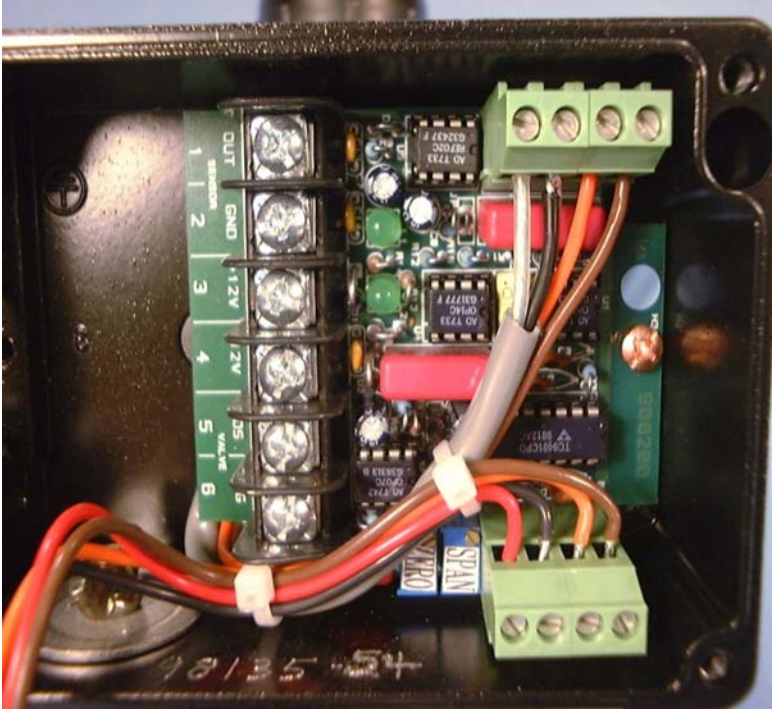


Standard Accuracy Series MagnaValves™



For the Following MagnaValve Models

250-N 1578

500-N 579

577 1579

1577 580

578 590

Hybrid Installations

VLP+599-5.0

LP+599-5.0

*Added 1500 Series
16 July, 2002



Electronics Inc.
Shot Peening Control

Electronics Inc.

56790 Magnetic Drive

Mishawaka, Indiana 46545

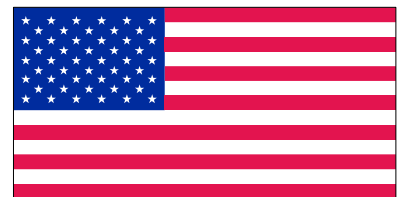
1-800-832-5653 (Toll Free)

Phone: 1-574-256-5001

Fax: 1-574-256-5222

E-mail: sales@electronics-inc.com

Website: www.electronics-inc.com



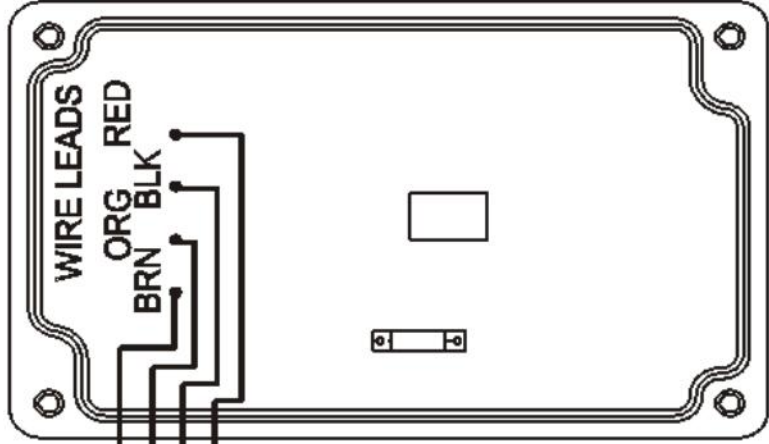
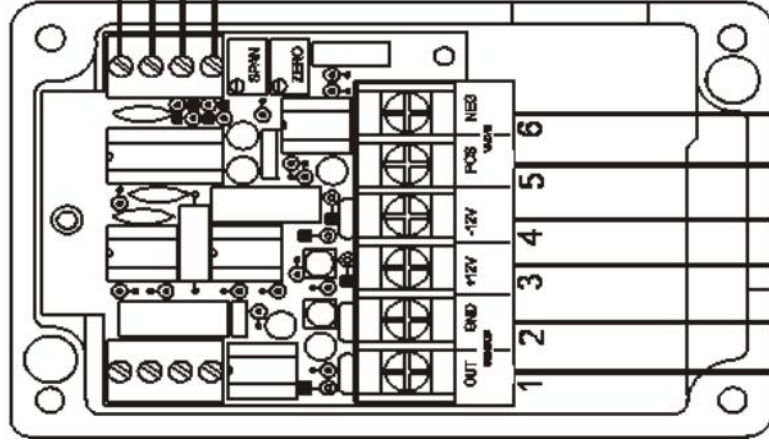
Made in the USA

Standard Accuracy Series MagnaValves

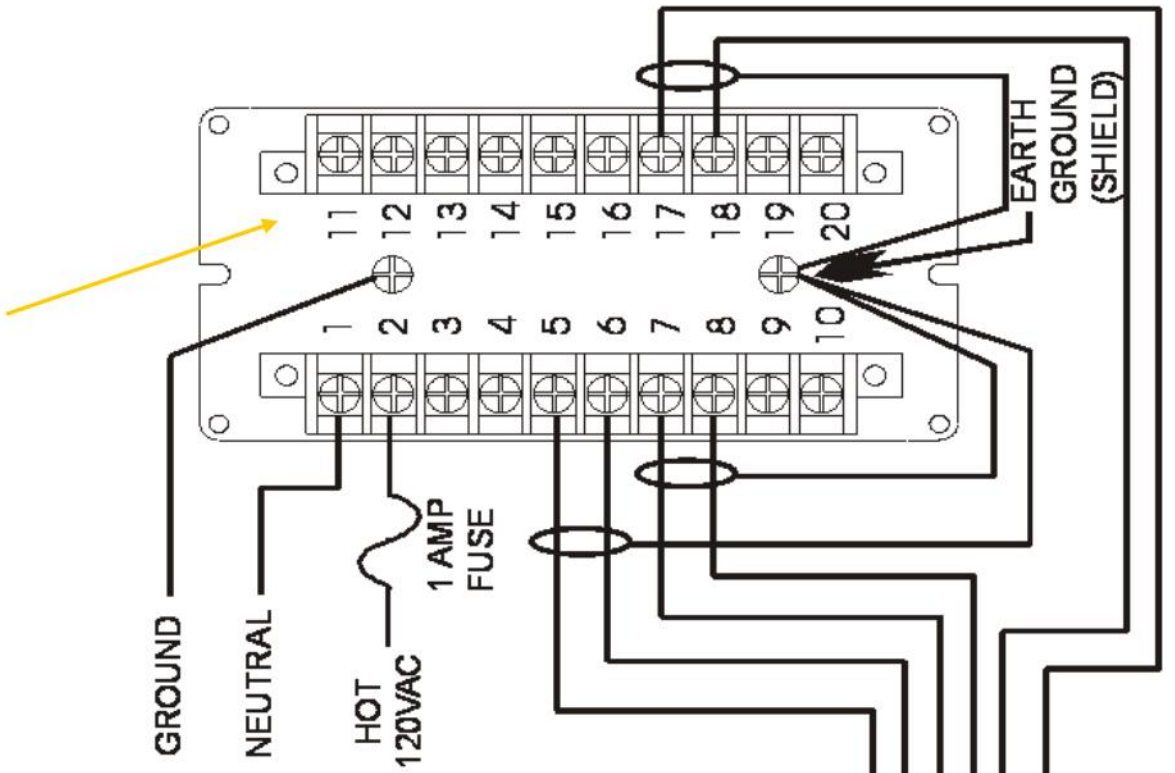
Wiring Diagram

VD11 Valve Driver
(Factory Wired)

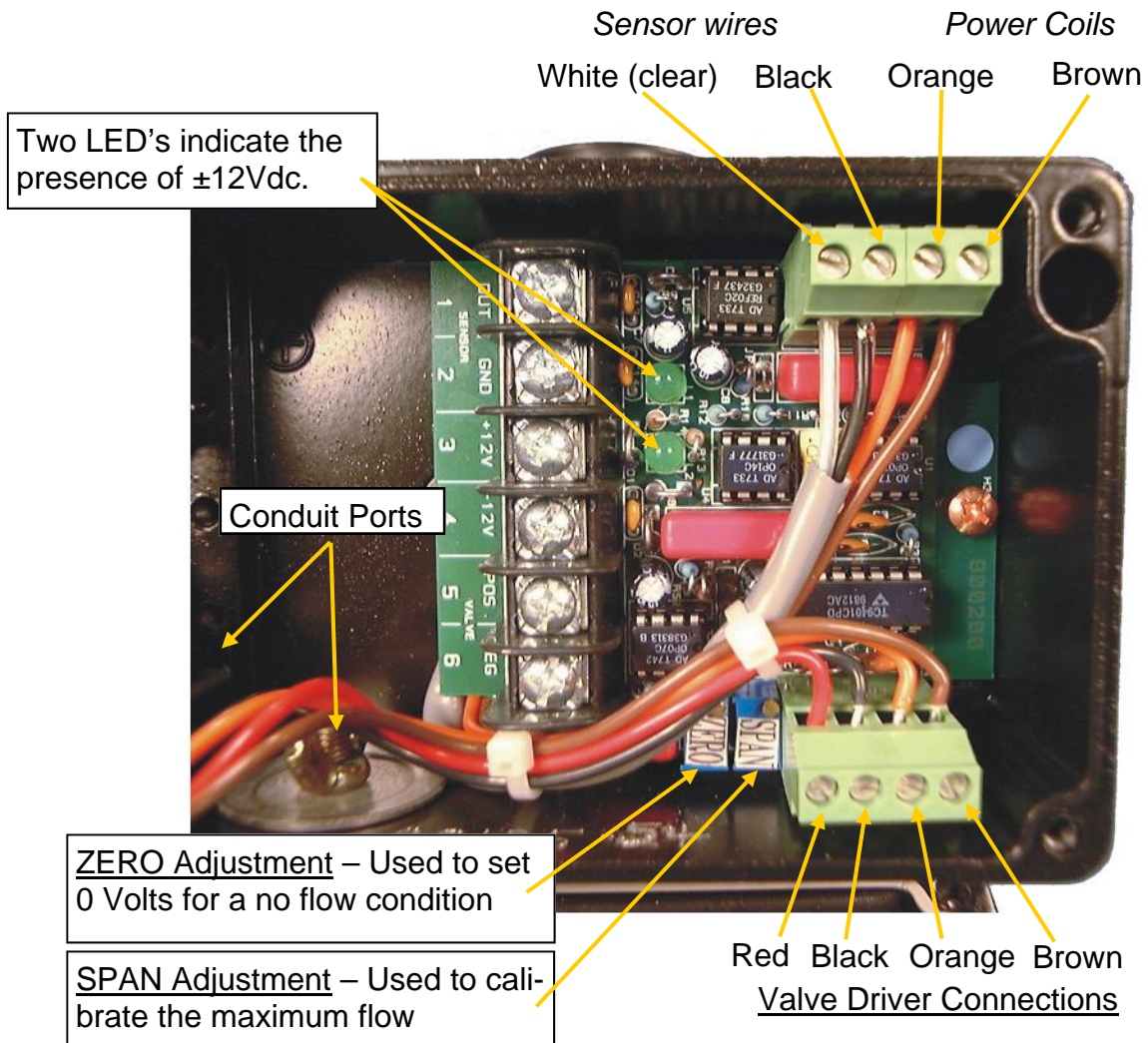
JUNCTION BOX



FC Controller back view



Factory MagnaValve Connections



Typical Customer wiring connections		
Pair 1	White	1. 0-5VDC out
	Black	2. 0VDC
Pair 2	Green	3. +12VDC
	Black	4. -12VDC
Pair 3	Red	5. (+) MagnaValve
	Black	6. (-) MagnaValve

Notes:

1. The Magna valve is calibrated at the factory. A catch and weigh test is recommended during installation. Make any adjustments for maximum flow using the Span at the MagnaValve only.
2. All cable shields at the valve must be isolated from any part of the valve and machine. The shields should be terminated at the controller only.
3. A separate conduit for MagnaValve cables must be used to prevent and interference from other equipment. Multiple MagnaValve cables may be routed in the same conduit.

1. Introduction

This instruction manual covers the MagnaValve models listed in Table 1. A pre-Amp is used to provide a flow rate signal and transmit it back to the FC Controller as a 0-5 Vdc analog signal with $\pm 10\%$ accuracy.

Valve Model	Maximum Flow Rate (Lb./min)	Operating Range (Lb./min)
250-N	700	70-700
500-N	1200	120-1200
577	2	.2-2
578	20	3-30
579	100	10-100
580	200	20-200
590	300	30-300
VLP 599-5.0 Sensor	1,000	100-1000
LP 599-5.0 Sensor	1,999	200-2000
1577	2	.2-2
1579	100	10-100

Table 1 MagnaValve Models

Custom calibrations may be used when special conditions prevail; however, we recommend the standard ranges listed above be used whenever possible because all production valves are pre-calibrated to the standard ranges shown. An emergency request for a spare MagnaValve calibrated to standard range is usually handled within 24 hours. A non-standard calibration may require one week to allow access to the calibration.

2. Theory of Operation

The MagnaValve is a magnetic valve used to control the flow rate of steel shot used in shot peening and abrasive blast cleaning machines. There are no moving parts in the MagnaValve. A strong permanent magnetic field holds the shot. Application of power from the Model FC controller will cancel the magnetic field and allow shot to flow. The valve is pulsed at eight times per second (8 Hz) to modulate the flow rate. A special sensor is located in the lower section of the MagnaValve (or in the 599-5.0 sensor mounted below the MagnaValve for hybrid installations) to detect the actual shot flow rate. The sensor signal is processed by the pre-amp and then sent to the FC controller for feedback information.

A valve driver module is used at each valve to precisely regulate the cancellation current to assure zero residual magnetic field. The valve driver module is factory set at an amperage value listed on the valve driver module and does not require any customer adjustment.

The Pre-Amp is factory calibrated and should not require any customer attention. The full-scale output voltage feedback signal of the Pre-Amp is 5.00 Vdc. The pre-amp uses an oscillator circuit and inductive sensor to detect metal density (shot flow) and converts this frequency into a 0-5 Vdc output feedback signal.

3. Calibration

SUMMARY –

- Set MagnaValve Pre-amp zero output
- Set Pre-Amp span to achieve full-scale flow
- Confirm accuracy (perform catch & weigh tests)

Full-scale flow range is the maximum flow, in pounds per minute, required for your installation. See Table 2. The MagnaValve pre-amp has been factory calibrated and should not need adjustment. In the event re-calibration is desired the following steps should be followed.

Model 250-N	700 lb./min.
Model 500-N	1200 lb./min.
Model 577	2 lb./min.
Model 578	20 lb./min.
Model 579	100 lb./min.
Model 580	200 lb./min.
Model 590	300 lb./min.
Model VLP + 599-5.0 Sensor	1,000 lb./min.
Model LP + 599-5.0 Sensor	1,999 lb./min.
Model 1577	2 lb./min.
Model 1579	100 lb./min.

Table 2. Maximum Flow Rate

- A. With no shot flowing, adjust the zero trimpot to achieve 0VDC output feedback signal.
- B. Perform a catch and weigh test to ascertain flow rate at maximum capacity.
- C. Adjust the span trimpot if required. Repeat the catch test to confirm accuracy.
- D. You must also match the Model FC Controller display to the MagnaValve pre-amp output signal. The Model FC Control display is used for many different size MagnaValves and therefore many display ranges are used. The FC Control display range can be changed as required for any particular MagnaValve. For example, to change the model FC Control display to 0-700 lbs/min full scale range.
- E. Turn setpoint knob to 100% (Full CW).
- F. Be sure the FC Control is in local mode, not remote mode. See the LED indicators on the front panel and use the local/remote slide switch if necessary.
- G. Push and hold display toggle until the FC Control display reads 700.
- H. The Model FC Control front panel span adjustment is factory set so that a 5.00 VDC signal input will display the proper full scale signal, such as 700.

The FC Controller span should not need adjustment.

To check this feature you may inject a precision 5.00VDC calibration control signal from any suitable DC source. If the Model FC Controller display does not show the de-

- sired value then adjust the Model FC Front panel span adjustment until it does.
- I. A catch test can be run to verify the accuracy of the maximum flow rate of the Magna-Valve. If necessary, Adjust the Pre-Amp span adjustment (not the FC controller span adjustment) and repeat the catch and weigh tests until the correct amount of shot is caught. Adjust the span once at any desired flow rate for proper flow then fill in the chart to check performance.
 - J. Confirm the accuracy by filling in the table column marked “Actual lbs/min” in the table corresponding to the desired maximum flow rate. Correct discrepancies by making adjustments to the compensation trimpots as necessary.
The Tables are located at the end of this document.

4. Trouble shooting

For additional troubleshooting information see the model FC installation manual IM0056.

For assistance call or fax the factory for help

Phone 1-(574)-256-5001

FAX 1-(574)-256-5222

www.shotpeener.com

Catch and Weigh Tables

Set Point	Ideal lb/min.	Actual lb/min.
100%	1200	
95%	1140	
85%	1020	
75%	900	
65%	780	
55%	660	
45%	540	
35%	420	
25%	300	
15%	180	

1200 lb/min Max

Set Point	Ideal lb/min.	Actual lb/min.
100%	700	
95%	665	
85%	595	
75%	525	
65%	455	
55%	385	
45%	315	
35%	245	
25%	175	
15%	105	

700 lb/min Max

Set Point	Ideal lb/min.	Actual lb/min.
100%	300	
95%	285	
90%	270	
85%	255	
80%	240	
75%	225	
70%	210	
65%	195	
60%	180	
55%	165	
50%	150	
45%	135	
40%	120	
35%	105	
30%	90	
25%	75	
20%	60	
15%	45	

300 lb/min Max

Set Point	Ideal lb/min.	Actual lb/min.
100%	200	
95%	190	
90%	180	
85%	170	
80%	160	
75%	150	
70%	140	
65%	130	
60%	120	
55%	110	
50%	100	
45%	90	
40%	80	
35%	70	
30%	60	
25%	50	
20%	40	
15%	30	

200 lb/min Max

Set Point	Ideal Lb./min.	Actual lb/min.
100%	100	
95%	95	
85%	85	
75%	75	
65%	65	
55%	55	
45%	45	
35%	35	
25%	25	
15%	15	

100 lb/min Max

Set Point	Ideal Lb./min.	Actual lb/min.
100%	20.0	
95%	19.0	
85%	17.0	
75%	15.0	
65%	13.0	
55%	11.0	
45%	9.0	
35%	7.0	
25%	5.0	
15%	3.0	

20 lb/min Max

Set Point	Ideal Lb./min.	Actual Lb./min.
100%	2.00	
95%	1.90	
85%	1.70	
75%	1.50	
65%	1.30	
55%	1.10	
45%	.90	
35%	.70	
25%	.50	
15%	.30	

2 lb/min Max