



Model 641

# **AURORA<sup>®</sup> 640 SERIES** SINGLE STAGE SEWAGE PUMPS – “KSS”

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# AURORA® 640 SERIES

## Single Stage Sewage Pumps – “KSS”

Capacities to 350 GPM

Heads to 90 Feet

Temperatures to 180° F

Discharge Sizes 2" through 4"

### Introduction

Water pollution and its effect on our environment is on everyone's mind. This is particularly true today and for the future generations. The population explosion, along with a broader understanding of the water pollution problem, has brought about the need for more and better sewage treatment facilities. The installations of today and tomorrow demand more reliable sewage pumping equipment. Long life has become essential to overall pump performance. Aurora Pump recognizes this need, and with this bulletin offers the 640 Series of heavy-duty, vertical, wet pit solids handling pumps as our solution to your sewage pumping problems. Contact your Aurora Pump representative for added details.

### Quick Reference 640 Series Feature Selector

#### Standard Features

- Bronze fitted construction
- Bronze pump bearings
- Bronze line bearings (6"2" settings and deeper)
- Dynamically balanced solids handling impeller passes 2" to 3" spheres depending on pump size
- Elevated regreaseable thrust ball bearing
- Grease lubricated pump and line bearings
- Standard hp base motors
- Carbon steel shaft
- Packing box with split gland and lantern ring
- Oval baseplate
- Gastight construction
- 4" Vent – 34" baseplate and larger
- Float switch
- Plastic float and rod
- Elevated switch support
- External adjustment of impeller
- Pump setting increments of 6"
- Pump settings up to 15' 6"

#### Optional Features

- All iron or all bronze construction
- Bronze impeller
- Various pump and line bearing types
- Drip oiler for line bearings
- Solenoid oiler for line bearings
- Stainless steel shaft
- Round, square or special baseplates
- Steel curb rings
- Various float switch enclosures
- Electric alternator
- Stainless steel or bronze float and rod
- High water alarm
- Alarm bells and horn
- Float guard
- 4" Vent – 28" baseplate and smaller
- Flushing lines to sleeve bearings
- Electric controllers
- Special pump setting increments
- Pump settings over 15' 8"



# Pump Features

## A. Motor Mounting

bracket that assures alignment of motor and pump shaft with tongue-and-groove machining. Motors are of standard hp manufacture.

## B. External Impeller Adjustment

is accomplished with hexagon shaped adjusting nut. A lock nut secures the bearing collar to the shaft.

## C. Thrust Bearing

is regreaseable and is protected from contamination by grease seals on both sides and a water slinger. The bearing is elevated 6" above the floor level for easy servicing and added protection from washdown, flooding, etc.

## D. Stuffing Box

is furnished with packing and a split gland for gastight construction. A lantern ring is also optionally available for packing lubrication.

## E. Elevated Float Switch Assembly

is standard. Several enclosures are available. Refer to page 7 for additional details.

## F. Steel Oval Baseplate

is standard and eliminates removing the complete cover plate.

## G. Bearing Assemblies

available in several arrangements and materials to suit difficult applications. Line bearings are provided on 6'2" settings and deeper. One bearing is provided for each additional 5' of setting. All the standard bearings are grease lubricated.

## H. Pump Shaft 1-3/16"

in diameter is provided to minimize deflection and bearing wear.

## I. Positive Alignment Throughout

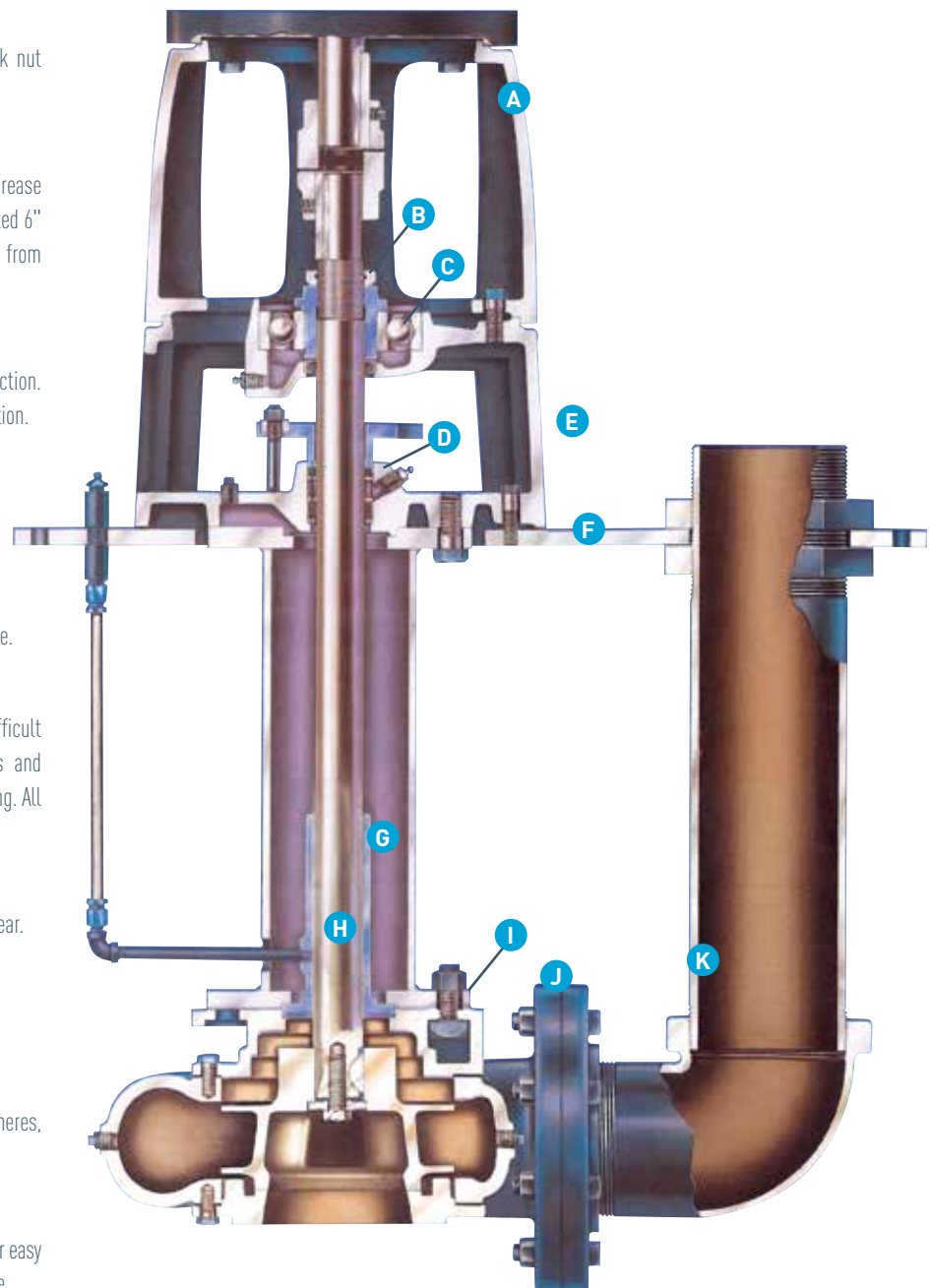
uses tongue-and-groove registered design.

## J. Liquid End

includes a solids handling impeller that passes up to 3" spheres, depending on pump size.

## K. Discharge Pipe

is securely locked to the baseplate. The pipe end is threaded for easy system piping. A below surface discharge is optionally available.

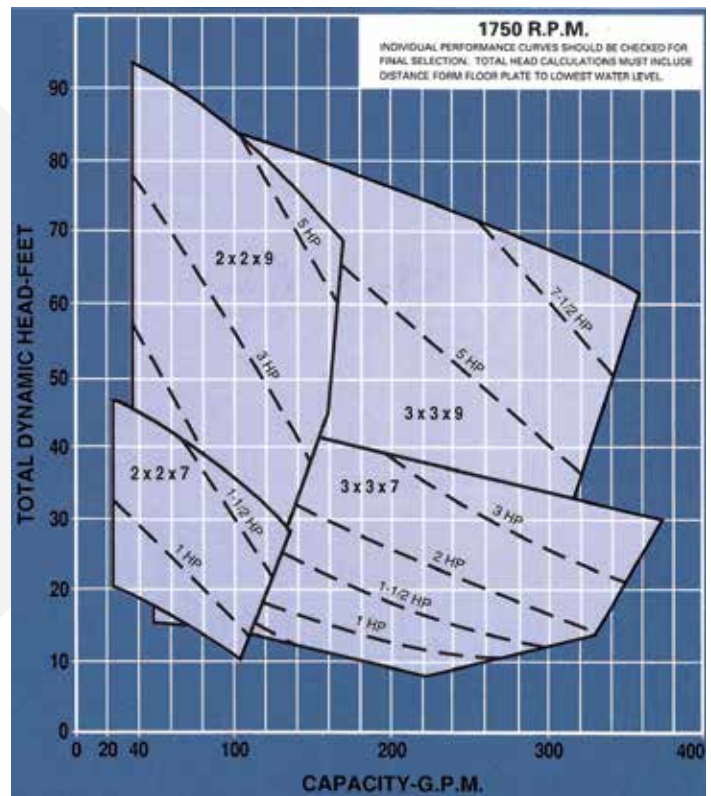


# Performance Data and Engineering Details

Material of Construction	
Description	Material
Baseplate	Steel WRT
Sleeve bearings	Bronze ASTM B62
Bearing collar	Bronze ASTM B62
Casing	Cast Iron ASTM A48
Discharge pipe	Steel WRT sch'd 40
Head – lower	Cast iron ASTM A48
Head – upper	Cast iron ASTM A48
Impeller	Cast iron ASTM A48
Packing	Graphited impreg. T.F.E.
Shaft	Steel AISI C1040
Bearing cover	Cast iron ASTM A48
Support pipe	Steel WRT sch'd 40

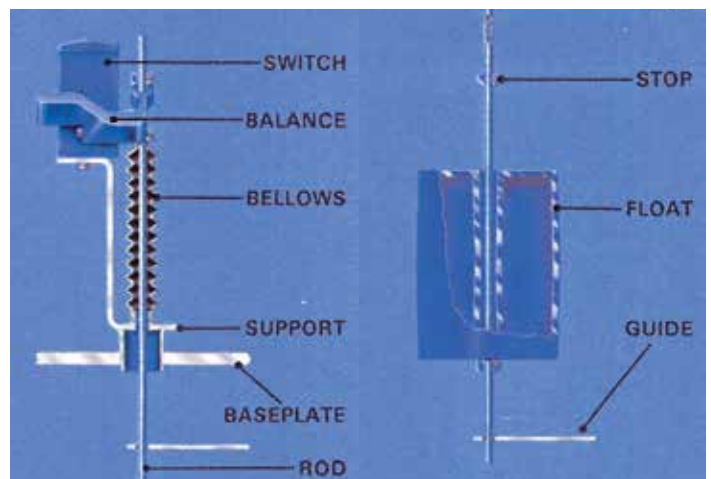
Intermediate Line Shaft Bearings		
Pit Depths	Pump Setting	No. of Line Shaft Bearing
7'0"	6'6"	1
12'0"	11'6"	2
17'0"	16'6"	3

Pit Depth or Pump Setting					
Length in Feet		Length in Feet		Length in Feet	
Pit Depth	Pump Setting	Pit Depth	Pump Setting	Pit Depth	Pump Setting
2'6"	2'0"	7'6"	7'0"	12'6"	12'0"
3'0"	2'6"	8'0"	7'6"	13'0"	12'6"
3'6"	3'0"	8'6"	8'0"	13'6"	13'0"
4'0"	3'6"	9'0"	8'6"	14'0"	13'6"
4'6"	4'0"	9'6"	9'0"	14'6"	14'0"
5'0"	4'6"	10'0"	9'6"	15'0"	14'6"
5'6"	5'0"	10'6"	10'0"	15'6"	15'0"
6'0"	5'6"	11'0"	10'6"	16'0"	15'6"
6'6"	6'0"	11'6"	11'0"	16'6"	16'0"
7'0"	6'6"	12'0"	11'6"	17'0"	16'6"



Limitations	
Maximum limitations based on standard materials and pumping clear water	
Speed – RPM	1750
Minimum Horsepower	1750 RPM: 10 1150 RPM: 5
Temperature – °F	180
Basin Pressure – psi	2
Basin cover size	w/o oval or manhole: 28" w/ or w/o oval or manhole: 78"

Designs Details		
Area	Description	Power Series 3
Pump Shaft	Diameter at impeller	7/8"
	Shaft diameter	1-3/16"
	Diameter at coupling end	1"
Bearings	Bearing (ball) – head	7311
	Bearing (sleeve) – pump	6" lg.
Support pipe size to 10 feet		2-1/2"



# Pump and Line Bearings

Two important parts in any sump pump construction are the pump and line bearings as they are immersed in the liquid. The line bearings frequently run wet or dry depending on the varying liquid level in the sump. A complete line of bearings for all types of service conditions is available. Line bearings are provided as standard on 6'6" pump settings and for each additional 5' of setting.

## Standard

All 640 Series pumps (except for 10 foot and deeper settings at 1750 RPM) are furnished with bronze sleeve type bearing unless an optional style is specified and is also the standard lineshaft bearing for all settings. This bearing is also available in cast iron or ceramic material. When pumping conditions are severe, abrasives are present in the liquid or the liquid temperature exceeds 140°F, specify one of the following optional bearings.

## Graphitar® (Optional Bearing)

The wearing surface of the graphitar bearing is made of nonmetallic material. It consists of a carbon steel relief-type bearing housing and three graphitar bushings. The graphitar bearing configuration is recommended for use on applications where the temperature of the liquid exceeds 140°F. Stainless steel shafting is recommended. Do not apply this option when liquid being pumped contains abrasives; in such cases, select one of the other bearing options.

## Cutless Rubber (Optional Bearing)

This bearing consists of a metal relief-type bearing housing and two cutless rubber bushings. A third bushing located at the bottom of the bearing housing is made of metal. Lubrication can be supplied by the liquid being pumped when used as a pump bearing. When used as an optional lineshaft bearing, water flush lubrication is provided. Grease lubrication is not recommended. This option is recommended for applications where abrasives are held in suspension in the liquid pumped. Stainless steel shafting is recommended. Do not apply this option when the liquid temperature exceeds 140°F; in such cases, select one of the other bearing options.

## Glass-Filled Teflon® (Optional Bearing)

This bearing consists of a carbon steel relief-type bearing housing with three glass-filled Teflon bushings as the bearing surface. The self-lubricating, low-friction and inert qualities of filled Teflon make it ideal for handling hot liquids, chemicals and solvents which may attack standard bearing materials. Stainless steel shafting is recommended.

## Relief

A relief-type bearing will be supplied as standard for 10'6" and deeper settings at 1750 RPM, and is otherwise optionally available. The relief-type bearing housing has three metal bushings. Since this relief-type bearing housing is also used with the other bushing materials (graphitar, cutless rubber and Teflon), the same venting principle applies to these bushing materials.

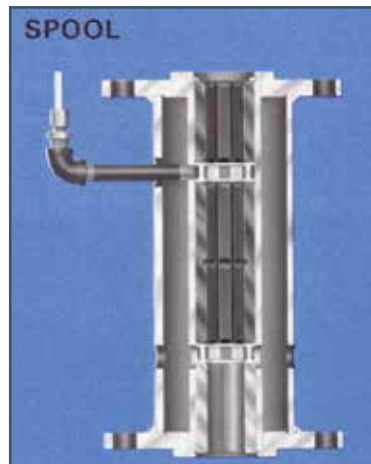
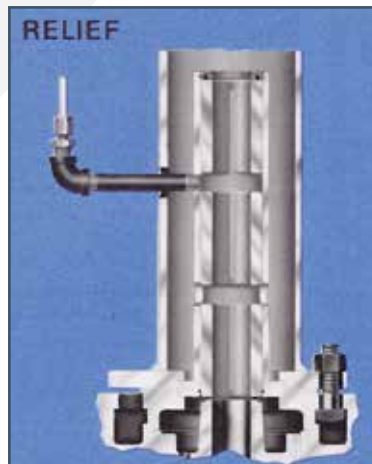
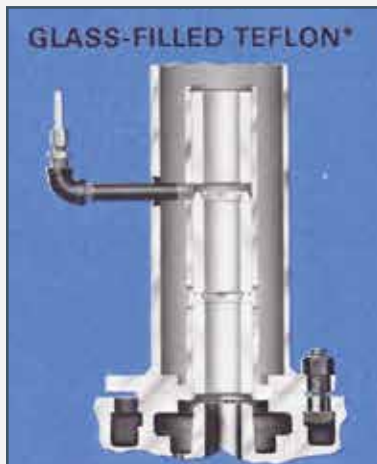
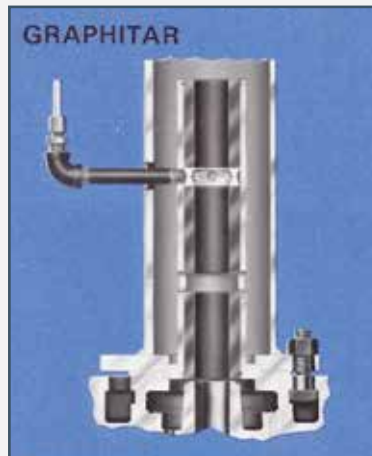
## Spool (Optional Bearing)

This bearing can be supplied as an optional bearing for any pump setting. It is intended for use as a rigid pump bearing for unusually rugged pump applications. The housing can be equipped with different bushing materials (iron, bronze, graphitar, cutless rubber or glass-filled Teflon), depending upon the application. The bearing housing is of rigid "double-wall" metal construction and is flanged at each end.

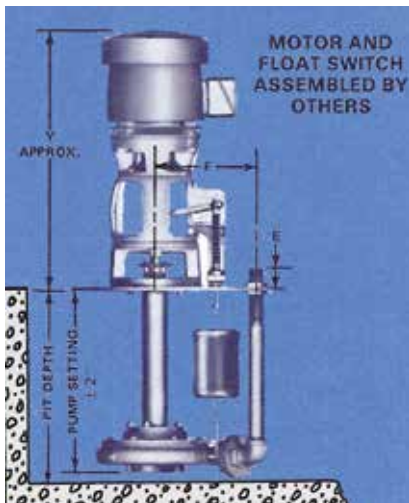
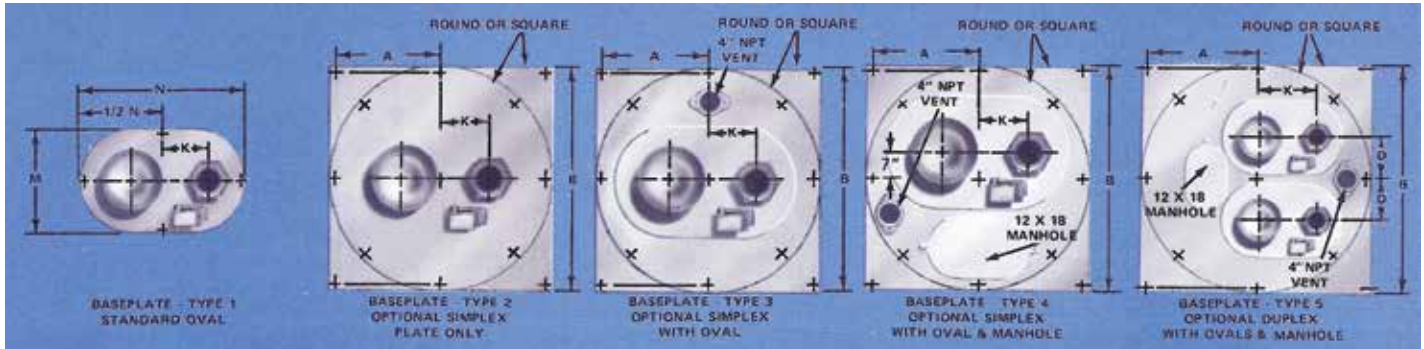
# Pump and Line Bearings

Bearing Type	Pump Construction	Bearing Housing Material	Materials of Construction				
			Iron	Bronze	Bushing Material Cutless Rubber	Graphitar® Filled Teflon®	
Standard Bearing for Pit Depths Under 10'	Bronze Fitted	Bronze	No Bushings Required				
	All Bronze	Bronze					
	All Iron	Iron					
	Stainless Steel	Stainless Steel					
Relief Bearing Standard for Pit Depths 10' and Deeper	Bronze Fitted	Steel		X			
	All Bronze	Bronze		X			
	All Iron	Steel	X				
	Stainless Steel	Stainless Steel				X	
Optional Relief Bearing	Bronze Fitted	Steel		X	X	X	
	All Bronze	Bronze		X	X	X	
	All Iron	Steel	X		X	X	
	Stainless Steel	Stainless Steel			X	X	
Optional Spool Bearing	Bronze Fitted	Steel		X	X	X	
	All Iron	Steel	X		X	X	
	Stainless Steel	Stainless Steel			X	X	
Standard Lubrication			Grease		Pumped Liquid		
Optional Lubrication			Water Flush Oil (1)		Water Flush (2)	Water Flush Grease (2)	Water Flush

(1) Oil – for line shaft bearings only  
 (2) Water flush – relief housing only



# Dimensional Data



- Notes:**
1. Dimensions and weights are approximate.
  2. Not for construction purposes unless certified.
  3. All horsepower ratings shown are for open drip-proof motors only.
  4. Add pump, motor and cover weights for unit weight.
  5. Standard pump length designed to clear bottom of pit 2" to 5".
- \*3 x 3 x 7 and 3 x 3 x 9 pump not available on 20 x 24 oval.

Oval				
Oval No.	Size	Weight (lbs.)	M	N
1	20 x 24*	34	20	24
2	22 x 28	63	22	28

Area	Description	Dim.	Limitations									
			Max. Basin Press.	Max. Std. Pit Depth	Max. Solid Hand. Size	Max. Temp.	Max. Motor Speed	Min. Motor Size		Max. Cover Size		
Pump Shaft	Rotation from driver end	CW										
	Diameter at impeller	7/8										
	Diameter between coupling and impeller	1-3/16										
	Diameter at coupling end	1	2 psi	16 feet (consult factory for deeper settings)	2-1/2	180°F	1750 RPM	1 hp	3/4 hp	22" x 28"	78"	
	Ball Bearing Head	311										
	Sleeve Bearing Pump	6" lg.										
	Support Pipe Size	2-1/2										
	Power Series	1	Limitations given are for water.									

Discharge	Pump Size		Pump Wgt. (lbs.)		E	F	D Duplex	K Oval	K Simplex	K Duplex
	Case Bore	Sphere Sizes	2'0" Pit Depth	Each Add'L. 6" of Pit Depth						
2	7	1-1/2	191	16	4-1/16	9-1/4	10-1/2	6-3/4	6-3/4	9-3/4
2	9	1-1/2	222	18	4-1/2	10-3/4	10-1/2	8-1/4	8-1/4	10-3/4
3	7	2-1/2	223	25	4-1/4	11-7/8	11-1/2	6-3/8	9-3/8	8-7/8
3	9	2	258	25	4-5/16	13-1/4	11-1/2	7-3/4	10-3/4	10-1/4

Frame	Horsepower		Motor Wgt. (lbs.)	Y Approx.
	1750 RPM	1150 RPM		
143 HP	1	3/4	40	25
145 HP	1-1/2 - 2	1	45	26
182 HP	3	1-1/2	72	27
184 HP	5	2	80	28
213 HP	7-1/2	3	130	30
215 HP	10	5	145	32

Steel Baseplates – Round or Square												
A	B	Type 2		Type 3		Type 4		Type 5		Oval No.	Rd. Wgt.	Sq. Wgt.
		Rd. Wgt.	Sq. Wgt.	Oval No.	Rd. Wgt.	Sq. Wgt.	Oval No.	Rd. Wgt.	Sq. Wgt.			
11	24	41	54									
13	28	58	76									
16	34			1	89	115						
19	40			2	126	163	1	136	173			
22	46			2	225	289	2	235	299	1	245	309
25-1/2	53			2	302	387	2	312	397	2	397	504
29	60			2	487	623	2	497	633	2	507	643
32	66			2	592	755	2	602	765	2	730	927
38	78			2	832	1060	2	842	1070	2	1016	1290

# Engineering Specifications

The contractor shall furnish (and install as shown on the plans) Aurora Model (641 simplex) (642 duplex) front or back pullout centrifugal solids handling pumps size \_\_\_ x \_\_\_ x \_\_\_ of (bronze fitted) (all bronze) (all iron) (stainless steel) construction. Each pump shall have a capacity of GPM at \_\_\_ ft. total head, with a temperature of \_\_\_ °F, \_\_\_ specific gravity. The units shall be designed for a pit depth of \_\_\_ feet and shall be furnished with an (above the floor discharge terminating at the baseplate with a male threaded connection) (below the floor discharge terminating at the baseplate with a female threaded connection). A steel baseplate (oval); (round) (square) -(simplex) (simplex with oval) (simplex with oval and manhole) (duplex with ovals and manhole) will be provided. The pump casing, bearing cover and suction cover shall be of high tensile strength cast iron. The casing is to be of the single stage design. The cast iron impeller is of the (enclosed) (semi-open) solids handling type and shall be capable of passing a \_\_\_" diameter sphere. Optional wear rings of iron are to be furnished and shall be held in place by means of machine screws. The impeller running clearances will be of the face type to provide simple adjustments axially to compensate for wear. The impeller is to be dynamically balanced before it is keyed and secured to the pump shaft. The column pipe must be heavy duty with a minimum diameter of \_\_\_" having machined tongue and grooved joints to ensure perfect shaft alignment. The pump shaft shall be a minimum of 1-3/16" diameter. A pump bearing will be located directly above the impeller and shall be of the heavy duty (bronze

sleeve) (cutless rubber) (relief) (spool) type. Line bearings must be provided on pumps designed for a pit depth 6'2" and one bearing for each additional 5' thereafter. All standard sleeve or relief pump and line bearings must be (grease) (oil) (water) lubricated by separate nylon tube lubrication lines terminating at the baseplate. Standard bearings will be grease lubricated (unless otherwise specified). The bearings must have internal lubrication grooves to provide adequate lubrication of the complete bearing running surface. The motor pedestal is to be of cast iron, two piece construction, fitted with a sealed thrust ball bearing located 6" above the baseplate. The ball bearing collar is to have a hexagonal arrangement to allow external axial adjustment of the shaft and impeller. Grease seals shall be provided to retain grease and to prevent contamination of the vertical mounted ball bearing. A grease fitting will be provided to allow regreasing of the bearing. A packed stuffing box complete with a split gland shall be provided for gastight construction. The upper head shall be of sufficient height to elevate the motor shaft extension should the motor be removed for servicing. The pump shall be controlled by an enclosed (heavy duty) (watertight) (explosion resisting) (hazardous location) type float operated switch 6" above the baseplate with fiberglass reinforced float and float rod. A flexible bellows will provide gastight construction. An automatic alternator shall be furnished on duplex pumps to allow the pumps to alternate on each successive cycle of operation. The pumps are to be driven by and flexible coupled to a standard hp, volt, hertz, RPM vertical electric open drip-proof motor.



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