



# PRODUCT CATALOG



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# 60 YEARS OF INNOVATION AND STILL PUMPING



**We look for inspiration everywhere.** For over 60 years, we have dedicated ourselves to developing the best in pump technology while providing the service and support to match. Pumps are our sole focus. We work tirelessly to produce the highest performing components at the heart of today's sprayers. We'd like to thank you for the trust that you've placed in us.

.....  
To learn about our entire line of high-performance pumps,  
visit [www.acepumps.com](http://www.acepumps.com) or call 800-843-2293.

**WHEN YOU ARE  
OBSESSED WITH  
PUMPS  
THE WAY WE ARE,**



FARM INDUSTRY STANDARD.

**YOU SEE THEM  
EVERYWHERE.**



60 Years of Innovation and Still Pumping

# HYDRAULIC DRIVEN CENTRIFUGAL PUMPS

## General Advantages

Ace developed the first hydraulic motor driven pump at the request of John Deere in 1969. Ace continues to develop a comprehensive range of reference materials and hydraulic accessories allowing the pumps to be effectively applied on the full range of hydraulic systems.

Centrifugal pump design provides good resistance to abrasive solutions and extra flow for agitation. All hydraulic driven pumps are equipped with a stainless steel shaft and wear ring for excellent corrosion resistance.

The advantages of the hydraulic motor driven pump are:

- **MOUNTING VERSATILITY:** The location of the pump is not tied to the PTO or engine drive shaft; the pump can be mounted in a variety of locations to suit application requirements.
- **CUSTOMIZED PERFORMANCE:** The performance is dependent on the supply of hydraulic oil to the motor and not necessarily tied to engine speed. A hydraulic driven pump can produce higher pressures than PTO or belt driven pumps. They can also hold constant pressure at varying engine speeds on closed center hydraulic systems.
- **EASY MAINTENANCE:** On a hydraulic driven pump there are no belts to align or break. Separate pump and hydraulic motor shafts simplify repair and replacement. Two main pump bearings support shaft loads. All pumps are equipped with easily replaceable Viton® mechanical seals.

The Ace gear type hydraulic motor is more efficient than gerotor type motors, and is less subject to damage by contamination than the gerotor design. A built-in needle valve allows for the bypass of up to 9 GPM (34 LPM) excess hydraulic fluid on open center systems. The standard motor has a reverse flow check valve which prevents backward hookup and a coasting check which protects the motor seal from the flywheel effect of the impeller. A restrictor orifice is included with pump models recommended for pressure compensating closed center systems.



# iHSG

Visit [www.AcePumps.com](http://www.AcePumps.com) for our online catalog or to use the Internet Hydraulic Selection Guide.

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©Viton is a registered trademark of Dupont Dow Elastomers.

## Features

- The farm industry standard since 1969.
- The 202 and 203 motors require 2 GPM (7.6 LPM) and 3 GPM (11.4 LPM) hydraulic fluid input. Recommended for engineered systems with limited oil flow.
- The 204 motor requires 4 GPM (15.1 LPM) maximum hydraulic fluid input.

Recommended for:

- Pressure Compensating Closed Center Systems
- Open Center Systems up to 13 GPM (49.2 LPM) using internal needle valve bypass.

- The 210 motor requires 10 GPM (37.9 LPM) maximum hydraulic fluid input.

Recommended for:

- Load Sensing Closed Center Systems
- Open Center Systems up to 17 GPM (64.4 LPM) using internal needle valve bypass

- The 310 motor requires 16 GPM (60.6 LPM) maximum hydraulic fluid input.

Recommended for large Open Center Systems up to 24 GPM (90.9 LPM) using internal needle valve bypass.

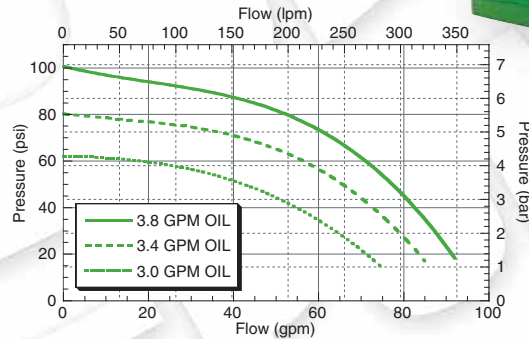
**FMC-HYD-202**  
**FMC-HYD-203**  
**FMC-HYD-204**

**1 1/4"**  
**SUCTION**

**1"**  
**DISCHARGE**



Maximum Flow: 92 GPM (350 LPM)  
 Maximum Pressure: 100 PSI (6.9 BAR)



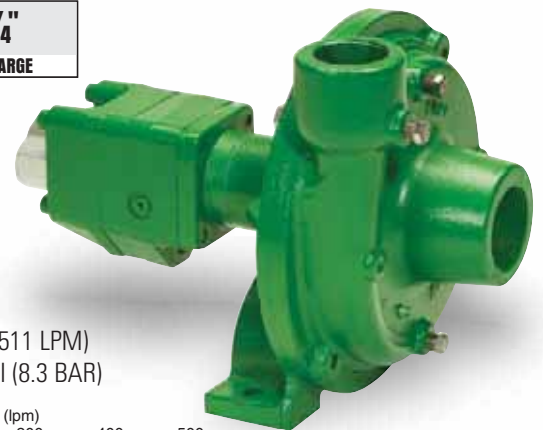
Note: Graph for FMC-HYD-204 model.

OIL FLOW	
GPM	LPM
3.8	14.4
3.4	12.9
3.0	11.4

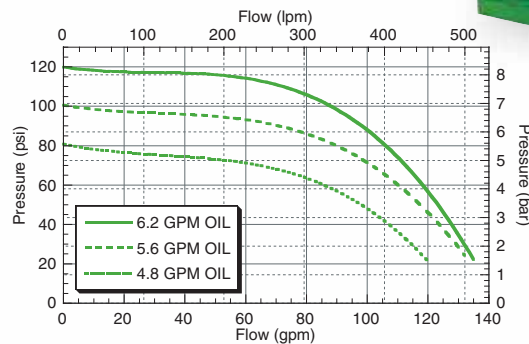
## FMC-150-HYD-206

**1 1/2"**  
**SUCTION**

**1 1/4"**  
**DISCHARGE**



Maximum Flow: 135 GPM (511 LPM)  
 Maximum Pressure: 120 PSI (8.3 BAR)



OIL FLOW	
GPM	LPM
6.2	23.5
5.6	21.2
4.8	18.2

## **150 SERIES** **HIGH PERFORMANCE**

## Features

- Provides higher pressure and greater volume for applications with large tanks and longer spray booms.
- The 206 motor requires 7 GPM (26.5 LPM) maximum hydraulic fluid input and fits virtually all tractor hydraulic systems.

Recommended for:

- Pressure Compensating Closed Center Systems
- Load Sensing Closed Center Systems
- Open Center Systems up to 16 GPM (60.6 LPM) using internal needle valve bypass

# HYDRAULIC DRIVEN CENTRIFUGAL PUMPS

## **150 SERIES** **HIGH PERFORMANCE**

### Features

- F model equipped with NPT ports and industry standard flanged connections.
- FS model constructed of 316 stainless steel with NPT ports and industry standard flanged connections.
- SP model is self-priming making it perfect for load and spray applications.
- Provides higher pressure and greater volume for applications with large tanks and longer spray booms.
- The 206 motor requires 7 GPM (26.5 LPM) maximum hydraulic fluid input and fits virtually all tractor hydraulic systems.

### Recommended for:

- Pressure Compensating Closed Center Systems
- Load Sensing Closed Center Systems
- Open Center Systems up to 16 GPM (60.6 LPM) using internal needle valve bypass
- The 304 motor requires 11 GPM (41.6 LPM) maximum hydraulic fluid input.

### Recommended for:

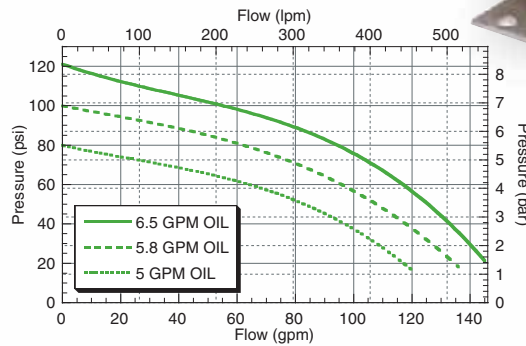
- Pressure Compensating Closed Center Systems
- Load Sensing Closed Center Systems
- Open Center Systems up to 20 GPM (75.7 LPM) using internal needle valve bypass

**FMC-150F-HYD-206**  
**FMC-150FS-HYD-206**

<b>1½"</b> <b>220 FLANGE</b> <b>SUCTION</b>	<b>1¼"</b> <b>200 FLANGE</b> <b>DISCHARGE</b>
---	---



Maximum Flow: 145 GPM (549 LPM)  
155 GPM (587 LPM) for 304  
Maximum Pressure: 120 PSI (8.3 BAR)  
130 PSI (9 BAR) for 304



Note: Graph for FMC-150F-HYD-206 model.

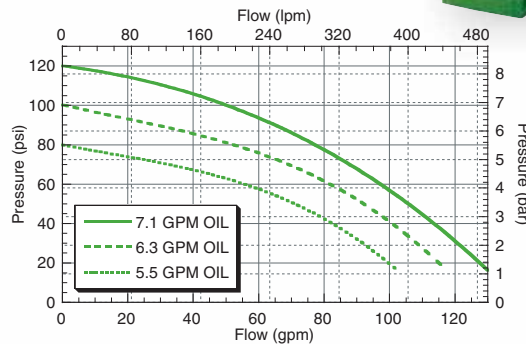
OIL FLOW	
GPM	LPM
6.5	24.6
5.8	21.9
5	18.9

**FMC-150SP-HYD-206**

<b>1½"</b> <b>SUCTION</b>	<b>1¼"</b> <b>DISCHARGE</b>
------------------------------	--------------------------------



Maximum Flow: 130 GPM (492 LPM)  
Maximum Pressure: 120 PSI (8.3 BAR)



OIL FLOW	
GPM	LPM
7.1	26.9
6.3	23.8
5.5	20.8

**FMC-200-HYD-210**  
**FMC-200-HYD-304**  
**FMC-200-HYD-310**

<b>2"</b>	<b>1½"</b>
<b>SUCTION</b>	<b>DISCHARGE</b>

***200 SERIES***  
***HIGH FLOW***

**Features:**

- F model equipped with industry standard flanged connections.
- Ideal for spraying, large tank agitation, liquid transfer, and spray - transfer combinations
- The 210 motor requires 10 GPM (37.9 LPM) maximum hydraulic fluid input.

Recommended for:

- Pressure Compensating Closed Center Systems
- Load Sensing Closed Center Systems
- Open Center Systems up to 17 GPM (64.4 LPM) using internal needle valve bypass
- The 304 motor requires 11 GPM (41.6 LPM) maximum hydraulic fluid input.

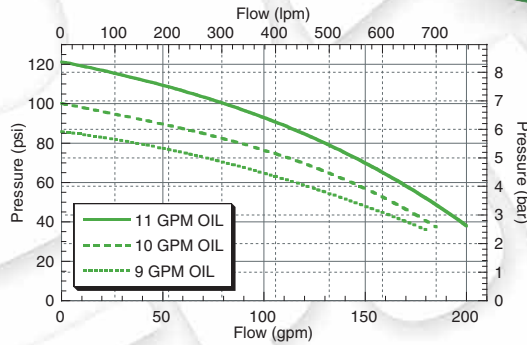
Recommended for:

- Pressure Compensating Closed Center Systems
- Load Sensing Closed Center Systems
- Open Center Systems up to 20 GPM (75.7 LPM) using internal needle valve bypass
- The 310 motor requires 16 GPM (60.6 LPM) maximum hydraulic fluid input.

Recommended for large Open Center Systems up to 24 GPM (90.9 LPM) using internal needle valve bypass.



Maximum Flow: 200 GPM (757 LPM)  
 Maximum Pressure: 120 PSI (8.3 BAR),  
 80 PSI (5.5 BAR) for 210



Note: Graph for FMC-200-HYD-304 model.

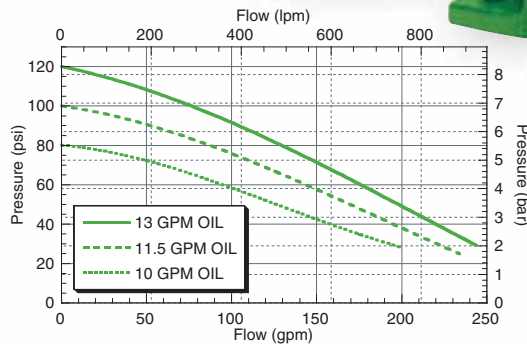
OIL FLOW	
GPM	LPM
11	41.6
10	37.9
9	34.1

**FMC-200F-HYD-304**

<b>300</b>	<b>220</b>
<b>FLANGE</b>	<b>FLANGE</b>
<b>SUCTION</b>	<b>DISCHARGE</b>



Maximum Flow: 240 GPM (908 LPM)  
 Maximum Pressure: 120 PSI (8.3 BAR)



OIL FLOW	
GPM	LPM
13	51.1
11.5	43.5
10	37.9

# MAX SERIES HYDRAULIC DRIVEN CENTRIFUGAL PUMPS

## General Advantages

Ace's MAX Series pumps are designed from the ground up for today's demanding applications. Each model is engineered for maximum reliability and performance. A durable e-coat finish provides extra corrosion resistance on all surfaces inside and out. The 4000 psi high efficiency pressure plated gear motors provide higher output with less oil flow. The impellers are designed to develop higher pressure at lower shaft speeds. A splined motor to pump shaft connection strengthens the power train while allowing for easy repair and maintenance. Oversized bearings round out the list of features for long, trouble free life.

# 650

**MAX SERIES**

## Features

- Modified impeller design develops higher pressure at lower RPM.
- F model equipped with NPT ports and industry standard flanged connections.
- The M16 motor requires 14 GPM (53 LPM) maximum hydraulic fluid input.

Recommended for:

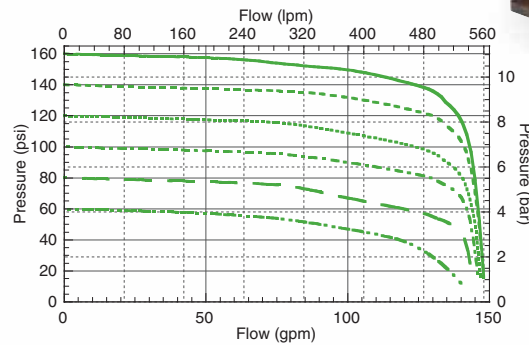
- Pressure Compensating Closed Center Systems
- Load Sensing Closed Center Systems
- Open Center Systems up to 14 GPM (53 LPM)

## FMC-650-HYD

<b>1½"</b> SUCTION	<b>1¼"</b> DISCHARGE
-----------------------	-------------------------



Maximum Flow: 140 GPM (530 LPM)  
Maximum Pressure: 160 PSI (11 BAR)



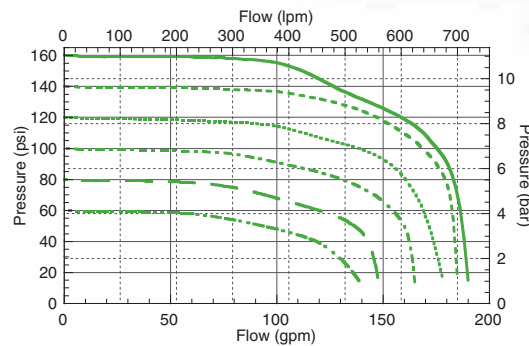
OIL FLOW	
GPM	LPM
14.3	54.1
13.5	51.1
12.5	47.3
11.2	42.4
9.6	36.3
8	30.3

## FMC-650F-HYD

<b>1½"</b> 220 FLANGE SUCTION	<b>1¼"</b> 200 FLANGE DISCHARGE
-------------------------------------	---------------------------------------



Maximum Flow: 170 GPM (643.5 LPM)  
Maximum Pressure: 160 PSI (11 BAR)



OIL FLOW	
GPM	LPM
14.5	54.9
13.6	51.5
12.4	46.9
11.3	42.8
9.8	37.1
8.3	31.4





The 750 MAX and 850 MAX pump models feature our Oasis™ WetSeal Technology. The dual shaft seals run in a pressurized barrier fluid which is specially formulated for seal face lubrication and heat dissipation. The liquid being pumped never comes into contact with the seal surfaces so abrasive wear failures are prevented. Additionally, the buffer fluid lubricates and cools the seal faces even when run dry to eliminate costly failure.

# 750 MAX SERIES

&

# 850 MAX SERIES

## Features

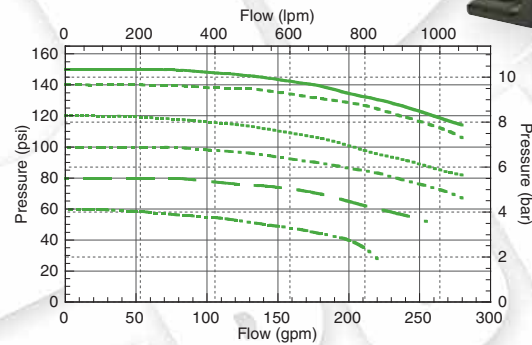
- Pressure balanced impeller eliminates thrust load on bearings.
- Standard industry flanged ports for higher flow.
- Hydraulic motor case drain option for extended seal life on engineered systems.
- Separate motor and pump shafts for easy maintenance.

## FMC-750F-HYD

<b>300 FLANGE SUCTION</b>	<b>220 FLANGE DISCHARGE</b>
-----------------------------------	-------------------------------------



Maximum Flow: 290 GPM (1097 LPM)  
Maximum Pressure: 150 PSI (10.3 BAR)



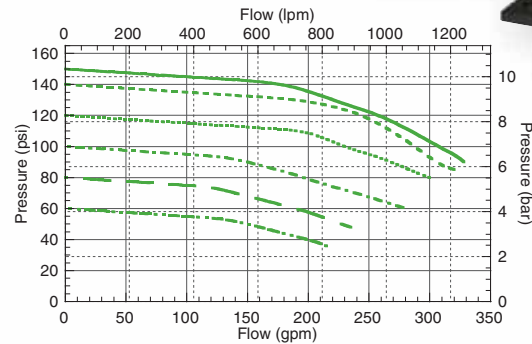
OIL FLOW	
GPM	LPM
18	65.8
17.4	65.9
15.9	60.2
14.8	56
13.2	49.9
11.2	42.4

## FMC-850F-HYD

<b>300 FLANGE SUCTION</b>	<b>300 FLANGE DISCHARGE</b>
-----------------------------------	-------------------------------------



Maximum Flow: 325 GPM (1230 LPM)  
Maximum Pressure: 150 PSI (10.3 BAR)



OIL FLOW	
GPM	LPM
23	87
22	83.2
20.5	77.6
18.3	69.2
15.5	58.7
13.2	49.9

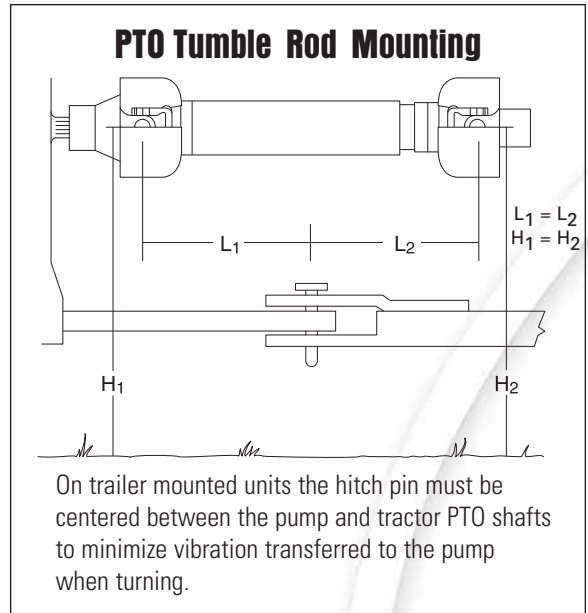
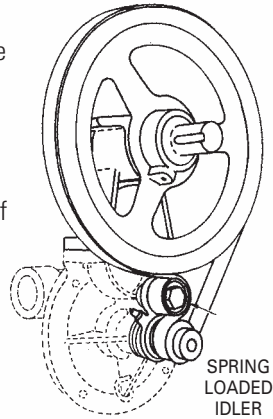
# PTO DRIVEN CENTRIFUGAL PUMPS

## General Advantages

PTO belt driven centrifugal pumps were first introduced by Ace in 1964 and enabled the applicator to mount centrifugal pumps directly on 540 RPM and 1000 RPM tractor PTO shafts. The simple, yet durable design of the PTOC pump has withstood the test of time while many attempts at imitation have come and gone.

The key to success of the Ace belt driven pump has been the Spring Loaded Idler. The idler maintains proper belt tension which minimizes the load on the pump bearings. More importantly, the idler helps absorb the shock of PTO engagement that can destroy cog belts or gears.

Model PTOC belt driven pumps are easy to operate and maintain. Belts can be replaced in the field with minimum downtime and at little cost. Maintenance features also include sealed ball bearings and a readily replaceable mechanical seal. The belt guard provides complete coverage of the pulleys, shaft and belt. All PTO driven pumps are equipped with a stainless steel shaft and wear ring for excellent corrosion resistance.



**PTOC-600**  
**PTOC-1000**

<b>1 1/4"</b> SUCTION	<b>1"</b> DISCHARGE
--------------------------	------------------------

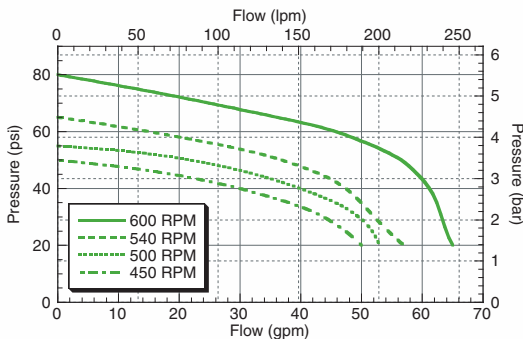
## Features

- Maximum Flow: 65 GPM (246 LPM)
- Maximum Pressure: 80 PSI (5.5 BAR)
- The original belt drive standard since 1964
- Time tested and field proven design
- Widespread parts and service availability
- Most Economical belt drive

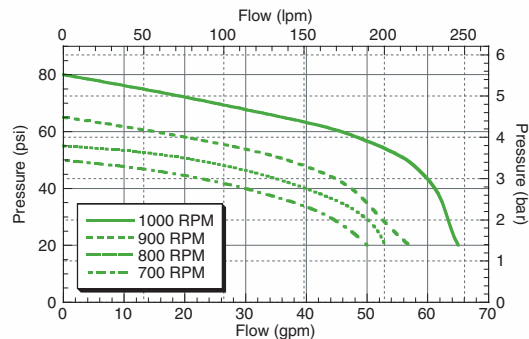
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## PTOC-600



## PTOC-1000



## PTO Shaft Options

**-6SP**



1 3/8" (34.9 MM)  
6 spline shaft for  
540 RPM models

**-6SPQC**



Instant-attach  
quick coupler for  
540 RPM models

**-21SP**



21 spline 1 3/8" (34.9 MM)  
split bore shaft with  
locking collar for  
1000 RPM models

**-20SP**



20 spline 1 3/4" (44.5 MM)  
split bore shaft with  
locking collar for  
1000 RPM models

**-B**



1" (25.4 MM) stub shaft  
for installation on trailer  
sprayers driven by  
PTO tumblerod

## **150 SERIES** **HIGH PERFORMANCE**

**PTOC-150-600**  
**PTOC-150-1000**

**1 1/2"**  
SUCTION

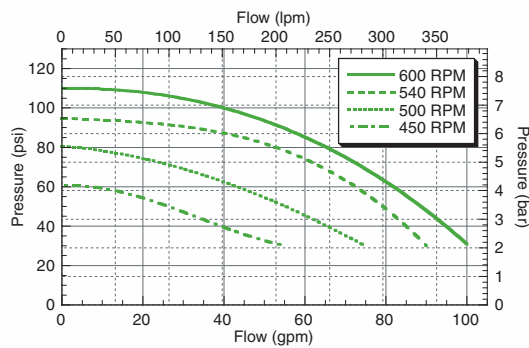
**1 1/4"**  
DISCHARGE

### Features

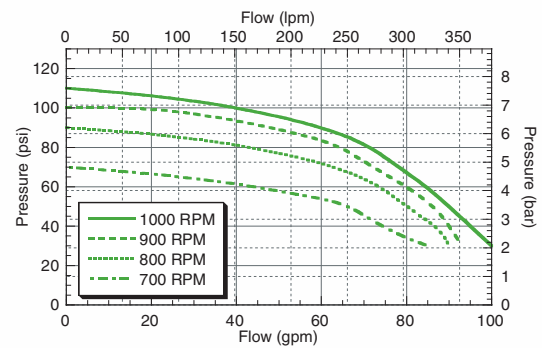
- Maximum Flow: 100 GPM (378 LPM)
- Maximum Pressure: 110 PSI (7.6 BAR)
- The High Performance Pump. 100 PSI (6.9 BAR) at 40 GPM (151 LPM) due to increased pulley ratio and larger 1 1/2" x 1 1/4" construction
- Provides higher pressure and greater volume for applications with large tanks and long spray booms
- Allows fuel savings by operating at lower engine speeds while maintaining adequate spraying pressures



**PTOC-150-600**



**PTOC-150-1000**



# BELT DRIVEN CENTRIFUGAL PUMPS

## General Advantages

### Frame Mount Advantages

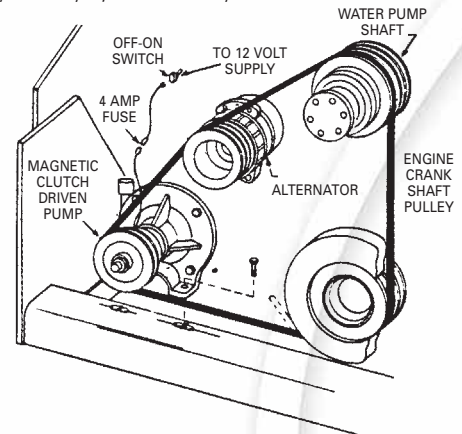
Ace belt driven pumps are available in a variety of models which can be belt driven or direct coupled to a power source. The pumps are available in either clockwise or counterclockwise rotation. The standard bare shaft pumps are designed with a keyway for mounting a drive pulley or coupling.

### Magnetic Clutch Driven Advantages

The integral magnetic clutch driven centrifugal pump design was first offered by Ace in 1982. These models enabled the operator to free the PTO shaft and hydraulic system for other uses. The 12 volt DC magnetic clutch is driven by a v-belt from the engine drive shaft. The clutch is idle until engaged by an on-off toggle switch located at the driver's seat.

## Typical Clutch Installation

Ace magnetic clutch driven frame mounted centrifugal pump models are available with counterclockwise (ccw) rotation and clockwise (cw) rotation. The direction of rotation is determined when facing the shaft. Sizes available are 1 1/4" x 1", 1 1/2" x 1 1/4", and 2" x 1 1/2".



FMC-CW-200-MAG-D



## -MAG-D CLUTCH

- 58 ft. lb. (78.6 NM) torque capacity
- Forged machined pulley for maximum strength
- Solid forged rotor to maximize torque
- E-coated for maximum corrosion protection
- High temperature epoxy coil
- Two bearings with high temperature, long life grease
- Single or double belt drive
- 4 3/4" (12.1 CM) pitch diameter

FMC-CW-200-X



## -X FRAME OPTION

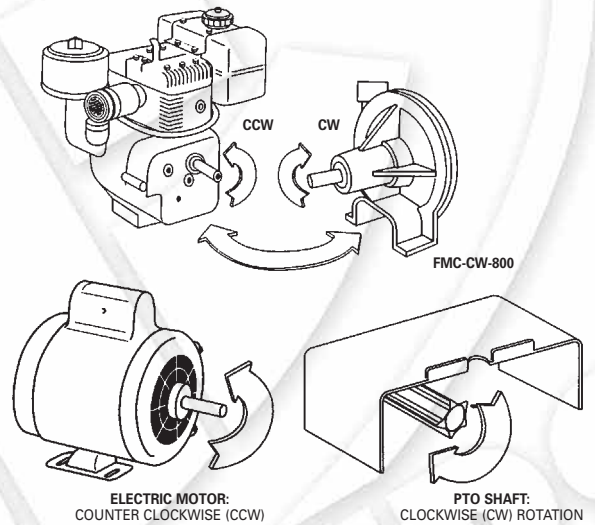
- 3/4" (1.91 CM) diameter stainless steel shaft, standard models 5/8" diameter (1.59 CM)
- Larger bearings for extended life
- Available with MAG-D clutch
- 5 1/4" (13.34 cm) mounting bolt spacing
- -X3 frame has 3" (7.62 CM) bolt spacing

## Pump Rotation

The direction of rotation is always determined WHEN FACING THE SHAFT. This rule applies for the pump shaft and the drive shaft. Ace Frame Mounted pumps are available in both clockwise (CW) and counter-clockwise (CCW) rotation. Ace model numbers which include a "CW" have a clockwise rotation; all other models are counterclockwise rotation.

When direct coupling shafts, always MATCH THE OPPOSITE ROTATION pump with the shaft. As illustrated, a gasoline engine with CCW rotation will direct couple to a FMC-CW-800 pump with clockwise rotation. When mounting a pump with belts and pulleys, either pump rotation can be used to match the drive shaft rotation and the desired direction of the pump.

The rotation of several common power sources are as follows: Gasoline engine and electric motor shafts rotate in a counterclockwise direction; a tractor PTO shaft rotates in a clockwise direction; the front tractor engine crankshaft rotates in a counterclockwise direction.



## Pulley Ratio

To get the desired performance from an ACE Frame Mounted Pump, the proper speed ratio between the pump and drive source must be established. The following formula should be helpful:

$$\frac{\text{Pump RPM}}{\text{Driveshaft RPM}} = \frac{\text{Drive Pulley Diameter}}{\text{Pump Pulley Diameter}}$$

For example: To drive an FMC-150-MAG pump at 5000 RPM with a drive source RPM of 3600 and knowing that the clutch pulley diameter on the pump is 4.75" (12 CM), what should the diameter of the drive pulley be?

$$\frac{5000 \text{ RPM}}{3600 \text{ RPM}} = \frac{\text{Drive Pulley Diameter}}{4.75" (12 \text{ CM})}$$

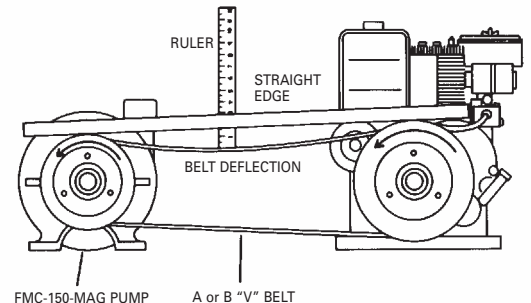
ENGLISH	METRIC
1) $5000 \times 4.75 = 23750$	1) $5000 \times 12 = 60000$
2) $23750 \div 3600 = 6.59$	2) $60000 \div 3600 = 16.67$

The drive pulley diameter, when rounded off should be 6.5" (17 CM).

## Belt Alignment and Tension

Proper belt alignment and belt tension will prevent premature bearing failure in the clutch and/or the pump. Use a straight edge held on the faces of the pulleys to check alignment. To provide proper belt tension, lay the straight edge on the tops of both pulleys as shown. Use mild force to deflect the belt as shown. Use a ruler to measure the amount of deflection. Proper tension will allow 1/2" (1 CM) of deflection for each 12" (30 CM) of distance between the pulleys.

For example: If the distance between the pulleys is 3' (90 CM), the deflection should be 1 1/2" (3 CM).



# BELT DRIVEN CENTRIFUGAL PUMPS

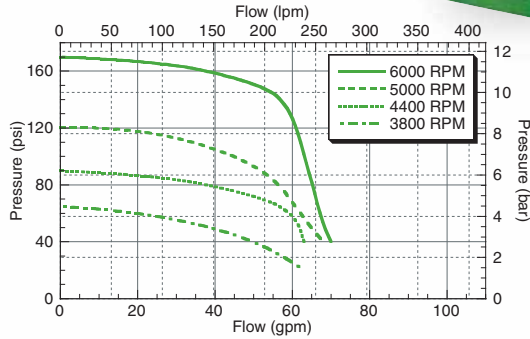
## COUNTERCLOCKWISE ROTATION

FMC  
FMC-MAG-D

<b>1 1/4"</b> SUCTION	<b>1"</b> DISCHARGE
--------------------------	------------------------



Maximum Flow: 70 GPM (265 LPM)  
Maximum Pressure: 170 PSI (11.7 BAR)  
Maximum Power: 4.2 HP (3.1 KW)



### Features

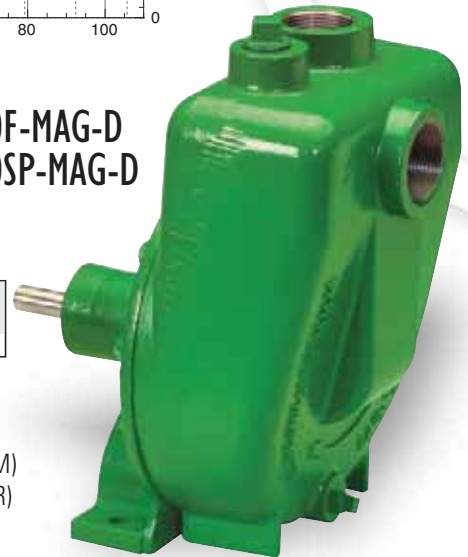
- Counterclockwise Rotation when facing shaft end
- Stainless Steel Shaft and Wear Ring
- Chemical resistant Valox® or optional Cast Iron Impeller
- Standard Viton® Carbon/Ceramic seal or optional Severe Duty Silicon Carbide Mechanical seal
- SP model is self-priming making it perfect for load and spray applications.
- F model equipped with NPT ports and industry standard flanged connections.

**150 SERIES**  
**HIGH PERFORMANCE**

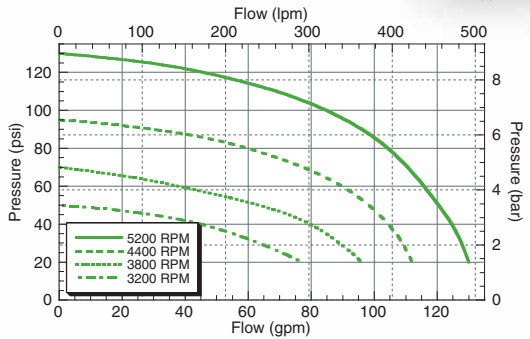
FMC-150  
FMC-150F  
FMC-150SP  
FMC-150-MAG-D

FMC-150F-MAG-D  
FMC-150SP-MAG-D

<b>1 1/2"</b> SUCTION	<b>1 1/4"</b> DISCHARGE
--------------------------	----------------------------



Maximum Flow: 130 GPM (492 LPM)  
Maximum Pressure: 130 PSI (9 BAR)  
Maximum Power: 10 HP (7.5 KW)



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©Viton is a registered trademark of Dupont Dow Elastomers.

# 650 MAX SERIES

## Features

- Modified impeller design develops higher pressure at lower RPM.
- F model equipped with NPT ports and industry standard flanged connections.
- E-Coat protection for excellent corrosion resistance

FMC-650  
FMC-650F

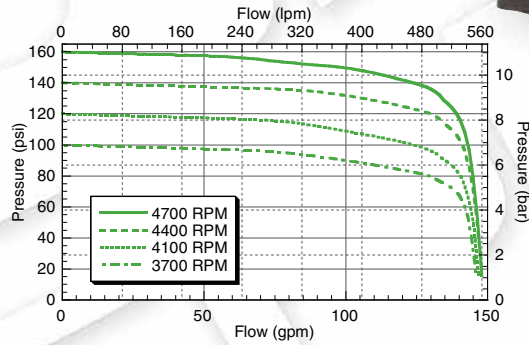
**1½"**  
**220 FLANGE**  
**SUCTION**

FMC-650-MAG-D  
FMC-650F-MAG-D

**1¼"**  
**200 FLANGE**  
**DISCHARGE**



Maximum Flow: 140 GPM (530 LPM)  
Maximum Pressure: 160 PSI (11 BAR)  
Maximum Power: 22 HP (16.4 KW)



# 200 SERIES HIGH FLOW

## Features

- Counterclockwise Rotation when facing shaft end
- Stainless Steel Shaft and Wear Ring
- Chemical resistant Valox® or optional Cast Iron Impeller
- Standard Viton® Carbon/Ceramic seal or optional Severe Duty Silicon Carbide Mechanical seal

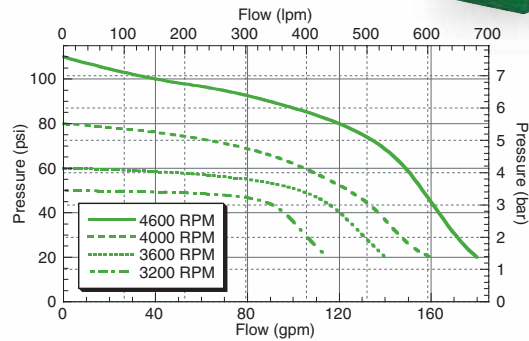
FMC-200  
FMC-200-MAG-D

**2"**  
**SUCTION**

**1½"**  
**DISCHARGE**



Maximum Flow: 200 GPM (757 LPM)  
Maximum Pressure: 120 PSI (8.3 BAR)  
Maximum Power: 7.5 HP (5.6 KW)



# BELT DRIVEN CENTRIFUGAL PUMPS

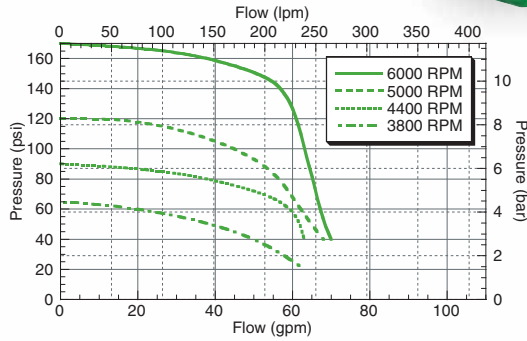
## CLOCKWISE ROTATION

FMC-CW  
FMC-CW-MAG-D

<b>1 1/4"</b> SUCTION	<b>1"</b> DISCHARGE
--------------------------	------------------------



Maximum Flow: 70 GPM (265 LPM)  
Maximum Pressure: 170 PSI (11.7 BAR)  
Maximum Power: 4.2 HP (3.1 KW)



### Features

- Clockwise Rotation when facing shaft end
- Stainless Steel Shaft and Wear Ring
- Chemical resistant Valox® or optional Cast Iron Impeller
- Standard Viton® Carbon/Ceramic seal or optional Severe Duty Silicon Carbide Mechanical seal
- MAG-D models equipped with heavy duty 12V clutch
- X3 model has 3 1/2" (8.89 CM) spacing on mounting base. All other models have 5 1/4" (13.34 CM).
- DX3 model for Spra-Coupe®  
Models: 3430, 3440, 3630, 3640, 4440, 4640

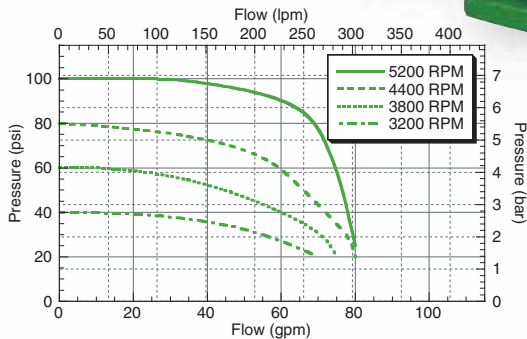
**150 SERIES**  
**HIGH PERFORMANCE**

FMC-CW-150  
FMC-CW-150-MAG-D  
FMC-CW-150-MAG-DX3

<b>1 1/2"</b> SUCTION	<b>1 1/4"</b> DISCHARGE
--------------------------	----------------------------



Maximum Flow: 80 GPM (303 LPM)  
Maximum Pressure: 120 PSI (8.3 BAR)  
Maximum Power: 4.7 HP (3.5 KW)



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©Valox is a registered trademark of GE Plastics.  
©Viton is a registered trademark of Dupont Dow Elastomers.



# 650 MAX SERIES

## Features

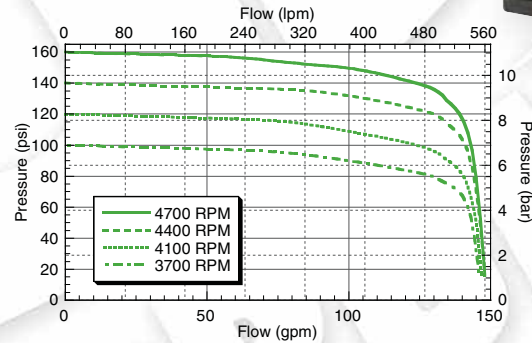
- Clockwise Rotation when facing shaft end
- Modified impeller design develops higher pressure at lower RPM.
- E-Coat protection for excellent corrosion resistance
- Standard Viton® Carbon/Ceramic seal or optional Severe Duty Silicon Carbide Mechanical seal
- MAG-D models equipped with heavy duty 12V clutch

## FMC-CW-650 FMC-CW-650-MAG-D

<b>1½"</b> <b>220 FLANGE</b> <b>SUCTION</b>	<b>1¼"</b> <b>200 FLANGE</b> <b>DISCHARGE</b>
---	---



Maximum Flow: 140 GPM (530 LPM)  
Maximum Pressure: 160 PSI (11 BAR)  
Maximum Power: 22 HP (16.4 KW)



# 200 SERIES HIGH FLOW

## Features

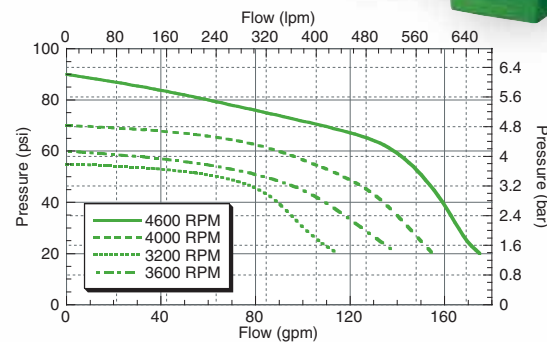
- Clockwise Rotation when facing shaft end
- Stainless Steel Shaft and Wear Ring
- Chemical resistant Valox® or optional Cast Iron Impeller
- Standard Viton® Carbon/Ceramic seal or optional Severe Duty Silicon Carbide Mechanical seal
- MAG-D models equipped with heavy duty 12V clutch

## FMC-CW-200 FMC-CW-200-MAG-D

<b>2"</b> <b>SUCTION</b>	<b>1½"</b> <b>DISCHARGE</b>
-----------------------------	--------------------------------



Maximum Flow: 200 GPM (757 LPM)  
Maximum Pressure: 120 PSI (8.3 BAR)  
Maximum Power: 7.5 HP (5.6 KW)



# BELT DRIVEN CENTRIFUGAL PUMPS

## CLOCKWISE ROTATION

### Features

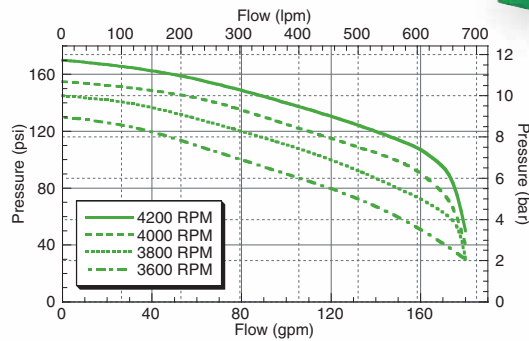
- Large diameter impeller provides higher pressure at slower speeds
- Easily replaceable mechanical seal
- Clockwise Rotation when facing shaft end
- Stainless Steel Shaft
- All iron construction
- Heavy duty double row ball bearings
- Standard Viton® Carbon/Ceramic seal or optional Severe Duty Silicon Graphite Mechanical seal

FMC-CW-800  
FMC-CW-800-MAG-D

<b>2"</b>	<b>1½"</b>
SUCTION	DISCHARGE



Maximum Flow: 180 GPM (681 LPM)  
Maximum Pressure: 170 PSI (11.7 BAR)  
Maximum Power: 14.2 HP (10.6 KW)



# ELECTRIC MOTOR DRIVEN CENTRIFUGAL PUMP

### Features

- For most industrial and agricultural blending, mixing, seed treating and liquid transfer applications.
- Easy replaceable Viton® mechanical seal
- Non-overloading ¾ HP (.56 KW) 3450 RPM single phase totally enclosed fan cooled electric motor, for use in all dusty, dirty or weather exposed locations.
- Optional silicon carbide seal available for abrasive solutions.
- Chemical resistant Valox® or optional Cast Iron Impeller

ACH-55

<b>1¼"</b>	<b>1"</b>
SUCTION	DISCHARGE



Maximum Flow: 40 GPM (151 LPM)  
Maximum Pressure: 30 PSI (2.1 BAR)

ENGLISH UNITS			METRIC UNITS		
PRESSURE	FLOW	FLOW	PRESSURE	FLOW	FLOW
PSI	GPM	GPH	BAR	LPM	LPH
30	10	600	2.1	37.85	2271
25	20	1200	1.7	75.70	4542
23	30	1800	1.6	113.56	6813
19	40	2400	1.3	151.42	9085

©Valox is a registered trademark of GE Plastics.  
©Viton is a registered trademark of Dupont Dow Elastomers.

Data based on 1 foot lift through unrestricted suction hose and fittings with full 1¼" I.D.

**A complete line of electric motor driven pumps is available. Contact the factory for details.**

# GASOLINE ENGINE DRIVEN CENTRIFUGAL PUMPS

## General Advantages

Ace offers a complete line of Gasoline Engine Driven Centrifugal Pumps. The pumps provide service where power sources are limited or unavailable. The pumps are ideally suited to develop pressure for spray or transfer applications.

The pumps feature a direct coupled design with an easily replaceable mechanical seal and slinger ring between pump and engine to prevent liquid from damaging the engine.

The pumps are available complete or less engine (-LE). Complete units come assembled on the specified engine ready to install and run. Less engine (-LE) units come with all hardware necessary to mount on the specified engine.

GE-75  
GE-85

<b>1"</b> SUCTION	<b>3/4"</b> DISCHARGE
----------------------	--------------------------

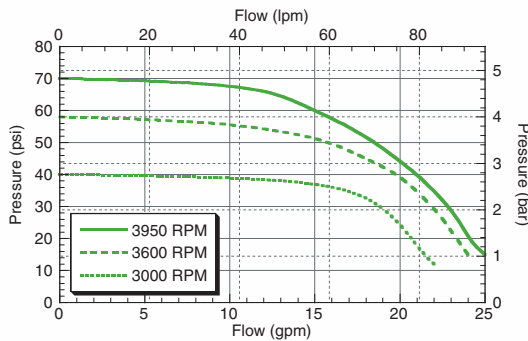
## Features

- Tall Blade Impeller design – higher pressure at standard engine speeds
- GE-75 Impeller attaches directly to 5/8" (1.59 CM) keyed shaft engine
- GE-85 Impeller attaches directly to 3/4" (1.91 CM) keyed shaft engine
- All Polypropylene corrosion resistant construction
- Available complete or less engine



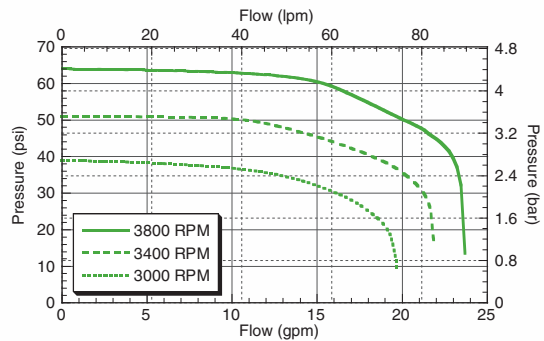
## GE-75-HONDA

Maximum Flow: 25 GPM (95 LPM)  
Maximum Pressure: 70 PSI (4.8 BAR)



## GE-85-HONDA

Maximum Flow: 24 GPM (91 LPM)  
Maximum Pressure: 65 PSI (4.5 BAR)



# GASOLINE ENGINE DRIVEN CENTRIFUGAL PUMPS

## GE-100-A Features

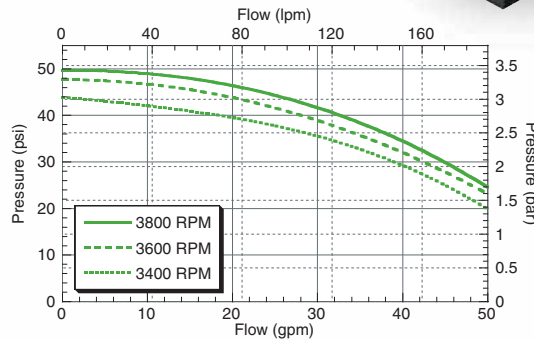
- Impeller attaches directly to 5/8" (1.59 CM) NF threaded shaft on 3 HP (2.8 KW) to 5.5 HP (4.1 KW) engine
- Stainless steel shaft sleeve with o-ring leak protection
- All iron construction
- Available complete or less engine

## GE-100-A

<b>1 1/4"</b> SUCTION	<b>1"</b> DISCHARGE
--------------------------	------------------------



Maximum Flow: 50 GPM (189 LPM)  
Maximum Pressure: 50 PSI (3.4 BAR)



## GE-650 Features

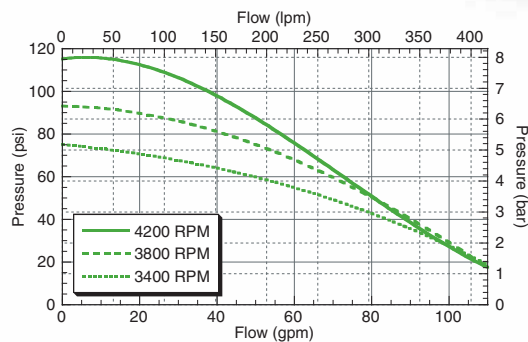
- Impeller attaches directly to 5/8" (1.59 CM) NF threaded shaft on 5.5 HP (4.1 KW) engine
- Stainless steel shaft sleeve with o-ring leak protection
- All iron construction
- Available complete or less engine

## GE-650 GE-660

<b>1 1/2"</b> SUCTION	<b>1 1/4"</b> DISCHARGE
--------------------------	----------------------------



Maximum Flow: 110 GPM (416 LPM)  
Maximum Pressure: 120 PSI (8.3 BAR)



## GE-660 Features

- Impeller attaches directly to 3/4" (1.91 CM) keyed shaft on 5.5 HP (4.1 KW) engine
- Optional electric start engine
- All iron construction
- Available complete or less engine

## GE-800 Features

- Impeller attaches directly to 1" (2.54 CM) - 14 NF threaded shaft on 8 HP (5.9 KW) to 10 HP (7.5 KW) engine
- Stainless steel shaft sleeve with double o-ring leak protection
- All iron construction
- Available complete or less engine

## GE-860 Features

- Impeller attaches directly to 1" (2.54 CM) keyed shaft on 8 HP (5.9 KW) to 10 HP (7.5 KW) engine
- Optional electric start engine
- All iron construction
- Available complete or less engine

## GE-1600 Features

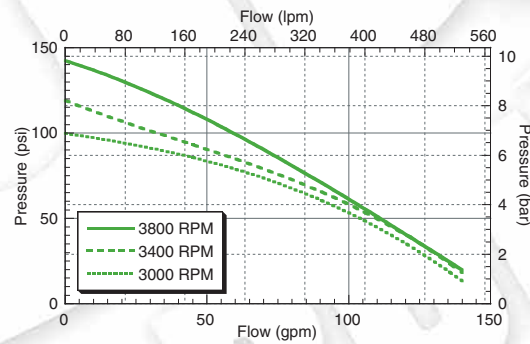
- Impeller attaches directly to 1" (2.54 CM) - 14 NF threaded shaft on 16 HP (12 KW) to 20 HP (15 KW) engine
- Standard 16 HP (12 KW) electric start engine
- Stainless steel shaft sleeve with double o-ring leak protection
- All iron construction
- Available complete or less engine

## GE-800 GE-860

<b>2"</b> SUCTION	<b>1½"</b> DISCHARGE
----------------------	-------------------------



Maximum Flow: 140 GPM (530 LPM)  
Maximum Pressure: 140 PSI (9.7 BAR)

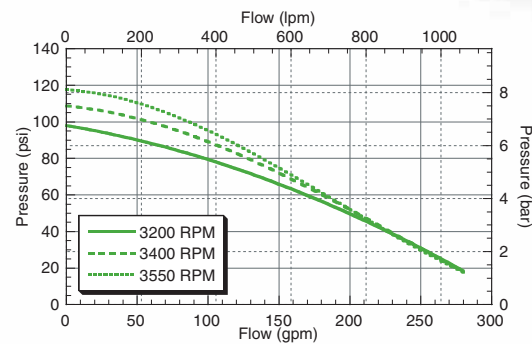


## GE-1600

<b>2½"</b> SUCTION	<b>2"</b> DISCHARGE
-----------------------	------------------------



Maximum Flow: 280 GPM (1060 LPM)  
Maximum Pressure: 120 PSI (8.3 BAR)



# ACE/VALVTEC™ BALL VALVES

## General Advantages

ACE/VALVTEC™ ball valves are the premium valves for critical uses. The valves are available with ratchet or quarter turn handle designs. ACE/VALVTEC™ puts the durability of metal where performance counts.



## SERIES 16 STANDARD PORT

Available with 1/4-turn handle or ratchet handle. An open-closed indicator is provided with ratchet handle model. Operation of ratchet handle may be cable, chain, cord, or push-pull rods. Available in cast iron, aluminum, or bronze. Choice of hard chrome plated carbon steel balls or stainless balls. Size range 1/2" to 3" NPT.

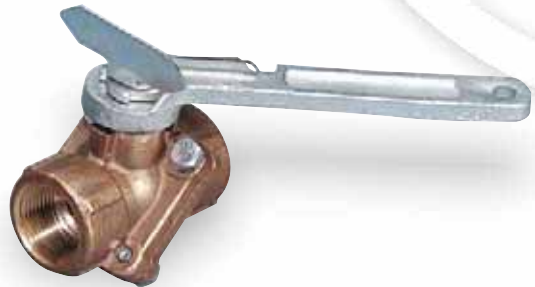


## Standard Valve Features

- Unique diagonally split valve body for easy cleaning and service
- Ratchet on/off or quarter turn operation
- Rugged all-metal bodies in cast iron, aluminum, or bronze
- Hard chrome plated or stainless steel balls
- Standard and full port models
- Withstand working pressures up to 400 PSI (27.6 BAR)

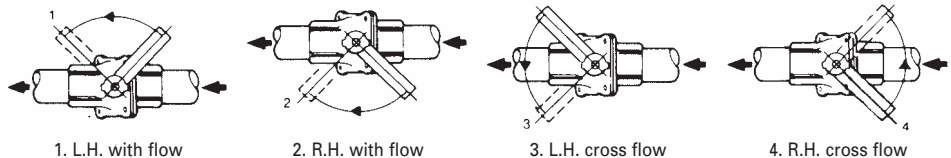
## SERIES 36 FULL PORT

A full flow valve available with 1/4-turn or ratchet handle. Available in cast iron only. Size range 3/4" to 2" NPT.



## RATCHET HANDLES

Ratchet handles are available for Series 16 and Series 36 valves and can be supplied for right or left handed operation and either with flow or crossflow. An open-closed indicator is provided with ratchet handle model. Operation of ratchet handle may be cable, chain, cord, or push-pull rods. Please specify when ordering.

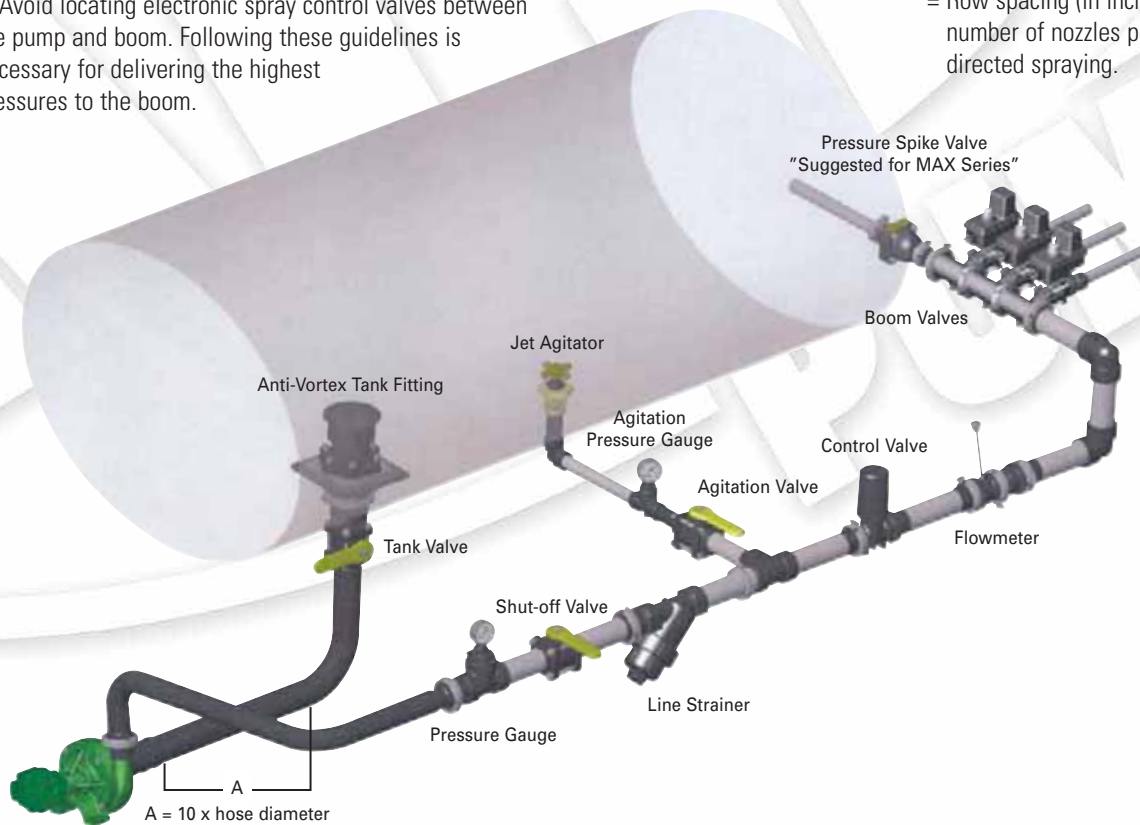


# APPLICATION INFORMATION

## SPRAYER PLUMBING SUGGESTIONS

The primary goal when plumbing a sprayer pump is to route liquid from the pump to the spray boom with minimum restriction. Minimizing restrictions is necessary for achieving the pump's maximum rated capacity.

- 1) Hoses should be the same size as the pump's suction and discharge ports.
- 2) Install a pressure gauge and valve on the discharge side of the pump for the purpose of measuring the SHUT-OFF pressure.
- 3) A minimum number of elbows, fittings, and valves should be used to reduce pressure losses.
- 4) Plumb a straight section of hose leading into the suction port equal to 10 times the hose inside diameter. (i.e. 1 1/2" hose = 15" of straight hose)
- 5) Avoid locating electronic spray control valves between the pump and boom. Following these guidelines is necessary for delivering the highest pressures to the boom.



## USEFUL FORMULAS

$$\text{GPA} = \frac{5940 \times \text{GPM (per Nozzle)}}{\text{MPH} \times \text{W}}$$

$$\text{GPM (per Nozzle)} = \frac{\text{GPA} \times \text{MPH} \times \text{W}}{5940}$$

GPA = Gallons Per Acre

GPM = Gallons Per Minute

MPH = Miles Per Hour

W = Nozzle spacing (in inches) for broadcast spraying

= Spray width (in inches) for single nozzles, band spraying, or boomless spraying

= Row spacing (in inches) divided by the number of nozzles per row for directed spraying.

## PUMP MOUNTING

- 1) The pump should be mounted below the tanks to allow gravity to naturally fill the pump with liquid.
- 2) The volute should be oriented with the discharge port pointing up or across the top of the pump which allows air to rise out of the pump.
- 3) A petcock valve may be installed in the top most pipe plug hole to allow air to be bled off each time the tanks are filled.
- 4) Another option would be to install a 1/8" air bleed line from the top most pipe plug hole to the sprayer tank. This will continually bleed air from the pump housing.
- 5) If the pump must be located above the liquid level, a check valve should be installed to maintain the pump's prime.

ACE centrifugal pumps are straight centrifugals and must be primed prior to operation. The word "primed" means the pump must be completely full of water and any trapped air vented before operation. Following the pump mounting guidelines will insure proper priming of the pump and avoid premature seal failure.

# GENERAL INFORMATION

## USEFUL FACTORS OR FORMULAS

$$\text{WHP} = \frac{\text{Ft. Head} \times \text{GPM}}{3960}$$

$$\text{BHP} = \frac{\text{WHP}}{\text{EFF}} \text{ or } \text{BHP} = \frac{\text{Ft. Head} \times \text{GPM}}{3960 \times \text{EFF (Pump)}}$$

$$\text{EFF} = \frac{\text{WHP}}{\text{BHP}} \times 100$$

WHP = Water Horsepower

BHP = Brake Horsepower

EFF = Pump Efficiency

To determine the approximate horsepower required for an ACE centrifugal pump at a given flow and pressure:

$$\text{HP} = \frac{\text{GPM} \times \text{PSI}}{1714 \times .5}$$

To determine the speed at which a liquid is traveling:

$$\text{Velocity (ft/sec)} = \frac{.408 \times \text{GPM}}{(\text{pipe diameter})^2}$$

To determine the heat generated from by-passed hydraulic oil:

$$\text{BTU Per Hour} = \text{GPM} \times \text{PSI} \times 1.48$$

$$12,000 \text{ BTU/HR} = 1 \text{ Ton Refrigeration}$$

$$\text{Feet Head} = \frac{\text{PSI (water)} \times 2.31}{\text{specific gravity}}$$

$$\text{PSI (pounds per square inch)} = \text{Feet Head} \times .433$$

$$\text{Weight of one U.S. Gallon of water} = 8.34 \text{ pounds}$$

$$\text{One cubic foot (cu. ft.) of water contains } 7.48 \text{ gallons}$$

$$\text{Specific gravity of water (sp. gr.)} = 1.0$$

## SPECIFIC GRAVITY

Water weighs 8.34 lbs./gallon and has a specific gravity of 1. Since specific gravity is a ratio of the weight of a liquid compared to the weight of water, the specific gravity of a liquid such as 28% nitrogen fertilizer, which weighs 10.65 lbs./gallon would be figured thus:

$$\frac{10.65 \text{ lbs./gallon}}{8.34 \text{ lbs./gallon}} = 1.28 \text{ specific gravity}$$

SOLUTION WEIGHT	SPECIFIC GRAVITY	CONVERSION FACTOR
8.0 lbs./gal.	.96	.98
8.34 lbs./gal.	1.0	1.0
9.0 lbs./gal.	1.08	1.04
10.0 lbs./gal.	1.2	1.1
10.65 lbs./gal.	1.28	1.13
11.0 lbs./gal.	1.32	1.15

All pump capacities (GPM) in this catalog are based on water. When pumping fluids that are heavier than water, pump capacity will be less than stated on each pump performance table. To compensate for pumping heavy liquids, multiply the required pump capacity in GPM times the appropriate conversion factor from the above chart.

EXAMPLE: Required pump capacity is 50 GPM of 28% nitrogen fertilizer.

$$50 \times 1.13 = 56.5 \text{ GPM}$$

Then select a pump from the preceding pages that will deliver 56.5 GPM at the desired pressure.

## CONVERSION FACTORS

	Multiply	By	To Obtain
LENGTH	inches	25.40	millimeters (mm)
	inches	2.540	centimeters (cm)
	feet	0.3048	meters (m)
	miles	1.609	kilometers (km)
AREA	acres	4046.7	square meters (m <sup>2</sup> )
	acres	0.4047	hectares (ha)
	hectares	2.471	acres
VOLUME	gallons	3.785	cubic decimeters (dm <sup>3</sup> )
	gallons	3.785	liters (L)
	gallons	231	cubic inches (in <sup>3</sup> )
	Imperial gallons	4.546	liters (L)
	Imperial gallons	1.201	U.S. gallons
	U.S. gallons	.833	Imperial gallons
	liter	0.264	gallon
	pounds water	0.119	gallon
FLOW RATE	gallons/hour (gph)	3.785	liters/hour (L/h)
	gallons/minute (gpm)	3.785	liters/minute (L/m)
APPL. RATE	gallons/acre (gpa)	9.353	liters/hectare (L/ha)
PRESSURE	pounds per square inch (psi)	6.895	kilopascals (kPa)
	PSI	2.31	ft. (head) of water
	ft. (head) of water	0.433	PSI
	inches mercury (in Hg)	0.491	PSI
	bar	14.5	PSI
	kilopascal (KPA)	0.145	PSI
SPEED	miles/hour (mph)	1.609	kilometers/hour (km/h)
	kilometers/hour (km/h)	0.621	miles/hour (mph)



# PIPE & HOSE FRICTION TABLES

**FLOW PRESSURE DROP IN PSI FOR VARIOUS PIPE SIZES (10FT. LENGTH)**

FLOW IN GPM	1/8"	1/4"	3/8"	1/2"	3/4"	1"	1 1/4"	1 1/2"
.2	.2							
.3	.4							
.4	.6	.16						
.5	1.0	.24						
.6	1.5	.34						
.8	2.5	.60	.13					
1.0	3.7	.89	.19	.08				
1.5	8.0	<u>1.8</u>	.40	.13				
2.0		3.1	<u>.65</u>	.21	.05			
2.5		4.7	1.1	.32	.08			
3.0		6.3	1.5	.45	.11			
3.5			2.0	.60	.14			
4.0			2.5	.78	.18	.06		
4.5			3.1	.98	.23	.08		
5.0			3.8	<u>1.2</u>	.28	.09		
6.0			5.2	1.6	.38	.11		
8.0				2.8	<u>.63</u>	.20	.06	
10.0				4.2	1.0	.30	.08	.04
15.0					2.2	<u>.61</u>	.16	.08
20.0					3.8	1.1	.29	.13
25.0						1.7	<u>.41</u>	.20
30.0						2.4	.59	.27
35.0							.79	<u>.36</u>
40.0							1.0	.48
50.0								.71

**NOTE:** The above figures are for standard pipe of either seamless or welded construction, in good clean condition. Recommended maximum capacity to keep velocity at approximately 5 ft. per second is shown above heavy lines.

**PRESSURE DROP IN PSI FOR VARIOUS HOSE SIZES  
25 ft. length with no coupling**

FLOW IN GPM	1/4" I.D.	3/8" I.D.	1/2" I.D.	5/8" I.D.	3/4" I.D.	1" I.D.	1 1/4" I.D.	1 1/2" I.D.
.2	.8							
.3	1.5							
.4	2.5							
.5	4.0	.5						
.6	5.0	.8						
.8	9.0	1.3						
1.0		1.8	.5					
2.0		6.0	1.5					
3.0		13.0	3.1	1.0				
4.0			6.0	1.8				
5.0			8.5	2.5	1.0			
6.0			12.0	3.7	1.5			
8.0				6.5	2.5	.6		
10.0				9.5	3.7	1.0		
15.0					8.0	2.0	.7	
20.0					14.0	3.4	1.2	.4
25.0						5.0	1.8	.6
30.0						6.5	2.5	.9
40.0						12.0	4.4	1.4
50.0							6.0	2.1
60.0							9.0	2.9
70.0							13.0	4.0

**NOTE:** The above figures are for standard hose in good condition with no couplings.

**APPROXIMATE FRICTION LOSS IN PIPE FITTINGS**

in terms of equivalent feet of straight pipe.

PIPE SIZE STD. WT.	ACTUAL INSIDE DIAM. IN.	GATE VALVE	GLOBE VALVE	45° ELBOW	RUN OF STD. TEE	STD. ELBOW OR RUN OF TEE REDUCED 1/2	STD. TEE THRU SIDE OUTLET
		FULL OPEN	FULL OPEN				
1/8	.269	.15	8	.35	.40	.75	1.4
1/4	.364	.20	11	.50	.65	1.1	2.2
1/2	.622	.35	18.6	.78	1.1	1.7	3.3
3/4	.824	.44	23.1	.97	1.4	2.1	4.2
1	1.049	.56	29.4	1.2	1.8	2.6	5.3
1-1/4	1.380	.74	38.6	1.6	2.3	3.5	7.0
1-1/2	1.610	.86	45.2	1.9	2.7	4.1	8.1
2	2.067	1.1	58	2.4	3.5	5.2	10.4
2-1/2	2.469	1.3	69	2.9	4.2	6.2	12.4

# PUMP SELECTION WORKSHEET

Visit our web site at [www.AcePumps.com](http://www.AcePumps.com) to use an automated version of this worksheet.

**1.** Fill in the application information:

Application Rate (GPA) \_\_\_\_\_  
 Speed (MPH) x \_\_\_\_\_  
 Nozzle Spacing (inches) x \_\_\_\_\_  
 = \_\_\_\_\_

**2.** Complete the calculations

÷ 5940 = \_\_\_\_\_ GPM per Nozzle  
 x \_\_\_\_\_ # of Nozzles  
 = \_\_\_\_\_ Boom Flow (GPM)

**3.** Identify the flow required for AGITATION (typically 5% of tank's capacity):

<div style="border: 1px solid green; border-radius: 50%; padding: 5px; width: 60px; margin: 0 auto;">25 GPM</div> <p><b>500 Gallon Tank</b></p>	<div style="border: 1px solid green; border-radius: 50%; padding: 5px; width: 60px; margin: 0 auto;">37 GPM</div> <p><b>750 Gallon Tank</b></p>	<div style="border: 1px solid green; border-radius: 50%; padding: 5px; width: 60px; margin: 0 auto;">50 GPM</div> <p><b>1000 Gallon Tank</b></p>	<div style="border: 1px solid green; border-radius: 50%; padding: 5px; width: 60px; margin: 0 auto;">75 GPM</div> <p><b>1500 Gallon Tank</b></p>
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**4.** Then Add:

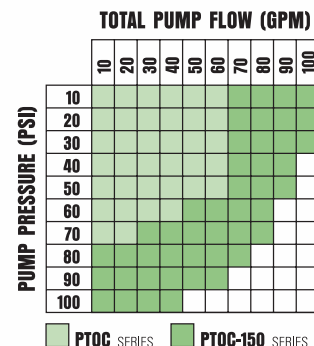
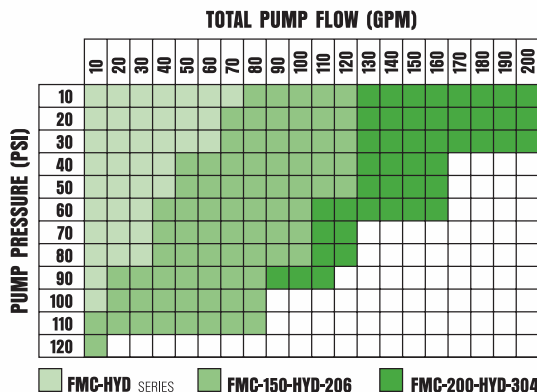
Boom Flow (GPM) + Agitation (GPM) = Total Pump Flow (GPM) required  
 \_\_\_\_\_ + \_\_\_\_\_ = \_\_\_\_\_

## PUMP SELECTION

## HYDRAULIC PUMPS

## PTO PUMPS

- Determine your highest spraying pressure (PSI). (Add 10-15 PSI for system pressure losses.)
- Find the TOTAL PUMP FLOW (GPM) calculated above.
- Choose the pump by color code or catalog performance charts.







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