DYNEX
High Pressure Hydraulics

ENGINEERING SPECIFICATIONS

High Pressure Checkball Piston Pumps

PF4000 SERIES
7.3 to 14.0 gpm (27,6 to 53,0 L/min) at 1800 rpm
6 000 to 10 000 psi (420 to 700 bar)

Fixed displacement checkball pumps, with bi-directional shaft rotation, provide constant direction of output flow regardless of the direction of drive shaft rotation.

Mounting

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

Shaft Options

Standard keyed shaft, 1.250 inch (31,75 mm) diameter.

Optional spline shaft, 1.248/1.247 inch diameter standard SAE 14 tooth, 12/24 DP 30° involute spline.

Outlet Port Options

Standard pressure models have 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).

Refer to *Fluid Recommendations and Port Specifications* download on the Dynex website and *Typical Model Code* on page 4 to specify outlet port.

Inlet Conditions

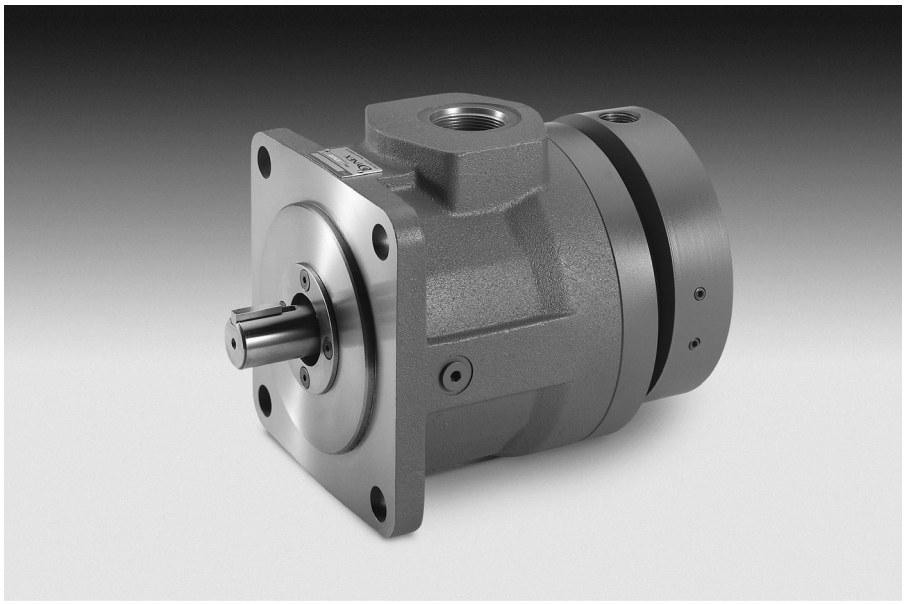
Pumps may require pressurized inlet conditions at higher speeds. Failure to meet minimum inlet requirements will result in slight flow reduction. Refer to the table on page 2.

Seal Options

Standard seals are Buna-N (Nitrile) with Disogrin. Options include Fluorocarbon (Viton® or Fluorel®), or EPR outlet seals. Refer to *Typical Model Code* on page 4.

Weight (Mass):

111 lb (50 kg).



Specifications

Pump Models	Output Flow at 1500 rpm① U.S. gpm	Output Flow at 1500 rpm① L/min	Output Flow at 1800 rpm① U.S. gpm	Output Flow at 1800 rpm① L/min	Rated Pressure psi	Rated Pressure bar	Max. Pressure psi	Max. Pressure bar	Speed rpm② Rated	Speed rpm② Max.
PF4011-30	6.4	24,2	7.7	29,1	6000	420	8000	560	1800	2400
PF4016-30	9.3	35,2	11.1	42,0	6000	420	8000	560	1800	2400
PF4018-30	10.3	39,0	12.4	46,9	6000	420	8000	560	1800	2400
PF4020-30	11.7	44,3	14.0	53,0	6000	420	8000	560	1800	2400
PF4011H-30	6.1	23,1	7.3	27,6	10 000	700	10 000	700	1800	2400
PF4016H-30	8.8	33,3	10.5	39,7	10 000	700	10 000	700	1800	2400
PF4018H-30	10.1	38,2	12.1	45,8	8000	560	10 000	700	1800	2400
PF4020H-30	11.4	43,2	13.7	51,9	8000	560	10 000	700	1800	2400

① *Output flow based on typical performance at rated pressure with pressurized inlet where required, as shown in the table.*

② *Contact the Dynex Sales department for applications requiring operation above rated speed. High speed operation may require a pressurized inlet. Refer to "Inlet Conditions" on page 2.*

PUMP SELECTION

The table shows specifications for standard pressure and high pressure "H" option models.

Ordering a PF4000 Series, 30 Design, pump requires a complete model code specifying shaft, seal and outlet port options. Refer to *Typical Model Code* on page 4.

Maximum Pressure

Checkball pumps are especially suited for applications susceptible to excessive pressure spikes.

The pressures listed are the maximum pressures a pump can sustain for occasional, short periods of operation without appreciably reducing life expectancy.

Fluid Guidelines

Refer to *Fluid Recommendations and Port Specifications* download on Dynex website.

Some pump models may require reduced operating pressures when using low-lubricity fluids.

Because of the wide range of fluid characteristics, contact the Dynex Sales department for a review of any application using non-petroleum based fluids.

Minimum Inlet Pressure①

Pump Models	Operating Speed							
	1200 rpm		1500 rpm		1800 rpm		2400 rpm	
	psi	bar	psi	bar	psi	bar	psi	bar
PF4011	0	0	0	0	0	0	5	0,4
PF4016	0	0	0	0	0	0	5	0,4
PF4018	0	0	0	0	5	0,4	10②	0,7②
PF4020	0	0	5	0,4	10②	0,7②	15②	1,0②

① *Values shown are based on fluid viscosity of 100 SUS (20 cSt).*
② *Inlet pressures higher than 10 psig (0,7 bar) require a high-pressure shaft seal. Refer to "Typical Model Code" on page 4 for seal options.*

Variable Dimensions

Variable Dimension	Outlet Port Option			
	SAE or BSPP Port		Coned and Threaded	
	Models PF4011, PF4016	Models PF4018, PF4020	Models PF4011, PF4016	Models PF4018, PF4020
A	8.59 (218,2)	8.66 (220,0)	8.46 (214,9)	8.53 (216,7)
B	3.94 (100,2)	3.94 (100,2)	4.09 (103,8)	4.09 (103,8)
C	9.49 (241,1)	9.56 (242,9)	9.49 (241,1)	9.56 (242,9)

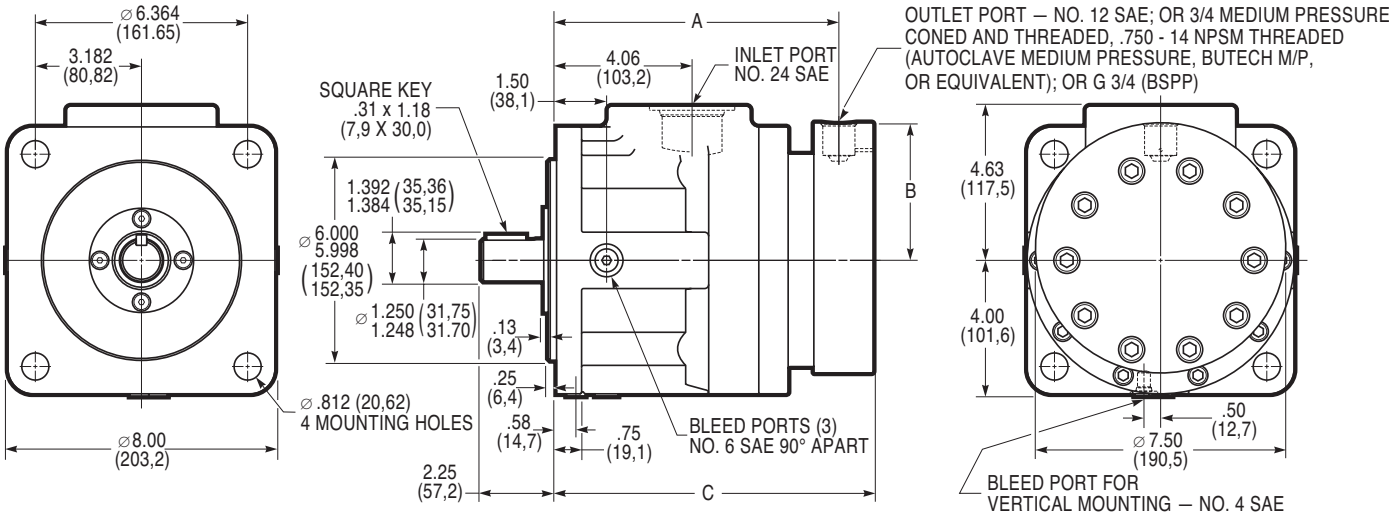
Split-Flow® Provides Multiple Outlets

PF4000 models with split-flow covers efficiently supply flows for multiple function circuits. Piston outputs are grouped together in the cover, with various piston flow splits available in this ten-piston pump. Refer to *Typical Model Code* on page 4 and contact the Dynex Sales department for availability.

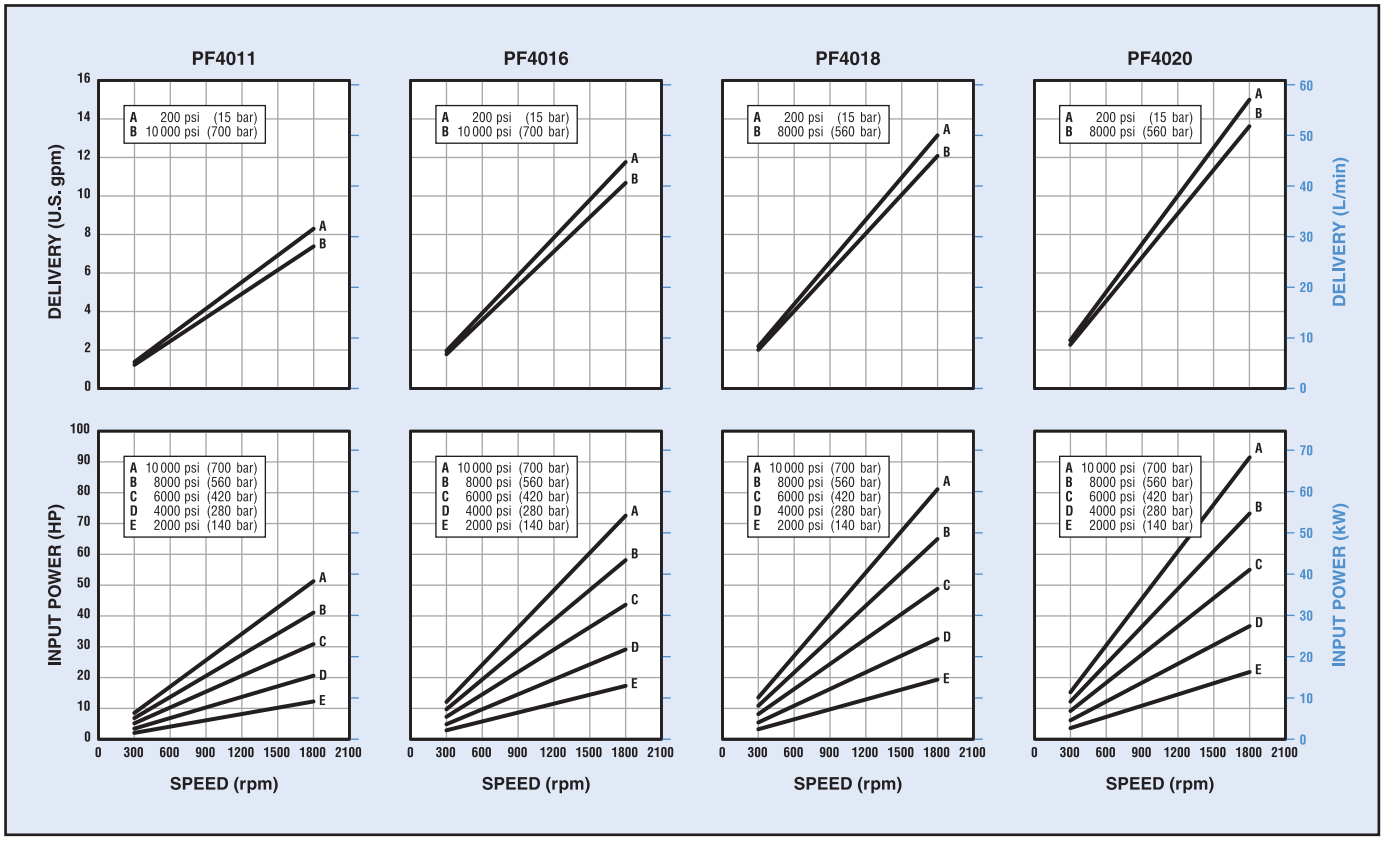
INSTALLATION

All dimensions are shown in inches (millimeters in parentheses) and are nominal. See page 1 for spline shaft data. Refer to *Checkball Pumps Service, Installation, and Operating Instructions* for general installation and operating recommendations.

The thickness of the cover and the location of the outlet port varies as shown, dependent on the port option.



Typical Performance Curves



Typical performance curves are based on 100 SUS (20 cSt) mineral oil with pressurized inlet where required. Refer to the "Minimum Inlet Pressure" table on page 2.

TYPICAL MODEL CODE

PF40 11 H – S XV A L – 55 – 3 0

Pump Type	
PF40	Fixed Displacement Checkball Pump

Output Flow (At 1800 rpm, at Rated Pressure)①	
11	Standard: 7.7 gpm (29,1 L/min) "H" option: 7.3 gpm (27,6 L/min)
16	Standard: 11.1 gpm (42,0 L/min) "H" option: 10.5 gpm (39,7 L/min)
18	Standard: 12.4 gpm (46,9 L/min) "H" option: 12.1 gpm (45,8 L/min)
20	Standard: 14.0 gpm (53,0 L/min) "H" option: 13.7 gpm (51,9 L/min)

① *Output flows based on typical performance at rated pressure. Refer to performance curves for flows at lower pressures.*

Operating Pressure	
No Code	Standard Pressure
H	High Pressure①

① *Requires "A" or "B" port option.*

Drive Shaft	
No Code	Keyed, 1.250 inch (31,75 mm) diameter
S	SAE Spline, 1.250 inch (31,75 mm)

Seals	
No Code	All Buna-N (Nitrile)①
D	Standard: Buna-N (Nitrile) with Disogrin® (Polyurethane) o-rings in the cover②
XE	All EPR (Ethylene-Propylene Rubber) with High Pressure Shaft Seal①
XV	All Fluorocarbon (Viton® or Fluorel®) with High Pressure Shaft Seal

① *Not available with high pressure "H" option. Contact the Dynex Sales department for recommended operating conditions.*
② *Recommended in high pressure applications.*

Options	
No Code	Standard
L	Low Lubricity Kit①

① *Provides an additional internal passage for improved bearing lubrication when using low-lubricity fluids*

Ports	
No Code	Inlet No. 24 SAE; Outlet No. 12 SAE①
A	Inlet No. 24 SAE; Outlet 3/4 Medium Pressure Coned and Threaded, 3/4-14 NPSM Threaded②
B	Inlet No. 24 SAE; Outlet G 3/4 (BSPP)③

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 *Outlet port uses British Standard Pipe Parallel fitting. Not recommended for operation above 10 000 psi (700 bar).*

Split-Flow® Options (10 Piston Pump)①	
No Code	Full flow from single outlet
Split-Flow® Cover Models:	
55	Five-piston output + five-piston output
64	Six-piston output + four-piston output
73	Seven-piston output + three-piston output
82	Eight-piston output + two-piston output
91	Nine-piston output + one-piston output
10X	Ten ports, each with one-piston output
5	Five-piston output + five inactive pistons
5X	Five ports, each with two-piston output

① *For outlet port sizes, locations and pump cover dimensions, contact the Dynex Sales department.*

Design Number

Modification Number

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