PVS Series - Models 185, 600, 1200, 1800 and 2700

Portable Purification Systems

Reduce the catastrophic results of water contamination

Eliminate water from the hydraulic system

The PVS Series Portable Purification Systems, available in several models, is used to draw water contaminated fluid out of a system, remove the water content and return the 'clean' fluid to the reservoir. Maximum flow 170 l/min (PVS2700). Reduce the catastrophic results of water contamination.

Contact Information:

Parker Hannifin
Hydraulic Filter Division Europe

European Product Information Centre
Freephone: 00800 27 27 5374
(from AT, BE, CH, CZ, DE, EE, ES, FI, FR, IE, IT, PT, SE, SK, UK)
filtrationinfo@parker.com

www.parker.com/hfde

Product Features:

- PVS draws water contaminated fluid out of a system.
- Removes water, air and particulate content and returns the 'clean' fluid to the reservoir.
- Maximum flow 170 l/min (PSV2700).
- Reduce the catastrophic results of water contamination.

PVS Series
Portable Purification Systems

Effects of Water Contamination

Water is one of the most common and destructive contaminants in a fluid system. When water contaminates a system, it can cause serious problems such as:

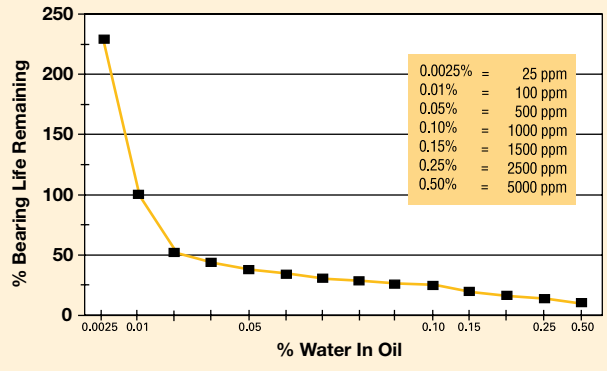
- Corrosion by etching metal
- Fluid breakdown, reduction of lubricating properties, additive precipitation, and oil oxidation
- Reduced dielectric strength
- Abrasive wear in hydraulic components

Typical saturation points

Fluid type	PPM	%
Hydraulic fluid	300	.03%
Lubrication fluid	400	.04%
Transformer fluid	50	.005%

Free water occurs when oil becomes saturated and cannot hold any more water. This water is usually seen as cloudy oil or puddles of water at the bottom of an oil reservoir. Water which is absorbed into the oil is called dissolved water. At higher temperatures, oil has the ability to hold more water in the dissolved stage due to the expansion of oil molecules. As the oil cools, this ability reverses and free water will appear where not visible before. In addition to temperature, fluid type also determines the saturation point for your system (see chart above).

Effect Of Water In Oil On Bearing Life



Effect of water in oil on bearing life (based on 100% life at .01% water in oil.)
Reference: "Machine Design" July 86, "How Dirt And Water Effect Bearing Life" by Timken Bearing Co.

Principles of Operation

Contaminated oil is drawn into the Parker portable purification system by a vacuum of 25 In/Hg. The oil passes through the in-line low watt density heater/s where the oil is heated to an optimum temperature of 66°C (150°F).

The oil then enters the distillation column where it is exposed to the vacuum through the use of dedicated dispersal elements. This increases the exposed surface area of the oil and converts the water to a vapor form, which is then drawn through the condenser by the vacuum pump. The vapour returns to water and drops into the condensate holding tank - this can then be drained off at a later stage.

The water-free oil falls to the bottom of the vacuum chamber and is passed through a final particulate removal filter by a heavy duty lube oil pump.

Clean dry oil re-enters the reservoir/system via the outlet port.

Applications for PVS Portable Purification Systems

- **Paper mills**
  - Dryer lubrication
  - Hydraulic
  - Compressor lubrication
  - Calenders
- **Steel mills**
  - Bearing lubrication
  - Continuous casters
  - Press roll lubrication
- **Power generation**
  - Turbine oil
  - Transformer oil
  - EHC systems
- **Industrial/aerospace**
  - Test stands
  - Machine tools

Features	Advantages	Benefits
Variable flow circuit	Allows oil to heat to required temperature quickly	Starts removing water quickly
Moisture sensor	Real-time water content indication	Indicates when safe water content level is obtained
Condensate holding tank	Captures removed water/solvents Large enough to provide long service interval	Eliminate potential hazard of exhausting to atmosphere Reduced maintenance costs
Compact size	Smallest envelope in the industry Ease of portability	Fits through doorways and down narrow aisles Increased use
Forklift guides Lifting eyes	Provides safe and secure method to lift unit	Employee safety Easily transported
Programmable thermostat	Maintains oil within 1°C Prevents overheating oil	Unattended operation Increases oil life
Automatic operation	Unattended use	Reduced labour costs Increased running time
Reverse pole switch/phase fail	Change motor rotation for different power source locations	Flexibility, less maintenance Prevents incorrect rotation
High temperature safety circuit	Shuts down heater if primary contacters fail Oil can never exceed 120°C (250°F)	Prevents system damage Worker safety
Circuit breakers utilised in electrical panel	No fuses to replace Simple diagnostics	Fewer spare parts, increased uptime Reduced maintenance
Available with EPR seals and stainless steel	Phosphate ester compatible	Specifically designed for application
Solid state heater contacter	Longer more reliable service life	Reduced downtime

PVS Series

Portable Purification Systems

Potential contaminant	PVS performance
Solid particulate 14/13/10 attainable	ISO cleanliness code*
Water 80-90% of dissolved water.	Removes 100% of free water,
Air 90% of dissolved air.	Removes 100% of free air,
Gases 90% of dissolved gases.	Removes 100% of free gases,

* When utilising 2Q media

PVS (Vacuum dehydration) compared to other technologies

Centrifuge units – Removes free water only; has difficulty breaking stable emulsions; larger envelope dimensions but lower flows; higher initial and operating costs.

Desiccant units – Have limited water removal capability due to absorbing material; only removes air ingressed particles; expensive compared to the volume of water removed.

Coalescer units – Removes free water only; has difficulty breaking stable emulsions; does not work well in viscous fluids (>23cSt); much larger in size compared to PVS.

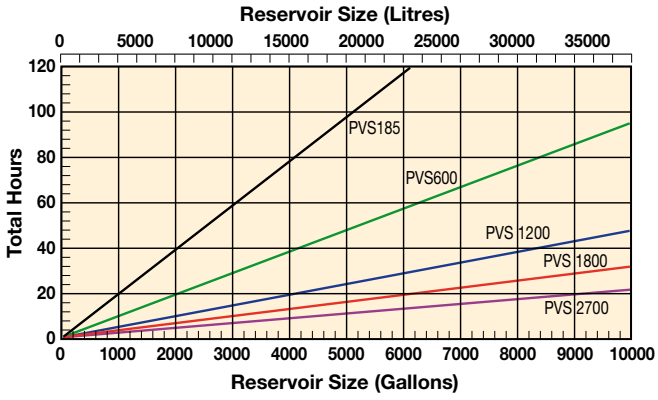
Typical Performance

Tank size	**227 litres (50 gallons)**
Run time	**62 minutes**
Parker model	**PVS 600 (37.9 l/min)**
Water content (ppm)	**Start: 10,000 PPM (1.0%)** **Stop: 50 PPM(0.005%)**
Contamination level	**Start: ISO 21/18/16** **Stop: ISO 16/14/11**

Start

Stop

Estimated Water Removal Time
5000 ppm (0.5%) to 150 ppm (0.015%)



PVS 185

Portable Purification Systems

Specification

Flow rate:
19 lpm (4.2 gpm).

Height:
1651mm (65”).

Width:
825.5mm (32.5”).

Length:
1206.5mm (47.5”).

Weight:
294.8 kg (650 lbs).

Seal material:
Fluorocarbon (EPR opt.).

Condensate tank:
15.5 ltrs (3.4 gals).

Dispersal elements:
1.

Minimum operating capacity:
18.9 ltrs (4.2 gals).

Vacuum (max):
25 In/Hg.

Viscosity (max):
108 cSt (500sus) – disposable.
460 cSt (2150 sus) – packed tower.

Outlet pressure (max):
4.1 bar (60 psi).

Ports:
3/4” JIC (male) inlet.
3/4” JIC (male) outlet.

FLA (full load amps):
15-41 amps.
(Depending on voltage used).

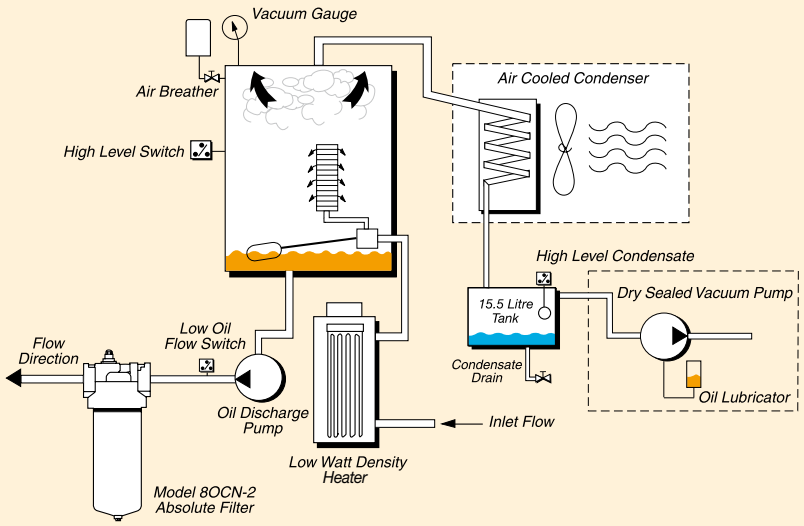
Replacement elements

Standard Coreless Particulate 80CN-2		
02QE	(2 micron)	936716Q
05QE	(5 micron)	936717Q
10QE	(10 micron)	936718Q
20QE	(20 micron)	936719Q

Option Coreless Particulate IL8-3		
02QE	(2 micron)	933734Q
05QE	(5 micron)	933612Q
10QE	(10 micron)	933735Q
20QE	(20 micron)	933736Q

Dispersal	
Disposable (Coalescing)	933180
Packed tower (Cleanable)	933553

PVS 185 flow diagram



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FDHB500UK/PVS

PVS 600

Portable Purification Systems

Specification

Flow rate:
38 lpm (8.3 gpm).

Height:
1638.3mm (64.5").

Width:
1117.6mm (44").

Length:
1549.4mm (61").

Weight:
408.2 kg (900 lbs).

Seal material:
Fluorocarbon (EPR opt.).

Condensate tank:
15.5 ltrs (3.4 gals).

Dispersal elements:
2.

Minimum operating capacity:
22.7 ltrs (5.0 gals).

Vacuum (max):
25 In/Hg.

Viscosity (max):
108 cSt (500sus) – disposable.
460 cSt (2150 sus) – packed tower.

Outlet pressure (max):
4.1 bar (60 psi).

Ports:
1" JIC (male) inlet.
1" JIC (male) outlet.

FLA (full load amps):
24-38 amps.
(Depending on options & voltages).

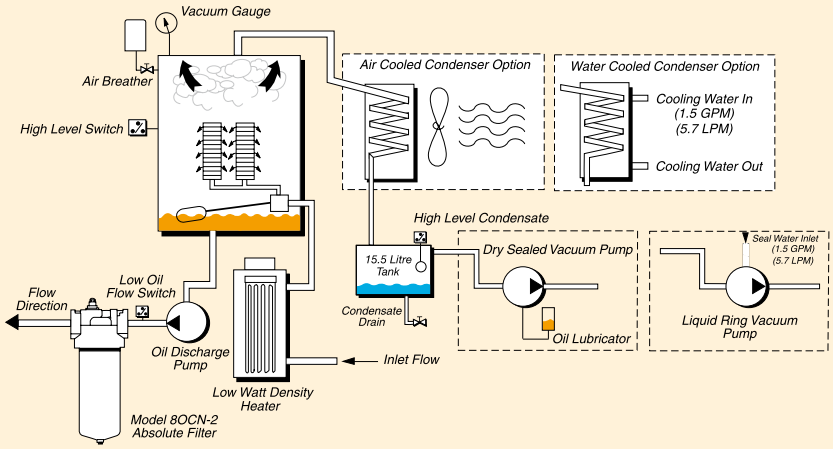
Replacement elements

Standard Coreless Particulate 80CN-2		
02QE	(2 micron)	936716Q
05QE	(5 micron)	936717Q
10QE	(10 micron)	936718Q
20QE	(20 micron)	936719Q

Option Coreless Particulate IL8-3		
02QE	(2 micron)	933734Q
05QE	(5 micron)	933612Q
10QE	(10 micron)	933735Q
20QE	(20 micron)	933736Q

Dispersal	
Disposable (Coalescing)	933180
Packed tower (Cleanable)	933553

PVS 600 flow diagram



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FDHB500UK/PVS

PVS 1200

Portable Purification Systems

Specification

Flow rate:
76 lpm (16.7 gpm).

Height:
1651mm (65").

Width:
1117.6mm (44").

Length:
1549.4mm (61").

Weight:
703.1 kg (1550 lbs).

Seal material:
Fluorocarbon (EPR opt.).

Condensate tank:
31.4 ltrs (6.9 gals).

Dispersal elements:
4.

Minimum operating capacity:
41.6 ltrs (9.1 gals).

Vacuum (max):
25 In/Hg.

Viscosity (max):
108 cSt (500sus) – disposable.
460 cSt (2150 sus) – packed tower.

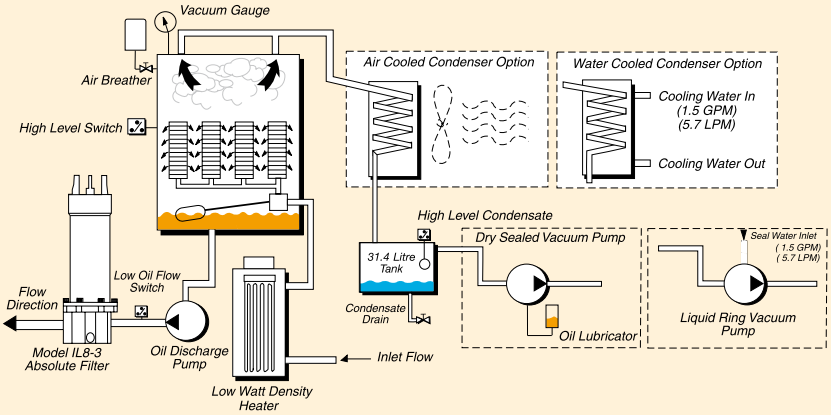
Outlet pressure (max):
4.1 bar (60 psi).

Ports:
1 1/2" NPTF inlet.
1" JIC (male) outlet.

FLA (full load amps):
30-48 amps.
(Depending on options & voltages).

Replacement elements	
Coreless IL8-3	
02QE	933734Q
05QE	933612Q
10QE	933735Q
20QE	933736Q
Dispersal	
Disposable (coalescing)	933180
Packed tower (cleanable)	933553

PVS 1200 flow diagram



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PVS 1800

Portable Purification Systems

Specification

Flow rate:
114 lpm (25 gpm).

Height:
1651mm (65").

Width:
1066.8mm (42").

Length:
1943.1mm (76.5").

Weight:
1156.7 kg (2550 lbs).

Seal material:
Fluorocarbon (EPR opt.).

Condensate tank:
31.4 ltrs (6.9 gals).

Dispersal elements:
8.

Minimum operating capacity:
68.1 ltrs (14.98 gals).

Vacuum (max):
25 In/Hg.

Viscosity (max):
108 cSt (500sus) – disposable.
460 cSt (2150 sus) – packed tower.

Outlet pressure (max):
4.1 bar (60 psi).

Ports:
2" NPTF inlet.
1.5" JIC (male) outlet.

FLA (full load amps):
40-65 amps @ 460 V/60hz.

Replacement elements	
Coreless IL8-3	
02QE	933734Q
05QE	933612Q
10QE	933735Q
20QE	933736Q
Dispersal	
Disposable (coalescing)	933180
Packed tower (cleanable)	933553

PVS Specification Worksheet - Section 1

Note: The following information will be required before a PVS order can be processed.

1. Application.....

2. Fluid type..... Brand.....
   Grade..... Specific Gravity.....

3. Viscosity Min ..... SUS/cSt @..... °F/°C
   Max..... SUS/cSt @..... °F/°C
   Normal..... SUS/cSt @..... °F/°C

4. Contamination level Current ISO level ___ /___ /___
   Desired PPM level ___ /___ /___

5. Water concentration Current ISO level.....
   Desired PPM level.....

6. Suction Head Positive/Negative ..... Ft./metres.....

7. Operating distance ..... Ft./metres .....

8. System fluid operating temperature: ..... °F/°C
   Is there a cooler?.....

9. Operating environment air temperature: (air cooled model)
   Min .....°F/°C
   Max .....°F/°C
   Normal.....°F/°C

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PVS 2700

Portable Purification Systems

Specification

Flow rate:
170 lpm (37.4 gpm).

Height:
1651mm (65”).

Width:
1066.8mm (42”).

Length:
1943.1mm (76.5”).

Weight:
1156.7 kg (2550 lbs).

Seal material:
Fluorocarbon (EPR opt.).

Condensate tank:
31.4 ltrs (6.9 gals).

Dispersal elements:
8.

Minimum operating capacity:
68.1 ltrs (14.98 gals).

Vacuum (max):
25 In/Hg.

Viscosity (max):
108 cSt (500sus) – disposable.
460 cSt (2150 sus) – packed tower.

Outlet pressure (max):
4.1 bar (60 psi).

Ports:
3” NPTF inlet.
2” NPTF outlet.

FLA (full load amps):
50-70 amps @ 460 V/60hz.

Replacement elements	
Coreless IL8-3	
02QE	933734Q
05QE	933612Q
10QE	933735Q
20QE	933736Q
Dispersal	
Disposable (coalescing)	933180
Packed tower (cleanable)	933553

PVS Specification Worksheet - Section 2

10. Water supply temperature: (liquid ring model)
    Min .....°F/°C
    Max .....°F/°C
    Normal.....°F/°C

11. Operating environment above/below sea level: ..... Ft./metres

12. Voltage Options: 230Vac, 3p, 60Hz (185,600)
    380Vac, 3p, 50Hz (185,600,1200,1800,2700)
    460Vac,3p,60Hz (185,600,1200,1800,2700)
    575vac, 3p 60Hz (185,600,1200,1800,2700)

13. Available amperage:.....

14. System volume: .....

15. Special requirements: .....
    .....
    .....

16. Any previous filtration problems with application: .....

17. PVS model selected: .....

Specification sheet must be completed before order can be entered

PVS Range
Portable Purification Systems

Ordering Information

Product configurator
Select the desired symbol (in the correct position) to construct a model code.

Box 1	STD	Box 2	Box 3	Box 4	Box 5	Box 6	Box 7	Box 8	Box 9
-	PVS	600	460	DS	D	10QE	12	AC	CEPDL

Box 1

Seals	
Description	**Code**
Fluorocarbon	**None**
EPR	E8

Box 2

Flow rate	
Description	**Code**
19 lpm (4.2 gpm)	**185**
38 lpm (8.3 gpm)	**600**
76 lpm (16.7 gpm)	**1200**
114 lpm (25.0 gpm)	1800
170 lpm (37.4 gpm)	2700

Box 3

Power supply		
Model	**Description**	**Code**
185	380VAC, 3P, 50HZ	380
	460VAC, 3P, 60HZ	460
	575VAC, 3P, 60HZ	550
600	380VAC, 3P, 50HZ	380
	460VAC, 3P, 60HZ	460
	550VAC, 3P, 60HZ	550
1200	380VAC, 3P, 50HZ	380
	460VAC, 3P, 60HZ	460
	550VAC, 3P, 60HZ	550
1800	380VAC, 3P, 50HZ	380
	460VAC, 3P, 60HZ	460
	550VAC, 3P, 60HZ	550
2700	380VAC, 3P, 50HZ	380
	460VAC, 3P, 60HZ	460
	550VAC, 3P, 60HZ	550

Box 4

Vacuum pump	
Pressure setting	**Code**
Dry sealed	**DS**
Liquid ring	**LR**

Box 5

Dispersal element	
Description	**Code**
Disposable (coalescing)	**D**
Packed tower (cleanable – for use with viscious or highly contaminated fluids)	**P**

Box 6

Particulate element µm (c)	
Description	**Code**
2 micron Microglass III	02QE
5 micron Microglass III	05QE
10 micron Microglass III	10QE
20 micron Microglass III	20QE

Note: Above elements are rated for Beta 200+ (99.5% efficiency)

Box 7

Heater		
Model	**Description**	**Code**
185	12 KW (3 phase)	**12**
600	12 KW	**12**
	24 KW	24
1200	24 KW	**24**
1800	36 KW	36
2700	48 KW	48

Box 8

Condenser	
Description	**Code**
Air cooled	**AC**
Water cooled (External water)	**LC**
Air and water cooled	**BC**

Box 9

Options	
Description	**Code**
Standard	**None**
Pneumatic wheels	PNW
5" Dia. wheels	5DW
Auto condensate drain	ACD
Dirty filter light	DFL
Resetable hour meter	RHM
Sight flow indicator	SFI
Inlet control valve	ICV
CE marked	CE
Differental pressure gauge	DPG
3HP High viscosity circuit	3HP
Condensate drain counter	CDC
Cable reel	CR
Explosion Proof (Class 1, Div. 2, Zone 1&2)	EX2
Upgrade to IL8-3 coreless filter*	IL8
icountPD with LED display	PD
icountPD with LCD display	PDL

Note*: IL8 option available on 185 & 600 models and is standard on 1200 modles and larger.

Note 1: Contact parker for part number profile availability