

Ex-proof hydraulics for offshore mooring systems

The heart of the motion control systems of oil&gas vessels deck equipment

Improved corrosion resistance, heavy equipment handling and potentially explosive area: all the strict requirements typical of the energy and offshore sector are together combined in mooring systems for oil&gas vessels, for which ex-proof electrohydraulics represents the most widespread solution, meeting all the mentioned requirements, as well as ensuring high-performance controls and simple maintenance.



Atos ex-proof hydraulics

Moorings: a key equipment of oil&gas offshore units

Mooring systems are a key equipment of offshore units deployed for petroleum and gas production, as they allow any floating platform to be safely held in position, avoiding risks or potential damages coming from rough sea waves.

Spread-mooring, tower systems and turret-type solutions: different executions are available on the market, but they all share the same key features, from the necessity to handle heavy equipment and strong forces - e.g. catenaries or winches -, to the strict requirements of the offshore oil&gas sector, such as the need for improved corrosion-resistance, the application of specific international norms and the mandatory use of explosion-proof certified products due to the presence of petroleum and gas. Ex-proof hydraulic systems are thus the most widespread solution for the actuation of mooring systems, as they meet offshore requirements with long-term operative life, allowing also to perform high-performance motion controls.



Tower Yoke Mooring System

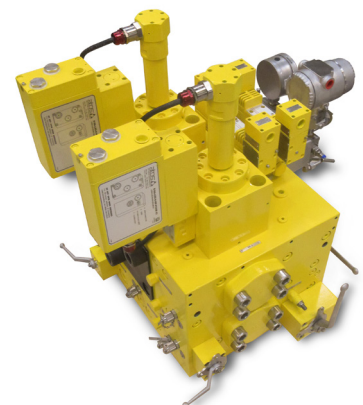
Electrohydraulic systems for moorings

A typical ex-proof electrohydraulic system for a mooring application comprises a central HPU for the Power Generation and various hydraulic manifolds directly mounted on the deck equipment, so that the control valves are as close as possible to the winches and the actuators.

Explosion proof solenoid valves are present in every actuation: on/off valves are used for simpler or auxiliary movements, while proportional valves or cartridges are generally applied whenever higher performances are required. A typical example is the Chain Jack System, where high-flow ex-proof proportional valves control the reciprocating movement of a big-bore cylinder used to haul-in and tension the mooring chain.

The hazardous area is typically classified according to the IEC 60079 directive as zone 1 for overdeck installation, requiring explosion-proof certification for hydraulic components and electrical equipment.

As for corrosion resistance, manifolds, valves and actuators are usually protected with dedicated marine painting cycles with thicknesses up to 300 µm, while piping and fittings are generally stainless steel made. Although, whenever the installation involves a particularly weathered location or very low temperatures, it is not uncommon to use ex-proof stainless steel valves.



Atos explosion proof block for mooring systems

Atos: the widest range of ex-proof hydraulic components

The classification of potentially explosive areas within Oil&Gas vessels could vary according to ship section. For example, process systems located underdeck are typically classified as Zone 0 requiring Ex-i intrinsically safe valves, while overdeck mooring systems are usually classified as Zone 1 requiring flameproof Ex-d valves combined with certified Ex-h actuators and pumps to prevent eventual risks caused by hot surfaces or mechanical moving parts.

Atos offers the most complete [ex-proof range](#) of multi-certified electrohydraulics components for applications in potentially explosive environments, from on-off valves to the complete systems.

Atos ex-proof hydraulics certifications

Ex-proof products category	Classifications			Certifications							
	Gas surface	Dust surface	Gas mining	ATEX	IECEX	EAC	CCC	PESO	cULus	MA	TIIS
Proportional valves	Ex-d II 2G	Ex-t II 2D	Ex-d I M2	●	●	●	●	●	●		●
Axis & P/Q controls	Ex-d II 2G	Ex-t II 2D	Ex-d I M2	●	●	●	●	●	●		●
On-off valves	Ex-d II 2G	Ex-t II 2D	Ex-d I M2	●	●	●	●	●	●	●	
Intrinsically safe on-off valves	Ex-i II 1G		Ex-i I M1	●	●	●	●				
Stainless steel on-off valves	Ex-d II 2G	Ex-t II 2D		●	●	●	●	●	●		
Cylinders	Ex-h II 2G	Ex-h II 2D		●							
Pumps	Ex-h II 2/2G	Ex-h II 2/2D		●							
Systems	According to application requirements			●	●	●	●	●	●		

■ Multi-certification ● Available ● Available only with off-board driver ● On request

Explosion proof proportional valves with on-board digital technology allow smart solutions developed for industrial sector to be extended also to hazardous locations, like the last generations fieldbuses, built-in oscilloscope for advanced diagnostics, high performance axis and pq control.

The range includes specific on-off executions aimed to further increase the safety level in hazardous environments, like ex-proof solenoid valves certified up to SIL2 / SIL3 according to IEC 61508 or explosion proof directional valves with inductive proximity sensors to monitor the spool position.

Explosion proof power units and hydraulic blocks designed for marine environments classified as hazardous locations are certified by TÜV, DEKRA, UL, CSA, ABS, BV, DNV GL, RINA: high production quality, strict compliance to customer specifications and specific marine painting cycles are only some of the key factors making Atos Systems Division the preferred hydraulic partner for the offshore sector.



Ex-proof proportional valve

Are you interested in Atos ex-proof hydraulic products?

Do not hesitate to [contact us!](#)

Follow us on [LinkedIn](#) to stay updated on our activities and products.