

Wilo-Stratos MAXO/-D/-Z

High Efficiency Commercial Circulators

Engineering Specification

Wilo_Spec_Stratos_MAXO_092023

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Variable speed, high efficiency, electronically commutated motor-driven, wet rotor circulator pump shall be a Wilo-Stratos MAXO/-D/-Z as manufactured by Wilo USA.
B. Furnish and install a variable speed, high efficiency, electronically commutated motor-driven, wet rotor circulator pump with a capacity as indicated in the plans.

1.02 RELATED SECTIONS

A. 23 21 23.19 – Vertical-Mounted, Double-Suction Centrifugal Hydronic Pumps.
B. 22 11 23.23 – Close-Coupled, Inline, Sealless Centrifugal Domestic-Water Pumps.

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1.03 REFERENCES

A. NSF – NSF International.
B. HI – Hydraulic Institute.
C. UL – Underwriters Laboratories.
D. cUL – Canadian Underwriters Laboratories.
E. NEC – National Electrical Code.
F. ANSI – American National Standards Institute.
G. ECM – Electronically Commutated Motor.
H. HMI – Human Machine Interface.

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 Hydronic pump shall be NSF 61 Annex G and NSF 372 listed for drinking water and low lead requirements (-Z Models only).
B. Liquid temperature range for the variable speed, high efficiency, electronically commutated motor-driven, wet rotor circulator pump shall be rated for 14°F to 230°F; with a minimum of 32°F for domestic water.
C. Ambient temperature range for the variable speed, high efficiency, electronically commutated motor-driven, wet rotor circulator pump shall be rated for +14°F to 104°F.
D. Stratos MAXO/-D/-Z pressure rating shall be 145 PSI.
E. The wet rotor pump manufacturer shall have minimum 10 years of experience in the country of the installation.

F. Shall be compliant to the UL Standard for Adjustable Speed Electrical Power Drive Systems - Part 5-1: Safety Requirements - Electrical, Thermal and Energy; UL61800-5-1.
G. Shall be compliant to UL 778 standards for motor pump.
H. Shall be compliant to UL 50 and UL 50E standards for enclosures for electrical equipment.
I. Shall be compliant to CAN/CSA C22.2 No. 274.
J. The pump shall be labeled on the nameplate as having an Energy Efficiency Index (EEI) of no greater than 0.20.

1.06 WARRANTY

A. Provide manufacturer's standard warranty against defects in materials and workmanship.
   1. Warranty Period: Wilo-Stratos MAXO/-D/-Z shall be free of defects in materials and workmanship for a period of four (4) years from date of manufacture or three (3) years from the date of installation; whichever expires first. Warranty shall cover pump, motor and terminal box as a complete unit.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

A. Subject to compliance with these specifications, the following manufacturers shall be acceptable:
   1. Wilo-Stratos MAXO/-D/-Z as manufactured by Wilo.
   2. Pre-approved equal.
B. The variable speed, high efficiency, electronically commutated motor-driven, wet rotor circulator pump shall be a standard product of a single pump manufacturer. The entire pump system including pump, motor and pump HMI, shall be designed, built and tested by the same manufacturer.
C. The variable speed, high efficiency, electronically commutated motor-driven, wet rotor circulator pump manufacturer shall have a minimum of 10 years of experience in the country of the installation.

2.02 COMPONENTS

A. PUMP(S)
   1. Shall be of variable speed, high efficiency, electronically commutated motor-driven, wet-rotor circulator pump design.
   2. Shall be NSF 61 Annex G / NSF-372 listed for drinking water and low lead requirements (-Z Models Only)
   3. Pump Housing:
      a. Stratos MAXO and Stratos MAXO –D pump housings shall be constructed of EN-GJL-250 Grey Cast Iron and surface-treated with Cataphoretic coating. Stratos MAXO-Z pump housings shall be constructed of Austenitic Stainless Steel 1.4408.
   4. Impeller(s) shall be constructed of glass fiber reinforced PPS-GF40.
   5. Shaft:
      a. Stratos MAXO shall have a shaft constructed of X39CrMo17-1 Martensitic stainless steel.
      b. Stratos MAXO-D shall have shafts constructed of X30Cr13 Martensitic stainless steel.
      c. Stratos MAXO-Z shall have a shaft constructed of 1.4122 Chromium martensitic stainless steel with molybdenum.
   6. Bearing:

a. Stratos MAXO and Stratos MAXO –D bearings shall be constructed of Carbon-Graphite. Stratos MAXO-Z bearings shall be constructed of Antimony-Impregnated Carbon.

B. MOTOR/ELECTRONICS
   1. Shall be an Electronically Commutated Motor.
   2. Voltage and Hz:
      a. Stratos MAXO and Stratos MAXO-Z shall be compatible to supply voltage in 115v~1±10%, 50/60 Hz or 230v -240v~1±10%, 50/60 Hz.
      b. Stratos MAXO- D shall compatible to supply voltage 230v -240v~1±10%, 50/60 Hz.
   3. Shall have a protection class of Enclosure 2 with Class F insulation.

C. HMI
   1. Shall have a 4.3" LED color screen.
   2. Shall allow for easy menu navigation using "GREEN BUTTON" technology.
   3. Shall have the following, selectable, control modes:
      a. Permanent, automatic performance adaptation to system requirements without set point specification; Wilo Dynamic Adapt plus with up to 20% energy savings compared to dp-v control mode.
      b. Constant temperature (T-const., factory setting).
      c. Constant differential temperature (dT-const.).
      d. Needs-based volume flow optimization of the feeder pump through connectivity and communication between multiple pumps (Multi-Flow Adaptation).
      e. Constant volume flow (Q-const.).
      f. Differential pressure control (dp-c) to a remote point in the pipe network (index circuit evaluator).
      g. Constant differential pressure (dp-c).
      h. Variable differential pressure (dp-v) with the option to set the nominal duty point.
      i. Constant speed (n-const.).
      j. User-defined PID control.
   4. Shall have the following display characteristics:
      a. Control mode.
      b. Setpoint.
      c. US gallons per minute.
      d. Power consumption.
      e. Active influences (e.g. STOP, No-flow Stop).
      f. Fault; yellow screen – pump still runs.
      g. Failure; red screen – pump stop.
   5. Shall have the following I/O:
      a. Two configurable analogue inputs: 0–10 V, 2–10 V, 0–20 mA, 4–20 mA and commercially available PT1000; +24 V DC power supply.
      b. Two configurable digital inputs (Ext. OFF, Ext. Min, Ext. Max, heating/cooling, manual override (uncoupled from building automation), operation lock (key lock and remote operation configuration protection).
      c. Two configurable signal relays for operational and fault messages.
      d. Slot for Wilo-CIF modules with interfaces for building automation BA (optional accessories: CIF modules Modbus RTU, BACnet MS/TP).
      e. Wilo Net as a Wilo system bus for communication between Wilo products, e.g. Multi-Flow Adaptation; double pump operation and Wilo-Smart Gateway.

f. Integrated temperature sensor.
g. Automatic emergency operation with definable pump speed for exceptional circumstances, e.g. bus communication or sensor value malfunction.
h. Use the Wilo-Assistant app to read and set operating data and –among other things– set up a commissioning protocol through the Bluetooth interface (no further accessories required).
i. Cable break detection when using an analogue signal (in connection with 2–10 V or 4–20 mA).
j. Pre-set date and time.

D. FUNCTIONS

1. Heat quantity measurement.
2. Cooling quantity measurement.
3. Pump automatically deactivates when no flow is detected (No-Flow Stop).
4. Switchover between heating and cooling mode (automatic, external or manual).
5. Adjustable volume flow limiter using the Q-Limit function (Qmin. and Qmax.).
6. Operating modes of twin-head pumps: Efficiency-optimized parallel operation for dp-c and dp-v, main and standby operation.
7. Ability to save and restore configured pump settings of up to three restoration points.
8. Fault and warning messages shown in plain text with advice on resolving the issue.
9. Pump venting function for automatic venting of the rotor chamber.
10. Automatic setback operation.
11. Automatic deblocking function and integrated full motor protection.
12. Dry-running detection.
13. Automatic detection of thermal disinfection for domestic hot water circulation in conjunction with a separate temperature sensor (Stratos MAXO-Z Only).

E. EXTERNAL ACCESSORIES

1. CIF Modules:
   a. BACnet MS/TP.
   b. Modbus RTU.
   c. LonWorks.
   d. CanBUS.
2. PT 1000 (B) pipe contact sensor (for domestic hot water).
3. PT 1000 (AA) sensor for installation in immersion well.
4. Differential pressure sensor.

PART 3 – EXECUTION

3.01 INSTALLATION

A. Scope of delivery

a. Complete pump and motor assembly.
b. Stratos MAXO and Stratos MAXO-Z shall have an optimized Wilo-Connector with ½" NPT connection adaptor. Stratos MAXO-D shall have 2x optimized Wilo-Connector with ½" NPT connection adaptor.
c. Stratos MAXO and Stratos MAXO-Z shall have 5x threaded cable glands M16 x 1.5. Stratos MAXO-D shall have 10x threaded cable glands M16 x 1.5.

d. Stratos MAXO and Stratos MAXO-Z shall have gaskets for 1.25, 1.5 and 2 inch flange connections.
e. Concise Installation and operating instructions.

B. Install equipment in accordance with manufacturer's instructions.
C. 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.
D. All factory wiring shall be numbered for easy identification and the numbers shall coincide with those shown on the wiring diagram.
E. Unit shall be a Wilo-Stratos MAXO as manufactured by Wilo USA.

END OF SECTION