



Offshore Cranes

Colibri™ 3D Motion Compensated Crane

The TTS Colibri™ combines TTS' competences in crane design and manufacturing with Ulstein's expertise in innovative motion technology and analysis. All TTS Colibri™ cranes are based on TTS' range of cylinder luffing box boom cranes designed for long service life in harsh, North Sea conditions.



A MacGregor Company

The Cooperation

Ulstein Equipment B.V. and TTS Offshore Solutions AS have entered an exclusive, world-wide cooperation agreement for newbuilding projects. Combining Ulstein's expertise in motion analysis and TTS' renowned offshore and marine cranes results in an innovative approach to 3D motion compensation.



ULSTEIN®



- Innovative Solutions
- Market leader in motion analysis
- Workability & Operational studies
- Below the hook specialists

- Crane Design & Manufacturing
- Market leader in AHC
- Global Presence
- Above the hook specialists

The Principle

In any motion compensation system, sufficient power should be available to move the object. When more mass is introduced into a system, more power is required.

The first generation of motion compensated cranes were based on moving the entire crane structure in order to keep the boom tip still.

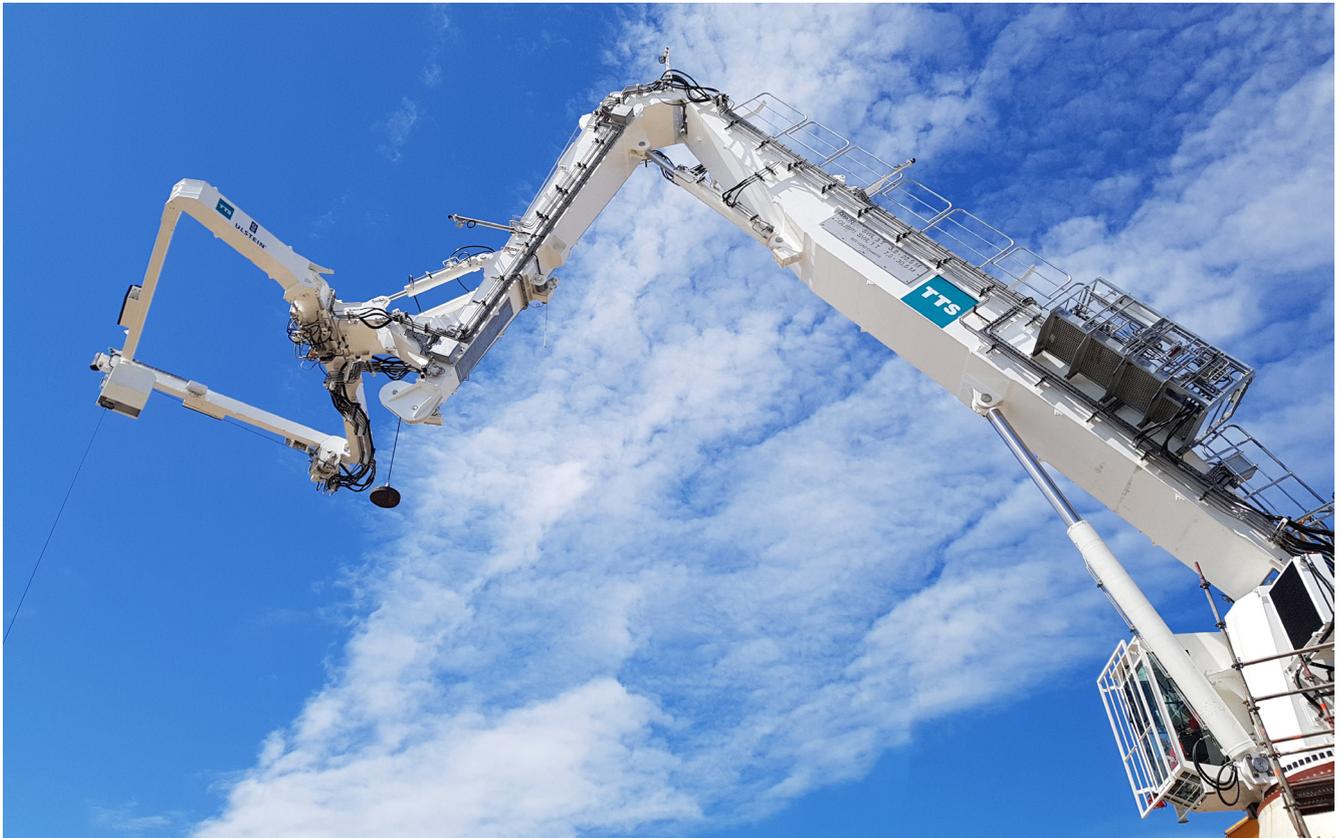
These systems required a relatively high power installed and large foundations to enable the compensation equipment to move a crane structure of 30-50T. What became apparent is that when actively compensating high masses on vessels, the crane compensation could induce motions to the vessel

Ulstein started on a bright idea - to reduce the compensated mass to an absolute minimum.

From this idea, the Colibri™ motion compensation concept was formed. The development of the Colibri™ went through several iterations, and in cooperation with TTS resulted in a

cost-efficient, lightweight, high performance system.

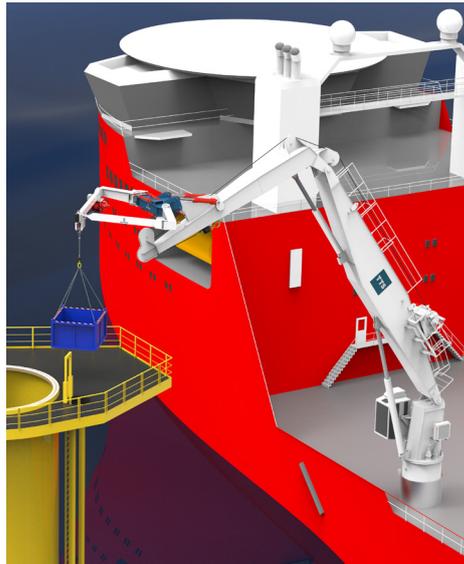
When compared to other motion compensated cranes, the Colibri™ has a superior power-to-compensated mass ratio, giving a perfect balance between installed power and performance



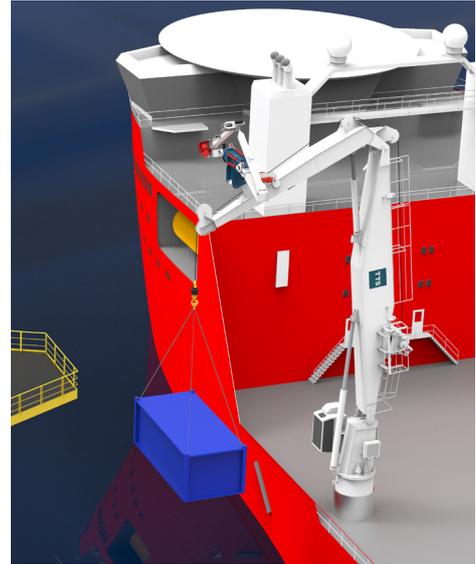
Best of both worlds

The Colibri™ is in principal an additional articulation on the folding jib of a traditional Knuckle Boom Crane. However, this extra articulation can compensate in the X & Y plane, adding an additional axis of compensation.

The Colibri™ crane functions both as a normal offshore crane with AHC, and as a 3D motion compensated crane, without the need for any mobilization or interchanging of parts. The Colibri™ has it's own cylinders that control the articulation, so switching from Main Winch operation to Colibri™ operation can be rigged in a couple of minutes.



Colibri™ 3D Operation



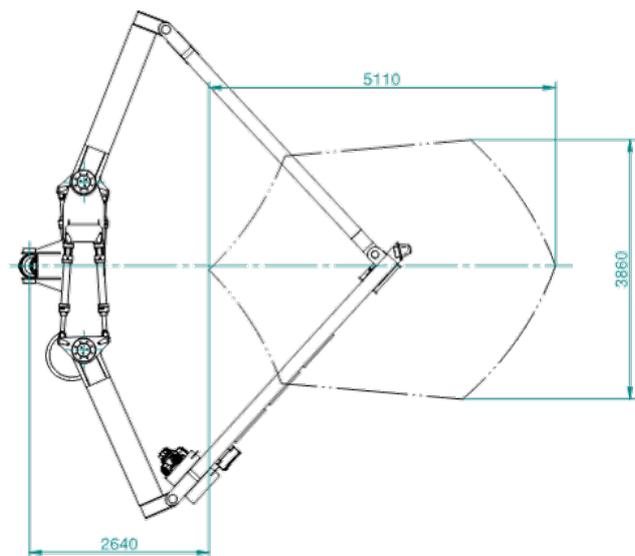
Main Winch Operation

Standard Features

- Independent Main Winch from 1T to 50T
- Anti-sway function with wind load compensation
- Side-/Off-lead detection
- Colibri™ Anti-collision system
- X / Y Compensation
- Z Compensation
- Camera on Jib-tip and Colibri™
- Constant Tension function on all winches
- User friendly, touch screen graphical interface (HMI)
- Integrated Hydraulic Power Unit (HPU)
- 24/7 Remote Access System
- Emergency Operation
- Safety systems according to applicable Class
- High quality marine grade components and surface treatment throughout.

Optional Features

- Main Winch with AHC and Subsea capability
- Personnel Handling on both Colibri™ and Main Winch
- Fully redundant HPU array
- Radio Remote Control
- Remote Release load hooks
- Remote mounted HPU (tank-top, machinery space)
- IP Camera on Jib-tip and Colibri™ with Wi-Fi connectivity
- Crane Anti-collision system
- Tugger Winches
- Variable Constant Tension, 0-80% of SWL (CT-VAR)
- XYZ Control
- Path Control
- Condition Based Monitoring System
- Winterization

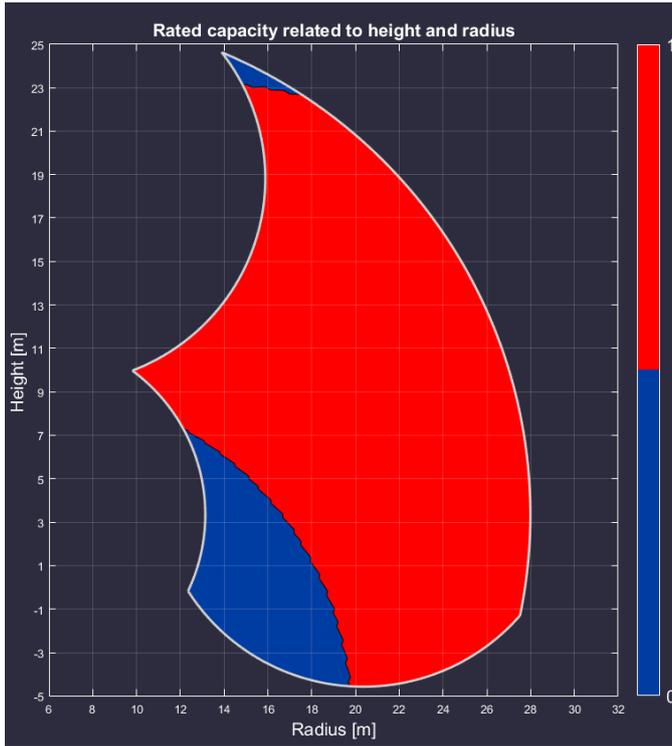


Colibri™ X & Y Operation Envelope

The X & Y operational envelope is controlled by hydraulic cylinders, fed by the integrated HPU array in the crane, resulting in reduced installed power on the vessel. The Z-axis compensation is via a conventional AHC winch based on TTS' market leading system, which has proven levels of compensation exceeding 99%.

The Colibri™ has an absolute minimum of moving parts, ensuring both low CAPEX and OPEX. Furthermore with TTS' 24/7 remote access service, downtime and service costs are reduced, as trouble shooting and tuning can be done via remote connection.

Working Range & Available Sizes



A unique feature of the Colibri™ is that it is articulated on the folding jib and therefore always stays horizontal when in operation. This articulation gives a market leading working range and at the same time reduces the amount of power required to an absolute minimum. The red area in the butterfly chart on the left shows the typical working range of a Colibri™ crane. The red area is full SWL capacity.

The zero point on the height axis is the top of the pedestal, and the radius axis is measured from the centre of the pedestal.

The Colibri™ is available as standard in the following sizes:

- 1.0mT
- 3.0mT
- 7.0mT

Other sizes are available on request.

The Colibri™ can be delivered with a 3rd Party Certificate from most IACS member societies.

Retrofitting & Operability

The Colibri™ is also suitable for installation on existing knuckle boom cranes of any make. Generally, a retrofit will require a rebuild of the Control System, Folding Jib, and supply lines along

the jibs. In some cases a more substantial rebuild may be required, but on all TTS Offshore Cranes manufactured after 2009 the required scope is minimal.

We can provide tailored solutions and operability studies to evaluate the potential performance of the retrofit, and accurately determine the required scope. Please do not

hesitate in contacting us to find out more about the possibilities available.

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