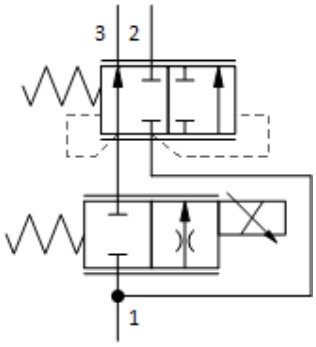
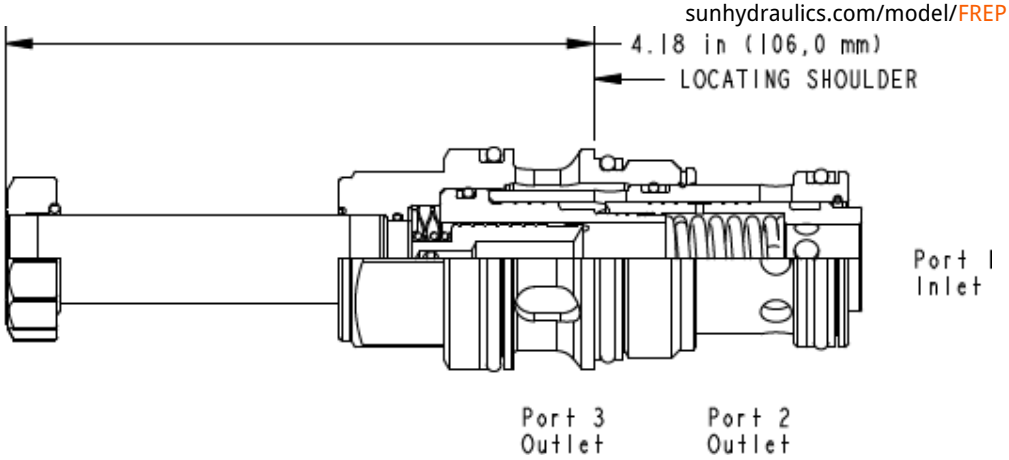
MODEL
FREP

FLeX Series 3-way, direct-acting, electro-proportional, bypass/restrictive, priority flow control valve
SERIES 3 / CAPACITY: 30 gpm / CAVITY: T-17A

sunhydraulics.com/model/FREP





CONFIGURATION

X	Control	No Manual Override
A	Flow Rate	Nominal 8 gpm (30 L/min.)
N	Seal Material	Buna-N
(none)	Coil	No coil

This valve is a normally closed, electro-proportional, bypass/restrictive, priority flow control valve. The valve takes an input flow at port 1 and uses it to satisfy the priority flow at port 3. If the input flow exceeds the priority requirement, the excess is bypassed out port 2. The valve pressure compensates the priority flow for precise flow regulation for applications where there may be wide pressure fluctuations. Port 2 may also be completely blocked so that the valve can be used as a 2-way, electro-proportional pressure compensated flow control from 1 to 3.

TECHNICAL DATA

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-17A
Series	3
Capacity	30 gpm
Maximum Operating Pressure	5000 psi
Viscosity Range	35 - 2000 SUS
Typical Valve Leakage at 110 SUS (24 cSt) from port 1 to port 3 at 1450 psi (100 bar)	30 mL/min.
Typical Valve Leakage at 110 SUS (24 cSt) from port 1 to port 3 at 5000 psi (350 bar)	110 mL/min.
Response Time - Typical	50 ms
Switching Frequency	3,600 max. cycles/hr
Valve Hex Size	1 1/4 in.
Valve Installation Torque	150 - 160 lbf ft
U.S. Patent #	10,969,033
Seal kit - Cartridge	Buna: 990017007
Seal kit - Cartridge	Viton: 990017006
Model Weight	1.02 lb.

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PROPORTIONAL PERFORMANCE DATA

Hysteresis (with dither)	A-spool: 9%, B-spool: 7%, C-spool: 5%
Linearity (with dither)	A-spool: 2%, B-spool: 3%, C-spool 5%
Repeatability (with dither)	1.5%
Recommended dither frequency	100 Hz
Deadband, nominal (as a percentage of input)	25%

NOTES

- Please verify cartridge clearance requirements when choosing a Sun manifold. Different valve controls and coils require different clearances.
- An additional 2.00 inches (50,8 mm) beyond the valve extension is needed for coil installation and removal.

CONFIGURATION OPTIONS

Model Code Example: FREPArray

CONTROL (X)	FLOW RATE (A)	SEAL MATERIAL (N)	COIL *
X No Manual Override	**A** Nominal 8 gpm (30 L/min.)	**N** Buna-N	No coil
P Manual Pull Override	**B** Nominal 16 gpm (60 L/min.)	**V** Viton	* Additional coil options are available
	C Nominal 22 gpm (88 L/min.)		

TECHNICAL FEATURES

- The valve's patent-pending design uses a pull-type solenoid that allows the main throttle spool to be less sensitive to flow forces, resulting in greater efficiencies, with more flow control using less power.
- FLeX Series proportional valves are fully compatible with the XMD Expandable Mobile Drivers from Sun.
- Designed and tested to 10 million on-off operational cycles.
- Exceeds new NFPA test standard T2.6.1 R2014 for fatigue and burst pressure ratings.
- Designed using CFD fluid simulation for optimized geometries.
- All configurations of this valve include zinc-nickel plating as standard for 1000-hour salt fog protection.
- This valve can be used with both the 740 Series high-power coils and 747 Series hazardous location coils.
- A wide variety of coil termination and voltage options are available, with and without surge protection. See the CONFIGURATION section.
- Coil connector options offer ratings up to IP69K. See individual coil product pages for details.
- Both, priority and bypass flow, are usable up to the system operating pressure.
- For optimum performance, an amplifier with current feedback and adjustable dither (80 - 250 Hz) should be used.
- Bypass flow is not available until priority flow requirements are satisfied.
- Pressure at the bypass port (port 2) may exceed pressure at the priority port (port 3).
- In applications where the priority flow will be blocked completely, bypass pressure drop will increase over time unless a leak path is provided for the priority flow.
- Priority flow remains relatively constant regardless of variation in input flow.
- The minimum bleed at port 3 must meet or exceed the published leakage numbers.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

PERFORMANCE CURVES

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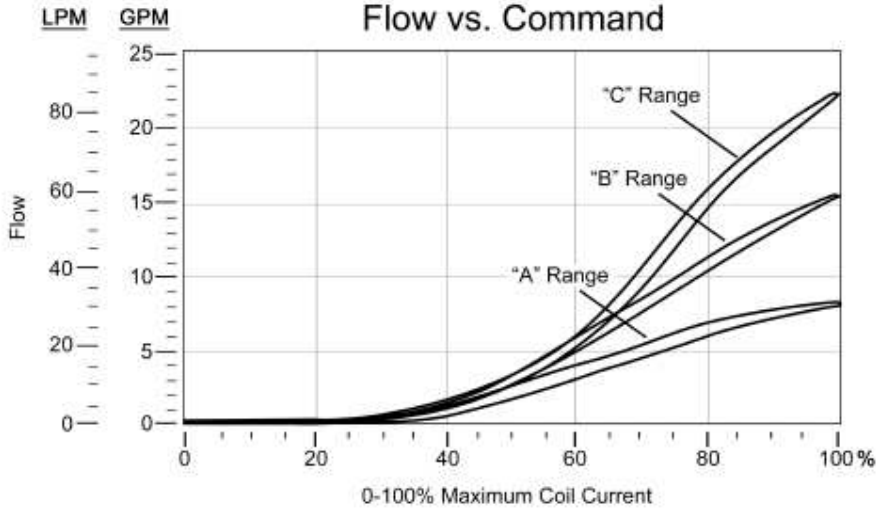
FREP

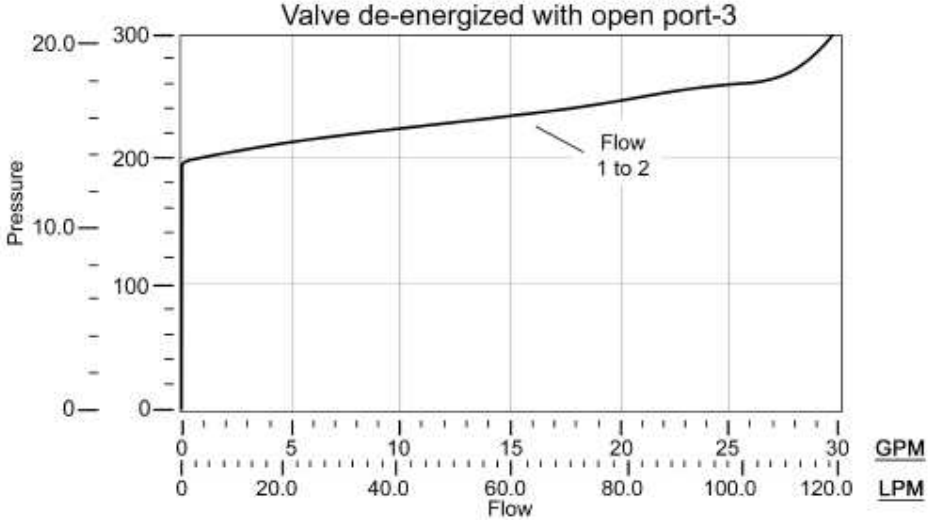
Flow vs. Command



FREP

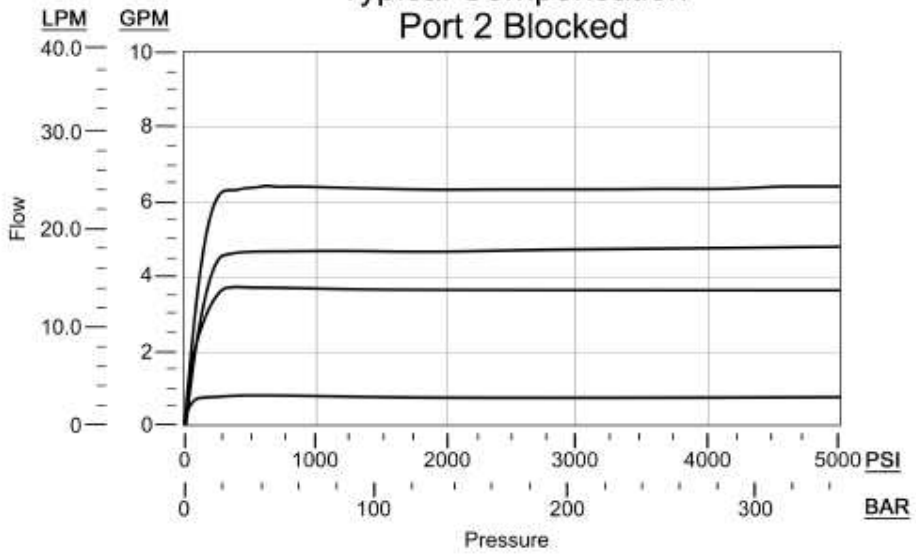
Typical Pressure Differential (Port-1 to Port-3) vs. Bypass Flow (P2)

Valve de-energized with open port-3



FREP-*A*

Typical Compensation Port 2 Blocked



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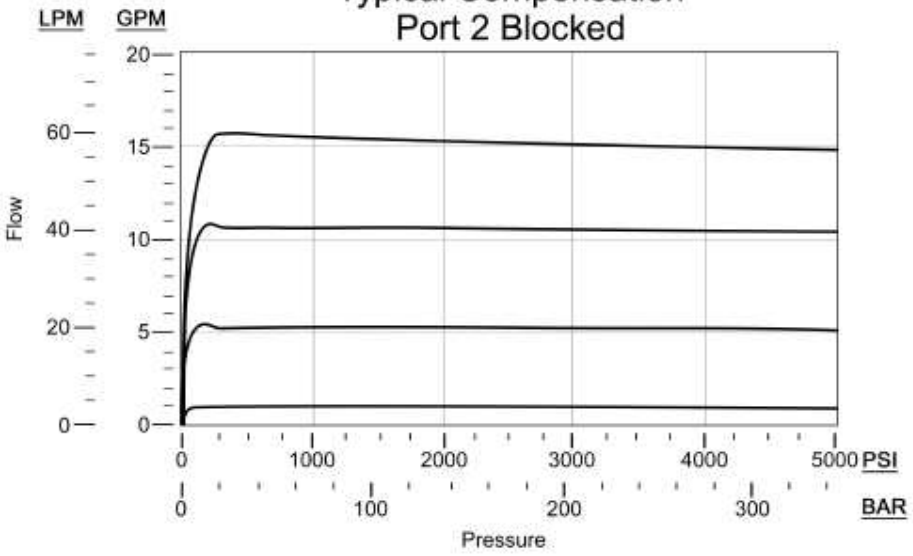
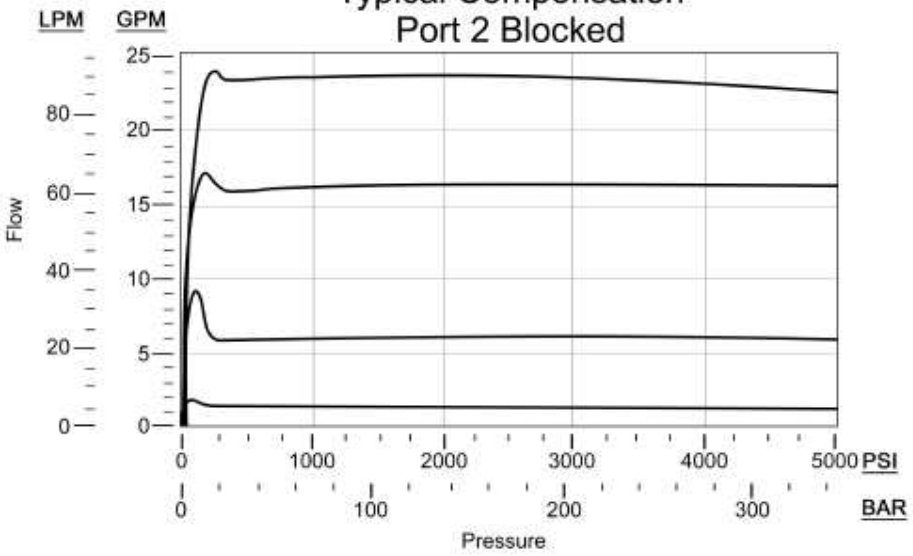
FREP-*B*
Typical Compensation
Port 2 Blocked



FREP-*C*
Typical Compensation
Port 2 Blocked



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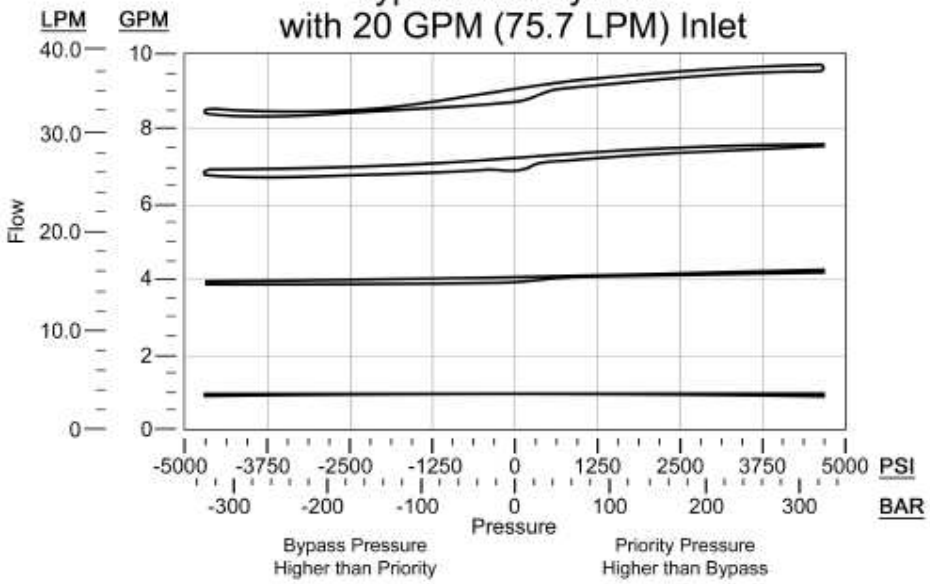
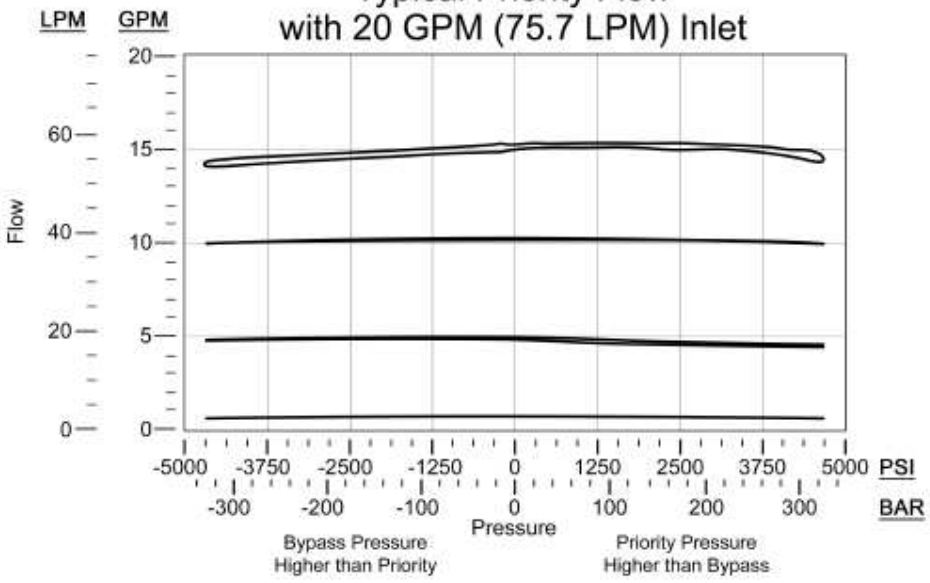
FREP-*A*

Typical Priority Flow
with 20 GPM (75.7 LPM) Inlet



FREP-*B*

Typical Priority Flow
with 20 GPM (75.7 LPM) Inlet



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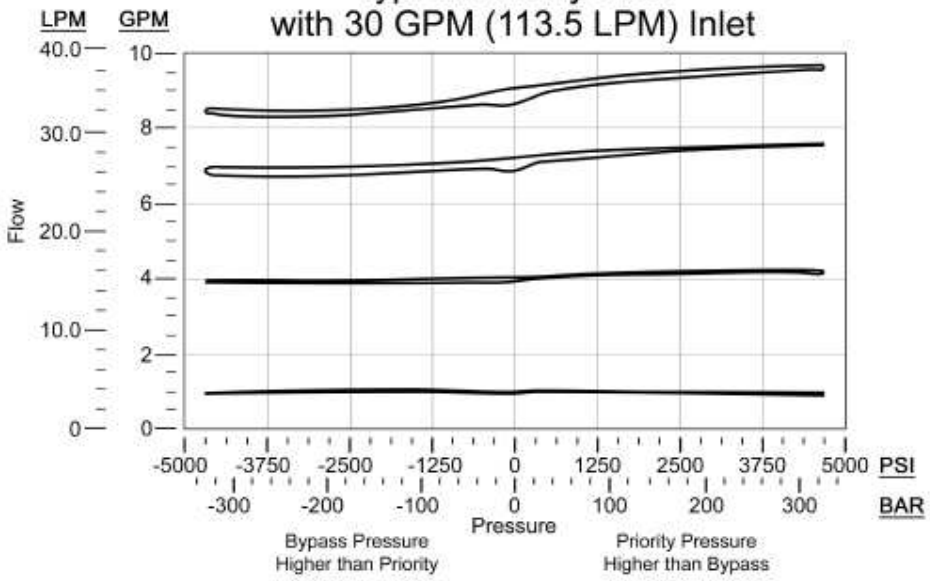
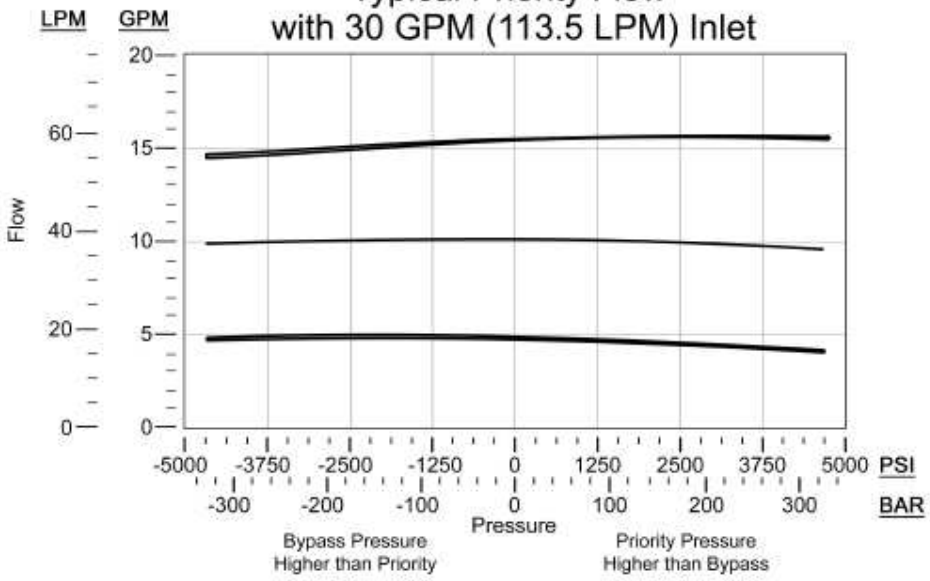
FREP-*A*

Typical Priority Flow
with 30 GPM (113.5 LPM) Inlet



FREP-*B*

Typical Priority Flow
with 30 GPM (113.5 LPM) Inlet



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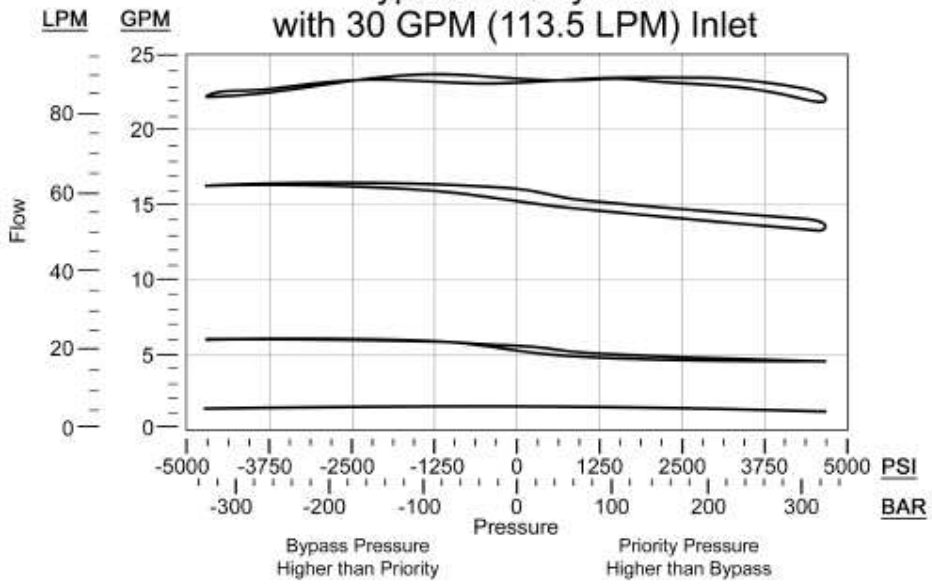
FREP-*C*

Typical Priority Flow with 30 GPM (113.5 LPM) Inlet



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