

e-HMTM 60 Hz TECHNICAL MANUAL

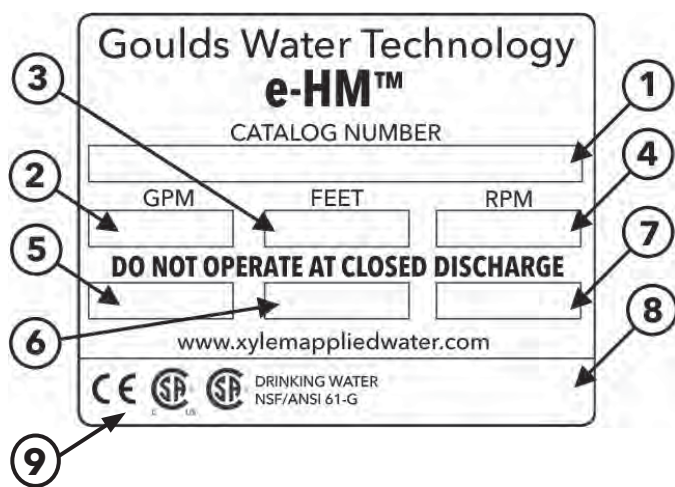
THREADED HORIZONTAL MULTISTAGE CENTRIFUGAL ELECTRIC PUMPS



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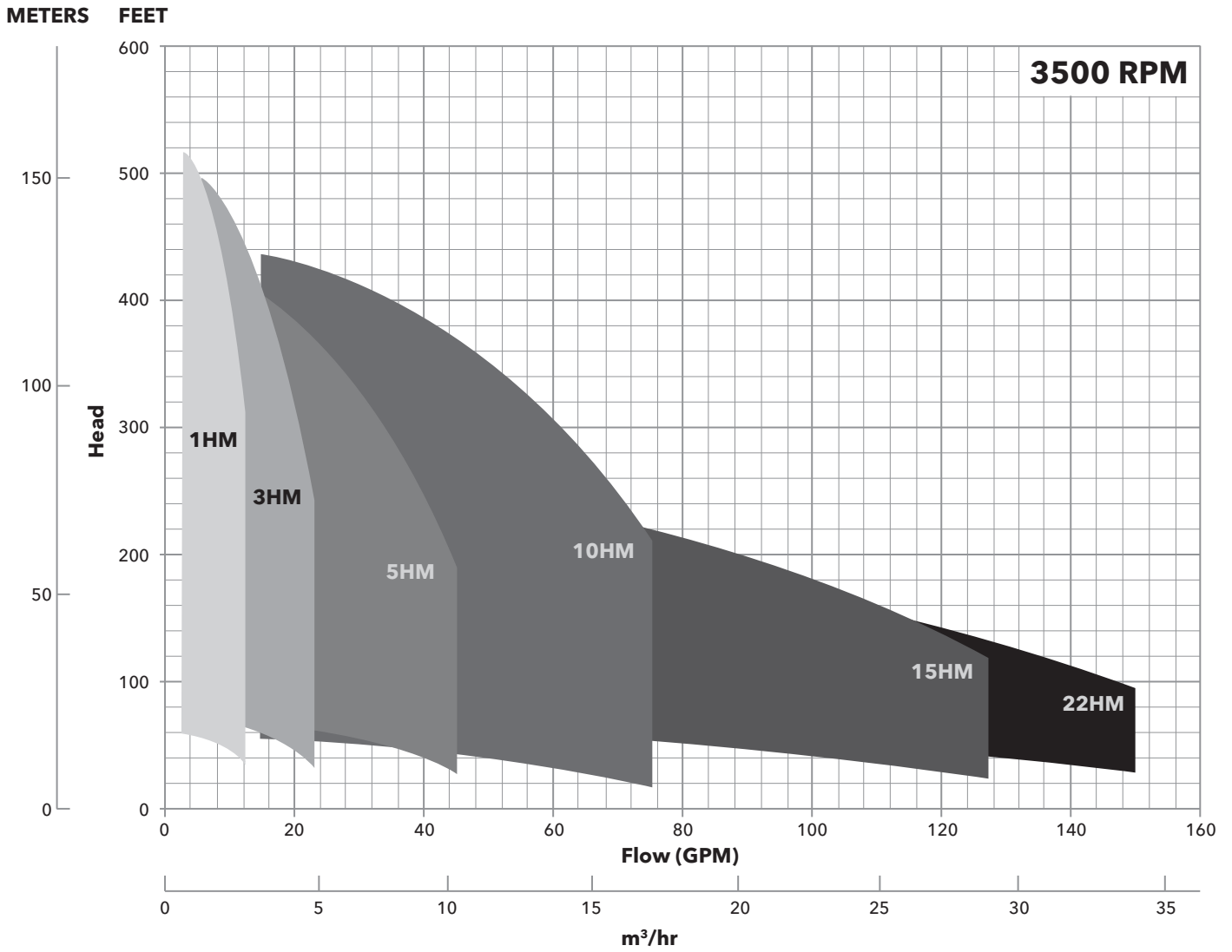
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e-HM RATING PLATE



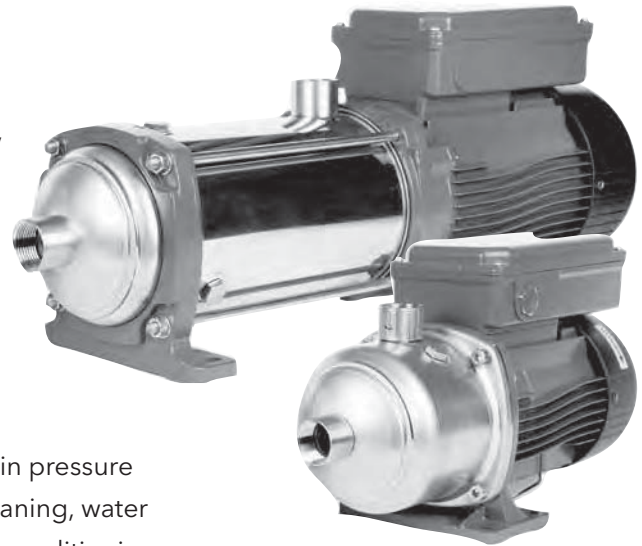
1	Goulds Water Technology Catalog Number
2	Capacity Range
3	TDH Range
4	Rated Speed
5	Rated Horsepower
6	Maximum Operating Pressure
7	Maximum Fluid Temperature
8	Pump Serial Number
9	Certifications Where Applicable

e-HM™ Series Hydraulic Coverage Curve



e-HM™ SERIES **Applications, Benefits and Industry**

Whether you're in the market for industry specific applications, building services, or residential applications, the e-HM is designed to meet your water needs. Customizable options mean you get exactly the right pump for your application, exactly when you need it.



APPLICATIONS

Designed with compactness in mind, the e-HM is ideal for applications where a smaller footprint is needed. Ideal for use in pressure boosting and water supply systems, industrial washing and cleaning, water treatment, or circulation of hot and cold liquids in cooling and conditioning systems. The broad coverage and range of applications make this pump an ideal solution in industry, building services and residential applications.

BENEFITS

Reliability: The e-HM series was designed to withstand heavy-duty applications in Industry. Made of 316 stainless steel and construction incorporating a 20% increase in the pump body thickness, ensures enhanced durability and reliability.

Versatility: Offering two different mechanical configurations, 7 mechanical seal options, high-efficiency motors, and surface treatment options such as electropolishing and passivation, make the e-HM suitable for multiple applications.

Performances: The e-HM series provides best-in-class efficiency and is up to 72% efficient. Compared to similar pumps in the market, the e-HM offers a potential of 30% in energy savings versus the competition.

Global Platform: Assembled in different factories around the world, the e-HM can offer easier accessibility due to its proximity to our customers. Beyond our commitment to reduce the carbon footprint of e-HM, this global platform offers the same design which is available everywhere using the same quality processes.

FEATURES

- Wide range of performances with 6 sizes, flow up to 127 gpm, heads up to 525 feet
- Maximum working pressure up to 230 psi (16 bar)
- Premium efficient, UL Recognized (cURus) motor
- 90% of the range has the same suction height (3.54") for easy installation or system upgrades

Commercial Water

e-HM™ SERIES GENERAL INTRODUCTION

Our newly redesigned horizontal multi-stage high pressure centrifugal pump offers outstanding efficiencies. The high-efficiency motor coupled with an innovative hydraulic design, NPT threaded inlet and outlet connections, and broad coverage provides flexible options for a variety of applications. Whether you're in the market for industry specific applications, building services, or residential applications, the e-HM is designed to meet your water needs.

Pump Design

The e-HM is a close-coupled horizontal multi-stage design with NPT threaded inlet and outlet connections, and a TEFC equivalent high-efficiency motors. The pump incorporates an innovative hydraulic design that provides the highest efficiency in the market today.

The e-HM is available in two configurations:

Compact Design

Sizes 1HM, 3HM, and 5HM

- 1HM and 3HM up to 6 stages
- 5HM up to 5 stages

Sleeve Design

Sizes 1HM, 3HM, 5HM, 10HM, 15HM and 22HM

- 1HM & 3HM start at 7 stages
- 5HM starts at 6 stages

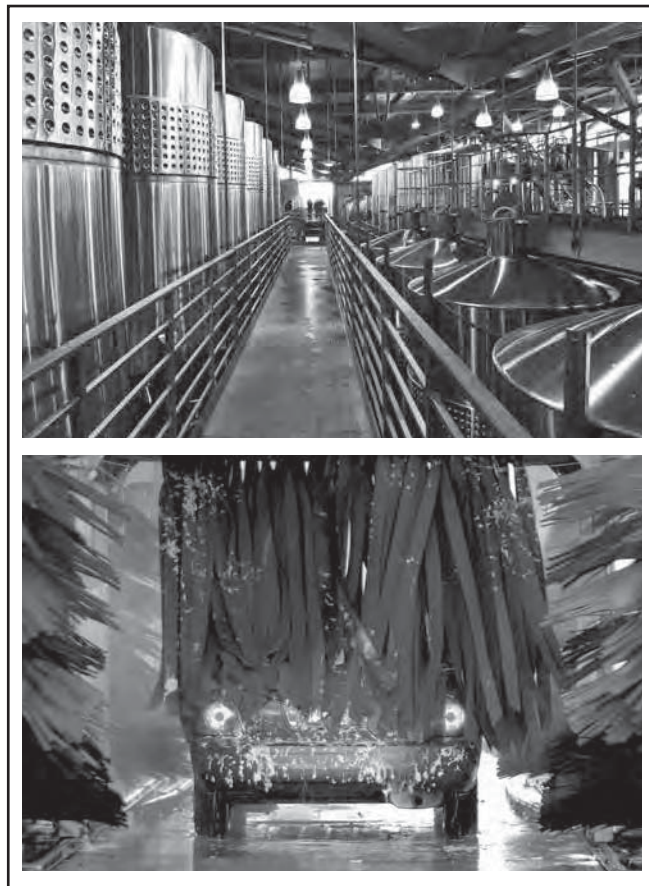
The compact design is made of one single piece of fabricated stainless steel for the pump body which is directly connected to the motor flange. The sleeve design is made of an external stainless steel TIG welded sleeve, and incorporates a separate suction housing. All available in 316 stainless steel construction consisting of a 20% increase in pump body thickness for enhanced durability and reliability.

Motor

The e-HM series incorporates a UL Recognized (cURus) premium efficiency, inverter design motor for additional energy savings and versatility. The standard motor enclosure is a TEFC (IP55) design which can be paired with Goulds Water Technology variable speed drives such as the Hydrovar.

EISA Compliance

Xylem conforms to the requirements of the Energy Independence and Security Act (EISA) of 2007. Under the Energy Independence and Security Act of 2007 (EISA), covered motors that are manufactured or imported for distribution in commerce in the United States on or after December 19, 2010, must comply with the applicable EISA energy conservation standards. EISA-covered motors include general purpose electric motors (subtype I), general purpose electric motors (subtype II), fire pump motors, and NEMA Design B general purpose electric motors, which are manufactured alone or as a component of another piece of equipment. The standards are found in sections 431.25(c)-(f) of Title 10 of the Code of Federal Regulations, Part 431 (10 CFR Part 431).



e-HM™ SERIES GENERAL CHARACTERISTICS

1HM, 3HM			
2-6 Stages		7+ stages	
t (F)	PSI	t (F)	PSI
-20	147	-20	235
248	147	248	235
248	147	248	235
248	147		
248	147	194	235
		194	235
194	147		

5HM			
2-5 Stages		7+ stages	
t (F)	PSI	t (F)	PSI
-20	147	-20	235
248	147	248	235
248	147	248	235
248	147		
248	147	194	235
		194	235
194	147		

10HM, 15HM, 22HM	
All Stages	
t (F)	PSI
-20	235
248	235
248	235
194	235
194	235
194	0

ELECTRIC PUMP NOISE

POWER	NOISE
HP	LpA dB
0.75	55
1	55
1.5	60
2	60
3	60
4	60
5.5	60
7.5	60

The table shows the mean sound pressure (Lp) measured as per Curve A (Standard ISO 1680). Noise values were measured with the 50 Hz motor running idle with a tolerance of 3 dB (A).

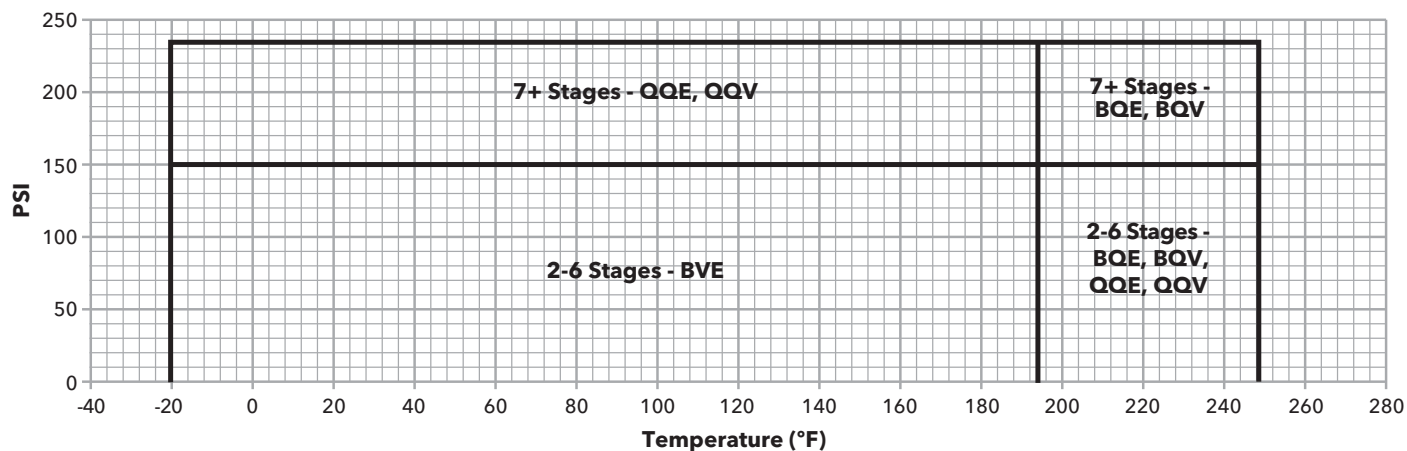
STORAGE AND TRANSPORT TEMPERATURE

-40°C to +60°C

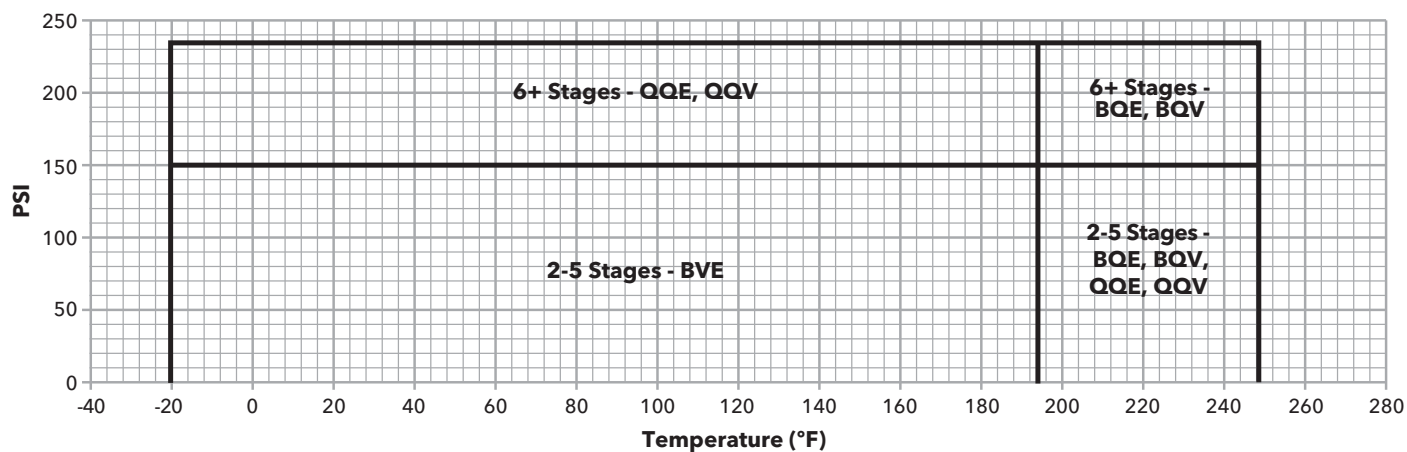
NEMA MG-1 TABLE 12-12 FL EFFICIENCIES FOR 60 HZ NEMA PREMIUM

HP	2-POLE	Lowara	2-POLE
1	77	Lowara SM IE3	83.4
1½	84		85.6
2	85.5		87.2
3	86.5		87.7
5	88.5		91.0
7½	89.5		90.5
10	90.2	Lowara PLM IE3	90.8
15	91		92.4
20	91		93.4
25	91.7		93.5
30	91.7		93.4
40	92.4		

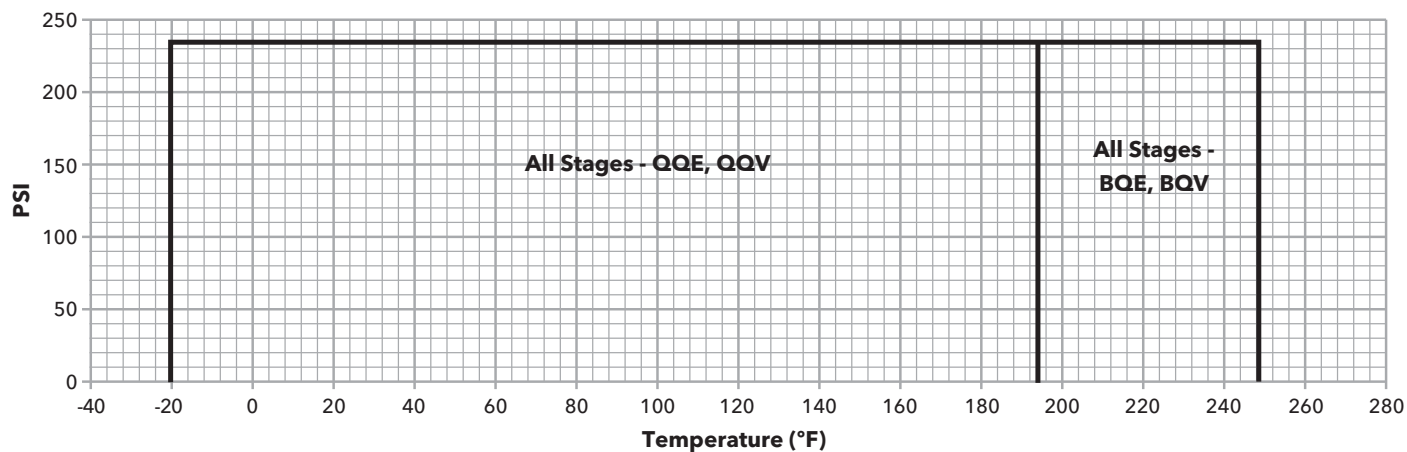
1HM, 3HM PRESSURE AND TEMPERATURE LIMITS



5HM PRESSURE AND TEMPERATURE LIMITS



10HM, 15HM, 22HM PRESSURE AND TEMPERATURE LIMITS



e-HM™ SERIES

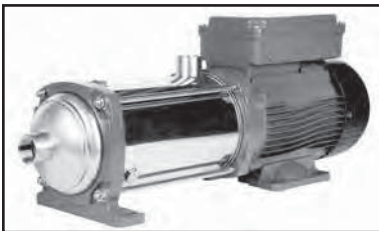
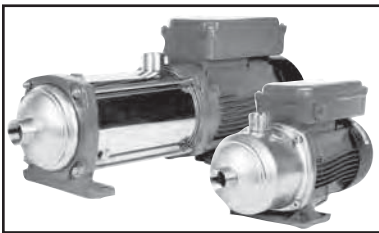
**High efficiency
horizontal
multistage pump**

MARKETS

BUILDING SERVICES.
INDUSTRY.

APPLICATIONS

Pressure boosting and water supply systems.
Washing and cleaning industry including vehicles washing.
Circulation of hot and cold liquids (like water, water and glycol) for heating, cooling and conditioning systems.
Water treatment applications.
Handling of moderately aggressive liquids.
Food and beverage industries.



SPECIFICATIONS

Pump

- Flow rate: up to 127 GPM
- Heads: up to 525 feet
- Designs:
 - Compact - one piece pump body
 - 1HM and 3HM, sizes up to 6 stages
 - 5HM, sizes up to 5 stages
 - Sleeve - Sleeve and separate suction housing
 - 1HM and 3HM, 7 stages and above
 - 5 HM, 6 stages and above
 - All 10HM, 15HM, and 22HM sizes
- Connections: NPT threaded suction and discharge
- Temperature of the pumped liquid: -20°F to 248°F (-30°C to 120°C)
- Ambient Temperature:
 - Standard Offering: -15°C to 40°C
 - Available Options: Single Phase: -15°C to 45°C
 - Three Phase: -15°C to 50°C
- Maximum Operating Pressure:
 - Compact pump designs - 145 PSI
 - Sleeve pump designs - 230 PSI

Motor

- Premium Efficiency
- TEFC (IP 55) design
- cURus
- 3500 RPM
- Class F insulation
- Standard voltage:
 - Single Phase: 115 or 230V, 60 Hz - built in auto reset overload protection
 - Three Phase: 208-230/460V, 50 or 60 Hz; or 575V, 60 Hz

e-HM™ SERIES GENERAL CHARACTERISTICS



Compact



Sleeve

HM Series	1HM	3HM	5HM	10HM	15HM	22HM
Nominal Flow (GPM)	10	16	33	56	90	100
Flow Range (GPM)	3 - 12	5-23	10 - 45	15 - 75	25 - 127	30 - 150
Number of Stages	2 - 18	2 - 14	2 - 12	1 - 8	1 - 4	1 - 3
Maximum Head (Ft)	520	500	430	450	275	217
Maximum Working Pressure	145 psi - Compact pumps 230 psi - Sleeve pumps					
Temperature Range (°F)	-20°F to 248°F (-30°C to 120°C)					
Maximum Pump Efficiency (%)	51	60	70	70	70	68
HP Range	3/4 - 2	3/4 - 3	3/4 - 4	1 - 7 1/2	2 - 7 1/2	3 - 7 1/2
Piping Connections (NPT)	1" x 1"	1" x 1"	1 1/4" x 1"	1 1/2" x 1 1/4"	2" x 1 1/2"	2" x 1 1/2"

OPTIONAL FEATURES:

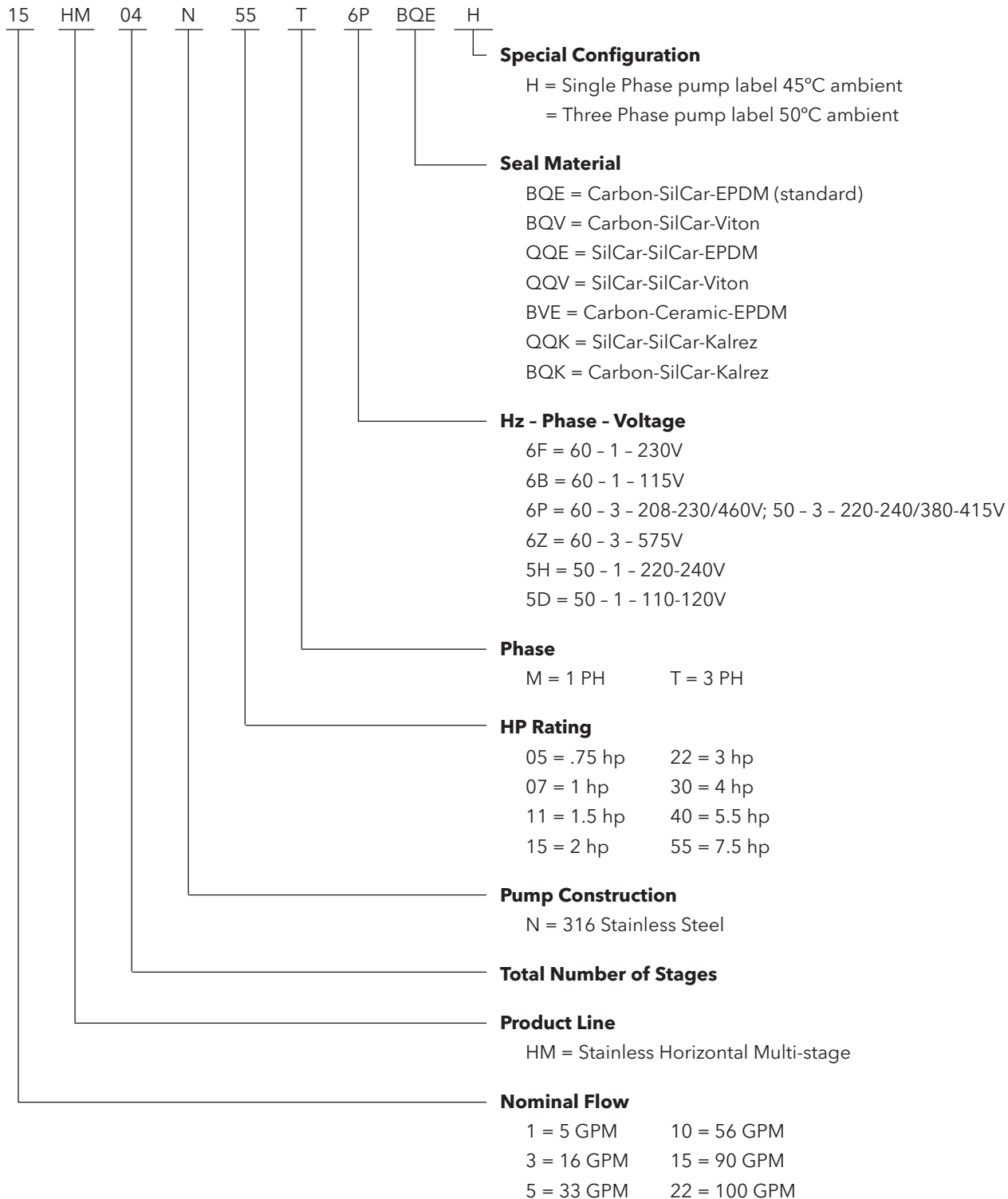
- Special Voltages
- 50 Hz Frequency
- Suitable for use with VFDs (ABII, SPD, Hydrovar, CPC and IPC)

e-HM PRODUCT LINE NUMBERING SYSTEM FOR 1 - 22HM PUMPS

The various versions of the e-HM line are identified by a product code number on the pump label. This number is also the catalog number for the pump. The meaning of each digit in the product code number is shown below.

Note: Not all combinations are possible.

Example Product Code



MODEL 1, 3, 5 HM..N SERIES - MAJOR COMPONENTS

(COMPACT DESIGN)

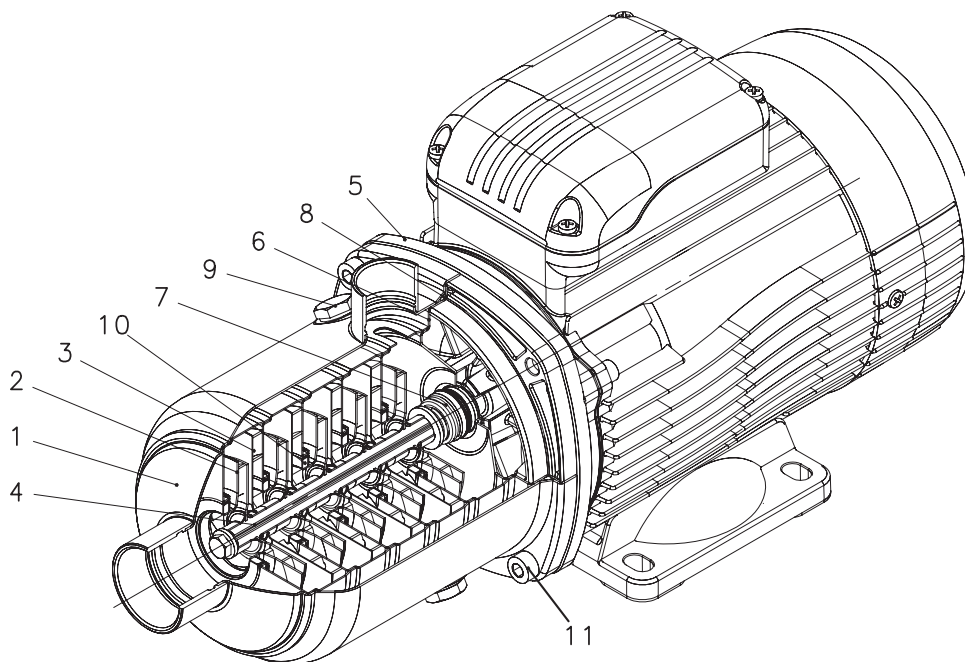


TABLE OF MATERIALS HM..N SERIES

REFERENCE NUMBER	NAME	MATERIAL	REFERENCE STANDARDS	
			USA	EUROPE
1	Pump body	Stainless steel	AISI 316L	EN 10088-1-X2CrNiMo17-12-2 (1.4404)
2	Impeller	Stainless steel	AISI 316L	EN 10088-1-X2CrNiMo17-12-2 (1.4404)
3	Diffuser	Stainless steel	AISI 316L	EN 10088-1-X2CrNiMo17-12-2 (1.4404)
4	Shaft	Stainless steel	AISI 316	EN 10088-1-X5CrNiMo17-12-2 (1.4401)
5	Adapter	Aluminium	-	EN 1706-AC-AISI11Cu2 (Fe) (AC46100)
6	Seal housing	Stainless steel	AISI 316L	EN 10088-1-X2CrNiMo17-12-2 (1.4404)
7	Mechanical seal	Ceramic / Carbon / EPDM		
8	Elastomers	EPDM		
9	Fill / drain plugs	Stainless steel	AISI 316	EN 10088-1-X5CrNiMo17-12-2 (1.4401)
10	Wear ring	Technopolymer (PPS)		
11	Bolts and screws	Stainless steel	AISI 304	EN 10088-1-X5CrNi18-10 (1.4301)

MODEL 1, 3, 5, 10, 15, 22 HM..N SERIES - MAJOR COMPONENTS

(SLEEVE DESIGN)

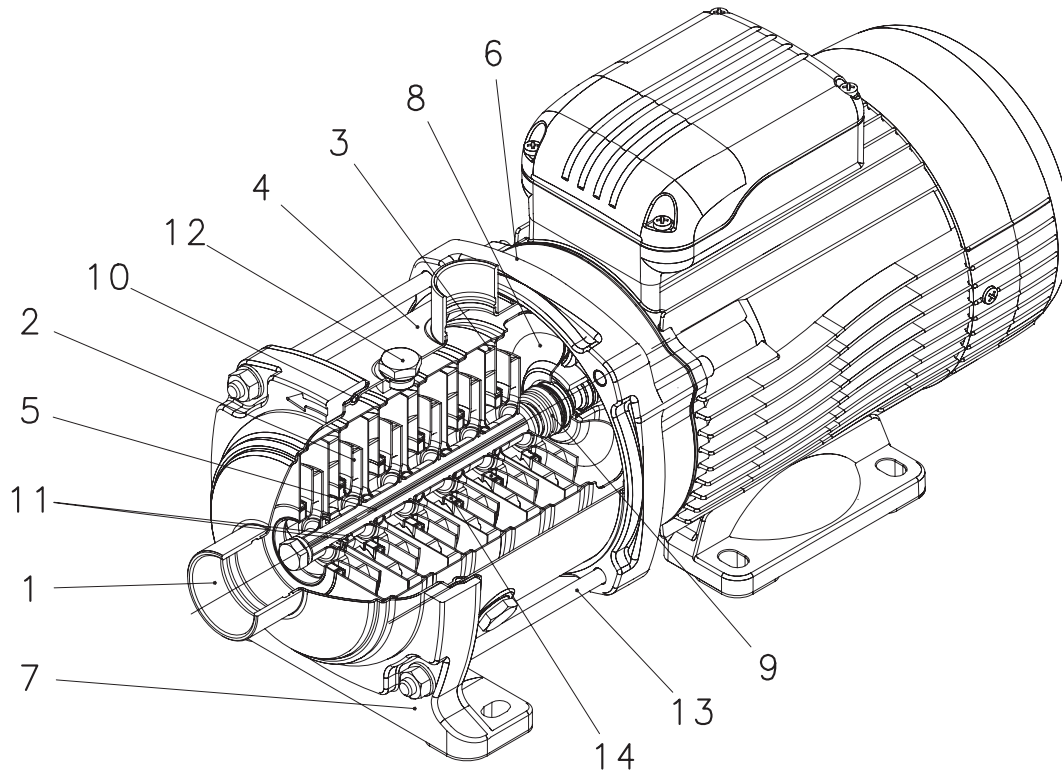
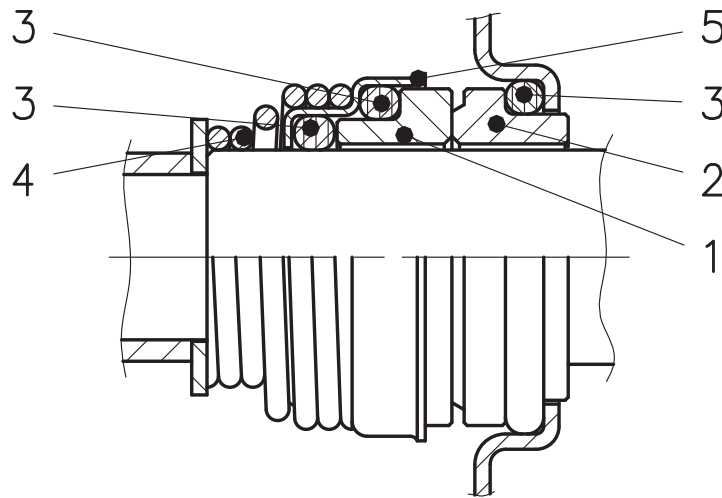


TABLE OF MATERIALS HM..N SERIES

REFERENCE NUMBER	NAME	MATERIAL	REFERENCE STANDARDS	
			USA	EUROPE
1	Head	Stainless steel	AISI 316L	EN 10088-1-X2CrNiMo17-12-2 (1.4404)
2	Impeller	Stainless steel	AISI 316L	EN 10088-1-X2CrNiMo17-12-2 (1.4404)
3	Diffuser and upper spacer	Stainless steel	AISI 316L	EN 10088-1-X2CrNiMo17-12-2 (1.4404)
4	Outer sleeve	Stainless steel	AISI 316L	EN 10088-1-X2CrNiMo17-12-2 (1.4404)
5	Shaft	Stainless steel	AISI 316	EN 10088-1-X5CrNiMo17-12-2 (1.4401)
6	Adapter	Aluminium	-	EN 1706-AC-AISI11Cu2 (Fe) (AC46100)
7	Ring with foot	Aluminium	-	EN 1706-AC-AISI11Cu2 (Fe) (AC46100)
8	Seal housing	Stainless steel	AISI 316L	EN 10088-1-X2CrNiMo17-12-2 (1.4404)
9	Mechanical seal	Ceramic / Carbon / EPDM (PN10) - Silicon Carbide/Carbon/EPDM (PN16)		
10	Elastomers	EPDM		
11	Shaft sleeve and bushing	Tungsten carbide		
12	Fill / drain plugs	Stainless steel	AISI 316L	EN 10088-1-X5CrNiMo17-12-2 (1.4401)
13	Tie rods	Stainless steel	AISI 431	EN 10088-1-X17CrNi16-2 (1.4057)
14	Wear ring	Technopolymer (PPS)		

e-HM™ SERIES MECHANICAL SEALS



LIST OF MATERIALS

Components	Part Number			
	1	2	3	4 and 5
	Rotory Face	Stationary Face	Elastomers	Hardware
Materials	B - Carbon		E - EPDM (EPR)	All 316 SS
	Q - Sil Carbide		V - Viton	
	V - Ceramic			

PRESSURE AND TEMPERATURES LIMITS

Seal Code	1HM, 3HM		5HM		10HM, 15HM, 22HM
	2-6 Stages	7+ Stages	2-5 Stages	6+ Stages	All Stages
BQE	147PSI at 248F	235PSI at 248F	147PSI at 248F	235PSI at 248F	235PSI at 248F
BQV	147PSI at 248F	235PSI at 248F	147PSI at 248F	235PSI at 248F	235PSI at 248F
QQE	147PSI at 248F	235PSI at 194F	147PSI at 248F	235PSI at 194F	235PSI at 194F
QQV	147PSI at 248F	235PSI at 194F	147PSI at 248F	235PSI at 194F	235PSI at 194F
BVE	147PSI at 194F	Not Available	147PSI at 194F	Not Available	Not Available

MOTOR DATA

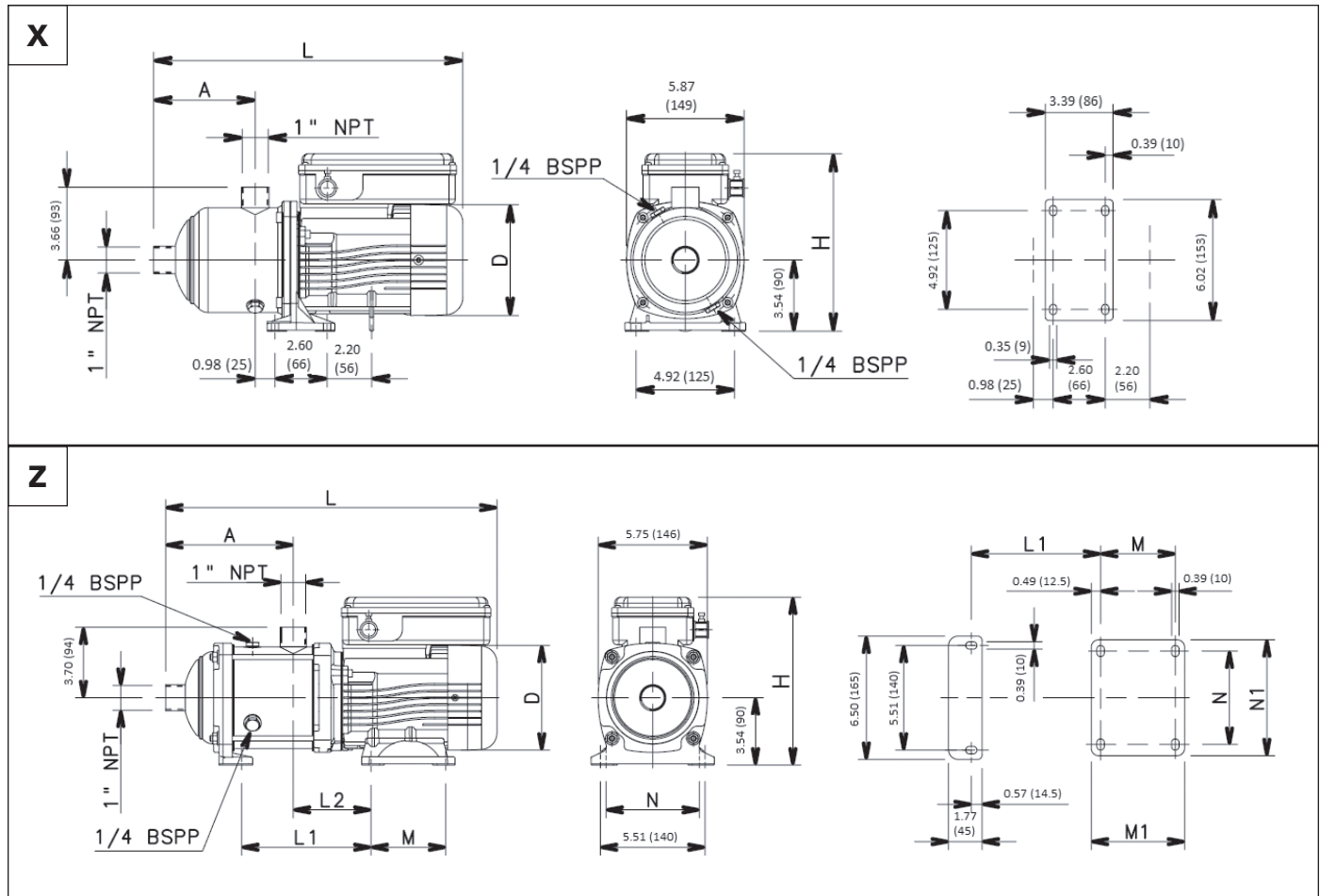
3500 RPM, 60Hz, Lowara Motors

HP	Ph	Volts	Enclosure	SF	FL Amps	SF Amps	Frame Size	Motor Flange Type	GWT P/N
3/4	1	115	TEFC / IP55	1.0	8.07	N/A	71	COMPACT 1-3-5 EHM	107236000
1.0	1	115	TEFC / IP55	1.0	10.3	N/A	71	COMPACT 1-3-5 EHM	107236040
								SLEEVE 1-3-5 EHM	107236050
3/4	1	230	TEFC / IP55	1.0	3.69	N/A	71	COMPACT 1-3-5 EHM	107236010
1.0	1	230	TEFC / IP55	1.0	4.84	N/A	71	COMPACT 1-3-5 EHM	107236060
								SLEEVE 1-3-5 EHM	107236070
1.5	1	230	TEFC / IP55	1.0	6.85	N/A	80	SLEEVE 10-15-22 EHM	107236100
								COMPACT 1-3-5 EHM	107236110
								SLEEVE 10-15-22 EHM	107236130
2.0	1	230	TEFC / IP55	1.0	9.22	N/A	80	SLEEVE 1-3-5 EHM	107236160
								SLEEVE 10-15-22 EHM	107236170
3/4	3	208-230/460	TEFC / IP55	1.15	2.61-2.64/1.32	2.87	71	COMPACT 1-3-5 EHM	107236020
1.0	3	208-230/460	TEFC / IP55	1.15	3.09-3.02/1.51	3.46	80	COMPACT 1-3-5 EHM	107236180
								SLEEVE 1-3-5 EHM	107236190
1.5	3	208-230/460	TEFC / IP55	1.15	4.35-4.24/2.12	4.89	80	SLEEVE 10-15-22 EHM	107236200
								COMPACT 1-3-5 EHM	107236240
2.0	3	208-230/460	TEFC / IP55	1.15	5.77-5.58/2.79	6.51	80	SLEEVE 1-3-5 EHM	107236250
								COMPACT 1-3-5 EHM	107236280
								SLEEVE 10-15-22 EHM	107236300
3.0	3	208-230/460	TEFC / IP55	1.15	8.23-7.98/3.99	9.33	90	SLEEVE 1-3-5 EHM	50A01R300H
								SLEEVE 10-15-22 EHM	50A01R500H
4.0	3	208-230/460	TEFC / IP55	1.15	11.3-10.9/5.45	12.8	90	SLEEVE 1-3-5 EHM	50A02R300H
								SLEEVE 10-15-22 EHM	50A02R500H
5.5	3	208-230/460	TEFC / IP55	1.15	14.1-13.4/6.7	16	100	SLEEVE 10-15-22 EHM	50A08R500H
7.5	3	208-230/460	TEFC / IP55	1.15	18.7-17.8/8.91	21.4	112	SLEEVE 10-15-22 EHM	50A13R500H
3/4	3	575	TEFC / IP55	1.15	1.04	1.12	71	COMPACT 1-3-5 EHM	107236030
1.0	3	575	TEFC / IP55	1.15	1.20	1.31	80	COMPACT 1-3-5 EHM	107236210
								SLEEVE 1-3-5 EHM	107236220
1.5	3	575	TEFC / IP55	1.15	1.69	1.87	80	SLEEVE 10-15-22 EHM	107236230
								COMPACT 1-3-5 EHM	107236260
2.0	3	575	TEFC / IP55	1.15	2.2	2.44	80	SLEEVE 1-3-5 EHM	107236270
								COMPACT 1-3-5 EHM	107236310
								SLEEVE 10-15-22 EHM	107236330
3.0	3	575	TEFC / IP55	1.15	3.18	3.53	90	SLEEVE 1-3-5 EHM	50A01T300H
								SLEEVE 10-15-22 EHM	50A01T500H
4.0	3	575	TEFC / IP55	1.15	4.36	4.86	90	SLEEVE 1-3-5 EHM	50A02T300H
								SLEEVE 10-15-22 EHM	50A02T500H
5.5	3	575	TEFC / IP55	1.15	5.26	5.92	100	SLEEVE 10-15-22 EHM	50A08T500H
7.5	3	575	TEFC / IP55	1.15	7.2	8.07	112	SLEEVE 10-15-22 EHM	50A13T500H

Above data is for Lowara™ Motors. Specifications are subject to change.

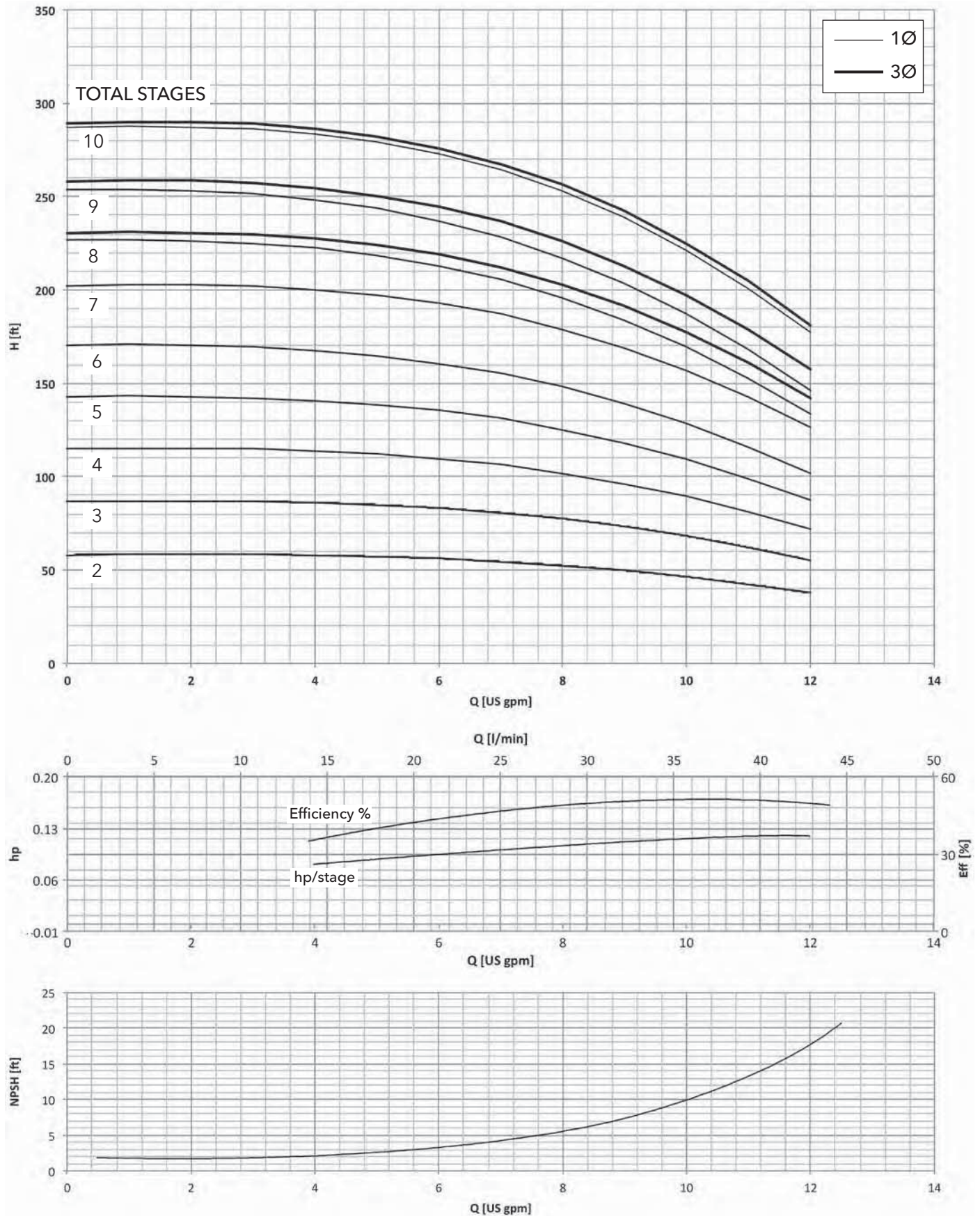
Commercial Water

1HM..N SERIES, (2 TO 10 STAGES) DIMENSIONS AND WEIGHTS AT 60 HZ, 3500 RPM



Pump Size Stages	Phase	DWG No.	Motor		Dimensions (in)										Max. Working Pressure (PSI)	Weight (lbs)
			HP	Frame Size	A	D	H	L	L1	L2	M	M1	N	N1		
1HM02	SINGLE PHASE	X	0.75	71	3.43	5.51	8.86	13.78	-	-	-	-	-	-	147	18
1HM03			0.75	71	3.43	5.51	8.86	13.78	-	-	-	-	-	-	147	18
1HM04			0.75	71	4.21	5.51	8.86	14.57	-	-	-	-	-	-	147	20
1HM05			0.75	71	5.00	5.51	8.86	15.35	-	-	-	-	-	-	147	20
1HM06			0.75	71	5.79	5.51	8.86	16.14	-	-	-	-	-	-	147	20
1HM07		Z	1	71	5.94	5.51	8.86	16.69	6.02	4.09	3.94	4.92	4.92	6.10	235	24
1HM08			1	71	6.73	5.51	8.86	17.48	6.81	4.09	3.94	4.92	4.92	6.10	235	26
1HM09			1	71	7.52	5.51	8.86	18.27	7.60	4.09	3.94	4.92	4.92	6.10	235	26
1HM10			1.5	80	8.31	6.10	9.13	20.79	8.39	4.09	3.94	4.92	4.92	6.10	235	35
1HM10			1.5	80	8.31	6.10	9.13	20.79	8.39	4.09	3.94	4.92	4.92	6.10	235	35
1HM02	THREE PHASE	X	0.75	71	3.43	5.51	8.86	13.78	-	-	-	-	-	-	147	18
1HM03			0.75	71	3.43	5.51	8.86	13.78	-	-	-	-	-	-	147	18
1HM04			0.75	71	4.21	5.51	8.86	14.57	-	-	-	-	-	-	147	20
1HM05			0.75	71	5.00	5.51	8.86	15.35	-	-	-	-	-	-	147	20
1HM06			0.75	71	5.79	5.51	8.86	16.14	-	-	-	-	-	-	147	20
1HM07		Z	1	71	5.94	6.10	9.13	18.43	6.02	4.09	3.94	4.92	4.92	6.10	235	31
1HM08			1	71	6.73	6.10	9.13	19.21	6.81	4.09	3.94	4.92	4.92	6.10	235	33
1HM09			1	71	7.52	6.10	9.13	20.00	7.60	4.09	3.94	4.92	4.92	6.10	235	33
1HM10			1.5	80	8.31	6.10	9.13	20.79	8.39	4.09	3.94	4.92	4.92	6.10	235	35
1HM10			1.5	80	8.31	6.10	9.13	20.79	8.39	4.09	3.94	4.92	4.92	6.10	235	35

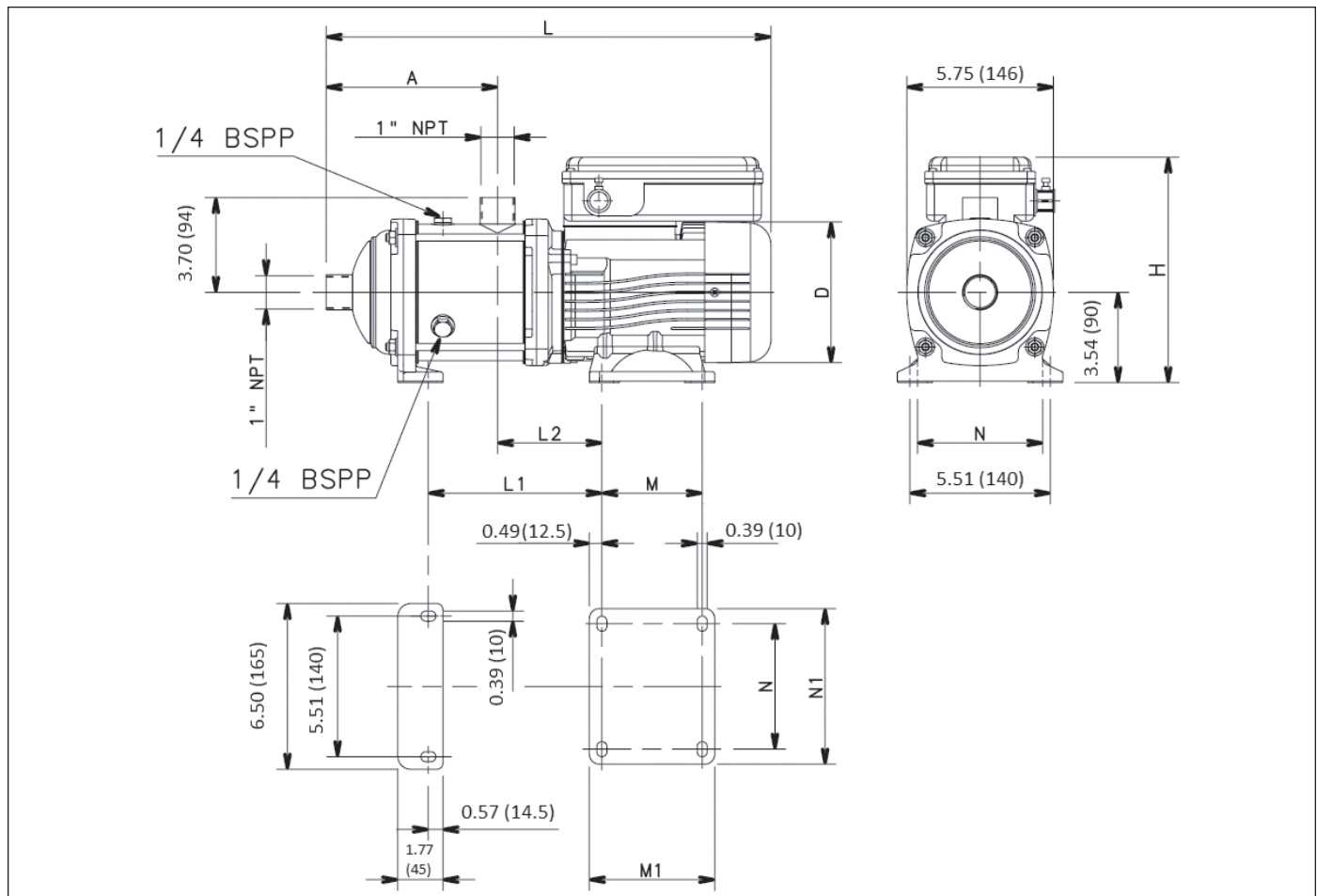
1HM..N SERIES, (2 TO 10 STAGES) OPERATING CHARACTERISTICS AT 60 HZ, 3500 RPM



MINIMUM FLOW RATE: 3 GPM

Commercial Water

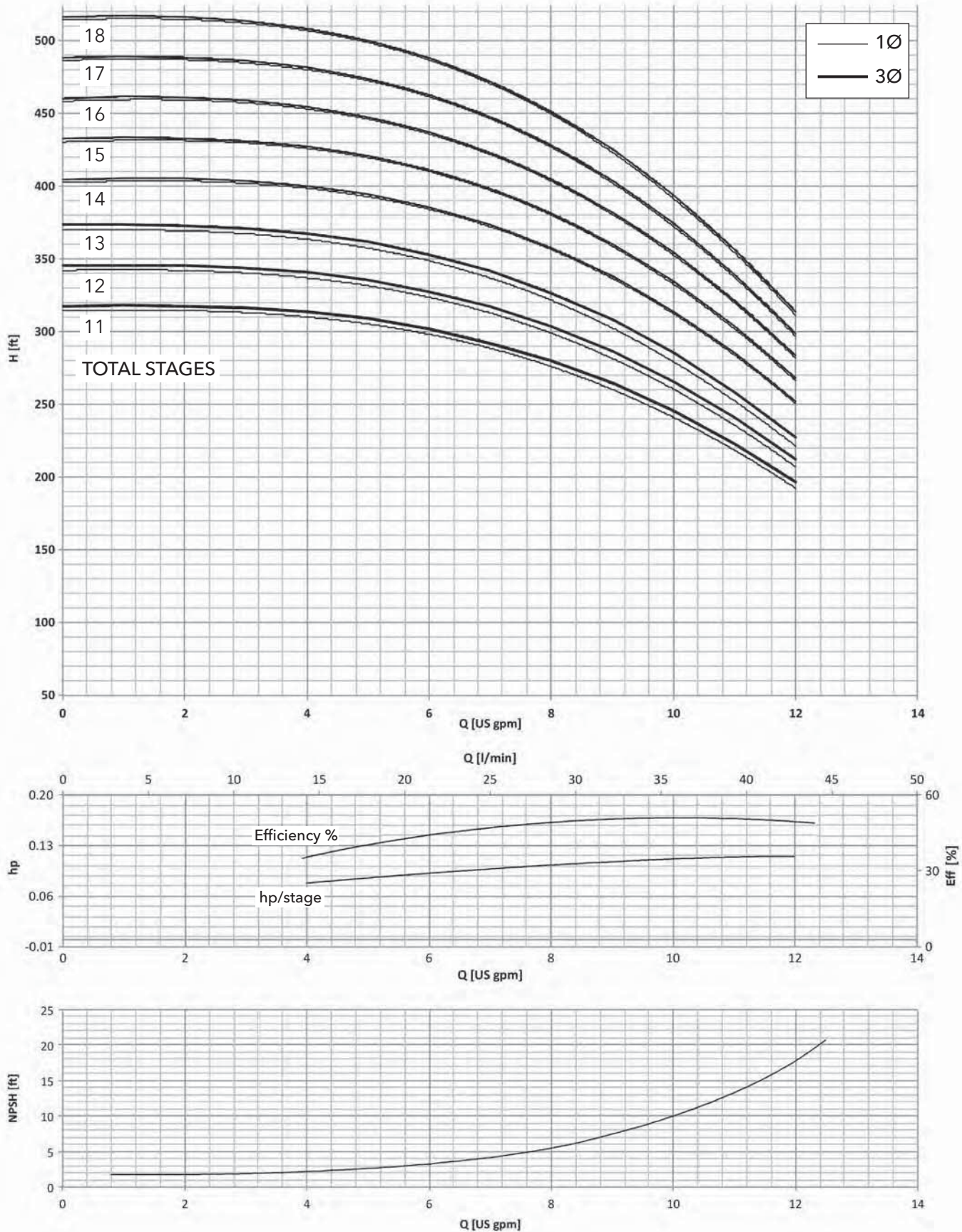
1HM..N SERIES, (11 TO 18 STAGES) DIMENSIONS AND WEIGHTS AT 60 HZ, 3500 RPM



Pump Size Stages	Phase	Motor		Dimensions (in)										Max. Working Pressure (PSI)	Weight (lbs)
		HP	Frame Size	A	D	H	L	L1	L2	M	M1	N	N1		
1HM11	SINGLE PHASE	1.5	80	9.09	6.10	9.13	21.57	9.17	4.09	3.94	4.92	4.92	6.10	235	37
1HM12		1.5	80	9.88	6.10	9.13	22.36	9.96	4.09	3.94	4.92	4.92	6.10	235	37
1HM13		1.5	80	10.67	6.10	9.13	23.15	10.75	4.09	3.94	4.92	4.92	6.10	235	37
1HM14		2	80	11.46	6.10	9.13	23.94	11.54	4.09	3.94	4.92	4.92	6.10	235	42
1HM15		2	80	12.24	6.10	9.13	24.72	12.32	4.09	3.94	4.92	4.92	6.10	235	42
1HM16		2	80	13.03	6.10	9.13	25.51	13.11	4.09	3.94	4.92	4.92	6.10	235	42
1HM17		2	80	13.82	6.10	9.13	26.30	13.90	4.09	3.94	4.92	4.92	6.10	235	44
1HM18		2	80	14.61	6.10	9.13	27.09	14.69	4.09	3.94	4.92	4.92	6.10	235	44

1HM11	THREE PHASE	1.5	80	9.09	6.10	9.13	21.57	9.17	4.09	3.94	4.92	4.92	6.10	235	37
1HM12		1.5	80	9.88	6.10	9.13	22.36	9.96	4.09	3.94	4.92	4.92	6.10	235	37
1HM13		1.5	80	10.67	6.10	9.13	23.15	10.75	4.09	3.94	4.92	4.92	6.10	235	37
1HM14		2	80	11.46	6.10	9.13	23.94	11.54	4.09	3.94	4.92	4.92	6.10	235	42
1HM15		2	80	12.24	6.10	9.13	24.72	12.32	4.09	3.94	4.92	4.92	6.10	235	42
1HM16		2	80	13.03	6.10	9.13	25.51	13.11	4.09	3.94	4.92	4.92	6.10	235	42
1HM17		2	80	13.82	6.10	9.13	26.30	13.90	4.09	3.94	4.92	4.92	6.10	235	44
1HM18		2	80	14.61	6.10	9.13	27.09	14.69	4.09	3.94	4.92	4.92	6.10	235	44

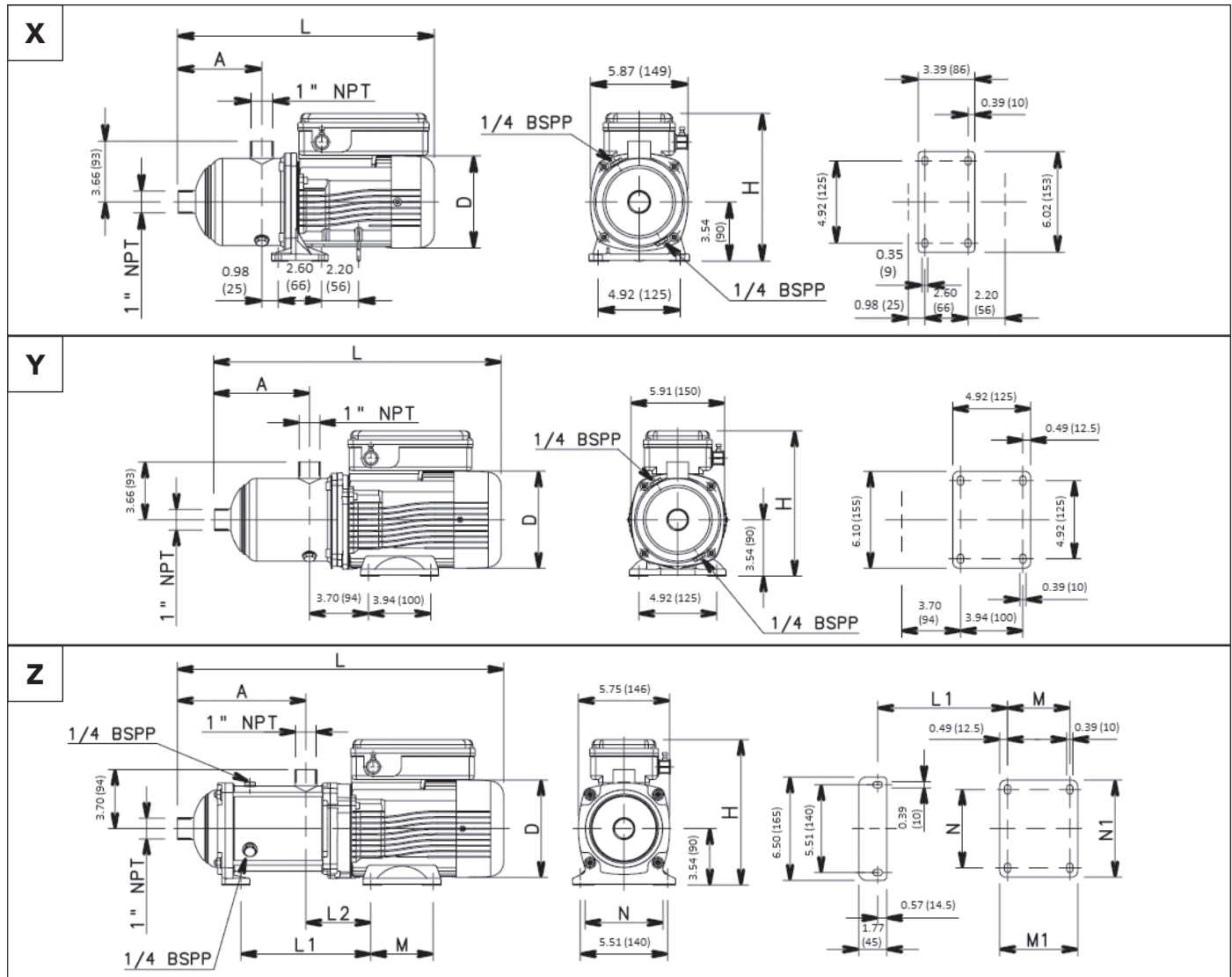
1HM..N SERIES, (11 TO 18 STAGES) OPERATING CHARACTERISTICS AT 60 HZ, 3500 RPM



MINIMUM FLOW RATE: 3 GPM

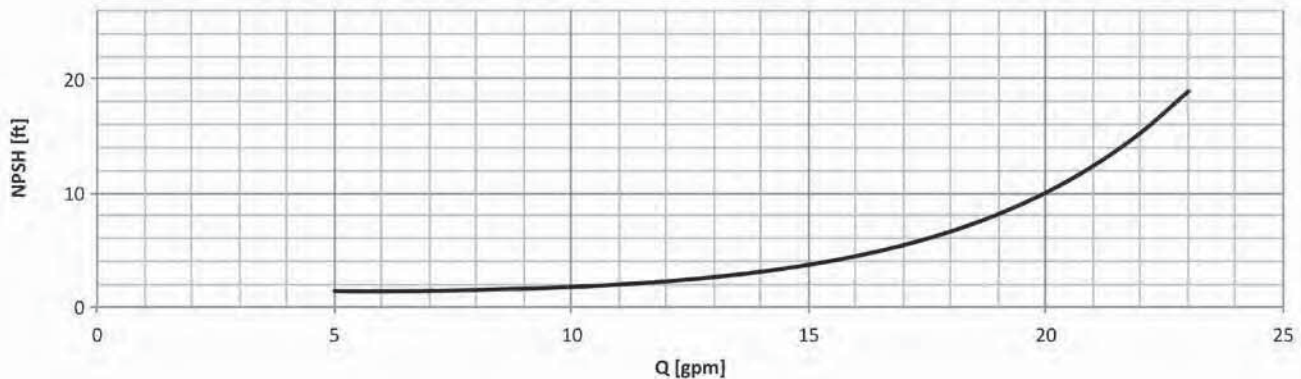
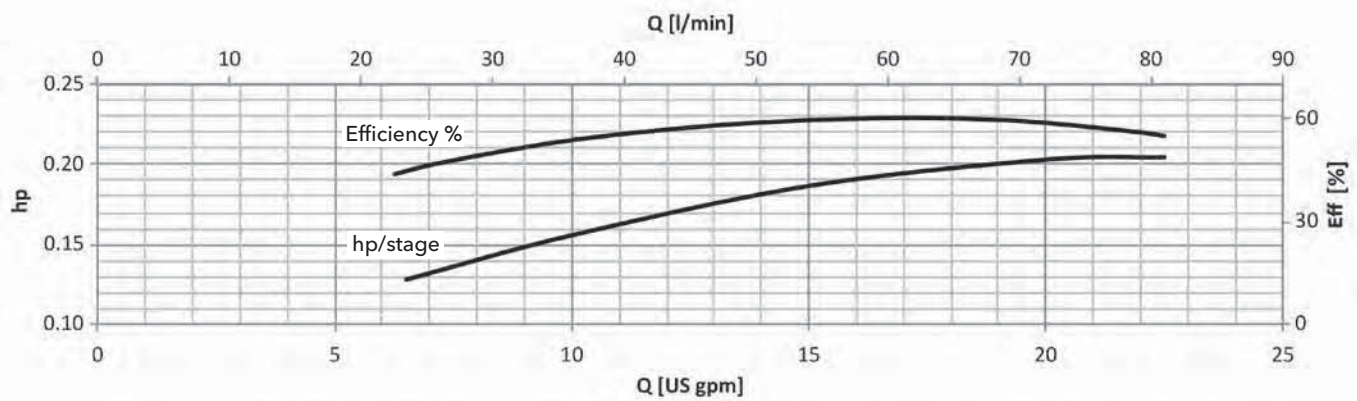
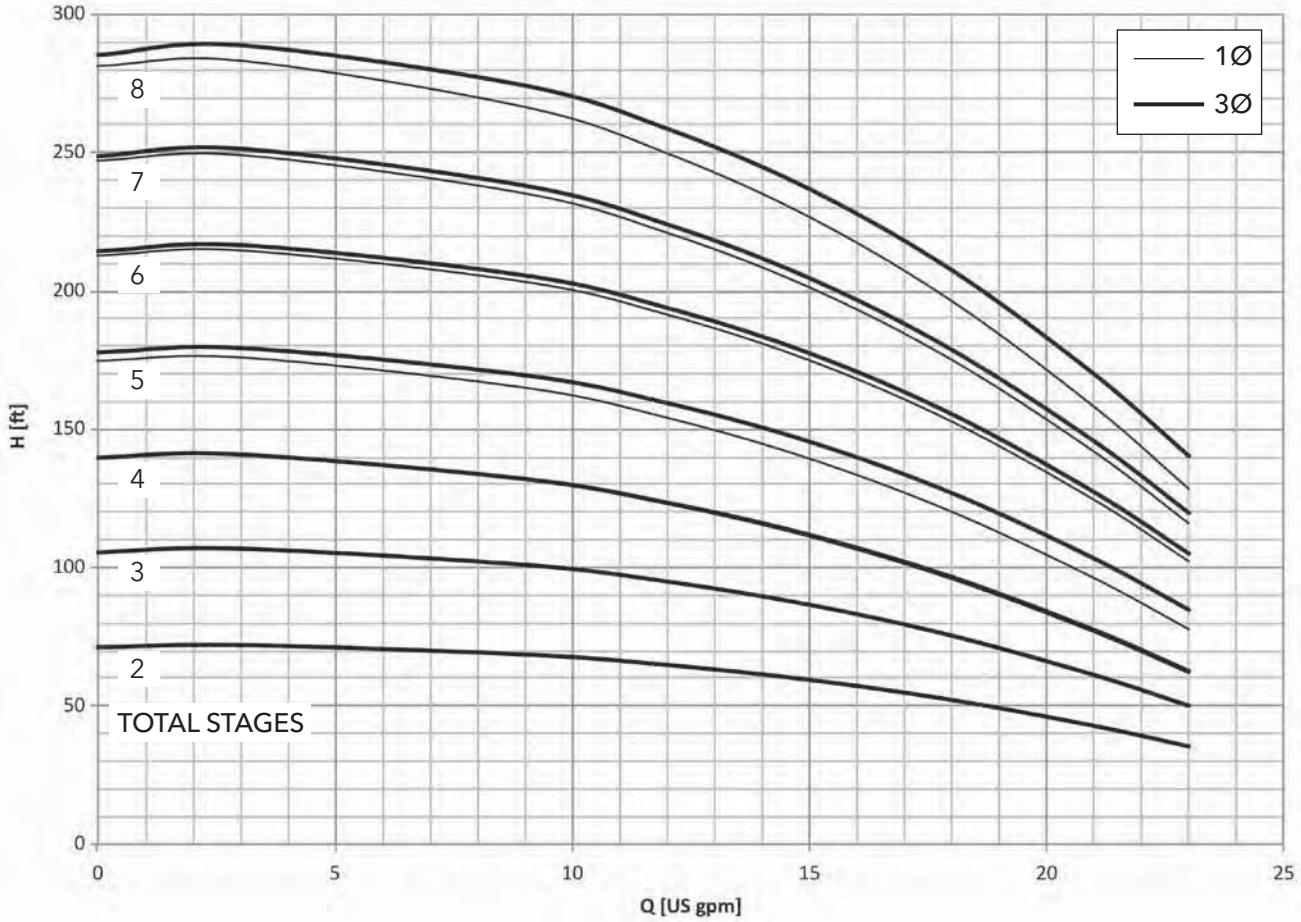
Commercial Water

3HM..N SERIES, (2 TO 8 STAGES) DIMENSIONS AND WEIGHTS AT 60 HZ, 3500 RPM



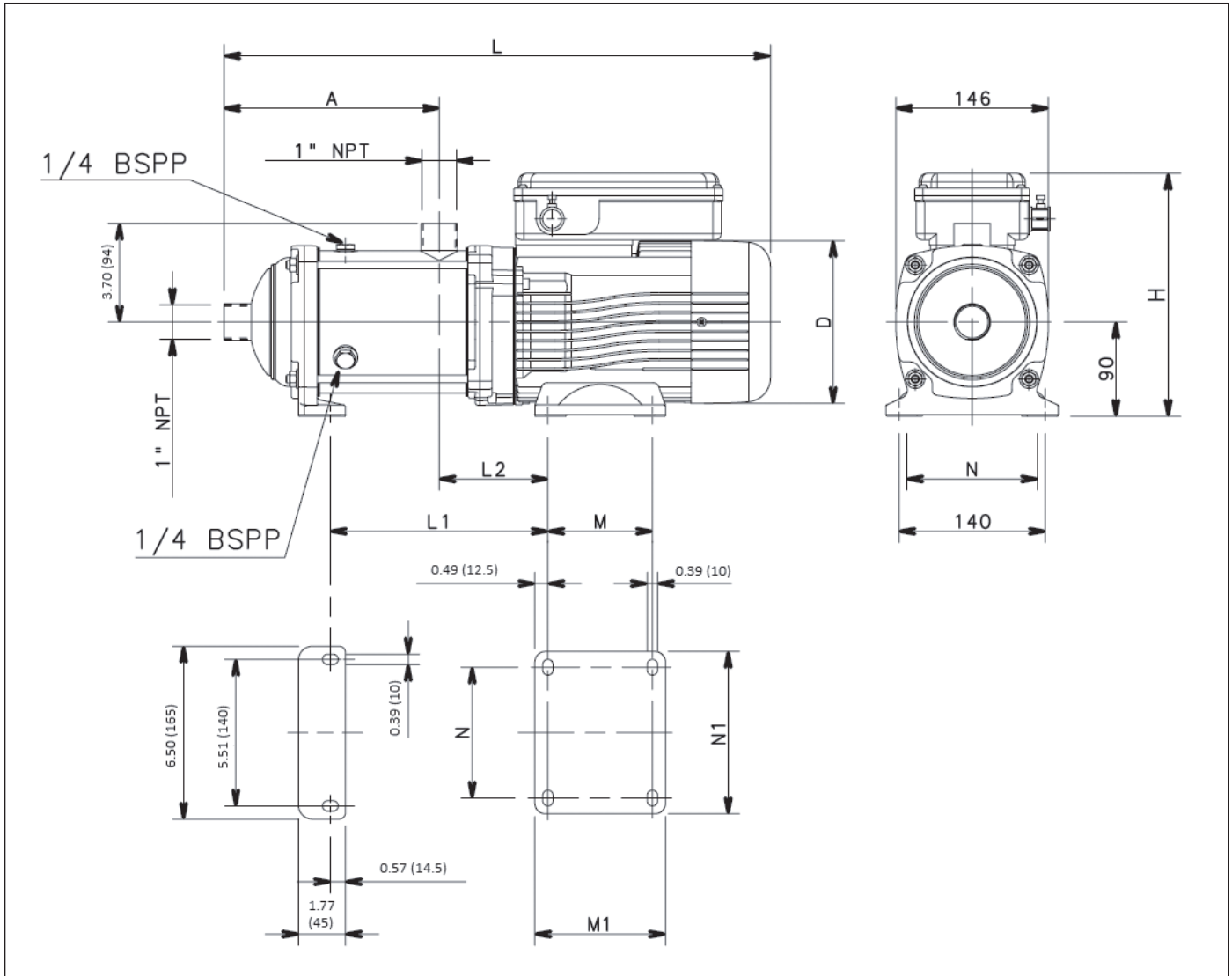
Pump Size Stages	Phase	DWG No.	Motor		Dimensions (in)										Max. Working Pressure (PSI)	Weight (lbs)
			HP	Frame Size	A	D	H	L	L1	L2	M	M1	N	N1		
3HM02	SINGLE PHASE	X	0.75	71	3.43	5.51	8.86	13.78	-	-	-	-	-	-	147	18
3HM03			0.75	71	3.43	5.51	8.86	13.78	-	-	-	-	-	-	147	18
3HM04			0.75	71	4.21	5.51	8.86	14.57	-	-	-	-	-	-	147	20
3HM05			1	71	5.00	5.51	9.13	16.85	-	-	-	-	-	-	147	22
3HM06		Y	1.5	80	5.79	5.94	9.13	17.64	-	-	-	-	-	-	147	31
3HM07		Z	1.5	80	5.94	5.94	9.13	18.43	6.02	4.09	3.94	4.92	4.92	6.10	235	33
3HM08			1.5	80	6.73	5.94	9.13	19.21	6.81	4.09	3.94	4.92	4.92	6.10	235	35
3HM02		THREE PHASE	X	0.75	71	3.43	5.51	8.86	13.78	-	-	-	-	-	-	147
3HM03	0.75			71	3.43	5.51	8.86	13.78	-	-	-	-	-	-	147	18
3HM04	0.75			71	4.21	5.51	8.86	14.57	-	-	-	-	-	-	147	20
3HM05	Y		1	80	5.00	5.51	9.13	16.85	-	-	-	-	-	-	147	29
3HM06			1.5	80	5.79	5.94	9.13	17.64	-	-	-	-	-	-	147	31
3HM07	Z		1.5	80	5.94	5.94	9.13	18.43	6.02	4.09	3.94	4.92	4.92	6.10	235	33
3HM08			2	80	6.73	5.94	9.13	19.21	6.81	4.09	3.94	4.92	4.92	6.10	235	37

3HM..N SERIES, (2 TO 8 STAGES) OPERATING CHARACTERISTICS AT 60 HZ, 3500 RPM



MINIMUM FLOW RATE: 5 GPM

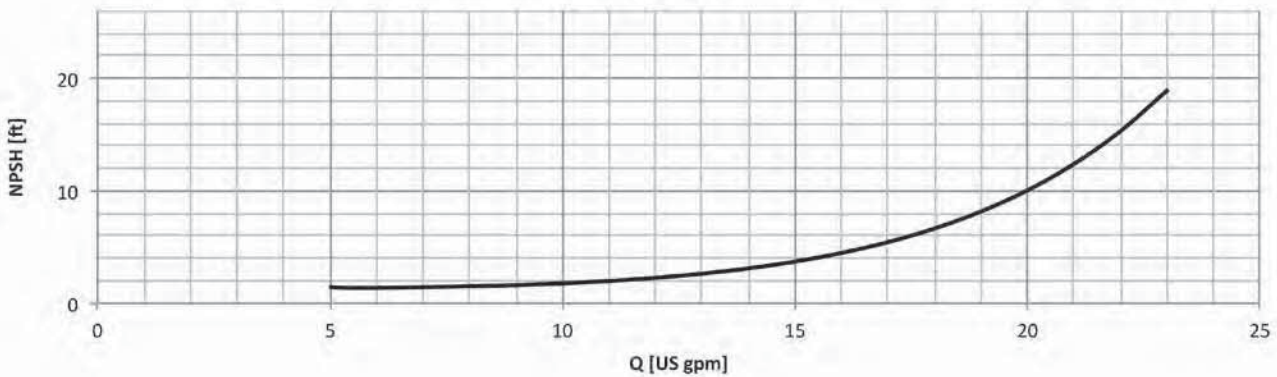
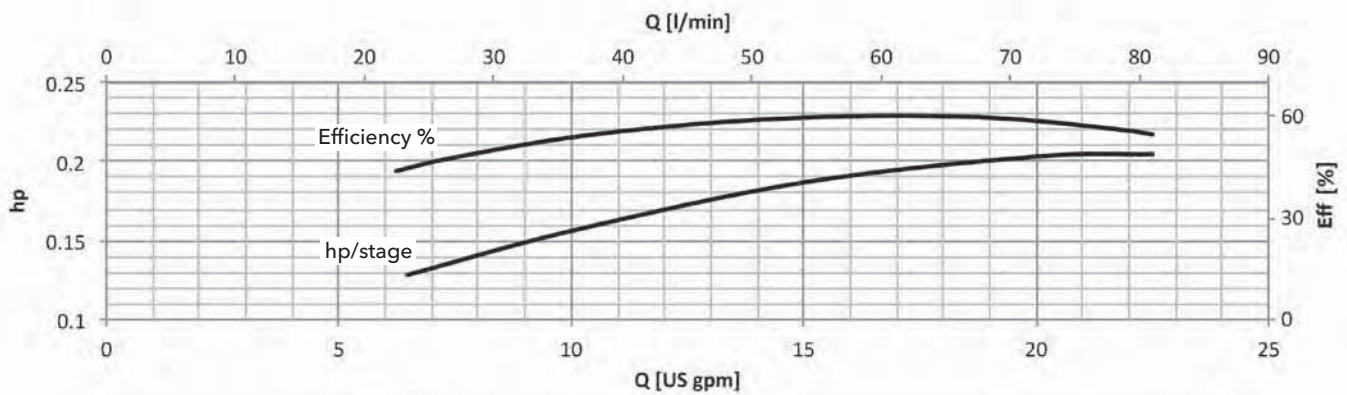
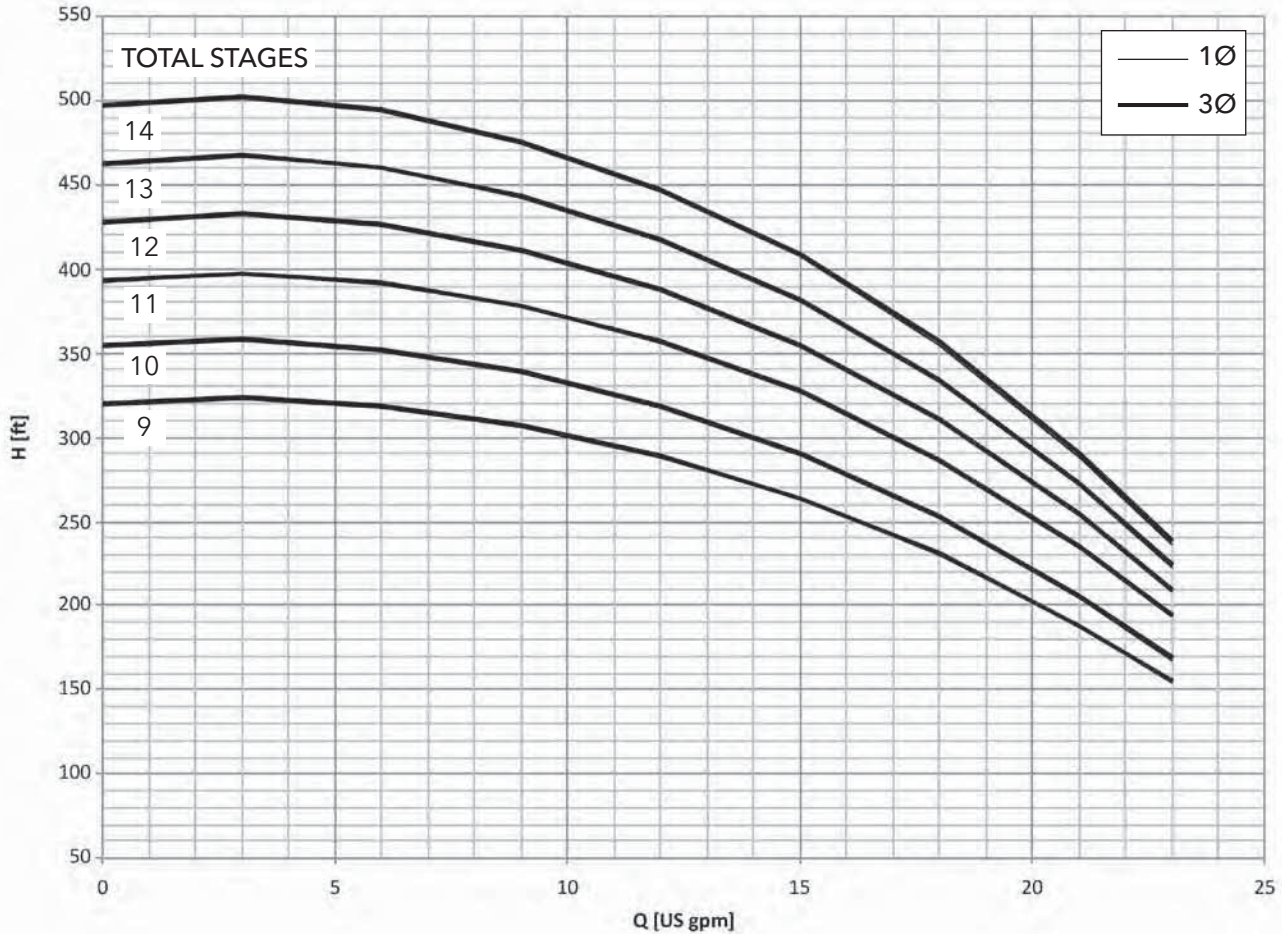
3HM..N SERIES, (9 TO 14 STAGES) DIMENSIONS AND WEIGHTS AT 60 HZ, 3500 RPM



Pump Size Stages	Phase	Motor		Dimensions (in)										Max. Working Pressure (PSI)	Weight (lbs)
		HP	Frame Size	A	D	H	L	L1	L2	M	M1	N	N1		
3HM09	SINGLE PHASE	2	80	7.52	6.10	9.13	20.00	7.60	4.09	3.94	4.92	4.92	6.10	235	37
3HM10		2	80	8.31	6.10	9.13	20.79	8.39	4.09	3.94	4.92	4.92	6.10	235	37

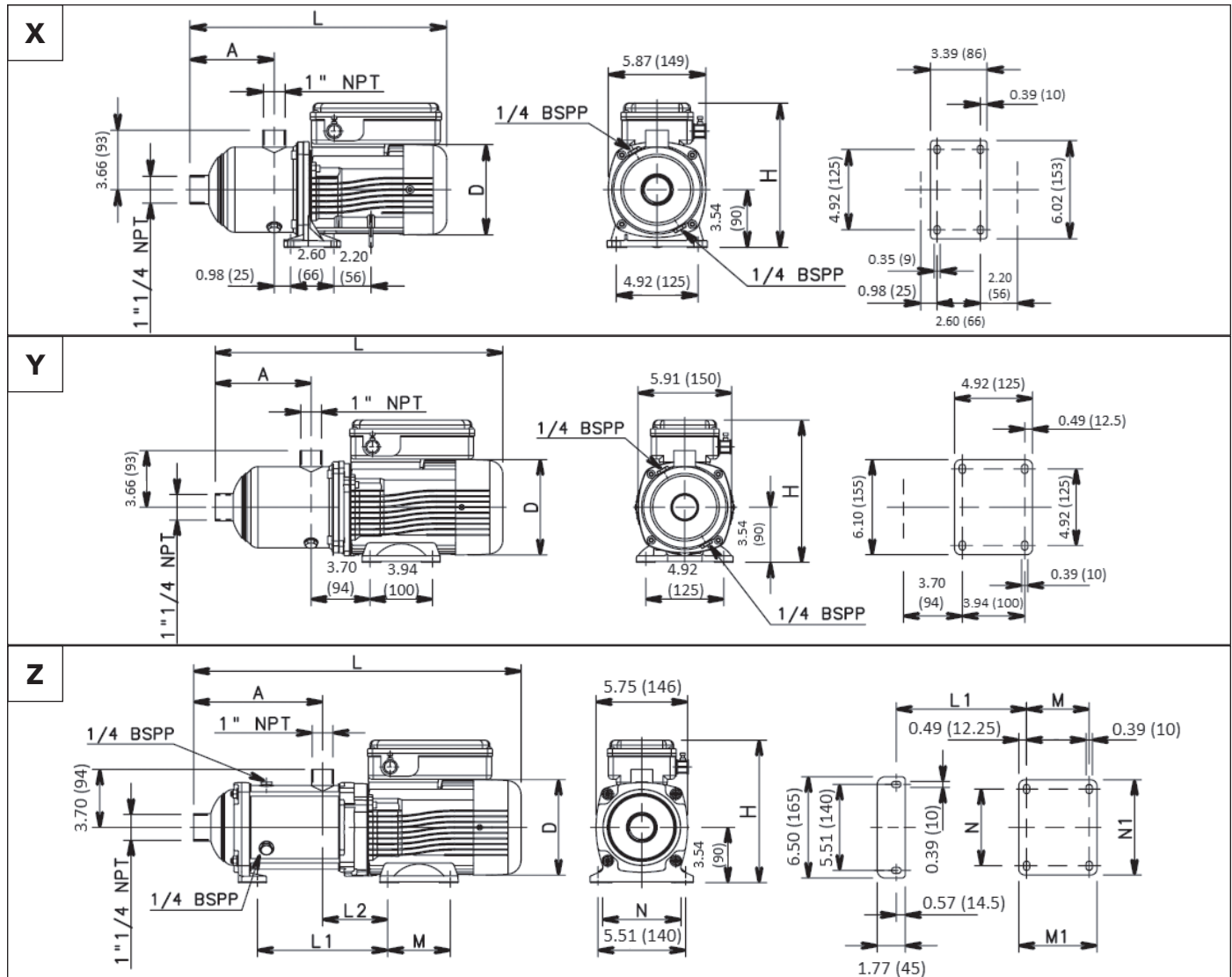
3HM09	THREE PHASE	2	80	7.52	6.10	9.13	20.00	7.60	4.09	3.94	4.92	4.92	6.10	235	37
3HM10		2	80	8.31	6.10	9.13	20.79	8.39	4.09	3.94	4.92	4.92	6.10	235	37
3HM11		3	90	9.09	6.85	9.13	23.58	10.08	5.00	4.92	5.91	5.51	6.46	235	51
3HM12		3	90	9.88	6.85	9.13	24.37	10.87	5.00	4.92	5.91	5.51	6.46	235	51
3HM13		3	90	10.67	6.85	9.13	25.16	11.65	5.00	4.92	5.91	5.51	6.46	235	51
3HM14		3	90	11.46	6.85	9.13	25.94	12.44	5.00	4.92	5.91	5.51	6.46	235	53

3HM..N SERIES, (9 TO 14 STAGES) OPERATING CHARACTERISTICS AT 60 HZ, 3500 RPM



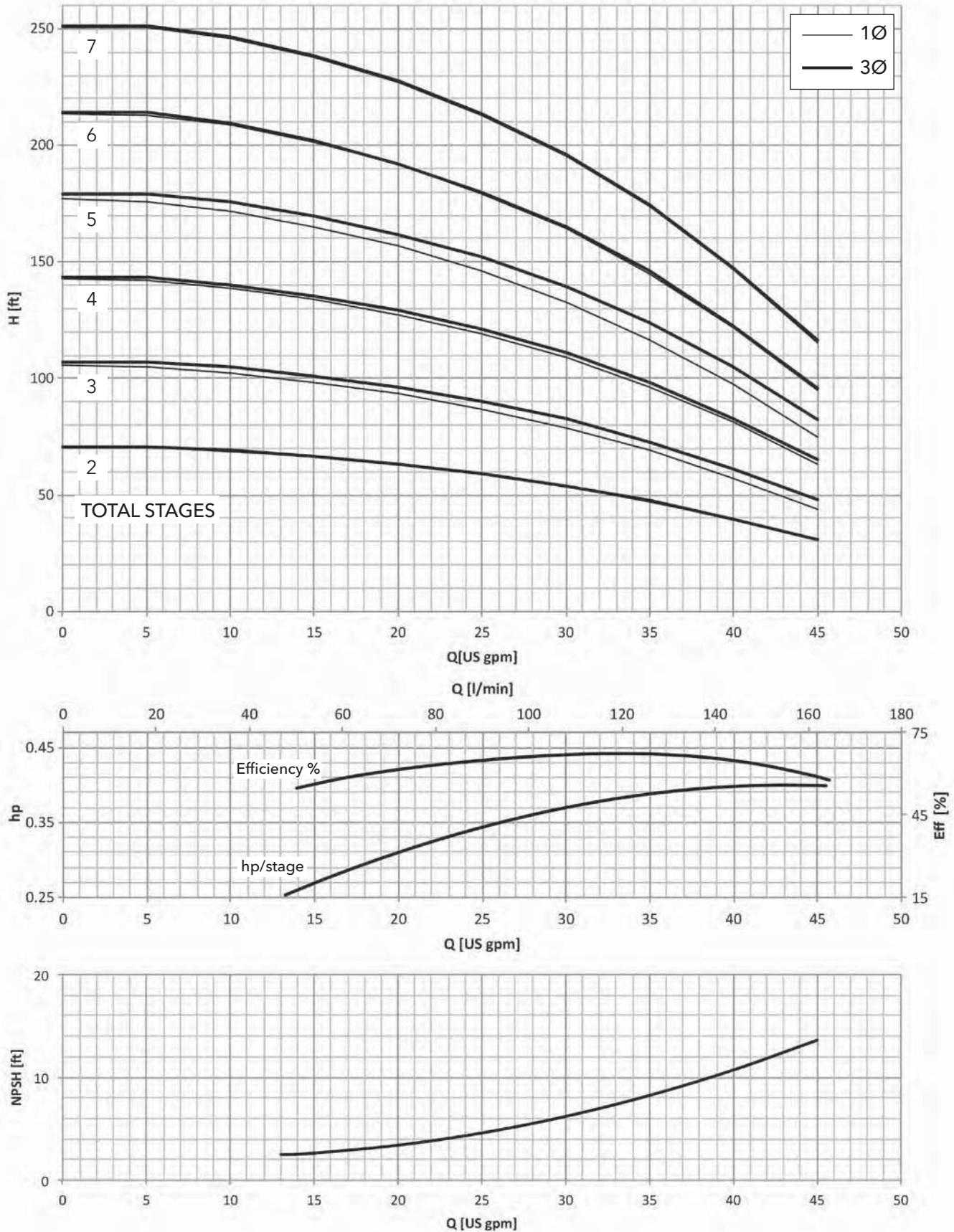
MINIMUM FLOW RATE: 5 GPM

5HM..N SERIES, (2 TO 7 STAGES) DIMENSIONS AND WEIGHTS AT 60 HZ, 3500 RPM



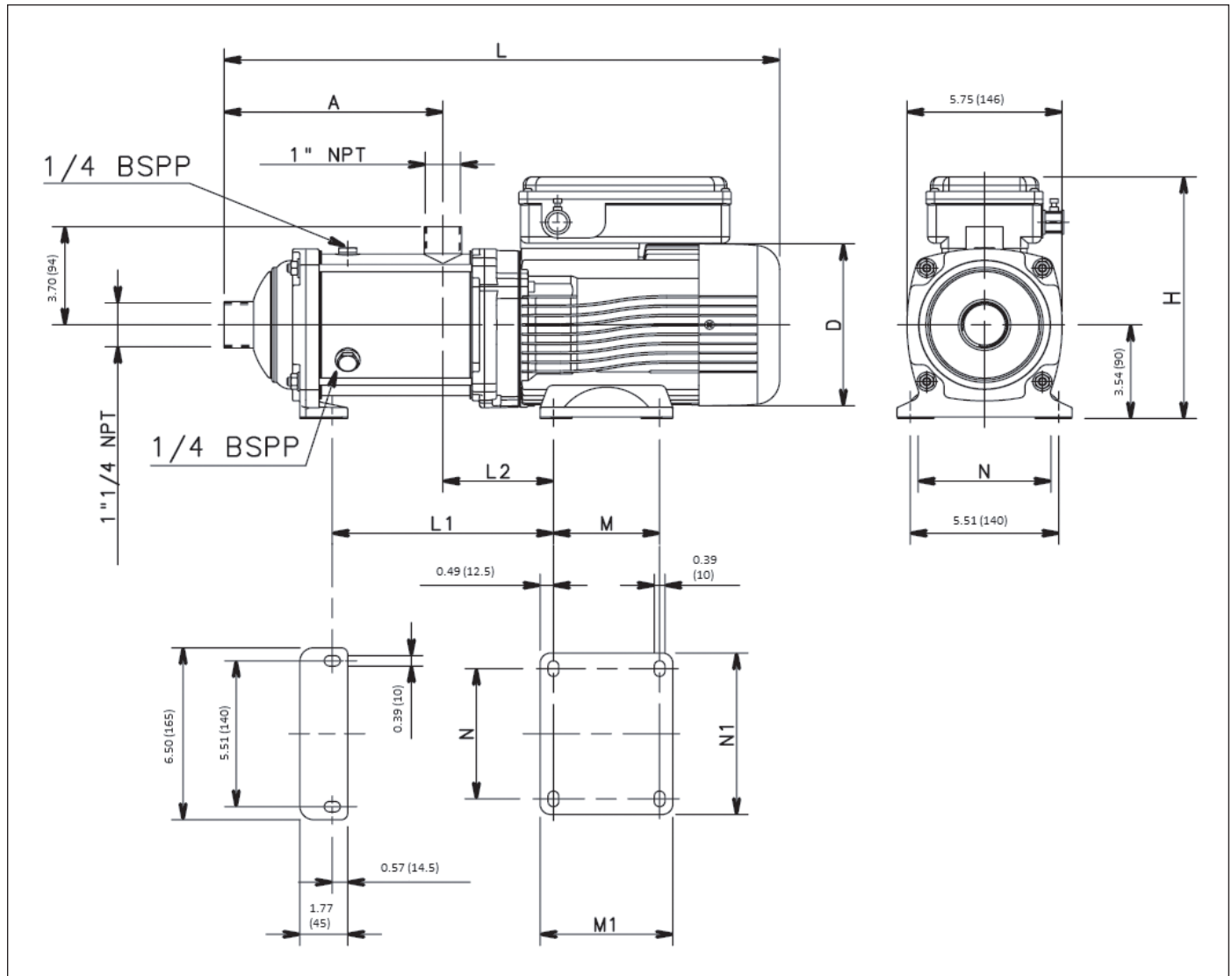
Pump Size Stages	Phase	DWG No.	Motor		Dimensions (in)										Max. Working Pressure (PSI)	Weight (lbs)
			HP	Frame Size	A	D	H	L	L1	L2	M	M1	N	N1		
5HM02	SINGLE PHASE	X	0.75	71	4.09	5.51	8.86	14.45	-	-	-	-	-	-	147	18
5HM03			1	71	4.09	5.51	8.86	14.45	-	-	-	-	-	-	147	20
5HM04		Y	1.5	80	5.08	6.10	9.13	16.93	-	-	-	-	-	-	147	31
5HM05			1.5	80	6.06	6.10	9.13	17.91	-	-	-	-	-	-	147	31
5HM06		Z	2	80	6.22	6.10	9.13	18.70	6.22	4.09	3.94	4.92	4.92	6.10	235	36
5HM02		THREE PHASE	X	0.75	71	4.09	5.51	8.86	14.45	-	-	-	-	-	-	147
5HM03	1			80	4.09	6.10	9.13	15.94	-	-	-	-	-	-	147	27
5HM04	Y		1.5	80	5.08	6.10	9.13	16.93	-	-	-	-	-	-	147	31
5HM05			2	80	6.06	6.10	9.13	17.91	-	-	-	-	-	-	147	34
5HM06	Z		2	80	6.22	6.10	9.13	18.70	6.22	4.09	3.94	4.92	4.92	6.10	235	36
5HM07			3	90	7.20	6.85	9.13	21.89	8.11	5.00	4.92	5.91	5.51	6.46	235	49

5HM..N SERIES, (2 TO 7 STAGES) OPERATING CHARACTERISTICS AT 60 HZ, 3500 RPM



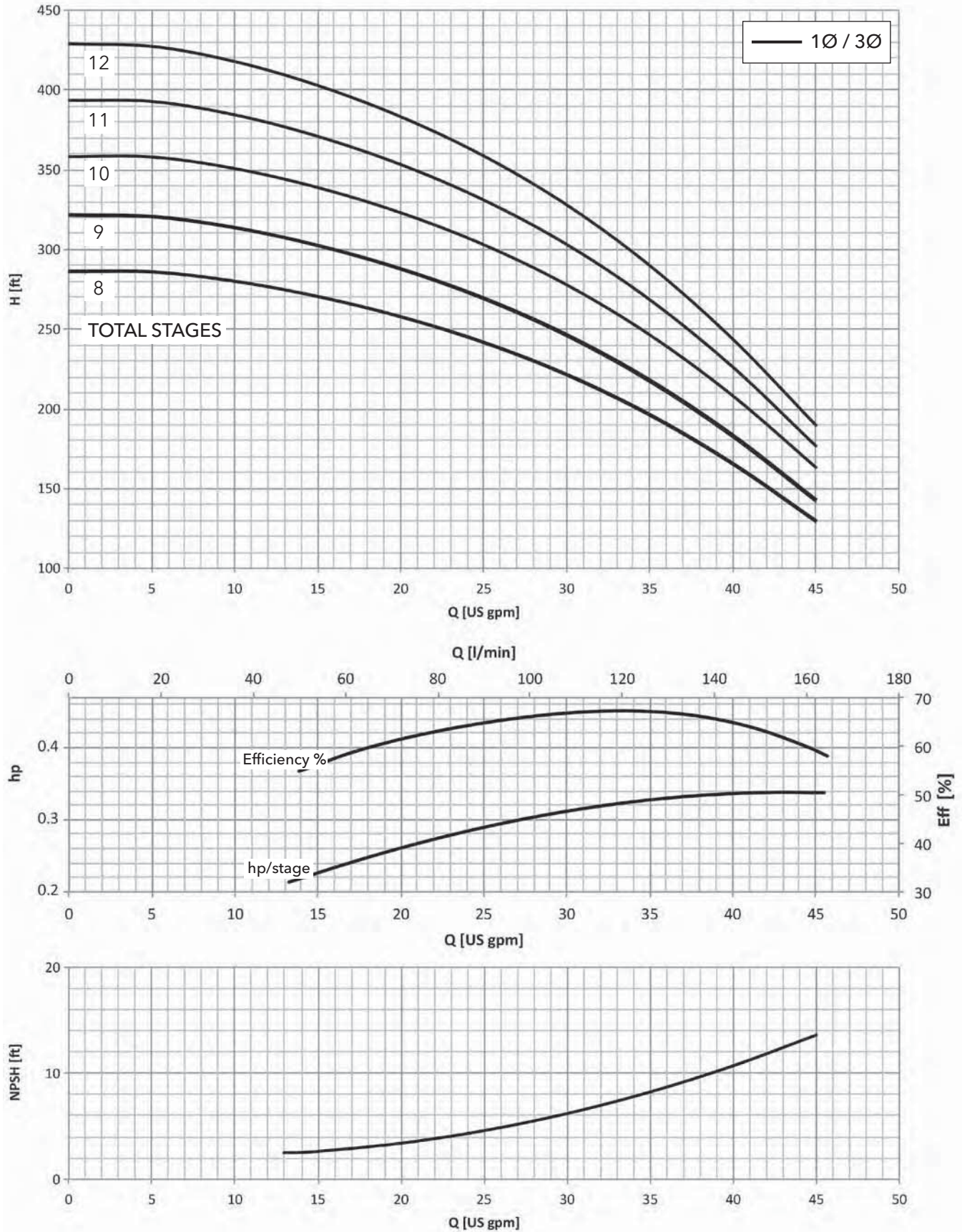
MINIMUM FLOW RATE: 10 GPM

5HM..N SERIES, (8 TO 12 STAGES) DIMENSIONS AND WEIGHTS AT 60 HZ, 3500 RPM



Pump Size Stages	Phase	Motor		Dimensions (in)										Max. Working Pressure (PSI)	Weight (lbs)
		HP	Frame Size	A	D	H	L	L1	L2	M	M1	N	N1		
5HM08	THREE PHASE	3	90	8.19	6.85	9.13	22.87	9.09	5.00	4.92	5.91	5.51	6.46	235	49
5HM09		3	90	9.17	6.85	9.13	23.86	10.08	5.00	4.92	5.91	5.51	6.46	235	51
5HM10		4	90	10.16	6.85	9.13	24.84	11.06	5.00	4.92	5.91	5.51	6.46	235	58
5HM11		4	90	11.14	6.85	9.13	25.83	12.05	5.00	4.92	5.91	5.51	6.46	235	60
5HM12		4	90	12.13	6.85	9.13	26.81	13.03	5.00	4.92	5.91	5.51	6.46	235	60

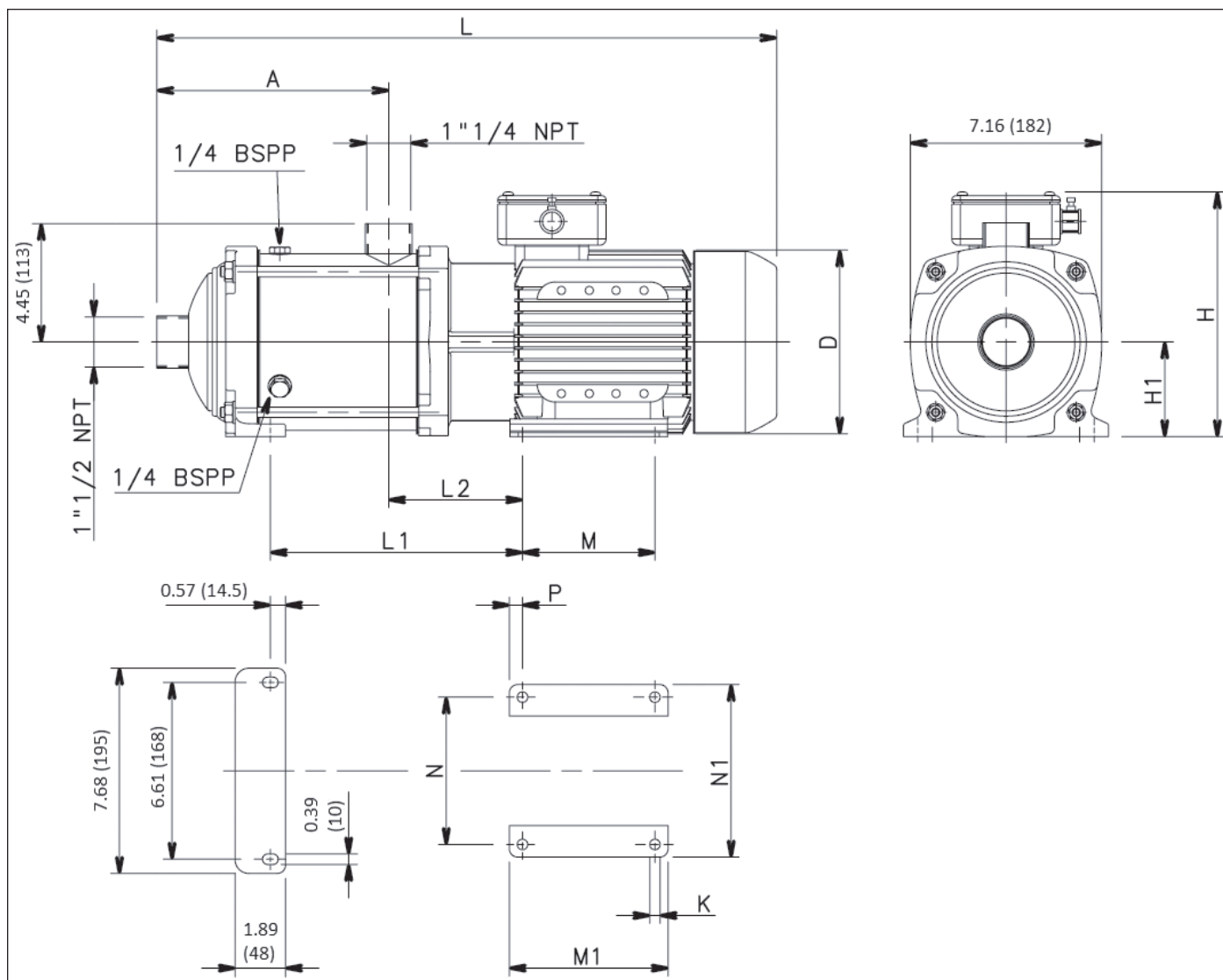
5HM..N SERIES, (8 TO 12 STAGES) OPERATING CHARACTERISTICS AT 60 HZ, 3500 RPM



MINIMUM FLOW RATE: 10 GPM

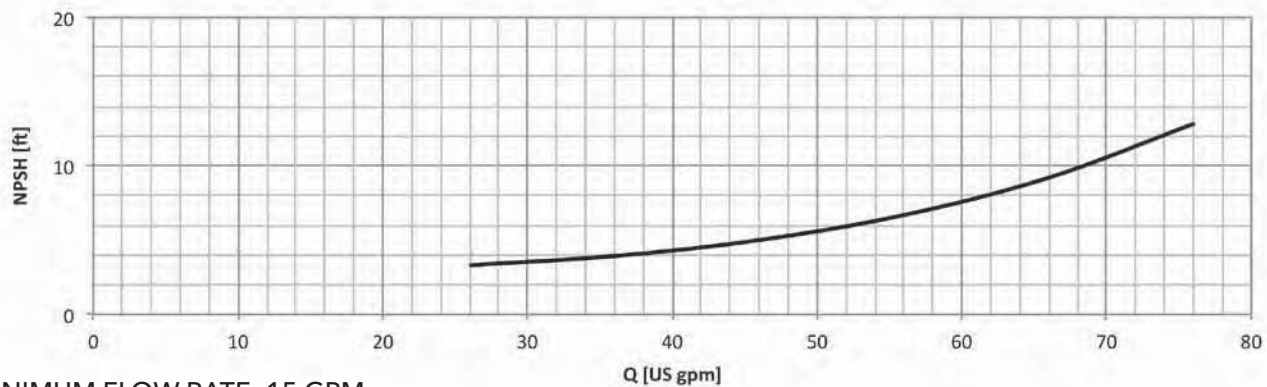
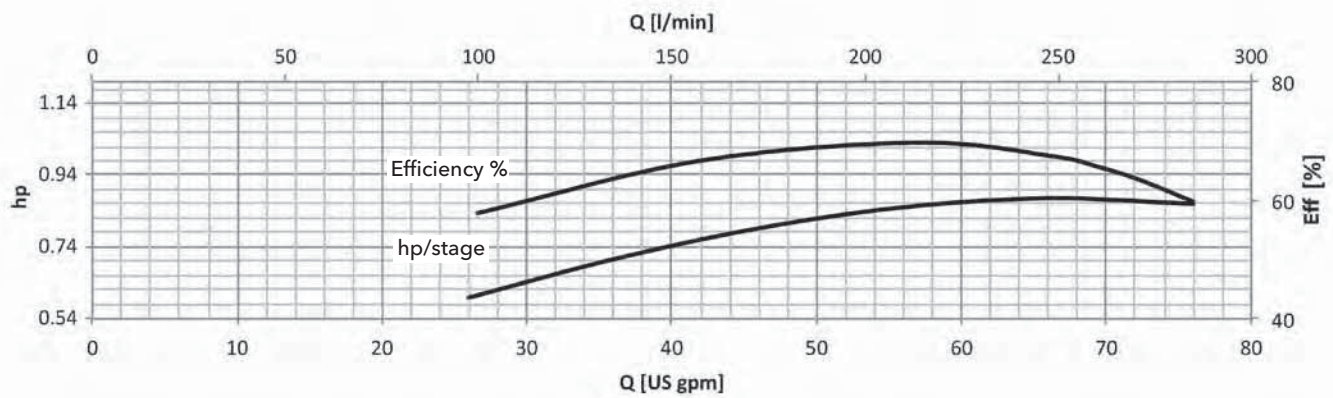
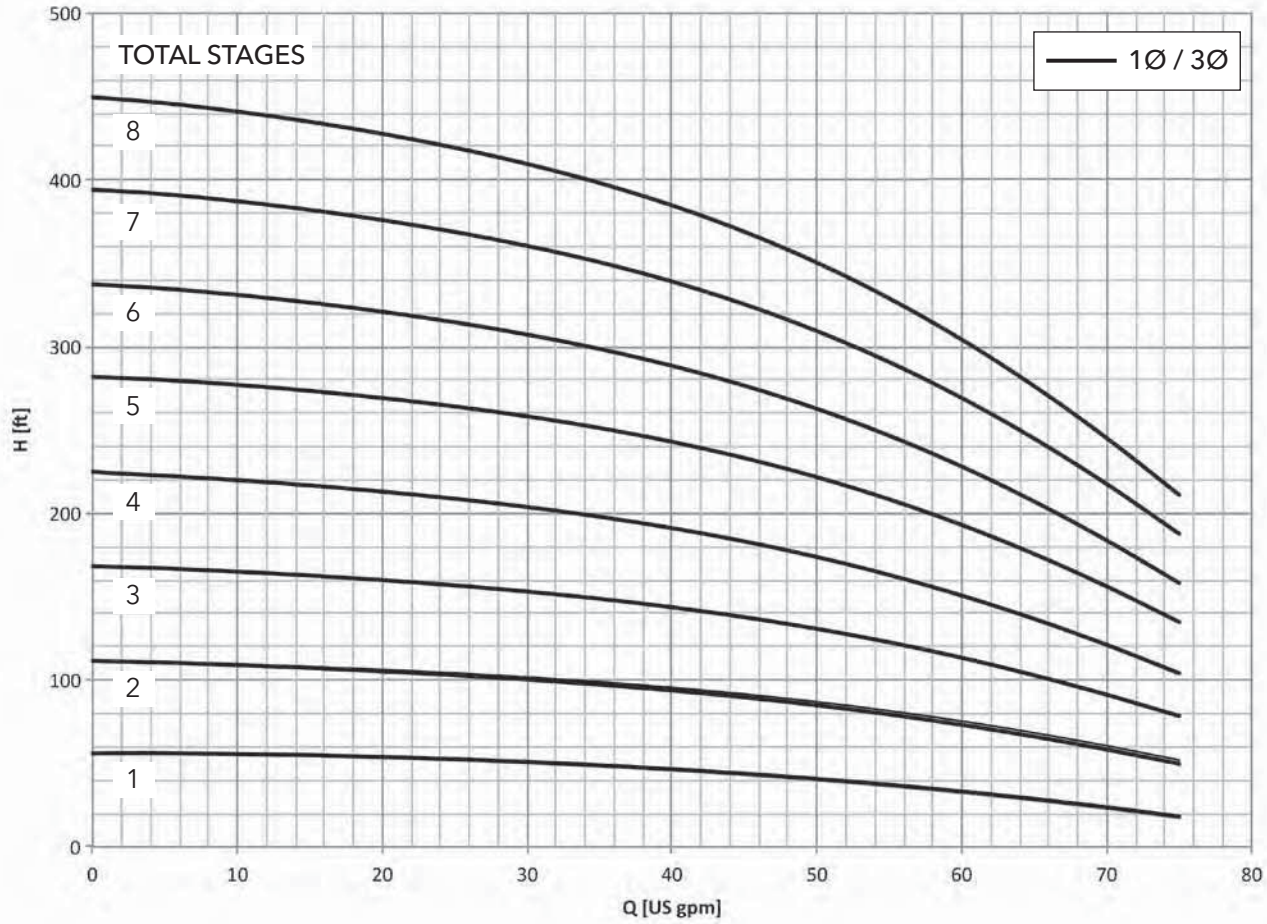
Commercial Water

10HM..N SERIES, (1 TO 8 STAGES) DIMENSIONS AND WEIGHTS AT 60 HZ, 3500 RPM



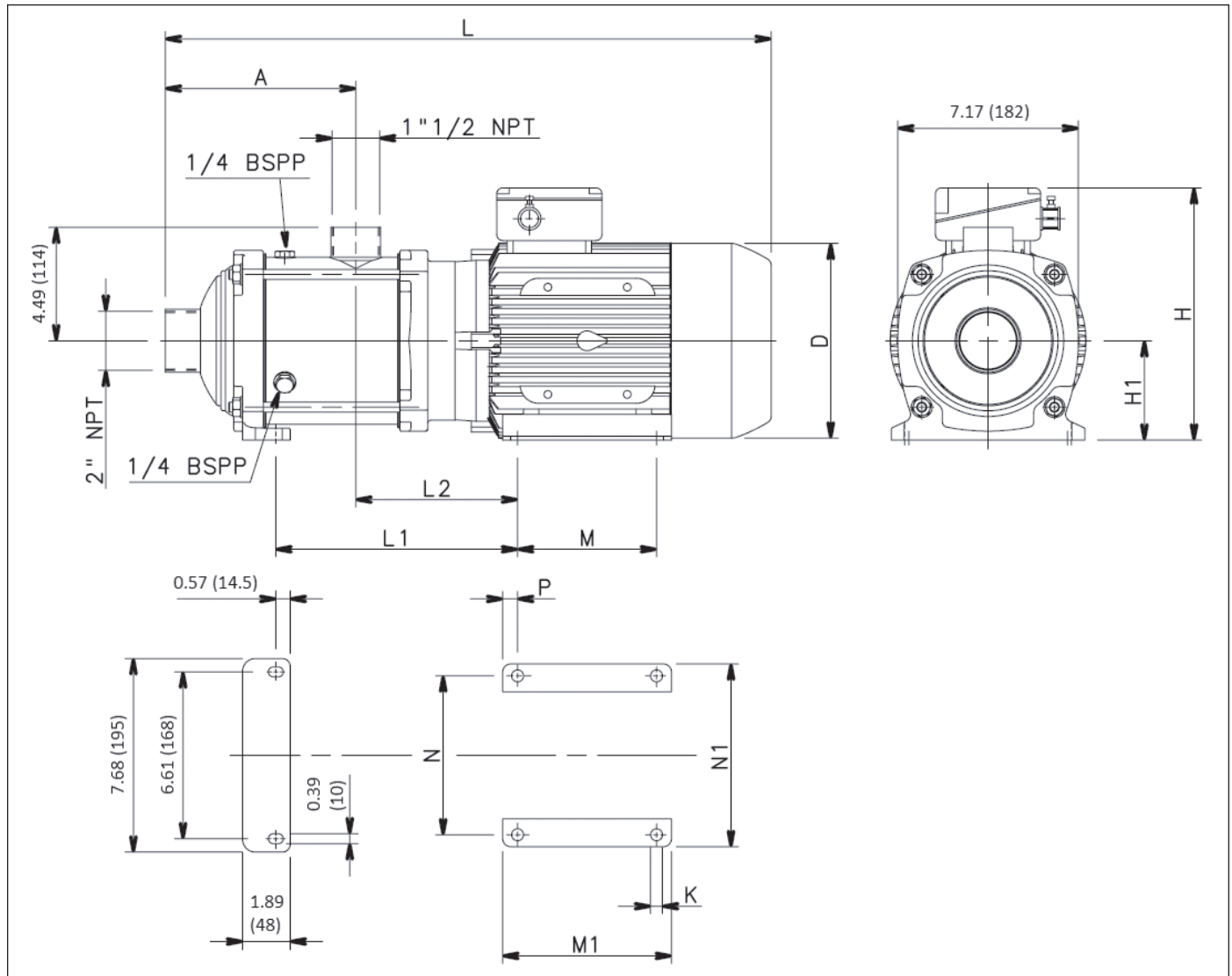
Pump Size Stages	Phase	Motor		Dimensions (in)													Max. Working Pressure (PSI)	Weight (lbs)
		HP	Frame Size	A	D	H	H1	L	L1	L2	M	M1	N	N1	P	K		
10HM01	SINGLE PHASE	1.5	80	4.92	6.1	9.13	3.54	17.44	4.8	4.13	3.94	4.92	4.92	6.1	0.49	0.39	235	36
10HM02		2	80	4.92	6.1	9.13	3.54	17.44	4.8	4.13	3.94	4.92	4.92	6.1	0.49	0.39	235	38
10HM01	THREE PHASE	1	80	4.92	6.1	9.13	3.54	17.44	4.8	4.13	3.94	4.92	4.92	6.1	0.49	0.39	235	34
10HM02		2	80	4.92	6.1	9.13	3.54	17.4	4.8	4.13	3.94	4.92	4.92	6.1	0.49	0.39	235	38
10HM03		3	90	4.92	6.85	9.13	3.54	19.45	5.67	5.04	4.92	5.91	5.51	6.46	0.49	0.39	235	51
10HM04		4	90	6.18	6.85	9.13	3.54	20.71	6.93	5.04	4.92	5.91	5.51	6.46	0.49	0.39	235	60
10HM05		5.5	100	7.44	7.76	10	3.94	23.31	8.98	5.79	5.51	6.69	6.3	7.24	0.59	0.47	235	75
10HM06		5.5	100	8.7	7.76	10	3.94	24.57	10.24	5.79	5.51	6.69	6.3	7.24	0.59	0.47	235	78
10HM07		7.5	112	9.96	8.43	11.02	4.41	27.17	11.77	6.06	5.51	6.69	7.48	8.62	0.59	0.47	235	95
10HM08		7.5	112	11.22	8.43	11.02	4.41	28.43	13.03	6.06	5.51	6.69	7.48	8.62	0.59	0.47	235	98

10HM..N SERIES, (1 TO 8 STAGES) OPERATING CHARACTERISTICS AT 60 HZ, 3500 RPM



MINIMUM FLOW RATE: 15 GPM

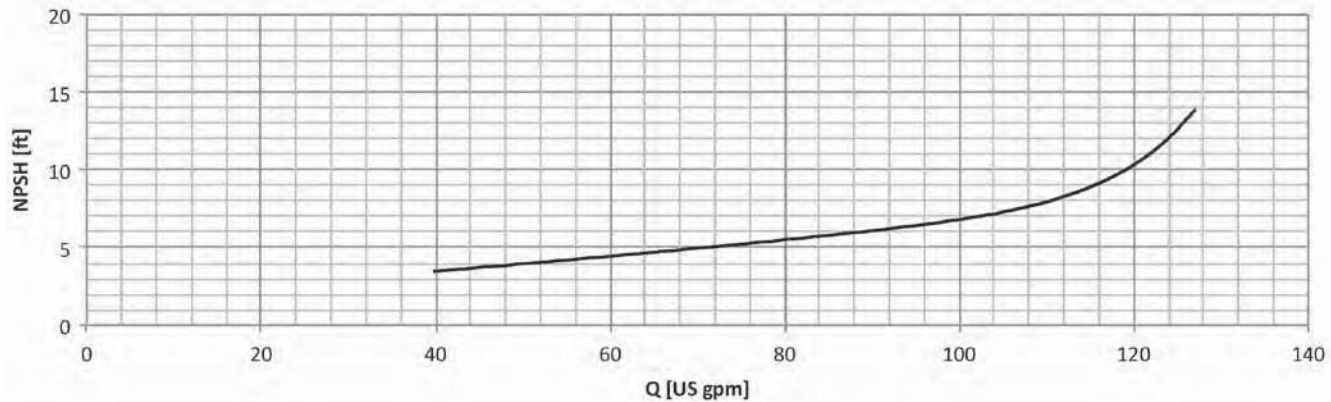
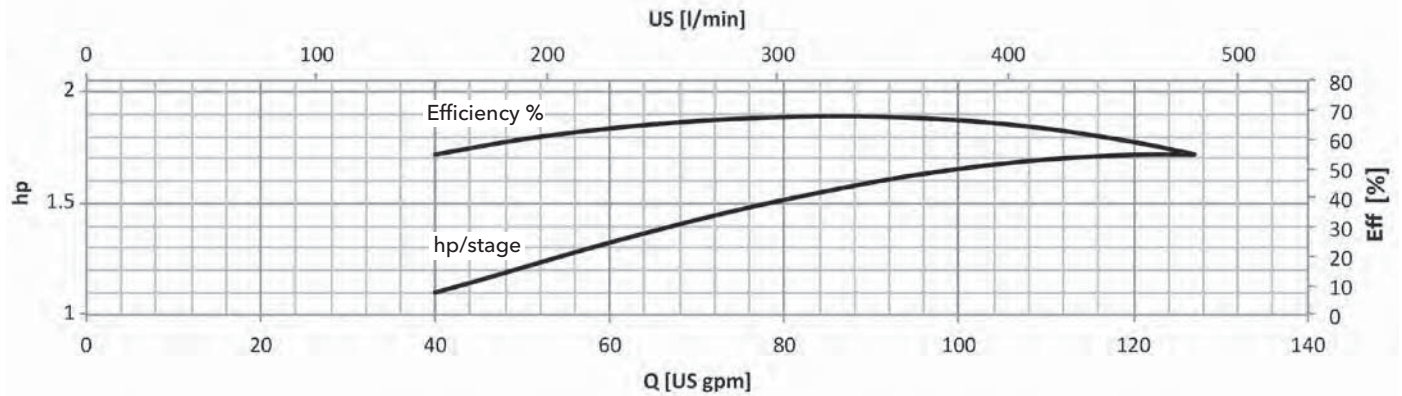
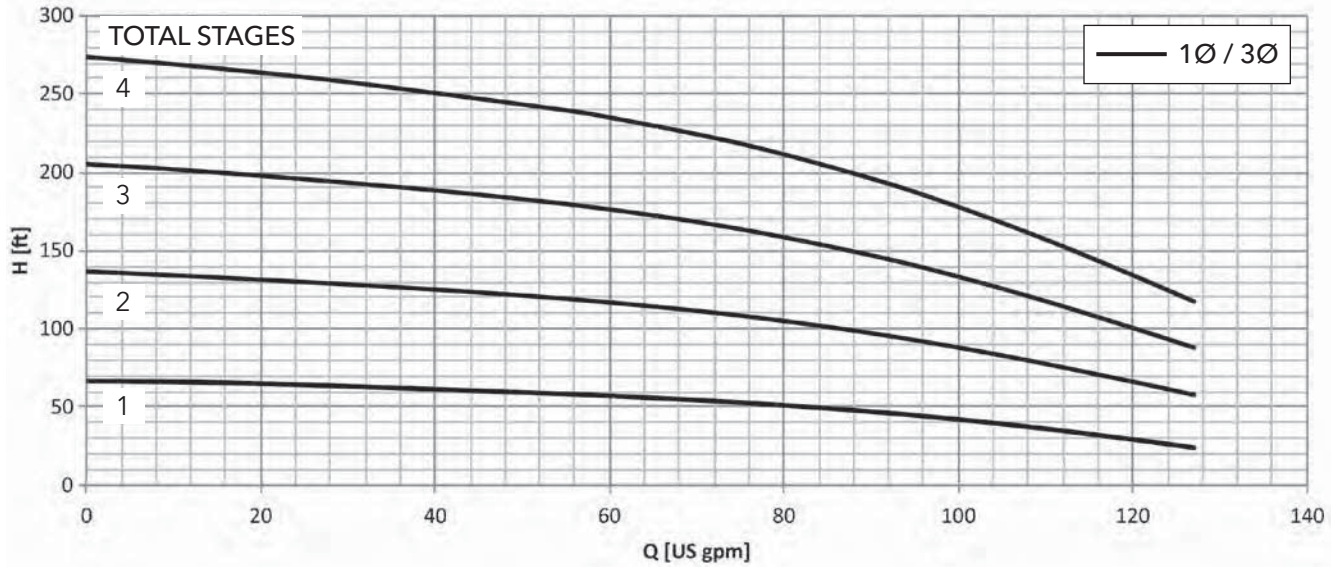
15HM..N SERIES, (1 TO 4 STAGES) DIMENSIONS AND WEIGHTS AT 60 HZ, 3500 RPM



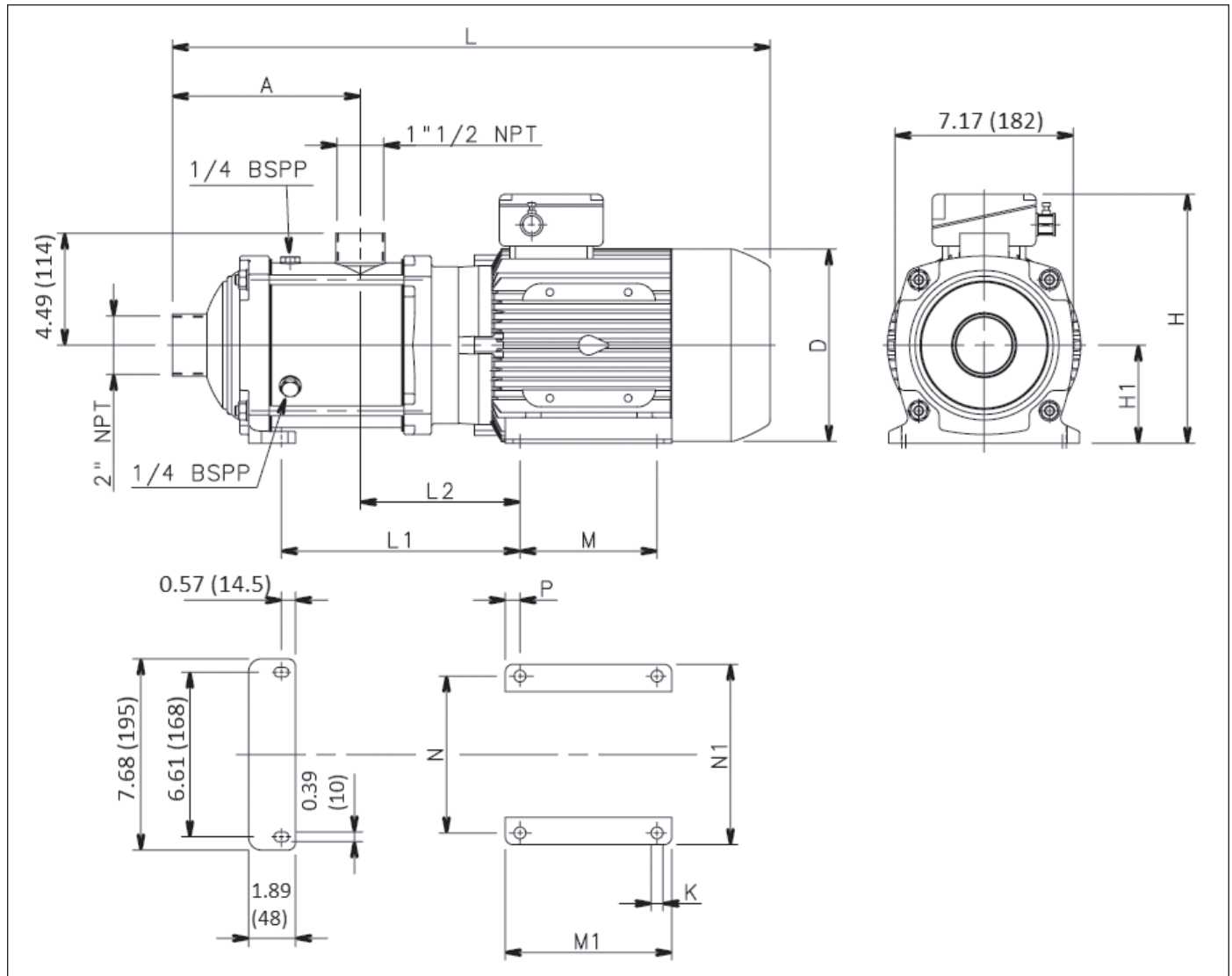
Pump Size Stages	Phase	Motor		Dimensions (in)														Max. Working Pressure (PSI)	Weight (lbs)
		HP	Frame Size	A	D	H	H1	L	L1	L2	M	M1	N	N1	P	K			
15HM01	SINGLE PHASE	2	80	5.67	6.10	9.13	3.54	18.82	6.06	4.76	3.94	4.92	4.92	6.10	0.49	0.39	235	38	

15HM01	THREE PHASE	2	80	5.67	6.10	9.13	3.54	18.82	6.06	4.76	3.94	4.92	4.92	6.10	0.49	0.39	235	38
15HM02		4	90	5.67	6.85	9.13	3.54	20.87	6.93	5.67	4.92	5.91	5.51	6.46	0.49	0.39	235	58
15HM03		5.5	100	5.67	7.76	10.00	3.94	22.17	7.72	6.42	5.51	6.69	6.30	7.24	0.59	0.47	235	71
15HM04		7.5	112	7.56	8.43	11.02	4.41	25.39	9.88	6.69	5.51	6.69	7.48	8.62	0.59	0.47	235	89

15HM..N SERIES, (1 TO 4 STAGES) OPERATING CHARACTERISTICS AT 60 HZ, 3500 RPM

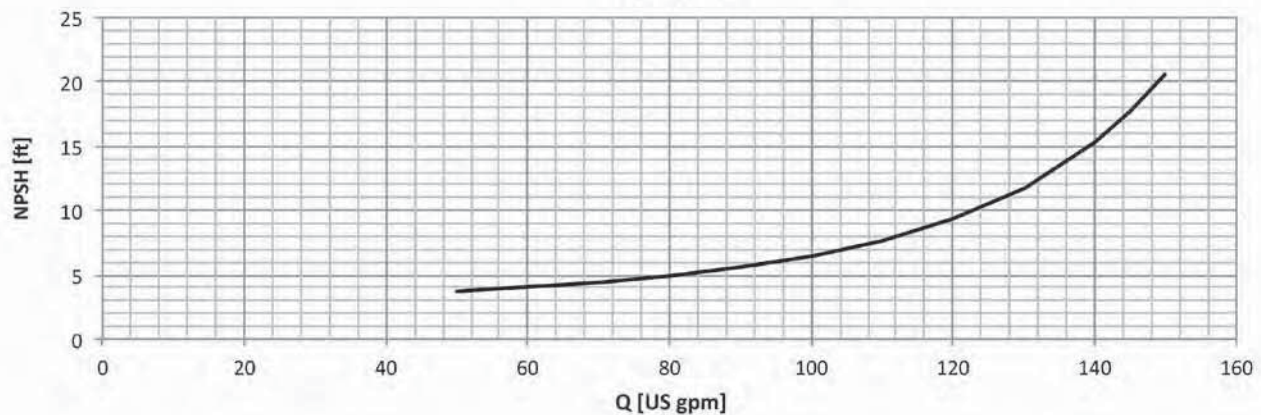
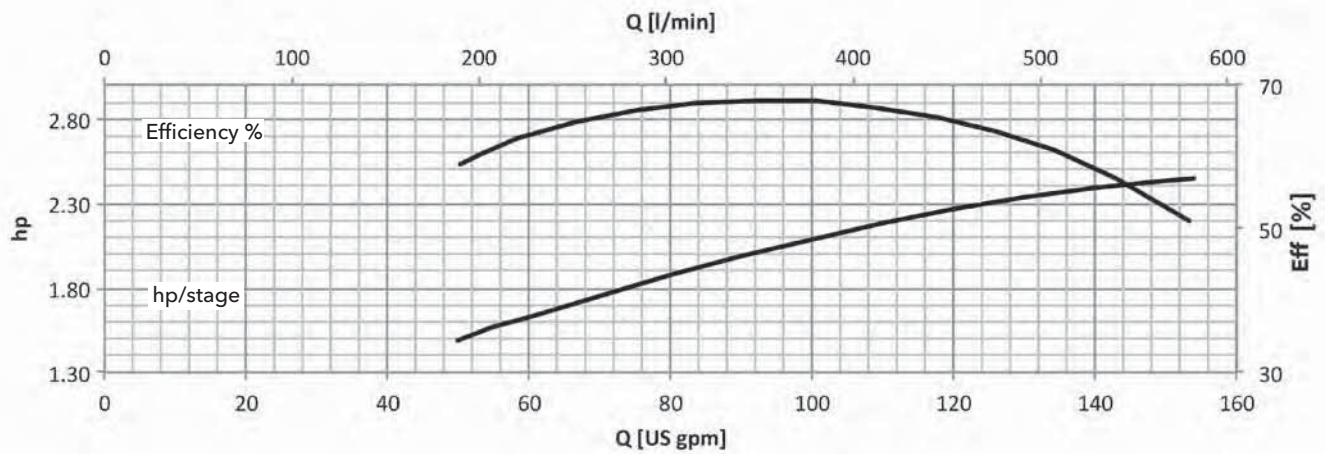
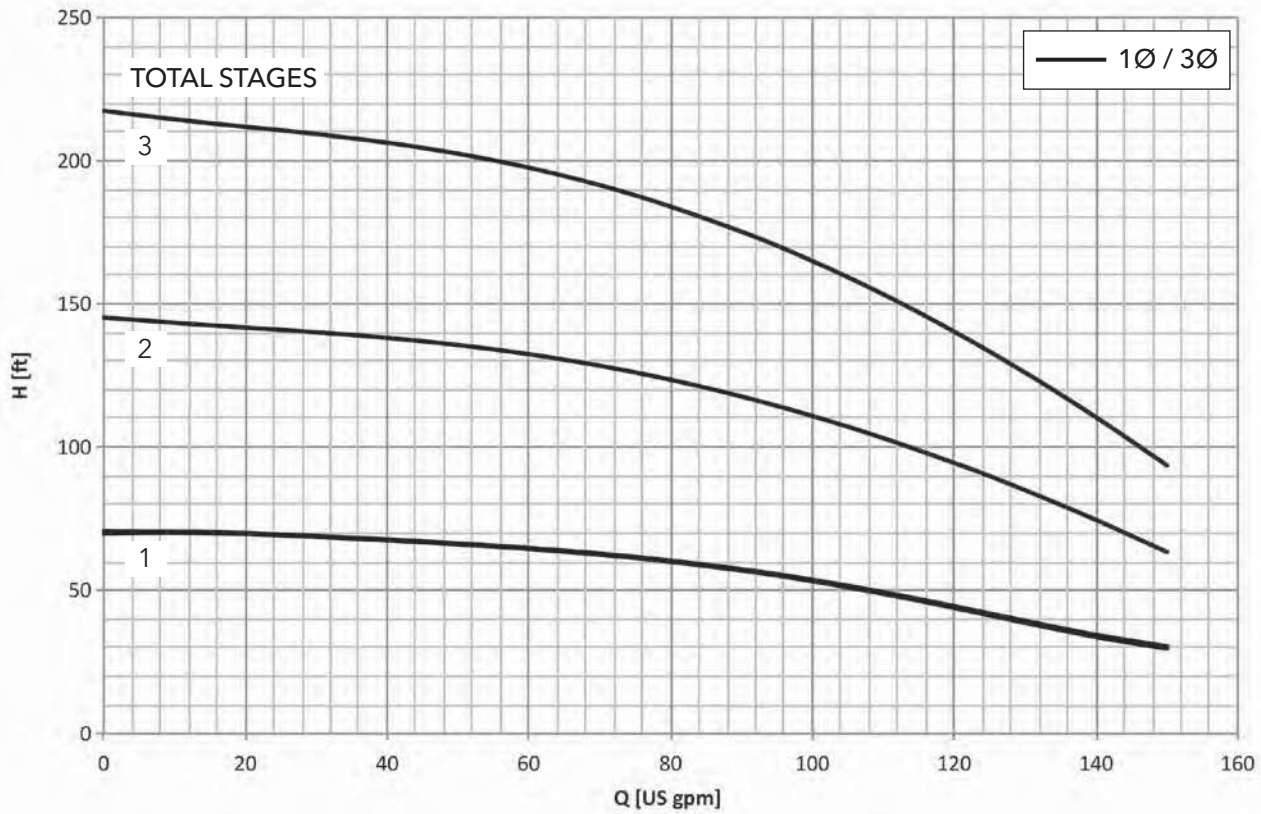


22HM..N SERIES, (1 TO 3 STAGES) DIMENSIONS AND WEIGHTS AT 60 HZ, 3500 RPM



Pump Size Stages	Phase	Motor		Dimensions (in)													Max. Working Pressure (PSI)	Weight (lbs)
		HP	Frame Size	A	D	H	H1	L	L1	L2	M	M1	N	N1	P	K		
22HM01	THREE PHASE	3	90	5.67	6.85	9.13	3.54	20.83	6.93	5.67	4.92	5.91	5.51	6.46	0.49	0.39	235	49
22HM02		5.5	100	5.67	7.76	10.00	3.94	22.17	7.72	6.42	5.51	6.69	6.30	7.24	0.59	0.47	235	71
22HM03		7.5	112	5.67	8.43	11.02	4.41	23.50	7.99	6.69	5.51	6.69	7.48	8.62	0.59	0.47	235	86

22HM..N SERIES, (1 TO 3 STAGES) OPERATING CHARACTERISTICS AT 60 HZ, 3500 RPM



MINIMUM FLOW RATE: 30 GPM

TECHNICAL DATA - WATER PROPERTY CHART

Temp °F	Temp °C	Specific Volume (Cubic ft/lb)	Specific Gravity			Weight (lb/cubic ft)	Vapor Pressure (psi Abs)
			@ 39.2°F	@ 60°F	@ 68°F		
32	0.0	0.01602	1.000	1.001	1.002	62.42	0.088
35	1.7	0.01602	1.000	1.001	1.002	62.42	0.100
40	4.4	0.01602	1.000	1.001	1.002	62.42	0.122
50	10.0	0.01603	0.999	1.001	1.002	62.38	0.178
60	15.6	0.01604	0.999	1.000	1.001	62.34	0.256
70	21.1	0.01606	0.998	0.999	1.000	62.27	0.363
80	26.7	0.01608	0.996	0.998	0.999	62.19	0.507
90	32.2	0.0161	0.995	0.996	0.997	62.11	0.698
100	37.8	0.01613	0.993	0.994	0.995	62.00	0.949
120	48.9	0.0162	0.989	0.990	0.991	61.73	1.692
140	60.0	0.01629	0.983	0.985	0.986	61.39	2.889
160	71.1	0.01639	0.977	0.979	0.979	61.01	4.741
180	82.2	0.01651	0.970	0.972	0.973	60.57	7.510
200	93.3	0.01663	0.963	0.964	0.966	60.13	11.526
212	100.0	0.01672	0.958	0.959	0.960	59.81	14.696
220	104.4	0.01677	0.955	0.956	0.957	59.63	17.186
240	115.6	0.01692	0.947	0.948	0.949	59.10	24.97
260	126.7	0.01709	0.938	0.939	0.940	58.51	35.43
280	137.8	0.01726	0.928	0.929	0.930	58.00	49.20
300	148.9	0.01745	0.918	0.919	0.920	57.31	67.01
320	160.0	0.01756	0.908	0.909	0.910	56.66	89.66
340	171.1	0.01787	0.896	0.898	0.899	55.96	118.01
360	182.2	0.01811	0.885	0.886	0.887	55.22	153.04
380	193.3	0.01836	0.873	0.874	0.875	54.47	195.77
400	204.4	0.01864	0.859	0.860	0.862	53.65	247.31
420	215.6	0.01894	0.846	0.847	0.848	52.80	308.83
440	226.7	0.01926	0.832	0.833	0.834	51.92	381.59
460	237.8	0.0196	0.817	0.818	0.819	51.02	466.9
480	248.9	0.02	0.801	0.802	0.803	50.00	566.1
500	260.0	0.0204	0.785	0.786	0.787	49.02	680.8
520	271.1	0.0209	0.765	0.766	0.767	47.85	812.4
540	282.2	0.0215	0.746	0.747	0.748	46.51	962.5
560	293.3	0.0221	0.726	0.727	0.728	45.30	1133.1
580	304.4	0.0228	0.703	0.704	0.704	43.90	1325.8
600	315.6	0.0236	0.678	0.679	0.680	42.30	1542.9
620	326.7	0.0247	0.649	0.650	0.650	40.50	1786.6
640	337.8	0.026	0.617	0.618	0.618	38.50	2059.7
660	348.9	0.0278	0.577	0.577	0.578	36.00	2365.4
680	360.0	0.0305	0.525	0.526	0.527	32.80	2708.1
700	371.1	0.0369	0.434	0.435	0.435	27.10	3093.7

TECHNICAL DATA - NPSH

NPSH

The minimum operating values that can be reached at the pump suction end are limited by the onset of cavitation.

Cavitation is the formation of vapor-filled cavities within liquids where the pressure is locally reduced to a critical value, or where the local pressure is equal to, or just below the vapor pressure of the liquid.

The vapor-filled cavities flow with the current and when they reach a higher pressure area the vapor contained in the cavities condenses. The cavities collide, generating pressure waves that are transmitted to the walls. These, being subjected to stress cycles, gradually become deformed and yield due to fatigue. This phenomenon, characterized by a metallic noise produced by the hammering on the pipe walls, is called incipient cavitation.

The damage caused by cavitation may be magnified by electrochemical corrosion and a local rise in temperature due to the plastic deformation of the walls. The materials that offer the highest resistance to heat and corrosion are alloy steels, especially austenitic steel. The conditions that trigger cavitation may be assessed by calculating the total net suction head, referred to in technical literature with the acronym NPSH (Net Positive Suction Head).

The NPSH represents the total energy (expressed in feet) of the liquid measured at suction under conditions of incipient cavitation, excluding the vapor pressure (expressed in feet) that the liquid has at the pump inlet.

To find the static height (h_z) at which to install the machine under safe conditions, the following formula must be verified:

$$h_p + h_z \geq (\text{NPSHr} + 2 \text{ ft}) + h_f + h_{pv}$$

where:

- h_p** is the absolute pressure applied to the free liquid surface in the suction tank, expressed in feet of liquid; h_p is the quotient between the barometric pressure and the specific weight of the liquid.
- h_z** is the suction lift between the pump axis and the free liquid surface in the suction tank, expressed in feet; h_z is negative when the liquid level is lower than the pump axis.
- h_f** is the flow resistance in the suction line and its accessories, such as: fittings, foot valve, gate valve, elbows, etc.
- h_{pv}** is the vapor pressure of the liquid at the operating temperature, expressed in feet of the liquid. h_{pv} is the quotient between the Pv vapor pressure and the liquid's specific weight.

0.5 is the safety factor.

The maximum possible suction head for installation depends on the value of the atmospheric pressure (i.e. the elevation above sea level at which the pump is installed) and the temperature of the liquid.

To help the user, with reference to water temperature (40°F) and to the elevation above sea level, the following tables show the drop in hydraulic pressure head in relation to the elevation above sea level, and the suction loss in relation to temperature.

Water Temperature (°F)	68	104	140	176	194	230	248
Suction Loss (ft)	-.7	2.3	6.6	16.4	24.3	50.5	70.5

Elevation Above Sea Level (ft)	1600	3300	4900	6500	8200	9800
Suction Loss (ft)	1.8	3.6	5.4	7.2	9.0	10.8

To reduce it to a minimum, especially in cases of high suction head (over 13 - 16 feet) or within the operating limits with high flow rates, we recommend using a suction line having a larger diameter than that of the pump's suction port. It is always a good idea to position the pump as close as possible to the liquid to be pumped.

TECHNICAL DATA - COMPATABILITY CHART FOR MATERIALS IN CONTACT WITH MOST COMMONLY USED LIQUIDS

Liquid	Concentration (%)	Temperature Min/Max °F	Specific Weight (lb/in ³)	1HM - 22HM	Recommended Seal	Elastomers
				316		
Water	100	23/248		•	QBEGG	E
Deionized, demineralized	100	-13/230		•	QBEGG	E
Water and oil emulsion	any	23/194		•	QBVG	V
Acetic acid (•)	80	14/158	.038	•	QBEGG	E
Citric acid	5	14/158	.056	•	QBEGG	E
Hydrochloric acid	2	23/77	.043	•	QQVG	V
Phosphoric acid	10	23/86	.048	•	QBEGG	E
Nitric acid (•)	50	23/86	.053	•	QQVG	V
Sulphuric acid (•)	2	14/77	.066	•	QBVG	V
Tannic acid	20	32/122		•	QBEGG	E
Tartaric acid	50	14/77	.063	•	QQVG	V
Uric acid	80	14/176	.068	•	QBEGG	E
Benzoic acid	70	32/158	.047	•	QBVG	V
Boric acid	Saturated	14/194	.052	•	QQVG	V
Formic acid (•)	5	5/77	.044	•	QBEGG	E
Ethyl alcohol (•)	100	23/104	.029	•	QBEGG	E
Methyl alcohol (•)	100	23/104	.029	•	QBEGG	E
Propyl alcohol (•)	100	23/176	.029	•	QBEGG	E
Butyl alcohol	100	23/176	.030	•	QBVG	V
Denatured alcohol (•)	100	23/158	.030	•	QBEGG	E
Ammonia in water (•)	25	-4/122	.038	•	QBEGG	E
Chloroform		14/86	.053	•	QBVG	V
Caustic soda	25	32/158	.077	•	QQEG	E
Water, detergents, Cleaning products		23/176		•	QQVG	V
		23/212		•	QQVG	V
Diesel oil (•)	100	32/176	.033	•	QBVG	V
Kerosene (•)	100	32/176		•	QBVG	V
Fuel oil (•)		32/194	.027	•	QBVG	V
Glycerine	100	68/194	.046	•	QBEGG	E
Sodium Hypochlorite	1	14/77		•	QQVG	V
Phosphates/polyphosphates		23/194		•	QQVG	V
Sodium nitrate	Saturated	14/176	.081	•	QBEGG	E
Cutting fluid	100	23/230	.033	•	QBVG	V
Peanut oil (•)	100	23/230	.034	•	QBEGG	E
Colza oil (•)	100	23/230	.034	•	QBEGG	E
Linseed oil (•)	100	23/230	.034	•	QBEGG	E
Coconut oil (•)	100	-4/194	.033	•	QBEGG	E
Soybean oil (•)	100	32/194		•	QBEGG	E
Diathermic oil	100	23/230	.033	•	QBVG	V
Hydraulic oil	100	23/230		•	QBVG	V
Mineral oil	100	23/230	.034	•	QBVG	V
Sodium sulfate	15	14/104	.094	•	QQEG	E
Aluminum sulfate	30	23/122	.097	•	QQEG	E
Ammonium sulfate	10	14/140	.064	•	QQEG	E
Iron sulfate	10	23/86	.076	•	QBEGG	E
Copper sulfate	20	32/86	.082	•	QQVG	V
Trichloroethylene		14/104	.053	•	QBVG	V
Perchloroethylene		14/86	.057	•	QBVG	V

Legend

Q = Silicon carbide B = Carbon E = EPDM V = Viton G = AISI 316 (spring, metal components)

(•) A special version may be necessary for this fluid. For additional information, please contact our sales network.

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- 1) The tissue in plants that brings water upward from the roots;
- 2) a leading global water technology company.

We're a global team unified in a common purpose: creating innovative solutions to meet our world's water needs. Developing new technologies that will improve the way water is used, conserved, and re-used in the future is central to our work. We move, treat, analyze, and return water to the environment, and we help people use water efficiently, in their homes, buildings, factories and farms. In more than 150 countries, we have strong, long-standing relationships with customers who know us for our powerful combination of leading product brands and applications expertise, backed by a legacy of innovation.

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