Applications
General heating and cooling duties. Heating by means of steam.

Standard design
The plate heat exchanger consists of a pack of corrugated metal plates with portholes for the passage of the 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 interplate channel and directs the fluids into alternate channels. The number of plates is determined by the flow rate, physical properties of the fluids, pressure drop and temperature program. The plate corrugations promote fluid turbulence and support the plates against differential pressure.

The plate and the pressure plate are suspended from an upper carrying bar and located by a lower guiding bar, both of which are fixed to a support column.

Connections are located in the frame plate or, if either or both fluids make more than a single pass within the unit, in the frame and pressure plates.

Typical capacities
**Liquid flow rate**
Up to 60 GPM, depending on media, permitted pressure drop and temperature program.

**Water heating by steam**
50 to 250 kW, 14 tons to 90 tons

Plate types
M3 and M3-X, where M3 provides parallel and M3-X diagonal flow (see figures on the next page).
M3D, double wall plates.

Frame types
VG
VGL (non-ASME)
Working principle
Channels are formed between the plates and the corner ports are arranged so that the two media flow through alternate channels. The heat is transferred through the plate between the channels, and complete counter-current flow is created for highest possible efficiency. The corrugation of the plates provides the passage between the plates, supports each plate against the adjacent one and enhances the turbulence, resulting in efficient heat transfer.

Standard materials
Frame plate
Mild steel, painted

Nozzles
Stainless steel AISI 316 or Titanium

Plates
Stainless steel AISI 316 or Titanium

Gaskets
M3 Nitrile, EPDM
M3X Nitrile, EPDM, Viton®
M3D Nitrile, EPDM

Connections
1-1⁄4" NPT

Technical data
Mechanical design pressure (g)/temperature
VG 230 Psig/320°F
FGL 230 Psig/320°F (non-ASME)

Maximum heat transfer surface
40 sq. ft

Particulars required for quotation
– Flow rates or heat load
– Temperature program
– Physical properties of liquids in question (if not water)
– Desired working pressure
– Maximum permitted pressure drop
– Available steam pressure

Dimensions

Measurements (mm)
The number of bolts may vary depending on pressure rating.
Applications
General heating and cooling duties. Heating by means of steam.

Standard design
The plate heat exchanger consists of a pack of corrugated metal plates with portholes for the passage of the 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 interplate channel and directs the fluids into alternate channels. The number of plates is determined by the flow rate, physical properties of the fluids, pressure drop and temperature program. The plate corrugations promote fluid turbulence and support the plates against differential pressure.

The plate and the pressure plate are suspended from an upper carrying bar and located by a lower guiding bar, both of which are fixed to a support column.

Connections are located in the frame plate or, if either or both fluids make more than a single pass within the unit, in the frame and pressure plates.

Typical capacities
**Liquid flow rate**
Up to 250 gpm, depending on media, permitted pressure drop and temperature program.

**Water heating by steam**
80 tons to 225 tons

Plate types
M6 and M6M

Frame types
FG, FD (ASME design)
FGL (non-ASME)
Working principle
Channels are formed between the plates and the corner ports are arranged so that the two media flow through alternate channels. The heat is transferred through the plate between the channels, and complete counter-current flow is created for highest possible efficiency. The corrugation of the plates provides the passage between the plates, supports each plate against the adjacent one and enhances the turbulence, resulting in efficient heat transfer.

Standard materials
**Frame plate**
Mild steel, painted

**Nozzles**
Flange: Stainless steel, Titanium
Lined: Stainless steel, Titanium
Pipe: Stainless steel

**Plates**
Stainless steel AISI 316
Titanium (M6M only)

**Gaskets**
M6 Nitrile, EPDM, HeatSeal $F^{TM}$
M6M Nitrile, EPDM, HeatSeal $F^{TM}$, Viton®G

**Connections**
Pipe connections:
2" NPT

With flanges:
FG 2" SOLJ ANSI 150
FD 2" SOLJ ANSI 150/ANSI 300

Technical data
**Mechanical design pressure (g)/temperature**
FGL 150 psig/320°F (non-ASME)
FG 150 psig/356°F
FD 360 psig/356°F

**Maximum heat transfer surface**
410 sq. ft.

**Dimensions**

<table>
<thead>
<tr>
<th>Type</th>
<th>H</th>
<th>W</th>
<th>h</th>
</tr>
</thead>
<tbody>
<tr>
<td>M6-FG</td>
<td>36.22&quot;</td>
<td>12.60&quot;</td>
<td>5.51&quot;</td>
</tr>
<tr>
<td>M6-FD</td>
<td>37&quot;</td>
<td>13&quot;</td>
<td>5.91&quot;</td>
</tr>
</tbody>
</table>

The number of tightening bolts may vary depending on pressure rating.

**Particulars required for quotation**
- Flow rates or heat load
- Temperature program
- Physical properties of liquids in question (if not water)
- Desired working pressure
- Maximum permitted pressure drop
- Available steam pressure
Applications
General heating and cooling duties. Heating by means of steam.

Standard design
The plate heat exchanger consists of a pack of corrugated metal plates with portholes for the passage of the 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 interplate channel and directs the fluids into alternate channels. The number of plates is determined by the flow rate, physical properties of the fluids, pressure drop and temperature program. The plate corrugations promote fluid turbulence and support the plates against differential pressure.

The plate and the pressure plate are suspended from an upper carrying bar and located by a lower guiding bar, both of which are fixed to a support column.

Connections are located in the frame plate or, if either or both fluids make more than a single pass within the unit, in the frame and pressure plates.

Typical capacities

**Liquid flow rate**
Up to 20 kg/s (158,400 lb/hr), depending on media, permitted pressure drop and temperature program.

**Water heating by steam**
200 – 1,800 kW (682,400 – 6,141,600 BTU/hr)

Plate types
TS6M

Frame types
FG and FD
Working principle
Channels are formed between the plates and the corner ports are arranged so that the two media flow through alternate channels. The heat is transferred through the plate between the channels, and complete counter-current flow is created for highest possible efficiency. The corrugation of the plates provides the passage between the plates, supports each plate against the adjacent one and enhances the turbulence, resulting in efficient heat transfer.

Standard Materials
Frame plate
Mild steel, Epoxy painted

Nozzles
Carbon steel
Lined: Stainless steel, Titanium

Plates
Stainless steel AISI 316 or Titanium

Gaskets
Nitrile, EPDM or HeatSeal F™

Connections
FG ASME Size 3" ANSI 150
FD ASME Size 2 1/2" ANSI 300

Technical data
Mechanical design pressure (g)/temperature
FG ASME 150 psig /350°F
FD ASME 300 psig /350°F

Maximum heat transfer surface
13 m² (140 sq. ft.)

Particulars required for quotation
– Flow rates or heat load
– Temperature program
– Physical properties of liquids in question (if not water)
– Desired working pressure
– Maximum permitted pressure drop
– Available steam pressure

Measurements (in/mm)
<table>
<thead>
<tr>
<th>Type</th>
<th>H</th>
<th>W</th>
<th>h</th>
</tr>
</thead>
<tbody>
<tr>
<td>TS6-FG</td>
<td>27.72/704</td>
<td>15.75/400</td>
<td>7.40/188</td>
</tr>
<tr>
<td>TS6-FD</td>
<td>27.72/704</td>
<td>16.14/410</td>
<td>7.40/188</td>
</tr>
</tbody>
</table>

The number of tightening bolts may vary depending on pressure rating.
Applications
General heating and cooling duties. Heating by means of steam.

Standard design
The plate heat exchanger consists of a pack of corrugated metal plates with portholes for the passage of the 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 interplate channel and directs the fluids into alternate channels. The number of plates is determined by the flow rate, physical properties of the fluids, pressure drop and temperature program. The plate corrugations promote fluid turbulence and support the plates against differential pressure.

The plate and the pressure plate are suspended from an upper carrying bar and located by a lower guiding bar, both of which are fixed to a support column.

Connections are located in the frame plate or, if either or both fluids make more than a single pass within the unit, in the frame and pressure plates.

Typical capacities
Liquid flow rate
Up to 980 gpm, depending on media, permitted pressure drop and temperature program.

Water heating by steam
0.7 to 3.0 MW
200 tons – 850 tons

Plate types
M10B, M10M and M10BD

Frame types
FM, FG and FD (ASME design)
FML (non-ASME)
Working principle
Channels are formed between the plates and the corner ports are arranged so that the two media flow through alternate channels. The heat is transferred through the plate between the channels, and complete counter-current flow is created for highest possible efficiency. The corrugation of the plates provides the passage between the plates, supports each plate against the adjacent one and enhances the turbulence, resulting in efficient heat transfer.

Standard materials
Frame plate
Mild steel, painted

Nozzles
Carbon steel
Lined: Stainless steel, Titanium

Plates
Stainless steel AISI 304, AISI 316
Titanium, Alloy 20/18/6

Gaskets
M10B Nitrile, EPDM, Viton®
M10M Nitrile, EPDM, HeatSeal F™
              EPDM-FDA, Viton®

Connections
FML Size 4” ANSI 150
FM Size 4” ANSI 150
FG Size 4” ANSI 150
FD Size 4” ANSI 150
FD Size 4” ANSI 300

Technical data
Mechanical design pressure (g)/temperature
FML 150 psig/320°F (non-ASME)
FM 100 psig/320°F
FG 150 psig/356°F
FD 360 psig/356°F

Maximum heat transfer surface
M10B 1126 sq. ft.
M10M 660 sq. ft.

Dimensions

Measurements (mm)

Particulars required for quotation
- Flow rates or heat load
- Temperature program
- Physical properties of liquids in question (if not water)
- Desired working pressure
- Maximum permitted pressure drop
- Available steam pressure
Applications
General heating and cooling duties.

Standard design
The plate heat exchanger consists of a pack of corrugated metal plates with portholes for the passage of the 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 interplate channel and directs the fluids into alternate channels. The number of plates is determined by the flow rate, physical properties of the fluids, pressure drop and temperature program. The plate corrugations promote fluid turbulence and support the plates against differential pressure.

The plate and the pressure plate are suspended from an upper carrying bar and located by a lower guiding bar, both of which are fixed to a support column.

Connections are located in the frame plate or, if either or both fluids make more than a single pass within the unit, in the frame and pressure plates.

Typical capacities
Liquid flow rate
Up to 1,850 gpm, depending on media, permitted pressure drop and temperature program.

Plate types
M15B, M15E and M15M

Frame types
FG, FD and FS (ASME design)
FML (Non-ASME design)
Working principle
Channels are formed between the plates and the corner ports are arranged so that the two media flow through alternate channels. The heat is transferred through the plate between the channels, and complete counter-current flow is created for highest possible efficiency. The corrugation of the plates provides the passage between the plates, supports each plate against the adjacent one and enhances the turbulence, resulting in efficient heat transfer.

Standard materials
Frame plate
Mild steel, Epoxy painted

Nozzles
Carbon steel
Lined: Stainless steel, Titanium

Plates
Stainless steel: AISI 304, AISI 316
Titanium
Alloy C-276
Alloy 254 SMO

Gaskets (Clip-on/Tape-on,Glued)
Nitrile Nitrile hydrogenated
EPDM Viton®
AL-EPDM

Connections
FML Size 6" ANSI 150
FG Size 6" ANSI 150
FD Size 6" ANSI 300
FS Size 6" ANSI 300

Technical data
Max.working pressure
FML 150 psig/320°F (Non-ASME)
FG 150 psig/320°F
FD 300 psig/320°F
FS 460 psig/320°F

Maximum heat transfer surface
4,200 sq.ft

Dimensions

Measurements (mm)

Particulars required for quotation
- Flow rates or heat load
- Temperature program
- Desired working pressure
- Maximum permitted pressure drop
- Available steam pressure
Applications
General heating and cooling duties. Heating by means of steam.

Standard design
The plate heat exchanger consists of a pack of corrugated metal plates with portholes for the passage of the 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 interplate channel and directs the fluids into alternate channels. The number of plates is determined by the flow rate, physical properties of the fluids, pressure drop and temperature program. The plate corrugations promote fluid turbulence and support the plates against differential pressure.

The plate and the pressure plate are suspended from an upper carrying bar and located by a lower guiding bar, both of which are fixed to a support column.

Connections are located in the frame plate or, if either or both fluids make more than a single pass within the unit, in the frame and pressure plates.

Typical capacities
Liquid flow rate
Up to 190 kg/s, depending on media, permitted pressure drop and temperature program.

Water heating by steam
2.5 – 15 MW at a steam condensation temperature of 150°C
2.5 – 9 MW at a steam condensation temperature of 120°C

Plate types
TS20M plates

Frame types
FG and FS
Working principle
Channels are formed between the plates and the corner ports are arranged so that the two media flow through alternate channels. The heat is transferred through the plate between the channels, and complete counter-current flow is created for highest possible efficiency. The corrugation of the plates provides the passage between the plates, supports each plate against the adjacent one and enhances the turbulence, resulting in efficient heat transfer.

Standard materials
Frame plate
Mild steel, epoxy painted

Nozzles
Carbon steel
Metal lined: Stainless steel, Titanium

Plates
Stainless steel AISI 316 or Titanium

Gaskets
Nitrile, EPDM or HeatSeal F™

Connections
FG ASME Size 8” ANSI 150
FS ASME Size 8” ANSI 150/ANSI 300

Technical data
Mechanical design pressure (g)/temperature
FG ASME 150 psig /350°F
FS ASME 400 psig /320°F
*Frame FG also approved for 1.2 MPa /200°C to allow use in steam systems without safety valves.

Maximum heat transfer surface
85 m² (910 sq. ft)

Particulars required for quotation
– Flow rates or heat load
– Temperature program
– Physical properties of liquids in question (if not water)
– Desired working pressure
– Maximum permitted pressure drop
– Available steam pressure

Dimensions

Measurements (mm)

<table>
<thead>
<tr>
<th>Type</th>
<th>H</th>
<th>W</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>TS20-MFG</td>
<td>1405</td>
<td>800</td>
<td>360</td>
</tr>
<tr>
<td>TS20-MFS</td>
<td>1435</td>
<td>800</td>
<td>390</td>
</tr>
</tbody>
</table>
Applications
Plate heat exchanger for general heating and cooling duties.

Standard design
The plate heat exchanger consists of a pack of corrugated metal plates with portholes for the passage of the two fluids between which heat transfer will take place.

The plate pack is assembled between a fix frame plate and a movable pressure plate and compressed by tightening bolts. The plates are fitted with a gasket, which seals the interplate channel and directs the fluids into alternate channels. The number of plates is determined by the flow rate, physical properties of the fluids, pressure drop and temperature program. The plate corrugations promote fluid turbulence and support the plates against differential pressure.

The plate and the pressure plate are suspended from an upper carrying bar and located by a lower guiding bar, both of which are fixed to a support column.

Connections are located in the frame plate or, if either or both fluids make more than a single pass within the unit, in the frame and pressure plates.

Typical capacities
Liquid flow rate.
Up to 350 kg/s (5600 gpm), depending on media, permitted pressure drop and temperature program.

Plate types
MX25B and MX25M plates

Frame types
FMS, FGS, FG, FD and FS

Working principle
Channels are formed between the plates and the corner ports are arranged so that the two media flow through alternate channels. The heat is transferred through the plate between the channels, and complete counter-current flow is created for highest possible efficiency. The corrugation of the plates provides the passage between the plates, supports each plate against the adjacent one and enhances the turbulence, resulting in efficient heat transfer.
STANDARD MATERIALS
Frame plate
Mild steel, Epoxy painted

Nozzles
Carbon steel
Metal lined: Stainless steel, Titanium
Rubber lined: Nitrile, EPDM

Plates
Stainless steel Alloy 316, Alloy C276, Alloy 254 SMO or Titanium

Gaskets
Nitrile or EPDM

TECHNICAL DATA
Pressure vessel codes PED, ASME, pvcALS™
Mechanical design pressure (g) / temperature
FMS PED, pvcALS™ 1.0 MPa / 180°C
FGS PED, pvcALS™ 1.6 MPa / 180°C
FGS ASME 150 psig / 350°F
FG PED, pvcALS™ 1.6 MPa / 180°C
FG ASME 150 psig / 350°F
FD PED, pvcALS™ 2.5 MPa / 180°C
FD ASME 300 psig / 350°F
FS ASME 400 psig / 350°F

CONNECTIONS
FMS PED Size 200/250 mm DIN 2501 PN10, ASME Cl. 150
FMS pvcALS™ Size 200/250 mm DIN 2501 PN10, ASME Cl. 150, JIS 10K
FGS PED Size 200 mm DIN 2501 PN16, ASME Cl. 150
FGS pvcALS™ Size 200/250 mm DIN 2501 PN16, ASME Cl. 150, JIS 16K
FGS ASME Size 8” ASME Cl. 150
FG PED Size 200/250 mm DIN 2501 PN16, ASME Cl. 150
FG pvcALS™ Size 200/250 mm DIN 2501 PN16, ASME Cl. 150, JIS 16 K
FG ASME Size 8’/10” ASME Cl.150
FD PED Size 200/250 mm DIN 2501 PN25, ASME Cl. 300
FD ASME Size 8’/10” ASME Cl. 300
FS ASME Size 8’/10” ASME Cl. 400

Maximum heat transfer surface
940 m² (10.000 sq. ft)

Dimensions

Measurements mm (inch)

<table>
<thead>
<tr>
<th>Type</th>
<th>H</th>
<th>W</th>
<th>h</th>
</tr>
</thead>
<tbody>
<tr>
<td>MX25-FMS</td>
<td>2595 (102”)</td>
<td>920 (36.2”)</td>
<td>325 (12.8”)</td>
</tr>
<tr>
<td>MX25-FGS</td>
<td>2595 (102”)</td>
<td>920 (36.2”)</td>
<td>325 (12.8”)</td>
</tr>
<tr>
<td>MX25-FG</td>
<td>max 3100 (122”)</td>
<td>920 (36.2”)</td>
<td>435 (17.1”)</td>
</tr>
<tr>
<td>MX25-FD</td>
<td>max 3100 (122”)</td>
<td>940 (37”)</td>
<td>435 (17.1”)</td>
</tr>
<tr>
<td>MX25-FS</td>
<td>max 3100 (122”)</td>
<td>940 (37”)</td>
<td>435 (17.1”)</td>
</tr>
</tbody>
</table>

The number of tightening bolts may vary depending on the pressure rating

Particulars required for quotation
- Flow rates or heat load
- Temperature program
- Physical properties of liquids in question (if not water)
- Desired working pressure
- Maximum permitted pressure drop
- Available steam pressure

THERMAL TRANSFER SYSTEMS, INC.
SALES@THERMALTRANSFERSYSTEMS.COM
PH: 800-527-0131  FAX: 972-242-7568