

Liebherr Port Cranes FCC and TCC



LIEBHERR



FCC 350 with timber grab



Table of Contents

1	Product Range	4
2	Design Overview	6
3	Modularity	7
4	Applications	8
5	FCC - Configuration and Installation	12
6	TCC - Configuration and Installation	14
7	Operational Comfort	16
8	Liebherr Service	17

1 Product Range

Many years of experience in the construction of maritime cranes is one of Liebherr's core competences. Constant technical progress ensures innovative and flexible solutions orientated towards customer requirements.

The Liebherr FCC/TCC series is designed for the flexible handling of dry bulk, general cargoes and containers in both sea and domestic ports. Low initial outlay as well as minimum running and maintenance costs round off the operational profile of the FCC/TCC series.



350 series
Radius 36 m
Max. capacity 45 t

Continuous heavy duty grab and multi-purpose operation



300 series
Radius 30 m
Max. capacity 30 t

Continuous heavy duty grab operation



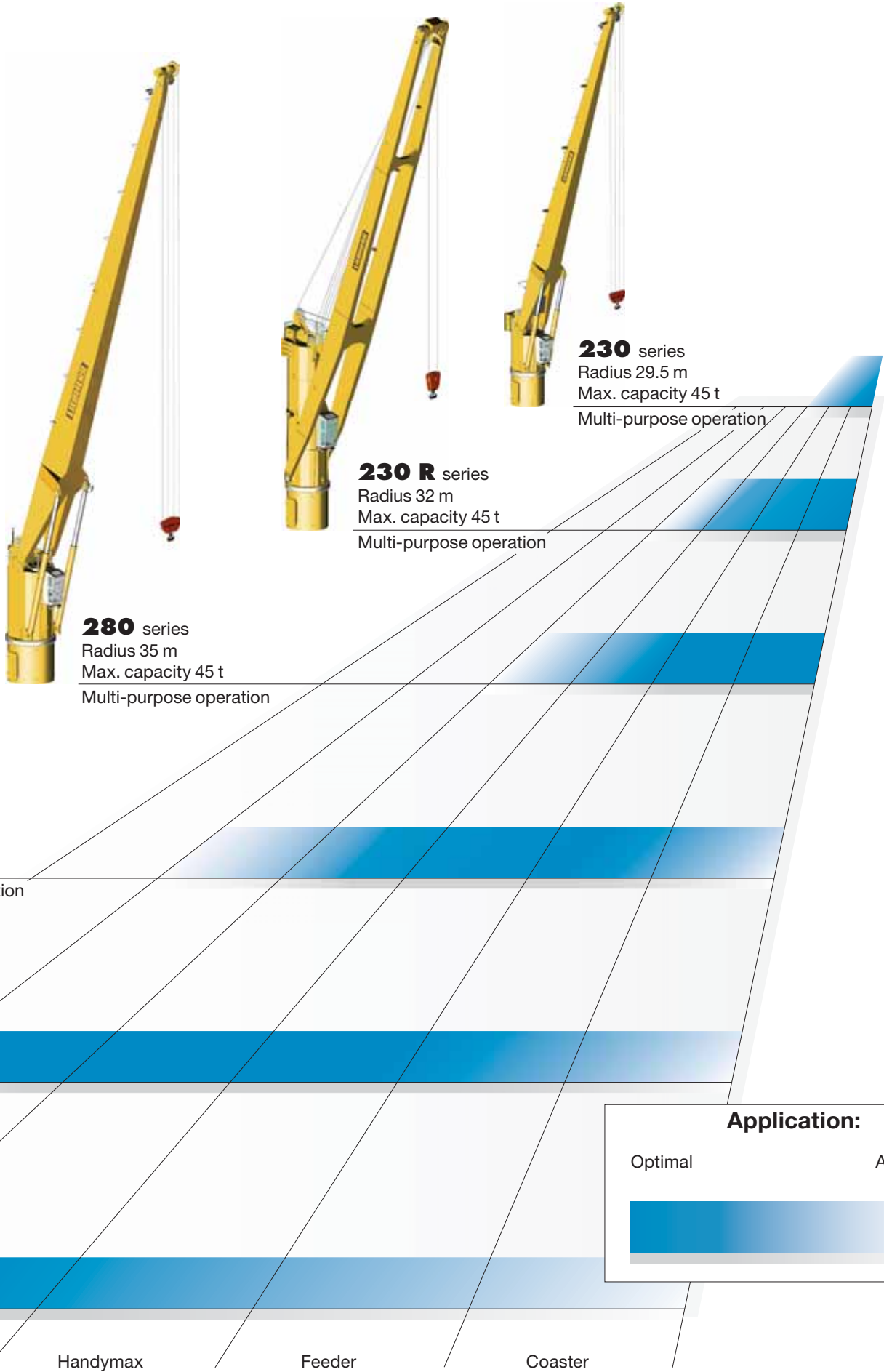
280 R series
Radius 33 m
Max. capacity 120 t

Multi-purpose and h

Capesize

Post Panamax

Panamax



280 series
 Radius 35 m
 Max. capacity 45 t
 Multi-purpose operation

230 R series
 Radius 32 m
 Max. capacity 45 t
 Multi-purpose operation

230 series
 Radius 29.5 m
 Max. capacity 45 t
 Multi-purpose operation

heavy lift operation

Application:

Optimal Additional

■ ■

max Handymax Feeder Coaster

2 Design Overview

Liebherr port cranes have been developed using the latest scientific and technical knowledge and excel through the following design features:

230/280 series



Double chord box girder jib
(high stability)

Box type jib

Luffing cylinder
(maintenance free)

Internal hoisting and luffing winches
(optimum protection)

230 R/280 R series



300 series



Double chord box girder jib
(high stability)

4-rope grab

Luffing cylinder
(maintenance free)

Internal
luffing winches

Single layer holding and
closing winch

350 series



3 Modularity

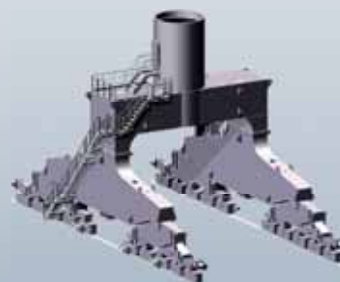
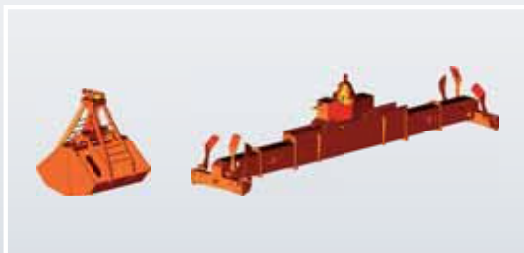
The Liebherr port crane concept is distinguished by its unique modularity. Three different crane types and two different substructures are available. Under consideration of the infrastructure and individual needs of the port the optimum combination can be determined.

FCC - Fixed Cargo Crane

The FCCs are fitted on fixed pedestals. Due to their slender design they are especially suitable for operation on narrow quaysides. Thanks to jib lengths of up to 36 m vessels and barges can be efficiently loaded and unloaded from a fixed position.

TCC - Travelling Cargo Crane

TCCs are fitted on rail-mounted travelling gantries. A system of parallel tracks under the gantry enables travel along the length of the quayside. This means relocation of the vessels and barges is not necessary during loading and unloading of cargoes, thus improving efficiency.



4 Applications

Whether container, general cargo or dry bulk handling Liebherr port cranes can meet a wide variety of cargo demands ranging from universal to special applications.

Container and General Cargo Handling

No matter what type of vessel thanks to the various jib lengths Liebherr port cranes invariably fulfil your needs. With up to 25 cycles per hour vessels and barges can be quickly and efficiently loaded or unloaded.

For container and general cargo handling the cranes can be equipped with a rotator. Manual, semi or fully automatic spreaders are available for all regular container sizes.



FCC 230



FCC 230 R





TCC 350

Dry Bulk Handling

Various types of grab, ranging from motor grab up to four-rope grab, can be easily fitted and operated. Liebherr's leading position in dry bulk handling is emphasized by its high performance crane series 300 and 350 offering the following benefits:

- classified for 360 days 24 hours continuous operation
- up to 45 cycles per hour
- operation of all 3 motions simultaneously at full load/full speed
- continuously variable speed control from zero to max. speed
- independent closed hydraulic circuits for each crane motion



FCC 280 R



TCC 300

5 FCC – Configuration and Installation

Practical Application

Liebherr port cranes are tailor-made to meet individual customer requirements and are especially suitable for operation on narrow quaysides thanks to their compact design and the following features:

- economical and robust pedestal design
- point reinforcement of the quayside keeps the foundation costs at a minimum
- relatively low forces and moments affect the crane's pedestal making dense positioning of the cranes on the quayside possible
- electric components are protected from the environment

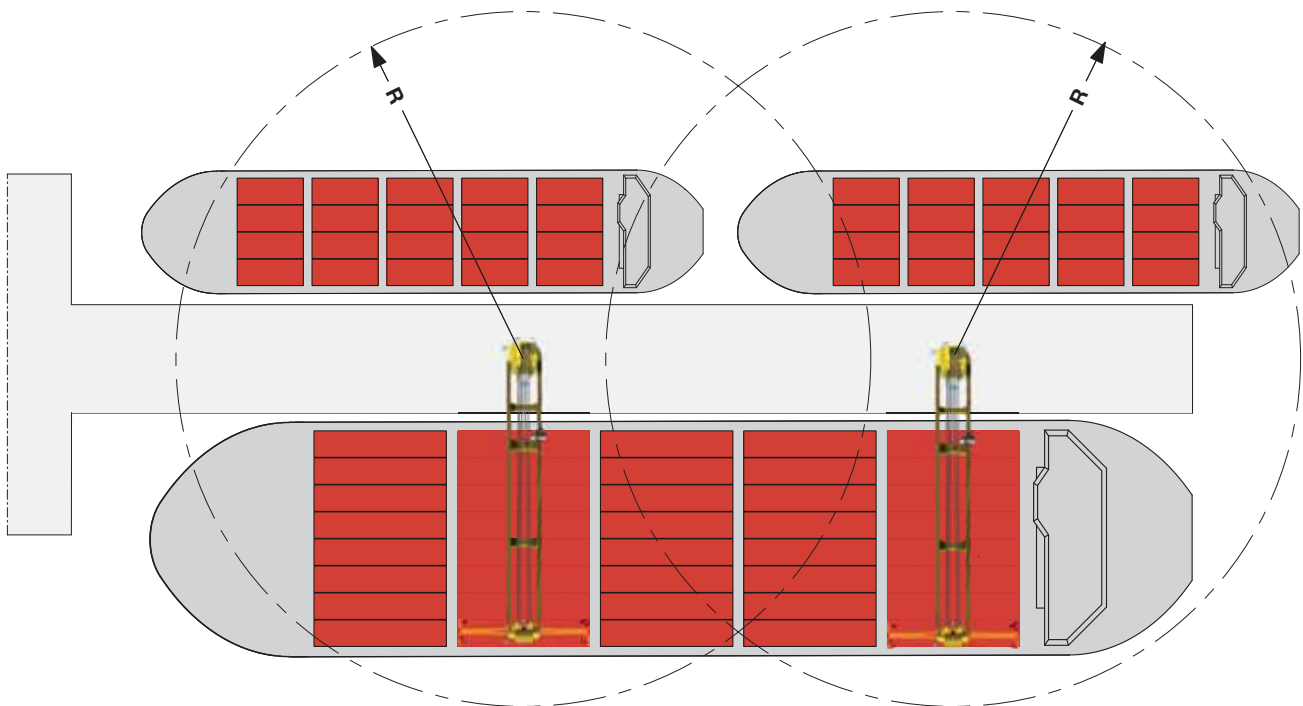
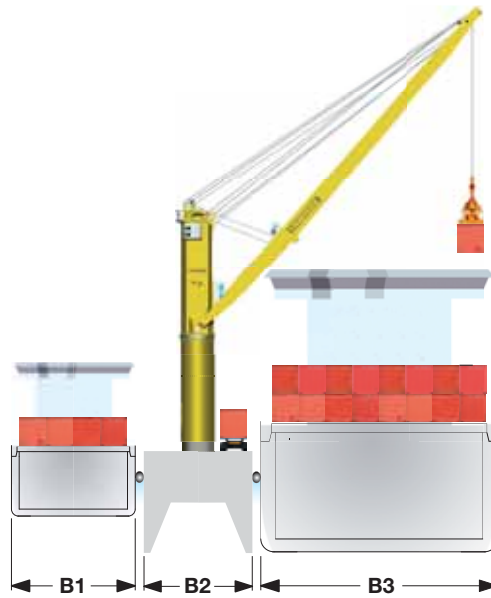
FCC series

B1 = ship width

B2 = quay

B3 = ship width

R = max. working radius

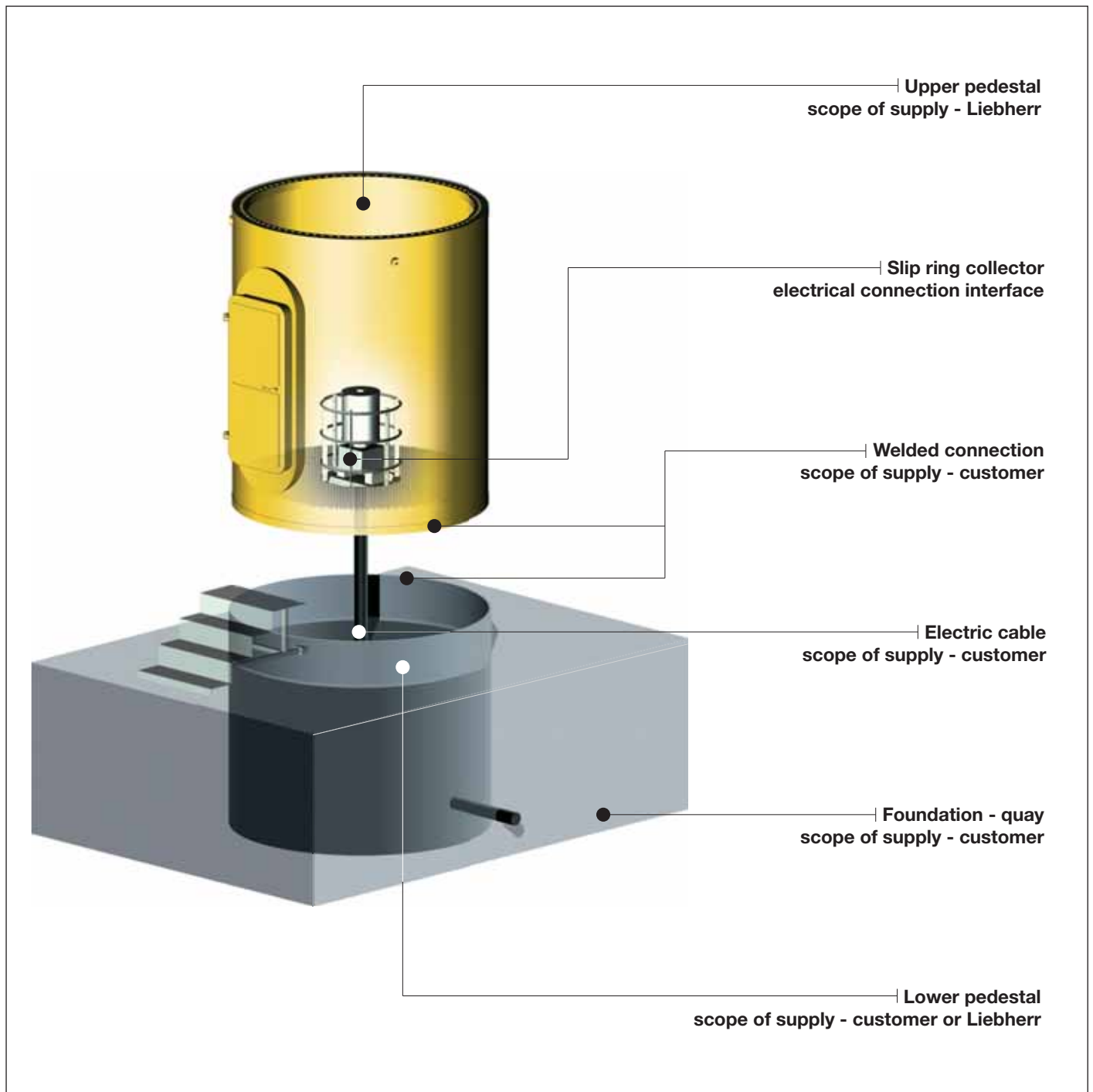


Pedestal

The upper pedestal of the crane is welded to the lower pedestal, enabling straightforward and uncomplicated installation of the cranes.

Power Supply

An external electric cable provides power for the electro-hydraulic cranes. This cable is embedded in the quayside and is lead through the inside of the lower pedestal to the terminal box on the slipping.



6 TCC – Configuration and Installation

Gantry Design

Based on many years of experience in gantry construction, Liebherr designs and manufactures tailor-made gantries to meet the requirements of individual port infrastructures.

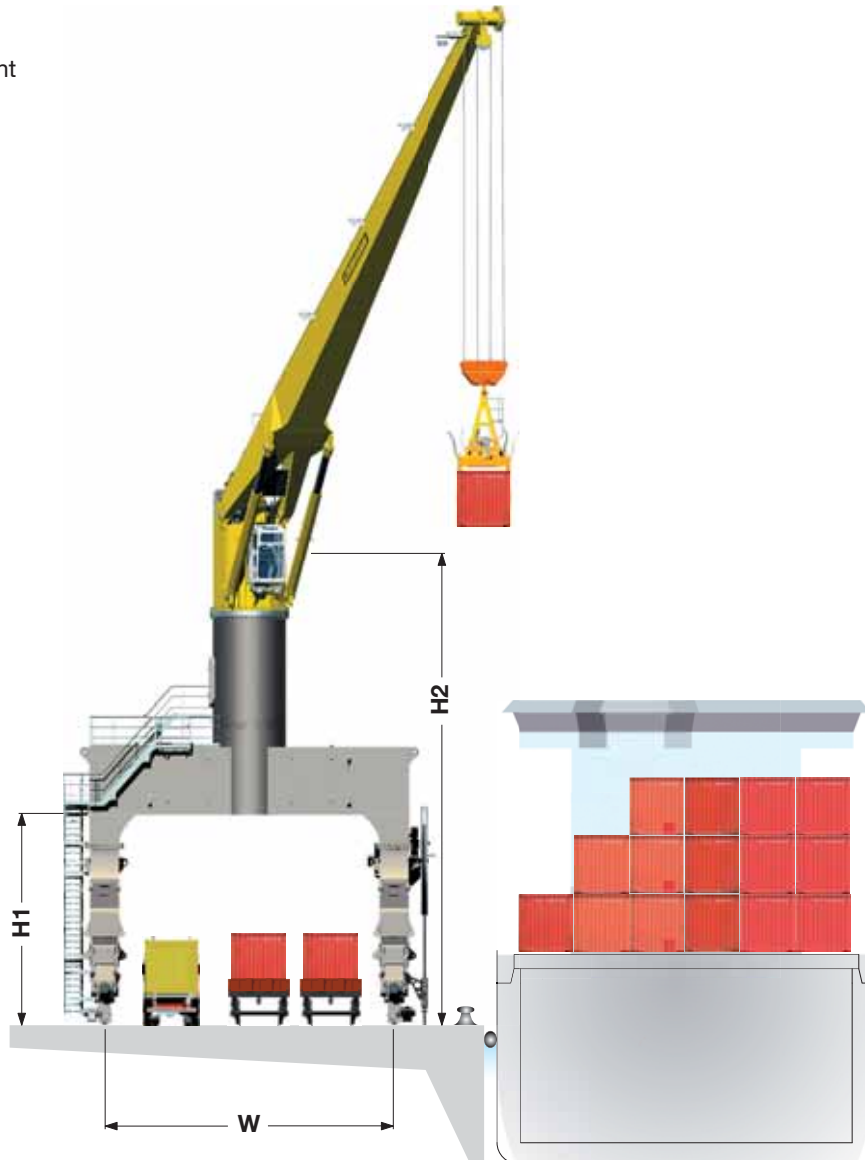
- the width of the gantry is determined by the rail span
- the working height of the gantry and the TCC port crane is optimized to suit the types of vessels to be handled
- the clearance height of the gantry depends on the transport requirements on the quayside. For example, TCCs in intermodal ports can be designed to enable the free movement of trucks and rail-mounted vehicles under the gantry in order to allow for improved cargo clearance
- the number of bogies is dependent on the type of crane and the maximum permissible wheel load on the quayside
- counterweights are necessary where rail spans are narrow in order to reduce overturning moment and ensure safe operation and stability

TCC series

H1 = clearance height

H2 = eye level

W = track gauge

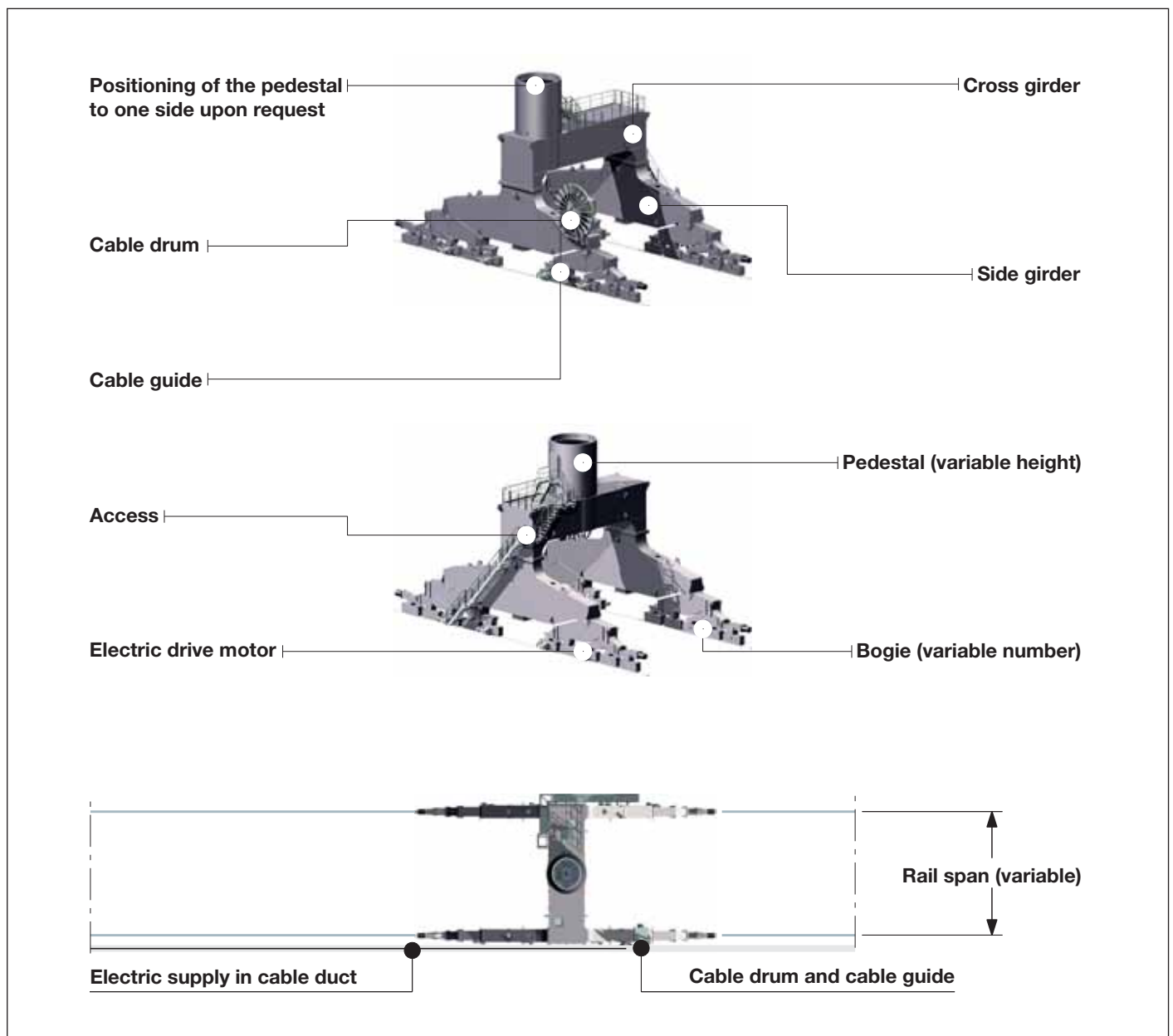


Installation

- gantry drives are electrically powered
- prevailing forces and moments are evenly distributed to all wheels on the gantry and so absorbed by the quay foundation
- crane can be either central or side-mounted depending on cargo handling requirements
- safe and direct access to the driver's cab via stairway and ladders
- gantries are optionally fitted with a mechanical locking device in order to prevent gantry travel during gales/storms

Power Supply

An external electric cable provides power for the electro-hydraulic travelling cargo cranes. This cable is embedded in the quayside and leads to the TCC through a cable guide which should be positioned in the middle of the quayside in order to optimize the size of the cable drum.



7 Operational Comfort

Optional Driver's Cabin

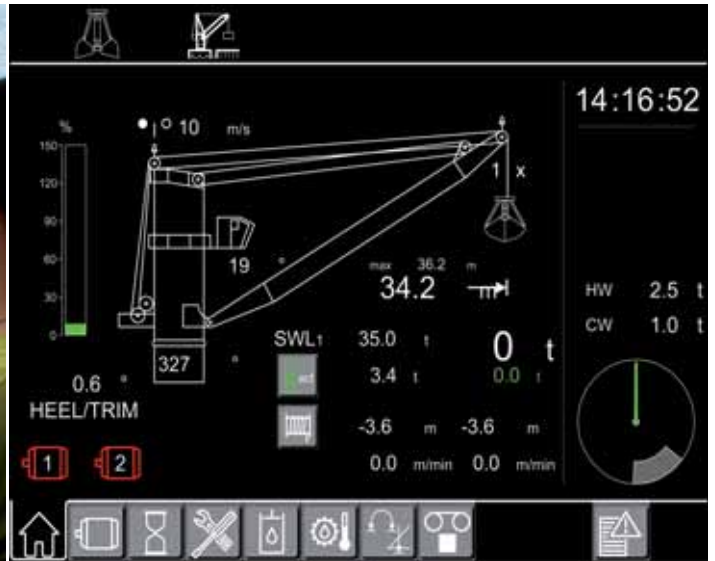
Particular attention has been paid to the ergonomic layout of the cabin as well as the optical and acoustic requirements of the driver:

- comfortable adjustable driver's seat
- full vision with front, overhead, floor and side windows of tinted safety glass
- two self-centring ergonomically positioned joysticks allow all motions to be operated simultaneously
- air-conditioning
- swing equalizers to reduce vibration to a minimum

Litronic Crane Control

Liebherr's own crane control system Litronic facilitates smooth and high speed operation as well as preventive maintenance and includes:

- load indication and limitation
- load recording
- machine data recording including alarms and failures
- determination of service / inspection intervals
- modem access for remote fault-finding
- software available in several languages



Maximum visibility range

Extended cabin

8 Liebherr Service

Over 10,000 marine and port cranes are attended by Liebherr-Werk Nenzing GmbH through a world-wide network of service centres with the aim of providing maximum efficiency through maximum machine availability.

Competence on Site

Speed and reliability are inherent attributes of Liebherr's service. Short response times mean reduced downtime and contribute to the quick restoration of crane productivity.

A close service network throughout the world guarantees support within 24 hours, if necessary. Qualified specialists are on stand-by to provide maximum availability, round the clock if required.

Optimal Spare Parts Logistics - quick, reliable, at all times

Every working hour is vital for the efficiency of a port crane. The Liebherr original spare parts service is available for customers round the clock, even at weekends and on public holidays.

Liebherr's standardised overnight distribution service secures quick and universal delivery of original parts.

Dependable Partnership

Comprehensive know-how ensures first-class and effective execution of all service and maintenance work, which contributes to availability and productivity. Liebherr combines expertise with customer's practical experience in order to constantly optimize equipment and service.

- preventive maintenance and safety checks
- individual customer service and maintenance agreements
- comprehensive training for crane drivers, service and maintenance personnel
- world-wide 24-hour customer hotline
- implementation of technical modifications and up-grades
- remote diagnoses for fault-finding and rectification



Organisation with high-speed guarantee

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

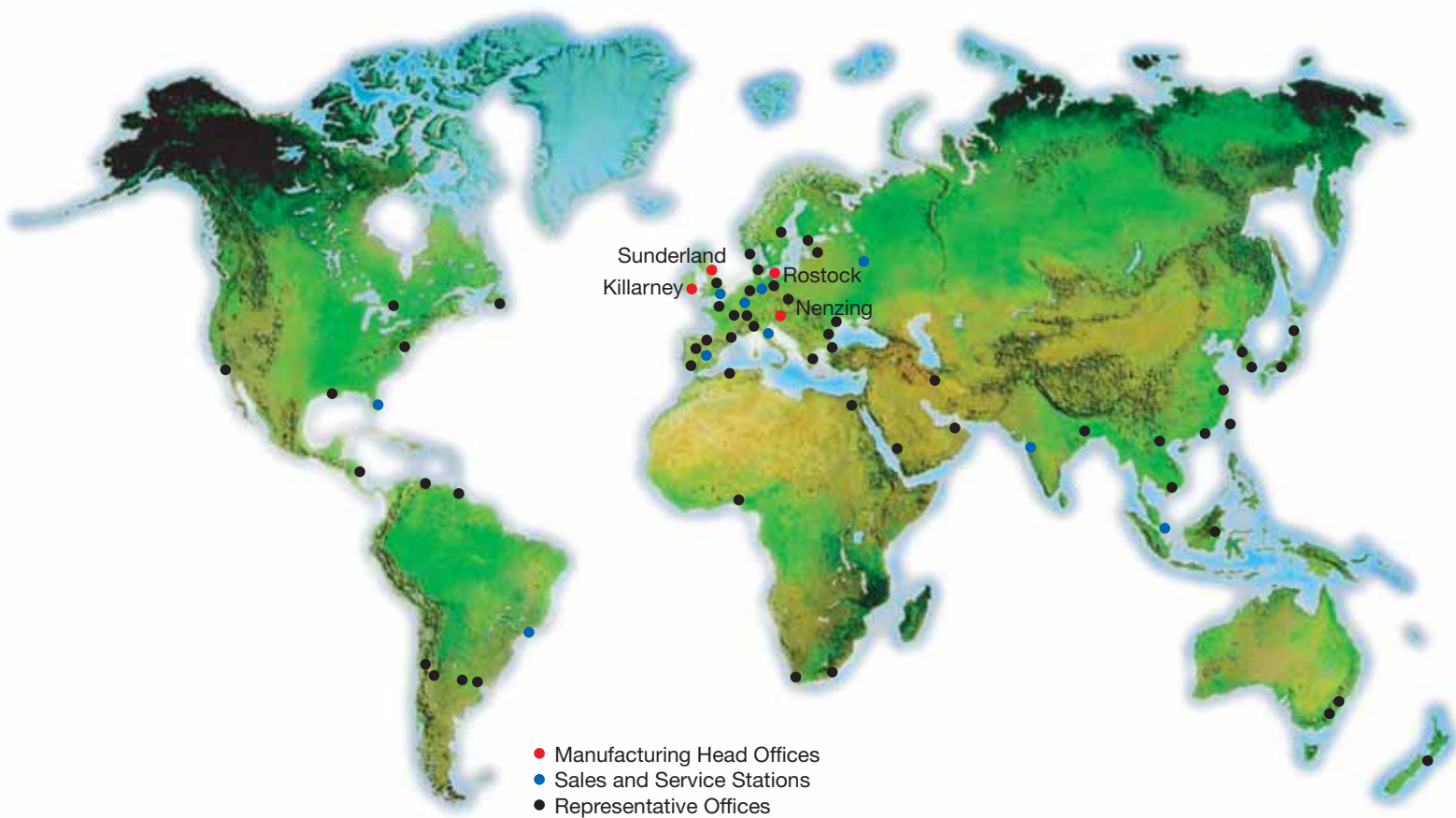
In view of the high quality that Liebherr demands of its products, mastering key technologies internally and keeping core competencies in-house has always been of great importance to the company. Therefore, Liebherr develops and produces crucial components, such as the entire propulsion and control technology,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

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.



Maritime Equipment Worldwide



Members of Liebherr-MCCtec GmbH (Maritime Division):

Liebherr-Werk Nenzing GmbH
 P.O. Box 10,
 6710 Nenzing/Austria
 Tel.: +43 50809 41 0
 Fax: +43 50809 41 500
 E-Mail: info.lwn@liebherr.com

Liebherr Container Cranes Ltd.
 Killarney, Co. Kerry
 Republic of Ireland
 Tel.: +353 64 70 200
 Fax: +353 64 31 602
 E-Mail: sales.lcc@liebherr.com

Liebherr-MCCtec Rostock GmbH
 Liebherrstrasse 1
 18147 Rostock
 Germany
 Tel.: +49 381 60 06 0
 Fax: +49 381 60 06 100
 E-Mail: info.mcr@liebherr.com

Liebherr Sunderland Works Ltd.
 Ayres Quay, Deptford Terrace
 Sunderland
 Tyne and Wear, SR4 6DD
 Great Britain
 Tel.: +44 191 51 43 001
 Fax: +44 191 51 44 191
 E-Mail: info.lsw@liebherr.com

Sales and Service Stations:

Liebherr Nenzing Crane Co.
 11801 NW 100th Road, Suite 17
 Miami, FL 33178
 USA
 Tel.: +1 305 889 0176
 Fax: +1 305 889 0655

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.
 Beeldschmerweg 2
 3821 AH Amersfoort
 Netherlands
 Tel.: +31 33 4500 830
 Fax: +31 33 4500 899

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 Great Britain Ltd.
 Stratton Business Park
 Normandy Lane
 Biggleswade, SG18 8QB
 Great Britain
 Tel.: +44 1767 602 160
 Fax: +44 1767 602 161

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

Liebherr Russland
 1-aja Borodinskaja str. 5
 Office 302
 121059 Moscow
 Russian Federation
 Tel.: +7 495 502 1734
 Fax: +7 495 933 7223

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

Liebherr Brasil Port Equipment
 Latin America
 Rua do Rocio, 288 - Cjs 81 e 82
 Vila Olímpia
 04552-000 Sao Paulo - SP
 Brazil
 Tel.: +55 11 3845 4181
 Fax: +55 11 3845 7268

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

www.liebherr.com

Liebherr-Werk Nenzing GmbH
 P.O. Box 10, A-6710 Nenzing/Austria
 Tel.: +43 50809 41-280
 Fax: +43 50809 41-448
ship.port.crane@liebherr.com
www.liebherr.com