



# CRYOGENIC





## LNG BUNKERING

The Viking Grace, the worlds first large passenger ferry powered by LNG engines, is refuelled safely, quickly and easily with Mann Tek Dry Cryogenic Couplings, DCCouplings.

# THE WORLD'S WIDEST RANGE OF DRY QUICK COUPLINGS- A PART OF THE FUTURE

Noticing a rapidly growing need for a safe and spillage free handling of LNG a new product range at Mann Tek® was born.

With a full range of 1" to 6" self sealing, quick connecting and disconnecting coupling our focus of a safe and spill free handling was applied in this new but growing industry.

## Pioneering development

The first marine application for Mann Tek® cryogenic coupling was to establish a LNG fuelling connection between the world first and largest LNG cruise ferry, M/S Viking Grace and the worlds 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 world wide. Mann Tek® supplied all couplings for this project and where therefor enable to offer both connection and disconnection within one minute, safely with no leaking of gas.

With the fact that the coupling enabled the fuelling lines and hose to be gas free without emitting any natural gas molecules to the atmosphere or exposed to operators – the entire operation were considered highly safe and environmentally friendly.

## New ISO-standards

In 2015 a new ISO-standard, in regards for supply of LNG as fuel to ship was published. Mann Tek Dry Cryogenic Coupling is the first manufacturer world wide, to offer a fully compatible series of products in this new standard, ISO/ TS 18683:2015.

Besides the marine applications, the couplings are also used in many other areas such as filling LNG-tank trucks both at the depot side and on the customer side, filling vehicles and LNG containers etc.



*AGA's bunker ship Seagas is loaded with 70 tons or 167 cubic meters of natural gas in liquid form and with the large hose Seagas is connected to the passenger ferry Viking Grace for refuelling. The couplings used in this world wide break through in the LNG-industry, are exclusively Mann Tek's Dry Cryogenic Coupling and Cryogenic Breakaway Coupling.*



# ***DCCouplings***

## ***Dry Cryogenic Couplings***

Mann Tek Dry Cryogenic couplings are a breakthrough within the LNG industry. With one single action, a straight forward push and a turning motion, to connect the couplings for a full flow motion. A quick and easy "turn and pull"- action will disconnect, close the valve with no spillage.

Mann Tek couplings are used to prevent any excess spillage and protect people and environment from dangerous liquids and vapours.



### **TECHNICAL INFORMATION**

#### **Sizes:**

1" (DN 25) to 6" (DN 150)

#### **Materials:**

Stainless steel

#### **Seals:**

PTFE

#### **Maximum working pressure:**

MWP 25 bar- 1"-4" couplings

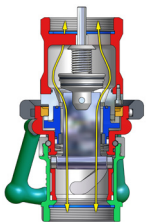
MWP 16 bar- 6" coupling

#### **Working temperature:**

Minimum -200°C

#### **Connections:**

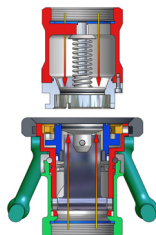
Female NPT thread, EN1092 (DIN) and ANSI flanges. Other on request



#### **To connect**

*Push and turn -*

*it's coupled with full flow*



#### **To disconnect**

*Turn and pull -*

*it's released and no spillage*

### **Advantages**

- **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 at connection or disconnection.

### **Applications**

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

Refuelling M/S Viking Grace with LNG from AGA/ Lindes LNGF Seagas. Mann Tek Dry Cryogenic Coupling and Cryogenic Breakaway Coupling in use.



# CBCouplings

## Cryogenic Break-away Couplings

Mann Tek Cryogenic Breakaway Coupling is a development of our Safety Breakaway Coupling which has been successfully used for many years. The internal valves will immediately close the flow in both halves of the coupling and therefor prevent accidents and unwanted spillage of product. Installed at fixed points like manifolds, pipelines and depots or on to a hose.



### TECHNICAL INFORMATION

#### Sizes:

1" (DN 25) to 6" (DN 150)

#### Materials:

Stainless steel

#### Seals:

PTFE

#### Maximum working pressure:

MWP 25 bar- 1"-4" couplings

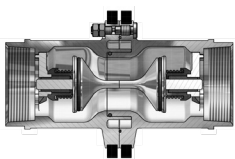
MWP 16 bar- 6" coupling

#### Working temperature:

Minimum -200°C

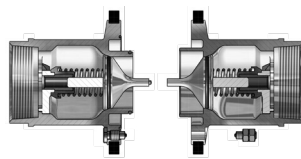
#### Connections:

Female NPT thread, EN1092 (DIN) and ANSI flanges. Other on request.



#### In service

The CBCoupling consists of two halves, each with a valve.



#### Released

After an emergency disconnection the CBCoupling separates and both vaults close immediately.

### Advantages

- Passive security against situations where a hose or loading arm could be subjected to accidental high loads.
- A simple mechanism and no loose components which could be lost after release.
- Operates independently of shut off safety system and does not require an external power source.
- Easy to reset on site with one person
- High flowrate / low pressure drop
- No product loss, positive shut-off of both coupling halves results in minimum.
- 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
- Vapor recovery lines

## About

Mann Tek is a Swedish manufacturer and supplier of Dry Cryogenic Couplings and has during the past years made a significant market leading breakthrough in LNG. We offer a dry cryogenic coupling which operates by our system "push and turn- free ow" and "turn and pull- closed".

We have supplied couplings for several passenger ferries and OSV's, which runs on LNG, and the worlds first LNG-bunker ship.

In 2015 a new ISO-standard, in regards to LNG as fuel to ship was published. Mann Tek Dry Cryogenic Coupling is the first manufacturer world wide, to offer a fully compatible series of products in this new standard, ISO/ TS 18683:2015



With more than twenty years of knowledge and experience in the industry it has accumulated extensive expertise about applications in many types of variations in which our couplings have been, and can be used, with excellent results.

We constantly strive to develop and improve the performance and design of our products, to meet changes, new market demands and standards. Which, today, is what made us market leading. Our couplings are the obvious choice when certifications and product approvals are required, anywhere in the world.

Mann Tek® is certified to ISO9001:2008

## Company Approvals



Mann-Tek is a certified ISO9001-company.

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