

Alfa Laval AS-H Fully Mechanised Plate Press

For dewatering of sludge and other liquids with solids capture >99%

Introduction

Plate presses, also known as chamber filter presses or plate and frame presses, offer the highest solids capture rate of any dewatering technology. Alfa Laval AS-H Fully Mechanised Plate Presses with side bar design are especially suited for high capacity, continuous dewatering in municipal and industrial applications where a very high level of dry solids of the cake is of paramount importance. They offer maximum degree of automation, also with extremely sticky filter cake e.g. from ceramic and mining applications. Compared with other technologies, polymer and power costs are minimal.

A wide range of standard sizes and plate types are available to suit the needs for different types of sludge and process requirements

Applications

- Dewatering of sludge from municipal and industrial wastewater treatment
- Sludge dewatering from potable water treatment
- Dewatering of sludge from environmental dredging and clean-up of sediments in ponds, lagoons, bays, canals, harbours and waterways
- Dewatering of liquid products in a wide variety of industrial applications
- Mining and minerals
- Food and beverage
- Paper industry
- Pharmaceuticals
- Pigments and dyes
- Chemicals

Benefits

- Very dry and stable end-product (cake)
- Best technology on the market with up to 40% dry solids for environmental and 85% industrial plus solids capture >99%
- Combustable cake, suitable for incineration
- Low operational costs thanks to very low polymer and power consumption
- Continuous, highly efficient operation with low manpower requirements as all main operational steps are fully mechanised e.g. opening, closing, assisted cake discharge mechanism plus fully automated cloth washer (optional), which ensures that full automation is achieved



- Low head washing machine makes the plate press suitable for buildings with low height
- Robust, simple and maintenance friendly design
- High level of safety for operators
- Wide and versatile portfolio; Plate presses for both recessed, membrane and plate/frame plates in a variety of different materials can be supplied
- Can easily be customized for all dewatering needs

Features and design

The range of fully mechanised Alfa Laval AS-H Plate Presses offer unrivalled quality, integrity and engineering excellence as well as a number of special features for safe and efficient operation:

- Robust design
- Frames are manufactured from carbon steel
- Fully automated plate separator
- Full operator safety system based on infrared light (standard in most markets; optional in some)
- Hydraulic closing system
- Single hydraulic system for open/closing, filter plate separation and drip tray via a single motor
- Pneumatic centre core blow cleaning
- Feed end liners for corrosion protection in polypropylene (as standard) or stainless steel (optional)

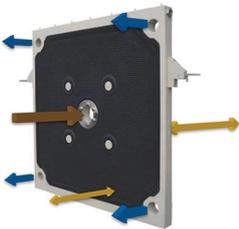
- Fully automatic cloth washing machine (optional) especially suited for large capacity plate presses
- Fully mechanised, double acting hydraulic drip trays (standard with all presses supplied with cloth wash machine; otherwise offered as an option)

Features description

Filter plates

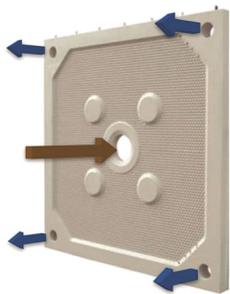
To cater for any dewatering need, the Alfa Laval AS-H Fully Mechanised Plate Press can operate with a wide range of different plate types, both recessed and membrane plates with facilities for filtration, cake washing and air blowing. The materials of the plates can range from polypropylene (PP), poly- vinylidene fluoride (PVDF), and ethylene propylene diene monomer (EPDM) rubber or PP membranes.

External drainage plate



Membrane inflation plate

Corner feed plate



Recessed chamber plate

Filter cloths

A variety of filter cloths can be used, usually synthetic materials such as nylon, polypropylene and polyester. Types available include monofilament, staple fibre and continuous multifilament. Weave can be plain, twill or satin finish.

Hydraulic closing system

A hydraulic power pack with a low and high pressure system operates a double acting hydraulic cylinder for closing the plate press plate pack and seals the filter plates. On the return stroke of the cylinder the plate press is opened allowing the stainless steel plate separator to discharge the filter cakes.

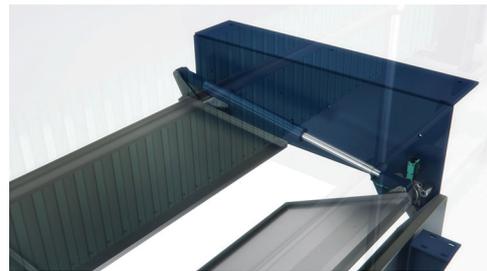
Fully automated plate separator

The fully automated plate separator in stainless steel ensures fast cake discharge with no or minimal need for operator invention. The separator is equipped with wear strips as standard for corrosion prevention and spaced off sidebars to avoid cake collection/build up.



Fully mechanised hydraulic double acting drip trays

These are available on all models for mounting beneath the plate press and are hydraulically operated via the main power pack. The frames are in stainless steel and can either be fitted with stainless steel or polypropylene sheets dependent upon process application, for corrosion protection.



Safety guard protection

For maximum operator safety, it is necessary to have a safety guard protection on both sides of the plate press. Infra-red safety light guards in full height, which will automatically stop the operation if hands or other objects move into the safety area, are installed on both the operating and non-operating sides.



Local control system

The Alfa Laval AS-H Fully Mechanised Plate Press is controlled via a locally mounted panel fitted with PLC and HMI.

Options

Optional equipment for the fully mechanised plate press

- Corrosion protection options for polypropylene clad sidebars
- Polypropylene or stainless steel feed and filtrate port liners
- Polypropylene or stainless steel clad feed and moving end
- Fully automatic, enclosed stainless steel cloth washing machine that work in conjunction with the plate transfer mechanism to clean the filter cloths utilizing high pressure water. High pressure cloth wash water pumps rated at up to 100 bar. The washing machine can be retrofitted to existing plate presses.

Other types of plate presses

Alfa Laval also offers semi-mechanised side bar AS-H plate presses with hand operated pneumatic separator as well as tie bar design with manual movement of plates and pilot scale mobile plate press test units.

Service agreements/refurbishment and upgrades

- Alfa Laval AS-H Fully Mechanised Plate Presses have been designed for maximum robustness and minimal maintenance requirements.
- Automatic lubrication for general maintenance free operation; This also improves the sludge thickening process
- Easy access design for removal of plate separators and base frame mounted hydraulic power pack for ease of maintenance.
- Various levels of service and agreement packages, tailored to suit your requirements, are available; Our premium package gives complete peace of mind.
- Refurbishment of current plate press and ancillary equipment to 'as new' level – not only for Alfa Laval AS-H plate presses but any make and model, regardless of manufacturer.
- Upgrade of present plate press to provide a suitable level of automation, and to bring the machine in line with current health and safety legislation.

Working principles

The Alfa Laval AS-H Fully Mechanised Plate Press operates by pumping sludge into an enclosed vessel with chambers in between filter plates under pressure, which is counter reacted by the hydraulic system.

The chambers of the plate press are gradually filled up with sludge via a feed pump. Under continuous and increasing feed pressure cakes are formed from the outside inwards in the plate chambers.

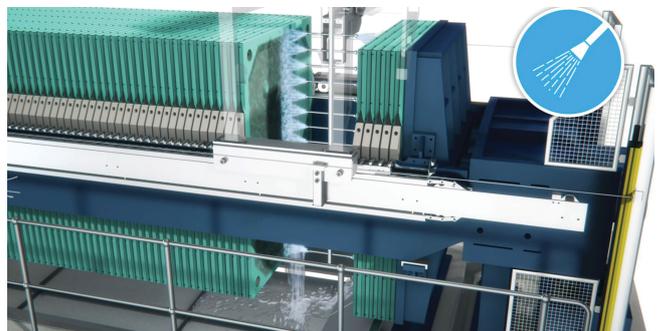
At this stage a high volume of filtrate is extracted at rapid speed due to the full surface area of the filter cloth that covers the plates. In the example below, recessed plates with centre feed and filtrate extraction in the four corners.



During the filtrate discharge the sludge particles are left behind on the surface of the filter cloth, decreasing the throughput of filtrate as it now has to pass through the cake. The chambers of the plate press are now full of sludge, forming a compact, very dry cake, which severely limits the filtrate flow. However, the centre core will remain wet due to lack of filtration surface. When all chambers of the plate press are full, the wet centre core is removed using compressed air (normally referred to as core blow). The Alfa Laval AS-H Fully Mechanised Plate Press utilizes pneumatic centre core blow cleaning.

The filter plates are now opened to release the filter cake. The fully automated positive plate separator releases one plate at a time using hydraulic pressure. Prior to this, the hydraulic, double acting drip trays are opened to allow the cake to drop into a cake disposal system or a container below the plate press (not part of the plate press delivery but can be provided on request).

During the closing, opening and cake discharge, the infra-red safety light guards will automatically stop the operation if hands or other objects move into the safety area. In order to continue working efficiently, the cloth of the filter plates needs cleaning at regular intervals, either manually or mechanically. If the plate press is equipped with the Alfa Laval AS-H Fully Automatic Cloth Washer Machine, the entire process is done without any need for operator intervention. The machine will automatically separate the plates, and double acting arms will be lowered and travel along the plates and wash two plates at a time.



Technical Data

Construction

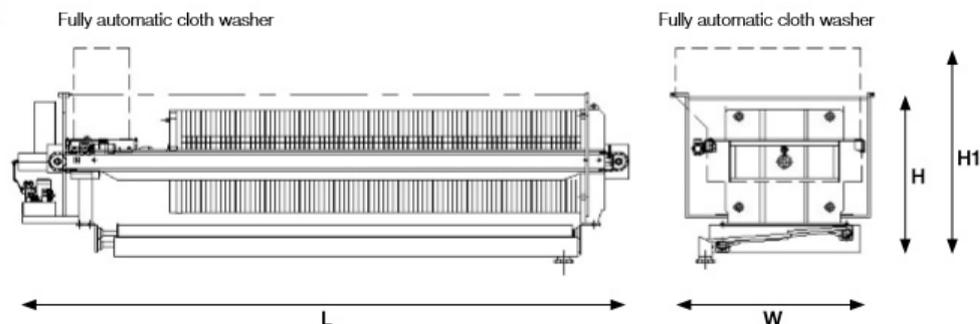
The plate press is fabricated from steel end structures with carbon steel sidebars located on both sides of the end

structures to provide a rigid frame. The hydraulic cylinder is mounted centrally in the cylinder stand. For larger machines two hydraulic cylinders are used. A fabricated steel travelling end-piece is supported on the side bars and connected to the hydraulic cylinder for closing and sealing the filter plate pack.

Dimensions

Standard feed pressures:

- 7 bar g
- 10 bar g



The automatic wash system (optional) is included in the H1 dimensions

Dimensions - For guidance reference only

Model	Length		Width		Height-H (without washer)		Height H-1 (with washer)	
	mm	(inches)	mm	(inches)	mm	(inches)	mm	(inches)
80	8,175	(321)	2,270	(89)	2,050	(81)	2,490	(98)
100	9,415	(370)	2,470	(97)	2,150	(84)	2,690	(106)
120	10,655	(420)	2,670	(105)	1,955	(77)	2,310	(91)
150	12,585	(495)	2,970	(117)	1,955	(77)	2,610	(103)
175	14,010	(552)	2,820	(111)	2,325	(92)	2,955	(116)
200	14,715	(579)	3,320	(131)	2,325	(92)	2,955	(116)

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