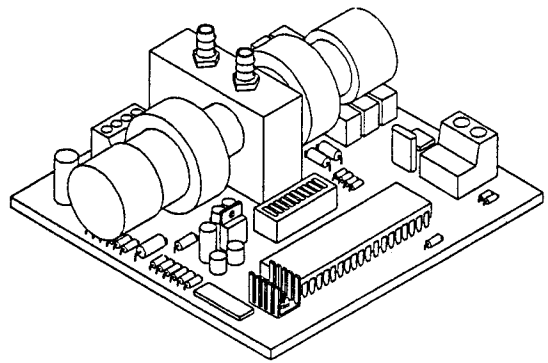




PNEUMATIC TRANSDUCER

THE PNEUMATIC OUTPUT TRANSDUCER PROVIDES A PRECISE METHOD OF CONTROLLING PNEUMATIC SYSTEMS FROM A SOLIDYNE FAST PWM CONTROL SIGNAL. THE UNIT ACCEPTS A 4% TO 96% SIGNAL AND CONVERTS IT TO A PROPORTIONAL 2-20 PSIG OUTPUT.

- 2-20 PSI Proportional Output
- Pressure Sensor for accurate control
- Optically Isolated PWM Input
- Manual Override
- Snap-track mounted
- Requires 24 VAC supply



#M956

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GENERAL

The M956 is ideal for direct digital control of pneumatic actuators typically used for variable air volume, hot water valves, cold water valves, mixed air dampers, or any pneumatic type actuator.

A pressure sensor connected to the branch output of the M956 accurately controls the circuit to assure a precision pneumatic output which will be proportional to the PWM control signal input.

The M956 is provided with manual override capability. If the signal to the M956 is lost, a jumper on the M956 can be selected to manual mode and a potentiometer can be adjusted which varies the pneumatic output to maintain a comfortable zone temperature. This feature also provides the capability to balance the pneumatic system prior to connecting it to the Solidyne controller.

SPECIFICATIONS

ELECTRICAL

SUPPLY: 22-32 VAC, 300 mA

INPUT: Solidyne Fast PWM signal, optically isolated 0-16 VDC PWM signal.

PNEUMATIC

AIR SUPPLY: 20-30 psi, clean air

AIR CONSUMPTION: Depends on rate of output variance. None, if output pressure does not change.

MAXIMUM AIR FLOW: 0.5 scfm @20 psi

OUTPUT: 2-20 psi

MECHANICAL

DIMENSIONS: See fig. 1

MOUNTING: 4.00" Snap-Track

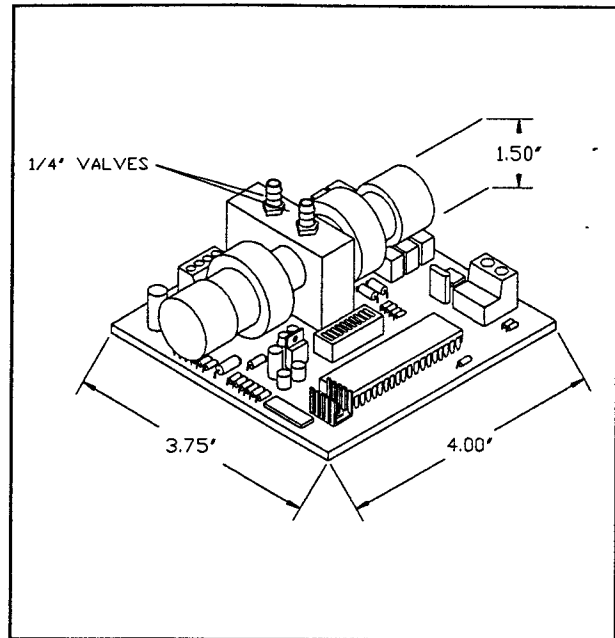


Fig. 1, Dimensions

ENVIRONMENTAL

OPERATING TEMP.: 32° F to 125° F

OPERATING HUMIDITY: 10-95% RH,
non-condensing

INSTALLATION

CAUTION

BEFORE INSTALLING OR REMOVING THE M956 MODULE, DISCONNECT POWER TO THE CONTROLLER TO PREVENT EQUIPMENT DAMAGE OR PERSONAL INJURY

1. Read installation instructions carefully.
2. Discharge any static you may have accumulated by touching a good earth ground before touching any components.
3. Check the range of operation and applicability of this product for your application.
4. This product should be installed by a trained, qualified service technician.
5. After the installation is complete, be sure to check the system out for proper operation.

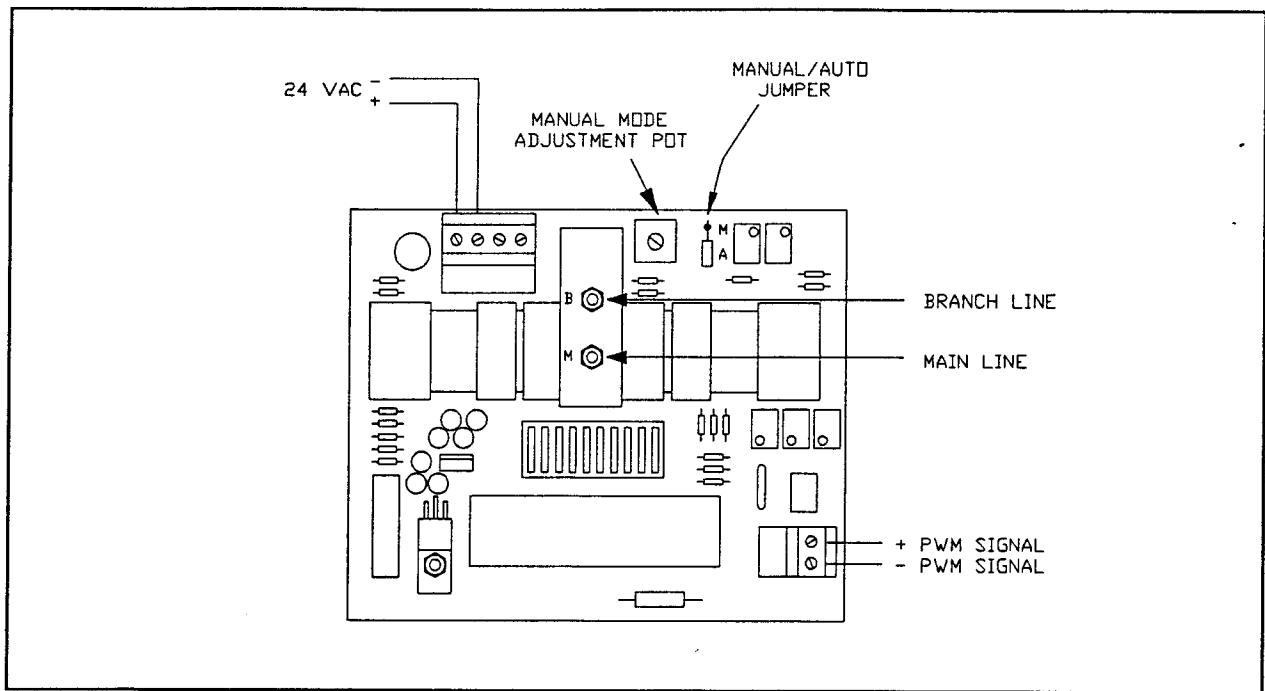


Fig. 2: M956 Terminations

MOUNTING / LOCATION

The M956 is designed to be mounted in a suitable enclosure where it will not be exposed to direct outside environment such as rain, condensation, etc. A snap track is supplied for mounting. The snap track should be secured to the mounting surface by screws and the M956 board then snapped into place.

TERMINATIONS

The M956 terminations are illustrated in figure 2. A FAST PWM signal, created by a Solidyne controller, is applied to the two position terminal block located in the bottom right hand corner. The polarity (+, -) of the FAST PWM signal should be noted.

BRANCH and MAIN lines are connected, using 1/4" tubing, to the the valves marked B and M.

A 24 VAC power supply is connected to the 4-position terminal block located in the top left corner.

IMPORTANT

THE POWER SUPPLY FOR THE M956 SHOULD BE 22-32 VAC. DO NOT EXCEED THESE RECOMMENDED VALUES.

To control the M956 manually, the MANUAL /AUTO jumper must be set to MANUAL. The manual mode is set by placing the jumper between pins 1 and 2. Otherwise, in the auto mode, pins 2 and 3 must be jumpered together (Fig. 3).

In the manual mode, the output of the M956 may be adjusted through the MANUAL MODE ADJUSTMENT POT. To increase the psi output, turn the potentiometer clockwise, counterclockwise to decrease the pressure.

The MANUAL MODE ADJUSTMENT POT has no effect when the MANUAL/AUTO jumper is in the AUTO position.

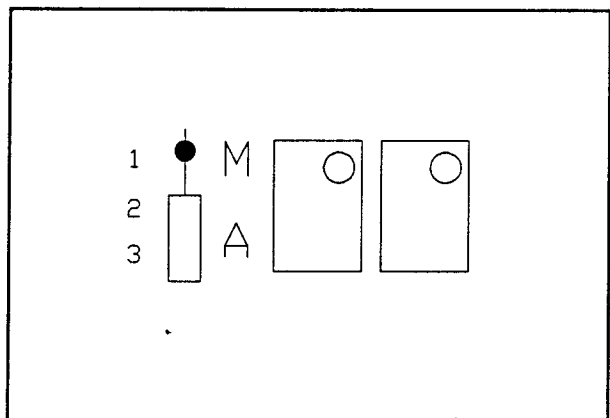


Fig. 3: Jumper Connection, Auto Mode

WIRING with ClipperNet

The M956 can be wired to a Solidyne Clipper Controller capable of creating FAST PWM signals. The two position terminal block located in the lower right corner of the M956 connects to the Clipper Output (+) and I/O COM (-) see figure 4. The (+) terminal connects to an "OUTPUT" terminal, the (-) terminal connects to the "IN/OUT COMMON" terminal. Typically, a twisted-pair of 18 AWG wires is used. Shielding is not necessary under most conditions.

NOTE: After the Clipper has been programmed the AUTO/MANUAL jumper should be in the AUTO mode for Clipper control.

WIRING with XL9600

The M956 can be wired to an XL9600 directly. The M956 will be wired to the "DIGITAL OUTPUT" and "DIGITAL OUT COMMON" terminals on the XL9600 (Fig. 5). Pay close attention to the wiring polarity. The (+) terminal on the M956 is wired to a "DIGITAL OUT COMMON" terminal on the XL9600, the (-) terminal is wired to a "DIGITAL OUTPUT" terminal.

Typically, a twisted-pair of 18 AWG wires should be used. Shielding is not necessary under most conditions.

NOTE: Wiring between the M956 and Clipper is different than wiring the M956 to the XL9600. Note the polarity when wiring to either controller.

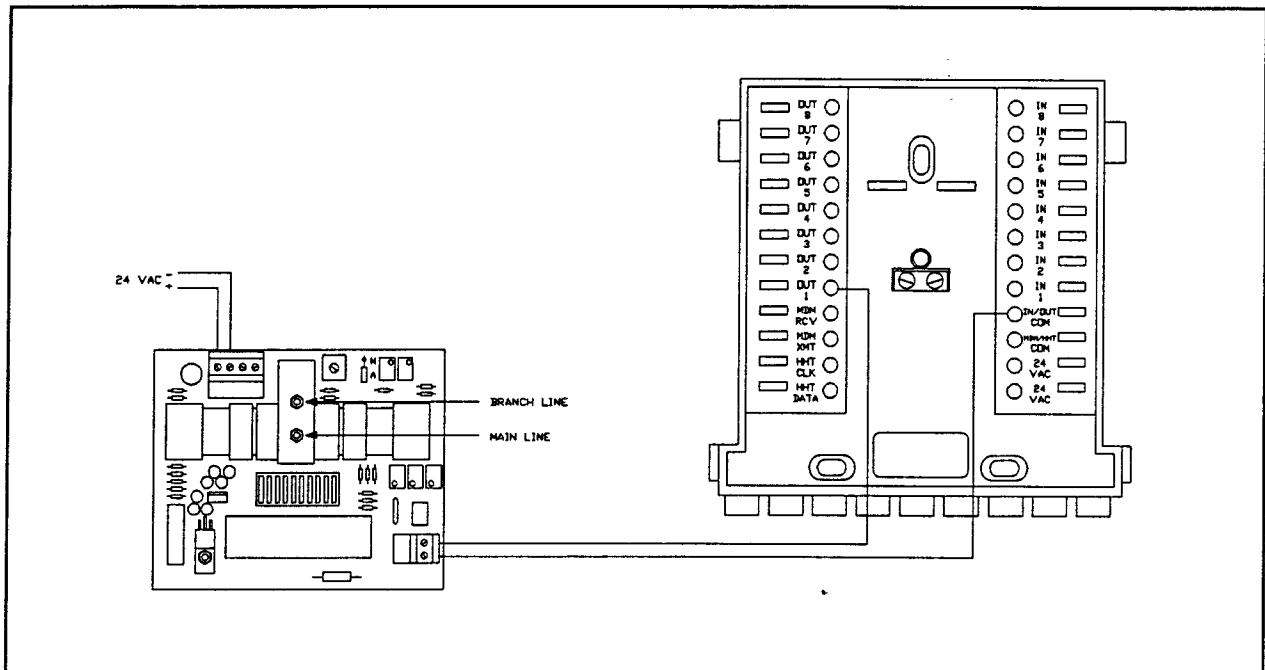


Fig. 4: M956 to Clipper Connection

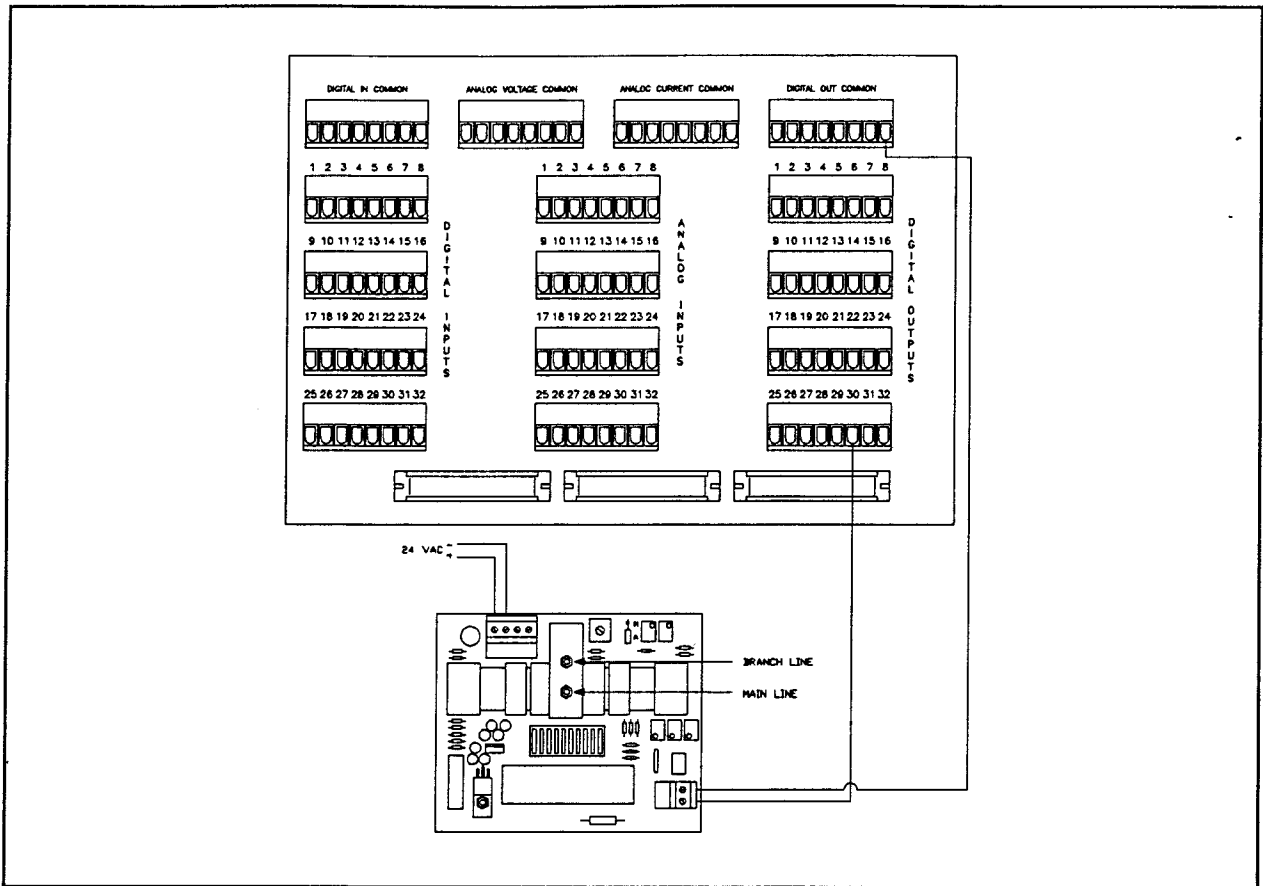


Fig. 5: M956 to XL9600 Connection

NOTE

Since the M956 requires only 8 VA, multiple M956 cards may be tied to the same transformer. Careful attention should be made when wiring one transformer to multiple M956 cards. The X1 of the trans-

former should be tied to the (+) terminal of all the M956 cards while X2 should be tied to all the (-) terminals of the M956 (see fig. 6). Do not criss-cross X1 and X2 from one M956 to another. It is important that this polarity be observed with multiple M956 cards tied to the same transformer.

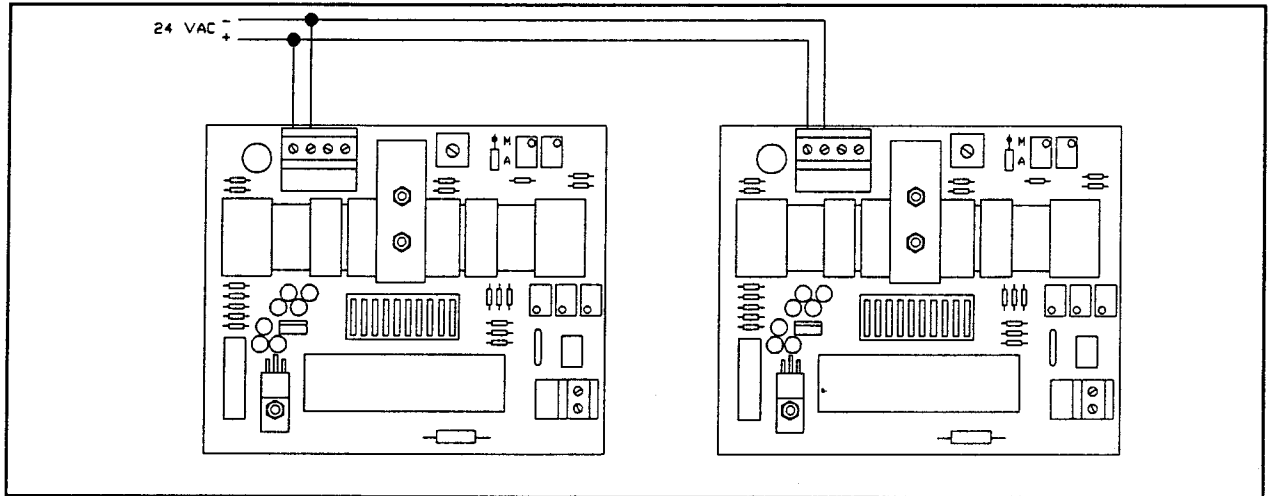


Fig. 6: 24 VAC Connections

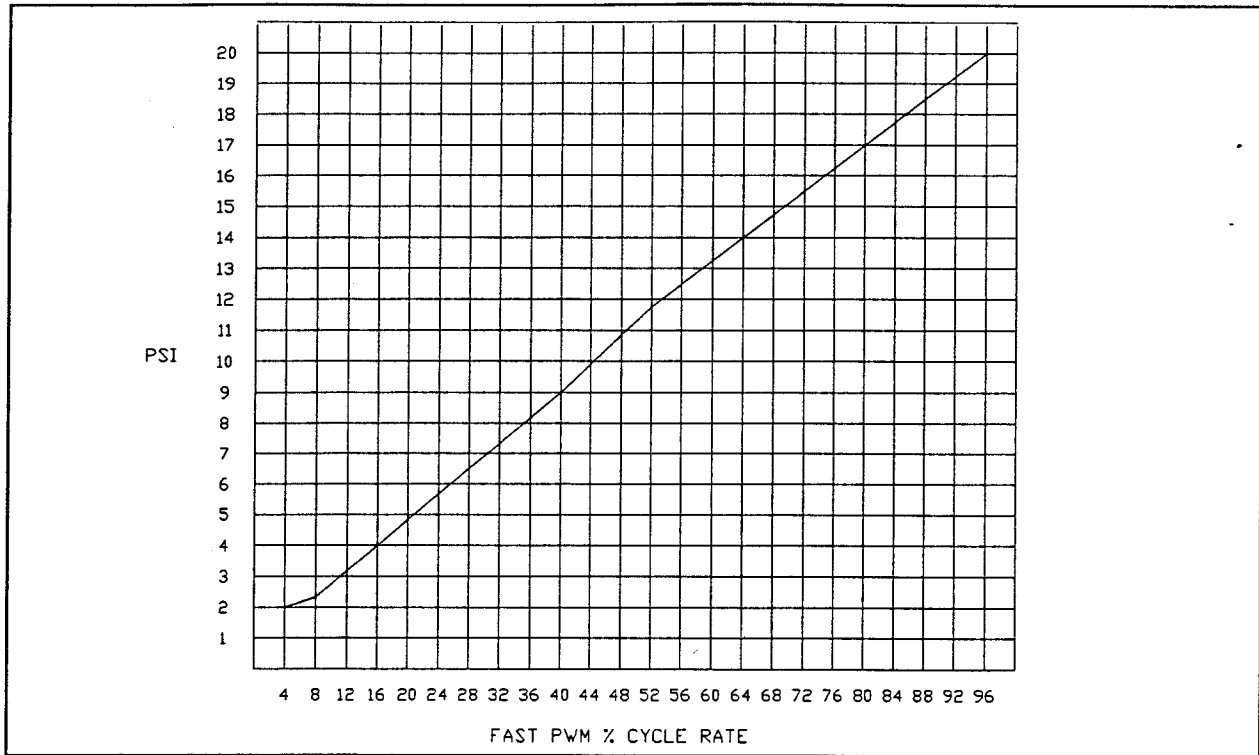


Fig. 7: PSI vs. Output Duty Cycle Values

OPERATION

The M956 accepts a FAST PWM signal and outputs a 2-20 PSI output. As the FAST PWM cycle rate increases or decreases the output of the M956 increases or decreases proportionally, see fig. 7 or Table 1. The M956 can be operated manually through the AUTO/MANUAL jumper. In the AUTO position (jumpering pins 2 and 3), the M956 is under Controller operation. In the MANUAL mode (jumpering pins 1 and 2), the M956 can be manually controlled through the Manual Mode Adjustment Pot. To increase the output of the M956 manually, turn the screw of the potentiometer clockwise. To decrease the output, turn the screw of the potentiometer counter-clockwise.

If power to the M956 is disrupted and the system is leak-tight, the last pneumatic output position prior to power failure will be maintained.

LED's on the unit indicate increases or decreases in pressure output (Figure 8). The LED marked "F" illuminates as the M956 feeds air to the branch output and the "B" LED illuminates while the branch output is bled. The LED's should not illuminate simultaneously at any given time.

Fast PWM %	PSI
04	2.00
08	2.36
12	3.25
16	4.13
20	5.00
24	5.75
28	6.49
32	7.38
36	8.12
40	9.00
44	10.04
48	10.77
52	11.73
56	12.62
60	13.36
64	14.24
68	14.83
72	15.72
76	16.75
80	17.49
84	18.38
88	19.11
92	20.00
96	20.00

Table 1: PWM% vs. PSI Output

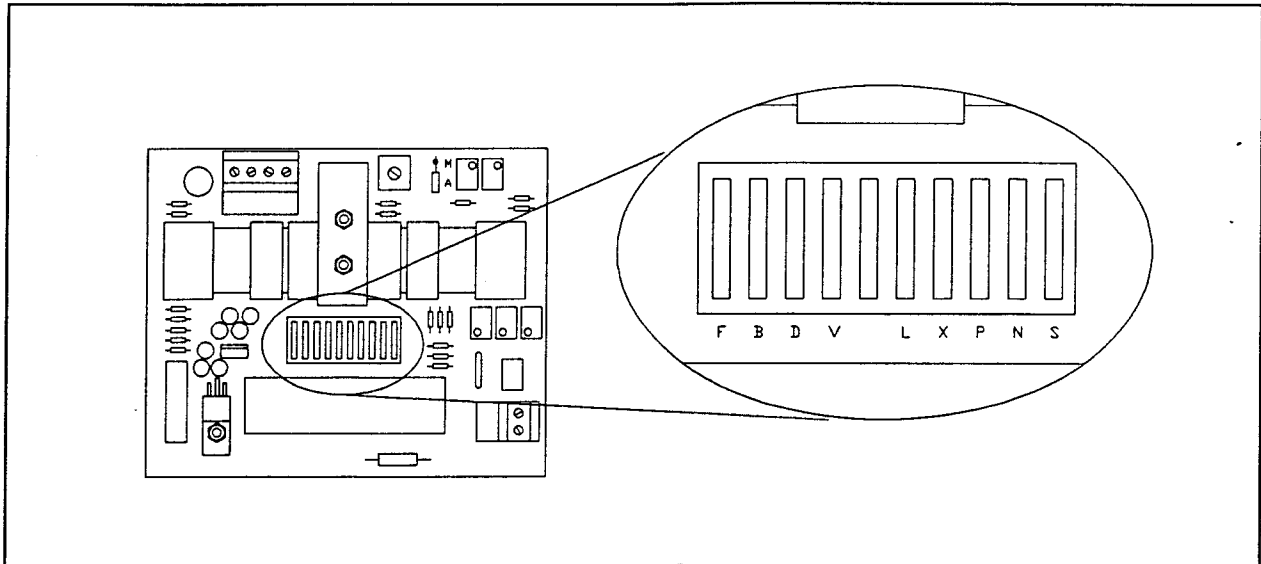


Fig. 8: M956 LED's

The "D" LED indicates the power supply has been detected. "V" indicates the M956's Power Up Delay. While "L", "N", and "S" do not apply, "X" indicates Maximum Pressure Output, and "P" indicates PWM Input has been detected.

CHECK OUT PROCEDURE for ClipperLAN +, LAN XL and XL9600

1. Apply power to the controller. The output controlling the M956 should be selected under the Miscellaneous Menu as a FAST PWM OUTPUT and the LOAD POLARITY under the same menu should be selected to be ON = ENERGIZED. Refer to the Controllers' Operations manual for details. Do not enter a PWM setpoint at this point.
2. Verify the 24 VAC supply to the M956 is present. The load connected to the M956 should not be powered at this time.
3. If the Controller and M956 are mounted some distance from each other, an assistant would be helpful for this procedure.

Under the EXAMINE LOGGED DATA menu of the Controller, select the PWM OUTPUT DUTY CYCLE VALUES menu. Select the output to which the M956 is connected. This menu will allow you to see the PWM value of that output, as well as "manually enter" a known test value (See Controller Operations Manual for details). The display should

now show 50%, which if no program was entered, would be the default value.

NOTE: *If a program were entered, this step would not be possible as the program would take control of the output and not allow manually entered values to set the duty cycle rate.*

With the PWM output at 50%, check the M956 for the correct PSI output. Use the PSI vs. Output Duty Cycle Values graph (fig. 7) to verify other PSI outputs versus a known Duty Cycle Value.

4. Enter a PWM setpoint and verify the operation of the M956.

IMPORTANT NOTE

PWM OUTPUTS REQUIRE 24 HOUR CONTROL FOR PWM MODULES TO OPERATE PROPERLY. TYPICALLY A DAYTIME AND NIGHT SETBACK CONTROL STRATEGIES WILL COVER THE 24 HOUR PERIOD. WITH ONLY A DAYTIME CONTROL STRATEGY IMPLEMENTED, THE PWM SIGNAL RATE WILL BE LOCKED ONTO ITS LAST VALUE BEFORE THE PROGRAM BECAME INACTIVE. THIS MAY LOCK THE PWM MODULE INTO AN UNDESIRABLE STATE UNTIL DAYTIME CONTROL BECOMES ACTIVE.

NOTE: *The permissible duty cycle range is from 4% to 96%.*

IMPORTANT NOTE

THERE ARE OTHER POTENTIOMETERS ON THE M956 THAT HAVE NOT BEEN MENTIONED IN THIS INSTRUCTION SHEET. THESE POTENTIOMETERS HAVE BEEN PRE-CALIBRATED AT THE FACTORY AND SHOULD NOT BE TAMPERED WITH. OTHERWISE THE M956 MAY NOT OPERATE PROPERLY.

ORDERING KEY

Refer to your authorized SOLIDYNE Wholesaler or Blue Sheet price list for complete ordering information.

If you have additional questions or need further information related to this product or any other SOLIDYNE products, call (800) 648-3980 for order information, or call (708) 394-3333 for technical help and support.

1. Order Part # M956.
2. For use with the Solidyne #8008LAN series of ClipperNet controllers.
3. For use with Solidyne XL9600 Controller (Part #STB required).