

MONOSTAGE LIQUID/LIQUID CENTRIFUGAL CONTACTORS



PHARMACY

Purification of active principles (example: antibiotics).



CHEMICALS

Washing of polymers or extraction (example: acetic acid).



FOOD INDUSTRY

Purification of good components (Lactic and Citric acids).



HYDROMETALLURGY

Separation or purification (precious metals).



PARACHEMISTRY

Perfumes, aromas, essential oils,...

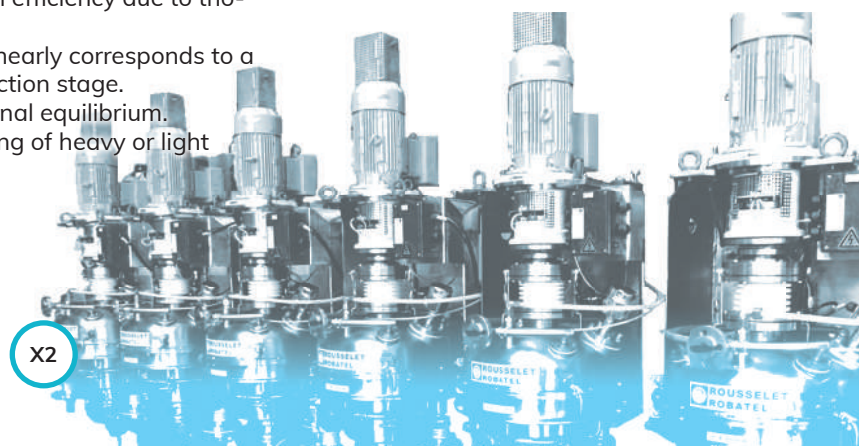
COMMON FEATURES AND ADVANTAGES

- Direct motor coupling to the main shaft.
- No bottom bearing in process area.
- Unique all-fluoropolymer construction for corrosive applications.
- Optional pharmaceutical grade polishing.
- Centrifuges perfectly adapted to both batch and continuous operations.
- Short retention time and low liquid hold-up.
- Efficient phase separation utilizing centrifugal force.
- Various agitator designs to accomo-

date a wide range of solvent systems.

- Low mix turbines for shear sensitive applications.
- Unattended operation.
- High throughputs achieved in compact unit.
- High extraction efficiency due to thorough mixing.
- Each extracto nearly corresponds to a theoretical extraction stage.
- Rapid operational equilibrium.
- Internal recycling of heavy or light liquid phase.

- Can serve as liquid/liquid separator and/or liquid/liquid extractor.
- Possibility to connect several BXP in series (no-inter-stage pumps required) to achieve the required number of stages.

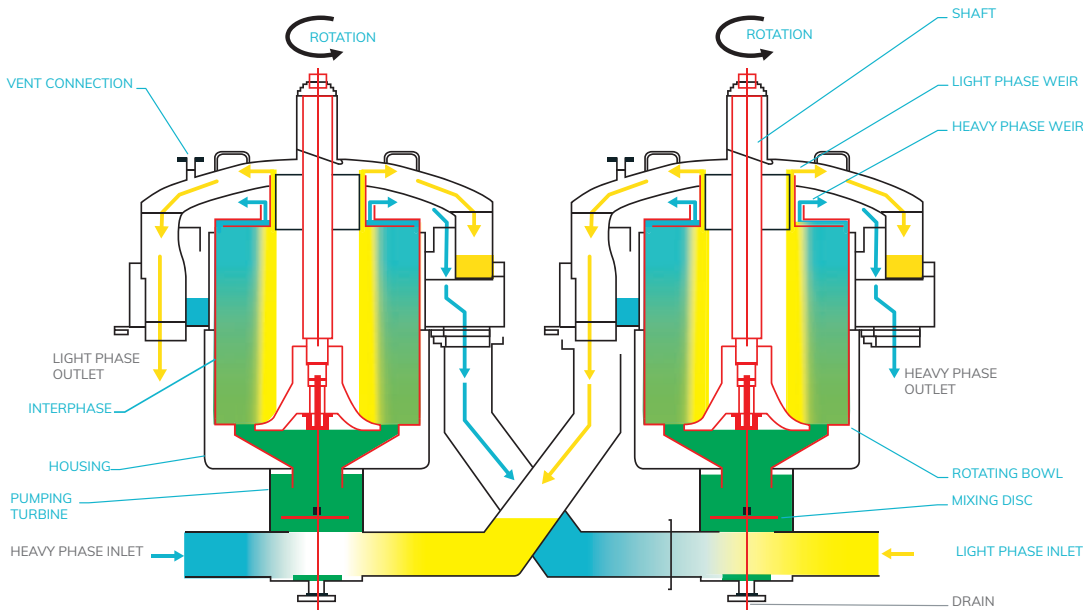


LIQUID/LIQUID EXTRACTORS

EXTRACTION CONFIGURATION

When operating as a centrifugal extractor for performing liquid/liquid extractions, a feed solution, containing one or more solutes (shown in blue), and an immiscible solvent (shown in yellow) with a different density than that of the feed solution are fed to the mixing chamber located on the bottom of the centrifuge housing.

A rotating agitator disc mixes the two immiscible liquids into a dispersion (shown in green). Different agitator disc design can be used depending upon the liquid's interfacial tension. The efficient mixing creates a large interfacial area between the two liquids to ensure maximum mass transfer of the solutes.



2 stage battery for counter-current extraction

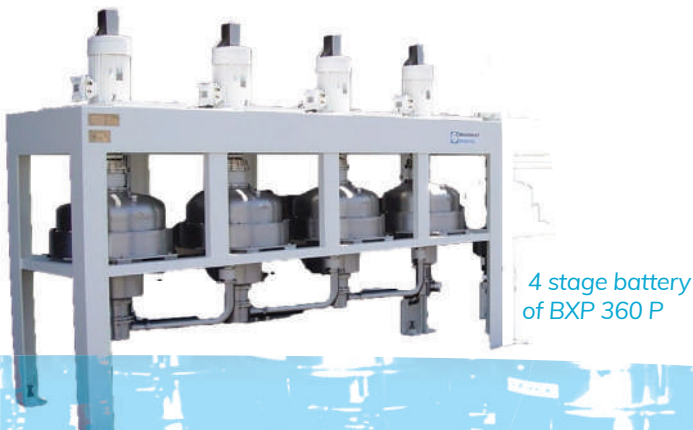
An efficient mixing allows a large interfacial area between two liquids, so making the solute(s) transfer easier.

- **The dispersion** is aspirated into the centrifuge bowl by a turbine located on the bottom of the rotating bowl.
- The liquids are separated by the centrifugal force generated by rotating bowl. The heavier liquid (shown in blue) occupies the outer portion of the bowl. The light liquid (shown in yellow) occupies the inner portion of the bowl.
- The position of the liquid/liquid interface is regulated by a heavy phase weir.

- **Interchangeable heavy phase weirs** of different diameters accommodate a wide range of density ratios.
- **The heavy phase** underflows to a static receiving chamber. **The light phase overflows** to a separate static receiving chamber.
- **The liquids are discharged by gravity** to the next BXP centrifugal extractor or to downstream equipment.

For multi-stage extraction processes, BXP centrifugal extractors can be installed in series to provide the required number of stages. **No inter-stage pumps required between the extractors.**

The external inter-stage piping allows liquids to be fed into or routed out of the extraction process (main extraction, scrubbing, back extraction) as required for optimum flexibility.



BXP 012

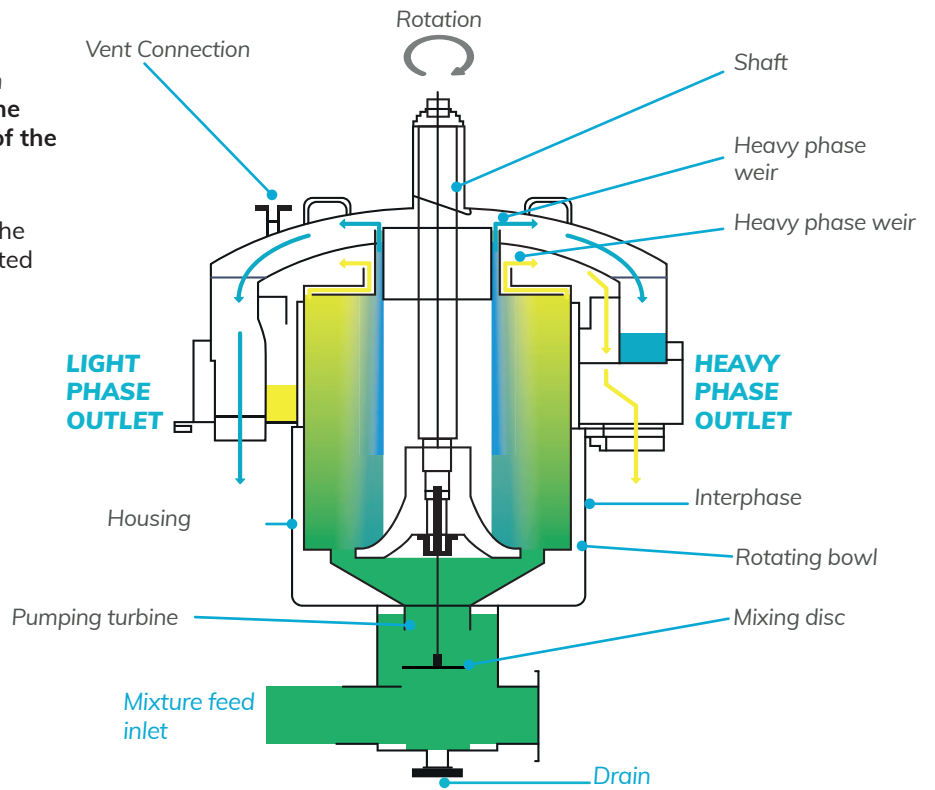


LIQUID/LIQUID SEPARATOR

SEPARATION CONFIGURATION

A mixture of two immiscible liquids (shown in green) with different densities is fed to the pumping chamber located on the bottom of the centrifuge housing.

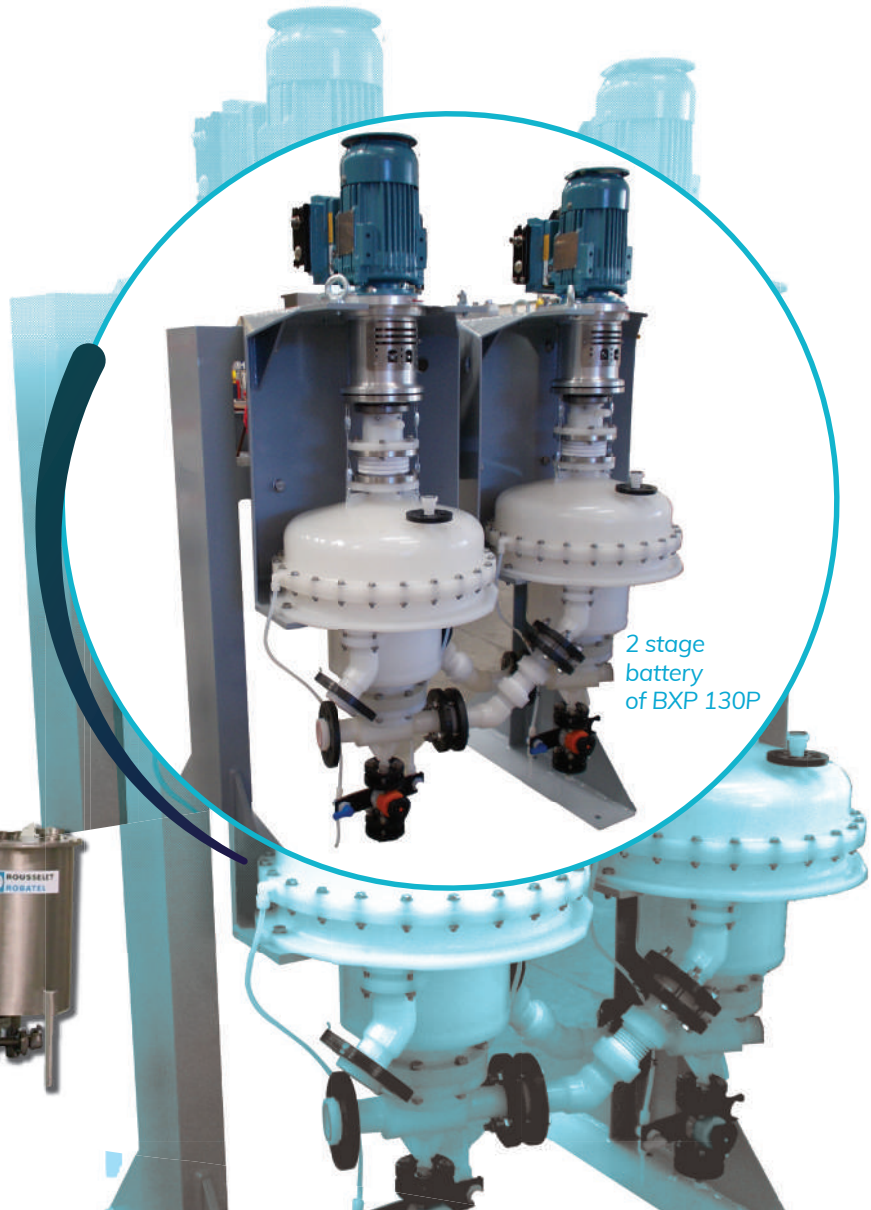
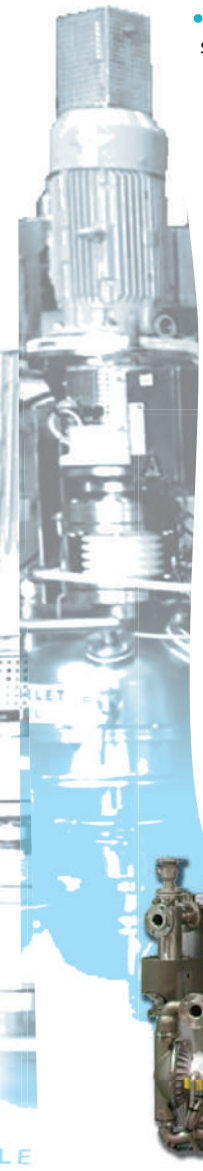
- The liquid/liquid mixture is aspirated into the centrifuge bowl by an pumping turbine located on the bottom of the rotating bowl.
- Liquids will be separated by centrifugal force.
- The heavier liquid (shown in blue) occupies the outer portion of the bowl. The lighter liquid (shown in yellow) occupies the inner portion of the bowl.
- The position of the liquid/liquid interphase is regulated by a heavy phase weir.
- Interchangeable heavy phase weirs of different diameters accommodate a wide range of density ratios.
- The heavy phase underflows to a static receiving chamber. The light phase overflows to a separate static receiving chamber.
- The liquids are discharged by gravity to downstream equipment.



BXP liquid/liquid separator.

BXP 520

2 stage battery of BXP 130P



PRODUCTION MODELS

CENTRIFUGAL EXTRACTORS

These machines can be installed on **single or common frames** and are interconnected with **flexible inter-stage piping**.

The hourly flowrates depend upon the viscosity, emulsification tendency, density ratio and the flow ration of the liquids being processed.

METALLIC CONSTRUCTION

| Monostage centrifugal extractors manufactured from metal. Stainless steel - (Alloys, Titanium) | | | | | | | | |
|--|------|-------------------|-----------------|-------|-----------------------|-------|----------------|-------|
| TYPE | Bowl | | | | Extractor | | | |
| | ∅ mm | Useful capacity l | Rotor speed rpm | | Nominal Flowrate m³/h | | Motor power kW | |
| | | | 50 Hz | 60 Hz | 50 Hz | 60 Hz | 50 Hz | 60 Hz |
| BXP040 | 40 | 0.11 | 3000 | 3600 | 0.050 | 0.060 | 0.020 | 0.020 |
| BXP080 | 80 | 0.30 | 3000 | 3600 | 0.120 | 0.140 | 0.120 | 0.120 |
| BXP130 | 130 | 1.30 | 3000 | 3600 | 0.900 | 1.000 | 0.750 | 0.750 |
| BXP190 | 190 | 4.2 | 2900 | 3500 | 3 | 3.5 | 0.75 | 1.1 |
| BXP320 | 320 | 17 | 2900 | 3500 | 6 | 7 | 4 | 5.5 |
| BXP360 | 360 | 19 | 2900 | 3500 | 10 | 12 | 5.5 | 5.5 |
| BXP520 | 520 | 110 | 1450 | 1750 | 25 | 30 | 7.5 | 7.5 |
| BXP800 | 800 | 320 | 970 | 870 | 60/80 | 55/75 | 18.5 | 18.5 |

Stainless steel
AISI 316 L

Stainless steel
AISI 904 L

Alloy
AVAILABLE MATERIALS

Other specific alloys on demand and provided by the mechanical compatibility.

PVDF CONSTRUCTION

Some Rousselet Robatel's Liquid/Liquid centrifuges can be fabricated from PVDF for all surfaces in contact with the product. This construction is advantageous if the process materials are corrosive and it is not possible to use metallic construction.

| Monostage centrifugal extractors manufactured from PVDF. | | | | | | | | |
|--|------|-------------------|-----------------|-------|-----------------------|-------|----------------|-------|
| TYPE | Bowl | | | | Extractor | | | |
| | ∅ mm | Useful capacity l | Rotor speed rpm | | Nominal Flowrate m³/h | | Motor power kW | |
| | | | 50 Hz | 60 Hz | 50 Hz | 60 Hz | 50 Hz | 60 Hz |
| BXP040P | 40 | 0.11 | 3000 | 3600 | 0.05 | 0.06 | 0.02 | 0.02 |
| BXP130P | 135 | 1.3 | 1450 | 1750 | 0.6 | 0.7 | 0.25 | 0.37 |
| BXP130PL | 135 | 1.9 | 1450 | 1750 | 0.85 | 1 | 0.25 | 0.37 |
| BXP210P | 210 | 5.6 | 1450 | 1750 | 3 | 3.5 | 0.75 | 0.75 |
| BXP210PL | 210 | 7.8 | 1450 | 1750 | 4.2 | 4.8 | 0.75 | 0.75 |
| BXP360P | 360 | 29 | 970 | 1170 | 12 | 14 | 1.5 | 2.2 |
| BXP360PL | 360 | 39 | 970 | 1170 | 16 | 18 | 1.5 | 2.2 |
| BXP460P | 460 | 80 | 730 | 870 | 25 | 28 | 2.2 | 3.6 |
| BXP620P | 620 | 175 | 580 | 580 | 60 | 60 | 3.6 | 3.6 |

PVDF

LABORATORY MODELS

For performing feasibility tests with minimum quantities of material.

| Laboratory monostage extractors (metallic construction only) | | | | | |
|--|------|-------------------|-----------------|-----------------------|----------------|
| TYPE | Bowl | | | Extractor | |
| | ∅ mm | Useful capacity l | Rotor speed rpm | Nominal flowrate m³/h | Motor power kW |
| BXP012 | 12 | 0.0022 | 10,000 | 0.002 | 25 |
| BXP025 | 25 | 0.0190 | 4,000 | 0.010 | 41 |

Stainless steel
AISI 316 L

Stainless steel
AISI 904 L

Alloy

Titanium

Available materials

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