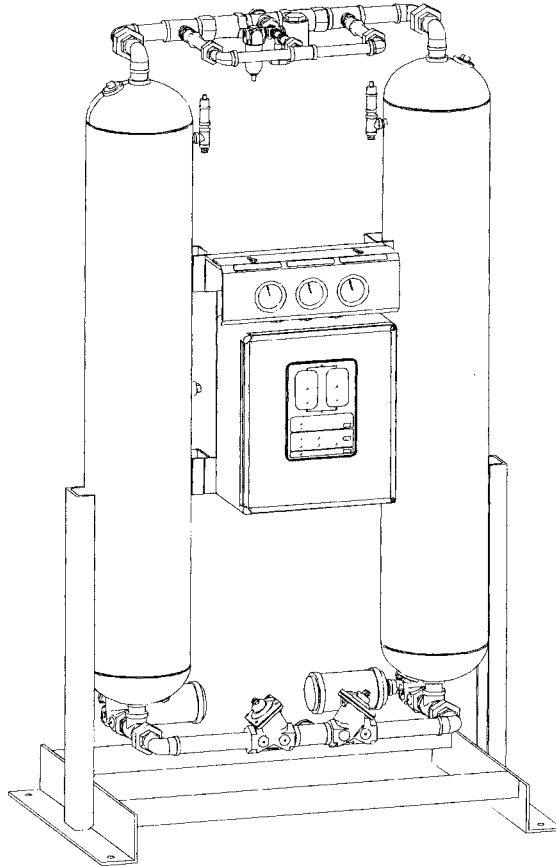


**Heatless Desiccant Air Dryer**

**HEATLESS DESICCANT AIR DRYER**



**MODELS RH203-RH224**



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**READ CAREFULLY BEFORE ATTEMPTING TO INSTALL, OPERATE OR MAINTAIN YOUR DRYER. PROTECT YOURSELF AND OTHERS BY OBSERVING ALL SAFETY INFORMATION. FAILURE TO DO SO COULD RESULT IN PERSONAL INJURY AND/OR PROPERTY DAMAGE. KEEP OWNER'S MANUAL FOR FUTURE REFERENCE.**

### UNPACKING

**ARROW REGENERATIVE AIR DRYERS ARE SHIPPED AS COMPLETELY ASSEMBLED PACKAGES FILLED WITH DESICCANT READY TO INSTALL.**

**VISUALLY CHECK THE DRYER FOR DAMAGE THAT MAY HAVE OCCURRED IN TRANSIT. IF THERE IS EVIDENCE OF DAMAGE, IMMEDIATELY ENTER A CLAIM WITH THE CARRIER, AND NOTIFY YOUR ARROW REPRESENTATIVE.**

### APPLICATION CHECK AND ANALYSIS

**TO ACHIEVE THE BEST DRYER PERFORMANCE, YOU SHOULD CAREFULLY CHECK THAT THE DESIGN AND INSTALLATION REQUIREMENTS OUTLINED BELOW ARE SATISFIED.**

- ① Standard operating pressure of your Arrow Dryer can range from 75 minimum to 150 maximum PSIG. Check dryer label to verify maximum service pressure. Air available for your air usage will vary with operating pressure.
- ② The dryer should not be installed where compressed air and/or ambient temperature exceeds 120°F or drops below 32°F. Locate dryer to avoid extremes of heat and cold from other conditions. Best results occur when dryer is located as close to point of use as practical. Where applicable, dryer towers should be insulated to reduce heat loss. Avoid locating dryer outside or where it is exposed to the elements.
- ③ Arrow dryers are sized according to air flow not pipe size. The dryer requires 10% to 15% of inlet airflow (SCFM) for regeneration. The difference between the inlet and outlet flow is the amount of purge air required. This air is purged to atmosphere and is not available for use downstream. Make certain air supply to dryer meets your air demand plus purge air requirements.

### INTRODUCTION TO HEATLESS REGENERATIVE DRYING

Twin tower regenerative air dryers are the dryers of choice when traditional refrigerated dryers do not provide sufficient air quality required for today's applications. Arrow's reliable "RH" series of heatless twin tower regenerative dryers normally produce -40°F and can optionally be as low as -100°F dew points. The dryer utilizes activated alumina for efficient drying of compressed air and will operate under extreme environmental conditions. Activated alumina is aluminum oxide that is highly porous and exhibits tremendous surface area (350 sq. meters/gram). Activated alumina is resistant to thermal shock and abrasion. It has a smooth, uniform ball size that prevents channeling of the air flow, which maintains low bed velocities. This maintains air contact time for efficient moisture removal and minimal pressure drop. Arrow's printed circuit board dryer controls are housed in a NEMA 4X rated enclosure and provide control of pneumatically piloted valves chosen for long life and high air flow.

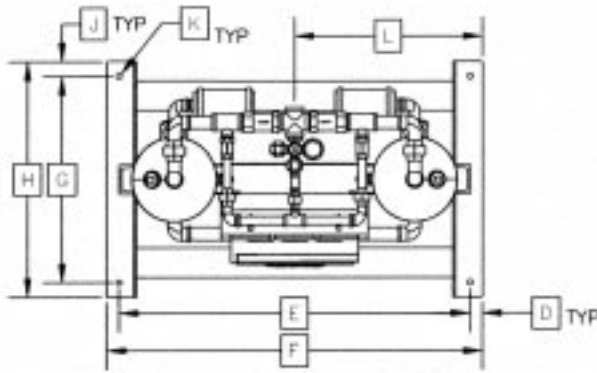
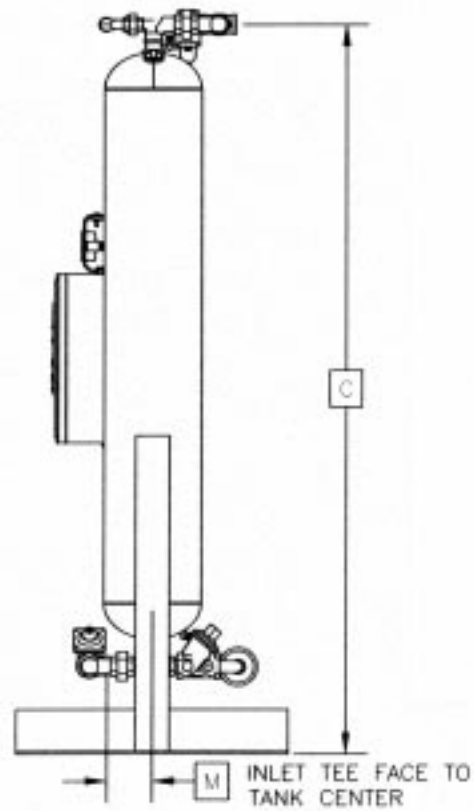
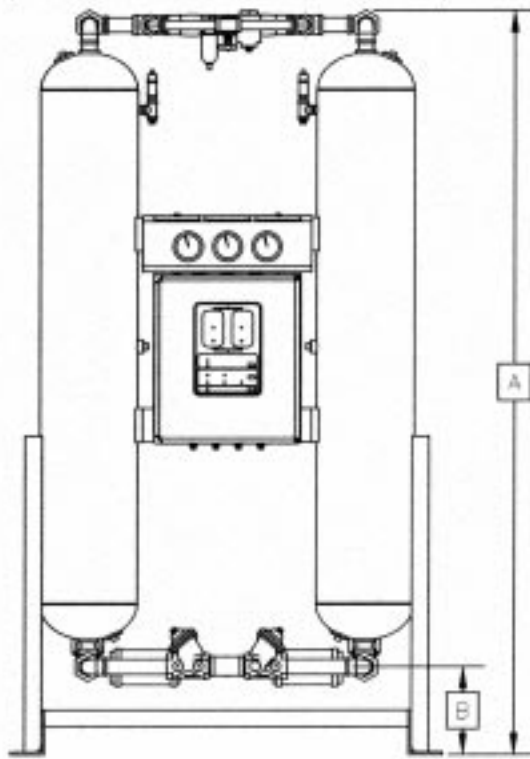
**SPECIFICATIONS**

Model No.	Drying Capacity SCFM	Pipe Size Connection	Height Inches	Width Inches	Depth Inches	Weight Lbs.	Purge Flow SCFM	Purge Pressure Setting
RH203	35	3/4" NPT	40	31	18	360	4.9	45 PSIG
RH204	50	3/4" NPT	57	39	24	508	7.00	45 PSIG
RH205	75	3/4" NPT	57	39	24	599	10.60	42 PSIG
RH206	100	1" NPT	66	39	24	627	14.12	60 PSIG
RH207	125	1" NPT	66	39	24	657	17.50	39 PSIG
RH208	150	1-1/2" NPT	73	45	36	739	21.20	50 PSIG
RH209	200	1-1/2" NPT	73	45	36	797	28.50	50 PSIG
RH210	250	1-1/2" NPT	73	45	36	855	35.30	45 PSIG
RH211	300	2" NPT	70	51	36	918	42.37	42 PSIG
RH212	350	2" NPT	70	51	36	1,124	48.10	50 PSIG
RH213	400	2" NPT	88	52	36	1,187	56.50	45 PSIG
RH214	500	2" NPT	88	52	36	1,245	70.60	38 PSIG
RH215	650	2-1/2" NPT	95	60	36	1,905	88.70	35 PSIG
RH216	750	2-1/2" NPT	95	60	36	2,022	105.90	44 PSIG
RH217	900	2-1/2" NPT	95	60	36	2,197	127.10	40 PSIG
RH218	1,100	3" FLG	103	71	48	2,500	155.40	40 PSIG
RH219	1,300	3" FLG	103	71	48	3,350	183.60	47 PSIG
RH220	1,500	3" FLG	113	83	60	3,775	211.80	55 PSIG
RH221	1,800	3" FLG	113	83	60	4,550	254.00	55 PSIG
RH222	2,100	3" FLG	113	83	60	5,725	297.00	43 PSIG
RH223	2,500	4" FLG	110	95	60	6,500	353.00	36 PSIG
RH224	3,000	4" FLG	110	95	60	8,500	424.00	46 PSIG

**ADDITIONAL SPECIFICATIONS**

- **Specifications and dimensions** are subject to change without notice.
- **Standard design conditions** are 100°F inlet temperature, 100 psig and 100°F ambient temperature. For other than standard design conditions or capacities up to 12,000 scfm, consult your factory representative.
- **Maximum pressure drop** of 2 PSIG
- **Maximum Working Pressure:** 150 PSIG
- **Minimum Working Pressure:** 75 PSIG
- **Maximum Inlet Temperature:** 120°F
- **Minimum Inlet Temperature:** 32°F
- **Standard Pressure Dew Point:** -40°F
- **Electrical Construction:** NEMA 4X
- **Standard Voltage:** 120V/1PH/60HZ
- **AMPS:** 0.5

## Dimensional Drawing

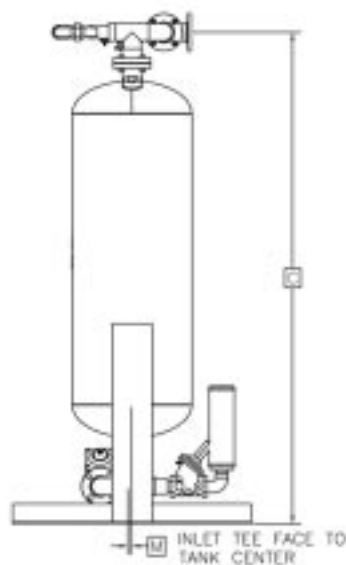
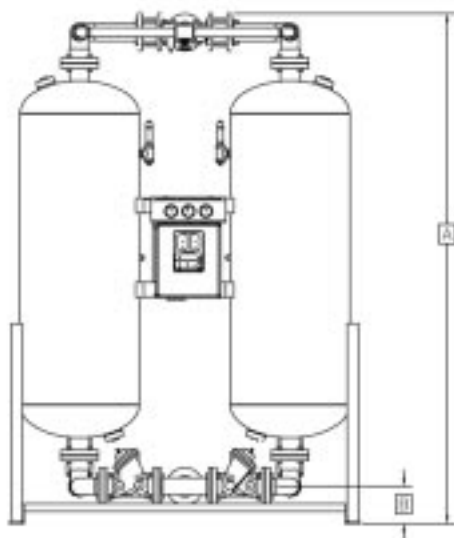
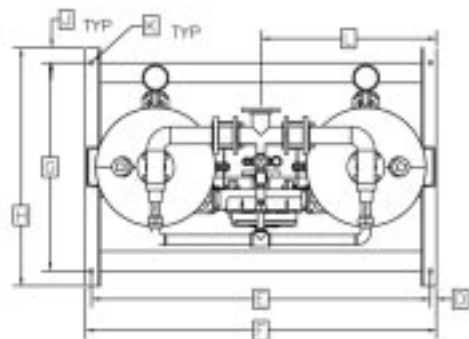


		MODEL NO.				
		203	204	205	206	207
DIMENSIONED IN INCHES	A	39.37	57.37	57.37	66.50	66.50
	B	6.42	8.41	8.41	7.81	7.81
	C	31.79	47.81	47.81	65.94	65.94
	D	0.75	1.25	1.25	1.25	1.25
	E	29.70	35.75	35.75	35.75	35.75
	F	31.20	39.00	39.00	39.00	39.00
	G	15.00	21.00	21.00	21.00	21.00
	H	18.00	24.00	24.00	24.00	24.00
	J	1.50	1.50	1.50	1.50	1.50
	K	0.5625	0.5625	0.5625	0.5625	0.5625
	L	15.60	19.50	19.50	19.50	19.50
M	3.90	3.92	3.92	3.98	3.98	

		MODEL NO.				
		208	209	210	211	212
DIMENSIONED IN INCHES	A	72.78	72.78	72.78	69.77	69.77
	B	9.73	9.73	9.73	9.65	9.65
	C	61.32	61.32	61.32	57.95	57.95
	D	1.25	1.25	1.25	1.25	1.25
	E	42.25	42.25	42.25	48.75	48.75
	F	44.75	44.75	44.75	51.25	51.25
	G	30.00	30.00	30.00	30.00	30.00
	H	36.00	36.00	36.00	36.00	36.00
	J	3.00	3.00	3.00	3.00	3.00
	K	0.8125	0.8125	0.8125	0.8125	0.8125
	L	22.375	22.375	22.375	22.125	22.125
	M	5.59	5.59	5.59	6.46	6.46

		MODEL NO.				
		213	214	215	216	217
DIMENSIONED IN INCHES	A	88.27	88.27	95.32	95.32	95.32
	B	10.65	10.65	12.05	12.05	12.11
	C	75.45	75.45	80.70	80.70	80.64
	D	1.25	1.25	1.25	1.25	1.25
	E	49.00	49.00	57.40	57.40	57.40
	F	51.50	51.50	59.90	59.90	59.90
	G	30.00	30.00	30.00	30.00	30.00
	H	36.00	36.00	36.00	36.00	36.00
	J	3.00	3.00	3.00	3.00	3.00
	K	0.8125	0.8125	0.8125	0.8125	0.8125
	L	25.75	25.75	29.95	29.95	29.95
	M	6.47	6.47	7.77	7.77	7.74

## Dimensional Drawing



DIMENSIONED IN INCHES	MODEL NUMBER			
	RH218	RH219	RH220	RH221
A	102.90	102.90	112.41	112.41
B	7.55	7.55	8.05	8.05
C	99.16	99.16	108.65	108.65
D	1.25	1.25	1.25	1.25
E	68.00	68.00	80.00	80.00
F	70.50	70.50	82.50	82.50
G	42.00	42.00	54.00	54.00
H	48.00	48.00	60.00	60.00
J	3.00	3.00	3.00	3.00
K	0.8125	0.8125	0.8125	0.8125
L	35.25	35.25	41.25	41.25
M	0.8750	0.8750	0.8750	0.8750

DIMENSIONED IN INCHES	MODEL NUMBER		
	RH222	RH223	RH224
A	112.41	110.18	110.18
B	8.05	7.07	7.07
C	108.65	105.68	105.68
D	1.25	1.25	1.25
E	80.00	92.5	92.5
F	82.50	95	95
G	54.00	54	54
H	60.00	60	60
J	3.00	3	3
K	0.8125	0.8125	0.8125
L	41.25	47.5	47.5
M	0.8750	3.84	3.84

## MOUNTING SPECIFICATIONS AND DRYER LOCATION

- ① Electrical connection must be hard piped with an external fused disconnect switch and proper overload protection. See electrical connection section for connection location.

**WARNING**  
**ARROW DRYERS ARE WIRED FOR HIGH VOLTAGE. ONLY QUALIFIED ELECTRICIANS**  
**ARE AUTHORIZED TO SERVICE THIS ELECTRICAL EQUIPMENT**

- ② Frame must be suitably grounded.
- ③ Generally locate your dryer downstream from the air receiver. The only exception would be on applications with a fluctuating demand. Then the dryer should be located upstream of the receiver to avoid air surges through the dryer's desiccant beds.
- ④ Provide adequate space around the dryer for servicing.  
Bolt dryer skid to foundation where possible.

## PIPING ARRANGEMENT & FILTER INSTALLATION

- ① Remove all pipe plugs from the dryer. Take care to insure that pipe dope, pipe tape, scale or metal chips are not trapped before the inlet port.

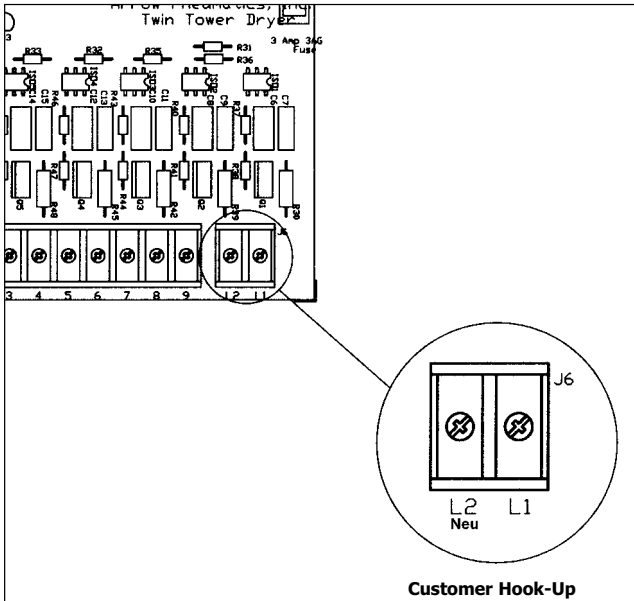
**Note: Pre & after filters must be used  
on all Regenerative Air Dryers.**

**Note: In situations where air supply is required 24 hours a day (it is undesirable to interrupt the airflow), a three valve bypass system is recommended to bypass the dryer and filters. Use the fewest elbows and taper connections necessary to keep pressure drop at a minimum.**

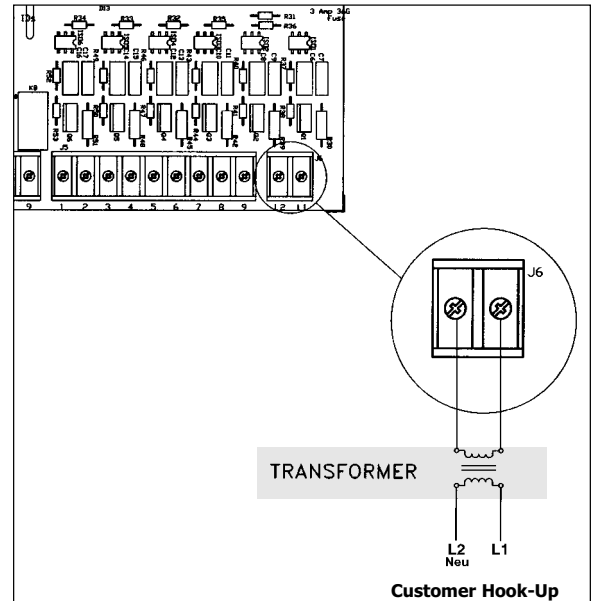
- ② Wet air inlet is at the dryer's bottom piping assembly. Dry air outlet is from the dryer's top piping assembly (see flow diagram on page 9).
- ③ Install **Pre-Filters** to "Inlet Air" connection on the bottom piping assembly.
  - Wet, compressed air should be connected to **pre-filter**.
  - Compressed air entering the dryer must be cooled to at least 120°F.
  - Pre-filters, located before the dryer, protect desiccant beds from contamination by oil, entrained water, pipe scale, etc., thereby extending dryer desiccant life. Locate pre-filters as close to the dryer as possible.
  - It is recommended that a mechanical separator be installed immediately preceding the pre-filter to remove the bulk liquid oil and entrained water.
- ④ Install **After Filter** to "Outlet Air" connection on the top piping assembly.
  - Dry, service air should be connected to **after-filter**.
  - After filters, located after the dryer, help eliminate the possibility of desiccant dusting and carry over into the air system.

**ELECTRICAL CONNECTION**

**Standard Voltage - 120V/1ph/60Hz**



**All Other Voltages**

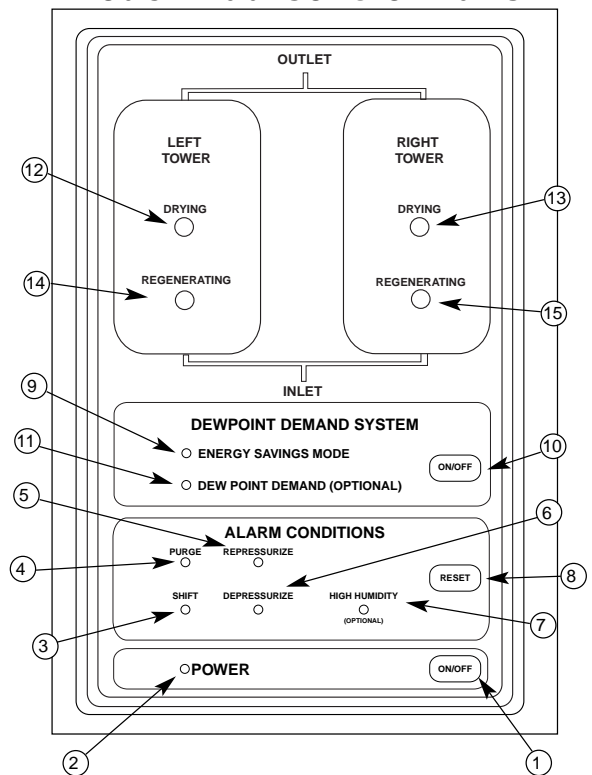


**Note: Circuit Board Timer is rated for 120V/1ph/60Hz ONLY**

**START - UP OPERATIONS**

1. **Power On/Off Push Button** - Energizes circuit board timer, initiating dryer operation.
2. **Power ON LED** - Illuminates when dryer is in operation.
3. **Failure to Shift Alarm LED** - Illuminates when dryer has failed to shift.
4. **Failure to Purge Alarm LED** - Illuminates when dryer has failed to purge.
5. **Failure to Repressurize Alarm LED** - Illuminates when dryer has failed to repressurize.
6. **Failure to Depressurize Alarm LED** - Illuminates when dryer has failed to depressurize.
7. **High Humidity Alarm LED (Optional)** - Illuminates when an elevated dew point has occurred.
8. **Alarm Condition Reset Button** - Clears all alarms conditions
9. **Energy Savings Mode LED (Optional)** - Illuminates when dryer has reached the desired dew point and initiates Energy Savings Mode.
10. **Dew Point Demand On/Off Button** - Energizes Dewpoint Demand Logic.
11. **Dew Point Demand LED (OPTIONAL)** - Illuminates when Dewpoint Demand Logic is in operation.
12. **Left Tower Drying LED** - Illuminates when left tower is drying service air.
13. **Right Tower Drying LED** - Illuminates when right tower is drying service air.
14. **Left Tower Regenerating LED** - Illuminates when left tower is regenerating.
15. **Right Tower Regenerating LED** - Illuminates when right tower is regenerating.

**Touch Pad Control Panel**





## Dryer Operation

### AFTER ALL PIPING AND ELECTRICAL CONNECTIONS ARE MADE, PROCEED AS FOLLOWS:

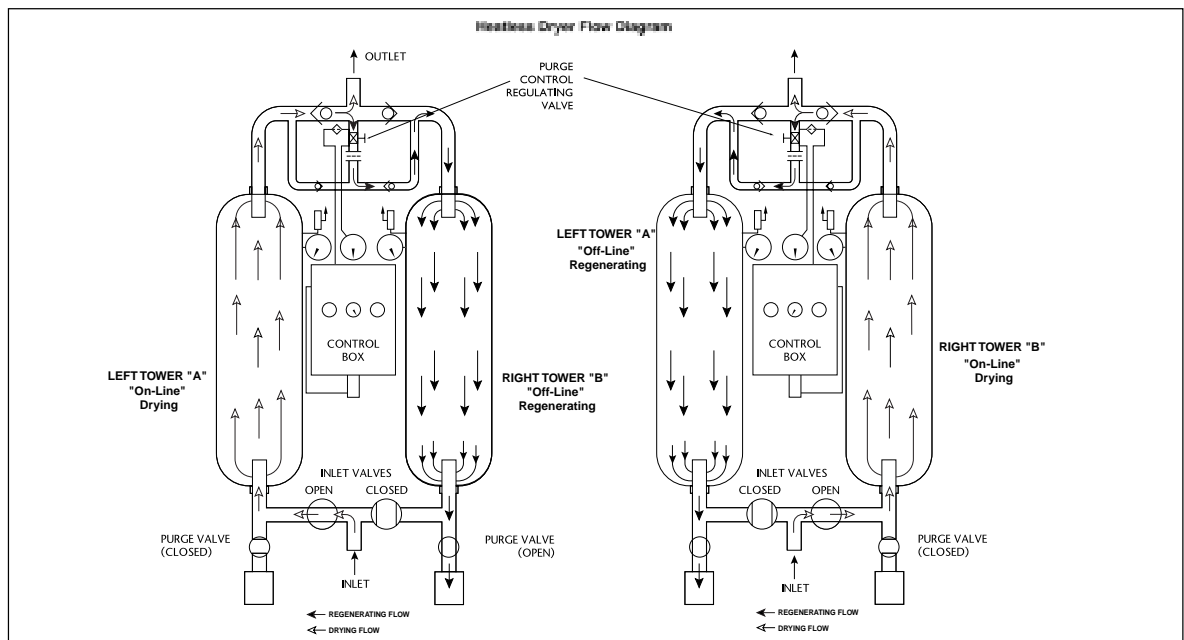
- 1 SLOWLY PRESSURIZE THE DRYER!
- 2 When the dryer reaches full operating pressure, check the system for air leaks. Soap test all joints and fittings. To maintain desired dew point, any leaks detected must be fixed, especially those on the outlet side of the dryer.
- 3 Energize electrical circuit by simply pressing the power on/off button.
- 4 The Power On LED will be illuminated when the dryer is in operation. When the electrical circuit has been energized, the control circuit board will start to operate and automatically initiate dryer operation. The timer is factory set, so that no field adjustment is necessary.
- 5 Adjust purge adjustment valve so that the center purge pressure gauge reads appropriate pressure (see specifications chart for purge pressure on page 2).

### Dryer Operation

Compressed air saturated with water vapor passes through the inlet valve and flows upward through the desiccant in tower "A." Tower "A" is said to be "on line." The activated alumina desiccant adsorbs the water vapor in the compressed air and the pressure dew point is lowered to a minimum of  $-40^{\circ}\text{F}$ . The dried air then passes through a check valve assembly to the outlet piping and then to the factory tools or equipment.

While the air is being dried in tower "A," the desiccant in tower "B" that adsorbed moisture in the previous cycle is simultaneously regenerated. Tower "B" is "off line." At the start of the regeneration cycle, tower "B" is depressurized from the operating pressure to atmospheric pressure with a downward air flow and passes through the purge valve and out the purge muffler. Regeneration continues with a portion of the dry air from tower "A" passing through an orifice assembly and downward through tower "B" out to atmosphere.

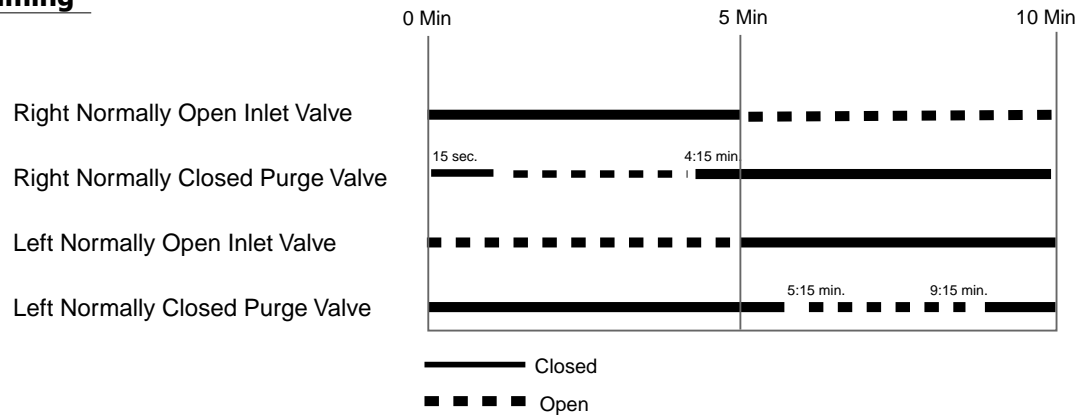
This process takes about ten minutes to complete, with the drying cycle using about five minutes to provide the desired dew point. The regeneration cycle takes approximately 45 seconds less to allow for repressurization before switchover. The complete operation therefore consists of two cycles, one for drying and the other for regeneration. Required purge air is generally 15% of rated flow. As pressure is a direct function of purge air, the higher the pressure, the lower the purge.



**NOTE: At Initial Start-Up, check the dryer operation for one or two cycles, especially at the time of the tower shift. Verify that all systems are operating in their proper order and sequence. If the dryer is not functioning properly, contact your Arrow Representative.**

## DRYER OPERATION cont'd

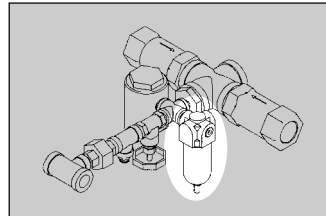
### Cycle Timing



### Moisture Indicator

The Moisture Indicator is located in the top center piping. The Moisture indicator is provided to warn operating personnel of dryer malfunction. If the dryer is functioning properly, the desiccant in the Moisture Indicator will be blue. Should the blue color fade or turn pink, discontinue dryer use and refer to elevated dew point section in Troubleshooting Guide.

Note: A small portion of air should flow through the moisture indicator



### Pressure Alarm Package

The pressure alarm package is designed to monitor the following: Depressurization and repressurization of towers, purge pressure and tower shifting.

**Failure to Depressurize** – Senses for pressure on the offline tower after tank shift-over. Should the tower fail to depressurize do to a malfunctioning system component (i.e. purge valve, solenoid valve, purge check valve or circuit board timer) the Failure to Depressurize LED will be illuminated. The Failure to Shift LED will also be illuminated to show a shift failure. Should the alarm LED be observed, refer to Troubleshooting Guide.

**Failure to Repressurize** – Senses for pressure on the offline tower before tank shift-over. Should the tower fail to repressurize do to a malfunctioning system component (i.e. purge valve, solenoid valve, or circuit board timer) the Failure to Repressurize LED will be illuminated. The Failure to Shift LED will also be illuminated to show a shift failure. Should alarm LED be observed, refer to Troubleshooting Guide.

**Failure to Purge** – Senses for pressure on the center purge piping at all times during dryer operation. Should a low purge pressure condition occur (i.e. purge flow regulator turned down or debris in the purge pressure piping) the Failure to Purge LED will be illuminated. Should alarm LED be observed, refer to Troubleshooting Guide.

**Failure to Shift** – The Failure to Shift LED will be illuminated when a dryer shift failure has occurred. The shift failure was due to a Failure to Depressurize or Failure to Repressurize. Observe dryer operation to determine which failure caused the Failure to Shift and refer to Troubleshooting Guide.

## Dewpoint Demand Plus

**NOTE: At initial startup and during the first six months of continuous dryer operation, the Dew Point Demand Plus logic SHOULD NOT BE ACTIVATED. A conditioning process must occur in new desiccant, this will allow the desiccant to remove its precise water vapor capacity from the airflow.**

The function of DDP is to conserve energy by eliminating unnecessary dryer cycling, purge air consumption, and compressor power consumption.

The DDP works by utilizing a moisture sensitive probe to measure the water vapor content of the outlet air flow. The moisture content of the sample air stream indicates the wetness of the drying tower's desiccant bed.

The purpose of the probe and its associated electronics is to first measure the "wetness" of the air within the desiccant beds and then regenerate the desiccant beds only when the moisture loading reaches a pre-set maximum, desired dewpoint.

The Dew Point Demand Plus is packaged with a digital dew point controller and High Humidity Alarm option. The digital dew point controller allows the end user to pre-set a desired dew point at which the dryer will start the Energy Savings Mode. This controller also allows the end-user to pre-set a dew point at which a high humidity alarm condition would occur. See High Humidity Alarm option for full description. See the digital dew point controller Owners Manual enclosed for changing desired dew points.

**NOTE: Digital dew point controller UNLOCKING CODE 430.**

**NOTE: Energy Savings Mode is factory preset to activate at -30° F dew point. High Humidity alarm is factory preset to +10° F dew point.**

## AFTER APPROXIMATELY SIX MONTHS

### Dew Point Demand System Startup and Operation

**NOTE: Allow the dryer to operate for a number of cycles to ensure that the probe will not be exposed to high humidity and damaging liquid water. This is especially important when the dryer has been stored or sitting idle for several months.**

- ① Press the Dew Point Demand ON/OFF button to energize Dew Point Demand Logic.
- ② **Slowly** open the DDP sample valve<sup>1</sup>. This valve should be fully opened.
- ③ **Slowly** open the DDP sample valve<sup>2</sup> so that a small flow of air passes across the probe (approximately 2 to 3 SCFH). This valve should be open at all times when dryer is in operation.
- ④ When the desired dew point is reached, the energy savings mode LED will be energized to indicate the dryer is in energy savings mode; eliminating unnecessary dryer cycling, purge air flow and compressor power consumption.

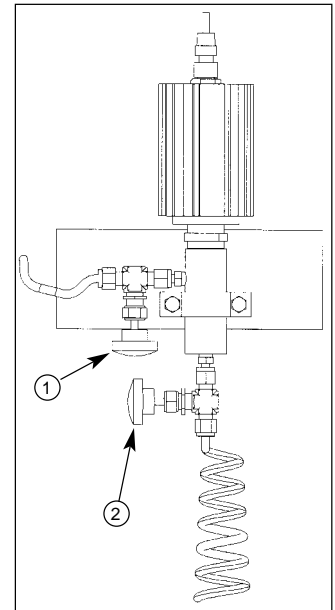
## Dew Point Demand

Dew Point Demand is a cost effective alternative to Dew Point Demand Plus. This system operates similar to the Dew Point Demand Plus, but does not have the digital display, high humidity alarm or an adjustable dew point "tank switchover". The "tank switchover" occurs at a fixed -40°F dew point.

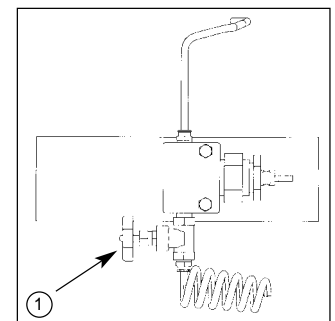
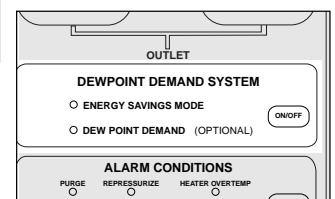
### Dew Point Demand System Startup and Operation

**NOTE: Allowing the dryer to operate for a number of cycles ensures that the probe will not be exposed to high humidity and damaging liquid water. This is especially important when the dryer has been stored or sitting idle for several months.**

- ① Press the Dew point ON/OFF button to energize Dew Point Demand Logic
- ② **Slowly** open the DDP sample valve<sup>1</sup> so that a small flow of air passes across the probe (approximately 2 to 3 SCFH). This valve should be open at all times when dryer is in operation.
- ③ When "fixed" -40°F dewpoint is reached, the energy savings mode LED will be energized to indicate the dryer is in energy savings mode; eliminating unnecessary dryer cycling, purge air flow and compressor power consumption.



**NOTE: Factory Shipped With Dew Point Demand Logic Turned Off and DDP Sample Valve <sup>1</sup> and <sup>2</sup> closed.**

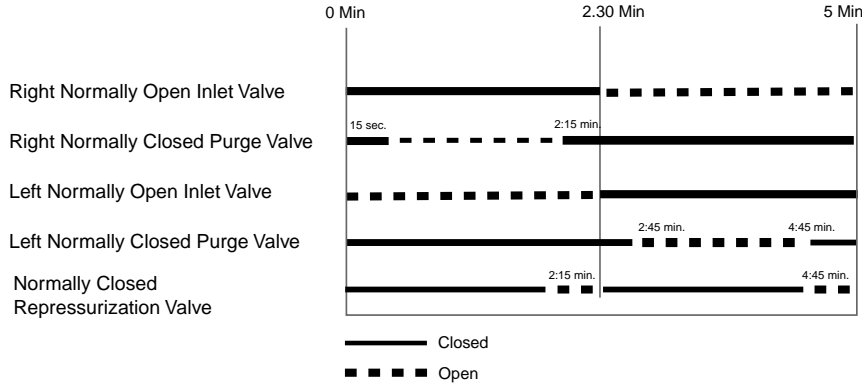


**NOTE: Factory Shipped With Dew Point Demand Logic Turned Off and DDS Sample Valve <sup>1</sup> closed.**

## Optional Equipment cont'd

**High Humidity Alarm:** This option continuously monitors the outlet air stream for dew point performance. Should the dryer dew point elevate because of malfunctioning system component, overflow condition, oil contamination or desiccant attrition, the High Humidity Alarm LED will be illuminated. Should the light be observed, refer to Troubleshooting Guide.

**-100°F Pressure Dew Point:** This option lowers the outlet dew point from the standard -40°F to -100° F. The cycling time is adjusted accordingly and a repressurizing system is added. The cycle time will be adjusted from a five minute cycle, 2-1/2 minutes each tower. A normally closed valve will be added to the upper center piping to assist repressurizing each tower.



**Remote Alarm Contacts:** Contacts will be supplied for: Energy Saving Mode, High Humidity Alarm, Failure to Depressurize alarm, Failure to Repressurize, Failure to Purge and Failure to Shift, allowing an easy connection method for energizing remote visual or audible alarms. A 120-volt signal is sent when a failure occurs. (Refer to attached diagram.)

**Remote Alarm Dry Contacts:** Contacts will be supplied for: Energy Saving Mode, High Humidity Alarm, Failure to Repressurize, Failure to Depressurize alarm, Failure to Purge and Failure to Shift, allowing for Customer supplied alarm circuits to be easily connected. Maximum voltage and current is 120V, 3 amperes.(Refer to attached diagram.)

**Low Ambient Package:** Low ambient temperature protection is accomplished by encasing both towers with a rugged insulation. This insulation along with heat trace cables eliminates "freeze-ups" from low ambient conditions such as cold outdoor or unheated indoor installations.

- ① Check to see that the power supply to the heat trace cable is 120V.
- ② Install the power cord plug into receptacle.

**RS-232 Serial Communications Interface:** Allows serial port connections for computer monitoring of dryer functions and operating statuses. (Refer to attached diagram.)

**Pre-piped Connection With Pre and After Filters<sup>1</sup>**

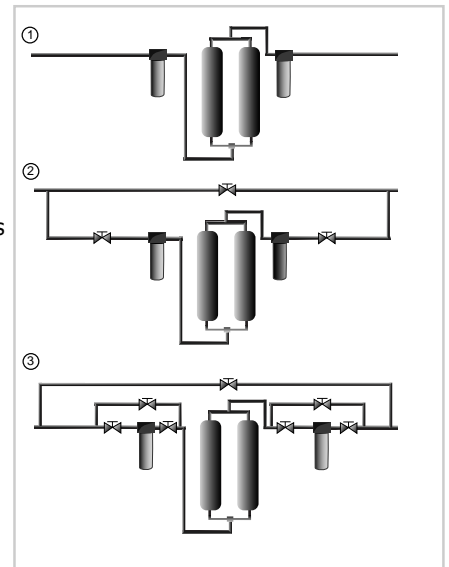
Prefilter and afterfilter mounted to dryer with integral piping ready to install in system.

**3-Valve Bypass w/Pre-piped Connection<sup>2</sup>**

Prefilter and afterfilter mounted to dryer with integral piping and 3 bypass valves for bypassing filters and dryer. Ready to install in system.

**7-Valve Bypass w/Pre-piped Connection<sup>3</sup>**

Prefilter and afterfilter mounted to dryer with integral piping and 7 bypass valves for individually bypassing either filter and/or dryer. Ready to install in system.



**WARNING:**  
**BEFORE MAINTENANCE OF DRYER ALWAYS SHUT DRYER OFF, DISCONNECT THE ELECTRICAL SUPPLY, AND DEPRESSURIZE THE PNEUMATIC SYSTEM TO AVOID PERSONAL INJURY**

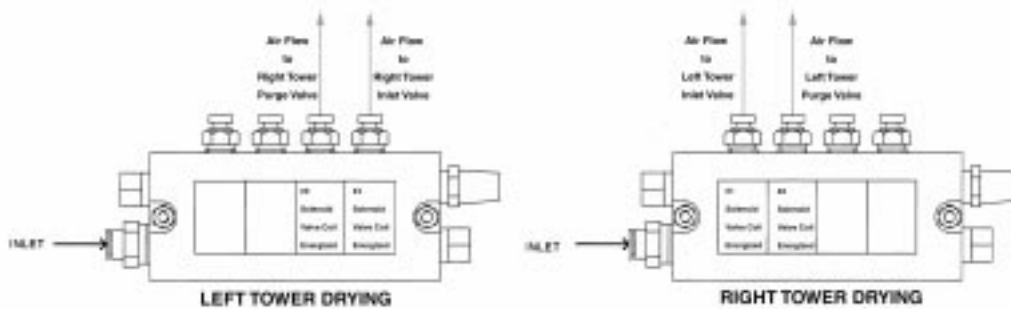
**Prefilters and Afterfilters**

**Note: For maximum filtration efficiency service elements and drains according to manufacturer’s recommended schedule.**

**Solenoid Valves**

Periodically clean entire solenoid valve block. If any of the normally closed solenoid valves fail to operate, use the air flow diagram below to check operation, and then check the following:

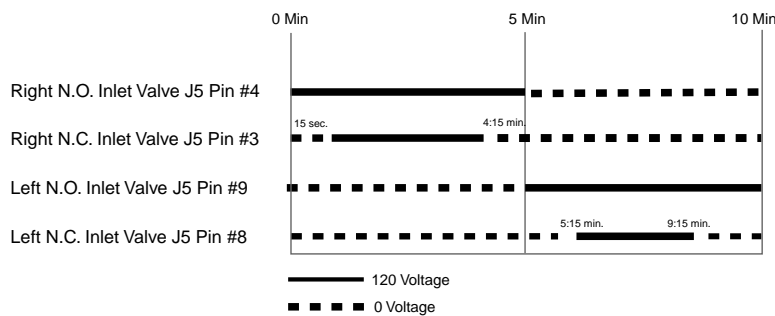
1. Control Voltage - Check the outlet voltage sequence from the circuit board to verify that the solenoid is receiving electric voltage.
2. Burned out solenoid cell
3. High/low voltage - Voltage should be plus or minus 10% of nameplate reading.
4. Solenoid valve leaking - Disassemble, clean and repack or replace.



**Timer**

Should the sequencing of towers fail, first check the red light marked "Status" located on the timer circuit board. When blinking, the timer board is energized. If the light is not blinking, check the voltage across the 3 Amp 3 AG fuse located on the board. Replace fuse if "blown". If fuse is not "blown" check voltage sequence to the appropriate solenoid valve.

**VOLTAGE SEQUENCE**



**WARNING**

**WHEN REPLACING THE PURGE MUFFLERS IT IS RECOMMENDED THE DRYER BE TURNED OFF AND FULLY DEPRESSURIZED. BACKPRESSURE CAUSED BY CLOGGED MUFFLER CAN CAUSE INJURY SHOULD YOU ATTEMPT TO DISASSEMBLE WHILE PRESSURIZED.**

**Purge Muffler**

At high pressures a clogged muffler could result in a high backpressure and could result in mechanical failure or personal injury. For this reason the purge muffler must be periodically checked for any restrictive debris. If pressure is observed on the offline tower replace muffler immediately.

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**PREVENTATIVE MAINTENANCE**

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**WARNING**

**TO AVOID INJURY, DEPRESSURIZE DRYER BEFORE PERFORMING ANY SERVICE**

**Purge Valve**

Should either of the normally closed purge valves fail to operate check the following:

1. Check air signal to valve.
  - If air signal is present; disassemble, clean and replace diaphragm and seals.
  - If no air signal is present; see solenoid valve information in Maintenance Section.

**Inlet Valve**

Should either of the normally open inlet valves fail to operate check the following:

2. Check air signal to valve.
  - If air signal is present; disassemble, clean and replace diaphragm and seals.
  - If no air signal is present; see solenoid valve information in Maintenance Section.

**Outlet and Purge Check Valves**

**NOTE: Signs of a faulty outlet and/or purge check valve include;**

- Failure to Depressurize Alarm
- System air is being drained and compressor is running at below normal efficiency.

Periodically check the outlet and purge check valves for an absolute seal.

Procedure:

1. Close purge adjustment valve. Verify offline tower pressure is 0 PSIG.
2. Check offline purge muffler for airflow. No airflow should be present.
  - If no airflow is present, the outlet and purge check valve have a positive seal. Repeat procedure next cycle to check opposite outlet and purge check valves.
  - If airflow is present, the outlet and/or purge check valves do not have a positive seal. Clean and/or replace corresponding check valves. See air flow diagram for corresponding check valves.

**Pilot Air Filter**

For maximum filtration efficiency, service the element 3 times a year and replace yearly.



## PREVENTATIVE MAINTENANCE SCHEDULE cont'd

### Daily

1. Check and record inlet pressure, temperature and flow. Verify that it is within specifications.
2. Check tower pressure gauge readings within operating tolerance.
3. Check tower pressure gauges for proper dryer cycling.
4. Verify that pressure in purging tower is 5 PSIG or less.
5. Verify that prefilters and off-line differential pressure is within operating limits.

### Monthly

1. Check your operating conditions: inlet flow, inlet pressure, and inlet temperature.
2. Check prefilters and after filters.
3. Check dryer cycle and sequence of operations, (i.e. drying and regenerating).

### Every Three Months

1. Check pilot air filter element and clean.
2. Replace prefilter and afterfilter elements.

### Semi-Annually

1. Check outlet dew point.
2. Blow down relief valves.

### Annually

1. Check desiccant and replace if necessary.
2. Inspect and clean pilot operated valves and replace packing as necessary.
3. Inspect and clean solenoid valves, check valves and purge lines.
4. Test electrical components, replace as necessary.

### Every Three Years

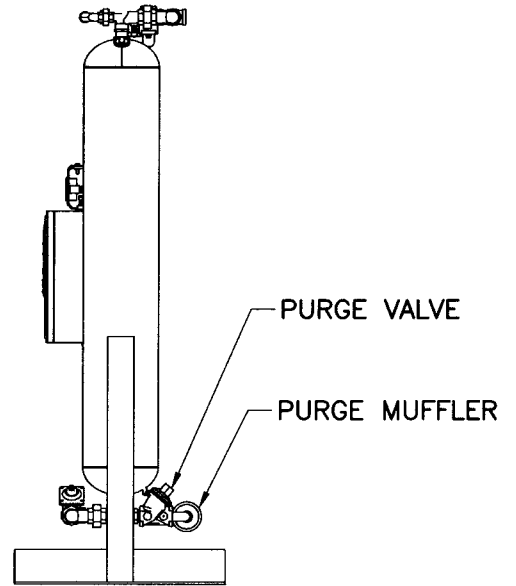
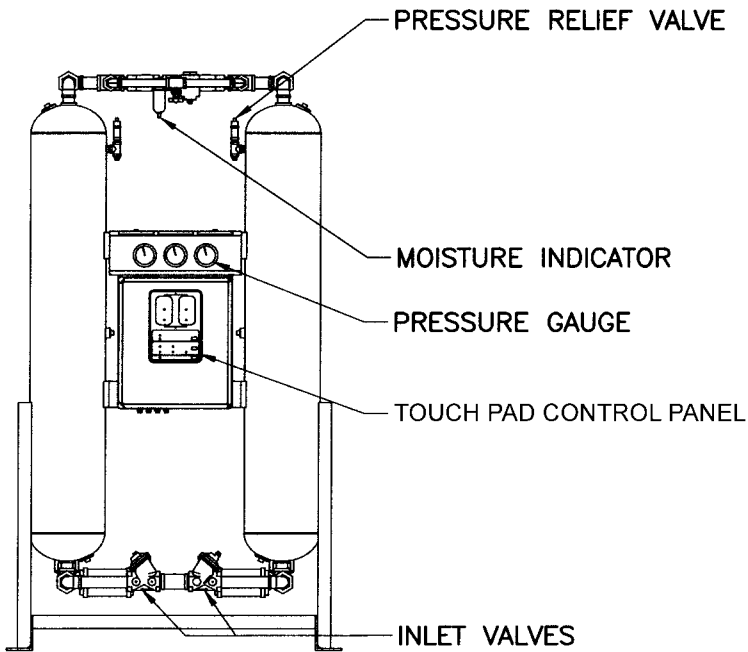
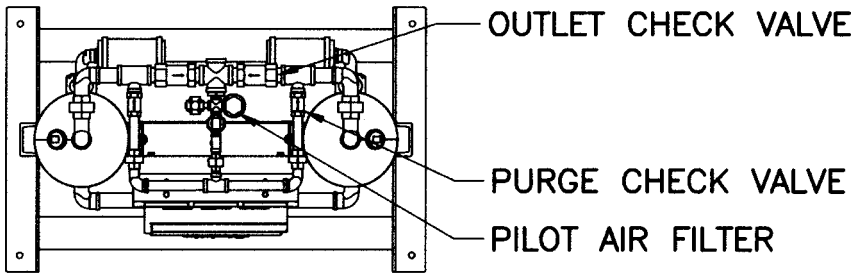
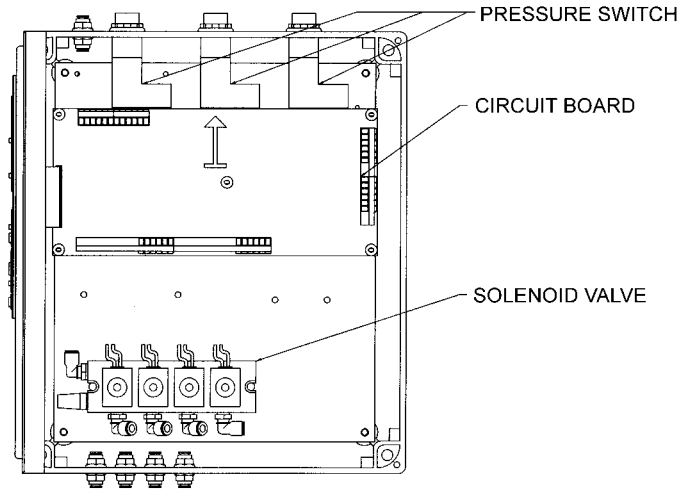
1. Replace desiccant if necessary.

## TROUBLE SHOOTING GUIDE

PROBLEM	PROBABLE CAUSE	CORRECTIVE ACTION
Dryer fails to depressurize	Purge valve does not open	Check purge valve, air signal to valve and its solenoid valve. Refer to earlier steps if pilot air is detected. Refer to Preventative Maintenance (PM) Section. Check timer voltage sequencing.
	Purge muffler is clogged	Replace Purge Muffler.
	Purge Check Valve stuck open	See outlet/purge check valve PM section for positive seal.
	Outlet check valve stuck open	See outlet/purge check valve PM section for positive seal.
Excessive back pressure in regenerating tower (above 5PSIG)	Purge muffler is clogged	Replace purge muffler.
	Outlet check valve stuck open	Clean and/or replace valve.
System air being drained	Outlet and/or purge check valve stuck open	See outlet/purge check valve PM section for positive seal.

<b>PROBLEM</b>	<b>PROBABLE CAUSE</b>	<b>CORRECTIVE ACTION</b>
Elevated Dewpoint	Insufficient purge rate	Check purge flow settings. Check purge piping for obstruction.
	Clogged Purge Muffler	Replace Purge Muffler.
	Inlet air/gas pressure below design condition	Check pressure source.
	Flow rate higher than design condition	Check flow rate and causes for increased demand.
	Inlet temperature above design condition	Check aftercooler, clean and service as necessary.
	Entrained water entering desiccant bed	Check air/moisture separator, elements and prefilter. Replace dryer desiccant if necessary.
	Desiccant contaminated by oil	Install suitable prefilter and replace dryer desiccant.
Excessive pressure drop in dryer	Excessive flow rate	Check flow rate. Locate cause for increased air demand.
	Inlet pressure below design condition	Check pressure source.
Failure to shift towers from drying to regenerating service	No input power	Check input voltage.
	Dryer not turned on	Check power on LED.
	Defective timer	Check input and output voltages.
	Defective solenoid valve	Check input voltage to solenoid valve. Check outlet air flow from solenoid valve.
	No pilot air	Check pilot air-line for blockage Check to see if pilot air-line filter is clean. Replace element if needed.
	Defective inlet valves	Check for pilot air to operate valve. Refer to steps above if no pilot air is detected.
Dryer fails to pressurize	Purge Valve does not close	Check purge valve, air signal to purge valve and its solenoid valve. Refer to earlier steps if pilot air is detected. Check timer sequencing.
Dryer depressurizes too rapidly	Purge valve does not close; dryer depressurizing through purge valve	Check purge valve, air signal to purge valve and its solenoid valve. Refer to earlier steps if pilot air is detected. Check depressurization timer circuit.





## Replacement Parts

Part Description	M O D E L				
	RH203 RH204 RH205	RH206 RH207	RH208 RH209 RH210	RH211 RH212	RH213 RH214
INLET VALVE	126150	126155	126156	126157	126157
REPAIR KIT (INLET VALVE)	126150-RK	126155-RK	126156-RK	126157-RK	126157-RK
PURGE VALVE	126151	126151	126151	126151	126154
(REPAIR KIT) PURGE VALVE	126151/54-RK	126151/54-RK	126151/54-RK	126151/54-RK	126151/54-RK
OUTLET CHECK VALVE	25526	25527	126167	126168	126168
PURGE CHECK VALVE	122028	122091	25526	25526	25527
CIRCUIT BOARD TIMER	126719	126719	126719	126719	126719
PANEL OVERLAY	126530	126530	126530	126530	126530
SOLENOID VALVE BLOCK	126183	126183	126183	126183	126183
PURGE MUFFLER	126060	126060	126061	126061	126039
PRESSURE GAUGE	122150	122150	122150	122150	122150
PRESSURE RELIEF VALVE	122050	122050	122050	122051	126026
MOISTURE INDICATOR ASSEMBLY	126502	126502	126502	126502	126502
PILOT AIR FILTER (ELEMENT KIT)	9052T	9052T	9052T	9052T	9052T
PILOT AIR FILTER	EK9052	EK9052	EK9052	EK9052	EK9052
REPLACEMENT DESICCANT (TOTAL)	RH203: 42 lbs RH204: 58 lbs RH205: 88 lbs	RH206: 116 lbs RH207: 146 lbs	RH208: 174 lbs RH209: 232 lbs RH210: 290 lbs	RH211: 348 lbs RH212: 406 lbs	RH213: 464 lbs RH214: 580 lbs
ACTIVATED ALUMINA 400 LBS. FIBER DRUM 1/8" BEADS	34010	34010	34010	34010	34010
ACTIVATED ALUMINA 50 LBS. FIBER DRUM 1/8" BEADS	34011	34011	34011	34011	34011
PRESSURE SWITCH	122245	122245	122245	122245	122245
DEWPOINT DEMAND PLUS SENSOR (OPT)	126048	126048	126048	126048	126048
DEWPOINT DEMAND PLUS CONTROLLER (OPT)	126536	126536	126536	126536	126536
CIRCUIT BOARD - DEWPOINT DEMAND/HIGH HUMIDITY (OPT)	122717	122717	122717	122717	122717
HIGH HUMIDITY SENSOR (OPT)	123079	123079	123079	123079	123079
DEWPOINT DEMAND SENSOR (OPT)	122158	122158	122158	122158	122158
TRANSFORMER 230V & 480V (OPT)	122297	122297	122297	122297	122297
TRANSFORMER 380V, 440V, 550V, & 600V (OPT)	122335	122335	122335	122335	122335
REPRESSURIZING VALVE	122223	122223	122223	122223	122223



## Replacement Parts

Part Description	M O D E L					
	RH215 RH216	RH217	RH218 RH219	RH220 RH221	RH222	RH223 RH224
INLET VALVE	126862	126862	126227	126227	126227	126201
REPAIR KIT (INLET VALVE)	126862-RK	126862-RK	126227-RK	126227-RK	126227-RK	126201-RK
PURGE VALVE	126154	126161	122136	122136	12775	126776
(REPAIR KIT) PURGE VALVE	126151/54-RK	126161-RK	122136-RK	122136-RK	12775-RK	126776-RK
OUTLET CHECK VALVE	126859	126859	126228	126228	126228	126166
PURGE CHECK VALVE	25527	126575	126167	126167	126167	126168
CIRCUIT BOARD TIMER	126719	126719	126719	126719	126719	126719
PANEL OVERLAY	126530	126530	126530	126530	126530	126530
SOLENOID VALVE BLOCK	126183	126183	126183	126183	126183	126183
PURGE MUFFLER	126039	126214	126214	126214	126214	126214
PRESSURE GAUGE	122150	122150	122150	122150	122150	122150
PRESSURE RELIEF VALVE	122076	122076	122053	122053	122053	126113
MOISTURE INDICATOR ASSEMBLY	126502	126502	126502	126502	126502	126502
PILOT AIR FILTER	9052T	9052T	9052T	9052T	9052T	9052T
(ELEMENT KIT) PILOT AIR FILTER	EK9052	EK9052	EK9052	EK9052	EK9052	EK9052
REPLACEMENT DESICCANT (TOTAL)	RH215: 754 lbs RH216: 870 lbs	RH217: 1044 lbs	RH218: 1276 lbs RH219: 1508 lbs	RH220: 1740 lbs RH221: 2088 lbs	RH222: 2436 lbs	RH223: 2750 lbs RH224: 3300 lbs
ACTIVATED ALUMINA 400 LBS. FIBER DRUM 1/8" BEADS	34010	34010	34010	34010	34010	34010
ACTIVATED ALUMINA 50 LBS. FIBER DRUM 1/8" BEADS	34011	34011	34011	34011	34011	34011
PRESSURE SWITCH	122245	122245	122245	122245	122245	122245
DEWPOINT DEMAND 126048 PLUS SENSOR (OPT)	126048	126048	126048	126048	126048	126048
DEWPOINT DEMAND PLUS CONTROLLER (OPT)	126536	126536	126536	126536	126536	126536
CIRCUIT BOARD - DEWPOINT DEMAND/HIGH HUMIDITY (OPT)	122717	122717	122717	122717	122717	122717
HIGH HUMIDITY SENSOR (OPT)	123079	123079	123079	123079	123079	123079
TRANSFORMER (230V & 480V OPT)	122297	122297	122297	122297	122297	122297
TRANSFORMER (380V, 440V, 550V, & 600V OPT)	122335	122335	122335	122335	122335	122335
REPRESSURIZATION VALVE (OPT.)	122223	122223	122223	122223	122223	+122223

## W a r r a n t y

The Arrow Regenerative type compressed air dryer is warranted to be free from defects in material and workmanship, when used under conditions recommended by the manufacturer, for a period of 12 (twelve) months from date of shipment from factory to job site of original owner. Products purchased from warehouse stock are warranted for a period of 12 (twelve) months from date of shipment from that warehouse provided Arrow is furnished full name, address and date of shipment information.

This warranty is limited to parts and labor F.O.B. factory, and is subject to the same restrictions as outlined below concerning misuse, abuse or accident.

This warranty will apply to equipment installed, operated, and maintained in accordance with the procedures and recommendations as outlined in the owners manual published by Arrow Pneumatics.

During the life of this warranty, Arrow Pneumatics will repair or replace (at Arrow's option) free of charge, F.O.B. its plant, any defective part of assembly, if such defect occurred in normal service and was not due to apparent misuse, abuse, or accident.

Any warranty service performed in the field must be authorized by Arrow Pneumatics. Unauthorized service voids the warranty and resulting charge will not be paid by Arrow Pneumatics.

Arrow Pneumatics makes no other warranties or guarantees, expressed or implied. The merchantability of the components is expressly excluded. The manufacturer assumes no liability for indirect or consequential damage.

(This warranty good only in the continental boundary of the United States. For export, contact the factory)

### For Your Records

Record the serial number, found on the front of your dryer and inside the electrical enclosure, in the spaces designated on the warranty card, and in the spaces provided below. Refer to the model and serial number whenever you call your distributor for information or service on this product.

Model \_\_\_\_\_ Serial Number \_\_\_\_\_



**Arrow Pneumatics, Inc. 2111 W. 21<sup>st</sup> Street Broadview, Illinois 60155-4627**  
TEL: 708-343-9595 FAX: 708-343-1907  
[www.arrowpneumatics.com](http://www.arrowpneumatics.com)