LNG
solutions

MannTek

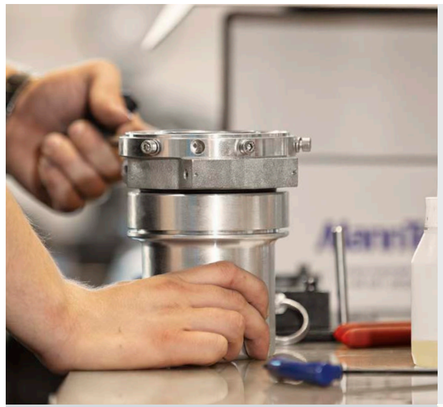
Connections, dedicated teams, innovative expertise – all beyond expectations

The MannTek way

We strongly believe in connections – in more ways than one. Since 1997 we have been producing innovative and safe coupling products. But that's not where the story ends. We develop coupling solutions beyond expectations.

None of this would be possible without dedicated teams. Our experienced personnel are the heart of our existence. We deliver engagement and dedication embodied in customized solutions for our customers. In a world where humans create new challenges every day, we provide reliable and innovative solutions to meet our customers' most pressing needs.

That's why our organization is built upon good communication, respect for others, and trust. At MannTek it is essential to connect with each other, with customers and with distributors, based on respect and understanding. Our open working environment and company culture fosters communication and knowledge sharing in a free climate.

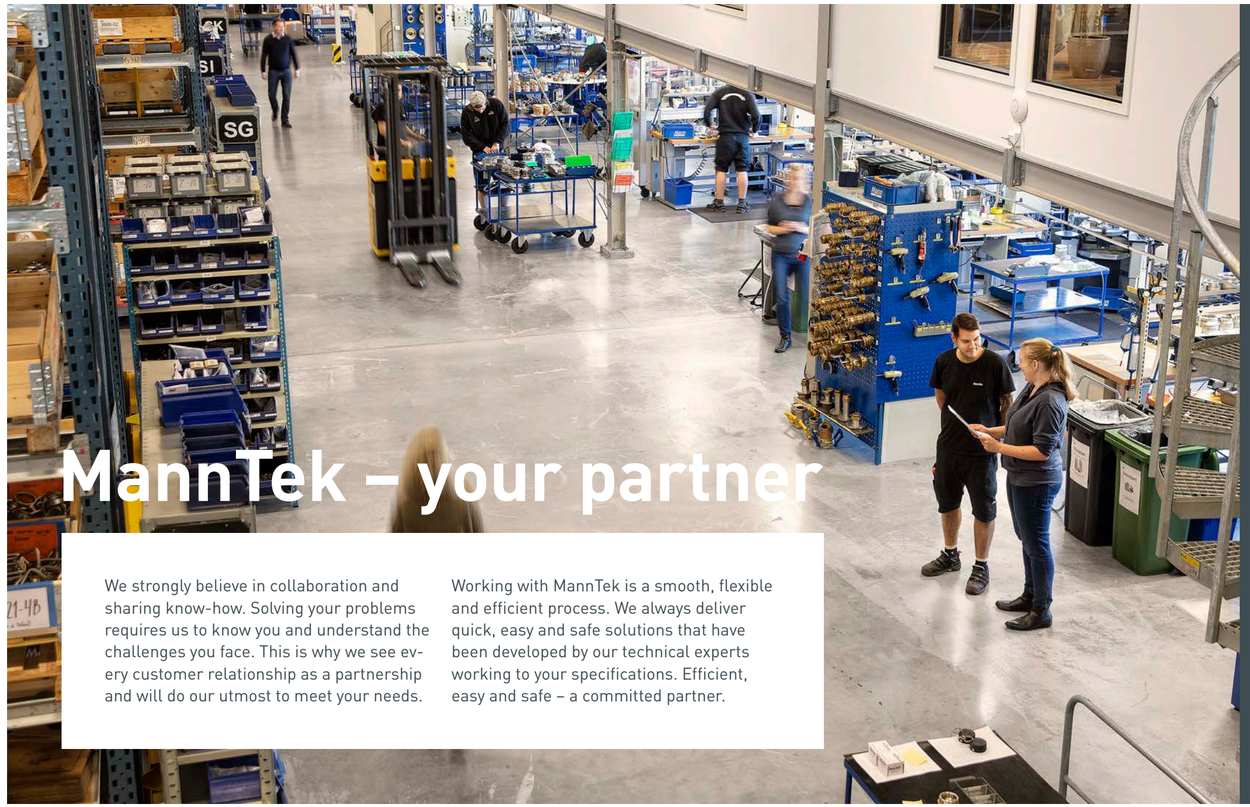


Customized solutions

UNLIMITED POSSIBILITIES

Innovative, safe and reliable

SIMPLE EFFICIENCY



MannTek – your partner

We strongly believe in collaboration and sharing know-how. Solving your problems requires us to know you and understand the challenges you face. This is why we see every customer relationship as a partnership and will do our utmost to meet your needs.

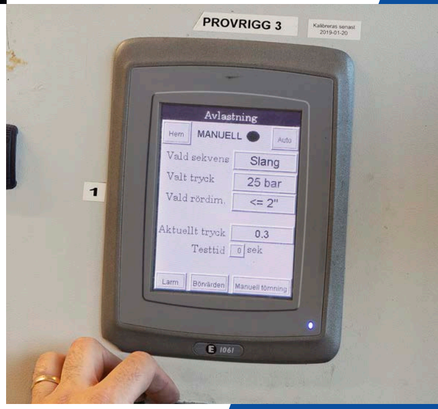
Working with MannTek is a smooth, flexible and efficient process. We always deliver quick, easy and safe solutions that have been developed by our technical experts working to your specifications. Efficient, easy and safe – a committed partner.

A UNIQUE CRAFT

We never compromise with quality. Designing for essential safety requires knowledge, competence and expertise. Our production team has unique skills that take innovation to a new level. This is the foremost reason we can call ourselves market leaders today.

TAILOR-MADE COUPLINGS
Working with aggressive fluids, gases and bulk powder requires more than safety. Our couplings guarantee no spill thanks to a tailor-made design. A solution from MannTek is the best way to make sure the work environment remains clean, safe and spill-free.

EASY, READY AND OPTIMIZED
With more than 20 years of experience of producing couplings for harsh environments, we know the drill. We are continuously improving and extending the performance and design of our products. Working with us is easy as we deliver safe, cost-effective solutions.



BE SAFE – EVERY DAY

Designing pipe works, hoses, valves and tanks for aggressive, explosive or otherwise dangerous media is always challenging. And it's especially challenging to design the parts that human hands touch. Safety, robustness and reliability are what we cope with every day.

We design the widest range of DDC couplings in the world – available in almost any existing metal and many composite materials. Combined with sealing materials with working temperatures from -196°C to +280°C, and the largest variation of connections, this makes a unique match to specific requirements. To fulfil special handling procedures our couplings could be equipped to suit almost any requirements.

Service to the food and beverage industry. Our couplings have been used for beer transportation for many years now. Distilleries are now following in their footsteps, as both whisky and other liquor producers appreciate how our dry disconnect couplings improve their working environment. DDCs deliver full spillage control and eliminate unwanted mixing of products.

LNG TRANSFER SYSTEMS

MannTek LNG transfer systems feature simple, easy-to-use and reliable designs. All components in the system are designed and carefully selected with safety as the highest concern. This, combined with our vast experience in the majority of LNG bunkering projects around the world and our participation in the leading regulatory and trade associations, ensures the final product is cutting edge. It also employs the latest knowledge to comply with current industrial regulations.

A transfer system design consists of a DCC coupling, a CBC breakaway and a hose transfer line in the basic format used on many truck fill applications. For many other applications, a transfer system needs to be compliant with industry standards and may include more advanced solutions such as the PERC (Powered Emergency Release Coupling), the HPN2 release control system and the Vessel Seperation Device, all of them compliant SIL 2.

MannTek LNG system solutions are tailored to meet precise customer needs, such as design specifications, safety requirements, as well as local and international regulations.

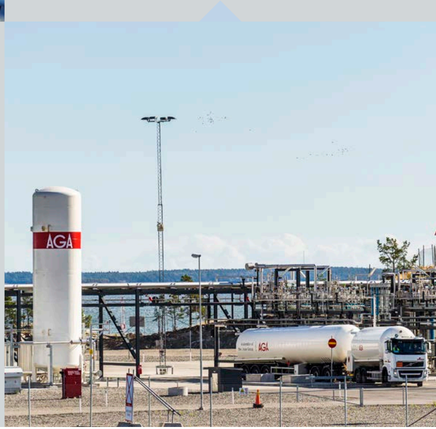
Available sizes range from 2" to 10" and may include either single transfer hose line or multiple hoses of up to 10 hose lines. MannTek transfer systems can be used to transfer LNG either for cargo purposes or for LNG as fuel (bunkering operations). They can be used for applications including:

TRUCK TO SHIP
operations are generally where ships and ferries are fuelled from tank trucks.

TERMINAL OPERATIONS
cover both loading and unloading of rail tankers and tank trucks.

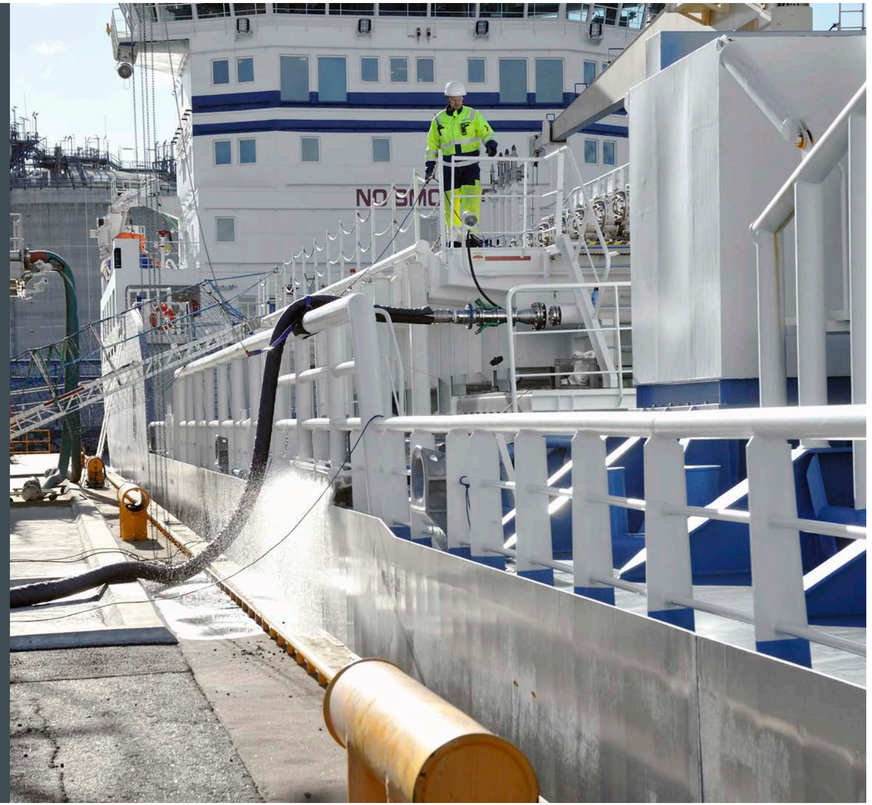
SHIP TO SHIP
transfer between ships, either as fuel or cargo

SHORE TO SHIP
Shore-to-ship operations at an LNG bunker terminal or an LNG terminal.



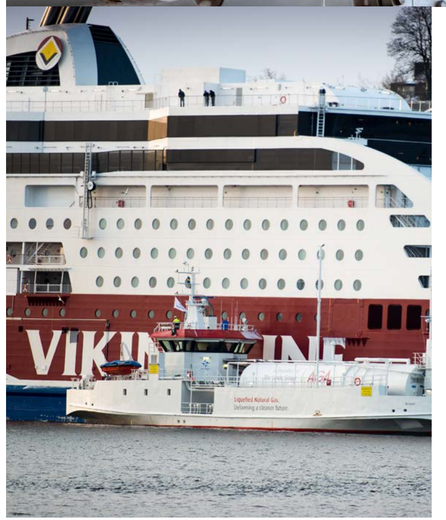
THE WORLD'S WIDEST RANGE OF DRY QUICK COUPLINGS

A part of the future
In response to a rapidly growing need for safe and spillage free handling of LNG, a new product range was born at MannTek. With a full range of 1" to 8" self sealing, quick connecting and disconnecting couplings, we applied our focus on safe and spill free handling to this new but growing industry.



PIONEERING DEVELOPMENT
It all started in 2013 – the first marine application for MannTek cryogenic coupling was to establish an LNG fuelling connection between the world's first and largest LNG cruise ferry, M/S Viking Grace, and the world's first LNG fuel bunkering vessel, AGA/ Lindes LNGF Seagas, in Stockholm Sweden. This was the very first ship-to-ship LNG fuelling operation ever undertaken anywhere in the world. MannTek supplied all of the couplings for this project and were able to offer both connection and disconnection within one minute, safely with no gas leaking out.

The ships are still bunkering, five times per week. With the coupling enabling the fuelling lines and hoses to be gas free, without emitting any natural gas molecules to the atmosphere or exposing operators, the entire operation is considered highly safe and environmentally friendly. Today MannTek continues their pioneering development.



NEW ISO-STANDARDS
MannTek has taken an active part in the development and standardization of an ISO-standard for the DCC couplings to guarantee interchangeability and safe LNG transfers. Already in 2015 ISO/TS18683:2015 was launched and now later has another ISO standard ISO 21593 been launched as well. Both standards cover standardization for supply of LNG as fuel for ships. MannTek manufactures couplings in a full range according both standards to fulfill any requirements. Besides the marine applications, the couplings are also used in many other areas such as filling LNG tank trucks both at depot side as well as customer delivery, refueling LNG vehicles and LNG containers etc.

LNG TRANSFER SYSTEM

DCC – Dry Cryogenic Couplings

CBC – Cryogenic Break-away Couplings

PERC – Powered Emergency Release Coupling

HPN2 – High Pressure Nitrogen System

VSD – Vessel Seperation Device

LNG TRANSFER HOSES

DCC
Dry Cryogenic Couplings

DCCs, Dry Cryogenic Couplings, employ the same design principles as our Dry Disconnect Couplings, which have been in use for more than 25 years. Dry Cryogenic Couplings have been tested under cryogenic conditions by connecting and disconnecting over 10,000 times. With more than 25.000 LNG transfers having been completed using MannTek DCCs, they are considered by operators worldwide to be the safest in the market.
These coupling are used for ship to ship transfer, LNG Bunkering, Marine applications, filling tank trucks and LNG containers. The proven self-sealing valve design enables quick connection and disconnection while protecting operators, the environment and equipment from dangerous liquids and vapours. The MannTek DCC is designed to be compliant with both ISO 18683 and the new ISO 21593.

Key benefits

TIME SAVING Connect or disconnect hoses and pipelines in seconds. No need for retightening during cool down phace. Wet disconnect possible. No need for draining or purging.

EASY TO HANDLE Push and turn - free flow. Turn and pull - closed.

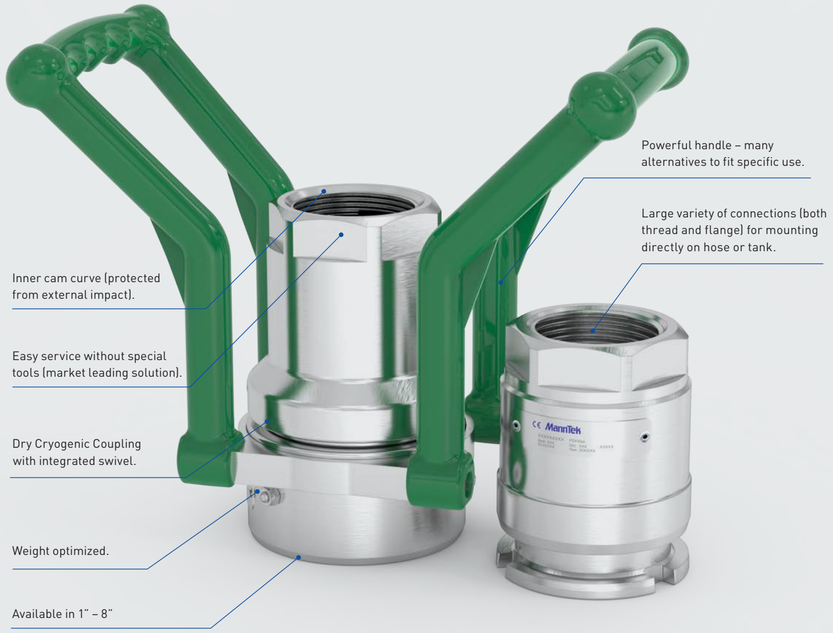
SAFE The valve cannot be opened until the unit is coupled and closes automatically when disconnecting.

ENVIRONMENTALLY FRIENDLY Accidental spillage eliminated.

RELIABILITY No loss or spillage of liquids on connection or disconnection.

Applications

- Container discharge
- Fuel bunkering
- Loading/unloading of tank trucks, rail tankers, bunkering and tank vessels
- Vapour recovery lines



TRY OUR ONLINE CONFIGURATOR

Find your solution

Find your tailor-made product easily with our configurator. Your solution is just a few clicks away. You can save and return to your products.

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LNG TRANSFER HOSES

CBC
Cryogenic Breakaway Couplings

The CBC (Cryogenic Breakaway Couplings) product line is available in three different designs: Breaking Pin, Cable Release, PERC suited to a wide array of applications. All three configurations use the same reliable and well-proven closure mechanism with an optimised poppet, designed to close and stop the flow while containing the product in the hose and pipe.

Key benefits

PASSIVE SECURITY against situations where a hose or loading arm could be subjected to accidental high loads.

A SIMPLE MECHANISM and no loose components that could be lost after release.

OPERATES INDEPENDENTLY of shut-off safety system and does not require an external power source.

EASY TO RESET by a single person on-site.

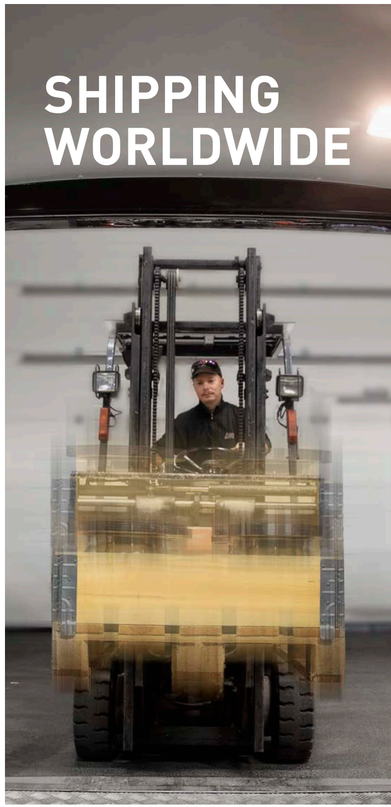
HIGH FLOWRATE / LOW PRESSURE DROP

NO PRODUCT LOSS, positive shut-off of both coupling halves results in minimum wastage.

LIGHTWEIGHT AND ROBUST DESIGN. Available with ANSI/EN flanges or threaded (female NPT).

Applications

- Container discharge
- Fuel bunkering
- Loading/unloading of tank trucks, rail tankers, bunkering and tank vessels
- Vapour recovery lines



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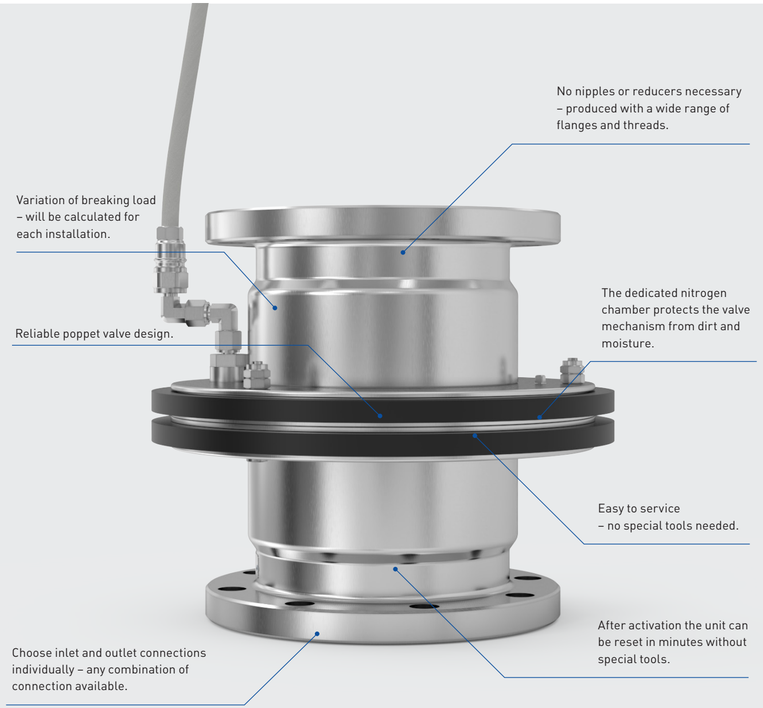
LNG TRANSFER HOSES

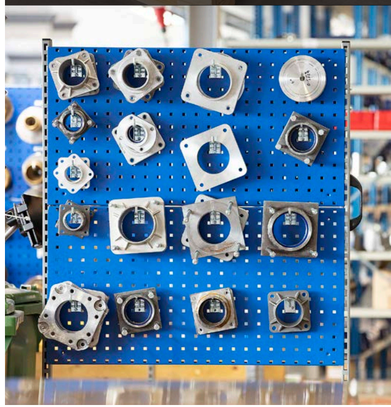
PERC
Powered Emergency Release Coupling

PERC (Powered Emergency Release Coupling), uses the well proven technology from breaking pin design breakaways. These couplings provide 100-percent shut-off of the valves in each half of the PERC and the ability to actively and remotely release the coupling automatically without strain on the transfer system or manifolds. The activated release of the coupling is achieved by injecting high pressure nitrogen into a dedicated chamber isolated from the transferred media in the coupling body resulting in instantaneous release of the PERC.
The PERC is designed to be both lightweight and compact. It is designed with redundancy.

HIGHEST SAFETY LEVEL, THREE WAYS OF RELEASE

1. Release by ESD-signal.
2. Release by manual override, independent of electrical signal.
3. Reverting from nitrogen activated to passive breaking pin. Breaking pins designed to be the weakest point of hose or manifold.





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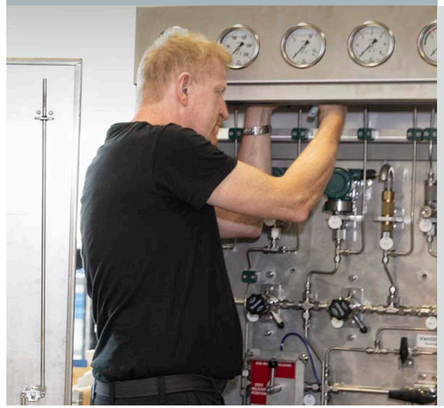
LNG TRANSFER HOSES

VESSEL SEPERATION DEVICE (VSD)
is designed as a vessel separation system utilising two robust wires of different lengths both shorter than the hose. When sudden movement occurs (vessel drift-off), the wires will be stretched and when reaching a pre-set pull/load the wires will activate the VSD switches.

The first VSD 1 will create an ESD 1 signal, and then with continued movement the VSD 2 will create an ESD 2 signal. Output from the VSD 1&2 control device via a terminal block are standard electrical signals that are taken into the ship or shore ESD system enabling pumps to be shut down and manifold ESD valves to be closed (ESD1). ESD2 sends a signal to the ship or shore ESD system to the MannTek HPN2 (High Pressure N2) PERC release system to activate separation of the PERC.

HIGH PRESSURE NITROGEN SYSTEM, HPN2 – SIL1 SIL2
power unit is the dedicated release and monitoring system for the MannTek PERC coupling.
It includes the complete control, monitoring and release system, which uses high pressure Nitrogen in the release mechanism. The system also features a pilot pressure regulator to constantly monitor the system and keep the system free from moisture and ice.



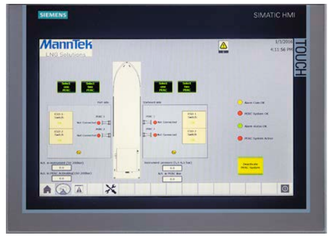
LNG TRANSFER HOSES
are offered for various applications and requirements. MannTek offers two different hose technologies, either a composite hose or a stainless steel design. No matter which hose technology you choose, MannTek makes sure that safety is the highest priority and offers the highest level of certifications and approvals.
Available in sizes 1" to 10" and WP 10-25 bar.

ACCESSORIES

MannTek offers a large variety of options to help customise transfer systems according to the operator's needs, including remote controls for CCR, Y-piece reducers, conical reducers etc.

SIL2 (SAFETY INTEGRITY LEVEL 2)
MannTek SIL2 PLC LNG transfer systems have been assessed by DNV-GL and certified compliant to SIL2. This extra safety feature has been developed in accordance with IEC 61508 and IEC 61511 with input data from the PDS Data Handbook 2010.

Identifying the mean time between failure (MTBF), probability of failure on demand (PDF), all safety instrumented functions (SIF) and achieving a minimum probability of failure on demand is compliant with safety integrity level SIL2.
Safety functions of the LNG Transfer System is SIL2 compliant, including the PERC, HPN2 PLC control system, the ESD1&2 functionality, the logic solver (Siemens PLC controller) as well as the software, sensor elements and final elements.



HOSE SADDLE
A single or double hose saddle can be used to hold the hose in position on both vessels and maintain the correct bend radius. Can be supplied with or without integrated hose break/fall arrest, with an option for adjustable height.

HOSE BREAK SYSTEM/FALL ARREST
This friction device will maintain a constant rate of descent of the hose following activation of the PERC following an ESD2. Once it has reached its full extent, the rope will 'break-away' from the friction device.

HEATED PARKING DEVICE
Heated parking device is used to easily defrost and dry the hose unit after LNG transfer operation. The heated parking device ensures that the hose unit will be ready for transfer operations again within minutes.

OTHER ACCESSORIES
MannTek offers a variety of other extra features, such as:

- Hose Lifting Device
- Hose Protection Covering
- Insulation Flanges
- Hose Reels
- Adjustable N2 Trigger Hoses
- N2 Purge Lines

APPROVALS MannTek complies with all applicable industrial standards and regulations as below.
Transfer systems can be supplied with class approval from any major classification society.

DESIGNATION	DOCUMENT NUMBER	MANNTEK COMPLY
SIL compliance	SIL1/SIL2	✓
Installation and equipment for liquefied natural gas Shore to Ship	EN1473	✓
Installation and equipment for liquefied natural gas Ship to Ship – design (no longer valid)	EN1474 - 1	✓
Installation and equipment for liquefied natural gas Ship to Ship – design/functionality of whole LNG Transfer system)	EN1474 - 3	✓
Petroleum and natural gas industries – Design and testing of LNG marine transfer arms for conventional onshore terminals (superseded EN1474-1)	ISO 16904:2016	✓
Guidelines for systems and installations for supply of LNG as fuel to ships	ISO 18683	✓
Cryogenic vessels. Cryogenic flexible hoses.	EN12434	✓
Safety of Machinery – Safety-related parts of controls systems	ISO 13849	✓
Petroleum and natural gas industries – Installation and equipment for liquefied natural gas – Ship-to-shore interface and port operations	ISO 28460	✓
Ships and marine technology – specification for bunkering of liquefied natural gas fuelled vessels	ISO 20519	✓

DESIGNATION	DOCUMENT NUMBER	MANNTEK COMPLY
Degrees of Protection provided by enclosures (IP Code)	IEC 60529	✓
Electrical and electronic installations in ships – Electromagnetic compatibility (EMC) – Ships with a metallic hull	IEC 60533	✓
Electrical installations in ships – including Parts: 201, 350, 351, 376, 502, 504	IEC 60092	✓
Functional safety – Safety instrumented systems for the process industry sector	IEC 61511 (all parts)	✓
Functional safety of electrical/electronic/programmable electronic safety-related systems	IEC 61508 (all parts)	✓
International Code for the Construction and Equipment of Ships Carrying Liquefied Gasses in Bulk	IMO IGC Code	✓
Manifold Arrangements for gas fuelled vessels	SGMF Publication	✓
Gas as a Marine Fuel Safety Guidelines	SGMF Publication	✓
Preview Ships and marine technology – Technical requirements for dry-disconnect/connect couplings for bunkering liquefied natural gas	ISO 21593:2019	✓
LNG STS Guidelines	SIGTTO	✓

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COMPANY APPROVALS

Apragaz · TDT · VdTÜV · ClassNK · Lloyd's Register · Ex II 2G · EAC · CE · ISO 9001

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