



BASIC REQUIREMENTS FOR GRAB TYPE SHIP UNLOADER

Item	Description	Data	Offer
1.	Working conditions		
1.1.	Working time	Three shift work (3 x 8 hour)	
1.2.	Ambient temperature	-12 + 45°C	
1.3.	Wind speed. operational	0 ... 22 m/s	
1.4.	Wind speed. operational limited performance	22 ... 35 m/s	
1.5.	Wind speed, wheels in parking position	35 ... 44 m/s	
1.6.	Wind speed, stowed condition	> 44 m/s	
1.7.	Humidity	10 – 90 %	

Item	Description	Data	Offer
2.	Crane main features		
2.1.	Total weight of the crane in full working conditions	Tonnes	
2.2.	Materials to be handled	Coal, Iron ore, chrome ore, iron ore pellets, hot briqued iron (HBI)	

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2.3.	Rated load of grab	32 tonnes (in calculation must be taken to exceed the hoisting capacity for 20% before overload protection is activated)	
2.4.	Maximum digging capacity	2.000 tonnes / hour	
2.5.	Free digging capacity	1.500 tonnes / hour	
2.6.	Rail type and size	A100 - DIN 536	
2.7.	Distance between rails	18 m	
2.8.	Number of driven gantry wheels per gantry corner		
	Sea side corner		
	Land side corner		
2.9.	Space between adjacent wheels (centre to centre)	mm	
2.10.	Diameter of gantry wheels	mm	
2.11.	Driven wheels		
	Sea side corner		
	Land side corner		
2.12.	Vertical wheel load, sea side / land side		
	In operation	410 kN	
	In storm	550 kN	
2.13.	Total gantry travel distance	600 m (+- 300 m)	
2.14.	Distance between hoisting ropes	1250 mm	
2.15.	Distance between closing ropes	780 mm	
2.16.	Rope system		
2.17.	Hook on A-frame	Hook on A-frame for fixing boom in upper position	
2.18.	Vessel size	Up to 200.000 DWT	

Item	Description	Data	Offer
3.	General design criteria		
3.1.	Standard	F.E.M. 1.001 3rd edition	
3.2.	Structure classification according to BSI/FEM standard		
	Class of utilisation	U8	
	State of loading	Q4	
	Group class	A8	
3.3.	Mechanisms classification according to BSI/FEM standard		
	Hoisting / lowering	T8 – L4 – M8	
	Closing / opening	T8 – L4 – M8	
	Boom hoist	T4 – L3 – M5	
	Gantry travel	T4 – L3 – M5	
	Cabin traversing	T4 – L3 – M5	
3.4.	Natural frequency	Between 0.8 Hz and 1 Hz (in trolley travel direction)	

Item	Description	Data	Offer
4.	Main dimensions		
4.1.	Crane width (free bumper to bumper distance)	Max. 30 m	

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4.2.	Lift height above waterside rail to bottom if closed grab	Min. 22 m	
4.3.	Lowering depth below waterside rail to bottom of open grab	Min. 22 m	
4.4.	Total clearance under portal beam		
4.5.	Iside leg clearance		
4.6.	Locaion of quay conveyor 1 from waterside rail	4,3 m	
4.7.	Locaion of quay conveyor 2 from waterside rail	6,6 m	
4.8.	Quay conveyor height from waterside rail	0,77 m	
4.9.	Rail height above mean water level	3 m	
4.10.	Distance from waterside rail centerline to quay edge	5 m	
4.11.	Trolley travel distance	m	
4.12.	Cabin travel distance	m	
4.13.	Clearance on seaside (centre of grab till centre of seaside rail)	40 m	
4.14.	Cleaarance on landside (centre of grab till centre of landside rail)	10 m	

Item	Description	Data	Offer
5.	Speeds		
5.1.	Hoisting / Lowering with rated load	200 m/min	
5.2.	Lowering with empty grab	240 m/min	
5.3.	Opening / closing	120 m/min	
5.4.	Trolley traversing with rated load against operating wind load	200 m/min	
5.5.	Trolley traversing with empty load against operating wind load	200 m/min	
5.6.	Gantry drive against the operating wind load with or without rated load	25 m/min	
5.7.	Operators cabin traveling against the operating wind load with or without rated load	40 m/min	

Item	Description	Data	Offer
6.	Accelerations		
6.1.	Main hoist / close with rated load		
	Acceleration and deceleration, hoisting / closing	Max. 4 sec	
	Acceleration and deceleration, lowering / opening	Max. 3 sec	
6.2.	Main hoist / close with empty grab		
	Acceleration and deceleration, hoisting / closing	Max. 3 sec	
	Acceleration and deceleration, lowering / opening	Max. 3 sec	
6.3.	Operators cabin traveling against the operating wind load with or without rated load	Max. 5 sec	
6.4.	Gantry travel acceleration and deceleration time against 50% of wind load operation	Max. 5 sec	
6.5.	Gantry travel acceleration and deceleration time against 100% of wind load operation	Max. 14 sec	

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Item	Description	Data	Offer
7.	Electrical parameters		
7.1.	Electric standard	IEC, EC directives	
7.2.	Power supply		
	Supply voltage	20 kV, 3 phase, 50 Hz	
	Drive supply voltage	500 V, 3 phase, 50 Hz	
	Motor supply voltage	500 V, 3 phase, variable frequency	
	Main voltage for auxiliaries	400 V, 3 phase, 50 Hz	
	Control voltage	230 V, 1 phase, 50 Hz	
	Control voltage, PLC	12, 24 VDC	
7.3.	Supply method	Cable reel on the crane	
7.4.	Fiber optic	MM 12 optic fibres on cable reel	
7.5.	Cable lenght for crane travelling distance	± 300 m	
7.6.	Control methods of main machineries	AC frequency control	
7.7.	Motor power		
	Hoisting / lowering		
	Closing / opening		
	Boom hoist		
	Gantry travel		
7.8.	Cable system on boom	Cable festoon systems	

Item	Description	Data	Offer
8.	Operator's cabin		
8.1.	Operator's cab	Brieda or equivalent, possibility of exit from cabin regardless of the position of trolley	
	Radio station	Motorola DM 4600 (low power, UHF, outside antena) or equivalent	
	Autoradio	USB autoradio with stereo speakers	
	Air conditioning	Integrated with channelised airflow on roof and ground of cabin	
	Tinted anti-glare safety glass windows	Possibility to clean all glasses from outside platform	
	Sun shades	Light non-permeable	
	Windscreen washer and wiper		
	Fire extinguisher	1 pcs	
	Electrical heater	Min. 2000 W (wall mounted)	
	Trainers seat		
	Electrical sockets	230 V, 2 pcs	
	Isolation	Cabin must be sound and thermal isolated	
	Vacuum cleaner	230V, wall installed, suitable for coal dust	
	Driver seat	Multifunctional, ergonomic, swivable, with armrest	
	Crane controls	Controls and indication devices installed as on existing crane G880	
	Anemometer for windspeed		

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	Commands, joysticks	Joysticks with the same functions and location as on existing G880	
	Ventilation system	Ventilation system with air filtration to provide overpressure in the cabin	
	Anticolision system	System for prevention the colision of cabin in obstacles	

Item	Description	Data	Offer
9.	Air conditioning		
9.1.	Operator's cabin		
	Supplier (Type)	Integrated with channelised airflow on roof and ground of cabin	
9.2.	Electric control room		
	Supplier	Mitsubishi, Panasonic or equivalent; isolated chanel from unit to e-room; chanalized airflow; Alarms show on CMS	
	Number of air conditioner units	2 units with full capacity each	

Item	Description	Data	Offer
10.	Hydraulic Components		
10.1.	Manufacturer	Rexroth or equivalent	

Item	Description	Data	Offer
11.	Lubrication system		
11.1.	Automatic centralized lubrication system	Long traveling, drives in machinery house, sheaves and boom	
11.2.	Manual centraized lubrication system	Trolley	

Item	Description	Data	Offer
12.	Limit switches		
12.1.	Manufacturer	Schmersal/IFM or equivalent	

Item	Description	Data	Offer
13.	Personnel lift		
13.1.	Name of manufacturer	ALIMAK SE 300 DOL or equivalent	
13.2.	Safe working load	300 kg	

Item	Description	Data	Offer
14.	Total electrical primary load		
14.1.	Total primary load average	KVA	
14.2.	Total primary load peak maximum in worst conditions	KVA	

Item	Description	Data	Offer
15.	Collision prevention		
15.1.	Boom collision prevention system	Laser sensors	

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15.2.	Collision prevention system on ship	Laser sensors	
15.3.	Collision preventions system for cabin	Laser sensors	
15.4.	4x cameras with ultrasonic sensors on each corner of boggie		

Item	Description	Data	Offer
16.	Lighting		
16.1.	Floodlights	LED type (color temperature max. 4000 K, CRI ≥70, IP65, the lamps shall be in accordance with the regulation of light pollution in Slovenia)	
16.2.	Illumination working area	Min. 50 lux	
16.3.	Walkway lights	LED type	
16.4.	Emergency lights	Portable hand lights in machinery, electric room and cabin	
16.5.	Gantry alarm with LED rotating light	SA BBS 107 smart brigade white sound; Deep LT, SIR-E LED S or equivalent	

Item	Description	Data	Offer
17.	Noise level when crane is in operation		
17.1.	Inside electric control room from the drives, fans, etc.	Max. 72 dBA	
17.2.	Inside operator cabin	Max. 70 dBA	
17.3.	During unloading all types of material (see item 30), the noise level must be in accordance with Slovenian regulatives and standards		

Item	Description	Data	Offer
18.	Hopper		
18.1.	Hopper volume	105 m ³	
18.2.	Maximum weight of material in hopper in normal operation	110 tonnes	
18.3.	Antidust protection	Installed on hopper, on dosage system to shore transporters and on vibrating feeders; Highpressure system, water fog, min. 100 bar, 2 pumps	

Item	Description	Data	Offer
19.	Maintenance crane		
19.1.	Maker		
19.2.	Type		
19.3.	Lifting capacity	Possibility to lift the heaviest part in machinery house (min. 5 ton)	
19.4.	Capacity of maintenance crane	Min. 5 ton	
19.5.	Lifting height of maintenance crane	(all units may be lowered down through a bottom hatch from the	

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		machinery house onto the ground level)	
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Item	Description	Data	Offer
20.	Wire ropes		
20.1.	Wire ropes for main hoist		
	Type (supplier)	Casar, Teufelberger or equivalent - Galvanized and plastificated steel core	
	Nominal diameter of rope	mm	
	Total estimated lenght for each crane	m	
	Tensile grade	N/mm ²	
	Pier sockets	Nemag quick release link (NKP 12, NPS 12)	
20.2.	Wire ropes for boom hoist		
	Type (supplier)	Casar, Teufelberger or equivalent - Galvanized and plastificated steel core	
	Nominal diameter of rope	mm	
	Total estimated lenght for each crane	m	
	Tensile grade	N/mm ²	

Item	Description	Data	Offer
21.	Drums		
21.1.	Drums for main hoist		
	Diameter	mm	
	Minimum spare grooves		
21.2.	Drums for boom hoist		
	Diameter	mm	
	Minimum spare grooves		

Item	Description	Data	Offer
22.	Sheaves		
22.1.	Sheaves for main hoist		
	Diameter	mm	
22.2.	Sheaves for boom hoist		
	Diameter	mm	

Item	Description	Data	Offer
23.	Breaks		
23.1.	Main hoist brakes with monitoring connected to CMS		
	Type	Electro - Hydraulic disc brakes	
	Diameter of disk	mm	
	Number of brake		
	Manufacturer	Bubenger or equivalent	
	Overload system		

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23.2.	Boom hoist brakes with monitoring connected to CMS		
	Type	Electro - Hydraulic disc brakes	
	Diameter of disk	mm	
	Number of brake		
	Manufacturer	Bubbenzer or equivalent	
23.3.	Boom hoist emergency brakes		
	Type	Electrical - Disc brakes	
	Manufacturer	Bubbenzer or equivalent	

Item	Description	Data	Offer
24.	Gear reducers		
24.1.	Main hoist reducer		
	Type	Helical Multi-Shaft	
	Manufacturer	Flender or equivalent	
24.2.	Boom hoist reducer		
	Type	Helical Multi-Shaft	
	Manufacturer	Flender or equivalent	
24.3.	Gantry hoist reducer		
	Type	Bevel/Helical	
	Manufacturer	Flender or equivalent	

Item	Description	Data	Offer
25.	Wheels		
25.1.	Trolley wheels		
	Diameter	mm	
	Number of wheels	4	
	Minimum hardening		
25.2.	Trolley rail and rail clips		
	Type of rail		
	Head width	mm	
	Type of pad		
25.3.	Gantry travel wheels		
	Diameter	mm	
	Number of wheels		
	Number of wheels per corner		
	Minimum hardness		
25.4.	Rail brakes		
	Ram type rail brake		
	Storm pin - on both legs (>180km/h)		

Item	Description	Data	Offer
26.	Drives		
26.1.	Main drive motors (hoist, closing)		
	Type	AC	
	Rated power	kW	
	Number of motors		
26.2.	Boom hoist motor		
	Type	AC	

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	Rated power		kW
	Number of motors		
26.3.	Gantry travel motor		
	Type		AC
	Rated power		kW
	Number of motors		
26.4.	Main drives emergency drive (hoist, closing)		
	Motor type		AC
	Rated power		kW
26.5.	Boom hoist emergency drive		
	Motor type		AC
	Rated power		kW

Item	Description	Data	Offer
27.	Cabel reel systems and HV Cable		
27.1.	Power supply on cable reel	Installed on land side	
	Manufacturer	Stemmann or equivalent	
	HV cable with fiber optic	3 - phase, 20 kV, 50 Hz (cable with 12 MM optical fibres)	
	Rating voltage	20 kV	
27.2.	Water supply on cable reel	Installed on sea side	
	Manufacturer	Stemmann or equivalent	
	Type	For charging brackish water from shore collector	
	Diameter of pipe	mm	

Item	Description	Data	Offer
28.	Electrical house power transformer		
28.1.	Dry type MV transformer with fix fixed power factor correction bank (compensating unit)	Siemens, Schneider or equivalent	
28.2.	Gas - Insulated MV modular units SM6-24	Schneider or equivalent	
28.3.	Primary voltage	20 KV	
28.4.	Regenerate power back to network		

Item	Description	Data	Offer
29.	Electronic components		
29.1.	PLC	Siemens or equivalent	
29.2.	Display in slovenian and english language		
29.3.	Regulation switch and control system	Siemens or equivalent	
29.4.	Frequency inverters		
29.5.	Data logger		

Item	Description	Data	Offer
30.	Materials to be handled		
30.1.	Coal		
	Density	0,8 tonnes/m3	

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	Graininess	Maximum 50 mm	
	Special features	Lump material	
30.2..	Iron ore		
	Density	Maximum 2,5 tonnes/m ³	
	Graininess	Maximum 250 mm	
30.3.	Hot briquetted iron (HBI)		
	Density	Maximum 2,5 tonnes/m ³	
30.4.	Pellets, magnesite, bauxite, thermagnesitis		
	Graininess	Maximum 250 mm	

Item	Description	Data	Offer
31.	Remote crane management system (RCMS)	Connected to terminal SCADA system	

Item	Description	Data	Offer
32.	Remote access to crane for maintenance purpose		

Item	Description	Data	Offer
33.	External emergency power supply	kW, 3 phase, V, A	

Item	Description	Data	Offer
34.	Energy measurement		
34.1.	Energy measurement information integration	Data input from production information system shall be provided to RCMS. All energy measurement data from RCMS shall be saved in SQL database and integrated in the energy efficiency system ENIS of Port of Koper.	

Item	Description	Data	Offer
35.	Anticorrosion protection		
35.1.	Color	RAL 5017 (Re 2)	
35.2.	Thickness of dry layer	Min. 250 µm	
35.3.	Warranty for anticorrosion protection	Min. 10 years	
35.4.	Stears, walkways, ladders and handrails	Hot-dip galvanised	
35.5.	Logo Luka Koper	2x on boom, 2x on machinery house	

Item	Description	Data	Offer
36.	Documentation		
36.1.	Operation and maintenance manuals of crane	4x in Slovenian language	
36.2.	Spare parts	4x in Slovenian language	

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36.3.	USB stick with operation and maintenance manuals of crane, spare parts	4x in English language	
36.4.	Laptop for programing	PLC program, inverter parameters and all related software	
36.5.	Electrical and mechanical drawings	4x in English language	
36.6.	Functional description, Single line diagram	4x in English language	

Item	Description	Data	Offer
37.	Waranty and training		
37.1.	General waranty		
	Mechanical and electrical components	Min. 2 years	
	Steel structure	Min. 5 years	
	Anticorrosion protection	Min. 10 years	

Item	Description	Data	Offer
38.	Spare parts must be provided	Min. 10 years	

Item	Description	Data	Offer
39.	Delivery type	Fully erected	

Item	Description	Data	Offer
40.	Delivery times		
40.1.	Delivery and errection of crane (out of Port of Koper area)	Months	
40.2.	Unloading the crane to the operational shore and setting up the crane in operation	Maximum 14 days (without interruptions)	
40.3.	Testing and acceptance	Maximum 1 month	
40.4.	Training for maintanence and crane operators after acceptance	15 working days	
40.5.	Assitance after acceptance	30 working days	