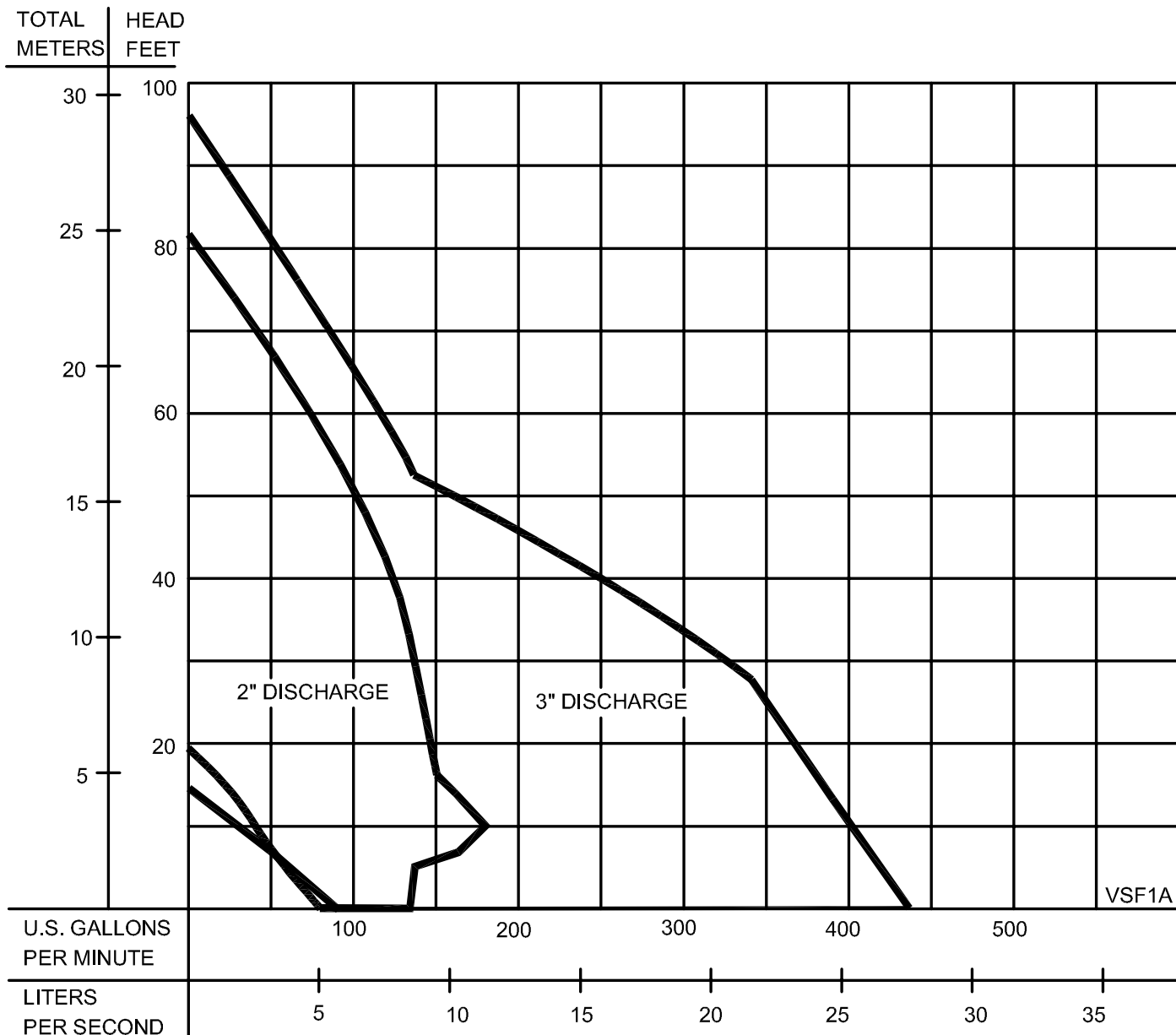


Submersible Non-Clog Pumps



VSF1A

SCOPE: Furnish and install _____ submersible non-clog sewage pump (s). Each pump shall be capable of delivering the following performance points, _____ U.S. GPM at _____ TDH; _____ U.S. GPM at _____ TDH; _____ U.S. GPM at _____ TDH, with a shut off head of _____ TDH (minimum) and _____ % minimum efficiency at _____ U.S. GPM at _____ TDH (operating point). The pump motor speed shall be _____ RPM, _____ HP (maximum), _____ Phase, 60 Hertz, _____ Volts. The pump (s) shall be manufactured in North America by a company regularly engaged in the manufacture and assembly of similar units for a minimum of five (5) years. The pump (s) shall be Barnes® Pumps model _____.

PUMP DESIGN: Each pump shall be capable of handling raw, unscreened domestic sewage consisting of water, fibrous materials, and _____ inch diameter spherical solids. The pump (s) shall be capable of handling liquids with temperatures to 104 degrees F continuous, 160 degrees F intermittent, and shall be capable of running dry for extended periods.

PUMP CONSTRUCTION: The volute, seal plates, impeller and motor housing shall be constructed of high quality cast iron. The pump (s) shall be painted with a water based air dry enamel of 2.0 mil minimum thickness. All exposed hardware shall be 300 series stainless steel. The pump construction shall contain no points of critical clearance nor require periodic adjustment or replacement to maintain operating efficiency. Discharge connection shall be a standard _____ inch NPT in the vertical position. All gaskets shall be of the compression square ring type eliminating critical slip fits and the possibility of damage during service associated with sliding o-ring sealing arrangements.

The impellers shall be of the non-clog design with pump out vanes on the back side. The impellers shall be dynamically balanced to ISO G6.3 specifications.

The unit shall utilize a single mechanical shaft seal which will operate in an oil atmosphere. The materials of construction shall be carbon for the rotating face and ceramic for the stationary face, lapped and polished to a tolerance of one light band, 300 series stainless steel hardware, and all elastomer parts to be of Buna-N. The seal shall be commercially available and not a proprietary design of the manufacture.

The pump shall be designed to be non-overloading throughout the entire pump curve. The rotor and stator assembly shall be of the standard frame design and secured to the pump seal plate by four threaded fasteners allowing for easy serviceability. Motor designs incorporating shrink or press fit assembly between the stator and motor housing shall not be acceptable. The motor shall be constructed with the windings operating in a sealed environment containing clean dielectric oil, making it capable of operating in a totally, partially or non-submerged condition for extended periods of time without damage due to the heat being generated. Air-filled motors shall not be acceptable. The motor windings shall be of Class _____ insulation. The motor shall meet the standard NEMA design L for single phase and NEMA design B for three phase. The motor shaft shall be of 416 stainless steel. The lower bearing shall be of the single ball type to accept radial and thrust loads, and the upper bearing of the sleeve or ball design, for radial loads. Bearings shall operate in an oil bath atmosphere for superior life. Permanently lubricated bearings are not acceptable.

Thermal sensor shall be used on three phase units to monitor stator temperatures. The stator shall be equipped with a thermal switch embedded in the end coil of the stator winding. This shall be used in conjunction with external motor overload protection and wired to the control panel. Single phase shall have an overload switch on the motor windings and do not require any external protection.

The pump shall be equipped with _____ ft. of type SOW power cable and connected to the motor via quick disconnect pin terminals. Threaded cord grip type cord entries are not acceptable. Pin receptacles shall be crimped and molded to the power cord in a PVC plug. The plug shall be secured with a stainless steel compression plate to prevent water from entering the housing and to provide strain relief at the point of cable entry. A stainless steel clamp shall compress the PVC molding against the cable jacket to prevent water from entering the jacket. A polybutylene terephthalate terminal block with brass pin inserts shall connect the power cord leads with the motor leads. The ground pin shall be longer than the other pins such that the ground connection is the first connection made and the last connection broken when the plug is inserted and removed, respectively. A Buna-N o-ring shall provide isolation sealing between the terminal block and the motor housing when the cord plug is removed.

PUMP TEST: The pump manufacturer shall perform the following inspections and tests in accordance with Hydraulic Institute type B standards before shipment from the factory:

1. A check of the motor voltage and frequency shall be made as shown on the name plate.
2. A motor and cable insulation test for moisture content or insulation defects shall be made per UL criteria.
3. The pump shall be completely submerged and run to determine that the unit meets three pre-determined hydraulic performance points.
4. A written report shall be available showing the aforementioned tests have been performed in accordance with the specifications.

START-UP: The pump(s) shall be tested at start-up by a qualified representative of the manufacturer. A start-up report as provided by the manufacturer shall be completed before final acceptance of the pump(s).

DOCUMENTATION: The manufacturer, if requested, will supply a minimum of _____ sets of standard submittal data; Standard submittal data consist of:

- a. Pump catalog data;
- b. Pump performance curve;
- c. Break Away Fitting (BAF) data;
- d. Access frame data;
- e. Typical installation drawing;
- f. Control panel data
- g. Panel wiring schematic;
- h. Accessory data;
- i. Installation & Operation Manuals with Parts List.

Specifications

2" Vertical Discharge

SE - High Temperature, Single Seal, Oil-Filled

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Submersible Non-Clog Pumps

FILE: SPEC8

SCOPE: Furnish and install _____ submersible non-clog sewage pump (s). Each pump shall be capable of delivering the following performance points, _____ U.S. GPM at _____ TDH; _____ U.S. GPM at _____ TDH; _____ U.S. GPM at _____ TDH, with a shut off head of _____ TDH (minimum) and _____ % minimum efficiency at _____ U.S. GPM at _____ TDH (operating point). The pump motor speed shall be _____ RPM, _____ HP (maximum), _____ Phase, 60 Hertz, _____ Volts. The pump (s) shall be manufactured in North America by a company regularly engaged in the manufacture and assembly of similar units for a minimum of five (5) years. The pump (s) shall be Barnes® Pumps model _____.

PUMP DESIGN: Each pump shall be capable of handling raw, unscreened domestic sewage consisting of water, fibrous materials, and _____ inch diameter spherical solids. The pump (s) shall be capable of handling liquids with temperatures to 200 degrees F continuous, and shall be capable of running dry for extended periods.

PUMP CONSTRUCTION: The volute, seal plates, impeller and motor housing shall be constructed of high quality ASTM A-48 class 30 cast iron. The pump (s) shall be painted with a water based air dry enamel of 2.0 mil minimum thickness. All exposed hardware shall be 300 series stainless steel. The pump construction shall contain no points of critical clearance nor require periodic adjustment or replacement to maintain operating efficiency. Discharge connection shall be a standard 2 inch NPT in the vertical position. All gaskets shall be of the compression square ring type eliminating critical slip fits and the possibility of damage during service associated with sliding o-ring sealing arrangements.

The impeller shall be of the non-clog design with pump out vanes on the back side. The impeller shall be dynamically balanced to ISO G6.3 specifications.

The unit shall utilize a single mechanical shaft seal which will operate in an oil atmosphere. The materials of construction shall be carbon for the rotating face and ceramic for the stationary face, lapped and polished to a tolerance of one light band, 300 series stainless steel hardware, and all elastomer parts to be of Buna-N. The seal shall be commercially available and not a proprietary design of the manufacture.

The pump shall be designed to be non-overloading throughout the entire pump curve. The rotor and stator assembly shall be of the standard frame design and secured to the pump seal plate by four threaded fasteners allowing for easy serviceability. Motor designs incorporating shrink or press fit assembly between the stator and motor housing shall not be acceptable. The motor shall be constructed with the windings operating in a sealed environment containing clean dielectric oil, making it capable of operating in a totally, partially or non-submerged condition for extended periods of time without damage due to the heat being generated. Air-filled motors shall not be acceptable. The motor windings shall be of Class B insulation. The motor shall meet the standard NEMA design L for single phase. The motor shaft shall be of 416 stainless steel. The lower bearing shall be of the single ball type to accept radial and thrust loads, and the upper bearing of the sleeve or ball design for radial loads. Bearings shall operate in an oil bath atmosphere for superior life. Permanently lubricated bearings are not acceptable.

Thermal sensor shall be used on three phase units to monitor stator temperatures. The stator shall be equipped with a thermal switch embedded in the end coil of the stator winding. This shall be used in conjunction with external motor overload protection and wired to the control panel. Single phase shall have an overload switch on the motor windings and do not require any external protection.

The pump shall be equipped with _____ ft. of type SOO power cable and connected to the motor via quick disconnect spade terminals. Crimp connected cords are not acceptable. Heat shrink tubes shall be used to connect power cord leads with motor leads. A master heat shrink tube shall be provided and filled with epoxy to seal the outer cable jacket and the individual strands to prevent water from entering the motor housing. A secondary rubber pressure grommet shall be provided as an additional sealing point and strain relief at the point of cable entry. Cable entry designs utilizing terminal boards to connect power cord leads with motor leads shall not be acceptable.

PUMP TEST: The pump manufacturer shall perform the following inspections and tests in accordance with Hydraulic Institute type B standards before shipment from the factory:

1. A check of the motor voltage and frequency shall be made as shown on the name plate.
2. A motor and cable insulation test for moisture content or insulation defects shall be made per UL criteria.
3. The pump shall be completely submerged and run to determine that the unit meets three pre-determined hydraulic performance points.
4. A written report shall be available showing the aforementioned tests have been performed in accordance with the specifications.

START-UP: The pump(s) shall be tested at start-up by a qualified representative of the manufacturer. A start-up report as provided by the manufacturer shall be completed before final acceptance of the pump(s).

DOCUMENTATION: The manufacturer, if requested, will supply a minimum of _____ sets of standard submittal data; Standard submittal data consist of:

- a. Pump catalog data;
- b. Pump performance curve;
- c. Break Away Fitting (BAF) data;
- d. Access frame data;
- e. Typical installation drawing;
- f. Control panel data
- g. Panel wiring schematic;
- h. Accessory data;
- i. Installation & Operation Manuals with Parts List

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PUMPS & SYSTEMS

USA: (937) 778-8947 • Canada: (905) 457-6223 • International: (937) 615-3598

FILE: SPEC26

Submersible Non-Clog Pumps

SCOPE: Furnish and install _____ submersible non-clog sewage pump (s). Each pump shall be capable of delivering the following performance points, _____ U.S. GPM at _____ TDH; _____ U.S. GPM at _____ TDH; _____ U.S. GPM at _____ TDH, with a shut off head of _____ TDH (minimum) and _____ % minimum efficiency at _____ U.S. GPM at _____ TDH (operating point). The pump motor speed shall be _____ RPM, _____ HP (maximum), _____ Phase, 60 Hertz, _____ Volts. The pump (s) shall be manufactured in North America by a company regularly engaged in the manufacture and assembly of similar units for a minimum of five (5) years. The pump (s) shall be Barnes® Pumps model _____.

PUMP DESIGN: Each pump shall be capable of handling raw, unscreened domestic sewage consisting of water, fibrous materials, and two (2) inch diameter spherical solids. The pump (s) shall be capable of handling liquids with temperatures to 104 degrees F continuous, 160 degrees F intermittent, and shall be capable of running dry for extended periods.

PUMP CONSTRUCTION: The volute, seal plates, impeller and motor housing shall be constructed of high quality ASTM A-48 class 30 cast iron. The pump (s) shall be painted with a water based air dry enamel of 2.0 mil minimum thickness. All exposed hardware shall be 300 series stainless steel. The pump construction shall contain no points of critical clearance nor require periodic adjustment or replacement to maintain operating efficiency. Discharge connection shall be a standard _____ inch NPT in the vertical position. All gaskets shall be of the compression square ring type eliminating critical slip fits and the possibility of damage during service associated with sliding o-ring sealing arrangements.

The impeller shall be of the non-clog design with pump out vanes on the back side. The impeller shall be dynamically balanced to ISO G6.3 specifications.

The unit shall utilize a single mechanical shaft seal which will operate in an oil atmosphere. The materials of construction shall be carbon for the rotating face and ceramic for the stationary face, lapped and polished to a tolerance of one light band, 300 series stainless steel hardware, and all elastomer parts to be of Buna-N. The seal shall be commercially available and not a proprietary design of the manufacturer.

The pump shall be designed to be non-overloading throughout the entire pump curve. The rotor and stator assembly shall be of the standard frame design and secured to the pump seal plate by four threaded fasteners allowing for easy serviceability. Motor designs incorporating shrink or press fit assembly between the stator and motor housing shall not be acceptable. The motor shall be constructed with the windings operating in a sealed environment containing clean dielectric oil, making it capable of operating in a totally, partially or non-submerged condition for extended periods of time without damage due to the heat being generated. Air-filled motors shall not be acceptable. The motor windings shall be of Class B insulation. The motor shall meet the standard NEMA design L for single phase and NEMA design B for three phase. The motor shaft shall be of 416 stainless steel. The lower bearing shall be of the single ball type to accept radial and thrust loads, and the upper bearing of the single ball design, for radial loads. Bearings shall operate in an oil bath atmosphere for superior life. Permanently lubricated bearings are not acceptable.

Thermal sensor shall be used on three phase units to monitor stator temperatures. The stator shall be equipped with a thermal switch embedded in the end coil of the stator winding. This shall be used in conjunction with external motor overload protection and wired to the control panel. Single phase shall have an overload switch on the motor windings and do not require any external protection.

The pump shall be equipped with _____ ft. of type _____ power cable and connected to the motor via quick disconnect pin terminals. Threaded cord grip type cord entries are not acceptable. Pin receptacles shall be crimped and molded to the power cord in a PVC plug. The plug shall be secured with a stainless steel compression plate to prevent water from entering the housing and to provide strain relief at the point of cable entry. A stainless steel clamp shall compress the PVC molding against the cable jacket to prevent water from entering the jacket. A polybutylene terephthalate terminal block with brass pin inserts shall connect the power cord leads with the motor leads. The ground pin shall be longer than the other pins such that the ground connection is the first connection made and the last connection broken when the plug is inserted and removed, respectively. A Buna-N o-ring shall provide isolation sealing between the terminal block and the motor housing when the cord plug is removed.

PUMP TEST: The pump manufacturer shall perform the following inspections and tests in accordance with Hydraulic Institute type B standards before shipment from the factory:

1. A check of the motor voltage and frequency shall be made as shown on the name plate.
2. A motor and cable insulation test for moisture content or insulation defects shall be made per UL criteria.
3. The pump shall be completely submerged and run to determine that the unit meets three pre-determined hydraulic performance points.
4. A written report shall be available showing the aforementioned tests have been performed in accordance with the specifications.

START-UP: The pump(s) shall be tested at start-up by a qualified representative of the manufacturer. A start-up report as provided by the manufacturer shall be completed before final acceptance of the pump(s).

DOCUMENTATION: The manufacturer, if requested, will supply a minimum of _____ sets of standard submittal data; Standard submittal data consist of:

- a. Pump catalog data;
- b. Pump performance curve;
- c. Break Away Fitting (BAF) data;
- d. Access frame data;
- e. Typical installation drawing;
- f. Control panel data
- g. Panel wiring schematic;
- h. Accessory data;
- i. Installation & Operation Manuals with Parts List.

Specifications

2" Vertical Discharge

SE - High Temperature, Single Seal, Oil-Filled

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Submersible Non-Clog Pumps

FILE: SPEC27

SCOPE: Furnish and install _____ submersible non-clog sewage pump (s). Each pump shall be capable of delivering the following performance points, _____ U.S. GPM at _____ TDH; _____ U.S. GPM at _____ TDH; _____ U.S. GPM at _____ TDH, with a shut off head of _____ TDH (minimum) and _____ % minimum efficiency at _____ U.S. GPM at _____ TDH (operating point). The pump motor speed shall be _____ RPM, _____ HP (maximum), _____ Phase, 60 Hertz, _____ Volts. The pump (s) shall be manufactured in North America by a company regularly engaged in the manufacture and assembly of similar units for a minimum of five (5) years. The pump (s) shall be Barnes® Pumps model _____.

PUMP DESIGN: Each pump shall be capable of handling raw, unscreened domestic sewage consisting of water, fibrous materials, and two (2) inch diameter spherical solids. The pump (s) shall be capable of handling liquids with temperatures to 200 degrees F continuous, and shall be capable of running dry for extended periods.

PUMP CONSTRUCTION: The volute, seal plates, impeller and motor housing shall be constructed of high quality ASTM A-48 class 30 cast iron. The pump (s) shall be painted with a water based air dry enamel of 2.0 mil minimum thickness. All exposed hardware shall be 300 series stainless steel. The pump construction shall contain no points of critical clearance nor require periodic adjustment or replacement to maintain operating efficiency. Discharge connection shall be a standard 2 inch NPT in the vertical position. All gaskets shall be of the compression square ring type eliminating critical slip fits and the possibility of damage during service associated with sliding o-ring sealing arrangements.

The impeller shall be of the non-clog design with pump out vanes on the back side. The impeller shall be dynamically balanced to ISO G6.3 specifications.

The unit shall utilize a single mechanical shaft seal which will operate in an oil atmosphere. The materials of construction shall be carbon for the rotating face and ceramic for the stationary face, lapped and polished to a tolerance of one light band, 300 series stainless steel hardware, and all elastomer parts to be of Buna-N. The seal shall be commercially available and not a proprietary design of the manufacture.

The pump shall be designed to be non-overloading throughout the entire pump curve. The rotor and stator assembly shall be of the standard frame design and secured to the pump seal plate by four threaded fasteners allowing for easy serviceability. Motor designs incorporating shrink or press fit assembly between the stator and motor housing shall not be acceptable. The motor shall be constructed with the windings operating in a sealed environment containing clean dielectric oil, making it capable of operating in a totally, partially or non-submerged condition for extended periods of time without damage due to the heat being generated. Air-filled motors shall not be acceptable. The motor windings shall be of Class B insulation. The motor shall meet the standard NEMA design L for single phase. The motor shaft shall be of 416 stainless steel. The lower bearing shall be of the single ball type to accept radial and thrust loads, and the upper bearing of the single ball design for radial loads. Bearings shall operate in an oil bath atmosphere for superior life. Permanently lubricated bearings are not acceptable.

Thermal sensor shall be used on three phase units to monitor stator temperatures. The stator shall be equipped with a thermal switch embedded in the end coil of the stator winding. This shall be used in conjunction with external motor overload protection and wired to the control panel. Single phase shall have an overload switch on the motor windings and do not require any external protection.

The pump shall be equipped with _____ ft. of type _____ power cable and connected to the motor via quick disconnect pin terminals. Threaded cord grip type cord entries are not acceptable. Pin receptacles shall be crimped and molded to the power cord in a PVC plug. The plug shall be secured with a stainless steel compression plate to prevent water from entering the housing and to provide strain relief at the point of cable entry. A stainless steel clamp shall compress the PVC molding against the cable jacket to prevent water from entering the jacket. A polybutylene terephthalate terminal block with brass pin inserts shall connect the power cord leads with the motor leads. The ground pin shall be longer than the other pins such that the ground connection is the first connection made and the last connection broken when the plug is inserted and removed, respectively. A Buna-N o-ring shall provide isolation sealing between the terminal block and the motor housing when the cord plug is removed.

PUMP TEST: The pump manufacturer shall perform the following inspections and tests in accordance with Hydraulic Institute type B standards before shipment from the factory:

1. A check of the motor voltage and frequency shall be made as shown on the name plate.
2. A motor and cable insulation test for moisture content or insulation defects shall be made per UL criteria.
3. The pump shall be completely submerged and run to determine that the unit meets three pre-determined hydraulic performance points.
4. A written report shall be available showing the aforementioned tests have been performed in accordance with the specifications.

START-UP: The pump(s) shall be tested at start-up by a qualified representative of the manufacturer. A start-up report as provided by the manufacturer shall be completed before final acceptance of the pump(s).

DOCUMENTATION: The manufacturer, if requested, will supply a minimum of _____ sets of standard submittal data; Standard submittal data consist of:

- a. Pump catalog data;
- b. Pump performance curve;
- c. Break Away Fitting (BAF) data;
- d. Access frame data;
- e. Typical installation drawing;
- f. Control panel data
- g. Panel wiring schematic;
- h. Accessory data;
- i. Installation & Operation Manuals with Parts List

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FILE: SPEC28

Submersible Non-Clog Pumps

SCOPE: Furnish and install _____ submersible non-clog sewage pump (s). Each pump shall be capable of delivering the following performance points, _____ U.S. GPM at _____ TDH; _____ U.S. GPM at _____ TDH; _____ U.S. GPM at _____ TDH, with a shut off head of _____ TDH (minimum) and _____ % minimum efficiency at _____ U.S. GPM at _____ TDH (operating point). The pump motor speed shall be _____ RPM, _____ HP (maximum), _____ Phase, 60 Hertz, _____ Volts. The pump (s) shall be manufactured in North America by a company regularly engaged in the manufacture and assembly of similar units for a minimum of five (5) years. The pump (s) shall be Barnes® Pumps model _____.

PUMP DESIGN: Each pump shall be capable of handling raw, unscreened domestic sewage consisting of water, fibrous materials, and two (2) inch diameter spherical solids. The pump (s) shall be capable of handling liquids with temperatures to 104 degrees F continuous, 160 degrees F intermittent, and shall be capable of running dry for extended periods.

PUMP CONSTRUCTION: The volute, seal plates, impeller and motor housing shall be constructed of high quality cast iron. The pump (s) shall be painted with a water based air dry enamel of 2.0 mil minimum thickness. All exposed hardware shall be 300 series stainless steel. The pump construction shall contain no points of critical clearance nor require periodic adjustment or replacement to maintain operating efficiency. Discharge connection shall be a standard three (3) inch NPT in the vertical position. All gaskets shall be of the compression square ring type eliminating critical slip fits and the possibility of damage during service associated with sliding o-ring sealing arrangements.

The impeller shall be of the non-clog design with pump out vanes on the back side. The impeller shall be dynamically balanced to ISO G6.3 specifications.

The unit shall utilize a tandem mechanical shaft seal and shall operate in an oil atmosphere. The materials of construction shall be carbon for the rotating face and ceramic for the stationary face, lapped and polished to a tolerance of one light band, 300 series stainless steel hardware, and with all elastomer parts of Buna-N. The seal shall be commercially available and not a proprietary design of the manufacturer. An optional moisture sensor detection system consisting of two probes utilized as a positive/negative pole shall be intergrated within the oil-filled seal chamber. Units utilizing one probe and grounding through the pump case or a float device are not acceptable

The pump shall be designed to be non-overloading throughout the entire pump curve. The rotor and stator assembly shall be of the standard frame design and secured to the pump seal plate by four threaded fasteners allowing for easy serviceability. Motor designs incorporating shrink or press fit assembly between the stator and motor housing shall not be acceptable. The motor shall be constructed with the windings operating in a sealed environment containing clean dielectric oil, making it capable of operating in a totally, partially or non-submerged condition for extended periods of time without damage due to the heat being generated. Air-filled motors shall not be acceptable. The motor windings shall be of Class B insulation. The motor shall meet the standard NEMA design L for single phase and NEMA design B for three phase. The motor shaft shall be of 416 stainless steel.

The lower bearing shall be of the single ball type to accept radial and thrust loads, and the upper bearing of the single ball type for radial loads. Bearings shall operate in an oil bath atmosphere for superior life. Permanently lubricated bearings are not acceptable.

Thermal sensor shall be used on three phase units to monitor stator temperatures. The stator shall be equipped with a thermal switch embedded in the end coil of the stator winding. This shall be used in conjunction with external motor overload protection and wired to the control panel. Single phase shall have an overload switch on the motor windings and do not require any external protection.

The pump shall be equipped with _____ ft. of type _____ power cable and connected to the motor via quick disconnect pin terminals. Threaded cord grip type cord entries are not acceptable. Pin receptacles shall be crimped and molded to the power cord in a PVC plug. The plug shall be secured with a stainless steel compression plate to prevent water from entering the housing and to provide strain relief at the point of cable entry. A stainless steel clamp shall compress the PVC molding against the cable jacket to prevent water from entering the jacket. A polybutylene terephthalate terminal block with brass pin inserts shall connect the power cord leads with the motor leads. The ground pin shall be longer than the other pins such that the ground connection is the first connection made and the last connection broken when the plug is inserted and removed, respectively. A Buna-N o-ring shall provide isolation sealing between the terminal block and the motor housing when the cord plug is removed.

PUMP TEST: The pump manufacturer shall perform the following inspections and tests in accordance with Hydraulic Institute type B standards before shipment from the factory:

1. A check of the motor voltage and frequency shall be made as shown on the name plate.
2. A motor and cable insulation test for moisture content or insulation defects shall be made per UL criteria.
3. The pump shall be completely submerged and run to determine that the unit meets three pre-determined hydraulic performance points.
4. A written report shall be available showing the aforementioned tests have been performed in accordance with the specifications.

START-UP: The pump(s) shall be tested at start-up by a qualified representative of the manufacturer. A start-up report as provided by the manufacturer shall be completed before final acceptance of the pump(s).

DOCUMENTATION: The manufacturer, if requested, will supply a minimum of _____ sets of standard submittal data; Standard submittal data consist of:

- a. Pump catalog data;
- b. Pump performance curve;
- c. Break Away Fitting (BAF) data;
- d. Access frame data;
- e. Typical installation drawing;
- f. Control panel data
- g. Panel wiring schematic;
- h. Accessory data;
- i. Installation & Operation Manuals with Parts List

Specifications

2" & 3" Vertical Discharge

SEV - Vortex, Single Seal, Oil-Filled

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Submersible Non-Clog Pumps

FILE: SPEC29

SCOPE: Furnish and install _____ submersible non-clog sewage pump (s). Each pump shall be capable of delivering the following performance points, _____ U.S. GPM at _____ TDH; _____ U.S. GPM at _____ TDH; _____ U.S. GPM at _____ TDH, with a shut off head of _____ TDH (minimum) and _____% minimum efficiency at _____ U.S. GPM at _____ TDH (operating point). The pump motor speed shall be _____ RPM, _____ HP (maximum), _____ Phase, 60 Hertz, _____ Volts. The pump (s) shall be manufactured in North America by a company regularly engaged in the manufacture and assembly of similar units for a minimum of five (5) years. The pump (s) shall be Barnes® Pumps model _____.

PUMP DESIGN: Each pump shall be capable of handling raw, unscreened domestic sewage consisting of water, fibrous materials, and two (2) inch diameter spherical solids. The pump (s) shall be capable of handling liquids with temperatures to 104 degrees F continuous, 160 degrees F intermittent, and shall be capable of running dry for extended periods.

PUMP CONSTRUCTION: The volute, seal plates, impeller and motor housing shall be constructed of high quality ASTM A-48 class 30 cast iron. The pump (s) shall be painted with a water based air dry enamel of 2.0 mil minimum thickness. All exposed hardware shall be 300 series stainless steel. The pump construction shall contain no points of critical clearance nor require periodic adjustment or replacement to maintain operating efficiency. Discharge connection shall be a standard _____ inch NPT in the vertical position. All gaskets shall be of the compression square ring type eliminating critical slip fits and the possibility of damage during service associated with sliding o-ring sealing arrangements.

The impeller shall be of the vortex design with pump out vanes on the back side. The impeller shall be dynamically balanced to ISO G6.3 specifications.

The unit shall utilize a single mechanical shaft seal which will operate in an oil atmosphere. The materials of construction shall be carbon for the rotating face and ceramic for the stationary face, lapped and polished to a tolerance of one light band, 300 series stainless steel hardware, and all elastomer parts to be of Buna-N. The seal shall be commercially available and not a proprietary design of the manufacturer.

The pump shall be designed to be non-overloading throughout the entire pump curve. The rotor and stator assembly shall be of the standard frame design and secured to the pump seal plate by four threaded fasteners allowing for easy serviceability. Motor designs incorporating shrink or press fit assembly between the stator and motor housing shall not be acceptable. The motor shall be constructed with the windings operating in a sealed environment containing clean dielectric oil, making it capable of operating in a totally, partially or non-submerged condition for extended periods of time without damage due to the heat being generated. Air-filled motors shall not be acceptable. The motor windings shall be of Class B insulation. The motor shall meet the standard NEMA design L for single phase and NEMA design B for three phase. The motor shaft shall be of 416 stainless steel. The lower bearing shall be of the single ball type to accept radial and thrust loads, and the upper bearing of the single ball design, for radial loads. Bearings shall operate in an oil bath atmosphere for superior life. Permanently lubricated bearings are not acceptable.

Thermal sensor shall be used on three phase units to monitor stator temperatures. The stator shall be equipped with a thermal switch embedded in the end coil of the stator winding. This shall be used in conjunction with external motor overload protection and wired to the control panel. Single phase shall have an overload switch on the motor windings and do not require any external protection.

The pump shall be equipped with _____ ft. of type _____ power cable and connected to the motor via quick disconnect pin terminals. Threaded cord grip type cord entries are not acceptable. Pin receptacles shall be crimped and molded to the power cord in a PVC plug. The plug shall be secured with a stainless steel compression plate to prevent water from entering the housing and to provide strain relief at the point of cable entry. A stainless steel clamp shall compress the PVC molding against the cable jacket to prevent water from entering the jacket. A polybutylene terephthalate terminal block with brass pin inserts shall connect the power cord leads with the motor leads. The ground pin shall be longer than the other pins such that the ground connection is the first connection made and the last connection broken when the plug is inserted and removed, respectively. A Buna-N o-ring shall provide isolation sealing between the terminal block and the motor housing when the cord plug is removed.

PUMP TEST: The pump manufacturer shall perform the following inspections and tests in accordance with Hydraulic Institute type B standards before shipment from the factory:

1. A check of the motor voltage and frequency shall be made as shown on the name plate.
2. A motor and cable insulation test for moisture content or insulation defects shall be made per UL criteria.
3. The pump shall be completely submerged and run to determine that the unit meets three pre-determined hydraulic performance points.
4. A written report shall be available showing the aforementioned tests have been performed in accordance with the specifications.

START-UP: The pump(s) shall be tested at start-up by a qualified representative of the manufacturer. A start-up report as provided by the manufacturer shall be completed before final acceptance of the pump(s).

DOCUMENTATION: The manufacturer, if requested, will supply a minimum of _____ sets of standard submittal data; Standard submittal data consist of:

- a. Pump catalog data;
- b. Pump performance curve;
- c. Break Away Fitting (BAF) data;
- d. Access frame data;
- e. Typical installation drawing;
- f. Control panel data
- g. Panel wiring schematic;
- h. Accessory data;
- i. Installation & Operation Manuals with Parts List.

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CRANE®

A Crane Co. Company

PUMPS & SYSTEMS

USA: (937) 778-8947 • Canada: (905) 457-6223 • International: (937) 615-3598

FILE: SPEC30

Submersible Non-Clog Pumps

SCOPE: Furnish and install _____ submersible non-clog sewage pump (s). Each pump shall be capable of delivering the following performance points, _____ U.S. GPM at _____ TDH; _____ U.S. GPM at _____ TDH; _____ U.S. GPM at _____ TDH, with a shut off head of _____ TDH (minimum) and _____% minimum efficiency at _____ U.S. GPM at _____ TDH (operating point). The pump motor speed shall be _____ RPM, _____ HP (maximum) , _____ Phase, 60 Hertz, _____ Volts. The pump (s) shall be manufactured in North America by a company regularly engaged in the manufacture and assembly of similar units for a minimum of five (5) years. The pump (s) shall be Barnes® Pumps model _____.

PUMP DESIGN: Each pump shall be capable of handling raw, unscreened domestic sewage consisting of water, fibrous materials, and two (2) inch diameter spherical solids. The pump (s) shall be capable of handling liquids with temperatures to 104 degrees F continuous, 160 degrees F intermittent, and shall be capable of running dry for extended periods.

PUMP CONSTRUCTION: The volute, seal plates, impeller and motor housing shall be constructed of high quality ASTM A-48 class 30 cast iron. The pump (s) shall be painted with a water based air dry enamel of 2.0 mil minimum thickness. All exposed hardware shall be 300 series stainless steel. The pump construction shall contain no points of critical clearance nor require periodic adjustment or replacement to maintain operating efficiency. Discharge connection shall be a standard _____ inch NPT in the vertical position. All gaskets shall be of the compression square ring type eliminating critical slip fits and the possibility of damage during service associated with sliding o-ring sealing arrangements.

The impeller shall be of the vortex design with pump out vanes on the back side. The impeller shall be dynamically balanced to ISO G6.3 specifications.

The unit shall utilize a tandem mechanical shaft seal and shall operate in an oil atmosphere. The materials of construction shall be carbon for the rotating face and ceramic for the stationary face, lapped and polished to a tolerance of one light band, 300 series stainless steel hardware, and with all elastomer parts of Buna-N. The seal shall be commercially available and not a proprietary design of the manufacturer. An optional moisture sensor detection system consisting of two probes utilized as a positive/negative pole shall be intergrated within the oil-filled seal chamber. Units utilizing one probe and grounding through the pump case or a float device are not acceptable.

The pump shall be designed to be non-overloading throughout the entire pump curve. The rotor and stator assembly shall be of the standard frame design and secured to the pump seal plate by four threaded fasteners allowing for easy serviceability. Motor designs incorporating shrink or press fit assembly between the stator and motor housing shall not be acceptable. The motor shall be constructed with the windings operating in a sealed environment containing clean dielectric oil, making it capable of operating in a totally, partially or non-submerged condition for extended periods of time without damage due to the heat being generated. Air-filled motors shall not be acceptable. The motor windings shall be of Class B insulation. The motor shall meet the standard NEMA design L for single phase and NEMA design B for three phase. The motor shaft shall be of 416 stainless steel. The lower bearing shall be of the single ball type to accept radial and thrust

loads, and the upper bearing of the single ball design, for radial loads. Bearings shall operate in an oil bath atmosphere for superior life. Permanently lubricated bearings are not acceptable.

Thermal sensor shall be used on three phase units to monitor stator temperatures. The stator shall be equipped with a thermal switch embedded in the end coil of the stator winding. This shall be used in conjunction with external motor overload protection and wired to the control panel. Single phase shall have an overload switch on the motor windings and do not require any external protection.

The pump shall be equipped with _____ ft. of type _____ power cable and connected to the motor via quick disconnect pin terminals. Threaded cord grip type cord entries are not acceptable. Pin receptacles shall be crimped and molded to the power cord in a PVC plug. The plug shall be secured with a stainless steel compression plate to prevent water from entering the housing and to provide strain relief at the point of cable entry. A stainless steel clamp shall compress the PVC molding against the cable jacket to prevent water from entering the jacket. A polybutylene terephthalate terminal block with brass pin inserts shall connect the power cord leads with the motor leads. The ground pin shall be longer than the other pins such that the ground connection is the first connection made and the last connection broken when the plug is inserted and removed, respectively. A Buna-N o-ring shall provide isolation sealing between the terminal block and the motor housing when the cord plug is removed.

PUMP TEST: The pump manufacturer shall perform the following inspections and tests in accordance with Hydraulic Institute type B standards before shipment from the factory:

1. A check of the motor voltage and frequency shall be made as shown on the name plate.
2. A motor and cable insulation test for moisture content or insulation defects shall be made per UL criteria.
3. The pump shall be completely submerged and run to determine that the unit meets three pre-determined hydraulic performance points.
4. A written report shall be available showing the aforementioned tests have been performed in accordance with the specifications.

START-UP: The pump(s) shall be tested at start-up by a qualified representative of the manufacturer. A start-up report as provided by the manufacturer shall be completed before final acceptance of the pump(s).

DOCUMENTATION: The manufacturer, if requested, will supply a minimum of _____ sets of standard submittal data; Standard submittal data consist of:

- a. Pump catalog data;
- b. Pump performance curve;
- c. Break Away Fitting (BAF) data;
- d. Access frame data;
- e. Typical installation drawing;
- f. Control panel data
- g. Panel wiring schematic;
- h. Accessory data;
- i. Installation & Operation Manuals with Parts List.

Specifications

3" Vertical Discharge
SE - Double Seal, Oil-Filled

BARNES®

www.cranepumps.com

Submersible Non-Clog Pumps

FILE: SPEC11

SCOPE: Furnish and install _____ submersible non-clog sewage pump (s). Each pump shall be capable of delivering the following performance points, _____ U.S. GPM at _____ TDH; _____ U.S. GPM at _____ TDH; _____ U.S. GPM at _____ TDH, with a shut off head of _____ TDH (minimum) and _____ % minimum efficiency at _____ U.S. GPM at _____ TDH (operating point). The pump motor speed shall be _____ RPM, _____ HP (maximum), _____ Phase, 60 Hertz, _____ Volts. The pump (s) shall be manufactured in North America by a company regularly engaged in the manufacture and assembly of similar units for a minimum of five (5) years. The pump (s) shall be Barnes® Pumps model _____.

PUMP DESIGN: Each pump shall be capable of handling raw, unscreened domestic sewage consisting of water, fibrous materials, and two and one-half (2-1/2) inch diameter spherical solids. The pump (s) shall be capable of handling liquids with temperatures to 104 degrees F continuous, 160 degrees F intermittent, and shall be capable of running dry for extended periods.

PUMP CONSTRUCTION: The volute, seal plates, impeller and motor housing shall be constructed of high quality cast iron. The pump (s) shall be painted with a water based air dry enamel of 2.0 mil minimum thickness. All exposed hardware shall be 300 series stainless steel. The pump construction shall contain no points of critical clearance nor require periodic adjustment or replacement to maintain operating efficiency. Discharge connection shall be a standard three (3) inch NPT in the vertical position. All gaskets shall be of the compression square ring type eliminating critical slip fits and the possibility of damage during service associated with sliding o-ring sealing arrangements.

The impeller shall be of the non-clog design with pump out vanes on the back side. The impeller shall be dynamically balanced to ISO G6.3 specifications.

The unit shall utilize a tandem mechanical shaft seal and shall operate in an oil atmosphere. The materials of construction shall be carbon for the rotating face and ceramic for the stationary face, lapped and polished to a tolerance of one light band, 300 series stainless steel hardware, and with all elastomer parts of Buna-N. The seal shall be commercially available and not a manufacturers proprietary design. A moisture sensor detection system consisting of two probes utilized as a positive/negative pole shall be intergrated within the oil-filled seal chamber. Units utilizing one probe and grounding through the pump case or a float device are not acceptable

The pump shall be designed to be non-overloading throughout the entire pump curve. The rotor and stator assembly shall be of the standard frame design and secured to the pump seal plate by four threaded fasteners allowing for easy serviceability. Motor designs incorporating shrink or press fit assembly between the stator and motor housing shall not be acceptable. The motor shall be constructed with the windings operating in a sealed environment containing clean dielectric oil, making it capable of operating in a totally, partially or non-submerged condition for extended periods of time without damage due to the heat being generated. Air-filled motors shall not be acceptable. The motor windings shall be of Class _____ insulation. The motor shall meet the standard NEMA design L for single phase and NEMA design B for three phase. The motor shaft shall be of 416 stainless steel.

The lower bearing shall be of the single ball type to accept radial and thrust loads, and the upper bearing of the sleeve design and single ball type for radial loads. Bearings shall operate in an oil bath atmosphere for superior life. Permanently lubricated bearings are not acceptable.

Thermal sensor shall be used on three phase units to monitor stator temperatures. The stator shall be equipped with a thermal switch embedded in the end coil of the stator winding. This shall be used in conjunction with external motor overload protection and wired to the control panel. Single phase shall have an overload switch on the motor windings and do not require any external protection.

The pump shall be equipped with _____ ft. of type SOW power cable and connected to the motor via quick disconnect pin terminals. Threaded cord grip type cord entries are not acceptable. Pin receptacles shall be crimped and molded to the power cord in a PVC plug. The plug shall be secured with a stainless steel compression plate to prevent water from entering the housing and to provide strain relief at the point of cable entry. A stainless steel clamp shall compress the PVC molding against the cable jacket to prevent water from entering the jacket. A polybutylene terephthalate terminal block with brass pin inserts shall connect the power cord leads with the motor leads. The ground pin shall be longer than the other pins such that the ground connection is the first connection made and the last connection broken when the plug is inserted and removed, respectively. A Buna-N o-ring shall provide isolation sealing between the terminal block and the motor housing when the cord plug is removed.

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