

Magna1® Wet Rotor Circulator

Part I – GENERAL

1.1 WORK INCLUDED

A. Contractor shall furnish and install Grundfos Magna1® variable speed wet rotor in-line circulator pumps in accordance with manufacturer's recommendations and plans.

1.2 REFERENCE STANDARDS

The work in this section is subject to the requirements of applicable portions of the following standards:

- A. Hydraulic Institute
- B. ANSI – American National Standards Institute
- C. ASTM – American Society for Testing and Materials
- D. IEEE – Institute of Electrical and Electronics Engineers
- E. NEMA – National Electrical Manufacturers Association
- F. NEC – National Electrical Code
- G. ISO – International Standards Organization
- H. UL – Underwriters Laboratories, Inc.
- I. CSA –Canadian Standards Association
- J. ETL – ETL Listed Mark by Intertek Testing Services

1.3 INSTALLATION REFERENCES

The wet runner pump manufacturer shall have minimum 10 years of experience in the country of the installation.

Part 2 – PRODUCTS

2.1 VARIABLE SPEED WET ROTOR CIRCULATOR PUMPS

- A. Pump shall be of the in-line wet rotor design. Oil lubricated pumps and shaft coupled pumps shall not be accepted.
- B. The pump shall be a standard product of a single pump manufacturer. The pump, motor, and variable speed drive shall be an integral product designed and built by the same manufacturer.
- C. The enclosure shall be marked "Enclosure Type 2."
- D. The pump shall be certified and listed by a Nationally Recognized Test Laboratory (NRTL) for U.S. and Canada to comply with:
 - a. UL778
 - b. UL 60730-1A
 - c. CAN/CSA No. 108

- E. The pump shall be labeled on the nameplate as having an Energy Efficiency Index (EEI) of no greater than 0.20.

2.1.1 Ratings

- A. Maximum Pressure: 175 PSIG
- B. Minimum Media Temperature: 14 °F
- C. Maximum Media Temperature: 230 °F
- D. Maximum Continuous Media Temperature: 203 °F
- E. Maximum Sound Pressure Level: 43dB(A)
- F. Voltage: [1x115V +/-10%][1x208-230V +/-10%]
- G. Maximum Energy Efficiency Index: 0.20

2.1.2 Pump Construction

- A. Pump housing: Cast Iron: EN-JGL-250 with Cataphoresis surface treatment
Stainless Steel: 304 Stainless
- B. Impellers: Composite PES 30% GF
- C. Rotor Can: PPS reinforced with Carbon Fiber(Fortran MT9141L PPS-GF40)
- D. Rotor Cladding: 316 Stainless Steel
- E. Stator Housing: Aluminum
- F. Shaft: 316L Stainless Steel
- G. Thrust Bearing: Axial: Carbon Graphite, Radial: ceramic Alumina Hilox 961
- H. O-Rings: EPDM
- I. Bearing Plate: 304 Stainless Steel
- J. Neck Ring: 304 Stainless Steel
- K. Control Box: Polycarbonate

2.1.3 Motor

- A. Motor shall be 4-pole permanent-magnet (PM motor) and tested with the pump as one unit by the same manufacturer. Conventional asynchronous squirrel-cage motors shall not be acceptable.
- B. Each motor shall be of the integrated Variable Speed Drive design consisting of a motor and a Variable Frequency Drive (VFD) built and tested as one unit by the same manufacturer.
- C. The stator housing shall be made of pressure die cast aluminum.
- D. The motor shall be cooled by the pumped fluid
- E. The power electronics shall be cooled to the ambient air.
- F. The Motor shall be self-ventilating.
- G. Minimum insulation class for the motor shall be Class F.

2.1.4 Operating Modes

The pump shall have the following control mode and operating modes:

- A. Proportional Pressure – The head delivered shall be reduced from a manual setpoint linearly in accordance with decrease in flow demand in the system
- B. Constant Pressure – A manual set, constant head is maintained, irrespective of flow up to the maximum speed of the pump.
- C. Constant Curve – The pump runs as an uncontrolled pump by the means of a set of pump curves. The pump curve adjustable between maximum and minimum from the control panel or through a wireless remote control.

2.1.5 Interface and Communication

- A. The pump shall have an integrated operator interface consisting of:
 - i. 1 push button for navigation of operating modes
 - ii. Push Buttons must be isolated from the main supply by reinforced insulation according to UL60730
 - iii. LEDs to signal pump operating mode for quick indication

2.2 INSTALLATION

The pump shaft shall be installed horizontally per manufacturer's recommendations. The terminal box shall be located as per manufacturer's recommendations. The system shall be vented out from a higher location from the pump. The required inlet pressure by the pump shall be available at the pump inlet.

2.3 TESTING

- A. The pumps shall be factory performance and hydrostatic tested as a complete unit prior to shipment. The testing shall be done in accordance with ISO 9906 Annex A. No test certificate is required.

2.4 WARRANTY

- A. The warranty period shall be a non-prorated period of 24 months from date of installation, not to exceed 30 months from date of manufacture. Warranty shall cover pump, motor and terminal box as a complete unit.