

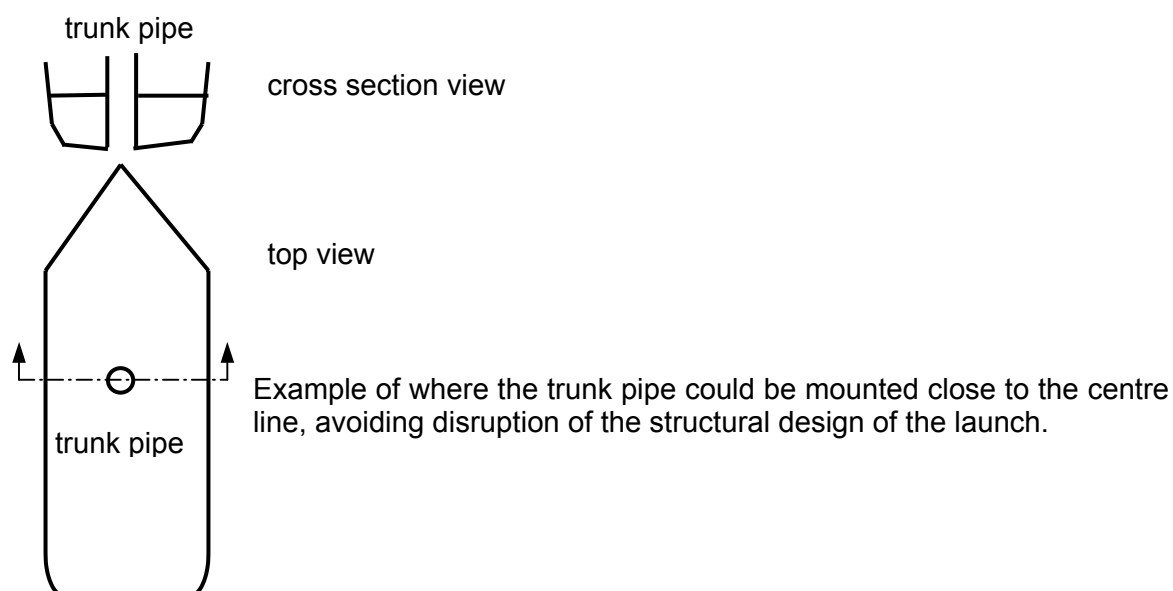
**Approval Date: 6<sup>th</sup>, October 1999****Reviewed on : 23 October 2007****Version: 1.00****Purpose**

The launch will be used to execute hydrological measurements in rivers, canals and reservoirs. Many of the measurements will be made in very shallow water.

**Conditions & Requirements**

- The launch shall be of such a design that it operates reliably and safely under the prevailing environmental and hydraulic conditions.
- The launch shall be capable to operate in shallow water where repeatedly the hull may impact with rock or sediment.
- The launch shall be constructed of Grade A quality shipbuilding steel. All corrosive materials shall be provided with full and durable coating.
- All coatings used shall provide full protection against rusting and corrosion to the steel body, structural parts, and components of the launch.
- All parts, structural members and components of the launch remaining exposed to water shall be provided with complete cathodic protection.
- The launch shall be very sturdy, unsinkable and shall have an adequate stability.
- The launch shall be easy to operate and maintain.
- All hull sections shall be accessible from the inside for quick repair of damage to the hull. The float material shall be removable to give access to the hull.
- The launch shall have an expected technical lifetime of not less than 15 years.
- The launch and the engines shall be capable to operate for at least 6 months without any major servicing.
- The launch shall have floatation chambers filled with closed cell foam.
- The launch shall be provided with appropriate fenders.
- The launch's welded and/or riveted joints shall be designed to avoid leakage while taking into account the hostile environment of operation e.g. shallow water, high flow rate, floating debris, high sediment loads.
- The launch shall have a cabin to accommodate equipment and staff.
- The cabin shall, at port and starboard side, have sitting/sleeping benches.
- The cabin shall have windows that can be opened and a lockable door.
- The cabin shall have provisions to safely install and operate the following equipment: echosounder, DGPS system, ADCP, laptop PC, helmsman display, power supply with car batteries.
- The cabin shall have a stable table for the operator, to spread maps and paper charts, to make notes etc.
- On deck adequate workspace (at least 3 x 3 m<sup>2</sup>) should be provided to carry out hydrological measurements.
- The rear deck shall be provided with an awning.
- The launch shall be supplied with the accessories as needed for effective deployment.
- The launch shall be fitted with two inboard diesel engines.
- The engines shall be operated by a remote control system, located in the cabin.
- The control system shall have a starting switch, gear switch and a throttle system for each engine and a steering wheel and emergency stop switch for simultaneous operation of the engines.
- A break water arrangement shall be provided in the front.

- Guard-rail and stanchions with detachable chain will be rigged out around the deck-opening. Suitable guard-rails shall also be provided around the deck.
- Arrangements shall be made for safe working on the launch.
- Bollards and fairleads are to be provided on the deck for mooring purpose.
- A maintenance manual, related to the type and model of the launch, shall be part of the delivery
- The launch shall be fitted with a transducer trunk pipe (transducer well).
- The internal diameter of the trunk pipe shall be sufficient to pas both the high frequency echosounder transducer and a low frequency echosounder transducer or an ADCP.
- It shall be easy to install or recover the transducers and / or the ADCP.
- The transducer trunk pipe shall be installed in or very close to the centre of the hull. In forward / backward direction, it may be in the middle of the launch.
- The transducer trunk pipe shall have a top cover to avoid water entering the launch, in particular while sailing.
- The top cover shall pass the transducer rod and its cable but prevent water to enter the launch.
- The transducer trunk pipe shall be at least as high as the sideboards of the launch.
- The transducer trunk pipe shall be flush with the launch hull; it shall not protrude below the launch hull.
- The trunk pipe shall be tightly fixed to the launch and shall be properly supported.
- The trunk pipe shall be waterproof, corrosion proof and very sturdy. The trunk pipe shall be so constructed that it cannot break off, tear apart or suffer any other damage that may result in water entering (seeping or flushing) into the launch.
- At the lower end of the trunk pipe, a bottom lid or dummy transducer shall close the trunk pipe during fast sailing. The trunk pipe lid shall be smoothly fitted in the curved shape of the hull; i.e. it should not disrupt the flow of water along the hull.
- The bottom lid shall be easily installable/removable from above through the trunk pipe, while the launch is floating.
- The transducer and support rod shall be vertically adjustable and also removable.
- The transducer and its support rod shall be tightly fixed in the trunk pipe to avoid vibrations during sailing.
- It shall be possible to immerse the transducer deeper than the lower end of the transducer trunk pipe.



## Specifications

### 1. Launch

<b>construction material</b>	Grade A quality shipbuilding steel.
<b>length</b>	12 m ± 0.5 m
<b>width</b>	3.5 m ± 0.25 m
<b>draft</b>	≤ 1.0 m
<b>free board</b>	≥ 0.5 m
<b>bottom shape</b>	flat or slightly catamaran
<b>propulsion</b>	2 Nos. of 50 kW (65 HP) inboard diesel engines
<b>propeller</b>	2 Nos, 3-blade bronze
<b>carrying capacity</b>	≥ 6000 kg pay load

### 2. Engine

<b>power</b>	≥ 50 kW (approx. 65 HP)
<b>operation</b>	four stroke, natural aspirated
<b>revolutions</b>	1800 rpm at rated power
<b>cylinders</b>	4
<b>fuel</b>	diesel direct injection air filter fuel filter
<b>cooling</b>	water cooled direct using river water belt driven water pump and fan
<b>intake scoop</b>	bars across opening to prevent entry of debris
<b>sea-cock/valve</b>	allowing unrestricted flow of water, closed for cleaning
<b>full flow strainer/filter</b>	preventing clogging of the pump by smaller particles
<b>electrical</b>	12 V electrical starter generator with battery charger
<b>gauges</b>	oil pressure water temperature battery voltage battery charging
<b>lubrication</b>	forced feed replaceable filters

### 3. Cabin

<b>length</b>	5 m ± 0.5 m
<b>height</b>	ample sitting height
<b>door</b>	lockable
<b>door width</b>	> 1 m
<b>windows</b>	glass, possibility to open, closed water tight
<b>windshield</b>	glass, fitted with screen wipers

### 4. Launch outfit

<b>anchor</b>	adequate for size of launch, fitted with 5 m chain and rope for water depth of 50 m and current velocity of 5 m/s
<b>fuel tanks</b>	2 Nos, 100 L each
<b>echo-sounder</b>	indicator type, fitted in the launch
<b>compass</b>	magnetic type, fitted in the launch
<b>fenders</b>	4 of Coir type
<b>life-jacket</b>	8 nos
<b>life-buoy</b>	8 pieces with at least 50 m line, readily available on board

**fire extinguisher** 4 Nos, >5 kg

The fire extinguishers shall be readily accessible in the motor compartment (if any), in the cabin and on deck.

## **Remarks**

For the installation of winches, fitting of survey echo-sounder transducers etc. some local reinforcements and/or supports may be required. Arrangements shall be possible for mounting a duly compensated magnetic compass on to the launch for use in positioning the launch for flow measurements. Arrangements shall exist for mounting the launch outfit (Bracket) and for dropping of the anchor to keep the launch stationary, during flow measurements. These can only be specified after selection of the survey instruments and other relevant equipment.

Arrangements shall be made for safe working on the launch.

For Indian bidders, the Registrar of Shipping, Mumbai, shall approve the design and drawing. For international bidders the design and drawing shall be approved by a national agency in their country authorised for the purpose and acceptable to the purchaser.

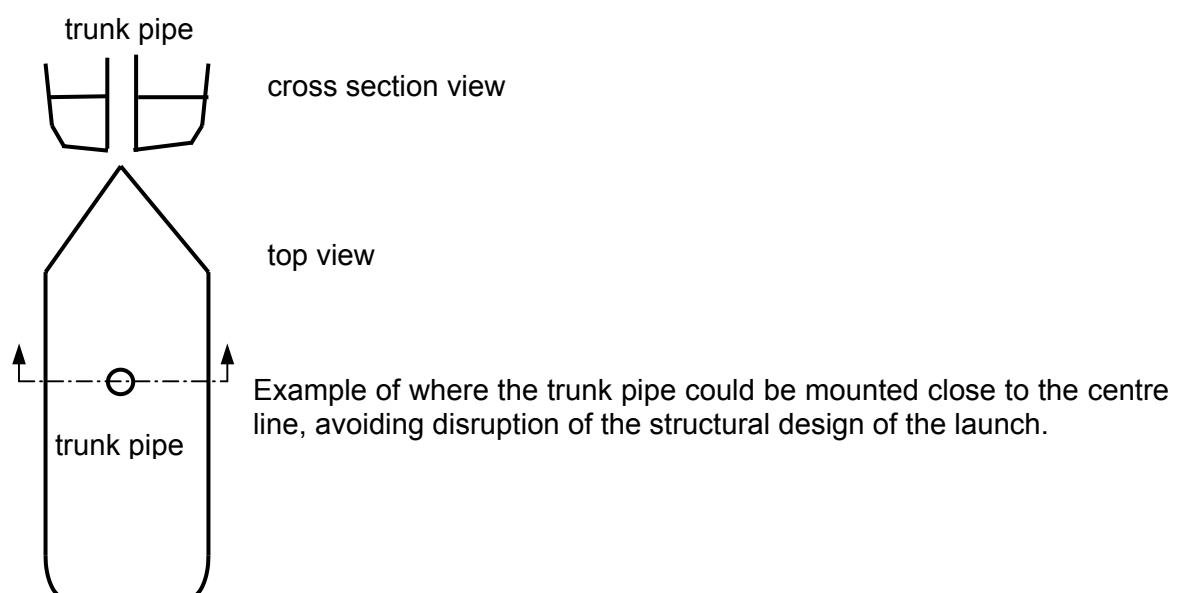
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- It shall be possible to immerse the transducer deeper than the lower end of the transducer trunk pipe.



## Specifications

### 5. Launch

<b>construction material</b>	Grade A quality shipbuilding steel.
<b>length</b>	12 m ± 0.5 m
<b>width</b>	3.5 m ± 0.25 m
<b>draft</b>	≤ 1.0 m
<b>free board</b>	≥ 0.5 m
<b>bottom shape</b>	flat or slightly catamaran
<b>propulsion</b>	2 Nos. of 50 kW (65 HP) inboard diesel engines
<b>propeller</b>	2 Nos, 3-blade bronze
<b>carrying capacity</b>	≥ 6000 kg payload

### 6. Engine

<b>power</b>	≥ 50 kW (approx. 65 HP)
<b>operation</b>	four stroke, natural aspirated
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<b>cylinders</b>	4
<b>fuel</b>	diesel direct injection air filter fuel filter
<b>cooling</b>	water cooled direct using river water belt driven water pump and fan
<b>intake scoop</b>	bars across opening to prevent entry of debris
<b>sea-cock/valve</b>	allowing unrestricted flow of water, closed for cleaning
<b>full flow strainer/filter</b>	preventing clogging of the pump by smaller particles
<b>electrical</b>	12 V electrical starter generator with battery charger
<b>gauges</b>	oil pressure water temperature battery voltage battery charging
<b>lubrication</b>	forced feed replaceable filters

### 7. Cabin

<b>length</b>	5 m ± 0.5 m
<b>height</b>	ample sitting height
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