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Large Sump or Drainage Pumps

General

Furnish and install, as shown on the plans _____ Deming Fig. 4500 Series Heavy Duty Vertical Sump Pumps, each pump to be capable of pumping _____ GPM when operating against a total pumping head of _____ feet at temperature, specific gravity and viscosity indicated. Each pump shall operate at _____ RPM and shall have _____ percent efficiency at the design point. Shut-off head shall be not less than _____ feet. Pump shall be (clockwise)(counter-clockwise) rotation when viewed from the driver. The unit shall be designed for installation in a sump _____ feet deep and furnished with (above)(below) plate discharged of size indicated.

Construction Details

The pump liquid end including casing, impeller, suction head, strainer and bearing housing shall be of cast iron having minimum tensile strength of 30,000 lbs. Impeller shall be semi-open type secured to shaft with key, washer and lock nut and shall be fully adjustable, without dismantling the pump, by means of an adjusting nut located above the thrust bearing in the motor support. Flanged column pipe shall be full weight steel pipe with a machined register fit at all assembly points to assure concentric alignment. Pump shaft shall be of a high grade carbon steel of sufficient size to transmit required horsepower.

Replaceable shaft guide bearings, of material suitable for the liquid being pumped, shall be contained in precision machined bearing housings; flanged for machined register fit in column pipe flanges and spaced on recommended bearing centers, but not to exceed 5-foot centers. Bottom bearing assembly shall include choker ring. Suitable lubrication shall be provided to each shaft guide bearing. Cast iron motor support, mounted on heavy steel support plate, shall align the motor with column pipe and shafting. High capacity ball thrust bearing, in waterproof housing, shall be mounted in the motor support. Bearing shall be grease lubricated with provision for purging old grease from bearing housing.

The pump assembly shall include a heavy steel support plate _____ inches diameter, for mounting on a pit _____ inches diameter. Pump discharge pipe shall extend above the plate and shall be supported from the plate by two lock nuts. Duplex pump sump cover shall include a manhole 11 x 15 inches, or larger with cover and with _____ inch (flanged)(threaded) vent connection.

Control

For single pump, a suitable float switch shall be mounted on support plate and shall be operated by a guided copper plated float. Switch shall operate motor directly or with starter, as required.

For duplex pumps, supply mechanical or electric alternator and control which will alternate the normal operation of the two pumps, operate both pumps simultaneous, if required, and provide standby control should one pump become inoperative.

Motor

The motor shall be not less than _____ hp _____ RPM, NEMA design B squirrel cage type, (drip proof)(TEFC) (EISA)(premium) efficiency motor with (1.15)(1.0) service factor and suitable for operation on (115)(230) volt, 1 phase, (50)(60) Hertz power supply OR (200)(230)(460)(575) volt, 3 phase, 60 hertz power supply. Motor size shall be sufficient to prevent overloading at operating conditions or at the lowest listed head conditions, whichever point requires greater horsepower. Following installation, grouting and connection of all piping, pump and motor must be checked for alignment in accordance with standards of the Hydraulic Institute.

Large Sump or Drainage Pumps

The proper selection of guide bearing assembly, column closure and shaft material is essential for the successful operation of Vertical Sump and Process Pumps, due to the variety of liquids that may be encountered at the point of installation.

DEMING offers a wide choice of bearing construction and shaft materials to meet requirements of most installations. Listed below are recommendations for the proper selection of these important items.

BEARING SELECTION
Maximum Recommended Operating Temperature 400°F

Type of Service	Typical Application	Bearing Material	Max. Liquid Temp °F	BHN	Recommended Lubrication			Abrasion Resistance of Bearing when used in Bearing Assembly Indicated		
					Clean Liquid (1)	Grease (2)	Dry (3)	Fair	Good	Best
General	Furnished on Standard Fitted and Bronze Fitted Pumps	Bronze	180°	57/64	NR	R	NR	6 & 8	11	NR
Clean Liquids	Cold or Hot Water, Sea Water, Cleaning Fluids, Gasoline, Kerosene, Jet Fuels	Babbit-Graphite*	300°	19	R	NR	R	NR	NR	NR
Acids (clean)	Most Acids - Max., 60% Sulfuric	Carbolube*	400°	237	R	NR	R	6 & 8	11	NR
	Most Acids - Max., 100% Sulfuric	Nickel Graphite*	400°	--	R	NR	R	NR	NR	NR
Alkaline Caustic	Sodium Hydroxide, etc. Standard on All Iron Pumps	Class 30 Cast Iron	180°	160	NR	R	NR	6 & 8	11	NR
Chemical	General Service with most clean Acids and Solvents	Teflon *	350°	--	R	R	NR	10	NR	NR
Mild Abrasive	General Service with Compatible Liquids	Cast Iron	180°	180	NR	R	NR	NR	6 & 8	11
General Abrasives	Used in Compatible Liquids except Concentrated Acids and Solvents	Rubber * (Buna)	150°	--	R	NR	NR	NR	NR	12
Molten Sulphur	Used as bottom bearing with Carbolube Intermediate Bearing	Babbit-Graphite*	360°	220	NR	NR	R	NR	NR	6
Nuclear	Demineralized Water	Nickel Graphite *	400°	--	R	NR	R	6 & 8	11	NR

(*) Requires Type 416, Carp. 20 or 316 Stainless Steel Shaft.

R - Recommended

NR - Not Recommended

Important! - Pump Should be Minimum 1 HP.

- Note:** (1) Clean liquid flush to bearing requires approx. ½ gpm per bearing at pressure equal to or greater than ½ of the pump discharge pressure. Solenoid valve is required.
 (2) Standard grease lubricated pump includes grease fitting on lube line to each bearing assembly. Spring loaded grease cup optional when specified.
 (3) Bearings indicated for dry lubrication are lubricated by the liquid being pumped.
 (4) Add ½ hp per Intermediate Bearing.

RECOMMENDED SHAFT MATERIALS

Listed below is general recommendation of shaft materials for various types of chemical service

Shaft Material	Brinell Hardness	Application
4140 SAE Steel	163	General Service - Furnished in standard fitted pumps
416 Stainless Steel	207 - 241	General Service in mild acids and chloride solutions
316 Stainless Steel	135 - 185	Industrial chemicals, solvents, chlorides, brines and most acids
Carp. 20 Stainless Steel	160	Most active acids except those requiring Hastelloy or other metals

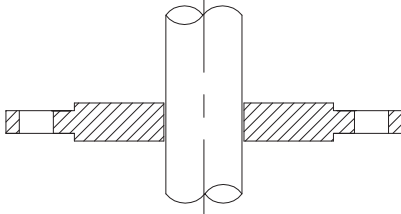
For specific applications, contact Factory with full information.

Large Sump or Drainage Pumps

STANDARD SHAFT GUIDE BEARING ASSEMBLIES

For standard drainage service - non-corrosive liquids without abrasives or vapors.

DESIGN 1 - TOP

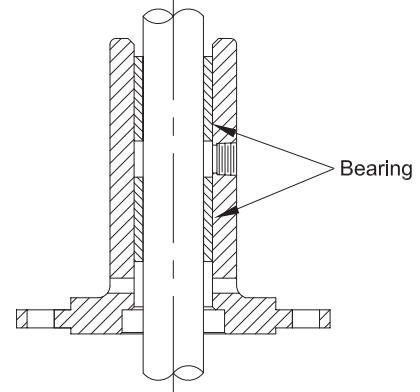


Design 1 is the standard cast iron column top closure. On Standard Fitted and All Iron pumps, it is of Fianite material. On alloy pumps, it will be of the same material as the liquid end parts

Normally furnished with pressurized grease lubrication with bearings of Bronze or Cast Iron.

For pressurized liquid lubrication, specify Babbit-Graphite, Nickel Graphite or Carbolube bearing material. If liquid being pumped is compatible, it may be used to lubricate the bearing.

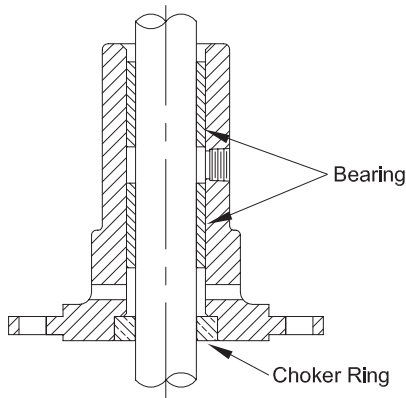
DESIGN 8 - INTERMEDIATE



Design 8 is the standard intermediate shaft guide bearing assembly including two guide bearings of the material as selected. Used where pit depth is greater than 6 ft. For pressurized grease lubrication, specify bearings of Bronze or Cast Iron.

For pressurized liquid lubrication, specify Babbit-Graphite, Nickel Graphite or Carbolube bearing material. If liquid being pumped is compatible, it may be used to lubricate the bearing.

DESIGN 6 - BOTTOM



Design 6 is the standard bottom shaft guide bearing assembly with choker ring and two guide bearings of the material selected.

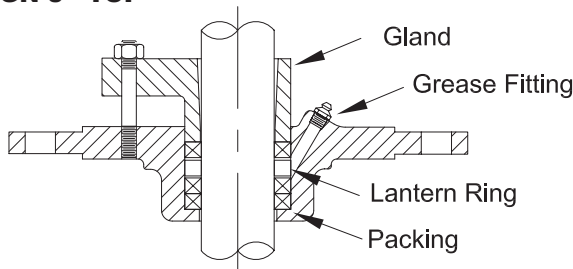
FOR SPECIAL APPLICATIONS

When pumping abrasive, corrosive or hot liquids, the standard construction as shown above must be modified to meet the

requirements of the particular installation. Shown below are recommendations for specific applications.

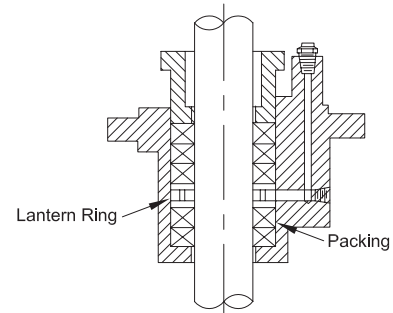
ALTERNATE TOP COLUMN CLOSURE

DESIGN 3 - TOP



Design 3 top closure is used instead of Design #1 and is recommended to seal the shaft when gas or obnoxious vapors are present in the liquid. Includes three rings of packing and lantern ring. May be grease lubricated or liquid flushed. Has 1/8" inlet and outlet connections.

DESIGN 5



Top closure is also used in place of Design #1 and is recommended for containment of hot or corrosive vapors, high pumping pressures, abrasives and with pressurized column assembly. Includes five rings of packing and lantern ring. May be grease lubricated or liquid flushed. Has 1/8" connections.

Shaft and Guide Bearing Assemblies

4500 Series
Bulletin 4500

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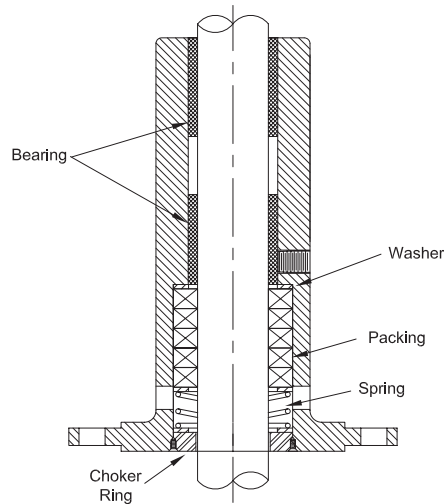
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Large Sump or Drainage Pumps

ALTERNATE GUIDE BEARING ASSEMBLIES

BOTTOM OR INTERMEDIATE

FOR SLIGHTLY ABRASIVE LIQUIDS

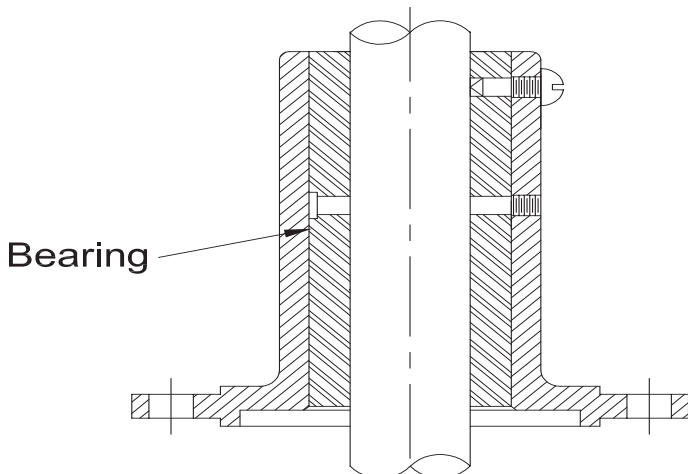


DESIGN 11 includes bearings of the material selected, five rings of packing under spring tension plus choker ring in bottom of the housing to form a seal to exclude abrasives from the bearings.

For pressurized grease lubrication, specify bearing of Bronze or Cast Iron.

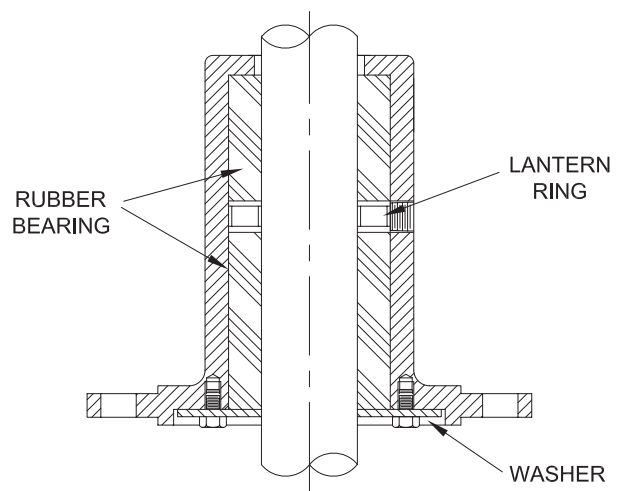
For pressurized liquid lubrication, specify bearings of Babbit Graphite, Nickel Graphite or Carbolube.

FOR CHEMICAL SERVICE



DESIGN 10 includes Teflon bearing with lock screw and is lubricated by the liquid being pumped, or may be pressured with compatible liquid.

FOR ABRASIVE LIQUIDS



DESIGN 12 is recommended for abrasive liquids and includes two rubber bearings separated by lantern ring for flush connection. Requires pressurized liquid lubrication.

For installation requiring maximum protection against abrasives, refer full information to Factory.

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Large Sump or Drainage Pumps

Pump Selection Data

Total Pumping Head:

Often overlooked in selecting vertical pumps that take suction from open sumps is the need to add the losses in the sump below the mounting plate to the head above the mounting plate to determine the total pumping head for selecting the pump. These additions include the elevation from the lowest liquid in the sump to the support plate plus friction loss in the discharge elbow and discharge pipe plus velocity head in the discharge pipe to the support plate.

The pump characteristic curves indicate the pump performance measured at the casing discharge flange; therefore in selecting the pump size and motor horsepower, the total pumping head must include the data as above.

Example of Total Head Calculations:

Pump required - 400 GPM, Pit depth 10'-6", lowest liquid level 7ft. below support plate, highest point in discharge line 38ft., pressure required at the discharge 8 p.s.i., friction loss in 4" discharge line beyond the pump 4 ft.

Highest Elevation	38 ft.
Pressure Required 8 p.s.i. x 2.31.....	18.48 ft.
Friction Loss - Discharge line.....	4 ft.
Lift in Sump	7 ft.
Friction in elbow and discharge pipe.....	2.05 ft.
Velocity head in pump discharge pipe	1.58 ft.

Total Pumping Head 71.11 ft.

Normally the "pit depth" can be substituted to compensate for the low liquid level and pipe losses below the support plate; when added to the pumping head above the pump, this will give the approximate total pumping head for selecting the pump.

When the capacity and the total pumping head are specified by the customer, it will be assumed that the total pumping head includes all friction losses and velocity head beyond the pump casing plus allowance for lowest liquid level in the sump; otherwise the indicated total pumping head must be corrected as above.

Minimum Submergence:

The distance from the surface of a liquid in a sump or tank to the pump suction inlet is known as submergence. Depending on the pump size, a "minimum submergence" is required to prevent vortex formation around the pump suction which will reduce pump capacity and may cause pump damage and rapid wear.

Submergence should not be confused with Net Positive Suction Head or NPSH. It is possible to have sufficient submergence but insufficient net positive head or vice versa depending on the installation and liquid characteristics.

Proposed installations must be checked for both required submergence and available NPSH to be sure they are equal to or greater than that required by the pump.

The table below shows minimum submergence above the pump suction nozzle in 65°F water, where pump is fitted with standard strainer and where tank liquid velocity is negligible. Omission of pump strainer, liquid velocity, sump obstructions or other pumps installed in the same sump may require greater submergence.

Minimum Submergence Above Suction Nozzle

Figure 4501 - 4511 - 4521

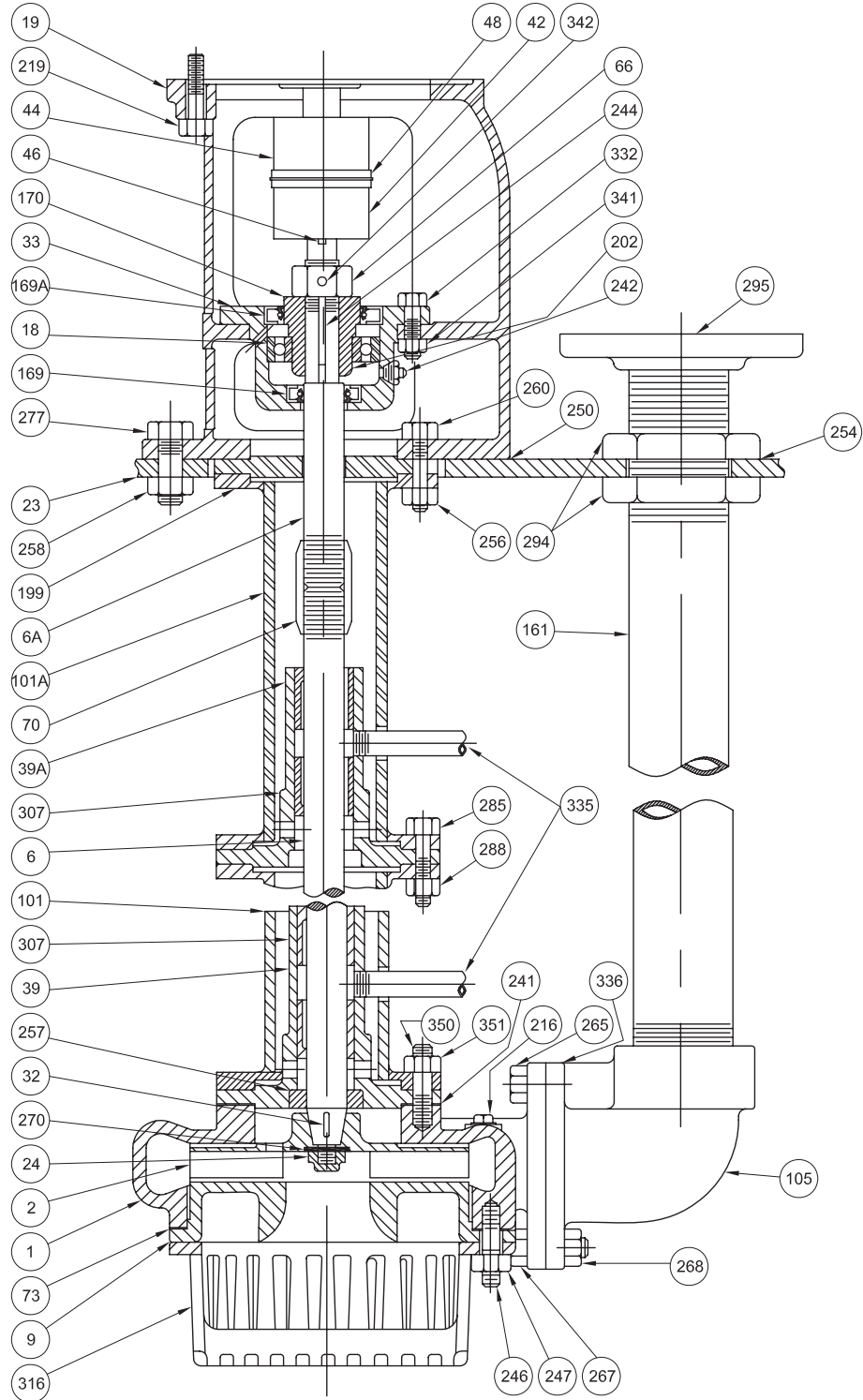
Pump Size	1	1½	2½	1¼ S	1½ S	1½ M	1½ L	2 S	2 M
Min. Subm.	18"	18"	18"	18"	18"	18"	18"	18"	18"
Pump Size	3 S	3 MD	4 S	4 MD	5 MSD	5 MD	6 MD	6 MLD	
Min. Subm.	24"	24"	24"	24"	24"	24"	24"	24"	

Figure 4565 - 4566 - 4568

Pump Size	4 x 4 x 12	6 x 4 x 12	6 x 6 x 12	8 x 6 x 12	8 x 8 x 12	10 x 10 x 12
Min. Subm.	8"	20"	24"	30"	36"	36"

Large Sump or Drainage Pumps

Item No.	Name Of Part
1	Casing
2	Impeller
6A	Top Shaft
6	Bottom Shaft
9	Suction Cover
* 18	Ball Bearing
19	Frame
23	Base Plate
* 24	Impeller Nut
32	Impeller Key
33	Bearing Housing
* 39	Bearing Bushing
* 39A	Top Bearing Bushing
42	Coupling Half - Driver
44	Coupling Half - Pump
46	Coupling Key
48	Coupling Bushing
66	Shaft Adjusting Nut
70	Shaft Coupling
* 73	Gasket
101	Column
101A	Top Column Pipe
105	Discharge Elbow
161	Discharge Fitting
* 169	Seal - Lower
* 169A	Seal - Top
170	Bearing Adapter
199	Top Closure
202	Snap Ring
216	Pipe Plug
219	Cap Screw
226	Cap Screw (Not Shown)
241	Gasket
242	Grease Fitting
244	Brg. Adapter Key
246	Stud
247	Hex Nut
* 250	Frame Gasket
* 254	Pipe Nut Gasket
256	Hex Nut
257	Choker Ring
258	Hex Nut
260	Cap Screw
265	Cap Screw
267	Cap Screw
268	Hex Nut
270	Impeller Washer
277	Cap Screw
285	Cap Screw
288	Hex Nut
294	Pipe Nut
295	Discharge Flange
307	Bearing Retainer
316	Strainer
332	Cap Screw
335	Lube Pipe Assembly
* 336	Gasket
341	Hex Nut
342	Set Screw
350	Stud
351	Hex Nut

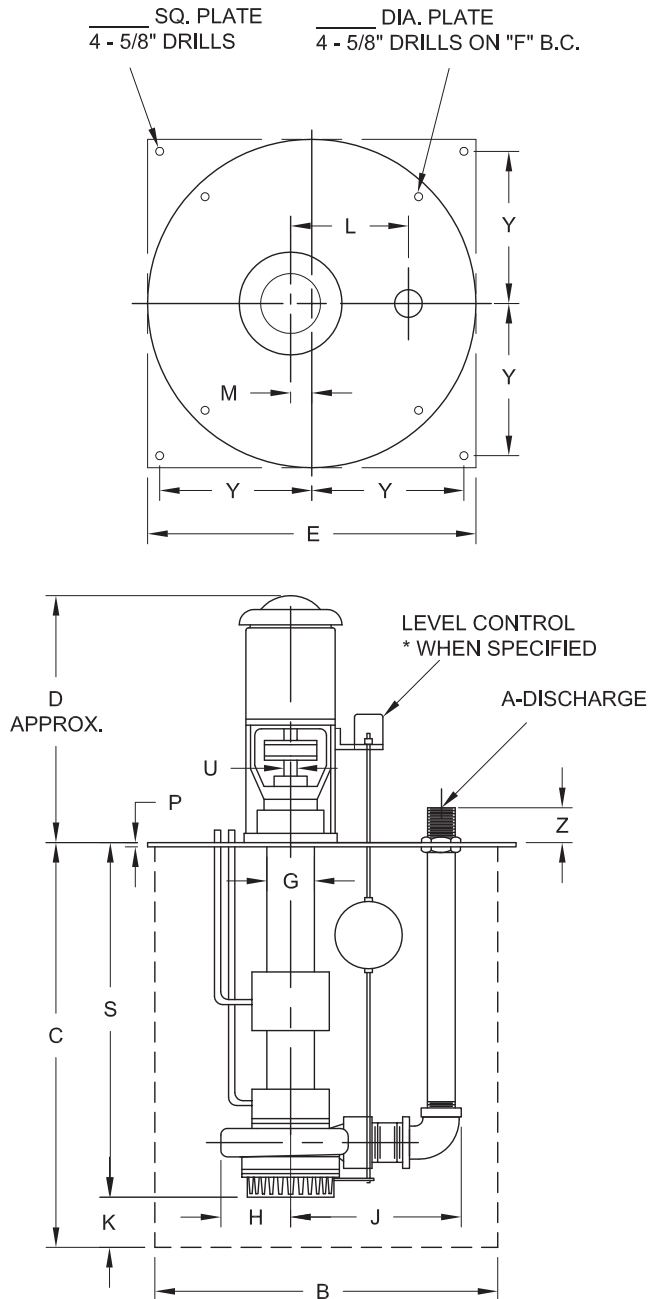


* Recommended spare parts

Large Sump or Drainage Pumps

FRAME	56C	143TC	145TC	182TC	184TC	213TC	215TC	254TC	256TC	284TC	286TC	324TC
D	23 ⁷ / ₈	22 ¹ / ₂	23 ¹ / ₂	25 ⁵ / ₈	26 ⁷ / ₈	27 ¹ / ₁₆	29 ¹ / ₁₆	31 ¹ / ₁₆	33 ¹ / ₁₆	36 ¹³ / ₁₆	38 ⁵ / ₁₆	39 ³ / ₈
FRAME	326TC	364TSC	365TSC	404TSC								
D	40 ⁷ / ₈	41 ⁵ / ₈	42 ³ / ₈	43 ³ / ₈								

FIG. SIZE MAX. SOLIDS	A	B	C	E	F	G	H	J	K	L	M	P	Y	Z	U
4501-1 3/8 Solids	1 1/2	24	2 FT. TO 20 FT. IN 6 IN. MULTIPLES	28	26	3	4	8 5/8	6 3/4	7 1/2	4	3/8	13	3 3/8	1 1/2
	2	24		28	26	3	4 1/4	10 1/2	6 3/4	8 3/4	4	3/8	13	3 3/8	
4501-1 1/2 1 1/16 Solids	2 1/2	24		28	26	3	4 1/4	12	6 3/4	9 3/4	4	3/8	13	3 3/4	
	3	24		28	26	3	5 1/2	13	4 3/4	10 3/8	4	3/8	13	3 3/4	
4501-2 1/2 1 1/16 Solids	2 1/2	24		28	26	3	5 1/2	14	4 3/4	11 1/4	4	3/8	13	3 3/4	
	3	24		28	26	3	5 1/2	15 1/2	4 3/4	13 1/4	4	3/8	13	4 1/4	
4511-1 1/2 S 5/16 Solids	1 1/2	24		28	26	3	5 1/2	10 3/4	4 3/4	8 3/4	4	3/8	13	3 3/8	
	2	24		28	26	3	5 1/2	11 1/4	4 3/4	9 3/4	4	3/8	13	3 3/8	
4511-1 1/2 S 7/16 Solids	2	24		28	26	3	5 1/2	11 1/4	4 3/4	9 3/4	4	3/8	13	3 3/8	
	2 1/2	24		28	26	3	5 1/2	12 1/4	4 3/4	10	4	3/8	13	3 3/4	
4511-1 1/2 M 7/16 Solids	1 1/2	24		28	26	3	6 1/4	11 1/4	6 1/4	10 3/4	4	3/8	13	3 3/8	
	2	24		28	26	3	6 1/4	12 1/4	6 1/4	10 3/4	4	3/8	13	3 3/8	
4511-1 1/2 M 7/16 Solids	2 1/2	24		28	26	3	6 1/4	13 1/4	6 1/4	11 1/4	4	3/8	13	3 3/4	
	3	24		28	26	3	6 1/4	15 1/4	6 1/4	12 1/4	4	3/8	13	4 1/2	
4511-2 S 1 1/16 Solids	2	24		28	26	3	5 1/2	11 1/4	4 1/2	10	4	3/8	13	3 3/4	
	2 1/2	24		28	26	3	5 1/2	13 3/8	4 1/2	10 3/4	4	3/8	13	3 3/4	
4511-2 S 1 1/16 Solids	3	24		28	26	3	5 1/2	13 3/8	4 1/2	11 1/4	4	3/8	13	3 3/8	
	2	24		28	26	3	6 1/4	13	5 1/4	11 1/4	4	3/8	13	3 3/4	
4511-2 M 1 1/16 Solids	2 1/2	24		28	26	3	6 1/4	14 1/2	5 1/4	11 1/4	4	3/8	13	3 3/4	
	3	24		28	26	3	6 1/4	15	5 1/4	12 1/4	4	3/8	13	3 3/8	
4511-2 M 1 1/16 Solids	4	24		28	26	3	6 1/4	16 1/4	5 1/4	14 1/4	5	3/8	13	4 3/4	
	3	24		28	26	3	6	15	3 3/4	12 1/4	4	3/8	13	5	
4511-3 S 1 3/16 Solids	3	24		28	26	3	6	15 3/4	3 3/4	12 1/4	4	3/8	13	4 3/8	
	4	24		28	26	3	6	15 3/4	3 3/4	12 1/4	4	3/8	13	4 3/8	
4511-3 MD 1 3/16 Solids	3	30	34	32	3	7 1/4	16 1/4	4 3/4	13 1/2	6	3/8	16	5		
	4	30	34	32	3	7 1/4	16 3/4	4 3/4	13 1/2	6	3/8	16	4 3/4		
4511-4 S 1 5/16 Solids	4	30	34	32	3	7	17	3 3/4	13 3/8	6	3/8	16	5 1/4		
	5	30	34	32	3	7	17 3/4	3 3/4	13 3/8	6	3/8	16	5 1/4		
4511-4 S 1 5/16 Solids	6	30	34	32	3	7	18 1/4	3 3/4	13 3/8	6	3/8	16	5 1/4		
	1 1/2	24	28	26	4	7 3/4	13 3/4	7 3/4	11 1/4	4	3/8	13	3 3/8		
4521-1 1/2 L 7/16 Solids	2	24	28	26	4	7 3/4	13 3/4	7 3/4	12	4	3/8	13	3 3/8		
	2 1/2	24	28	26	4	7 3/4	15 1/4	7 3/4	12 1/4	4	3/8	13	3 3/4		
4521-4 MD 1 3/16 Solids	3	30	34	32	4	7 3/4	16 3/4	7 3/4	13 3/8	6	3/8	16	4 1/2		
	5	30	34	32	4	7 1/2	19	4	15 3/8	6	3/8	16	5 1/4		
4521-5 MD 1 1/2 Solids	5	36	40	38	4	8 3/4	19 3/4	3 3/4	15 3/4	6	1/2	19	5 3/8		
	6	36	40	38	4	8 3/4	20 3/4	3 3/4	15 3/4	6	1/2	19	5 1/2		
4521-5 MSD 1 3/16 Solids	5	36	40	38	4	8 3/4	19 3/4	3 3/4	15 3/4	6	1/2	19	5 3/8		
	6	36	40	38	4	8 3/4	20 3/4	3 3/4	15 3/4	6	1/2	19	5 1/2		
4521-6 MD & 6 MLD 1 1/2 Solids 6 MD	6	36	40	38	4	9 1/4	20 3/4	3 3/4	16 1/4	6	1/2	19	5 1/2		
	8	36	40	38	4	9 1/4	22 1/4	3 3/4	17	6	1/2	19	6 1/8		



1" through 2 1/2" discharge pipe furnished with pip coupling,
3" and larger are furnished with a 125# companion flange.

Customer				Shop Order No.			Date:		By:	
Pump Data	Fig. No.	Size	Curve No.	GPM	Head	Sp. Gr.	Temp.	Rotation	Packing/Seal	
Motor Data	MFGR	Hp	RPM	Phase-Cycle Voltage		Frame	Enclosure	Insulation	Furnished by	Mounted

All Sizes - Figs. 4501, 4511 & 4521

Duplex Units
Bulletin 4500

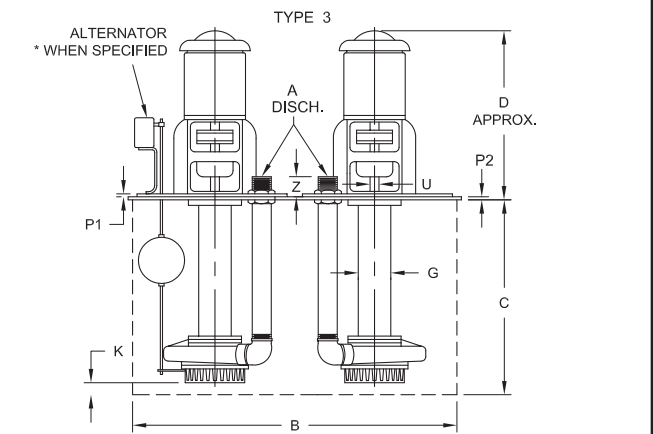
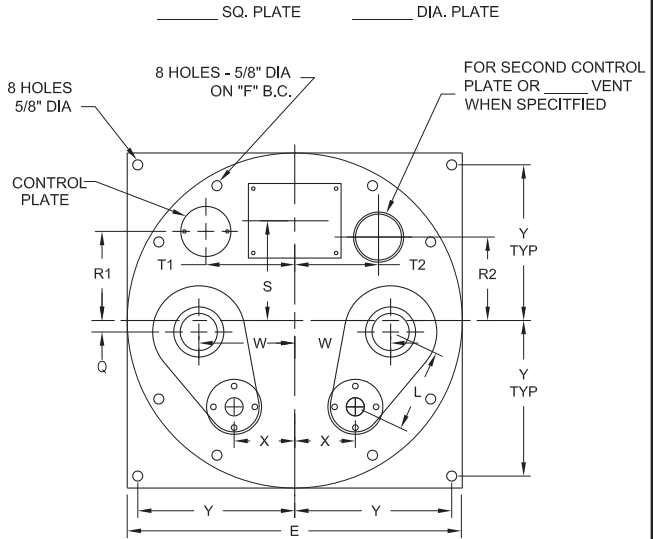
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Large Sump or Drainage Pumps

FRAME	56C	143TC	145TC	182TC	184TC	213TC	215TC	254TC	256TC	284TC	286TC	324TC
D	24 ³ / ₈	23	24	26 ³ / ₈	27 ³ / ₈	28 ¹ / ₆	29 ⁹ / ₁₆	31 ¹³ / ₁₆	33 ⁹ / ₁₆	37 ⁹ / ₁₆	38 ³ / ₁₆	39 ⁷ / ₈
FRAME	326TC	364TSC	365TSC	404TSC								
D	41 ³ / ₈	41 ⁷ / ₈	42 ⁷ / ₈	44 ³ / ₈								

FIG. SIZE MAX. SOLIDS	TYPE NO	A	B	C	E	F	G	K	L	P	Q	R	S	T	W	X	Y	Z	U	
4501-1 3/8 Solids	3	1 1/2	44	2 FT. TO 20 FT. IN 6 IN. MULTIPLES	48	46	3	7 7/8	7 7/8	1/2	5	8 1/2	13	14 1/2	10	7 1/2	23	3 3/8		
	3	2	44		48	46	3	6 3/4	8 3/4	1/2	5	8 1/2	13	14 1/2	10	7	23	3 3/8		
4501-1 1/2 1 1/8 Solids	3	2 1/2	44		48	46	3	6 3/4	9 3/4	1/2	5	8 1/2	13	14 1/2	10	6 3/4	23	3 3/8		
	3	3	48		54	51	3	5 1/4	10 3/4	1/2	2 1/2	13	16	14 1/2	12	9 1/4	25 1/2	3 3/8		
4501-2 1/2 1 1/4 Solids	3	2 1/2	48		54	51	3	5 1/4	11 1/4	1/2	2 1/2	13	16	14 1/2	12	9	25 1/2	3 3/8		
	3	3	48		54	51	3	5 1/4	13 1/4	1/2	2 1/2	13	16	14 1/2	12	8 1/2	25 1/2	4 1/4		
4511-1 1/4 S 5/8 Solids	3	1 1/2	48		54	51	3	5 1/4	8 3/4	1/2	2 1/2	13	16	14 1/2	12	9 3/4	25 1/2	3 3/8		
	3	2	48		54	51	3	5 1/4	9 3/4	1/2	2 1/2	13	16	14 1/2	12	9 1/2	25 1/2	3 3/8		
4511-1 1/2 S 7/8 Solids	3	2	48		54	51	3	5 1/4	9 3/4	1/2	2 1/2	13	16	14 1/2	12	9 1/2	25 1/2	3 3/8		
	3	2 1/2	48		54	51	3	5 1/4	10 3/4	1/2	2 1/2	13	16	14 1/2	12	9 1/4	25 1/2	3 3/8		
4511-1 1/2 M 7/8 Solids	3	1 1/2	48		54	51	3	6 3/4	10 3/4	1/2	2 1/2	13	16	14 1/2	12	9 1/4	25 1/2	3 3/8		
	3	2	48		54	51	3	6 3/4	11 1/4	1/2	2 1/2	13	16	14 1/2	12	9	25 1/2	3 3/8		
4511-2 S 1 1/8 Solids	3	2	48		54	51	3	6 3/4	12 1/4	1/2	2 1/2	13	16	14 1/2	12	9 3/4	25 1/2	4 1/4		
	3	2 1/2	48		54	51	3	6 3/4	10 3/4	1/2	2 1/2	13	16	14 1/2	12	9 3/4	25 1/2	3 3/8		
4511-2 M 1 1/8 Solids	3	2 1/2	48		54	51	3	6 3/4	10 3/4	1/2	2 1/2	13	16	14 1/2	12	9 3/4	25 1/2	3 3/8		
	3	3	48		54	51	3	6 3/4	11 1/4	1/2	2 1/2	13	16	14 1/2	12	9	25 1/2	3 3/8		
4511-2 M 1 1/8 Solids	3	2 1/2	48		54	51	3	6 3/4	11 1/4	1/2	2 1/2	13	16	14 1/2	12	9	25 1/2	3 3/8		
	3	3	48		54	51	3	6 3/4	12 1/4	1/2	2 1/2	13	16	14 1/2	12	9 3/4	25 1/2	4 1/4		
4511-3 S 1 3/8 Solids	3	3	48		54	51	3	4 3/4	12 1/4	1/2	2 1/2	13	16	14 1/2	12	8 3/4	25 1/2	5		
	3	4	48		54	51	3	4 3/4	12 1/4	1/2	2 1/2	13	16	14 1/2	12	8 3/4	25 1/2	4 3/4		
4511-3 MD 1 3/8 Solids	3	3	54		60	57	3	5 1/4	13 1/4	1/2	3	16	19	15	15	10 1/4	28 1/2	5		
	3	4	54		60	57	3	5 1/4	13 1/4	1/2	3	16	19	15	15	10 1/4	28 1/2	4 3/4		
4511-4 S 1 5/8 Solids	3	4	54		60	57	3	3 3/4	13 3/4	1/2	3	16	19	15	15	10 1/4	28 1/2	5 1/4		
	3	5	54		60	57	3	3 3/4	13 3/4	1/2	3	16	19	15	15	10 1/4	28 1/2	5 1/4		
4511-4 S 1 5/8 Solids	3	6	54	60	57	3	3 3/4	13 3/4	1/2	3	16	19	15	15	10 1/4	28 1/2	5 1/4			
	3	5	54	60	57	3	3 3/4	13 3/4	1/2	3	16	19	15	15	10 1/4	28 1/2	5 1/4			
4521-1 1/4 L 7/8 Solids	3	1 1/2	48	54	51	4	8 3/4	11 1/4	1/2	2 1/2	13	16	14 1/2	12	8 3/4	25 1/2	3 3/8			
	3	2	48	54	51	4	8 3/4	12 1/4	1/2	2 1/2	13	16	14 1/2	12	8 3/4	25 1/2	3 3/8			
4521-4 MD 1 3/8 Solids	3	3	48	54	51	4	8 3/4	12 1/4	1/2	2 1/2	13	16	14 1/2	12	8 3/4	25 1/2	3 3/8			
	3	4	54	60	57	4	4 1/2	15 1/4	1/2	3	16	19	15	15	9 3/4	28 1/2	5 1/4			
4521-5 MD 1 1/2 Solids	3	5	60	66	63	4	4 3/4	15 3/4	1/2	2	18	21 1/2	15	15	10	31 1/2	5 1/4			
	3	6	60	66	63	4	4 3/4	15 3/4	1/2	2	18	21 1/2	15	15	10	31 1/2	5 1/4			
4521-5 MSD 1 1/2 Solids	3	5	60	66	63	4	4 3/4	15 3/4	1/2	2	18	21 1/2	15	15	10	31 1/2	5 1/4			
	3	6	60	66	63	4	4 3/4	15 3/4	1/2	2	18	21 1/2	15	15	10	31 1/2	5 1/4			
4521-6 MD & 6MLD 1 3/8 Solids 6MD	3	6	60	66	63	4	4 1/4	16 1/4	1/2	2	18	21 1/2	15	15	9 3/4	31 1/2	5 1/4			
	3	8	60	66	63	4	4 1/4	17 1/4	1/2	2	18	21 1/2	15	15	9 3/4	31 1/2	6			



1" through 2 1/2" discharge pipe furnished with pip coupling,
3" and larger are furnished with a 125# companion flange.

Customer				Shop Order No.			Date:		By:	
Pump Data	Fig. No.	Size	Curve No.	GPM	Head	Sp. Gr.	Temp.	Rotation	Packing/Seal	
Motor Data	MFGR	Hp	RPM	Phase-Cycle Voltage		Frame	Enclosure	Insulation	Furnished by	Mounted

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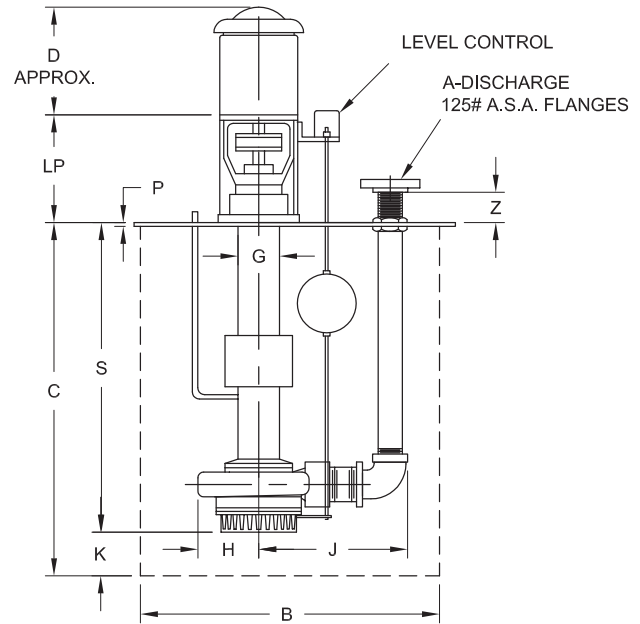
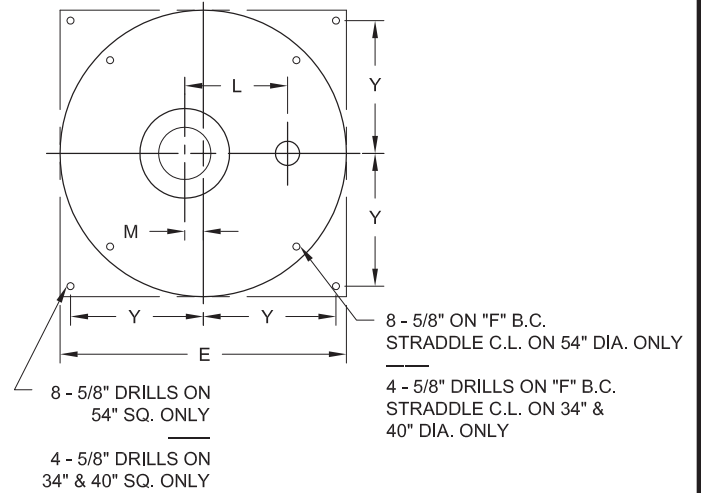
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Large Sump or Drainage Pumps

FRAME	184	213	215	254	256	284	286	324	326	364	365	404	405	444	445
TYPE	TC	TC	TC	TC	TC	TC	TC	TSC	TSC	TSC	TSC	TSC	TSC	TSC	TSC
D	13¼	13½	15¾	18½	20½	20	21¾	23¼	25	25¼	24¾	28	29¾	32¾	35
LP	13 ⁵ / ₁₆			17 ¹ / ₁₆			17 ¹³ / ₁₆								

SIZE FIG. NO.	A	B	C	E	F	G	H	J	K	L	M	P	U	Y	Z		
4 x 4 x 12 4565	4	36	2 FT. TO 20 FT. IN 6 IN. MULTIPLES	40	38	4	9	19 ⁵ / ₈	4	16¼	6	½	1½	19	5¼		
	6							21							6¾		
6 x 4 x 12 4565	4	36		40	38	4	8 ⁵ / ₈	9 ¹ / ₈	19 ⁵ / ₈	2 ⁵ / ₈	16¼	6	½	1½	19	5¼	
	6								21							6¾	
6 x 6 x 12 4565	6	36		40	38	4	9½	10	21	1 ¹ / ₈	16 ³ / ₈	6	½	1½	19	6 ³ / ₈	
	8								23		7						
8 x 6 x 12 4565	6	36		40	38	4	10	10	21¼	1½	17 ¹ / ₈	6½	½	1½	19	6 ³ / ₈	
	8								23¾		7						
4 x 4 x 12 4566	4	36		3 FT. TO 20 FT. IN 6 IN. MULTIPLES	40	38	6	9	19 ⁵ / ₈	6	16¼	6	½	1 ¹ / ₈	19	5¼	
	6								21							6¾	
6 x 4 x 12 4566	4	36			40	38	6	8 ⁵ / ₈	9 ¹ / ₈	19 ⁵ / ₈	5 ⁵ / ₈	16¼	6	½	1 ¹ / ₈	19	5¼
	6									21							6¾
6 x 6 x 12 4566	6	36	40		38	6	9½	10	21	4 ⁷ / ₈	16 ³ / ₈	6	½	1 ¹ / ₈	19	8¼	
	8								23		6¾						
8 x 6 x 12 4566	6	36	40		38	6	10	10	21¼	3 ³ / ₈	17 ¹ / ₈	6½	½	1 ¹ / ₈	19	8¼	
	8								23¾		6½						
8 x 8 x 12 4566	8	48	54		51	6	12 ³ / ₈	12 ³ / ₈	26 ³ / ₈	2¼	20½	8	½	1 ¹ / ₈	25½	7½	
	10								29		2 ¹ / ₈					2 ⁵ / ₈	
6 x 6 x 12 4568	6	48	54		51	8	9½	10	21	8 ⁷ / ₈	16 ³ / ₈	6	½	1 ¹ / ₈	25½	12	
	8								23		10¼						
8 x 6 x 12 4568	6	48	54	51	8	10	10	21¼	7 ⁷ / ₈	17 ¹ / ₈	6½	½	1 ¹ / ₈	25½	12		
	8							23¾		10¼							
8 x 8 x 12 4568	8	48	54	51	8	12 ³ / ₈	12 ³ / ₈	26 ³ / ₈	6¼	20½	8	½	1 ¹ / ₈	25½	11½		
	10							29		2 ¹ / ₈					6 ³ / ₈		
10x10x12 4568	10	48	54	51	8	12½	29	4	21¼	8	½	1 ¹ / ₈	25½	6½			

1" through 2½" discharge pipe furnished with pip coupling.
3" and larger are furnished with a 125# companion flange.



Customer				Shop Order No.			Date:		By:	
Pump Data	Fig. No.	Size	Curve No.	GPM	Head	Sp. Gr.	Temp.	Rotation	Packing/Seal	
Motor Data	MFGR	Hp	RPM	Phase-Cycle Voltage		Frame	Enclosure	Insulation	Furnished by	Mounted

All Sizes - Fig. 4560

Duplex Units
Bulletin 4500

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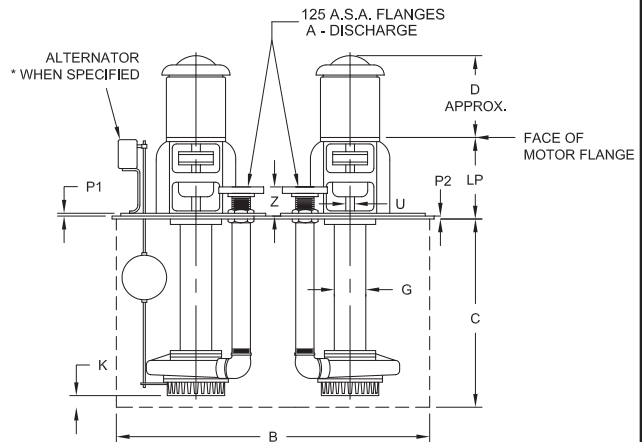
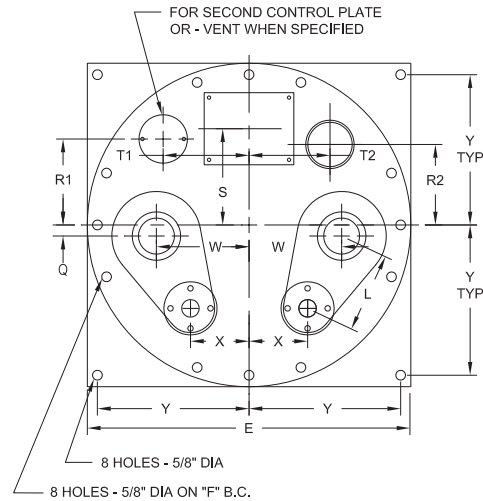
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Large Sump or Drainage Pumps

FRAME	184	213	215	254	256	284	286	324	326	364	365	404	405	444	445
TYPE	TC	TC	TC	TC	TC	TC	TC	TSC	TSC	TSC	TSC	TSC	TSC	TSC	TSC
D	13¼	13½	15¼	18½	20½	20	21¾	23¼	25	25¼	24¾	28	29¾	32¾	35
LP	13 ⁵ / ₁₆					17 ¹ / ₁₆			17 ¹³ / ₁₆						

SIZE FIG. NO.	A	B	C	E	F	G	K	L	P	Q	R	S	T	U	W	X	Y	Z
4 x 4 x 12 4565	4	60	66	63	4	4¼	16¼	7/8	½	2	18	21¼	15	1½	15	9¾	31½	5¼
	6																	6¾
6 x 4 x 12 4565	4	60	66	63	4	3	16¼	7/8	½	2	18	21½	15	1½	15	9¾	31½	5¼
	6																	6¾
6 x 6 x 12 4565	6	60	66	63	4	2¼	16¾	7/8	½	2	18	21½	15	1½	15	9¾	31½	6¾
	8																	7
8 x 6 x 12 4565	6	60	66	63	4	1¾	17¾	7/8	½	2	18	21½	15	1½	15	9¾	31½	6¾
	8																	7
4 x 4 x 12 4566	4	60	66	63	6	6¼	16¼	7/8	½	2	18	21½	15	1 ¹³ / ₁₆	15	9¾	31½	5¼
	6																	6¾
6 x 4 x 12 4566	4	60	66	63	6	6	16¼	7/8	½	2	18	21½	15	1 ¹³ / ₁₆	15	9¾	31½	5¼
	6																	6¾
6 x 6 x 12 4566	6	60	66	63	6	5¼	16¾	7/8	½	2	18	21½	15	1 ¹³ / ₁₆	15	9¾	31½	8¼
	8																	6¾
8 x 6 x 12 4566	6	60	66	63	6	3¾	17¾	7/8	½	2	18	21½	15	1 ¹³ / ₁₆	15	9¾	31½	8¼
	8																	6½
8 x 8 x 12 4566	8	78	84	81	6	2¾	20½	1 1/8	5/8	--	26	29	15	1 ¹³ / ₁₆	22	14¾	40½	7½
	10																	2 5/8
6 x 6 x 12 4568	6	78	84	81	8	5¼	16¾	7/8	5/8	--	26	29	15	1 ¹³ / ₁₆	22	14¾	40½	12
	8																	10¼
8 x 6 x 12 4568	6	78	84	81	8	7¾	17¾	1 1/8	5/8	--	26	29	15	1 ¹³ / ₁₆	22	14¾	40½	12
	8																	10¼
8 x 8 x 12 4568	8	78	84	81	8	6¾	20½	1 1/8	5/8	--	26	29	15	1 ¹³ / ₁₆	22	14¾	40½	11½
	10																	6¾
10x10x 12 4568	10	78	84	81	8	4%	21¼	1 1/8	5/8	--	26	29	15	1 ¹³ / ₁₆	22	14¾	40½	6½

1" through 2½" discharge pipe furnished with pip coupling.
3" and larger are furnished with a 125# companion flange.



Customer				Shop Order No.			Date:		By:	
Pump Data	Fig. No.	Size	Curve No.	GPM	Head	Sp. Gr.	Temp.	Rotation	Packing/Seal	
Motor Data	MFGR	Hp	RPM	Phase-Cycle Voltage		Frame	Enclosure	Insulation	Furnished by	Mounted

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Large Sump or Drainage Pumps

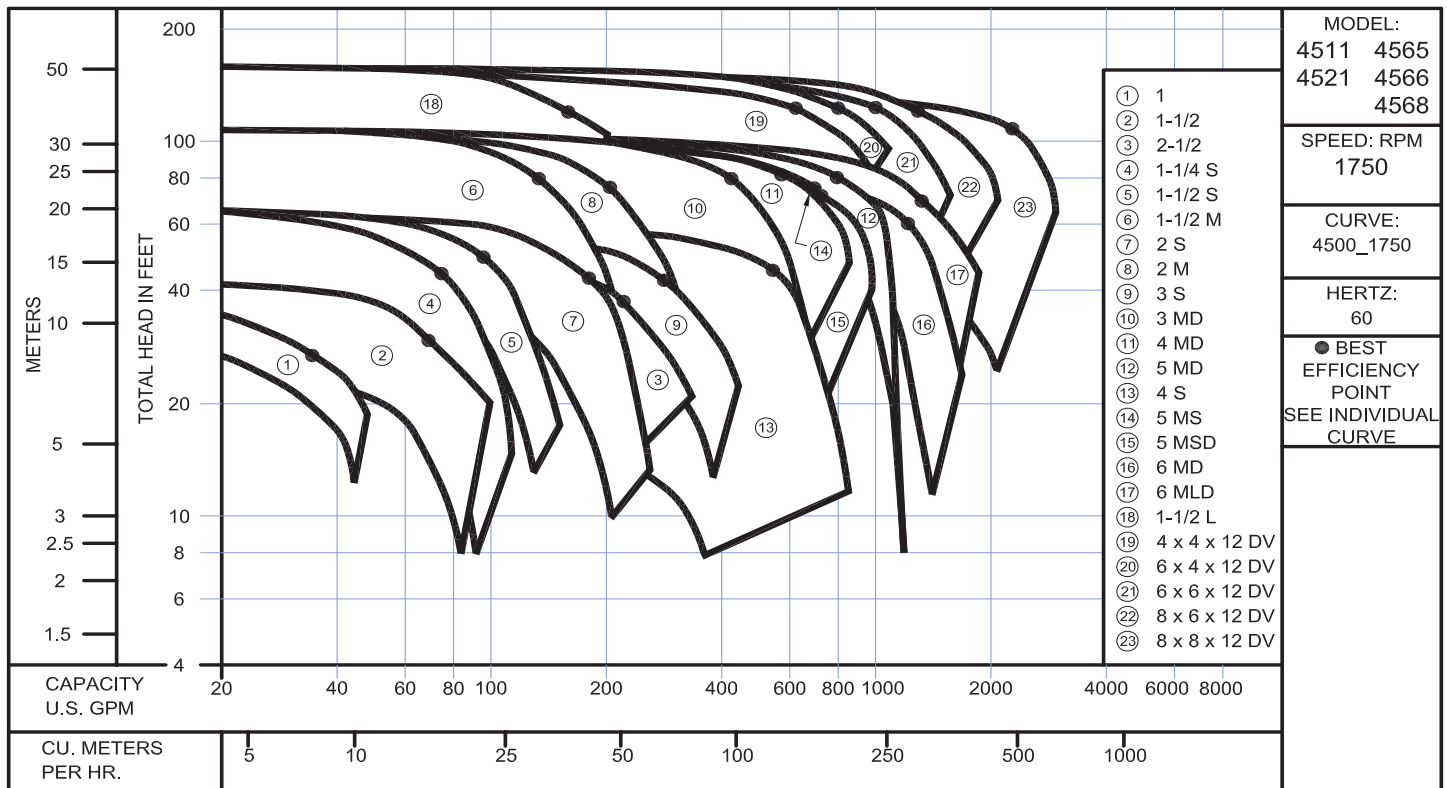
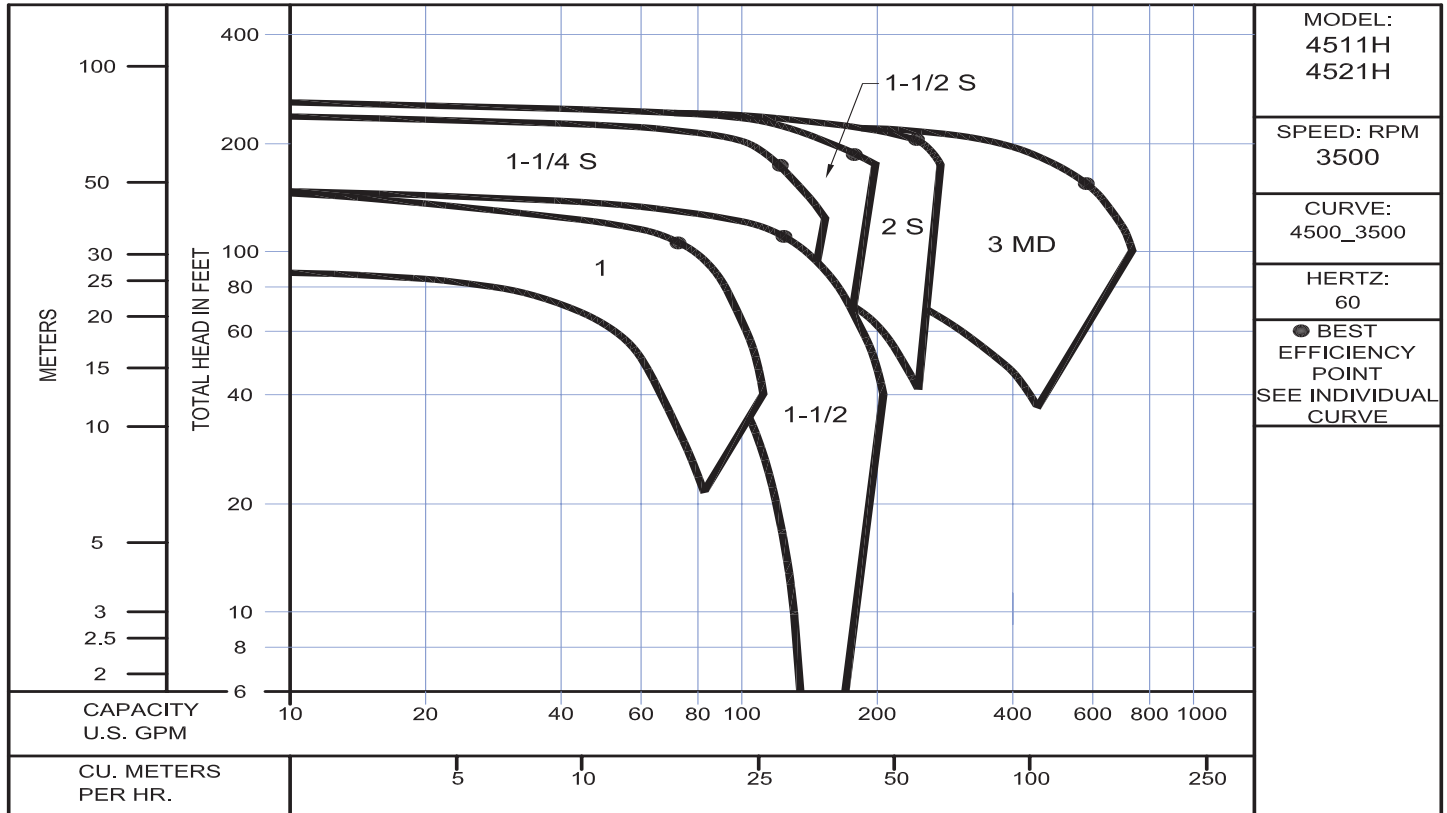


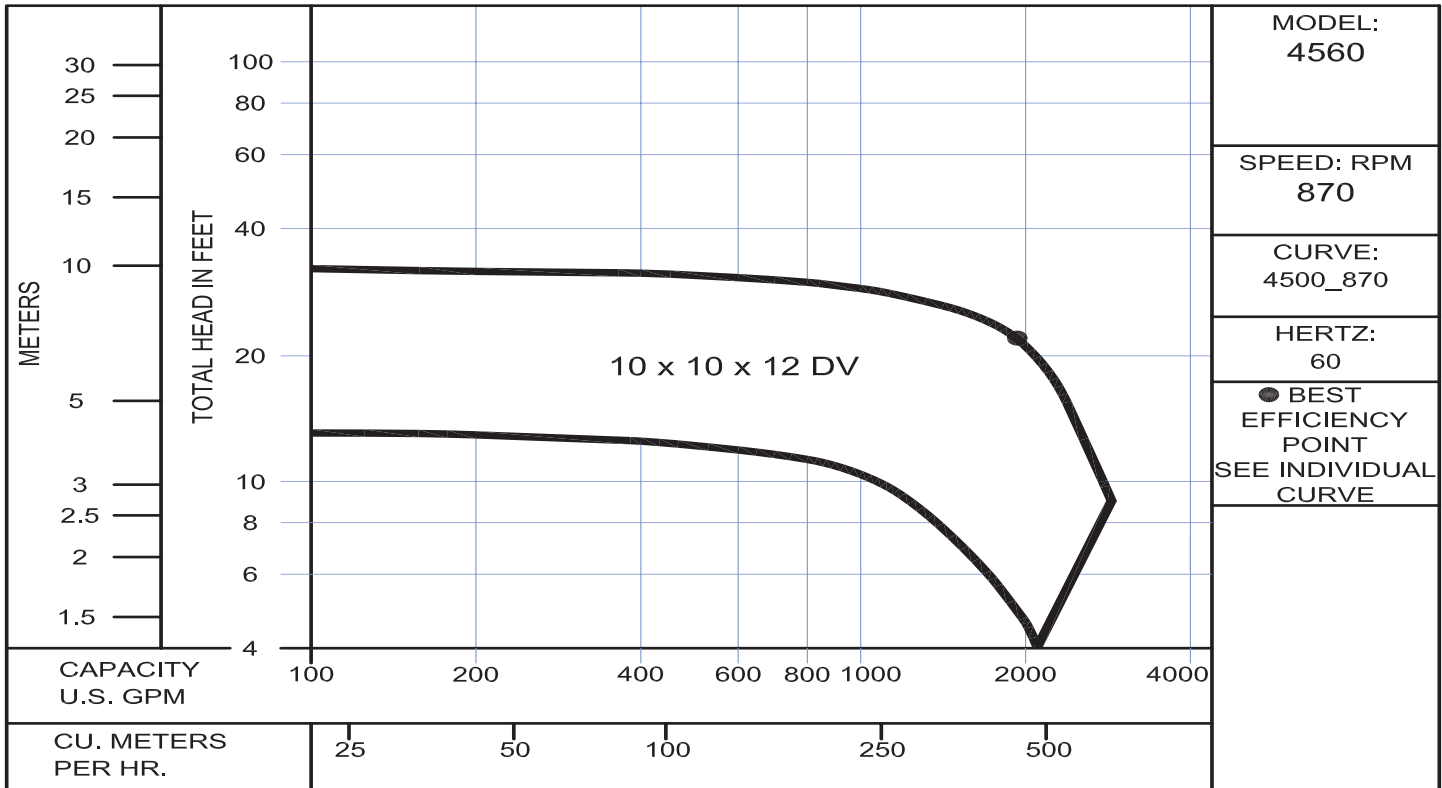
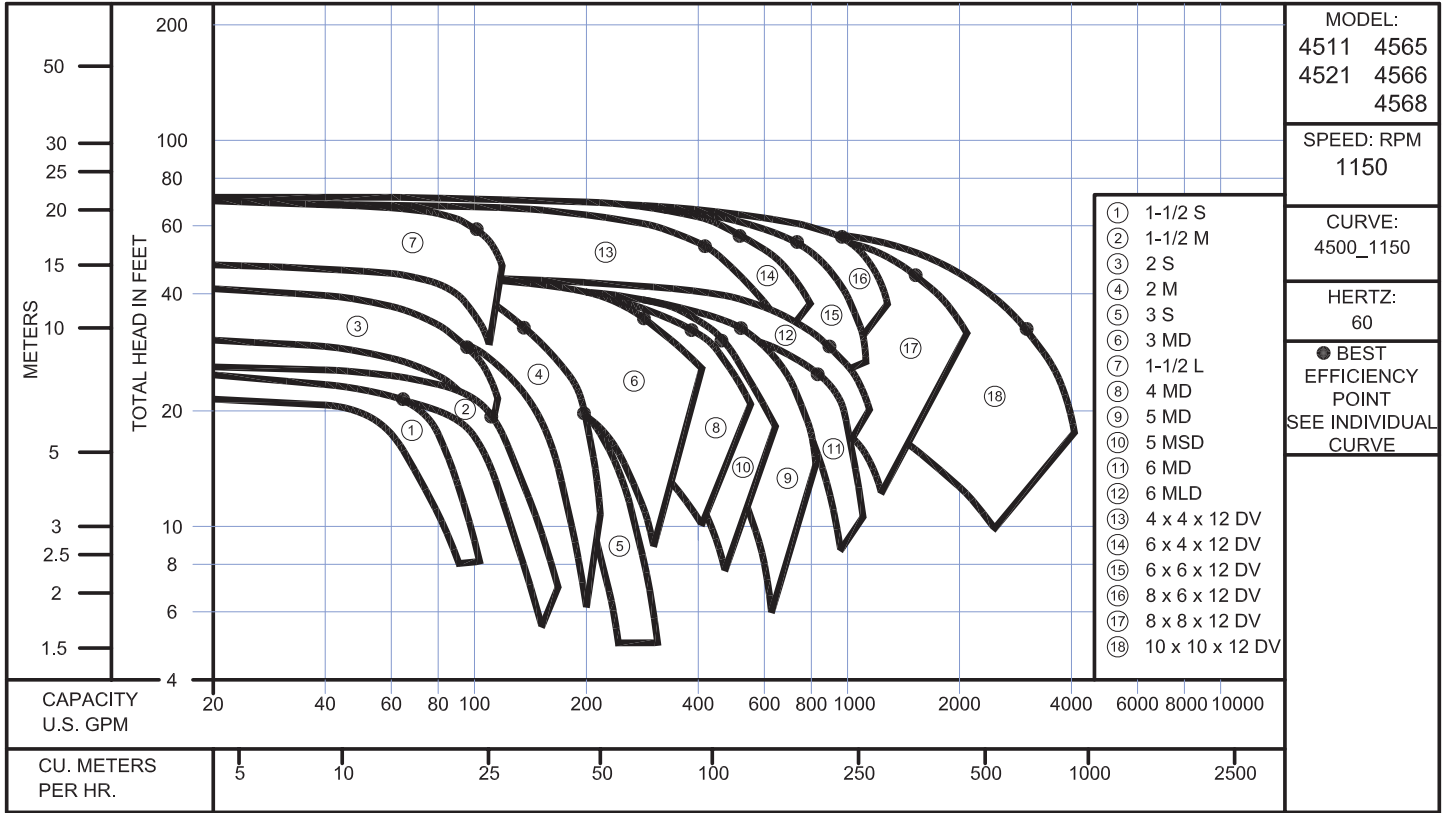
Fig. 4500

Selection Curves, 1150RPM & 870RPM
Bulletin 4500

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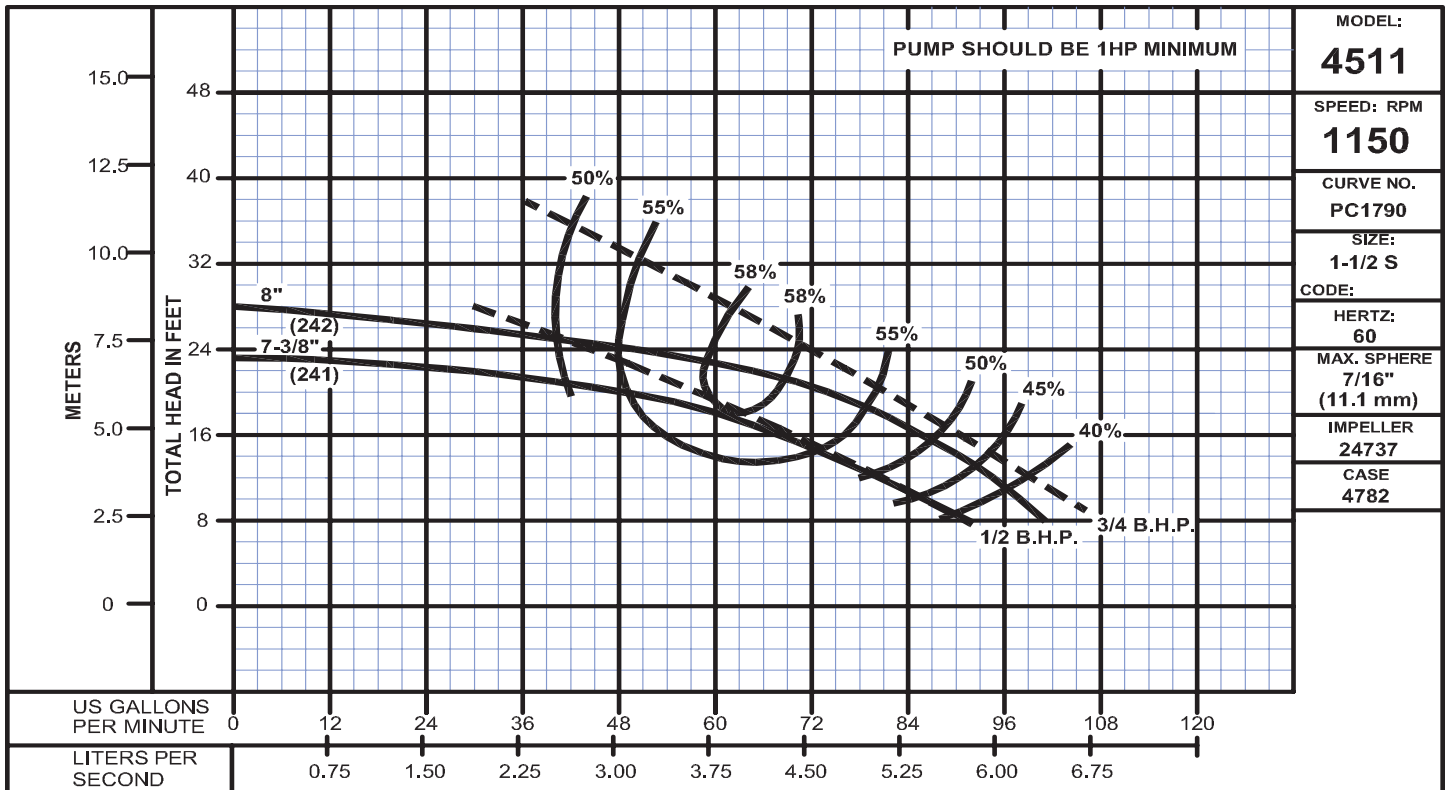
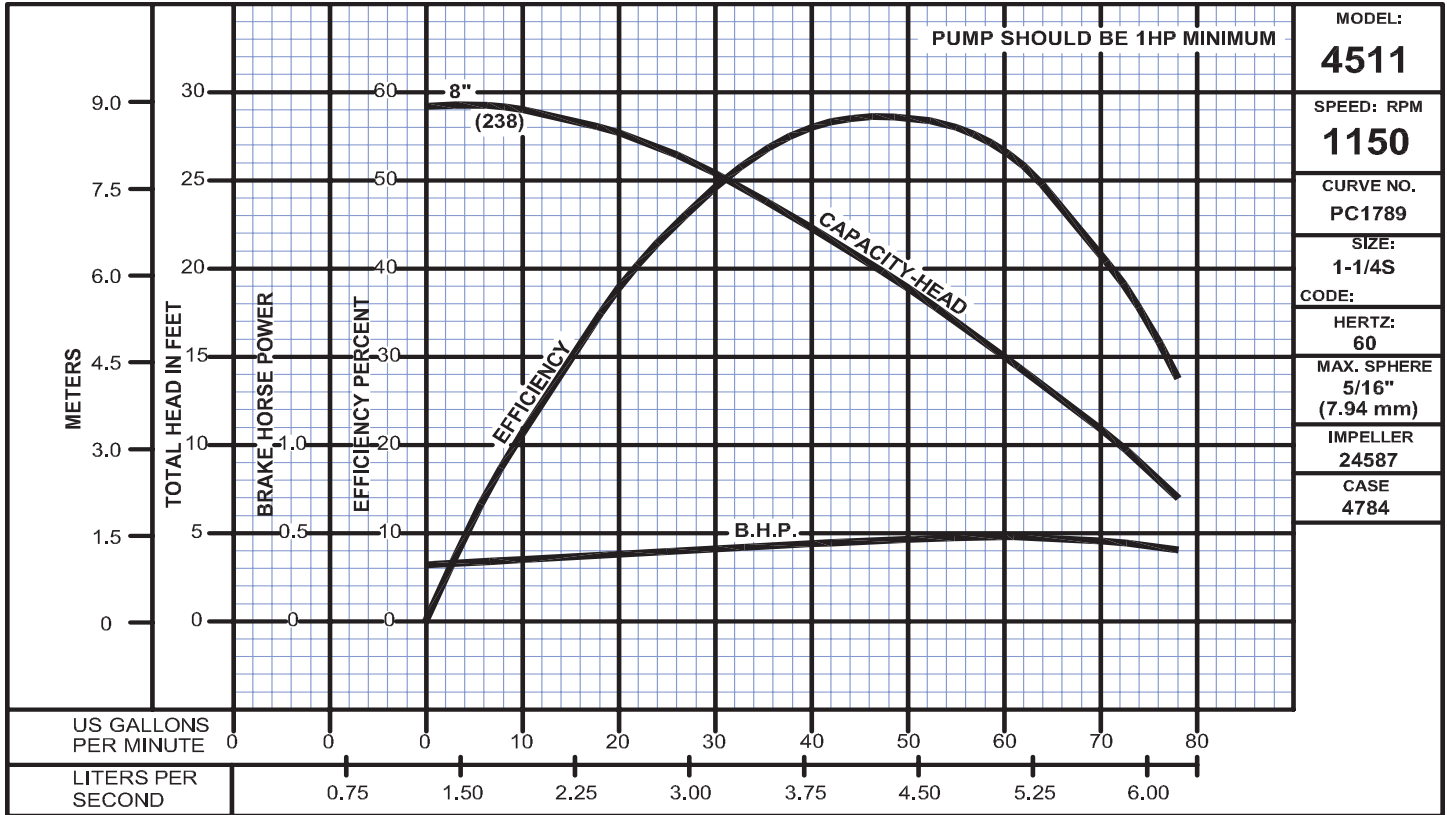


Fig. 4511

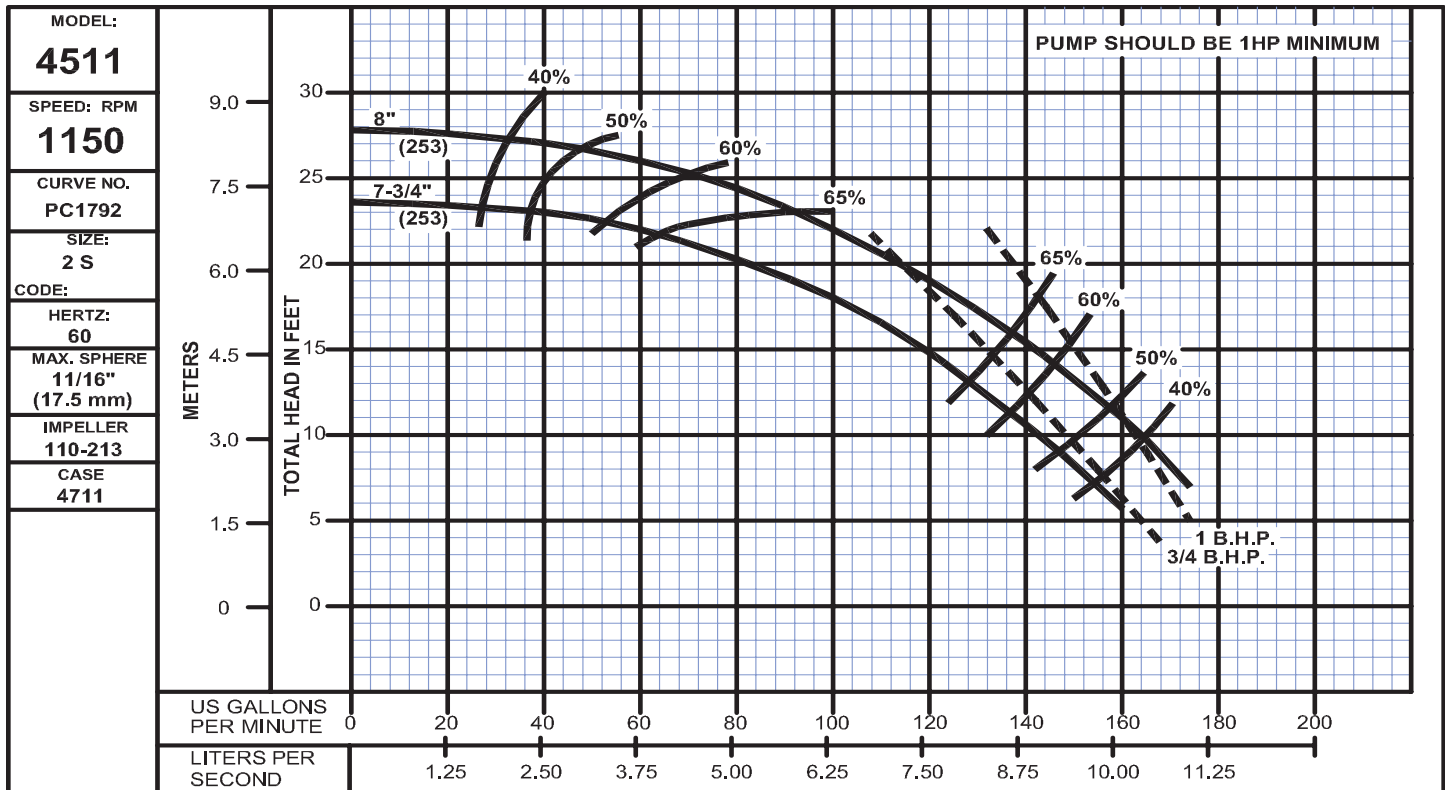
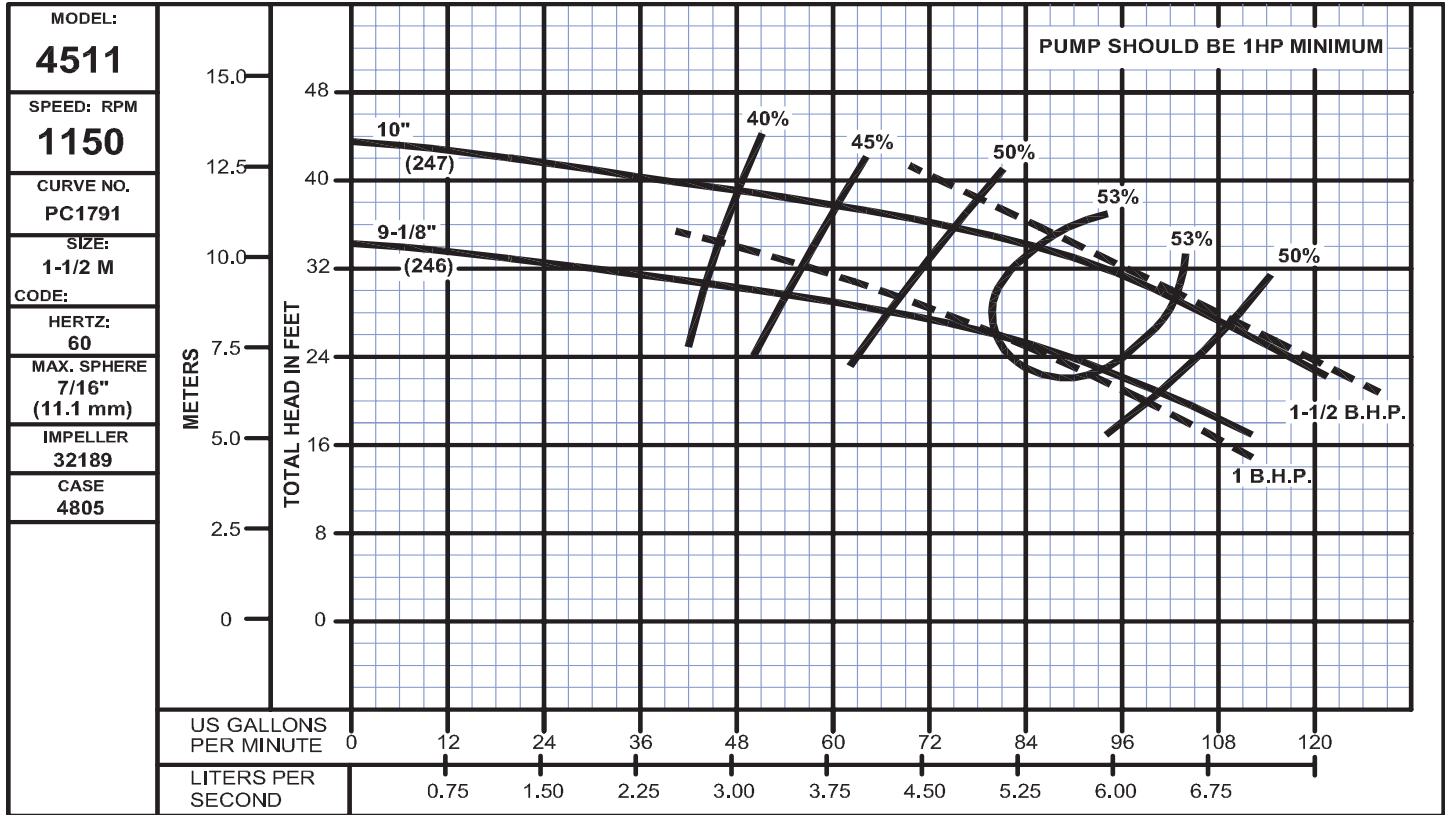
Sizes: 1½M & 2S, 1150RPM

Bulletin 4500

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Large Sump or Drainage Pumps



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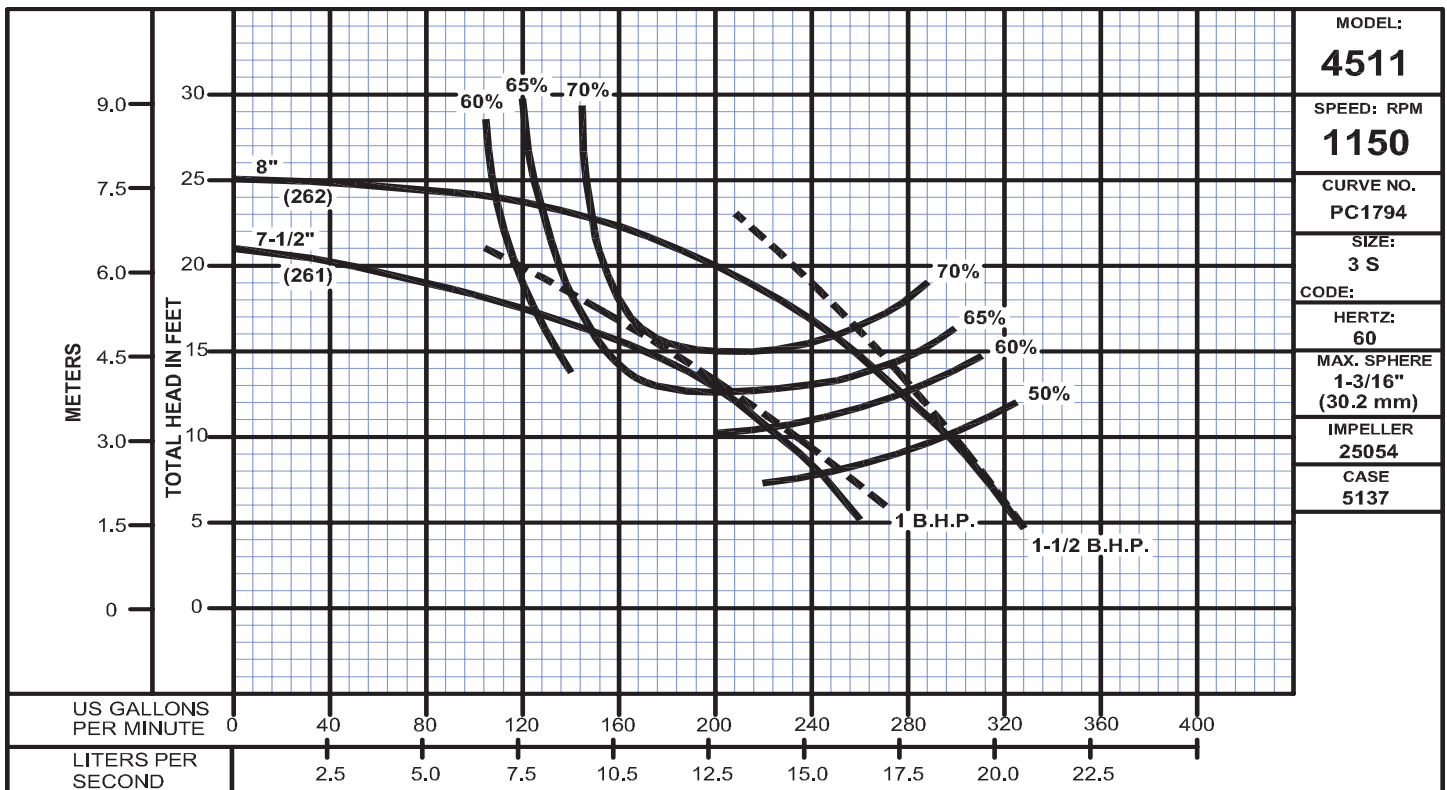
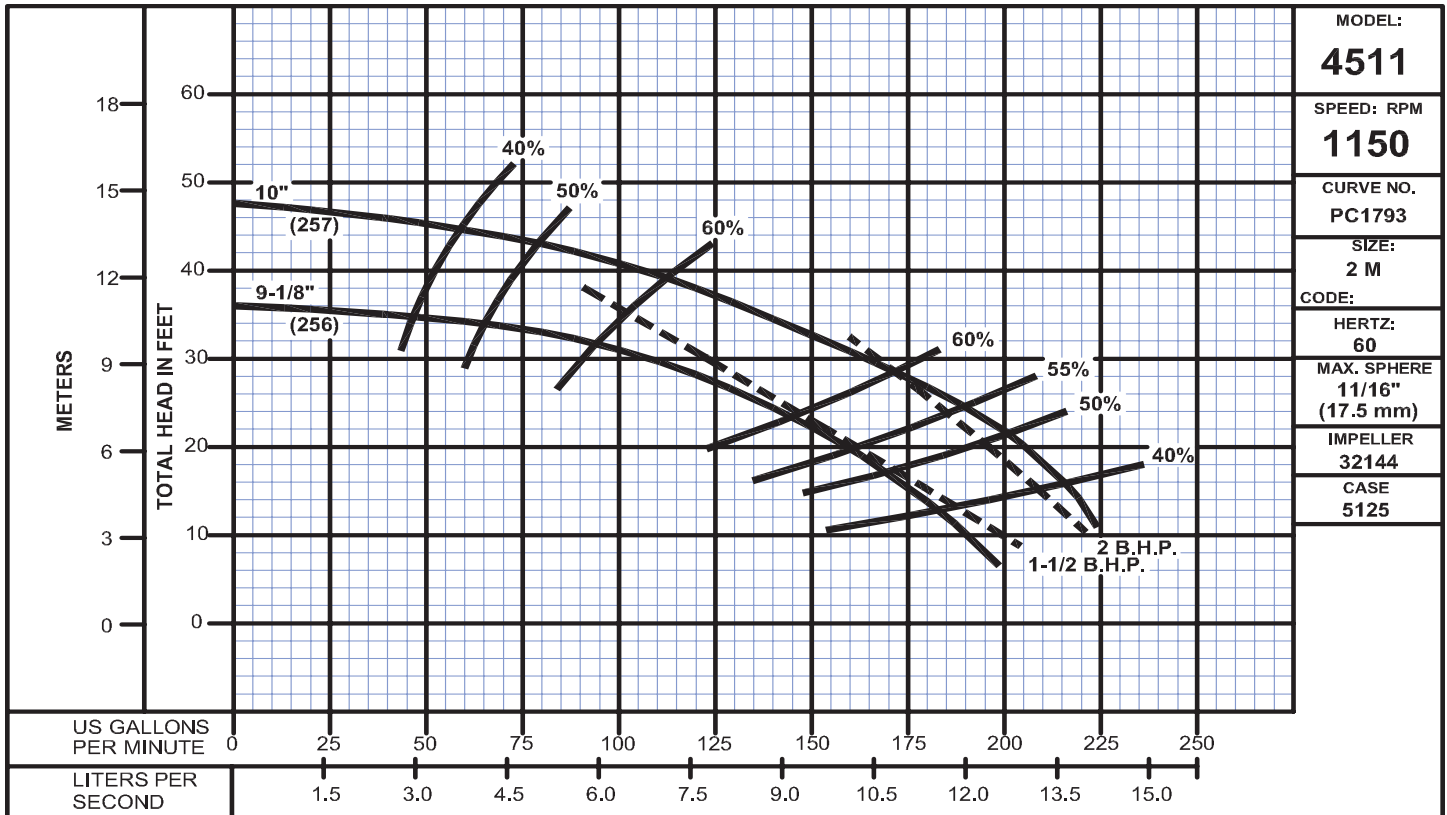


Fig. 4511 & 4521

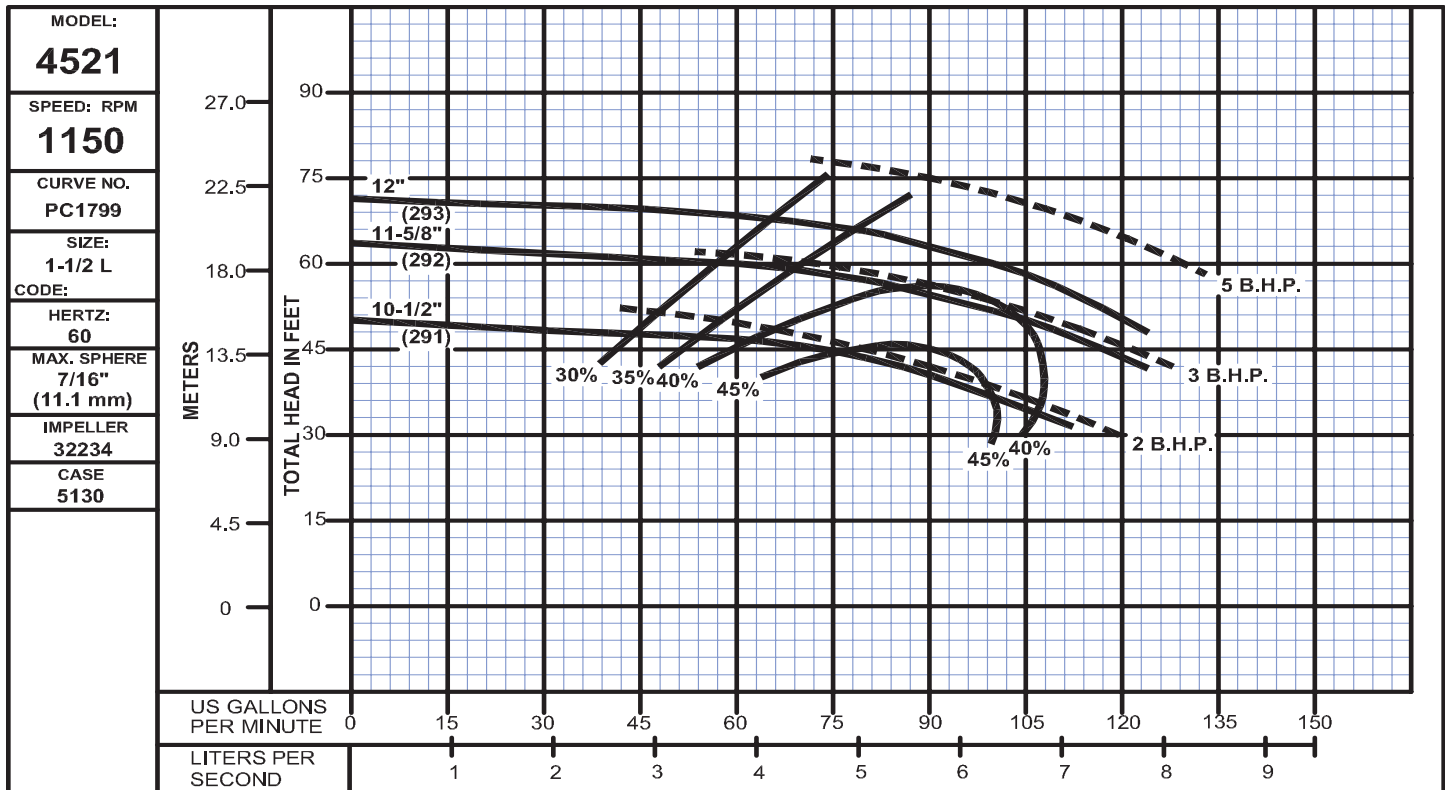
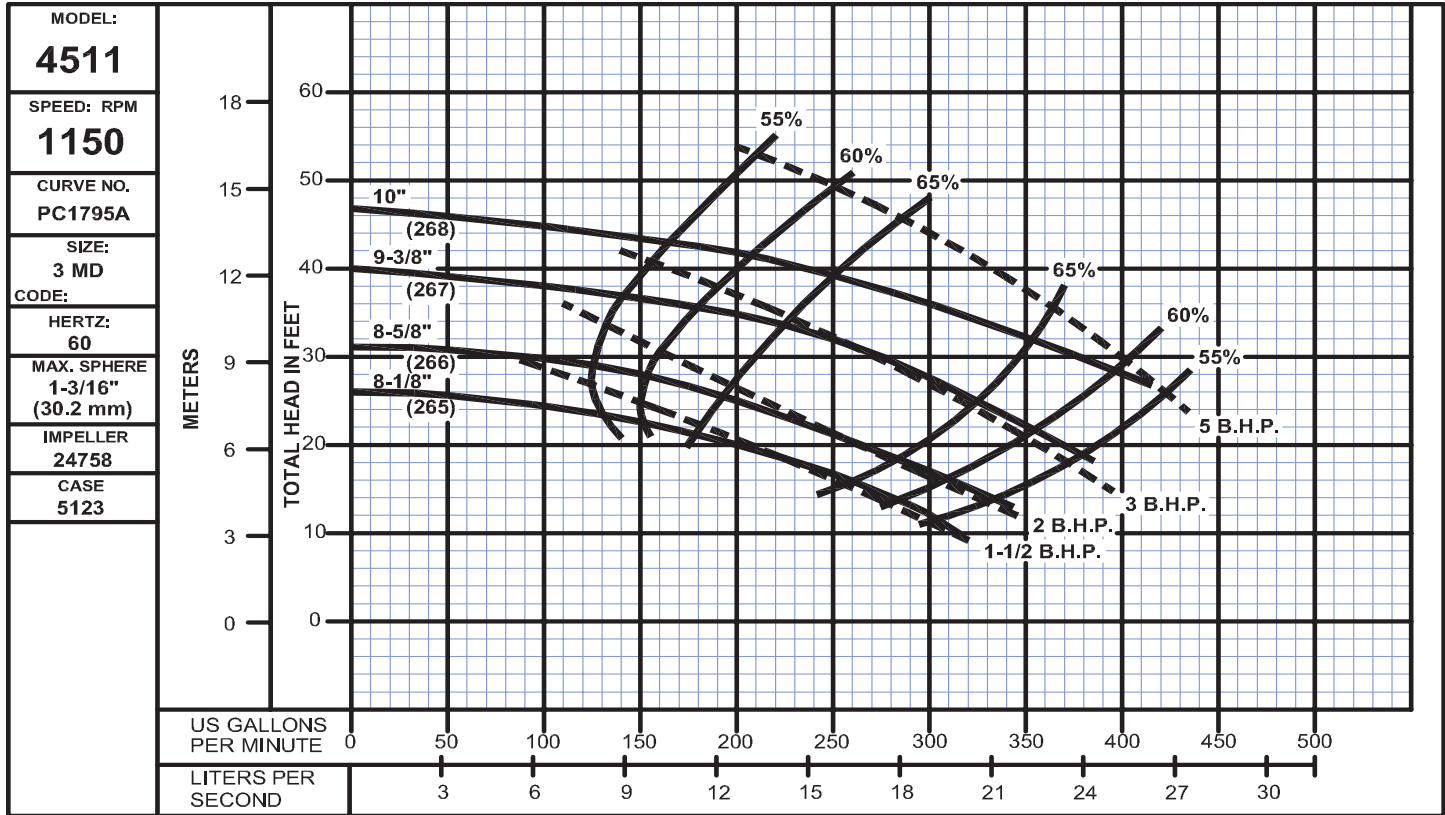
Sizes: 3MD & 1½L, 1150RPM

Bulletin 4500

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Large Sump or Drainage Pumps

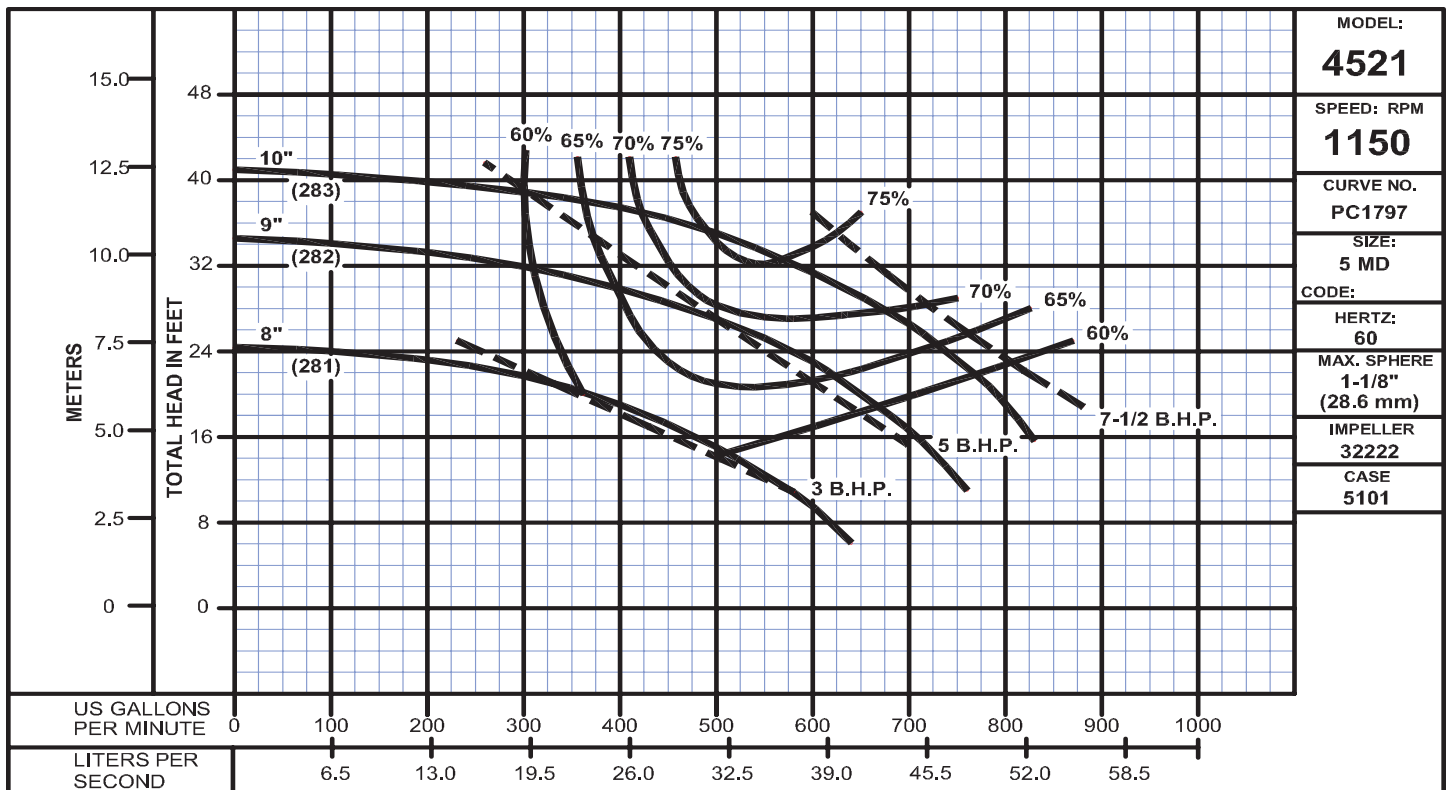
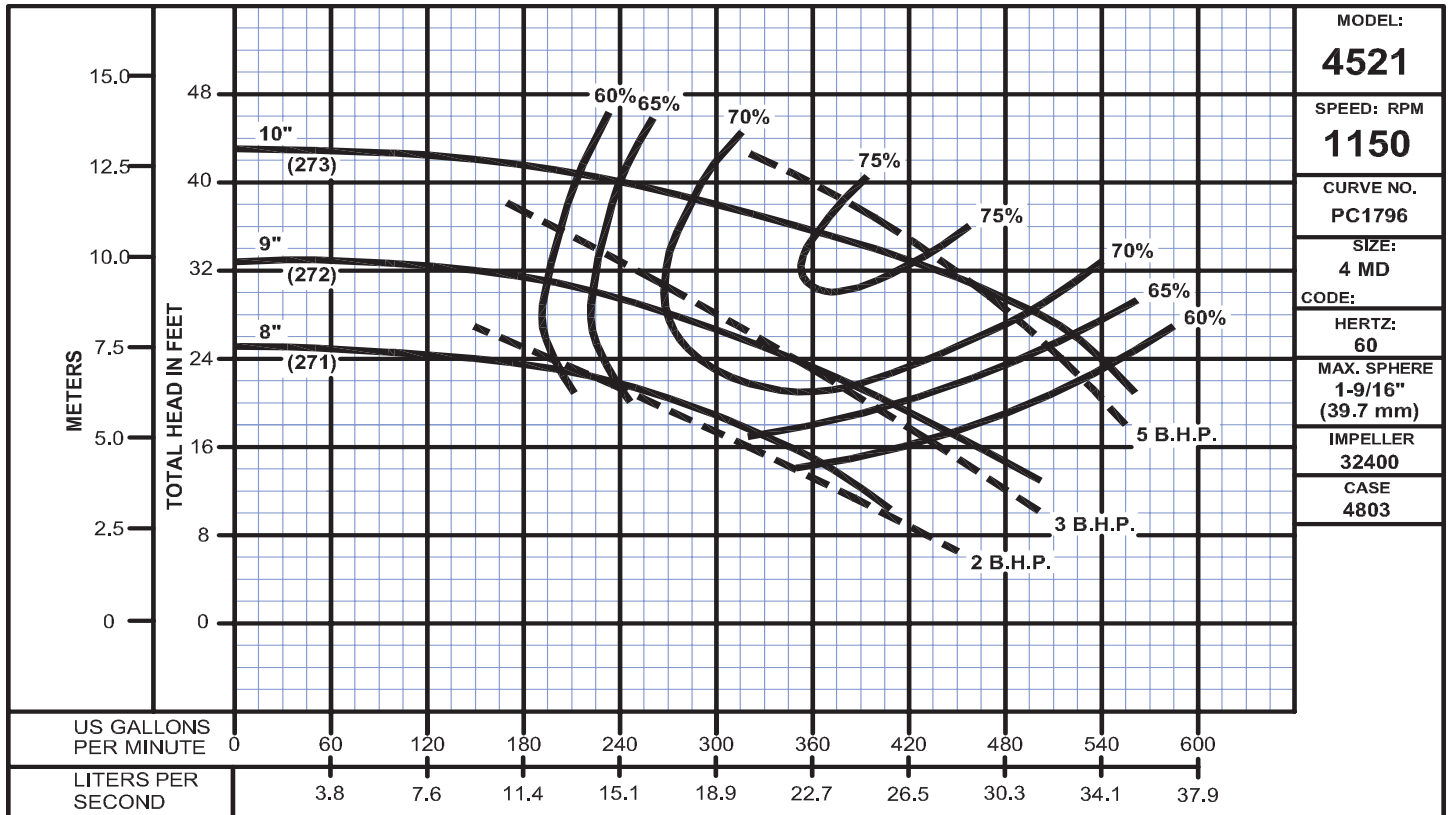


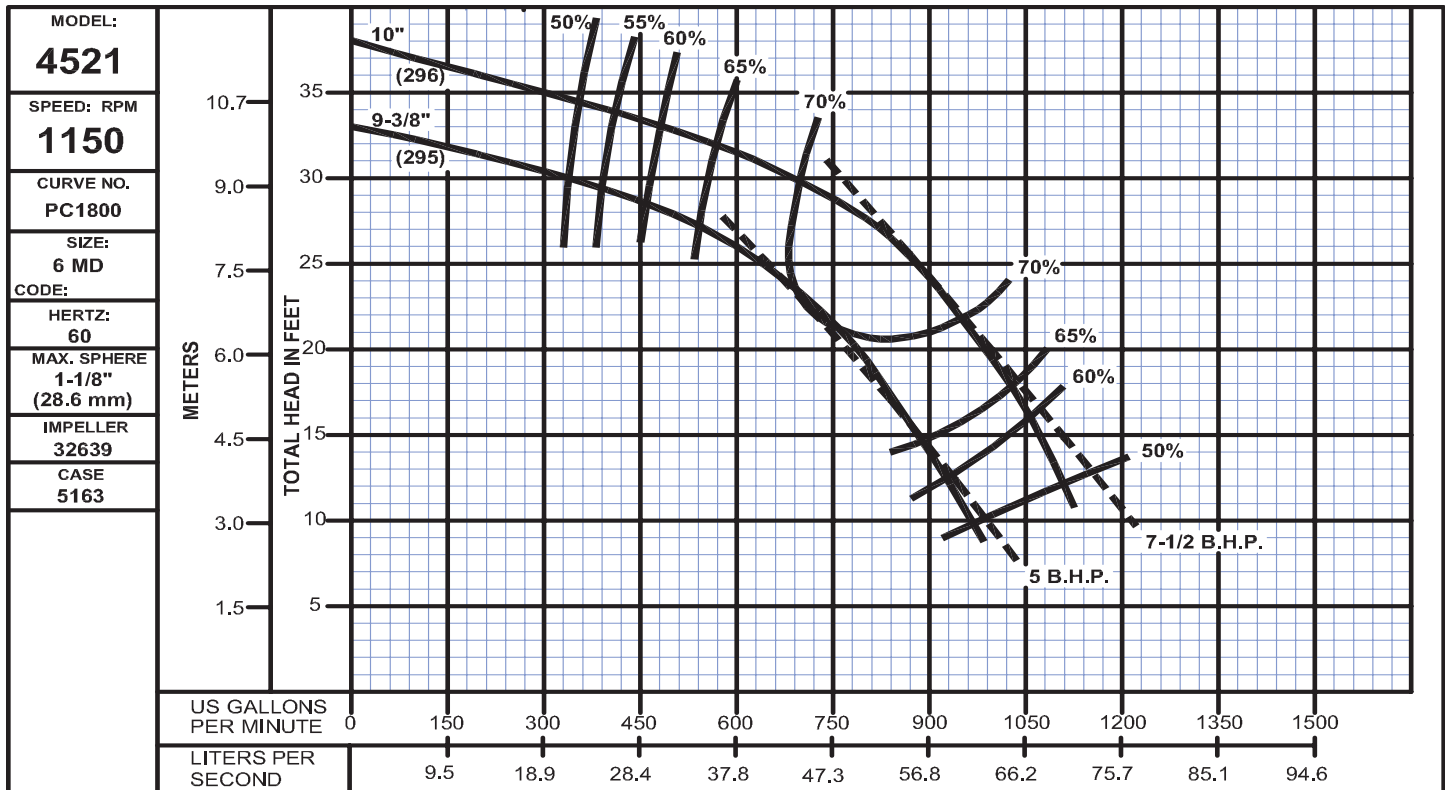
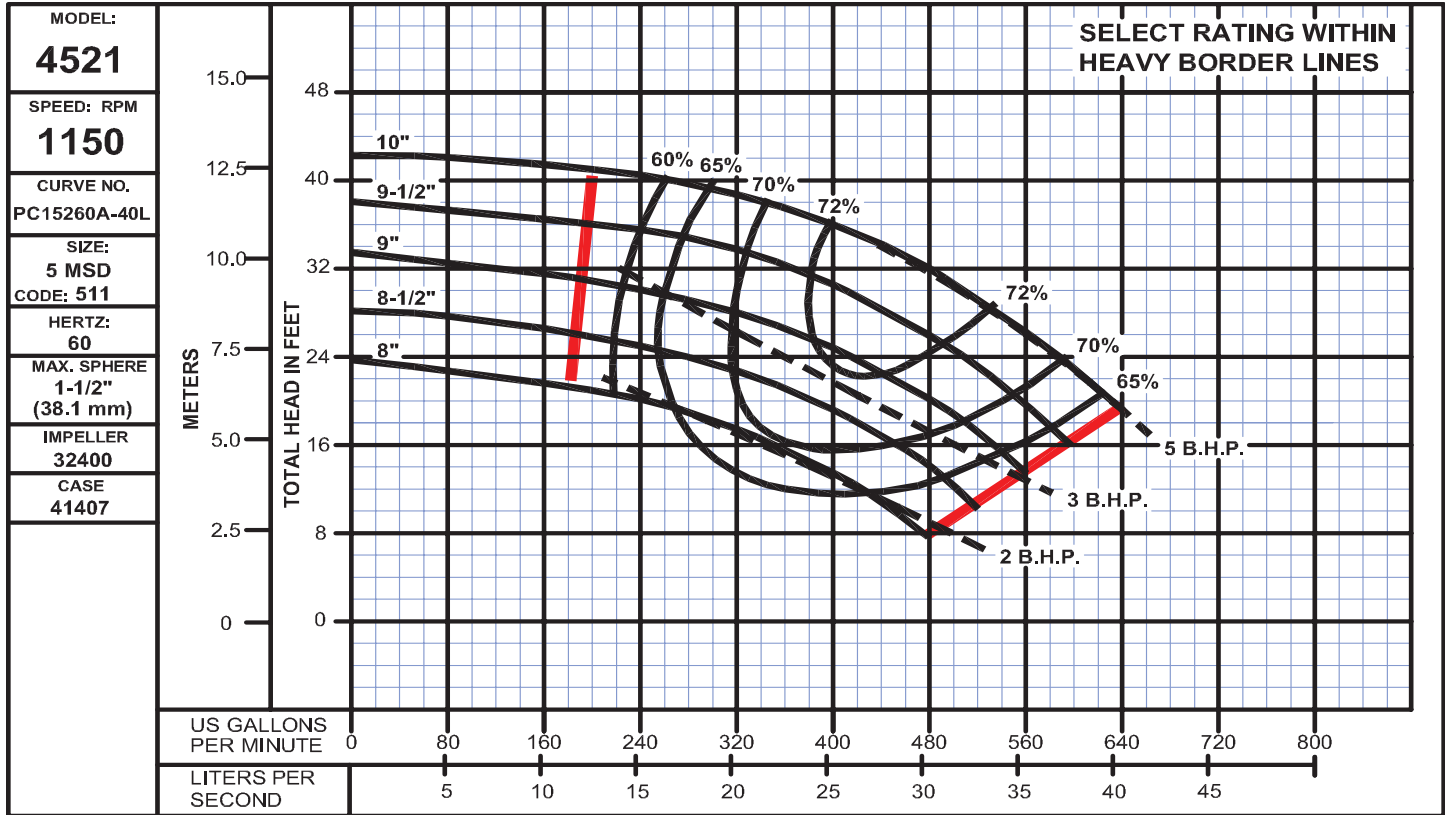
Fig. 4521

Sizes: 5 MSD & 6MD, 1150RPM
Bulletin 4500

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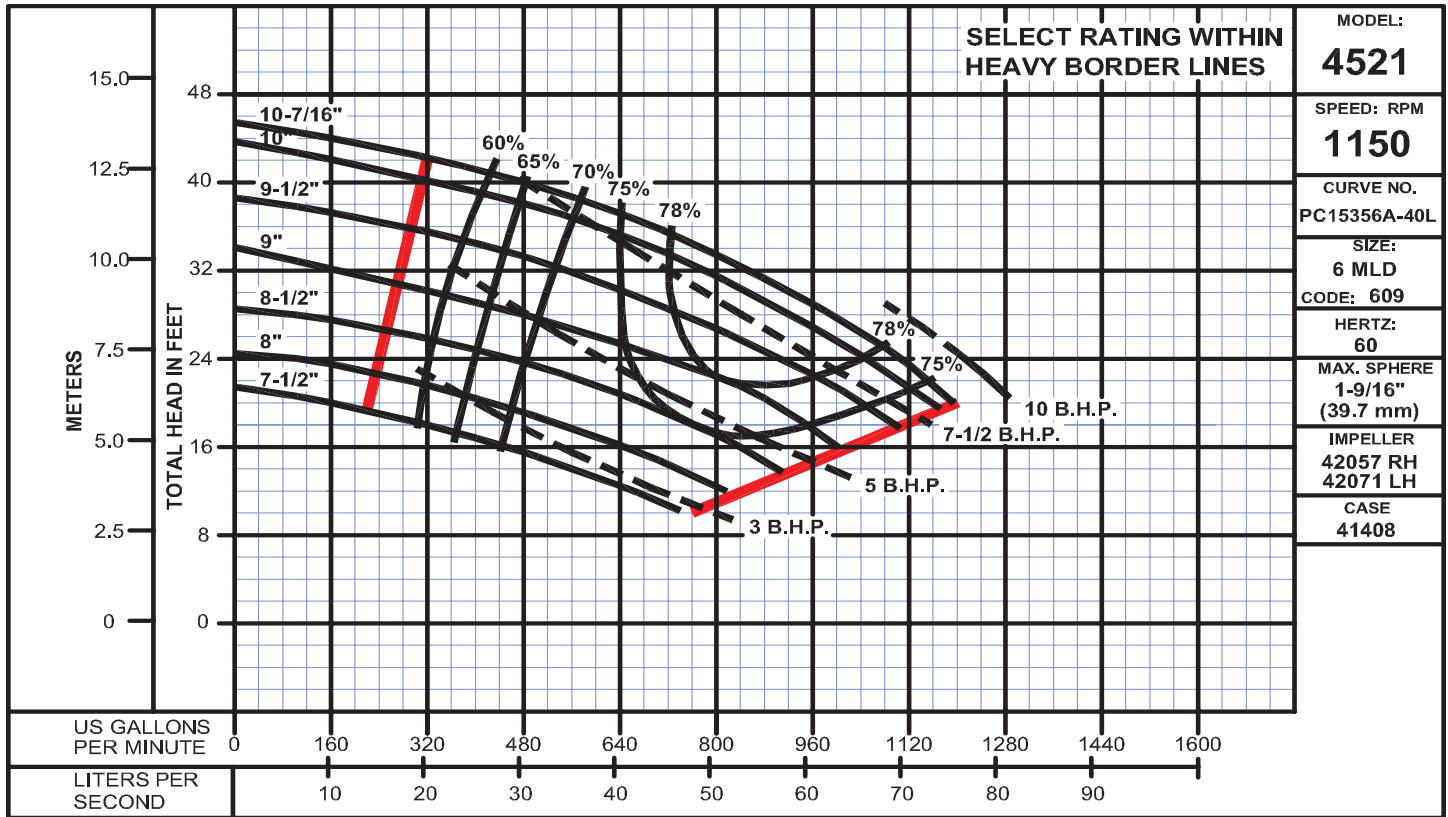


Fig. 4565, 4566 & 4568

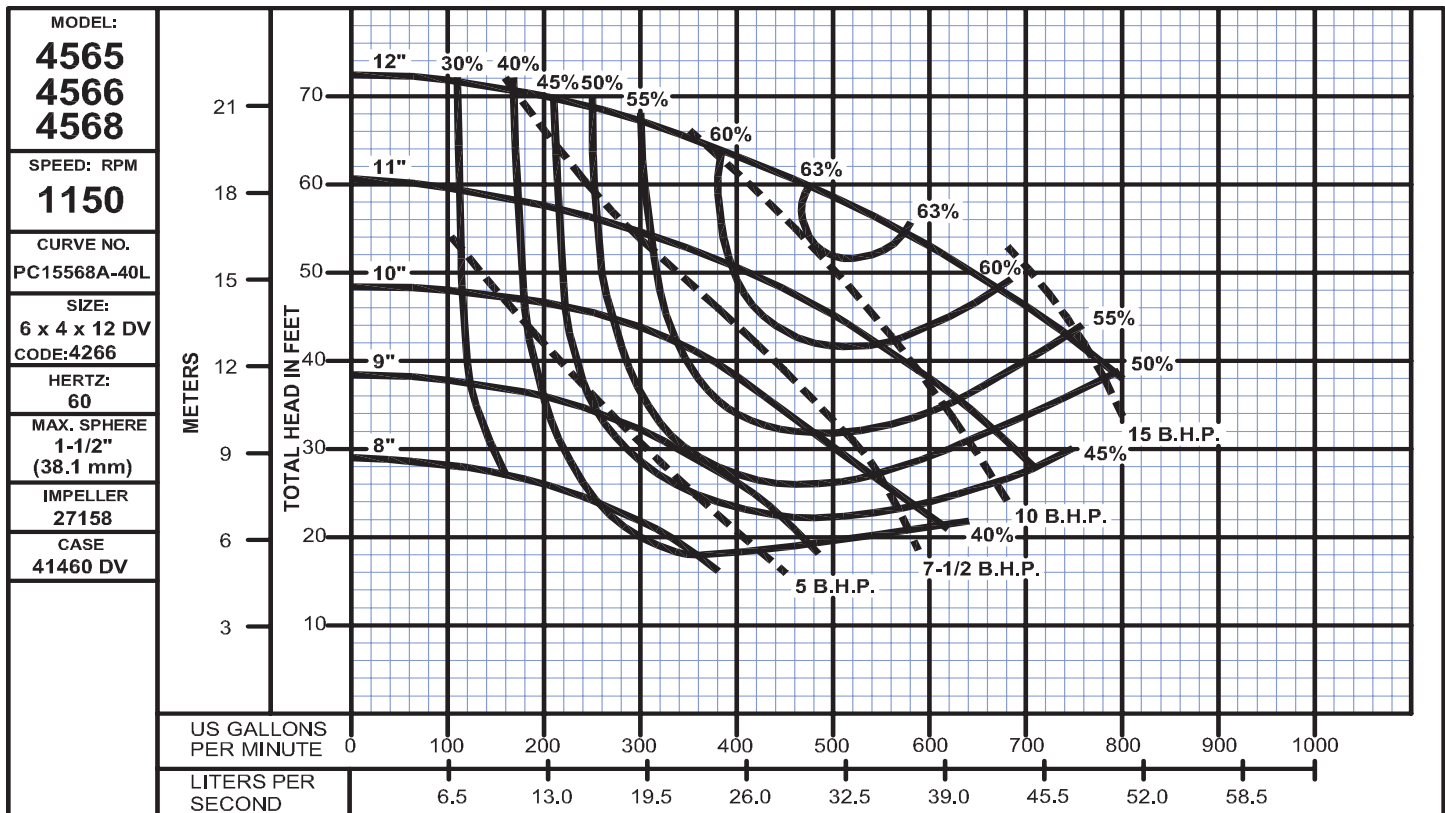
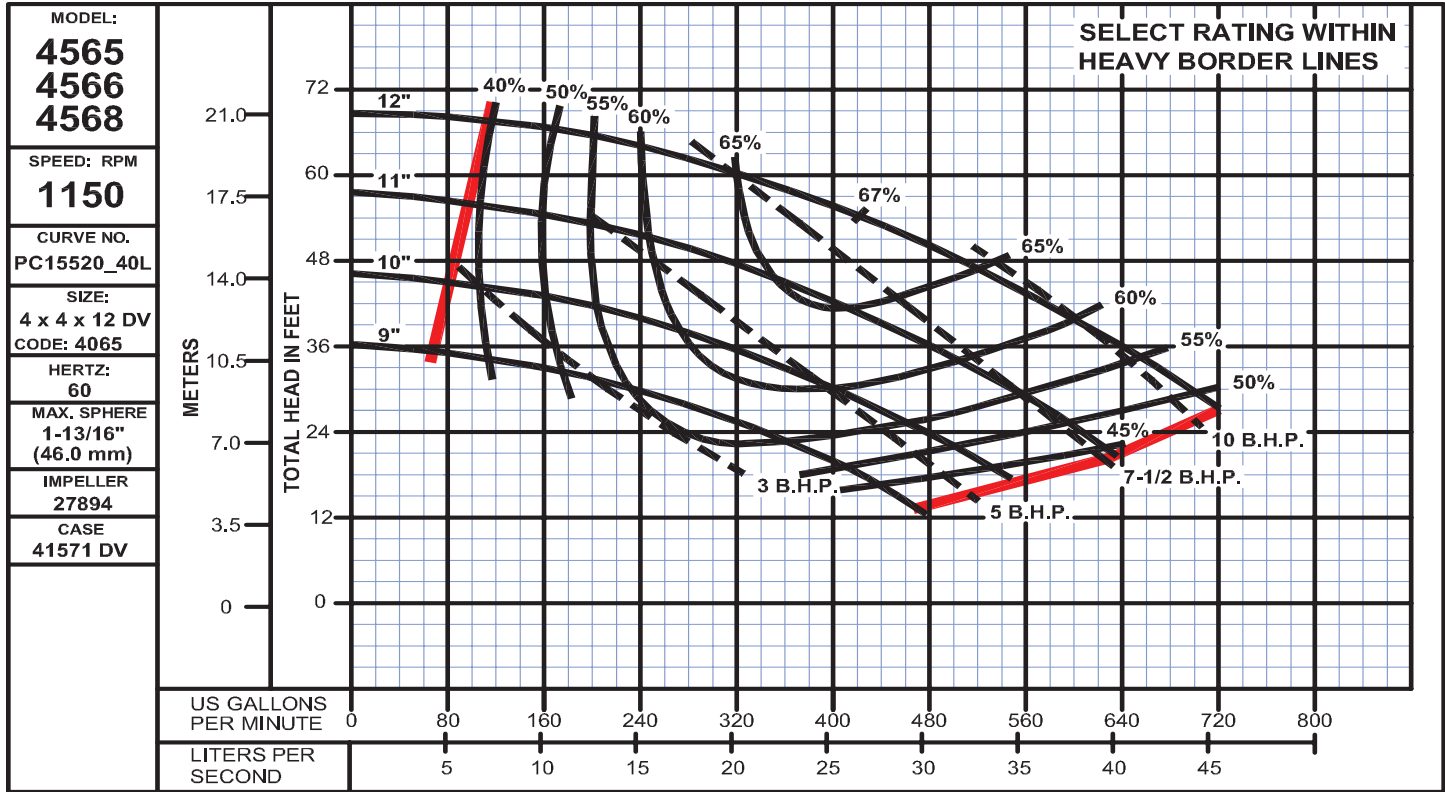
Sizes: 4 x 4 x 12 DV & 6 x 4 x 12 DV, 1150RPM

Bulletin 4500

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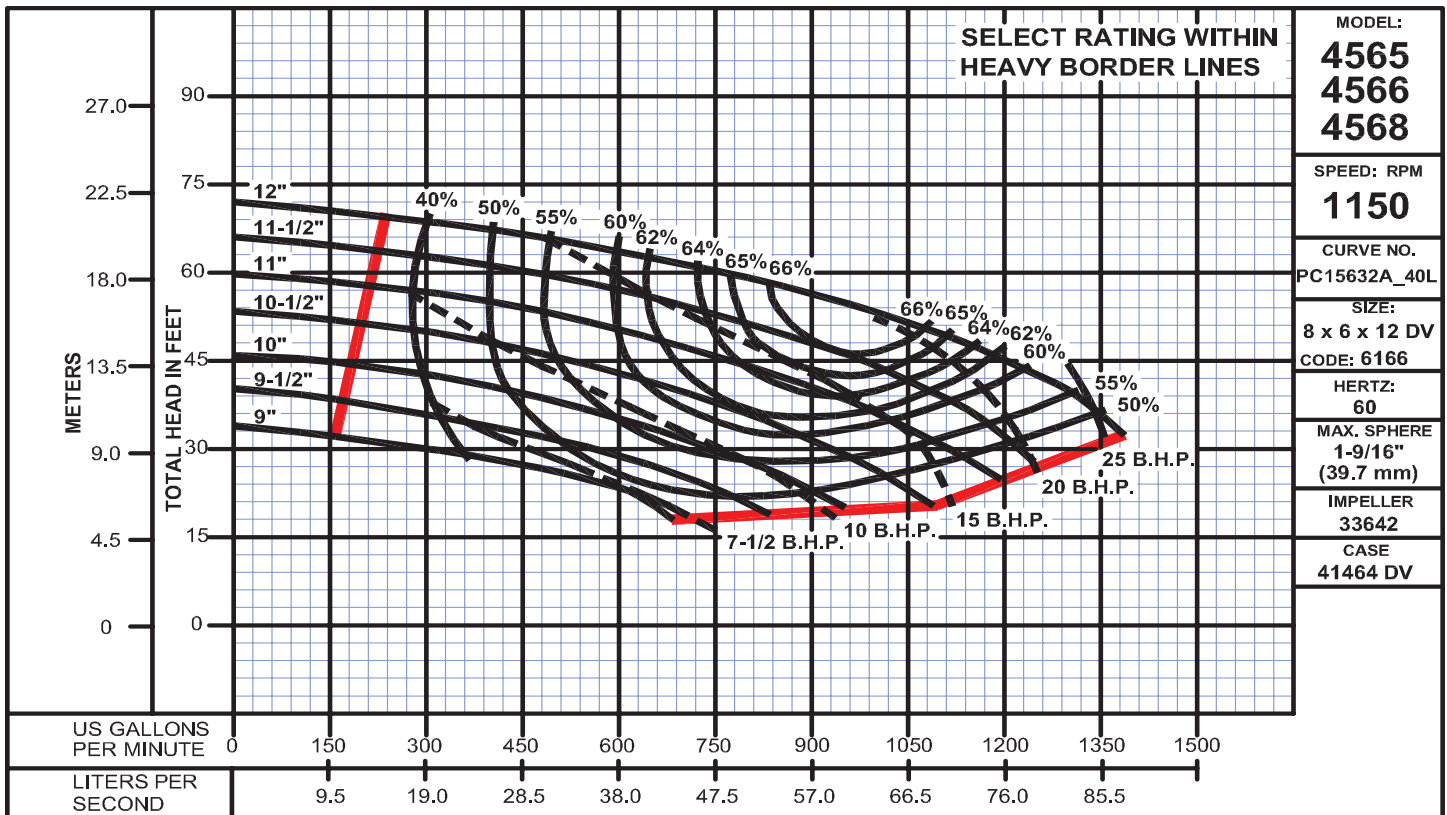
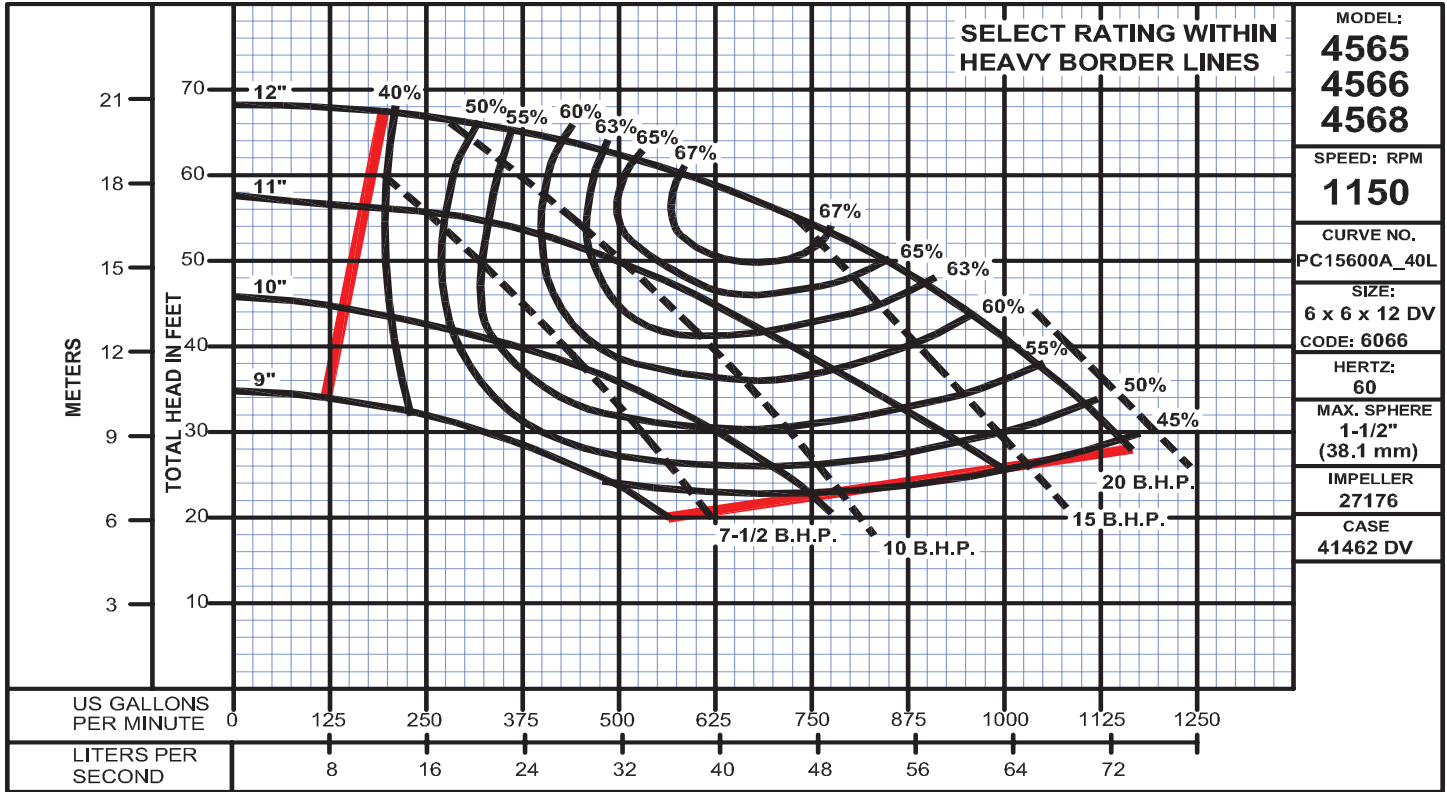


Fig. 4565, 4566 & 4568

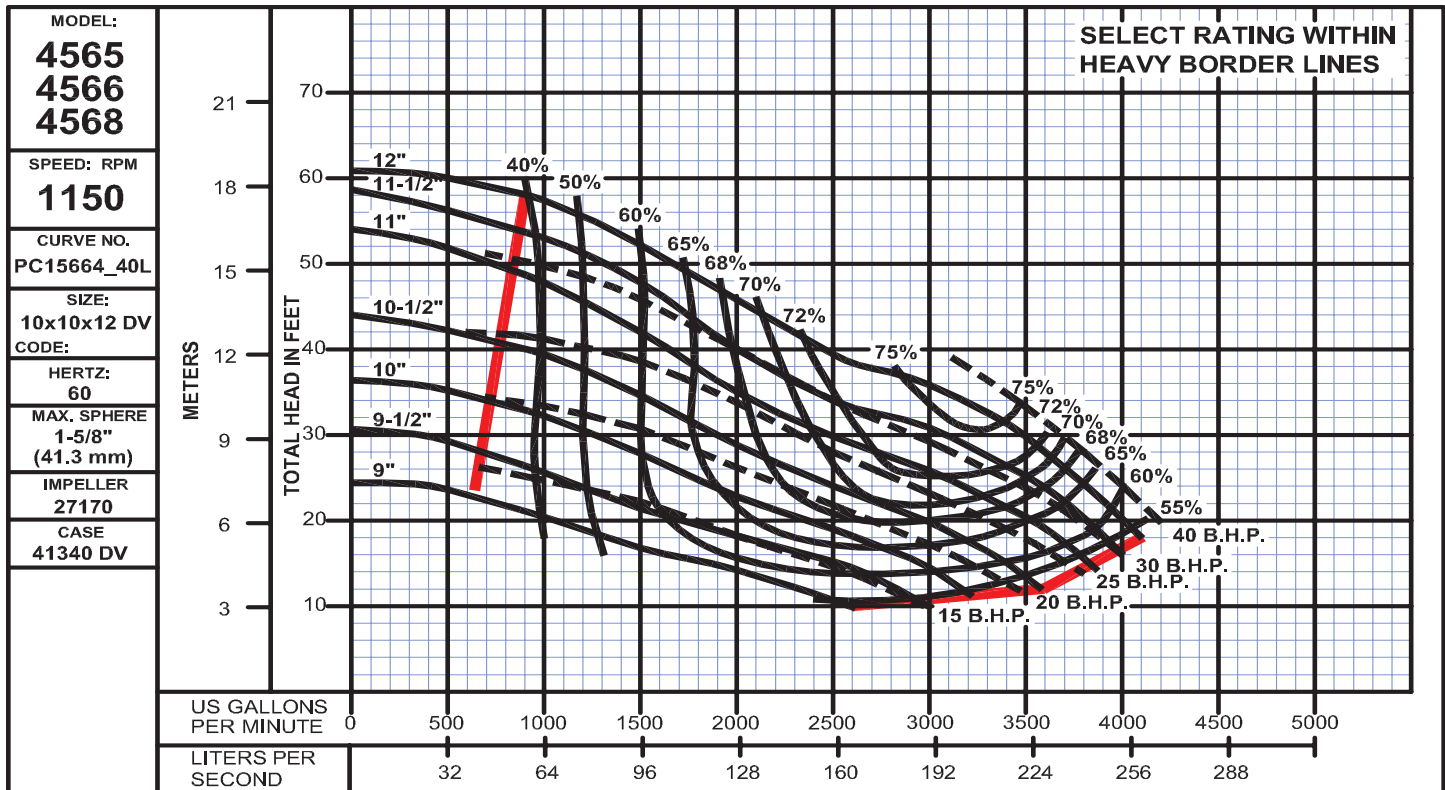
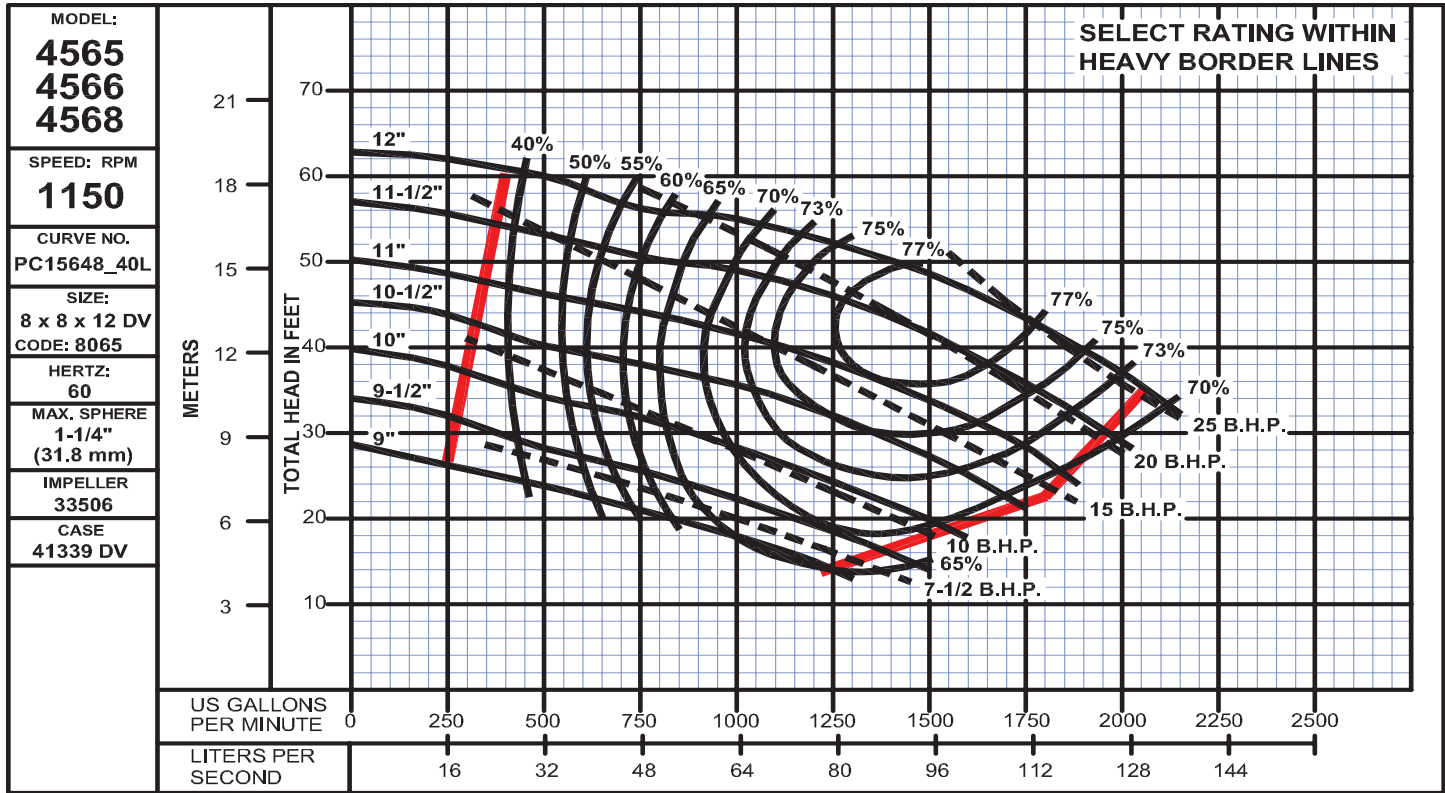
Sizes: 8 x 8 x 12 DV & 10 x 10 x 12 DV, 1150RPM

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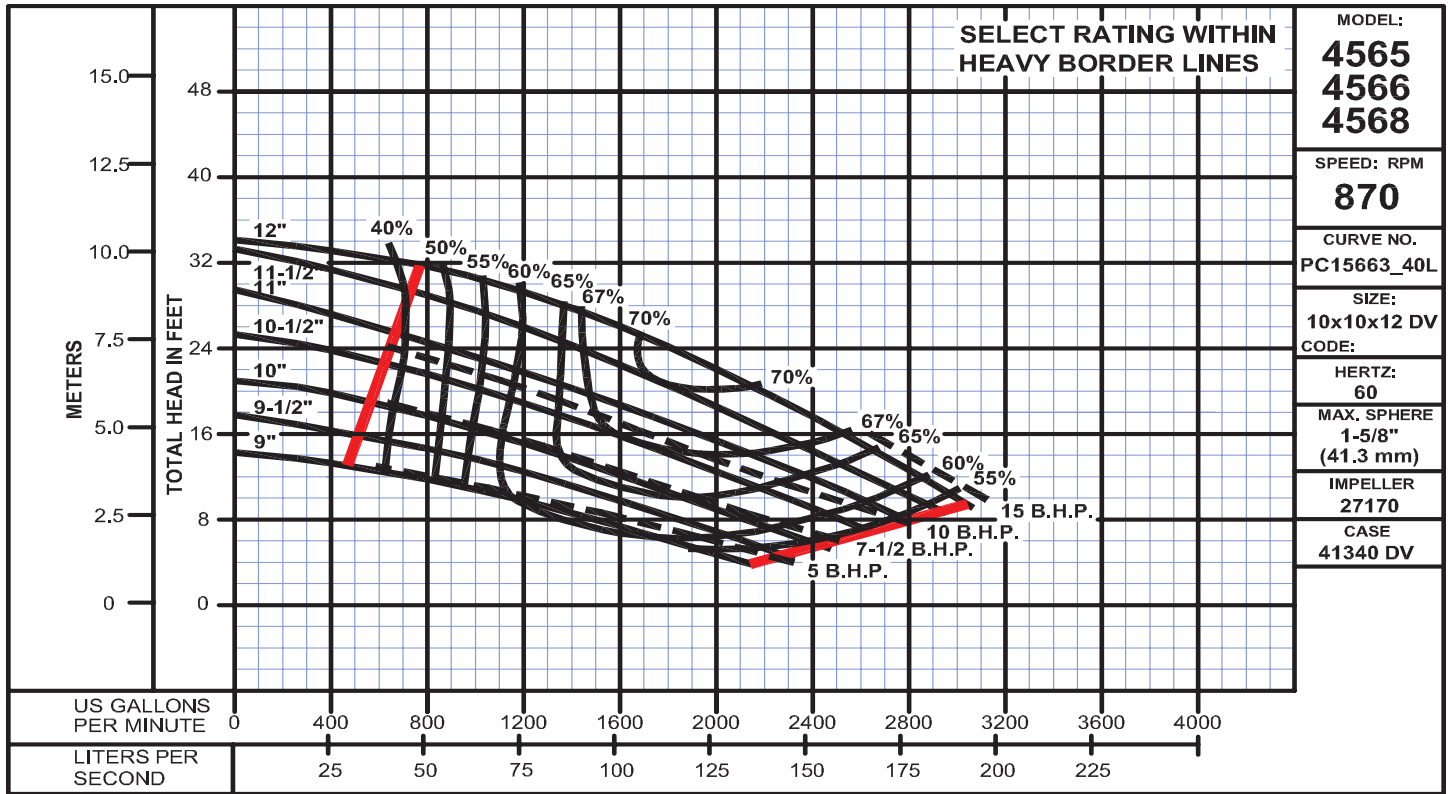


Fig. 4501

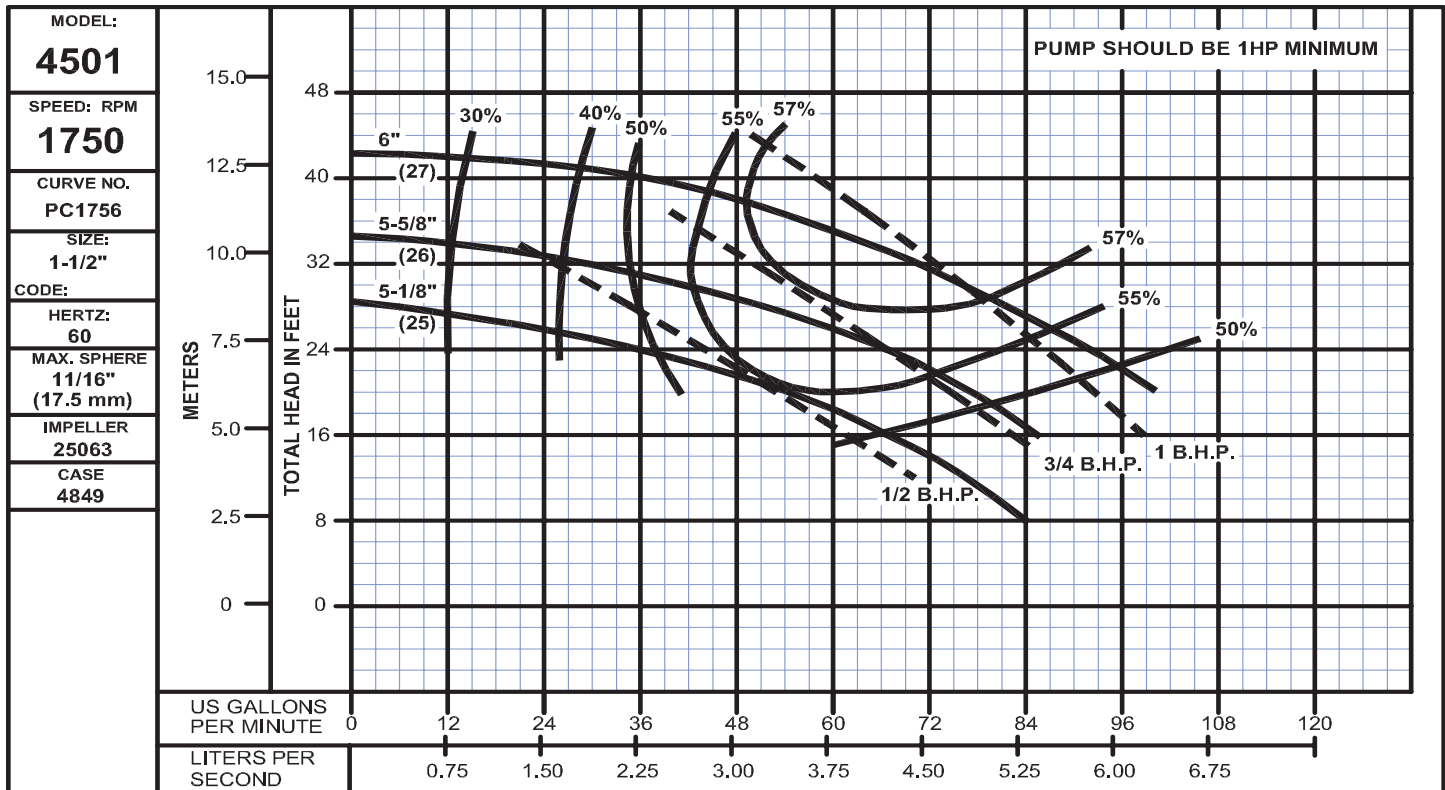
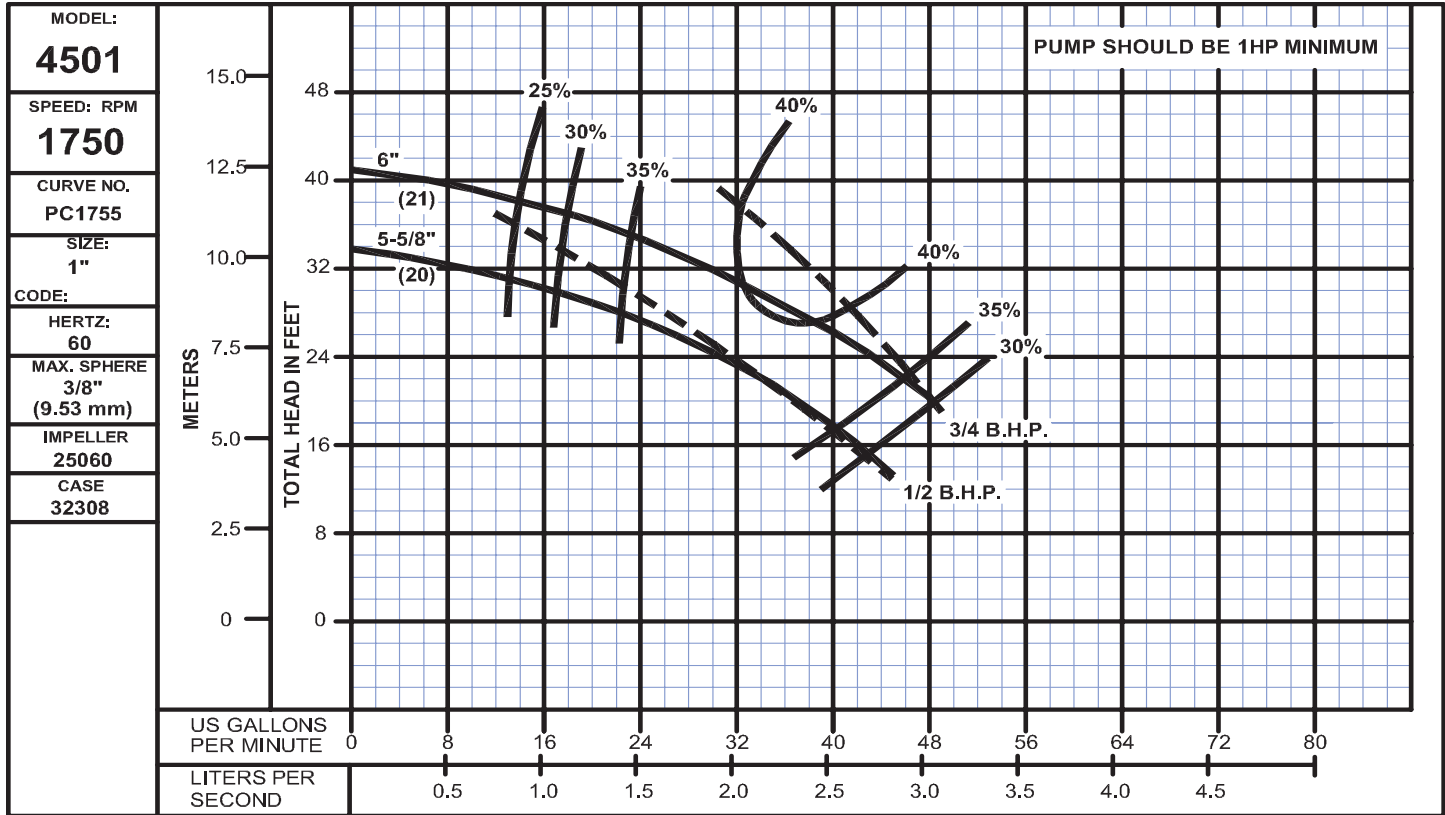
Sizes: 1" & 1½", 1750RPM

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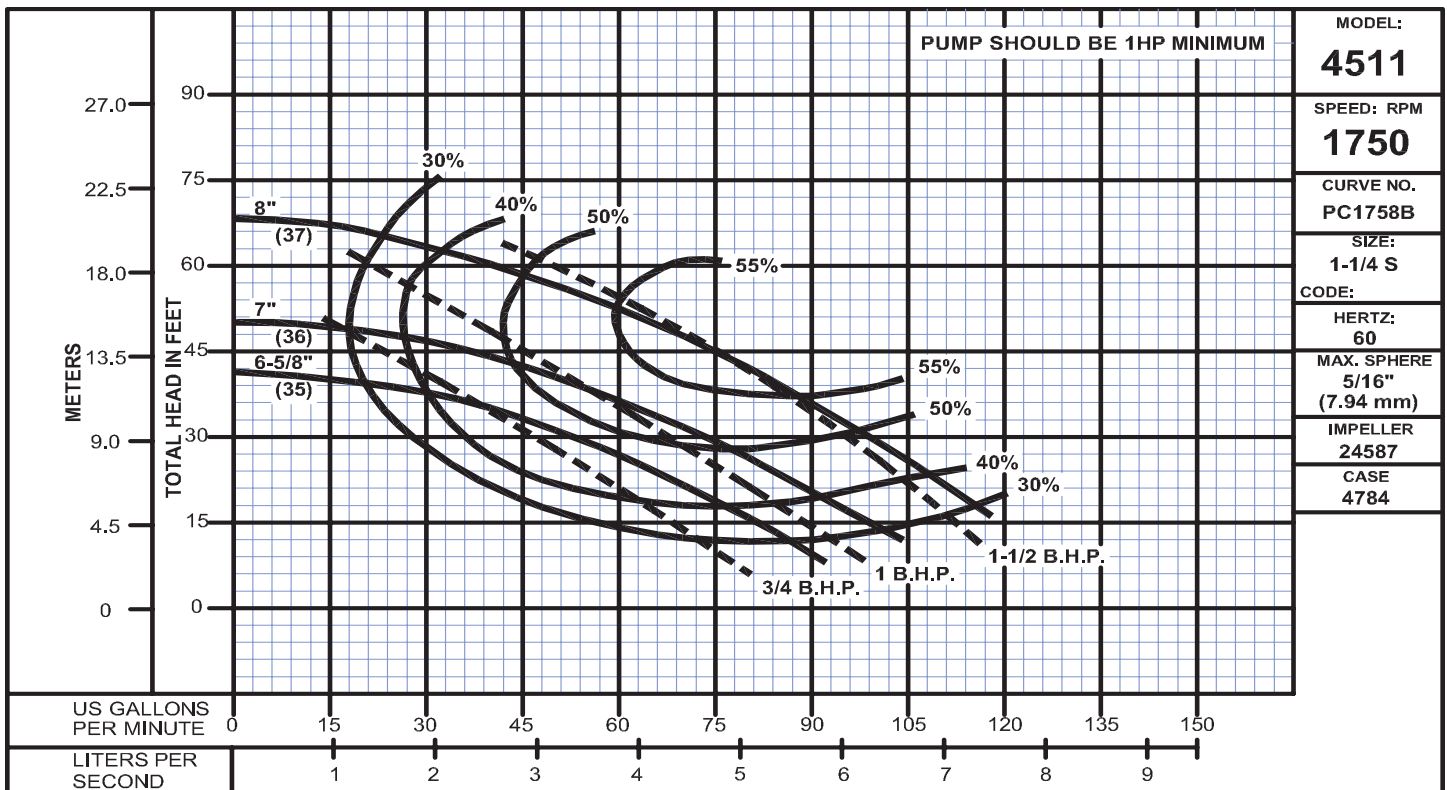
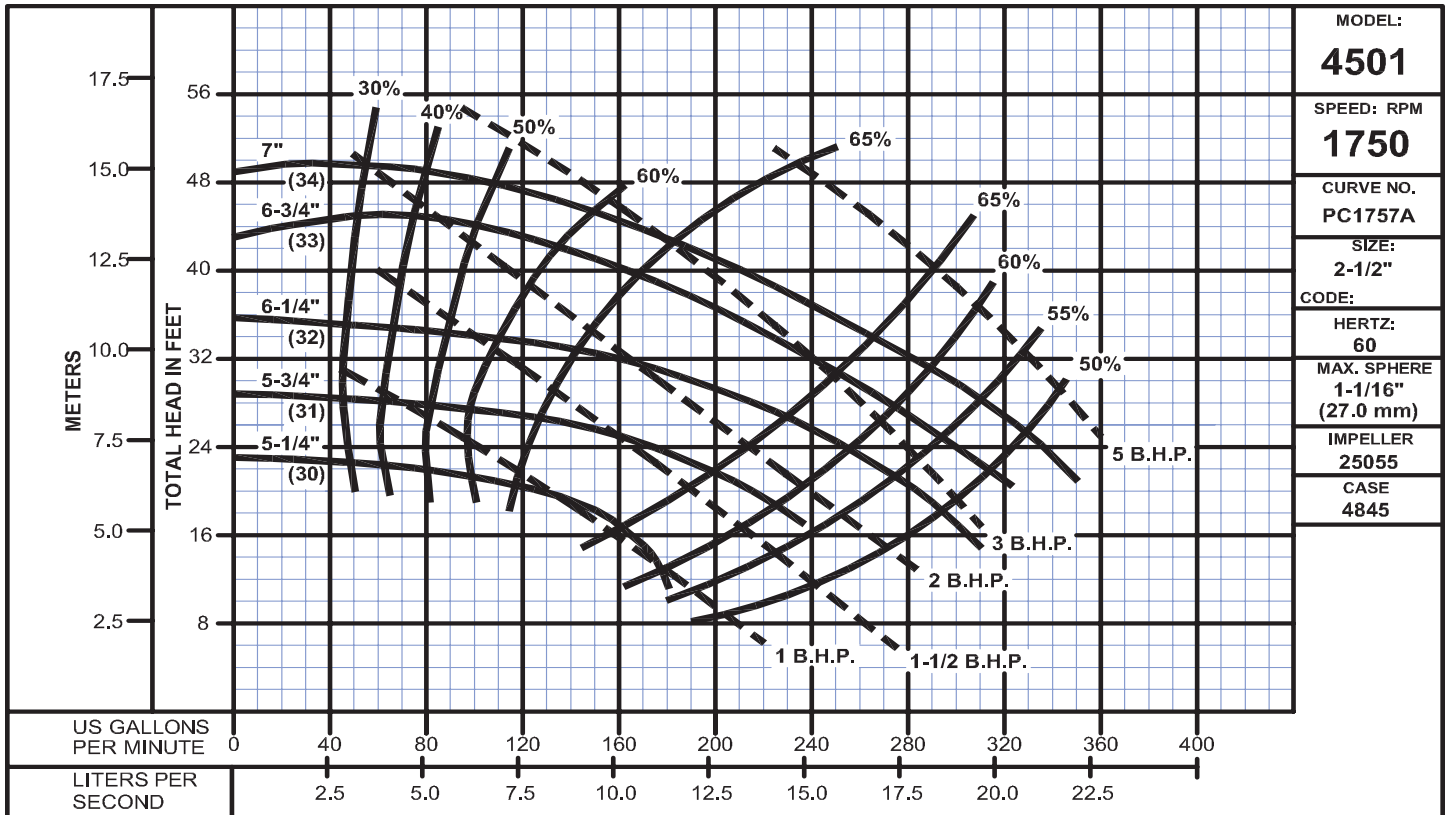


Fig. 4511

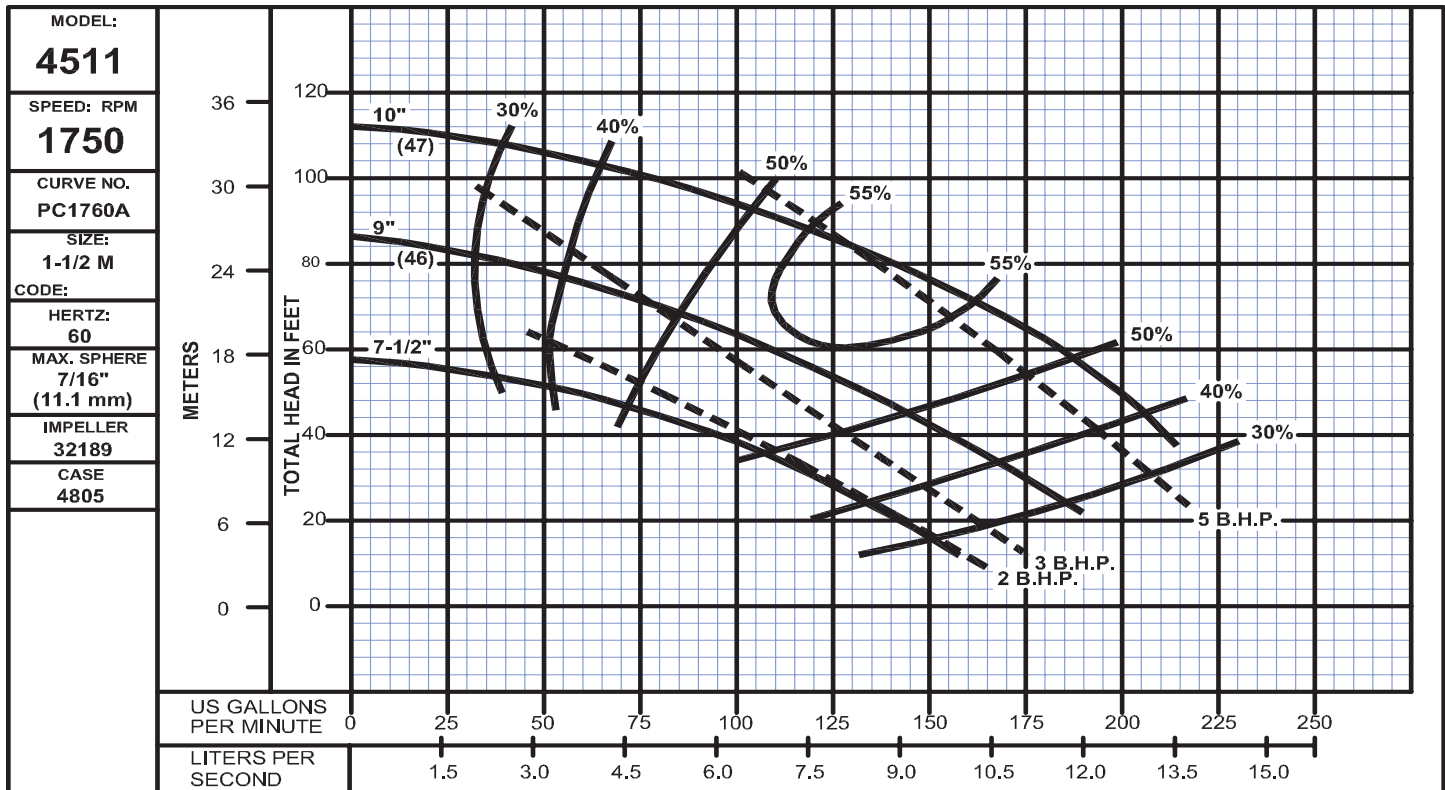
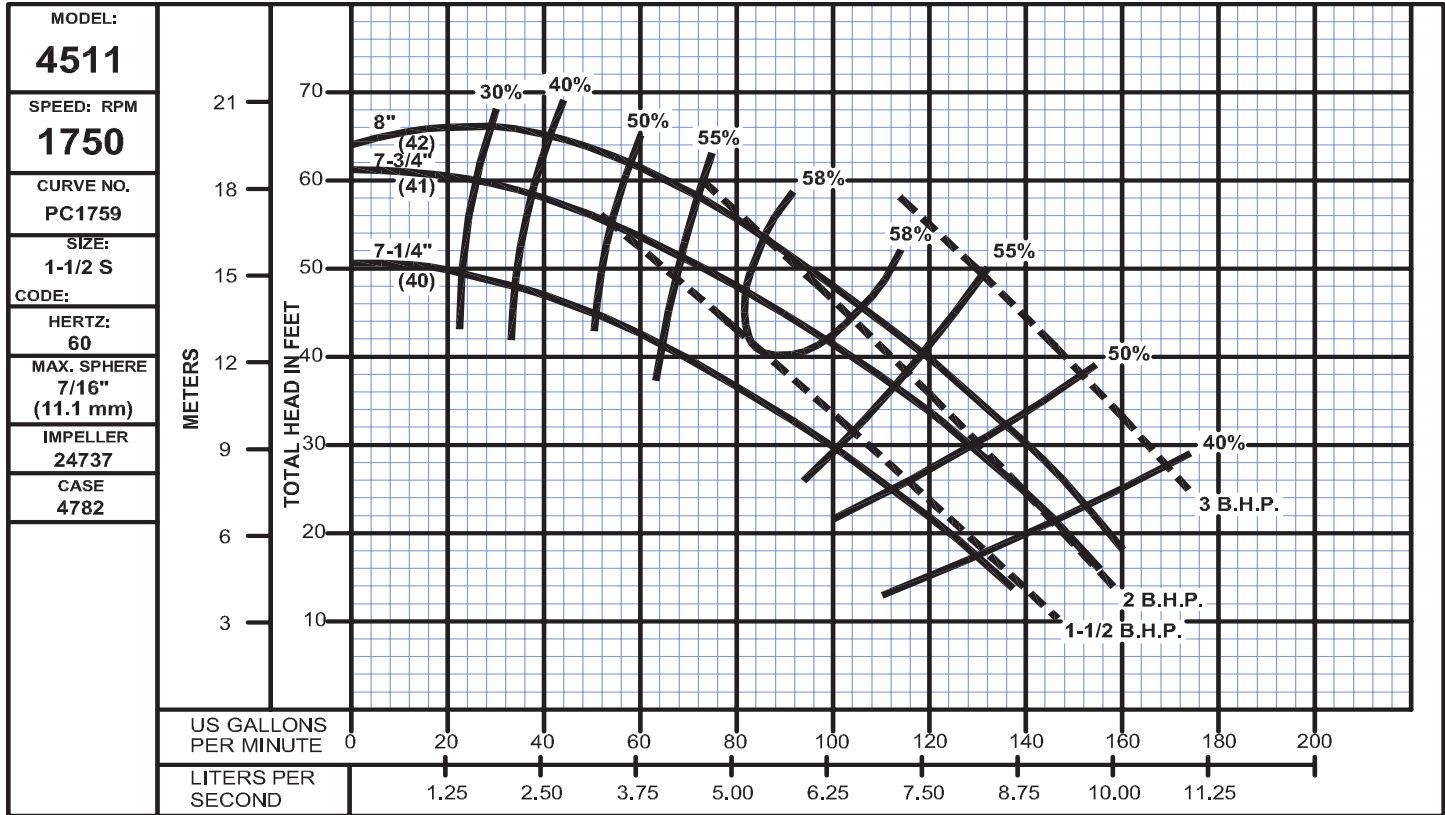
Sizes: 1½S & 1½M, 1750RPM

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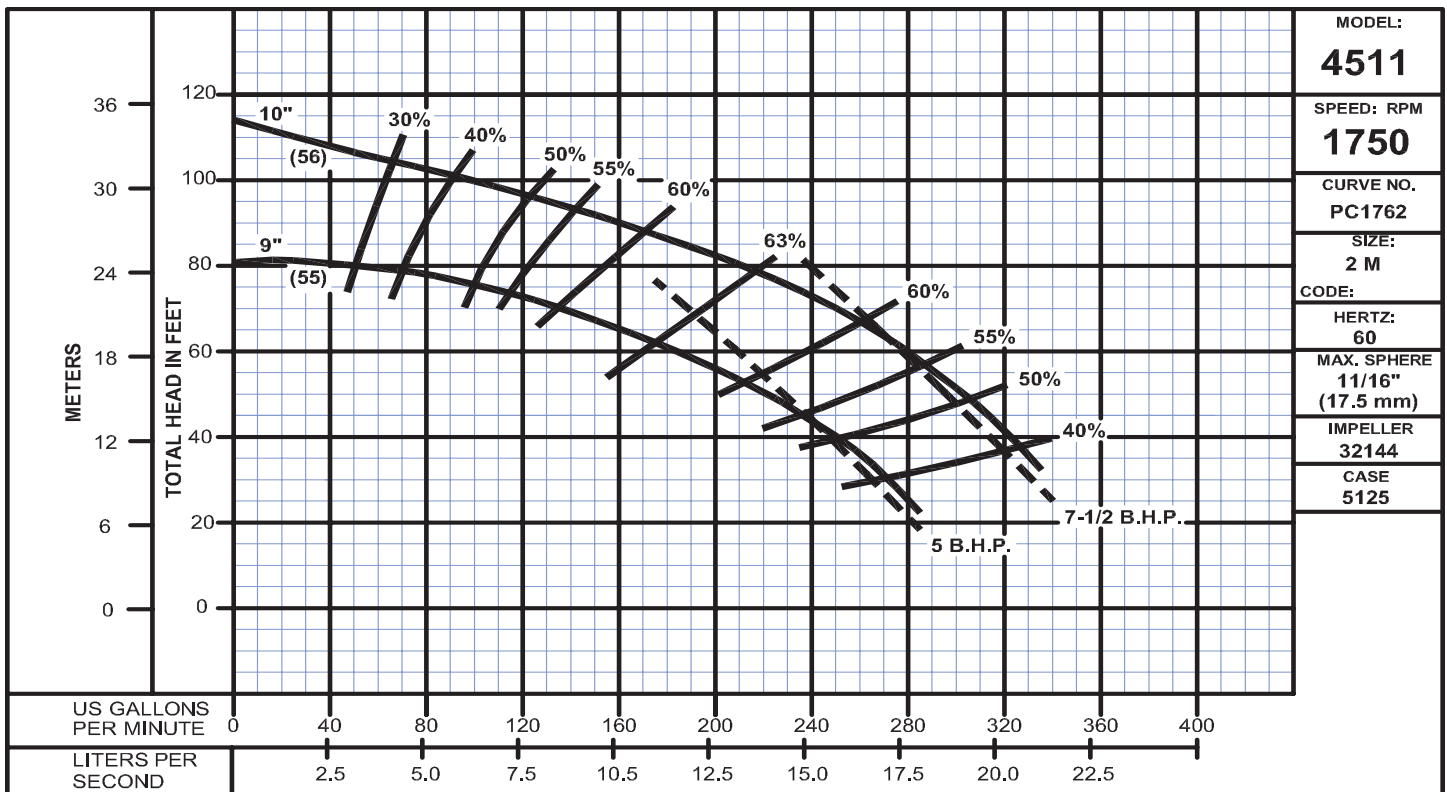
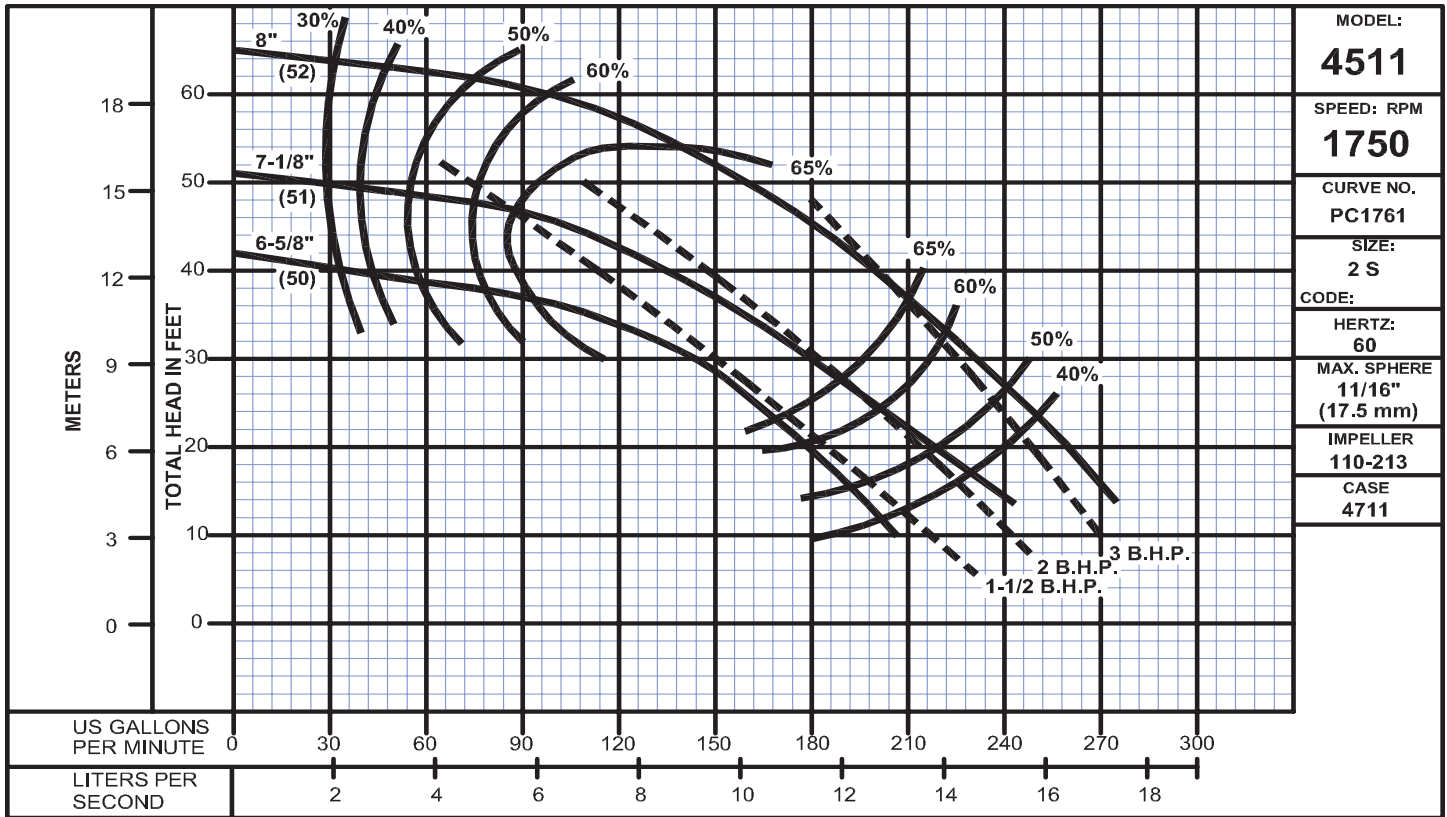


Fig. 4511

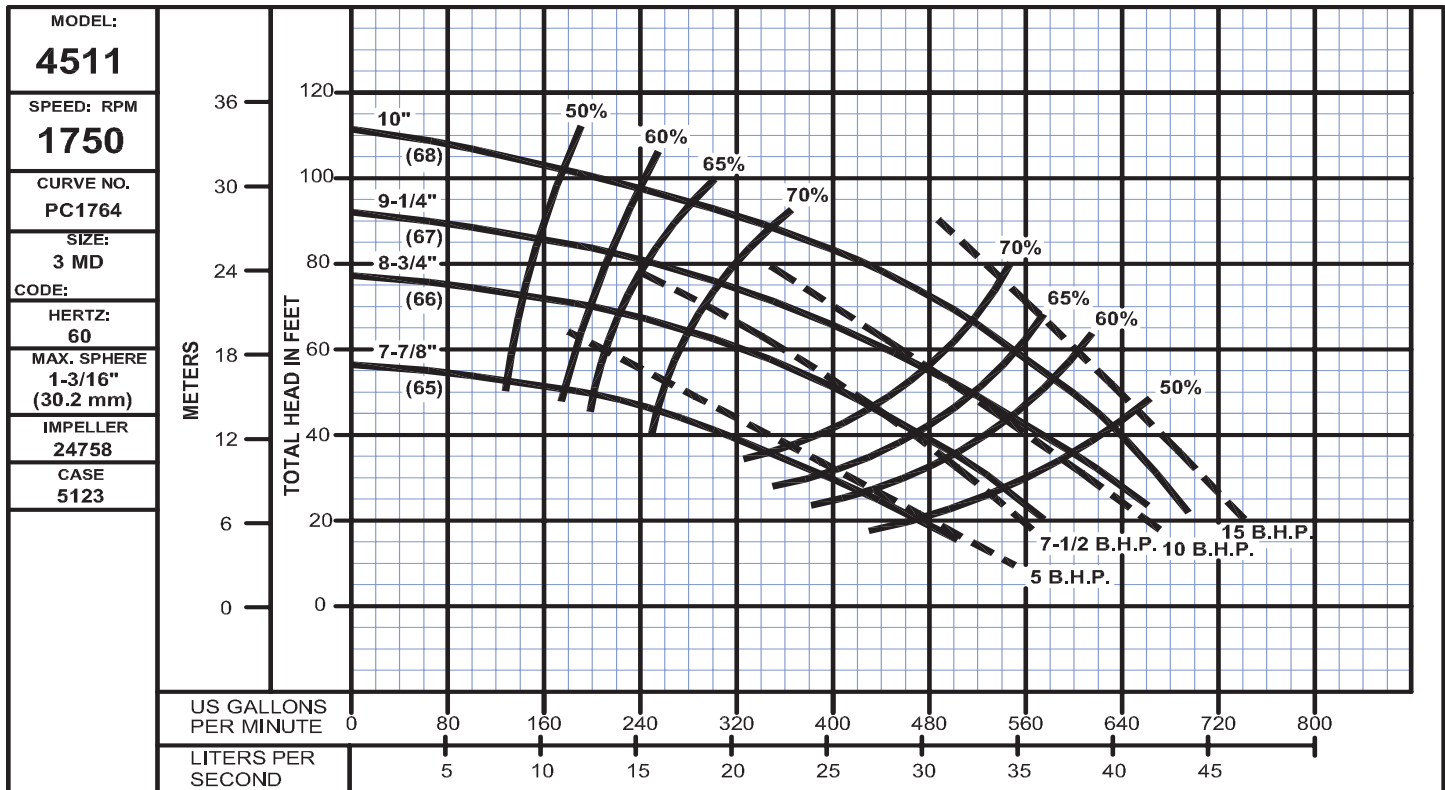
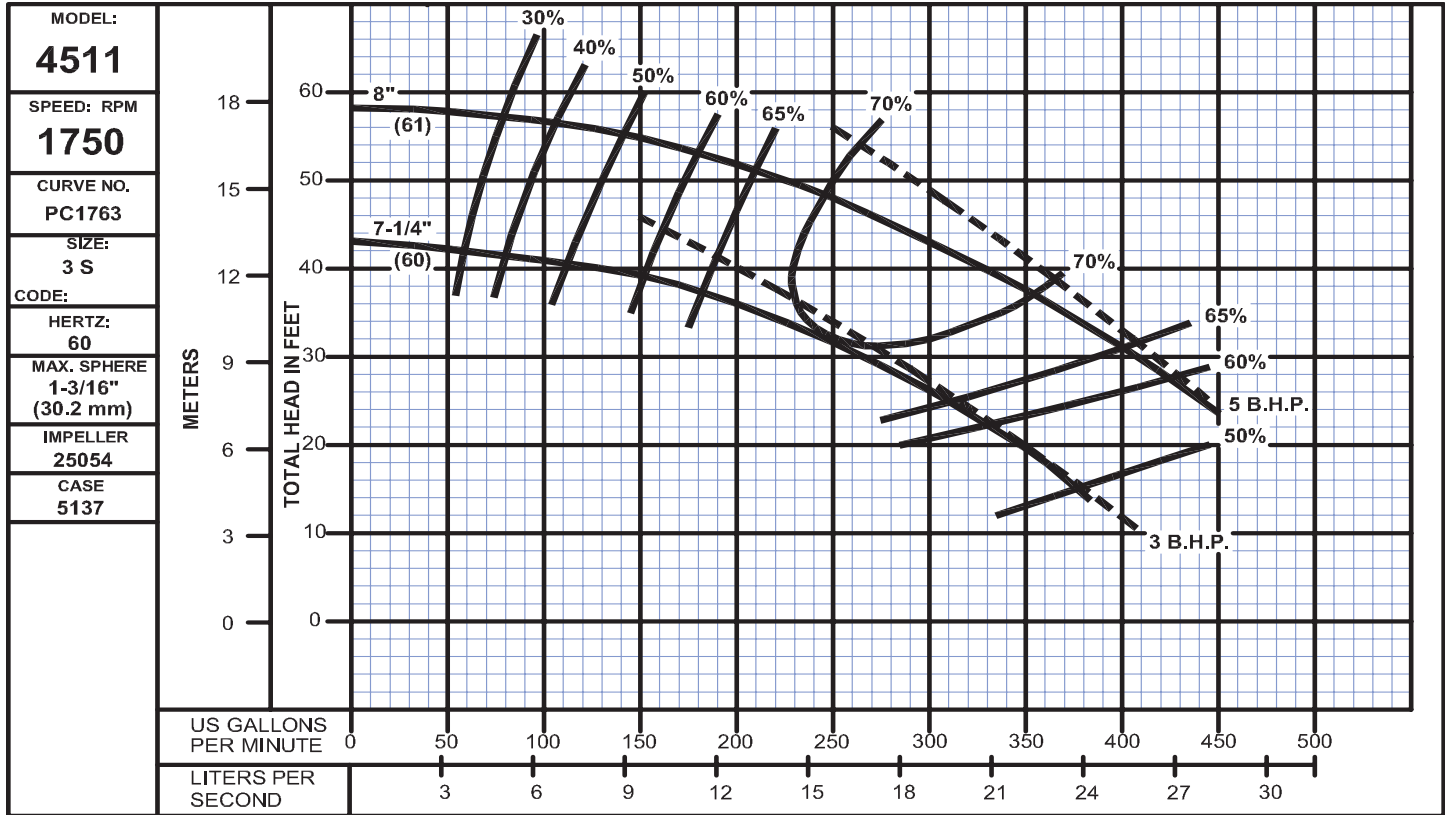
Sizes: 3S & 3MD, 1750RPM

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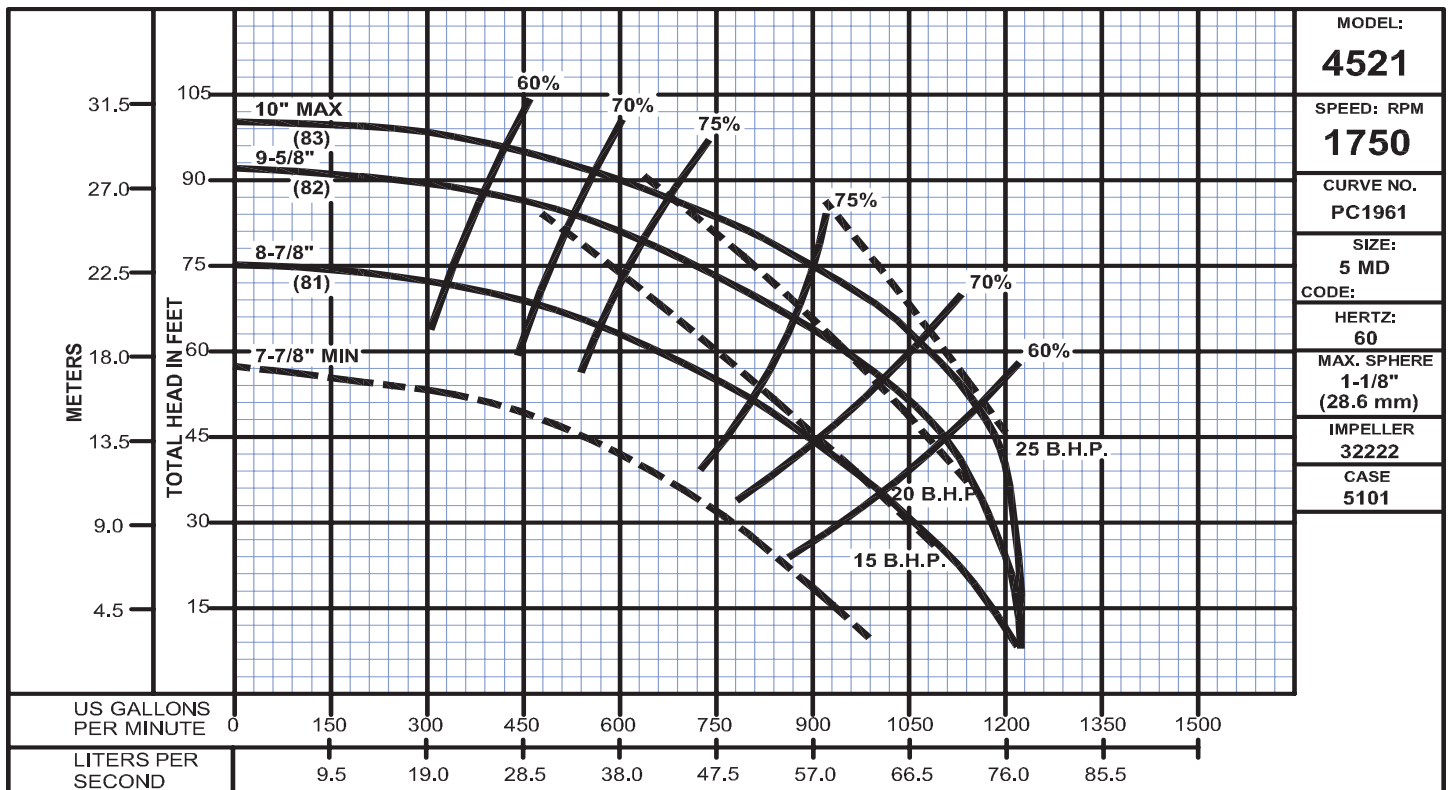
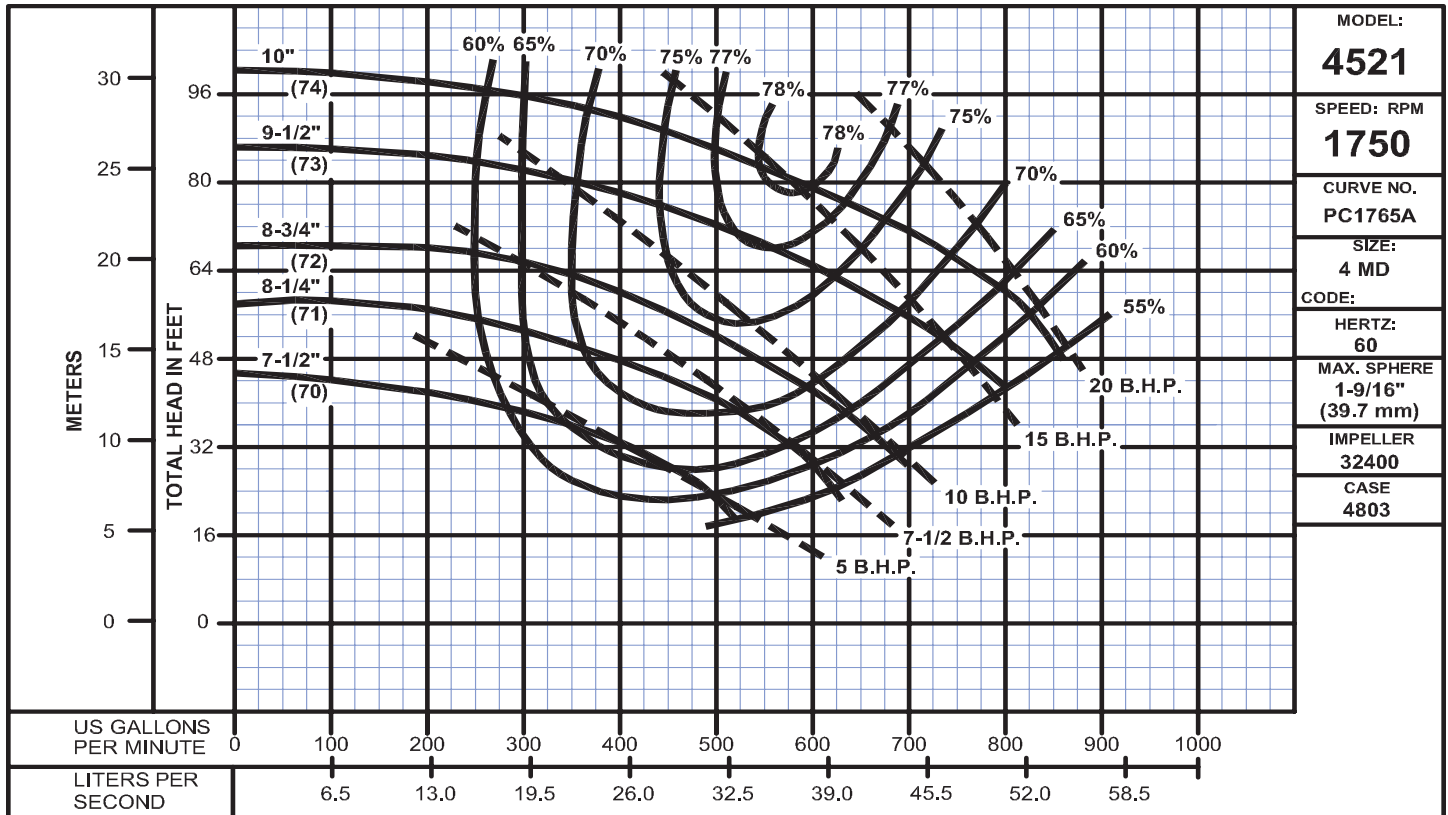


Fig. 4511 & 4521

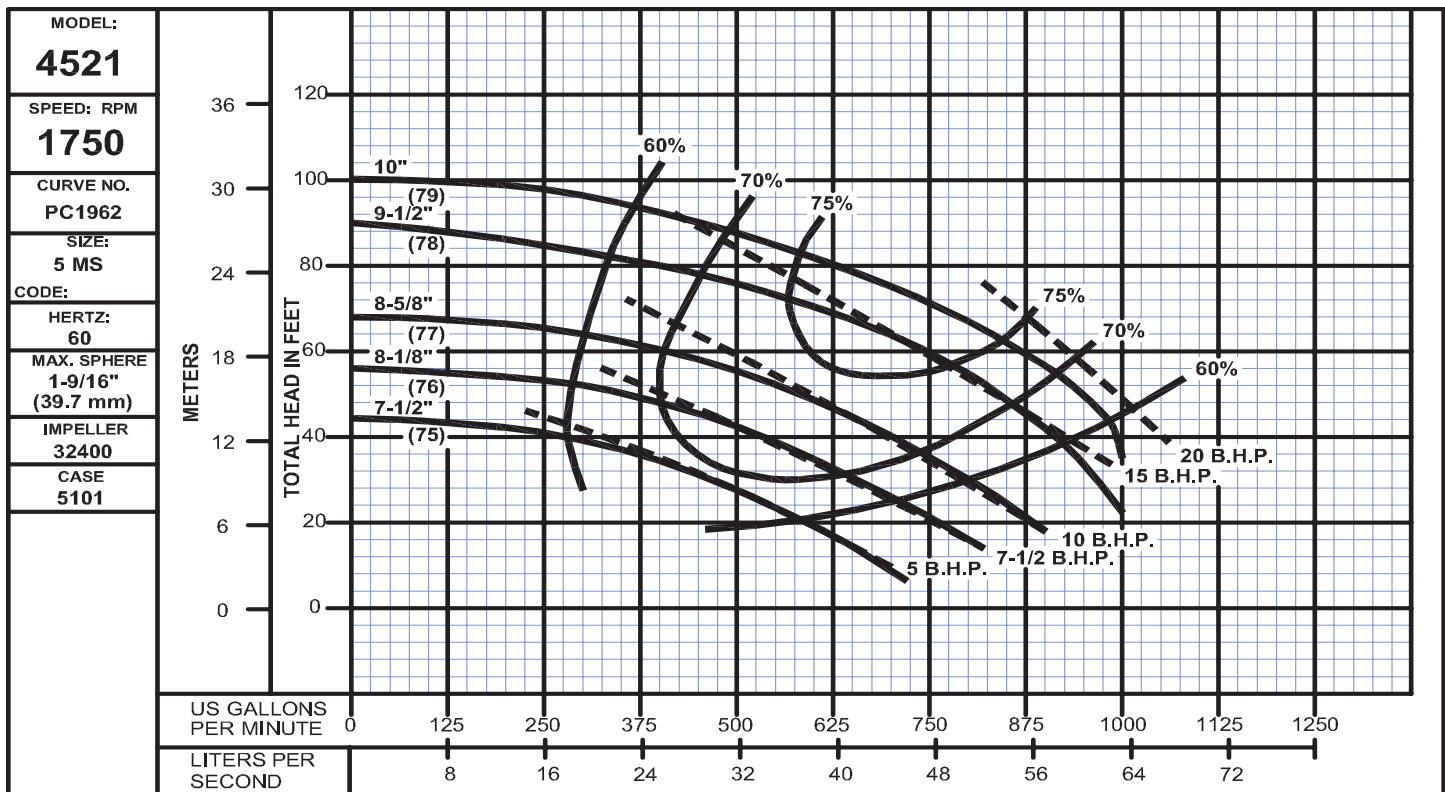
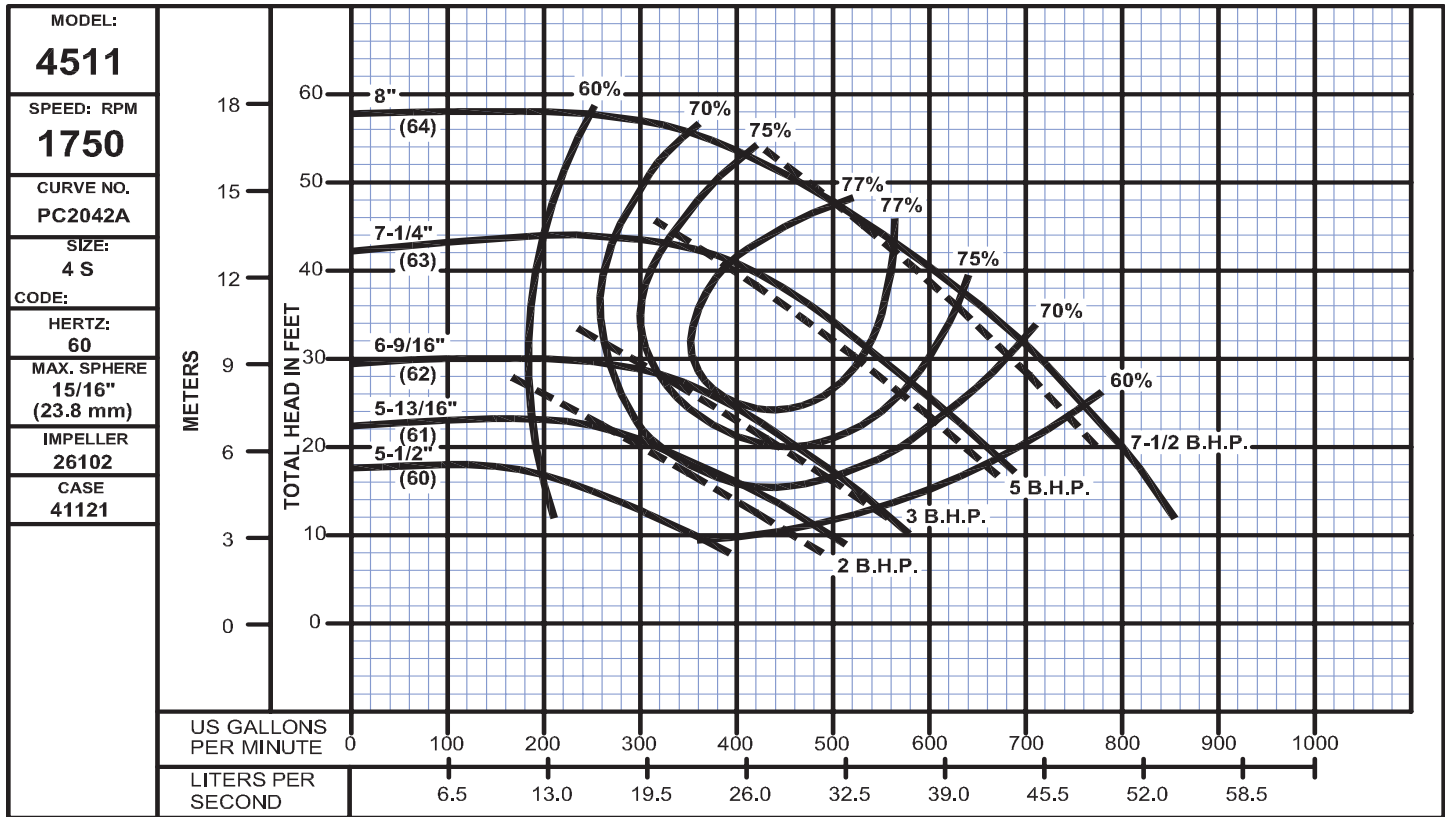
Sizes: 4 S & 5 MS, 1750RPM

Bulletin 4500

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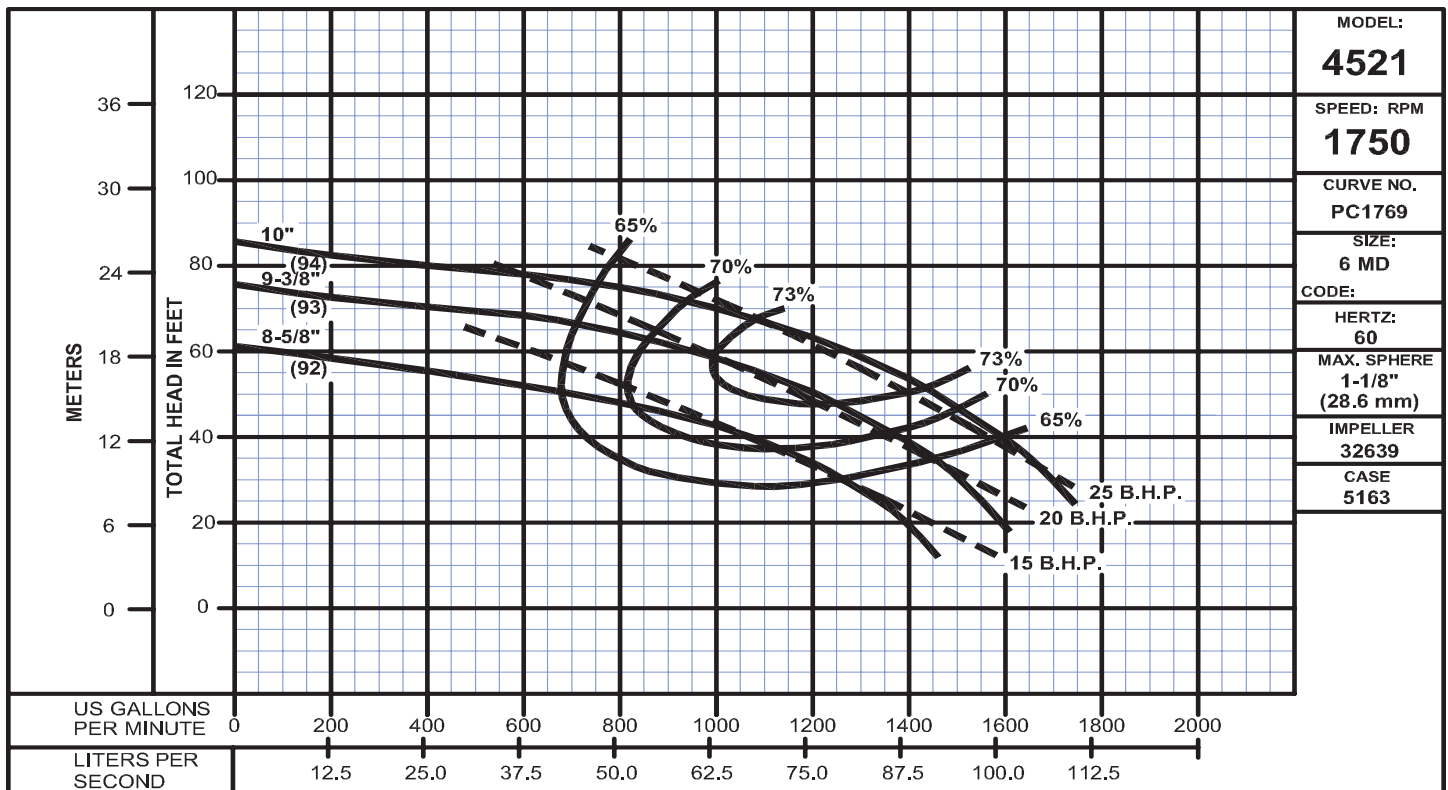
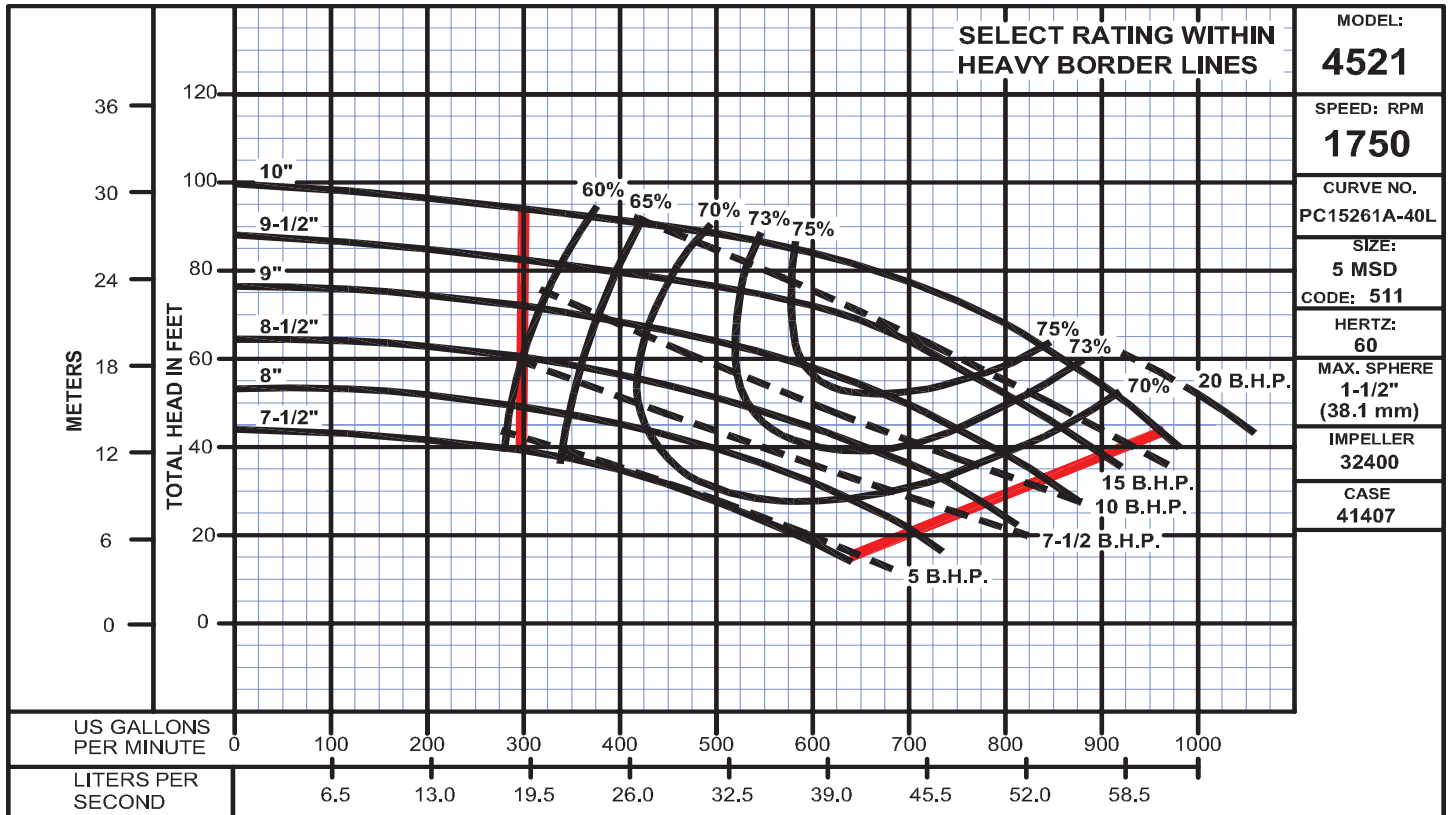


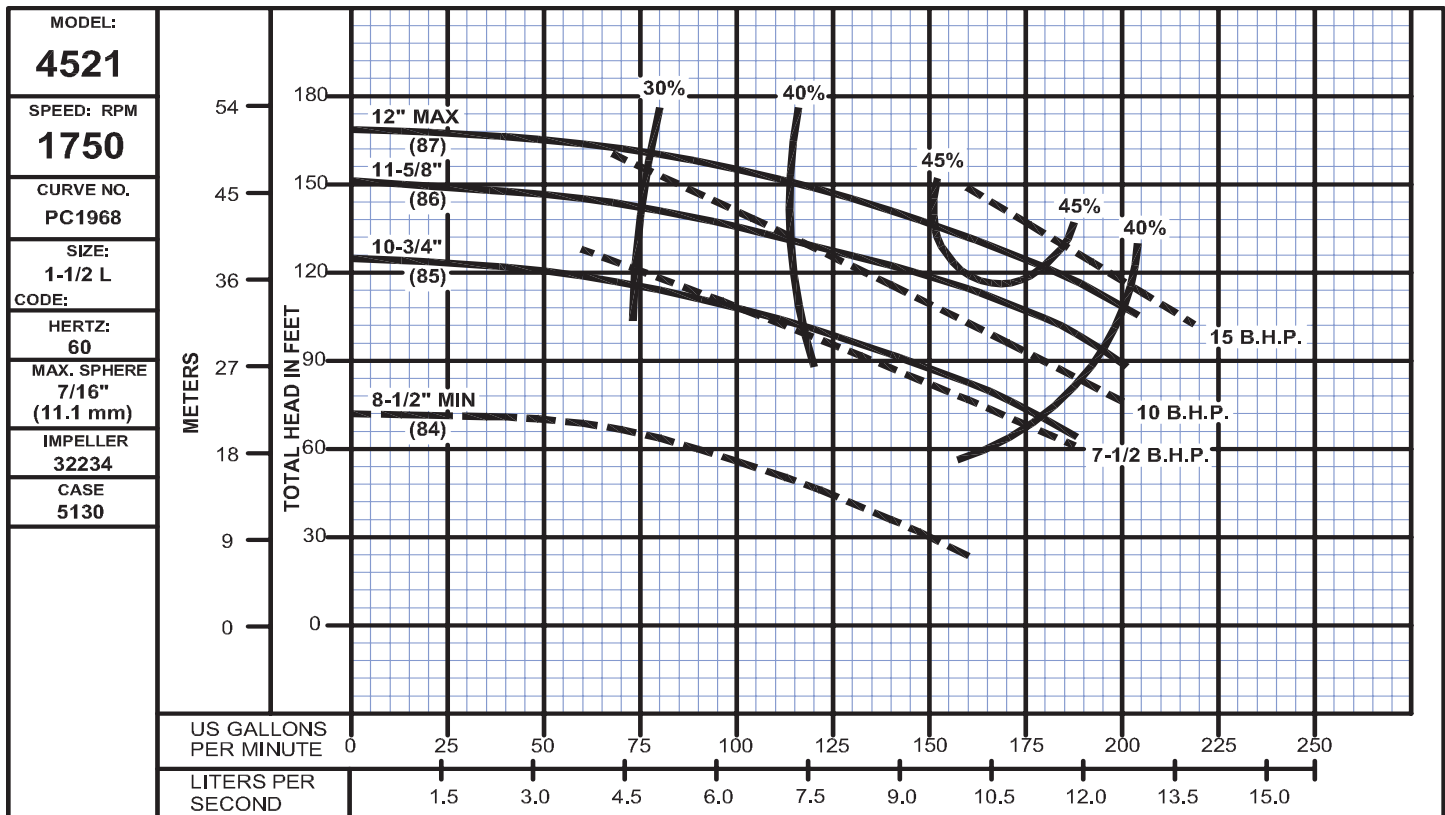
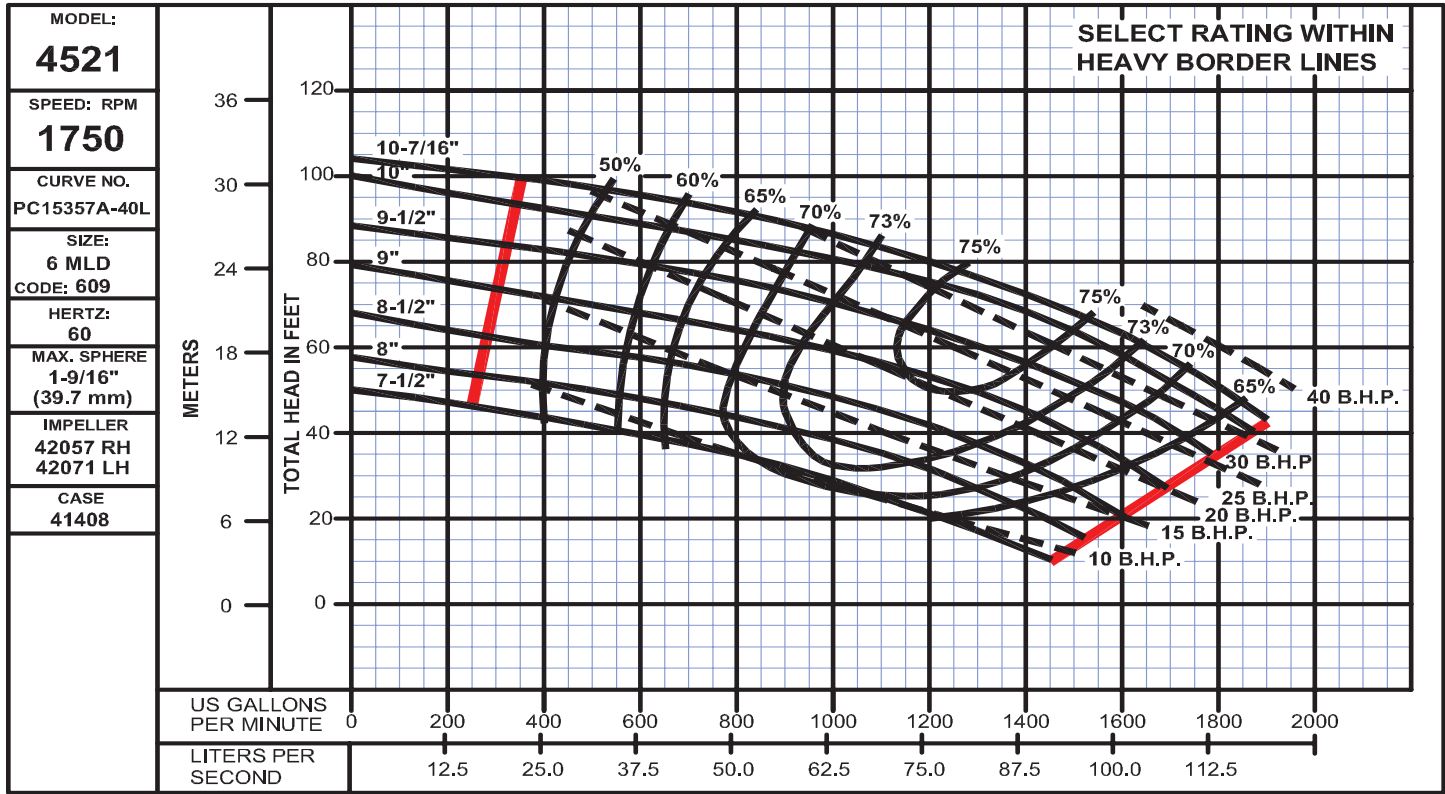
Fig. 4521

Sizes: 6 MLD & 1½L, 1750RPM
Bulletin 4500

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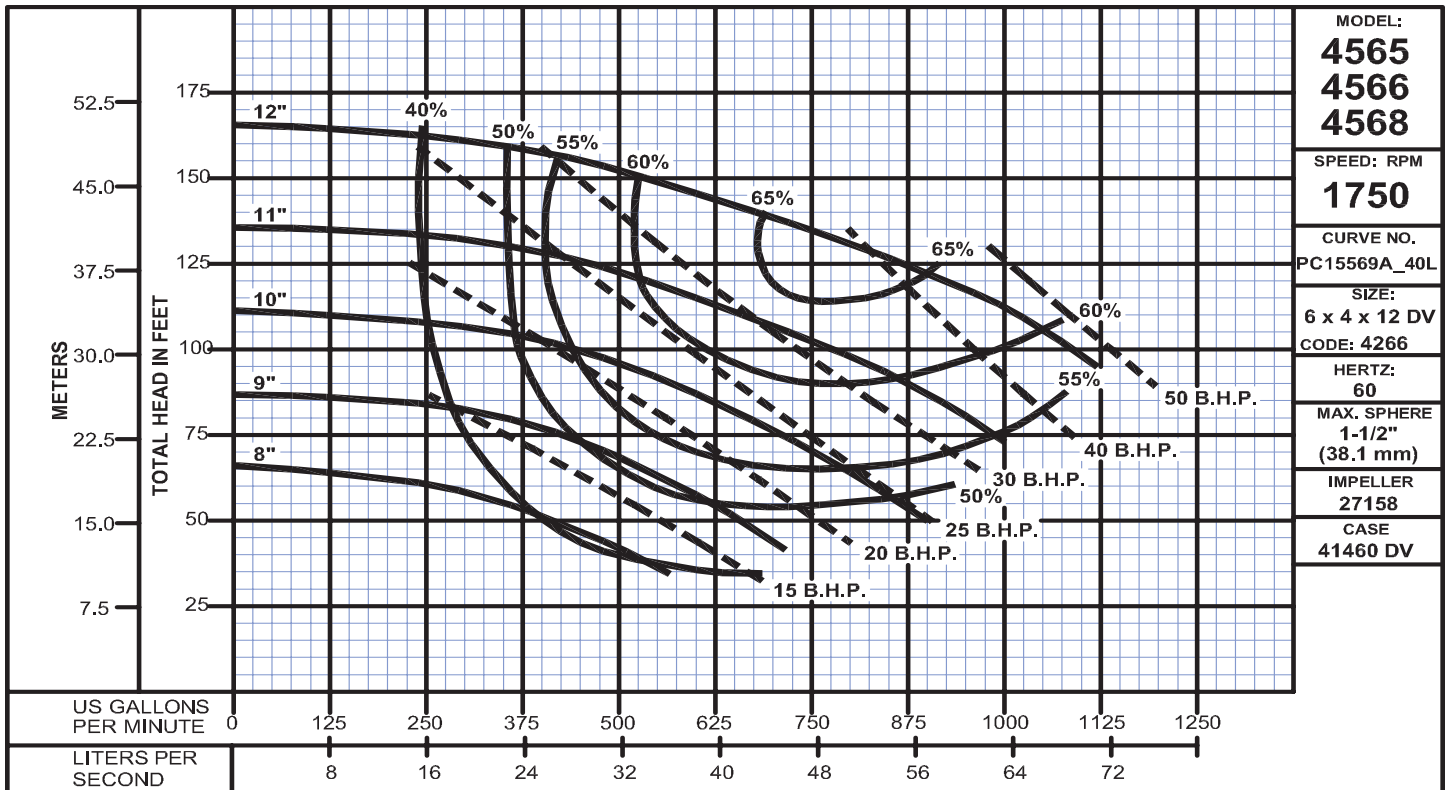
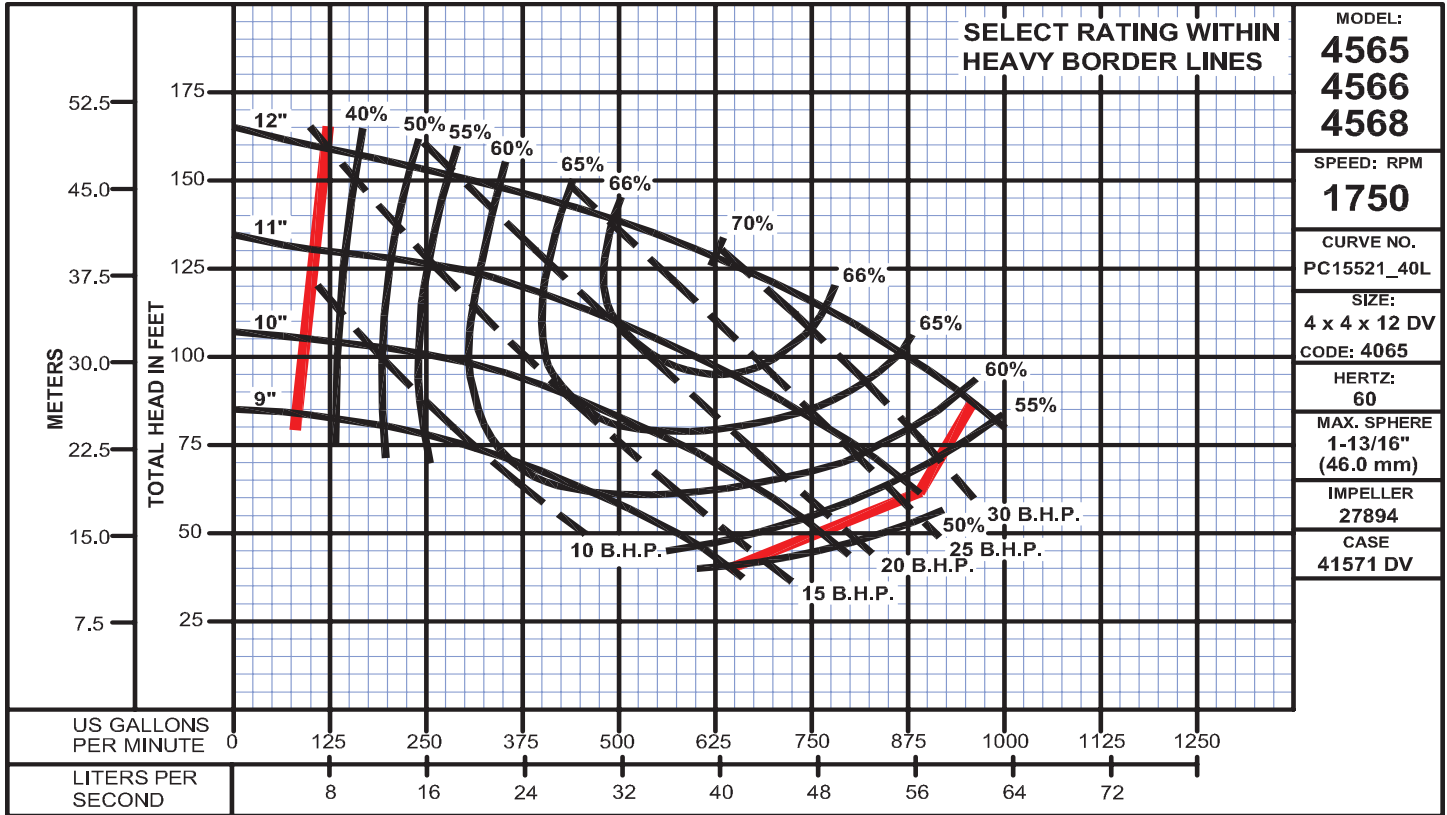


Fig. 4565, 4566 & 4568

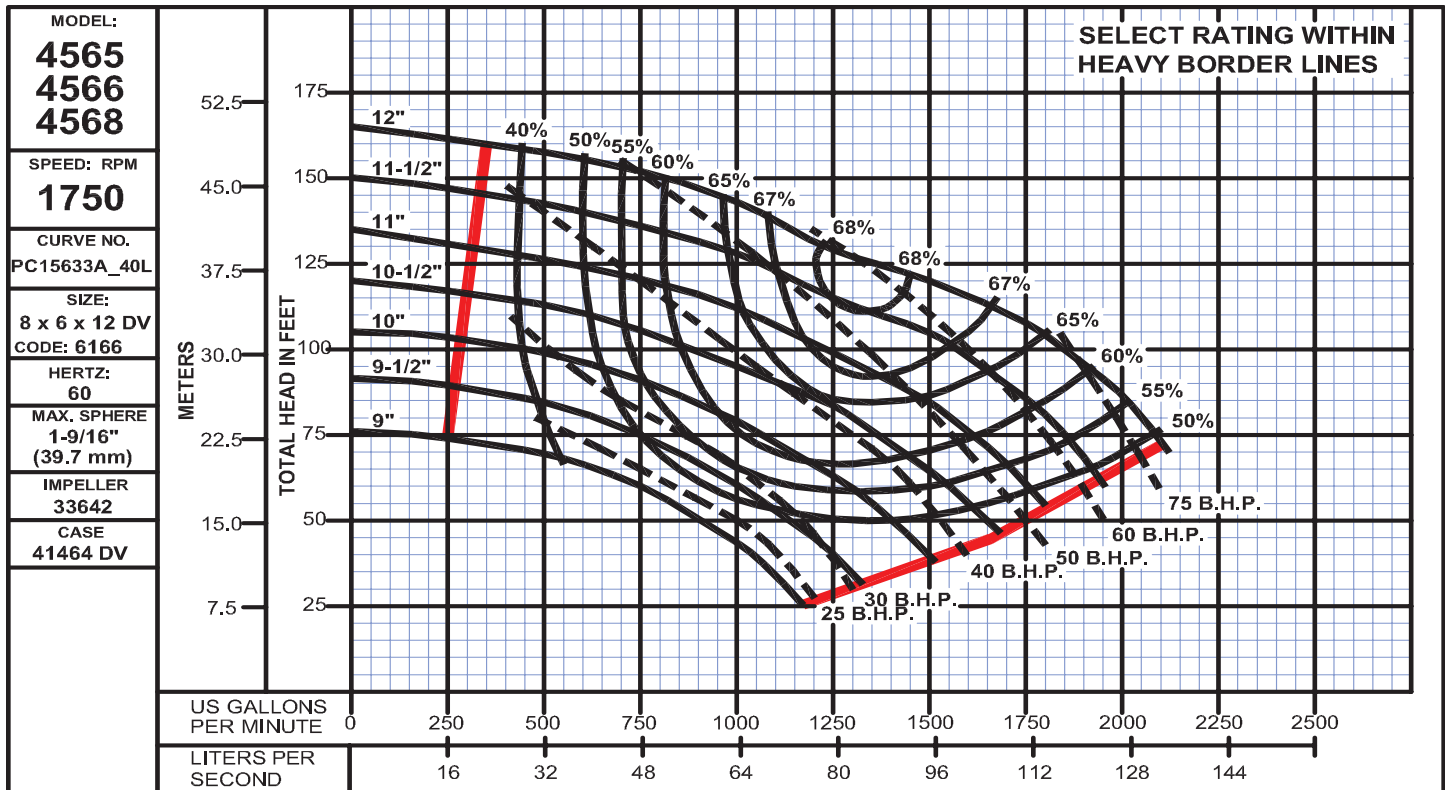
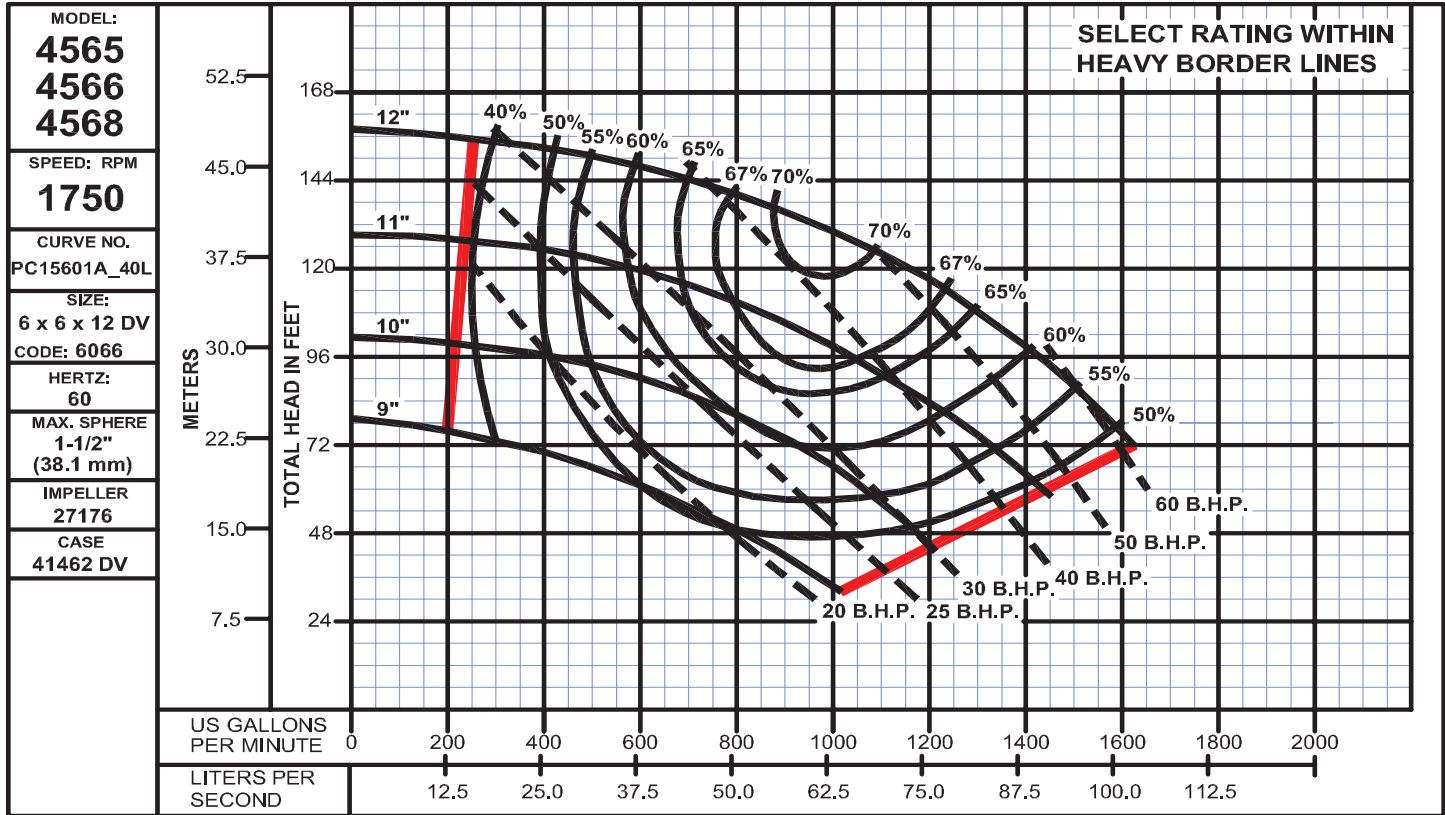
Sizes: 6 x 6 x 12 DV & 8 x 6 x 12 DV, 1750RPM

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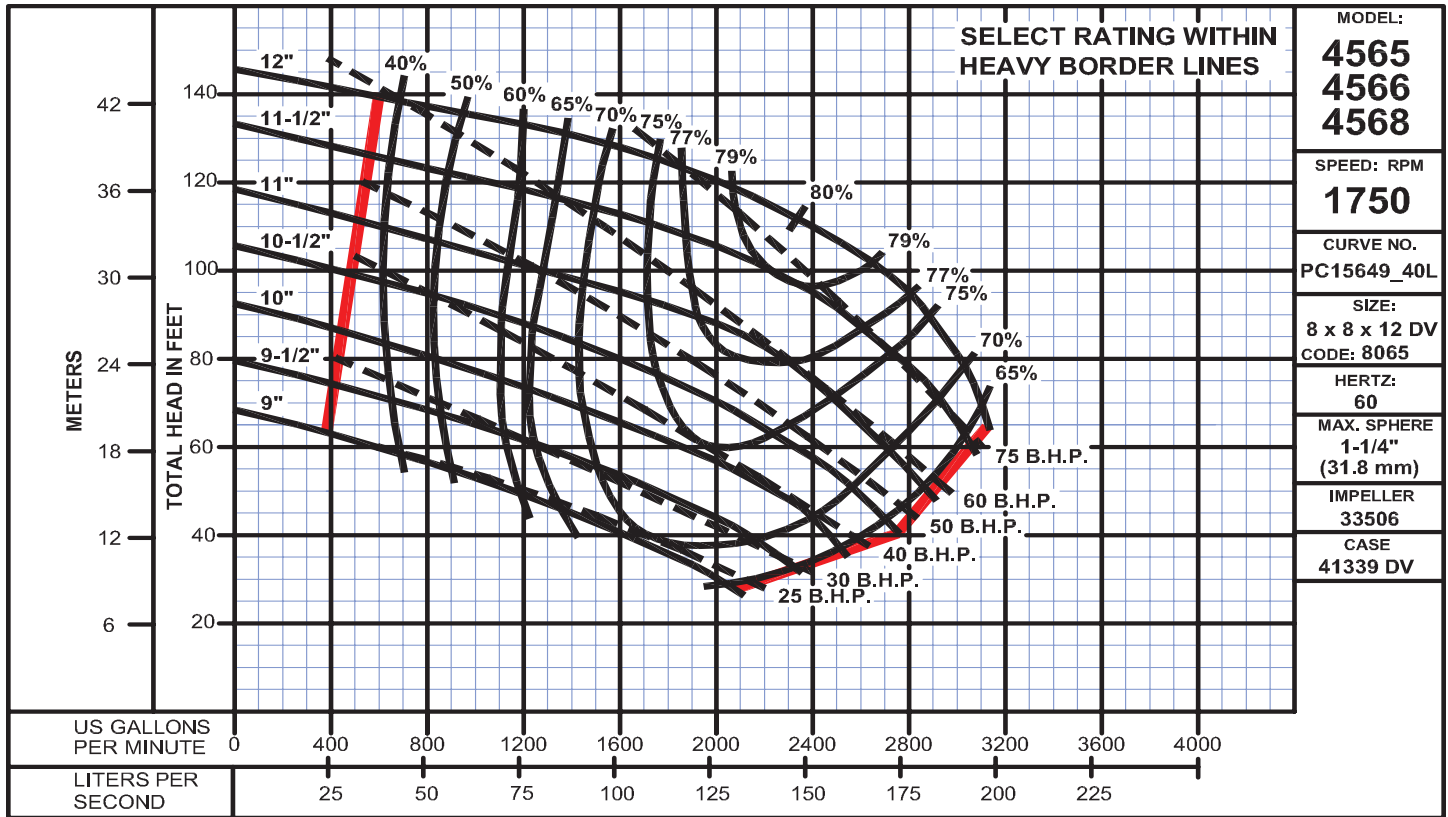


Fig. 4511H

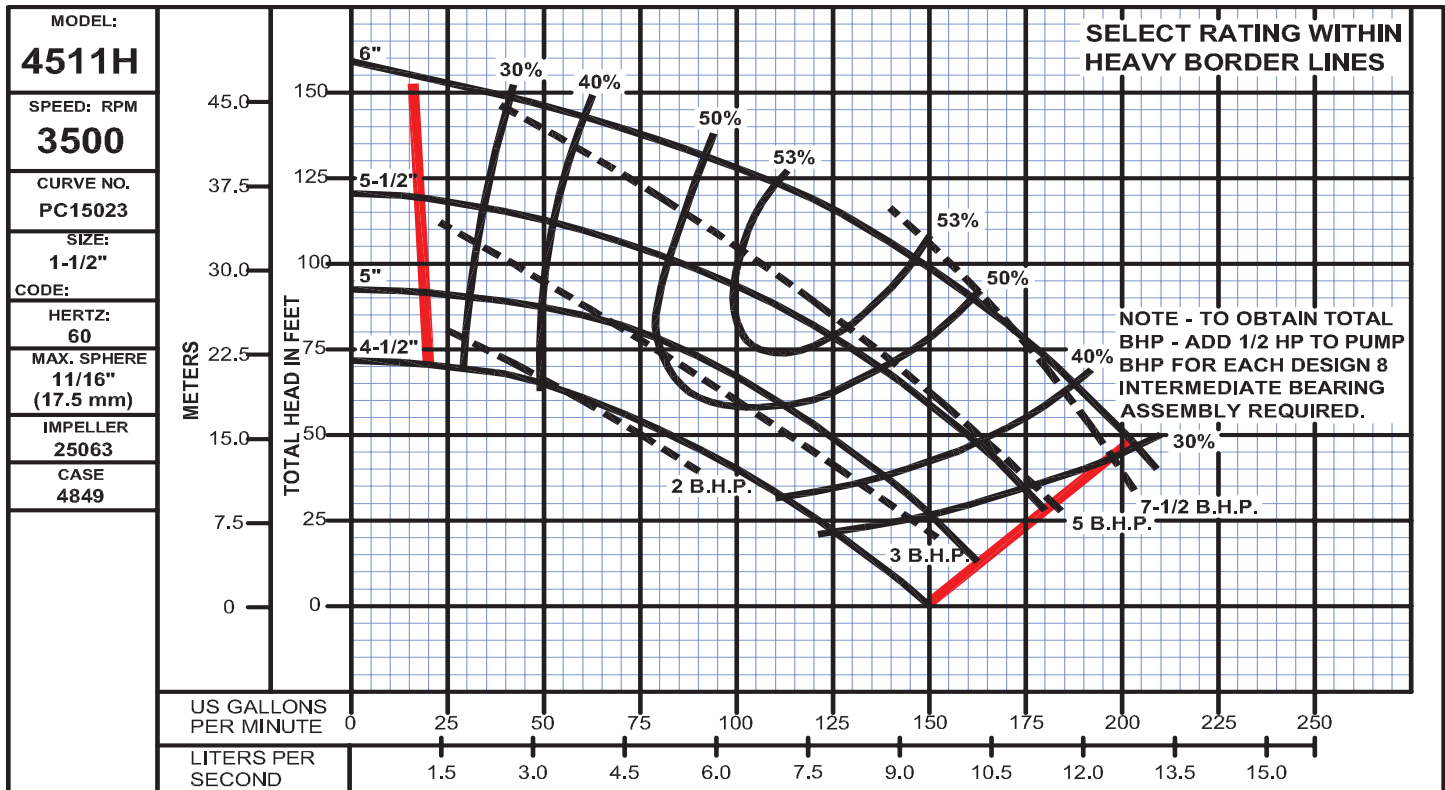
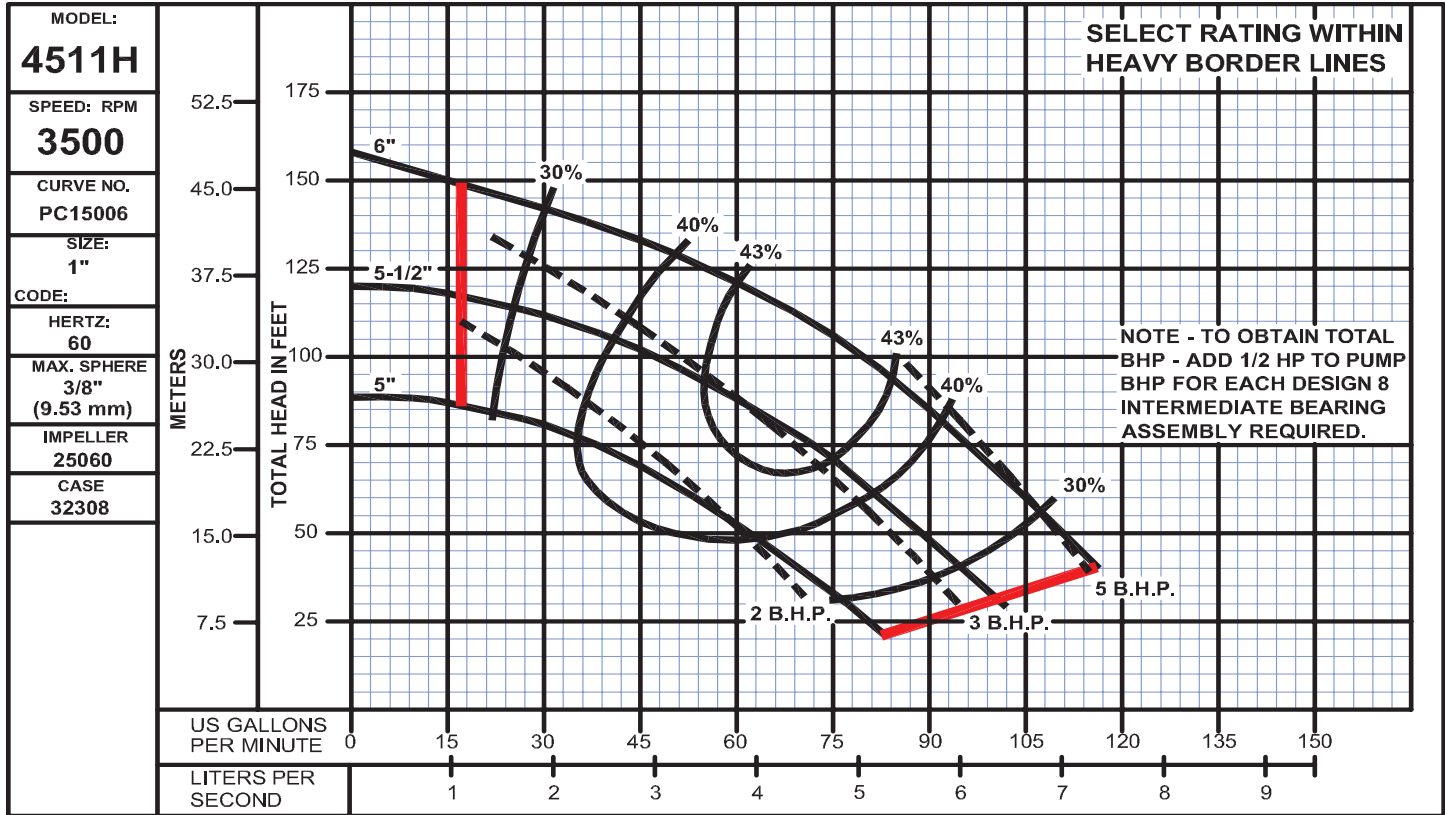
Sizes: 1" & 1½", 3500RPM

Bulletin 4500

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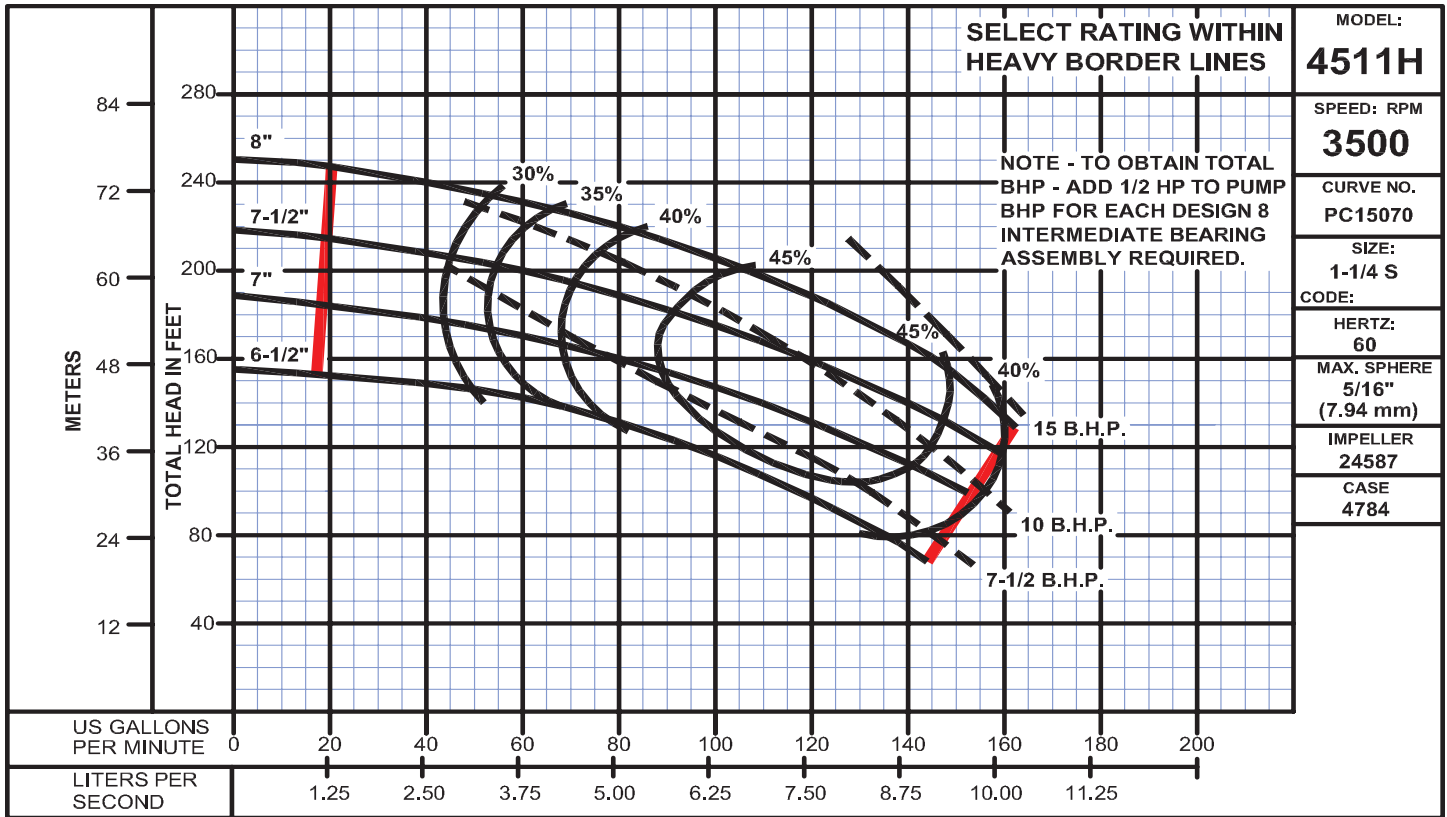
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Large Sump or Drainage Pumps



MODEL:
4511H

SPEED: RPM
3500

CURVE NO.
PC15070

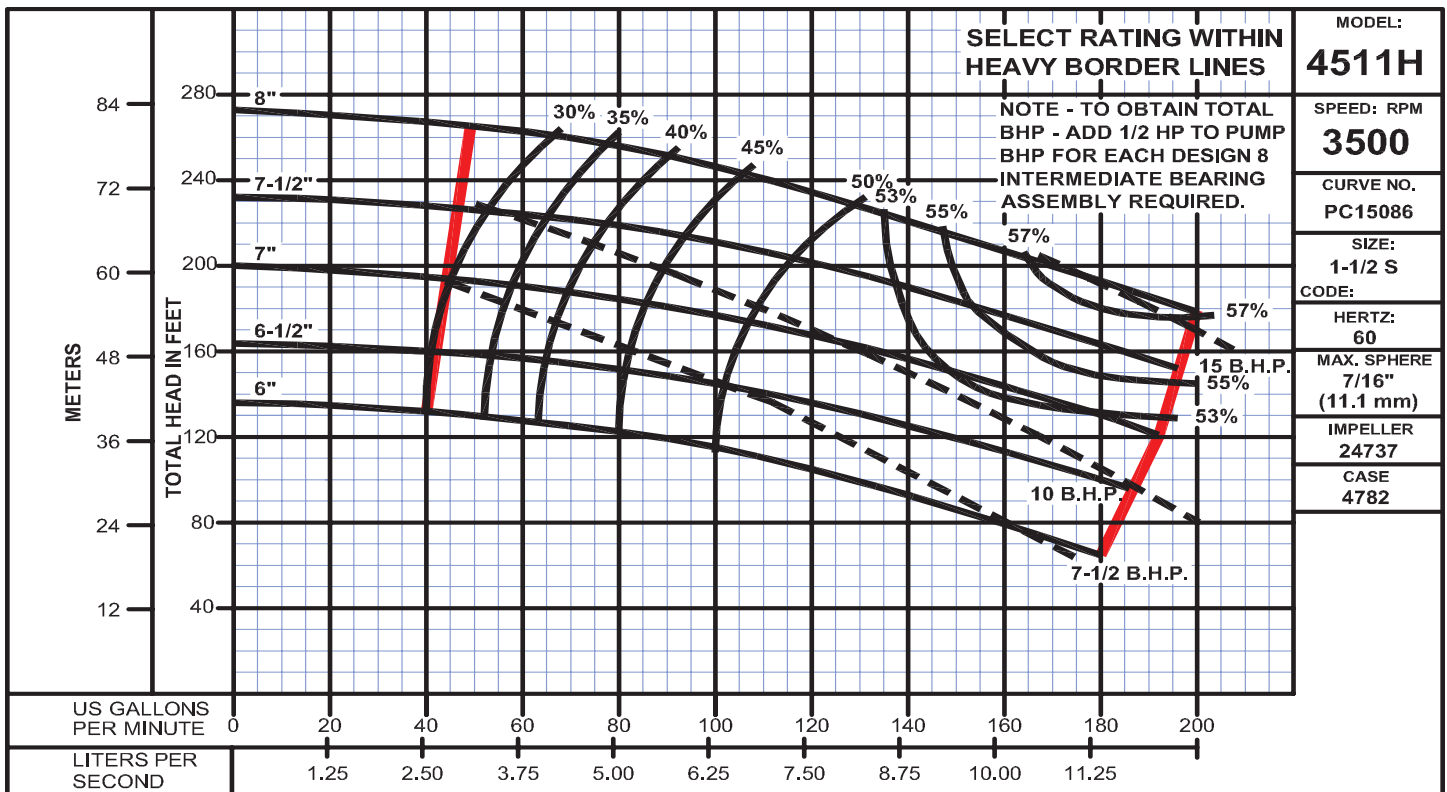
SIZE:
1-1/4 S

HERTZ:
60

MAX. SPHERE
5/16"
(7.94 mm)

IMPELLER
24587

CASE
4784



MODEL:
4511H

SPEED: RPM
3500

CURVE NO.
PC15086

SIZE:
1-1/2 S

HERTZ:
60

MAX. SPHERE
7/16"
(11.1 mm)

IMPELLER
24737

CASE
4782

Fig. 4511H

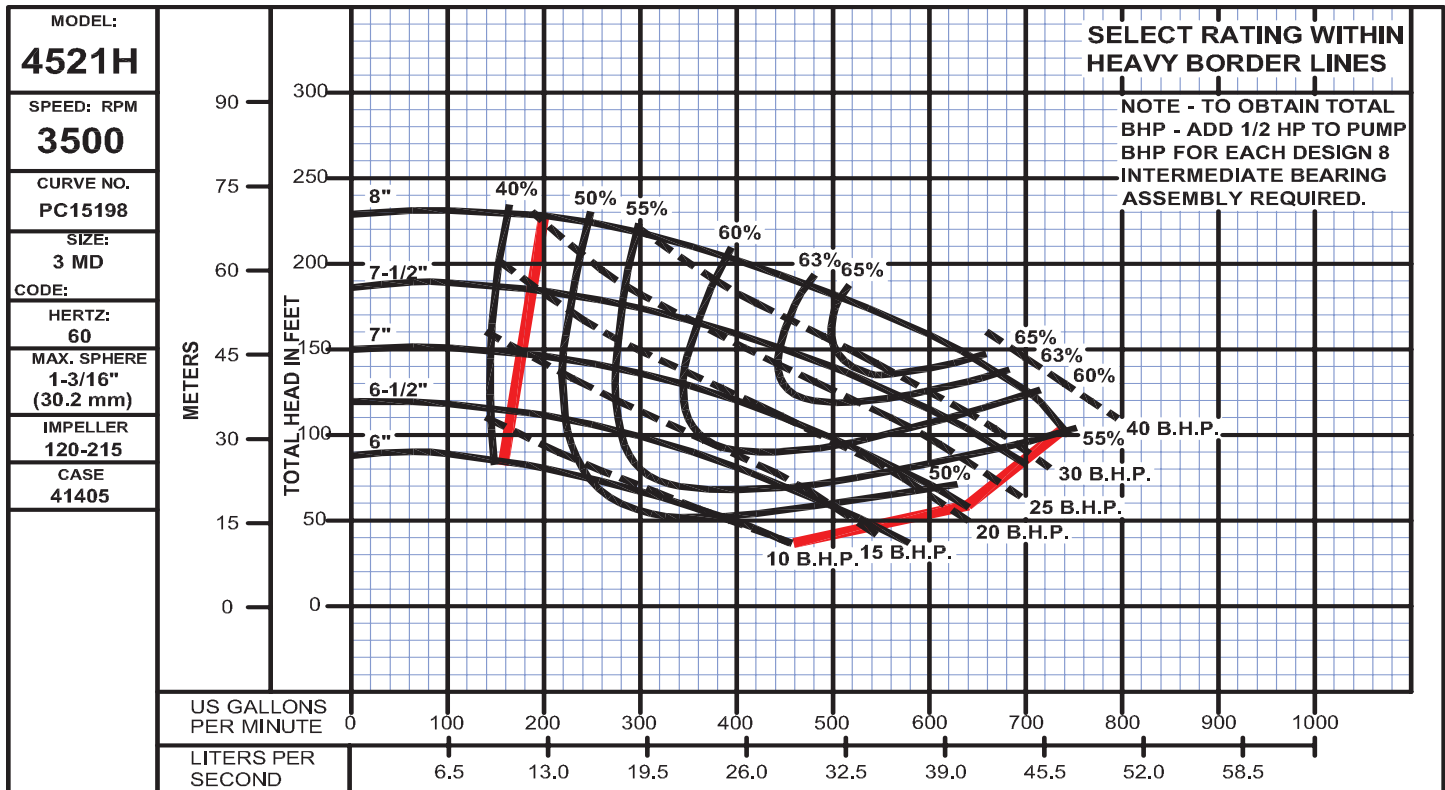
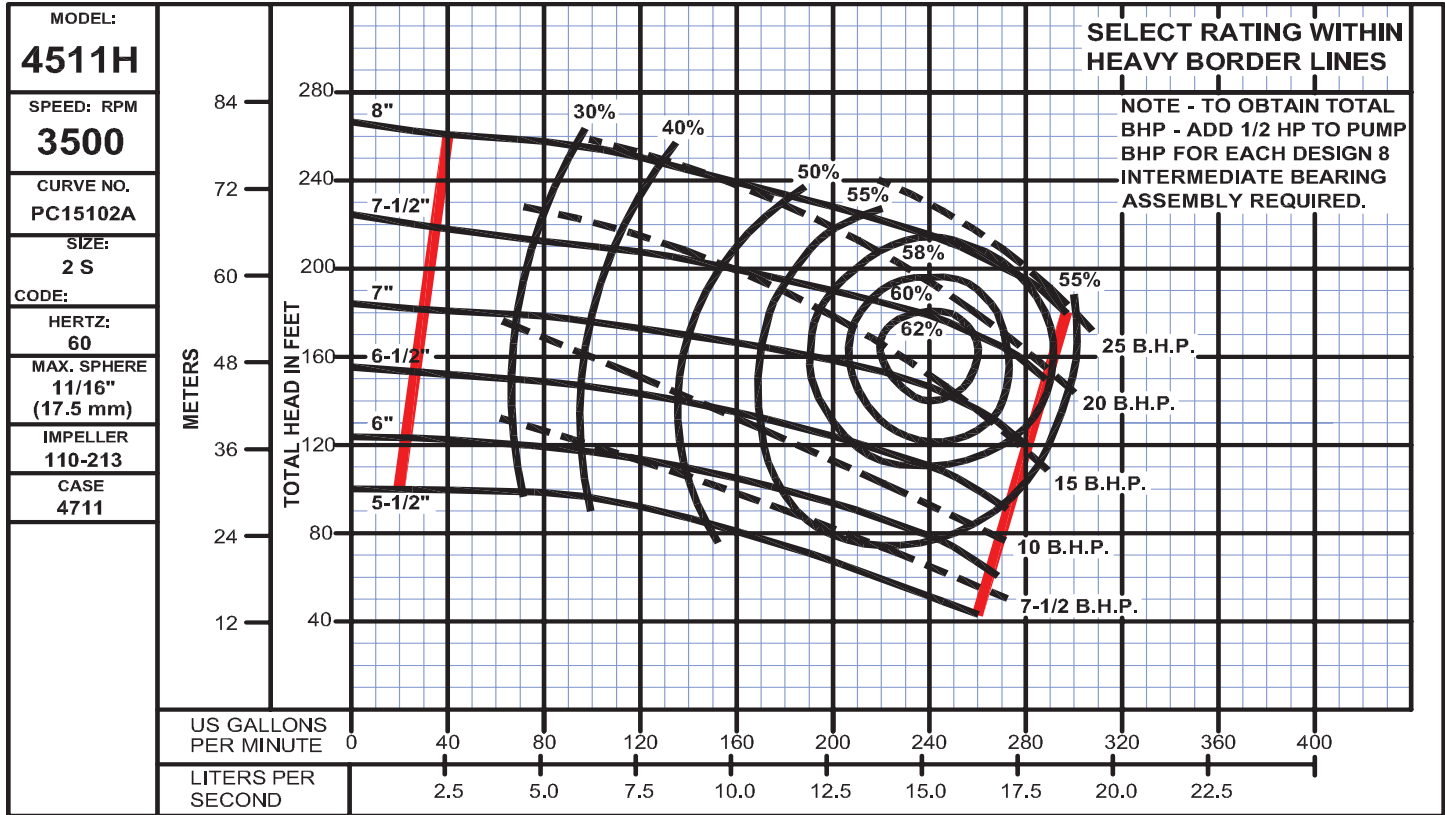
Sizes: 2 S & 3 MD, 3500RPM

Bulletin 4500

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Large Sump or Drainage Pumps



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