KENZ CRANES

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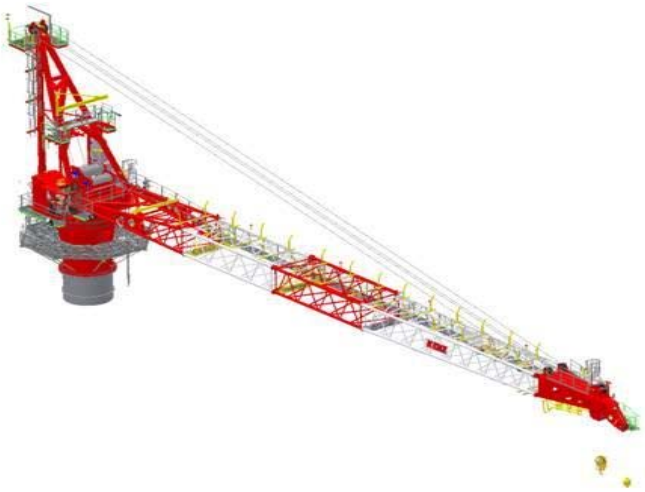

typical drawing of rope luffing crane

Customer:	POSH Semco
Project:	
Client ITT No.:	
Our Project:	P324N001
Crane type:	DHC 100/4000 O.S.
Issue:	0020/001 Rev. 1
Preparation date:	
Prepared by:	
Checked by:	

				Comment	Rev
1	**General**				
2		*Installation*	Vessel		
3		*Location*	World wide		
4					
5		*Type of Crane*	Diesel Hydraulic Pedestal Rope luffing Crane (DHC)		
6					
7		*Type of Boom*	Multiple section lattice boom		
8					
9		*Type of Operation*	Unloading and backloading of supply vessels		
10			Working within the confines of the Installation		
11			Man-riding SWL 1500kg on Aux Hoist		
12		References			
13		*General Plan drawing*			
14		*Load/radius curves*			
15					
16					
17	**Design considerations**				
18		*Crane Structural Design Life [Years]*	25		
19		*Failure Mode Philosophy*	Main frame including cabin will be the last in the failure sequence		
20					
21		*Ambient temperatures*			
22		Minimum [ºC]	-10		
23		Maximum [ºC]	+40		
24		*Structural design temperature [ºC]*	-10		
25		*Relative humidity*	Up to 100%		
26					
27		*Wind speed*			
28		In operation[m/s]	25 (3 sec. Gust 30)		
29		Stored [m/s]	60 (3 sec. Gust 70) in boomrest only		
30					
31		*Maximum Pedestal inclination [º]*	1		
32		*Underside of Slew Bearing to Sea level [m]*	18	To be confirmed	
33		*Boomrest position [m]*	40	To be confirmed	
34					
35		Area classification			
36		Crane *Zone*	Safe area		
37		*Gas group*	-		
38		*Temperature Class*	-		
39					
40		Boom *Zone*	Safe area		
41		*Gas group*	-		
42		*Temperature Class*	-		
43					
44		*Crane Duty-Cycle Classification*	Intermediate Duty		
45		*Dynamic Force Calculation Method*	General Method		
46					
47	Codes and requirements				
48		General			
49		*Certification*	ABS		
50		*Main Design Codes*	API 2C, 7th edition		
51					
52		Structural design guidelines			
53		*Crane & mechanism classification*	API 2C, 7th edition		
54		*Fattique*	API 2C, 7th edition		
55		*Fabrication tollerances*	EN 10034		
56		*Structural material*	EN 10025		
57		*Material certification*	EN 10204		
58		*Welding codes*	AWS D1.1		
59		*Fasteners*	DIN125 (Washers), DIN912, DIN931, DIN933 (Bolts), DIN934, DIN985 (Nuts),		
60		*Studbolts*	EN-ISO 898-1		
61					
62		Protective coating			
63		*Surface preparation*	EN-ISO 8501-1		
64		*Paint system*	ISO 12944		
65		*Hot dip galvanising*	EN-ISO 1461		
66					
67		Electric design guidelines			
68			EN 50014, 18, 19, 20, 28 and 39		
69			IEC 60079 part 10, 14, 17		
70		*E-motor*	IEC 60034		
71			EMC (electromagnetic compatibility)		
72					
73		Hydraulic design guidelines			
74		*Hydraulic system*	ISO 4413		
75		*Pressure vessels*	PED		
76		*Hydraulic hoses*	EN 856		
77					

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78	**Performance Data**					
79	Lifting Capacity					
80		Main Hoist				
81			*Deck lift*	100t @ 14m		
82			*Off-board lift*	60t @ 17,5m up to SWH 0,5m		
83						
84		Aux. Hoist		See Load / Radius curve		
85			*Deck lift*	15t @ maximum radius		
86			*Off-board lift*	15t @ maximum radius up to SWH 1,0m		
87			*Man-riding*	1,5t @ maximum radius up to SWH 2,0m		
88						
89	Boom Working Angles					
90			*Minimum Boom angle*	18,5°		
91			*Maximum Boom angle*	82°		
92			*Boom storage angle*	9°		
93						
94	Number of falls					
95			*Main Hoist*	4-fall, 3-fall and 2-fall		
96			*Aux. Hoist*	1-fall		
97			*Boom hoist*	2x6-fall		
98						
99	Hook Speeds ± 5%			*Infinite variable speeds 0-max. with load dependent speed*		
100						
101	Main Hoist		*Fall arrangement*	4-fall 3-fall 2-fall		
102			*Max. SWL*	Acc. Main design code		
103			*Empty hook*	Acc. Main design code		
104						
105	Aux Hoist		*Fall arrangement*	1-fall		
106			*Max. SWL*	Acc. Main design code		
107			*Empty hook*	Acc. Main design code		
108						
109	Hook Elevation			*Measured from underside slewbearing till highest hook position @ minimum radius*		
110				Main hoist Aux. Hoist		
111			*Fall arrangement*	4-falls 1-fall		
112			*Elevation [m]*	65 70		
113						
114	Luffing time +/- 5%			max. to min. working radius		
115			*Empty hook*	Acc. Main design code		
116			*With max allow. load*	Acc. Main design code		
117						
118	Slewing					
119			*Slewing Range*	n x 360° Unristricted slewing by the use of slip ring unit incl option for slewing envelope		
120			*Slewing speed ± 5%*	0,6 rpm		
121						
122	Simultaneous operation					
123				One function with full load and speeds		
124				Three functions simultaneous with reduced speeds		
125						

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126	**Crane**				
127			*Dimensions*	See general arrangement drawing	
128					
129			*Weights*	See general arrangement drawing	
130					
131	**Pedestal Adapter**				
132			*Scope*	1,3m Pedestal adapter	
133					
134					
135			*Design Loads*	The design loads will be provided by VDRS Document	
136					
137			*Interfaces*	Interface data with slewbearing and other components will be provided by VDRS document	
138					
139					
140	**Main Frame**				
141		*Walkway's*	*Main*	On the RHS and LHS of the Main Frame	
142			*Catwalk*	At each side of operator's cabin for window cleaning and wiper servicing	
143		*Access*	*Outside*	Ladder from pedestal walkway, located on the cabin side	
144			*Inside*	Hatch on top of main frame, ladder inside Main Frame	
145			*Gate*	N/A	
146					
147	**A-Frame**				
148			*Walkway*	At the top of the A-Frame, U-shape for access to sheaves	
149			*Access*	Ladder from mainframe	
150			*Gate*	Self-closing at ladder opening in railing	
151					
152			*Boomstop*	Rubber boomstoppers	
153					
154			*Lubrication*	Centralised grease nipples for sheave bearing lubrication on shaft ends.	
155					
156	**Boom**				
157		**General**			
158			*Type*	Multiple section lattice boom	
159			*Section connection*	Bolted	
160					
161			*Hook storage*	Suitable for Main Hoist hook block	
162					
163		**Pivot Section**			
164			*Pivot bearings*	Spherical ball bearings, requiring maintenance type	
165			*Lubrication*	Grease nipples trough shafts	
166					
167				Mechanical radius indicator, visable from operator cabin	
168					
169		**Boom head**			
170			*Lubrication sheave bearings*	Lubrication points equipped with grease nipples.	
171					
172	**Slew Mechanism**				
173		**Slew Bearing**			
174			Description	Large diameter anti-friction roller bearing	
175			*Type*	Triple Row Roller Bearing	
176			*Make*	Rothe Erde or equivalent	
177			*Material of Rings*	42CrMo4 V	
178			*Nominal Diameter [mm]*	4000	
179			*Safety feature*	Retainer device	
180			*Gear*	Internal	
181			*Fasteners*	Stud bolts with HV washers and nuts	
182			*Removal*	Crane and pedestal* fitted with brackets for jacking of crane and bearing removal	
183					
184			***Maintenance***		
185			*Lubrication bearing*	Centralized lubrication point equipped with grease nipples.	
186			*Lubrication teeth*	Manual by spraying or brush	
187			***Inspection***		
188			*Play*	Dedicated points for rocking test	
189			*Wear*	Grease sampling points	
190					
191		**Slew gear**			
192			*Type*	Multi stage planetary gearbox with splash oil lubrication	
193			*Slew gears installed*	4-off	Finalised during detail engineering
194			*Adjustment*	Excentric for adjustable back-lash	
195			*Brake (parking)*	Spring loaded hydr released multi disc brake	
196			*Brake (dynamic)*	By the hydraulic closed loop system	
197			*Maintenance*	Oil level check, oil drain and oil filling plug	
198			*Motors*	Fixed displacement high pressure piston motor of the bent-axis type	
199					

				Comment	Rev
200	**Winches, Wire Ropes, Sheaves and Hooks**				
201	**Main Hoist Winch**				
202		**Winch**			
203		Frame	*Type*	Welded construction	
204			*Lifting lugs*	To be included	
205			*Safety*	Rope guards to prevent "rope over the flange" situation	
206					
207		Drum	*Type*	Welded construction	
208			*Type of grooving*	LeBus type	
209			*Drum diameter*	Drum diameter : rope diameter ratio = ≥ 18:1	
210			*Rope capacity*	Sufficient for agreed maximum hook travel at minimum radius	
211			*Number of dead turns*	5	
212			*Rope anchorage*	Weak link for emergency rope release	
213			*Rope anchorage cappacity*	10-20% of MBL but minimum 50% of max. nominal line pull	
214			*Limit settings*	By means of drum installed encoder	
215					
216		Gearbox		Multi-stage planetary gearbox with splash oil lubrication	
217					
218		Brakes	*Parking**	On input shaft of gearbox, cappacity 150% of maximum rope pull excluding factors	
219			*Dynamic*	By motor and pump running in closed loop	
220			***note****	Parking brakes are of the fail-safe spring loaded hydraulic released multiple disc brakes	
221					
222		Hydraulic motor	*Type*	Variable displacement high pressure piston motor, bent-axis type including constant	
223				power control for low speed-high torque and Including directly mounted safety	
224				and lock valve and automatic' pressurisation to avoid load drop at rotation start	
225					
226		Maintenance			
227			*Gearbox*	Oil level check, oil drain and oil filling plug	
228			*Support bearing*	Lubrication through grease nipple	
229					
230		**Rope**			
231			*Make*	Bridon or equivalent	
232			*Type*	Non-rotating	
233			*Grade [N/mm2]*	1960	
234			*Rope safety factor*	Acc certifying authority	
235			*Preservation*	All ropes galvanized and greased	
236			*Dead end termination*	Open spelter socket	
237					
238		**Sheaves**			
239			*Groove diameter*	Groove diameter : rope diameter ratio = ≥ 18:1	
240			*Bearing type*	Sealed anti-friction with greasing through shaft	
241					
242		**Hook**	*Type*	Multiple-sheave hookblock with top-connection	
243			*Fall arrangements*	4-fall, 3-fall and 2-fall	
244			*Number of sheaves*	3	
245			*Hook type*	Acc DIN 15401	
246			*Hook safety latch*	Included, spring-loaded safety latch incl positive lock	
247			*Hook swivel*	Acc DIN 15411	
248			*Dead weight [kg]*	Suitable for correct spooling and lowering of emty hook	
249					
250	**Aux Hoist Winch**				
251		**Winch**			
252		Frame	*Type*	Welded construction	
253			*Lifting lugs*	To be included	
254			*Safety*	Rope guards to prevent "rope over the flange" situation	
255					
256		Drum	*Type*	Welded construction	
257			*Type of grooving*	LeBus type	
258			*Drum diameter*	Drum diameter : rope diameter ratio = ≥ 18:1	
259			*Rope capacity*	Sufficient for agreed maximum hook travel at minimum radius	
260			*Number of dead turns*	5	
261			*Rope anchorage*	Weak link for emergency rope release	
262			*Rope anchorage cappacity*	10-20% of MBL but minimum 50% of max. nominal line pull	
263			*Limit settings*	By means of drum installed encoder	
264					
265		Gearbox		Multi-stage planetary gearbox with splash oil lubrication	
266					
267		Brakes	*Parking**	On input shaft of gearbox, cappacity 150% of maximum rope pull excluding factors	
268			*Dynamic*	By motor and pump running in closed loop	
269			***note****	Parking brakes are of the fail-safe spring loaded hydraulic released multiple disc brakes	
270					
271		Hydraulic motor	*Type*	Variable displacement high pressure piston motor, bent-axis type including constant	
272				power control for low speed-high torque and Including directly mounted safety	
273				and lock valve and automatic' pressurisation to avoid load drop at rotation start	
274					
275		Maintenance			
276			*Gearbox*	Oil level check, oil drain and oil filling plug	
277			*Support bearing*	Lubrication through grease nipple	
278					

				Comment	Rev
		Rope			
			Make	Bridon or equivalent	
			Type	Non-rotating	
			Grade [N/mm2]	1960	
			Rope safety factor	Acc certifying authority	
			Preservation	All ropes galvanized and greased	
			Dead end termination	Open spelter socket	
		Sheaves			
			Groove diameter	Groove diameter : rope diameter ratio = ≥ 18:1	
			Bearing type	Sealed anti-friction with greasing through shaft	
		Hook	*Type*	Hookblock with top connection	
			Fall arrangements	1-fall	
			Number of sheaves	Not Applicable	
			Hook type	Acc DIN 15401	
			Hook safety latch	Included, spring-loaded safety latch incl positive lock	
			Hook swivel	Acc DIN 15411	
			Dead weight [kg]	Suitable for correct spooling and lowering of emty hook	
Boom Hoist Winch					
		Winch			
		Frame	*Type*	Welded construction	
			Lifting lugs	To be included	
			Safety	Rope guards to prevent "rope over the flange" situation	
		Drum	*Type*	Welded construction	
			Type of grooving	LeBus type	
			Drum diameter	Drum diameter : rope diameter ratio = ≥ 18:1	
			Rope capacity	Sufficient for boom travel between minimum and maximum boom angles	
			Number of dead turns	5	
			Rope anchorage	by clamps to winch drum	
			Rope anchorage cappacity	100% of MBL	
			Limit settings	By means of drum installed encoder	
		Gearbox		Multi-stage planetary gearbox with splash oil lubrication	
		Brakes	*Parking**	On input shaft of gearbox, cappacity 150% of maximum rope pull excluding factors	
			Dynamic	By motor and pump running in closed loop	
			note*	Parking brakes are of the fail-safe spring loaded hydraulic released multiple disc brakes	
		Hydraulic motor	*Type*	Variable displacement high pressure piston motor, bent-axis type including constant	
				power control for low speed-high torque and Including directly mounted safety	
				and lock valve and automatic' pressurisation to avoid load drop at rotation start	
		Maintenance			
			Drum holding device	Means to be installed for locking the drum. Lock to support the drum at maximum torque of the hoist	
			Gearbox	Oil level check, oil drain and oil filling plug	
			Support bearing	Lubrication through grease nipple	
		Rope			
			Make	Bridon or equivalent	
			Type	Lang-lay	
			Grade [N/mm2]	1960	
			Rope safety factor	Acc certifying authority	
			Preservation	All ropes galvanized and greased	
			Dead end termination	Open spelter socket	
		Sheaves			
			Groove diameter	Groove diameter : rope diameter ratio = ≥ 18:1	
			Bearing type	Sealed anti-friction with greasing through shaft	

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341	**Power unit**				
342		***Diesel engine***			
343			**Engine**	Four Stroke Watercooled Diesel Engine	
344			*Make*	Mitsubishi	
345			*Type*	S6B3-T2MPTAW	
346			*Intermittent Power*	Approx. 350 kW @ 1800 rpm	
347			*Engine speeds*	From Idle (no load) to 1800 rpm operating speed	
348			**Intake**		
349			*Discription*	Protected with Rig saver, butterfly valve type	
350			*Air filter*	Dry element type	
351			**Exhaust**		
352			*Engine connection*	Flanged stainless steel flexible piece	
353			*Exhaust lines*	Stainless Steel 316L	
354			*Insulation*	Exhaust line inside machinery house including flexible piece	
355			*Mufler*	Stainless Steel 316L including spark arrester	
356			**Cooling**		
357			*Radiator*	Engine skid mounted unit	
358			*Means of cooling*	Fan forced airstream	
359			*Fan drive*	Diesel engine	
360			**Start system**		
361			*Start system*	Electric	
362			**Electrical**		
363			*Electrical charging*	Engine driven alternator	
364			**Safety**		
365			*Safe guarding*	V-belts, pulleys and other rotating parts	
366					
367		**Splitterbox**	*Type*	Spur gear box	
368			*Mounting*	Direct to E-motor	
369			*Input*	Direct to splitterbox shaft	
370			*Output*	Pumps directly mounted to gear box outputs	
371					
372		**Main pumps**	*Type*	Variable displacement piston pumps of the swash plate type	
373			*Mounting*	Pumps directly mounted to splitterbox	
374			*Control*	Electric/hydraulic servo controlled and with built-in main press relief	
375			*Safety*	Built-in main pressure relief valves and pressure cut-off	
376					
377	**Machinery compartment**				
378			*Execution*	Self standing housing made of carbon steel	
379			*Preservation*	According preservation specification	
380			*Location*	At the back side of main frame	
381			*Mounting*	Bolted	
382			*Sound level*	≤ 115dB	
383			*Splilled fluids*	Sump underneath a grated floor	
384			*Draining*	Interconnected piping reachable from inside the pedestal	
385			*Drain valve*	1" valve blanked off with blind plug	
386			*Access*	Door accesible from main frame	
387			*Heating*	See tab Electrics > heating	
388			*Lights*	See tab Electrics > lighting	
389			*Grating*	Galvanized, anti slip 30x30 maze dimension	
390			*Maintenace*	Access to E-motor, pumpunit and E-cabinets	
391			*Lifting*	Lifting facilities above E-motor and pump unit	
392			*Ventilation*	Through mushroom type ventilator	
393			***Special notes***	The Machinery compartment is to be defined as Restricted Area when E-motor running	
394				Warning signs on access doors to wear hearing protection	
395					
396		**Hydraulic oil tank**			
397			*Execution*	Standing tank with slope bottom	
398			*Location*	Inside machinery house	
399			*Inspection*	Inspection hatch	
400			*Level indication*	Level glass, operated by spring return push button	
401			*Temperature gauge on tank*	Required	
402			*Drain*	1"drain valve, blanked off by blind plug	
403			*Watertrap*	Included, integrated in drain connection	
404			*Breather*	Silica gel filed breather	
405			*Suction line*	Butterfly type valves with safety switch	
406			*Return line*	Direct to tank top	
407			*Filling*	Filling through filter into return line	
408			*Material*	Stainless Steel 316L, pickled and passivated	
409			*Heating*	See tab Electrics > heating	
410					
411		**Fuel oil tank**			
412			*Execution*	Standing tank with slope bottom	
413			*Location*	Inside machinery house	
414			*Inspection*	Inspection hatch	
415			*Level indication*	Level glass, operated by spring return push button	
416					
417			*Drain*	1"drain valve, blanked off by blind plug	
418			*Watertrap*	Included, integrated in drain connection	
419			*Breather*	Included	
420			*Filling*	Fuel cap, screw on type, on top of tank	
421			*Material*	Stainless Steel 316L	
422					

				Comment	Rev
Operator's cabin					
			Type	1300	
			Execution	Self standing housing made of carbon steel	
			Preservation	According preservation specification	
			Location	Cabin location on crane seen from the back of the crane looking towards boom direction	
				Right-Hand Side	
			Mounting	On anti vibration pads of the fail safe type	
			Sound Level	≤ 65 dB(A) inside cabin with door and windows closed, Airconditioning noise excluded	
		Windows	*Front*	10 mm Bright safety glass fitted in rubber and securred with SS 316 safety clips	
				Horizontal protection bar in front of the window on inside cabin	
			Roof	8mm Bright safety glass fitted in rubber	
				Roof window protected by steel grillage on the outside	
			Side	6mm Bright safety glass fitted in rubber	
			Bottom	6mm Bright safety glass fitted in rubber	
			Door	6mm Bright safety glass fitted in rubber	
		Wipers	*Front*	Electric driven parallel arm type wiper inclusive spray nozzle	
			Roof	Electric driven parallel arm type wiper inclusive spray nozzle	
			Sun visor	1 off, adjustable sun visor for front / roof window	
			Coat hook	2-off coat / hat hooks	
			Insulation	Acoustic and thermal insulation in walls and roof. Rubber mat on floor	
			Heating	See tab Electrics > heating	
			HVAC unit	Included	
			Defrosting & Demisting	N/A	
			Lights	See tab Electrics > lighting	
			Socket outlet	See tab Electrics > Socket outlet	
			Door	Marine type door with lock and catch to hold door in the open position	
			Operator's chair	Upholstered chair with arm rests inclusive all direct controls	
			Ventilation	Natural ventilation trough closeable openings	
Electrics					
	Utilities		*Main*	690 V / 50 Hz, 3-ph	
			Emergency	400 V / 50 Hz, 3-ph	
			UPS	230 V / 50 Hz, 1-ph	
			Power to crane	Power and signals via slip ring (see Slip Ring Unit)	
	Equipment				
			Minimum degree of protection	≥ IP 65 for outside electrical equipment	
				≥ IP 42 for inside electrical equipment	
			Junction boxes	All Junction Boxes GRP	
	Glands		*Make*	Hummel	
			Preservation	Supplier standard	
	Lighting				
			General lighting fixtures	All fluorescent lighting fixtures will be high power factor type	
			Make & Type	Chalmit Protecta or equivalent	
			Cabin	2-off 2x18W	
			Cabin entrance	1-off 2x18W	
			Machine house	3-off 2x18W	
			Roof of machine house	1-off 2x18W	
			Inside mainframe	1-off 2x18W	
			Main access walkway RHS	1-off 2x18W	
			Main access walkway LHS	1-off 2x18W	
			A-frame walkway	1-off 2x18W	
	Floodlights		*Boomhead*	2-off 400 W HP sodium floodlights, swivel mounted	
	Aircraft Warning Lights				
			Execution	AWL unit is according CAP 437 guidelines for AWL's	
			Boomtop	1-off	
			A-Frame	1-off	
	Heating				
			Operators Cabin	Finned tube heater, thermostatic controlled	
			Machinery compartment	Finned tube heater, thermostatic controlled	
			Hydraulic oil heater	Immersed oil heater	
			Slip ring column	Anti-condensation heating	
	Socket outlet				
			Cabin	1-off socket	
	Slip ring unit				
			Location	In Pedestal	
			Heating	See tab Heating	
			Number of rings	After detailed engineering	

					Comment	Rev
499	**Hydraulics**					
500		**Hydraulic lines**				
501				*Hard piping*	< ø 42mm Stainless steel 316L. Stainless Steel piping not coated	
502					> ø 42mm Carbon steel including preservation	
503				*Couplings*	Carbon steel, yellow passivated	
504					WALFORM' tube fittings with captive seal	
505					Carbon steel welding nipples with O-ring	
506					Large size coupling with SAE flange	
507				*Hoses*	Aeroquip	
508				*Certification*	Standard manufacturers type test certification	
509				*Couplings*	Carbon steel, yellow passivated	
510				*Pressure test*	Test certificate for each fully identified hose, 2 times the rated design pressure	
511						
512				***Special notes***	All exposed couplings wrapped with Denso tape	
513						
514		**Hydraulic oil**				
515				*Type*	Mineral oil	
516				*Viscosity*	ISO VG 32 or 46	
517				*Cooling*	Fan forced airstream through oil cooler	
518				*Fan drive*	Hydraulic motor	
519						
520		**Hydraulic oil filtering**				
521				*Type*	Single full-flow with contamination indicator	
522				*System filters*	Main return	
523					Booster pressure	
524					Auxiliaries	
525				*Meshing*	10 micron	
526						
527	**Controls and Indicators**					
528		**General**		*Power*	Electric/electronic, 24 Vdc internally derived from main power supply, incl. back-up	
529						
530		**Located in Divers Cabin**				
531		Mains		*Crane control*	Multi-functional levers built in arm rests	
532				*RHS Lever*	Main and Aux. Hoist	
533				*LHS Lever*	Slewing and Luffing	
534				*Switches*	Crane on/off key switch	
535					Luffing down cut-out override key switch	
536						
537		Auxiliaries		*Location*	In arm rest panel or wall mounted within reach of the operator	
538						
539		Safe load Indicator				
540				*Type*	Kenz SLI system	
541				*Display*	Allowable and actual load and load moment (percentage) and radius	
542				*Alarms*	Visual and audible for 95% and 110% SWL incl. accept and reset	
543				*Controls*	Hoist, falls and seastate selector	
544				*Load recorder*	Electronic, integrated in the Safe Load Indicator	
545					with min. 4000 cycles cap., PC compatible	
546						
547		**Crane PLC**				
548			Indicators			
549				Electrical system	Platform power available	
550						
551			Alarms		*Visual on crane PLC screen & Audible*	
552				Crane operation	Main and Aux Hoist upper and lower limit	
553					Luffing upper and lower limt	
554					Overload / overmoment	
555				Diesel engine	Overspeed and shut down	
556						
557		**Communications**			UHF / VHF radio	
558					PA/GA speaker	
559					Telephone set	
560						
561		**Located in Machinery House**				
562			Indicators			
563				Hydraulic system	Hydraulic system pump pressure (Pressure gauge)	
564					Hydraulic control system pressure (Pressure gauge)	
565					Hydraulic oil temperature (tank mounted gauge)	
566					Hydraulic oil level glass (tank mounted)	
567						
568				Diesel Engine	Engine lube oil pressure (local on engine)	
569					Engine coolant temperature (local on engine)	
570					Fuel level glass (tank mounted)	
571						
572		**Located in Boom**				
573				*Radius Indicator*	Mechanical Radius Indicator	
574						

				Comment	Rev
575	**Preservation**				
576		**Coating type / system**	To be discussed		
577		*Pedestal adapter*	Painted		
578		*Main frame*	Painted		
579		*A-frame*	Painted		
580		*Boom*	Painted		
581		*Cabin*	Painted		
582		*Ladders*	Galvanized		
583		*Railing*	Galvanized		
584		*Hooks & blocks*	Painted		
585		**Colour**			
586		*Pedestal adapter outside*	Yellow	RAL 1023	
587		*Pedestal adapter inside*	Yellow	RAL 1023	
588		*Main frame*	Yellow	RAL 1023	
589		*A-frame*	Yellow	RAL 1023	
590		*Boom*	Red	RAL 3020	
591		*Cabin*	Yellow	RAL 1023	
592		*Hooks & blocks*	Day-glow Orange	RAL 2005	
593					
594	**Testing**				
595		Crane test			
596		*FAT*	Functional testing		
597		*Installation, Commisioning and SAT*	Function, Load, Performance and Overload		
598		*Endurance test [hours]*	8	Following SAT	
599		*Noise*	Noise level test during SAT including noise level rapport		
600					

Customer	POSH Semco
Crane type	DHC 100/4000 O.S.
Our Project	P324N001
Issue	0020/001 Rev. 1

KENZ CRANES

				Comment	Rev
Loose deliveries					
	Documentation	Acc. Agreed dates on MDR			
	Documents on MDR	0010_001	General arrangement		
		0020_000	Crane Specification		
		0040	Project planning		
		0050_001	Load curves MH		
		0050_002	Load curves AH		
		0070	Master Document Register		
		0110	Quality plan		
		0120	QC Inspection schedule		
		0130	Manufacturing record book		
		0131	Manufacturing record book Index		
		0140	Operation & maintenance manual		
		0141	Operation & maintenance manual Index		
		0220	Spare parts list		
		0310_001	Weight & C.O.G.		
		0310_002	Pedestal Loads		
		0310_003	Boomrest loads		
		0320_001	Utility requirements		
		0330_001	Mech / Struc / Elec Interfaces		
		0340_001	Structural material specification		
		0350_001	Preservation specification		
		0350_002	Preservation details		
		5520_501 *Serie*	Connection Diagram Slipring unit		
		9003_002	Crane test program		
		9003_003	Installation procedure		
		9004_010	Hoisting plan complete crane		
Adittional Requirements					
	Tag plates components	Outside: Engraved multi-layer plastic (Resopal)			
		Inside: Engraved multi-layer plastic (Resopal)			
	E-cable tags	Printed sleeves at both ends of wires/cables			
Maintenance					
	Regular maintenance	All gearboxes have splash-gear oil lubrication incl. level check,			
		drain and filling plug			
		All bearings can be greased manually through Stailess Steel grease nipples			
		Grease nipple centralisation is limited to its location (e.g. boomhead, main frame)			
	Lifting devices	Lifting beam in machine house			
Special features					
	Mechanical	Fail safe spring loaded hydr. released brake on primary shafts			
		Mechanical radius indicator			
		Slew lock by means of the boom rest (boom rest by others)			
		Rig saver in diesel engine air inlet			
	Hydraulic	Full size pressure relief valves in all systems			
		Plussing of Main, Aux and Boom Hoist system to avoid "load-drop"			
		Hydraulic lock valves directly to motors			
	Electric	Emergency stop push buttons			
		Interlock to allow starting only with all functions in neutral			
		Electric limit switches on hoisting (high/low) , luffing			
		Warning horn to deck crew			
	Overload cut-out	Only on luffing-down when reaching 110% SWL			
	Safe Load Indicator	Kenz-Figee SLI system			