MOBILE HARBOUR CRANE

TYPE

LHM 420 Litronic®

TECHNICAL DATA

Inquiry/Project No.:	Port of Bar
Liebherr Project/Offer No.:	2019-003446

MCR
20.12.2019

Rev. 2017/06

TECHNICAL DATA

TABLE OF CONTENTS

1	**MAIN DATA**	**3**
1.1	Load Table	3
1.1.1	Load Capacity Chart	3
1.1.2	Travelling Window	4
1.2	Operating Speeds	4
1.3	Weights	4
1.4	Dimensions	5
1.5	Environmental Conditions	6
1.6	Requirements on Quay	6
1.7	Drive System	7
1.8	Hydraulic Oil	7
1.9	Lighting	8
1.10	Heating	8
1.11	Group Classification of Crane and Components	9
1.12	Documentation	9
1.13	Protective Coat/Painting	10

1 MAIN DATA

1.1 Load Table

Dead weight rotator =	3,5 t
Dead weight spreader =	9,0 t
SWL spreader =	41,0 t

1.1.1 Load Capacity Chart

	Hook Operation Utilisation of Tipping standard supporting base 12,5m x 12,5 m		Spreader Operation	Four Rope Grab Operation
Radius (m)	on Rope (t)	on Hook (t)	under Spreader (t)	on Rope (t)
11	124,0	120,5	41,0	75,0
12	124,0	120,5	41,0	75,0
13	117,6	114,1	41,0	75,0
14	111,5	108,0	41,0	75,0
15	105,6	102,1	41,0	75,0
16	100,1	96,6	41,0	75,0
17	94,9	91,4	41,0	75,0
18	90,0	86,5	41,0	75,0
19	85,3	81,8	41,0	75,0
20	81,0	77,5	41,0	72,9
21	76,9	73,4	41,0	69,2
22	73,1	69,6	41,0	65,8
23	69,5	66,0	41,0	62,6
24	66,2	62,7	41,0	59,6
25	63,1	59,6	41,0	56,8
26	60,2	56,7	41,0	54,2
27	57,5	54,0	41,0	51,8
28	55,1	51,6	41,0	49,5
29	52,7	49,2	40,2	47,5
30	50,6	47,1	38,1	45,5
31	48,6	45,1	36,1	43,7
32	46,8	43,3	34,3	42,1
33	45,0	41,5	32,5	40,5
34	43,4	39,9	30,9	39,1
35	41,9	38,4	29,4	37,7
36	40,5	37,0	28,0	36,5
37	39,2	35,7	26,7	35,3
38	38,0	34,5	25,5	34,2
39	36,8	33,3	24,3	33,1
40	35,7	32,2	23,2	32,1
41	34,6	31,1	22,1	31,1
42	33,5	30,0	21,0	30,2
43	32,5	29,0	20,0	29,2
44	31,4	27,9	18,9	28,3
45	30,3	26,8	17,8	27,3
46	29,3	25,8	16,8	26,3
47	28,3	24,8	15,8	25,4
48	27,3	23,8	14,8	24,5

1.1.2 Travelling Window

For travelling the boom of crane must be positioned either over front part (slew angle = 0°) or over rear part of undercarriage (slew angle = 180°).

The maximum load on ropes during travelling is (travelling in both directions) 25t / 17t.

1.2 Operating Speeds

* 100 percent infinitely variable speed control from zero to maximum speed
* electronic-controlled acceleration/deceleration, to avoid shocks to crane and load and to enable smoother speed control
* automatic power output regulators
* slewing, luffing, hoisting can be operated simultaneously

	ac- / deceleration time			
Hoisting / Lowering	appr. 1 sec	16,0	m/min with	124 t
		28,0	m/min with	70 t
		40,0	m/min with	50 t
		65,0	m/min with	30 t
	appr. 3 sec	120,0	m/min with	empty hook
Slewing	appr. 5-6 sec	0 - 1,6	rpm	
		280	m/min	max speed boom head
		360	°	unlimited slewing range
Luffing	appr. 2 sec	41	sec	with full load from max. to min working radius (theoretical without ac- and deceleration)
		55	m/min	average horizontal speed
Travelling	appr. 6 sec	0 - 5	km/h	without load
Max. inclination in transverse direction			2%	without load, during travelling
Max. inclination in longitudinal direction			5%	without load, during travelling

1.3 Weights

Total weight of crane	appr.	336	t

1.4 Dimensions

Support base	12.5 m x 12.5 m		
Size of supporting pads	8.0 m x 2.0 m		
Supporting area of pads	16.0	m²	
Overall width without supporting pads	6,0	m	
Overall width with supporting pads and swung in outriggers	10,2	m	
Overall width in traveling position and deployed outriggers	14,3	m	
Overall length of undercarriage	20,0	m	
Length of boom (centre sheaves)	48,6	m	
Overall height (top of tower)	32,8	m	
Height of boom fulcrum	17,8	m	
Cab height (eye level)	24,0	m	
Turning radius	0,0	m	inner
incl. supporting pads	13,0	m	outer
Tail swing radius	7,0	m	
Max. hoisting height (measured at crane rope socket)			
above quay at minimum radius	43,0	m	
above quay at maximum radius	29,0	m	
below quay	10,0	m	
Winchconfiguration	2x62t		
Number of winches	2	(2 ropes per winch)	
Diameter of hoisting rope	40	mm	
Diameter of sheaves at boom head	1040	mm	
Ratio between diameter of hoisting rope to sheaves	1 : 26,0		
Diameter of rope drum	900	mm	
Ratio between diameter of rope to drum	1 : 22,5		
Number of axle sets	14		
Axle sets driven	5		
Axle sets steerable	all		
No. of tyres	4	per axle set	
Tyres	285/70 R 19.5	make Continental	
Tyre pressure	10	bar max	

1.5 Environmental Conditions

Ambient temperature	-20° C to +45 ° C
Humidity (relative)	97 %
Max. wind speed in operation	24 m/s
Max. wind speed out of operation	42 m/s
Max. wind speed during travelling	20 m/s

1.6 Requirements on Quay

During crane operation and driving, the following pressures are relevant

Assumed Conditions:

Normal	=	all static loads are included
Extreme	=	all static loads and dynamic factors are included

Max. axle set loading:
(2 axle sets = 1 axle line)

Normal	appr.	24,0 t
Extreme	appr.	29,4 t

Max. Corner Loading:

Normal (static excl. wind)	boom 45°		204,4 t
	boom 90°		162,5 t
Normal (static incl. wind)	boom 45°		218,1 t
	boom 90°		168,1 t
Extreme (dynamic incl. wind)	boom 45°	MAX.	232,4 t
	boom 90°		175,0 t

Max. Area Pressure:

Normal (static excl. wind)	boom 45°		12,8 t/m²
	boom 90°		10,2 t/m²
Normal (static incl. wind)	boom 45°		13,6 t/m²
	boom 90°		10,5 t/m²
Extreme (dynamic incl. wind)	boom 45°	MAX.	14,5 t/m²
	boom 90°		11,0 t/m²

1.7 Drive System

Prime mover	Diesel Engine	
Make	LIEBHERR	
Type	D 9512 A7	
Combustion system	Diesel	
Emission standard	none	
Number of cylinder	12	
Cooling system	Water	
Max. torque	4750 Nm	at 1500 rpm
Output on the drive shaft	750 kW	at 1700 rpm acc. ISO 9249
Average consumption	198	g/KWh
Fuel tank capacity	13000	l
Starter	Bosch QB	
Output	9	kW
Dynamo	Bosch	
Nominal current	140	Amp
Voltage	24	V

1.8 Hydraulic Oil

Oil	See table of lubricants
Oil cooling	The hydraulic driven oil cooler is located outside the machinery room, protected via cover, cooling medium is fresh air

1.9 Lighting

Appropriate illumination is fitted in	- machinery room - switch cabinet room - cabs - access to the crane
Floodlight type	- LED
Position	- two on the boom - one on the tower
Rating (per floodlight)	- 450 W

Steps from the tower cabin are provided with battery-buffered 24 VDC emergency lights. Two warning lights (on undercarriage) and a ringing bell when travelling are standard

1.10 Heating

- Heating of driver's cabin (6 kW)
- Heating of switch cabinet room (1 x 2 kW)
- Standstill heating of slipring collector, switch cabinet
- Total installed heating capacity approx. 12 kW.

1.11 Group Classification of Crane and Components

Authorities, Regulations EN, FEM, DIN, VDE, VDI, IEC, ISO

Classification of crane as a whole in appliance groups

		Crane group at operation with	
		75%	**Grab**
Hook operation	SWL < 124t	A3	
Hook operation	SWL < 70t	A6	
Spreader Operation	SWL < 57t	A7	
Four Rope Grab Operation	SWL < 60t		A7
Four Rope Grab Operation	SWL < 52t		A8

Classification of individual mechanisms

	Mechanism group			
	Hook operation	**Hook operation**	**spreader**	**four rope grab**
Winch gear	M8 (90t)	M6 (124t)	M8 (90t)	M8 (75t)
Luffing gear	M7	M7	M7	M8
Slewing gear	M7	M8	M7	M8
Travelling gear	M4	M4	M4	M4

1.12 Documentation

Standard scope of delivery includes

- 3 operation/maintenance manuals
- 3 spare parts books
- 3 works certificates

1.13 Protective Coat/Painting

I GENERAL

- Liebherr LH N° 983593014
- Cleaning and Substrate Preparation
- Solvent Cleaning/Degreasing
- Shot Blasting SA 2.5 (ISO 8501-1)
- Surface Profile: Comparator Type "G"
- Segment 2-3 (ISO 8503-1)

II CRANE - INTERNAL SURFACES

		Film thickness	
1 Priming Coat			
2-Pack Zinc Rich Epoxy Primer Interzinc 315 HS		75 (+30/-20)	microns
3 Finish Coat			
2-Pack Epoxy Amerlock 400C		110 (+15/-15)	microns
Total Min. Dry Film Thickness		**185**	**microns**

III CRANE - EXTERNAL SURFACES

		Film thickness	
1 Priming Coat			
2-Pack Zinc Rich Epoxy Primer Interzinc 315 HS		75 (+30/-20)	microns
2 Intermediate Coat			
2-Pack Epoxy Amerlock 400 C or Interseal 670 HS		100 (+25/-15)	microns
3 Finish Coat			
2-Pack Polyurethane Finish Interfine 979 or PSX 700		75 (+15/-15)	microns
Total Min. Dry Film Thickness		**250**	**microns**

Note:
Above values are related to primary structure.

The final colour shade for undercarriage, slewing platform steel construction, counter weights and tower is RAL 7043.
The colour shade for the slewing platform is Liebherr yellow (RAL 1006-1007), jib and housing of the cooling devices are in RAL 7047.
The cabin is in RAL 9002.

All ladders, stairs, walkways, etc. are hot dip galvanised.

- Subject to engineering modification -