Quality Heat Exchangers

FUNKE

Brazed Plate Heat Exchangers

Universal solutions for industrial
and domestic applications

With partnership into the future

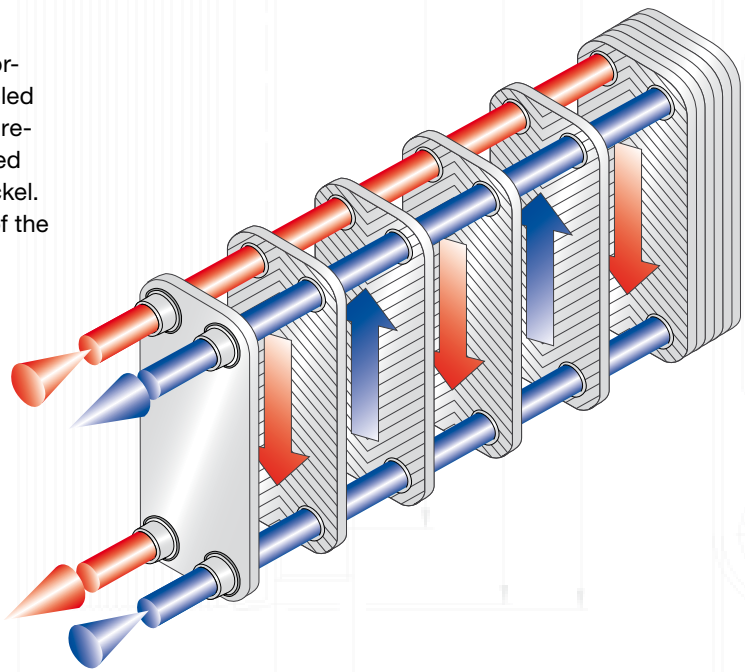
FUNKE is a leader in the development and production of quality heat exchangers with a heat transfer area of up to 2 400 m². The range of products comprises shell-and-tube heat exchangers, bolted and brazed plate heat exchangers as well as oil / air cooling units and electrical oil pre-heaters. Thus, as one of the few producers worldwide, FUNKE offers solutions with optimum thermodynamic designs for different industries and virtually all applications.

FUNKE focuses on customer orientation, highest quality standards, flexibility and advisory skills – important benefits a company of just the right size is able to offer.

With a large range of standard- and special designs the FUNKE brazed plate heat exchangers can cover manifold applications in different industrial areas and domestic applications.

Construction

FUNKE brazed plate heat exchangers are made of corrugated stainless steel plates. The plates are assembled in a 180° angle to each other. Depending on the requirements of the application, the plates are vacuum brazed to a pressure-resistant unit using either copper or nickel. This results in separate flow gaps with counter-flow of the media involved in the heat exchange (standard).



Advantages

The series GPL, GPLK und TPL provide for a well balanced ratio of high heat transfer rates with low pressure losses. The thermodynamically optimized corrugation of the embossed plates and the inserted turbulators (TPL) allow for high turbulent flow even at low volumetric flow rates. This allows for efficient use of the heat exchange area available and leads to a perfectly optimized heat transfer. The high turbulent flow also results in an efficient self-cleaning effect, which greatly reduces maintenance and time-out. FUNKE brazed plate heat exchangers have a compact design and are used for high pressures and temperatures.

Applications

Typical applications for brazed plate heat exchangers are heating, cooling, condensing

- System separation
- Heat extraction and heat recovery in domestic and process technology
- Refrigeration engineering
- Mechanical engineering
- Oil cooling
- Hot water / Process water
- Heating engineering (solar thermal systems, central heating, floor heating)
- Evaporation / Condensing in cooling systems
- Air drying
- Hydraulic oil cooling
- Cooling of machines and motors
- Mold machine temperature control
- Economizing

Media

Copper brazed plate heat exchangers are mainly used for media such as

- Oil and oil containing fluids
- Glycol mixtures
- Alcohols
- Refrigerants
- Gas / Air
- Water
- many more (according to media properties and its viscosity)

Information

Copper brazed plate heat exchangers GPLK should not be used for the following media:

- Seawater
- Ammonia
- Deionates
- Silicone oils
- high chloride media

For applications with

- Ammonia
- Deionates
- Silicone oils

the nickel brazed plate heat exchangers NPL are recommended.

Series GPL / GPLK

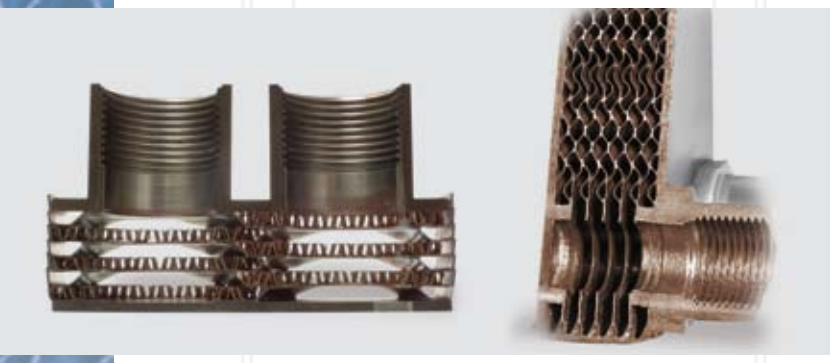
These series were designed for universal applications with media of low viscosity. Main feature is the balanced ratio of high heat transfer rates to minimal pressure drops. Yet at low volume flows the thermodynamically optimized V-corrugation of the plates generates a highly turbulent flow, resulting in an optimum use of the heat transfer area available.

Special design series NPL

Construction and function are identical to GPL / GPLK. Deviant is the solder which in this case is nickel.

Special design series GPLS

The standard safety heat exchanger with the double wall. The function is identical to a heat exchanger plate, one double wall element consists of two brazed plates. The individual elements are not brazed at the circumferential outer wall, so that leakage can escape at all sides of the unit.



Cross-section: TPL with turbulence sheets and GPL / GPLK

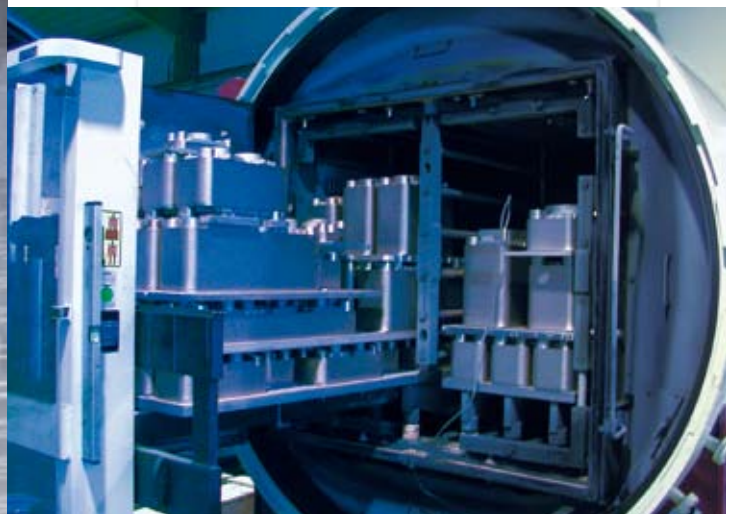
Series TPL

The TPL-series is a special development for the demands in mechanical engineering and plant engineering (e.g. for cooling of hydraulic oil and motor oil). The TPL-volume of the flow gap is up to 80% larger compared to units with conventional heat exchanger plates. With special turbulence sheets inserted in the flow gaps and thermodynamically highly efficient diagonal media flow in combination with maximal diameter connections very high heat transfer rates are obtained. Variable designs of these elements allow for optimal adaptation to different applications. Due to the efficient performance of the FUNKE TPL for media with higher viscosities the unit can be of a much smaller size compared to conventional plate heat exchangers!

Technical Data

Application conditions

Series	max. operating pressure (bar)	max. operating pressure (bar) special design	max. operating temperature (°C)
GPL / GPLK	30 / exception GPLK 80: 16 bar	45	200 / 150
TPL	30 / TPL 01 + 02: 25 bar		200
GPLS	30		200
NPL	16	27	200



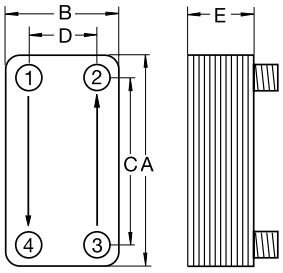
Performance

2.0 to 6 000 kW

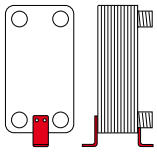
Material

For the plates stainless steel 1.4401 / AISI 316 is used.
For the series GPL, GPLK and TPL the solder is copper.
For the series NPL the solder is nickel.

Overview types GPL and GPLK



Optional: angular feet

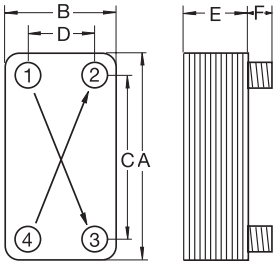


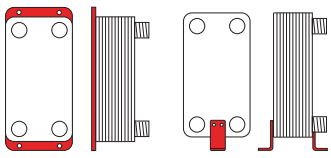
1: hot side IN
2: cold side OUT
3: cold side IN
4: hot side OUT

Connections may be changed at each side as long as counter flow is continued.

Type		Dimensions								Volume
Solder		Overall			Dist. (connection)		Connection	No. of plates	Empty weight	Volume / Channel
Copper	Nickel	A (mm)	B (mm)	E (mm)	C (mm)	D (mm)	(standard)	(N) (max)	(kg)	(ltr. / Channel)
GPL 2	NPL 2	230	89	12+2,3xN	182	43	G 3/4“	50	0,06xN+1,1	0,03
GPL 3	NPL 3	325	89	12+2,3xN	279	43	G 3/4“	50	0,08xN+1,3	0,045
GPL 4	NPL 4	171	124	12+2,3xN	120	73	G 1“	100	0,06xN+1,2	0,03
GPL 5	NPL 5	332	124	12+2,3xN	281	73	G 1“	100	0,12xN+1,6	0,065
GPL 6	NPL 6	529	124	12+2,3xN	478	73	G 1“	100	0,24xN+2,0	0,1
GPL 7	NPL 7	529	269	14+2,4xN	460	200	G 2“	150	0,60xN+5,5	0,23
GPL 8		529	269	14+2,4xN	421	161	G 2 1/2“	260	0,54xN+10	0,22
GPL 9		798	269	14+2,4xN	690	161	G 2 1/2“	260	08xN+11,5	0,4
GPL 10		870	383	23+2,4xN	723	237	DN 100	360	1,25xN+39,5	0,6
GPLK 10		206	73	8+2,27x(N-1)	172	42	G 1/2“	60	0,81+0,04x(N-1)	0,025
GPLK 20		194	80	10+2,25xN	154	40	G 3/4“	60	0,8+0,05xN	0,025
GPLK 30		311	73	10+2,3xN	278	40	G 3/4“	60	0,84+0,07xN	0,04
GPLK 35		466	74	10+2,3xN	432	40	G 3/4“	60	1,37+0,113xN	0,063
GPLK 40		306	106	10+2,4xN	250	50	G 1“	100	1,5+0,135xN	0,055
GPLK 50		304	124	10+2,4xN	250	70	G 1“	100	1,6+0,15xN	0,065
GPLK 55		522	106	10+2,4xN	466	50	G 1“	120	3,1+0,22xN	0,095
GPLK 60		504	124	10+2,4xN	444	64	G 1“	120	3,5+0,24xN	0,107
GPLK 70		528	245	11, 5+2,4xN	456	174	G 2“	160	7,2+0,52xN	0,232
GPLK 80		527	246	11+2,85xN	430	148	G 2 1/2“	140	8,5+0,49xN	0,289

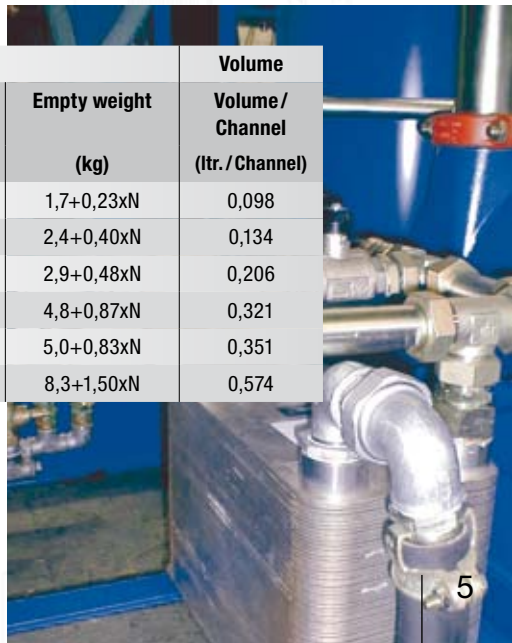
Overview types TPL





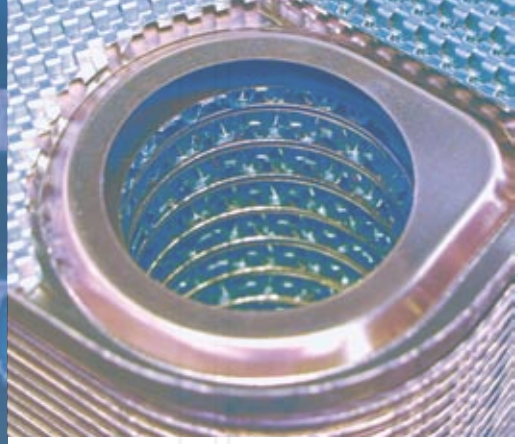
1: hot side IN
2: cold side OUT
3: hot side OUT
4: cold side IN

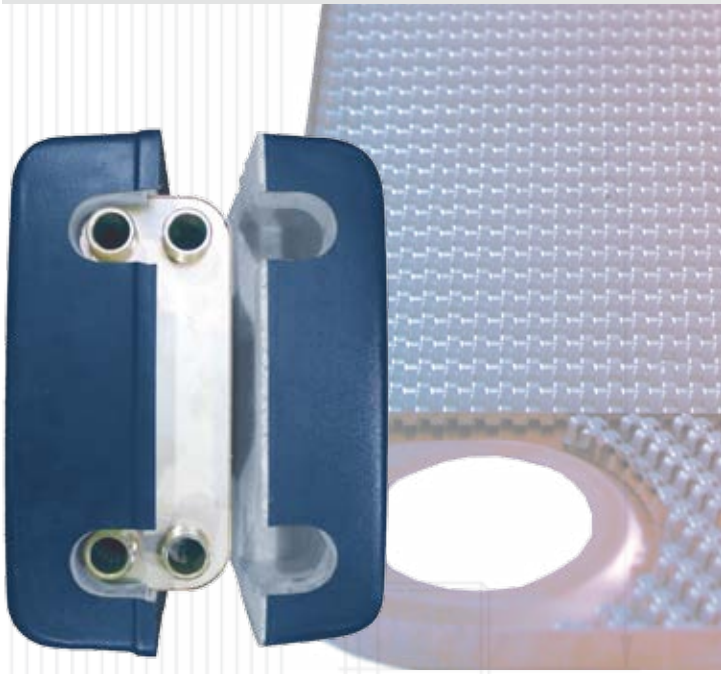
Optional: extended end plate with holes for fastening, angular feet respectively



Type		Dimensions								Volume
	No. of plates	Overall			Dist. (connection)		Connection	Volumetric flowrate	Empty weight	Volume / Channel
Copper	(N) (max)	A (mm)	B (mm)	E (mm)	C (mm)	D (mm)	(standard)	(m^3/h)	(kg)	(ltr. / Channel)
TPL 00-K	60	274	111	6+4xN	213	50	G 1“	13	1,7+0,23xN	0,098
TPL 00-L	60	439	111	6+4xN	378	50	G 1“	13	2,4+0,40xN	0,134
TPL 01-K	90	383	168	6+4xN	309	43	G 1 1/2“	45	2,9+0,48xN	0,206
TPL 01-L	90	631	168	6+4xN	557	73	G 1 1/2“	45	4,8+0,87xN	0,321
TPL 02-K	120	488	225	6+4xN	403	73	G 2“	70	5,0+0,83xN	0,351
TPL 02-L	120	818	225	6+4xN	733	73	G 2“	70	8,3+1,50xN	0,574

N = number of plates





Connections

TPL / GPL / GPLS / NPL

standard:
- threaded nozzles (male threads)

optional:
- soldered connections
- threaded nozzles (female thread)
- flanges on request

GPLK

standard:
- threaded nozzles (male threads)
- flat sealing screw (FSS) joints

Insulation (optional)

Heat insulation

PU-foam with a long-term thermal stability up to 135°C. Normally consisting of two parts, fastened to the heat exchanger with tension belts or spring locks.

Cold insulation

Diffusion tight insulation on the basis of nitrile rubber with a long-term thermal stability of up to 105°C. Available as self-adhesive multiple part set.

Mounting (optional)

TPL

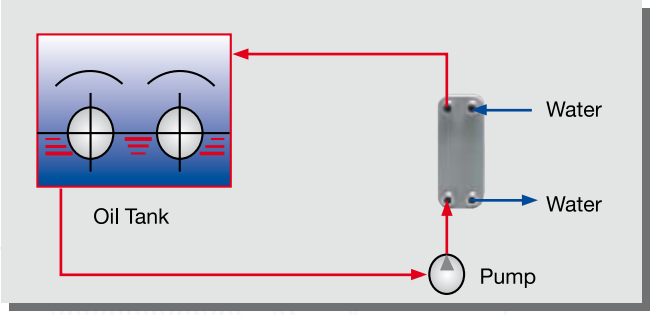
- extended end plate
- angular feet

GPL / GPLK / GPLS / NPL

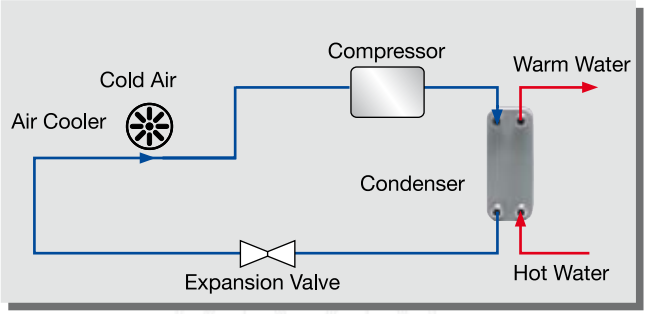
- angular feet
- wall brackets
- transport hooks

Note: Angular feet are only used for units with a minimum weight of approximately 10 kg.

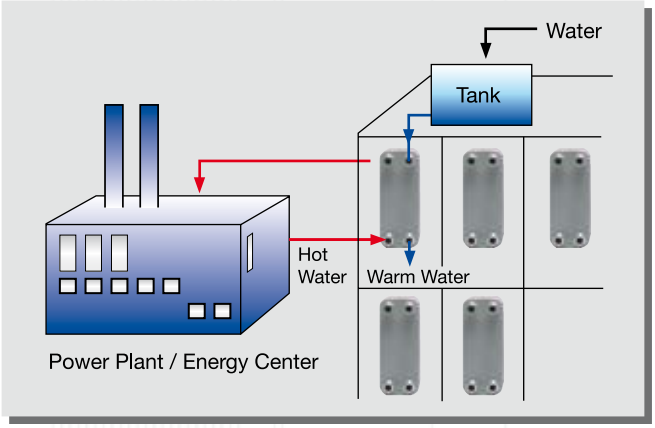
Oil Cooler System



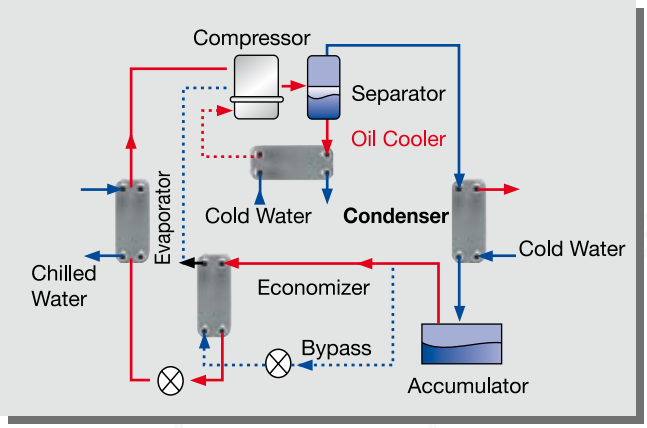
Heat Pump System



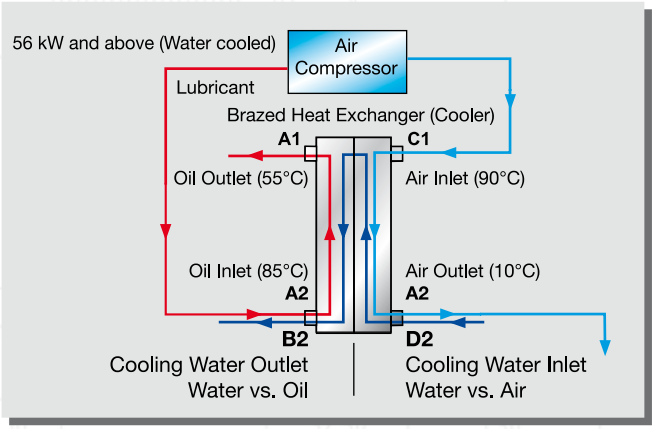
Power Plant / Energy Center



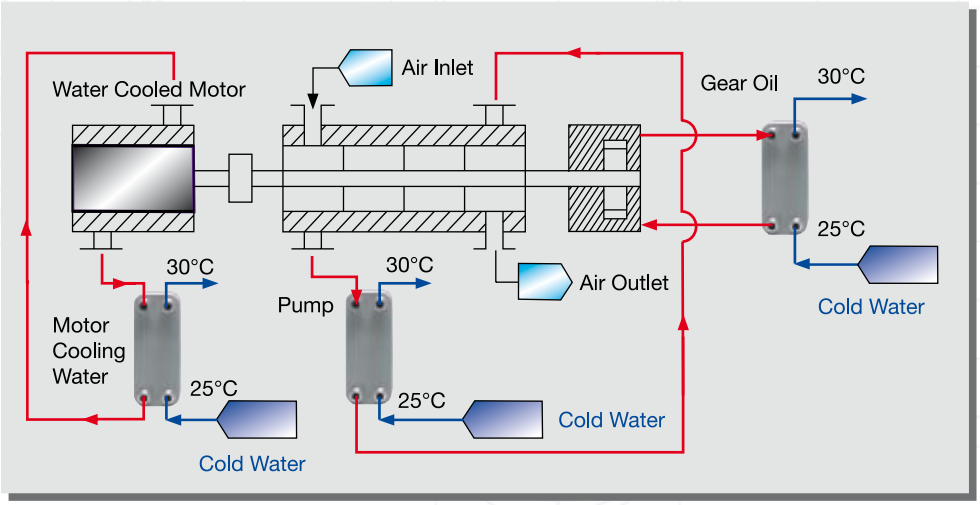
Chiller



Air Compressor System



Vacuum Pump Cooling System



Quality means safety. Each unit built by FUNKE is design and pressure tested. Additional approvals are also available in accordance with quality authorities such as:

- American Bureau of Shipping (ABS)
- Bureau Veritas (BV)
- Det Norske Veritas (DNV)
- Germanischer Lloyd (GL)
- Lloyds Register of Shipping (LRS)
- Schweizerischer Verein für technische Inspektionen (SVTI)
- Technischer Überwachungsverein (TÜV)

as well as customers' test and inspection regulations.

FUNKE has been certified according to DIN EN ISO 9001:2008 and is an approved manufacturer according to:

- EU Pressure Equipment Directive 97/23/EC (PED), Module H/H1
- HP0 in connection with DIN EN 729-2
- ASME U-Stamp
- GOST R (incl. RTN & hygiene certificate)
- China Certificate

FUNKE

Funke Wärmeaustauscher Apparatebau GmbH
Zur Dessel 1
31028 Gronau/Leine · Germany

T +49 (0) 51 82/582-0
F +49 (0) 51 82/582-48

info@funke.de
www.funke.de