

TECHNICAL SPECIFICATION

1 DESCRIPTION OF THE CRANE

ITALGRU make Diesel Engine driven Rubber Tyred Mobile Harbour Crane of 40 T Capacity (Model No. IHC 850, Sl. No.C1519) has been installed in Cochin Port Authority, W/Island in 2012 and is being used for loading and unloading dry bulk/break bulk cargo in the ships being berthed at Q7, Q8 & Q9 berths at Ernakulam wharf

1.1 Main functions of the crane

Hoisting/Lowering, Slewing,Luffing and Travelling are the main functions of the crane and these operations are being done by hydraulic motors attached to the main Engine. One number 40 KVA Generator is also attached to the engine for giving auxiliary power to crane functions. A Hook of 40 T and a Grab of 25 T Capacity are attached to the crane as per the requirement of type and tonnage of the load. Communication and Logic Control system/PLC of the crane is of Cobo make

2 General Specification

Crane make	: ITALGRU
Crane type	: Mobile Harbour Crane
Input Supply voltage to Crane	: 3.3kV
Power Supply to system	: 400V
Frequency	: 50Hz
Ambient temperature range	: 40°C
Relative Humidity	: 5 to 95% (No condensation)
Climate	: seaside
Altitude range	: 1000mt. above sea level

3 Scope of Supply

- 3.1 Supply of PLC CPU panel with tentatively 250Nos of DI/DO s at E-Room and at Operator cabin
- 3.2 Supply of ASI Master module which will communicate to existing AS-I slave stations via existing Slip-ring arrangement
- 3.3 Supply of Operator chair with console and master controller
- 3.4 Supply of 2Nos HMI (Human Machine Interface) at E Room & at Operator cabin
- 3.5 Supply of Communication cables inside the crane for communication of PLC modules
- 3.6 Supply of 3 Nos of Absolute Encoder
- 3.7 Supply of 2Nos of angle sensor

3.8 Supply of Limit switches

3.9 Supply of junction boxes

4 Scope of work

- 4.1 Detailed Design, Engineering, Manufacturing, Software development, erection, testing, & Commissioning PLC Panel at ERoom & Operator cabin station
- 4.2 Installation , Testing & Commissioning of HMI station at E Room & at Operator cabin
- 4.3 Installation, Testing & Commissioning of Absolute Encoders
- 4.4 Installation, Testing & Commissioning of Slew angle sensors
- 4.5 Installation, Testing & Commissioning of Operator cabin console with chair

- 4.6 Communication Establishment and PLC programming of existing slaves at Lower leg
- 4.7 Removal of existing system and erection of supplied system
- 4.8 Replacing the field devices for integrating with new control system
- 4.9 Replacement of damaged junction boxes, control cables, cable trays , light fittings, LT switches/ MCB etc.
- 4.10 Repainting of the crane as per the details given in accordance with the specifications as furnished in the subsequent sections of the tender document

5 Supply of Documents

Three sets of drawings (A4) and Manuals of the entire documentation shall be submitted

- a) Preliminary documentation
- b) Final documentation for the installation
- c) As built documentation
- d) In the details it includes:
- e) Single line diagram
- f) Devices list
- g) Electrical drawings and terminals
- h) Cables list
- i) Operating, and maintenance instruction manual

6 MAIN TECHNICAL DATA

6.1 Performances and Charecteristics

Crane Lifting Capacity	t	40/30/0
Hook Hoisting Speed	m/min	26/34/89
Slewing Speed	rpm	1.5
Boom Luffing Time from max to min radius	Sec	30

Boom Luffing Time from min to max radius	Sec	30
Travelling speed	Km/h	0-5
Minimum working radius	m	9
Maximum working radius	m	34
Max hook deep below ground	m	15
Crane Max gradient	%	8
Crane turning radius	m	15.66
Superstructure turning radius	m	5.44

6.2 Capacities

	Crane in execution	Double in Winch
Average Load Mement	Tm	800
Diesel Power	KW-RPM	486 or 453/1500
Parts of Ropes Lines	N	4 x 1
Boom Length	m	36
Boom Pivot point above ground	m	12
Operator's eye level	m	17.50
Outrigger's spread	m	9.00 x 9.95
Maximum Load on outrigger's pads (360°)	T	105
Outrigger Pad size	m	4.3 x 1
Total number of outriggers pads	No	4
Bulk handling capacity of the crane with grab in free digging test condition	TPH	400

6.3 Dimensions

Carrier Overall length	mm	14.862
Carrier Overall length with boom lowered	mm	54.502
Carrier Overall Height without Tower	mm	7.387
Carrier Overall Height with tower Lowered	mm	11.138
Crane Height with Tower in Working Position	mm	22.905
Overall Height at the crane Tower Pivot point	mm	4.418
Overall crane carrier height	mm	2.579
Number of axles	No.	4
Minimum clearance	mm	300
Wheels base		
1 st /2 nd /3 rd /4 th Axis	mm	2.800
3 rd /4 th Axis	mm	7.300

Axle track	mm	3673
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6.4 Wheels

Tyres	14.00 x 24"-15.00 x 25"
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6.5 Axles Loads

During travelling in the worst condition	Kg	≤ 40.000
Admitted load for each Axle (Dynamic)	Kg	60.000
Admitted load for each Axle (Static)	Kg	80.000

6.6 Crane Grounded Pressure

1.6.1	On wheel during travelling	Kg/Cm2	6.43
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1.6.2	On outriggers pad with max cargo		
	With pads (4.300 mm x 1.000 mm)	Kg/Cm2	2.44
	Load uniformly Distributed	t/Cm2	1.79

6.7 Wind resistance

In travelling condition	Km/h	72
In working condition	Km/h	72
Crane standing on outriggers		
With tower an boom in upright position	Km/h	180
With boom lowered	Km/h	Over 180

6.8 Structures Classifications

1.8.1	Standard General Group of Classification		
	Grab Use	Intensive Use	Heavy Use
General	A8 (Q3-U7)	A7 (Q2-U7)	A4 (Q2-U4)

1.8.2	Gears		
	Grab Use upto 25 t	Intensive Use upto 30 t	Heavy Use
Hoisting	M8 (L3-T7)	M7 (L2-T7)	M4 (L2-T4)
Slewing	M8 (L3 – T7)	M7 (L2 –T6)	M6 (L2-T6)
Luffing	M8 (L3– T7)	M7 (L2 - T6)	M6 (L2-T6)
Travelling	M4 (L4-T2)		

6.9 Materials

Steel S 235 JR	Counter weight
Steel S 355 J2	Slewing structure crane, boom and carrier frame
Steel S 355 J2	Column
Steel S 355 J2	Outriggers and beam
Steel 34 Cr N.Mo 6V	Hooks
Steel 39 Ni Cr Mo 3 bon	Shaft and Pin
Steel 17 Cr – N.Mo 6	Gears

6.10 Grab

Make		CFS handling /SMAG
Capacity	M3	16
Weight	Kg	7850(appx)
Max duration for Closing	Sec	12.7
Max duration for opening	Sec	11.4