ROUSSELET ROBATEL®
ROUSSELET CENTRIFUGATION GROUP

MULTISTAGE CENTRIFUGAL EXTRACTORS
MODEL LX
FOR LIQUID/LIQUID EXTRACTION

LX 576

Types of applications :

- ➜ PHARMACEUTICALS : Purification of active compounds *(e.g. Antibiotics)*.
- ➜ CHEMICALS : - Washing *(e.g. polymers)*,
  - Extraction *(e.g. Acetic acid)*,
  - Effluent treatment *(e.g. Phenol extraction from aqueous phase)*.
- ➜ VARIOUS INDUSTRIES : - Perfumes,
  - Aromas,
  - Essential oils,…
- ➜ FOOD INDUSTRY : Purification of food components *(e.g. Carboxylic acid)*.
- ➜ HYDROMETALLURGY : Separation or purification *(e.g. Precious metals)*.

x3

OPERATING PRINCIPLE

The feed solution initially containing one or more solutes (heavy phase on cross section sketches), and an immiscible solvent having a different density (light phase on cross section sketches) flow counter-currently through the extractor's rotor, designed with a stack of mechanical subassemblies representing the required number of separate stages.

The successive mixing and separation operations performed in each mechanical stage permit the mass transfer of the solutes from the feed solution to the solvent.

Each stage consists of :

A mixing chamber where the two phases are mixed and where the transfer of solutes to be extracted is achieved. A fixed disk allows the two phases to be mixed and to create an emulsion. It operates as a pump to draw the two phases from the preceding stage.

A decantation chamber where the two previously mixed liquids are thoroughly separated by centrifugal force. Overflow weirs stabilize the separation area independently of flow rates. The interphase position depends on the diameter of the heavy phase overflow weir, which is interchangeable and to be selected according to the phase density ratio.

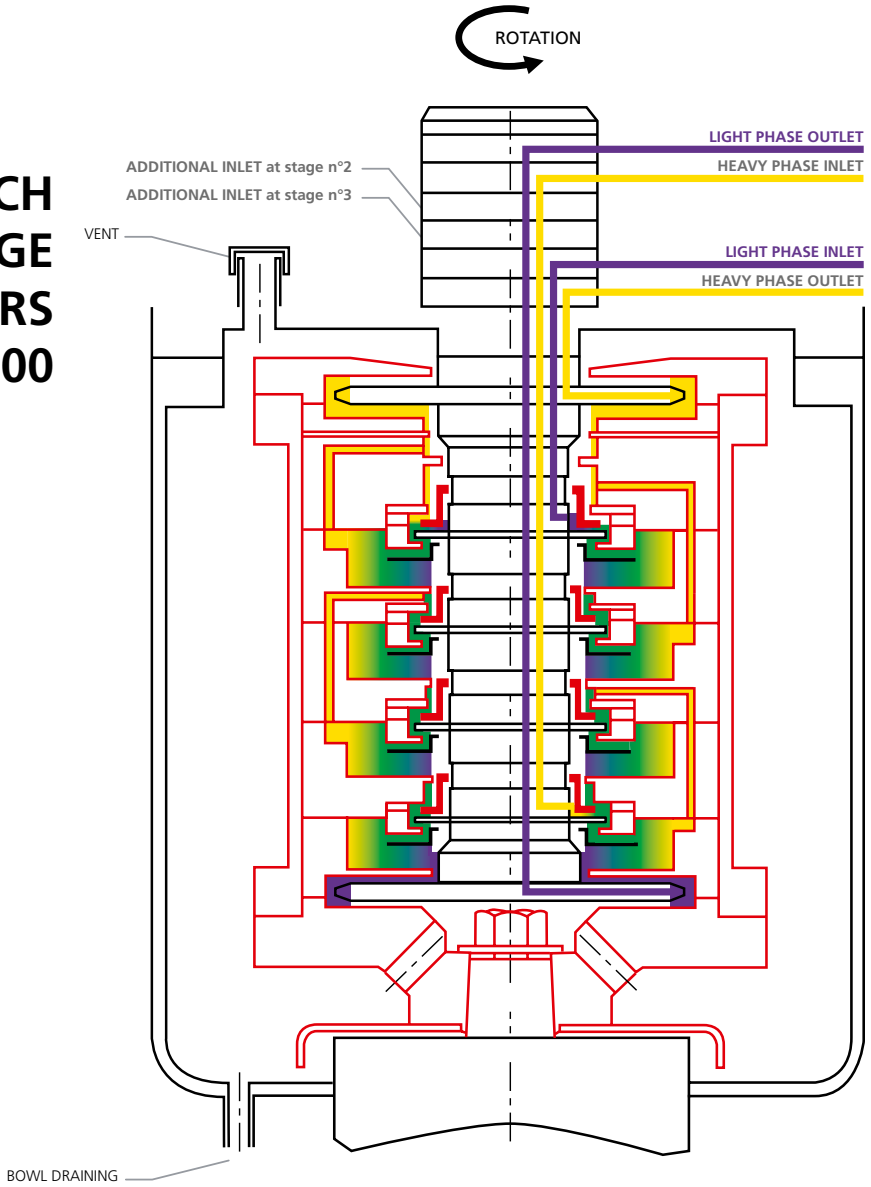
The two phases are fed into the extractor through feeding pipes set on the top part of the shell ; on LX 320/360/520/570 models, the heavy phase is fed into the upper stage and the light phase into the lower stage, and vice versa on models LX 120/200, to achieve counter current extraction.

Depending on the model, the separated phases are discharged either by gravity or by means of inward-flow turbines.

CROSS SECTION SKETCH 4 STAGE CENTRIFUGAL EXTRACTORS LX120 & LX200

LX 124

LX 364

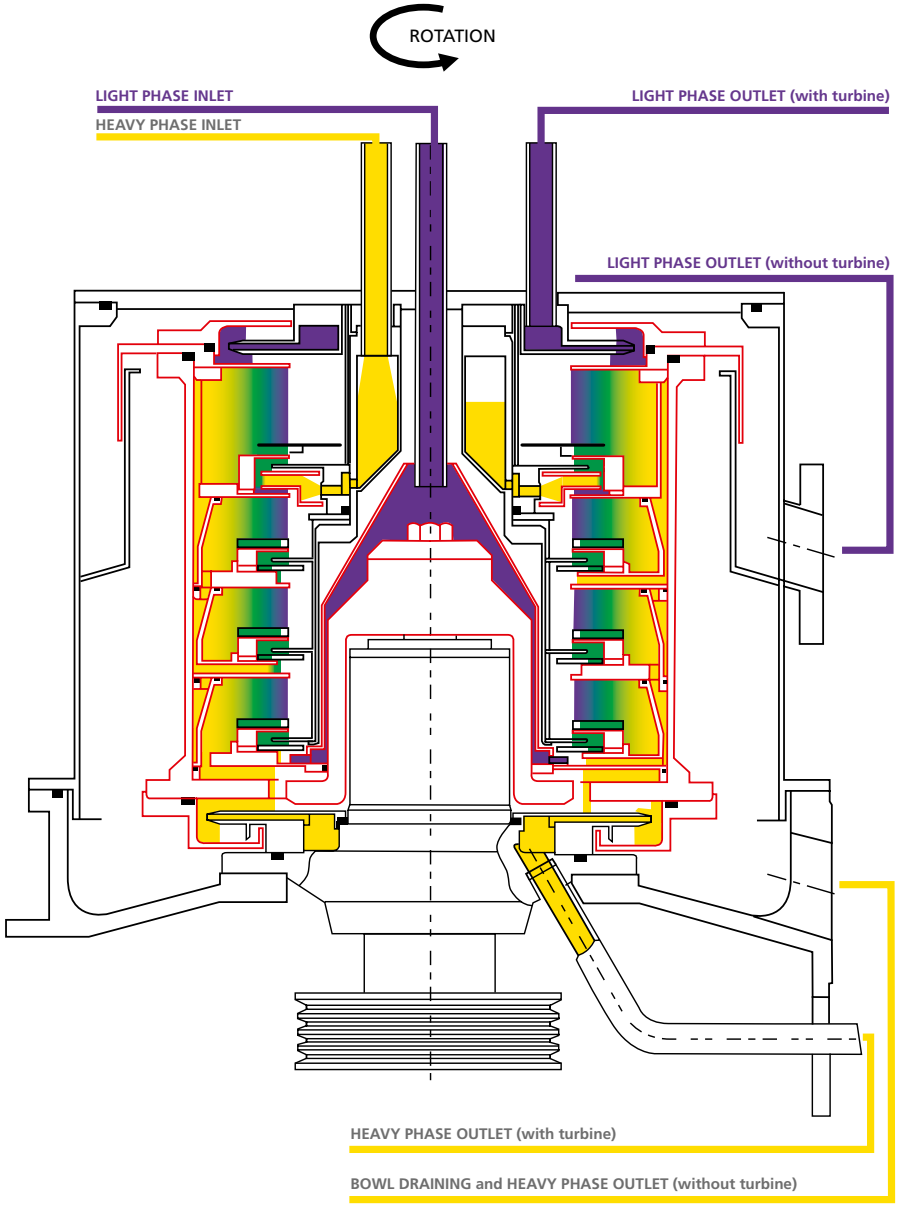


GENERAL ADVANTAGES OF ROUSSELET ROBATEL CENTRIFUGAL EXTRACTORS :

- ➜ Centrifuges perfectly adapted to both batch and continuous operations.
- ➜ Short retention time and low liquid hold-up.
- ➜ Efficient phase separation utilizing centrifugal force.
- ➜ Unattended operation.
- ➜ High extraction efficiency due to thorough mixing.
- ➜ Rapid operational equilibrium.

SPECIFIC ADVANTAGES OF ROUSSELET ROBATEL MULTISTAGE CENTRIFUGAL EXTRACTORS

- ➜ Up to 7 stages installed on a single machine allowing unrivalled extraction efficiency.
- ➜ Each mechanical stage nearly corresponds to a theoretical extraction stage.
- ➜ Compact installation with small footprint.
- ➜ Possibility to set the extractor up on a mobile trolley to be moved very easily.
- ➜ Low operating and maintenance costs (1 single rotor / 1 single motor).
- ➜ Inward-flow turbines for pressurized discharge of the two separated phases toward collecting tanks or downstream equipment (or to the inlet of a second extractor if many extraction stages are required).



CROSS SECTION SKETCH 4 STAGE CENTRIFUGAL EXTRACTORS LX320, LX360, LX520, LX570

LX 365

LX 575

Several models are designed with a feeding pipe on each intermediary stage allowing fractionated extraction or to feed a third phase (pH adjustment, washing of one phase before its removal, introduction of a third liquid miscible with either one of the two phases).
In case the extraction process only requires one or two stages, and according to the extractor model, it is possible to use the other stages to improve phase clarity and reduce the volume on one phase carried away by the other phase.

CONSTRUCTION FEATURES :

All parts in contact with the product are manufactured from alloys such as stainless steel AISI 316 L, AISI 904 L, Hastelloy C, Titanium, and seals from PTFE.
Casing installed on a supporting frame (manufactured from carbon steel or cast steel with stainless steel cladding on its inner side), equipped with all piping (inlet and outlet pipes, drain pipe for emptying the bowl when stopped, nitrogen inlet, vent pipe,…). Frame mounted on anti vibration supports.
Transmission consisting in one watertight or explosion proof electrical motor linked to a frequency inverter with elastic coupling for motor/sub assembly link (LX 120/200) or pulleys and anti static V belts transmission (LX 320/360/520/570).
Bearing housing with ball bearings (LX 120/200) or grease lubricated roller bearings, and nitrogen sweep.
Centrifuges compliant with European directive and standards (and ATEX for relevant countries).

LX 124 SKID MOUNTED

TECHNICAL DATA

Type		Number of stages	Ø bowl (mm)	Bowl capacity (l)	Maximum speed (rpm)		Maximum combined flow rate for both phases(l/hr)		Motor power (kW)	Net wight (kg)	Dimensions l x w x h (mm)
					50 Hz	60Hz	50 Hz	60Hz			
LX120	LX122	2	120	0,15	2900	3450	25	30	0,75	180	720 x 720 x 1130
	LX123	3		0,21						185	720 x 720 x 1170
	LX124	4		0,27						190	720 x 720 x 1200
	LX126	6		0,39						210	720 x 720 x 1280
LX200	LX202	2	200	1	2900	3450	250	300	1,5	220	720 x 720 x 1250
	LX203	3		1,4						230	720 x 720 x 1290
	LX204	4		1,8						240	720 x 720 x 1330
	LX204P	4		1,6	1450	1750	125	150		200	720 x 720 x 1510
LX320	LX323	3	320	11	3200		1800		5,5	280	1050 x 590 x 760
	LX324	4		10,2			1500			290	
	LX325	5		9,3			1300			300	
LX360	LX363	3	360	14,6	3000		2100		7,5	300	1050 x 590 x 760
	LX364	4		13,6			1800			310	
	LX365	5		12,6			1500			320	
LX520	LX524	4	517	57	2000		6000		18,5	1020	1550 x 840 x 1100
	LX525	5		54			5000			1040	
	LX526	6		52			4500			1060	
	LX527	7		49			3500			1080	
LX570	LX574	4	570	74	2000		8000		18,5	1100	1550 x 840 x 1100
	LX575	5		70			7000			1130	
	LX576	6		67			6000			1160	

Flow rates are dependent on viscosity, emulsivity, phase density differences and phase flowrate ratio.

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