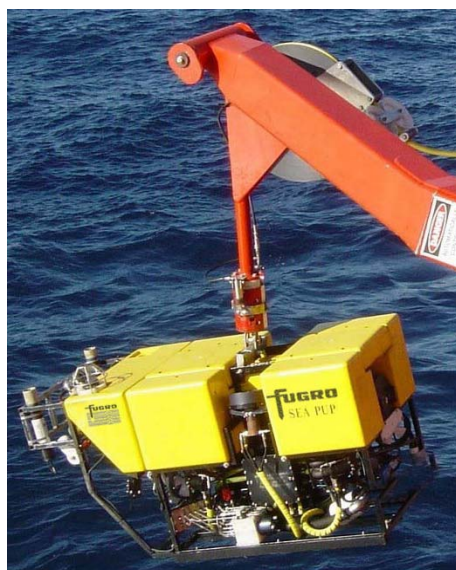


Sea Pup Inspection Class ROV



Fugro brings a unique underwater vehicle to the offshore arena with the Sea Pup ROV system. This small but powerful electro-hydraulic machine is an inspection class ROV capable of operating light hydraulic tools. Unlike pure electrical observation vehicles, the Sea Pup has superior tool deployment capabilities. Sea Pup is a compact system with control van, launch and recovery system (LARS) and vehicle fully integrated in a single-lift configuration. As such it is most suitable 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. Being an electro-hydraulic system, the Seapup can perform many tasks that cannot normally be performed by pure electrical vehicles. Some of the tasks that a Sea Pup can perform are listed below:-

- ✓ Drill Support/Light Intervention
 - Spud can inspection
 - Seabed surveys
 - Guidewire cutting
 - Bullseye monitoring
 - Light intervention tooling
 - Placement & recovery of beacon
- ✓ Survey
 - Sub-bottom pipe/cable detection/tracking
 - Boom cameras/profilers pipeline survey
- ✓ Construction support
 - Pre-lay & Post-lay survey / Diver observation
 - Touch down monitoring / Rock dumping support
 - Grout bag operation
 - Trench profile survey
- ✓ IRM
 - General/close visual inspection/Wire brush cleaning
 - Flooded member detection
 - CP/Wall thickness measurement/crack detection
 - Still photography

The Sea Pup is rated at 20HP (30HP with hydraulic pump upgrade) and designed for operating at depth up to 600MSW (Mk2) and 1000MSW (Mk3). The horizontal thrusters on this ROV follow the vectored arrangement which enables high forward/lateral thrust. The Sea Pup inherited all the successful design features of the Fugro's Sealion & Seal ROV family. Flexibility is a key feature of the Sea Pup, 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 7" Kaplan thrusters
- 30HP electro-hydraulic power unit
- Servo valve pack
- Subsea transformer
- Main control/gyro pod
- Oil compensators with level monitoring
- One unit of 5-function manipulator (Optional)
- Electric pan and tilt unit
- 1 x echo sounder & 1 x obstacle avoidance sonar
- 3 to 4 cameras and 4 x 250W dimmable lights

The Seapup 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. It also comes with a fully equipped 15ft x 8ft workshop container that satisfies all offshore maintenance requirements.

Sea Pup Inspection Class ROV

DEPTH AND POWER	Mk2	Mk3
Depth rating	600 m	1000 m
Power	20HP or 30HP (pump upgrade)	

PHYSICAL	Mk2	Mk3
Length	1615 mm	1693 mm
Width	870 mm	770 mm
Height	975 mm	885 mm
Weight	470 kg	540 kg
Payload (lead)	30 kg	60 kg
Through frame lift	500 kg (3g)	600 kg (3g)

THRUST

Six thrusters provide the following at 150bar system pressure:-

Forward	85 kg
Lateral	82 kg
Vertical	66 Kg (Dive) / 50 Kg (Surface)

SPEED	Mk2	Mk3
Forward/Reverse	2.31knots	2.55 knots
Lateral	1.73knots	1.75 knots

MANIPULATOR	(Optional)
Type	5-function rate controlled (Hydrolek)

CAMERAS

Standard vehicle configuration supports 2 simultaneous video channels with focus/zoom control. Up to 6 additional video channels are available if fibre optics mux disc is installed.

LIGHTS

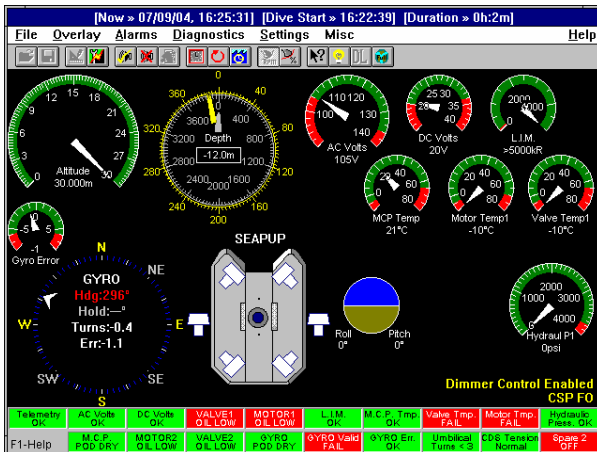
2x500W or 4x250W quartz halogen lights on two dimmer channels.

PAN & TILT UNIT

Type	Sub Atlantic Electric P&T
Pan Travel	±150°
Tilt Travel	±110°
Payload	40kg

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.



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 degree

DEPTH SENSOR

Transducer type	DRUCK PCDR 810
Range/Accuracy	0 - 1000m / 0.1%

ECHO SOUNDER

Type	Tritech PA200 or Simrad 1007
Range	1 to 100 or 0.5 to 50 metres

OPTIONAL FIBRE OPTICS SYSTEM

Installation of fibre optics mux system is a plug & play process for the Seapup system. The dual Prizm mini mux system will provide 4 x video channels, 4 x RS232 and 2 x RS485/422 channels.

OPTIONAL TETHER MANAGEMENT SYSTEM

Fugro's Seapup top-hat TMS with 200m tether excursion range.

UMBILICAL & TETHER

	Volt	OD	Quad	Pair	Coax	Fibre
Armoured	3.3KV	24mm	2	1	2	2 MM
Kevlar	3.3KV	27mm	2	1	2	4 MM
Tether	3.3KV	30mm	2	1	2	4 MM

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. Electrical supplies for the ROV are stepped up to 1200V by two transformers (2.2KVA single phase & 40KVA 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 150KVA.

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.

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