

Hydraulic Power Unit (HPU)



Topside HPU

Product Definition

Frames Hydraulic Power Units (HPUs) provide reliable and clean hydraulic energy to a variety of users in offshore and onshore locations. Our HPUs will reliably operate a range of equipment, including subsea controls, IWOCS, topside actuated valves, turret actuated valves, cargo handling systems, turret disconnect systems, and seal isolation.

Product Description

Frames HPUs provide clean hydraulic power at specified pressure and flow levels to ensure reliable operation and control of a wide variety of equipment. The Frames team of experienced engineers works closely with your business to develop HPUs that match your unique process conditions, site-specific requirements, local legislation and, if applicable, third-party requirements, such as Lloyd's, ABS, DNV and BV. In addition, our systems are designed to operate in harsh environments that can vary from extremely cold offshore arctic seas to extremely hot and dry desert environments.

Frames Hydraulic Power Units are often part of integrated packages that also comprise other equipment. The main purpose of our HPUs is to provide hydraulic power to actuated valves. However, in specific cases our HPUs can be designed to operate quick-disconnect couplings used on disconnectable turrets or pressurized seal systems.

Frames HPUs generally comprise the following hydraulic components:

- Enclosure
- Reservoirs
- Motor pump assembly
- Filters
- Accumulators
- Control panel

The selection of components and materials depends on the required flow and pressure rating, but also on the type of fluid, as well as environmental conditions.

Enclosure

HPUs assembled by Frames can be housed in a fully enclosed AISI316 cabinet, or we can choose an open-skid/rack principle for easy maintenance. Which enclosure is used depends on the location in which the HPU is being installed. If required, the cabinet/skid can be designed, built and certified to standards such as DNV 2.7-1, ABS, and CE.

Reservoirs

Each Frames HPU is equipped with at least one main supply reservoir, but in many cases HPUs include a dedicated return reservoir, especially when a production environment involves polluted return fluids.

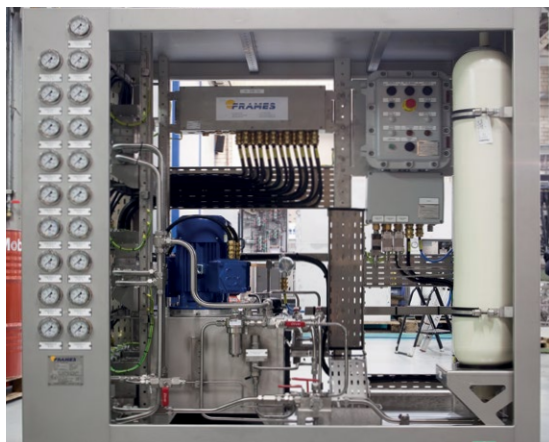
Motor pump assembly

The pump units selected for our HPUs depend on the fluid type used, which can vary from mineral oil, synthetic oil or biodegradables to water/glycol-based fluids. Pump drives can either be electric or pneumatic, depending on the available utilities.

Filters

Our hydraulic power units are designed to guarantee sound operation of the hydraulic controls in the field downstream from the unit. The HPUs include filters that maintain the cleanliness of a system during operation by preventing contamination of any of its components. All Frames HPUs are thoroughly flushed before testing.

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Wellhead Control Panel



Topside HPU



HPU Pump Section

Accumulators

Frames HPUs include either piston or bladder type accumulators that store the pressurized hydraulic fluid in order to ensure users a constant hydraulic flow during operation. Accumulators can be selected in compliance with a variety of standards, including PED, ASME, AS1210, NR13 or the standard of any of the major certification bodies.

Controls

HPUs are generally controlled by the client's control system, which is connected with the client's MCC and DCS. However, Frames can also provide plug & play solutions in which our unit only requires a 230-690 VAC three-phase power supply to automatically operate pumps and provide feedback signals showing the soundness of the operation. Feedback signals can be directed to the client's control room, significantly reducing interface engineering and cabling.

Materials

The materials used in our units match the specific requirements of our client's operational environment, and can therefore include the full range of exotic materials used in tubing and fittings, but also in valves and instruments.

Process Description

Frames HPUs are built to continuously meet the varying conditions of our client's operational processes. Our HPUs include hydraulic pumps (single or dual arrangement) that draw hydraulic fluids (mineral oil or water/glycol) out of a supply reservoir/tank and store hydraulic energy in a hydraulic accumulator bank. The pumps keep running until the pressure in the accumulator bank reaches a pre-set pressure level. Each pump header contains a filter set to ensure the cleanliness of the hydraulic system.

The pump discharge line is typically equipped with isolation valves, a check valve and a safety relief valve to protect the system from overpressurization. When the pressure drops to a pre-set level, the system reactivates the pumps, and the accumulators are refilled with fluid by the pumps.

While the accumulators are keeping the system's pressure at the right level, a pressure control valve enables the operator to regulate the hydraulic pressure moving to the actuated valves.

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Each pressure section is equipped with automatic and/or manual control systems, pressure gauges and/or pressure transmitters to monitor and control the hydraulic pressure at all times. Each hydraulic pressure line contains bulkhead connectors at the panel's sides to connect the actuated valves in the field.

Frames can also include a directional control valve in the HPU package in case the actuated valves are not supplied with local controls.

Project Management

At Frames, we understand that success depends on sharp project management. Just like our clients, we are driven to support your business, with our dedicated project team always on hand for one-on-one contact, providing you with the best possible service.

From concept through to design, production, testing and delivery, our project team will know your operating environment, and will use the latest technology to precisely meet your needs.

We are solution-oriented, we understand your industry and we always use strict document control and professional planning to exercise tight process control and meet all delivery deadlines. Our global office network, international supply chain and partnerships with leading vendors mean we are always able to supply the best systems and meet all of the local requirements and regulations.

Technical Details

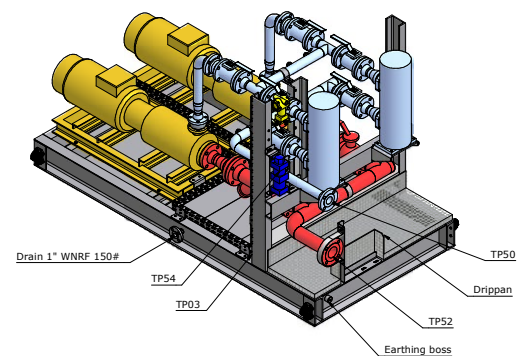
- Fully enclosed cabinet or open framework skid
- Output pressure up to 20,000 psi
- Suitable for hydraulic oil or water/glycol-based hydraulic fluids
- Extensive range of pump types and flow rates
- Design suitable for hazardous areas
- Bladder or piston type accumulators in various sizes and materials
- Individually regulated hydraulic power header lines
- Recirculation system and state-of-the art filters to maintain cleanliness of the hydraulic fluid
- Motor control center and/or local control panel can be included
- DNV 2.7-3 and 2.7-1 certification, including drop test

Added Value Frames

- Customized design according client requirements and project conditions.
- In-house engineering team that designs powerful hydraulic packages with limited plot space
- Organized design philosophy for simplified operation and maintenance of the units
- Complete package supplied skid-mounted, making it easy to transport
- Lean engineering and usage of high-end materials for reliable and solid equipment
- 24/7 worldwide service and after-sales support

References

- FPSO (Santos Bassin), offshore, CESSÃO ONEROSA, FPSO P-74, P-75, P-77, P-76 – Brazil
- QUAD 204 FPSO, offshore – United Kingdom
- Iraq Crude Oil Export Expansion – Iraq
- Skarv FPSO, offshore – Norway
- Gorgon Field, offshore – Australia
- Ichthys Gas Field, offshore – Australia



Recirculation Skid

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Frames Family Tree

