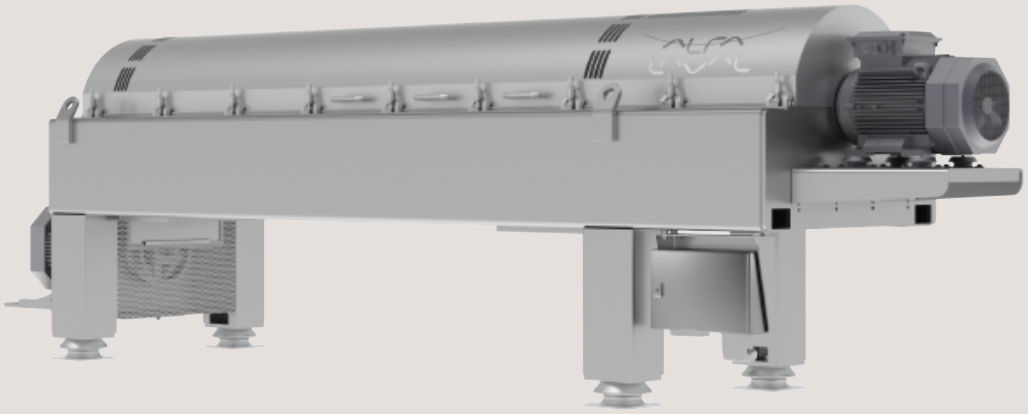
The Alfa Laval Sigma range of decanter centrifuges

Extracting oil from olives



Introduction

Alfa Laval introduces the Sigma range of decanter centrifuges specially designed for two-phase olive oil extraction.

These units are designed to operate as part of the first and secondary extraction stages, also known as re-milling. The focus is on maximizing oil recovery throughout the flow range, while maintaining oil quality by preventing any rise in temperature during the separation process.

Application

Decanter centrifuges in the Sigma range are designed to ensure cost-effective olive oil processing. These compact, efficient decanters are optimized for use in two-phase olive oil separation processes that include clarification, extraction and dewatering.

With the introduction of Sigma 6 and Sigma 8 to supplement the existing Sigma 9 and Sigma 10 models, Alfa Laval now covers the full spectrum of market needs from small and medium-volume olive oil producers up to large industrial olive oil mills.

Working principles

The Sigma decanter centrifuge design makes sure the incoming olive paste is effectively separated into oil and wet solids.

The olive paste is fed into the bowl of the unit through a stationary inlet tube, and is then smoothly accelerated by an inlet rotor. Separation takes place in a horizontal cylindrical bowl equipped with a screw conveyor. Centrifugal force makes the oil accumulate at the liquid surface, while the solids settle on the inner wall of the bowl, surrounded by the water separated out of the feed stream.

The conveyor rotates at a slightly different speed than the bowl and moves the solids to the discharge ports in the conical end. Oil extraction takes place along the entire length of the cylindrical part of the bowl. The oil is returned to the large end for discharge, and then passes into collecting tanks via a filter.

Benefits

Sigma olive oil decanter centrifuges are designed with a focus on easy cleaning, easy access, reliability and quiet running.

The rotating assembly is mounted on a compact welded box beam frame fitted with main bearings at both ends. High-quality stainless steel is used throughout. The cover is designed to ensure easy access. The casing is hinged for easy opening, maintenance and cleaning.

The drive system comprises a new type of gearbox, driven by a variable frequency drive. The electrical installation is straightforward, power consumption is very low, and accurate

control is achieved within a wide range of differentials, with no need to change belts and pulleys.

Direct Drive is used as the basis for a unique system that automatically controls the differentials between the rotation speed of the bowl and the conveyor. This makes it easy to maintain the best possible balance between oil clarification and oil recovery, irrespective of variations in the feed.

Processing high-quality olive oil using a Sigma decanter centrifuge

Standard configuration

Sigma decanter centrifuges are available as individual items of olive oil processing equipment, as complete modules fitted with a control panel and basic auxiliaries, or as part of a complete Alfa Laval processing line.

Standard configurations of Sigma decanter centrifuges include the following features:

- Feed zone position that maximizes the time the oil spends inside the unit, and how much oil is extracted
- Special conveyor design that improves solids transport and maximizes oil recovery
- Special flights to prevent turbulence as the oil moves towards the liquid outlet, to optimize yield and oil clarification
- Surface level of olive oil outlets ensure minimal heating of the oil during separation, helping protect oil quality
- Special bowl design with easy oil discharge minimizes the quantity of oil held inside the bowl
- Fully protected feed zone, featuring a special design that improves resistance to wear
- 360° solids discharge outlets made of tungsten carbide, which provides exceptional protection against wear and keeps power consumption to a minimum
- Conveyor fitted with tungsten carbide tiles (optional on Sigma 6) to provide wear protection that significantly reduces maintenance costs
- Conveyor parts subject to high wear are easy to replace
- Easy serviceability
- Cover is equipped with hinges and springs to make it easy and safe to open, clean and inspect the decanter

Automation

Decanter centrifuges in the Sigma range are equipped with a variable frequency drive (VFD) and are available with control solutions to comply with your specific operating requirements.

The Sigma range is also available with optional vibration and temperature sensors for additional processing safety and operating convenience.

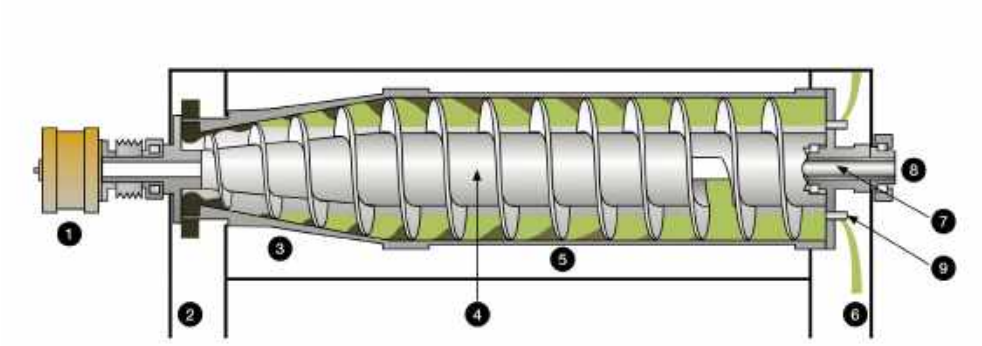
Connectivity

Sigma decanter centrifuges can also be fitted with connectivity equipment, to provide users and decision-makers with a wide range of operating data, whether onsite or off.

- Remote support enables your service provider to provide remote troubleshooting to help ensure maximum processing uptime and keep your Sigma unit or units running throughout the hectic olive processing season
- Remote monitoring ensures greater peace of mind. Access Alfa Laval´s connectivity portal to remotely monitor your decanter centrifuge and receive any appropriate alarm notifications.

Example of the tungsten carbide tiles fitted on a Sigma decanter centrifuge

Two-phase operation



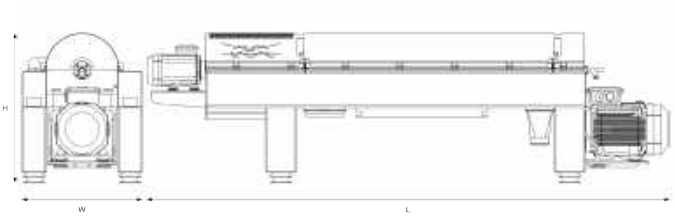
1: Gearbox
2: Wet husk outlet
3: Conical end
4: Screw conveyor
5: Bowl
6: Olive oil discharge outlet
7: Feed tube
8: Feed inlet
9: Oil discharge ports

Technical data

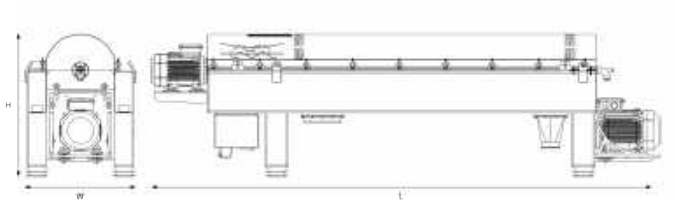
	Sigma 6	Sigma 8	Sigma 9	Sigma 10
Bowl diameter	360 mm / 14.17 inches	500 mm / 19.69 inches	550 mm / 21.65 inches	650 mm / 25.59 inches
Bowl length	1800 mm / 70.87 inches	2500 mm / 98.43 inches	2200 mm / 86.61 inches	2565 mm / 100.98 inches
Bowl speed (maximum)	3950 rpm	2850 rpm	3400 rpm	3100 rpm
G-force (maximum)	3139 G	2270 G	3554 G	3491 G
Gross weight	2300 kg / 5071 lbs	5100 kg / 11244 lbs	5000 kg / 11023 lbs	6500 kg / 14330 lbs
Length	4270 mm / 168.11 inches	5476 mm / 215.59 inches	5722 mm / 225.27 inches	6382 mm / 251.25 inches
Width	990 mm / 38.98 inches	1140 mm / 44.88 inches	1300 mm / 51.18 inches	1450 mm / 57.08 inches
Height	1304 mm / 51.34 inches	1528 mm / 60.16 inches	1693 mm / 77.28 inches	2381 mm / 93.74 inches
Gearbox size	DD 3.5 kNm	DD 8 kNm	DD 12 kNm	DD 12 kNm
Main power	22 KW / 29.5 hp	37 KW / 49.6 hp	55 KW / 73.8 hp	75 KW / 100.6 hp
Back drive motor power	11 KW / 14.8 hp	15 KW / 20.1 hp	22 KW / 29.5 hp	37 KW / 49.6 hp
Total installed power	33 KW / 44.3 hp	52 KW / 69.73 hp	77 KW / 103.3 hp	112 KW / 150.1 hp

Measurements

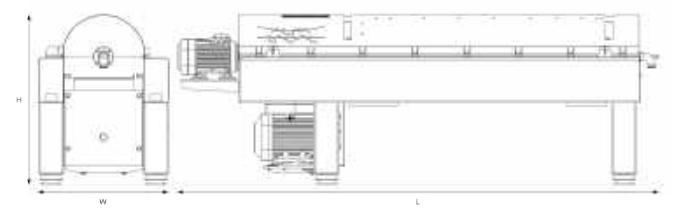
Sigma 6



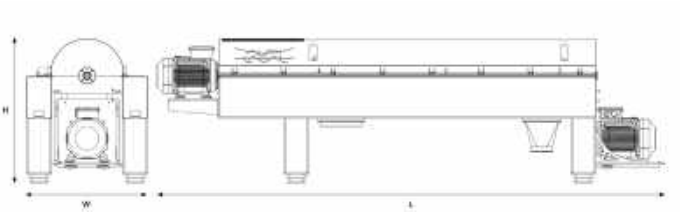
Sigma 8



Sigma 9



Sigma 10



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How to contact Alfa Laval

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