

# Alfa Laval Astepo clean filler

Bag-in-box clean filling system for the food and dairy industries

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## Introduction

The Astepo clean filler is a bag-in-box (BIB) system for filling flexible bags fitted with international standard 1-inch spouts.

## Application

The Astepo clean fillers are widely used within the food and dairy industries. They are particularly well suited for the filling of liquids such as milk, flavoured milk, milk shakes and sundaes – which need to be kept under refrigerated conditions – and dense, viscous products (often containing small particles) such as ketchup and mayonnaise, and sauces such as pesto and chilli, and shelf-stable syrups and extracts.

Special ‘Ultraclean’ filler versions are available for dairy and egg products as well as other delicate products.

## Benefits

- Easy to convert from semi-automatic to automatic operation
- User-friendly operation with minimal supervision and maintenance required
- Compact, “plug and play” unit.

## Design

The Astepo clean filler can be configured for either automatic or semi-automatic operation. It is designed for easy operation and maintenance and to ensure that swapping between different bag sizes is done rapidly. Astepo clean fillers operate with all types of bags and spouts currently available and can be configured with single or double filling heads.

The semi-automatic filler with a maximum hourly capacity of 6,000 l can be used with:

- Small bags 1–20 l in capacity
- Bins 200–1,000 l in capacity.

If the small-bag production output exceeds 100 bags per hour an automatic bag feeder for web-type bags is added under the filling valve. This ensures output of up to 350 bags per hour.



Automatic Astepo clean bag-in-box filler for 3 – 20 l bags

The automatic Astepo clean filler carries out the operations of uncapping, filling and capping of the bag along with the CIP cycles needed and has an hourly filling capacity of up to 4,000 l with a filling accuracy of +/- 0.5%.

The automatic Astepo clean filler can be linked up to an automatic Alfa Laval Combibox cartoning line featuring carton sealing with hot-melt glue or adhesive tape.

The Ultraclean version of the Astepo clean filler ensures extended product shelf life as there is no physical interference from an operator after the first bag is inserted and the machine is started. The filler automatically loads, fills and re-caps the bags and is completely equipped with sensors to stop filling if a no-bag – or no-valve condition exists.

Maximum capacity for Ultraclean filler:

- 350 l per hour (5 l bags)
- 300 l per hour (10 l bags)
- 250 l per hour (20 l bags).

### Standard configuration

- Frame made of AISI 304 stainless steel
- 1-inch filling valve made of AISI 316 stainless steel
- Volumetric dosing by magnetic flow meter
- Sloped and adjustable roller conveyor table made of AISI 304 stainless steel, for small bags
- Motorized two-way roller conveyor for bins and drums, with supporting pneumatic clamps for big bags
- Stainless steel AISI 304 IP54 electric cabinet with operator interface terminal.



Semi-automatic filler for 1,000 l bags

**Standard configuration for Ultraclean fillers:** The Ultraclean filler is delivered with the filling area completely covered, in addition to sealed Lexan transparent polycarbonate safety guards to protect the operator's eyes and hands. It also has a positive over-pressure of sterile air with a HEPA class 100 filter positioned over the filling area to be used when filling dairy products.

When used for filling egg products it is fitted with a gasket-free AISI 304 stainless steel net and an air-sterile filter.

### Certification

The unique ultraclean "white" filling valve is validated for cleanliness and EHEDG certified by the European Hygienic Equipment Design Group. It is protected during the filling operation by an overpressure of filtered air and with the additional option of a nebulizer system for liquid disinfectants such as oxonia, peracetic acid and hydrogen peroxide. The "white" valve is also ideal for use when filling dense, sticky products. It helps avoid dripping and can be safely sanitized as part of the cleaning-in-place (CIP) cycle, using steam.



### Options

- Fully drainable structure made of AISI 304 stainless steel
- Food contact surfaces that can be sterilized using steam
- "White" filling valve (EHEDG hygienic certificate)
- Volumetric dosing by 3A magnetic flow meter or massic flow meter on request
- Corrosion-resistant filling chamber
- Cleaning-in-place (CIP) cycle and loop

- Closed filling chamber, with optional disinfectant nebulization from a 50-litre stainless steel tank with automatic alarm level
- Fully integrated 0.02-micron sterile filter and loop for air treatment and pressurization in the chamber for egg products or fully integrated HEPA filter system for dairy products, including class 100 air generator
- Fully interlocked and hygienic safe guards
- “Air-less” cylinder to prevent air from entering the bag after filling and prior to re-capping
- Siemens S7 and OP 317 programmable logic controller (other PLC solutions available on request)
- IP54 control board made of AISI 304 stainless steel
- Easy to set up by selecting from pre-configured menus
- User-friendly change-over of bag volume
- Automatic sample taker that does not require operator involvement
- Filling of bags with caps, one or two positions, or dispenser tubes
- Automatic bag-into-box loader available for automatic version
- Loads carton boxes or plastic crates
- Left, right or reverse exit of bags to load station.

soon as this happens, a filling cycle starts. This cycle includes the removal of the cap and the positioning of the filling valve in the fitting provided on the open bag. A vacuum removes residual air on basis of a customized time setting. The bag is then filled using volumetric dosing, determined by a recipe selected at the operator interface terminal. An adjustable puff of nitrogen can clear the valve before it is lifted off. The cap is then repositioned and the filled bag is released.

In automatic fillers, each filled bag is separated from an incoming empty bag by the action of an automatic knife.



Ultraclean bag-in-box filling system

Available options	Semi-automatic	Automatic	Ultraclean
Vacuum	x	x	x
Nitrogen puff	x	x	x
Steam sterilization	x	x	x
Ultra-clean kit (overpressure of sterile gas)	x	x	x
Disinfectant jet			x
Filling 200–1,000 l (55–264 gal.) bags	x		
Double filling heads	x	x	x
Product recycle valve	x	x	x

### Working principle

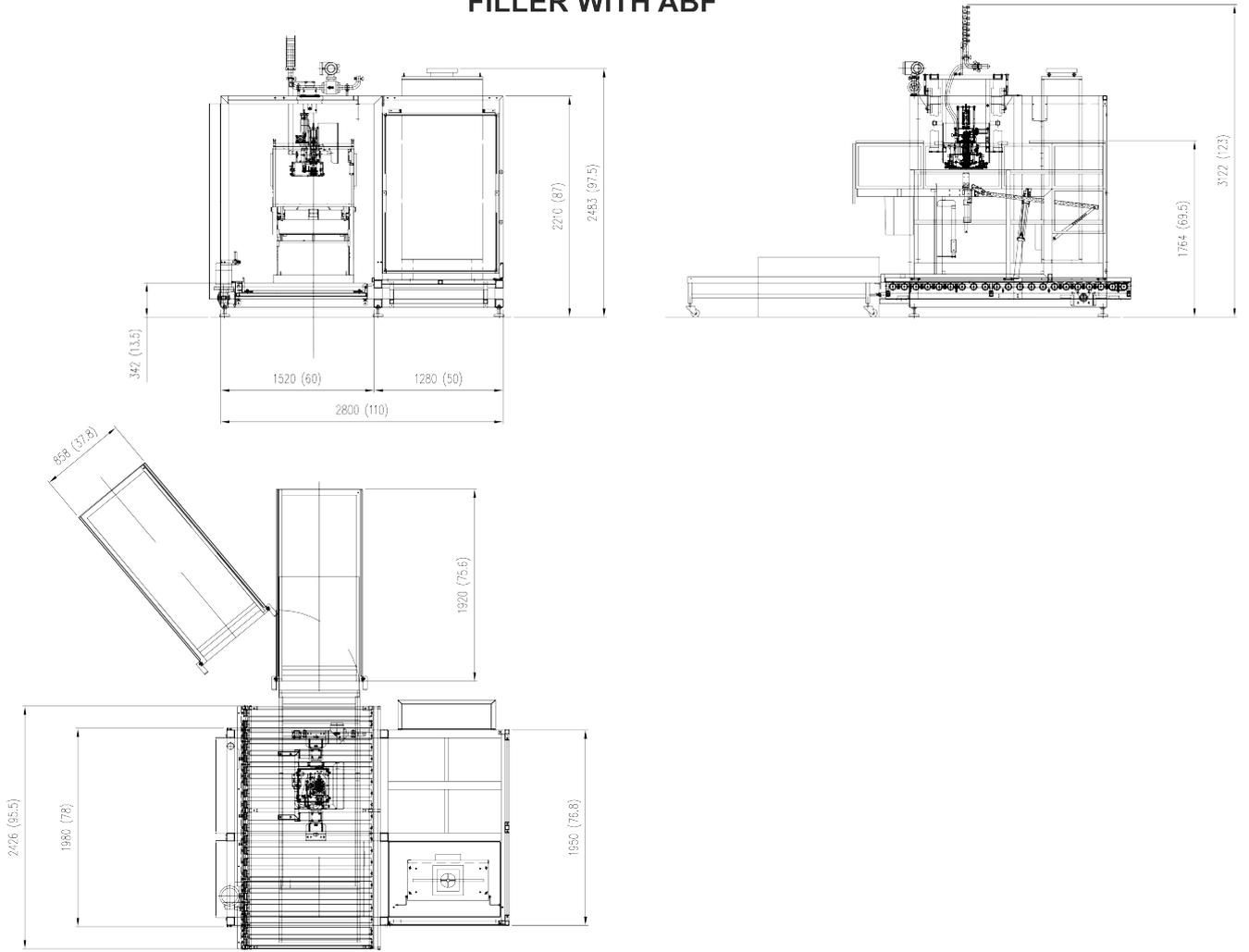
The Astepo clean filler detects when a cap has been inserted, whether manually or mechanically (automatic version). As

Technical data	Semi-automatic	Automatic	Ultraclean
Bag size in litre (gallon)	1-20 l (0.25-6 gal.) 200-1,000 l (55-264 gal.)	3-20 l (1-6 gal.)	3-20 l (1-6 gal.)
Maximum performance in cycle per hour (cph) for different bag sizes	200 cph/1-20 l (0.25-6 gal.) 6 bins per hour	350 cph/5 l (1.5 gal.) 250 cph/20 l (5 gal.)	350 cph/5 l (1.5 gal.) 300 cph/10 l (2.5 gal.) 250 cph/20 l (5 gal.)
Product infeed	> 1.5 to < 3 bar (> 22 to < 44 PSI)		
Filling temperature	0-95°C (32-203°F)		
Instantaneous product flow meter	6,000 l/h (1,600 gal./h)		
Maximum temperature sanitization	120°C (248°F)		
Air infeed	6-8 bar dry microfiltered (87-116 PSI)		
Compressed air consumption	6 Nm <sup>3</sup> /h		
Electrical supply	220/240V, 0.5 kW, 50/60 Hz		400V, 2.5 kW, 50/60 Hz
Dimensions single W x L <sup>1</sup> x H (depending on design and configuration)	2,800 x 2,426 x 3,122 mm (110 x 96 x 123 inches)	2,800 x 2,426 x 3,122 mm (110 x 96 x 123 inches)	2,800 x 2,426 x 3,122 mm (110 x 96 x 123 inches)
Weight (depending on design and configuration)	1-20 l bags = 650 kgs 1,000 l bags = 1,100 kgs	3-20 l bags = 900 kgs	

<sup>1</sup> Roller excluded

Dimensional drawing

FILLER WITH ABF



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