURE SENSING UNIT (TSU)

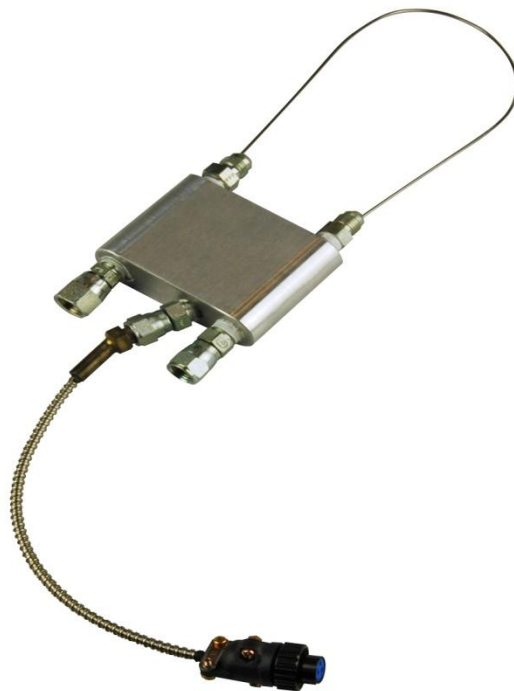
PART NUMBER	DESCRIPTION	QTY
EL-51A	TSU ASSEMBLY	1
EL-51A-2	TSU PROBE REPLACEMENT	1
EL-00051A-1	TSU BODY	1
EL-00051A-3	FITTING, 1/8 NPT x #4 JIC SWIVEL	1
EL-00051A-4	FITTING, 1/4 NPT x #5 JIC MALE (A)	1
EL-00051A-5	FITTING, 1/4 NPT x #6 JIC SWIVEL (R)	1
EL-00051A-6	FITTING, 1/4 NPT x #6 JIC (R)	1
EL-00051A-7	FITTING, 1/4 NPT x #5 JIC SWIVEL (A)	1
EL-00051A-8	INSULATION	1



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HOSE TEMPERATURE SENSING UNIT (TSU)

<i>PART NUMBER</i>	<i>DESCRIPTION</i>	<i>QTY</i>
EL-51A	TSU ASSEMBLY	1
EL-51A-2	TSU PROBE REPLACEMENT	1
EL-00051A-1	TSU BODY	1
EL-00051A-3	FITTING, 1/8 NPT x #4 JIC SWIVEL	1
EL-00051A-4	FITTING, 1/4 NPT x #5 JIC MALE (A)	1
EL-00051A-5	FITTING, 1/4 NPT x #6 JIC SWIVEL (R)	1
EL-00051A-6	FITTING, 1/4 NPT x #6 JIC (R)	1
EL-00051A-7	FITTING, 1/4 NPT x #5 JIC SWIVEL (A)	1
EL-00051A-8	INSULATION	1





Heated Hose Manual

NOTES