



**Wilo-Atmos TERA-SCH-HE
Base-Mounted Split Case Pumps**

Engineering Specification

Division 23 – Heating, Ventilating and Air Conditioning (HVAC)
23 21 23 – HYDRONIC PUMPS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Horizontally, axially split pump housing, separately coupled, base-mounted (double-suction) centrifugal pump shall be an Atmos TERA-SCH-HE as manufactured by Wilo USA LLC.
- B. Furnish and install a horizontal, single stage centrifugal pump, with a capacity as indicated in the plans.

1.02 RELATED SECTIONS

- A. 22 21 23.16 – Base-mounted, Centrifugal Hydronic Pumps.
- B. 23 65 13 – Forced-Draft Cooling Towers.
- C. 23 22 23.13 – Electric-Driven Steam Condensate Pumps.
- D. 23 53 13 – Boiler Feedwater Pumps.

1.03 REFERENCES

- A. ANSI – American National Standards Institute.
- B. ESIA 2007 – Energy Independence and Security Act of 2007.
- C. NEMA – National Electrical Manufacturers Association.
- D. ISO – International Standards Organization.
- E. HI – Hydraulic Institute
- F. UL– Underwriters Laboratories

1.04 SUBMITTALS

- A. Submittal data sheet(s).
- B. Dimensional print(s).
- C. Three-dimensional CAD Models.
- D. Wiring diagram(s).
- E. Installation, operation, and maintenance manual [IOM].

1.05 QUALITY ASSURANCE

- A. Pumps using EPDM seals operating with flowrates 1,000 to 20,500 US GPM and head of 65 to 770 ft, shall be rated for 18°F to 248°F fluid temperatures. (212°F for gland packing version)
- B. The pump shall either have a maximum operating pressure rating of 175 PSI (12 bar) or 232 PSI (16 bar) depending on the size of pump.
- C. The pump shall have an ambient air temperature range of -4°F – 104°F.

1.06 WARRANTY

- A. Provide manufacturer's standard warranty against defects in materials and workmanship.
 - 1. Warranty Period: Wilo Atmos TERA-SCH-HE shall be free of defects in materials and workmanship for a period of two (2) years from the date of purchase.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Subject to compliance with these specifications, the following manufacturers shall be acceptable:
 - 1. Atmos TERA-SCH-HE series pump(s) as manufactured by Wilo USA LLC.
 - 2. Pre-approved equal.

2.02 COMPONENTS

- A. Pump Housing
 - 1. Shall be constructed of ASTM 2001 A48 CLASS-35 high grade cast iron.
 - 2. Flanges connections shall meet a drill pattern in accordance with SME B16.1, 125# construction.
 - 3. Shall be furnished with an ASTM B584 C90500 bronze wear ring.
 - 4. Shall be equipped with a drain plug.
 - 5. Casing shall allow removal and replacement of impeller without disconnecting piping or requiring the realignment of pump and motor shaft.
 - 6. Rotation shall be specified as clockwise or counterclockwise as viewed from the coupling end.
- B. Pump Shaft
 - 1. Shall be ASTM A276, GR. 410 Stainless Steel.
- C. Shaft Sleeve
 - 1. Shall be ASTM A276, GR. 410 Stainless Steel.
- D. Impeller
 - 1. Shall be cast impellers to be constructed of ASTM A743 Gr.CF8 Stainless Steel
 - 2. Shall be double-suction type, statically and/or dynamically balanced and keyed to shaft.
 - 3. The allowable residual unbalance in the impeller rotating assembly shall conform to ANSI Grade G6.3. Trim diameter to match specified performance.
- E. Pump Seal
 - 1. Shall be either be a mechanical seal with ceramic seat of 99.5% pure alumina oxide and hardness of 68 Rockwell C, or a tensile strength of 300,000 PSI (20,685 bar) or an externally flushed gland packed seal featuring a logging ring and gland covers made from 20% glass fiber reinforced blend of polyphenylene ether (PPE) + polystyrene (PS) resin and 12.7 mmSQ graphited cotton packing.
 - 2. Replaceable sleeve under mechanical seal shall be AISI 410 Stainless Steel and completely cover the wetted area of the shaft under the seal.
 - 3. Shall be suitable for continuous operation at 248°F (120°C) water temperature.
- F. Bearings
 - 1. Shall be permanently lubricated heavy-duty SKF 2Z ball bearings.
 - 2. A drive-end (inboard) single row bearing will absorb thermal expansive forces while a non-drive-end (outboard) single row bearing shall be clamped in place to absorb both radial and thrust loads and keep the rotating element in proper axial alignment.
 - 3. Under continuous operation bearings shall have a minimum L10 life of 20,000 hours.
 - 4. The bearings will be contained in cast iron housings with grease fittings/ports.

- G. Shaft Coupling
 - 1. The shaft coupling shall be flexible molded insert and interlocking (jawed) 'spider' capable of absorbing torsional vibration shall be employed between the pump and motor.
 - 2. Coupler shall be drop-out type to allow for disassembly and removal without removing the pump shaft or motor.

- H. Coupling Guard
 - 1. A dual-rated ANSI B15.1, Section 8 & OSHA 1910.219 compliant coupling guard which contains viewing windows for inspection of the coupling mounted to the pump end.

- I. Mounting/Base-Frame
 - 1. Shall be of structural steel or fabricated steel channel with fully enclosed sides and ends, and securely welded cross members.
 - 2. Grouting area shall be fully open. The combined pump and motor baseplate shall be sufficiently stiff as to limit the susceptibility of vibration.

- J. Motor
 - 1. Single Speed, Premium Efficient, Inverter-Ready (Compliant with NEMA MG-1 Table 12-12), with permanently lubricated ball bearings, unless otherwise indicated, secured mounting to base frame, with adjustable alignment.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install equipment in accordance with manufacturer's instructions.
- B. Power wiring, as required, shall be the responsibility of the electrical contractor. All wiring shall be performed per manufacturer's instructions and applicable state, federal and local codes.
- C. All factory wiring shall be numbered for easy identification and the numbers shall coincide with those shown on the wiring diagram.
- D. Unit shall be an Atmos TERA-SCH-HE as manufactured by Wilo USA LLC.
- E. Shall comply with Hydraulic Institute 14.5 standards.
- F. The pump and motor shall be mounted on a common base plate of heavy structural steel design and securely welded cross members and open grouting area.

3.02 ALIGNMENT

- A. Align pump and motor shafts and piping connections after setting on foundation, grout has been set and, foundation bolts have been tightened, and piping connections have been made.
- B. Comply with pump and coupling manufacturers' written instructions.
- C. Adjust pump and motor shafts for angular and offset alignment by methods specified in installation and operation manual.
- D. After alignment is correct, tighten foundation bolts evenly but not too firmly. Completely fill baseplate with non-shrink, non-metallic grout while metal blocks and shims or wedges are in place. After grout has cured, fully tighten foundation bolts.
- E. Grout pump mounting base full after piping is connected but before pump drive is aligned. After grouting, align pump drive shaft to 5 mils, even if pump is factory aligned, and conduct vibration test.
- F. Realignment after installation prior to start up will be performed by owner. .

3.03 STARTUP SERVICE

- A. Engage a factory–authorized service representative to perform startup service.
- B. Complete installation and startup checks according to manufacturer's written instructions.
- C. Check piping connections for tightness.
- D. Clean strainers on suction piping.
- E. Perform the following startup checks for each pump before starting:
 - 1. Verify bearing lubrication.
 - 2. Verify that pump is free to rotate by hand.
 - 3. Verify that pump is rotating in the correct direction.
 - 4. Prime pump by opening suction valves and closing drains and prepare pump for operation.
- F. Start motor
- G. Open discharge valve slowly.

END OF SECTION