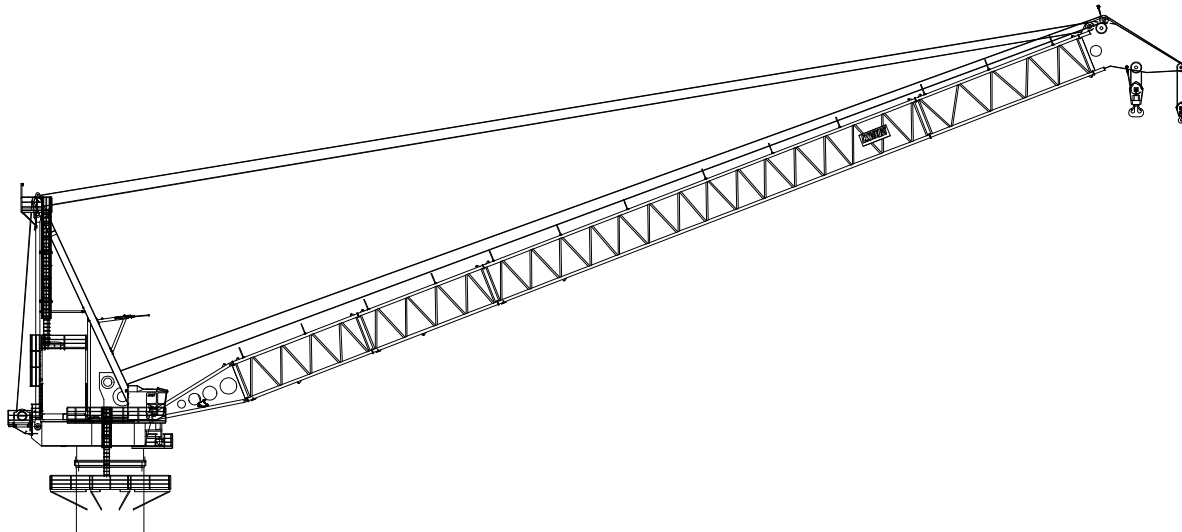


Crane Specification



Typical image

Customer : Mayflower Energy
Project : 300 t Crane Self-Elevating Crane Vessel
Our Project : 11652
Crane type : EHC 300 / 5500 O.S.
Issue : Rev. C Updated for contract issue
Preparation date : 12 Sept 2001

Originator : Gerard Jacobs
Checked by : Jaco P. Fleumer

Customer	: Mayflower Energy
Project	: 300 t Crane Self-Elevating Crane Vessel
Crane type	: EHC 300 / 5500 O.S.
Issue	: Rev. C
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Comment: Rev.

Design considerations

Zone location	World wide except Arctic waters
Ambient temperatures	-10 ° C to +35 ° C.
Design temperature	-10 ° C.
Relative humidity	max. 100 %
Wind speed stored	63 m/s only in Boom rest.
Operational wind speed	16 m/s

	Elevated	Floating	
Max. static Heel	1 °	3 °	
Max. static Trim	1 °	2 °	
Dist. sealevel to slewbearing	25.00 m		to be confirmed
Crane location	Longitudinal	94.00 m	to be confirmed
	Transverse	0.00 m	to be confirmed
Max. snow and ice cover	negligible		

B
B

Type of Operation	General deck operations in harbour and sheltered waters in elevated position or floating Offshore in elevated position only Loading or unloading supply boats by means of the whip hoist Personnel transfer by means of the whip hoist, max 1500 kg at 1-fall
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Conditions	Elevated		Floating		Whip hoist	
	in harbour	sea lifts	in harbour	in harbour	supply boat	
Duty factor	1.00	1.00	1.00	1.00	1.00	
Dynamic factor on dead load	1.00	1.00	1.00	1.00	1.00	
Dynamic factor Fh	1.15	1.60	1.15	1.25	2.00	
Offlead	1 °	1 °	1 °	2 °	5 °	
Sidelead	2 °	2 °	2 °	2 °	3 °	

Off and side lead acc DnV

Lifting curves for floating offshore conditions are available upon request and when vessel motions are known

A

Type of Crane	Pedestal mounted Ropeluffing Electric Hydraulic Offshore Crane
Type of Boom	Five sections lattice boom with Whip hoist extension
General Plan drawing	11652-01.01 rev. F
Load curves	11652-08.51 rev. C

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Area classification

Zone	All safe area
Class	
Temperature Class	

Class. acc. BS 2573	Crane	Main Hoist	Whip Hoist	Luffing	Slewing
Class of utilization	U3	T2	T4	T4	T4
State of Loading	Q2	L3	L2	L2	L2
Group Classification	A3	M3	M4	M4	M4

Design

Crane structural design Life	20 years
Main Design	Det norske Veritas, Rules for certification of Lifting Appliances
Certification	Det norske Veritas including CRANE notation
Additional requirements	

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Power supply

Electric	Main Power 690 V / 60 Hz	Max. consumed power approx. 1210 kW	B
	Max. starting current 1400 A approx. (1 motor running, 1 starting)		B
	Emergency power 450 V / 60 Hz	Max. installed power approx. 35 kW	C
	UPS 230 V / 60 Hz	if required for AWL's	C

Performance Data

Lifting Capacity (SWL)	Main Hoist 12-falls	Whip Hoist 2-falls	Tuggers (2x)	
Harbour lifts	300 t @ 25.5 m, 43 t @ 83 m	30 t @ 87 m	0-10 t	B
Constant tensioning (1-fall)	-	5 t @ 100 m/min	0-30 m/min	C
<i>See the Load-Radius Graph's</i>				

Working Radius	Main Hoist	Whip Hoist
Max. Radius	83 m	87 m
Min. Radius	10 m	11.5 m

Boom Angles

Maximum working angle	88 °
Minimum working angle	22 °
Storage angle	0 °

Number of falls	Main Hoist	Whip hoist	Boom hoist	Tuggers	
	12, 10, 8 or 6	2 or 1	20	1	C

Hook Elevation

Main Hoist 12-falls	100 m	B
Main Hoist 10-falls	125 m	
Whip Hoist 2-falls	125 m	
Tuggers 1-fall	100 m	

Speeds ± 5%

Hook Speeds	100% SWL	50% SWL	Empty hook	
Main hoist 12-falls	5 m/min	10 m/min	12.5 m/min	B
10-falls	6 m/min	12 m/min	15 m/min	
8-falls	7.5 m/min	15 m/min	18 m/min	
6-falls	10 m/min	20 m/min	25 m/min	
Whip hoist 2-falls	30 m/min	50 m/min	50 m/min	
1-fall	60 m/min	100 m/min	100 m/min	
Tuggers 1-fall	10 t stall	30 m/min	30 m/min	

Stepless Infinite variable and load dependent speeds, zero to max.

Luffing time

With load from max radius	300 s
With no load	180 s

Slewing

Slewing Range	nx360 °
Slewing speed	0.3 RPM during main hoist operations
	0.6 RPM during whip hoist operations

Simultaneous operation

Two functions	Any two functions at full power	
Three functions	E.g. Hoisting with full power together with slewing and luffing at reduced speed	
	Main and Whip hoist can be operated simultaneously, sum of the hoists not to exceed the allowable SWL for the Main hoist at the actual radius	C
	Automatic power limiter with function preference for Main or Whip hoist	

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Wire Ropes, drums and sheaves

	Main Hoist	Boom hoist	Whip hoist	Tuggers (2-off)	
Diameter	36 mm	36 mm	30 mm	24 mm	
Tensile strength [N/mm ²]	1960	1960	1960	1960	
Min. Breaking Load [t]	116	118	82	30	
Type of Wire	Non-rotating	Lang-lay	Non-rotating	WS+IWRC	
Preservation	All ropes galvanized and greased				
No of dead turns on drum	4x	4x	4x	3x	
Drum size	800x1788	680x2x750	630x1788	400x500	
Nr. of layers	7	4	3	4	
Type of grooving	LeBus	LeBus	LeBus	Helical	
Rope sheave diam	800	800	630	450	
Bearing type	sealed anti-friction				
Hook blocks	12-falls	6-sheaves with ramshorn for main hoist			B
	2-falls	1-sheave block with hook acc DIN 15401 for whip hoist			B
	1-fall	ball weight with single hook acc DIN 15401 for whip hoist			

Weights & Dimensions

Crane Dimensions (approx.)

Height in stowed position	23.00 m	above slewing ring
Overall Length	99.00 m	
Overall Width	10.50 m	
Tail Radius	8.50 m	

Crane weights (-5 / +10%)

Super Structure incl cabin..	Operational weights
M.C. and walkways	240.00 t
Boom	110.00 t
300 t 12-fall block	6.00 t
30 t 2-fall block	0.60 t
15 t single line hook	0.50 t
Total Crane Weight	357.10 t

Pedestal Dimensions

Pedestal Adaptor height	5500 mm	
Wall thickness	40 mm	
Diameter lower End	5538 mm	to be confirmed
Diameter upper End	5538 mm	to be confirmed
Thickness of Flange	ca. 130 mm	

Pedestal weights (-5 / +10%)

Pedestal Adaptor	35.00 t
Circular Walkway	5.00 t
Equipment	1.00 t
Total Pedestal Weight	41.00 t

Pedestal Design Loads:

	incl. factors	(Preliminary data at slewbearing level)
Load case	300 t @ 25.5 m	
Max. Overturning Moment	110000 kNm	
Axial Force	7500 kN	
Radial Force	550 kN	
Slewing Moment	5500 kNm	

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Slewbearing

Type	Three Row Roller Bearing
Make	Rothe Erde or RKS SKF
Nominal Diameter	5550 mm
Pitch of outer Bolts	5300 mm
Pitch of inner Bolts	5770 mm
No. and size of Bolts	2 x 160 x M48 (HV)
Material of Rings	42CrMo4 V
Slewing gear	6, Pinions excentric for adjustable back-lash
Safety feature	Integral retainer ring
Inspection	Play : Rocking test
	Wear : Grease sampling points
	Removal : Jacking points will be provided on pedestal and main frame

C

C

Main Driver

Type	2-off Squirrel cage induction motor TEFC
Nominal Power	2x 400 kW, S1 duty @ 1800 RPM
Intermittent Power	2x 600 kW, S6-10% duty @ 1800 RPM
Cooling	Air
Starting	Star/Delta (on crane)
Controls	Remote, from crane cab
Power take off	One shaft
Emergency pump motor	1-off Squirrel cage induction motor TEFC, 35 kW @ 1800 RPM

C

C

Pump unit

Splitterbox(es)	Spur gearbox with 3 outputs
Input shaft	Flexible coupling
Pumps	High pressure variable piston pumps of the swash plate type
Execution	Electric motor(s) with splitterbox, pumps and tank built on common skid in machinery house
Hydr.oil tank	capacity 3000 l
	material carbon steel, inside shotblasted, cleaned and coated
Hydraulic oil	ISO VG 46
	Environmentally acceptable oil e.g. Mobil Biofluid HLP 46
Heating	Oil immersed heaters incl. thermostat and max temp switch
Cooling	Oil/air cooling suitable for the specified environment

A

Hydraulic piping

Hard piping	< 30mm Stainless steel 316L > 30mm Carbon steel
Couplings	For piping and hoses, carbon steel, yellow passivated For rigid piping carbon steel 'WALFORM' tube fittings with captive seal or carbon steel welding nipples with O-ring All non-coated couplings wrapped with Denso tape Large size coupling with SAE flange
Hoses	Aeroquip or equivalent

Hydr. oil filtering

Main return filter	Single full-flow with contamination indicator, plus indicator in cabin
Booster press fliter	Single full-flow with contamination indicator
Aux. press filter	Single full-flow with contamination indicator

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Controls and Instrumentation

Location	In driver's cabin
Type	Electric / electronic
Main and whip hoist	Double lever
Luffing and slewing	Joy-stick
Constant tensioning	Push button on hoist lever
Tuggers	Foot operated (toe and heel)
Logics	PLC
Safe load Indicator (SLI)	Electronic, with display screen showing all functions

A

Operator's cabin

Type	1800 XLS
Mounting	Anti vibration pads of the fail safe type
Windows	min. 6 mm bright safety glass fitted in rubber front window in one piece, 8 mm thick
Wipers	2-off electric driven parallel arm type wipers on front window and single arm type on roof window incl. Washers on each wiper
Sun visor	1-off adjustable sun visor for front windows
Insulation	Acoustic and thermal insulation on walls, rubber mat on floor
Door	Marine type door with window and day and night lock and catch
Air conditioning	Heating and cooling system for 18-25°C inside temp. incl. demister for the front windows
Operator's chair	Upholstered chair with arm rests incl. all direct controls
Noise levels	70 dB(A) inside cabin with door and windows closed (exl. airco)

Machinery house

Type	Self standing housing out of steel sheets and stiffeners with allowance for painting and with a sump underneath a grated floor
Mounting	Bolted on top of the main frame
Access	One door at each side of the main frame
Ventilation	One automatic opening/closing louvre at each side
Insulation	Noise insulation on the walls
Maintenance aids	Full size hatch for the power unit(s) in the roof and a service crane of 2.5 t SWL

Power supply, slipping body

Electrics	Main power 690 V / 60 Hz, 3 ph	4-rings	C
	Emergency power 450 V / 60 Hz, 3 ph	4-rings	C
	AWL power 230 Vac UPS, 1 ph +N	2-rings	
	Earthing	1-ring	
	Instrumentation or spare	8-rings	proposal
	Isolation By local pad-lockable switches (motor in main switchboard)		

Lighting

Cabin	Switchable fixture 2-off 2x18 W	C
Machinery compartment	6-off 2x18 W fixture incl. emerg. back-up for 60 min	
Walkways (2-sides)	Main access at cabin level 2-off fixture 2x18 W	C
Roof of mach. house	1-off 2x18 W fixture incl. emerg. back-up for 60 min	
Inside pedestal	1-off 2x18 W fixture incl. emerg. back-up for 60 min	
Floodlights	4-off 400 W Floodlights, swivel mounted near boom head	
Aircraft Warning Light (AWL)	1-off in boomhead 1-off in A-frame top	C

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Comment: Rev.

Safety Devices

Mechanical	Fail safe spring loaded hydraulically released parking brakes	
	Safety brake direct on drum for whip hoist	
	Mechanical radius indicator	
	Progressive telescoping boom stoppers	
	Slew lock will be by means of the boomrest (boomrest by others)	
Hydraulic	Full size pressure relief valves in all systems	
	Hydraulic lock valves directly to motors	
Electric	Emergency stop push buttons (with cotroled action) in cabin, machinery compartment and bottom of main access (rotating) ladder	
	Interlock to allow starting only with all function in neutral	
	Electric limit switches on all functions with automatic ramp-down	
	Warning horn to deck crew	
Overload Protection	Electronic overload detection	
	Automatic brake release under back tension for Whip hoist	C
Emergency release	Manual operated load release push button, protected against accidental operation and break-away link on Whip Hoist	C
	rope connection to the drum and slew torque limiting device	
Emergency operation	Lowering of the hook(s) and boom	
	Emergency slewing powered by means of seperate power pack fed by the vessel's emergency power system	
	max. slewing speed 0.05 RPM against wind and 2° list	
Fire & Gas	One fire extinguisher in driver's cab and in machinery house	free issued
	Fire detector in driver's cab and machinery house, stand alone system with common alarm to the vessel's system	free issued

Preservation

refer to Data sheet 0839				C
Shotblasting	Sa 2 1/2			
Primer	Zinc rich epoxy	Amercoat 68	75 micr	
Finish coat	Engineered siloxane	PSX 700	150 micr	
Total DFT			225-250 micr.	
Finish color	To be agreed upon			
Paint supplier to be agreed upon				

Quality documents

	(available on request)
Project quality plan	Acc. KENZ Doc. 0910
Quality control Inspection Sch.	Acc. KENZ Doc. 0911
Structural material requirements	Acc. KENZ standard Data sheet 0830
Welding requirements	Acc. KENZ standard Data sheet QC 302
Non-destructivce testing req.'s	Acc. KENZ standard Data sheet QC 301
Pre-commissioning and testing	Acc. KENZ doc.9504
Factory acceptance test	Acc. KENZ doc.9502
Site commissioning and test	Acc. KENZ doc.9505

Loose deliveries

Spares	Start-up and commissioning spares
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