

HIGH-PRESSURE PUMP SOLUTION FOR DEMINERALISED WATER APPLICATIONS

Featuring a Centrifugal High-Pressure Pump Designed for Flexible Test Bench Operations in Extreme Conditions

Context and Challenge

A **research and testing laboratory** required a **durable high-flow circulation pump** to integrate into a **test bench system** for evaluating the **strength of specific components**. The pump needed to handle **demineralised water** at **169 bar** and **320°C**, with the flexibility to simulate **several different test scenarios**.

Key requirements included:

- **High-pressure resistance:** up to **169 bar**
- **High-temperature operation:** up to **320°C**
- **Variable-speed operation:** **1450 to 2300 rpm**
- **Several operating modes** with varying **flow rates** and **heads**
- **Compliance with the Pressure Equipment Directive (PED)**
- **Compact footprint** despite the pump's large size due to its characteristics (**3.2 tons**)

Solution Provided by OPTIMEX

To meet the client's demanding performance and safety standards, OPTIMEX designed a tailor-made centrifugal high-pressure pump with the following features:

- **Monoblock design**, ensuring mechanical stability and compact integration for high-pressure usage
- **Canned motor technology**, providing a leak-free, safe operation environment
- **Single-stage design** aligned with EN 13445 standards
- **Pressure resistance** compliant with the PED directive
- **Temperature handling** from 20°C up to 320°C
- **External cooling system** with a heat exchanger to ensure thermal stability
- **Speed control via variable frequency drive**, enabling dynamic performance adjustments for multiple test configurations



Pump Specifications

Fabrication Number: BF1816

Name of the Pump: PREI-R 200/32 Hp_P150F2

User Industry: Testing Laboratory, France

Pumped Fluid: Demineralised Water

Design Conditions: 169 barg at 320°C

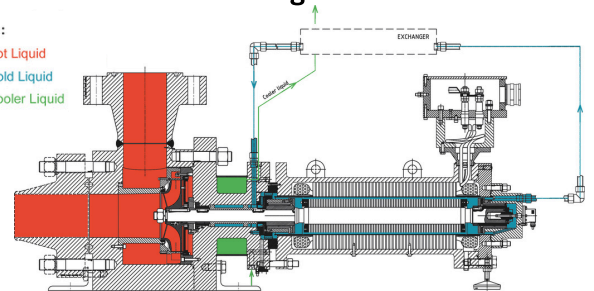
Operating Range with VFD used:

- **Flow rate:** from 80 to 403 m³/h
- **Head:** from 33 to 76 m

Motor Power: 150 kW - **Weight:** 3.2 tons

Legend :

- Hot Liquid
- Cold Liquid
- Cooler Liquid



Results and Benefits for the Client

The OPTIMEX solution delivered significant **operational** and **technical advantages**:

- **Full PED compliance** for **high-pressure conditions**
- **Adaptability** to **several distinct test scenarios** with a **single pump**
- **High reliability** with **reduced maintenance needs** and excellent **MTBF**
- **Simplified testing process** through **wide-range adjustability**
- **Cost savings on equipment** due to the pump's **multi-purpose use**
- **Integration** into the client's layout despite the **heavy pump weight**

OPTIMEX's **engineering expertise** resulted in a **tailored, flexible, and compliant solution**, enabling the client to carry out **various test conditions** efficiently with a **single high-performance pump**, while meeting strict requirements in terms of **safety, reliability, and adaptability**.