

microwaveValve

Microwave Assisted Media Dosage Unit for Shot Peening



THE WORLD'S FIRST

- Flowrate Valve designed for ferrous and non-ferrous media with microwave technology for shot peening
 - 2 sizes: 15 kg/min and 100 kg/min
- PA Flowmaster capable of controlling multiple flowrate valves

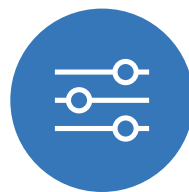
BENEFITS



Real-time and precise flow rate monitoring



Full scale accuracy according to AMS specification



Control of up to 4 valves with single FlowMaster controller



Compatibility with existing PA FlowMaster controller



Non-contact based sensing mechanism for both ferrous and non-ferrous media



Contact the official distributor at:
Peening Accessories GmbH
Frohbergstr. 38, 8620 Wetzikon Switzerland



www.peening.ch



info@peening.ch

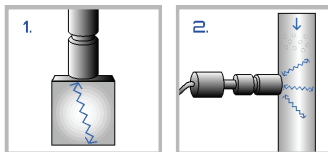
BACKGROUND

Shot peening is extensively used by various industries to enhance the fatigue life of the component. One of the most important control parameters for shot peening process is mass flow rate.

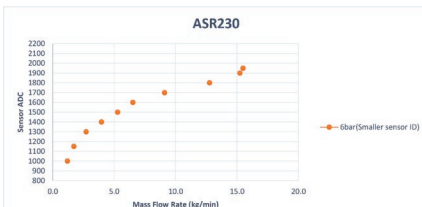
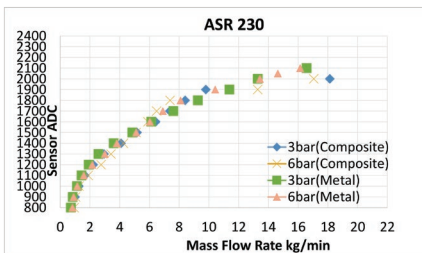
In order to achieve precise dosing of peening media to achieve the right kinetic energy and hence the residual stress in the component, most conventional shot peening machines use contactable sensors to detect mass flow rate. One of the problems faced by industry is that prolonged contact of media with the sensor would result in the wear and tear of the sensing head. Secondly, most media dosage units that are available in the market can only detect either ferrous or non-ferrous media independently.

PRODUCT DEVELOPMENT OBJECTIVE

One stop solution for monitoring and controlling both ferrous and non-ferrous media flow for shot peening machine. The proposed media dosage unit meets the requirements of SAE AMS 2430 & AMS 2432 through testing.



3. Calibration Results



PRODUCT DETAILS

Microwave Technology

- The proposed media dosage unit creates a homogenous measurement field of the media flow and thereby detects and controls the media flow rate.
- This technology is based upon Doppler effect; wherein on encountering an object, the microwaves will either be reflected, absorbed or pass through the object, the amount of which will depend on the composition of the object encountered.
- The microwave sensor in the dosage unit incorporates a transceiver which is positioned into the material process pipe as shown in figure 1). If a particle is moving into the field as shown in figure 2), this will be accounted for and evaluated. The corresponding signal of the microwave sensor will then be evaluated to give a corresponding mass flow output as shown in figure 3).

PATENT PENDING FILING, REFERENCE NUMBER:

PCT/SG2019/050109

IN THE PIPELINE

ISO17025 (pending) certification of the calibration unit

PA microwaveValve

Purpose

Flow rate control valve for non-ferrous and ferrous media for peening and blasting machines

Model

μWValve-15: Range 1.5-15 kg/min (ferrous)
 μWValve-07: Range 0.7-7 kg/min (non-ferrous)
 μWValve-100: Range 10-100 kg/min (ferrous)
 μWValve-40: Range 4-40 kg/min (non-ferrous)

Features

- ±5% full-scale accuracy
- FPGA technology, closed loop in real-time
- Shock resistant Touchscreen for improved troubleshooting
- Meets SAE AMS 2430 and AMS 2432 specifications
- Digital signal: no data transmission lost
- Only one cable per valve
- Able to include 4 media calibrations in one valve
- Includes a 5 meter wire (optional: 1m)
- 24V DC
- CE compliant
- Patented in USA and China



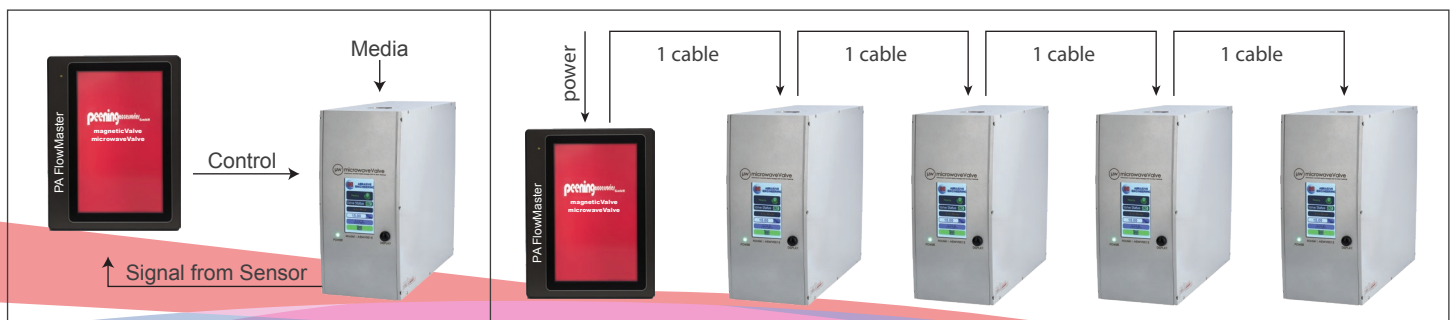
μWValve-15: Range 1.5-15 kg/min (ferrous)
 μWValve-07: Range 0.7-7 kg/min (non-ferrous)
 μWValve-100: Range 10-100 kg/min (ferrous)
 μWValve-40: Range 4-40 kg/min (non-ferrous)

Description

The unit is a precision control valve that regulates media in pressure or gravity feed peening and blasting machines. The valve has a built-in flow sensor that is able to provide closed loop feedback to the shot flow processor. The shot flow processor is a high end processing device which regulates the media flow rate with auto tune technology.

When connected to the PA FlowMaster, the configuration of the PA microwaveValve can be retrieved and manipulated by the users for their desired applications. The equipment can be operated in two modes – manual mode or auto mode. Manual mode allows users to control the valve with constant flow rate, while auto mode enables auto tune technology to regulate the flow rate.

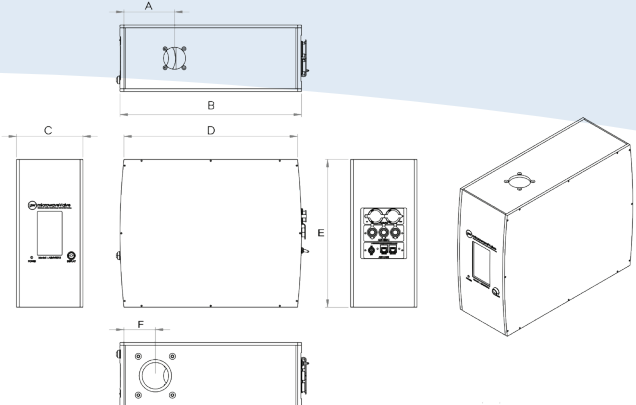
The PA microwaveValve complies with SAE AMS 2430, AMS 2432 and other technical requirements. It only needs a 24V DC power supply to operate.



Closed loop system using PA FlowMaster (sold separately) and PA microwaveValve

Easy plug & play system with a minimum of cables. Valves connect in serial order.

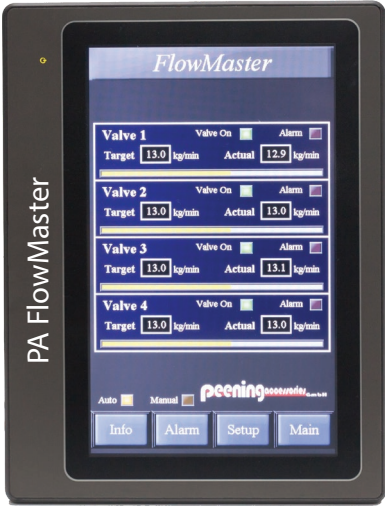
Specifications

Power	24 Vdc @ 4A (100 VA)																																				
Media	Ferrous media and Non-ferrous media																																				
Maximum pressure	6 bar (100 PSI)																																				
Mode	Manual/Auto																																				
Temperature range	5° – 48 ° C (40 ° – 110 ° F)																																				
Analog input	0 – 10 Vdc																																				
Valve ON signal supply	24 Vdc																																				
Flow sensor output	0 – 10 Vdc																																				
<div><div></div><div><table><tr><td>Model</td><td>A (mm)</td><td>Model</td><td>B (mm)</td></tr><tr><td>μWValve-15</td><td>109.90</td><td>μWValve-15</td><td>393.85</td></tr><tr><td>μWValve-100</td><td>47.49</td><td>μWValve-100</td><td>370.27</td></tr></table><table><tr><td>Model</td><td>C (mm)</td><td>Model</td><td>D (mm)</td></tr><tr><td>μWValve-15</td><td>144.00</td><td>μWValve-15</td><td>376.81</td></tr><tr><td>μWValve-100</td><td>184.00</td><td>μWValve-100</td><td>318.98</td></tr></table><table><tr><td>Model</td><td>E (mm)</td><td>Model</td><td>F (mm)</td></tr><tr><td>μWValve-15</td><td>320.00</td><td>μWValve-15</td><td>68.27</td></tr><tr><td>μWValve-100</td><td>553.50</td><td>μWValve-100</td><td>154.49</td></tr></table></div></div>		Model	A (mm)	Model	B (mm)	μWValve-15	109.90	μWValve-15	393.85	μWValve-100	47.49	μWValve-100	370.27	Model	C (mm)	Model	D (mm)	μWValve-15	144.00	μWValve-15	376.81	μWValve-100	184.00	μWValve-100	318.98	Model	E (mm)	Model	F (mm)	μWValve-15	320.00	μWValve-15	68.27	μWValve-100	553.50	μWValve-100	154.49
Model	A (mm)	Model	B (mm)																																		
μWValve-15	109.90	μWValve-15	393.85																																		
μWValve-100	47.49	μWValve-100	370.27																																		
Model	C (mm)	Model	D (mm)																																		
μWValve-15	144.00	μWValve-15	376.81																																		
μWValve-100	184.00	μWValve-100	318.98																																		
Model	E (mm)	Model	F (mm)																																		
μWValve-15	320.00	μWValve-15	68.27																																		
μWValve-100	553.50	μWValve-100	154.49																																		

Price

μWValve-15: Range 1.5-15 kg/min (ferrous)	Ref. No. 822 209	Price on request
μWValve-07: Range 0.7-7 kg/min (non-ferrous)	Ref. No. 822 210	Price on request
μWValve-100: Range 10-100 kg/min (ferrous)	Ref. No. 822 211	Price on request
μWValve-40: Range 4-40 kg/min (non-ferrous)	Ref. No. 822 212	Price on request
Recalibration for 1 valve	Ref. No. 822 900-R	€ 450/pc

PA FlowMaster (sold separately)

	Power	24 Vdc @ 0.5 A
	Analog input	0 – 10 Vdc
	Flow recording output	0 – 10 Vdc
	Flow enable output	24 Vdc @ 10 mA
	Temperature range	32 – 122 ° F (0 – 50 ° C)
	Dimensions	188mm (W) x 143mm (H) x 90mm (D)
	Display touchscreen	7"
Functions	Flow rate display: Up to 4 valves! Substantial cost savings if more than one valve is in use.	
	Valve status	
	Standard configuration 6 languages: English, Spanish, French, German Chinese Simplified, Japanese. Other languages on request.	
	Up to 64 peening data recipes	
	Configuration	
	Alarm system	



Contact the official distributor at:
Peening Accessories GmbH
Frohbergstr. 38, 8620 Wetzikon Switzerland



www.peening.ch



info@peening.ch