

Ref. 11020-9

MICROPPALOIL non-miscible liquids separator

Small sized = reduced space required

*Diaphragm pneumatic pump = safe working without electric cables,
self-priming pump*

*Working under reduced pressure = indifferent level positioning, in
charge or discharge*



Height : 50 cm Diameter : 42cm

The « **MICROPPALOIL** » device is designed in view of continuous separation of compounds of 2 non-miscible liquids of different densities; for example: water / hydrocarbon, water / fat, cutting oils (emulsions) / hydrocarbons; waste water / hydrocarbons.

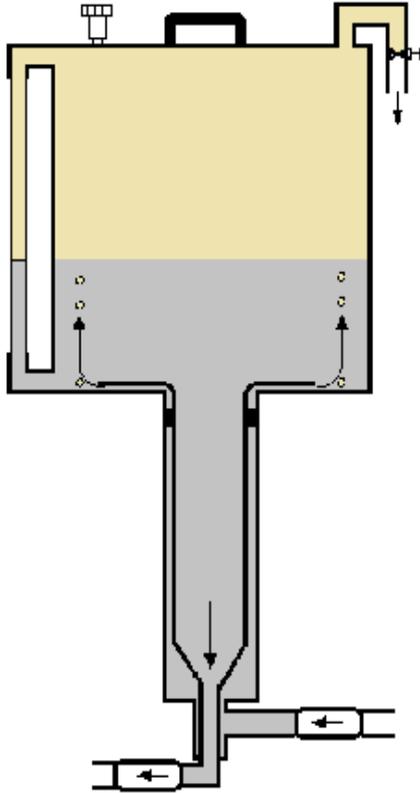
The result, after separation, is obtaining water or water based emulsions without any hydrocarbons and hydrocarbons without any water, whatever the percentage of components of the compound to be treated could be.

The separation process is based on the difference of density between the two liquids to be separated and their non-miscible property, i.e. decanting the liquid to be treated in the upper part of the « resting chamber » (without any turbulence), in order to get the lighter liquid floating on top of the denser one. ***This is not a gravity device.***

Once the dense phase decanted, (usually aqueous), it is recycled in the effluents separation tank, whilst the light phase trapped in the upper part of the « **MICROPPALOIL** » device is floating and consequently can be decanted at any time, in accordance with the needs of the user. Saturation of light decanted phase in the « **MICROPPALOIL** » device, due to lack of draining by the user, does not lead at all to any outflow on the floor, but only a backflow to the primary effluents separation tank.

Draining the light phase (whilst the device is working), does restart without any further action the separation of the non-miscible liquids.

The pumping of liquid to be treated is performed by means of a floating surface strainer.



Unlike oil separators – most often based on separation of non-miscible liquids by coalescence – the capacity of the « **MICROPPALOIL** » separator is not calculated on the quantity of water carried off, but on the quantity of oil which can be extracted from the liquid matrix, without any output adjustment of light or dense fluids, whatever the concentration of oil, water, or cutting emulsion to separate (in case of machine tools) might be, what does reduce the quantities of fluid to be treated in order to obtain the same result, as well as the consumption of energy in proportion to the output.

Thus a « **MICROPPALOIL 110** », has the capacity to « extract » 110 litres oil (or light fluid) per hour for a nominal output of 1.8 litre / minute.

WORKING:

The device operates without any moving part. There is no coalescence filter (union of droplets of an emulsion) and it operates under reduced pressure, the latter corresponding to the desired discharge height, within the capacity limits of the diaphragm pneumatic pump, i.e. at least 10 metres water column (at the discharge) for an aspiration of 5 metres (the pump being self priming).

(It has to be stressed out that the concerned pneumatic pump is indicated as for 7 bar at the discharge).

The efficiency of the process allows reducing significantly the volume of the device (diameter / height).

DESIGN:

- The floating suction strainer, which does pump the liquid to be treated, is made of polypropylene; its buoyancy is adjustable in accordance with the density of the liquid to be treated and the desired liquid output.
- The oil separator body is made of stainless steel 316L (other materials upon request).
- The pump is a « diaphragm without pulsation damper » type pump, appropriate for processing any type of fluid. An electrically driven pump can be fit upon specific request.
- All components of the micro oil separator are readily removable in order to make maintenance processes easier.
- The peripheral devices (pneumatic diaphragm pump, particle filter and adjusting devices of pump compressed air feeding), are fit on the stand of the « **Micropalmoil 110** » by means of neodymium magnets, which do guarantee a full adhesion of the whole, every single component being then dismantled without any effort nor tool in view of the maintenance of the 1.000 microns stainless steel particle filter, the replacement of the diaphragms about every two years, or for a simple « grooming » of the separator's body at user's request.



- The connecting pipes are set up with nitrile joints which are hydrocarbon resistant and don't need any tools in order to be fixed or replaced, if need be.

Some data regarding the fluid mechanics, determining design, operation and performance of the MICROPALOIL non-miscible phases separator.

It has to be considered, to start with, that all the walls of the hydraulic circuit of the **MICROPALOIL** device are exclusively made of "smooth" materials in order to minimize as far as possible roughness that generates turbulences which are detrimental for separation of non-miscible liquids.

A floating strainer made of polypropylene is used for pumping the aqueous effluent; this choice has been determined by the latter's density (less than 1), and the chemical inertness of this material towards the media encountered in metalworking fluids.

The floating strainer allows, as a priority, the elimination of the surface fluid (light liquid phase), without introducing any air into the suction pipe of the effluent, which is not a compulsory condition for the appropriate working of the **MICROPALOIL**, which has in its upper part an automatic air valve, as far as the device is working under reduced pressure.

The input of the effluent in the separator of non-miscible phases is operated by using a diaphragm pump without any need of a pulse dampener; this type of pump has been chosen in order to operate at a maximum rate of 10% of the nominal flow, using the balance between pressure and flow of the fluid at the outlet of the volumetric pump and thereby reducing considerably the wear of diaphragms and providing to them an exceptional longevity.

The device operates consequently without electrical power. If requested, the treatment programming can then be performed by opening or closing the outlet pipe of the pump - without any risk of damaging the equipment – by means of a self-contained programmer (without any power feeding unit), which is not supplied.

The **MICROPALOIL** operating system is regulated by the mechanics of so-called non-Newtonian fluids, i.e. in other words when their deformation is directly proportional to the force applied to them; they are characterized by a coefficient of viscosity dependent on pressure and temperature.

The temperature being considered uniform on the whole hydraulic piping system of the non-miscible liquid phases separator, and as far as an infinitesimal increase in pressure can take place only at the level of the ball valve of the pump, the fluid flow is considered « uniform », irrotational (without vortices), which doesn't generate any multi-phase outflow.

That induces an almost laminar, even flow, in accordance with the separation of non-miscible liquid phases; it may be almost transient during the warm season, given the presence of oil and water, but never turbulent.

TECHNICAL SPECIFICATIONS

The information of the following tables can be modified, without any notice, according to the technical developments of the products presented:

Model / Ref.	Micropaloi 110 (machine tools)	Micropaloi 500 (hydrocarbon waste)	Micropaloi 1000 (hydrocarbon waste)
Operating flow in l/minute	1,8	8,5	17
Correspondence in l/hour	110	500	1000
Compressed air flow	1,7 Nm ³ /hour	2,7 Nm ³ /hour	5,1 Nm ³ /hour
Size	Height : 500 mm Diameter : 420 mm	Upon request	Upon request
Unladen weight	15Kg	/	/
Compressed air pressure	1 bar	1 bar	2 bar

EQUIPEMENT DESCRIPTION:

	Number	Type / Material
Floating strainer	1	Polypropylene
Pneumatic pump / electrical	1	Body of polypropylene ATEX
Separator body	1	Stainless steel nuance 316L
Valves	1	Stainless steel
Diaphragm (bi components)	2	PTFE on the liquid side, EPDM on the compressed air side
Float	1	According to density detect. limit

Note: only the original parts do guarantee a good working of the non-miscible liquid phases separator, particularly the parts of the diaphragm pneumatic pump. Any non original part fit onto the « Micropaloi », releases the responsibility of the manufacturer and renders the guarantee null and void.

Information: *the level gauge (vertically fit on the outside of the upper body of the « MICROPPALOIL » non-miscible liquid phases separator), is a polyamide gauge and has in no case at all to be brought in contact with alcohol, or with products containing alcohol, as for example some maintenance and surface cleaning products (particularly for windows and mirrors).*

Technology: patent pending in Switzerland.

For technical and commercial information
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