



KONGSBERG



# VESSEL TENSIONER (VT)

## KONGSBERG MARITIME DECK MACHINERY

### Vessel Tensioner (VT)

The Vessel Tensioner (VT) is a combined fairlead, chain stopper and remote tensioning device in one unit. The VT enables the mooring chain to be tensioned by an anchor handling vessel.

**Eliminating the need for onboard floater winches leads to reduced CAPEX.**

Having mooring winches installed onboard the floater itself is not cost-efficient, acknowledging that the floater will remain at location for a prolonged period without the need for re-positioning. The hook-up and tensioning of the floater is made possible by using the VT and utilizing a typical spot-market AHT-vessel to apply tension.

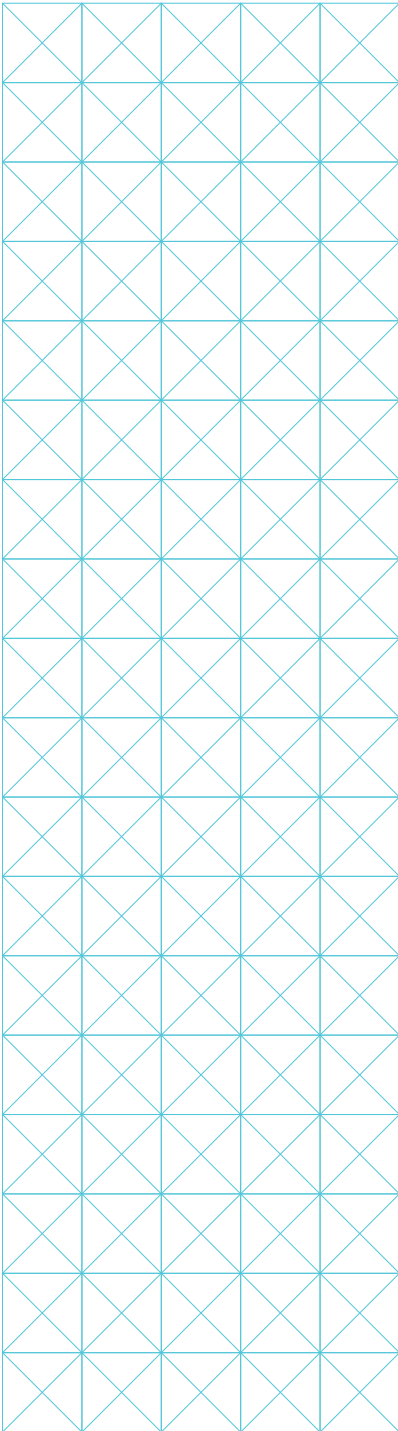
**Utilizing the pulley block-effect leads to a larger range of suitable AHT-vessels to perform the hook-up and tensioning thus reduced OPEX.**

As the chain runs over a sheave in the VT and the angle of wrap around the sheave is large, the reaction load on the floater leg will be considerably increased compared to the applied bollard pull from the AHT-vessel. The anchor lines on the opposite side of the floater from the one tensioned will experience the increased reaction load.

The VT has received an Approval in Principle by DNV for compliance with DNV-OS-E301 and is patent pending.

#### DESCRIPTION

A Vessel Tensioner (VT) is an anchor point for the mooring chain installed on the leg of a floating offshore unit or a floating offshore wind turbine foundation. The VT enables the mooring chain to be tensioned by an anchor handling vessel.

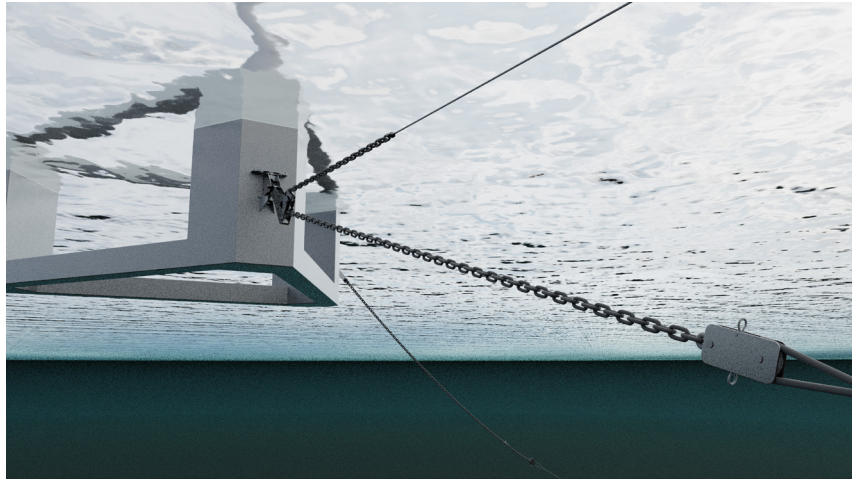


## Operational advantages

The structural integrity of the mooring chain is ensured by a robust self-locking chain stopper system, designed to optimize the lifetime of the resting chain link and minimizing any Out of Plane Bending. The chain stopper system itself consists of a minimum of moving parts thus is maintenance kept to a minimum.

Load measurement can be included, either from a shear-pin in the VT or a sensor-less system.

The VT is designed according to offshore standards and is built on decades of experience from the E&P Industry.



## The solution has the following characteristics and benefits:

- Mooring chain dimension from 76mm to 220mm and chain quality ranging from R3 to R6.
- Pull-in of chain and thus tensioning is done by bollard pull from an AHT-vessel.
- The chain load is held by a fail-safe pawl mechanism.
- The self-closing pawl is opened by transmitting a signal to a temporary energy storage unit and apply tension by work wire from AHT to chain end link.
- The pawl and sheave design secures large contact surface on the chain link, optimizing the stress distribution and the out of plane bending properties.
- Few moving parts, making the solution robust and reliable.
- Can be used as a strong point for attachment of the towing line during tow-out of the floater and position keeping during hook-up to anchor lines.
- Can be installed in wet or dry environment.



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