**End Suction Split Coupled Pump Specification**

**Part I – GENERAL**

**1.1 WORK INCLUDED**

A. Contractor shall furnish and install Grundfos end suction split coupled pump, Grundfos Model NBS complete with pump, motor, 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 the mechanical seal without requiring removal of the impeller, system piping, pump volute or drive motor.

**1.2 REFERENCE STANDARDS**

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

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

**Part 2 – PRODUCTS**

**2.1 End Suction Split Coupled Pumps**

1. A. Furnish and install end suction split coupled pumps as per plans and pump schedule.
2. B. The pump, electric motor, motor support bracket, 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**

1. A. The pumps shall be split coupled, single stage, end suction top discharge design, cast iron stainless steel fitted construction. Pumps up to 6” discharge shall be centerline discharge, 8” and 10” discharge shall be tangential discharge.
2. B. The pumps shall have the following features:
3. Seal replacement shall be possible by only removing the coupling and seal cap.
4. Pump shall not require a baseplate or grouting to maintain correct alignment and maintain vibration levels to Hydraulic Institute standards (HI 9.6.4).
5. 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. Motors shall pull back without requiring lifting.
6. The casing material shall be close-grained cast iron ASTM A48 - Class 35 with a minimum tensile strength of 35,000 P.S.I.
7. Volute shall have integrally cast suction and discharge ports, vent and drain ports. Pump volute shall have and integrally cast diffuser vane to provide balanced flow to the eye of the impeller reducing axial forces and improving 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.
8. Suction and discharge flanges shall be flat-faced and be drilled to ANSI Class 125 standards.
9. Pump shall be constructed such that grouting and field alignment are not required and that proper alignment tolerances are continuously maintained throughout the lifetime of the pump.
10. Pump volutes shall have an integrally cast foot to eliminate deflections and distortions.
11. The pump shaft shall be of solid stainless steel AISI 420.
12. The mechanical seal shall have as standard Silicon Carbide – Silicon Carbide rotating and stationary faces with EPDM elastomers. The silicon carbide shall be of the advanced type having optimized hydrodynamic properties for long life and emergency dry running. The pump manufacturer shall recommend the proper mechanical seal based on the pressure, temperature and liquid outlined on the equipment schedule. On request, 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.
13. [OPTIONAL]: Recirculation line of copper tubing with brass fitting (optional nylon or stainless) shall be provided to vent the mechanical seal.
14. Impeller shall be of the enclosed single suction design, made of Stainless Steel 304 (UNS S30400), dynamically balanced to ISO 1940-1:2003 balance grade G6.3 and keyed to the shaft.
15. Pump Construction. The standard material of construction for the pump shall be as below. Special material shall be available as an option to suit the liquid pumped.

• Volute: Cast iron ASTM A48 - Class 35

• Impeller: Stainless Steel 304 (UNS S30400)

• Shaft: Stainless Steel AISI 420

• Coupling: Ductile Iron (ASTM 70-50-05)

• Motor Support Rails: Carbon Steel (ASTM A36)

• Mechanical Seal: Silicon Carbide – Silicon Carbide, EPDM Elastomers and Stainless Steel hardware

• [OPTIONAL] Recirculation Line: Copper Tubing with Brass Fittings

C. Pump rotating assembly shall be connected to the drive motor by a rigid, ductile iron, axially split coupling capable of maintaining alignment under all torsional, radial and axial loads. The coupling design shall facilitate alignment of the motor and pump shaft.

D. The motor support rails shall be structural steel. The entire unit shall not require grouting for operation within Hydraulic Institute Standards for Vibration.

E. Pump shall be of a maintainable design for ease of maintenance and should use machine fit parts that are easily disassembled.

F. Each pump shall be painted with one coat of high quality factory approved paint and name-plated before shipment from the factory.

G. Pumps shall be manufactured and assembled in an ISO-14001 and 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 standard NEMA C-face design.

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 Page 4 of 4 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 2B or the latest HI standard as noted in the pump schedule.

**2.4 WARRANTY**

The warranty period shall be a non-prorated period of 24 months from date of installation, not to exceed 30 months from date of manufacture. Warranty shall cover against defective material and/or faulty workmanship.

**END OF SECTION**