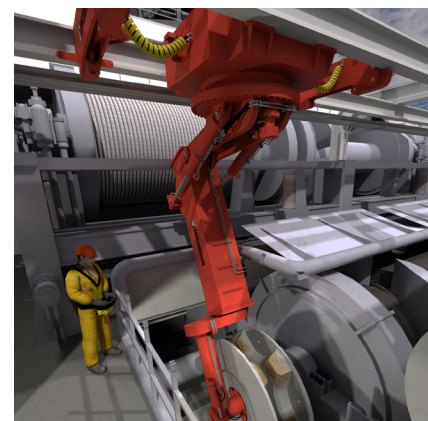


Offshore, Advanced Load Handling
Chain Wheel Manipulator



TECHNICAL INFORMATION

Chain Wheel Manipulator

For safe and accurate chain wheel replacement at sea

Cargotec supplies a wide range of MacGregor solutions for anchor handling and mooring operations, including advanced winch systems and related deck handling equipment.

MacGregor Chain Wheel Manipulator (CWM) is a remotely-controlled system, specifically designed to perform continuous successive cycles of chain wheel installation/replacement onto an anchor handling/towing winch while the vessel is on site of operation even in adverse sea conditions. CWM substantially reduces necessity for heavy manual labor, ensuring cost efficiency of operations and safety of personnel and equipment.

The system is designed in compliance with DNV "Rules for Certification of Lifting Appliances, 2008".

Assuring safety and efficiency

In anchor handling operations, an AHTS carries a range of interchangeable chain wheels allowing it to handle chains of various sizes on its anchor handling winches.

Due to hazardous offshore environment and the heavy weight of the chain wheels the labour intensive chain wheel installation/replacement task has normally required the AHTS to return to port to perform this operation at keyside.

The MacGregor CWM is designed to handle wheels for various chain sizes at all stages of wheel changing operations and at every axis for positioning on to and off the winch shaft. The system is installed in a vessel's winch hangar and is overhead-mounted on two traverse beams. The manipulator

moves along the beams by means of a hydraulic "clamp on" system, ensuring that it is hydraulically locked onto the beam at all times, even when changing position. A hydraulic jack is fitted on the jib arm for replacement of the chain wheel on and off the winch shaft.

Main system functions

- Performs chain wheel replacement operation while offshore
- Secure and controlled lifting and positioning of chain wheels from storage position on/off the winch shaft
- Highly articulated with seven degrees of freedom
- Connection flange rotation to mate with chain wheel
- Allows for numerous chain wheel storage schemes
- Can be designed for full integration into newbuild vessel or modularised for fitting into existing vessel

Technical specifications

| | |
|-----------------------------|--------------|
| Safe working load: | 12,5 t |
| Dynamic factor: | Daf = 1,5 |
| Outreach min: | 4,000 mm |
| Outreach max: | 5,200 mm |
| Slew bearing rotation: | 350° |
| Connection flange rotation: | 75° |
| Jib tilt up/down: | 105° |
| Jib extension: | 0 – 1,200 mm |

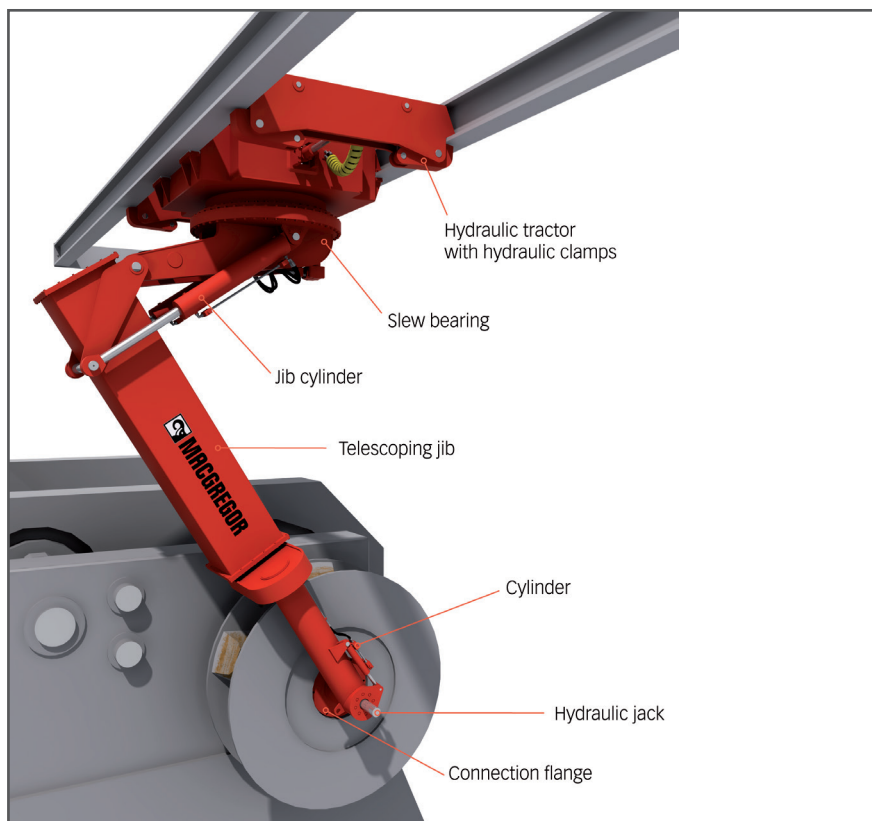
Main hydraulic data

| | |
|---------------------|-----------|
| Hydraulic pressure: | 250 bar |
| Flow: | 100 L/min |

Hydraulic power can either be fed through vessel's ring-line system or supplied by an HPU (hydraulic power unit).

Unique advantages

- Allows for uninterrupted anchor handling tasks in severe offshore conditions on site of operation
- Grants time and cost efficiency of operations
- Fully remote-controlled operations reduce heavy manual labour, enhancing crew and equipment safety



Lloyd's Register Quality Assurance certifies that the Quality Management System for Cargotec Marine is ISO 9001:2008 compliant.

MacGregor is the world's leading brand of engineering solutions and services for handling marine cargoes and offshore loads. MacGregor products serve the maritime transportation, offshore and naval logistics markets, in ports and terminals as well as on board ships.

Our cargo flow solutions integrate cargo access, stowage, care and handling functions to suit a particular ship's cargo profile. This benefits its productivity, environmental impact and profitable service lifetime. www.macgregor-group.com

MacGregor is part of Cargotec. Cargotec's class B shares are quoted on NASDAQ OMX Helsinki.