

SERVICE MANUAL LN-9245-00.6 (Replaces LN-9245-00.5) February - 2008

AIR HEATER ASSEMBLY



MODEL: A11065-05

CE

IMPORTANT: Before using this equipment, carefully read SAFETY PRECAUTIONS, starting on page 1, and all instructions in this manual. Keep this Service Manual for future reference.

Service Manual Price: €15.00 (Euro) \$20.00 (U.S.)



NOTE: This manual has been changed from revision **LN-9245-00.5** to revision **LN-9245-00.6** Reasons for this change are noted under "Manual Change Summary" inside the back cover of this manual.

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SAFETY

SAFETY PRECAUTIONS

Before operating, maintaining or servicing any ITW Ransburg electrostatic coating system, read and understand all of the technical and safety literature for your ITW Ransburg products. This manual contains information that is important for you to know and understand. This information relates to USER SAFETY and PREVENTING EQUIPMENT PROBLEMS. To help you recognize this information, we use the following symbols. Please pay particular attention to these sections.

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

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

A NOTE is information relevant to the procedure in progress.

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

Careful study and continued use of this manual will provide a better understanding of the equipment and process, resulting in more efficient operation, longer trouble-free service and faster, easier troubleshooting. If you do not have the manuals and safety literature for your Ransburg system, contact your local ITW Ransburg representative or ITW Ransburg.

WARNING

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

➤ This manual MUST be read and thoroughly understood by ALL personnel who operate, clean or maintain this equipment! Special care should be taken to ensure that the WARNINGS and safety requirements for operating and servicing the equipment are followed. The user should be aware of and adhere to ALL local building and fire codes and ordinances as well as NFPA-33 SAFETY STANDARD, prior to installing, operating, and/or servicing this equipment.

WARNING

► The hazards shown on the following page may occur during the normal use of this equipment. Please read the hazard chart beginning on page 2.

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AREA	HAZARD	SAFEGUARDS
Tells where hazards	Tells what the hazard is.	Tells how to avoid the hazard.
may occur.		
Spray Area	Fire Hazard Improper or inadequate operation and maintenance procedures will cause a fire hazard. Protection against inadvertent arcing that is capable of causing fire or explosion is lost if any safety interlocks are disabled during operation.	Fire extinguishing equipment must be present in the spray area and tested periodically.
		Spray areas must be kept clean to prevent the accumulation of combustible residues.
1		Smoking must never be allowed in the spray area.
		The high voltage supplied to the atomizer must be turned off prior to cleaning, flushing or maintenance.
	supply shutdown indicates a problem in the system requiring	When using solvents for cleaning:
	correction.	Those used for equipment flushing should have flash points equal to or higher than those of the coating material.
		Those used for general cleaning must have flash points above 100°F (37.8°C).
		Spray booth ventilation must be kept at the rates required by NFPA-33, OSHA, and local codes. In addition, ventilation must be maintained during cleaning operations using flammable or combustible solvents.
		Electrostatic arcing must be prevented.
		Test only in areas free of combustible material.
		Testing may require high voltage to be on, but only as instructed.
		Non-factory replacement parts or unauthorized equipment modifications may cause fire or injury.
		If used, the key switch bypass is intended for use only during setup operations. Production should never be done with safety interlocks disabled.
		Never use equipment intended for use in waterborne installations to spray solvent based materials.
		The paint process and equipment should be set up and operated in accordance with NFPA-33, NEC, and OSHA requirements.

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AREA	HAZARD	SAFEGUARDS
Tells where hazards	Tells what the hazard is.	Tells how to avoid the hazard.
may occur.		
General Use and Maintenance	Improper operation or maintenance may create a hazard.	Personnel must be given training in accordance with the requirements of NFPA-33.
\wedge	Personnel must be properly trained in the use of this equipment.	Instructions and safety precautions must be read and understood prior to using this equipment.
		Comply with appropriate local, state, and national codes governing ventilation, fire protection, operation maintenance, and housekeeping. Reference OSHA, NFPA-33, and your insurance company requirements.
Electrical Equipment	High voltage equipment is utilized. Arcing in areas of flammable or combustible materials may occur. Personnel are exposed to high voltage during operation and	The power supply, optional remote control cabinet, and all other electrical equipment must be located outside Class I or II, Division 1 and 2 hazardous areas. Refer to NFPA-33.
14	maintenance.	Turn the power supply OFF before working on the equipment.
	Protection against inadvertent arcing that may cause a fire or explosion is lost if safety circuits are disabled during operation.	Test only in areas free of flammable or combustible material.
	Frequent power supply shut-down indicates a problem in the system	Testing may require high voltage to be on, but only as instructed.
	which requires correction.	Production should never be done with the safety circuits disabled.
	An electrical arc can ignite coating materials and cause a fire or explosion.	Before turning the high voltage on, make sure no objects are within the sparking distance.
Explosion Hazard / Incompatible Materials	Halogenated hydrocarbon solvents for example: methylene chloride and 1,1,1,-Trichloroethane are not chemically compatible with the aluminum that might be used in many system components. The chemical reaction caused by these solvents reacting with aluminum can become violent and lead to an equipment explosion.	Aluminum is widely used in other spray application equipment - such as material pumps, regulators, triggering valves, etc. Halogenated hydrocarbon solvents must never be used with aluminum equipment during spraying, flushing, or cleaning. Read the label or data sheet for the material you intend to spray. If in doubt as to whether or not a coating or cleaning material is compatible, contact your material supplier. Any other type of solvent may be used with aluminum equipment.

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AREA	HAZARD	SAFEGUARDS
Tells where hazards	Tells what the hazard is.	Tells how to avoid the hazard.
may occur.		
Toxic Substances	Certain material may be harmful if inhaled, or if there is contact with the skin.	Follow the requirements of the Material Safety Data Sheet supplied by coating material manufacturer. Adequate exhaust must be provided to keep the air free of accumulations of toxic materials. Use a mask or respirator whenever there is a chance of inhaling sprayed materials. The mask must be compatible with the material being sprayed and its concentration. Equipment must be as prescribed by an industrial hygienist or safety expert, and be NIOSH approved.

INTRODUCTION

GENERAL DESCRIPTION

In automated finishing applications, the expansion of pressurized air causes cooling which may result in condensation on surfaces of electrostatic applicators. The ITW Ransburg *Air Heater Assembly* is designed to reduce or eliminate condensation that may form in or on the ITW Ransburg TurboDisk and Rotary Atomizers, or other pressurized applicators under certain operating conditions.

Ambient temperature and relative humidity in most installations is hard to maintain. The Air Heater Assembly is designed to maintain the temperature of your operating air supply to ensure no moisture or condensation will occur on/in the applicator or its feed or exhaust lines. This helps reduce high voltage faults and rejected parts due to excess moisture issues.

FEATURES AND BENEFITS

- *Heats up quickly and accurately* Allows system users to ramp up production in a minimum of time.
- **Self contained** Small, compact cabinet features plug'n play components making it easy to fit into existing systems or add into planned system designs.
- *Cabinet is "touch-safe"* Exterior of the heater is cool to the touch.
- **Precision control** Provides users with accurate temperature feedback via audible and visual displays and alarms.

- Heats drive-air to optimum temperature -Heats as required to keep rotator housing warm enough to prevent condensation by maintaining exhaust temperatures above the dew point.
- The actual heater process setting depends on applicator fluid flow rate, booth conditions, air flow, inlet and ambient air temperatures. The heater should be set as low as possible, sufficient to maintain the applicator surface temperatures above the dewpoint of the booth environment.

SPECIFICATIONS

Environmental /	Physical	Mechanical	
Dimensions: 16.5-inch H X 10 41.91 cm H X 20).31-inch W X 5.5-inch D 6.18 cm W X 13.97 cm D	Air Supply Pressure:	150 psi (1034 kPa) maximum
Weight:	23 lbs./10.43 kilograms	Air Flow:	1 SCFM (141.6 SLPM) minimum
Air Inlet & Outlet:	1/2-inch NPT Pipe Thread		60 SCEM maximum
Electrical			(1699.0 Liter/minimum)
Electrical			
Input/Dual Voltage:	120/240 VAC + 10%/15 amps/50-60 hertz Single Phase (J1 / J2 jumpers prewired @ 240 VAC)	Filtration:	50 micron (Additional filtration may be required depending on applicator used. Refer to an "Applicator Manual" for required filtration.)
		Air Temperature	
		Output Range:	50°F to 150°F (10°C to 66°C)
		Mounting Location	: Non-hazardous location

Air Flow and Pressure Drop Comparisons



INSTALLATION

LOCATION

WARNING

► The air heater **MUST** be located **outside** of any hazardous area(s) as close to applicator as possible. (See NFPA-33.)

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

Install the air heater near the applicator, but in an area <u>outside of the hazardous location</u>. The unit should be located so that it is not exposed to water, paints or solvents, and high temperatures. (The ambient temperature should not exceed 120°F.)

CAUTION

> Do not locate the unit near or adjacent to heat producing equipment such as oven, high wattage lamps, steam pipes, etc.

WARNING

► The air heater cabinet must be properly connected to earth ground.

INPUT POWER

Input supply voltage connection should be made from a fused disconnect. Route the input power wires through the side of the cabinet. Generally, conduit should be used for the input power. (Always comply with national and local electrical codes.)

PNEUMATIC CONNECTIONS

Use appropriate size piping to connect the air heater to a filtered inlet source. The air heater compressed air input is at the bottom of the unit and is identified as "IN". Connect the heated air output located at the top of the unit identified as "hot outlet pipe" to the coating applicator(s) using 1/2-inch OD, nylon 11/12-inch tubing, with proper pressure rating.

A secondary sensing air supply must be connected to the pressure switch [8] through 1/4-inch OD tube fitting [29].

If the unit is being wired directly to the PLC electrical connections, the pressure switch must be by-passed. (Refer to "Figure 1: Installation Options" for assistance.)

WARNING

► All hardware and tubing used between the air heater and applicator must have proper working pressure (150 psig) and temperature (150°F) ratings.

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NOTE

► Recommended air filtration for the air heater is 50 micron and must be free of oil. Additional filtration may be required depending on applicator used. (Refer to Applicator manual for required filtration.)

WARNING

► **DO NOT** operate air heater without a minimum of 1 SCFM of air flow through the unit.

INSTALLATION OPTIONS (See Figure 1)

Heater Pressure Switch Interlock Options for Activation:

1. Pilot from one of the following items which corresponds and signals air is flowing:

- a. Volume booster requires a minimum of 1 psig.
- b. PLC pneumatic output requires a minimum of 1 psig.
- c. Air regulator requires a minimum of 1 psig.

CAUTION

► Never activate heater without air flow.

2. Directly from a remote electrical control (such as a turbine speed control or PLC). This contact must correspond and signal that air is flowing through the heater. This electrical circuit must be connected using a minimum 1 amp dry contact relay (such as PLC contact). This can be completed by the following:

1. Remove the present wire from TB8-1.

2. Using a wire nut, connect the wire removed in step 1 to a longer wire and route to one side of the remote contact.

3. Run a wire from the other side of the remote contact back to TB8-1.

4. Add pressure switch changes, A1.

When the remote contact is closed, the air heater will turn on.

Air Heater Assembly - Installation

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Figure 1: Installation Options

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CAUTION

► Air filters must be located before the air heater. Heated air may damage air filters.

► The use of an in-line lubricator before the air heater is **NOT** recommended. Oil laden air passing across the heating elements results in burnt contaminates which will accumulate and plug applicator ports. This action may cause premature atomizer turbine failure.

► It is the user's responsibility to ensure clean air at all times. Failures resulting from contaminated air will not be covered under warranty.

FRONT PANEL DISPLAY AND FUNCTIONS FUJI MICRO CONTROLLER "X", MODEL PXG4



OPERATION PARTS

USER Key

Press this key in monitoring mode display or setup mode display returns you to the PV/SV display. Pressing this key on the PV/SV display allows you to set the function for uTey under the system menu (5Y5 Ch 7). (The factory set function for this key is switching between auto and manual.)

SEL Key

Switches the PV/SV display to the monitoring mode display or setup mode display. Switches to setup mode when parameter display and this key functions as the select key when changing parameters. Holding this key down in channel display or parameter display returns you to the PV/SV display. Pressing this key at PV/SV display in manual mode, manual output value is shown in the lower display.

🔼 Key

Pressing once will increase the setting value by one. Holding down the button will continue to increase the value. It changes SV on the PV/ SV display. It is also used to move between items in channel screen display and parameter screen display.

Key

Pressing once will decrease the setting value by one. Holding down the button will continue to decrease the value. It changes SV on the PV/ SV display. It is also used to move between items in channel screen display and parameter screen display.

DISPLAY

Display C1/C2 Lamp

Displays the condition of the control output. Lights ON at 100% output and goes out at 0% output. For values between 0% and 100%, the output is indicated by the length of time the lamp flickers. When acting as a valve control, the C1 lamp will light with OPEN output, and the CS lamp will flicker with CLOSE output.

DO1/2/3 Lamp

Lights ON when there is digital output is on state (DO1, DO2, DO3). The lamp flickers when delay behavior is on.

PV Display

Displays the measurement value (PV). Displays the name of the parameter when setting parameters.

NOTE

 Expect alarm light to flash when auto tuning.

SV Display

Displays the set value (SV). Also can display the output value during manual mode. Displays the parameter setting value when setting parameters. Displays (rEN) during remote SV operation and 50F^R and set value alternately during soft start.

SV Lamp

Lights when displaying the set value (SV). Goes out when displaying the manual output value. The lamp flickers while performing ramp soak or lamp SV operations.

MAN/AT/SELF Lamp

Normally lights up during manual mode and blinks during auto-tuning or self-tuning.



NOTES

OPERATION

PRINCIPLES OF OPERATION

The ITW Air Heater system is shipped as 230V/ 1 phase 50/60 Hz operation but can be converted with simple jumper changes to 115 volt operation. Heater and controls are contained in a single, steel NEMA Type 12 enclosure vented to the atmosphere through access ports for compressed air delivery.

Three LED indicator lights indicate the status of the system. Green indicates a "power on" condition. Red indicates an "alarm condition" resulting in shutdown of power to the heater. Amber indicates "insufficient air flow" for safe operation. The red or amber light remains steady when ON or can be jumper selected to flash when ON. In addition, an audible warning option is also jumper selectable to sound in intermittent warning when either the red or the amber light is lit.

If an alarm condition occurs such as high temperature or insufficient air flow, the power to the heater is interrupted by the safety contactor. When the alarm condition is removed by the heater cooling off or the airflow increasing, the heater will be energized and operate until the system is turned off or the next alarm condition occurs.

The heart of the control process is the temperature controller. Upon startup, or immediately following the acknowledgement of any alarm condition, the controller's PID programming provides a fast, smooth approach to the final temperature setpoint. The PID parameter is set per "Auto-Tuning Procedure" (see "Controller" manual for "Auto-Tuning Procedure and all detailed controller functions").

No cooling is required for the system. Air flow of at least one (1) SCFM (28.3 SLPM) will satisfy heater needs.

NOTES



Figure 2: Wiring Diagram Schematic

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START-UP

NOTES

1. Apply main power to unit.

2. Turn on and set air at a minimum of 1 SCFM with a pneumatic pilot signal to the pressure switch of at least 1 psig.

3. Adjust temperature to desired setting using the key pad on face panel (maximum setting is 150°F).

NOTE

► Heating the drive-air to between 120°F and 140°F will usually keep the rotator housing warm enough to prevent condensation. Use **ONLY** enough heat to prevent moisture buildup!

4. The unit is now ready for normal operation.

CAUTION

► When turning the air heater off, first remove power and allow the unit to cool prior to turning off air flow. Failure to do so may create excessive heat in the heating element and may cause permanent damage or reduced service life of heating element.

MAINTENANCE

HEATER REMOVAL

When removing the heater from the system, assure the following:

- The air supply is off and locked out.
- Main supply power is off and locked out.
- The heating element section, attached fittings, and tubing are cool enough to touch.

NOTES

TROUBLESHOOTING GUIDE

General Problem	Possible Causes	Corrective Action
No Heat Output	1. Power to unit not On	1. Turn Power On.
	2. Blown fuse(s) in tempera- ture controller	2. Replace fuse(s) with same type and determine cause.
	3. Air not turned On to unit or pressure switch	3. Turn air On.
	4. Air pressure too low at pressure switch	4. Increase air pressure signal to the pressure switch.
	5. High limit thermostat switch off	5. Manually reset switch and investigate reason for switch turning off.

PARTS IDENTIFICATION



Figure 4: A11065-05 Air Heater Assembly

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A11065-05 AIR HEATER ASSEMBLY - PARTS LIST (Figure 4)

•/		
Part #	Description	Qty
A11028-00	Cool Touch In-Line Air Heater	1
A11027-00	Thermocouple (Air Heater)	1
A11021-00	PC Board Assembly (TC0002 - Air Heater)	1
A11019-00	PC Board Assembly (TC0003 - Air Heater)	1
A11022-00	Fuse, 15A, CER, ABC (Air Heater)	2
A11738-00	Temperature Controller (Air Heater)	1
A11024-00	DPDT Switch (Air Heater)	1
77235-02	Pressure Switch (Air Heater)	1
A11026-00	Relay, Solid State (Air Heater)	1
A11005-00	Enclosure (Air Heater)	1
SSH-7739	Sheet Metal Plug	1
SSW-8230	PLC Outlet Fitting	1
5307-01	Conduit Nut	1
TRM-35-038	Ground Label	1
A10996-00	Decal, Heat Cover	1
A10997-00	Label, Set (Air Heater)	1
LSF10072-00	Male Elbow, 1/2" OD Tube X 1/2" NPT	1
LSF10065-00	Connector, Male	1
3364-04	Tee, Pipe 1/2" NPT	1
A11064-00	Coupling, Pipe 1/2" NPT Stainless Steel	1
78167-00	SAE 45° Male Connector, Air Inlet	1
TRC-35-103	Serial Tag	1
7715-00	Serial No. Label	1
A11065-11	Purchased Air Heater	1
LSF10065-00	1/2" OD Tube Connector, Air Inlet	1
ASI-4004	Temperature Conversion Chart	1
LN-9245-00	Manual, Air Heater Assembly	1
LSF10002	Fitting, 1/4" T X 1/8" NPT, Bulkhead	1
A11737-00	High Limit Thermostat, Manual Reset	1
	Part # A11028-00 A11027-00 A11027-00 A11021-00 A11022-00 A11022-00 A11022-00 A11024-00 77235-02 A11026-00 A11026-00 SSH-7739 SSW-8230 5307-01 TRM-35-038 A10996-00 A10997-00 LSF10072-00 LSF10065-00 3364-04 A11064-00 78167-00 TRC-35-103 7715-00 A11065-11 LSF10065-00 ASI-4004 LN-9245-00 LSF10002 A11737-00	Part #DescriptionA11028-00Cool Touch In-Line Air HeaterA11027-00Thermocouple (Air Heater)A11021-00PC Board Assembly (TC0002 - Air Heater)A11019-00PC Board Assembly (TC0003 - Air Heater)A11022-00Fuse, 15A, CER, ABC (Air Heater)A11024-00DPDT Switch (Air Heater)A11024-00DPDT Switch (Air Heater)A11026-00Relay, Solid State (Air Heater)A11005-00Enclosure (Air Heater)A11005-00Enclosure (Air Heater)SH-7739Sheet Metal PlugSSW-8230PLC Outlet Fitting5307-01Conduit NutTRM-35-038Ground LabelA10996-00Decal, Heat CoverA10997-00Label, Set (Air Heater)LSF10072-00Male Elbow, 1/2" OD Tube X 1/2" NPTLSF10072-00SAE 45° Male Connector, Air InletTRC-35-103Serial Tag7715-00Serial Tag7715-00Serial Tag7715-00Iserial Tag7715-00Serial Tag7715-00

ACCESSORIES	
Part #	Description
A12060-00	PLC Kit (Optional)

WARRANTY POLICIES

LIMITED WARRANTY

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

THE USE OF OTHER THAN ITW RANS-BURG APPROVED PARTS, VOID ALL WARRANTIES.

SPARE PARTS: One hundred and eighty (180) days from date of purchase, except for rebuilt parts (any part number ending in "R") for which the warranty period is ninety (90) days.

EQUIPMENT: When purchased as a complete unit, (i.e., guns, power supplies, control units, etc.), is one (1) year from date of purchase. WRAPPING THE GUN IN PLASTIC WILL VOID THIS WARRANTY. ITW RANSBURG'S ONLY OBLIGATION UNDER THIS WARRANTY IS TO REPLACE PARTS THAT HAVE FAILED BECAUSE OF FAULTY WORKMANSHIP OR MATER-IALS. THERE ARE NO IMPLIED WARRAN-TIES NOR WARRANTIES OF EITHER MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. ITW RANS-BURG ASSUMES NO LIABILITY FOR INJURY, DAMAGE TO PROPERTY OR FOR CONSEQUENTIAL DAMAGES FOR LOSS OF GOODWILL OR PRODUCTION OR INCOME, WHICH RESULT FROM USE OR MISUSE OF THE EQUIPMENT BY PURCHASER OR OTHERS.

EXCLUSIONS:

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

MANUAL CHANGE SUMMARY

This manual was published to replace Service Manual **LN-9245-00.5** Air Heaster Assembly, to make the following changes:

1. Revised "Figure 4 - A11065-05 Air Heater Assembly" in the "Parts Identification" section.

2. Removed "A11065-05 Air Heater Assembly Parts List - Item #17 - A11029-00 - Communication Card" in the "Parts Identification" section. Service Manual Price: €15.00 (Euro) \$20.00 (U.S.)

Manufacturing

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Telephone: 800/233-3366	Fax: 419/470-2071

Technical Support Representative will direct you to the appropriate telephone number for ordering Spare Parts.





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