



**Wilo SCP
Base-Mounted Split Case Pumps**

Engineering Specification

PART 1 - GENERAL

1.1 SUMMARY

- A. Pump shall be Series SCP, separately coupled (a.k.a. long coupled), base-mounted, horizontally split, double-suction centrifugal pump as manufactured by Wilo-North America.
- 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. E I S A 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. 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 anti-corrosion 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-North America

(2) Pre-approved equal

2.2 SERIES SCP BASE-MOUNTED, FLEXIBLE/SEPARATELY COUPLED, HORIZONTALLY SPLIT, DOUBLE-SUCTION CENTRIFUGAL PUMPS

A. Product Description:

A factory-assembled and tested base-mounted, single-stage, double-suction centrifugal pump as defined in HI 1.1-1.2 and 1.3 with an impeller-between-bearings, an integrally cast foot-mounted volute and separately coupled; designed for base mounting, with pump and motor shafts horizontal. Pump rating is 175-psig (12 Bar) minimum working pressure and a continuous water temperature of 250 °F (120 °C). The pump(s) shall allow service of the impeller and bearings without disturbing piping connections, pump volute, or motor.

B. Pump Construction:

1. *Pump Casing*: Horizontally/axially split, cast iron (ASTM A48, Class 35), threaded gauge tapings at inlet and outlet, drain plug at bottom and air vent at top of volute, and ASME B16.1, Class 125 flanged connections. Casing supports shall allow removal and replacement of impeller without disconnecting piping or requiring the realignment of pump and motor shaft. Mounting feet shall be integrally cast into the bottom half of the casing.

2. *Impeller*: Cast bronze (ASTM B584), double-suction type, dynamically balanced and keyed to shaft. The allowable residual unbalance in the impeller rotating assembly shall conform to ANSI Grade G6.3. Trim diameter to match specified performance.

3. *Pump shaft*: Shall be AISI 410 Stainless Steel

4. *Mechanical Seal*: Shall be an externally flushed 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), and carbon seal ring, suitable for continuous operation at 250 °F (121 °C).

5. *A replaceable stainless steel shaft sleeve*: Shall completely cover the wetted area of the shaft under the seal. A stuffing box mechanical seal design with longer span between the impeller centerline and first bearing will not be allowed.

6. *Bearings*: Permanently lubricated, sealed heavy-duty ball bearings. 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 to keep the rotating element in proper axial alignment. Under continuous operation, at Shutoff, bearings shall have a minimum L10 life of 20,000 hours. The bearings will be contained in cast iron housings with ports in them that allow for the mounting of vibration or temperature sensors.

7. *Casing Wear/Neck Ring*: Machined bronze (ASTM B584).

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

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

9. *Mounting/Base Frame*: Shall be of structural steel or fabricated steel channel with fully enclosed sides and ends, and securely welded cross members. Grouting area shall be fully open. The combined pump and motor baseplate shall be sufficiently stiff as to limit the susceptibility of vibration. The minimum baseplate stiffness shall conform to HI 1.3 for Horizontal Baseplate Design standards.

10. *Motor*: Single speed, with permanently lubricated ball bearings, unless otherwise Indicated; secured mounting to base frame, with adjustable alignment. Motor meets EISA 2007 requirements and NEMA specifications and shall be the size, voltage and enclosure called for on the plans.

C. Conditions:

1. *Alignment*: Pump and motor shall be factory aligned, and shall be realigned by mechanical contractor or by an alignment service contractor to factory recommendation, prior to commissioning the pump for service.

2. *Seismic Capability*: Pumps shall be capable of withstanding 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.

3. *Chilled Water Applications*: Pumps shall have painted or galvanized drip pans supplied.

4. *Pump rotation*: Shall be clockwise or counter-clockwise as viewed from the coupling end.

PART 3 EXECUTION

3.1 PUMP INSTALLATION

- Comply with HI 1.4

3.2 ALIGNMENT

A. Align pump and motor shafts and piping connections after the following items are completed:

1. Setting on the foundation
2. Grout has been poured and set
3. Foundation bolts have been tightened
4. 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 HI 1.1-1.5, "Centrifugal Pumps for Nomenclature, Definitions, Application and Operation."

D. After alignment is correct, tighten foundation bolts evenly but not too firmly. Completely fill baseplate with nonshrink, nonmetallic 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 minimum, even if pump is factory aligned, and conduct vibration test.

F. Realignment after installation prior to start up will be performed by Owner.

3.3 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.

E. Clean strainers on suction piping.

F. 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.

G. Prime pump by opening suction valves and closing drains, and prepare pump for operation.

H. Start motor.

I. Open discharge valve slowly.

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.

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.

EISA 2007 Full-Load Nominal Efficiency Requirements (%)						
	TEFC			ODP		
HP	3600	1800	1200	3600	1800	1200
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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