

Docking & Mooring

PRODUCT BROCHURE



The Smarter Approach



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Better connected systems mean faster turnaround and increased throughput, improved safety and lower operating costs.

Connecting decades of experience with a new, smarter approach to port and terminal equipment optimization, Trelleborg's marine systems operation helps ports and terminals deploy smart, engineered solutions for port approach, berthing, docking and mooring. This enables better informed real-time and strategic decision making, both onshore and on board the vessel.

From port owners and operators to consulting engineers, Trelleborg works with customers to determine best fit solutions for specific applications, and supply a fully integrated solution. End-to-end service and a comprehensive product portfolio meet and exceed customer needs, enhancing safety and improving efficiency in all marine environments, from conception to completion and beyond.

Docking & Mooring

When installing or upgrading Docking & Mooring Systems, you need to ensure you choose the right partner. Ensure your provider can deliver the solution for you, on time and on budget, wherever you are in the world.

Ensure your solution is designed around the needs of you and your customers, with a dedicated team that has the experience to understand them.

Ensure your Docking & Mooring Systems feature technically superior products to maximize durability and reliability, whilst minimizing downtime and whole life costs.

Ensure your partner can offer you the maintenance and aftersales service you need.

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A Smarter Approach at every stage

A smarter approach to...

CONSULTATION

Consultation from the earliest project phase to ensure the optimum fender, mooring, navigation and transfer solutions are specified, with full technical support from our global offices.



CONCEPTS

Conceptual design in your local office – with full knowledge of local standards and regulations, delivered in your language – for optimized port and vessel solutions.



DESIGN

Concepts are taken to our Engineering Center of Excellence where our team generates 3D CAD designs, application-engineering drawings, a bill of materials, finite engineering analysis and calculations for both our fender systems and marine technology solutions.



MANUFACTURE

Our entire product range is manufactured in-house, meaning we have full control over the design and quality of everything we produce. Our strategically located, state-of-the-art facilities ensure our global, industry leading manufacturing capability.



TESTING

Across our entire product range, stringent testing comes as standard at every step in our in-house manufacturing process. We ensure that life-cycle and performance of our entire product range meet your specifications, and more.



INSTALLATION

Dedicated project management, from solution design right the way through to on site installation support. We design products and solutions that always consider ease of installation and future maintenance requirements.



SUPPORT

Local support on a truly global scale, with customer support teams all over the world. And this service doesn't stop after a product is installed. You have our full support throughout the entire lifetime of your project, including customized training programs, maintenance and onsite service and support.



THE FUTURE

Deploying the latest in smart technologies to enable fully-automated, data-driven decision making that optimizes port and terminal efficiency. At Trelleborg, we're constantly evolving to provide the digital infrastructure our industry increasingly needs.



When you choose Trelleborg you ensure your expectations will be met, because we deliver a truly end-to-end service – retaining vigilance and full control at every stage.

Total Cost Of Ownership

When considering the selection of docking and mooring equipment, a holistic review of port and terminal operations should be undertaken. This should focus on how docking and mooring solutions can impact or improve facilities ability to transfer product or personnel. A docking and mooring system is far more than just a means to berth and moor a vessel. Like with any business case for investment, when reviewing Total Cost Of Ownership (TCO) of a docking and mooring system, return on investment should be first and foremost in the decision making process.

Proper selection of docking and mooring equipment can greatly reduce facility downtime and improve operational efficiency, safety and ultimately profitability.

Some of the key points that often get overlooked in this review are factors that can negatively impact operations and the solutions that are available. While the initial investment may be higher with a premium solution, the case for return on investment is overwhelming.

FACTORS THAT NEGATIVELY IMPACT THE COST OF OWNERSHIP

- Exposed berths having to slow or stop transfer operations when metocean conditions or passing ships result in vessel motions outside the guidelines for safe or efficient transfer.
- Inefficient mooring operations extending facility downtime and adding overheads for mooring crews, pilotage and tugs.
- Unbalanced mooring loads, parting lines and having to stop transfer to tend moorings.
- Using tugs to supplement mooring systems during extreme events – passing ship or environmental.

HOW TRELLEBORG SOLUTIONS CAN MINIMIZE TOTAL COST OF OWNERSHIP AND IMPROVE PROFITABILITY OF PORT AND TERMINAL OPERATIONS

- Automated mooring solutions that can dampen vessel motion and extend the range of metocean conditions in which efficient transfer can take place or combat effects from passing ships.
- SmartPort turnkey solutions integrating multiple port and terminal subsystems.
- Confidence that equipment complies with local regulatory requirements, design codes and standards.
- Class leading structural design to accommodate worst case loading conditions and provide superior integrity for dynamic loading.
- Global aftersales support network offering total lifecycle management packages, extending asset life and minimizing downtime.
- Accredited and best practice quality systems that ensure mooring solutions reliability.

Docking and Mooring

With just under 100 dedicated docking and mooring employees worldwide, Trelleborg has the largest and most experienced docking and mooring team to provide an unparalleled level of support and expertise throughout your docking and mooring journey.

Some of the key resources that form part of the docking and mooring lifecycle are:

FUNCTIONAL AREA	PURPOSE	CORE COMPETENCY
Technical Sales Managers	The first point of contact in the Trelleborg experience, to understand your needs and establish an aligned technical and commercial solution.	<ul style="list-style-type: none"> • Application Engineering • Customer Management
Project Management	An experienced project manager will oversee the design, manufacture and delivery of your docking and mooring solution; providing regular communication and ensuring project execution on time, to budget and in accordance with the project specifications and Trelleborg ISO9001 management system.	<ul style="list-style-type: none"> • Docking & Mooring Application Expertise • Contract and Risk Management • Customer Management
Project Design Engineers	Bespoke design solutions to meet the project requirements from concept to inspection and testing.	<ul style="list-style-type: none"> • Structural & Mechanical Engineering • Electrical & Instrumentation Engineering • Software Development • Mooring Analysis • Hazardous Area Product Development and Regional Statutory Compliance • International Design Codes Compliance • Offshore Design Code Compliance (Class DNV, ABS)
Research & Development	Developing the next generation of docking and mooring solutions to improve safety, efficiency and throughput and in doing so reducing facilities' overall total operating cost and improving profitability.	
Site Service Engineers	Support for sites from commissioning, training and whole life product support.	<ul style="list-style-type: none"> • Calibration Services • Routine Maintenance • Training
Quality Assurance	Establish and ensure internal business processes and manufacturing activities are upheld to the highest achievable standards and in compliance with Trelleborg ISO9001 accredited Integrated Management System.	<ul style="list-style-type: none"> • Application Engineering • Customer Management

Applications Summary

APPLICATION	PRODUCT														
	Quick Release Hook Onshore	Quick Release Hook Offshore	Quick Release Hook Load monitoring	Quick Release Hook remote release	Free Standing Capstans	Tugger Winches	AutoMoor	Pelican (Buoy) Hooks	Hawser Hooks	Hawser Load Monitoring Bit	Chain Stoppers	Tandem Mooring Winch	Docking Systems	Enviro Monitoring	Integrated Systems
LNG carrier berths	✓		✓	✓	✓	✓	✓						✓	✓	✓
Oil berths	✓		✓	✓	✓	✓	✓						✓	✓	✓
LPG berths	✓		✓	✓	✓	✓	✓						✓	✓	✓
Bulk liquids berths	✓		✓	✓	✓	✓	✓						✓	✓	✓
Bulk materials berths	✓		✓	✓	✓	✓	✓						✓	✓	✓
Smale scale mooring	✓		✓	✓											✓
Commercial (RoRo, ferry, container)					✓	✓	✓							✓	
Cruise terminals							✓								
Buoy moorings								✓						✓	
Tandem Mooring									✓	✓		✓	✓	✓	✓
Bow to a Single Point Mooring (SPM)											✓	✓			
Spread mooring											✓	✓		✓	✓
(F)LNG and FSRU vessels		✓	✓	✓										✓	✓
Offshore berths													✓	✓	
Ship-to-ship		✓	✓	✓									✓		✓
Bunkering		✓	✓	✓											✓

Application Summary

Quick Release Hook
Onshore
+ LMS/ERR/Capstan



Hawser Hook



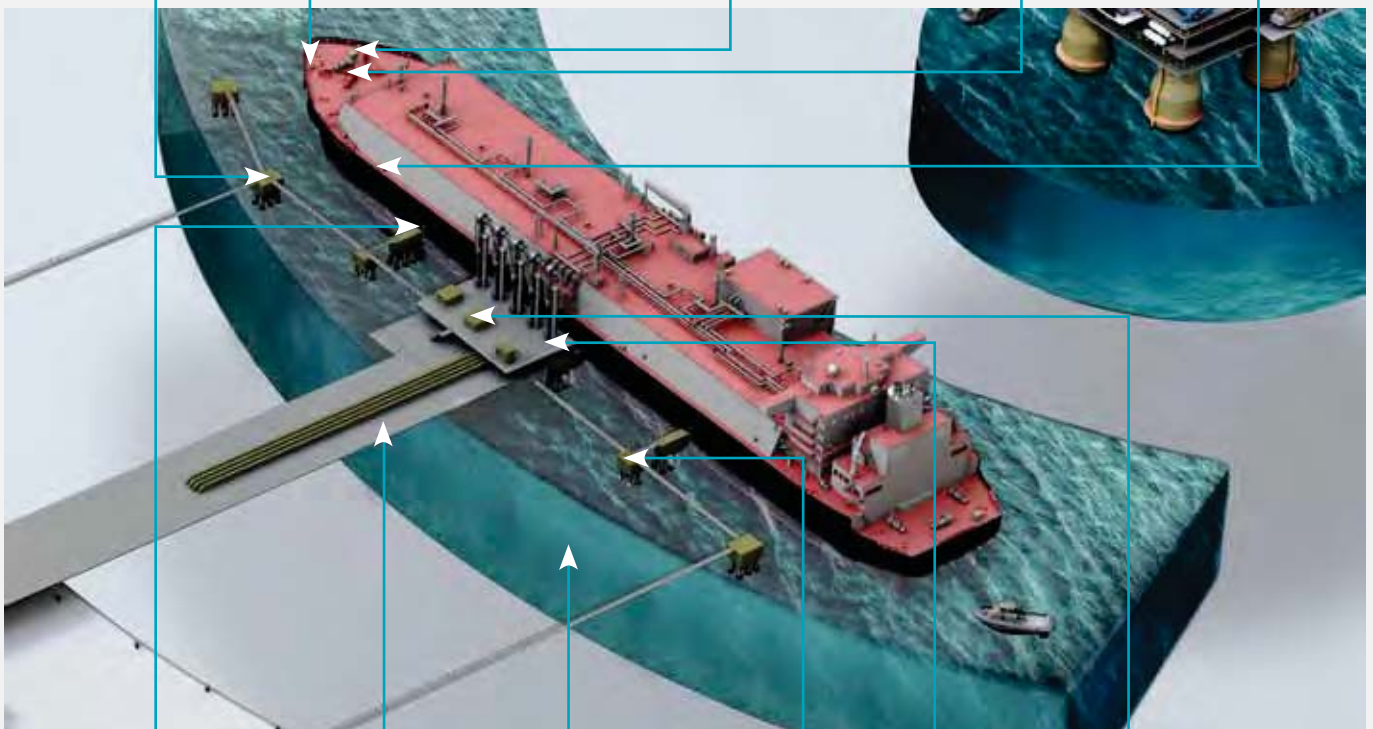
Chain Stopper



Winches &
Hawser Reels



Quick Release Hook
Offshore
+ LMS/ERR/Capstan



AutoMoor



Environmental Monitoring



Docking
+ Display Board
+ Lasers



Integrated System



Quick Release Hook



Since 1972, Quick Release Hooks (QRH) have enabled mooring lines to be safely secured, and quickly and easily released, even when loaded to their safe working load limit.

A range of hook sizes and capacities are available, as well as various mounting options. Typically, a cast QRH base is used for new installations. To upgrade older facilities, fabricated hook bases can be designed to suit existing hold-down bolt patterns.

For offshore applications, the QRH is class certified and designed for a new generation of ship-to-ship FLNG and bunkering applications.

Powered By
SmartPort



QRH Onshore

FEATURES

Safe, efficient and reliable mooring operations

Options to suit all types of mooring ropes, loading conditions and foundations

Low maintenance option available

Integrated capstan available with speed and power options

Low profile and compact footprint

All hooks individually tested

All hooks can be safely released, even at the hook safe working load (SWL)

Compliant with international standards

APPLICATIONS

LNG carrier berths

Oil berths

LPG berths

Bulk liquids berths

Bulk materials berths

Small scale mooring

ADD-ONS

■ Low maintenance, dual lock, safety keeper bars and grit guards (refer to page 17)

■ Capstan (refer to page 20)

■ Load monitoring (refer to page 21)

■ Hook release (refer to page 23)

■ Tugger winch (refer to page 27)

■ Integration with the central monitoring system (refer to page 55)

QRH Offshore

FEATURES

Safe, efficient and reliable mooring operations

Low maintenance option available

Integrated capstan available with speed and power options

Low profile, compact footprint and efficient integration with ship deck super structure

All hooks individually tested

All hooks can be safely released, even at the hook safe working load (SWL)

Class certificate including DNV, ABS, Lloyds or BV

Stowing place for capstan foot switch to avoid damage due to ship movement

APPLICATIONS

Ship-to-ship mooring

Import LNG terminals

Export LNG terminals

Offshore ship-to-ship mooring on FLNG bunkering

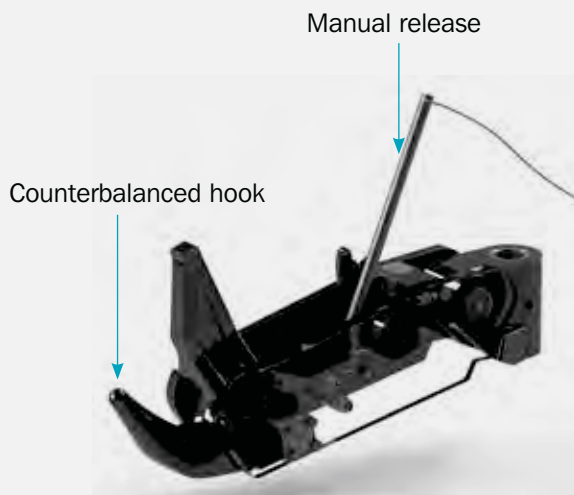
Quick Release Hooks

COUNTERBALANCED HOOKS

The cast mooring hook is counterbalanced for easy reset by operators. The smooth hook profile, rope throat area and steep rake angle ensure the rope sits correctly, providing greater load monitoring accuracy, reduced stress concentrations and chafing.

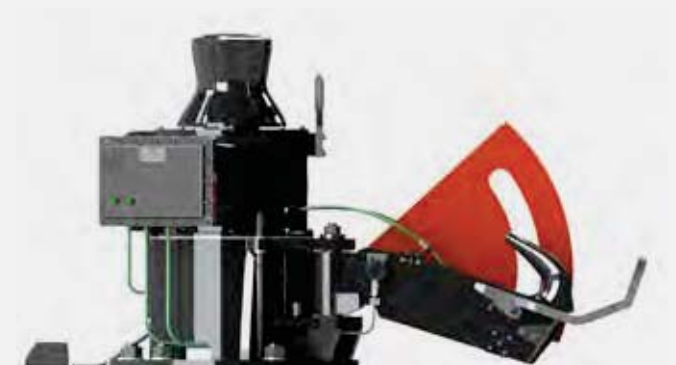
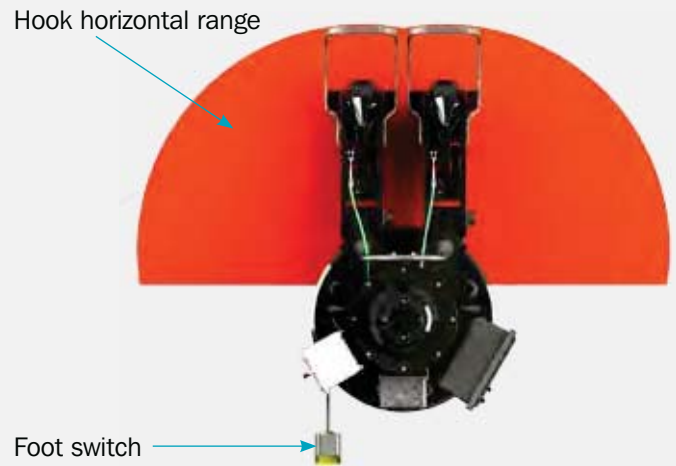
MANUAL RELEASE

All hook release components are enclosed within the hook side plates, protecting the mechanism from debris and damage. A 20kg force is required to release the hook at full load while a single operator stands safely behind the hook.



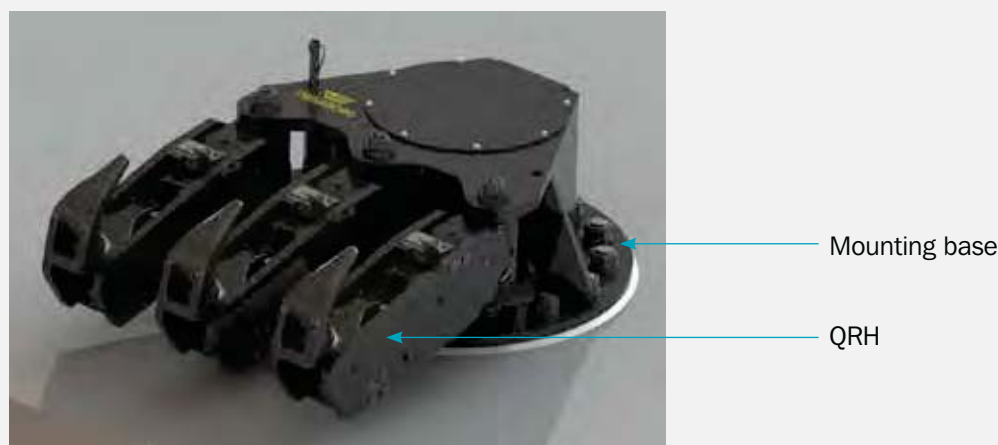
LARGE MOORING ANGLES

Hooks can rotate under full load through horizontal angles up to ± 90 degrees and vertical angles 0 to $+45$ degrees or more.



BASES

Single or multiple hooks configurations are available. Bases can be cast or fabricated to suit new or retrofit installations.



Add Ons

INTEGRATED CAPSTANS

Capstans are fully enclosed within the base for ultra low maintenance, corrosion protection and reliability. Various load ratings and running speeds are available to suit all ship sizes and mooring line materials (refer to page 20).

ROPE GUIDE

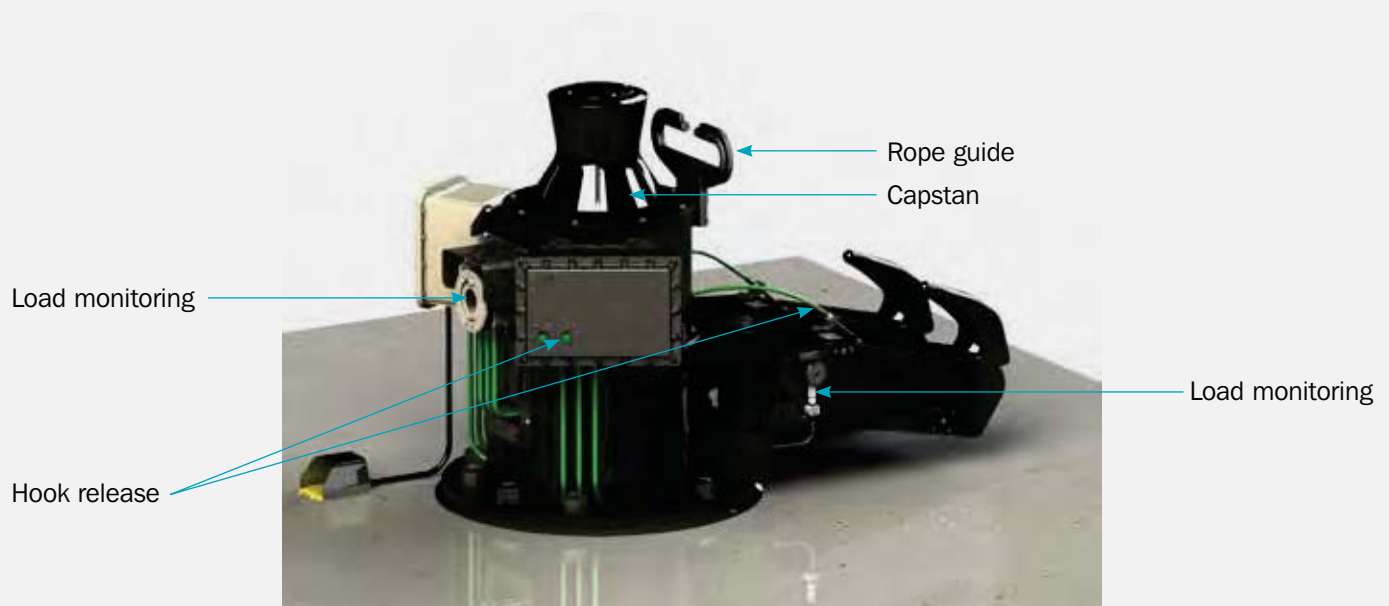
Rope guide for efficient and safe line handling during capstan operation.

LOAD MONITORING

Load cells can be incorporated into each hook to provide monitoring and warning of mooring line tension for each QRH installed on the jetty efficiently and with increased safety (refer to page 21).

HOOK RELEASE

The hook release system allows for simple and safe release of mooring lines from each hook using local or remote pushbutton controls (refer to page 23).



SAFETY KEEPERS

Safety Keepers prevent slack mooring lines from accidentally detaching at high vertical angles (refer to page 18).

HAZARDOUS AREA OPERATIONS

All electrical components are certified for hazardous area operations (where required). The hook design prevents contact with the structure during mooring and on release, eliminating spark risk.

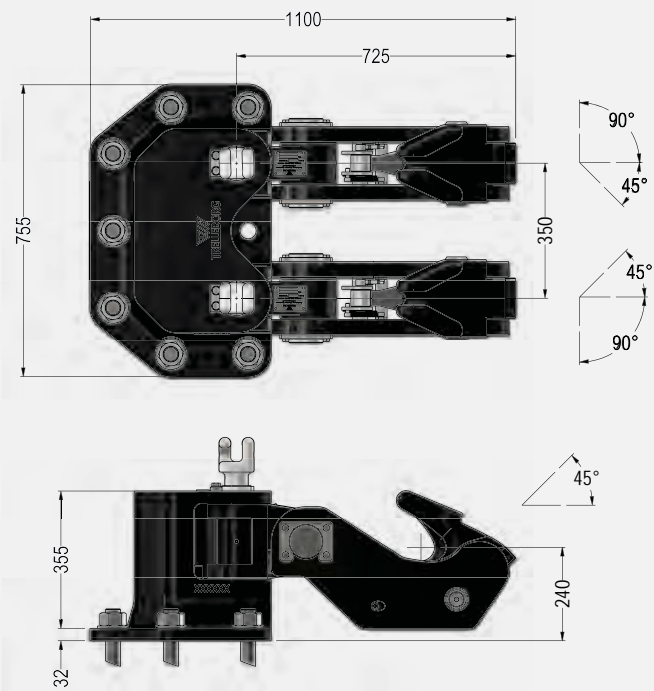
Quick Release Hook - Onshore Options

QUICK RELEASE HOOK & BASE OPTIONS	SWL (T)	INTEGRAL CAPSTAN
50 Series	50	N/A
60 Series	60	Available
75 Series	75	Available
100 Series	100	Available
125 Series	125	Available
150 Series	150	Available

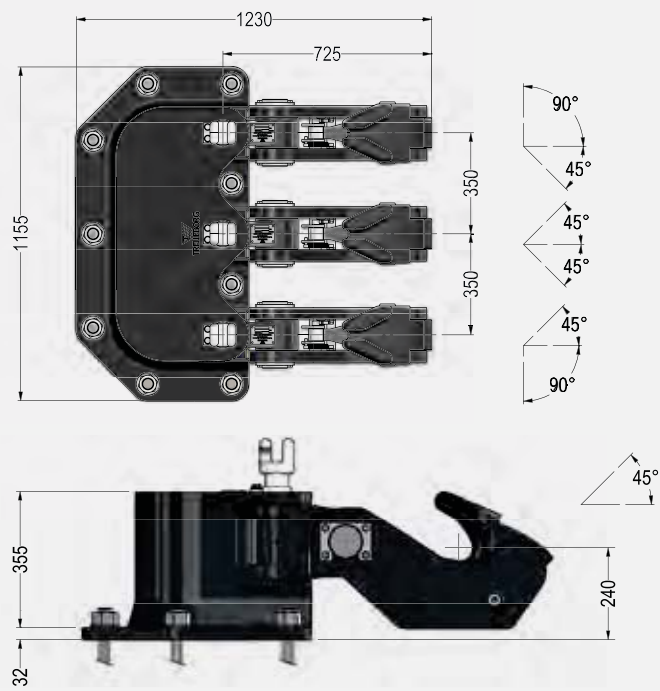


QRH 50 Series

DOUBLE HOOK

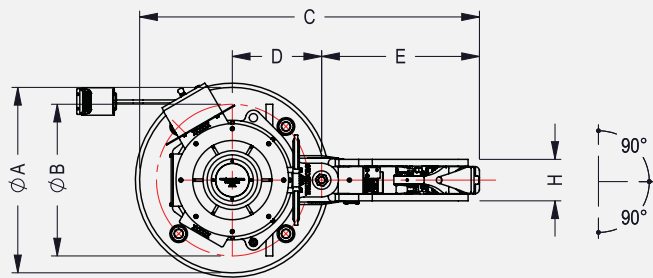


TRIPLE HOOK

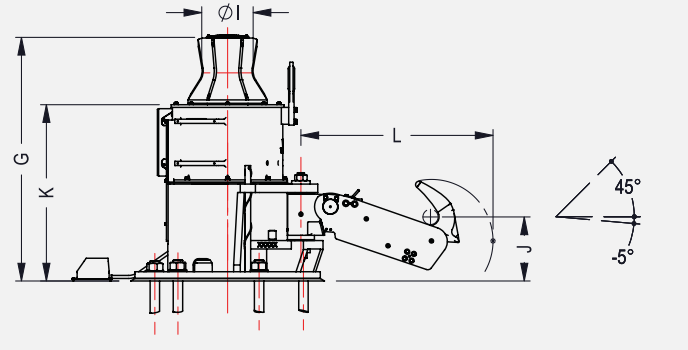
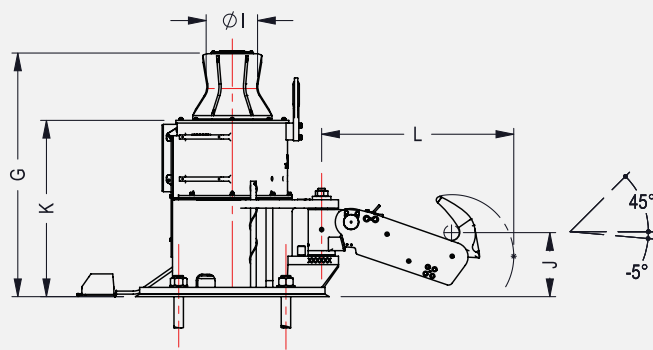
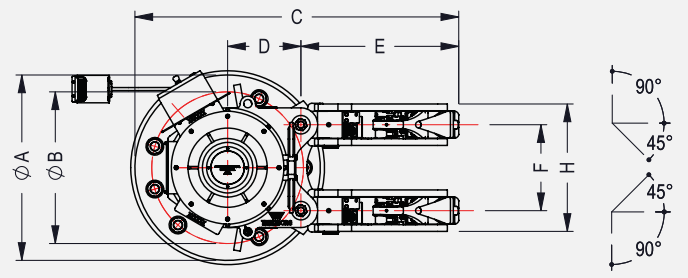


QRH 60-150 Series

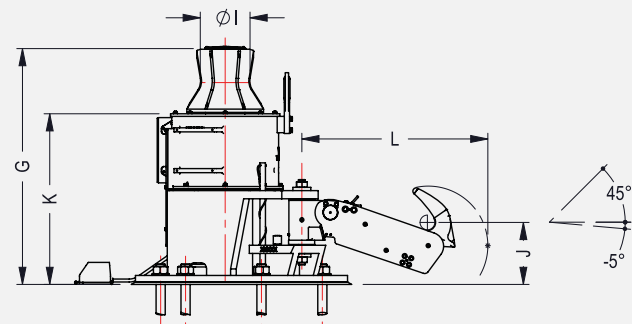
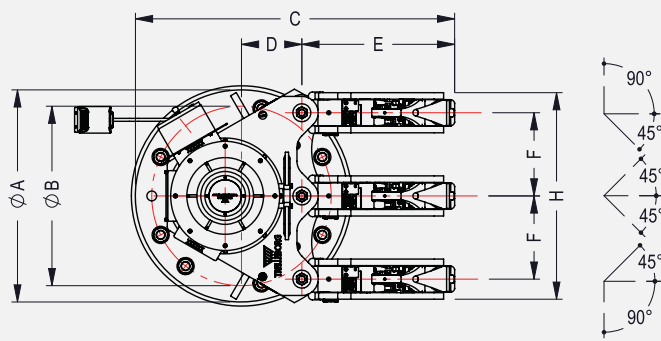
SINGLE HOOK



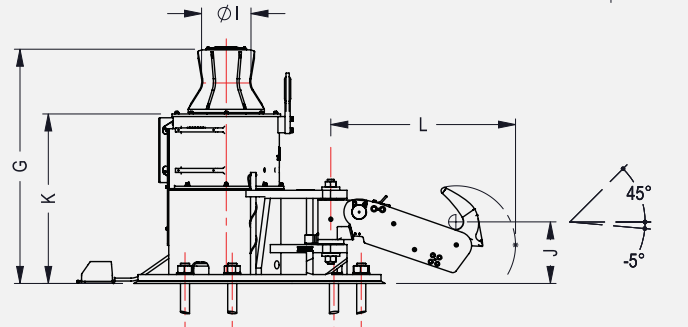
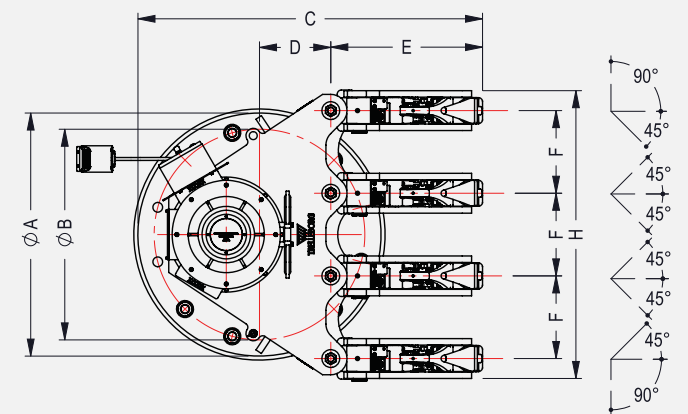
DOUBLE HOOK



TRIPLE HOOK



QUADRUPLE HOOK



Model numbers & Dimensions

MODEL NUMBER	QTY QRH	A	B	C	D	E	F	G	H	I	J	K	L	HD BOLT QTY	SHIPPING MASS kg
CB45 (SAFE WORKING LOAD = 45 T)															
CP45-01	Single	1100	900	2016	530	936	–	1445	246	305	380	1045	1140	4	1450
CP45-02	Double	1100	900	1921	435	936	510	1445	756	305	380	1045	1140	5	1500
CP45-03	Triple	1300	1100	1956	370	936	510	1445	1266	305	380	1045	1140	6	2130
CP45-04	Quad.	1500	1300	2126	430	936	510	1445	1776	305	380	1045	1140	10	2870
CB60 (SAFE WORKING LOAD = 60 T)															
CP60-01	Single	1100	900	2016	530	936	–	1445	246	305	380	1045	1140	4	1450
CP60-02	Double	1100	900	1921	435	936	510	1445	756	305	380	1045	1140	5	1500
CP60-03	Triple	1300	1100	1956	370	936	510	1445	1266	305	380	1045	1140	8	2130
CP60-04	Quad.	1500	1300	2126	430	936	510	1445	1776	305	380	1045	1140	10	2870
CB75 (SAFE WORKING LOAD = 75 T)															
CP75-01	Single	1100	900	2016	530	936	–	1445	246	305	380	1045	1140	4	1450
CP75-02	Double	1100	900	1921	435	936	510	1445	756	305	380	1045	1140	5	1500
CP75-03	Triple	1300	1100	1956	370	936	510	1445	1266	305	380	1045	1140	8	2130
CP75-04	Quad.	1500	1300	2126	430	936	510	1445	1776	305	380	1045	1140	10	2870
CB100 (SAFE WORKING LOAD = 100 T)															
CP100-01	Single	1100	900	2127	530	1047	–	1445	262	305	385	1045	1260	4	1530
CP100-02	Double	1100	900	2032	435	1047	510	1445	772	305	385	1045	1260	7	1600
CP100-03	Triple	1300	1100	2067	370	1047	510	1445	1282	305	385	1045	1260	10	2280
CP100-04	Quad.	1500	1300	2237	430	1047	510	1445	1792	305	385	1045	1260	14	3070
CB125 (SAFE WORKING LOAD = 125 T)															
CP125-01	Single	1100	900	2126	530	1046	–	1445	262	305	385	1045	1260	7	1700
CP125-02	Double	1200	1000	2081	435	1046	510	1445	772	305	385	1045	1260	11	1840
CP125-03	Triple	1300	1100	2066	370	1046	510	1445	1282	305	385	1045	1260	14	2460
CP125-04	Quad.	1650	1450	2324	440	1046	510	1445	1792	305	385	1045	1260	14	3370
CB150R (SAFE WORKING LOAD = 150 T)															
CP150R-01	Single	1100	900	2126	530	1046	–	1445	262	305	385	1045	1260	7	1700
CP150R-02	Double	1200	1000	2081	435	1046	510	1445	772	305	385	1045	1260	11	1840
CP150R-03	Triple	1300	1100	2066	370	1046	510	1445	1282	305	385	1045	1260	14	2460
CP150R-04	Quad.	1650	1450	2324	440	1046	510	1445	1792	305	385	1045	1260	14	3370
CP200 (SAFE WORKING LOAD = 200 T)															
Dimensions available upon request															

Note 1 : Dimensions are in mm.

Note 2 : Dimensions are typical. Always request a certified hook/base drawing before starting construction.

Note 3 : Customized bases to suit bolt patterns are available upon request.

Note 4 : Shipping mass includes base, capstan, hold down bolts and packing. Mass is for indication only.