Scot Pump
A WILO BRAND

MVI
High-pressure Vertical Multistage Centrifugal Pumps

Engineering Specification

SCOT_SPC_MVI_1121

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Vertical, multistage, centrifugal pump shall be a Model MVI as manufactured by Scot Pump.
B. Furnish and install a vertical, multistage, centrifugal pump, 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. CSA - Canadian Standards Association
B. NSF – NSF International.
C. UL – Underwriters Laboratories.
D. HI – Hydraulic Institute.
E. PEI – Pump Efficiency Index.
F. NEC – National Electrical Code.
G. ANSI – American National Standards Institute.
H. ISO – International Standards Organization.
I. NEMA – National Electrical Manufacturers Association.

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. Shall be a non-self-priming, high-efficiency multistage high-pressure centrifugal pump in a vertical design with in-line connections.
B. All pumps shall meet or exceed the DOE requirements for Pump Efficiency Index (PEI).
C. 304 and 316 stainless steel pump(s) shall be NSF-372 and NSF 61 listed with CSA.
D. All wetted surfaces shall be made of corrosion-resistant material.
E. The pump shall either have a maximum operating pressure rating of 232 PSI, 363 PSI or 435 PSI: depending on size and number of stages.
F. The pump shall have an ambient air temperature range of 32°F to 104°F.
G. The pump shall have a fluid temperature range of 5°F to 248°F; determined by liquid type.
H. All pumps shall be hydrostatically tested prior to shipment.

1.06 WARRANTY

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

2.02 COMPONENTS

A. Pump Housing:
    1. Shall either be constructed of:
        a. AISI 304 stainless steel.
        b. AISI 316L stainless steel.
    2. Shall be assembled with 150 or 300 Class ANSI flanges: depending on size and number of stages.
    3. Shall be equipped with drain and vent ports with ability to accommodate a bypass.

B. Pump Shaft
    1. 304 stainless steel constructed pumps shall be equipped with an AISI 431 stainless steel shaft.
    2. 316 stainless steel constructed pumps shall be equipped with an AISI 316 stainless steel shaft.

C. Impeller
    1. Shall be two-piece and tack-welded prior to shipment.
    2. 304 stainless steel pumps shall be equipped with ANSI 304 stainless steel impeller(s).

2.03 COMPONENTS – Continued

    3. 316 stainless steel pumps shall be equipped with AISI 316 stainless steel impeller(s).

D. Pump Seal
    1. Seal cartridge assemblies shall have the ability to be disassembled and replace the mechanical seal without having to replace the entire cartridge assembly.
    2. Stationary and rotary seal face shall be of Silicon Carbide.
    3. Secondary seal rubber components shall be made of EPDM or VITON.
    4. Mechanical seal frame and spring shall be constructed of 304 or 316 stainless steel for 304 and 316 stainless steel pumps respectively.

E. Motor Bracket/Pedestal
    1. Shall either be constructed of ASTM 65-45-12 or ASTM 35B cast iron.
    2. Shall be rotatable by 90 degrees.
    3. Shall have a coupling guard in stainless steel for shaft protection.
    4. Shall allow for easy access to the coupler, spacer, and seal cartridge assembly.
    5. Shall allow for removal/replacement of seal cartridge without removing the motor.

F. Motor
    1. Shall be Premium energy–efficient, TEFC Enclosure, squirrel–cage induction motors, NEMA frame size 56C through 405TSC.
    2. Motor enclosure including frame and terminal box shall be constructed of SAE 1010 Rolled Steel or FC-200 Cast Iron depending on motor.
    3. W01 Rolled Steel TEFC motors shall have a protection of IP55 with a Class F insulation and a 1.15 service factor.
    4. W22 Cast Iron TEFC motor shall have a protection of IP55 with a Class F insulation and a 1.25 service factor.
    5. Shall be 2-pole and run up to 60 Hz.
    6. All motors shall conform to the latest applicable requirements of NEMA MG1, ANSI, and NEC standards.
    7. Motor efficiency shall be determined in accordance with NEMA MG 1–2016–12.58.1 and full load efficiency labeled on motor nameplate in accordance with NEMA MG 1–2016–12.58.2.
    8. Motors are to be designed for continuous duty for 3 phase and single phase, 60 HZ, 115, 208-230, 460 or 575-volt operation.
    9. Motor ambient temperature range shall be -22°F to +104°F for W22 cast iron motors and -4°F to +104°F for W01 rolled steel motors with altitudes up to 3,300 feet above sea level.
    10. For W01 Rolled Steel 56C, 182/4TC and 213/5TC frame motors, shielded ball bearings (ZZ type) and permanently lubricated are the standard. For 254/6TC frames, a relubrication system consisted by grease fittings and single shielded ball bearings is provided as standard.
    11. W22 cast iron motors shall be supplied with deep groove ball bearings as standard.
    12. By default, the bearings shall be grease lubricated and have L10h lifetime of 26,280 hours, for the conditions and loads defined by NEMA MG 1 – 2016 – 14.42.
    13. The lubrication interval for cast iron motors with grease fittings shall be stamped on the motor nameplate.
    14. When specified, the shaft ground device to be used shall be AEGIS® SGR Solid Ring, mounted inside the motor enclosure only, with bolt through mounting.
    15. When operated by Variable Frequency controllers, the motor Variable Torque turndown ratio capability shall be 1000:1.
    16. Motor windings should be suitable for use on Variable Frequency controllers and meet the requirements of NEMA MG1 part 31.4.4 for voltage spike resistance. The voltage spike at motor terminals allowed for 115V, 208-230V, and 460V motors shall be less than or equal to 1,600 volts. The voltage spike allowed for $460 \leq V_{rated} \leq 575$ shall be less than or equal to 2,000 volts.
    17. The no–load sound pressure, based on the A–weighted scale at 3 feet when measured in accordance with NEMA MG1-2014 part 9.

The sound power levels shall be in accordance with the table 9-1 from the same standard.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install equipment in accordance with manufacturer's instructions.
B. Power wiring and motor protection, 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 Series MVI as manufactured by Scot Pump.

END OF SECTION