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"Saving the planet, one compressor at a time"

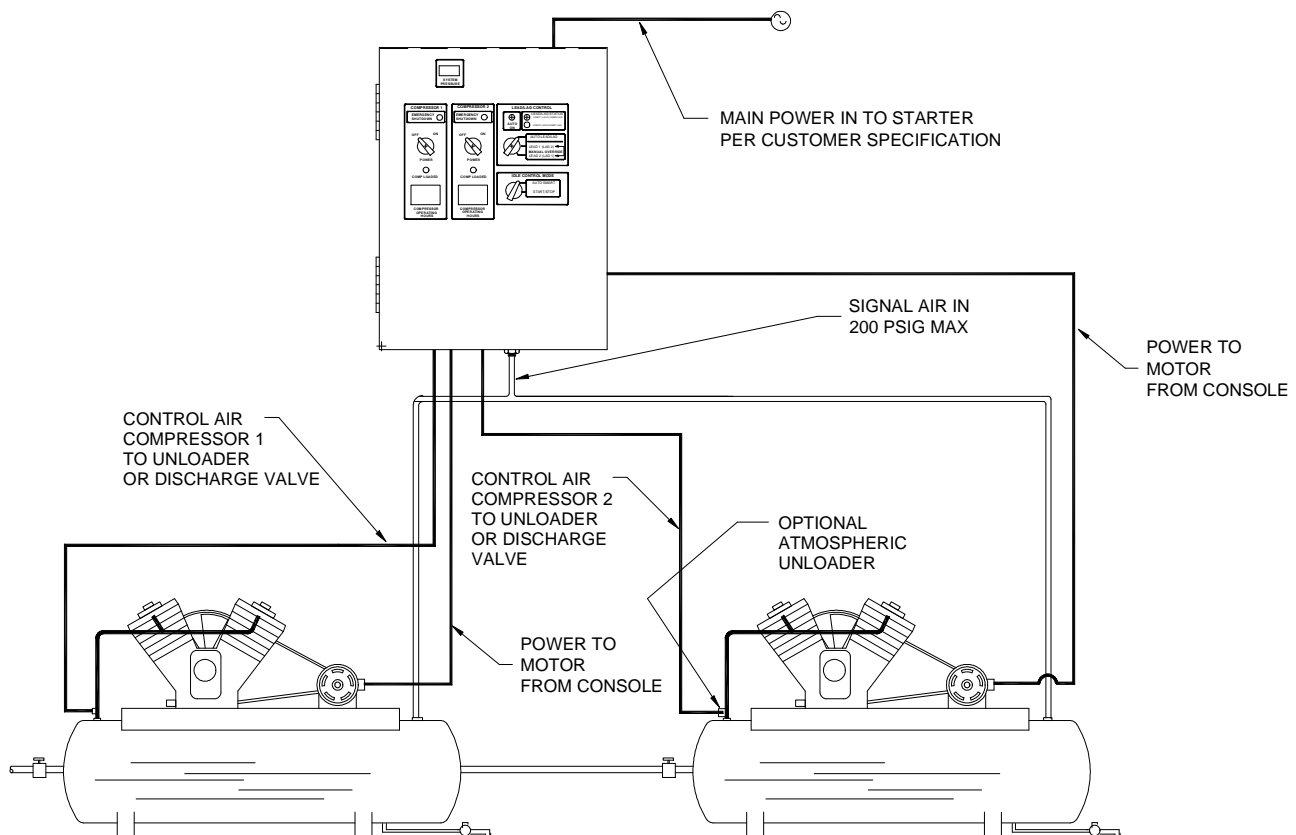
INSTRUCTIONS FOR INSTALLING AND OPERATING **THE UNIVERSAL AUTOSYNC MODEL ASPSS-2** **DUAL COMPRESSOR SEQUENCER** **MK3 Firmware Version 1.00 Rev 3**

Congratulations on your purchase of the Universal ASPSS ASPSS Dual Compressor Sequencer. The ASPSS DUAL/STARTER COMBINATION CONTROLLER is a modern controller that will operate, sequence, and idle your air compressors automatically, in one easy to install, self-contained package.

PLEASE READ INSTRUCTIONS BEFORE INSTALLING.

The ASPSS 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 ASPSS 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 ASPSS 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 ASPSS/STARTER Sequencer requires only 3 wiring connections to operate, 3 phase wiring in, and 3-phase wiring out to each motor on the compressors.

On starter equipped ASPSS units, all power connections are complete to the starters. Console power is taken from the motor input line on compressor contactor 1. Input and output wires to each motor are required.

On non-starter equipped ASPSS units, power in to the console and power out to the starter coils is via the internal terminal block inside the console. Knockouts are provided for cable entry to 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 matches the inlet voltage to the controller. Always use a locking/tagout electrical disconnect box between the main compressor power source and the ASPSS.

Test for proper motor direction rotation, then start unit by pushing the rocker switch to the "ON" position. For initial setup, the ASPSS "START/STOP - 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 ASPSS 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 ASPSS controller using the terminals labeled, "Comp 1 & Comp 2 Emerg Shutdown." The emergency shutdown switch must have non-powered dry contacts, and detect fault from the compressor when the contacts on the emergency switch are CLOSED. An open circuit on the switch (normally open) indicates proper operation of the compressor. **IMPORTANT: Sending Powered safety switches to the ASPSS controller will cause severe damage to the microprocessor board and VOID the factory warranty.**

Remote Signal

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

Tank Drain

Connect leads from the tank drain to the ASPSS terminal block. Power to the drain is supplied from the ASPSS 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 **ASPSS**. 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 ASPSS Console has a Lead/Lag control switch for operating Automatic lead/lag functionality. On initial ASPSS Console startup, and when switched to the "auto" position, **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 its 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.

These pressure settings automatically "flip-flop" back and forth between compressors during AUTOMATIC lead-lag cycling, equally distributing lead-lag pumping load on both compressors. Automatic Lead-Lag cycling is temporarily disabled when placed in either manual mode position. However, the 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 both controllers MUST BE PERFORMED with the Lead/Lag control switch set to the "Lead 1/ Lag 2 manual" Center Switch Position.

The ASPSS-2 Controller is factory preset to automatically switch 2 Compressors (Compressor 1 and Compressor 2) between Lead and Lag mode every 10 MIN. This Lead-Lag timing may easily be changed via the display on the Mark II display.

Start/Stop – AutoSmart - AutoDual Control

When front panel switch is placed in START/STOP Mode, both compressors shut off after they reach pressure. In AUTO SMART Mode, both compressors continue to idle the motors after pressure is reached based on the previous cycle times of the compressors. AutoSmart will determine the MINIMUM amount of idle time required to keep the compressor motors running and never exceed 6 start and stop cycles per hour. AutoSmart will continuously monitor the compressors operation over days and weeks and adjust idle time automatically. If AutoDual mode is selected on the MK III display, the end user has full control of the idle times on the compressors. Both Auto features ensure a no-load cool down of the motors, and avoid excessive Start-Stop Cycling of the compressors. It is highly recommended that the compressors remain in AutoDual or AutoSmart mode, even if AutoDual is only set for the minimum time allowed in the control board.

Pressure Settings (SMC 150 & 300 PSI Transducer)

Compressor 1: Press the center blue button **QUICKLY** on the transducer at the top of the console until the display toggles between n_1 and 120.0psi (the default factory **TURN-ON** 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 TURN-ON PRESSURE**

Compressor 2: Press blue button again until n_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 “n_1” setting must ALWAYS be set higher than the COMPRESSOR 2 “n_2” setting for proper lead/lag operation.**

IMPORTANT NOTE: Changing the turn-on pressure above also changes the shut-off pressure, as the **compressor ON/OFF dead band** always remains at a 20 psi differential. For example, if you change the “compressor turn on-off” pressure to 110 psi, the compressor will shut off (or idle) at 130 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 setting on each transducer 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.

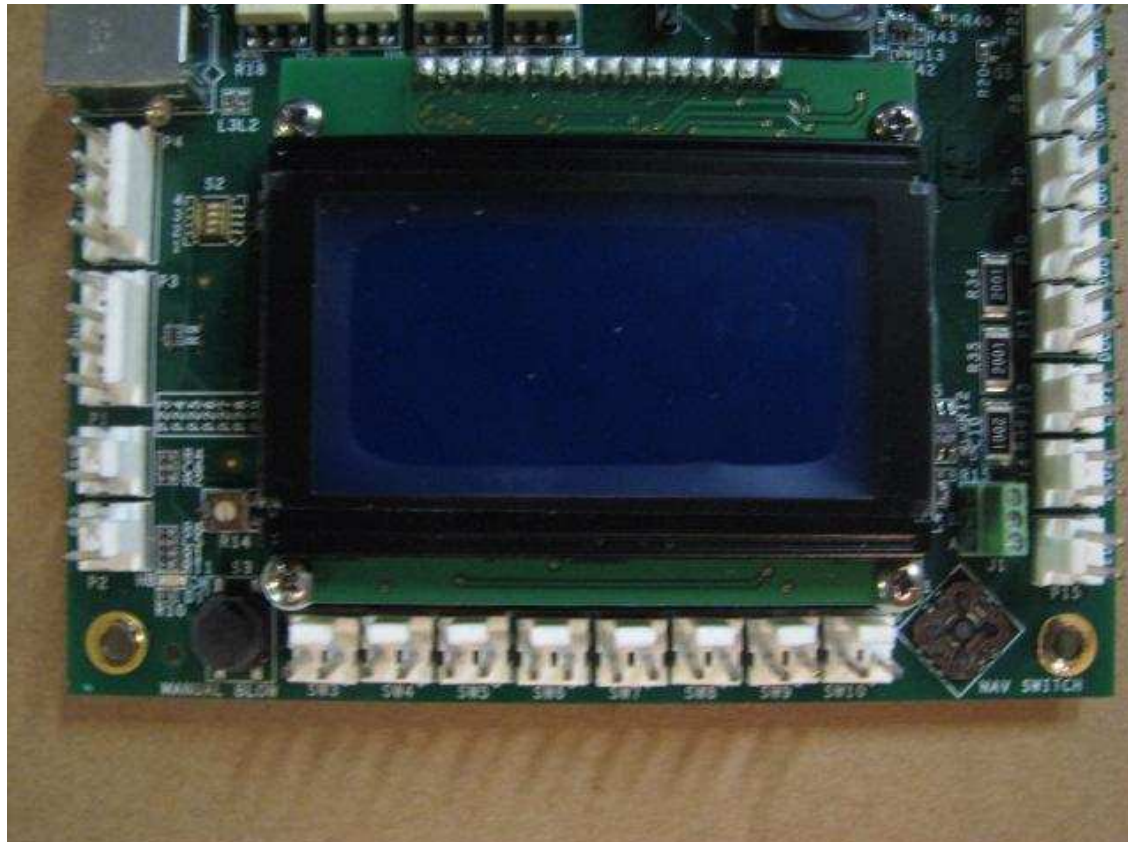
After changing above settings. Hold Blue button down until Shop pressure reading appears on display.

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 and Nav Switch beneath it.



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 nav switch to move between functions. This switch, located directly below the display, moves up, down, left, right, and can be pressed down to store the users requirement:

1. Press the Nav Switch up or down (like a joystick) until the '>' cursor appears next to the parameter value you wish to adjust.
2. Press the Nav Switch center button in toward the board (like a button) to enter Edit Mode. The cursor will change to an '='.
3. Press the Nav Switch up and down until you have selected the value you want.
4. 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:

Function #1:LL 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:Lead/Lag Cycle time

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

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

Function #3: DrainBloTime (Optional)

Description: How much Pumping time to accumulate before an automatic drain blow.

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

Function #4:AutoDual Description: How long to idle a compressor after pumping cycle ends.

Adjust this parameter to ensure that the compressor is not started more frequently than the manufacturer recommends.

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 ASPSS 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-way 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.