



**Wilo Stratos Giga  
High Efficiency Vertical Inline Pumps**

**Engineering Specification**

# **PART 1 - GENERAL**

## **1.1 SUMMARY**

- A. Pump shall be Series Stratos Giga, long (split)-coupled, single stage vertical inline, mechanically sealed, dry rotor centrifugal pump as manufactured by WILO SE.
- 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 motor-controller assembly shall comply with UL 508c for power conversion equipment.

## **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 SE

(2) Pre-approved equal.

### **2.2 SERIES STRATOS GIGA, LONG-COUPLED, VERTICAL INLINE SINGLE-STAGE CENTRIFUGAL PUMPS**

- A. Product Description:

Factory-assembled and -tested, centrifugal, overhung impeller, split-coupled, inline pump as defined in HI 1.1-1.2 and HI 1.3; designed for installation with pump and motor shafts mounted horizontally or vertically.

- B. Pump Construction:

1. Casing: Radially split, EN-GJL-250 (ASTM A48, class 40B) cast iron cathaphoresis coated, with threaded gage tappings at inlet and outlet, drain plug at bottom and air vent at top of volute. Integrally cast pump feet drilled and tapped, with service slots and flow direction arrows.
2. Lantern: EN-GJL-250 (ASTM A48, class 40B) cast iron cathaphoresis coated with integral condensate/leakage drain, venting plug, pump housing disassembly support thread and motor housing disassembly support thread.
3. Impeller: Corrosion resistant Polyphenylene Sulfide (Ryton) reinforced with 40% glass-fiber (PPS/GF40) with stainless steel inlet engineering composite, single-suction type, statically and dynamically balanced, keyed to shaft. The allowable residual unbalance in the impeller rotating assembly shall conform to ISO Grade G6.3. The impeller to include bore holes for reduction of axial forces, fluid flushing of mechanical seal and three-dimensional Francis vanes.
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. ]  $L^3/d^4 < 55$
5. Seal: Mechanical seal consisting of carbon rotating ring against a ceramic seat held by a stainless-steel spring and HNBR bellows and Gasket. Temperature ranges from 15°F (-10°C) to 284°F (140°C)

6. Motor Bearings: Permanently lubricated deep groove ball bearings, sized for  $L_{50} > 100,000$  hours.
7. 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: High efficiency motor exceeding 93% efficiency, with integrated variable speed drive, totally enclosed fan cooled with user interface and graphical output. Electrical components, devices and accessories UL listed 508, labeled and defined in NFPA 70 marked for intended location, IP54 protection.
10. Drive: Variable frequency drive, capable of modulating from 500-5500 RPM without internal recirculation, built in  $\Delta P-V$ ,  $\Delta P-C$ , PID control, constant speed control, or control via integral 0-10V or 4-20mA signal. Ability to control via either human-user-interface or via external BMS through 0-10V control input or through building management system (BMS) software.
11. Data Logger: Non-volatile data logger, recording system changes, error codes and warnings.
12. Ext. Off: Integrated external off contact switch.

C. Operational Construction:

1. Vibration Threshold: Vibrations as measured at the bearing housing not to exceed 4.1 mm/sec total vibrational movement.
2. Sound Levels: Total sound level, dBA from the pump less motor not to exceed 64dBA or 80 dBA with motor installed.
3. Variable Speed Application: Ability to adjust speed to 10% of maximum speed without internal recirculation or cavitation.

## **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.
- F. Prime pump by opening suction valves and closing drains, and prepare pump for operation.
- G. Start motor.
- H. 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. These standards are:

- ISO 9001: Covers design, development, and after-sales servicing, final inspection and testing, production and installation.
- ISO 9002: Covers final inspection and testing, production and installation
- ISO 9003: Covers only final inspection and testing

ISO 9001 is the most comprehensive of the three standards.

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.

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## 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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