



**Wilo Helix EXCEL  
High Efficiency Multistage Pumps**

**Engineering Specification**

## **PART 1 GENERAL**

### 1.01 SECTION INCLUDES

- A. Vertical, multistage, centrifugal pump shall be a Wilo Helix EXCEL as manufactured by Wilo.
- B. Furnish and install a vertical, multistage, centrifugal pump, with a capacity as indicated in the plans.

### 1.02 RELATED SECTIONS

- A. 22 11 23.13 – Domestic Water Packaged Booster Pumps.
- B. 23 22 23.13 – Electric-Driven Steam Condensate Pumps .
- C. 23 53 13 – Boiler Feedwater Pumps.
- D. 23 09 13 – Instrumentation and Control Devices for HVAC.
- E. 25 14 00 – Integrated Automation Local Control Units.

### 1.03 REFERENCES

- A. NSF – NSF International.
- B. UL – Underwriters Laboratories.
- C. NEC – National Electrical Code.
- D. ANSI – American National Standards Institute.
- E. ISO – International Standards Organization.
- F. IEC – International Electrotechnical Commission.
- G. TIA/EIA-485 – Telecommunications Industry Association/Electronic Industries Alliance.

### 1.04 SUBMITTALS

- A. Submittal data sheet(s).
- B. Dimensional print(s).
- C. Wiring diagram(s).
- D. Installation, operation, and maintenance manual.

### 1.05 QUALITY ASSURANCE

- A. 304 stainless steel pump(s) shall be NSF-61 certified.
- B. 316L stainless steel pump(s) shall be NSF-372 certified.
- C. Grey cast iron EN-GJL 250 with cataphoresis coating pump(s) shall be NSF-372 certified.
- D. The pump manufacturer shall be ISO 9001 and ISO 14001 certified.
- E. All wetted surfaces shall be made of corrosion-resistant material.
- F. Pumps using EPDM seals with flowrates 10–80 GPM, shall be rated for –22°F to 248°F fluid temperatures. Pumps using EPDM seals with flowrates 110–270 GPM shall be rated for –4°F to 248°F fluid temperatures.
- G. Pumps using FKM seals with flowrates 10–270 GPM, shall be rated for 5°F to 194°F fluid temperatures.
- H. The pump shall either have a maximum operating pressure rating of 232 PSI or 363 PSI.
- I. The pump shall have an ambient air temperature range of 5°F – 104°F.

- J. High efficiency drive (HED) control interface and electronic commutated motor (ECM) shall produce motor efficiencies greater than, or equal to, IE4 (NEMA MG1 TABLE 12-12) motor efficiency standards.

## 1.06 WARRANTY

- A. Provide manufacturer's standard warranty against defects in materials and workmanship
  - 1. Warranty Period: Wilo Helix EXCEL 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. Wilo Helix EXCEL series pump(s) as manufactured by Wilo.
  - 2. Pre-approved equal.

### 2.02 COMPONENTS

- A. Pump Housing
  - 1. Shall either be constructed of:
    - a. AISI304 stainless steel.
    - b. AISI316L stainless steel.
    - c. Grey cast iron EN-GJL 250 with cataphoresis coating.
  - 2. Shall be assembled with 300 class ANSI flanges for up to V80 and 250lb ANSI cataphoresis coated ductile iron (EN-GJS-500-7) split flanges for V110-V270. Shall be furnished with a carbon and polyphenylene sulfide (PPS) wear ring.
  - 3. Shall be equipped with drain and vent ports with the ability to accommodate a bypass.
- B. Pump Shaft
  - 1. 304 stainless steel and cast Iron pumps with flowrates 10-80 GPM shall be equipped with an AISI304 or AISI318 LN stainless steel shaft depending on the number of Impeller stages.
  - 2. 304 stainless steel and cast Iron pumps with flowrates 110-270 GPM shall be equipped with an AISI431 stainless steel shaft.
  - 3. 316L stainless steel pumps shall be equipped with an AISI316L or AISI318 LN; depending on number of impeller stages.
- C. Impeller
  - 1. Shall be 100% laser-welded, 2D/3D blades, and sandblasted.
  - 2. 304 stainless steel and cast Iron pumps shall be equipped with AISI304L stainless steel impeller(s).
  - 3. 316L stainless steel pumps shall be equipped with AISI316L stainless steel impeller(s).
- D. Pump Seal
  - 1. Seal cartridge assemblies shall facilitate, at the discretion of the operator, a seal replacement or an entire cartridge replacement.
  - 2. Sleeve under mechanical seal shall be AISI316L.

3. 304 stainless steel and cast Iron pumps shall be equipped with 304 stainless springs, clips, and constructed with EPDM inserts.
4. 316L stainless steel and cast Iron pumps shall be equipped with 304 stainless springs, clips, and constructed with FKM inserts.

E. Lantern

1. Shall be constructed cataphoresis-coated grey cast iron EN-GJL 250
2. Shall be rotatable by 90°.
3. Shall have lifting lugs to facilitate pump installation or extraction from packaging.
4. Shall have a coupling guard in AISI316L stainless steel with Wilo design for better shaft protection.
5. Shall allow for easy access to the coupler, spacer and seal cartridge assembly.
6. Shall allow for removal/replacement of seal cartridge without removing motor on motor sizes 7.5 HP and greater.

F. Motor

1. Shall be a Wilo-developed, electronically commutated, synchronous permanent magnet, super premium motor.
2. Shall meet standard IEC 60034-30.
3. Shall have a protection class of IP55.
4. Shall produce motor efficiencies greater than, or equal to, IE4 and NEMA MG1 TABLE 12-12 motor efficiency standards.

G. Control interface

1. Shall allow for quick access to the main parameters using LCD display and Wilo RED BUTTON.
2. Shall have two configurations:
  - a. Standard control
  - b. Expert control
3. Shall offer four control modes:
  - a. Speed control
  - b. Constant pressure
  - c. Variable pressure
  - d. PID control
4. Shall allow for speed reduction turndown of up to 70%.
5. Shall be UL 508 compliant and listed.

H. (Communications)<sup>1</sup>

1. Shall allow for real time interfaces for BUS communication via plug-in IF-modules.
2. IF-modules shall accommodate the following protocols:
  - a. BACnet
  - b. Modbus
  - c. LON
3. IR Stick shall allow for communication with the pump(s) via an infrared interface. Software updates shall be available.

I. (External Components)<sup>1</sup>

1. Pressure sensor
2. Differential pressure sensor

## PART 3 EXECUTION

### 3.01 INSTALLATION

- A. Install equipment in accordance with manufacturer's instructions as written in the Installation and Operation Manual (IOM).
- 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 a Wilo Helix EXCEL as manufactured by Wilo.

END OF SECTION

<sup>1</sup>Components in parenthesis indicate an optional item.