

MOORING & TOWING

RELEASE 2.1



MACHINEFABRIEK

L. STRAATMAN BV

WWW.MFSTRAATMAN.COM

PRODUCTS

Below you find some examples of the Straatman products, in order to give you an idea of the possibilities.



DREDGING

- Bow discharge installations
- Steel plate ball-joints
- Pinch ball-joints
- Turning glands
- Water monitors



MOORING AND TOWING

- Quick release mooring hooks
- Berthing Aid Systems
- Mooring hook for buoys
- FPSO / FSRU hooks
- Quick release towing hooks



SOLAR SYSTEMS

- Solar-powered mooring solutions
- Offshore solar power solutions
- Buoy telemetry and power supply
- Solar skids



PARTS & SERVICE

- Frame and construction work
- Cutting steel up to 200 mm.
- Turning and milling
- Service and inspection
- Commissioning

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INTRODUCTION

Machinefabriek L. Straatman was established in 1902 in The Netherlands. The company rapidly grew in the market of kettle construction and ship repairs. Through the years, Straatman developed sophisticated products for the dredging, fabrication, oil & gas and maritime industry. Straatman is well known for its high quality and reliable quick release mooring & towing equipment and related solutions.

QUALITY

- 100% own production in The Netherlands
- Only European certified steel
- Own painting facility
- Own testing facility
- Expected life-time > 25 years

EXPERIENCE

For more than 35 years, Straatman produces quick release mooring and towing hooks in its own factory in the Netherlands. During this period, our hooks have been installed all over the world in several kinds of industries. Our products have proven their worth in practice, as Straatman became a leading manufacturer of mooring and towing solutions.

Port of Rotterdam, Manager Port Engineering departement:

"We declares in name of the Port of Rotterdam Authority that Machinefabriek L Straatman has satisfactorily completed engineering, production an implementation of the quick release hooks and independent power supply by solar panel for the project "Mooring- and breasting dolphins Calandkanaal" in the Port of Rotterdam"



**Port of
Rotterdam**



Egyptian Maintenance Co., Project Manager:

"Egyptian Maintenance Company -EMC- is presenting its thanks & appreciation to Machinefabriek L. Straatman, for its commitment regarding the high quality products & deliverable time of Quick Release Hooks and Berthing Aid System)... EMC explains its satisfaction & strongly recommends the products and services of Machinefabriek L. Straatman".

Antara koh private limited, Deputy General Manager:

"Recently, our company placed an order with Machinefabriek L. Straatman for a project involving Quick Release Hooks Systems. The equipment supplied was of high quality and the delivery was punctual. We are satisfied by their work and their technical assistance and we are looking forward to work with this company again for future projects".



QUICK RELEASE MOORING HOOKS

Our quick release mooring hook is especially designed to guarantee safe and efficient mooring operations at oil, gas, chemical, iron, coal and grain terminals. All hooks are available in single and multiple assemblies and can be equipped with all kinds of options.

The GMH mooring hook can be operated manually with an effort of ± 20 kgf at full SWL. A two-step release mechanism prevents accidental opening. It can be reset manually by means of a simple rotation movement. Rubber blocks absorb the energy impact during the release.

All hooks are tested on our calibrated 3,500 kN hydraulic testing machine and all standard test certificates will be issued, as a part of the user manual. If so desired, the test can be witnessed by a classification authority of your choice.



APPLICATIONS

- LNG berths
- oil berths
- bulk liquid berths
- FPSO / FSRU
- grain terminals
- mooring buoys
- container terminals
- coal/iron terminals



MOORING



Traceability

Each vital part is stamped with a unique number so as to ensure traceability to the material certificate.



Insulation

If required, the capstan can be insulated from the mooring hook unit.

Manual Release Lever

All quick release hooks can be released manually with an effort of ± 20 kgf at full load.

Guided lines

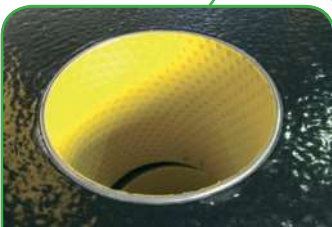
Smartly designed rope guards guide the mooring line and prevent accidental loss of the line.

Hazardous zone

All electric parts and capstan motors can be certified for hazardous zones.

Counter balanced hook

The hook parts are made of forged steel and are counter-balanced. The hook can easily be reset by means of one simple rotation movement.



Bearing bushes

All shafts are provided with high quality bearing bushes which results in a long life cycle.

Self supporting

All hooks are self-supporting. All movements are limited so as to prevent contact with the structure.

Energy absorbers

Rubber blocks absorb the energy during hook release.

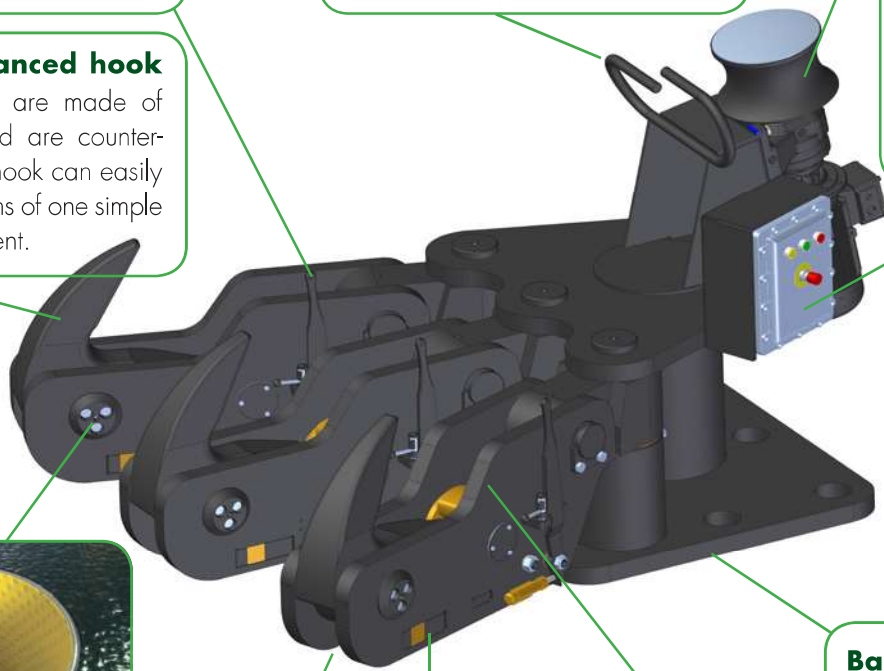
Base plate

The base plates are made of high quality steel. Custom-made base plates to fit existing bolt patterns are available on request.

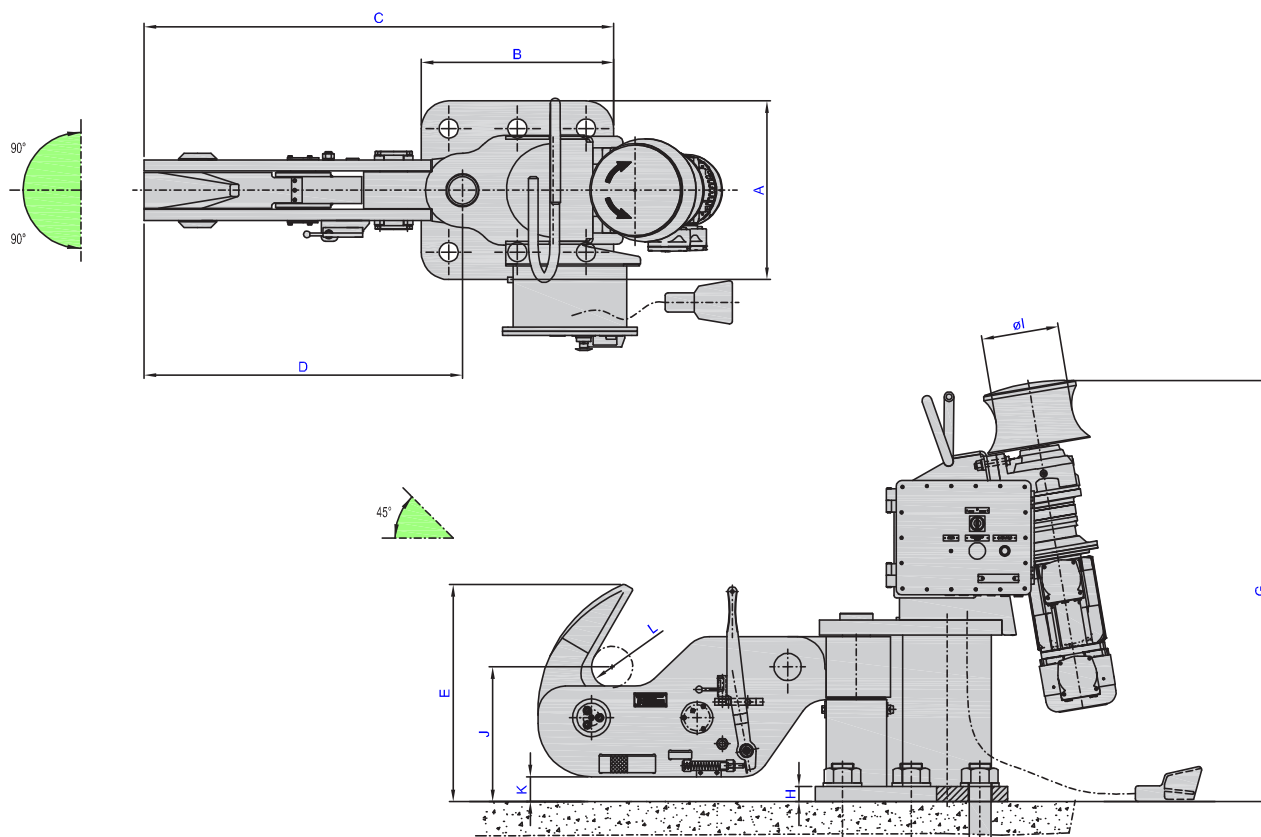


Locking device

The locking device prevents accidental release and confirms a positive reset.



SINGLE MOORING HOOK UNITS



Dimensions in mm and provided for information only.

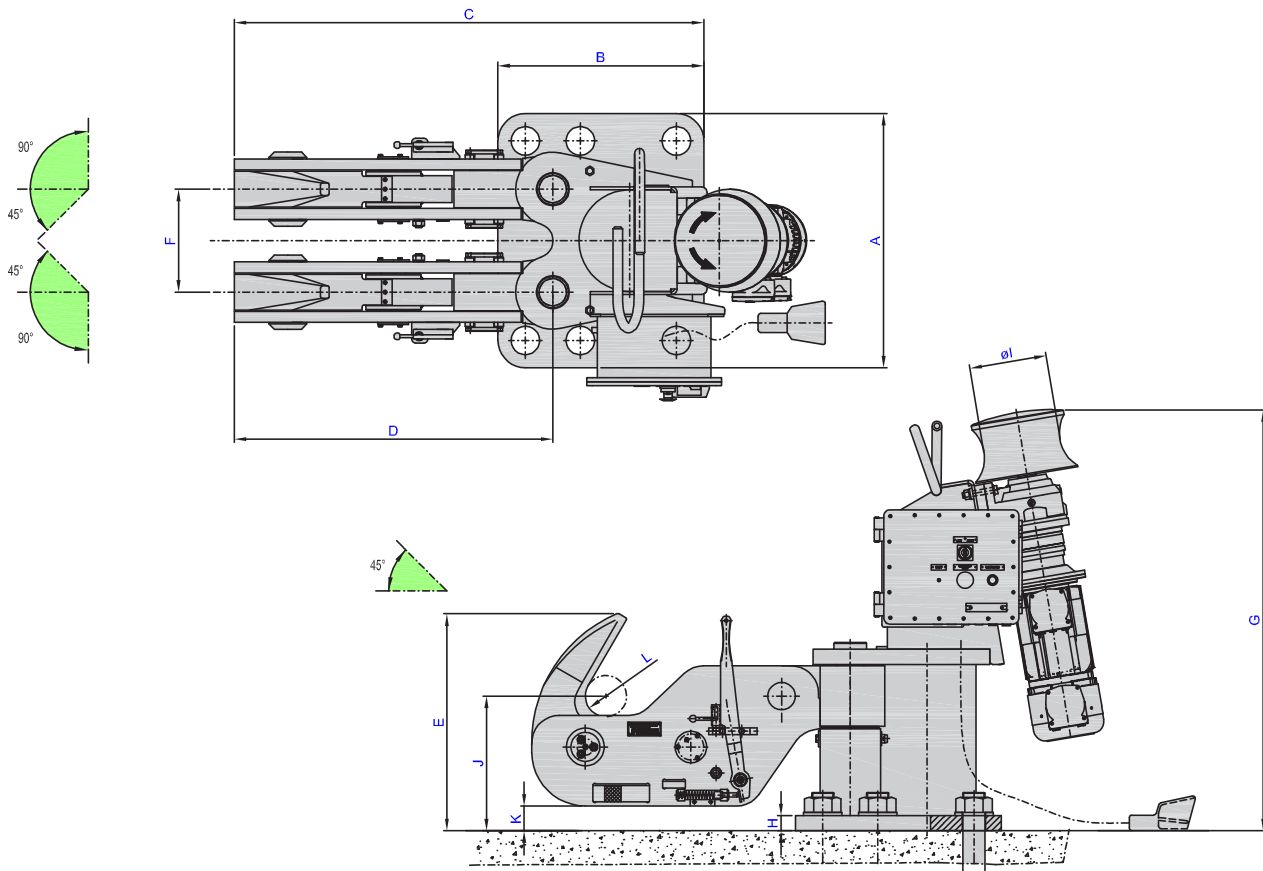
SINGLE QUICK RELEASE MOORING HOOK, TYPE GMHU () -1							
	40 ton	60 ton	75 ton	100 ton	125 ton	150 ton	200 ton
A	600	650	650	650	650	650	650
B	600	650	650	700	700	700	865
C	1266	1523	1573	1760	1760	2160	2160
D	785	1073	1073	1160	1160	1415	1415
E	585	705	705	790	790	860	860
F	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
G*	1400	1400	1400	1400	1400	1400	1400
H	35	45	45	50	55	60	65
I	275	275	275	275	275	275	275
J	358	440	440	490	490	535	535
K	90	90	90	90	90	90	90
L	96	130	130	150	150	150	150
Anchors	4 x M48	6 x M48	6 x M56	6 x M56	6 x M64	6 x M72	6 x M90
Weight**	310	520	600	800	900	1275	1400

Custom-made base plates are available on request, in order to fit existing bolt patterns

*Capstan heights (G) can vary, depending on the capacity required.

**Weight is excluding capstan.

DOUBLE MOORING HOOK UNITS



Dimensions in mm and provided for information only.

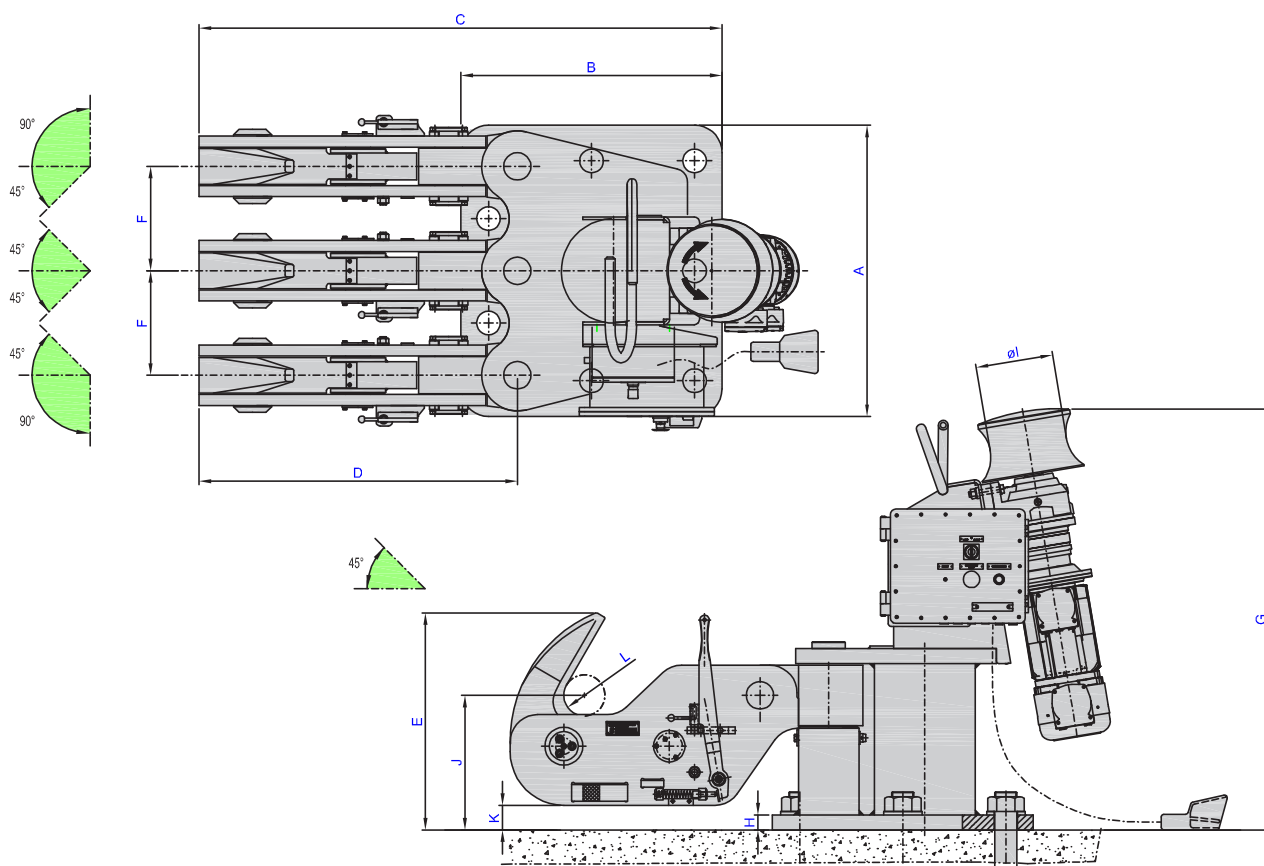
DOUBLE QUICK RELEASE MOORING HOOK, TYPE GMHU () -2							
	40 ton	60 ton	75 ton	100 ton	125 ton	150 ton	200 ton
A	700	780	900	925	925	1000	1000
B	650	750	750	750	750	1020	1150
C	1266	1573	1573	1760	1760	2157	2157
D	785	1023	1073	1160	1160	1415	1415
E	585	705	705	790	790	860	860
F	300	330	350	375	375	425	425
G*	1400	1400	1400	1400	1400	1400	1400
H	35	45	45	50	55	60	65
I	275	275	275	275	275	275	275
J	358	440	440	490	490	535	535
K	90	90	90	90	90	90	90
L	96	130	130	150	150	150	150
Anchors	6 x M48	6 x M56	6 x M64	6 x M72	6 x M80	7 x M80	7 x M100
Weight**	500	890	1070	1450	1620	2350	3200

Custom-made base plates are available on request, in order to fit existing bolt patterns

*Capstan heights (G) can vary, depending on the capacity required.

**Weight is excluding capstan.

TRIPLE MOORING HOOK UNITS



Dimensions in mm and provided for information only.

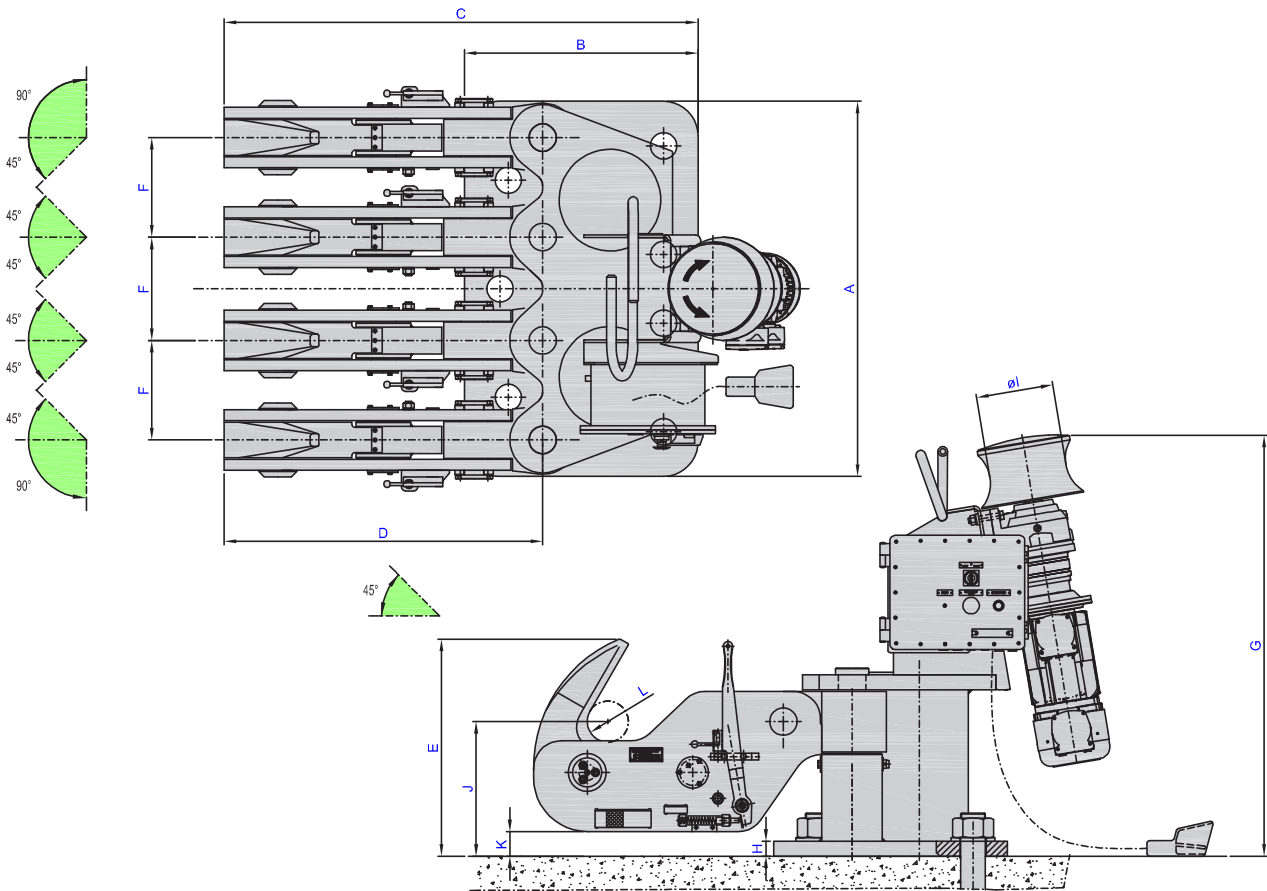
TRIPLE QUICK RELEASE MOORING HOOK, TYPE GMHU () -3							
	40 ton	60 ton	75 ton	100 ton	125 ton	150 ton	200 ton
A	800	900	1000	1060	1060	1200	1200
B	700	800	850	900	900	1020	1020
C	1266	1630	1743	1860	1860	2240	2240
D	785	1023	1073	1160	1160	1415	1415
E	585	705	705	790	790	760	760
F	300	330	350	375	375	425	625
G*	1400	1400	1400	1400	1400	1400	1400
H	35	45	45	50	55	60	65
I	275	275	275	275	275	275	275
J	358	440	440	490	490	535	535
K	90	90	90	90	90	90	90
L	96	130	130	150	150	150	150
Anchors	6 x M56	6 x M64	6 x M72	7 x M72	7 x M80	7 x M90	7 x M120
Weight**	715	1275	1560	2160	2470	3700	4000

Custom-made base plates are available on request, in order to fit existing bolt patterns

*Capstan heights (G) can vary, depending on the capacity required.

**Weight is excluding capstan.

QUADRUPLE MOORING HOOK UNITS



Dimensions in mm and provided for information only.

QUADRUPLE QUICK RELEASE MOORING HOOK, TYPE GMHU () -4							
	40 ton	60 ton	75 ton	100 ton	125 ton	150 ton	200 ton
A	1185	1185	1300	1365	1400	1670	2250
B	750	750	800	850	850	1025	1100
C	1340	1630	1743	1750	1940	2160	2200
D	785	1023	1023	1160	1160	1415	1415
E	585	705	705	790	790	860	860
F	300	330	350	375	375	425	625
G*	1400	1400	1400	1400	1400	1400	1400
H	45	45	45	50	55	60	65
I	275	275	275	275	275	275	275
J	358	440	440	490	490	535	535
K	90	90	90	90	90	90	90
L	96	130	130	150	150	150	150
Anchors	7 x M64	7 x M72	7 x M80	7 x M90	7 x M90	9 x M80	9 x M120
Weight**	940	1690	2060	2850	3200	4500	4800

Custom-made base plates are available on request, in order to fit existing bolt patterns.

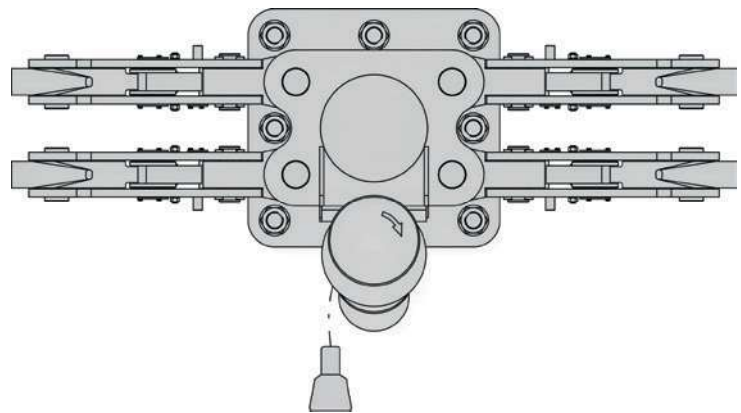
*Capstan heights (G) can vary, depending on the capacity required.

**Weight is excluding capstan.

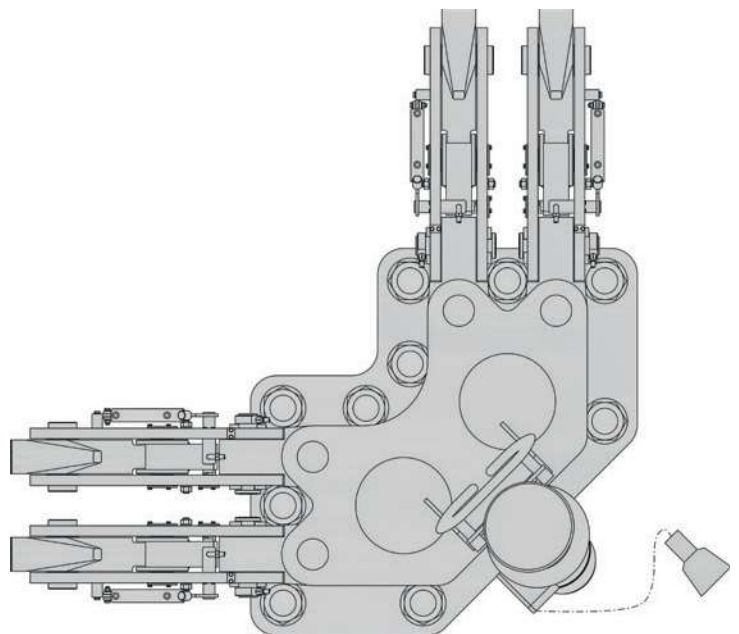
SPECIAL CONFIGURATIONS

Apart from our wide range of standard hook configurations, we also produce special configurations as shown below. Upon request, we design and produce custom-made foundations, such as sextuple hook foundations.

CUSTOM-MADE FOUNDATION



CUSTOM MADE



REMOTE RELEASE

All quick release hooks can be equipped with an electric or electric-hydraulic release mechanism.

For this purpose all hooks are equipped with electric actuators or hydraulic cylinders with a power pack. The switch box on the hook is equipped with control buttons for opening the hook locally.

In the event of a breakdown or failure, it is possible to open the hooks on the unit manually. A removable lever prevents accidental opening.



LOAD MONITORING

Our quick release mooring and towing hooks can be equipped with load cells, for a continuous measurement of the load.

The mooring loads and alarms can be viewed and recorded in various ways, such as:



- display(s) on the hook itself
- TFT colour monitor in the control room
- display(s) integrated in a control panel (in combination with remote control)

The mooring load monitoring system can also be integrated in a berthing aid system. All data will be monitored, visualised and recorded in a single system.

REMOTE CONTROL

The remote release option can be integrated in a remote control system. A control panel, located in the control room can be provided with a variety of controls, such as:

- an individual hook release indicator lamp
- an individual hook release push button
- an assembly release push button (all hooks of one mooring unit)
- a signal lamp test switch
- a power on/off switch
- a power on/off indicator lamp



In combination with the option of remote release, it is also possible to equip the junction box with controls, allowing to perform the hook release in a wireless manner.

EXPLOSION PROOF (ATEX / IECEx)



Our quick release hook units are often used and located in a hazardous zone. In these specific situations, all electrical parts are available in an explosion proof version. Each component will be supplied with an explosion proof certificate, in accordance with ATEX / IECEx.



The following parts can be supplied in an explosion proof version:

- capstan (brake) motor
- junction box
- load cell
- foot pedal
- power pack for automatic release



Furthermore, the mooring hook unit will be electrically insulated from the deck surface by means of hard PE black plates and insulation bushes.

ROPE KEEPERS

In some specific situations, there is a risk of the mooring or towing rope slipping off the quick release hook. For example, on anchoring pontoons or mooring buoys that are subjected to waves.

In order to avoid this risk, all quick release mooring hooks can be equipped with a device that prevents the rope from slipping (also known as a rope keeper).



INTEGRATED CAPSTANS

Our quick release mooring hook units can be equipped with an integrated capstan. The capstan allows hauling in the mooring line in a safe and efficient way.

Our capstans can be provided with several features, such as:

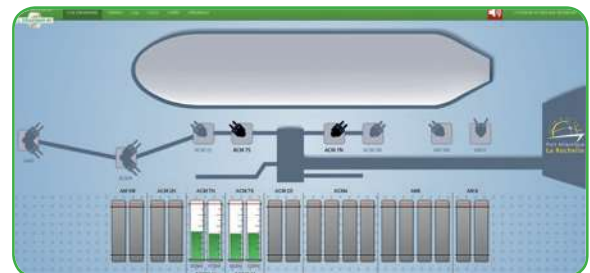
- brake motor with reversible rotation
- single turn bearing (Back stop)
- switch box with control equipment
- motor starter
- foot pedal for operating the capstan

The power of the motor will depend on the line speed required and the running pull of the capstan.



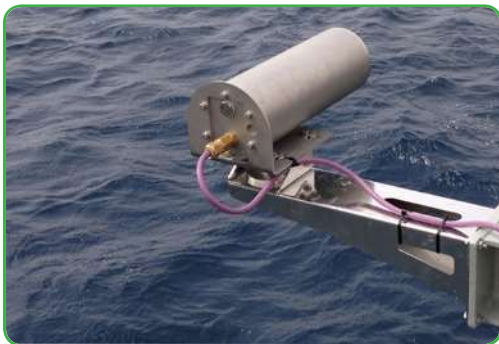
SOFTWARE SOLUTIONS

The data is available at the office PC, which will run on Windows software. There are a number of different ways to present the information to the operators in the field. The most common way is to use large displays, typically mounted on the jetty, which can be read from a maximum distance of 300 metres. Another option consists of using hand-held pagers or PDA's.



BERTHING AID SYSTEMS

The Straatman Berthing Aid System or so-called Docking Aid System is Based on the latest laser and LED technology. The laser system will measure the distance from the jetty to the side of the approaching vessel. Besides on a standard PC all values can be displayed on a large display like distance (Bow and Aft), speed of approaching and angle. Since the display is based on LED technology we are able to show other parameters as well like wind speed, current, waves or other crucial information in order to guarantee a safe mooring.



Features lasers:

- High accuracy, maintenance free lasers (class 1)
- Distance 0 - 300 meter
- Rail mounting options
- Accuracy +/- 2 cm
- Optional suitable for ATEX zone 1 and 2
- Suitable for all weather conditions



Features LED screen:

- Visible from 300 meters (day-time)
- Size 2500x1200x200mm (WxHxD)
- Stainless Steel 316, coated, (colour to be agreed upon)
- Optional suitable for ATEX zone 1 and 2
- PC/PLC-controlled LED screen
- LED based
- Most cost effective solution in hazardous area

Interested in our Berthing Aid Systems? Contact our specialists: info@mfstraatman.nl

ENVIRONMENTAL MONITORING

As an integrated solution, the BAS can be extended with the environmental monitoring system (EMS).

The most basic option consists of a wind speed and direction sensor. However, often more sensors are added, in order to provide the pilots and operators with meteorological data for defining the operational limits and thus increasing the overall safety. Most sensors are available for hazardous areas, should this be required.



For oceanographical data, the standard instrumentation offered consists of a wave & tide sensor and a current sensor.

The instrumentation offered is robust and has been designed to minimise maintenance.

CAPSTANS

Capstans are used for safe and efficient handling of the mooring lines. Although they are mostly supplied as integrated part of our quick release mooring hook units, they often are produced as free standing vertical capstans as well. In these cases they are used in combination with for example bollards or basic quick release hooks. Our standard range of capstans are driven by high-quality electrical motors.

Technical specifications (standard range):

Nominal pull: 10-30 kN

Line speed: 10-30 m/s

Capstan head diameter: 275 mm.

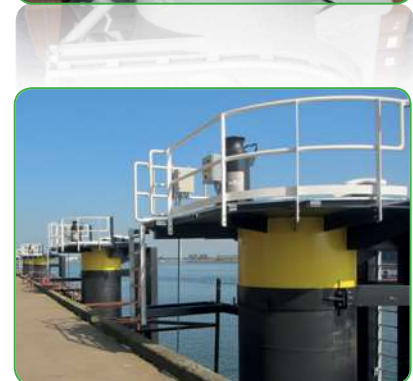
Brake: mechanical (back stop)

Switch box and foot switch are included.

Preservation in accordance with DIN EN ISO 12944, category C5-M.

Options:

- Custom made design
- 2 rotation directions
- Electrical brake
- Hydraulic or pneumatic motor
- ATEX / IECex certified for hazardous areas



SOLAR SYSTEMS

In the situation where a regular power supply system, by meaning of cables, is not preferred or even impossible we can supply a perfect solution.

We have developed a sustainable power supply system based on solar panels to power our capstans which are integrated in our quick release mooring hook units. The use itself of solar panels is not that innovative, but in this application particularly revolutionary.



Straatman was the first company in the world that supplied quick release mooring hook units with integrated capstans powered by solar panels, to be used on mooring dolphins.

Benefits of Straatman Solar Systems

The use of our solar systems can and will lead to convincing benefits:

- reduction of lead time during construction of dolphins and berths
- damages to cables caused by anchors are history
- expensive and risk-full cable laying on the sea or port bottom is history
- low maintenance costs
- reduction of energy costs
- environmental contribution
- fits perfectly in the vision of sustainability



Options

In addition to the design and supply of a solar system to power our capstan, we can supply a wide range of options.

In order to increase safety of both mooring operators and vessel berthing operations, the following components can be integrated in our solar system:

- working lights to lighten the working area of the operators
- navigation lights to mark the berths (in conformance with IALA normatives)
- an integrated data system for logging relevant data
- a webbased software solution to monitor e.g. the actual available power
- all components can be supplied as explosion proof components, certified according to ATEX or IECEx guidelines



QUICK RELEASE HOOKS FOR MOORING BUOYS

Our quick release mooring hooks type GMH are often used on mooring buoys as well. As a standard they are equipped with a rope keeper, a device to avoid accidentally slip of the mooring lines caused by for example waves. Hooks for mooring buoys are most often supplied as single hooks, to be integrated in the structure of the buoy. However, these quick release mooring hooks can be supplied as multiple assemblies as well.



The standard GMH mooring hook can be operated manually with a minimum effort, even at full SWL. A two-step release mechanism prevents accidental opening. All our quick release mooring hooks can be reset manually by means of a simple rotation movement. Rubber blocks absorb the energy impact during the release.

Our quick release mooring hooks are available in a range of **40 – 200 tons** (SWL per hook).

Options for mooring buoy hooks

Operating a mooring hook on a buoy can be a dangerous activity. Especially in bad weather conditions or in the unlikely situation that the quick release hook need to be released under load. Through the years of experience and evaluating feedback of our clients, we have developed a wide range of options. All these options are dedicated to the safety of the mooring operators.

All our hooks can be executed with the following options:

- remote release by meaning of a hydraulic cylinder
- an integrated hydraulic power pack for automatic release
- an integrated calibrated load pin
- a solar power system
- explosion proof components in accordance with ATEX/IECex
- telemetry software

QUICK RELEASE MOORING HOOKS FOR BUOYS

Straatman Telemetry system

Moreover, we have developed a sophisticated telemetry system enabling the port operators to control their mooring buoys from a safe distance. The system is using Wifi/UHF technology to obtain a wireless network and communication system between the buoys and the port operators.



Options within the Straatman Telemetry system:

- integrated load monitoring software
- integrated automatic release software
- a sophisticated logging functionality storing all alarms, data and activities per vessel
- a single and clear schematic view of all mooring buoys
- a portable device showing all integrated software, even suitable for a hazardous area (ATEX or IECex certified)



Using the Straatman Telemetry System for mooring buoys will lead to:

- increased safety of operators, equipment and environment;
- the possibility to respond real quickly on unsafe situations;
- insight information about mooring data which will lead to improvements.



FPSO / FSRU QUICK RELEASE HOOKS

Based on our "standard" quick release mooring hook we have developed a special design used for FPSO's (or other offshore vessels). Most common safe working load (SWL) for FPSO hooks is 200 or 250 tons. On request we can design and produce hooks for even higher capacities.

The Straatman FPSO hook is mostly executed as a single hook configuration, integrated with a bracket or foundation to be mounted on a deck surface. This can be done by either welding or bolting.

The standard FPSO hook is designed as a fixed (non-swiveling) configuration, which is able to withstand limited sideway loads. Certain circumstances will require a swiveling hook, which is included in our delivery program as well.



Basic features of our FPSO / FSRU quick release hook:

- SWL: 200 or 250 tons;
- Release: manual and remote;
- Remote release from a local panel, which is integrated in our hydraulic power pack;
- Remote controlled release system from a control panel;
- Integrated load pin;
- Remote controlled mooring load monitoring and logging system, integrated in the control panel;
- All components are certified according to ATEX or IECEx, in order to meet the requirements of hazardous environments.



QUICK RELEASE TOWING HOOKS

Our quick release towing hook (also known as disc hook) is especially designed to guarantee safe operation on work boats, supply vessels, harbour, coastal, fire fighting and seagoing tugs. Our hooks can be equipped with all kinds of options.

The GSH towing hook can be operated manually by means of a lever or a rope with a maximum effort of 15 kg at full load. A two-step release mechanism prevents accidental opening. It can be reset manually very easily, as the disc is counterbalanced. During the release, the rotation reduces the energy impact to a minimum.

All hooks are tested on our 3,500 kN hydraulic testing machine and all standard test certificates will be issued. If so desired, the test can be witnessed by a classification authority of your choice.



APPLICATIONS

- tug boats
- work boats
- towing winches

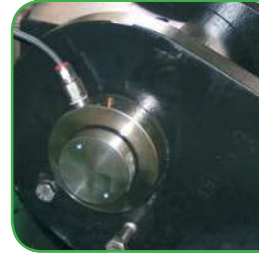
Rope keeper

All towing hooks are provided with rope keepers so as to avoid accidental loss of the towing line.



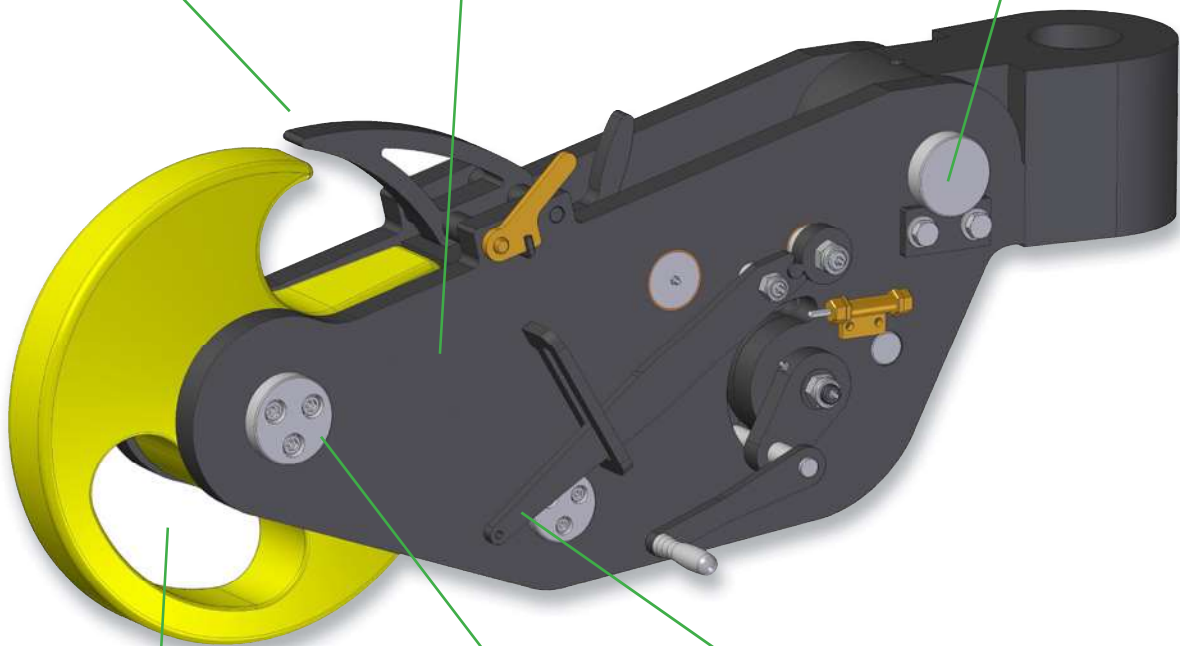
Fairlead

All towing hooks are provided with a fairlead, guiding a rope for release of the hook from a safe distance.



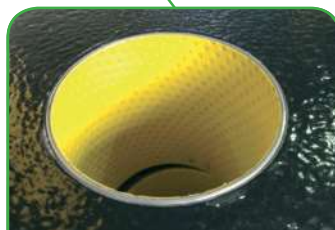
Load monitoring

If required, the towing hooks can be provided with a load pin.



Rotating disc hook

The disc hook is made of steel and is counterbalanced. Due to the smooth rotation, the hook can be reset very easily.



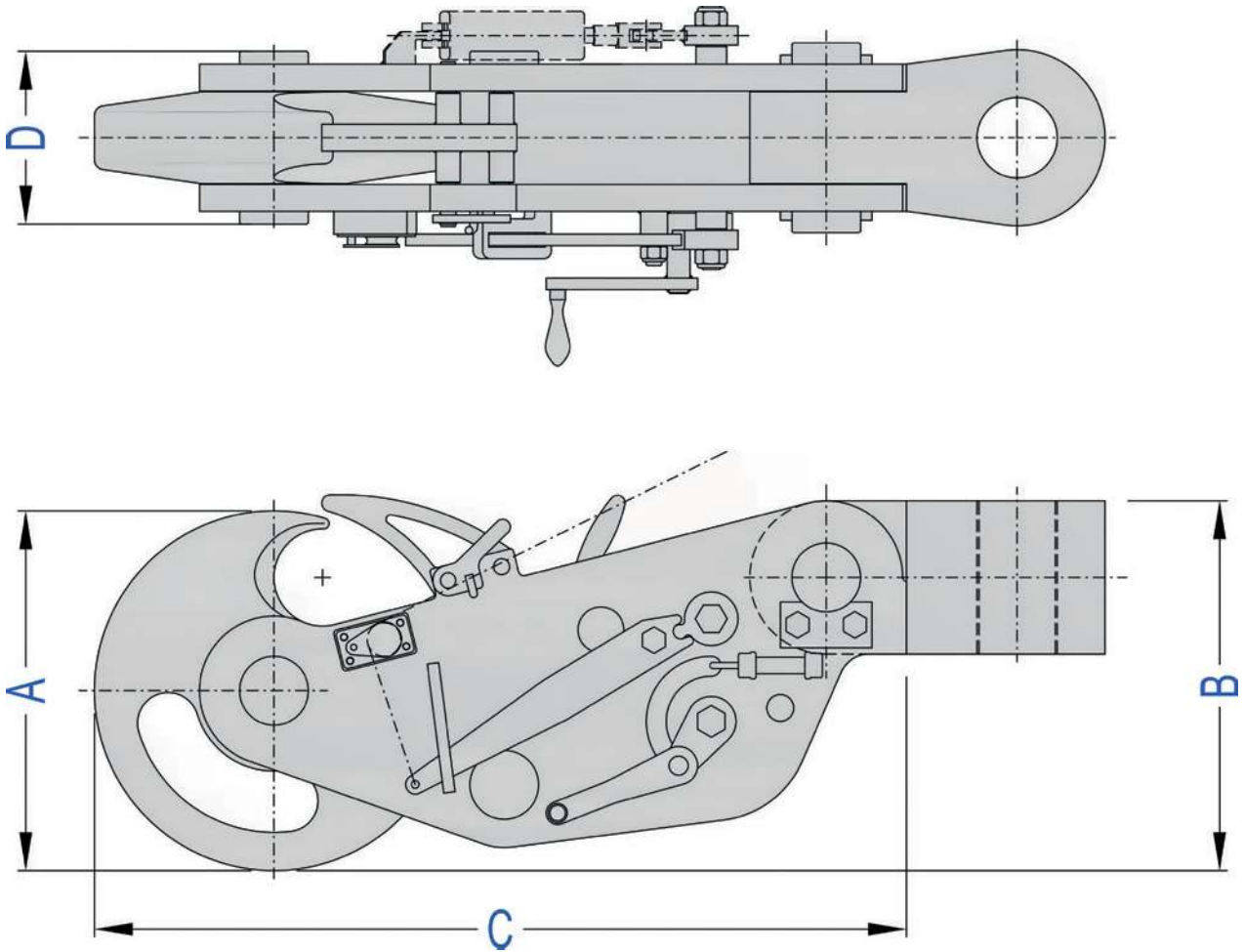
Bearing bushes

All shafts are provided with high quality bearing bushes which results in a long life cycle.

Manual Release Lever

All quick release hooks can be released manually with an effort of ± 15 kgf at full load.

QUICK RELEASE TOWING HOOK - TYPE GSH



Dimensions in mm and provided for information only.

QUICK RELEASE TOWING HOOK, TYPE GSH					
	7/15 ton	25 ton	45 ton	65 ton	100 ton
A	340	470	470	600	650
B	340	473	483	599	670
C	765	1058	1063	1338	1465
D	152	196	226	268	322
Weight	150 kg	350 kg	470 kg	770 kg	1080 kg

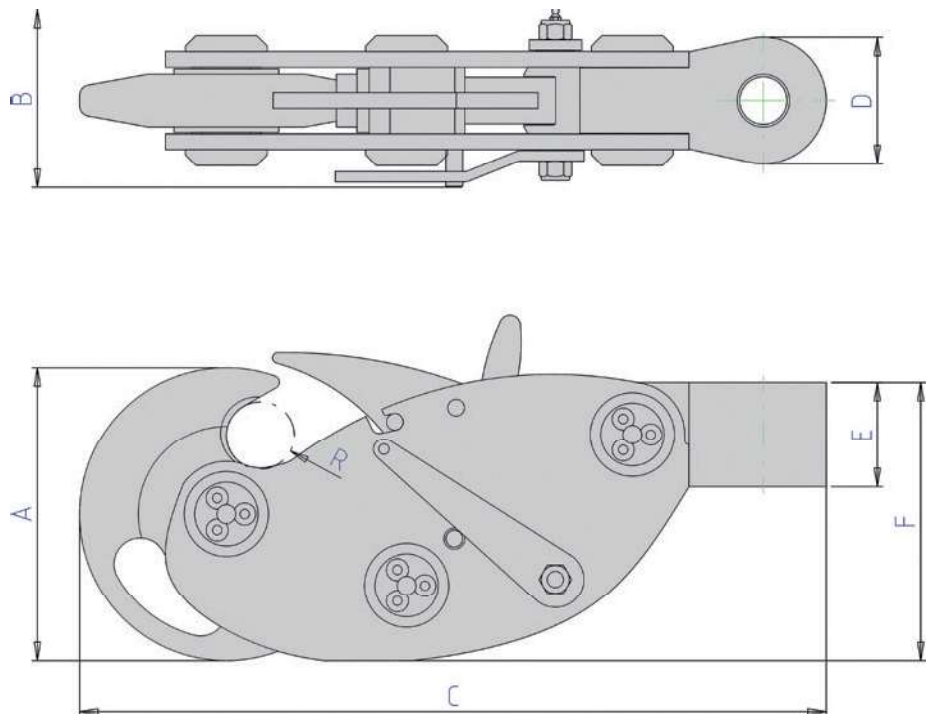
QUICK RELEASE TOWING HOOK – TYPE BG-7

Besides our well known quick release towing hook type GSH, we have developed a small and light towing hook type BG-7 especially designed for small tugs and work boats.

The BG-7 can be operated manually by means of a lever or a rope with a little effort of maximum 15 kgf at full load. A two-step release mechanism prevents accidental opening. It can be reset manually very easily, as the disc is counterbalanced. During release, the rotation reduces the energy impact to a minimum.

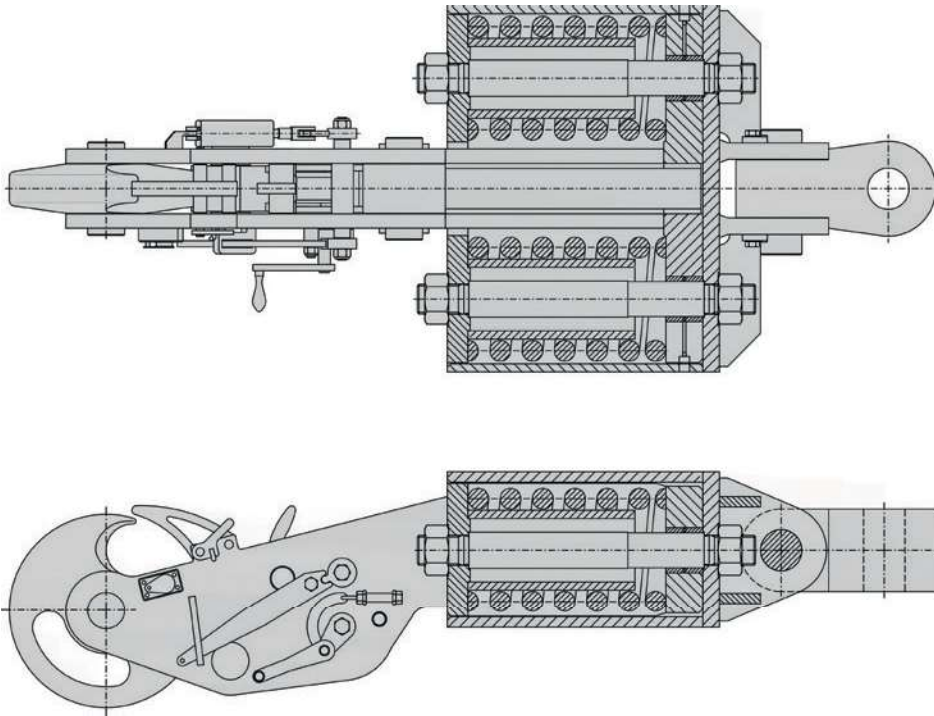


BG-7	
A	280 mm.
B	170 mm.
C	713 mm.
D	120 mm.
E	100 mm.
F	266 mm.
R	∅ 65 mm.
SWL	7 kN (7 ton)
Weight	80 kg.



SHOCK ABSORBERS

Our quick release towing hooks can be provided with spring-loaded shock absorbers. When the maximum pulling force is reached, the springs will reach their end position and the shock absorber will become static.



FOUNDATIONS

Upon request, we design and produce foundations or brackets for towing hooks.

Depending on the requirements, we can build a foundation or bracket to be welded or bolted onto the deck structure.



TESTS and CERTIFICATES

All hooks are tested on our calibrated 3,500 KN hydraulic testing machine.

Each quick release **mooring** hook will be tested at 150% of the safe working load (SWL).

Each quick release **towing** hook will be tested at 200% of the safe working load, with the exception of the GSH-100. This hook is tested at 150% of the SWL.

All hooks undergo a release performance test at the safe working load.

If so desired, the test can be witnessed by a classification authority of your choice.

All factory and witness test certificates will be provided as a part of the user manual.



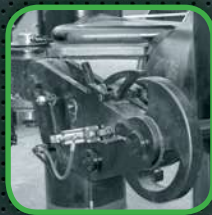
Australian Representative
Chris Millwood
General Manager

Email info@speq.com.au
Tel +61 7 3117 3767
Mobile +61 478 099 199

Building 1, Gateway Office Park
747 Lytton Road
Murarrie QLD 4172

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L. STRAATMAN BV



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WWW.MFSTRAATMAN.COM