aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding

Portable Purification Systems

Models PVS 185, 600, 1200, 1800, 2700

Parker

ENGINEERING YOUR SUCCESS.

PVS Series

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 where the oil is heated to an optimum temperature of 150° F (66°C).

The oil then enters the distillation column where it is exposed to the vacuum through the use of special dispersal elements. This increases the exposed surface area of the oil and converts the water to vapor form, which is then drawn through the condenser by the vacuum pump.

The water-free oil falls to the bottom of the column and is removed by a heavy duty lube oil pump. This pump forces the dry oil through a final particulate removal filter. Clean oil passes out of the unit, back to the reservoir — and into the system.

Typical Saturation Points

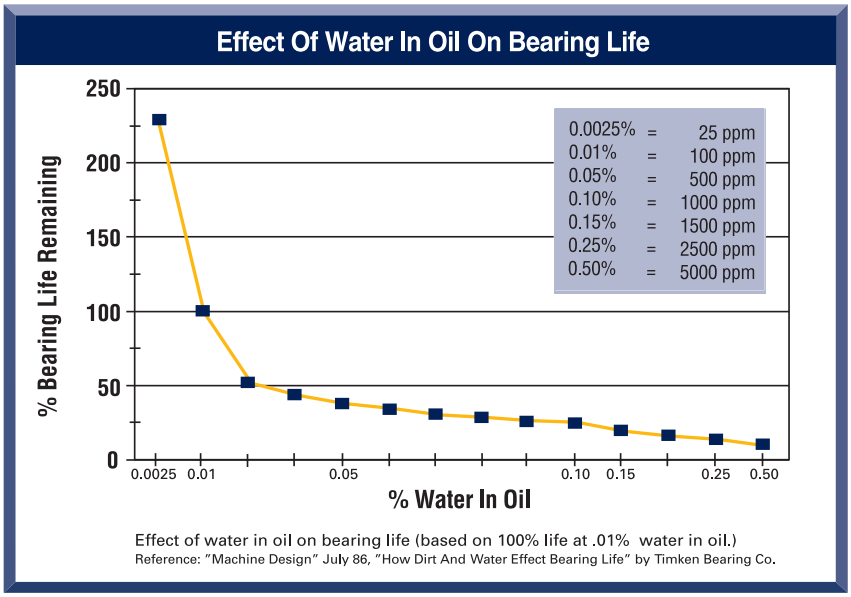
Fluid Type	PPM	%
Hydraulic Fluid	300	.03%
Lubrication Fluid	400	.04%
Transformer Fluid	50	.005%

Effects of Water Contamination

Water is one of the most common contaminants in a fluid system and one of the most damaging. 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

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 (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.

PVS Series

Applications

- Hydraulic Systems
- Lubrication Systems
- Turbine Oil
- Transformer Oil
- New Oil (oil storage)
- Seal Oil
- Explosion Proof Environments

NEMA 7 Explosion Proof

Markets

- Power Generation
- Pulp and Paper
- Primary Metals
- Mining
- Plastic Injection Molding
- Oil Exploration
- Petrochemical
- Automotive
- Aerospace
- Refineries
- Transportation

Standard Features	Advantages	Benefits
Variable flow circuit	• Allows oil to heat more quickly so water is removed faster	• Time savings
Moisture sensor	• Real-time water content indication in % saturation	• At-a-glance visual confirmation
Automatic operation	• Unattended use • Designed for 24/7 operation	• Reduces labor costs • Increases operation time
316 Stainless steel used for primary wetted surfaces	• No corrosion	• Product reliability
Ecoglass particulate element	• Coreless, non-metallic construction	• Environmentally friendly, easy disposal
Clear plexiglass covers on the condensate tank and vacuum chamber	• See the vacuum dehydration process work	• Visual verification of water removal
Desiccant breather	• Insures dry, clean intake air	• More efficient operation
Reverse phase switch	• Enables easy changing of motor rotation if out-of-phase	• Ease of maintenance • Prevents incorrect rotation
Condensate holding tank with optional auto drain	• Large volume for infrequent servicing intervals	• Reduces maintenance costs
Programmable thermostat	• Maintains oil within 1°F • Prevents overheating the oil	• Unattended operation
Forklift guides and lifting eyes	• Provides safe and secure method of lifting the unit	• Employee safety
Coalescing or packed tower oil dispersal elements	• Flexibility with various fluid viscosities	• Greater efficiency in removing moisture

PVS Series

Vacuum Dehydration Performance

Potential Contaminant	PVS Performance
Solid particulate	ISO Cleanliness Code* 14/13/10 Attainable
Water	Removes 100% of free water, 90% of dissolved water
Air/Gases	Removes 100% of free air and gases, 90% of dissolved air and gases

When utilizing 02Q media.

Typical Performance	
Tank Size	60 Gallons (227 liters)
Run Time	62 minutes
Parker Model	PVS 600 (10 GPM)
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

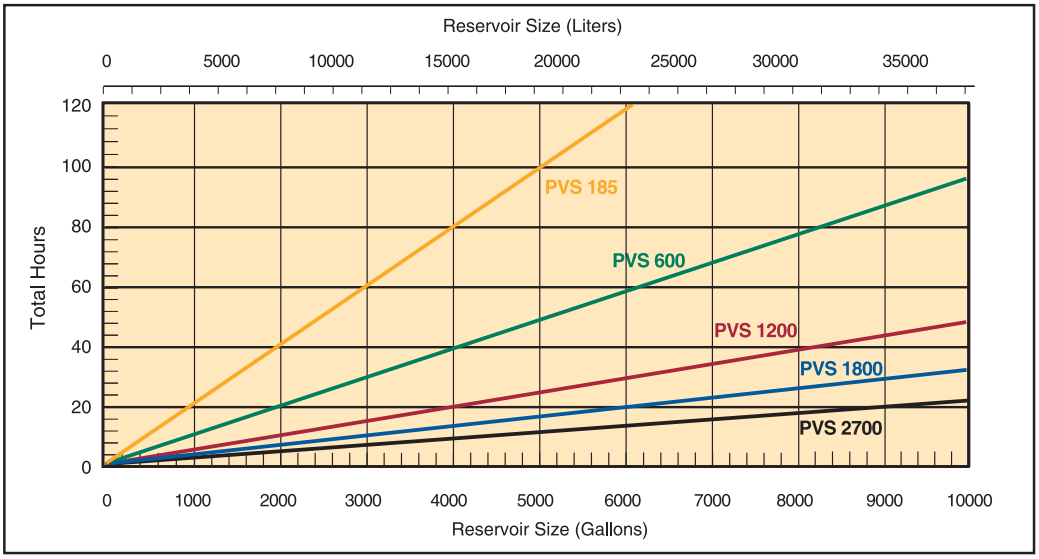
PVS (Vacuum Dehydration) Compared to Other Technologies

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 (>100 sus); much larger in size compared to PVS.

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



PVS 185 Series

Specifications

Flow rate	5 gpm (18.9 lpm)
Dimensions	65" H x 33" W x 48" L
	(1651mm x 838mm x 1219mm)
Weight	650 lbs. (295 kg)
Seal material	Fluorocarbon (EPR optional)
Condensate tank	4.1 gal (15.5 ltrs)
Dispersal elements	1
Minimum operating capacity	5 gal (18.9 ltrs)
Vacuum (max)	25 In/Hg
Viscosity (max)	500 sus (108 cSt)-Disposable
	2150 sus (460 cSt)-Packed Tower
Outlet pressure (max)	60 psi (4.1 bar)
Ports	3/4" JIC (male) inlet
	3/4" JIC (male) outlet
FLA (full load amps)	15-41 amps
	(Depending on options & voltages)
Shipping Weight	1400 lbs. (635 kg) maximum
Shipping Dimensions	70" H x 48" W x 60" L
	(1778mm x 1219mm x 1524mm)

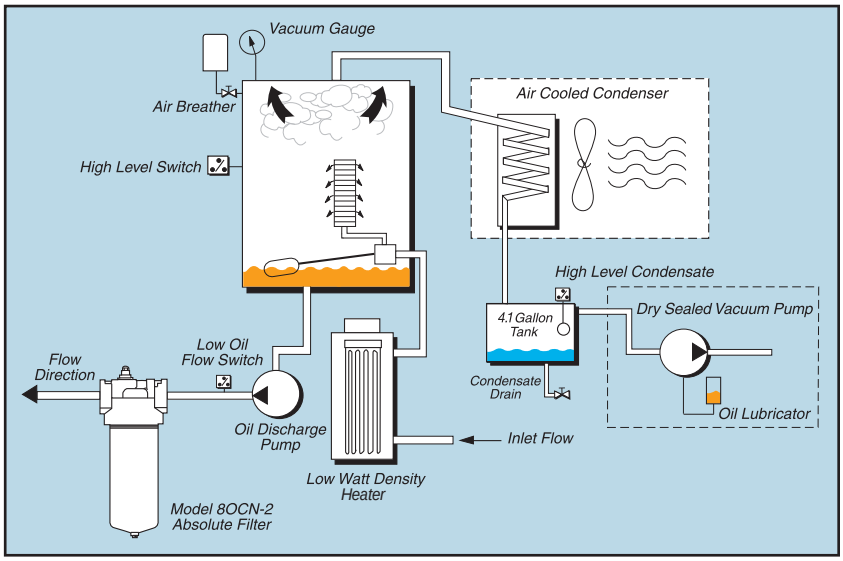
UL and CUL Marked

Note: Dimensions and weights are approximate and for reference only.

Replacement Elements

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



PVS 600 Series

Specifications

Flow rate	10 gpm (37.9 lpm)
Dimensions	65" H x 33" W x 48" L (1651mm x 838mm x 1219mm)
Weight	900 lbs. (408.2 kg)
Seal material	Fluorocarbon (EPR optional)
Condensate tank	4.1 gal (15.5 ltrs)
Dispersal elements	2
Minimum operating capacity	6 gal (22.7 ltrs)
Vacuum (max)	25 In/Hg
Viscosity (max)	500 sus (108 cSt)-Disposable 2150 sus (460 cSt)-Packed Tower
Outlet pressure (max)	60 psi (4.1 bar)
Ports	1" JIC (male) inlet 1" JIC (male) outlet
FLA (full load amps)	24-38 amps (Depending on options & voltages)
Shipping Weight	1500 lbs. (680 kg) maximum
Shipping Dimensions	70" H x 48" W x 60" L (1778mm x 1219mm x 1524mm)

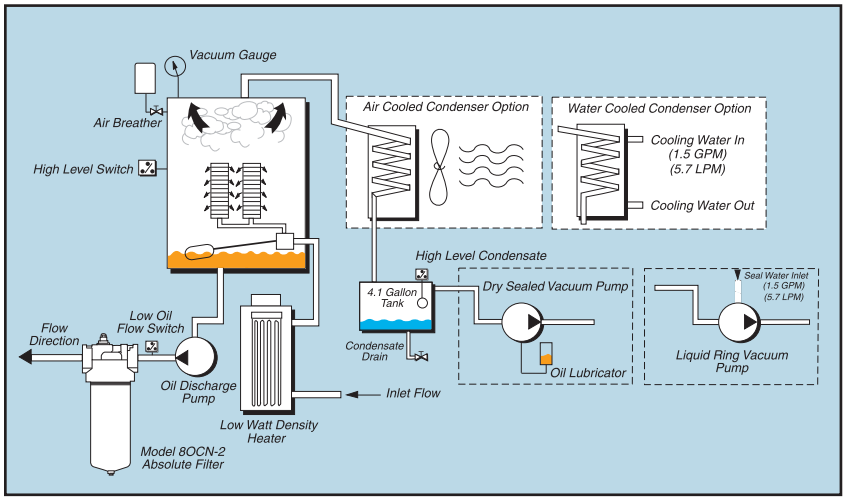
Note: Dimensions and weights are approximate and for reference only.

UL and CUL Marked

Replacement Elements

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



PVS 1200 Series

Specifications

Flow rate	20 gpm (75.7 lpm)
Dimensions	65" H x 44" W x 61" L
	(1651mm x 1118mm x 1549mm)
Weight	1550 lbs. (703 kg)
Seal material	Fluorocarbon (EPR optional)
Condensate tank	8.3 gal (31.4 ltrs)
Dispersal elements	4
Minimum operating capacity	11 gal (41.6 ltrs)
Vacuum (max)	25 In/Hg
Viscosity (max)	500 sus (108 cSt)-Disposable
	2150 sus (460 cSt)-Packed Tower
Outlet pressure (max)	60 psi (4.1 bar)
Ports	1½" JIC (male) inlet
	1" JIC (male) outlet
FLA (full load amps)	30-48 amps
	(Depending on options & voltages)
Shipping Weight	2300 lbs. (1043 kg) maximum
Shipping Dimensions	70" H x 48" W x 65" L
	(1778mm x 1651mm x 1524mm)

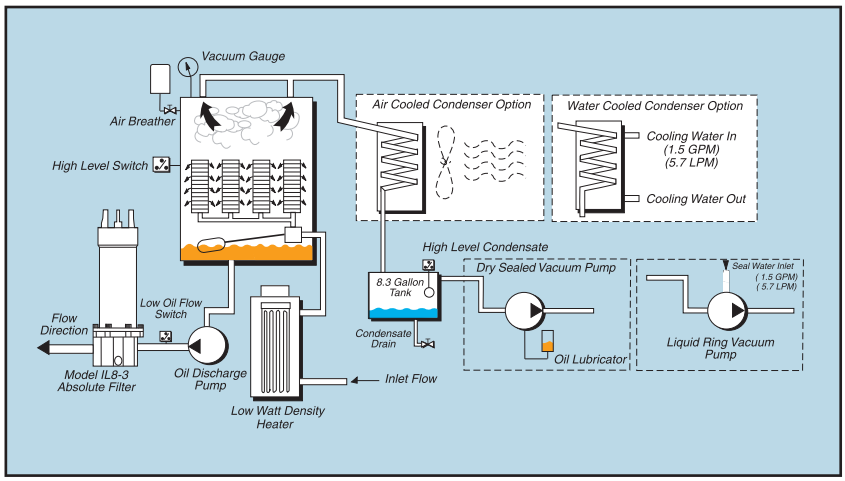
Note: Dimensions and weights are approximate and for reference only.

UL and CUL Marked

Replacement Elements

Standard 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 1200 Flow Diagram



PVS 1800 Series

Specifications

Flow rate	30 gpm (113.6 lpm)
Dimensions	68” H x 42” W x 75” L (1727mm x 1067mm x 1905mm)
Weight	2550 lbs. (1157 kg)
Seal material	Fluorocarbon (EPR optional)
Condensate tank	8.3 gal (31.4 ltrs)
Dispersal elements	8
Minimum operating capacity	18 gal (68.1 ltrs)
Vacuum (max)	25 In/Hg
Viscosity (max)	500 sus (108 cSt)-Disposable 2150 sus (460 cSt)-Packed Tower
Outlet pressure (max)	60 psi (4.1 bar)
Ports	2" JIC (male) inlet 1.5" JIC (male) outlet
FLA (full load amps)	40-65 amps @ 460 V/60hz
Shipping Weight	3000 lbs. (1361 kg) maximum
Shipping Dimensions	70” H x 48” W x 80” L (1778mm x 1219mm x 2032mm)

Note: Dimensions and weights are approximate and for reference only.

Replacement Elements

Standard 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

UL and CUL Marked

PVS 2700 Series

Specifications

Flow rate	45 gpm (170.3 lpm)
Dimensions	65" H x 42" W x 75" L (1727mm x 1067mm x 1905mm)
Weight	2550 lbs. (1157 kg)
Seal material	Fluorocarbon (EPR optional)
Condensate tank	8.3 gal (31.4 ltrs)
Dispersal elements	8
Minimum operating capacity	18 gal (68.1 ltrs)
Vacuum (max)	25 In/Hg
Viscosity (max)	500 sus (108 cSt)-Disposable 2150 sus (460 cSt)-Packed Tower
Outlet pressure (max)	60 psi (4.1 bar)
Ports	3" JIC (male) inlet 2" JIC (male) outlet
FLA (full load amps)	50-70 amps @ 460 V/60hz
Shipping Weight	3000 lbs. (1361 kg) maximum
Shipping Dimensions	70" H x 48" W x 80" L (1778mm x 1219mm x 2032mm)

Replacement Elements

Standard 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

Note: Dimensions and weights are approximate and for reference only.

UL and CUL Marked

PVS Series

Specification Worksheet

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 ISO level _____/____ / ____

5. Water concentration: Current PPM level _____
   Desired PPM level _____

6. Suction head: Positive/Negative _____ Ft./meters _____

7. Operating distance: _____ Ft./meters _____

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

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

11. Operating environment above/below sea level: _____ Ft./meters

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. Reservoir volume: _____

15. Special requirements: _____

    _____

    _____

16. Any previous filtration problems with the application: _____

17. PVS model selected: _____

NOTE: Specification sheet must be completed before order can be entered.

PVS Series

How to Order

Select the desired symbol (in the correct position) to construct a model code.
Example:

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	ACD DFL CR

BOX 1: Seals

Symbol	Description
None	Fluorocarbon
E8	EPR

BOX 2: Base Unit Flow rate

Symbol	Description
185	5 GPM (18.9 lpm)
600	10 GPM (37.9 lpm)
1200	20 GPM (75.7 lpm)
1800	30 GPM (113.6 lpm)
2700	45 GPM (170.3 lpm)

BOX 3: POWER SUPPLY *

Model	Symbol	Description
185	230	230VAC, 3P, 60HZ
	380	380VAC, 3P, 50HZ
	460	460VAC, 3P, 60HZ
	575	575VAC, 3P, 60HZ
600	380	380VAC, 3P, 50HZ
	460	460VAC, 3P, 60HZ
	575	575VAC, 3P, 60HZ
1200	380	380VAC, 3P, 50HZ
	460	460VAC, 3P, 60HZ
	575	575VAC, 3P, 60HZ
1800	380	380VAC, 3P, 50HZ
	460	460VAC, 3P, 60HZ
	575	575VAC, 3P, 60HZ
2700	380	380VAC, 3P, 50HZ
	460	460VAC, 3P, 60HZ
	575	575VAC, 3P, 60HZ

*Consult factory for special voltages.

BOX 4: Vacuum Pump

Symbol	Description
DS	Dry sealed
LR[1]	Stationary liquid ring
ALR[2]	Portable liquid ring

BOX 5: Dispersal Element

Symbol	Description
D	Coalescing (disposable)
P	Packed tower (cleanable)

BOX 6: Particulate Element

Symbol	Pressure Setting
02QE	Ecoglass III, 2 micron
05QE	Ecoglass III, 5 micron
10QE	Ecoglass III, 10 micron
20QE	Ecoglass III, 20 micron

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

BOX 7: Heater

Model	Symbol	Description
185	12	12 KW/3 phase
600	12	12 KW/3 phase
	24	24 KW/3 phase
	36	36 KW/3 phase
1200	24	24 KW/3 phase
	36	36 KW/3 phase
	48	48 KW/3 phase
1800	36	36 KW/3 phase
	48	48 KW/3 phase
2700	48	48 KW/3 phase

Notes:

1. External water source.
2. Onboard water source.

BOX 8: Condenser

Symbol	Description
AC	Air cooled
LC	Liquid cooled
BC	Air and water cooled

BOX 9: Options*

Symbol	Description
3HP	3HP High Viscosity Circuit
5DW	5” Diameter Wheels
ACD	Auto Condensate Drain
CDC	Condensate Drain Counter
CE	CE Marked
CF	Carbon Exhaust Filter
CR	Cable Reel
DFL	Dirty Filter Light
DPG	Differential pressure gauge
EX1	Explosion Proof (Class I, Division I, Zone I and II)
EX2	Explosion Proof (Class I, Division II, Zone I and II)
NM7	NEMA 7 Explosion Proof
MBV	Motorized Ball Valve
IL8	Upgrade to IL8-3 coreless filter
PNW	Pneumatic Wheels
RHM	Resetable Hour Meter
SFI	Sight Flow Indicator
PD	LED Particle Detector
PDL	LCD Particle Detector
NYM	No Yellow Metals

* Consult factory for other options.

Global products as identified are offered worldwide through all Parker locations and utilize a common ordering code.