

Alfa Laval Alrox deaeration module under vacuum

Deaerator module for food applications

Introduction

Alrox deaeration module under vacuum is designed for removing free, dispersed and/or dissolved air from a wide range of food products – including juices, purées, nectars and baby food – using vacuum deaeration.

Applications

- Egg processing
- Food and feed ingredient processing
- Fruit and vegetable processing
- Prepared food processing.

Benefits

- Less oxidation of the product
- Better retention of important nutrients
- Better flavour and colour stability
- Less fouling in subsequent heat treatment operations.

Design

The Alrox deaeration module under vacuum is intended for integration with Alfatherm and Steritherm heat treatment modules. The unit is pre-assembled on a skid for easy, rapid delivery and installation. The special design of the Alrox deaeration module under vacuum, with different options available to suit different applications, provides efficient deaeration of almost everything from single-strength juice to very viscous food products.

A special condenser can be added to the Alrox deaeration module under vacuum in order to minimize aroma losses. The stripped air and vapour are conveyed to the condenser, where the vapour that includes the aroma constituents is condensed. This aroma condensate is then returned to the deaerated product, while the non-condensable gases are vented out through the vacuum pump. In cases where a relatively large amount of vapour is stripped from the product, the condenser is necessary in order to maintain the required vacuum.



The Alrox deaeration module under vacuum is designed from the outset for effective Cleaning in Place (CIP) procedures, and the separator is equipped with CIP spray balls.

Working principle

The Alrox deaeration module under vacuum basic model works on the basis of hot deaeration. Adding an optional Alfa Laval spinner distribution system makes it possible to work at lower temperatures, using cold deaeration.

Hot deaeration

The incoming product, which is normally at a temperature around 40–60°C (102–140°F), is fed into a vacuum vessel via a distributing nozzle. The vacuum present inside this vessel corresponds to a boiling temperature that is 2–5°C (3.6–9.0°F) lower than the product inlet temperature.

The product expands into the vacuum. The release of pressure, and the resultant boiling, causes instant evaporation of some of the water in the product. This has the effect of stripping out any air that may be present, in whatever form.

The vacuum in the separator is maintained by a liquid ring vacuum pump. The deaerated product is discharged through the bottom outlet to an extraction pump that pumps the product out to the next processing step.

Cold deaeration

In the Alfa Laval spinner distribution system, which is optional equipment for the Alrox deaeration module under vacuum, a special disc rotates at high speed, spreading the product in thin layers as it enters the vacuum vessel. This means the entrapped air is mechanically exposed to the vacuum with maximum efficiency.

This system provides efficient deaeration for very viscous products (up to 10000 cP), making it particularly suitable in processing fruit purées and concentrates.

The spinner distribution system makes it possible to also remove the air from product flows at lower inlet temperatures of 10–40°C (50–102°F). This is usually called “cold deaeration”, and is very advantageous with products that are particularly sensitive to heat.

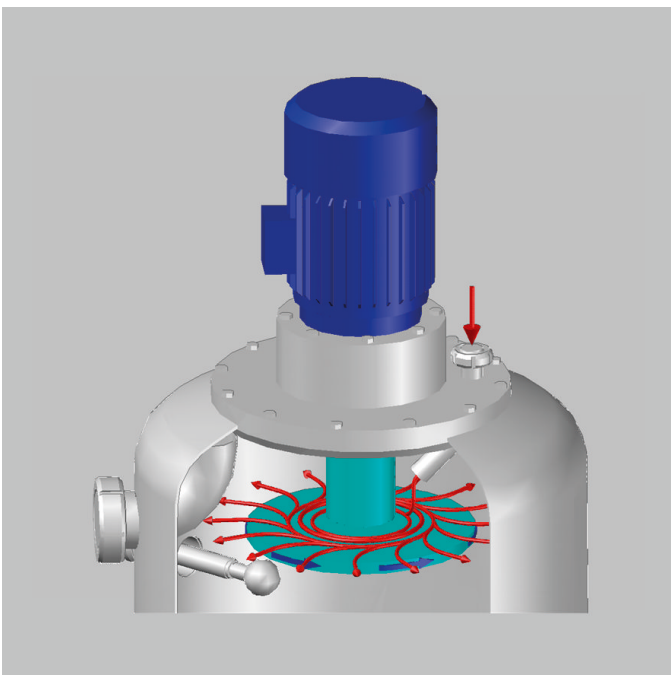
Standard configuration

- Vacuum vessel in which deaeration takes place
- Level control system
- Vacuum pump for extracting non-condensable air or gas
- Vacuum control system
- Frame for mounting the equipment
- All surfaces in contact with product made of AISI 304 stainless steel, or equivalent

The module is pre-assembled on a skid for easy, rapid delivery and installation.

Options

- Spinner distribution system for use with highly viscous products
- Condenser
- Inspection cover
- Control panel
- Product extraction pump (centrifugal type)
- Product extraction pump (positive type) and CIP pump (centrifugal type)
- Product wetted surfaces made of other materials than AISI 304



Spinner distributor working principle

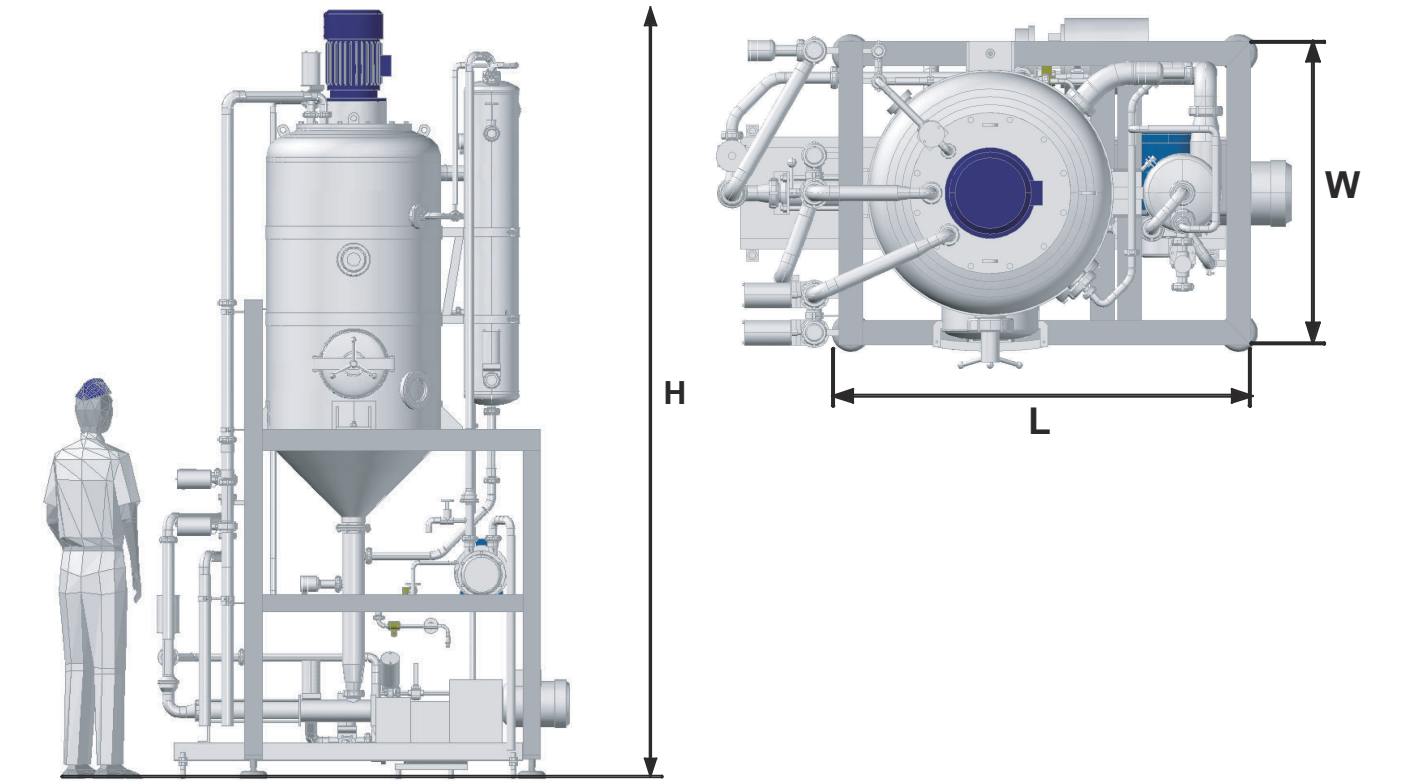
Technical data

		3-DR 450	6-DR 650	12-DR 800	18-DR 1000	24-DR 1300	48-DR 1600
Nominal capacity ¹	Lit./h (GPM)	3000 (13.2)	6000 (26.5)	12000 (52.9)	18000 (79.4)	24000 (105.8)	48000 (211.64)
Installed power ²	kW (HP)	1.5 (2.0)	3.0 (4.0)	3.0 (4.0)	4.0 (5.4)	4.0 (5.4)	5.5 (7.4)

¹ Capacity based on a feeding temperature of 50-60°C (122-140°F) and viscosity < 200cP, for higher viscosities capacity is lower

² Product extraction pump not included

Dimensional drawing



Model	3-DR 450	6-DR 650	12-DR 800	18-DR 1000	24-DR 1300	48-DR 1600
	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)
Length	1500 (59)	1700 (67)	1800 (71)	2200 (87)	2500 (98)	2700 (106)
Width	800 (31)	950 (37)	1200 (47)	1300 (51)	1600 (63)	1900 (75)
Height	2700 (106)	3200 (126)	3600 (142)	4000 (157)	4700 (185)	5000 (197)

Dimensions are indicative.

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