

# **FLOWTECH**<sub>DIV.</sub>

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## Specification for **UNIBLOC®-PD** Pump

### **1.0 UNIBLOC®-PD Pump Design**

#### **A. General**

UNIBLOC® Positive Displacement (PD) pump shall comply with the requirements of cGMP/FDA Materials of constructions shall comply with the requirements of FDA

The design and construction of the UNIBLOC®-PD pump shall be such that the pump shall be able to be cleaned in place (CIP) while running without being disassembled.

The design and construction of the UNIBLOC®-PD pump shall be such that the pump shall be able to be steamed in place (SIP). The UNIBLOC®-PD pump will not be running during steaming operation.

The design and construction of the UNIBLOC®-PD pump shall be the suppliers proven design for the biotechnology/pharmaceutical industry.

Complete pump assembly, including pump housing and mechanical seals, shall be self venting and self draining.

The UNIBLOC®-PD pump shall be capable of bi-directional flow without any modifications to the standard biotechnology/pharmaceutical designed pump.

The UNIBLOC®-PD pump shall be capable of furnishing the specified flow rate and discharge pressure at the rated conditions at 80% of the maximum rated pump speed.

The UNIBLOC®-PD pump shall be capable of stable operation, with minimal pulsation, over the range from maximum operating conditions to dead head conditions.

The UNIBLOC®-PD pump shall be universally mountable to achieve either horizontal or vertical ports.

#### **B. Pump Housing**

The pump housing shall be free from pits, crevices and voids. There shall be no welds on the pump housing. The pump housing ferrules shall be machined as a part of the pump housing.

The pump housing shall be manufactured from 316L or 316 stainless steel.

Internals of UNIBLOC®-PD pump housing shall not change if jacketed housing is required

#### **C. Shafts**

The shafts shall be splined so that the rotors can be assembled in only one way to avoid incorrect assembly.

The shafts shall be timed with key ways. This will allow the pump to be easily maintained without having to infinitely adjust the timing gears or bearing locking assemblies.

The splines of the shaft shall be encapsulated with o-rings on both sides of the rotors to avoid any form of contamination.

The shafts shall be manufactured from 316L stainless steel.

#### **D. Rotors**

The rotors of the UNIBLOC®-PD pump shall be splined so that the rotors can be assembled in only one way to avoid incorrect assembly.

The rotors of the UNIBLOC®-PD pump shall be free of timing marks or dimples.

The rotors shall be of the bi-wing design to optimize efficiency.

The rotors shall be manufactured from 316L stainless steel.

The rotors shall have an o-ring and o-ring groove, on the backside of the rotor, to seal the spline from any contamination.

#### **E. Front Cover**

The ID of the front cover of the pump shall be flat. There shall be no machined cavities for rotor retention devices.

The front cover design shall not change if a jacketed front cover is required.

The front cover shall be manufactured from 316L stainless steel.

#### **F. Gear Box**

The gearbox shall be manufactured from 304 stainless steel.

The exterior of the gearbox is to be machined and shall be free of painted surfaces.

The exterior of the gearbox shall have a smooth profile for ease of cleaning.

The shaft bearing shall be taper roller bearings.

The gear box shall be permanently lubricated. There shall be no breather plugs allowing oil vapor to escape.

The timings internal to the gear box shall be helical cut and shaved. These timing gears shall also be hardened

#### **G. Rotor Retention**

The pump shall have the option of a hex head rotor nut or slotted rotor nut, designed for low shear.

The rotor retention device shall contain an o-ring to seal the splines of the shaft from any contamination.

#### **F. Seals**

The pump shall be designed to accept single, single with flush and a double flushed mechanical seal. These seal combinations shall be interchangeable without modifying the rotor case design.

The seals shall be constructed of 316L stainless steel, carbon, silicon carbide, and/ or tungsten carbide.