ShinMaywa

ShinMaywa Submersible Sewage Pump CNWX(Explosion Proof)

SPECIFICATIONS

A. General

CNWX series is the submersible sewage pumps, which has the ideal combination of high pass-through capacity and high efficiency. This series has employed ShinMaywa revolutionary new non-clog scroll impeller and special housing. It improves solids handling with high pump efficiency, and which virtually eliminates clogging problems in comparatively low-flow applications. CNWX series provides superb performance while reducing energy and maintenance costs.

Pump system design shall include a guide rail system be such that the pump will be automatically connected to the discharge piping when lowered into place on the discharge connection. The pump shall be easily removable for inspection or service, requiring no bolts, nuts, or other fasteners to be disconnected, or the need for personnel to enter the wet well. The nameplate ratings of the motor shall be based on $104 \,^{\circ}F$ ($40 \,^{\circ}C$) ambient environment and depth of 65feet (20m). The motor and pump shall be designed, manufactured, and assembled by same manufacturer.

B. Manufacturer

ShinMaywa Industries, Ltd.

C. Pump Characteristics

Pumps shall conform to the following requirements:

Number of units		
Design flow (GPM)		
Design TDH (ft)		
Minimum shut off head (ft)		
RPM	1800	
Maximum HP		
Minimum efficiency at design (%)		
Minimum power factor at design (%)		
Voltage / Hz / Phase		208/230V, 460V / 60Hz / 3

D. Pump Construction

Major parts of the pumping unit(s) including pump housing and impeller shall be manufactured from gray cast iron, ASTM A48-Class 35. Major parts of the submersible motor unit(s) include motor frame and oil casing shall be manufactured from gray cast iron, ASTM A48-Class 30. Casting shall have smooth surfaces devoid of blowholes or other casting irregularities. Units shall be furnished 150lb.flat face ANSI flange. All exposed bolts and nuts shall be 304 stainless steel. All mating surface of major components shall be machined and fitting with NBR O-rings where watertight sealing required. Machining and fitting shall be such that sealing is accomplished by automatic compression of O-rings in two planes and O-ring contact is made on four surfaces without the requirement of specific torque limits. All metal surfaces coming into contact with the water, other than stainless steel or brass, shall be coated by Epoxy paint.

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JUDG	Takeuchi	Apr. 25. 2017			
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1. Impeller

ShinMaywa revolutionary new impeller "Single Vane Non-clog Scroll Impeller" has scroll formed passage at its suction area and smoothly connected to single vane non-clog passage. This impeller(s) has high pass-through capability with high-hydraulic efficiency. This feature eliminates clogging, plugging and entangling of fibrous obstacles with hydraulic efficiency; thus, reducing maintenance cost and operating cost. The impeller(s) can also pass-through 2.5inch (3CNWX41.5T ***** E 15-2, 3CNWX42.2 ***** E 22-2 / 3inch (3CNWX41.5T ***** E 15-4, 3CNWX42.2 **T *** E 22-4, 3CNWX43.7 **T *** E 37-4, 4CNWX41.5 **T *** E 15-4, 4CNWX42.2 **T *** E 22-4, 4CNWX43.7 **T *** E 37-4, 4CNWX47.5 **T *** E 55-2, 4CNWX47.5 **T *** E 75-2) / 4inch (4CNWX43.7 **T *** E 37-6, 4CNWX45.5 **T *** E 55-4, 4CNWX47.5 **T *** E 75-4, 6CNWX47.5 **T *** E 75-4) spherical solid, qualifying it as a "true" non-clog by definitions.

2. Wear Ring

The design shall include a replaceable casing wear ring at the pump suction to maintain working clearance and hydraulic efficiency.

3. Mechanical Seal

Mechanical Seal shall be designed to Double Mechanical seal—Tandem Arrangement consisting of two totally independent seal assemblies. Each seal interface shall be held in contacted by its own spring system and also the position of both mechanical seals shall be depended on the shaft. Lower side seal faces and Upper side seal faces (All seal faces) material shall be silicon carbide. The mechanical seal's NBR elastomer shall be designed for submersible pumps to increase sealing quality. These feature makes high reliable than popular design tandem mechanical seal.

E. Motor construction

The pump motor shall be an air filled induction type with a squirrel cage rotor, shell type design. Stator windings shall be copper, insulated with moisture resistance Class F insulation, rated for $311 \,^{\circ}$ F ($155 \,^{\circ}$ C).

The stator shall be dipped and baked in Class F varnish and heat shrank fitted into the stator housing. Rotor bars and short circuit rings shall be manufactured of cast aluminum. Motor Shaft shall be made from JIS420 J₂. The pump shaft shall rotated on two bearing. Motor bearings shall be permanently grease lubricated. The upper bearing shall be a single deep grove ball bearing. The lower bearing shall be two ball bearings, designed for a long life (at least 100,000 hours (L10 at B.E.P. calculated). Motor service factor shall be 1.15. Motor capable 20 starts per hour. The motor shall be designed for operation up to 104 °F (40°C) ambient and with a temperature rise not to exceed 70 degree. The motor shall have a voltage tolerance of plus or minus 10%. The motor shall be non-overloading the entire specified range of operation. Motor over temperature protection shall be provided by miniature thermal protectors embedded on each winding. Float Type Leakage detector is provided for mechanical seal failure protection located in seal failure chamber.

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F. Cable

Power cable jacket shall be made of an oil resistant PVC material, designed for submerged applications. Standard power cable length is 50ft (15m). Cable entry of submersible motor shall prevent incursion of the pumpage into the motor due to the phenomena knows as "WICKING", a portion of each conductor is stripped back exposing the copper conductor. The cable is placed in a mold and is molded into one piece. The mold rubber seals the end of the power cable and flows in between each strand of conductor. This feature prevents "WICKING", through the fiber reinforcement found in standard submersible cable, and through the strands of the conductor itself.

G. Guide rail system

Design shall include two 304 stainless steel guide rails to mount directly to the Connection Elbow, at the floor of the wetwell and to a guide rail bracket at the top of the wetwell below the hatch opening. Intermediate guide brackets are recommended for rail lengths over 15 feet.

Guide rails are not part of the pump package and shall be supplied by others.

The Connection Elbow shall be manufactured of cast iron, ASTM A48 Class 30. It shall be designed to adequately support the guide rails, discharge piping, and pumping unit under both static and dynamic loading conditions with support legs that are suitable for anchoring it to the wetwell floor. The face of the inlet Connection Elbow flange shall be perpendicular to the floor of the wetwell. The discharge flange of the Connection Elbow shall conform to ANSI B16.1 Class 125.

The pump design shall include an integral self-aligning slide bracket. Sealing of the pumping unit to the Connection Elbow shall be accomplished by single, linear, downward motion of the pump. The entire weight of the pump unit shall be guided to and wedged tightly against the inlet flange of the Connection Elbow, making metal-to-metal contact with the pump discharge forming a seal without the using bolts, gaskets or O-rings. Lifting chain shall be galvanized (stainless steel) suitable for removing and installing the pump unit.



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OPERATING CONDITION

Temperature	32-104 °F (0-40°C)		
рН	6 - 9		
Electric Conductivity	100mS/m or less		
DO (Dissolved Oxygen)	1 – 4 mg O ₂ /ℓ		
Chlorine Iron	1,000 mg/ℓ or less		
SS	3,000 mg/ℓ or less		
BOD, COD	1,000 mg/ℓ or less		
Viscosity	5cP or less		
Liquid Specific Gravity	1.05 or less		
Sludge Concentration	1% or less		



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SHOP PAINTING STANDARD

1. Scope

This specification covers the methods for painting the following SHINMAYWA PUMPS in the shop. SHINMAYWA Models: CNWX, CNW

2. Surface Preparation

All surfaces to be painted shall be cleaned of oil, grease or other similar materials with solvent, and then shall be brushed and air blasted to remove rust or scale.

Prior to above preparation, mill scale, rust scale, chips and other foreign materials shall be removed in accordance with painting schedule.

3. Coating Procedure

Detailed coating procedures are as shown in each paint schedule.

	Painting Schedule				
Service	Painting Part	Coating Material	Thickness of standards		
Priming Coat	Cast Parts	Alkyd resin coating	10µm or more		
Finishing Coat	Cast Parts and The other	Epoxy resin paint (Non-Tar) Final color: BLACK (Munsell system of color No.1.0)	40µm or more		

(Note)

- 1. Painting is assumed to be spray painting.
- 2. Painting excludes the cable and the resin parts.