

# PULSAR *Ultra* Oracle 160



PULSAR  
Process Measurement

The Pulsar Oracle 160 **Open Channel Flowmeter** provides **non contacting**, maintenance-free **flow measurement** and control in a wide range of **flumes** and **weirs** by calculating flow from the measured head preceding a primary element, using ultrasonic technology. Flow calculation is to the **British Standard BS3680** where applicable.

The unit has been designed for applications where its advanced measurement and control routines, which include on board totalisation of flow and outputs for remote logging and alarm.

**Three or five** control relay setpoints ensure large control choices.

The high level specification, incorporating **back lit LCD** display, **ac and dc supply** capability in one unit, two-way digital (RS232) communication and a choice of integral or remote programming, is available in wall mount, panel mount, fascia mount, or 19 inch rack configuration.



**An optional analogue input on the five relay unit** allows the it to accept an input from other devices to provide, (for instance, velocity,) to enable an "area times velocity"  $Q=VA$  calculation to be utilised.

Oracle 160  
open channel flow meter

#### BS3680 Flow Calculations:

- **Open channel flow** monitoring, with flow calculations including absolute and ratiomatic.

#### Open channel flow measurement categories:

- Simple exponential (venturi flume, trapezoidal weir etc.).
- Selected primary element to BS3680 (Flumes: rectangular, rectangular with hump, U-throated, U-throated with hump, thin plate weirs: rectangular contracted, rectangular non contracted, V notch 90° and 60°).
- Others (Palmer Bowlus, H flume etc.)
- A universal flow calculation.
- Area x Velocity ( $Q=VA$  calculation) in channels or pipes.

#### Display:

- 8 digit on board totaliser
- 6 digit display of flowrate or head

#### Pen-stock Control Features:

A 'step time' feature allows opening and closure of a gate or pen-stock, up or downstream of the Oracle unit.

#### Alarm functions:

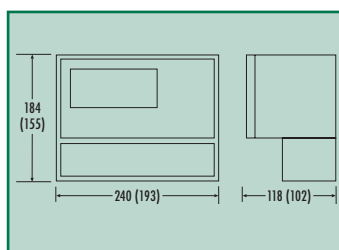
Alarm function on changing flow or head to provide:

- High or low level
- In or out of band
- Rate of filling or emptying
- High or low temperature
- System failed
- Low voltage

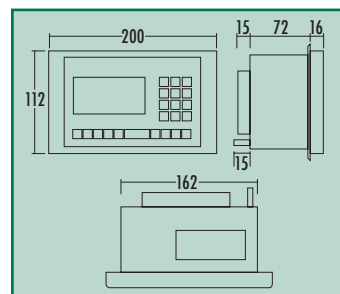
#### Flow totalisation and outputs:

- Relay closure assignable to totalised flow for remote totaliser
- Relay closure assignable for flow volume for a flow sampler
- Relay closure assignable to time for a flow sampler
- Ten days logged flow at 24 hour intervals, recorded by date, accessible via the key pad.

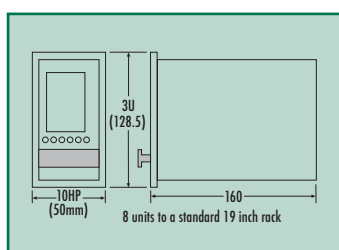
#### Outside dimensions



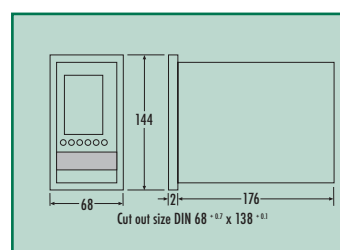
Wall mounted 5 and (3 relay unit)



Fascia mounted



19" rack mounting



Panel mounted

Specifying information and wiring up diagrams are available on request from Pulsar

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# Technical Specification: PULSAR*ultra* Oracle 160

## Physical:

Outside dimensions (wall mount)	(3 relay unit) 193 x 155 x 102: (5 relay unit) 240 x 184 x 118mm
Weight	Nominal 1kg
Case material/description	Polycarbonate, flame resistant to UL94-V2
Transducer cable requirements	extended with twin screened
Maximum separation	500m
Cable entry detail	(5 relay unit) 10 cable entry knockouts, 5 x PG11, 1 x PG9, underside, 4 x PG11 at rear (3 relay unit) 8 cable entry knock outs, 3 x PG11, 1 x PG9, underside, 4 x PG11 at rear

## Options

Rack mount	10HP x 160mm deep x 3U (128.5mm) high
Panel mount: 72mm wide x 144mm high x 176 deep	Fascia mount (see separate Tech update TU-001-Z)

## Environmental

IP Rating (wall mount)	IP65
Fascia mount (see separate Tech update TU-001-Z)	IP54
Optional IP rated panel mount	IP65
Max. & min. temperature (electronics)	-20°C to +60°C
Flammable atmosphere approval	Safe area: compatible with approved dB transducers (see transducer spec' sheet)
CE approval	EMC approval to BS EN 50081-1:1992 for emissions and BS EN50082-2:1995 for immunity, and to BS EN61010-1:1993 for low voltage directive

## Performance

Accuracy	0.25% of the measured range or 6mm (whichever is greater)
Resolution	0.1% of the measured range or 2mm (whichever is greater)
Max. range	3m (dB3 transducer), 6m (dB6 transducer), 10m (dB10 transducer)
Min. range	0.125 with dB3 Dependent upon transducer

## Echo processing

Description	Patented DATEM (Digital Adaptive Tracking of Echo Movement)
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## Outputs

Analogue output	Isolated output of 4-20 mA or 0-20 mA into 500Ω (user programmable and adjustable) 0.1% resolution
Digital output	full Duplex RS232 via (RJ11 port)
Volt free contacts, number and rating	3 from "C" or 5 form "C" (SPDT) rated at 5A at 240V ac
Display	6 digits plus 12 character text, plus bargraph with direction indicators, remote communicator identifier, and program/run/test mode indicators

## Analogue input (optional) on 5 relay version

0-20 or 4-20 mA for pressure sensor, velocity sensor

## Programming

Remote programming	Standard on panel, 19" rack and optional on wall mount via infra red communicator
On-board programming	Standard on wall and fascia mount with integral keypad
PC programming	Via RS232 (RJ11 port)
Programming security	Via password (user selectable and adjustable)
Programmed data integrity	Via non-volatile RAM, plus backup

## Supply

Power supply	115V ac + 5% / -10% 50/60 Hz, 230V ac + 5% / -10% 50/60 Hz, dc 18 - 36V
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All Pulsar*ultra* Oracle units to be mounted in a safe area. See transducer spec sheet for flammable atmosphere approval to suit.

Represented by



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