

# INDUSTRIAL PUMPS



- FLOMAX® PUMPS
- HHLF PUMPS
- TRASH PUMPS
- SERIES PUMPS

- CHEMFLO® PUMPS
- TEMPULFLO®
- HYDRASUB PUMPS
- FRX PUMPS

We don't just go with the flow, we create it!™



[www.mppumps.com](http://www.mppumps.com)

# MP PUMPS, INC.

## DICTIONARY AND CONVERSION TABLE

**Flooded Suction** The liquid source is higher than the pump and flows to the pump by gravity. Flooded suction is preferred for centrifugal pump installations.

**Flow** The liquid volume capacity of a pump measured in gallons-per-minute (gpm) or gallons-per-hour (gph).

**Head** A measure of pressure expressed in feet. This indicates the height of a column of water being lifted by the pump (neglecting friction losses in the piping). To convert head to pressure in pounds-per-square-inch (psi), divide head by 2.31.

**Lift (Suction lift)** Occurs when the liquid source is lower than the pump. The pumping action creates a partial vacuum and atmospheric pressure forces liquid up to the pump. The theoretical limit of suction lift is 34 feet for water, but in practical applications it is 25 feet, or less, depending on the pump style and elevation above sea level.

**Pressure** The force exerted on the system (pipe, tank, etc.) by the liquid within, measured in pounds-per-square-inch (psi). To convert pressure to head, in feet, multiply by 2.31 then divide by Specific Gravity.

**Prime** The liquid required to begin pumping action.

**Seal** A device mounted in the pump housing and/or on the pump shaft to prevent liquid leakage from the pump.

### **SEAL TYPES**

- **Lip** A flexible ring (usually rubber or similar material) with the inner edge held closely against the rotating shaft by a spring.

- **Mechanical** A two-part seal with one rotating part and one stationary. Touching surfaces on the parts are highly polished and provide excellent sealing capability and life. The surfaces can be damaged by dirt or grit in the liquid.

**Packing** Rings of flexible material (foil, graphite or kevlar) held in the pump body gland or stuffing box by a packing nut. Permits adjustable sealing with minimal maintenance.

**Specific Gravity** The ratio of the weight of a given volume of liquid to the same volume of pure water (unless stated otherwise). Power requirements increase for liquids with specific gravities greater than 1.0.

**Sump** A well or pit that collects liquid below floor level. Sometimes refers to the waste sump or oil reservoir.

**Total Head** The sum of discharge head, suction lift and friction losses.

**Viscosity** The thickness of a liquid affecting its ability to flow. The more viscous the liquid, the slower the pump speed.

Here is a conversion guide you may want to keep handy.

### **Conversion Factors**

#### **Flow**

Lbs of water/hr x .002	= gal min
Gal/min x 500	= lbs of water/hr
Lbs of fluid/hr x .002	= gal min
Specific gravity x .002	= gal min
Liters/min x .264	= gal/min (US)
Gpm x 3.785	= liters/min
Cu meters/hr x 4.4	= gal/min (US)
Gal/min x .227	= cu meters/hr
Kg of water/min x .264	= gal/min (US)
Gal/min x 3.8	= Kg of water/min

#### **Pressure**

Ft of water x .433	= psi
Psi x 2.31	= ft of water
Inches Hg x .491	= psi
Inches Hg x 1.133	= ft of water
ATM x 14.7	= mm Hg
ATM x 33.9	= ft of water
Kg/sq cm x 14.22	= psi
Meters of water x 1.42	= psi
ATM x 760	= mm Hg
mm Hg x .039	= inches Hg
Bar x 14.5	= psi
Newton/meter <sup>2</sup> x 1	= Pascal
Psi x 6.9	= kPa (Kilopascal)
kPa x .145	= psi

#### **Volume**

Lbs of water x .119	= gal
Gal (Brit) x 1.2	= gal (US)
Gal x 128	= fluid ounces
Cubic ft x 7.48	= gal
Cubic in x .00433	= gal
Gal x 3.785	= liters
Liters x .264	= gal
Cubic meters x 264.2	= gal
Cubic meters x 1,000	= liters
Liters x 1,000	= cubic centimeters
Cubic centimeters x .0338	= fluid ounces
Fluid ounces x 29.57	= cubic centimeters

#### **Length**

Mils x .001	= inches
Meters x 3.281	= feet
Centimeters x .394	= inches
Millimeters x .0394	= inches
Microns x .0000394	= inches

#### **Mass**

Gal of water x 8.336	= lbs
Cubic foot of water x 62.4	= lbs
Ounces x .0625	= lbs
Kilograms x 2.2	= lbs
Lbs x .454	= Kilo
Metric ton x 2205	= lbs

#### **Metric prefixes**

Mega	= 1,000,000
Kilo	= 1,000
Hecto	= 100
Deca	= 10
Deci	= .1
Centi	= .01
Milli	= .001
Micro	= .000001

# ***Industrial Pumps***

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# **MP PUMPS**

## **Committed To Excellence...**



### **OUR HISTORY**

MP Pumps was organized in Detroit in 1942, shortly after America's entry into World War II. Our first pumps were used in landing craft and other amphibious vehicles where quality and reliability were absolutely essential.

After the war, we continued to grow along with our reputation for superior design, engineering and manufacturing of centrifugal pumps for a wide variety of applications. In 1984, MP Pumps built and occupied a 100,000-square-foot facility in Fraser, Michigan. The facility houses all of our manufacturing and engineering operations as well as our administrative and marketing staffs.

Nearly 20,000 square feet of our Fraser headquarters is devoted to parts warehousing. We stock over 10,000 different parts to ensure prompt delivery of replacement parts to MP Pumps' customers worldwide.

### **OUR FUTURE**

MP Pumps remains committed to designing and developing innovative products to meet the fluid handling requirements of both current and emerging markets. To maintain our role as a leader in the design and manufacture of centrifugal pumps, we will continue to invest in the best equipment and people.

### **RESEARCH & DEVELOPMENT**

A strong research and development program is fundamental to innovation. A highly trained and experienced research staff is backed by a fully equipped laboratory for conducting rigorous performance and endurance testing.

Development projects range from endurance testing of new seal materials to performance testing of custom housing geometries. Prototypes are frequently subjected to elevated



Test Lab Dynamometers With AC And DC Controllers

*Exceeding customer expectations ... that's what we're all about at MP Pumps. Whether you use one of our many standard centrifugal pumps or have us design a new one to meet your specific requirements, our only goal is your complete satisfaction.*

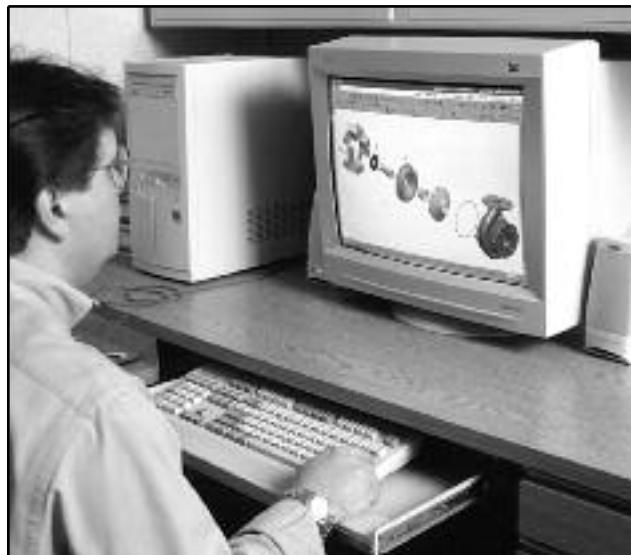
**Greg Peabody, President**

ambient conditions to simulate actual operating environments and gain more reliable data.

Laboratory facilities include dynamometers ranging from 3 to 125 horsepower, two test cells for measuring impeller radial and thrust loads and provision for testing self-priming pumps up to 25 feet of static lift.

## ENGINEERING

Solid modeling design software for manufacturing techniques and fast prototype capability gives MP Pumps' Engineering Department the ability to move rapidly from initial concept to first production.



Typical CAD Workstation With Solid Modeling

Our application design expertise encompasses a broad range of markets, among them:

- Industrial
- Transportation
- Agriculture
- Marine

Similarly, our engineers are accustomed to working with a wide range of materials. Commonly used materials include bronze, ductile iron, aluminum, cast iron and stainless steel.

## MANUFACTURING

Speed, uniformity and consistent high quality translates into customer satisfaction.



Vertical CNC Machining Center

Computer numerical control (CNC) machining centers on the factory floor are linked to a central server for rapid loading of machine programs.

This direct interface speeds set-up, which, in turn, boosts productivity.

Automated machining

also improves precision in milling, boring, facing, drilling and other critical operations. Greater accuracy and repeatability means consistent high quality — your next MP pump will perform as well as your last.

## QUALITY CONTROL

At MP Pumps, quality is designed into every component and every pump we build. From concept, through development and on into production, our focus is to provide durable and reliable products that satisfy every customer requirement.

- American Bureau of Shipping (ABS) Certification for select models.
- ISO 9001 certification assures our customers that all products are manufactured with an uncompromised commitment to quality, and that's something every employee at MP Pumps, Inc. takes personally.
- ISO 14001 specifies requirements for establishing an environmental policy determining environmental impacts of MP Pumps products/activities/services. It includes planning environmental objectives and measurable targets, implementation and operation of policies to meet objectives and targets and continuous management review.

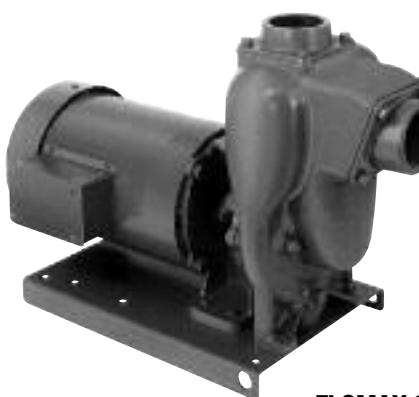


Computer Controlled Coordinate Measuring System (CMM)

# **FLOMAX 5 8 10**

## **SELF PRIMING CENTRIFUGAL PUMP FEATURES**

- CLOSED COUPLED TO ELECTRIC MOTOR
- PUMPAK ONLY TO MOUNT TO STANDARD NEMA "C" FACE MOTOR
- FLOWS - 100-750 GPM
- PRESSURES - 100-230 FEET HEAD
- AVAILABLE IN: CAST IRON AND BRONZE  
FLOMAX 5 AND FLOMAX 8 ALSO AVAILABLE IN ALUMINUM  
FLOMAX 8 AND FLOMAX 15 ALSO AVAILABLE IN  
STAINLESS STEEL
- WITH OR WITHOUT ELECTRIC MOTOR
- IMPELLER - CAST IRON, BRONZE, ALUMINUM & STAINLESS STEEL  
FLOMAX 40 CAST IRON, BRONZE & STAINLESS STEEL  
FLOMAX 30 DUCTILE IRON & BRONZE
- SHAFT SLEEVE - STAINLESS STEEL
- FASTENERS - STAINLESS STEEL
- SEALS - STANDARD VITON, OPTIONAL SEALS AVAILABLE  
PRESSURE LUBRICATED DOUBLE SEALS
- OPTIONS:
  - ENGINE DRIVES
  - PEDESTAL MODELS
  - HYDRAULIC DRIVES AND CLUTCHPAKS
- ABS TYPE APPROVAL FOR MANY SHIPBOARD SERVICES

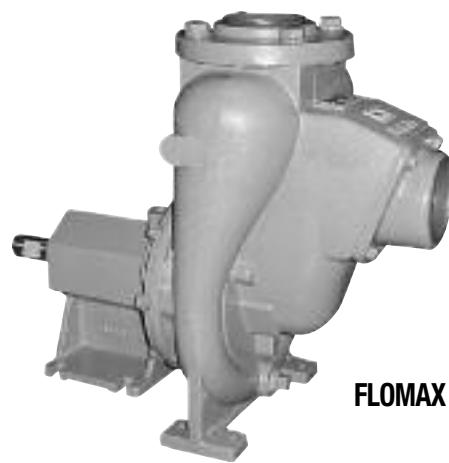
**FLOMAX 5****FLOMAX 8****316 SS FLOMAX 8****FLOMAX 10**

MODEL	Suction	Discharge	Max. Solid Size
FLOMAX 5	1 1/2" NPT	1 1/2" NPT	.56"
FLOMAX 8	2" NPT	2" NPT	.56"
FLOMAX 10	2" NPT	2" NPT	.625"
FLOMAX 15	3" NPT	3" NPT	.625"
FLOMAX 30	3" NPT	3" NPT	.60"
FLOMAX 40	4" NPT	4" NPT	.65"

# 15 30 40



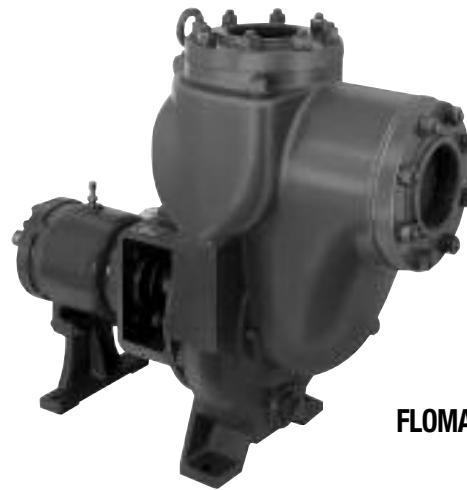
FLOMAX 5 & 8  
DOUBLE SEAL



FLOMAX 30

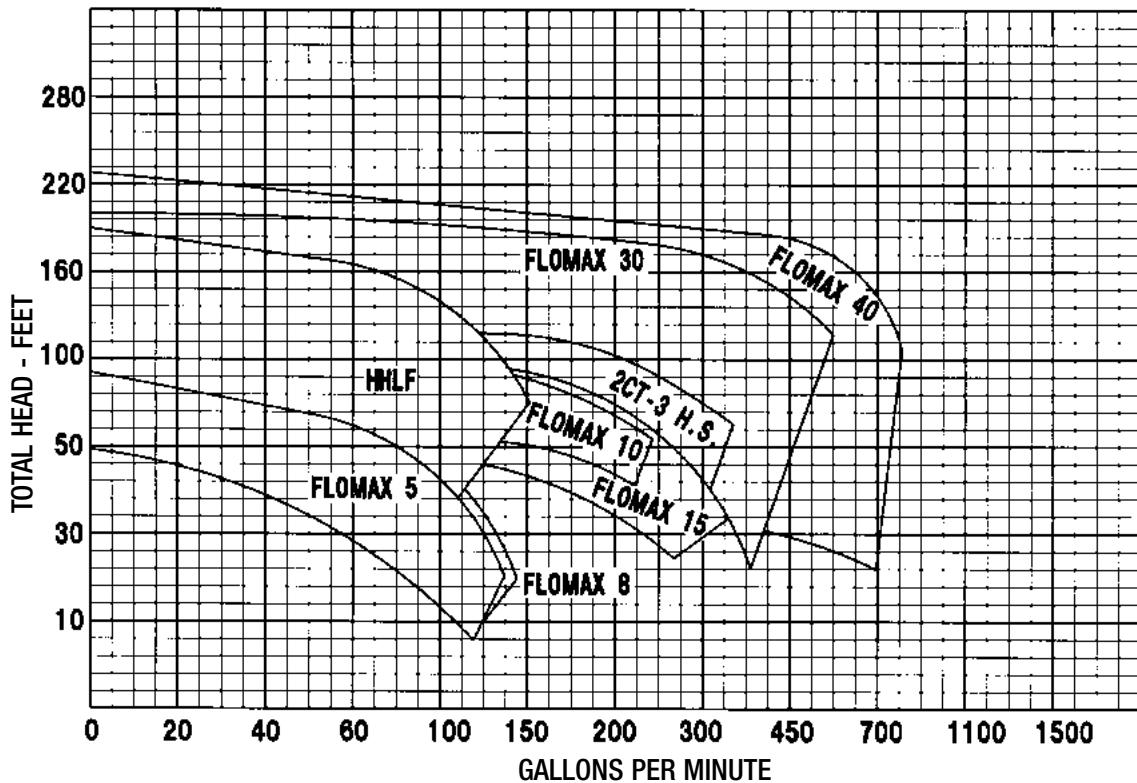


FLOMAX 15

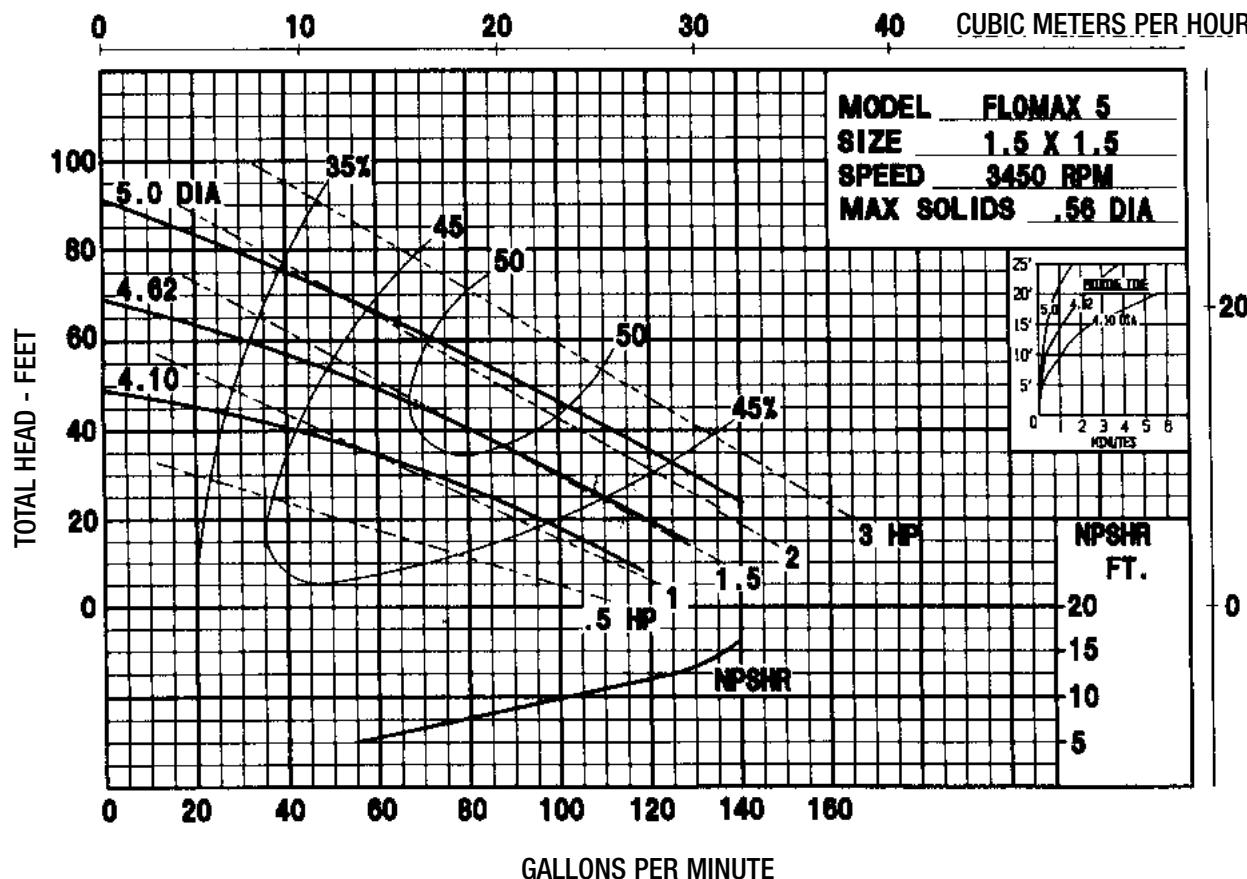
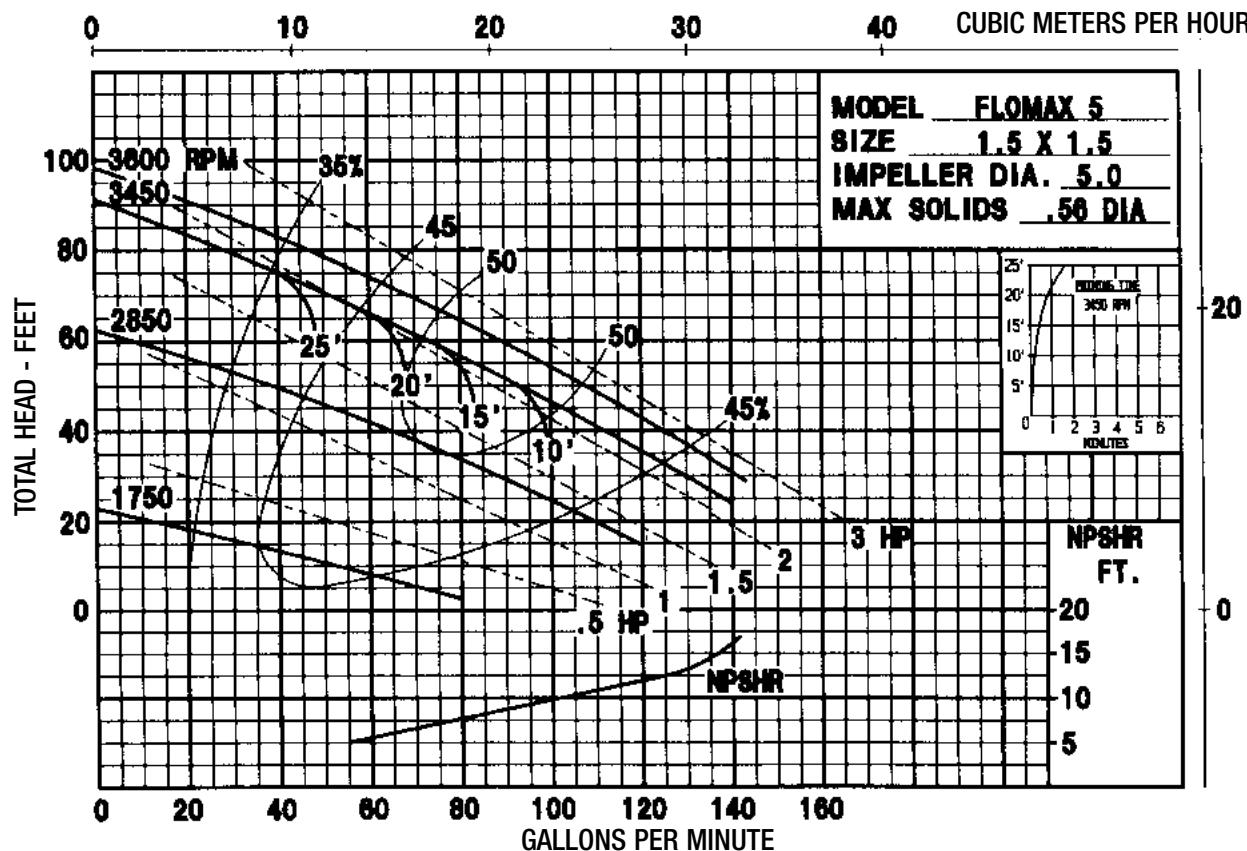


FLOMAX 40

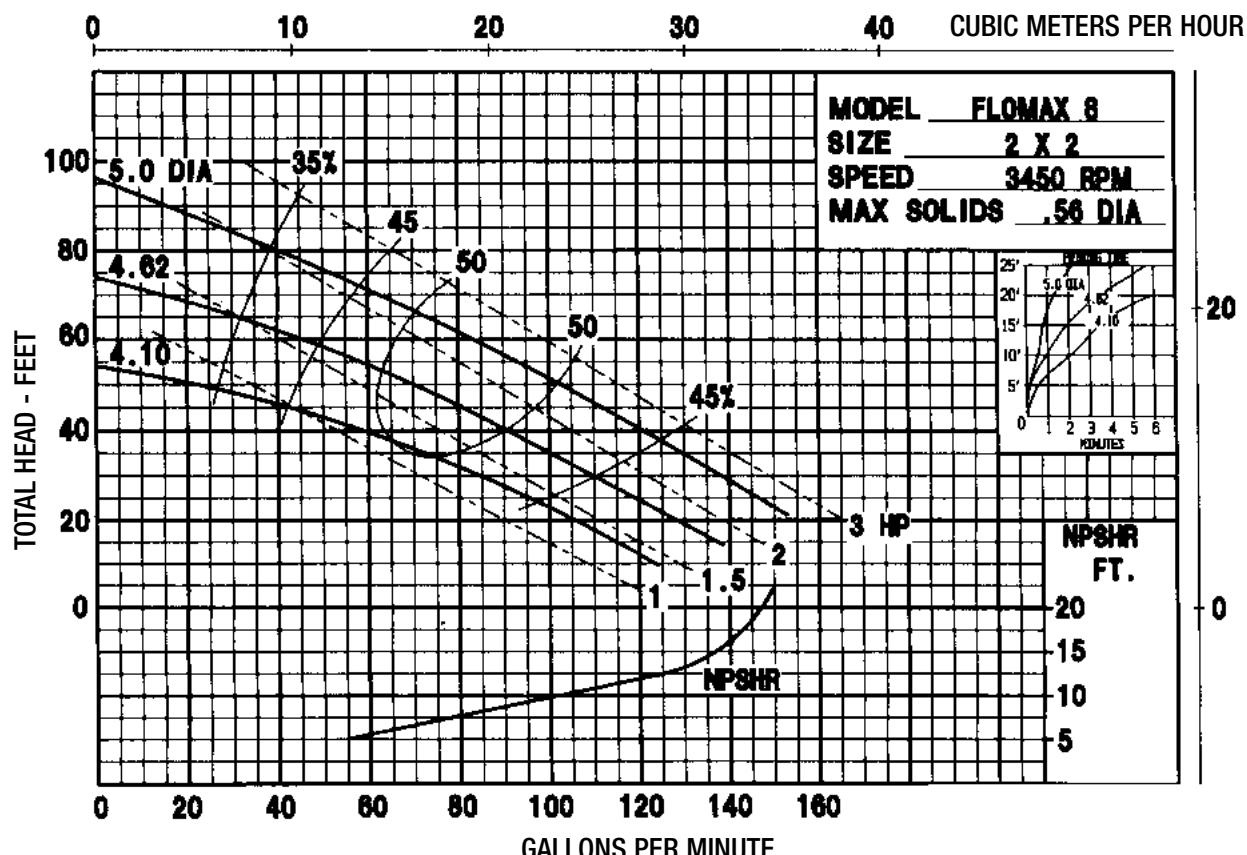
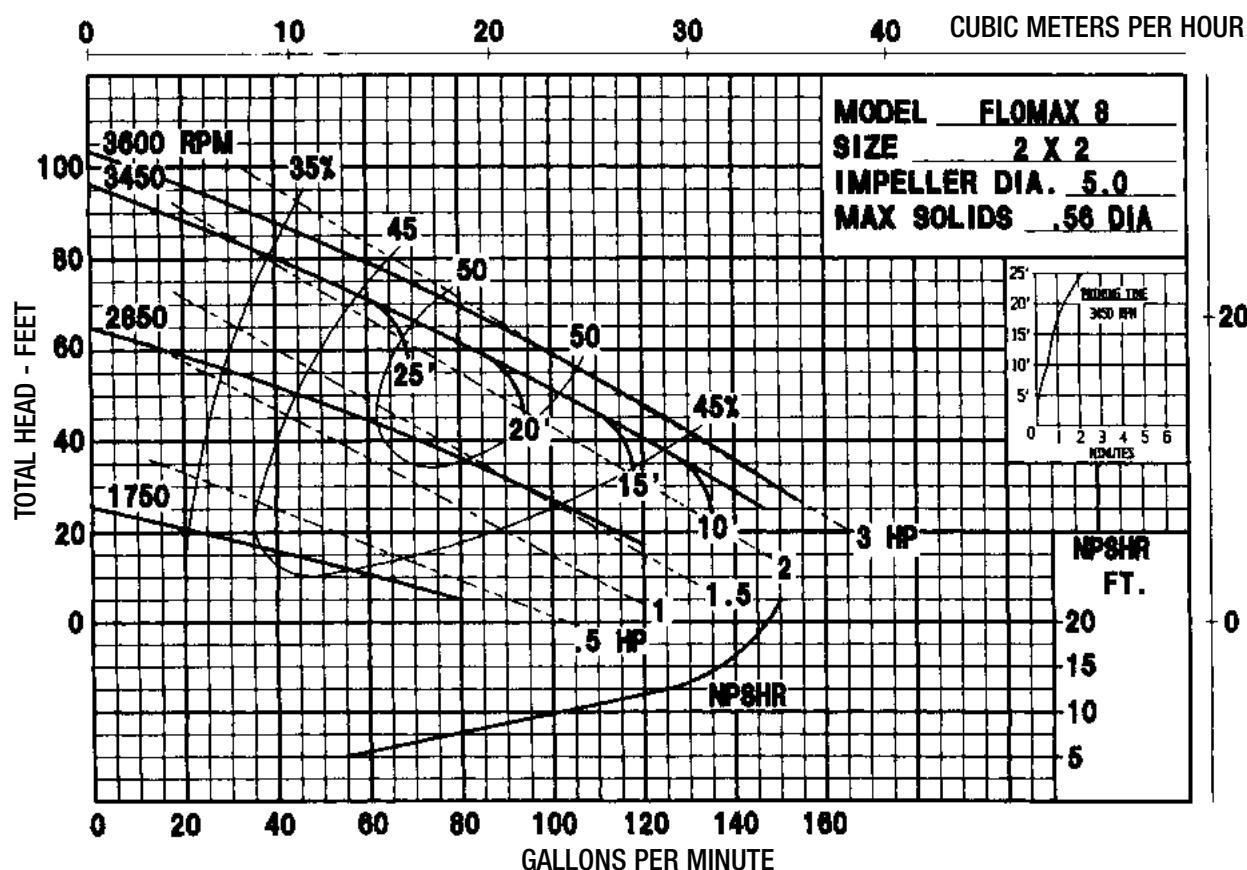
## ***Self-Priming Centrifugal Pump Selection***



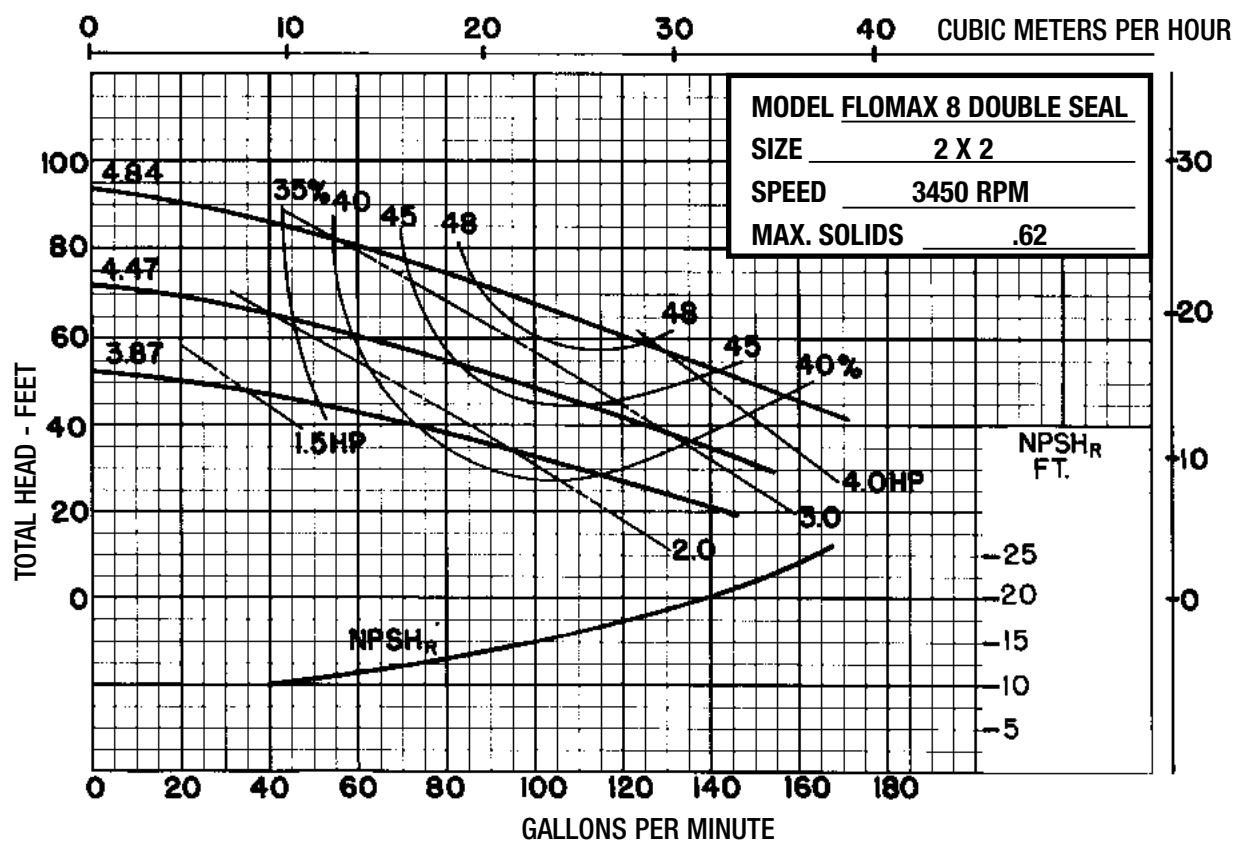
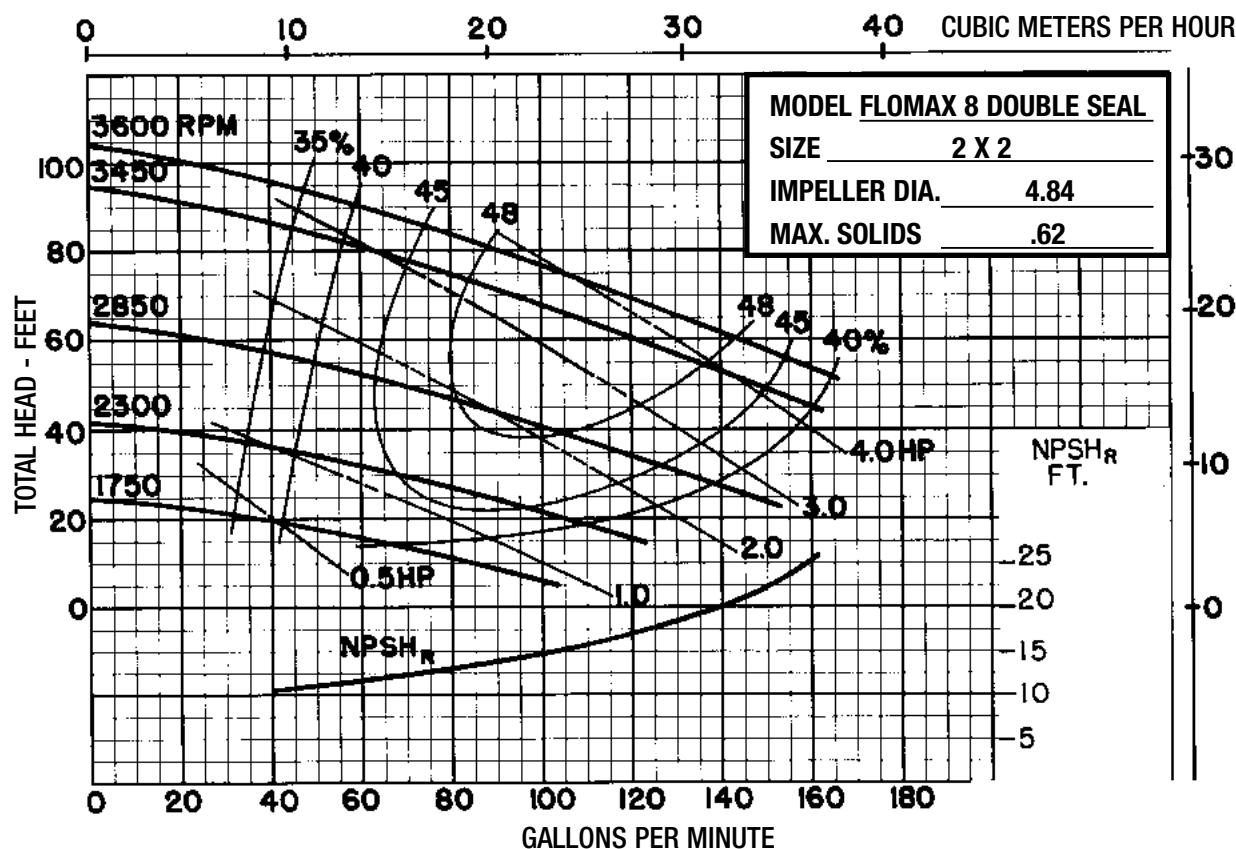
**Flomax 5 Pump Performance Curves**



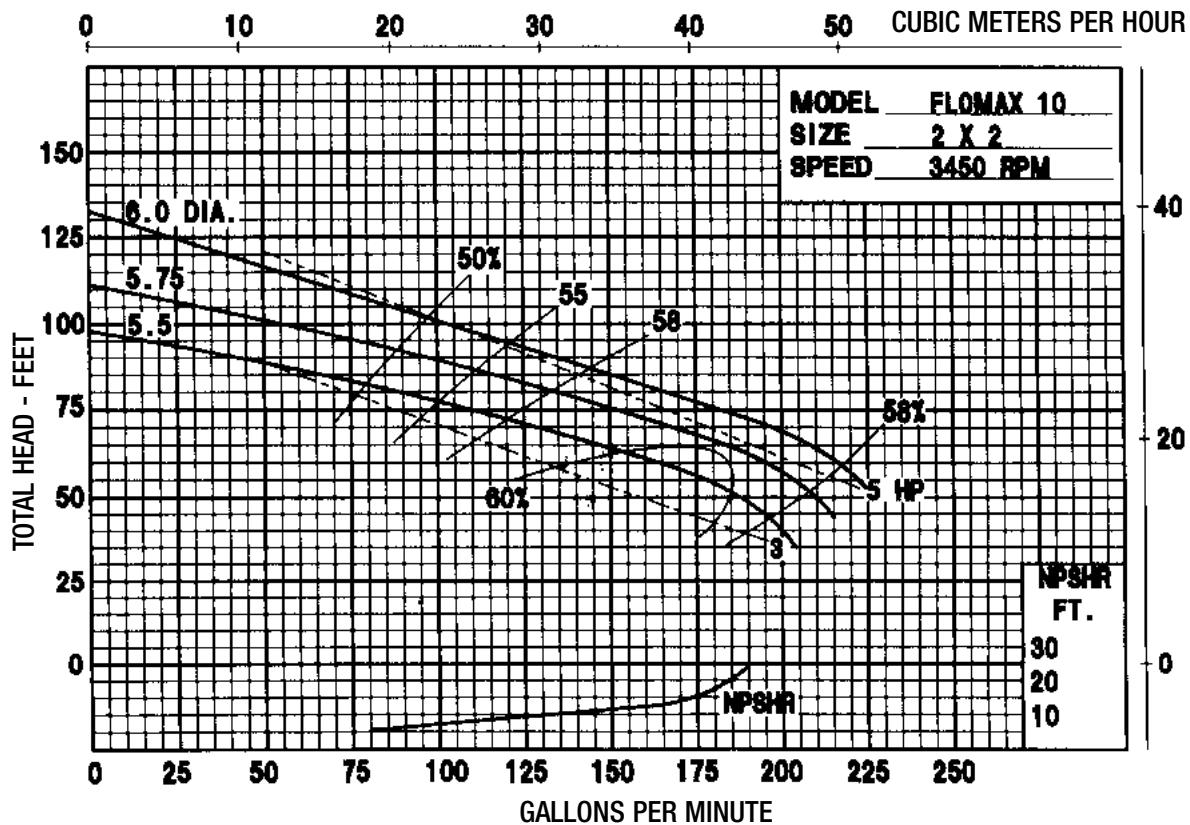
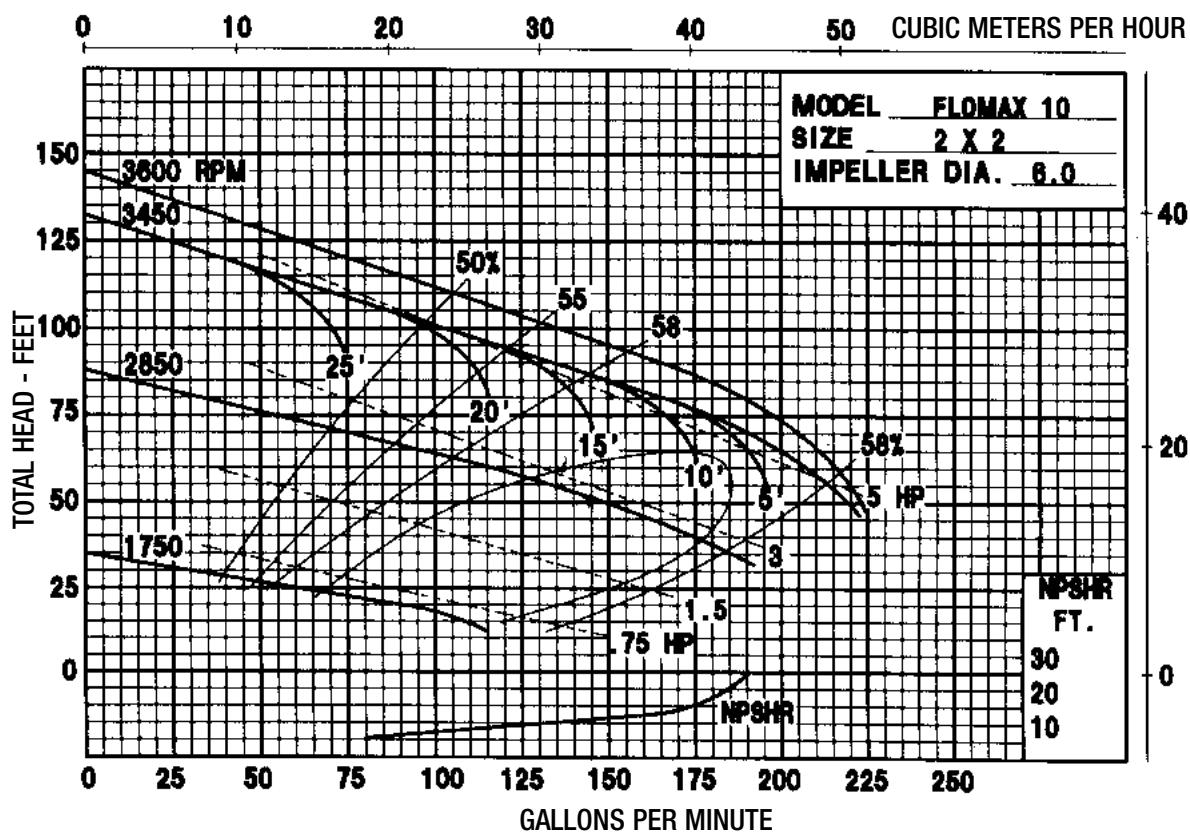
**Flomax 8 Pump Performance Curves**



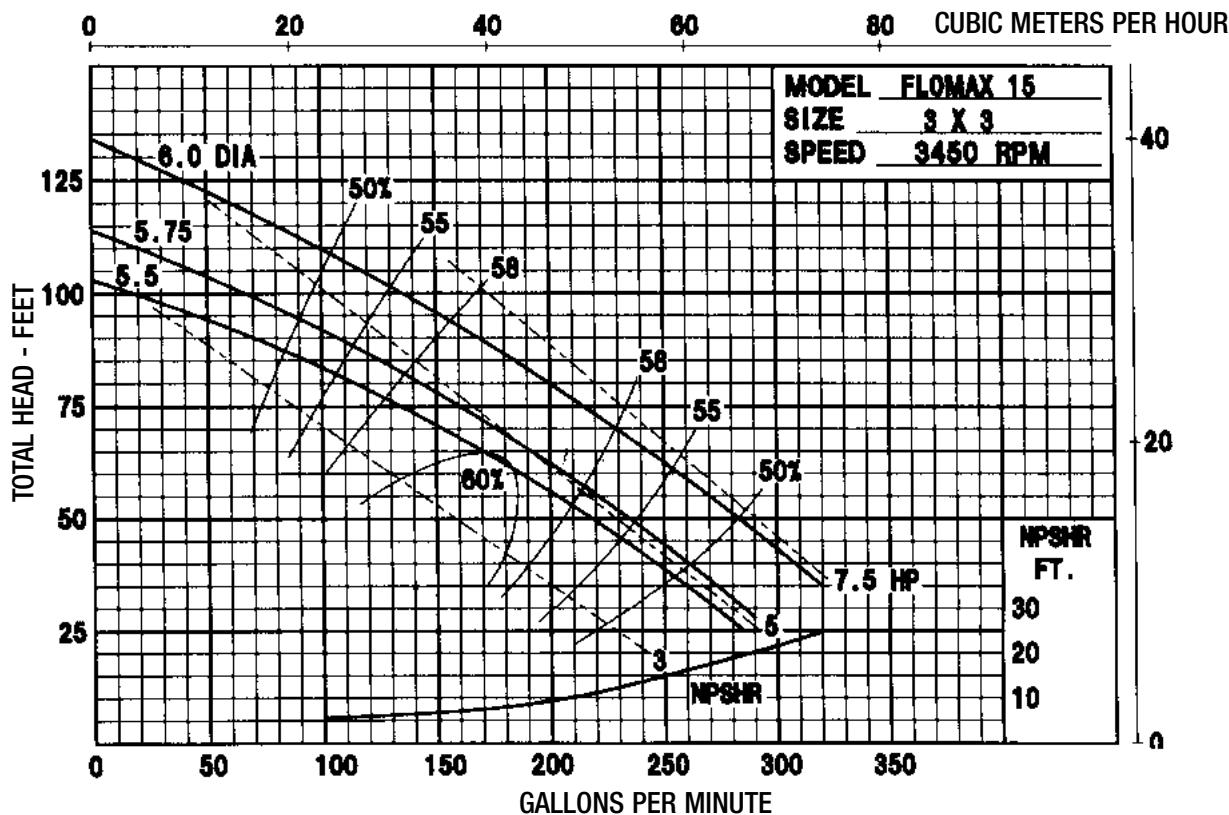
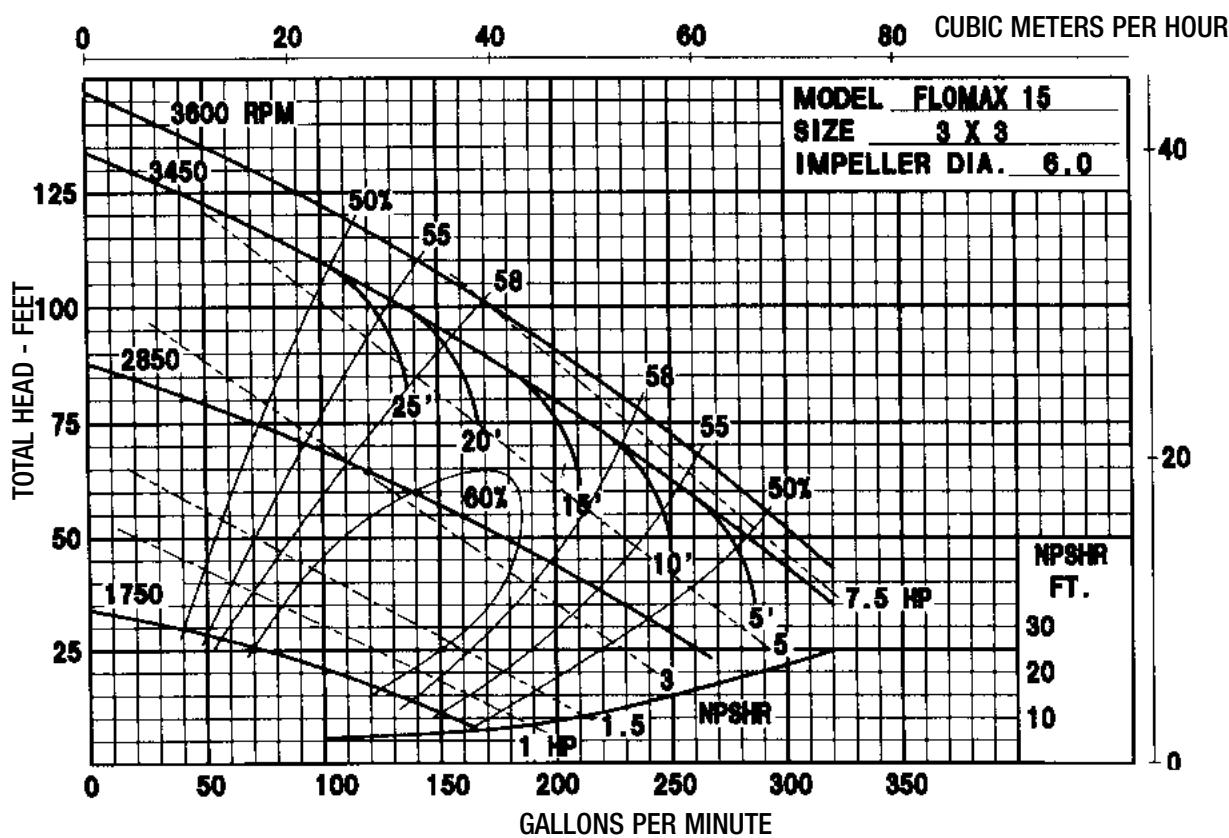
**Flomax 5 & 8 Pump Double Seal Performance Curves**



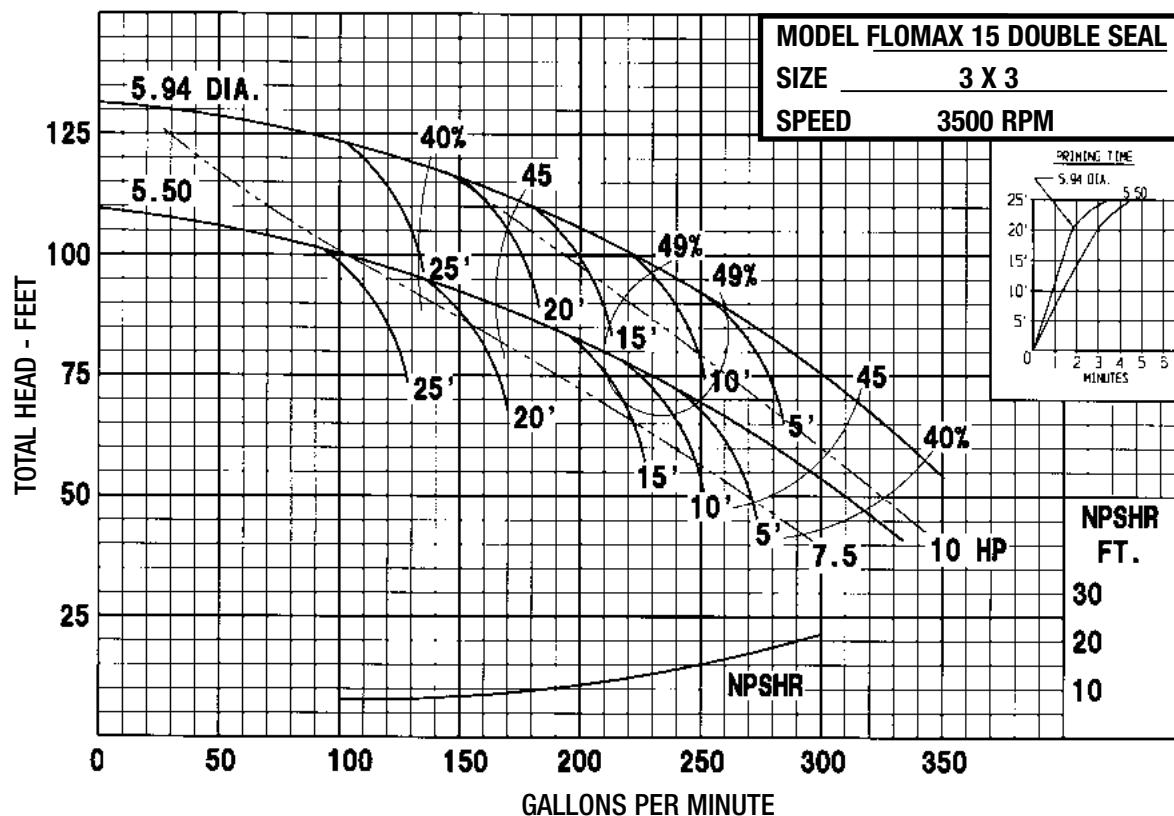
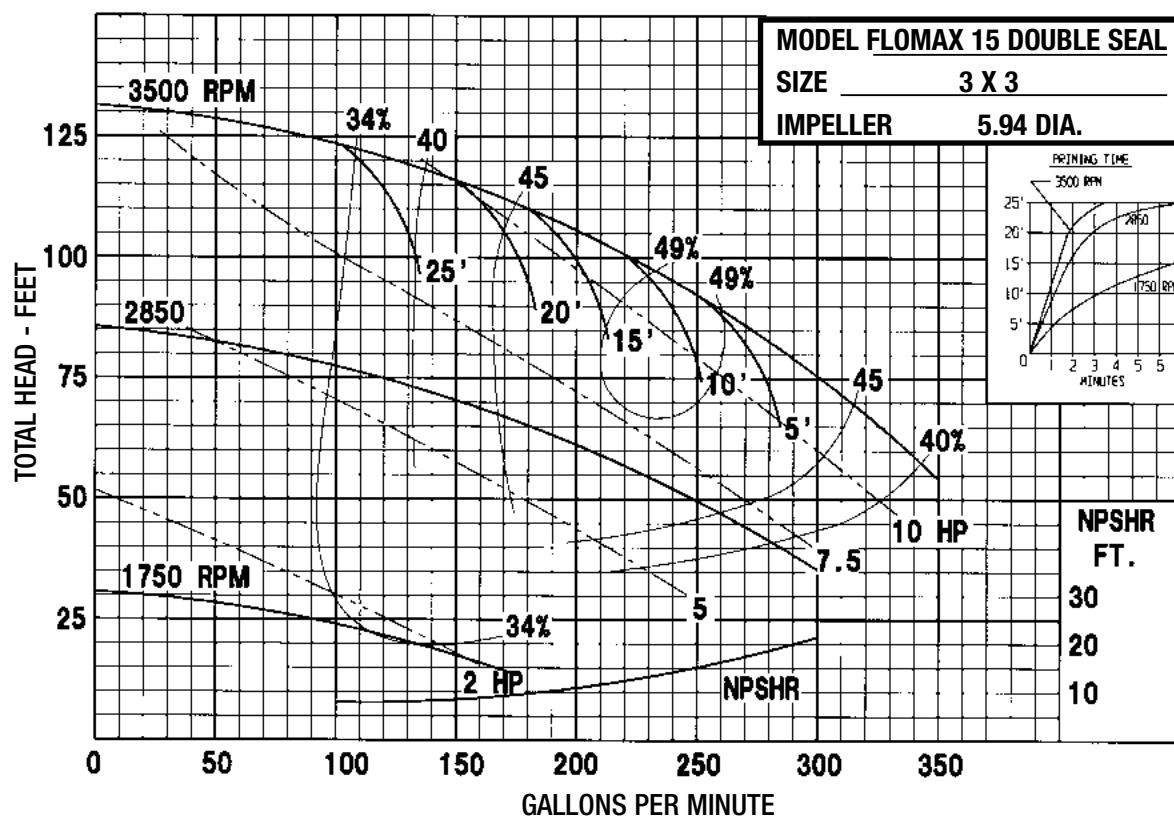
## Flomax 10 Pump Performance Curves



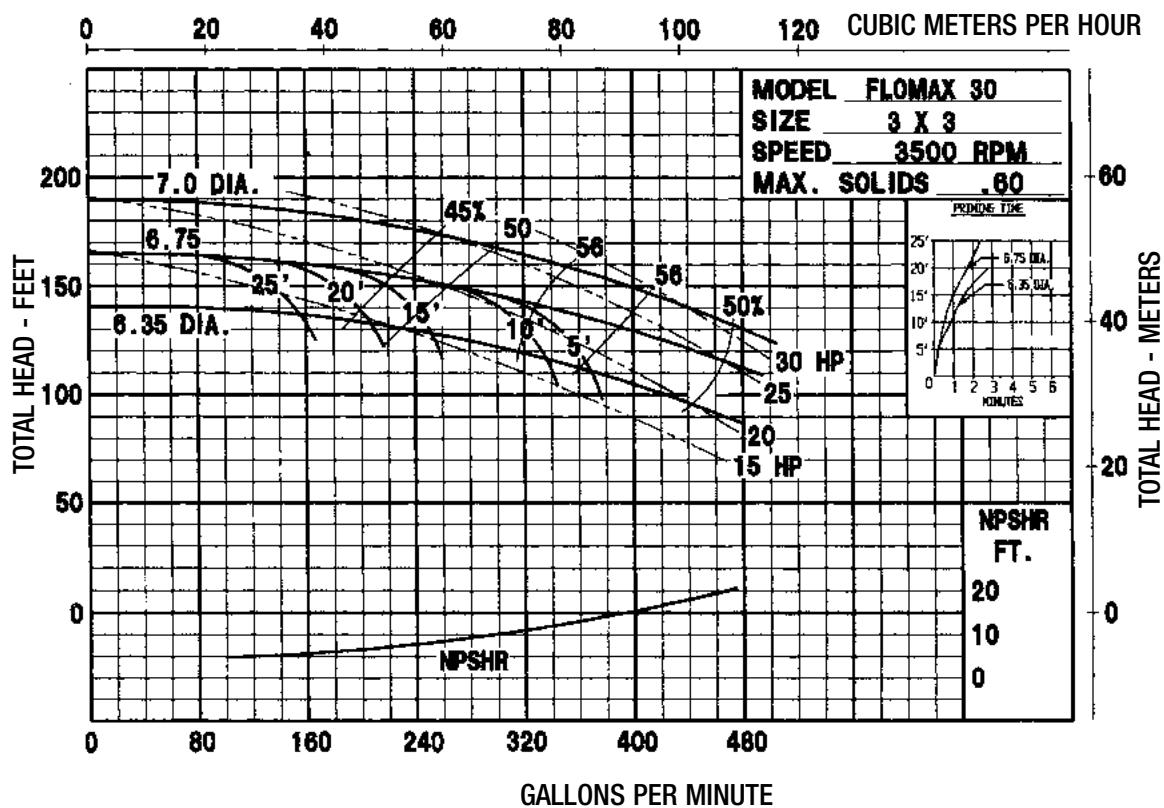
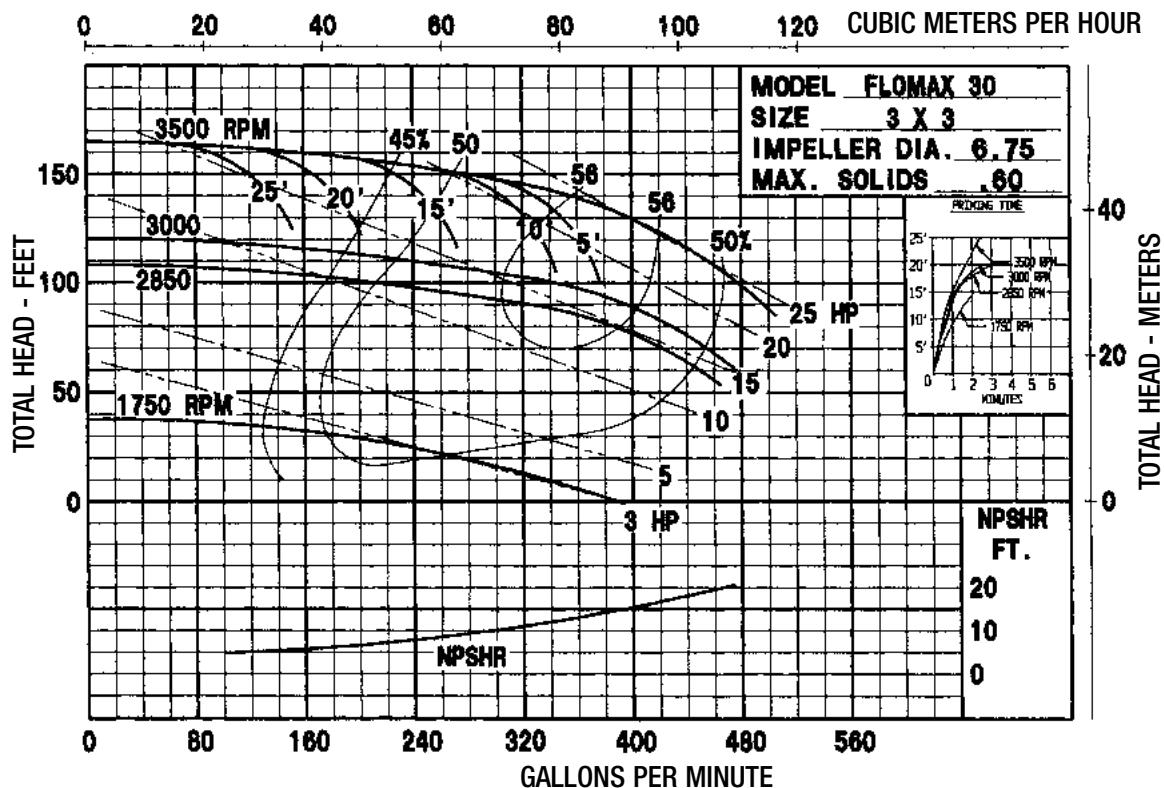
**Flomax 15 Pump Performance Curves**



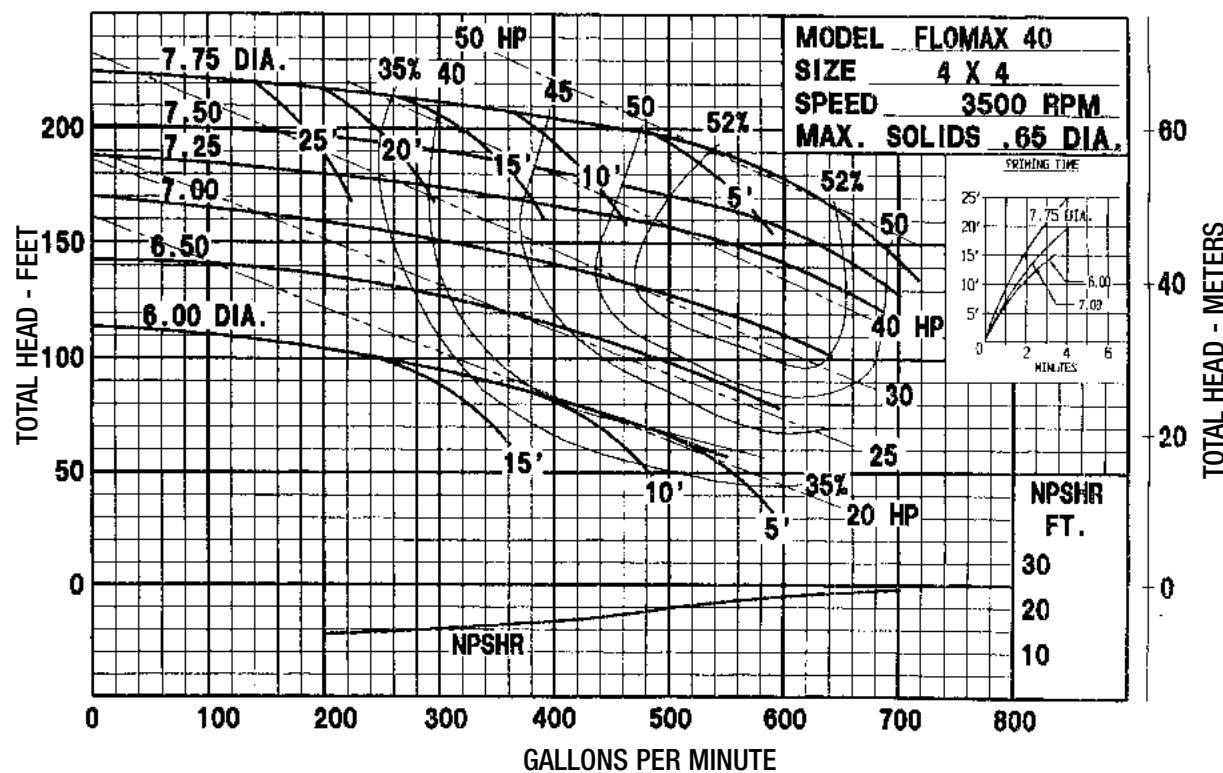
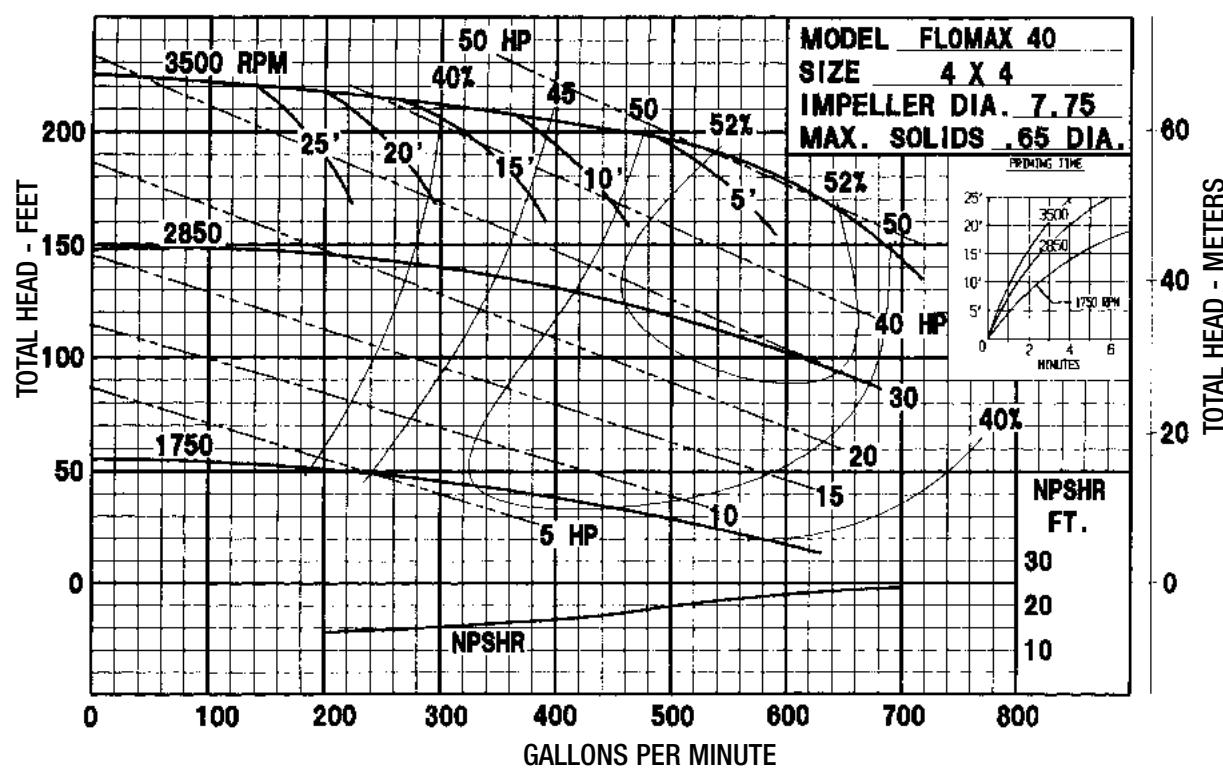
**Flomax 15 Pump Double Seal Performance Curves**



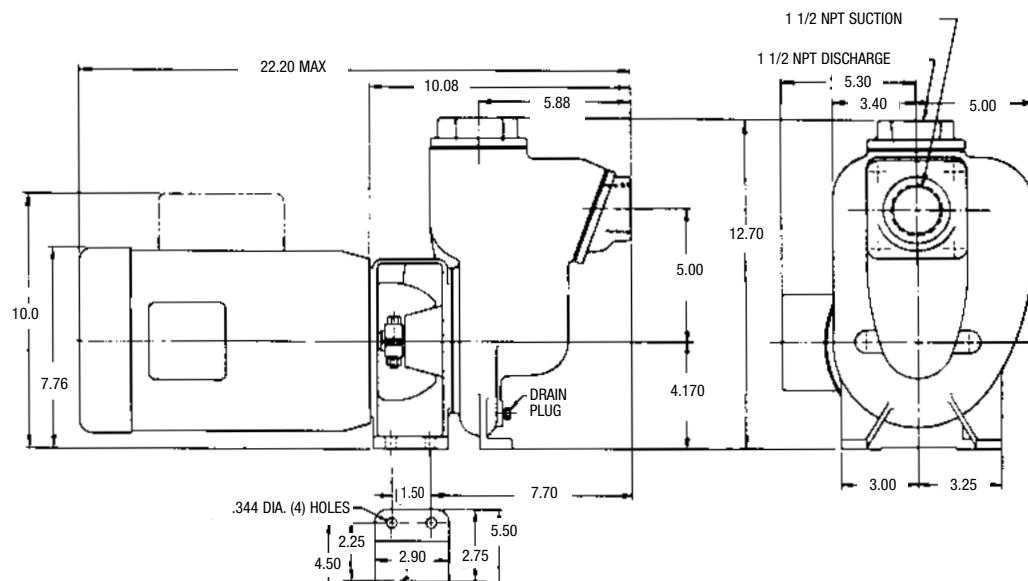
**Flomax 30 Pump Performance Curves**



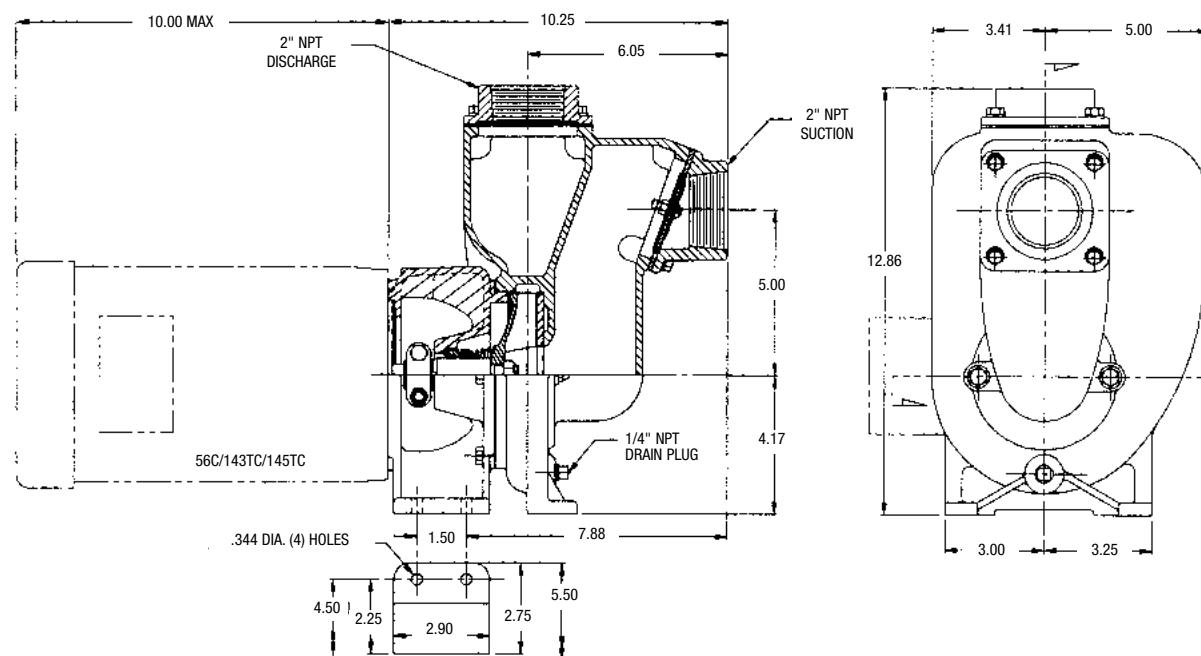
**Flomax 40 Pump Performance Curves**



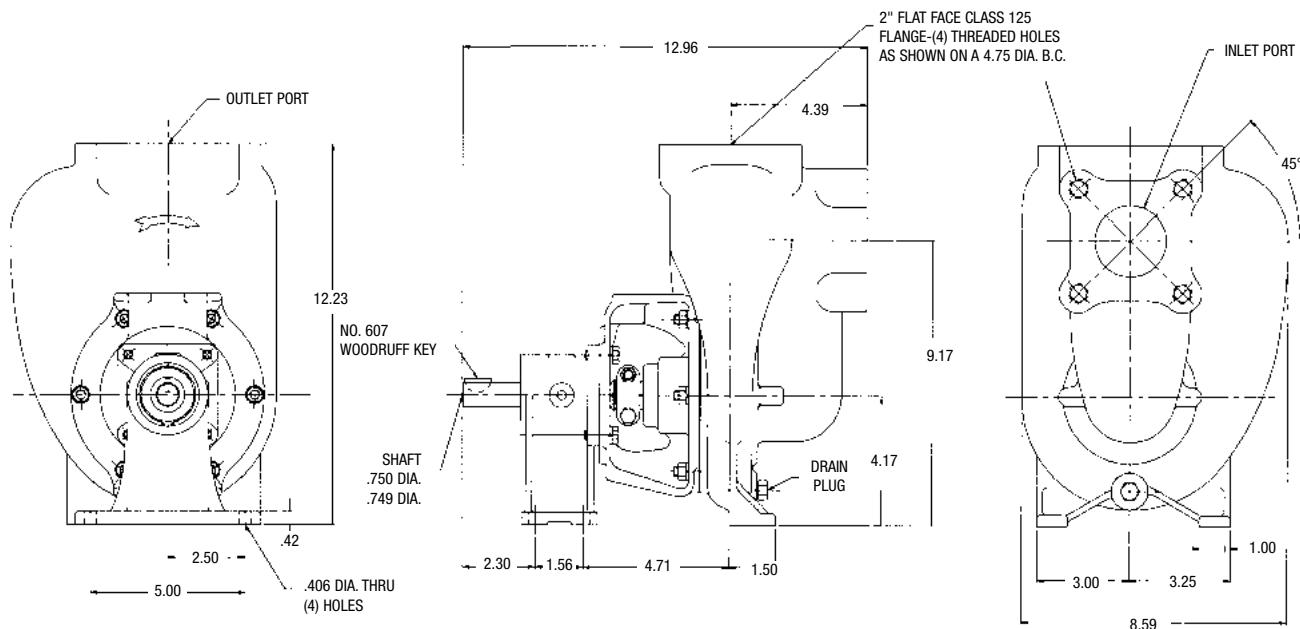
## **Flomax 5 Dimensions**



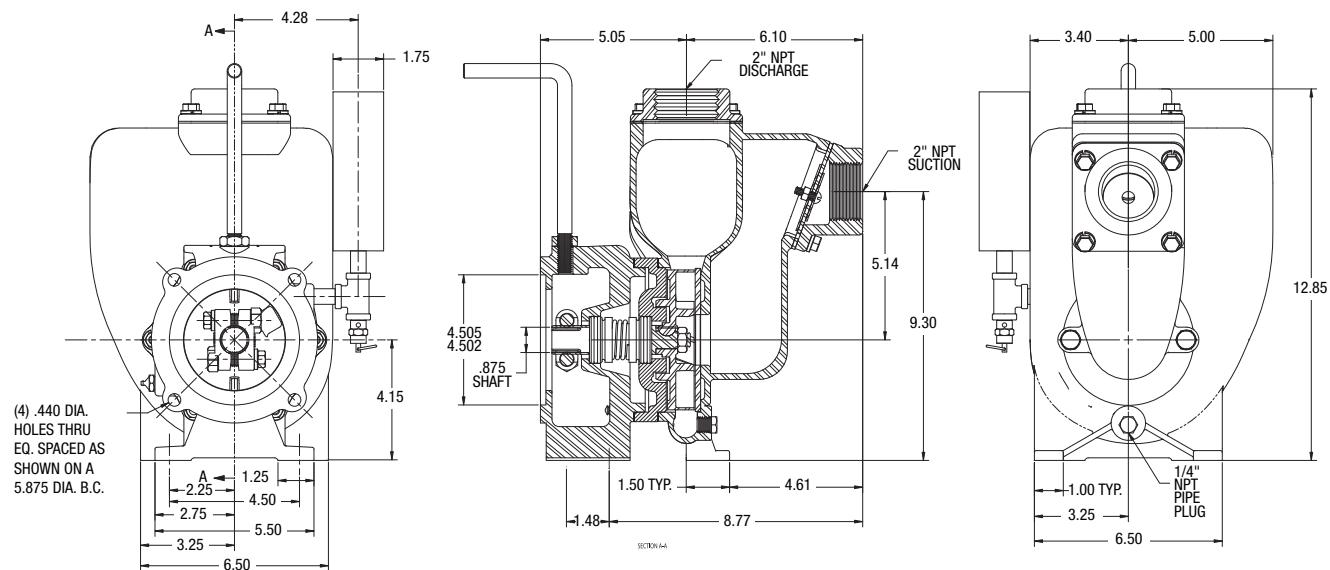
## **Flomax 8 Dimensions**



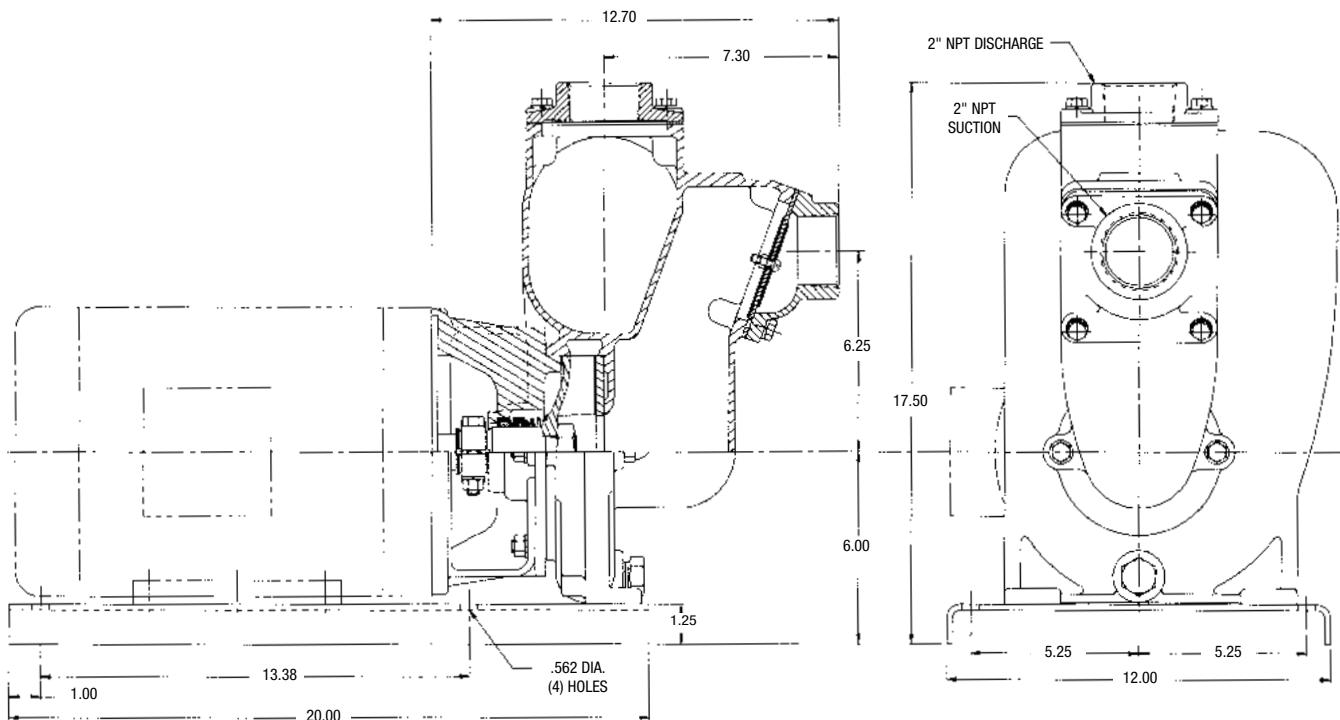
## **Flomax 8 316 SS Dimensions**



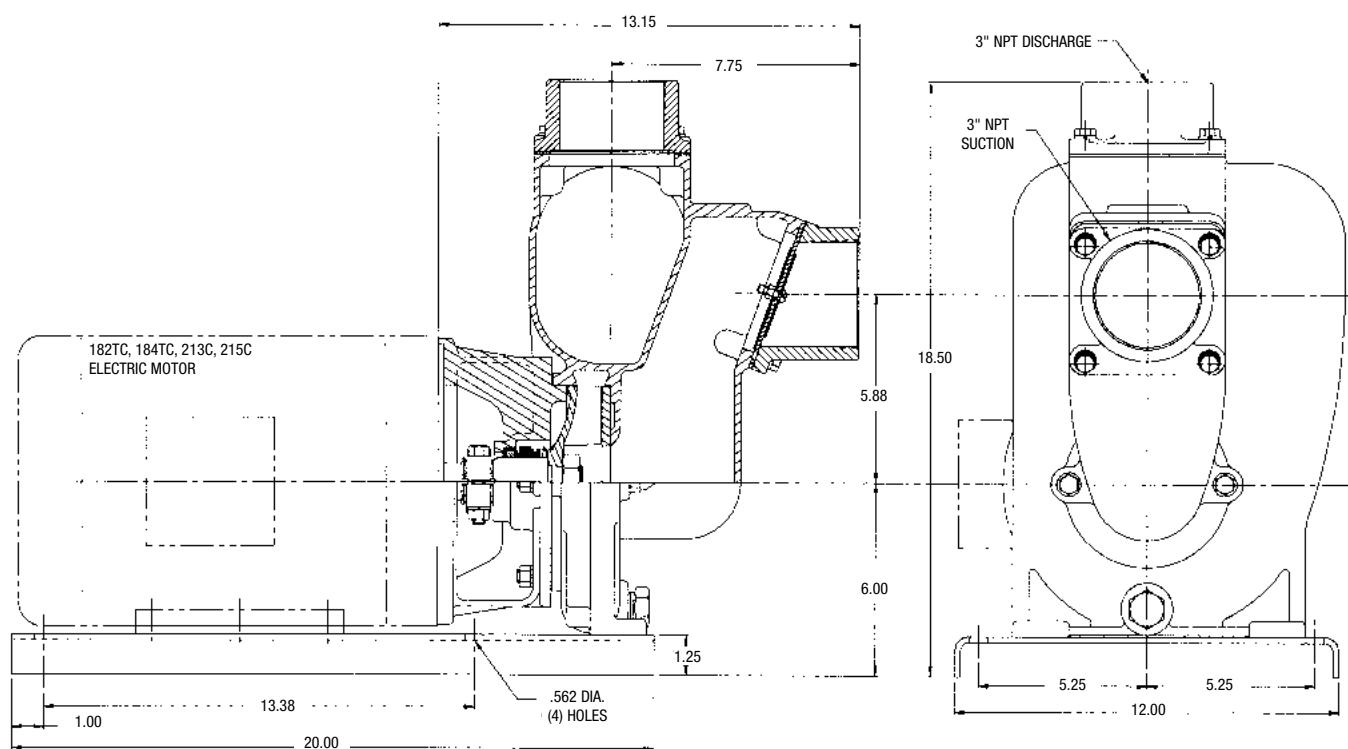
## **Flomax 5 & 8 Double Seal Dimensions**



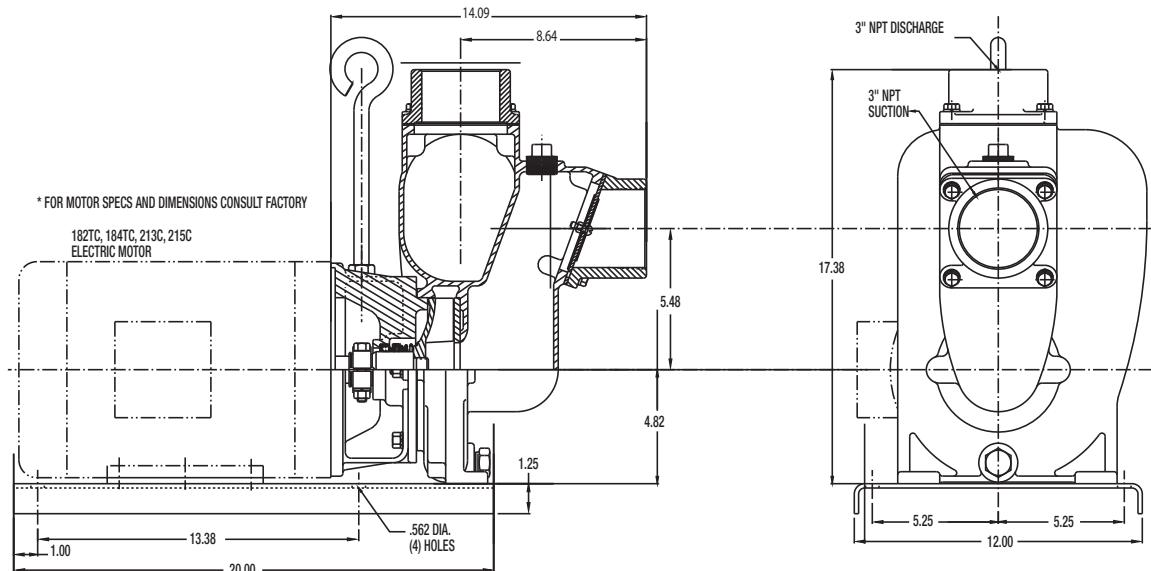
### **Flomax 10 Dimensions**



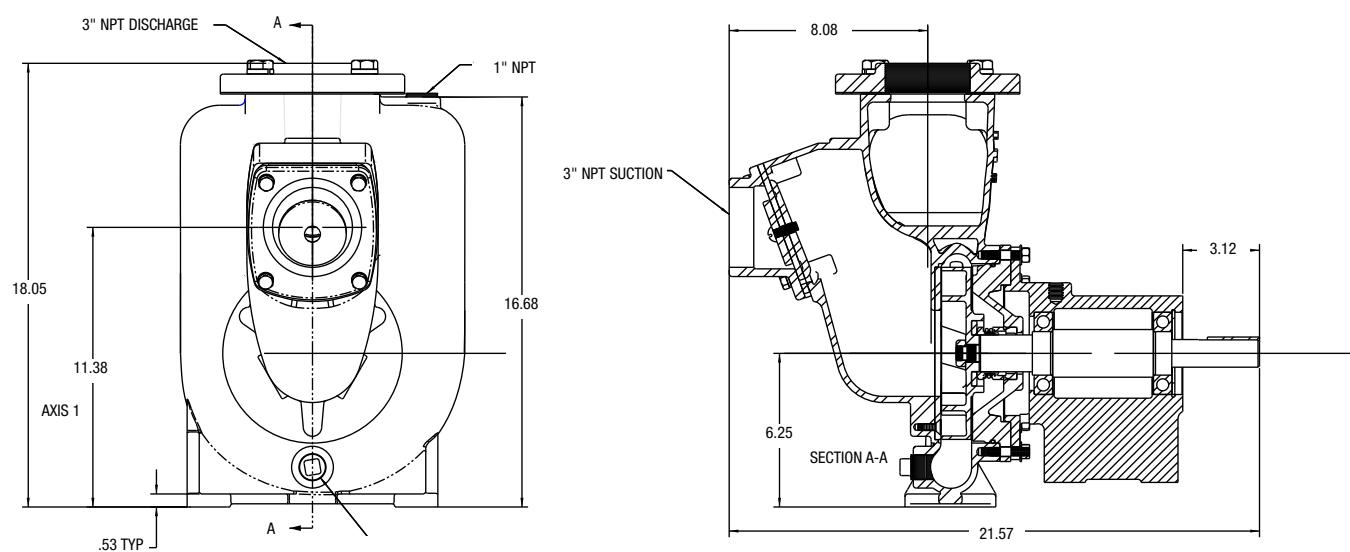
### **Flomax 15 Dimensions**



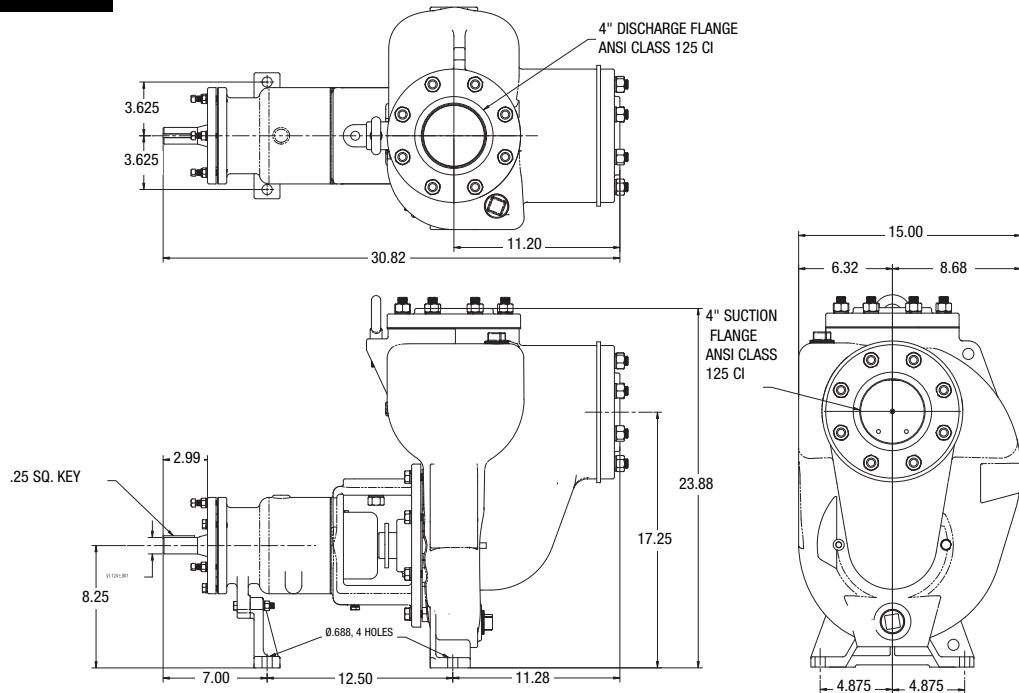
## **Flomax 15 316 SS Dimensions**



## **Flomax 30 Pedestal Mount Dimensions**



## **Flomax 40 Dimensions**



## HIGH HEAD & HIGH OUTPUT CENTRIFUGAL PUMP FEATURES

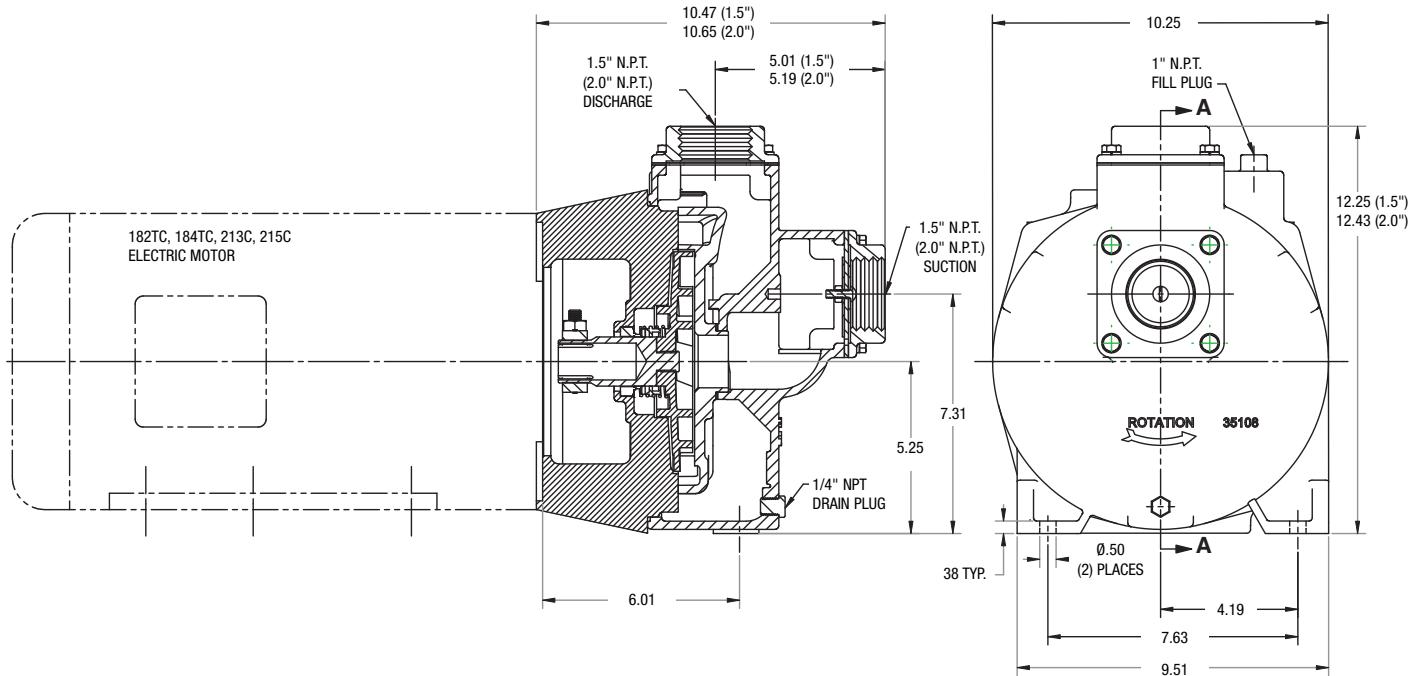
- 1 ½ x 1 ½  
2 x 2 HIGH HEAD  
2 x 2 HIGH OUTPUT
- PUMPAK ONLY TO MOUNT TO STANDARD NEMA "C" FACE MOTOR
- HIGH HEAD MODELS: "C" FACE ELECTRIC MOTOR DRIVE 5 TO 7.5 HP  
HIGH OUTPUT MODELS: "C" FACE ELECTRIC MOTOR DRIVE 10 TO 15 HP
- PEDESTAL DRIVE
- HYDRAULIC DRIVE AND CLUTCHPAKS
- HIGH HEAD FLOWS - TO 140 GPM  
HIGH OUTPUT FLOWS - TO 150 GPM
- HIGH HEAD PRESSURES - TO 190 TDH  
HIGH OUTPUT PRESSURES - TO 250 TDH
- CAST IRON CLASS 30 OR SILICON BRONZE CA 875 CONSTRUCTION
- DRIVE SLEEVE – 304 STAINLESS STEEL
- FASTENERS – STAINLESS STEEL
- SEALS, STANDARD – CARBON, CERAMIC, STAINLESS STEEL, VITON  
OPTIONAL SEALS (CONSULT FACTORY).
- ABS TYPE APPROVED FOR MANY SHIPBOARD SERVICES



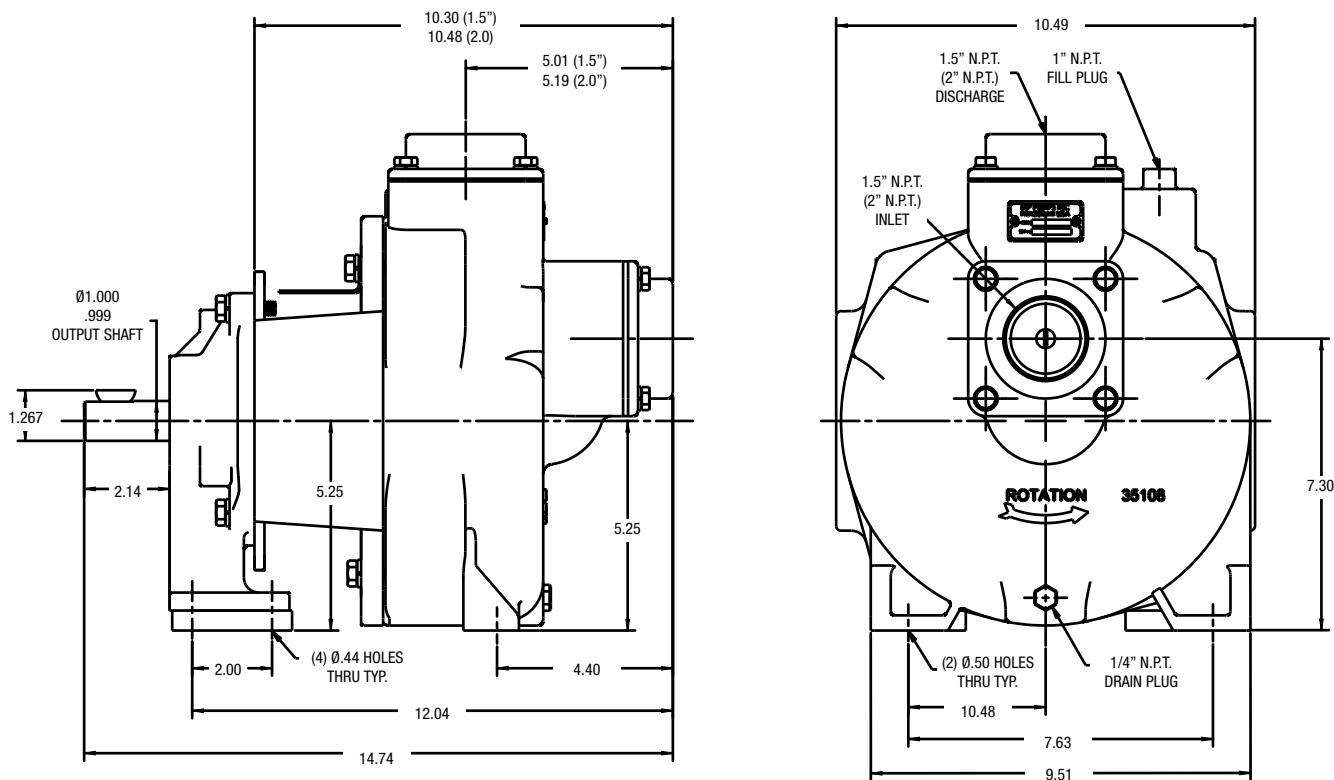
HHLF

MODEL	Suction	Discharge
HHLF	1 ½"-2" NPT	1 ½"-2" NPT
HHLF HO	2" NPT	2" NPT

## Dimensions



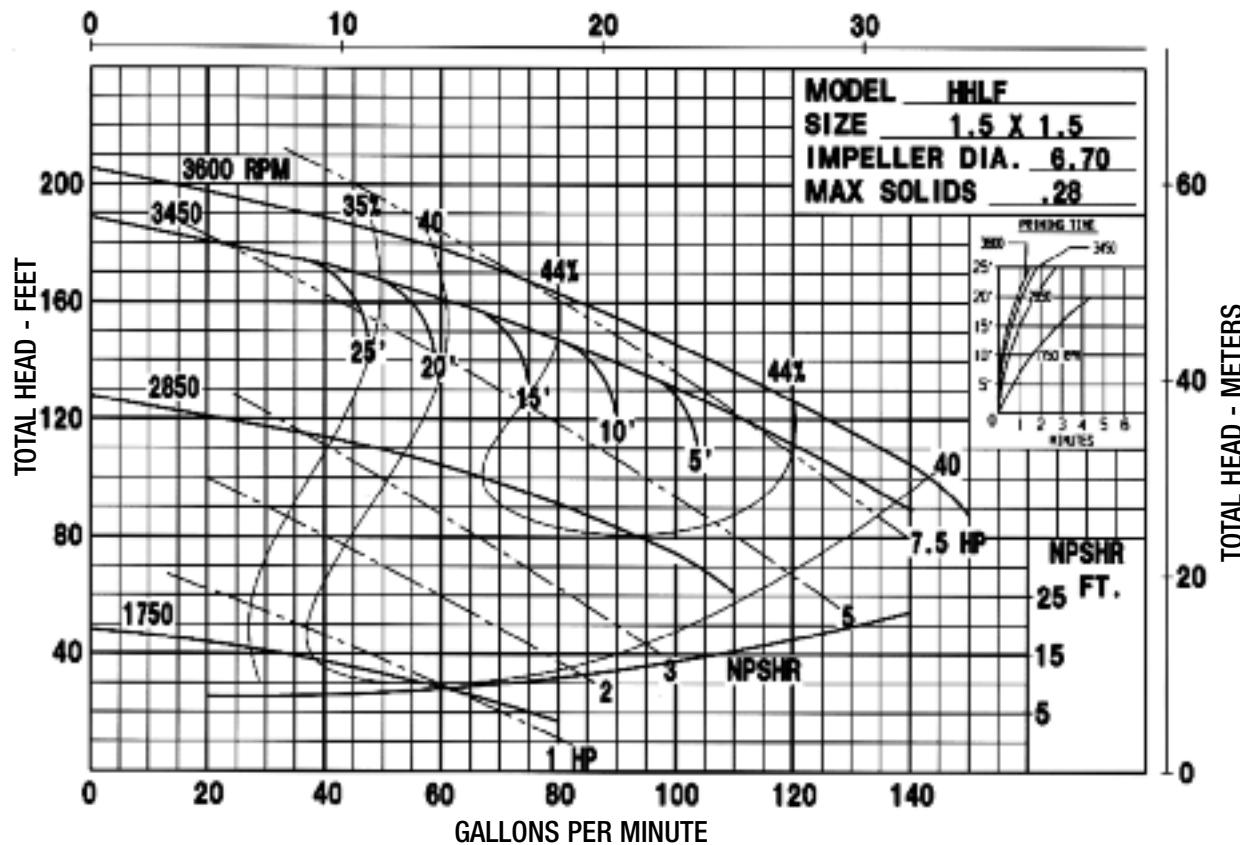
## Dimensions, Pedestal Mount



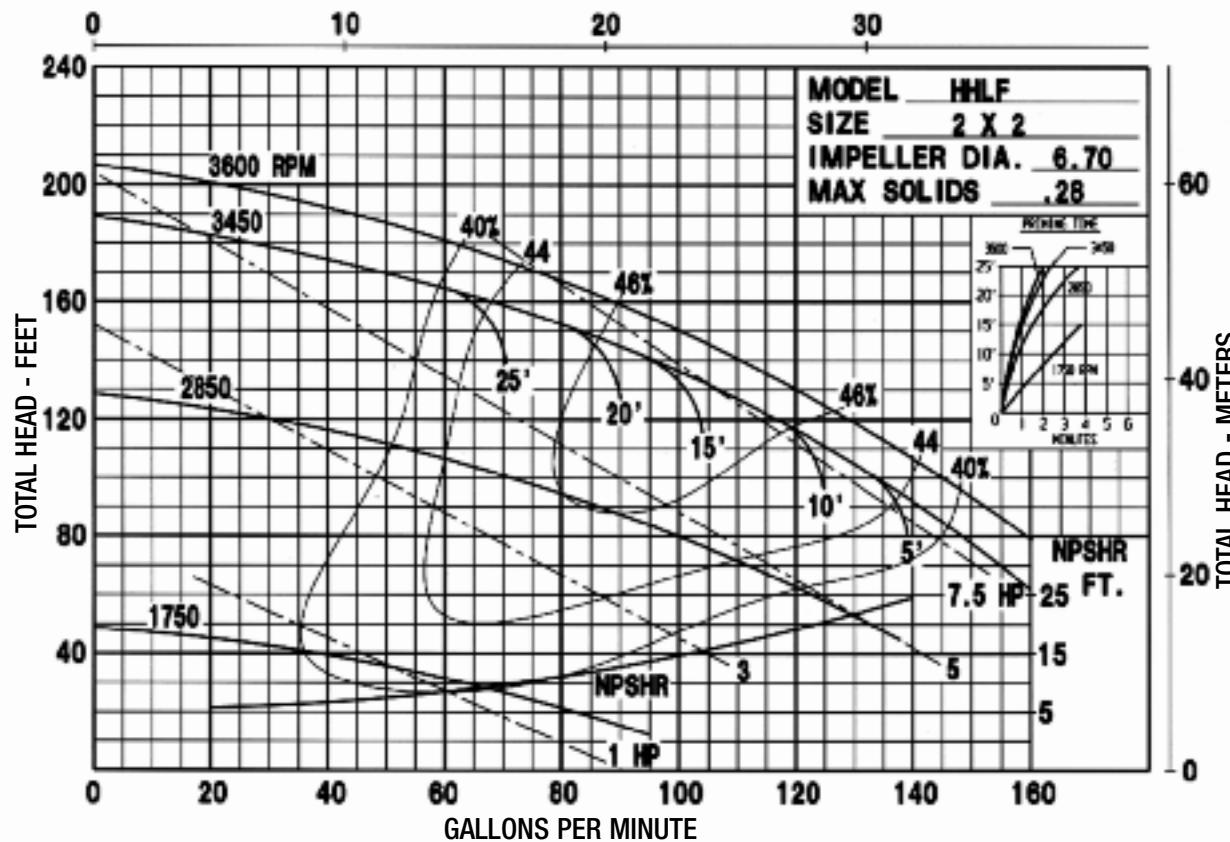
Other Performance Curves Available Upon Request

## Pump Performance Curves

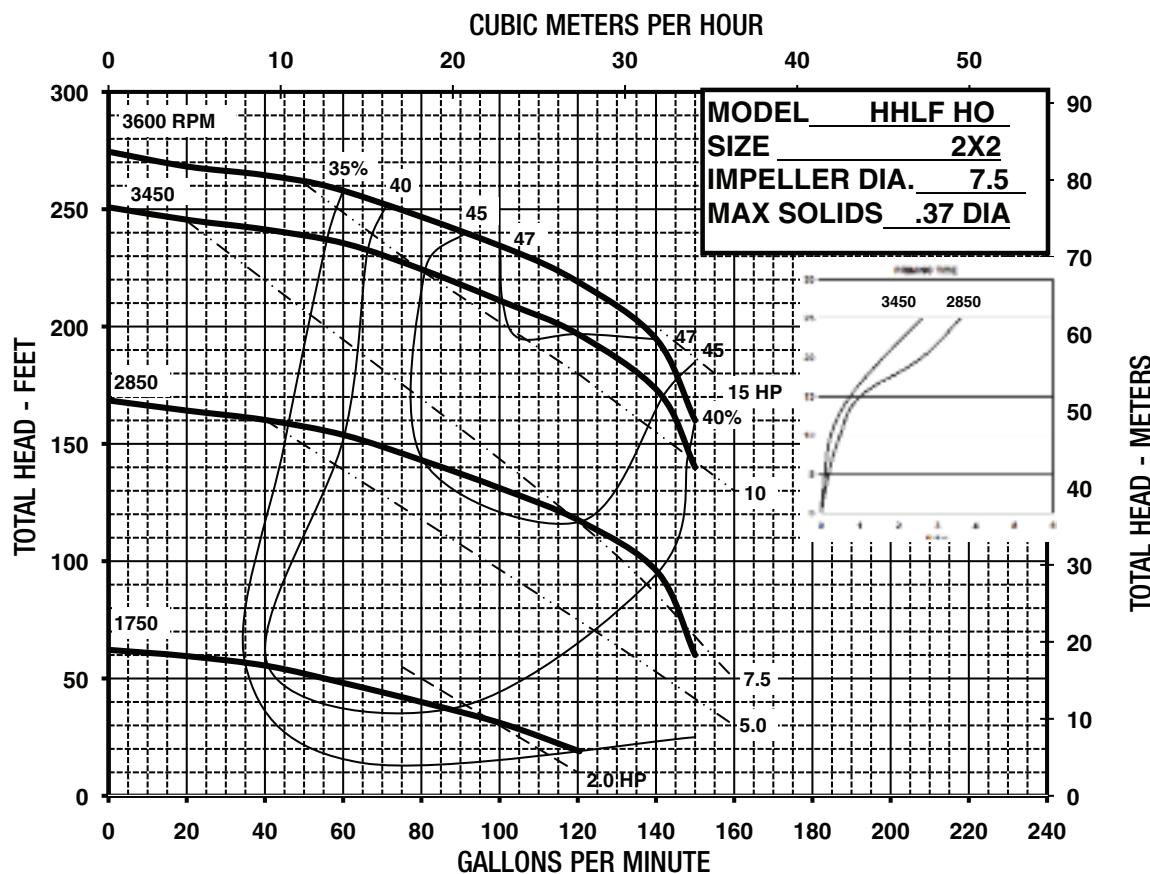
CUBIC METERS PER HOUR



CUBIC METERS PER HOUR



## Pump Performance Curves



# 2CT

## SELF PRIMING TRASH PUMP FEATURES

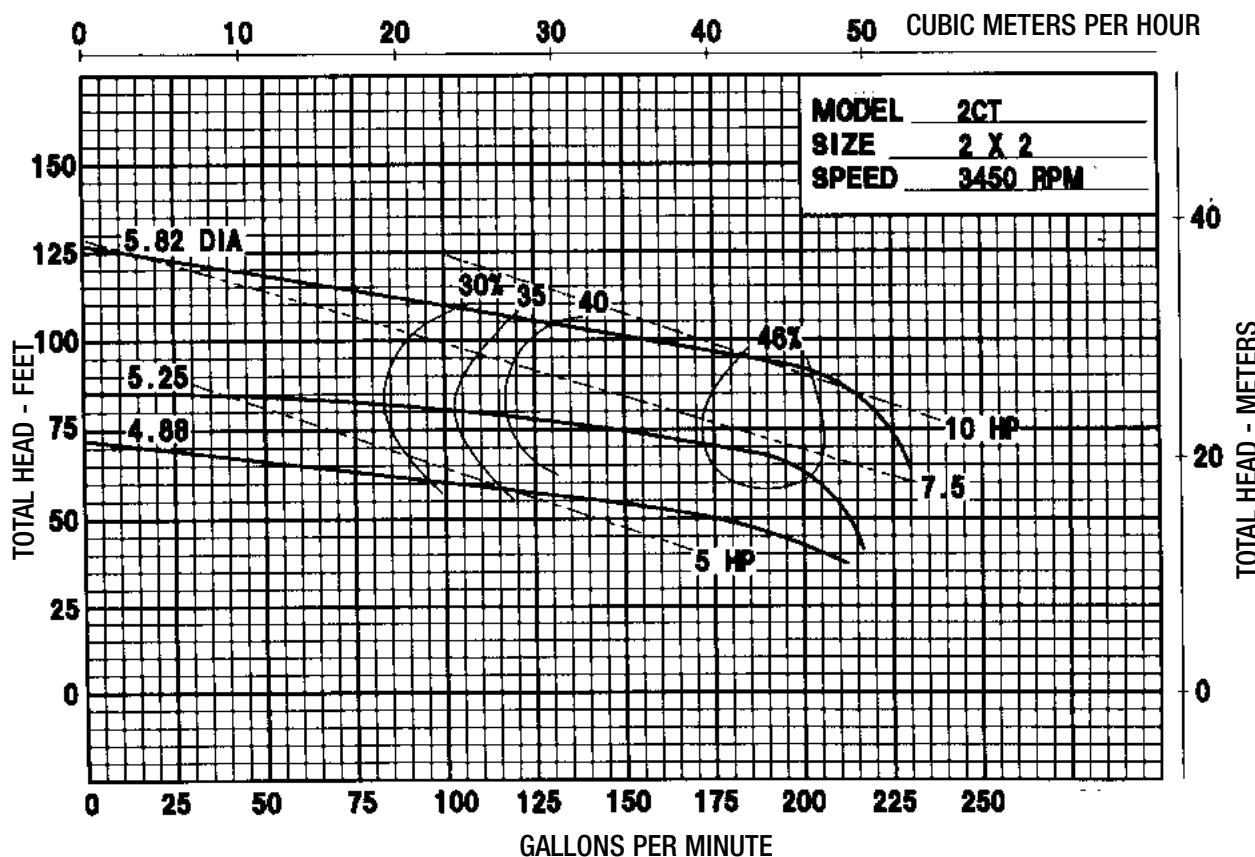
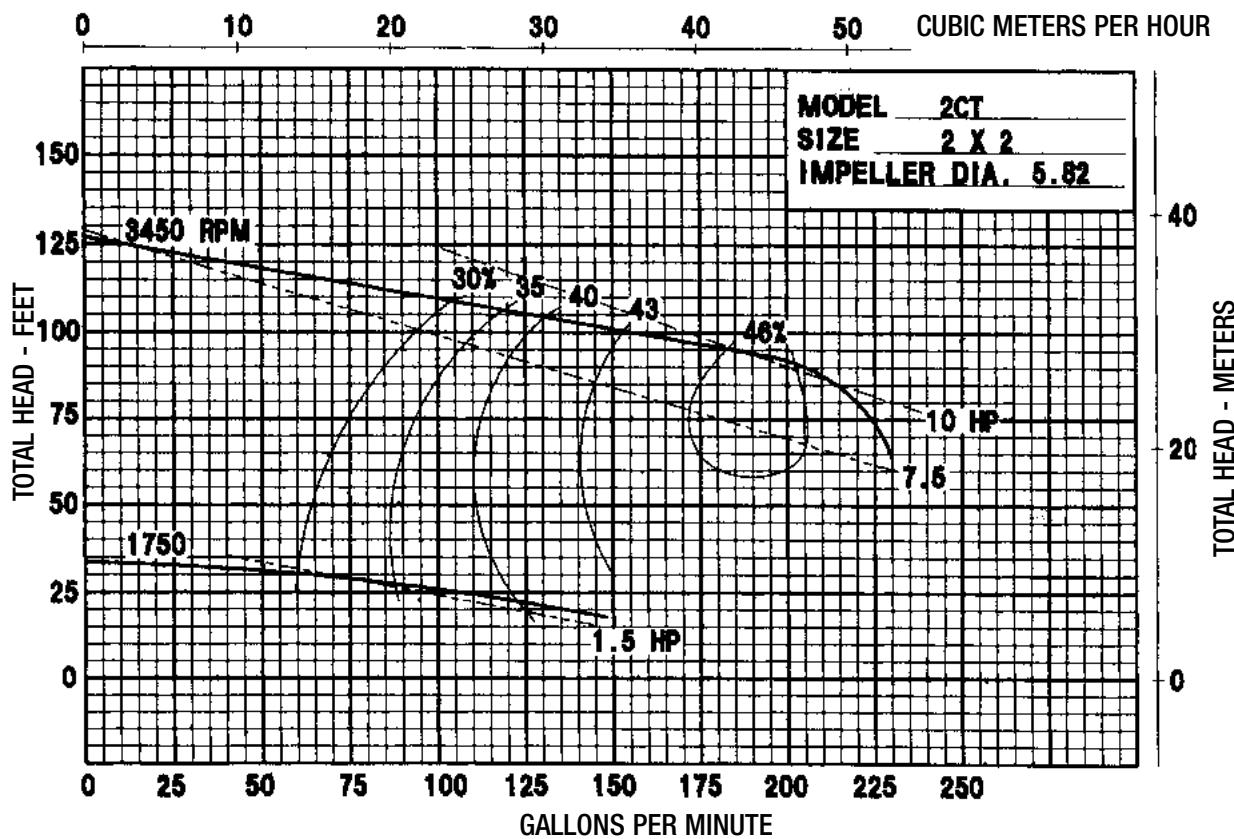
- CLOSED COUPLED TO ELECTRIC MOTOR OR PEDESTAL FOR STANDARD MOTOR
- FLOW - TO 400 GPM
- PRESSURES - TO 125 FEET HEAD
- CAST IRON CONSTRUCTION
- ELECTRIC MOTOR DRIVE
- IMPELLER - DUCTILE IRON
- SHAFT SLEEVE - 304 STAINLESS STEEL
- SEALS - CARBON/CERAMIC VITON MECHANICAL SEAL
- OPTIONS:
  - HYDRAULIC DRIVES
- 2CT AND 2CT-3 AVAILABLE FOR CLOSE-COUPLE TO 145TC MOTOR (MAXIMUM 5HP) OR PEDESTAL
- 2CT-3HS AVAILABLE FOR CLOSE-COUPLE TO 184TC AND 215TC MOTOR



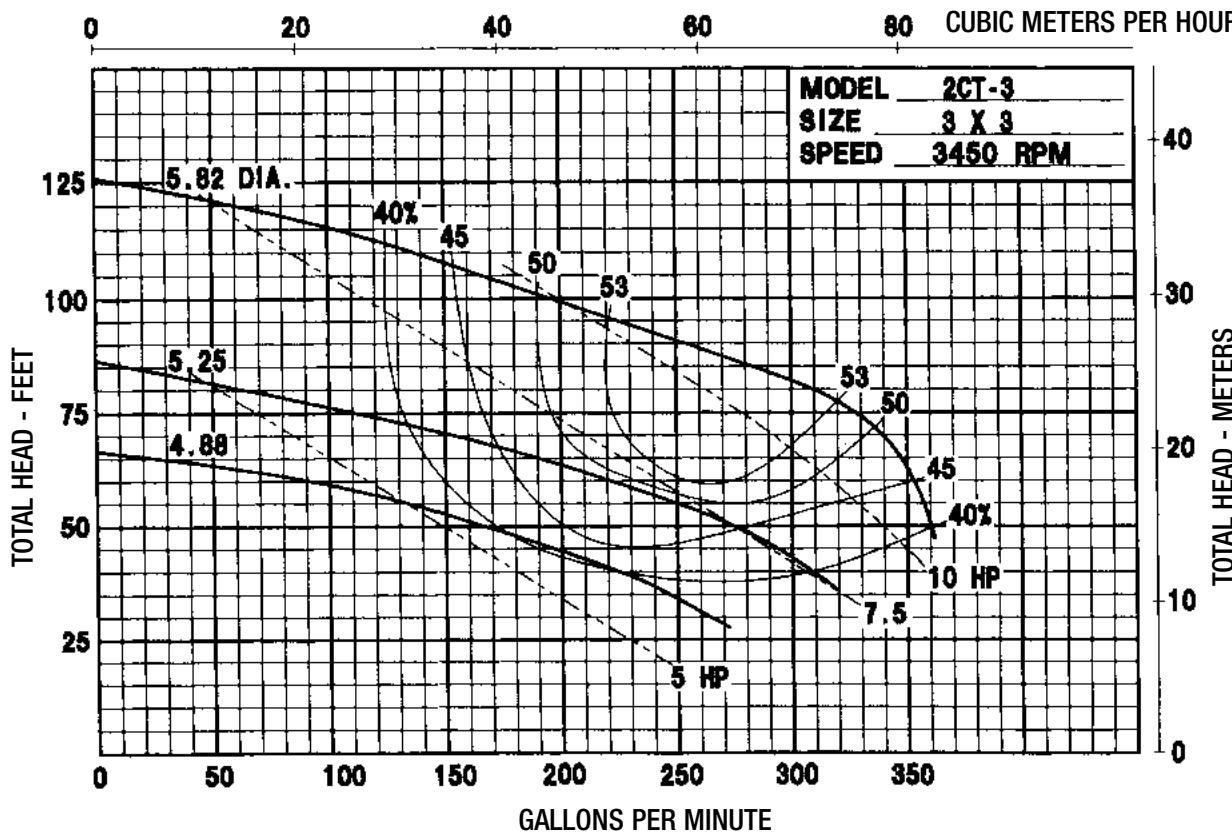
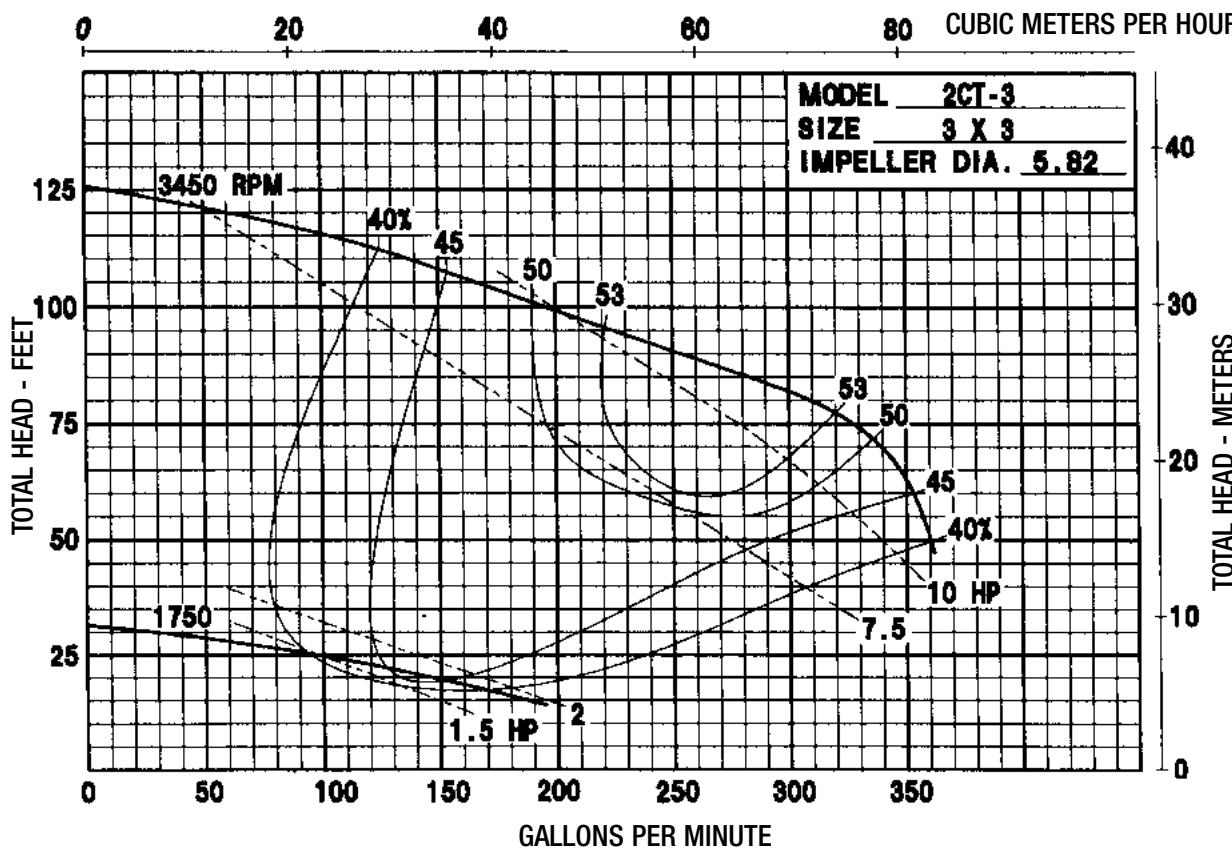
2CT & 2CT3

MODEL	Suction	Discharge	Max. Solid Size
2CT	2" NPT	2" NPT	1.5"
2CT-3	3" NPT	3" NPT	1.5"
2CT-3HS	3" NPT	3" NPT	1.25"

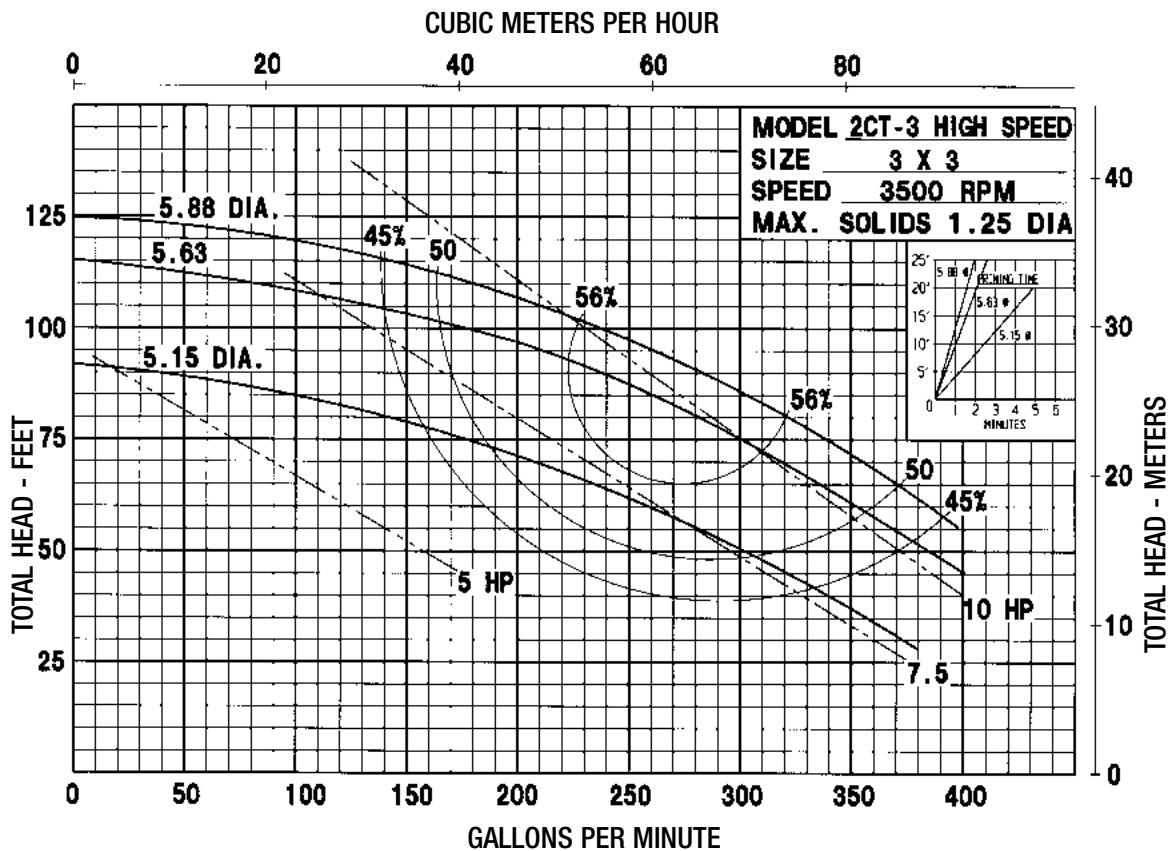
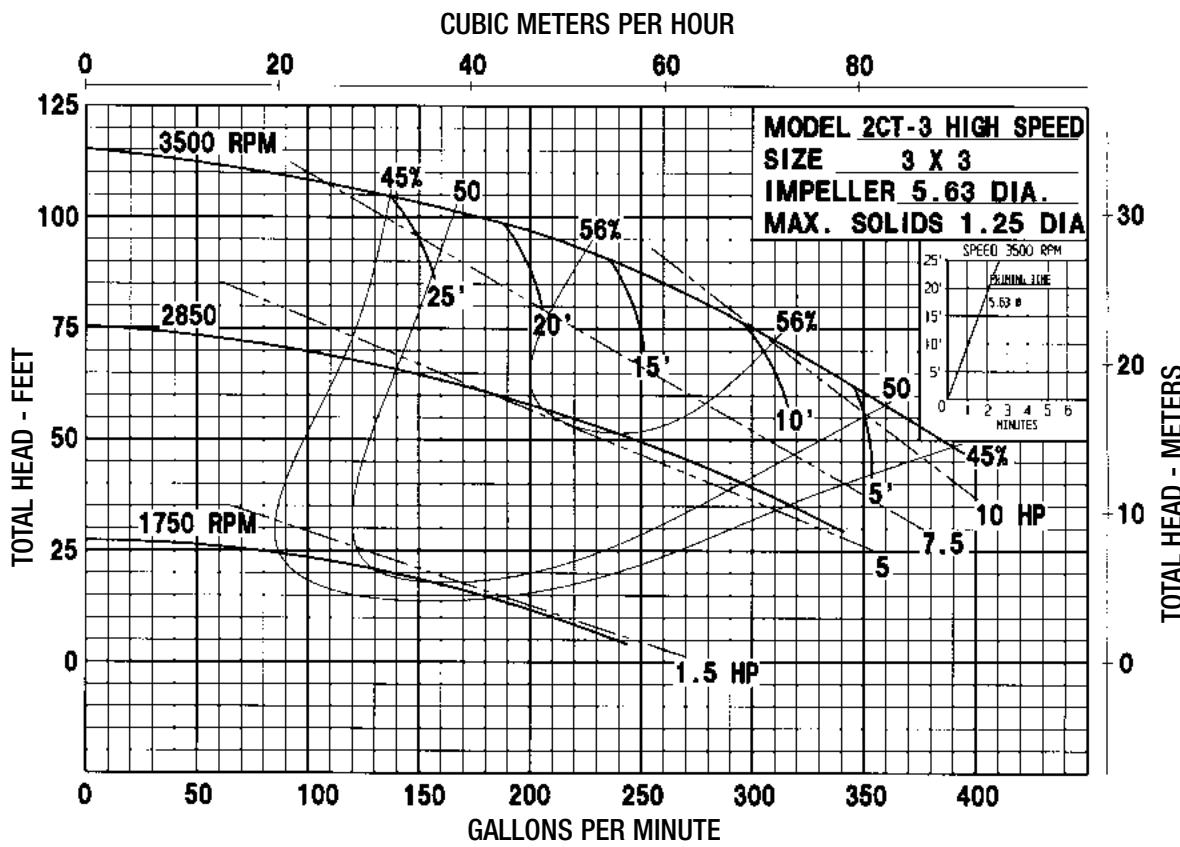
**2CT Pump Performance Curves**



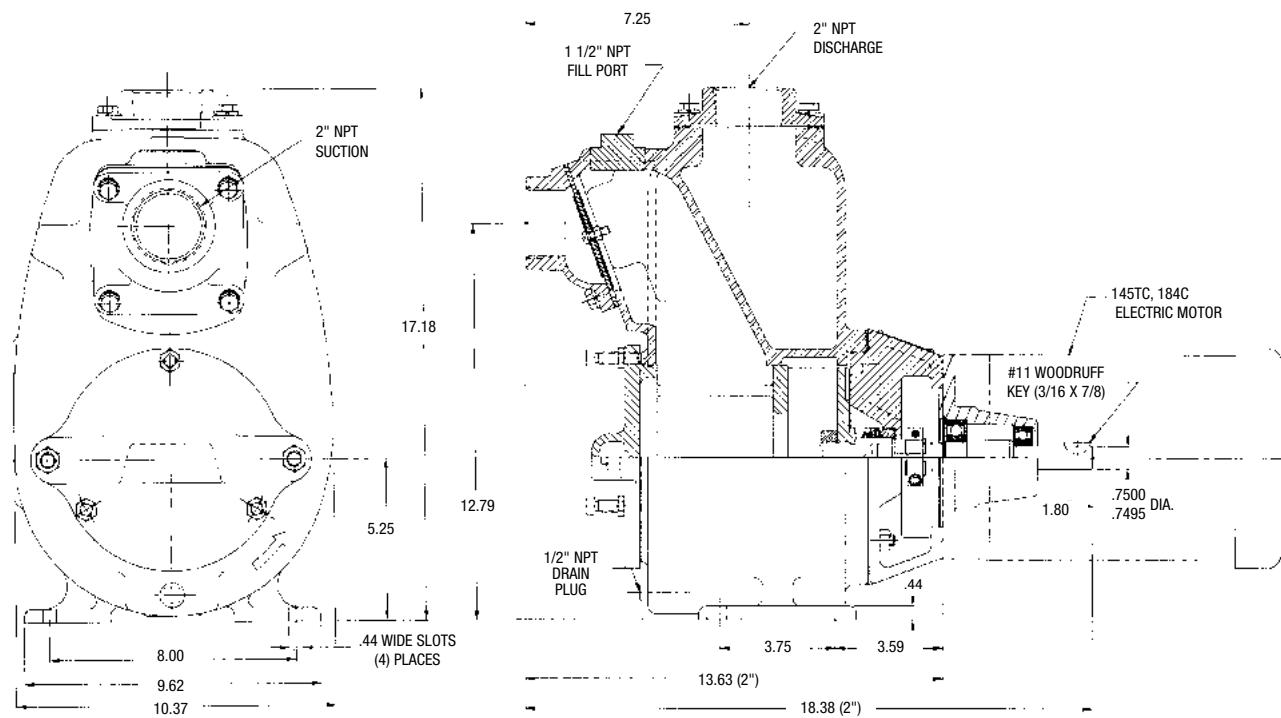
**2CT-3 Pump Performance Curves**



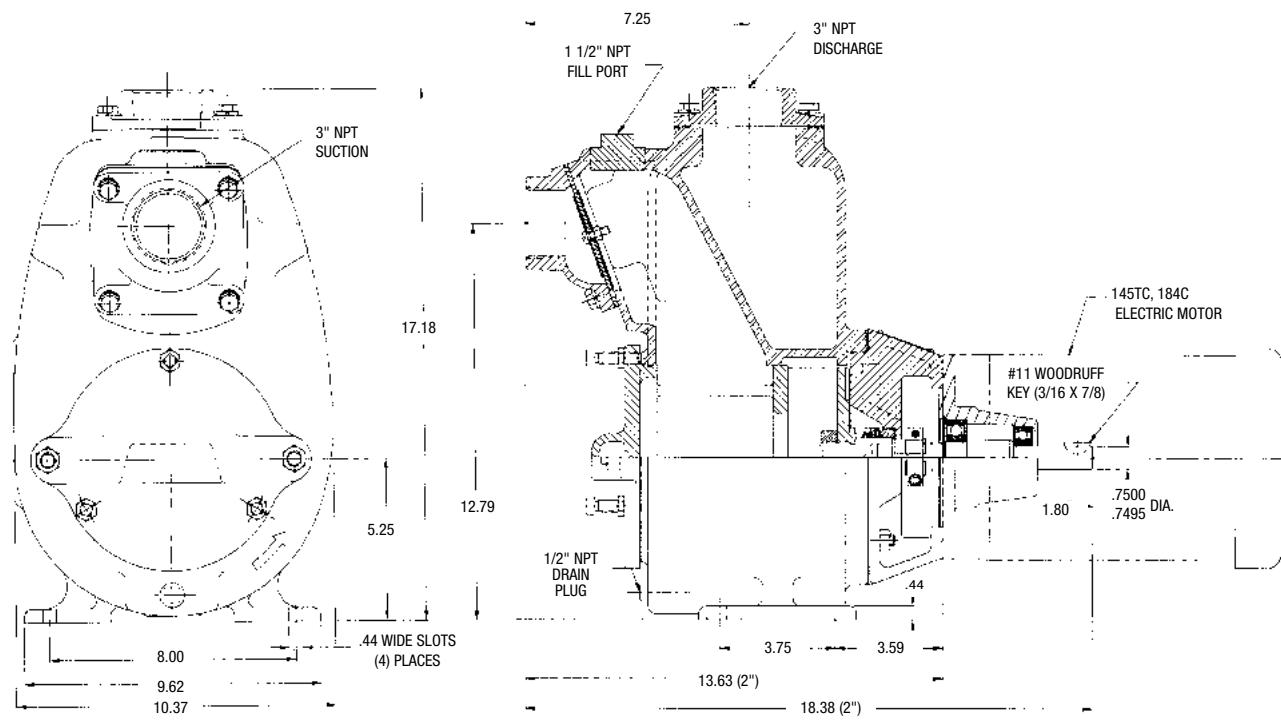
**2CT-3 High Speed Performance Curves**



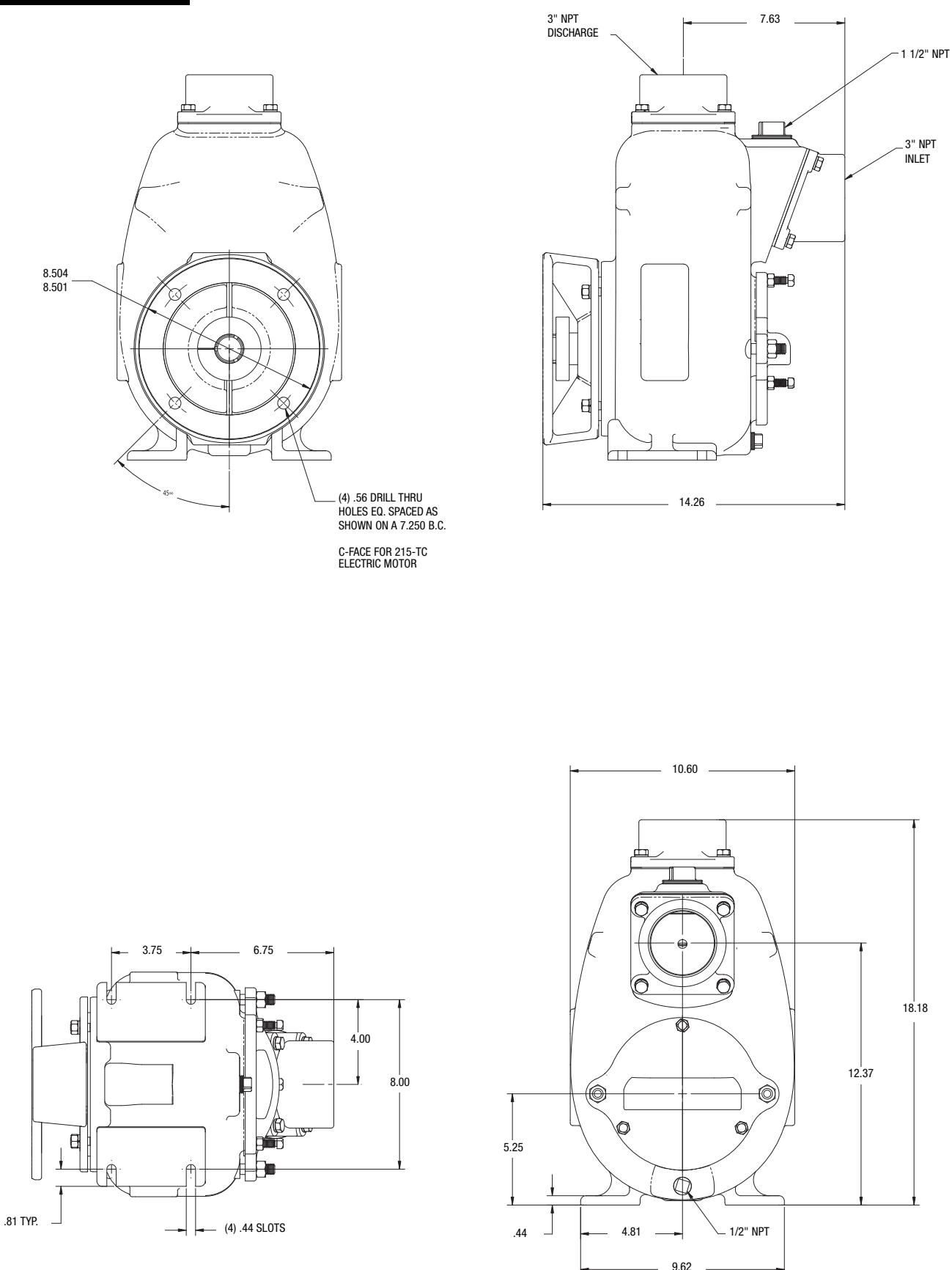
## 2CT Dimensions



## 2CT-3 Dimensions



## 2CT-3HS Dimensions



Other Performance Curves Available Upon Request

# **SERIES 30 60 80 110**

## **END SUCTION CENTRIFUGAL PUMP FEATURES**

- SERIES 30, 60, 80, 110, 120, 130, 200, 300 & 700 CLOSED COUPLED TO ELECTRIC MOTOR

SERIES 300 PEDESTAL PUMP, OR FOOT MOUNTED FOR BELT

OR DIRECT DRIVE

SERIES 700 PEDESTAL PUMP FOR BELT

OR DIRECT DRIVE

- PUMPAK ONLY TO MOUNT TO STANDARD NEMA "C" FACE MOTOR .3-40 HP

- NEMA JP PUMP MOTOR UP TO 25HP

- FLOWS - 40-800 GPM

- PRESSURES - 40-190 FEET HEAD

### **AVAILABLE IN:**

- SERIES 30 CAST IRON, BRONZE CONSTRUCTION
- SERIES 60 CAST IRON
- SERIES 80, 110, 120, 130 & 200 CAST IRON & BRONZE
- SERIES 300 CAST IRON AND CAST IRON STAINLESS STEEL FITTED
- SERIES 700 DUCTILE IRON CONSTRUCTION

- VERTICAL OR HORIZONTAL DISCHARGE

### **■ IMPELLER:**

SERIES 30 AVAILABLE IN CAST IRON, BRONZE

SERIES 60, 110, 130 AND 200 AVAILABLE IN CAST IRON & BRONZE

SERIES 80 & 120 AVAILABLE IN BRONZE (CAST IRON OPTIONAL)

SERIES 300 & 700 AVAILABLE IN DUCTILE IRON-ENCLOSED

### **■ SHAFT SLEEVE:**

SERIES 30, 60, 80, 110, 130 & 200 STAINLESS STEEL

SERIES 300 STEEL

SERIES 700 STEEL OR STAINLESS STEEL

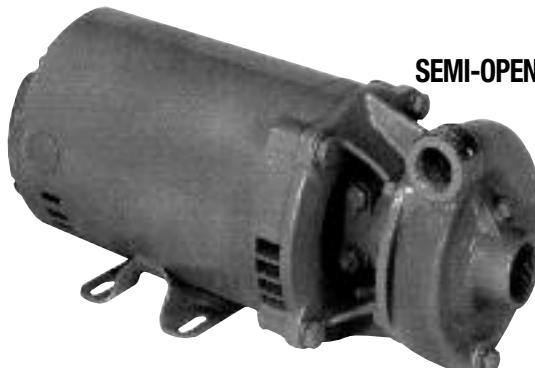
- FASTENERS - STAINLESS STEEL

- SEALS - STANDARD VITON, OPTIONAL SEALS AVAILABLE

(CONSULT FACTORY)

### **■ OPTIONS:**

- ENGINE DRIVES
- PEDESTAL MODELS
- HYDRAULIC DRIVES
- CLUTCHPAKS
- MOTOR DRIVES



SEMI-OPEN



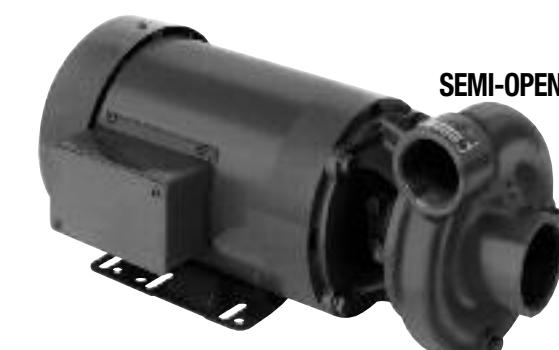
SERIES 30

ENCLOSED



SERIES 60

ENCLOSED



SERIES 80

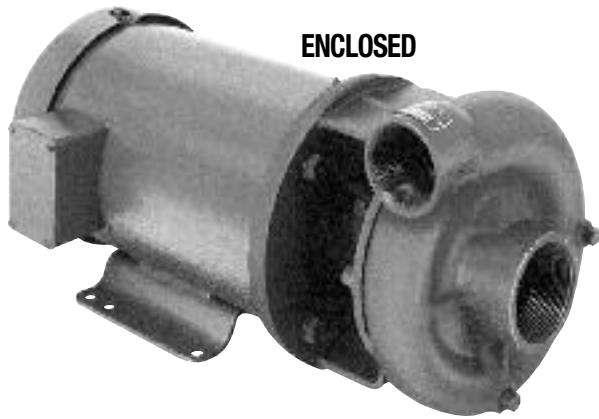
SEMI-OPEN

SERIES 110

# **120 130 200 300 700**

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**ENCLOSED**



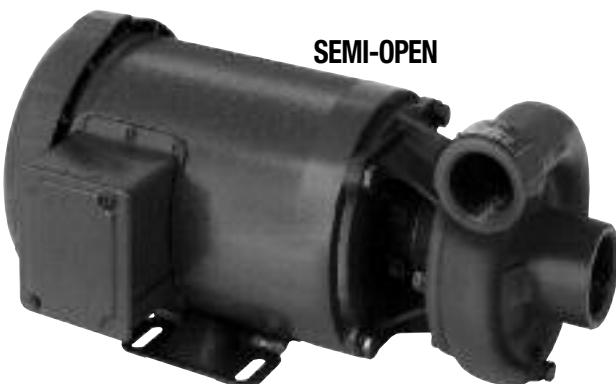
**SERIES 120**

**ENCLOSED**



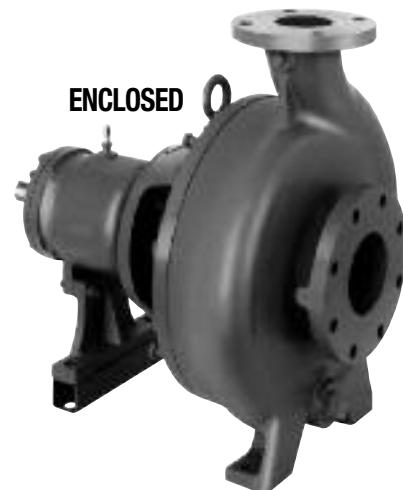
**SERIES 300**

**SEMI-OPEN**



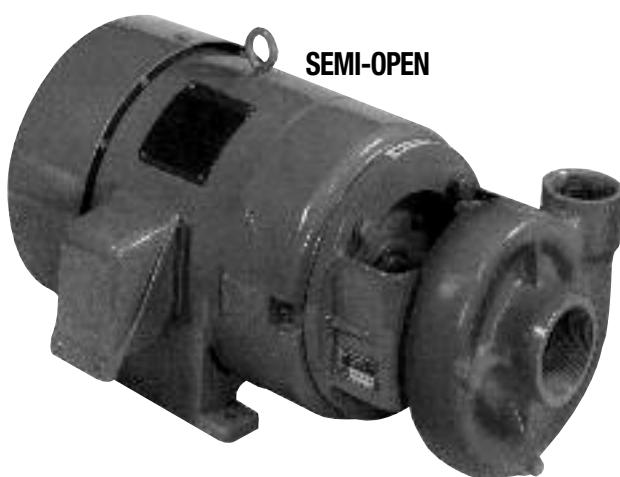
**SERIES 130**

**ENCLOSED**



**SERIES 700**

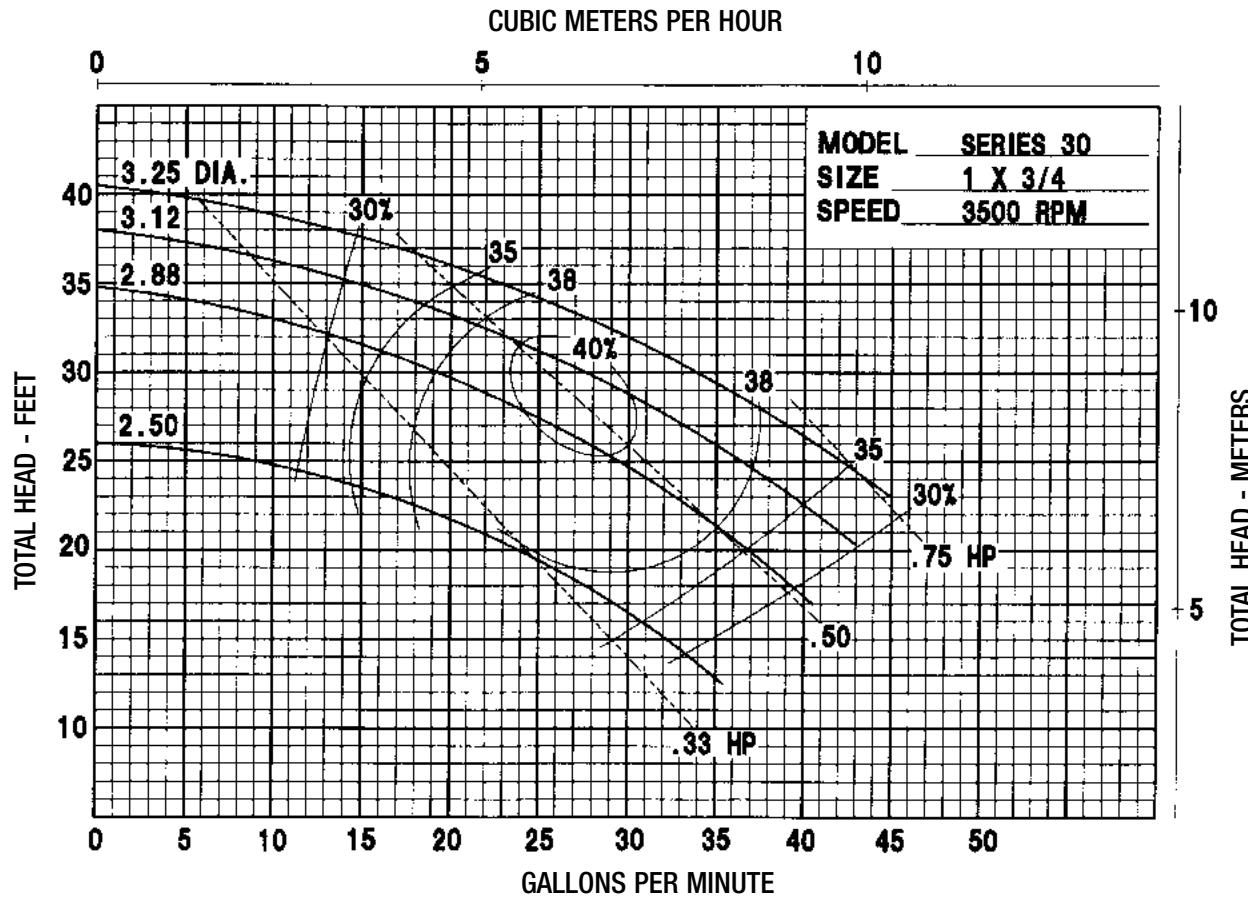
**SEMI-OPEN**



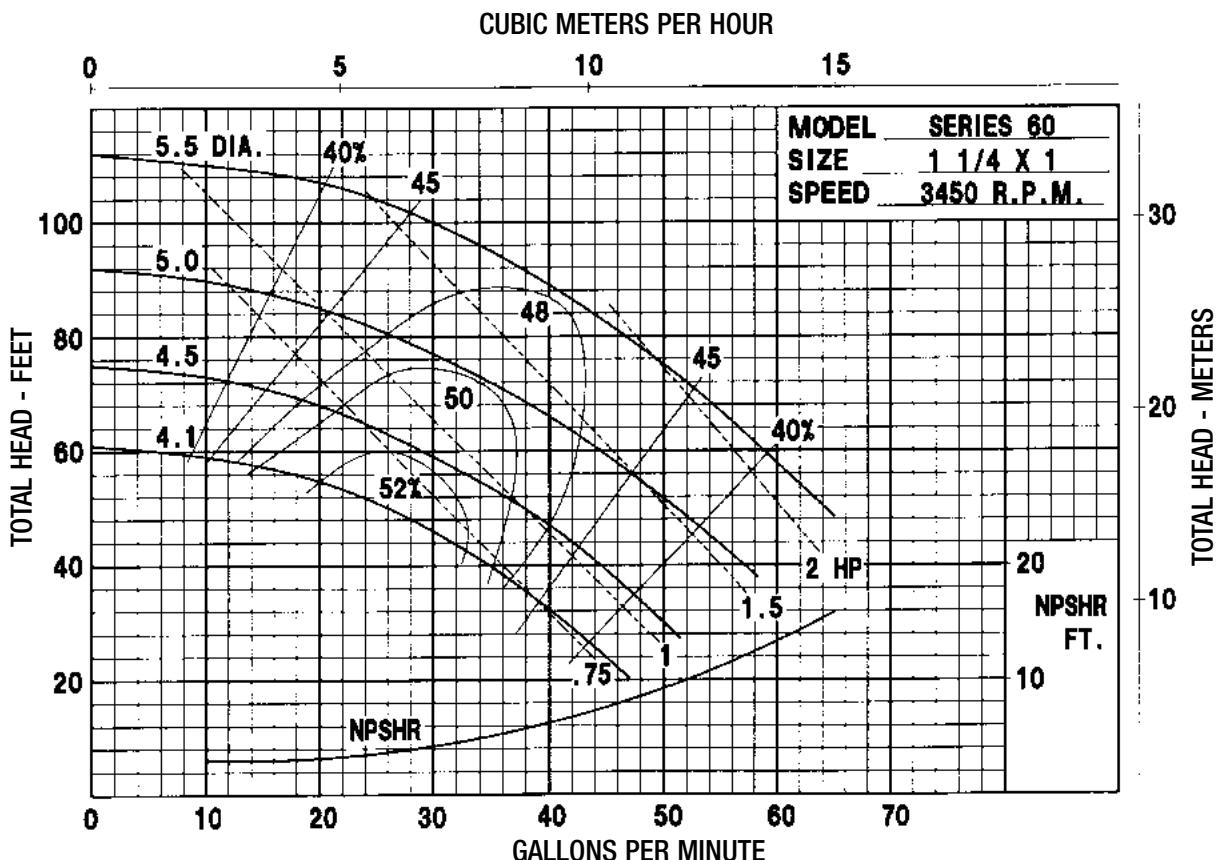
**SERIES 200**

MODEL	Suction	Discharge
SERIES 30	1" NPT	3/4" NPT
SERIES 60	1 1/4" NPT	1" NPT
SERIES 80	1 1/2" NPT	1 1/4" NPT
SERIES 110	1 1/2" NPT	1 1/4" NPT
SERIES 120	2" NPT	1 1/2" NPT
SERIES 130	2" NPT	1 1/2" NPT
SERIES 200	2 1/2" NPT	2" NPT
SERIES 300	3" ANSI Flange	2 1/2" ANSI Flange
SERIES 700	4" ANSI Flange	3" ANSI Flange

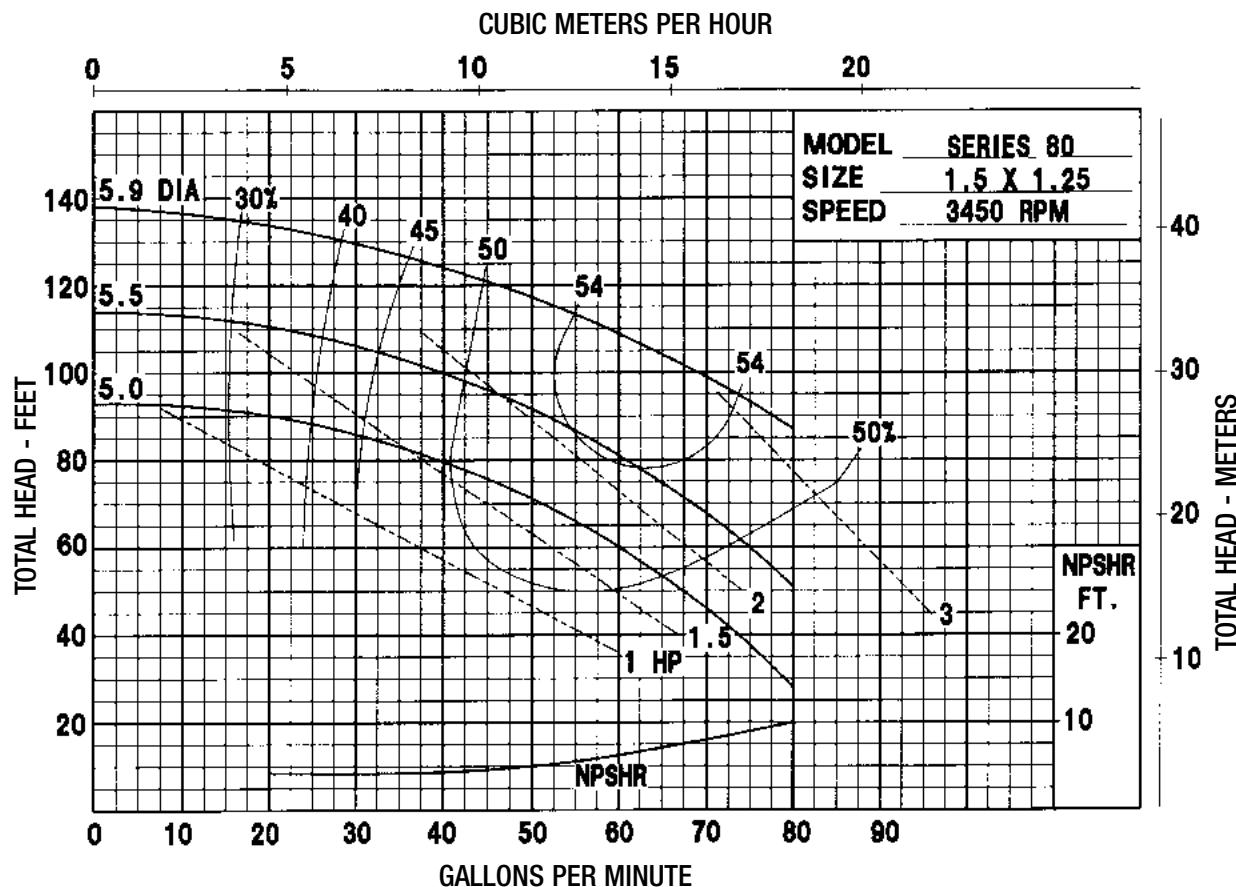
### **Series 30 Pump Performance Curves**



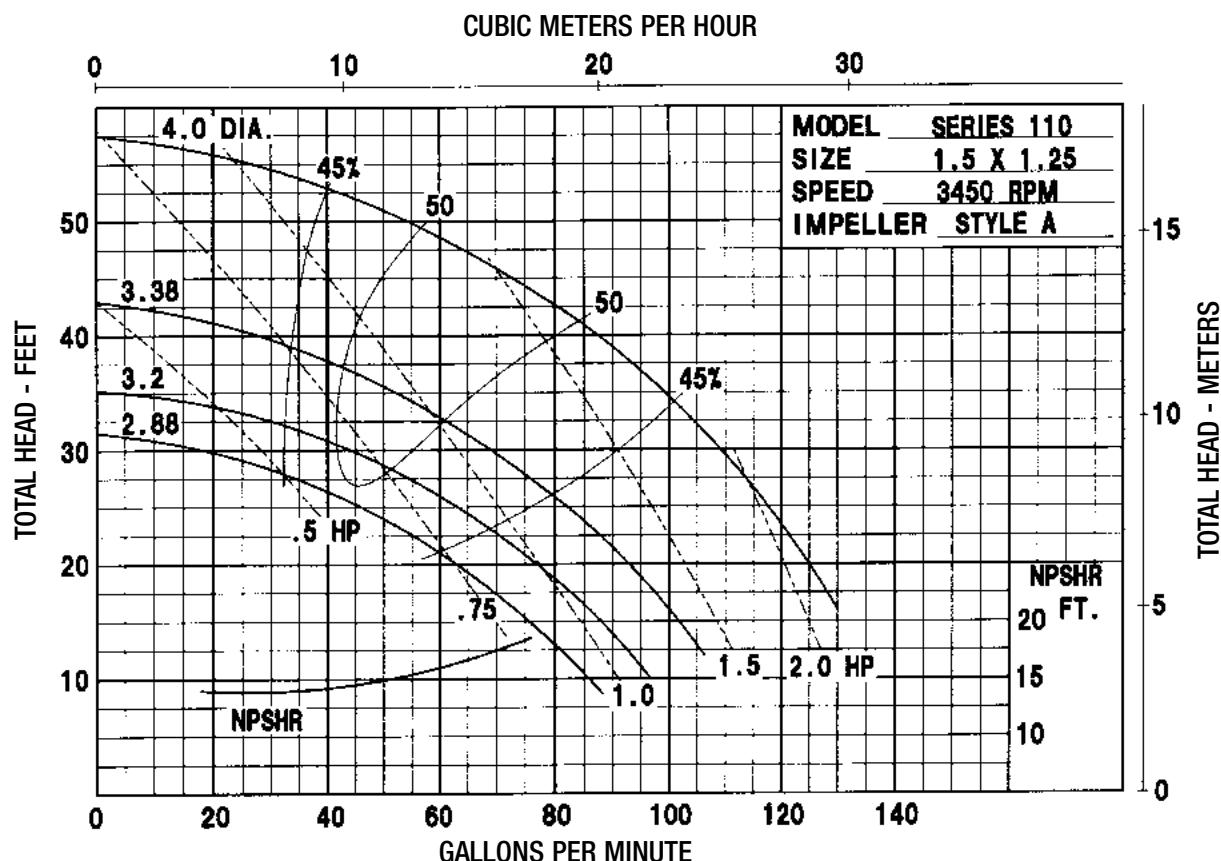
### **Series 60 Pump Performance Curves**



### Series 80 Pump Performance Curves

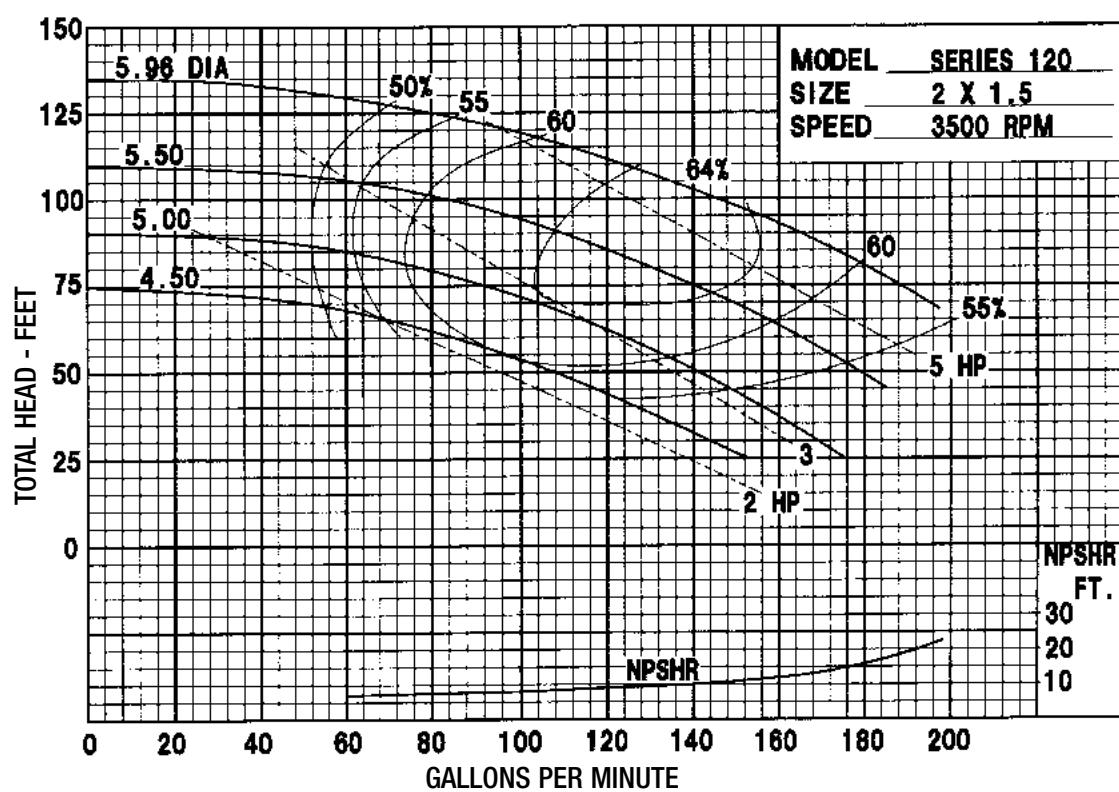


### Series 110 Pump Performance Curves

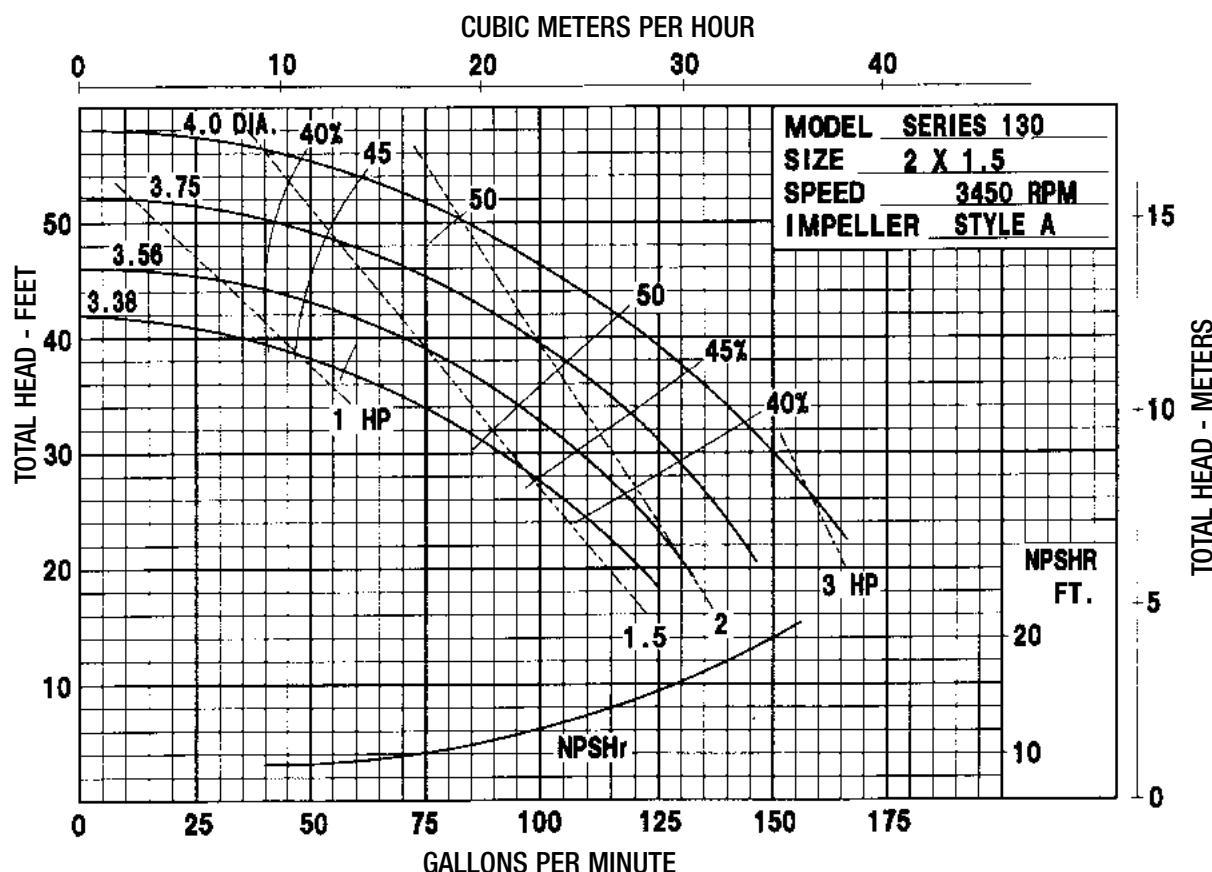


Other Performance Curves Available Upon Request

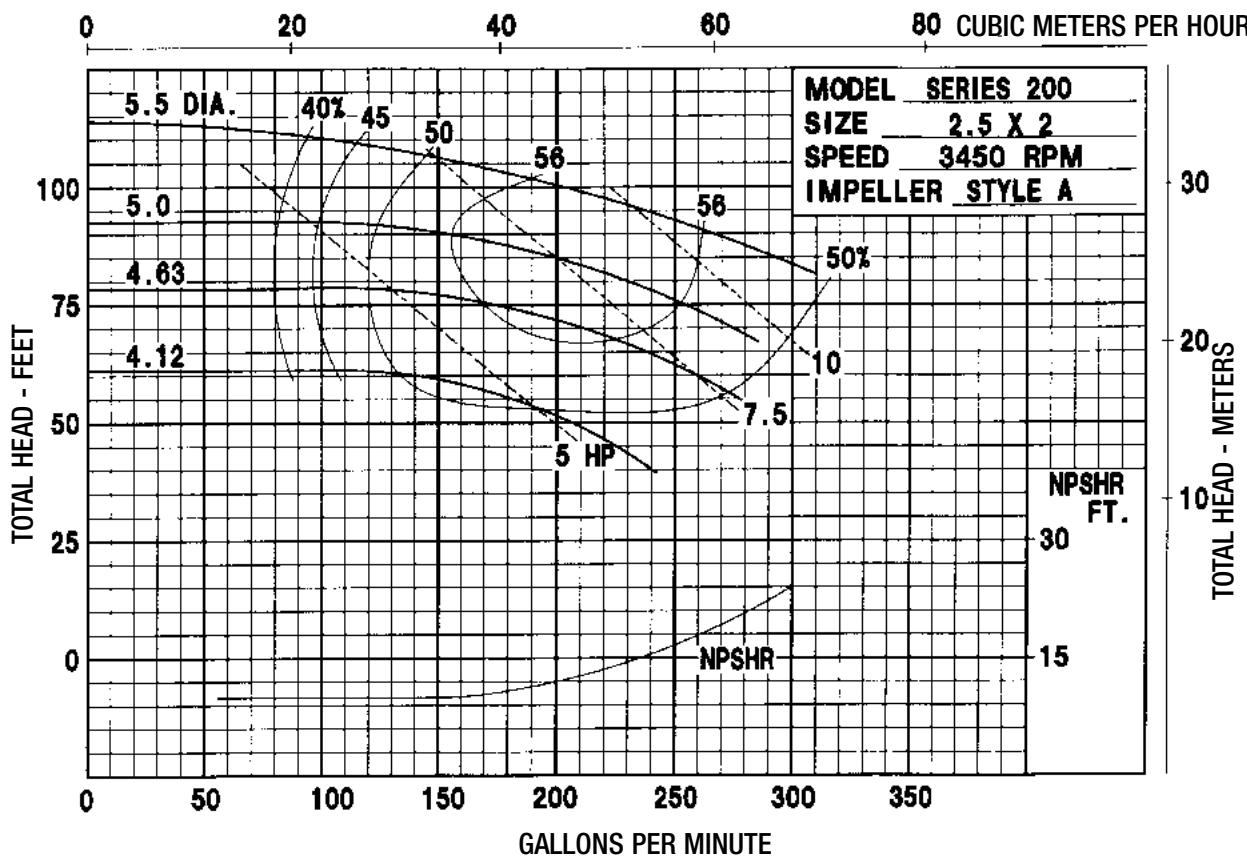
### Series 120 Pump Performance Curves



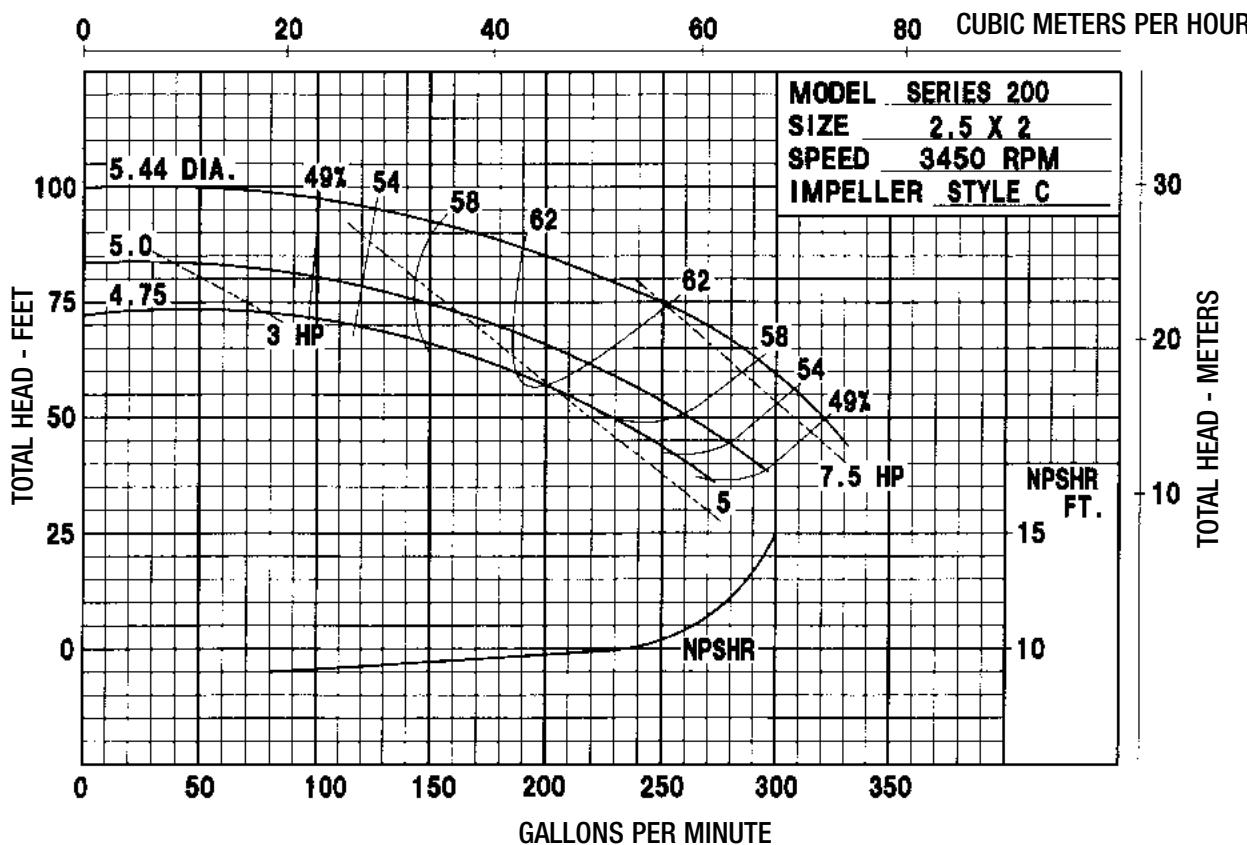
### Series 130 Pump Performance Curves



### **Series 200 Style A Pump Performance Curves**

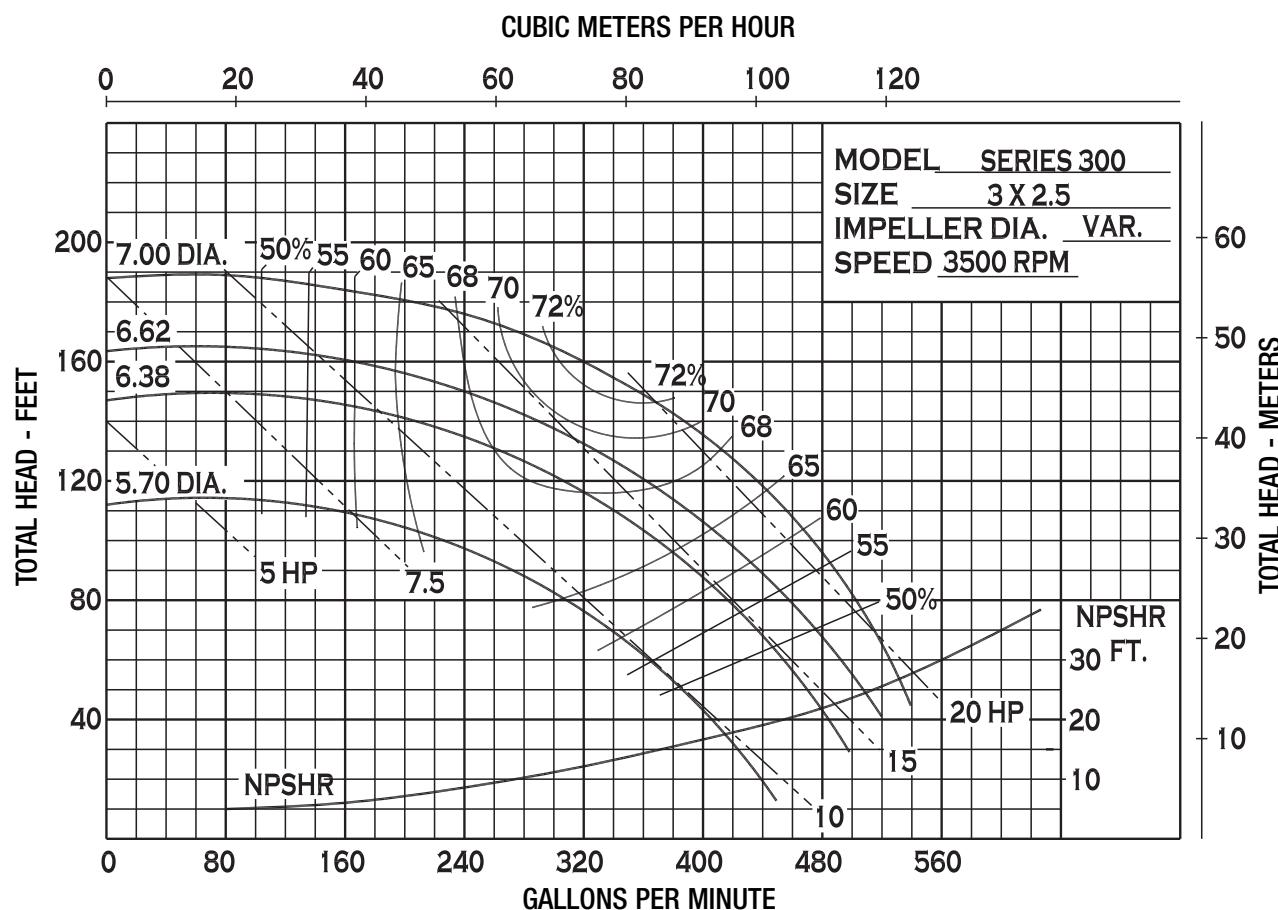


### **Series 200 Style C Pump Performance Curves**

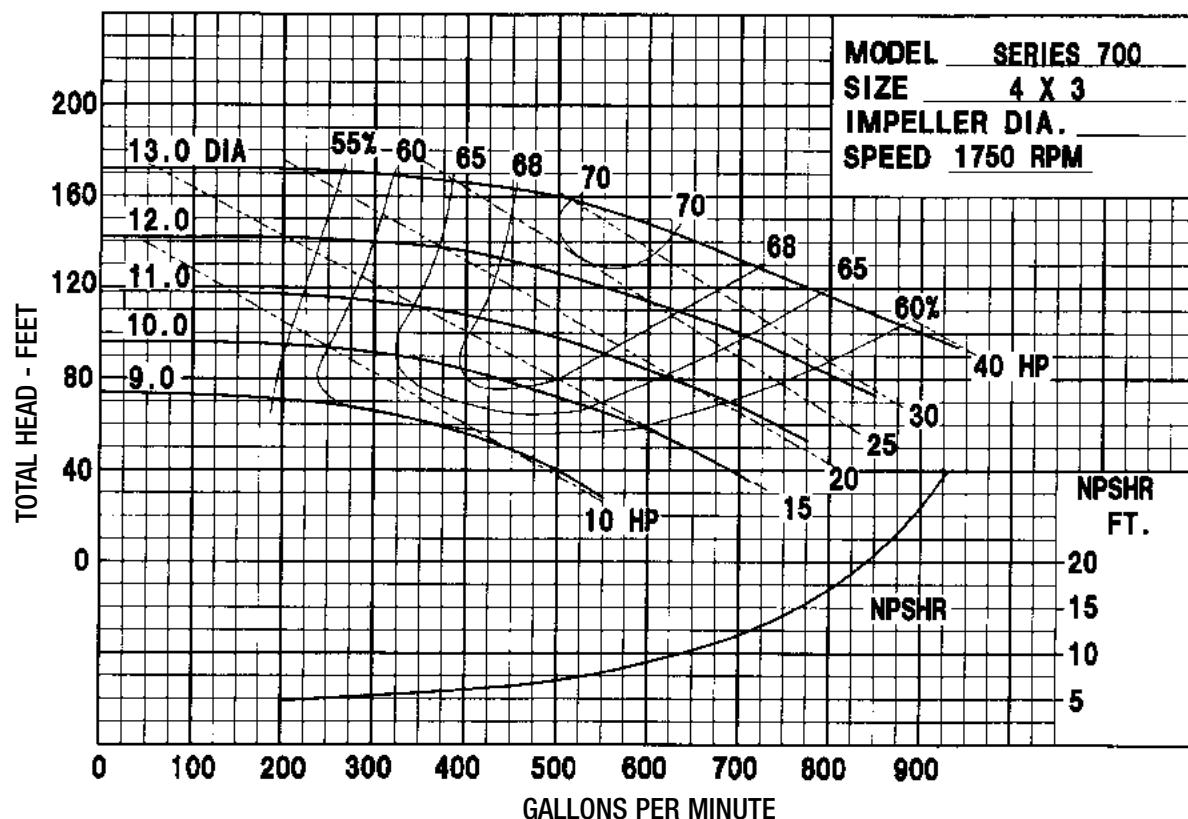


Other Performance Curves Available Upon Request

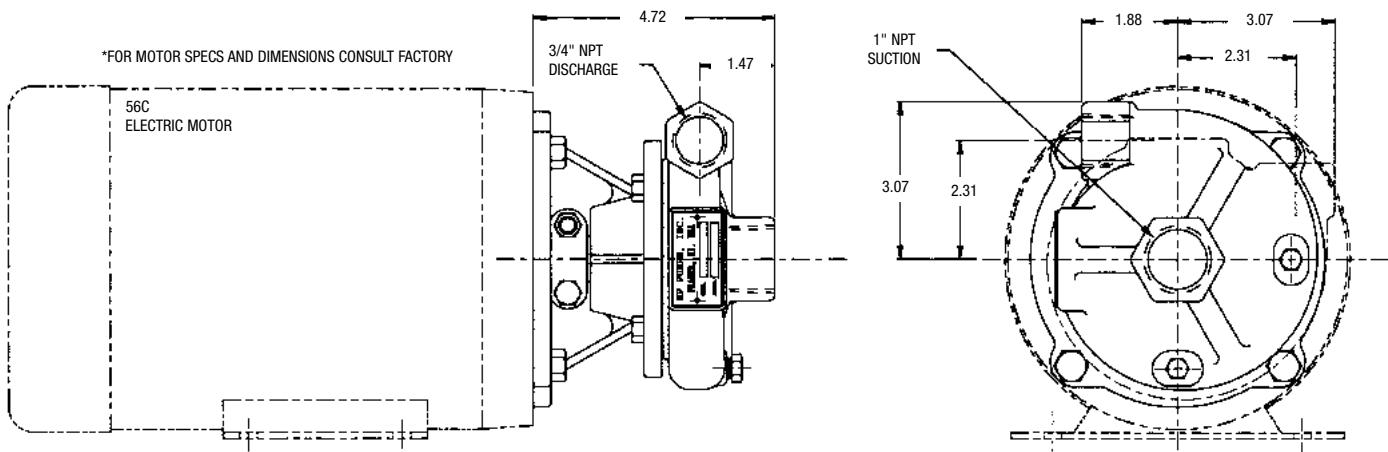
### **Series 300 Pump Performance Curves**



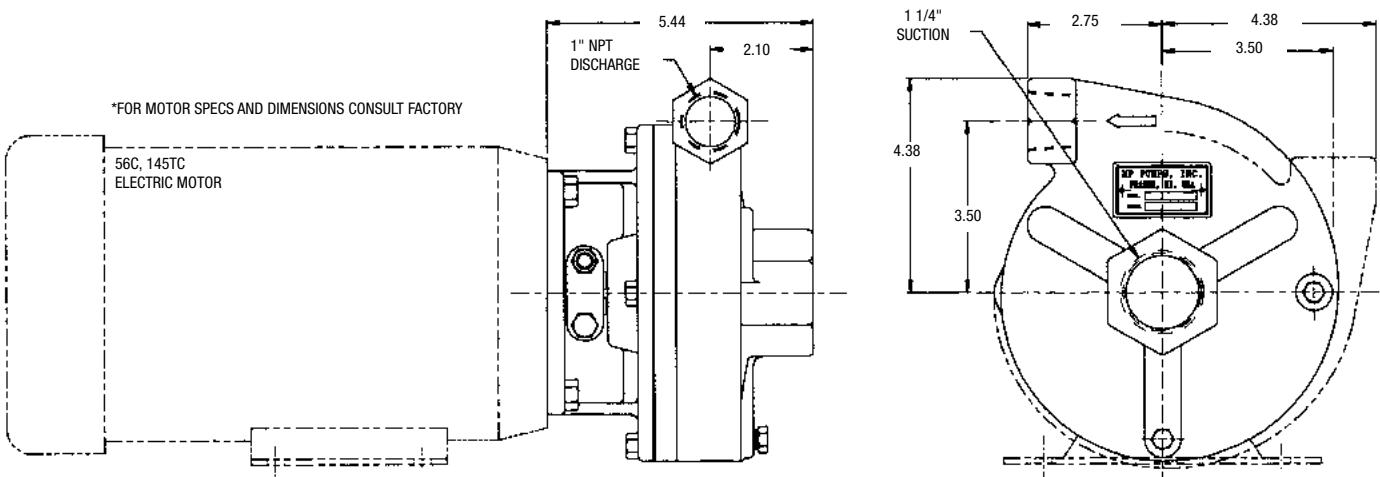
### **Series 700 Pump Performance Curves**



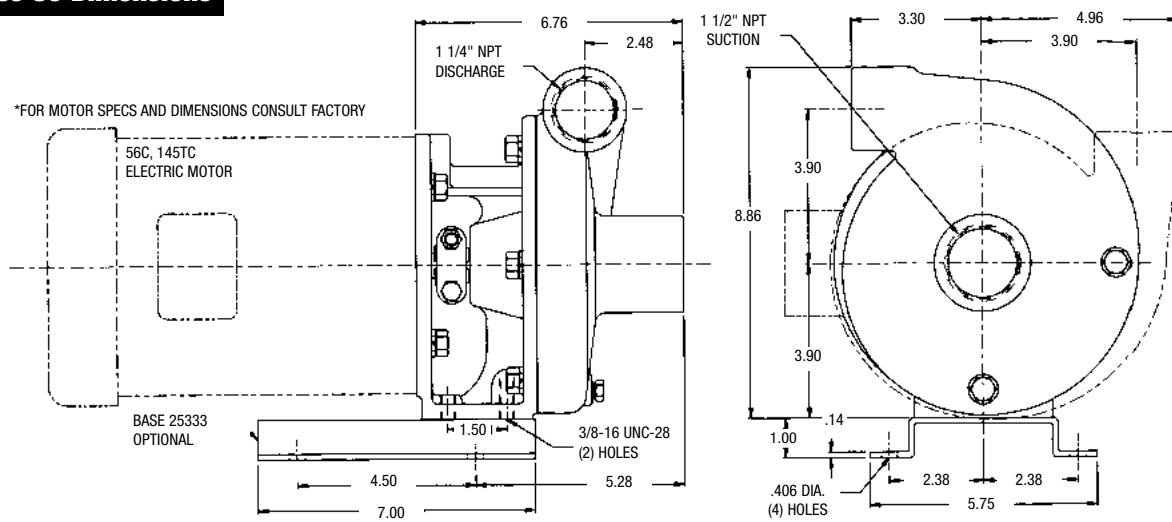
## Series 30 Dimensions



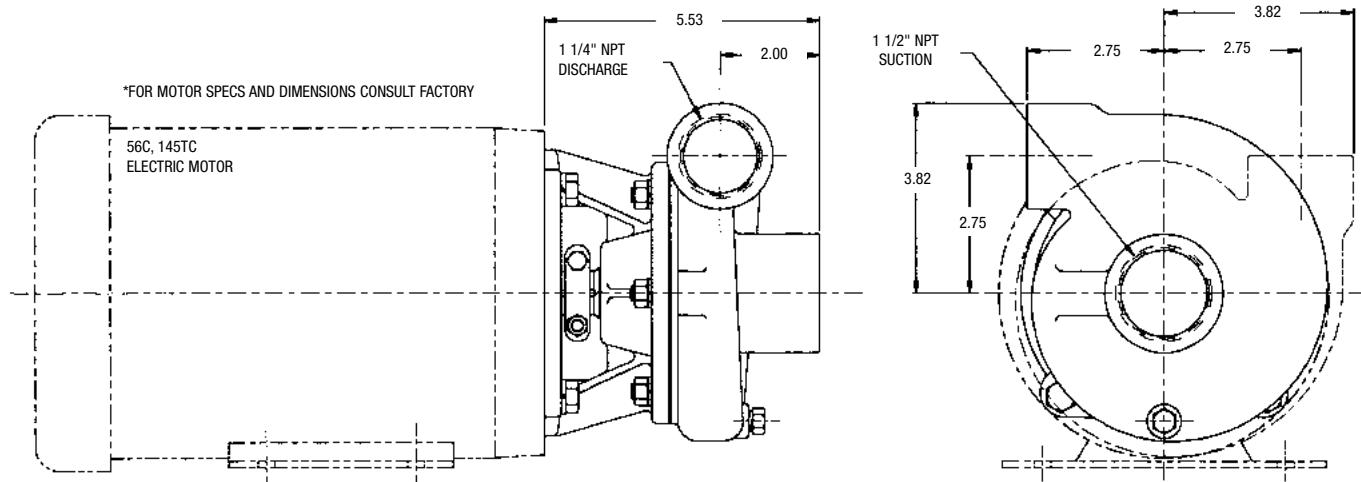
## Series 60 Dimensions



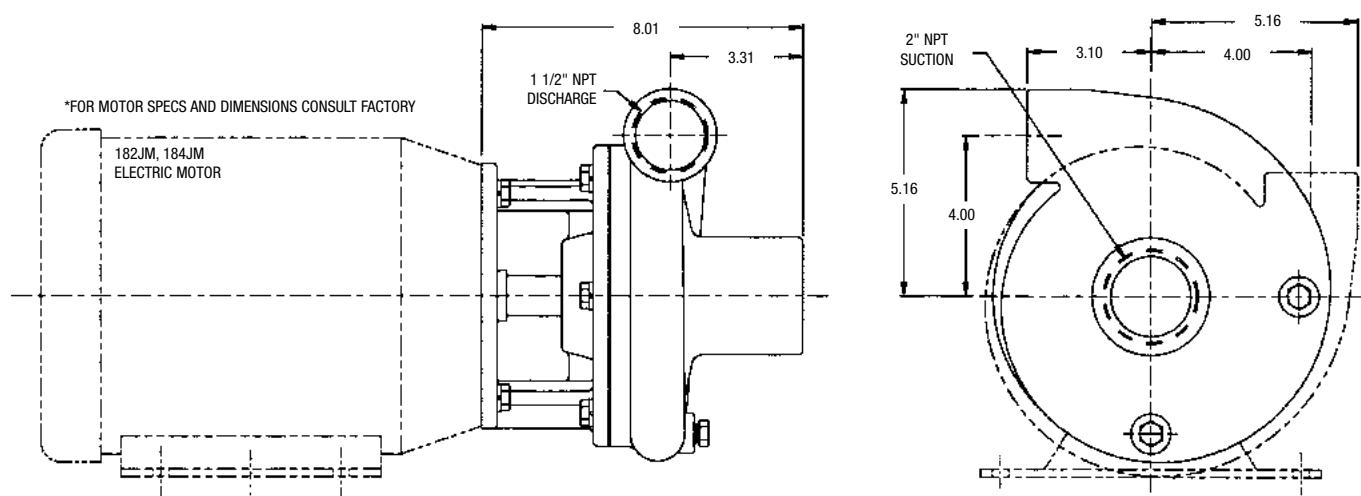
## Series 80 Dimensions



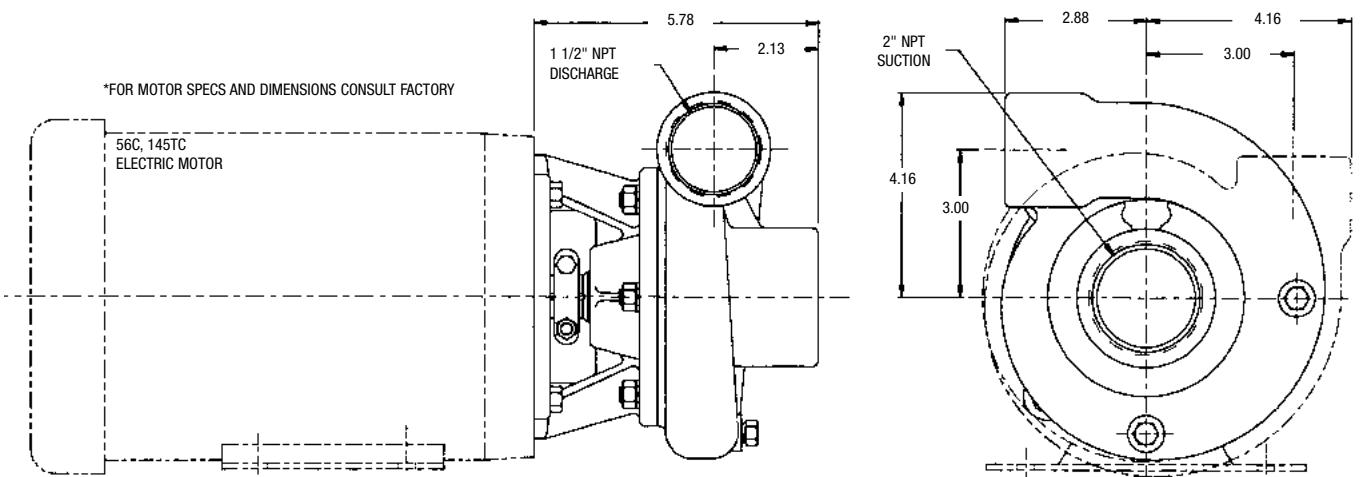
## **Series 110 Dimensions**



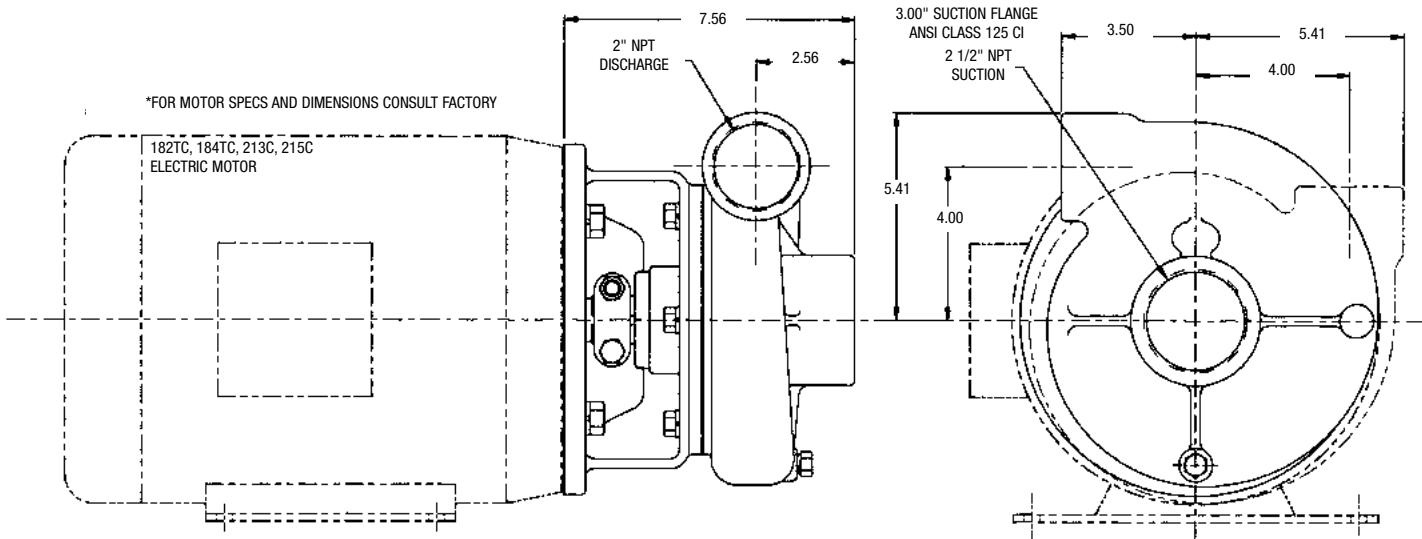
## **Series 120 Dimensions**



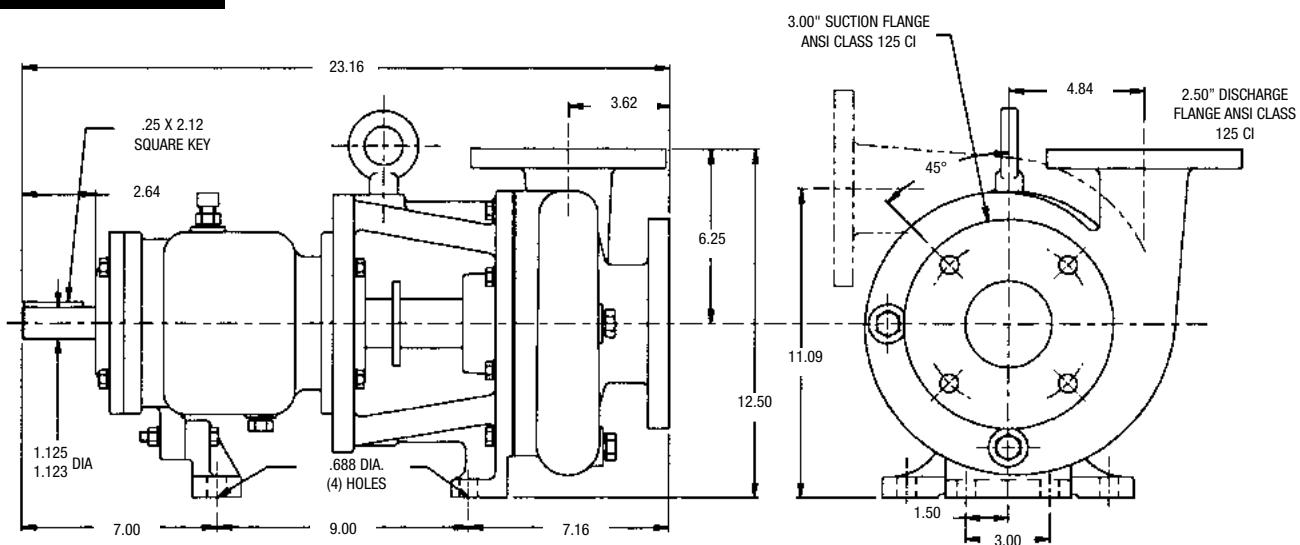
## **Series 130 Dimensions**



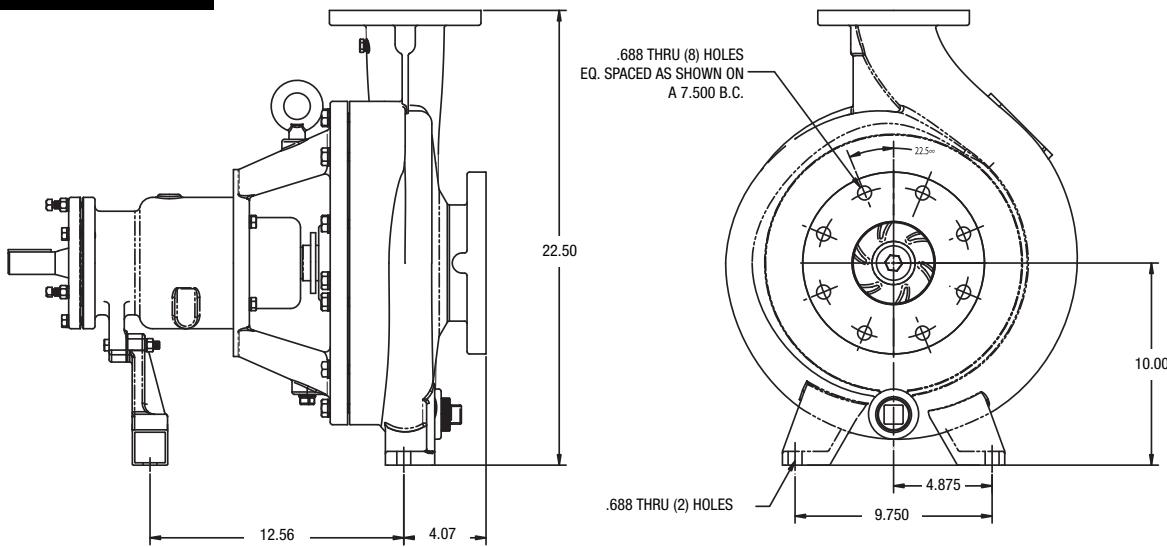
## Series 200 Dimensions



## Series 300 Dimensions



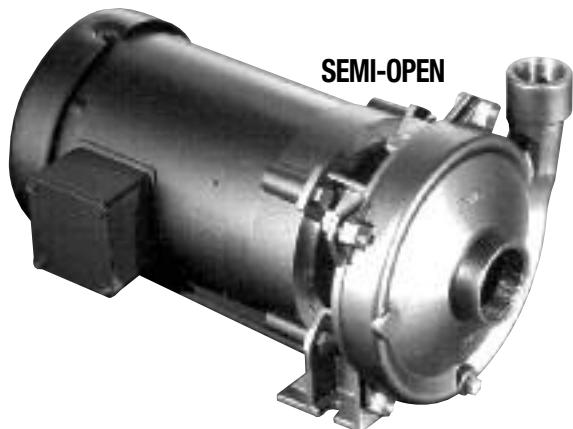
## Series 700 Dimensions



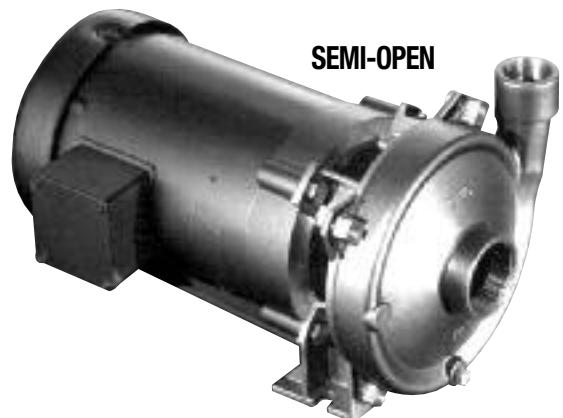
# **CHEMFLO 1 2 3 4**

## **END SUCTION CENTRIFUGAL PUMP FEATURES**

- CHEMFLO 1,2,3 & 4 - INVESTMENT-CAST, 316 STAINLESS, NICKEL/ALUMINUM/BRONZE
- CHEMFLO 5,6,7, 8 & 9 - 316 CF8M STAINLESS STEEL HOUSING, SEAL HOUSING & IMPELLER
- PRESSURES - 105-460 FEET HEAD
- FLOWS - 100-450 GPM
- CHEMFLO 1,2,3,4 PUMPAKS FOR 56C AND 145TC ELECTRIC MOTORS  
CHEMFLO 5, 6, 7, 8, AND 9 PUMPAKS FOR ELECTRIC MOTOR FRAME SIZE 145TC THROUGH 286TCS
- HORSEPOWER - 1-40 HP
- OPTIONAL ELASTOMERS AVAILABLE
- HYDRAULIC MOTOR DRIVE AVAILABLE



**CHEMFLO 1 & 2**



**CHEMFLO 3 & 4**

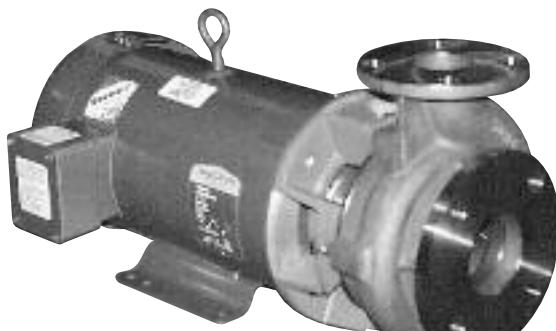
MODEL	Suction	Discharge
CHEMFLO 1 & 2	1½" NPT	1" NPT
CHEMFLO 3 & 4	2" NPT	1½" NPT
CHEMFLO 5	2" ANSI 125 Flange	1½" ANSI 125 Flange
CHEMFLO 6	3" ANSI 125 Flange	2" ANSI 125 Flange
CHEMFLO 7	2" ANSI 125 Flange	1" ANSI 125 Flange
CHEMFLO 8	3" ANSI 125 Flange	1½" ANSI 125 Flange
CHEMFLO 9	2"ANSI 125 Flange	1" ANSI 125 Flange



**CHEMFLO 5**

# **5 6 7 8 9**

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**CHEMFLO 6**



**CHEMFLO 8**

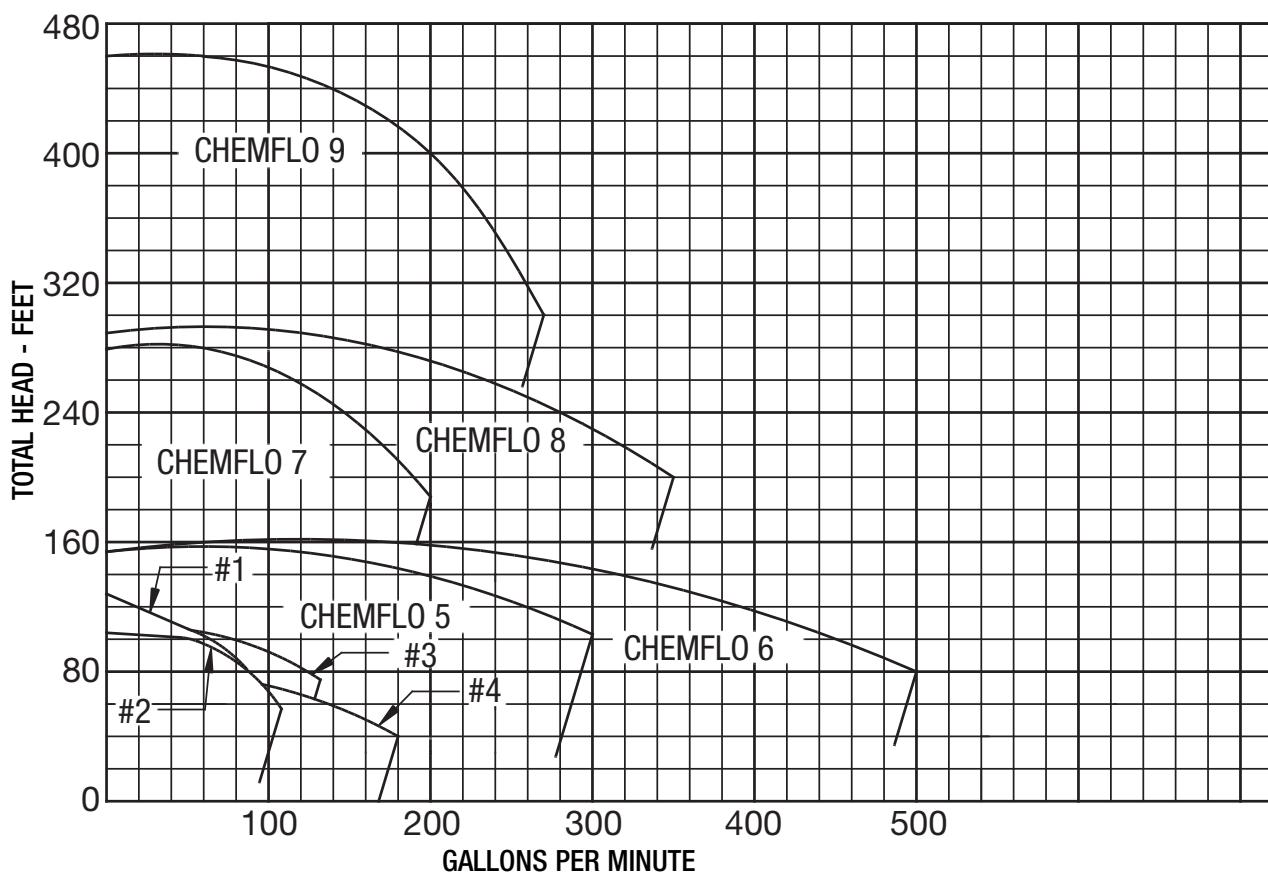


**CHEMFLO 7**

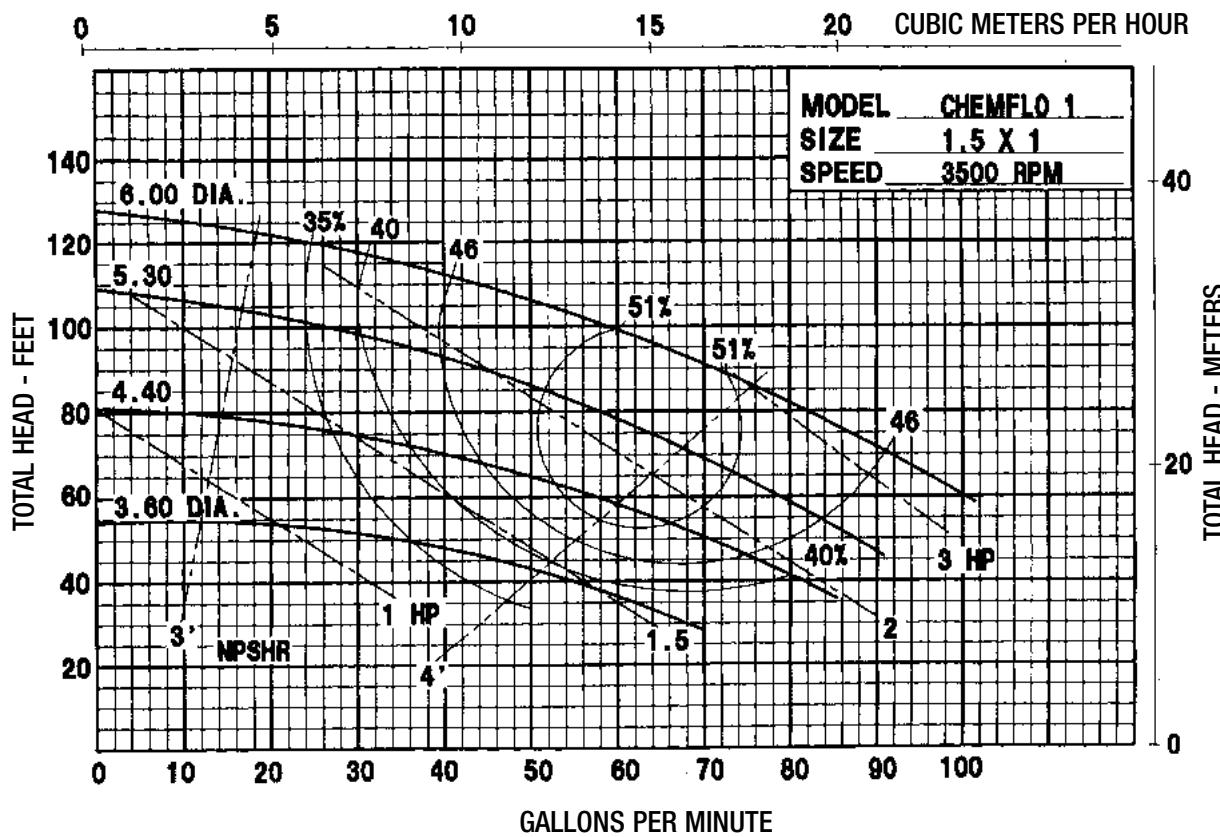


**CHEMFLO 9**

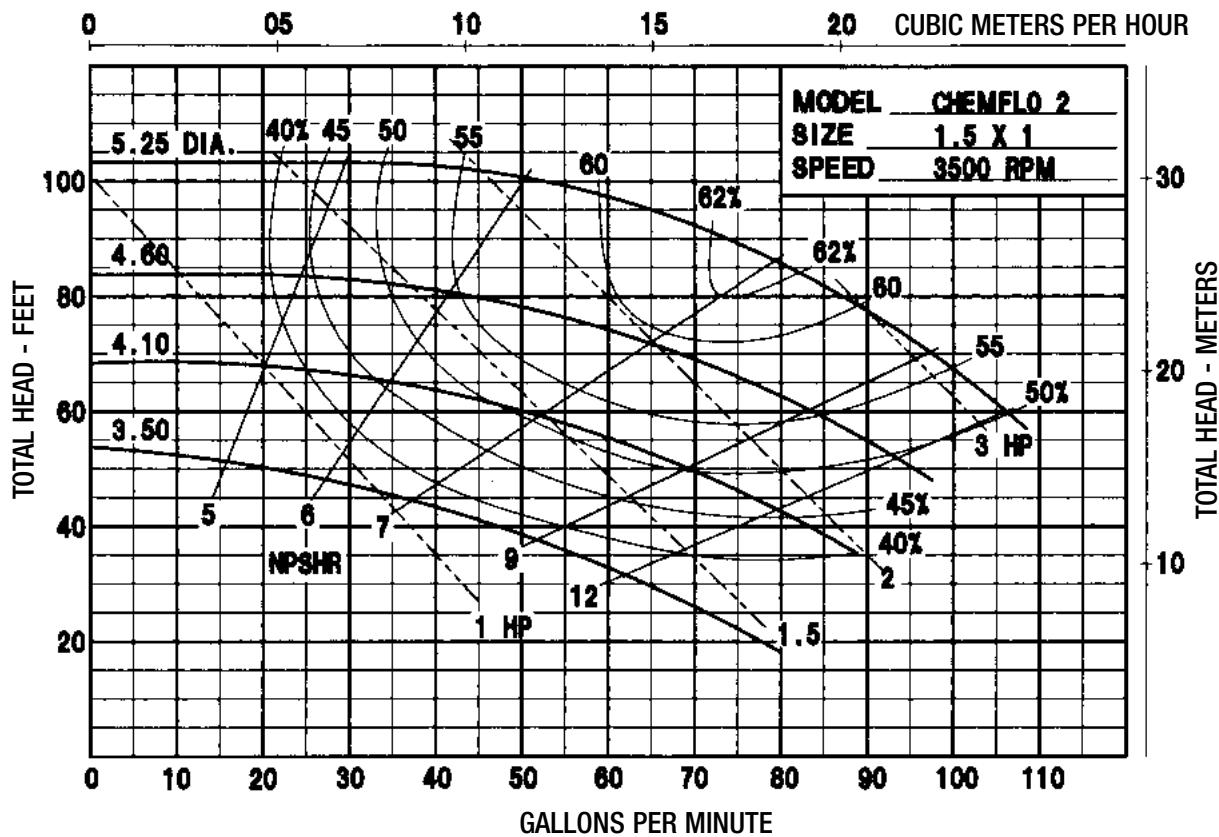
## **CHEMFLO Selection**



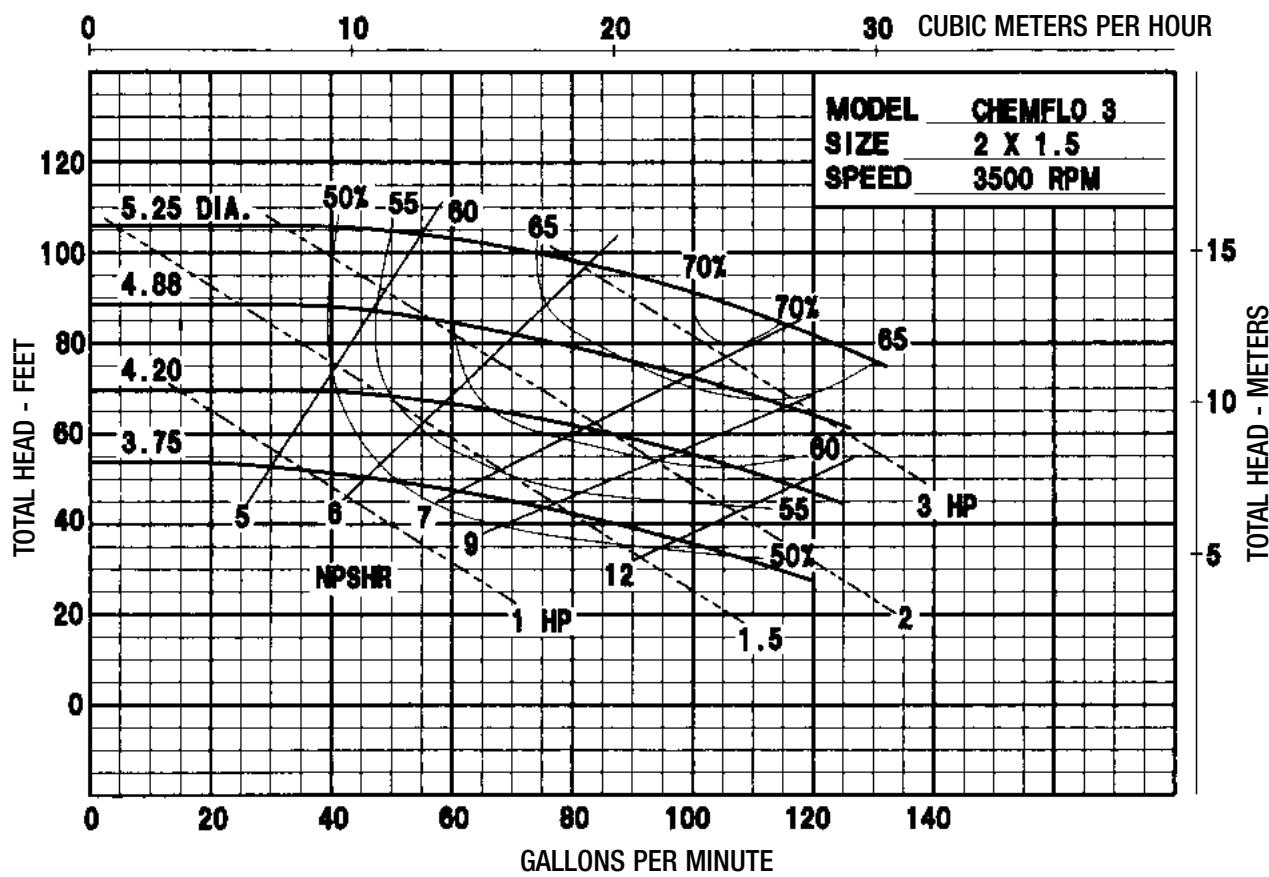
### CHEMFLO 1 Pump Performance Curves



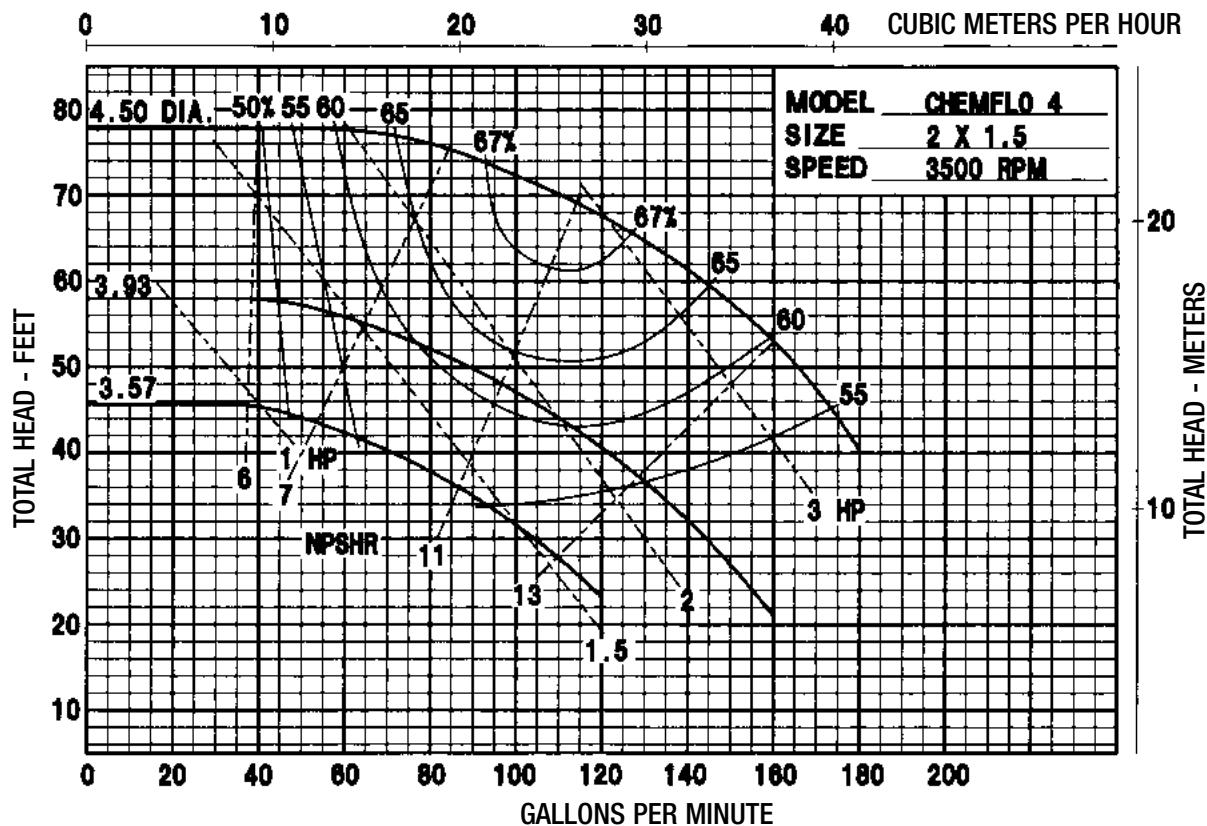
### CHEMFLO 2 Pump Performance Curves



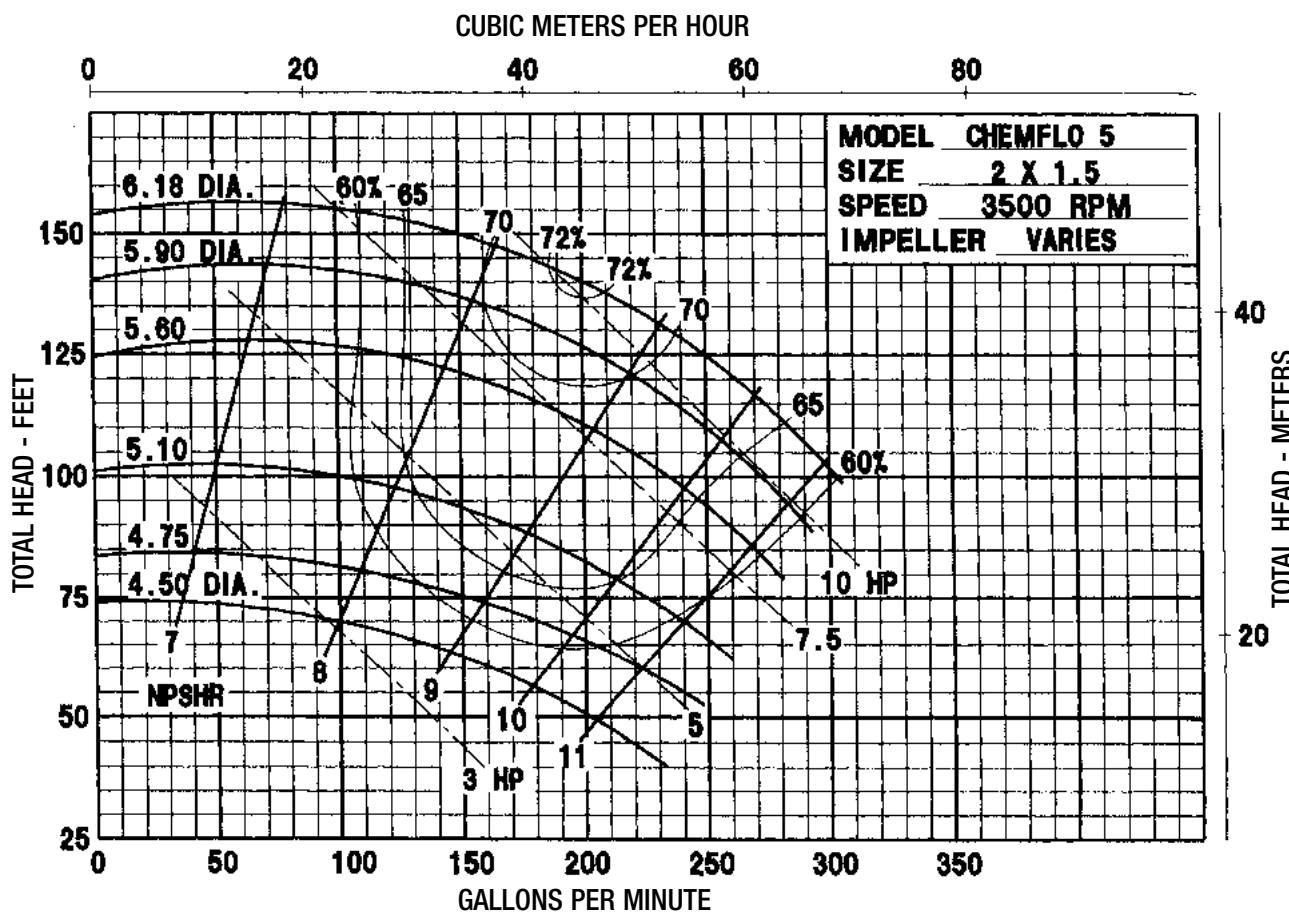
### CHEMFLO 3 Pump Performance Curves



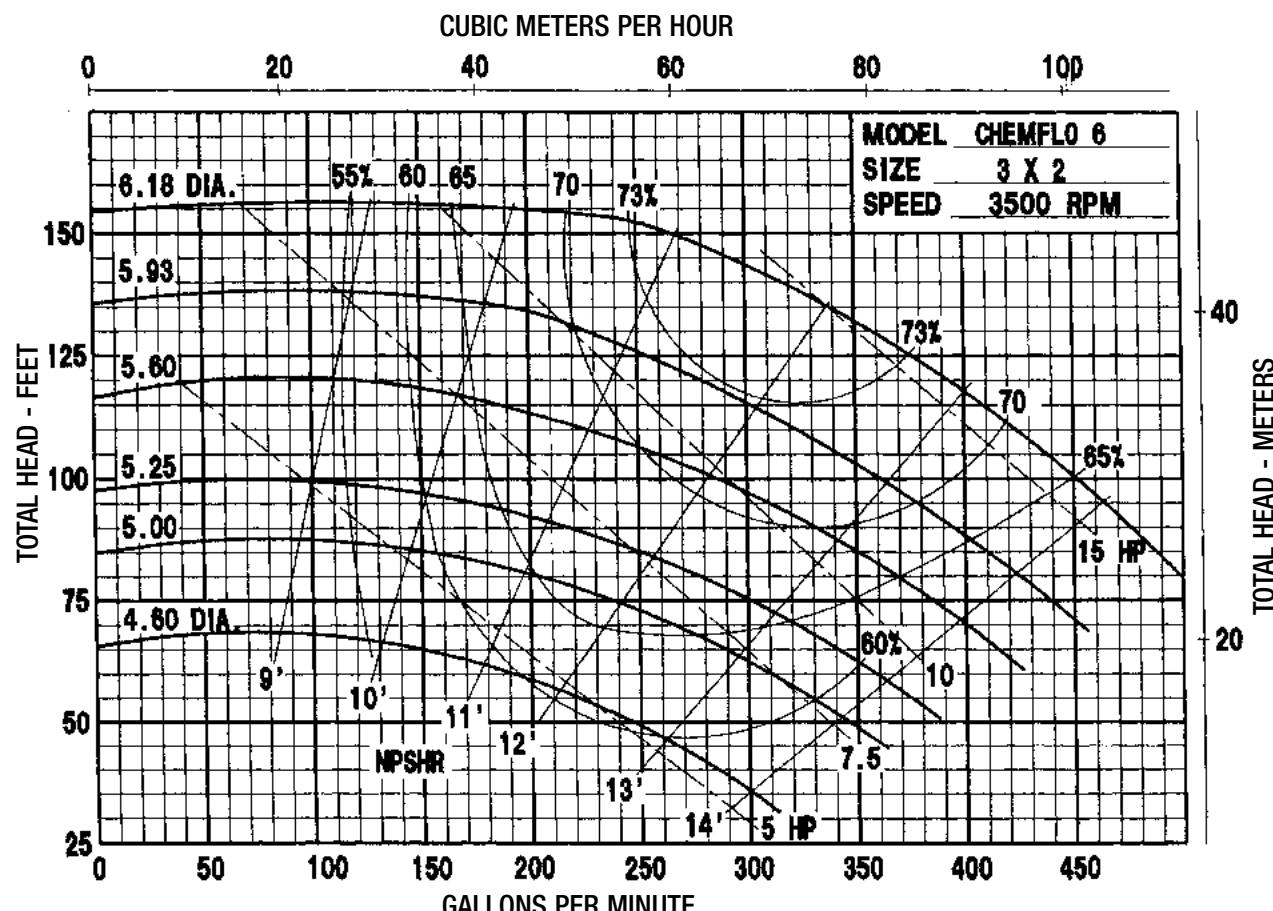
### CHEMFLO 4 Pump Performance Curves



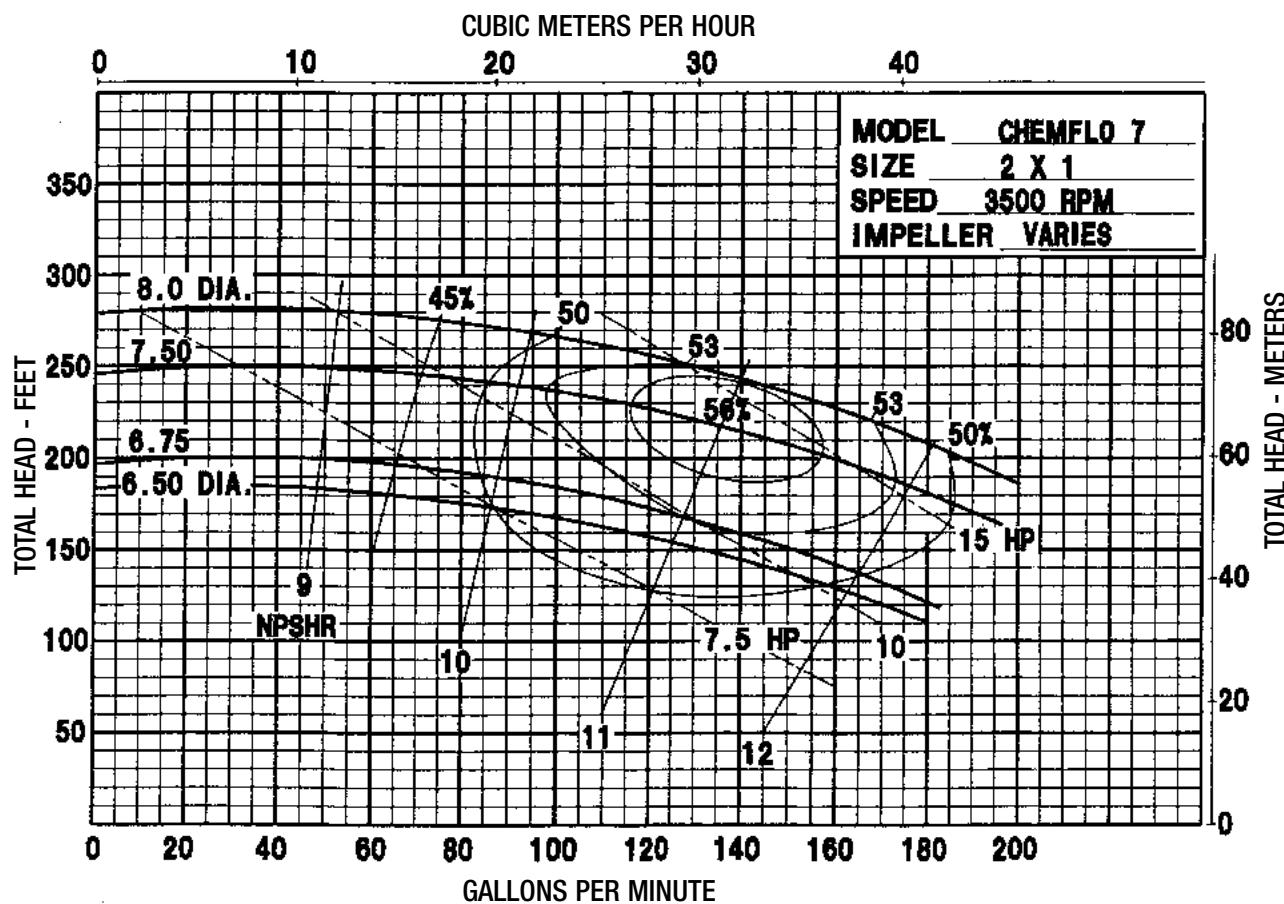
### CHEMFLO 5 Pump Performance Curves



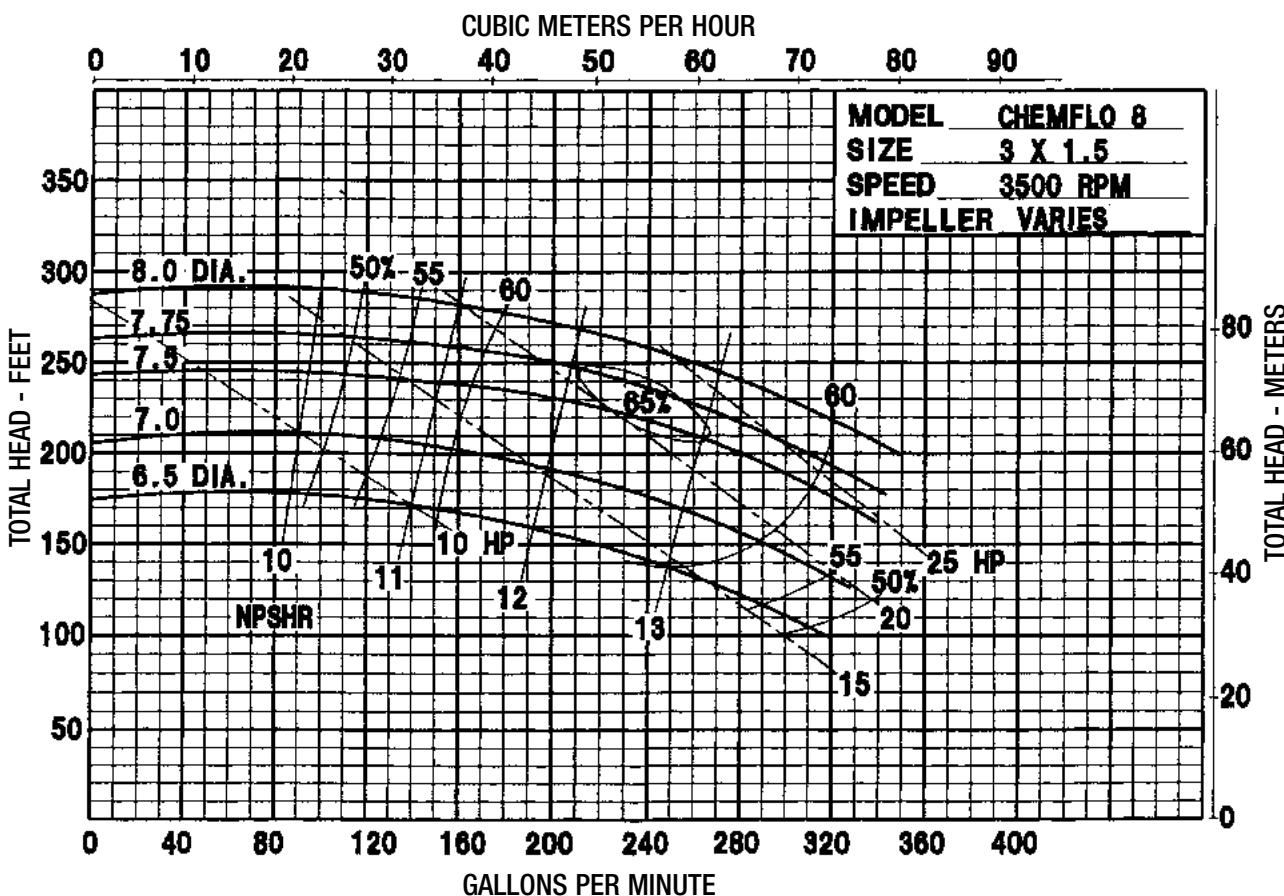
### CHEMFLO 6 Pump Performance Curves



### CHEMFLO 7 Pump Performance Curves

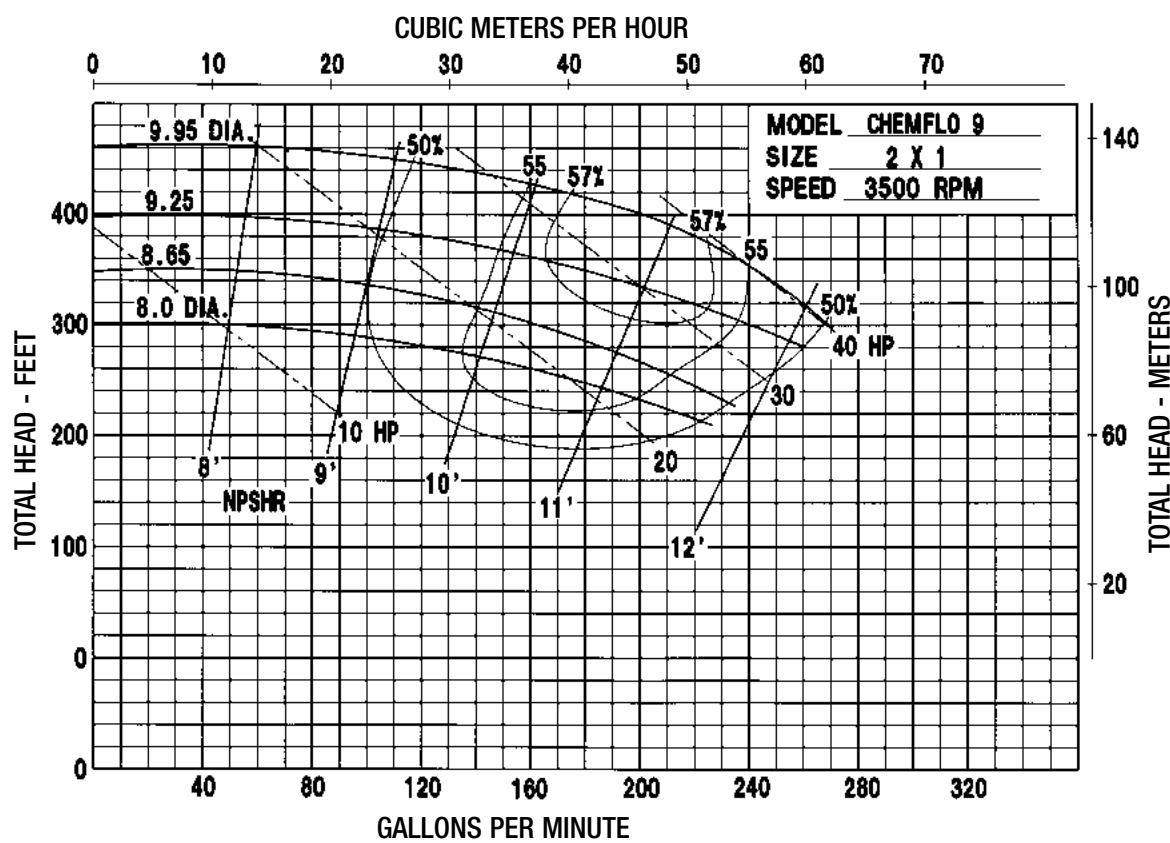


### CHEMFLO 8 Pump Performance Curves

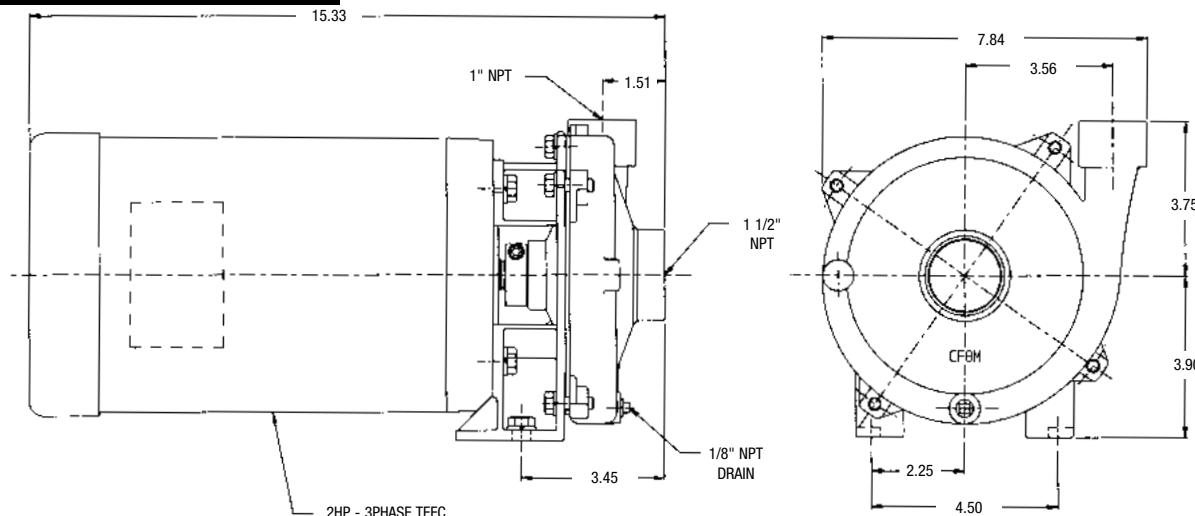


Other Performance Curves Available Upon Request

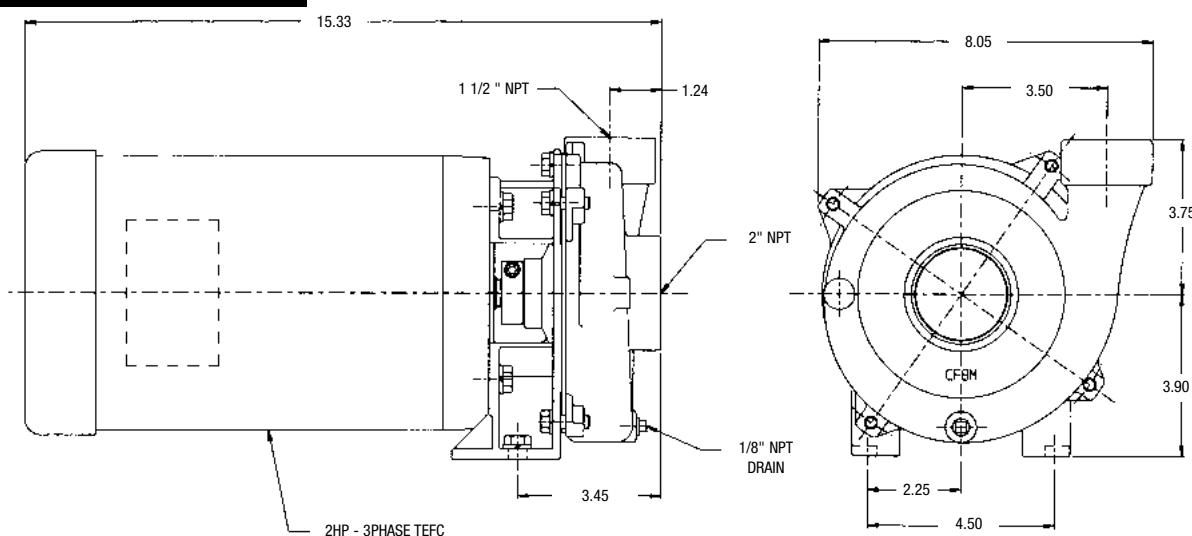
## CHEMFLO 9 Pump Performance Curves



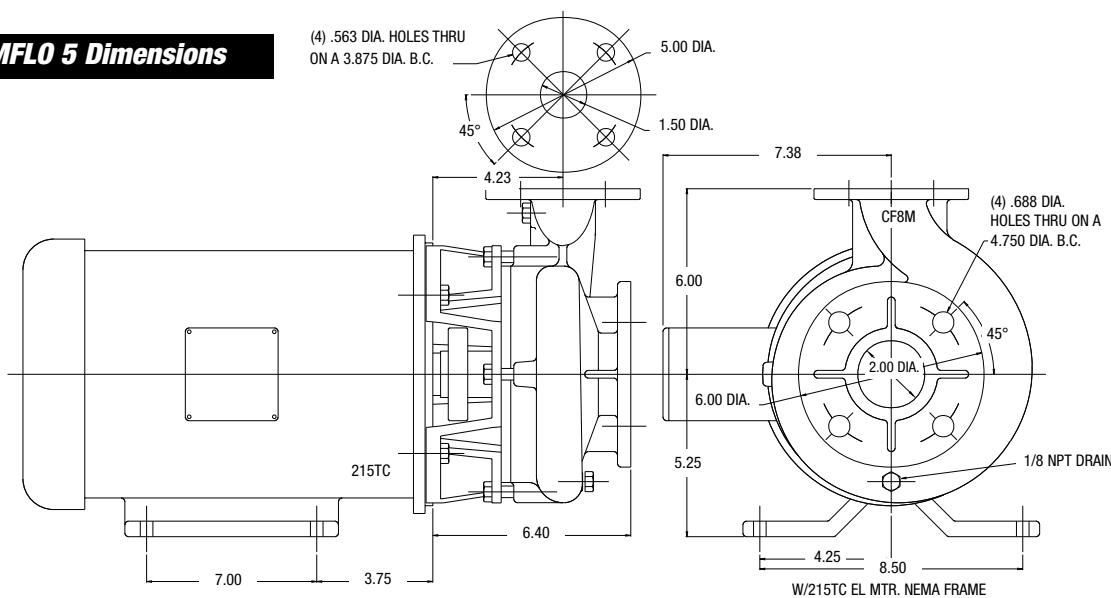
### CHEMFLO 1&2 Dimensions



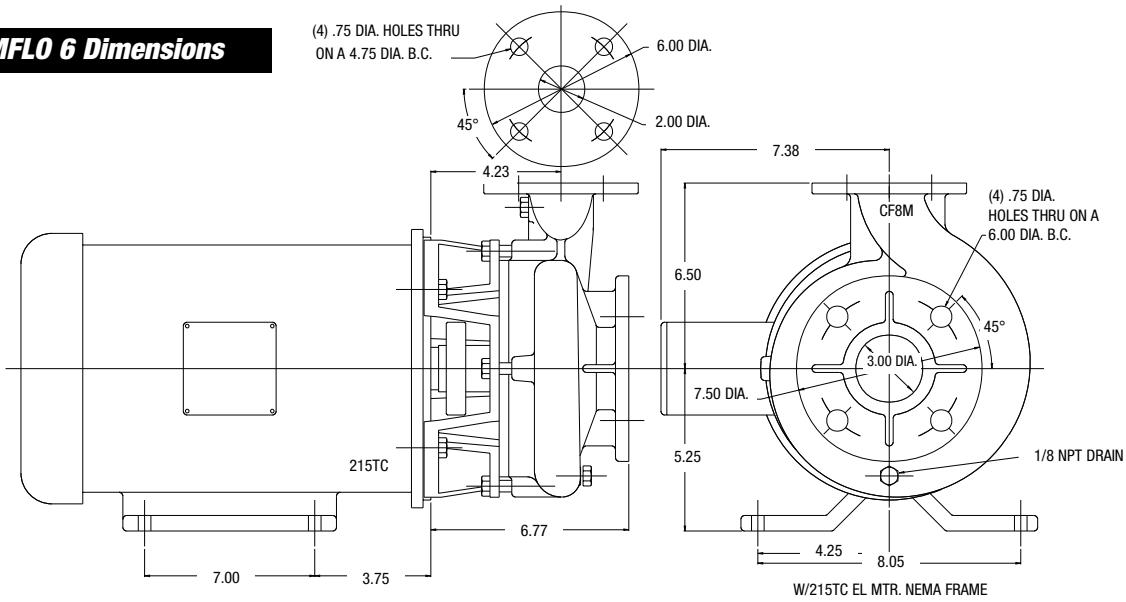
### CHEMFLO 3&4 Dimensions



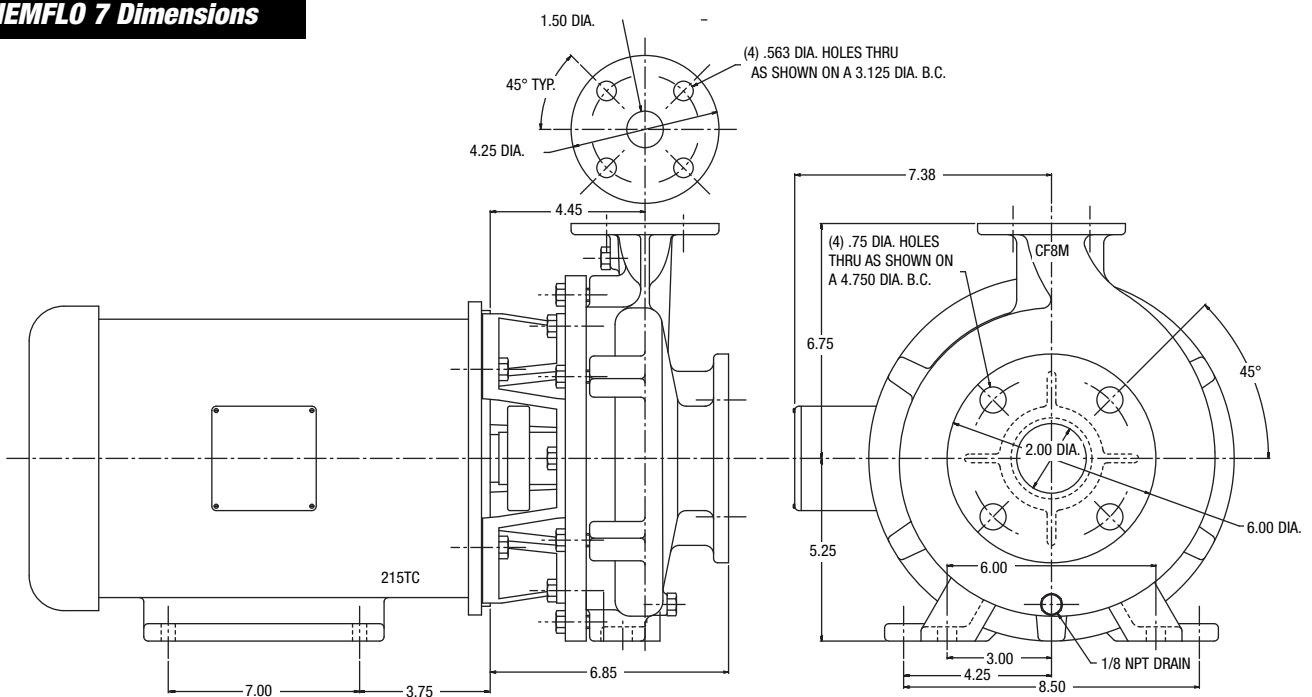
### CHEMFLO 5 Dimensions



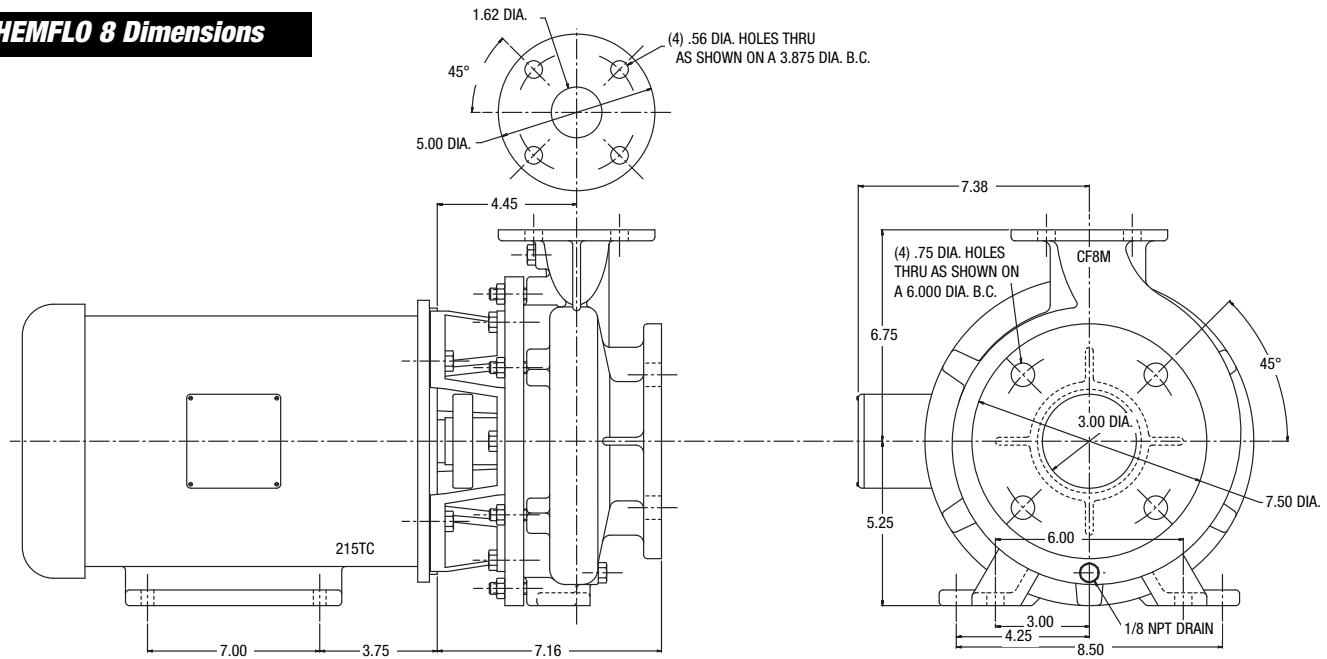
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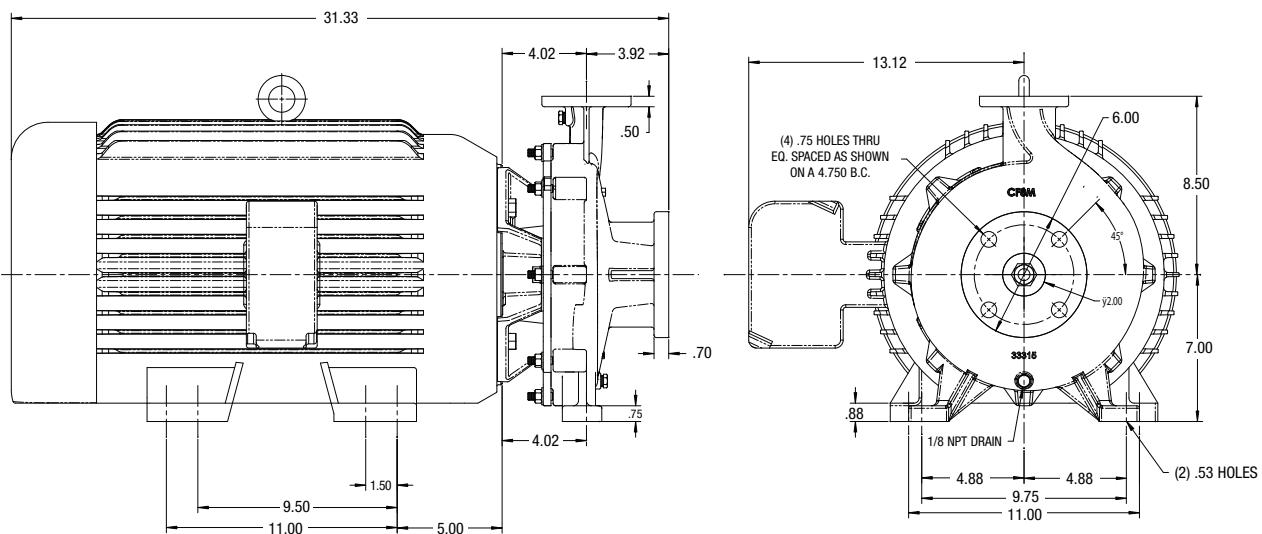
### CHEMFLO 7 Dimensions



## CHEMFLO 8 Dimensions



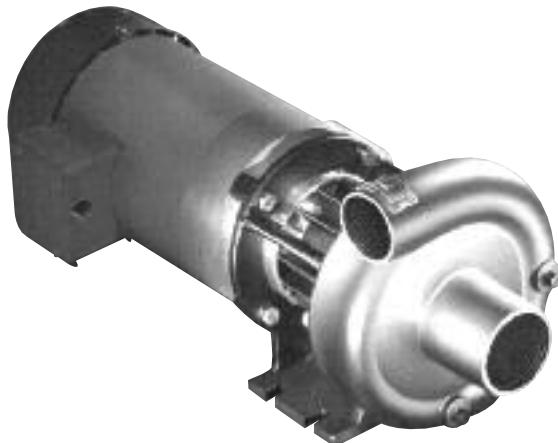
## CHEMFLO 9 Dimensions



# **HTO 80 120 180 300**

## **CENTRIFUGAL HOT OIL PUMP FEATURES**

- **APPLICATIONS:** PLASTICS, CHEMICAL, FOOD, AND PROCESSING INDUSTRIES WHICH REQUIRE PUMPING OF HIGH TEMPERATURE FLUIDS
- **UTILIZES AN ISOLATED SEAL CHAMBER, EFFECTIVELY COOLED BY A FAN CLAMP, WHICH COUPLES THE UNIT TO THE SHAFT OF A C-FRAME MOTOR**
- **STANDARD CARBON/SILICON CARBIDE MECHANICAL SEAL WITH VITON ELASTOMERS, STAINLESS STEEL FITTED**
- **CARBON GRAPHITE ISOLATOR BUSHING SEPARATES MECHANICAL SEAL FROM HIGH TEMPERATURE FLUIDS**
- **STAINLESS STEEL DRIVE SLEEVE AND ALUMINUM DRIVE CLAMP COUPLES PUMP UNIT TO MOTOR**
- **VERTICAL & HORIZONTAL DISCHARGE**
- **A UNIQUE CENTRIFUGAL PUMP (PATENTED) DESIGNED FOR HIGH TEMPERATURE APPLICATIONS WITHOUT REQUIRING EXTERNAL FLUSHES OR JACKET COOLING**
- **CAPACITIES - 10-500 GPM**
- **HEADS - UP TO 190' TDH**
- **TEMPERATURES - TO 650°F**



**HTO 80**



**HTO 120**

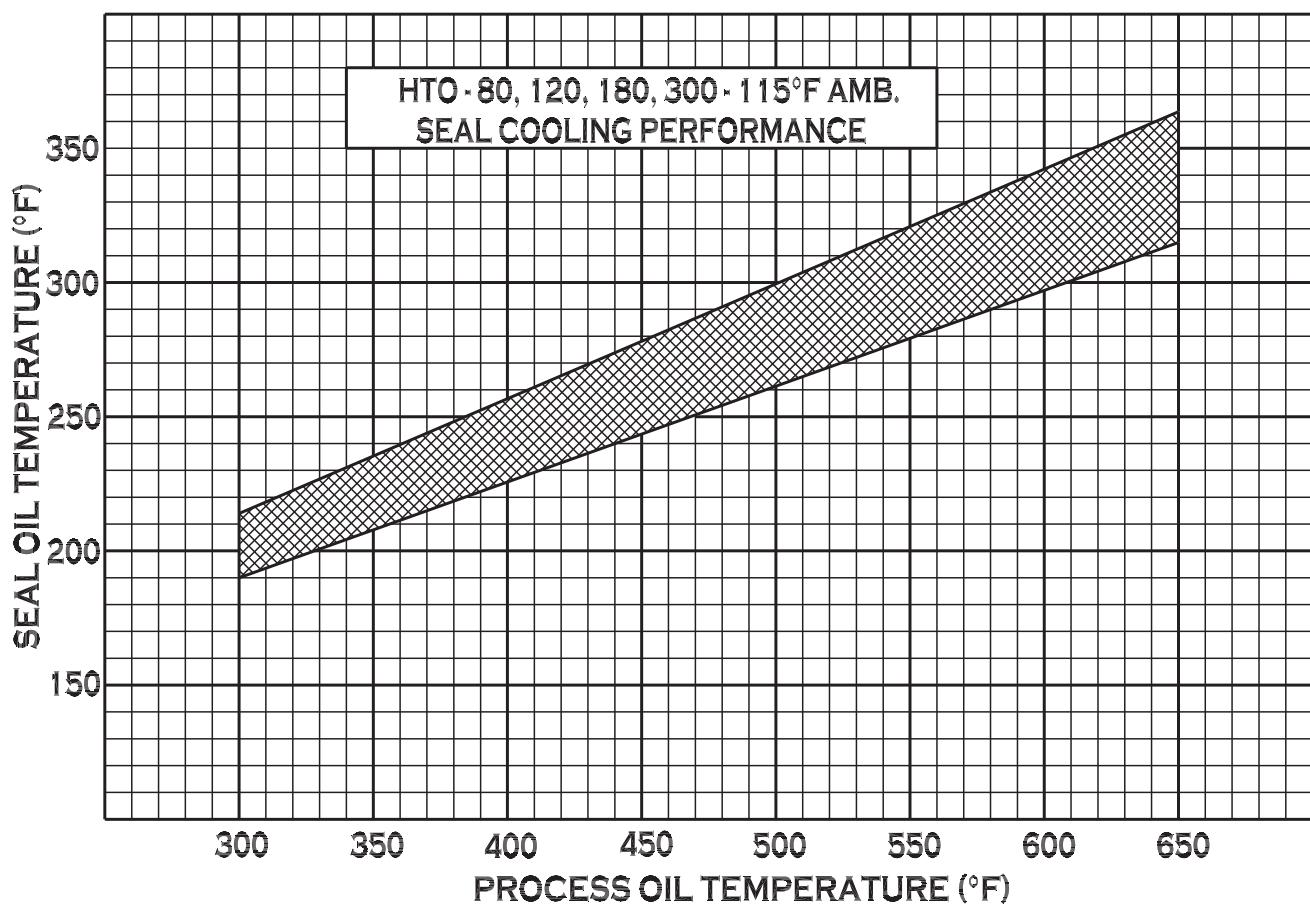
MODEL	Suction	Discharge
HTO 80	1½" NPT (Flange Option)	1¼" NPT (Flange Option)
HTO 120	2" NPT (Flange Option)	1½" NPT (Flange Option)
HTO 180	3" ANSI 150 Flange	1½" ANSI 150 Flange
HTO 300	3" ANSI 150 Flange	2½" ANSI 150 Flange



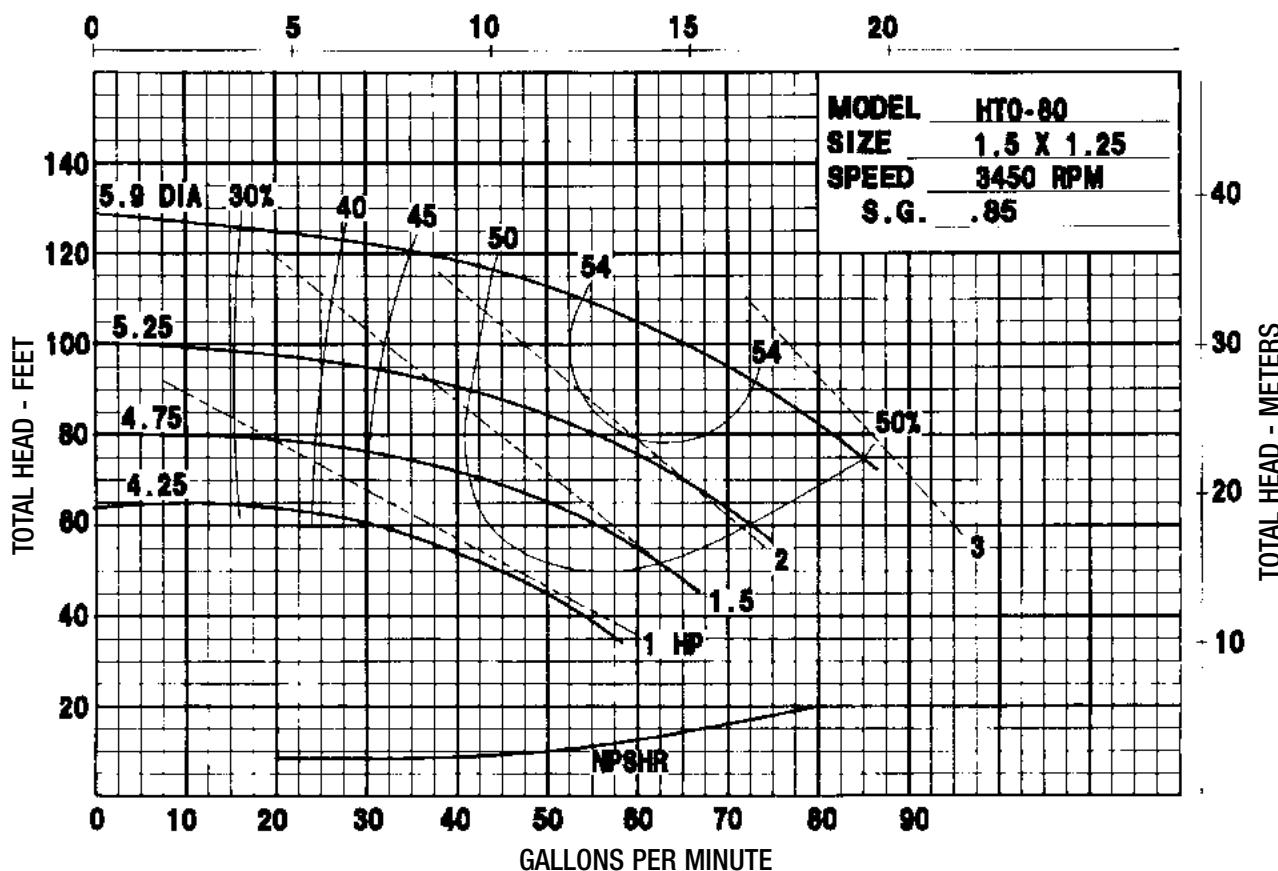
HTO 180



HTO 300



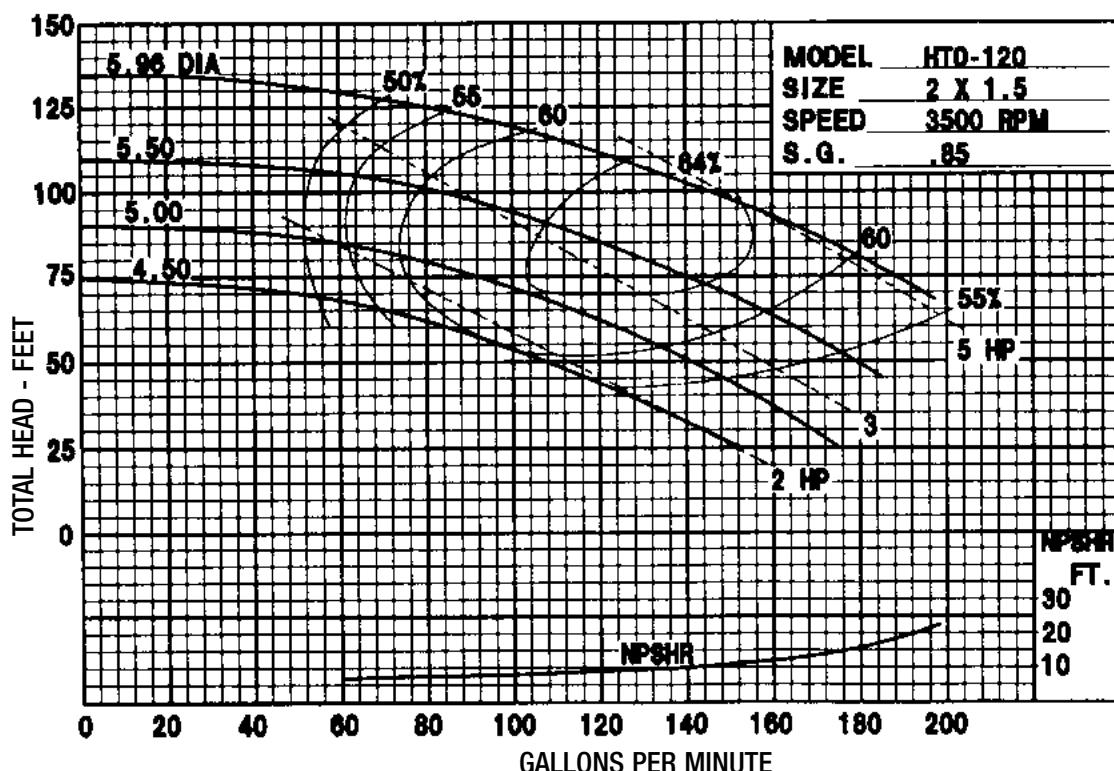
## HTO 80 Pump Performance Curves



Horsepower requirements based upon 0.85 specific gravity. Calculations can be applied for fluids of other specific gravities.

Maximum operating temperature is 650°F. Maximum working pressure is 150 PSI.

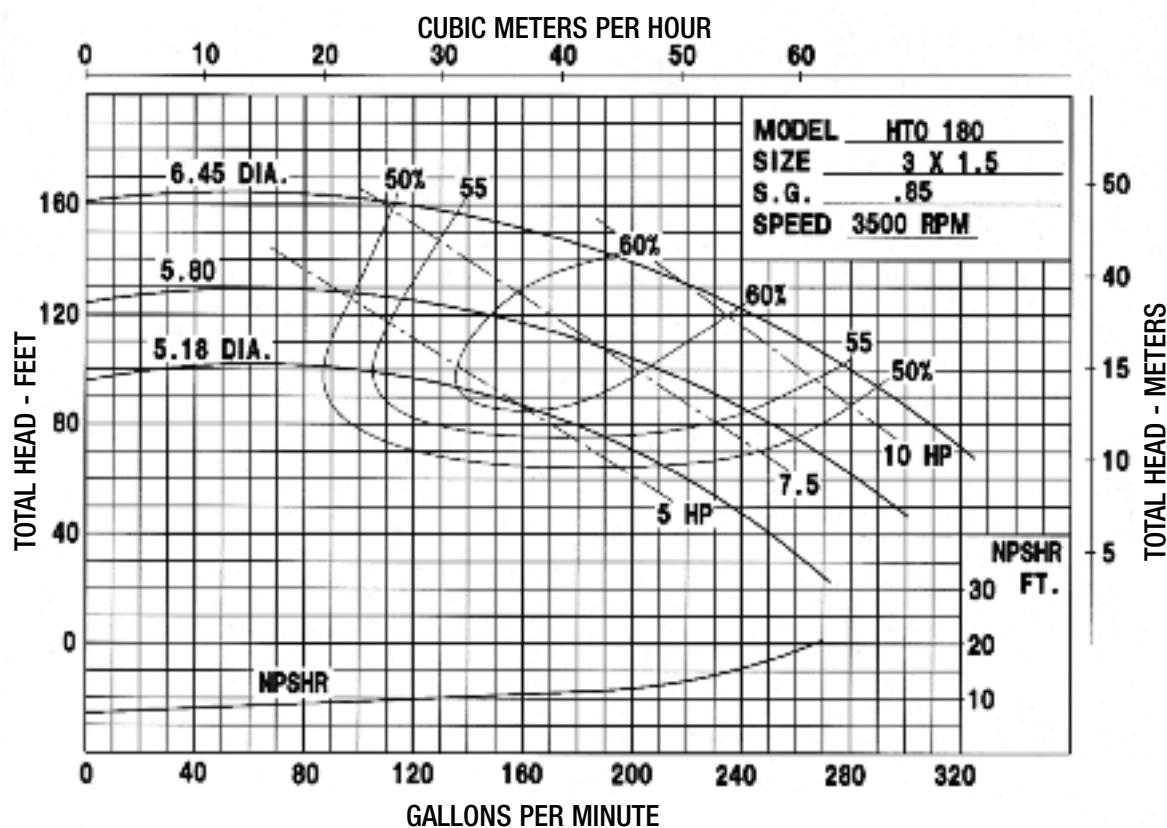
## HTO 120 Pump Performance Curves



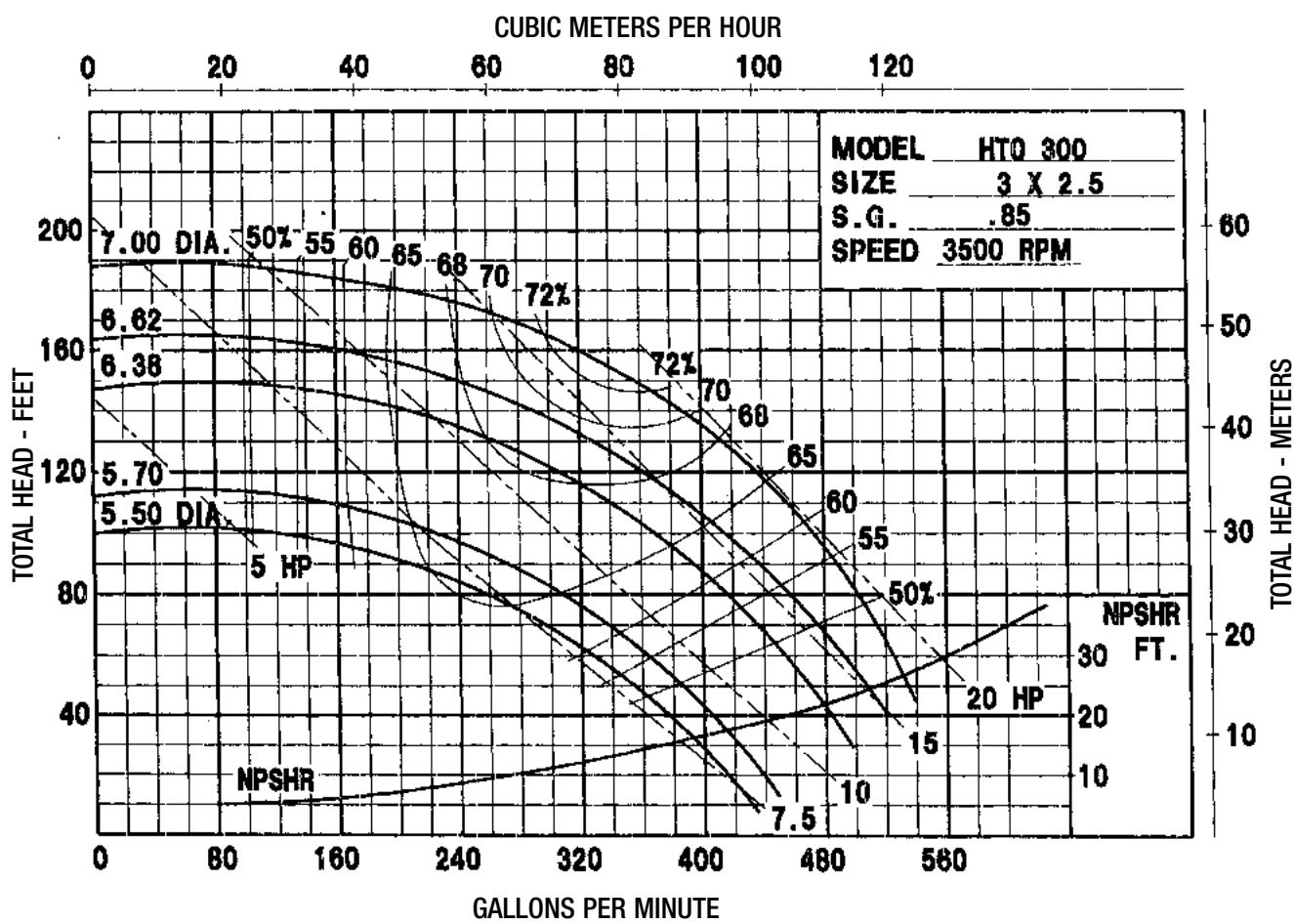
Horsepower requirements based upon 0.85 specific gravity. Calculations can be applied for fluids of other specific gravities.

Maximum operating temperature is 650°F. Maximum working pressure is 150 PSI.

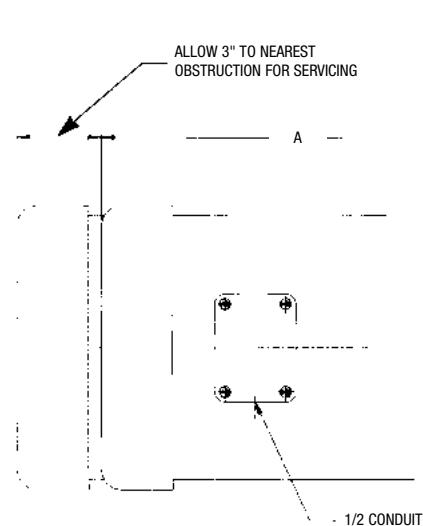
### HTO 180 Pump Performance Curves



### HTO 300 Pump Performance Curves

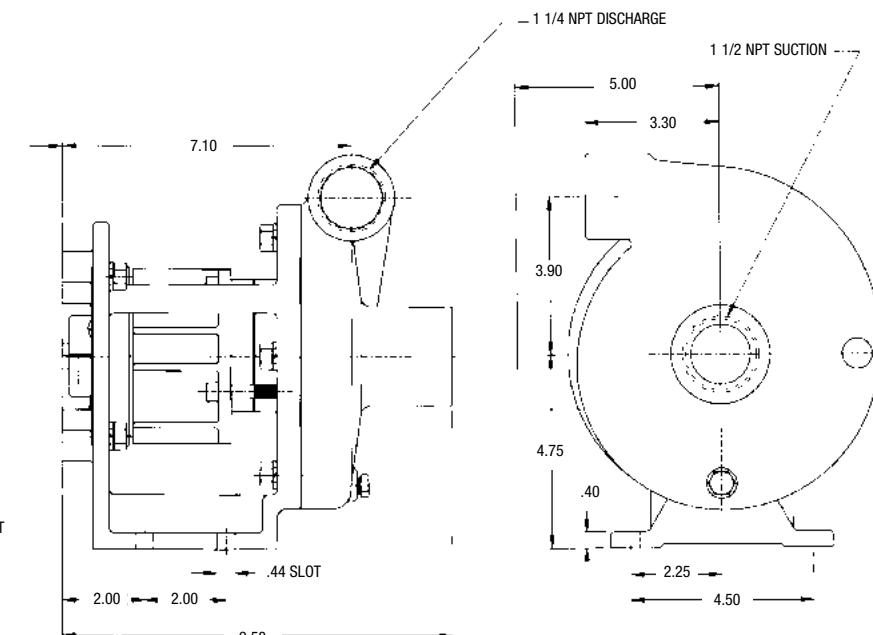


## HTO 80 Dimensions



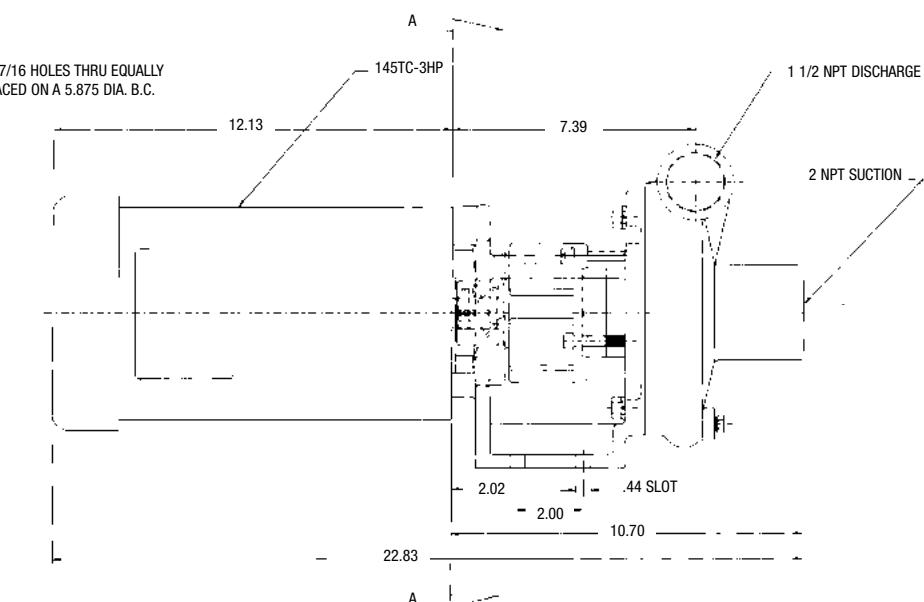
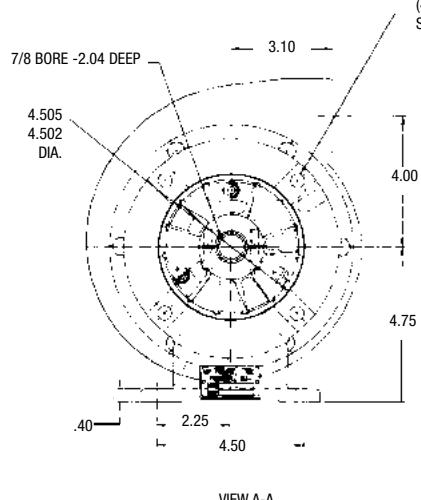
3 PHASE TYPICAL TEFC ROUND BODY MOTOR

FRAME	HP	PH	"A" DIM TEFC
56C	1	3	9.31
56C	1.5	3	9.94
56C	2	3	11.25
56C	3	3	12.12



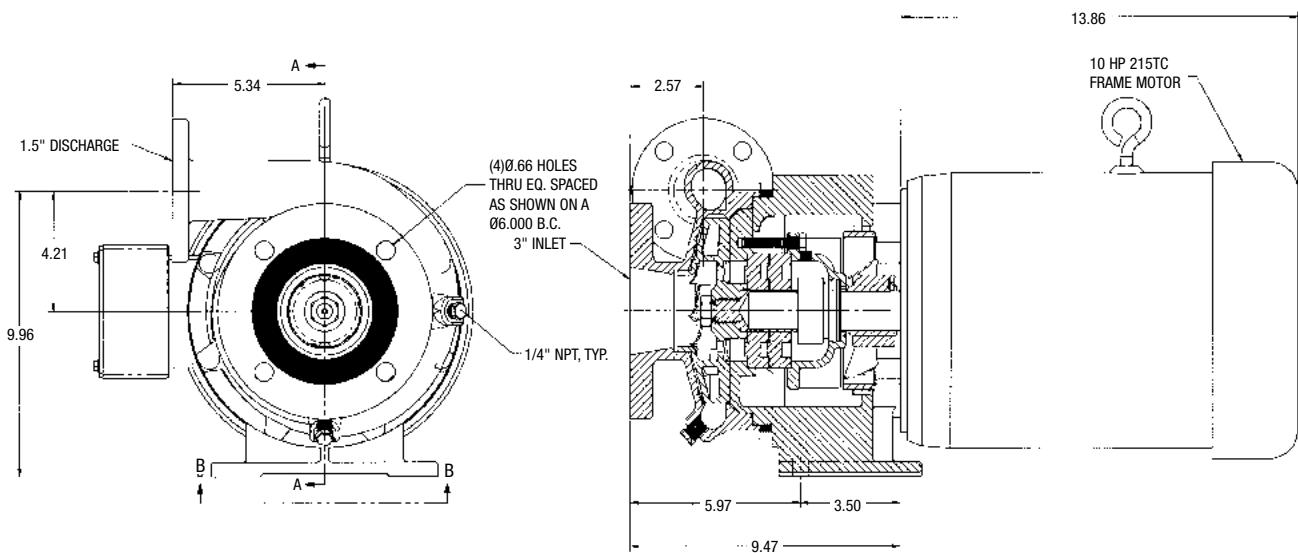
Pump dimensions certifiable for construction purposes.  
Motor dimensions dependent upon motor manufacturer.

## HTO 120 Dimensions

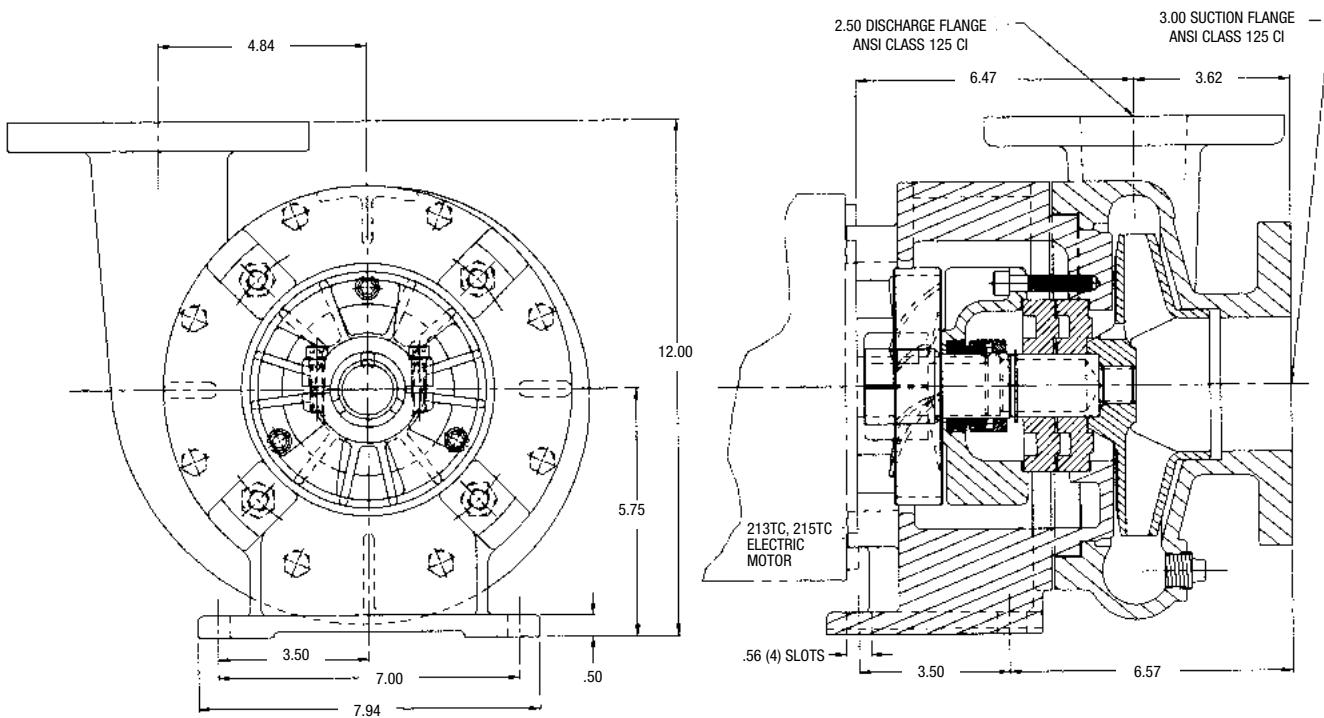


Pump dimensions certifiable for construction purposes.  
Motor dimensions dependent upon motor manufacturer.

## **HTO 180 Dimensions**



## **HTO 300 Dimensions**



# **HYDRASUB 20, 25 & 30**

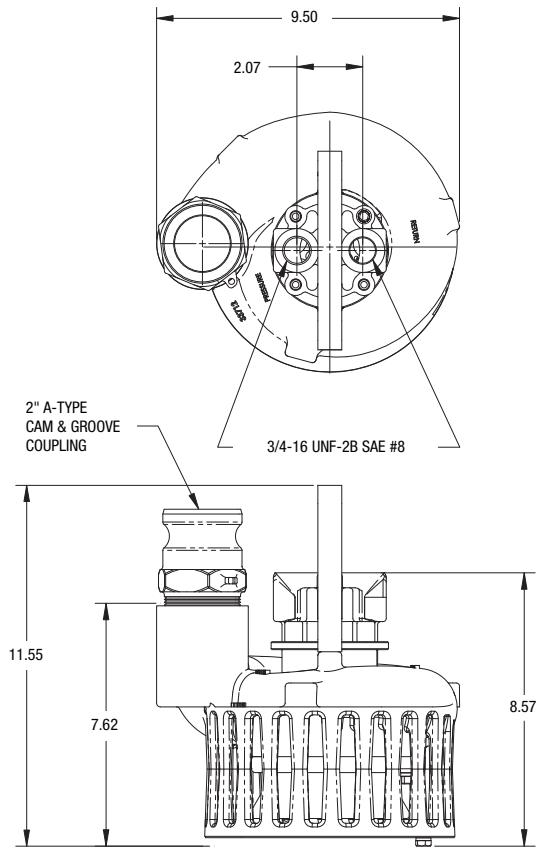
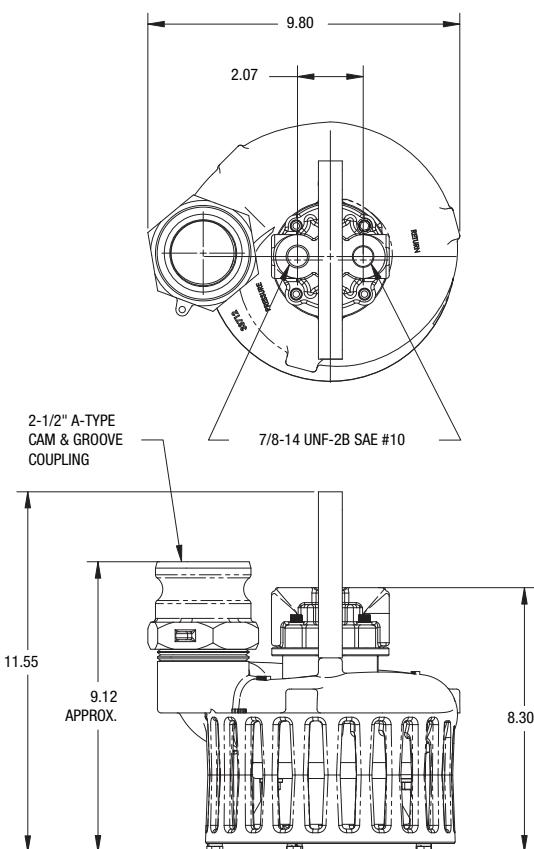
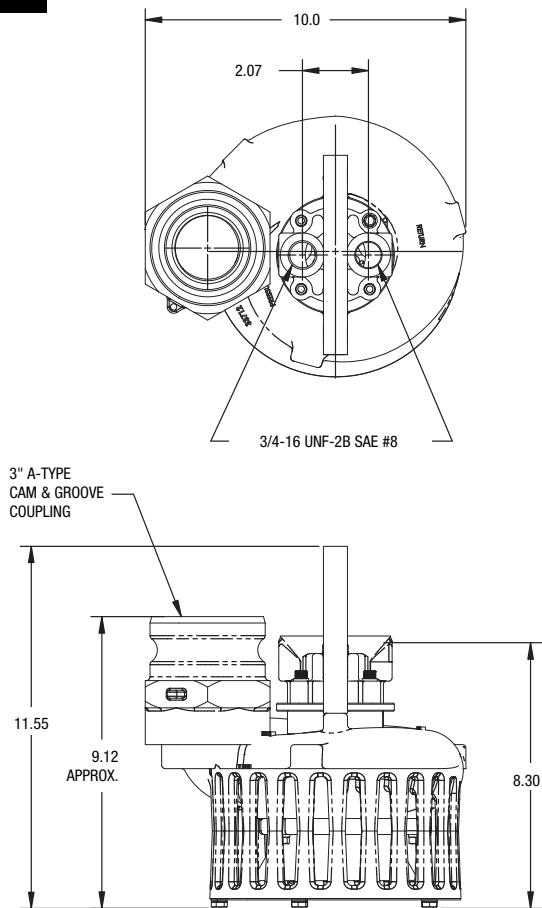
## **HYDRAULIC MOTOR DRIVEN SUBMERSIBLE PUMP FEATURES**

- TOTALLY SUBMERSIBLE
- COMPACT, LIGHT WEIGHT, PORTABLE
- NO PRIMING REQUIRED
- CAN RUN DRY WITHOUT DAMAGE
- FOR OPEN OR CLOSED CENTER OPERATION
- HYDRAULIC CONNECTIONS 3/4-16 SAE O-RING
- OIL FLOW RANGE 5-14 GPM
- MAXIMUM OIL PRESSURE 2,000 PSI
- MAXIMUM BACK PRESSURE 100 PSI
- INTEGRAL, ANODIZED ALUMINUM SUCTION STRAINER HANDLES  
1/2" SOLID SPHERES
- IMPELLER - STAINLESS STEEL
- DISCHARGE CONNECTION 2", 2.5" OR 3", A-TYPE CAM FITTING INCLUDED
- REMOVES LIQUID DOWN TO 3/4" DEPTH



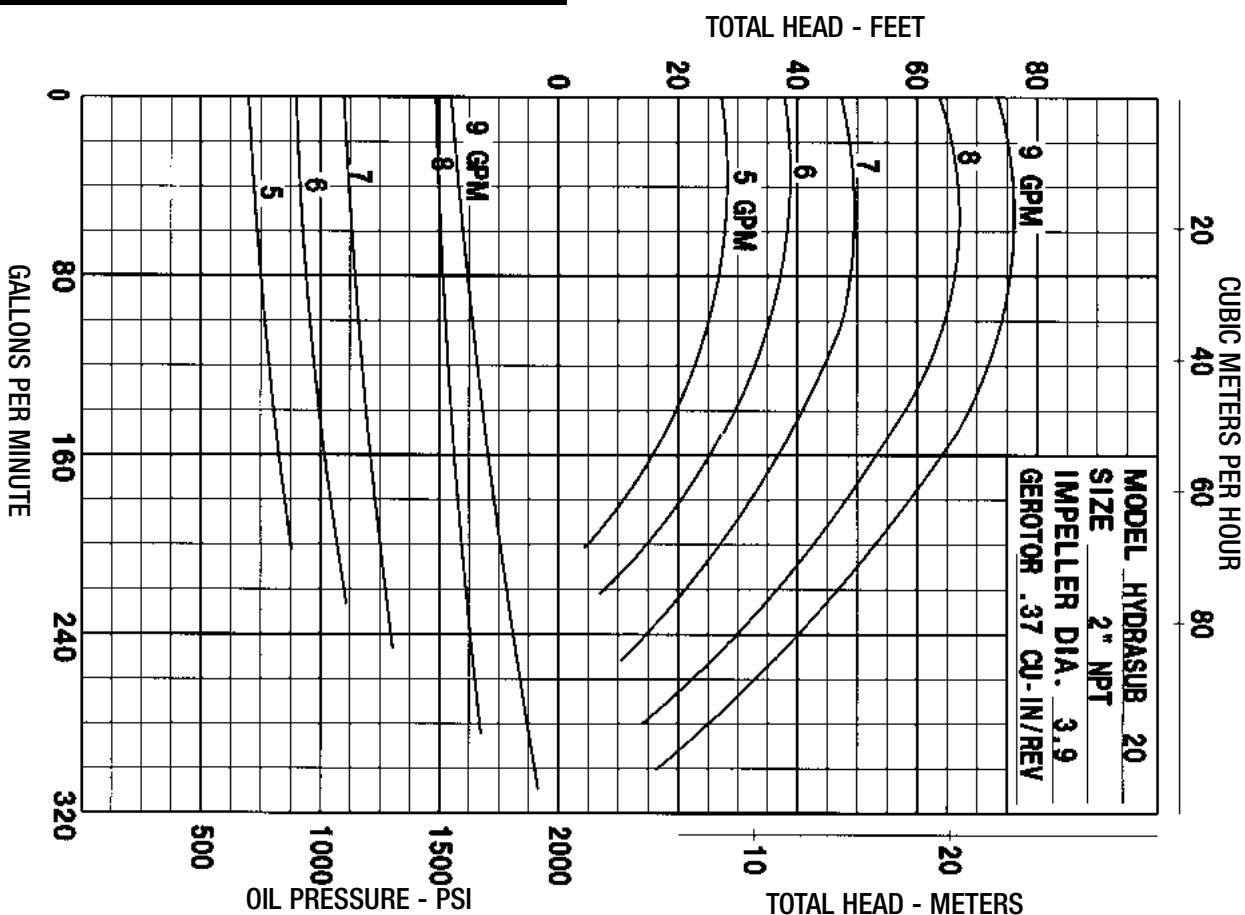
**HYDRASUB**

MODEL	Discharge	Solid Size	Weight	Height	Width
20	2"	1/2"	11 LBS	11.5"	10"
25	2.5"	1/2"	13 LBS	11.5"	10"
30	3"	1/2"	13 LBS	11.5"	10"

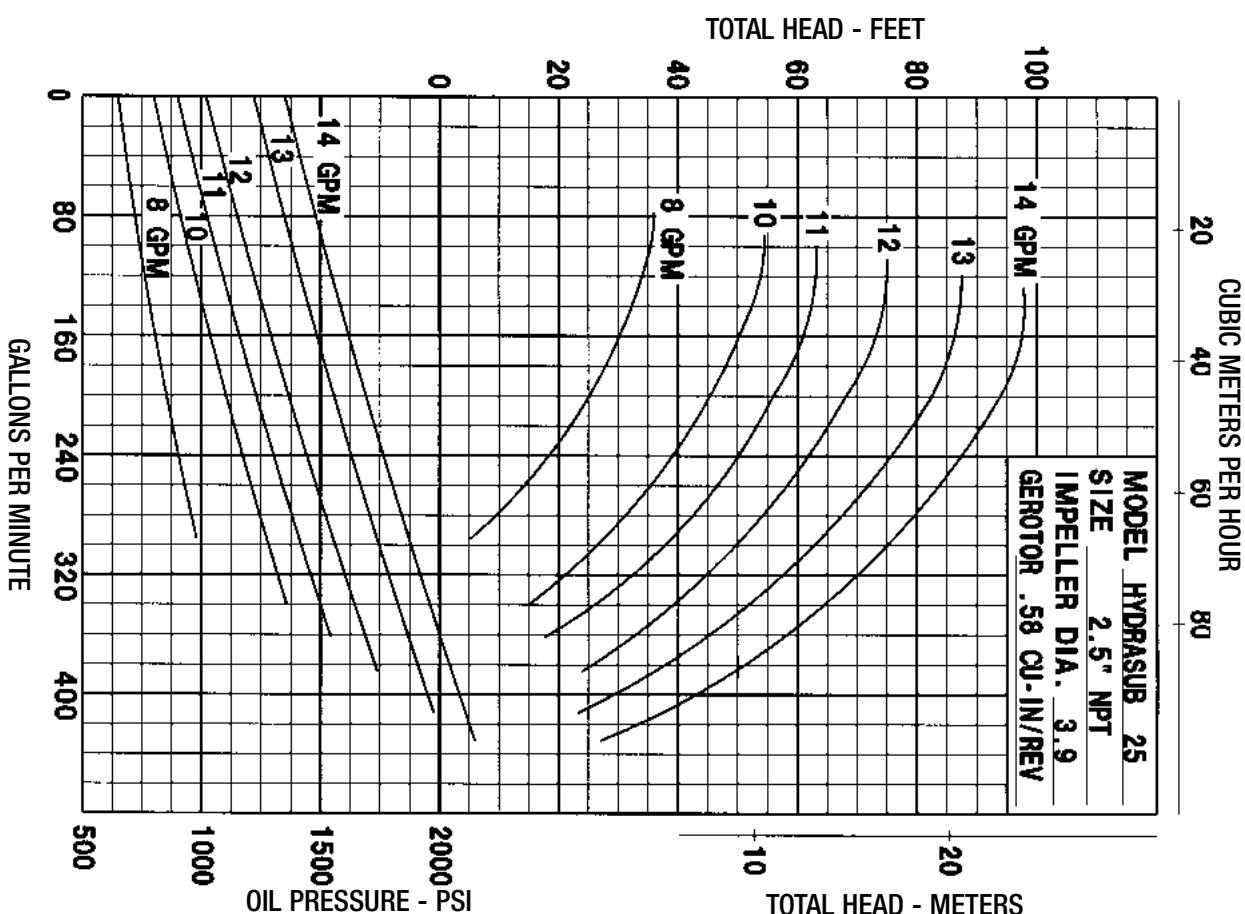
**HYDRASUB 20 Dimensions****HYDRASUB 25 Dimensions****HYDRASUB 30 Dimensions**

Other Performance Curves Available Upon Request

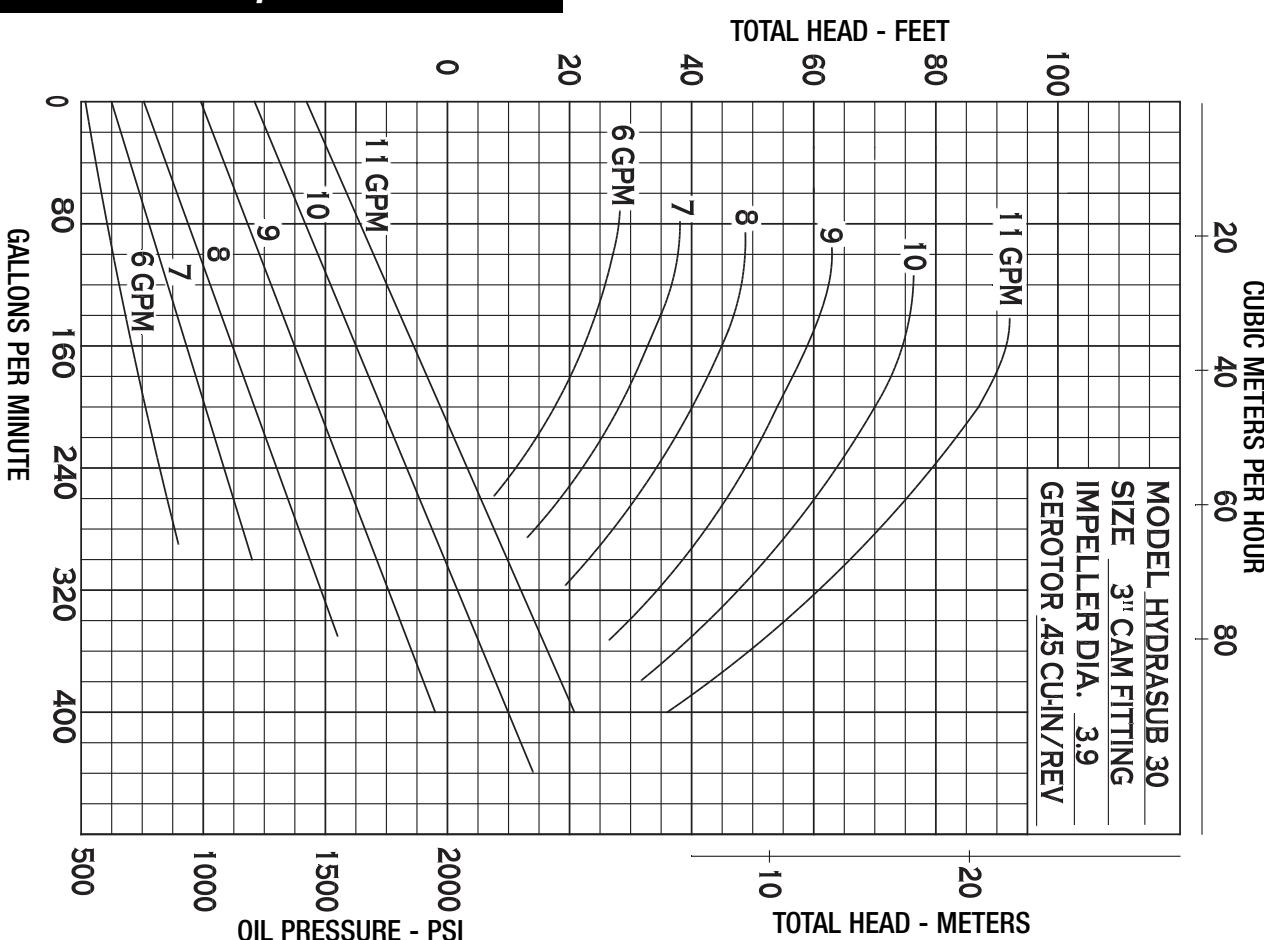
### HYDRASUB 20 Pump Performance Curves



### HYDRASUB 25 Pump Performance Curves



## HYDRASUB 30 Pump Performance Curves



Other Performance Curves Available Upon Request

# **FRX Series**

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## **FRACTIONAL HP CENTRIFUGAL PUMP FEATURES**

- CLOSE COUPLED TO ELECTRIC MOTORS
- 316 STAINLESS STEEL CONSTRUCTION  
FRX75 P – POLYPROPYLENE 40% GLASS FILLED
- FLOWS: 8 TO 50 GPM
- PRESSURES: 9 TO 85 FEET HEAD
- IMPELLER: 316 STAINLESS STEEL
- FRX75-SP: SUCTION LIFT TO 12 FEET
- MECHANICAL SEALS: CARBON / CERAMIC / VITON
- MOTOR OPTIONS: AC AND DC  
FRX125 AC ONLY  
HYDRAULIC: FRX75, FRX75-SP, FRX75-H

MODEL	Suction	Discharge
FRX 50	1/2" NPT/1" HOSE	1/2" NPT/1" HOSE
FRX 75	3/4" NPT	3/4" NPT
FRX 75-SP	3/4" NPT	3/4" NPT
FRX 75-H	1" HOSE	1" HOSE
FRX 75-P	1" HOSE	1" HOSE
FRX 100	1" NPT	1" NPT
FRX 125	1 1/4" NPT	1" NPT



FRX 50



FRX 75



FRX 75-SP



FRX 75-H



FRX 75-P



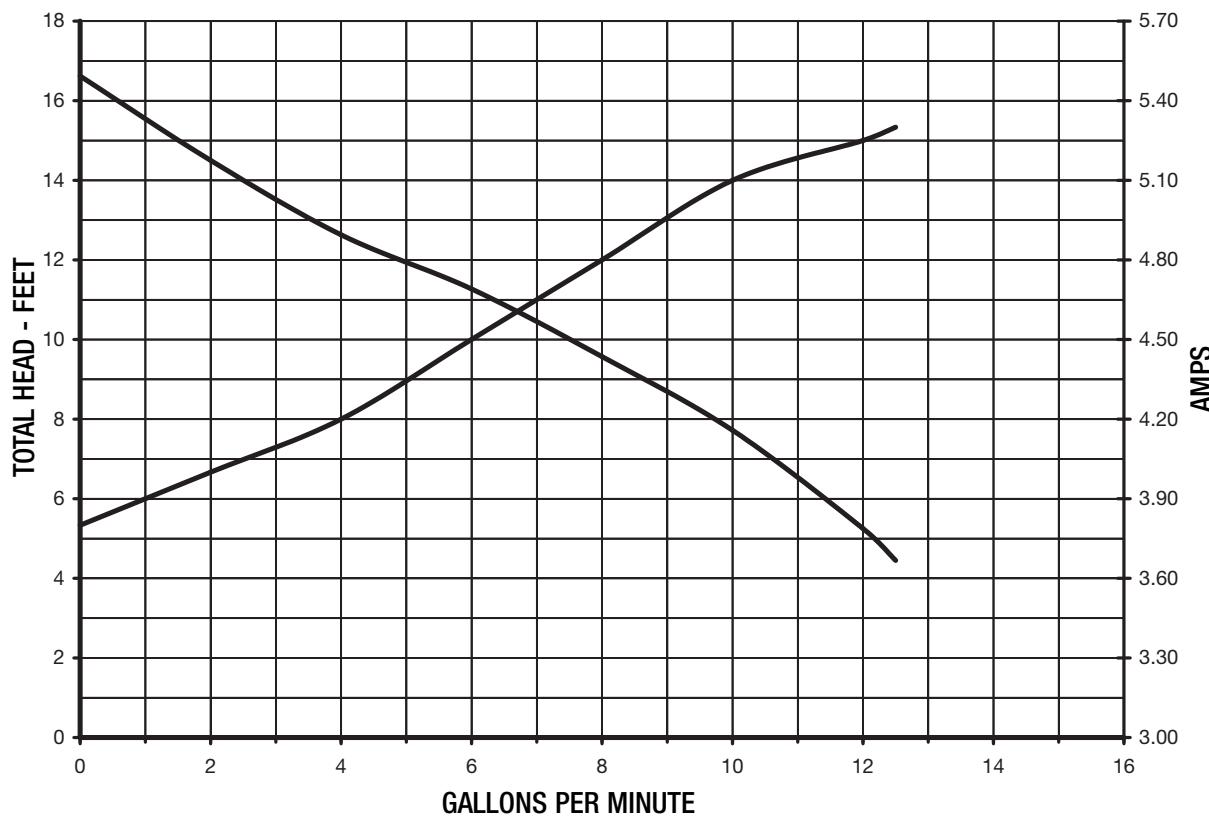
FRX 100



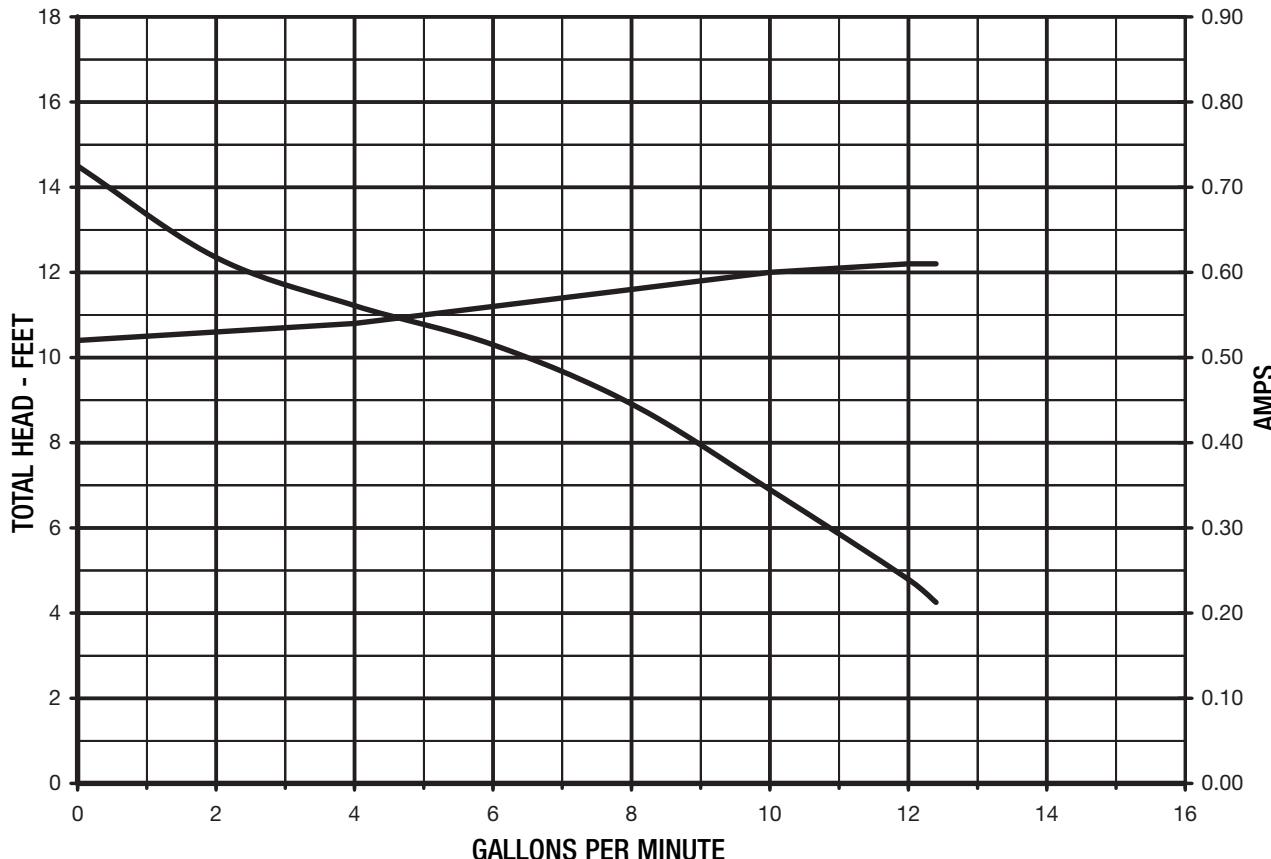
FRX 125

## FRX 50 Performance Curves

12V DC MOTOR  
FOR 24 V DC MOTOR  
DIVIDE AMPS BY TWO

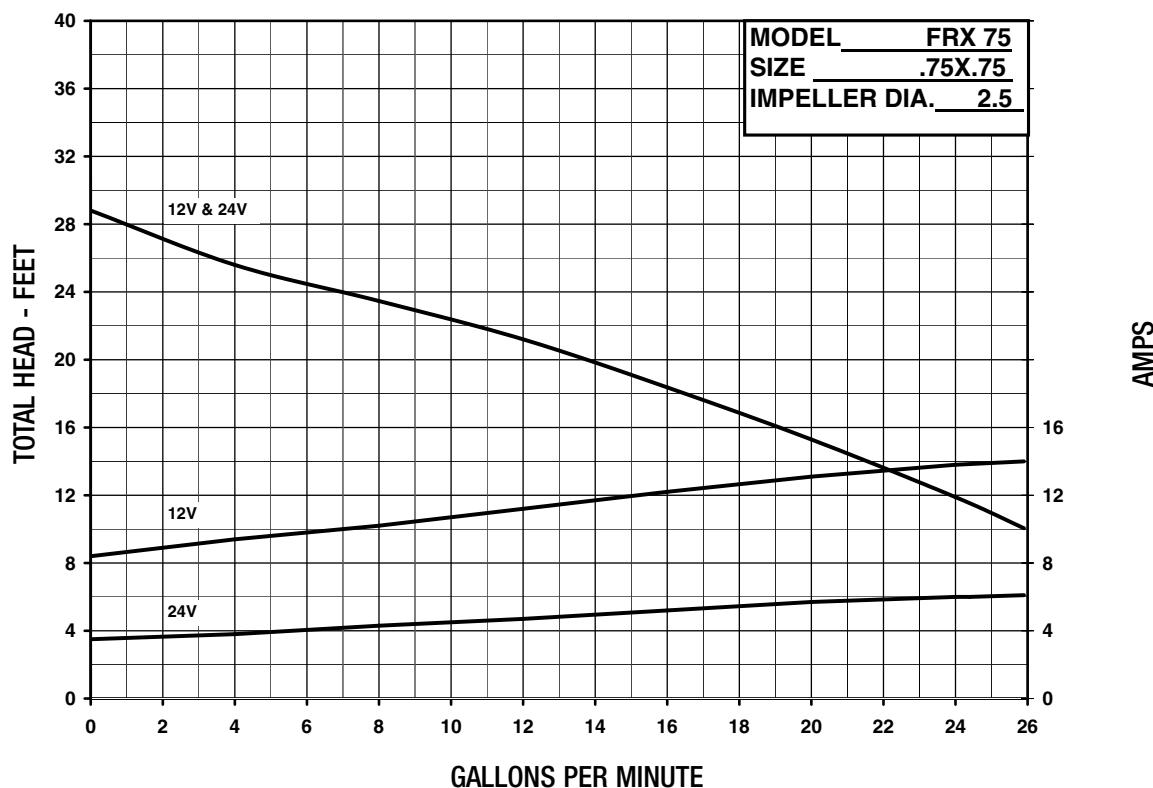
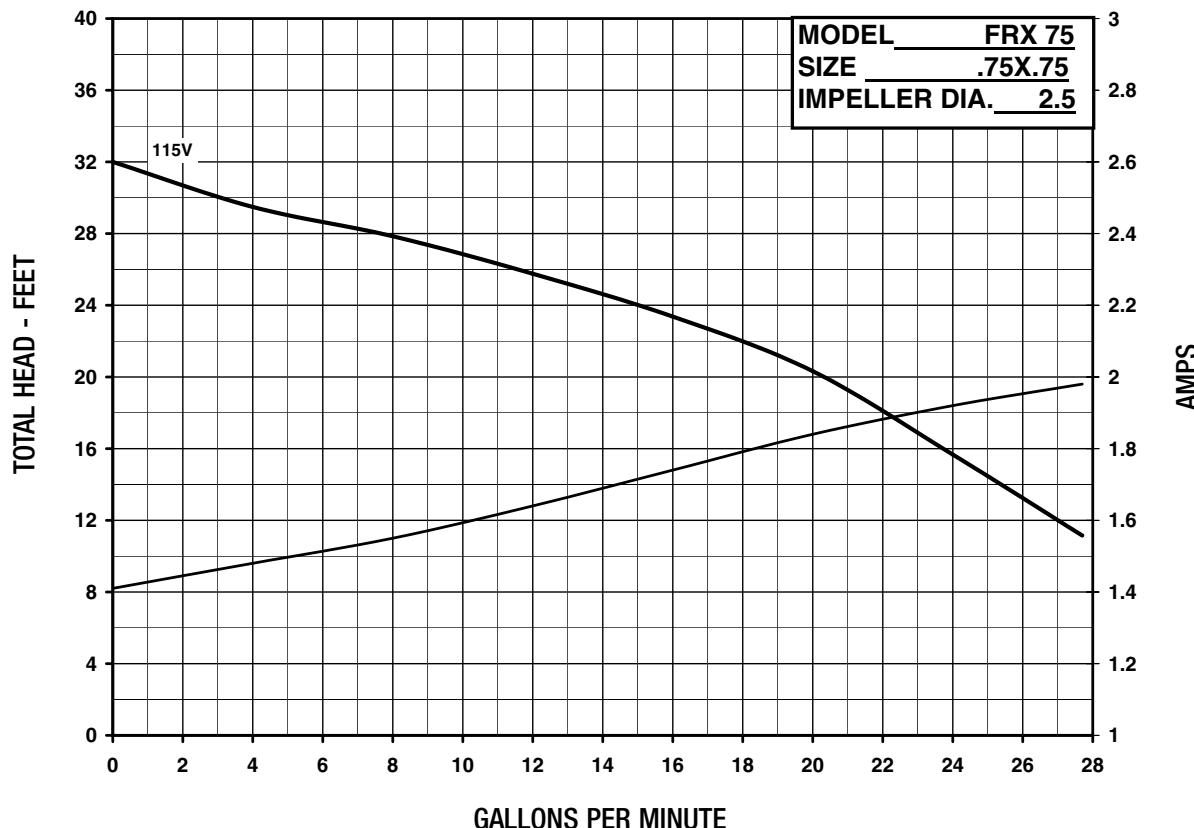


## 115V AC MOTOR

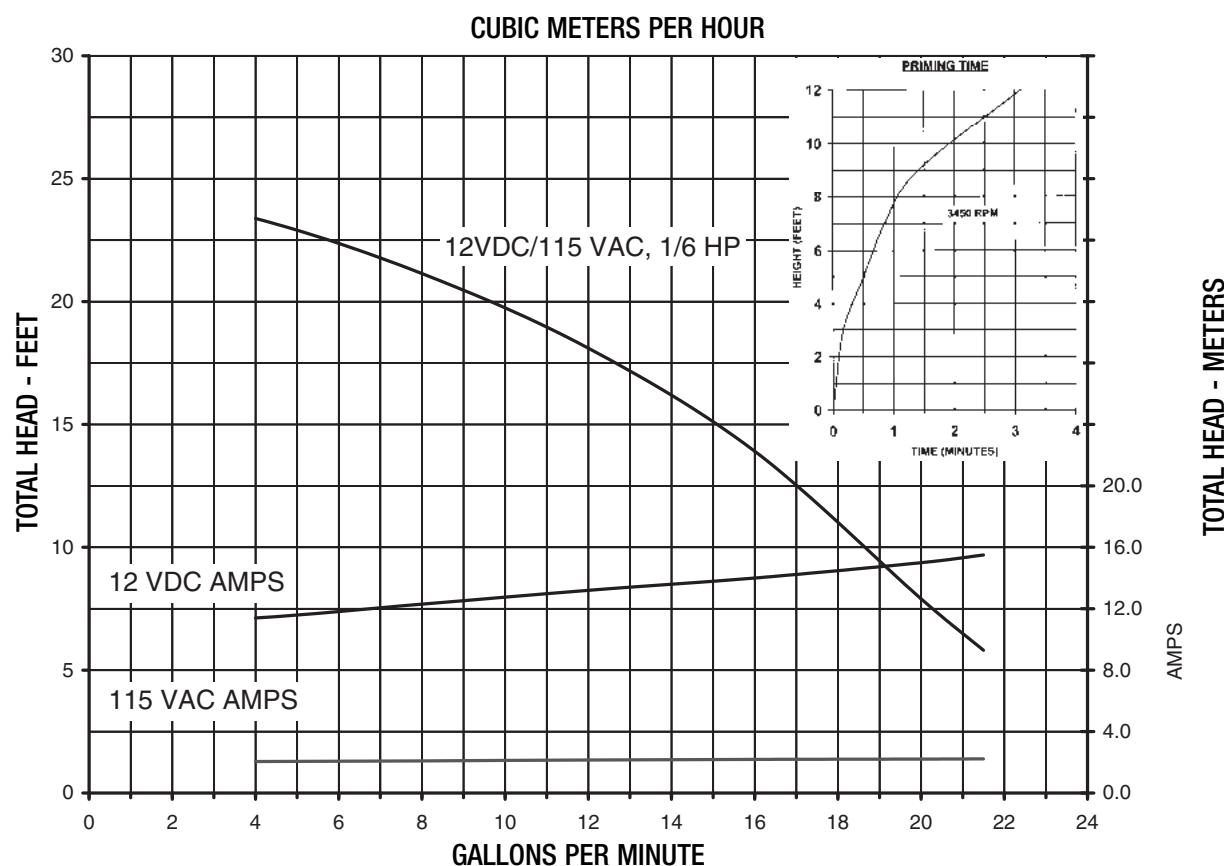


**FRX 75, FRX 75-H, FRX 75-P 12 or 24V Performance Curves**

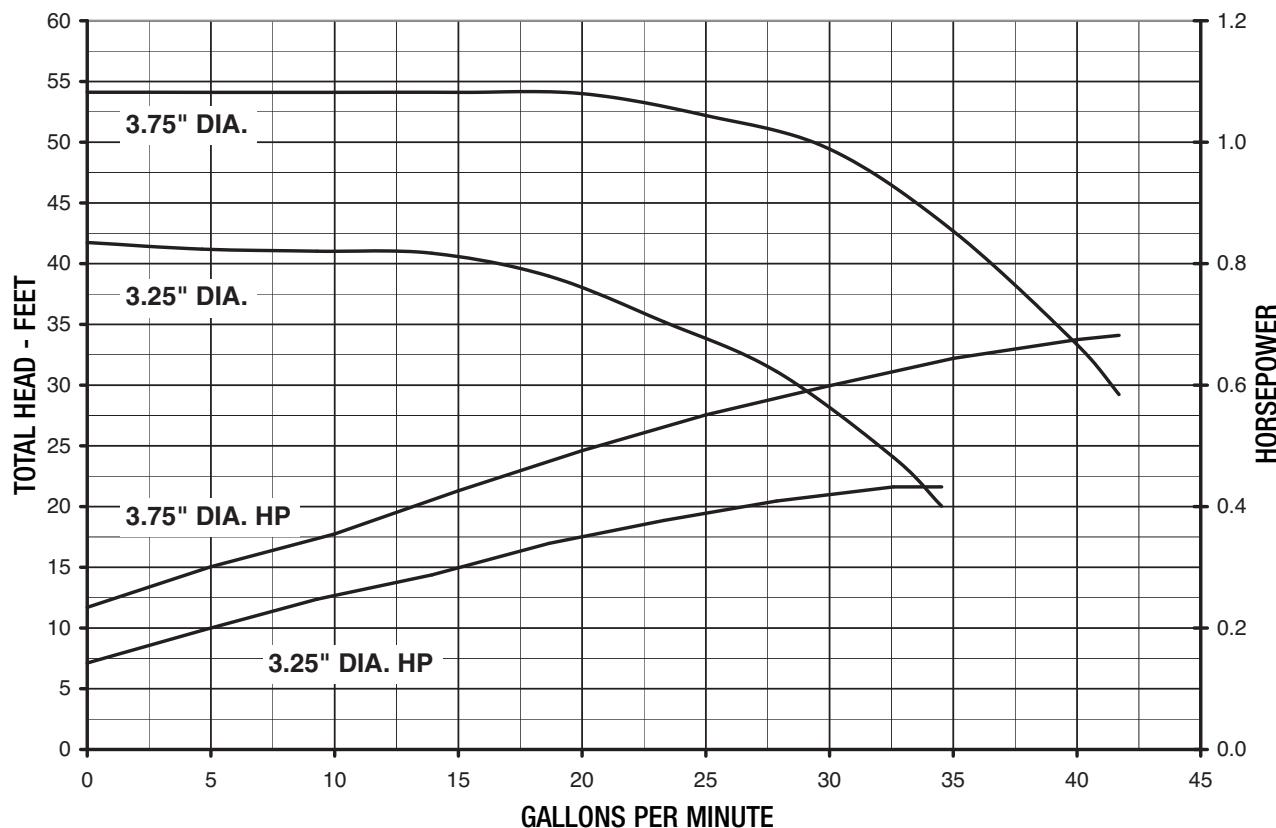
12V DC MOTOR  
FOR 24 V DC MOTOR  
DIVIDE AMPS BY TWO

**FRX 75, FRX 75-H, FRX 75-P 115V Performance Curves**

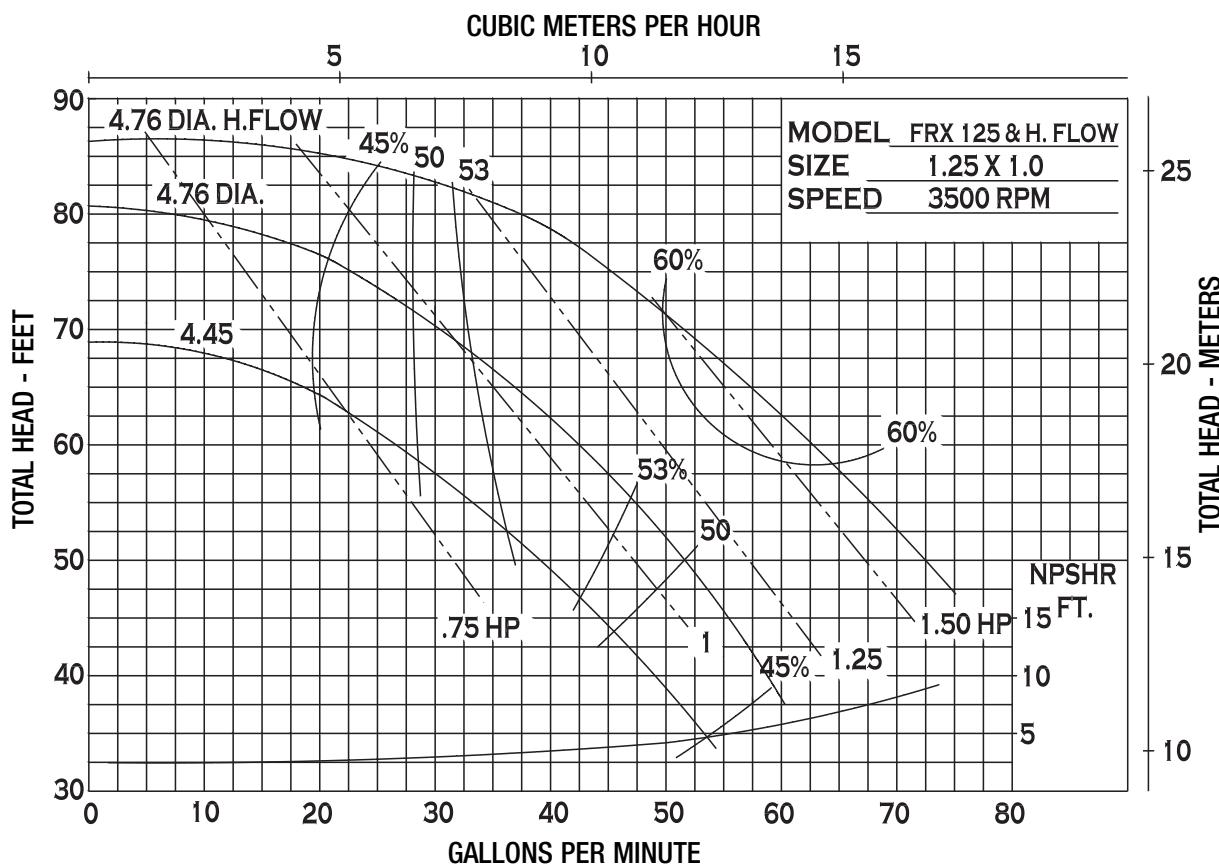
## FRX 75-SP Performance Curves



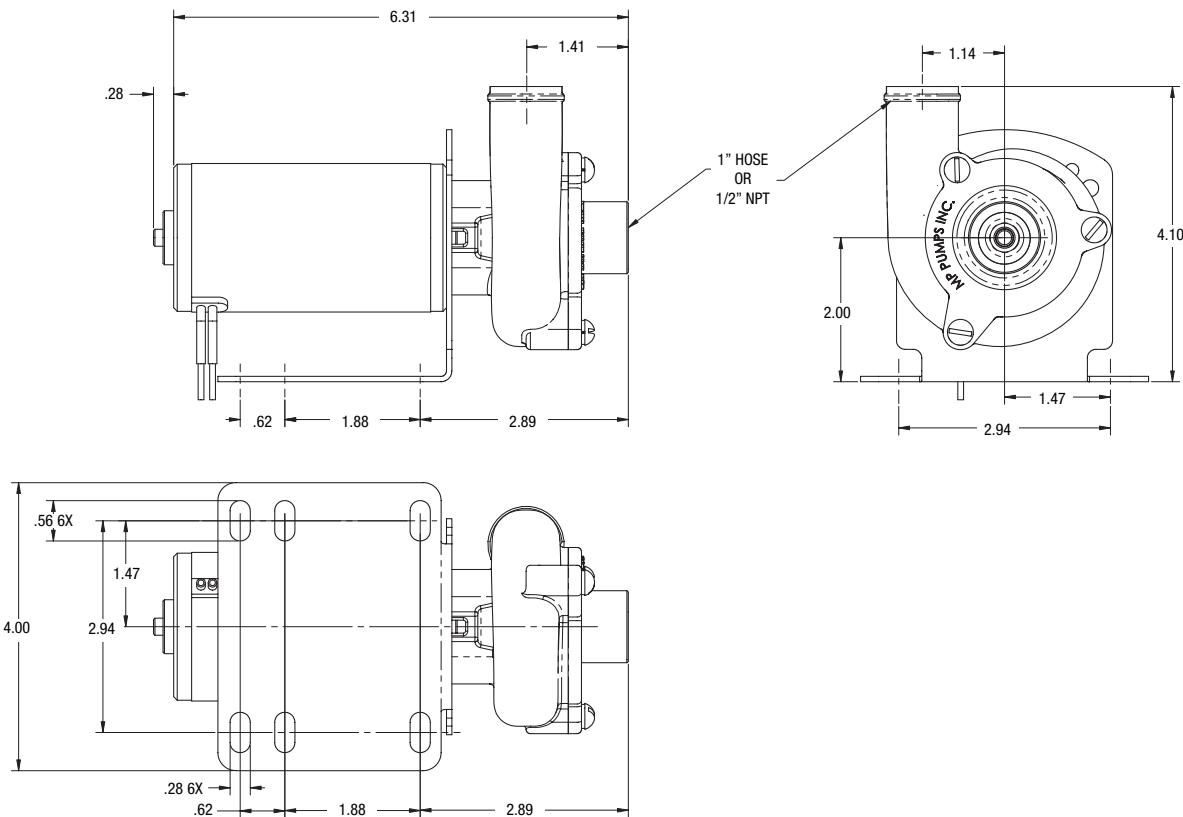
## FRX 100 Performance Curves



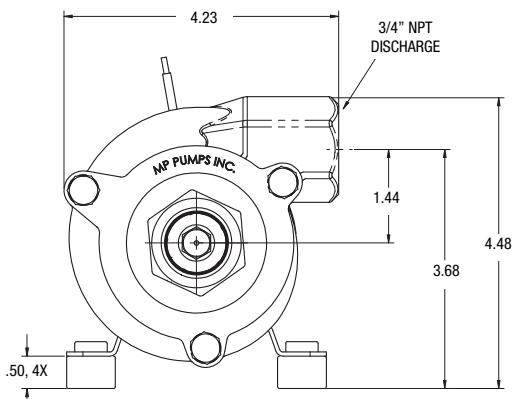
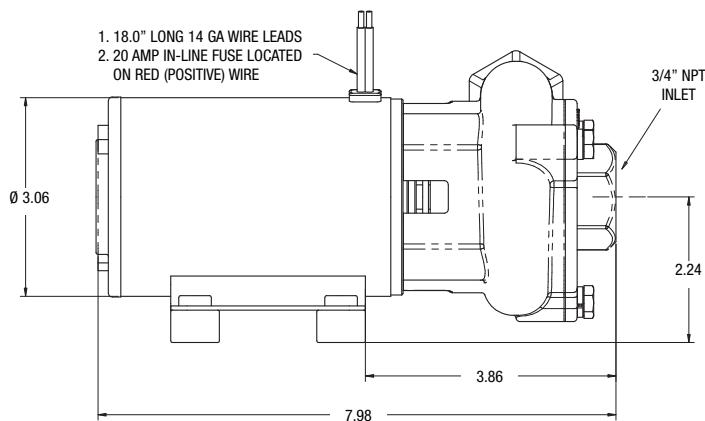
## FRX 125 Performance Curves



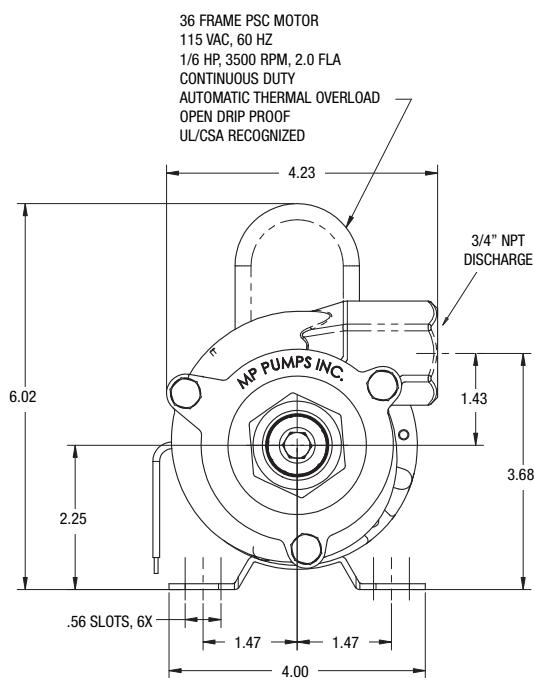
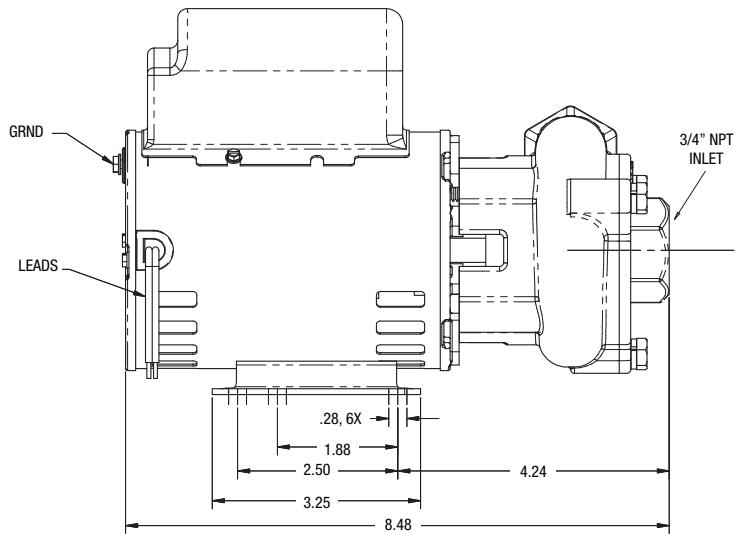
## FRX 50 Dimensions



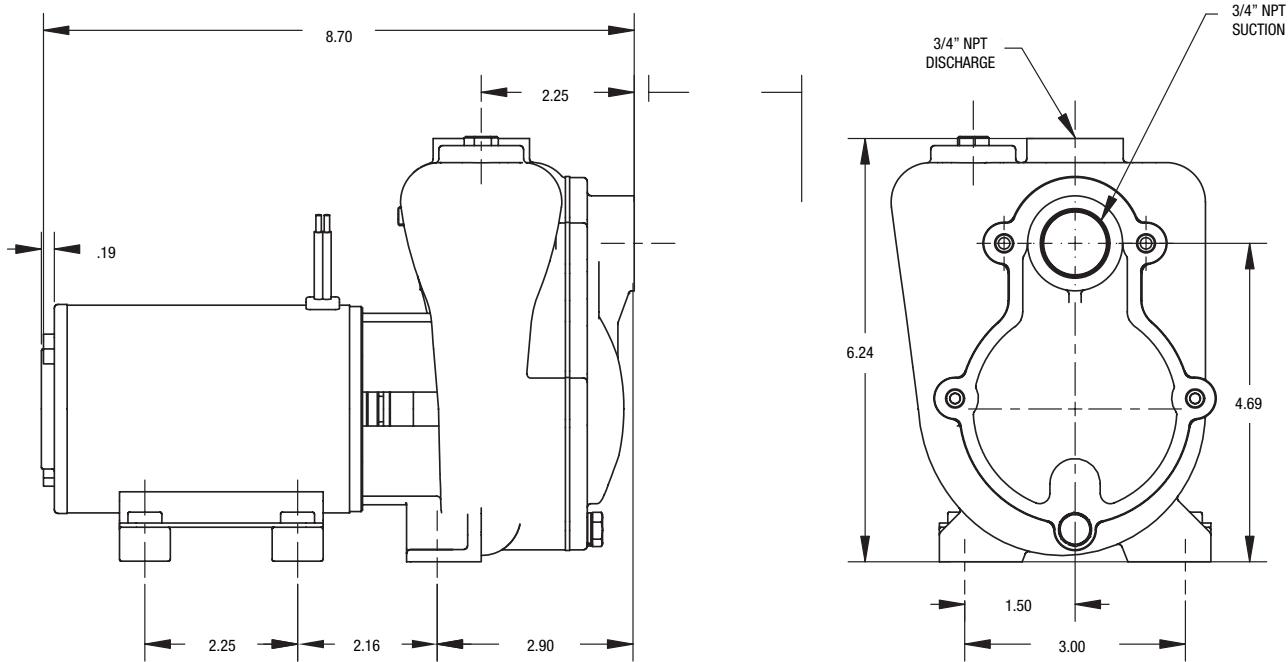
## FRX 75 12 or 24V Dimensions



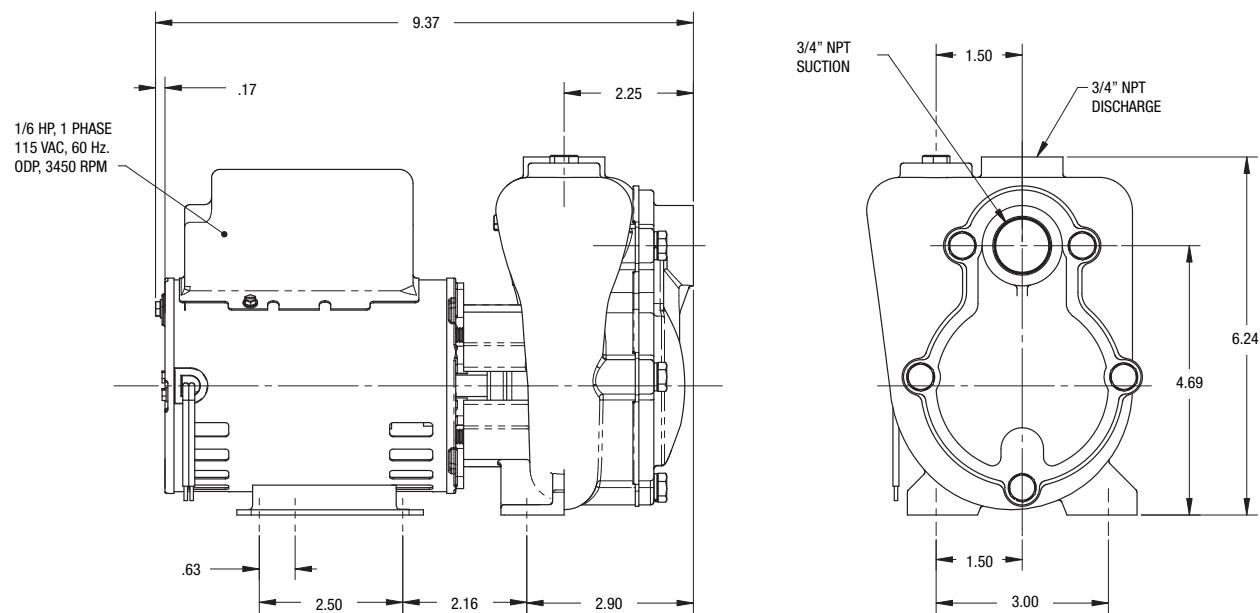
## FRX 75 115V Dimensions



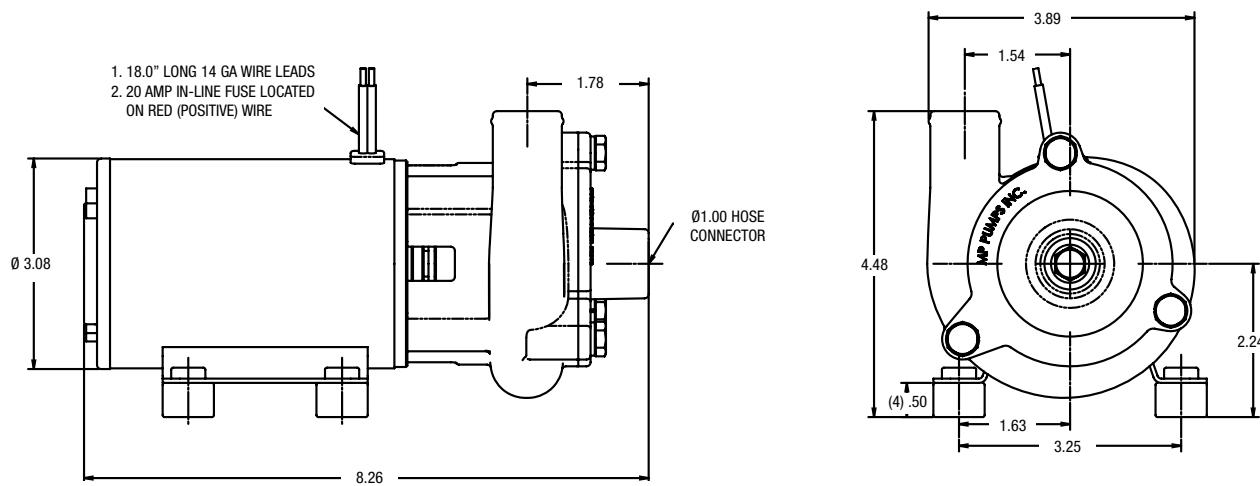
### **FRX 75-SP 12V or 24V Dimensions**



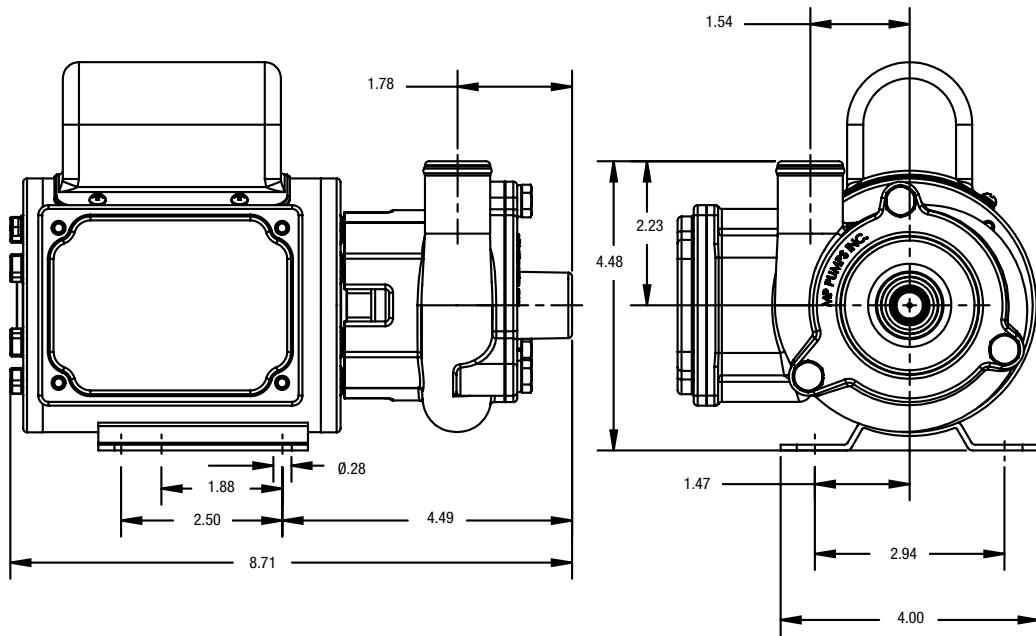
### **FRX 75-SP 115V Dimensions**



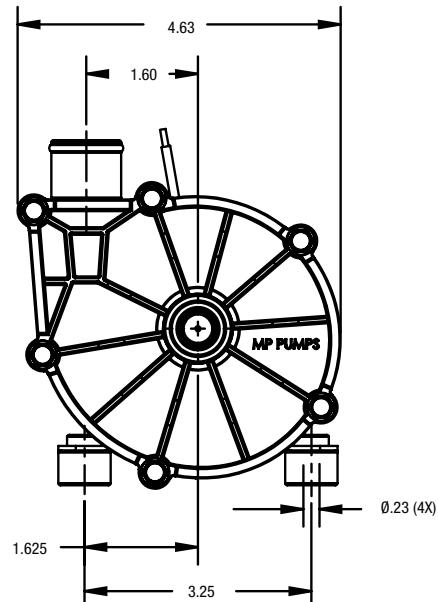
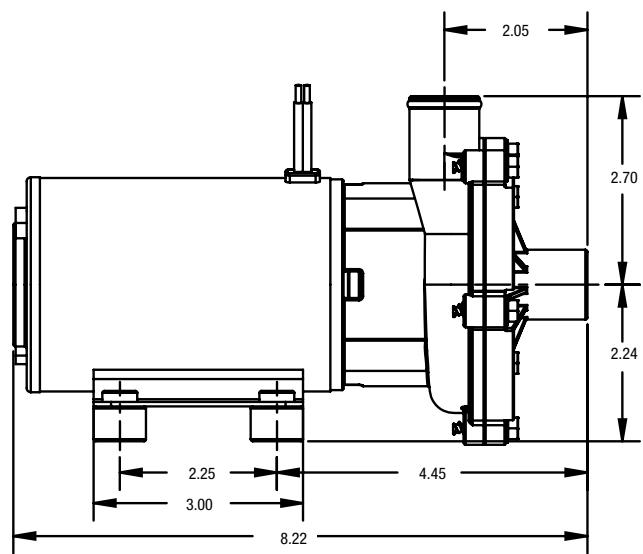
### **FRX 75-H 12 or 24V Dimensions**



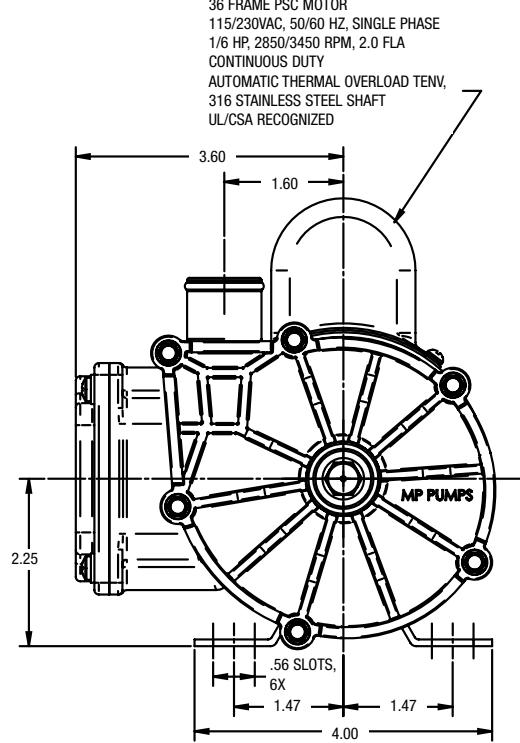
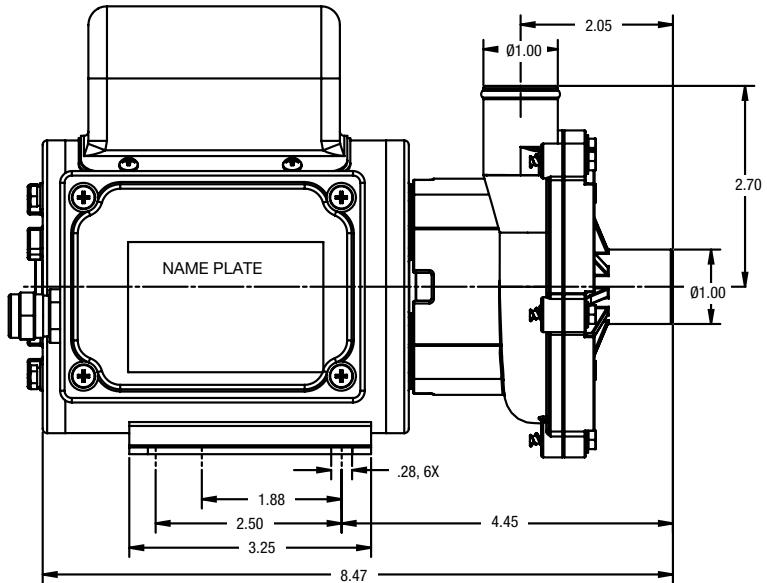
### **FRX 75-H 115V Dimensions**



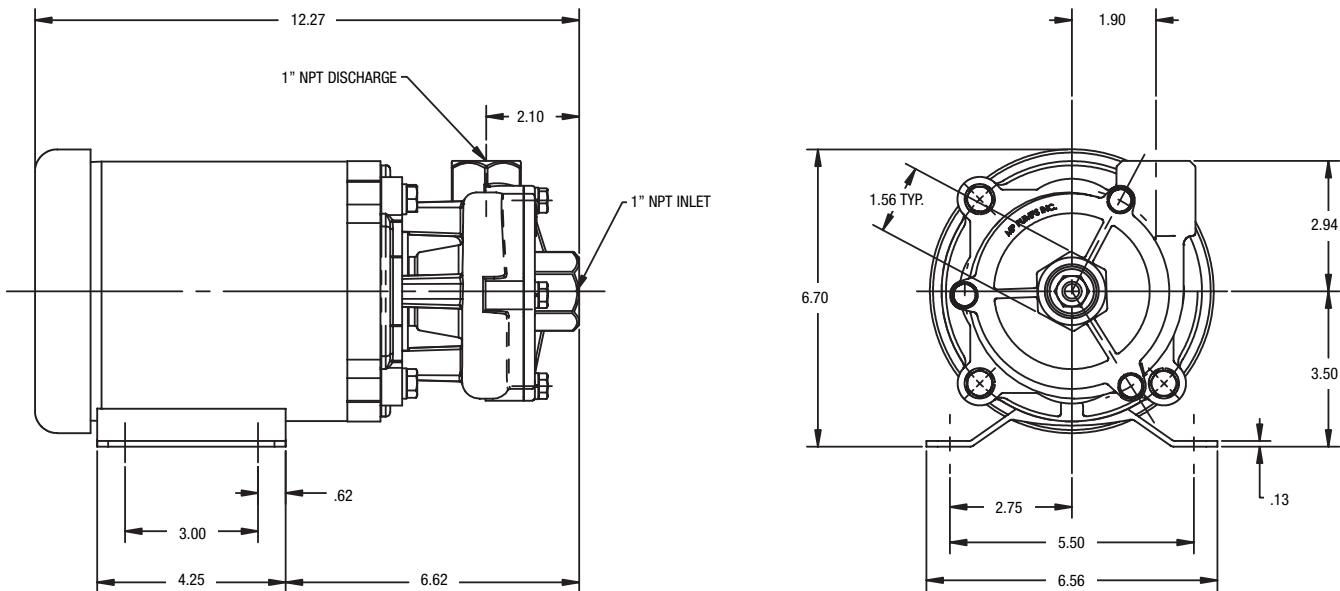
**FRX 75-P 12V or 24V Dimensions**



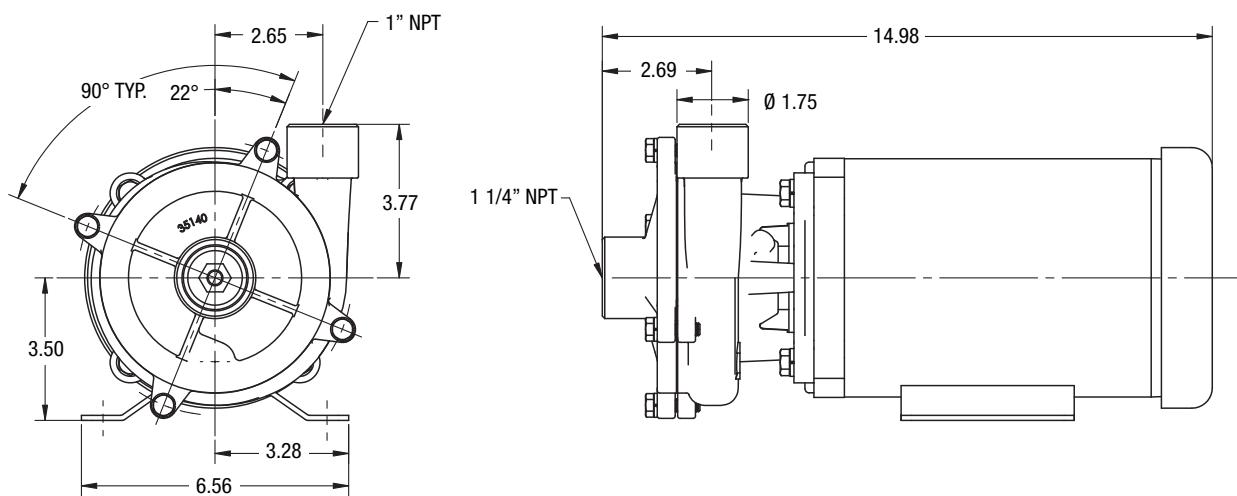
**FRX 75-P 115V Dimensions**



### FRX 100 Dimensions



### FRX 125 Dimensions





## **MP PUMPS, INC. TERMS AND CONDITIONS OF SALE**

1. **Exclusive and Entire Agreement.** All sales by M. P. Pumps, Inc., a Michigan corporation (herein, "Seller"), of any goods to any customer (herein, "Buyer") are subject to these Terms and Conditions of Sale as well as any writing from Seller that references or is attached to these Terms and Conditions of Sale (collectively, the "terms"), and the terms constitute the entire, complete, and exclusive agreement between the parties with respect to any goods provided by Seller as specified in these terms. **If these terms are different from, or contain terms and conditions in addition to, Buyer's purchase order or any other document provided by Buyer (including any modifications thereto) Seller expressly rejects such different or additional terms in Buyer's document, and Seller's provision of the goods is expressly conditioned upon Buyer's assent to these terms. Notwithstanding any other acts or omissions of the parties, Buyer's acceptance of a product constitutes Buyer's assent to all of these terms.** No order received by Seller shall be a contract binding Seller unless accepted by Seller in writing.
2. **Delivery.** Delivery is F.O.B. Seller's facility. Except as otherwise set forth in a quotation, Buyer assumes full responsibility for goods upon Seller's delivery to Buyer's carrier at Seller's facility, including proper arrangement and security for transport.
3. **Price.** Except to the extent Seller provides a signed quotation that states that it is a firm quote for a fixed period of time, all prices provided by Seller, whether in its catalog, pricing software or otherwise, are subject to change and revision by Seller at any time. All orders are deemed made at Seller's prices current at the time of order acceptance and may be accepted by Seller on those terms. The price specified in any quote for goods is exclusive of taxes and shipping related costs and is payable only in U.S. currency. Availability of goods and descriptions and specifications of goods is subject to change without notice. Buyer shall reimburse Seller for all taxes, shipping related costs or other charges which Seller may be required to pay upon the sale, transportation or use of the goods. The opening and maintenance of a credit account with Seller is subject to Buyer providing satisfactory references and observing all of the terms on which credit is given. Seller reserves the right to refuse to extend credit at any time and for any reason.
4. **Payment Terms.** Unless otherwise agreed by Seller in writing, Payment terms for all sales are net 30 days. If Buyer fails to make payment when due, in addition to Seller's other rights and remedies, (i) Buyer shall pay Seller a late charge equal to the greater of 2%, per month and/or part of a month on the remaining unpaid balance due Seller or the highest lawful amount which may be charged to Buyer and pay all expenses of collection of amounts due Seller from Buyer, including reasonable attorneys' fees and (ii) Seller may suspend performance without responsibility or liability to Buyer for resultant delay. Buyer shall not be entitled to make any deductions or set off of any amounts (including those for alleged damages) against payments due to Seller hereunder. Seller may treat any failure by Buyer to make any payment within 10 days of the due date as an improper cancellation of this order under Section 8 hereof.
5. **Security Interest.** Until the entire amount due Seller is paid, Buyer grants Seller a purchase money security interest in all goods, including the proceeds thereof, with all rights and remedies of a secured party in any jurisdiction. Buyer authorizes Seller to file financing statements, or such other documents, appropriate to protect Seller's security interest, without Buyer's signature. If Buyer has granted a third party a blanket security interest in the type of collateral of which the goods would be characterized under the Uniform Commercial Code or applicable law, Buyer shall notify Seller of such fact in writing prior to shipment of goods.
6. **Inspection and Acceptance.** Buyer cannot reject goods as non-conforming unless promptly upon delivery, but no later than fifteen (15) days after delivery, Buyer shall (i) examine and inspect all goods, and (ii) notify Seller of any defect in material or workmanship or any other fact that causes the goods not to conform to the agreement between Buyer and Seller. Failure to so inspect and inform Seller of a defect within the foregoing time period or the use of any goods by Buyer at any time shall be conclusive evidence that Seller has satisfactorily tendered delivery and that Buyer has inspected and accepted the goods. Should Buyer so notify Seller of any defects in goods, in addition to any obligations Buyer may have to Seller, Buyer shall re-pack the goods into their original packaging and store those goods in an appropriate environment pending instructions from Seller. At Seller's option, Seller may ship and bill to Buyer product replacing defective goods and issue a credit to Buyer only when the rejected goods are received by Seller.
7. **Shortages and Delays.** Any dates quoted for delivery are approximate only. In the event of inability for any reason to supply the total demand for goods, Seller may allocate its available supply among any or all purchasers, as well as departments and divisions of the Seller, on such basis as it may deem fair and practical, without liability for any failure of performance which may result therefrom. Seller shall not be liable for loss, damage, detention or delay nor be deemed to be in default from causes beyond its reasonable control including without limitation fire, strike, labor difficulties, act or omission of any governmental authority or of Buyer, compliance with import or export regulations, insurrection or riot, embargo, delays or shortages in transportation or inability to obtain necessary labor, materials or manufacturing facilities from usual sources, failure of supply. In the event of delay due to any such cause, the date of delivery will be postponed by such length of time as may be reasonably necessary to compensate for the delay, without liability to Seller. In no event shall Seller be liable for any production losses due to late delivery or failure of any goods whether or not due to any of the foregoing enumerated causes. If shipments are delayed at Buyer's request, due to Buyer's acts or omissions, or due to circumstances that are not within Seller's control, payment shall be made by Buyer within seven (7) days after Buyer has been notified by Seller that the particular goods are ready for shipment. If shipment is delayed, in addition to any other remedy available to Seller, the goods may be stored by Seller at Buyer's risk and expense. If an order is delayed at Buyer's request or due to Buyer's fault for more than 30 days, the order shall, if Seller so elects, be considered cancelled unless other arrangements acceptable to Seller are made.
8. **Returns/Cancellation.** No goods may be returned outside of warranty except upon Seller's written authorization in Seller's sole discretion. Section 11 governs warranty service. Any such authorized return must (i) be in new condition, suitable for resale and with all its original parts and in original undamaged packaging and (ii) not have been used, installed, modified, rebuilt, reconditioned, repaired, altered or damaged. If Seller agrees to accept a return Buyer must pay all costs and bear all risk of returning the goods to Seller's facility and pay a restocking charge of 25% of the price for all returns out of warranty. Orders accepted by Seller can be cancelled only with the written consent of Seller in Seller's sole discretion and only upon payment of a cancellation charge of 20% of the price or such greater amount as may be specified by Seller in its consent. Any cancellation without Seller's consent or other improper cancellation by Buyer shall obligate Buyer to pay reasonable and proper termination charges based on Seller's costs plus a fixed sum of 30% the price of the goods. Any cancellation shall terminate all of Seller's obligations with respect to the order.
9. **Buyer Responsibilities.** Unless and only to the extent set forth in the quotation of which these terms are a part, Buyer, its employees and agents will take all necessary steps to ensure that the goods will be set-up, assembled, installed, labeled and used (whether by Buyer or a third party) in accordance with Seller's instructions, the instruction manual provided as well as all requirements of all applicable governmental authorities pertaining to the installation and operation of the goods. Buyer shall be fully responsible for the safety of any worksite at which any services by Seller away from Seller's premises are performed. Buyer shall indemnify, defend and hold harmless Seller against all damages, losses, costs, claims and expenses, including reasonable legal fees incurred by Seller, arising out of any of the foregoing.
10. **Limited Warranty.** Seller warrants to Buyer and, if Buyer is not the original end-user purchaser, to the original end-user purchaser, that the goods sold will be free from defects in material and workmanship (in either case the "Limited Warranty"). The period of the Limited Warranty (the "Warranty Period") shall be twenty-four months for FLOMAX® brand product (except for the drive, which is warranted for twelve months) and twelve months for all other goods, in each case measured from the date of sale to the Buyer or the original end-user purchaser as applicable. This Limited Warranty covers only parts of new goods which are found upon examination by Seller's factory in Fraser, Michigan, to be defective in material or workmanship as delivered to Buyer or the original end-user purchaser as applicable.

Except as expressly set forth in this Section 10 or specifically authorized by an executive officer of Seller in writing, the Limited Warranty is not transferable or assignable and any such transfer or assignment is void. The Limited Warranty does not cover service trips, service calls, costs of removing and reinstalling goods or components and other labor charges or the cost of shipment of replacement parts. The Limited Warranty does not cover and excludes damages due to (i) failure to install, label, operate or maintain goods as directed in any instruction manual or bulletin or under applicable law or regulation, (ii) misuse, abuse, neglect or modification of the goods in any way, (iii) improper service, use of replacement

parts or accessories that are not specified by Seller, (iv) improper installation, incorrect supply, accident, fire, flood, acts of God or other casualty, (v) use of any goods other than their intended purpose and normal usage, (vi) damage during shipment (all claims must be filed with carrier), or (vii) incompatibility with items not supplied by Seller. Wear items or normal maintenance items including but not restricted to seals and wear plates, etc. are not included under the Limited Warranty. No warranty coverage is applicable if Buyer or the original end-user purchaser cannot prove the original purchase date, the data plate and/or serial number on any goods is removed, defaced, modified or altered in any way, or Seller is not permitted to inspect the damaged goods.

The Limited Warranty is VOID if the goods are not decontaminated prior to return to Seller or if the material pumped is not identified as provided below.

11. **Securing Warranty Service.** Warranty service can be arranged by contacting Seller at M. P. PUMPS, Inc., c/o Service Manager, 34800 Bennett Drive, Fraser, Michigan 48026. Warranty service can only be obtained through Seller at its factory in Fraser, Michigan. At the time of requesting warranty service, evidence must be presented of the date of sale to the Buyer or original end-user purchaser as applicable and the serial number of the goods. Seller, at its option, will supply a "Return Goods Authorization Form" ("RGA") or will prepare an RGA and provide an RGA reference number. The person requesting service must fully identify the product pumped and that product shall be listed on the RGA. All goods or parts returned to Seller for any reason must be completely and properly decontaminated prior to delivery to Seller. If the product pumped requires a Material Safety Data Sheet ("MSDS"), reference to this fact must be indicated under "Application Information" on the RGA form which must be returned with the part(s) or if an RGA was completed by Seller the person requesting service must provide the RGA reference number. A copy of all applicable MSDS's must also be included with the returned RGA forms or with the RGA reference number. New or unused goods need not be decontaminated. This fact must be indicated under "Application Information" on the RGA form which must be returned with the goods. The person seeking service shall pay any charges for making service calls and/or for transporting the goods to and from the place where the inspection and/or warranty work is performed. Goods submitted for inspection and/or warranty work that are not covered by the Limited Warranty or which do not comply with the requirements of this section will be returned to the sender at the sender's expense or scrapped at Seller's facility and no credits will be issued. The person requesting service shall be responsible for any damage or loss incurred in connection with the transportation of the goods or any component submitted for inspection and/or warranty work.

12. **Limitation on Warranties/Damages.** Any claim under the Limited Warranty must be made within the Warranty Period or such claim is waived.

No person (including without limitation any dealer or distributor) other than an executive officer of Seller has authority to change or extend the terms of the Limited Warranty, and Buyer confirms that no other warranty terms have been extended by Seller or are applicable to the goods. Change or extensions to the terms of the Limited Warranty (whether before or after sale) are binding only if confirmed in writing by Seller's duly authorized executive officer.

**Except as set forth in these terms, Seller makes no representation or warranty of any type, express or implied, including any warranty of merchantability, warranty of fitness for a particular purpose or warranty of non-infringement or warranty arising from any course of dealing, course of performance or usage of trade.**

**Seller will not under any circumstances, be liable for any special, indirect, punitive or consequential damages (even if Seller has been notified of the possibility of such damages) resulting from or related to a product including, without limitation, any loss of profits, or loss of opportunity.** Some jurisdictions do not allow limitations on warranties or damages, so this limitation or exclusion may not apply.

13. **Remedy. Seller's sole obligation and Buyer's and the original end-user purchaser's exclusive remedy with respect to any goods, whether arising in contract, tort (including negligence), strict liability, breach of warranty or otherwise, is limited to Seller, at its discretion, replacing or repairing the defective goods, providing replacement parts or issuing Buyer a credit equal to the price paid to Seller for such defective goods, and in no event will Seller's liability exceed the amounts actually received by Seller for any goods.**

This exclusive remedy shall not be deemed to have failed its essential purpose so long as Seller is willing and able to repair or replace defective goods or parts thereof or, also at Seller's option, to refund the price received by Seller for the defective goods, within a reasonable time after Buyer demonstrates that a defect exists in accordance with the terms and limitations of the Limited Warranty.

14. **Intellectual Property.** Seller is not transferring to Buyer any patent, copyright, trademark or other intellectual property rights in or related to any goods, other than the limited license to use the goods for Buyer's internal business purposes. The goods provided hereunder may be subject to patent, trade secret and other intellectual property rights and Buyer agrees that should the goods or certain information relevant thereto be made available to others it would cause irreparable harm to Seller. Therefore Buyer agrees not to, and not to permit others to, use, disclose, copy or replicate (through for example reverse engineering or other similar process) any goods and/or any documentation or information regarding any goods.

Should Buyer request that any goods conform to a certain specification or description, including but not limited to specifications or descriptions regarding design, performance or labeling and marking of goods, Buyer warrants to Seller that Seller's compliance with such specifications or descriptions will not infringe any third-party's intellectual property rights and Buyer shall indemnify, defend and hold Seller harmless from any losses, liabilities, claims, causes of action and expenses (including reasonable attorneys' fees) arising out of Seller's compliance with Buyer's specifications.

15. **Limitation of Actions. Any action against Seller arising out of this transaction shall be commenced within one (1) year from the date such cause of action has accrued, otherwise the same shall be barred.**

16. **Export Control.** If any goods are being exported, the commodities, technologies and software are exported from the United States in accordance with the Export Administration Regulations. Diversion contrary to United States Law is prohibited.

17. **Governing Law.** These terms shall be governed by and construed in accordance with the laws of the State of Michigan, without regard to its principles of conflicts of laws, and shall not be governed by the provisions of the United Nations Convention on Contracts for International Sales of Goods. The parties agree that all actions or proceedings between them shall be tried and litigated only in the state and federal courts located in the County of Macomb, State of Michigan USA.

18. **Termination.** Seller may terminate these terms, and have no obligation to supply goods, immediately upon the bankruptcy or insolvency of Buyer or Buyer's breach of these terms. Buyer will pay the price for any goods delivered on or before the date of termination. Seller is not liable for any other costs, expenses, losses, damages or liabilities arising out of such termination. Termination or cancellation will not alter or terminate any of the parties' obligations under any section of the terms that by its nature extends beyond termination or cancellation.

19. **Severability/Revision.** Should any provision of these terms be held by a court of law, or other body having proper jurisdiction to be illegal, invalid or unenforceable, the legality, validity and enforceability of the remaining provisions of these terms shall not be affected or impaired thereby and the parties agree that partial enforcement of these terms or revisions of the illegal, invalid or unenforceable provision is appropriate.

20. **Notices.** To be effective, all notices and other communications under these terms shall be in writing and sent to the intended recipient by personal delivery, by recognized overnight courier or international courier, at the party's address as set forth in the face of the purchase order. Each party may change its address for receipt of notice by giving notice of such change pursuant to this section. Notice is given immediately upon personal delivery, the next day following the date on which such notice is sent by overnight courier or three days following the date on which such notice is sent by international courier.

21. **Entire Agreement.** These terms constitute the entire agreement between the parties as to the subject matter thereof, and may be modified, or any right waived, only by a written document signed by the party to be charged that specifically references these terms and the section(s) so modified.

# **Customer Support Worldwide**

**IT'S SIMPLE TO CONTACT MP PUMPS FOR INFORMATION**



***MP Pumps Operates In A Global Marketplace.***

We are keenly aware of the need to provide prompt delivery of our products to customers worldwide and have in place an international network of distributors to meet this need.

***"It is the policy of MP Pumps to satisfy customers by consistently supplying them with products that fully meet their requirements.  
Customer Satisfaction Today, Tomorrow, Always."***

**— Mission Statement**

Our computerized inventory control system tracks the more than 10,000 parts we stock in our 20,000-square-foot parts warehouse. We also maintain E-mail capability and a site on the worldwide web to speed communication between us, our distributor network and our customers.

**800-563-8006**

(Outside the U.S., 586-293-8240)

FAX: 586-293-8469

**www.mppumps.com**



34800 BENNETT • FRASER, MI 48026-1686  
(586) 293-8240 • FAX (586) 293-8469  
(800) 563-8006 • [www.mppumps.com](http://www.mppumps.com)