



PX 115e & PX 115eEX

High-capacity disc stack centrifuge for fats & oils refining



PX 115e complete with direct drive system

The Alfa Laval range of centrifuges for the vegetable oil and animal fat refining industries is continuously modernized to take advantage of developments in materials, mechanical design and fluid dynamics. The PX 115e/115eEX is a large-sized machine equipped with the direct drive system eDrive™.

Applications

Continuous degumming, neutralizing, dewaxing, and washing of fatty oils, such as various vegetable oils, lard, tallow, and fish oil.

Performance

The table below shows nominal capacities. Actual throughputs vary according to the type of oil and fat to be treated.

Degumming, neutralization, washing	54,000 kg/h
Dewaxing	25,000 kg/h

Standard design

The machine consists of a frame with a base that contains a hollow vertical bowl spindle, on which the rotor part of the electric motor is mounted. The motor stator is placed inside the bottom part of the frame. The bowl is fixed on top of the spindle inside the space formed by the upper part of the frame, the solids collecting cover and the frame hood. The hood carries the liquid discharge system.

All parts in contact with the process liquid are made of stainless steel. The bowl is of the solids-ejecting type with an automatic hydraulic operating system for intermittent solids discharge.

In the eDrive™ system, the electric motor is a switched reluctance motor with a permanent magnet rotor. The motor is powered by a frequency inverter.

Design features

Inlet. The PX 115e/115eEX is based on a unique, semi-hermetic design concept. The hermetic, bottom-fed inlet ensures a gentle, non-destructive acceleration of the feedstock up to full bowl speed. This minimizes drop splitting and maximizes separation performance. The flow area for the feedstock has been increased to minimize inlet pressure drop.

Outlets. The outlets on the heavy and light phases are open, reducing the pressure drop across the separator. The feed-pressure requirement of the machine is therefore low. The outlets are equipped with stationary paring devices for removal of the different phases. The paring disc on the light phases is fixed, while the paring tubes on the heavy phase are adjustable.

Centrizoom™. By adjusting a positioner on the heavy-phase outlet, the operator can reduce or extend the paring diameter of the paring tubes. This patented innovation, Centrizoom™, makes it possible to adjust the interface between oil and soapstock in the bowl during operation to obtain maximum separation efficiency.

Low noise level. With the working environment in mind, the PX 115e/115eEX is designed to operate at low noise levels. This is achieved through a rubber-damped bearing assembly, jacketed frame and an outer bowl design which is engineered for low wind noise.

Energy savings. The eDrive™ electric motor is placed between the bearings in the bearing system that is well

proven for more than two decades. The motor type has a higher efficiency than conventional induction motors, which means energy savings of 10-15% in combination with the absence of a mechanical gear. The motor is water cooled and controlled by frequency inverter.

Small footprint. The compact design of eDrive™ means a small footprint and saving of valuable floor area.

Lubrication system. The lubrication system consists of tank, heat exchanger, pump and filter.

Control and supervision. A 2Touch service panel controls and/or supervises the following functions:

- Cooling of motor and bowl casing.
- Cooling and lubrication of mechanical seals.
- Flushing of outside of bowl and inside of bowl casing.
- Control of the frequency converter and the bowl speed.
- Control and supervision of lubrication and bearing temperatures.
- Control and supervision of discharge system.
- Supervision of vibration.
- Communication with plant control system via Modbus TCP.

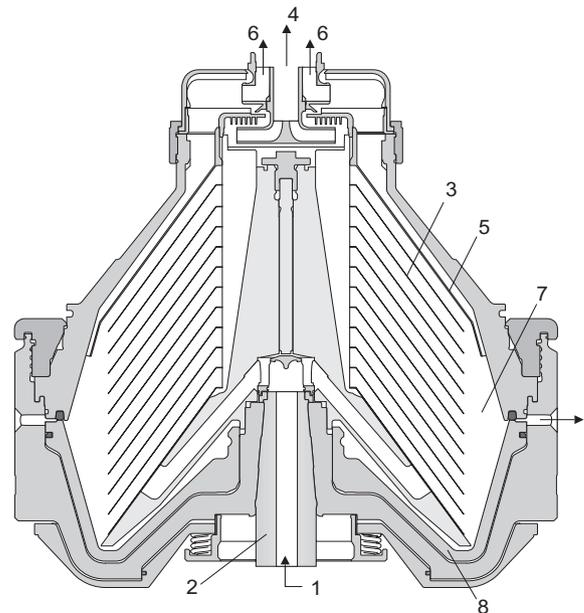
The controller program is built in modules for easy incorporation of different combinations of functions.

Operating principles

The oil to be separated is fed (1) into the separator bowl from the bottom through a hollow spindle (2) and enters the disc stack (3).

The heavy phase and heavy sludge are forced towards the periphery of the bowl, while the light phase flows towards the centre of the bowl, from where it is pumped out (4) for further processing. The heavy phase is led over a top disc (5) into a chamber where an adjustable paring device pumps it out of the separator (6).

Sludge collects in the sludge space (7) and is discharged intermittently and automatically. The discharge is achieved by a hydraulic system which at preset suitable intervals forces the sliding bowl bottom (8) to drop down, thus opening the sludge ports at the bowl periphery. The sludge is collected in the frame and leaves the centrifuge via a cyclone.



Typical bowl drawing for a solids ejecting hermetic centrifuge. Drawing details do not necessarily correspond to the centrifuge described.

Material data

Bowl body, hood and lock ring	s.s. 1.4418
Frame top part and hood	s.s. 1.4401 UNS 31600
Frame bottom part	Cast iron, clad with stainless steel 1.4301 UNS 30400
Gaskets and O-rings	Nitrile rubber

Shipping data (approximate)

Centrifuge incl. bowl and motor	2,830 kg (6,240 lbs)
Bowl	1,160 kg (2,600 lbs)
Gross weight	3,230 kg (7,120 lbs)
Volume	4.4 m ³ (190 cuft)

Standard equipment

Each PX 115e/115eEX comes complete with control unit, electric motor, inlet and outlet connections, auxiliary equipment, a spare parts kit and set of tools.

Technical specifications

Throughput capacity	max. 85 m ³ /h (374 US gpm)
Bowl speed	4,800 rpm
Bowl volume	72 l (19 US gal)
Sludge space volume	17 l (4.5 US gal)
Motor power installed	55 kW (75 HP)
Inlet pressure at 60 m ³ /h (263 US gpm)	0 kPa
Sound pressure	80 dB(A)
Overhead hoist lifting capacity	min. 1,200 kg (2,700 lbs)

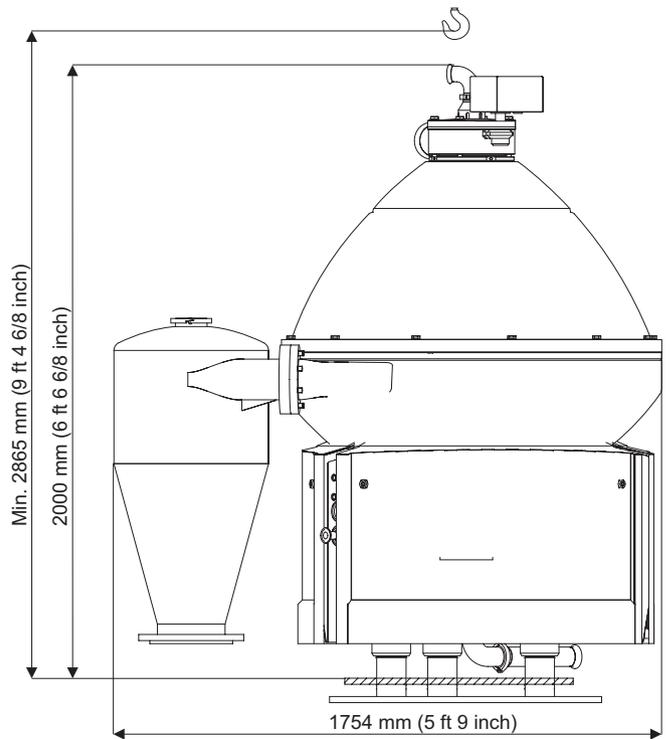
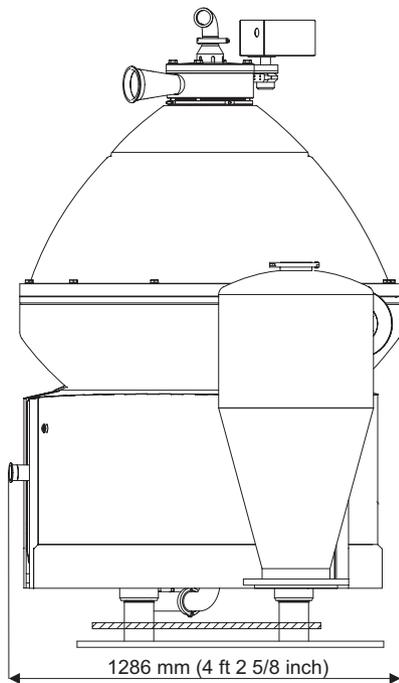
ATEX design code

EX II 3 G T4 X for zone 2

Basic executions

PX 115e for non-explosive environments.
PX 115eEX for ATEX zone 2.

Dimensions



How to contact Alfa Laval

Up-to-date Alfa Laval contact details for all countries are always available on our website at www.alfalaval.com.