

Electrostatic oil cleaners



KLEENTEK

by RIGHINI INDUSTRIAL DIVISION

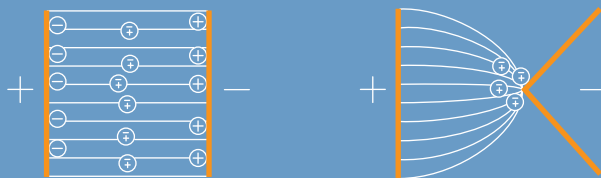
Kleentek technology

A contaminant particle, regardless of its nature (whether it be dust, metal, rust, sludge etc.) and size (from many microns to molecular size), can only be either:

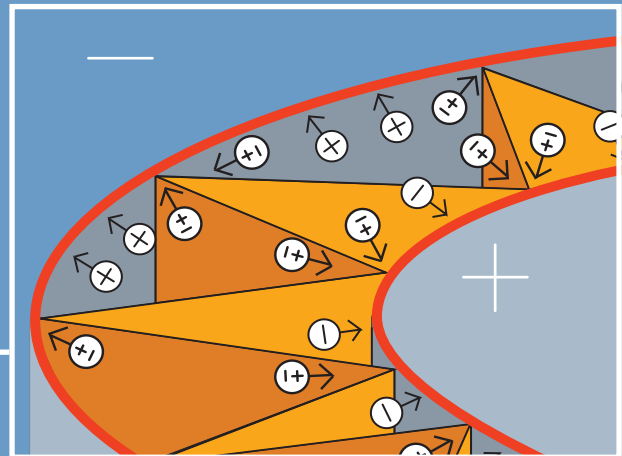
+ Positive **- Negative** **± Neutral**

⊕ ⊖ ±

In a uniform high potential electrostatic field produced by parallel electrodes, the positive particles are attracted/pushed towards the negative electrode and viceversa (electrophoresis). In this situation, the neutral particles are not influenced. In contrast, if one electrode has a sharp edge, the concentration of forces is so strong that it can polarise even neutral parti-



cles which become positive or negative (dielectrophoresis). The KLEENTEK oil cleaner combines these two effects in a single cylindrical cartridge (the collector) that can remove any kind of contaminant from the oil, irrespective of its size or nature.



The collector

The KLEENTEK collector is not a filter: it is a cartridge through which the oil passes from the bottom to the top without coming against any obstacles and therefore without coming under pressure.

Quick and easy to replace, it is made up of a cylinder with coaxial aluminium cylinders inside, separated by dielectric material in fan-like folds. Regardless of their size, the contaminants in the oil are electrostatically attracted and captured by the collector's cylindrical walls. KLEENTEK collectors never clog, even when handling particularly dirty oils.

Thanks to their large holding surface, KLEENTEK collectors can capture a very large quantity of contaminants, far greater than that collected by traditional filters.

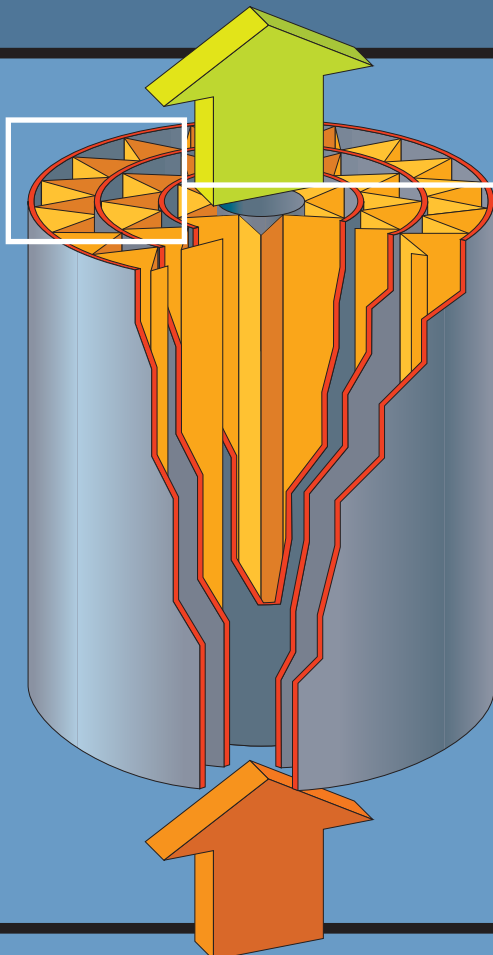
This feature gives the collector an extraordinary long service life and therefore guarantees reduced maintenance costs.

A KLEENTEK collector is easy to dismantle (all you need to do is remove a few clips).

Moreover, by separating the paper parts from the metal parts, it is possible to reduce its volume and make disposal easier.

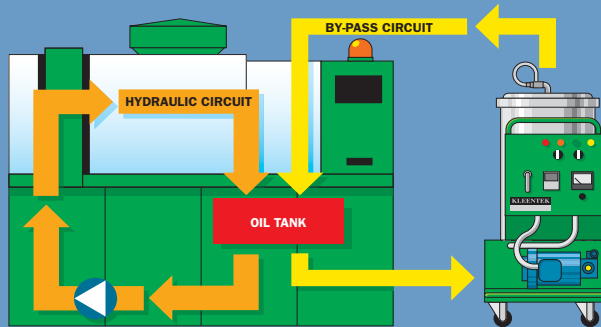


Collector mod. CC-R 50 SP



Application diagram

The KLEENTEK electrostatic oil cleaner works as a by-pass unit and therefore can be installed and removed without the need to stop the machine it is connected to and interrupt production. It can work whether the machine is running or not. The cleaner's pump creates a continual external flow of oil, which remains separate from the machine's circuit: in short, the oil is sucked out of the tank, passes through the cleaner and returns to the tank. The KLEENTEK electrostatic oil cleaner can be used for cleaning the oil in a single tank (a permanently installed cleaner) or for cleaning the oil in several systems (cleaner used in rotation).



Fields of application

The KLEENTEK electrostatic oil cleaner can be used in the following applications:

Hydraulic systems

- Hydraulic presses
- Injection moulding presses
- Blow moulding machines
- Forging presses
- Extrusion presses
- Rubber presses
- Ceramic/tile presses
- Hydraulic controls
- Machine tools
- Paper machines
- Hydraulic test stands

Lubrication systems

- Turbines
- Compressors
- Vacuum pumps
- Bearings
- Rolling mills

Test stand

- Test oil

H.V. Transformers

- Insulating oil

Guide to correct sizes

In order to choose the cleaner most suited to a specific application, we must consider the oil working conditions, the type of oil, its viscosity and the quantity of oil that needs treating. The following chart shows the maximum amount of oil that each model can manage, de-

pending on the oil viscosity.

These maximum values are a rough guide and could be less depending on the conditions of the application. KLEENTEK technicians can help you find the best solution for any specific requirements (a custom service).

Max. oil quantity (litres)

Unit	Oil viscosity ISO VG		
	32	46	68
ELC - R 100 SP	48.000	33.000	22.000
ELC - R 50 SP	24.000	16.000	11.000
ELC - R 25 SP	12.000	8.000	5.500
ELC - R 10 SP	5.000	3.400	2.200
ELC - R 6P SP	1.600	1.100	750
ELC - R 3P SP	800	550	380

Types of oil that can be cleaned:

- Mineral oils (except engine oil and oil HLP-D according to DIN 51524/2)
- Synthetic oils (PAO, ester, vegetable, with a standard unit)
- Phosphate ester (except Skydrol) and PGA (with a special unit)

Specifications

Power	Size (w x l x h) [mm]	Weight [Kg]	Flow rate [l/min]	Collector type n/model
600 W	530x1066x1080	161	12.0	2/CC-R50SP
500 W	530x725x1080	108	9.0	1/CC-R50SP
150 W	350x675x950	72	3.7	1/CC-R25SP
150 W	350x675x915	70	2.2	1/CC-R10SP
150 W	386x359x531	23	1.2	2/CC-R3SP
150 W	361x311x531	20	1.2	1/CC-R3SP

- Max oil temperature: 65 °C (constant) (H type for temperature up to 90 °C)
- Max Viscosity: 600 cst
- Max water content removable: 500 ppm
- Standard power source: 230 V 1P - 380 V 3P

Functional features

The KLEENTEK electrostatic oil cleaner offers many unique advantages:

- works as a by-pass unit to the oil tank 24 hours a day;
- there is no pressure inside and it doesn't clog, even with particularly dirty oils. Consequently there are no safety issues (vibrations, pipe breakages, leaks etc.) and it does not require any particular maintenance or supervision;
- thank to its limited overall power (from 150 to 1.200 W), the power consumption is negligible;
- it has a low flow rate, allowing it to work as a by-pass without causing problems for the system it is connected to;
- it can remove water at a rate up to 500 ppm;
- it is an excellent and reliable humidity (and water) monitoring system, one of the most dangerous contaminants for oil and for circuits;
- it does not remove oil additives;
- it does not affect oil's chemical makeup;
- it is compact, making it very practical and simple to use in all circumstances;
- it does not require any specific maintenance and therefore there are no unexpected costs;
- it is very simple and very hard-wearing which means it boasts a very long service life without problems.

Kleentek: unique technology

The KLEENTEK electrostatic oil cleaner is the only technology that:

- removes any kind of contaminant from the oil, regardless of its size and its nature and therefore it is the only technology able to totally remove even insoluble oil oxidation products, so called "varnish";
- ensures that oil cleaned with this technology removes the deposits accumulated in the circuits ensuring the perfect cleaning of all components (valves, pumps, filters, etc.);
- ensures that, while passing through the collector, the oil does not become electrostatically charged, as happens when using standard filtration system. This protects the oil and the circuits involved;
- ensures a significant increase in the oil's service life;
- encourages us to no longer consider oil a consumable but rather as a precious technological fluid and as a long-term asset to be maintained in good conditions over time.

Results

The KLEENTEK electrostatic oil cleaner guarantees that all circuit components are kept clean (especially the most fragile components such as valves, filters, pumps, etc.) and that results considered unthinkable with traditional filtering system can be attained:

- reduction of maintenance costs (manpower and spares);
- reduction of - machine malfunctioning - and breakdowns;
- improvement of equipment dependability and efficiency;
- faster machine start-up times;
- less friction and therefore less wear and energy consumption;
- increase in process repeatability;
- increase in product quality;
- reduction in number of rejects;
- reduction of stock spare parts.

As well as the undeniable economic advantages, the KLEENTEK electrostatic oil cleaner also offers remarkable benefits in terms of environmental protection:

- reduction in energy consumption;
- the prolonging of oil service life;
- cleaner and safer equipment.

A highly innovative tool, essential for the efficiency of any industrial process, the KLEENTEK electrostatic oil cleaner guarantees a real return on investment which is easily evaluated at the planning stage, helping to enhance the company's overall competitiveness.

The models



ELC-R100SP



ELC-R50SP



ELC-R25SP



ELC-R10SP



ELC-R6PSP



ELC-R3PSP

Analysis Kit Kleentek Contaminant Checker

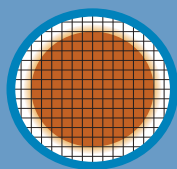
In order to monitor the electrostatic oil cleaner's work and to find out the level of contaminants present in the oil at any time and quickly, KLEENTEK Contaminant Checker kit is available.

This kit allows you to perform the gravimetric patch test quickly and easily. It is a test that is as precise as it is easy to carry out. A measured oil sample, is diluted (with petroleum ether) and passed through a filter/membrane of a porosity of 0,8 microns (or less) with the help of a vacuum pump. All the larger contaminant particles are captured on the membrane's surface.

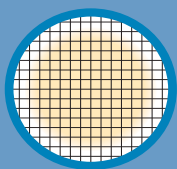
This fine porosity is used to detect all the contaminants, and in particular the smallest kinds i.e. those produced by oil oxidation (so called "varnish").

Since the latter are extremely minute, they are normally left undetected in normal test based on particle counts (ISO code 4406 or NAS 1638).

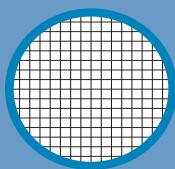
The examples shown here highlight the difference between



Dirty oil



Oil filtered
by a traditional filter



Oil cleaned
by Kleentek



the test results on oil "filtered" by a standard filter and on oil "cleaned" by KLEENTEK.

The brown stain on the first sample completely disappears in the second sample. This demonstrates the extraordinary efficiency of the KLEENTEK electrostatic cleaner.

Easy to use, the membrane patch test can be carried out by the machine's own operator and it is the quickest and most accurate system available to verify the oil contamination level and therefore to evaluate the equipment's level of safety and dependability.



KLEENTEK

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