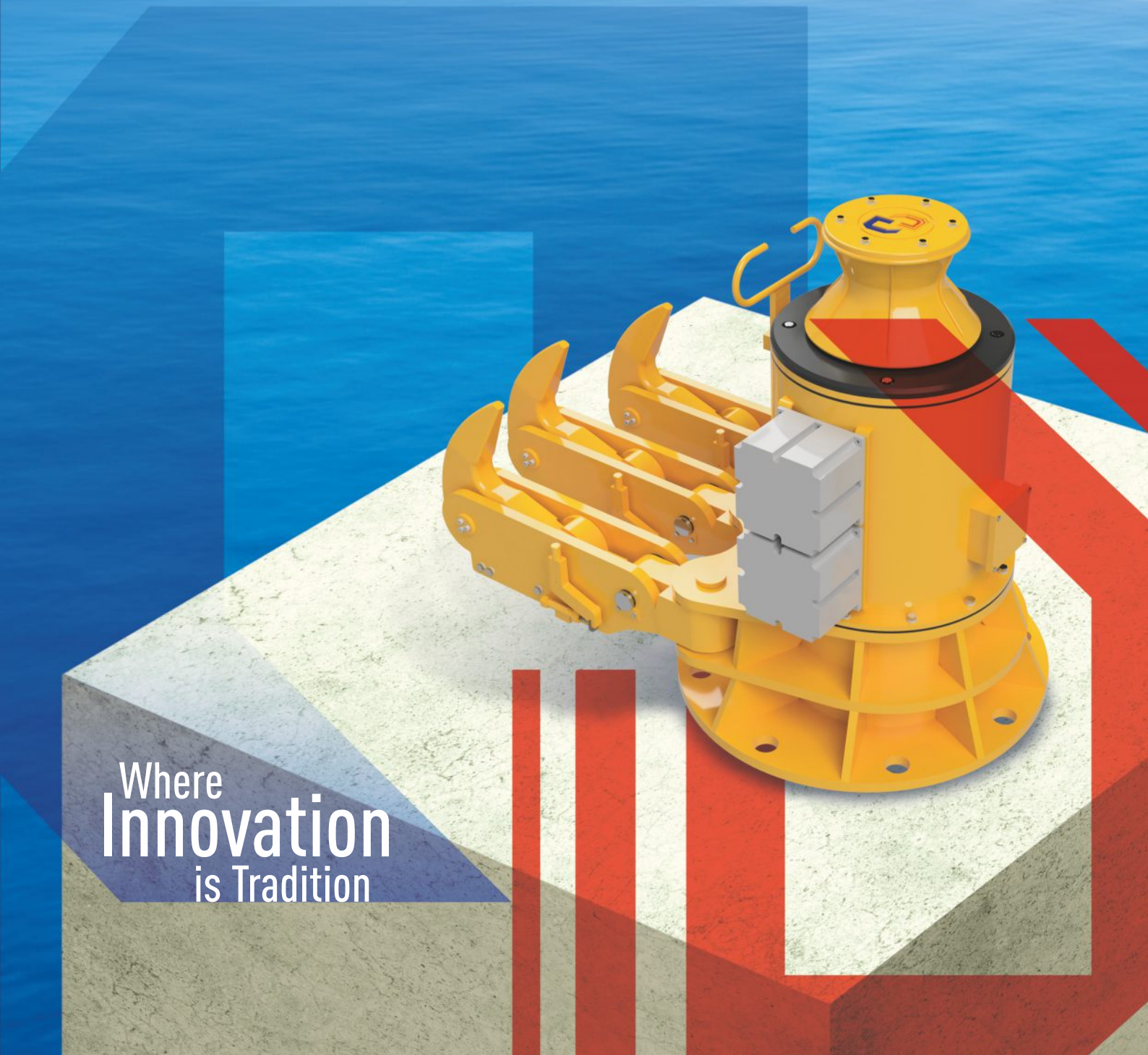
HI-TECH ELASTOMERS LTD.

DOCKING AND MOORING

QUICK RELEASE MOORING HOOKS (HQRMH)



Where
Innovation
is Tradition

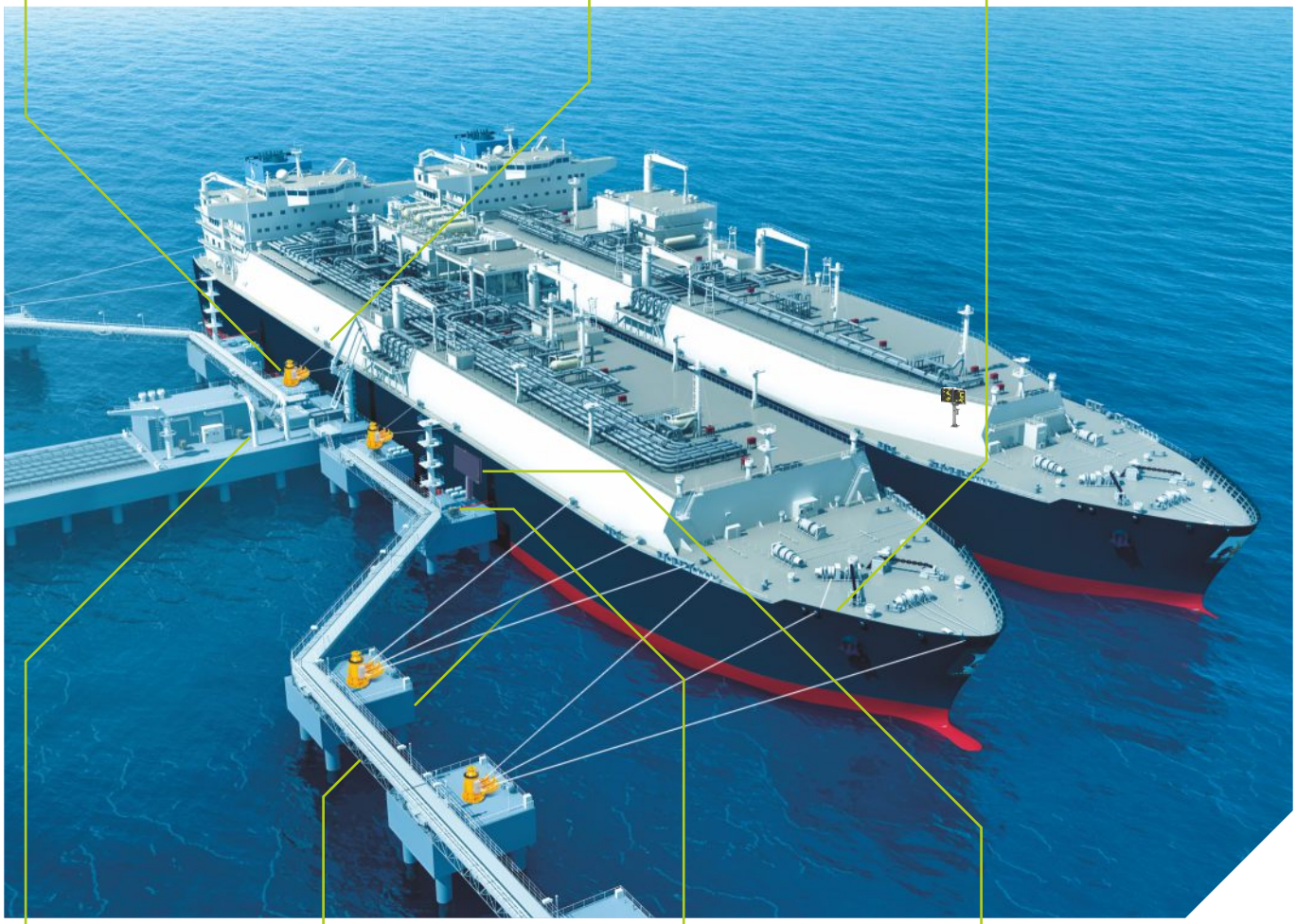
APPLICATION SUMMARY

APPLICATION	QUICK RELEASE HOOK LOAD MONITORING	QUICK RELEASE HOOK REMOTE RELEASE	FREE STANDING CAPSTANS	HAWSER HOOKS	DOCKING SYSTEMS	ENVIRONMENTAL MONITORING	INTEGRATED SYSTEMS
	PRODUCT						
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	✓	✓			✓		
Bunkerin	✓	✓					

QUICK RELEASE MOORING HOOKS (HQRMH)

FREE STANDING CAPSTANS

HAWSER HOOKS

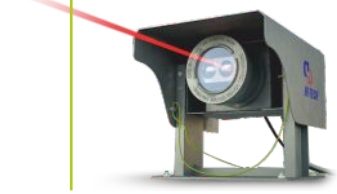


METEOROLOGICAL MONITORING

OCEANOGRAPHIC MONITORING

ENVIRONMENTAL MONITORING

DAS LASERS



DOCKING SYSTEMS

DAS DISPLAY BOARD

QUICK RELEASE MOORING HOOKS (HQRMH)

Quick Release Mooring Hooks (HQRMH) enable 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.

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, compact footprint and efficient integration with ship deck superstructure
- 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 and LPG berths
- Bulk liquids and materials berths
- Small scale mooring
- Ship-to-ship mooring
- Import and Export LNG terminals

QUICK RELEASE MOORING HOOKS (HQRMH)

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

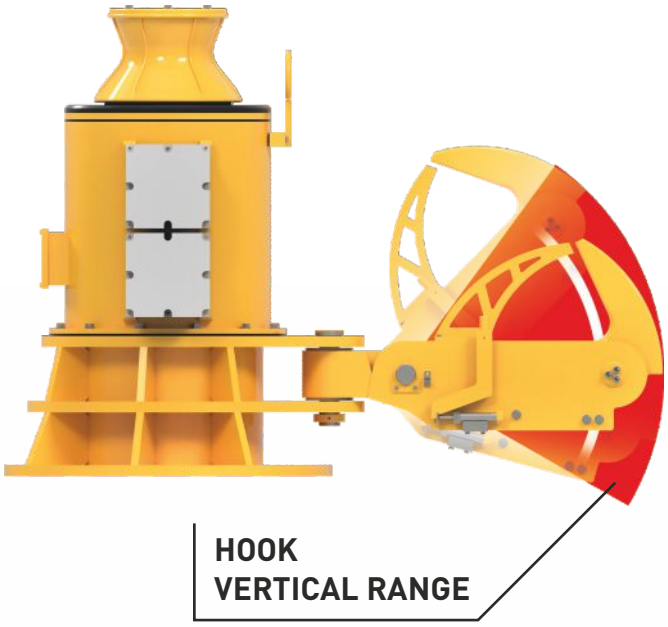
All hook release components are enclosed within the hook side plates, protecting the mechanism from debris and damage. A 20kg force is required to release the hook at full load while a single operator stands safely behind the hook.

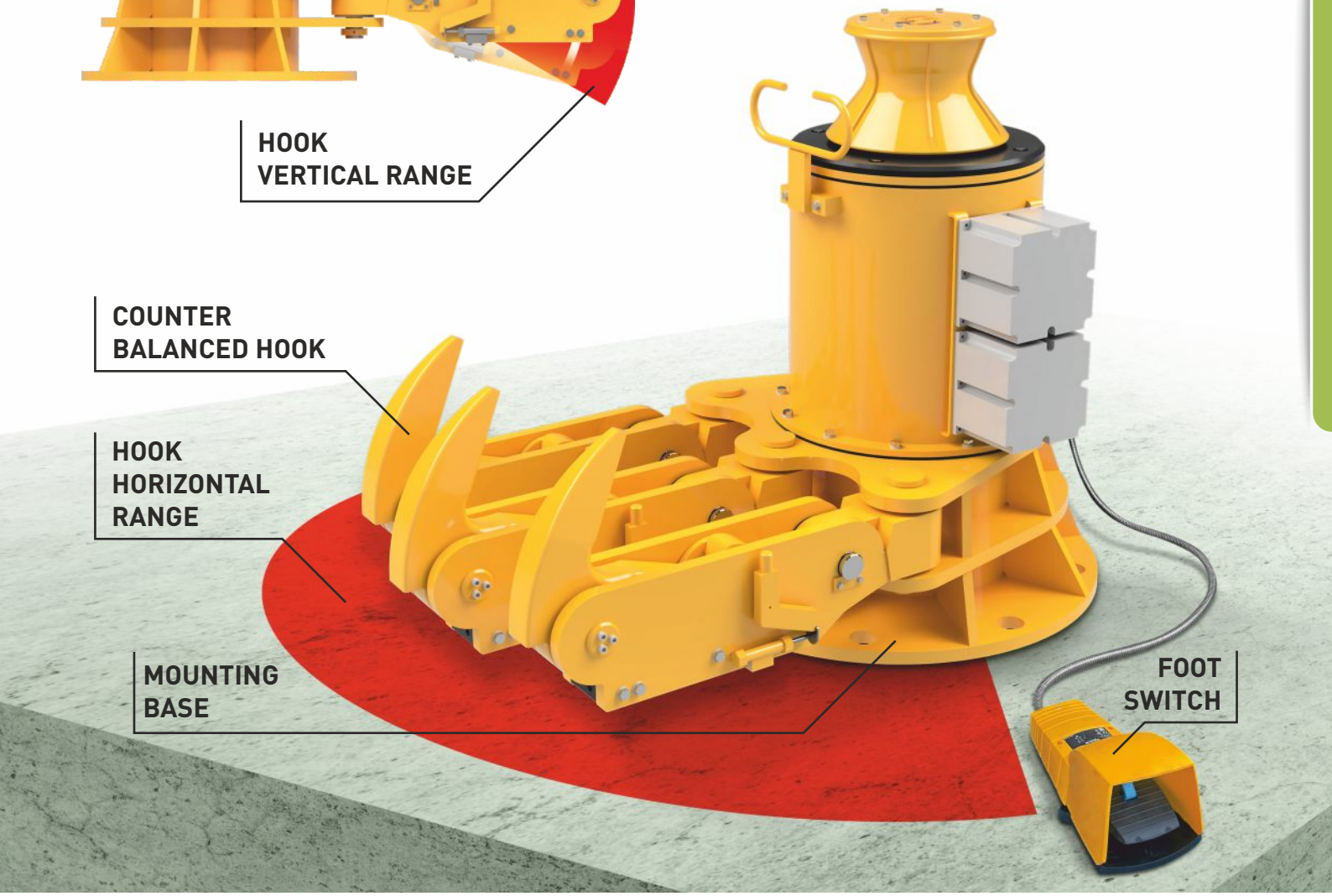
LARGE MOORING ANGLES

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.





QUICK RELEASE MOORING HOOKS (HQRMH)

ADD ONS & FEATURES

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.

ROPE GUIDE

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

SAFETY KEEPERS

Safety Keepers prevent slack mooring lines from accidentally detaching at high vertical angles.

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.

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.

HOOK RELEASE

The hook release system allows for simple and safe release of mooring lines from each hook using local or remote pushbutton controls.

QUICK RELEASE MOORING HOOKS (HQRMH)

ADD ONS & FEATURES

LOW MAINTENANCE

The low maintenance range of QRH builds on Hi-Tech Marine Systems' renowned design to engineer a QRH that is virtually maintenance free, which is critical for operations where maintenance access is restricted or where there are extreme operating conditions.

FEATURE

The upgrade uses a combination of custom self lubricating bushes and stainless steel sleeves to provide a low friction bearing surface for all moving parts, offering excellent corrosion resistance and years of greatly reduced or maintenance free operation. This is available either as part of a new hook unit or as a kit for retrofit (requires rebuild).

BENEFITS

- Reduced maintenance costs and increased operational time.
- Increased protection against hook seizures caused by long periods of no maintenance.
- Increased lifespan in comparison to a standard hook

SAFETY KEEPER BARS

The Keeper Bar improves safety and efficiency of mooring operations by eliminating inadvertent releases of mooring lines caused by positive line angles. This is done by increasing the safe vertical operating range of a QRH and ensuring correct positioning of the mooring line at the throat of the mooring hook.

HOW IT WORKS

The Keeper Bar holds the mooring line in the throat of the QRH. As tension is applied to the mooring line the Keeper Bar lifts the QRH to ensure it is correctly aligned with the applied load / mooring line.

BENEFITS

- Improved safety and efficiency by eliminating inadvertent line release.
- Acts as a rope guide during mooring.
- Protects against paint damage when adjacent hooks clash together as mooring lines are tensioned.

QUICK RELEASE MOORING HOOKS (HQRMH)

ADD ONS & FEATURES

DUAL LOCK

The dual lock QRH provides a robust solution to increase plant safety for bulk material terminals. These terminals are subject to an environment with airbourne particulate matter which can deposit on the locking mechanism of a conventional QRH, jeopardizing safety.

Without regular maintenance and careful operational checks, such deposits can result in a QRH being set in a “hair trigger” position. Often, busy shipping schedules leave little time for maintenance and correct operation of the hook is reliant on the training and diligence of the operator.

The dual lock QRH utilizes a secondary locking latch that engages with the primary locking mechanism of the QRH. The system can be provided as a manual only option or fully integrated into Hi-Tech Electric Remote Release System. An upgrade kit can also be provided for retrofit to existing hooks.

GRIT GUARD

In bulk material terminals, especially iron ore, dirt may accumulate over the QRH mechanism which requires more frequent maintenance.

The grit guard is fitted on the hook to prevent dirt build up and reduce the maintenance frequency without obstruction to normal operation.

QUICK RELEASE MOORING HOOKS (HQRMH)

ADD ONS & FEATURES

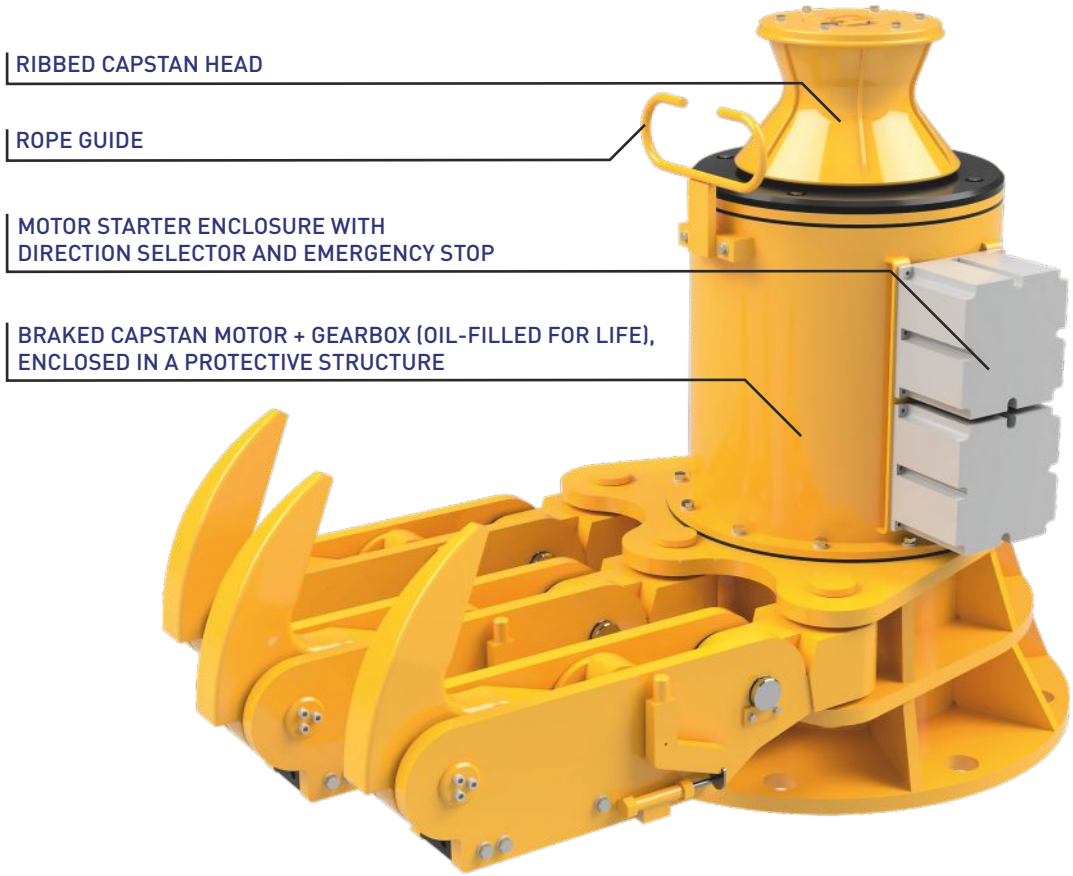
INTEGRATED CAPSTAN

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 Free Standing Capstans on page 25 for additional information.

FEATURES

- Ribbed capstan head and integral rope guide for improved line handling.
- Enclosed design for protection from harsh marine environment and mechanical damage
- Reversible direction, emergency stop and automatic brake for improved operator safety.
- Rugged low profile footswitch for safer operations.
- Nominal line speed of 30 meters / minute (other speeds and line pull sizes available upon request).



AREA CLASSIFICATION	LINE PULL (T)	STARTING PULL (T)	MOTOR SIZE (KW)
Hazardous Safe	1	2	5.5
Hazardous Safe	1.5	3	7.5
Hazardous Safe	2	4	11
Hazardous Safe	3	6	15

QUICK RELEASE MOORING HOOKS (HQRMH)

ADD ONS & FEATURES

LOAD MONITORING SYSTEMS

Operating autonomously, or integrated with a central monitoring system, the Hi-Tech SmartHook load monitoring system enables safe mooring and efficient line handling by providing real-time mooring line tension and alarm warning.

The Hitech load cell located in the QRH integrates seamlessly with the SmartHook on the QRH base. Local processing is then done before this data is sent to the central monitoring system; this also enables control of warning lights and sirens on the dolphin without a connection to a central monitoring system.

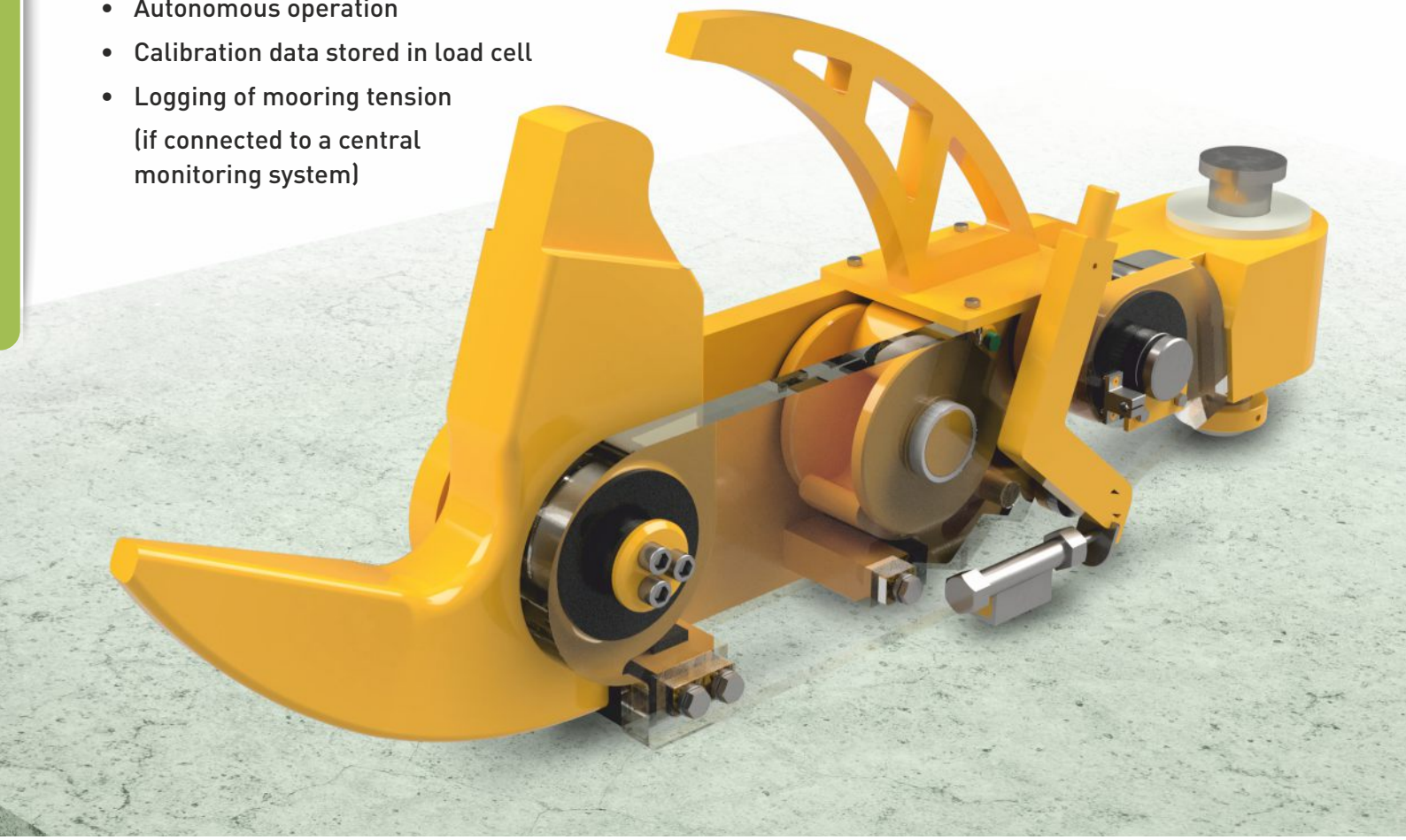
FEATURES

- Real-time monitoring of mooring tension
- Local processing and calculation of loads
- Autonomous operation
- Calibration data stored in load cell
- Logging of mooring tension
  (if connected to a central monitoring system)

SMARTHOOK

The SmartHook reads the calibration data stored in the load cell and uses this to calculate the mooring tension. A local display allows the mooring crew to quickly and easily see the current tension on the mooring rope. Alarms are also generated from the SmartHook and this can be connected to a warning light and siren to alert the ship's crew.

Load cells	Max of 4 load cells connected per SmartHook
Communications output	RS 485 Modbus RTU
LCD Display Information	Hook load, error information and alarm status
Area classification	Hazardous or non-hazardous
IP Rating	Ip66



QUICK RELEASE MOORING HOOKS (HQRMH)

ADD ONS & FEATURES

LOAD CELL

Each load cell is manufactured from high quality stainless steel and load tested up to 150% of the safe working load (SWL). Calibration data is stored inside the load cell enabling load cells to be placed in any hook anywhere on the jetty.

Calibrated range	0 to SWL (T)
Accuracy	±2%
Material	Grade 431 or 630 stainless steel
Area classification	Hazardous or non-hazardous
IP Rating	Ip66

WARNING LIGHT AND SIREN

The warning light and siren can be connected to the SmartHook to allow audible and visual indication of an alarm condition

QUICK RELEASE MOORING HOOKS (HQRMH)

HOOK RELEASE SYSTEM

The hook release system allows quick release hooks to be released from no load up to the SWL using either a manual release lever or an electric remote release system.

The electric remote release system has the added benefit of allowing the operator the option to release mooring lines safely from a distance.

FEATURES

- Release from no load to SWL
- Remote release keeps operators out of danger zone
- Manual release system as standard on all hooks

ADD-ONS

- Pushbutton remote release console
- PC based remote release console

Local release controller

Manual release

The manual release of the hook is possible up to the SWL. The release mechanism is designed so that only ~ 20kg of force is required to release the hook at the SWL.

QUICK RELEASE MOORING HOOKS (HQRMH)

HOOK RELEASE SYSTEM

LOCAL RELEASE CONTROLLER

The local release controller enables the hook to be released by pushbuttons (on the front of the controller), or remotely from a release console. The hook release is achieved by an electric actuator connected to the hook via a stainless steel push-pull cable.

Local Release Controller

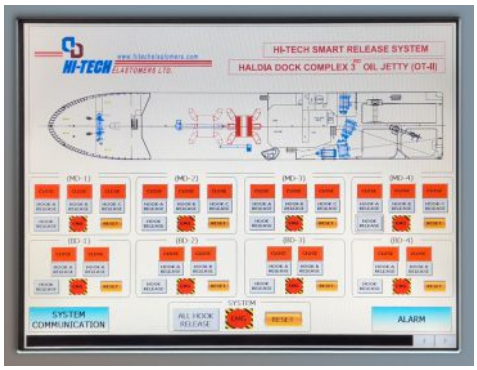
ENCLOSURE DETAILS

Hooks	Max of 4 hooks connected per local release controller
Communications output	RS 485 Modbus RTU
Area classification	Hazardous or non-hazardous
IP Rating	Ip66

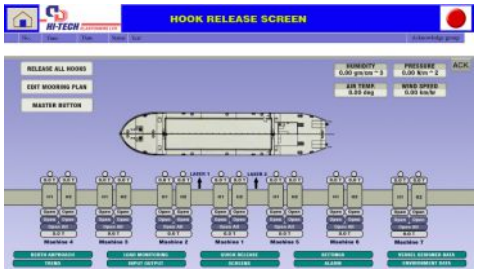
REMOTE RELEASE CONSOLE

The remote release console enables releasing of the hook from a remote location, such as the jetty control room or the upper deck of the jetty. Consoles can be either pushbutton or PC based.

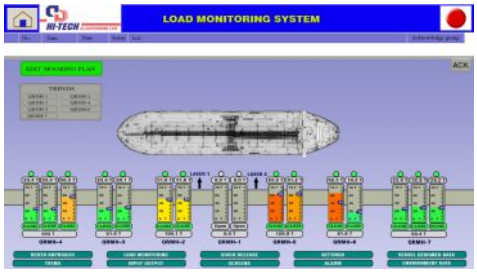
PC based consoles can also include an optional hook release control station for arming the hook release system.



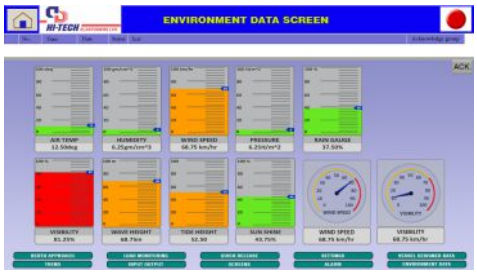
Hook Release Control Station



PC Based Remote Release System



Load Monitoring System



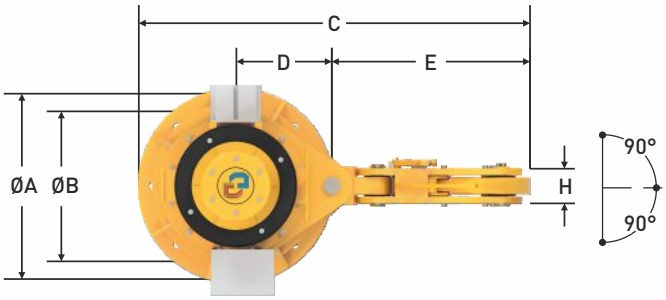
Weather Monitoring System

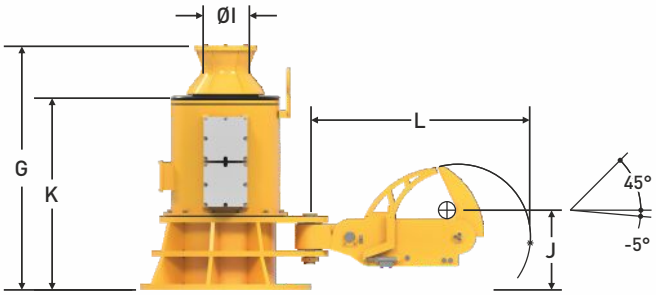
QUICK RELEASE MOORING HOOKS (HQRMH)

DIMENSIONS

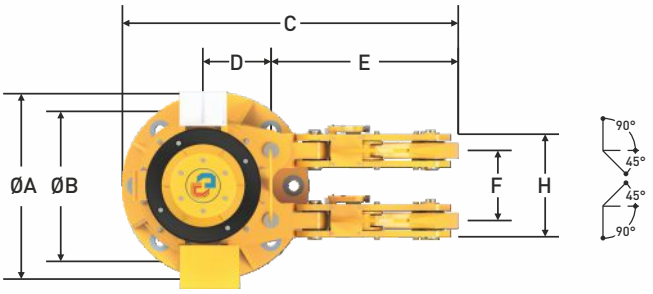
HQRMH 45-150 SERIES

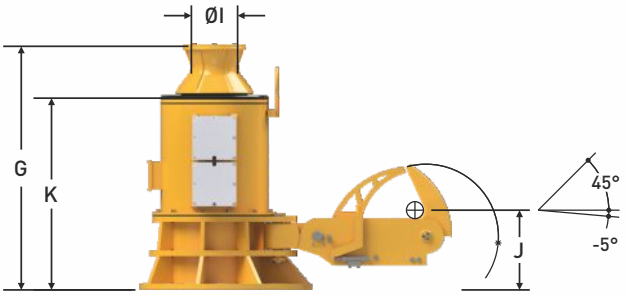
SINGLE HOOK



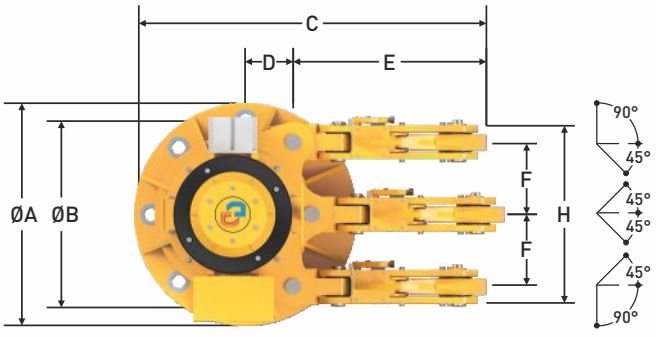


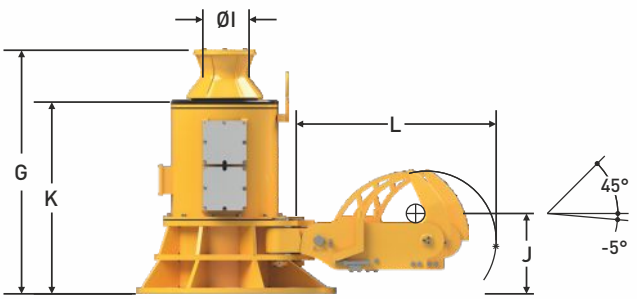
DOUBLE HOOK



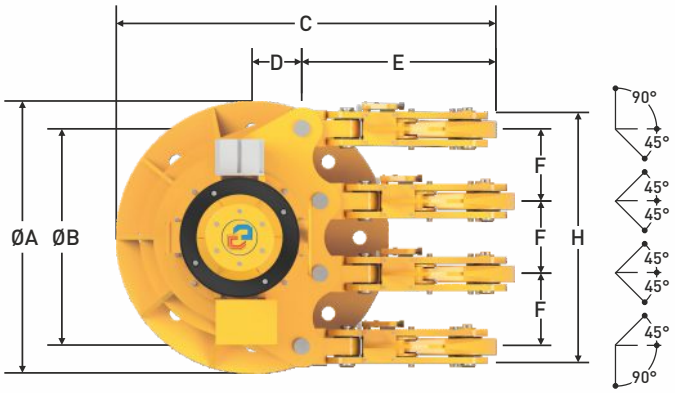


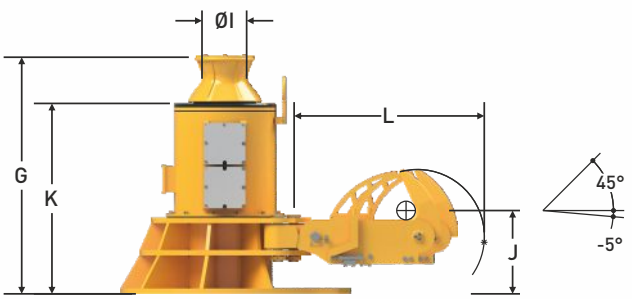
TRIPLE HOOK





QUADRUPLE HOOK





QUICK RELEASE MOORING HOOKS (HQRMH)

MODEL NUMBERS & DIMENSIONS

MODEL NUMBER	QTY QRH	A	B	C	D	E	F	G**	H	I	J	K**	L	HD BOLT QTY
CB45 (SAFE WORKING LOAD = 45 T)														
CP45-01	Single	790	650	1600	390	815	-	1513	202	292	377	1192	1036	6
CP45-02	Double	980	750	1600	295	815	400	1513	602	292	377	1192	1036	6
CP45-03	Triple	1030	800	1660	330	815	400	1513	1002	292	377	1192	1036	8
CP45-04	Quad.	1040	800	1675	340	815	400	1513	1402	292	377	1192	1036	10
Cb60 (SAFE WORKING LOAD = 60 T)														
CP60-01	Single	810	650	1705	400	900	-	1513	217	292	416	1192	1143	6
CP60-02	Double	980	790	1700	310	900	400	1513	617	292	416	1192	1143	8
CP60-03	Triple	1060	800	1780	350	900	400	1513	1017	292	416	1192	1143	8
CP60-04	Quad.	1100	850	1810	360	900	400	1513	1417	292	416	1192	1143	10
CB75 (SAFE WORKING LOAD = 75 T)														
CP75-01	Single	1050	892	2113	518	1070	-	1513	247	292	495	1192	1360	8
CP75-02	Double	1125	892	1923	390	1070	400	1513	647	292	495	1192	1360	8
CP75-03	Triple	1235	935	2058	440	1070	400	1513	1047	292	495	1192	1360	8
CP75-04	Quad.	1500	1180	2245	445	1070	400	1558	1450	292	540	1558	1360	10
CB100 (SAFE WORKING LOAD = 100 T)														
CP100-01	Single	1100	950	2320	530	1240	-	1570	277	292	540	1212	1570	8
CP100-02	Double	1235	1075	2258	400	1240	400	1570	677	292	540	1212	1570	10
CP100-03	Triple	1380	1100	2373	443	1240	400	1620	1077	292	590	1262	1570	10
CP100-04	Quad.	1610	1250	2508	463	1240	400	1620	1477	292	590	1262	1570	10
CB125 (SAFE WORKING LOAD = 125 T)														
CP125-01	Single	1120	950	2592	580	1452	-	1640	314	292	671	1319	1844	8
CP125-02	Double	1345	1100	2675	550	1452	400	1640	714	292	671	1319	1844	10
CP125-03	Triple	1455	1180	2760	580	1452	400	1640	1114	292	671	1319	1844	10
CP125-04	Quad.	1560	1250	2832	600	1452	400	1700	1514	292	731	1379	1844	10
CB150R (SAFE WORKING LOAD = 125 T)														
CP150R-01	Single	1140	950	2835	600	1665	-	1837	352	292	770	1435	2115	8
CP150R-02	Double	1425	1150	2948	570	1665	400	1837	752	292	770	1435	2115	8
CP150R-03	Triple	1500	1220	3015	600	1665	400	1892	1152	292	770	1490	2115	10
CP150R-04	Quad.	1700	1390	3135	620	1665	400	1892	1552	292	770	1490	2115	12

** Height is as per capstan, motor gear-box & break specification

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.

FREE STANDING CAPSTANS

Hi-Tech's free standing capstans provide a field proven, safe and reliable method of hauling in the mooring line alleviating the need for mooring crews to haul in the lines manually

FEATURES

- Ribbed capstan head and integral rope guide for improved line handling
- Enclosed design for protection from harsh marine environment and mechanical damage
- Reversible direction, Emergency Stop and automatic brake for improved operator safety
- Rugged low profile footswitch for safer operations

APPLICATIONS

- LNG carrier berths
- Oil berths
- LPG berths
- Bulk liquids berths
- Bulk materials berths
- Commercial (RoRo, ferry, container)

FREE STANDING CAPSTAN

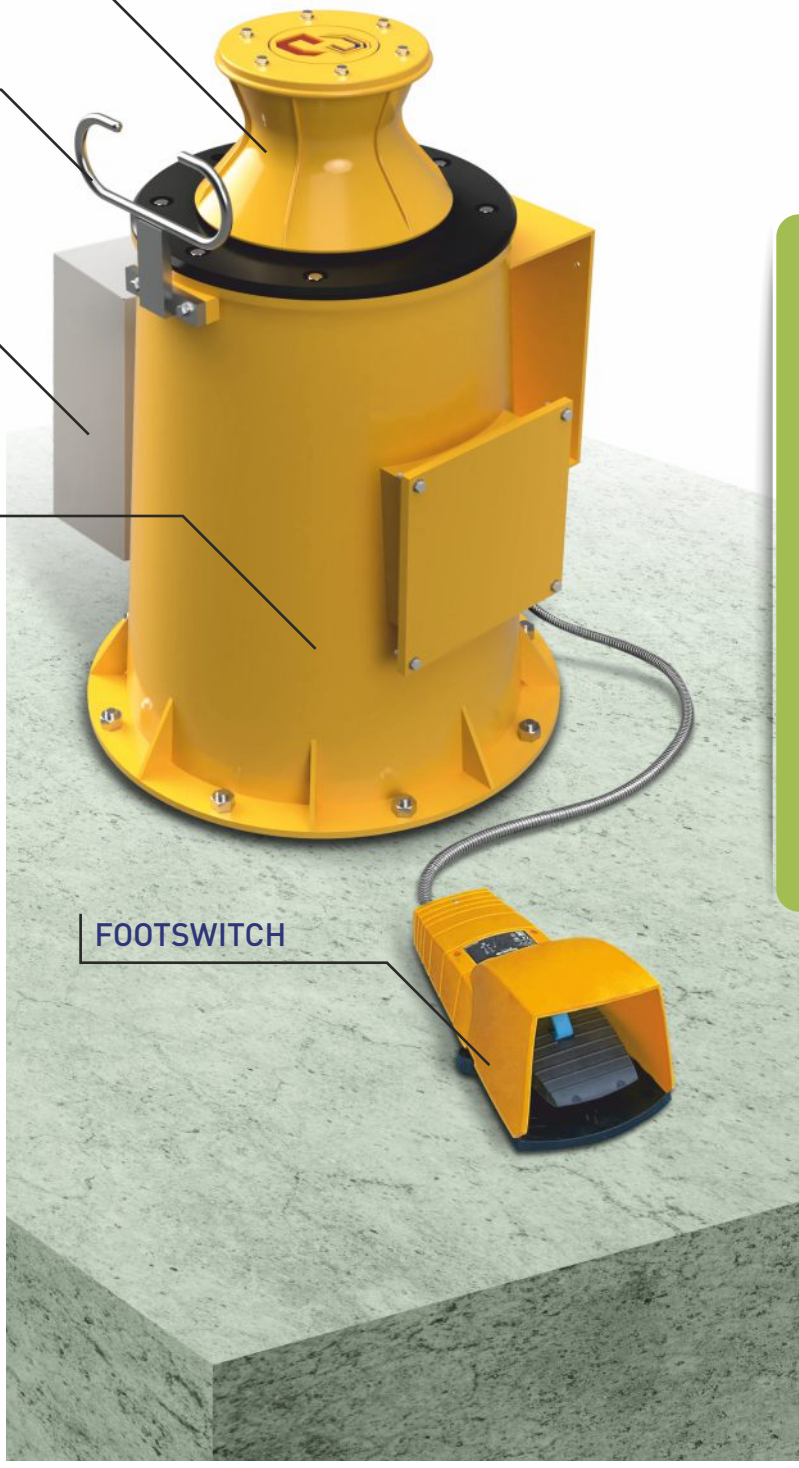
A critical part of the mooring operation, capstans need to be robust and reliable to ensure the line handling process is trouble-free and efficient.
Capstans can be supplied for non-hazardous areas or as an explosion-proof certified unit for installation in hazardous areas. A range of capacities are available to suit many line handling applications.

RIBBED
CAPSTAN HEAD

ROPE GUIDE

MOTOR STARTER ENCLOSURE
WITH DIRECTION SELECTOR AND
EMERGENCY STOP

BRAKED CAPSTAN MOTOR +
GEARBOX (OIL-FILLED FOR LIFE),
ENCLOSED IN A PROTECTIVE STRUCTURE



LINE PULL (T)	STARTING PULL (T)	MOTOR SIZE (kW)
1	2	5.5
1.5	3	7.5
2	4	11
3	6	15

* Capstans upto 50T capacity are available as standard design, for any other capacity please contact Hi-Tech Office.

Line Speed	Nominal 30 meters / minute Note: other speeds and line pull sizes available upon request
Area Classification	Hazardous or non-hazardous
IP Rating	Capstan motor and motor starter: IP55 minimum Footswitch: Ip68
Holding Capacity	Automatic, spring applied brake when de-energized holding torque > 150% of motor torque
Capstan Controls	Selector Switch: Counter clockwise / OFF / clockwise Emergency Stop Footswitch: Depress to operate
Electrical Supply	3Ø + Earth: 380 to 480 VAC(+/- 5%) @ 50 Hz or 60 Hz (+/- 5%) Note: voltages outside these ranges available upon request

HAWSER HOOKS

Hi-Tech's Hawser Hooks have been installed in over 100 FPSO facilities for tandem mooring or bow mooring during offloading.

FEATURES

- Safe, efficient and reliable mooring operations
- Low profile and compact footprint
- Load monitoring & high load warning system designed for ship board operation
- Emergency release, local or remote release from the cargo control room (CCR) panel
- Designed in accordance with OCIMF Recommendations for Equipment Employed in the Bow Mooring of Conventional Tankers at Single Point Moorings 4th Edition and OCIMF Tandem Mooring and Offloading Guidelines for Conventional Tankers at F(P)SO Facilities 1st Edition
- Class Approval to DNV, ABS, BV, Lloyds or RINA as applicable

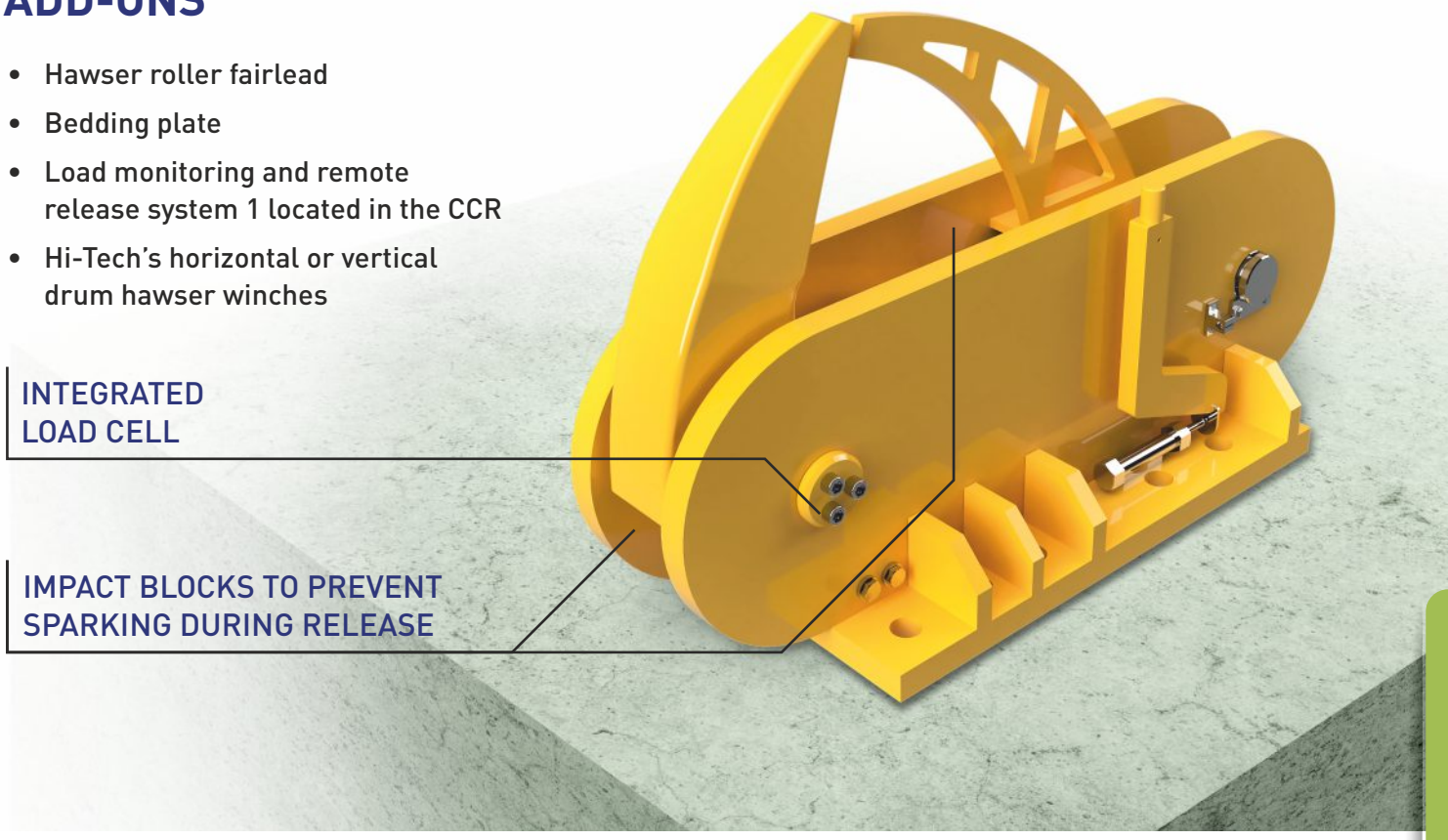
APPLICATIONS

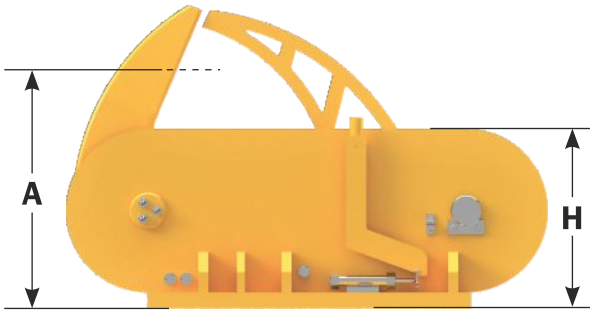
- Tandem mooring
- Bow mooring to a Single Point Mooring (SPM)

HAWSER HOOKS

ADD-ONS

- Hawser roller fairlead
- Bedding plate
- Load monitoring and remote release system 1 located in the CCR
- Hi-Tech's horizontal or vertical drum hawser winches





MODEL NUMBER	LENGTH (L) mm	WIDTH (W) mm	HEIGHT (H) mm	HEIGHT TO CHAIN CENTRELINE (A) mm	MAX. SAFE WORKING LOAD (T)	MAX. PROOF LOAD (T)	HD BOLT QTY	SHIPPING MASS (kg)
H580	1560	560	540	440	250	313	14 x M42	950
H850	1790	680	540	580	350	550	14 x M56	1650

Chain Angles between Chock and Hook	Horizontal Plane: +/- 5º of centreline Vertical Plane: 0 to + 5º above centreline.
Mooring Connection	The Hawser Hooks will accept an OCIMF standard (open) end link of 76mm chafe chain. Type A or B as per OCIMF MEG3.
Area Classification	Hazardous
Holding Capacity	Automatic, spring applied brake when de-energized holding torque > 150% of motor torque Note: voltages outside these ranges available upon request
IP Rating	Ip66
Local Control Unit	Display of hook load, error information & alarm status. Pushbutton control to release the hawser unit.
Hydraulic Power Pack For	release system, located below deck in safe area.

DOCKING AID SYSTEMS (DAS)

Docking Aid Systems provide feedback essential to the safe docking of vessels and to reduce berthing velocities to prolong fender and jetty life.

FEATURES

- Safe, efficient and reliable docking operations
- Day and night visibility
- Long range
- Vessel database and data logging, including ship details and pilot name
- 3 modes of operation – Approach, Drift and Depart

APPLICATIONS

- TLNG carrier berths
- Oil berths
- LPG berths
- Bulk liquids berths
- Bulk materials berths
- Offshore berths and ship-to-ship docking

DOCKING AID SYSTEMS (DAS)

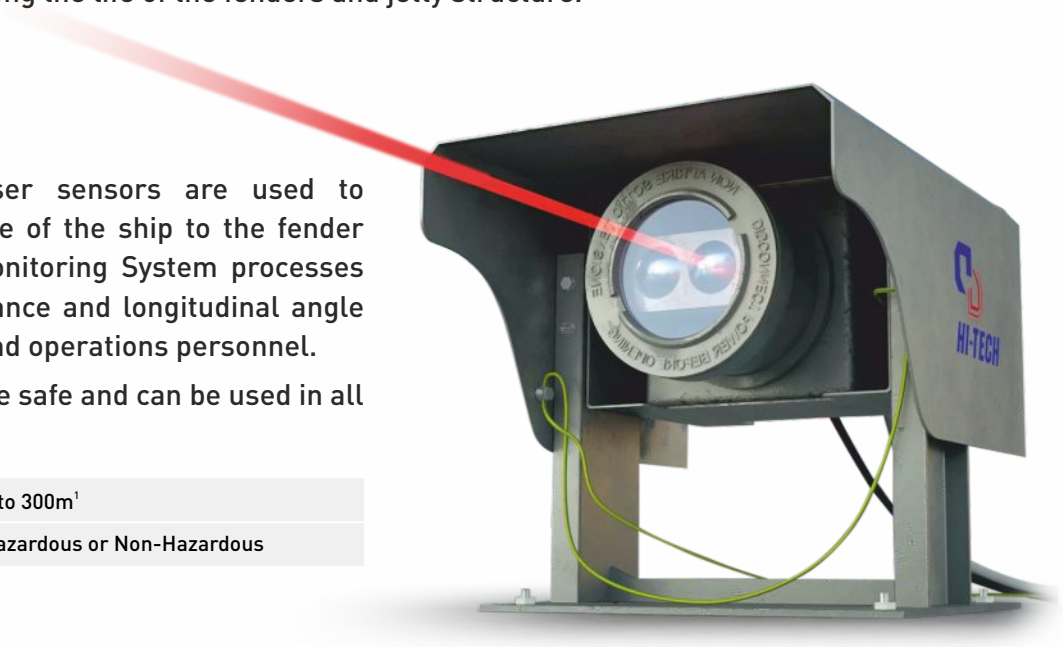
Speed and distance information can be viewed on the display board from the ships' bridge using lasers located on the jetty. Logging of data can also be used to diagnose any damage caused by abnormal events and help prolong the life of the fenders and jetty structure.

DAS LASERS

Highly accurate laser sensors are used to measure the distance of the ship to the fender line. The Central Monitoring System processes this into speed, distance and longitudinal angle for use by the pilot and operations personnel.

Laser sensors are eye safe and can be used in all weather conditions.

Range	0 to 300m[1]
Area classification	Hazardous or Non-Hazardous



DAS DISPLAY BOARD

The display board provides speed and distance information for the vessel, as produced from the DAS lasers. Vessel angle relative to the fender line can also be shown as an option.

A traffic light system (red, amber, green) gives visual indication of whether the vessel is moving too fast toward the fender line.

Mounting options for the display board include both fixed and rotating pedestals.

Distance Display	0 to 199m
Speed Display	0 to 99cm/s
Speed Warning Lamps	Red/Amber/Green
Viewing Angle	Horizontal ±60° Vertical ±50°
Rotating Pedestal Range	±150°
Area Classification	Hazardous or Non-Hazardous

ENVIRONMENTAL MONITORING

Accurate real-time environmental and MetOcean monitoring is vital to the safe docking and mooring of vessels, as well as prolonging the life of the fender and jetty assets

FEATURES

- Meteorological monitoring options
- Oceanographic monitoring options (MetOcean)
- Deployment and retrieval systems
- Safe and efficient docking and mooring operations
- Accurate, real-time data
- Integrated with mooring and docking systems or as a standalone system
- Can be installed remotely with solar power and telemetry options available

APPLICATIONS

- LNG carrier berths
- Oil berths
- LPG berths
- Bulk liquids berths
- Bulk materials berths
- Buoys
- Commercial (RoRo, ferry, container

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METEOROLOGICAL MONITORING

WEATHER STATION

Monitoring capabilities:

- Wind Speed
- Wind Direction
- Temperature
- Air Pressure
- Humidity
- Rainfall
- Lightning detection (optional)
- Solar radiation (optional)

Temperature	-50 to 60°c
Relative Humidity	0 to 100%
Solar Radiation Spectral Range	300 to 1100 nm
Solar Radiation Measuring Range	1400 W/m2
Lightning Detection	Number of lightning events
Pressure	300 to 1200 hPa
Wind Direction	0 to 360°
Wind Speed	0 to 30 m/s 0 to 75 m/s (optional)
Area Classification	Non-hazardous

VISIBILIT

Measuring Range	10 to 20,000 m
Area Classification	Non-hazardous

WIND

Wind Speed	0.6 to 100 m/s
Wind Direction	0 to 360°
Area Classification	Hazardous or non-hazardous

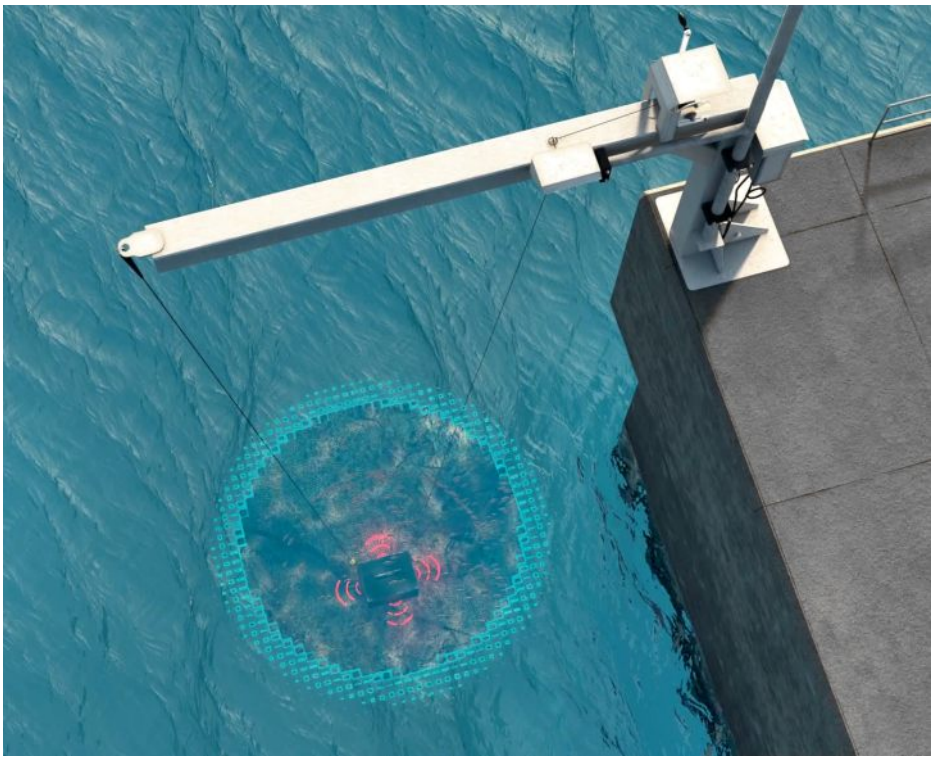
LIGHTNING DETECTION

Detection Range	30 nautical miles
Detection Bearing	0 to 360°
Area Classification	Non-hazardous

OCEANOGRAPHIC MONITORING

WAVE TIDE LASER

- Significant wave height
- Long wave height
- Short wave height
- Period of significant waves
- Water level



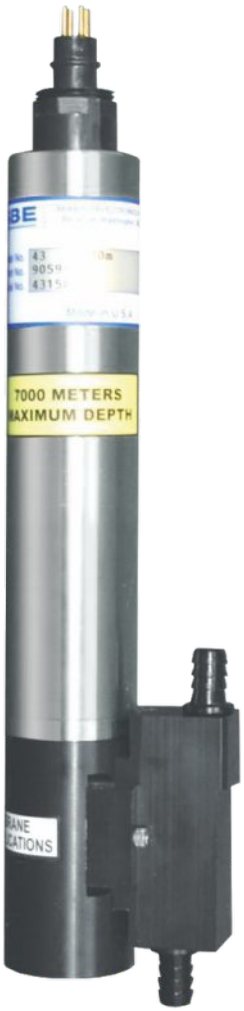
Measuring Range	2.5 to 30 m
Area Classification	Hazardous or non-hazardous

SINGLE POINT CURRENT METER

- Current speed
- Current direction
- Water temperature (optional)
- Salinity (optional)

Current Speed	0 to 300 cm/s
Current Direction	0 to 360º
Water Temperature	-4 to +36ºc
Conductivity Range	0 to 7.5 S/m
Depth Rating	2000 m

SALINITY

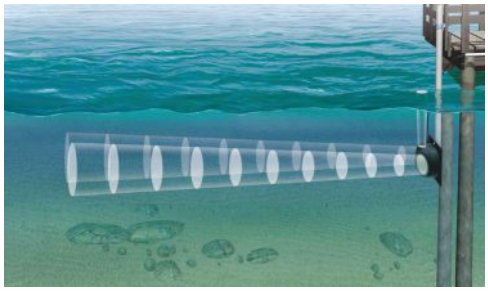


- Conductivity
- Water temperature

Conductivity	0 to 70 mS/cm
Water Temperature	-5 to +35ºc
Depth Rating	250 m

OCEANOGRAPHIC MONITORING

SIDE LOOKING CURRENT PROFILER



- Multiple cells for readings at different distances
- Current speed
- Current direction
- Water temperature
- Tide level

Current Speed	0 to 6 m/s
Current Direction	0 to 360º
Tide Level	0.2 to 18 m
Water Temperature	-5 to +40ºC
Depth Rating	30 m

BOTTOM MOUNT CURRENT PROFILER

- Multiple cells for current readings at different depths
- Current speed
- Current direction
- Water temperature
- Max wave height
- Mean wave period
- Significant wave frequency (long and short)
- Significant wave height (long and short)
- Peak wave period (long and short)
- Wave direction (optional)
- Tide leve

Current Speed	0 to 5 m/s
Current Direction	0 to 360º
Water Temperature	-5 to +45ºC
Conductivity Range	1 s
Depth Rating	200 m

SERVICE AGREEMENTS

Leading companies recognize that it is the total cost of ownership which really matters in the purchase of capital equipment. Without doubt, regular preventative maintenance reduces downtime, improves productivity and manages risk.

A tailored service program gives you inside access to Hi-Tech product experts and allows you to leverage our experience and product knowledge for your benefit.

A Hi-Tech aftersales representative can work with you to tailor a service solution including some or all of the following:

- Programmed maintenance and inspection
- Call out service with defined response times
- Onsite calibration
- Refresher training
- Audit of spare parts holdings
- Remote technical support and diagnostics
- Comprehensive reporting and recommendations

TRAINING PROGRAMS

Our experienced trainers can help you invest in your most important asset – your people. Training can be customized to your needs, whether at our factory or onsite.

Training is offered in three levels:

- Level 1 – System Overview
- Level 2 – Operator Training
- Level 3 – Maintenance Training

CALIBRATION AND INSPECTION SERVICES

LOAD CELL CALIBRATION

Hi-Tech offers a number of convenient options to keep your load cells calibrated to meet SIGTTO guidelines.

- **Factory Calibration**

- **Onsite Calibration**
  - Hi-Tech portable calibration equipment is shipped to site
  - A Hi-Tech engineer completes calibration checks together with your team

- **Load Cell Exchange Programs**
  - A full jetty set of calibrated load cells with cables are delivered ready for installation
  - A Hi-Tech engineer will be onsite (if needed) to work with your team to perform the exchange
  - Removed load cells are returned to Hi-Tech
  - Exchange agreements typically run for 3 - 5 years

ONSITE INSPECTION

Our experienced and knowledgeable Service Engineers are ready to assist in assessing your installed Hi-Tech equipment for:

- General equipment condition
- Damage inspections
- Onsite technical advice
- Maintenance tips and recommendations
- Replacement and upgrade options for existing equipment – Hi-Tech or others

CALIBRATION AND INSPECTION SERVICES

WARRANTY

All new Hi-Tech docking and mooring projects are backed by an 18 month back to base warranty. For warranty extensions or details please talk to your Hi-Tech sales representative and they'll be happy to discuss your needs.

Spare and service warranty is valid for 12 months and non-extendable.

TECHNICAL SUPPORT

If you have any queries on the operation of your Hi-Tech docking and mooring products, please contact your local Hi-Tech representative. We can provide both remote and onsite support options.

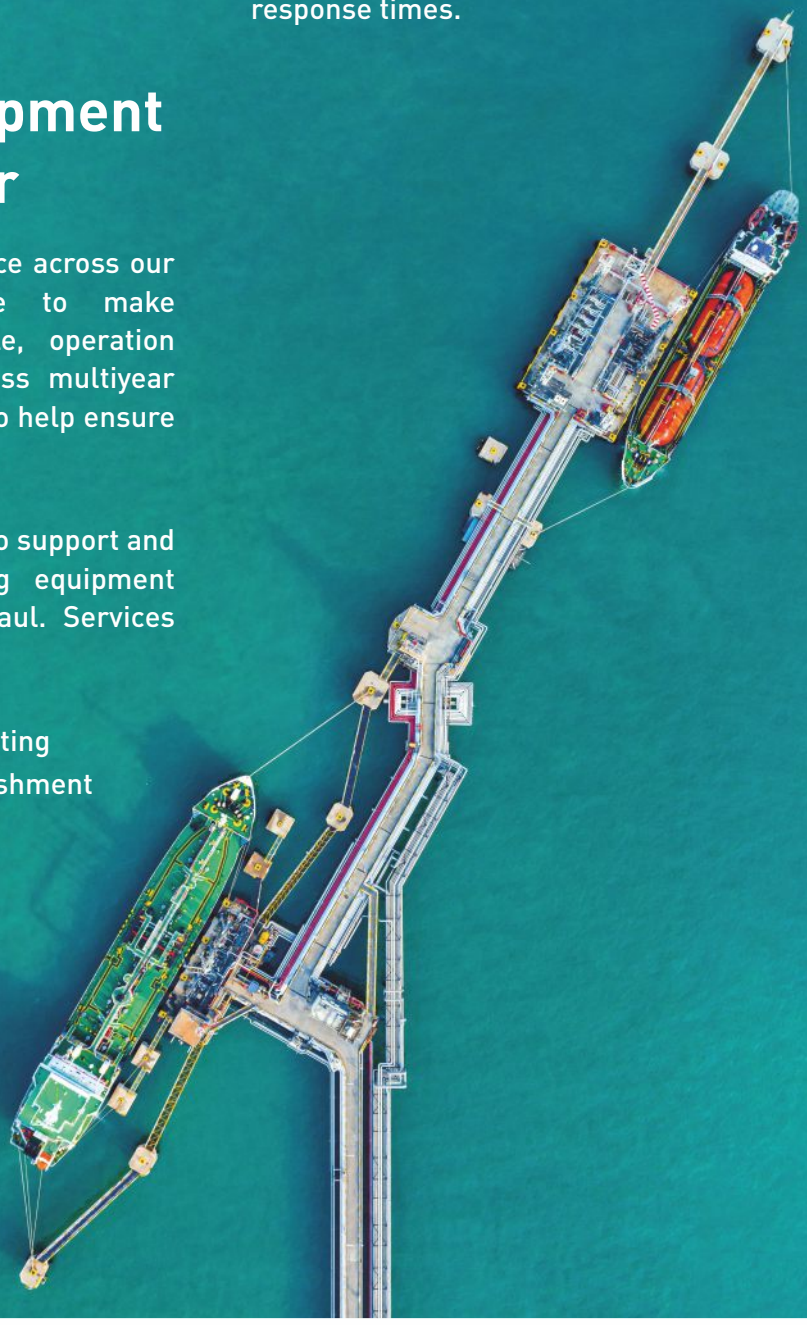
For mission critical technical support, Hi-Tech offers Priority Support Packages with defined response times.

Spare Parts, Equipment Overhaul & Repair

Leveraging our extensive experience across our customer base, we are able to make recommendations for consumable, operation and capital spares holdings across multiyear time periods, e.g., 1, 2 or 3 years, to help ensure maximum equipment availability.

We also offer a number of options to support and extend the life of your existing equipment through factory repair and overhaul. Services include:

- QRH hook refurbishment and testing
- Capstan motor / gearbox refurbishment and testing
- Load cell repairs and overhaul
- General equipment repairs



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PRODUCT INSTALLATION PICTURES

NOTES

NOTES

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