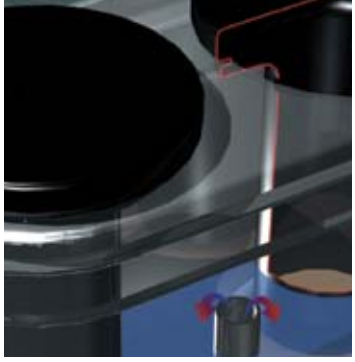
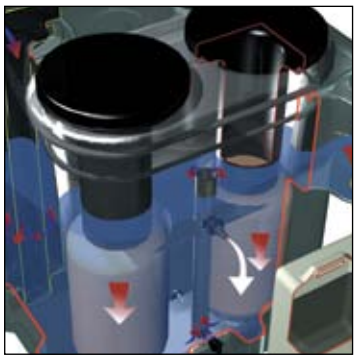




aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding

ES2000 Series

Oil / Water Separators

Parker

ENGINEERING YOUR SUCCESS.

The Problem

Discharging oil contaminated condensate from compressed air systems is not only harmful to the environment, it is usually illegal.

Oil spillages from industry do not have to be big to be serious. One litre of oil can cover 3500m^2 of water surface. One gallon of oil can cover 4 acres of water surface
All compressed air systems contain water, dirt, rust and even degraded lubricating oil which all mix together to form unwanted compressed air condensate. This abrasive sludge collects in piping systems, filters, aftercoolers and dryers and must be efficiently removed before it brings your production process to an expensive standstill.

Why oil is a problem?

The use of water and its transportation has been developed over the years. Behind the simple action of turning on a tap lies a vast network of pump houses, treatment works, laboratories, reservoirs and pipes to ensure that a supply of water suitable for human consumption is always available.

Water taken from rivers, reservoirs and underground sources is very carefully checked, treated and purified so that it is safe to drink.

As we have changed our mode of living, industry has developed and we have created problems with our water supply. Water we have used and contaminated finds its way back to the natural water courses and degrades the source of our supply.

A system of sewage purification using millions of bacteria and other tiny organisms which occur naturally is used to convert organic matter into carbon dioxide, water and nitrogen compounds.

Oil can seriously effect the efficient operation of sewage purification by obstructing oxygen transfer to the bacteria essential for sludge digestion. Because of the serious effects oil can create, very low industrial discharge limits are permitted.

Rigid legislation exists in most countries to protect the environment against contamination.

Most users of compressed air systems are unaware of exactly how much condensate is produced by their system each year, and the devastating effect it can have on the environment.

For example in Europe, a typical 28.3 m^3/min (1000 cfm), compressor and refrigeration dryer combination can produce up to 220,000 Litres (58,000 US gallons) of oil contaminated condensate per year, which increases significantly in warmer, more humid climates.

In the past, legal requirements have forced the compressed air user to have all this oily condensate removed, at significant cost Parker now have a lower cost solution.

The Solution

Efficient on-site disposal of compressed air condensate with the Parker ES2000 Series oil/water separators.

After the oily condensate has been efficiently removed from the compressed air system it cannot be discharged directly to the foul sewer without the oil content being reduced to within legal disposal limits.

The simple, economical and environmental solution is a Parker oil/water separator.

Oil/water separators are installed as part of the purification system and simply reduce the oil concentration in the collected condensate. By reducing the oil concentration in water to a permitted level, this allows the larger volume of clean water, up to 99.9% of the total condensate, to be discharged safely into the foul sewer. This leaves the relatively small amount of concentrated oil to be disposed of legitimately and economically.

Which separator type?

Most compressed air condensate is just a simple mixture of oil and water. Left over a period of time, the oil and water will separate naturally, as the oil, which has a lower density, rises to the surface of the water.

In certain instances, the condensate forms a stable emulsion. A stable emulsion will not separate over time, and for these applications, Parker recommend the use of an emulsion separator.

Benefits:

- **Help to protect and maintain the environment**
- **Efficiently separate oil and water on-site and return up to 99.9% of the condensate to foul sewers**
- **Meet trade effluent discharge regulations**
- **Rapid payback over conventional disposal methods**
- **Simple to install, operate and maintain**
- **Helps to achieve ISO14001 Certification**

Simple Test:
Take a sample of condensate and leave it for 24 hours.

If the oil & water separates into two distinct bands, then use the ES2000 Series of static oil/water separators.

If the condensate has not separated, an emulsion separator is required.

ES2000 Series oil/water separators.

This will also assist a company in achieving ISO14000

ES2000 Series Oil Water Separators clean and simple operation

Operation

Parker ES2000 Series of static oil/water separators are designed to separate compressor oil from condensate without the use of external power.

The oil/water condensate should be removed from the compressed air system using a drainage method appropriate for the unit.

Condensate from the system will enter the oil/water separator under pressure, and is allowed to expand in the specially designed centrifugal inlet chamber.

Liquid will drop out of the air stream as it impinges on the chamber walls of the vortex generator, draining without turbulence into the primary settlement chamber below.

Dirt particles suspended in the condensate will settle to the bottom of the primary settlement chamber and the accumulating condensate will then flow into the main settlement tank.

Entrained droplets of oil dispersed in the water will rise to the surface due to the lower specific gravity of the oil, eventually coalescing to form a thick layer on the surface.

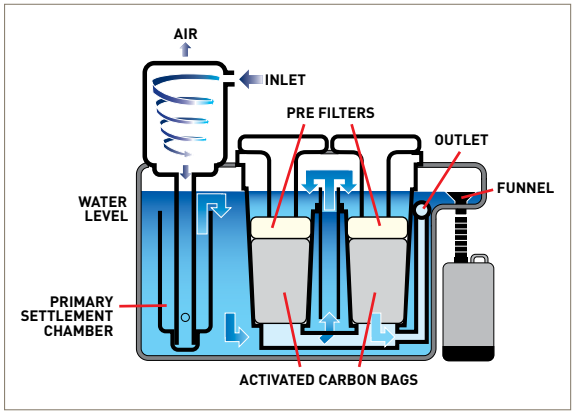
An adjustable oil funnel allows the oil to be continuously skimmed off the surface. Drained oil is collected in the external oil container where it can be disposed of according to legal requirements.

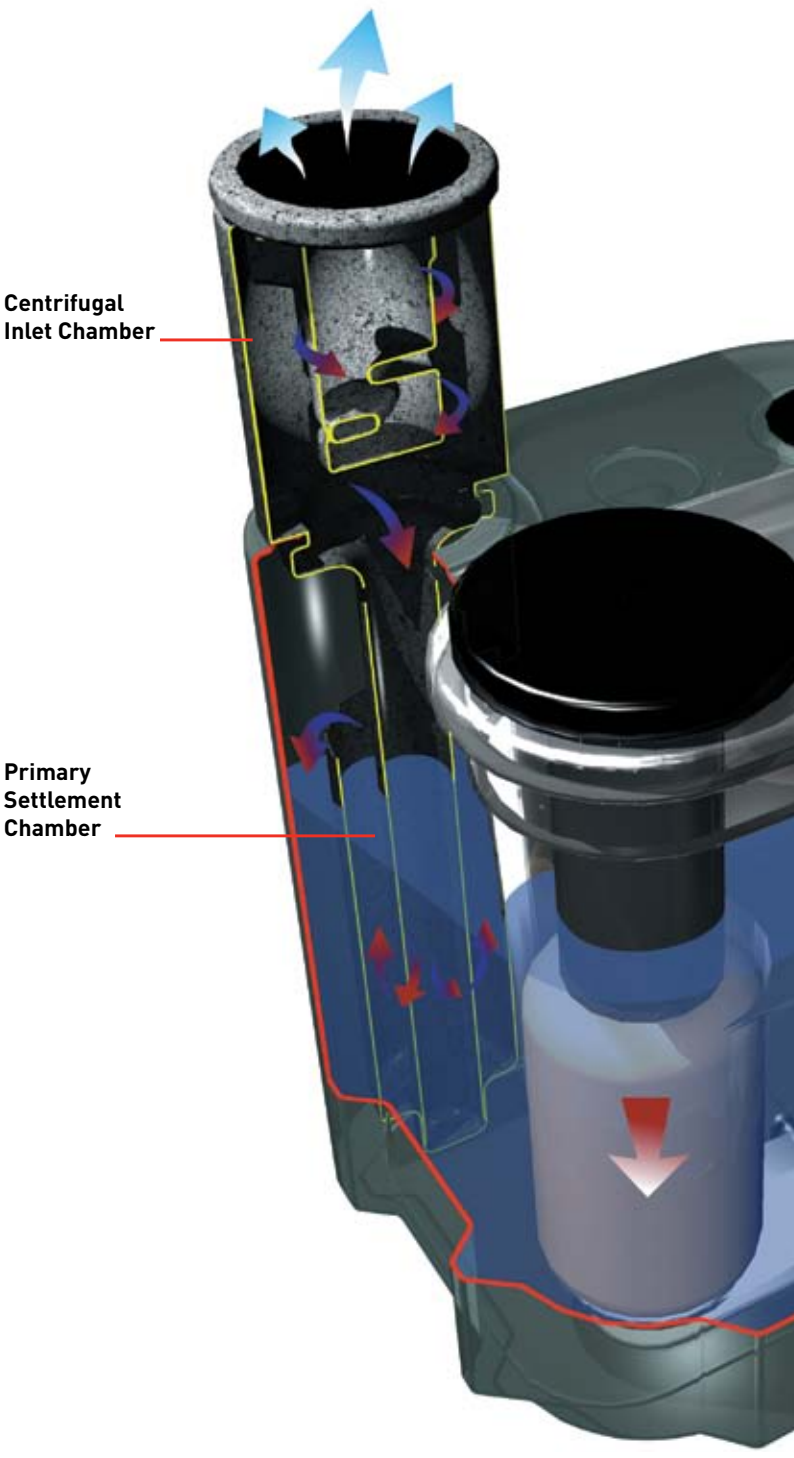
Cleaner water taken from the bottom of the tank, flows into the carbon stage, through a pre-filter, into the top of the carbon bags.

Any entrained droplets of oil remaining are then removed by adsorption.

The cleaned water can now be safely discharged to the foul sewer through the outlet.

Condensate Flow Path Diagram





Special Features

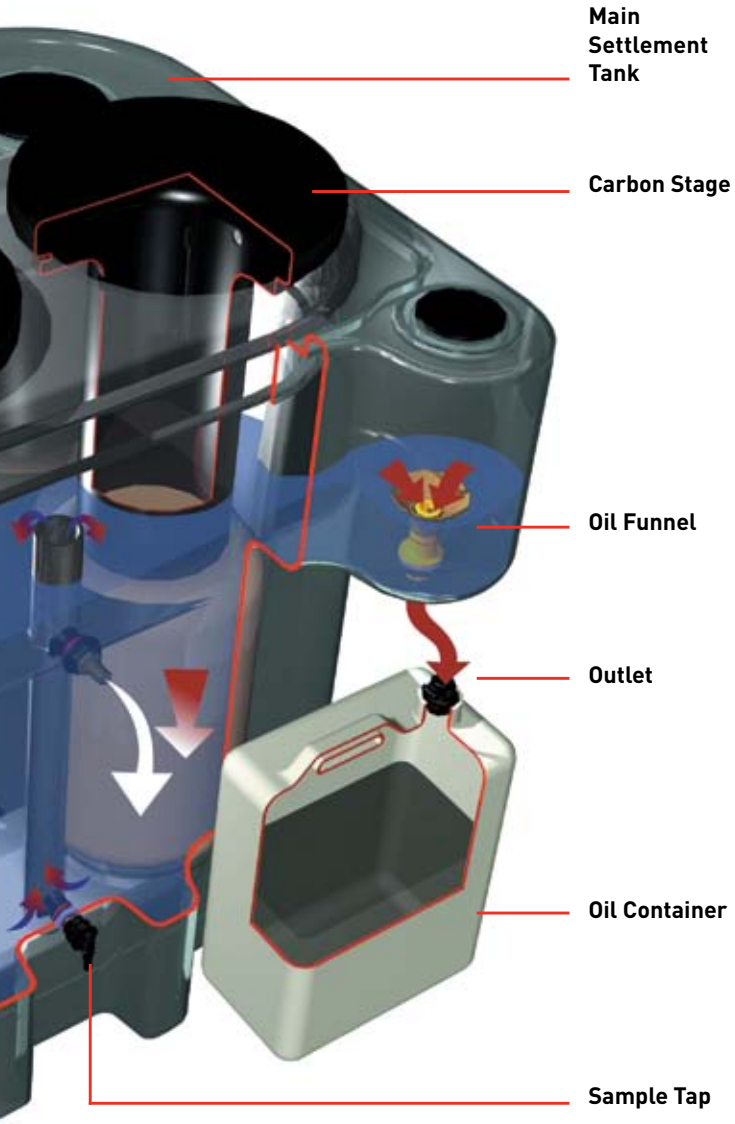
Air

Oil / water

Oil / clean water

Clean water

Oil



Model ES2600 sectional view of main settlement tank with twin carbon bags

Special Features

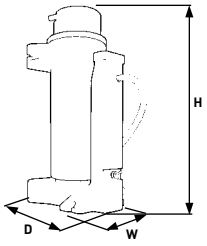
- Single piece units – reduce overall footprint
- Robust, corrosion resistant, polyethylene construction, includes ribbing for extra strength
- Large centrifugal inlet chamber provides effective venting of compressed air energy, whilst two inlet ports and four inlet chamber positions simplify installation
- Large, easily cleaned primary settlement chamber for the accumulation and removal of dirt particles
- Large main tank increases settlement time and reduces oil carryover to carbon filter stage
- Large internal galleries reduce risk of an internal blockage and simplify maintenance
- Oil absorbing pre-filter(s) protect carbon stage from bulk contamination
- Large carbon stage for increased contact time, improving water quality and extending carbon life
- High specification carbon for improved service intervals
- Adjustable oil outlet funnel for the efficient removal of separated oil
- Sealed external oil container for easy disposal
- Sample tap removes need to disconnect outlet piping when obtaining a test sample

Technical Data

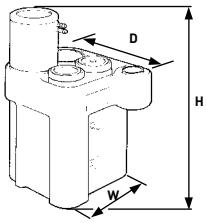
Model		ES2100	ES2150	ES2200	ES2300	ES2400	ES2500	ES2600
Inlet Connections		1 x ½" 1 x ¼"	1 x ½" 1 x ¼"	1 x ½" 1 x ¼"	1 x ½" 3 x ¼"	1 x ½" 3 x ¼"	1 x ½" 3 x ¼"	1 x ½" 3 x ¼"
Outlet Hose Connections		19mm (¾")	25mm (1")	19mm (¾")	25mm (1")	25mm (1")	25mm (1")	25mm (1")
Settlement Tank Capacity		N/A	60 litres	75 litres	125 litres	185 litres	355 litres	485 litres
		N/A	16 US G	20 US G	33 US G	49 US G	94 US G	128 US G
Max. Pressure		16 bar g (232 psi g)						
Min/ Max Temperature	°C	5 to 35	5 to 35	5 to 35	5 to 35	5 to 35	5 to 35	5 to 35
	°F	41 to 95	41 to 95	41 to 95	41 to 95	41 to 95	41 to 95	41 to 95
Material (Re-cyclable)		Polyethylene						

Weights and Dimensions

Model	Height (H)		Width (W)		Depth (D)		Weight			
							Empty		Full	
	mm	ins	mm	ins	mm	ins	kg	lbs	kg	lbs
ES2100	842	33.1	250	9.8	315	12.4	6	13	24.5	154
ES2150	810	31.9	350	13.8	430	16.9	10	22	78.5	173
ES2200	805	31.7	350	13.8	450	17.7	12	26	93.5	206
ES2300	1195	47.0	500	19.7	800	31.5	27	59	159	350
ES2400	1195	47.0	650	26.6	800	31.5	36	79	217	477
ES2500	1535	60.4	700	27.6	985	38.8	70	154	400	880
ES2600	1535	60.4	1000	39.4	1010	39.8	97	214	550	1210



ES2100



ES2150 to ES2600

Product Selection

Correct selection is critical for the operation of oil/water separators. Increased condensate flow through an oil/water separator reduces settlement time in the main tank, increases oil carryover to the carbon stage & reduces contact time with the carbon. The overall effect of incorrect sizing is poor outlet water quality, reduced carbon filter life and the potential for overflowing.

Capacities shown in this literature assume installation in two of the worlds major climatic conditions. Should the oil/water separator be installed in conditions other than those shown, please contact your local Parker outlet or approved distributor/ agent for correct sizing.

Oil types

To simplify the selection, lubricant classifications have been split into three bands depending upon their ability to separate within a static type oil/water separator.

Band A: Turbine Oil, Additive Free Oil

Band B: Mineral
Poly alpha olefins (PAO)
Trimethylolpropane Ester (TMP),
Pentaerythrityl Ester (PE)

Band C: Diesters, Triesters,
Polyoxyalkylene glycol (PAG)

Inseparable using Static Separation

Techniques: Automatic transmission fluid (ATF)

Drain type

The condensate should be removed from the compressed air system using a drainage method that does not cause emulsification of the condensate and is appropriate for the unit. Usual methods include :

- **Level Operated Electronic Drain**
- **Float Drain**
- **Timed Solenoid Drain***

Parker recommends the use of the ED3000 Series range of condensate drains. Manual and Thermodynamic Disc trap drains must not be used with the ES2000 Series oil/water separators.

***If the use of Timed Solenoid Drains is unavoidable, steps must be taken to reduce the air loss as this has an emulsifying effect on the condensate.**

Refrigeration dryers

A refrigeration dryer installed in a compressed air system can significantly increase the condensate produced. The oil/ water separator must be sized appropriately to treat the extra condensate produced. Flow capacities within this literature are shown both with and without a refrigeration dryer installed.

Important Note:
Additives blended into the lubricants to prevent bacterial growth, rusting, corrosion, and to promote emulsification, such as detergents etc., can have an impact on the separating process. Static oil/water separators are unable to separate stable emulsions or oils that are miscible in water. Additionally, these units will not totally separate lubricants containing: Emulsifying Agents; Glycol additives; or Polyglycol based coolants.

There are many factors which play a part in the selection of a static oil/water separator, with ambient conditions of the installation and oil type being the most important. Capacities shown in this literature assume installation in two of the worlds major climatic conditions. Should the oil/water separator be installed in conditions other than those shown, please contact your local Parker outlet or approved distributor/agent for correct sizing.

Climate Condition 1

System Conditions

Ambient Temperature at Compressor Inlet: 25°C (77°F)
Relative Humidity: 65%
Compressor Discharge Temperature: 35°C (95°F)
Refrigeration Dryer Dewpoint If Fitted: 2°C (35°F)
Min. System Temp. Without Refrigeration Dryer 30°C (86°F)
System Pressure: 7 bar g (102psi g)
Outlet quality: <20mg/l oil in water*

No Refrigeration Dryer Installed in System		Oil Type											
		Band A Turbine, Additive Free				Band B Mineral, PAO, TMP, PE				Band C Diesters, Triesters, PAG			
Compressor Type	Model	L/s	m³/min	m³/hr	cfm	L/s	m³/min	m³/hr	cfm	L/s	m³/min	m³/hr	cfm
Rotary Screw, Vane	ES2100	20	1.2	74	43	17	1.0	62	36	14	0.9	51	30
	ES2150	59	3.5	211	124	50	3.0	179	106	40	2.4	146	86
	ES2200	90	5.4	325	191	77	4.6	276	162	62	3.7	224	132
	ES2300	127	7.6	456	268	106	6.4	383	225	87	5.2	314	185
	ES2400	252	15.1	909	535	212	12.7	764	450	174	10.5	628	370
	ES2500	501	30.1	1804	1062	425	25.5	1530	900	346	20.8	1247	734
	ES2600	997	59.8	3590	2113	849	51.0	3057	1800	689	41.4	2482	1461

Refrigeration Dryer Installed in System		Oil Type											
		Band A Turbine, Additive Free				Band B Mineral, PAO, TMP, PE				Band C Diesters, Triesters, PAG			
Compressor Type	Model	L/s	m³/min	m³/hr	cfm	L/s	m³/min	m³/hr	cfm	L/s	m³/min	m³/hr	cfm
Rotary Screw, Vane	ES2100	15	0.9	55	33	13	0.8	46	27	10	0.6	38	22
	ES2150	44	2.6	158	93	37	2.2	134	79	30	1.8	109	64
	ES2200	67	4.1	243	143	57	3.4	207	122	47	2.8	168	99
	ES2300	95	5.7	341	201	79	4.8	286	169	65	3.9	235	138
	ES2400	189	11.3	680	400	159	9.5	572	337	130	7.8	470	277
	ES2500	375	22.5	1351	795	318	19.1	1145	674	259	15.6	934	549
	ES2600	746	44.8	2687	1582	635	38.1	2288	1347	516	31.0	1858	1093

Climate Condition 2

System Conditions

Ambient Temperature at Compressor Inlet: 35°C (95°F)
Relative Humidity: 85%
Compressor Discharge Temperature: 45°C (113°F)
Refrigeration Dryer Dewpoint If Fitted: 2°C (35°F)
Min. System Temp. Without Refrigeration Dryer 40°C (104°F)
System Pressure: 7 bar g (102psi g)
Outlet quality: <20mg/l oil in water*

No Refrigeration Dryer Installed in System		Oil Type											
		Band A Turbine, Additive Free				Band B Mineral, PAO, TMP, PE				Band C Diesters, Triesters, PAG			
Compressor Type	Model	L/s	m³/min	m³/hr	cfm	L/s	m³/min	m³/hr	cfm	L/s	m³/min	m³/hr	cfm
Rotary Screw, Vane	ES2100	8	0.5	28	16	6	0.4	23	14	5	0.3	19	11
	ES2150	22	1.3	80	47	19	1.1	68	40	15	0.9	55	33
	ES2200	34	2.1	123	73	29	1.7	105	62	24	1.4	85	50
	ES2300	48	2.9	173	102	40	2.4	145	85	33	2.0	119	70
	ES2400	96	5.7	345	203	80	4.8	290	171	66	4.0	238	140
	ES2500	190	11.4	684	403	161	9.7	580	341	131	7.9	473	278
	ES2600	378	22.7	1361	801	322	19.3	1159	682	261	15.7	941	554

Refrigeration Dryer installed in system		Oil Type											
		Band A Turbine, Additive Free				Band B Mineral, PAO, TMP, PE				Band C Diesters, Triesters, PAG			
Compressor Type	Model	L/s	m³/min	m³/hr	cfm	L/s	m³/min	m³/hr	cfm	L/s	m³/min	m³/hr	cfm
Rotary Screw, Vane	ES2100	6	0.4	23	13	5	0.3	19	11	4	0.3	16	9
	ES2150	18	1.1	64	38	15	0.9	55	32	12	0.7	45	26
	ES2200	27	1.7	99	58	23	1.4	84	50	19	1.1	69	40
	ES2300	39	2.3	139	82	32	1.9	117	69	27	1.6	96	56
	ES2400	77	4.6	278	163	65	3.9	234	137	53	3.2	192	113
	ES2500	153	9.2	551	324	130	7.8	467	275	106	6.4	381	224
	ES2600	305	18.3	1097	645	259	15.6	934	550	210	12.6	758	446

For systems using 1 or 2 stage piston/reciprocating compressors multiply compressor flow by 1.4 and select a separator from screw compressor flow rates shown, ensuring due consideration is given to oil type.

* For outlet quality levels of 10mg/l or 5mg/l please contact Parker for correct product selection.