AURORA PUMP A member of PENTAIR PUMP GROUP

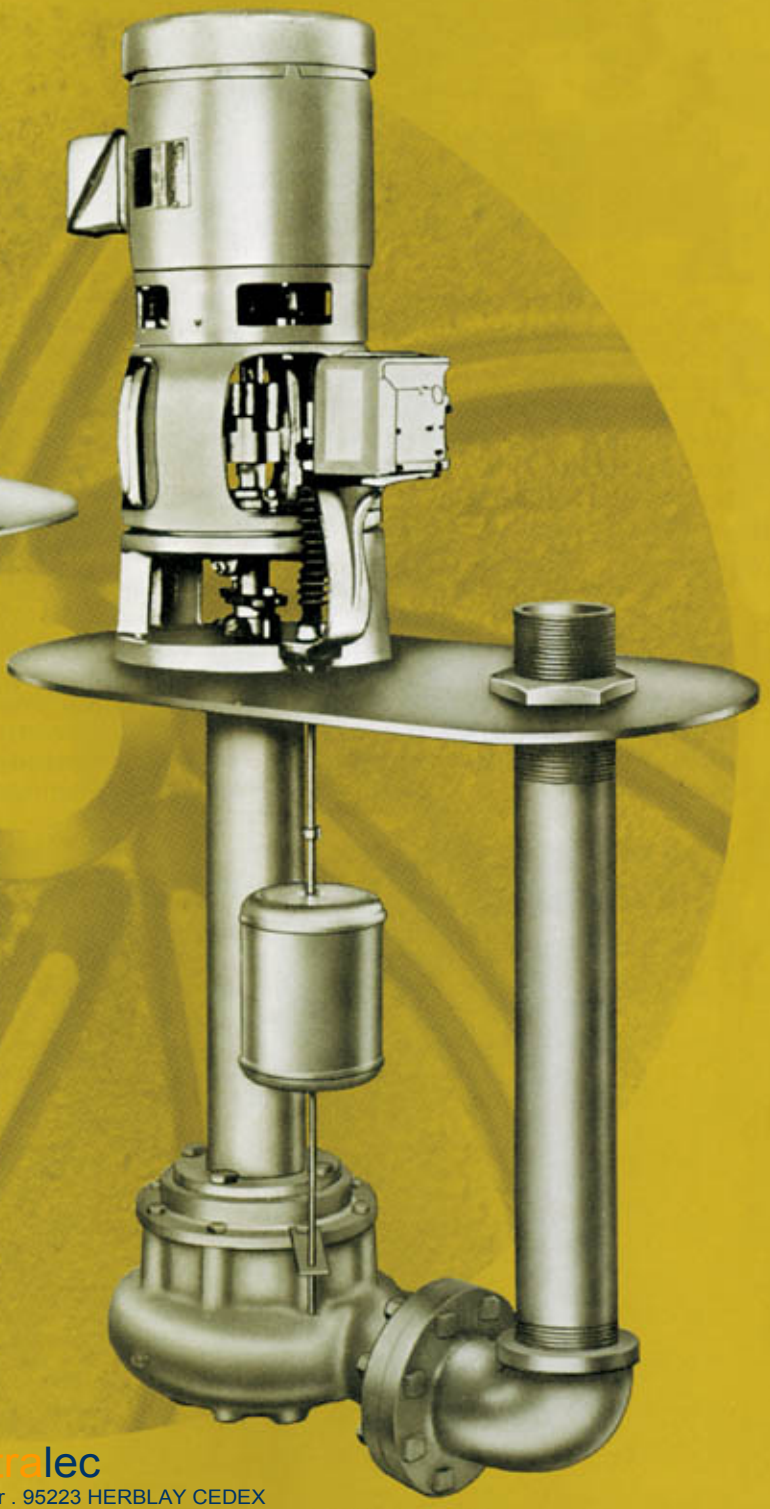
AURORA PUMP

BULLETIN 670/Rev. D

670 SERIES SINGLE STAGE VORTEX PUMPS

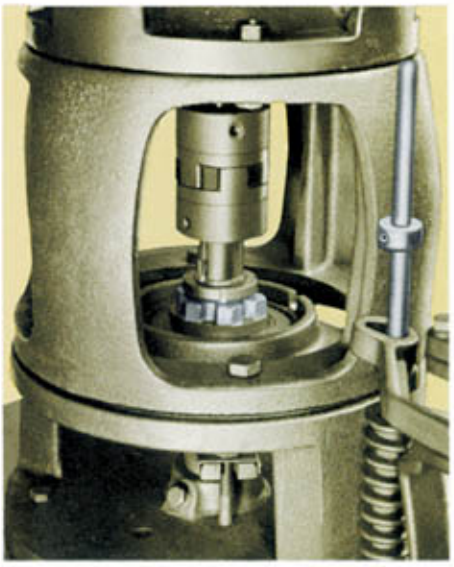
CAPACITIES TO 1025 G.P.M.
HEADS TO 160 FEET
TEMPERATURES TO 180°F.

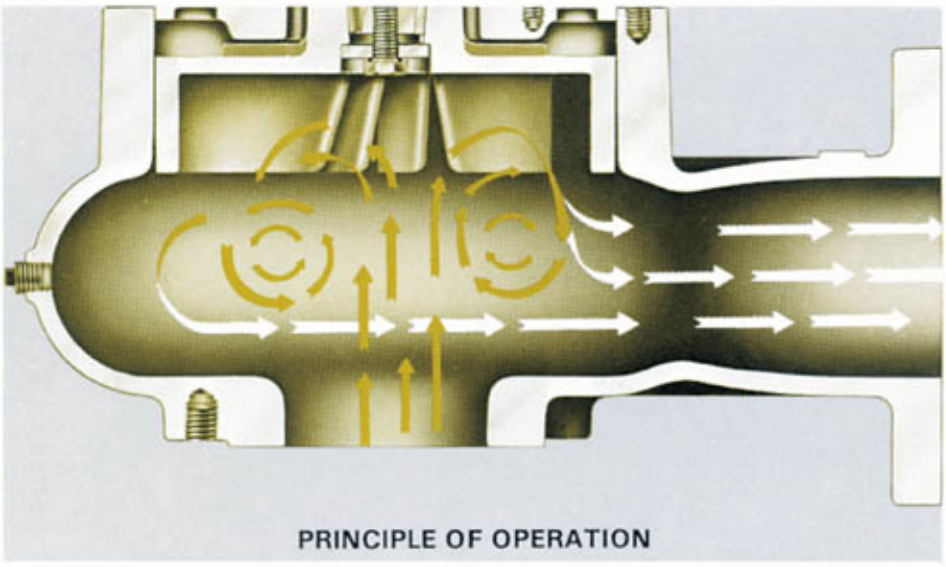
MODEL 672



MODEL 671

INTRODUCTION AND PRINCIPLE OF OPERATION VORTEX PUMPS





PRINCIPLE OF OPERATION

The application difficulties inherent in the pumping of heavy concentrations of solid materials are solved with the introduction of the Aurora Vortex Pump. The Vortex design is suited primarily to the pumping of sludge or slurry but may be readily applied to food processing and other diverse applications ranging from acetic acid to zinc sulphate. A 28% Hi-Chrome Iron is available for highly abrasive mixtures. This product coupled with a complete line of Aurora Non-Clog Pumps provides a single source availability unique in the centrifugal pump industry.

The Model 670 vertical wet pit pump operates on the vortex principle. The vortex action created by the impeller is similar to a hurricane in that the liquid upon entering the casing is constantly swirling. The majority of the liquid, as well as stringy material does not contact the impeller, but is caught up in the mainstream of the casing and by centrifugal force is discharged. The unique impeller design and the fact that the material pumped does not flow thru the impeller in a conventional manner requires special consideration of the specifying engineer.

1 MOTOR MOUNTING bracket that assures alignment of motor and pump shaft with tongue and groove machining. Motors are of standard "HP" manufacture.
2 THRUST BEARING is regreasable 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.
3 EXTERNAL IMPELLER ADJUSTMENT is accomplished with hexagon shaped adjusting nut using standard tools. A locking nut secures the adjustment.

QUICK REFERENCE 670 SERIES FEATURE SELECTOR

STANDARD

Standard fitted construction
Bronze pump bearings
Bronze line bearings (6'-6" settings and deeper)
Dynamically balanced impeller
Sphere size equals suction size
Elevated regreaseable thrust bearing
Grease lubricated pump and line bearings
Standard "HP" base motors
Carbon steel shaft
Packing box with split gland and lantern ring
Oval baseplate

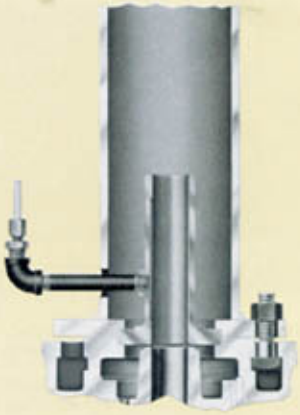
4" vent — 46" baseplate and larger
Plastic float and rod
Elevated float switch and support
External adjustment of impeller
Pump settings up to 21'-0"

OPTIONAL

Special alloy construction
Various pump and line bearing types
Drip oiler for line bearings
Solenoid oiler for line bearings
Stainless steel shaft
Round, square or special baseplate
Steel curb rings
Various float switch enclosures
Electric alternator
Stainless steel or bronze float and rod
High water alarm
Alarm bells
Float guard
4" vent — 28" baseplate and smaller
Flushing lines to sleeve bearings
Electric controllers
Gastight construction

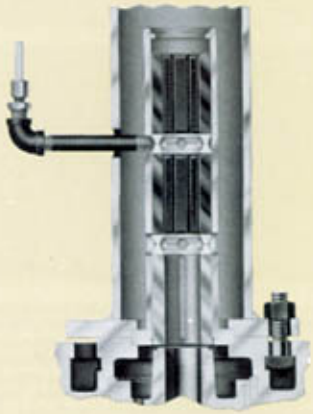
PUMP AND LINE BEARINGS

STANDARD



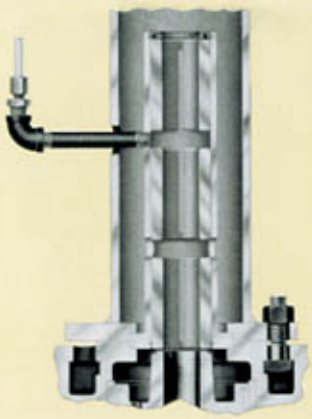
GRAPHITAR

CUTLESS RUBBER

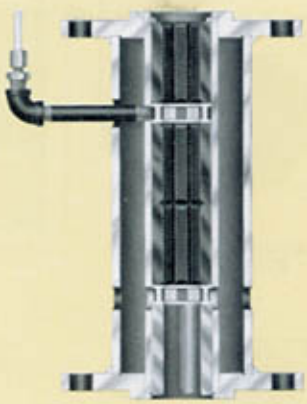


GLASS-FILLED TEFLON*

RELIEF



SPOOL



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 670 Series pumps (except for 10 foot and deeper settings at 1750 R.P.M.) 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 ni-resist material. When pumping conditions are severe, abrasives are present in the liquid or the liquid temperature exceeds 140°F., one of the following optional bearings should be selected.

GRAPHITAR (OPTIONAL BEARING)—The wearing surface of the graphitar bearing is made of non-metallic 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 R.P.M., 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.

*Teflon is a registered trademark of E.I. duPont

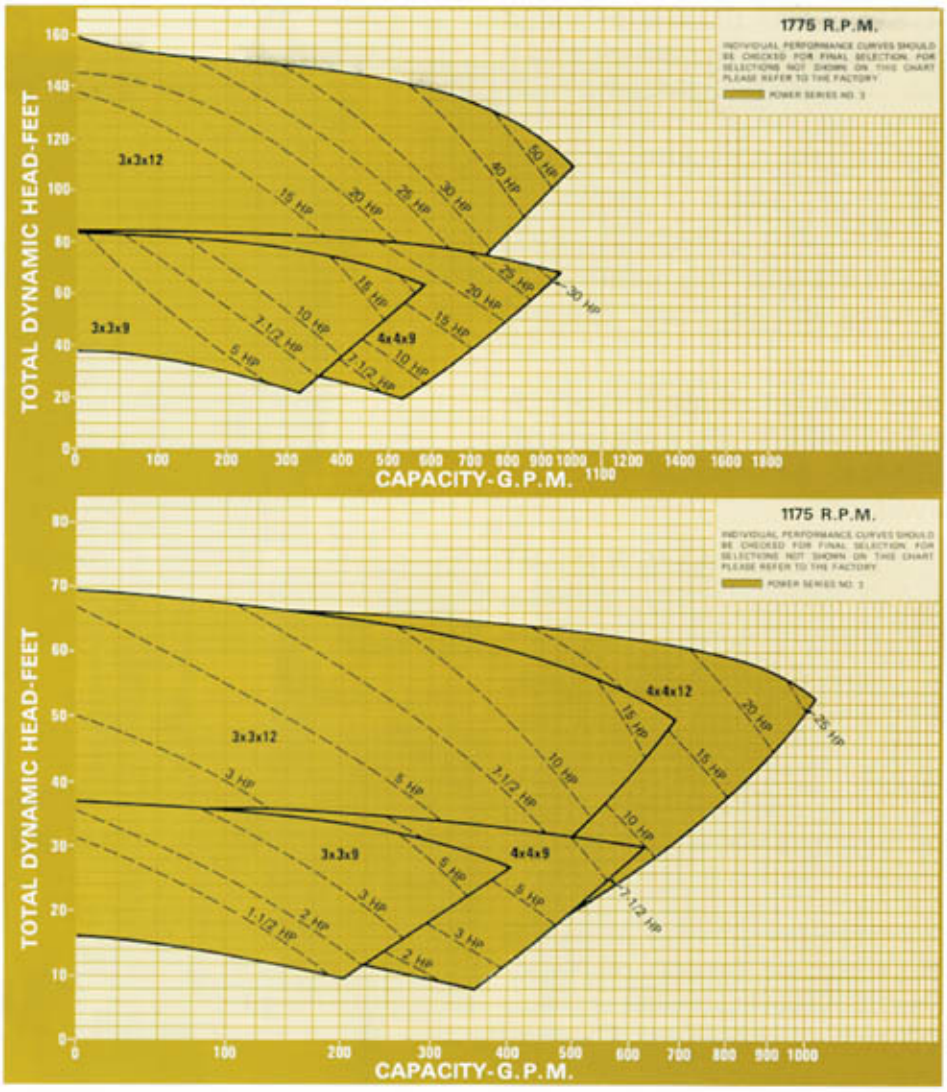
BEARING TYPE	PUMP CONSTRUCTION	BEARING HOUSING MATERIAL	BUSHING MATERIAL				
			IRON	BRONZE	CUTLESS RUBBER	GRAPHITAR	FILLED TEFLON
STANDARD BEARING FOR PIT DEPTHS UNDER 10'	BRONZE FITTED	BRONZE	NO BUSHINGS REQUIRED				
	ALL BRONZE	BRONZE					
	ALL IRON	IRON					
	STAINLESS STEEL	STAINLESS STEEL					X
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	X
	ALL BRONZE	BRONZE		X	X	X	X
	ALL IRON	STEEL	X		X	X	X
	STAINLESS STEEL	STAINLESS STEEL			X	X	X
OPTIONAL SPOOL BEARING	BRONZE FITTED	STEEL		X	X	X	X
	ALL IRON	STEEL	X		X	X	X
	STAINLESS STEEL	STAINLESS STEEL			X	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

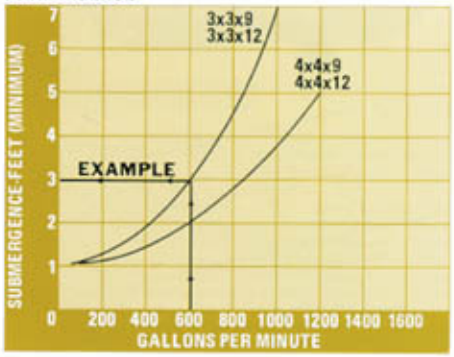
RANGE CHARTS AND ENGINEERING DETAILS

Air may be entrained in the pumped liquid if the pump suction is located too close to the free liquid surface in the suction source. Pumping liquid with entrained air can cause a reduction of capacity, vibration, loss of efficiency and wasted power. Excessive wear of close running parts, bearing stresses and shaft damage are also subsequent effects. If the capacity in gallons per minute and the suction inlet size or area is known, the minimum height of the liquid above the suction inlet (submergence) can be determined. A properly designed suction inlet and sump can be attained with the help of the submergence chart shown below.

EXAMPLE:
The recommended minimum submergence for a 3" x 3" x 9" Model 670 pump operating at 600 gallons per minute (G.P.M.), from water level to suction flange is 3 feet.



SUBMERGENCE



STANDARD 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	GRAPHITE IMPREGNATED 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 BRG.
7'-0"	6'-6"	1
12'-0"	11'-6"	2
17'-0"	16'-6"	3

PIT DEPTH OR PUMP SETTING (APPROX.)

LENGTH IN FT.		LENGTH IN FT.		LENGTH IN FT.	
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"

DESIGN DETAILS

AREA	DESCRIPTION	POWER SERIES 3
PUMP SHAFT	DIAMETER AT IMPELLER	1¼
	DIAMETER BETWEEN COUPLING AND IMPELLER	1 3/16
	DIAMETER AT COUPLING END	1¼
BEARINGS	BEARING (BALL) — HEAD	311
	BEARING (SLEEVE) — PUMP	6" LG.
SUPPORT PIPE SIZE		4"
POWER SERIES		3

LIMITATIONS

MAXIMUM LIMITATIONS BASED ON STANDARD MATERIALS AND PUMPING CLEAR WATER		
SPEED — R.P.M.		1750
MINIMUM HORSEPOWER	1750 R.P.M.	3
	1150 R.P.M.	1
TEMPERATURE °F.		180
BASIN PRESSURE — P.S.I.		2
BASIN COVER SIZE	MINIMUM W/O OVAL OR MANHOLE	28
	MAXIMUM W OR W/O OVAL OR MANHOLE	78

PUMP FEATURES

4 STUFFING BOX is provided as standard with packing and a split gland for gastight construction. A lantern ring is also available for packing lubrication.

5 STEEL OVAL BASEPLATE is standard and eliminates removing the pit cover for service.

6 ELEVATED FLOAT SWITCH ASSEMBLY is standard. Several enclosures are also available.

7 POSITIVE ALIGNMENT THROUGHOUT utilizes tongue and groove register fit design.

8 SUPPORT PIPE is 4" sch. 40.

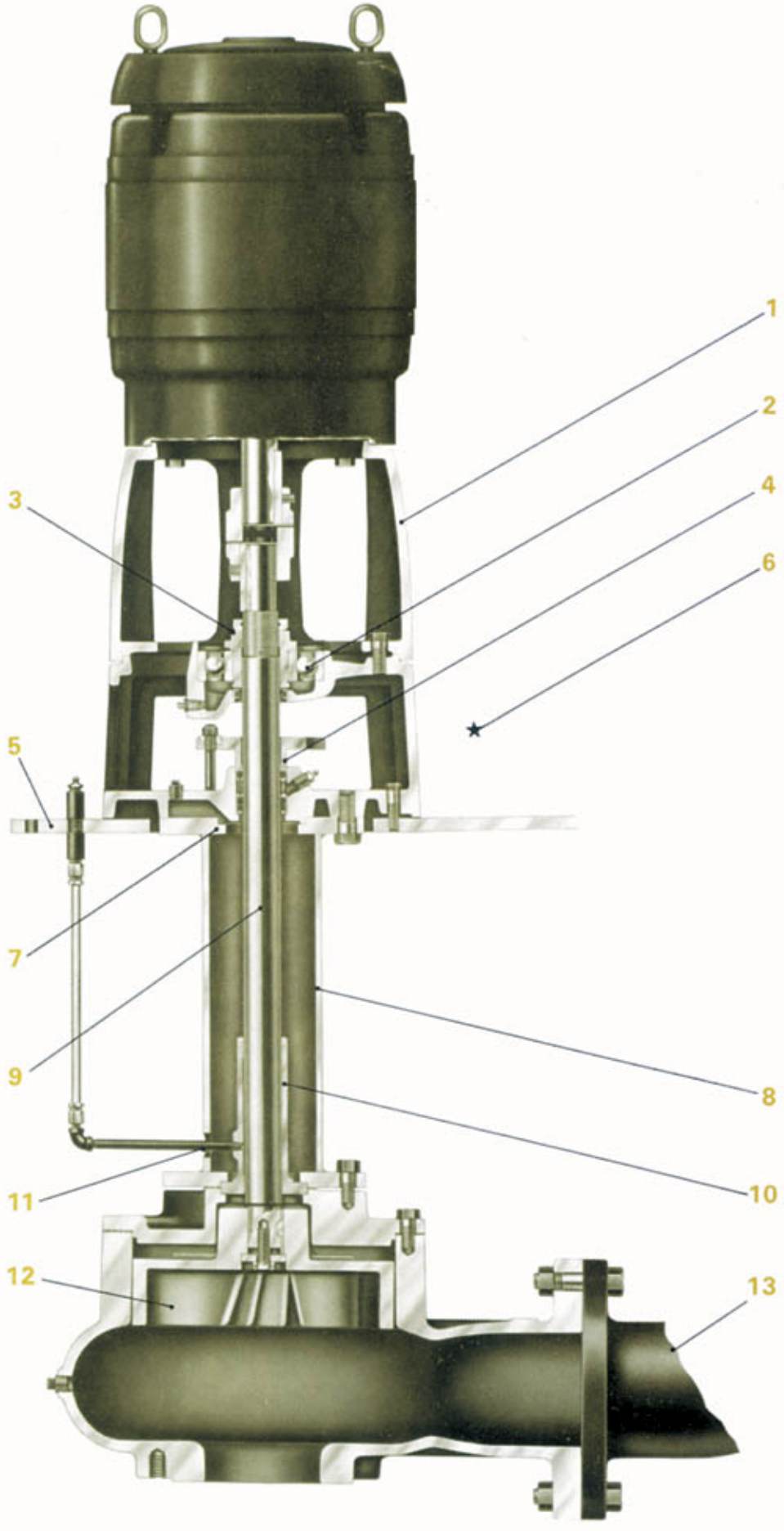
9 PUMP SHAFT that is 1-7/16" in diameter, is provided to minimize deflection. C1040 steel.

10 BEARING ASSEMBLIES available in several arrangements and materials to suit difficult applications. The line bearings are provided for pump settings of 6'-6" and longer. One bearing is provided for each additional 5' of setting. All standard line bearings are grease lubricated.

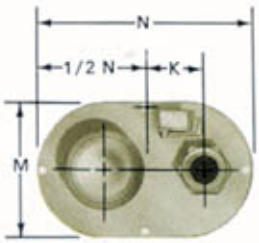
11 RELIEF HOLES prevent liquid under pressure from rising above the normal sump levels.

12 LIQUID END includes a totally recessed impeller as standard. The impeller is computer designed and dynamically balanced. Casing is concentric with all internal clearances larger or equal to the discharge opening.

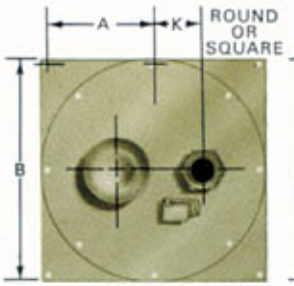
13 DISCHARGE PIPE is secured to the baseplate and is threaded for easy system piping. Below surface discharge is optional.



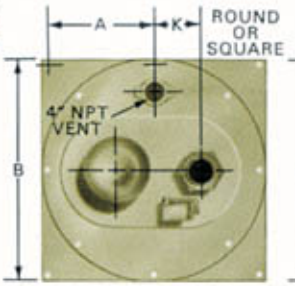
ENGINEERING SPECIFICATIONS AND DIMENSIONS



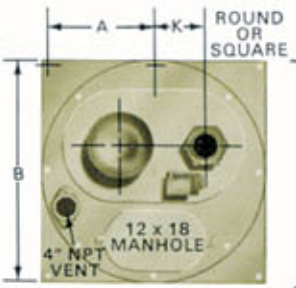
BASEPLATE — TYPE 1
STANDARD OVAL



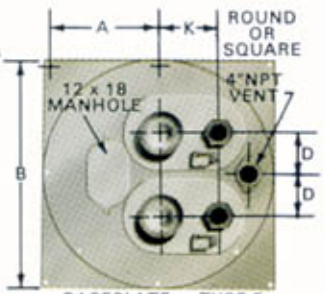
BASEPLATE — TYPE 2
OPTIONAL SIMPLEX
PLATE ONLY



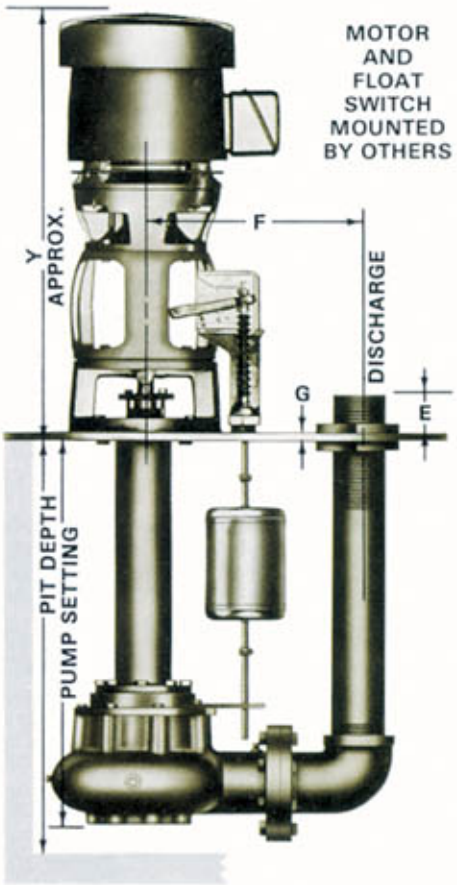
BASEPLATE — TYPE 3
OPTIONAL SIMPLEX
WITH OVAL



BASEPLATE — TYPE 4
OPTIONAL SIMPLEX
WITH OVAL & MANHOLE



BASEPLATE — TYPE 5
OPTIONAL DUPLEX
WITH OVALS & MANHOLE



NOTES:
1. Dimensions and weights are approximate.
2. All dimensions are in inches and may vary ± 1/2".
3. Frame sizes, "Y" dimension and motor weight are for open drip-proof motors only.
4. Conduit box is shown in approximate position. Dimensions are not specified as they vary with each motor manufacturer.
5. Add pump(s), base(s), upper head(s) and motor weight(s) for unit weight.
6. Not for construction purposes unless certified.
7. Motor H.P. will increase due to friction when multiple line shaft bearings are required.
8. Refer to factory for float suitability for liquids other than water.
9. Aurora Pump reserves the right to make revisions to its products and their specifications, and to this bulletin and related information, without notice.

BASEPLATE — OVAL — STEEL

NO.	TYPE	G	M	N	WGT.
2	22 x 28	½	22	28	63
3	26 x 36	½	26	36	95

BASEPLATES — ROUND OR SQUARE — STEEL

		TYPE 2				TYPE 4				TYPE 5			
A	B	OVAL NO.	G	WGT. RD.	WGT. SQ.	OVAL NO.	G	WGT. RD.	WGT. SQ.	OVAL NO.	G	WGT. RD.	WGT. SQ.
13	28	N.A.	½	41	54								
16	34	N.A.	½	58	76								
TYPE 3													
22	46	2	½	225	289	3	½	235	299				
25½	53	2	½	302	387	3	½	312	397				
29	60	2	¾	487	623	3	¾	497	633				
32	66	2	¾	592	755	3	¾	603	765	3	¾	730	927
38	78	2	¾	832	1060	3	¾	842	1070	3	¾	1016	1290

MOTOR

FRAME	HORSEPOWER 1750	HORSEPOWER 1150	MOTOR WGT (LBS)	UPPER HEAD WGT (LBS)	Y APPROX
143 HP	1	¾	40	21	25
145 HP	1½ 2	1	45	21	26
182 HP	3	1½ 2	72	21	27
184 HP	5	2	80	21	28
213 HP	7½	3	130	21	30
215 HP	10	5	145	21	32
254 HP	15	7½	220	21	34
256 HP	20	10	240	21	36
284 HPH	25	15	330	42	39
286 HPH	30	—	370	42	40
324 HP	40	—	475	42	41
326 HP	50	—	525	42	43
364 HP	60	—	630	42	48
365 HP	75	—	690	42	48

PUMP SIZE			PUMP WGT. IN LBS.		MINIMUM BASEPLATE SIZE											
DISCHARGE	SUCTION	CASE BORE	6'-0" SETTING	FOR EA. ADD. 1' SETTING	D	E	F	TYPE 1 SIZE	TYPE 1 K	TYPE 2 SIZE	TYPE 2 K	*TYPE 3 SIZE	*TYPE 3 K	*TYPE 4 SIZE	*TYPE 4 K	**TYPE 5 SIZE	**TYPE 5 K
3	3	9	452	30	10½	6½	14⅞	22x28	9⅜	28	9⅜	46	9⅜	46	9⅜	66	9⅜
4	4	9	527	30	10½	6	17	26x36	9	34	9	46	9	46	9	66	9
3	3	12	489	30	11½	6½	17⅞	26x36	9⅜	34	9⅜	46	9⅜	46	9⅜	66	9⅜
4	4	12	557	30	11½	6	19	26x36	11	34	11	46	11	46	11	66	11

*All Bases 46" and larger — use 26x36 oval only. **All bases 66" and larger — use 26x36 oval only.

The contractor shall furnish (and install as shown on the plans) Aurora Model (671 Simplex) (672 Duplex) centrifugal sewage pumps size . . . x . . . x . . . of (stand fitted) (all iron) construction. Each pump shall have a capacity of . . . G.P.M. at . . . ft. total head, with a temperature of . . . °F., . . . specific gravity. The unit shall be designed for a sump depth . . . feet and shall be furnished with an (above the floor discharge terminating at the baseplate) (below the floor discharge terminating with a 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. A 4" vent will be provided on all round or square baseplates*. The pump casing will be constructed of "CLASS 30 CAST IRON". The impeller is to be "CLASS 30 CAST IRON" and shall be capable of passing a maximum sphere size of . . . inches. The impeller shall be dynamically balanced before assembly into the pump and shall be securely fastened to the shaft by means of a steel key and impeller lock nut. The column pipe must be 4" diameter having machined tongue and grooved joints to insure shaft alignment. A pump bearing will be located directly above the impeller and shall be (bronze sleeve) (iron sleeve) (stainless steel sleeve) or relief type with (iron) (bronze) (cutless rubber) (graphitar) (filled teflon*) bushing. Spool bearing with (steel) (stainless steel) housing with (iron) (bronze) (cutless rubber) (graphitar) (filled teflon*) bushing. Line bearings must be provided with a setting of 6'-6" and one bearing for each additional 5' of setting thereafter. All standard sleeve or relief pump and line bearings must be (grease) (oil) (water) lubricated through separate Nylon tube lubrication lines terminating at the (baseplate) (discharge pipe). Standard bearings will be grease lubricated (unless otherwise specified). 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 will be arranged to allow external axial adjustment of the shaft and impeller. Grease seals shall be provided to retain grease and to prevent contamination of the vertically 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 and explosion resisting) (explosion proof) type float operated switch 6" above the baseplate with plastic 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 driven by a flexible coupled std. . . . H.P., . . . volt, . . . Hertz, . . . R.P.M., vertical motor. *Teflon is a registered trademark of E.I. duPont

NOTE: Aurora Pump reserves the right to make revisions to its products and their specifications, and to this bulletin and related information without notice.

AURORA PUMP
A MEMBER OF THE PENTAIR PUMP GROUP
MARKETING & SALES: 800 AIRPORT ROAD • NORTH AURORA, ILLINOIS USA • 60542
PHONE: (630) 859-7000 USA/CANADA FAX: (630) 859-7060 INTERNATIONAL FAX: (630) 859-1226
AURORA MFG. PLANT: 800 AIRPORT ROAD • NORTH AURORA, ILLINOIS USA • 60542
HYDROMATIC MFG. PLANT: 1840 BANEY ROAD • ASHLAND, OHIO USA • 44805
PHONE: (419) 289-3042 FAX: (419) 289-9574
SALES OFFICES IN ALL MAJOR CITIES AND COUNTRIES
Refer to "Pumps" in the yellow pages of your phone directory for your local Distributor