PRESENTED BY:

Air Pak Drying Systems

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



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- Each service section consists of a symptom, service procedure and animation slides
- A quiz at end of presentation

SAFETY

Safety

-WARNING-

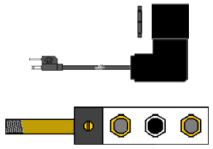
BEFORE SERVICING DRYER UNIT(S) RELIEVE ALL AIR PRESSURE FROM DRYER UNIT(S) AND AIR LINES

- 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 wrenches not shown to assist in clarity

SERVICE

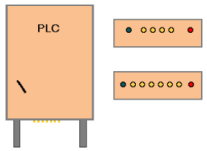
Annual Service Recommendations

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

ALL MODELS

Basic Dryer Operation (All Models)

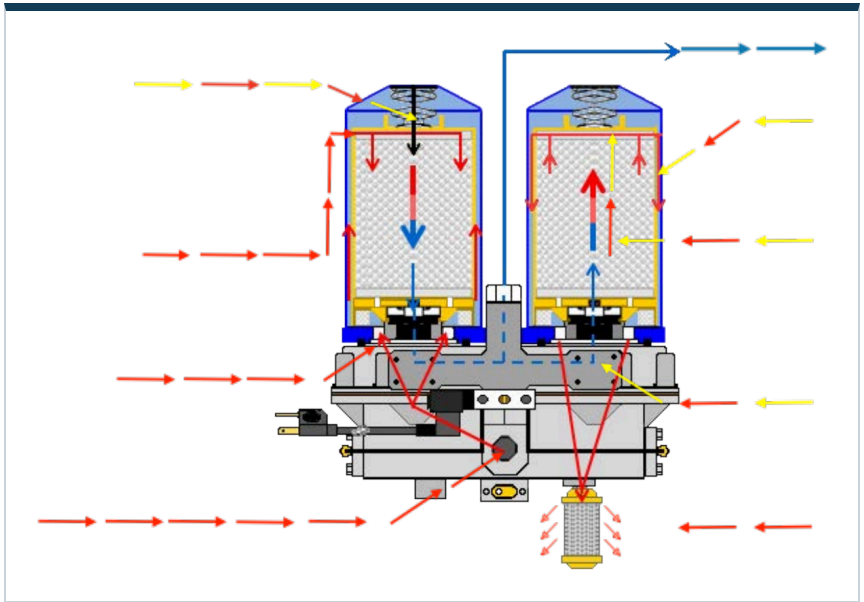
1A
Inlet Port wet air enters dryer

2A
Passes through .3 micron filter entering desiccant cartridge

3A
Wet air enters desiccant bed

4A
Wet air adsorbed onto desiccant bed

5A
Dry air to air systems



1B
Wet air removed from dryer

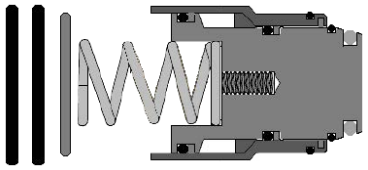
2B
Dry air enters desiccant bed via regeneration valve

3B
Dried air desorbs (removes) condensate from desiccant bed

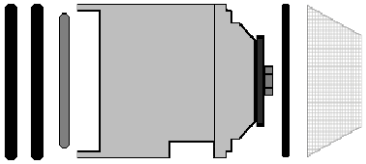
4B
Wet air removed from desiccant bed

COMPONENTS

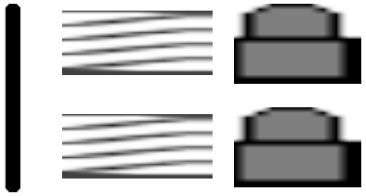
Service and Related Components



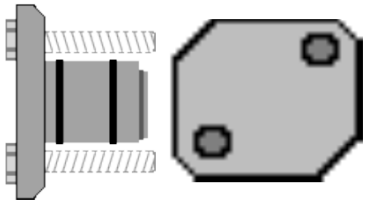
Intake Valve



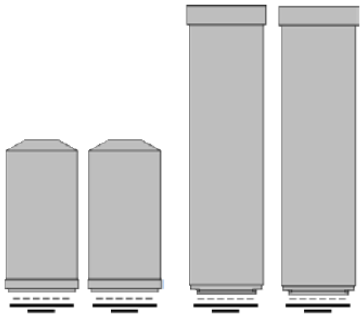
Purge (Unloader) Valve



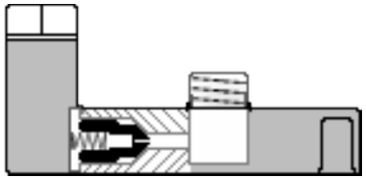
Regeneration Valve



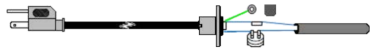
Seal Retainer Valve



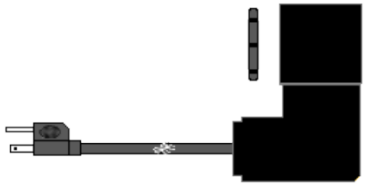
Desiccant Cartridges



Adapter Plate w/ regen valve



Heater Assembly (optional)



Micro Logic Timer (MLT)

Inlet Check Valve

#619702 Valve Service Kit

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

INLET CHECK VALVE TROUBLESHOOTING SYMPTOMS

POSSIBLE CAUSE	REMEDY
Worn inlet check valves (O-rings)	**Clean cavities and replace valve assemblies included in service kit #619702**
Worn purge valve or dirt/foreign material stuck in purge valve	Clean cavities and replace purge valve assemblies included within service kit
Regeneration valve not closing	Clean cavities and replace regeneration valve assemblies within service kit

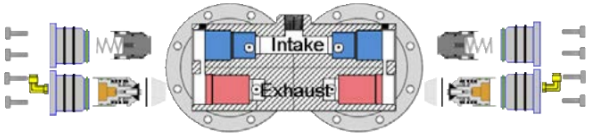
It is recommended if servicing one valve to service all four valves at this time

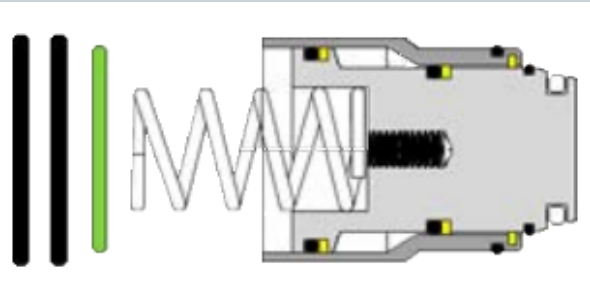
INLET CHECK VALVE

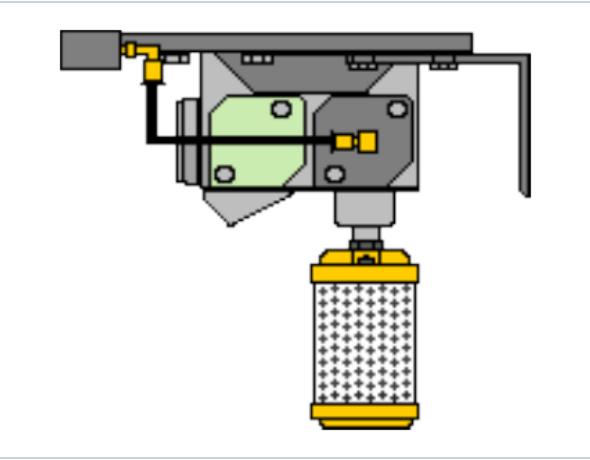
Inlet Check Valve Removal / Installation

SYMPTOM:

Heavy Air From Exhaust Port (all models)





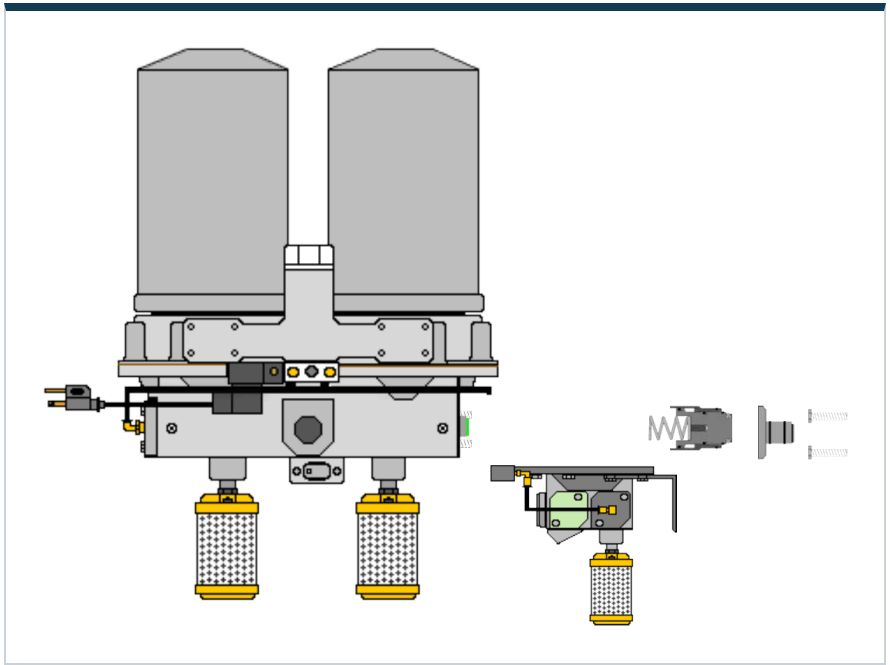


WARNING **Relieve all system air pressure**

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.

INLET CHECK VALVE

Animated Inlet Check Valve Procedures



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

Purge Valve

#619702 Valve Service Kit

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

PURGE VALVE TROUBLESHOOTING

POSSIBLE CAUSE	REMEDY
Worn inlet check valves (O-rings)	Clean cavities and replace valve assemblies included in service kit #619702
Worn purge valve or dirt/foreign material stuck in purge valve	**Clean cavities and replace purge valve assemblies included within service kit**
Regeneration valve not closing	Clean cavities and replace regeneration valve assemblies within service kit

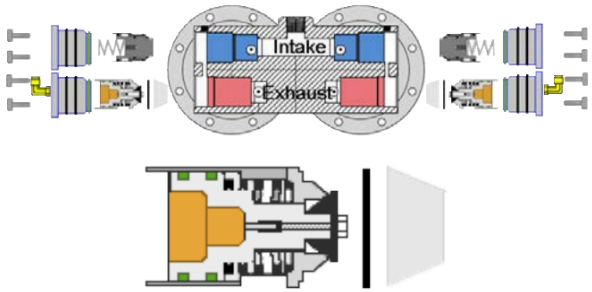
It is recommended if servicing one valve to service all four valves at this time

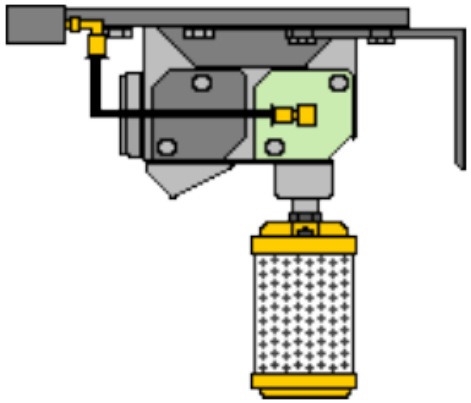
PURGE VALVE

Purge Valve Removal / Installation

SYMPTOM:

Heavy Air From Exhaust Port (all models)





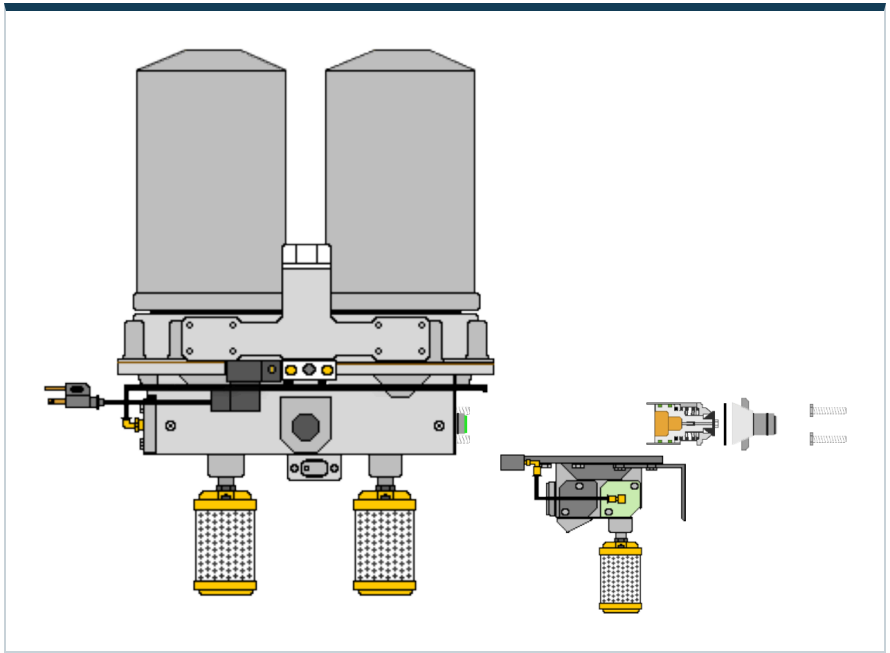
PURGE (EXHAUST) VALVES – (ALL MODELS)

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 ensure that hole in valve sleeve aligns over housing exhaust port (muffler). Use care not to dislodge the thin O-ring from its seat

PURGE VALVE

Animated Purge Valve Procedures

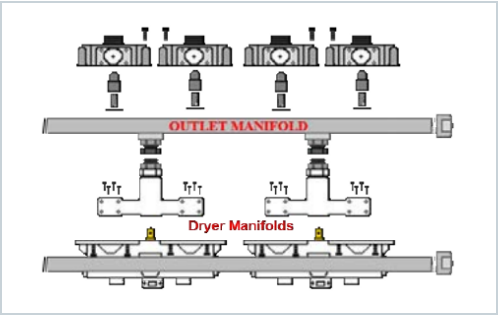


1. Remove two bolts from Seal retainer
2. Remove seal retainer (identified as green in illustration)
3. Remove purge valve assembly Valve, O-ring, screen

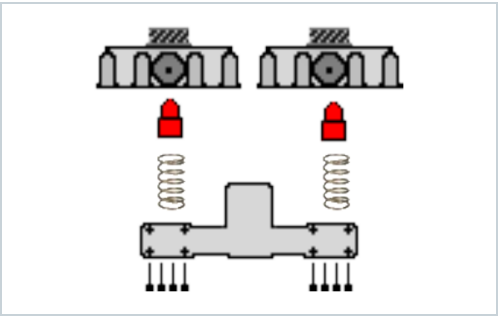
1. Install new screen, O-ring and purge valve assembly
2. Reinstall seal retainer
3. Reinstall two bolts

Regeneration Valve Service Kit

#619708, #619715, #619730







SYMPTOMS:

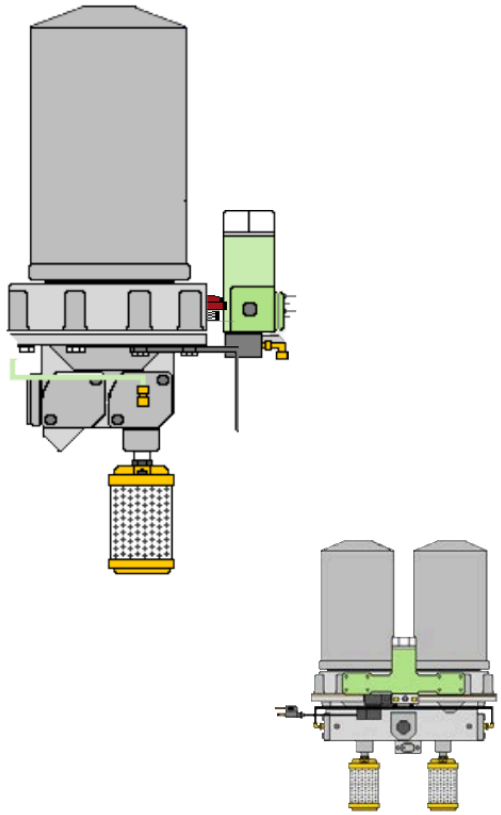
Heavy Air From Exhaust Port (all models)
Clogged Orifice

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

REGENERATION VALVE

Animated Regeneration Valve Procedures



EIGHT 10/32 BOLTS

REGENERATION VALVE SERVICE KITS – #619708 #619715 #619730

WARNING **Relieve all system air pressure**

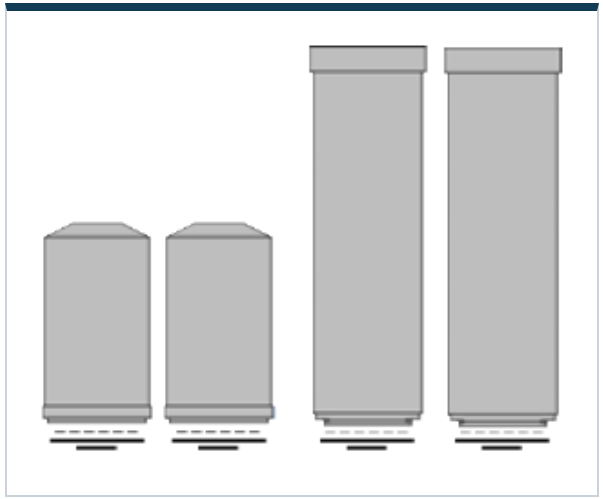
1. Disconnect air line from dryer outlet port and ¼" Pilot air line from Spool Valve
2. Remove the eight (8) socket head bolts fastening manifold to dryer
3. Remove manifold (identified as green in illustration)
4. Discard O-rings, springs and regeneration valves
5. Clean valve cavities in housing
6. 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 4 lb. and HC 8 lb. Service Kits

SYMPTOMS:

Water in air system (all models)



DESICCANT CARTRIDGE KITS

#619708, #619715, #619730

POSSIBLE CAUSES	REMEDY
Desiccant cartridge contaminated	Replace desiccant cartridges - service kit
Micro Logic Timer (MLT) malfunctioning	Replace Micro Logic Timer (MLT)
(PLC) malfunctioning	Replace Programmable Logic Control (PLC)
Pneumatic Control unit malfunctioning	Replace Pneumatic Control Unit assembly (PC)
Air control valve malfunctioning	Replace air control valve assembly
Regeneration valve malfunctioning	Replace regeneration valves
1/4" tubing connecting air control valve and valve housing and/or manifold damaged or missing	Repair or replace ¼ air line tubing
Worn, stuck or clogged purge valve	Replace purge valve assemblies
Purge Valves incorrectly serviced	Align exhaust ports in purge valve as detailed within service kit instructions
Compressed air usage exceeds drying capacity of dryer system	

DESICCANT CARTRIDGE KITS

Desiccant Cartridge Kits

2 EACH – 4 LB. **#619830 #619704 #619951**

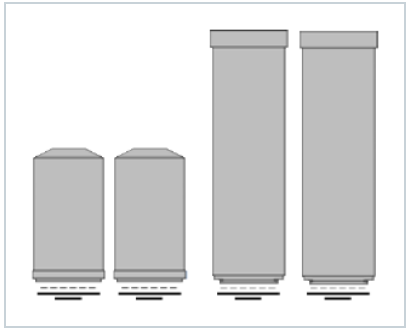
Desiccant Cartridges

2 EACH – 8 LB.

#4055A002 #4055A020 #4055A012

Desiccant Cartridges

WARNING **Relieve all system air pressure.**

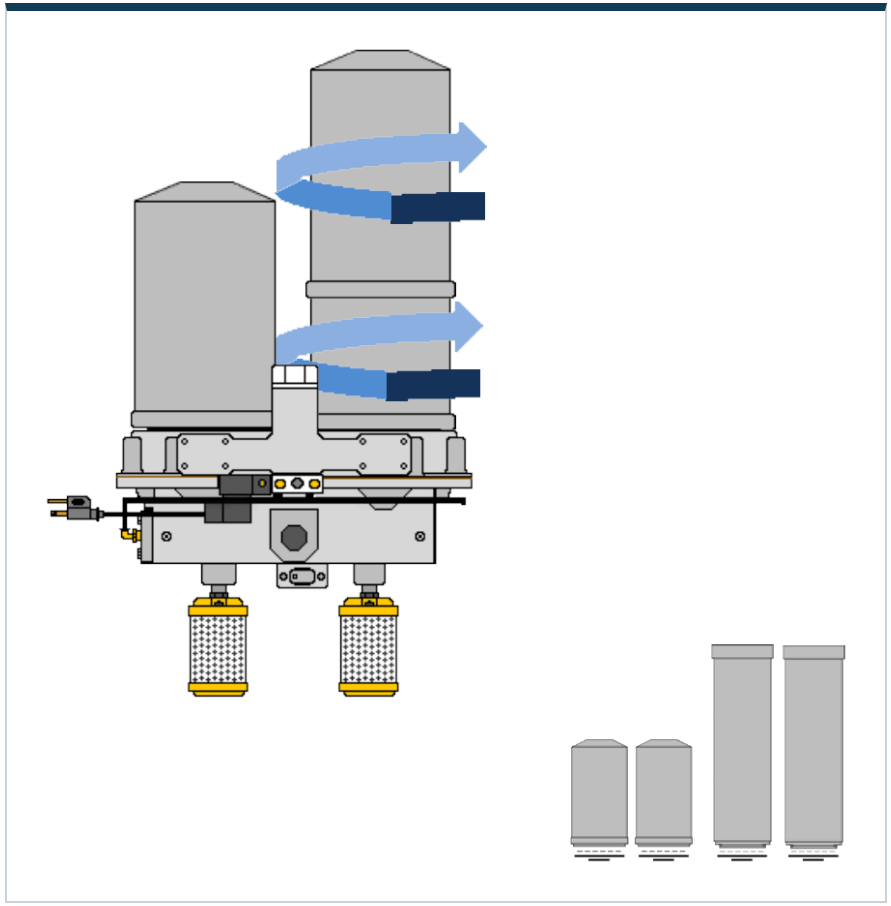


1. Using a strap wrench, turn the desiccant cartridge counterclockwise and remove it. Discard.
2. Remove and discard O-ring from adapter plate stud.
3. Clean top surface of adapter plate and threaded stud
4. Apply a light coating of grease on O-ring (included in kit). Install O-ring on stud.
5. Apply 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!**

DESICCANT CARTRIDGE KITS

Animated Desiccant Cartridge Removal



DESICCANT CARTRIDGE

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!**

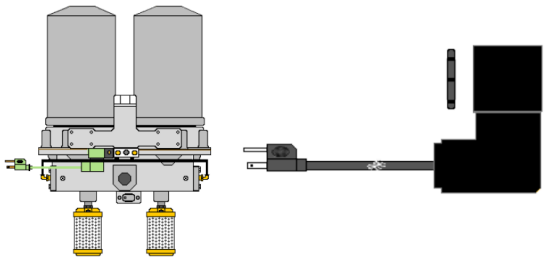
Micro Logic Timer (MLT)

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

Except: Pneumatically controlled & Programed Logic Controlled (PLC)

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

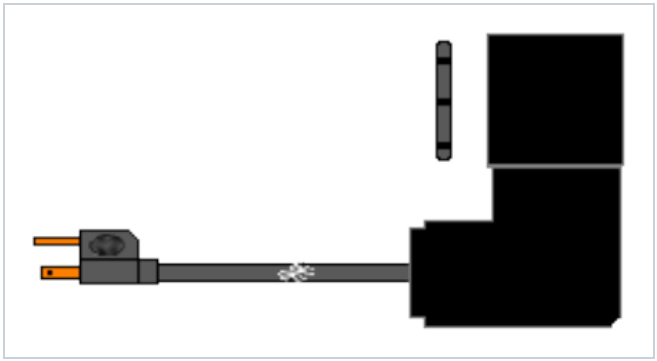
- **Test:** Unplug timer, manually cycle dryer by turning brass screw in valve assembly to 2 o'clock (1/4 turn right) and back to 12 o'clock position
- Ensure MLT is connected to power source
- Replace MLT timer part service kit
- Replace air control valve
- Replace ¼ air line tubing
- Clean air control vents

MICRO LOGIC TIMER

Micro Logic Timer

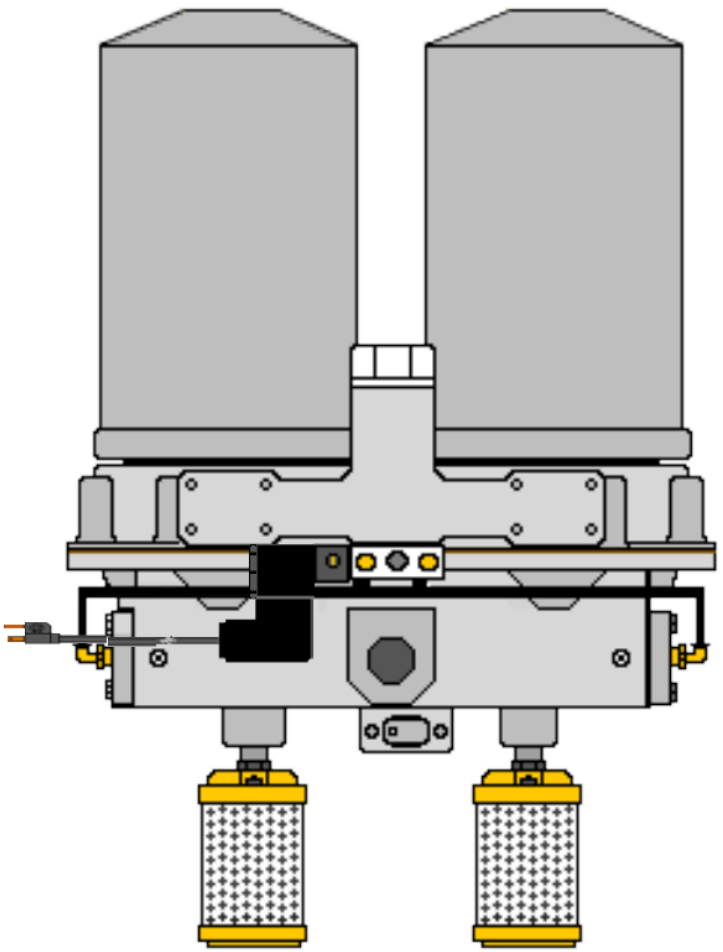
WARNING **Relieve all system air pressure.**

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



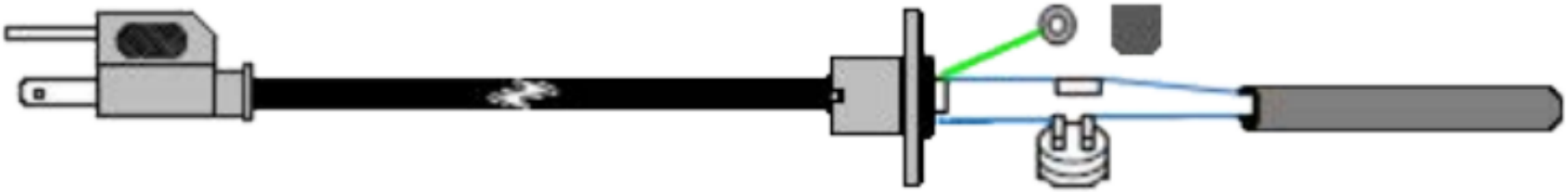
MICRO LOGIC TIMER

Animated Micro Logic Timer Removal



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

Heater Assembly (optional)



QUIZ

Quiz

01

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

A True

B False

02

Always install desiccant cartridges with strap wrench

A True

B False

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

03

Inlet and purge valves differ on larger CFM Air Pak Systems

A True

B False

04

Always twist valve retainer when reinstalling into dryer

A True

B False

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

QUIZ

Quiz

05

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

- A UP
- B LEFT
- C RIGHT
- **D DOWN**

06

Air Pak dryer systems should be inspected

- A Every month
- **B 1 year**
- C 2.5 years
- D 4 years

Annual inspections to verify cycling, check for leaks, etc

07

Micro Logic Timer (MLT) cycles dryer every

- A 45 SECONDS
- B 90 SECONDS
- C 180 SECONDS
- **D 120 SECONDS**

MLT cycles (switches) every two minutes for desiccant regeneration

08

Continuous large amount of air from one exhaust port may be caused by

- A Plugged MLT Vents
- B Worn Inlet Check Valve
- C Worn Purge Valve
- **D All of the above**

QUIZ

Quiz

09

Turning brass screw 1/4 turn to right

- A Tightens down spool valve
- B Resets MLT
- **C Manually cycles dryer**
- D Increases regeneration time between cycles

Brass screw used to manually shift dryer cycles for testing

10

Water in air down stream air may be caused by

- A Worn, stuck or clogged purge valve
- B Air control valve malfunctioning
- C Purge Valves incorrectly serviced
- D Desiccant cartridges require service
- **E All of the above**

Thank you for your participation