

AirStar[®] **DENTAL AIR SYSTEM**

Installation and Operation Manual



**AIR
TECHNIQUES**

**ISO
9001**
ISO 13485
FDA-GMP COMPLIANT

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SAFETY INSTRUCTIONS

Use of the **AIRSTAR** not in conformance with the instructions specified in this manual may result in permanent failure of the unit.

WARNING: To prevent fire or electrical shock, do not expose this appliance to rain in or moisture.

All user serviceable items are described in the maintenance section.

Manufacturing date code on serial number label is in the format Month YYYY.

ATTENTION USERS:



Alerts users to important Operating and Maintenance instructions. Read carefully to avoid any problems.



Warns users that uninsulated voltage within the unit may be of sufficient magnitude to cause electric shock.



Indicates the ON and OFF position for the Equipment power switch.

All AirStar compressors comply with NFPA 99C level 3 requirements



Indicates that the equipment complies with the Medical Device Directive 93/42/EEC.



MEDICAL ELECTRICAL EQUIPMENT

WITH RESPECT TO ELECTRICAL SHOCK, FIRE, MECHANICAL AND OTHER SPECIFIED HAZARDS ONLY
IN ACCORDANCE WITH UL-60601-1, CAN/CSA C22.2 NO.601.1
66CA



Indicates protective Earth Ground for the Equipment power switch.



Medical Device Safety Service
Schiffgraben 41
30175 Hannover, Germany

CONGRATULATIONS

Your AIRSTAR generates 100% oil-less, ultra-dry dental air which protects valuable handpieces from premature failure due to the effects of moist air and the build-up of oil residue. Because no oil is used for mechanical lubrication, there is no chance of introducing an oily film to a prepared surface which could compromise resin retention and restorations, wasting chair time. Most important, your patients's health is protected with ultra-dry air that provides an environment that is not conducive to bacterial growth.

The AIRSTAR utilizes a long stroke, small bore piston to compress the air. This piston is bonded with an anti-friction polymer to eliminate the need for oil. The air is forced through the Membrane Dryer System consisting of the cooler and the membrane. This system removes moisture and air impurities providing the driest possible compressed air while maximizing performance. This 100% ultra-dry air is reserved in the main storage tank for use by the operatory air system. The AIRSTAR features include:

- Virtually Maintenance Free
- Low Pressure Dew Point
- Maximum Dryness with Quadruple Filtered Air
- Uninterrupted Compressor Availability
- Compact size for space-saving installation

Since 1971, when Air Techniques pioneered the manufacture of oil-less air for dentistry, thousands of dentists have depended on their AIRSTAR. Now that your practice has an AIRSTAR , you, too, can depend on the delivery of 100% oil-less, ultra-dry air and efficient, trouble-free operation.

WARRANTY

Each AIRSTAR is warranted to be free from defects in material and workmanship from the date of installation for a period as follows:

- Standard Warranty: 2 years (24 months) on complete unit.
- Extended Warranty: 3 years (36 months) all motors, heads and pistons.
- Total 5-year Warranty on all motors, heads and pistons.

Any item returned to our factory through an authorized distributor, will be repaired or replaced at our option at no charge provided that our inspection shall indicate it to have been defective. Dealer labor, shipping and handling charges are not covered by this warranty.

This warranty does not apply to damage due to shipping, misuse, careless handling or repairs by other than authorized service personnel. Warranty is void if equipment is installed or serviced by other than dealer service personnel authorized by Air Techniques. Air Techniques, Inc. is not liable for indirect or consequential damages or loss of any nature in connection with this equipment.

This warranty is in lieu of all other warranties expressed or implied. No representative or person is authorized to assume for us any liability in connection with the sale of our equipment.

ON-LINE WARRANTY REGISTRATION

Quickly and easily register your new AIRSTAR on-line. Just have your product model and serial numbers available. Then go to the Air Techniques web site, www.airtechniques.com/dental, click the **warranty registration** link and complete the registration form. This on-line registration ensures a record for the warranty period and helps us keep you informed of product updates and other valuable information.

KEY PARTS IDENTIFICATION

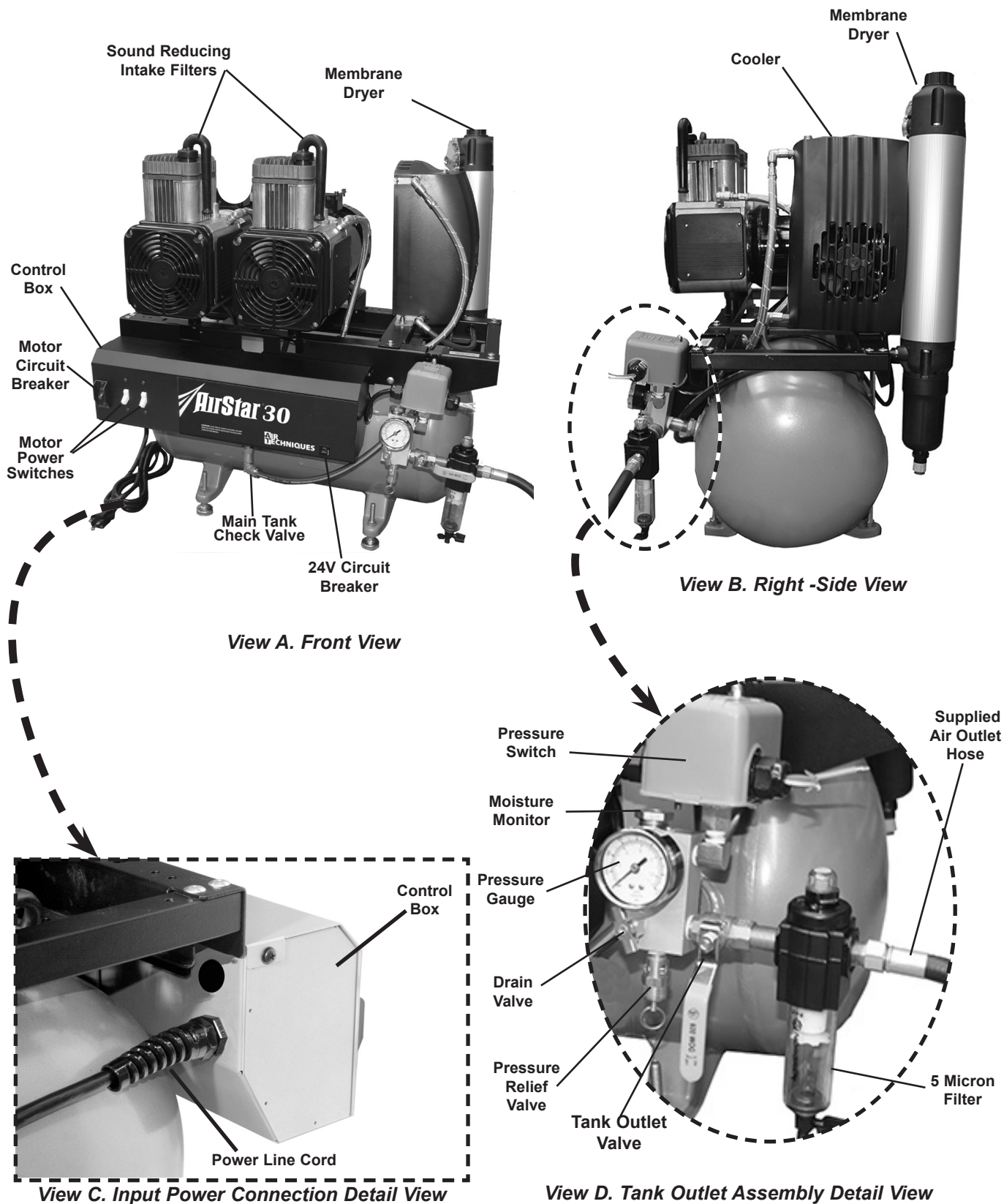


Figure 1. AirStar Parts Location

Choosing the correct size AIRSTAR for your practice depends on the number of air users and the anticipated air demand. To assure optimum compressor operation, the air demands should not exceed the number of air handpiece users shown in the chart below:

Model	Recommended Number of Users	Number of Heads	Number of Motors
AS10	1 - 2	1	1
AS21	2 - 3	2	1
AS22	2 - 3	2	1
AS30	3 - 4	2	2
AS40	4 - 5	3	2
AS50	5 - 7	4	2
AS70	7 - 10	6	3

OPERATING INFORMATION

■ AS10, AS21 and AS22

- If a remote Control Panel is being used, the circuit breaker on the face of the compressor Control box must be in the ON position.
- The 24 volt circuit breaker must also be in the ON position. Make sure the reset button is flush with the face of the circuit breaker. If it isn't, push it in to reset.
- If a Remote Control Panel is not being used, be sure that the yellow and the orange wires are connected to one another. These wires are located in the pressure switch. The circuit breaker located on the face of the compressor Control Box is the power control for the motor.

■ AS30, AS40, AS50 and AS70

- If a Remote Control Panel is being used, ALL switches on the face of the compressor Control Box must be in the ON position.
- If a Remote Control Panel is not being used, be sure that the yellow and the orange wires are connected to one another. These wires are located on the pressure switch. The power switches located on the face of the compressor Control Box are the power control for each motor.

Note: Compressor motors are designed to run together. Do not run one head at a time unless one head has failed and you are waiting for service.

- The motor circuit breaker must be kept in the ON position and should not be used as a switch.

SITE REQUIREMENTS

Requirement \ AirStar Model	AS10	AS21	AS22	AS30	AS40	AS50	AS70
Voltage Min/Max * (VAC)	105/125	105/125	200/250	200/250	200/250	200/250	200/250
Frequency (Hz)	60	60	60	60	60	60	60
Full Load Amps	8	15	8	8	12	16	24
Minimum Circuit Breaker Rating (Amps)	20	30	20	20	20	30	40
Minimum. Wire Size (AWG)	12	10	12	12	12	10	8

* Install a buck or boost transformer if service is above or below these ratings

Service Clearance: Allow 12" on all sides for all models.

Ambient Temperature: Must not exceed 105°F

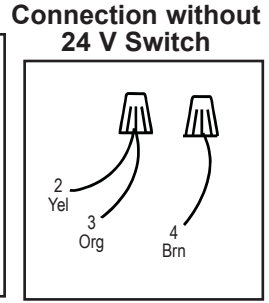
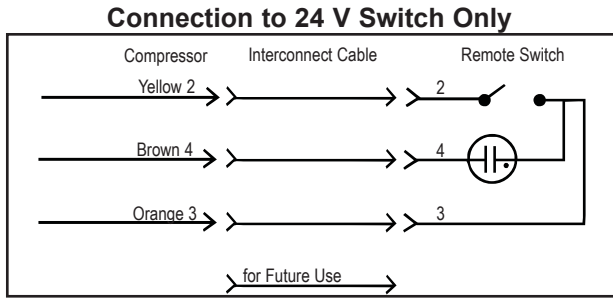
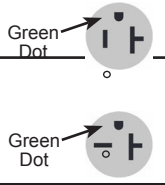
Air System Plumbing Connection: 3/8" F.N.P.T. Shut-off valve and a 6 ft. pressure hose (supplied)
 Air distribution piping for all models - 1/2", type "L" or type "K" copper
 If pipe volume is too great, more than 235 in³ or more than 100 ft. of 1/2" diameter pipe, a pressure regulator should be installed between the main tank and the distribution piping and pressure set at 80 PSI.

Environmental:
 Operating Indoor use at altitudes up to 2000m. Temperature 5 to 40°C (41 to 105°F).
 Maximum relative humidity 80% for temperatures up to 31°C, decreasing linearly to 50% relative humidity at 40°C.
 Supply voltage fluctuation of +/- 10% of nominal voltage.

Classification:
 IEC 60601-1
 Protection against electric shock (5.1, 5.2). Class I
 Applied Parts: There are no Applied Parts.
 Protection against harmful ingress of water (5.3). Ordinary, IPX0
 Degree of safety in the presence of flammable anesthetics mixture with air or with oxygen or with nitrous oxide (5.5). Not suitable.
 Mode of operation (5.6). Continuous

SITE REQUIREMENTS

Type	Style
AS10	5-20R
AS21	NEMA*
AS22	6-20R
AS30	NEMA*
AS40	
AS50	Hard Wired**
AS70	



Use 18 Gauge, 4 Conductor, Interconnect Cable Between Compressor and Remote Switch

Electrical Box Connections

*Hospital Grade Receptacle
 **Disconnect Needed for Service

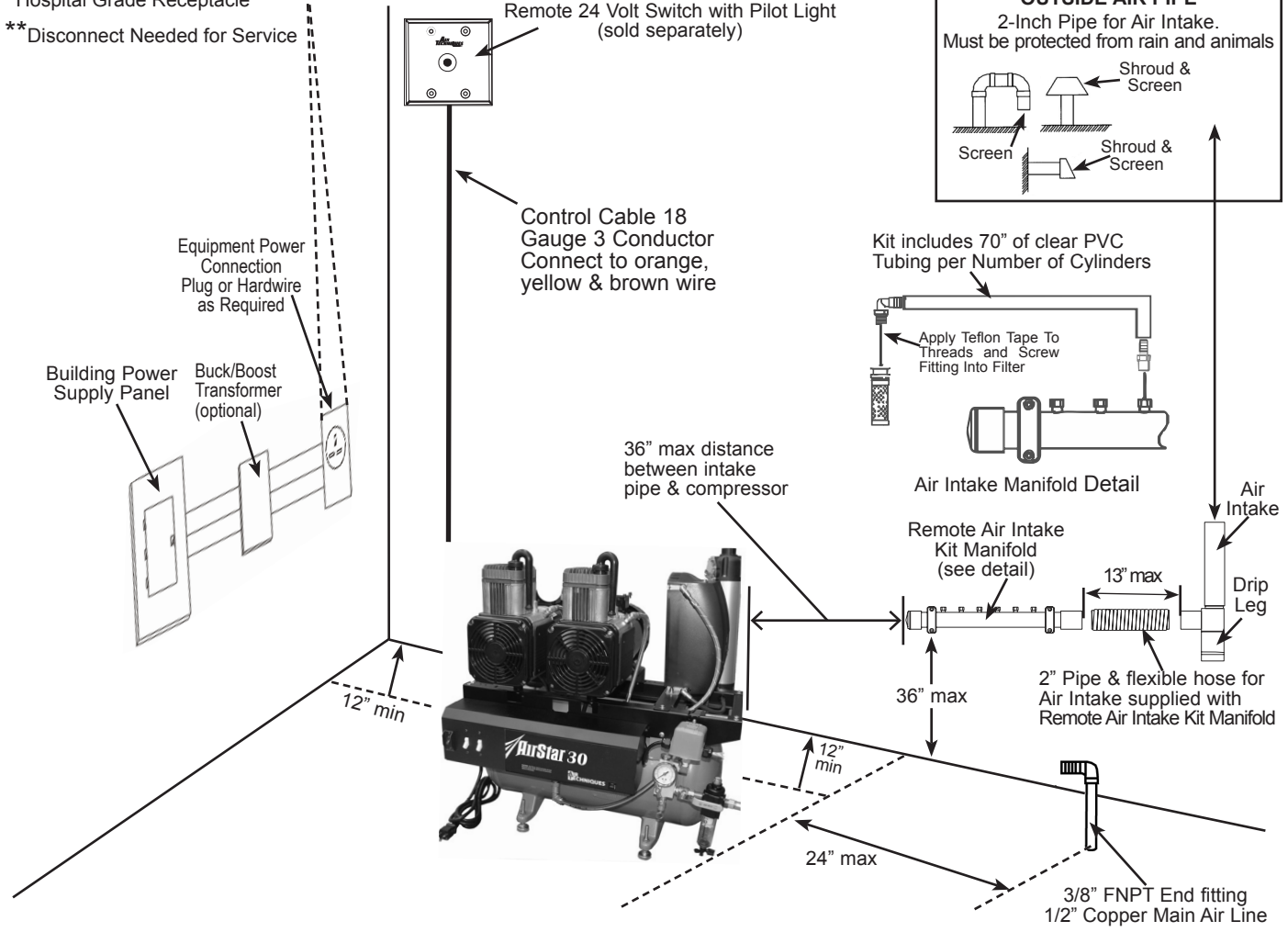
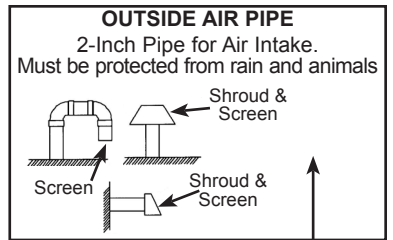


Figure 2. Overall Site Requirements

INSTALLATION INFORMATION

AIRSTARs are installed by authorized Air Techniques dealer service technicians. Please review these installation guidelines to make sure that your **AIRSTAR** will work to capacity for your office. (See Site Requirements, pages 6 and 7)

- Your **AIRSTAR** should be installed in a well ventilated area, with at least 12 inch clearance on each side for service access and to prevent overheating during high demand periods. If other equipment is located in the vicinity, the ambient temperature of the area must not exceed 105°F.
- The installation site should be clean and dry to prevent the air intake filters from clogging. If there is a concern about the quality of air where the **AIRSTAR** is placed, we recommend an optional Remote Air Intake (See Optional Accessories, page 14) which allows the compressor to intake clean air from a remote location.
- Air distribution piping for all models should be 1/2", type "L" or type "K" copper.
- The minimum voltage for an AS10 or AS21 is 105 Volts. The minimum voltage required for an AS22, AS30, AS40, AS50 or AS70 is 200 Volts. Install a boost transformer if the service is below these ratings.

Note: If voltage is higher than 125V/250V, install a bucking transformer.

■ AIR SYSTEM PLUMBING CONNECTION:

The Tank Outlet Assembly (See Figure 1, View A), (the storage tank outlet for the dry air) is connected to the operatory air system via a 3/8" F.N.P.T. shut-off valve and 6 foot length of pressure hose (supplied).

■ ELECTRICAL CONNECTION:

- If your **AIRSTAR** comes with a line cord, plug it into a hospital grade electrical outlet.
- If your **AIRSTAR** comes with open electrical connections, it must be wired directly in accordance with local electrical codes. (See Figure 3 below.)

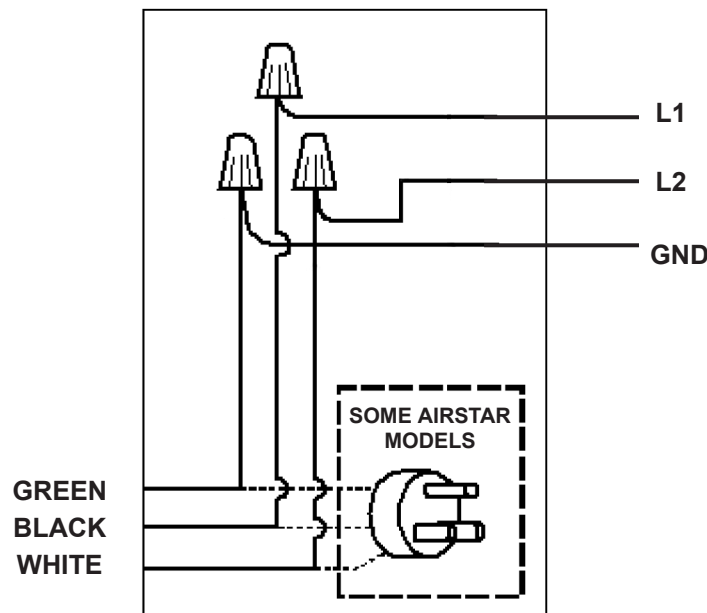


Figure 3. Electrical Connection Box

POST INSTALLATION CHECK

Make Sure Everything Is Running Properly

After your AIRSTAR has been installed and before it is put into operation, be sure to follow the check-out procedure detailed below:

- Check that Intake Filter(s) are fully seated into the compressor head(s) and that the Tank Outlet Valve is closed.
- Turn on the electricity. Check the incoming line voltage. It should be at least 105 Volts for the AS10 and AS21; and 200 Volts for the AS22, AS30, AS40, AS50 and AS70. This voltage should remain at or above these levels while the AIRSTAR is running. If not, install the appropriate boost transformer and check that the correct main circuit breaker and wire size are being used.
- Check pump-up and recovery times as detailed below and compare to the times in the table.
 - Turn on the AIRSTAR's power and determine the pump-up time from 0-115 PSI. See the table below.
 - Drain the storage tank to 80 PSI and determine the recovery time from 85 to 115 PSI. See the table below.

Model	Number of Motors/Heads	Pump-up Time 0-115 PSI Maximum	Recovery Time 85-115 PSI Maximum
AS10	1/1	2 minutes, 55 seconds	48 seconds
AS21	1/2	3 minutes, 10 seconds	47 seconds
AS22	1/2	3 minutes, 10 seconds	47 seconds
AS30	2/2	3 minutes, 10 seconds	47 seconds
AS40	2/3	1 minute, 40 seconds	34 seconds
AS50	2/4	2 minutes, 50 seconds	42 seconds
AS70	3/6	2 minutes, 40 seconds	40 seconds

If the recovery time differ as listed above, call authorized dealer for service.

TROUBLESHOOTING

Problem	Possible Cause	Possible Solutions
1. Motor does not start.	<ul style="list-style-type: none"> a. No electric power. b. Power not connected. c. Defective circuit breaker. 	<ul style="list-style-type: none"> a. Check circuit breaker at main power panel. b. Check 24 Volt remote connections. c. Circuit breaker needs to be replaced. Call your authorized Air Techniques dealer for service.
2. Motor tries to start, circuit breaker trips off. (* See bottom page 10)	<ul style="list-style-type: none"> a. Voltage too low.If each compressor head runs separately,but will not run together, the voltage is too low. b. Power supply cable too small. c. Loose electrical connection. 	<ul style="list-style-type: none"> a. AS10 and AS21 require a minimum of 105 Volts. AS22, AS30, AS50 and AS70 require a minimum of 200 Volts. If the voltage is below the required minimum, a boost transformer must be installed. Call your authorized dealer. b. See SITE REQUIREMENTS Table. c. Call your authorized dealer for service.
3. Unusual noise.	<ul style="list-style-type: none"> a. Intake filter(s) not seated correctly. b. Intake filter(s) clogged or dirty. c. Motor noise. d. Air leaks e. Check cooling fans 	<ul style="list-style-type: none"> a. Remove filter(s). Replace if clogged or dirty. When installing, make sure filter chamber is clean and rubber flange on top of filter is pushed all the way down into the metal cylinder b. Replace filter(s). (PN 89831) c. Call your authorized dealer for service. d. Call your authorized dealer for service. e. If fan is loose or broken, call your authorized dealer for service.
4 Compressor cycles but no pressure buildup to 115 psi.	<ul style="list-style-type: none"> a. Motor noise. b. Leak in compressor. c. Pressure switch needs to be adjusted. 	<ul style="list-style-type: none"> a. Replace filter(s). (PN 89831) b. Close the storage tank outlet valve. Check all fittings for leaks. If a leak is found, call your authorized dealer for service. c. Disconnect the main power supply. Drain the storage tank slowly until a “click” is heard. Storage tank pressure should read 85 PSI on the pressure gauge. Close the tank outlet valve, turn on the power switch and verify the pump-up time for your model AirStar. Call your authorized dealer if the pump-up time is incorrect. (See Post Installation Check for pump-up times.)

Problem	Possible Cause	Possible Solutions
5. Compressor cycles even when there is no air demand from the operatory.	<p>a. Leak in the compressor.</p> <p>b. Leak in the office air system.</p>	<p>a. Disconnect the main power supply. Drain the storage tank slowly until a “click” is heard. Storage tank pressure should read 85 PSI on the pressure gauge. Close the tank outlet valve, turn on the power switch and verify the pump-up time for your model AirStar. Call your authorized Air Techniques dealer if the pump-up time is incorrect. (See Post Installation Check for pump-up times.)</p> <p>b. Look at the moisture monitor (see KEY PARTS to locate). If it is blue, perform the following:</p> <ol style="list-style-type: none"> 1. With the AirStar's power switch ON, drain the storage tank to 85 PSI to start the compression cycle. 2. When the cycle shuts off at 115 PSI, close the storage tank outlet valve. 3. Wait 5 minutes and open the storage tank outlet valve. 4. If the pressure drops, the air leak is in the office air system or delivery units and not in the AirStar. Call your dealer or plumber for service. <p>If it is pink, see #6 below</p>
6. Moisture monitor is not blue (pink or white).	<p>a. Leak in the office air system.</p> <p>b. Compressor keeps cycling.</p>	<p>a. If the moisture monitor is pink, there is too much moisture in the system. Call your authorized Air Techniques dealer for service.</p> <p>b. Check the SIZING GUIDE. There may be excessive air demands placed on the AirStar. A larger capacity model may be required.</p>

***DIAGNOSTIC PROCEDURE FOR DEFECTIVE COMPRESSOR HEAD(S)**

1. Put power switches in the OFF position.
2. Reset the circuit breaker if it was previously tripped.
3. Test heads by turning ONE on at a time. If the motor fails to start, or the circuit breaker trips, the problem may be in that compressor head. Leave the power switch for the effective head in the OFF position. Call your Authorized Air Techniques dealer for service.

NOTE: One head may be run TEMPORARILY while waiting for service.

4. If all heads run independently, but will not run together, check the line voltage. If the voltage is within the min./max. voltage required in PRODUCT SPECIFICATIONS, call your Authorized Air Techniques dealer for service.

MAINTENANCE

Like all precision products, your AIRSTAR requires a certain amount of care on a regularly scheduled basis. A well-organized maintenance program aids dependable equipment operation and reduces problems to a minimum. Routine checks help to detect general overall wear, and replacement of parts can often be made before a problem occurs.

Understanding this, we have established minimum maintenance requirements listed below that include routine inspections and the replacement of filters using preventative maintenance kits available for the specific AIRSTAR model. Adherence to this recommended maintenance schedule will ensure that the equipment will continue performing at its best with uninterrupted service.

■ Routine Inspection - Monthly

Clean exterior surfaces.

Check for abnormal noises and air leaks.

Make sure that no flammable, corrosive, or combustible materials are stored in the equipment room (especially in the area around the equipment).

Check operational range of pressure switch is between 85-115 psi.

Inspect the Moisture Monitor (Figure 4) for a color change:

Blue indicates that the air in the storage tank is dry.

Pink indicates a high level of humidity is in the storage tank. See TROUBLESHOOTING page 11 to correct this situation.

Note: To comply with NFPA 99C, a 5-micron Filter is installed on the output of all AIRSTAR models.

■ Routine Inspection - Yearly

Refer to Figure 4 and check the Service Indicator on the 5-micron Outlet Filter.

Red indicates that the filter must be replaced P/N 87168.

Green indicates No service is required.

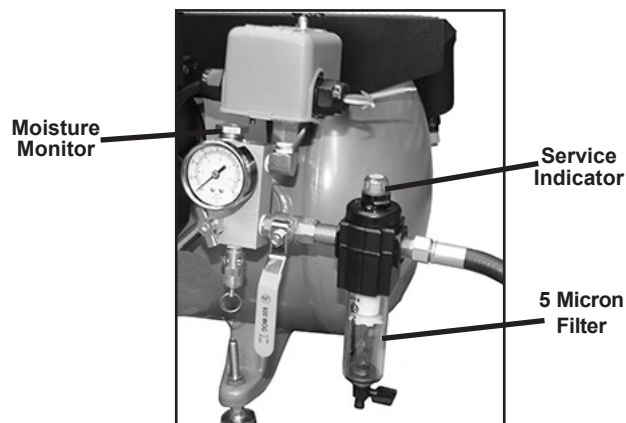


Figure 4.
Moisture Monitor and 5-Micron Filter Location

Important: In dusty environments, the Intake Filter, PN 89938, may need to be changed more often than once a year.

Always dispose of the removed filter in accordance with local codes.

■ **Filter Replacement - Yearly**

Refer to Figure 5 for the location of filters to be replaced using the preventative maintenance kit for the specific AIRSTAR mode listed below. Replace the filters and associated O-rings in accordance with the instructions provided with the kit.

Filter Replacement Kits Supplied Components

AirStar Model		AS10	AS21, AS22 & AS30	AS40	AS50	AS70	89938 - See Table for Kit Quantities
Kit Part No		87351	87352	87355	87353	87354	
Component	Part No.	Qty	Qty	Qty	Qty	Qty	
Compressor Air Intake Filter	89938	1	2	3	4	6	
Top Membrane Filter	87366	1	1	1	1	2	
Bottom Membrane Filter	87367	1	1	1	1	2	
Top Cover O-ring	87368	1	1	1	1	2	
Filter Bowl O-ring	87369	1	1	1	1	2	

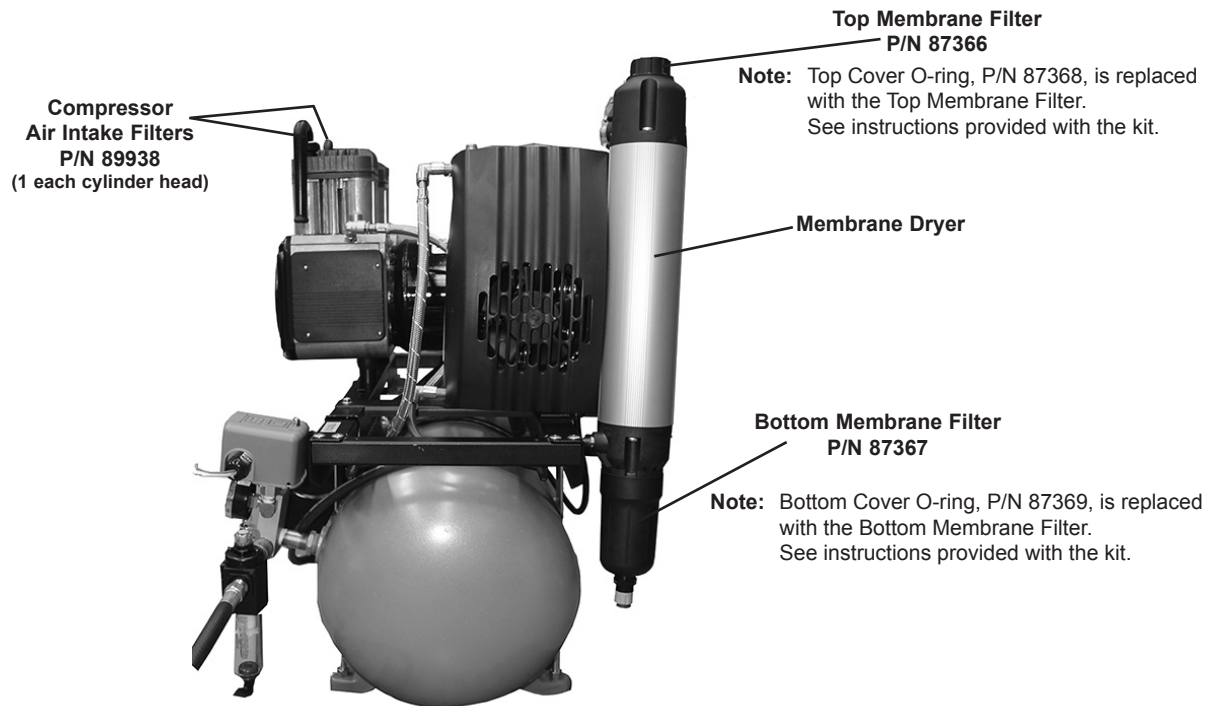


Figure 5.
AirStar Filter Location

REPLACEMENT PARTS

Description	Part No.
5 Micron Replacement Filter	87168

Filter Replacement Kits

AirStar Model	Kit Part No.
AS10	87351
AS21 AS22 AS30	87352
AS40	87355
AS50	87353
AS70	87354

OPTIONAL ACCESSORIES

Description	Model	Part Number	
REMOTE AIR INTAKE KIT	AirStar 10	85491	
	AirStar 21, 22, 30	85492	
	AirStar 40	87361	
	AirStar 50	85493	
	AirStar 70	85494	
REMOTE CONTROL PANEL w/24 V switches	For all AirStars	1-Switch Plate Kit	53111
		2-Switch Plate Kit	53251
		3-Switch Plate Kit	53250
		4-Switch Plate Kit	53133
SOUND COVER	AirStar 10	85961	
	AirStar 21	85962-1M	
	AirStar 22	85962-2M	
	AirStar 30	85963M	
	AirStar 40	87440M	
	AirStar 50	89523M	
AirStar 70	89574M		

PRODUCT SPECIFICATIONS

AirStar Model		AirStar 10	AirStar 21	AirStar 22	AirStar 30	AirStar 40	AirStar 50	AirStar 70	
Requirement									
Horsepower/Kilowatts		0.75/0.56	1.5/1.1	1.5/1.1	1.5/1.1	2.25/1.68	3.0/2.2	4.5/3.4	
Voltage Rating		115	115	208/230	208/230	208/230	208/230	208/230	
Frequency (Hz)		60	60	60	60	60	60	60	
Voltage Min./Max. (VAC)		105/125	105/125	200/250	200/250	200/250	200/250	200/250	
Maximum Number of Simultaneous Air Users		2	3	3	4	5	7	10	
CFM (Cubic Ft./Min) @ 80 psi		2.5	5.0	5.0	5.0	7.5	10.0	15.0	
Pump-up Time 0-115 PSI		2 mins, 55 secs	3 mins, 10 secs	3 mins, 10 secs	3 mins, 10 secs	1 min, 40 secs	2 min, 50 secs	2 min, 40 secs	
Recovery Time 85-115 PSI		48	47	47	47	34	42	40	
Tank Size (cu. ft.) (US Gal.)		0.8 6	1.6 12	1.6 12	1.6 12	1.6 12	2.7 20	4.0 30	
Shipping Weight (Approximate lbs)									
No Sound Cover		170	200	200	240	255	290	430	
With Sound Cover		215	240	240	285	300	335	N/A	
Dimensions (inches)	No Sound Cover	H	28.50	30.50	30.50	30.50	30.50	33.50	35.00
		W	25.00	29.00	29.00	29.00	32.50	35.50	47.75
		D	19.75	20.00	20.00	20.00	20.00	20.50	21.75
	With Sound Cover	H	30.00	32.00	32.00	32.00	32.25	33.50	36.00
		W	25.00	31.00	31.00	31.00	33.25	36.50	51.00
		D	22.50	22.25	22.25	22.25	22.50	22.75	29.50

For over 50 years, Air Techniques has been a leading innovator and manufacturer of dental products. Our priority is ensuring complete satisfaction by manufacturing reliable products and providing excellent customer and technical support. Whether the need is digital imaging, utility room equipment or merchandise, Air Techniques can provide the solution via our network of authorized professional dealers. Proudly designed, tested and manufactured in the U.S., our products are helping dental professionals take their practices to the next level.

Air Techniques' family of quality products for the dental professional include:

- ❑ **Digital Imaging**
 - Digital Radiography
 - Intraoral Camera
 - Caries Detection Aid
 - Intraoral X-ray
 - Panoramic X-ray
 - Film Processors

- ❑ **Utility Room**
 - Dry Vacuums
 - Wet Vacuums
 - Air Compressors
 - Amalgam Separator
 - Utility Accessories
 - Utility Packages

- ❑ **Merchandise**
 - Surface Disinfectant
 - Enzymatic Cleaner
 - Hand Sanitizer and Lotion
 - Waterline Cleaner
 - Evacuation System Cleaner
 - Imaging Accessories
 - Chemistry
 - Processor Accessories

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