

2.0 COMBINE SERVICE & RESCUE BOAT HANDLING CRANE

2.1 TECHNICAL DESCRIPTION & SPECIFICATION

The Plimsoll combine service & rescue boat-handling crane consist of a steel fabricated boom with guide sheaves for the hoist cable at the outboard end. The boom is pivoted vertically on a base plate, and the topping motion of the boom is achieved by hydraulic cylinder connected from base plate to boom. The plate is rotated on slewing ring, which is driven by pinion mounted on ring slew drive. The inner race of the slewing ring is mounted on the support column, which is to be welded to the deck or plate form provided. An electric winch mounted at the back of the slewing column is used for both store handling and rescue boat function.

A boom rest is installed to support the boom when the crane is not in use.

A) Design Criteria

The Plimsoll combine service & rescue boat handling cranes are designed accordance to:

- BV – Rules for the Classification and Certification of Lifting Appliances of Ships and Offshore Units
- International Convention for Safety of Life at Sea, Consolidated Edition, 1992, Chapter 3, Part C, Section VI – Launching & Embarkation Appliances

The steel quality is selected in accordance with classification societies recommendation to obtain necessary ductility and to withstand the lower temperature-working environment if required.

B) Hoisting

An electric winch does the hoisting of the service handling and rescue boat, with wire rope coiled on the drum to give sufficient hoisting height. It is equipped with powered hoisting to give the maximum hoist capacity and hoisting speed at the top layer, and incorporates a set of remote control brakes (via pulling-handle and strategically placed roller sheaves) to allow personnel on board of the rescue boat to lower themselves to the sea with the help of gravity. There is also a hand crank for manual hoisting / recovery of the rescue boat.

C) Boom

The boom is fabricated from ship plate or equivalent material, continuously welded in a rectangular box section.

Sheaves with diameter to suit the hoisting rope are mounted on the boom outboard end, so as to properly guide the wire rope at all boom angles. They are provided with heavy-duty roller bearing and grease nipple lubrication.

D) Topping

The boom is topped by hydraulic cylinder with sufficient stroke to achieve boom positions from maximum working radius to minimum working radius.

The heavy-duty marine type hydraulic cylinder has composite bearings on the clevis ends and mounted onto the boom. The cylinder is equipped with integral counterbalance valve at the porting to prevent sudden retract of cylinder rod in case of hose burst.

E) Slewing

The crane slews at the joint position of base plate and base column by the slewing bearing and slewing drive. The crane is fabricated from ship plate or equivalent material.

The slewing drive unit consists of a pinion gear mounted on the output shaft of planetary type reduction gear, coupled with a spring set fail-safe brake, driven by a hydraulic motor. The complete drive unit is bolted onto the base plate and drives the inner race of slewing ring.

The slewing ring is a 4-point contact bearing type for optimum transfer of thrust and moment loads. It consists of an outer race bolted onto the rotating base plate, and an inner race, which includes internal type gear teeth, bolted to the stationary support column.

A safety feature of the rescue boat-handling crane is that the system is designed to slew under an adverse condition of 20 degrees list (either side) and 10 degrees trim. In addition, a backup system consisting of accumulators allow the crane to be slewed 180 degrees under a complete loss of power to the ship.

F) Support Column

The support column is fabricated from ships plate or equivalent material, rolled to the diameter to suit the slewing gear inner race dimension. A mounting plate is welded on top of column for bolting the inner race of slew ring. The bottom of column is to be welded onto the deck structure with webs. The column or pedestal dimensions are designed to keep hoist hook deflections to a minimum.

G) Rope

The wire rope for hoist winch is of the non-rotating type and galvanized with minimum breaking strength of 6 times the maximum hoisting capacity of winch.

H) Electro-Hydraulic Power Pack

The hydraulic service crane is powered by a built-in electro-hydraulic power pack.

I) Crane Control

The crane is controlled from an operating platform above the slewing ring. Access to platform is by ladder. All cranes movements are smooth and fast, with step less speed control throughout and protection against overloading by relief valve.

Two motions may be operated at the same time with full capacity but reduced speed.

J) Load Limiting System

Each hydraulic system is provided with relief valve for limiting hydraulic pressure to preset valves corresponding to the crane operating capacity.

K) Limit Switches

The hoisting winch is installed with an automatic limit switch to protect the hoisting hook from over travel.

The topping cylinder is designed with cushioning effect for safe buffering in the extreme positions during luffing up and down operation.

Two limit switches and two proximate switches are fitted on the crane, which are designed for limiting the working area of the crane.

2.2 TECHNICAL SPECIFICATION

Type of Crane	Service & Rescue Boat Handling Crane
Safe Working Load – Service Handling – Rescue Boat Handling	1.5 Tonne 1.5 Tonne
Maximum Boom Outreach @ 0° - Service Handling - Rescue Boat Handling	7.0 Meters 7.0 Meters
Minimum Boom Outreach - Service Handling	2.3 Meters
Hoist Winch Model	04 - E
Maximum Hoisting (Lowering) Speed - Service Handling - Rescue Boat Handling	15 M/MIN (15 M/MIN) 18 M/MIN (42 – 45 M/MIN)
Winch Drum Capacity	Ø14 mm x 30 M
Topping Cylinder Model	CM250 CHCH125/90-1200 RHB
Luffing Time (Average)	45 Sec
Slewing Drive Model	RPR 3065 / 125

Type of Crane	Service & Rescue Boat Handling Crane
Slewing Sector - Normal Condition - Dead Ship Condition	270° 180° (CCW from Top)
Slewing Speed - Service Handling - Rescue Boat Handling	1 RPM 1 RPM
Max. Working Pressure	280 Bar
Max. Flow	41 L/MIN
Weight of Crane (Approx.)	~3.2 tonnes
Serial No.	F0010 - HRSC030 - 01507
Date of Manufactured	2003



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