



# Standard Pneumatic Products, Inc.

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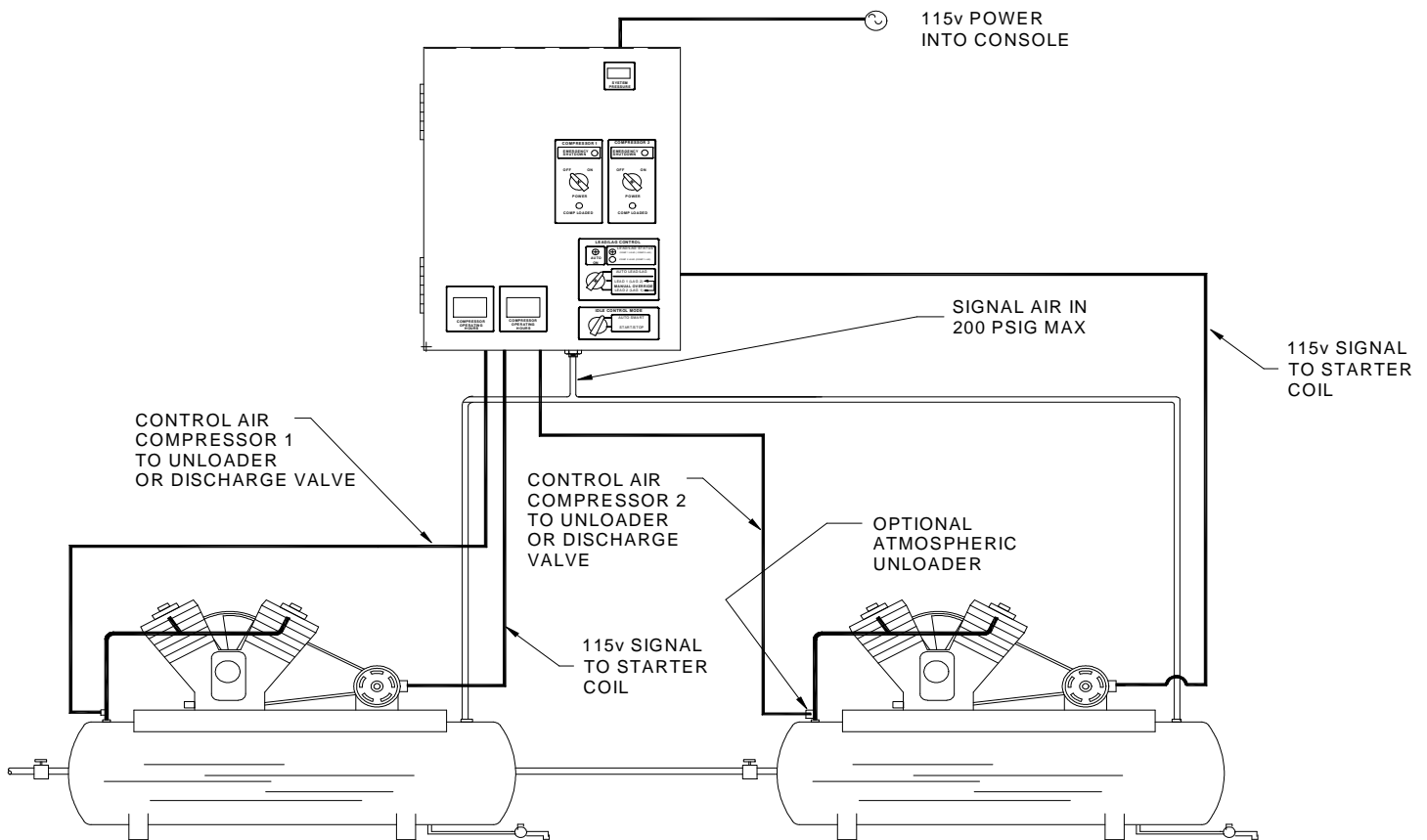
*"Saving the planet, one compressor at a time"*

## **INSTRUCTIONS FOR INSTALLING AND OPERATING THE UNIVERSAL AUTODUAL MODEL ADSE-2 DUAL COMPRESSOR SEQUENCER (firmware ver 1.02)**

Congratulations on your purchase of the Universal Autodual ADSE Dual Compressor Sequencer. The ADSE CONTROLLER is a modern microprocessor controller that will operate, sequence, and idle your air compressors automatically. PLEASE READ INSTRUCTIONS BEFORE INSTALLING.

The ADSE Dual Compressor Sequencer was designed to be simple to install and requires only 3 (three) plumbing (air) connections and 3 (three) electrical connections to control and sequence 2 complete air compressors.

### MODEL ADSE DUAL COMPRESSOR SEQUENCER GENERAL ARRANGEMENT



**Note:** Plumbing and power to console locations may vary depending on customer options

## SYSTEM PLUMBING

### Preparing the Air Compressor

1. Per O.S.H.A. regulation 1910.147, relieve the system of all pressure before attempting to service any part of the unit.
2. 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).
3. Do not attempt to service any part of the unit while it is operating.
4. 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.
5. Lock open a pressure relief valve within the pressurized system to allow the system to be completely de-pressurized. **NEVER** remove a plug to relieve the pressure!

**Mount** the ADSE COMPRESSOR SEQUENCER to the compressor platform on one of the compressors using the supplied mounting holes inside the controller box or mount as a remote unit to an adjacent wall.

**Plumb** compressed air from the air receiver into the bottom ¼” connection of the enclosure and then connect the compressor head unloaders control air lines directly to the ¼” outlet connections on the left side of the enclosure. The unloader fittings are identified as Compressor 1 and Compressor 2. These **MUST** be routed to the proper compressor head on the compressors

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 console gauge errors and/or subsequent failure.

**Select** the power switches on both compressors to the “**OFF**” position. Plumbing is now complete.

# **SYSTEM ELECTRICAL**

## **Standard Features Electrical Connections**

The standard ADSE Sequencer requires only 3 wiring connections to operate, power in to console, and power to external starter coils on both compressors.

Power in to the console and power out to the starter coils (115v) is via the internal terminal block inside the console. Penetrations must be provided for cable entry into the console. The terminal block is labeled Main Power in, Power to Compressor 1 coil and Power to Compressor 2 coil. **THESE WIRES MUST BE CONNECTED TO THE CORRECT STARTER COILS.** Verify that the voltage of the starter coils (115v) matches the inlet voltage to the controller. Always use a locking/tagout electrical disconnect box between the main compressor power source and the ADSE.

Test for proper motor direction rotation, then start unit by pushing the rocker switch to the "ON" position. For initial setup, the ADSE "START/STOP – AUTOSMART/AUTODUAL" switches should be placed in "**Start/Stop**" mode. Optional features will be located on the same bank of terminals and labeled accordingly.

Test for proper motor direction rotation, then start unit by turning the selector switch of each compressor to the "ON" position. For initial setup, the ADSE Lead/Lag switch should be set to the center position (LEAD 1/LAG2 Manual).

## **Optional Features Electrical Connections**

### **Emergency Shutdown**

Connect Switched Emergency shutdown device (L.O.P., High Air Temp, etc) to the terminals inside the ADSE controller using the terminals labeled, "Comp 1 & Comp 2 Emerg Shutdown." There are 3 separate fault circuits for each compressor. The emergency shutdown switch must have non-powered dry contacts, and will detect fault from the compressor when the contacts on the emergency switch are OPEN, therefore all switches should be of the N/C (Normally closed) type. The exception is low oil pressure. The controller will not sense any faults for 20 seconds after startup. This allows time for the oil pressure to build up inside the compressor and close the Pressure switch. A closed circuit on the switch (normally closed) indicates proper operation of the compressor. Up to 3 separate fault detection circuits per compressor are available as an option, with 1 fault detect circuit as standard. Multiple switches can be attached in series to a single fault detection circuit.

### **Remote Signal (Optional)**

Upon ADSE fault detected, the REMOTE SIGNAL terminals on the ADSE terminal block can send a 24VDC 300mA signal to an external relay allowing the use of a remote signal light or annunciator horn, etc. Connect wiring from the ADSE terminals to the 24VDC coil of the relay, and wire the contacts of the relay to the selected external alarm/annunciator source

### **Day-Timer (Optional)**

The daytimer option allows the compressors to automatically turn on in the morning and off in the evening at a preselected time, 7 Days of the week. If this option is ordered, Separate timer instructions are included

## IMPORTANT NOTE REGARDING EMERGENCY SHUTDOWN AND REMOTE SIGNAL:

Do not under any circumstance provide any external power to the emergency shutdown switches on the compressor. Any external power fed into the fault sensors will destroy the microprocessor board and void the ADSE warranty.

### Tank Drain

Connect leads from the tank drain to the ADSE terminal block. Power to the drain is supplied from the ADSE controller (120VAC) A Manual Drain Blow button is on the lower left had corner of the MK III Logic board. Release the button when the manual drain blow is complete.

## SEQUENCER OPERATION

### WARNING

Be sure to check the air compressor manufacturer's limitations on pressure before setting the pressure switch on the **ADSE**. 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.

### Automatic Lead Lag Control Operation

The front panel of the ADSE Console has a Lead/Lag control pushbutton switch for controlling the Automatic lead/lag functionality. Pressing the button on the lead lag control rotated the compressors between auto or manual lag manual override. On initial ADSE Console startup, and when switched to the "auto" position, (green lamp) **Compressor 1 begins as the lead compressor** and maintains its **Lead pumping cycle** for the time assigned by the Lead/Lag timer settings on the logic board. The lead/lag timer is factory set to a 20 minute Lead/Lag swap. (see below for Lead/lag time adjustment)

The compressor 2 unit serves as the Lag compressor during this cycle, and will come on if additional shop air is required. When the Lead/Lag timer reaches its "swap cycle", compressor 2 begins it's cycle as the LEAD machine, as #1 serves as a backup. Factory pressure settings on controllers are 90/120 psi low/high on compressor 1 and 75/105 psi low/high on compressor 2. The "high end" pressure settings on both compressors can be changed, as well as the low/high pressure "deadband" range using the adjusting method on Page 5 depending on Customer air requirements.

If you are using the 3 or 4 compressor controller, compressor 3 and/or compressor 4 will continue this lead/lag cycling. There are 4 cycle orders for the compressors. Lead 1, (Lag 2,3,4), Lead 2, (Lag 3,4,1), Lead 3, (Lag 4,1,2), and Lead 4, (Lag 1,2,3). These sequences are preprogrammed and cannot be modified.

The pressure settings on the transducer automatically "flip-flop" back and forth between compressors during AUTOMATIC lead-lag cycling, equally distributing lead-lag pumping load on all compressors. Automatic Lead-Lag cycling is temporarily disabled when placed in manual mode position, However, the internal lead/lag timer will continue to clock its preset cycle timing while in manual override mode. **Turning the green Power switches on the front panel to "off" does not affect or stop the timing cycle.** Only complete power loss to the console or a blown console fuse will stop the timers clock cycle. In this case the timer will restart from zero beginning with Compressor 1 console as the "Lead" machine when console power is restored.

**IMPORTANT NOTE: Pressure adjustments to all compressors MUST BE PERFORMED with the Lead/Lag control set to the “Lead 1” manual override position.**

### **Start/Stop – AutoSmart - AutoDual Control**

There are three distinct compressor shutoff modes supplied with the ADSE, and are user selectable on the logic board control setup screen, and the front panel. They operate as follows:

- 1) **START/STOP Mode** – All compressors turn on to pump, and turn off after pressure is reached.
- 2) **AUTODUAL Mode** – If selected from logic board display, user controls the actual idle to timeout time of the compressor after pressure is reached. This idle time stays the same regardless of actual pumping time (only applies to firmware Ver 1.01 or earlier)
- 3) **AUTO SMART Mode** – If selected, the microprocessor monitors pumping and idle time over a user selectable period of time to optimize motor running time for energy and compressor efficiency. AutoSmart will automatically determine the MINIMUM amount of idle time required to keep the compressor motors running and never exceed 6 start and stop cycles per hour (or whatever max hourly cycle time is selected). AutoSmart will continuously monitor the compressors operation over this time and adjust idle time automatically. It is highly recommended that the compressors remain in AutoSmart or at a minimum, AutoDual mode, as idling the motors briefly allows for less motor maintenance and slower cool down time to enhance motor longevity.

### **Pressure Settings (SMC 150 & 300 PSI Transducer)**

**Compressor 1:** Press the blue button on the transducer at the top of the console until the display toggles between P\_1 and 120.0psi (the default factory **SHUT OFF** pressure setting for the “high” compressor). Use the up or down arrows next to the blue button as required to change the pressure setting. Note that the pressure you are changing is the **COMPRESSOR SHUTOFF PRESSURE**

**Compressor 2:** Press blue button again until P\_2 appears on display. This is the compressor 2 setting, and can be changed as above using the up/dn arrow keys. After changing settings, hold Blue button Down until Shop air pressure shows on display. **The Compressor 1 “P\_1” setting must ALWAYS be set higher than the COMPRESSOR 2 “P\_2” setting for proper operation.**

**Compressor 3 :** Uses a second transducer and the P\_1 setting for setting compressor 3  
**Compressor 4:** Uses a second transducer and the P\_2 setting for setting Compressor 4  
**(Note: the P\_2 transducer setting is non-functional on 3 compressor units)**

**IMPORTANT NOTE:** Changing the shut-off pressure above also changes the turn-on pressure, as the **compressor ON/OFF dead band** always remains at a 20 psi differential. For example, if you change the “compressor shut-off” pressure to 135 psi, the compressor will shut off (or idle) at 115 PSI, a difference of 20 psi. This is known as the deadband or hysteresis setting. This HIGH/LOW deadband can be changed as follows:

**CHANGE START/STOP LOW/HIGH PRESSURE DEADBAND** - Factory preset to 20 psi differential between the high and low pressure settings on each pressure setting.

**Compressor 1:** Press and hold down the blue button on the transducer until F\_0 flashes on the display. Press the “up” arrow ONCE until F\_1 appears on the display.

Quickly press the blue button 4 times until H\_1 appears on the display, and alternately toggles between H\_1 and 20.0. This is the current pressure dead band for Compressor 1. Use the Up/Dn arrows to change the deadband pressure.

**Compressor 2:** Press Blue Button quickly 2 times until display returns to F\_1. Press “up” arrow once until display reads F\_2. Press the blue button 4 times again until H\_2 appears on the display, and alternately toggles between H\_2 and 20.0. This is the current pressure dead band for Compressor 2. Use the Up/Dn arrows to change the deadband pressure.

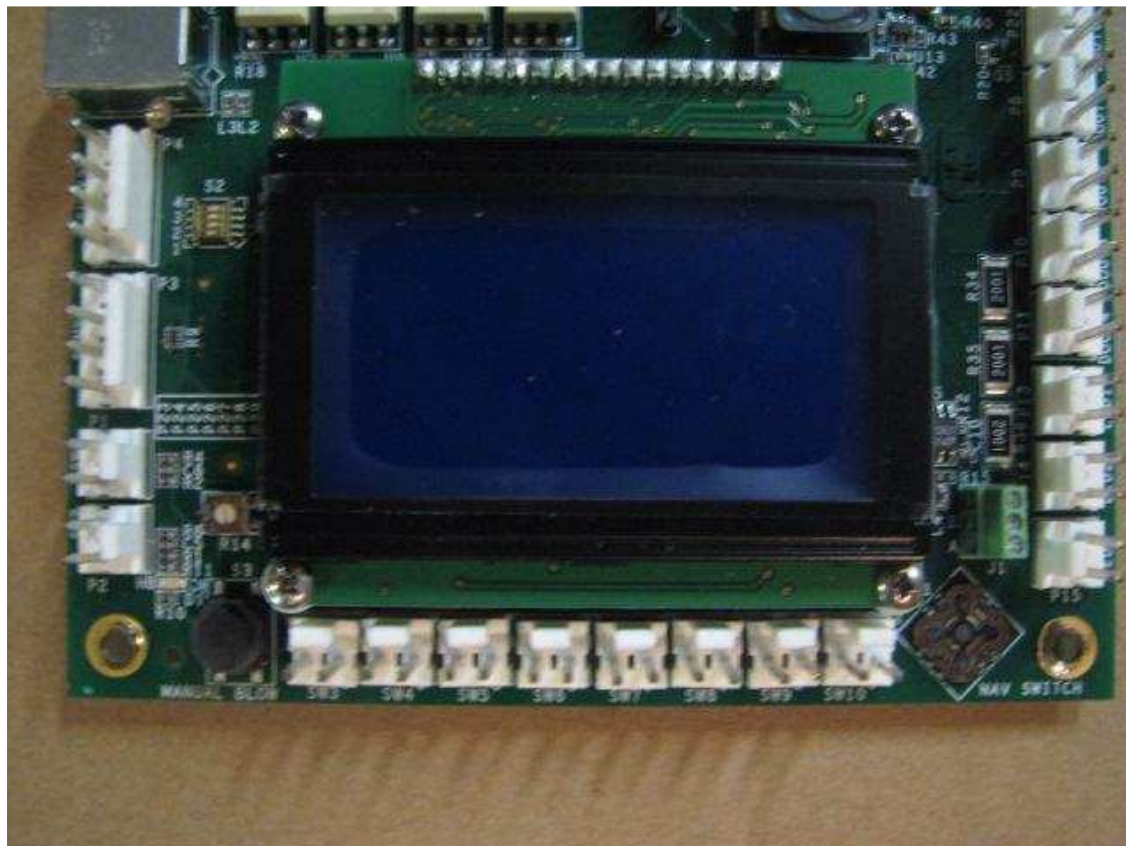
After changing above settings. Hold Blue button down until Shop pressure reading appears on display.

### Using the Logic Board settings for the SPP MK-III

The SPP MK-III uses a digital logic board with an embedded microcontroller to provide reliable, flexible lead/lag compressor control. The logic board allows you to configure operating parameters for the SPP MK-III, and to perform a manual drain blow.

### **Configuring Operating Parameters**

The SPP MK-III digital logic board has several configurable parameters for adjusting its behavior. These are configured using the LCD Display and Nav Switch beneath it. 2 displays are included on 3 & 4 compressor units, but appear as “slave mode” on the display and are controlled by the primary display.



MKIII Logic board display

After starting up and displaying identification and version information, the MK-III will automatically display the parameter configuration screen. This screen displays parameter names and their current values.

## **Using the Parameter Configuration Screen on the MKIII Logic board**

To adjust all parameter values you will use the onboard nav switch to move between controller functions. This switch, located directly below and to the right of the display, moves the cursor up down, left & right, and can be center button pressed down to store the users requirement. A pencil tip or some small object helps to navigate this switch as it is small in size:

1. Place front panel override switch to "Autosmart/Autodual position
2. Press the Nav Switch up or down buttons (like a joystick) until the '>' cursor appears next to the parameter value you wish to adjust.
3. Press the Nav Switch center button in toward the board (like a button) to enter Edit Mode. The cursor will change to an '='.
4. Press the Nav Switch up and down until you have selected the value you want.
5. Press the switch in again to confirm your selection and leave Edit Mode. The cursor will change back to a '>'.

### **The Option Parameters**

The adjustable parameters are listed below. Navigate to the correct function using the nav switch under the display to select the function you want to change, then press the center nav button to generate an "=" sign. This allows the parameter value to be selected:

#### **Function #1:Lead/Lag OnTime**

**Description:** How long Compressor #1 should be the Lead Compressor before switching the Lead to Compressor #2.

**Possible Values:** 10M, 30M, 1H, 2H, 4H, 8H, 16H, 1D, 7D

#### **Function #2:Compressor QTY (only seen on 3-16 compressor controllers)**

**Description:** Tells logic board how many compressors are being controlled.

**Possible Values:** 3-16

#### **Function #3: DrainBloTime (Optional)**

**Description:** Duration of tank drain "blow time" for each hour of actual pumping time accumulated by both compressors. 1 hour of combined pumping time is fixed and cannot be changed

**Possible Values:** 10S-90S in 5 second increments

#### **Function #4:Auto Style**

**Description:** Selects Autosmart © or AutoDual Idle Mode.

**Possible Values:** Smart, Dual

#### **Function #5:Max Motor Starts per hour**

**Description:** Controls Autosmart Mode. Tells Autosmart what calculations to use to determine optimum idle time in autosmart mode

**Possible Values:** 2-8 Stop/start cycles per hour (6 is recommended by most compressor and starter manufacturers) Motoridle time after pumping is automatically calculated by the processor board, based on starts/stops per hour. Do not expect the motors to idle after pumping, especially uder light usage or less than the selected starts/stops per hour.

**Function #6:** AS Time Window

**Description:** Controls Autosmart Mode Monitoring time. Tells Autosmart what monitoring time to use to determine optimum idle time in autosmart mode

**Possible Values:** 30, 45, 60minutes

**Function #7:** AutoUnload

**Description:** Determined unloaded time of compressor to begin pumping after compressor motor starts

**Possible Values:** 0-20 seconds in 5 sec increments

**Function #8:** Lag Assist

**Description:** Determines max amount of time Lead compressor runs before forcing secondary compressors to turn on to satisfy shop air requirements

**Possible Values:** 1-3 hours in 1HR increments



## WARRANTY

### General Provisions

Standard Pneumatic Products, Inc. (the Seller) warrants to each Purchaser products of the Seller's own manufacture against defects in material and workmanship. With respect to products not manufactured by the Seller, the Seller will, if practical, pass along the warranty of the original manufacturer.

The Seller's sole obligation under this warranty shall be, at its option, to repair, replace, or refund the purchase price of any product or part thereof which is deemed to be defective, provided the Purchaser meets all of the applicable requirements of this warranty and none of the limitations apply.

### Warranty Periods

#### Units

The Models AD and ADS, and ADSE are warranted for one (1) year from date of manufacture or 15 months from shipment.

### Replacement Parts

Seller warrants repaired or replaced parts against defects in material and workmanship under normal use and service for ninety (90) days, or for the remainder of the warranty on the product being repaired, whichever is longer.

Normal maintenance items and procedures are not warranted unless found to be defective in material or workmanship, e.g., a clogged 3-valve.

### Limitations

Notice of the alleged defect must be given to the Seller in writing with all identifying details, including serial number, model number, type of equipment and date of purchase within thirty (30) days of discovery of same during the warranty period. If requested by Seller, such

product or product thereof must be promptly returned to Seller, freight collect for inspection. No models are eligible for travel expense.

The above warranties shall not apply and Seller shall not be responsible or liable for:

- a. Consequential, collateral or special losses or damages.
- b. Equipment conditions caused by fair wear and tear, abnormal conditions, accident, neglect or misuse of equipment, improper storage or damages resulting during shipment.
- c. Deviation from operating instructions, specifications or other terms of sales.
- d. Labor charges, loss or damage resulting from improper operation, maintenance or repairs made by person(s) other than Seller or Seller's authorized service station.
- e. Improper application or installation of product.

### Disclaimer

In no event shall Seller be liable for any claims, whether arising from breach of contract or warranty or claims of negligence or negligent manufacture, in excess of the purchase price.

**This warranty is the sole warranty of Seller and any other warranties, express, implied in law or implied in fact, including any warranties of merchantability and fitness for particular use, are hereby specifically excluded.**

**Please do not hesitate to call us at Standard Pneumatic Products for assistance when wiring in any of Standard Pneumatics Controller. The price of a phone call is far less costly than a mis-wired Controller.**