



ROVTECH SOLUTIONS

Harsh Environment Problem Solvers

Adaptable Nuclear Seaker ROV with Jetpump



Seaker Remotely Operated Vehicle with Jetpump

The RSL Jetpump Suction Dredger has been specifically designed to be utilised within the Inspection and Light Work Remotely Operated Vehicle systems.

The RSL Jetpump can be permanently mounted to a vehicle or can be skid mounted to be incorporated within the size constraints of the Adaptable Seaker System that is deployed within Sellafield FGMSF

With remote operations being so dependent on running power over vast distances the input power required to operate the unit is less than 2 kilowatts @ 240vac, split between twin 960 watt electric motors.

The motors operate the integrated centrifugal water pump units which in turn provide the motive water flow to the central Jetpump module. The jet pump is an annular nozzle device providing a clear through bore with no convergence or restrictions. The clean internal profile of the unit virtually eliminates blockages.

The RSL Jetpump unit can be supplied with an optional back flush unit which can be utilised for both flushing and jetting dependant on the operational need.

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The Jetpump Suction Dredger is mounted to a Seaker Nuclear ROV (as deployed in the Sellafield Nuclear Facility).

Power Requirements: 240v/4A

Typical Out Jetting: 1 BAR@4l/min

Typical Solids Removal: 1m³/Hour

Jetting Hose Internal Dia: 1"

Discharge Hose Internal Dia: 3"

Suction Hose Internal Dia: 2"

Clean Water Inlet Hose Internal Dia: 2" – 3"

Weight In Water: 0-15Kg (Dependent on Buoyancy Modules)

Weight In Air: 15-25Kg Depending on Specification

Materials: Acetyl/316L Stainless Steel/Cast Iron

Seaker Nuclear ROV

The Remotely Operated Vehicle is a Nuclear RSL Seaker based on a proven existing design which has operated in the challenging Sellafield environment. It is an open frame structure manufactured in Stainless Steel 316L.

Thrusters

Propulsion is supplied by four interchangeable thrusters. Two are mounted horizontally and thrust the vehicle forward, astern, and provide clockwise and anti clockwise direction. One thruster is mounted laterally and thrusts the vehicle port and starboard. The fourth thrusters is mounted vertically and thrusts up and down. The thrusters are easy to work on and the supplied manual carries work instructions for various maintenance procedures.

Cameras

There can be up to three cameras fitted to the ROV. One is fitted to a tilt unit and is the pilots' camera, another is fitted to the frame viewing forward and the third is fitted to view aft. All cameras are colour. Standard Cameras are housed in Stainless 316L or can be supplied in Acetyl (if final weight is a major consideration).

Tilt Unit

The tilt unit which carries the pilots' camera and light is housed in light weight Acetyl and is electrically driven from the surface console unit. The unit tilts 70 degrees up and 100 degrees down, however this footprint can be increased by minor adjustments.

LED Lighting

Three hi powered RSL LED lights are fitted to the vehicle. All can be dimmed. One light is fitted to the tilt unit, one forward and one on the rear of the vehicle. The light is extremely robust with a long life capability. They are extremely bright and should not be viewed directly with the human eye.

Umbilical

All power and control for the vehicle is fed via the umbilical which is terminated with a multi mould. The power and control is then distributed throughout the vehicle via two termination units. All of the connectors and plugs are Subconn (an off the shelf underwater product used widely in the oil and gas industry, a well proven product). The main umbilical can be up to 200M long if required (or Client

determined) and is slightly positively buoyant. It has sufficient conductors for the vehicles power and signal requirements.

As part of RSLs' robust design ethos, all thrusters, lights, hydraulic functions and tilt drives are powered from the control console through the umbilical. There are spares in the umbilical in the unlikely event of conductor failure.

At the vehicle end the umbilical is terminated with a multi mould and the top end is terminated via a rotating junction box through a slip ring assembly, through a static junction box, fed through a free standing marshalling box via a deck cable to the control room where it is terminated into a junction box where the console, Rad probe and manipulator control box are interfaced.

Winch Assembly

The winch assembly is also referred to as the reeling drum. It can be designed by RSL to be of modular construction to facilitate ease of mobilisation. The winch can have lockable wheels. Located on the reeling drum are the static and rotating junction boxes, slip rings, single phase motor controller, umbilical and remote pendant for operation away from the shine path. The reeling drum requires a supply of 440vac three phase but other voltages can be accommodated. The frame has a certified lift point.

ROV Control Console

The ROV console is the heart of the system. It is connected to the ROV hand controller via a QM connector. It is connected to the deck cable using another QM connector via the control room junction box. The Console is designed to fit into a 19" rack system. On board the console there is: An enable switch to turn the console power on LED indications for 240vac live and neutral Emergency stop Separate fused switches for the ROV power and lights All four thrusters are independently enabled and monitored Thruster voltages and current monitors Healthy LED indicator for motors

Vehicle Hand Controller

The hand controller has all the required controls to operate the ROV. It is connected to the main console via a QM connector. LED indicators show that the relevant control supplies are present. The thrusters are controlled by using the joystick and the vertical pot which has a centre detent for zero demand.

The joystick controls the forward/astern movement, lateral port and starboard and clockwise/anti clockwise rotation. All control is proportional and can be operated together as is required to manoeuvre the vehicle in a controlled measure. Lights are dimmed by using the variable light dimmer pot. The pilots' camera can be zoomed and focussed by use of the small push button switches. The tilt unit is controlled by two push button switches.

Electrical Power Supply.

The console requires a 240vac supply fed via an RCD. Total current should not exceed 16amps. The control room junction box will require a 240vac supply for its internal power supplies. The reeling drum assembly requires a 440vac single phase supply for the drive motor.