



Solids-discharging Nozzle Centrifuge MBUX 510T-34C

Applications

The solid-discharging nozzle centrifuge type MBUX 510 is designed specially for separation of minute micro-organism and cell debris from such organisms in processes where sterilization or containment is not required.

The centrifuge is used to separate and concentrate micro-organisms or cell debris with normal particle size in the range 0,1 - 3 μm . The content of suspended solids in the feed varies but is normally in the range 0,5 - 4% DS. In cell debris type of duties normally a significant amount of solids are dissolved in the process liquid.

Working principle

The feed containing the liquid and the solids is introduced to the rotating centrifuge bowl (fig 2) from the top via a stationary inlet pipe (1), and is accelerated in a distributor (2) before entering the disc stack (3). It is between the discs that the separation takes place.

The liquid phase moves through the disc stack towards the centre of the bowl, from where it is pumped out under pressure by means of a built-in paring disc (4).

The heavy solids phase is moved outwards by centrifugal force to the solids pockets at the bowl periphery and from there through concentrate tubes (5) and internal vortex nozzles (6) into the paring tube chamber, where the concentrate is skimmed off by the paring tube (7) and discharged under pressure.

The bowl can be opened intermittently during production and/or the cleaning cycle for ejections of solids while the machine continues to run at full speed.

The pneumatically (8) controlled valve slide (9) under the bowl bottom opens the discharge valves (10) momentarily, permitting the ejections of solids.

Special features

With the patented Alfa Laval self regulating vortex nozzles the concentration of discharged solids phase can be kept at a high and even level irrespective of fluctuations in the feed flow or feed concentration. The centrifuge can thus be operated closer to the clogging point without increasing the risk of clogging.

The light and heavy phases are both discharged under pressure which prevents foaming and simplifies installation by eliminating pump systems and improves hygiene.

Solids pockets in the bowl guide the solids to the concentrate tubes, preventing accumulation of firmly packed solids and making separation and CIP easier and more effective.

Frame hood, solids receptacle and large cyclone are jacketed for circulation of cooling water, which also reduce the noise level. Frame hood and large cyclone are fitted with spray nozzles for washing the outside of the bowl and the interior of the large cyclone.

The Control Panel (optional) handles the control and supervision of the MBUX 510 centrifuge including a cleaning in-place (CIP) mode. Necessary control valves are optional.

Conversion from the solids-discharging vortex nozzles type, to solids-ejecting type is possible.



Fig 1. MBUX 510T-34C (large cyclone).

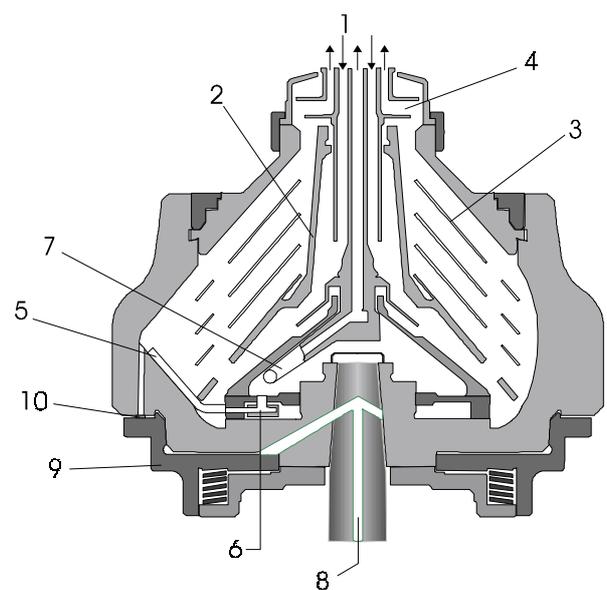


Fig 2. Typical bowl drawing for a Vortex nozzle centrifuge. Drawing details do not necessarily correspond to the centrifuge described.

Standard design

All liquid-wetted parts are made in high-grade stainless steel except the rubber gaskets (EPDM or nitrile).

A special controlled-torque motor eliminates the need for a clutch between the motor and the centrifuge.

The gear is splash lubricated without any need for an external lubrication circuit. The vertical driving device and bowl spindle is designed as an easily serviced unit. The entire assembly lifts out in one piece.

The centrifuge is equipped with sensors for monitoring of bowl speed and vibration level.

Technical specification

Max. throughput capacity	10 m ³ /h ¹⁾
Max. solids-handling capacity	3 m ³ /h ²⁾
Feed temperature range	0-100 °C
Feed inlet pressure required	-10 kPa ³⁾
Centrifugate outlet pressure available	Up to 600 kPa
Concentrate outlet pressure available	Up to 600 kPa (300 kPa normal)
Installed motor power	37 kW
Noise level	82 dB(A)

¹⁾ Actual throughput capacity depends on amount and type of solids in the feed, temperature, viscosity and required degree of clarification.

²⁾ Wet solids.

³⁾ Data valid for water at feed flowrates up to 10 m³/h.

Utilities consumption

Electric power	20-30 kW ¹⁾
Operating air	30 NI/discharge ²⁾
Safety water	0.2 - 2 m ³ /h ³⁾
Flushing liquid; above bowl, in cyclone & air compensation pipe	0 - 25 l/discharge ⁴⁾
Cooling liquid, frame	0 - 1400 l/h ⁵⁾
Cooling liquid, cyclone	max. 2400 l/h ⁶⁾

¹⁾ Actual consumption depends on exact throughput capacity, centrifugate & concentrate flowrate and applied back pressure.

²⁾ Instrument quality, 500 - 600 kPa. Actual consumption depends on CIP-discharge frequency.

³⁾ The bowl should be filled with liquid at start, stop and normal operation. In case process liquid is not available, safety water should be used. Minimum flow shall be 10% above nozzle flow.

⁴⁾ 100 - 600 kPa, 300 kPa suggested. Momentary flowrate at suggested pressure up to 1000 l/h.

⁵⁾ Max. pressure 100 kPa. Flowrate at 30 kPa 700 l/h.

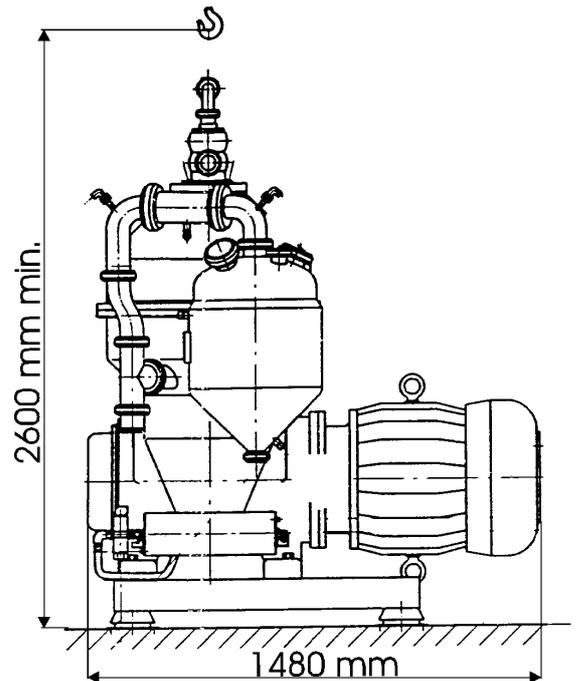
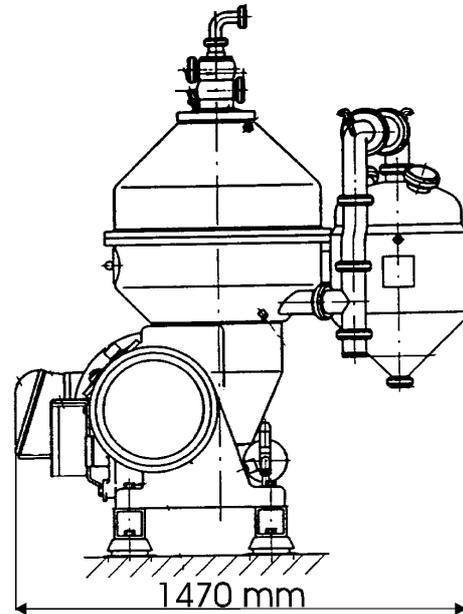
⁶⁾ Max. Pressure 100 kPa. Flowrate at 30 kPa 800 l/h. (Valid for large cyclone only)

Shipping data (approximate)

Centrifuge with bowl and motor	
Net weight:	1500 kg
Gross weight:	1800 kg
Volume:	4.0 m ³

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Main dimensions



Options

The centrifuge can be equipped with a gauge switch to prevent the motor from being started unless the centrifuge top part has been properly mounted.

The centrifuge is available with two alternative disc stacks with different caulk thickness.

Vortex outlet washer and chambers in stainless steel instead of tungsten carbide.

Small cyclone without cooling jacket.