WM 3000-24 MagnaValve®

Instruction Manual

Electronics Inc.
Shot Peening Control

56790 Magnetic Drive, Mishawaka, Indiana 46545 USA • 1-800-832-5653 or (574)256-5001 • www.electronics-inc.com

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Read this manual completely before installing the MagnaValve.

WARNING!

The MagnaValve emits magnetic fields and can be harmful to pacemaker wearers.

Product Overview and Principle of Operation

MagnaValve® Description

The MagnaValve® WM 3000-24 is a normally closed valve that regulates the flow of steel shot or grit in wheel-blast machines for blast cleaning applications. It is a powerful valve with a flow rate capacity of up to 3,000 lb/min (1,361 kg/min) for wheels up to 125 hp. The Remote Valve Driver for the MagnaValve comes with a 6-ft cable for installation in the customer's electrical panel, making it an ideal valve for blast machines in high-temperature environments.

The MagnaValve reduces media usage, energy costs, machine downtime, and wear and tear on equipment.

How It Works

The MagnaValve's maintenance-free construction includes a rare earth permanent magnet for normally closed operation and an electromagnet for controlling shot flow rates. With power applied, the magnetic field is neutralized and shot is allowed to flow through the valve. When no power is applied to the MagnaValve, the permanent magnet stops all flow. If the power is interrupted for any reason, the permanent magnet securely holds the shot.

The MagnaValve is factory tested and results are supplied upon request.

MagnaValve Controllers for Closed-Loop Operation

For an "automatic" closed-loop operation, an Electronics Inc. **AC-24 Controller** will detect the current load on the wheel motor and regulate the flow of media to the WM 3000-24. The WM 3000-24 MagnaValve, with the AC-24 Controller, provides reliable, repetitive, and consistent media flow rates for blast cleaning applications. The MagnaValve system makes it easy to document flow rates and establish or repeat a good set-up.

AC-24 Controller Data Sheet

http://www.electronics-inc.com/uploads/AC-24Controller(1).pdf

AC-24 Controller Instruction Manual

http://www.electronics-inc.com/data_sheets_and_instruction_manuals_for_wheel_blast_machine_products2.html

Installation

MagnaValve

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

Remote Valve Driver

The Remote Valve Driver should be mounted in an electrical panel that conforms to the temperature range of 50˚- 120˚ F (10˚- 49˚ C).

Adjustments

MagnaValve

No adjustments are required or recommended. The valve has been tested at the factory prior to shipment.

Remote Valve Driver

Adjustments to the Remote Valve Driver can be made from the front of the driver; however, the factory settings should not be changed. The output signal is 10 Vdc. See page 5 for additional information on the Remote Valve Driver.

Operation

MagnaValve

Signals used to operate the MagnaValve originate at the AC-24 Controller. There are three conditions necessary for correct operation.

1) **Power.** 24 Vdc power must be continuously applied to the valve. The valve requires 2 Amps for operation and a power supply rated at 50 Va. The voltage should be 24 ±2 Vdc.
2) **Enable Signal.** The 24 Vdc Enable Signal is used to activate the valve.
3) **Input Signal.** The analog 0-10 Vdc input signal must be above 0.25 Vdc as a minimum flow command signal.

AC-24 Controller Operation

Please download the AC-24 Instruction Manual

http://www.electronics-inc.com/data_sheets_and_instruction_manuals_for_wheel_blast_machine_products2.html

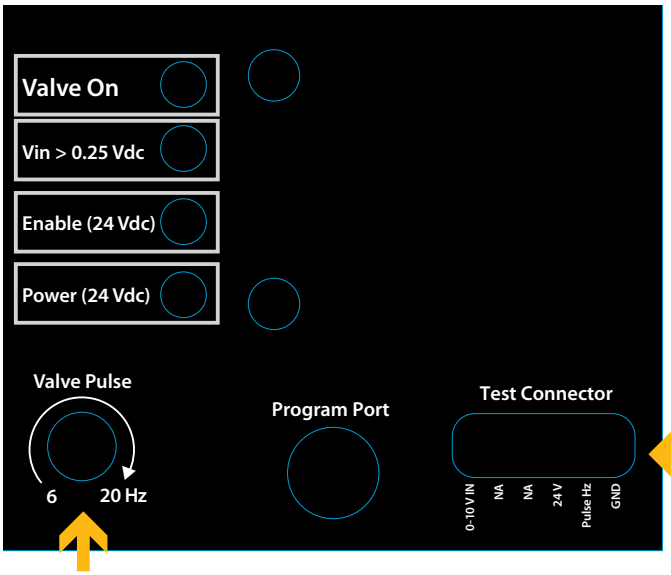
Operation

Remote Valve Driver

Valve Driver Panel (behind the cover plate)

The large knurled screw on the front cover of the Remote Valve Driver can be removed to gain access to the factory adjustments. Please refer all adjustments to qualified personnel.

Diagnostic LEDs*



Test Connector
Provides access to diagnostic voltages.
- 0 - 10 Vdc input
- 24 Vdc "Enable" input
- 6 - 20 Hertz pulse rate
- 0 Vdc common

Valve Pulse
Rate at which the valve dispenses shot. The Valve Pulse is factory set to match the best flow characteristics of the media (cast steel or cut wire). The typical operation rate is 8 Hertz.

**Diagnostic LEDs*

Valve On. Indicates when power is being sent to the MagnaValve's electromagnet. When the LED is on, the valve is on for full capacity flow rate. When the LED is off, the MagnaValve's permanent magnet has stopped the media flow. When the LED is blinking, the shot flow is being regulated.

Vin > 0.25 Vdc. Indicates that an analog signal input greater than 0.25 Vdc has been received. When this LED is off, no media flow is allowed. The input signal range is 0 -10 Vdc. At 10 Vdc, the MagnaValve will open to full capacity. The relationship between the 0 -10 Vdc input signal and actual flow rate is non-linear.

24 Vdc Enable. Indicates that the 24 Vdc Enable Signal has been received. When the LED is off, the MagnaValve is inhibited and no shot will flow. This feature is provided as an on-off action so the 0-10 Vdc input signal does not have to be disabled or removed.

24 Vdc Power. Indicates that 24 Vdc is available to operate the electromagnet for media flow. It should always be available and able to supply 2 Amps.

All four LEDs must be on in order to have media flow.

Specifications

MagnaValve

Power	+24 Vdc @ 2A (50 VA)
Media	Steel Shot and Grit
Weight	32 lb (14.5 kg)
Mode	Normally Closed
Temperature Range	Valve: 50˚- 230˚ F (10˚-110˚ C)
Signal Input	0 - 10 Vdc
Flow Output	0 - 3,000 lb/min (0 - 1,361 kg/min)*
Display LEDs	Valve On
	0 - 10 Vdc Command Input Available
	24 V Flow Enable
	+24 Vdc Power

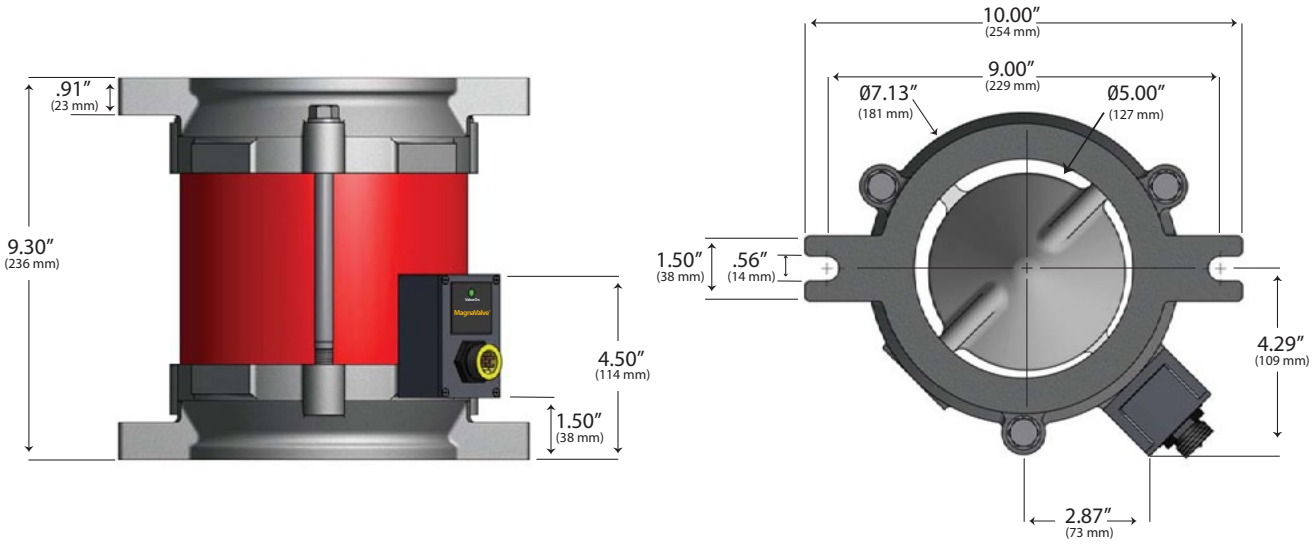
Cable: 2 Conductor shielded 18 AWG or equivalent.
Connect shield at control only.

** Flow rate based on S230 cast steel shot*

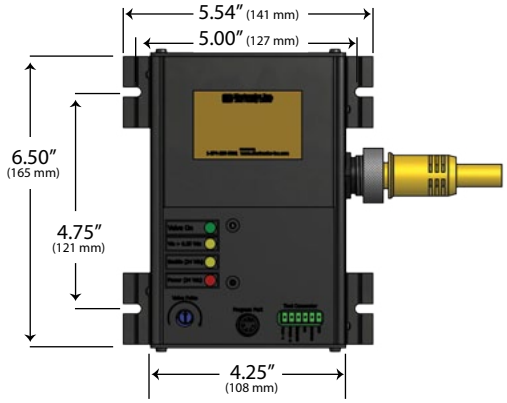
Remote Valve Driver

Temperature Range 50˚- 120˚ F (10˚- 49˚ C)

Dimensions



For stability, the MagnaValve should be located as close as possible (within at least 3 ft / 1 m) to the blast machine wheel.



Panel spacing for the Remote Valve Driver: 5″ on cable side, 0.5″ on top and bottom.

Remote Valve Driver Cable Connection

The Remote Valve Driver should be installed in customer's electrical panel. The 6-pin plug and cable wires connect to customer's wiring per the following:

White MagnaValve power signal - connect to valve driver, White only

Green MagnaValve power signal - connect to valve driver, Green only

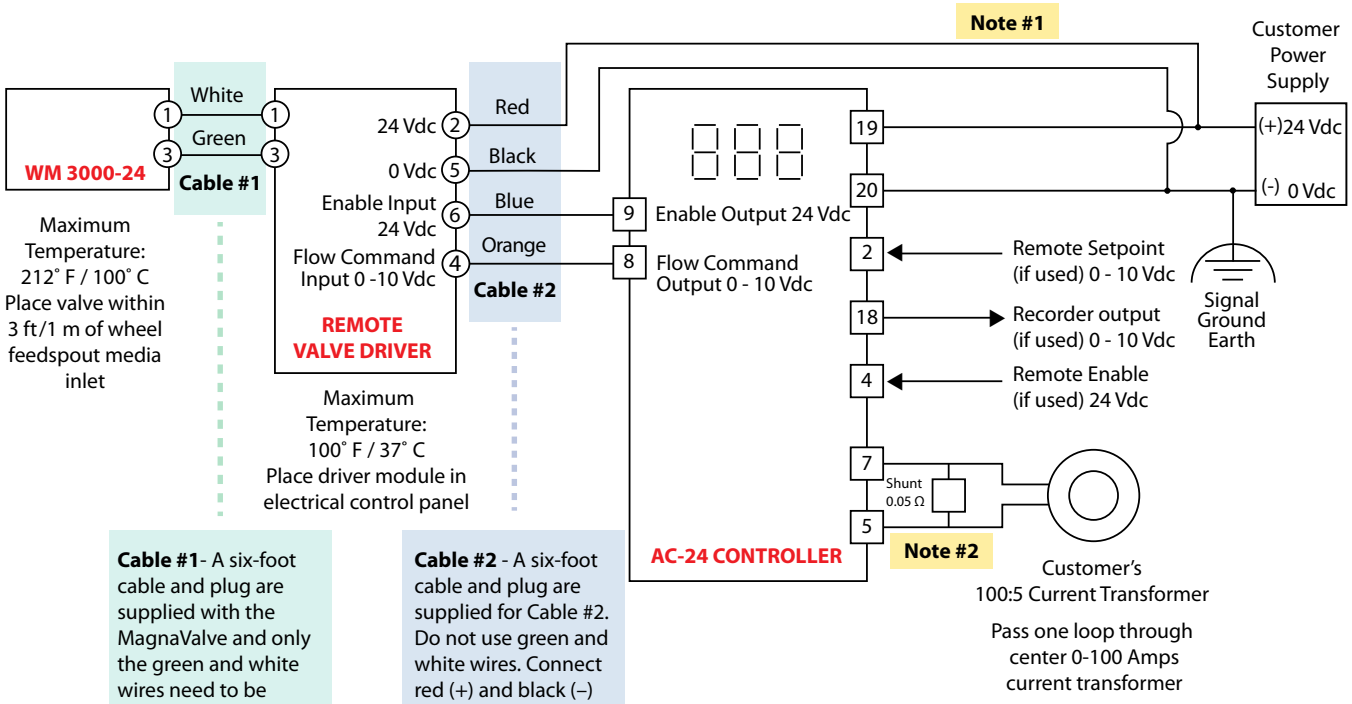
Red Customer Power Supply in control panel - Power bus hot +24 Vdc

Black Customer Power Supply in control panel - Power bus common 0 Vdc

Blue 24 Vdc Enable Input - connect to AC-24 Controller Screw terminal #9, Enable Output

Orange 0-10 Vdc Flow Command Input - connect to AC-24 Controller Screw terminal #8, Flow Command Output

AC-24 Controller Cable Connection



Cable #1- A six-foot cable and plug are supplied with the MagnaValve and only the green and white wires need to be connected. Do not use the other wires in the cable. Wiring from the MagnaValve to the Remote Valve Driver should be in a private conduit (no adjacent motor leads, etc). Use 16 AWG. For runs longer than 98 ft/30 m, use larger wire such as 14 AWG.

Cable #2 - A six-foot cable and plug are supplied for Cable #2. Do not use green and white wires. Connect red (+) and black (–) wires directly to 24 Vdc power source. Connect blue and orange to AC-24 Controller terminals 9 and 8.

Note #1 Do not attach Red and Black wires to terminals 19 and 20. Connect Red and Black wires directly to power supply — this prevents ground noise interference.

Note #2 Shunt is supplied with AC-24 Controller and is attached to terminals 5 and 7.

Troubleshooting

If all of the LEDs are on but there is no media flow, please check the following:

1) Is the mechanical slide gate valve above the MagnaValve fully open?
2) Is media available from the hopper?
3) Is there a blockage above or below the MagnaValve?
4) Is the magnetic field completely cancelled when the "Valve On" LED is on? Check this by removing the valve from the machine and applying the proper signals for 100% flow. Did all of the shot fall from the valve?

If the problem can't be identified or if you detect a problem with the magnetic field, contact Electronics Inc. Please have the following information ready.

1) Number of valves on the machine _____
2) Controller model _____
3) Valve model_____Valve serial number_____
4) Media type ☐ cast steel ☐ cut wire ☐ grit ☐ other_____
5) Media size _____
6) Wheel size (hp)_____ Wheel size (diameter) _____
7) Desired wheel amperage (Amps) _____
8) Wheel speed (cpm) _____
9) Blasting cycle time_____
10) Time between cycles_____

Make note of LED indicators on the MagnaValve:

How do the MagnaValve LED indicators react during the blast cycle?

_____

Make note of LED indicators on the AC-24 Controller (if used):

How do the AC-24 Controller LED indicators react during the blast cycle?

_____

What does the AC-24 Controller display at the end of the blast cycle? _____

To expedite a solution, please send images of your valve installation, the valve's ID label and/or a video of the controller and valve driver during operation. Troubleshooting with Skype is also recommended.

Electronics Inc.
Telephone: (574) 256-5001 or 1-800-832-5653 (USA and Canada)
Fax: (574) 256-5222

Maintenance

The MagnaValve has no moving parts and is thereby maintenance free.

Spare Parts List

The MagnaValve has no moving parts to replace.

Contacting Electronics Inc.

Electronics Inc.
56790 Magnetic Drive
Mishawaka, Indiana 46545 USA

Telephone: (574) 256-5001 or 1-800-832-5653 (USA and Canada)
Fax: (574) 256-5222
Email: sales@electronics-inc.com
Website: www.electronics-inc.com

Limited Warranty

The warranty obligations of Electronics Inc. for this product are limited to the terms set forth below.

Length of Warranty Period
This limited warranty lasts one (1) year from the shipping date of this product.

What is Covered
This limited warranty covers defects in materials and workmanship in this product.

What is Not Covered
This limited warranty does not cover any damage, deterioration or malfunction resulting from any alteration, modification, improper or unreasonable use or maintenance, misuse, abuse, accident, neglect, exposure to excess moisture, fire, improper packing and shipping (such claims must be presented to the carrier), lightning, power surges, or other acts of nature. This limited warranty does not cover any damage, deterioration or malfunction resulting from the installation or removal of this product from any installation, any unauthorized tampering with this product, any repairs attempted by anyone unauthorized by Electronics Inc. to make such repairs, or any other cause which does not relate directly to a defect in materials and/or workmanship of this product. This limited warranty does not cover equipment enclosures, cables or accessories used in conjunction with this product.

How to Obtain a Remedy Under this Limited Warranty
To obtain a remedy under this limited warranty, contact Electronics Incorporated by letter, email, fax or telephone with the following information:
• Product name and model
• Product serial number
• Original shipping date (see label on product)
• Company name and location
• Name of contact person for description of symptoms
• Return shipping address and any special instructions

If it is determined that the product must be returned under this limited warranty, a Returned Goods (RG) number, obtained from Electronics Inc., will be required. This product should be properly packed to prevent damage in transit. Cartons not bearing a RG number will require additional processing time and repair service may be delayed.

What Electronics Inc. Will Do Under This Limited Warranty
Electronics Inc. will, at its sole discretion, provide one of the following remedies to whatever extent it shall deem necessary to satisfy a proper claim under this limited warranty:

1.) Elect to repair or facilitate the repair of any defective parts within a reasonable period of time, free of any charge for the necessary parts and labor to complete the repair and restore this product to its proper operating condition. Electronics Inc. will pay the shipping costs necessary to return this product once the repair is complete.

2.) If the defective product cannot be repaired, it will be replaced with a new unit and the original warranty period will be extended by six (6) months. Electronics Inc. will pay the shipping costs necessary to replace this product.

If this product is returned to Electronics Inc., the product must be insured during shipment, with the insurance and shipping charges prepaid. If this product is returned uninsured, Electronics Inc. does not assume any risk of loss or damage during shipment. Electronics Inc. will not be responsible for any costs related to the removal or re-installation of this product.

Out-of-Warranty Product

Product that is out-of-warranty will be repaired at customer's request and the cost of repair will be disclosed prior to proceeding with the repair. A purchase order must be received prior to repair. If the product cannot be repaired, Electronics Inc. will provide one of the following remedies:

1) New unit at current pricing with a one (1) year Limited Warranty from the shipping date of product.

2) Refurbished unit (if available) at a discounted price with a six (6) month Limited Warranty from the shipping date of product.

Limitation on Liability

The maximum liability of Electronics Inc. under this limited warranty shall not exceed the actual purchase price paid for the product. Electronics Inc. is not responsible for direct, special, incidental or consequential damages resulting from any breach of warranty or condition, or under any other legal theory to the maximum extent permitted by law.

Exclusive Remedy

To the maximum extent permitted by law, this limited warranty and the remedies set forth above are exclusive and in lieu of all other warranties, remedies and conditions, whether oral or written, express or implied. To the maximum extent permitted by law, Electronics Inc. specifically disclaims any and all implied warranties, including, without limitation, warranties of merchantability and fitness for a particular purpose. If Electronics Inc. cannot lawfully disclaim or exclude implied warranties under applicable law, then all implied warranties covering this product, including warranties of merchantability and fitness for a particular purpose, shall apply to this product as provided under applicable law.

Rights Under State Law

This warranty defines specific legal rights relative to these products provided by Electronics Inc. Legal rights may also vary from state to state.