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Steering gears of piston type

HYDROSTER is a producer of piston type steering gears of rated torque $M_{nom} = 6,3 \div 2500$ kNm, designed for all type of seagoing ships including passenger ships, tankers, chemical tankers and gas carriers. There are 2 or 4 cylinder steering gears. The 2 cylinder steering gears are equivalent to 4 ram steering gears. **They meet SOLAS 1974 Convention with all later amendments** and can be built according to the rules and under the supervision of the following Classification Societies: **ABS, BV, DNV, GL, LR, PRS, RMRS**. Rules and an approval of other Classification Societies should be agreed-upon with HYDROSTER. The steering gears made by HYDROSTER have a double hydraulic system automatically divided into subsystems in case of a single failure. When the oil leakage occurs as a result of pipeline or other hydraulic element failure, the damaged part of the system is automatically isolated and the steering gear remains efficient and ensures continuous ship's control.



Considering types of applied pumps and the range of rated torques steering gears are divided into two groups:

- steering gear maximal with constant gear pumps of rated torque $M_{nom} = 6,3 \div 320$ kNm
- steering gear maximal with variable multipiston pumps of rated torque $M_{nom} = 500 \div 2500$ kNm.

Steering gear maximal torque $M_{max} = 1,25 M_{nom}$.

Steering gear consists of the following main units:

- rudder actuator:
 - split tiller joined with 4 bolts or conically holed tiller for hydraulic fit,
 - 2 or 4 piston type cylinders,
 - elements connecting tiller with cylinders: bolts, eyes, connecting links, etc.
- two identical pump units with indispensable valve blocks, valves and hydraulic fittings:
 - free-standing with constant delivery gear pumps for steering gears from size MS320,
 - directly placed on the steering gear cylinders for steering gears from size MS500,
- oil spare tank with hand pump,
- electrical equipment of electric motors drive and signalling system. All required alarms are in accordance with the Class Rules.

Steering gears from size MS200 are fitted with fan air/oil coolers preventing against oil temperature excessive increase especially in tropical climates. The steering gears are designed to mate with electrical remote control system.

The steering gears elements mating directly with remote control system are as follows:

- 4 way/ 3 position "ON-OFF" solenoid directional control valve for each pump for steering gears with constant delivery gear pumps up to size MS320,
- 4 way/ 3 position "ON-OFF" solenoid directional control valve or 3 position proportional solenoid directional control valve for each pump of steering gears with multipiston variable delivery pumps A4VG... (REXROTH) from size MS500.

Directional valves are fitted with hand local control levers.

HYDROSTER also offers steering gears of special design:

- steering gears for rudder deflection angle $\alpha = \pm 45^\circ$,

- steering gears for 2 or more rudders drive,
- steering gears with nominal moments less than $M_{nom}=6,3kNm$,
- steering gears for small manageable vessels of rudder putting over time $t \leq 20s$ from $a = -35^\circ$ to $a = +30^\circ$ with one pump operating,
- economical steering gears for all types of cargo ships of rudder putting over time $t \leq 28 s$ from $a = -35^\circ$ to $a = +30^\circ$ with two pumps operating simultaneously (electric power motors of this type of steering gear is twice smaller than of a standard steering gear),

The scope of delivery of one complete steering gear includes:

- steering gear,
- standard set of spare parts,
- special tools,
- technical operation documentation,
- maker's certificate,
- guarantee documents,
- Classification Society certificate,

HYDROSTER grants the guarantee for the period of 18 months from the date of steering gear sale.

HYDROSTER ensures the guarantee and after guarantee service as well as a delivery of spare parts during the whole steering gear exploitation period.