CARVER PUMP™
Built for purpose

100 – 19.02.EN

GHJM – General Horizontal, Close-Coupled Pumps

Technical Specification Pages

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1.0 Overview.

The GHJM Close-Coupled Pump is Carver's horizontal, end suction pump for handling water, oils, and chemicals in process, marine, and general industrial applications. Available as a close coupled (GHJMC) unit, the GHJM is based on the same product platform as our horizontal GH and vertical G2V and shares many of the same parts.

All GHJM models are a back pull-out design with removable suction covers and rotatable casings to accommodate different piping orientations.

Other standard features include 316 SS shaft sleeves, keyed impellers for more positive driving and to prevent accidental spin off, dynamic balancing to ISO G2.5 guidelines, and regreasable bearings secured with lock nuts.

The GHJM is the natural evolution of the L & H. While designed for maximum dimensional and parts interchangeability, the GHJM is nonetheless a new pump series and all parts are not necessarily identical to everything that preceded it. External dimensions, however, are unchanged.

1.1 Basic Hydraulic Features

Standard hydraulic features for the GHJM are given in the table below.

Basic Hydraulic Features										
Basic Pump Size	General Design Features						Hydraulic Performance			
	Discharge Type	*Maximum Solids*	*Casing Volutes*	*Connection Type*	*Bearing Frame*	*Impeller Type*	*Max RPM*	*Max / Min diameter*	*Specific Speed N_S*	*Suction Sp. Speed N_{SS}*
AA - 1 ¼ x 1 x 5	Tangential	0.187"	Single	NPT	10 M	Semi-open	3500	5.0" / 3.5"	996	3,303
AB - 2 x 1 ½ x 5		0.250"							1,646	2,450
AC - 2 ½ x 2 x 5		0.313"							1,982	5,181
BA - 1 ¼ x 1 x 7	Tangential	0.187"	Single	NPT	10 M	Enclosed	3500	7.0" / 4.5"	703	2,582
BB - 1 ½ x 1 ¼ x 7		0.218"							894	2,856
BC - 2 ½ x 2 x 7		0.313"							1,143	3,984
BD - 3 x 2 ½ x 7		0.437"		Flanged					1,435	6,824
BE - 4 x 3 x 7		0.562"	Quad						2,070	7,937
BF - 5 x 4 x 7		0.750"	Dual						2,091	5,821
CA - 1 ½ x 1 ¼ x 10	Tangential	0.218"	Single	NPT	20 M	Enclosed	3500	9.8" / 7.0"	474	1,996
CB - 2 x 1 ½ x 10		0.250"							740	4,811
CC - 2 ½ x 2 x 10		0.313"							970	3,244
CD - 3 x 2 ½ x 10		0.437"		Flanged					1,017	5,018
CE - 4 x 3 x 10		0.562"	Quad						1,311	5,693
CF - 5 x 4 x 10		0.750"	Dual						1,687	5,808
CG - 6 x 5 x 10		0.875"					1750		2,598	5,635

1.2 GHJM Ordering Code.

The following Ordering Code defines the GHJM pump and pump/motor arrangements. When quoting or ordering a GHJM pump, **this Ordering Code must be used**.

This Ordering Code enables Carver Pump Company to accept orders quickly, assuring timely and correct manufacture of the desired pump.

GHJM C – BD C – A A B – G B C

Pump Series:
GHJM – GHJM Pump

Mounting Style:
C – Close Coupled
F – Frame Mounted

Volute Nozzle and Impeller Sizes:

AA – 1 ¼ x 1 x 5
AB – 2 x 1 ½ x 5
AC – 2 ½ x 2 x 5

BA – 1 ¼ x 1 x 7
BB – 1 ½ x 1 ¼ x 7
BC – 2 ½ x 2 x 7
BD – 3 x 2 ½ x 7
BE – 4 x 3 x 7
BF – 5 x 4 x 7

CA – 1 ½ x 1 ¼ x 10
CB – 2 x 1 ½ x 10
CC – 2 ½ x 2 x 10
CD – 3 x 2 ½ x 10
CE – 4 x 3 x 10
CF – 5 x 4 x 10
CG – 6 x 5 x 10

Material of Construction:
A – All Cast Iron Construction

C – 316 SS Fitted Cast Iron Construction

X – Special

Seal Arrangement:
A – Type 1, Carbon on Ceramic Faces (**Standard**)
B – Type 1, Carbon on Silicon Carbide Faces

X - Special

Motor Enclosure:

NEMA	IEC
A – ODP	**A** – IP54
B – TEFC	**B** – IP55
C – X-Proof	**C** – IP56

D – HAZ – CL1. DIV.2
X – Special

Z – No Motor or Customer Supplied Motor

Motor Speed, Voltage and Frequency:

A – 1150 RPM, 230/460 Volt, 60 Hz
B – 1750 RPM, 230/460 Volt, 60 Hz
C – 3500 RPM, 230/460 Volt, 60 Hz

E – 1000 RPM, 190/380 Volt, 50 Hz
F – 1500 RPM, 190/380 Volt, 50 Hz
G – 3000 RPM, 190/380 Volt, 50 Hz

X – Special
Z – No Motor (GHF only)

Motor Power Rating:

NEMA

A –	1.5 HP	**J** –	25 HP
B –	2.0 HP	**K** –	30 HP
C –	3.0 HP	**M** –	40 HP
D –	5.0 HP	**N** –	50 HP
E –	7.5 HP	**P** –	60 HP
F –	10 HP	**Q** –	75 HP
G –	15 HP	**R** –	100 HP
H –	20 HP	**S** –	125 HP

IEC

A –	1.1 KW	**K** –	18.5 KW
B –	1.5 KW	**M** –	22 KW
C –	2.2 KW	**N** –	30 KW
D –	3.7 KW	**P** –	37 KW
E –	4 KW	**Q** –	45 KW
F –	5.5 KW	**R** –	55 KW
G –	7.5 KW	**S** –	75 KW
H –	11 KW	**T** –	90 KW
J –	15 KW	**U** –	110 KW

X - Special **Z** – No Motor – Bare Pump

Base Plate:

X – Special
Z – No Baseplate, Coupling or Coupling Guard (**Standard w/GHJMC**)

Seal Flush Arrangements:
A – Plan 11 Seal Flush

X – Special
Z – No seal Flush (**Standard**)

1.3 Standard Surface Treatment.

All GHJM pumps handling liquids less than 230 °F are painted per Carver Standard PA-001. This provides for one coat of Carver Blue, industrial alkyd metal enamel with a 3-5 mils dry film thickness.

All paint is applied over a clean, dry, bare metal surface. All iron castings are spot primed over any area exhibiting minor discoloration from rust or oxidation.

Surface Preparation of Key Components		
Component	**Material**	**Specification**
Backcover/Adaptor	Cast iron	Carver Standard PA-001
Base	Steel	Carver Standard PA-001
Volute	Steel	Carver Standard PA-001
Motor	Any	Mfg. Std. Coating

Since all pumps and parts are assumed to be installed and operated soon after receipt, we do not include any special preservation for long term storage. We also assume no responsibility for storage deterioration after shipment unless explicitly stated in our quotation and purchase order acknowledgment.

Users can also provide their own protection by sealing all ports and openings and coating the pump internals with a water soluble preservative.

1.4 Material of Construction.

The standard GHJM materials and material specifications are given in the table below:

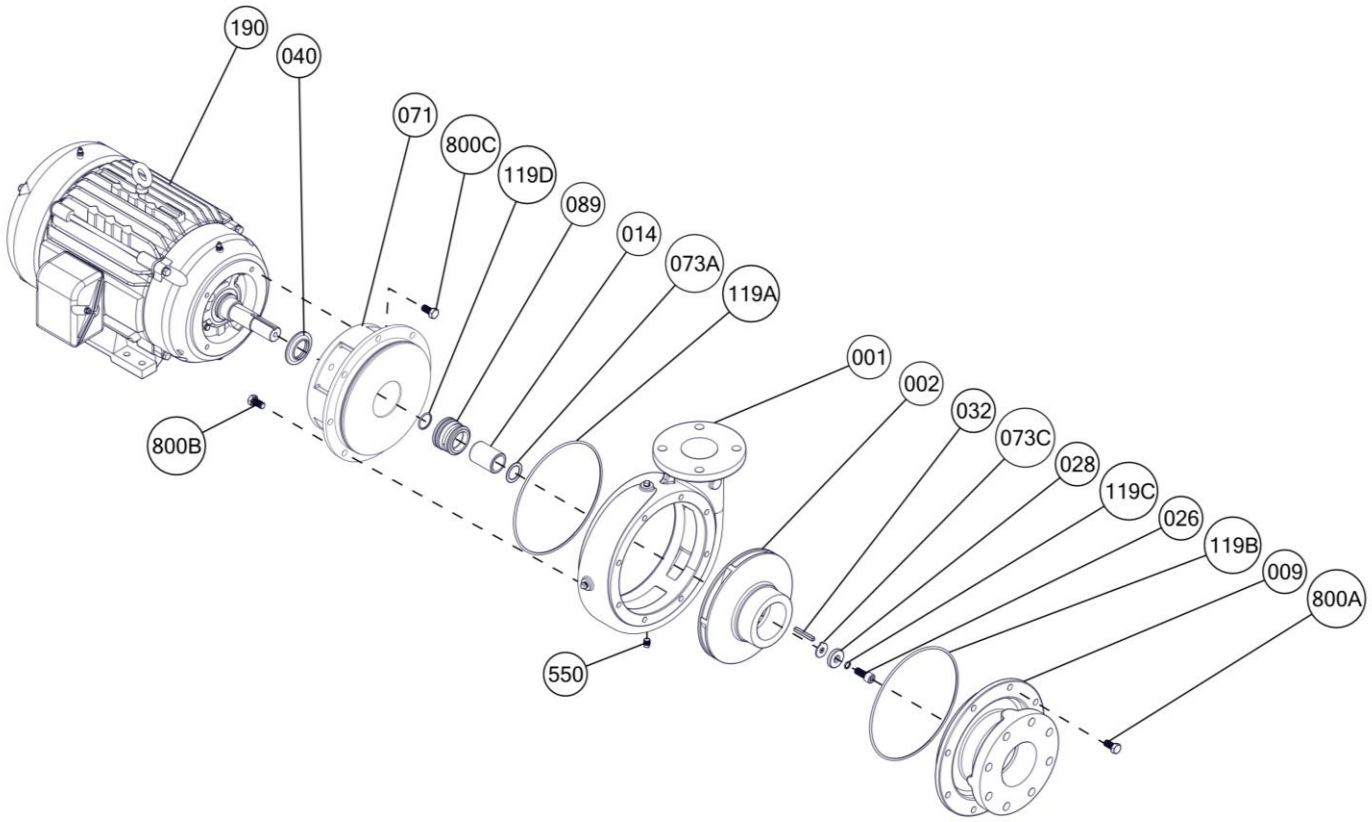
Key Component Materials		
Component	**Material**	**Specification**
Volute	Cast Iron	ASTM A48, Class 30
Impeller	Cast Iron	ASTM A48, Class 30
	316 SS	ASTM A744, Grade CF-8M
Backcover/Adaptor	Cast Iron	ASTM A48, Class 30
O-Rings	Elastomer	Viton
Shaft Sleeve	316 SS	ASTM A276, CL. 316
Standard Seal	Type 1 or 21	XF1C1 (316) Viton with carbon on ceramic faces, 316 SS metal parts.
Optional Seal	Type 1 or 21	XF10$_{58}$1 (316) Viton with carbon on silicon carbide faces, 316 SS metal parts

1.5 GHJM Standard Parts Identification.

Standard parts for frame mounted units with enclosed impellers are shown with the exploded view.

Wet End Kit	
Item	**Description**
001	Casing
002*	Impeller, Enclosed
003*	Impeller, Semi-Open
009	Suction Cover
073B*	Shim – Suction Cover
119B	O-ring – Suction Cover Casing
550	Pipe Plug – Casing
800A	Bolt – Suction Cover/Casing
Adaptor Kit	
Item	**Description**
014	Shaft Sleeve
026	Impeller Capscrew
028	Impeller Screw Washer
032	Impeller Key
040	Slinger
071	Adaptor
073A	Sleeve Gasket
073C	Impeller Gasket
089	Mechanical Seal Assembly
119A	O-ring – Adaptor/Casing
119C	O-ring – Impeller Cap Screw
119D	O-ring – Shaft Sleeve
550A	Pipe Plug – Adaptor
800B	Bolt – Adaptor/Casing
800C	Bolt – Adaptor/Motor

* Parts are options that vary by pumping unit.



Close coupled units use a NEMA GHJM frame motor. For further detailed descriptions, material designations and/or quantities for the items shown refer to the GHJM Series Price book.

1.6 A Typical GHJM Specification. (Specifier's options in parentheses)

Each pump shall be a horizontal, end suction, close-coupled centrifugal pump capable of developing (1,800) US GPM at a total head of (150) feet when pumping (water) at a temperature of (125) °F with a fluid specific gravity of (1.00) without the use of special clearances, materials, or other internal or external modifications. In meeting these hydraulic conditions, the pump shall have an NPSH requirement of not more than (10) feet and a hydraulic operating efficiency at the normal duty point of at least (70.0)% as defined by the Hydraulic Institute Level A requirements, which includes all mechanical seal and/or bearing losses.

The pump shall include separate liquid end, mechanical seal, and adaptor sections for ease of maintenance. The liquid end shall be cast iron, with all components fully compatible with the temperature, corrosion and abrasion properties of the pumped fluid. All pressure retaining parts of the pump shall be hydrostatically tested to 150% of its operating pressure and all piping connections shall be NPT threaded connections for discharge connections up to and including 2" nominal pipe size, and ANSI 150 lb flanges for all larger sizes. The entire assembly shall be secured to a mounting plate with a minimum of four steel tie down bolts to assure complete hydraulic and structural integrity of the unit.

The impellers shall be precision, enclosed type cast iron (316 stainless steel) for highest efficiency without the need for axial adjustments to compensate for wear as is typical with other impeller types. The impellers shall also be positively keyed to the pump drive shaft for more positive driving and to prevent the impeller from spinning off the shaft and damaging itself and/or the pump casing in the event of accidental reverse rotation. As a further means of assuring longer component life, all impellers shall be dynamically balanced in accordance with ISO G2.5 guidelines. A replaceable 316 stainless steel sleeve for added protection from erosion and corrosion over the life of the pump.

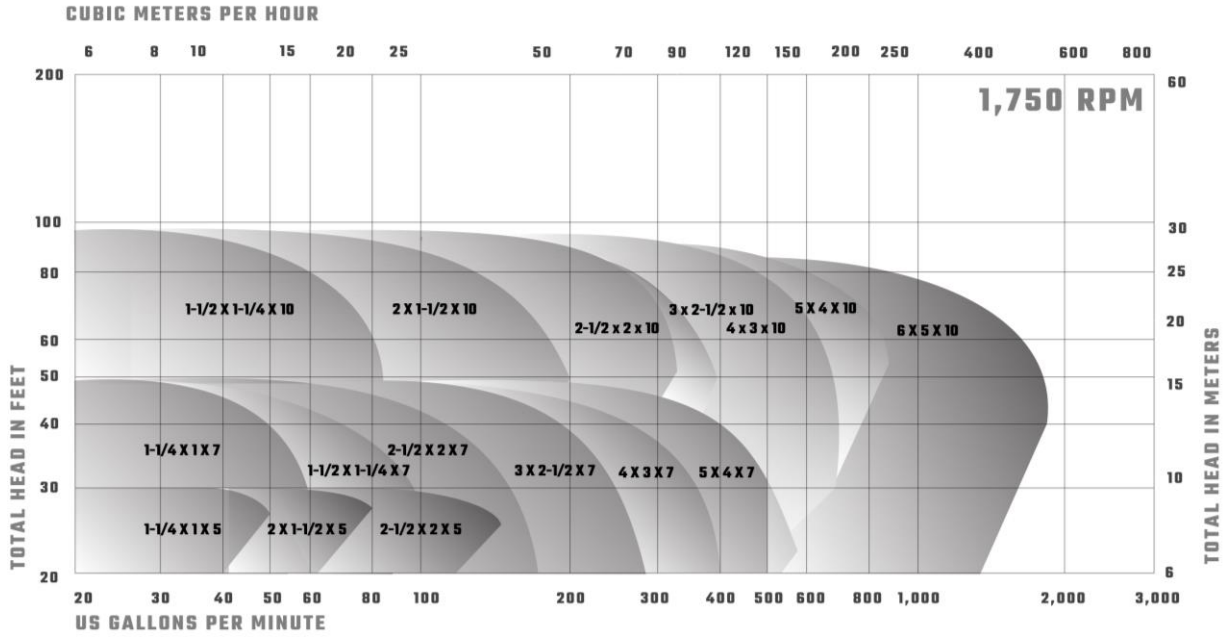
The pump shall have one mechanical seal. The seals shall have Viton elastomers, 316 stainless steel metal components, carbon on ceramic (silicon carbide) faces, and capable of operating up to 230 °F without external cooling. When conditions warrant, the pump shall also be equipped with a 316 stainless steel balance line to facilitate flushing and cooling in the stuffing box area of the pump.

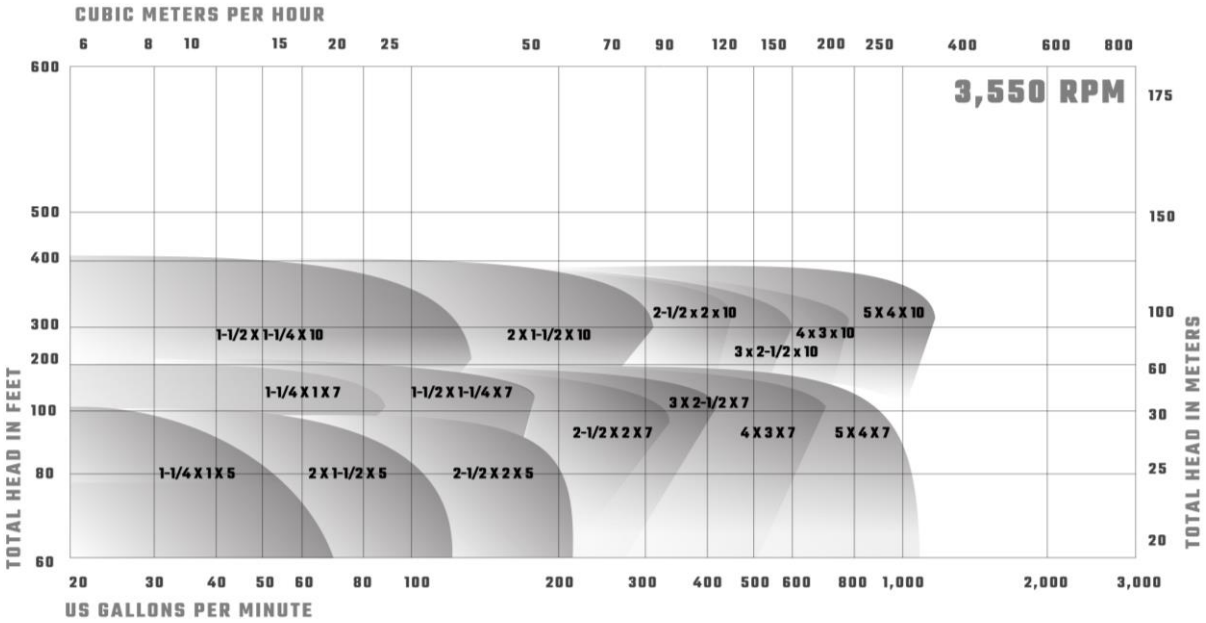
For added ease of operation, the entire pump casing shall be rotatable in 90° increments to accommodate different field piping orientations and shall be the back pull-out type to allow disassembly, inspection, and assembly without otherwise disturbing the pump mounting or system piping.

The pump shall be supplied complete with a baseplate, coupling, and coupling guard. If an electric motor is also provided, it shall be sized to operate throughout the entire range of the pump performance curve without exceeding the nameplate horsepower rating of the motor. In all cases, the pump shall be a heavy-duty industrial design, GHJM Close-Coupled Pump as manufactured by the Carver Pump Company of Muscatine, Iowa, or ISO-9001 certified, United States manufactured approved equal.

1.7 GHJM Hydraulic Coverage and Performance by Individual Size.

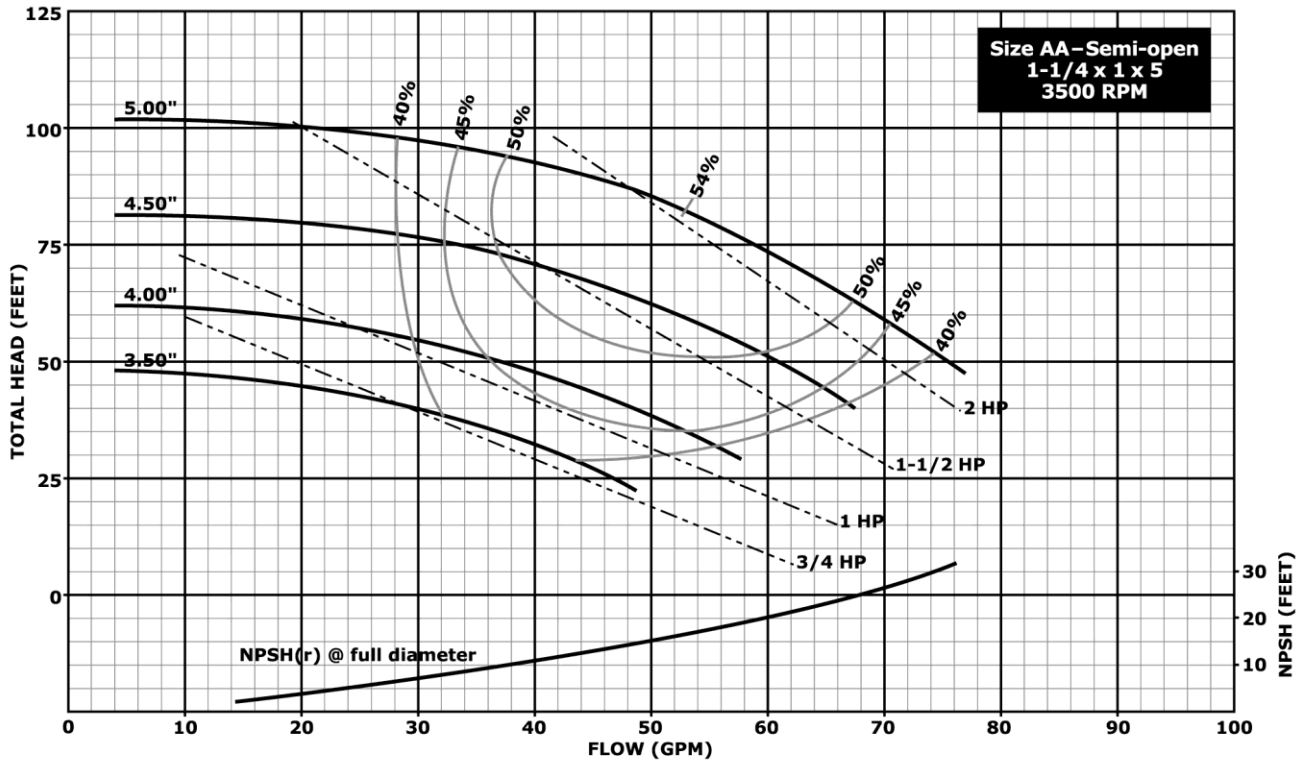
GHJM hydraulic performance extends to 1,800 GPM and 400 feet of head. This range is covered by sixteen sizes in cast iron or 316 SS fitted cast iron construction.

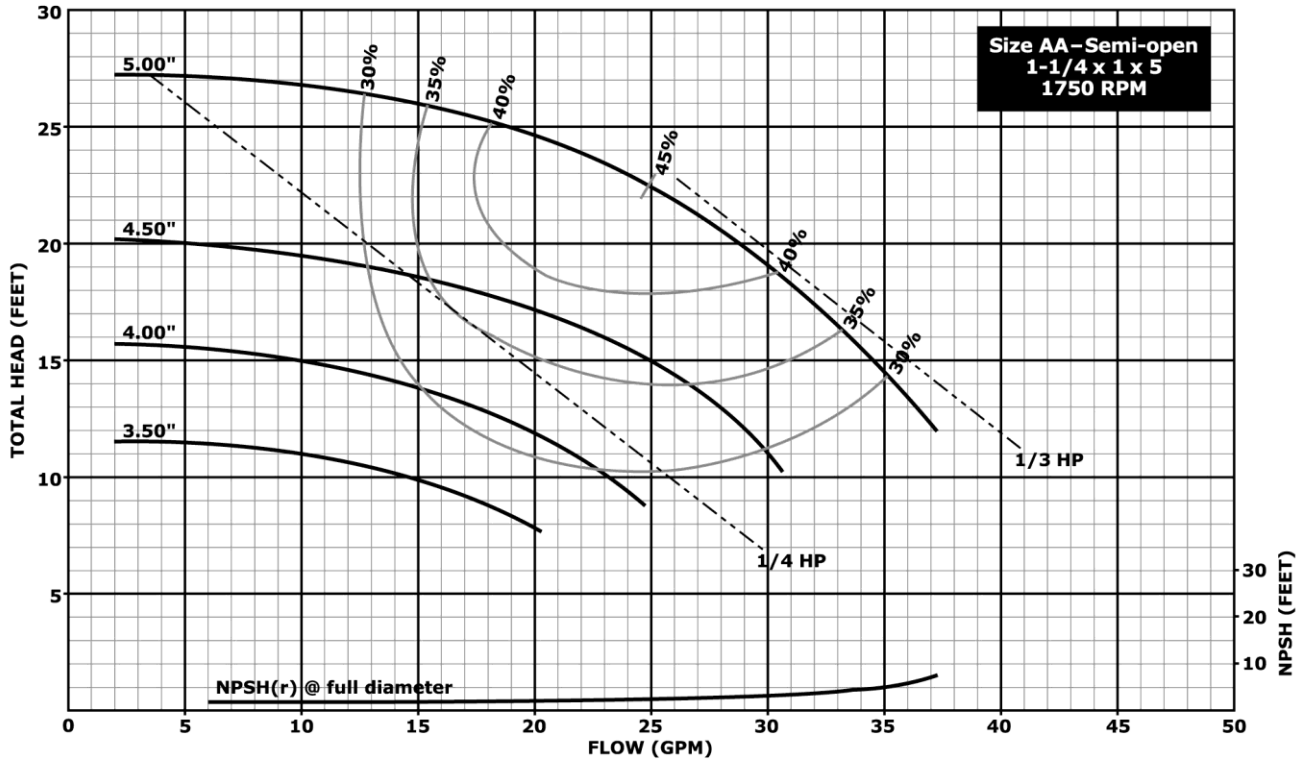




All 5”, 7”, and 10” pumps with 2” or smaller discharges have NPT connections. All other sizes have ANSI flat face 125 lb. (cast iron) or 150 lb. (316 SS) flanges.

Hydraulic Performance – 5” Impeller Pumps

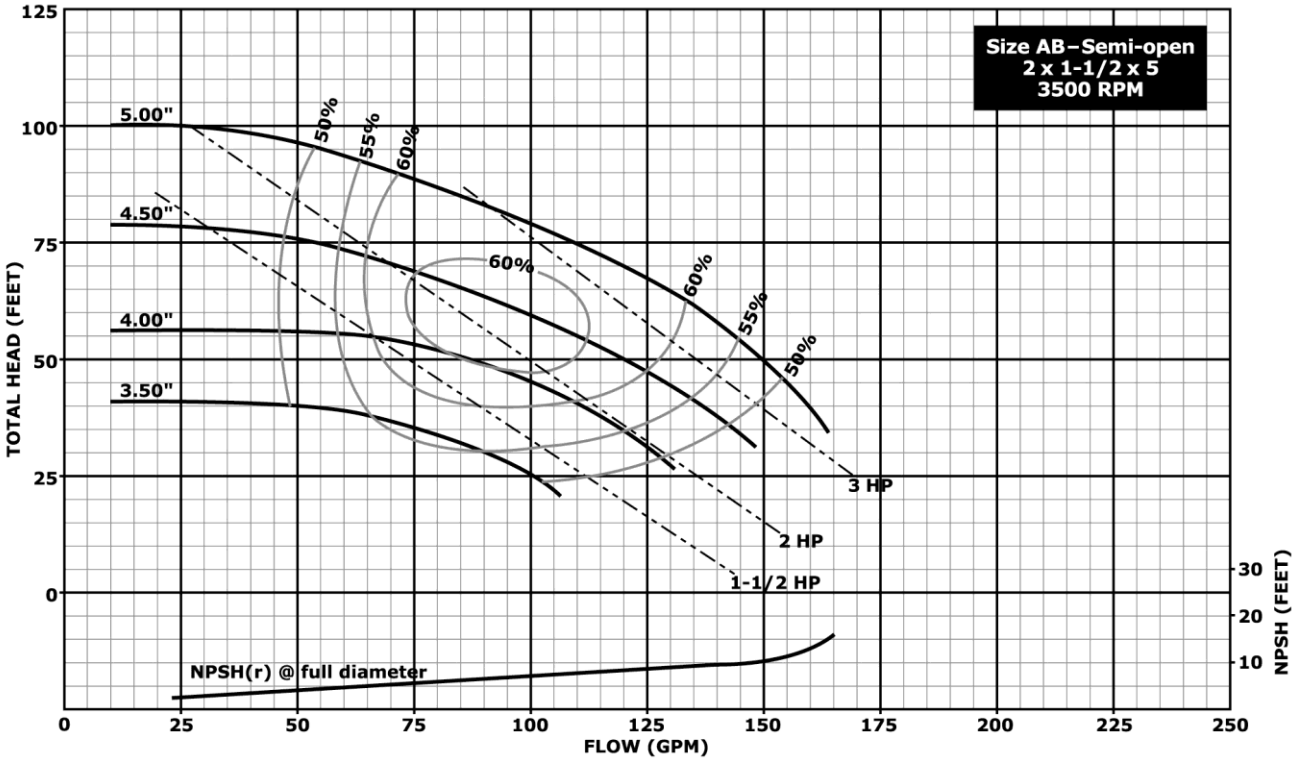


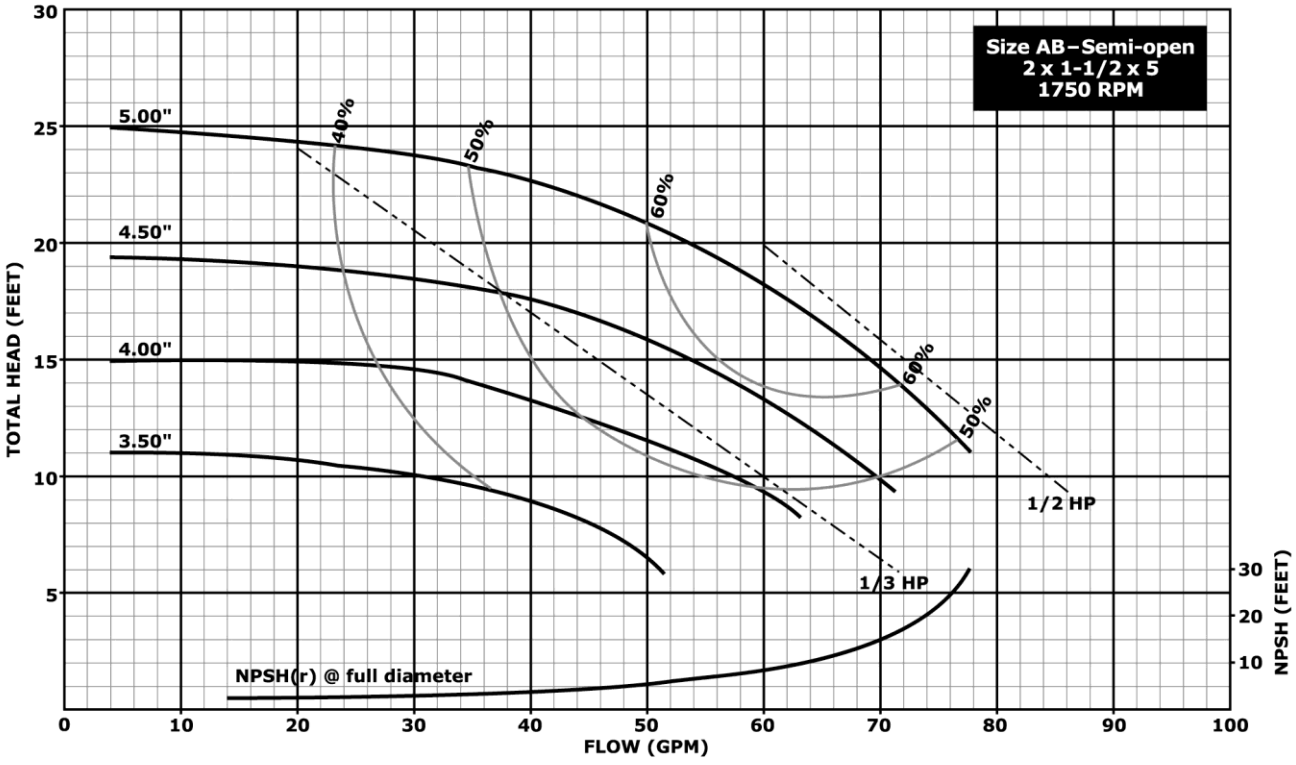


Notes:

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 – 5” Impeller Pumps





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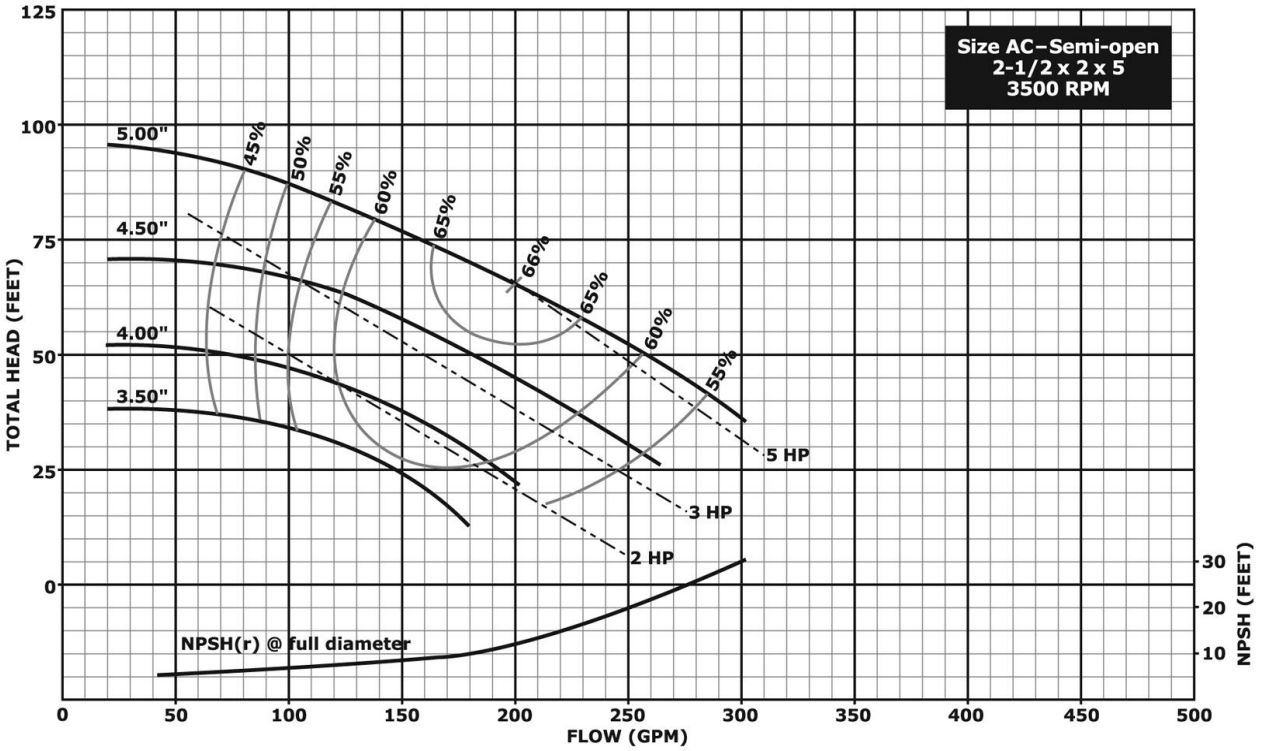
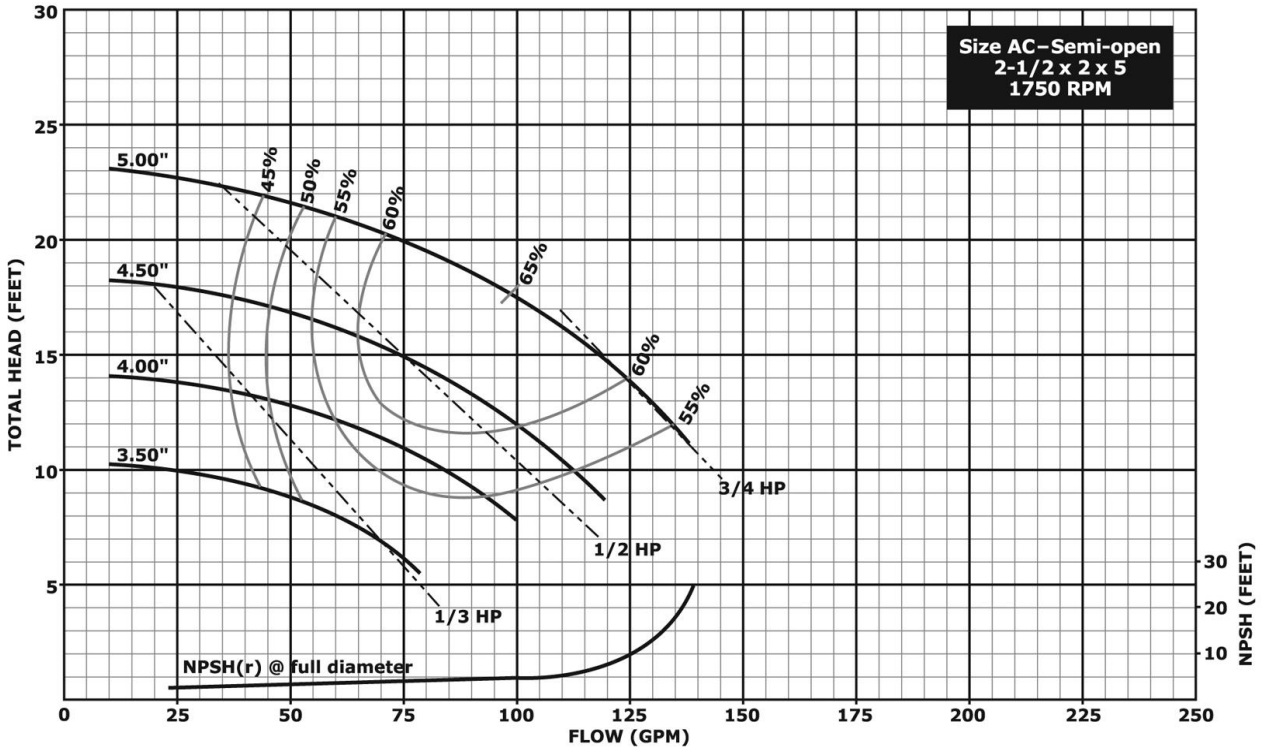
Hydraulic Performance – 5” Impeller Pumps





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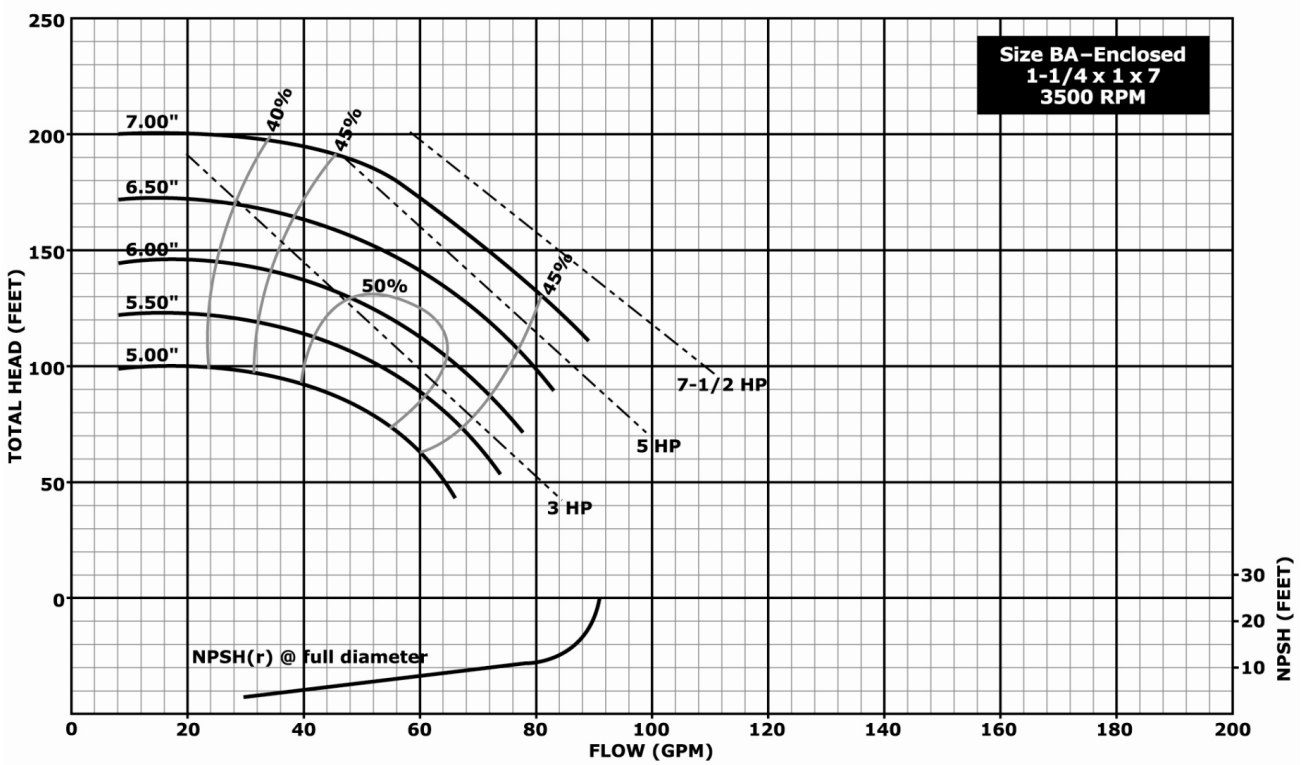
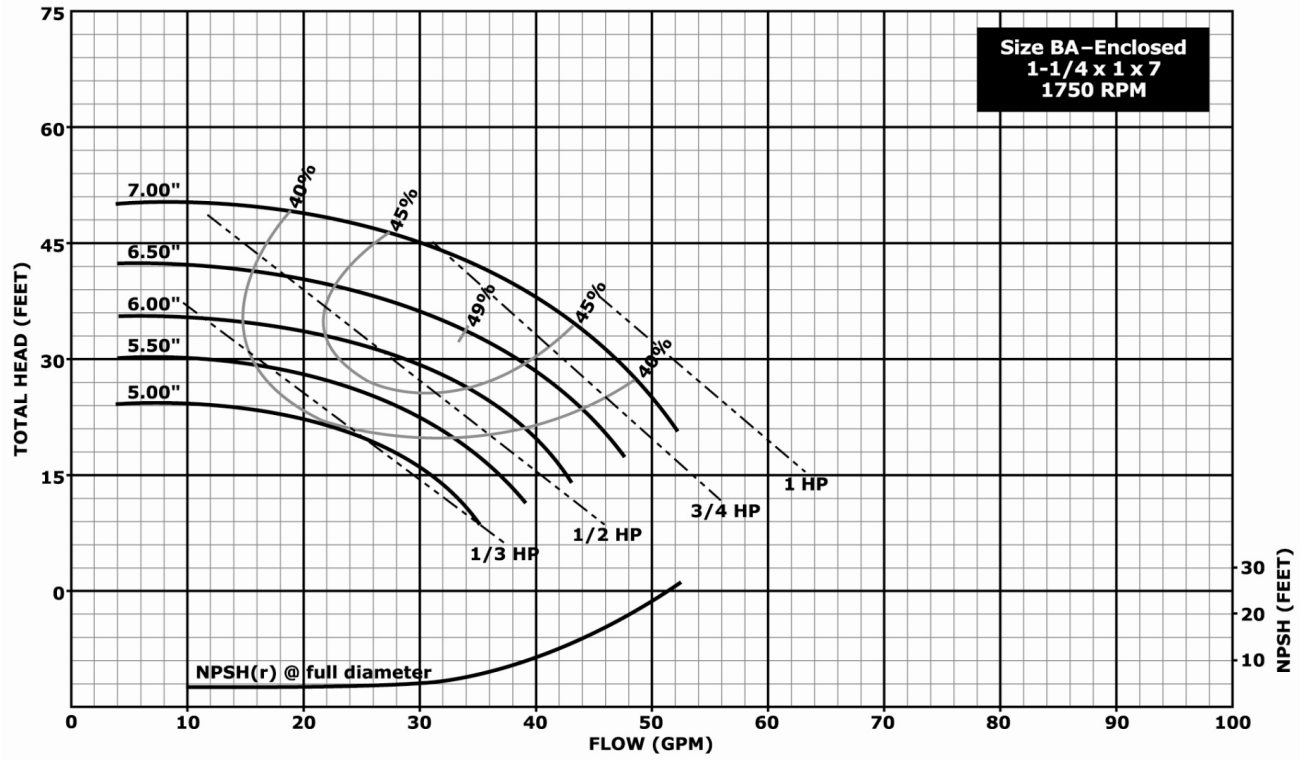
Hydraulic Performance – 7” Impeller Pumps





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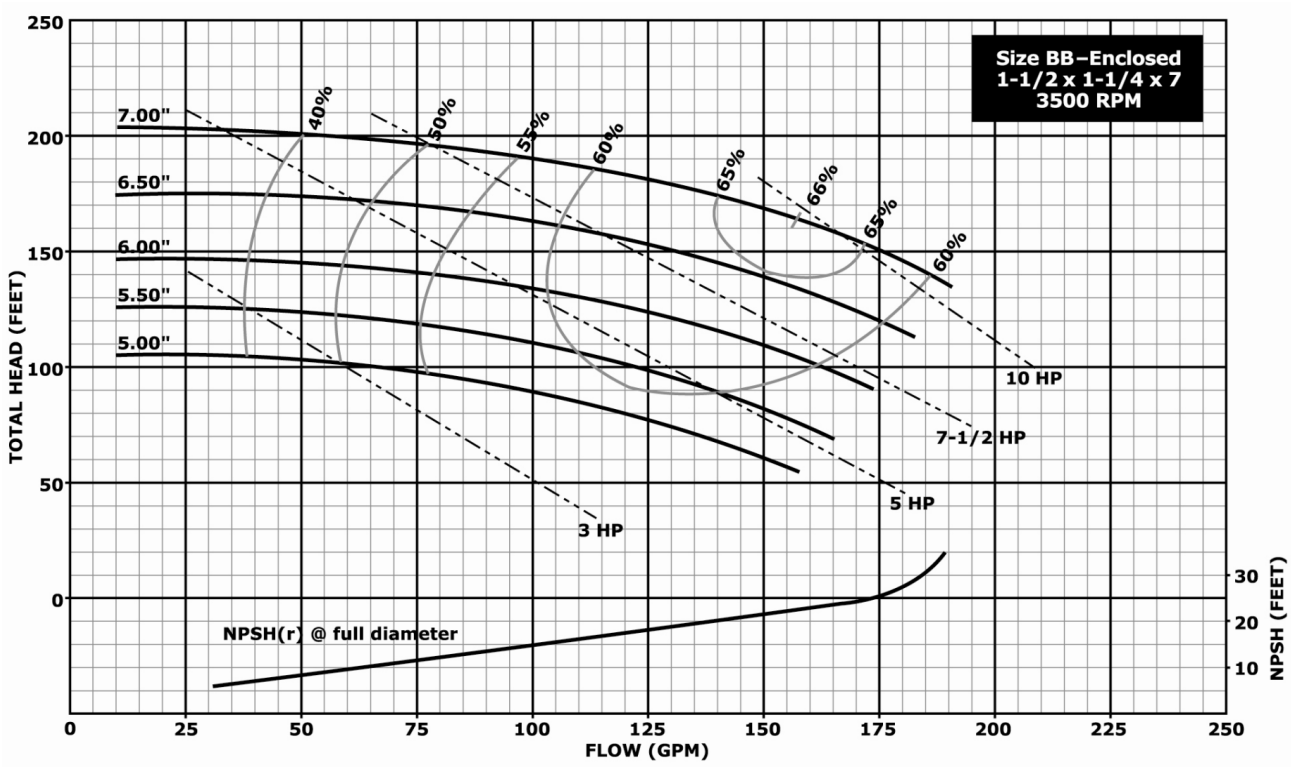
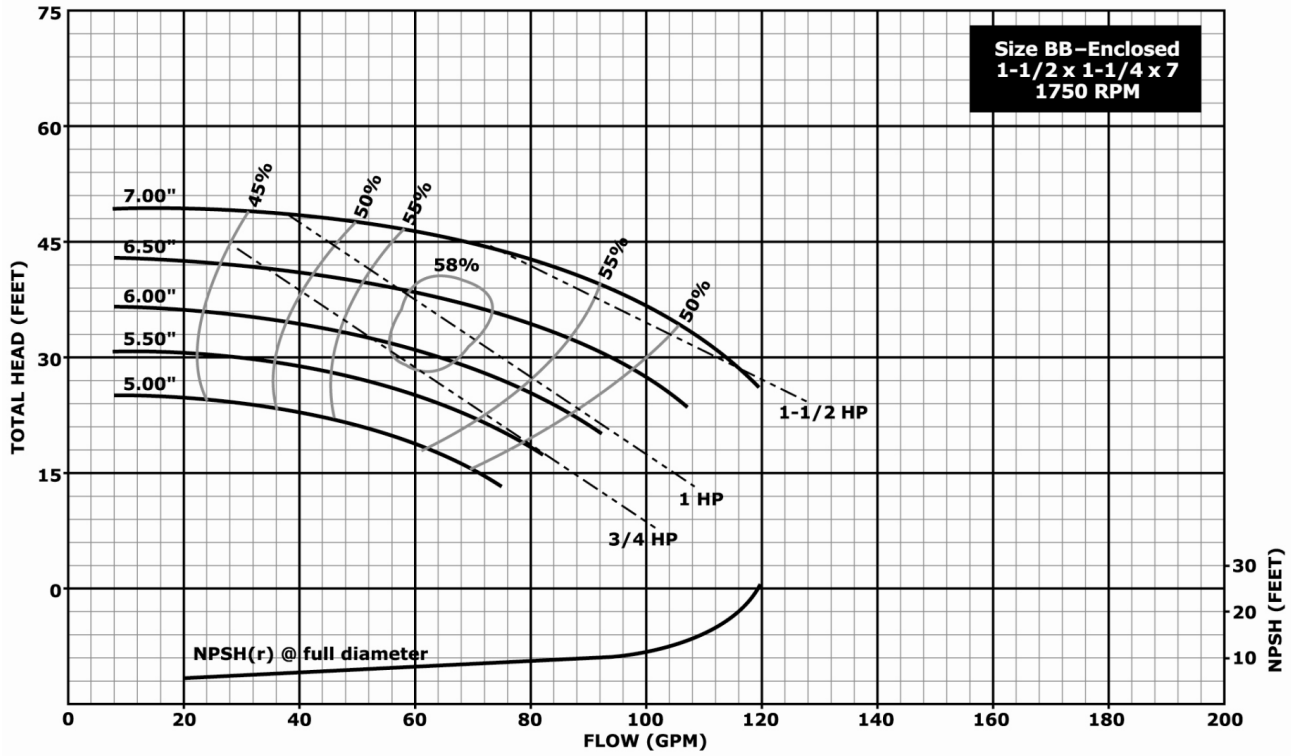
Hydraulic Performance – 7” Impeller Pumps





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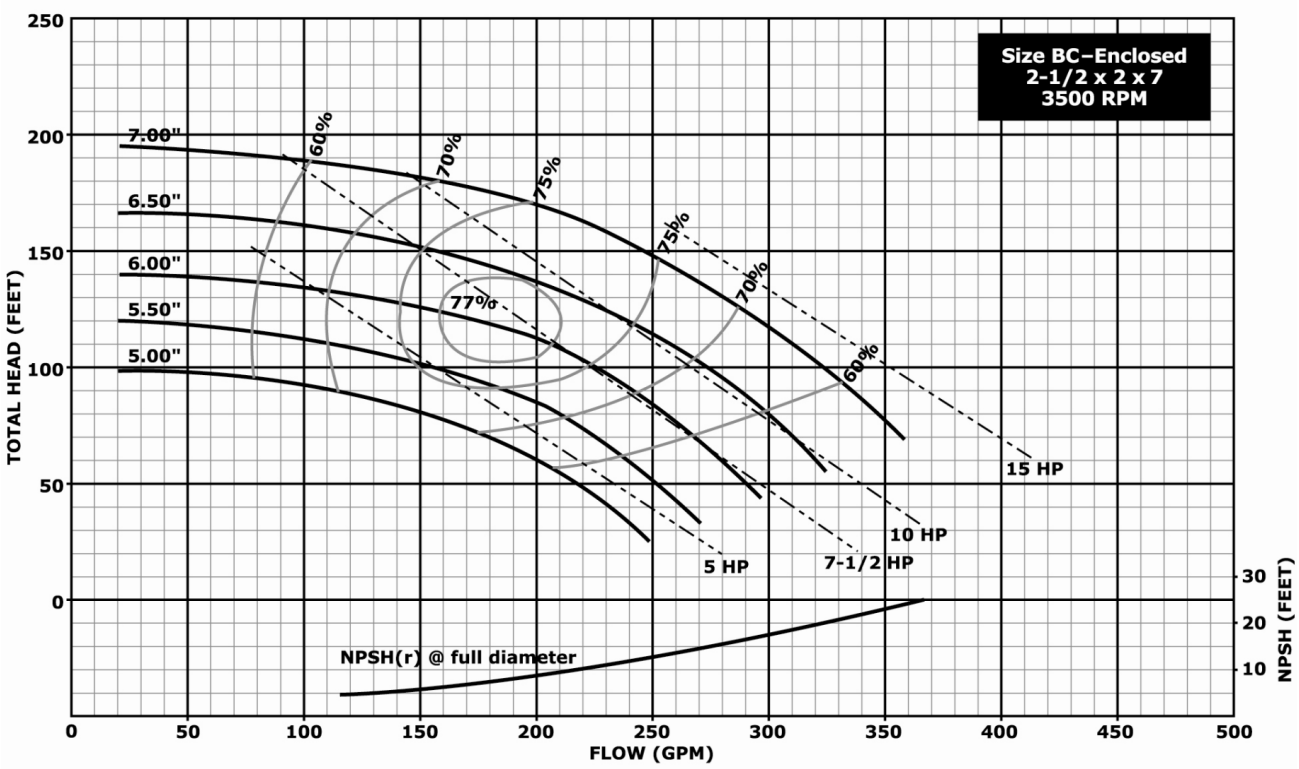

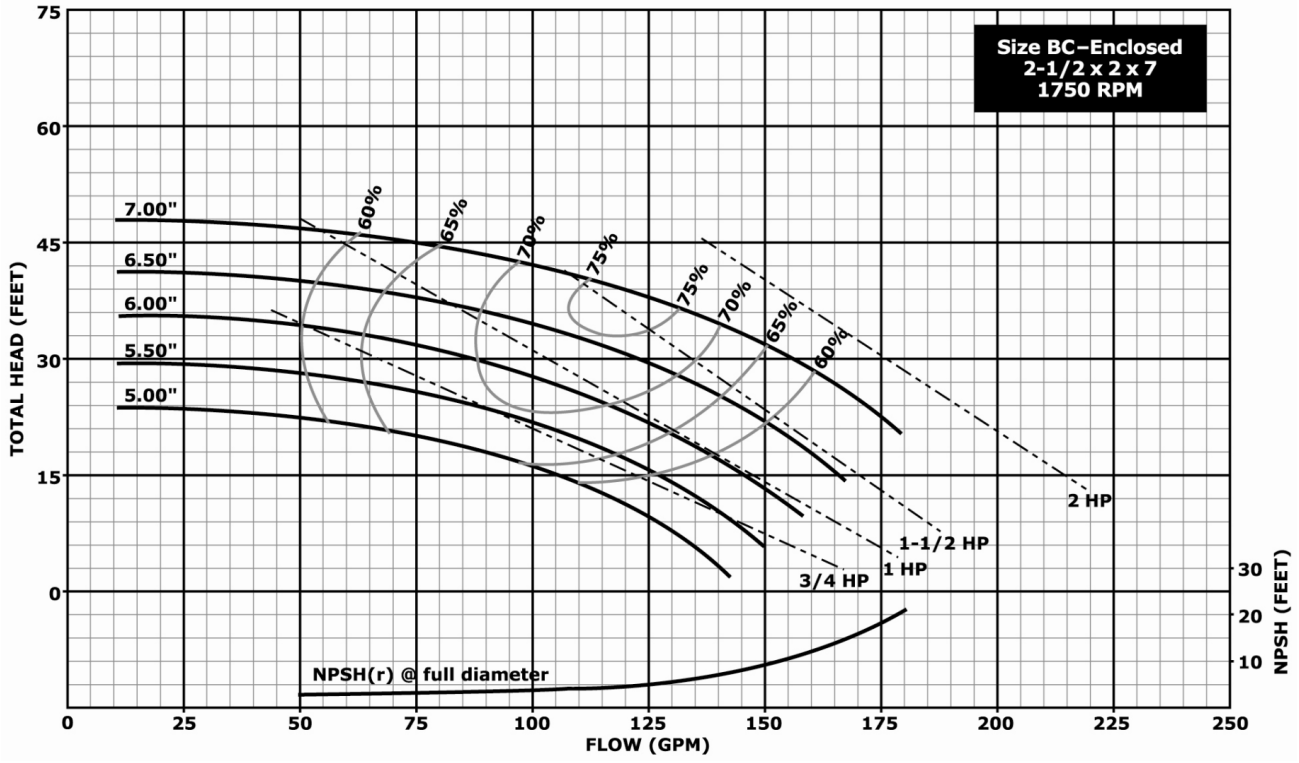

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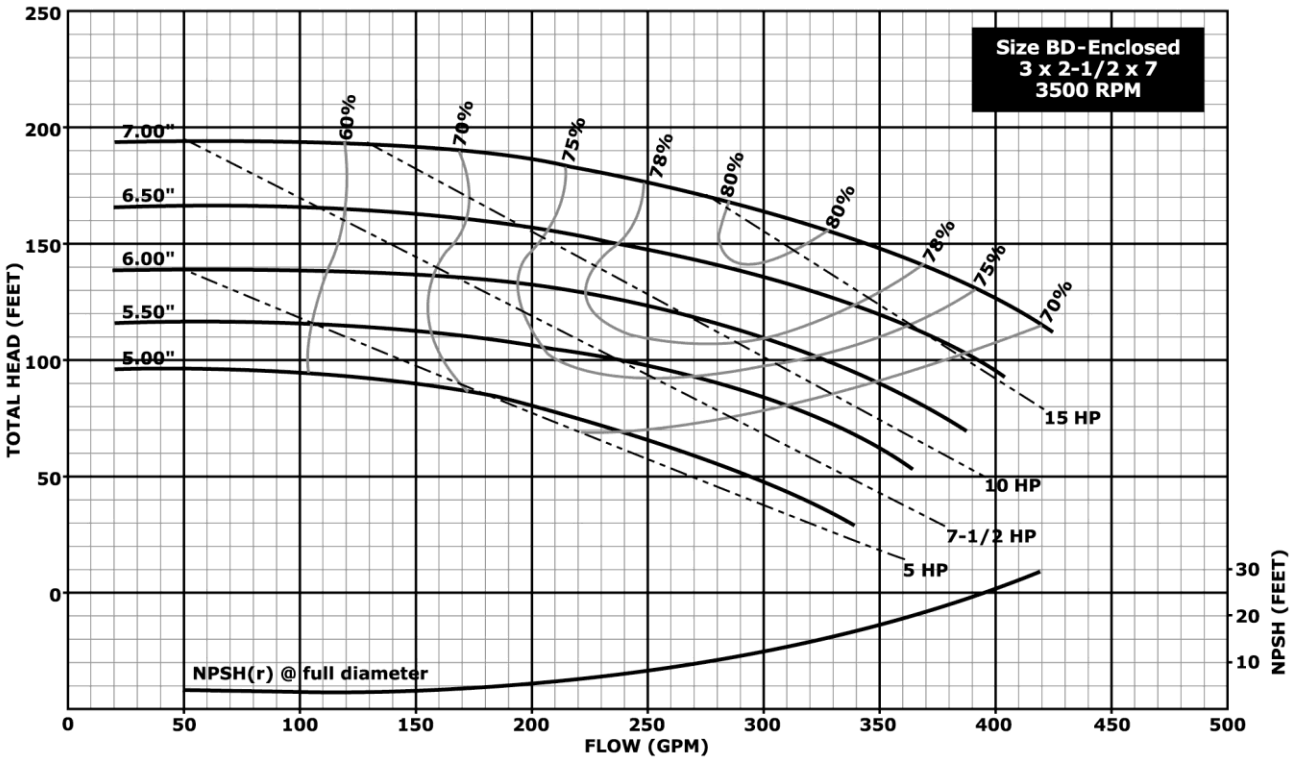

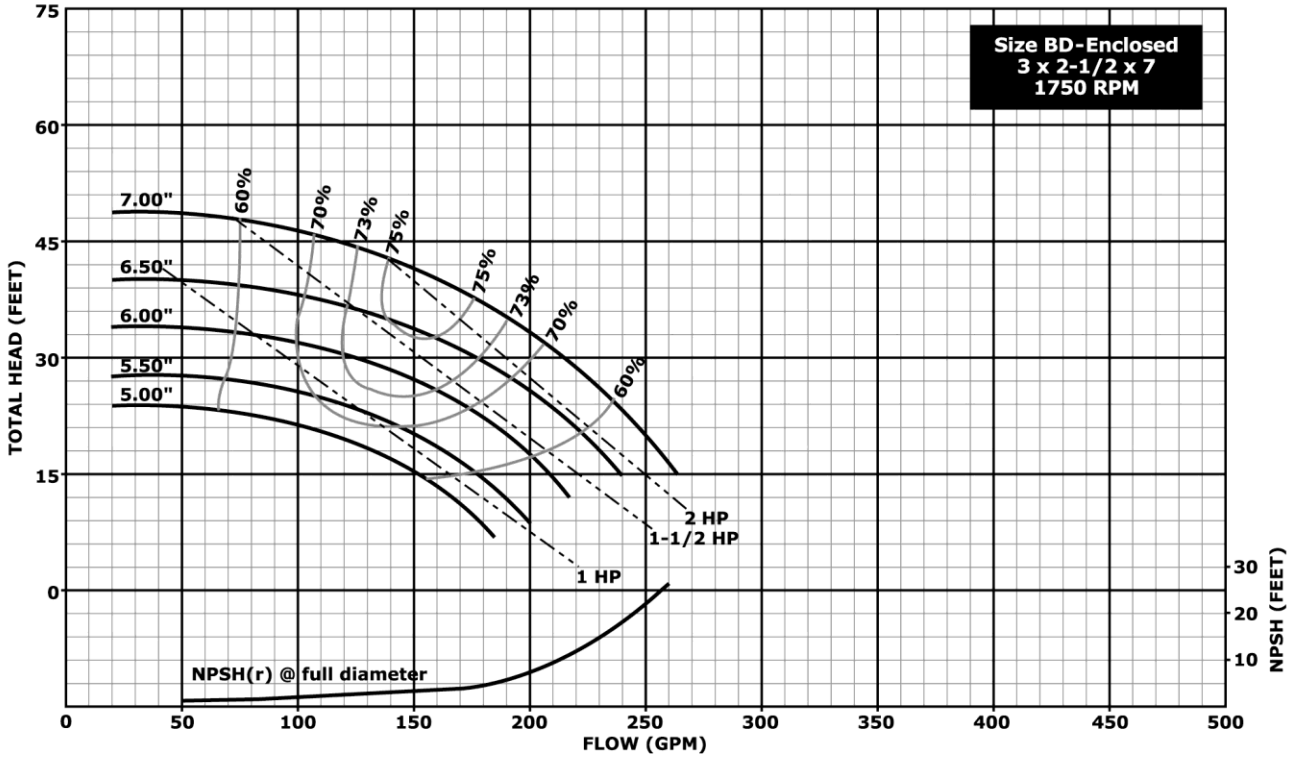

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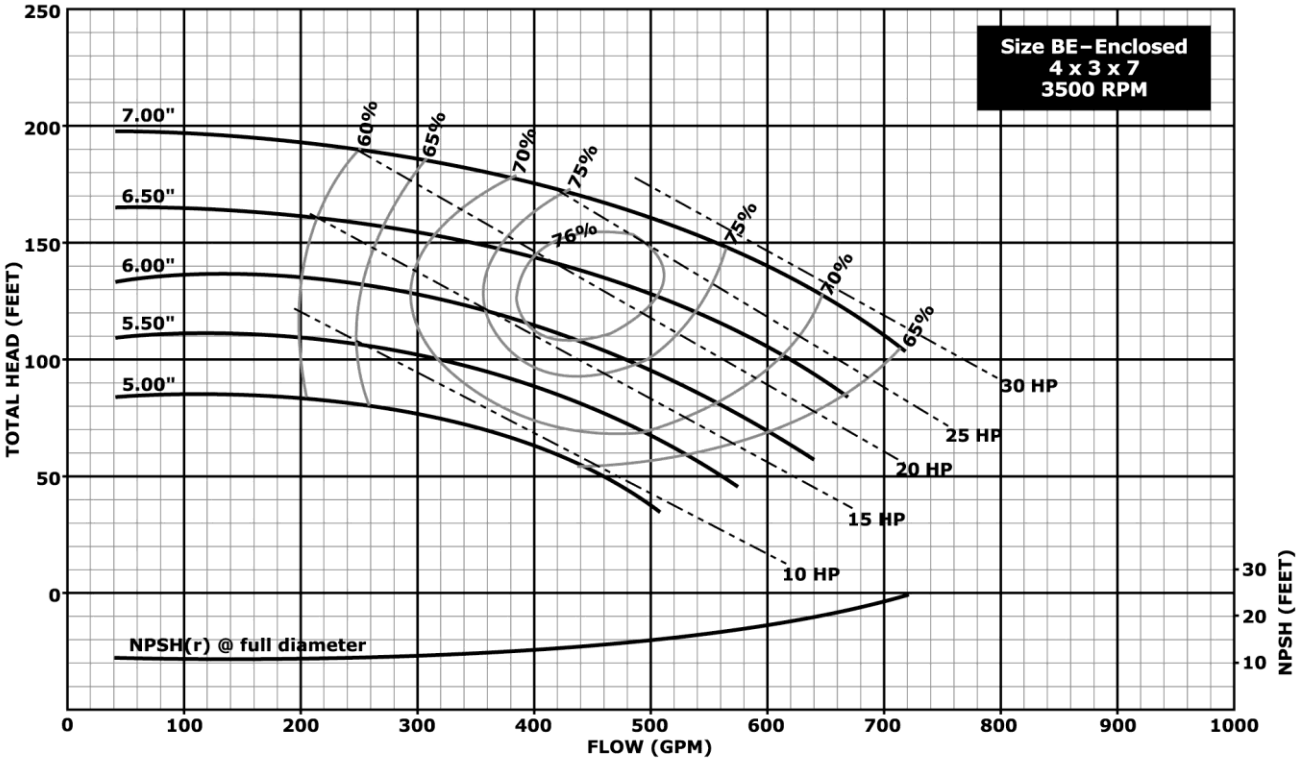
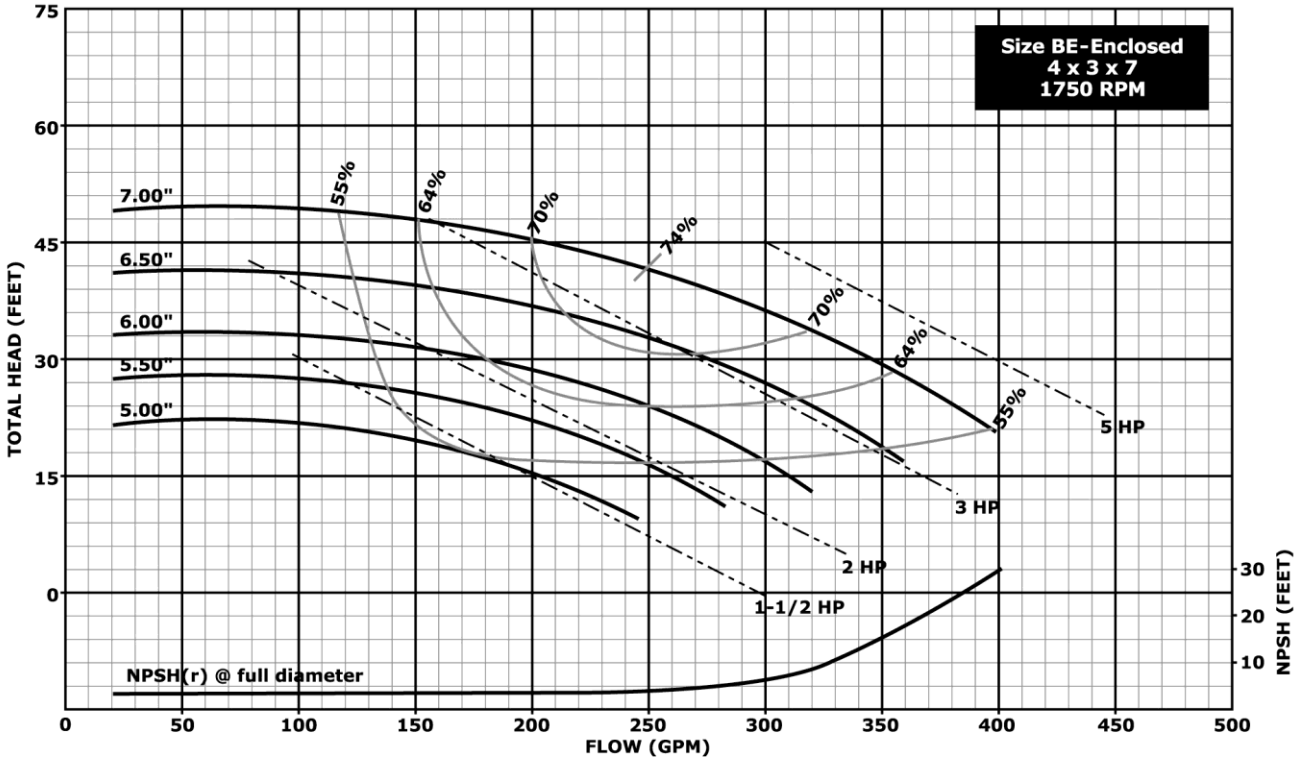
Hydraulic Performance – 7” Impeller Pumps





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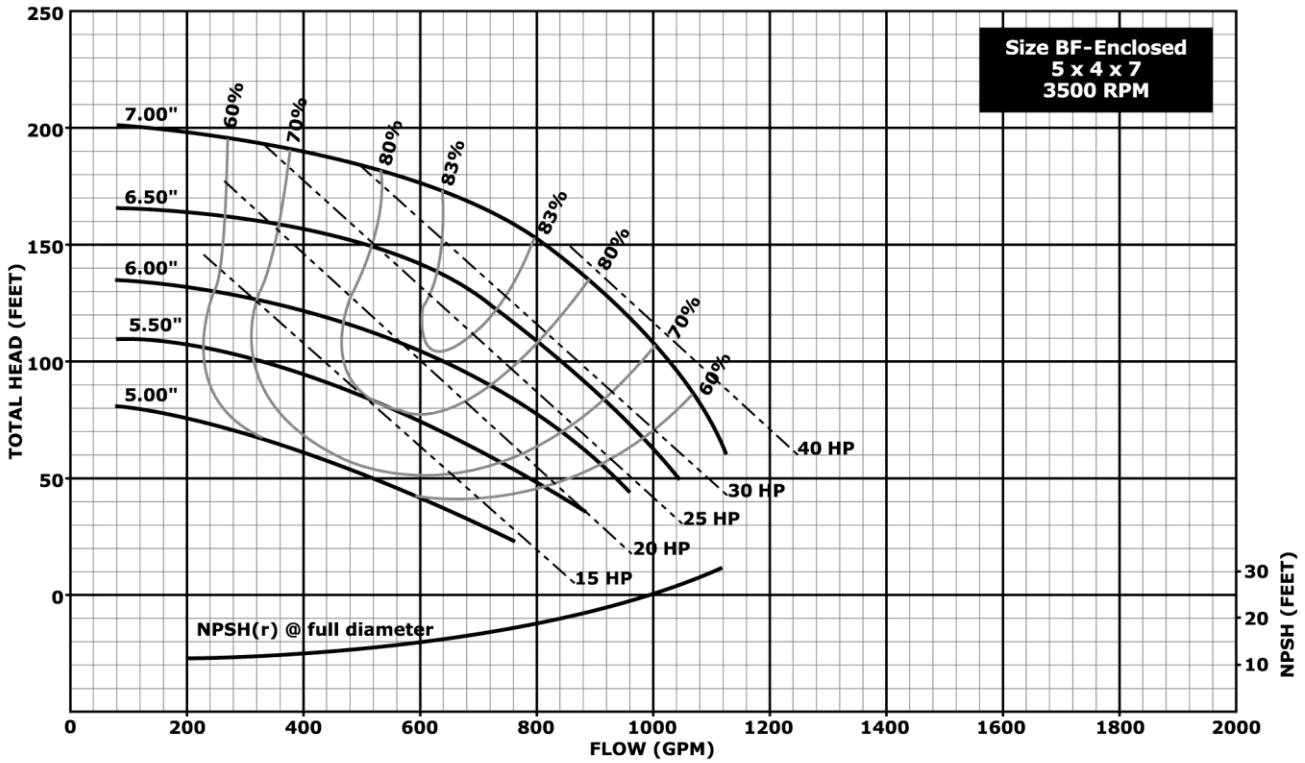
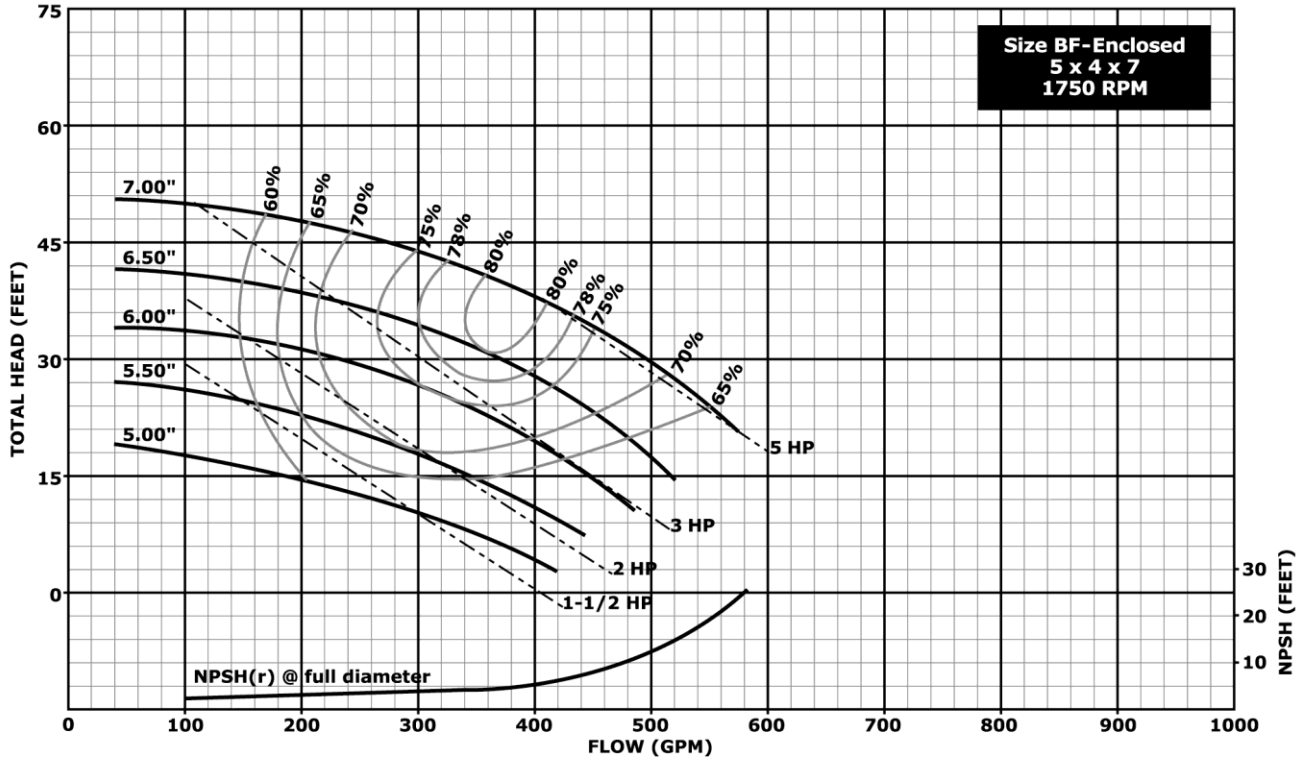
Hydraulic Performance – 7” Impeller Pumps





Notes:

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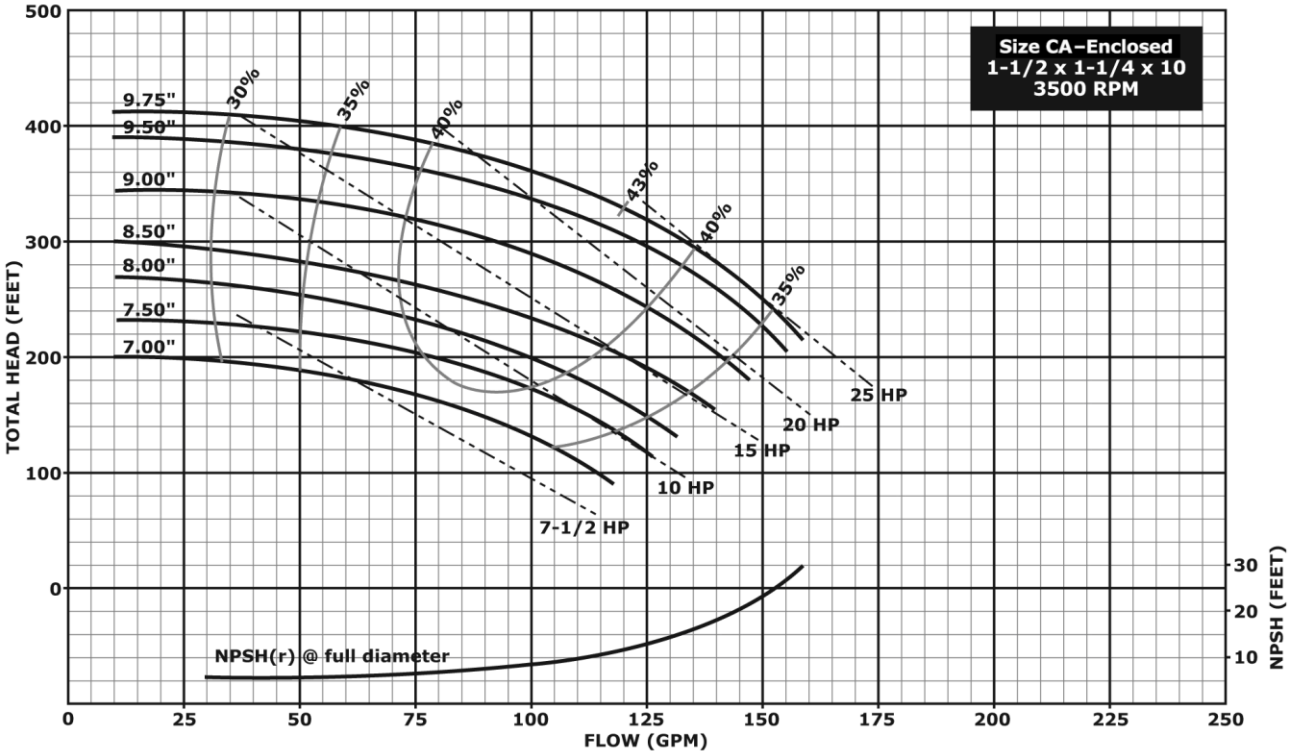
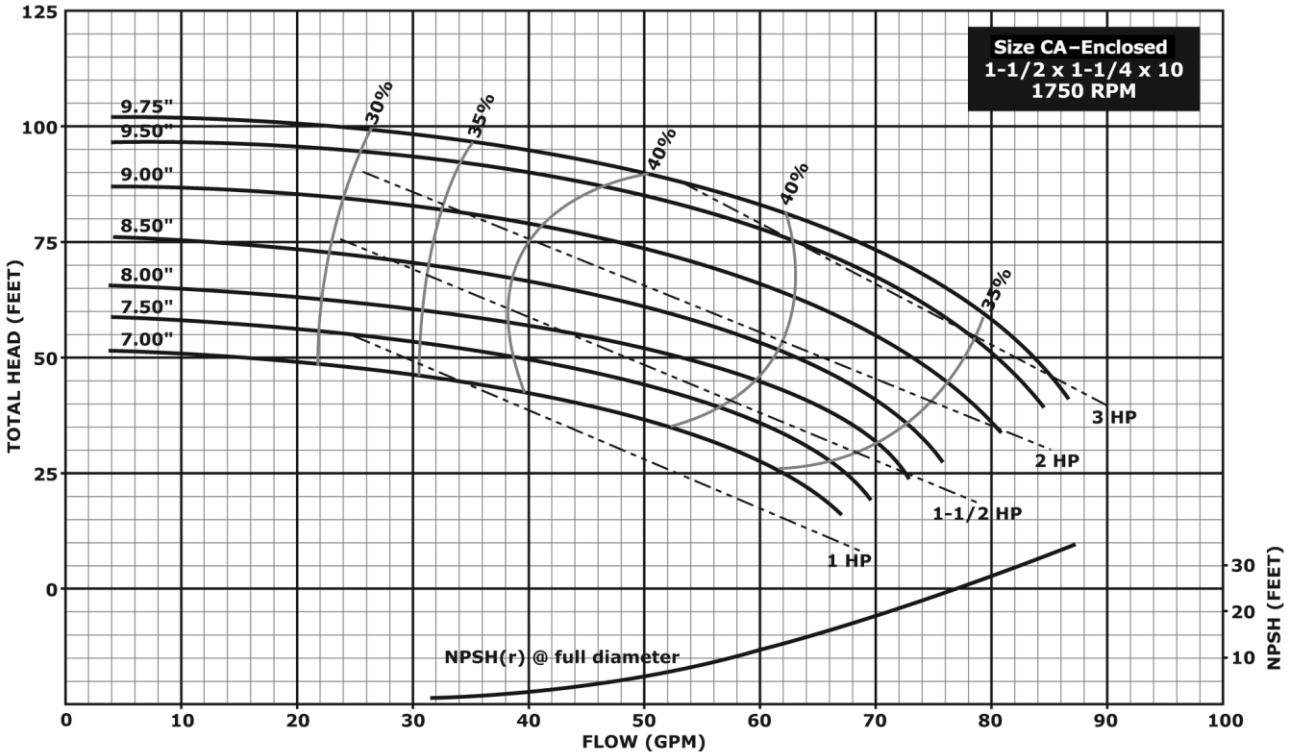
Hydraulic Performance – 10” Impeller Pumps





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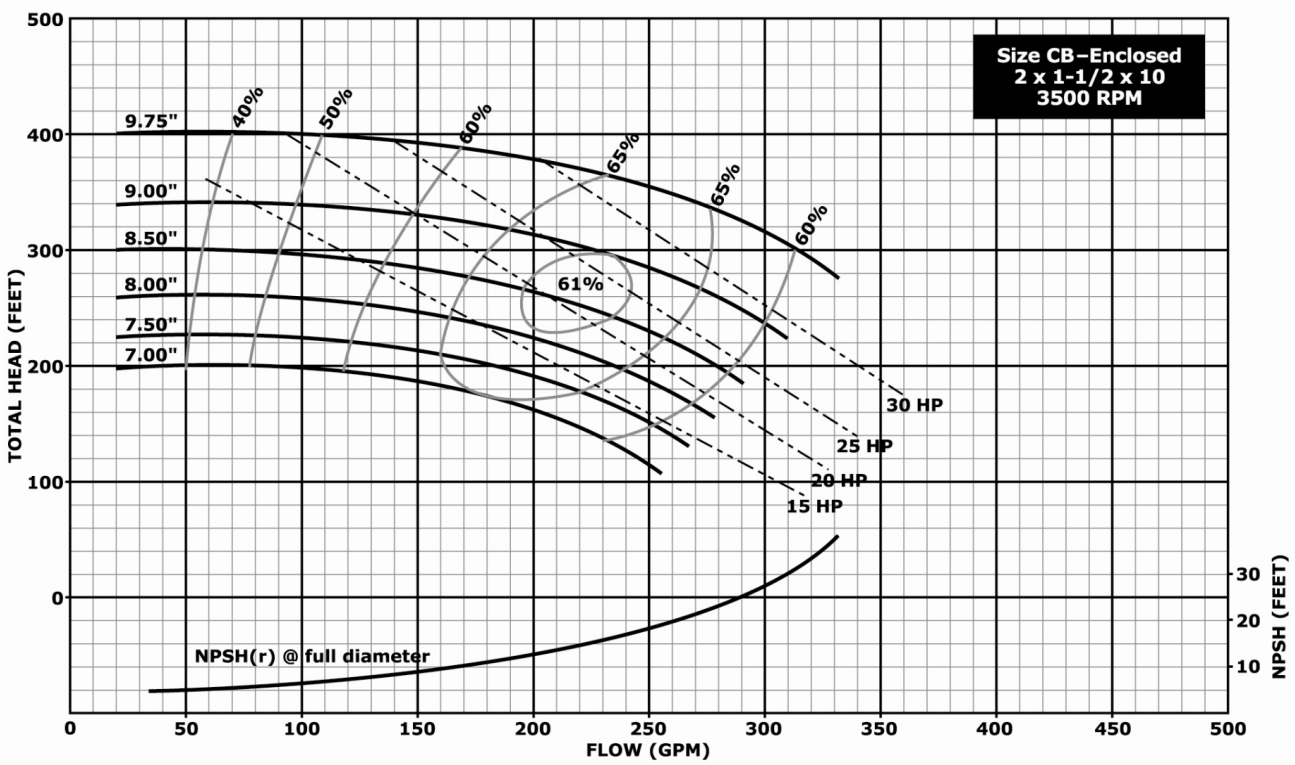
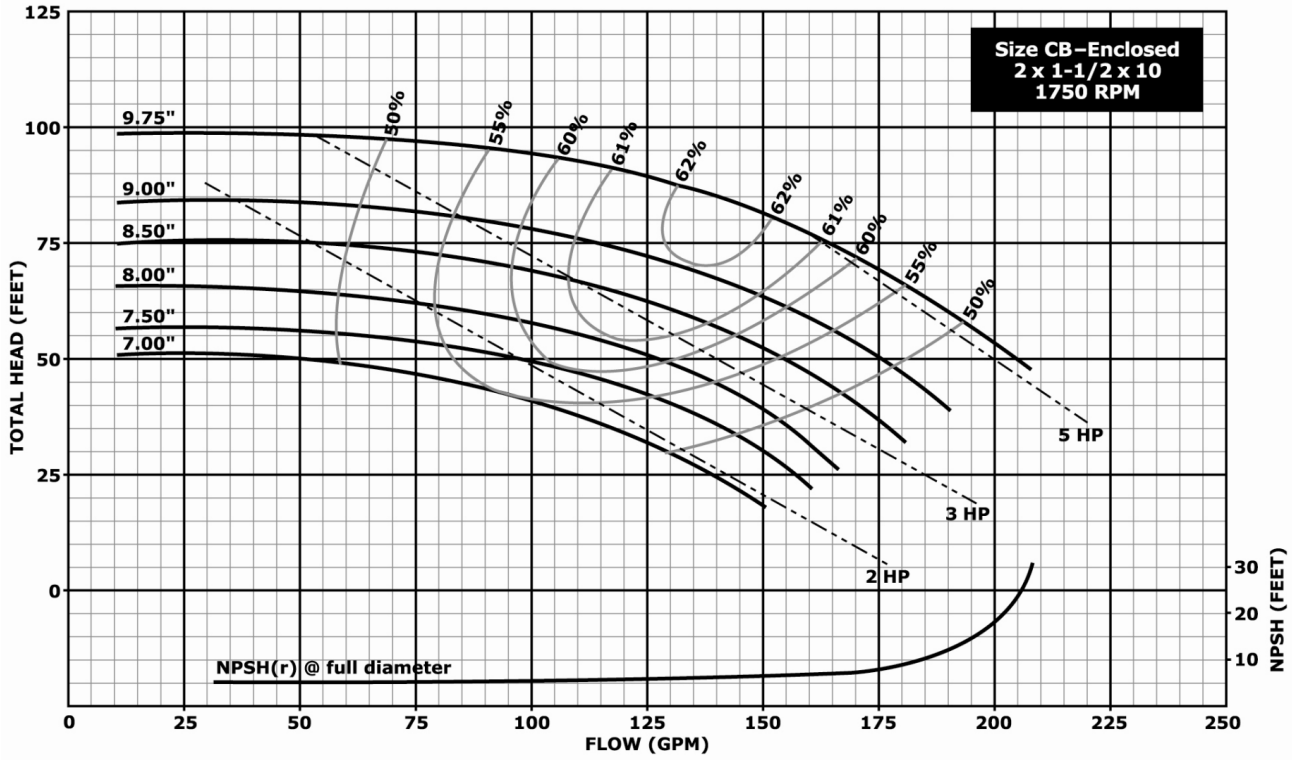
Hydraulic Performance – 10” Impeller Pumps





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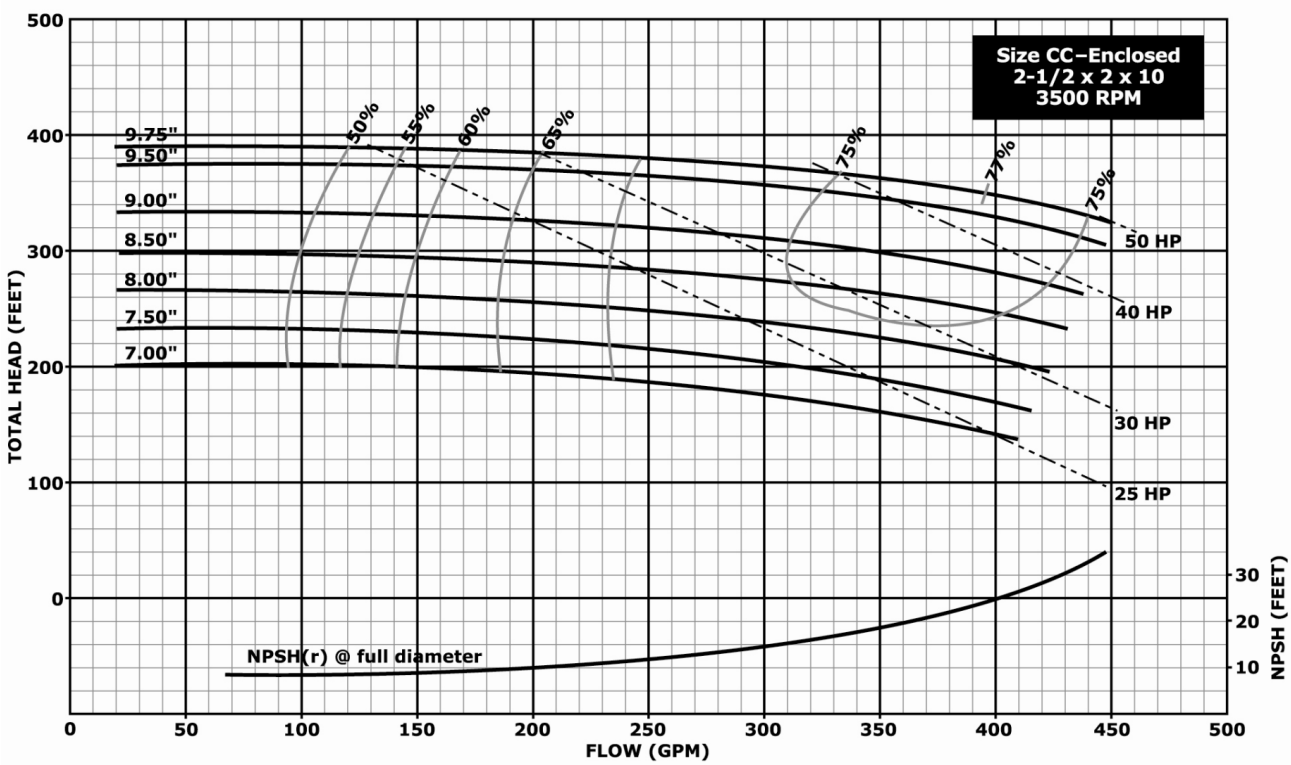
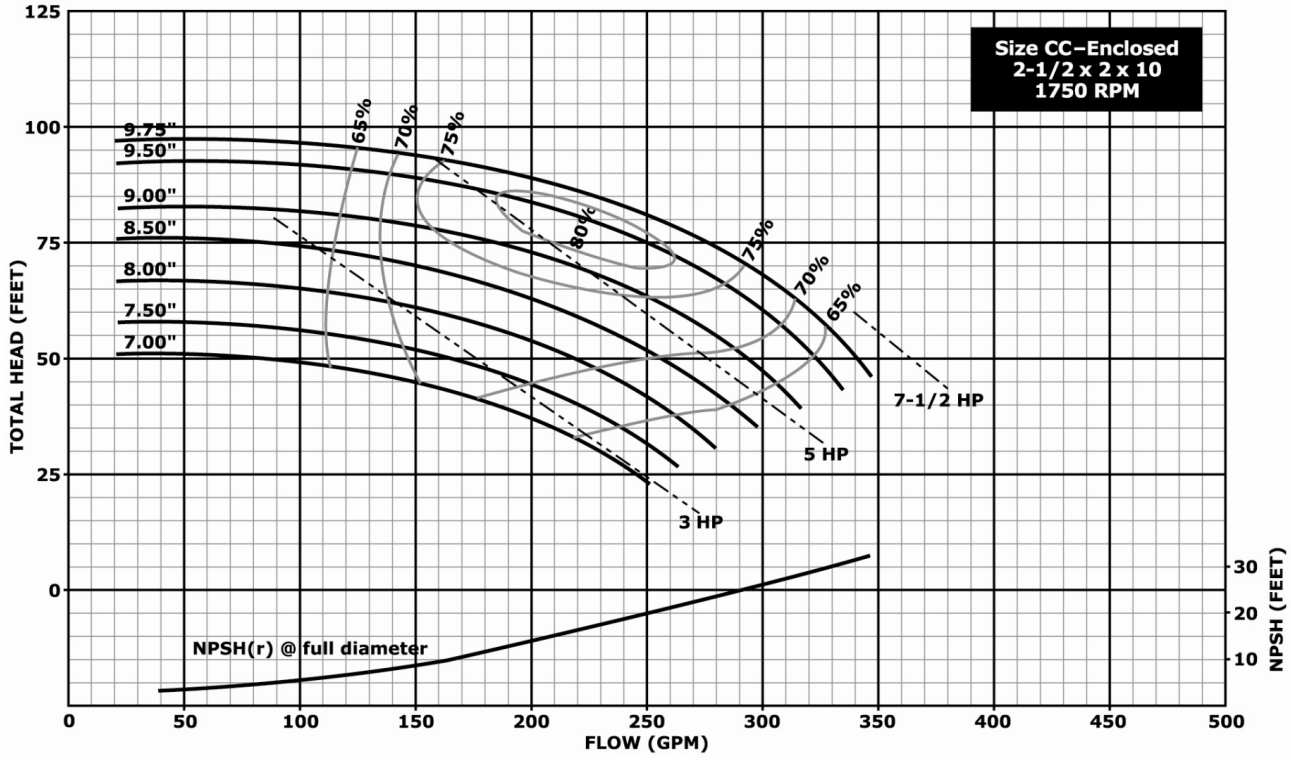
Hydraulic Performance – 10” Impeller Pumps





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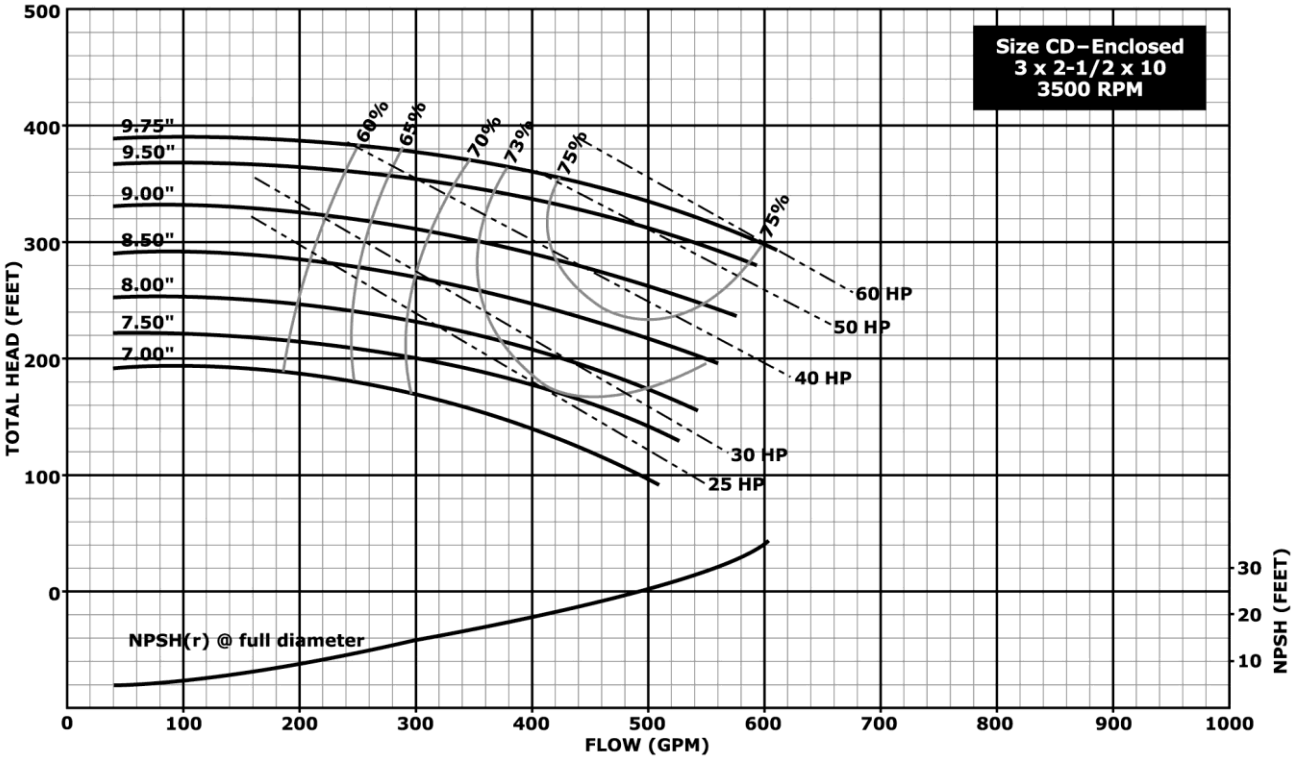
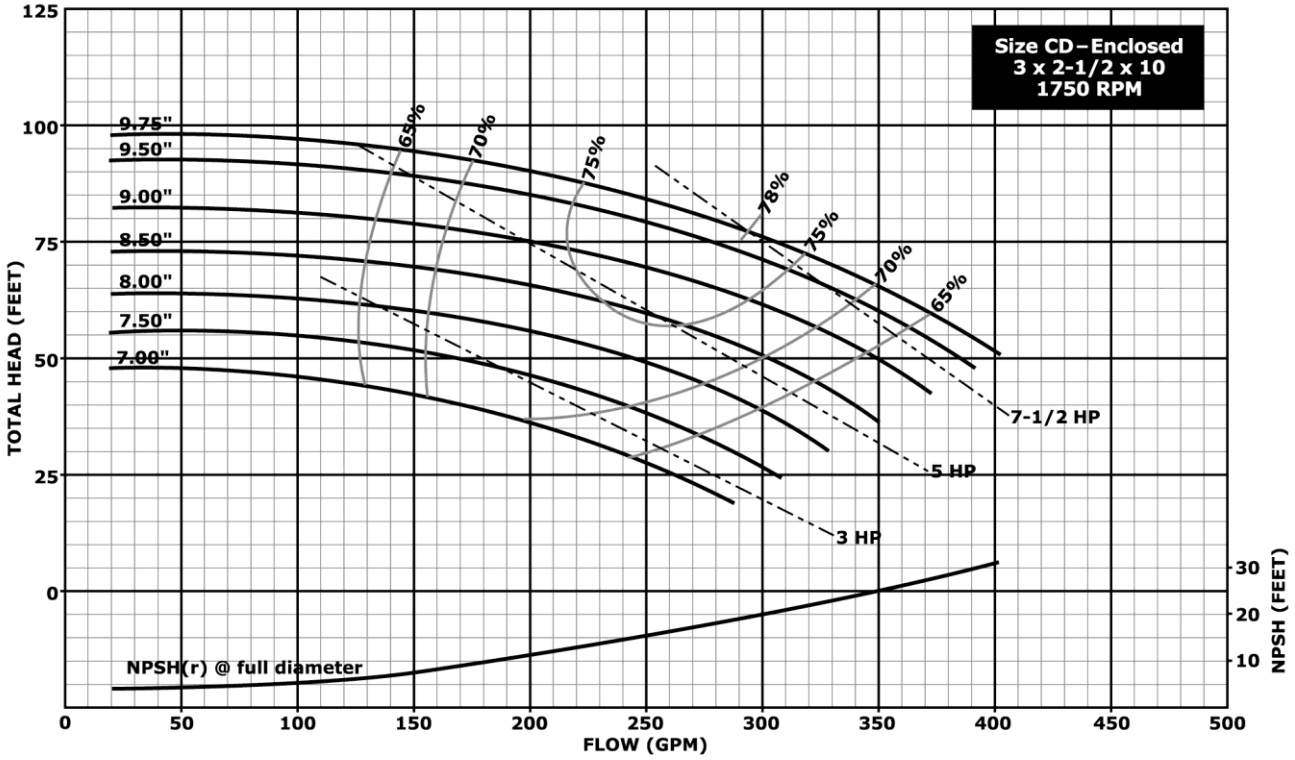
Hydraulic Performance – 10” Impeller Pumps





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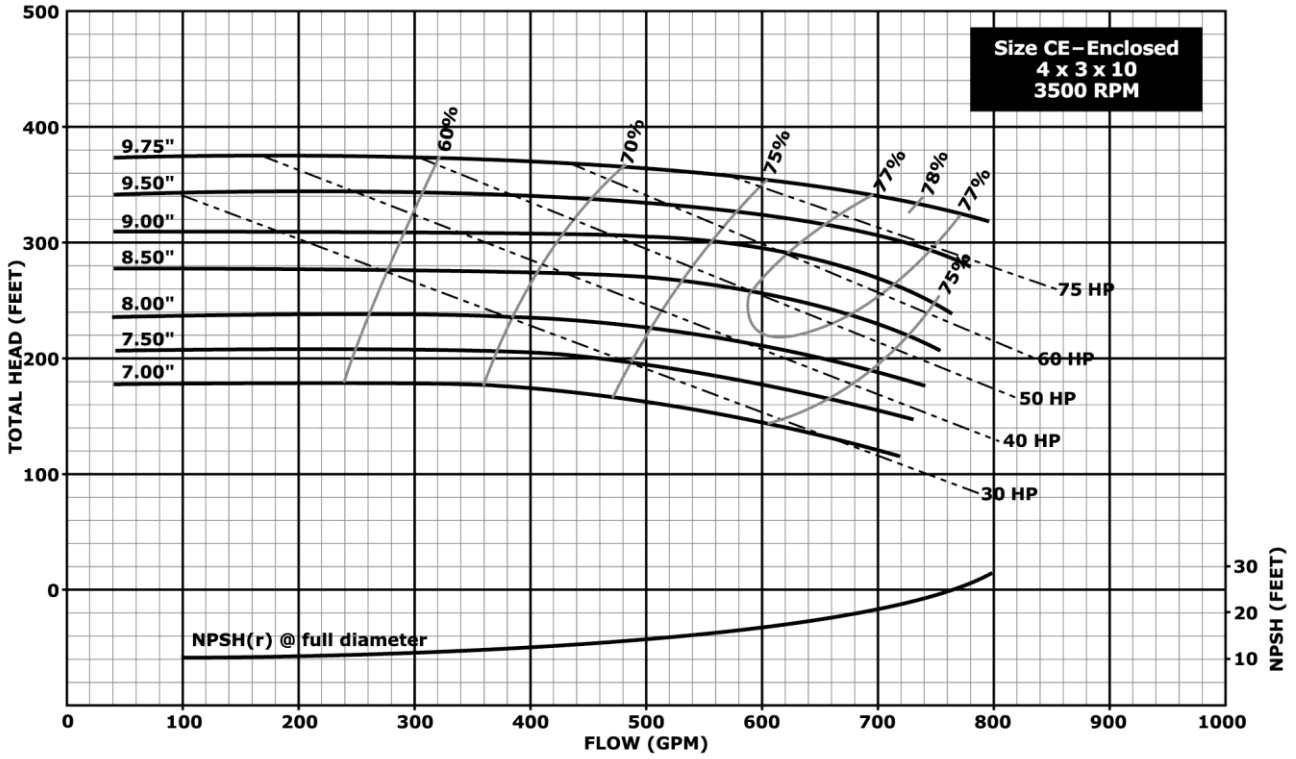
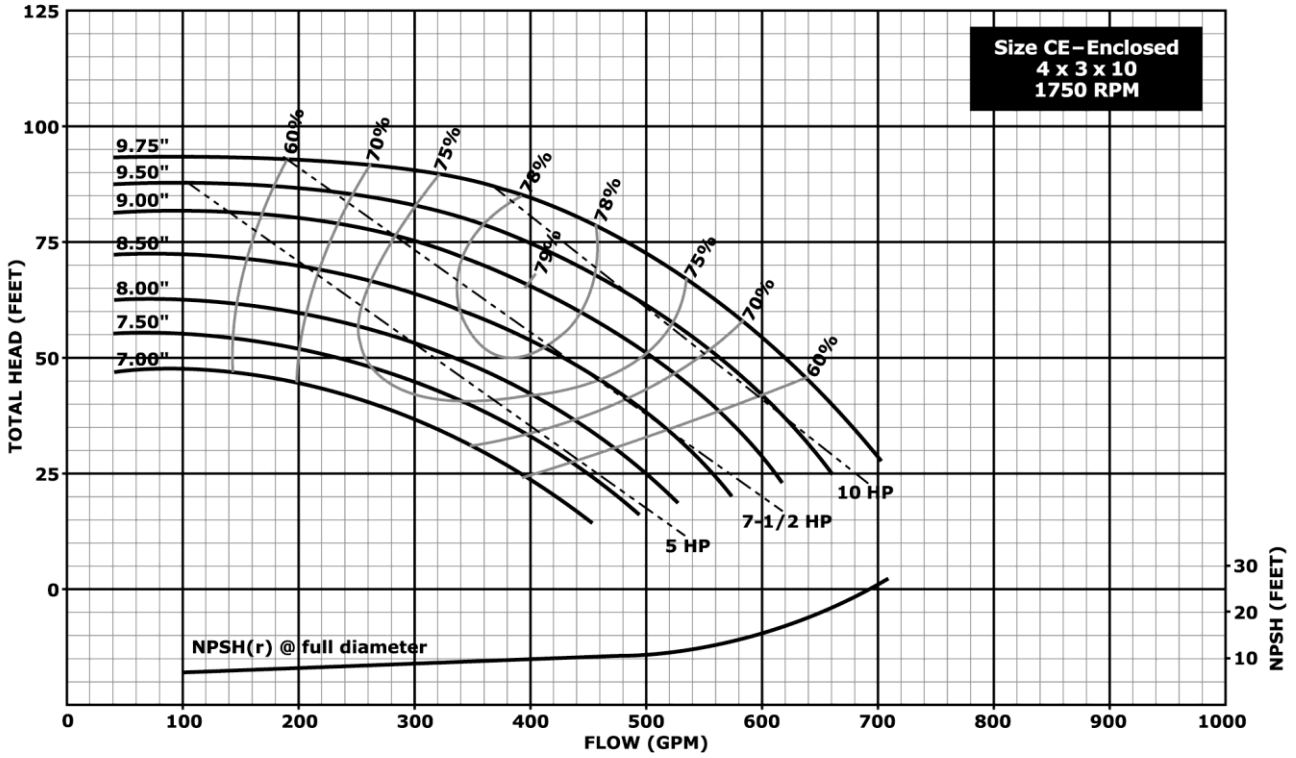
Hydraulic Performance – 10” Impeller Pumps

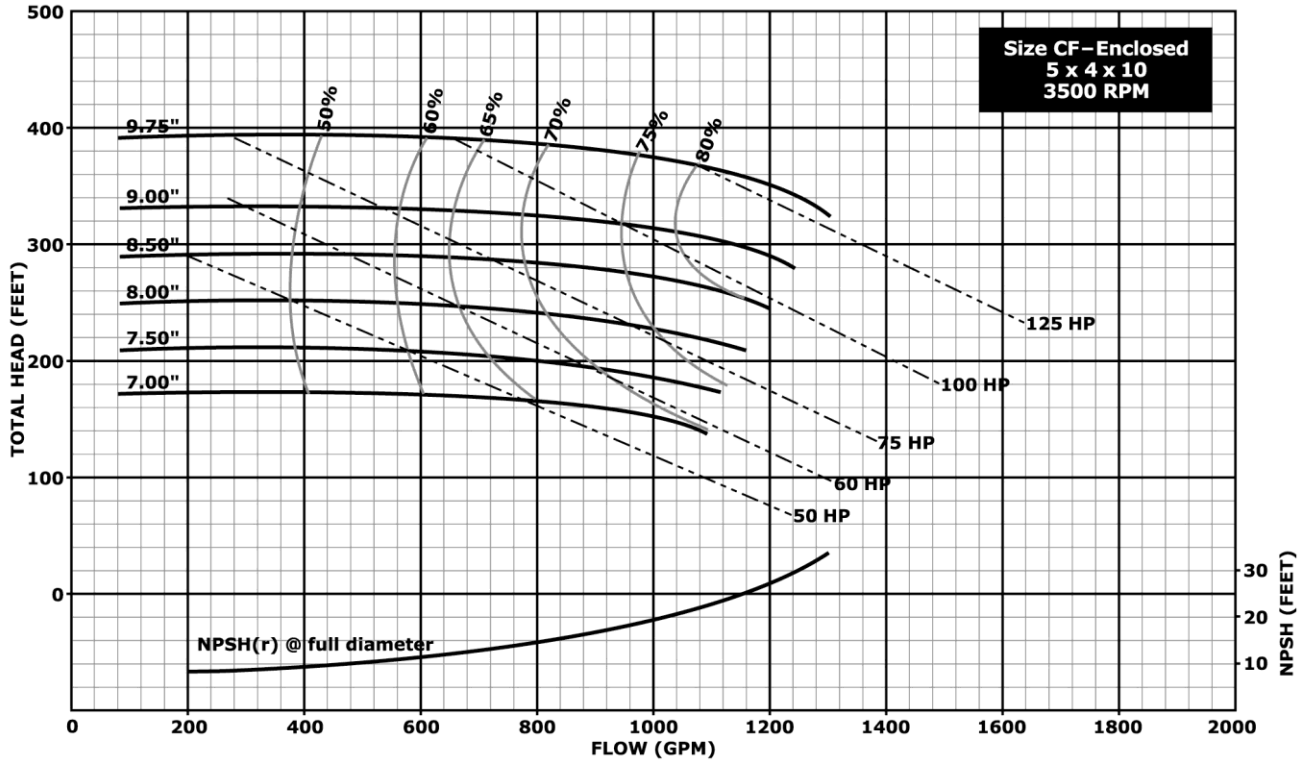


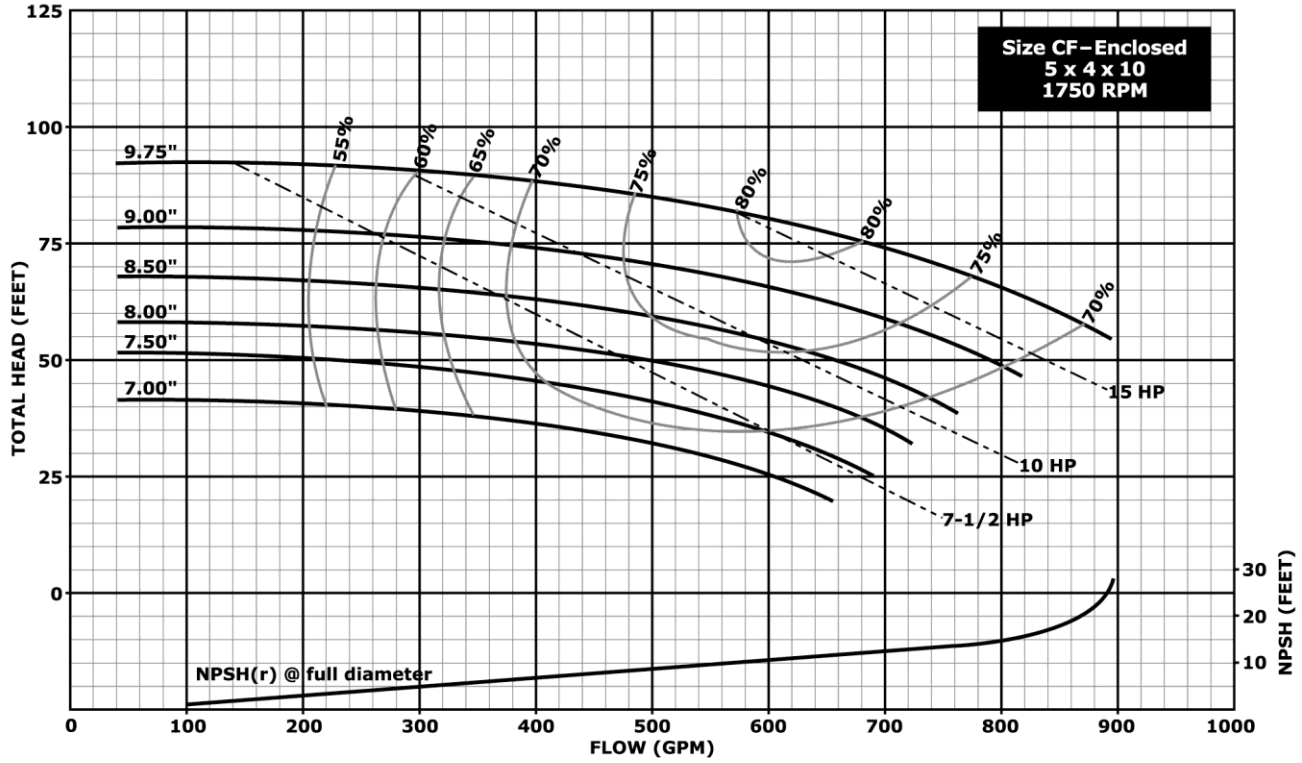


Notes:

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





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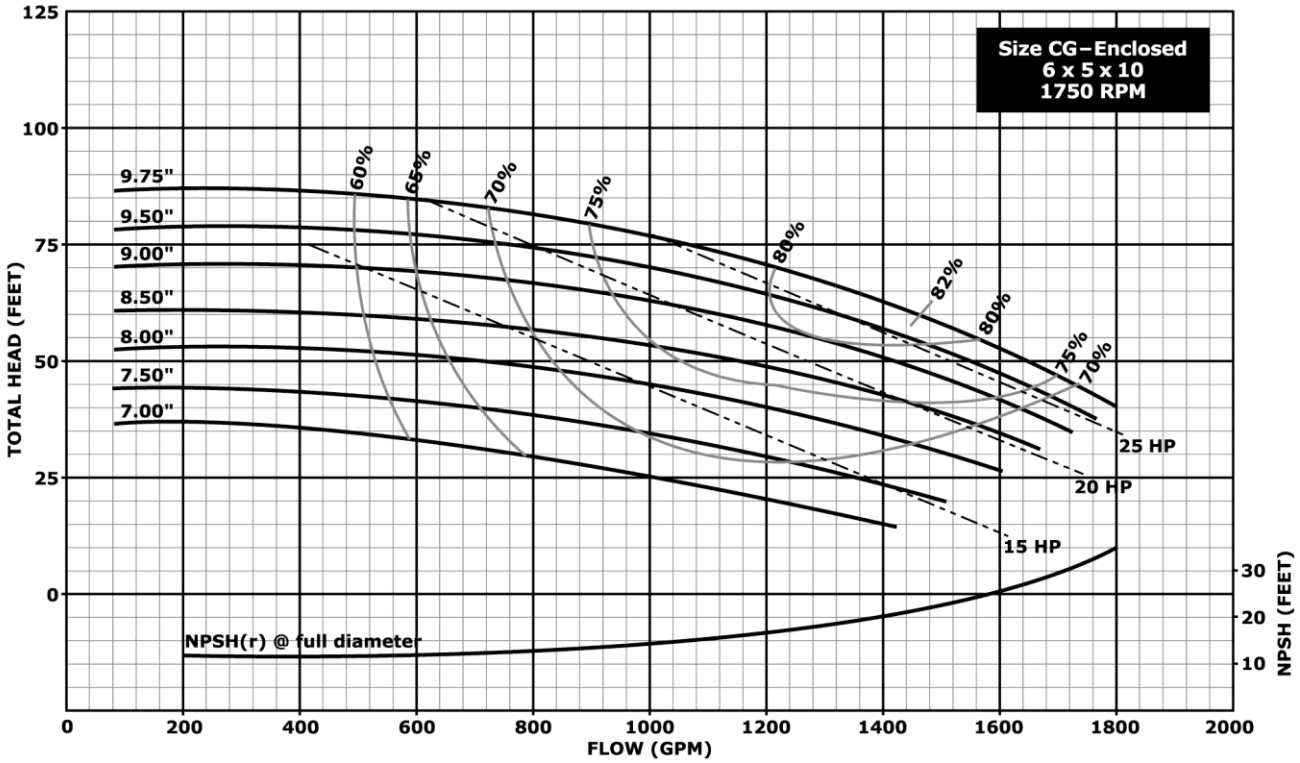
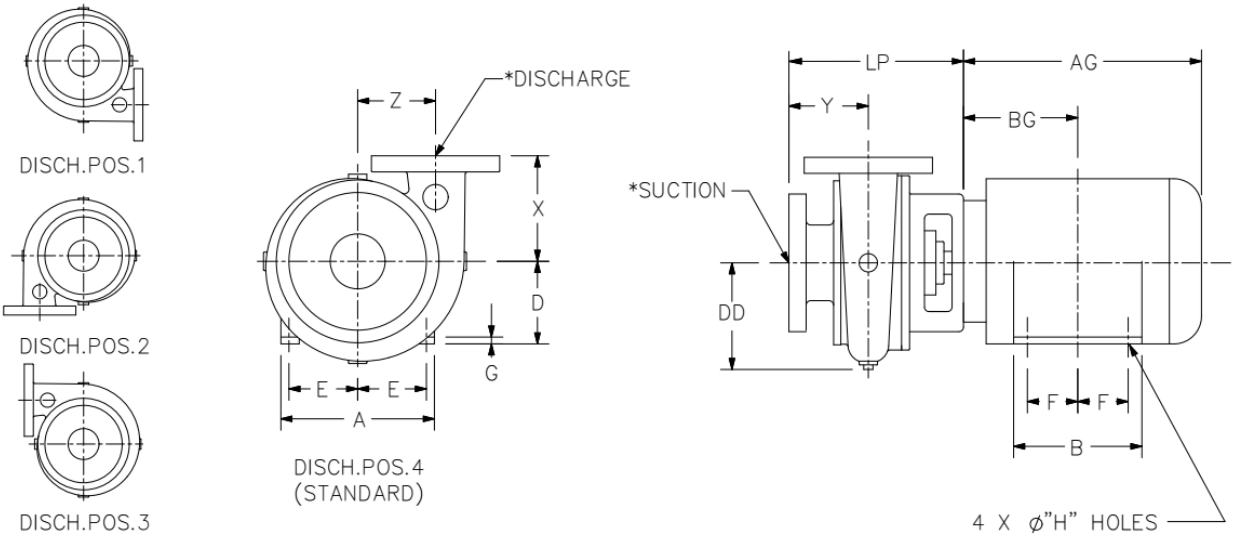
Hydraulic Performance – 10” Impeller Pumps



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.

5”, 7” and 10” Impeller Sizes, Close Coupled



Pump Size	Pump Dimensions					
	X	Y	Z	DD	LP	
					143-215 JM	254-326 JM
1 ¼ x 1 x 5	4.00	1.72	3.00	4.00	6.08	NA
2 x 1 ½ x 5	3.50	2.07	3.25	4.75	6.40	NA
2 ½ x 2 x 5	4.50	2.38	3.50	5.00	6.76	NA
1 ¼ x 1 x 7	4.25	2.65	3.81	5.25	7.13	NA
1 ½ x 1 ¼ x 7	4.50	3.38	4.00	5.50	7.50	NA
2 ½ x 2 x 7	5.00	3.75	4.13	6.00	7.80	8.76
3 x 2 ½ x 7	5.75	4.33	4.25	6.25	8.37	9.33
4 x 3 x 7	6.00	4.90	4.50	6.75	9.12	10.09
5 x 4 x 7	7.50	5.19	4.75	7.25	9.35	10.31
1 ½ x 1 ¼ x 10	6.00	3.30	5.25	7.00	7.18	8.10
2 x 1 ½ x 10	6.00	4.43	5.44	8.00	8.45	9.36
2 ½ x 2 x 10	6.25	4.81	5.50	7.25	8.91	9.81
3 x 2 ½ x 10	7.00	5.75	5.75	8.00	9.85	10.75
4 x 3 x 10	7.00	5.38	6.00	8.25	9.47	10.38
5 x 4 x 10	8.50	4.71	6.50	9.50	NA	9.71
6 x 5 x 10	8.38	5.81	7.63	10.75	NA	11.60

NEMA Motor Frame	Motor Dimensions (Approximate)								
	A (max)	AG	B (max)	BG	D	E	F	G	H
143 JM	7.00	10.50	6.00	4.88	3.50	2.75	2.00	0.44	0.34
145 JM	7.00	11.50	6.00	5.38	3.50	2.75	2.50	0.44	0.34
182 JM	9.00	12.63	6.75	5.88	4.50	3.75	2.25	0.56	0.41
184 JM	9.00	13.63	6.75	6.38	4.50	3.75	2.75	0.56	0.41
213 JM	10.50	15.25	7.00	7.25	5.25	4.25	2.75	0.63	0.44
215 JM	10.50	16.75	8.50	8.00	5.25	4.25	3.50	0.63	0.44
254 JM	12.50	19.13	10.50	9.13	6.25	5.00	4.13	0.63	0.53
256 JM	12.50	20.88	12.25	10.0	6.25	5.00	5.00	0.63	0.53
284 JM	13.88	21.00	12.25	9.75	7.00	5.50	4.75	0.75	0.53
286 JM	13.88	22.44	13.75	10.50	7.00	5.50	5.50	0.75	0.53
324 JM	15.88	23.13	13.75	10.75	8.00	6.25	5.25	0.81	0.69
326 JM	15.88	24.63	15.25	11.50	8.00	6.25	6.00	0.81	0.69

Notes:

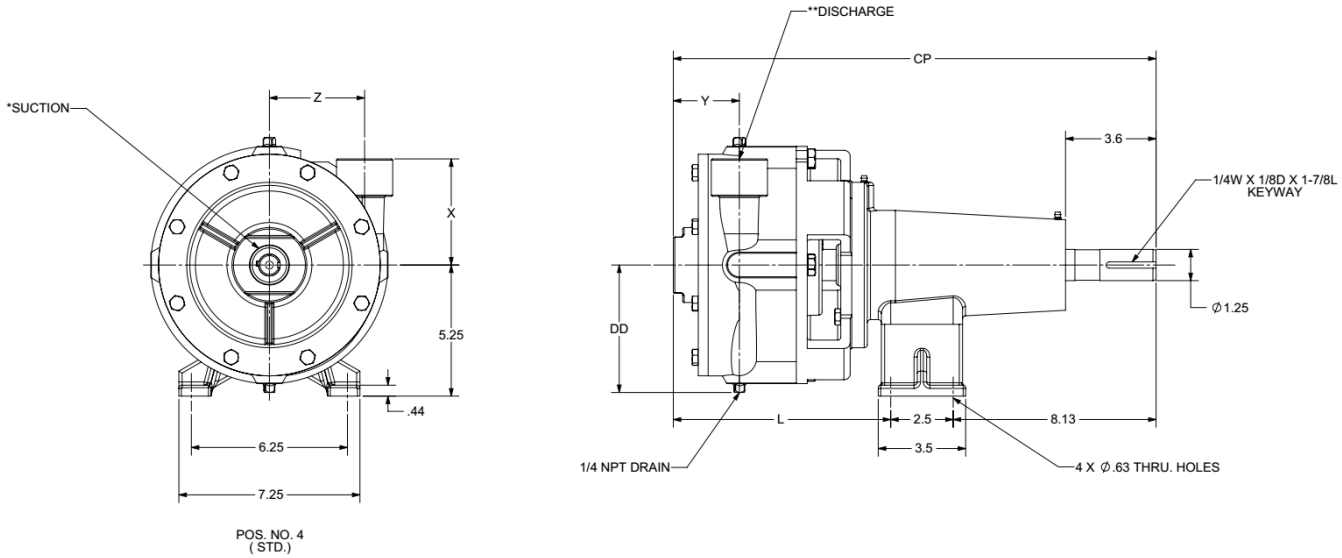
1. All 5”, 7”, and 10” pumps with suction sizes 1.25” thru 2.5” have NPT connections. All other Sizes have 125 lb. FF flange (cast iron) or 150 lb. FF flange (316 SS).

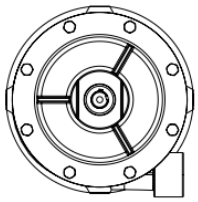
CARVER PUMP™

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

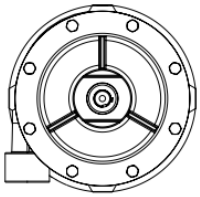
Dwg: SP-GHJM-1, Rev: 0

5”, 7” and 10” Impeller Sizes, 10M Frame Mounted, Bare Pump

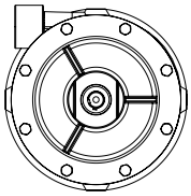




POS. NO. 1



POS. NO. 2



POS. NO. 3

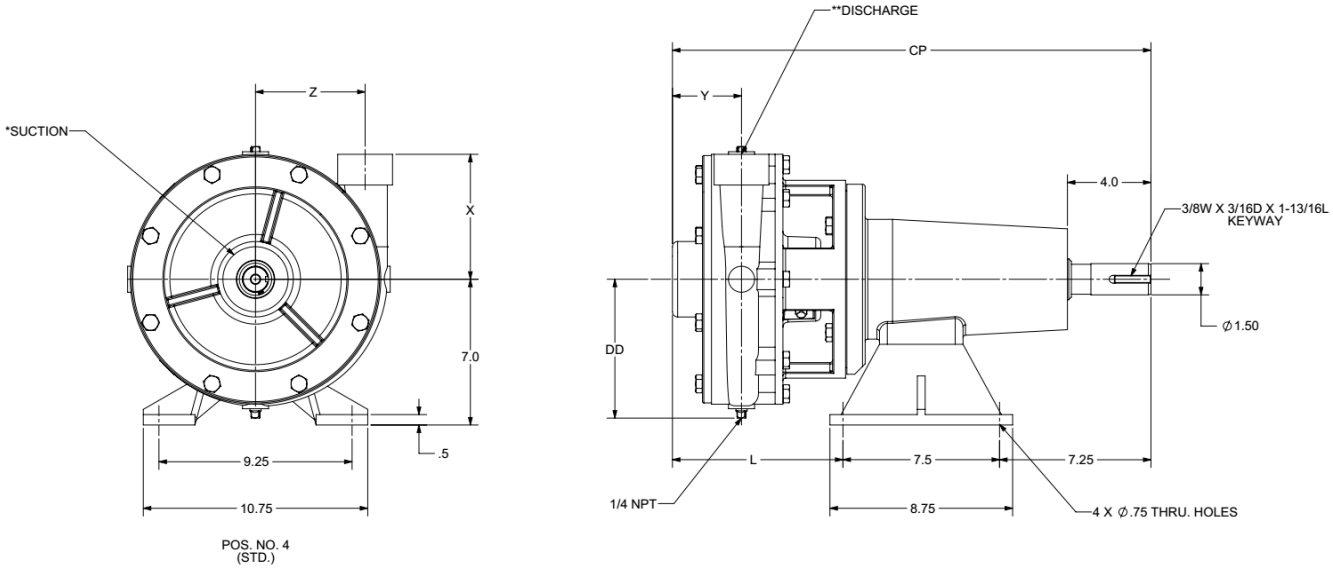
Pump Size	*Suction	**Discharge	Impeller Type	Pump Dimensions					
				X	Y	Z	DD	L	CP
1 ¼ x 1 x 5	1.25” FNPT	1” FNPT	Closed	4.00	2.44	3.00	4.00	8.47	19.10
2 x 1 ½ x 5	2” FNPT	1.5” FNPT	Closed	3.50	2.59	3.25	4.75	8.60	19.23
2 ½ x 2 x 5	2.5” FNPT	2” FNPT	Closed	4.50	2.78	3.50	5.63	8.85	19.48
1 ¼ x 1 x 7	1.25” FNPT	1” FNPT	Closed	4.25	2.65	3.81	5.13	8.71	19.33
1 ½ x 1 ¼ x 7	1.5” FNPT	1.25” FNPT	Closed	4.50	3.38	4.00	5.25	9.04	19.67
2 ½ x 2 x 7	2.5” FNPT	2” FNPT	Closed	5.00	3.77	4.13	5.75	9.36	19.99
3 x 2 ½ x 7	3” FLG	2.5” FLG	Closed	5.75	4.33	4.25	6.00	9.93	20.55
4 x 3 x 7	4” FLG	3” FLG	Closed	6.00	4.90	4.50	6.50	10.68	21.30
5 x 4 x 7	5” FLG	4” FLG	Closed	7.50	5.19	4.75	7.13	10.91	21.53
1 ½ x 1 ¼ x 10	1.5” FNPT	1.25” FNPT	Closed	6.00	3.31	5.25	6.50	8.76	19.39
2 x 1 ½ x 10	2” FNPT	1.5” FNPT	Closed	6.00	4.43	5.44	7.25	10.02	20.65
2 ½ x 2 x 10	2.5” FNPT	2” FNPT	Closed	6.25	4.81	5.50	7.25	10.47	21.09
3 x 2 ½ x 10	3” FLG	2.5” FLG	Closed	7.00	5.75	5.75	7.50	11.41	22.03
4 x 3 x 10	4” FLG	3” FLG	Closed	7.00	5.38	6.00	7.75	11.03	21.65

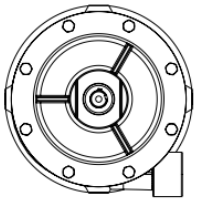
Notes:

1. All 5”, 7”, and 10” pumps with suction sizes 1.25” thru 2.5” have NPT connections. All other Sizes have 125 lb. FF flange (cast iron) or 150 lb. FF flange (316 SS).

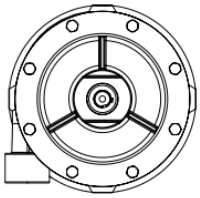
CARVER PUMP™	1. All dimensions in inches, all tolerances +/- 0.125 inch. 2. Not valid for construction unless certified.	**Dwg: SP-GH10M-001, Rev: 0**

7” and 10” Impeller Sizes, 20M Frame Mounted, Bare Pump

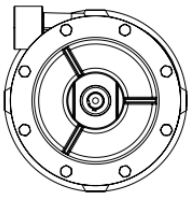




POS. NO. 1



POS. NO. 2



POS. NO. 3

Pump Size	*Suction	**Discharge	Impeller Type	Pump Dimensions					
				X	Y	Z	DD	L	CP
2 ½ x 2 x 7	2.5” FNPT	2” FNPT	Closed	5.00	3.77	4.13	5.75	8.83	23.58
3 x 2 ½ x 7	3” FLG	2.5” FLG	Closed	5.75	4.33	4.25	6.00	9.39	24.14
4 x 3 x 7	4” FLG	3” FLG	Closed	6.00	4.90	4.50	6.50	10.15	24.90
5 x 4 x 7	5” FLG	4” FLG	Closed	7.50	5.19	4.75	7.13	10.38	25.13
1 ½ x 1 ¼ x 10	1.5” FNPT	1.25” FNPT	Closed	6.00	3.31	5.25	6.50	8.17	22.92
2 x 1 ½ x 10	2” FNPT	1.5” FNPT	Closed	6.00	4.43	5.44	7.25	9.43	24.18
2 ½ x 2 x 10	2.5” FNPT	2” FNPT	Closed	6.25	4.81	5.50	7.25	9.88	24.63
3 x 2 ½ x 10	3” FLG	2.5” FLG	Closed	7.00	5.75	5.75	7.50	10.82	25.57
4 x 3 x 10	4” FLG	3” FLG	Closed	7.00	5.37	6.00	7.75	10.44	25.19
5 x 4 x 10	5” FLG	4” FLG	Closed	8.50	4.71	6.50	9.50	9.78	24.53
6 x 5 x 10	6” FLG	5” FLG	Closed	8.38	5.81	7.63	10.50	11.66	26.41

Notes:

1. All 7”, and 10” pumps with suction sizes 1.25” thru 2.5” have NPT connections. All other Sizes have 125 lb. FF flange (cast iron) or 150 lb. FF flange (316 SS).

CARVER PUMP™

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

Dwg: SP-GH20M-001, Rev: 0

CARVER PUMP™

Built for purpose

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