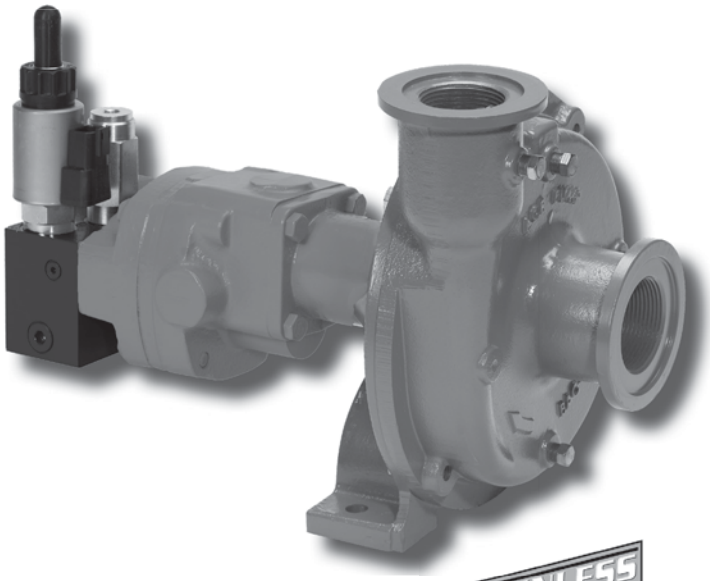
High Performance Hydraulic Motor Driven Centrifugal Pump

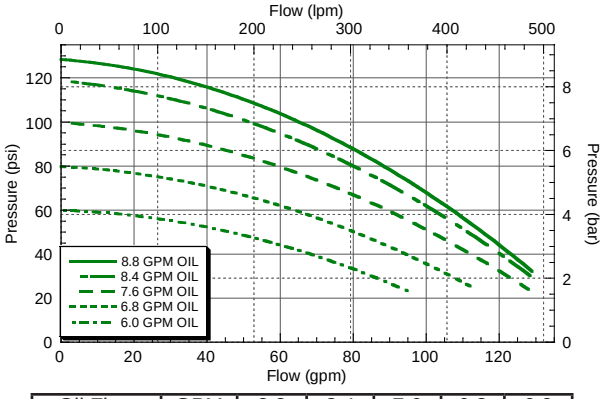
ACE 150 SERIES HIGH PERFORMANCE PUMPS

FMCSC-150F-HYD-304-PWM



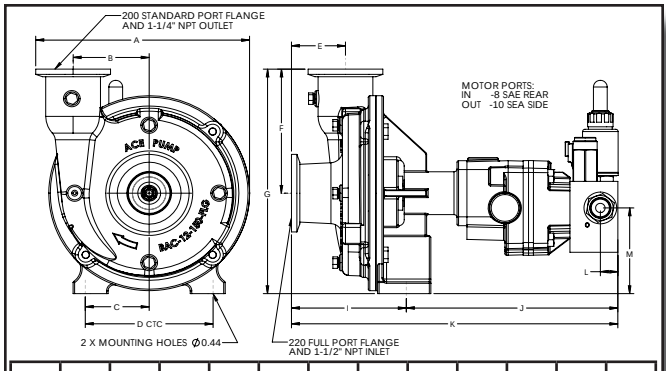
- Suction 220 Flange & 1-1/2” NPT
- Discharge 200 Flange & 1-1/4” NPT
- Integrated Proportional 12V Control Valve for Precision Ag applications using Pulse Width Modulated (PWM) control signals
- Integrated Pressure Relief Valve prevents overspeeding
- For the following Hydraulic Systems:
  - ✓ Pressure Compensating Closed Center
  - ✓ Load Sensing or Pressure Flow Compensating Closed Center
- Standard Carbon/Ceramic seal or Optional Severe Duty Silicon Carbide Mechanical Seal
- Chemical Resistant Thermoplastic Impeller or Optional Cast Iron or Polypropylene available

PERFORMANCE CHART



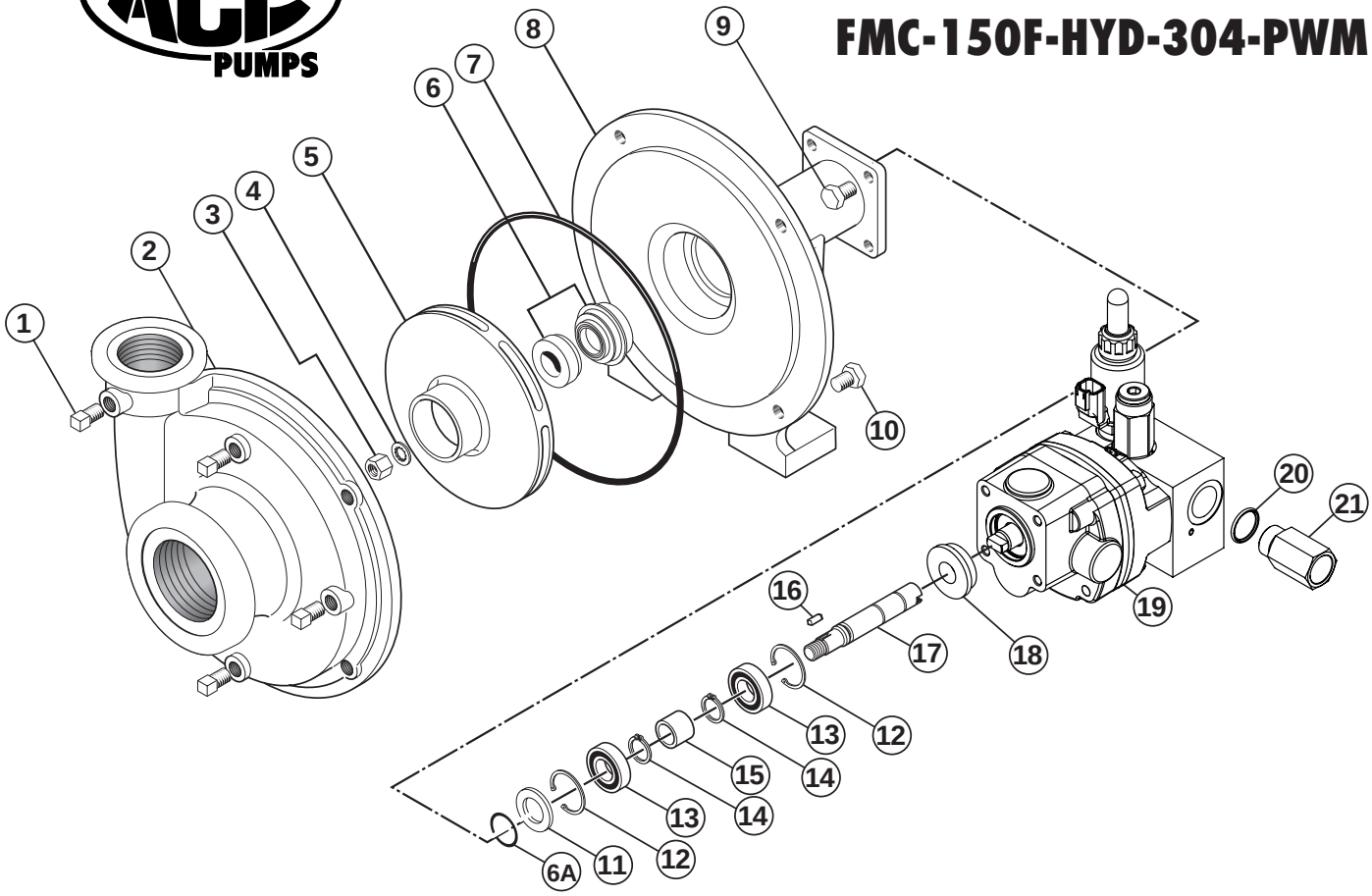
Oil Flow Conversion	GPM	8.8	8.4	7.6	6.8	6.0
	LPM	33.3	31.8	28.8	25.7	22.7

DIMENSIONS



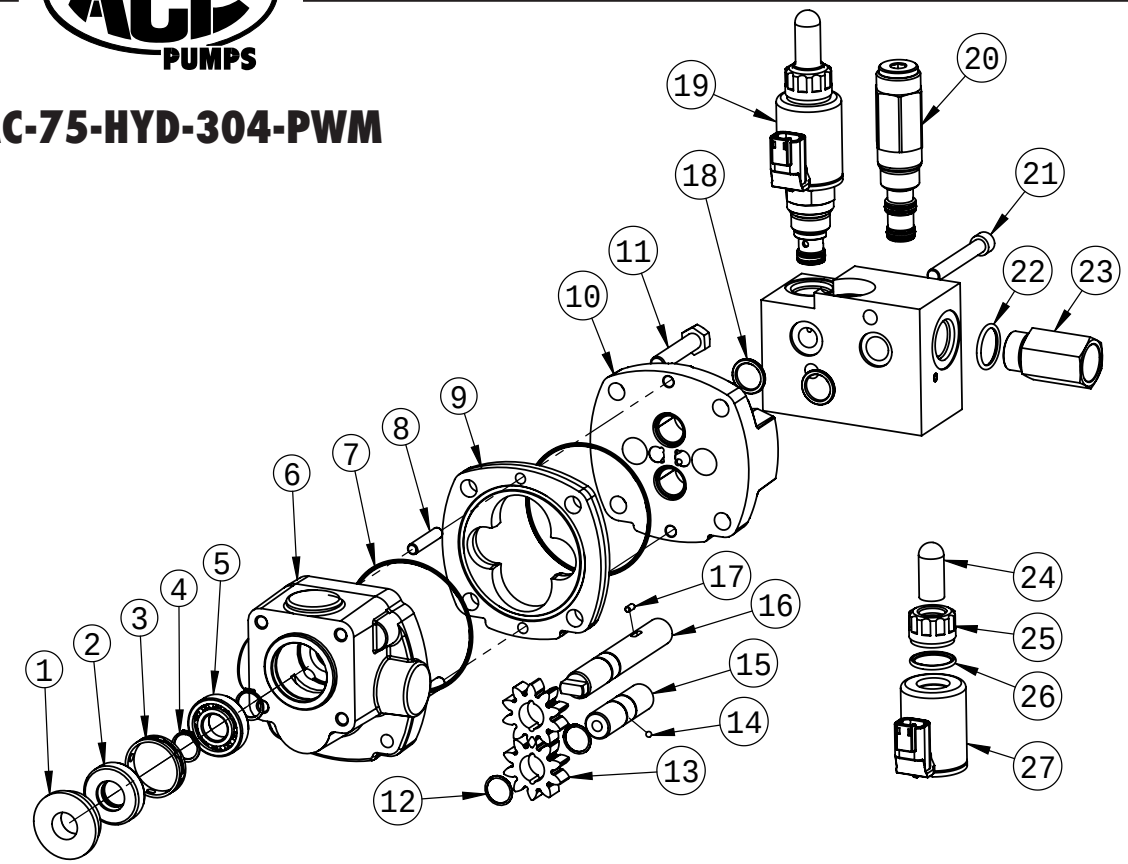
	A	B	C	D	E	F	G	I	J	K	L	M
INCHES	8.79	3.13	2.63	5.25	2.22	5.25	9.5	4.72	8.7	13.41	0.72	3.63
MM	223.1	79.4	66.7	133.4	56.4	133.4	241.3	119.9	220.7	340.6	18.3	92.1

FMC-150F-HYD-304-PWM



REF. #	PART NUMBER	EDP #	DESCRIPTION	REQ.
1	BAC-53	41110	Pipe plug	4
1	41120	41120	Pipe plug, stainless steel (optional)	4
2	BAC-12-150-FLG	40257	Volute, 1-1/2” NPT & 220 flange x 1-1/4” NPT & 200 flange	1
3	BAC-23-B-SS	40393	Nut, 3/8” NF, SS	1
4	BAC-24-B-SS	42702	Washer, 3/8” SS, vibration proof	1
5	BAC-26-150-P	40446	Impeller,thermoplastic, keyway	1
5	BAC-26-150-CI	40445	Impeller, cast iron, keyway (optional)	1
5	BAC-26-150-PI	40448	Impeller, polypropylene, keyway (optional)	1
6①	BAC-7V	40151	Seal, mechanical, carbon/ceramic (includes 40160 O-Ring)	1
6②	BAC-7SC	40152	Seal, mechanical, silicon carbide (includes 40160 O-Ring) (optional)	1
6A①②	40160	40160	O-ring, shaft seal	1
7①②	BAC-4-150	40015	O-ring, body seal	1
8	BAC-14-150-HYD-300A	40328	Mounting frame (for 300N Series hydraulic motor)	1
9	41330	41330	Cap screw, 5/16” N. C. x 3/4” Hex head (for 304 motor)	4
10	40950	40950	Cap screw, 3/8” NC x 3/4” hex head	4
10	40930	40930	Cap screw, 3/8” NC x 3/4” hex head, stainless steel (optional)	4
11	BAC-54	41130	Slinger	1
12	BAC-33	40810	Snap ring, internal, BAC-14 mounting frame	2
13	BAC-37	40870	Ball bearing, sealed, BAC-6 shaft	2
14	BAC-32	40790	Snap ring, external, BAC-6 shaft	2
15	BAC-32-S	40795	Spacer for BAC-6 shaft	1
16	BACH-25	40420	Key, 1/8” x 1/8” x 1/2”	1
17	BAC-6-HYD-SS	40061	Shaft, 5/8” diameter, keyway and tang slot, stainless steel	1
18	S300	40162	Seal support spacer for 300 Series HYD motor, effective 6/00	1
19	BAC-75-HYD-304-PWM	41348	Hydraulic motor, 11 GPM, PWM	1
20	41445	41445	O-ring, #10 SAE fitting	1
21	BAC-78-10X10SAE	41467	Reverse check assembly, #10 SAE x #10 SAE	1
①	RK-FMC-150	52710	Repair kit for FMC-150 series pump	-
②	RK-FMCSC-150	52711	Repair kit for FMC-150 series pump with silicon carbide seal	-
#	RK-BAC-75-HYD-300-L	41362	Repair kit for 300-L Series motor	-

BAC-75-HYD-304-PWM



REF #	PART #	EDP #	DESCRIPTION	REQ.
1	S305	40163	Seal support spacer, S305 for 205 Series pumps	1
2①	BAC-75-300-TLS	40154	Seal cartridge, BAC-75-300-TLS	1
3	43056	43056	Spacer seal/bearing, perforated, 300 series motor	1
4	43205	43205	Retaining ring, bearing	2
5	43225	43225	Ball bearing	1
6	43016	43016	Drive plate	1
7①	43130	43130	O-ring, housing seal	2
8	43085	43085	Dowel pin, housing	2
9	43005	43005	Gear housing	1
10	43023	43023	End plate, 300-PWM series motor	1
11	43185	43185	Cap screw, 3/8” N.C. hex head	4
12	43240	43240	Retaining ring, gear	2
13	43035	43035	Gear	2
14	43250	43250	Ball, idler shaft	1
15	43235	43235	Idler shaft	1
16	43046	43046	Drive shaft	1
17	43195	43195	Dowel pin, drive shaft	1
18	74205	74205	O-ring, port sealing, manifold to motor	2
19	PWM-18-PRO-11	74220	Valve assembly, 12V proportional	1
20	PWM-18-PRV-11	74210	Valve assembly, pressure reducing	1
21	41251	41251	Cap screw, 5/16” N.C. x 2.25” socket head	2
22	41445	41445	O-ring, #10 SAE fitting	1
23	BAC-78-10X10SAE	41467	Reverse check assembly, #10 SAE x #10 SAE	1
24	74235	74235	Protector, manual override, PWM-18-PRO	1
25	74230	74230	Nut, coil retainer for PWM-18-PRO	1
26	41445	41445	O-ring, coil nut	1
27	74225	74225	Coil, 12V for PWM-18-PRO	1
28	BAC-75-HYD-304P	41328	Motor, BAC-75-HYD-304-PWM, less manifold	-
#	PWM-1	74200	Manifold assembly, 304-PWM, includes 18 - 23	-
①	RK-BAC-75-HYD-300-L	41362	Motor repair kit, includes item 2 & 7	-

Item not shown.

REGULATING HYDRAULIC FLOW TO THE SPRAYER PUMP

There are three general types of hydraulic systems:
1) Load Sensing (LS), also known as Pressure-Flow Compensating (PFC) Closed Center
2) Pressure Compensating Closed Center (PC)
3) Open Center (OPEN)

This product is designed to operate on both Closed Center Hydraulic Systems. It should not be used with Open Center systems. Please consult the Tractor Hydraulic System Pump Selection Guide(HSG), Internet Hydraulic Selection Guide (IHSG) at www.AcePumps.com, or your tractor dealer to determine your tractor's hydraulic system.

The two valve design limits the maximum oil flow to the motor and prevents overspeeding. So the Restrictor Orifice and Flow Limiter are not needed with this product.

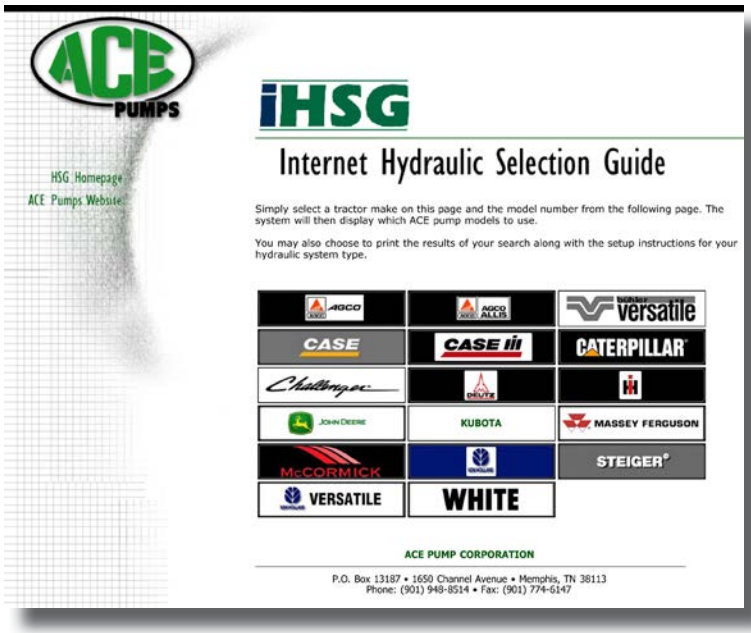
All PWM controllers are slightly different in the terminology used and setup procedures. Please consult your controller documentation or their technical service department for additional assistance with your specific application and implement in use.

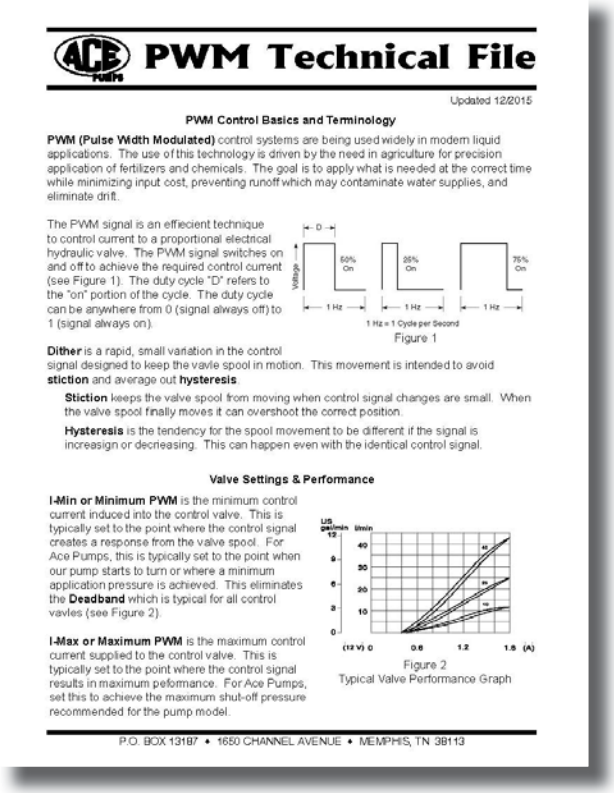
Link to Ace Pump iHSG

http://www.acepumps.com/ihsg/

Link to Ace Pump PWM Technical File

http://www.acepumps.com/_Assets/Literature/PWM_Technical_File.pdf




PWM Technical File

Updated 12/2015

PWM Control Basics and Terminology

PWM (Pulse Width Modulated) control systems are being used widely in modern liquid applications. The use of this technology is driven by the need in agriculture for precision application of fertilizers and chemicals. The goal is to apply what is needed at the correct time while minimizing input cost, preventing runoff which may contaminate water supplies, and eliminate drift.

The PWM signal is an effiecient technique to control current to a proportional electrical hydraulic valve. The PWM signal switches on and off to achieve the required control current (see Figure 1). The duty cycle "D" refers to the "on" portion of the cycle. The duty cycle can be anywhere from 0 (signal always off) to 1 (signal always on).

Figure 1

Dither is a rapid, small variation in the control signal designed to keep the vavle spool in motion. This movement is intended to avoid **stiction** and average out **hysteresis**.

Stiction keeps the valve spool from moving when control signal changes are small. When the valve spool finally moves it can overshoot the correct position.

Hysteresis is the tendency for the spool movement to be different if the signal is increasign or decreasing. This can happen even with the identical control signal.

Valve Settings & Performance

I-Min or Minimum PWM is the minimum control current induced into the control valve. This is typically set to the point where the control signal creates a response from the valve spool. For Ace Pumps, this is typically set to the point when our pump starts to turn or where a minimum application pressure is achieved. This eliminates the **Deadband** which is typical for all control vavles (see Figure 2).

I-Max or Maximum PWM is the maximum control current supplied to the control valve. This is typically set to the point where the control signal results in maximum peformance. For Ace Pumps, set this to achieve the maximum shut-off pressure recommended for the pump model.

Figure 2
Typical Valve Performance Graph

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