Certificate No:
TAP00001YT

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Quick Connecting Coupling for LNG / LPG

with type designation(s)
DDCCoupling (Dry Disconnect/Connect Couplings)

Issued to
Mann Teknik AB
MARIESTAD, **Sweden**

is found to comply with

Application :

Dry-disconnect/connect couplings for bunkering liquified natural gas.

This certificate is not valid for couplings which are subject to Classification by DNV.

Max. working temp.:	**-196°C to +85°C**
Max. working press.:	**See page 2**
Sizes:	**DN25, DN50, DN65, DN80, DN100, DN150 and DN200**

Issued at **Høvik** on **2021-12-21**
This Certificate is valid until **2026-12-20**.
DNV local station: **Sweden CMC**

Approval Engineer: **Sinisa Sedlan**

for **DNV**

Zeinab Sharifi
Head of Section

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid.
The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.

Product description

The DDCCouping consist of a “tank unit” which is a type of non-return valve and a “hose unit” with a valve driven by an internal cam curve to open both valves at the same time. An initial push and turn action on the hose unit provides engagement with the tank unit, thus locking and sealing the two units together.

End connections: Flanges PN16/PN25 acc. to EN 1092-1
Flanges Class 150/300 acc. to ASME B16.5
NPT threaded connection acc. to ASME B1.20.1 (size 2" Class 150 only)

Material: Stainless steel 1.4404 (EN 10272)

The coupling interfaces are in accordance with ISO 21593:2019.

Application/Limitation

Components covered by this certificate may be used for transfer of LNG/LPG into tanks within limits of maximum working pressure and temperature range.

Max. working pressure:
- As per pressure-temperature ratings of end connection (for couplings with flanges PN16/PN25 acc. to EN 1092-1 and flanges/threaded ends Class 150 acc. to ASME B16.5/ASME B16.34)
- 25 bar (for couplings with flanges Class 300 acc. to ASME B16.5)

The method for cooling down coupling bodies by flow of liquid phase through hose and coupling (ref. ISO 21593 [8.3.2]) is not followed in the high-pressure test (ref. ISO 21593 [8.17]).

Components covered by this certificate may be installed where fire safe applications are required.

The couplings shall always be installed according to the manufacturer's instructions.

This certificate is not valid for designs, components, equipment, systems or products which are subject to classification by DNV.

Type Approval documentation

Tests carried out

As per ISO 21593:2019 Section 8.

Marking of product

As per ISO 21593:2019 Section 7.

Periodical assessment

For retention of the Type Approval, a DNV Surveyor shall perform periodical assessment after two years (+/- 90 days) and after 3.5 years (+/- 90 days) to verify that the conditions for the approval are complied with. Reference is made to DNV-CP-0338.