



Certificate no.:
TAS00004EX

TYPE APPROVAL CERTIFICATE

This is to certify:

that the Cranes, gen.

with type designation(s)
Tensioner

issued to

MacArtney A/S
Esbjerg V, Syddanmark, Denmark

is found to comply with

DNV standard DNV-ST-0378 – Offshore and platform lifting appliances

Application:

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

Issued at **Høvik** on **2024-11-20**

This Certificate is valid until **2029-11-19**.

for **DNV**

DNV local unit: **Esbjerg Verification**

Approval Engineer: **Fredrik Per Olof Höglund**

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 USD 300 000.

Product description

Product: 2-track Tensioner for cable laying

Design codes/standards used as references

DNV-RP-0232 – Pipeline and cable laying equipment

Application/Limitation

Category: Active equipment – high risk

Self-weight of tensioner: 18 mT

Operating mode: 2 track mode, bi-directional	Operational*	
Maximum operational line load (MOLL)	200 kN	
Maximum emergency line load (MELL)	250 kN	
Maximum brake load	300 kN	
Maximum squeeze force, operational	667 kN/track	
Maximum squeeze force, braking	1000 kN/track	
Contact length between track pads and cable	4000 mm	
Product diameter range	Ø50/400 mm	
Maximum pay-out speed	15 m/min	
Maximum product fleet angle, from centreline	0 deg.	
Minimum friction coefficient between track pads and cable	0.15**	
Vessel accelerations	Operational	Transit
Vertical (in addition to gravity)	±10 m/s ²	±13 m/s ²
Horizontal, parallel to tracks moving direction	7 m/s ²	9 m/s ²
Horizontal, perpendicular to tracks moving direction	10 m/s ²	13 m/s ²
Wind speed (at tensioner level)	24 m/s	44 m/s

* During transit, the tracks will not be subjected to any line loads.

** The minimum friction coefficient has been provided by MacArtney, data and procedures adopted for estimating have not formed part of DNV scope.

Minimum design temperature: -20°C

Approval limitations

The following have not formed part of this approval:

- Motors, brakes and gearboxes
- Hydraulic cylinders
- The tracks
- The track pads; it is the end user's responsibility to ensure that track pads are appropriate to the product (e.g. cable) dimensional, physical and mechanical characteristics are used.
- Corrosion and functionality in marine environment



Job ID: **262.1-041812-1**
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Type Approval documentation

Certification

This Type Approval covers design(s) only. i.e. the Type Approval is not valid for the final product, but may be used as basis for obtaining a product certificate.

If a DNV Product Certificate is required, the following shall apply:

- The manufacturing survey shall be followed-up by a DNV Surveyor
 - Subcomponents such as gears, brakes, hydraulic cylinders, etc. shall be delivered with certificates in accordance with DNV-RP-0232 Table 2-3.
 - Overload, functional and failure mode testing as per DNV-RP-0232 Sec.7 and DNV approved test procedures and the following:
 - The tensioner shall be calibrated to a certified load cell; the certified load cell used for calibration shall have a certificate from a recognized certification body
 - Test loads for retrieving/laying/holding:
 - Static pull (retrieving) & static holding (laying): 250 kN
 - Static brake (holding): 300 kN
- Testing shall be witnessed by a DNV surveyor.
- Marking as per DNV-ST-0378 Sec.14.

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.

This certificate is only valid if required periodical assessments are carried out with satisfactory results. To check the validity of this certificate, please look it up in <https://approvalfinder.dnv.com>.

End of certificate