Steel & O'Brien Manufacturing
Sanitary Simplified™

Premium Manufacturer of Sanitary Fittings, Valves, Pumps & More

# TOP-FLO® Centrifugal Pump Model TF-C Series Catalog


Stainless Steel Flow Control Equipment for the Food, Beverage, Dairy, Cosmetics, Pharmaceutical, Biotechnology, and Electronics Processing Industries

**STEEL & O'BRIEN IS AT YOUR SERVICE**

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SIMPLIFYING SANITARY THROUGH SUPERIOR SERVICE.™

# TOP-FLO®

The centrifugal pump for the process industry.

# Contents



# Introduction

The TOP-FLO® name represents the finest in sanitary process equipment. TOP-FLO® pumps have been designed to offer efficient transfer of product over a wide range of head and viscosity conditions. TOP-FLO® pumps are easy to install, clean, and operate.

This catalog will answer many of the questions you may have regarding TOP-FLO® pumps. If you require additional information, a representative will be happy to assist you and can be reached at 585-492-5800.

TOP-FLO® pumps are suitable for use in CIP (clean-in-place) installations. This feature enables easy self-cleaning with no dismantling or take-down. Sanitizing of all product contact areas is automatic.

All TOP-FLO® pumps are available in standard inlet sizes and outlet sizes. In addition, enlarged inlet sizes are available for special applications.

# Pump Ordering Information

Determining the model number of your pump is easy as 1-2-3-4.

| TF-C | 216 | M | D |
|---|---|---|---|
| ↑ | ↑ | ↑ | ↑ |
| 1 | 2 | 3 | 4 |

## 1 PUMP SERIES

TF-C Close Coupled

## 2 PUMP MODEL

TF-C100, TF-C114, TF-C216, TF-C218, TF-C328

Note:

- TF-C Series furnished without legs unless otherwise specified on order.
- Casing Gaskets: BUNA (Standard). If other type is required, specify on order.
- Enlarged inlet: When ordering pump with enlarged inlet state inlet size, i.e., TF-C218MD with 3" inlet.

## 3 PORT CONNECTIONS

M - Clamp (Standard)

T - Acme Bevel Seat Thread

S - NPT Female Thread

F - Flanged

W - Weld

## TYPE OF SEAL/STANDARD MATERIAL:

4

D - External balanced sanitary seal

DG - External balanced sanitary seal w/clamped insert

E - Water cooled balanced double seal

F - External balanced seal w/cascading water

**Motor Data** is not included as part of 4-step ordering number.

Provide the following information:

- Horsepower and RPM
- Electrical phase and voltage
- TEFC is standard

If motor is furnished from another source, supply the following:

- Horsepower
- RPM
- NEMA frame size

Remember to order needed accessories:

- Seal Kits and Parts
- Gaskets
- Clamps
- Hangers
- Air Relief Valves
- Check Valve
- Butterfly Valves
- Ball Valves
- Fittings

# TOP-FLO® TF-C Series Centrifugal Pumps

PUMP SPECIFICATIONS:

Capacity: 10gpm to 600gpm
Pressure: 135 PSIG
Viscosity: 200cp
Temperature: 212°F

| Model No. | TF-C100 | TF-C114 | TF-C216 | TF-C218 | TF-C328 |
|---|---|---|---|---|---|
| Inlet | 1-1/2 | 1-1/2 or 2 | 2 or 2-1/2 | 2 or 3 | 3 or 4 |
| Outlet | 1 | 1-1/2 | 1-1/2 | 1-1/2 | 2 |
| Max. Imp. | 3.68 | 4 | 6 | 8 | 8 |

## PUMP SPECIFICATIONS

**Pump Casings:**
- Volute type - Standard
- Inlet-oversizing as noted in chart above

**Pump Connections:**

SANITARY:
- Clamp
- Bevel Seat (ACME)

INDUSTRIAL:
- Threaded
- Flanged

**Pump Construction Materials:**
- All wetted parts - 316L SS
- Seals - Carbon (other seals available)
- Casing Gasket - BUNA (Standard)
- FKM, EPDM, and PTFE are available

**Pump Finishes:**
- Polished or Electropolished
- 32$R_a$ standard

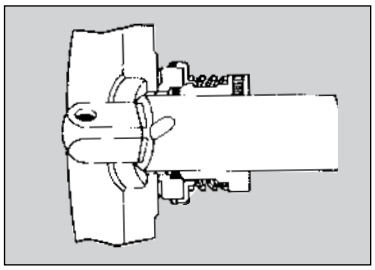
**Pump Seals:**
- Available in D, DG, E, and F styles

**Motor, Electrical:**
- 3 Phase - 230/460 volts - 1750 & 3500 rpm
- Single Phase - 115/230 volts - 1750 & 3500 rpm

**Motor Housings:**
- TEFC (Totally Enclosed Fan Cooled)
- Washdown Duty
- Other styles available on request

## SEAL SPECIFICATIONS

**TYPE D**
**External**
**Balanced**
**Seal**
**(Sanitary)**



This versatile seal has numerous applications but yet is extremely durable. Dairy products, soft vegetables, beverages, and even acid cleaning solutions and detergents are among the recommended uses.

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**TYPE DG**
**External Balanced Seal with Clamped-in Seat (Sanitary)**
The DG seal uses the standard Type D rotating seal components with a reversible silicon carbide, tungsten carbide or ceramic seat. Typical applications include liquid sugar, beverage syrup, chocolate and abrasive products.

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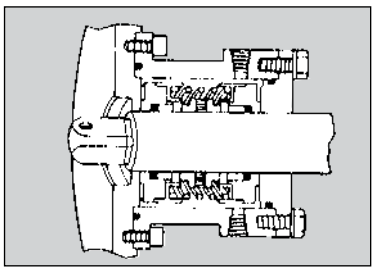
**TYPE E**
**Water Cooled**
**Balanced**
**Double Seal**
**(Sanitary)**



Type E is designed to withstand heavy duty vacuum applications (to 28" Hg), tacky products, slurries, or pumped products up to 212°F. The seal chamber can be pressurized to permit use of drain piping for coolants and sealants. Coolant or sealant can be circulated through the seal chamber under very low pressure when used to cool the seal face or seal against vacuum.

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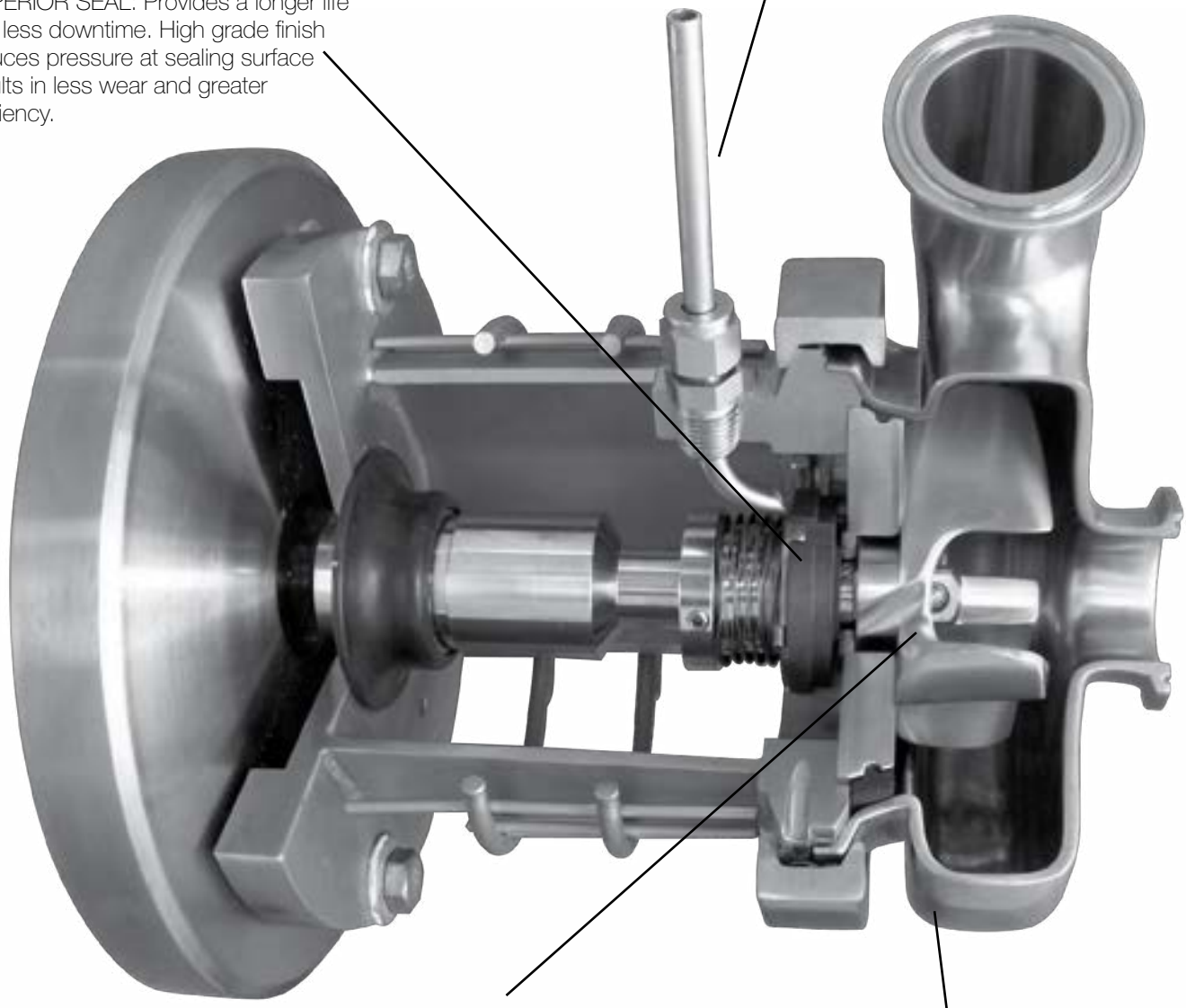
**TYPE F – (Sanitary)**
Seal same as Type D seal except includes a water cascade (not shown).
All sanitary seals meet 3A accepted practices.

TYPE IS
Internal seal for C114

# TOP-FLO® pumps are top performers using numerous features

TYPE F SEAL: Water cascade attachment is recommended for pumping tacky or hot products up to 200° F, and for vacuum applications to 14" Hg.

SUPERIOR SEAL: Provides a longer life and less downtime. High grade finish reduces pressure at sealing surface results in less wear and greater efficiency.



NO DISASSEMBLY FOR CLEANING: Unique groove-in-shaft design directs sanitizer to all critical areas. A must for clean-in-place applications.

CASING: Finely polished casing suitable to meet numerous requirements. Casing available in a wide selection of port connections to meet a variety of piping systems.

# TOP-FLO® Pump Sizing Application Data

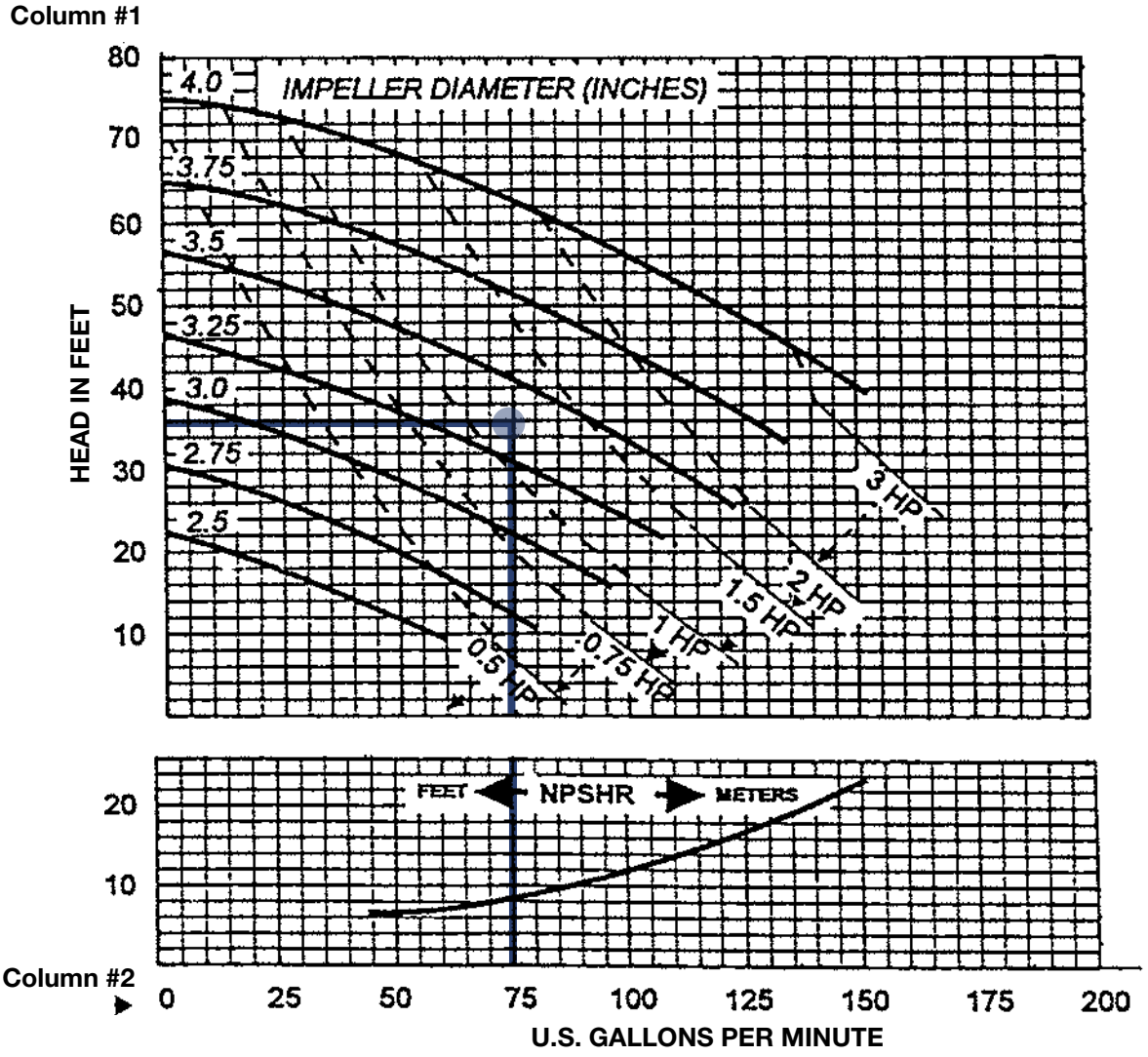
## Use of a Pump Curve Chart

The curve chart is the best resource to use when selecting the proper impeller and motor for applications in the food, dairy, beverage, pharmaceutical and cosmetic industries. The curve chart enables the user to determine how a pump will perform at different impeller sizes and motor speeds.

Operating at 1750 RPM and 3500 RPM, curves have been listed for the TOP-FLO® TF-C100, TF-C114, TF-C216, TF-C218, and TF-C328 centrifugal pumps on the following pages. An instructional chart is listed below.

**Note:** Column #1 on the left shows head in feet
Column #2 at the bottom shows gallons per minute
Impeller sizes are listed on curve line
Motor horsepower listed on diagonal serrated lines
NPSH required is #3 and listed at the bottom of chart

**Example:** On the curve listed below, find the impeller size and horsepower of motor for 75 GPM against total head pressure of 40'.




**Answer to example:**

1. To determine duty point: First, find the 35' of head in column #1. Second, find the 75 gallon per minute in column #2. Then, trace the 35' of head mark to the right until it intersects the 75 GPM line.
2. To determine impeller diameter. The duty point falls between the 3.25 and 3.5 impeller curve lines. Always choose the curve line above the duty point. In this case it would be 3.5.
3. To determine NPSHR (Net Positive Suction Head Required): Use the NPSHR graph and plot the intersection point of 75 GPM. Follow horizontally to the left. It reads 9'. (This will be Net Positive Suction Head Required.)
4. You will see at this point a 3.25 impeller and a 1-1/2 horsepower motor is required.

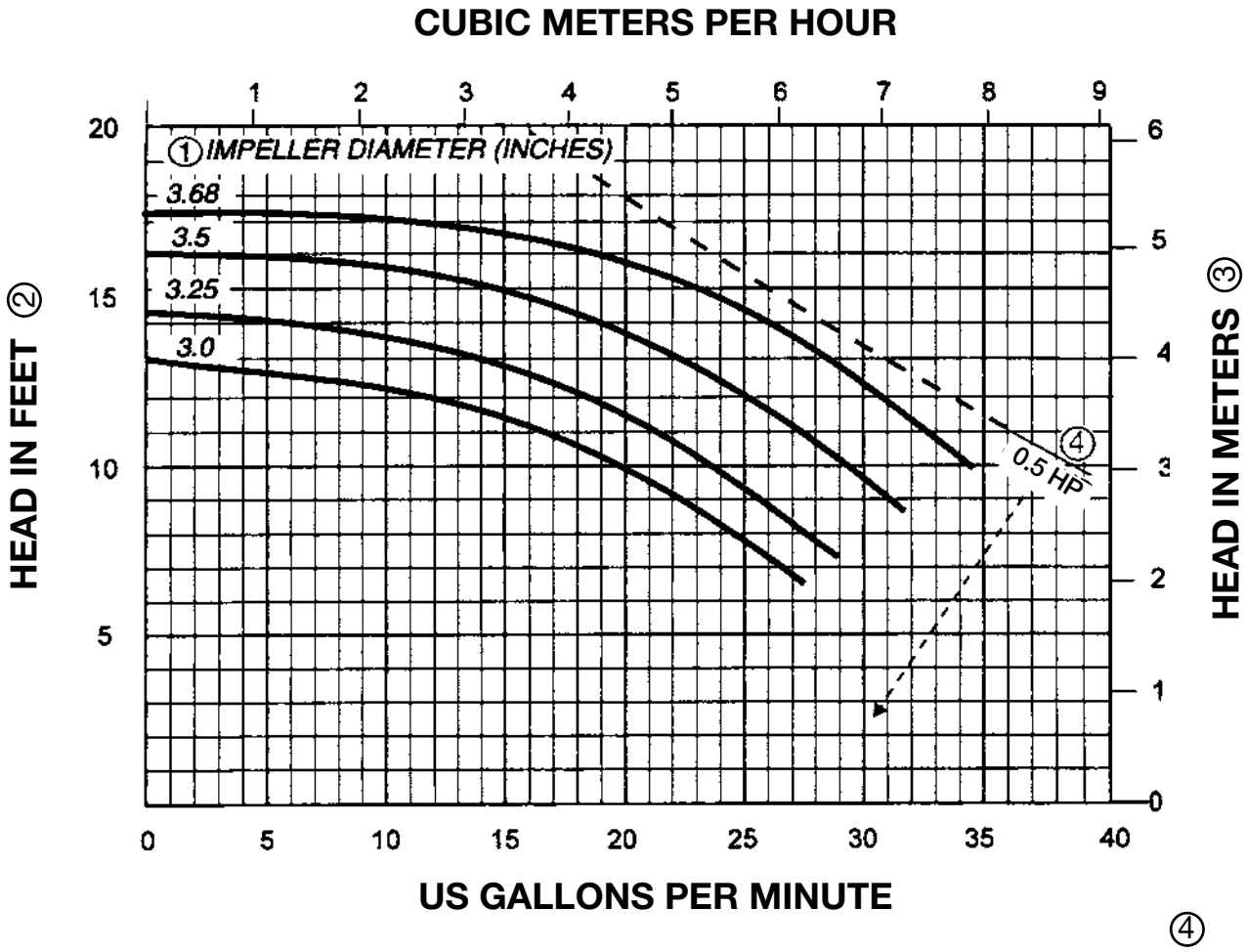
Note: NPSHA (Net Positive Suction Available) must be > or = NPSHR (Net Positive Suction Head Required).

# TOP-FLO® TF-C Series Centrifugal Pumps

## Capacity Curves

**Based on water at 70°F (22°C)**

**Model: TF-C100**
**60 Hz 1750 RPM**
**Size: 1-1/2 x 1 x 3-11/16**




**NOTES:**

① Impeller diameters available in 1/16 inch increments

② PSI = $\frac{\text{Head in Feet X Specific Gravity}}{2.3}$

③ $Kg/cm^2 = \frac{\text{Head in Meters X Specific Gravity}}{10}$

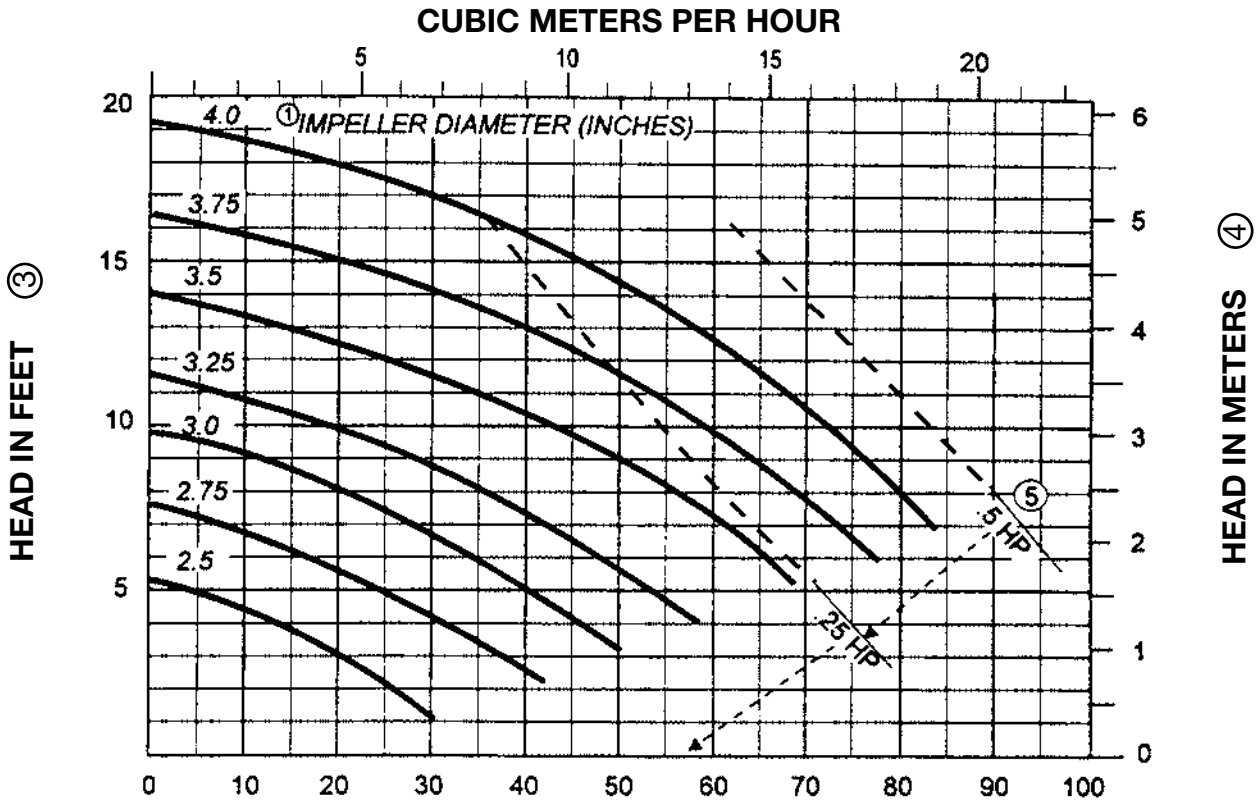
④ HP x 0.746 = Kw

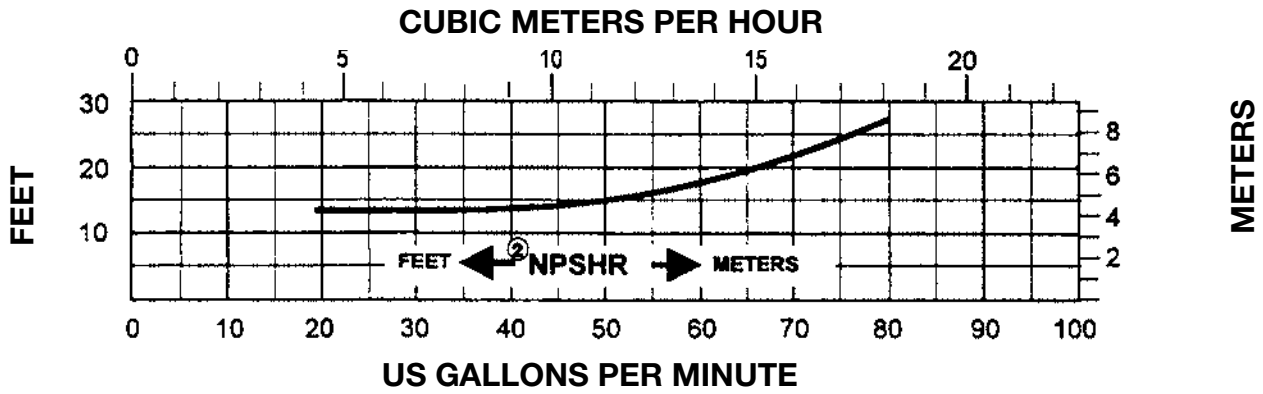
# TOP-FLO® TF-C Series Centrifugal Pumps

## Capacity Curves

**Based on water at 70°F (22°C)**

**Model: TF-C114**
**60 Hz 1750 RPM**
**Size: 1-1/2 x 1-1/2 x 4**




**NOTES:**

① Impeller diameters available in 1/4 inch increments

② NPSHR is shown for maximum impeller diameter

③ PSI = $\frac{\text{Head in Feet X Specific Gravity}}{2.3}$

④ Kg/cm² = $\frac{\text{Head in Meters X Specific Gravity}}{10}$

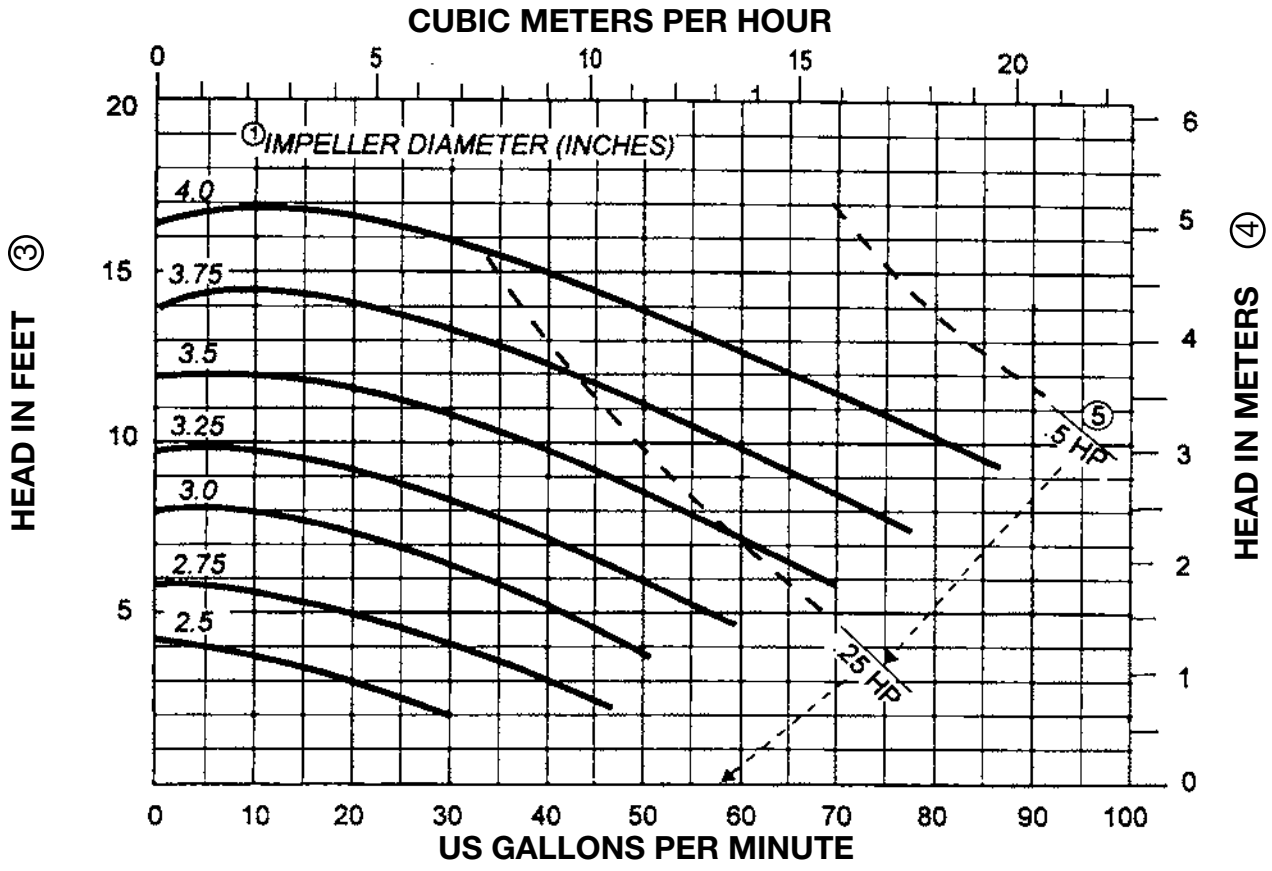
⑤ HP x 0.746 = Kw

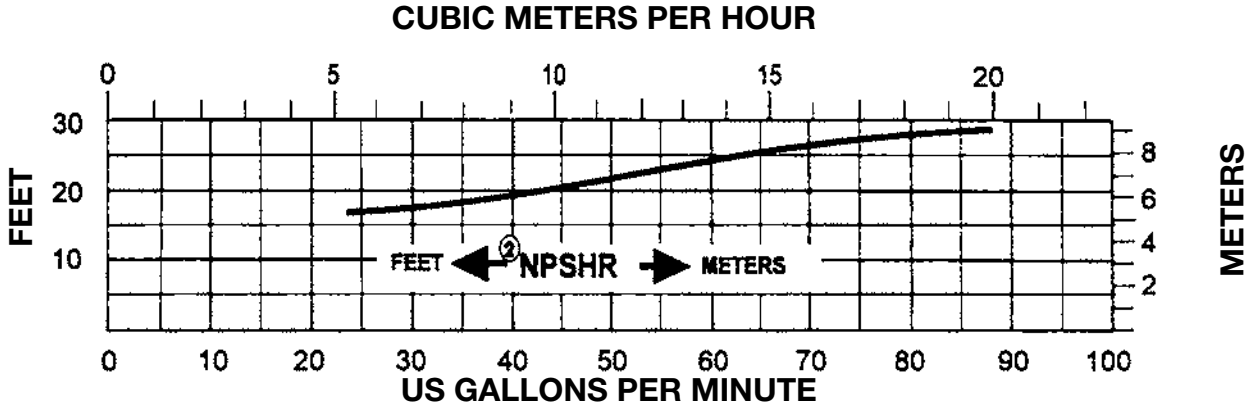
# TOP-FLO® TF-C Series Centrifugal Pumps

## Capacity Curves

**Based on water at 70°F (22°C)**

**Model: TF-C114**
**60 Hz 1750 RPM**
**Size: 2 x 1-1/2 x 4**




**NOTES:**

① Impeller diameters available in 1/16 inch increments

② NPSHR is shown for maximum impeller diameter

③ PSI = $\frac{\text{Head in Feet X Specific Gravity}}{2.3}$

④ Kg/cm² = $\frac{\text{Head in Meters X Specific Gravity}}{10}$

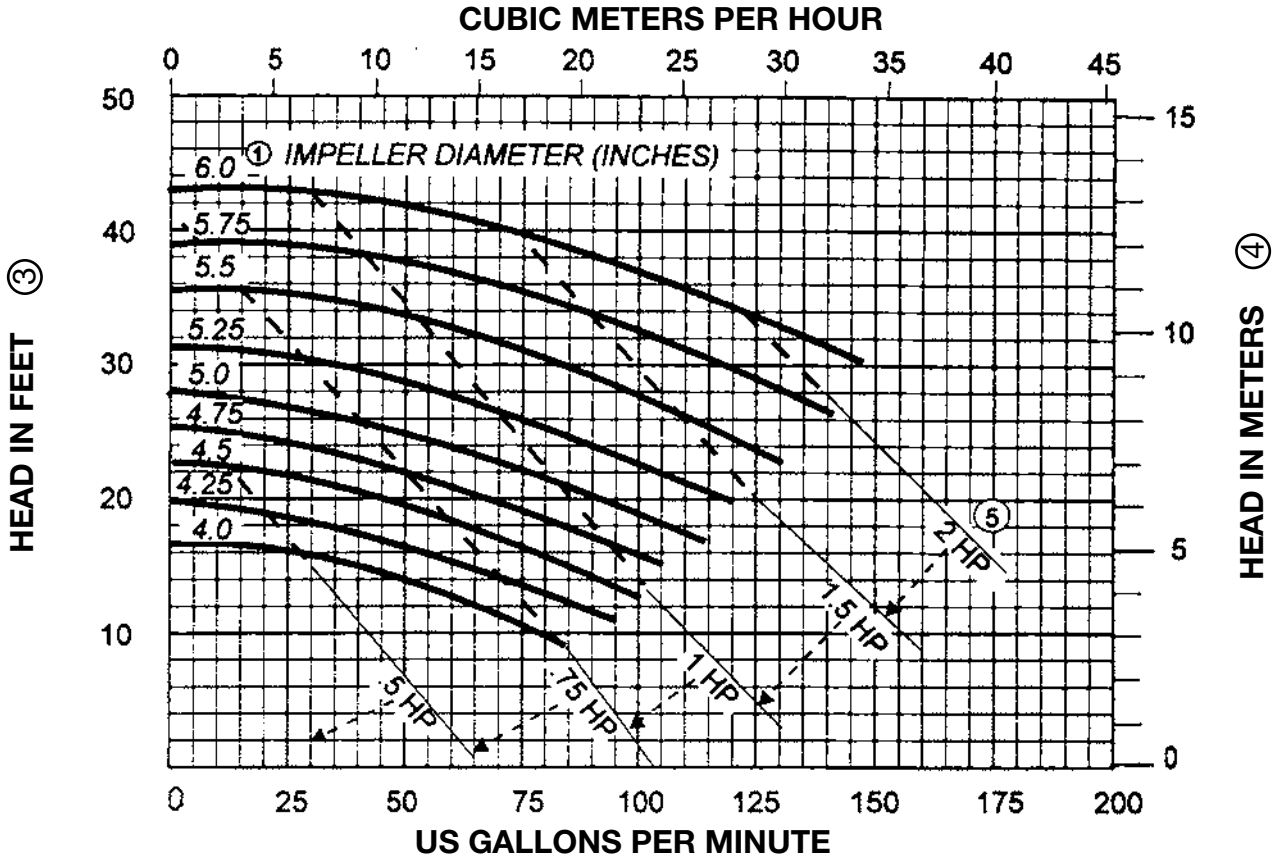
⑤ HP x 0.746 = Kw

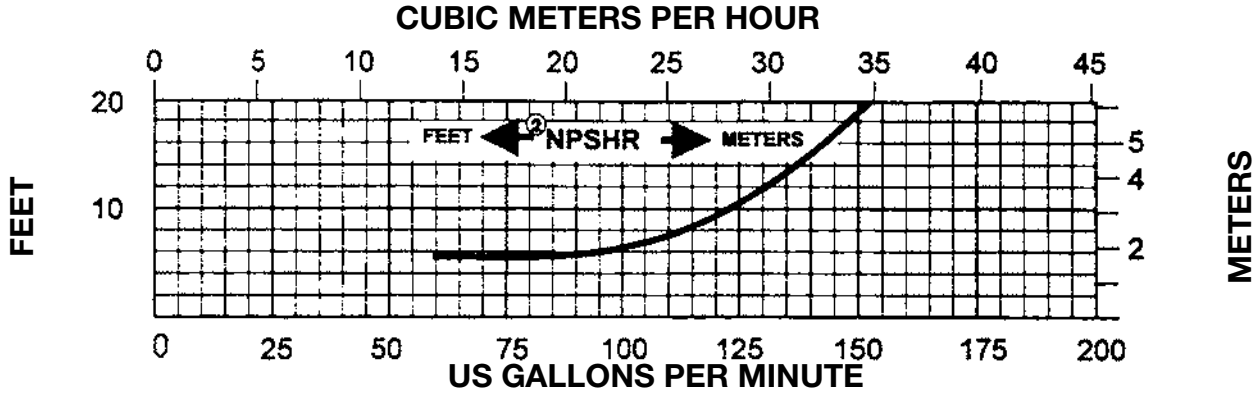
# TOP-FLO® TF-C Series Centrifugal Pumps

## Capacity Curves

**Based on water at 70°F (22°C)**

**Model: TF-C216**
**60 Hz 1750 RPM**
**Size: 2 x 1-1/2 x 6**




**NOTES:**

① Impeller diameters available in 1/4 inch increments

② NPSHR is shown for maximum impeller diameter

③ PSI = $\frac{\text{Head in Feet X Specific Gravity}}{2.3}$

④ $Kg/cm^2 = \frac{\text{Head in Meters X Specific Gravity}}{10}$

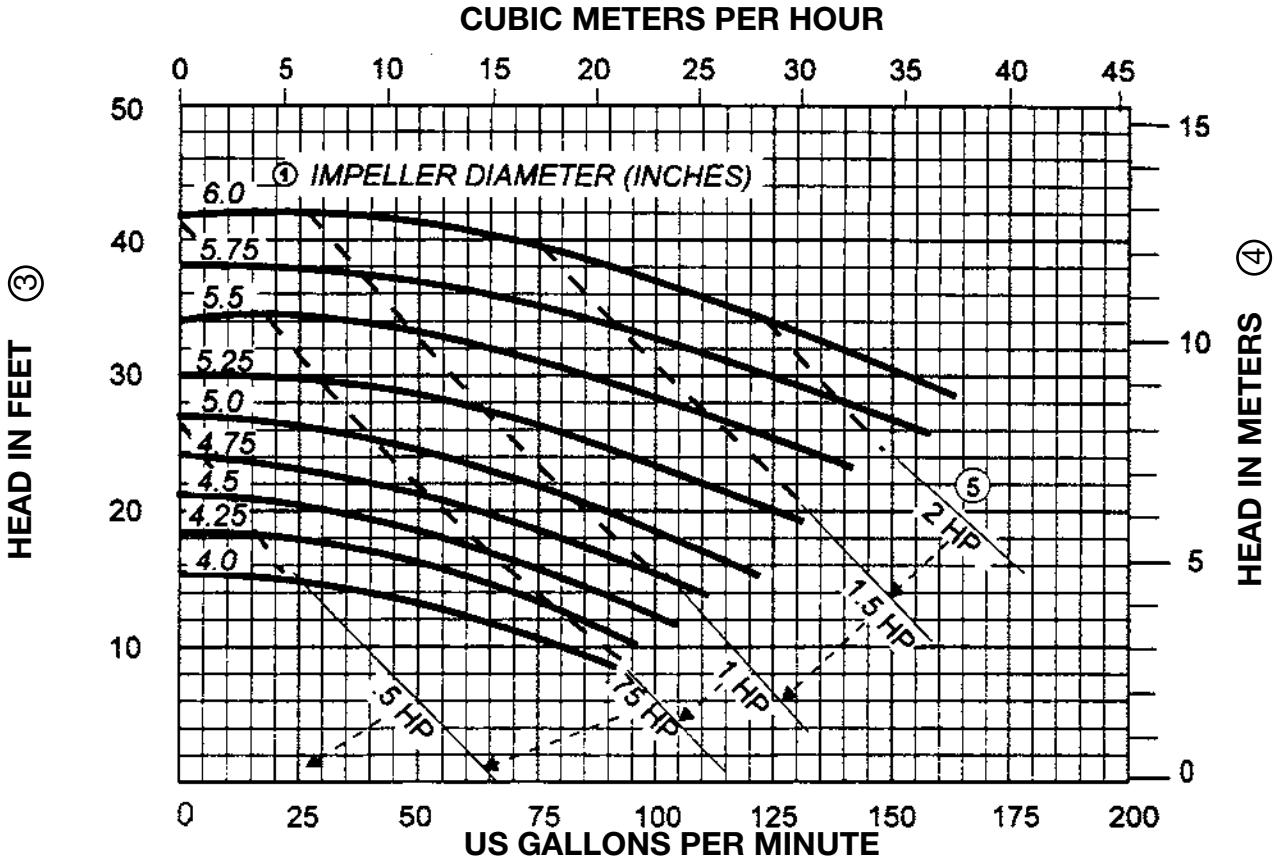
⑤ HP x 0.746 = Kw

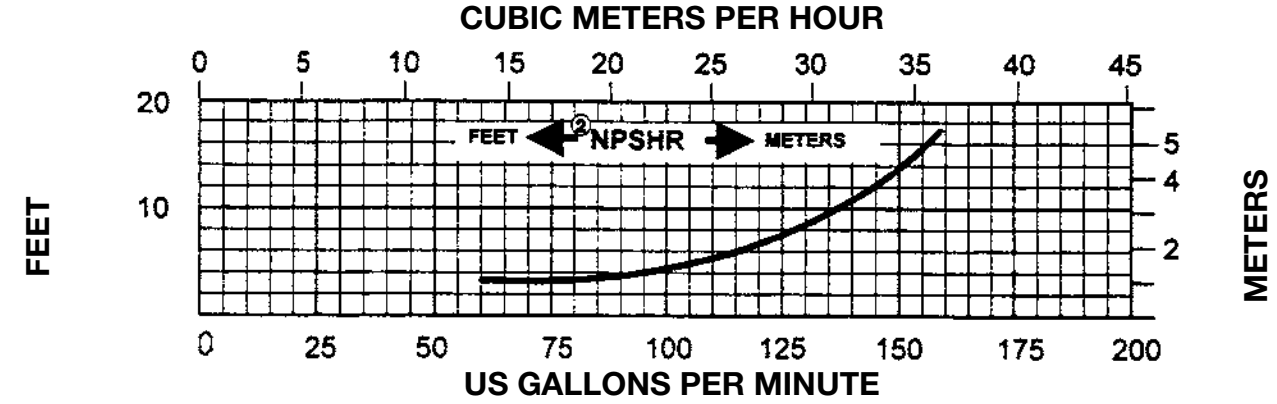
# TOP-FLO® TF-C Series Centrifugal Pumps

## Capacity Curves

**Based on water at 70°F (22°C)**

**Model: TF-C216**
**60 Hz 1750 RPM**
**Size: 2-1/2 x 1-1/2 x 6**




**NOTES:**

① Impeller diameters available in 1/4 inch increments

② NPSHR is shown for maximum impeller diameter

③ PSI = $\frac{\text{Head in Feet X Specific Gravity}}{2.3}$

④ Kg/cm² = $\frac{\text{Head in Meters X Specific Gravity}}{10}$

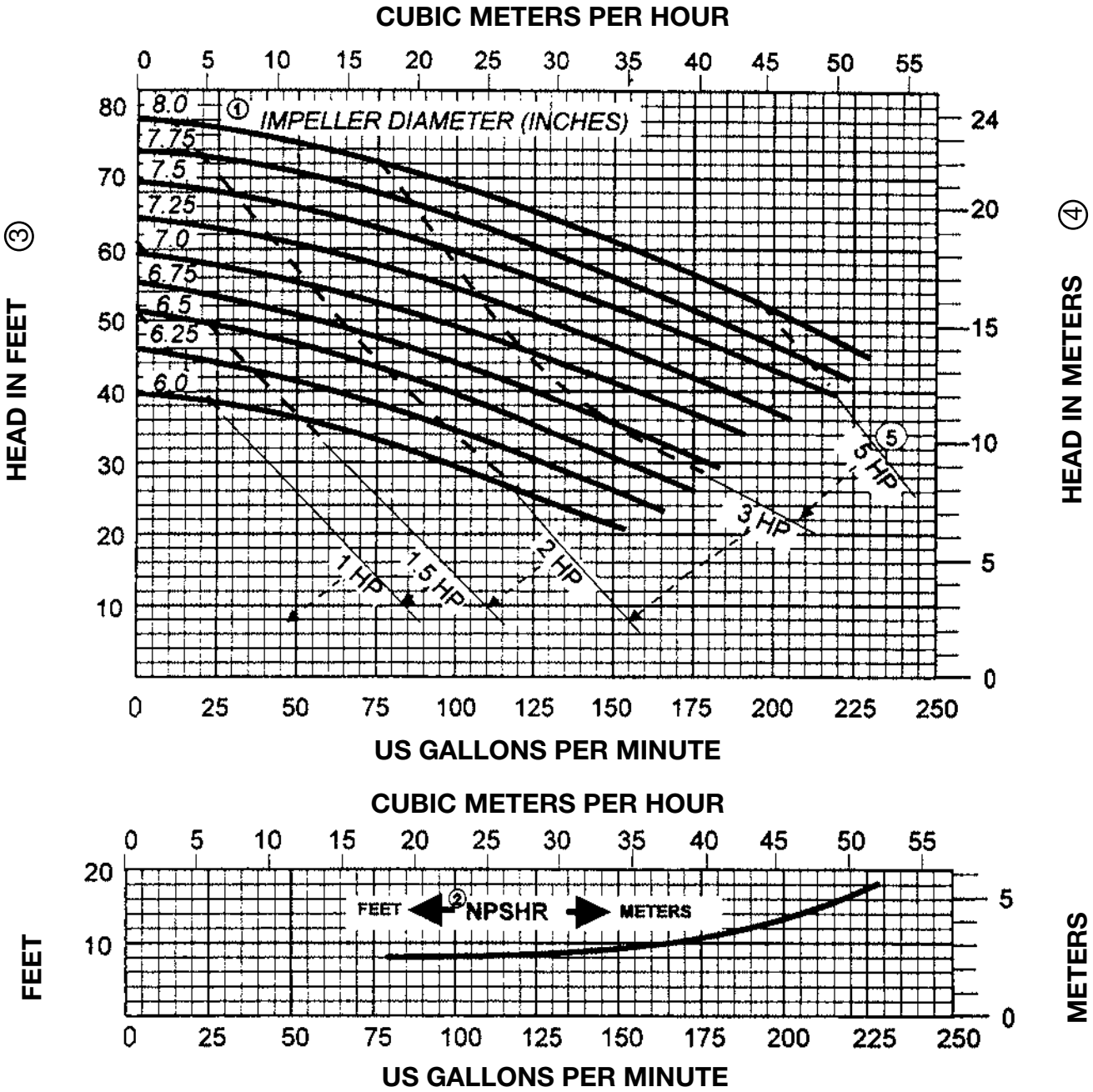
⑤ HP x 0.746 = Kw

# TOP-FLO® TF-C Series Centrifugal Pumps

## Capacity Curves

**Based on water at 70°F (22°C)**

**Model: TF-C218**
**60 Hz 1750 RPM**
**Size: 2 x 1-1/2 x 8**




**NOTES:**

① Impeller diameters available in 1/4 inch increments

② NPSHR is shown for maximum impeller diameter

③ PSI = $\frac{\text{Head in Feet X Specific Gravity}}{2.3}$

④ $Kg/cm^2 = \frac{\text{Head in Meters X Specific Gravity}}{10}$

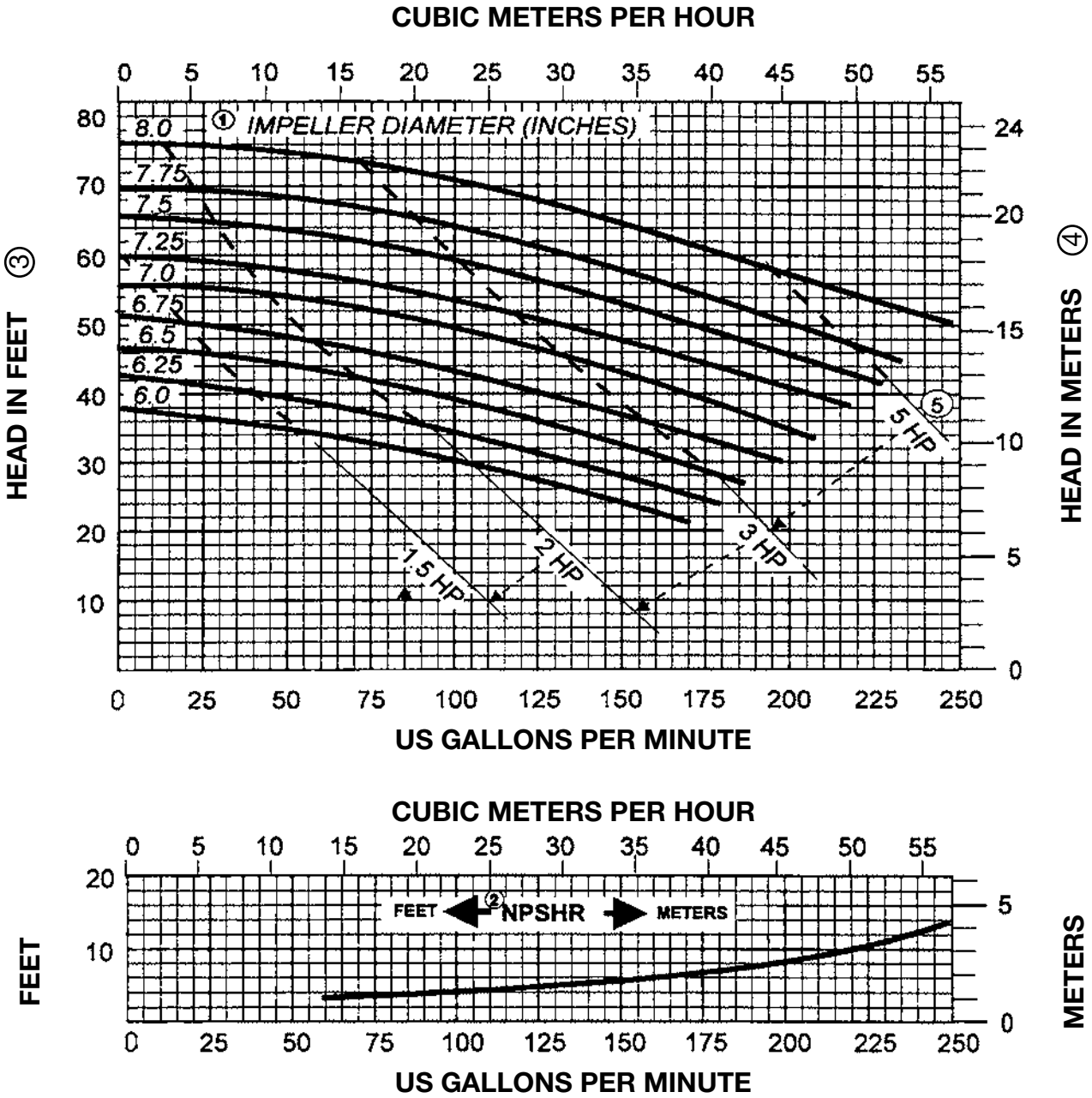
⑤ HP x 0.746 = Kw

# TOP-FLO® TF-C Series Centrifugal Pumps

## Capacity Curves

**Based on water at 70°F (22°C)**

**Model: TF-C218**
**60 Hz 1750 RPM**
**Size: 3 x 1-1/2 x 8**




**NOTES:**

① Impeller diameters available in 1/16 inch increments

② NPSHR is shown for maximum impeller diameter

③ PSI = $\frac{\text{Head in Feet X Specific Gravity}}{2.3}$

④ $Kg/cm^2 = \frac{\text{Head in Meters X Specific Gravity}}{10}$

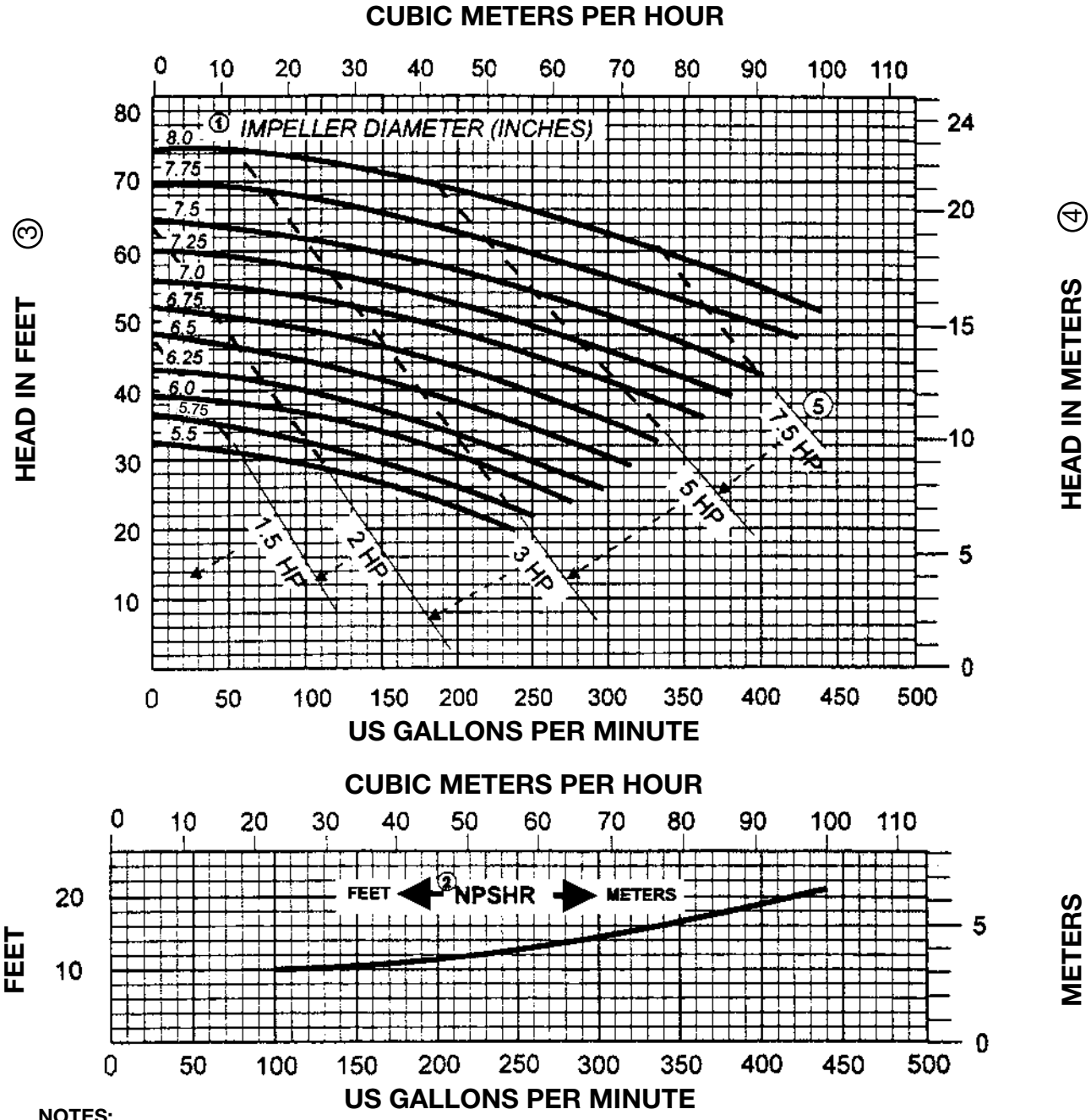
⑤ HP x 0.746 = Kw

# TOP-FLO® TF-C Series Centrifugal Pumps

## Capacity Curves

**Based on water at 70°F (22°C)**

**Model: TF-C328**
**60 Hz 1750 RPM**
**Size: 3 x 2 x 8**




**NOTES:**

① Impeller diameters available in 1/4 inch increments

② NPSHR is shown for maximum impeller diameter

③ PSI = $\frac{\text{Head in Feet X Specific Gravity}}{2.3}$

④ $Kg/cm^2 = \frac{\text{Head in Meters X Specific Gravity}}{10}$

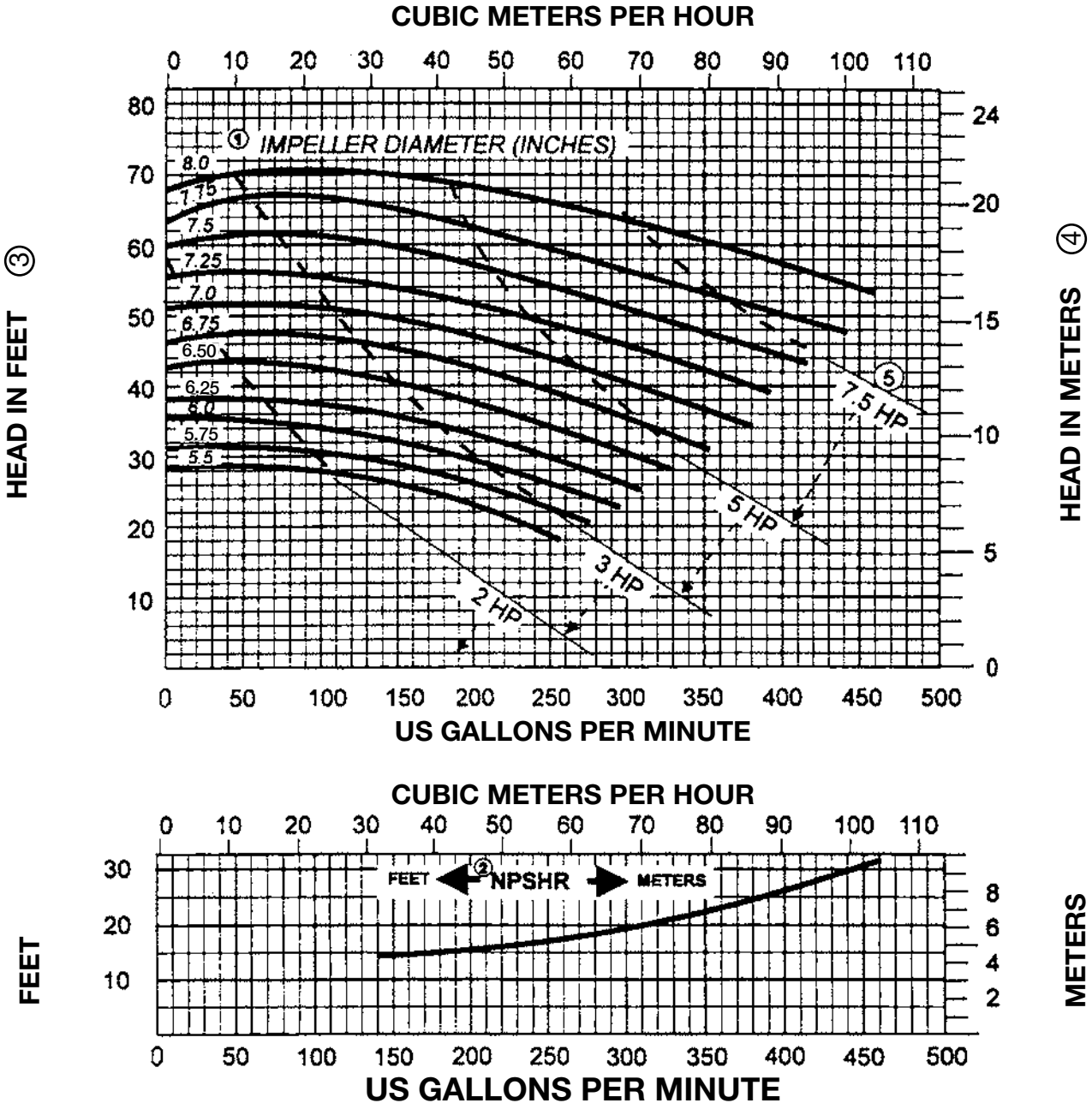
⑤ HP x 0.746 = Kw

# TOP-FLO® TF-C Series Centrifugal Pumps

## Capacity Curves

**Based on water at 70°F (22°C)**

**Model: TF-C328**
**60 Hz 1750 RPM**
**Size: 4 x 2 x 8**




**NOTES:**

① Impeller diameters available in 1/4 inch increments

② NPSHR is shown for maximum impeller diameter

③ PSI = $\frac{\text{Head in Feet X Specific Gravity}}{2.3}$

④ $Kg/cm^2 = \frac{\text{Head in Meters X Specific Gravity}}{10}$

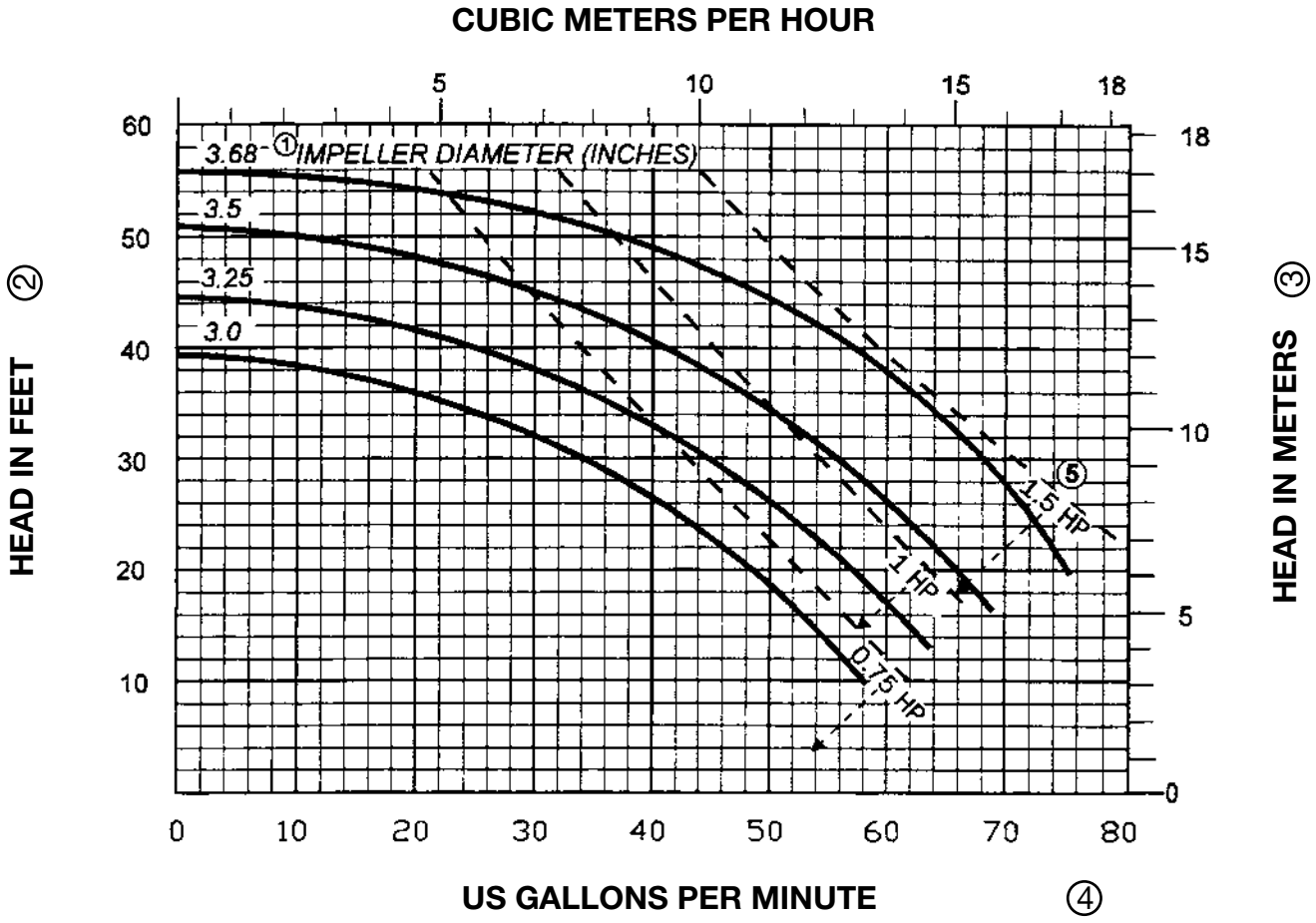
⑤ HP x 0.746 = Kw

# TOP-FLO® TF-C Series Centrifugal Pumps

## Capacity Curves

**Based on water at 70°F (22°C)**

**Model: TF-C100**
**60 Hz 3500 RPM**
**Size: 1-1/2 x 1 x 3-11/16**




**NOTES:**

① Impeller diameters available in 1/16 inch increments

② PSI = $\frac{\text{Head in Feet X Specific Gravity}}{2.3}$

③ $Kg/cm^2 = \frac{\text{Head in Meters X Specific Gravity}}{10}$

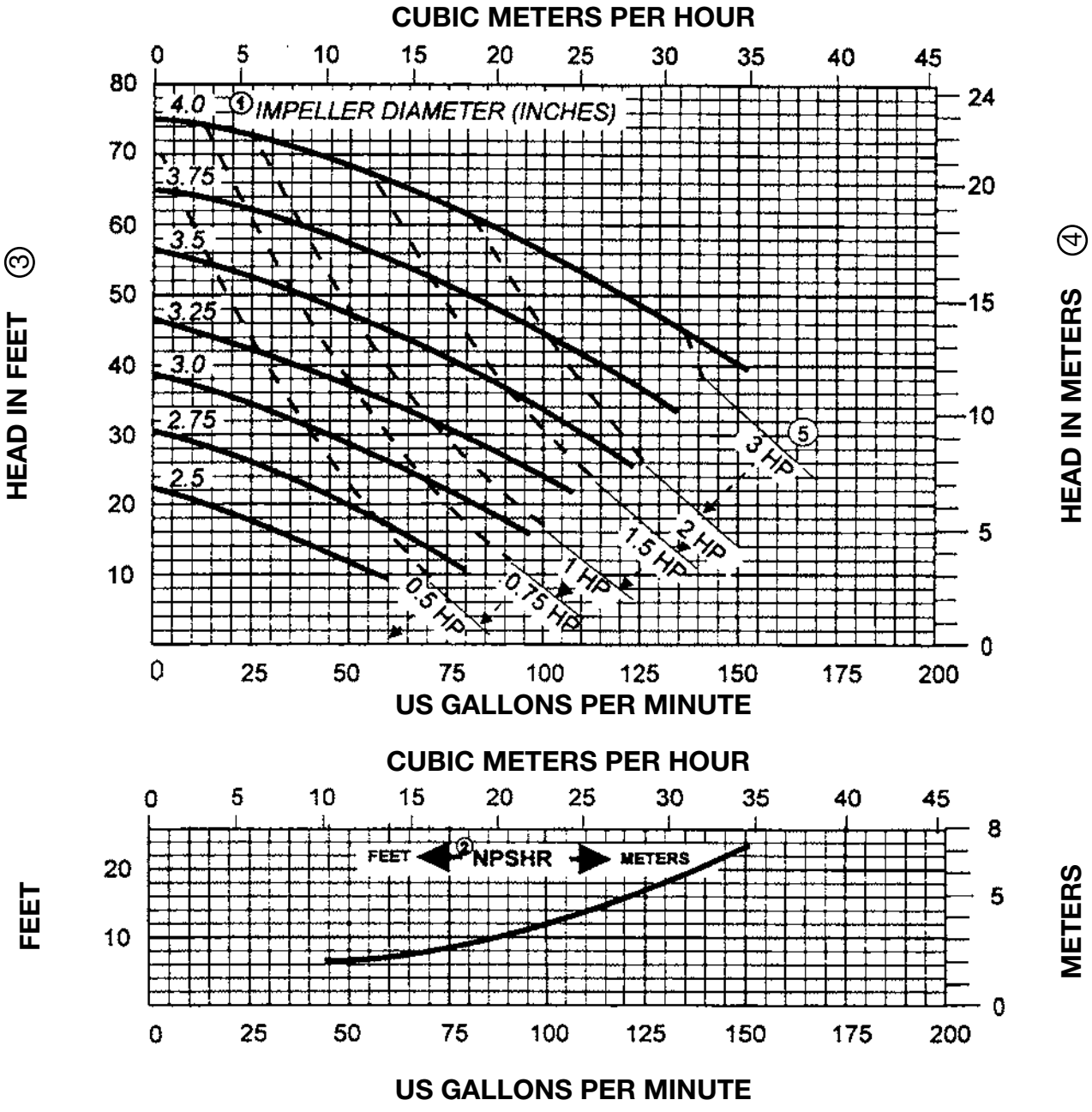
④ HP x 0.746 = Kw

# TOP-FLO® TF-C Series Centrifugal Pumps

## Capacity Curves

**Based on water at 70°F (22°C)**

**Model: TF-C114**
**60 Hz 3500 RPM**
**Size: 1-1/2 x 1-1/2 x 4**




**NOTES:**

① Impeller diameters available in 1/4 inch increments

② NPSHR is shown for maximum impeller diameter

③ PSI = $\frac{\text{Head in Feet X Specific Gravity}}{2.3}$

④ Kg/cm² = $\frac{\text{Head in Meters X Specific Gravity}}{10}$

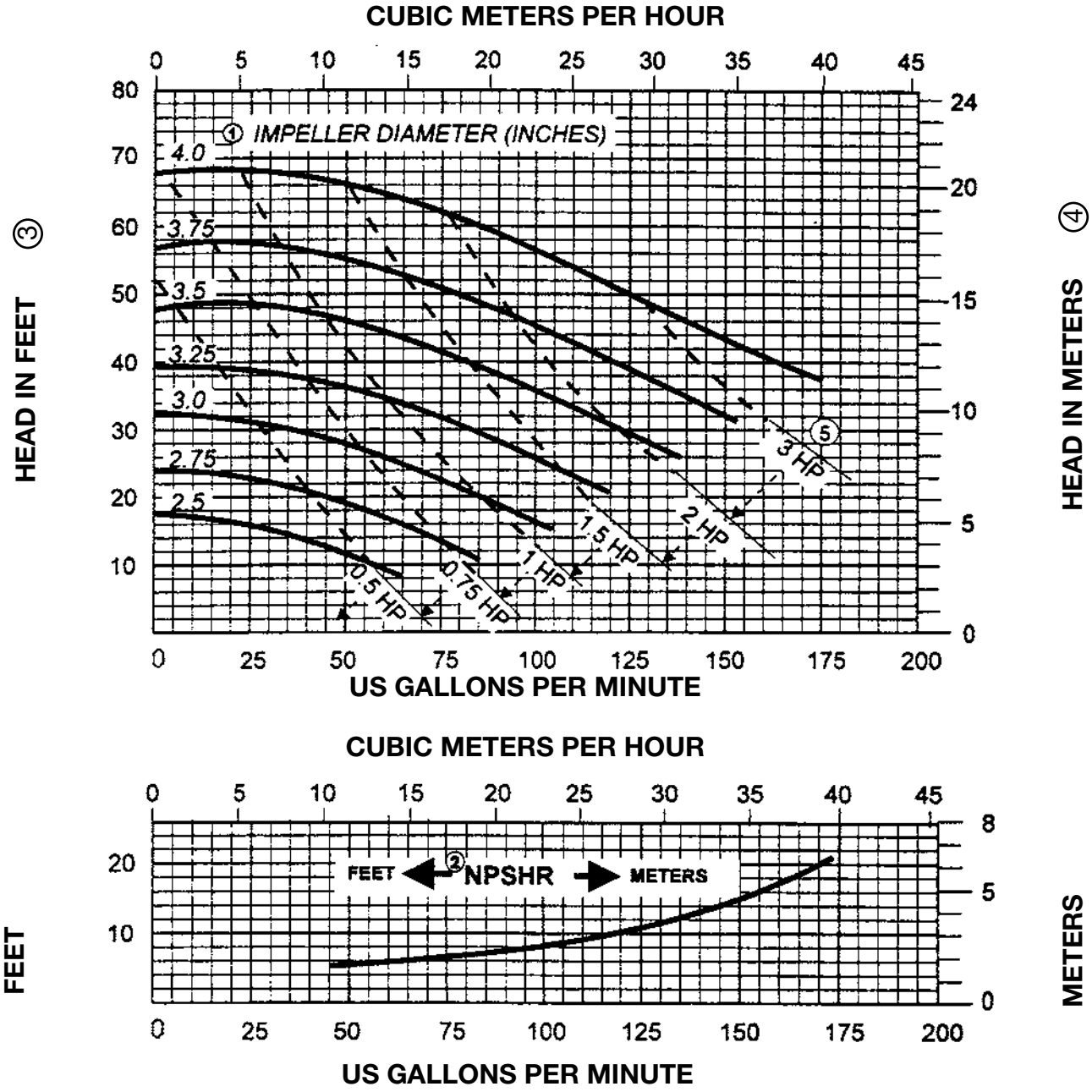
⑤ HP x 0.746 = Kw

# TOP-FLO® TF-C Series Centrifugal Pumps

## Capacity Curves

**Based on water at 70°F (22°C)**

**Model: TF-C114**
**60 Hz 3500 RPM**
**Size: 2 x 1-1/2 x 4**




**NOTES:**

① Impeller diameters available in 1/4 inch increments

② NPSHR is shown for maximum impeller diameter

③ PSI = $\frac{\text{Head in Feet X Specific Gravity}}{2.3}$

④ $Kg/cm^2 = \frac{\text{Head in Meters X Specific Gravity}}{10}$

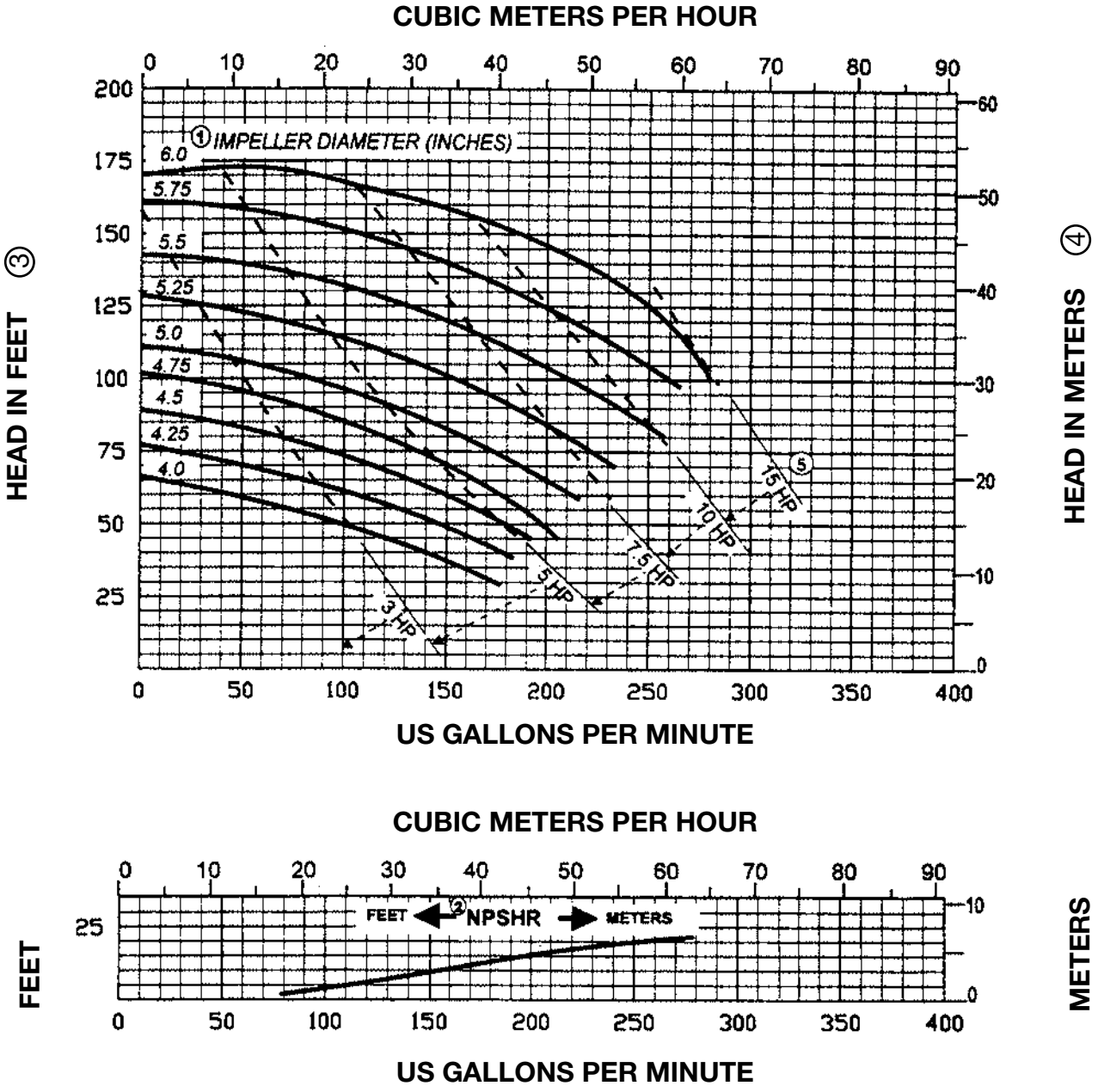
⑤ HP x 0.746 = Kw

# TOP-FLO® TF-C Series Centrifugal Pumps

## Capacity Curves

**Based on water at 70°F (22°C)**

**Model: TF-C216**
**60 Hz 3500 RPM**
**Size: 2 x 1-1/2 x 6**







**NOTES:**

① Impeller diameters available in 1/4 inch increments

② NPSHR is shown for maximum impeller diameter

③ PSI = $\frac{\text{Head in Feet X Specific Gravity}}{2.3}$

④ Kg/cm² = $\frac{\text{Head in Meters X Specific Gravity}}{10}$

⑤ HP x 0.746 = Kw

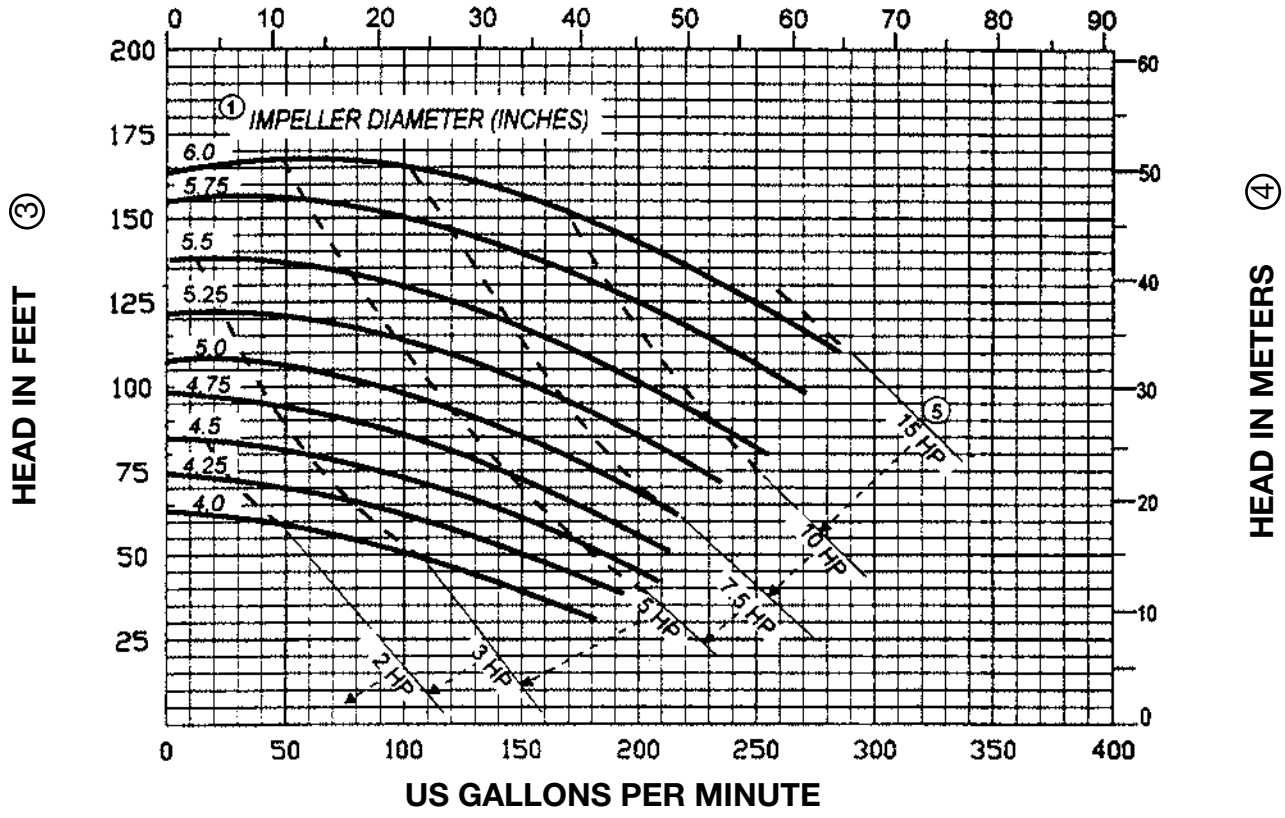
# TOP-FLO® TF-C Series Centrifugal Pumps

## Capacity Curves

**Based on water at 70°F (22°C)**

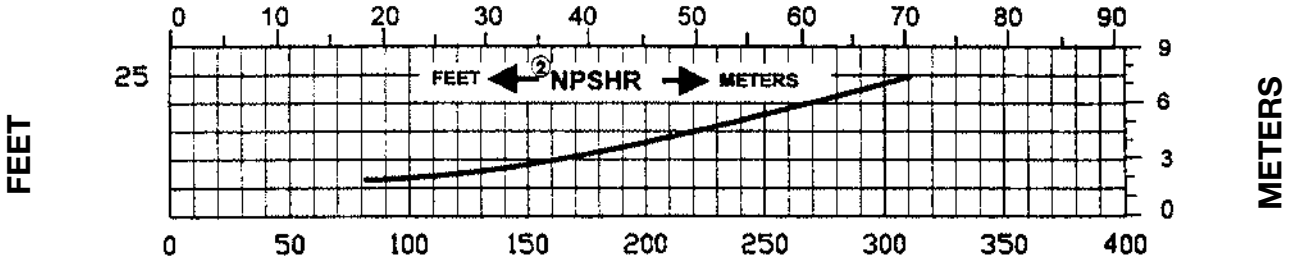
**Model: TF-C216**
**60 Hz 3500 RPM**
**Size: 2-1/2 x 1-1/2 x 6**

**CUBIC METERS PER HOUR**




**US GALLONS PER MINUTE**

**CUBIC METERS PER HOUR**




**US GALLONS PER MINUTE**

**NOTES:**

① Impeller diameters available in 1/4 inch increments

② NPSHR is shown for maximum impeller diameter

③ PSI = $\frac{\text{Head in Feet X Specific Gravity}}{2.3}$

④ $Kg/cm^2 = \frac{\text{Head in Meters X Specific Gravity}}{10}$

⑤ HP x 0.746 = Kw

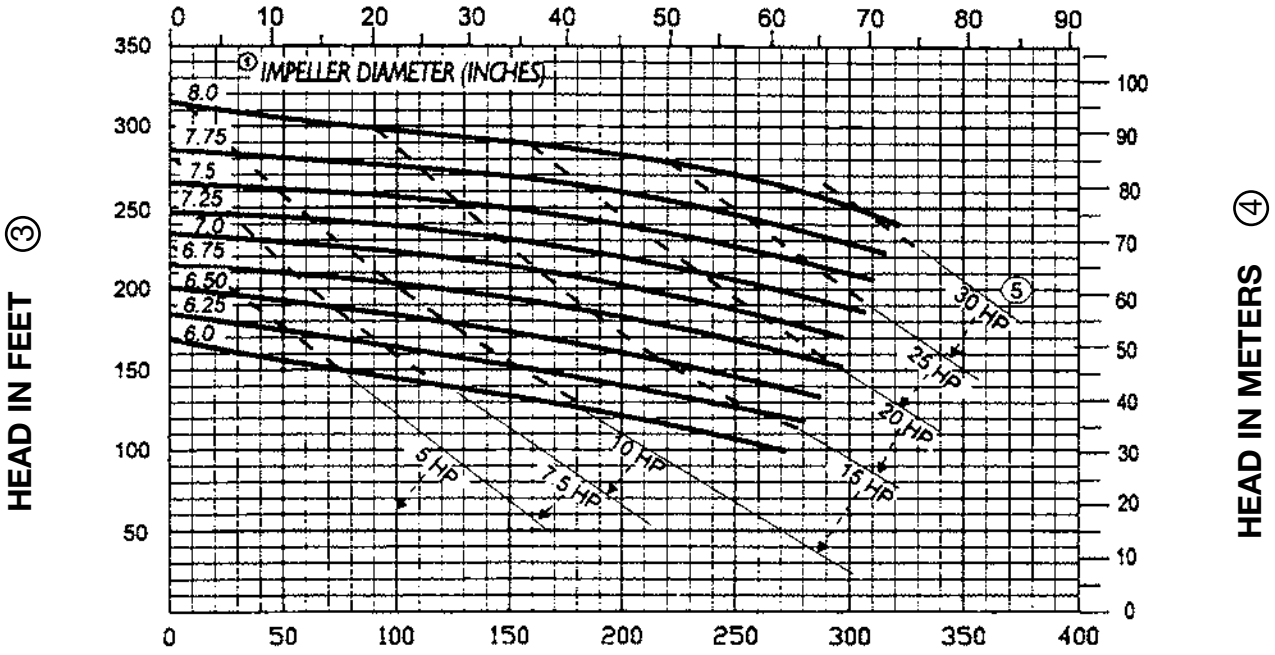
# TOP-FLO® TF-C Series Centrifugal Pumps

## Capacity Curves

**Based on water at 70°F (22°C)**

**Model: TF-C218**
**60 Hz 3500 RPM**
**Size: 2 x 1-1/2 x 8**

**CUBIC METERS PER HOUR**

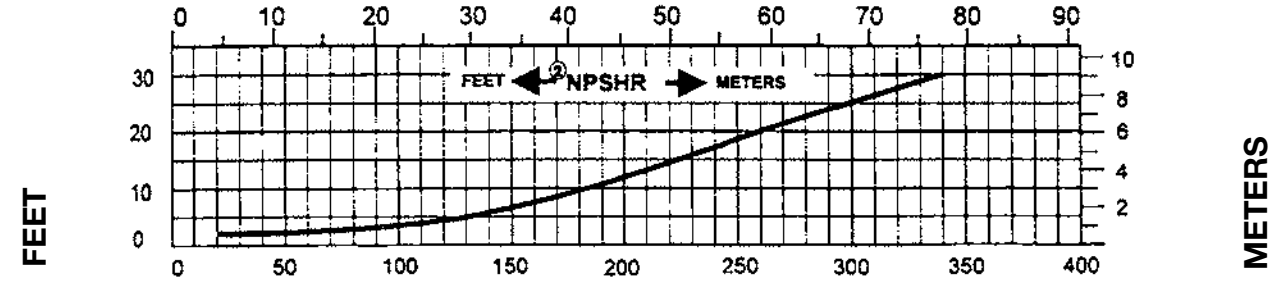



③ **HEAD IN FEET**

④ **HEAD IN METERS**

**US GALLONS PER MINUTE**

**CUBIC METERS PER HOUR**




**FEET**

**METERS**

**US GALLONS PER MINUTE**

**NOTES:**

① Impeller diameters available in 1/4 inch increments

② NPSHR is shown for maximum impeller diameter

③ PSI = $\frac{\text{Head in Feet X Specific Gravity}}{2.3}$

④ Kg/cm² = $\frac{\text{Head in Meters X Specific Gravity}}{10}$

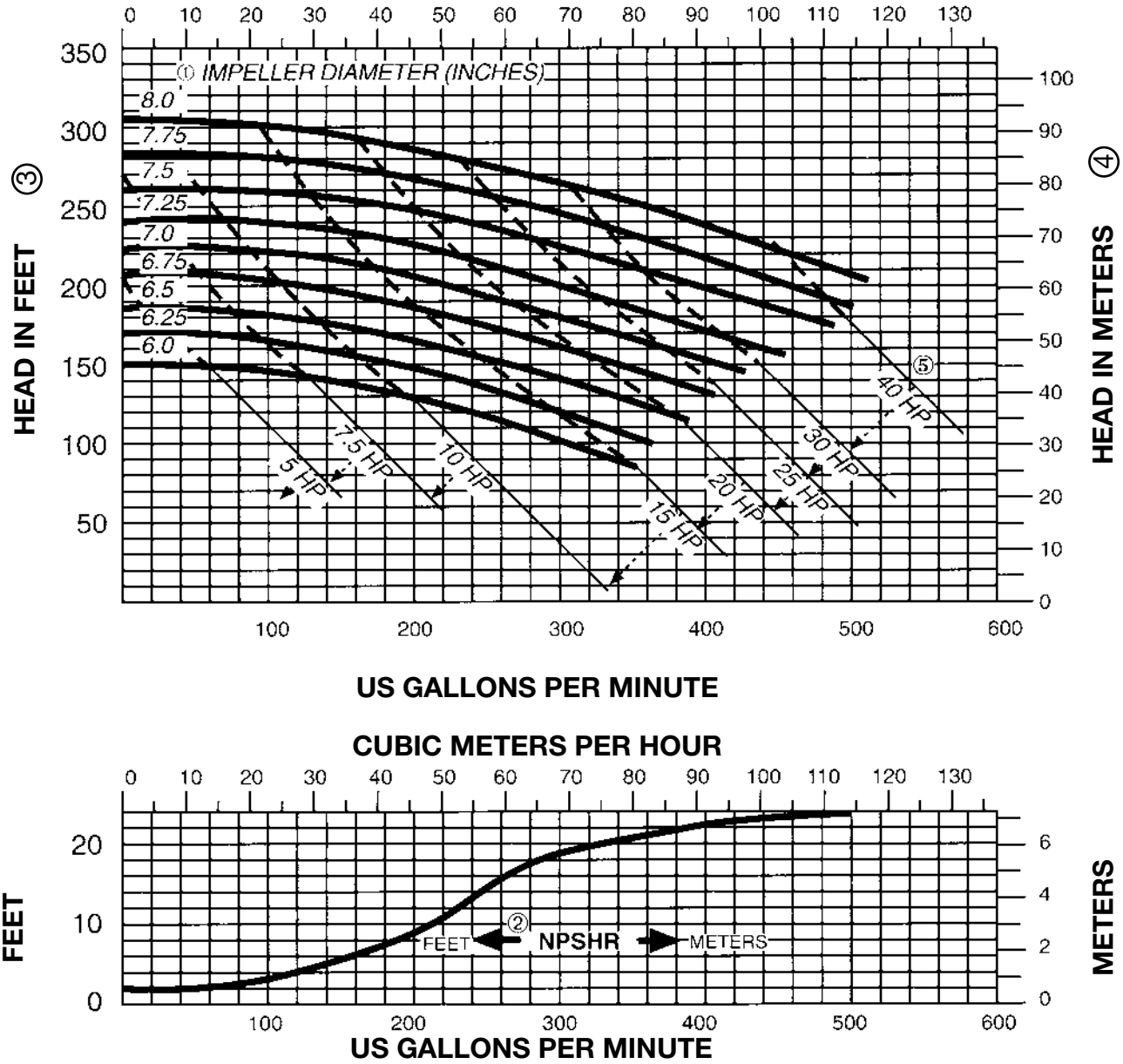
⑤ HP x 0.746 = Kw

# TOP-FLO® TF-C Series Centrifugal Pumps

## Capacity Curves

**Based on water at 70°F (22°C)**

**Model: TF-C218**
**60 Hz 3500 RPM**
**Size: 3 x 1-1/2 x 8**




**NOTES:**

① Impeller diameters available in 1/4 inch increments

② NPSHR is shown for maximum impeller diameter

③ PSI = $\frac{\text{Head in Feet X Specific Gravity}}{2.3}$

④ $Kg/cm^2 = \frac{\text{Head in Meters X Specific Gravity}}{10}$

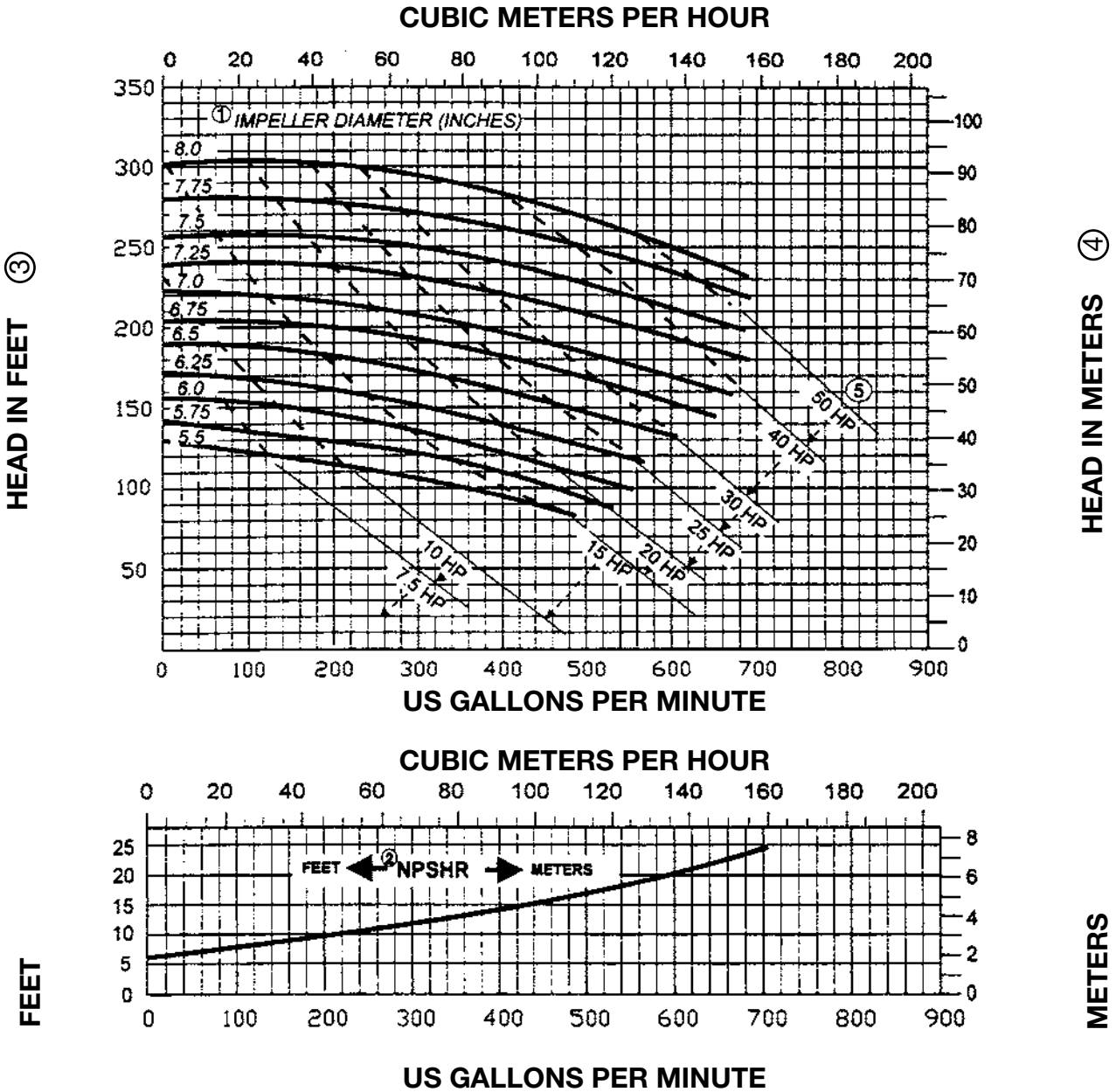
⑤ HP x 0.746 = Kw

# TOP-FLO® TF-C Series Centrifugal Pumps

## Capacity Curves

**Based on water at 70°F (22°C)**

**Model: TF-C328**
**60 Hz 3500 RPM**
**Size: 3 x 2 x 8**




**NOTES:**

① Impeller diameters available in 1/4 inch increments

② NPSHR is shown for maximum impeller diameter

③ PSI = $\frac{\text{Head in Feet X Specific Gravity}}{2.3}$

④ Kg/cm² = $\frac{\text{Head in Meters X Specific Gravity}}{10}$

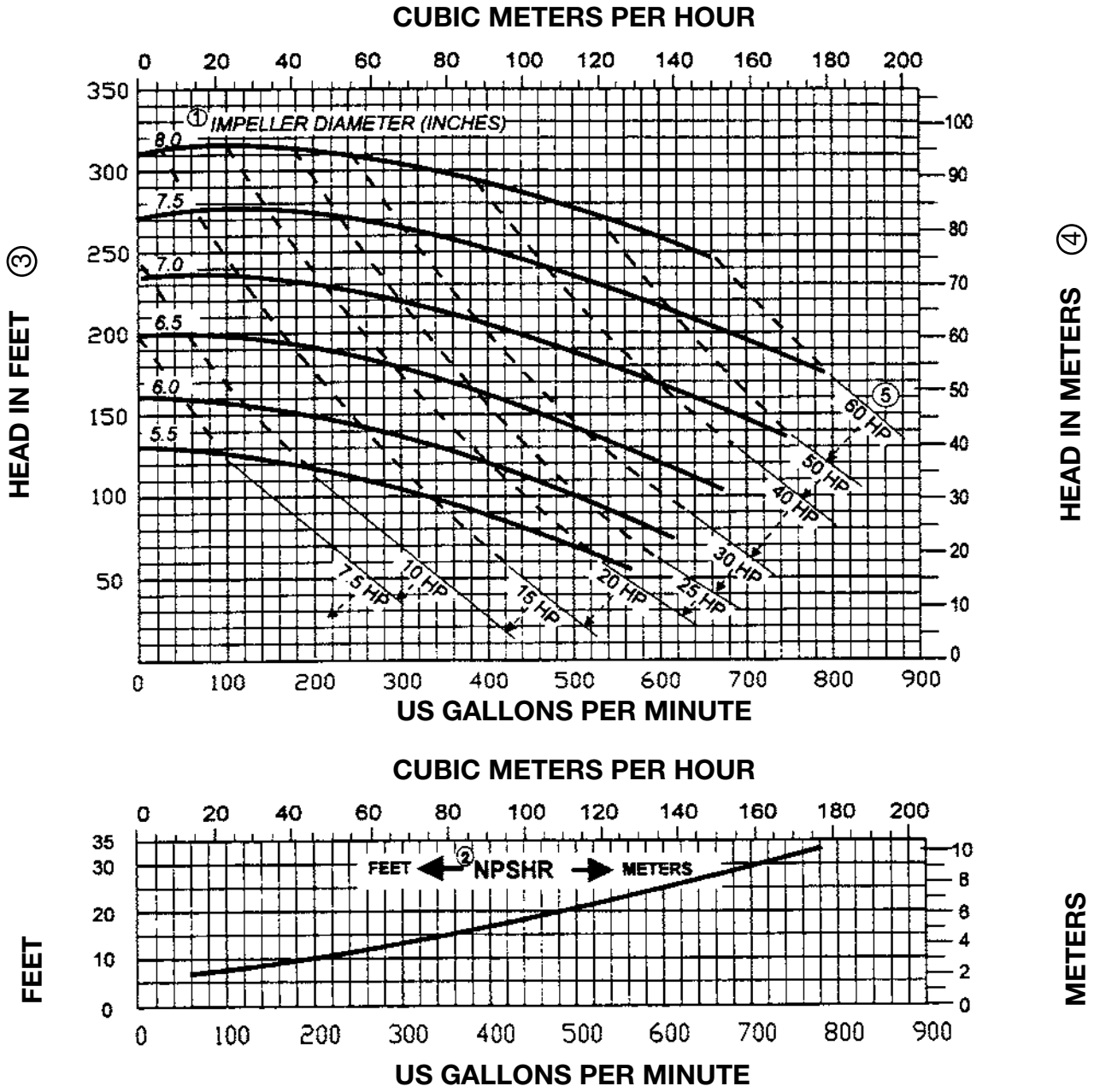
⑤ HP x 0.746 = Kw

# TOP-FLO® TF-C Series Centrifugal Pumps

## Capacity Curves

**Based on water at 70°F (22°C)**

**Model: TF-C328**
**60 Hz 3500 RPM**
**Size: 4 x 2 x 8**




**NOTES:**

① Impeller diameters available in 1/4 inch increments

② NPSHR is shown for maximum impeller diameter

③ PSI = $\frac{\text{Head in Feet X Specific Gravity}}{2.3}$

④ $Kg/cm^2 = \frac{\text{Head in Meters X Specific Gravity}}{10}$

⑤ HP x 0.746 = Kw

# Viscosity and Specific Gravity Table for Various Products

| Product | Specific Gravity | Viscosity |
|---|---|---|
| Acetic Acid | | |
| 5% | 1.01 | |
| 10% | 1.01 | 31.7 SSU @ 59°F |
| 50% | 1.06 | 33 SSU @ 59°F |
| 80% | 1.08 | 35 SSU @ 59°F |
| Animal Fat | 0.9 | 130 SSU @ 115°F |
| | | 50 SSU @ 200°F |
| Barbecue Sauce | 1.05 | 11,500 SSU @ 40-75°F |
| Beer | 1.02 | 32 SSU @ 68°F |
| Blood - Animal | .93-.98 | 15,000 SSU @ 55°F |
| Butter | .93-.98 | 15,000 SSU @ 55°F |
| | | 440 SSU @ 90°F |
| | | 220 SSU @ 115°F |
| Coconut Oil | 0.92 | 125 SSU @ 106°F |
| Corn Oil | 0.92 | 135 SSU @ 130°F |
| | | 54 SSU @ 212°F |
| Corn Starch Solutions | | |
| 22 Baume | 1.18 | 150 SSu @ 70°F |
| | | 130 SSU @ 100°F |
| 24 Baume | 1.2 | 600 SSU @ 70°F |
| | | 440 SSU @ 100°F |
| 25 Baume | 1.21 | 1400 SSU @ 70°F |
| | | 800 SSU @ 100°F |
| Cottage Cheese | 1.02 | 4,300 SSU |
| Dressing | | |
| Cream (Sweet) | 1 | 73 SSU |
| | .99 | 140 SSU |
| | .99 | 215 SSU |
| Egg Yolk | 1.12 | 21,500 @ 35°F |
| Gelatin | 1.01 | 1,380 - 2,580 SSU |
| | | @ 160°F |
| Glucose | 1.35 - 1.44 | 35M - 100M SSU |
| | | @ 100°F |
| | | 4M - 11M @ 150°F |

| Product | Specific Gravity | Viscosity |
|---|---|---|
| Honey | 1.3 | 1250 - 1425 |
| | | SSU @ 100°F |
| Ice Cream Mix | 1.15 | 1050 SSU @ 46°F |
| Lard | 0.96 | 287 @ 100°F |
| Linseed Oil | .92-.94 | 143 @ 100°F |
| | | 93 @ 130°F |
| Malt Syrup | 1.41 | 85,400 SSU @ 77°F |
| Maple Syrup | 1.37 | 2,000 SSU @ 68°F |
| Margarine | 0.93 | 13,900 |
| | | SSU @ 84°F |
| Milk | 1.02 - 1.05 | 31.5 @ 68°F |
| Molasses | | |
| A. First | 1.4 - 1.46 | 1300 - 23,500 SSU |
| | | @ 100°F |
| | | 700 - 8160 SSU |
| | | @ 130°F |
| B. Second | 1.43 - 1.48 | 6535 - 61,180 SSU |
| | | @ 100°F |
| | | 3058 - 15294 SSU |
| | | @ 130°F |
| C. Blackstrap | 1.46 - 1.49 | 12,190 - 255M |
| | | @ 100°F |
| Mustard | 1 | 17,000 SSU |
| | | @ 85°F |
| Olive Oil | .91 - .92 | 200 SSU |
| | | @ 100°F |
| Peanut Butter | 1.2 | 77,400 SSU @ |
| | | 110 - 140°F |
| Sesame Seed Oil | 0.92 | 184 SSU @ 100°F |
| | | 110 @ 130°F |
| Soy Bean Oil | 0.91 | 500 SSU @ 44°F |
| Tomato Paste | 1.14 | 60M - 80 M SSU |
| | | 21M SSU approx. |
| Water | 1 | 31 SSU @ 68°F |

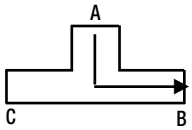
# How Capacity Affects Friction

The following table was developed to indicate loss of head due to friction – in feet loss per fitting or in feet loss per foot of tubing – through stainless steel tubing and sanitary fittings.

## Friction Loss in Sanitary OD Tubing and Fittings

| Capacity in U.S. G.P.M. | O.D. Tube Size | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 I.D.=.870 | | | 1-1/2 I.D.=1.370 | | | 2 I.D.=1.870 | | | 2-1/2 I.D.=2.370 | | | 3 I.D.=2.870 | | | 4 I.D.=3.834 | | |
| | Tubing | Elbow | Tee | Tubing | Elbow | Tee | Tubing | Elbow | Tee | Tubing | Elbow | Tee | Tubing | Elbow | Tee | Tubing | Elbow | Tee |
| 2 | .01 | .01 | .1 | | | | | | | | | | | | | | | |
| 4 | .025 | .02 | .2 | | | | | | | | | | | | | | | |
| 5 | .035 | .025 | .25 | | | | | | | | | | | | | | | |
| 10 | .12 | .06 | .4 | .02 | .01 | .15 | .005 | .015 | .1 | | | | | | | | | |
| 15 | .25 | .1 | .8 | .04 | .02 | .25 | .013 | .02 | .15 | | | | | | | | | |
| 20 | .43 | .22 | 1.5 | .06 | .03 | .3 | .02 | .025 | .2 | .005 | .02 | .1 | .003 | .02 | .06 | | | |
| 25 | .66 | .4 | 2.3 | .08 | .04 | .4 | .025 | .03 | .25 | .006 | .03 | .15 | .004 | .03 | .08 | | | |
| 30 | .93 | .7 | 3.3 | .105 | .06 | .55 | .035 | .05 | .3 | .008 | .05 | .2 | .005 | .04 | .1 | | | |
| 35 | 1.22 | 1.25 | 5.2 | .135 | .09 | .8 | .04 | .06 | .4 | .011 | .06 | .25 | .006 | .05 | .13 | | | |
| 40 | | | | .17 | .11 | 1.0 | .05 | .08 | .5 | .015 | .07 | .3 | .007 | .06 | .15 | | | |
| 45 | | | | .21 | .16 | 1.3 | .063 | .1 | .6 | .02 | .09 | .35 | .008 | .065 | .18 | | | |
| 50 | | | | .25 | .2 | 1.6 | .073 | .12 | .7 | .022 | .1 | .4 | .01 | .07 | .2 | | | |
| 60 | | | | .34 | .35 | 2.2 | .1 | .18 | .9 | .03 | .12 | .45 | .015 | .08 | .25 | | | |
| 80 | | | | .57 | .76 | 3.7 | .16 | .3 | 1.5 | .05 | .15 | .55 | .02 | .1 | .4 | | | |
| 100 | | | | .85 | 1.35 | 5.8 | .23 | .44 | 2.3 | .075 | .18 | .6 | .03 | .11 | .5 | .008 | .04 | .1 |
| 120 | | | | 1.18 | 2.05 | 9.1 | .32 | .64 | 3.3 | .105 | .21 | 1.0 | .04 | .13 | .6 | .01 | .05 | .15 |
| 140 | | | | | | | .42 | .85 | 4.5 | .14 | .23 | 1.25 | .05 | .16 | .8 | .013 | .06 | .2 |
| 160 | | | | | | | .54 | 1.13 | 5.8 | .17 | .28 | 1.6 | .07 | .2 | 1.1 | .015 | .07 | .25 |
| 180 | | | | | | | .67 | 1.45 | 7.4 | .205 | .31 | 2.0 | .08 | .21 | 1.3 | .02 | .08 | .3 |
| 200 | | | | | | | .81 | 1.82 | 9.0 | .245 | .35 | 2.5 | .1 | .26 | 1.6 | .025 | .09 | .4 |
| 220 | | | | | | | .95 | 2.22 | 11.0 | .29 | .41 | 3.0 | .12 | .3 | 1.9 | .028 | .1 | .5 |
| 240 | | | | | | | 1.10 | 2.63 | 13.5 | .34 | .48 | 3.7 | .14 | .33 | 2.2 | .035 | .11 | .55 |
| 260 | | | | | | | | | | .39 | .53 | 4.5 | .165 | .39 | 2.5 | .04 | .115 | .6 |
| 280 | | | | | | | | | | .45 | .61 | 5.3 | .19 | .42 | 2.8 | .045 | .12 | .65 |
| 300 | | | | | | | | | | .515 | .7 | 6.2 | .22 | .5 | 3.1 | .05 | .13 | .7 |
| 350 | | | | | | | | | | .68 | 1.05 | 8.5 | .28 | .67 | 4.1 | .07 | .15 | .9 |
| 400 | | | | | | | | | | .86 | 1.55 | 11.0 | .36 | .88 | 5.2 | .085 | .18 | 1.2 |
| 450 | | | | | | | | | | 1.05 | 2.25 | 13.5 | .44 | 1.1 | 6.6 | .105 | .2 | 1.5 |
| 500 | | | | | | | | | | | | | .54 | 1.4 | 8.0 | .13 | .23 | 1.75 |
| 550 | | | | | | | | | | | | | .64 | 1.7 | 9.5 | .15 | .27 | 2.1 |
| 600 | | | | | | | | | | | | | .75 | 2.05 | 10.2 | .175 | .3 | 2.5 |
| 650 | | | | | | | | | | | | | .87 | 2.41 | 13.0 | .2 | .34 | 2.8 |
| 700 | | | | | | | | | | | | | 1.0 | 2.8 | 15.0 | .23 | .4 | 3.4 |
| 750 | | | | | | | | | | | | | | | | .26 | .43 | 3.8 |
| 800 | | | | | | | | | | | | | | | | .3 | .5 | 4.4 |
| 850 | | | | | | | | | | | | | | | | .33 | .56 | 5. |
| 900 | | | | | | | | | | | | | | | | .37 | .62 | 5.7 |
| 950 | | | | | | | | | | | | | | | | .41 | .7 | 6.3 |
| 1000 | | | | | | | | | | | | | | | | .45 | .8 | 7.0 |
| 1100 | | | | | | | | | | | | | | | | .53 | 1.06 | 8.6 |

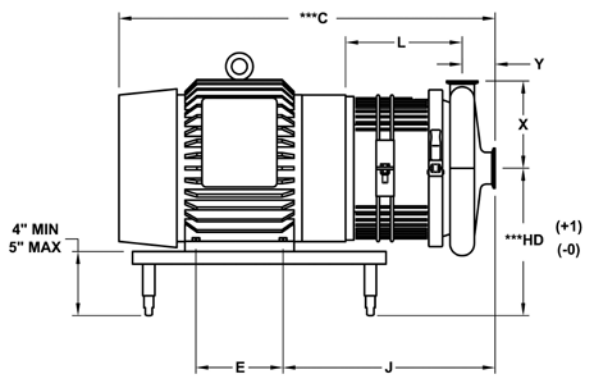
Flow through tees are in part A, out part B. Part C capped off.

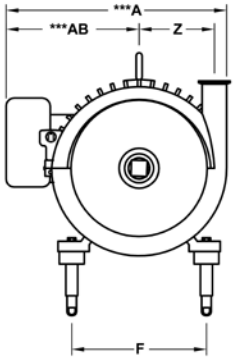



Tests based on water at temperature of 70°F

Source: National Association of Food and Dairy Equipment Manufacturers.

# TOP-FLO® TF-C Series
# Close-Coupled Pump Dimensions




**PUMP DIMENSIONS**

| PUMP MODEL | SUCTION | DISCHARGE | *X | *Y | **X | **Y | Z |
|---|---|---|---|---|---|---|---|
| TF-C100 | 1.500 | 1.000 | 3.500 | 1.554 | | | 1.453 |
| TF-C114 | 1.500 | 1.500 | 3.625 | 1.594 | 3.875 | 1.844 | 2.625 |
| TF-C216 | 2.000 | 1.500 | 4.500 | 1.906 | 4.750 | 2.156 | 3.688 |
| TF-C218 | 2.000 | 1.500 | 5.500 | 1.719 | 5.750 | 1.969 | 4.750 |
| TF-C328 | 3.000 | 2.000 | 5.500 | 2.219 | 5.750 | 2.719 | 4.750 |

**PUMP AND MOTOR DIMENSIONS WITH "WASHDOWN" TOTALLY ENCLOSED BALDOR MOTORS**

| PUMP MODEL | FRAME | A | *C | **C | HD | AB | *J | E | F | L |
|---|---|---|---|---|---|---|---|---|---|---|
| TF-C100 | 56C | 8.313 | 13.312 | | 7.500 | 5.000 | 6.875 | 3.000 | 4.875 | 2.750 |
| TF-C114 | 56C | 8.313 | 16.821 | 17.071 | 7.500 | 5.000 | 10.375 | 3.000 | 4.875 | 6.219 |
| | 143 TC | 8.563 | 17.813 | 18.063 | 7.500 | 5.250 | 10.844 | 4.000 | 5.500 | 6.219 |
| | 145 TC | 8.563 | 19.848 | 18.063 | 7.500 | 5.250 | 10.688 | 5.000 | 5.500 | 6.219 |
| | 182 TC | 9.813 | 20.938 | 21.188 | 8.500 | 5.875 | 12.219 | 4.500 | 7.500 | 6.781 |
| | 184 TC | 9.813 | 23.790 | 24.915 | 8.500 | 5.875 | 12.000 | 5.500 | 7.500 | 6.781 |
| TF-C216 | 56C | 8.313 | 16.976 | 17.226 | 7.500 | 5.000 | 10.531 | 3.000 | 4.875 | 6.062 |
| | 143 TC | 8.563 | 17.968 | 18.223 | 7.500 | 5.250 | 10.844 | 4.000 | 5.500 | 6.062 |
| | 145 TC | 8.563 | 20.003 | 20.253 | 7.500 | 5.250 | 10.844 | 5.000 | 5.500 | 6.062 |
| | 182 TC | 9.813 | 21.157 | 21.399 | 8.500 | 5.875 | 12.219 | 4.500 | 7.500 | 6.688 |
| | 184 TC | 9.813 | 24.009 | 24.259 | 8.500 | 5.875 | 12.219 | 5.500 | 7.500 | 6.688 |
| | 213 TC | 12.156 | 26.487 | 26.624 | 9.250 | 7.375 | 13.969 | 5.500 | 8.500 | 7.813 |
| | 215 TC | 12.156 | 27.864 | 28.114 | 9.250 | 7.375 | 13.969 | 7.000 | 8.500 | 7.813 |
| | 254 TC | 16.094 | 28.533 | 28.783 | 10.250 | 9.625 | 14.594 | 8.250 | 10.000 | 8.437 |
| | 256 TC | 16.094 | 30.163 | 30.413 | 10.250 | 9.625 | 14.594 | 10.000 | 10.000 | 8.437 |
| TF-C218 | 143 TC | 8.563 | 18.036 | 18.281 | 7.500 | 5.250 | 10.281 | 4.000 | 5.500 | 6.312 |
| | 145 TC | 8.563 | 20.066 | 18.286 | 7.500 | 5.250 | 10.281 | 5.000 | 5.500 | 6.312 |
| | 182 TC | 9.813 | 21.211 | 20.941 | 8.500 | 5.875 | 12.281 | 4.500 | 7.500 | 6.938 |
| | 184 TC | 9.813 | 24.071 | 24.321 | 8.500 | 5.875 | 12.281 | 5.500 | 7.500 | 6.938 |
| | 213 TC | 12.156 | 25.686 | 25.936 | 9.250 | 7.375 | 13.281 | 5.500 | 8.500 | 7.312 |
| | 215 TC | 12.156 | 27.176 | 27.426 | 9.250 | 7.375 | 13.281 | 7.000 | 8.500 | 7.312 |
| | 254 TC | 16.094 | 28.096 | 28.346 | 10.250 | 9.625 | 14.157 | 8.250 | 10.000 | 8.188 |
| | 256 TC | 16.094 | 29.726 | 29.977 | 10.250 | 9.625 | 14.157 | 10.000 | 10.000 | 8.188 |
| | 284 TC | 20.438 | 33.916 | 34.166 | 11.000 | 13.125 | 15.281 | 9.500 | 11.000 | 8.812 |
| | 286 TC | 20.438 | 33.916 | 34.166 | 11.000 | 13.125 | 15.281 | 11.000 | 11.000 | 8.812 |
| TF-C328 | 182 TC | 9.813 | 22.024 | 22.524 | 8.500 | 5.875 | 13.094 | 4.500 | 7.500 | 7.250 |
| | 184 TC | 9.813 | 24.884 | 25.384 | 8.500 | 5.875 | 13.094 | 5.500 | 7.500 | 7.250 |
| | 213 TC | 12.156 | 26.499 | 26.999 | 9.250 | 7.375 | 14.094 | 5.500 | 8.500 | 7.625 |
| | 215 TC | 12.156 | 29.664 | 28.489 | 9.250 | 7.375 | 14.094 | 7.000 | 8.500 | 7.625 |
| | 254 TC | 16.094 | 28.909 | 29.409 | 10.250 | 9.625 | 15.000 | 8.250 | 10.000 | 8.500 |
| | 256 TC | 16.094 | 30.539 | 31.039 | 10.250 | 9.625 | 15.000 | 10.000 | 10.000 | 8.500 |
| | 284 TC | 20.438 | 34.729 | 35.229 | 11.000 | 13.125 | 16.094 | 9.500 | 11.000 | 9.125 |
| | 286 TC | 20.438 | 34.729 | 35.229 | 11.000 | 13.125 | 16.094 | 11.000 | 11.000 | 9.125 |
| | 324 TC | 22.375 | 37.311 | 37.811 | 12.000 | 14.125 | 17.156 | 10.500 | 12.500 | 9.812 |
| | 326 TC | 22.375 | 37.311 | 37.811 | 12.000 | 14.125 | 17.156 | 12.000 | 12.500 | 9.812 |

* WITH CLAMP CONNECTIONS (STANDARD)
** WITH THREADED BEVEL SEAT CONNECTIONS
*** DIMENSIONS ARE FOR BALDOR WASHDOWN MOTORS
OTHER MOTOR MANUFACTURERS DIMENSIONS MAY VARY
FLANGE MOTORS

NOTES:
ALL DIMENSIONS IN INCHES
DIMENSIONS ARE APPROXIMATE AND FOR GUIDANCE ONLY
THESE DIMENSIONS ARE FOR PUMPS USING NEMA STANDARD "C" FACE MOTORS

# TOP-FLO® Pump Replacement Kits

From time to time, centrifugal pump sealing components need to be replaced. TOP-FLO® centrifugal pump replacement part kits are specifically designed to fit in the pumps of not only TOP-FLO® pumps but those of major pump suppliers. These components are rugged and will provide the necessary sealing conditions under a wide range of conditions.

In addition to the pump replacement kits, Steel O'Brien offers a complete line of replacement parts. From impellers to leg brackets, Steel O'Brien should be your first choice for replacement parts.

KIT #1

KIT #2

KIT #3

## "D" SEAL KITS

### TF-C100

| | BUNA | FKM |
|---|---|---|
| Kit #1 | 5629K-1 | 5629V-1 |
| Kit #2 | 5629K-2 | 5629V-2 |
| Kit #3 | 5629K-3 | 5629V-3 |

### TF-C114

| | BUNA | FKM |
|---|---|---|
| Kit #1 | 5649K-1 | 5649V-1 |
| Kit #2 | 5649K-2 | 5649V-2 |
| Kit #3 | 5649K-3 | 5649V-3 |

### TF-C216

| | BUNA | FKM |
|---|---|---|
| Kit #1 | 5669K-1 | 5669V-1 |
| Kit #2 | 5669K-2 | 5669V-2 |
| Kit #3 | 5669K-3 | 5669V-3 |

### TF-C218/C328

| | BUNA | FKM |
|---|---|---|
| Kit #1 | 5689K-1 | 5689V-1 |
| Kit #2 | 5689K-2 | 5689V-2 |
| Kit #3 | 5689K-3 | 5689V-3 |

**Kit #1** (Consists of 1 - Carbon Seal, 1 - Casing Gasket, 1 - O-Ring, and 1 - Retaining Pin)
**Kit #2** (Consists of 3 - Carbon Seals, 3 - Casing Gaskets, and 3 - O-Rings)
**Kit #3** (Consists of 1 - Carbon Seal, 1 - Spring, 1 - Cup, and 1 - O-Ring)

## "DG" SEAL KITS

| TF-C114 KIT | | | |
|---|---|---|---|
| **5649K-1DG** | | | |
| CONSISTS OF: | KEY # | QTY. | DESCRIPTION |
| 564980 | 80 | 1 | Carbon Seal, Rotating |
| 564924 | 24 | 1 | Impeller Retainer Pin |
| 564980N-SC | 80N | 1 | Stationary Seat, Silicone Carbide |
| 564980P | 80P | 1 | PTFE Gasket, Outboard |
| 564980R | 80R | 1 | PTFE Gasket, Inboard |
| 564980V | 80V | 1 | Seal, O-Ring FKM |
| 564990V | 90V | 1 | Casing Gasket, FKM |

| TF-C216 KIT | | | |
|---|---|---|---|
| **5669K-1DG** | | | |
| CONSISTS OF: | KEY # | QTY. | DESCRIPTION |
| 566980 | 80 | 1 | Carbon Seal, Rotating |
| 566924 | 24 | 1 | Impeller Retainer Pin |
| 566980N-SC | 80N | 1 | Stationary Seat, Silicone Carbide |
| 566980P | 80P | 1 | PTFE Gasket, Outboard |
| 566980R | 80R | 1 | PTFE Gasket, Inboard |
| 566980V | 80V | 1 | Seal, O-Ring FKM |
| 566990V | 90V | 1 | Casing Gasket, FKM |

| TF-C218/328 KIT | | | |
|---|---|---|---|
| **5689K-1DG** | | | |
| CONSISTS OF: | KEY # | QTY. | DESCRIPTION |
| 568980 | 80 | 1 | Carbon Seal, Rotating |
| 568924 | 24 | 1 | Impeller Retainer Pin |
| 568980N-SC | 80N | 1 | Stationary Seat, Silicone Carbide |
| 568980P | 80P | 1 | PTFE Gasket, Outboard |
| 568980R | 80R | 1 | PTFE Gasket, Inboard |
| 568980V | 80V | 1 | Seal, O-Ring FKM |
| 568990V | 90V | 1 | Casing Gasket, FKM |

## "E" SEAL KITS

| TF-C114 KIT | | | |
|---|---|---|---|
| **5649EK-1** | | | |
| CONSISTS OF: | KEY # | QTY. | DESCRIPTION |
| 564980 | 80 | 2 | Carbon Seal |
| 564980V | 80V | 2 | Seal O-Ring FKM |
| 564980G | 80G | 2 | Cup (E Seal) |
| 564917B | 17B | 1 | O-Ring FKM |
| 566917B | 83E | 1 | O-Ring FKM |
| 564980H | 80H | 1 | Spring (E Seal) |
| 564990V | 90V | 1 | Casing Gasket FKM |

| TF-C216 KIT | | | |
|---|---|---|---|
| **5669EK-1** | | | |
| CONSISTS OF: | KEY # | QTY. | DESCRIPTION |
| 566980 | 80 | 2 | Carbon Seal |
| 566980V | 80V | 2 | Seal O-Ring FKM |
| 566980G | 80G | 2 | Cup (E Seal) |
| 566917B | 17B | 1 | O-Ring FKM |
| 566983E | 83E | 1 | O-Ring FKM |
| 566980H | 80H | 1 | Spring (E Seal) |
| 566990V | 90V | 1 | Casing Gasket FKM |

| TF-C218/328 KIT | | | |
|---|---|---|---|
| **5689EK-1** | | | |
| CONSISTS OF: | KEY # | QTY. | DESCRIPTION |
| 568980 | 80 | 2 | Carbon Seal |
| 568980V | 80V | 2 | Seal O-Ring FKM |
| 568980G | 80G | 2 | Cup (E Seal) |
| 568917B | 17B | 1 | O-Ring FKM |
| 562990V | 83E | 1 | O-Ring FKM |
| 568980H | 80H | 1 | Spring (E Seal) |
| 568990V | 90V | 1 | Casing Gasket FKM |

# **T0P-FL0**® Pump Cart/Dolly

The mobility of the **T0P-FL0**® Pump Dolly allows you to find many uses in your manufacturing facility.

## SPECIFICATIONS:

- 304 SS metal components
- Bead blast finish
- Dimension 29"H x 12"W x 40.5" high
- (2) 8.0"D x 2.25"W ACM-TUFF wheels
- Right side mount cord bracket

## OPTIONAL FEATURES:

- Finishes: mechanical polish, electropolish
- Full range of control options: VFD, start/stop controls, network controls
- Wheels: non-marking white wheels, full pneumatic, solid
- Special customer design requirements

* Wiring upgrade available** Detailed drawings available upon request** Pumps, motors, VFD, and switches sold separately.

**T0P-FL0® PUMP DOLLY CONFIGURATIONS**

**DOLLY 1**
(CUSTOMER MOUNTS MOTOR)

**DOLLY 2**
(SUPPLIED WITH MOTOR MOUNTED)

**DOLLY 3**
(SUPPLIED WITH MOTOR & VFD MOUNTED)

**DOLLY 4**
(SUPPLIED WITH MOTOR
& START/STOP MOUNTED)

**DOLLY 5**
(SUPPLIED BARS FOR CUSTOMERS TO
MOUNT MOTOR AND SWITCHES OR VFD)

# TOP-FLO® TL60ARV Air Relief Valve

The TL60ARV Air Relief Valve is used primarily when removal of air from a line without loss of product is a concern. The design of the TL60ARV is simple: a ferrule, a housing with a plastic ball, and a vent pipe all connected using 2 standard heavy duty clamps. This design will not let air enter the line or container under negative pressure.

The TL60ARV is double seated. The lightweight ball is freely moving and depending on pressure conditions will close against upper or lower seat. This valve is not designed for use in operation with liquids having less than 1.0 specific gravity.

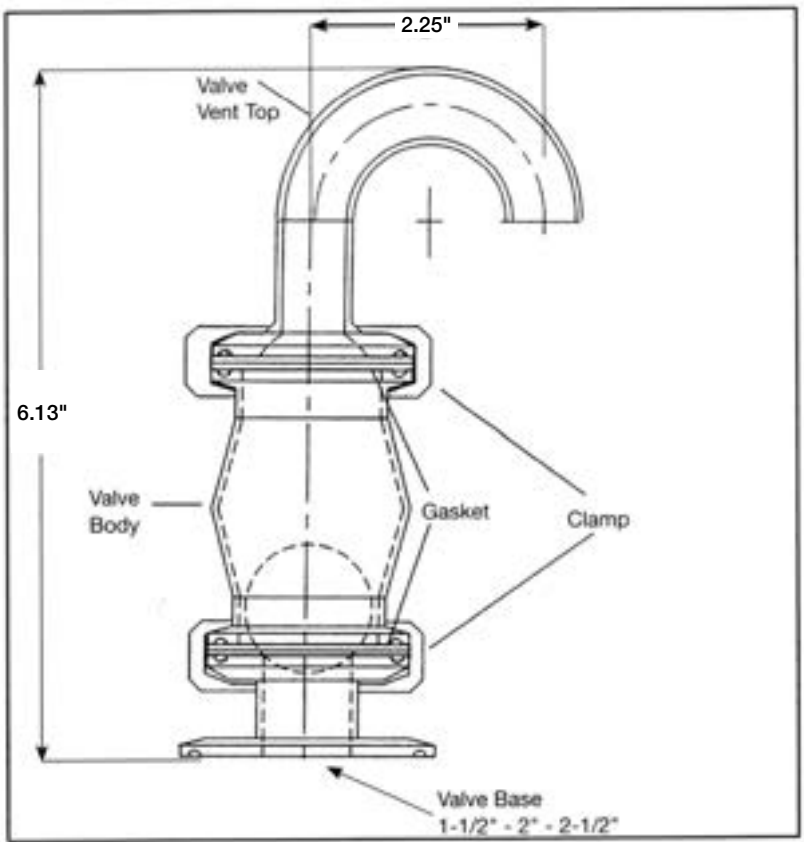
The valve can be mounted on the top of a pipeline or container to bleed a pipeline where an air pocket may have formed during operation.

Bleeding a pipe on the suction side of a pump will be automatic. Air binding will be prevented. These valves are found mounted on the top of the inlet pipe in front of the pump.

| TL60ARV Air Relief Valve 1-1/2 | | |
|---|---|---|
| **Description** | **Part Number** | **Qty.** |
| 1-1/2 TL60ARV | 386015ARV | |
| Vent Top | 38601525VT | 1 |
| Body | 38601525 | 1 |
| Base – 1-1/2 | 386015 | 1 |
| Clamp | 3299915 | 2 |
| Gasket (FKM) | 321010V | 2 |
| Ball 1.25 | 38601525B | 1 |

| TL60ARV Air Relief Valve 2 | | |
|---|---|---|
| **Description** | **Part Number** | **Qty.** |
| 2 TL60ARV | 386020ARV | |
| Vent Top | 38601525VT | 1 |
| Body | 38601525 | 1 |
| Base – 2 | 386020 | 1 |
| Clamp | 3299915 | 2 |
| Gasket (FKM) | 321010V | 2 |
| Ball 1.25 | 38601525B | 1 |

| TL60ARV Air Relief Valve 2-1/2 | | |
|---|---|---|
| **Description** | **Part Number** | **Qty.** |
| 2-1/2 TL60ARV | 386025ARV | |
| Vent Top | 38601525VT | 1 |
| Body | 38601525 | 1 |
| Base – 2-1/2 | 386025 | 1 |
| Clamp | 3299915 | 2 |
| Gasket (FKM) | 321010V | 2 |
| Ball 1.25 | 38601525B | 1 |




**Ordering Information**

Steel grade .....Stainless steel, AISI 316L
Ball.....Polypropylene
Finish .....Polished to 32Ra

**Technical Data**

Maximum product pressure .....150 PSI
Maximum temperature .....275ºF
Net weight .....19 oz. (9.5 kg)

For proper operation:

- Product density must be 1.0 or higher
- The valve must be mounted vertically