



**Brazed Plate Heat Exchangers
for mechanical engineering
and domestic technology**

Compact, reliable, efficient – the “brazed ones” of FUNKE

Even in case of full-load operation - everything is in apple-pie order...

... for FUNKE has been successful in developing and producing heat exchangers for most industrial applications and for applications in the fields of heating, air-conditioning, ventilation. Heat-exchanging surface of the units is between 0,02 m² and 1500 m².

In the field of brazed plate heat exchangers (PHE) our company can offer a large range of standard- and special series for "harder" cases of application in mechanical engineering and plant engineering as well as for low-cost water/water applications in the domestic technology.

In any case FUNKE-customers take advantage of our know-how covering all branches.

Let us know your case of application and we offer you the most economic solution.



Advantages of the brazed FUNKE plate heat exchangers

- compact design, light weight
- optimum heat transfer by means of special plate embossing and installed turbolators.
- series for special applications like oil and gas cooling
- durable and easy-to-maintain
- extensive application know-how, covering a lot of industrial branches and further heat transfer technologies

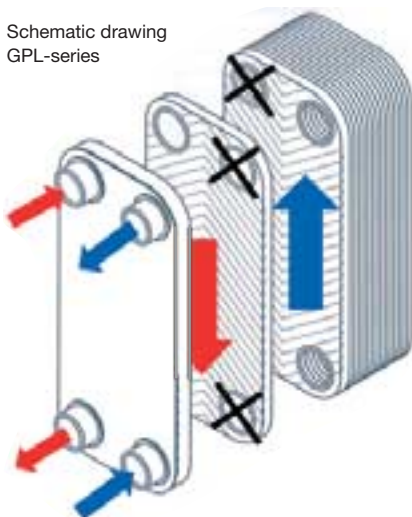
Structure and function

The brazed FUNKE plate heat exchangers consist of embossed stainless steel plates, fit into one another and vacuum brazed with copper or nickel to form a compact and pressure-proof unit.



During assembly every second plate is staggered by 180° creating two separate flow gaps. Heat-exchanging media (normally in counter-flow) are passing the gaps. Embossing of plates, the inserted turbolators respectively (in case of TPL) create a highly turbulent flow which enables most effective heat - even in case of low volumetric flow rates - and reduce the risk of fouling to a minimum.

Schematic drawing GPL-series



Materials (standard series) :

Plates : stainless steel 1.4401/
AISI 316

Solder: copper solder
(GPL, TPL, SPL series)

nickel solder (NPL series)



Facilitated request for quotation

For your enquiry use our internet page where you will find an enquiry form which please send us online or print it to be used for fax enquiry. Furthermore, you will find corresponding calculation programs for download.

Internet enquiry:
www.funke.de

Fax enquiry:
+49 (0) 5182 / 582 76

Mail/phone:
see overleaf

TPL The powerful unit for top heat transfer rates in case of media with average viscosity and high viscosity



The TPL unit is especially developed for mechanical engineering and plant engineering (for cooling of hydraulic oil and motor oil etc.)

Volume of the flow gap is max. 80 % bigger compared to classical heat transfer plates.

By means of special turbolators placed between the flow gaps and by diagonal media flow together with large diameter connections very high heat transfer rates are reached.



In case of media with higher viscosity the unit can be much smaller in size compared to conventional plate heat exchangers!

Media

- oil/water
- water/water
- gas/liquid (condensation)
- specific media on request

Applications

(heating, cooling, condensing)
System separation, use of waste heat and heat recovery in mechanical engineering, process technology as well as refrigeration engineering and domestic technology, for instance

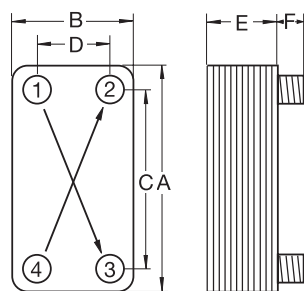
- cooling of lubricating-oil
- district heat transfer stations
- system separation on cooling ceilings

Limit conditions

- operating pressure max. 30 bar
- operating temperature min. -160°C, max. +200°C
- heat duty 2,0 to 2000 kW

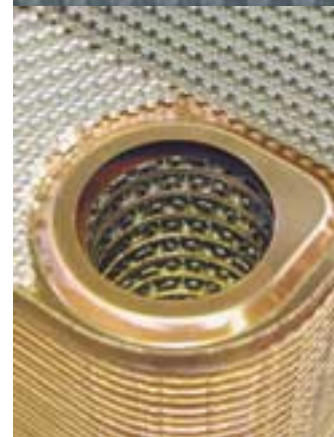
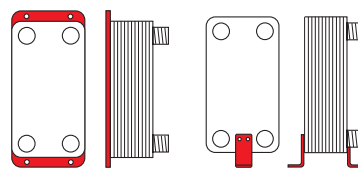
Location of the connections:

standard: on front plate
optional: on front plate and end plate



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



Caution: on principle brazed plate heat exchangers are unsuited for: seawater, ammonia, demineralized water, silicone oil and high-chloride media (exception: NPL series)

Type	Dimensions (mm)						Connections	max. number of plates	Empty weight kg	max. volume-flow m ³ /h	Volume/channel (liter)
	A	B	C	D	E	F					
TPL 00-K	274	111	213	50	6+4xN	50	G 1"	60	1,7+0,23xN	13	0,098
TPL 00-L	439	111	378	50	6+4xN	50	G 1"	60	2,4+0,40xN	13	0,134
TPL 01-K	383	168	309	94	6+4xN	50	G 1 1/2"	90	2,9+0,48xN	45	0,206
TPL 01-L	631	168	557	94	6+4xN	50	G 1 1/2"	90	4,8+0,87xN	45	0,321
TPL 02-K	488	225	403	140	6+4xN	50	G 2"	120	5,0+0,83xN	70	0,351
TPL 02-L	818	225	733	140	6+4xN	50	G 2"	120	8,3+1,50xN	70	0,574

N = number of plates

GPL Heat transfer plates with V-corrugation for universal application in case of media with low viscosity

Feature of the GPL series is a balanced relation between heat transfer rate and low pressure drops. Even in case of low mass flows the thermally optimised plate corrugation produces a highly turbulent flow, very effective utilisation of the available heat-exchanging surface and, furthermore, a self-cleansing effect.

Limit conditions

- operating pressure max. 30 bar
- operating temperature min. -160°C, max. +200°C
- heat duty 2,0 to 4000 kW

Special designs

NPL series with nickel solder (resistant to ammonia, demineralized water, synthetic oils etc.)

GPLS series with double plates as safety heat exchanger

Applications

(heating, cooling, condensing)
System separation, use of waste heat and heat recovery in domestic technology, process technology, refrigeration engineering and mechanical engineering etc.

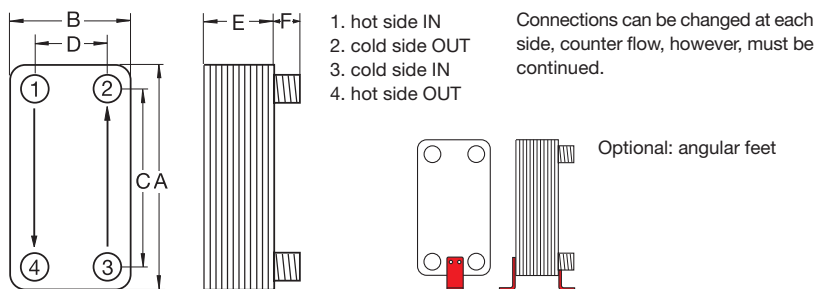
- hot-water/process water
- heating engineering (solar heating, central heating, underfloor heating)
- vapouriser/condenser in refrigeration plants

Media

- water/water
- oil/water
- gas/liquids
- and a lot of different media (in accordance with material resistance and viscosity)

Caution:

On principle brazed plate heat exchangers are unsuited for: seawater, ammonia, demineralized water, silicone oil and high-chloride media (exception: NPL series)



Type	Dimensions (mm)						Connections	max number of plates	Empty weight kg	Volume/channel
	A	B	C	D	E	F				
GPL 1	203	73	170	40	7 + 2,3 x N	20	G 1/2"	30	0,05 x N + 0,75	0,02
GPL 2	230	89	182	43	12 + 2,3 x N	20	G 3/4"	50	0,06 X N + 1,1	0,03
GPL 3	325	89	279	43	12 + 2,3 x N	20	G 3/4"	30	0,08 x N + 1,3	0,045
GPL 4	171	124	120	73	12 + 2,3 x N	20	G 1"	50	0,06 x N + 1,2	0,03
GPL 5	332	124	281	73	12 + 2,3 x N	20	G 1"	100	0,12 x N + 1,6	0,065
GPL 6	529	124	478	73	12 + 2,3 x N	20	G 1"	100	0,24 x N + 2,0	0,1
GPL 7	529	269	460	200	14 + 2,4 x N	65	G 2"	150	0,60 x N + 5,5	0,23
GPL 8	529	269	421	161	14 + 2,4 x N	65	G 2 1/2"	200	0,54 x N + 10	0,22
GPL 9	798	269	690	161	14 + 2,4 x N	65	G 2 1/2"	200	0,8 x N + 11,5	0,4
GPL 10	870	383	723	237	23 + 2,4 x N	134	DN 100	220	1,25 x N + 39,5	0,6

N = number of plates

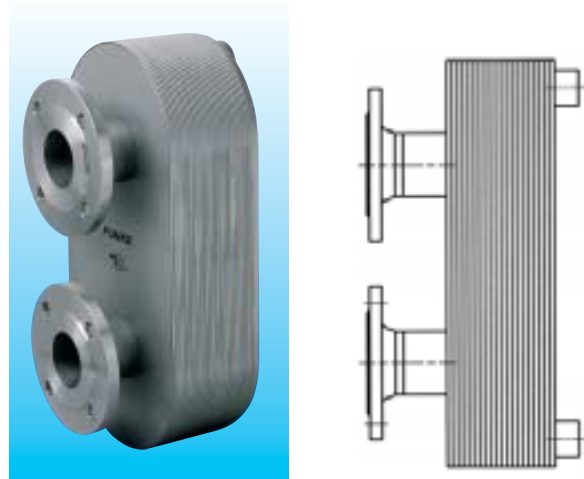
Special series

APL series for gas cooling

The APL series was especially designed for gas/water applications. Turbulators are used in the flow gaps like the TPL series for optimum heat transfer.

Connections may be on the front plate but also on the front plate and endplate, in accordance with order specification (see opposite example)

APL units are especially suited as compressed air coolers for dry and moist air.



SPL series Safety heat exchangers

The SPL safety heat exchanger with two separate flow gaps was developed for cases of application where stringent rules must be followed concerning intermixing of media in the event of a leakage (for example heating of fresh water by means of a lubricating oil cooler)

To guarantee maximum safety, there is one corrugated spacer plate each between cold and hot product, being a leakage gap, allowing the leakage to escape on both longitudinal sides.

See opposite photo showing from left to right the "spacer plate" and the "flow gap plate" with turbulator.



Connections

TPL/GPL/GPLS/NPL

Standard design:

- threaded nozzles (male threads)

Optional:

- soldered connections
- threaded nozzles (female thread)
- flanges

SPL

Standard design:

- threaded nozzles (male threads)

Optional:

- threaded nozzles (female thread)

APL

Standard design:

- flanges DN 65 (gas side)

- threaded nozzles (female thread) R 1 1/2" (water side)
- Optional:
- threaded nozzles (male thread)

Attachments (optional)

TPL

- extended end plate
- angular feet

GPL/GPLS/NPL

- angular feet
- wall brackets
- transport hooks

SPL

on request

APL

on request

Note:

Angular feet only for units with a min. weight of approx. 10 kg.

up to 105°C.

Available multiple part set, self-adhesive.

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



Quality secured by specialists



Quality must be checked. Each unit is designed and pressure tested. Further tests can be performed according to rules and corresponding inspection requirements if requested, such as

- EU pressure vessel rules 97/23

- AD 2000-Merkblatt
- ASME
- TEMA (international)
- API (USA)
- GOST (Russia)
- Australian Standard
- ISCR (Romania)
- Lloyd's register etc. as well as in accordance with



customer's requirements. Obviously FUNKE is certified in accordance with ISO 9001 and as authorised manufacturer to

- ASME U-Stamp
- UDT-Poland
- HP0/DIN EN 729-2
- China certificate.



- Shell-and-tube heat exchangers
- Plate heat exchangers
- Oil/air-cooling units

Quality Heat Exchangers



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