



Wilo IPL  
Vertical Inline Pumps

**Engineering Specification**

## **PART 1 – GENERAL**

### **1.1 SUMMARY**

- A. Pump shall be Series IPL, long (split)-coupled, single stage vertical inline, mechanical sealed, dry rotor centrifugal pump as manufactured by WILO-NA.
- B. Furnish and install extended life, low maintenance pumps with capacities as shown on plans/submittals.

### **1.2 REFERENCES**

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

### **1.3 QUALITY ASSURANCE**

- A. The pump manufacturer shall be fully certified by the International Standards Organization per ISO 9001:2008.
- B. Each pump shall be factory tested per Hydraulic Institute standards prior to shipment and shall conform to ANSI/HI 1.1-1.2, and 1.3 for recommended acceptable unfiltered field vibration limits.
- C. The pump assembly shall comply with NFPA 70, Article 100 and marked for intended use.
- D. Each pump assembly shall comply with UL 778 for motor-operated water pumps.

### **1.4 DELIVERY AND HANDLING**

- A. In preparation for shipping, the pump shall have clean flanges and any exposed machined metal surfaces will be treated with anticorrosion compound after assembly and testing.
- B. Protection of the flanges, pipe openings, and nozzles shall be supplied with wooden or plastic flange covers or with screwed-in plugs.

## **PART 2 – PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Subject to compliance with the specifications, the following manufacturers shall be acceptable:
  - (1) WILO – NA
  - (2) Pre-approved equal.

## 2.2 SERIES IPL, LONG-COUPLED, VERTICAL INLINE SINGLE-STAGE CENTRIFUGAL PUMPS

### A. Product Description:

Factory-assembled and –tested, centrifugal, impeller mounted on stub shaft, split-coupled, single-suction pump as defined in HI 1.1-1.2 and 1.3; designed for base mounting, with pump and motor shafts horizontal. Designed with an integrally cast suction diffuser in volute inlet. Pump rating is 145-psig (10 Bar) maximum working pressure and a continuous water temperature of 15 to 250 °F (-10 to 120 °C). Maximum inlet pressure is NPSHreq dependant (see performance curves). Maximum ambient temperature is 104 °F (40 °C).

### B. Pump Construction:

1. Pump Casing: cast iron (ASTM A48, class 35), threaded gage tappings at inlet and outlet, drain plug at bottom and air vent at top of volute, flanged connections (see table below), and sealed via an o-ring. Integrally cast pump feet are drilled and tapped for ease of installation onto a base pad if necessary. A cataphoresis coating is applied electrostatically to prevent corrosion.

Flanges	< 2.5", Wilo-specific
	≥2.5", ASME B16.1, Class 125

2. Pump Cover/Motor Stool: cast iron (ASTM A48, class 35), drilled/tapped to accommodate a mechanical seal flush line which can be connected to the corresponding discharge connection or via an external source to facilitate cooling and flushing of the mechanical seal. The motor stool shall is sealed via an o-ring and also includes extra tappings for removal from pump volute by using "jack screws".

3. Impeller: Engineering composite (polypropylene or noryl), single-suction type, statically and/or dynamically balanced and keyed to shaft. The allowable residual unbalance in the impeller rotating assembly shall conform to ANSI Grade G6.3.

4. Stub Shaft: Shall be AISI 316L Stainless Steel (1.4122, X 35 CrMo 17) and attached to the motor shaft via a cast steel, split, balanced coupling.

5. Mechanical Seal: Shall be an eternally flushed mechanical seal with silicium carbide seal faces, HNBR/EPDM elastomers, stainless steel spring.

6. Motor Bearings: Grease lubricated heavy-duty ball bearings housed within motor housing with provisions for the addition and relief of grease.

7. Split Coupling: Axial-split device capable of absorbing torsional vibration shall be employed between the pump stub and motor shafts.

8. Coupling Guard: 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.

9. Motor: Single speed, with permanently lubricated ball bearings, unless otherwise indicated; secured mounting motor stool. Motor meets ESIA 2007 requirements and NEMA specifications and shall be the size, voltage and enclosure called for on the plans.

### **PART 3 EXECUTION**

#### **3.1 PUMP INSTALLATION**

- A. Comply with HI 1.4
- B. Pumps can be installed in a vertical up or horizontal shaft orientation

#### **3.2 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. Pipe connections to pumps shall be made in such a manner so as not to exert any stress on the pump housing.
- 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 and that pump for handling hot liquid is free to rotate with pump hot and cold. If pump is bound or drags, do not operate until cause of trouble is determined and corrected.
  - 3. Verify that pump is rotating in the correct direction. **IMPORTANT** never run pump dry.
- G. Prime pump by opening suction valves and closing drains, and prepare pump for operation.
- H. Start motor.
- I. Open discharge valve slowly.

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## **ISO 9001**

ISO stands for the International Organization for Standardization. ISO 9000 is a series of standards that define the requirements for a quality management system. Companies are registered to these standards by an independent registration body. Registration means that an independent organization has evaluated and approved the quality system against the requirements of the appropriate ISO 9000 standard. This standard is:

- ISO 9001:2008 Covers manufacturing, machining and assembly of centrifugal pumps and submersible mixers.

Although complying with ISO registration is voluntary, registration to these standards is becoming recognized and growing world-wide. In many cases it is a customer requirement for trade.

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## **Computer Controlled, Dynamically Balanced Impeller**

This modern method of computer balancing impellers provides for quiet, efficient, vibration free performance. Diameters are computer selected at the factory to furnish assurance that your capacity requirements will be met.

## EISA 2007

The Energy Independence and Security Act was passed by Congress in 2007 and applies to motors manufactured after December 19, 2010. EISA establishes efficiency standards for general purpose, 3-phase AC industrial motors from 1–250 HP.

<b>EISA 2007 Full-Load Nominal Efficiency Requirements (%)</b>						
	<b>TEFC</b>			<b>ODP</b>		
<b>HP</b>	<b>3600</b>	<b>1800</b>	<b>1200</b>	<b>3600</b>	<b>1800</b>	<b>1200</b>
1	77.0	85.5	82.5	77.0	85.5	82.5
1-1/2	84.0	86.5	87.5	84.0	86.5	86.5
2	85.5	86.5	88.5	85.5	86.5	87.5
3	86.5	89.5	89.5	85.5	89.5	88.5
5	88.5	89.5	89.5	86.5	89.5	89.5
7-1/2	89.5	91.7	91.0	88.5	91.0	90.2
10	90.2	91.7	91.0	89.5	91.7	91.7
15	91.0	92.4	91.7	90.2	93.0	91.7
20	91.0	93.0	91.7	91.0	93.0	92.4
25	91.7	93.6	93.0	91.7	93.6	93.0
30	91.7	93.6	93.0	91.7	94.1	93.6
40	92.4	94.1	94.1	92.4	94.1	94.1
50	93.0	94.5	94.1	93.0	94.5	94.1
60	93.6	95.0	94.5	93.6	95.0	94.5
75	93.6	95.4	94.5	93.6	95.0	94.5
100	94.1	95.4	95.0	93.6	95.4	95.0
125	95.0	95.4	95.0	94.1	95.4	95.0
150	95.0	95.8	95.8	94.1	95.8	95.4
200	95.4	96.2	95.8	95.0	95.8	95.4
250	95.8	96.2	95.8	95.0	95.8	95.4

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