
Dry Pit Submersible Sewage Pump with Anti-Clog Technology



Model DDKEU
Model DDKEXU

Technical Specification

Specification

Model DDKEU / DDKEXU

100DDKE(X)U465.5
100DDKE(X)U467.5
100DDKE(X)U4611
100DDKEB(X)U4611
100DDKE(X)U4615
100DDKEB(X)U4615
100DDKE(X)U4618
100DDKEB(X)U4618
100DDKE(X)U4622
100DDKEB(X)U4622
100DDKE(X)U4630
100DDKE(X)U4637
100DDKE(X)U4645
150DDKE(X)U467.5
150DDKE(X)U4611
150DDKE(X)U4615
150DDKE(X)U4618
150DDKE(X)U4622
150DDKE(X)U4630
150DDKEB(X)U4630
150DDKE(X)U4637
150DDKEB(X)U4637
150DDKE(X)U4645
150DDKEB(X)U4645
200DDKE(X)U4630
200DDKE(X)U4637
250DDKE(X)U4630
250DDKE(X)U4637
250DDKE(X)U4645



Specification

Model Designation



DISCHARGE - mm

100:4"(100mm) 200: 8"(200mm)
150:6"(150mm) 250: 10"(250mm)

MODEL TYPE

DDKE or DDKEB: Dry pit submersible sewage pump

EXPLOSION-PROOF

X: FM/FMc Explosion proof designation
None: Non Explosion proof designation

GEOGRAPHIC DESIGNATION

U: U.S.A Market

SPEED

4: 4 POLE

HERTZ

6: 60

MOTOR POWER

5.5: 7.5HP(5.5kW) 15: 20HP(15kW) 30: 40HP(30kW)
7.5: 10HP(7.5kW) 18: 25HP(18.5kW) 37: 50HP(37kW)
11: 15HP(11kW) 22: 30HP(22kW) 45: 60HP(45kW)

VOLTAGE

2: 208/230V
4: 460V
5: 575V

OPTION(S)

1001: ICS



Specification

Overview

	Standard	Optional
Size Suction Discharge	4, 6, 8, 10, 12 inches (100, 150, 200, 250, 300mm) 4, 6, 8, 10 inches (100, 150, 200, 250mm)	
Range of HP	7.5 to 60hp	
Range of Performance	Capacity 80 to 4500 GPM Head 18 to 260 Feet	
Limitation Maximum Water Temp.	104°F (40°C)	
Synchronous Speed	1800 RPM	
Materials Casing Impeller Shaft Motor Frame Fastener ICS Jacket	Cast Iron Cast Iron 403 Stainless Steel Cast Iron 304 Stainless Steel 304 Stainless Steel & Cast Iron	
Mechanical Seal Type Material – Upper Side Material – Lower Side	Double Mechanical Seal Carbon/Ceramic Silicon Carbide/ Silicon Carbide	
Impeller Type	Semi-Open	
Bearing	Pre-Lubricated Ball Bearing	
Motor Type Efficiency Start Method Insulation Service Factor Starts per Hour Operational Time Bearing Life Voltage/Frequency Tolerance Junction Chamber Protection	NEMA MG-1 Design B Premium (Equiv. to IEC 60034-30, IE3) Direct-on-Line (DOL) or VFD (30-60Hz) Class H 1.15 20 Continuous in air (ICS) Minimum 50,000hrs Maximum ± 10/5% respectively Terminal board sealed from motor stator Thermal Detector – Klixons Mech. Seal Leakage Detector – Float Style	



Specification

	Standard	Optional
Submersible Cable	Multi-Conductor (Single 8-Core Cable)	
Type	RHW-2 / RW90	
Rating	90°C / 600V	
Listing	UL / CSA	
Submergence Approval	NEC & CEC	
Specifications	ASTEM B3, ASTM B172, ASTM B173 ASTM B174, UL44, CSA C22.2 No. 38	
AWG	#14/8, #10/4+#14/4, #6/4+#14/4, #3/4+#14/4	
Length	50 Feet	75 Feet
Accessories	Suction Elbow	Discharge Elbow



Specification**Specification-DDKEU****A. General:**

Provide dry pit submersible sewage pump(s) suitable for continuous duty operation without loss of watertight integrity. The pump system design shall include a permanently mounted suction elbow on which the pump/motor unit is mounted. The same manufacturer shall design, manufacture, and assemble the motor and pump.

B. Manufacturer:

Ebara Pumps Americas Corporation

C. Pump Characteristics:

Pumps shall conform to the following requirements:

Number of units	
Design Flow (gpm)	
Design TDH (ft)	
Minimum shut off head (ft)	
Synchronous RPM	1800
Maximum HP	60
Voltage/HZ	208/230V, 460V, 575V / 60Hz
Phase	3

D. Pump Construction:

All major parts of the pumping unit(s) including casing, impeller, suction cover, and motor frame shall be manufactured from gray cast iron. Suction elbow shall be manufactured from gray cast iron or Steel. Castings shall have smooth surfaces devoid of blow holes or other casting irregularities. The casing design shall be centerline discharge with the large radius on the cut water to prevent clogging. Units shall be furnished with a discharge elbow and a 125 Lb. flat face ANSI flange. All exposed bolts and nuts shall be 304 stainless steel. All mating surfaces of major components shall be machined and fitted with NBR O-rings where watertight sealing is 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. Internal and external surfaces are prepared to SPPC-VISI-SP-3-63 then coated with a Zinc-Rich primer. The external surfaces are then coated with a Ni-Build TNEMEC series 46H-413 Coal Tar paint.

1. Impellers:

- a. The impeller shall be single or multi-vane, semi-open back swept design. It shall be dynamically balanced and shall be designed for solids handling with a long throughlet without acute turns. The inlet edge of the impeller vanes shall be angled toward the impeller periphery so as to facilitate the release of objects that might otherwise clog the pump. The design shall also include back pump out vanes to reduce the pressure and entry of foreign materials into the mechanical seal area. In addition, a lip seal shall be located behind the impeller hub to further reduce the entry of foreign materials into the seal area. Impellers shall be directly connected to the motor shaft with a slip fit, key driven and secured with an impeller bolt. The design shall include a replaceable cast iron suction cover. The impeller and suction cover shall be designed such that it may be adjusted to maintain working clearances and hydraulic efficiencies. The combination of a guide pin at the suction cover and the slot on the surface of suction cover lead foreign material out to the discharge side of casing to avoid clogging.

2. Mechanical Seals:

- a. Double mechanical seals shall be provided on all units. They operate bathed in Propylene Glycol.
- b. The Propylene Glycol (PG) filled seal chamber shall be designed to prevent over-filling and include an anti-vortexing vane to ensure proper lubrication of both seal faces. Lower face materials shall be silicon carbide, upper faces carbon on ceramic, NBR elastomers, and 304SS hardware. The seal system shall not rely on pumping medium for lubrication.



Specification**E. Motor Construction:**

- a. The pump motor shall be an air-filled induction type with a squirrel-cage rotor, shell type design, built to NEMA MG-1, Design B specification. The motor shall be inverter duty rated for VFD operation. Stator windings shall be copper, insulated with moisture resistant Class H insulation, rated for 356° F (180° C). The stator shall be dipped and baked in Class H varnish and heat shrunk fitted into the stator housing. Rotor bars and short circuit rings shall be manufactured of cast aluminum. Motor shaft shall be one-piece AISI 403 SS material, rotating on two permanently lubricated ball bearings designed for a minimum life of 50,000 hours.
- b. The Premium Efficient motor shall meet the efficiency standard in accordance with IEC 60034-30, level IE3. Motor ratings tests shall be conducted in accordance with IEC 60034-2-1.
- c. The motor service factor shall be 1.15 capable of up to 20 starts per hour. The motor shall be designed for continuous duty pumping at a maximum sump temperature of 104° F. The motor shall be non-overloading over the entire specified range of operation and be able to operate at full load for up to 30 minutes while unsubmerged without damage to the unit.
- d. ICS (Internal Cooling System) allows the motor to be cooled down by Propylene Glycol (PG), which circulates inside the ICS jacket so that the motor may be operated at full load continuously while unsubmerged without damage to the unit. ICS is applied as standard.
- e. The junction chamber shall be sealed off from the stator housing with O-rings and packing and contain a terminal board mounted on a DIN rail for simple connection of the cable conductors to the motor stator and sensor leads. The use of wire nuts or crimp-type connectors is not acceptable.
- f. Voltage and frequency tolerances shall be a maximum $\pm 10 / 5\%$ respectively. Motor over temperature protection shall be provided by three miniature thermal protectors (one per phase) embedded in the windings. Mechanical seal failure protection shall be provided by a mechanical float switch located in a chamber above the seal. This switch shall be comprised of a magnetic float that actuates a dry reed switch encapsulated within the stem. Should the mechanical seal fail, liquid shall be directed into the float chamber, in which the rising liquid activates the switch opening the normally closed circuit. The float body and float shall be a polypropylene material with a 316SS stopper.
- g. Motor shall have oversized AISI 304 SS Lifting hanger to easily install and remove pump and motor.
- h. Motor cable shall be a single eight core cable containing both power and sensor conductors. The cable jacket shall be manufactured of an oil resistant chlorinated polyethylene (CPE) rubber material, designed for submerged applications. Cable shall be Type RHW-2 / RHW90, 90°C, 600V, UL/CSA Listed, & NEC/CEC approved for wet locations. Cable shall be watertight to a depth of at least 65'. The cable entry system shall comprise of primary, secondary, and tertiary sealing methods. The primary seal shall be achieved by a NBR tapered elastomeric grommet compressed between the cable gland, cable housing, and a set of 304SS washers. Secondary sealing is accomplished with a compressed O-ring made of NBR material. Compression and subsequent sealing shall preclude specific torques requirements. The system shall also include tertiary sealing to prevent leakage into the motor housing due to capillary action through the insulation if the cable is damaged or cut. The cable wires shall be cut, stripped, re-connected with a copper butt end connector, and embedded in epoxy within the cable gland. This provides a dead end for leakage through the cable insulation into the motor junction area.

Specification

Specification – DDKEXU(FM/FMc certified motor)

F. General:

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