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AURORA PUMP

BULLETIN 640/Rev. J

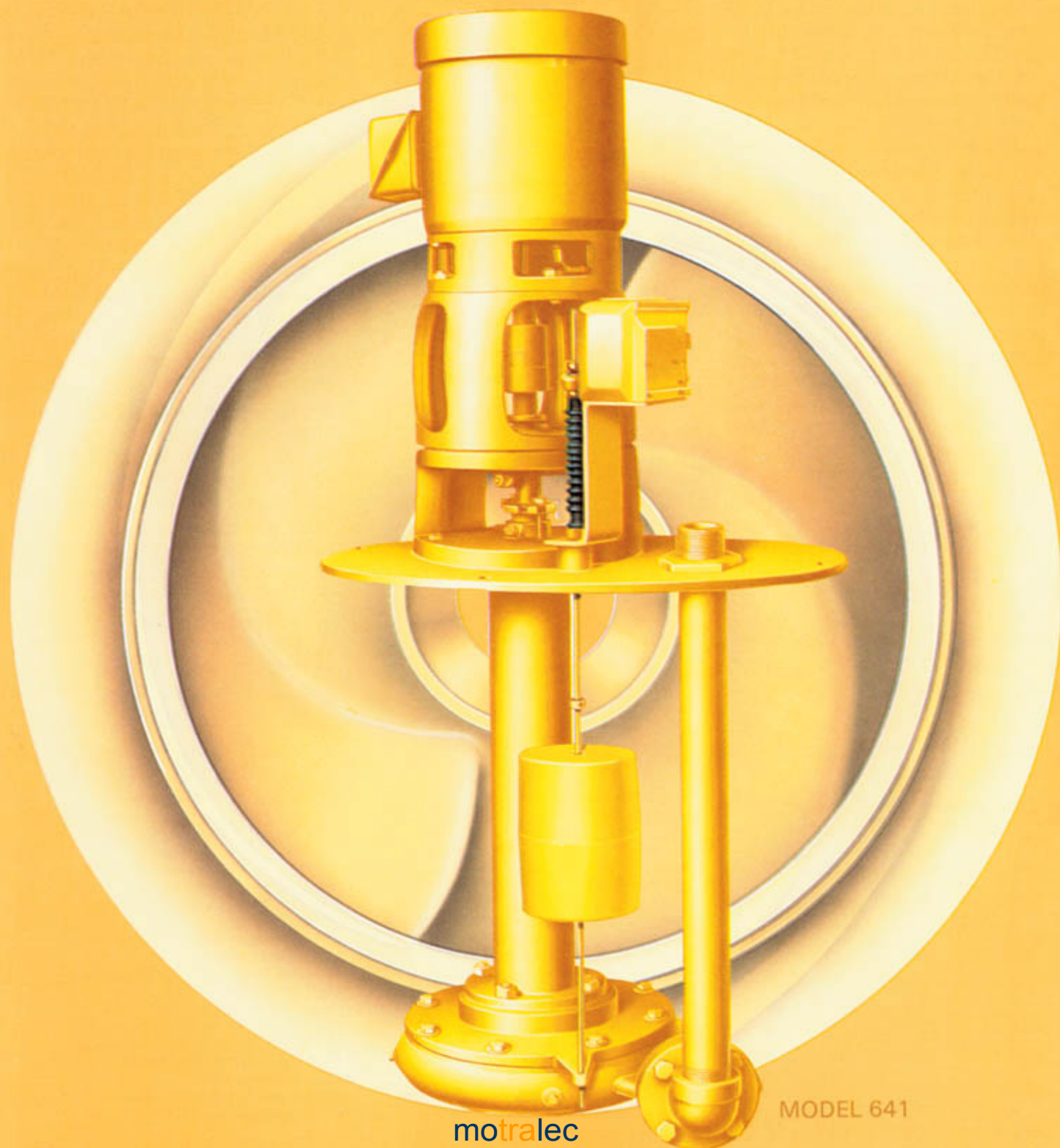
640 SERIES SINGLE STAGE SEWAGE PUMPS—"KSS"

CAPACITIES TO 350 G.P.M.

HEADS TO 90 FEET

TEMPERATURES TO 180°F.

DISCHARGE SIZES 2" THRU 4"



MODEL 641

motralec

4 rue Lavoisier . ZA Lavoisier . 95223 HERBLAY CEDEX

Tel. : 01.39.97.65.10 / Fax. : 01.39.97.68.48

Demande de prix / e-mail : service-commercial@motralec.com

www.motralec.com

INTRODUCTION AURORA 640 SERIES PUMPS

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 non-clog pumps as our solution to your sewage pumping problems. Contact your Aurora Pump representative for added details.

1 MOTOR MOUNTING bracket that assures alignment of motor and pump shaft with tongue and groove machining. Motors are of standard "HP" manufacture. **2 EXTERNAL IMPELLER ADJUSTMENT** is accomplished with hexagon shaped adjusting nut. A lock nut secures the bearing collar to the shaft. **3 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. **4 STUFFING BOX** is furnished with packing and a split gland for gastight construction. A lantern ring is also optionally available for packing lubrication. **5 ELEVATED FLOAT SWITCH ASSEMBLY** is standard. Several enclosures are available. Refer to page 6 for additional details. **6 STEEL OVAL BASEPLATE** is standard and eliminates removing the complete cover plate. **7 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. **8 PUMPSHAFT** 1-3/16" in diameter is provided to minimize deflection and bearing wear. **9 POSITIVE ALIGNMENT THROUGHOUT** utilizes tongue and groove registered design. **10 LIQUID END** includes a non-clog impeller that passes up to 3" spheres depending on pump size. **11 DISCHARGE PIPE** is securely locked to the baseplate. The pipe end is threaded for easy system piping. A below surface discharge is optionally available.

QUICK REFERENCE 640 SERIES FEATURE SELECTOR

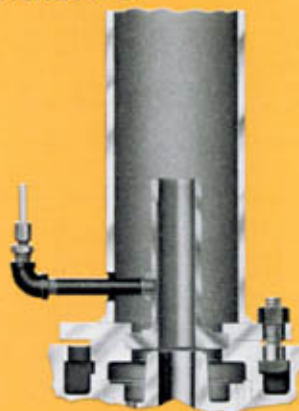
STANDARD

Bronze fitted construction
Bronze pump bearings
Bronze line bearings (6'-2" settings and deeper)
Dynamically balanced non-clog 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 & 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'-8"

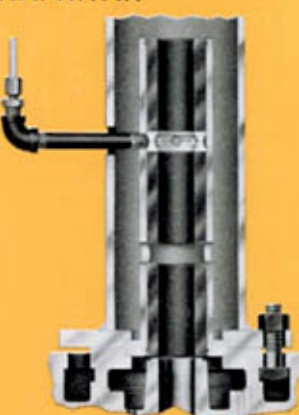
OPTIONAL

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"

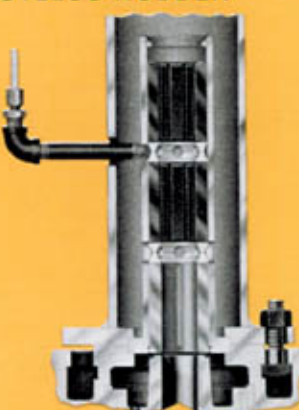
STANDARD



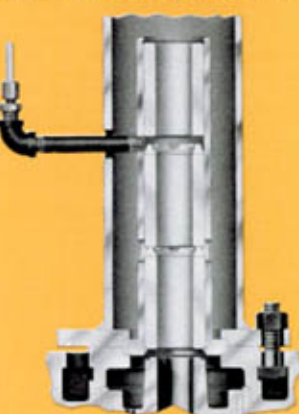
GRAPHITAR



CUTLESS RUBBER



GLASS-FILLED TEFLON*



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 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., specify one of the following optional bearings.

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.**

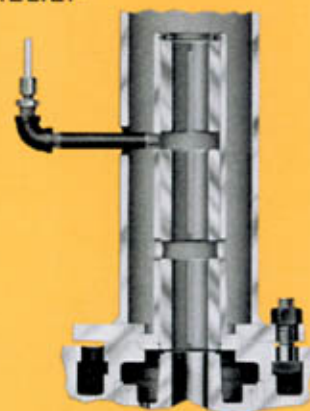
CUTLESS RUBBER (OPTIONAL BEARING)—This bearing consists of a metal relief-type bearing housing and two cutless rubber bushings. A third bushing located at the bottom of the bearing housing is made of metal. Lubrication can be supplied by the liquid being pumped when used as a pump bearing. When used 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.

RELIEF



SPOOL



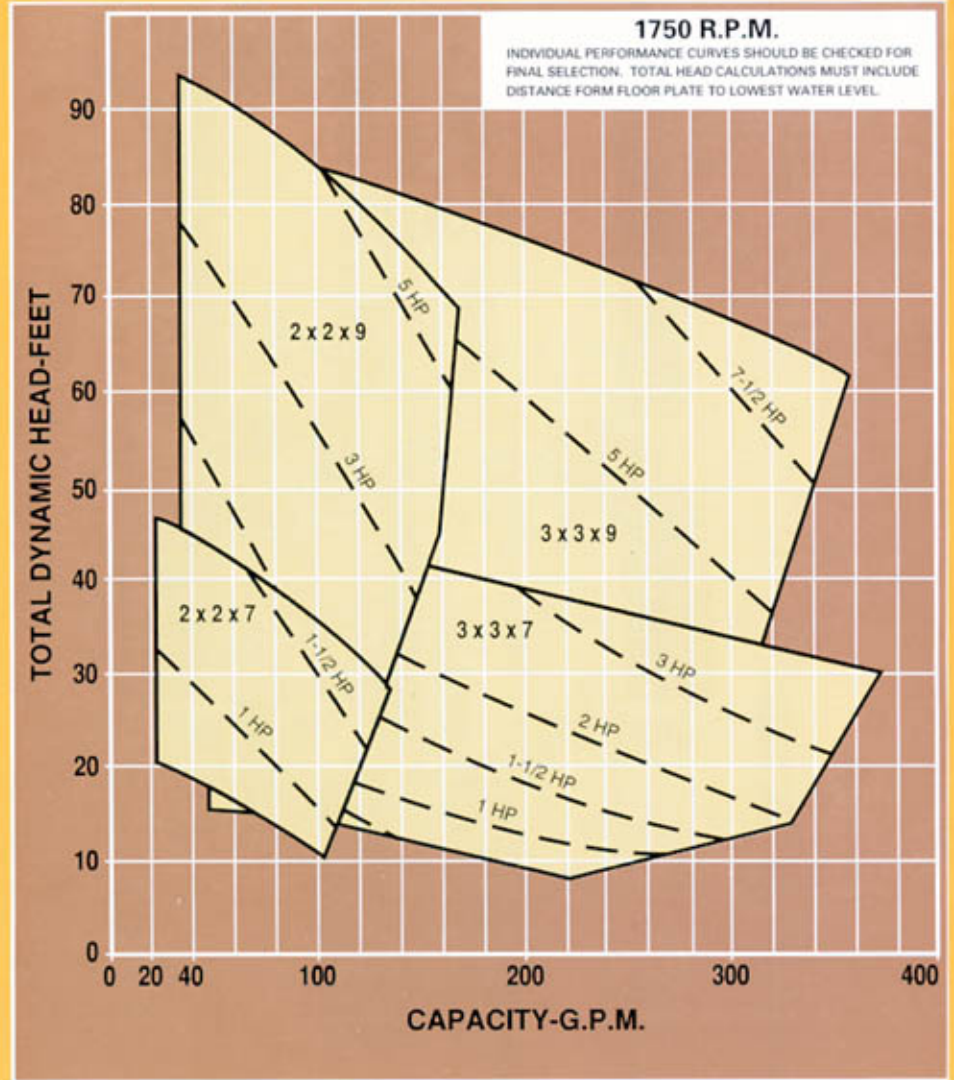
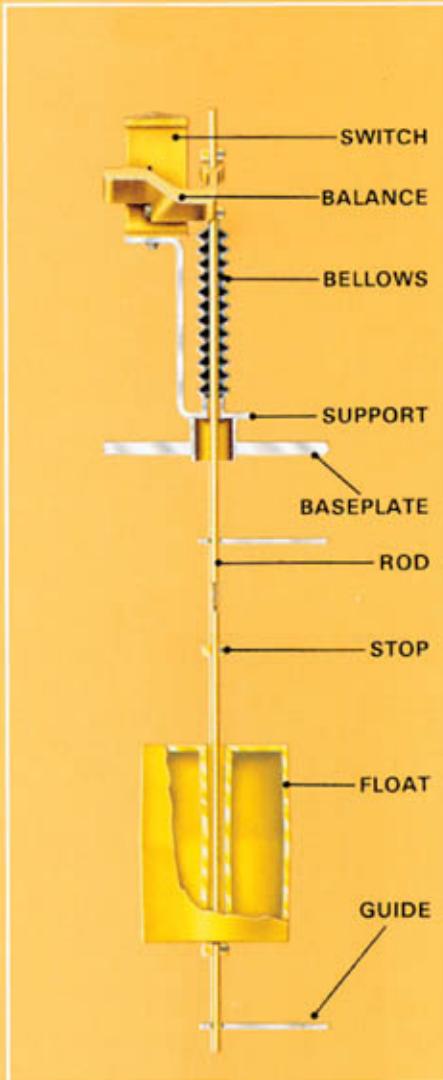
MATERIALS OF CONSTRUCTION

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	X
	ALL BRONZE	BRONZE	X	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	X
	ALL IRON	STEEL	X		X	X	X
	STAINLESS STEEL	STAINLESS STEEL			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 (3)	WATER FLUSH	

(1) OIL—FOR LINE SHAFT BEARINGS ONLY
(2) WATER FLUSH—RELIEF HOUSING ONLY

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

RANGE CHART AND ENGINEERING DETAILS



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

PIT DEPTH OR PUMP SETTING

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"

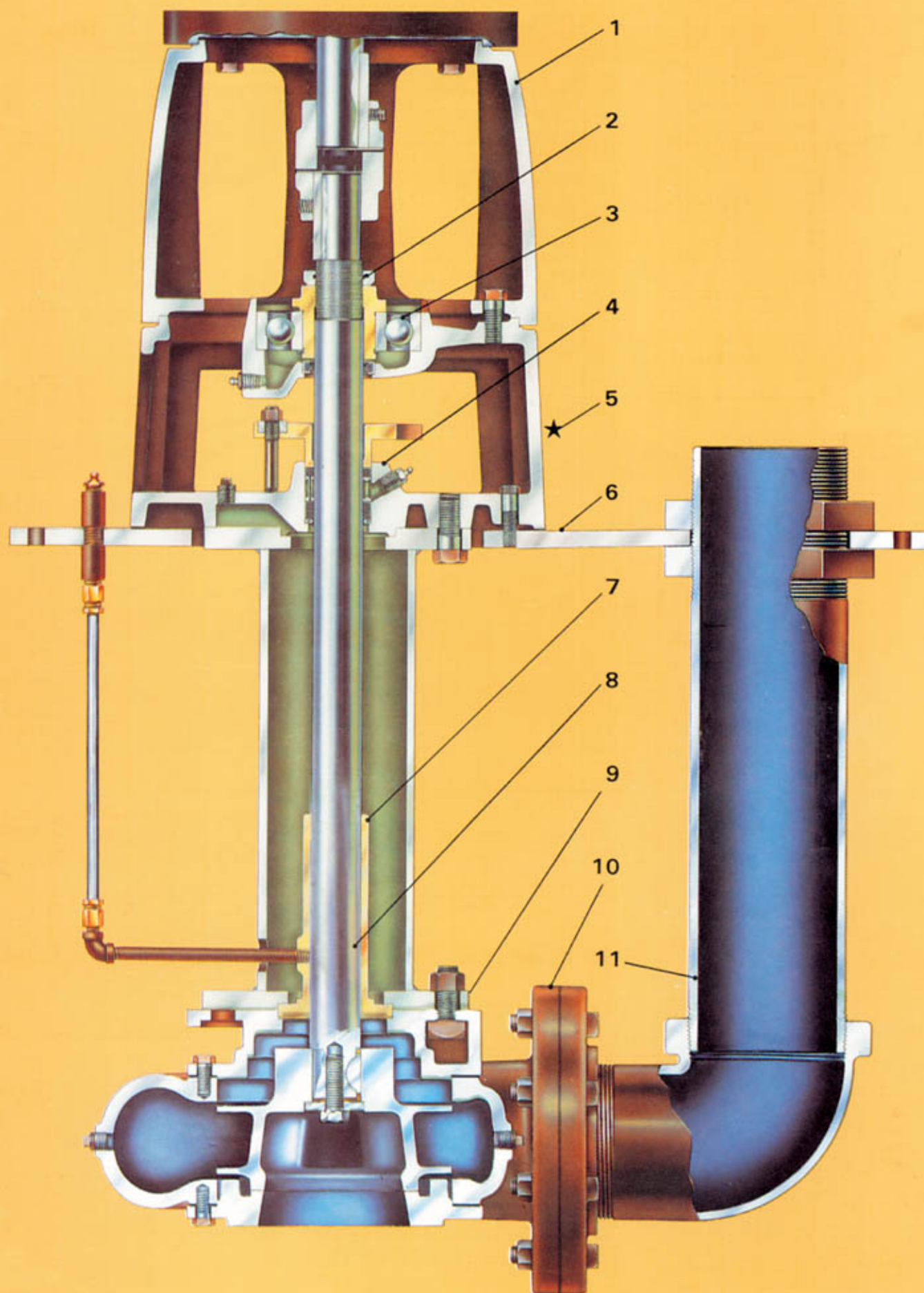
DESIGN DETAILS

AREA	DESCRIPTION	POWER SERIES 3
PUMP SHAFT	DIAMETER AT IMPELLER	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"

LIMITATIONS

MAXIMUM LIMITATIONS BASED ON STANDARD MATERIALS AND PUMPING CLEAR WATER		
SPEED — R.P.M.		1750
MAXIMUM HORSEPOWER	1750 R.P.M.	10
	1150 R.P.M.	5
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



ENGINEERING SPECIFICATIONS AND DIMENSIONS

AREA	DESCRIPTION	DIM.	LIMITATIONS								
PUMP SHAFT	ROTATION FROM DRIVER END	CW	MAX. BASIN PRESS.	MAX. STD. PIT DEPTH	MAX. SOLID HAND. SIZE	MAX. TEMP	MAX. MOTOR SPEED	MIN. MOTOR SIZE		MAX. COVER SIZE	
	DIAMETER AT IMPELLER	7/8						1750 RPM	1150 RPM	RD. OR SQ.	
	DIAMETER BETWEEN COUPLING & IMPELLER	1-3/16									
	DIAMETER AT COUPLING END	1									
	BALL BEARING HEAD	311									
	SLEEVE BEARING PUMP	6" LG.									
	SUPPORT PIPE SIZE	2-1/2						ALL LIMITATIONS GIVEN ARE FOR WATER.			
	POWER SERIES	1									

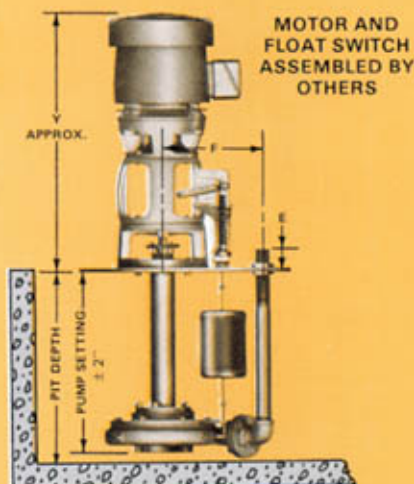
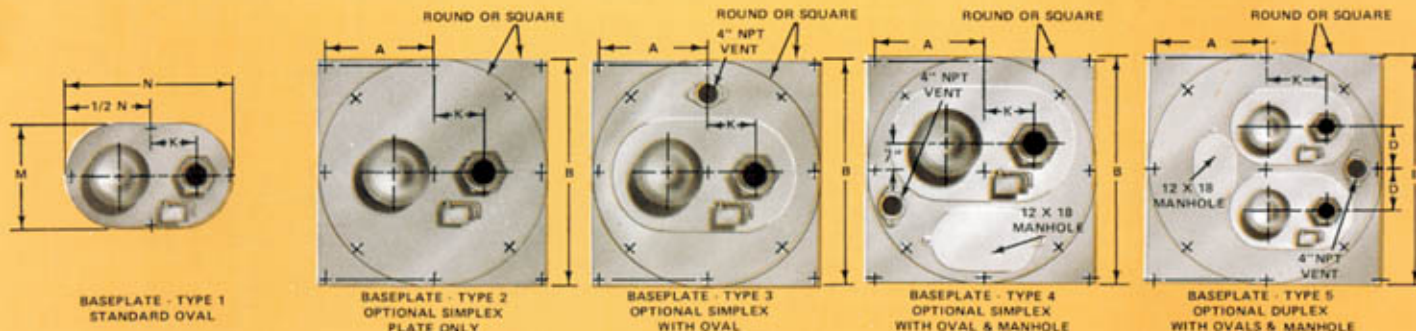
NOTES:

1. All 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".

*3x3x7 and 3x3x9 pump not available on 20x24 oval.

OVER

OVER NO.	SIZE	WEIGHT (LBS.)	M	N
1	20 x 24*	34	20	24
2	22 x 28	63	22	28



PUMP SIZE		SPHERE SIZES	PUMP WGT. (LBS.)		E	F	D DU- PLEX	K OVAL	K SIM- PLEX	K DU- PLEX
DIS- CHARGE	CASE BORE		2'0" PIT DEPTH	EACH ADD'L 6" OF PIT DEPTH						
2	7	1½	191	16	4½	9½	10½	6½	6½	9½
2	9	1½	222	18	4½	10½	10½	8½	8½	10½
3	7	2½	223	25	4½	11½	11½	6½	9½	8½
3	9	2	258	25	4½	13½	11½	7½	10½	10½

MOTOR				STEEL BASEPLATES — ROUND OR SQUARE											
FRAME	HORSE- POWER		MOTOR WGT. (LBS.)	Y APPROX.	A	B	TYPE 2		TYPE 3		TYPE 4		TYPE 5		
	1750 RPM	1150 RPM					WGT.		WGT.		WGT.		WGT.		
							RD	SQ	RD	SQ	RD	SQ	RD	SQ	
143 HP	1	¾	40	25	11	24	41	54							
145 HP	1½-2	1	45	26	13	28	58	76							
182 HP	3	1½	72	27	16	34			1	89	115				
184 HP	5	2	80	28	19	40			2	126	163	1	136	173	
213 HP	7½	3	130	30	22	46			2	225	289	2	235	299	
215 HP	10	5	145	32	25½	53			2	302	387	2	312	397	
					29	60			2	487	623	2	497	633	
					32	66			2	592	755	2	602	765	
					38	78			2	832	1060	2	842	1070	
												2	1016	1290	

The contractor shall furnish (and install as shown on the plans) Aurora Model (641 Simplex) (642 Duplex) front or back pull out centrifugal non-clog pumps size 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) non-clog type and shall be capable of passing a diameter sphere. Optional wearing 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 insure 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 gas tight 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) (water tight) (explosion resisting) (explosion proof) type float operated switch 6" above the baseplate with fiberglass reinforced float and float rod. A flexible bellows will provide gas tight 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" horsepower, volt, Hertz, RPM vertical electric open drip-proof motor.

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

— Your Authorized Local Distributor —

motralec

4 rue Lavoisier . ZA Lavoisier . 95223 HERBLAY CEDEX

Tel. : 01.39.97.65.10 / Fax. : 01.39.97.68.48

Demande de prix / e-mail : service-commercial@motralec.com

www.motralec.com

WEMM



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AURORA
Pentair Pump Group

MARKETING & SALES:

800 AIRPORT ROAD • NORTH AURORA, ILLINOIS U.S.A. • 60542
PHONE: (630) 859-7000 U.S.A./CANADA FAX: (630) 859-7060
WORLDWIDE FAX: (630) 859-1226

WEB: www.aurorapump.com
EMAIL: aurora_info@pentairpump.com

AURORA MFG. PLANT:
800 AIRPORT ROAD • NORTH AURORA, ILLINOIS U.S.A. • 60542

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