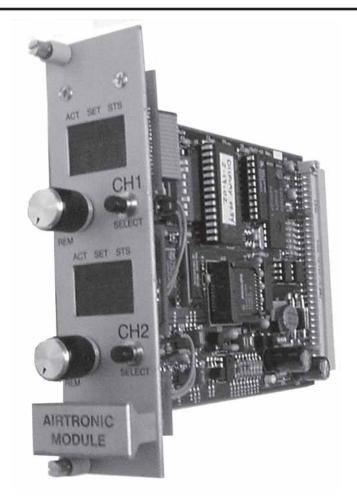


SERVICE MANUAL LN-9241-02.1

AIRTRONIC



MODELS: 79053 AirTronic Module A10449-XX Remote AirTronic Assembly

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

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





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SAFETY

SAFETY PRECAUTIONS

Before operating, maintaining or servicing any Ransburg coating system, read and understand all of the technical and safety literature for your 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 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 Ransburg representative or Ransburg.

🚺 W A R N I N G

► The user **MUST** read and be familiar with the Safety Section in this manual and the 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, 2000 EDITION, 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.



AREA	HAZARD	SAFEGUARDS
Tells where hazards	Tells what the hazard is.	Tells how to avoid the hazard.
may occur.		
Spray Area	Fire Hazard	Fire extinguishing equipment must be present in the spray area and tested periodically.
12.00	Improper or inadequate opera- tioning and maintenance proce- dures will cause a fire hazard.	Spray areas must be kept clean to prevent the accumulation of combustible residues.
Jacky y	Protection against inadvertent arc- ing that is capable of causing fire or	Smoking must never be allowed in the spray area.
	explosion is lost if any safety inter- locks are disabled during opera- tion. Frequent power supply shut-	The high voltage supplied to the atomizer must be turned off prior to cleaning, flushing or maintenance.
	down indicates a problem in the system requiring correction.	When using solvents for cleaning:
	system requiring 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, 1995 Edition, OSHA and local codes. In addition, ventilation must be maintained during cleaning operations using flammable or com- bustible 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 equip- ment modifications may cause fire or injury.
		If used, the key switch by-pass is intended for use only during set-up operations. Production should never be done with safety interlocks disabled.
		Never use equipment intended for use in waterborne installations to spray solvent based materials.
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, Chapter 16, 1995 edition.
	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. OSHA references are Sections 1910.94 and 1910.107. Also refer to NFPA-33, 1995 edition and your insurance company requirements.



AREA	HAZARD	SAFEGUARDS
Tells where hazards	Tells what the hazard is.	Tells how to avoid the hazard.
may occur.		
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 maintenance. Protection against inadvertent arcing that may cause a fire or explosion is lost if safety circuits are disabled during operation. Frequent power supply shut-down indicates a problem in the system which requires correction. An electrical arc can ignite coating materials and cause a fire or explosion. 	 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 No. 33, 1995 Edition. Turn the power supply OFF before working on the equipment. Test only in areas free of flammable or combustible material. Testing may require high voltage to be on, but only as instructed. Production should never be done with the safety circuits disabled. Before turning the high voltage on, make sure no objects are within the sparking distance.
Spray Area / High Voltage Equipment	This is a high voltage ungrounded device that can produce electrical arcs capable of igniting coating materials.	Parts being sprayed must be supported on conveyors or hangers and be grounded. The resistance between the part and ground must not exceed 1 megohm. (Reference NFPA Bulletin No. 33, 1995 Edition.) A safe distance must be maintained between the parts being coated and the atomizer bell. A distance of at least 1 inch for each 10 kV of power supply output voltage is required at all times. Parts must be supported so that they will not swing and reduce the clearance specified above. All electrically conductive objects in the spray area, with the exception of those objects required by the process to be at high voltage, must be grounded. Unless specifically approved for use in hazardous locations, the power supply and other electrical equip- ment must not be used in Class I, Division 1 or 2 locations.



INTRODUCTION

GENERAL DESCRIPTION

The *AirTronic System* provides a means for regulating two channels of airflow. It consists of a Euro card Display Module and a Remote Unit. The Remote Unit is mounted close to the application requiring the airflow control. The Display Module is mounted in an ITW Euro card control rack containing a 78145 or 78147 "1/4 Rack" Motherboard.

The Flow Control printed circuit board permits the measurement and regulation of the airflow of both channels. The air volumes are continuously measured and compared with the desired values and automatically regulated by the Remote printed circuit board. The Remote printed circuit board automatically compensates for fluctuations in the compressed air or dynamic air pressure caused by the system.

A serial bus using a shielded twisted pair of cables provides communication between the Display Module and Remote Unit. The connections are made at Pins 7(+) and 8 (-) on the motherboard 8pin terminal strip (connector in center of Motherboard and just behind the Display Module) for the Display Module and at Remote PCB J1, pins 4 (+) and 5 (-). The cable shield must be connected to Remote PCB J1, pin-3.

NOTE

► 24VDC connects to J1, pin-1 and 24VDC return (GND) connects to J1, pin-2.

SPECIFICATIONS

AirTronic Basic Mode

All HOLIC Dasic Mot	
Main Connections Input Voltage: Total Power Consumption:	24V DC 36 Watts Max.
General Information Type of Protection: Temperature Range:	Polyfuse 0° to 40°C (32°F to 104°F)
Pneumatic Data Input Pressure:	Regulated 6.0 bar (85 psi) ± 2 psi
Max. Oil Vapor Content: Max. Water Vapor Content: Max. Compressed Air: Consumption:	1.3 g/m3 0.1 mg/kg 85 psi 600 slpm (300) 1500 slpm (750)
Remote Panel Dimensions Width: Height: Depth: Weight:	12 in. (304.8 mm) 14 in. (356 mm) 6.0 in.(152 mm) 15.2 lbs. (6.9 kg)
Flow Control Input Pressure: Operating Temperature:	6.0 bar (85psi) 0° to 40°C (32°F to 104°F)
Air Volume Working Ran 300 Unit: 750 Unit: Resolution:	
Accuracy: Reaction Time Step Mode 0-100%: Ramp Mode 0-100%:	Approx. 3 sec. Approx. 6 sec.



INSTALLATION

LOCATION

Install the Rack Assembly in a control cabinet that is protected from the possibility of any contact with water, vapor or high humidity. Ambient temperature should not exceed maximum 104°F (40°C). **DO NOT** locate control cabinet near or adjacent to heat producing equipment such as ovens, high wattage lamps, etc. The area should be clean, dry and well ventilated. If the remote rack is located remotely from the remote Rack assembly, the control cabinet should be located such that the total length of the cable between remote rack and remote rack assembly is no longer than 100 feet.

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► The AirTronic Module **MUST** be located outside the HAZARDOUS area (See NFPA Bulletin 33, 1995 Edition).

► The user should be aware of, and adhere to, all local fire codes and ordinances.

► Conduit MUST be used for the input AC electrical connections.

► The user MUST provide a properly fused disconnect between the power source and the power supply which complies with appropriate codes.



OPERATION

MODES OF I/O

The *AirTronic System* may be run in three different I/O modes:

- 1. Local
- 2. External Discrete signals
- 3. Remote I/O via the Serial Node Adapter, and Serial Node Adapter Plus Module

Local Mode

All I/O is via Display Module front panel. The front panel knob sets the flow Setpoints for each channel. In the full CCW position, this control has a detent and in this detent position the module accepts a Setpoint from the Node Adapter or external discrete signals. (See Figure 1)

The front panel display information is determined by the **SELECT** push button. On power-up, the display for each channel reads actual flow in standard liter/minute (SLPM) in that channel. The **LED** under the **ACT** (Actual) label is illuminated. If the **SELECT** button is pressed once, the **LED** under the **SET** label is illuminated and the display reads that channel's setpoint. If the **SELECT** button is pressed once more, the **LED** under the **STS** (Status) label is illuminated, and the display provides status information. (See Status Conditions section for status code information.) If the **SELECT** button is pressed once more, the display goes back to the actual flow condition.

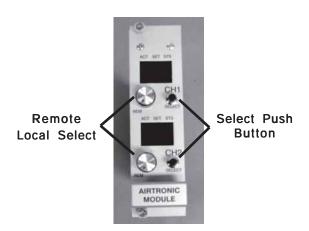
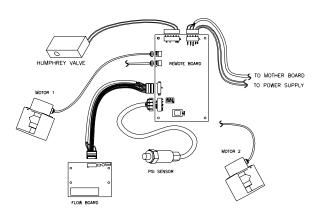


Figure 1: Remote Local Modes





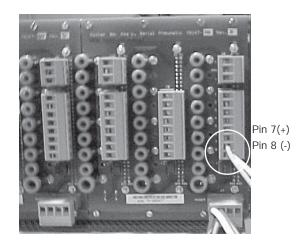


Figure 3: Local Canbus Signal Connection

All Local Canbus Communication between the AirTronic Module to the RemoteUnit Back panel is via discrete wiring to the 8-pin terminal strip on the motherboard. Motherboard 78145-00 uses J9 and J12. Motherboard 78147-00 uses J5, J8, and J11.

NOTE

► The Display Module Flow Control knob must be in the full CCW "REM" (remote) position for the module to accept flow setpoints from outside the module.

EXTERNAL DISCRETE SIGNALS				
PIN #	SIGNAL	DESCRIPTION		
1	Channel 1 Analog Set Point *	0-10V = 0 To Full Scale 4-20 mA = 0 To Full Scale		
2	Channel 2 Analog Set Point *	0-10V = 0 To Full Scale 4-20 mA = 0 To Full Scale		
3	Channel 1 Trigger	24 Vdc if Status Condition Is Active **		
4	Channel 2 Trigger	24 Vdc if Status Condition Is Active **		
5	Channel 1 Hold	24 Vdc If Status Condition Is Active **		
6	Channel 2 Hold	24 Vdc If Status Condition Is Active **		
7	Serial Bus (+)	Serial Bus to Remote Unit		
8	Serial Bus (-)	Serial Bus to Remote Unit		

* Set by Display Module SW2, Position 7. (Off = 0-10 Vdc & On = 4 to 20 mA)

** Set by display Module jumper E2

E2 Pins 1 & 2 24V input required (Sourcing)

E2 Pins 2 & 3 Ground input required (Sinking)

Triggering Flow

A Trigger signal and a Hold signal are provided for each channel. The channel is triggered On with discrete inputs or from an external PLC. In order to get air to flow, the AirTronic unit must have an active Trigger signal with a non-zero set point. The set point is set on the display card or from an external PLC. See "Local Mode" in the "Operation" section for operation of the display card. The Trigger signal opens the air supply line by positioning the needle valve with the stepper motor. The needle valve position is adjusted until the set point is achieved. The Control loop may take a few seconds to position the needle valve and stabilize the flow.

The Hold signal is needed for applications where relatively quick On-Off triggering is required. The Hold signal is designed to work with an atomizer with an air valve to trigger air source. The Hold signal works as follows:

• The Atomizer and AirTronic are triggered "On".

- The Hold signal is applied.
- The Atomizer and AirTronic are triggered "Off"."

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Electrostatic Systems

- The airflow stops because the atomizer air valve is triggered "Off".
- The AirTronic needle valve remains at the same position, as it was when the Hold was applied. The pressure in the channel(s) will rise to inlet pressure.
- The atomizer is triggered "On". The airflow is immediate. The system will quickly ramp down to the preset airflow set when the system was given the Hold signal.
- The Hold signal is removed. The control loop positions the needle valve to achieve the set point flow.
- The AirTronic will now open and **fully close** the needle valve upon trigger signal



Remote I/O Mode

Direct connection to Rockwell/Allen-Bradley Remote I/O can be made via the Serial Node Adapter or Serial Node Adapter +. Connect the Allen-Bradley (AB) RIO cable directly to the motherboard of the Node Adapter. If the AirTronic Display Module is in the same motherboard as the Serial Node Adapter, no further connection is necessary. If the Display Module is located in a different motherboard, the local serial bus must be connected via the connector labeled "Serial Bus."

NOTE

► This is not the same bus that is used to connect the Display Module to the Remote Unit.

In general, the I/O data is:

Block Transfer Writes: Channel 1 and 2 Setpoints and tolerances for over and under flow alarms

Block Transfer Reads: Channel 1 and 2 actual flows, system input air pressure at the input of flow block, status indicators for Display module in Local Setpoint mode, and Channel 2 in Slave Mode.

Discrete Inputs: Seven status conditions for each Display Module are provided.

Discrete Outputs: One trigger bit for each channel for operating a trigger valve in the flow line output.

The detailed PLC I/O Tables for these signals are located in the Serial Node Adapter Manual, LN-9238-02 and later versions.



MODES OF OPERATION

The Display Module can be configured so: a. Channels 1 and 2 operate independent of each other

b. Channels 1 and 2 operate in a Slave Mode, meaning that the Channel 1 Setpoint sets the total flow of Channels 1 and 2. The Channel 2 Setpoint sets the amount of flow in Channel 2 in percent (%) of total flow.

SETTINGS

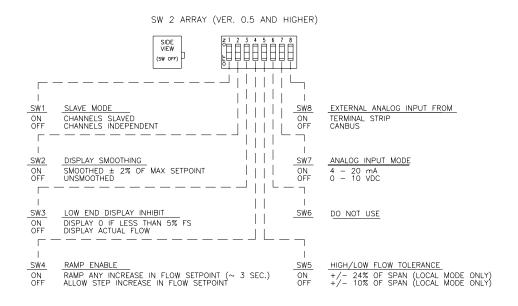


Figure 4a: AirTronic System Settings

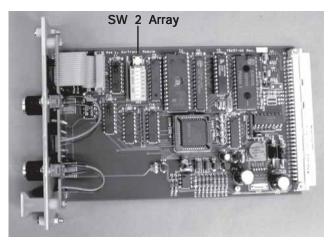
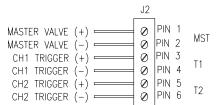


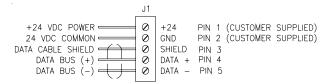
Figure 4b: Display Module 79053



REMOTE PCB J2 CONNECTIONS



REMOTE PCB J1 CONNECTIONS



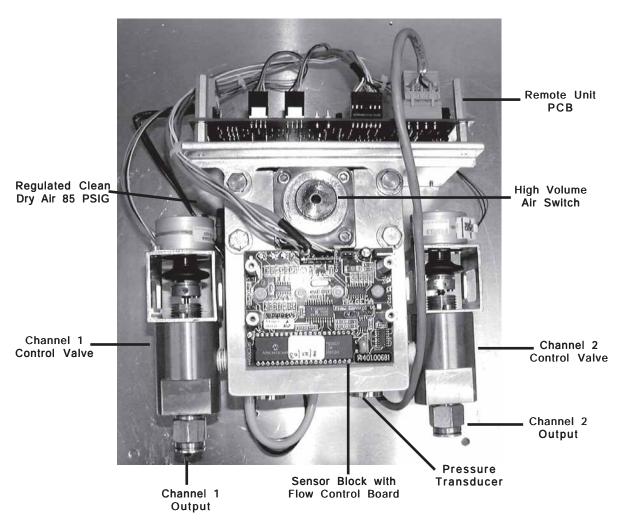


Figure 5: Remote Unit Back Panel

NOTE

► 24VDC connects to J1, pin-1 and 24VDC return (GND) connects to J1, pin-2.

NOTE

► This unit is not field calibratable. Must replace Flow Block with recalibrated Flow Block.

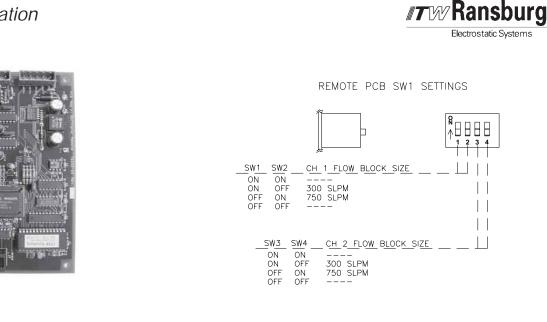


Figure 6: Remote Unit PCB

Status Conditions

SW1

The following table shows the error conditions determined by the AirTronic Display Module. The Low and High Flow errors are determined by the tolerance set by the PLC input or fixed at 10% or 24% (SW2 Array - SW6) if there are no PLC inputs.

The error codes (E4, E3, etc.) are shown on the Display Module display. If more than one error condition is present, the display will show them both. For example, E1 and 3 (E13) indicates low input pressure and low flow.

AIRTRONIC ERROR / FAULT FUNCTION						
ERROR / FAULT	DISPLAY CODE	PLC INPUT BIT	ACTION	ACTION REQ'D.		
Low Flow - Channel 1	E3	x0	Signal Only	Get parameter back within tolerance.		
High Flow - Channel 1	E4	x1	Signal Only	Get parameter back within tolerance.		
Low Flow - Channel 2	E3	x2	Signal Only	Get parameter back within tolerance.		
High Flow - Channel 2	E4	х3	Signal Only	Get parameter back within tolerance.		
Pressure Low (<75 psi)	E1	x4	Signal Only	Get parameter back within tolerance.		
Pressure High (>95 psi)	E2	x5	Signal Only	Get parameter back within tolerance.		
CanBus Comm. Fault	E5	х6	Shutdown	Reconnect Local Canbus		



PARTS IDENTIFICATION

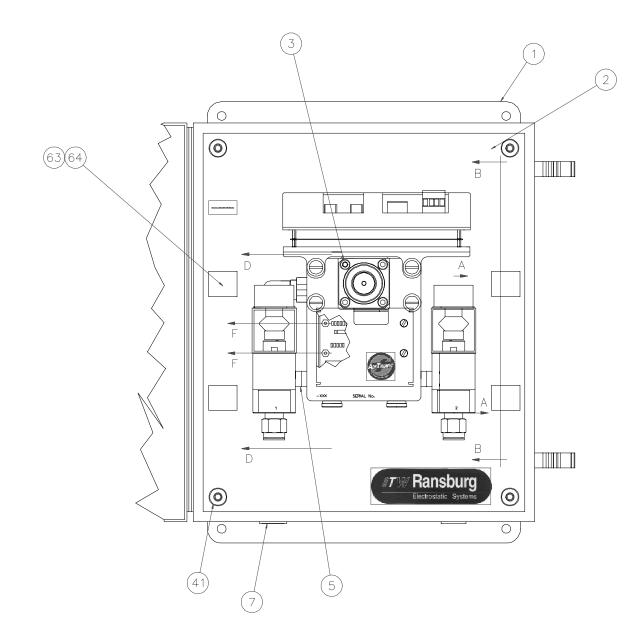


Figure 7: Remote Back Panel Mounted In Enclosure



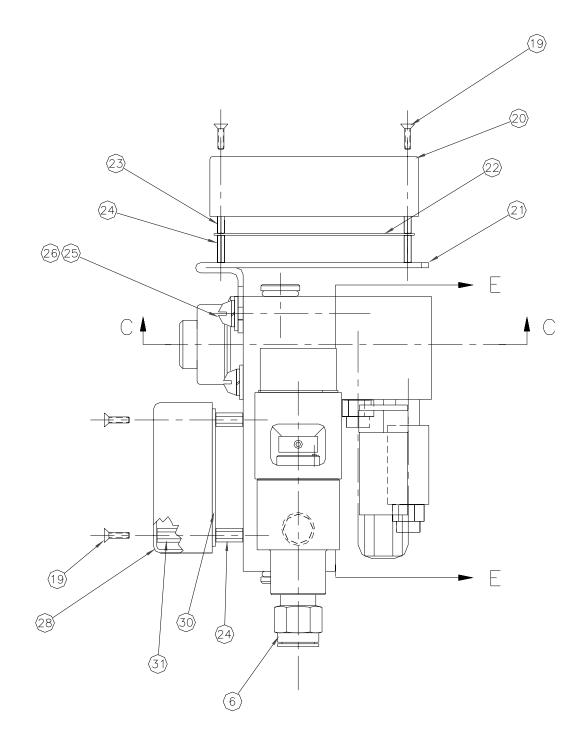


Figure 8: Side View of Remote Back Panel Without Enclosure & Back Panel



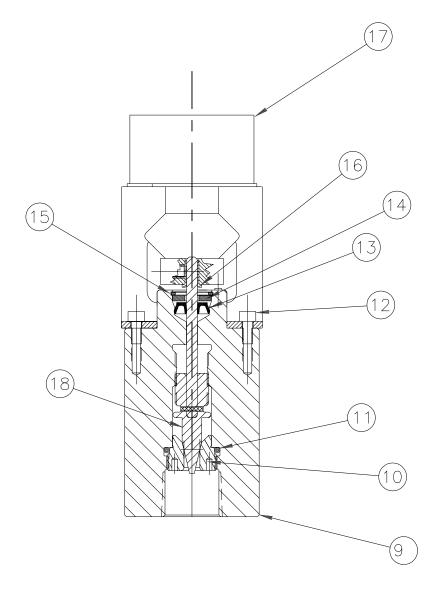
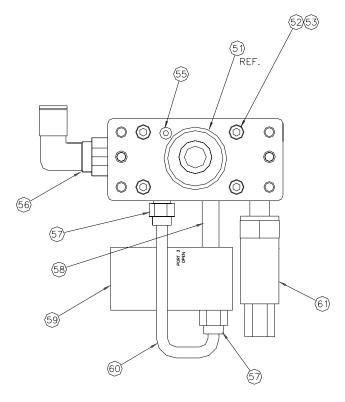
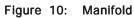


Figure 9: Valve Section







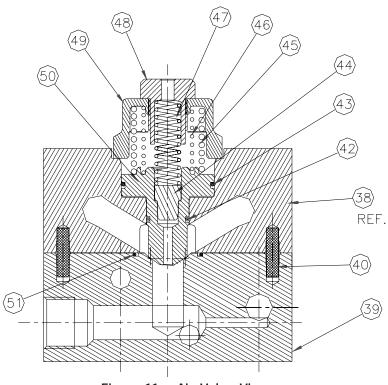
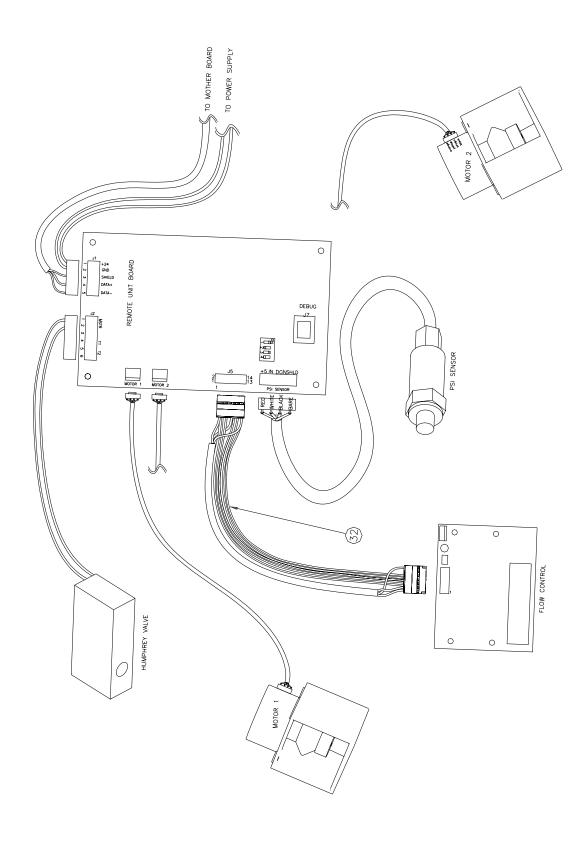


Figure 11: Air Valve View





AIRTRONIC ASSEMBLY PARTS LIST				
Item #	Part #	Qty		
1	See Table "A"	AirTronic Enclosure (12 X 14)	1	
2	A10448-00	Back Panel, 12.75" X 10.88"	1	
3	8212-20C	Socket Head Cap Screw #10-24 X 5/8"	4 5	
4	79060-00	Socket Pipe, Plug	4 4	
5	A10434-00	Pipe Nipple (Short), 1/4-NPT	2 4	
6	See Table "G"	Male Connector	2 4	
7	See Table "B"	Vinyl Hole Grommet 9/16"	3	
8	7554-42	Socket Pipe, O-Ring	4 3	
9>9	A10416-00	Valve Manifold	1	
9>10	See Table "C"	Orifice	2	
9>11	7554-11	O-Ring (2-014)	2 3>	
9>12	A10431-00	Socket Head Cap Screw #4-48 X .25"	4	
√ 9>13	A10441-00	AirTronic Needle Seal	2 3	
9>14	A10451-00	Washer	2	
∮ <u>></u> 15	A10450-00	Snap Ring	2	
√9>16	A10428-00	Needle Sleeve	2	
9>17	A10429-00	Stepper Motor & Mount	2	
9>18	See Table "D"	Needle	2	
19	79100-00	Flat Head, 4-40 X .375"	8	
20	79096-00	Cover (Remote PCB)	1	
21	A10426-00	Remote PCB Plate	1	
22	78655-00	Remote Unit Board	1	
23	79099-00	Standoff, 4-40 X .75"	4	
24	79058-00	Standoff, 4-40 X .50"	8	
25	SS-1505-CD	Lock Washer, 1/4-20	4	
26	A10430-00	Round Head Screw, 1/4-20 X 2.00"	4	
27	(Not Used)			
28	79097-00	Cover (Flow Control)	1	
29	(Not Used)			
30	79068-00	Flow Control Board, Gema	1	
31	79098-00	Standoff, 4-40 X 1.00"	4	
32	79089-00	Sensor Block Cable	1	
33	(Not Used)			
34	7554-05	O-Ring (2-008)	4 3>	
35	A10427-00	Plug for O-Rings	4	
36	See Table "E"	Flow Orfice	2	
37	7554-09	O-Ring (2-012)	4 3	
38	A10419-00	Flow Block	1	
39	A10417-00	Base Manifold	1	
40	A10433-00	Spring Pin, .187 Diameter X .75"	2	
41	SS-1505-00	Lock Washer	4	
42	A10442-00	Piston O-Ring	1 3	
43	A10443-00	Piston O-Ring	1 3	
44	A10421-00	Piston Plug	1	
		- isisin ing		

(Continued on next page)

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Electrostatic Systems

AIRTRONIC ASSEMBLY PARTS LIST CONT.				
Item #	Part #	Description Qty		
45	A10437-00	Piston Spring, Large	1	
46		Piston Spring (Middle)	1	
47		Piston Spring (Inner)	1 🗈	
48	A10445-00	Knob	1	
49	A10436-00	AGX Back Piece	1	
50	A10440-00	AGX Piston	1 3>	
51	7606-21	O-Ring (2-022)	1	
52	7734-04	Lock Washer #10-24	4	
53	8212-48C	Socket Head Cap Screw, #10-24 X 1.5"	4	
54	(Not Used)		3>	
55	7554-04	O-Ring (2-007)	1 4>	
56	See Table "H"	Male Elbow	1 4>	
57	78327-00	Alkon Male Connector, 6 X 4	2 4>	
58	A10435-00	Pipe Nipple, 1/8-BSPT X 1.5"	1	
59	79072-00	Humprey Valve	1	
60	78326-00	Tubing, 6mm I.D.	1 4>	
61	79067-00	Pressure Transducer	1	
62	A10425-00	Tool (Not Shown)	1	
63	20827	Cable Mount	4	
64	TR-SSEM-083	Cable Tie	8	

PARTS LIST BULLET DEFINITION TABLE

Items are included in A01459-XX (Not Sold Seperately)

- Item 62 Tool and Service Manual for AirTronic Included but not shown
- \supset Use hardware to mount back panel.
- Apply 7969-02 Loctite (Red) to threads.
- 5> Apply 7969-03 Loctite (Blue) to threads.
- Apply 7969-10 Loctite (White) to threads.
- B Apply SSL-11 Petroleum Jelly to o-rings and u-cups prior to assembly.



AIRTRONIC MODEL IDENTIFICATION

When ordering, use a10449-AB as indicated by Tables A & B. Two digits must follow the basic part number, for example:

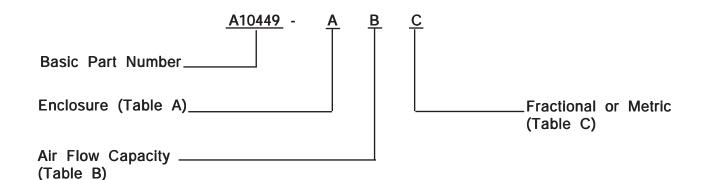


TABLE "A" - ENCLOSUREDash #ABDescription1--------AirTronic Back Panel Assy. Without Hoffman Box2A10447-0079090-00AirTronic Back Panel Assy. W/Hoffman Box

TABLE "B" - AIR FLOW CAPACITY					
Dash #	С	D	E	F	Description
1	A10421-00	A10415-00	A20418-01	300 SLPN	AirTronic Needle and Seat
2	A10413-00	A10424-00	A10418-02	750 SLPM	AirTronic Needle and Seat

TABLE "C" - ENCLOSURE					
Dash #	G	Н	Description		
1	79081-00	79070-00	Metric Tube Connections, 12mm		
2	A10460-01	A10461-01	Fractional Tube connections, 1/2"		



AirTronic - Parts Identification

NOTES



WARRANTY POLICIES

LIMITED WARRANTY

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 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, VOIDS 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 APPLICATOR, ASSO-CIATED VALVES AND TUBING, AND SUPPORTING HARDWARE IN PLASTIC, SHRINK-WRAP, OR ANY OTHER NON-APPROVED COVERING, WILL VOID THIS WARRANTY.

FLUID HANDLING: One (1) year from date of purchase (i.e., Totalizer, CCV Valves, etc.).

AIR BEARING ROTATORS: Fifteen thousand (15,000) hours or three (3) years, whichever occurs first. Warranty period begins on the date of purchase.

RANSBURG'S ONLY OBLIGATION UN-DER THIS WARRANTY IS TO REPLACE PARTS THAT HAVE FAILED BECAUSE OF FAULTY WORKMANSHIP OR MATE-RIALS. THERE ARE NO IMPLIED WAR-RANTIES NOR WARRANTIES OF EITHER MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. RANSBURG ASSUMES NO LIABILITY FOR INJURY, DAMAGE TO PROPERTY OR FOR CON-SEQUENTIAL DAMAGES FOR LOSS OF GOODWILL OR PRODUCTION OR IN-COME, WHICH RESULT FROM USE OR MISUSE OF THE EQUIPMENT BY PUR-CHASER OR OTHERS.

EXCLUSIONS:

If, in Ransburg's opinion the warranty item in question, or other items damaged by this part was improperly installed, operated or maintained, 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.



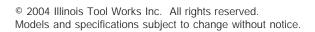
Manufacturing

1910 North Wayne Street Angola, Indiana 46703-9100 Telephone: 260/665-8800 Fax: 260/665-8516

Technical/Service Assistance

Automotive Assembly and Tier I	Telephone: 800/ 626-3565	Fax: 419/ 470-2040
Industrial Systems	Telephone: 800/ 233-3366	Fax: 419/ 470-2071
Ransburg Guns	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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