

PULSAR

PULSARflow 500 series

500 Series
non-invasive flow switches

Description

Flow measurement using ultrasonic Doppler technology as a reliable, non-invasive method of indicating liquid and slurry flow in pipes, where high accuracy is simply not required.

There are three units in the range, **Pulsarflow 510 and 515**, both general purpose units system and **Pulsarflow 511** for use in flammable atmospheres.

Application

The Pulsarflow 500 series is capable of operating in general flow measurement applications with velocities from 1ft/second to 11.5ft/second on liquids and slurries. (The Pulsarflow 515 offers higher flow capacity.)

Operation

Pulsarflow 500 series is a non-invasive pipe-mounted liquid indicator with analog and switch output. The unique design combines both sensor and electronics in a single robust stainless steel enclosure which allows quick and easy installation on the outside of a metal or plastic pipe. Pulsarflow 500 series has internal transmit and receive transducers which detect ultrasonic reflections from particles (minimum particle size 100 microns > 150ppm) or air inclusions in the liquid or slurry. The change in frequency detected from these reflections is proportional to the velocity of the particle in the flow, and therefore can be converted by the system into a flow indication. It is possible, on the majority of liquids, to indicate the flowrate and provide a repeatable switching point on higher or lower than desired flow.

Each unit has ease of installation and calibration as a key feature, having a single button set up with status feed-back during initial calibration from red and green LEDs. The Pulsarflow 500 series has ingress protection to Nema 6. The rugged design provides a high degree of protection from bump, shock and vibration within a typical industrial environment.



Typical Industries

- Chemical
- Food and Drink
- Mineral Extraction
- Pharmaceutical
- Power Generation
- Pulp and Paper
- Sewage and Water Treatment

Typical Applications for the Pulsarflow 500 Range

- Activated carbon slurries
- Aerated liquids
- Coal slurries
- Cooling water circulation
- Filter back wash
- Fly ash slurries
- Limestone slurries
- Oil/coal mixtures
- Paint
- Paper slurry/stock
- Primary sewage and sludge
- Raw sewage
- Resin slurries
- Return activated sludge
- River water
- Secondary effluent
- Soap solutions
- Spent acids
- Taconite slurries
- Tertiary effluent
- Thickened or digested sludge

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Specifying information and wiring diagrams are available on request from Pulsar

Technical Specification: 500 Series

Outputs	
Pulsarflow 510/515	1 volt free contact, programmable 1A at 30V dc SPCO 4-20mA auto-scaled to velocity range
Pulsarflow 511 (Approval pending)	auto-scaled 4-20mA loop powered
Power requirements	
	22-36Vdc, 120mA typically
Operating temperatures	
	(-40°C to +80°C) -40°F to +176°F
Ingress protection rating	
	(IP68) Nema 6
Velocity range	
	Minimum particle size in liquid: 100 microns > 150 ppm 510 unit 1 to 11.5 ft/s 515 unit 1.6 to 19.7 ft/s
Size / weight	
	(118mm L x 70mm H x 65mm) 4.65 x 2.76 x 2.56 inch / (1kg) 2.2 lbs
Pipe diameter	
	(30mm) 1.18 inch min. diameter up to (400mm) 15.75 inch, larger diameters ok for Flow/No Flow
Pipe wall thickness	
	Metal or rigid plastic pipe up to (10mm) .4 inch
Flammable atmospheres approval	
	EEx m IIC T6 (Pulsarflow 511 only)
Installation	
By means of a suitable fixing strap, hose clip or similar (having a .43 inch max. width) and using a silicone grease coupler material applied to the base of the sensor and the pipe. Silicone compound from Dow Corning DC-4 or equal. Cable entry M20 x 1.5mm for gland	
Repeatability / accuracy	
	(accuracy decreases as pipe diameter increases) ± 2% to ± 7.5%, application dependent
Housing material	
	Type 316 stainless steel investment casting
CE / EMC Approval	
	Complies with BS EN 50081-1:1992 for emissions & BS EN 50082-2:1995 for immunity
Bump, shock & vibration	
	Complies with BS 60068



Installation Recommendations

The Pulsarflow units should be mounted in direct contact with the outside wall of the pipe, which should be clean and free from any loose or flaking material. The sensor to pipe contact area should be coated with non-melting waterproof silicone compound to provide a direct acoustic coupling. A suitable strap is provided to firmly position and clamp the sensor in place.

The sensor must be mounted to coincide with liquid flow. For example on pipes where there may be large inclusions of air running along the top of the pipe. It is recommended that the Pulsarflow unit be mounted several degrees off vertical. Once clamped on to the pipe the 510/515 unit's lid is unscrewed (the four captive screws are retained by the lid) and electrical connections made to the terminal strip. Commissioning and set-up are simple and straightforward. The set-up consists of a one-button calibration routine to establish flow rate and to enable an alarm setting with an option for 'high flow' or for 'low flow'.

Represented by

Our policy is one of constant development and improvement. Pulsar reserves the right to amend details as necessary.

