



# FrontLine™ Plate Heat Exchangers

## FrontLine™

### Applications

- Pasteurisation
- General cooling/heating of dairy, brewery, beverage and food products
- Heating/cooling in the pharmaceutical industry.

### Standard design

#### Frame

The plates and the pressure plate are suspended from an upper carrying bar and located by a lower guiding bar, both of which are fixed to the support column. The tightening bolts are equipped with ball bearing washers in order to facilitate opening and closing of the unit. The frame and support column have adjustable feet.

One unit may contain several heat exchangers, separated by connection plates with interchangeable connections.

#### The Front plate

The Front plates are designed to meet the highest requirements in food processing. The combination of high pressing depth and a pattern with relatively few contact points provides longer operation time without interruptions. The distribution pattern assures an even flow over the entire plate. The ports have a diameter enabling cleaning in place (CIP) with the same flow used in the process itself.

#### The plate pack

The chevron corrugation of the plates provides a passage between the plates and supports each plate against the adjacent one. It also enhances the turbulence, resulting in efficient heat transfer.

Different chevron angles are available to reach the optimal high heat transfer at a given pressure drop. A unique distribution area provides an efficient flow over the plate surface. The Alfa Laval hanging system enables easy handling of the plates in the frame. Furthermore the corner guiding provides a strong plate pack. The plates are reversible and have parallel flow, which means that only one type of gasket is needed.

### Working principle

A Plate Heat Exchanger consists of a pack of corrugated metal plates with port holes for the passage of two fluids between which heat transfer will take place.

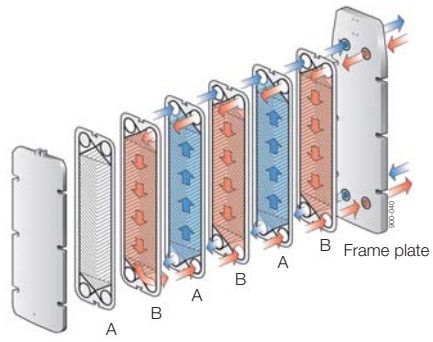
The plate pack is assembled between a fixed frame plate and a movable pressure plate and compressed by tightening bolts.

The plates are fitted with a gasket which seals the inter-plate channel and directs the fluids into alternate channels. The number of plates is



Front plate

determined by the flow rate, physical properties of the fluids and the temperature program. Connections may be located in frame plate and pressure plate.



Pressure plate

Flow principle of FrontLine plate heat exchanger

## Standard Materials

### Frame

Frame and pressure plate in solid or clad stainless steel or surface coated. All wetted parts in acid proof stainless steel. Other surfaces in various grades of stainless steel. Movable nuts on tightening bolts in chromium plated brass.

### Plate Types

Front6, Front8, Front10 and Front15.

Other plates of the FrontLine™ series are the WideStream® and Gemini plates.

### Plates

Stainless steel AISI 316, Titanium or SMO

### Gaskets

Nitrile-FDA or EPDM-FDA.

The FrontLine™ plates are supplied with glue-free Clip-On gaskets, which are easy to replace even with the plates still hanging in the frame. The material of gaskets are selected for safe use in connection with pharmaceutical and food products.

## Technical Data

### Mechanical design pressure (g) / Temperature

|                            |                 |
|----------------------------|-----------------|
| FRM solid stainless steel  | 10 bar / 150 °C |
| FRH* solid stainless steel | 16 bar / 150 °C |
| FRD solid stainless steel  | 21 bar / 150 °C |

|                         |                 |
|-------------------------|-----------------|
| RM clad stainless steel | 10 bar / 150 °C |
| RH clad stainless steel | 16 bar / 150 °C |
| RD clad stainless steel | 21 bar / 150 °C |

|                    |                 |
|--------------------|-----------------|
| RMS surface coated | 10 bar / 150 °C |
| RHS surface coated | 16 bar / 150 °C |

Complies with the European Pressure equipment Directive (PED). May carry the CE mark depending on the design conditions. Complies with Alfa Laval Sound Engineering Standard (ALS).

\* Not applicable for Front 15

### Connections

DIN, SMS, Tri-CLAMP, B.S./RJT and IDF/ISO male parts. Others on request

### Plates

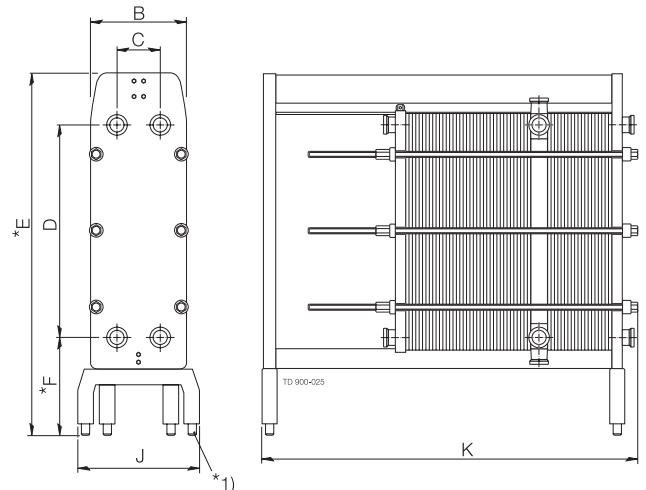
| Plates                  | Front 6                 | Front8                   | Front10                  | Front 15                 |
|-------------------------|-------------------------|--------------------------|--------------------------|--------------------------|
| Plate pattern           | Chevron                 | Chevron                  | Chevron                  | Chevron                  |
| Surface m <sup>2</sup>  | 0.18                    | 0.38                     | 0.62                     | 0.91                     |
| Overall dim., mm (inch) | 1000 x 250 (39.4 x 9.8) | 1250 x 375 (49.2 x 14.8) | 1500 x 500 (59.1 x 19.7) | 1750 x 625 (68.9 x 24.6) |
| Port dim., mm (inch)    | 55 (2.2)                | 80 (3.1)                 | 105 (4.1)                | 150 (5.9)                |
| Thickness, mm           | 0.5/0.6/0.7             | 0.5/0.6/0.7              | 0.5/0.6/0.7              | 0.5/0.6/0.7              |

## Options

- A. Thermometer pocket and nib with ventilation cock<sup>1)</sup>
- B. Thermometer pocket<sup>1)</sup>
- C. Connection for 51 mm pressure transmitter<sup>1)</sup>
- D. Protection sheet
- E. Bolt protections of stainless steel
- F. 3-A finish
- G. Extended legs
- H. Extra standard wrench or pneumatic tightening tool
- I. Test certificates and material certificate
- J. Testing by authorized inspection companies

<sup>1)</sup> At through pass corners in connection plates.

## Dimensions (mm)



1) Adjustable feet ± 40 mm

| Measurements mm / (inch) | Front 6 |        |        |        | Front8 |        |        |         | Front10 |  |        |  | Front 15 |  |        |  |
|--------------------------|---------|--------|--------|--------|--------|--------|--------|---------|---------|--|--------|--|----------|--|--------|--|
|                          | mm      |        | (inch) |        | mm     |        | (inch) |         | mm      |  | (inch) |  | mm       |  | (inch) |  |
| B                        | 370     | (14.6) | 492    | (19.4) | 670    | (26.4) | 803    | (31.6)  |         |  |        |  |          |  |        |  |
| C                        | 129     | (5.1)  | 220    | (8.7)  | 324    | (12.8) | 400    | (15.7)  |         |  |        |  |          |  |        |  |
| D                        | 859     | (33.8) | 1095   | (43.1) | 1324   | (52.1) | 1524   | (60)    |         |  |        |  |          |  |        |  |
| E*                       | 1420    | (55.9) | 1850   | (72.8) | 2167   | (85.3) | 2605   | (102.6) |         |  |        |  |          |  |        |  |
| F*                       | 400     | (15.7) | 500    | (19.7) | 500    | (19.7) | 700    | (27.6)  |         |  |        |  |          |  |        |  |
| J                        | 520     | (20.5) | 670    | (26.4) | 850    | (33.5) | 970    | (38.2)  |         |  |        |  |          |  |        |  |
| K* min                   | 1000    | (39.4) | 1440   | (56.7) | 1400   | (55.1) | 1588   | (62.5)  |         |  |        |  |          |  |        |  |
| K* max                   | 2500    | (98.4) | 3860   | (152)  | 5000   | (197)  | 6400   | (252)   |         |  |        |  |          |  |        |  |

\* Variable dimension depending on various components.

| Connection mm (inch) | Front 6 |     |        |     | Front8   |       |           |       | Front10 |  |        |  | Front 15 |  |        |  |
|----------------------|---------|-----|--------|-----|----------|-------|-----------|-------|---------|--|--------|--|----------|--|--------|--|
|                      | mm      |     | (inch) |     | mm       |       | (inch)    |       | mm      |  | (inch) |  | mm       |  | (inch) |  |
| Diameter             | 51      | (2) | 76     | (3) | 76/101.6 | (3/4) | 101.6/150 | (4/6) |         |  |        |  |          |  |        |  |

| Capacity l/h    | Front 6 |       |       |        | Front8 |        |        |        | Front10 |  |       |  | Front 15 |  |       |  |
|-----------------|---------|-------|-------|--------|--------|--------|--------|--------|---------|--|-------|--|----------|--|-------|--|
|                 | l/h     |       | (gpm) |        | l/h    |        | (gpm)  |        | l/h     |  | (gpm) |  | l/h      |  | (gpm) |  |
| Pasteurization  | 15000   | (400) | 35000 | (900)  | 65000  | (1650) | 100000 | (2550) |         |  |       |  |          |  |       |  |
| Heating/Cooling | 15000   | (400) | 35000 | (900)  | 65000  | (1650) | 150000 | (3800) |         |  |       |  |          |  |       |  |
| Water           | 30000   | (760) | 75000 | (1900) | 130000 | (3300) | 200000 | (5100) |         |  |       |  |          |  |       |  |

Overall length varies depending on numbers of plates and connecting plates. Recommended free space around the unit is 1.5 meter at sides and frame head end.

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The information contained herein is correct at the time of issue, but may be subject to change without prior notice.

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**How to contact Alfa Laval**

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