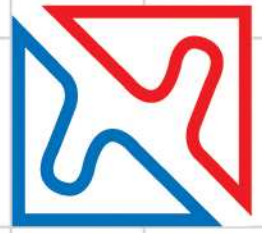


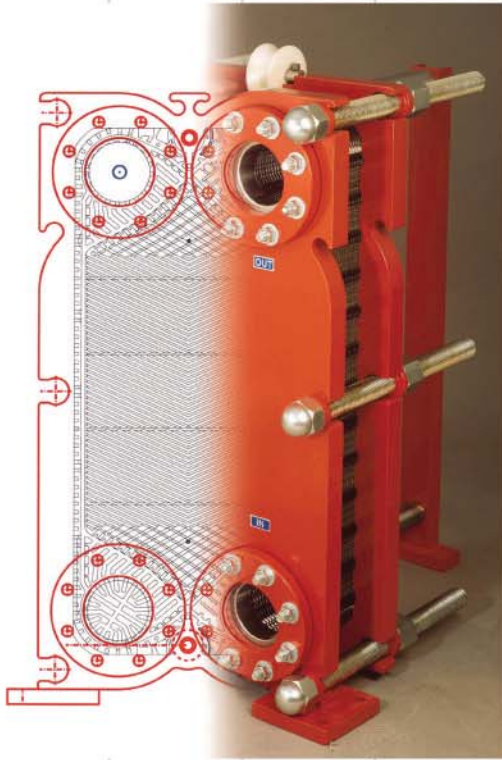
# ORAN



HEATING EQUIPMENT LTD.

**M10 / Plate Heat Exchangers**





## **Plate Heat Exchangers Series M10**

### **Applications**

Heat exchange processes involving heating, cooling, or pasteurization

### **Flows**

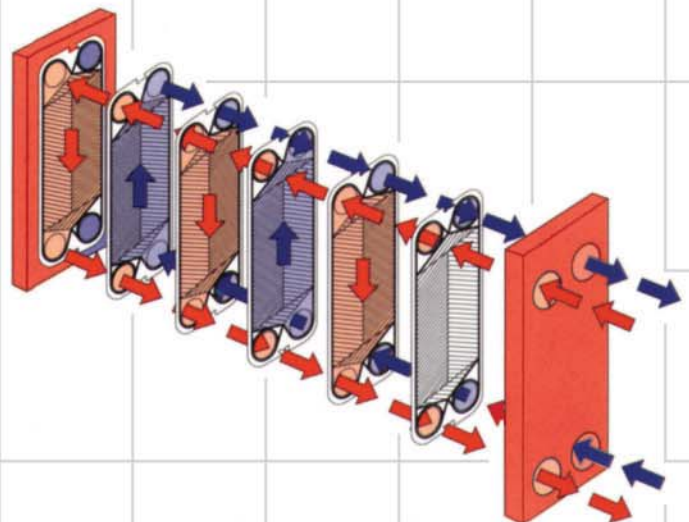
Liquid/liquid, steam/liquid, compressed-air/liquid

### **Configuration and Operation of Heat Exchanger**

The heating surface of the Oran plate heat exchanger (OPHE) is provided by a pack of corrugated plates stamped from stainless steel sheets, titanium, or other materials. The plates – which are sealed around their edges and ports with elastomeric gaskets fitted into special grooves – are clamped together in a frame consisting of two thick walls held together by tie rods and bolts (see illustration).

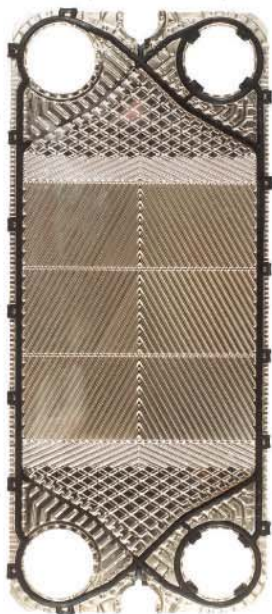
The upper and lower edges of the plates are provided with flexible grippers (patent application submitted) that position and hold each plate precisely with respect to the other plates, as well as to the upper and lower carrying bars (see photograph of the operation of the positioning gripper).

The elastomeric gaskets are strongly attached to the metal plate with special gasket fasteners (patent registered), eliminating the use of adhesives (see photograph of installed gasket with fasteners). The two heat exchanging fluids flow sequentially in a countercurrent manner in the spaces between the plates (see diagram). The patterns on the corrugated plates increase their rigidity and enhance heat transfer.



### **Advantages of the OPHE**

- Plates of high quality metals (stainless steel, titanium, etc.) are resistant to corrosion
- High rates of heat exchange in a small-scale device
- Easy disassembly makes for facile internal inspection, cleaning and servicing
- Easily adapted to new working conditions by changing the number of plates or altering flow patterns by combining various plates having the appropriate properties
- Energy efficient
- Competitive pricing
- Fast delivery
- Strongly bound gasket requiring no adhesives
- Faultless assembly thanks to flexible gripper
- Optimal adaptation of the plate type system with the availability of a range of models with a variety of thermal lengths



**Inserting the carrying-bar gripper**



**Gripper in place**



**Positioning the gasket fastener**



**Attaching the fastener**



**Fastener in place**



**Maximum Output**

Up to 180,000 kg/hour, depending on fluid types, the allowable pressure drop and the temperature requirements.

**Plate types**

M10-B and M10-M, which differ in shape and depth of pressed patterns .  
M10-B = 2.5 mm  
M10-M = 3.9 mm

**Frame types**

IG, IS, IX

**Plate models**

Each plate type is manufactured in 13 different models, which differ in their heights and heat exchange areas. These are numbered 0 through 12. Plates are designated as M10/0-B – M10/12-B and M10/0-M – M10/12-M.

**Plate patterns: H,M,L**

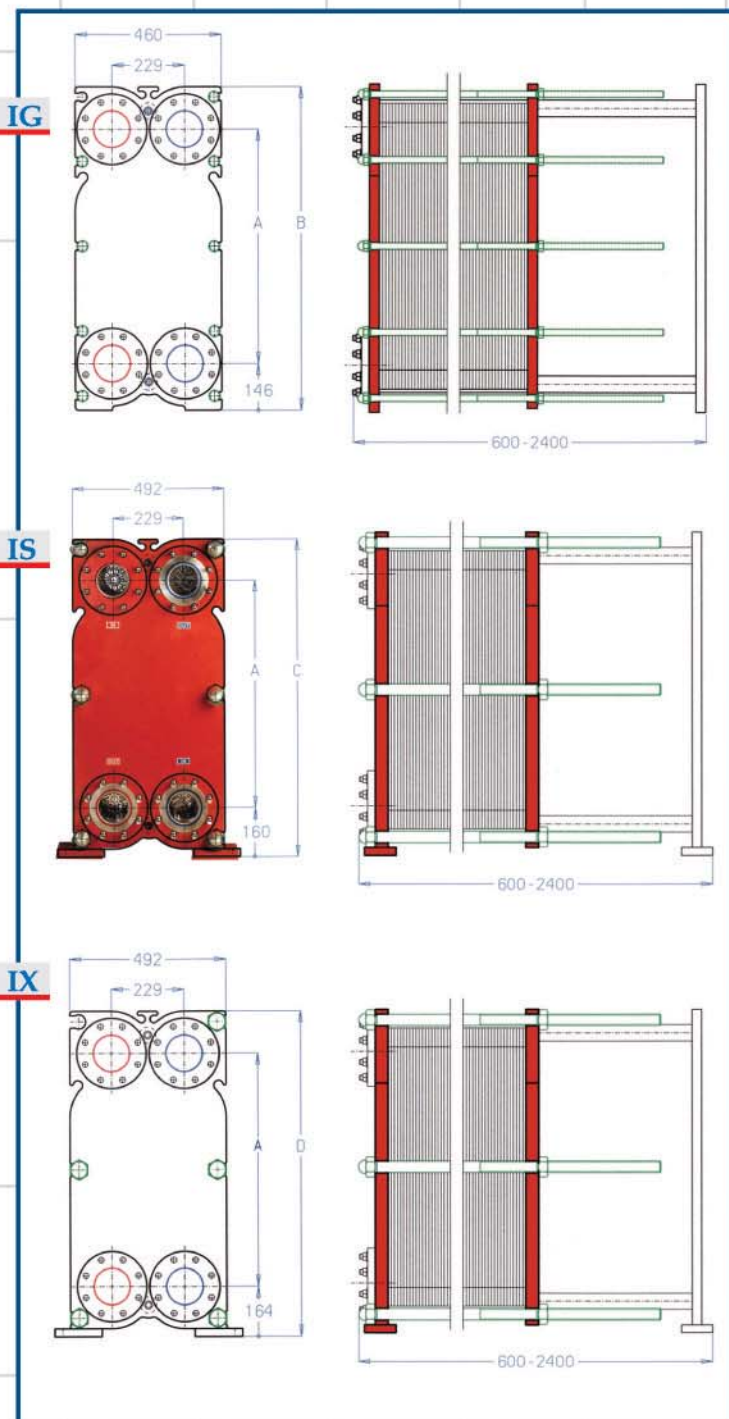
The PHE M10 Series can be stamped with patterns characterized by various flow patterns with a variety of heat exchange characteristics and flow resistance.

**Comprehensive thermal properties**

The use of various plate patterns along with the range of plate models of the M10 heat exchange series, creates a variety of ratios of thermal variables and flow resistance enabling optimal design of the exchanger for the required rates of heat transfer and pressure drop. The appropriate size and structure of the heat exchanger is determined by computer modeling.

**ORAN engineers can help you solve heat-exchange application problems. Just send us the following information:**

- Heat transfer capacity
- Flow rates
- Inlet and outlet temperatures
- Physical properties of the fluids: specific gravity, specific heat, viscosity, thermal conductivity
- Maximum allowable pressure drop
- Maximum operating pressure required



## Standard Heat Exchanger Parts

### End Covers

- Stainless steel AISI 304 or 316 epoxy-polyester heat-cured powder.
- Heat resisting structural steel ASTM 516 gr 70 (painted with epoxy-polyester heat-cured powder)

### Plates

- Stainless steel AISI 304 or 316
- Stainless steel Avesta 254 SMO
- Stainless steel 904L
- Titanium
- Titanium-palladium
- Other metals that can be pressed

### Flange Connectors

- IG - Flange 100 mm PN10 DIN 2501 or 4" ANSI B 16.5 #150
- IS - Flange 100 mm PN16 DIN 2501 or 4" ANSI B 16.5 #300
- IX - Flange 100 mm PN25 DIN 2501 or 4" ANSI B 16.5 #600

### Elastomeric Gaskets

- EPDM (Ethylene Propylene Diene Monomer)
- Industrial high-temperature EPDM
- NBR (Acrylonitrile-Butadiene Rubber) FDA
- Industrial high-temperature-NBR
- Hydrogenated-NBR
- VITON
- Other suitable elastomeric materials

### Nozzles

#### Metal Cladded:

- Carbon steel
- Stainless steel AISI 304
- Stainless steel AISI 316L
- Titanium
- Titanium/palladium

#### Rubber cladded

### Technical Data

#### Maximum operating pressure/testing pressure

- IG - 10/13 bar
- IS - 16/21 bar
- IX - 25/37 bar

#### Maximum number of plates

- M10-B - 425
- M10-M - 251

Size	M10/11	M10/10	M10/9	M10/8	M10/7	M10/6	M10/5	M10/4	M10/3	M10/2	M10/1	M10/0	M10/12
A	1854	1729	1604	1479	1354	1229	1104	979	854	729	604	479	354
B	2136	2006	1881	1756	1631	1506	1381	1256	1131	1006	881	756	631
C	2146	2021	1896	1771	1646	1521	1396	1271	1146	1021	896	771	646
D	2150	2025	1900	1775	1650	1525	1400	1276	1150	1025	900	775	650



**ORAN**  
HEATING EQUIPMENT LTD.

14 OHALIAV ST. JERUSALEM 94467, ISRAEL  
TEL: 972-2-571-4244, FAX: 972-2-587-0267

sales@oranheat.co.il  
www.orantherm.com