ShinMaywa Submersible Sewage Pump CNX/CNXH(Explosion Proof)

SPECIFICATIONS

A. General

CNX / CNXH series is the submersible sewage pumps, which has the ideal combination of high efficiency and 3 inch solid handling capability. This series has employed ShinMaywa enclosed solid handling impeller. CNX employed Double Vane Enclosed impeller which has a high efficiency in its operation range. CNXH employed Single Vane Enclosed impeller which has improved path through capability with high head operation.

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 °F (40℃) ambient environment and depth of 65feet (20m).

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 or ductile cast iron, ISO 500-7S. Major parts of the submersible motor unit(s) include motor frame and oil casing shall be manufactured from gray cast iron, ASTM A48-Class 35. 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.

SPECIFICATIONS

1. Impeller

   Impeller shall have good pump characteristics with no overload in its operation range. CNX has Double Vane Enclosed Impeller with Large Capacity characteristics. CNXH has Single Vane Enclosed Impeller with High Head characteristics. ShinMaywa new Single Vane Enclosed Impeller which is employed CNXH has improved pass through capability. The impeller(s) can also pass-through 3 inch spherical solid.

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 FKM 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 °F (155℃).

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 J_2. The pump shaft shall rotated on two bearing. The upper bearing shall be a single deep grove ball bearing. The lower bearing shall be Duplex Angular 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℃) 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. Dual-electrode Leakage detector is provided for mechanical seal failure protection located in oil 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.

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・OPERATING CONDITION

Temperature	32-104 °F (0-40℃)
pH	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

SHOP PAINTING STANDARD

1. Scope

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

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.

Service	Painting Schedule		
	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.