



PUMP MODEL – Pump shall be of the centrifugal type, model KE102, KE102C, or KE103 with submersible type motor. Model KE102C shall have internal start components (Start capacitor, Run Capacitor, Start switch). Pumps not manufactured complete in the USA shall not be considered equal.

OPERATING CONDITIONS – The pump shall have a non-overloading maximum capacity of ___GPM, a maximum total dynamic head of ___ feet, and shall use a motor rated at 1 HP and 3450 RPM.

CONSTRUCTION – All castings must be manufactured and supplied by a domestic source located in the USA. Major pump components shall be of gray cast iron, ASTM A-48, Class 35, with smooth surfaces devoid of blowholes or other irregularities. All exposed nuts or bolts shall be 304 stainless steel. All metal surfaces coming into contact with the pumpage, other than stainless steel, shall be protected by a factory applied spray coating of primer and an air dry acrylic paint finish to the exterior of the pump.

Sealing design shall incorporate metal-to-metal contact between machined surfaces. Critical mating surfaces where watertight sealing is required shall be machined and fitted with O-rings, designed and constructed to meet FM3615 for Class 1, Division 1, Groups C & D standards. Fittings will be the result of controlled compression of rubber O-rings in two planes and O-ring contact of four sides (rabbet joint construction) without the requirement of a specific torque limit. All elastomers shall be nitrile. No secondary sealing compounds, elliptical O-rings, grease or other devices shall be used.

PUMP IMPELLER – Pump impeller shall be ductile iron and threaded onto a stainless steel shaft. The impeller shall be of the recessed vortex type to provide an unobstructed passage through the volute for any solid materials. Impeller must be dynamically balanced to specification ISO 1940G 6.3 standard.

SEALS – Type 21, domestic manufactured, dual mechanical seal construction mounted in tandem shall protect the motor. Standard construction of primary seal shall be silicon / carbide with Viton® elastomers. Standard construction of secondary seal shall be silicon / carbide with Viton® elastomers. The seal face shall be lapped to a flatness of one light band. Lip seal arrangements shall not be considered equal. An optional electrode can be mounted in the seal chamber to detect water entering the chamber through the lower seal. Water in the chamber shall cause a red light to turn on at the control box. This signal shall not stop the motor, but shall act as a warning only, indicating service is required.

MOTOR – The pump motor construction shall be per NEMA MG-1 1.15 standard and shall be of the submersible type, rated 1 HP, 3450 RPM. The motor shall be for 60 Hz, 208 or 230 volt, single-phase operation. Three-phase operation shall be 208, 230 or 460 volt. Single-phase motors shall be capacitor start, capacitor run type for high starting torque. Start & run capacitors, and starting

switch for operating the motor will be found in the control box. Major motor operating temperature must not exceed Class B ratings.

The stator winding shall be of the open type with Class F insulation. Any other construction shall not be considered equal. The stator shall be pressed into the cast iron motor housing. Winding housing shall be filled with clean, high dielectric oil that lubricates bearings and seals, transferring heat from windings and rotor to the outer cast housing. Maximum skin temperature of motor assembly shall not exceed a T-4 rating per FM3615 standards. Any motor assembly T-code per FM3615 standard that exceeds a T-4 rating shall be considered not equal.

Single-phase motors shall have automatic reset overload protection attached to the top end of the motor windings to stop the motor if the motor winding temperature reaches 130 degrees C. The high temperature shut-off will cause the pump to cease operation, should a control failure cause the pump to run in a dry wet well. The overload shall automatically reset when the motor cools to a safe operating temperature. The motor shall be capable of operating over the full range of the performance curve without overloading. Single phase motors shall have a heat sensor thermostat and overload attached to the top end of the motor windings to stop the motor if the motor winding temperature reaches 200 degrees F. The high temperature shut-off will cause the pump to cease operation, should a control failure cause the pump to run in a dry wet well. The thermostat shall automatically reset when the motor cools to a safe operating temperature.

Three-phase motors contain temperature sensors with (2) two wires for attachment to the control panel.

INTERNAL START KIT – For Model KE102C, Start/Run capacitors with start switch shall be securely positioned in a dry compartment. A total of (4) bolts quickly removes cord cap for easy servicing.

BEARINGS / SHAFT - The motor shall have two heavy-duty ball bearings and one sleeve bearing to support the pump shaft, taking radial and thrust loadings. Bearings shall be designed to an ABEC® System 1 or better. The upper bearing shall be a Conrad type, single row, deep groove ball bearing designed to adequately handle the required radial loads. The lower bearing shall be a single-row, deep groove ball bearing designed to adequately compensate for the axial loads and radial forces. Bearings shall be designed to deliver a minimum L-10 bearing life of 100,000 hours when operation is within the limitations of the manufacturer's performance curve. The bearings shall be lubricated in oil and will not require maintenance as described in ANSI/HI 1.4-2010 A.6.

POWER CORD – The motor power cord shall be 12 Ga. Type SOOW, UL listed, CSA approved cable. The cable jacket shall be sealed at the motor entrance by means of an agency-approved rubber compression washer and compression nut. An epoxy-filled cord cap seals the outer cable jacket and individual leads to prevent water from entering the motor housing. Compression fittings with quick disconnect molded