



# Powder mixer and pump in one mobile unit

## Alfa Laval Hybrid Powder Mixer M15

### Application

The Alfa Laval Hybrid Powder Mixer is a patented hygienic mobile unit that both disperses powders into liquids quickly and efficiently and pumps the resulting solution at outlet pressures of up to ~72.5 psi (5 barg), all using a single motor. This versatile, easy-to-use mixer produces homogeneous products at high dry matter concentrations and high productivity.

The mixer is an excellent choice for use in a wide range of dairy, beverage and food powder mixing applications, e.g. for incorporating thickeners and stabilizers like pectin and xanthan and emulsifiers in the concentrations required in most applications. It is also capable of producing recombinant milk with more than 50% dry matter.

### Design

The Alfa Laval Hybrid Powder Mixer is comprised of a two stage pump with one rotor-stator stage and one pump stage. The unit is fitted with a single motor and a frequency converter. A funnel is used for introduction of powder through an injector system which can be isolated using a sanitary C-Ball valve. The construction is mounted on a stainless steel frame and the liquid inlet is equipped with a sight glass and a butterfly valve.

### TECHNICAL DATA

#### Versions:

US version . . . . . (380-480 VAC)  
 CANADA version . . . . . (525-600 VAC)

#### Materials:

Product wetted steel parts: . . . W. 1.4404 (316L) and Duplex steel  
 Other steel parts: . . . . . W. 1.4301 (304)  
 Product wetted seals: . . . . . EPDM, PTFE  
 Other O-rings: . . . . . EPDM  
 Finish: . . . . . Semi-Bright  
 Internal surface roughness: . . . Pipework acc. to DIN11850 Ra<32  
 μ inch  
 Shaft seal: . . . . . Single mechanical SiC/SiC, flushed  
 version  
 Flush tank: . . . . . Approx. 1 ltr. incl. sight glass  
 Note: Flush through possible via easy connection

#### Motor:

US/CANADA version: Standard-C Face/Foot mounted NEMA motor with a fixed ball bearing on drive side, according to NEMA standard, 2 poles = 3600 RPM at 60 Hz, enclosure TEFC Wash Down

#### Power:

Installed power: . . . . . 25 hp



#### Frequency drive

Type: . . . . . Danfoss VLT® AutomationDrive FC  
 300 series  
 Power rating: . . . . . 25 hp (Normal overload 110 %/60 s)  
 Input voltage:  
 US version: . . . . . 380-480 VAC  
 CANADA version: . . . . . 525-600 VAC  
 Mains option: . . . . . Local mains disconnect  
 Insulation class: . . . . . IP66/NEMA 4X  
 RFI filter:  
 US version: . . . . . Class A1/B  
 CANADA version: . . . . . No filter  
 Display: . . . . . Graphical local control panel

#### Connections:

Liquid inlet connection:  
 US/CANADA versions: . . . . . TriClamp 2"  
 Liquid outlet connection:  
 US/CANADA versions: . . . . . TriClamp 1½"

#### Control of powder addition:

Manually actuated special C-Ball valve for dry ingredient adding

#### Other:

Funnel strainer.  
 Blind cover at powder inlet for use during CIP

**OPERATIONAL DATA**

**Technical data:**

Temperature range: . . . . . 14°F to + 203°F  
 Recommended inlet pressure: . . . . . 0.0 - 2.9 psi  
 Min. back pressure recommended: . . . 14.5 psi  
 Dry ingredient capacity: . . . . . Dependent on powder  
 (e.g. 6614 lb/h capacity for  
 skimmed milk powder).  
 Noise level (at 1 m): . . . . . < 90 dB(A)

**Dimensions/weight:**

HxWxL [inch]: . . . . . 44.45 X 32.52 X 52.76  
 Weight: . . . . . Approx. 617 lb  
 Max. table load: . . . . . 661 lb

**Benefits**

The Alfa Laval Hybrid Powder Mixer provides a lower total cost of ownership of a powder-mixing system by combining powder mixer and pump function in one unit, thereby reducing installation costs. The system also allows the introduction of additional pressure-drop producing equipment downstream of the powder mixer, such as valves, heat exchangers, etc. without the necessity of installing an additional pump for boosting pressure. In addition, the simple design of the system keeps maintenance costs low. Furthermore, for a mixing application in a batch tank, the powder mixer can be configured in combination with an Alfa Laval Rotary Jet Mixer in such a way that the Hybrid Powder Mixer delivers the flow and pressure needed for the Rotary Jet Mixer.

**Operation of the Alfa Laval Hybrid Powder Mixer**

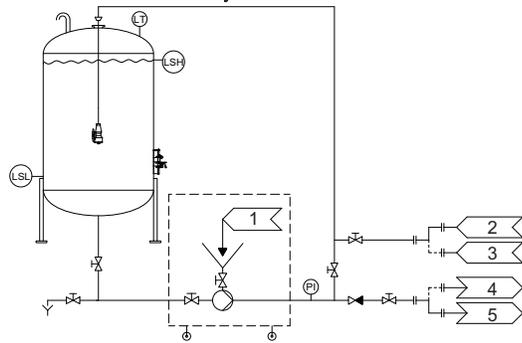
The two-stage in-line Hybrid Powder Mixer is installed in a recirculation loop connected to a batch tank. This user-friendly mobile unit has a built-in table to facilitate handling of heavy bags of powder. The table easily slides into position for convenient placement of the bags during mixing.

After adding liquid ingredients to the tank, the Alfa Laval Hybrid Powder Mixer is used to circulate the liquid over the tank. To provide high-efficiency mixing in tanks with volumes larger than 500 gallons it is recommended to install an Alfa Laval Rotary Jet Mixer in the tank by connecting it to the end of the circulation pipe.

After powder is introduced in the funnel, the C-Ball valve under the funnel is opened. The valve is the only component that the operator must control during introduction of the powder. The injector positioned under the valve creates an under pressure in the funnel outlet, drawing the powder into the rotor-stator stage of the pump and blending the powder and liquid into a homogeneous mixture. The impeller in the second stage of the pump transfers the powder-liquid mixture back to the tank while part of the powder-liquid mixture is sent through the injector creating the under pressure in the funnel outlet, which enables the suction of the powder into the liquid.

When mixing is complete, the Hybrid Powder Mixer may be used as a discharge pump or, when used with the Alfa Laval Rotary Jet Mixer, as a CIP forward pump – depending on the size of the tank and Rotary Jet Mixer - to clean the tank interior.

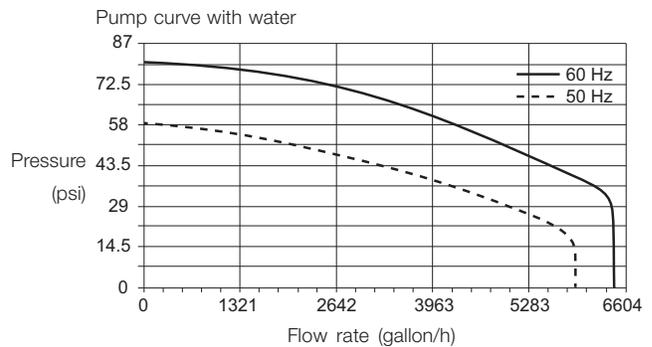
**Example of setup with the Alfa Laval Hybrid Powder Mixer and an Alfa Laval Rotary Jet Mixer**



NOTE: This diagram is for illustration and guidance only!

- 1. Powder/Crystals
- 2. Water/main media
- 3. CIP-F
- 4. CIP-R
- 5. Product

**Pump Curve for the Alfa Laval Hybrid Powder Mixer**





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**How to contact Alfa Laval**

Contact details for all countries are continually updated on our website. Please visit [www.alfalaval.us](http://www.alfalaval.us) to access the information direct.