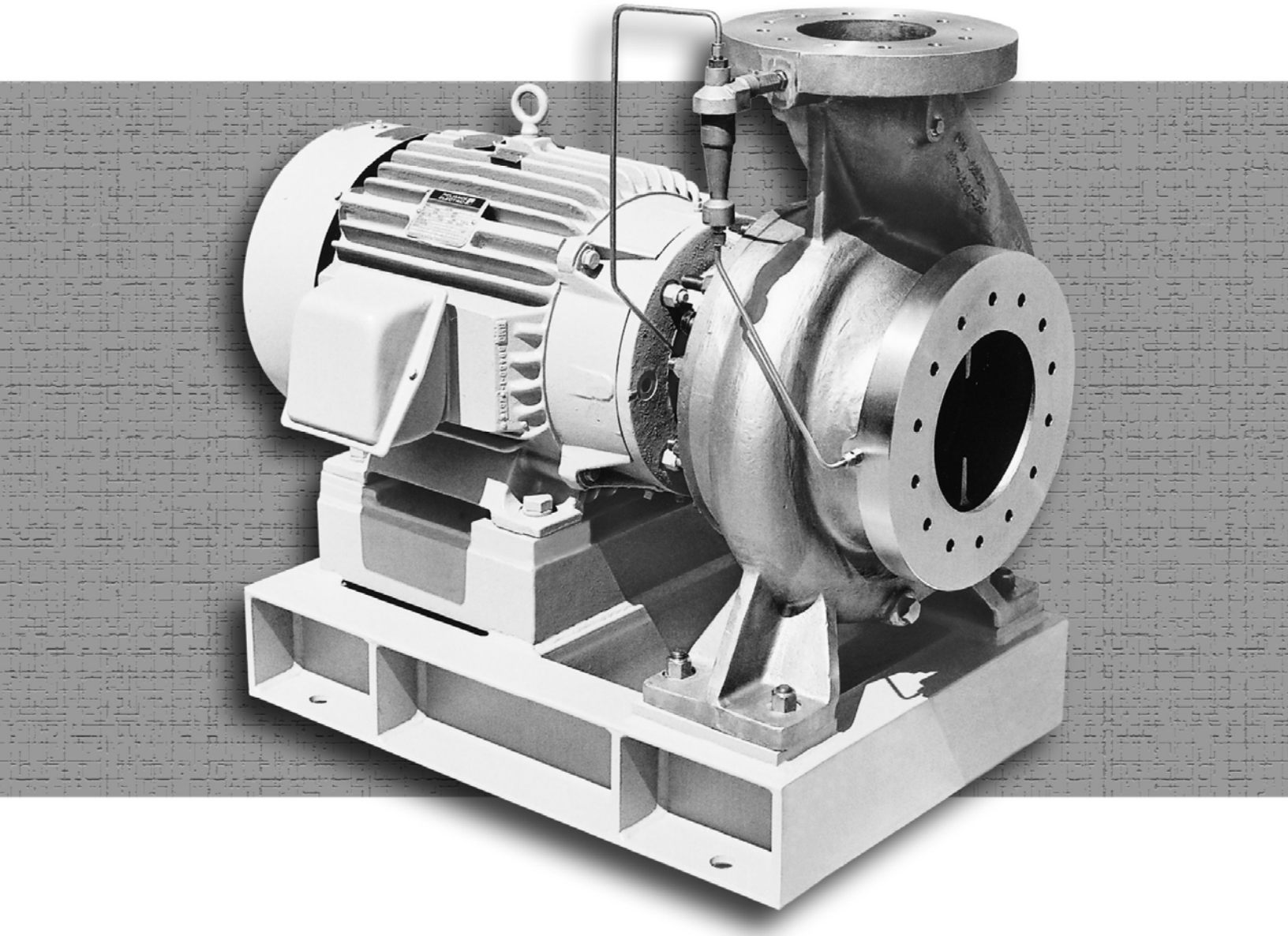
M Series

Technical Support Information



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1.0 Overview

The M Series is for freshwater, seawater, and light hydrocarbons in commercial marine and naval applications. Conforming to the full requirements of ASTM F 998, including the Supplementary Requirements, the M Series is a close coupled unit that can be horizontally or vertically mounted.

1.1 Ordering Code

When ordering an M Series pump **this Ordering Code must be used**. Doing so enables us to accept orders quicker and to assure the timely and correct manufacture of the desired pump.

MCC - CFD - AAZ - KCD

Pump Series
M - ASTM F 998 Marine Series

Construction
S - US Navy shock approved version
C - Commercial marine version

Mounting Style
H - Horizontal, close coupled
V - Vertical, close coupled

Casing Nozzle and Impeller Sizes
BA - 1-1/4 x 1 x 7
BB - 1-1/2 x 1-1/4 x 7
BC - 2-1/2 x 2 x 7
BD - 3 x 2-1/2 x 7
BE - 4 x 3 x 7
BF - 5 x 4 x 7

CA - 1-1/2 x 1-1/4 x 10
CB - 2 x 1-1/2 x 10
CC - 2-1/2 x 2 x 10
CD - 3 x 2-1/2 x 10
CE - 4 x 3 x 10
CF - 5 x 4 x 10
CG - 6 x 5 x 10

DA - 2 x 1 x 11
DB - 4 x 2 x 11
DC - 4 x 3 x 11
DD - 5 x 4 x 11
DE - 8 x 6 x 11
EC - 4 x 3 x 13
ED - 6 x 4 x 13
EE - 6 x 6 x 13
EF - 8 x 6 x 13
EG - 10 x 8 x 13
EH - 12 x 10 x 13

Basic Materials of Construction
D - 316 SS casing, 416 SS shaft, composite impeller, sleeves and rings
E - CD4MCu casing, 316 SS shaft, composite impeller, sleeves and rings
F - 316 SS casing and impeller, 416 SS shaft and sleeve, bronze wear rings
X - Special

Sealing Arrangement
A - Single spring, carbon on tung. carb. faces (**standard**)
X - Special

Seal Flush Arrangements
A - Plan 11 seal flush
B - Plan 41 seal flush with cyclone separator
X - Special
Z - No seal flush (**standard**)

Baseplate and Coupling
A - Non-shock steel baseplate (**standard**)
B - Shock resistant steel baseplate
X - Special
Z - No baseplate provided

Motor Power Rating

A - 1.5 HP	**G** - 15 HP	**P** - 60 HP	**V** - 250 HP
B - 2.0 HP	**H** - 20 HP	**Q** - 75 HP	**W** - 300 HP
C - 3.0 HP	**J** - 25 HP	**R** - 100 HP	
D - 5.0 HP	**K** - 30 HP	**S** - 125 HP	**X** - Special
E - 7.5 HP	**M** - 40 HP	**T** - 150 HP	
F - 10 HP	**N** - 50 HP	**U** - 200 HP	**Z** - No motor

Motor Speed, Voltage and Frequency
A - 1150 RPM, 440 Volt, 60 Hz
B - 1750 RPM, 440 Volt, 60 Hz
C - 3500 RPM, 440 Volt, 60 Hz
X - Special

Motor Mounting and Rating
D - Close coupled, IEEE 45 commercial marine duty
E - Close coupled, Mil-Spec rated
X - Special
Z - None or customer supplied motor

1.1 Basic Hydraulic Features

Standard hydraulic features for the M Series are given in the table below.

Basic Hydraulic Features									
Pump Size	General Design Features						Hydraulic Performance		
	Inlet Size (in.)	*Discharge Size (in.)*	*Discharge Type*	*Casing Volute*	*Impeller Type*	*No. Impeller Vanes*	*Max. Speed (RPM)*	*Specific Speed N_S*	*Suction Sp. Speed N_{SS}*
1 ¼ x 1 x 7	1 ¼	1	Tangential	Single	Enclosed	6	3,500	703	2,582
1 ½ x 1 ¼ x 7	1 ½	1 ¼		Single		5	3,500	894	2,856
2 ½ x 2 x 7	2 ½	2		Single		5	3,500	1,143	3,984
3 x 2 ½ x 7	3	2 ½		Single		5	3,500	1,435	6,824
4 x 3 x 7	4	3		Quad		5	3,500	2,070	7,937
5 x 4 x 7	5	4		Quad		6	3,500	2,091	5,821
1 ½ x 1 ¼ x 10	1 ½	1 ¼	Tangential	Single	Enclosed	5	3,500	474	1,996
2 x 1 ½ x 10	2	1 ½		Single		6	3,500	740	4,811
2 ½ x 2 x 10	2 ½	2		Single		6	3,500	970	3,244
3 x 2 ½ x 10	3	2 ½		Single		5	3,500	1,017	5,018
4 x 3 x 10	4	3		Quad		6	3,500	1,311	5,693
5 x 4 x 10	5	4		Dual		6	3,500	1,687	5,808
6 x 5 x 10	6	5		Dual		7	1,750	2,598	5,635
2 x 1 x 11	2	1	Centerline	Single	Enclosed	8	3,500	475	2,671
4 x 2 x 11	4	2		Single		5	3,500	757	7,584
4 x 3 x 11	4	3		Quad		6	3,500	1,061	10,202
5 x 4 x 11	5	4		Quad		6	1,750	1,546	8,261
8 x 6 x 11	8	6		Dual		5	1,750	2,505	10,693
4 x 3 x 13	4	3	Centerline	Dual	Enclosed	7	3,500	792	11,080
6 x 4 x 13	6	4		Dual		7	3,500	912	10,500
6 x 6 x 13	6	6		Dual		7	1,750	1,350	7,475
8 x 6 x 13	8	7		Dual		8	1,750	1,771	10,595
10 x 8 x 13	10	8		Dual		7	1,750	2,466	13,029
12 x 10 x 13	12	10		Dual		7	1,750	792	11,080

1.2 Surface Painting, and Packing

All pump ferrous surfaces, baseplates, and coupling guards will be painted to ASTM F 998 – 02, Paragraphs 9.1 and 9.2 (Carver Specification PA-009). All surfaces will be cleaned prior to painting by removing all rust, scale or any other foreign material (Carver Specification PA-004). The surfaces to be cleaned will be wiped clean with a rag using paint thinner (20% toluene/80% acetone)

Surface Preparation of Key Components		
Component	**Material**	**Paint Specification**
Adaptor bracket	Ductile iron	Carver Standard PA-009
	316 SS	N/a
Bases	Steel	Carver Standard PA-009
Casing	CD4MCu	N/a
	316 SS	N/a
Motor	Any	Carver Standard PA-009

All paint will be applied over a clean, dry surface primed with zinc molybate primer. The priming will consist of applying one (1) coat per TT–P-645B, Formula 84 (Sherwin-Williams No. P62RL or equal) to a minimum film thickness of 3 mils.

After drying a finish coat of Carver light gray enamel paint per MIL-E-1509C, Type II, Class 2 (Hammercast #43400 from the Klinger Paint Company, Inc. Series 200 or equal) is applied to a film thickness of 3-5 mils.

Each complete pump/motor assembly will be packaged per Carver Packaging Specification PK-STD-001, Level 6. They will be securely fastened by bolting or banding the unit to a solid bottom skid, covered with a drip proof covering, and enclosed in a solid wood box. Crating structural members will be added, as required, to protect any tubing, fittings, seal flush hardware or other items that may otherwise contribute to an irregular shaped package.

Since all pumps are assumed to be installed and operated soon after receipt, we do not include any provisions for long term storage **as standard**. We also assume no responsibility for storage deterioration after shipment unless explicitly stated in our quotation and the contract documents.

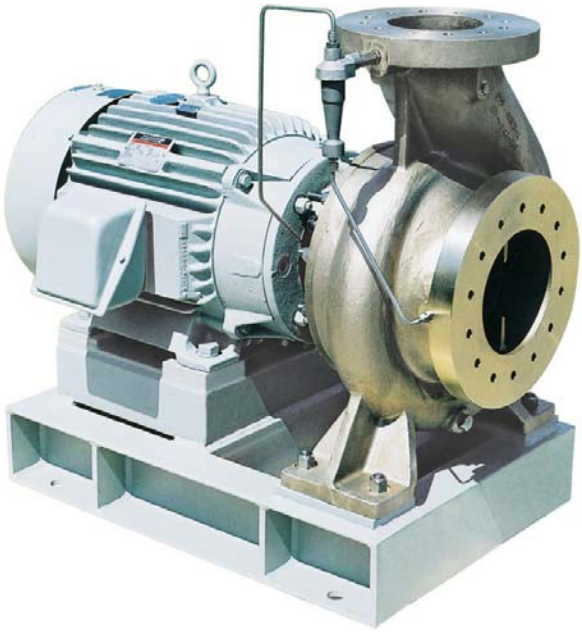
1.3 Standard Materials of Construction

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

Standard M Series Materials – by ASTM F 998 Application Code			
Component	**Class 1 - Freshwater**	**Class 2 - Seawater**	**Class 3 - Hydrocarbons**
Motor adaptor bracket	316 SS or ductile iron	CD4MCu or ductile iron	316 SS or ductile iron
	(See Notes 1 and 2 below)	(See Notes 1 and 2 below)	(See Notes 1 and 2 below)
Casing	316 Stainless steel	CD4MCu duplex SS	316 Stainless steel
	ASTM A 276	ASTM 890	ASTM A 276
Impeller	Composite	Composite	316 Stainless steel
	Carver CPC 550	Carver CPC 550	ASTM A 276
Wear rings	Composite	Composite	Bronze
	Carver CPC 550	Carver CPC 550	ASTM B 584
Shaft sleeves	Composite	Composite	316 Stainless steel
	Carver CPC 550	Carver CPC 550	ASTM A 276
Motor shaft	416 Stainless steel	316 Stainless steel	416 Stainless steel
	ASTM A 582	ASTM A 276, UNS 31600	ASTM A 582

Notes:

1. Motor adaptors for all 7", 10" and 11'' diameter pumps, except size 8 x 6 x 11, are integral with the casing back cover and stuffing box and are the same material as the casing.
2. Motor adaptors for size 8 x 6 x 11 and all 13'' diameter pumps are separate from the pump casing and stuffing box (i.e., non-wetted) and are ASTM A-536-70 ductile iron.
3. For other options or materials not listed, contact Carver Sales and Marketing department.



1.4 Comments to ASTM F 998 – 02, including Supplementary Requirements

1.0 Scope

None

2.0 – Referenced Documents

None

3.0 – Terminology

None

4.0 – Ordering Information

None

5.0 – Material

None

6.0 – General Requirements

6.9 As a close-coupled unit without any couplings, belts or other external rotating parts guards are not needed and will not be provided.

6.12 All 13" diameter impeller pumps have supporting feet as an integral part of the casing casting, which precludes rotation of the casing. All other pump sizes (7", 10" and 11" impeller diameters) have casings rotatable in four possible orientations.

7.0 – Pump Design

None

8.0 – Performance Requirements

None

9.0 – Painting and Coatings

None

10.0 – Equipment Identification Plates

None

11.0 – Testing Requirements

None

12.0 – Technical Documentation

12.1.7 All instruction book ("Installation, Operation and Maintenance Manual") curves will be typical, minimum guaranteed performance curves that plot total head, efficiency, NPSH and brake horsepower as a function of capacity.

12.1.8 As no hazardous fluids are involved or associated with the manufacture or testing of these pumps, no Material Safety Data Sheets (MSDS) are necessary or will be provided.

12.2 Submittal documents shall be provided in accordance with specific contract requirements.

13.0 – Packaging and Preservation

None

14.0 – Quality Assurance

None

15.0 – Keywords

None

S1 - Referenced Documents

None

S2 - Ordering Data

None

S3 - Design Requirements

S3.8.3 The pump gland area shall be drilled and tapped but any fittings, piping, and/or tubing to collect the drainage shall be by others.

S3.8.6 Due to the physical constraints within the stuffing box area, and the inherent design of the mechanical seal which renders an anti-rotation pin unnecessary, anti-rotation pins shall not be provided.

S3.11.2 All pumps intended for Class 1 (freshwater) services have composite impellers and wear rings as standard per Table S3.1. If metal impellers and/or wear rings are required, a minimum hardness difference of 50 BNH shall exist between the impeller and rings.

S4 - Shock and Vibration Testing

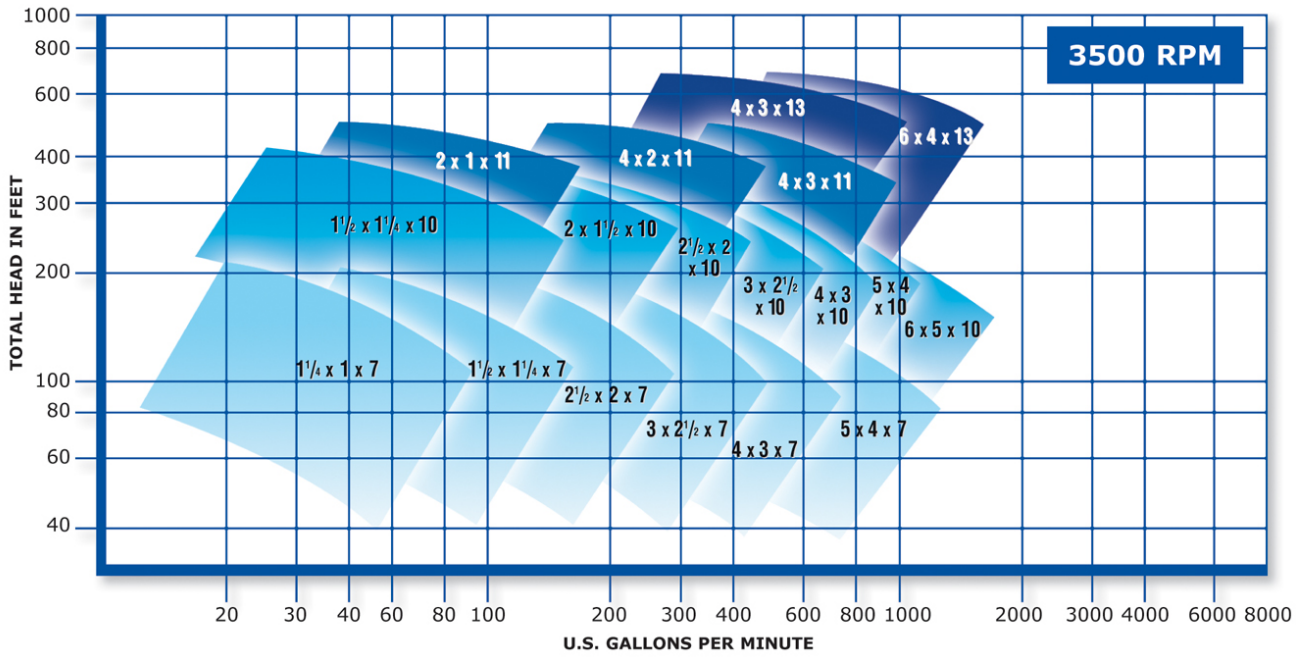
None

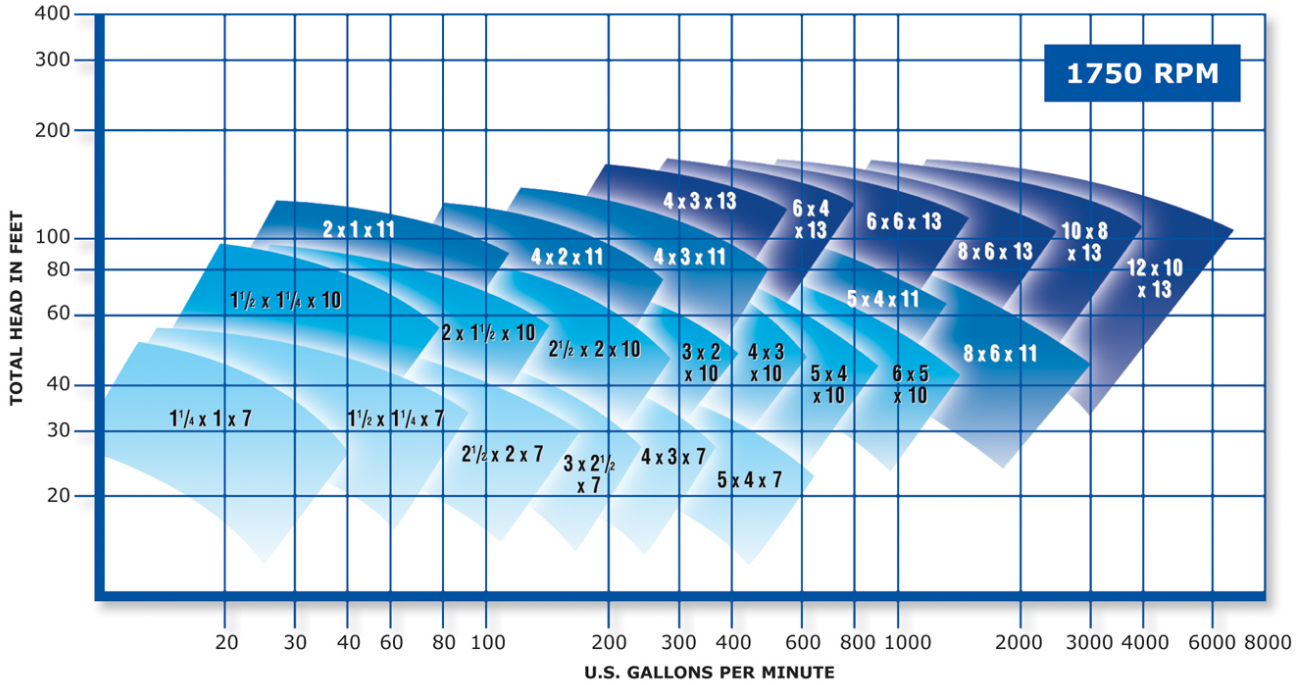
S5 - Testing Requirements

None

1.7 M Series Hydraulic Coverage

M hydraulic performance extends to 5,000 GPM and 700 feet of head. This range is covered by twenty-four sizes in 316 SS and CD4MCu duplex SS as the standard materials. Shaft deflections are less than 0.002" as measured at the mechanical seal at shut off, and overall the M Series offers some of the most efficient hydraulics to be found in a pump of this type anywhere.

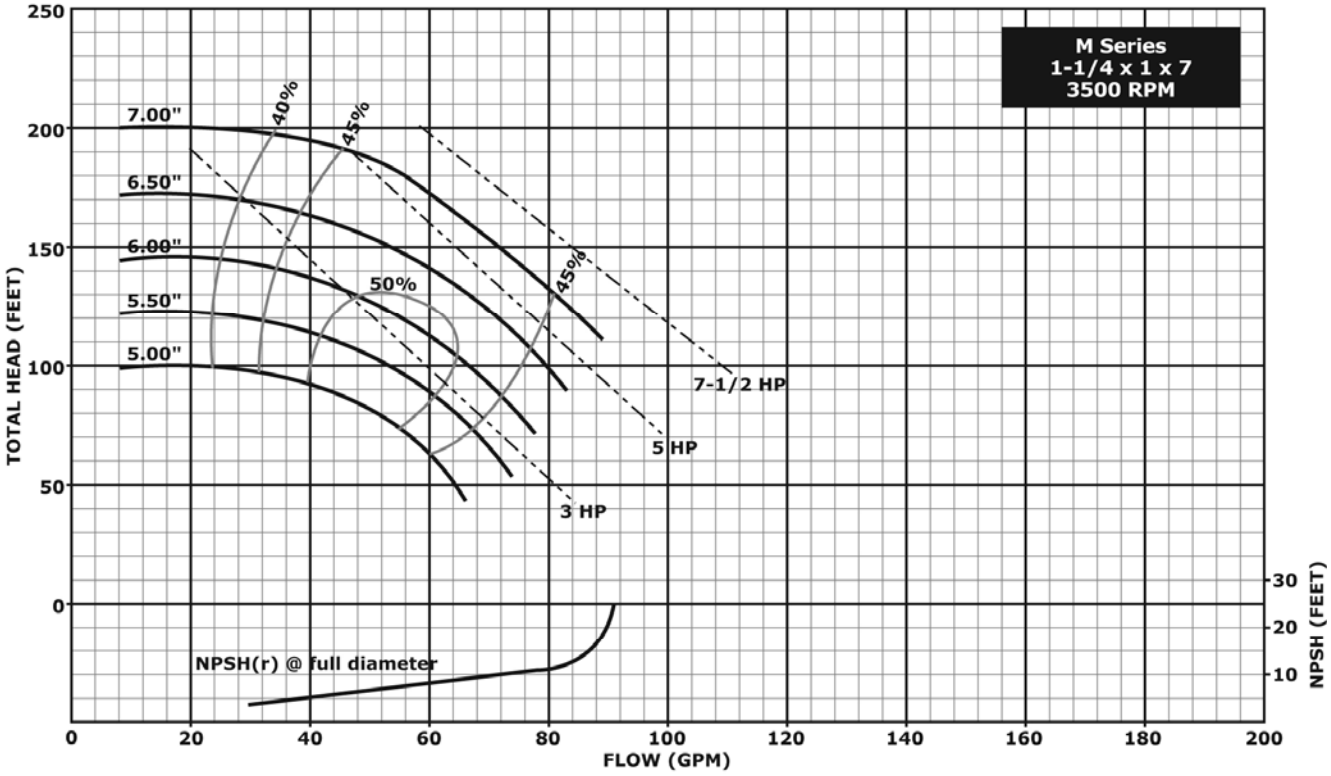


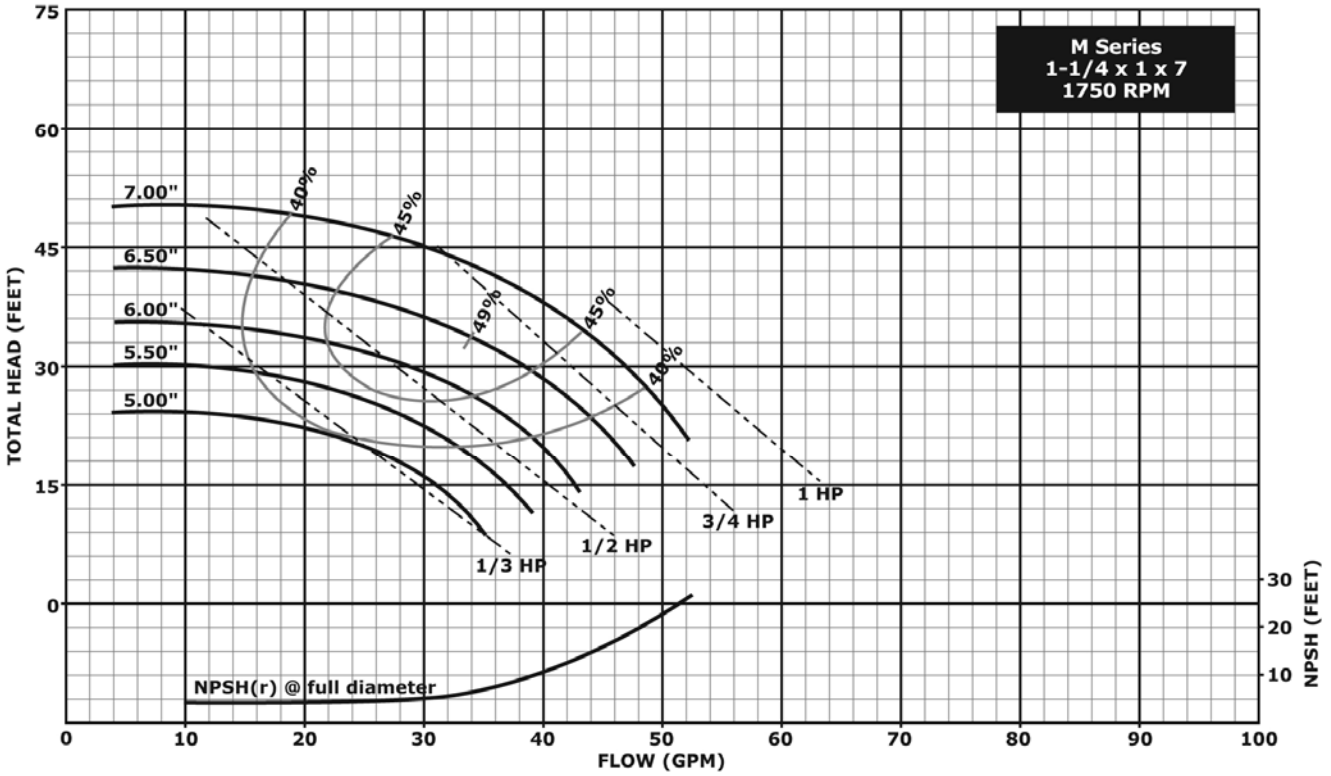


Selecting a pump can start by referring to the table above. From there the selection can then be fine tuned by using the performance curves on the following pages to complete the process.

Note that other sizes and allowable speeds may be possible. Contact Carver Sales and Marketing department.

Hydraulic Performance – 7" Impeller Pumps

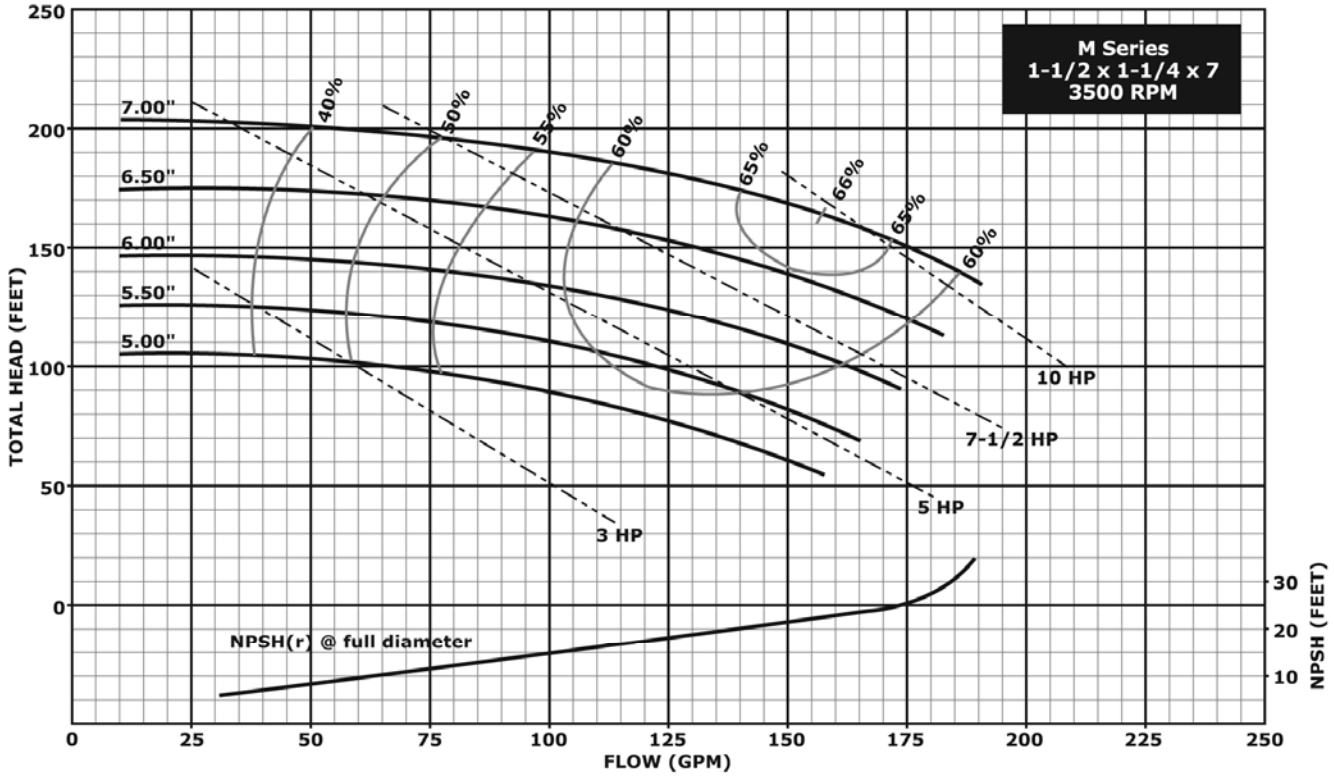


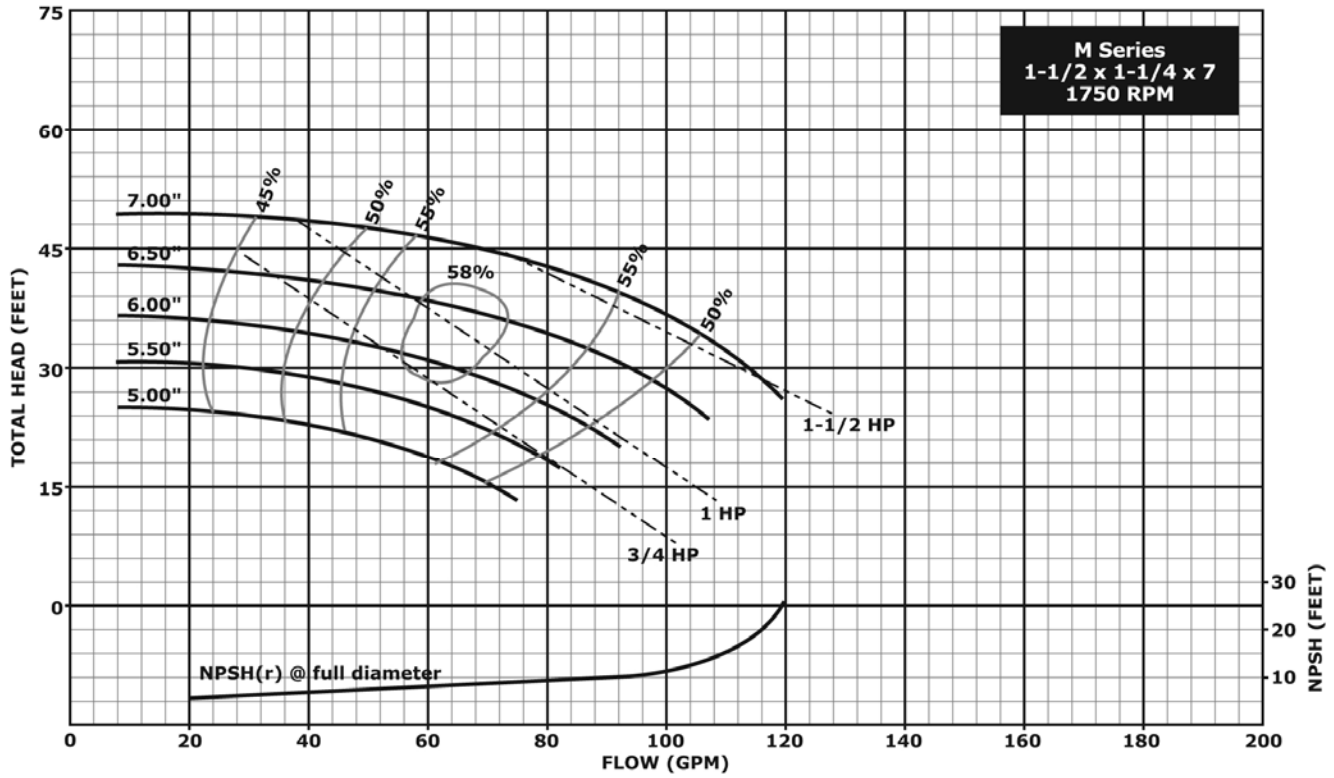


Notes:

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 – 7" Impeller Pumps





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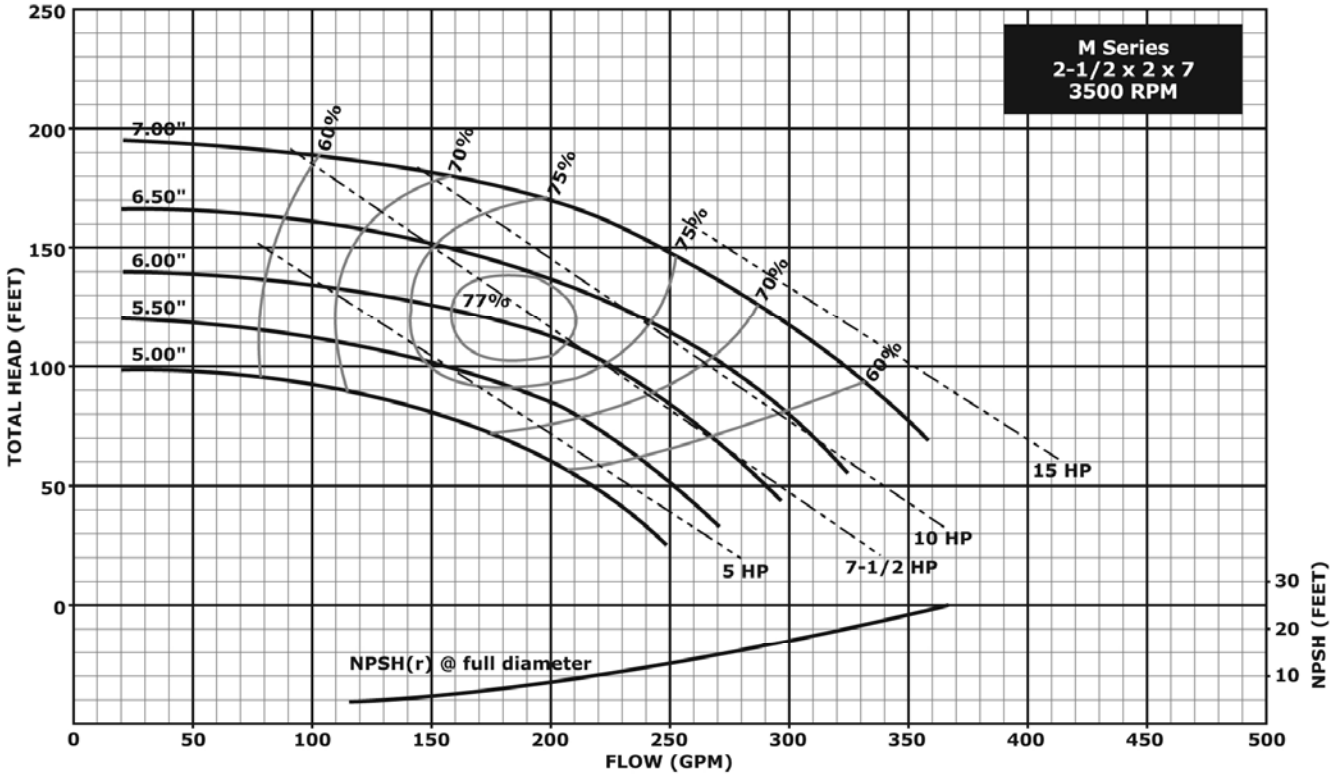

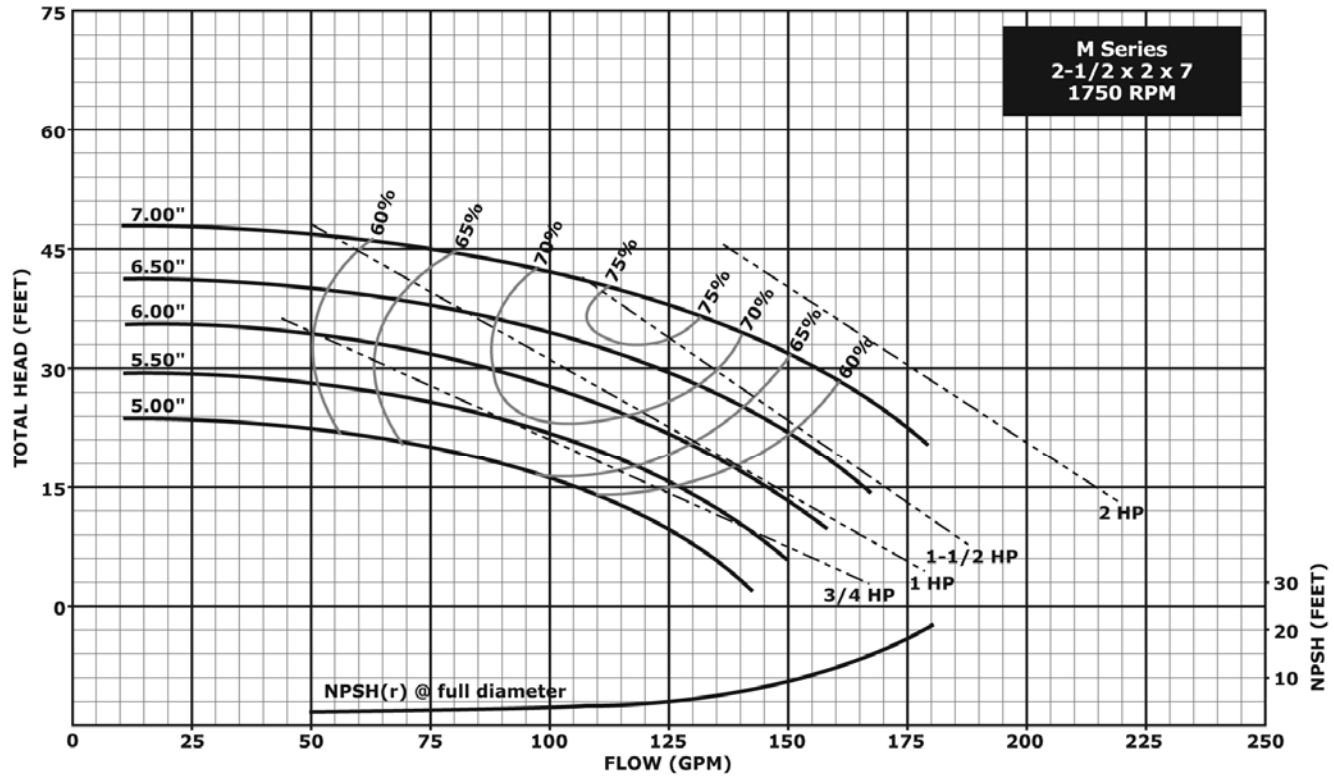

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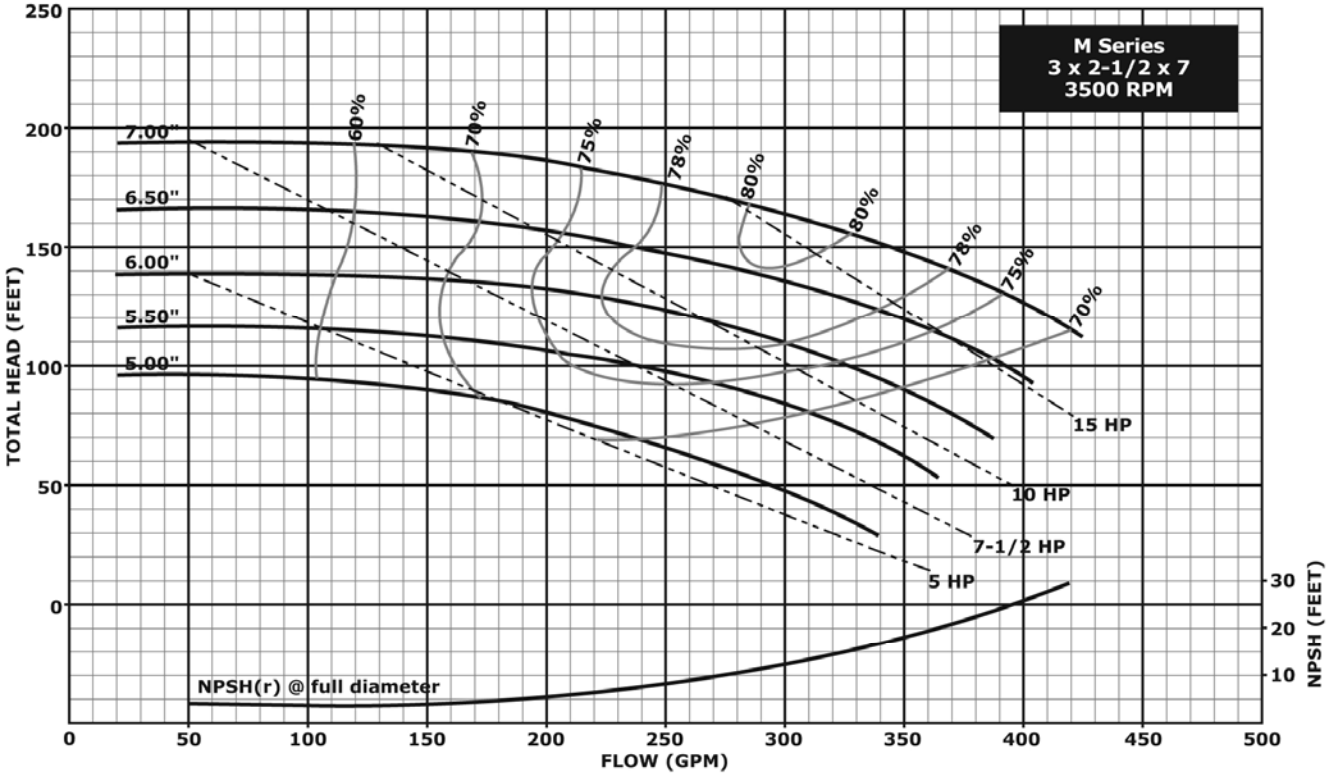

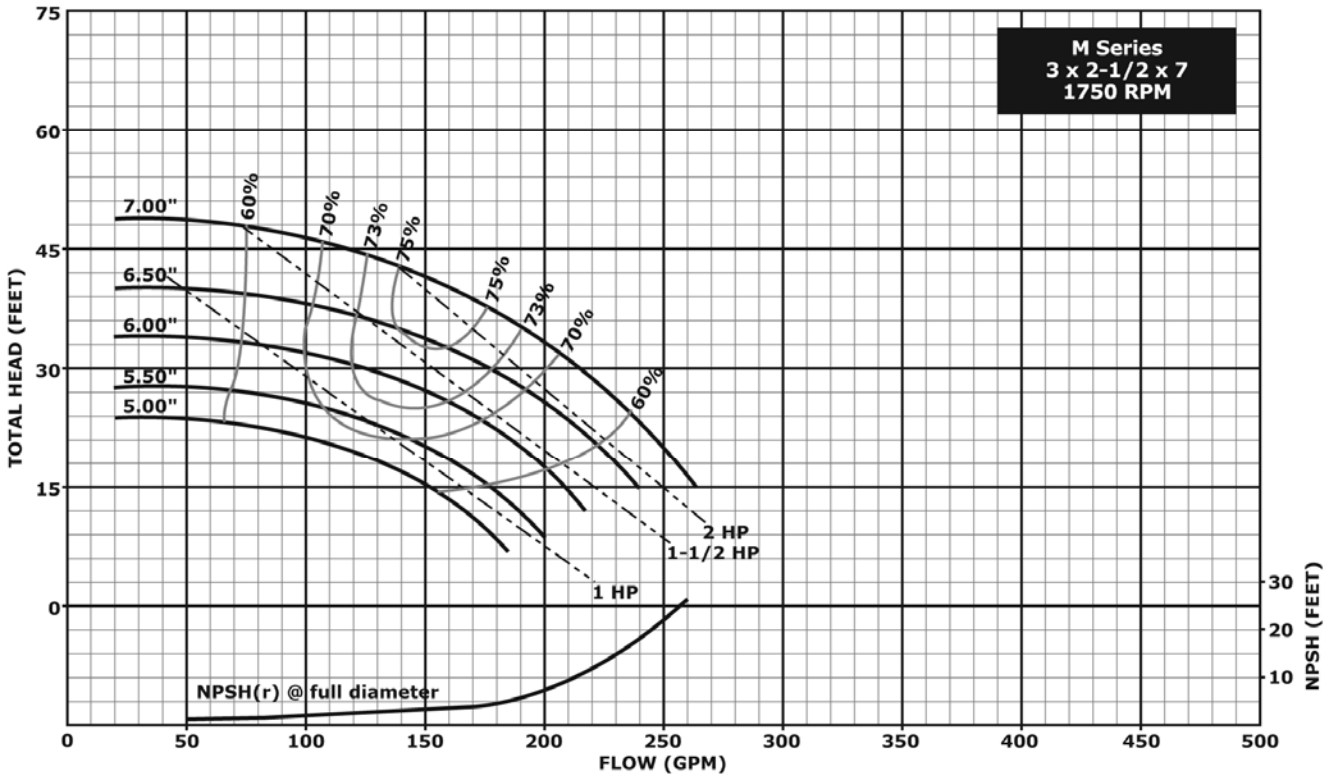

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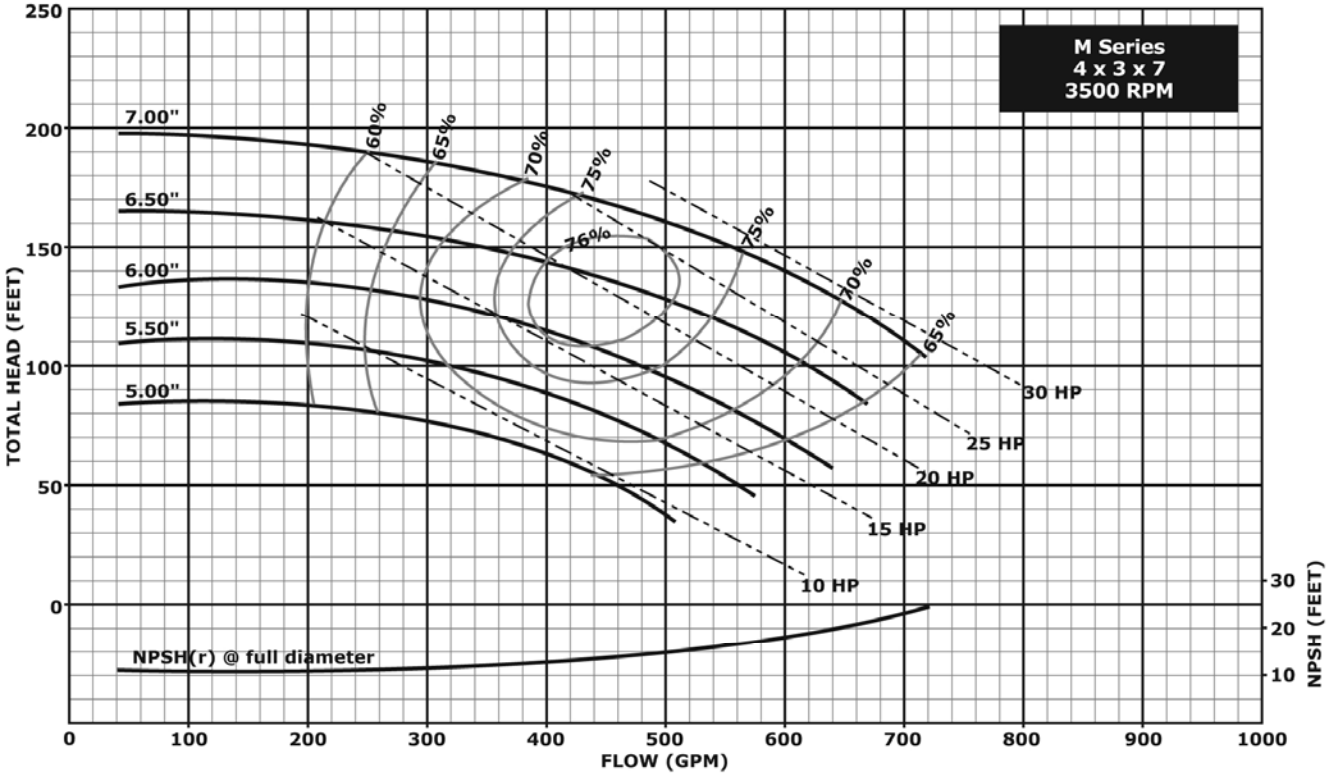

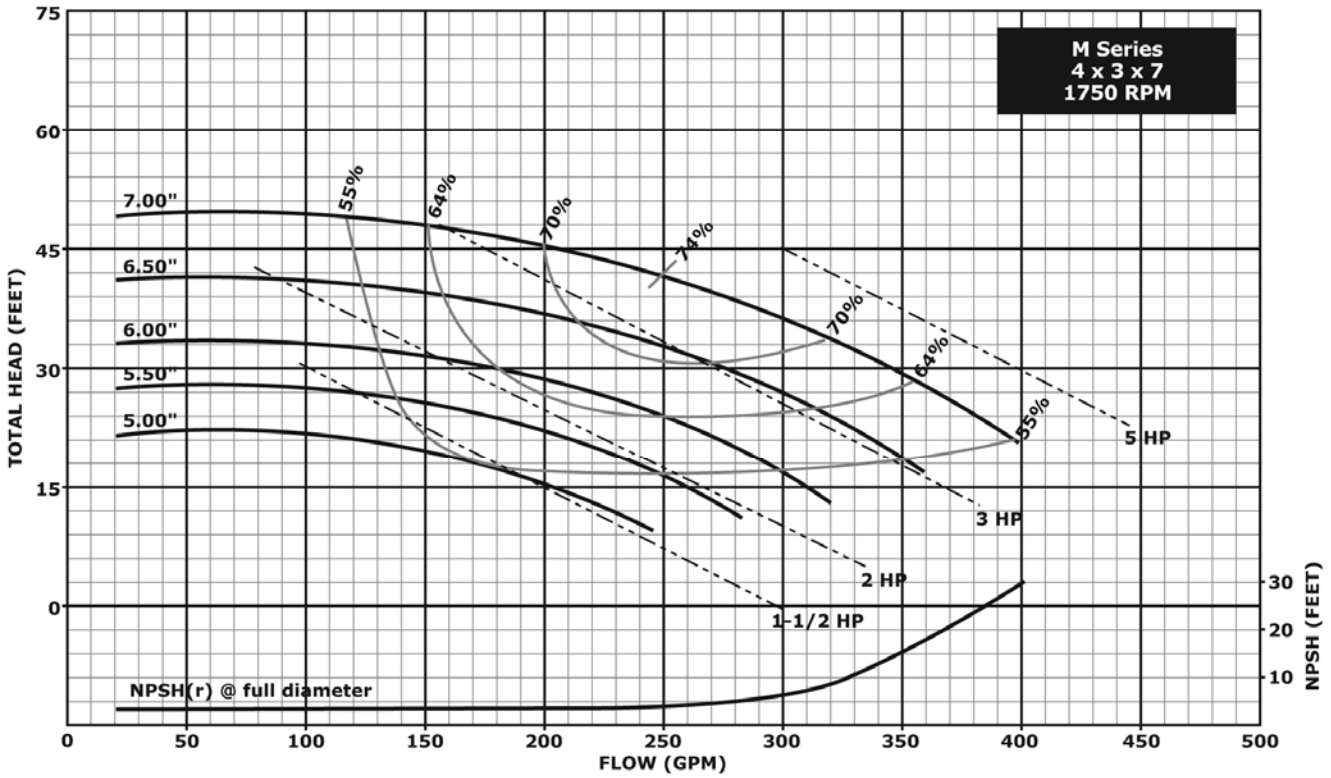

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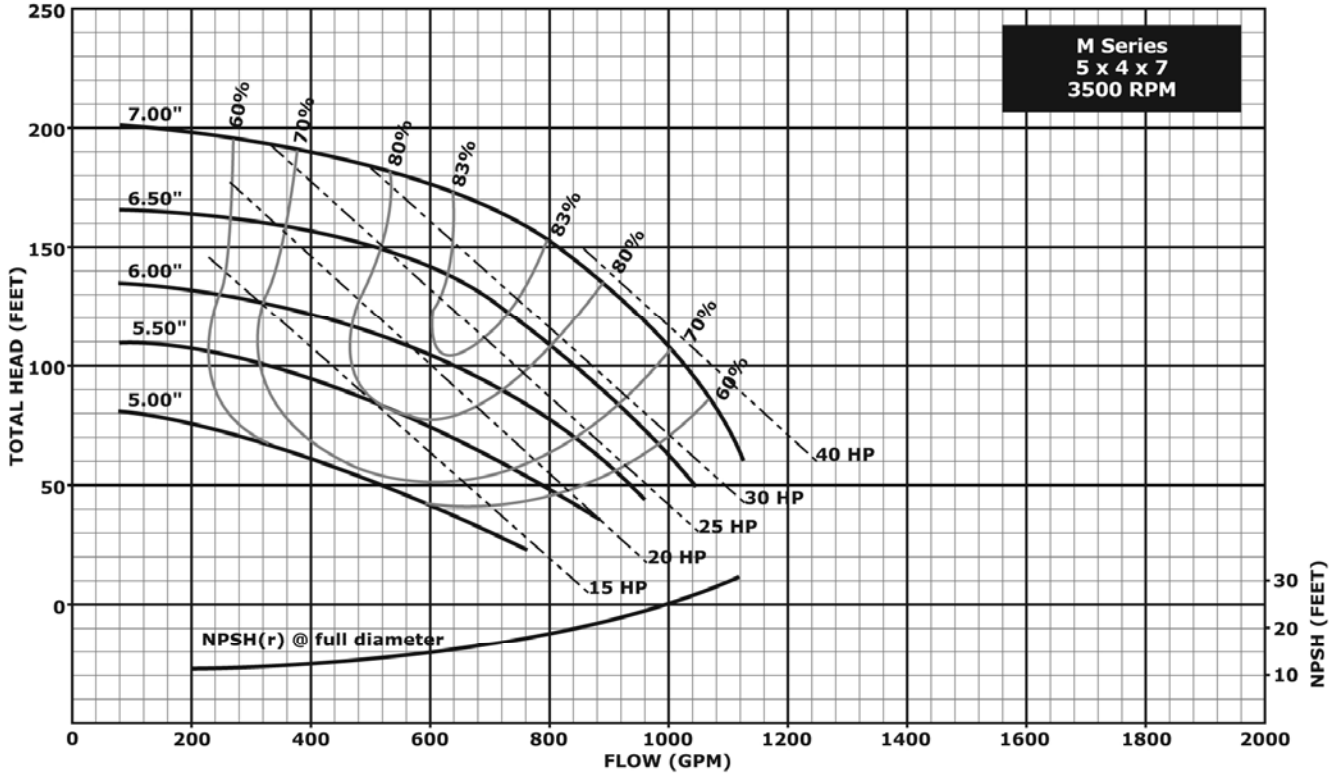

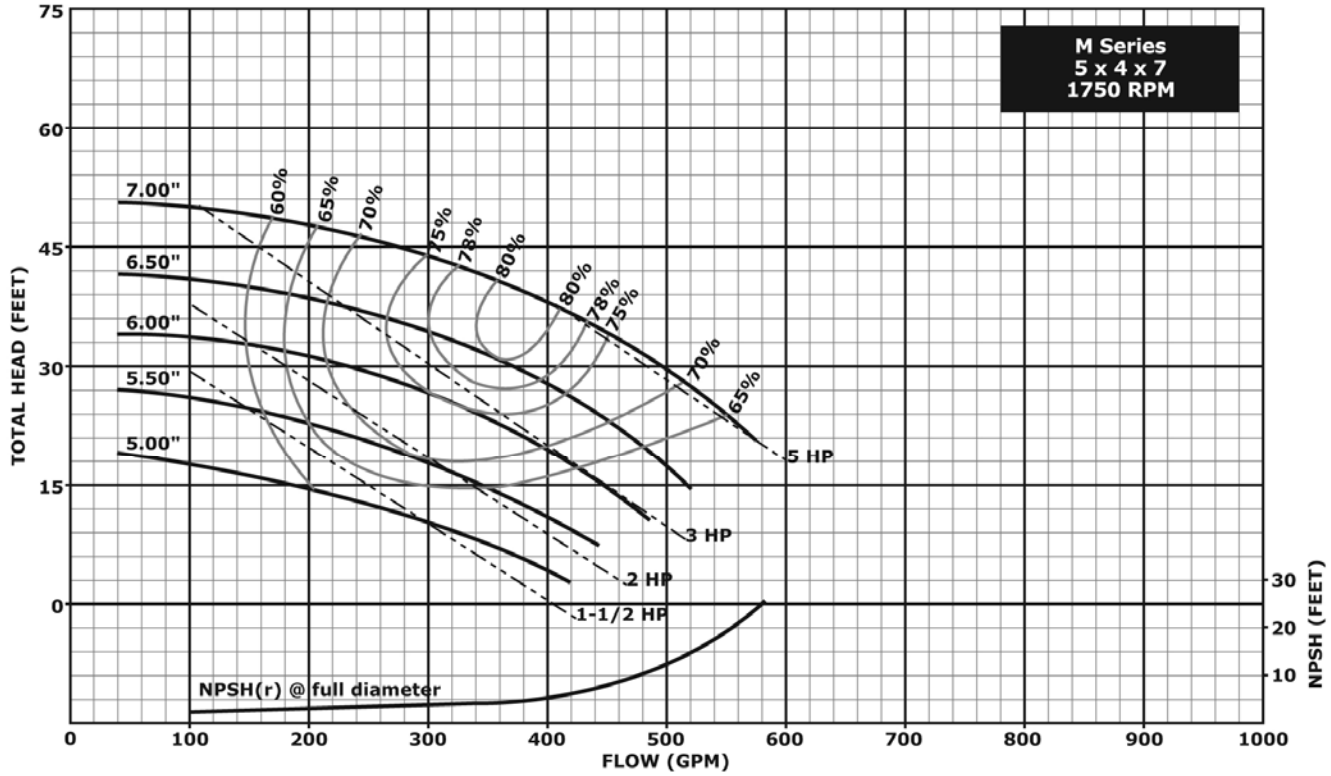

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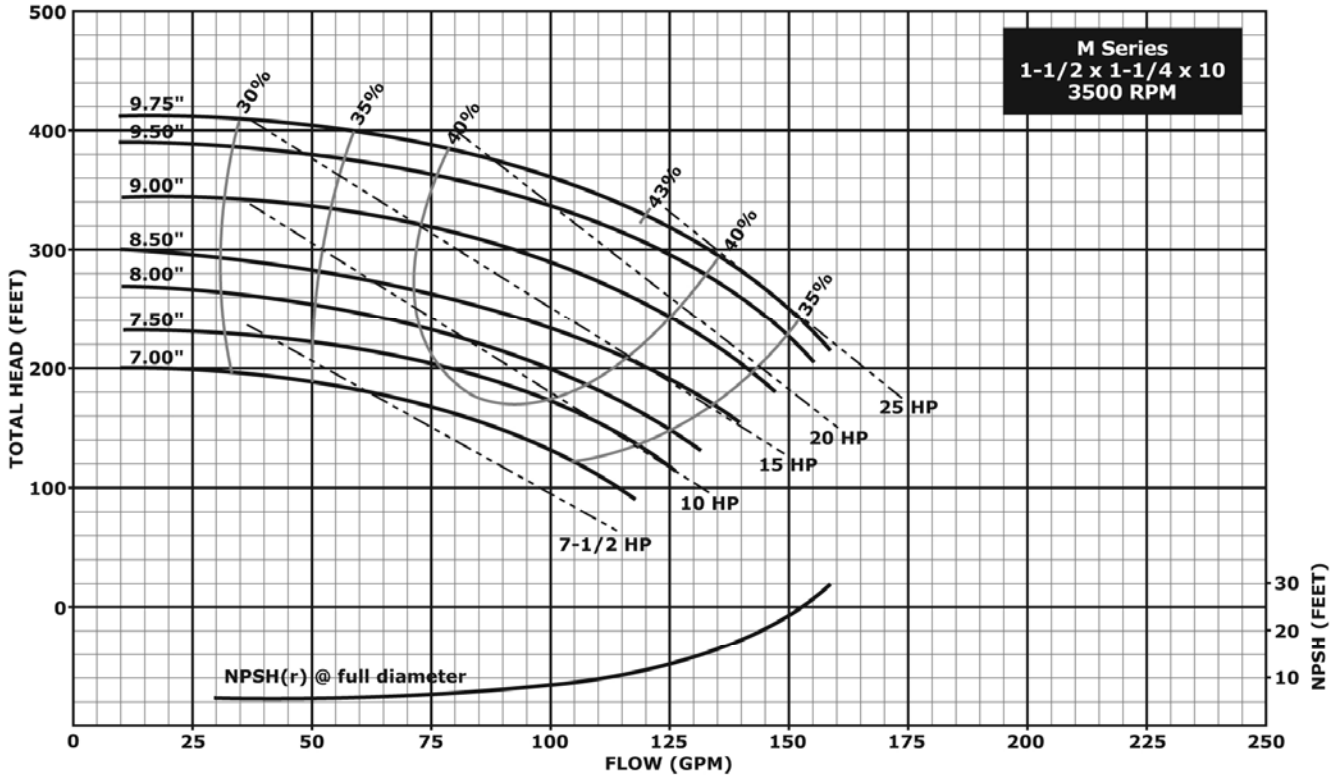
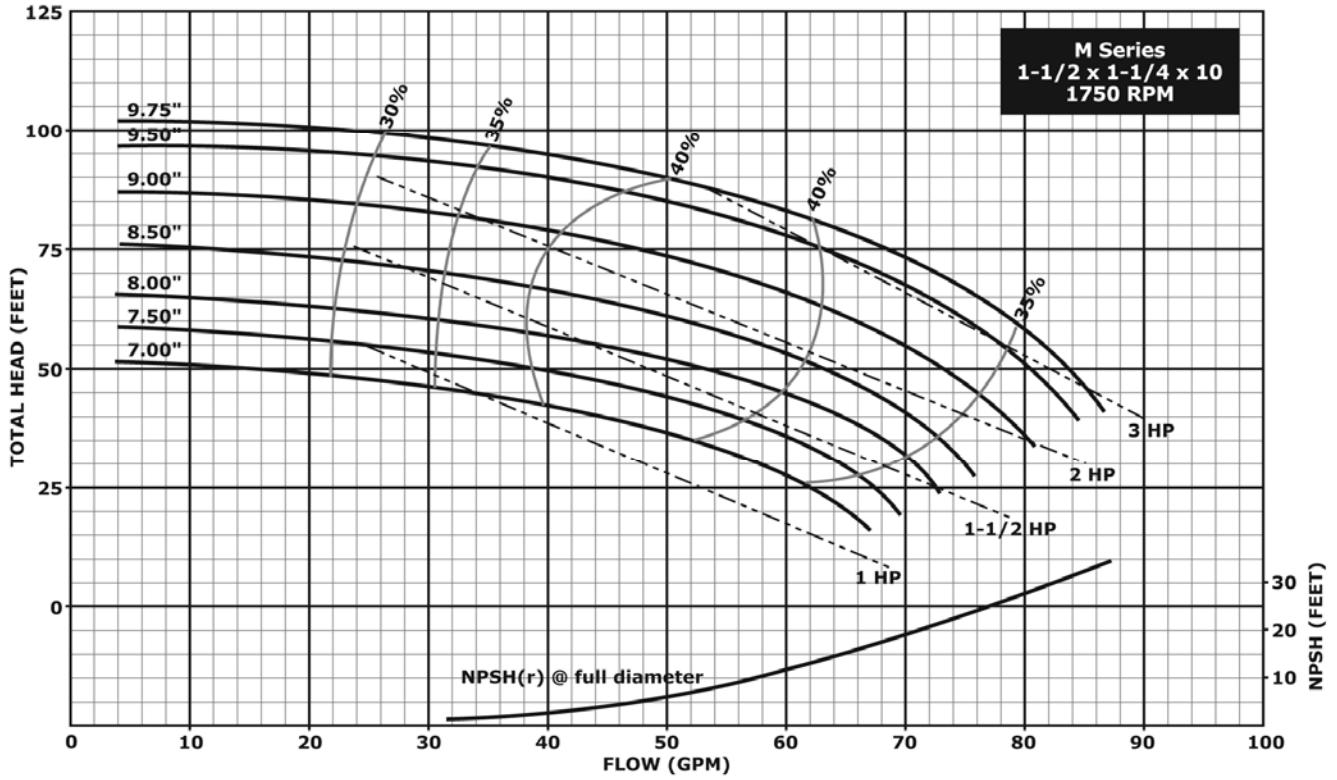
Hydraulic Performance – 10" Impeller Pumps





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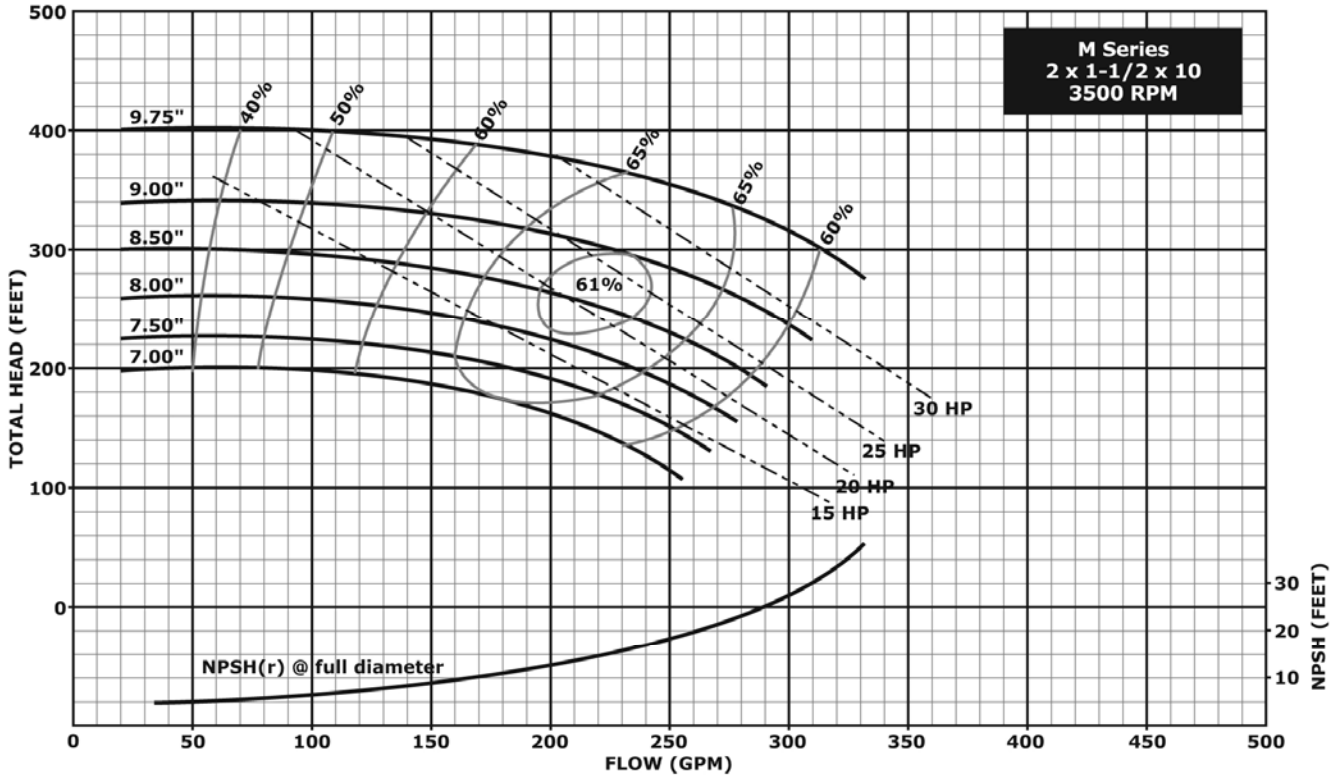

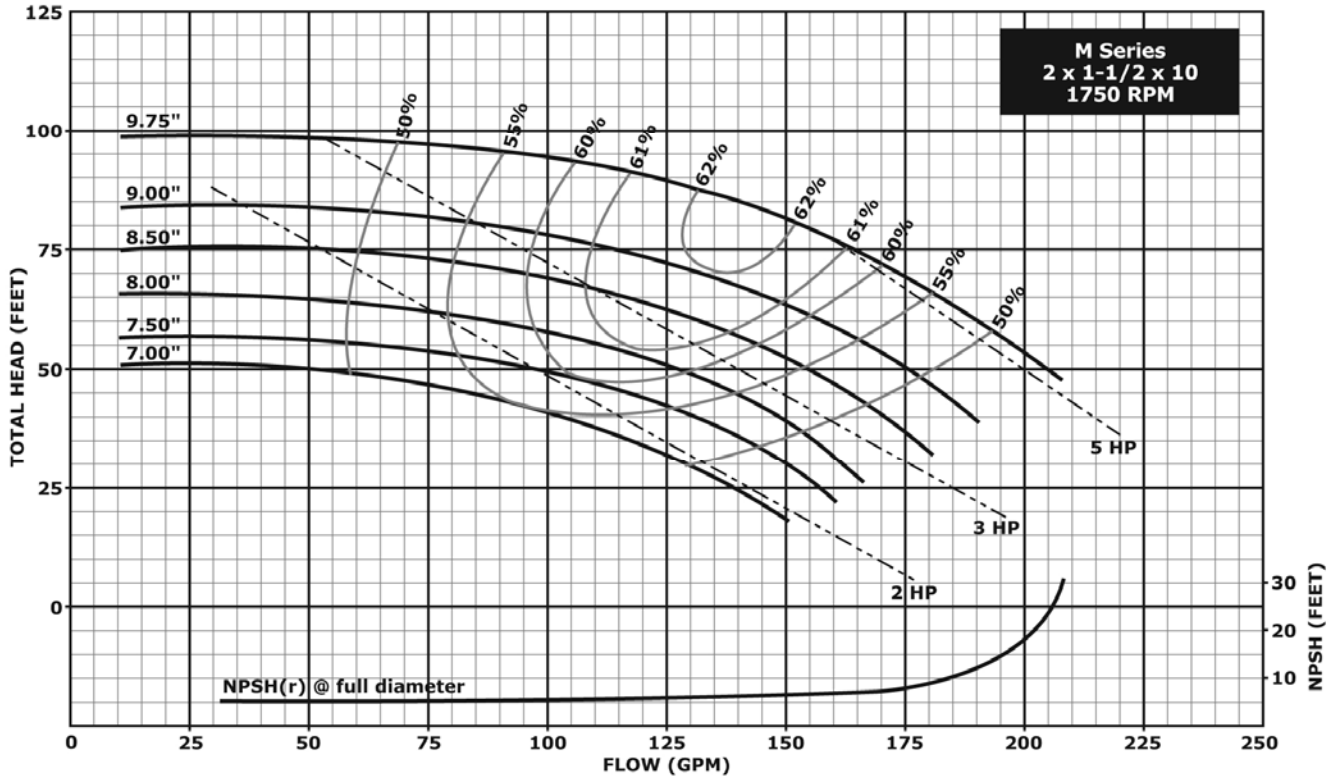

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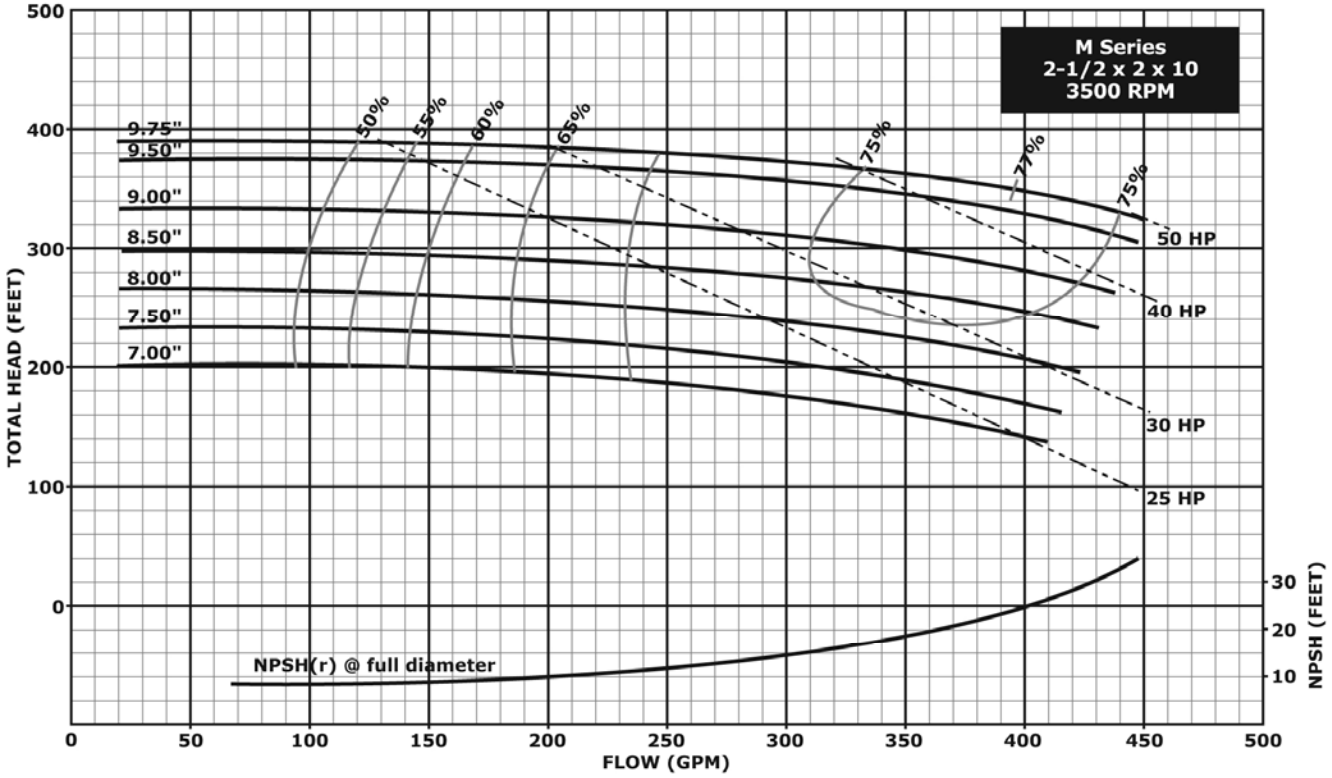

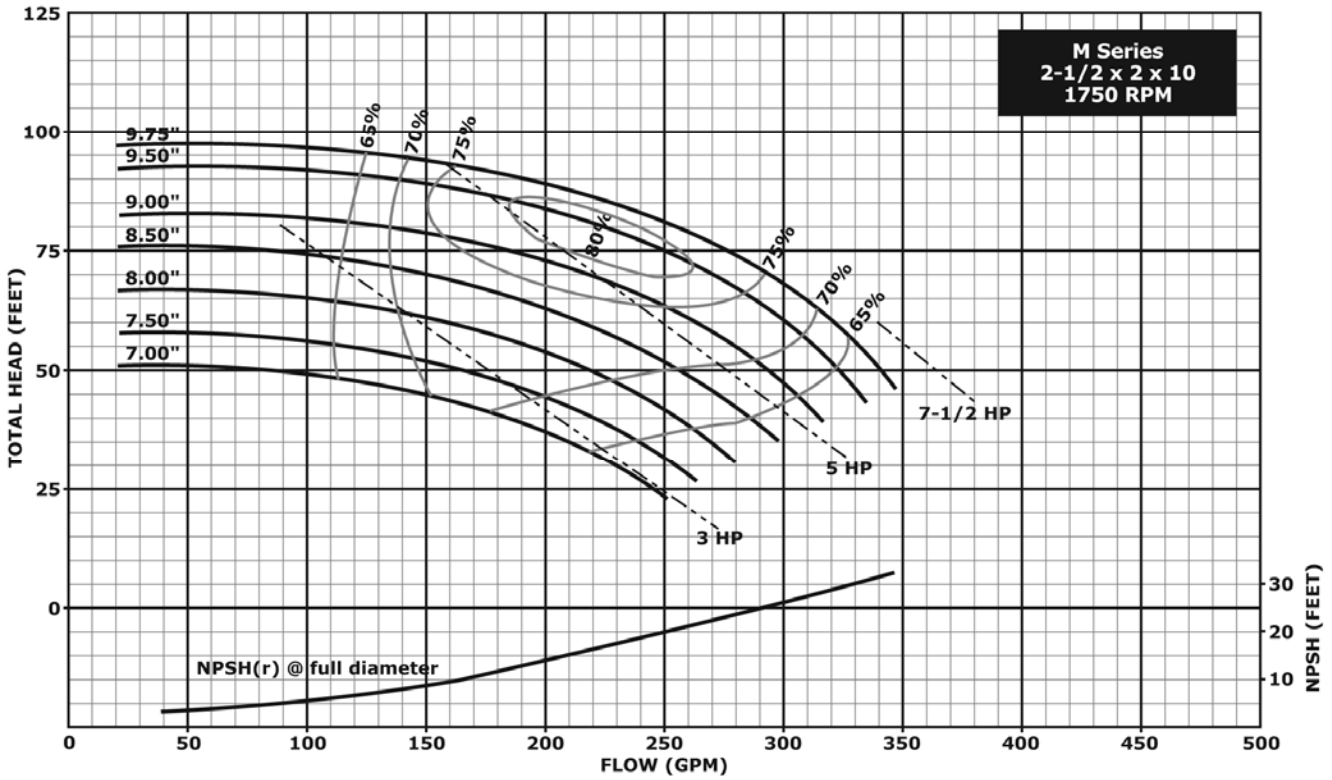

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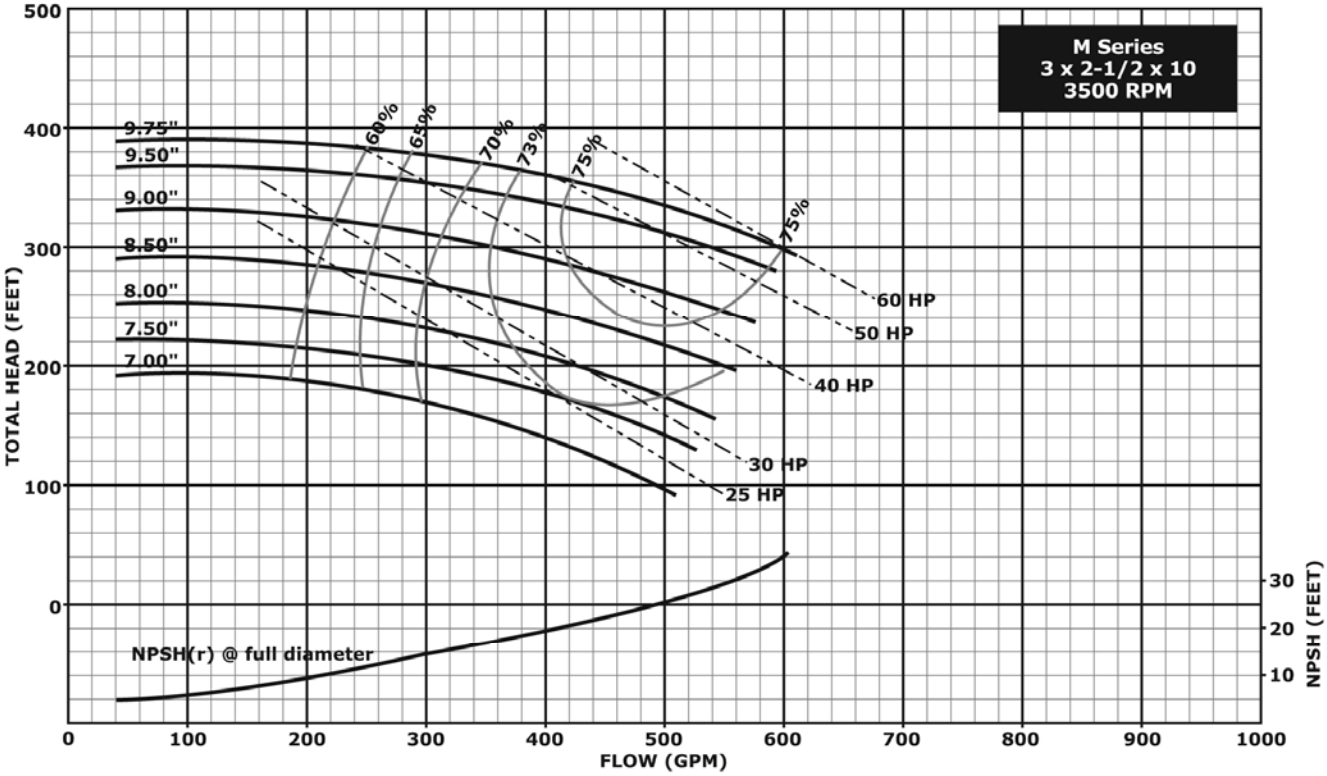

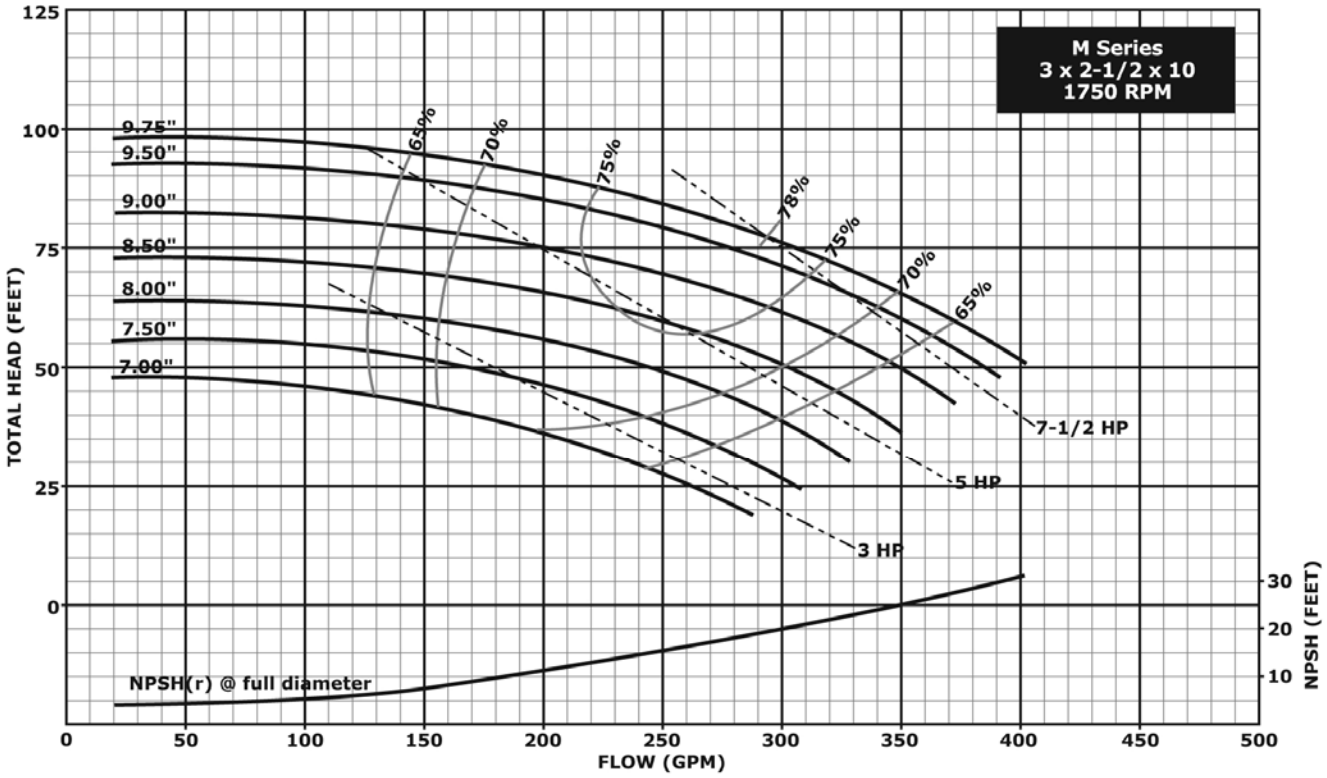

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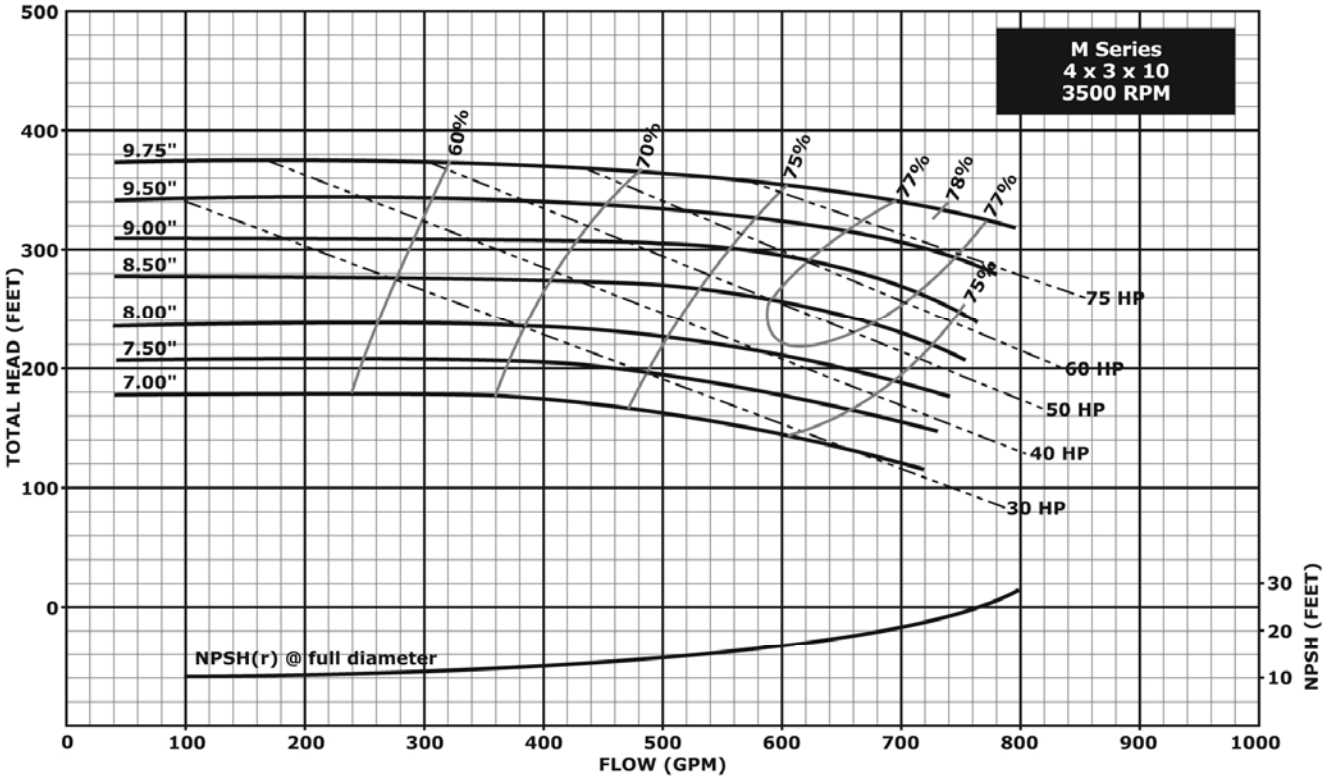

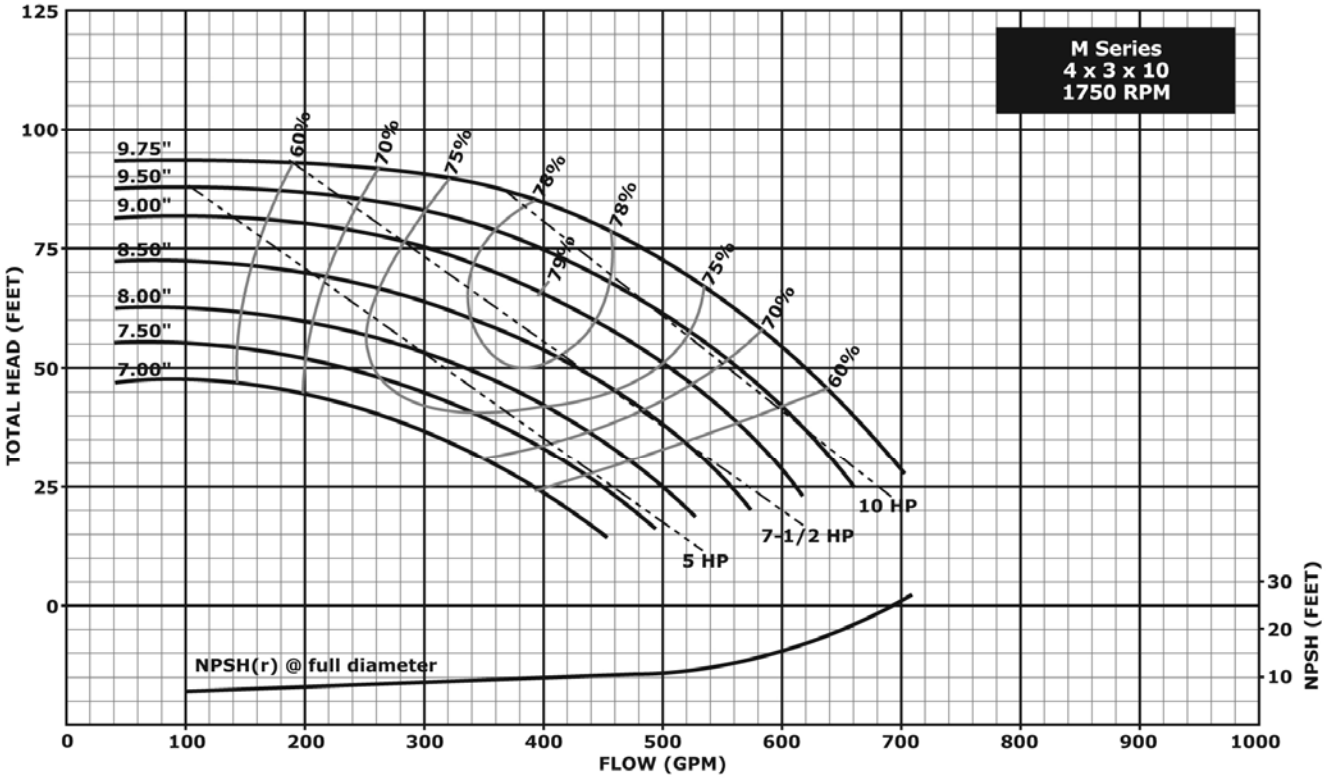

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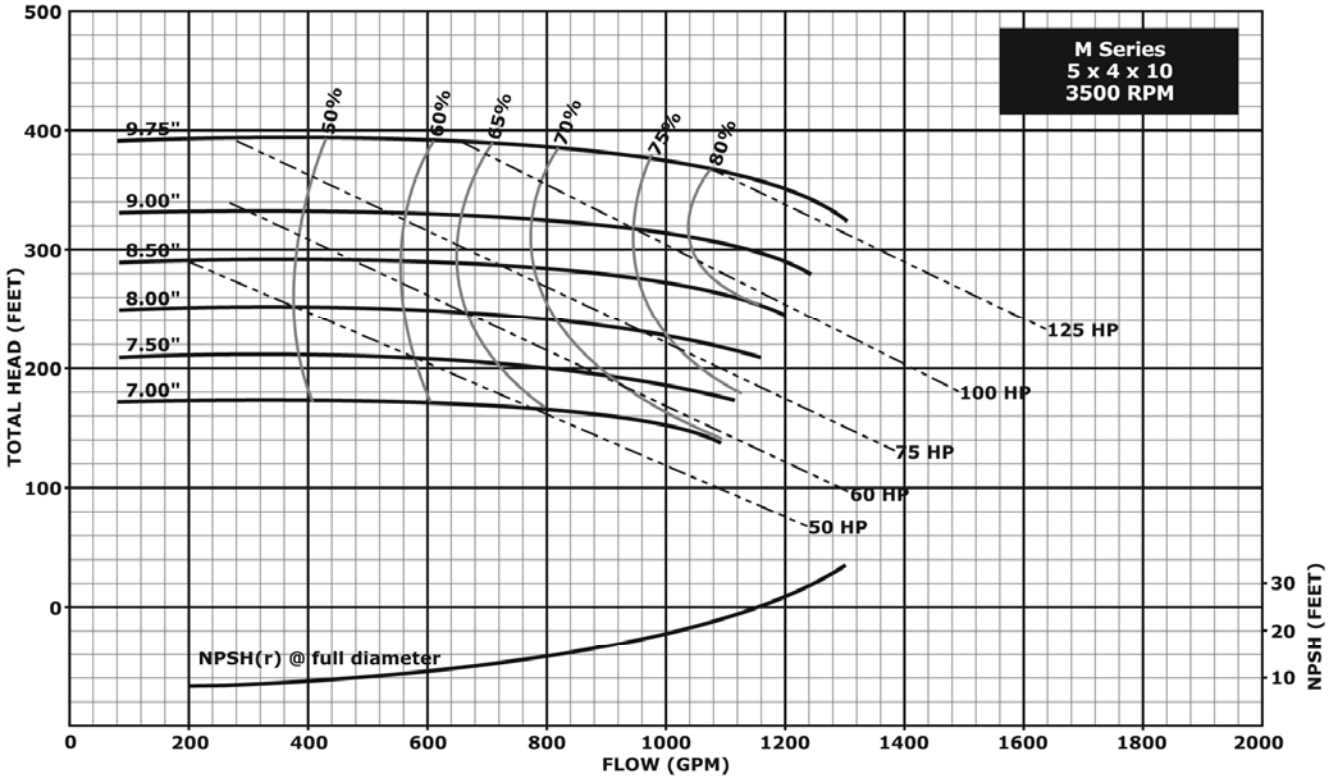

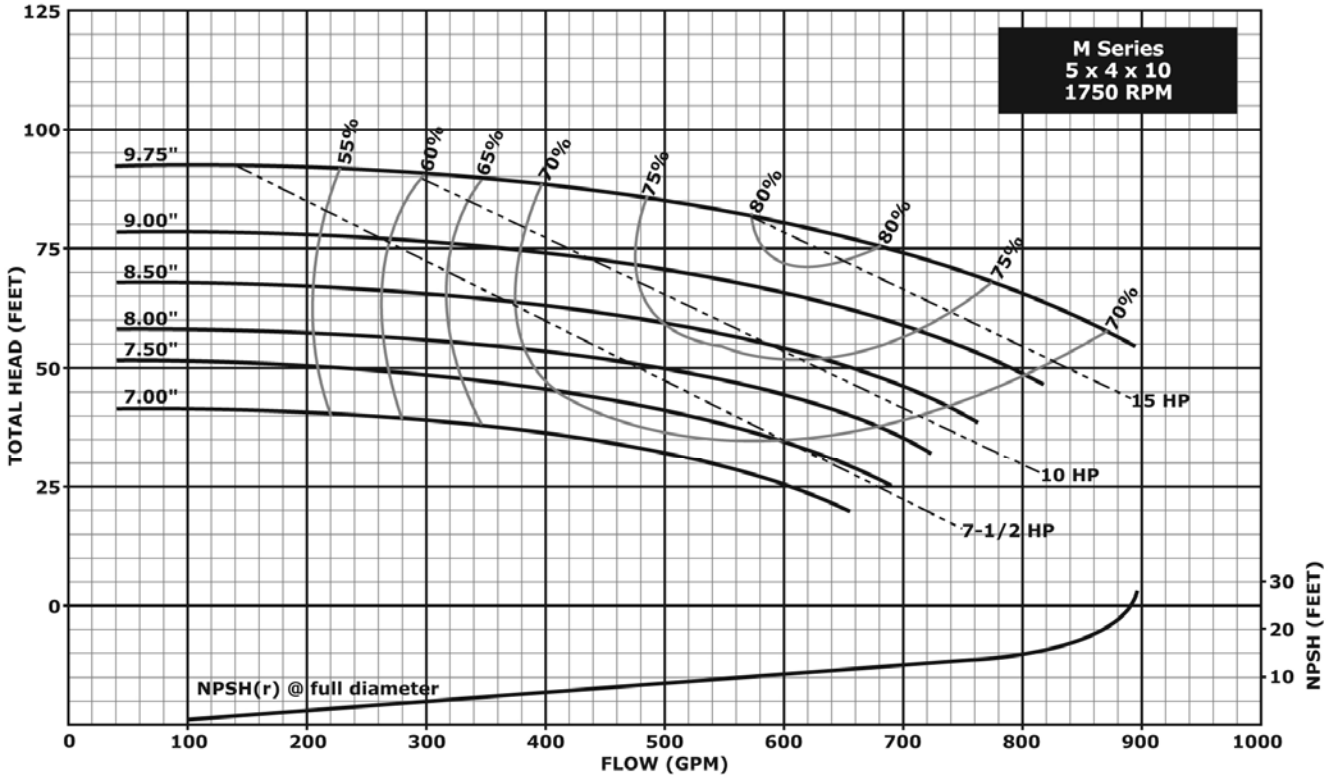

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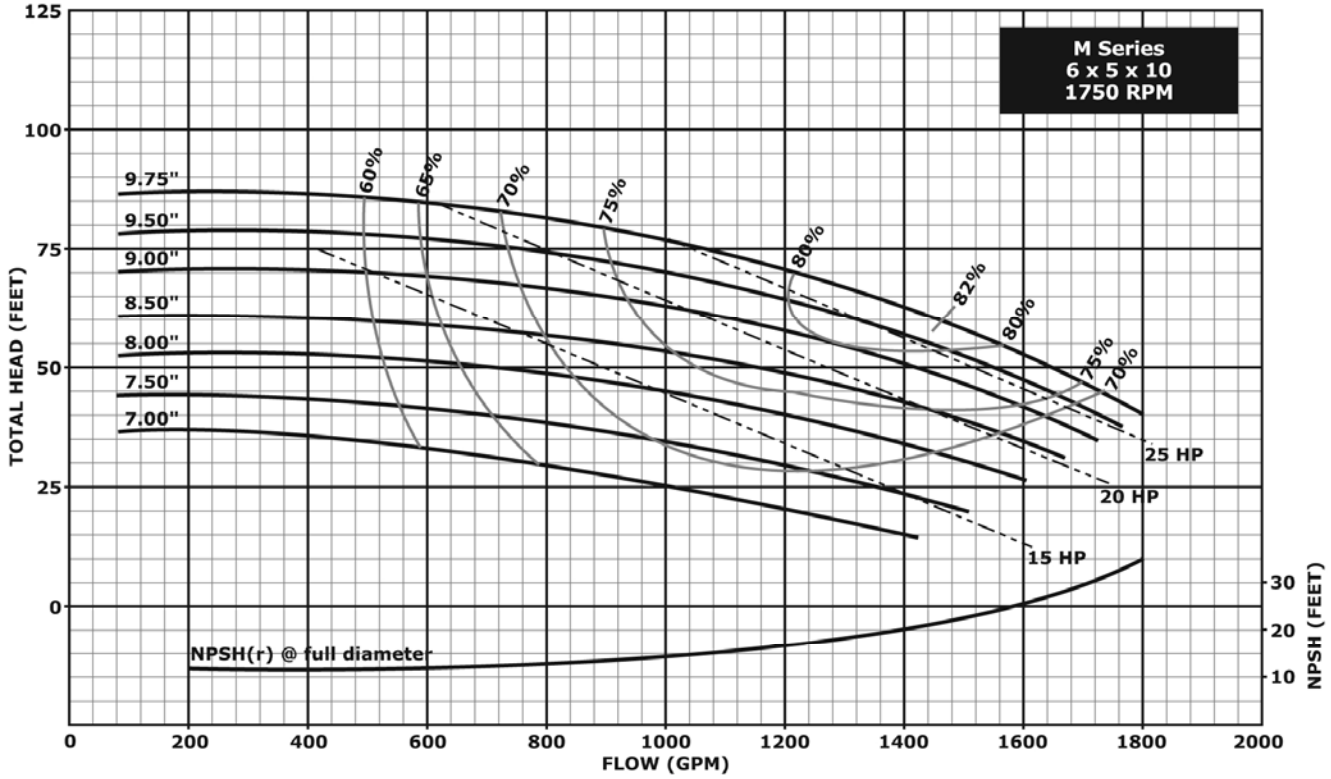

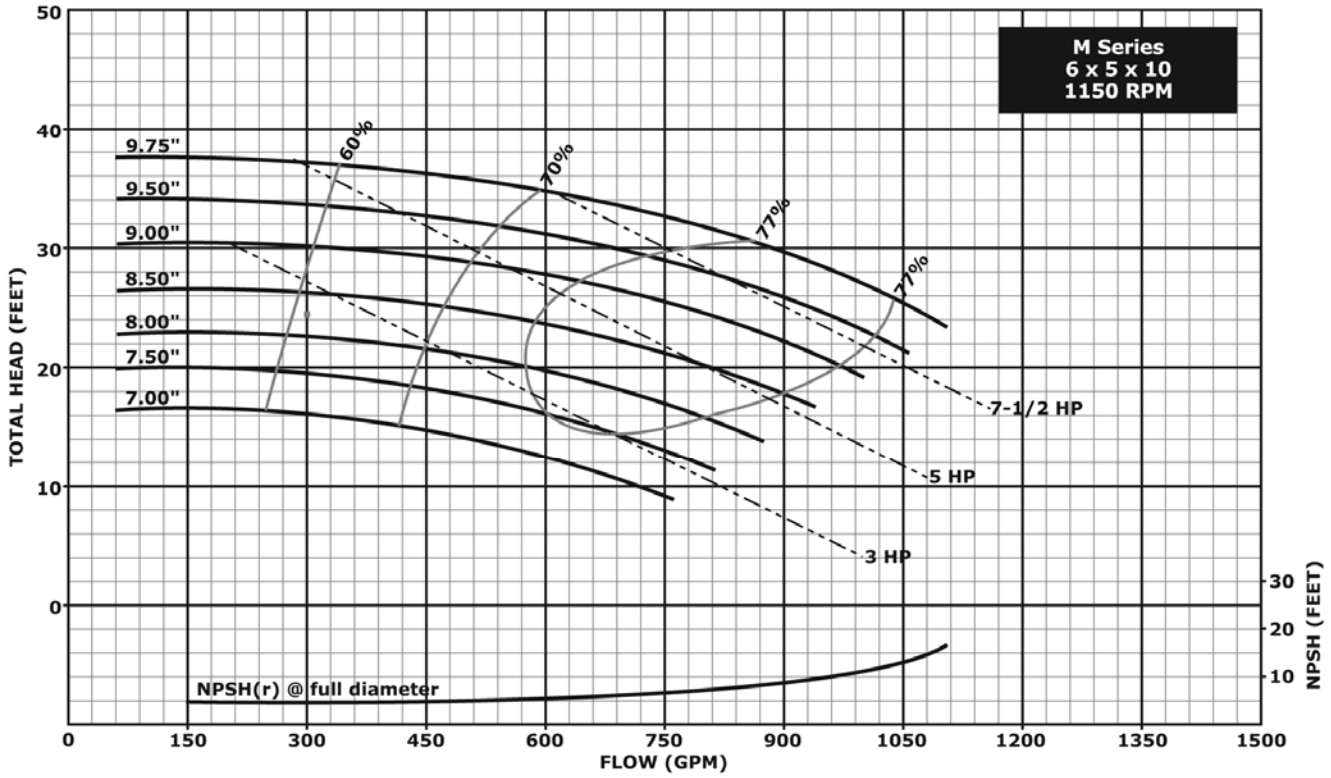

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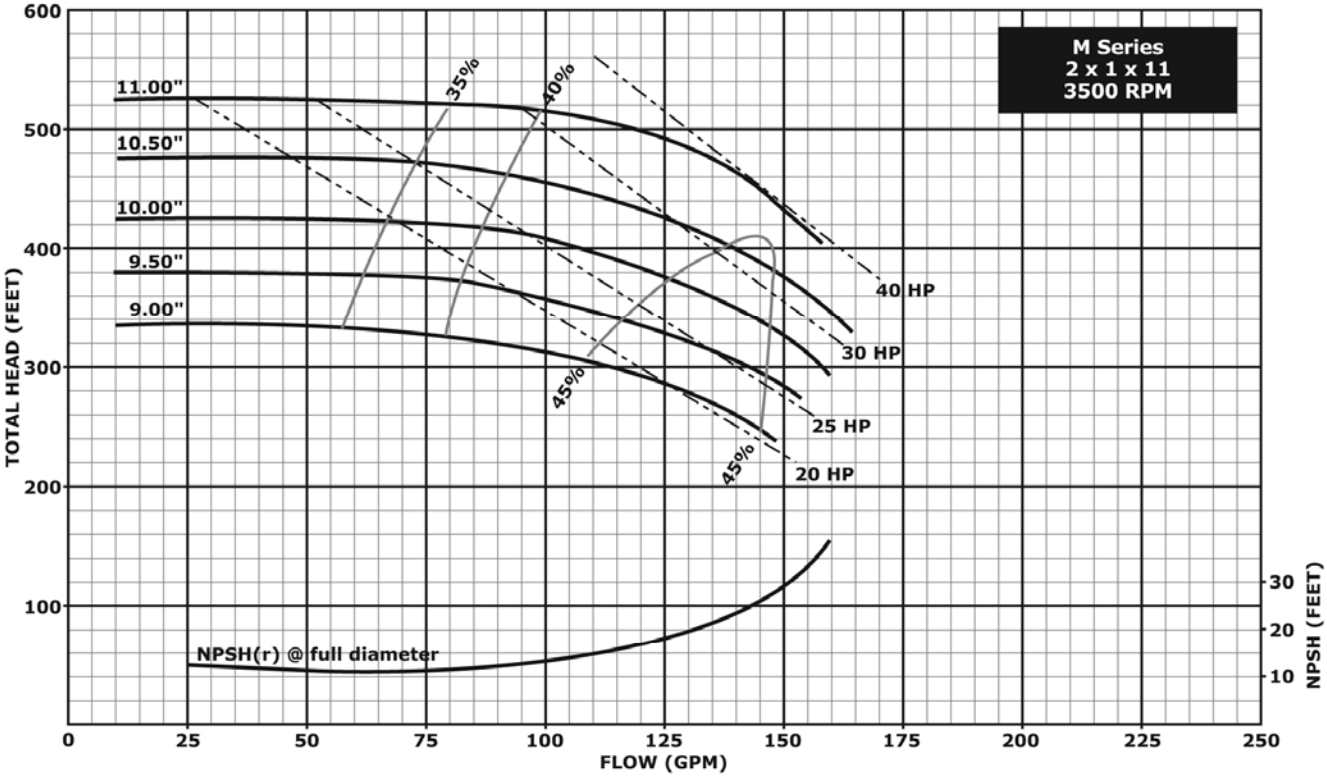
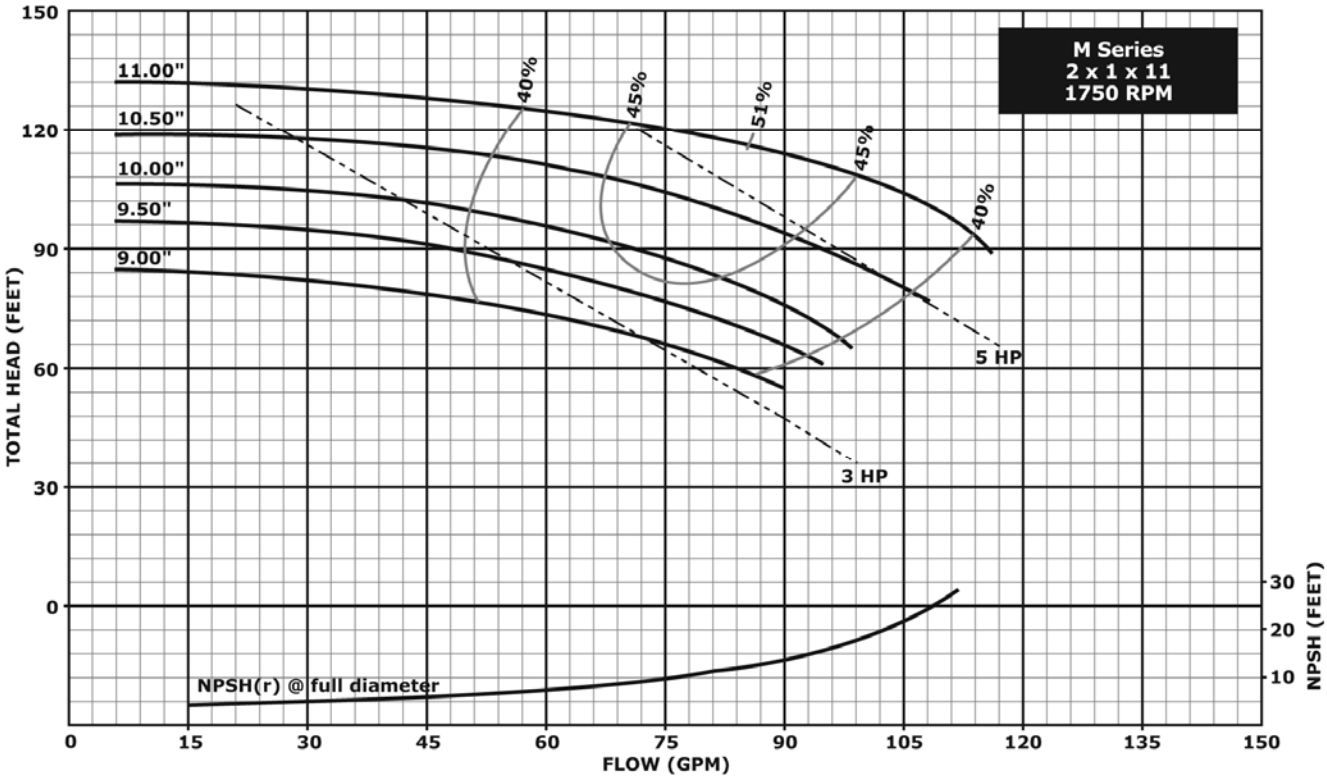
2. Impeller diameters between minimum and maximum shown are available in 1/8 inch increment trims.

Hydraulic Performance – 11" Impeller Pumps

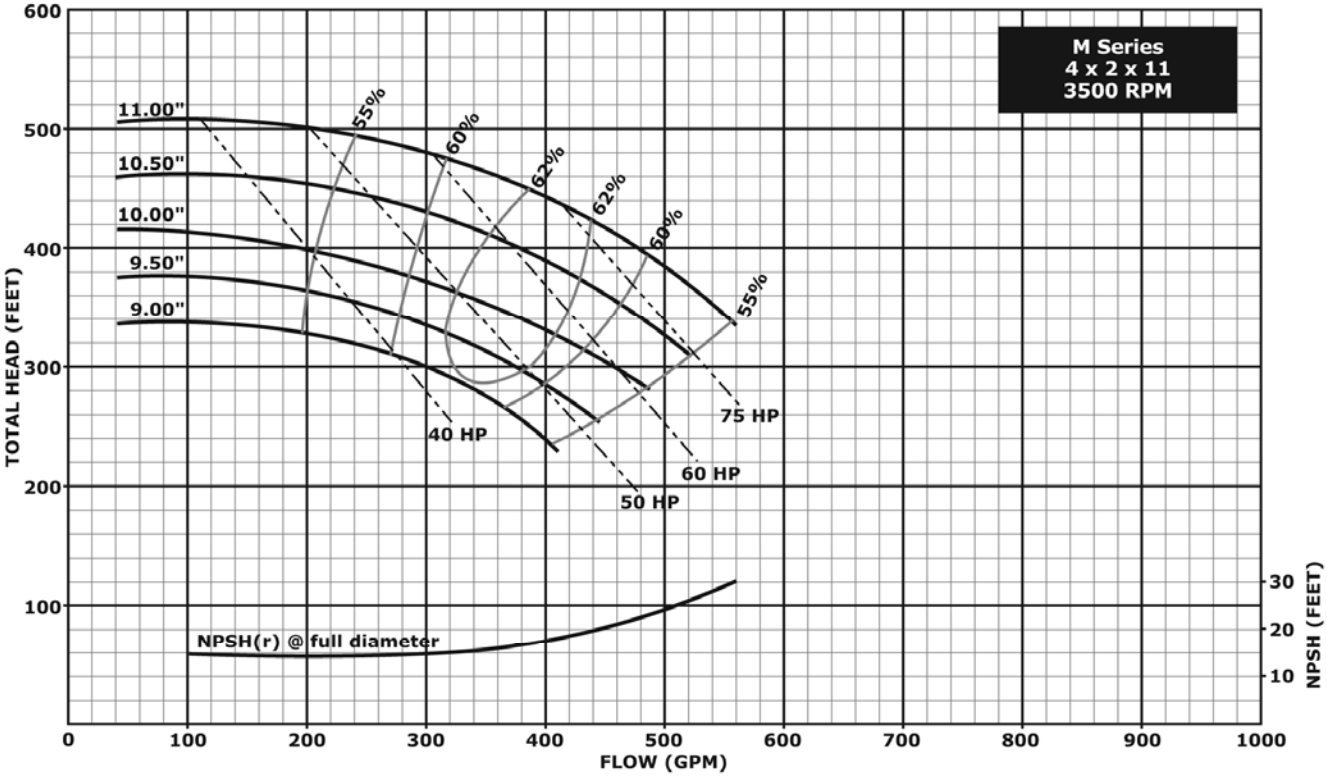


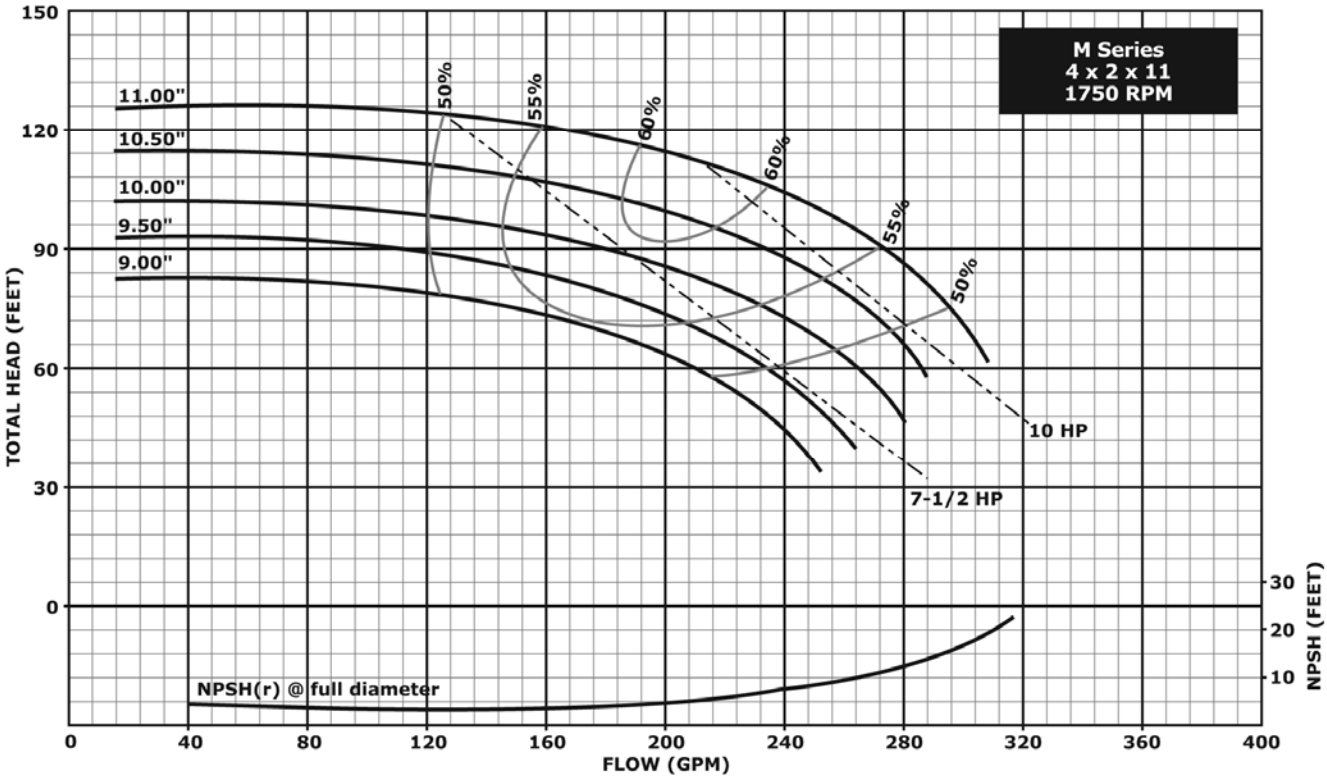


Notes:

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 – 11" Impeller Pumps

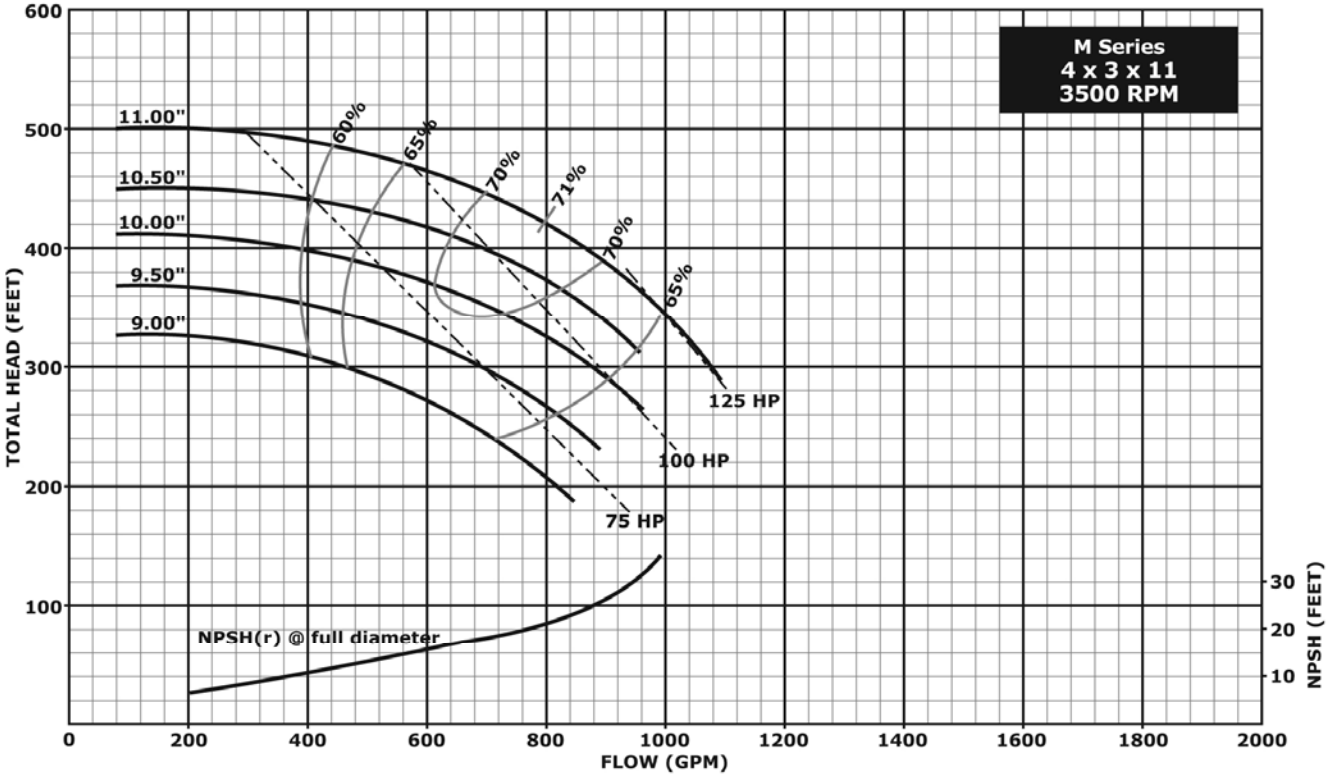


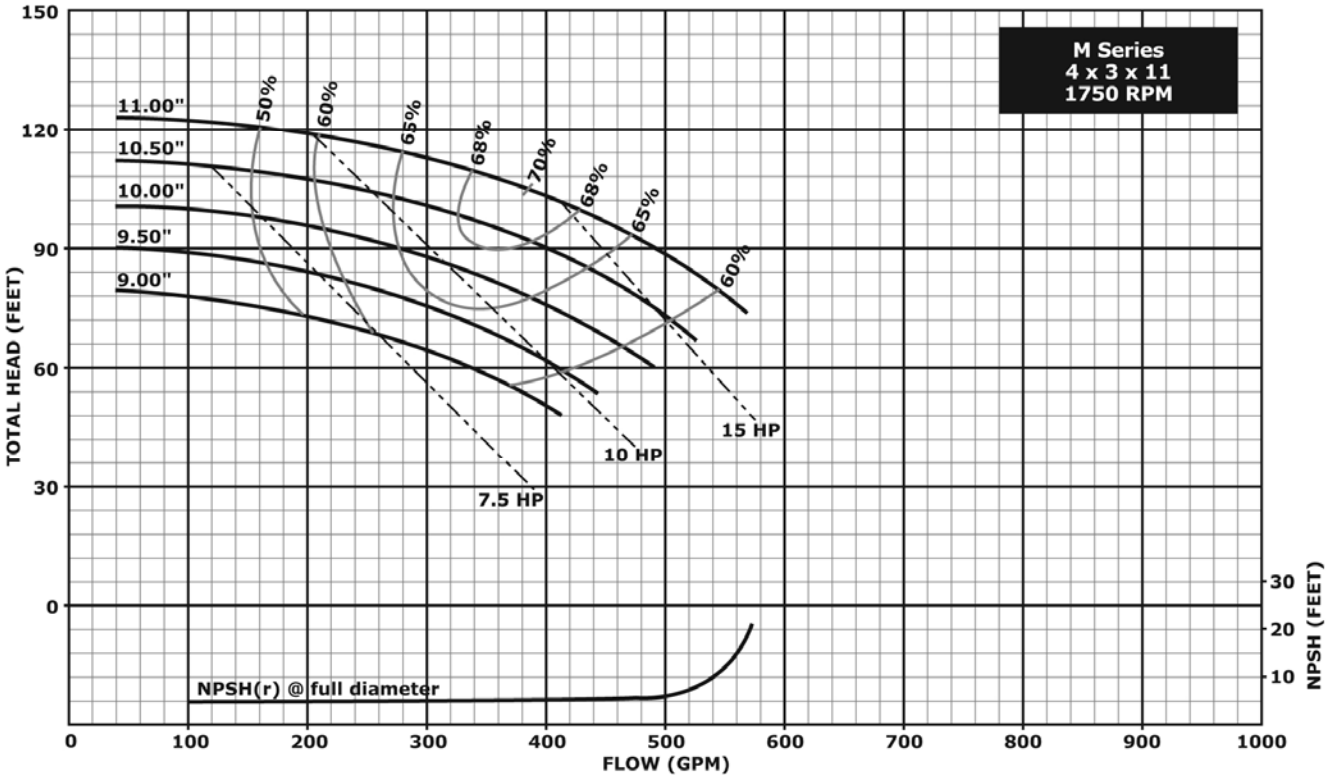


Notes:

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 – 11" Impeller Pumps

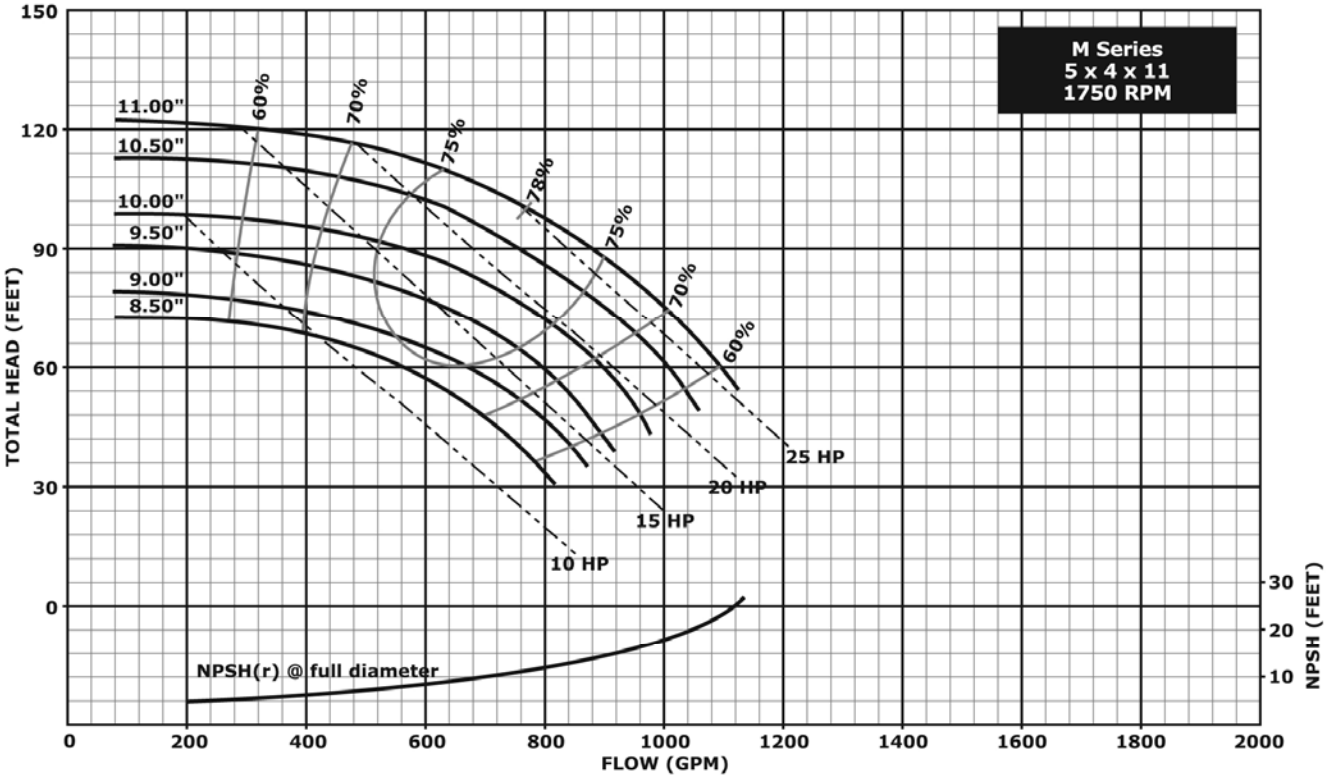


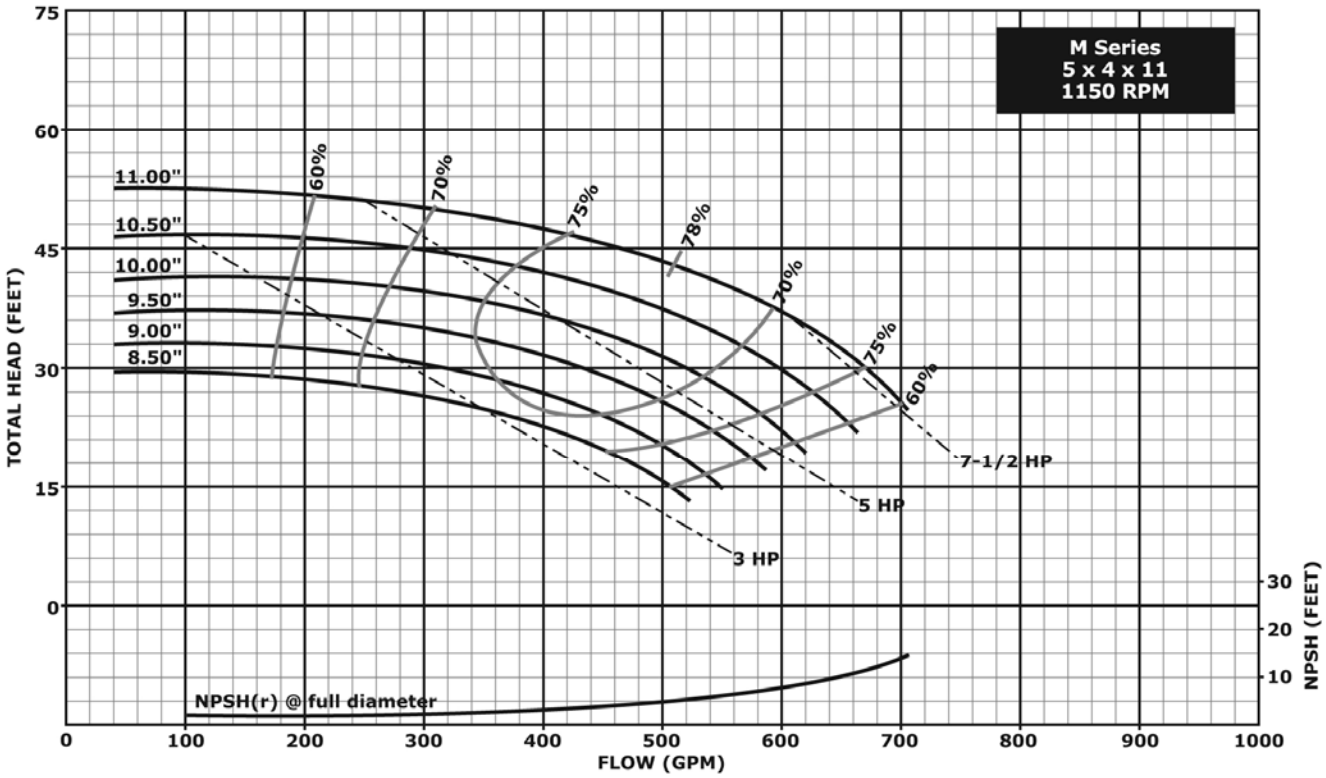


Notes:

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 – 11" Impeller Pumps

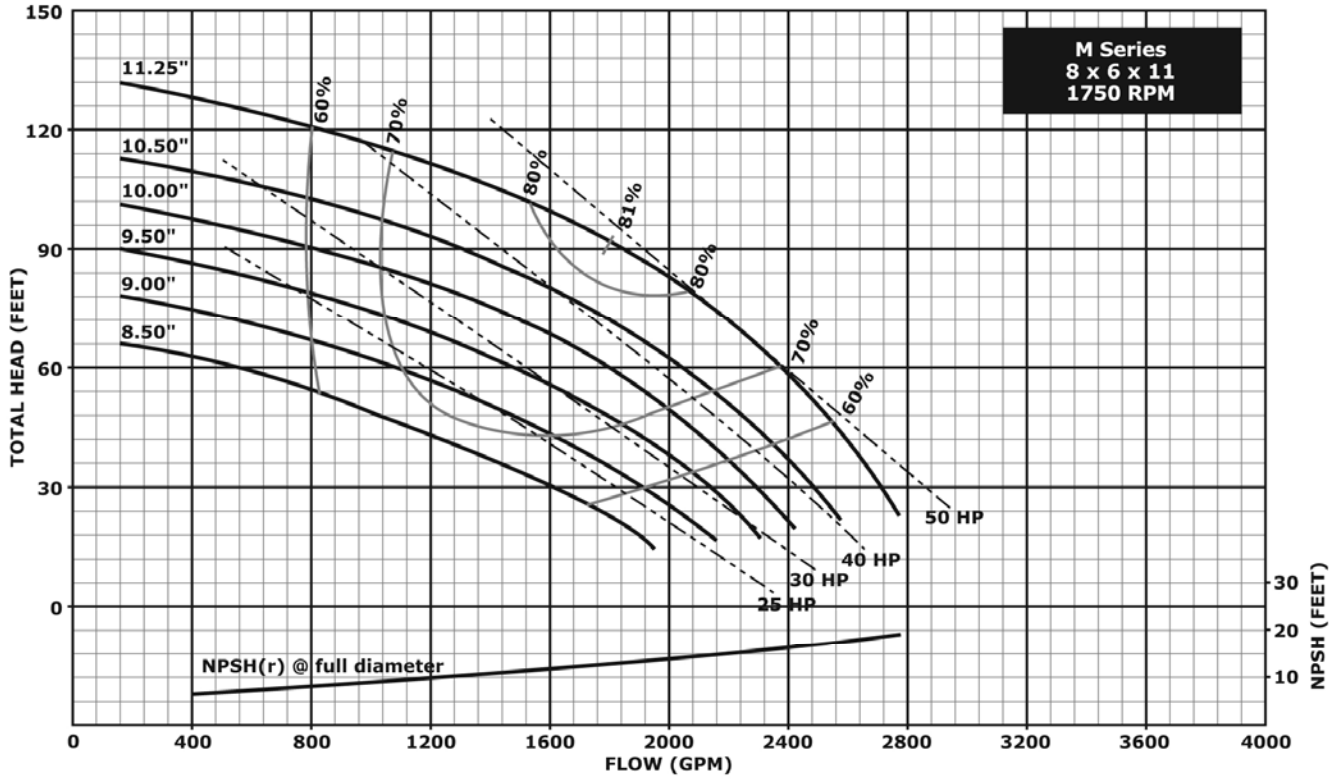


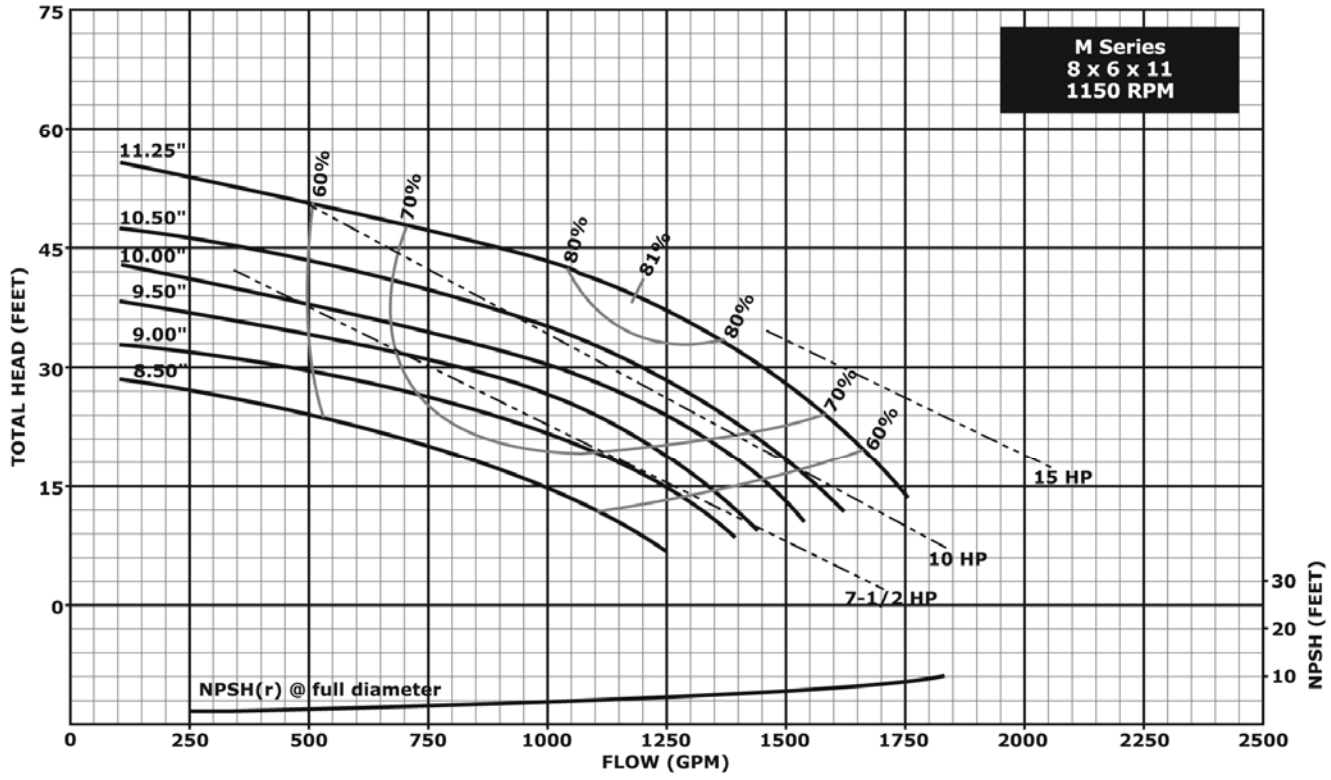


Notes:

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 – 11" Impeller Pumps

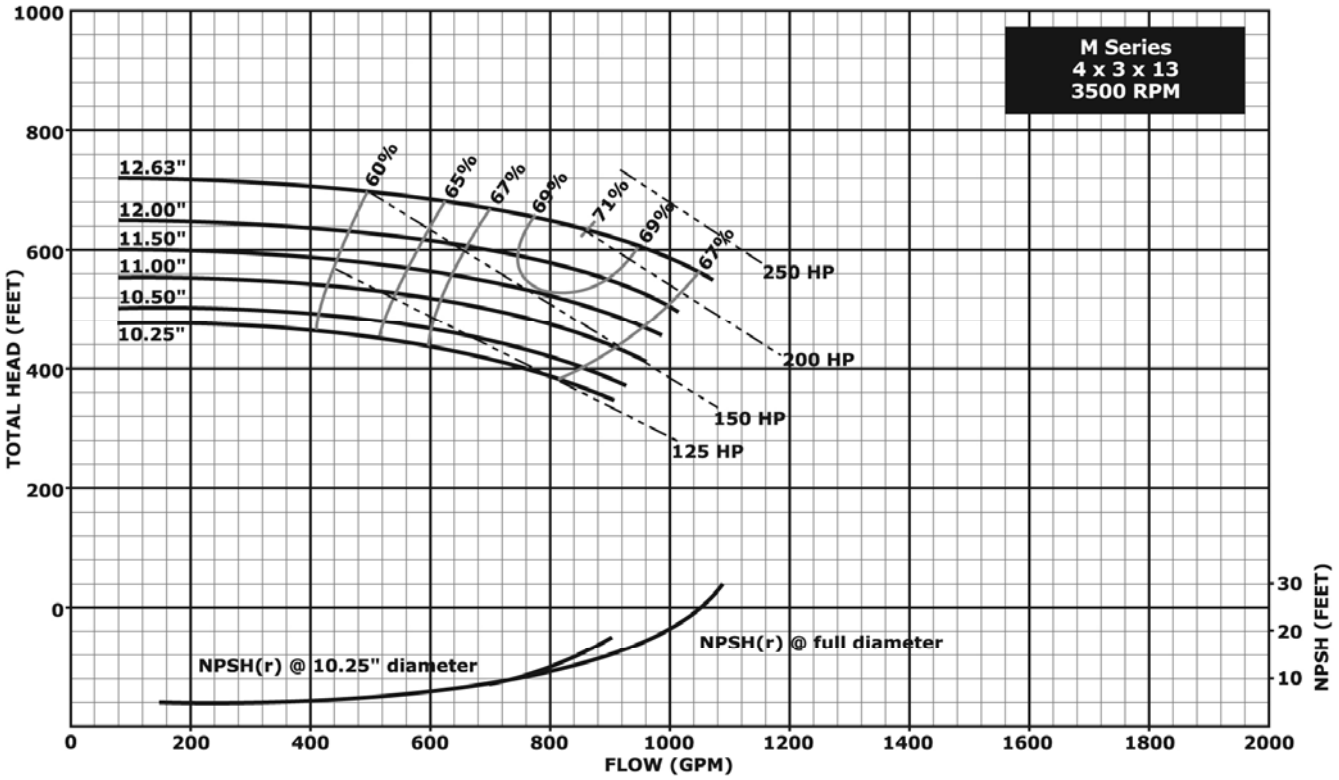


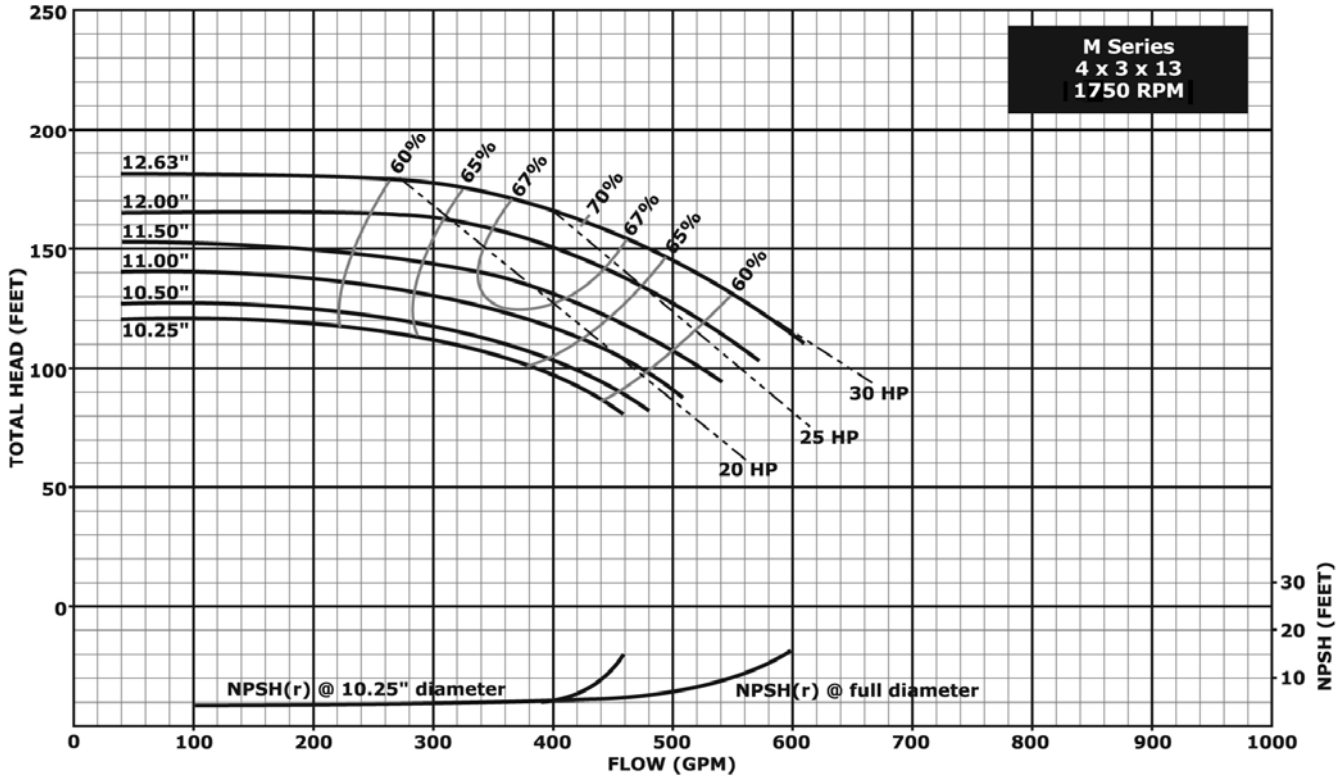


Notes:

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

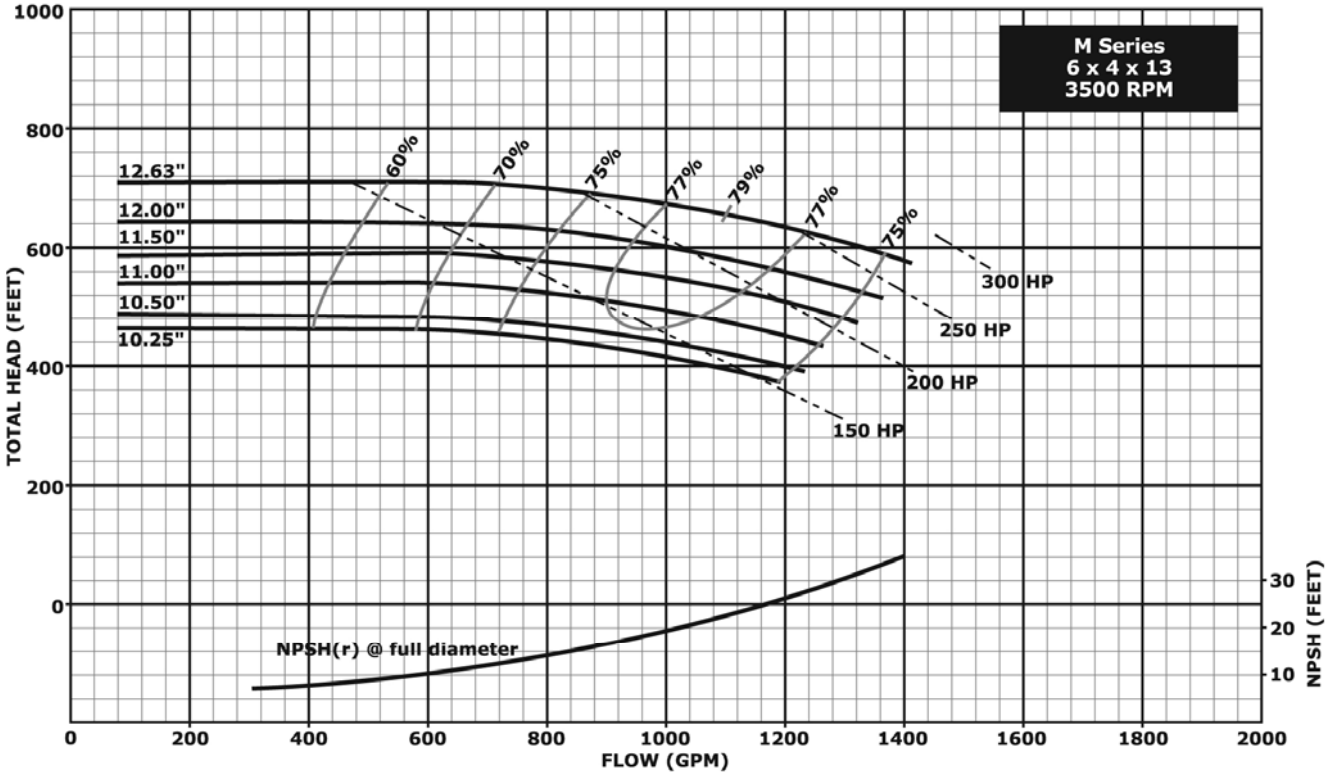


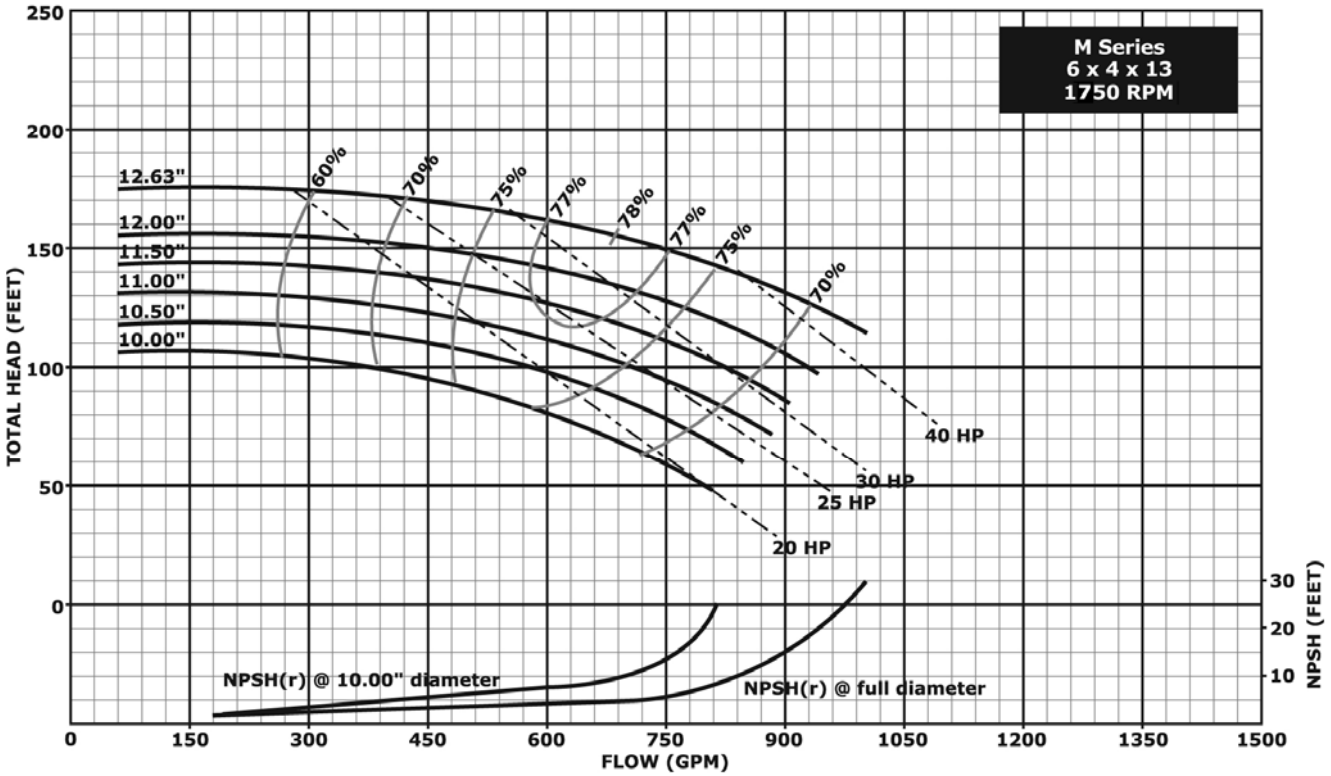


Notes:

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

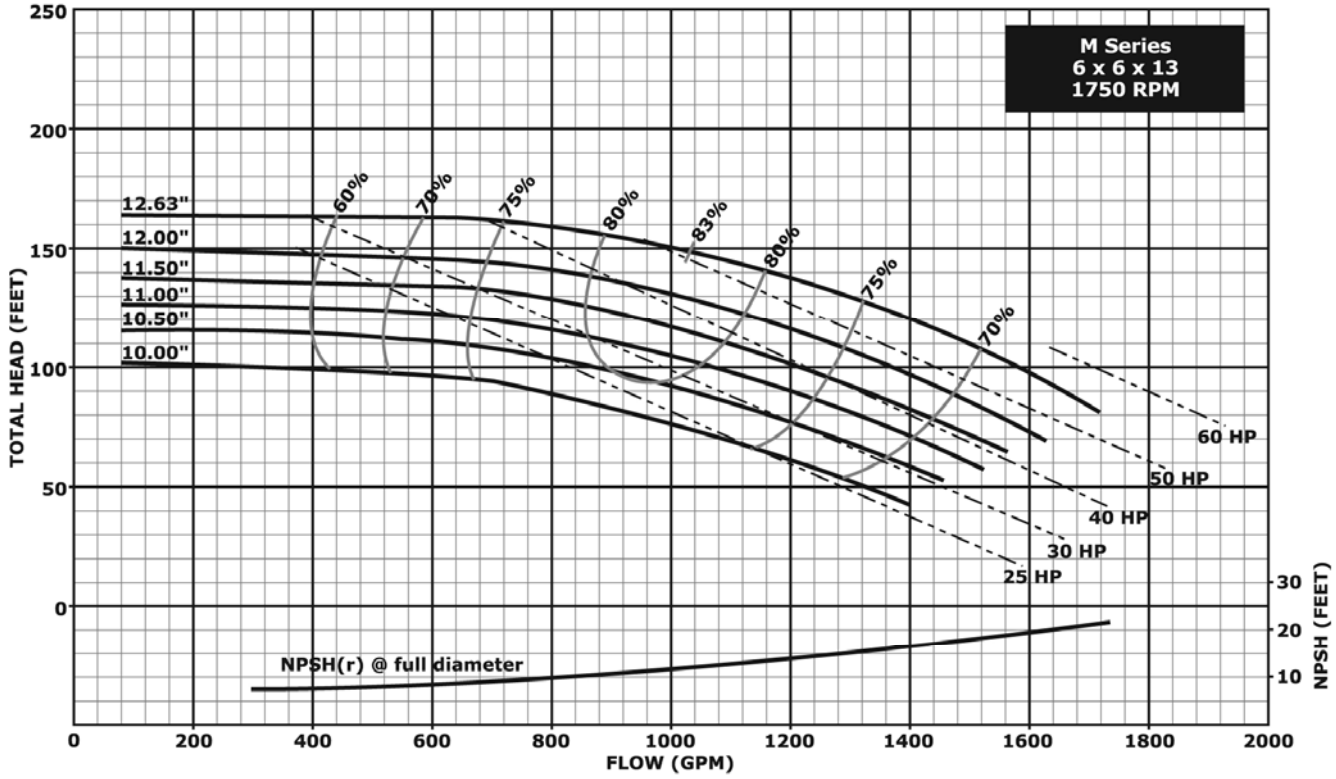


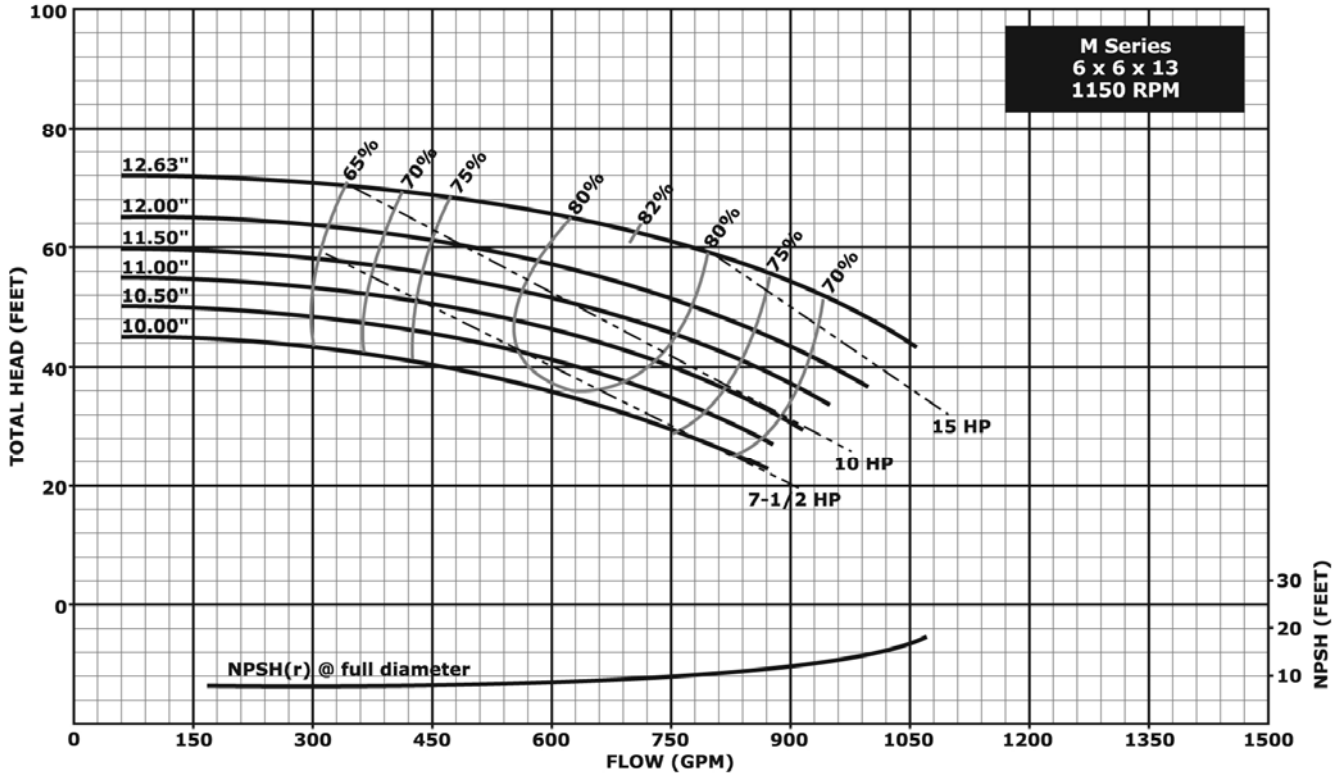


Notes:

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

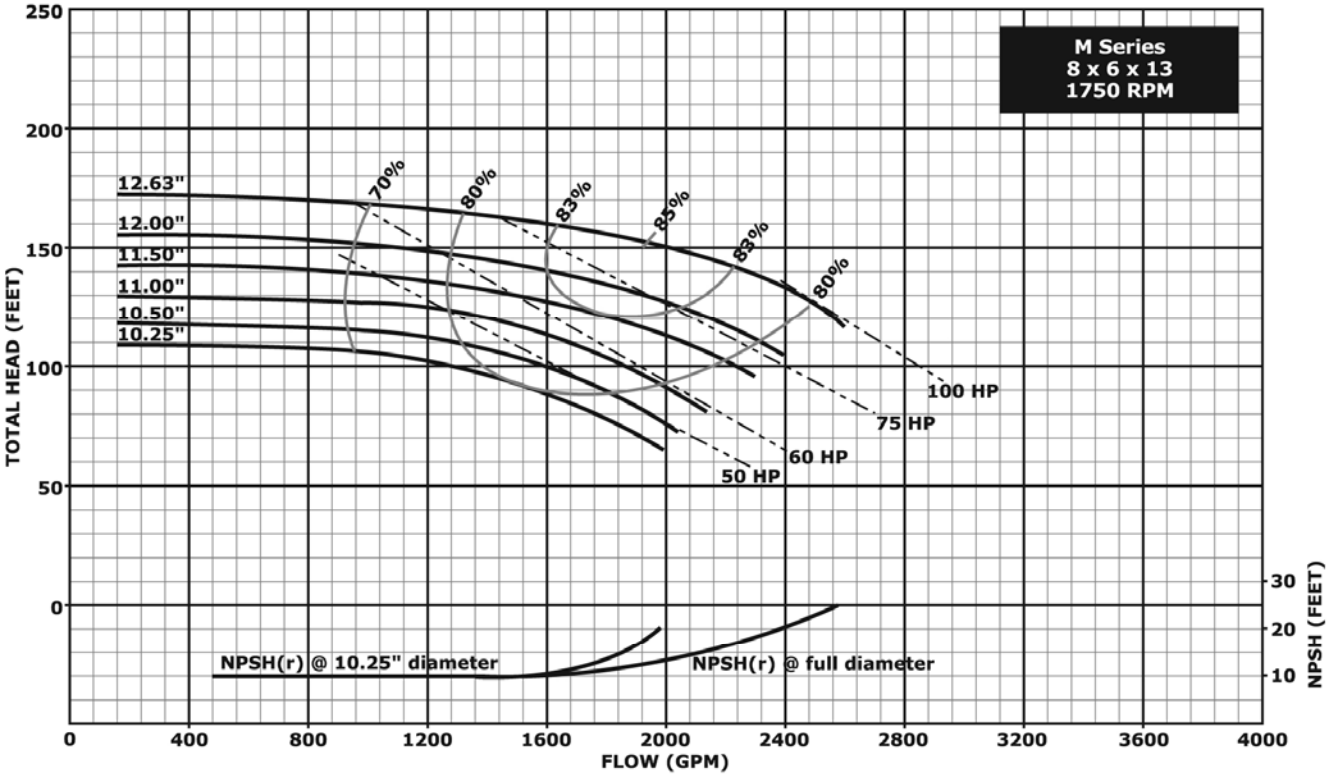


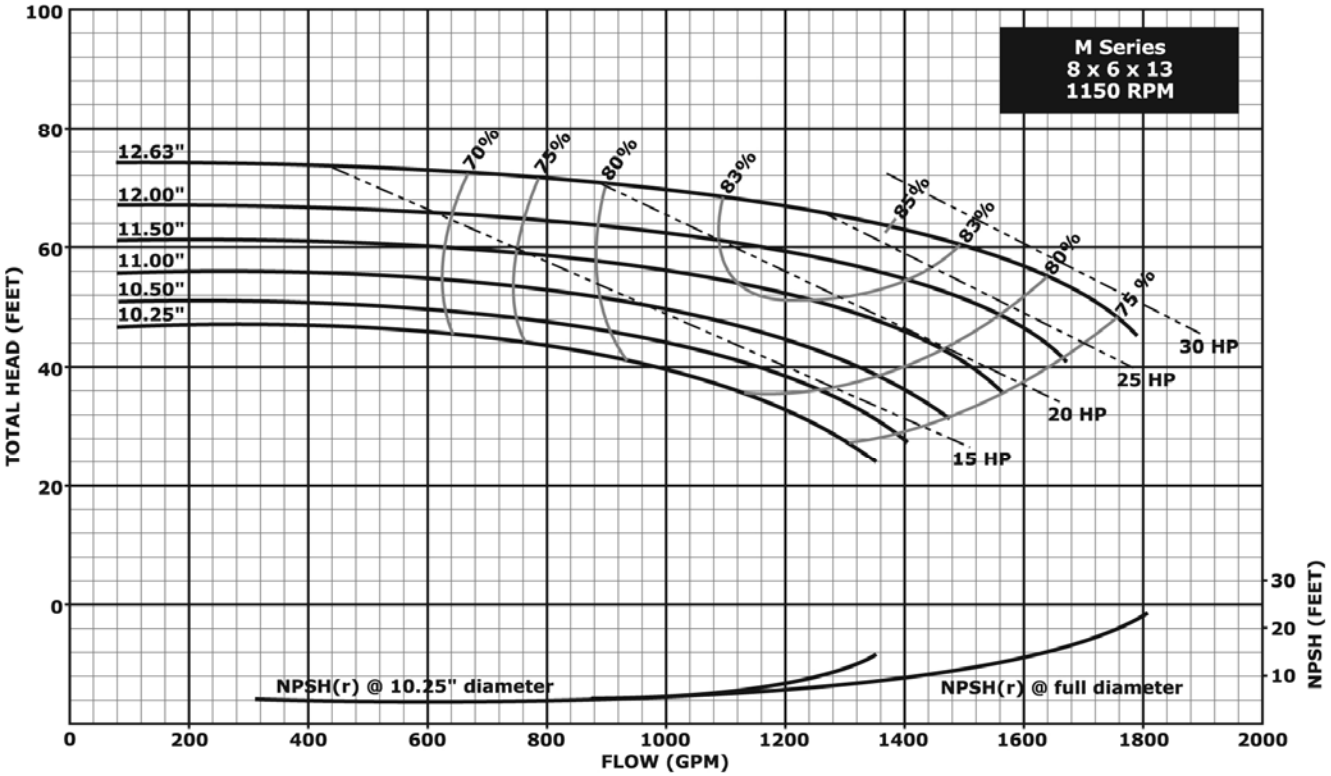


Notes:

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

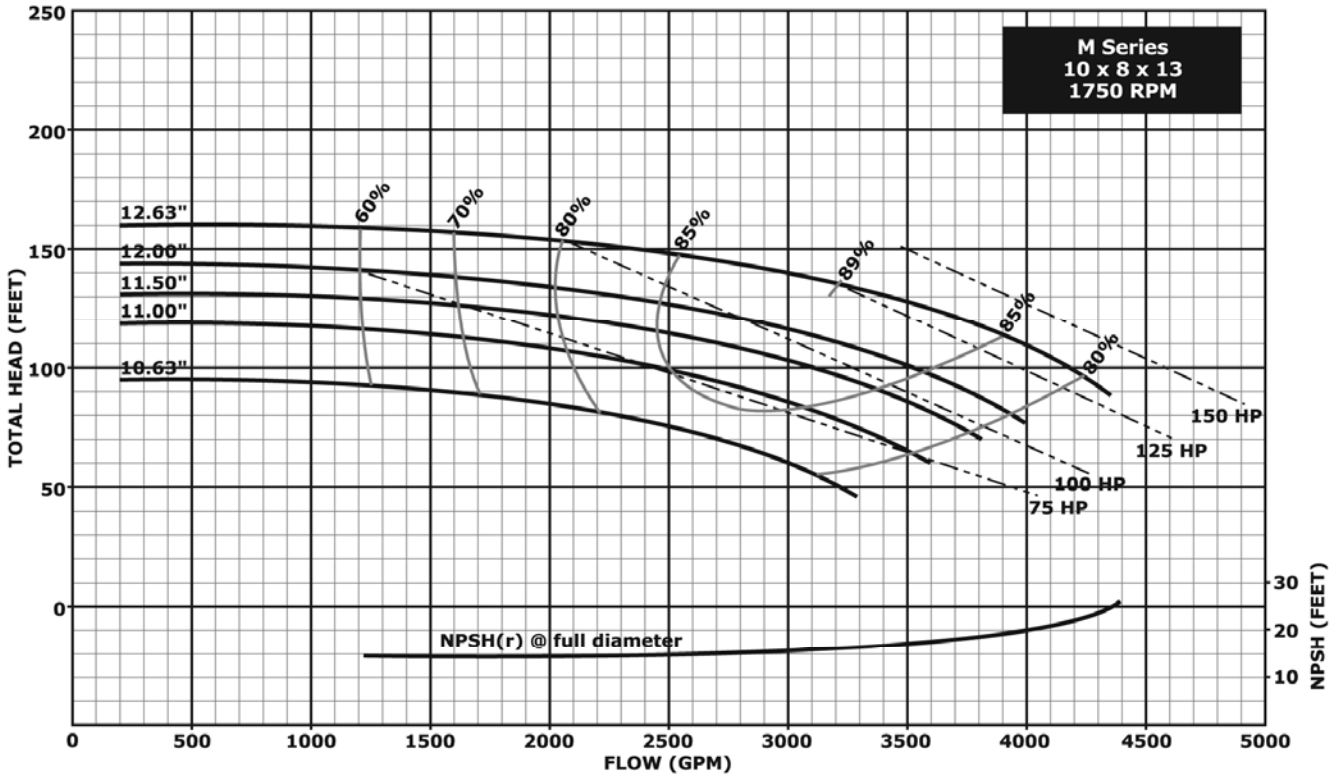


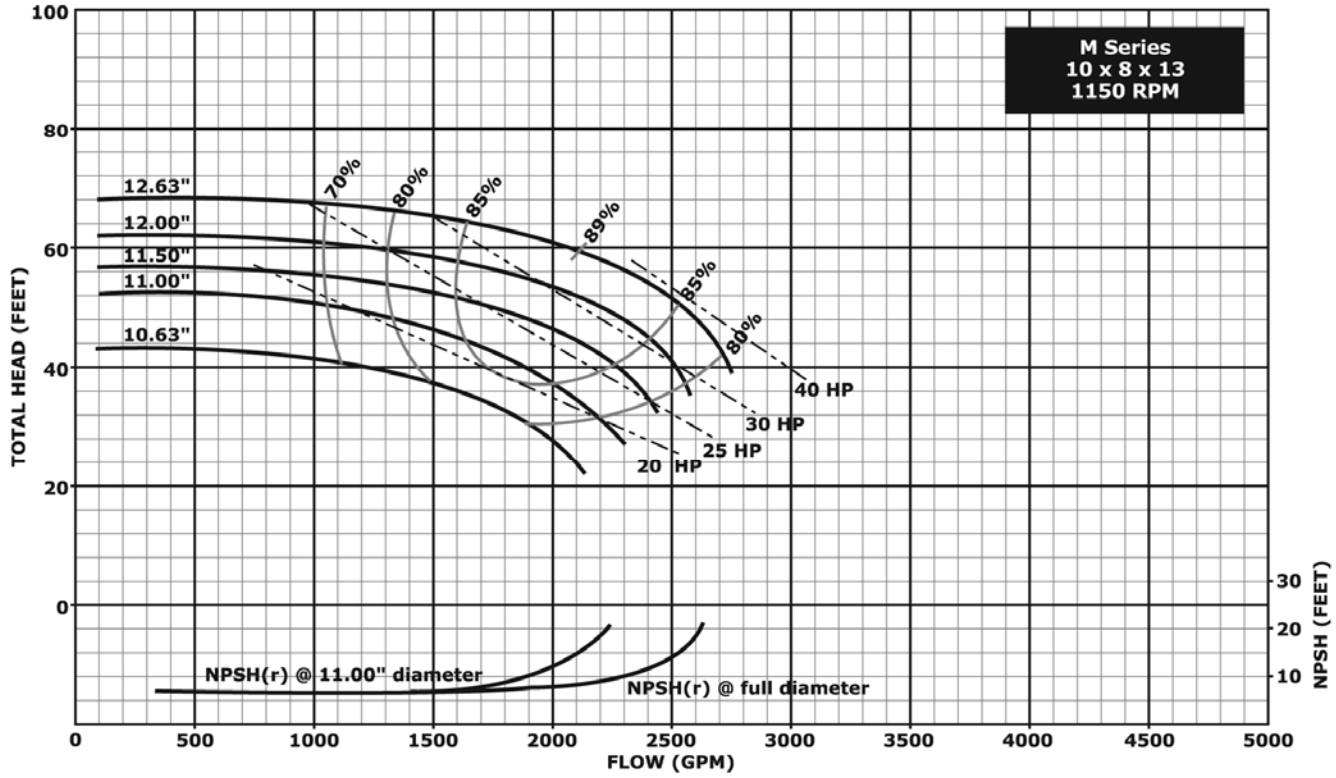


Notes:

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

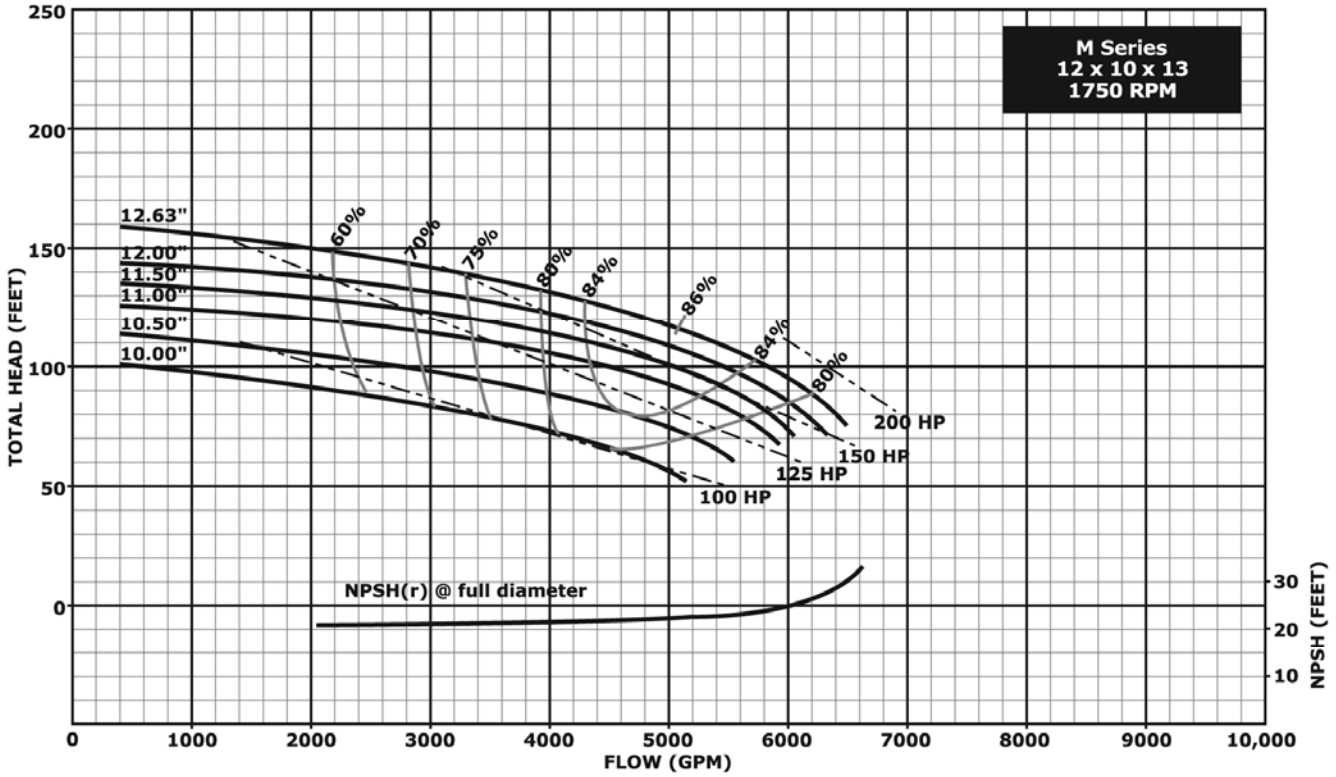


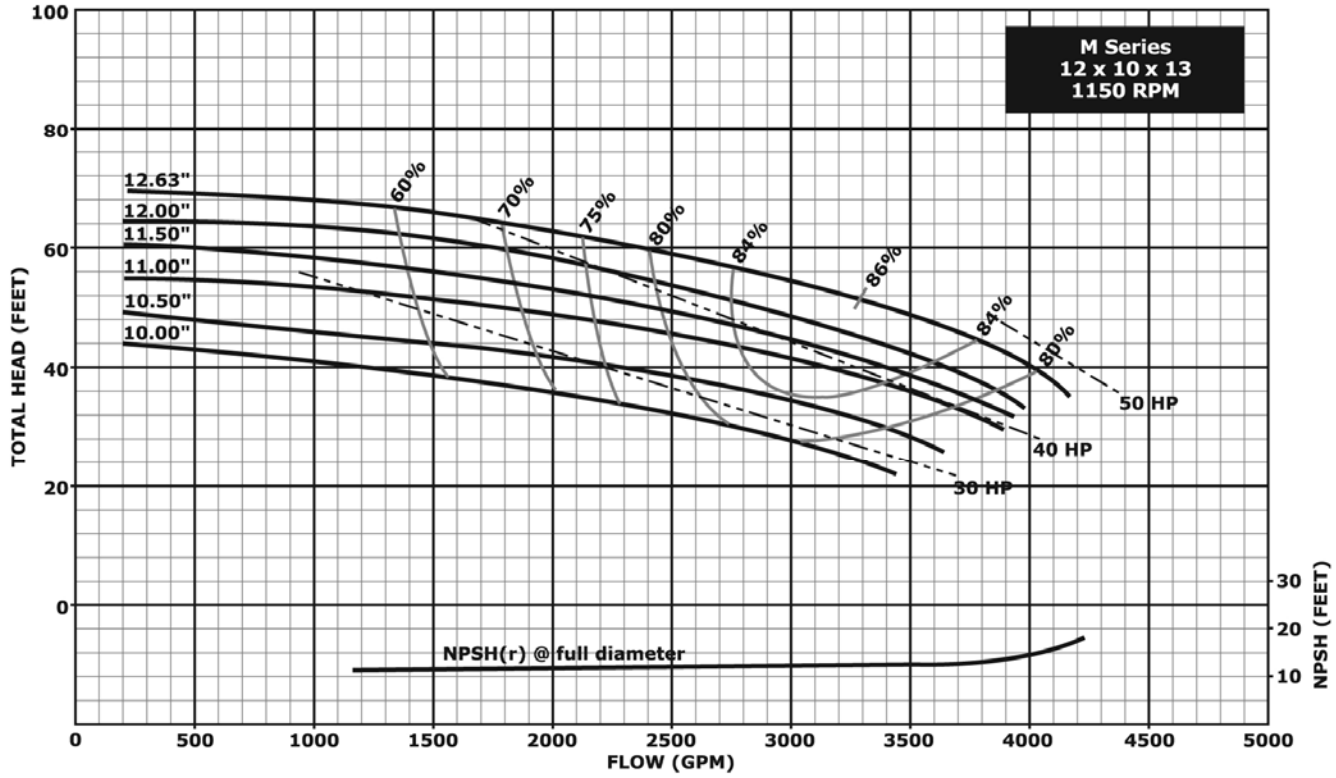


Notes:

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 by angular vane cuts. Impeller diameter trims shown are approximations only.

Hydraulic Performance – 13" Impeller Pumps

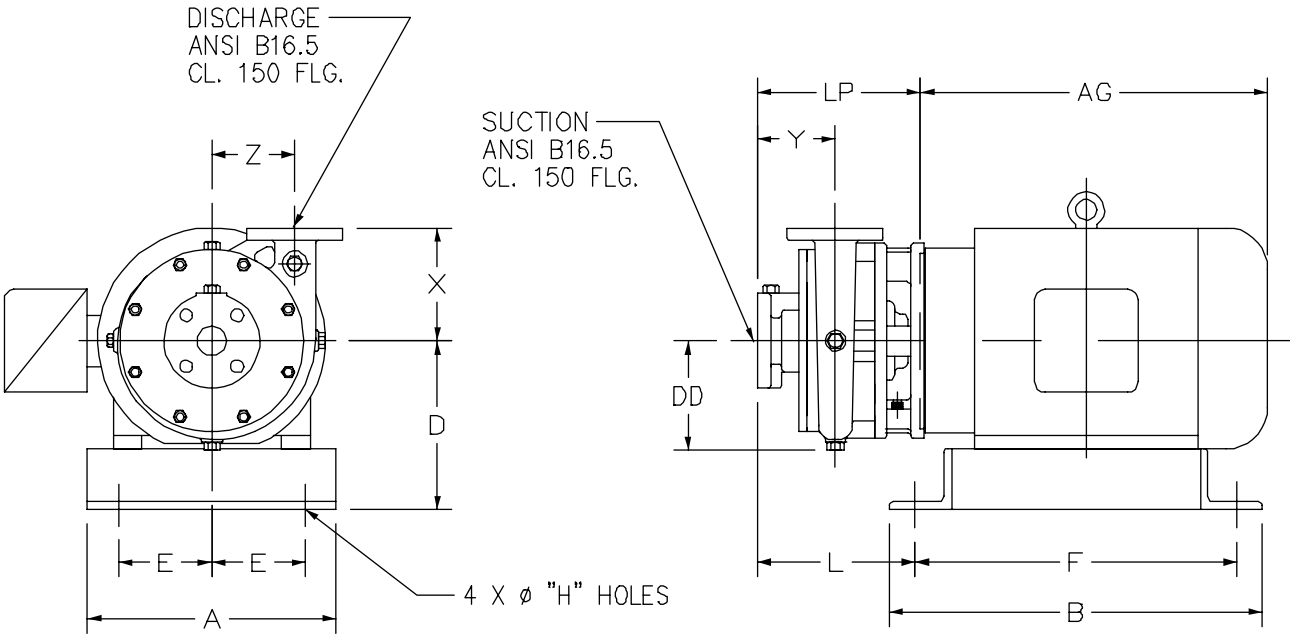




Notes:

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 by angular vane cuts. Impeller diameter trims shown are approximations only.

7" Impeller Sizes, Close Coupled



Pump Size	Pump Dimensions													
	X	Y	Z	DD	*143 -145 JM*		*182 -184 JM*		*213 -215 JM*		*254 -256 JM*		*284 -286 JM*	
					L	*LP*	*L*	*LP*	*L*	*LP*	*L*	*LP*	*L*	*LP*
1 ¼ x 1 x 7	5.38	3.56	3.81	5.25	7.44	8.06	7.69	8.06	-	-	-	-	-	-
1 ½ x 1 ¼ x 7	5.50	4.00	4.00	5.50	7.47	8.09	7.72	8.09	7.84	8.09	-	-	-	-
2 ½ x 2 x 7	6.50	4.50	4.13	6.00	7.91	8.53	8.16	8.53	8.28	8.53	-	-	-	-
3 x 2 ½ x 7	5.75	4.33	4.25	6.25	7.74	8.36	8.00	8.36	8.11	8.36	9.08	9.33	-	-
4 x 3 x 7	6.00	4.88	4.50	6.75	8.50	9.12	8.75	9.12	8.87	9.12	9.84	10.1	9.52	10.1
5 x 4 x 7	7.50	5.18	4.75	7.25	8.73	9.35	9.00	9.35	9.10	9.35	10.1	10.3	9.75	10.3

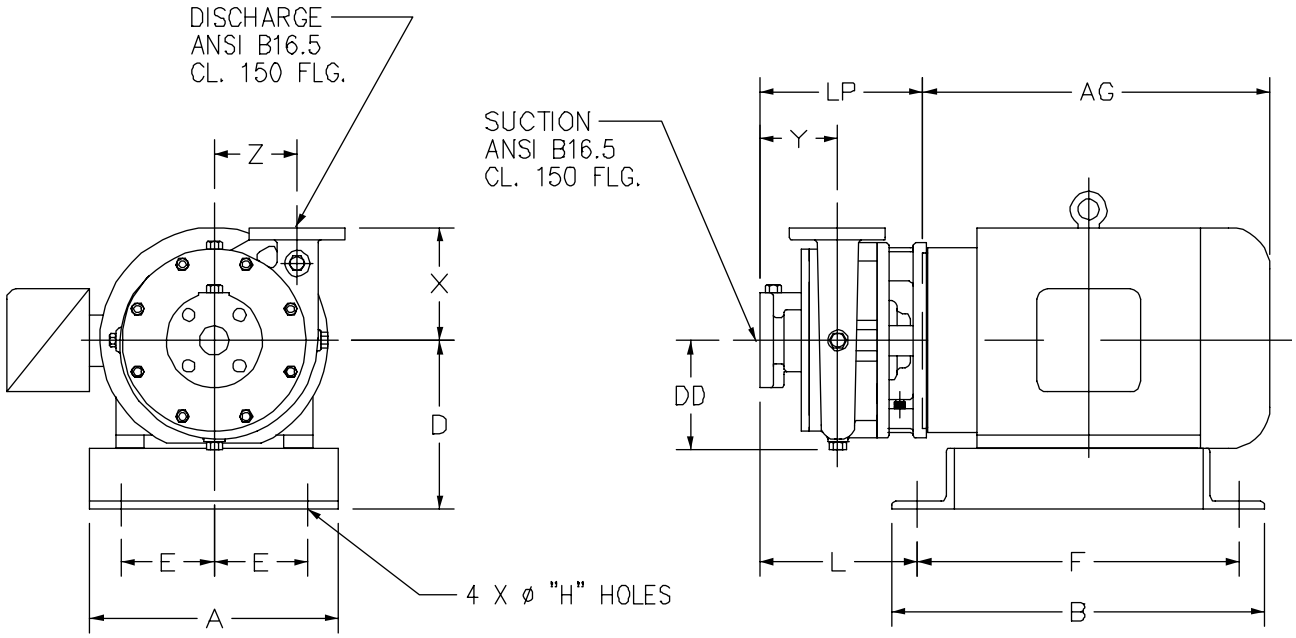
Key Dimensions	Motor and Baseplate Dimensions									
	143 JM	145 JM	182 JM	184 JM	213 JM	215 JM	254 JM	256 JM	284 JM	286 JM
A	10.0	10.0	10.0	10.0	12.0	12.0	15.0	15.0	15.0	15.0
B	15.0	15.0	15.0	15.0	18.0	18.0	24.0	24.0	24.0	24.0
D	6.10	6.10	7.10	7.10	8.00	8.00	9.65	9.65	10.4	10.4
E	3.75	3.75	3.75	3.75	4.50	4.50	6.00	6.00	6.00	6.00
F	13.0	13.0	13.0	13.0	15.5	15.5	21.5	21.5	21.5	21.5
H	0.75	0.75	0.75	0.75	1.00	1.00	1.00	1.00	1.00	1.00
AG (approx.)	11.0	12.0	13.0	14.0	16.0	17.0	20.0	21.0	21.0	22.5

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-M-1, Rev: 0

10" Impeller Sizes, Close Coupled



Pump Size	Pump Dimensions															
	X	Y	Z	DD	143 -145 JM		182 -184 JM		213 -215 JM		254 -256 JM		284 -286 JM		324 -326 JM	
					L	*LP*	*L*	*LP*	*L*	*LP*	*L*	*LP*	*L*	*LP*	*L*	*LP*
1 ½ x 1 ¼ x 10	7.00	5.00	5.25	7.00	8.27	8.88	8.52	8.88	8.64	8.88	9.54	9.79	-	-	-	-
2 x 1 ½ x 10	7.00	5.00	5.44	7.00	8.41	9.03	8.66	9.03	8.78	9.03	9.68	9.93	9.37	9.93	-	-
2 ½ x 2 x 10	7.25	5.00	5.50	7.25	8.48	9.10	8.73	9.10	8.85	9.10	9.75	10.0	9.44	10.0	10.0	10.0
3 x 2 ½ x 10	7.00	5.75	5.75	8.00	9.23	9.85	9.50	9.85	9.60	9.85	10.5	10.8	10.2	10.8	10.8	10.8
4 x 3 x 10	7.00	5.37	6.00	8.25	-	-	9.10	9.47	9.22	9.47	9.22	10.4	8.88	10.4	10.4	10.4
5 x 4 x 10	8.50	4.71	6.50	9.50	-	-	-	-	8.56	8.81	9.46	9.71	9.15	9.71	9.71	9.71
6 x 5 x 10	8.38	5.81	7.63	10.8	-	-	-	-	-	-	11.3	11.6	11.0	11.6	11.6	11.6

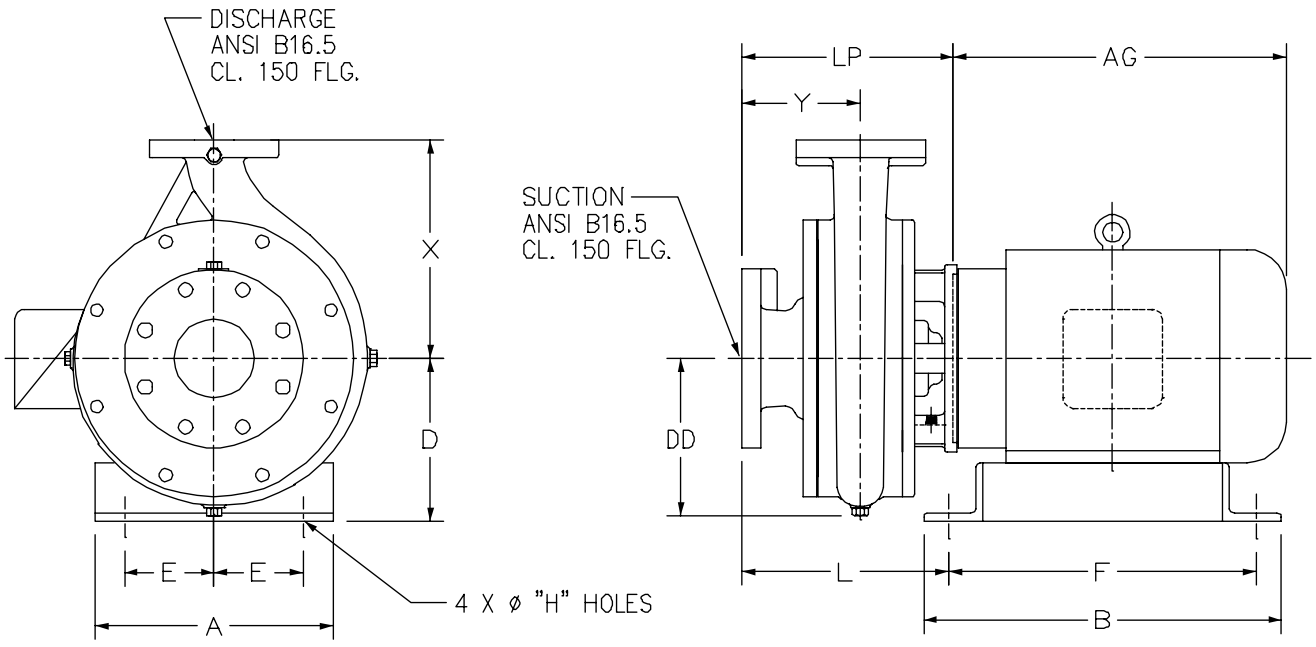
Key Dimensions	Motor and Baseplate Dimensions											
	143 JM	145 JM	182 JM	184 JM	213 JM	215 JM	254 JM	256 JM	284 JM	286 JM	324 JM	326 JM
A	10.0	10.0	10.0	10.0	12.0	12.0	15.0	15.0	15.0	15.0	18.0	18.0
B	15.0	15.0	15.0	15.0	18.0	18.0	24.0	24.0	24.0	24.0	25.0	25.0
D	6.10	6.10	7.10	7.10	8.00	8.00	9.65	9.65	10.4	10.4	12.0	12.0
E	3.75	3.75	3.75	3.75	4.50	4.50	6.00	6.00	6.00	6.00	7.50	7.50
F	13.0	13.0	13.0	13.0	15.5	15.5	21.5	21.5	21.5	21.5	22.5	22.5
H	0.75	0.75	0.75	0.75	1.00	1.00	1.00	1.00	1.00	1.00	1.13	1.13
AG (approx.)	11.0	12.0	13.0	14.0	16.0	17.0	20.0	21.0	21.0	22.5	23.5	25.0

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-M-2, Rev: 0

11" Impeller Sizes, Close Coupled



Pump Size	Pump Dimensions											
	X	Y	DD	182 -184 JM		213 -215 JM		254 -256 JM		284 -286 JM		324 -326 JM	
				L	*LP*	*L*	*LP*	*L*	*LP*	*L*	*LP*	*L*	*LP*
2 x 1 x 11	11.0	3.94	7.63	8.21	8.58	8.33	8.58	9.22	9.47	8.88	9.47	-	-
4 x 2 x 11	11.0	5.94	8.13	10.3	10.6	10.4	10.6	11.3	11.5	10.9	11.5	-	-
4 x 3 x 11	12.0	5.94	9.00	-	-	10.4	10.6	11.3	11.5	10.9	11.5	-	-
5 x 4 x 11	10.8	6.00	8.75	-	-	10.5	10.7	11.4	11.6	11.0	11.6	-	-
8 x 6 x 11	16.0	6.69	11.5	-	-	-	-	14.4	14.6	14.1	14.6	14.6	14.6

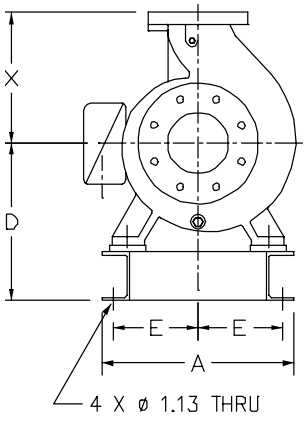
Key Dimensions	Motor and Baseplate Dimensions											
	143 JM	145 JM	182 JM	184 JM	213 JM	215 JM	254 JM	256 JM	284 JM	286 JM	324 JM	326 JM
A	10.0	10.0	10.0	10.0	12.0	12.0	15.0	15.0	15.0	15.0	18.0	18.0
B	15.0	15.0	15.0	15.0	18.0	18.0	24.0	24.0	24.0	24.0	25.0	25.0
D	6.10	6.10	7.10	7.10	8.00	8.00	9.65	9.65	10.4	10.4	12.0	12.0
E	3.75	3.75	3.75	3.75	4.50	4.50	6.00	6.00	6.00	6.00	7.50	7.50
F	13.0	13.0	13.0	13.0	15.5	15.5	21.5	21.5	21.5	21.5	22.5	22.5
H	0.75	0.75	0.75	0.75	1.00	1.00	1.00	1.00	1.00	1.00	1.13	1.13
AG (approx.)	11.0	12.0	13.0	14.0	16.0	17.0	20.0	21.0	21.0	22.5	23.5	25.0

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-M-3, Rev: 0

13" Impeller Sizes, Close Coupled



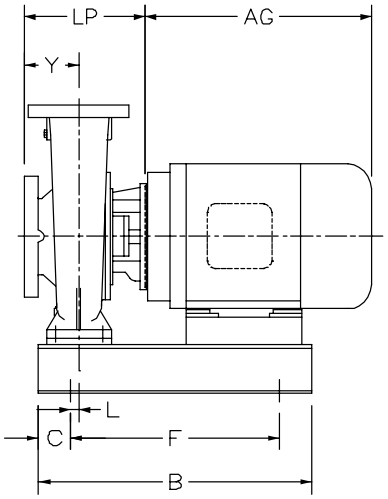


Fig. 1 – Sizes 6 x 6 x 13 and larger

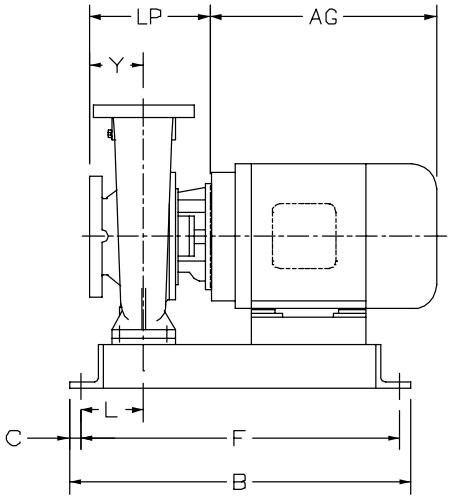


Fig. 2 – Sizes 4 x 3 x 13 and 6 x 4 x 13

Pump Size	Pump, Motor, and Baseplate Dimensions																				
	A	C	D	E	L	LP	X	Y	256 JP			284 JP			286 JP			324 JP		
									B	F	AG	B	F	AG	B	F	AG	B	F	AG
4 x 3 x 13	18.0	1.25	14.4	7.50	6.50	13.1	12.5	5.50	36.0	33.5	21.0	38.0	35.5	21.0	38.0	35.5	22.5	40.0	37.5	23.5
6 x 4 x 13	18.0	1.25	14.4	7.50	6.50	13.8	12.8	6.00	36.0	33.5	21.0	38.0	35.5	21.0	38.0	35.5	22.5	40.0	37.5	23.5
6 x 6 x 13	26.0	4.00	19.5	11.8	1.00	15.4	16.1	7.52	32.0	24.0	21.0	32.0	24.0	21.0	32.0	24.0	22.5	34.0	26.0	23.5
8 x 6 x 13	26.0	4.00	19.5	11.8	1.00	15.0	16.3	6.75	-	-	-	-	-	-	-	-	-	34.0	26.0	23.5
10 x 8 x 13	26.0	4.00	20.9	11.8	1.00	16.9	18.5	8.50	-	-	-	-	-	-	-	-	-	-	-	-
12 x 10 x 13	34.0	4.00	23.1	15.8	2.00	19.5	22.5	10.5	-	-	-	-	-	-	-	-	-	-	-	-

Pump Size	Motor and Baseplate Dimensions																				
	326 JP			364 JP			365 JP			404 JP			405 JP			444 JP			445 JP		
	B	F	AG	B	F	AG	B	F	AG	B	F	AG	B	F	AG	B	F	AG	B	F	AG
4 x 3 x 13	40.0	37.5	25.0	40.0	37.5	27.0	40.0	37.5	28.0	-	-	-	-	-	-	-	-	-	-	-	-
6 x 4 x 13	40.0	37.5	25.0	40.0	37.5	27.0	40.0	37.5	28.0	-	-	-	-	-	-	-	-	-	-	-	-
6 x 6 x 13	34.0	26.0	25.0	34.0	26.0	27.0	34.0	26.0	28.0	-	-	-	-	-	-	-	-	-	-	-	-
8 x 6 x 13	34.0	26.0	25.0	34.0	26.0	27.0	34.0	26.0	28.0	38.0	30.0	31.0	38.0	30.0	32.0	-	-	-	-	-	-
10 x 8 x 13	-	-	-	34.0	26.0	27.0	34.0	26.0	28.0	38.0	30.0	31.0	38.0	30.0	32.0	42.0	34.0	36.0	42.0	34.0	37.0
12 x 10 x 13	-	-	-	-	-	-	-	-	-	40.0	32.0	31.0	40.0	32.0	32.0	44.0	36.0	36.0	44.0	36.0	37.0

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-M-4, Rev: 0




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, multistage, 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.

Carver®

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M-TS-1M-09/04