

End Suction Split Coupled Pump Specifications

Part I – GENERAL

1.1 WORK INCLUDED

- A. Contractor shall furnish and install Grundfos end suction split coupled pump, PACO Model LCS complete with pump, motor, base frame, and coupling in accordance with manufacturer's recommendations and plans.

- B. Pump unit shall have machined registered fits between volute, motor bracket and motor. No factory or field alignment shall be required on this pump unit.

- C. The coupling design shall permit replacement of mechanical seal without requiring removal of the drive motor.

1.2 REFERENCE STANDARDS

The work in this section is subject to the requirements of applicable portions of the following standards:

- A. HI – Hydraulic Institute
- B. ANSI – American National Standards Institute
- C. ASTM – American Society for Testing and Materials
- D. IEEE – Institute of Electrical and Electronics Engineers
- E. NEMA – National Electrical Manufacturers Association
- F. NEC – National Electrical Code
- G. ISO – International Standards Organization
- H. UL – Underwriters Laboratories, Inc.
- I. CSA –Canadian Standards Association
- J. OSHA – Occupational Safety & Health Administration
- K. ASME – American Society of Mechanical Engineers
- L. IEC– International Electrotechnical Commission
- M. ETL – Electrical Testing Laboratories
- N. NSF – National Sanitation Foundation

Part 2 – PRODUCTS

2.1 End Suction Split Coupled Pumps

- A. Furnish and install end suction split coupled pumps as per plans and pump schedule.
- B. The pump, electric motor, base frame, coupling and coupling guard shall be factory assembled at

the pump manufacturer's facility. The pump manufacturer shall have complete unit responsibility.

2.1.1 PUMPS

- A. The pumps shall be split coupled, base mounted, single stage, end suction top discharge design, cast iron stainless steel fitted construction.
- B. The pumps shall have the following features:
 - 1. All pumps shall be of the back pull-out design so that the rotating element can be removed from the casing without disconnecting the suction or discharge piping. The casing material shall be close-grained cast iron ASTM A48 - Class 30 with a minimum tensile strength of 30,000 P.S.I. Volute shall have integrally cast suction and discharge connections, gauge ports at nozzles, and vent and drain ports. Pumps with specific speed greater than 1600 shall have double volute casing. Pumps with discharge size 3" and larger shall have suction splitter to reduce pre-rotation and improve efficiency. Casings shall be designed for scheduled working pressure and can withstand hydrostatic test at 150% of the maximum working pressure under which the pump could operate at design speed.
 - 2. Pumps with impeller diameter larger than 5" shall be fitted with vesconite renewable case wear rings.
 - 3. Pumps with discharge size 2.5" and larger shall have full flanged connections on both suction and discharge. Suction and discharge flanges shall be drilled to ANSI Class 125# standards and be machined flat face.
 - 4. Pumps with discharge sizes 2" and below shall have NPT threaded connection.
 - 5. Pump shall be mounted on a structural steel base with cast iron motor deck and a ductile iron pump support.
 - 6. The pump shaft shall be of solid stainless steel AISI 303.
 - 7. The pump manufacturer shall recommend the proper mechanical seal based on the pressure, temperature and liquid outlined on the equipment schedule. Mechanical seals, at a minimum, shall have ceramic stationary seats, carbon rotating rings, Buna elastomers and stainless steel hardware. Application of a mechanical seal shall be internally flushed type, without requiring external flushing lines. Seals shall be capable of being inspected and easily replaced without removing the piping or volute.
 - 8. Recirculation line of nylon tubing with brass fitting shall be provided to vent the mechanical seal and cool the bushing (shaft bearing).
 - 9. Impeller shall be of the enclosed francis vane type, single suction design, made of Stainless Steel 304 (UNS S30400), both hydraulically and dynamically balanced to ISO 1940-1:2003 balance grade G6.3 and keyed to the shaft. The impeller shall be trimmed to meet the specific hydraulic requirements.
 - 10. Pump Construction. The standard material of construction for the pump shall be as below. Special material shall be available as option to suit the liquid pumped.

- Volute: Cast iron ASTM A48 - Class 30
 - Case Wear ring: Vesconite
 - Impeller: Stainless Steel 304 (UNS S30400)
 - Shaft: Stainless Steel AISI 303
 - Coupling: 2011-T3, 2017-T4, or 2024-T351 Aluminium
 - Motor Bracket: Cast Iron ASTM A48- Class 30
 - Bushing (shaft bearing): Vesconite
 - Pump Support: Ductile Iron ASTM 536- Class 65
 - Mechanical Seals: Carbon – Ceramic with Buna Elastomers and Stainless Steel hardware
 - Recirculation Line: Nylon Tubing with Brass Fittings
- C. Pump shall be connected to the drive motor by a rigid, aluminum, axially split coupling capable of withstanding all torsional, radial and axial loads. The coupling design shall facilitate alignment of the motor and pump shaft.
- D. The base shall be of bolted construction. The motor deck shall be cast iron with ductile iron pump support. The side rail shall be structural steel. The minimum stiffness of the base shall conform to ANSI/HI 1.3-2000, section 1.3.5.3 for *Horizontal Base Plate Design* standards. The entire unit shall not require grouting for operation within Hydraulic Institute Standards for Vibration.
- E. Pump rotation shall be clockwise as viewed from the motor end.
- F. Pump shall be of a maintainable design for ease of maintenance and should use machine fit parts that are easily disassembled.
- G. Each pump shall be painted with one coat of high quality factory approved paint and name-plated before shipment from the factory.
- H. Where noted on schedule the pump shall also be NSF-61 certified.
- I. Pumps shall be manufactured and assembled in an ISO-9001 certified facility.

2.1.2 MOTORS

- A. Motors shall meet scheduled horsepower, speed, voltage, and enclosure design. Pump and motors shall be factory aligned.
- B. Motor shall be of a C-face design with a lockable split collar on motor side to facilitate precise positioning of rotating assembly with reference to Hydraulic geometry.
- C. Motors shall be suitably sized per ISO5199 and shall meet NEMA specifications and conform to the standards outlined in EISA 2007.

2.2 INSTALLATION

The pump shall be installed per manufacturer's recommendations and according to the standards

of the Hydraulics Institute.

2.3 TESTING

Where noted on schedule, pumping equipment may require one or more of the following:

Certified Performance test

Hydro static test

NPSH Test

Any other factory test as noted in the pump Schedule

The testing shall be in accordance with Hydraulic Institute level B or the latest HI standard as noted in the pump schedule.

2.4 WARRANTY

The warranty period shall be a non-prorated period of 12 months from date of installation, not to exceed 18 months from date of manufacture. Warranty shall cover against defective material and/or faulty workmanship.

END OF SECTION