

**SPECIFICATIONS** SP-B516

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**Series HSCS**

**Large Horizontal Split Case Pumps**

DIVISION 15- MECHANICAL

Section 15540 - HVAC Pumps and Specialties

**DOUBLE SUCTION, HORIZONTAL SPLIT CASE PUMPS**

**1.00 PART 1 -GENERAL**

**1.01 DESCRIPTION OF WORK:**

 Provide pumps for heating, chilled water, and dual temperature water systems including all related appurtenances for a complete and operating systems.

**1.02 SECTION INCLUDES:**

 Double Suction, Horizontal Split Case Pumps (Base Mounted)

**1.03 RELATED DOCUMENTS:**

 Drawings and general provisions of the Contract, including General and supplementary Conditions and Division 1 Specification Sections, apply to these Sections.

 Section \*\*\* - Alignment of Rotating Equipment

 Section \*\*\* - Cast-in-Place Concrete

 Section \*\*\* - Mechanical General Requirements

 Section \*\*\* - Supports, Anchors, and Sleeves

 Section \*\*\* - Motors and Starters

 Section \*\*\* - Drives

 Section \*\*\* - Mechanical Identification

 Section \*\*\* - Vibration Isolation

 Section \*\*\* - Piping Insulation

 Section \*\*\* - Equipment Installation

 Section \*\*\* - Hydronic Piping and Specialties

 Section \*\*\* - Testing, Adjusting, and Balancing

 Section \*\*\* - Meters and Gauges

 Section \*\*\* - Electrical

**1.04 QUALITY ASSURANCE:**

A. All equipment or components of this specification section shall meet or exceed the requirements and quality of the items herein specified, or as denoted on the drawings.

B. Ensure pump operation at specified system fluid temperatures without vapor binding and cavitation, are non-overloading in parallel or individual operation, and operate to ANSI/HI 9.6.3.1 - 1997 standards for Preferred Operating Region (POR) unless otherwise approved by the engineer. The pump NPSH shall conform to the ANSI/HI 9.6.1 - 1998 standards for Centrifugal and Vertical Pumps for NPSH Margin.

C. Ensure pump pressure ratings are at least equal to system’s maximum operating pressure at point where installed, but not less than specified.

D. Equipment manufacturer shall be a company specializing in manufacture, assembly, and field performance of provided equipment with a minimum of five- (5) years experience.

E.Equipment provider shall be responsible for providing certified equipment start-up and, when noted, an in the field certified training session. New pump start-up shall be for the purpose of determining pump alignment, lubrication, voltage, and amperage readings. All proper electrical connections, pump’s balance, discharge and suction gauge readings, and adjustment of head, if required. A copy of the start-up report shall be made and sent to both the contractor and to the Engineer.

**1.05 PRODUCT HANDLING:**

A. Protection: Use all means necessary to protect equipment before, during, and after installation.

B. Replacement and Repair: All scratched, dented, and otherwise damaged units shall be repaired or replaced as directed by the Architect Engineer.

**1.06 REGULATORY REQUIREMENTS:**

 A. Conform to Health/Life Safety Code for Public Schools

 B. Conform to International Mechanical Code

 C. Conform to BOCA National Building Code

 D. Conform to State Plumbing Code

 E. Conform to National Electric Code NFPA 70

 F. Conform to Accessibility Code

 G. Conform to applicable ANSI/HI standards

 H. Products: Listed and classified motors by Underwriters Laboratories, Inc. as suitable for the purpose specified and indicated.

**1.07 SUBMITTAL:**

A. Submit each item in this article according to the Conditions of the Contract and Division 1 Specification Sections.

 B. Submit manufacturer’s installation instructions under provisions of General Conditions and Division 1.

 C. Product Data including certified performance curves and rated capacities of selected models, weights (shipping,
 installed, and operating), furnished specialties, and accessories. Indicate pump’s operating point on curves.

 D. Hanging and support requirements should follow the recommendations in the manufacturer’s installation instructions.

**1.08 OPERATION AND MAINTENANCE DATA:**

A. Submit Operation and Maintenance information under provisions of Division 15 “Mechanical General Requirements” and the provisions of the General Conditions and Division 1.

 B. Operation and Maintenance Data: Include installation instructions, assembly views, lubrication instructions, and
 replacement parts lists.

 C. Under provisions of commissioning documentation; testing of pumps, as well as training of owner’s operation and
 maintenance personnel may be required in cooperation with the commissioning consultant.

**1.09 DELIVERY, STORAGE, AND HANDLING:**

 Store materials in clean, dry place and protect from weather and construction traffic. Handle carefully to avoid damage.

**1.10 WARRANTY:**

 Provide a minimum one- (1) year warranty on materials and installation under provision of Section 15010.

**1.11 EXTRA MATERIALS:**

 Provide one (1) set of mechanical seals for each model type of primary pump scheduled.

**2.00 PART 2- PRODUCTS**

The specifying engineer reserves the right to specify a primary supplier / lead spec manufacturer on all supplied schedule and specification documents. These primary suppliers have lead their respective industry in research and development and their products have had proven track records in the field. These primary suppliers, in the opinion of this engineering firm, produce a superior product to the alternately listed manufacturers. The contractor may choose to supply equivalent equipment as manufactured by the alternately specified manufacturer. This alternately specified equipment will be supplied on a deduct alternate basis and based on the approval of the supplied alternate manufacturer’s submittals. The use of a primary supplier and deduct alternates protects the specifying engineer’s design concept, but allows for a check-and-balance system to protect the post-commissioning owner.

**2.01 DOUBLE SUCTION, HORIZONTAL SPLIT CASE PUMPS (BASE MOUNTED):**

 **A. Manufacturer:**

 Contractor shall furnish and install new double suction horizontal split case pumps for chilled water and hot water heating systems as indicated on the drawings. Pumps shall be model HSCS as manufactured by Bell & Gossett under base bid. Equivalent units manufactured by the Aurora Pump company or Paco Pumps Incorporated may be substituted as deduct alternates. Pumps shall meet types, sizes, capacities, and characteristics as scheduled on the Equipment Schedule drawings.

 **B. Double Suction Horizontal Split Case Pump (Base Mounted):**

1. The pumps shall be long coupled, base mounted, single stage, double suction, horizontally split case
design, in cast iron bronze fitted construction specifically designed and guaranteed for quiet operation.Suitable standard operations at 220ºF and 175 psig maximum working pressure, or optional 300 or 400 psig working pressures. The pump internals shall be capable of being serviced without disturbing piping connections or electrical motor connections.

2. A cast iron housing shall supply support for anti-friction type bearings, with provisions for purging or
 flushing through the bearing surface. An inboard single row bearing will absorb thermal expansive forces
while an outboard double row bearing will be clamped in place to absorb both radial and thrust loads, and keep the rotating element in proper axial alignment. Bearings shall be replaceable without disturbing the system piping and shall be regreaseable without removal of the bearings from the bearing housing. Lip seals and deflectors shall be used for bearing protection.

3. The impeller shaft material shall be carbon steel\* or equivalent, with bronze shaft sleeves for corrosion and wear prevention.

4. Pump shall be equipped with a pair of externally flushed mechanical seal assemblies mounted on the
pumps’ shaft sleeves. Seal assemblies shall be John Crane Type 8 or equal, with viton elastomers, stainless steel hardware, carbon primary ring and a stationary ceramic mating ring.

5. Impeller shall be of the enclosed double suction type made of bronze, hydraulically balanced to ANSI/
HI 9.6.4.5 - 2000, figure 9.6.4.15B, balance grade G6.3, keyed to the shaft and positioned axially by shaft sleeves.

6. An all-metal gear type coupling, capable of absorbing torsional vibration, shall be employed between the pump and motor.

7. The coupling shall be shielded by a dual rated ANSI B15.1, Section 8 and OSHA 1910.219 compliant
coupling guard and contain viewing windows for inspection of the coupling.

8. Pump volute shall be of a cast iron (rated for 175\*\* psig MWP) or ductile iron (rated for 300 or 400 psig MWP), axially-split design with flanges and mounting feet cast integral with the lower casing. Flanges are drilled for 125# ANSI FF for 175\*\* psig MWP pumps, or 250# ANSI FF for optional 300 and 400 psig MWP pumps. Suction and discharge flanges shall be on a common centerline in both the horizontal and vertical planes, and the volute shall include Bronze Casing Wear Rings, priming port, gauge ports at nozzles, and vent and drain ports. The upper half casing shall be capable of being removed without disturbing piping connections or electrical motor connections.

9. Pump seal flushing lines shall be mounted on the upper half pump casing. Sealing from an external source
 shall be possible for lubrication an/or cooling.

10. Motors shall meet scheduled horsepower, speed,
voltage, and enclosure design. Pump and motors shall
be aligned after installation. Motors shall be non-overloading at any point on the pump curve and shall
meet NEMA specifications and conform to the standards outlined in EPACT 92.

11. Base plate shall be of structural steel or fabricated steel channel configuration fully enclosed

 at sides and ends, with securely welded cross members and fully open grouting area (for field grouting). The minimum base plate stiffness shall conform to ANSI/HI 1.3.5 - 2000 for Horizontal Baseplate Design standards.

12. Pump rotation shall be right-hand or left-hand as viewed from the pump end and in respect to the
discharge flange.

13. Pump manufacturer shall be ISO-9001 certified.

14. The pump(s) vibration limits shall conform to Hydraulic Institute ANSI/HI 9.6.4.4 - 2000 for recommend acceptable unfiltered field vibration limits (as measured per ANSI/H.I. 9.6.4.4 - 2000, Figure 9.6.4.12) for pumps with rolling contact bearings.

15. The seismic capability of the pump shall allow it to withstand a horizontal load of 0.5g, excluding piping
and/or fasteners used to anchor the pump to mounting pads or to the floor, without adversely affecting
pump operation.

16. Each pump shall be factory tested and name-plated before shipment.

\* Standard shaft material for size 10x14x20L is 4140. For speeds greater than 1200 RPM, the standard shaft material
is 17-4 PH condition H1150 for sizes 12x16x23 and 14x16 x17.

\*\* 8x12x22M and 8x12x22L standard configurations are rated for 300 psi MWP, and have 125# ANSI FF suction and 250# ANSI FF discharge flanges. Equivalent units manufactured by the Aurora Pump company or Paco Pumps Incorporated may be substituted as deduct alternates.



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