



## Checkball Piston Pumps For Water-Based Fluids

These corrosion resistant, stainless steel pumps are compatible with a variety of water-based and other low-viscosity fluids. Bi-directional shaft rotation provides constant direction of output flow regardless of drive shaft rotation.

### MAINTENANCE-FREE DESIGN

The single-fluid checkball design uses the pumped fluid for internal bearing lubrication. This eliminates the potential for fluid cross-contamination, possible in other designs with isolated lubrication. It also avoids the cost of a lubrication circuit.

### RELIABLE HIGH PRESSURE

Individual piston check valves provide long service life and greater volumetric efficiency, especially at high pressures and with low-viscosity fluids.

The check valves take the place of a valveplate in other pump designs. With no rotating sealing surface, checkball pumps are resistant to wearing and scoring.

### TYPICAL APPLICATIONS

These pumps are ideal for use in wellhead safety control systems and other subsea applications, providing long life operating at high pressures with water-based fluids.

They are also suitable for applications with low viscosity fluids such as Skydrol, Hyjet, and various MIL-Spec fluids.

### PUMP SELECTION

The table shows specifications for standard pressure models, and for high pressure "H" option models. Maximum pressures to 15 000 psi (1040 bar).

The "H" option requires high pressure coned and threaded or BSPP outlet ports. Refer to *Typical Model Code* on page 7 to specify shaft, seal and outlet port options.

**PF1300 SERIES**  
**0.32 to 1.42 gpm (1,19 to 5,37 L/min) at 1800 rpm**  
**8000 to 15 000 psi (560 to 1040 bar)**



### Specifications

Pump Models	Output Flow at 1500 rpm <sup>①</sup>		Output Flow at 1800 rpm <sup>①</sup>		Maximum Pressure		Rated Speed rpm
	U.S. gpm	L/min	U.S. gpm	L/min	psi	bar	
PF1301-20	0.26	0,98	0.32	1,19	8000	560	1800
PF1303-20	0.36	1,35	0.43	1,63	8000	560	1800
PF1305-20	0.46	1,73	0.55	2,08	8000	560	1800
PF1308-20	0.61	2,29	0.73	2,76	8000	560	1800
PF1311-20	0.43	1,64	0.53	1,99	8000	560	1800
PF1313-20	0.60	2,25	0.72	2,72	8000	560	1800
PF1315-20	0.76	2,87	0.92	3,47	8000	560	1800
PF1318-20	1.01	3,82	1.22	4,60	8000	560	1800
PF1320-20	1.18	4,46	1.42	5,37	8000	560	1800
PF1301H-20	0.23	0,86	0.28	1,06	15 000	1040	1800
PF1303H-20	0.32	1,22	0.39	1,48	15 000	1040	1800
PF1305H-20	0.44	1,65	0.53	1,99	12 000	830	1800
PF1308H-20	0.60	2,27	0.72	2,73	9000	630	1800
PF1311H-20	0.38	1,44	0.46	1,76	15 000	1040	1800
PF1313H-20	0.54	2,03	0.65	2,48	15 000	1040	1800
PF1315H-20	0.72	2,74	0.88	3,32	12 000	830	1800
PF1318H-20	1.00	3,78	1.21	4,56	9000	630	1800

<sup>①</sup> Output flow based on typical performance using 33 SUS (1,9 cSt) water glycol fluid at maximum pressure with flooded inlet.

## INSTALLATION AND OPERATING

All dimensions are shown in inches (millimeters in parentheses) and are nominal.

Note that models PF1301, PF1303, PF1305 and PF1308 have three pistons. Other models have five pistons.

### Mounting

SAE A 2-bolt pattern with 0.25 inch (6,4 mm) pilot engagement.

### Shaft

Standard keyed shaft, 0.875 inch (22,20 mm) diameter.

### Outlet Port Options

Standard pressure models are available with SAE ports. High pressure "H" option models require the use of outlet port option "A" (Autoclave Medium Pressure, Butech M/P or equivalent fittings), or outlet port option "B" (British Standard Pipe Parallel fittings).

### Inlet Conditions

Pumps using water-based fluids require a flooded inlet up to 1800 rpm rated speed. Higher viscosity fluids may require pressurized inlet conditions.

Contact the Dynex Sales department for applications requiring continuous duty operation at speeds higher or lower than shown in the *Typical Performance Curves*.

## Hydraulic Fluid Viscosity Guidelines<sup>①</sup>

Operating				Start-up	
Minimum		Maximum		Maximum	
SUS	cSt	SUS	cSt	SUS	cSt
32	1,5	927	200	927	200

<sup>①</sup> If fluid conditions fall outside of the range shown, contact the Dynex Sales department.

### Orientation/Drive

Shaft horizontal with inlet vertically up is preferred. Vertical shaft mounting is possible, but requires connecting a line to the bleed port to remove air from the pump housing.

### Seal Options

Standard seals are Buna-N (Nitrile) with Polyurethane (Disogrin<sup>®</sup>) o-rings in the cover. Options include Fluorocarbon (Viton<sup>®</sup> or Fluorel<sup>®</sup>) with Polyurethane (Disogrin<sup>®</sup>) o-rings in the cover, all Fluorocarbon with high pressure shaft seal, or EPR seals for use with some phosphate ester fluids. Refer to *Typical Model Code* on page 7.

### Fluid Cleanliness

Minimum: NAS 1638 Class 9  
ISO 4406 20/18/15

Optimal: NAS 1638 Class 6  
ISO 4406 19/15/12

If a system component fails resulting in fluid contamination, it is important to drain and clean the reservoir, all lines, filter screens and all components. Refill with new fluid.

### Weight (Mass):

38 lb (17 kg).

## FLUID RECOMMENDATIONS

Below is list of water-based hydraulic fluids that have proven to be compatible with PF1300 series pumps:

- **Castrol** – Transaqua HC 10, HC 20, HT, HT2, SP
- **Houghton** – Aqualink HT804F, 300F
- **MacDermid** – Oceanic HW443, HW540, ECF, Pelagic 100M, 100H, 100HC

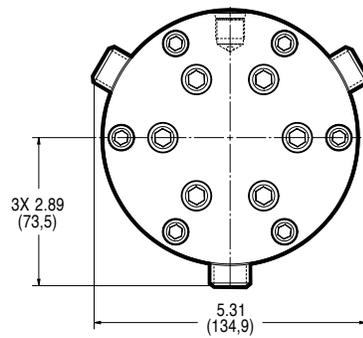
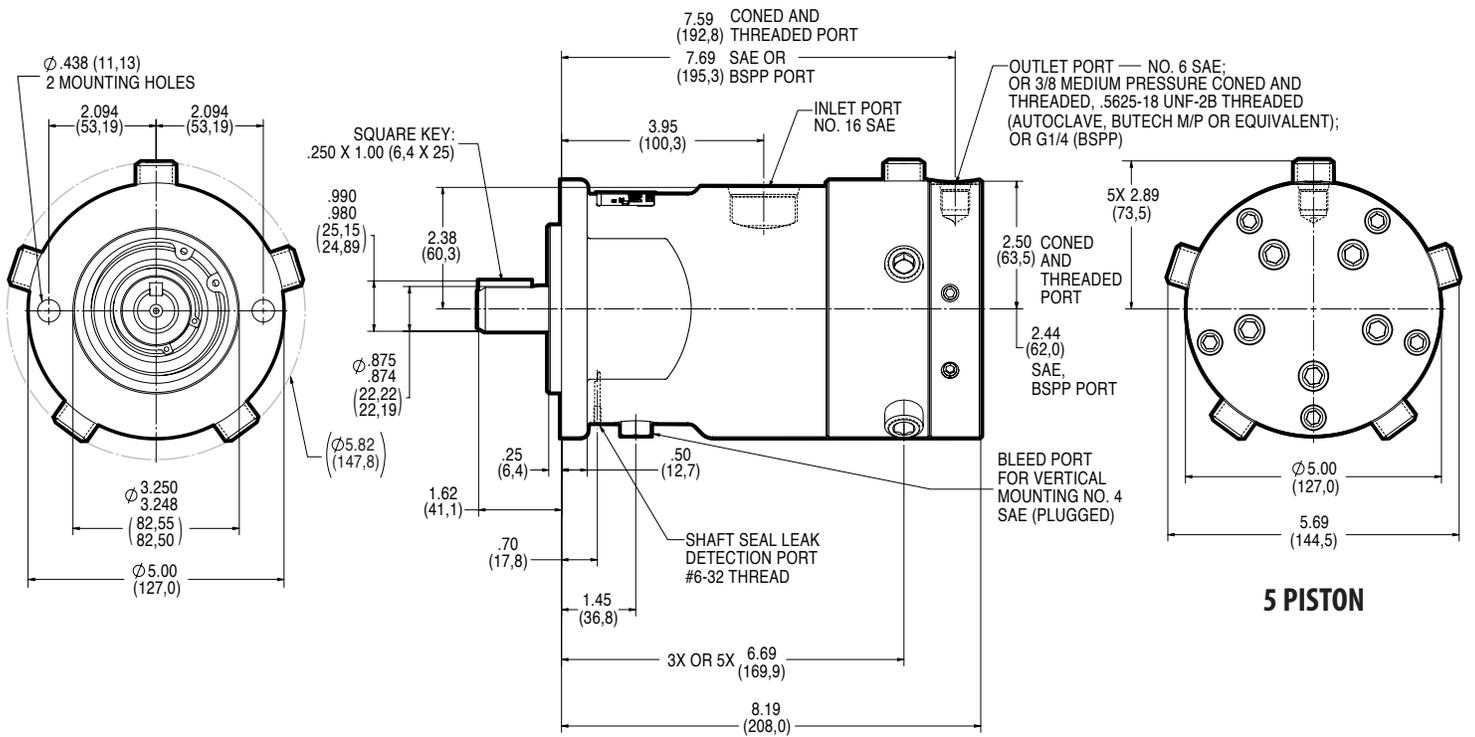
Mineral and phosphate ester fluids are also compatible with PF1300 series pumps and may allow for increased maximum pressures on some models.

Contact the Dynex Sales department to review an application operating with fluids not listed or those that fall outside of the *Hydraulic Fluid Viscosity Guidelines* table.

### Fluid Viscosity Specifications

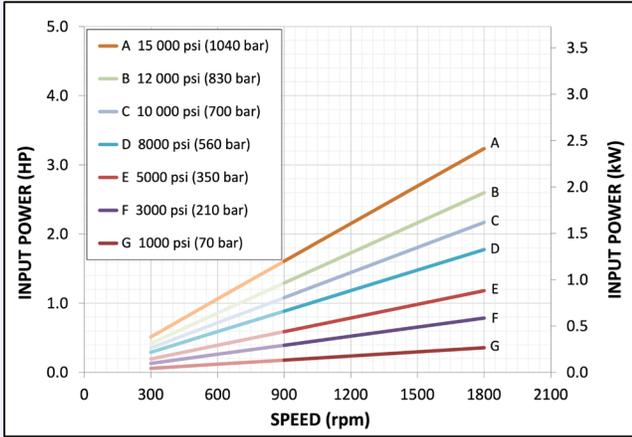
Using fluid with the correct viscosity range is critical to achieving long component life.

Fluid conditions outside the ranges shown in the *Hydraulic Fluid Viscosity Guidelines* table may result in reduced pump output, requiring pressurized inlet conditions. For more information, contact the Dynex Sales department.

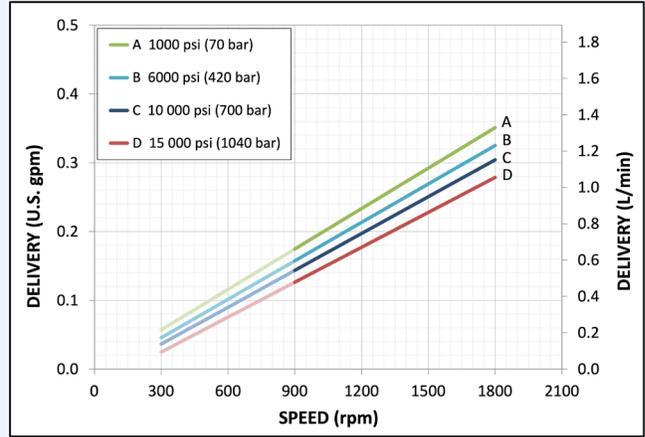


# Typical Performance Curves<sup>①</sup>

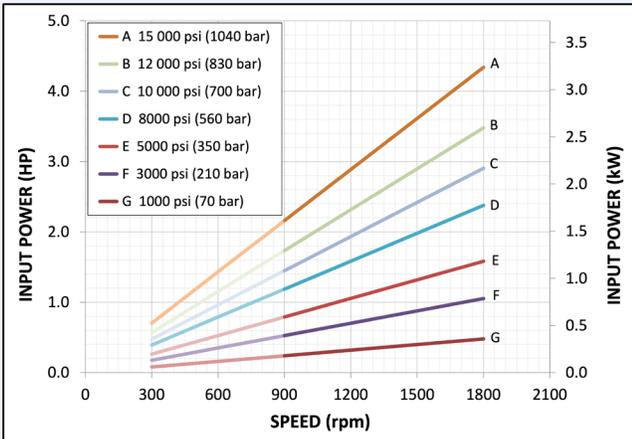
## PF1301 Input Power



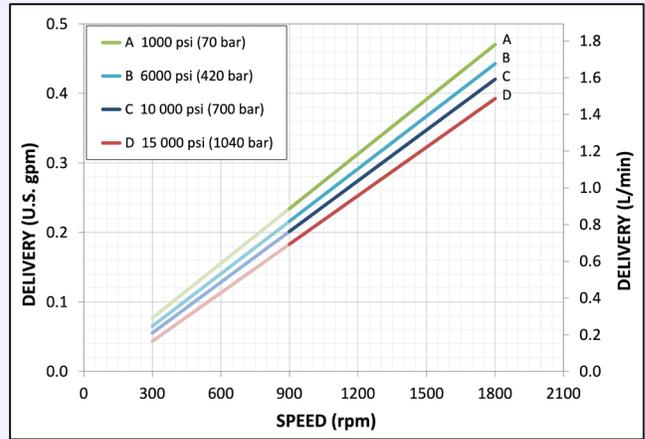
## PF1301 Delivery



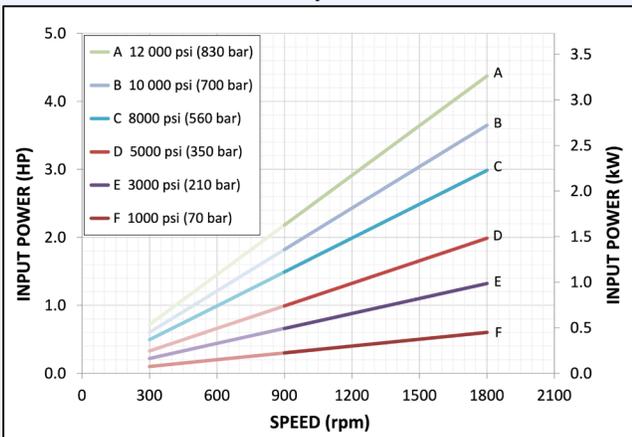
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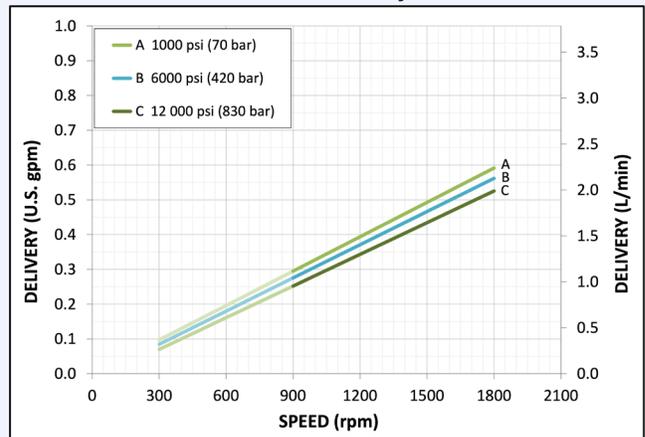
## PF1303 Delivery



## PF1305 Input Power



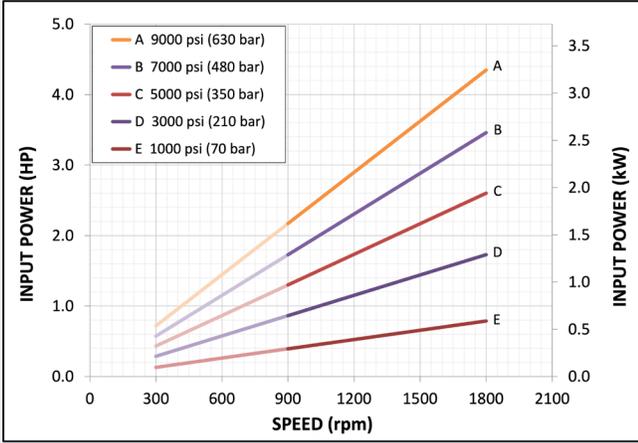
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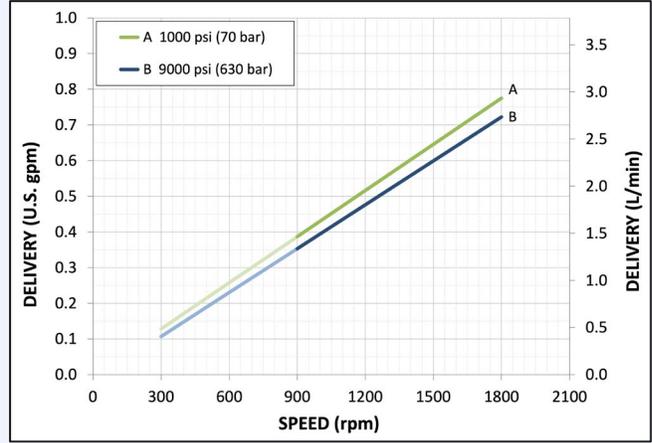
<sup>①</sup> Contact the Dynex Sales department for operation below 900 rpm.

Typical Performance Curves<sup>①</sup>

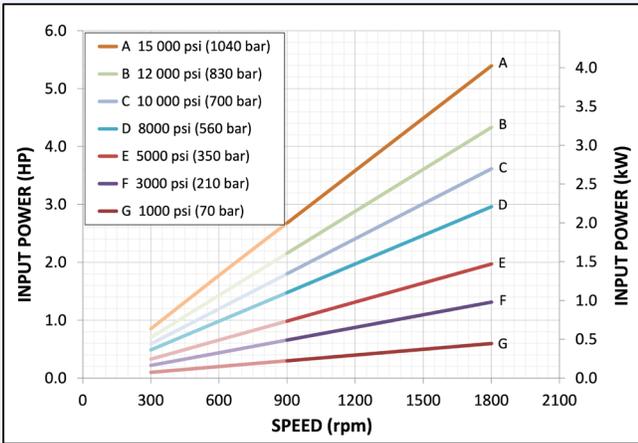
PF1308 Input Power



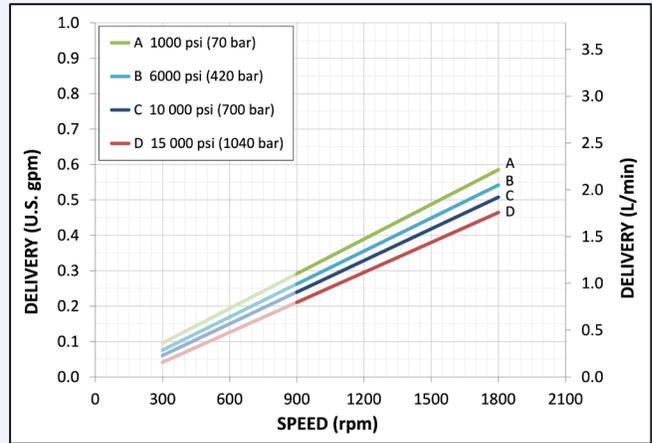
PF1308 Delivery



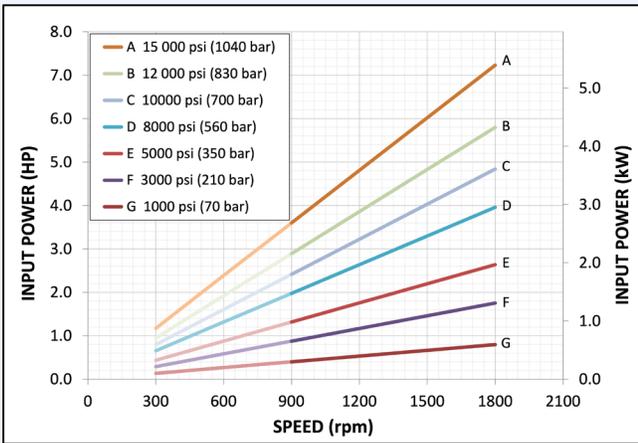
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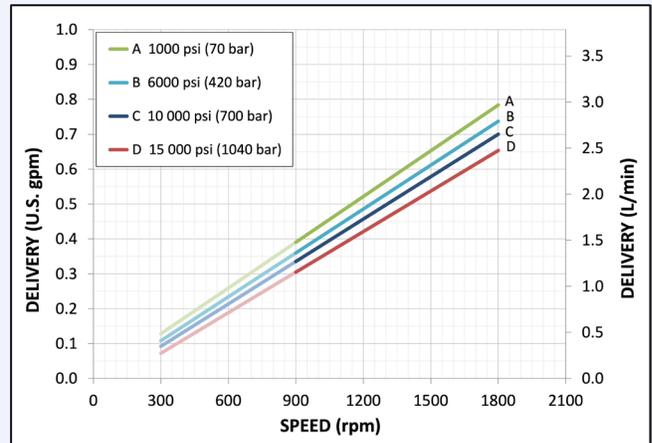
PF1311 Delivery



PF1313 Input Power



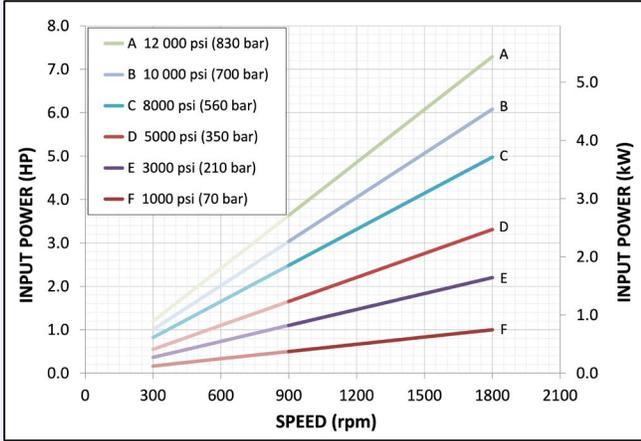
PF1313 Delivery



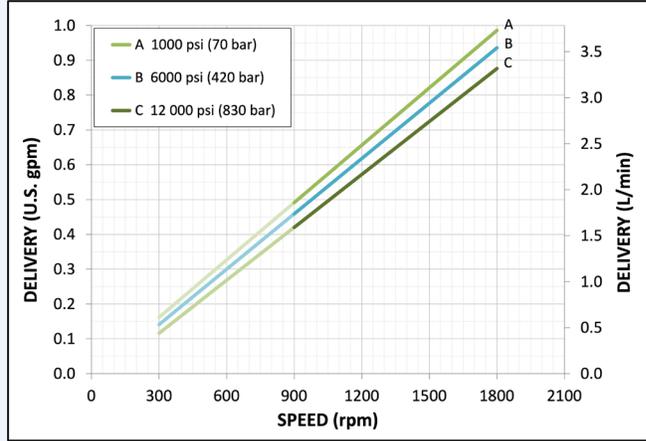
① Contact the Dynex Sales department for operation below 900 rpm.

# Typical Performance Curves<sup>①</sup>

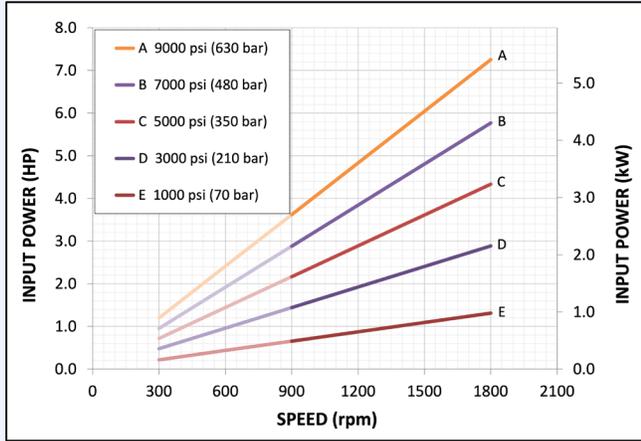
## PF1315 Input Power



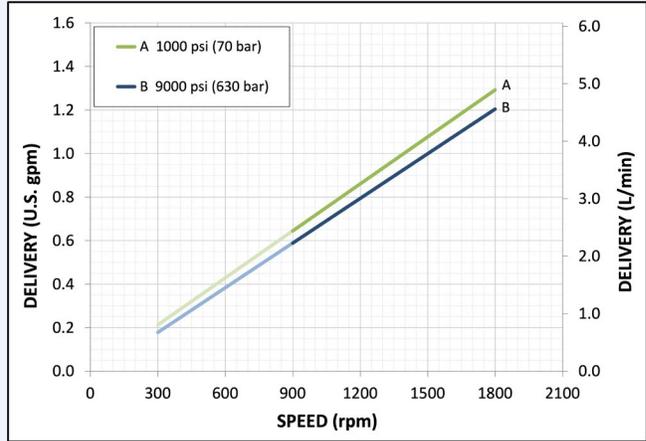
## PF1315 Delivery



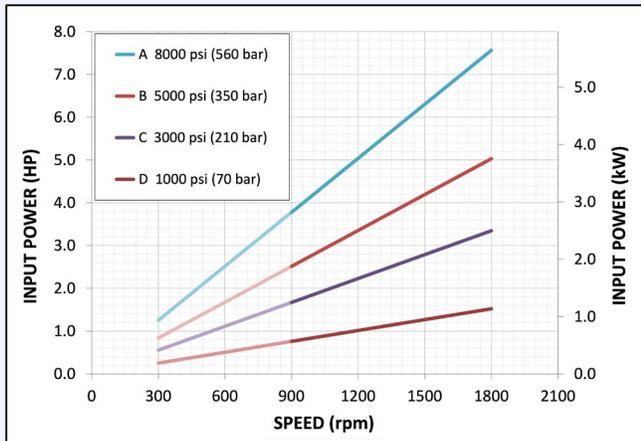
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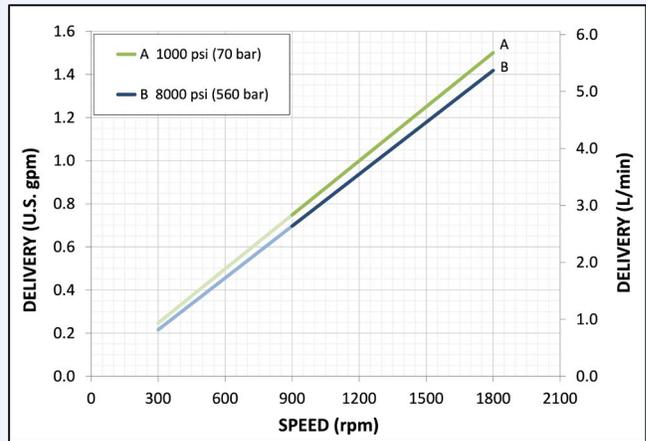
## PF1318 Delivery



## PF1320 Input Power



## PF1320 Delivery



<sup>①</sup> Contact the Dynex Sales department for operation below 900 rpm.

# TYPICAL MODEL CODE

PF13

01

H - D

A

-

2

0

Pump Type	
PF13	Fixed Displacement Checkball Pump

Output Flow (At 1800 rpm, at Maximum Pressure) <sup>①②</sup>	
01	Standard: 0.32 (1,19 L/min) "H" option: 0.28 gpm (1,06 L/min)
03	Standard: 0.43 (1,63 L/min) "H" option: 0.39 gpm (1,48 L/min)
05	Standard: 0.55 (2,08 L/min) "H" option: 0.53 gpm (1,99 L/min)
08	Standard: 0.73 (2,76 L/min) "H" option: 0.72 gpm (2,73 L/min)
11	Standard: 0.53 (1,99 L/min) "H" option: 0.46 gpm (1,76 L/min)
13	Standard: 0.72 (2,72 L/min) "H" option: 0.65 gpm (2,48 L/min)
15	Standard: 0.92 (3,47 L/min) "H" option: 0.88 gpm (3,32 L/min)
18	Standard: 1.22 (4,60 L/min) "H" option: 1.21 gpm (4,56 L/min)
20	Standard: 1.42 (5,37 L/min) <sup>③</sup>

① Output flows based on typical performance at maximum pressure. Refer to performance curves for flows at lower pressure.  
② Models PF1301, PF1303, PF1305 and PF1308 have three pistons. Other models have five pistons.  
③ Not available with high pressure "H" option.

Design Number
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Modification Number
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Ports	
No Code	Inlet No. 16 SAE; Outlet No. 6 SAE <sup>①</sup>
A	Inlet No. 16 SAE; Outlet 3/8 Medium Pressure Coned and Threaded, 0.5625-18 UNF-2B Threaded <sup>②</sup>
B	Inlet No. 16 SAE; Outlet G 1/4 (BSPP) <sup>③</sup>

① Not recommended for operation above 8000 psi (560 bar). Contact the fitting manufacturer for the pressure rating of the fitting.  
② High pressure port uses Autoclave Medium Pressure, Butech M/P or equivalent fitting.  
③ High pressure port uses British Standard Pipe Parallel fitting. Not recommended for operation above 10 000 psi (700 bar).

Seals	
D	Standard: Buna-N (Nitrile) with Disogrin <sup>®</sup> (Polyurethane) o-rings in the cover
E	All EPR (Ethylene-Propylene Rubber) with Medium Pressure Shaft Seal <sup>①</sup>
XD	Fluorocarbon (Viton <sup>®</sup> or Fluorel <sup>®</sup> ) with Polyurethane (Disogrin <sup>®</sup> ) o-rings in the cover and High Pressure Shaft Seal
XV	All Fluorocarbon (Viton <sup>®</sup> or Fluorel <sup>®</sup> ) with High Pressure Shaft Seal
XE	All EPR (Ethylene-Propylene Rubber) with High Pressure Shaft Seal <sup>①</sup>

① Contact the Dynex Sales department for recommended operating conditions with EPR seals.

Operating Pressure	
No Code	Standard Pressure
H	High Pressure <sup>①</sup>

① Requires "A" or "B" port option.



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