

## Seal Light Work Class ROV



Designed and manufactured by Fugro, the Seal is a multi-function light work class ROV system intended for rapid deployment on any appropriate vessel of opportunity. It is suitable for drill support, construction support, inspection repair maintenance (IRM), survey and subsea intervention tasks. Some of the typical tasks are listed below:-

- General drill support
- Hot stabbing
- Torque/ linear override tools operation
- Lift lines attachment
- Steel, fibre cables or ropes cutting
- Guide wire replacement
- Operation of disc grinders/cutters
- Debris removal/dredging
- Water jetting & wire brush cleaning
- Removal of cuttings from wellheads
- Installation and removal of AX/VX rings
- Placement & recovery of acoustic beacon
- Flow line pull-in operation
- General/close visual inspection
- Flooded member detection
- Wall thickness measurement/crack detection
- Still photography
- Cathodic potential measurement
- Bathymetric survey
- Trench profile survey
- General construction support
- Pre-lay & Post-lay survey
- Touch down monitoring
- Grout bag operation
- Boom cameras/profilers/undercarriage pipeline survey
- Sub-bottom pipe/cable detection/tracking

The Seal ROV is rated at 75HP and designed for operating at depth up to 600MSW. The horizontal thrusters on this ROV follow the vectored arrangement which enables high forward/lateral thrust. The Seal system inherited all the successful design features from Fugro Sealion ROV family. Flexibility is a key feature of the Seal ROV, allowing survey sensors, hydraulic power tools and work skid to be added when required. Telemetry and video transmission is via copper or fibre optic link. The vehicle frame is constructed from easily repairable stainless steel hollow sections that form a robust 'box' and houses the following major equipment:-

- Six units of 9" Kaplan thrusters
- 75HP electro-hydraulic power unit
- Servo valve and solenoid valve pack
- Subsea transformer
- Gyro compass pod & main control pod
- Oil compensators with level monitoring
- One unit of 7-function manipulator (Optional)
- Pan and tilt unit
- 1 x echo sounder & 1 x obstacle avoidance sonar
- 3 to 4 cameras and 4 x 250W dimmable lights

The Seal ROV is operated from a fully air conditioned A60 rated (upgradeable for zoned area operation) 10ft x 10ft control cabin certified by Lloyds Register of shipping. The system comes with a rugged A-frame based launch & recovery system (LARS) rated for sea state 6 operation. The control cabin and LARS can be coupled together to form a single-lift rapid deployment package. It also comes with a fully equipped 15ft x 8ft workshop container that satisfies all offshore maintenance requirements.

# Seal Light Work Class ROV

## DEPTH AND POWER RATING

Depth	600 MSW
Power	75 HP

## PHYSICAL CHARACTERISTICS

Length	1650 mm
Width	1075 mm
Height	1385 mm
Weight in air	950 kg
Through frame lift	3500 kg
Payload	80 kg (with standard buoyancy)

## THRUST

Six Thrusters provide the following at 180bar system pressure:-

Forward	286 kg
Vertical	146 kg surface / 241kg dive
Lateral	286 kg

## SPEED

Forward	1.6 m/s (3.14 knots)
Lateral	1.3 m/s (2.60 knots)

## MANIPULATOR (Optional)

Type	7-function rate controlled
Reach	1.6m
Lift capacity	50kg
Rotate torque	108Nm (79lbf.ft)
Jaw gripping force	80-85kg at 175bar

## CAMERAS

The vehicle supports 4 simultaneous video channels and equipped with circuits to operate 3 cameras with focus/zoom control.

## LIGHTS

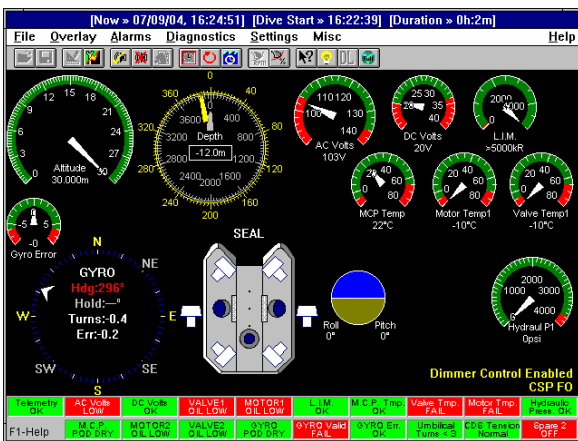
2x500W or 4x250W quartz halogen lights on two dimmer channels.

## PAN & TILT UNIT

Type	Hydraulic rate control
Pan/Tilt travel	±135°
Torque	Adjustable up to 50 Nm
Speed	Adjustable up to 20°/sec

## VEHICLE CONTROL SYSTEM

Vehicle control is performed by a Z180 processor based real time control system housed in the main control pod. The Z180 system communicates with the surface control system via full duplex copper or fibre optics links. The surface control system runs on MS Windows/Intel 486 or Pentium platform. The surface control system is user friendly with a Windows GUI. An advanced diagnostic system and help screens are included.



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## VEHICLE AUTO CONTROL ROUTINES

Auto Depth ±100mm Auto Altitude ±100mm Auto Heading ±1.5°

## STANDARD GYRO COMPASS SYSTEM

Type	Bendix King KGS 305 with flux valve
Accuracy	± 1°

## DEPTH SENSOR

Transducer type	DRUCK PCDR 810
Range/Accuracy	0 - 600m / 0.1%

## ECHO SOUNDER

Type	Mesotech 807
Frequency/Range	200kHz 0.6m-30m

## SPARE INPUT AND OUTPUT CHANNELS

The vehicle comes with large number of spare input and output channels which can be configured for specific task requirements.

- Down
  - 10 x user relays, digital control 250V AC @ 2A
  - 3 x 8 bit analog output channels -5 to +5V @ 0.5A
- Up
  - 7 x 16 bit analog input data channels
  - 4 x 8 bit input flag channels
  - 2 x auxiliary channels
  - 2 x auxiliary/video water alarms
  - 4 x surface indicated LED, multi purpose flag inputs

## OPTIONAL TETHER MANAGEMENT SYSTEM

Fugro's side-entry TMS with 200m tether excursion range.

## SYSTEM POWER REQUIREMENTS

Incoming 3-phase electrical supply (380–500V 50-60Hz) is fed into a power distribution panel that performs the function of electrical power distribution management. The power distribution panel is equipped with digital power meters enabling real-time monitoring of electrical parameters such as V, A, KW, KVAR and PF. Electrical supplies for the ROV are stepped up to 1200V by two transformers (10KVA single phase & 100KVA three phase) before being transmitted via the umbilical cable. Incoming power is also reduced to 220V/110V for supplies to the control cabin lights, air conditioning, equipment racks and workbench sockets. Total system (ROV + Control cabin + Workshop container + LARS) power demand is 200KVA.

## SAFETY

Insulation resistance of the umbilical on high voltage lines is monitored with multiple LIM units (Line Insulation Monitor). The LIM units shut down the high tension outputs in the event of insulation fault. Earth leakage circuit breakers are provided to monitor leakage to earth of the cabin 220V supply to ensure safety of personnel.

## ROV CONTROL CABIN

This is an A60 rated 10ft by 10ft offshore container housing the electrical power system and two equipment rack units comprising:

- ROV pilot console
- Two to four 10-inch or 14-inch high resolution industrial colour video monitors
- Video recording systems
- Video switchers, video line correctors, video overlay unit and distribution amplifiers
- Personnel communication system c/w 3 headsets for deck use
- Obstacle avoidance sonar display
- Surface control unit for all other sensors if fitted

The cabin is fitted with emergency lighting, discussion table/workbench and filing cabinets. Electrical cable entry to cabin is via MCT cable transit system.

