



Portable Purification Systems

Models PVS 185, 600, 1200, 1800, 2700



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.

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:

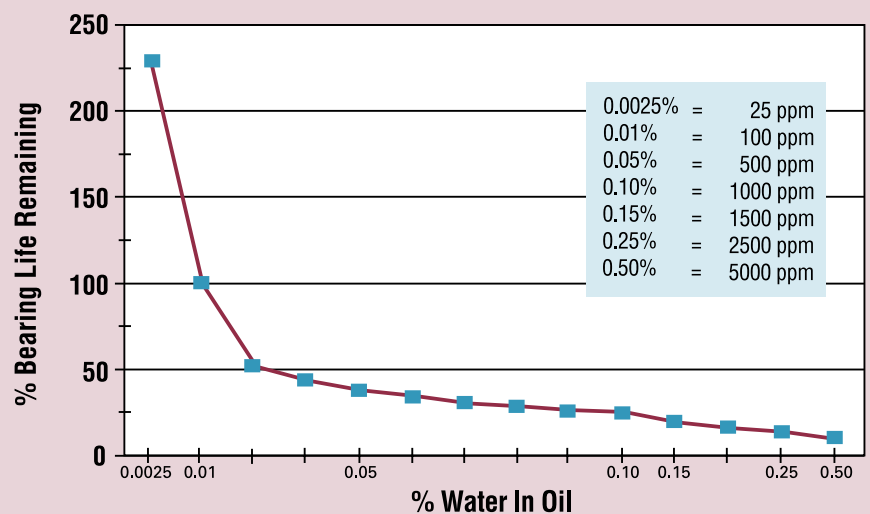
- Corrosion by etching metal
- Fluid breakdown, reduction of lubricating properties, additive precipitation, and oil oxidation
- Reduced dielectric strength
- Abrasive wear in hydraulic components

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.

**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	<ul style="list-style-type: none"> • Allows oil to heat more quickly 	<ul style="list-style-type: none"> • Starts to remove water more quickly
Moisture sensor	<ul style="list-style-type: none"> • Real-time water content indication in % saturation 	<ul style="list-style-type: none"> • At-a-glance visual confirmation
Automatic operation	<ul style="list-style-type: none"> • Unattended use • Designed for 24/7 operation 	<ul style="list-style-type: none"> • Reduces labor costs • Increases operation time
Stainless steel used for all wetted surfaces	<ul style="list-style-type: none"> • No corrosion 	<ul style="list-style-type: none"> • Product reliability
Compact size	<ul style="list-style-type: none"> • Smallest envelope in the industry • Ease of portability 	<ul style="list-style-type: none"> • Fits in tight areas • Encourages use
Clear plexiglass covers on the condensate tank and vacuum chamber	<ul style="list-style-type: none"> • See the vacuum dehydration process work 	<ul style="list-style-type: none"> • Visual verification of water removal
Desiccant breather	<ul style="list-style-type: none"> • Insures dry, clean intake air 	<ul style="list-style-type: none"> • More efficient operation
Reverse phase switch	<ul style="list-style-type: none"> • Enables easy changing of motor rotation if out-of-phase 	<ul style="list-style-type: none"> • Ease of maintenance • Prevents incorrect rotation
Condensate holding tank with optional auto drain	<ul style="list-style-type: none"> • Large volume for infrequent servicing intervals 	<ul style="list-style-type: none"> • Reduces maintenance costs
Programmable thermostat	<ul style="list-style-type: none"> • Maintains oil within 1°F • Prevents overheating the oil 	<ul style="list-style-type: none"> • Unattended operation
Forklift guides and lifting eyes	<ul style="list-style-type: none"> • Provides safe and secure method of lifting the unit 	<ul style="list-style-type: none"> • Employee safety
Coalescing or packed tower oil dispersal elements	<ul style="list-style-type: none"> • Flexibility with various fluid viscosities 	<ul style="list-style-type: none"> • Greater efficiency in removing moisture

PVS

Portable Purification Systems

Potential Contaminant	PVS Performance
Solid particulate	ISO Cleanliness Code* 14/13/10 Attainable
Water	Removes 100% of free water, 80-90% of dissolved water.
Air	Removes 100% of free air, 90% of dissolved air.
Gases	Removes 100% of free gases, 90% of dissolved gases.

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

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

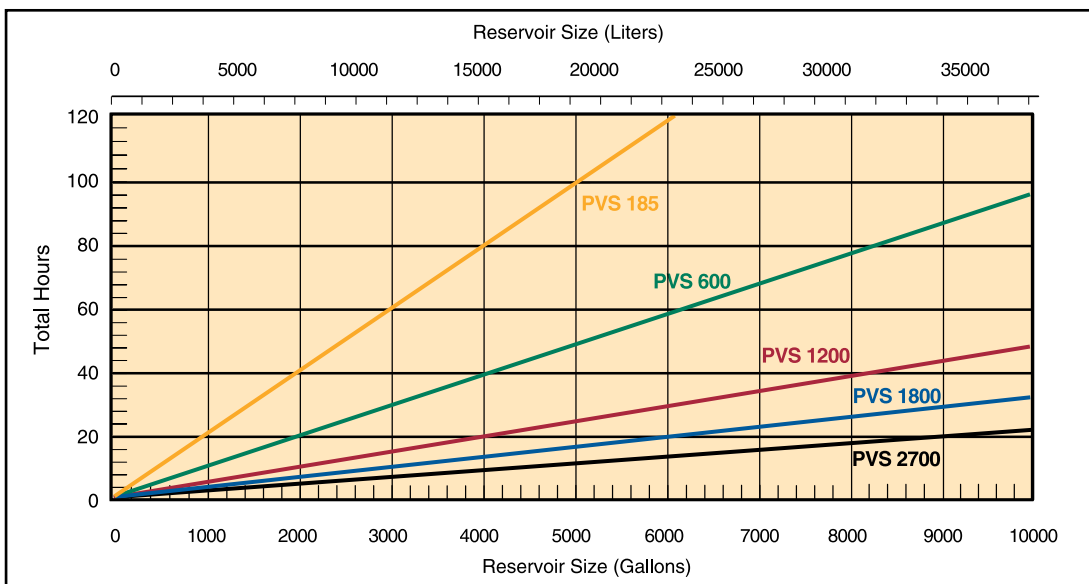


Start



Stop

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



PVS 185

SPECIFICATIONS

Flow rate	5 gpm (18.9 lpm)
Height	65" (1651 mm)
Width	33" (838.2 mm)
Length	48" (1219.2 mm)
Weight	650 lbs. (294.8 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 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

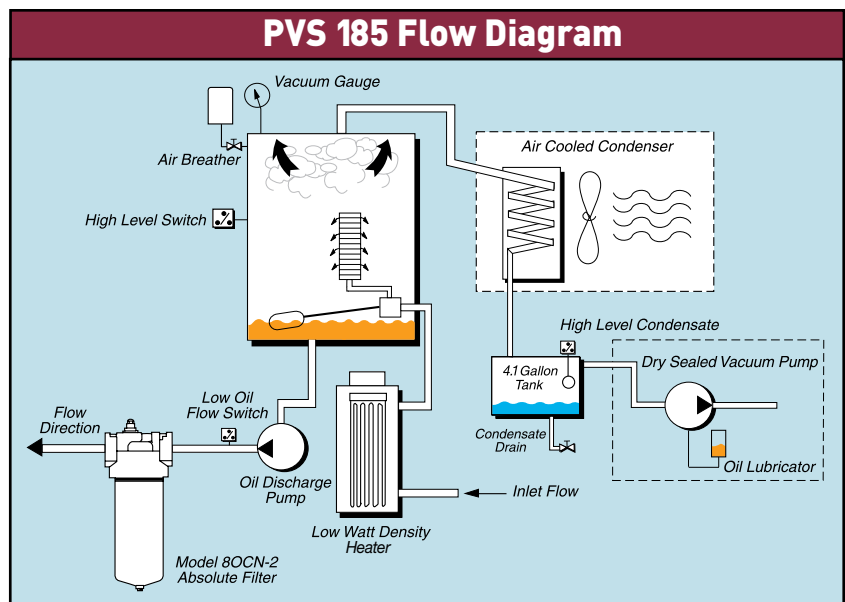
OPTIONAL CORELESS PARTICULATE (IL8-3)

2QE (2 micron)	933734Q
5QE (5 micron)	933612Q
10QE (10 micron)	933735Q
20QE (20 micron)	933736Q

DISPERSAL

Disposable (Coalescing)	933180
Packed tower (Cleanable)	933553

PVS 185 Flow Diagram



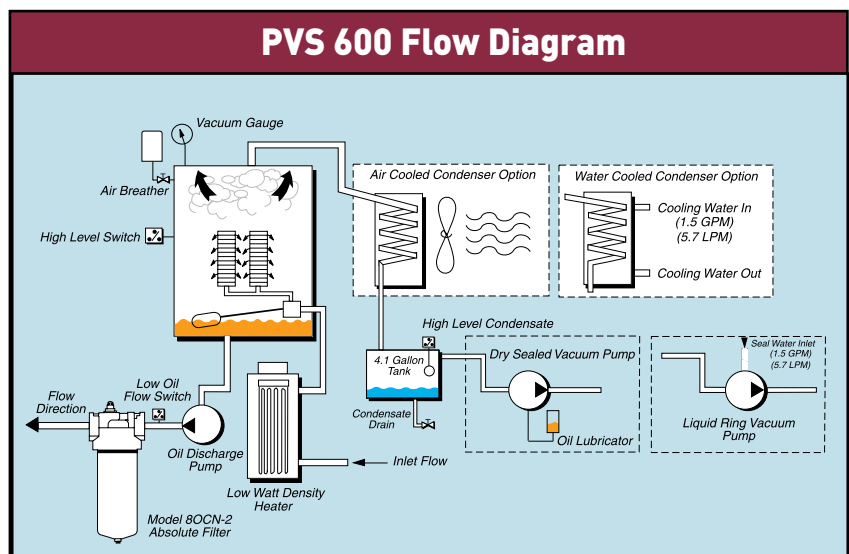
PVS 600

SPECIFICATIONS

Flow rate	10 gpm (37.9 lpm)
Height	65" (1651 mm)
Width	33" (838.2 mm)
Length	48" (1219.2 mm)
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)



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)	
2QE (2 micron)	933734Q
5QE (5 micron)	933612Q
10QE (10 micron)	933735Q
20QE (20 micron)	933736Q
DISPERSAL	
Disposable (Coalescing)	933180
Packed tower (Cleanable)	933553



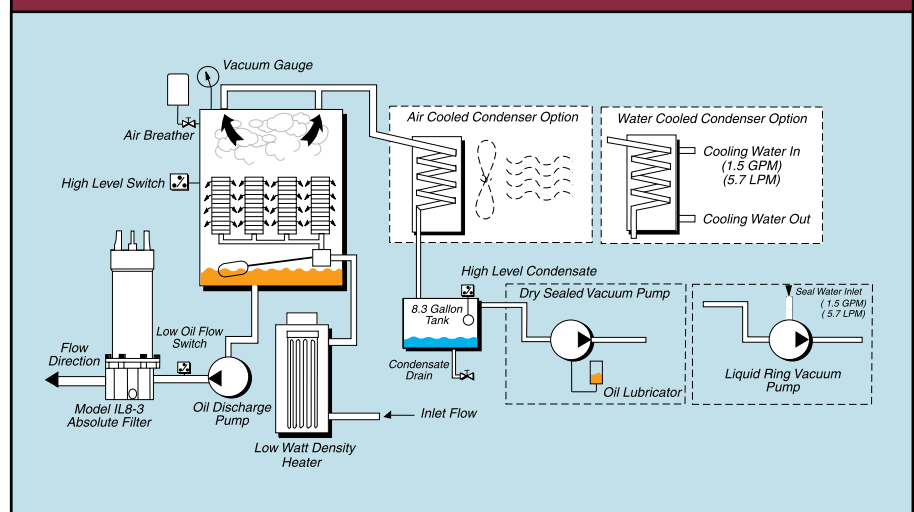
PVS 1200

SPECIFICATIONS

Flow rate	20 gpm (75.7 lpm)
Height	65" (1651 mm)
Width	44" (1117.6 mm)
Length	61" (1549.4 mm)
Weight	1550 lbs. (703.1 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" NPTF inlet 1" JIC (male) outlet
FLA (full load amps)	30-48 amps (Depending on options & voltages)



PVS 1200 Flow Diagram



REPLACEMENT ELEMENTS

DISPERSAL

Disposable (Coalescing)	933180
Packed tower (Cleanable)	933553

STANDARD CORELESS PARTICULATE (IL8-3)

02QE (2 micron)	933734Q
05QE (5 micron)	933612Q
10QE (10 micron)	933735Q
20QE (20 micron)	933736Q

PVS 1800

SPECIFICATIONS

Flow rate	30 gpm (113.6 lpm)
Height	66" (1676.4 mm)
Width	42" (1066.8 mm)
Length	73" (1854.2 mm)
Weight	2550 lbs. (1156.7 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" NPTF- inlet 1.5" JIC - outlet
FLA (full load amps)	40-65 amps @ 460 V/60hz

REPLACEMENT ELEMENTS

DISPERSAL

Disposable (Coalescing)	933180
Packed tower (Cleanable)	933553

STANDARD CORELESS PARTICULATE (IL8-3)

02QE (2 micron)	933734Q
05QE (5 micron)	933612Q
10QE (10 micron)	933735Q
20QE (20 micron)	933736Q



PVS 2700

SPECIFICATIONS

Flow rate	45 gpm (170.3 lpm)
Height	66" (1676.4 mm)
Width	42" (1066.8 mm)
Length	73" (1854.2 mm)
Weight	2550 lbs. (1156.7 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" NPTF - inlet 2" NPTF - outlet
FLA (full load amps)	50-70 amps @ 460 V/60hz

REPLACEMENT ELEMENTS	
DISPERSAL	
Disposable (Coalescing)	933180
Packed tower (Cleanable)	933553
STANDARD CORELESS PARTICULATE (IL8-3)	
02QE (2 micron)	933734Q
05QE (5 micron)	933612Q
10QE (10 micron)	933735Q
20QE (20 micron)	933736Q



PVS 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. System volume: _____
15. Special requirements: _____

16. Any previous filtration problems with the application: _____
17. PVS model selected: _____

***Specification sheet must be completed before order can be entered**

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	12KW	AC	ACD DFL CR

BOX 1: SEALS	
Symbol	Description
None	Fluorocarbon
E8	EPR

BOX 4: VACUUM PUMP	
Symbol	Description
DS	Dry sealed
LR	Liquid ring

BOX 7: HEATER		
Model	Symbol	Description
185	12KW	12 KW/3 phase
600	12KW	12 KW/3 phase
	24KW	24 KW/3 phase
	36KW	36KW/3 phase
1200	24KW	24 KW/3 phase
	36KW	36KW/3 phase
	48KW	48 KW/3 phase
1800	36KW	36 KW/3 phase
	48KW	48 KW/3 phase
2700	48KW	48 KW/3 phase

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 5: DISPERSAL ELEMENT	
Symbol	Description
D	Coalescing (Disposable)
P	Packed tower (Cleanable)

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

BOX 6: PARTICULATE ELEMENT	
Symbol	Description
2QE	2 Micron Coreless Microglass III
5QE	5 Micron Coreless Microglass III
10QE	10 Micron Coreless Microglass III
20QE	20 Micron Coreless Microglass III
Note: Above elements are rated for Beta 200+ (99.5% efficiency)	

BOX 8: CONDENSER	
Symbol	Description
AC	Air cooled
LC	Liquid cooled
BC	Air and water cooled

BOX 9: OPTIONS	
Symbol	Description
None	Lifting eyes (4)
None	Moisture Sensor
None	Variable Flow Circuit
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
CSA	CSA Marked
DFL	Dirty Filter Light
DPG	Differential pressure gauge
EXP	Explosion Proof (Class I, Division II, Zone I and II)
ICV	Inlet Control Valve
IL8	Upgrade to IL8-3 coreless filter
PNW	Pneumatic Wheels
RHM	Resetable Hour Meter
SFI	Sight Flow Indicator

* Consult factory for special voltages

Notes
