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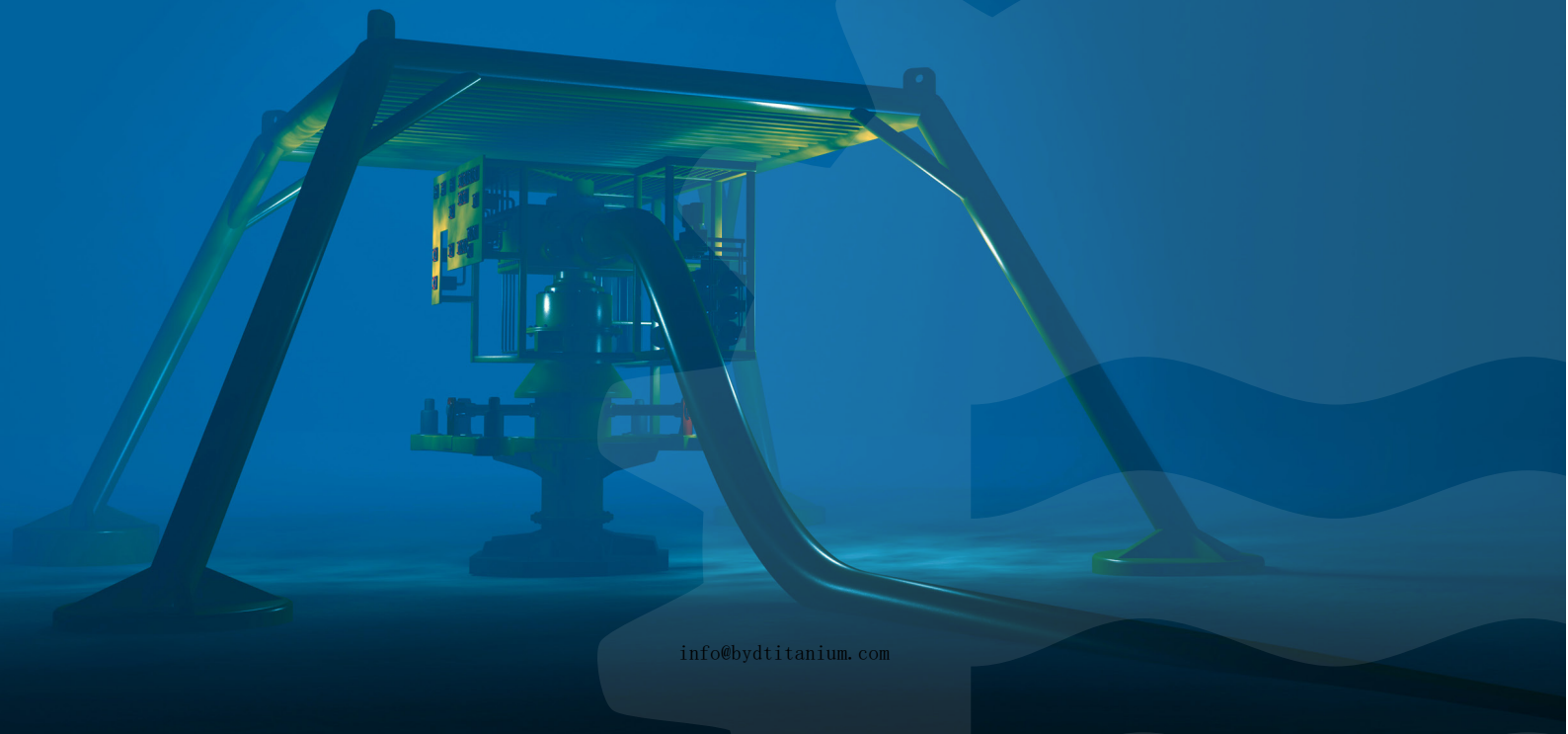
Subsea Applications

Flow Meters and Instrumentation



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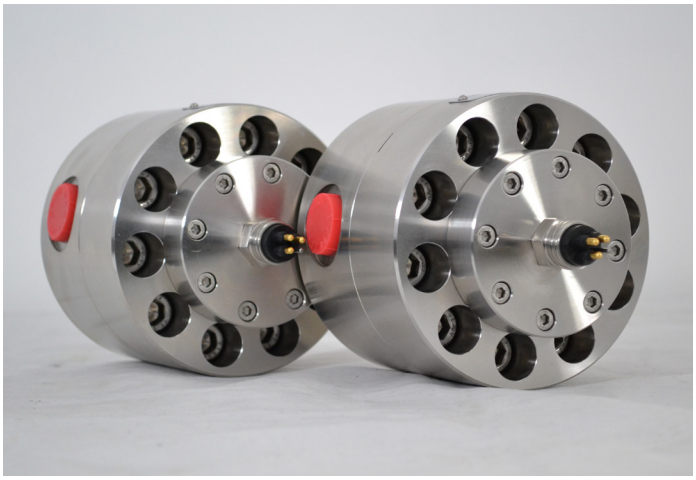
Our Subsea Positive Displacement Flowmeters, can be made to suit the specific requirement of the application, 6000m depth and 400 bar as standard, versions up to 1035 bar, electronics are sealed and potted for increased durability. Connections and subsea connectors are decided by the customer.

Our Subsea Flow Turbines, pressures and materials are dependent on the application, can be flanged or threaded, with amplified pulse, 4-20ma and RS232, pressures up to 1035 psi are possible flow rates from 0.6 l/min to 10,000 l/min.

Both the Subsea options can be part of a bespoke system or linked to a Subsea single or dual display.



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Flow Subsea PD Meters

Our Subsea PD Flow Meters are available in a wide variety of flow ranges and electrical outputs, as well as a variety of exotic materials for highest corrosion resistance and material compatibility.

0.006 - 2 l/min 1035 bar version with Burton Connector.

Electronics are housed in a separate vessel allowing interchangeability and spares to be held separate to the meter.

Only high grade steels are used in the production of the meters, short response times ,high resolution ,high turn down ratios , make these meters ideal for very low flow applications.

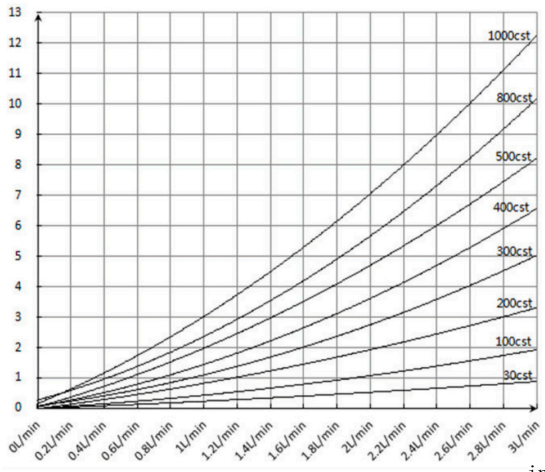
Two precise gears rotate freely inside the measuring chamber. The fluid passes through and causes rotation of the gears, their rotational frequency is proportional to the flow rate and we use a non intrusive subsea sensor to measure through the housing wall.

Working Pressure: Internal up to 15,000 psi (1,035 bar), external up to 6,000m depth.

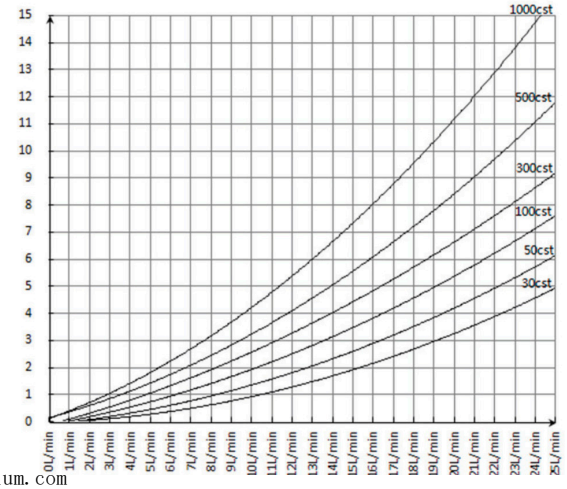
Communications:	Analog (4-20mA), Amplified Pulse, Pulse, RS232
Connections:	BSP NPT, Autoclave,
Accuracy:	±0.5% of measured value. A calibration certificate is provided based on a representative viscosity fluid for the application.

Pressure Loss / Viscosity / Flow Rate

Typical ETLFLOW-200-SSEA-3L



Typical ETLFLOW-200-SSEA-25L



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Subsea Graphical Datalogger

The Flow Subsea Graphical Datalogger builds on the capability of existing Flow Subsea Displays.

The SGD is designed to display the total number of sensor actuations on Subsea tools, modules & installations without the need for a complex control system or datalink.

Critical operations can be monitored and now data logged using an internal 32Gb Mass Storage Device (MSD). Diagnostic capability allows the operator to test / operation with customisable sensitivity level set-up.

Any displayed image automatically flips upright via an in built accelerometer and also logs this occurrence.

Facilities to log 'Shock and vibration' and upload data logs via IrDA 'infra-red' with for the SGD via external RS232 / USB host connections, will present the operator with a user-friendly GUI to configure parameters and execute functions.

The SGD has 2 inbulit light sensors that actuate the module only when illuminated by ROV lights or Rig Lights. This allows the SGD to remain dormant for years before operation.

The SGD display shows key data such as battery status, system temperature, date / time. The display is also highly custom text to be inserted as well as a bitmap such as a client logo and different text colour options to choose from.

A New Standard In Subsea Sensing

The Flow range of Jupiter Subsea Control Systems has led to the development of a range of stand-alone battery powered subsea sensor systems.

Features & Benefits

- Provides analogue count feedback from "dumb" tools or Subsea Modules scaled as per user needs
- 32GB Data logging and Diagnostics functionality
- Infra-red (IR) capability
- Accelerometer
- Rugged Titanium housing, 4000m rated
- User configurable via both USB and RS232
- Optional output available for connection to control system or datalink
- 3 cell Lithium ion batteries
- 5 hour full battery charge via USB port
- Display is a 3.5" WQVGA display (320 x 480 pixels)
- Battery status displayed
- System Temperature displayed and logged
- User Input – text and bitmap option
- Display colours are user configurable
- 2 x Proximity sensors.
- External scale change & zero
- 2 x Light sensors. Wakened by ROV lighting
- Suitable for any volt free sensor or 3v-5v Proximity Sensor
- User scalable measurement value
- Can typically be set to display Torque, Turns or Volume and Flow rate

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Subsea Graphical Datalogger

System Specification

Operational Modes & Battery Life:	1) Full power mode - 5 days (display on continuously with full operation) 2) Idle Mode - as above with no active display (30 days) 3) Background Running Mode with no data log & reduced operation - greater than 12 months 4) Deep Sleep Mode - greater than 24 months
Data Storage:	32 GB

Mechanical / Environmental

Size:	148mm Diameter x 139mm Long. Display 74mm x 50mm	
Weight:	5.2kg (air) 2.3kg	
Temperature:	Operating - 10 to + 55°C	Storage - 20 to + 60 °C
Depth:	4000msw	
Material:	Titanium Ti-6Al-4V	

Connectors:	
E1:	Subconn MCBH6M (External USB)
E2:	Subconn MCBH6M (RS232 to allow configuration of internal settings)
E3:	Subconn MCBH8F (Sensors)

Other products on this range include

2, 4 & 8 Digit Subsea Display Systems, Sensor Light System (open closed / on off), Data-logger and ICM – live / stand-alone inline hydraulic oil contamination monitor.

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Subsea Display Systems

The range of Subsea Control Systems have lead to the development of a stand-alone battery powered Subsea Display System (SDS). The SDS is a user configurable unit that can be set to act either as a counter or as an analogue display on Subsea tools, modules & installations without the need for a complex control system or datalink.

The SDS allows critical measurements of process values such as flow, torque, pressure or extension to be monitored at a low cost. The SDS can be set to accurately display correctly scaled values of any variable to 0.3%.

The SDS is supplied with various input interfaces. The user can quickly select what functionality they require with a PC. The SDS has an inbuilt light sensor that actuates the display only when illuminated by ROV lights or Rig camera. This allows the SDS to remain dormant for years before operation and display. A dual display option is also available.

Single Subsea Display

Dual Subsea Display

Advantages

- Provides analogue feedback accurate to 0.3% for 'dumb' tools or Subsea Modules or:
- Provides count feedback to 'dumb' tools or Subsea Modules
- Rugged 316 Stainless Steel housing, 4000m deep water rated
- Ultra-low power with selectable dormant state can be installed Subsea for years before use.
- Bright 5 digit solid state 14mm display
- User can zero display or change scale units by front panel magnetic switches
- Rechargeable NiMh D Cell Field replaceable with primary cell
- Low battery warning

Features

- Battery Life:
  7 days (average display on continuously)
  6 months standby (NiMH), 4 years (Primary)
- Wakened by ROV lighting
- 5 digit LED display displays up to +/- 9999
- User scaleable measurement value
- External zero (tare) capability
- Scaling & Input type displayed on power up
- Size:
  200 x 80 x 40mm (L x W x Dia.)
- Weight:
  1.6kg (in air), 1.1kg in water
- Environmental: -10 to 50oC
- Connectors:
  Subconn MCDC8M (Sensor)
  Subconn MCDC5M (Charge)

ETL Flow use the g£€qrr subsea display & data logger products which are considered to be the industry standard choice for reliability and criticality for subsea operations.

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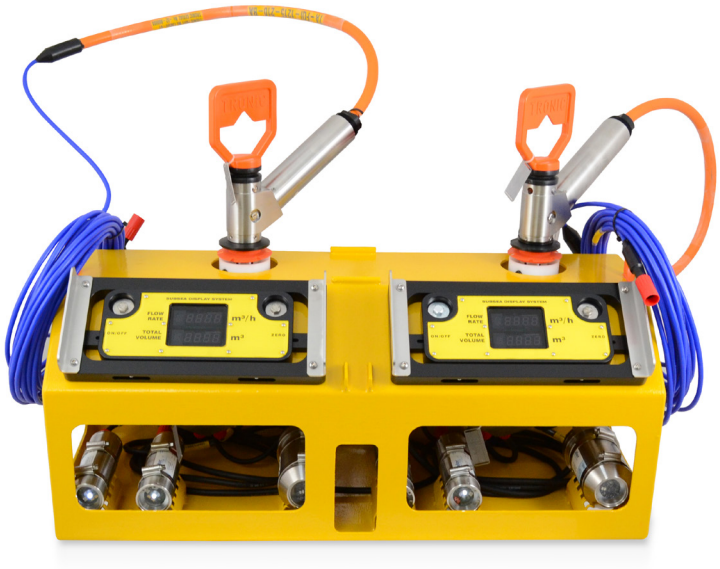
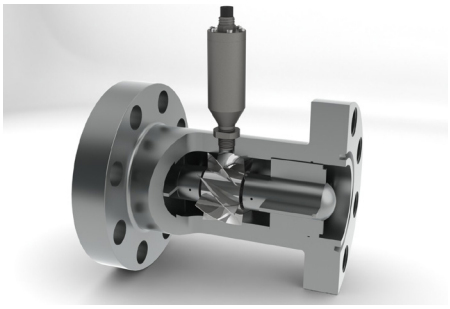
Subsea - Bespoke Subsea Systems

0fQ-has recently supplied a major oil company with important Subsea Flow Meter equipment. The equipment was designed for operational use up to 4000 Meters with flow range of 4000 litres/ min.

The design brief was for the system to be battery driven and able to work for up to 15 days before the system needed to be recharged. 0fQ-designed a system with a low power transmitter, and the ability to meet and exceed the specifications required.



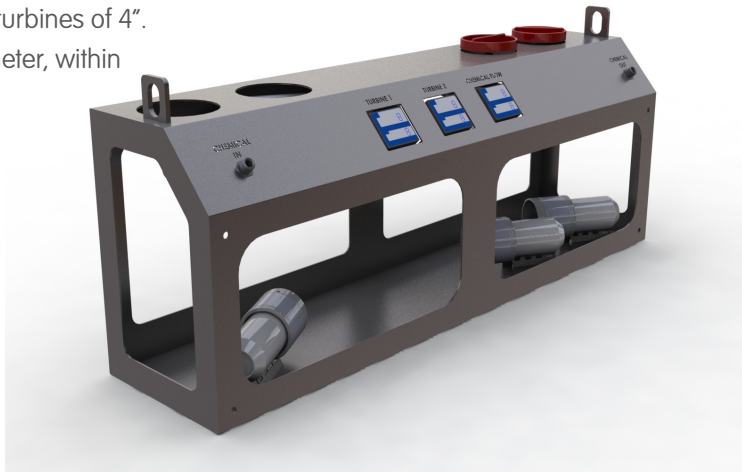
Bespoke Subsea display system, with integral data logging. This unit was connected to two separate flow meter turbines and the display to be viewed by an ROV and the data recorded.



3D design and development enabling NORSOK flanges to be built and tested without the need for additional welding. Can be tested and approved to Lloyds registry requirements.

Chemical Injection Dosing Skid

This structure was designed and built for a prestigious subsea project. It involves 2 displays to monitor and log, rate and total for turbines of 4". It also involves a chemical dosing positive displacement meter, within the framework with ROV actuation.



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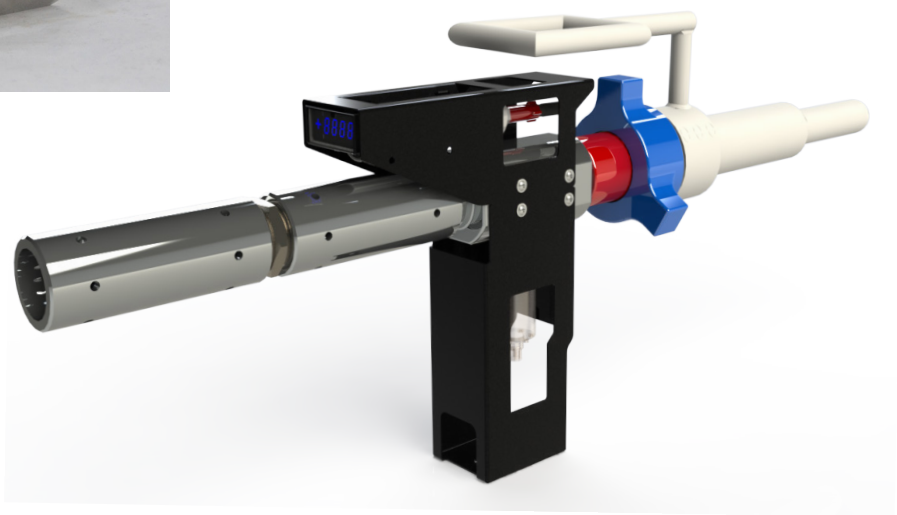
Custom Subsea Manifold Builds

Subsea Dewatering Flowmeters and Digital Display



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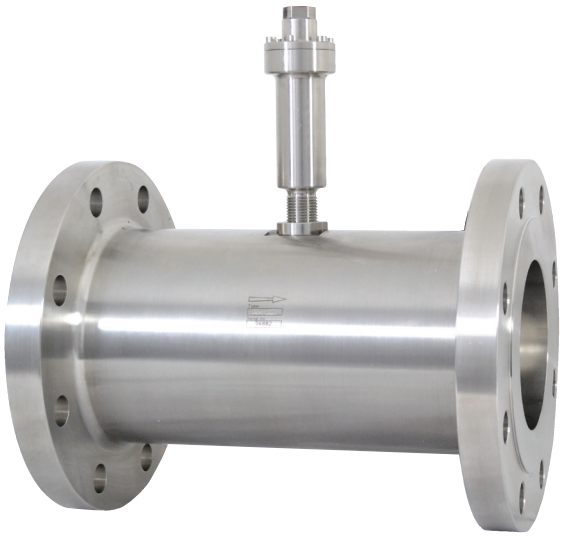

Subsea displays and datalogging with Subsea connection to flow turbines