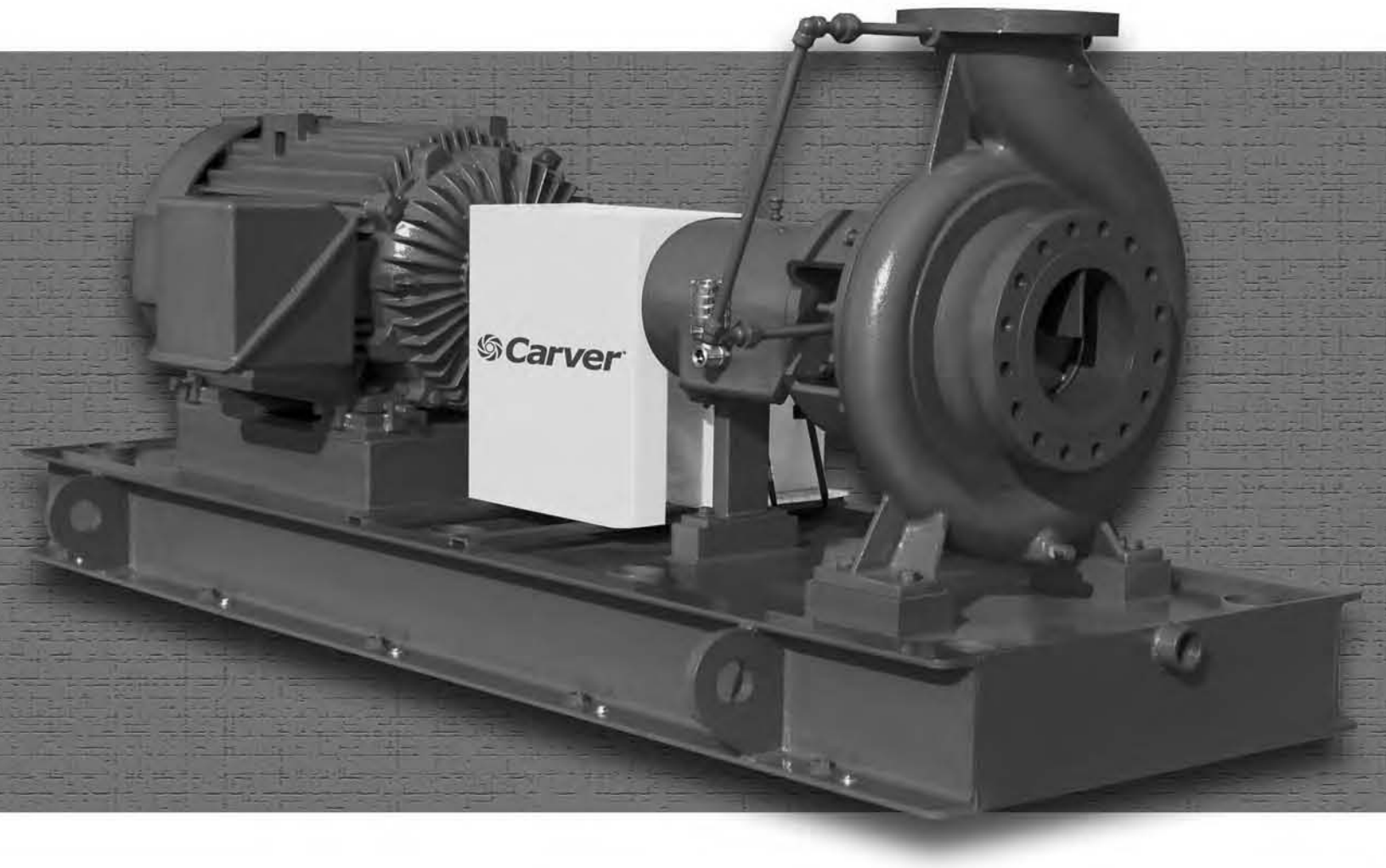
Process Maxum Series

Technical Support Information



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2009

1.0 Overview

The Maxum is our medium duty process pump for handling hydrocarbons in refining and process industry applications. It is offered as a foot or centerline mounted unit. High temperature, vertical in-line, and mag-drive versions are also available. Hydraulic performance extends to 9,000 GPM and 720 feet of head.

Standard design features are given in the table below.

Basic Design Features

Pump Size	Bearing Frame	Max Speed (RPM)	1st Critical Speed (RPM)	Casing Design		Shaft Deflection @ 20% BEP		Shaft Stiffness L^3/D^4	WK^2 @ Max. Impeller Dia.
				Discharge	Volute(s)	@ Seal (in.)	@ Impeller (in.)		
AA - 1½ x 1 x 6	A	3500	20,432	Centerline	Single	0.0001	0.0003	56.8	9.500
AB - 2 x 1½ x 6	A	3500	18,917	Centerline	Single	0.0001	0.0007	59.9	10.45
AC - 3 x 1½ x 6	A	3500	17,695	Centerline	Single	0.0002	0.0008	59.9	11.40
AD - 3 x 2 x 6	A	3500	18,917	Centerline	Single	0.0003	0.0014	59.6	10.45
AE - 4 x 3 x 6	A	3500	14,448	Centerline	Single	0.0005	0.0027	66.5	15.20
BA - 1½ x 1 x 8	B	3500	24,016	Centerline	Single	0.0000	0.0002	21.2	34.31
BB - 2 x 1½ x 8	B	3500	21,063	Centerline	Single	0.0001	0.0003	21.4	41.42
BC - 3 x 1½ x 8	B	3500	21,923	Centerline	Single	0.0001	0.0004	21.6	39.05
BD - 3 x 2 x 8	B	3500	21,923	Centerline	Single	0.0001	0.0006	20.4	39.05
BE – 4 x 3 x 8	B	3500	20,297	Centerline	Dual	0.0000	0.0003	23.5	43.79
BF - 6 x 4 x 8	B	3500	19,609	Centerline	Dual	0.0001	0.0004	26.7	46.16
CA – 2 x 1½ x 10	B	3500	19,609	Centerline	Single	0.0001	0.0004	21.2	92.29
CB - 3 x 1½ x 10	B	3500	19,609	Centerline	Single	0.0001	0.0004	22.2	92.29
CC - 3 x 2 x 10	B	3500	19,609	Centerline	Single	0.0001	0.0008	21.8	92.29
CD - 4 x 3 x 10	B	3500	17,901	Centerline	Single	0.0002	0.0013	23.2	108.6
CE - 6 x 4 x 10	B	3500	15,502	Centerline	Dual	0.0001	0.0004	24.6	141.3
CF - 6 x 6 x 10	B	1750	15,502	Centerline	Dual	0.0000	0.0003	26.8	141.3
CG - 8 x 6 x 10	B	1750	14,894	Centerline	Dual	0.0001	0.0005	29.5	152.2
DA - 2 x 1½ x 13	C	3500	18,926	Centerline	Dual	0.0000	0.0003	14.9	209.6
DB - 3 x 2 x 13	C	3500	19,352	Centerline	Dual	0.0001	0.0004	17.3	201.8
DC - 4 x 3 x 13	C	3500	16,572	Centerline	Dual	0.0002	0.0009	15.0	263.8
DD - 6 x 4 x 13	C	3500	15,801	Centerline	Dual	0.0000	0.0003	16.4	287.1
DE - 6 x 6 x 13	C	1750	15,125	Centerline	Dual	0.0000	0.0001	13.5	310.3
DF - 8 x 6 x 13	C	1750	14,725	Centerline	Dual	0.0000	0.0003	16.4	310.3
DG - 10 x 8 x 13	C	1750	12,836	Centerline	Dual	0.0000	0.0006	18.6	418.9
DH – 12 x 10 x 13	C	1750	12,836	Centerline	Dual	0.0001	0.0009	19.1	418.9
ED - 6 x 4 x 16	D	1750	9,949	Centerline	Dual	0.0000	0.0002	22.8	563.6
EA - 8 x 6 x 16	C	1750	11,527	Centerline	Dual	0.0000	0.0004	25.0	647.3
EB - 10 x 8 x 16	C	1750	12,239	Centerline	Dual	0.0000	0.0005	25.4	595.9
EE - 12 x 10 x 16	D	1750	10,113	Centerline	Dual	0.0004	0.0008	27.3	722.6
EC - 14 x 12 x 16	D	1750	10,113	Centerline	Dual	0.0004	0.0008	27.3	849.4
FA - 8 x 6 x 20	C	1750	10,023	Centerline	Dual	0.0000	0.0005	27.3	1232.0
FB - 10 x 8 x 20	C	1750	9,076	Centerline	Dual	0.0001	0.0007	24.8	1495.0
FC - 12 x 10 x 20	D	1750	7,435	Centerline	Dual	0.0002	0.0004	27.5	1859.0
FD - 14 x 12 x 20	D	1750	6,597	Centerline	Dual	0.0004	0.0007	29.9	2298.0

1.1 Standard Surface Treatment

All Maxums handling liquids below 230 °F are painted to Carver Standard PA-001. This provides for one coat of Carver Blue, industrial enamel with a 3-5 mils dry film thickness. Pumps handling liquids above 230 °F are painted to Carver Standard PA-013 with two coats modified silicone alkyd resin, aluminum colored, to a total of 2 mils dry film thickness.

Since all pumps and parts are assumed to be installed and operated soon after receipt, no special preservation for long term storage are included.

Standard Surface Preparation

Component	Material	Specification
Adaptor bracket	Steel	Carver Standard PA-001
	316 SS	Not applicable
Base & Coupling Guard	Steel	Carver Standard PA-001
	316 SS	Not applicable
Bearing frame	Cast iron	Carver Standard PA-001
Casing	Steel	Carver Standard PA-001
	316 SS	Not applicable
Motor	Any	Carver Standard PA-001

1.2 Basic Impeller Design Features

Standard impeller design features for the Maxum are given in the table below. All standard impellers are of the enclosed type with back wear rings for axial thrust control.

Basic Impeller Design Features

Basic Pump Size	Type	Axial Thrust Back Design	Eye Area (inch)^2	No. of Vanes	Shut Off Head (ft)	Specific Speed Ns	Suction Sp. Speed Nss	Max. Solids Size (inch)	Wear Ring Clearance (inch) Front	Rear
AA- 1½ x 1 x 6	Enclosed	Wear ring	2.4	4	120	1071	6907	0.23	0.012	0.012
AB - 2 x 1½ x 6	Enclosed	Wear ring	3.8	4	160	1337	14044	0.31	0.015	0.015
AC- 3 x 1½ x 6	Enclosed	Wear ring	5.1	5	158	1250	7446	0.38	0.014	0.014
AD - 3 x 2 x 6	Enclosed	Wear ring	8.2	6	190	1455	11644	0.50	0.016	0.016
AE - 4 x 3 x 6	Enclosed	Wear ring	12.0	8	171	2279	8516	0.88	0.016	0.016
BA - 1½ x 1 x 8	Enclosed	Wear ring	2.1	4	270	578	5183	0.14	0.012	0.012
BB - 2 x 1½ x 8	Enclosed	Wear ring	3.6	6	285	690	6423	0.19	0.012	0.012
BC - 3 x 1½ x 8	Enclosed	Wear ring	5.5	5	292	807	9761	0.25	0.014	0.014
BD - 3 x 2 x 8	Enclosed	Wear ring	8.0	5	285	952	7361	0.38	0.016	0.016
BE – 4 x 3 x 8	Enclosed	Wear ring	15.8	7	290	1746	10135	0.75	0.017	0.017
BF - 6 x 4 x 8	Enclosed	Wear ring	18.0	8	290	2111	11683	1.13	0.017	0.017
CA – 2 x 1½ x 10	Enclosed	Wear ring	3.3	6	475	413	4793	0.19	0.012	0.012
CB - 3 x 1½ x 10	Enclosed	Wear ring	5.9	5	420	413	9939	0.30	0.015	0.015
CC - 3 x 2 x 10	Enclosed	Wear ring	8.6	6	470	663	7887	0.38	0.016	0.016
CD - 4 x 3 x 10	Enclosed	Wear ring	16.0	7	465	668	11824	0.63	0.017	0.017
CE - 6 x 4 x 10	Enclosed	Wear ring	21.5	7	450	1117	11547	0.88	0.018	0.018
CF - 6 x 6 x 10	Enclosed	Wear ring	24.7	5	115	1960	7180	1.00	0.018	0.018
CG - 8 x 6 x 10	Enclosed	Wear ring	39.0	6	103	2828	10204	1.50	0.019	0.019
DA - 2 x 1½ x 13	Enclosed	Wear ring	5.2	6	730	329	5624	0.31	0.016	0.016
DB - 3 x 2 x 13	Enclosed	Wear ring	8.6	6	705	480	11296	0.38	0.016	0.016
DC - 4 x 3 x 13	Enclosed	Wear ring	18.0	7	720	792	11080	0.38	0.017	0.017
DD - 6 x 4 x 13	Enclosed	Wear ring	21.5	7	710	912	10500	0.69	0.018	0.018
DE - 6 x 6 x 13	Enclosed	Wear ring	28.6	7	167	1350	7475	0.88	0.018	0.018
DF - 8 x 6 x 13	Enclosed	Wear ring	44.0	8	172	1771	10595	1.44	0.020	0.020
DG - 10 x 8 x 13	Enclosed	Wear ring	60.0	7	160	2466	13029	1.88	0.021	0.021
DH – 12 x 10 x 13	Enclosed	Wear ring	89.0	6	164	3570	12182	2.75	0.023	0.023
ED- 6 x 4 x 16	Enclosed	Wear ring	21.6	6	287	736	7666	0.45	0.018	0.018
EA- 8 x 6 x 16	Enclosed	Wear ring	44.0	7	282	1211	10677	1.00	0.020	0.020
EB - 10 x 8 x 16	Enclosed	Wear ring	60.0	8	265	1477	12794	1.38	0.021	0.020
EE - 12 x 10 x 16	Enclosed	Wear ring	105.0	6	290	2188	12409	1.90	0.023	0.023
EC - 14 x 12 x 16	Enclosed	Wear ring	105.0	7	265	3106	13609	2.50	0.024	0.024
FA - 8 x 6 x 20	Enclosed	Wear ring	43.5	7	425	909	10268	0.75	0.020	0.020
FB - 10 x 8 x 20	Enclosed	Wear ring	61.0	7	435	1092	11449	1.00	0.021	0.021
FC - 12 x 10 x 20	Enclosed	Wear ring	102.0	7	425	1633	13006	1.38	0.023	0.023
FD - 14 x 12 x 20	Enclosed	Wear ring	125.0	7	405	2026	9912	2.00	0.025	0.025

1.3 Minimum / Maximum Flow Calculation.

Unless specified otherwise in the characteristic curves or on the data sheets, the following applies:

Qmin = 0.1 x Qopt for short operation
Qmin = 0.3 x Qopt for continuous operation
Qmax = 1.1 x Qopt for 2-pole operation
Qmax = 1.25 x Qopt for 4-pole operation
Qopt = optimum efficiency

The data above refers to water and water-like liquids. However, if the physical properties of the fluids handled are different from water, the calculation formula below must be used to check if an additional heat build-up may lead to a dangerous temperature increase at the pump surface. If necessary, the minimum flow must be increased.

$$T_o = T_f + \Delta T$$

$$\Delta T = \frac{g * H}{c * \eta} * (1 - \eta)$$

c Specific heat	[J / kg K]
g Acceleration due to gravity	[m/s_]
H Pump head	[m]
T f Temperature of fluid handled	[°C]
T o Temperature of casing surface	[°C]
η Pump efficiency at duty point	[-]
Δ T Temperature difference	[°C]

1.4 Standard Materials

The standard Maxum materials, and their corresponding material specifications for the major components, are given in the table below:

Standard Materials – by API Material Code				
Component	S-1	S-8	A-8	D-1
Bearing frame	Carbon steel ASTM A216 Grade WCB	Carbon steel ASTM A216 Grade WCB	Carbon steel ASTM A216 Grade WCB	Carbon steel ASTM A216 Grade WCB
Casing	Carbon steel ASTM A216 Grade WCB	Carbon steel ASTM A216 Grade WCB	316 Stainless steel ASTM A744 Grade CF-8M	Duplex stainless steel ASTM A890 Grade1A, CD4MCu
Backhead	Carbon steel ASTM A216 Grade WCB	Carbon steel ASTM A216 Grade WCB	316 Stainless steel ASTM A744 Grade CF-8M	Duplex stainless steel ASTM A890 Grade1A, CD4MCu
Impeller	Ductile iron ASTM A536 Grade 65-45-12	316 Stainless steel ASTM A744 Grade CF-8M	316 Stainless steel ASTM A744 Grade CF-8M	Duplex stainless steel ASTM A890 Grade1A, CD4MCu
Wear rings	Ductile iron ASTM A536 Grade 65-45-12	Stainless steel 17-4 PH UNS No. J92180	Stainless steel 17-4 PH UNS No J92180	Duplex stainless steel 17-4 PH UNS No. J92180
Shaft	Steel AISI 4140 UNS No. G41400	316 Stainless steel ASTM A276 UNS 31600	316 Stainless steel ASTM A276 UNS 31600	316 Stainless steel ASTM A890 Grade1A, CD4MCu

1.5 Key Mechanical Data

Many of the key Maxum mechanical design specifications and parameters are as follows:

Key Mechanical Data				
Item	**Bearing Frame**			
	A	*B*	*C*	*D*
Max power (BHP) @ 3500 RPM	150	240	550	-
@ 1750 RPM	75	120	275	1500
@ 1150 RPM	50	80	180	1000
Bearing type - radial bearing	6208	6211	6213	6219
thrust bearing	7308	7311	7313	7318
Lubrication method (standard)	Oil - ISO Grade 68			
L_{10} bearing life (hrs) - radial	50,000			
thrust	50,000			
Radial to thrust bearing centerline (in.)	5.98	5.98	8.92	13.19
Shaft diameter (in.) @ coupling	1.125	1.375	2.000	3.000
@ impeller hub (std. extension)	1.000	1.375	1.875	2.375
@ radial bearing	1.575	2.166	2.559	3.741
@ thrust bearing	1.575	2.166	2.559	3.544
under shaft sleeve	1.500	2.000	2.500	3.50
Coupling Key – width (in.)	0.250	0.313	0.500	0.750
length (in.)	2.000	2.000	2.000	5.000

1.6 Basic Structural Design Limits

Standard structural design features are given in the table below. Note that all casing pressure and inlet (suction) pressure values are given at an assumed worst case of 650 ºF, and all maximum inlet pressure values are given at an assumed worst case of maximum (i.e., untrimmed) impeller diameter.

Basic Structural Design Limits

Pump Size	Max. Casing Pressure (PSI)			Max. Inlet Pressure (PSI)			Min. Case Thickness (in.)	Wear Ring Clearance	
	Steel	*316 SS*	*CD4MCu*	*Steel*	*316 SS*	*CD4MCu*		*Front (in)*	*Back (in)*
AA - 1½ x 1 x 6	766	613	985	714	561	933	0.469	0.011	0.015
AB - 2 x 1½ x 6	652	522	838	583	452	769	0.500	0.013	0.015
AC - 3 x 1½ x 6	554	443	712	486	375	644	0.500	0.013	0.015
AD - 3 x 2 x 6	567	454	729	485	371	647	0.500	0.014	0.015
AE - 4 x 3 x 6	401	321	516	327	247	442	0.500	0.016	0.016
BA - 1½ x 1 x 8	550	440	707	433	323	590	0.540	0.011	0.014
BB - 2 x 1½ x 8	543	434	698	420	311	575	0.550	0.012	0.014
BC - 3 x 1½ x 8	401	321	516	275	194	389	0.500	0.013	0.014
BD - 3 x 2 x 8	381	305	490	258	181	366	0.500	0.014	0.014
BE – 4 x 3 x 8	345	276	444	219	150	318	0.500	0.017	0.017
BF - 6 x 4 x 8	539	431	693	413	306	567	0.670	0.017	0.017
CA – 2 x 1½ x 10	460	368	591	254	162	386	0.563	0.012	0.015
CB - 3 x 1½ x 10	467	374	600	285	192	419	0.590	0.014	0.016
CC - 3 x 2 x 10	360	288	463	157	85	259	0.562	0.014	0.016
CD - 4 x 3 x 10	406	325	522	205	124	321	0.670	0.017	0.017
CE - 6 x 4 x 10	517	414	665	322	219	470	0.750	0.018	0.018
CF - 6 x 6 x 10	419	335	539	369	285	489	0.750	0.018	0.018
CG - 8 x 6 x 10	344	275	442	299	231	398	0.750	0.019	0.018
DA - 2 x 1½ x 13	307	246	395	103	19	223	0.562	0.014	0.014
DB - 3 x 2 x 13	336	269	432	160	67	293	0.625	0.015	0.015
DC - 4 x 3 x 13	419	335	539	264	149	428	0.750	0.017	0.017
DD - 6 x 4 x 13	412	330	530	263	149	425	0.750	0.018	0.018
DE - 6 x 6 x 13	346	277	445	274	204	373	0.750	0.018	0.018
DF - 8 x 6 x 13	354	283	455	280	209	381	0.750	0.019	0.019
DG - 10 x 8 x 13	375	300	482	306	231	413	0.875	0.021	0.021
DH - 12 x 10 x 13	364	291	468	293	220	397	1.000	0.023	0.022
ED – 6 X 4 X 16	304	292	391	183	171	269	1.000	0.018	0.018
EA - 8 x 6 x 16	259	207	333	137	85	211	0.750	0.020	0.020
EB - 10 x 8 x 16	383	306	492	268	192	378	1.000	0.021	0.020
EE – 12 X 10 X 16	250	241	322	124	115	196	1.125	0.023	0.023
EC - 14 x 12 x 16	194	155	249	79	40	135	1.125	0.024	0.024
FA - 8 x 6 x 20	363	290	467	179	106	283	1.125	0.020	0.020
FB - 10 x 8 x 20	351	281	451	163	92	263	1.125	0.021	0.021
FC - 12 x 10 x 20	257	206	330	73	22	146	1.000	0.023	0.023
FD - 14 x 12 x 20	554	443	712	379	268	537	1.500	0.025	0.025

1.7 Bearing and Seal Arrangements

The standard Maxum uses single row, duplex, 40º angular contact ball bearings to handle axial thrust loads and a single row, Conrad type bearing for the radial loads.

Bearing and Seal Temperature Limits

Bearing	Cooling	Min	Max
Oil Lube	Air	-20° F	299° F
	1 GPM water flush	300° F	349° F
	2 GPM water flush	350° F	410° F
	3 GPM water flush	411° F	500° F

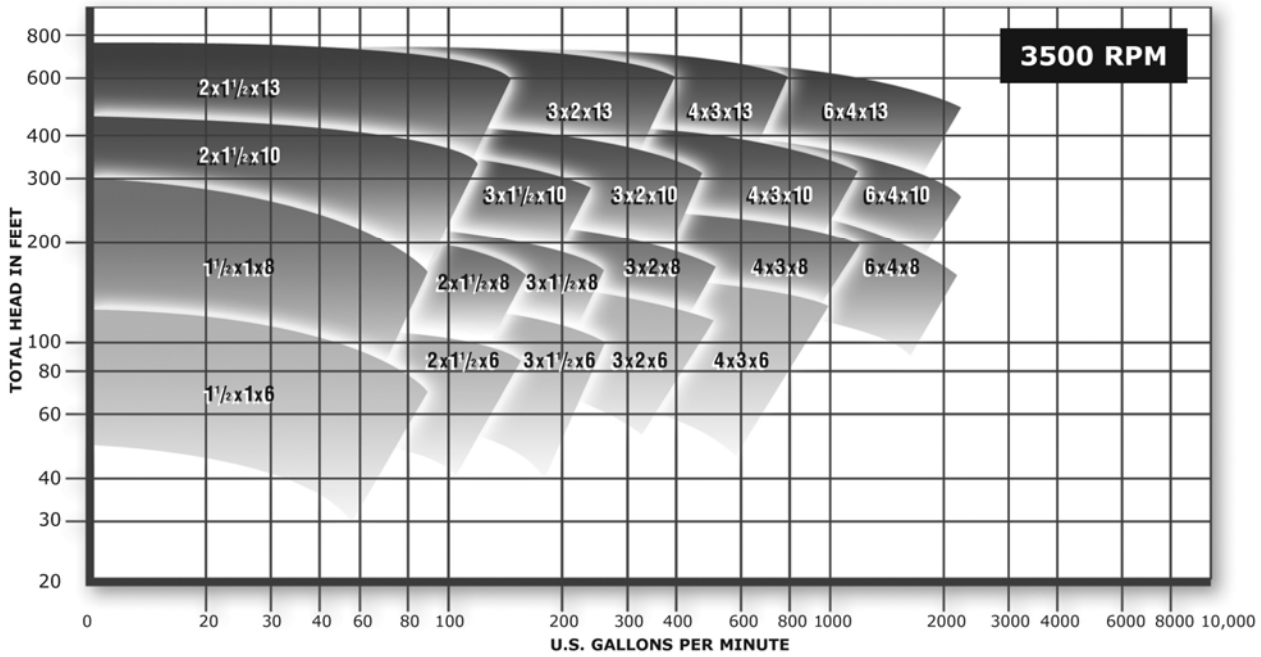
Both are oil lubricated for more effective lubricant penetration of the bearing internals. The bearings can also be provided with several different lubrication arrangements, including external water cooling for higher temperature applications.

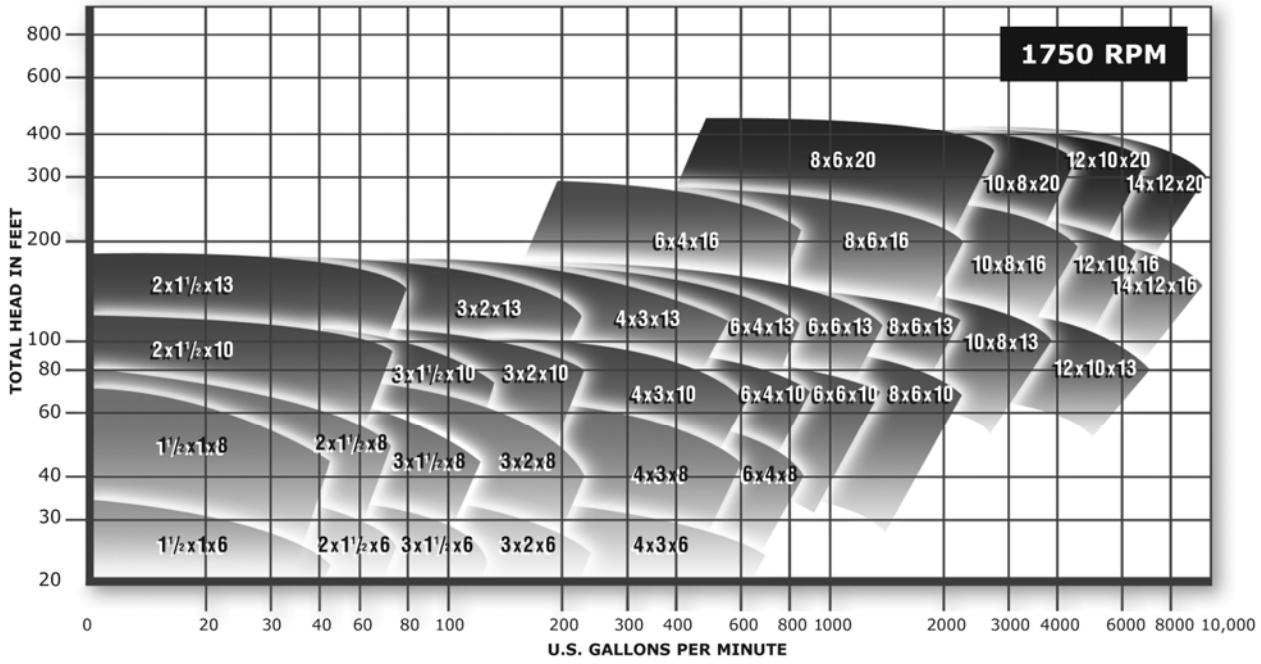
In the table a cooling water temperature of 60° F is assumed. These temperatures limits must be observed to avoid adversely effecting pump life, permanently degrading the fluid, bringing the pump out of alignment, and/or seizing the pump.

The Maxum warranty is also based on strict adherence to these limits.

1.9 Maxum Hydraulic Coverage

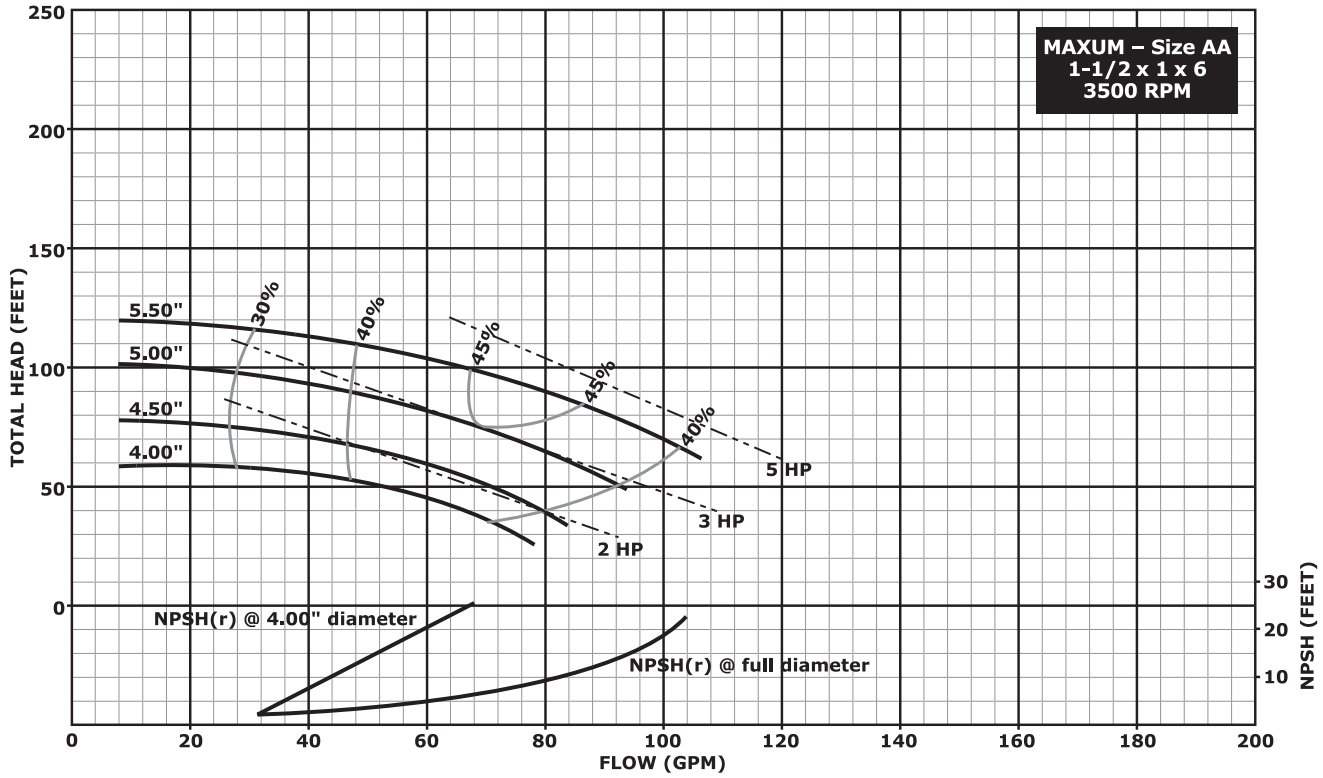
Maxum hydraulic performance extends to 9,500 GPM and 720 feet of head. This range is covered by thirty-three sizes in steel, 316 SS fitted steel, 316 stainless steel and CD4MCu construction.

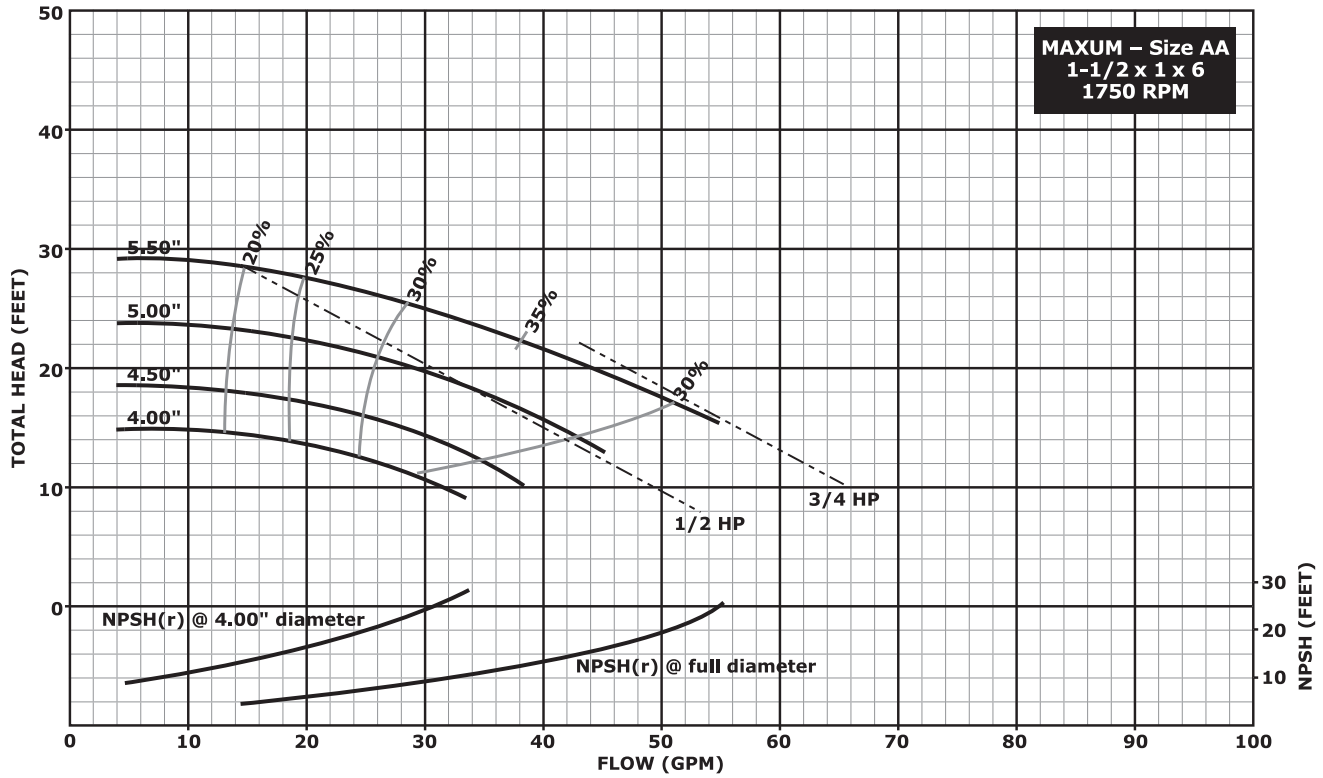




Other sizes and allowable speeds may also be possible. Contact Carver Sales and Marketing department.

Hydraulic Performance – 6" Impeller Pumps

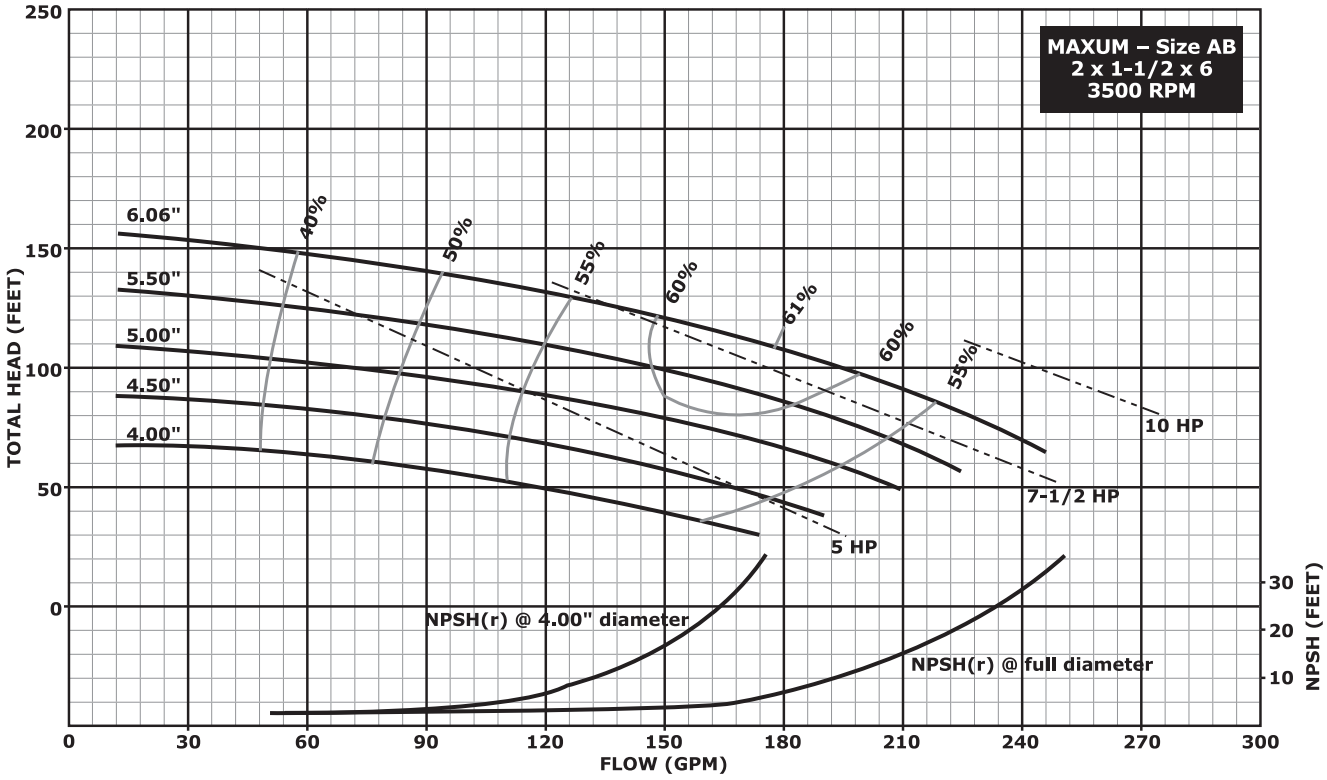


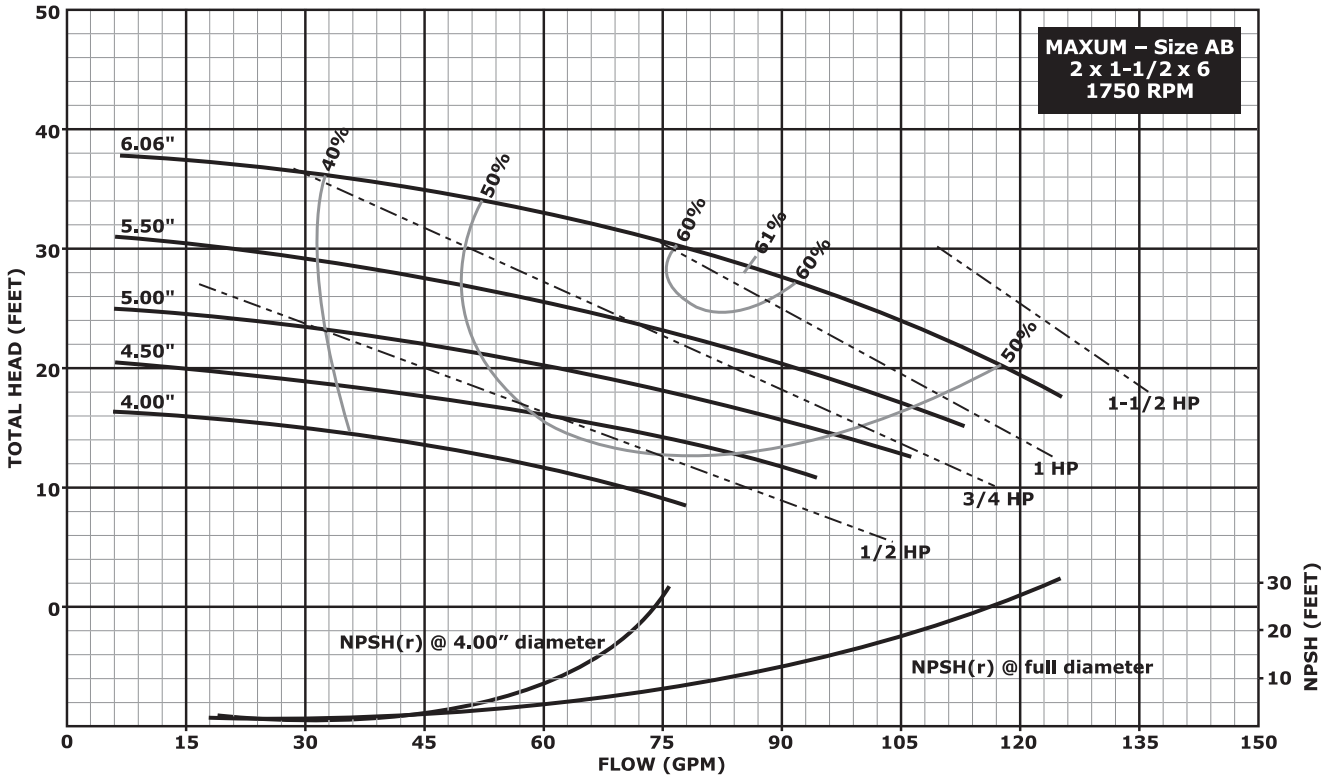


Notes:

1. Above data is based on 1.0 sp. gr. water at ambient temperature and pressure in accordance with Hydraulic Institute guidelines.
2. Impeller diameters between minimum and maximum shown are available in 1/8 inch increment trims.

Hydraulic Performance – 6" Impeller Pumps





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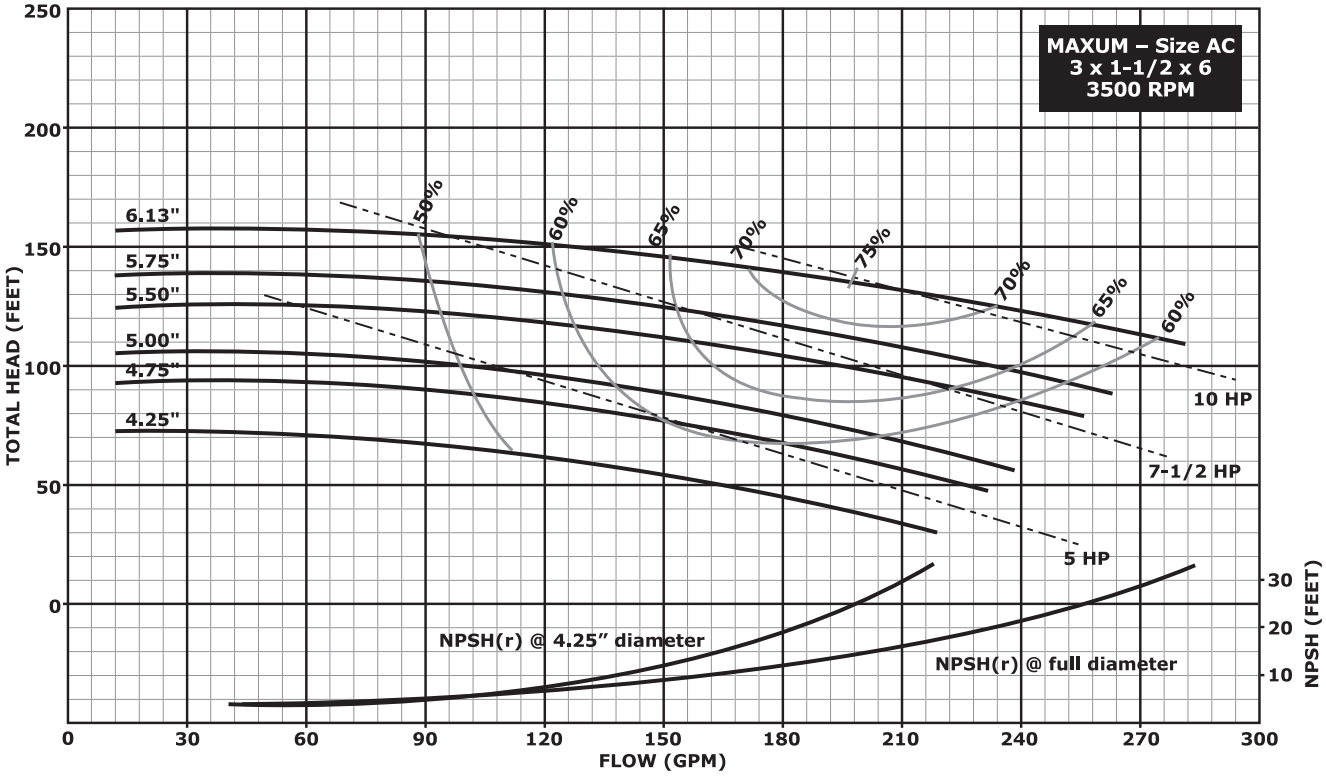
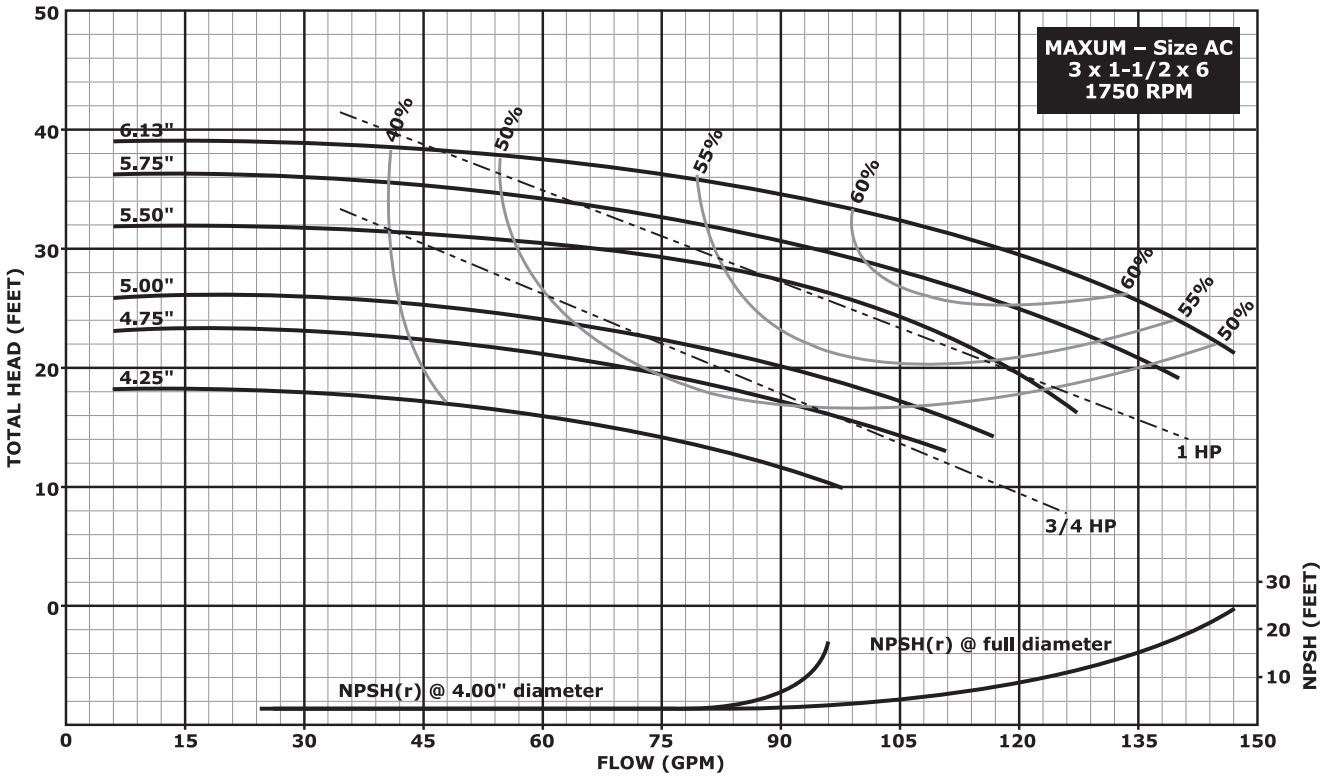
Hydraulic Performance – 6" Impeller Pumps





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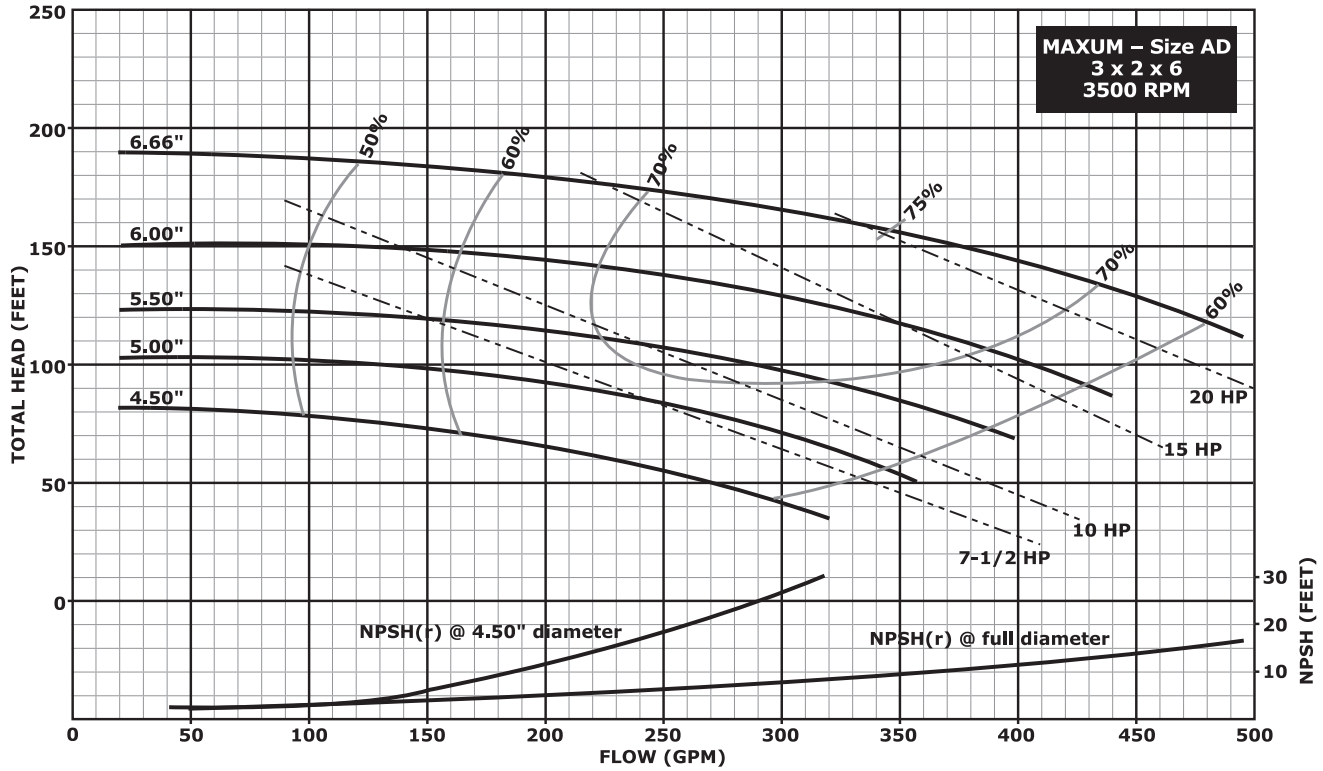

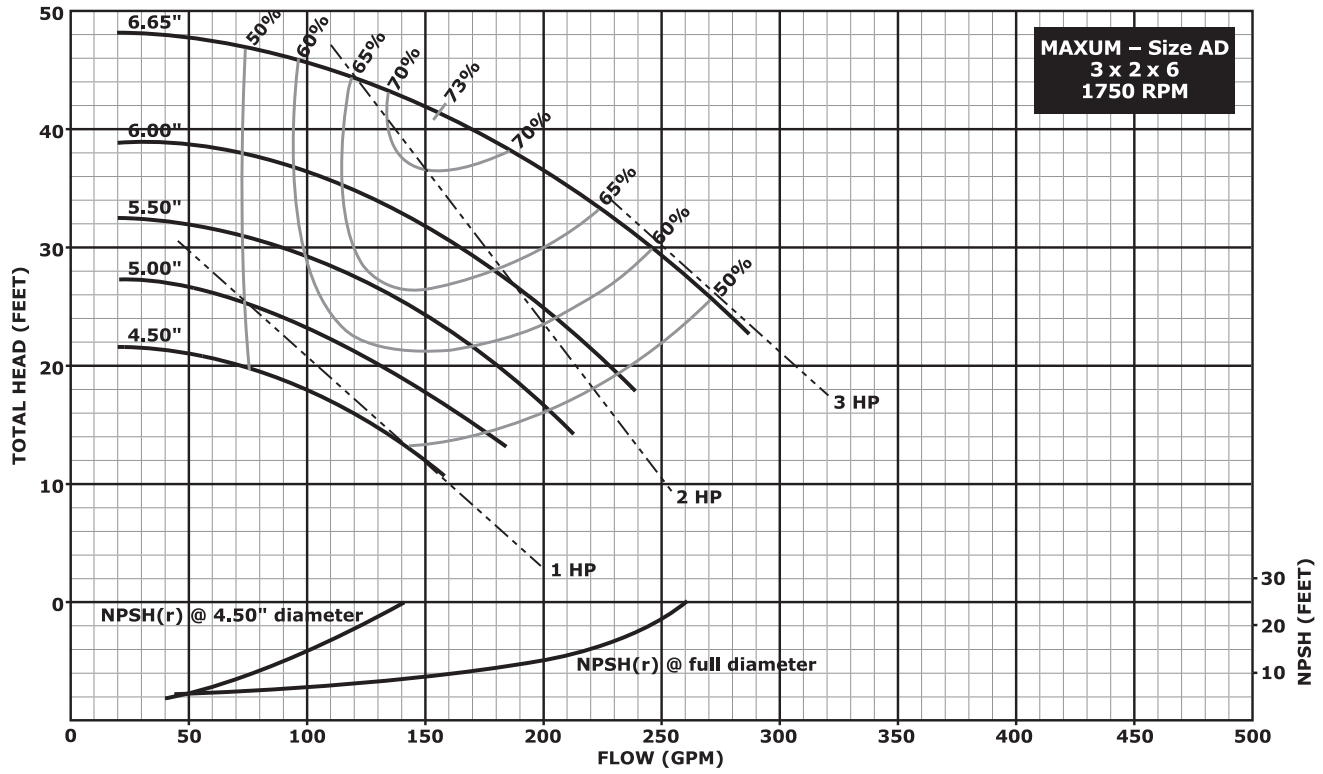

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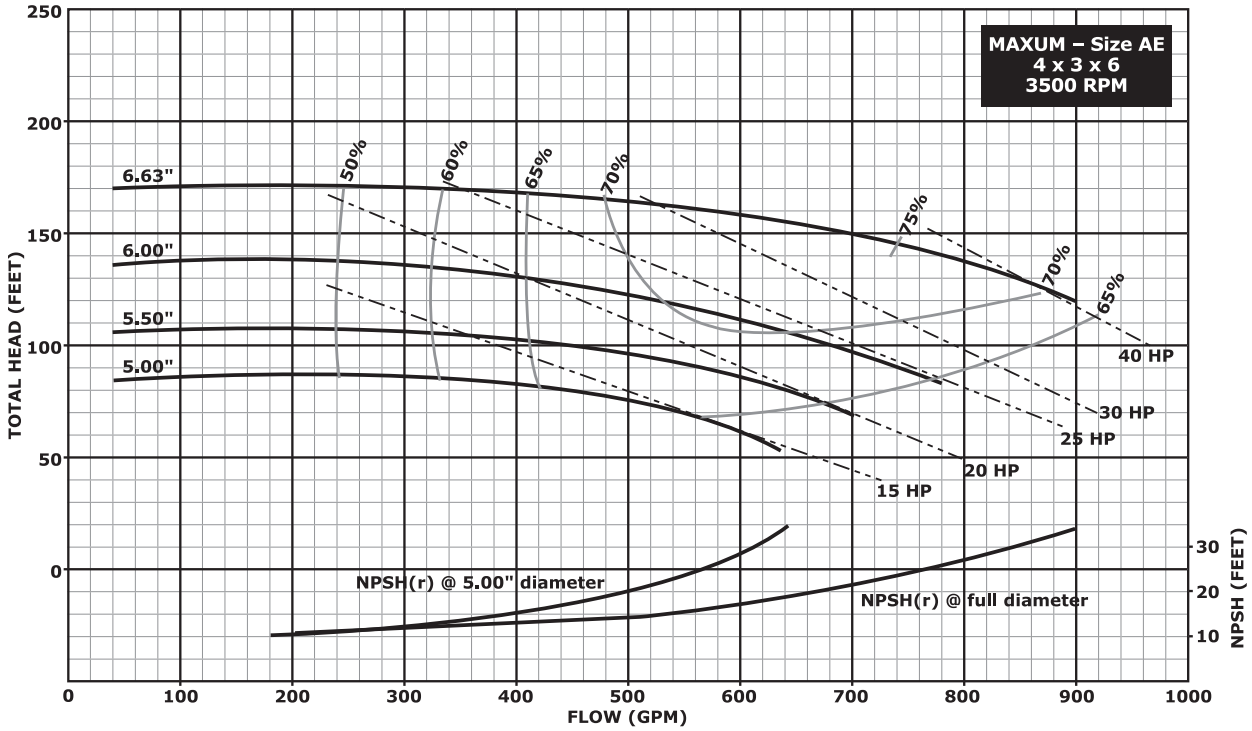
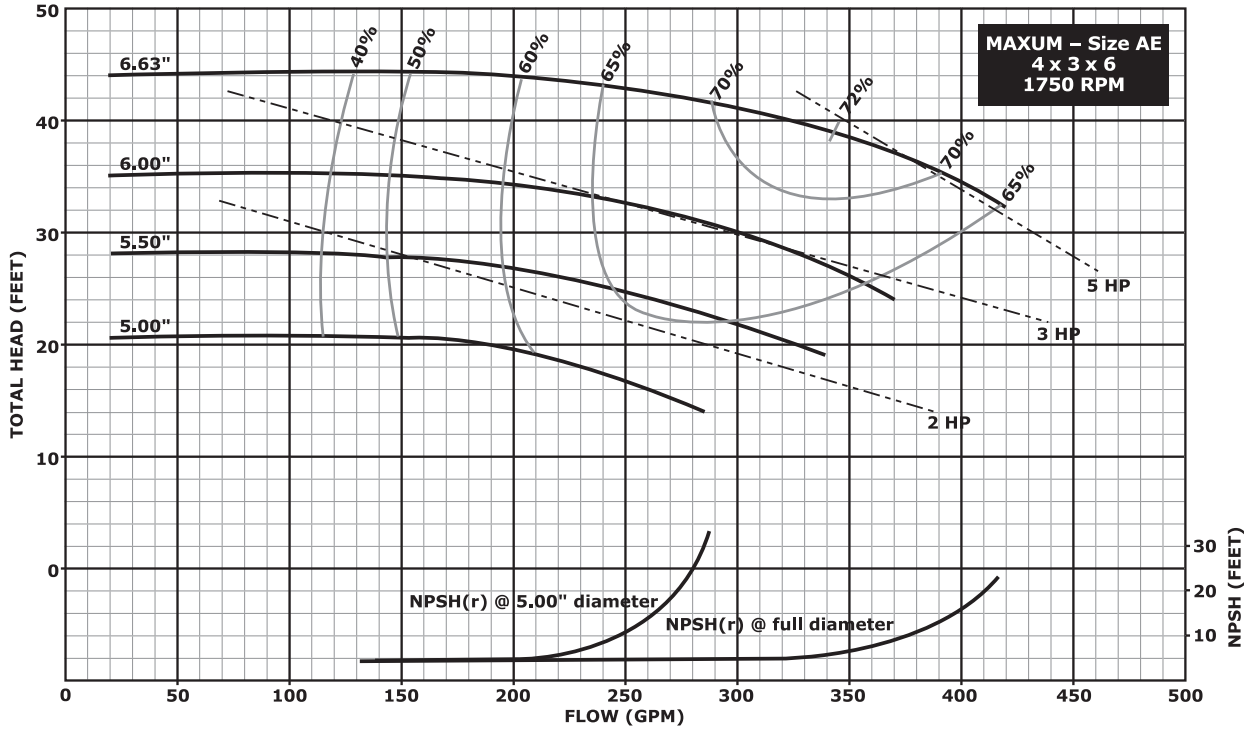
Hydraulic Performance – 6" Impeller Pumps

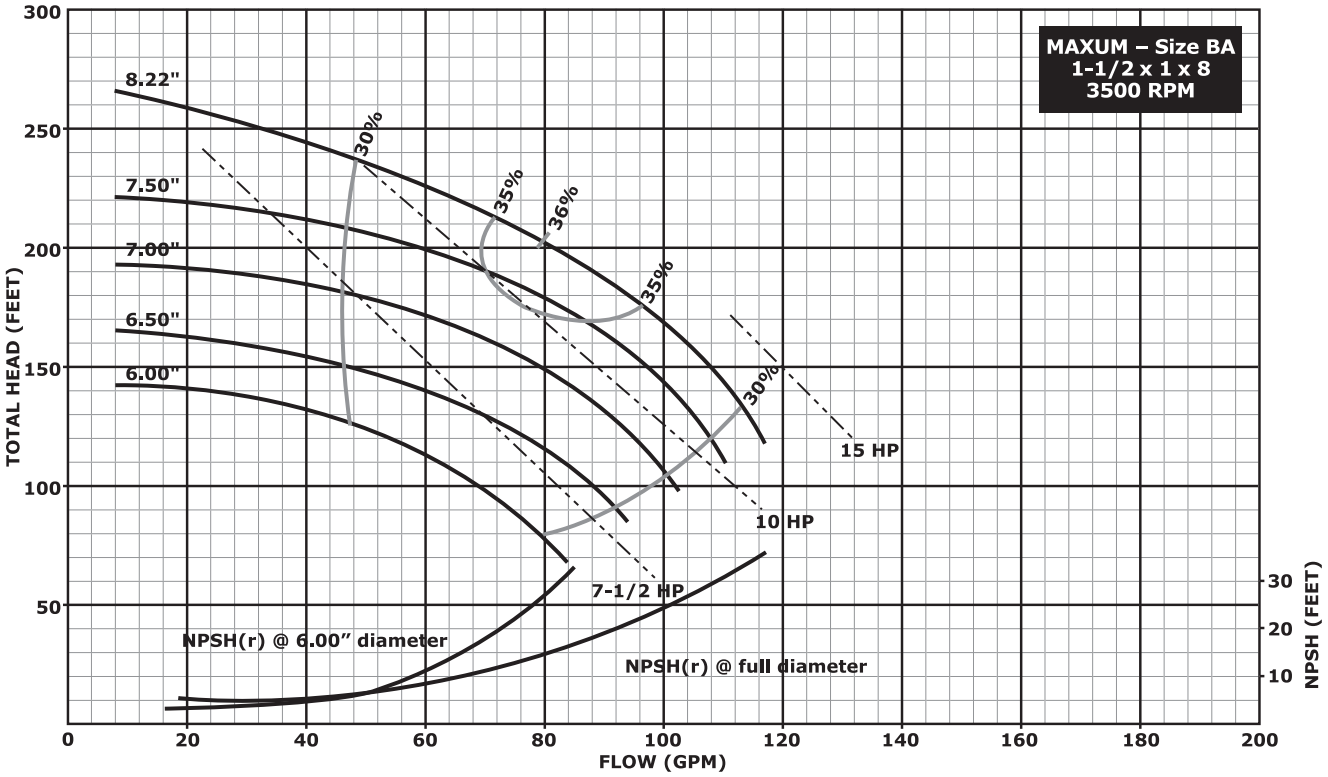


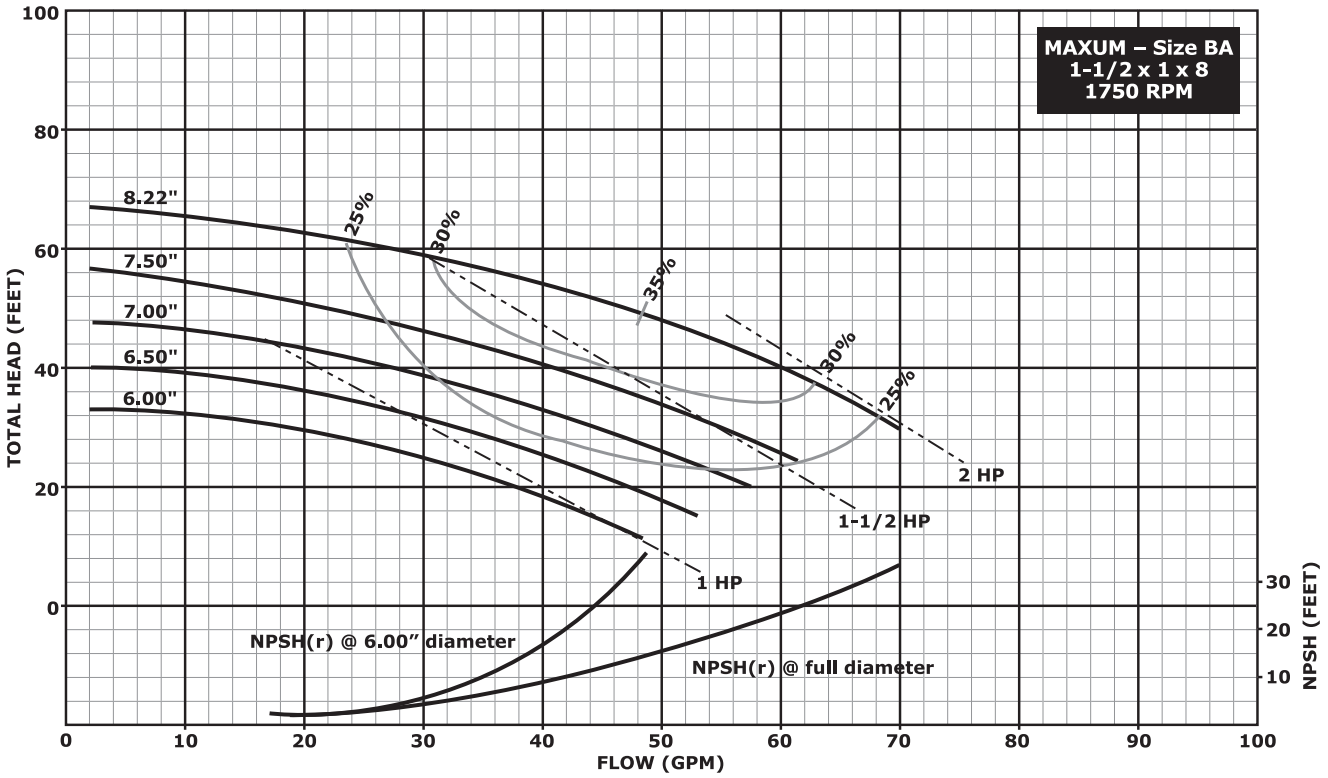


Notes:

1. Above data is based on 1.0 sp. gr. water at ambient temperature and pressure in accordance with Hydraulic Institute guidelines.
2. Impeller diameters between minimum and maximum shown are available in 1/8 inch increment trims.

Hydraulic Performance – 8" Impeller Pumps

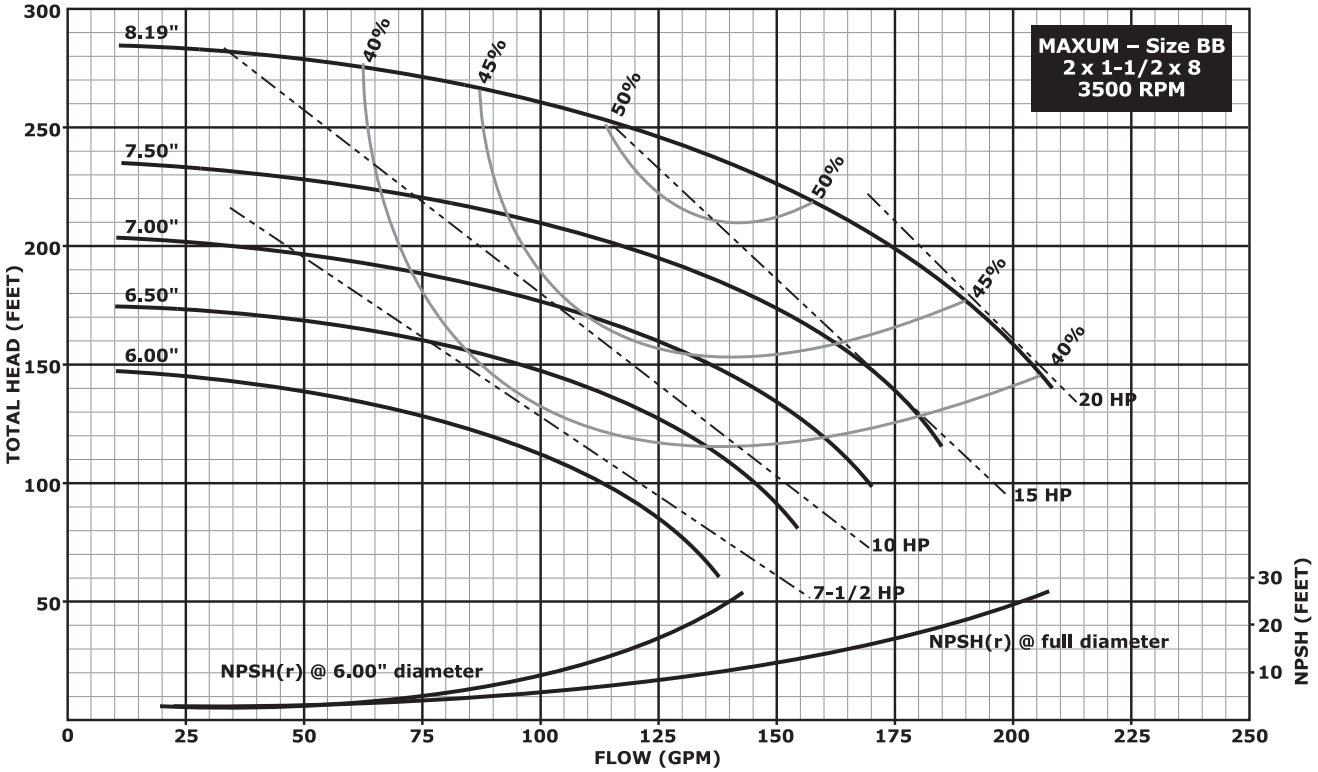


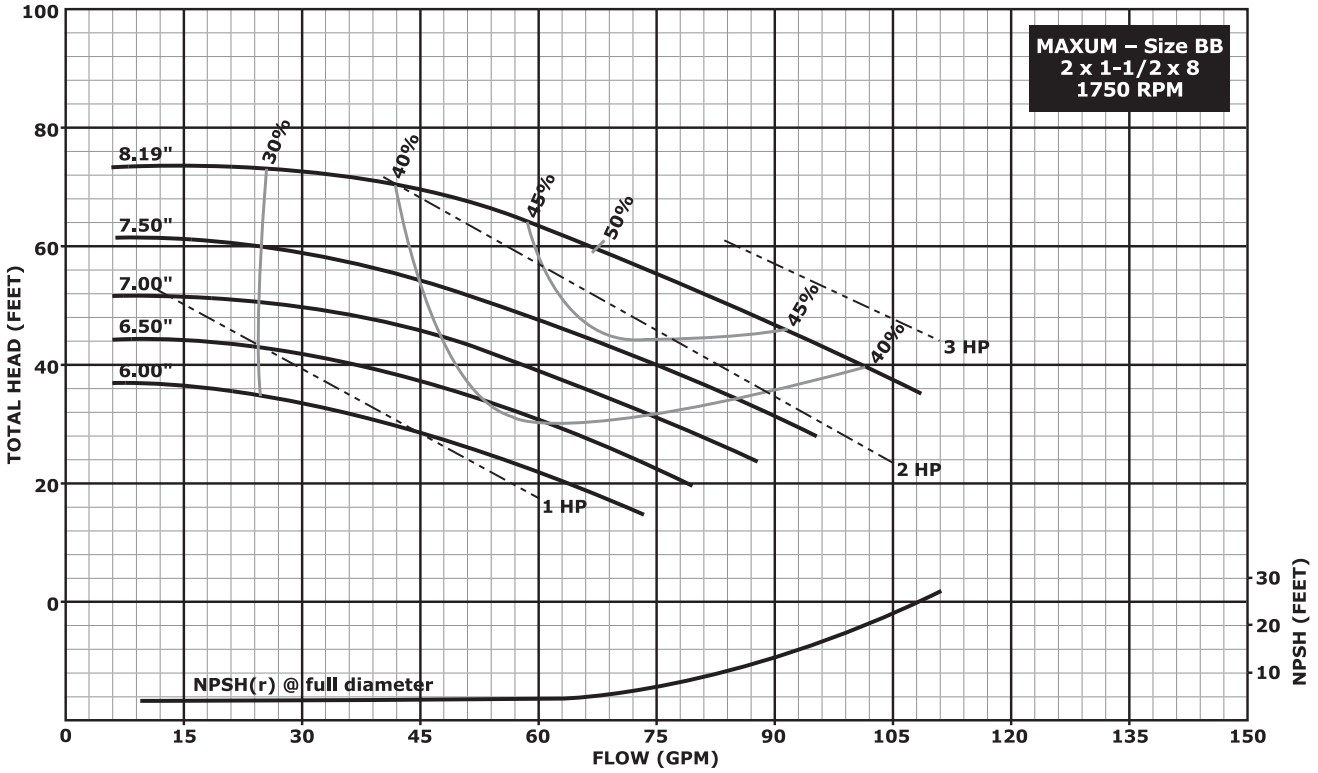


Notes:

1. Above data is based on 1.0 sp. gr. water at ambient temperature and pressure in accordance with Hydraulic Institute guidelines.
2. Impeller diameters between minimum and maximum shown are available in 1/8 inch increment trims.

Hydraulic Performance – 8" Impeller Pumps

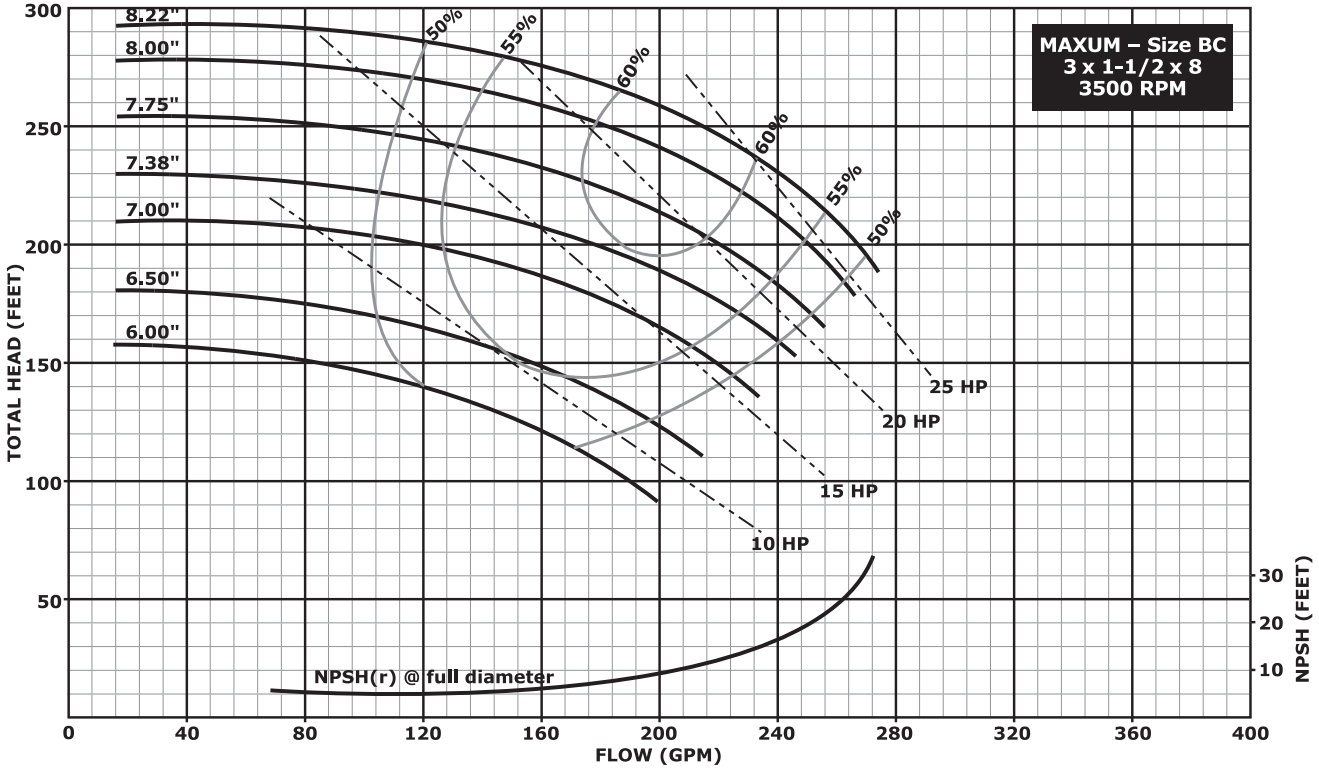


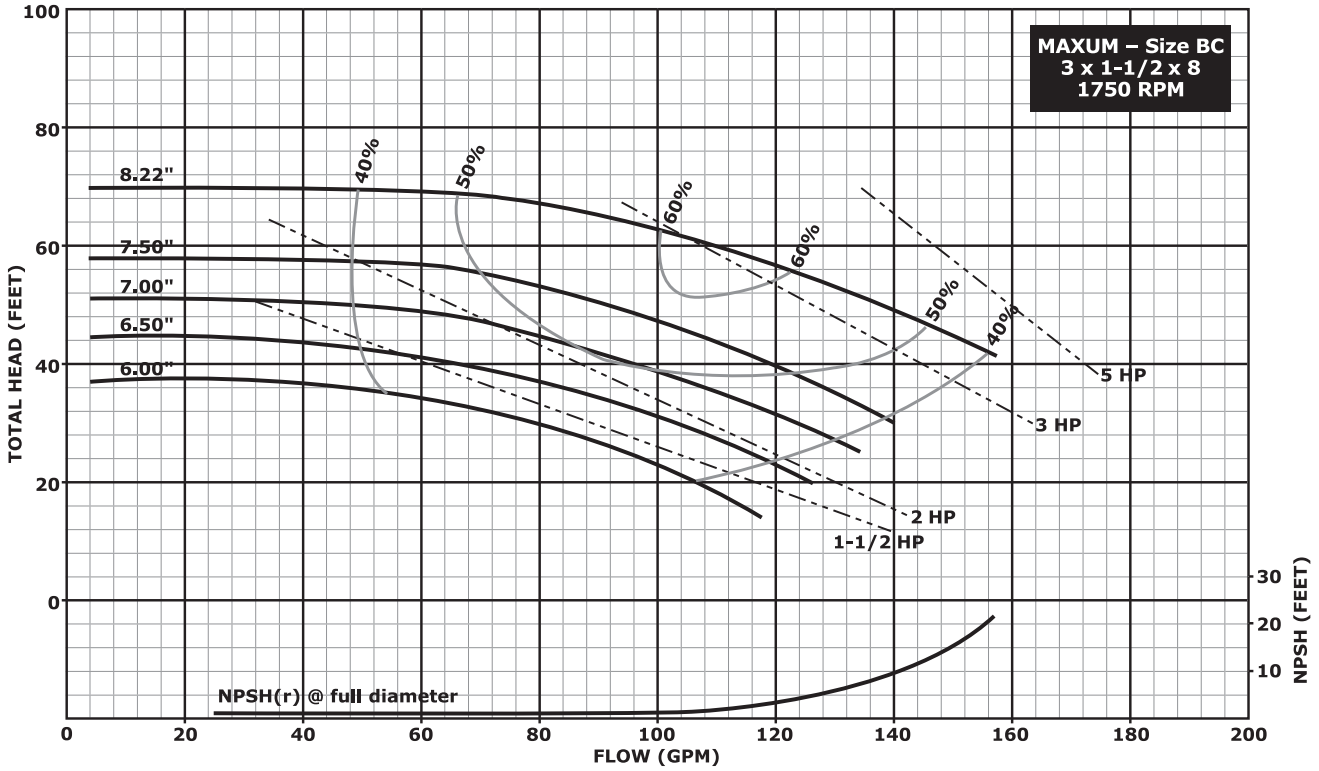


Notes:

1. Above data is based on 1.0 sp. gr. water at ambient temperature and pressure in accordance with Hydraulic Institute guidelines.
2. Impeller diameters between minimum and maximum shown are available in 1/8 inch increment trims.

Hydraulic Performance – 8" Impeller Pumps

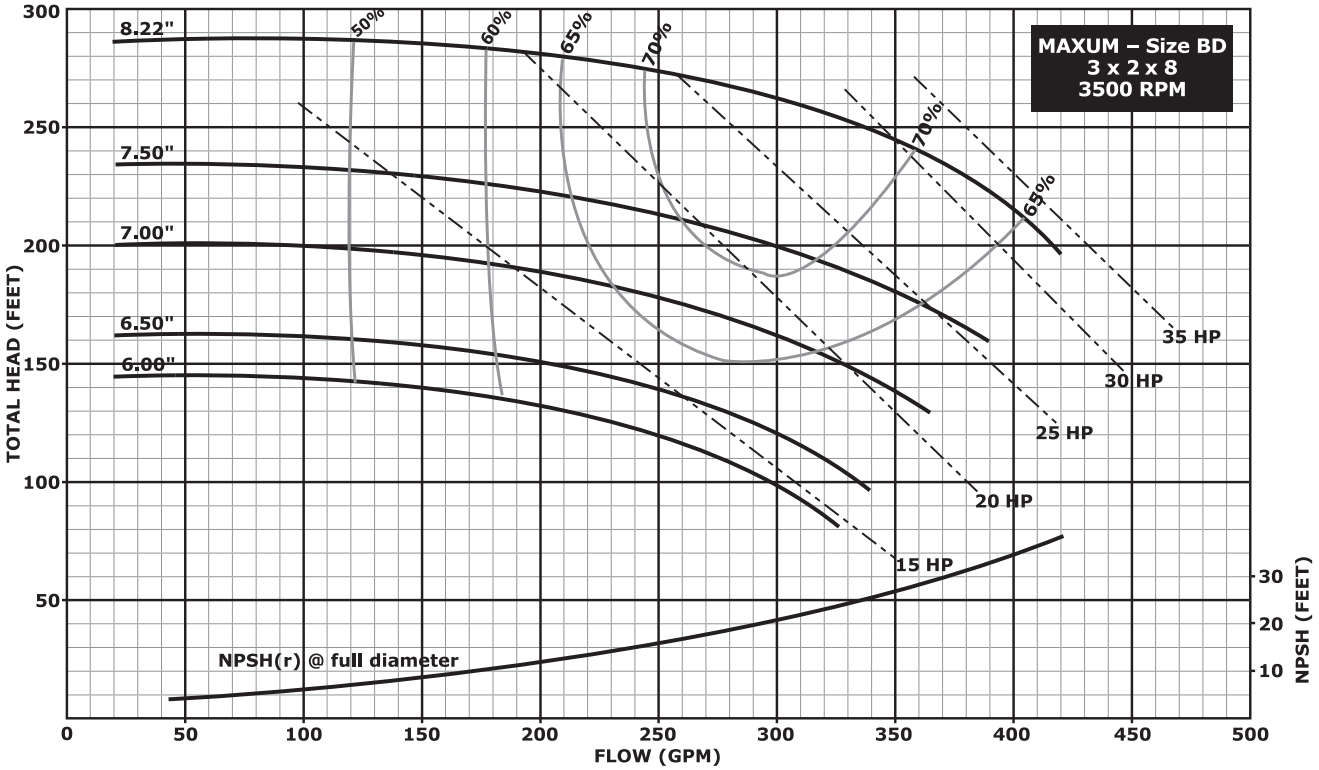


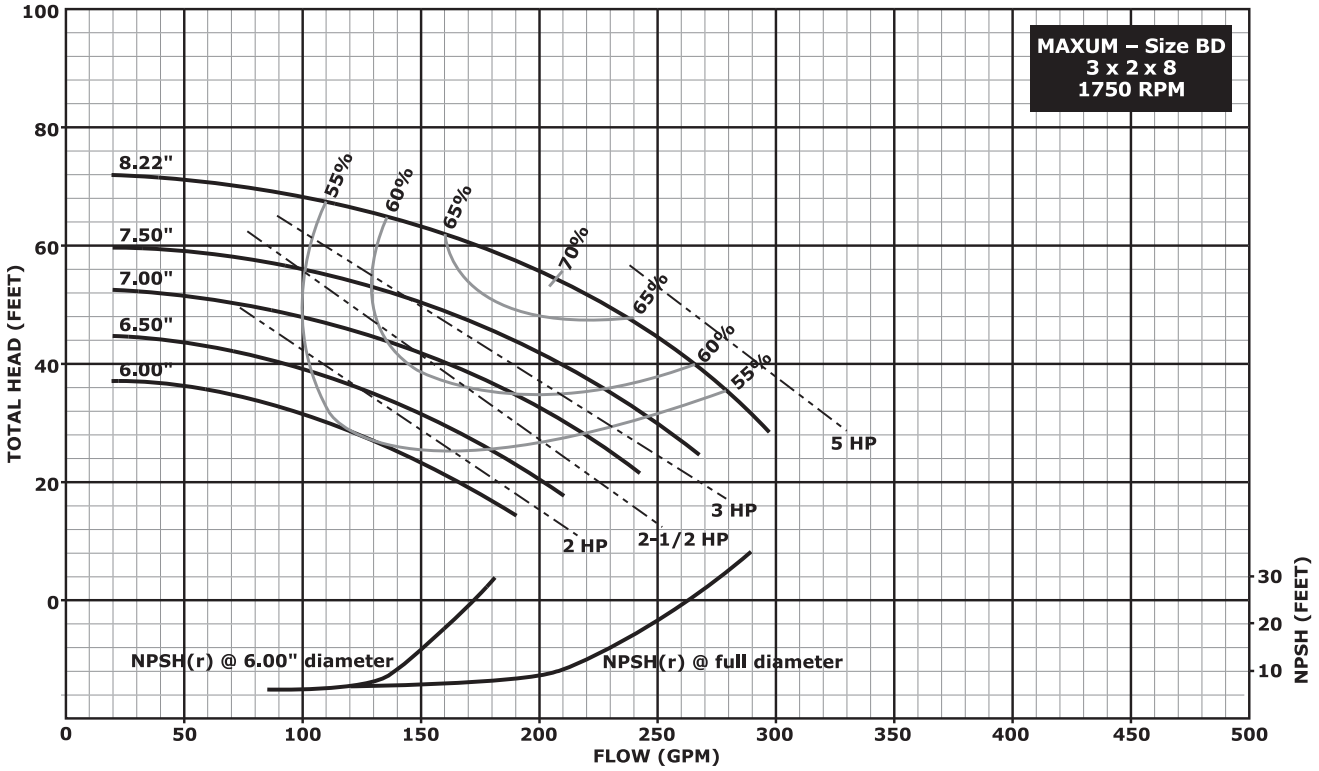


Notes:

1. Above data is based on 1.0 sp. gr. water at ambient temperature and pressure in accordance with Hydraulic Institute guidelines.
2. Impeller diameters between minimum and maximum shown are available in 1/8 inch increment trims.

Hydraulic Performance – 8" Impeller Pumps

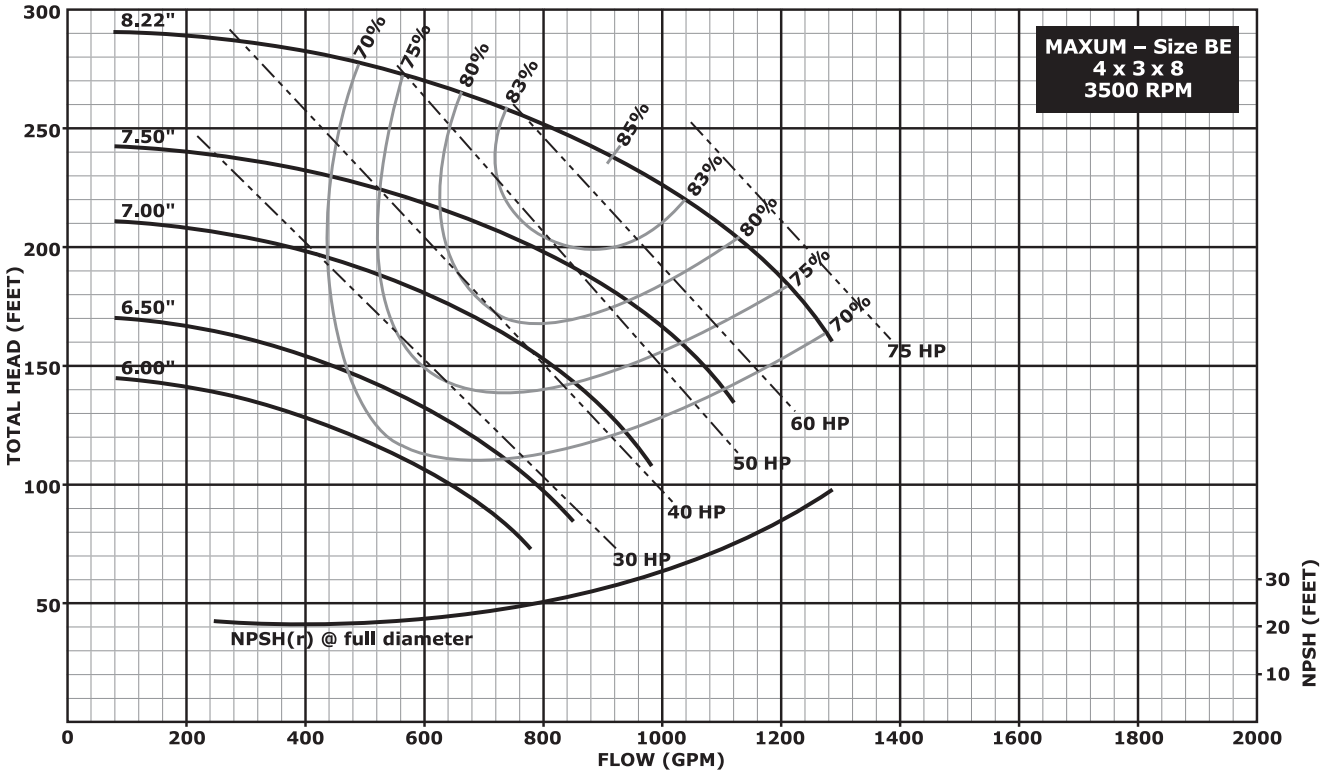


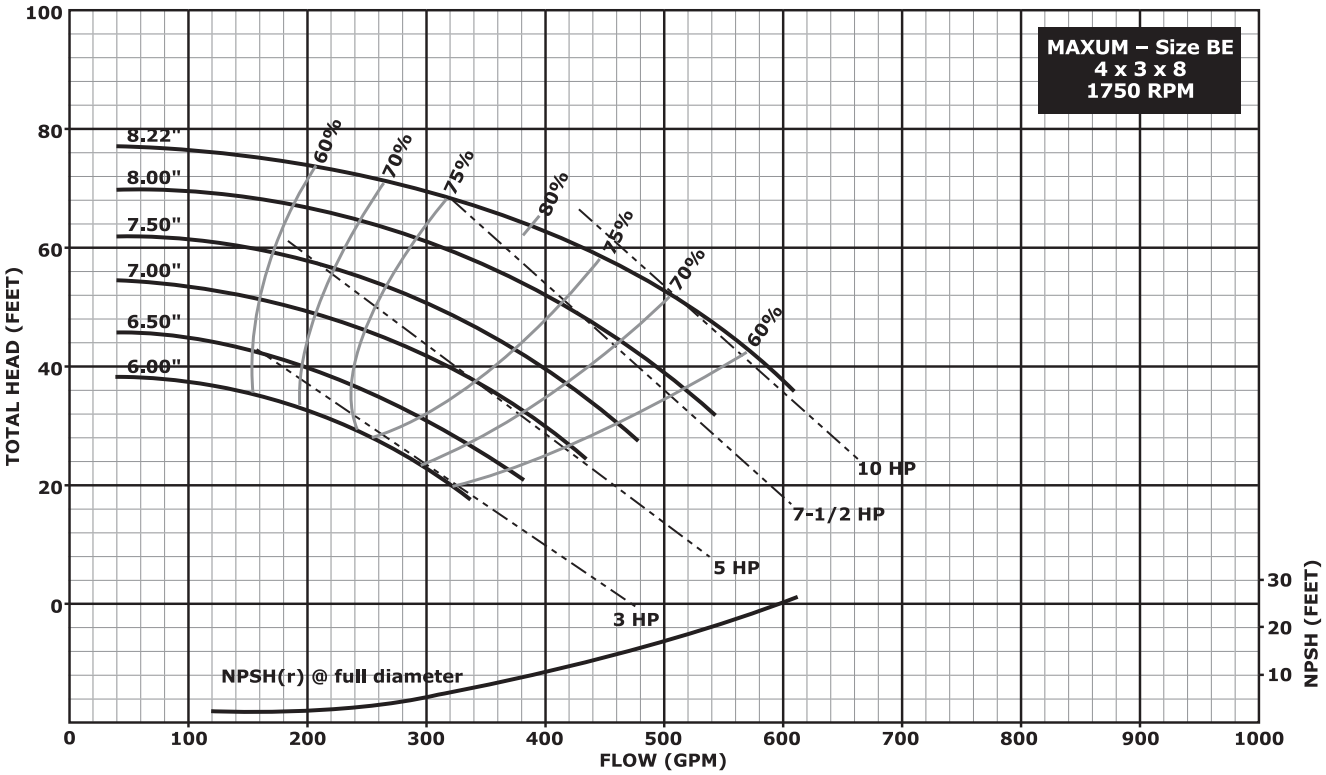


Notes:

1. Above data is based on 1.0 sp. gr. water at ambient temperature and pressure in accordance with Hydraulic Institute guidelines.
2. Impeller diameters between minimum and maximum shown are available in 1/8 inch increment trims.

Hydraulic Performance – 8" Impeller Pumps

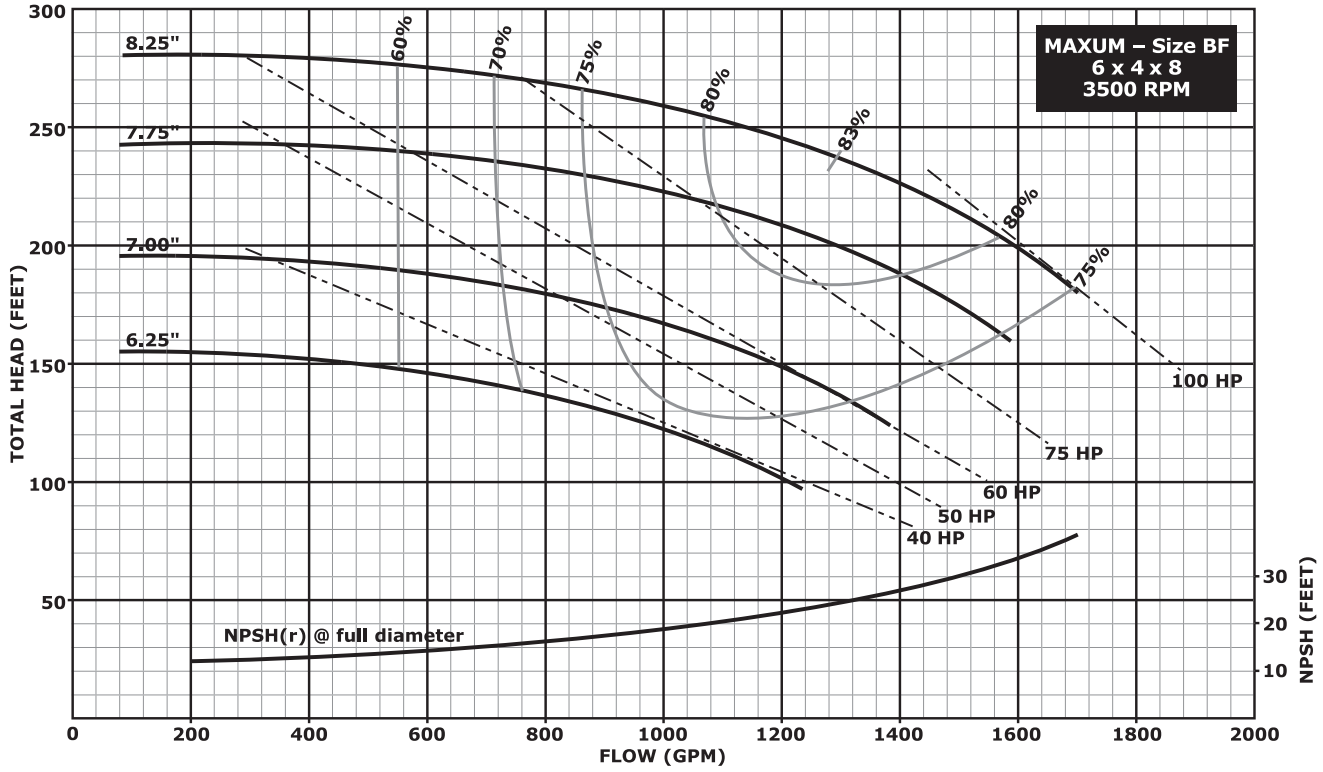


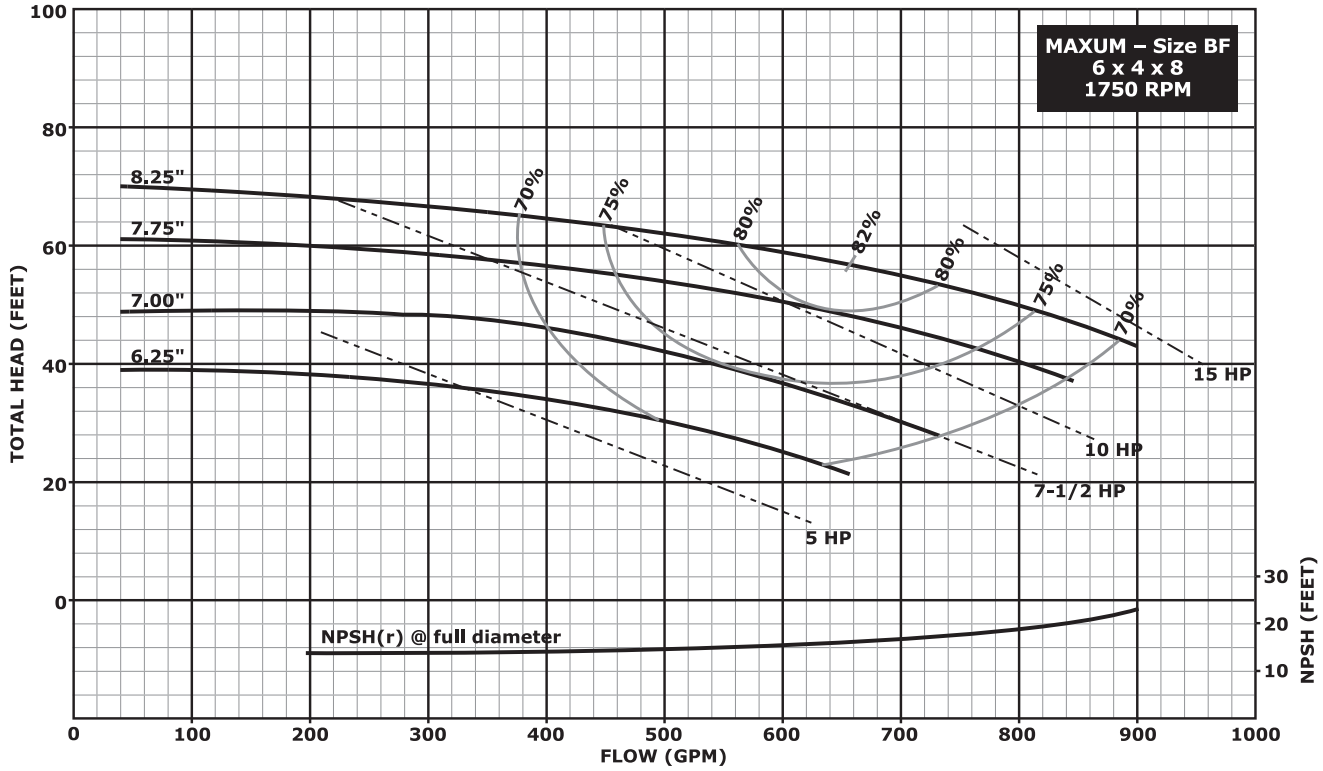


Notes:

1. Above data is based on 1.0 sp. gr. water at ambient temperature and pressure in accordance with Hydraulic Institute guidelines.
2. Impeller diameters between minimum and maximum shown are available in 1/8 inch increment trims.

Hydraulic Performance – 8" Impeller Pumps

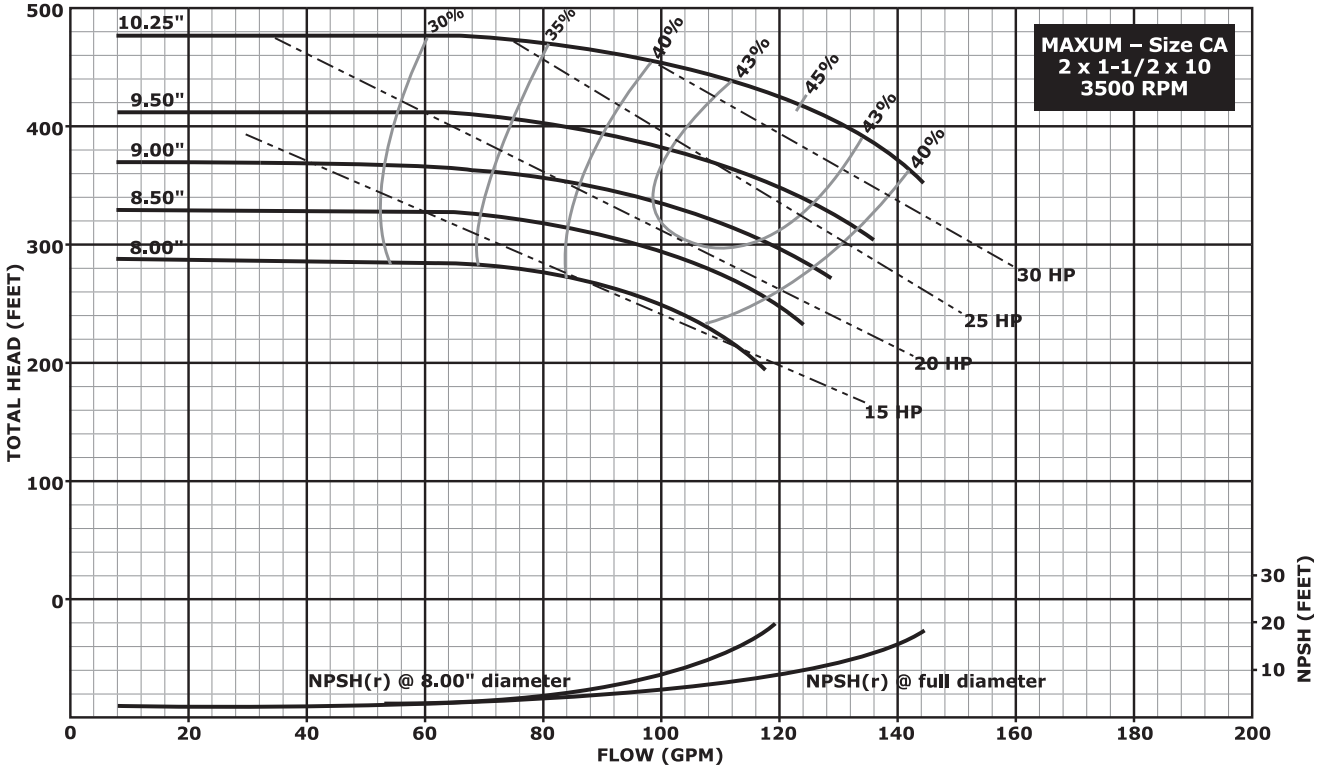


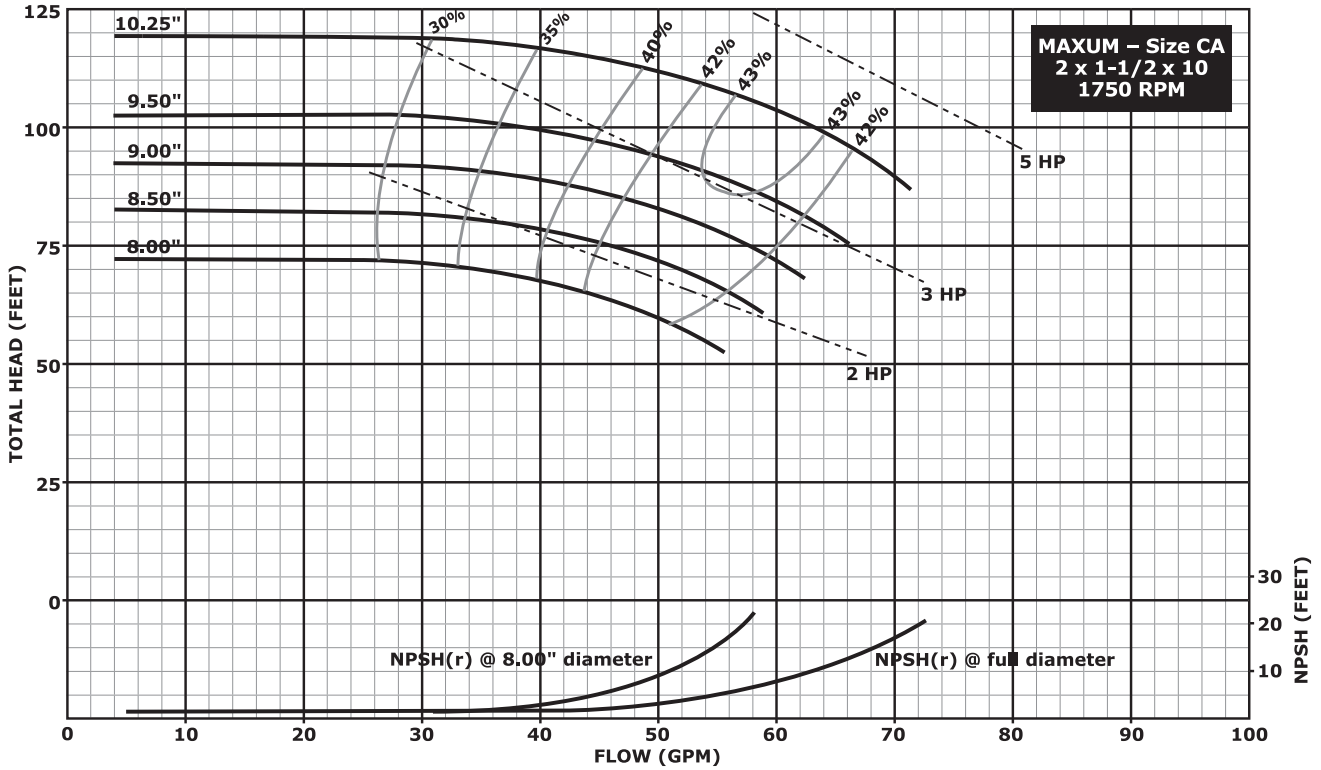


Notes:

1. Above data is based on 1.0 sp. gr. water at ambient temperature and pressure in accordance with Hydraulic Institute guidelines.
2. Impeller diameters between minimum and maximum shown are available in 1/8 inch increment trims.

Hydraulic Performance – 10" Impeller Pumps

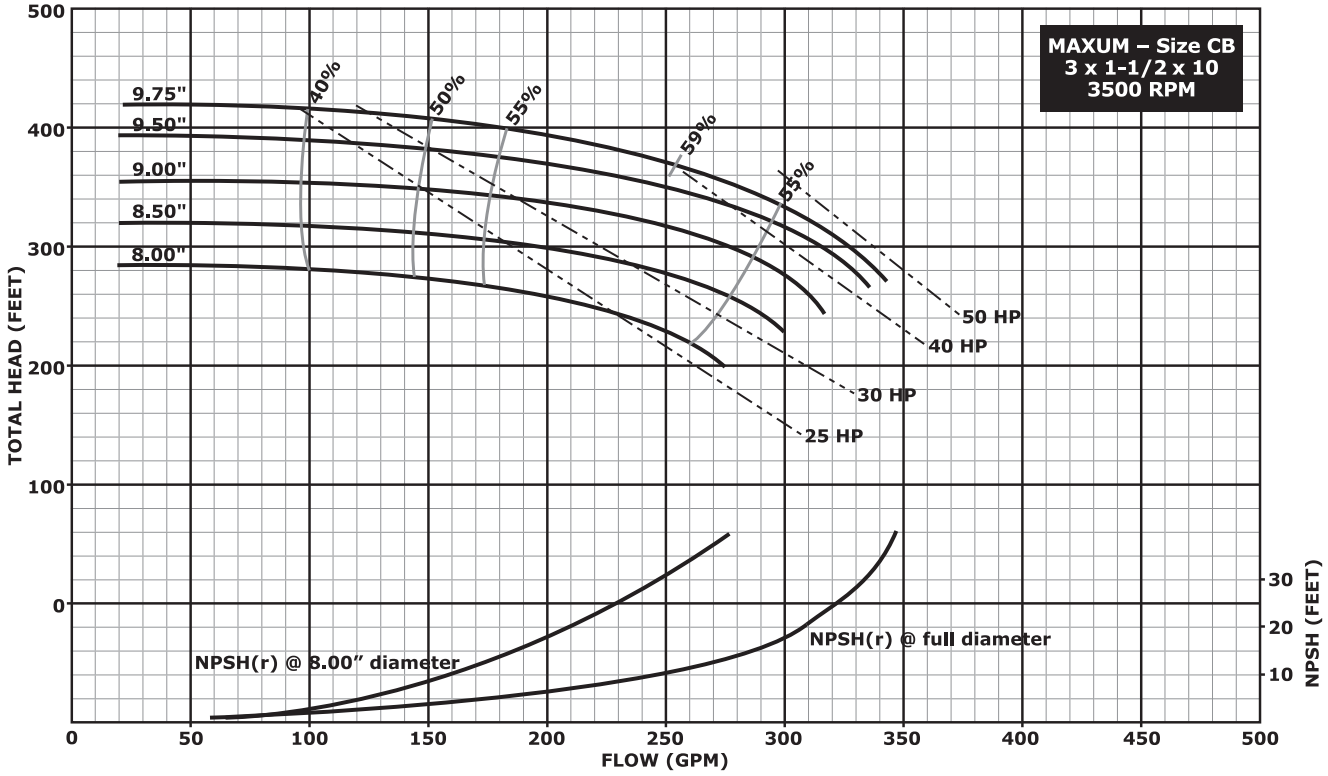


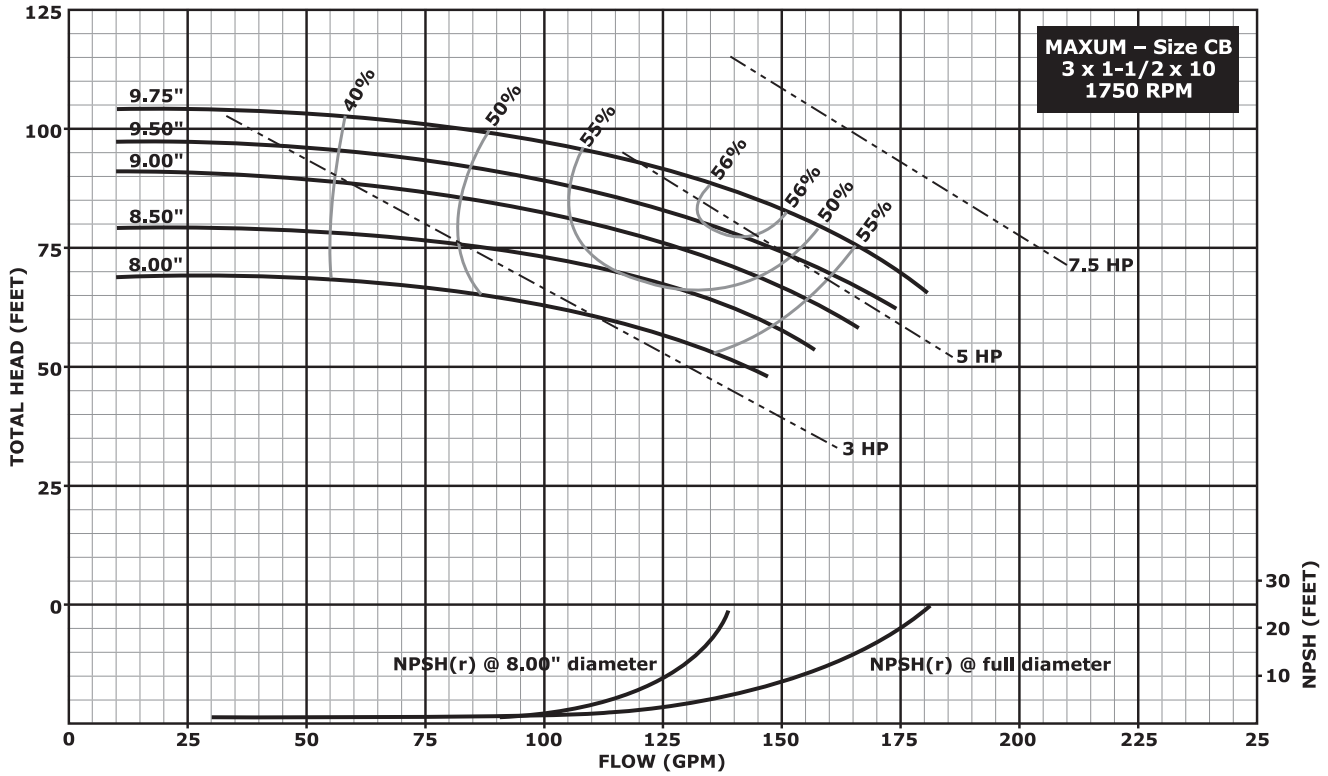


Notes:

1. Above data is based on 1.0 sp. gr. water at ambient temperature and pressure in accordance with Hydraulic Institute guidelines.
2. Impeller diameters between minimum and maximum shown are available in 1/8 inch increment trims.

Hydraulic Performance – 10" Impeller Pumps

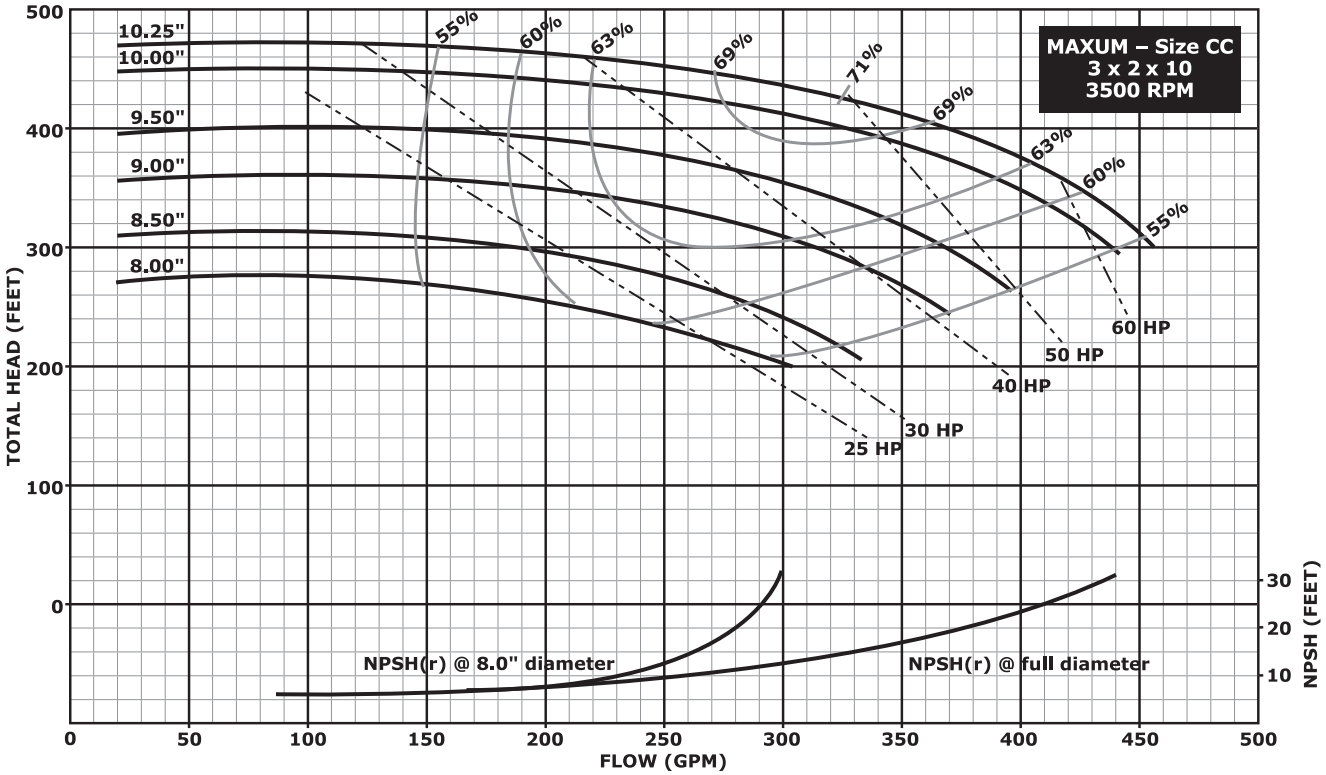


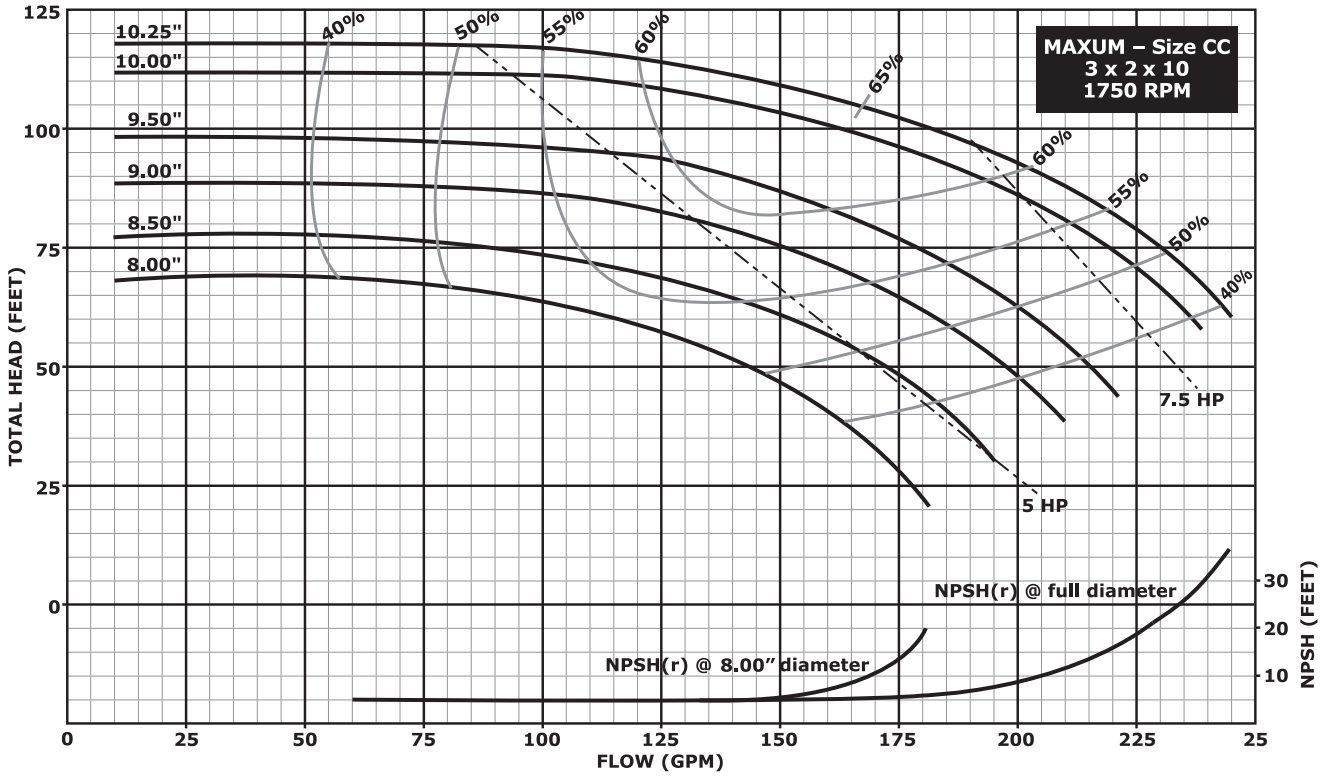


Notes:

1. Above data is based on 1.0 sp. gr. water at ambient temperature and pressure in accordance with Hydraulic Institute guidelines.
2. Impeller diameters between minimum and maximum shown are available in 1/8 inch increment trims.

Hydraulic Performance – 10" Impeller Pumps

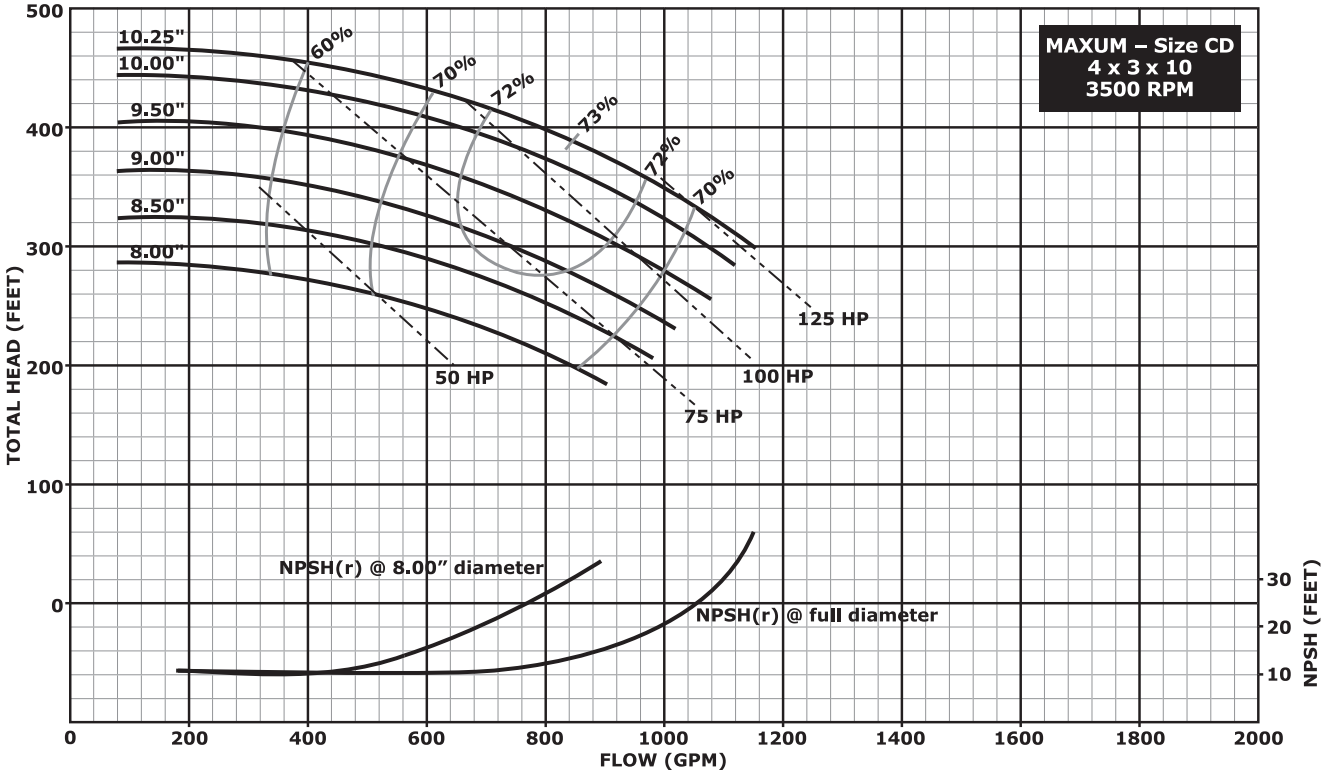


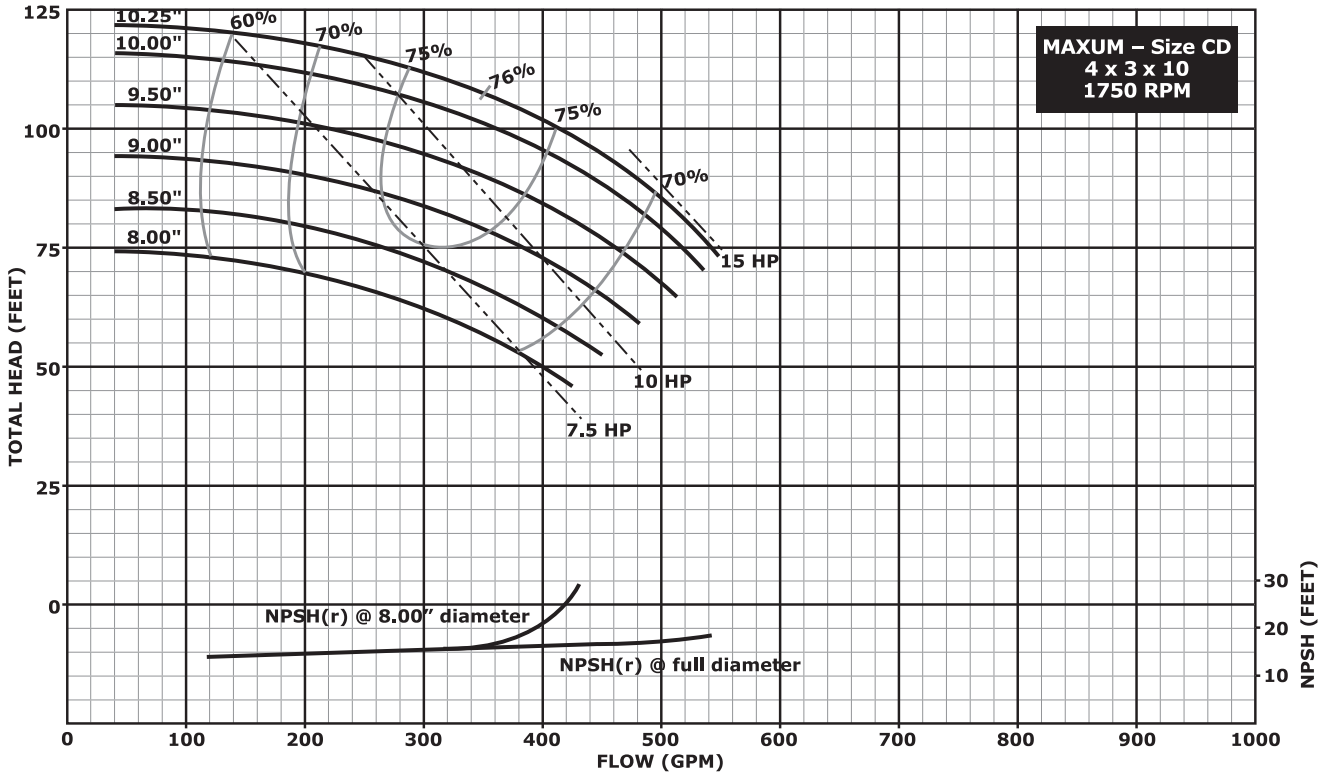


Notes:

1. Above data is based on 1.0 sp. gr. water at ambient temperature and pressure in accordance with Hydraulic Institute guidelines.
2. Impeller diameters between minimum and maximum shown are available in 1/8 inch increment trims.

Hydraulic Performance – 10" Impeller Pumps

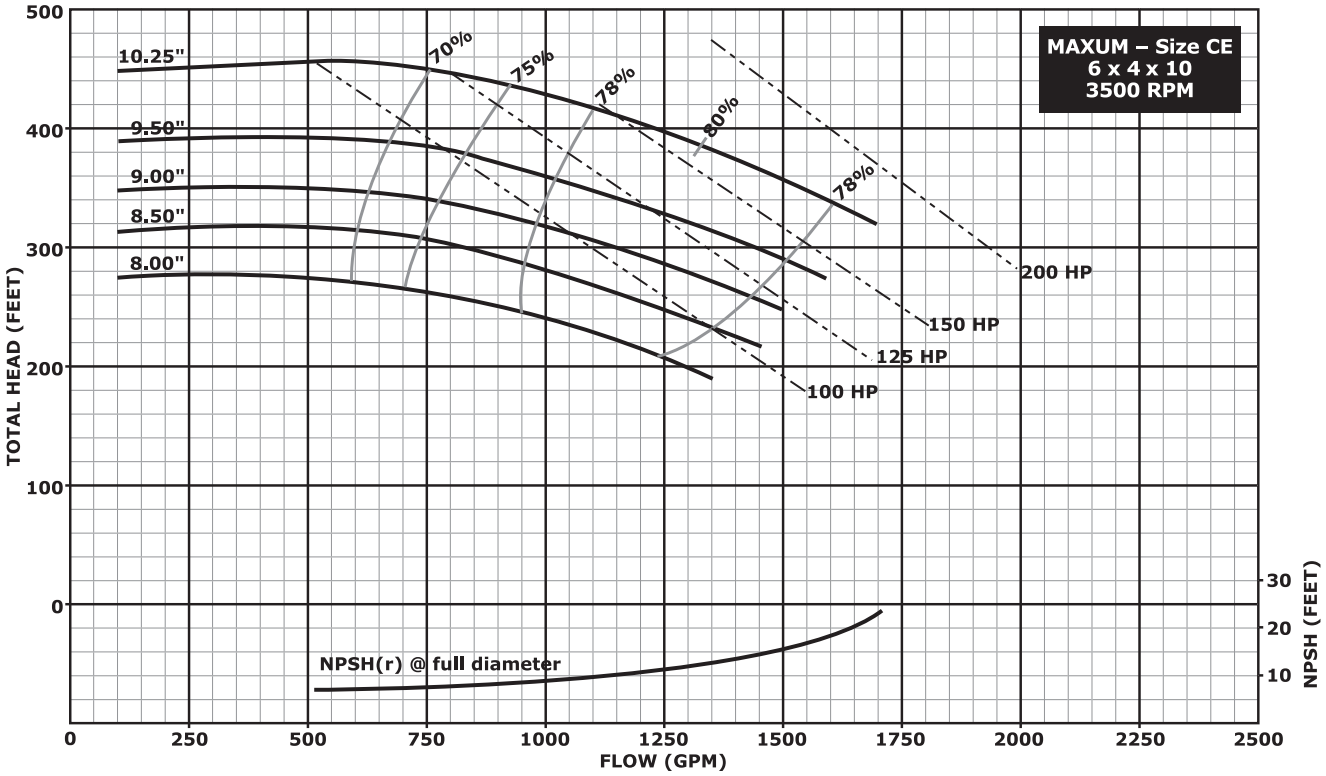


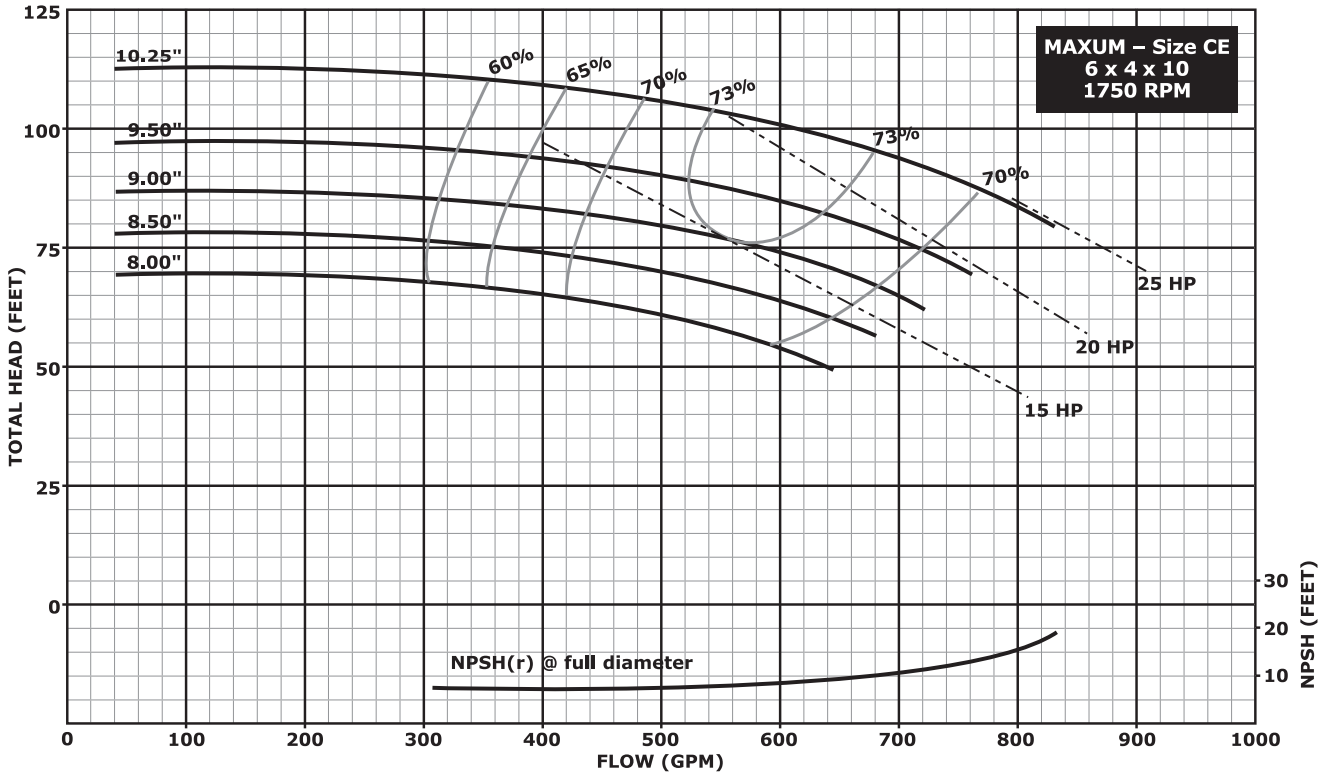


Notes:

1. Above data is based on 1.0 sp. gr. water at ambient temperature and pressure in accordance with Hydraulic Institute guidelines.
2. Impeller diameters between minimum and maximum shown are available in 1/8 inch increment trims.

Hydraulic Performance – 10" Impeller Pumps

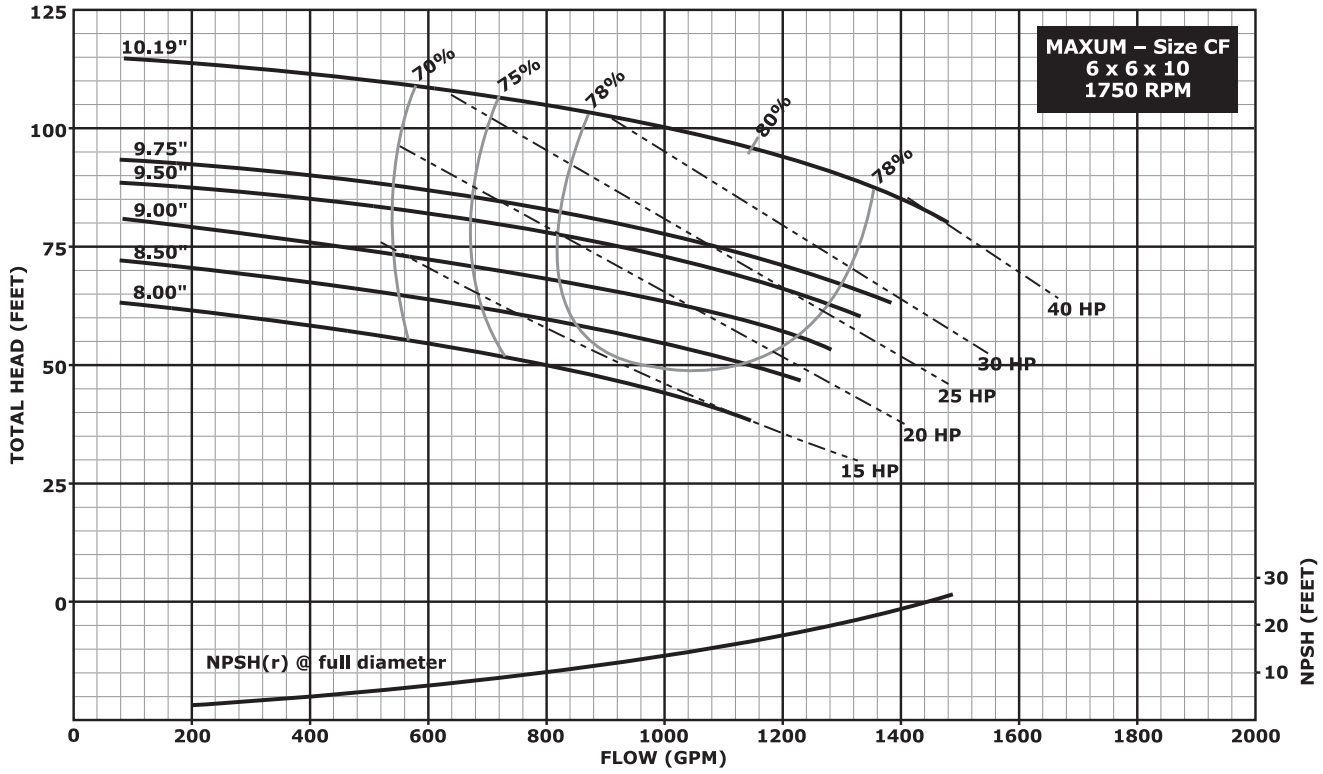


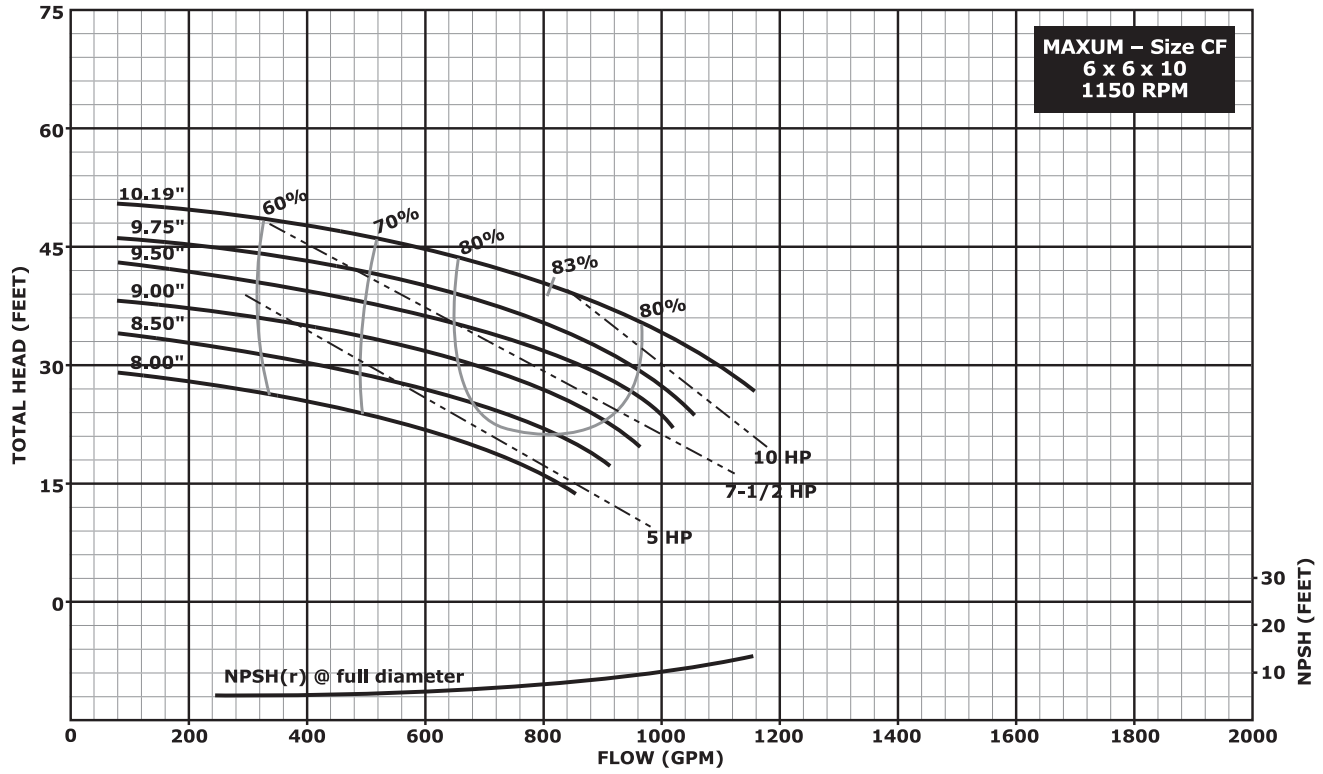


Notes:

1. Above data is based on 1.0 sp. gr. water at ambient temperature and pressure in accordance with Hydraulic Institute guidelines.
2. Impeller diameters between minimum and maximum shown are available in 1/8 inch increment trims.

Hydraulic Performance – 10" Impeller Pumps

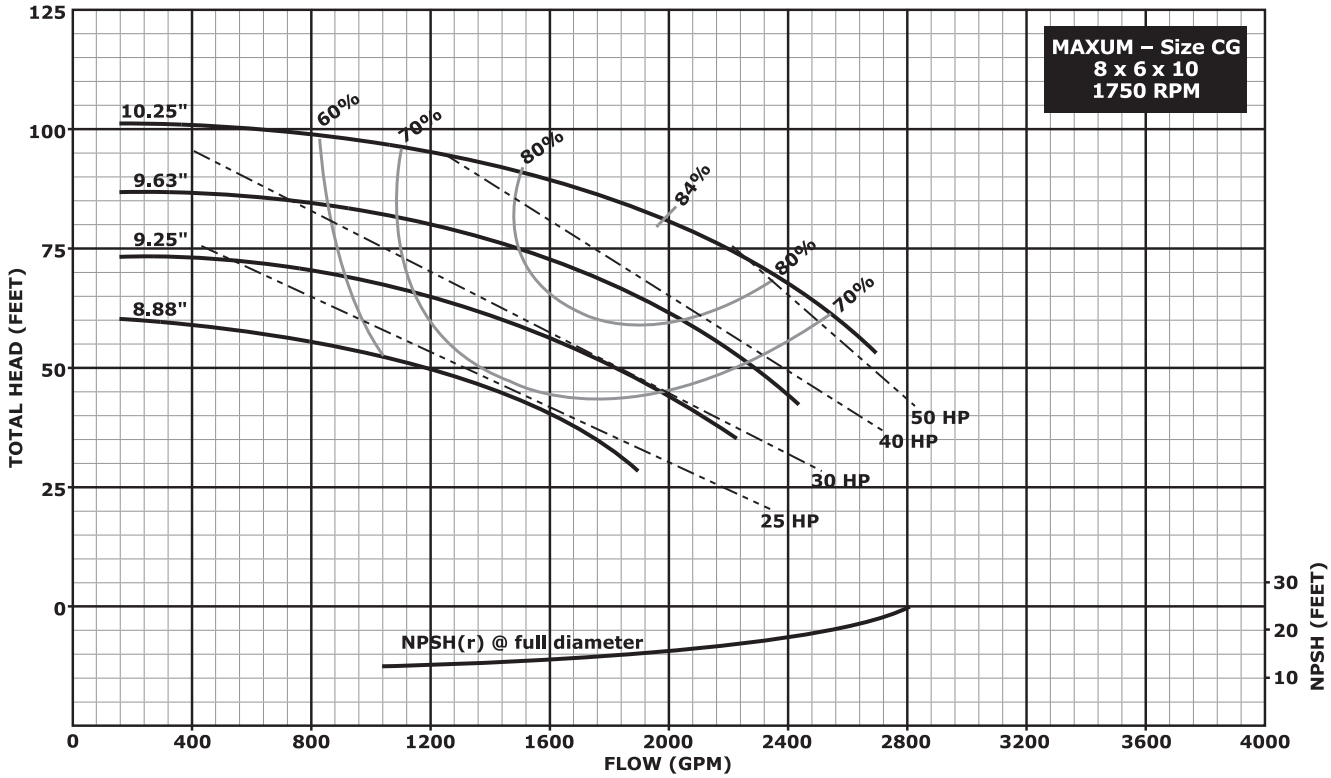


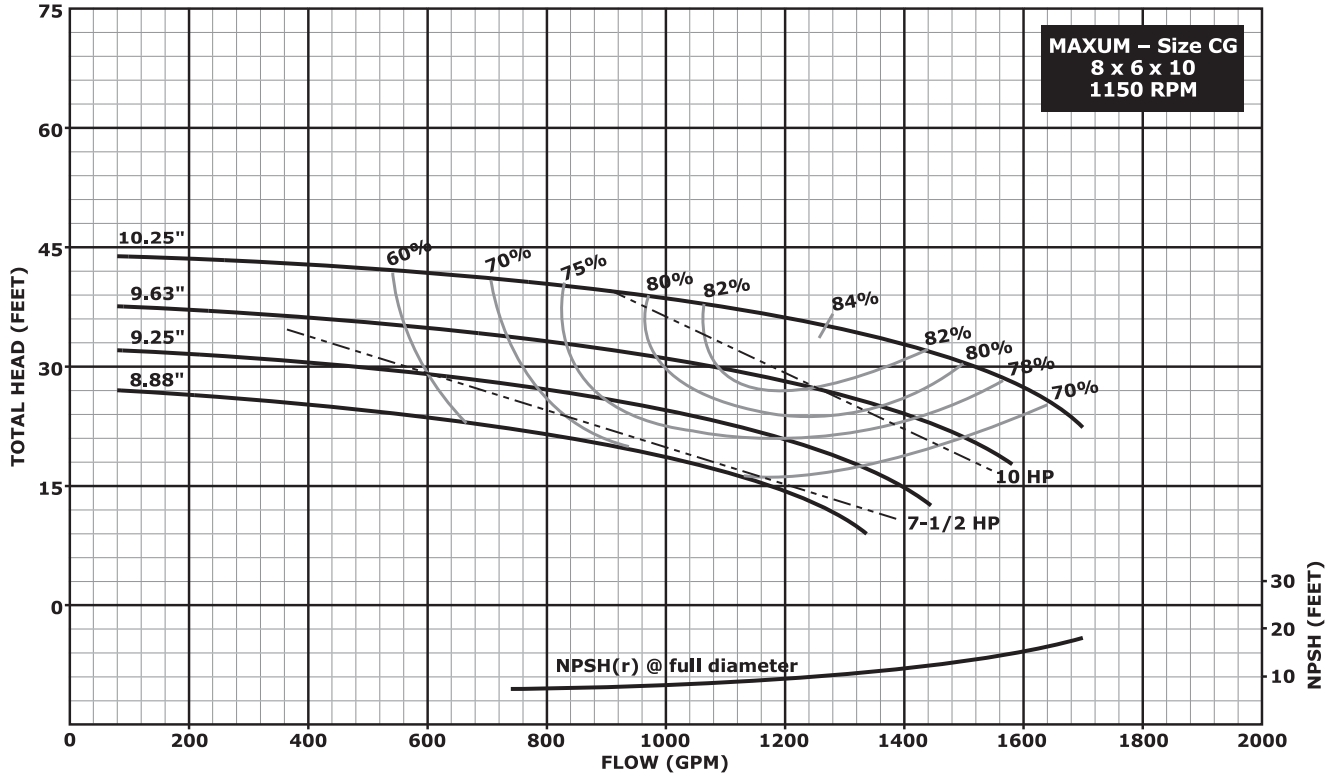


Notes:

1. Above data is based on 1.0 sp. gr. water at ambient temperature and pressure in accordance with Hydraulic Institute guidelines.
2. Impeller diameters between minimum and maximum shown are available in 1/8 inch increment trims.

Hydraulic Performance – 10" Impeller Pumps

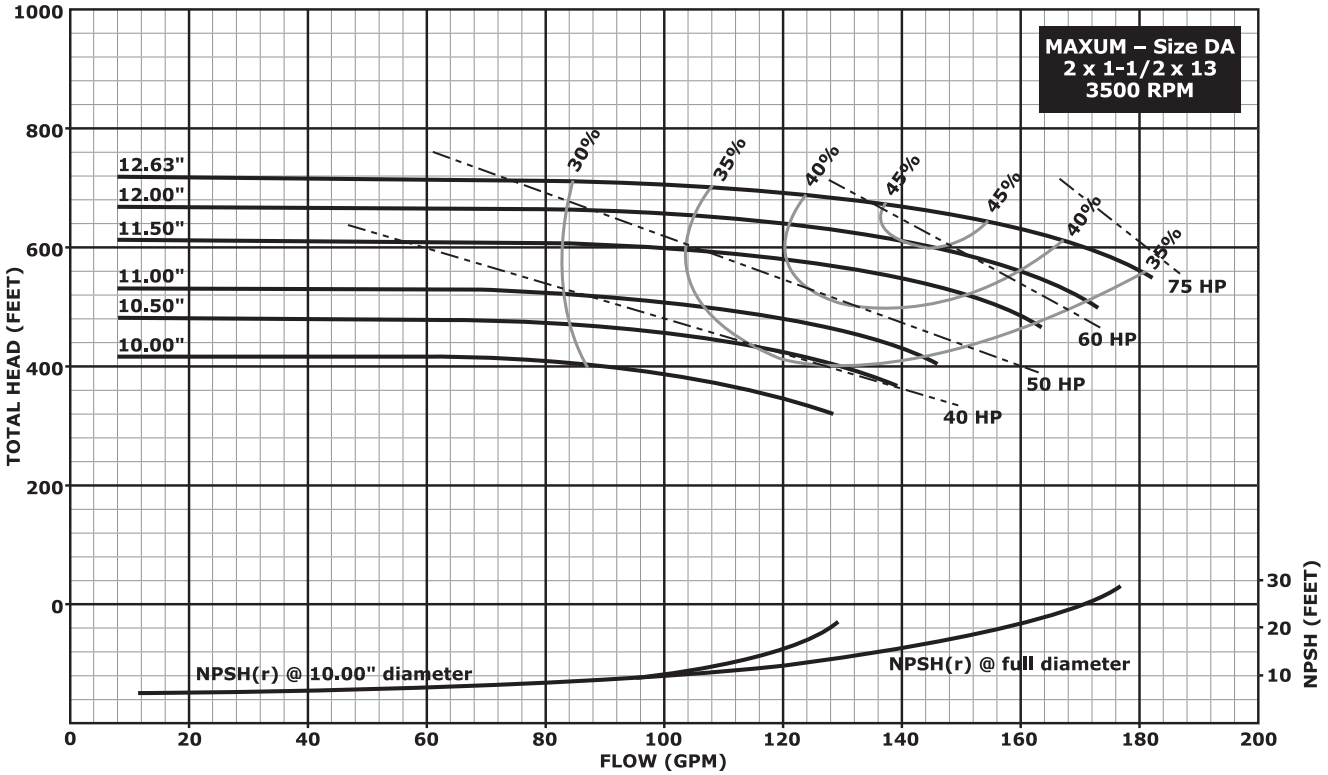


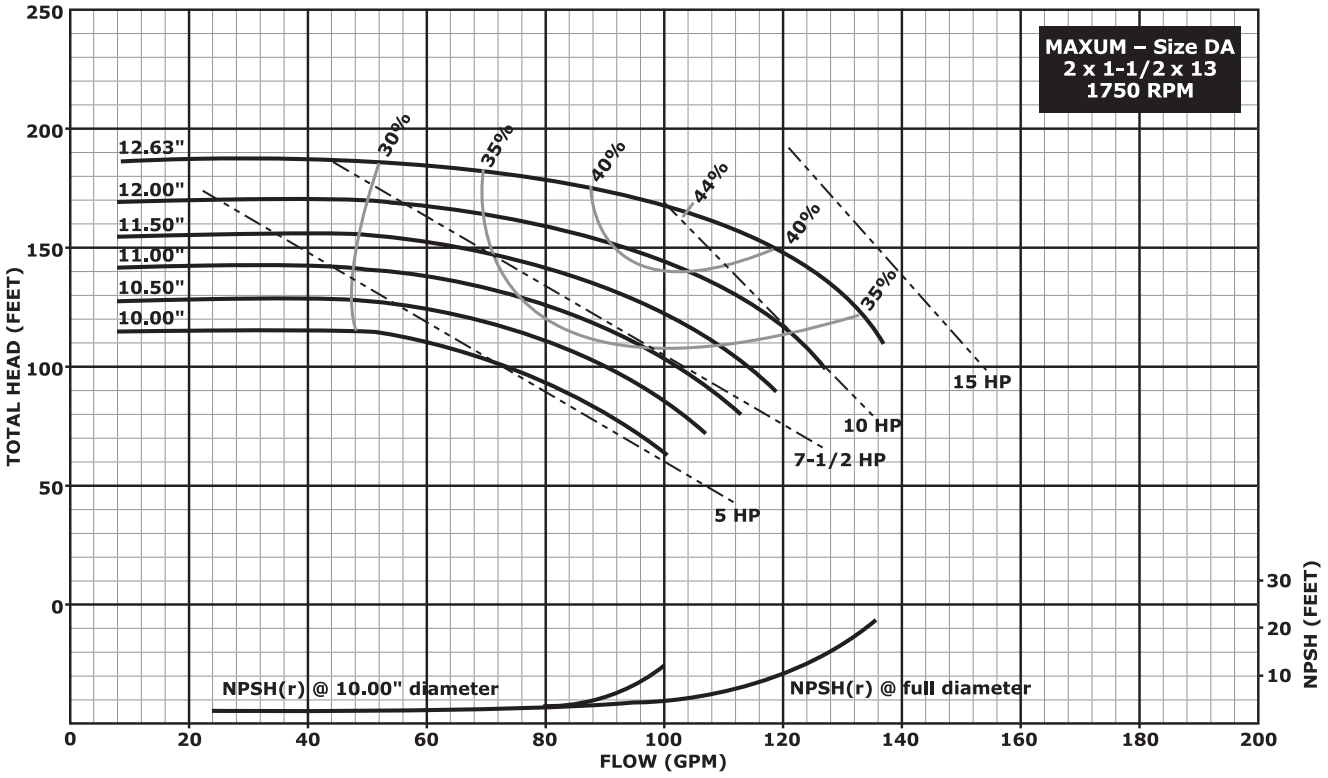


Notes:

1. Above data is based on 1.0 sp. gr. water at ambient temperature and pressure in accordance with Hydraulic Institute guidelines.
2. Impeller diameters between minimum and maximum shown are available in 1/8 inch increment trims.

Hydraulic Performance – 13" Impeller Pumps

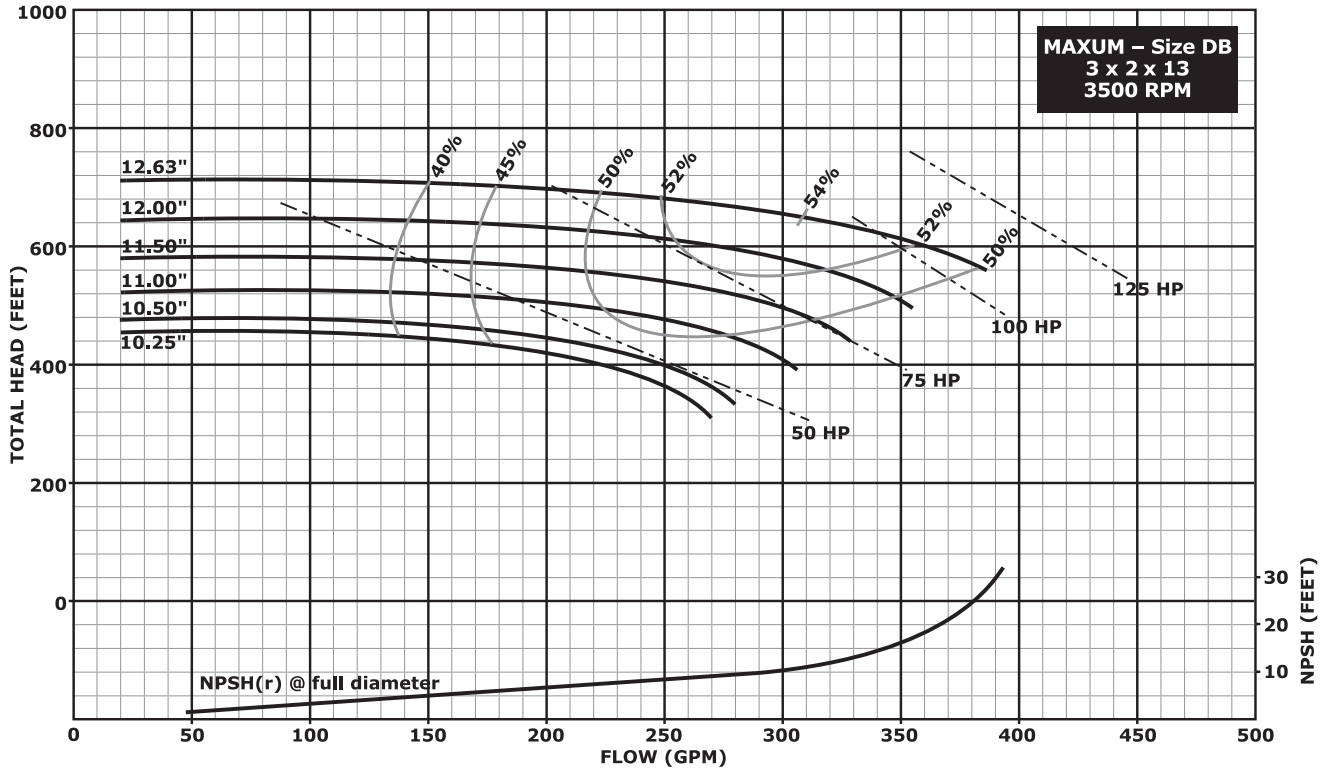


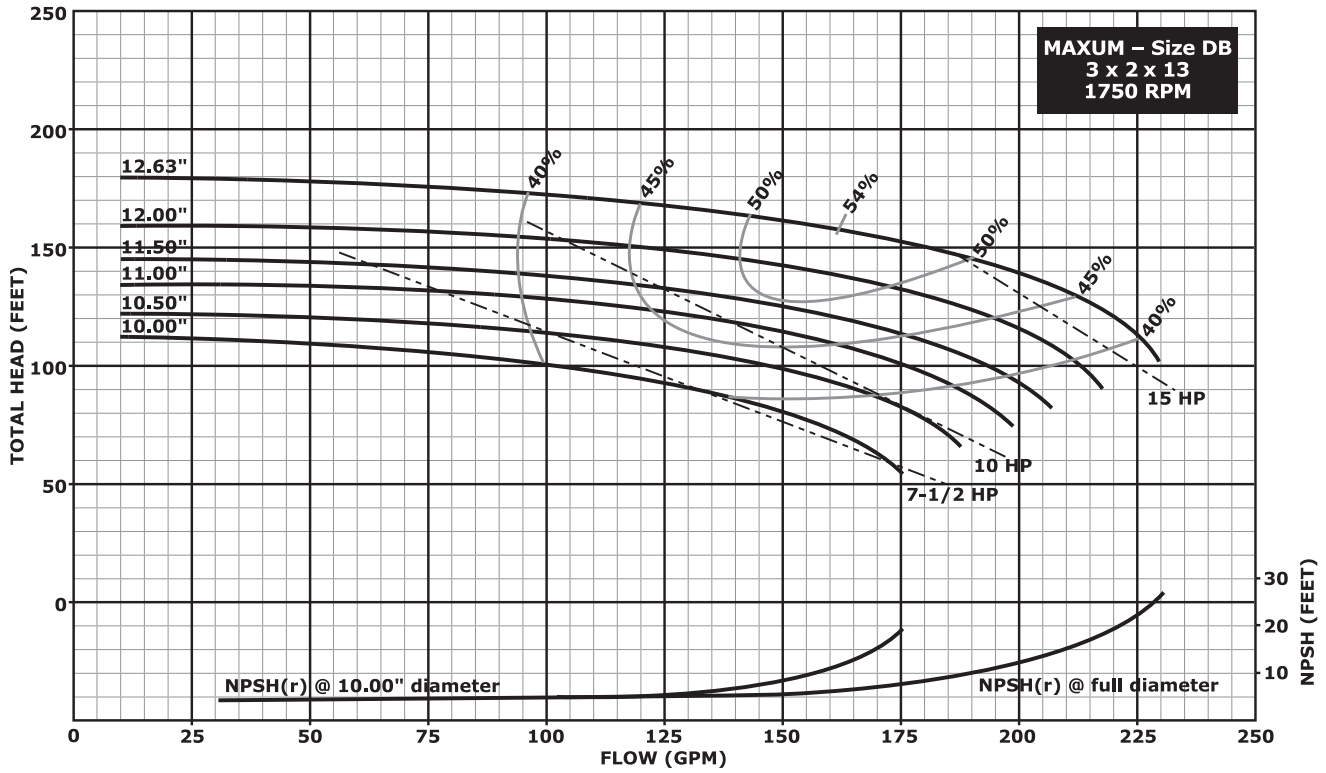


Notes:

1. Above data is based on 1.0 sp. gr. water at ambient temperature and pressure in accordance with Hydraulic Institute guidelines.
2. Impeller diameters between minimum and maximum shown are available in 1/8 inch increment trims.

Hydraulic Performance – 13" Impeller Pumps

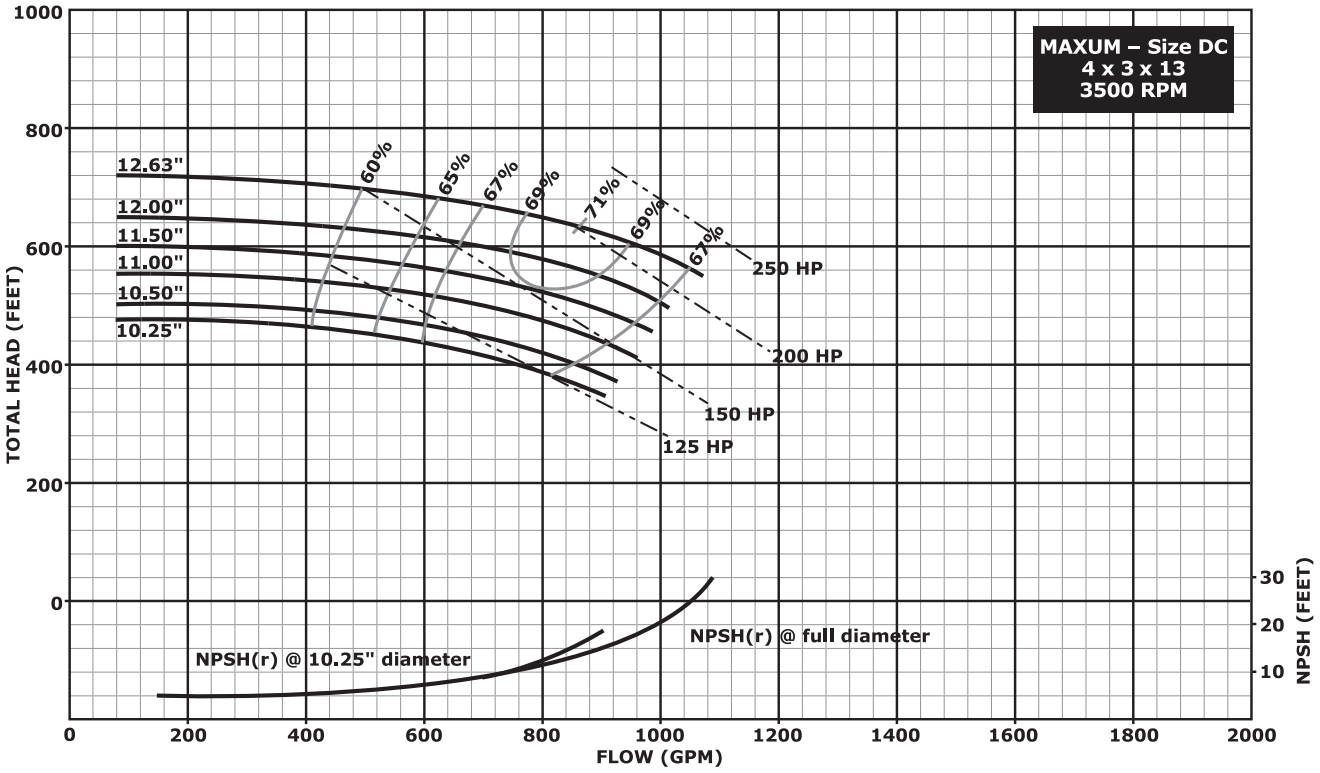


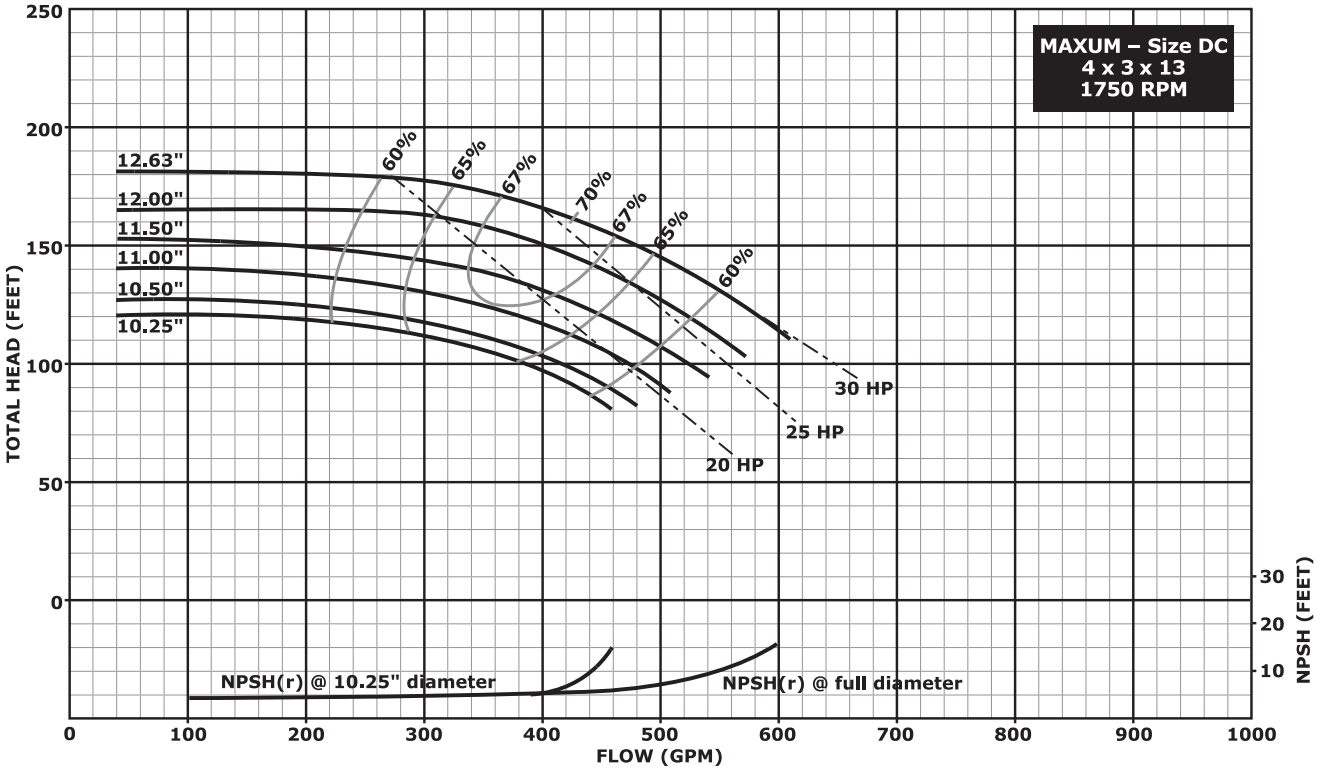


Notes:

1. Above data is based on 1.0 sp. gr. water at ambient temperature and pressure in accordance with Hydraulic Institute guidelines.
2. Impeller diameters between minimum and maximum shown are available in 1/8 inch increment trims.

Hydraulic Performance – 13" Impeller Pumps

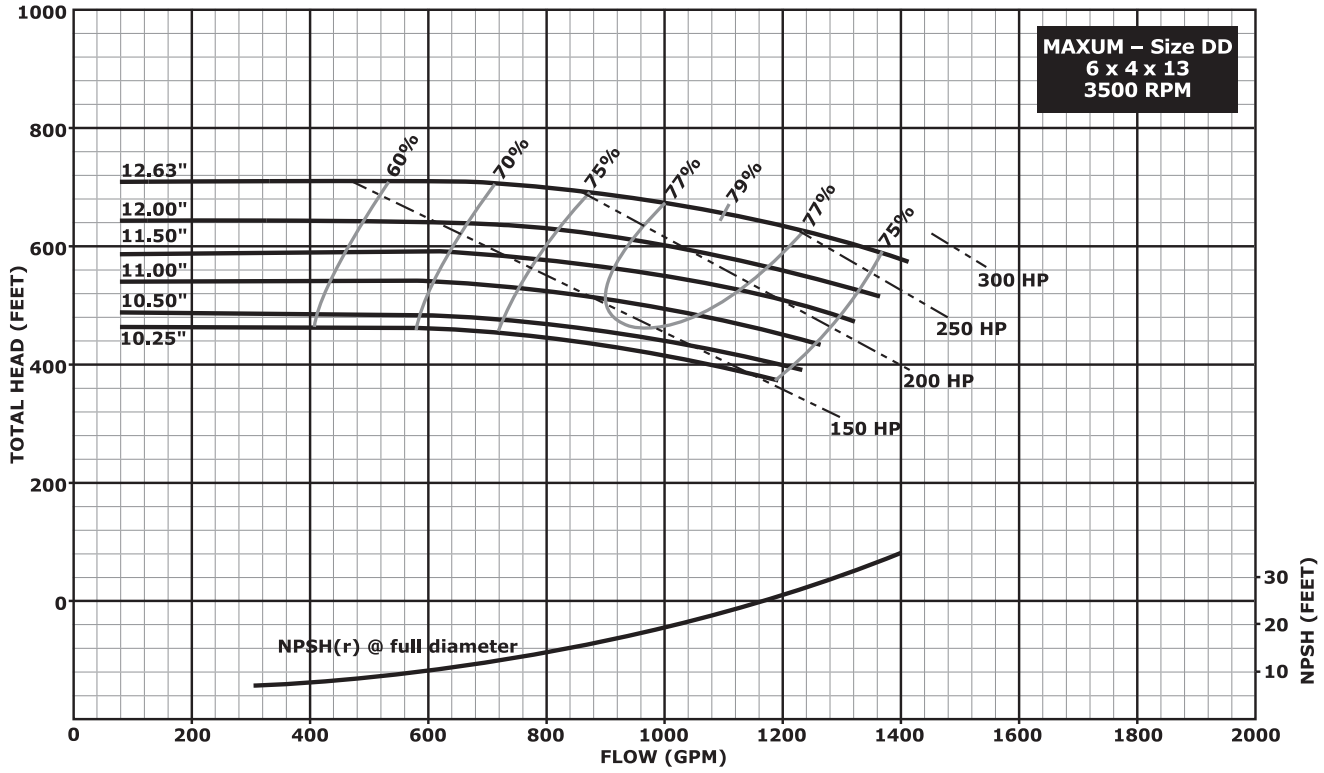


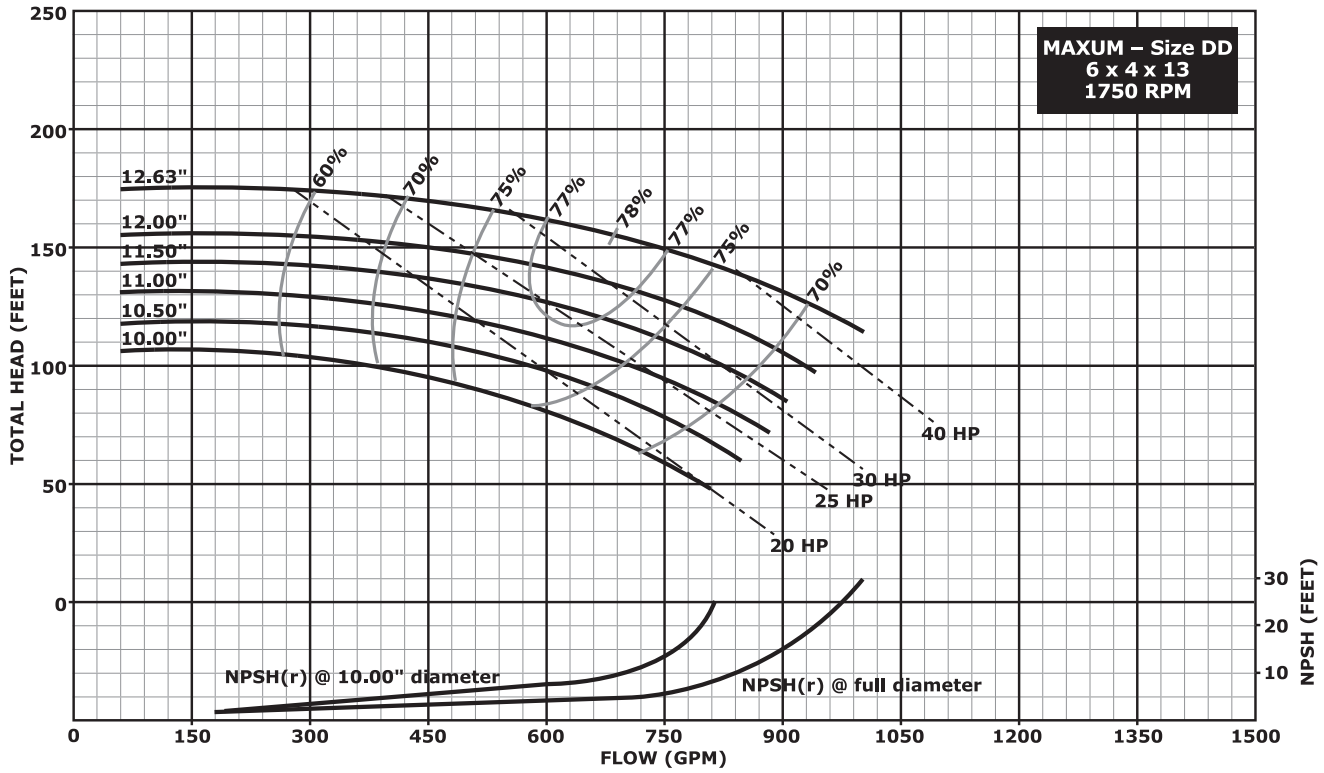


Notes:

1. Above data is based on 1.0 sp. gr. water at ambient temperature and pressure in accordance with Hydraulic Institute guidelines.
2. Impeller diameters between minimum and maximum shown are available in 1/8 inch increment trims.

Hydraulic Performance – 13" Impeller Pumps

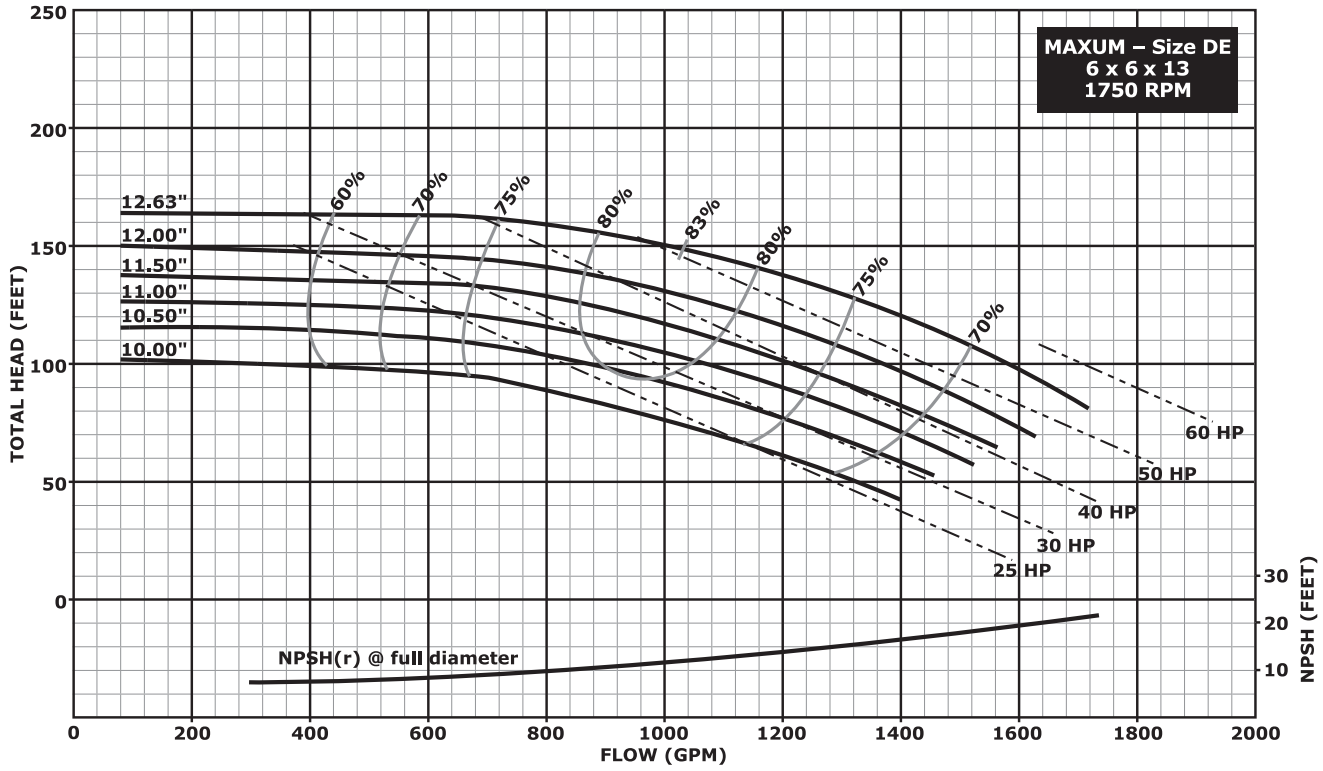


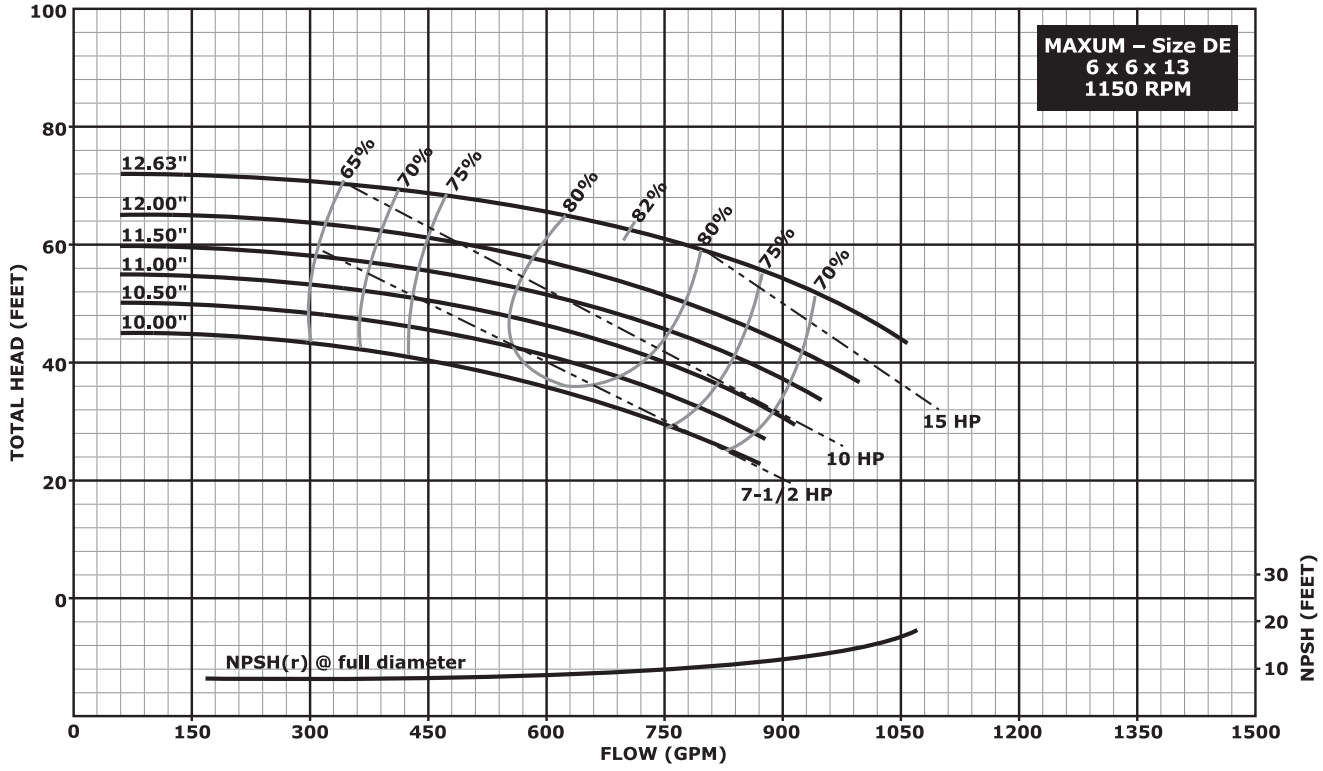


Notes:

1. Above data is based on 1.0 sp. gr. water at ambient temperature and pressure in accordance with Hydraulic Institute guidelines.
2. Impeller diameters between minimum and maximum shown are available in 1/8 inch increment trims.

Hydraulic Performance – 13" Impeller Pumps

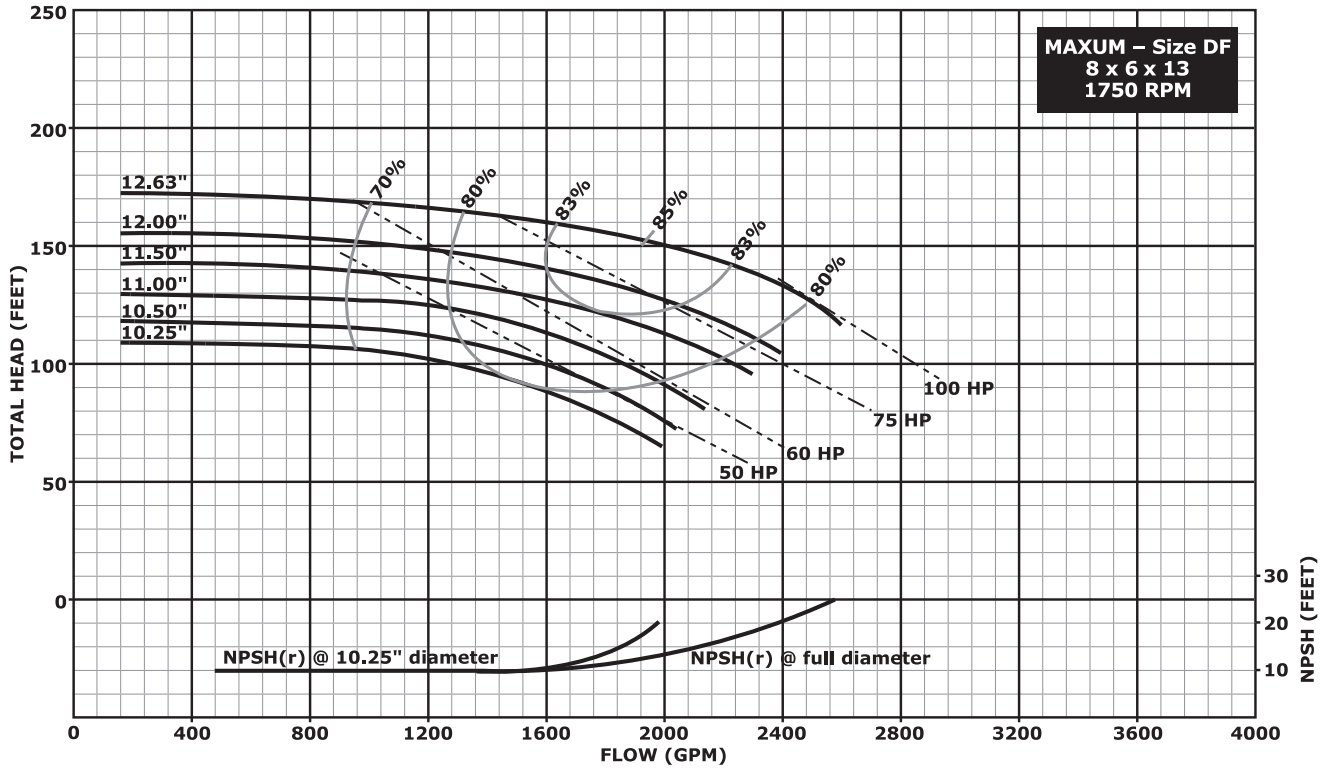


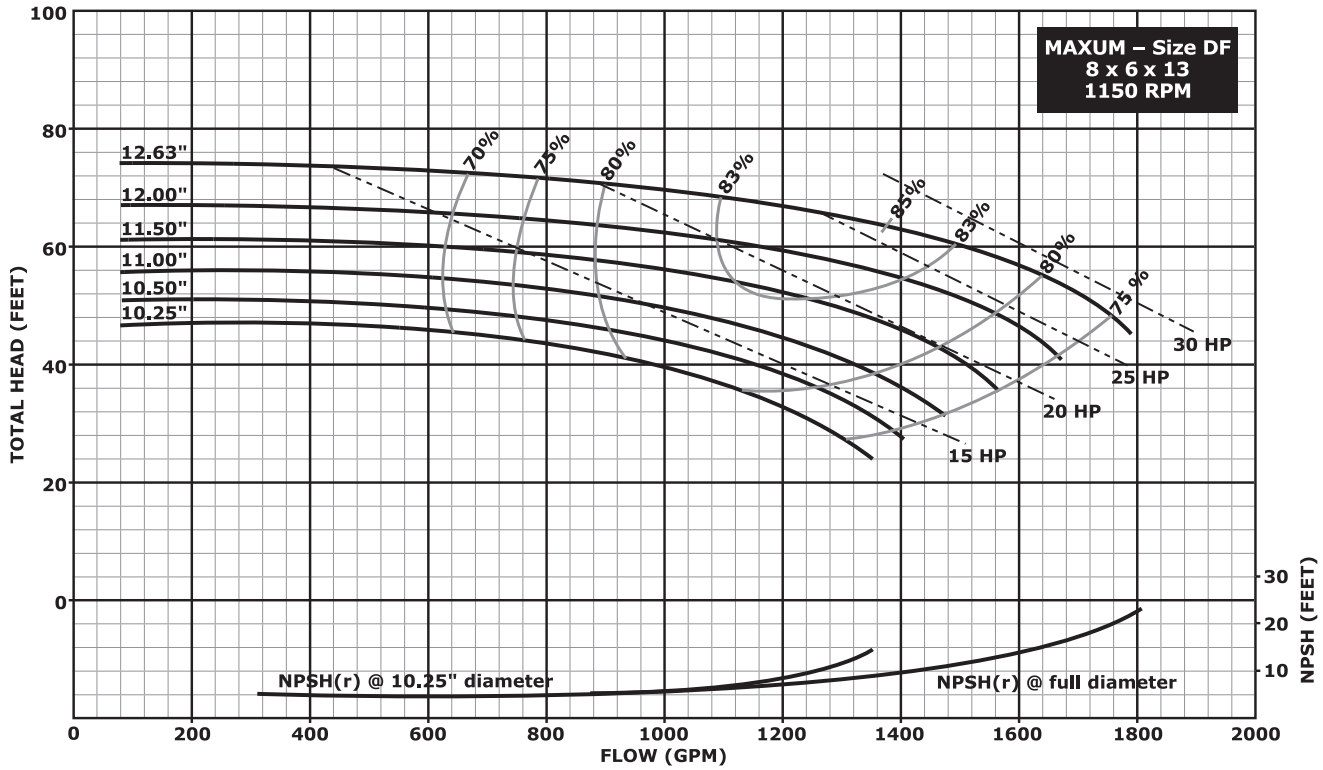


Notes:

1. Above data is based on 1.0 sp. gr. water at ambient temperature and pressure in accordance with Hydraulic Institute guidelines.
2. Impeller diameters between minimum and maximum shown are available in 1/8 inch increment trims.

Hydraulic Performance – 13" Impeller Pumps

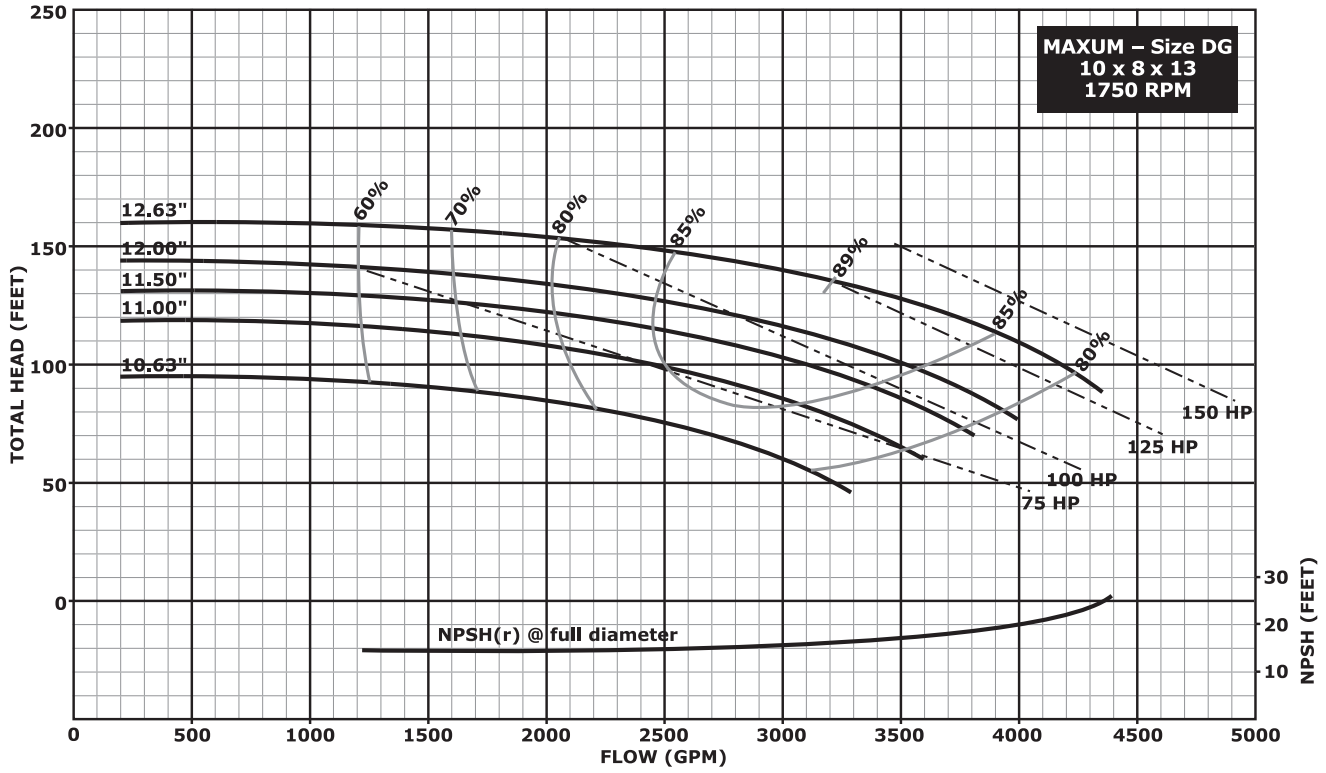


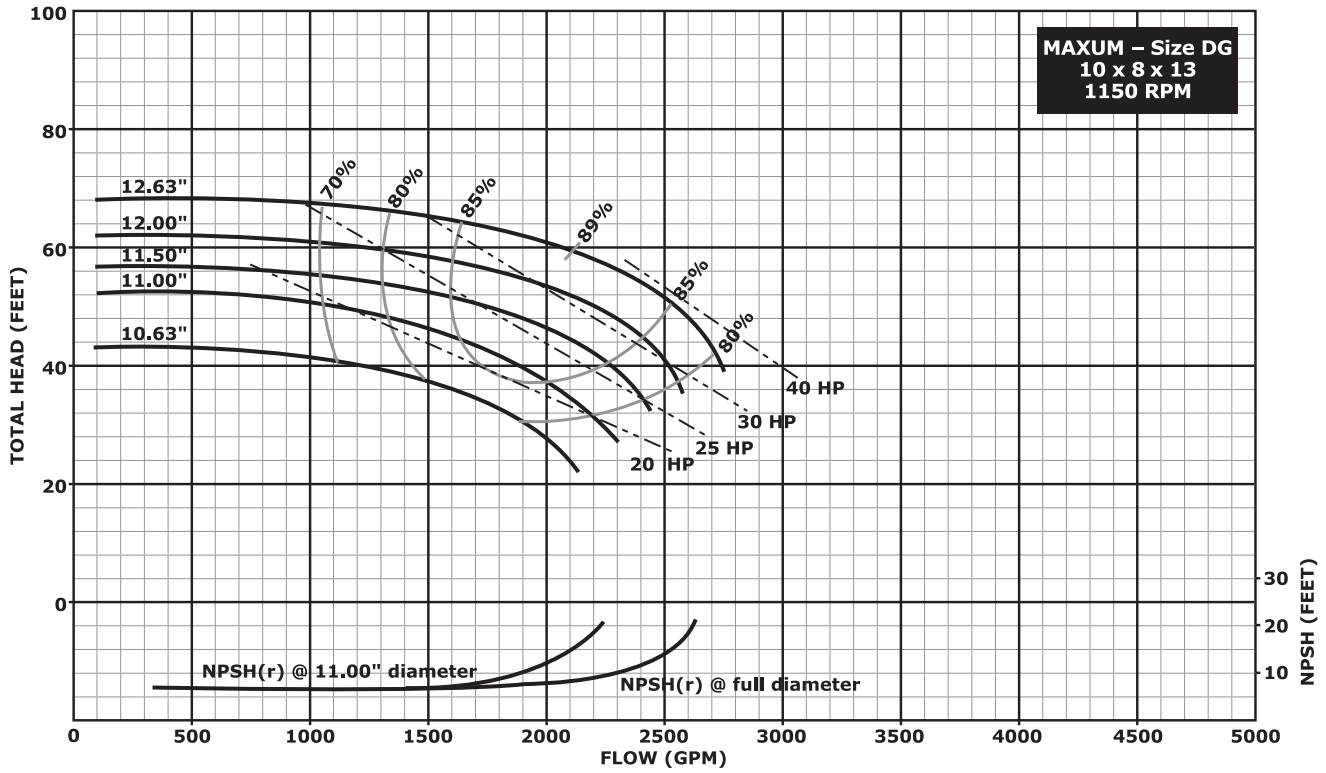


Notes:

1. Above data is based on 1.0 sp. gr. water at ambient temperature and pressure in accordance with Hydraulic Institute guidelines.
2. Impeller diameters between minimum and maximum shown are available in 1/8 inch increment trims.

Hydraulic Performance – 13" Impeller Pumps

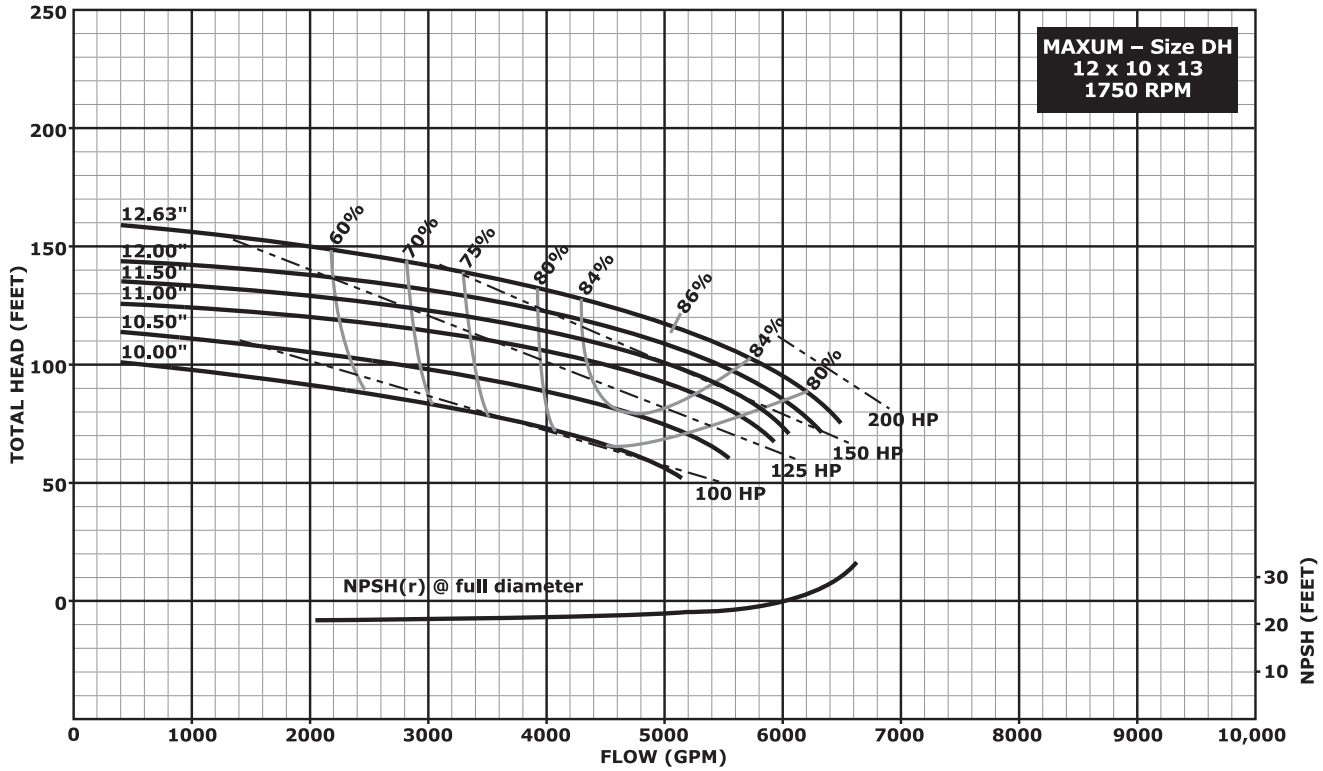


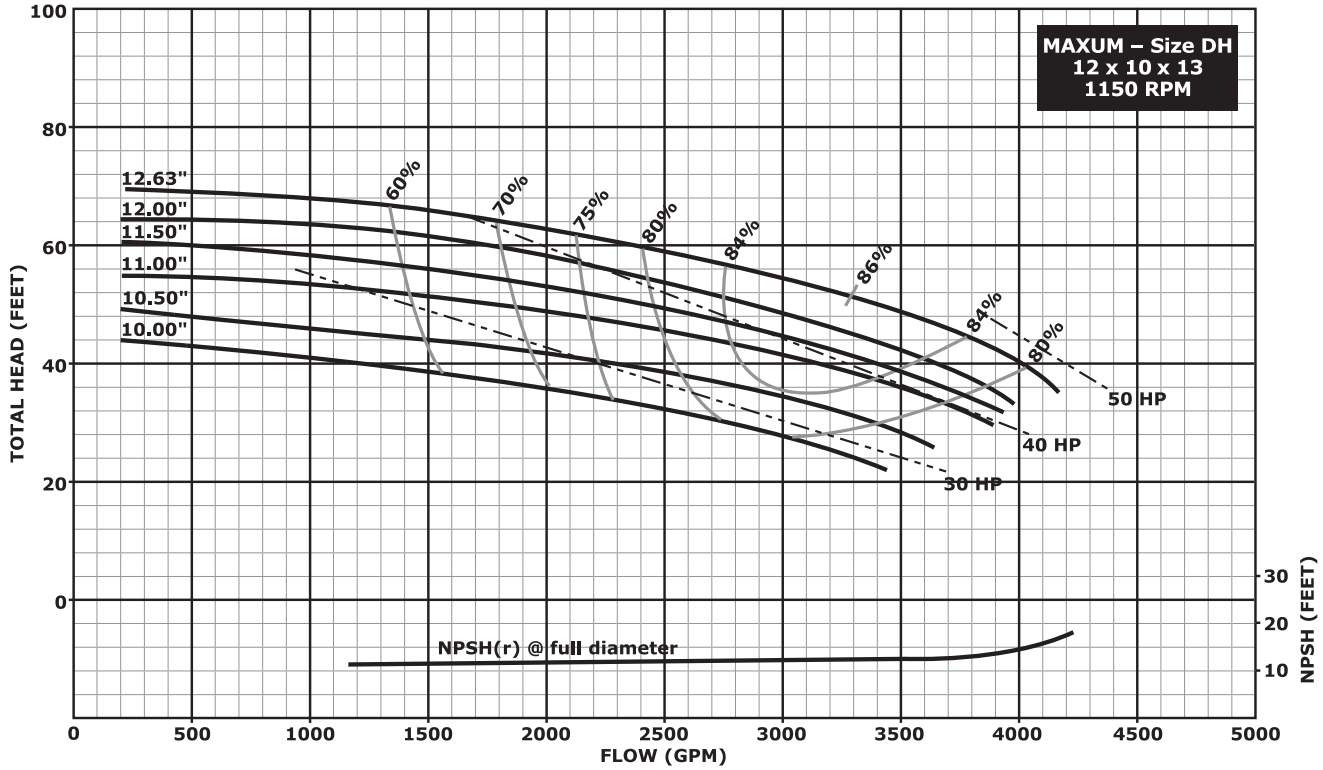


Notes:

1. Above data is based on 1.0 sp. gr. water at ambient temperature and pressure in accordance with Hydraulic Institute guidelines.
2. This is a mixed flow impeller pump, and trimming is accomplished by angular vane cuts. Impeller diameter trims shown are approximations only.

Hydraulic Performance – 13" Impeller Pumps

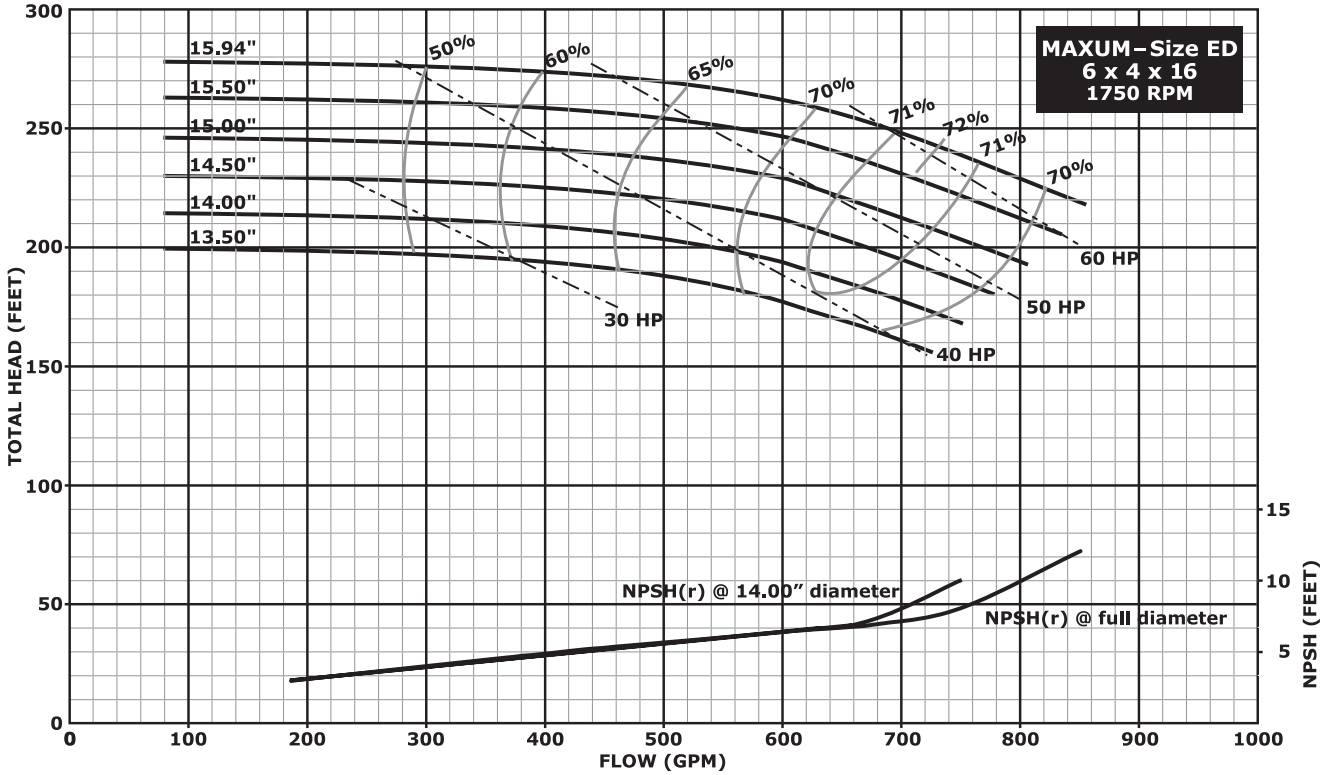


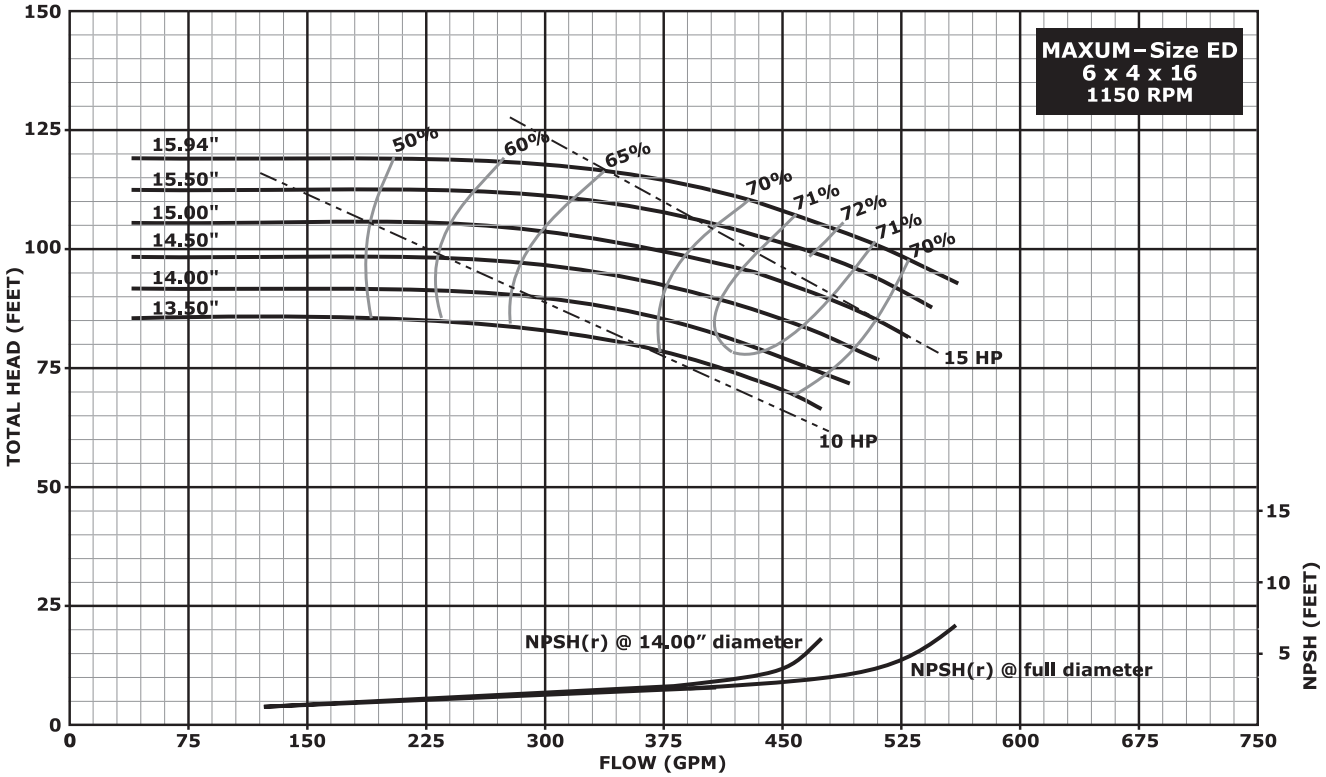


Notes:

1. Above data is based on 1.0 sp. gr. water at ambient temperature and pressure in accordance with Hydraulic Institute guidelines.
2. This is a mixed flow impeller pump, and trimming is accomplished by angular vane cuts. Impeller diameter trims shown are approximations only.

Hydraulic Performance – 16" Impeller Pumps

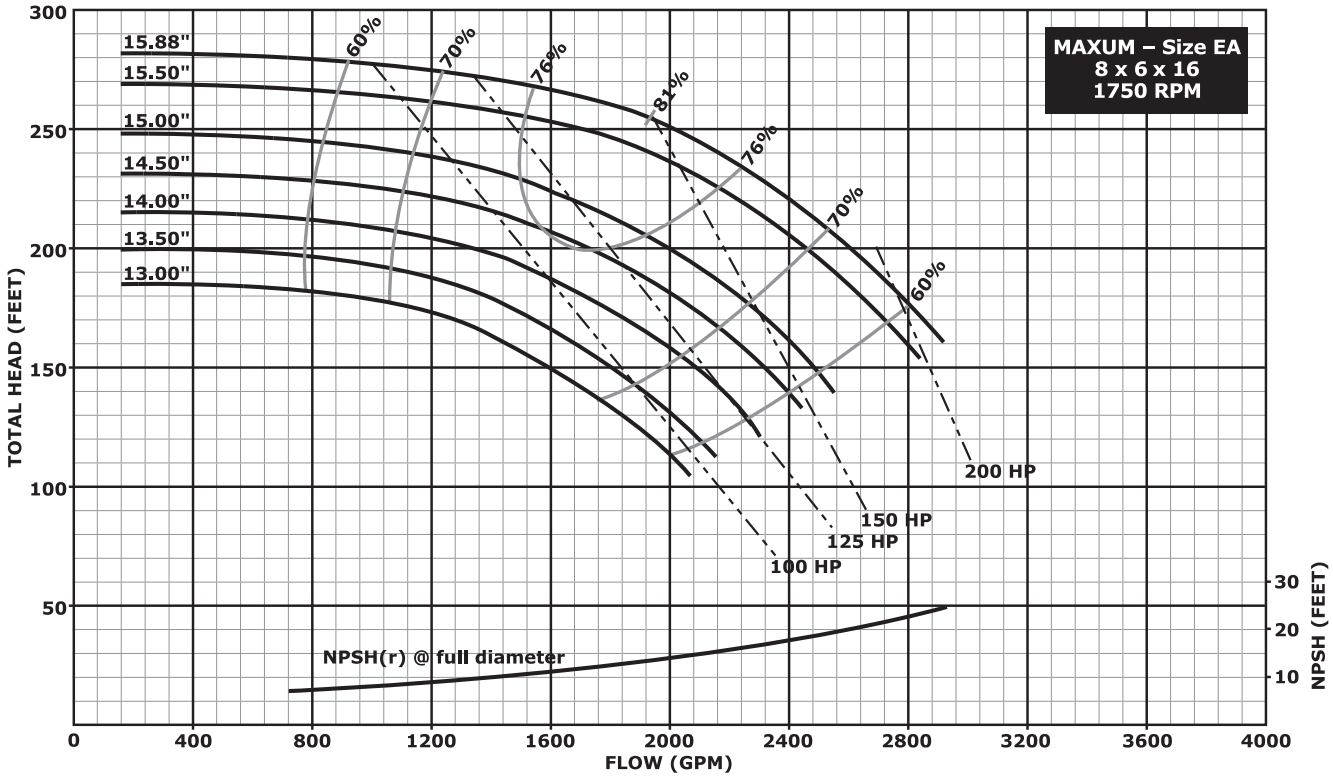


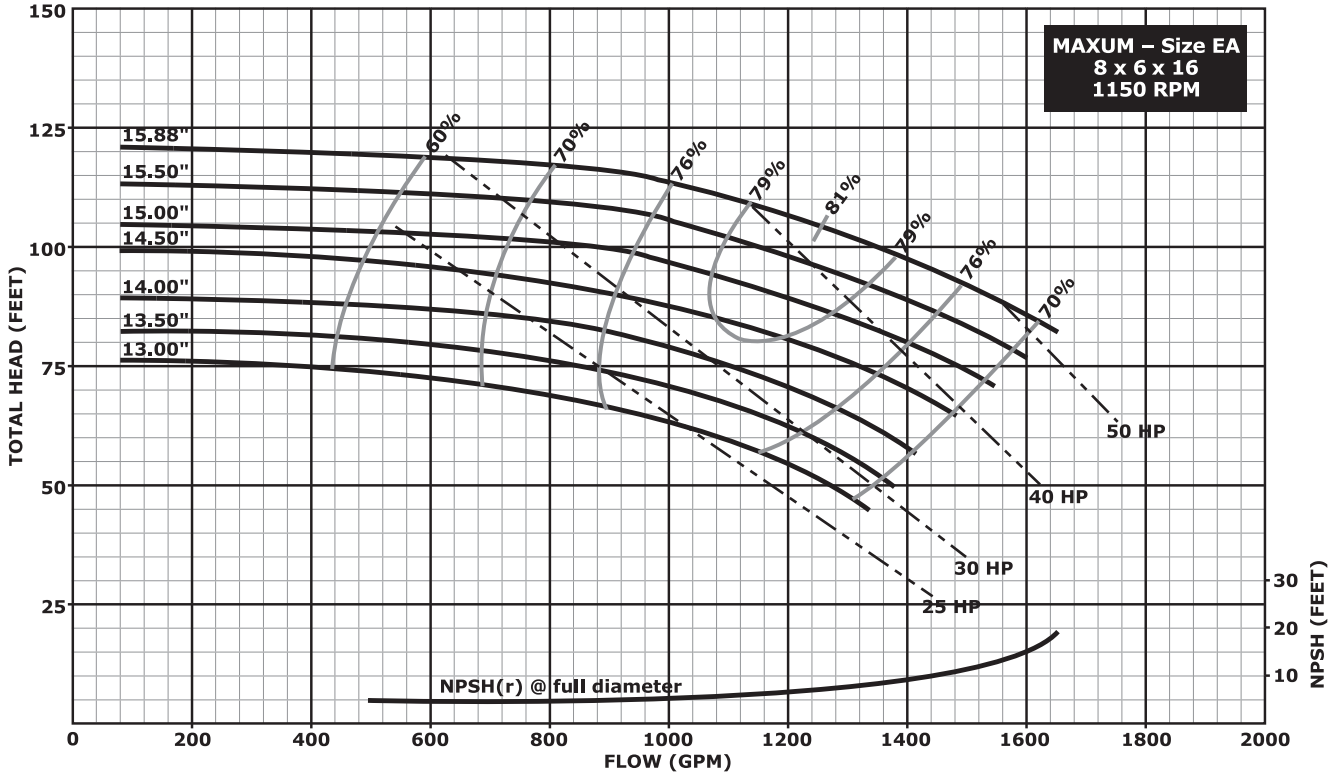


Notes:

1. Above data is based on 1.0 sp. gr. water at ambient temperature and pressure in accordance with Hydraulic Institute guidelines. Impeller diameters between minimum and maximum shown are available in 1/8 inch increment trims.

Hydraulic Performance – 16" Impeller Pumps

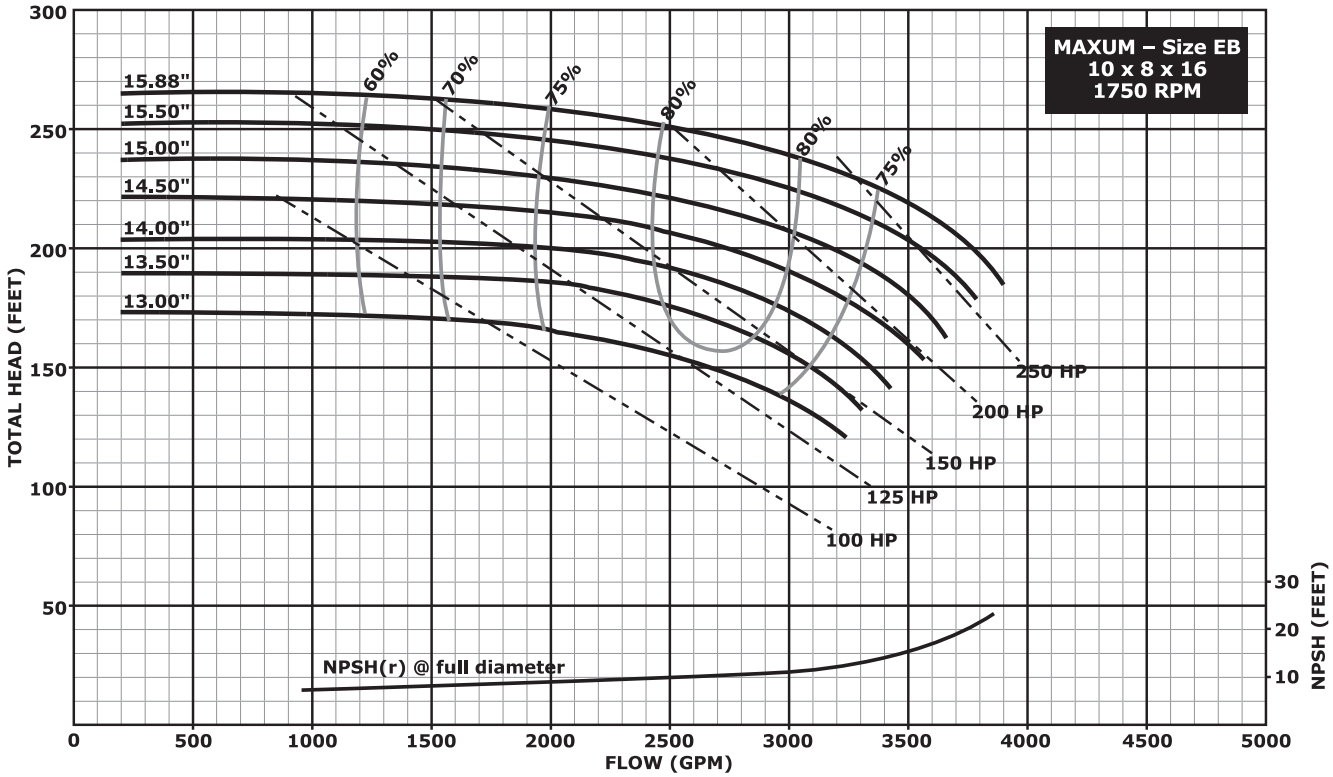


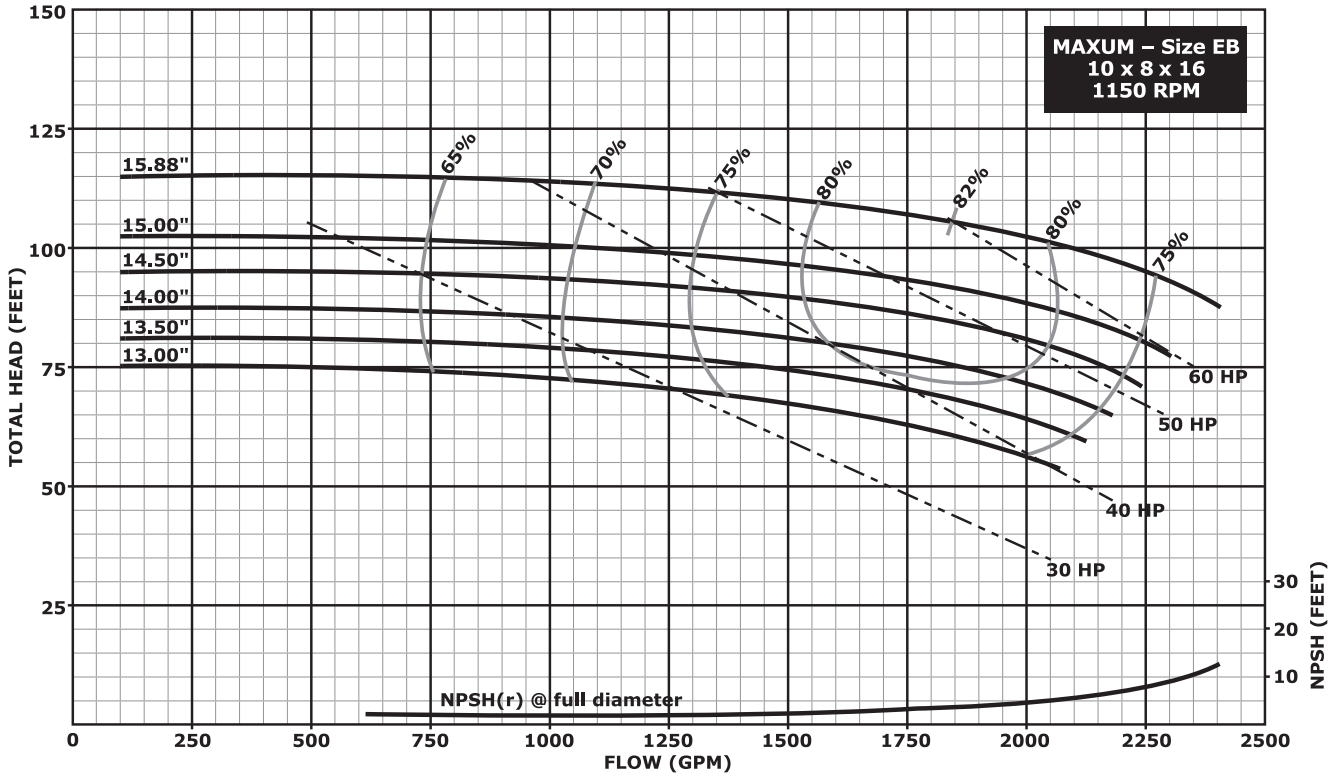


Notes:

1. Above data is based on 1.0 sp. gr. water at ambient temperature and pressure in accordance with Hydraulic Institute guidelines.
2. Impeller diameters between minimum and maximum shown are available in 1/8 inch increment trims.

Hydraulic Performance – 16" Impeller Pumps

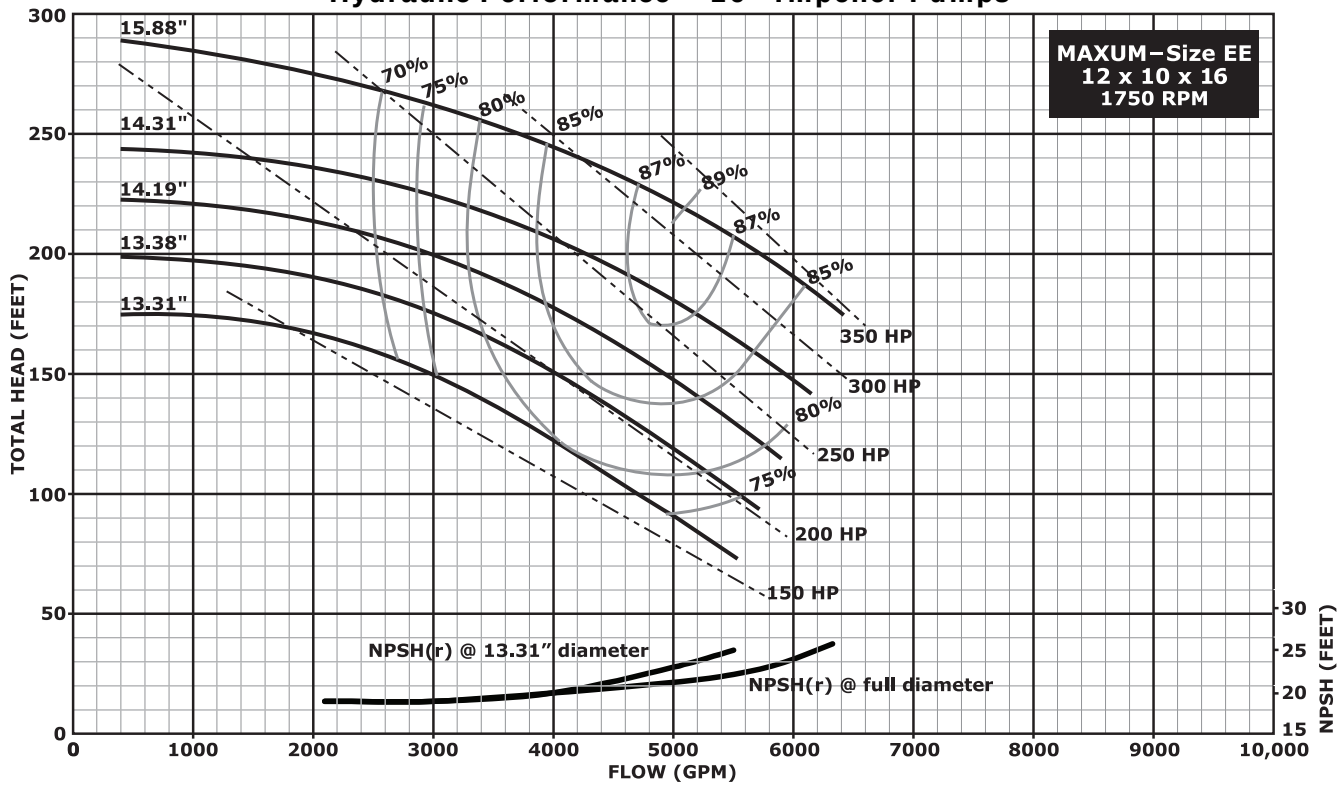


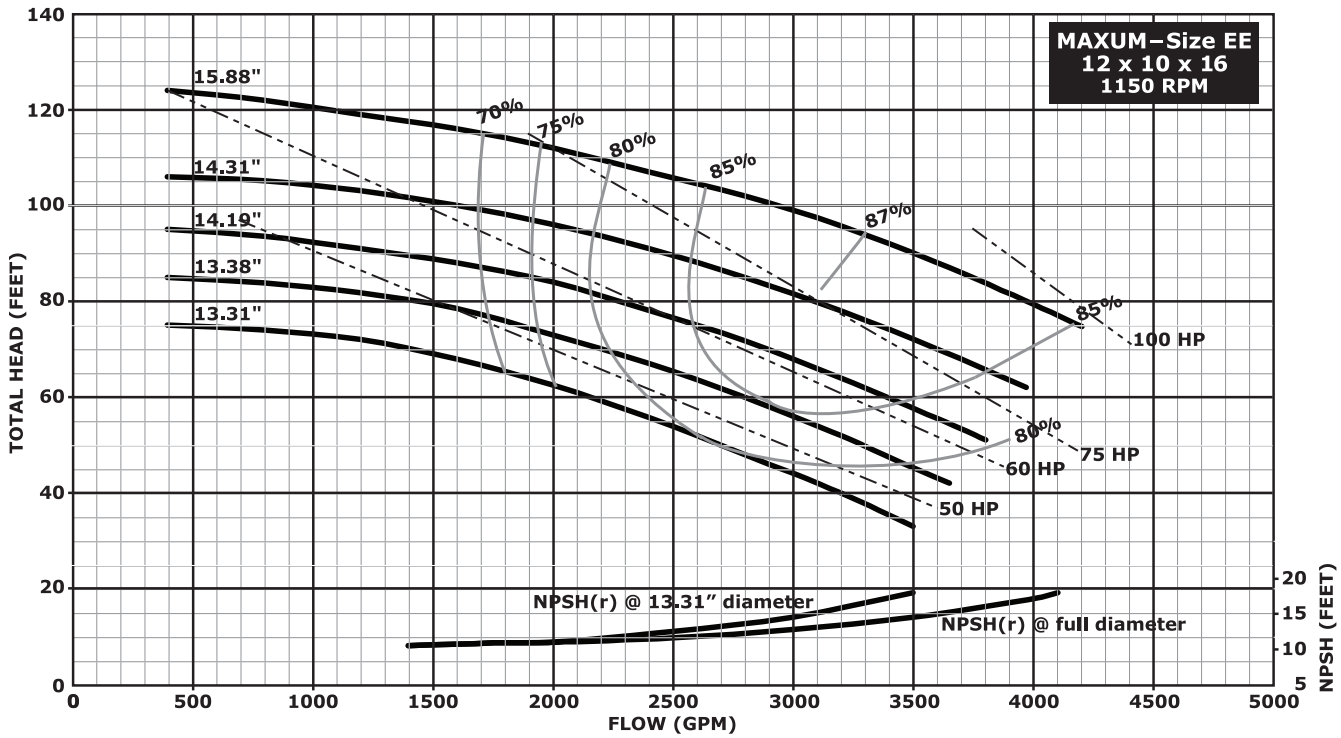


Notes:

1. Above data is based on 1.0 sp. gr. water at ambient temperature and pressure in accordance with Hydraulic Institute guidelines.
2. Impeller diameters between minimum and maximum shown are available in 1/8 inch increment trims.

Hydraulic Performance – 16" Impeller Pumps

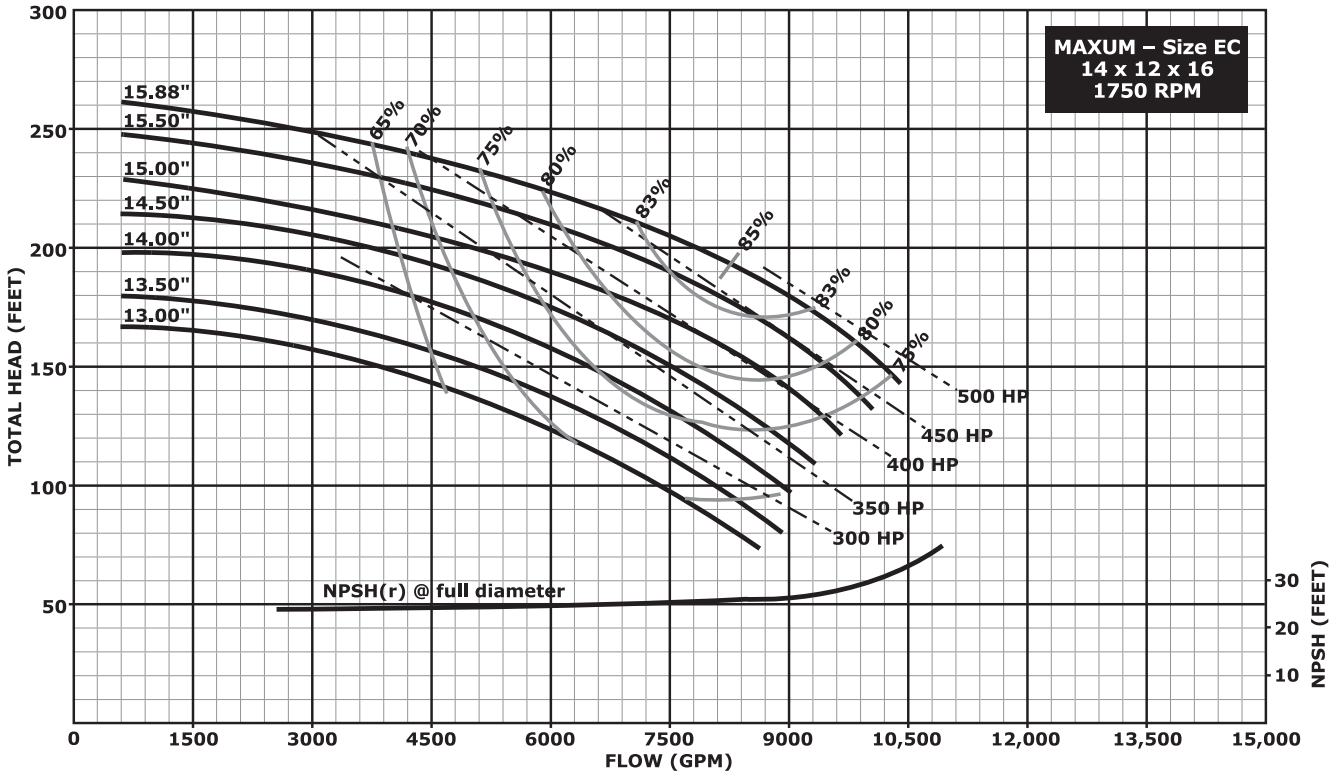


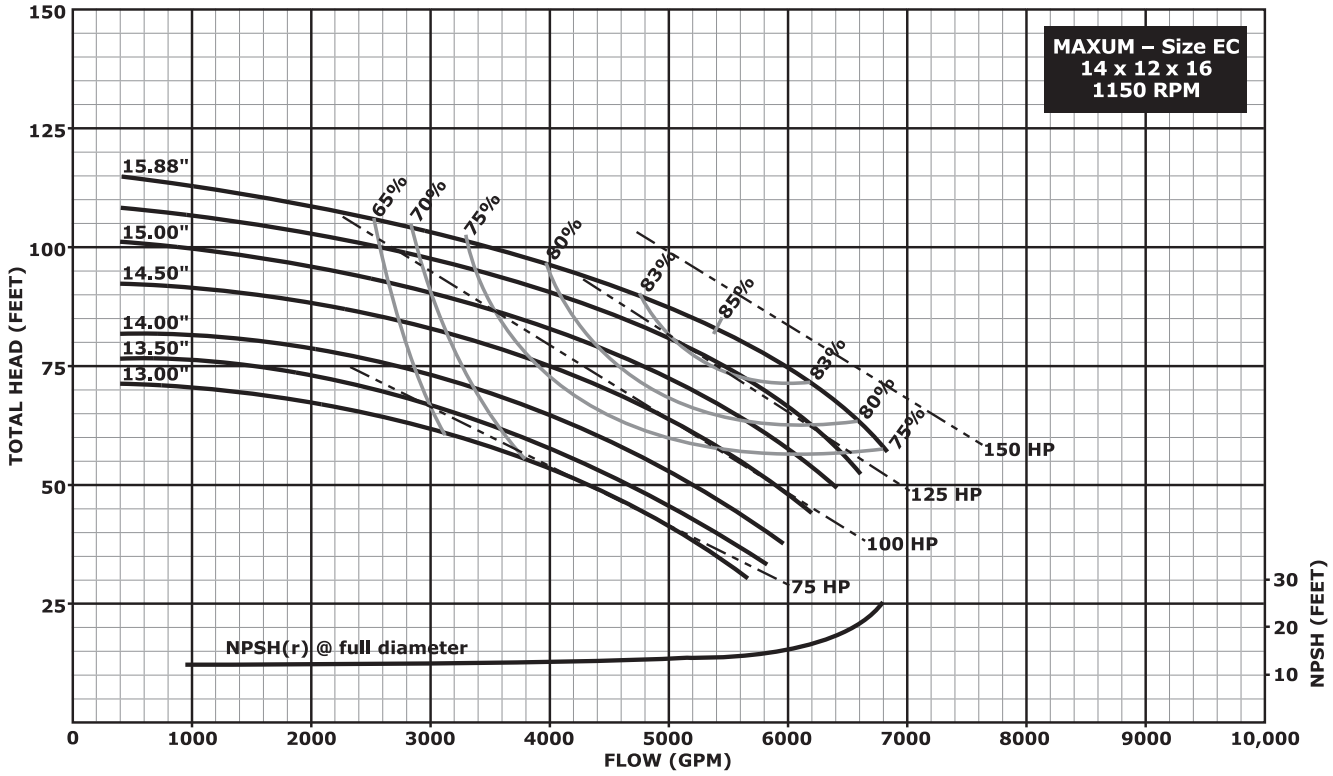


Notes:

1. Above data is based on 1.0 sp. gr. water at ambient temperature and pressure in accordance with Hydraulic Institute guidelines. Impeller diameters between minimum and maximum shown are available in 1/8 inch increment trims.

Hydraulic Performance – 16" Impeller Pumps

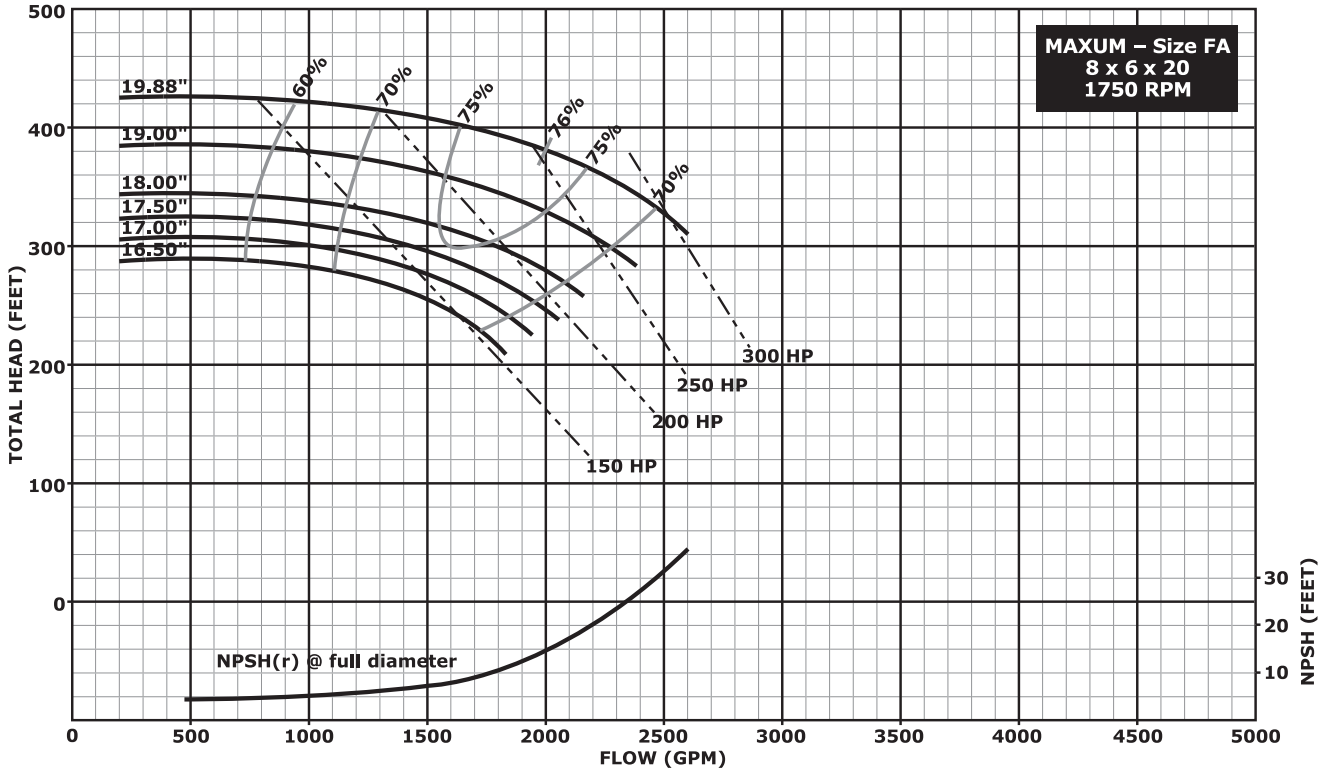


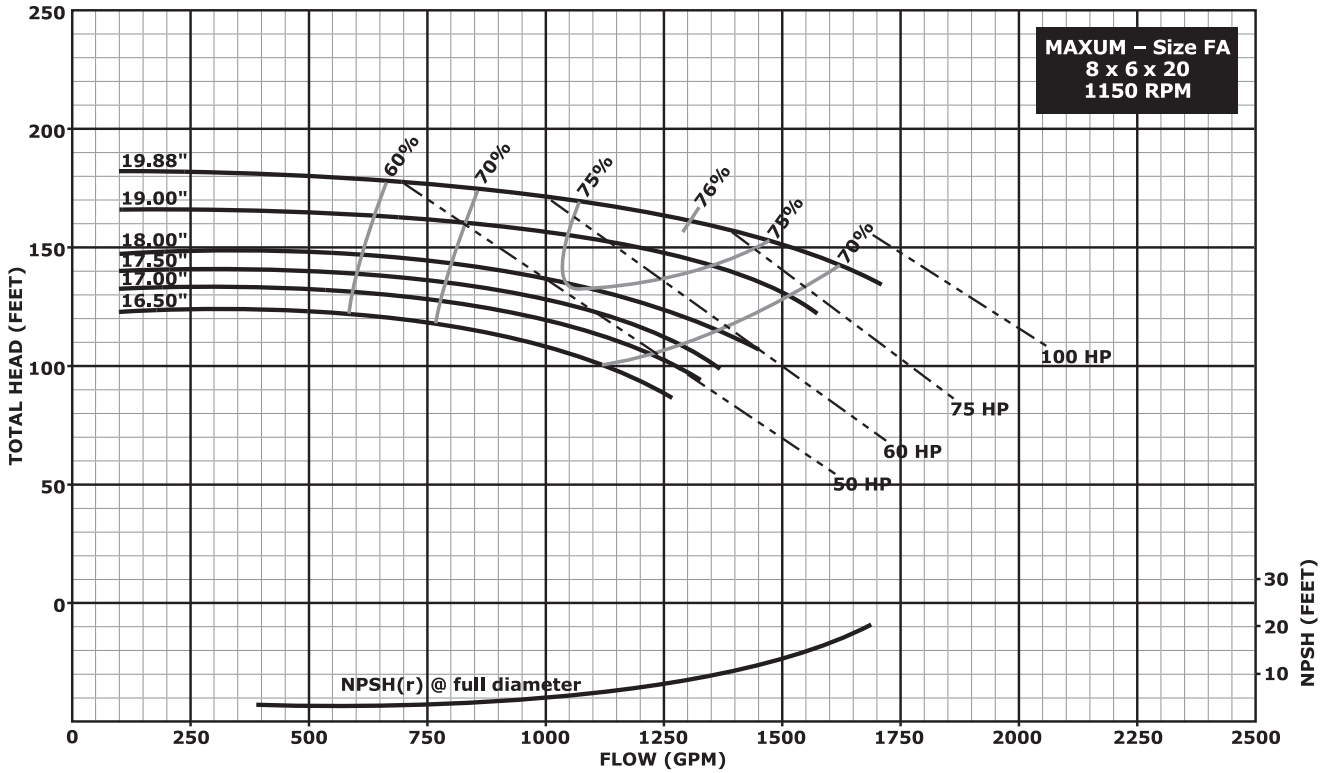


Notes:

1. Above data is based on 1.0 sp. gr. water at ambient temperature and pressure in accordance with Hydraulic Institute guidelines.
2. This is a mixed flow impeller pump, and trimming is accomplished by angular vane cuts. Impeller diameter trims shown are approximations only.

Hydraulic Performance – 20" Impeller Pumps

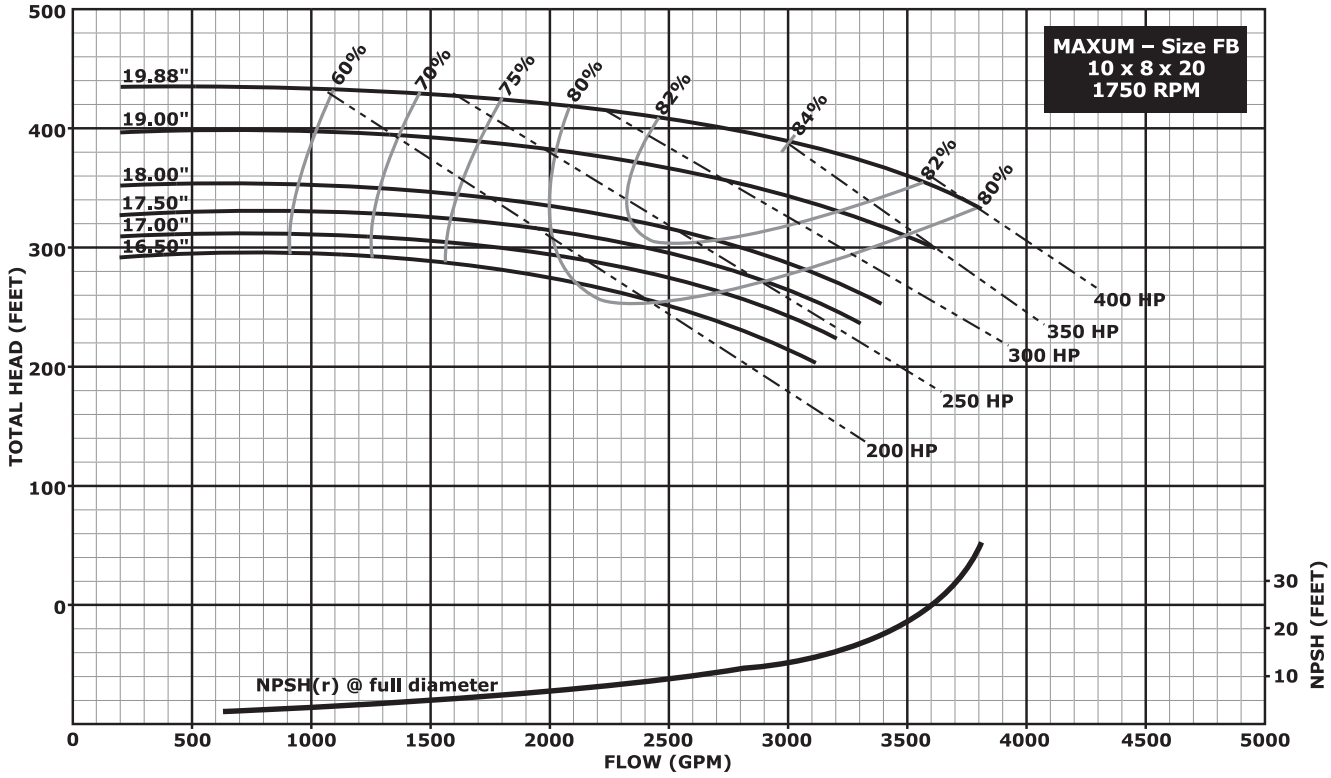


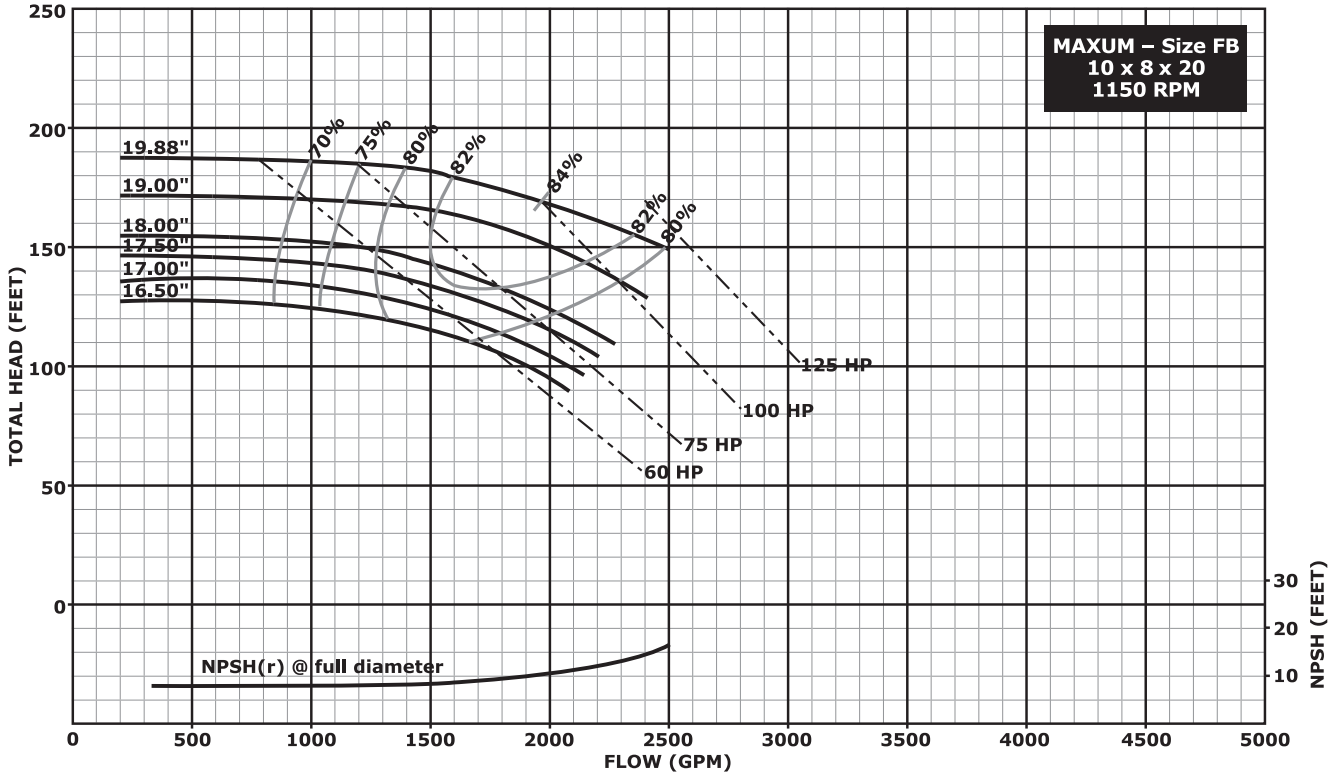


Notes:

1. Above data is based on 1.0 sp. gr. water at ambient temperature and pressure in accordance with Hydraulic Institute guidelines.
2. Impeller diameters between minimum and maximum shown are available in 1/8 inch increment trims.

Hydraulic Performance – 20" Impeller Pumps

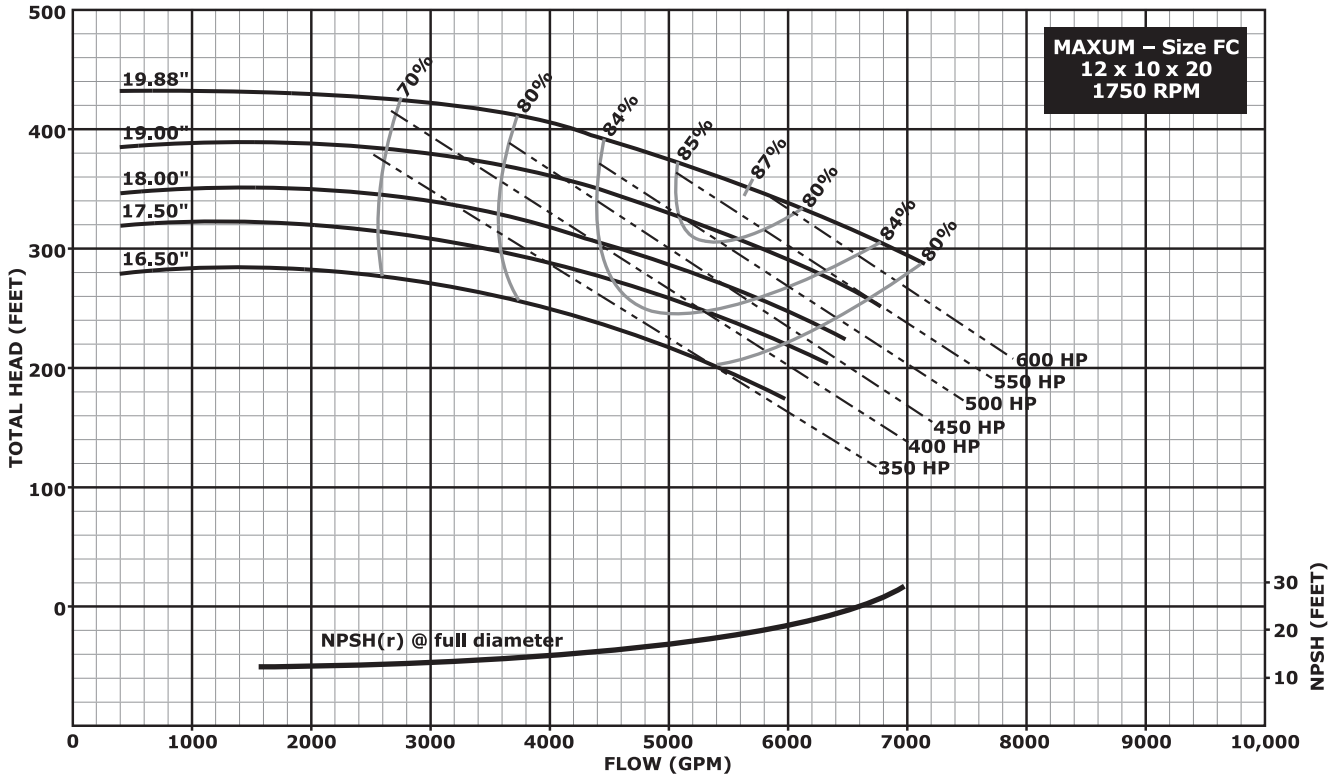


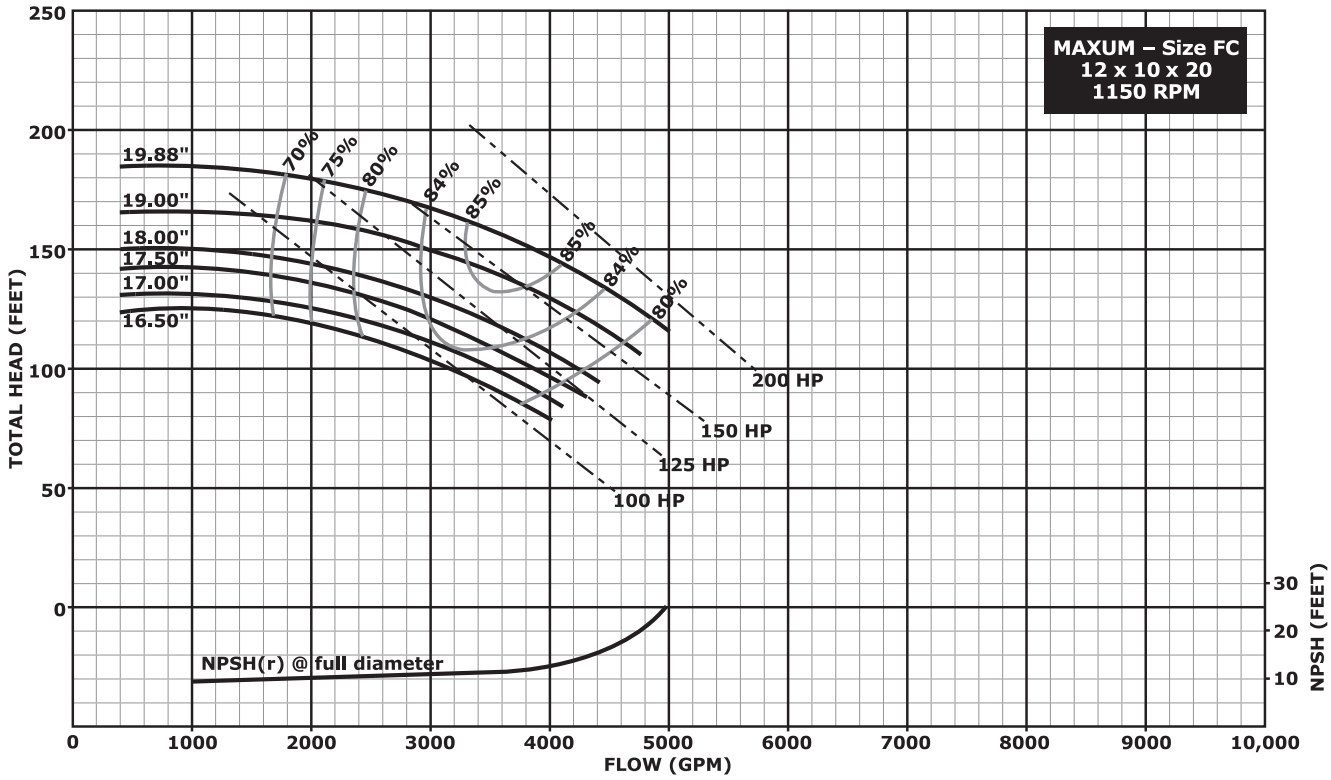


Notes:

1. Above data is based on 1.0 sp. gr. water at ambient temperature and pressure in accordance with Hydraulic Institute guidelines.
2. Impeller diameters between minimum and maximum shown are available in 1/8 inch increment trims.

Hydraulic Performance –20" Impeller Pumps

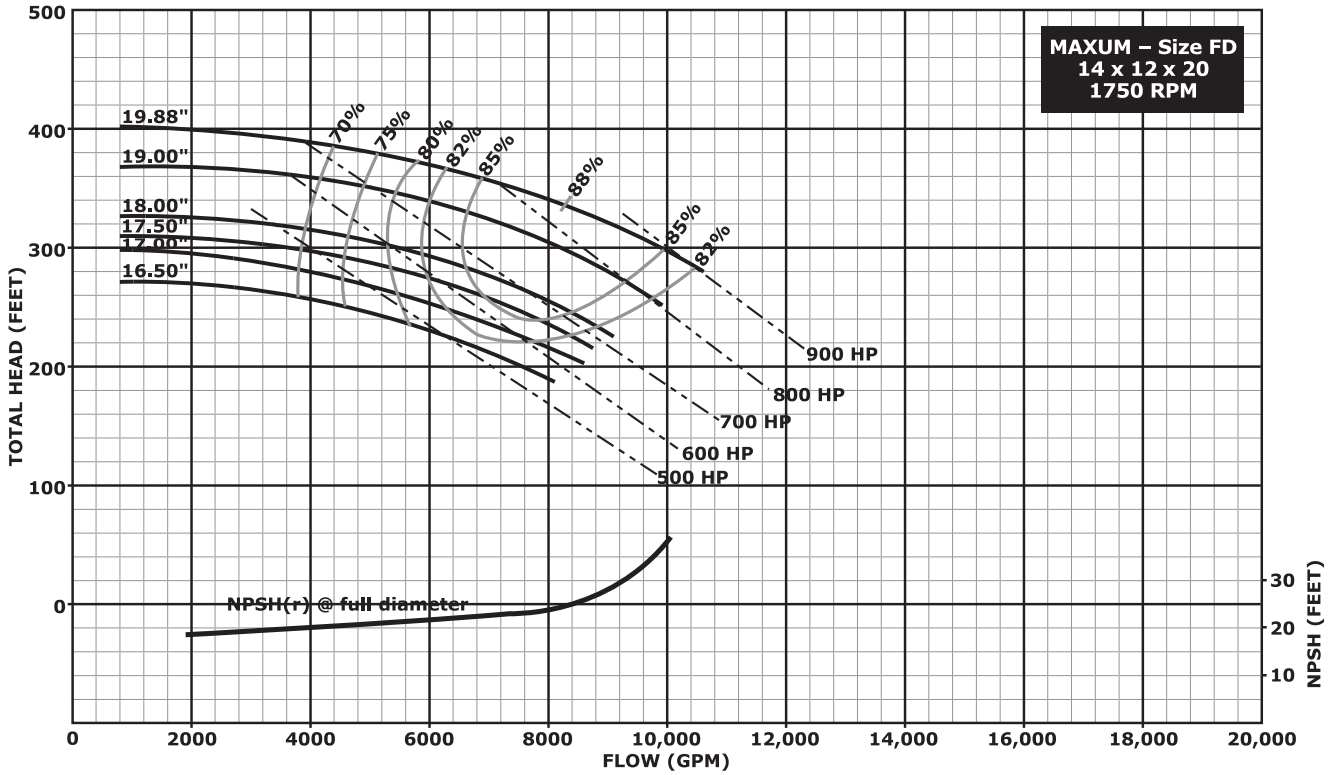


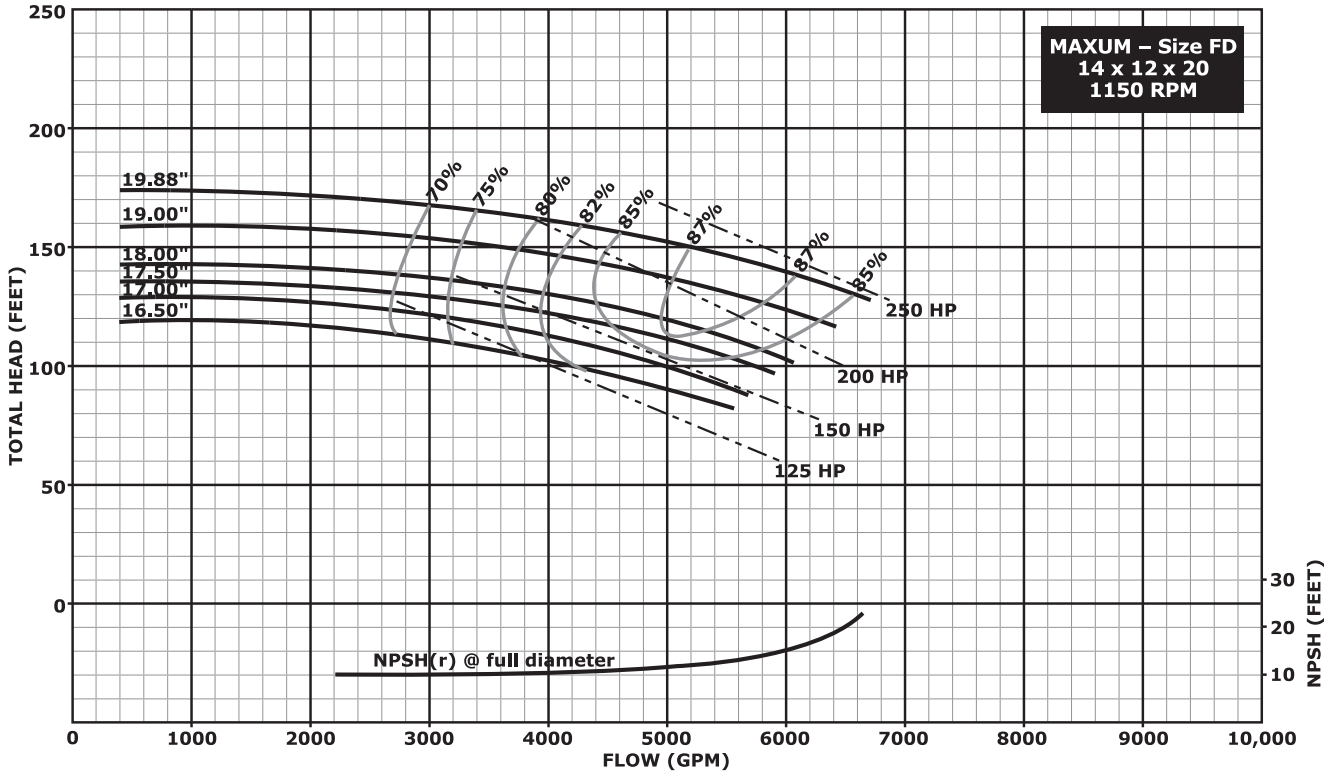


Notes:

1. Above data is based on 1.0 sp. gr. water at ambient temperature and pressure in accordance with Hydraulic Institute guidelines.
2. Impeller diameters between minimum and maximum shown are available in 1/8 inch increment trims.

Hydraulic Performance – 20" Impeller Pumps

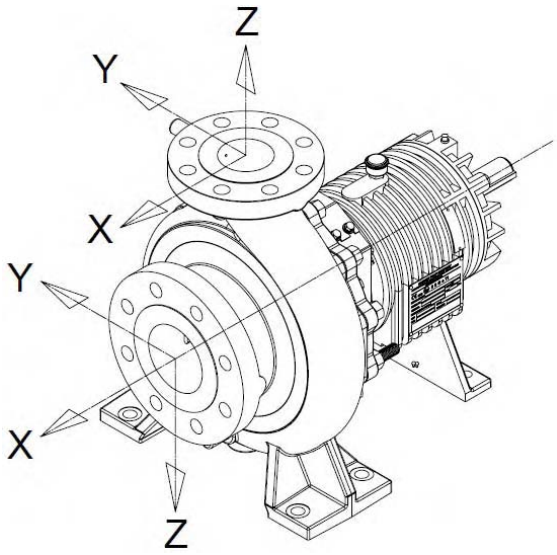




Notes:

1. Above data is based on 1.0 sp. gr. water at ambient temperature and pressure in accordance with Hydraulic Institute guidelines.
2. This is a mixed flow impeller pump, and trimming is accomplished by angular vane cuts. Impeller diameter trims shown are approximations only.

Permissible Nozzle Loads



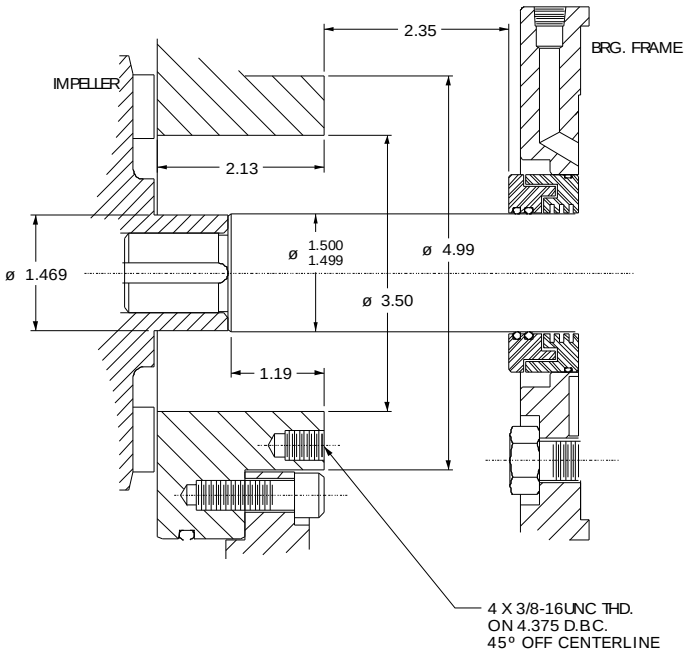
Pump Size	Suction						Discharge					
	Fx	Fy	Fz	Mx	My	Mz	Fx	Fy	Fz	Mx	My	Mz
AA – 1½ x 1 x 6	600	450	900	430	600	260	600	400	1,200	430	600	260
AB – 2 x 1½ x 6	1,010	760	1,500	680	960	340	890	650	2,000	680	960	340
AC - 3 x 1½ x 6	1,260	950	1,900	860	960	530	1,240	810	2,500	860	1,200	420
AD - 3 x 2 x 6	1,260	920	1,800	860	960	530	1,240	720	2,500	860	1,200	420
AE – 4 x 3 x 6	1,260	890	1,790	980	850	740	970	650	2,500	860	1,100	530
BA – 1½ x 1 x 8	1,820	650	1,120	770	820	390	600	660	1,600	770	820	390
BB – 2 x 1½ x 8	1,820	650	1,120	770	820	390	600	660	1,600	770	820	390
BC - 3 x 1½ x 8	1,260	740	1,440	930	990	530	800	750	2,000	930	990	460
BD - 3 x 2 x 8	1,260	930	1,800	1,160	1,240	580	1,000	940	2,500	1,160	1,240	580
BE – 4 x 3 x 8	1,260	870	1,750	1,150	1,080	740	860	770	2,500	1,150	1,280	570
BF – 6 x 4 x 8	2,000	1,440	2,800	1,850	920	1,300	830	1,170	4,000	1,850	1,300	920
CA – 2 x 1½ x 10	820	600	1,200	670	890	340	750	510	1,650	670	890	340
CB - 3 x 1½ x 10	1,260	900	1,810	1,020	1,350	530	1,020	770	2,500	1,020	1,350	510
CC - 3 x 2 x 10	1,260	900	1,810	1,020	1,350	530	1,020	770	2,500	1,020	1,350	510
CD - 4 x 3 x 10	1,480	1,420	2,800	2,600	1,350	1,320	670	1,300	4,000	2,600	1,350	1,320
CE - 6 x 4 x 10	1,240	1,100	2,200	2,080	1,140	1,300	540	980	3,200	2,080	1,140	1,050
CF – 6 x 6 x 10	1,560	1,380	2,750	2,600	1,430	1,320	670	1,230	4,000	2,600	1,430	1,320
CG - 8 x 6 x 10	1,560	1,380	2,750	2,600	1,300	1,900	670	1,230	4,000	2,600	1,430	1,320
DA - 2 x 1½ x 13	1,000	720	1,440	420	1,040	460	630	550	2,000	920	1,040	460
DB - 3 x 2 x 13	1,260	900	1,800	1,150	1,300	570	790	690	2,500	1,150	1,300	570
DC - 4 x 3 x 13	1,650	1,400	2,800	2,350	1,340	1,170	730	1,270	4,000	2,350	1,340	1,170
DD - 6 x 4 x 13	1,650	1,400	2,800	2,350	1,040	1,300	730	1,270	4,000	2,350	1,340	1,170
DE - 6 x 6 x 13	2,500	2,150	4,300	4,500	2,950	2,250	1,050	1,600	6,000	4,500	2,950	2,250
DF - 8 x 6 x 13	2,500	2,150	4,300	4,500	2,950	2,250	1,050	1,600	6,000	4,500	2,950	2,250
DG - 10 x 8 x 13	2,500	2,150	4,300	4,500	1,950	2,800	1,050	1,600	6,000	4,500	2,950	2,250
DH – 12 x 10 x 13	2,400	2,760	5,500	8,660	3,220	4,330	1,200	2,500	8,660	8,660	3,220	4,330
ED - 6 x 4 x 16	1,650	1,400	2,800	2,350	1,040	1,300	730	1,270	4,000	2,350	1,340	1,170
EA – 8 x 6 x 16	2,500	2,150	4,300	4,500	2,950	2,250	1,050	1,600	6,000	4,500	2,950	2,250
EB - 10 x 8 x 16	2,500	2,150	4,300	4,500	1,950	2,800	1,050	1,600	6,000	4,500	2,950	2,250
EE – 12 x 10 x 16	2,500	2,150	4,300	4,500	2,950	2,250	1,050	1,600	6,000	4,500	2,950	2,250
EC - 14 x 12 x 16	2,920	3,960	7,930	14,170	4,870	7,080	1,500	2,700	11,340	14,170	4,870	7,080
FA - 8 x 6 x 20	1,480	2,200	4,400	4,700	1,850	2,350	640	1,620	6,260	4,700	1,850	2,350
FB - 10 x 8 x 20	1,360	2,450	4,300	5,740	1,880	2,870	850	1,780	6,260	5,740	1,880	2,870
FC - 12 x 10 x 20	3,160	2,450	4,900	7,300	4,900	3,650	1,300	1,940	6,260	7,300	4,900	3,650
FD - 14 x 12 x 20	2,750	4,000	8,020	17,010	5,040	8,500	1,500	3,500	11,340	17,010	5,040	8,500

Carver

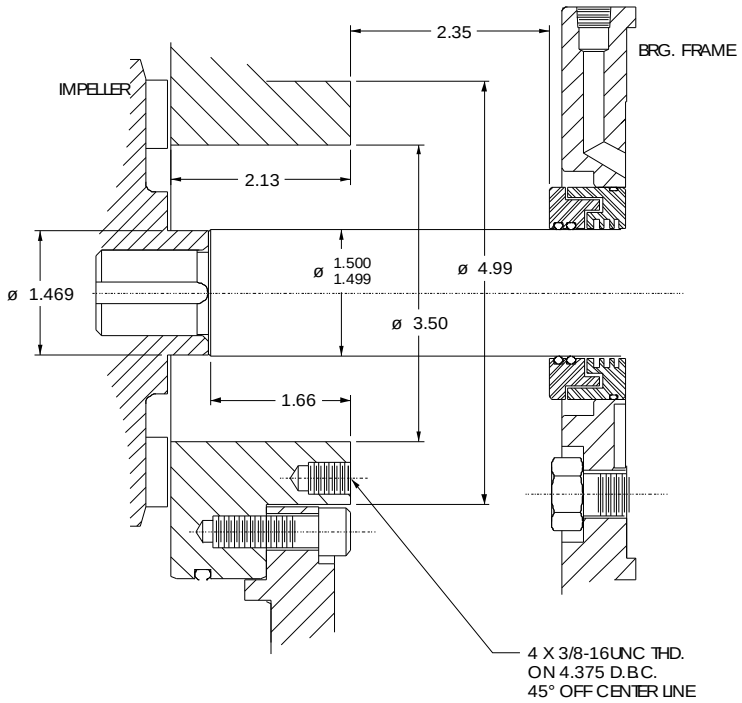
1. All force values in lbs. All moment values in ft.-lbs.
2. All moment values in ft.-lbs.
3. Not valid for construction unless certified.

Dwg: SP-MAX-1, Rev: 1

Stuffing Box Dimensions for "A" Bearing Frames



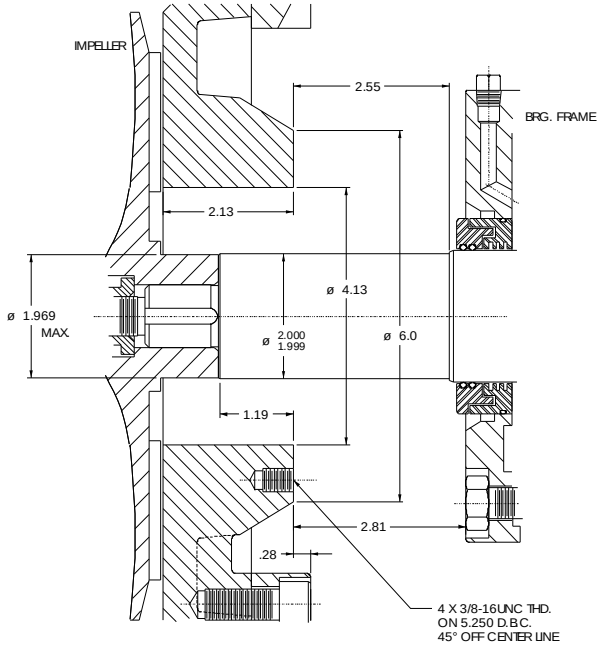
Sizes 1½ x 1 x 6, 3 x 2½ x 6, and 3 x 1½ x 6



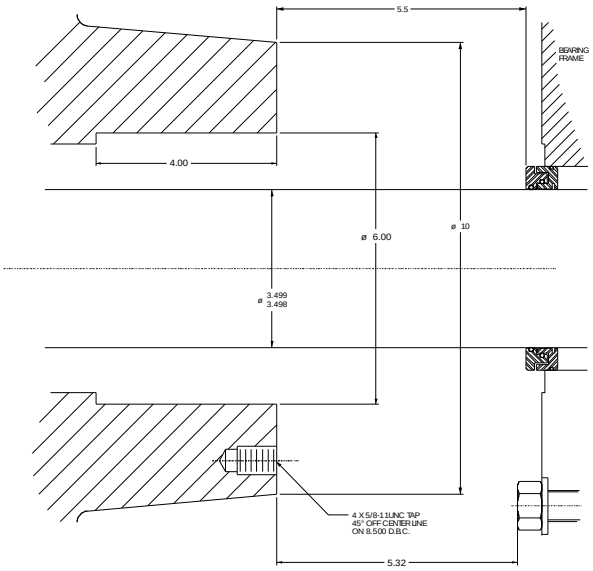
Sizes 3 x 2 x 6 and 4 x 3 x 6

Carver	1. All dimensions in inches unless otherwise noted. 2. All tolerances +/- 0.010 inch. 3. Not valid for construction unless certified.	**Dwg: SP-MAX-2, Rev: 0**

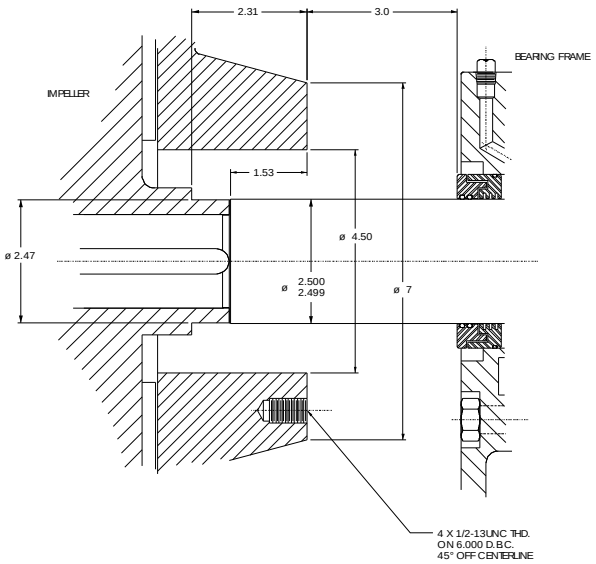
Stuffing Box Dimensions for "B", "C", and "D" Bearing Frames



Maxum "B" Bearing Frame



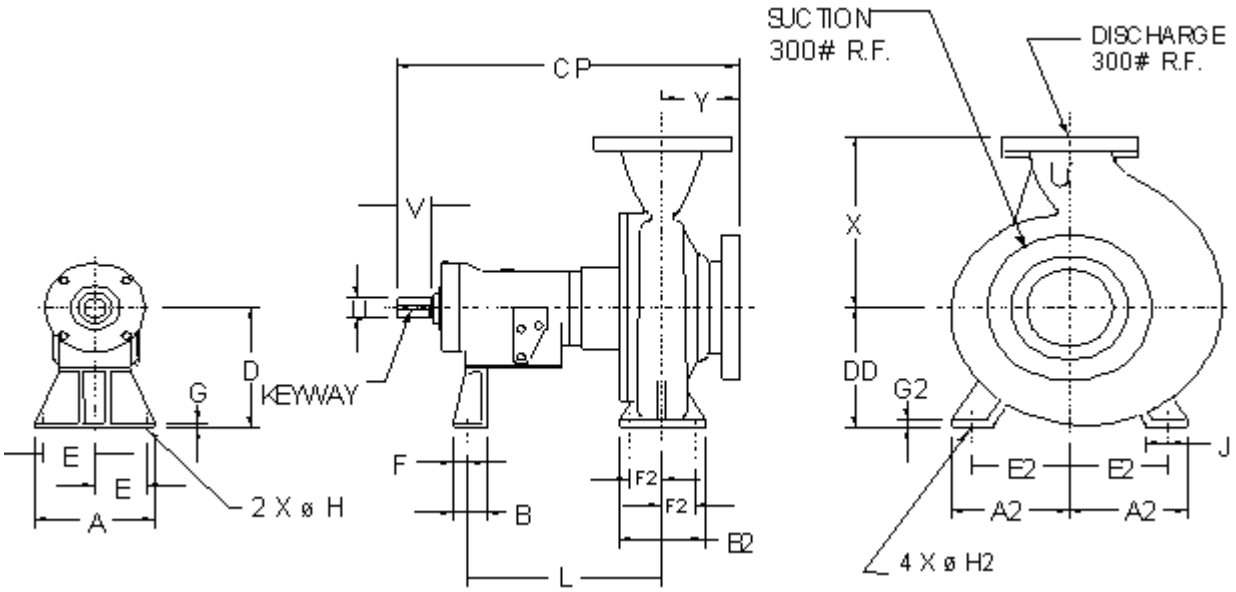
Maxum "D" Bearing Frame



Maxum "C" Bearing Frame

Carver	1. All dimensions in inches unless otherwise noted. 2. All tolerances +/- 0.010 inch. 3. Not valid for construction unless certified.	**Dwg: SP-MAX-3, Rev: 0**

Foot Mounted Pump Dimensions



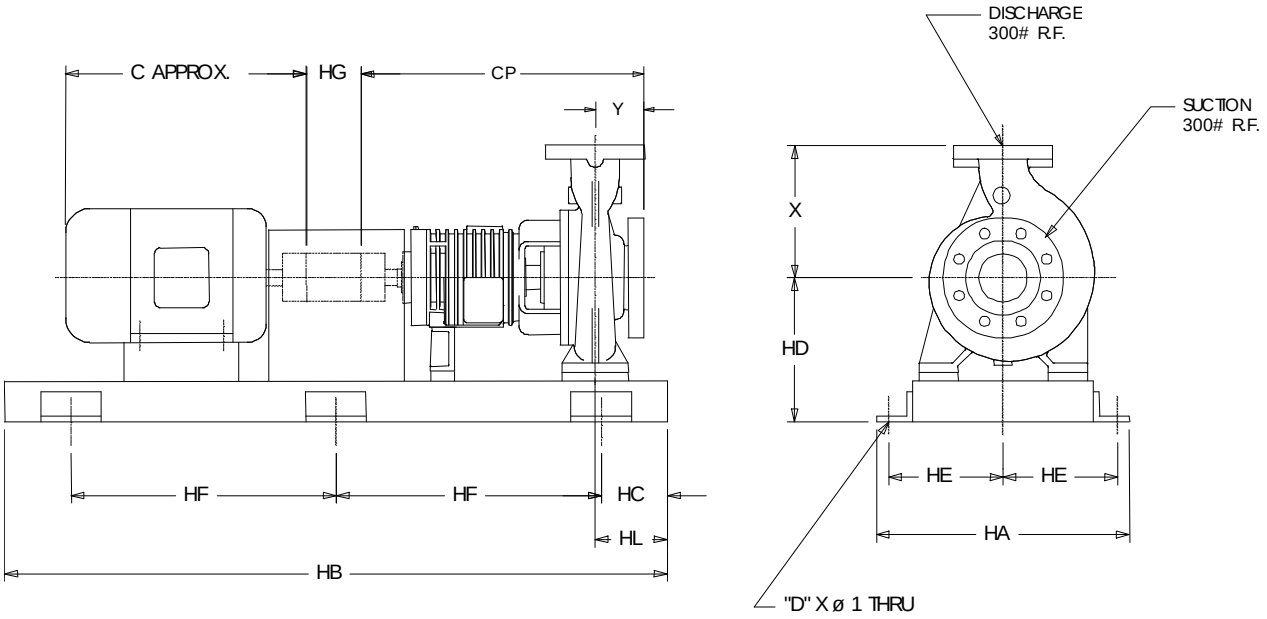
Pump Size	Pump Dimensions																					
	X	Y	CP	A	A2	B	B2	D	DD	E	E2	F	F2	G	G2	H	H2	J	L	U	V	Keyway
1½ x 1 x 6	6.50	4.00	22.3	8.25	5.25	2.00	4.00	5.94	6.00	3.50	4.19	0.69	1.38	0.44	0.75	0.63	0.63	2.25	12.0	1.13	3.00	0.25 x 0.125
2 x 1½ x 6	6.50	4.00	22.4	8.25	5.25	2.00	4.00	5.94	6.00	3.50	4.19	0.69	1.38	0.44	0.75	0.63	0.63	2.25	12.1	1.13	3.00	0.25 x 0.125
3 x 1½ x 6	6.50	4.00	22.4	8.25	5.25	2.00	4.00	5.94	6.00	3.50	4.19	0.69	1.38	0.44	0.75	0.63	0.63	2.25	12.1	1.13	3.00	0.25 x 0.125
3 x 2 x 6	8.25	4.00	22.4	8.25	5.25	2.00	4.00	5.94	6.00	3.50	4.19	0.69	1.38	0.44	0.75	0.63	0.63	2.25	12.1	1.13	3.00	0.25 x 0.125
4 x 3 x 6	11.0	5.13	23.8	8.25	5.25	2.00	4.00	6.94	7.00	3.50	4.38	0.69	1.38	0.44	0.75	0.63	0.63	2.25	12.4	1.13	3.00	0.25 x 0.125
1½ x 1 x 8	6.50	4.00	23.1	8.25	12.6	2.00	6.00	6.94	7.00	3.50	5.56	0.69	2.25	0.44	0.75	0.63	0.63	2.56	12.7	1.38	3.00	0.31 x 0.156
2 x 1½ x 8	6.50	4.00	23.2	8.25	12.6	2.00	6.00	6.94	7.00	3.50	5.56	0.69	2.25	0.44	0.75	0.63	0.63	2.56	12.8	1.38	3.00	0.31 x 0.156
3 x 1½ x 8	8.50	4.00	23.2	8.25	12.6	2.00	6.00	6.94	7.00	3.50	5.56	0.69	2.25	0.44	0.75	0.63	0.63	2.56	12.8	1.38	3.00	0.31 x 0.156
3 x 2 x 8	9.50	4.00	23.2	8.25	12.6	2.00	6.00	6.94	7.00	3.50	5.56	0.69	2.25	0.44	0.75	0.63	0.63	2.56	12.8	1.38	3.00	0.31 x 0.156
4 x 3 x 8	11.0	4.00	23.4	8.25	14.0	2.00	5.50	7.81	7.88	3.50	5.50	0.69	1.88	0.44	0.75	0.63	0.63	3.25	13.0	1.38	3.00	0.31 x 0.156
6 x 4 x 8	11.3	5.50	25.2	8.25	14.0	2.00	6.00	7.81	7.88	3.50	5.50	0.69	2.38	0.44	0.75	0.63	0.75	3.25	13.3	1.38	3.00	0.31 x 0.156
2 x 1½ x 10	9.06	4.13	23.5	8.25	12.6	2.00	4.88	6.94	7.00	3.50	5.00	0.69	1.50	0.44	0.69	0.63	0.63	2.56	12.9	1.38	3.00	0.31 x 0.156
3 x 1½ x 10	8.88	5.00	24.2	8.25	12.3	2.00	5.00	6.94	7.00	3.50	4.88	0.69	1.88	0.44	0.75	0.63	0.63	2.50	12.9	1.38	3.00	0.31 x 0.156
3 x 2 x 10	9.50	4.00	23.2	8.25	12.3	2.00	5.00	6.94	7.00	3.50	4.88	0.69	1.38	0.44	0.75	0.63	0.63	2.50	12.8	1.38	3.00	0.31 x 0.156
4 x 3 x 10	10.5	5.25	24.6	9.50	15.8	2.00	6.25	8.81	8.88	3.50	6.25	0.69	2.38	0.44	0.75	0.63	0.75	3.18	12.9	1.38	3.00	0.31 x 0.156
6 x 4 x 10	11.5	5.88	25.4	9.50	15.8	2.00	6.00	8.81	8.88	3.50	6.25	0.69	2.38	0.44	0.75	0.63	0.75	3.18	13.0	1.38	3.00	0.31 x 0.156
6 x 6 x 10	15.1	6.88	26.5	9.50	20.0	2.00	8.00	10.9	11.0	3.50	7.88	0.69	2.94	0.44	1.00	0.63	0.75	4.00	13.3	1.38	3.00	0.31 x 0.156
8 x 6 x 10	15.0	6.63	26.6	9.50	20.0	2.00	7.88	10.9	11.0	3.50	7.88	0.69	2.94	0.44	1.13	0.63	0.75	4.00	13.6	1.38	3.00	0.31 x 0.156
2 x 1½ x 13	10.0	5.00	28.5	11.0	13.5	3.00	5.00	7.81	7.88	4.75	5.50	1.25	1.88	0.56	0.75	0.63	0.63	2.56	17.0	2.00	3.00	0.50 x 0.250
3 x 2 x 13	11.0	5.10	28.6	11.0	13.5	3.00	5.00	8.81	8.88	4.75	5.50	1.25	1.88	0.56	0.75	0.63	0.63	2.56	17.0	2.00	3.00	0.50 x 0.250
4 x 3 x 13	12.5	5.50	29.1	11.0	16.5	3.00	6.25	9.69	9.75	4.75	7.00	1.25	2.38	0.56	0.88	0.63	0.75	3.13	17.2	2.00	3.00	0.50 x 0.250
6 x 4 x 13	12.8	6.00	29.8	11.0	16.5	3.00	6.25	9.69	9.75	4.75	7.00	1.25	2.38	0.56	0.88	0.63	0.75	3.13	17.4	2.00	3.00	0.50 x 0.250
6 x 6 x 13	16.1	7.52	31.4	11.0	21.5	3.00	8.00	12.4	12.6	4.75	8.88	1.25	2.94	0.56	1.00	0.63	0.88	4.13	17.4	2.00	3.00	0.50 x 0.250
8 x 6 x 13	16.3	6.75	31.0	11.0	21.5	3.00	8.00	12.4	12.6	4.75	8.88	1.25	2.94	0.56	1.00	0.63	0.88	4.13	17.8	2.00	3.00	0.50 x 0.250
10 x 8 x 13	18.5	8.50	32.9	11.0	22.0	3.00	8.00	13.9	14.0	4.75	9.00	1.25	3.00	0.56	1.00	0.63	0.88	4.00	18.0	2.00	3.00	0.50 x 0.250
12 x 10 x 13	22.5	10.5	35.5	11.0	28.0	3.00	10.0	15.9	16.0	4.75	12.0	1.25	3.50	0.56	1.13	0.63	1.00	5.00	18.5	2.00	3.00	0.50 x 0.250
6 x 4 x 16	16.5	7.00	46.0	8.00	10.8	3.00	8.00	12.4	12.5	3.00	9.00	1.50	3.00	0.63	1.13	0.75	1.06	4.00	26.93	3.00	5.75	0.75 x 0.250
8 x 6 x 16	17.8	7.00	31.3	11.0	10.8	3.00	7.88	12.4	12.5	4.75	9.00	1.25	3.00	0.56	0.88	0.63	0.88	3.94	17.8	2.00	3.00	0.50 x 0.250
10 x 8 x 16	20.3	7.50	31.9	11.0	11.0	3.00	8.00	13.9	14.0	4.75	9.00	1.25	3.00	0.56	1.00	0.63	0.88	4.00	17.9	2.00	3.00	0.50 x 0.250
12 x 10 x 16	23.6	9.38	48.8	11.0	10.8	3.00	10.2	16.6	16.75	4.75	14.0	1.50	3.00	0.63	1.13	0.75	1.06	5.12	28.1	3.00	5.75	0.75 x 0.250
14 x 12 x 16	26.0	12.0	52.0	11.0	17.8	3.00	14.2	19.9	20.0	4.75	15.0	1.50	5.00	0.63	1.25	0.75	1.06	7.00	27.9	3.00	5.75	0.75 x 0.375
8 x 6 x 20	19.8	7.25	31.2	11.0	10.9	3.00	8.00	14.9	15.0	4.75	9.00	1.50	3.00	0.56	1.13	0.63	0.88	4.00	17.1	2.00	3.00	0.50 x 0.250
10 x 8 x 20	22.0	7.88	32.0	11.0	13.0	3.00	7.88	16.6	16.6	4.75	11.0	1.50	3.00	0.56	0.63	0.63	0.88	4.00	17.4	2.00	3.00	0.50 x 0.250
12 x 10 x 20	26.4	7.88	47.8	12.0	15.8	3.00	10.3	18.6	18.7	5.00	14.0	1.00	3.75	0.63	1.00	0.75	0.88	5.13	28.3	3.00	5.75	0.75 x 0.375
14 x 12 x 20	29.6	12.0	52.5	12.0	21.3	3.00	14.8	21.9	22.0	5.00	18.0	1.00	5.00	0.63	1.98	0.75	1.06	10.0	29.0	3.00	5.75	0.75 x 0.375

Carver

1. All dimensions in inches, unless otherwise noted.
2. All tolerances +/- 0.125 inch.
3. Not valid for construction unless certified.

Dwg: SP-MAX-4, Rev: 1

Standard Pump / Motor Assembly Dimensions
All 6", 8", and 10" Impeller Sizes



Pump Size	Pump Dimensions																			
	X	Y	CP	HG	HL	182 – 184 T		213 – 215 T		254 – 256 T		284 – 286 TS		324 – 326 TS		364 – 365 TS		404 – 405 TS	
						Base	*HD*	*Base*	*HD*	*Base*	*HD*	*Base*	*HD*	*Base*	*HD*	*Base*	*HD*	*Base*	*HD*
1½ x 1 x 6	6.50	4.00	22.4	5.00	6.00	1	10.0	-	-	-	-	-	-	-	-	-	-	-	-
2 x 1½ x 6	6.50	4.00	22.5	5.00	6.00	1	10.0	1	10.0	-	-	-	-	-	-	-	-	-	-
3 x 1½ x 6	6.50	4.00	22.5	5.00	6.00	1	10.0	1	10.0	-	-	-	-	-	-	-	-	-	-
3 x 2 x 6	8.25	4.00	22.5	5.00	6.00	1	10.0	1	10.0	2	10.5	2	11.0	-	-	-	-	-	-
4 x 3 x 6	11.0	5.13	23.8	5.00	7.00	1	11.0	1	11.0	2	11.0	2	11.0	4	13.0	-	-	-	-
1½ x 1 x 8	6.50	4.00	23.1	5.00	6.00	1	11.0	1	11.0	2	11.0	-	-	-	-	-	-	-	-
2 x 1½ x 8	6.50	4.00	23.2	5.00	6.00	1	11.0	1	11.0	2	11.0	2	11.0	-	-	-	-	-	-
3 x 1½ x 8	8.50	4.00	23.2	5.00	6.00	1	11.0	1	11.0	2	11.0	2	11.0	-	-	-	-	-	-
3 x 2 x 8	9.50	4.00	23.2	5.00	6.00	1	11.0	1	11.0	2	11.0	2	11.0	3	13.0	-	-	-	-
4 x 3 x 8	11.0	4.00	23.4	5.00	7.00	-	-	1	12.0	2	12.0	2	12.0	4	13.0	4	14.0	-	-
6 x 4 x 8	11.3	5.50	25.2	5.00	7.00	-	-	-	-	2	12.0	2	12.0	4	13.0	4	14.0	5	14.00
2 x 1½ x 10	9.06	4.13	23.5	5.00	6.00	1	11.0	1	11.0	2	11.0	2	11.0	3	12.5	-	-	-	-
3 x 1½ x 10	8.88	5.00	24.2	5.00	6.50	1	11.0	1	11.0	2	11.0	2	11.0	4	13.0	-	-	-	-
3 x 2 x 10	9.50	4.00	23.2	5.00	6.50	1	11.0	1	11.0	2	11.0	2	11.0	4	13.0	4	14.0	-	-
4 x 3 x 10	10.5	5.25	24.6	5.00	7.00	-	-	3	13.5	3	13.5	3	13.5	4	13.5	4	13.5	5	14.00
6 x 4 x 10	11.5	5.88	25.4	5.00	7.00	-	-	-	-	3	13.5	3	13.5	4	13.5	5	14.0	5	15.00
6 x 6 x 10	15.1	6.88	26.5	7.25	8.00	-	-	-	-	5	16.0	5	16.0	5	16.0	-	-	-	-
8 x 6 x 10	15.0	6.63	26.6	7.25	7.00		-	-	-	-	-	5	16.0	5	16.0	5	16.0	-	-

Baseplate Number	Baseplate Dimensions					
	HA	HB	HC	HE	HF	D
1	21.0	55.0	5.50	9.50	22.0	6.00
2	21.0	61.0	5.50	9.50	25.0	6.00
3	24.0	61.00	5.50	11.0	25.0	6.00
4	24.0	73.0	6.50	11.0	30.0	6.00
5	30.0	73.0	6.50	14.0	30.0	6.00

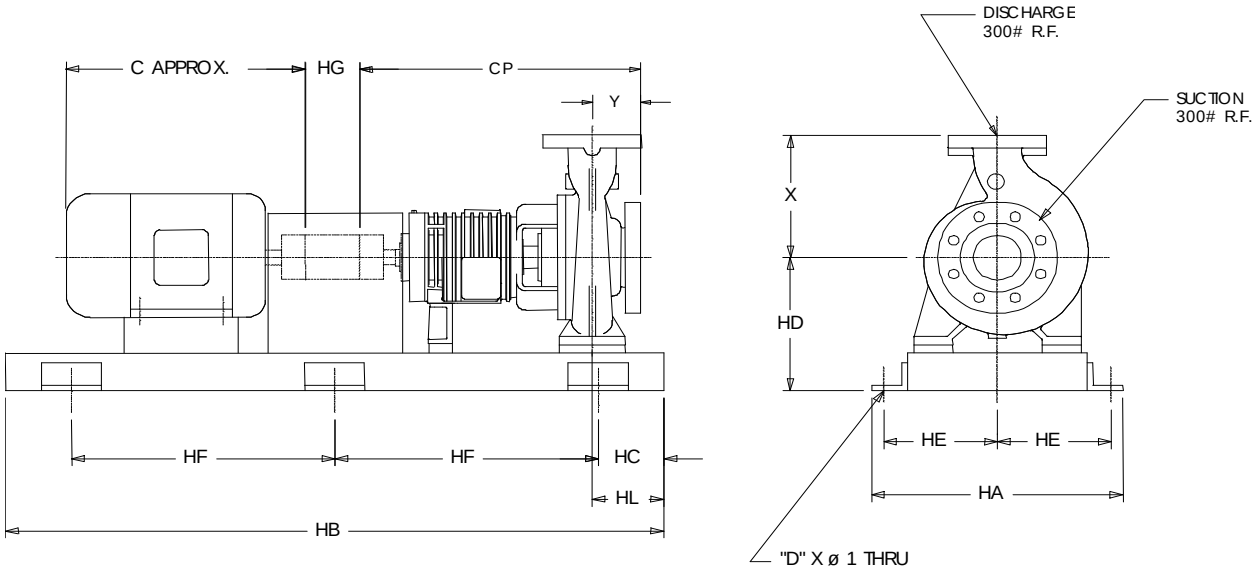
NEMA Motor Dimensions (Approximate)					
NEMA Frame	C	NEMA Frame	C	NEMA Frame	C
182T	15	256T	25	364TS	31
184T	16	284TS	25	365TS	32
213T	18	286TS	27	404TS	38
215T	19	324TS	28	405TS	40
254T	23	326TS	29		

Carver

1. All dimensions in inches, all tolerances +/- 0.125 inch.
2. All motor dimensions are approximate.
3. Not valid for construction unless certified.

Dwg: SP-MAX-6, Rev: 0

Standard Pump / Motor Assembly Dimensions
All 13", 16", and 20" Impeller Sizes



Pump Size	Pump Dimensions																			
	X	Y	CP	HG	HL	254 – 256 T		284 – 286 TS		324 – 326 TS		364 – 365 TS		404 – 405 TS		444 – 445 TS		447 TS	
						Base	*HD*	*Base*	*HD*	*Base*	*HD*	*Base*	*HD*	*Base*	*HD*	*Base*	*HD*	*Base*	*HD*
2 x 1½ x 13	10.0	5.00	28.5	5.00	6.50	2	12.0	4	12.5	4	12.5	4	13.5	-	-	-	-	-	-
3 x 2 x 13	11.0	5.10	28.6	5.00	6.50	2	13.0	4	13.5	4	13.5	4	14.0	5	14.00	6	15.00	-	-
4 x 3 x 13	12.5	5.50	29.1	5.00	7.00	3	14.5	4	14.5	4	14.5	4	14.5	6	14.00	6	15.00	-	-
6 x 4 x 13	12.8	6.00	29.8	5.00	7.50	-	-	4	14.5	4	14.5	4	14.5	6	14.00	6	15.00	6	15.0
6 x 6 x 13	16.1	7.52	31.4	7.25	9.00	-	-	-	-	5	16.5	5	16.5	6	16.50	-	-	-	-
8 x 6 x 13	16.3	6.75	31.0	7.25	8.00	-	-	-	-	5	16.5	5	16.5	6	16.50	-	-	-	-
10 x 8 x 13	18.5	8.50	32.9	7.25	10.0	-	-	-	-	-	-	5	18.0	6	18.00	6	18.00	-	-
12 x 10 x 13	22.5	10.5	35.5	8.00	13.0	-	-	-	-	-	-	28	25.3	29	25.25	30	25.25	-	-
6 x 4 x 16	16.5	7.00	46.0	7.25	8.00	-	-	-	-	-	-	6	16.5	6	16.5	-	-	-	-
8 x 6 x 16	17.8	7.00	31.3	7.25	8.50	-	-	-	-	-	-	6	16.5	6	16.50	6	16.50	-	-
10 x 8 x 16	20.3	7.50	31.9	7.25	8.50	-	-	-	-	-	-	-	-	6	18.00	6	18.00	6	18.0
12 x 10 x 16	23.6	9.38	48.8	9.75	11.0	-	-	-	-	-	-	-	-	-	-	36	29.25	36	29.3
14 x 12 x 16	26.0	12.0	52.0	9.75	13.0	-	-	-	-	-	-	-	-	-	-	36	29.25	36	29.3
8 x 6 x 20	19.8	7.25	31.2	7.25	8.50	-	-	-	-	-	-	-	-	6	19.0	6	19.0	6	19.0
10 x 8 x 20	22.0	7.88	32.0	7.25	9.00	-	-	-	-	-	-	-	-	28	25.3	28	25.3	28	25.3
12 x 10 x 20	26.4	7.88	47.8	7.25	9.00	-	-	-	-	-	-	-	-	30	27.8	30	27.8	30	27.8
14 x 12 x 20	29.6	12.0	52.5	9.75	13.0	-	-	-	-	-	-	-	-	-	-	47	33.8	47	33.8

Baseplate Number	Baseplate Dimensions					
	HA	HB	HC	HE	HF	D
2	21.0	61.0	5.50	9.50	25.0	6.00
3	24.0	61.0	5.50	11.0	25.0	6.00
4	24.0	73.0	6.50	11.0	30.0	6.00
5	30.0	73.0	6.50	14.0	30.0	6.00
6	30.0	85.0	6.50	14.0	36.0	6.00
28	36.0	84.5	6.00	16.5	24.1	8.00
29	36.0	90.5	6.00	16.5	26.1	8.00
30	36.0	96.5	6.00	16.5	28.1	8.00
36	42.0	96.5	6.00	19.5	28.1	8.00
47	48.0	108.5	6.00	22.5	24.1	10.0

NEMA Motor Dimensions (Approximate)					
NEMA Frame	C	NEMA Frame	C	NEMA Frame	C
254T	23	326TS	29	444TS	42
256T	25	364TS	31	445TS	44
284TS	25	365TS	32	447TS	46
286TS	27	404TS	38		
324TS	28	405TS	40		

Carver

1. All dimensions in inches, all tolerances +/- 0.125 inch.
2. All motor dimensions are approximate.
3. Not valid for construction unless certified.

Dwg: SP-MAX-7, Rev: 1




Since we built our first pumps in 1938, the Carver name has become synonymous with value. Today we are recognized as one of the world's leading centrifugal pump companies, building pumps to the most demanding engineering specifications and military standards in the world.

Our company is located in Muscatine, Iowa, 25 miles southwest of the Quad Cities area. Our operations there include some of the most modern manufacturing equipment and pump development software available, and we are committed to the highest quality possible-in our products and our people. Along these lines, Carver was also one of the first American pump companies to attain ISO 9001 certification-the most recognized standard for quality in the world.

From an applications standpoint Carver has traditionally built pumps for water, oil, and chemicals for both the public and private sectors. Our product line includes both horizontal and vertical end suction, multi-stage, axial split case, self-priming, API, and solids-handling pumps that all carry the same Carver trademark: lasting value from solid, straightforward designs engineered to provide many years of service.

These pumps are also backed by unparalleled aftermarket support. Our network of stocking distributors, manufacturer's representatives and certified service centers throughout the world means that no matter where your pump may be installed, there are local sales and service people ready to support your aftermarket needs.

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