

The logo for AIRTAK features the word "AIR" in a stylized, bold font with horizontal lines through it, followed by "TAK" in a solid, bold font. Below the logo is the text "Compressed Air System Products" in a bold, sans-serif font.

AIRTAK
Compressed Air System Products

REFRIGERATED AIR DRYERS
Operating Instructions
Models SD-10 through SD-250

SPECIFICATIONS:

Refrigerant:	R134a
Maximum Inlet Pressure:	250 psig
Maximum Inlet Temperature:	120°F
Minimum Ambient Temperature:	50°F
Maximum Ambient Temperature:	110°F

OPERATION:

Under normal conditions, the air dryer will run continuously when power is on. The dryer will provide a specified pressure dew point for the compressed air system with little maintenance or adjustments required.

Moisture and condensation will be removed from the moisture separator automatically through the automatic drain.

Units are designed for inlet air temperature of 100°F. If the inlet air temperature exceeds 100°F, there is a possibility of overloading the refrigerant compressor.

The allowable range for ambient temperature is 50°F to 110°F. At ambient temperature above 100°F, refrigeration capacity will decrease with a corresponding increase in pressure dew point. If the thermal overload switch trips out and stops the compressor, the unit will not restart until it has cooled.

INSTALLATION:

General:

A. Only qualified service people should install a compressed air dryer. Compressed air, machinery and electricity are involved in installation; all can be dangerous if not handled properly.

B. Upon unpacking your dryer, examine it for any external damage. If such damage exists, report it to the delivering carrier immediately and file a freight claim with the responsible carrier.

C. Prior to attempting installation of the dryer, read the accompanying literature thoroughly. Failure to follow the enclosed recommendations may result in invalidation of the warranty.

D. Dryers are designed for installation and operation in typical indoor industrial atmospheres. Do not install or operate dryers in hazardous locations or in explosive or flammable atmospheres.

Ambient Conditions:

- A. Indoor installation is recommended. Dryers installed outdoors must be well protected from precipitation, dust, dirt, debris and animals.
- B. The unit should be installed in a well ventilated area. Ambient temperature must be in the temperature range of 50°F to 110°F.
- C. If the dryer must be installed in area containing airborne particles or fines, or in an oily atmosphere conducive to the collection of dust and dirt particles on the surface of and in-between the fins of the refrigerant condenser, install and maintain an ambient air filter.
- D. Position the dryer to allow free circulation of cooling air through the front and sides of the dryer.

Mounting:

- A. The dryer should be placed on a rigid, level surface.
- B. If mounted on a shelf or on any surface or structure above the floor level, the dryer should be bolted down using the mounting holes provided in the cabinet base. Not all models have mounting holes.
- C. The dryer should be isolated from excessive vibration, which could be transmitted through the mounting surface or attachment piping.

Electrical:

- A. **For units 10 scfm through 100 scfm**, the unit should be connected to an appropriate grounded receptacle based upon its nominal voltage. Be sure the power cord is protected from possible damage after installation. **For units 150 scfm to 250 scfm**, you may need a qualified electrician to aid in the connection with its terminal block based upon its nominal voltage.
- B. The dryer should be connected to a fused disconnect, having a fuse size not to exceed the maximum fuse size indicated on the dryer data label.
- C. Power supplied to the dryer must conform to the electrical specifications listed on the dryer.
- D. On models 150 scfm to 250 scfm, they have a junction box with a 1/2 inch knockout. A conduit connector is provided. To connect to the terminals in the junction box, remove the aluminum access plate. The access plate is held in place with two screws. Thread the power cord through the conduit connector and, according the appropriate electrical schematics in this literature, connect to the terminals in the junction box. Replace the access plate.

Dryer installation should follow the installation arrangements shown in Figure 1. An aftercooler and moisture separator with automatic drain are recommended to reduce the moisture removal and temperature variation demands on the refrigerated dryer. Between the compressed air receiver and dryer, a general purpose coalescing filter with an automatic drain is used to remove liquid water, liquid oil and solid particles from the airstream. Pre-filtering eases the load on the dryer and prevents an emulsion of water, oil and particulates from forming. This emulsion can leave a deposit that reduces heat exchanger efficiency and clogs automatic drains.

For applications that require ultra-clean air, additional filtering may be required to remove the oil aerosols and vapors present in most systems. Oil coalescing filters remove oil in aerosol form. To remove oil vapor from the air stream use a filter fitted with an adsorbing activated carbon cartridge at the dryer outlet.

Note that the inlet and outlet ports of the air dryer are labeled. A dryer bypass valve should be installed for air dryer servicing. If the aftercooler exit air temperature averages less than 100°F, the dryer including prefilter and bypass system can be placed between the aftercooler separator and receiver.

If not already in place, connect condensate drain tube to the dryer's moisture separator drain trap. Position outlet of drain tube in such a manner that condensate will be drained away from dryer and other mechanical or electric equipment.

Make sure when piping is in place that no undue stress is placed on dryer connections. Union joints or flexible connections are recommended to relieve stress.

Dryer is to be connected to an appropriate electrical power source based upon specifications shown on unit data label. Do not connect unit to a power source other than that called out on data label. Power source should incorporate a fused disconnect using a fuse, not exceeding the maximum fuse size stated on the dryer data label.

Piping:

- A. Piping installation should follow general air line piping procedures.
- B. A bypass valve system is recommended in the dryer's pipe connections. This permits servicing of the dryer without the interruption of the airflow.
- C. If the pipes connecting the dryer vibrate, such as from compressor vibration, use vibration absorbers so that the dryer is not damaged over time by the vibration.
- D. The inlet and outlet ports on the dryer are labeled.
- E. Direct the drain tube under the dryer to a suitable sump. Do not restrict the drain.

Filtration:

- A. A compressed air filter with automatic drain should be installed upstream of the dryer. Filtration of dirt, rust and liquids from the supply air will greatly enhance the

performance and life of the dryer. Your distributor can provide additional information on compressed air filters.

AIR & REFRIGERANT CIRCUITS:

Air Circuit

Warm wet compressed air enters the refrigerant dryer at the inlet port. (On models 30 scfm through 250 scfm) It first passes through an air-to-air heat exchanger where its temperature is lowered by the cool air exiting the dryer. It then enters the evaporator or refrigerant-to-air heat exchanger where its temperature is lowered. The condensate (water) generated by the cooling action is collected in the moisture separator and automatically removed. The dry air then leaves the separator, and enters the air to air heat exchanger (30 scfm through 250 scfm models only) where it is heated and the air exits through outlet port.

Refrigerant Circuit

The refrigerant compressor compresses refrigerant vapor to a high pressure and temperature. The compressed vapor then flows through the condenser where it is cooled and forms a liquid. After this, it is filtered through the refrigerant filter-dryer where any traces of moisture and contaminants are removed. The expansion valve lowers the pressure which in turn lowers the temperature of the liquid refrigerant to its preset level. It remains at this pressure and vaporizes as it flows through the evaporator/refrigerant-to-air heat exchanger absorbing heat from the air being dried. The refrigerant then flows back to the compressor and the cycle repeats.

The dryer uses R134a refrigerant. For units with a refrigerant suction pressure gauge, the refrigerant suction pressure is listed in chart below for the appropriate model. If a lower pressure dew point is required, back off the adjustment screw on the expansion valve until gauge pressure reaches the desired level.

Model Number	Gauge Pressure Reading
SD10 through SD20	33 to 38 psig
SD30 through SD40	29 to 33 psig
SD50 through SD100	30 to 34 psig
SD150 through SD250	31 to 35 psig

TROUBLESHOOTING GUIDE

PROBLEM	POSSIBLE CAUSE	REPAIR
Water in system.	1. Inlet and outlet connections are reversed.	Check inlet and outlet connections. This dryer is designed for air flow in one direction only. Inlet and outlets are identified.
	2. Drain trap is clogged or inoperative.	Restore a free flow of water. Trap is a float type. The bowl will normally contain some water and valves should be free and clean. Trap should be periodically checked and cleaned. After initial installation, the trap should be checked weekly for dirt, pipe scale, etc. for the 60 days.
	3. Bypass system is open	Check the valves. Bypass piping should be installed around the dryer so the dryer may be isolated for service without shutting down the air supply. During dryer operation valves must be set so all air goes through the dryer.
	4. Free moisture remains in pipe lines	Blow out the system. Before dryer is first started all free moisture should be blown out of the system.
	5. Excessive air flow	Check actual (scfm) flow through the dryer. This dryer is designed for a specified air flow. If air flow into the dryer exceeds specifications, water removal capacity may not be sufficient, resulting in liquid carry-over downstream. Check the flow of air system.
	6. Excessive free moisture	Check the separator and drip legs ahead of the dryer. If this dryer is installed at an individual work station or in one portion only of the piping system, instead of near the compressor, there may be an accumulation of free moisture in the pipeline ahead of the dryer. If the moisture is pumped into the dryer intermittently, water removal capacity may not be sufficient. A separator or air line filter with an automatic trap should be installed ahead of the dryer.
	7. High temperature inlet air	Rated operating temperature is 100°F. The dryer is designed for inlet air temperature of 100°F. Temperatures above 100°F may cause water downstream and an overloading of the condensing unit. Increase dryer size or install an aftercooler.
	8. Clogged condenser fins	Clear fins of all obstructions. Clogged fins in the condenser coil will restrict air passage and reduce refrigeration capacity, causing water downstream. Fins should be periodically checked and

		cleaned. Install ambient air filter.
TROUBLESHOOTING GUIDE continued		
	9. Shortage of refrigerant	Fix the leak and add a charge of refrigerant. Loss of refrigerant will cause improper functioning. A qualified refrigerant specialist should perform the necessary repairs, or factory should be contacted if the unit is under warranty.
	10. Refrigeration system is not functioning.	Check to be certain refrigerant compressor is running. It is possible for the fan to be operating but not the compressor. Compressor not running can be caused by several factors. A qualified refrigeration contractor should check refrigerant and electrical controls.
	11. Excessive pressure dew point.	Readjust expansion valve. The expansion valve operates like a pressure regulator. Loosen lock nut. Turning the adjustment screw on the expansion valve counterclockwise decreases refrigerant pressure and lowers refrigerant temperature. Adjust valve in ¼ turn increments to allow 15 minutes for pressure stabilization with air flowing. Caution: too low a setting can cause moisture in heat exchanger to freeze.
High Pressure Drop	1. Excessive air flow	Check the air flow. This dryer is designed for a specified air flow as indicated. If air flow into the dryer exceeds specifications, the water removal capacity may be insufficient resulting in a liquid carry-over downstream. Check the flow of the air system.
	2. Freeze up	Readjust refrigeration controls. Frosting of the lines is an indication the controls are set too low. MODELS 10 SCFM THROUGH 40 SCFM -Controls may be adjusted in the field by means of the expansion valve adjustment screw. MODELS 50 SCFM THROUGH 250 SCFM Controls may be adjusted in the field by means of the hot gas bypass valve. Loosen lock nut. Turn screw clockwise to increase refrigerant pressure setting which will increase refrigerant temperature. Turn screw in ¼ turn increments until frost disappears. Allow 15 minutes between adjustments for pressure stabilization with air flowing.
The unit will not run or cycles off and on.	1. Line disconnect switch is open. Power on light will be off.	Close the start or disconnect switch. If the dryer is not operating check the disconnect switch or circuit breaker to be certain it is on.
	2. Fuse or breaker is open. Power on light will be off.	Replace fuse or reset the breaker. The fuse to the power line should be

		checked. Make sure the correct size fuse is used. See data tag label for correct fuse size.
TROUBLESHOOTING GUIDE continued		
	3. Faulty refrigerant compressor or controls. Power on light will be on.	Determine the cause and make corrections. Failure of compressor to run may be due to several factors. A qualified refrigeration specialist should check all electrical and refrigerant controls, or factory should be contacted if unit is in warranty.
	4. High Temperature inlet air. Power on light will be on	The dryer is designed for inlet air of 100°F. Temperatures above 100°F, may cause poor performance and an overloading of the condensing units.
	5. High ambient temperature. Power on light will be on.	Check the ventilation. Ambient temperature should not exceed 110°F. Air circulation around the dryer should be adequate, and proper ventilation in the equipment room should guarantee a correct ambient temperature.
	6. Clogged condenser fins. Power on light will be on.	Clear fins of all obstructions. The clogged fins in the condenser coil will restrict air passage and reduce refrigeration capacity, causing unit to shut down due to overheating. Fins should be periodically checked and cleaned. Install ambient air filter.
	7. Shortage of refrigerant.	Fix the leak and add a charge of refrigerant. Loss of refrigerant will cause improper functioning. A qualified refrigerant specialist should perform the necessary repairs, or factory should be contacted if the unit is in warranty/
“Hi-Temp” Indicator light is on	1. Excessive air flow, high temperature inlet air, clogged condenser fins or high ambient temperature	See solution in this troubleshooting guide for the appropriate possible cause. “Hi-Temp” Indicator Light is activated when a sensor (thermal/current overload) experiences excessive current draw to the compressor or the temperature of the compressor shell to which it is attached becomes excessive. Energization of the light indicates power to the compressor has been disrupted for one of the above reasons. This may be caused by excessive ambient or inlet air temperature but it is not directly indicative of either condition.

AIR/TAK WARRANTY POLICY

Air/Tak products will be warranted to be free from defects in materials and workmanship for a period of one year from date of shipment or up to one year from the verified date of installation not to exceed 15 months. Date of installation will be verified upon receipt of the completed Warranty Registration Card. All Air/Tak refrigerated dryers will additionally be warranted on parts only (excluding fan motors and drain valves) for a period of two years from the date of shipment. Also, deliquescent and regenerative air dryer pressure vessels and refrigerated air dryer heat exchangers have a 5-year prorated warranty.

All damaged pressure vessels and heat exchangers returned to AIR/TAK for warranty consideration must be returned freight prepaid. Warranty will be determined after factory inspection. Failure to return a damaged heat exchanger or pressure vessel will result in warranty denial.

Repairs, adjustments, parts, etc. are limited to actual labor cost provided that such defects are promptly reported and approved following AIR/TAK's warranty procedures. In no event shall the cost of repairs exceed the actual cost of materials and labor.

AIR/TAK or its representatives reserve the right to decide which warranty items are authorized. AIR/TAK shall not be liable for incidental or consequential damages which may result from a breach of the warranty described above.

For more information on warranty policies and procedures, contact your authorized AIR/TAK Distributor.

AIR/TAK's line of quality compressed air system products includes:

***COMPRESSED AIR SYSTEM FILTERS * AIR-COOLED AFTERCOOLERS
REFRIGERATED AIR DRYERS * CAD COMBINATION AFTERCOOLER DRYER SYSTEMS
RAD-PAK REFRIGERATED AIR DRYER/FILTER PACKAGES * HEATLESS REGENERATIVE AIR DRYERS
HLD-PAK HEATLESS REGENERATIVE AIR DRYER/FILTER PACKAGES
BLOWER PURGE REGENERATIVE AIR DRYERS * EXTERNALLY HEATED REGENERATIVE AIR DRYERS
AIR CHILLERS * FLUID CHILLERS***

***For an authorized distributor near you, contact Air/Tak at: Air/Tak Inc.
107 West Main St., Worthington, PA 16262
Phone: 724.297.3416 Fax: 724.297-5189***