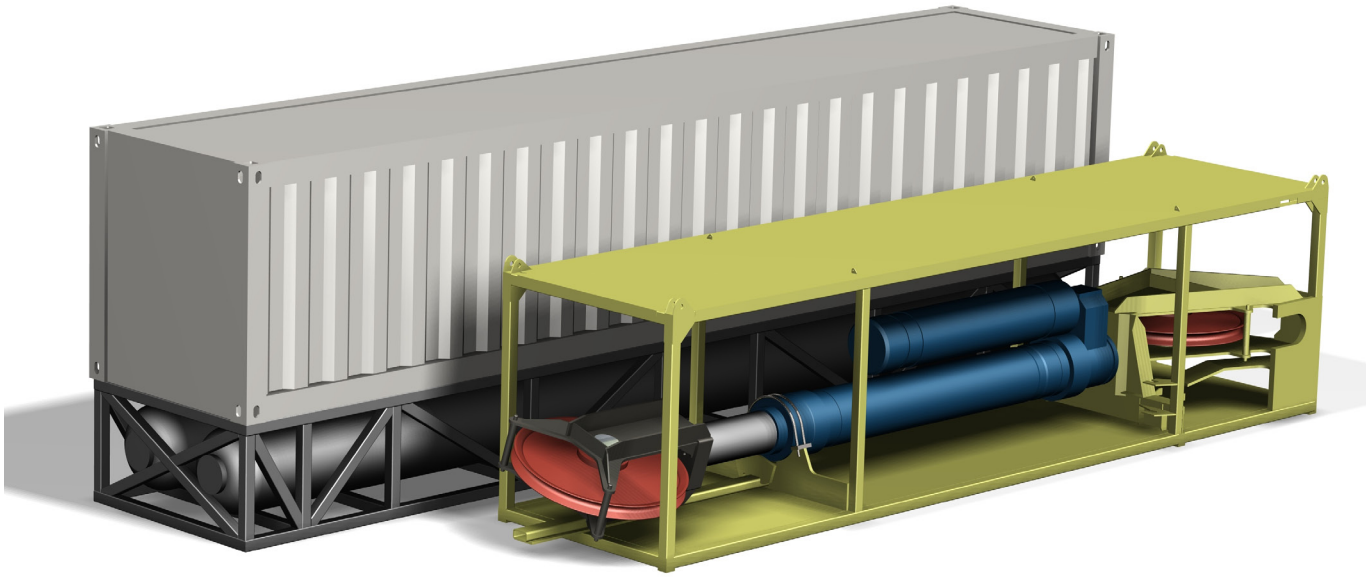
Modular Active Heave Compensation

System for winch applications



Containerized modular Active Heave Compensator including power pack and vessel rack

Description

For obvious reasons Active Heave Compensation finds its way into the deepwater installation applications more and more. Problems encountered during installing at greater water depths are amongst others: the uncontrolled take-over of the load at surface, excessive dynamic amplification of the load during lowering and the unstable situation in which the vulnerable load approaches the seabed.

Reacting to the demands of the market GustoMSC has developed an innovative active heave compensation system range for deepwater installation with capacities of up to 350 tons (max. single fall). The containerized AHC system allows for easy integration with existing high capacity winch facilities on board the vessel.

The system consists of a passive heave compensation system in combination with an active heave compensation system, to optimize the performance in relation to the power consumption.

Unlike existing heave compensation systems, both the active and passive systems have been combined in a single cylinder assembly.

The residual motions at the lift point are minimized to 10% by using feed forward control loops in combination with some new developed algorithms.

The software also controls the smooth transitions between the various operating modes. The system has been developed in a joint effort with Bosch Rexroth B.V. (formerly Hydraudyne BV), the drive and control company from Boxtel, the Netherlands.

For optimization of the installation procedures as well as temporary extractions due to installation errors the modular AHC system incorporates following operational modes:

1: Active Heave Compensated mode;
   lowering and landing
2: Empty hook mode;
   re- and disconnecting in deep water
3: Shock Absorber mode;
   at surface load handling
4: Tension mode;
   soft landing in shallow water
5: Manual mode;
   testing commissioning and reeving
6: Normal mode;
   no heave compensation.

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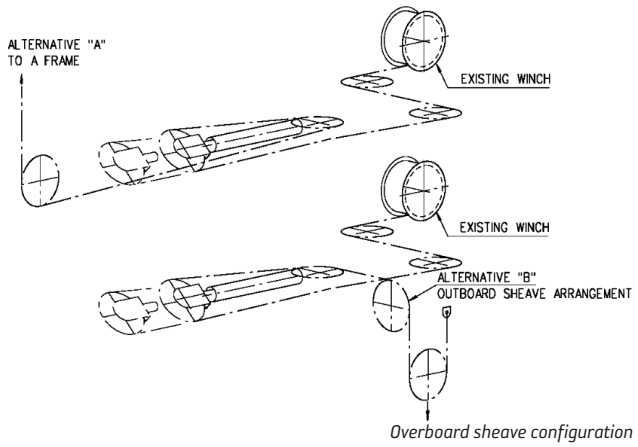
The system is built up from modular sized ISO containers, one container with the heave compensation cylinder, one power pack container and finally one or two racks with air bottles an air vessel unit and a control panel located on the bridge. The containerised system is easily transportable and suitable for deployment on almost every offshore installation vessel. After installation it functions in combination with existing winch facilities.

Operation of the AHC system and reeving of the wire can be done in various ways:
- through the A-frame or crane system, or
- with the use of an overboard sheave unit.

The AHC is developed in a variety of ranges to meet all subsea installation market needs. The 175/40/6200 is now in operation for more than three years, whereas the 350/90/4300 version is currently under construction.

TYPE Single fall	CAP. [mT]	PERIOD [s]	POWER [kW]
50 / 10 / 4200	50	8-16	150
100 / 25 / 5200	100	8-16	300
175 / 40 / 6200	175	8-16	600
250 / 50 / 5200	250	8-16	1000
350 / 90 / 4300	350	8-16	2000

Data presented in this product sheet is for information only and subject to change without notice.



Overboard sheave configuration

Modular AHC 175 / 40 / 6200 installed on deck of the SBM "Normand Progress"

AHC 175 / 40 / 6200 during tests under full dynamic load