

HYDROMA

HYDRAULIC SYSTEMS

Your test stand **MUST** be more reliable than the products you're testing!

Test stand failures are the last thing you want!

That's why Dynex checkball pumps and control valves have been specified for aerospace HPUs for over 50 years.

Compatible with
SKYDROL
MIL-SPEC
HYJET



A Dynex checkball pump on a modified mule (GSE) operating at 8000 PSI (550 bar) provided exceptional performance that later led to a higher-flow Dynex checkball pump being specified within Intermediate Level (shipboard) component test stands for the U.S. Navy.



Dynex aerospace HPU for testing helicopter rotor blades

Today customers rely on Dynex to build complete power units for performance and endurance testing of aircraft components.

This unit includes:

PF4200 Series Checkball Pumps specified for pressure capability to 15 000 psi (1040 bar) and ability to operate with MIL-H-83282 fluid.

VHR High-Pressure Safety Relief Valve for circuit protection up to 15 000 psi (1040 bar).

H8819 Proportional Relief Valve for remotely-controlled, infinitely-variable, pressure control up to 15 000 psi (1040 bar) and 50 GPM (190 L/min.).

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These products are all compatible with conventional fluids, low viscosity fluids, military fluids, and phosphate ester fluids such as Skydrol.



PF/PV SERIES CHECKBALL PUMPS

3.4 to 61.4 gpm (12,9 to 232,4 L/min) at 1800 rpm
Up to Maximum: 15 000 psi (1040 bar)

- Bi-directional rotation providing constant flow direction regardless of drive shaft rotation.
- Split-Flow® models can supply independent flows from up to ten separate outlets.
- Available in Fixed and Variable delivery models.

DYNEX HIGH-PRESSURE CONTROL & RELIEF VALVES with PROPORTIONAL CONTROL

Flows to 50 gpm at 15 000 psi (190 L/min at 1040 bar), or Flows to 75 gpm at 9000 psi (284 L/min at 620 bar)

- Available in Manual, Electric Vent, or Electro-Hydraulic Proportional Control.
- Available as a Relief, Unloading, or Decompression Valve.



DYNEX HP03 DIRECTIONAL CONTROL VALVES

Nominal Flow: 5 gpm (19 L/min), Max Flow: 15 gpm (57 L/min)
Rated Pressure: 10 000 psi (700 bar)

- Actuator Options include: Manual Lever, Direct Solenoid, Hydraulic Piloted, Air Piloted.
- Full range of Spool types, Actuators, Electrical connections and Solenoid options.

DYNEX VST SEATED VALVES - DIRECTIONAL CONTROL VALVES

Two position, two-way or three-way valves – rated for: 5 gpm at 10 000 psi (19 L/min at 700 bar), for low-flow venting, or load holding functions
Vent valves – rated for: 1 gpm at 15 000 psi (3,8 L/min at 1040 bar)

- Non-silting ball-on-seat design.



www.dynexhydraulics.com/aerospace.htm

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Proven Performance. Trusted Service.



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DYNEX PF500-LT Series Checkball Pumps

For Cold Weather
Operation
Down to
-58°F (-50°C)



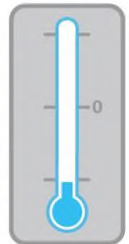
Power requirements
as low as **1.0 HP** at
10 000 psi (0,75 kW at 700 bar)

Ideal for mineral oil based panel
systems and aerospace fluids.

0.21 to 0.69 gpm (0,79 to 2,59 L/min) at 1800 rpm
Rated: 10 000 psi (700 bar), Maximum: 15 000 psi (1040 bar)

- Bi-directional rotation providing constant flow direction regardless of drive shaft rotation.
- Split-Flow® models can supply independent flows from up to four separate outlets.
- Used on wellhead control panel systems – Solar-powered systems – Power packs on high-torque service tools.

Specially
designed for
operating in
low-temperatures
& harsh
environments



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Water-Glycol Pumps for Improved Corrosion Resistance



© BP p.l.c.

PF4300-20 Series Pumps

- New stainless steel design
- Single-fluid design eliminates a secondary lubrication oil circuit
- Long life with no cross-fluid contamination
- Vertical or horizontal mounting
- ATEX compliant



**NEW STAINLESS
STEEL DESIGN!**

Dynex PF4300-20 Series pumps with NEW stainless steel option are functionally and physically interchangeable with standard models. These pumps operate reliably at pressures to 15 000 psi (1040 bar) with a wide range of water-based control fluids.

Only the system fluid is required for internal lubrication in this single-fluid design. The result is long life with low-cost operation on wellhead control systems around the world.

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PF4300 Series Pumps Operate Reliably at Pressures to 15000 psi (1040 bar)

Single-Fluid Design for Reduced Maintenance

PF4300 Series pumps provide reliable, lower-cost operation on wellhead control systems around the world.

Only the system fluid is required for internal lubrication in this single-fluid pump design. This design eliminates the cost of a secondary lubrication circuit and regular maintenance.

Installation is simplified, requiring less space with reduced labor, fewer components and lower piping cost.

These fixed displacement checkball pumps are compatible with a variety of water-based fluids. High pressure capability makes them ideal for offshore wellhead control systems and other hydraulic applications.

Pump Selection

The table shows specifications for standard pressure models, and for high-pressure "H" option models for use at pressures higher than 8000 psi (560 bar). The "H" option models are available with coned and threaded (Autoclave or Butech) or B.S.P.P. (British Standard Pipe) outlet ports.

Specifications

Pump Model	Output Flow at 1200 rpm ^①		Output Flow at 1500 rpm ^{①②}		Output Flow at 1800 rpm ^{①②}		Maximum Pressure		Rated Speed rpm ^②	Maximum Speed rpm ^②
	U.S. gpm	L/min	U.S. gpm	L/min	U.S. gpm	L/min	psi	bar		
PF4303	1.5	5.6	1.8	6.9	2.2	8.3	8000	560	1200	1800
PF4304	2.1	8.1	2.7	10.1	3.2	12.1	8000	560	1200	1800
PF4305	2.5	9.3	3.1	11.7	3.7	14.0	8000	560	1200	1800
PF4306	3.1	11.6	3.8	14.5	4.6	17.4	8000	560	1200	1800
PF4308	3.6	13.6	4.5	17.0	5.4	20.4	8000	560	1200	1800
PF4309	4.0	15.1	5.0	18.9	6.0	22.7	8000	560	1200	1800
PF4310	4.5	17.1	5.7	21.4	6.8	25.7	8000	560	1200	1800
PF4312	5.5	20.7	6.8	25.9	8.2	31.0	8000	560	1200	1800
PF4303H	1.3	4.8	1.6	6.2	2.0	7.5	15 000	1040	1200	1800
PF4304H	2.0	7.6	2.5	9.5	3.1	11.7	12 000	830	1200	1800
PF4305H	2.3	8.9	2.9	11.0	3.6	13.6	10 000	700	1200	1800
PF4306H	2.9	11.1	3.7	13.9	4.4	16.6	10 000	700	1200	1800
PF4308H	3.5	13.2	4.3	16.5	5.3	19.9	10 000	700	1200	1800
PF4309H	3.9	14.7	4.8	18.2	5.9	22.3	10 000	700	1200	1800
PF4310H	4.4	16.7	5.5	21.0	6.7	25.3	10 000	700	1200	1800
PF4312H	5.4	20.4	6.7	25.6	8.1	30.7	10 000	700	1200	1800

^① Output flow based on typical performance using 33 SUS (1.9 cSt) water glycol fluid at maximum pressure with pressurized inlet where required. Contact the sales department for minimum inlet pressure requirements.

^② Contact the sales department for operation above the rated speed of 1200 rpm.

Ordering requires a complete model code specifying shaft and outlet port options.

Some models are available with the Split-Flow® option, to supply multiple flows from one pump. Contact the Sales Department for details.

Installation

Mounting is S.A.E. D 4-bolt pattern with 0.25 inch (6.4 mm) pilot engagement. Vertical shaft mounting is possible with a line connected to the bleed port in the pump housing. Contact the sales department for instructions.

Weight (Mass): 116 lb (53 kg).

Special Fluid Operation

Because of the wide range of water-based fluid characteristics, contact the sales department for a review of the application requiring non-mineral oil fluid.

For complete specifications, refer to: dynexpf4300specs.pdf

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**Spend less time down here!
Using Dynex hydraulic pumps
makes that possible!**



This pump/motor unit was designed for the harsh steel mill environment that you work in every day and reliably operates at pressures to 20 000 psi (1380 bar).

Dynex pump/motor units provide long service life on roll balance and bearing lube systems in harsh steel mill environments. Dynex pumps are ideal because of their exceptional tolerance to contamination and high temperatures. They can provide the performance and reliability of a triplex pump at about half the cost.

 **DYNEX**
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<https://www.dynexhydraulics.com/markets/primary-metals>

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DYNEX HYDRAULIC COMPONENTS FOR THE STEEL MILL INDUSTRY

CHECKBALL PUMP ADVANTAGES:

- Contamination tolerant for operation in dirty environments.
- Bi-directional design provides constant flow direction regardless of drive shaft rotation.
- Single-fluid design which eliminates the need for a separate lubrication circuit for the pump.
- Wide range of fluid compatibility including: **fire resistant, water glycol, low lubricity, low or high viscosity fluids.**
- Used on hydrostatic roll balance and high-pressure bearing lubrication systems and hydraulic press applications.
- With Split-Flow® models, one pump can supply up to ten independent flows.



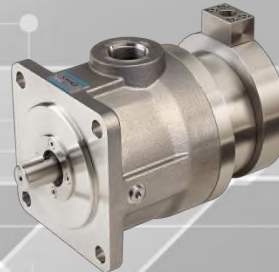
PF4200 SERIES FIXED DISPLACEMENT CHECKBALL PUMPS

2.2 to 6.7 gpm (8,3 to 25,4 L/min) at 1800 rpm
Rated: 8000 psi (560 bar),
Maximum: 20000 psi (1380 bar)



PF6000 SERIES FIXED DISPLACEMENT CHECKBALL PUMPS

12.7 to 54 gpm (48 to 204,4 L/min) at 1800 rpm
Rated: 5500 psi (380 bar) – 15000 psi (1040 bar)
Max: 5500 psi (380 bar) – 15000 psi (1040 bar)



PF4300 SERIES FIXED DISPLACEMENT PUMPS FOR WATER-BASED FLUIDS

2.2 to 8.2 gpm (8,3 to 31,0 L/min) at 1800 rpm
Maximum: 15000 psi (1040 bar)



VST SEATED VALVES AND HP03 SPOOL DIRECTIONAL CONTROL VALVES

Pressures to: 15000 psi (1040 bar)

<https://www.dynexhydraulics.com/markets/primary-metals>

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Hydraulic Pumps for Critical Wellhead Control Systems



Dynex Sales and Service for the Middle East

Checkball piston pumps provide solutions for your most challenging wellhead control applications.

The helpful staff at our UK location is your source for these pumps, which provide long-life operation at pressures to 15 000 psi (1040 bar).

Our UK facility is a stocking location to support customers in the region. We can provide quick quotes and can meet your critical requirements, including motor-pump units with AC or DC motors for safe or hazardous zoned areas.

Checkball Pump Advantages:

- Low input-power mineral-oil pumps for solar-panel systems for land-based oil wells.
- Water-glycol pumps for reliable operation without cross-fluid contamination on manned and unmanned offshore platforms.
- Single-fluid design eliminates the cost and extra maintenance of a lubrication circuit.
- Easy vertical mounting inside water glycol reservoirs.
- Contamination tolerant for harsh environments.

When pump failures are not an option, contact Dynex to solve your problems!

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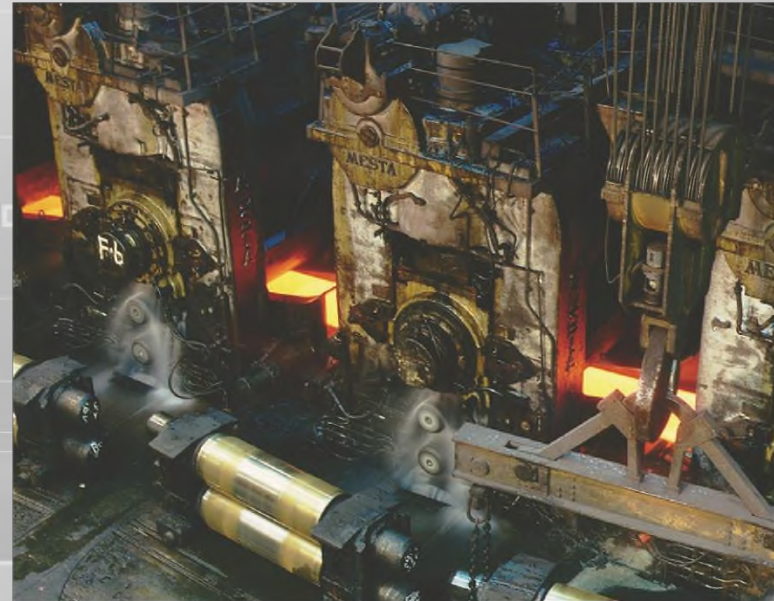
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Pump/Motor Sets Reduce Costs for Steel Mill Lube Systems

Power Units & Systems



In steel mill applications, pump/motor sets provide long service life on roll balance and bearing lube systems. Dynex checkball pumps offer the performance and reliability of a triplex pump at about half the cost. They are ideal for the harsh mill environment because of their exceptional tolerance to contamination and high temperatures.

In this hot strip mill in Indiana, the units supply the lube system in the finishing stands. The pumps are PF4 Series with adjustable high pressure relief valves integrally mounted to the rear of the pump barrel. The system operates at pressures to 12 500 psi (875 bar).

Reliability and serviceability were important factors in the design and manufacture of this high pressure system.



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Pumps for Pipe Jacking Operate at 9000 PSI (620 bar)

Checkball Pumps



Akkerman builds systems for tunnel boring and pipe jacking. One of their larger power units uses the Dynex PF4 pump and is capable of pipe jacking up to 9000 PSI.

In addition to *Akkerman*, many other pipe jacking machine manufacturers and users rely on Dynex pumps for long life at high pressure and under difficult conditions. Split-flow pumps are also used to operate the jacks with synchronized movement.



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Pumps Withstand Extremes on Blast-Hole Drill Rig

Checkball Pumps



Blast hole drilling is used in the mining of coal, gold, copper and other hard-rock minerals. Split-Flow® pumps, with hydraulic variable delivery, enhance the versatility and efficiency of the open-loop circuit used on this blast hole drill rig. The Dynex pumps in these systems are subjected to extreme conditions of contamination and temperature, shock and vibration.

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Reliable Operation in Difficult Mill Environment

Power Units and Systems



In this steel mill application, pump/motor sets supply the lube system on the finishing stands of the strip mill. Rugged checkball pumps perform reliably even when subjected to extreme heat and contamination.

Safety and serviceability were important factors in manufacturing this high pressure system.

Years of experience, together with flexible assembly and scheduling, enables the Dynex Power Unit Facility to satisfy difficult requirements with assured on-time delivery.



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Rockwell Reports 'Excellent' Pump Test Results

Checkball Pumps



A PV4 pump with mechanical variable delivery and high pressure compensation was supplied to *Rockwell International* when Dynex learned that the military was interested in exploring the possibility of upgrading military aircraft hydraulic systems to 8000 PSI (550 bar).

Rockwell International was conducting a study which was funded by the Navy. They had tried to operate a valveplate pump at 8000 PSI (550 bar) but encountered heat dissipation problems. They then tried the Dynex PV4 pump. In their findings they reported the performance of the PV4 at 8000 PSI (550 bar) as "excellent".