

# *Air Pak* Drying Systems

Presented By:



**Dry Air Systems, Inc. Innovator of Unique Regenerative  
Desiccant Air Dryers For Compressed Air**

&

**Fluid Power Controls, Inc.  
Innovator And Supplier of Custom  
Pneumatic Designs And Components**



# How To View Presentation

- Click to advance slides (you can work at your own pace)
- Look for  and click to advance animation within slides
- Click on  returns to Table of Contents
- Each service section consists of a symptom, service procedure and animation slides
- A quiz at end of presentation

# Table of Contents

- [Safety](#)
- [Annual Service Recommendations](#)
- [Basic Dryer Operation \(All Models\)](#)
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- [Valve Service – Regeneration Valve](#)
- [Desiccant Cartridge Service Kits](#)
- [Micro Logic Timer](#)
- [Heater Assembly](#)



# Safety

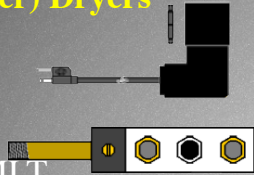
## **-WARNING-**

**BEFORE SERVICING DRYER UNIT(S) RELIEVE ALL AIR PRESSURE FROM DRYER UNIT(S) AND AIR LINES**

- Never connect or disconnect a pipe/line containing air pressure or remove a component, fitting or pipe plug unless you are certain all air pressure has been shut off and relieved
- Always wear proper eye protection and never look directly into ports of air dryer
- Never exceed recommended working air pressure of 190 psi/13.1 bar
- Use only proper tools and observe all precautions pertaining to the use of those tools
- Strap wrench, sockets and torque wrench's not shown to assist in clarity

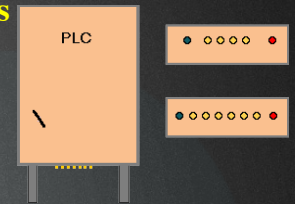
# Annual Service Recommendations

## MLT (Micro Logic Timer) Dryers



- Operational Check:
- Check electrical power to MLT
- Check all air connections for leaks or damaged signal lines
- Unit should exhaust (discharge) every two minutes
- Refer to flow diagram detailed in BASIC DRYER OPERATION
- If dryer fails to cycle, unplug timer, and manually cycle dryer several times turning small brass screw from 12 o'clock position to 2 o'clock position (approximately ¼ turn) located on spool valve. If dryer cycles manually, return brass screw back to original vertical position and reference "Troubleshooting AIR-PAK Air Dryer Systems".

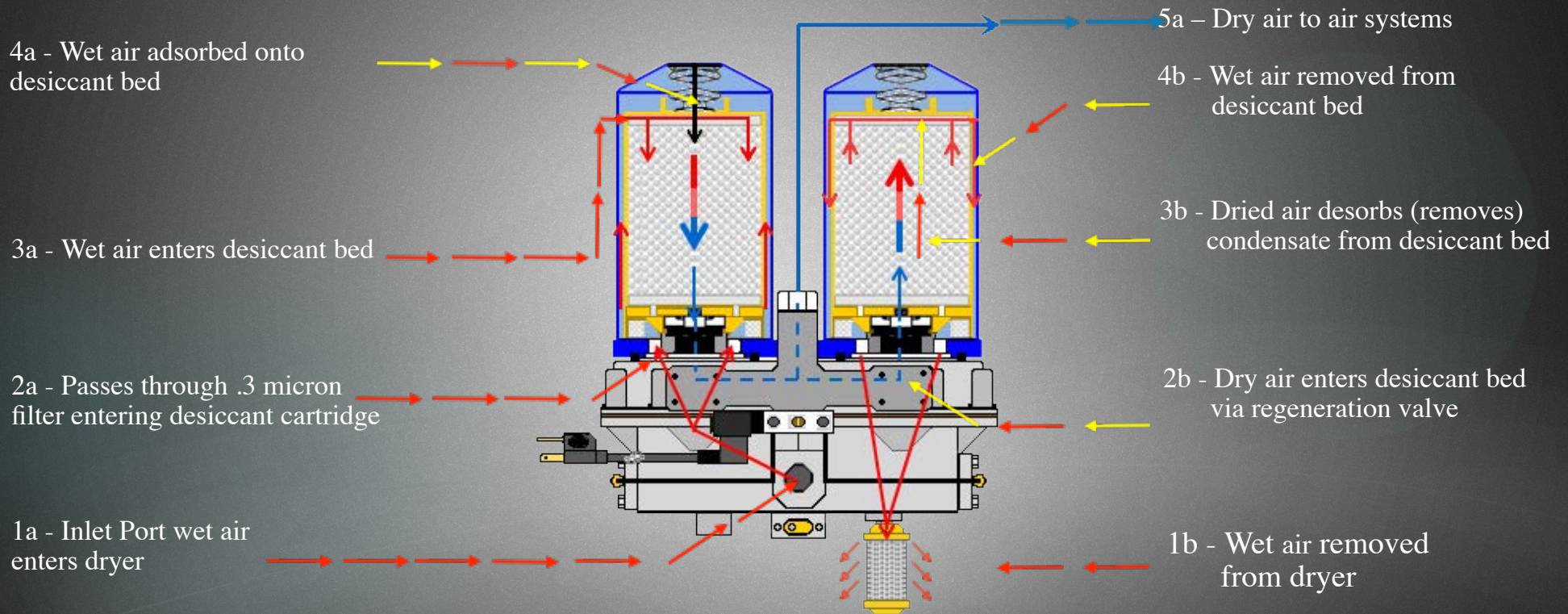
## PLC (Programmable Logic Control) Dryers



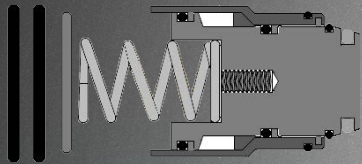
- Operational Check:
- Check electrical power to PLC (Green light on switch)
- Check all air connections for air leaks or damaged signal lines
- Unit should exhaust (discharge) every 45 seconds
- Refer to flow diagram detailed in BASIC Dryer Operation
- If dryer fails to cycle refer to TROUBLE SHOOTING AIR-PAK AIR DRYER SYSTEMS



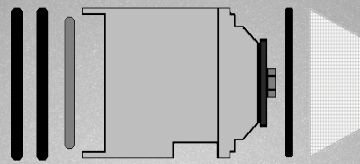
# Basic Dryer Operation (All Models)



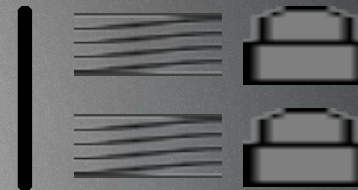
# Service and Related Components



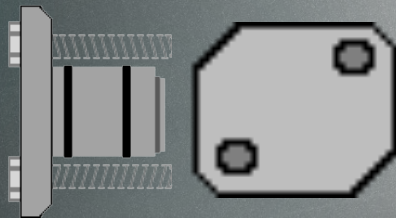
Intake Valve



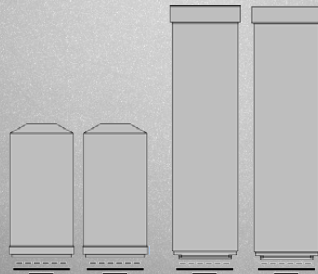
Purge (Unloader) Valve



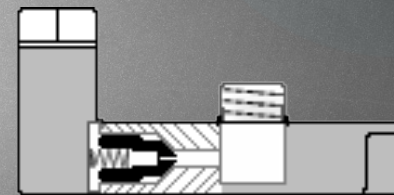
Regeneration Valve



Seal Retainer Valve

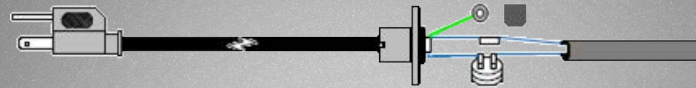


Desiccant Cartridges

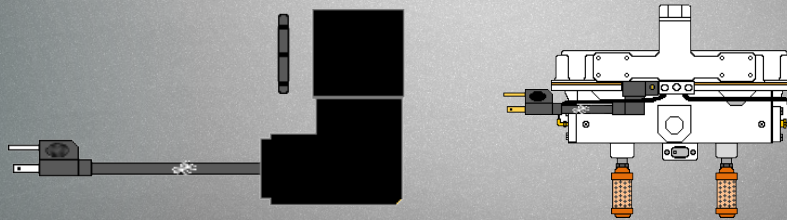


Adapter Plate w/ regen valve

# Service and Related Components cont'd



Heater Assembly (optional)



Micro Logic Timer (MLT)





**Inlet Check Valve**  
**#619702 Valve Service Kit**

# Inlet Check Valve Troubleshooting Symptoms

**Symptom:**  
**Heavy air flow from exhaust ports (all models)**

**NOTE:** Light air flow from .5 cfm - 1.6 cfm from either exhaust port (muffler) is normal as this represents the regeneration cycle

## Possible Cause

- Worn inlet check valves (O-rings)
- Worn purge valve or dirt/foreign material stuck in purge valve
- Regeneration valve not closing

## Remedy

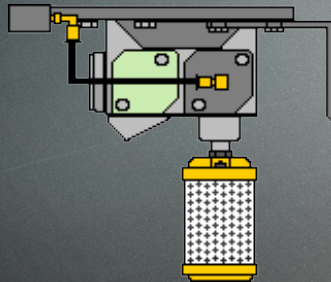
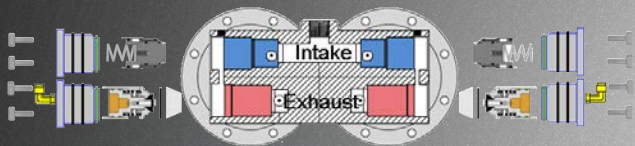
- Clean cavities and replace valve assemblies included in service kit #619702
- Clean cavities and replace purge valve assemblies included within service kit
- Clean cavities and replace regeneration valve assemblies within service kit

It is recommended if servicing one valve to service all four valves at this time



# Inlet Check Valve Removal / Installation

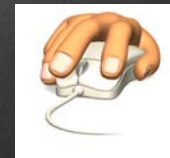
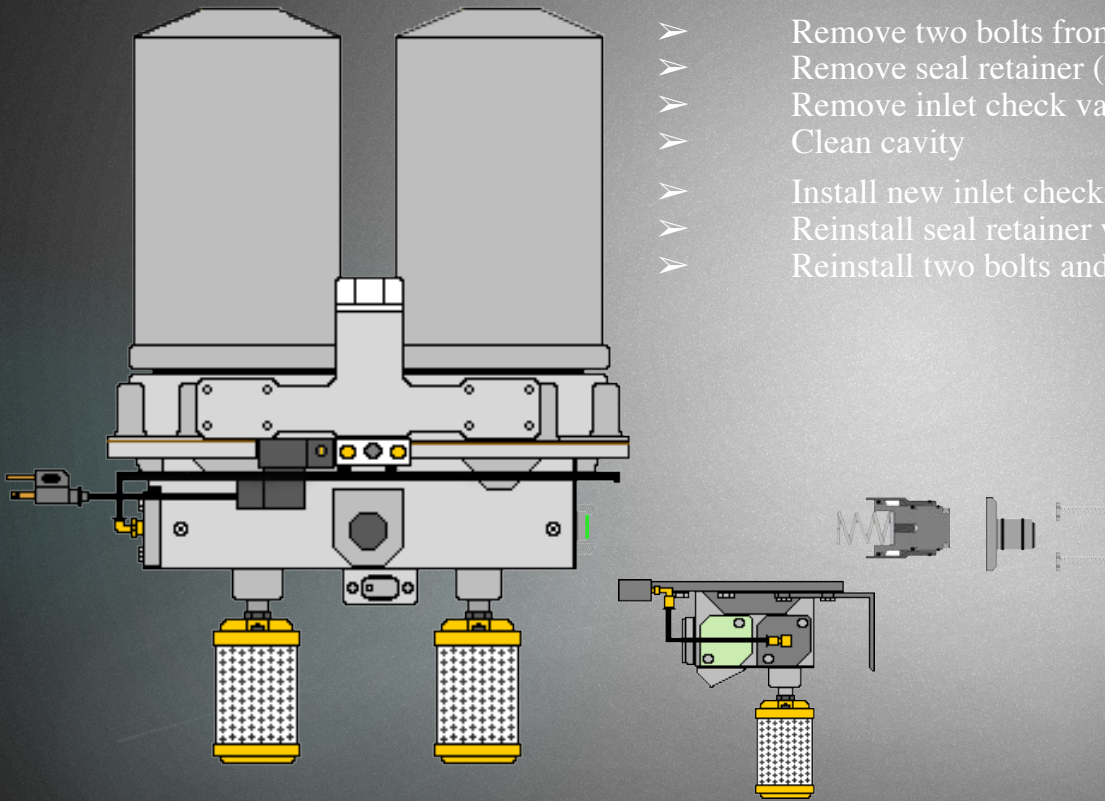
**Symptom:**  
**Heavy Air From Exhaust Port** (all models)



1. **WARNING: Relieve all system air pressure**
2. Remove two bolts from inlet check valve retainer and remove seal retainer - (identified as green in illustration)
3. Remove inlet check valve spindle from cavity and discard
4. Clean cavity thoroughly
5. Remove two (2) large O-rings and (1) smaller O-ring from retainer and discard
6. Install two (2) large O-rings and (1) smaller O-ring into grooves of seal retainer
7. Lubricate O-rings on check valve sleeve and install valve assembly (small end first) into the inlet cavity. Make sure spindle is completely seated
8. Lubricate O-rings on seal retainer and reinstall retainer.  
**AVOID TWISTING SEAL RETAINER**
9. Apply a light coating of grease on the threads of the two retainer bolts
10. Reinstall the retainer bolts torque to 15 ft. lb
11. Slowly pressurize system and check for leaks.

# Animated Inlet Check Valve Procedures

- Remove two bolts from Seal retainer
- Remove seal retainer (identified as green in illustration)
- Remove inlet check valve assembly
- Clean cavity
- Install new inlet check valve
- Reinstall seal retainer with three new O-rings
- Reinstall two bolts and torque to 15 ft. lb.





Purge Valve  
#619702 Valve Service Kit

# Purge Valve Troubleshooting

**Symptom:**  
**Heavy air flow from exhaust ports (all models)**

**NOTE:** Light air flow from .5 - 1.6 cfm from either exhaust port (muffler) is normal as this represents the regeneration cycle

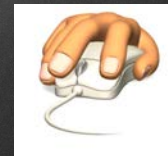
## Possible Cause

- Worn inlet check valves (O-rings)
- **Worn purge valve or dirt/foreign material stuck in purge valve**
- Regeneration valve not closing

## Remedy

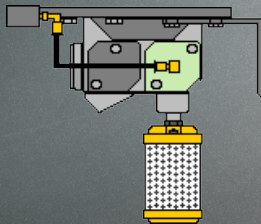
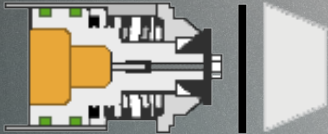
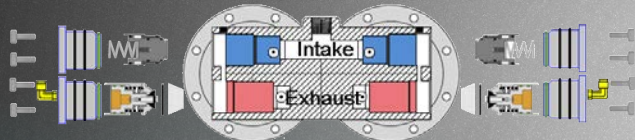
- Clean cavities and replace valve assemblies included in service kit #619702
- **Clean cavities and replace purge valve assemblies included within service kit**
- Clean cavities and replace regeneration valve assemblies within service kit

It is recommended if servicing one valve to service all four valves at this time



# Purge Valve Removal / Installation

**Symptom:**  
**Heavy Air From Exhaust Port** (all models)



Purge (Exhaust) Valves - (All models)

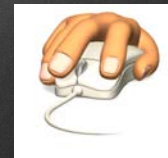
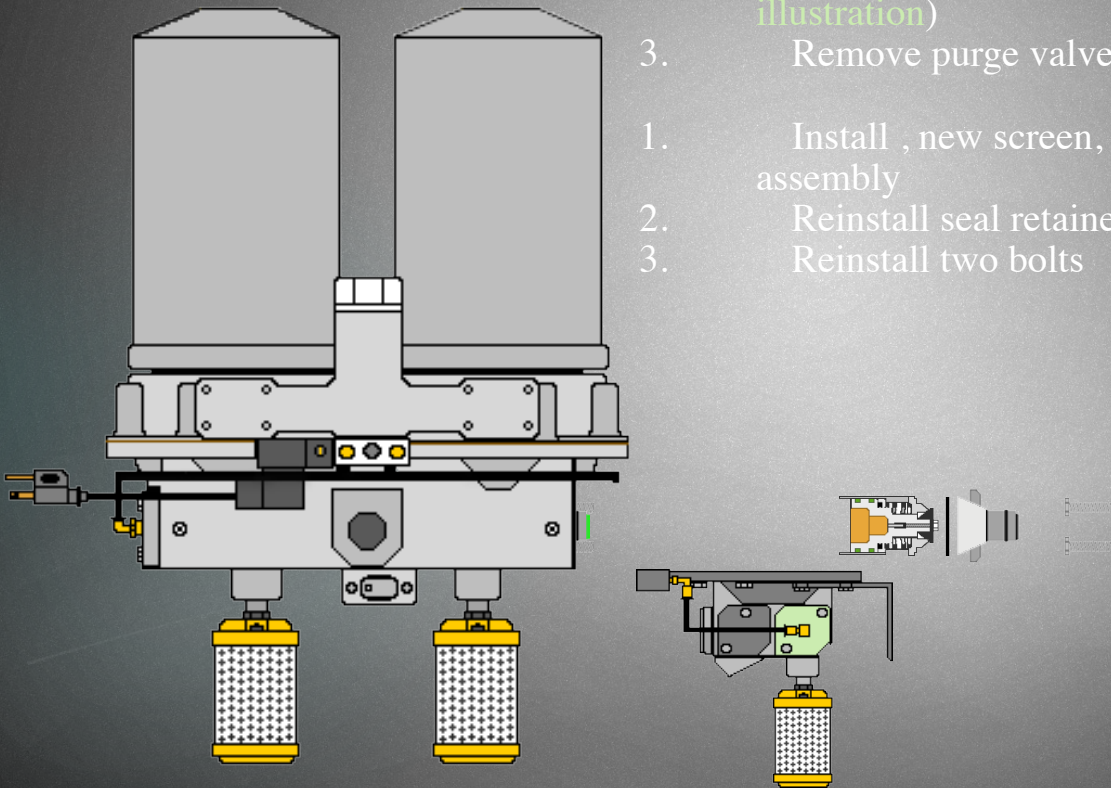
•**WARNING:** Relieve all system air pressure

1. Remove two bolts that attach the purge valve retainer and remove from housing – (identified as green in illustration)
2. Remove the purge valve assembly and O-ring from the purge cavity, trash screen and discard
3. Clean the cavity thoroughly
4. Remove the three (3) O-rings from retainer and discard
5. Using lubricant supplied, lightly grease all three new O-rings
6. Install on the retainer, the two (2) larger O-rings. Then install the third (smaller) O-ring
7. Apply a light coating of grease around the O-ring seat on valve assembly and install the thin O-ring on the purge valve seat
8. Insert valve assembly into cavity and insure that hole in valve sleeve aligns over housing exhaust port (muffler). Use care not to dislodge the thin O-ring from its seat

# Animated Purge Valve Procedures

1. Remove two bolts from Seal retainer
2. Remove seal retainer (identified as green in illustration)
3. Remove purge valve assembly Valve, O-ring, screen

1. Install , new screen, O-ring and purge valve assembly
2. Reinstall seal retainer
3. Reinstall two bolts







# Regeneration Valve Kits

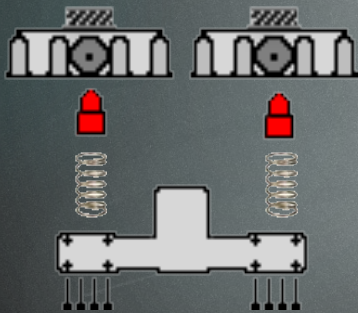
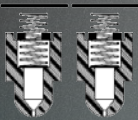
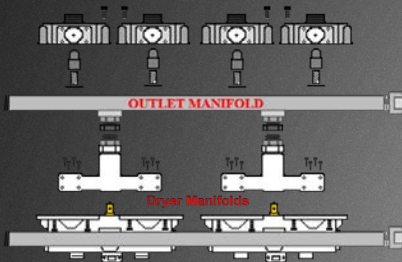
#619708, #619715, #619730

# Regeneration Valve Service Kit

**Symptoms:**  
**Heavy Air From Exhaust Port (all models)**  
**Clogged Orifice**

**WARNING: Relieve all system air pressure**

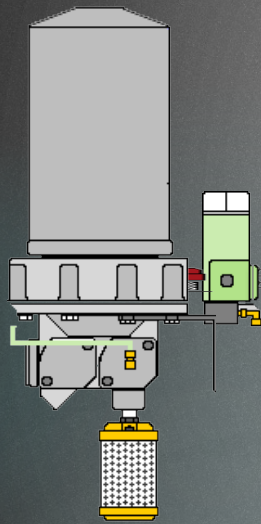
1. Remove air line from outlet port manifold
2. Disconnect JIC fittings at swivel (nut) and place outlet manifold to side
3. Remove 8 screws (4 on each side) of dryers' manifold and remove manifold(s) from dryer and discard O-rings
4. Remove spring and regeneration valve from defective adapter plate(s)
5. Discard O-rings, springs and regeneration valves
6. Clean valve cavities in adapter plate
7. Position new valve spindles into cavities with spring pockets out
8. Position springs into valves
9. Lubricate new O-rings and install onto manifold bosses
10. Position dryers' manifold(s) onto adaptor plate ensuring O-rings are positioned properly in bores.
11. Install eight (8) socket head bolts and tighten to 5-6 in. lbs. Torque.
12. Reconnect outlet manifold at JIC fittings and tighten
13. Reconnect air line to outlet manifold
14. **CAUTION:** Slowly pressurize system and check for any air leaks



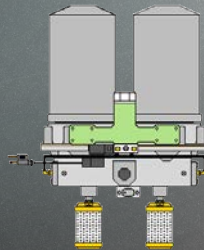
# Animated Regeneration Valve Procedures

## Regeneration Valve Service Kits - #619708 #619715 #619730

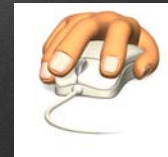
**WARNING: Relieve all system air pressure**



Eight  
10/32 bolts



1. Disconnect air line from dryer outlet port and ¼" Pilot air line from Spool Valve
2. Remove the eight (8) socket head bolts fastening manifold to dryer
3. Remove manifold (identified as green in illustration)
4. Discard O-rings, springs and regeneration valves
5. Clean valve cavities in housing
6. Position springs into valves
7. Position new valve spindles into cavities with spring pockets out
8. Lubricate new O-rings and install onto manifold bosses
9. Position manifold onto adaptor castings ensuring O-rings are properly positioned in bores.
10. Reinstall eight (8) socket head bolts and tighten to 5-6 in. lbs. Torque.
11. Reconnect air line to outlet port.
12. **CAUTION:** Slowly pressurize system and check for any air leaks





# Desiccant Cartridge Kits

STANDARD 4LB. AND HC 8LB. SERVICE KITS

# Desiccant Cartridge Kits

#619708, #619715, #619730

**Symptoms:**  
Water in air system (all models)

## Possible Causes

- Desiccant cartridge contaminated
- Micro Logic Timer (MLT) malfunctioning
- (PLC) malfunctioning
- Pneumatic Control unit malfunctioning
- Air control valve malfunctioning
- Regeneration valve malfunctioning
- 1/4" tubing connecting air control valve and valve housing and/or manifold damaged or missing
- Worn, stuck or clogged purge valve
- Purge Valves incorrectly serviced
- Compressed air usage exceeds drying

## Remedy

- Replace desiccant cartridges - service kit
- Replace Micro Logic Timer (MLT)
- Replace Programmable Logic Control (PLC)
- Replace Pneumatic Control Unit assembly (PC)
- Replace air control valve assembly
- Replace regeneration valves
- Repair or replace 1/4 air line tubing
- Replace purge valve assemblies
- Align exhaust ports in purge valve as detailed within service kit instructions

# Desiccant Cartridge Kits

2 each - 4 lb. #619830 #619704 #619951 Desiccant Cartridges

2 each - 8 lb. #4055A002 #4055A020 #4055A012 Desiccant Cartridges

**WARNING: Relieve all system air pressure.**

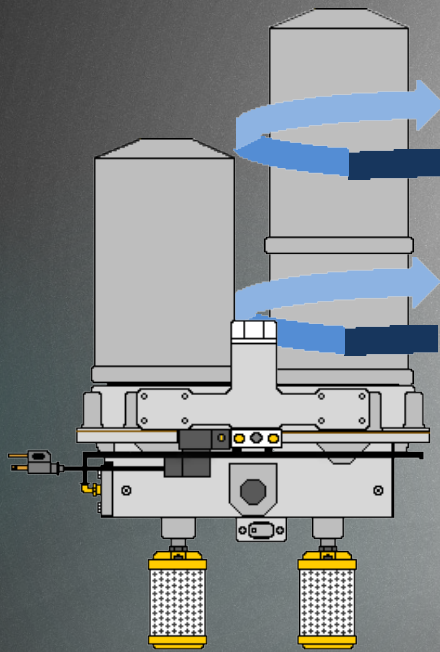
1. Using a strap wrench, turn the desiccant cartridge counterclockwise and remove it. Discard.
2. Remove and discard O-ring from adapter plate stud.
3. Clean top surface of adapter plate and threaded stud
4. Apply a light coating of grease on O-ring (included in kit). Install O-ring on stud.
5. Apply a generous coat of grease on the new desiccant cartridge gasket surface
6. Thread new cartridge onto stud turning clockwise. When gasket contacts adapter plate, tighten cartridge 1/2 to 3/4 turn

**CAUTION:**

- **DO NOT OVER-TIGHTEN** as it will result in damage to dryer and make it difficult to remove desiccant cartridge!



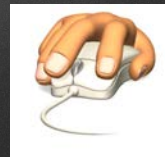
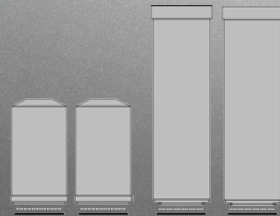
# Animated Desiccant Cartridge Removal



## Desiccant Cartridge

1. **WARNING: Relieve all system air pressure.**
2. Using a strap wrench, turn the desiccant cartridge counterclockwise and remove it. Discard.
3. Remove and discard O-ring from adapter plate stud.
4. Clean top surface of adapter plate and threaded stud
5. Apply a light coating of grease on O-ring (included in kit). Install O-ring on stud.
6. Apply a generous coat of grease on the new desiccant cartridge gasket surface
7. Thread new cartridge onto stud turning clockwise. When gasket contacts adapter plate, tighten cartridge 1/2 to 3/4 turn

**REMINDER:**  
**DO NOT OVER-TIGHTEN as it will result in damage to dryer and make it difficult to remove desiccant cartridge!**



# Micro Logic Timer (MLT)

#619790 = 110 VOLT AC, #619912 = 12 VOLT DC, #619924 = 24 VOLT DC

EXCEPT: PNEUMATICALLY CONTROLLED & PROGRAMED LOGIC CONTROLLED (PLC)



# Micro Logic Timer

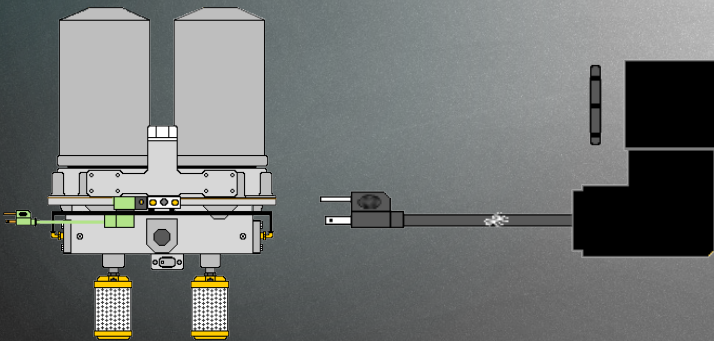
**Symptoms:**  
Water in air systems  
Dryer will not cycle every two minutes

## Possible Cause

- Micro logic timer (MLT) malfunctioning
- Air control valve malfunction, i.e., leaking
- Air tubing connecting air control valve and valve housing and/or manifold damaged or missing
- Air Control air vents clogged (plugged)

## Remedy

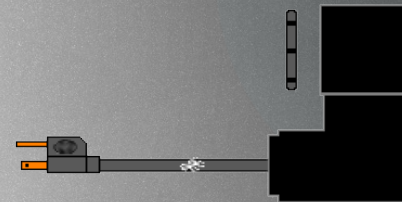
- **Test:** Unplug timer, manually cycle dryer by turning brass screw in valve assembly to 2 o'clock (1/4 turn right) and back to 12 o'clock position
- Ensure MLT is connected to power source
- Replace MLT timer part service kit
- Replace air control valve
- Replace 1/4 air line tubing
- Clean air control vents



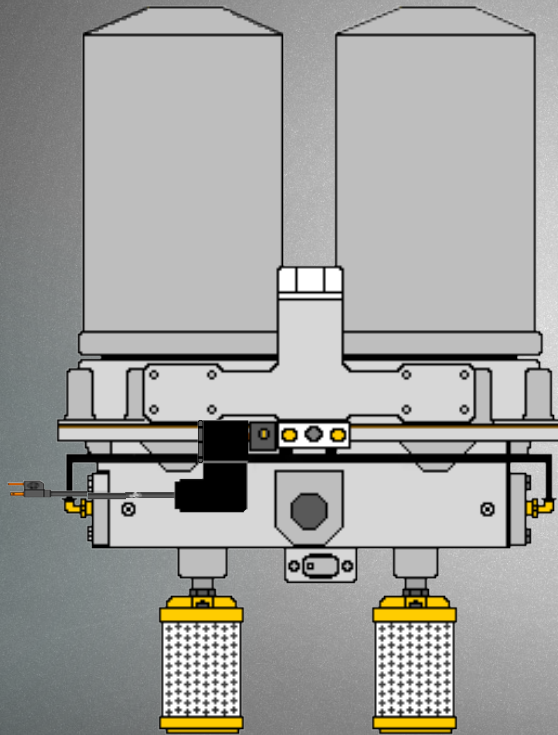
# Micro Logic Timer

**WARNING: Relieve all system air pressure.**

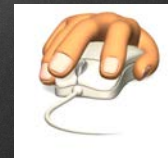
- Disconnect power cord from electrical outlet or VDC power source
- Remove round locking screw by turning counterclockwise
- Remove MLT from stem of air control valve
- Install new MLT onto stem of air control valve
- Reinstall round locking screw by turning clockwise (hand tighten only)
- Reconnect MLT to electrical or VDC power source (timer will cycle)



# Animated Micro Logic Timer Removal



- Disconnect power cord from electrical outlet or VDC power source
- Remove round locking screw by turning counterclockwise
- Remove MLT from stem of air control valve
- Install new MLT onto stem of air control valve
- Reinstall round locking screw by turning clockwise (hand tighten only)
- Reconnect MLT to electrical or VDC power source (timer will cycle)



# Heater Assembly (optional)



# Quiz

1. Read question
2. Click on ✓ to answer
3. Click on Submit
4. If incorrect answer, click retry

Select font size T T T

Always relieve air pressure from Air Pak Dryer systems when servicing units



Allow Retry

True



False



Preview

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Select font size **T** **T** **T**

Always install desiccant cartridges with strap wrench



Allow Retry

True



False



Cartridges must be hand tighten only 1/2 - 3/4 turn after contact of cartridge base gasket



Preview

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Select font size **T** **T** **T**

Inlet and purge valves differ on larger CFM Air Pak Systems



Allow Retry

True



False



Preview

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Select font size T T T

Always twist valve retainer when reinstalling into dryer



Allow Retry

True



False



Avoid twisting retainer; align holes with bottom cap push into position



Preview

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Select font size **T** **T** **T**

When insalling purge valve, what position should the hole in valve be facing?



Allow Single Choice Only  Allow Multiple Choices  Shuffle Answers  Allow Retry  Limit Attempts

UP



LEFT



RIGHT



DOWN



Preview

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Select font size **T** **T** **T**

Air Pak dryer systems should be inspected



Allow Single Choice Only  Allow Multiple Choices  Shuffle Answers  Allow Retry  Limit Attempts

Every month



1 year



Annual inspections to verify cycling, check for leaks, etc



2.5 years



4 years



Preview

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Micro Logic Timer (MLT) cycles dryer every



Allow Single Choice Only    Allow Multiple Choices    Shuffle Answers    Allow Retry    Limit Attempts

45 SECONDS



90 SECONDS



180 SECONDS



120 SECONDS



MLT cycles (switches) every two minuts for desiccant regeneration



Preview

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Select font size **T** **T** **T**

Continious large amount of air from one exhaust port may be casued by



Allow Single Choice Only    Allow Multiple Choices    Shuffle Answers    Allow Retry    Limit Attempts

Plugged MLT Vents



Worn Inlet Chcek Valve



Worn Purge Vlave



All of the above



[+ Add another answer](#)

[Preview](#)

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Select font size **T** **T** **T**

Turning brass screw 1/4 turn to right



Allow Single Choice Only    Allow Multiple Choices    Shuffle Answers    Allow Retry    Limit Attempts

Tightens down spool valve



Resets MLT



Manually cycles dryer



Brass screw used to manually shift dryer cycles for testing



Increases regeneration time between cycles



Preview

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Select font size **T** **T** **T**

Water in air down stream air may be caused by



Allow Single Choice Only    Allow Multiple Choices    Shuffle Answers    Allow Retry    Limit Attempts

Worn, stuck or clogged purge valve



Air control valve malfunctioning



Purge Valves incorrectly serviced



Desiccant cartridges require service



All of the above



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Thank you for your participation

Click HOME button to return to Dry Air  
System web site