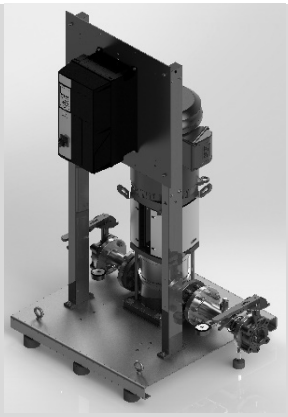

Wilo-Helix Complete
Pressure Boosting Systems

Engineering Specification

WILO_SPC_Helix Complete_0120

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Vertical, multistage, centrifugal, one-pump booster package shall be a Wilo-Helix Complete booster as manufactured by Wilo USA
B. Furnish and install a variable speed, vertical multistage, centrifugal booster pumping package with a capacity as indicated in the plans

1.02 RELATED SECTIONS

A. 23 21 23 – Hydronic Pumps
B. 23 22 23.13 – Electric-Driven Steam Condensate Pumps
C. 23 53 13 – Boiler Feedwater Pumps

1.03 REFERENCES

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

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. The complete packaged pumping system shall be NSF 61 and NSF 372 listed for drinking water and low lead requirements
B. The complete packaged pumping system shall be UL listed QCZJ.MH60113 Packaged Pumping Systems and

QCZJ7.MH60113 – Packaged Pumping Systems for Canada

C. All wetted surfaces shall be made of corrosion-resistant material
D. Liquid temperature range for the booster package shall be rated for -4°F to 248°F with a minimum of 32°F for domestic water.
E. Ambient temperature range for the booster package shall be rated for +32°F to 104°F
F. Booster pressure rating shall either be 232 PSI / 363 PSI depending on number of stages
G. The pumping package shall be performance tested prior to shipment

1.06 WARRANTY

A. Provide manufacturer's standard warranty against defects in materials and workmanship
    1. Warranty Period: Wilo-Helix Complete boosters 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.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

A. Subject to compliance with these specifications, the following manufacturers shall be acceptable:
    1. Wilo –Helix Complete series boosters as manufactured by Wilo
    2. Pre-approved equal
B. The packaged pumping system shall be a standard product of a single pump manufacturer. The entire pump system including pumps and pump logic controller, shall be designed, built and tested by the same manufacturer.

2.02 COMPONENTS

A. PUMPS
    1. Shall be of vertical, inline, multistage design
    2. Shall be NSF 61/Annex G listed for drinking water and low lead requirements
    3. Pump Housings:
        a. Shall be constructed of AISI 304 Stainless Steel with 300 class ANSI flanges
        b. Shall be furnished with a carbon and polyphenylene sulfide (PPS) wear ring
        c. Shall be equipped with drain and vent ports with ability to accommodate a bypass
        d. Shall be equipped with an AISI 304, AISI 318 LN, or AISI431 stainless steel shaft depending on number of impeller stages and flowrate
        e. Shall have lifting lugs to facilitate pump installation or extraction from packaging
        f. Shall have a coupling guard in AISI 316 L Stainless Steel with Wilo design for better shaft protection
        g. Shall allow for easy access to the coupler, spacer and seal cartridge assembly
        h. Shall allow for removal/replacement of seal cartridge without removing motor at any horse power
        i. Seal cartridge assemblies shall have the ability to be disassembled in order to replace the mechanical seal without having to replace the entire X-cartridge assembly
    4. Mechanical Seal:
        a. Sleeve shall be AISI 316 L
        b. Springs and clips shall be AISI 304 Stainless Steel
        c. Inserts shall be constructed of EPDM

5. Impellers:
    a. Shall be constructed of AISI 304 L Stainless Steel and 100% laser-welded 2D/3D blades shall be sandblasted prior to shipment

B. MOTORS
1. Shall be fixed speed, NEMA designed and covered at premium efficiency levels NEMA MG1, Table 12-12 or Part 20, Table B (IE3)
2. Shall have a NEMA C-faced flange for vertical mounting
3. Shall either be equipped with a 208- 230V~1, 208-230V~3, 460v~3 or 575V~3 motor
4. Shall be a 2-pole motor and run up to 60 hz
5. Shall be totally enclosed fan cooled
6. Shall have a protection class of IP55 with Class F insulation

C. EFC VARIABLE SPEED PUMP CONTROLLER
1. Shall be supplied with NEMA 12 enclosure
2. Assets shall be protected by software that prevents;
    a. Water hammer
    b. End-Of Curve detection
    c. Dry run detection
    d. Check valve protection
    e. Motor alternation
    f. SmartStart
    g. Low flow detection
    h. Safe torque off
    i. Pipe fill mode
    j. Sleep mode
    k. Overload protection
    l. Warnings and alarms
    m. Password protection
3. Shall be offered in voltages of:
    a. 208-230V~1 IN / 208-230V~3 OUT
    b. 203-280V~3
    c. 460V~3
    d. 575V~3
4. Electromagnetic interference and harmonic distortion are reduced by the built-in, scalable RFI filter and integrated DC link chokes
5. 3–8% additional energy savings are achieved, above variable speed energy savings, as a result of Automatic Energy Optimization
6. Shall have User-configurable info texts
7. Shall have one communication protocol internal to the frequency converter:
    a. Modbus RTU

D. PUMP MANIFOLD
1. Shall be constructed of AISI 304 Stainless Steel
2. Manifolds shall have smooth contour transitions to minimize build-up of organisms

3. All pump line connections shall either be NPT male / female pipe threads or 300 class flanges in accordance with ANSI B1.20 depending on size
4. All manifolds shall be electrolytic polished
5. All manifolds shall be 5S or 10S depending on size and rated pressure.
6. Suction and discharge manifolds shall each have two ¼" male NPT connections; one for a 316 stainless steel, pressure transducer and the other for a 2.5" 316 stainless steel, glycol-filled, analog pressure gauge
7. Suction and discharge manifolds shall have a ¾" Female NPT connection
8. Discharge manifold shall be equipped with ¾" Male NPT x ¾" Female NPT shut-off valve with ¾" stainless steel plug engaged into the Female NPT portion of the shut-off valve
9. Suction manifold shall be equipped with a ¾" stainless steel plug engaged into the Female NPT portion of the ¾"connection

E. ISOLATION VALVES

1. Shall be constructed of either ASTM 304 Stainless steel or an epoxy coated cast iron wafer body ISO 5211 with API609 face to face flange; depending on size
2. All threads shall be female, nominal tapered threads in accordance with ANSI B1.20.1
3. Packing, thrust washer, seal and gasket shall all be constructed of PTFE for threaded valve bodies
4. Seat shall be constructed of PTRE for threaded Stainless steel valve bodies and EPDM resilient seat for cast iron wafer body

CHECK VALVE

1. Every pump, in relation to the pump manifold, shall have a 316 Stainless Steel ASTM A240 in Female NPT or a Wafer-Style, Epoxy Coated Ductile Iron Body ASTM 65-45-12, with 316 Stainless steel internals; depending on booster size and model
2. Check valve shall be a "Piston-style, non-slam, check valve
3. Elastomer seal for check valve shall be made of EPDM

4. (External Component Options) [i]
   1. (Hydropneumatic Tank Option; Tanks for system capacity and ASME-rated tanks shall also be available upon request)
   2. (ODP motors available in lieu of TEFC upon request (but not recommended))
   3. (NEMA 3R and 4X enclosure)
   4. (Booster packages available at higher pressures upon request)

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. 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 Complete booster system as manufactured by Wilo USA.

END OF SECTION

[1] Components in parenthesis indicate an optional item.

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