



Wilo NL-HE
Base-Mounted End-Suction Pump

Engineering Specification

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. End Suction, Split-Coupled, Base mounted pump shall be a Wilo NL-HE as manufactured by Wilo USA.

1.02 RELATED SECTIONS

- A. 23 21 00 – Hydronic Piping and Pumps
- B. 23 21 23.16 – Base-Mounted, Centrifugal Hydronic Pumps

1.03 REFERENCES

- A. AISI – American Iron and Steel Institute.
- B. ANSI – American National Standards Institute.
- C. CSA – Canadian Standards Association.
- D. ETL – Electrical Testing Laboratories.
- E. HI – Hydraulic Institute.
- F. ISO – International Standards Organization
- G. NEMA – National Electrical Manufacturers Association.
- H. ODP – Open Drip Proof.
- I. TEFC – Totally Enclosed Fan Cooled.
- J. UL – Underwriters Laboratories.
- K. VFD – Variable Frequency Drive.

1.04 SUBMITTALS

- A. Submittal data sheet(s).
- B. Dimensional print(s).
- C. Installation, Operation, and Maintenance manual.

1.05 QUALITY ASSURANCE

- A. All wetted surfaces shall be made of corrosion-resistant material.
- B. Ambient temperature range for the NL-HE shall be rated for +32°F to 104°F.
- C. Pressure rating shall be 232 psi (up to +248°F) or 188 psi (up to +284°F).
- D. The pump shall be hydrostatically tested prior to shipment.
- E. Electrical assemblies (circuitry, wiring terminals and internal connections) of the centrifugal pumps shall be certified and registered to bear the emblem of UL, CSA or ETL as required. Electrical assembly shall meet codes and standards established by national bodies.

1.06 WARRANTY

- A. Provide manufacturer's standard warranty against defects in materials and workmanship.
 - 1. Warranty Period: Wilo NL-HEs shall be free of defects in materials and workmanship for a period of two (2) years from date of installation; not to exceed 6 months from date of purchase.
 - 2. After January 2020, all pumps must be compliant with the Department of Energy (DOE) New Standard (PEI of 1 or less for 1 to 200 hp) and include all new mandatory information on the nameplate.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Subject to compliance with these specifications, the following manufacturers shall be acceptable:
 - 1. WILO USA, LLC
 - 2. Pre-approved equal

2.02 COMPONENTS

A. BASE ASSEMBLY

- 1. Base material of construction shall be Q235 Steel in accordance to Chinese Standard GB/T 700; which is a plain carbon structural steel.
- 2. Shall have lifting holes in the side c channels to facilitate moving the entire system.
- 3. Base assembly fasteners shall be hot dipped or mechanically galvanized with an A307 Grade A rating tensile strength.
- 4. Shall include 6061 Aluminum spacer blocks as well as shims for either the pump end or the motor to permit vertical shaft alignment.
- 5. Base shall be mounted to floor by means of 6 anchor bolts that secure to the bottom of the c channels.
- 6. Base shall have partial areas available for grouting.

B. PUMP

- 1. Shall be of end suction back pull-out, single stage, centerline discharge base mounted centrifugal design.
- 2. Pump Housing:
 - a. Shall be constructed of EN-GJL-250 Grey Cast Iron with 125 class ANSI flanges.
 - b. Shall be rated for a 232 psi working pressure.
 - c. Shall be equipped with a factory plugged DIN 3858-Rp 3/8" BSPP drain port.
 - d. Shall be equipped with a factory plugged DIN 3858-Rp 1/8" BSPP gauge port on each flange.
 - e. Optional suction and discharge gauge kits which include a BSPP to NPT adapter shall be available at the customer's request. These shall be shipped separately to prevent damage during shipping.
 - f. Shall be foot mounted and no overhung cantilevered design shall be allowed.
 - g. Suction end shall have an integrally cast anti-rotational vane.
- 3. Bearing Bracket Assembly
 - a. Bearing bracket shall be constructed of EN-GJL-250 Grey Cast Iron.
 - b. Roller Bearings shall be permanently lubricated.
 - c. Shaft shall be constructed of EN 10088 1.4021 + QT 700 (AISI 420) stainless steel.

4. Mechanical Seal:
 - a. Shall be of type AQ1EGG or AQ7EGG.
 - b. Pressure rating shall be 232 psi (up to +248°F) or 188 psi (up to +284°F).
 - c. Shall have a Dry Run Capability of less than 1 minute.
 - d. Seat shall be constructed of Silicon Carbide.
 - e. Seal face and Sliding Ring shall be constructed of Antimony-Impregnated Carbon.
 - f. Metal parts shall be constructed of AISI 316Ti Stainless Steel.
 - g. Rubber corrugated Pipe/Bellows and O-ring shall be constructed of EPDM.
 - h. The entire pump line shall have no more than 3 different seal sizes.

5. Impeller:
 - a. Shall be constructed of EN 1.4408 (GX5CrNiMo19-11-2) Cast Stainless Steel.
 - b. Shall be dynamically balanced to DIN ISO 1940-1 balance grade G6.3.
 - c. Shall be fitted to the shaft with a key and fastened with a washer, spring lock washer and nut.
 - d. Trim diameter to match specified performance.

C. MOTOR

1. Shall be fixed speed, NEMA designed and covered at premium efficiency levels NEMA MG1.
2. Shall be constructed of SAE 1010 Rolled Steel or FC-200 Cast Iron.
3. Shall have mounting feet that comply with NEMA MG-1 Part 4.
4. Shall be either 208-230 V, 460 V or 575 V.
5. Shall be 2 or 4-pole and run up to 60 Hz.
6. Shall have an open drip proof (ODP) or totally enclosed fan cooled (TEFC) enclosure.
 - a. W01 Rolled Steel ODP motors shall have a protection of IP21 with a Class F insulation.
 - b. W01 Rolled Steel TEFC motors shall have a protection of IP55 with a Class F insulation.
 - c. W22 Cast Iron TEFC motor shall have a protection of IP55 with a Class F insulation.
 - d. W40 Cast Iron ODP motors shall have a protection of IP23 with a Class F insulation.
7. Bearings
 - a. The nominal bearing life L10h shall be 26, 280 hours.
 - b. Bearings on W01 Rolled Steel 143/5T to 213/5T frame motors shall be of the double-shielded type and shall be greased for its life. 254/6T frame motors shall be supplied with a lubrication system with grease fittings on the D and ND end shields.
 - c. W22 motors in frames 254T and above shall be provided as standard with deep groove ball bearings and grease fittings in each end shield to permit the lubrication of the bearings.
 - d. W40 motors shall be provided as standard with deep groove ball bearings and grease fittings in each end shield to permit the lubrication of the bearings.
 - e. Refer to motor nameplate for lubrication intervals and grease amount.
8. Shaft
 - a. W01 Rolled Steel shafts shall comply with NEMA MG 1 and shall be constructed of AISI 1040/45 steel.
 - b. The shaft of W22 standard motors shall be made of AISI 1040/45 steel, in frames 143T to 364/5T (all polarities), and 404/5T, 444/5T, 445/7T and 504/5T (2 poles) and in AISI 4140 steel for frames 404/5T and up (4 poles) and 447/9T, L447/9T, 586/7T and 588/9T (2 poles).
 - c. The shaft of W40 standard motors shall be made of AISI 1040/45 steel, in frames 254T to 444/5T.
9. Variable Frequency Drive (VFD) units shall be available upon request.

D. COUPLING

1. TB WOOD's SURE-FLEX PLUS ELASTOMERIC COUPLINGS

- a. Flanges shall be constructed of sintered carbon steel or cast iron.
- b. Sleeve shall be constructed of EPDM.
- c. Shall be suitable for VFD applications.

2. LOVEJOY S-FLEX ENDURANCE COUPLING

- a. Flanges shall be constructed from a die cast of high strength zinc alloy or high strength cast iron.
- b. Sleeve shall be constructed of EPDM.
- c. Shall be suitable for VFD applications.

3. KTR ROTEX JAW COUPLING

- a. Jaws shall be constructed of Cast Iron EN-GJL-250 (GG 25).
- b. Spider insert shall be constructed of T-PUR, a polyurethane material.
- c. Shall be suitable for VFD applications.

- 4. Pump and motor shafts shall be roughly aligned upon receipt at job, with verification during installation and after system fill by contractor.

E. COUPLING GUARD

- 1. Shall be constructed of Polypropylene 30% FV.
- 2. Shall allow for easy access to and servicing of the coupling and shafts.

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. Pumps shall NOT be run dry to check rotation.
- D. Pipe connections to pumps shall not be made in such a manner to exert any stress on the pump housing. Provide additional pipe supports and flex connectors as needed.
- E. Unit shall be a Wilo NL-HE end suction pump system as manufactured by Wilo USA.

END OF SECTION