



# MBPX 404

## Separation system for small scale fermenter capacities in the biotech Industry

### Applications

The MBPX 404 separation system is based on the solids ejecting disc stack separator MBPX 404SGP-31 in clarifier execution with fixed partial discharge mechanism for timer triggered discharge of solids. It is used to remove suspended solids with particle sizes of approximately 0.5 to 500  $\mu\text{m}$  from a liquid having lower specific gravity than the solids. The solids content is normally in the range of 0.1-10% by volume. The main applications are bacteria, rDNA products, enzymes, cell cultures and vaccines.

The MBPX 404 separation system is best suited for small scale fermenters ranging from 50 to 500 liters, and where in situ steam sterilization is not mandatory. Thanks to its compact size and mobility, the module is ideally suited for development applications. The MBPX 404 offers reliable scale-up possibility for production facility.

### Design features

The MBPX 404 separator is equipped with following features

- Fixed partial discharge mechanism for precise solids discharge
- Disc inlet for low shear acceleration of process media
- Variable speed to facilitate performance optimization
- Cooling jacket for the frame hood to minimize bowl surrounding temperature.
- Vibration dampers.
- All liquid wetted parts in high grade stainless steel
- All liquid wetted elastomers in FDA approved EPDM. As an option, EPDM with USP Class VI can be delivered.
- Hygienic design of solids handling area with internal spray nozzles for flushing above the bowl and sediment area.
- Monitoring kit with speed sensors for bowl speed and level sensor for make-up liquid. As an option, cover interlocking switch assembly can be delivered to ensure safe bowl start-up.
- Low flow paring disc for pressurized discharge of clarified liquid
- Enhanced surface finish to less than 0.8  $\mu\text{m}$  Ra for product contact parts, including bowl, sediment outlet and cyclone



- Discharged solids decelerated with cyclone with hygienic design, vent and connection for spray nozzle
- Main drive with fixed coupling and belt drive
- Matt finish stainless steel clad frame and stainless steel splash guard cover for drive motor.

### Complete system

The MBPX 404 separation system is flexible and designed to meet biotech industry standards.

- The separator is mounted on a compact mobile base frame, which includes process piping for service liquids and process liquids entering and leaving the centrifuge.
- Clamp connections for improved hygiene
- Electrical system including VFD starter for main drive, control system with a plc and HMI and optional suitable for connectivity (Profibus or Ethernet) with a supervising control system.
- Automatic CIP mode
- Automatic flow control with magnetic flow meter and flow regulating valve on inlet and back-pressure control on clarified liquid outlet. Diaphragm pump beneath cyclone for solids outlet.

- Optional turbidity monitoring, replacement buffer liquid addition, mass flow meter (replacing magnetic flowmeter) and temperature sensor on supernatant outlet, feed pump at the inlet, free steaming programming facility, etc. These options provide enhanced installation flexibility to customer.
- Enhanced documentation supporting cGMP qualification is available and FAT is performed before shipping.

### Operating principles

The feed is introduced to the rotating centrifuge bowl (fig 1) from the top via a stationary inlet pipe (1), and is accelerated by the disc inlet (2) in a distributor (3) before entering the disc stack (4). Separation of solids particles takes place in between the conical discs. The liquid phase moves towards the centre of the bowl from where it is pumped out under pressure by means of a built-in paring disc type centripetal pump (5). The heavier solids phase is collected at the bowl periphery (6) from where it is discharged intermittently in the sediment space and decelerated in the cyclone. The solids discharge is achieved by a hydraulic system below the separation space in the bowl, which at certain intervals forces the sliding bowl bottom (7) to drop down, thus opening the solids ports (8) at the bowl periphery. The bowl is mounted on a vertical spindle (9) driven by a vertically mounted motor, via a belt drive.

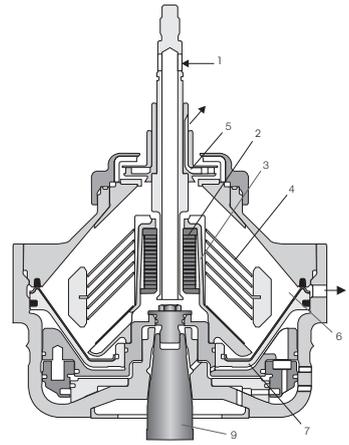


Fig. 1. Typical bowl drawing for solids-ejecting separator. Drawing details do not necessarily correspond to the centrifuge described.

### Utilities for MBPX 404 separation system

Electric power consumption, max.	0.6 / 2.2 kW <sup>1)</sup>
Flushing liquid	Pressure 200-600 kPa, momentary flow 1 m <sup>3</sup> /h
Buffer liquid	Pressure 200-600 kPa, momentary flow 8 l/h
Operating liquid	Pressure 200-600 kPa, momentary flow 1 m <sup>3</sup> /h, 1-2 l/discharge
Cooling water	Pressure min 20 kPa, max 50 kPa, flow 100-700 lph, temp > 0
Instrument air	Pressure 400-800 kPa, momentary consumption 6 Nm <sup>3</sup> /h

<sup>1)</sup> Idling power/power at 0.5 m<sup>3</sup>/h. Actual consumption depends on feed rate, feed characteristics and applied back-pressure on liquid outlet.

### Shipping data (approximate)

Complete system with bowl and motor.	
Net weight	500 kg
Gross weight	600 kg
Volume	3 m <sup>3</sup>

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### Technical specification, MBPX 404 separation system

Feed flow range and throughput capacity	50 to 1,000 l/h <sup>1)</sup>
Max solids handling capacity	60 l/h <sup>2)</sup>
Feed temperature range	0 - 100 °C
Feed inlet pressure required, max.	50 kPa <sup>3)</sup>
Liquid outlet pressure available upto	250 kPa <sup>4)</sup>
Installed motor power	3.7 kW
Sound pressure	69 dB(A) <sup>5)</sup>

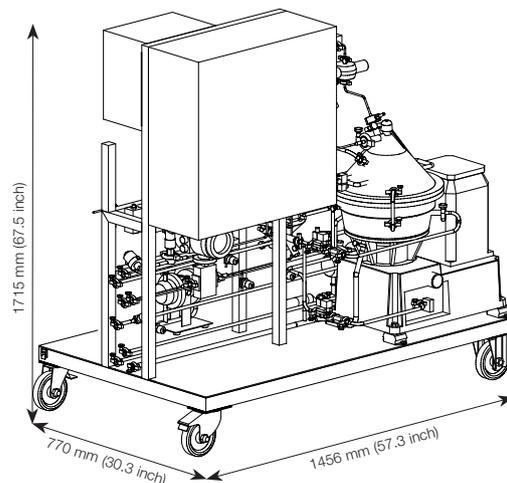
<sup>1)</sup> Max. hydraulic capacity depends on paring disc. Actual throughput capacity depends on amount and type of solids in the feed, viscosity and required degree of clarification.

<sup>2)</sup> Wet solids, 1 litre partial discharge volume every minute.

<sup>3)</sup> For product, buffer liquid and CIP normally 50 kPa will be sufficient.

<sup>4)</sup> Valid with low flow paring disc for water throughput capacity 0.5 m<sup>3</sup>/h at max. bowl speed. For lower speed, pressure reduces.

<sup>5)</sup> According to EN ISO 4871.



### How to contact Alfa Laval

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