

Split Coupled Vertical Mounted Split-Case Pump Specifications

Part I – GENERAL

1.1 WORK INCLUDED

- A. Contractor shall furnish and install Grundfos vertical mounted, split coupled split-case pump, Model KPVS complete with pump, motor, and coupling in accordance with manufacturer's recommendations and plans.
- B. Pump unit shall have machined registered fits between motor bracket and motor. The motor bracket shall be aligned to the volute and pinned at the factory. No 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.
- D. Overall split case design shall permit access to all pump internals, including rotating assembly, without need to remove the vertical 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

Part 2 – PRODUCTS

2.1 VERTICALLY MOUNTED SPLIT COUPLED SPLIT-CASE PUMPS

- A. Furnish and install vertically mounted split coupled, split-case pumps as per plans and pump schedule.
- B. The pump, stand, coupling, and electric motor 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, vertical mounted, single stage, double suction, between bearing, axial split case design, in cast iron or ductile iron bronze fitted construction specifically designed for quiet operation.
- B. Pumps shall have the casing divided on the vertical centerline. The casing halves shall be accurately machined, bolted and doweled together. A non-asbestos type gasket material shall be furnished between the casing halves. The casing material shall be close-grained cast iron ASTM A48 - Class 35 with a minimum tensile strength of 35,000 P.S.I. or ASTM A536-80 ductile iron with a minimum tensile strength of 80,000 P.S.I. Pumps shall be fitted with lead-free bronze renewable case wear rings indexed with a dowel pin for fixed positioning. Removal of the upper casing half and bearing housings shall permit removal of the complete rotating assembly without disturbing piping connections or motor. Volute shall have integrally cast support feet, gauge ports at nozzles, and vent and drain ports. Pumps with larger than 4-inch discharge flanges shall be of the double volute design extending to both upper and lower half of the casing. Casings shall be designed for scheduled working pressure and shall be hydrostatically tested at 150% of the maximum working pressure under which the pump could operate at design speed. Suction and discharge flanges shall be drilled to ANSI Standards and be machined flat face. Flanges shall be extra heavy-duty design and will be of 250# thickness while capable of being drilled for 125# ANSI flat face use.
- C. Pumps shall be provided with removable upper and lower bearing housings which will permit inspection and/or replacement of the mechanical seal and bearing without removing the rotating assembly or upper half of the casing. Straightening vanes shall be cast in both the bearing housings and casing to reduce pre-rotation of fluid prior to entry into the impeller.
- D. The upper and lower bearing housings shall be removable and supply support for the sleeve bearing, with required provision for purging or flushing. The pump shaft shall be adequately supported by the pump bearings to limit the shaft deflection to 0.008 inches. Sleeve bearings shall be Vesconite or Graphalloy material. Each bearing housing shall be bolted to the upper and lower casing halves for a full 360-degree support registered fit to insure

positive alignment.

- E. The pump shaft shall be of solid AISI 416 stainless steel without sleeves.
- F. 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 seats, Buna elastomers and stainless steel hardware. The mechanical seal and bearings shall have external flushing lines. Seals shall be capable of being inspected and easily replaced without removing the upper half of the casing. The pump shall have no mechanical seal at the bottom, for easy maintenance.
- G. Impeller shall be of the enclosed Francis Vane type, double suction design, made of silicon bronze, ASTM B584 C87600, 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.
- H. 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.
- I. The pump shall be supported from below by a cast iron, ductile iron, or fabricated steel mounting stand, which shall be bolted directly to the bottom of the casing and fully support the weight of the complete pump and motor. Supporting the casing from the side or top shall not be required, nor allowed.
- J. Pump rotation shall be clockwise or counter-clockwise as viewed from the pump's motor end.
- K. Pump shall be of a maintainable design for ease of maintenance and should use machine fit parts, which are easily disassembled.
- L. The pump(s) vibration limits shall conform to Hydraulic Institute ANSI/HI 1.1-1.5, section 1.4.6.1.1 for recommended acceptable unfiltered field vibration limits (as measured per HI 1.4.6.5.2, Figure 1.108).
- M. Each pump shall be painted with one coat of high quality factory approved paint and name-plated before shipment from the factory.
- N. Pump manufacturer shall be ISO-9001 certified.
- O. Standard Pump Construction
 - Volute: Cast iron ASTM A 48 – Class 35
 - Case wear ring: Lead-Free Bronze, ASTM B584-90500
 - Impeller: ASTM B584 C87600
 - Shaft: AISI 416 stainless steel
 - Mechanical Seal: Carbon–Ceramic with Buna elastomers and stainless steel hardware

- Bearings: Sleeve bearing- Vesconite
- Optional special material shall be available based on requirements

2.1.2 MOTORS

- A. Motors shall meet scheduled horsepower, speed, voltage, and enclosure design. Pump and motors shall be factory aligned.
- B. 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