

# TYPE APPROVAL CERTIFICATE

## This is to certify:

**That the Pipe Couplings, Bite and Compression Type**

with type designation(s)  
**RING-SAFE**

Issued to

**MANULI HYDRAULICS ITALIA SRL A SOCIO UNICO**  
**Milano MI, Italy**

is found to comply with

**DNV GL rules for classification – Ships Pt.4 Ch.6 Piping systems**  
**DNVGL-OS-D101 – Marine and machinery systems and equipment, Edition January 2018**  
**DNV GL class programme DNVGL-CP-0185 – Type approval – Mechanical joints**

## Application :

**Product(s) approved by this certificate is/are accepted for installation on vessels classed by DNV GL.**

**Temperature range:** see page 4

**Max. working press.:** 100 bar to 800 bar (see page 3)

**Sizes:** Tube O.D: 4 to 42 mm (see page 3)

Issued at **Høvik** on **2020-03-05**

This Certificate is valid until **2025-03-04**.

for **DNV GL**

DNV GL local station: **Italy/Malta CMC**

Approval Engineer: **Maheshraja Venkatesan**

**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.



## Product description

Cutting ring fittings and 24° swivel connectors according to DIN 2353 / ISO 8434-1 with following designation according to 'Manuli Ring safe catalogue':

<b>Coupling type</b>	<b>Manuli Designation</b>
Welding bulkhead	A50117W / A50128W
Equal elbow	A561111 / A561212 / A567373
Threaded bulkhead	A501177 / A501287
Equal tee	A701111 / A701212 / A707373
Straight coupling	A501111 / A501212 / A507373
Bulkhead elbow	A561177 / A561287
Equal cross	A901111 / A901212 / A907373
Male stud elbow	A561107 / A561188 / A561135 / A561207 / A561288 / A561235 / A567307 / A567388 / A567335
Male stud straight	A501101 / A501107 / A501114 / A501130 / A501135 / A501166 / A501171 / A501172 / A501188
	A501201 / A501207 / A501214 / A501230 / A501235 / A501266 / A501271 / A501272 / A501288
	A507307 / A507335 / A507388
Male stud branch tee	A781107 / A781135 / A781171 / A781172 / A781188
	A781207 / A781235 / A781271 / A781272 / A781288
	A787307 / A787335 / A787388
Male stud barrel tee	A761107 / A761135 / A761171 / A761172 / A761188
	A761207 / A761235 / A761271 / A761272 / A761288
	A767307 / A767335 / A767388
Male stud branch tee	A781111 / A781212 / A761111 / A761212
Standpipe adaptor	A520120 / A521420 / A520121 / A521421 / A523520 / A523521
	A527120 / A527121 / A527220 / A527221
Adjustable barrel tee	A581120 / A581221
Adjustable barrel tee	A711120 / A711221
Adjustable barrel tee	A721120 / A721221
Manometer coupling	A521153 / A521253 / A521143 / A521243
Adjustable manometer coupling	A512053 / A512153 / A512043 / A512143
Adjustable manometer coupling	A511553 / A511653
Adjustable W-coupling	A551115 / A581115 / A551216 / A581216
Adjustable T-coupling	A711115 / A711216
Adjustable L-coupling	A721115 / A721216
Standpipe adaptor	A520115 / A521415 / A523515 / A520116 / A521416 / A523516
Reducing standpipe	A521120 / A521221
Reducing standpipe	A521115 / A521216
Straight welding coupling	A501195 / A501295

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Coupling type	Manuli Designation
Straight female adaptor	A521104 / A521114 / A521135 / A521204 / A521214 / A521235
Straight reducing	A501111 / A501212 / A507373
Adjustable T-swivel	A7S11B3 / A7S11B4 / A7S11B7 / A7S11B8 / A7S12B3 / A7S12B4 / A7S12B7 / A7S12B8
Adjustable W-swivel	A5S11B1 / A5S11B2 / A5S11B3 / A5S11B4 / A5S12B1 / A5S12B2 / A5S12B3 / A5S12B4
Swivel coupling	A201111 / A201212
Swivel coupling	A201101 / A201201 / A201114 / A201214
Swivel coupling	A5S1111 / A5S1212
Swivel coupling	A5S1101 / A5S1201 / A5S1114 / A5S1214

#### Cutting rings

- SDR – metallic sealing, single edge cutting ring –24° cone end as per DIN 3861;
- PDR – metallic sealing, double edge cutting ring –24° cone end as per DIN 3861.

Assembling locations: : (1) MANULI HYDRAULICS ITALIA SRL A SOCIO UNICO, Milano MI, Italy  
(2) Fluiconnecto OY - Lasertie 2, 74200 Vieremä, Finland  
(3) Fluiconnecto OY - Hirvikoskentie 242, 32210 Loimaa, Finland

#### Material of construction

Component	Material designation	Standard/Specification
Pipe coupling, nut and cutting ring	C15 (1.0401) or C15E (1.1141) non alloy steel C22 (1.0402) non alloy steel C35 (1.0501) or C35E (1.1181) non alloy steel C45 (1.0503) or C45E (1.1191) non alloy steel 11SMnPb30 (1.0718) non alloy steel C10C (1.0214) non alloy steel	DIN EN 10277-2/-3:2008-06 DIN 3859-1:2005-09 DIN EN 10277:2018-09 DIN EN 10263-2:2018-02

#### Application/Limitation

Maximum working pressures (at room temperature):

Product line	Tube OD (mm)	Pressure (bar)
LL	4 – 8	100
L	6 – 10	500
	12 – 18	400
	22 – 42	250
S	6 – 10	800
	12 – 16	630
	20 – 38	420

At elevated temperatures, the maximum pressures are to be reduced according to following:

Temperature, [°C]	-20 to 120	150	200	250
Pressure reduction [-]	1	0.89	0.81	0.72

Temperature range depends on pressurised component and sealing ring materials:

Material	Temperature range
Non-alloy steel	-20°C up to +250°C
FPM	-25°C up to +200°C
NBR	-30°C up to +100°C
PTFE	-60°C up to +100°C

Couplings covered by this certificate are approved to be used in class I, II and III piping systems according to the latest requirements of governing rules in following applications<sup>(5)</sup>:

<p><b>a. Flammable fluids (flash point ≤ 60°C)</b></p> <ul style="list-style-type: none"><li>- Cargo oil lines <sup>(2)</sup></li><li>- Crude oil washing lines <sup>(2)</sup></li><li>- Vent lines</li></ul> <p><b>b. Inert gas</b></p> <ul style="list-style-type: none"><li>- Water seal effluent lines</li><li>- Scrubber effluent lines</li><li>- Main lines <sup>(1)(2)</sup></li><li>- Distributions lines <sup>(2)</sup></li></ul> <p><b>c. Flammable fluids (flash point &gt; 60°C)</b></p> <ul style="list-style-type: none"><li>- Cargo oil lines <sup>(2)</sup></li><li>- Fuel oil lines <sup>(1)</sup></li><li>- Lubricating oil lines <sup>(1)</sup></li><li>- Hydraulic oil <sup>(1)</sup></li><li>- Thermal oil <sup>(1)</sup></li></ul>	<p><b>d. Fresh water</b></p> <ul style="list-style-type: none"><li>- Cooling water system</li><li>- Condensate return</li><li>- Non-essential system</li></ul> <p><b>e. Sanitary/drains/scuppers</b></p> <ul style="list-style-type: none"><li>- Deck drains (internal) <sup>(4)</sup></li><li>- Sanitary drains</li><li>- Scuppers and discharge (overboard)</li></ul> <p><b>f. Sounding/vent</b></p> <ul style="list-style-type: none"><li>- Water tanks/dry spaces</li><li>- Oil tanks (f.p. &gt; 60°C) <sup>(1)</sup></li></ul> <p><b>g. Miscellaneous</b></p> <ul style="list-style-type: none"><li>- Starting/control air</li><li>- Service air (non-essential)</li><li>- Brine</li><li>- CO<sub>2</sub> system</li><li>- Steam <sup>(3)</sup></li></ul>
<p>(1) Not inside machinery spaces of category A or accommodation spaces. May be accepted in other machinery spaces provided the joints are located in easily visible and accessible positions.</p> <p>(2) Only in pump rooms and open decks</p> <p>(3) May be used for pipes on deck with a design pressure of 10 bar or less.</p> <p>(4) Only above bulkhead deck of passenger ships and freeboard deck of cargo ships.</p> <p>(5) Material of couplings covered by this certificate are not sea water resistant and shall not be used in direct contact with sea water.</p>	

This certificate is valid for the specific coupling type, assembled and delivered by the holder & the assembling locations as specified in this certificate.

For selection of the minimum wall thickness for pipes refer to DNVGL RU-SHIP Pt.4 Ch.6 Sec. 9 Tables 3 and 4. Requirements on material certificates are defined in Section 2, Table 3.

Pipe Couplings, Bite and Compression Type are not approved for installation in high pressure fuel injection systems of combustion engines.

Bulkhead connections (type GS-V and WS-V) are not approved for penetration through tank walls, fire divisions, watertight deck and bulkheads.

Materials and material protection chosen for the specific system shall be suitable for the intended medium and environmental conditions.

The couplings are not approved for gases having an oxygen content exceeding 25% as per DNVGL-CP-0185 Sec.5 [8].

Pipe coupling where pressure-tight joints are made on the threads with parallel or tapered threads are not approved for piping systems conveying toxic or flammable media or services where fatigue, severe

erosion or crevice corrosion is expected to occur as per DNVGL RU-SHIP Pt.4 Ch.6 Sec.9 [5.2.6]. Pipe coupling is limited to the following applications solely:

1. CO<sub>2</sub> systems inside of protected spaces and CO<sub>2</sub> cylinder rooms;
2. Threaded joints for direct connectors of pipe lengths with tapered thread shall be allowed for:
  - a. Class I, outside diameter not more than 33.7 mm;
  - b. Class II and class III;
3. Threaded joints with parallel thread shall be allowed for class III.

An overview of threaded pipe couplings with limitations due pressure-tight joint on a thread is as follows:

<b>Coupling type</b>	<b>Manuli Designation</b>
Straight standpipe connector	A523520 / A523521
Straight female connector	A521135 / A521235
Male stud connector	A501101 / A501107 / A501114 / A501130 / A501166 / A501171 / A501172 / A501188 A501201 / A501207 / A501214 / A501230 / A501266 / A501271 / A501272 / A501288 A507307 / A507388
Male stud connector	A501135 / A501235 / A507335
Male stud barrel tee	A761107 / A761171 / A761172 / A761188 A761207 / A761271 / A761272 / A761288 A767307 / A767388
Male stud barrel tee	A761135 / A761235 / A767335
Pressure gauge connector	A521143 / A521243
Pressure gauge connector standpipe	A512043 / A512143
Male stub branch tee	A781107 / A781171 / A781172 / A781188 A781207 / A781271 / A781272 / A781288 A787307 / A787388
Male stub branch tee	A781135 / A781235 / A787335
Male stud elbow	A561107 / A561188 / A561207 / A561288 / A567307 / A567388
Male stud elbow	A561135 / A561235 / A567335
Straight reducer	A527104
Straight reducer	A520104

## Type Approval documentation

### Tests carried out

Tightness test, Burst pressure test, Vacuum test, Pull-out test, Repeated assembly test, combined vibration and pressure pulsation test, Fire resistance test

### Marking of product

For traceability to this type approval, the couplings are at least to be marked with manufacturer's name or trade mark.

### Periodical assessment



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For retention of the Type Approval, a DNV GL 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 DNVGL-CP-0338.