Operation Manual

Plate Heat Exchanger

50671–50673, 50675–50687

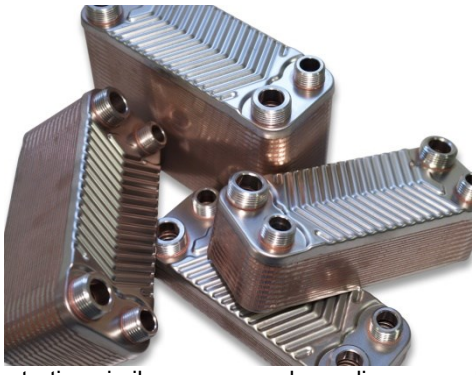

Illustration similar, may vary depending on model

Read and follow the operating instructions and safety information before using for the first time.

Technical changes reserved!
Due to further developments, illustrations, functioning steps, and technical data can differ insignificantly.

Updating the documentation
If you have suggestions for improvement or have found any irregularities, please contact us.

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Introduction

Thank you for purchasing this quality product. **To minimise the risk of injury we urge that our clients take some basic safety precautions when using this device. Please read the operation instructions carefully and make sure you have understood its content.**
Keep these operation instructions safe.

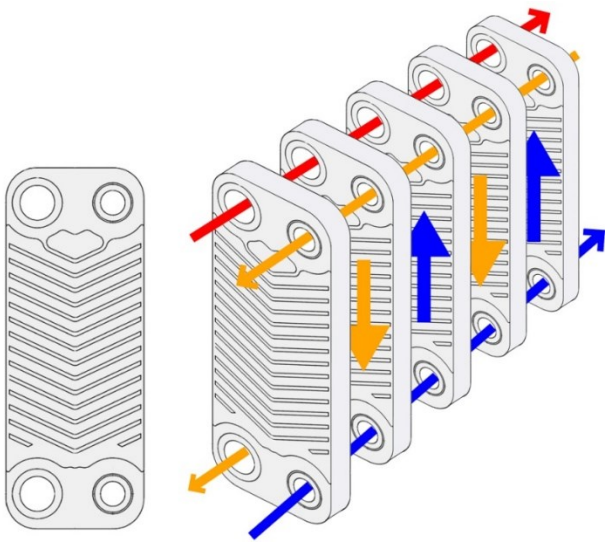
A plate heat exchanger is a form of heat exchanger, also called heat carriers. The term is appropriate because during the process no heat exchange is taking place, but a heat transfer from one medium to another one.

As suggested by its name, the plate heat exchanger consists of wave-shaped panels that are assembled in a unique way. There are interspaces between the plates. These interspaces are flown alternately by the heat-absorbing and the heat-dissipating medium. The device is sealed both towards the outside and beneath the mediums which is done by different ways. For example, there are screwed plate heat exchangers that dispose of a variety of advantages. They are expandable for example and conduct the flow in different ways.

As for the construction, there are different types of plate heat exchangers. It is the so-called soldered plate heat exchangers that are preferred being characterized by the fact that the different plates are soldered with each other. By this means, you can renounce any other assembly.

Plate heat exchangers work efficiently because they ensure a strong heat transfer which can even be increased by generating turbulences during the process of flowing through. The turbulent flow-through is done by the corrugated profile of the plates. Albeit plate heat exchangers need not necessarily be large, they are efficient by providing for a large heat flux density. Plate heat exchangers are components that dispose of a high-power density. Thanks to compact dimensions and low weight, they are highly efficient.

Soldered plate heat exchangers consist of embossed stainless-steel plates being soldered with copper using a vacuum procedure. When being assembled, each second plate is rotated by 180°, thus forming two separately rotated flow chambers by the means of which the mediums being involved in the heat transfer are conducted in counter flow. The embossing of the plates generates a highly turbulent flow-through, thus providing for an effective heat transfer even in low volume flows. Due to said highly turbulent flow-through even at low speed, a self-cleaning process is caused which essentially reduces the danger of calcification and contamination.



It is not only used in the field of industrial heating technology but also in cooling and solar technology. Other fields of application

- Combined Heat and Power
- Air conditioning systems
- Heating pumps
- Floor heating
- Thermal power station
- Heat extraction
- Air heating
- Air conditioning in buildings
- Food industry
- Refrigeration and air-conditioning systems
- Heating of domestic waters
- Heating of supply networks
- Solar thermal systems
- Frost-endangered heating systems
- Heating of regenerative fuels
- Heat recovery systems
- Vegetable oil conversion for cars and trucks
- System division for underfloor heating
- Chemical and pharmaceutical production process
- Transfer stations in district heating supply network

Installation

Plate heat exchangers should be assembled in a way that there is sufficient space to perform maintenance. The position for installation should be selected so that the plate heat exchanger can be ventilated and emptied. The minimum distance for the mounting on the thermal insulation is 40 mm. As for heat-technical applications, a vertical mounting position is most effective. Any other position for installation could lead to power loss.

Refrigeration applications such as evaporator or condenser systems always require vertical installation.

Never assemble the heat exchanger with the connections in a downwards position. The heat exchanger should be preventively mounted on a console. A support only on the ports is not sufficient. Make sure that there are no vibrations and/or pulsations affecting the heat exchanger.

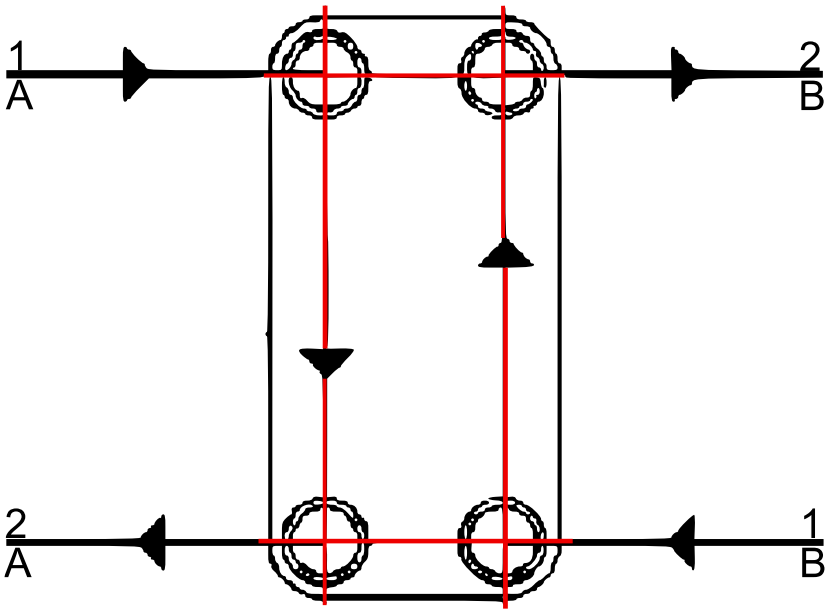
If necessary, you install expansion joints to ensure that there are no forces acting directly on the ports.

Connection to the pipe network

A – Primary side heating technology: primary in / out
B – Primary side refrigeration: refrigerant in / out

Heat exchangers are connected in reverse flow. The system needs to be rinsed before installing the heat exchanger.

ATTENTION: Pipelines should be routed the way that movements inside the pipes or improper forces to not act on the plate heat exchanger!



Number	Name	Letter	Name
1	In	A	Primary
2	Out	B	Secondary

Note!

- Before commissioning it is necessary to compare the operating data with the manufacturer's indications with regard to their agreement. Moreover, all screw connections must be checked.
- The pumps providing the plate heat exchanger must be equipped with shut-off valves. The pumps must not suck in air to exclude possible malfunctions caused by strokes of water.
- During the filling of the system, the plate heat exchanger must be ventilated to achieve fully performance.
- For prolonged deadlock of the system, the heat exchanger must be completely emptied and cleaned. This holds especially true for danger of frost, aggressive media and media tending to biological fouling.
- After start up, you must check that there are no pressure pulsations. In case the heat exchanger is mounted between a control valve and a differential pressure regulator, it must be ensured that in case of simultaneous closing of the two regulatory entities there is no vacuum pressure. This is to prevent any steam impacts.
- Generally, it must be ensured that there are no operating conditions being in contradiction to this assembly, operation, and maintenance manual.
- The formation of ice causes the destruction of the heat exchanger. At temperatures close to freezing point, it is recommended to use antifreeze agents (e.g., glycol).
- There are many different factors that may influence the fouling and contamination. These are for example: speed, temperature, turbulences, distribution, and quality of water. As for the use of media which may be contaminated such as surface waters, cooling circulation water (open circulation), heating water and the like, it is advisable to install filters on the plate heat exchanger thus minimizing the danger of contamination.
- The media must be effected with a maximum of mass flow. Low mass flows (partial load) the turbulence inside the heat exchanger can be affected thus increasing the tendency for contamination.
- With temperatures above 60 °C (140 °F), there can be lime sediments on the surface of the heat exchanger. A turbulent flow-through and lower temperatures reduce the risk of calcification.
- During the process of shutdown, it must be ensured that first the primary side and thereafter the secondary side is closed. When starting the system, it is the secondary side first to be opened and then the secondary one. By this means, overheating of the heat exchanger is excluded.

- In case you expect the formation of sediments due to poor water quality (e.g., extensive values of hardness or high contamination), there should be a purification at regular intervals. There is the possibility of cleaning by flushing.
- The heat exchanger is to be flushed against the normal direction of flow with a suitable cleaning solution.

Attention!

- Poor water quality causes an increased susceptibility to corrosion.
- The regular maintenance as well as the compliance with all regulations concerning the water quality reduces the risk of fouling. Fouling increases the susceptibility of corrosion.

Technical specifications

		50671	50672	50673	50675	50676
Panels	**Thickness conductive panel** (mm)	0.26				
	Thickness cover panel (mm)	1.0				
	Distance (mm)	2.1				
	Size (mm)	191×73				
	Number	10	20	30	50	60
Temperature range (°C)		-195–+225				
Capacity (ℓ)		0.18	0.36	0.54	0.90	1.08
Operational pressure (bar)		20				
Max. flow rate (ℓ/min)		ca. 67				
Max. power (kW)		22	44	66	90	130
Connectors (mm)	**F1, F3**	12.7 (½")				
	F2, F4	19.05 (¾")				
Effective exchange surface (m²)		ab. 0.12	ab. 0.24	ab. 0.36	ab. 0.60	ab. 0.72
Material		Stainless steel, copper				
Circulation		F1 → F3 / F4 → F2				

		50677	50678	50679	50680	50681
Panels	**Thickness conductive panel** (mm)	0.26			0.4	
	Thickness cover panel (mm)	1.0			2.0	
	Distance (mm)	2.1			2.1	
	Size (mm)	315×73			286×116	
	Number	30	40	50	20	30
Temperature range (°C)		-195–+225				
Capacity (ℓ)		1.2	1.6	2.0	1.0	1.5
Operational pressure (bar)		20			30	
Max. flow rate (ℓ/min)		ab. 67			ab. 200	
Max. power (kW)		125	165	210	115	175

Connectors (mm)	**F1, F3**	12.7 (½″)			25.4 (1″)	
	F2, F4	25.4 (1″)				
Effective exchange surface (m²)		ab. 0,69	ab. 0.92	ab. 1.15	ab. 0.64	ab. 0.96
Material		Stainless steel, copper				
Circulation		F1 → F3 / F4 → F2				

		50682	**50683**	**50684**	**50685**	**50686**	**50687**
Panels	**Thickness conductive panel** (mm)	0.4					
	Thickness cover panel (mm)	2.0					
	Distance (mm)	2.1					
	Size (mm)	286×116		529×124			
	Number	40	50	30	40	50	60
Temperature range (°C)		-195–+225					
Capacity (ℓ)		2.0	2.5	3.33	4.44	5.55	6.66
Operational pressure (bar)		30					
Max. flow rate (ℓ/min)		ab. 200		ab. 367			
Max. power (kW)		230	285	330	440	550	660
Connectors (mm)	**F1, F3**	25.4 (1″)					
	F2, F4						
Effective exchange surface (m²)		ab. 1.28	ab. 1.60	ab. 1.80	ab. 2.4	ab. 3.0	ab. 3.6
Material		Stainless steel, copper					
Circulation		F1 → F3 / F4 → F2					