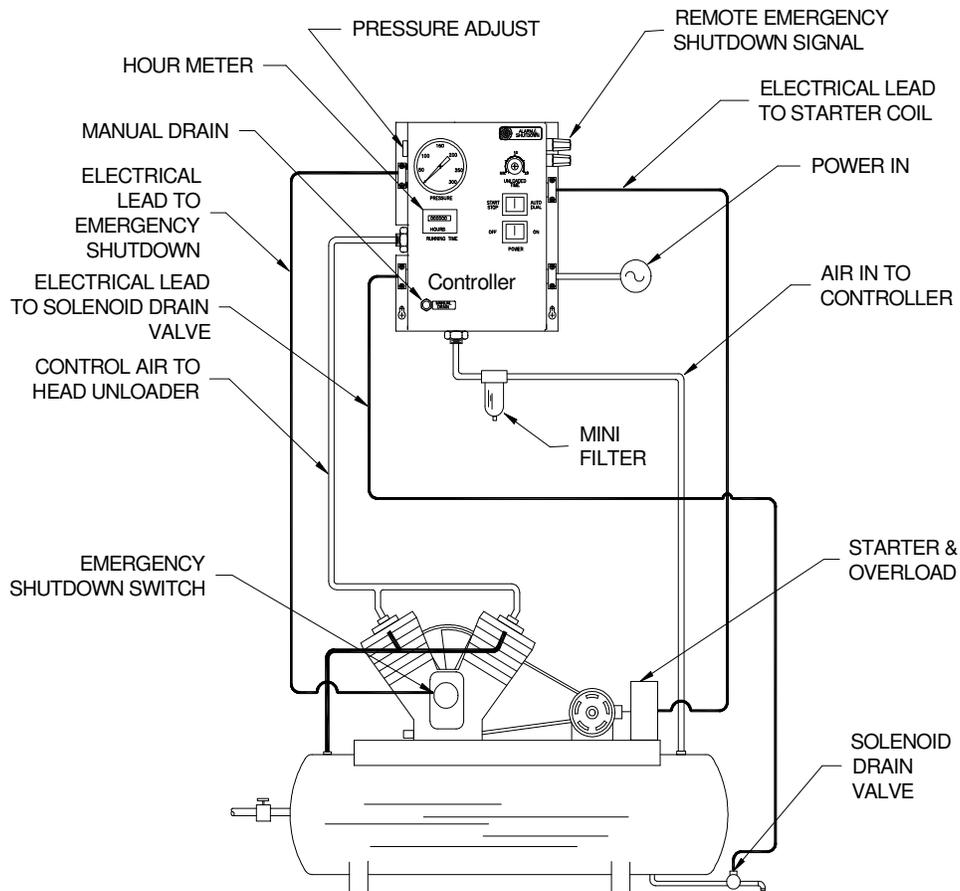


# INSTRUCTIONS FOR INSTALLING AND OPERATING THE UNIVERSAL AUTODUAL

## **SAFETY PRECAUTIONS – DO NOT DESTROY**

This manual contains important safety information and should be made available to all personnel who operate an/or maintain this product. Carefully read this manual before attempting to operate or perform maintenance on this product.



The **UNIVERSAL AUTODUAL** is a modern energy savings device that will operate your air compressor at its maximum level of efficiency. The **UNIVERSAL AUTODUAL** will eliminate the problems associated with long idle periods and will protect your compressor from low oil level failure. Further, the tank drain system will automatically drain condensate from the receiver tank with virtually no wasted air.

## **PLEASE READ INSTRUCTIONS BEFORE INSTALLING.**

The **UNIVERSAL AUTODUAL** is designed to be simple to install and requires only two plumbing (air) connections and two electrical connections to use all of the standard features.

## Preparing the Air Compressor

1.
  - A. Per O.S.H.A. regulation 1910.147, relieve the system of all pressure before attempting to service any part of the unit.
  - B. Turn off and lockout/tagout the main power disconnect switch before attempting to work or perform any maintenance (per O.S.H.A. regulation 1910.147).
  - C. Do not attempt to service any part of the unit while it is operating.
  - D. Isolate the compressor from the compressed air supply by closing a manual shutoff valve upstream and downstream from the compressor. Display a sign in clear view at the shutoff valve stating that the compressor is being serviced.
  - E. Lock open a pressure relief valve within the pressurized system to allow the system to be completely depressurized. **NEVER** remove a plug to relieve the pressure!
2. **Remove** the existing pressure switch, pilot unloading valve, and special valves associated with these controls from the air compressor.
3. **Mount** the **UNIVERSAL AUTODUAL** to the compressor platform using the flanges on the rear mounting plate of the enclosure or as a remote mount to an adjacent wall.
4. **Plumb** compressed air from the air receiver into the bottom ¼" connection of the **UNIVERSAL AUTODUAL** and then connect the compressor head unloader control air line **directly** to the ¼" outlet connection on the left side of the **AUTODUAL**, bypassing any other valves or control lines on the air compressor.
5. If your compressor is old and subject to oily water carryover, it is advisable to install a ¼" mini filter before the bottom air inlet to prevent pressure switch or solenoid valve failure.

Plumbing is now complete.

## WIRING TO THE STARTER

The following electrical procedures must be followed when stopping the compressor for **AUTODUAL** installation.

Per O.S.H.A. regulation 1910.147: The Control of Hazardous Energy Source (Lockout/Tagout), disconnect and lockout the main power source. Display a sign in clear view at the main power switch stating that the compressor is being serviced.

Select the **AUTODUAL** power switch to the "Off" position. The lead supplied on the upper right side of the **AUTODUAL** (labeled "Power Out – Starter Coil") is wired to the starter coil exactly like the lead on a standard pressure switch except that the **AUTODUAL** requires attention to the starter coil voltage. You **CANNOT** attach any 460-volt power directly to the **AUTODUAL** without damaging it. The **AUTODUAL** is available in two voltages, single phase, 115 volt and single phase, 230 volt.

- A. For a 3/60/460 volt main power system. The starter requires two items to operate the **AUTODUAL** successfully (see wiring diagram):

Item I. A step-down transformer (CVT) to convert the 460 volts to power the **AUTODUAL** (lower right hand lead) to 230 or 115 volts. For 115 volts, you have the option of powering the **AUTODUAL** from a 115-volt wall socket, or wiring the CVT (Control Voltage Transformer) to deliver 115 volts.

Item II. In all cases the starter **COIL VOLTAGE** must match the voltage, either 230 or 115 volts, single phase that powers the **AUTODUAL**.

- B. The simplest way to wire the **AUTODUAL** is 1/60/115 volts. This requires that you plug in the **AUTODUAL** power-in lead to a 115 volt socket, and then wire the control power to the starter coil (see diagram). However, the starter coil **MUST BE** 115 volts regardless of the main inlet voltage.
- C. For 230-volt main power inlet or for power transformed from 460 to 230 volts, the **AUTODUAL** is available as a 230-volt system (Model AD230). In this case you would power the **AUTODUAL** directly from the 230-volt hot side of the starter (single phase L1 and L3) or after the CVT (460 to 230v) -- see diagram -- and then run the control power to the starter coil. The coil voltage must be 230 volts.

If 115-volt control voltage is a requirement, then use an **AUTODUAL** (Model AD115) for 115 volts. Use a CVT (Control Voltage Transformer) to convert down from the 3/60/460 or 3/60/230 volt main power to 1/115 volt or plug in the **AUTODUAL** power-in to a standard 115-volt socket. Connect the control power lead to the **required 115-volt starter coil** (see diagram) and the wiring is complete.

- D. In all circumstances when wiring to the starter coil, it is a requirement to wire one leg through the dry contact auxiliary switch (normally on) on the starter (see diagram) to obtain a “stop” if the overload motor relay trips.

### **Starting the Compressor**

When the wiring job is completed and is checked for correctness, select the mode of operation –“START/STOP” or “AUTODUAL.”

Start the compressor unit by pushing the “OFF/ON” rocker switch to “ON.”

The compressor will start and stop in response to the pressure switch when operated in the “START/STOP” mode. The “AUTO DUAL” mode provides unattended start/timed-stop operation. The compressor will start automatically, load, unload, idle and stop in response to the automatic controls. The timed shutdown “UNLOADED TIME” interval is adjustable from 4 to 20 minutes and can be adjusted with the knob located on the front of the controller. AUTO DUAL mode is selected to prevent frequent starting and stopping of the compressor motor. The motor should not start more than 6 times per hour. An “UNLOADED TIME” setting of 10 minutes will guarantee this.

**Setting the Compressor Operating Pressure:** On the upper left hand side of the **AUTODUAL** labeled “PRESS ADJ”, insert the 1/8” allen wrench (supplied) through the opening to meet the pressure switch adjustment. The **AUTODUAL** is factory set at approximately 125 psi unless otherwise specified. Turn clockwise to increase the pressure and counterclockwise to reduce the pressure. ¼ turn changes the shutoff pressure by approximately 15 psi. The differential pressure is factory set and cannot be field changed.

## **INSTALLING AND USING THE OPTIONS**

### **A. EMERGENCY SHUTDOWN**

The emergency shutdown is wired normally closed, i.e., a break in the circuit simultaneously shuts down the air compressor and activates the emergency indicator light. After the emergency situation has been repaired, reset the **AUTODUAL** by pushing the “On/Off” rocker switch to “Off” for 5 seconds. Unit can then be restarted.

There is a 20 second delay in the **AUTODUAL** “brain” before an emergency shutdown will occur. The 20-second delay will give an air compressor with a pressure lubricated running system time for the oil pump to build pressure and eliminate false low oil pressure shutdowns.

The Emergency Shutdown System can be used equally on low-oil-level signals, high air temperature devices or low oil pressure switches. The single electrical characteristic is that the alarm devices must be normally closed since the **AUTODUAL** emergency system is activated when its circuit is broken. Wire the white and black wires to your alarm device. Multiple emergency shutdown devices can be wired in series. For example, a low oil pressure shutdown and a high air temperature shutdown wired in series.

The Remote Alarm contacts send a 24-volt, 40 ma signal to a low voltage relay for distribution to visual, audible or computer alarms.

## **A. AUTO TANK DRAIN**

The Auto Tank Drain electrical line connects directly to a two (2) way normally closed solenoid valve. After every hour of compressor pumping time, the solenoid will be activated to open and blow for the time interval set on the (optional) knob labeled "AUTO DRAIN DURATION", 5, 10 or 20 seconds. To manually operate the tank drain solenoid, push the "Test Drain" button. The drain solenoid valve is pre-wired from the factory with a DIN connector for easy installation to your tank exit pipe.

## **B. LEAD LAG CONTROL**

Setting the high and low pressure for lead-lag control is accomplished by adjusting the pressure switches on the left side of the UNIVERSAL AUTODUAL marked "PRESS ADJ." Set compressor #1 for your high or "lead" pressure and compressor #2 for the low or "lag" pressure. The UNIVERSAL AUTODUAL will automatically change the compressor high/low settings when you select the lead machine. Be sure the Lead/Lag switch is in the **Compressor 1 LEAD** position when making initial and subsequent pressure adjustments to either controller.

### **Setting the Compressor Operating Pressure**

On the upper left hand side of the AUTODUAL enclosure labeled "PRESS ADJ", insert the 1/8" allen wrench (supplied) through the opening to meet the pressure switch adjustment. The AUTODUAL is factory set at approximately 125 psi unless otherwise specified. Turn clockwise to increase the pressure and counterclockwise to reduce the pressure. 1/4 turn changes the shutoff pressure by approximately 15 psi. The differential pressure is factory set and cannot be field changed.

### **Electrical Connections**

When joining the two AUTODUALS be sure the unit is on "OFF" and the conduit box main electrical inlet line is on disconnect "OFF". The Model AD is shipped with the 30' lead/lag electrical line connected. The first supplied AD controller has a 4-pin socket connector for interface to the supplied 30-foot cable on the second AD controller. Simply plug this connector into the 4-pin connector on the first AD controller.

### **WARNING**

Be sure to check the air compressor manufacturer's limitations on pressure before setting the pressure switch on the **AUTODUAL**. Too high a pressure beyond the limits of the air compressor and the air receiver can result in a catastrophic failure causing destruction, injury or death. **Maximum pressure is 200 psig. Do not exceed.**

A safety valve must be installed on any air receiver to safely limit the discharge pressure and sized to handle the volume from the air compressor to avoid over pressurization.