



# Alfa Laval VHE Economizer

## For deodorization and physical refining of fats and oils

### Introduction

This high-performance heat exchanger is specially designed to recover heat by cooling the deodorized edible fats and oils in deodorization and physical refining plants and – at the same time – heating the incoming oil. This cooling takes place under vacuum and sparging steam conditions.

The VHE Economizer is part of the Alfa Laval deodorization concept, but is also available as a retrofit component for installation in other deodorization systems – irrespective of origin.

### Application

For deodorization and physical refining of fats and oils.

### Benefits

- Increased capacity
- Better product quality
- Greater efficiency

### Design

The VHE Economizer is designed to achieve a high level of heat recovery by cooling the deodorized oil under vacuum and sparge steam conditions, while heating the incoming oil. Under full sparge steam conditions, this gradual cooling means the oil is treated gently and the quality improves. The sparge steam also acts as stripping to remove volatiles that might form during the cooling phase, and to improve the heat transfer rate.

The large heat transfer surface area and the counter-current flow result in a very high oil-to-oil heat transfer rate, which normally means a heat recovery exceeding 75%, depending on the size, application and operating parameters.

The low liquid level and channel system with baffles ensure that the oil follows the desired path. The first oil that enters is the first out, and thus remains inside the VHE Economizer for the required time. In the last channel, there is a connection for dosing antioxidant, where the oil is under vacuum and at a lower temperature.

The tube side is designed to ensure maximum heat transfer and self-cleaning effect, thus ensuring the best possible operation for each specific duty.



To reduce time and contamination during stock changes, a drain valve arrangement is used on both sides for quick draining.

In order to simplify service and maintenance, the sparge steam tubes are removable from outside for manual cleaning. The inside of the heat exchange tubes is also accessible for cleaning.

The shell side is equipped with illuminated sight glasses that enable observation during processing.

### Options

- Tube/shell side drain valve with actuator
- Material: AISI 316/316L
- ASME code for the tube side
- Other temperature programs

### Working principles

The hot deodorized oil enters the VHE Economizer at one end of the shell side, which is under vacuum, and flows through a special system of channels and baffles until it reaches the outlet connection at the other end. It is then pumped out for final cooling and storage. A level transmitter installed on the shell controls the oil level on the shell side.

The sparge steam is injected through perforated tubes located on the bottom of the shell, below the heating tubes.

The cold oil enters the VHE Economizer under pressure on the tube side and flows through a multipass tube system until it reaches the outlet connection at the other end.

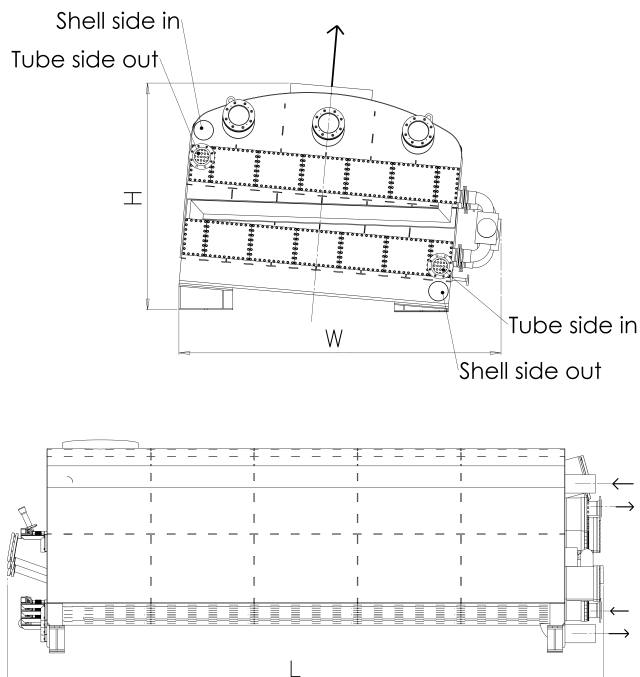
Counter-current flow between the incoming oil and deodorized oil is maintained by a special design of the tubes and baffles on the shell side.

To avoid cross-contamination and provide fast draining during stock changes, the heat exchanger is fitted with a special fast-drain valve arrangement on both sides.

## Technical data

Capacity (depending on temperature program)	up to 1600 tons/day
Operating temperature	up to 270°C (518°F)
Pressure on the tube side	up to 8 barg (116 psig)
Pressure on the shell side	full vacuum
Design pressure drop on tube side	2.5 barg (36 psig)
Typical temperature program, tube side	incoming oil 100–210°C (212–410°F)
Typical temperature program, shell side	deodorized oil 245–135°C (473–275°F)
Sparge steam consumption	0.1 % of oil flow
Standard code	AD Merkbblätter, ASME and PED
Material shell	AISI 304
Material tubes	AISI 304L

## Dimensional drawing



	L=length	W=width	H=height	Net weight
Model	mm (inch)	mm (inch)	mm (inch)	kg (lb)
55D	7000 (276)	2050/2465 <sup>1</sup> (81/97)	2000 (79)	7500 (16535)
115D	7100 (280)	2050/2450 (81/97)	2100 (83)	8500 (18739)
160D	7100 (280)	2450/3000 (97/118)	2500 (98)	11700 (25794)
213D	7100 (280)	3000/3450 (118/136)	2500 (98)	12900 (28440)
291D	7200 (284)	3350/3900 (132/154)	2500 (98)	16500 (36376)
385D	7200 (284)	3400/3900 (134/154)	2700 (106)	19500 (42990)
550D	7200 (284)	3400/3900 (134/154)	3000 (118)	22500 (49604)

<sup>1</sup> Including drain valves

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