LHM Mobile Harbour Cranes

LIEBHERR
Table Of Contents

1 Product Range ..................................................4

2 Structure Overview ..........................................6

3 Modularity Redefined .......................................7

4 Applications ....................................................8

5 Practical Solutions ...........................................14

6 Undercarriage ..................................................16

7 Slewing Platform .............................................20

8 Tower & Boom ..................................................24

9 Driver Comfort ................................................26

10 Environmental Record ......................................28

11 Production & Transportation ..............................30

12 Liebherr Service Worldwide .............................32
The LHM’s extreme flexibility makes it a universal all-rounder and key asset for handling everything from containers to bulk goods, general cargo and even heavy lifts up to 208 tonnes. Short delivery times, comparatively low costs for transport and erection, low operating and maintenance costs favour the LHM. It can be used in practically all areas of the harbour where crane capacity is required. Comprehensive basic equipment and easy transportation guarantee a high resale value and underline its flexibility as an investment.

Through many years of experience and technology strictly orientated towards customer requirements, a range of products has been created which sets new standards in innovation, quality, mobility and flexibility.
2 **Structure Overview**

Liebherr mobile harbour cranes use the most advanced design, engineering and production technology and consist of the following main constructional groups:

- **Closed tower design**  
  (with weatherproof access to tower cab)

- **Tower extension 4.8m**  
  (for higher boom fulcrum point and cabin height, optional)

- **S-Version**  
  (for increased lifting capacity, optional)

- **Undercarriage**  
  (with integrated diesel tank and additional access in middle section)

- **Optimized boom lengths**  
  (for practical applications)

- **Tension luffing cylinder**  
  (for more safety during operation)

- **Winches**  
  (application-oriented configurations)

- **Motorisation**  
  (diesel engines with different ratings depending on purpose and crane size)

- **Slewing Platform**  
  (GFRP=Glass-Fibre Reinforced Plastic)

---

3 **Modularity Redefined**

The Liebherr mobile harbour crane concept as a whole is characterized by an outstanding modularity regarding customer and port requirements.

The undercarriage is a patented Liebherr mobile harbour crane chassis where the number of individually mounted sets of four wheels each can be easily adapted to comply with the most stringent quay load restrictions. Alternatively, the basic undercarriage concept can be replaced by a portal or a barge. Different applications call for different configurations of winches and drive systems (power packs) to conform to all variants of professional cargo handling.

Tower extension, boom variants with different radii and increased lifting capacity on request (S-version) complement the modular concept of the Liebherr mobile harbour crane.
4 Applications

The range of Liebherr mobile harbour cranes is suited exactly to the demands of the ship, port and transport industries. Liebherr offers an optimum solution for every type of vessel, for every cargo and every size of port or stevedore.

Container Handling

Due to strikingly short acceleration times of all crane motions, which are precisely and accurately monitored by the Litronic control system, Liebherr emphasize their peak position in container handling. The outreach and load capacity are suitable to be used on a wide array of vessels, from coaster vessels to super post-panamax container liners.

The crane can be fitted with various types of spreaders (fixed or telescopic) connected to the rotator. Manual, semi or fully automatic telescopic spreaders are available for all regular container sizes between 10’ and 48’.

- The Liebherr hydrostatic drive is the most reliable and highest performing drive system for mobile harbour cranes. Independent closed loop hydraulic systems utilize the minimum number of components to guarantee highly responsive, smooth and precise operation while maximizing operational safety.
- Liebherr’s patented Cycoptronic (cycle optimizing electronic crane control system) allows for direct load positioning and aids the crane driver in mastering his task. With Cycoptronic turnover, safety and the confidence of the operator will be improved.
- Safety: The luffing cylinder is positioned above the lattice boom. This eliminates any damage to the cylinder that can occur through swinging loads or highly stowed rows of containers on board the vessel.

LHM 500 Port Nou, Spain
LHM 500 AKR Group, Indonesia
LHM 500 Giemport, Turkey
LHM 500 APM Terminal 4, Argentina
Bulk Handling

The optimised interaction between powerful hydrostatic transmission and advanced Liebherr electronics ensures short, productive working cycles in bulk handling. Independent of whether using a motor grab or a four-rope grab, all important handling parameters such as the volume to be lifted with each grab, the opening/closing and hoisting speeds, simultaneous functions, winch synchronisation etc. are optimized using specially developed Liebherr electronics.

- During grab operation, hoisting, slewing, and luffing are driven simultaneously at maximized speed to achieve the highest (possible) turnover
- During grab filling, features such as automatic lowering and hoisting guarantee the optimum filling level of the grab
- The slack rope monitoring system ensures extended lifetime of the ropes and increases operational safety
- Reverse power is returned to the drive process through closed loop hydraulics which results in reduced fuel consumption
- The Cycoptronic® anti-sway system automatically compensates for all rotational swing, transverse and longitudinal sway of the load at maximum speeds
- To provide safe and stress-free working conditions for the operator, Liebherr offers the Cycoptronic® including Teach-In® feature, a semi-automatic system, which pilots the crane from the vessel hatch to the quay without any sway. Especially for bulk operation into hoppers, the Teach-In® system increases turnover and ensures consistent turnover rates during the entire ship unloading

LHM 600 TPS, Spain  
LHM 500 SAPD, South Africa  
LHM 500 Hyundai Steel, South Korea  
LHM 180 TMB, Portugal
**Project Cargo & Heavy Duty**

Safety and precision are the most important criteria when lifting heavy goods. The hydrostatic drive concept in connection with closed hydraulic circuits guarantees immediate system reaction times for rapid and safe working cycles. Depending on the type, Liebherr mobile harbour cranes can lift up to a maximum of 208 tonnes. The endurance and stability required especially for this kind of cargo handling has been strongly considered as a basic concept. The unique Liebherr cruciform support base creates stability. The arising forces are diverted to the surface of the pier via the shortest routes.

- Absorption of all static and dynamic demands resulting from travelling and operation of the crane
- Reduction of stress and strain on all supporting parts and undercarriage to a minimum
- Increased safety which enhances the driver’s comfort and consequently improves productivity

**General Cargo**

The LHM displays its unique versatility and flexibility especially in general cargo handling with continuously changing operating appliances and handling methods.

- Changing from one lifting device to another requires only minutes
- Special controls & individual pre-selectable lifting methods – no modification delay
- Automatic recognition and pre-selection of the lifting device through Liebherr Litronic® control system
5 Practical Solutions

Liebherr develops and produces special designs and solutions to meet particular requirements outside the norm, supplemented by a wide variety of lifting appliances and equipment.

LPS

The Liebherr Portal Crane LPS is an efficient combination of space-saving portal undercarriage (mounted on rails) and a flexible mobile harbour upper carriage. Customer-specific requirements such as permissible quay and rail loadings, track gauges, clearance heights are individually adapted. Particularly on narrow quays, individual portal solutions permit railway trains and road trucks to travel below the portal.

LBS

In its floating crane concept, Liebherr combines state of the art technology and over 30 years of experience in the mobile harbour crane field with the expertise of established barge manufacturers.

Liebherr floating cranes can be used for transhipment and midstream operation between ocean-going vessels and river barges on different types of waterways, including those having no or few quays. In addition, the LBS solution allows direct cargo transfer from ship to shore; especially when quays have reached capacity limits.

This floating crane concept, based on many years of experience in designing and operating floating cranes and other transhipment units for various environmental conditions throughout the world, is conceived for midstream operation in ports and sheltered waters, on rivers and in coastal waters; for ship to ship as well as ship to shore handling. Based on the Liebherr mobile harbour crane series, the LBS models are precisely tailored to meet individual requirements and manufactured according to a uniform design principle combined with purpose-built barges as customer specific solutions.
Undercarriage – The Ultimate Travelling System

Varying design and construction methods of quays and terminals throughout the world have led Liebherr to a unique undercarriage design. Having turned away from a fixed axle concept, individually mounted sets of four wheels each enable movement in all directions.

Individual Wheel Sets

During steering operation all driven wheel sets are individually controlled and steerable. At every wheel set a sensor indicates the actual wheel position to the electronic control system. The steering can be operated either from the tower cabin or the operator’s cabin on the slewing platform.

- Optimal accessibility for an ease of maintenance
- Individually steerable axle sets reduce tyre wear
- Different arrangements with varying numbers of driven wheel sets allow for an inclination of up to 10%

Tyres

The tyres correspond to those used for heavy goods vehicles making requisition of spares economical and time-saving. Standard tyres means that customers can purchase locally from any dealer.

- Optimal availability - no delivery bottlenecks
- Highest tyre life time due to lowest tyre loading (below 6t/tyre) and individually steerable wheel sets
- Option: foam filled tyres for scrap handling

Outstanding Mobility

Liebherr mobile harbour cranes are characterised by their outstanding mobility. Due to the system of independent and individually steerable wheel sets (no additional infrastructure e.g. rails or power supply are required) and a very short undercarriage not only are the smallest turning circles possible but also longitudinal and diagonal movements of up to 135°. The LHM can travel in all directions, whether straight ahead, backwards, sideways diagonally or even turn around variable centre points, knowing no limits.

- Especially at narrow quays and terminals the above mentioned manoeuvrability is a decisive advantage for the positioning of the crane
- Smaller turning circle, allows better access to quays
- Side travelling to bypass obstacles and to move between bollards
- Fastest possible positioning at narrow sites
- Minimum tyre wear & tear – higher life time
- Less diesel consumption
Hydraulic Load Distribution

The modular undercarriage concept allows further reduction of quay loads by installing additional wheel sets to comply with the most stringent quay load restrictions. During travelling hydraulic suspension guarantees optimum pressure distribution on uneven ground and avoids overloading of the individual wheel sets and of the quay structure. The operational position of the crane can be adapted to the quay requirements on the basis of an X-shaped stabiliser arrangement (quadratic and rectangular support is possible) and different sizes of supporting pads depending on the condition of the quay.

X-shaped Support Base

A special Liebherr feature is the very solid propping system with four swing-out arms forming a cruciform propping configuration. Stresses and strains occurring during handling operation are thereby transmitted via the shortest route through the centre of the chassis onto the outriggers and further to the ground.

- Reduction of torsion strain in the undercarriage
- Lifetime enhancement of the slewing bearing and the chassis
- Optimised vertical stability during operation
- Maintenance free outriggers of x-shaped support base
- Flexibility of the x-shaped supporting base needs less space to pass narrow areas

Independent linked suspension causes lower loads onto quay structure
**Slewing Platform**

The slewing platform is designed to house the diesel-hydraulic power pack, the winches, the counterweight, the slewing gears and the electric control cabinet.

**Machinery House**

The front part of the slewing platform contains the diesel-hydraulic power pack. This machinery house is sound insulated and fully protected against any kind of corrosion using Glass-Fibre Reinforced Plastic (GFRP).

**Winch Frame**

The winches are located within the rear part of the slewing platform. Various winches are available according to crane variants and application.

**Middle Section**

The middle part of the slewing platform accommodates the base section of the tower, the slewing gears, the generator and access stairs to the tower cab.

A Liebherr triple row roller bearing connects the slewing platform with the undercarriage allowing for unlimited rotation in both directions. Slewing gear units are placed around the slew-ring bearing according to crane variants and application. Due to the round tower design the load is already distributed over 360 degrees when it arrives at the slew-ring resulting in longer life time of components as well as the steel structure.

- Maximum safety and reliability with minimum components
- All components are standardised and uniform throughout the LHM Series which reduces repair costs
- First class and practically maintenance-free hydraulic components for enormous cost savings and long-term endurance
- Optimal accessibility to all components and simplified maintenance
- Simple and easy training of personnel

*Winch room – axial piston motors & rope drum*

*Middle section – generator, slewing gears & access stairs to tower cab*

*Machinery house – diesel engine & splitter gearbox*
Cooling & Ventilation System

The cooling system for the engine water and the engine charge as well as the hydraulic oil cooler are situated outside on top of the slewing platform (for working conditions above 50°C). The cooling air flow is completely conducted outside the machinery room: for such reason it is not possible to contaminate the diesel engine and other hydraulic components with dust particles.

In addition Liebherr technology is absolutely insusceptible to all sorts of dust and dirt due to the closed hydraulic system and an electronic system which is military proven and tested.

Electric Switch Compartment

Situated on the right side of the slewing platform is the electric switch compartment, containing the in-house designed Liebherr Litronic® crane control system (VME-CAN-Bus 2-line).

- Availability of spare parts: 25 years
- All upgrades are downward compatible
- Ease of maintenance – no additional software specialist required
- Suitable for corrosive environment (special coating of all cards, salt spray tested)
- Designed and tested for maritime environment (military standard)
- Spacious arrangement for optimal service accessibility

Drive Concept - Advantages Of Liebherr Hydrostatic Power Transmission

The Liebherr hydrostatic drive is undeniably the most reliable and high performing drive system for every mobile harbour crane due to rapid achievement of high performance, long-term durability, low maintenance costs and a series of operation-specific advantages such as outstanding acceleration and deceleration. This means higher turnover in shorter periods and proven savings for the customer.

The crane drive is diesel-hydraulic consisting of a splitter gear box feeding variable displacement axial piston pumps for the hoisting, slewing and the luffing gear. In an effort to reduce complexity, during travelling pumps from other operations are used. The splitter gear box can either be driven by a diesel motor or alternatively by electric motors.

Closed hydraulic circuits technology for maximum performance and high efficiency is used. The independent, closed circuits guarantee a highly responsive, smooth and sensitive operation with a minimum of components, maximising the operating safety even in continuous operation or high ambient temperatures (-40°C to +50°C).

- Immediate and short system reaction times for rapid and safe working cycles
- All crane motions are applied continuously, precisely and simultaneously with maximum speed and load
- High performance density requiring a minimum of fuel and energy
- Faster acceleration and deceleration times due to low masses of inertia – higher turnover
- Closed loop systems from 300kW upwards require up to 75% less hydraulic oil than open loop systems
- Dynamic braking is accomplished by attempting to reverse the rotation of the pump. The pump and prime mover constitute the dynamic brake
- Use of reverse power – the lowering energy is led back to the power pack (less fuel consumption)
- Closed circuits allow easy fault finding and diagnosis due to separate circuits for each crane function
- Only one drive system simplifies and reduces service and maintenance costs
**8 Tower & Boom**

**Tubular Tower Design**
The submerged-arc welded pipe construction, a torsionally rigid design, is part of a unique stress-flow system absorbing all static and dynamic demands and distributing the load as best as possible onto the slew ring bearing. The spiral staircase is well lit with handrails and kick-plates, leading to the tower cabin. Access to the upper tower platform and rope pulleys is also gained through this route.

- Decrease of torsional strain
- Low stress for welding seams
- Longer lifetime of slewing gears & undercarriage
- Safe and convenient access to the tower cabin inside the tower

**Luffing Cylinder**
The cylinder rod is completely protected while in crane parking position. Due to the fact that the luffing ram is a tension cylinder, collisions between swinging loads and the cylinder during crane operation are impossible.

- Maintenance free
- Less corrosion
- Luffing cylinder is protected against damage
- No risk of buckling (only tension force)

**Boom**
The boom is of lattice construction featuring three main chords and consisting of 2 sections (fulcrum section, boom head). The boom head can be laid down on the ground. Seamless high strength tubular steel ensures operation without difficulty down to -40°C.

- More stability / high level of stiffness
- Precise crane movement
- Pivot point: up to 27.5 m
Driver Comfort

The tower and optional slewing platform cabin are fully equipped allowing the operation of all crane functions including travel and supporting options. The design of the tower and the slewing platform cabin was driven by the needs for visibility, comfort and operability.

Tower Cabin

The crane operator’s cabin layout has been designed to ergonomic principles and provides a comfortable, noise-free environment, essential for ensuring uninterrupted concentration for the driver when operating the crane. Any vibration is reduced to an unnoticeable minimum through active swing equalisers.

An ergonomic driver’s seat with adjustable armrests, screen wipers and washer as well as air conditioning allow the operator to work in all climatic environments. Control desk, joy-sticks and monitor are ergonomically arranged.

The window sections are constructed of tinted anti glare toughened safety glass mounted in an innovative glass frame design giving a clear view of the handled cargo throughout the slewing circle and an unobstructed line of sight between the boom tip and the vessel deck.

Control Meets Comfort

- Optimal forward mounted (standard)
- Cabin height – up to 29 m
- 70% glass proportion (safety glass)
- Unrestricted and reliable view of working surroundings
- Integrated Litronic® screen (shows all the crane functions on the monitor)
- Closed-circuit video system on the jib head with coloured monitor in the cabin
- Air conditioning (standard)
- Noise-insulated cabin (noise level: within requirements of 2000/14/EG)
- Active swing equalizer

Slewing Platform Cabin

The cabin is mounted on the front part of the slewing platform. This elevated position assures easy manoeuvrability in both directions, optimal view while travelling and minimises safety hazard. As it is always facing the load, it can be used by checkers in adverse conditions.

There are two different cabins available:
- Cabin equipped with identical controls to the tower cabin
- Cabin equipped with remote control only for travelling operations
Environmental Record

With its headquarters located in an environmentally protected area, ecological issues have always been high on the agenda for Liebherr-Werk Nenzing. The implementation of economy software, bio-degradable oils and special noise insulation throughout its mobile harbour crane range are just a few examples of Liebherr’s ecological awareness.

Eco-Control

The proven hydraulic drive system in combination with the in-house developed “ECO-Control” achieves a notable reduction of diesel consumption up to 25% without any impact on turn-over output. Once the designated speed of the crane movement is achieved, the Litronic® crane control system automatically calculates the minimal required rpm (revolutions per minute) for the diesel engine.

A further side effect is the low rpm of the hydraulic system, which means longer lifetime of hydraulic pumps and components. In addition, the lowered engine rpm has a direct impact on reduction of noise exposure.

Noise Insulation

The cooling system for the engine water and the engine charge as well as the hydraulic oil cooler are equipped with a specially designed cooling fan minimizing turbulences and decreasing noise emissions. Furthermore, regulated rpm guarantees higher lifetime, less required drive power and a decrease of fuel consumption.

Elastic suspension of the winches guarantees an additional reduction of vibrations and noise. With the optional attenuation package for the machinery as well as the winch room a further reduction of noise sound pressure can be reached.

Operating Liquids

Alternatively Liebherr mobile harbour cranes can be run on bio-diesel to comply with local regulations and the transition to alternative fuels in customer equipment fleets.

Liebherr developed biodegradable oil especially for the Liebherr product line. In combination with spectrographic oils analysis techniques oil life time is extended and keeps components such as pumps and motors for ever longer lifetimes.

Due to the special design of the luffing gear (tension cylinder in closed loop circuit) a minimal quantity of oil is required.
11 Production & Transportation

A clearly defined company strategy guarantees that only top quality products are developed and built in the most modern production facilities.

**Liebherr-MCCtec Rostock**

In order to further expand its position in the international maritime market Liebherr has established an additional production site for mobile harbour cranes in Rostock’s harbour district on the German Baltic Coast in 2006. The production facility in Rostock plays an important role in the further growth and development of the international market position of the LHM product division. Overall, the Liebherr Group has four state-of-the-art production sites for maritime cranes (Nenzing, Rostock, Killarney and Sunderland).

**Fully Assembled Transportation**

Thanks to direct access to the sea, Rostock is very well situated in terms of the logistics of worldwide sales, especially when shipping large equipment. Ro-Ro shipment, semi-erected or even fully assembled, are the standard means of transportation from the Rostock location. When sent by barge and tug from the Rostock facility, Liebherr mobile harbour cranes are ready for operation immediately after driving off from the barge and onto the quay.

**Factory Testing**

All LHM cranes are put through an intense factory testing program, this means that every single crane is fully assembled and tested before delivery which results in an extraordinary quick commissioning. Under normal conditions Liebherr mobile harbour cranes are assembled and ready for operation within two weeks after delivery.
Organisation with high-speed guarantee

Spare parts depot Rostock, Germany

12 **Liebherr Service Worldwide**

Over 10,000 mobile harbour, ship, offshore and gantry cranes as well as reachstackers are serviced by Liebherr’s maritime division. The worldwide network of customer service centres guarantees the supply of spare parts and service throughout the entire lifetime of all machines.

**Competence On Site**

Speed and reliability have always been part of our service. Liebherr fully understands the value of a quick response for reduced downtime and immediate restoration of LHM’s productivity. Qualified specialists will deal with any issue without delay – if necessary, right around the clock.

**Reliable Partnership**

Extensive know-how ensures first class and effective performance of all service and maintenance work, contributing to LHM’s availability and profitability. Liebherr combines expertise with client’s experience to continuously optimise products and services.

- Preventive maintenance and safety checks
- Tailor-made service contracts from inspection agreements to full service contracts
- Comprehensive training for customer’s operators, service and maintenance personnel
- Worldwide customer hotline round-the-clock
- Implementation of technical modifications and up-grades
- Remote diagnoses for fault analysis and repair

**Logistics Service – High Speed Organisation 24/7**

For your LHM to function effectively, every operational hour is vital. Liebherr original spare parts and service staff is there for our clients around the clock, even on weekends and public holidays. The standardised Liebherr overnight distribution service guarantees fast and safe delivery of the original parts to their destination.
The Liebherr Group — Partner For The Future

Today, Liebherr is among the leading manufacturers in the fields of hoisting technology and materials handling equipment. The name Liebherr stands for products and services. It has become a synonym for ideas and innovations.

Liebherr — A Family Enterprise

In family-operated companies, ownership merges with active entrepreneurship. This results in characteristic principles. Liebherr is both a family business and a corporation. This does not have to be a contradiction, as the continuous success and steady growth prove.

To create top products, the development capacities and production facilities must measure up to the highest standards. This requires substantial investments. From stable locations, Liebherr is following a solidly financed expansion course. The profits made are almost entirely retained within the Group. This provides ample scope for extensive investments. The economic power of the Liebherr Group is best shown by its unusually high equity ratio of more than 50%. This sound economic basis makes Liebherr highly independent in its strategic decisions, and it provides an important basis for future investment and innovation strategies. Offering high-quality products and services which are aimed towards customers’ needs remains the benchmark.

Mastering Key Technologies

In view of the high quality that Liebherr demands of its products, mastering key technologies internally and keeping core competencies in-house has always been of great importance to the company. Therefore, Liebherr develops and produces crucial components, such as the entire propulsion and control technology, themselves. Further examples are hydraulic components, slip ring elements, and diesel engines. Here, Group suppliers are measured against the best and most efficient external providers.

Decentralized And International, Based On Tradition

Operating efficiently in manageable, self-dependent units and aiming strategically at emerging markets have always formed part of the basic business principles. Thus, Liebherr regularly invests substantially in further marketing and service companies as well as in new production sites. Entering and expanding into new markets means being locally available to assure the customer receives full and lasting manufacturer support. While maintaining the proven decentralized organizational form, a divisional company structure, whose international expansion is being carried forward, was implemented globally.
Sales and Service Stations:

- **Liebherr Nenzing Service GmbH**
  Am Neuländer Baggerteich 1
  21079 Hamburg, Germany
  Tel. +49 40 767 022 00
  Fax +49 40 767 587 86

- **Liebherr--Maritime Benelux B.V.**
  Beeldschermweg 2
  3821 AH Amersfoort, The Netherlands
  Tel. +31 33 4500 830
  Fax +31 33 4500 899

- **Liebherr Great Britain Ltd.**
  Stratton Business Park
  Normandy Lane
  Bignoles, SG18 8QG
  Great Britain
  Tel. +44 1767 602 160
  Fax +44 1767 602 161

- **Liebherr EMtec Italia S.p.A.**
  Via dell’Industria, 8-12
  24040 Lallio (BG), Italy
  Tel. +39 035 69691 40
  Fax +39 035 69691 49

- **Liebherr Nenzing Crane Co.**
  7075 Bennington Street
  Houston, TX 77028-5812
  USA
  Tel. +1 713 636 4050
  Fax +1 713 636 4051

- **Liebherr Ibérica S.A.**
  Carretera A-2, km 41
  c/Aluminio, parcela 6-8
  Poligono Industrial Miralcampo
  19200 Azuqueca de Henares, Guadalajara, Spain
  Tel. +34 949 348 730
  Fax +34 949 262 853

- **Liebherr--Maritime Benelux B.V.**
  Beeldschermweg 2
  3821 AH Amersfoort, The Netherlands
  Tel. +31 33 4500 830
  Fax +31 33 4500 899

- **Liebherr Russia**
  1-ya Borodinskaya Str. 5
  Office 302
  121059 Moscow, Russia
  Federation
  Tel. +7 495 502 1734
  Fax +7 495 933 7223

- **Liebherr Nenzing Crane Co.**
  7075 Bennington Street
  Houston, TX 77028-5812
  USA
  Tel. +1 713 636 4050
  Fax +1 713 636 4051

- **Liebherr Brasil--Port Equipment**
  Latin America
  Rua Gomes de Carvalho, 1581
  Salas 202/203 - Vila Olímpia
  04547-006 – São Paulo – SP, Brazil
  Tel. +55 11 3845 4181
  Fax +55 11 3845 7268

- **Liebherr India Private Limited**
  D-16/3 MICD, Ground Floor
  TTC Industrial Area, Turbe
  Navi Mumbai – 400 703
  India
  Tel. +91 22 6795 7500
  Fax +91 22 6795 7505

- **Liebherr Singapore Pte. Ltd.**
  8 Pandan Avenue
  Singapore 609384
  Singapore
  Tel. +65 6265 2305
  Fax +65 6261 6485

- **Frontline Cranes and Construction Machinery**
  Jebel Ali Free Zone South
  Plot no. S 10508
  Dubai, United Arab Emirates
  Tel. +971 4 8860199 (Ext. 109)
  Fax +971 4 8860 324

- **Liebherr India Private Limited**
  D-16/3 MICD, Ground Floor
  TTC Industrial Area, Turbe
  Navi Mumbai – 400 703
  India
  Tel. +91 22 6795 7500
  Fax +91 22 6795 7505

www.liebherr.com