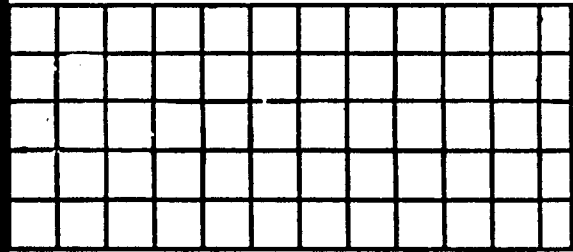




**Compressed Air System Products**  
**Installation & Maintenance Instructions**  
**Refrigerated Air Dryers**  
**Models SD-150 thru SD-250**



**Specifications**

Refrigerant: R134a  
 Maximum Inlet Air Pressure: 250 psig (17.3 bar)  
 Maximum Inlet Air Temperature: 130°F (54°C)  
 Minimum Ambient Temperature: 50°F (10°C)  
 Maximum Ambient Temperature: 110°F (43°C)  
 Net Weight:

150 scfm: 210 lb (95 kg)  
 200 scfm: 221 lb (100 kg)  
 250 scfm 250 lb.

**Flow Specifications:**

Nominal Flow Capacity (scfm)	Flow Ratings* scfm (dm <sup>3</sup> /s)	
	Outlet Pressure Dewpoint = 35° to 39°F (2° to 4° C)	Outlet Pressure Dewpoint = 50°F (10°C)
150 scfm	150 (70.8)	188 (88.7)
200 scfm	200 (94.4)	250 (118)**
250 scfm	250	300

\*Performance data obtained and presented in accordance with ANS/B93.45M-1982, Pneumatic fluid power - Compressed air dryers-Methods for rating and testing.

Condition	60 Hz
Inlet Air Pressure	100 psig (6.9 bar)
Inlet Air Temperature	100°F (38°C)
Ambient Air Temperature	100°F (38°C)
Pressure Drop	5 psid (0.3 bar) max.

For 50 Hz operation apply the following conditions to achieve the above stated Air Flow Ratings.

Condition	50 Hz
Inlet Air Pressure	100 psig (6.9 bar)
Inlet Air Temp.	90°F (32°C)
Ambient Air Temp.	85°F (29°C)
Pressure Drop	5 psid (0.3 bar) max.

\*\*At 7.3 psid

**Operation**

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

Moisture and condensation will be removed from the moisture separator automatically through the automatic drain. Units are sized 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 temperatures above 110°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 down.

**Installation**

**General**

- 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.
- 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.
- 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.
- 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**

- Indoor installation is recommended. Dryers installed outdoors must be well protected from precipitation, dust, dirt, debris, and animals.
- The unit should be installed in a well ventilated area. Ambient temperatures must be in the temperature range specified under Specifications and on the dryer data label.
- If the dryer must be installed in an 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 filter on the dryer.
- Position the dryer to allow free circulation of cooling air through the front of the dryer and at least two sides or one side and the back of the dryer.

**Mounting**

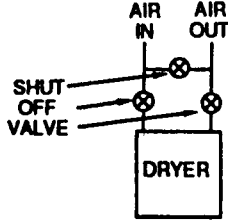
- The dryer should be placed on a rigid, level surface.
- If mounted on a shelf or on any surface or structure above the floor level, the dryer should be bolted down using the mounting holes provided in the base.
- The dryer should be isolated from excessive vibration, which could be transmitted through the mounting surface or attachment piping.

**Electrical**

- Electrical connections must be done only by a qualified electrician.
- 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 and under Electrical Specifications.
- Power supplied to the dryer must conform to the electrical specifications listed on the dryer data label.
- Each dryer has 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 to the appropriate electrical schematics in this literature, connect to the terminals in the junction box. Replace the access plate.

## Piping

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



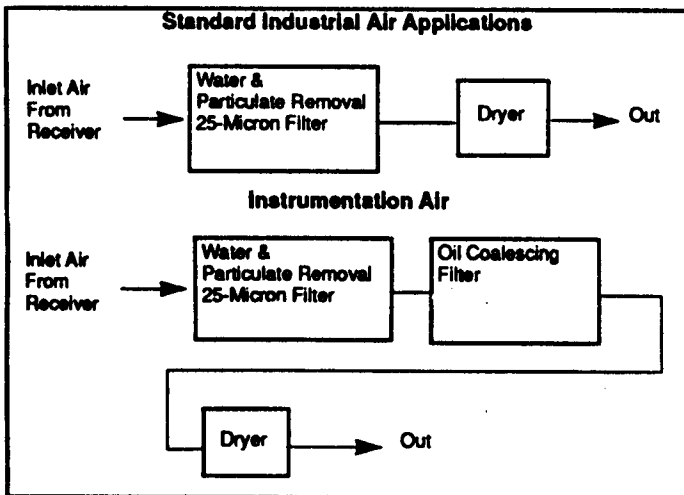
## Inlet Conditions

The temperature and pressure of the compressed air entering the dryer should be checked prior to installation and subsequent operation. The values must not exceed the maximum values indicated under Specifications and on the dryer data label. If excessive pressure or temperature conditions exist, they must be corrected prior to the installation and operation of the dryer.

## Filtration

- A. A compressed air filter with automatic drain should be installed upstream of the dryer. Figure 1 illustrates recommended filtration. Filtration of dirt, rust, and liquids from the supply air will greatly enhance the performance and life of the dryer.
- B. Figure 1 shows recommended Air/Tak compressed air filters for standard and enhanced levels of air purity. Your Air/Tak distributor can provide additional information on compressed air filters.

Figure 1



## Air & Refrigerant Circuits

### Air Circuit

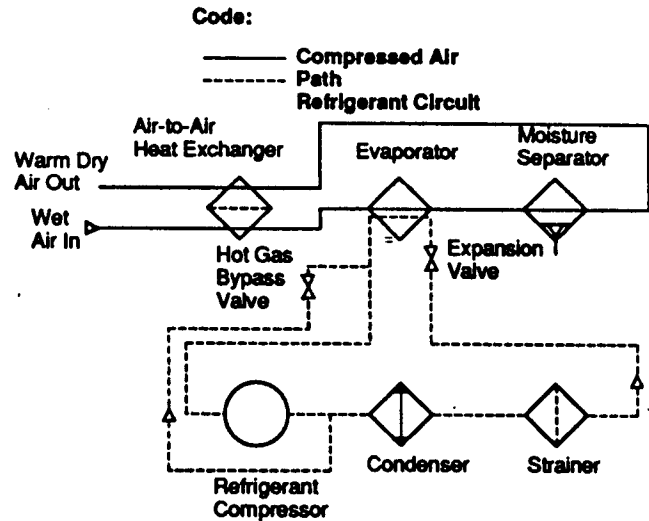
Warm wet compressed air enters the refrigerant dryer at the inlet port. It first passes through an air-to-air heat exchanger where its temperature is lowered by the cool air exiting the dryer. It then enters the evaporator or refrigerant-to-air heat exchanger where it is chilled further. The condensate (water) generated by the cooling action is collected in the moisture separator and automatically removed. The dry air then leaves the separator, enters the air-to-air heat exchanger where it is heated and then exits through the 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 strainer-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 approximately 35°F. 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. A hot-gas bypass valve allows efficient operation over a wide range of air flow rates and ambient temperatures.

The refrigerant used is R134a. For units with a refrigerant suction pressure gauge, the refrigerant suction pressure gauge setting should read between 31 and 35 psig.

### Air Dryer Circuit



## Accessories Ordered Separately

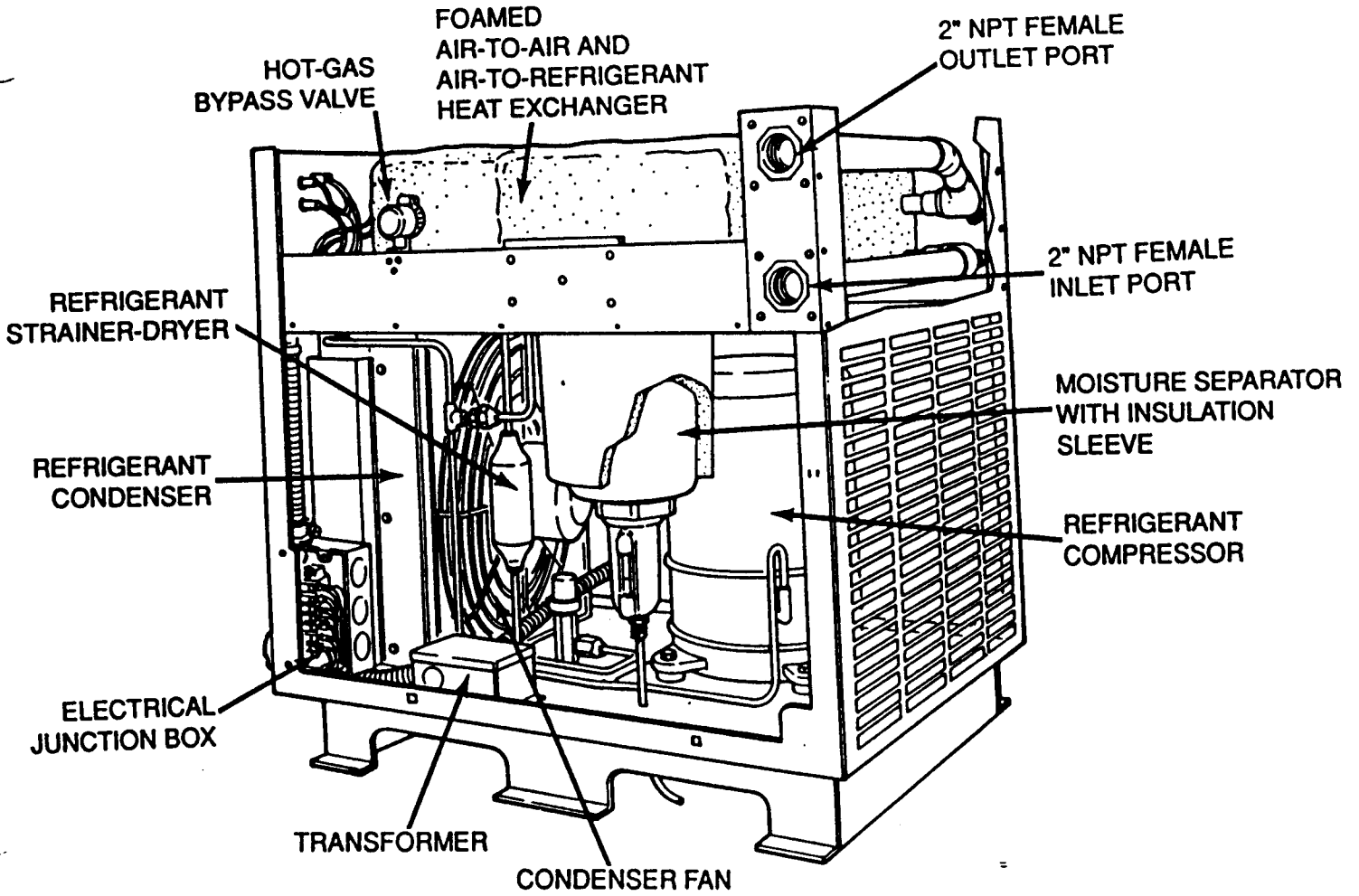
Side Panels Kit .....	71359-10
Ambient Filter Kit .....	71370-11
Panel Mounted Refrigerant Suction Pressure Gauge Kit .....	72010-23
Inlet or outlet Temperature Gauge Kit .....	71383-01
Inlet or Outlet Pressure Gauge Kit .....	71382-01

Refrigerant Discharge Pressure Gauge Kit .....72010-13

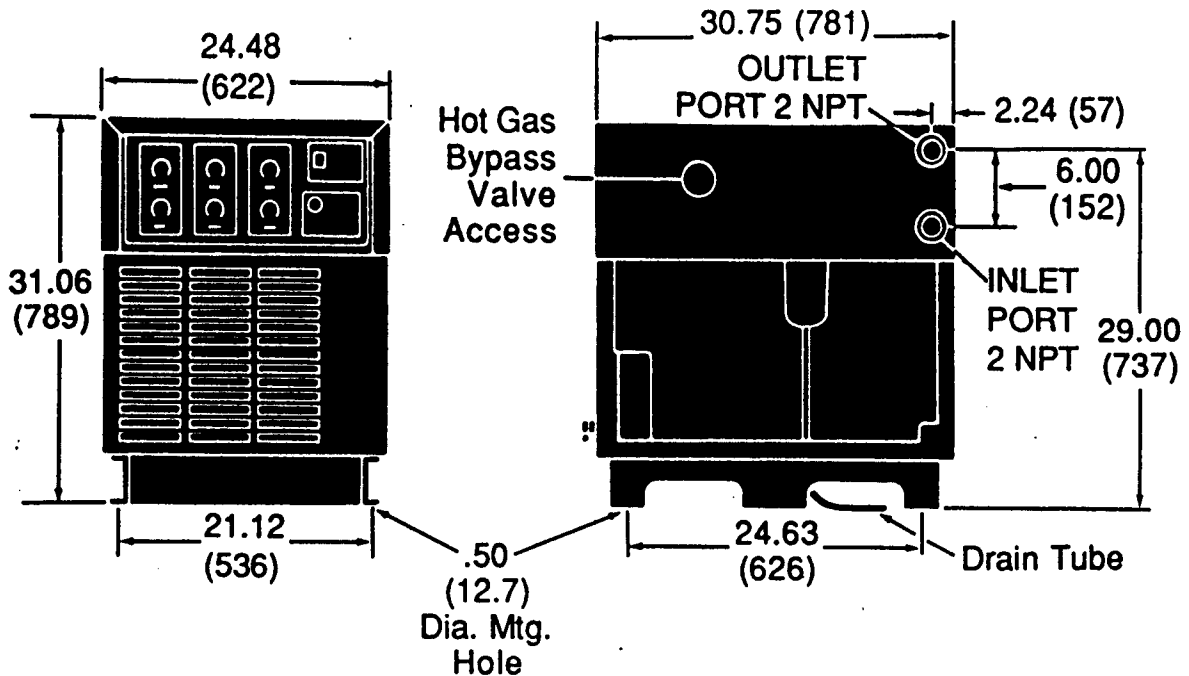
## Repair Kits

Automatic Drain Replacement

150 & 200 scfm units .....	71441-03
Ambient Filter Replacements (package of 6) .....	71370-14



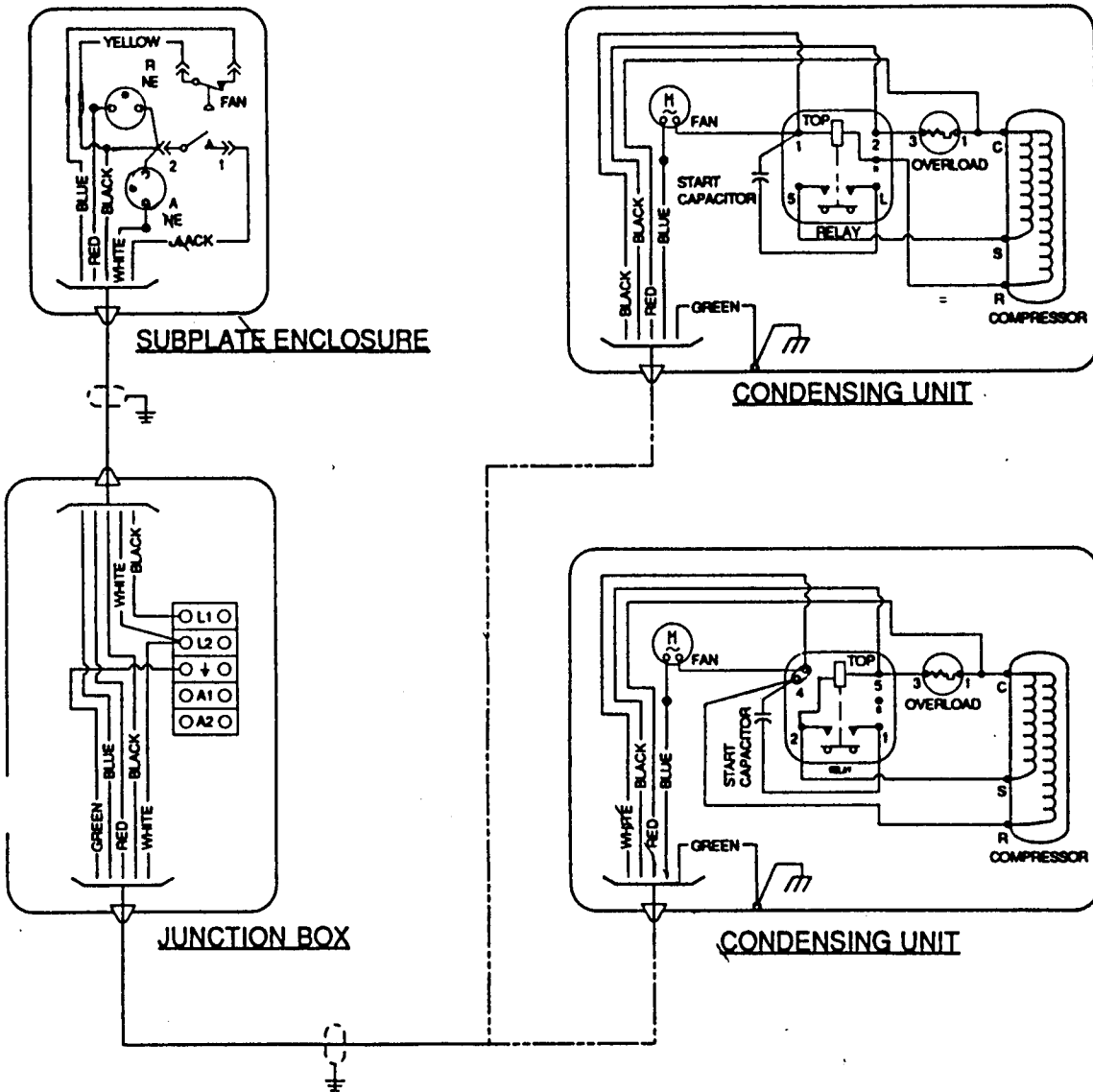
Dimensions – All Dimensions in Inches (mm) Models SD-150 thru SD-200



# Electrical Specifications – Refrigerant Compressor

Dryer Capacity	Compressor H.P.	Nominal Voltage	Permissible Voltage Range	Maximum Fuse Size	Rated Load Amperage	Locked Rotor Amperage 60 Hz	Watts At Rated Load
150 scfm	3/4	115-60-1/100-50-1	126.5-103.5/110-90	30	13.7	69.0	1260
150 scfm	3/4	230/208-60-1/200-50-1	253-187/220-180	15	7.0	41.8	1260
150 scfm	3/4	240/220-50-1	264-198	15	6.2	32.0	1050
200 scfm	1	230/208-60-1/200-50-1	253-187/220-180	15	7.0	41.0	1565
200 scfm	1	240/220-50-1	264-198	15	6.5	36.0	1304
200	1	230/460-60-3					
250	1 1/4	230/208-60-1					
250	1 1/4	230/460-60-3					

## 150 scfm Electrical Schematic



## Trouble Shooting Guide

Problem	Possible Cause	Repair	Comments
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 outlet connections are identified on the dryer.
	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. Important: (1) the trap should be periodically checked and cleaned, (2) during initial 60 days following installation, the trap should be checked weekly for dirt, pipe scale, etc.
	*3. Bypass system is open.	Check the valves	Important: 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 the 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 rated for inlet air temperature of 100°F. Temperatures above 100°F may cause water down stream and an overloading of the condensing unit. Increase dryer size or install an aftercooler upstream.
	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 down stream. Fins should be periodically checked and cleaned. Install ambient air filter.
	9. Shortage of refrigerant.	Fix the leak and add a charge of refrigerant.	Loss of refrigerant will cause improper functioning. A qualified refrigeration specialist should perform the necessary repairs, or factory should be contacted if the unit is in 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 may be caused by several factors. A qualified refrigeration contractor should check refrigerant and electrical controls.
	11. Excessive pressure dew point.	Readjust hot gas bypass valve.	The hot gas bypass valve operates like a pressure regulator. Turning the adjustment screw on the hot gas bypass valve counterclockwise decreases refrigerant pressure and lowers pressure dew point. Adjust valve in 1/4 turn increments and allow 15 minutes between adjustments with air flowing for pressure stabilization. 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 in the Specifications. If air flow into the dryer exceeds specifications, the pressure drop will increase and 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 hot gas bypass valve.	Freeze-up is an indication the temperature is set too low. Controls may be adjusted in the field by means of the hot gas bypass valve adjustment screw. Turn screw clockwise to increase refrigerant pressure setting which will increase pressure dew point. Turn screw in 1/4 increments until problem is rectified. Allow 15 minutes with air flowing for pressure stabilization.
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 breaker.	The fuse to the power line should be checked. Maximum fuse or breaker size is 15 amps for most 50 & 75 scfm units, 75 scfm dryers with nominal voltages of 115-60-1/100-50-1 can use 20 amp fuses or breakers.
	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.

\*These items are typical problem areas on initial start up of refrigerated compressed air dryers.

Problem	Possible Cause	Repair	Comments
The unit will not run or cycles off and on (cont'd)	4. High temperature inlet air. Power-on light will be on.	Rated operating temperature is 100°F.	The dryer is rated 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 refrigeration 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 solutions 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.

## Warning

These products are intended for use in industrial compressed air systems only. Do not use these products where pressures and temperatures can exceed those listed under Specifications.

Before using these products with fluids other than those specified, for nonindustrial applications, life-support systems, or other applications not within published specifications, consult Air/Tak.

Through misuse, age, or malfunction, components used in fluid power systems can fail in various modes. The system designer is warned to consider the failure modes of all component parts used in a fluid power system and to provide adequate safeguards to prevent personal injury or damage to equipment in the event of such failure modes.

System designers must provide a warning to end users in the system instructional manual if protection against a failure mode cannot be adequately provided.

System designers and end users are cautioned to review specific warnings found in instruction sheets packed and shipped with these products.

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107 W. Main Street, Worthington, PA 16262  
Phone: 724-297-3416 Fax: 724-297-5189  
URL: <http://www.airtak.com> e-mail: [airtak@airtak.com](mailto:airtak@airtak.com)

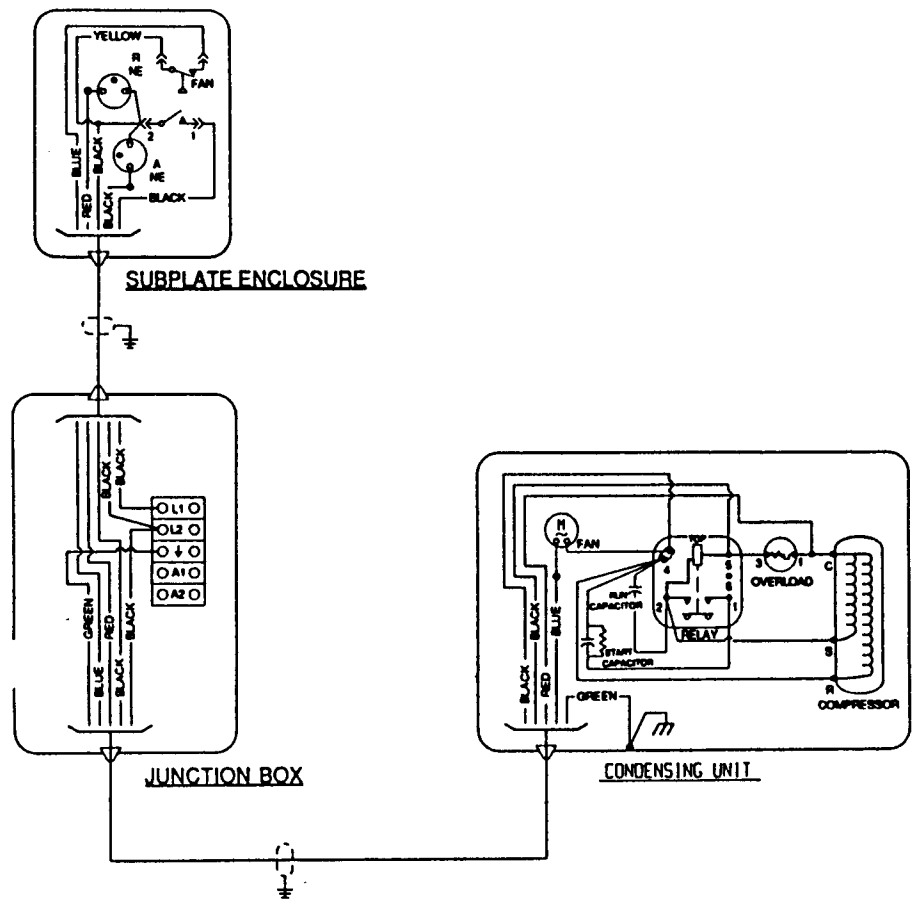
**CHECKLIST FOR SD OR SRD REFRIGERATED AIR DRYERS**

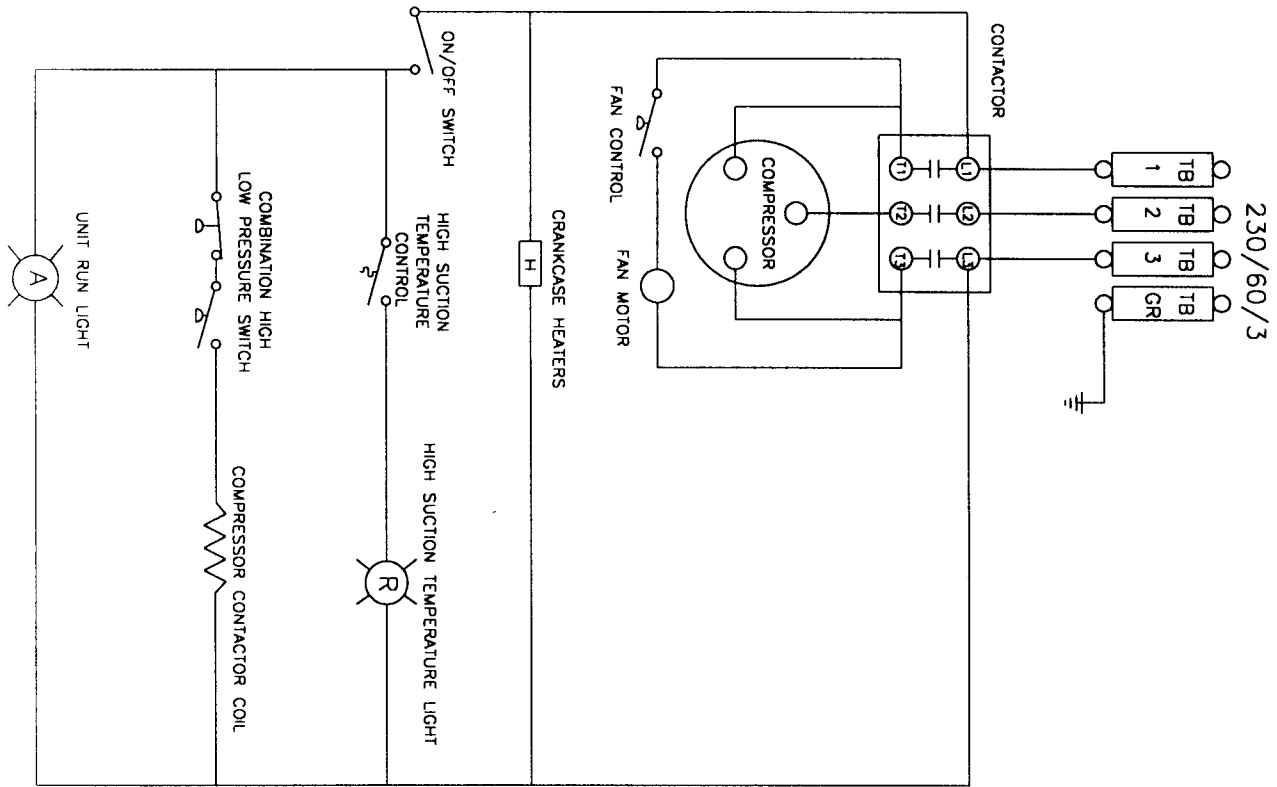
- |   | OK                       | NOT<br>OK                |
|---|--------------------------|--------------------------|
| 1. Check dryer for damaged cabinetry.   | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Check the refrigerant analyzer gauge reading. It must be reading a positive pressure. It should be no lower than 00# on a 60°F day for R-22 refrigerant and 57# on a 60°F day for R-134a refrigerant. Please note that this gauge is a compound gauge. Be sure to read the PSIG scale. | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Are the temperature gauge(s) registering a temperature   | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Are the air pressure gauge(s) reading zero?  | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Does your plant voltage match the required voltage on the dryer data tag?  | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Have you read the Operations Instruction Manual provided?  | <input type="checkbox"/> | <input type="checkbox"/> |

**DO NOT** place the air dryer in service unless you are able to check OK for each of the above items.

Notify the freight carrier and Airtak immediately of any problems.

# 200 scfm Electrical Schematic



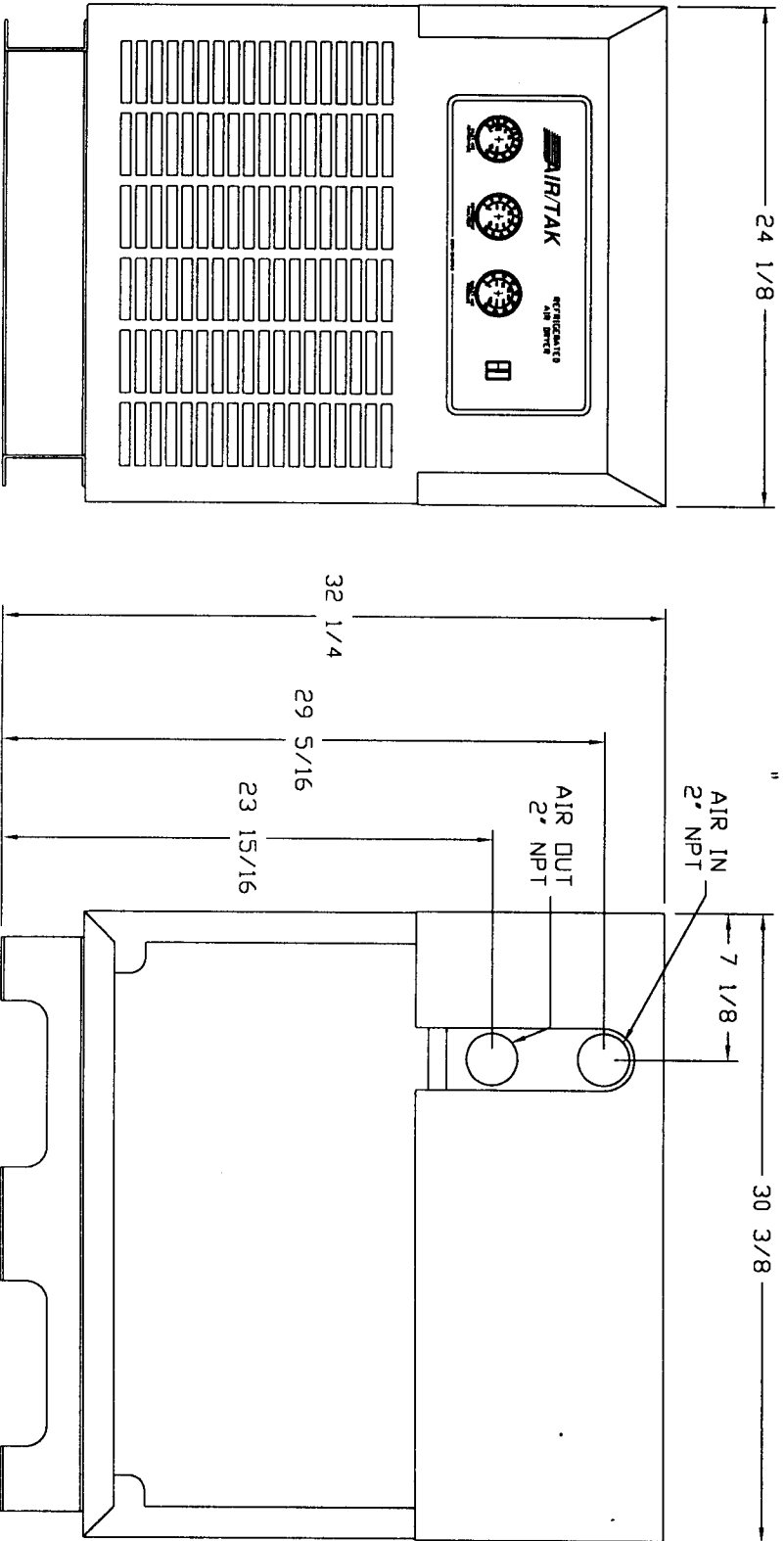


MODEL	MINIMUM CIRCUIT AMPACITY	TIME DELAY FUSE SIZE	COMPRESSOR MOTOR			CONDENSOR FAN MOTORS		
			H.P.	R.L.A.	L.R.A.	H.P.	NO.	F.L.A.
SD-200-A	10.5	15	1	7.5	51.0	50 WATTS	1	.85
SD-250-A	14.3	20	1.25	9.1	55.0	1/6	1	1.1

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 SD-200 R-134G  
 230/60/3  
 JAS 1/4/01 C 010401

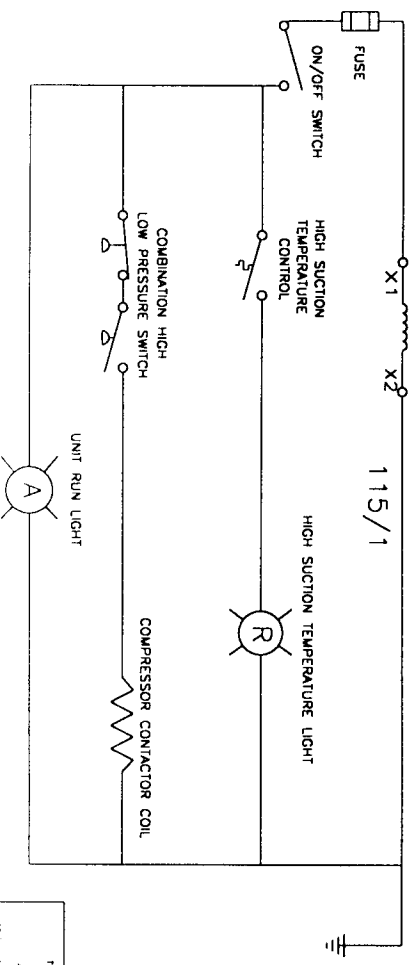
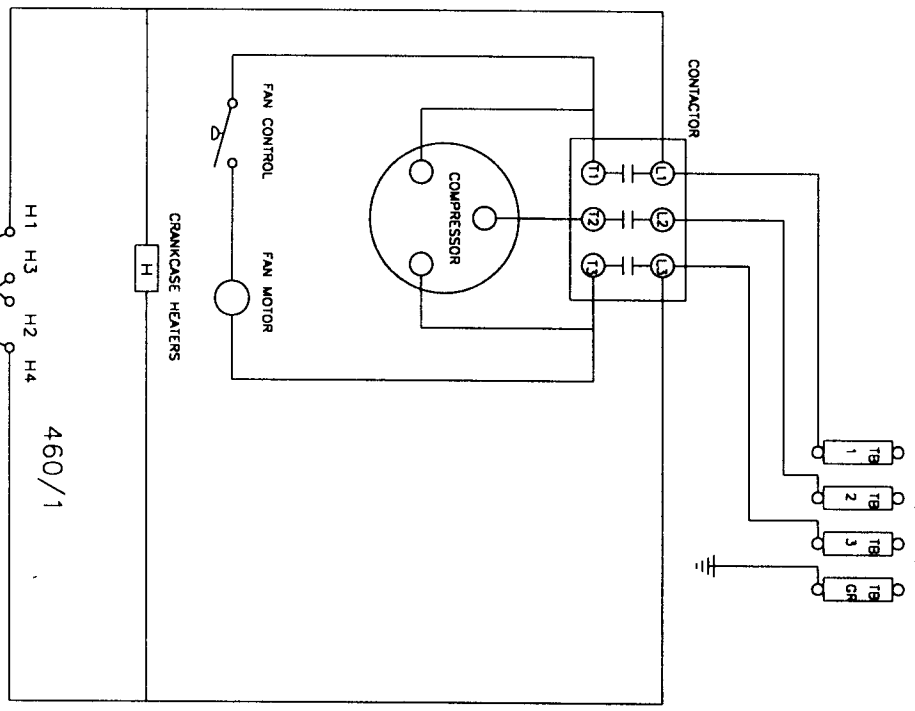
DATE: 3/1/01  
 BY: JAS



DIMENSIONS ARE IN INCHES  
 DIMENSIONS ARE APPROXIMATE  
 DRAWING NOT TO SCALE

IRTAK INC. 1242 DIMENSIONAL DRAWING FOR SD-250 DRYER		DATE: 1/6/01 D: 010601
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460/60/3



MODEL	MINIMUM CIRCUIT AMPACITY	TIME DELAY FUSE SIZE	COMPRESSOR MOTOR			CONDENSOR FAN MOTORS		
			H.P.	R.L.A.	L.R.A.	H.P.	NO.	F.L.A.
SD-200-A	5.2	15	1	2.6	25.0	50 WATT	1	.65
SD-250-A	7.5	15	1.25	4.7	28.0	1/6	1	.55

WSD250 460-3

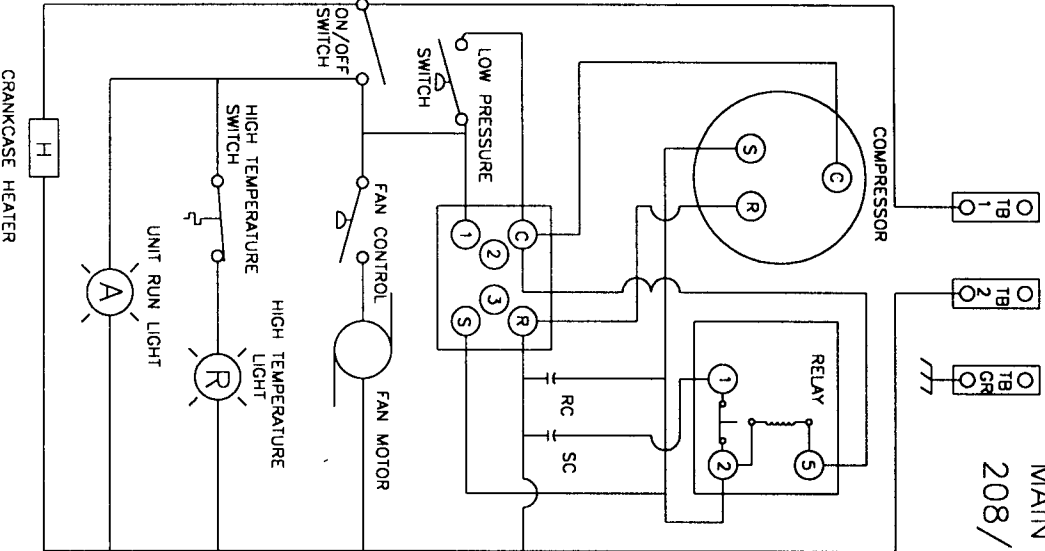
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 DRAWING NO: SD-250  
 SHEETS: 1 OF 1

DESIGNED BY: **JAS**  
 DATE: 1/9/01  
 DRAWING NO: C 010901

**IR TAK INC.** NORTHINGTON, PA. 15262  
 THE WIRING DIAGRAM FOR  
 SD-250-A R-134c  
 460/60/3

MAIN POWER  
208/230-60-1



RC = RUN CAPACITOR  
SC = START CAPACITOR

MODEL	MINIMUM CIRCUIT AMPACITY	TIME DELAY FUSE SIZE	COMPRESSOR MOTOR			CONDENSOR FAN MOTOR		
			H.P.	RLA	LRA	H.P.	NO.	FLA
SD-250-A	18.4	25	1.25	12.4	61.0	1/6	1	1.1

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**AIR/TAK INC.** WORTHINGTON, PA 16262

TITLE  
WIRING DIAGRAM

SD-250-A 208/230-60-1

WSD250 230-1

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