



## K4RC

4" Recessed Impeller High Head Sewage Pump

### HIGH OPERATING PRESSURES

- Up to 175' total dynamic heads
- Strong pumping capacities to 500 GPM
- Ideal for long pumping distances
- Handles challenging terrain conditions

### PUMPS STRINGY FIBEROUS WASTE

- Recessed impeller out of passageway
- Solids can not get caught
- Pump-out vanes, prevent material build-up
- Completely open volute flow

### HANDLES ALL OPERATING CONDITIONS

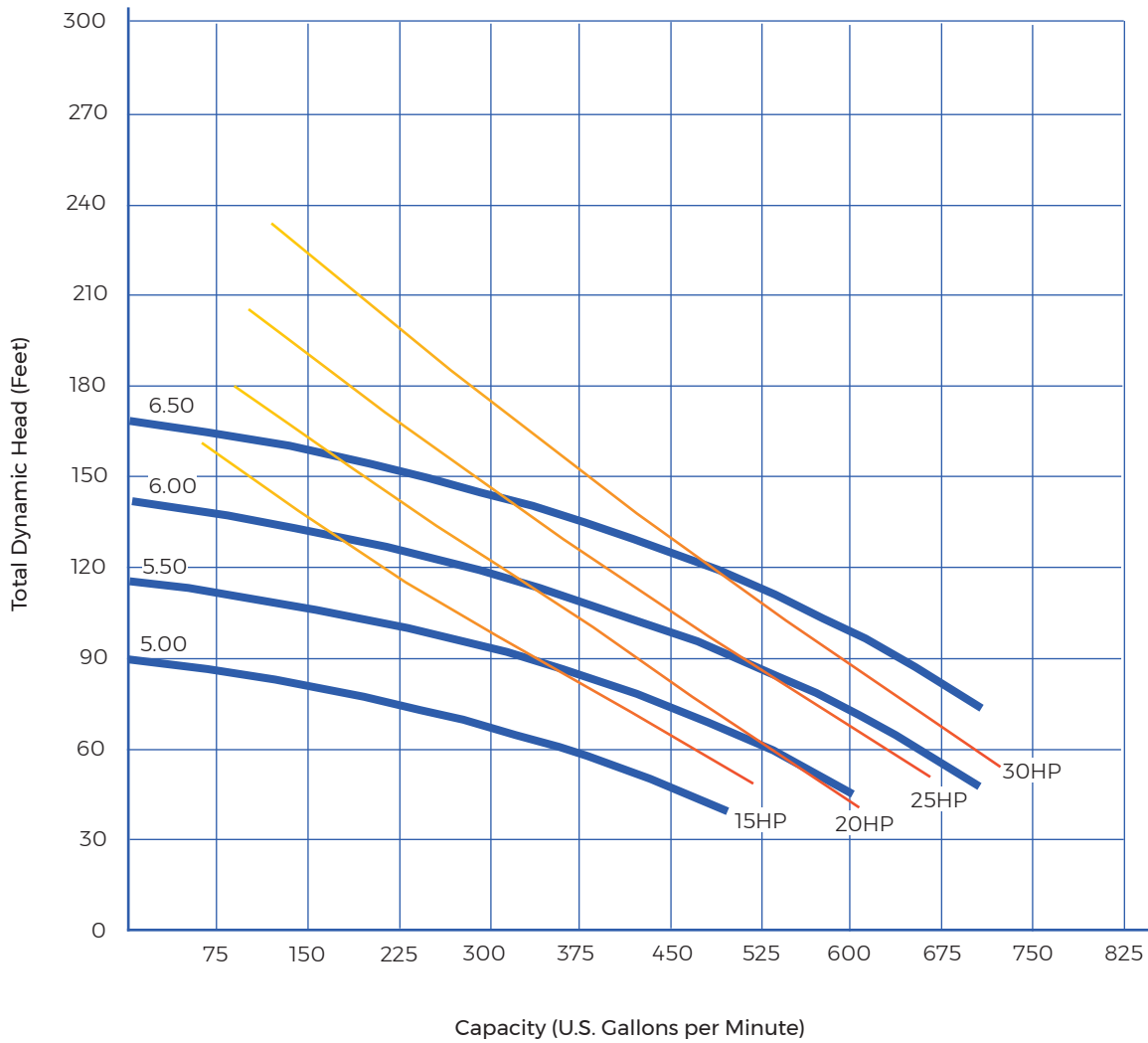
- Entire performance curve
- No cavitation or vibration
- Adjusts to changing pumping conditions
- Operates near shut-off and / or wide open flow

### LOW MAINTENANCE

- Unobstructed impeller passageway
- Grit-resistant silicon carbide shaft seals
- Large, 3" diameter solids handling
- High service factor motor handles tough electrical operating conditions
- Recessed impeller minimizes radial bearing load, significantly increasing bearing life

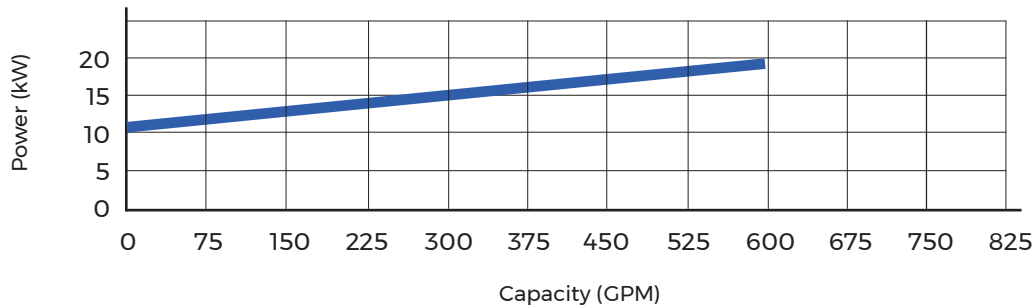
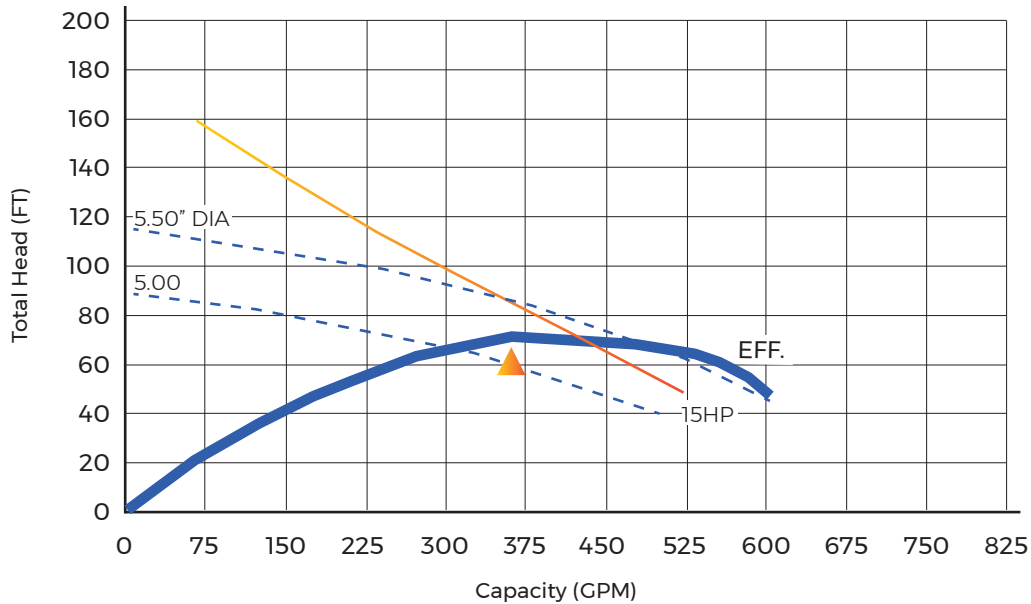


GENERAL		MOTOR DATA			
Pump Model	<b>K4RC</b>	Volt	230	460	575
		Phase	3	3	3
PUMP DATA		Hz	60 Hz		
Date	09/2022	HP	15, 20, 25, 30 HP		
Discharge Flange	4" ANSI, 150lb	Poles / Rated Speed	2 P / 3450 rpm		
Solids Size	3 inch	Insulation Class	H Class		
Impeller Type	Recessed				



GENERAL		MOTOR DATA			
Pump Model	<b>K4RC150M2-23/43</b>	Load	1/1	3/4	1/2
		Efficiency (%)	85	87	86
PUMP DATA		Power Supply	3 $\phi$ , 230/460 V, 60 Hz		
Date	09/2022	HP / Amps	15 HP/ 52/26 A		
Discharge Flange	4" ANSI, 150lb	Poles / Rated Speed	2 P / 3450 rpm		
Solids Size	3 inch	Insulation Class	H Class		
Impeller Type / Dia.	Recessed/ 5.00" Dia.				

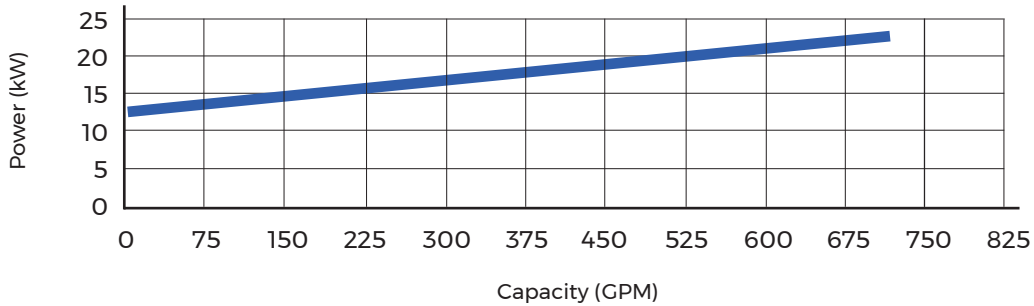
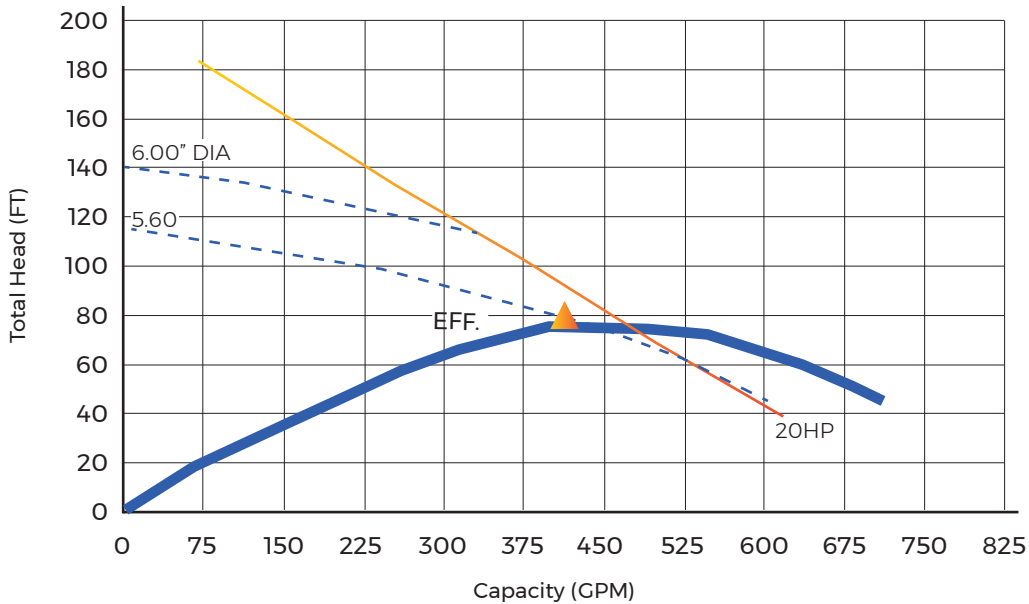
	HEAD (FT)	CAP. [USGPM]	POWER [KW]	EFF. [%]	NPSHRE [FT]
▲ Best Efficiency Point	60	356	16	35	5.7





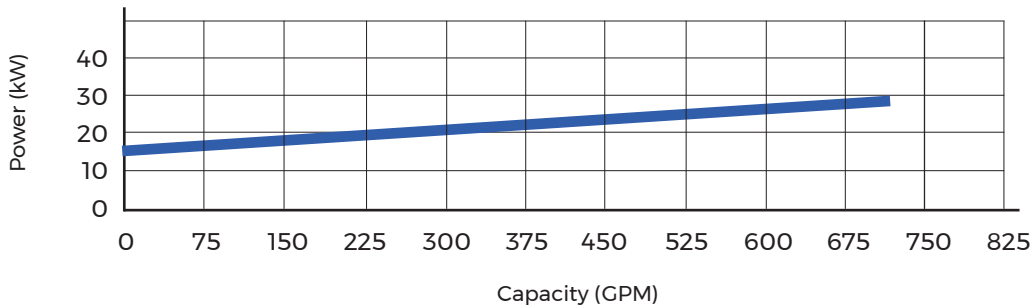
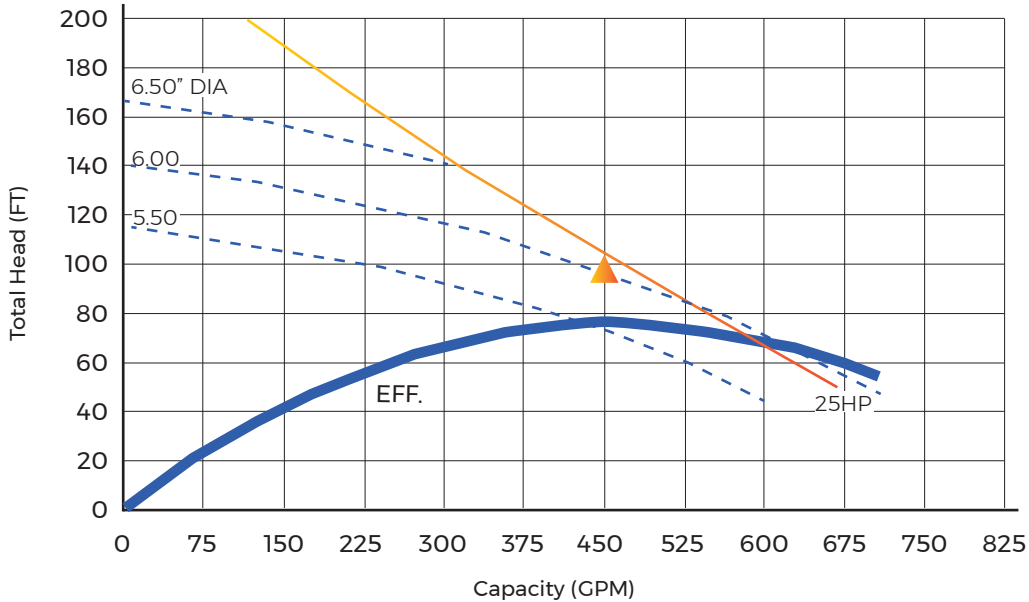
GENERAL		MOTOR DATA			
Pump Model	<b>K4RC200M2-23/43</b>	Load	1/1	3/4	1/2
		Efficiency (%)	85	87	86
PUMP DATA		Power Supply	3 $\phi$ , 230/460 V, 60 Hz		
Date	09/2022	HP / Amps	20 HP/ 60/30 A		
Discharge Flange	4" ANSI, 150lb	Poles / Rated Speed	2 P / 3450 rpm		
Solids Size	3 inch	Insulation Class	H Class		
Impeller Type / Dia.	Recessed/ 5.60" Dia.				

	HEAD (FT)	CAP. [USGPM]	POWER [KW]	EFF. [%]	NPSHRE [FT]
Best Efficiency Point	78	412	18	38	5.7



GENERAL		MOTOR DATA			
Pump Model	<b>K4RC250M2-23/43</b>	Load	1/1	3/4	1/2
		Efficiency (%)	85	87	86
PUMP DATA		Power Supply	3 $\phi$ , 230/460 V, 60 Hz		
Date	09/2022	HP / Amps	25 HP/ 84/42 A		
Discharge Flange	4" ANSI, 150lb	Poles / Rated Speed	2 P / 3450 rpm		
Solids Size	3 inch	Insulation Class	H Class		
Impeller Type / Dia.	Recessed/ 6.00" Dia.				

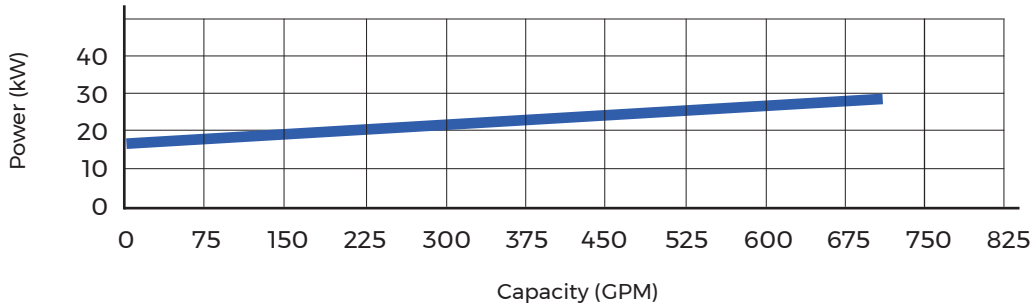
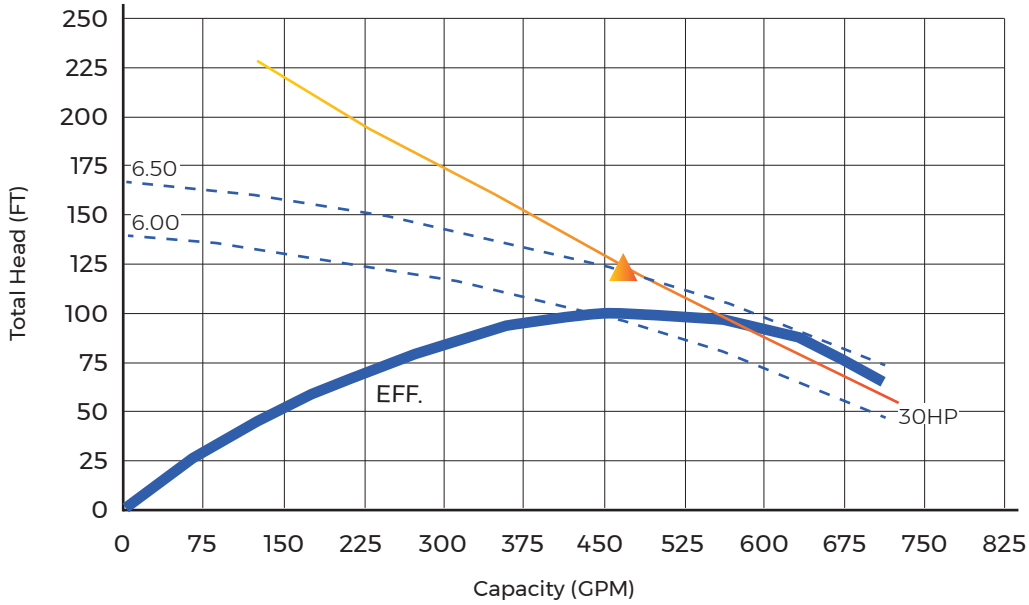
	HEAD (FT)	CAP. [USGPM]	POWER [KW]	EFF. [%]	NPSHRE [FT]
▲ Best Efficiency Point	97	450	24	38	5.7





GENERAL		MOTOR DATA			
Pump Model	<b>K4RC300M2-23/43</b>	Load	1/1	3/4	1/2
		Efficiency (%)	85	87	86
PUMP DATA		Power Supply	3 φ, 230/460 V, 60 Hz		
Date	09/2022	HP / Amps	30 HP/100/50 A		
Discharge Flange	4" ANSI, 150lb	Poles / Rated Speed	2 P / 3450 rpm		
Solids Size	3 inch	Insulation Class	H Class		
Impeller Type / Dia.	Recessed/ 6.50" Dia.				

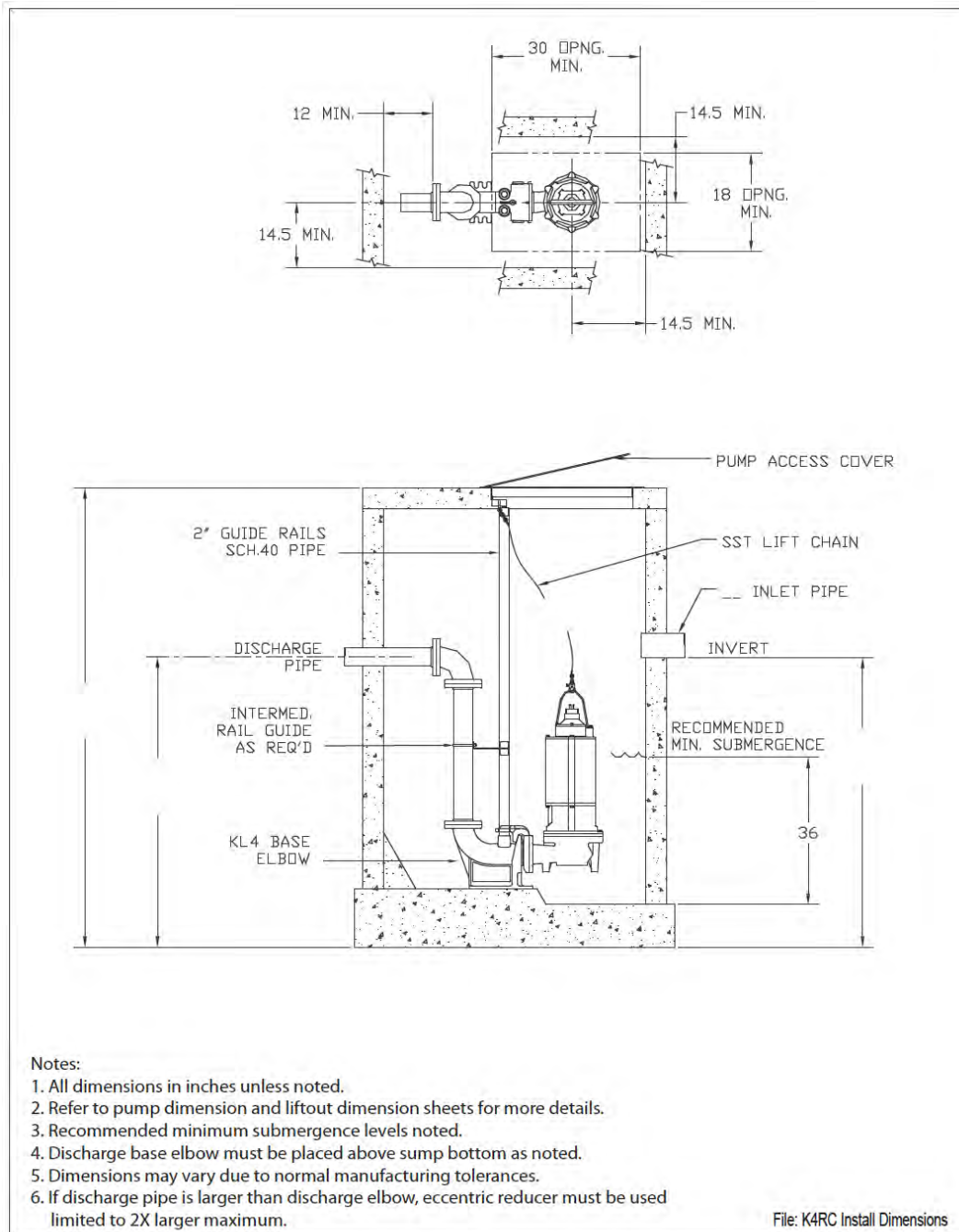
	HEAD (FT)	CAP. [USGPM]	POWER [KW]	EFF. [%]	NPSHRE [FT]
▲ Best Efficiency Point	120	470	30	41	5.7



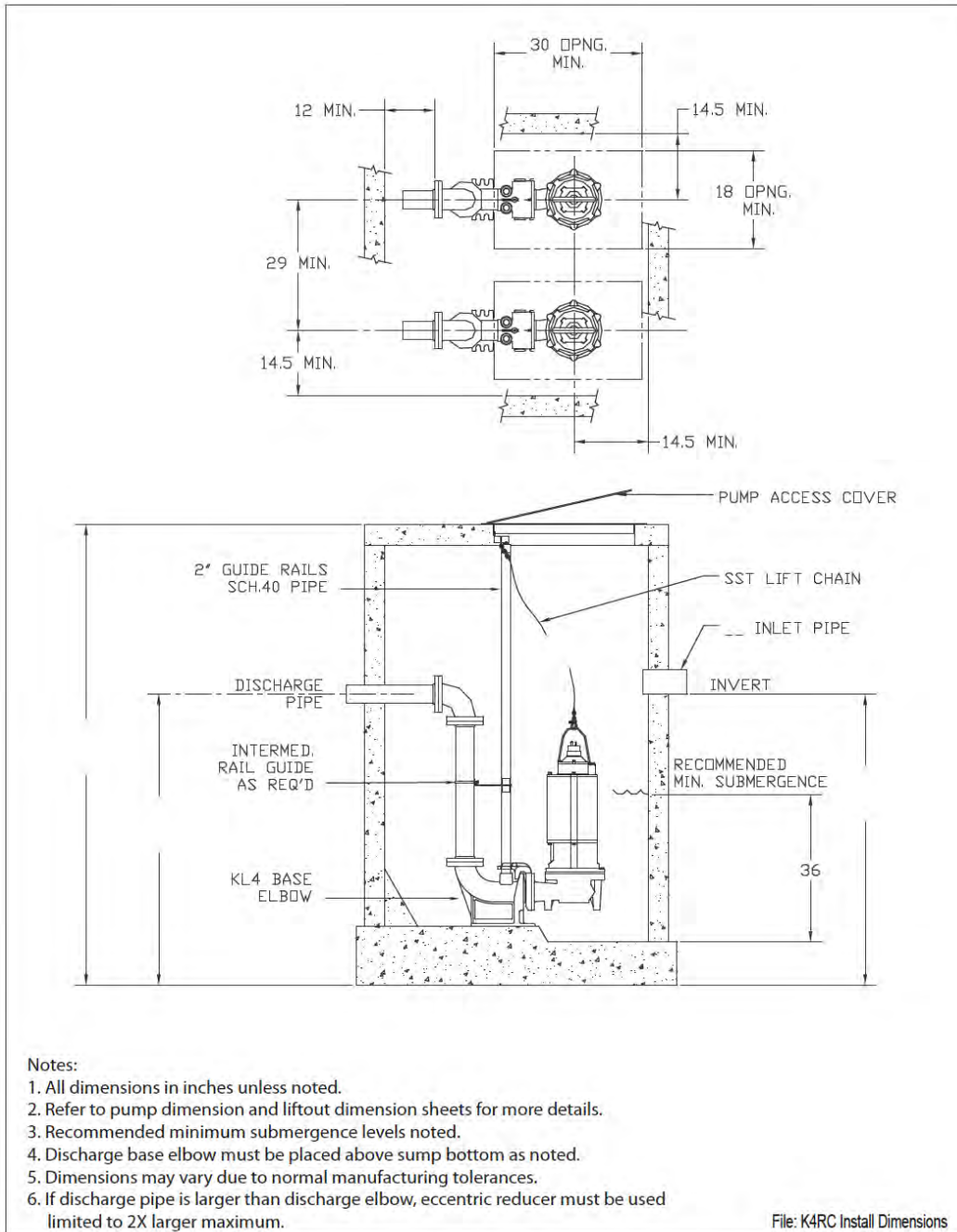




PUMP SERIES	K4RC	4" SUBMERSIBLE SEWAGE PUMPS
SIMPLEX INSTALLATION DIMENSIONAL DATA		



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DUPLIX INSTALLATION DIMENSIONAL DATA		





PHYSICAL DATA

Discharge Size	ANSI 4" Horizontal
Solid Size	3"
Impeller Type	Balanced, Vortex, 10 Vane
Power/Control Cable Length	30' Standard
Paint	Blue, Powder Coated

MOTOR CONSTRUCTION

Motor Type	Enclosed Submersible Air Filled
NEMA Insulation Code	Class H
Service Factor	1.2
NEMA Design Type	B (3Ø) L (1Ø)
Single Phase Configuration	External Start and Run Components
Motor Protection	Thermal Sensors Embedded in the Windings
Maximum Stator Temperature	356°F (180°C)
Power Cord Type	SOOW - 600V, 90° C
Control Cord Type	18-5 SOOW - 600V, 90° C

MATERIALS OF CONSTRUCTION

Cord Entry	Cast Iron, ASTM A48, Class 35
Motor Housing	Cast Iron, ASTM A48, Class 35
Bearing Housing	Cast Iron, ASTM A48, Class 35
Volute	Cast Iron, ASTM A48, Class 35 / Ceramic Coated Inside
Impeller	Ductile Iron, ASTM A536, 60-40-18 / Ceramic Coated
Shaft	ANSI 416 Stainless Steel
Inboard Mechanical Seal	Silicone Carbide / Silicone Carbide
Outboard Mechanical Seal	Silicone Carbide / Silicone Carbide
Fasteners	ANSI 18-8 Stainless Steel
O-Rings	Nitrile Rubber
Upper Bearing	Conrad Style Single Row Deep Groove Ball Bearing
Lower Bearing	Conrad Style Single Row Deep Groove Ball Bearing

THERMAL DATA	
Maximum Liquid	140° F (60° C) Intermittent
Maximum Stator	311° F (155° C)
Heat Sensor	Open: 257° F (125° C) Max. / 239° F (115° C) Min.
	Closed: 194° F (90° C) Max. / 119° F (48° C) Min.
Oil Flash Point	390° F (199° C)

ELECTRICAL DATA				
RPM	3450			
Electrical Ratings	Heat Sensor	24VDC, 5AMPS	115VAC, 5AMPS	230VAC, 5AMPS
	Seal Fail	300VAC 5mAMPS		
Voltage Tolerance	± 10%			

HP	VOLTS	PHASE	NEC CODE	SERVICE FACTOR	FULL LOAD AMPS	SF AMPS	LOCKED ROTOR AMPS	RUN KW	START KVA	RUN KVA
15	208	3	F	1.2	56.1	67.3	224.0	16.1	78.2	19.6
	230				48.2	57.8	193.6			
	460				24.1	28.9	95.8			
20	208	3	F	1.2	74.1	88.9	294.3	21.7	103.6	25.8
	230				64.1	76.9	257.3			
	460				32.0	38.4	129.6			
25	208	3	F	1.2	94.9	113.9	379.6	28.3	134.9	33.7
	230				84.1	100.9	338.1			
	460				42.1	50.5	167.9			
30	208	3	F	1.2	115.0	138.0	459.8	34.8	162.3	40.5
	230				100.1	120.1	401.6			
	460				50.1	60.1	201.8			

MOTOR EFFICIENCIES & POWER FACTOR									
HP	PHASE	MOTOR EFFICIENCY %				POWER FACTOR %			
		SERVICE FACTOR LOAD	100% LOAD	75% LOAD	50% LOAD	SERVICE FACTOR LOAD	100% LOAD	75% LOAD	50% LOAD
15	3	72	72	67	59	82.5	82	81	79
20	3	73	73	69	61	84	84	82	81
25	3	73	73	70	63	85	84	82	79
30	3	76	76	71	65	85	86	84	82



## **K4RC - SERIES (15 - 30 HP)**

### **NON-CLOG SUBMERSIBLE PUMP SPECIFICATION**

Furnish and install \_\_\_\_\_ submersible non-clog wastewater pump(s). The KEEN pump(s) shall be equipped with a \_\_\_\_\_ HP close coupled submersible electric motor, connected for operation on \_\_\_\_\_ volts, 1 or 3 phase, 60 hertz service, with \_\_\_\_\_ feet of heavy duty submersible electric power cable. Each pump shall be capable of producing \_\_\_\_\_ GPM at \_\_\_\_\_ feet TDH. The shutoff head shall be no less than \_\_\_\_\_ feet.

**DESIGN** - The KEEN pump(s) shall be capable of handling raw, unscreened sewage and shall be automatically and securely connected to the permanent discharge connection, guided by no less than two guide rails extending from the top of the station to the discharge connection. Sealing of the pumping unit to the discharge base elbow shall be accomplished by machined metal to metal watertight contact. The pump(s) shall be easily removed for inspection and service without the need for personnel to enter the wet-well. The entire pumping unit, including electric cable, shall be capable of continuous submergence underwater without loss of watertight integrity to a depth of 60 feet. No portion of the pump shall bear directly on the sump floor.

**CONSTRUCTION** - 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 enamel 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. Fittings will be the result of controlled compression of rubber o-rings in two planes and o-ring contact of four sides without the requirement of a specific torque limit. No secondary sealing compounds, elliptical o-rings, grease or other devices shall be used.

**COOLING SYSTEM** - Motors are sufficiently cooled by the submergence in the media. A cooling jacket is not required.

**CABLE / ENTRY SEAL** - The power cable shall be sized in accordance with NEC standards and shall be of sufficient length to reach the junction box without the need of any splices. The cable wires are individually stranded in epoxy in the cord cap assembly for a permanent seal.

**MOTOR** - The pump motor shall be an induction type, NEMA B design with a squirrel cage rotor, shell type design, housed in an air-filled, watertight chamber. The stator windings and stator leads shall be insulated with moisture resistant Class H insulation rated. Stator shall be heat-shrink fitted into the motor housing. The use of bolts, pins, or other fastening devices requiring penetration of the stator housing is not acceptable. The motor shall be designed for continuous duty handling pumped media of 104°F (40°C) and capable up to 20 evenly spaced starts per hour. The motor horsepower shall be adequate so that the pump is not overloading throughout the entire pump performance curve from shut-off through run-out. Thermal switches shall be used in conjunction with and supplemental to external motor overload protection and shall be connected to the control panel. The motor and pump shall be designed and assembled by the same manufacturer.



## K4RC – SERIES (15 – 30 HP) - Non-Clog Submersible Pump Specification

**BEARINGS** – The pump shaft shall rotate on two bearings. The upper motor bearing shall be a single ball type bearing to handle radial loads. The lower bearing shall be a two row angular contact ball bearing to compensate for axial thrust and radial forces. Single row lower bearings shall not be considered acceptable. The minimum L-10 bearing life shall be 50,000 hours at any useable portion of the pump curve.

**MECHANICAL SEAL** – Each pump shall be provided with a mechanical shaft seal system consisting of two assemblies. The seals shall operate in a lubricant reservoir that hydrodynamically lubricates the seal faces at a constant rate. The lower primary seal, located between the pump and the lubricant chamber, shall contain one stationary and one positively driven rotating, silicon-carbide ring. The upper, secondary seal, located between the lubricant chamber and the motor housing, shall contain one stationary and one positively driven rotating, silicon-carbide seal ring. The seals shall require neither maintenance nor adjustment and shall be capable of operating in either clockwise or counter clockwise direction of rotation without damage or loss of seal. For special applications, other seal face materials shall be available.

Each pump shall be provided with a lubricant chamber for the shaft sealing system. The lubricant chamber shall be designed to prevent overfilling and to provide lubricant expansion capacity. The drain and inspection plug, with positive anti-leak seal, shall be easily accessible from the outside. The seal system shall not rely upon the pumped media to operate dry without damage while pumping under load.

**PUMP SHAFT** – The pump shaft and motor shaft shall be the same unit. The pump shaft is an extension of the motor shaft; couplings shall not be acceptable. The pump shaft shall be 416 stainless steel.

**IMPELLER** – The vortex impeller shall be of ductile iron, Class 35B, dynamically balanced. The impeller shall be capable of handling solids, fibrous materials, heavy sludge and other material found in wastewater. The impeller shall be keyed to the shaft, retained with an impeller bolt, capable of passing a 3-inch diameter solid. Mass moment of inertia calculations shall be provided by the pump manufacture upon request. Ceramic coated on impeller for anti-abrasion wear.

**VOLUTE** – The pump volute shall be gray cast iron, ASTM A-48, Class 35, single piece design with smooth passages large enough to pass any solids that may enter the impeller. Ceramic coating on inside volute for anti-abrasion wear.

**PROTECTION** – All stators shall incorporate thermal switches in series to monitor the temperature of each phase winding. At 260°F (125°C) the thermal switches shall open to signal the control to stop the motor and activate the alarm. A leakage sensor shall be installed in the lubricant chamber to detect seal leakage prior to entry and contamination of the lower bearing and motor stator housing.