



# SVR™ SYSTEM FOR PHOSPHATE ESTER MAINTENANCE

## INDUSTRY-LEADING SOLUTION FOR ELECTRO-HYDRAULIC CONTROL SYSTEM RELIABILITY

### Overview

Phosphate ester fluids have excellent fire resistant properties, but must be maintained within a relatively narrow range of fluid operating parameters. For most phosphate ester fluid users, the existing electro-hydraulic control (EHC) fluid conditioning system is not capable of maintaining the key fluid parameters. Operating outside of these critical fluid parameters increases the rate of servo valve failure and the rate of fluid breakdown by up to 10x compared to what is achievable with a proper fluid maintenance system.

EPT's Soluble Varnish Removal (SVR™) system for phosphate ester fluid, SVR™ 1200PE, provides 200% – 400% more filtration capacity than most OEM systems, and provides the proper rate of filtration to keep your phosphate ester fluid reservoir in optimal condition. Combined with the optional TMR™ N<sub>2</sub> water removal system, the primary water contamination ingress pathway for most phosphate ester fluid reservoirs (atmosphere) can be eliminated. Together, the SVR™ and TMR™ N<sub>2</sub> systems will provide ideal phosphate ester fluid quality, significantly increasing servo valve and EHC system reliability.

## Key Benefits of SVR™ Systems for Phosphate Ester

- Features EPT's industry leading ICB™ filter purification technology to remove soluble contaminants including acids and dissolved metals.
  - This technology is the most experienced ion exchange resin product in the world with over 40 million operating hours of experience
- Quickly reduces and prevents servo valve sticking
- SVR™ has the highest acid removal capacity available in the market
- SVR™ quickly reduces Acid Number and can maintain AN <0.10 when filters are changed as required
- Significantly improves fluid resistivity
- Significantly reduces ISO particle-counts
- Small footprint and straightforward plumbing
- Lifting crane for easy filter removal
- 2-part epoxy paint for maximum resistance and durability
- Low maintenance and low cost of operation

## Recommended Water Removal Option

- With the recommended TMR™ N<sub>2</sub> option, system can reduce water by 150 ppm per day and maintain water <300 ppm. TMR™ N<sub>2</sub> also reduces oxygen levels and harmful dissolved gases, including CO, H<sub>2</sub>, and C<sub>2</sub>H<sub>4</sub>.
- TMR™ N<sub>2</sub> system can be mounted on the SVR™ system or externally mounted (See TMR™ N<sub>2</sub> specification sheet)

## Consumables

One complete set of filters are included with SVR™ system purchase.

P/N 600524A ICB™ filter (1) for SVR™ 600PE, (2) for SVR™ 1200PE, (4) for SVR™ 2400PE

P/N 601844 1 µm β200, micro glass particulate filter (1)

P/N 601677 O-ring for ICB™ filter vessel (1), P/N 601678 O-Ring for particulate vessel (1)

## SVR™ PE System Specifications

SVR SYSTEM SIZE	SVR 150PE	SVR 300PE	SVR 600PE	SVR 1200PE	SVR 2400PE
Dimensions LxWxH (cm/in.)	120 x 79 x 102/ 47 x 31 x 40	120 x 79 x 148/ 47 x 31 x 58	122 x 66 x 102/ 48 x 26 x 40	122 x 66 x 148/ 48 x 26 x 58	178 x 76 x 148/ 70 x 30 x 58
Weight (kg/lb)	159/350	181/400	201/550	273/600	454/1000
Connections: Inlet/Outlet FNPT (in.)	1.0/1.0	1.0/1.0	1.5/1.0	1.5/1.0	2.0/1.5
Electrical Options	120 VAC 1P, 230/ 380/ 475/ 575/ VAC 3P 50/60 Hz. Standard unit is general purpose. Class 1 Div. 1 and Div. 2 options are available.				
Current	12.8 Amps				
Oil Temperature	38-70°C/100-158°F. Heater and cooler options are available.				
Certifications	ASME Certified Vessels @ 150 psi / UL, CUL, CSA				

## SVR™ PE System Sizing for Phosphate Ester Fluid in EHC, Gas Turbine or Compressor Applications

For phosphate ester, EHC or gas turbine applications, the desirable filtration flow rate is to exchange the fluid reservoir volume >4 – 5x per day. For recovery projects higher exchange rates are desired.

SVR SYSTEM SIZE	SVR 150PE	SVR 300PE	SVR 600PE	SVR 1200PE	SVR 2400PE
Reservoir Volume (L/gal) For larger volumes contact factory.	500/130	1000/264	2000/530	4200/1110	8000/2110
Flow Rate (LPM/GPM)	2/0.5	4/1	8/2	16/4	32/8
Reservoir Exchange Rate per 24 hr	5.7x	5.7x	5.7x	5.7x	5.7x
Estimated Acid Reduction Capacity Per Set of Filters	0.4	0.4	0.4	0.4	0.4

**Note:** Using the above sizing, 80% of sites are typically restored with 2 sets of filters with a replacement interval of 6 weeks. The clean-up or restoration period is typically 3 – 4 months. Heavily contaminated sites normally require 3 sets of filters with a replacement interval of 1 month. After lubricant restoration is complete, the normal fluid maintenance mode requires that filters are replaced annually. All installations include detailed monthly analysis until clean-up period is complete. See SVR™ Case Studies for additional information.

### Additional Resources

1. Phosphate Ester Fluid Testing and Maintenance Challenges in EHC systems, EPT™, 2015
2. Ion Charge Bonding (ICB™) Filter Upgrades
3. Article “Thirty-Seven Years of Fleet Operating and Maintenance Experience Using Phosphate Ester Fluids for Bearing Lubrication in Gas-Turbine/ Turbo-Compressor Applications”, ASTM STP1573, 2014
4. Article “Phosphate Ester-based Fluid Specific Resistance: Effects of Outside Contamination and Improvement using Novel Media”, ASTM STP 1573, 2014

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