Instruction Manual

WM-3000-24

Electronics Inc.

Shot Peening Control

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Made in the **USA**

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1. **PRODUCT DESCRIPTION**

The WM-3000-24 MagnaValve is designed to regulate the flow of steel shot or grit in abrasive blast cleaning and shot peening machines. Valves are sized by flow rate capacity, either in pounds/minute or in Kg/minute, and are used in wheel-blast applications.

2. **THEORY OF OPERATION**

The Model WM 3000-24 MagnaValve is a normally closed valve used to regulate steel shot or grit in wheel blast systems. The valve is constructed with a permanent magnet to hold media until power is applied. An electromagnet cancels the permanent magnet and allows the media to flow at a controlled rate when the valve is powered and operating. A desired flow rate may be achieved by regulating the voltage to the electromagnet.

The WM 3000-24 MagnaValve is used in manual mode. In manual (or open loop) mode, a model AC-24 or a Pot 24 Controller is used to adjust the flow rate. This open loop system will provide accurate and repeatable flow rates over a 600-3000 pounds/minute flow range.

3. **LOCATION OF ADJUSTMENTS**

All of the adjustments are accessible from the front of the remote Valve Driver. The factory settings should not be changed. The rated flow range is shown on the identification label. The output signal is 10 Vdc. for calibrated valves.

4. **PRELIMINARY ADJUSTMENTS**

There are no preliminary adjustments required or recommended. The valve has been tested and calibrated at the factory prior to shipment. The full-scale range of the valve and the media type and size are listed on the product label.

5. **INSTALLATION**

The MagnaValve must be mounted in a vertical position with an adequate supply of media above it.

6. **OPERATON**

Signals used to operate the MagnaValve originate at the AC-24 or Pot24 Controller. There are three conditions necessary for correct operation. See figure 1 for additional information.

a. Power – The 24 Vdc power must be continuously applied to the valve. The valve requires 4Amps for operation and a power supply rated at 1000 VA. The voltage should be 24 ± 2 Vdc.
b. Enable – The 24 Vdc enable signal is used to activate the valve.
c. Input Signal – The analog 0-10 Vdc input signal must be above 0.25 Vdc as a minimum flow command signal.

For additional information about the MagnaValve consult the AC-24 or Pot24 installation manuals.

7. **CALIBRATION**

Calibration of the MagnaValve is done by a catch-and-weigh test. Media is allowed to flow through the valve for a timed period, usually one minute. The shot is weighed and compared to the requested amount. Note: Full scale output of the valve is 10 Vdc.

8. **SPARE PARTS LIST**

There are no spare parts for this series of MagnaValves

9. **TROUBLE-SHOOTING GUIDE**

The primary trouble-shooting is accomplished by reporting the status of the 4-LED indicators on the valve. They must all be ON in order for media to flow. If all of the LED's are ON but there is no media flow, check the following:

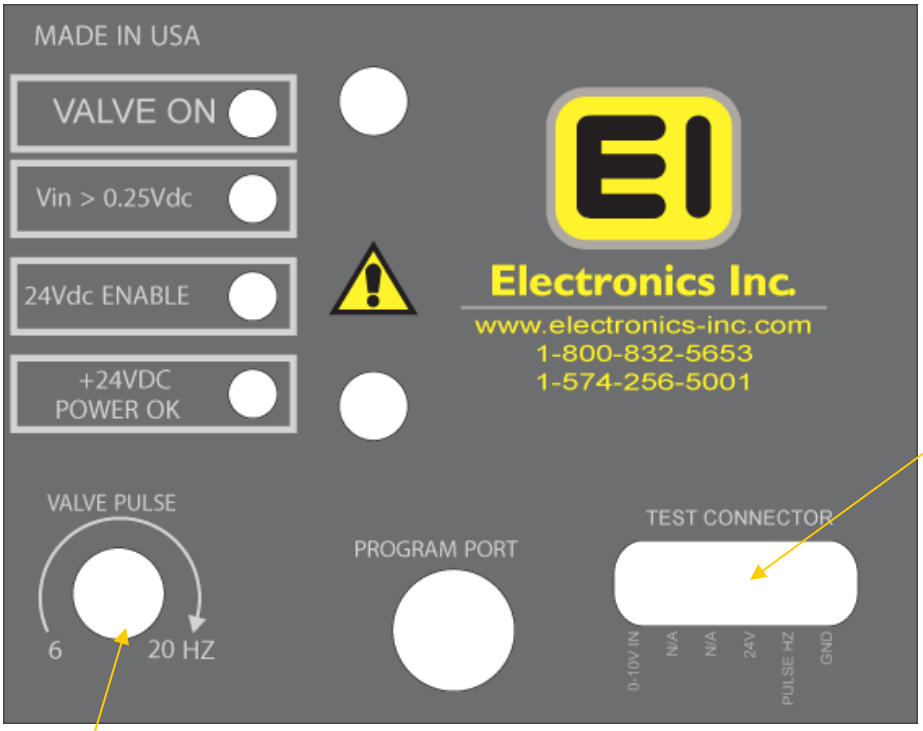
a. Is there media available from the hopper?
c. Is there any blockage above or below the MagnaValve?
d. Is the magnetic field completely cancelled when the red LED is ON? Check this by removing the valve from the machine and applying the proper signals for 100% flow.

10. **MAINTENANCE**

The only regular scheduled maintenance for a MagnaValve is annual re-calibration.

11. **FRONT PANEL DESCRIPTION**

The front panel of the MagnaValve contains the four LED's used for diagnostics. The large knurled screw on the front cover may be removed to gain access to the factory adjustments. Please refer all adjustments to qualified personnel.



Test Socket – This socket provides access to diagnostic voltages.

0-10 Vdc input
0-10 Vdc output
24 Vdc "Enable" input
6-20 Hertz pulse rate
0 Vdc common

Valve Pulse – This is the rate at which the valve dispenses shot, similar to a heart beat rate. It is factory set to match the best flow characteristics of the media (cast steel, cut wire or micro-bead). Typical operation is set at 8 Hertz .

Figure 1

Diagnostic LED's

VALVE ON – This LED is on when power is sent to the electromagnet. When the LED is off the permanent magnets will hold or block the shot flow. When the LED is on the valve is on for full capacity flow rate. When the LED is blinking then the shot flow is being regulated.

Vin > 0.25 Vdc- This LED indicates that an analog signal input greater than 0.25 Vdc has been received. When this LED is off there is no media flow allowed. The input signal range is 0-10 Vdc. At 10 Vdc the valve will "open" to full capacity which is usually 25% to 50% higher than the calibrated range. The relationship between the 0-10 Vdc input signal and actual flow rate is non -linear. The output signal 0-10 Vdc signal is linear and this makes accurate regulation by the FC -24 control possible.

24 Vdc ENABLE – This LED indicates that the 24 Vdc Enable signal has been received. When this LED is off then the valve is inhibited, no shot will flow. This feature is provided as an on-off action so that you do not have to disable or remove the 0-10 Vdc input signal.

24 Vdc Power – This LED indicates that 24 Vdc is available to operate the electromagnets for media flow. It should always be available and able to supply 4 Amps.

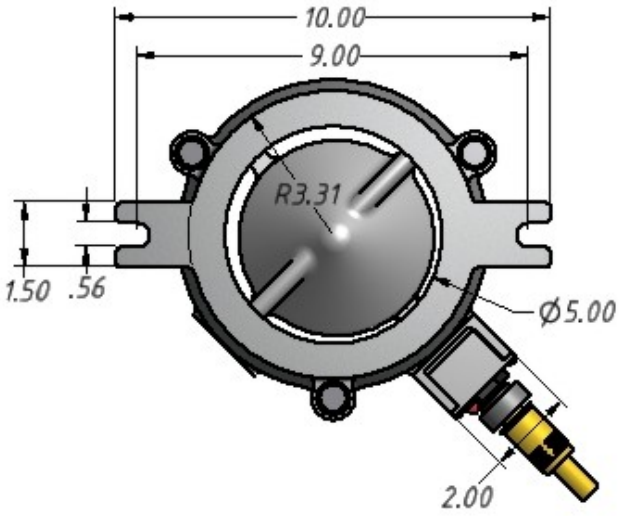
All of the LED's must be on in order to have media flow.

Specifications	
Input:	24Vdc @ 2A
Output:	600-3000 lbs/min
Indicator:	Red LED = Flow
Temp. Range:	32-212° F
	0-100° C
Weight:	32 lbs

NOTE: The valve should be located as close (5 feet or closer) to the wheel as possible for stability.

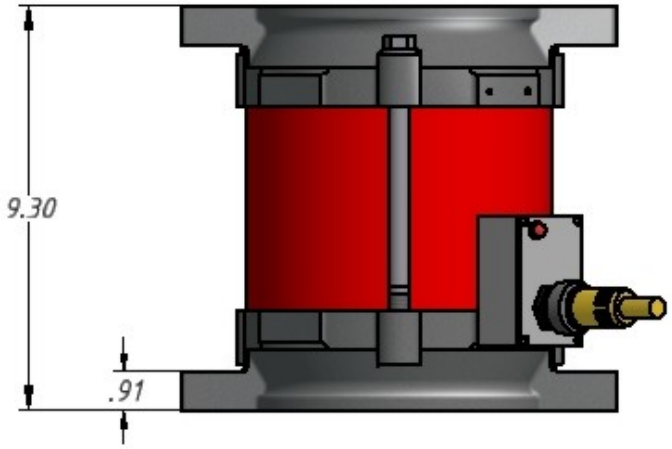
CABLE: 2 Conductor Shielded 18 AWG or equivalent. Connect shield at control only

Valve Dimensions



Panel Spacing:
5” on Cable Side
0.5” on Top & Bottom

Cable Connections: Remote Valve Driver
Black—0 Vdc Common
Red—24 Vdc Power
Blue—24 Vdc Enable input
Orange—0-10 Vdc Input Flow Command
Green —To MagnaValve
White — To MagnaValve



Cable Connections: Valve
Green —To Valve Driver
White — To Valve Driver