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LIEBHERR

# MOBILE HARBOUR CRANE

## TYPE

## LHM 550 Litronic®

## TECHNICAL DATA

Liebherr Project/Offer No.: Luka Bar

MCR
26.11.2024

Rev. -

# 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

Dead weight Rotator = 4,0 t

## 1.1 Load Table

### 1.1.1 Load Capacity Chart

| | Hook Operation | | | | Four Rope Grab Operation | |
|---|---|---|---|---|---|---|
| | Standard Supp. Base 13,5 m x 13,5 m | | 2nd Supp. Base 10,5 m x 15,8 m | | Standard Supp. Base 13,5 m x 13,5 m | 2nd Supp. Base 10,5 m x 15,8 m |
| Radius (m) | on Rope (t) | on Hook (t) | on Rope (t) | on Hook (t) | on Rope (t) | on Rope (t) |
| 11 | 144,0 | 140,0 | 144,0 | 140,0 | 75,0 | 75,0 |
| 12 | 144,0 | 140,0 | 144,0 | 140,0 | 75,0 | 75,0 |
| 13 | 144,0 | 140,0 | 144,0 | 140,0 | 75,0 | 75,0 |
| 14 | 144,0 | 140,0 | 137,3 | 133,3 | 75,0 | 75,0 |
| 15 | 144,0 | 140,0 | 130,7 | 126,7 | 75,0 | 75,0 |
| 16 | 144,0 | 140,0 | 124,4 | 120,4 | 75,0 | 75,0 |
| 17 | 144,0 | 140,0 | 118,3 | 114,3 | 75,0 | 75,0 |
| 18 | 144,0 | 140,0 | 112,4 | 108,4 | 75,0 | 75,0 |
| 19 | 144,0 | 140,0 | 106,8 | 102,8 | 75,0 | 75,0 |
| 20 | 144,0 | 140,0 | 101,4 | 97,4 | 75,0 | 75,0 |
| 21 | 137,5 | 133,5 | 96,3 | 92,3 | 75,0 | 75,0 |
| 22 | 130,5 | 126,5 | 91,4 | 87,4 | 75,0 | 75,0 |
| 23 | 123,9 | 119,9 | 86,8 | 82,8 | 75,0 | 75,0 |
| 24 | 117,9 | 113,9 | 82,5 | 78,5 | 75,0 | 73,3 |
| 25 | 112,3 | 108,3 | 78,6 | 74,6 | 75,0 | 69,9 |
| 26 | 107,2 | 103,2 | 75,0 | 71,0 | 75,0 | 66,7 |
| 27 | 102,5 | 98,5 | 71,7 | 67,7 | 72,9 | 63,8 |
| 28 | 97,7 | 93,7 | 68,4 | 64,4 | 69,5 | 60,8 |
| 29 | 93,3 | 89,3 | 65,3 | 61,3 | 66,3 | 58,0 |
| 30 | 89,2 | 85,2 | 62,4 | 58,4 | 63,4 | 55,5 |
| 31 | 85,6 | 81,6 | 59,9 | 55,9 | 60,9 | 53,3 |
| 32 | 82,3 | 78,3 | 57,6 | 53,6 | 58,5 | 51,2 |
| 33 | 79,0 | 75,0 | 55,3 | 51,3 | 56,2 | 49,2 |
| 34 | 76,0 | 72,0 | 53,2 | 49,2 | 54,1 | 47,3 |
| 35 | 73,3 | 69,3 | 51,3 | 47,3 | 52,1 | 45,6 |
| 36 | 70,7 | 66,7 | 49,5 | 45,5 | 50,3 | 44,0 |
| 37 | 68,3 | 64,3 | 47,8 | 43,8 | 48,5 | 42,5 |
| 38 | 66,0 | 62,0 | 46,2 | 42,2 | 47,0 | 41,1 |
| 39 | 63,9 | 59,9 | 44,8 | 40,8 | 45,5 | 39,8 |
| 40 | 62,0 | 58,0 | 43,4 | 39,4 | 44,1 | 38,6 |
| 41 | 60,1 | 56,1 | 42,1 | 38,1 | 42,8 | 37,4 |
| 42 | 58,4 | 54,4 | 40,9 | 36,9 | 41,5 | 36,3 |
| 43 | 56,8 | 52,8 | 39,7 | 35,7 | 40,4 | 35,3 |
| 44 | 55,2 | 51,2 | 38,6 | 34,6 | 39,3 | 34,4 |
| 45 | 53,7 | 49,7 | 37,6 | 33,6 | 38,2 | 33,4 |
| 46 | 52,2 | 48,2 | 36,5 | 32,5 | 37,1 | 32,5 |
| 47 | 50,7 | 46,7 | 35,5 | 31,5 | 36,0 | 31,5 |
| 48 | 49,3 | 45,3 | 34,5 | 30,5 | 35,0 | 30,7 |
| 49 | 47,8 | 43,8 | 33,5 | 29,5 | 34,0 | 29,8 |
| 50 | 46,4 | 42,4 | 32,5 | 28,5 | 33,0 | 28,9 |
| 51 | 45,0 | 41,0 | 31,5 | 27,5 | 32,0 | 28,0 |
| 52 | 43,6 | 39,6 | 30,5 | 26,5 | 31,0 | 27,1 |
| 53 | 42,2 | 38,2 | 29,6 | 25,6 | 30,0 | 26,3 |
| 54 | 40,9 | 36,9 | 28,6 | 24,6 | 29,1 | 25,4 |

### 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 .

## 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 | 15,0 | m/min with | 144 t |
| | | 25,0 | m/min with | 90 t |
| | | 37,0 | m/min with | 60 t |
| | | 56,0 | m/min with | 40 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 | 47 (57) | sec | theoretical with full load from max. to min working radius without ac- and deceleration (with 50 Hz) |
| | | 55 (45) | 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. | 458 t |

## 1.4 Dimensions

| | | |
|---|---|---|
| Support base | 13,5 m x 13,5 m | |
| 2nd support base | 10,5 m x 15,8 m | |
| Size of supporting pads | 8.0 m x 2.0 m | |
| Supporting area of pads | 16,0 m² | |
| Overall width without supporting pads | 6,5 m | |
| Overall width with supporting pads and swung in outriggers | 10,4 m | |
| Overall width in traveling position and deployed outriggers | 15,5 m | |
| Overall length of undercarriage | 20,7 m | |
| Length of boom (centre sheaves) | 55,0 m | |
| Overall height (top of tower) | 35,9 m | |
| Height of boom fulcrum | 17,8 m | |
| Cab height (eye level) | 24,3 m | |
| Turning radius | 0 m | inner |
| incl. supporting pads | 13,8 m | outer |
| Tail swing radius | 7,4 m | |
| Max. hoisting height | (measured on rope socket, not valid for 4-rope grab) | |
| above quay at minimum radius | 51,1 m | |
| above quay at maximum radius | 31,4 m | |
| below quay | 15,0 m | |
| Winchconfiguration | 2x72t | |
| 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 | 20 | |
| Axle sets driven | 6 | |
| 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. | 22,9 t |
| Extreme | appr. | 28,1 t |

Max. Corner Loading:

| | | Stand. supp. base | | 2nd supp. base | |
|---|---|---|---|---|---|
| **Boom 45°** | | **Hook** | **Grab** | **Hook** | **Grab** |
| Normal | (static excl. wind) | 276,3 t | 219,9 t | 179,1 t | 182,3 |
| Normal | (static incl. wind) | 290,1 t | 232,1 t | 185,6 t | 174,7 |
| Extreme | (dynamic incl. wind) | 308,8 t | 248,4 t | 191,6 t | 184,4 |

Max. Area Pressure:

| | | Stand. supp. base | | 2nd supp. base | |
|---|---|---|---|---|---|
| **Supporting pads 8,0 m x 2,0 m** | | **Hook** | **Grab** | **Hook** | **Grab** |
| Normal | (static excl. wind) | 17,3 t/m² | 13,7 t/m² | 11,2 t/m² | 11,4 t/m² |
| Normal | (static incl. wind) | 18,1 t/m² | 14,5 t/m² | 11,6 t/m² | 10,9 t/m² |
| Extreme | (dynamic incl. wind) | 19,3 t/m² | 15,5 t/m² | 12,0 t/m² | 11,5 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 | |

The crane will be equipped with a slip ring suitable for an electric drive.
This significantly reduces time and material expenditure upon a subsequent retrofitting with an electric drive at site.
Liebherr confirms that the offered crane allows the subsequent installation of transformer, HV and LV circuit breaker, cabe drum with a cable of minimum length 150m and other related equipment for the operation of the crane through the power suppy energy from the coast.

## 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<br>- switch cabinet room<br>- cabs<br>- access to the crane |
| Floodlight type | - LED |
| Position | - two on the boom<br>- one on the tower |
| Rating (per floodlight) | - 355 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 (tower cab 6 kW, optional lower cab 6,5 kW)
- Heating of switch cabinet room (1 x 2 kW)
- Standstill heating of slipring collector, switch cabinet
- Total installed heating capacity approx. 14,5 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 | | |
|---|---|---|---|
| | **Load** | **Hook** | **Grab** |
| Hook operation | < 144t | A4 | |
| Hook operation | < 77t | A6 | |
| Spreader operation | < 63t | A7 | |
| Four Rope Grab Operation | < 63t | | A7 |
| Four Rope Grab Operation | < 52t | | A8 |

Classification of individual mechanisms

| | Mechanism group | | | |
|---|---|---|---|---|
| | **Hook operation** | **Hook operation** | **spreader** | **four rope grab** |
| Winch gear | M8 (90t) | M5 (144t) | M8 (90t) | M8 (75t) |
| Luffing gear | M7 | M7 | M7 | M7 |
| Slewing gear | M6 | M7 | M6 | M7 |
| 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<br>Interzinc 315 or equiv. | 75 microns |
| **2 Finish Coat** | |
| 2-Pack Epoxy Finish Coat<br>Amerlock 400C or equiv. | 125 microns |
| **Total Min. Dry Film Thickness** | **200 microns** |

**III CRANE - EXTERNAL SURFACES**

| | Film thickness |
|---|---|
| **1 Priming Coat** | |
| 2-Pack Zinc Rich Epoxy Primer<br>Interzinc 315 or equiv. | 75 microns |
| **2 Intermediate Coat** | |
| 2-Pack Epoxy Finish Coat<br>Amerlock 400C or equiv. | 130 microns |
| **3 Finish Coat** | |
| 2-Pack Polyurethane Final Paint<br>Amercoat 450E or equiv. | 75 microns |
| **Total Min. Dry Film Thickness** | **280 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.