SERVICE BULLETIN

Subject: **Interfacing the 3200MP to a Pneumatic Guide Vane Actuator via the Triad Pneumatic Transducer**

Models Affected: **All with a pneumatic guide vane option**

Number: **C9314**

Date: **9/7/93**

Supersedes: **None**

Date:

Purpose:

To provide Installation and Operation Instructions for the Triad Pneumatic Transducer.

Department: Field Operations

Coin File Name: CMLA-SB

Prepared By: Todd C. Young

Approved By: Alan M. Johnson

Background:

The 3200MP controls retrofit instructions from RCD provides specific wiring instructions for interfacing the 3200MP to various types of guide vane/damper actuators. It is recommended that pneumatic interface be accomplished using solenoid valves HL73DC009 or equivalent. With this method, it is suggested that the vane position indicator be bypassed. See page 16 of the instructions (literature number 571-103) for details.

Fisher's CC-9900 series tri-state input to pneumatic transducer is another option for interfacing a pneumatic guide vane to the 3200MP. Using this method, the vane positioner does not have to be bypassed since the Fisher pneumatic transducer provides a 3-15 PSIG output.

The Triad pneumatic transducer is available through RCD. The part number is 17FA-522---122-1.

Contents

Overview

Triad's CC-9900 Series Tri-State Input to Pneumatic Transducer is a unique microprocessor-controlled interface which accepts an increase, decrease, and optional emergency stop input and provides a proportional 3-15 PSIG output. This unit provides a 3-15 PSIG signal from two digital or pulse signals. One signal controls the increase function and the other controls the decrease function. A unique benefit of this unit is the selectable ramp speeds which allow the unit to be tuned to each specific pneumatic actuator. The ramp speed options are field selectable from 15 to 240 seconds depending on your specific requirements. Triad's Tri-State Input to Pneumatic Transducer also provides an optional emergency stop feature which, when activated, immediately causes the unit to go to minimum output (3 PSIG).

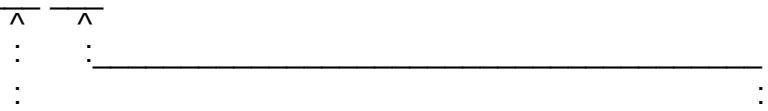
The unit can be powered by either 24 or 120 VAC. An isolation transformer is provided so multiple units can be powered by the same AC source.

All inputs to the system are 100% solid state and isolated to eliminate bulky mechanical relays. The compact size of Triad's Tri-State Input to Pneumatic Transducer allows it to be installed in most any control panel.

Used with the Pneumatic Guide Vane Option, the Triad Pneumatic Transducer interfaces the 3200MP to the Fisher 480 Actuator.

Ordering Instructions

Triad Part Number CC-990___-___



Power Supply

No Code = 24 VDC or 18 VAC

T = 24 VAC or 110 VAC

Input Signal

1 = 120 VAC

4 = 24 VAC

Carrier Part Number: 17FA_522___122-1

Triad Technologies, Inc.
6080-F McDonough Drive
Norcross, GA
Phone: 404-242-1922
Fax: 404-242-1944

OR

Carrier Replacement Components Division
ATTN: BSS Order Correspondent
P.O. Box 4808
Carrier Pkwy, Bldg TR-2A
Syracuse, NY 13221
Phone: 315-433-4226
Fax: 315-433-3963

General Installation

Unpack the CC-9900 Series and check the part number to verify you have received the correct model. The manufacturer part number should be CC-9901-T.

Mount the snap track which is provided by Triad to the 3200MP control panel and snap the CC-9900 Series into the mounted track.

All terminal blocks for electrical connections on the CC-9900 Series are of the removable type. All wiring is low voltage and should be in accordance with local regulations and the National Electric Code. Control signal wiring should not be run in the same conduit as line voltage wiring or other conductors that supply highly inductive loads such as generators, motors, contactors, etc. Use twisted pair, shielded wire 22 AWG or better for control signal wiring and 18 AWG or better for AC supply power wiring.

Ramp Speed Selections (DIP Switches & JP1)

The DIP switch settings determine the ramp up speed and Jumper JP1 determines the ramp down speed as a percentage of the ramp up speed. To set the ramp up speed, set DIP switch positions 1-4 to the proper on or off state. Add the respective DIP switch values by turning the DIP switch position to the “on” state to create the correct number of seconds. This feature provides the capability to field select the proper ramp up speed for your application.

1 on = add 15 seconds

2 on = add 30 seconds

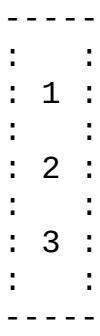
3 on = add 60 seconds

4 on = add 120 seconds

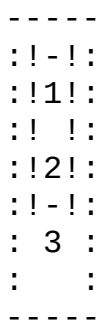
All off = add 240 seconds

Jumper JP1 determines the ramp down speed of the unit which is based as a percentage of the ramp up speed set by the DIP switches. See the diagram below.

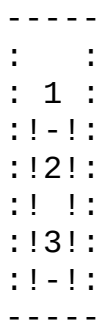
Ramp down =
Ramp up



Ramp down =
80% Ramp up

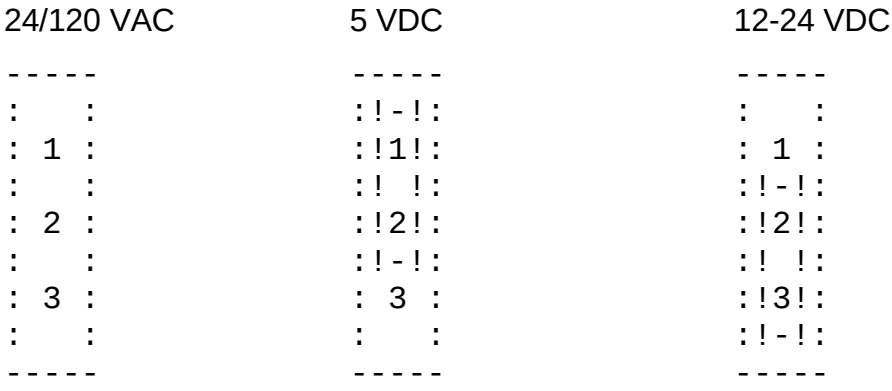


Ramp down =
60% Ramp up



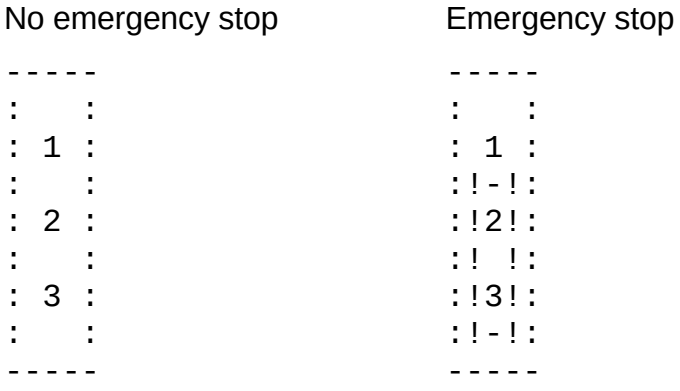
Control Voltage Settings

Jumpers JP3, JP10, and JP11 select the control voltage settings on the unit. This is always factory set for 110 VAC. However, you may change this value in the field by changing these jumpers. See the diagram below.



Emergency Stop Option

The unit provides the capability to field select an emergency stop option. In the “No Emergency Stop” mode, any input voltage option would keep the unit operative. If any input voltage option is NOT across “INPUT A,” then the unit will automatically revert to minimum pneumatic output. If this option is not selected, then no connection will be required across this input. When the “Emergency Stop” mode is activated, “INPUT A” needs to be input with any voltage option. See the diagram below.



Note: Make sure jumpers for input voltage are correct on JP3.

Input Connections

Connect control system inputs to the INCREMENT/DECREMENT/STOP terminals as follows: INCREMENT signal to “INPUT C + and -,” DECREMENT signal to “INPUT B + and -,” and EMERGENCY STOP signal (if utilized) to “INPUT A + and -.” Be sure the correct control signal voltage is selected via JP3, JP10, and JP11.

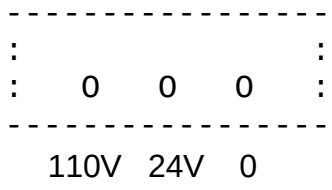
INPUT A - Input A is the emergency stop connection and requires 110 VAC to increase the air signal above 3 PSIG in the Carrier configuration. This is connected to terminal 18 of the 3200MP.

INPUT B - Input B is the decrease signal input requiring a 110 VAC signal. This is connected to 2J2-10 of the input/output board PCB #10.

INPUT C - Input C is the increase signal input requiring a 110 VAC signal. This is connected to 2J2-9 of the input/output board PCB #10.

Supply Power Connections

The CC-9900 Series can be powered by either 24 or 110 VAC. An isolation transformer is provided so multiple units can be powered from the same AC voltage which decreases the chance of ground loop problems. See the diagram below.



The power is supplied to the board at the 0 and 110 VAC connections, 110 VAC to L1 and 0 to L2 (L1 and L2 are the power terminals of the 3200MP).

LED Functions

There are four LED's located below the DIP switches and two on the pneumatic output section of this unit. The for LED's located next to the DIP switches indicate power and control input status, while the other two determine pneumatic output status.

Power and Control

LED "A" - LED "A" is red and located on the control board. It blinks when power is applied to the unit. It also indicates analog output status and will go steady at 15 PSIG pneumatic output.

LED "B" - LED "B" is red and located on the control board. It illuminates when an increase signal is input from the 3200MP. This is when voltage is applied across terminals "INPUT C + and -."

LED "C" - LED "C" is green and located on the control board. It illuminates when an emergency stop signal is input from the 3200MP. This is when voltage is applied across terminals "INPUT A + and -." LED "C" is solid when power to the board is applied.

LED "D" - LED "D" is green and located on the control board. It illuminates when a decrease signal is input from the 3200MP. This is when voltage is applied across terminals "INPUT B + and -."

Pneumatic Output

LED “B” - LED “B” is red and located on the transducer board. It is the bleed signal from the control board and illuminates as the unit is decreasing the pneumatic output flow rate.

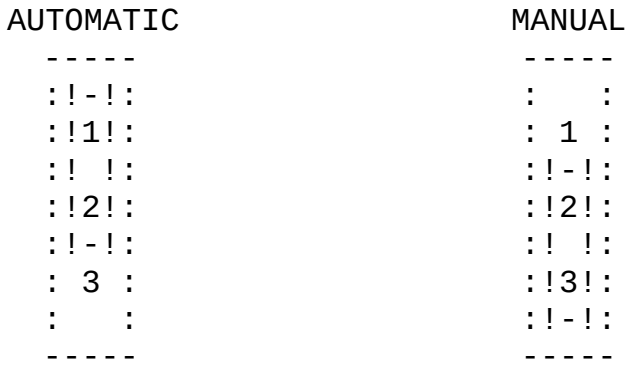
LED “F” - LED “F” is green and located on the transducer board. It is the feed signal from the control board and illuminates as the pneumatic output flow rate is increasing.

Manual Override

ON-LINE - The CC-9900 Series provides two on-line manual override pushbuttons.

The term on-line is used because the output is manually set by the pushbuttons until a control input signal is received. To manually increase the CC-9900 Series output, depress the “UP” push-button until the desired output is reached. Depress the “DOWN” pushbutton to manually decrease the unit’s output. The output will stay in the override state until the unit receiver an input signal. This feature provides the capability to set output signals during start-up or during controller failure and automatically allows the control input signals to regain control.

OFF-LINE - The unit provides the capability to manually adjust the pneumatic output and completely override the control input signals if desired. To accomplish this, jumper pins 2 & 3 on JP2 and turn the 10-5 mA potentiometer until the desired pneumatic output is set. To place the unit into automatic control jumper pins 1 & 2 on JP2 of the pneumatic output section on the unit. See the diagram below.



Pneumatic Connections

There are two pneumatic connections on the transducer board. “M” is the main air supply and “B” is the output air signal. Connect the supply (input) air tubing to the 1/4” barb fitting marked “M” and the branch (output) air to the 1/4” barb fitting marked “B.” An accumulator tank may be required between the branch output and the pneumatic actuator to act as a buffer as the C-9900 Series increases or decreases branch pressure.

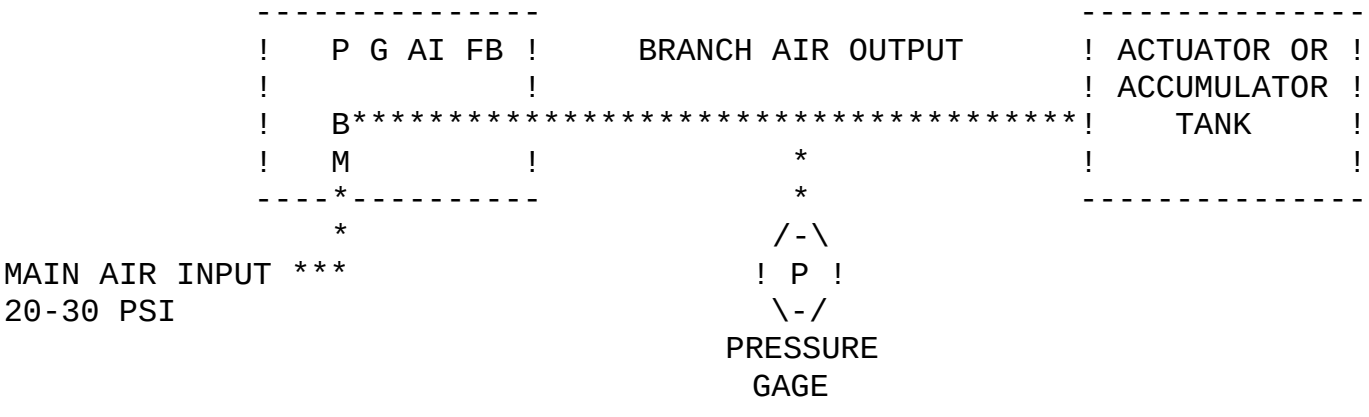
VDC Feedback Signal Connections

The CC-9900 Series provides a 5 VDC feedback signal which can be utilized at the user’s option. If the 5 VDC feedback is desired, connect the “FB” from the CC-9900 Series to “+” on the analog input and “G” from the CC-9900 Series to “-” on the controllers analog input.

Changing The Pneumatic Output Range

The CC-9900 Series is factory calibrated for a 3-15 PSIG output. Follow the directions below if a different output is desired to match the spring range on the pneumatic operator. The following items will be needed to complete this task:

- o 0-20 PSIG pressure gage
- o control signal (see above)
- o accumulator tank between CC-9900 Series branch output and pressure gage to provide buffering
- o 20 PSIG pressure source
- o 24 VDC or 24 VAC power source
- o slotted screwdriver



There are three 20-turn potentiometers (pots) on the CC-9900 series which are utilized for changing the pneumatic output range. The pots are labeled “ZERO,” “DB,” and “GAIN.” The “ZERO” pot is used to adjust the minimum pneumatic output. The “DB” pot is used to adjust the deadband of the unit. This pot shouldn’t need any adjustments unless the factory set deadband is not properly set for your application. The “GAIN” pot is used to set the output travel. For example, if the “ZERO” pot is set for 5 PSI and the “GAIN” pot is set for 12 PSI, then the unit will output a 5-17 PSI signal from minimum to maximum. Use a slotted screwdriver to adjust these pots.

Step 1 - Generate the minimum output signal from the controller to the CC-9900 Series and record the PSIG output.

Step 2 - Set the span by turning the “GAIN” pot until the desired span is selected. For instance, if you wish to change the factory set pneumatic output from 3-15 PSIG (12 PSIG span) to a 2-18 PSIG output (16 PSIG span), adjust the “GAIN” pot until the pneumatic output reaches 19 (16+3=19). You are now ready to set the minimum pneumatic output setting.

SPAN = (Desired Max Output - Desired Min Output) + Step 1 Output)

Step 3 - Generate the minimum output signal from the controller to the CC-9900 Series and adjust the “ZERO” pot to the desired minimum pneumatic output setting. Since the “GAIN” and “ZERO” pots are interactive you will have to repeat STEPS 2 and 3 until the unit is properly calibrated.

Step 4 - Optional only if utilizing the 5 VDC feedback signal of the CC-9900 Series. Once the minimum and maximum pneumatic outputs are recalibrated, generate the maximum output signal from the controller and adjust the CC-9900 Series pot labeled “FDBK” until a 5 VDC feedback signal is generated by the CC-9900 Series.

Setting The Deadband (DB)

The deadband is preset at the factory and should not require setting. Should it require setting, follow this general guide line:

Step 1 - Increase the “B” line pressure to 15 PSIG.

Step 2 - Adjust the “DB” pot counter-clockwise until the Feed and Bleed LED’s begin oscillating.

Step 3 - Adjust the “DB” pot clockwise until the oscillating stops. Then make an additional ¼ turn clockwise.

Step 4 - Check the output range of the transducer for a low pressure of 3 PSIG and a high pressure of 15 PSIG. If out of adjustment, perform the procedure described in the Changing the Pneumatic Output Range section above.

IF YOU HAVE ANY DIFFICULTY INSTALLING THE CC-9900 SERIES, PLEASE CALL TRIAD’S TECHNICAL SERVICE DEPARTMENT AT 404-242-1922.

Specifications

Electrical

Power Supply ..... See Power Supply Options

Input Signal ..... 24 or 120 VAC +/- 10%, 60 Hz

Ramp Speeds ..... Field Selectable, 15 sec. to 4 min.

Air Supply Required ..... 20 to 30 PSIG max, clean & oil free

Air Consumption ..... 0 scfm @ 20 PSIG

Air connections ..... 1/4” barb for tubing

Maximum Air Capacity ..... 0.5 scfm @ 20 PSIG

Output Signal ..... 3-15 factory set (field adjustable 1-20 PSIG)

Mechanical

Dimensions ..... 5”W x 4”H x 2”D

Shipping Weight ..... Approximately 2 lbs.

Mounting ..... Snap track

Environmental

Operating Temperature ..... 32 to 125 deg. F (0 to 50 deg. C)

Operating Humidity ..... 10% to 95% RH, non-condensing

Component Layout

The CC-9900 is essentially two components in one: the controls board and the transducer board. These two boards are connected by several permanent wires. The transducer board has the pneumatic connections.

THE GRAPHIC LAYOUT CANNOT BE INCLUDED ON COIN
BUT HAS BEEN DISTRIBUTED WITH HARDCOPY MAILINGS.