



**Compressed Air System Products**

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Installation, Operation, and Maintenance Instructions

Heatless Regenerative Air Dryers  
and HLD-PAK Dryer/Filter Packages  
HLD-25 through HLD-6250

SPECIFICATIONS
Maximum Working Pressure: 150 PSIG
Maximum Inlet Temperature: 110°F
Pressure Dewpoint: -40°F

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## INSTALLATION

1. Install dryer in a vertical (upright) position. In systems where air usage fluctuates or there are sudden demands, protect dryer against air flow surges by providing sufficient piping between dryer and point of air use or by installing a receiver tank between dryer and point of air use. Allow enough space for future servicing of the unit.
2. Install by-pass piping with inlet, outlet, and by-pass valves to isolate dryer for performing routine maintenance without interruption of the plant air system. HLD-PAK Plus I and Plus II Models include a factory installed three-valve bypass (See Section - Operating the Three-Valve Bypass.)
3. Install a coalescing filter(s) with automatic drain upstream of the dryer inlet, and a particulate filter(s) downstream of the dryer outlet. Bypass piping is recommended for both (all) filters. HLD-PAK, HLD-PAK Plus I and HLD-PAK Plus II Models include factory installed pre and after-filters.
4. Connect inlet air piping to dryer inlet (bottom of dryer) and outlet air piping to dryer outlet (top of dryer).  
**CHECK ALL CONNECTIONS ON THE UNIT FOR TIGHTNESS.**
5. Connect 115/60/1 electric power to terminals inside the control enclosure, in accordance with local and national codes. To prevent the solid state timing device and solenoid valves from operating when the air supply is interrupted, it is recommended that provisions be made to shut off the dryer when the air compressor is not in use. **WARNING: CHECK ALL ELECTRICAL CONNECTIONS!!**

## OPERATION

## **SET-UP:**

1. *AIR/TAK* Regenerative Dryers and Desiccant are shipped separately to prevent damage to the dryer during shipment. Fill both towers with desiccant following the procedures outlined in the section titled Replacing Desiccant. **Note: Always use AIR/TAK approved desiccant. Use of desiccant other than that approved by AIR/TAK, Inc. may void warranty. Contact the factory or an authorized AIR/TAK Distributor for more information.**
2. With dryer by-pass valve open, slowly open the inlet valve to the dryer and allow the unit to pressurize. When the pressure gauges indicate that the dryer is at full line pressure, open dryer outlet valve and close the by-pass valve. The filters should be placed on-line using a similar procedure.
3. Adjust the timing cycle to the desired length by changing the time values as shown on page 18.
4. Turn the dryer on. The dryer LCD screen will turn on indicating that the dryer is operating. After a short time, one tower will depressurize and start to purge. The other tower will be drying air at full line pressure. After about 4 minutes, the low pressure tower will re-pressurize and the towers will switch functions. The amber indicator lights should light in sequence with the LCD display and the tower pressure gauges (for more detail, see operating sequence on page14).
5. Adjust the purge flow control valve to the proper pressure setting following procedures outlined in the section titled Setting the Purge Pressure starting on page11.

## **SHUTDOWN:**

1. Open by-pass valve. Close dryer outlet valve and dryer inlet valve. Allow the dryer to continue to operate until tower switch-over. Both towers should now be at atmospheric pressure.
2. Turn the dryer off.

## **RECOMMENDATIONS FOR IMPROVED PERFORMANCE**

1. Do not exceed rated design flow, inlet temperature or operating pressure.
2. Make sure dryer is turned on when air is passed through the unit. Tower switching is vital to the successful drying of air.
3. Install a coalescing pre-filter before the dryer to prevent oil carry-over from the compressor from coating the desiccant. The dewpoint performance of the dryer is greatly diminished when the desiccant becomes dirty or coated with oil.
4. Install a particulate after-filter in the air line immediately after the dryer. The desiccant in your dryer can produce dust that will be passed downstream if a particulate filter is not used.
5. Change pre-filter and after-filter elements regularly. The coalescing pre-filter, when operating properly, will remove contaminants such as oil and liquid water as well as abrasive solids that could reduce the effectiveness of the dryer. The particulate after-filter will prevent desiccant particles from migrating downstream and possibly damaging equipment.
6. Never weld to vessel framework. This may cause damage to the digital timing device which controls dryer operation.
7. Check and clean the muffler often during initial operation. Desiccant dust is especially heavy after shipment and tower filling. Allow the dryer to cycle several times without the muffler. Remember to wear hearing protection.
8. A couple of weeks after filling dryer with desiccant, shut unit down and check desiccant level. Top off with fresh desiccant if necessary.
9. Should a problem arise, consult the Troubleshooting Guide (Page 21).
10. Ensure that each tower re-pressurizes to at least 90% of line pressure before switchover.

## MAINTENANCE

1. Change pre-filter and after-filter elements regularly!!! HLD-PAK Models are equipped with Differential Pressure Gauges or Indicators depending upon model. For those models equipped with indicators, the element should be changed when the red indicator pops up. For models equipped with gauges, the elements should be changed when the gauge needle moves into the red zone. The dryer's built-in "maintenance hours" may be use to track filter element life and schedule replacement. *(For specific instructions on changing filter elements, refer to the section entitled Changing Filter Elements.)*
2. Periodically check that the dryer is cycling properly. Watch for each tower to alternate between line and atmospheric pressure. The entire cycle will take about 8 minutes (unless unit time values have been adjusted).
3. Approximately once a year, shut unit down and inspect all valves. (Based on an 8 hour work day).
4. Approximately once a year, check the desiccant bed for oil contamination and/or losses.
5. Should a problem arise, consult the Troubleshooting Guide (Page 21).

### **REPLACING DESICCANT:**

Air/Tak regenerative air dryers utilize the ALCOA brand activated alumina. The 1/8" or 3/16" diameter is used on most Models. Smaller diameters of desiccant or other brands are not recommended. (For molecular sieve use: 1/3 activated alumina, 1/3 molecular sieve, 1/3 activated alumina)

1. Open by-pass valve. Close dryer outlet valve and dryer inlet valve. Allow the dryer to continue to operate until tower switch-over. Both towers should now be at atmospheric pressure.
2. Turn dryer off.
3. Loosen plug at bottom of tower. Allow desiccant to drain, then replace plug. Loosen plug at top of tower. Fill with fresh desiccant, then replace plug.
4. Desiccant dust may be unusually heavy after changing the desiccant. To remove this dust from the dryer, allow the dryer to cycle several time **without** the purge muffler. Remember to wear hearing protection during this procedure.
5. A couple of weeks after filling the dryer with desiccants shut the unit down and check desiccant level. Top off with fresh desiccant if necessary.
6. Should a problem arise, consult the Troubleshooting Guide (Page 21).

***IMPORTANT: Your AIR/TAK Heatless Regenerative Air Dryer was designed to use a specific desiccant. When replacing the desiccant, always use desiccant of the same size and type as that which was supplied with your dryer. For more information, please consult the factory.***

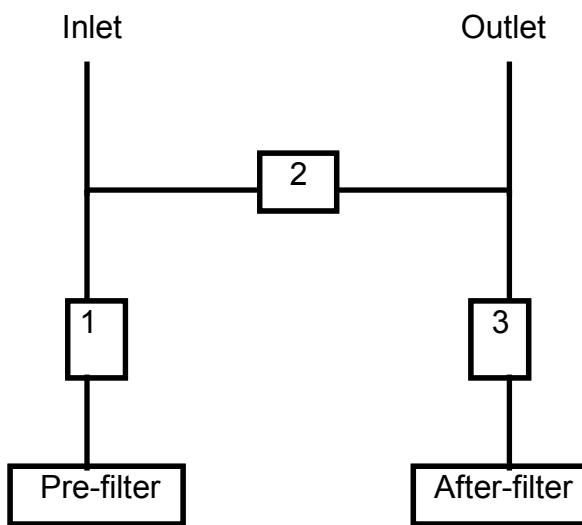
### **CHANGING FILTER ELEMENTS:**

1. Take the dryer off-line following the steps detailed in the section entitled Operating the Three-Valve Bypass. ***Be sure to bleed off all air pressure from the dryer and filters before performing any maintenance.***
2. Remove any external drain valve from the filter housing.
3. Remove the bowl from the head of the filter by turning bowl in a counter clockwise direction.
4. Remove the dirty filter element by removing the threaded endcap at the bottom of the filter. Dispose of dirty elements properly.
5. Guide new element over the center rod and replace the threaded endcap, taking care to ensure that the new element is seated properly. Do not overtighten the endcap.
6. Replace the filter housing and drain valve. ***Check all connections for tightness to prevent air leaks before bringing the dryer back online. See section entitled Operating the Three-Valve Bypass for instructions on bringing the dryer on-line.***

## OPERATING THE THREE-VALVE BYPASS (PAK MODELS)

1. HLD-PAK Plus I and Plus II Models of desiccant air dryers are equipped with a factory installed three-valve bypass for ease in performing routine maintenance such as changing filter elements. If your model is not a PAK Plus I or II, it is recommended that you install a three-valve bypass, similar to the one depicted in Figure 1.0 when installing the dryer.
2. During normal operation, valves 1 & 3 will be open and valve 2 will be closed, allowing air to flow through the filters and dryer.
3. To perform routine maintenance, operate the valves in 3-2-1 order to allow air to flow directly from the inlet connection to the outlet connection without passing through the dryer (close valve 3, open valve 2 and close valve 1). **Remember to bleed the air pressure from the dryer and filters before performing any service. See Sections entitled Maintenance, Changing Filter Elements, or Replacing Desiccant for specific instructions.**
4. When bringing the dryer back on-line after maintenance, operate the valves in 1-2-3 order to prevent backflow to the dryer and filters. (Open valve 1, close valve 2, open valve 3.)

Figure 1.0 - Typical HLD-PAK Three-Valve Bypass



## OPERATING THE PURGE SAVER (OPTIONAL)

**Description:**

The Purge Saver is a control system that adjusts the drying cycle based on the pressure dewpoint the dryer produces, thereby saving energy (compressed air). The Purge Saver is available as an option on all Air/Tak desiccant dryers.

The system consists of a moisture analyzer (hygrometer) connected to the outlet air piping of the dryer. This moisture analyzer transmits data to the Purge Saver solid-state mother board regarding the moisture content of the outlet compressed air supply.

The Factory set point is -20°F. The dryer cycle is based on this dewpoint, rather than being based on a constant time cycle. Energy saving is achieved when the dryer goes into Purge Saving cycle holding mode. This occurs if the dewpoint is less than -20°F at the end of the regeneration cycle.

**Operating the Purge Saver:**

If at the end of a half cycle, the measured value of the dewpoint at the outlet of the dryer exceeds the factory set point, the dryer will continue to the next half cycle. If the dewpoint is lower than the set point, the timer will hold the cycle with the online tower continuing to dry the air. The tower that was regenerating will remain idle until the dewpoint reaches the set point in the online tower, then the towers will switch and the next cycle will be initiated.

**Description:**

The Flex Power Purge System II (FPPS II) is a control system that enables the user to determine the pressure dewpoint the dryer produces, thereby saving energy (compressed air) when operating at dewpoints higher than -40°F. The Flex Power Purge System II is available as an option on all Air/Tak desiccant dryers and is standard equipment on the HLD-PAK Plus II models.

The system consists of a user interface with digital readout, and a hygrometer (moisture analyzer) connected to the outlet air piping of the dryer. This moisture analyzer transmits data to the FPPS II regarding the moisture content of the outlet compressed air supply.

The user enters the desired operating dewpoint of the dryer via the user interface. The dryer purges the off-line tower based on the dewpoint entered by the user, rather than purging based on a constant -40°F pressure dewpoint. Energy saving is achieved when the user selects a dryer operating dewpoint higher than -40°F.

The user interface enables the user to enter the desired dewpoint and to monitor the dewpoint of the outlet compressed air supply. The units can either be shown in °F or °C and are factory set.

**Front Panel Controls:**

The Flex Power Purge System II has two displays and four front panel controls that allow the user to interact with the instrument.

The upper display shows the actual system dewpoint and the bottom display shows the desired dewpoint setting.

The controller keys are as follows:



Up key



Down key



Advance key



Infinity (do not use)

**Selecting Dewpoint Units:**

The Flex Power Purge System can display the measured moisture content of the dryer outlet air in two different units:

- Dewpoint in °F
- Dewpoint in °C

**The desired units are factory set and must be stated when ordering.**

**Operating the Flex Power Purge System II:**

The Flex Power Purge System II enables the user to set the desired dewpoint for the dryer. If, at the end of a half cycle, the measured value of the dewpoint at the outlet of the dryer exceeds the setpoint, the dryer will continue to the next half cycle. If the dewpoint is lower than the setpoint, the timer will hold the cycle with the online tower continuing to dry the air. The tower that was regenerating will remain idle until the dewpoint reaches the setpoint in the online tower, then the towers will switch and the next cycle will be initiated. During this holding period "DEMAND" will be displayed on the LCD screen, along with the length of time that the cycle has been on hold.

When the dewpoint exceeds the high humidity setpoint the red alarm light will begin to flash and the lower portion of the LCD screen will display "HIGH HUMIDITY". When the dewpoint decreases below the high humidity setpoint and the reset button is depressed, the red alarm light will remain on steady for one full cycle. If the dewpoint remains below the setpoint, the alarm light will turn off.

To determine the current dewpoint setting, read the lower display.

Note: For accurate operation, the dewpoint transmitter (probe) must be supplied with a constant flow of air. In dryers where the transmitter is not placed directly in the stream of outlet air, a ¼" needle valve is used to provide air flow. This needle valve should be set to provide only a very small air flow.

### **Changing the Desired Dewpoint:**

- a) Determine the current dewpoint setting by reading the lower display.
- b) Indicate a change by depressing the UP key or the DOWN key. To increase the dewpoint, push the UP key, to decrease push the DOWN key. A momentary push-and-release will change the value by one unit. A push-and-hold will cause the value to scroll until the key is released.
- c) When the desired value is reached, no further action is necessary.

### **Setting the High Humidity Warning Light:**

Determine the current High Humidity Warning setting by using the following steps:

- a) Press the ADVANCE key: The upper display will show "-112" and the lower display will show "ALO". **DO NOT CHANGE.**
- b) Press the ADVANCE key a second time: The upper display will show "0" and the lower display will show "AHI". **Change the set point by using the UP key and DOWN key.**
- c) **Press the ADVANCE key a third time: The display will return to normal.**

### **Probe Removal:**

- a) It may be necessary to periodically remove the probe for calibration or repairs. **The minimum time period for calibration is every two (2) years.** In order to accomplish this without disruption of normal dryer operation use the following procedure:
  - Disconnect power to the dryer.
  - Without removing any connections place a jumper between Terminal 1 and Terminal 10 (controller terminals are in a horse shoe pattern) on the on the panel mounted controller (between Terminal 4 and Terminal 6 if the controller terminal are in a straight line). Orange/White and Orange/Black wires.
  - Restore power.
- b) These steps will disable the Flex Power Purge Mode.

***Troubleshooting Note:***

The operating range of the FPPS II is **-112°F to 68°F**. A number in the upper display outside of this range (such as **-157°F**) may indicate that the controller is not communicating with the probe (most likely there is an open cable connection or an incorrect connection). If a unit fails in this manner, the dryer will default to the **Flex Power Purge** mode. This condition is also indicated by the **High Humidity Alarm Light** and the LCD screen showing the word **"DEMAND"** at the same time.

If the dryer must continue to run for any period of time before the problem is corrected Alarm 1 must be disabled in order for the dryer to cycle (see Probe Removal).

### OPERATING THE FAIL-TO-SWITCH ALARM (OPTIONAL)

Air/Tak's Fail-To-Switch Warning Light option utilizes pressure switches to verify proper valve operation and tower sequencing. The pressure switches are factory set between 40PSIG and 60 PSIG. Each pressure switch has a single pole, single throw contact and the switch should alternate between the poles in sequence with the towers. The timer reads the inputs from the switches and will signal an alarm if the inputs are not correct. Once an alarm condition has occurred the red alarm light will begin to flash. When the problem has been corrected the reset button must be depressed. The red alarm light will remain steady on for one full cycle and then turn off (see troubleshooting chart for causes of switching failures).

### SETTING THE PURGE PRESSURE

There are four steps to determine and set the proper Purge Pressure for your AIR/TAK dryer based on your operating

conditions. Proper adjustment of the Purge Pressure is vital to the performance of your dryer.

**Step 1. Calculating Purge Flow Rate:** 
$$PurgeFlowRate = \frac{(Q \times 14.7)}{(P + 14.7)} \times 1.15$$

Perform the above calculation where Q = your inlet flow to the dryer in SCFM and P = your inlet pressure in PSIG.

**EXAMPLE:**

If your inlet flow is 200 SCFM and your inlet pressure is 110 PSIG, the calculation would look like this:

$$PurgeFlowRate = \frac{(200 \times 14.7)}{(110 + 14.7)} \times 1.15$$

OR

$$\frac{2940}{124.7} \times 1.15 = 27.1$$

Your Purge Flow Rate is 27.1 SCFM!

**Step 2. Determining Column on Purge Pressure Table:**

Consult the following table to determine which column on the Purge Pressure Table you will use to find your purge pressure:

AIR/TAK MODEL #	COLUMN
HLD-25/HLD-PAK-25	A
HLD-35/HLD-PAK-35	B
HLD-50/HLD-PAK-50	B
HLD-70/HLD-PAK-70	C
HLD-100/HLD-PAK-100	C
HLD-150/HLD-PAK-150	D
HLD-200/HLD-PAK-200	D
HLD-250/HLD-PAK-250	E
HLD-350/HLD-PAK-350	E
HLD-500/HLD-PAK-500	F
HLD-650/HLD-PAK-650	F
HLD-800/HLD-PAK-800	G
HLD-1000/HLD-PAK-1000	G
HLD-1250/HLD-PAK-1250	G
HLD-1500/HLD-PAK-1500	H
HLD-2000/HLD-PAK-2000	H
HLD-2500/HLD-PAK-2500	H
HLD-3000	H
HLD-3500	I
HLD-4500	I
HLD-5500	I
HLD-6250	I

EXAMPLE: If you have a Model HLD-250, you will use column E in the next step.

**Step 3. Determining Purge Pressure:**

Locate the column on the following table that corresponds with the letter you determined in Step 2. Once you have found the proper column, move down the column until you find the number that most closely equals the number you

calculated in Step 1 (Purge Flow Rate). Move across the table to the gauge reading at the end of the row in which you found your purge flow rate. This is your purge pressure.

### **PURGE PRESSURE CHART**

Purge Pressure	A	B	C	D	E	F	G	H	I
5	.965	2.18	3.86	8.71	15.4	34.7	61.6	139	246
10	1.36	3.08	5.45	12.3	21.8	49.1	87.2	196	349
15	1.67	3.75	6.65	15.0	26.7	60.1	107	240	427
20	1.93	4.25	7.7	17.1	30.8	69.3	123	277	493
25	2.16	4.75	8.6	19.4	34.5	77.6	138	311	552
30	2.52	5.6	10.0	22.5	40.0	90.0	160	360	640
35	2.8	6.2	11.2	25.0	44.7	101	179	402	715
40	3.07	6.8	12.3	27.5	49.1	110	196	442	786
45	3.36	7.6	13.4	30.3	53.8	121	215	484	861
50	3.64	8.2	14.5	32.8	58.2	131	233	524	931
60	4.20	9.4	16.8	37.5	67.0	151	268	603	1072
70	4.76	10.7	19.0	43.0	76.0	171	304	684	1216
80	5.32	11.9	21.2	47.5	85.0	191	340	765	1360
90	5.87	13.1	23.5	52.5	94.0	212	376	846	1504
100	6.45	14.5	25.8	58.3	103	232	412	927	1648

**EXAMPLE:**

You determined in Step 1 that your Purge Flow Rate was 27.1. In Step 2 you determined that you needed to use Column E on the Purge Pressure Chart by following Column E down to 26.7 (closest on the chart to 27.1). Next, move across this row to the Purge Pressure Column, you would find that your Purge Pressure for this dryer would be 15 PSIG.

**Step 4. Setting the Purge Pressure:**

In this Step, you will adjust the Purge Pressure of the dryer to that which you determined in Step 3. Locate the Purge Pressure Valve and Purge Pressure Gauge on your dryer. With the dryer pressurized and operating with one tower drying and one purging, adjust the Purge Pressure Valve to the setting determined in Step 3.

Your dryer has now been adjusted to match the specific operating conditions of your application. Should changes in operating pressure or inlet flow occur, you must repeat Steps 1 through 4 to re-adjust Purge pressure for the new conditions!

You should also consult the following Capacity Chart to determine the capacity of your dryer. Changes in operating pressure can result in increased or decreased dryer capacity. The following chart will help you determine if your dryer is sized properly for the conditions in which it is operating.

### **CAPACITY CHART (SCFM)**

<b>OPERATING PRESSURE</b>
---------------------------

MODEL NO.	60	75	80	85	90	95	100	105	110	125	150
HLD-25	16	20	21	22	23	24	25	26	27	30	36
HLD-35	23	27	29	30	32	33	35	37	38	43	50
HLD-50	33	39	41	43	46	48	50	52	54	61	72
HLD-70	46	55	58	61	64	67	70	73	76	85	101
HLD-100	65	78	83	87	91	96	100	104	109	122	144
HLD-150	98	117	124	130	137	143	150	157	163	183	215
HLD-200	130	156	165	174	183	191	200	209	217	244	287
HLD-250	163	196	206	217	228	239	250	261	272	304	359
HLD-350	228	274	289	304	319	335	350	365	381	426	503
HLD-500	326	391	413	435	456	478	500	522	544	609	718
HLD-650	423	508	537	565	593	622	650	678	707	792	933
HLD-800	521	626	661	695	730	765	800	835	870	974	1149
HLD-1000	651	782	826	869	913	956	1000	1044	1087	1218	1436
HLD-1250	814	978	1032	1087	1141	1196	1250	1304	1359	1522	1795
HLD-1500	977	1173	1238	1304	1369	1435	1500	1565	1631	1827	2154
HLD-2000	1303	1564	1651	1738	1826	1913	2000	2087	2174	2436	2872
HLD-2500	1628	1955	2064	2173	2282	2391	2500	2609	2718	3045	3590
HLD-3000	1954	2346	2477	2608	2738	2869	3000	3131	3262	3654	4308
HLD-3500	2280	2737	2890	3042	3195	3347	3500	3653	3805	4263	5026
HLD-4500	2931	3519	3715	3912	4108	4304	4500	4695	4892	5481	6462
HLD-5500	3582	4301	4541	4781	5020	5260	5500	5740	5980	6699	7898
HLD-6250	4070	4888	5160	5433	5705	5978	6250	6522	6795	7612	8974

**Heatless Regenerative Air Dryer Operating Sequence FOR HLD-25 through HLD-350**

Dryer operates on a standard 10:00 (10 Minute) cycle. The following chart shows how different components function

during that 10:00 time span:

FUNCTION	Initial Delay	Purge Delay	Purge	Re-press. Delay	Re-press	Initial Delay	Purge Delay	Purge	Re-press. Delay	Re-press	Initial Delay
<b>Length of Function (min:sec)</b>	0:02	0:04	4:24	0:06	0:24	0:02	0:04	4:24	0:06	0:24	0:02
<b>Total Time (min:sec)</b>	0:02	0:06	4:30	4:36	5:00	5:02	5:06	9:30	9:36	10:00	0:02
<b>4-Way Switching Valve</b>	OFF	ON	ON	OFF	OFF	OFF	ON	ON	ON	ON	OFF
<b>Purge Control Valve</b>	OFF	OFF	ON	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF

(ON- The solenoid coil is energized, OFF- The solenoid coil is de-energized)

- Turn the unit on. Both towers and the purge gauge will read line pressure.
- After a two (2) second initial delay the 4-way switching valve solenoid coil will be energized (Rung 14).
- After six (6) seconds the 2-way purge control valve solenoid coil will be energized and the right tower will depressurize to near 0 PSIG (Rung 16).
- The purge pressure should then be set to the appropriate purge pressure setting. Air will bleed out of the muffler, regenerating the right tower, for four minutes and twenty-four seconds (4:24), then the purge control valve will de-energize and close (Rung 16), allowing the right tower to begin re-pressurization.
- Following re-pressurization, the switching valve solenoid coil will de-energized and change positions will change positions (Rung 14).
- Both towers and the purge gauge will again be at line pressure.
- After six (6) seconds the 2-way purge control valve solenoid coil will be energized and the left tower will depressurize to near 0 PSIG (Rung 16) and regenerate for four minutes and twenty-four seconds (4:24).
- The cycle then repeats.

Optional Equipment:

Flex Power Purge:

- At the end of any half-cycle, the dewpoint is below the selected setpoint.
- The contacts of output 2 of the Flex Power Purge Controller will close (Rung 9).
- The purge control valve solenoid coil will de-energize (Rung 16) and the off-line tower will re-pressurize.
- The 4-way switching valve (Rung 14) will not change positions and the purge control valve will not be energized (Rung 16).
- All components will remain in this same state until the dewpoint is greater than the setpoint and the output 2 contact opens (Rung 9) or the maximum DEMAND time expires.
- At anytime, when the dewpoint is greater than the setpoint of AHI (see page 9), the contact of output 1 of the Flex Power Purge Controller will close (Rung 8).
- The alarm light (Rung 10) will flash.
- When the dewpoint becomes less than the setpoint of AHI, the output 1 contact will open.
- The alarm light will continue to flash until it is reset (see page 9).

Fail-to-Switch:

- The pressure switches (Rung 6 and Rung 7) must open and close to correspond with the proper sequence of the

- 4-way switching valve and the 2-way purge control valve.
- When the switches do not match the correct sequence, the alarm light (Rung 10) will begin to flash.
- The alarm light will continue to flash until it is reset (see page 10).

Dry Alarm Contact:

- This contact (Rung 4) may be used for a local or remote audible or visible alarm. The contact closed for both the Fail-to-Switch and the High Humidity conditions. It operates in unison with the flashing alarm light and is reset in the same manor.

Remote Reset:

- A momentary switch may be added to the dryer, so that alarm condition can be reset from a remote location (Rung 5).

This section of the menu allows you to set the unit's internal clock. It is not essential that the clock be correct unless shift settings are being used.

CURRENT DISPLAY	PRESS	RESULTING DISPLAY
NORMAL	ENTER	PASS CODE:
PASS CODE	ENTER	SET CLOCK: NO
SET CLOCK: NO	? OR ?	SET CLOCK: YES
SET CLOCK: YES	ENTER	SET DAY
SET DAY	? OR ?	To change day of the week
SET DAY	ENTER	SET HOURS
SET HOURS	? OR ?	To change hours
SET HOURS	ENTER	SET MINUTES
SET MINUTES	? OR ?	To change minutes
SET MINUTES	ENTER	SET MONTH
SET MONTH	? OR ?	To change month
SET MONTH	ENTER	SET DAY OF MONTH
SET DAY OF MONTH	? OR ?	To change day of month
SET DAY OF MONTH	ENTER	SET YEAR
SET YEAR	? OR ?	To change year
SET YEAR	ENTER	ENTER SETUP? NO
	ESC	
	ESC	

### ENABLING AND SETTING PASSCODE

This section of the menu allows you to protect the settings from inadvertent changes. It is recommended that the passcode is not enabled until all setting changes are completed and tested.

CURRENT DISPLAY	PRESS	RESULTING DISPLAY
NORMAL	ENTER	PASS CODE:
PASS CODE	ENTER	SET CLOCK: NO
SET CLOCK: NO	ENTER	ENTER SETUP? NO
ENTER SETUP? NO	? OR ?	ENTER SETUP? YES
ENTER SETUP? YES	ENTER	CHANGE PASS CODE? NO
CHANGE PASS CODE? NO	? OR ?	CHANGE PASS CODE? YES
CHANGE PASS CODE? YES	ENTER	PASS CODE: 55555
PASS CODE: 55555	? OR ?	To change passcode
PASS CODE: 12345	ENTER	PASSWRD DISABLED
PASSWRD DISABLED	? OR ?	PASSWORD ENABLED
PASSWORD ENABLED	ENTER	ARE YOU SURE? NO
ARE YOU SURE? NO	? OR ?	ARE YOU SURE? YES
ARE YOU SURE? YES	ENTER	
	ESC	
	ESC	
	ESC	

### DEFAULT SETTINGS

The following default options are available:

- 1) Make the factory default setting the current configuration.

- 2) Make the user default setting the current configuration.
- 3) Make the current configuration the user default setting.

These options allow you to adjust your settings as needed and to fall back to two different default configurations.

Terminology:

Factory Default Setting: The configuration set at the factory.

User Default Setting: The configuration set by you that best fits your system requirements.

Current Setting: The configuration that your unit is currently using.

CURRENT DISPLAY	PRESS	RESULTING DISPLAY
NORMAL	ENTER	PASS CODE:
PASS CODE	ENTER	SET CLOCK: NO
SET CLOCK: NO	ENTER	ENTER SETUP? NO
ENTER SETUP? NO	? OR ?	ENTER SETUP? YES
ENTER SETUP? YES	ENTER	CHANGE PASS CODE? NO
CHANGE PASS CODE? NO	ENTER	PASSWRD DISABLED/ENABLED
PASSWRD DISABLED/ENABLED	ENTER	MKE FCTRY DEFLTS CURNT SETS? NO
MKE FCTRY DEFLTS CURNT SETS? NO	ENTER	<i>MKE USER DEFLTS CURNT SETS? NO</i>
MKE USER DEFLTS CURNT SETS? NO	ENTER	MKE CURRENT SETS USER DEFLYS? NO
	ESC	
	ESC	
	ESC	

### ENABLING AND DISABLING FLEX POWER PURGE AND FAIL-TO-SWITCH

This section of the menu allows you to enable or disable the Flex Power Purge System and the Fail-to-Switch option. *Demand Mode* refers to the Flex Power Purge System and *PR alarm* refers to the Fail-to-Switch option.

CURRENT DISPLAY	PRESS	RESULTING DISPLAY
NORMAL	ENTER	PASS CODE:
PASS CODE	ENTER	SET CLOCK: NO
SET CLOCK: NO	ENTER	ENTER SETUP? NO
ENTER SETUP? NO	ENTER	SET DMD MODE? NO
ENTER SETUP? YES		CHANGE PASS CODE? NO
SET DMD MODE? NO	? OR ?	SET DMD MODE? YES
SET DMD MODE? YES	ENTER	DEMAND MODE OFF
DEMAND MODE OFF	? OR ?	DEMAND MODE ON
DEMAND MODE ON	ENTER	SET PR ALRM? NO
SET PR ALRM? NO	? OR ?	SET PR ALRM? YES
SET PR ALRM? YES	ENTER	PR ALRM DISABLED
PR ALRM DISABLED	? OR ?	PR ALRM ENABLED
PR ALRM ENABLED	ENTER	CHANGE SHIFT SETTINGS? NO
CHANGE SHIFT SETTINGS? NO	ESC	
	ESC	
	ESC	
	ESC	
	ESC	

### SETTING TIME VALUES

This section of the menu allows you to set time values for each portion of the dryer cycle. Each value will be the same during each half-cycle

Terminology:

INL DLY (Initial Delay) (00:00:02)

Delay after initial start-up

PRG DELAY (Purge Delay) (00:00:04)

Delay before purge valve opens

PURGE (Purge) (00:04:24)

Purge time before purge valve closes – sets the overall cycle time

RPR DLY (Re-pressurization Delay) (00:00:06)

Delay before re-pressurization valve opens (if used)

REPR (Re-pressurization) (00:00:24)

Length of time that re-pressurization valve remains open (if re-pressurization is not used re-pressurization occurs during this time via the purge adjusting valve)

MAX DLY (Maximum Delay) (00:30:00)

Maximum time the system will delay the cycle when the Flex Power Purge system is enabled

CURRENT DISPLAY	PRESS	RESULTING DISPLAY
NORMAL	ENTER	PASS CODE:
PASS CODE	ENTER	SET CLOCK: NO
SET CLOCK: NO	ENTER	ENTER SETUP? NO
ENTER SETUP? NO	ENTER	SET DMD MODE? NO
ENTER SETUP? YES	ENTER	CHANGE PASS CODE? NO
SET DMD MODE? NO	? OR ?	SET DMD MODE? YES
SET DMD MODE? YES	ENTER	DEMAND MODE OFF
DEMAND MODE OFF	? OR ?	DEMAND MODE ON
DEMAND MODE ON	ENTER	SET PR ALRM? NO
SET PR ALRM? NO	? OR ?	SET PR ALRM? YES
SET PR ALRM? YES	ENTER	PR ALRM DISABLED
PR ALRM DISABLED	? OR ?	PR ALRM ENABLED
PR ALRM ENABLED	ENTER	CHANGE SHIFT SETTINGS? NO
CHANGE SHIFT SETTINGS? NO	ESC	
	ESC	
	ESC	
	ESC	
	ESC	

### MAINTENANCE HOURS

This section of the menu allows you to monitor running hours of the dryer in order to accomplish preventative maintenance (such as checking and changing filters). The hours may be reset by choosing YES at the prompt.

CURRENT DISPLAY	PRESS	RESULTING DISPLAY
NORMAL	ENTER	PASS CODE:
PASS CODE	ENTER	SET CLOCK: NO
SET CLOCK: NO	ENTER	ENTER SETUP? NO
ENTER SETUP? NO	ENTER	SET DMD MODE? NO
SET DMD MODE? NO	ENTER	SET PR ALRM? NO
SET PR ALRM? NO	ENTER	CHANGE SHIFT SETTINGS? NO
CHANGE SHIFT SETTINGS? NO	ENTER	SET TIMES? NO
SET TIMES? NO	ENTER	RST MNT HRS? NO MAINT HRS 000095
RST MNT HRS? NO MAINT HRS 000095	ESC	
	ESC	
	ESC	
	ESC	
	ESC	

### MANUAL MODE

This section of the menu allows you to step the dryer through its sequence of operation manually for diagnostic purposes.

CURRENT DISPLAY	PRESS	RESULTING DISPLAY
NORMAL	ENTER	PASS CODE:
PASS CODE	ENTER	SET CLOCK: NO
SET CLOCK: NO	ENTER	ENTER SETUP? NO
ENTER SETUP? NO	ENTER	SET DMD MODE? NO
SET DMD MODE? NO	ENTER	SET PR ALRM? NO
SET PR ALRM? NO	ENTER	CHANGE SHIFT SETTINGS? NO
CHANGE SHIFT SETTINGS? NO	ENTER	SET TIMES? NO
SET TIMES? NO	ENTER	RST MNT HRS? NO
RST MNT HRS? NO	ENTER	MANUAL MODE? NO
MANUAL MODE? NO	? OR ?	MANUAL MODE? YES
MANUAL MODE? YES	ENTER	ENTER TO ADVANCE
ENTER TO ADVANCE	ESC	MANUAL MODE? NO
MANUAL MODE? NO	ENTER	CHGE PWR ON/OFF SETTINGS? NO
	ESC	
	ESC	
	ESC	
	ESC	

### START UP / SHUT DOWN OPTIONS

This section of the menu allows you to how the dryer will start. Toggle between selections using up and down keys.

PWR UP = PWR ON? NO - Following a loss of power, the power button must be depressed in order for the dryer to resume operation

PWR UP = PWR ON? YES - The unit will start automatically whenever power is applied or restored.

RESUME CYCLE ON TURN ON? NO - The dryer timing sequence will always start at the beginning of the cycle when turned on or power is restored.

RESUME CYCLE ON TURN ON? YES – The dryer will resume at part of the timing sequence when power was interrupted or the dryer was shut down.

START UP TOWER LEFT? \* This should not be changed unless directed by the factory.

START UP TOWER RIGHT?

SHUTDOWN MODE IMMEDIATE? When the power button is pushed, the dryer will shutdown without delay.

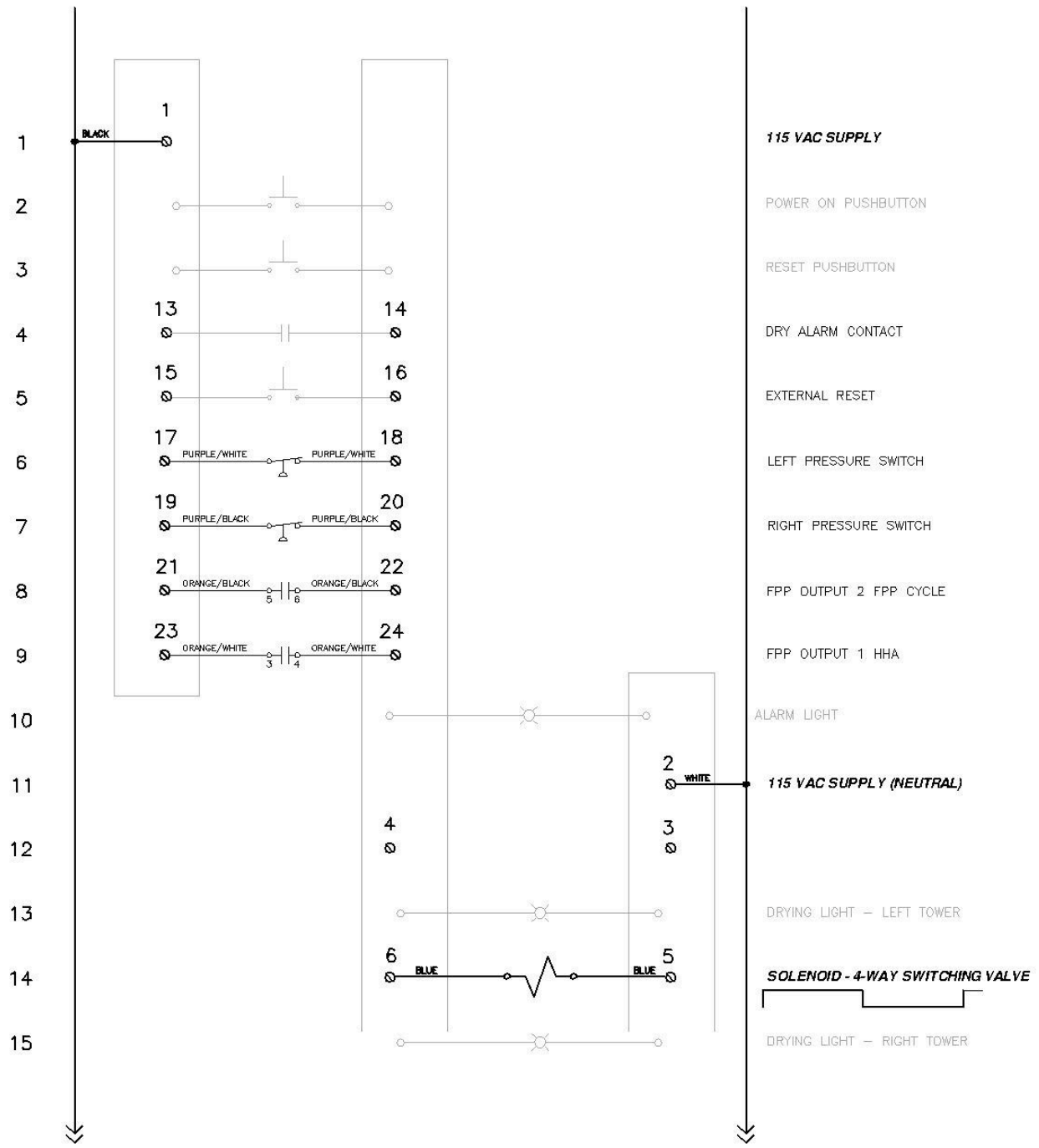
SHUTDOWN MODE FINISH CYCLE? When the power button is pushed, the dryer will finish the cycle and shutdown automatically.

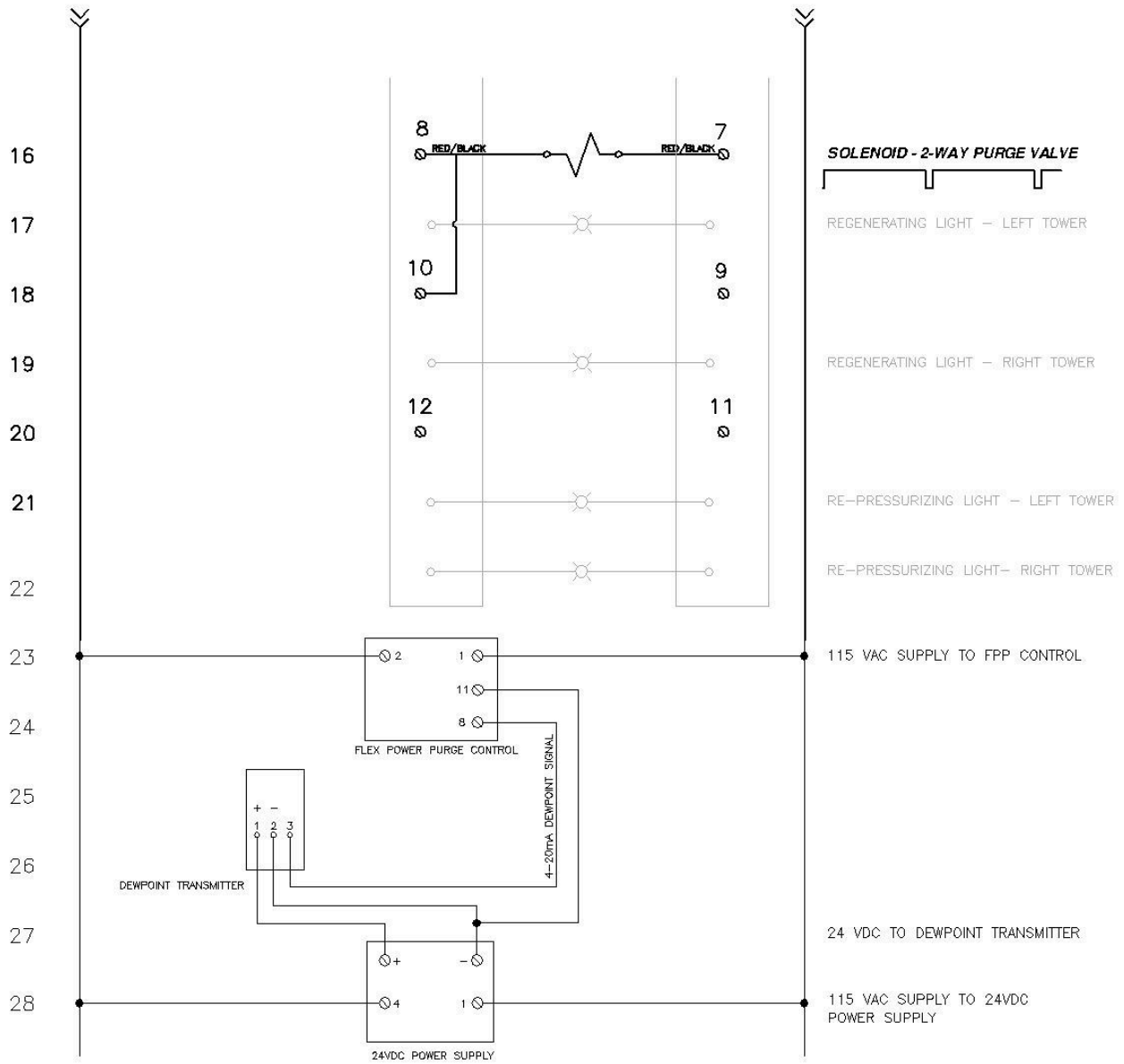
CURRENT DISPLAY	PRESS	RESULTING DISPLAY
NORMAL DISPLAY	ENTER	PASS CODE:
PASS CODE	ENTER	SET CLOCK: NO
SET CLOCK: NO	ENTER	ENTER SETUP? NO
ENTER SETUP? NO	ENTER	SET DMD MODE? NO
SET DMD MODE? NO	ENTER	SET PR ALRM? NO
SET PR ALRM? NO	ENTER	CHANGE SHIFT SETTINGS? NO
CHANGE SHIFT SETTINGS? NO	ENTER	SET TIMES? NO
SET TIMES? NO	ENTER	RST MNT HRS? NO
RST MNT HRS? NO	ENTER	MANUAL MODE? NO
MANUAL MODE? NO	ENTER	CHGE PWR ON/OFF SETTINGS? NO
CHGE PWR ON/OFF SETTINGS? NO	? OR ?	CHGE PWR ON/OFF SETTINGS? YES
CHGE PWR ON/OFF SETTINGS? YES	ENTER	PWR UP = PWR ON? NO
PWR UP = PWR ON? NO	ENTER	RESUME CYCLE ON TURN ON? NO
RESUME CYCLE ON TURN ON? NO	ENTER	START UP TOWER LEFT?
START UP TOWER LEFT?	ENTER	SHUTDOWN MODE IMMEDIATE?
SHUTDOWN MODE IMMEDIATE?	ENTER	NORMAL DISPLAY

## TROUBLESHOOTING GUIDE

PROBLEM	PROBABLE CAUSE	SOLUTION
Poor dewpoint performance	1. Flow exceeds rated capacity.	1. Reduce flow or consult factory if increased flow volume is needed.

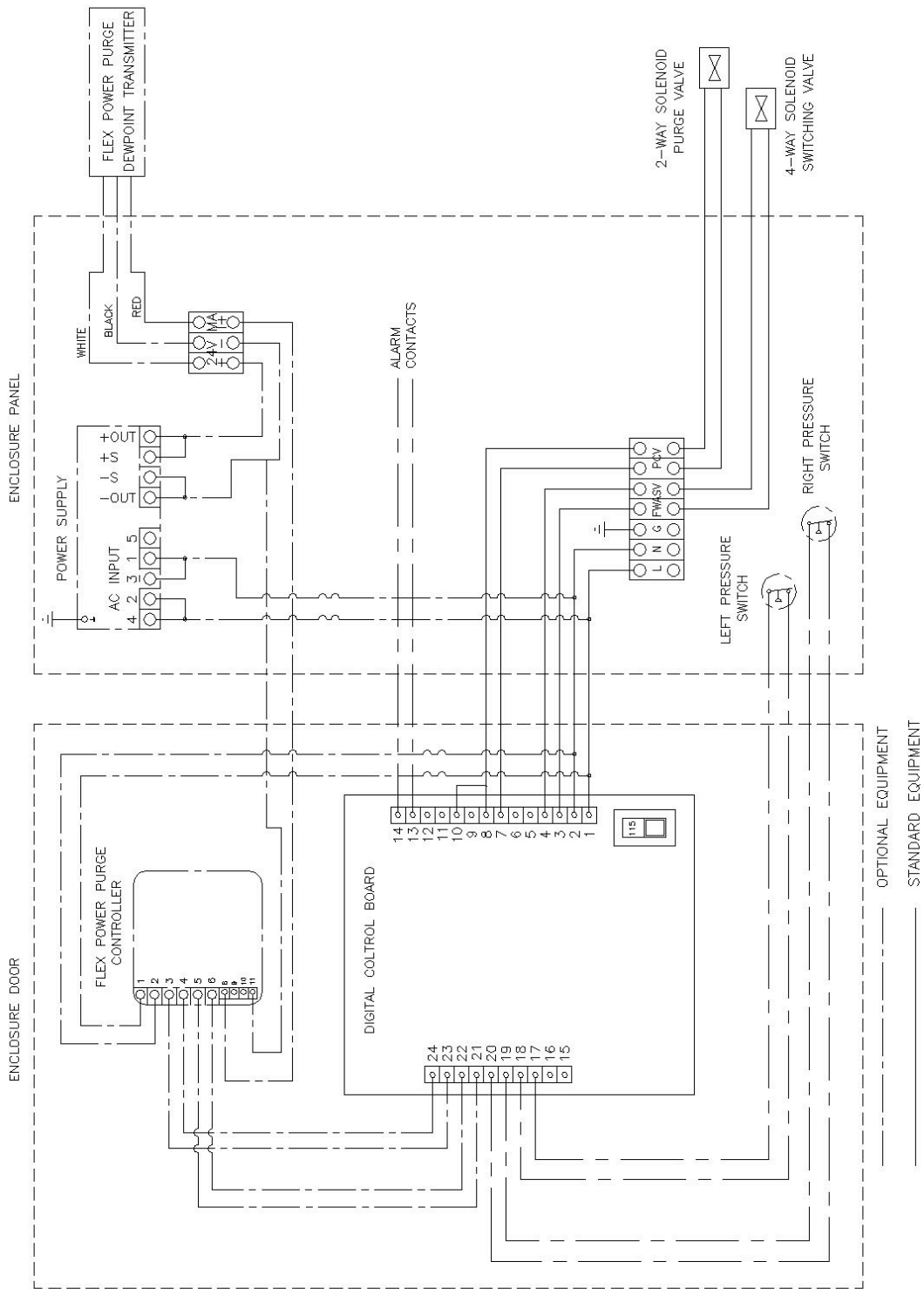
	2. Low Inlet pressure.	2. Adjust purge control valve to appropriate setting show in Purge Pressure Chart (page 10). Check and replace pre-filter element if necessary.
	3. Excessive water.	3. Check upstream separator, pre-filter and drain.
	4. Insufficient purge flow.	4. Check Purge Pressure Chart (page 10).
	5. Desiccant contamination.	5. Replace desiccant and filter elements.
	6. High inlet temperature, above 110°F.	6. Check aftercooler.
Excessive pressure drop across dryer.	1. Excessive inlet flow.	1. Reduce flow or consult factory if increased flow volume is needed.
	2. Low inlet pressure.	2. Check pre-filter and replace element if necessary.
	3. Switching valve failure.	3. Check for proper valve operation. If valve hangs up, check pilot air filter and replace element if necessary (Models 500 and above). Inspect valve, solenoid and actuator and replace if necessary.
Switch-over failure.	1. Electric power loss.	1. Turn dryer off. Check power to unit. Check all connections to solid state timer.
	2. Switching valve failure.	2. Check for proper valve operation. If valve hangs up, check pilot air filter and replace element if necessary (Model HLD-500 and above). Inspect valve, solenoid and actuator and replace if necessary.
	3. Fail-to switch pressure switch failure	3. Check for the proper operation of pressure switches.
Pressurization failure.	1. Purge flow control valve orifice clogged.	1. Clean or replace.
	2. Failed check valve.	2. Clean or replace.
	3. Purge exhaust solenoid valve failure.	3. Turn dryer off. Check connections to digital timer. Inspect valve and solenoid. Replace if necessary.
Purge failure.	1. Purge adjusting valve orifice clogged.	1. Clean or replace.
	2. Failure of check valve.	2. Clean or replace.
	3. Purge exhaust solenoid valve failure.	3. Turn dryer off. Check connections to solid state time. Inspect valve and solenoid. Replace if necessary.
	4. Purge exhaust muffler clogged.	4. Clean or replace.
Excessive desiccant dust	1. Low inlet pressure.	1. Increase inlet pressure.
	2. In adequate re-pressurization	2. Increase purge air pressure or increase re-pressurization time (see page 21)
Back-pressure build-up in tower being purged.	1. Purge exhaust muffler clogged.	1. Clean or replace.
	2. Failure of check valve.	2. Clean or replace.



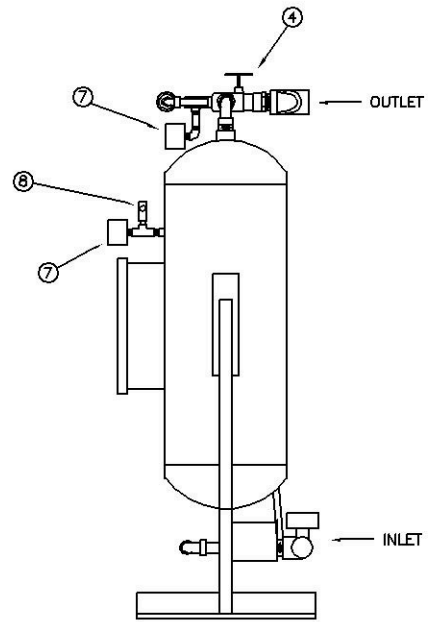
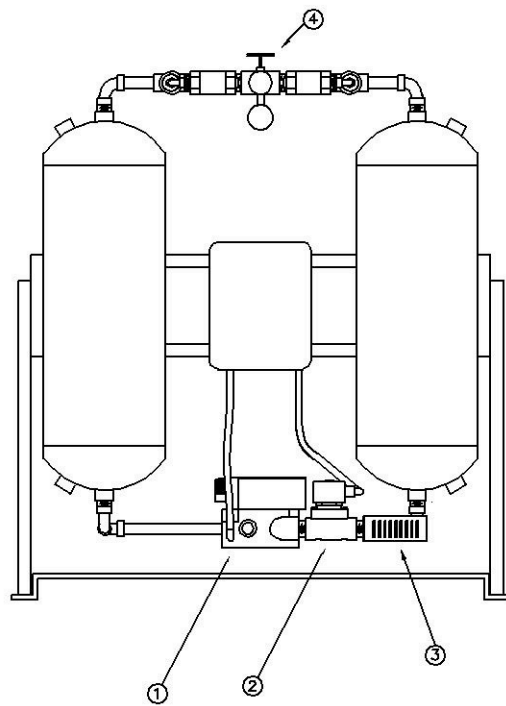
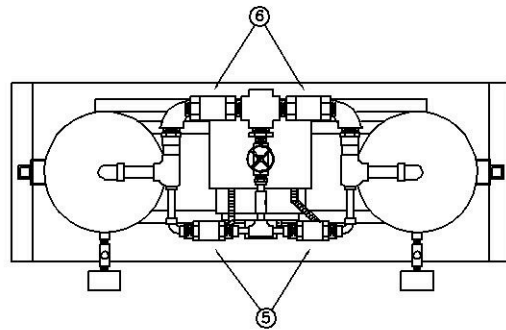


	<b>Visible components and wiring</b>
	Optional components and wiring
	Components and wiring internal to timer

# WIRING DIAGRAM FOR DIGITAL TIMER



TYPICAL HLD-25 THRU HLD-350  
THE APPEARANCE OF DRYER AND COMPONENTS MAY VARY



## 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 part 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.*

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

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**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**

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