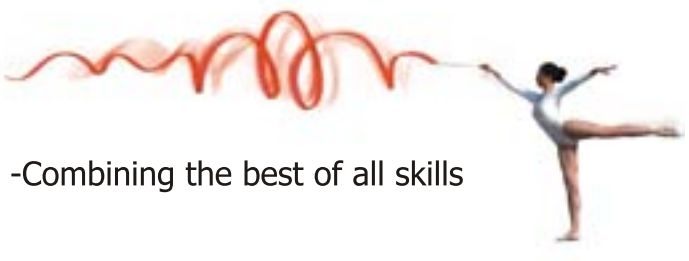
MAKING MODERN LIVING POSSIBLE

Brazed Plate Heat Exchanger
Type PHE



-Combining the best of all skills

INDUSTRIAL AUTOMATION

Around the world, Danfoss Makes Modern Living Possible. You'll find Danfoss mechanical and electronic products and controls across industries. For example

- In wind power generators, which are a growing source of clean energy
- In massive marine engines that drive ships from continent to continent packed with cargo containers
- In mobile hydraulic machinery that make it possible for farmers to harvest the maximum acreage of land with the minimum manpower.

Danfoss components are used in new applications every day. And our portfolio of products is growing all the time to meet our customers' needs.

Heat exchangers - the latest range of products from Danfoss

Aimed at the industrial business segment including mobile hydraulic, power generation and marine industries our new heat exchanger products help heat and cool a variety of media, like oil, water and air, in industrial applications.

The detailed technical information on the following pages will tell you about product design and specifications so you can decide which heat exchanger type and size is best suited to the needs of your specific applications.

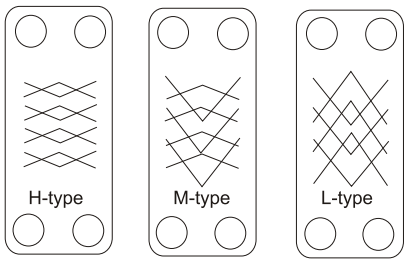
Danfoss Sales Companies and distribution networks around the world are ready to answer your questions - please give us a call!

Expression of The Type of BPHE

B3-052-50-3.0-H

- Brazed plate heat exchangers
- Copper braze
- Single plate heat transfer area m^2
- Number of plates
- Design pressure MPa
- Channel type H.L.M

Channel Type H-M-L



Heat Exchanger Channels

PHE type B is available with 2 different types of plates and 3 types of channels, that are responsible for the thermal characteristics of the heat exchanger.

The H type plate has obtuse angles that result in higher heat transfer efficiency by increasing the turbulence of the fluid.

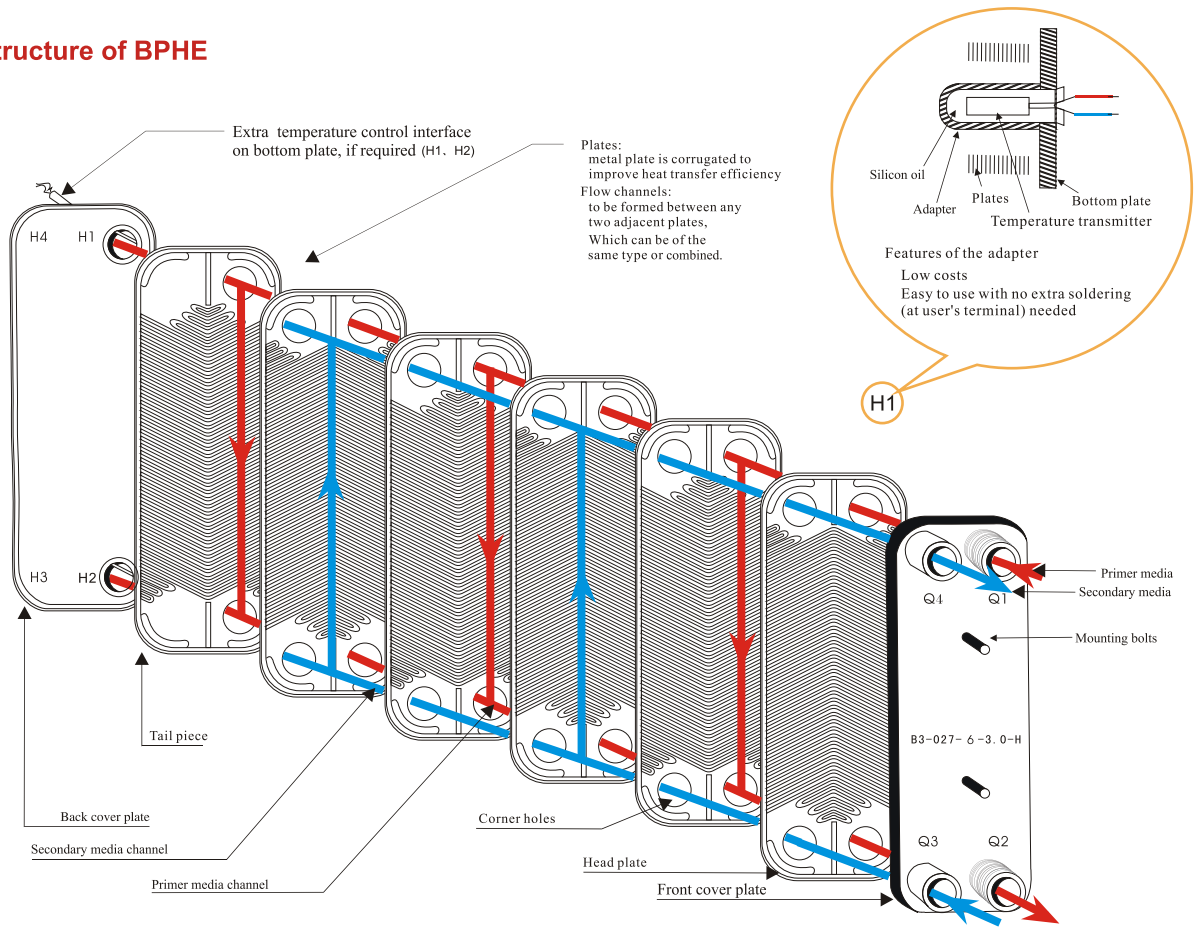
The L type plate has acute angles. This reduces the pressure drop and reduces the turbulence and lowers heat transfer efficiency.

The H channel is made by two H plates, with high heat transfer coefficient and high pressure drop

The L channel is made by two L plates, with lower heat transfer coefficient and lower pressure drop

The M channel is made by one H plate and one L plate, with both medium of pressure drop and heat transfer coefficient

Structure of BPHE

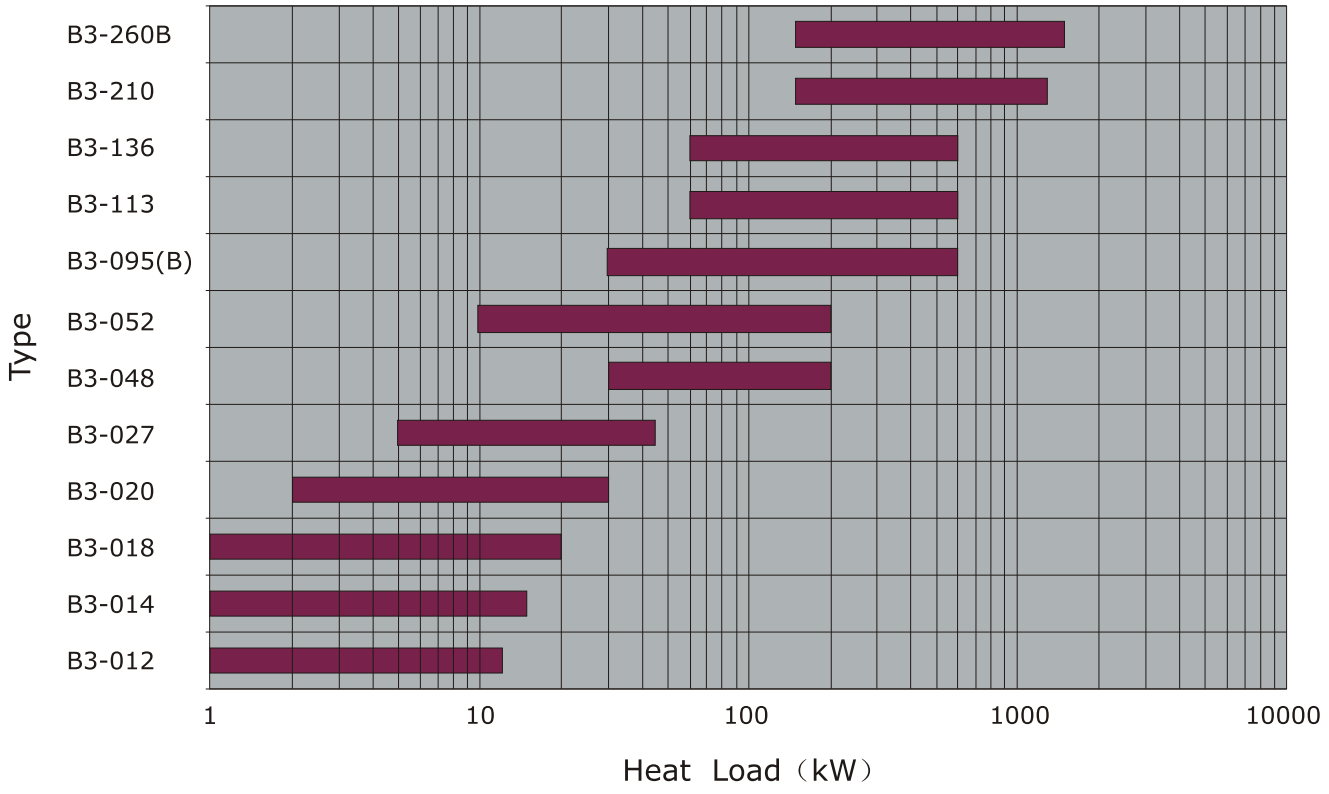


Technical data-Select the type that fits your appliaction

BPHE data	B3-012	B3-014	B3-018	B3-020
Heat Load（kW）（Max）	12	15	20	30
Heat exchanger area（m^2）（n=number of plates）	(n-2)×0.012	(n-2)×0.014	(n-2)×0.018	(n-2)×0.022
Design temperature（℃）	-196 /+200	-196 /+200	-196 /+200	-196 /+200
Standard Design pressure Q1-Q2/Q3-Q4（bar）	10	30	30	30
Hign Design pressrue Q1-Q2/Q3-Q4（bar）	30	45	45	40
Test pressure standard（bar）	15/45	45/67.5	45/67.5	45/60
Channel pattern	H	H、L、M	H	H、L、M
Max. number of plates	50	60	60	60
Height/width（mm）[1)]	186/72	207/77	231/90	314/72
Weight（kg）, empty（n=number of plates）	0.6+0.044×n	0.7+0.06×n	1+0.06×n	1.1+0.09×n
Max. size of thread connection[2)]	3/4″	3/4″	3/4″	3/4″
Standard plate material[3)]	AISI 304	AISI 304	AISI 316	AISI 304
Brazing material	Copper or Nickel	Copper or Nickel	Copper or Nickel	Copper or Nickel

1) Look for all dimensions and drawings in data sheet
2) Find various connections in the table on page 18-19
3) SMO 254 or AISI 316L steel plates on demand

Product range



	B3-027	B3-052	B3-095	B3-095B	B3-136	B3-260B
	45	200	600	600	600	1500
	(n-2)×0.026	(n-2)×0.050	(n-2)×0.095	(n-2)×0.095	(n-2)×0.136	(n-2)×0.260
	-196 /+200	-196 /+200	-196 /+200	-196 /+200	-196 /+200	-196 /+200
	30	30	30	30	30	25
	45	45	45	45	40	
	45/67.5	45/67.5	45/67.5	45/67.5	45/60	37.5
	H、L、M	H、L、M	H、L、M	H、L、M	H	H
	150	150	250	250	200	250
	311/111	527/111	615/188	615/188	492/252	798/363
	1.2+0.13×n	1.8+0.23×n	5.64+0.41×n	5.64+0.41×n	6.5+0.38×n	13.5+0.97×n
	1 1/4″	1 1/4″	2″	2″	3″	5″ clamp
	AISI 316L	AISI 316L	AISI 316L	AISI 316L	AISI 316L	AISI 316L
	Copper or Nickel	Copper or Nickel	Copper	Copper	Copper	Copper

Product Options

Adapter/Temperature Monitoring

The temperature sensor ports can be installed at back or front of the BPHE. The port is concentric with connection, and enable easy installation of temperature sensor for accurate system control. The port is brazed together with cover plate, and can withstand the pressure of medium.

High Pressure

Danfoss can offer a wide "High Pressure" range to meet the design requirements of many high pressure application such as hydraulic and fuel coolers. "HP" BPHE are designed to withstand up to 45 bar of design pressure.

Nickel Brazed

For deionized water, ammonia, solvents and other fluids not compatible with copper

Dual Circuit

The real dual circuit makes it possible to cool or heat two independent secondary media with one primer media. This can replace 2 separate heat exchangers in some applications. The "BB" symbol allows the same but with some limitations on where the connection can be placed.

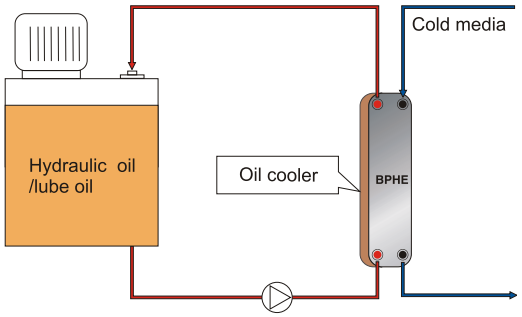
Back to Back

Danfoss "BB" type BPHE makes it possible like "DC" to run with 3 different media in the same heat exchanger.

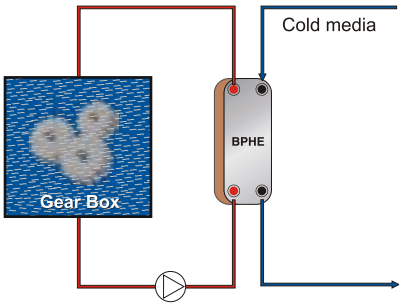
● BPHE is mainly used for liquid to liquid heat transfer in industrial applications.

- ◎ Hydraulic oil cooling
- ◎ Lubricating oil cooling
- ◎ Heat recovery
- ◎ Deionized water cooling
- ◎ Fuel oil heating
- ◎ Boiler application
- ◎ Process cooling

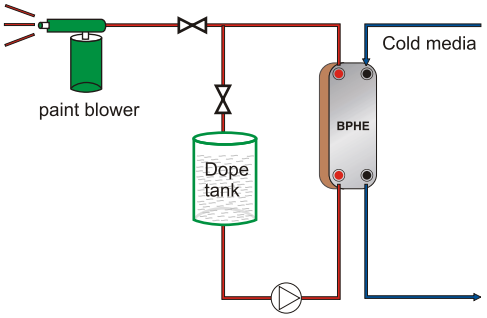
Hydraulic oil cooling



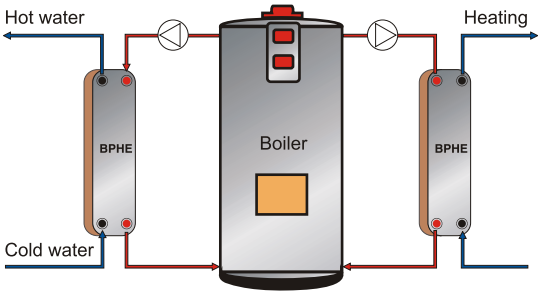
Lubrication oil cooling



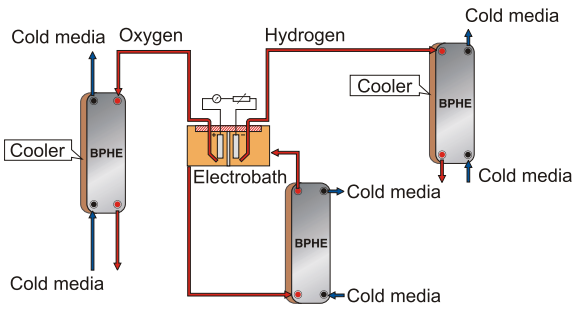
Painting



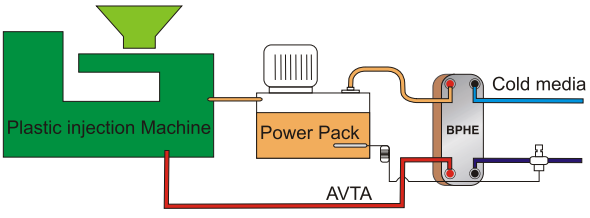
Boiler application



Hydrogen fuel cell



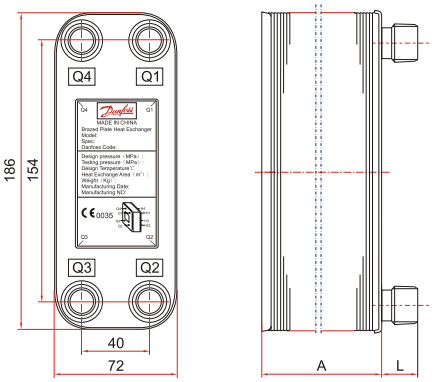
Cooling Unit Injection Machine



● Brazed Plate Heat Exchanger **PHE B3-012** A Ni

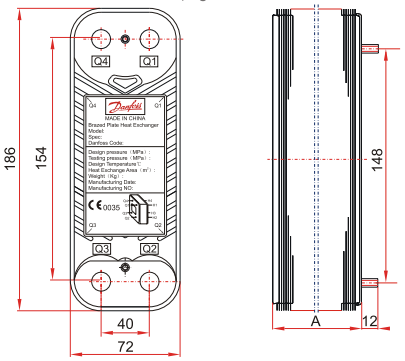
The standard plate material is stainless steel AISI 304. For other plate material (AISI 316L, SMO 254) please contact local sales organization.

Flat front / back cover plate



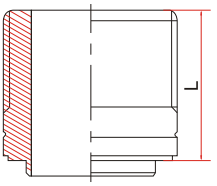
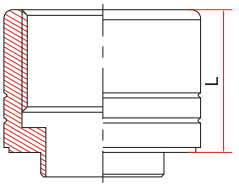
Upright flow

Corrugated front / back cover plate



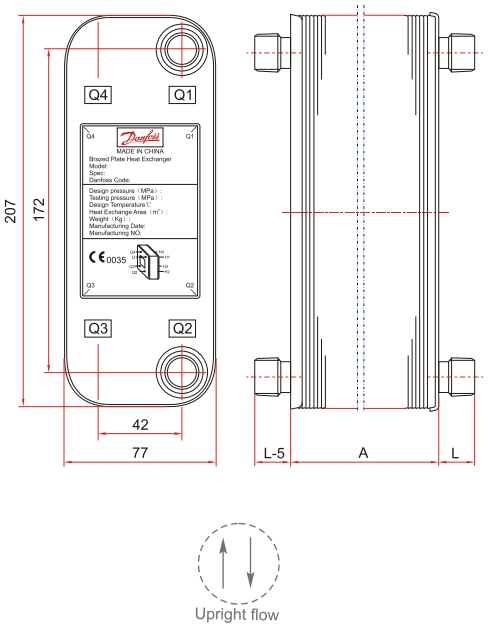
PHE B3-012 Dimensional Data				
Number of plates	A（mm）	Weight (kg)	Channel volume (L) Q1 Q2 side/ Q3 Q4side	Heat transfer area (m^2)
n	7+2.3n	0.6+0.044n	0.018×n/2/0.018×(n-2)/2	（n-2）0.012

Technical Data	
Design pressure	10 bar（A type）
	30 bar（B type）
Testing pressure	15 bar（A type）
	45 bar（B type）
Design temperature	-196 ~ +200℃
Plate type	H
Heat load	~12KW
Number of max plates	50

Male thread	Female thread
	
The max size of male thread connection 3/4″	The max size of female thread connection 1/2″

Danfoss provides customers with various thread connections. See connection table page 18.

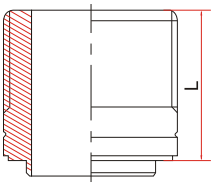
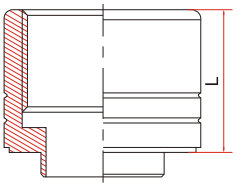
● Brazed Plate Heat Exchanger **PHE B3-014**



The standard plate material is stainless steel AISI 304. For other plate material (AISI 316L, SMO 254) please contact local sales organization.

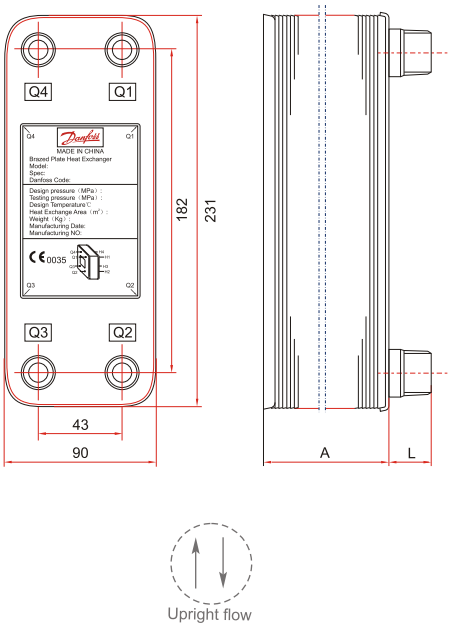
PHE B3-014 Dimensional Data				
Number of plates	A（mm）	Weight (kg)	Channel volume (L) Q1 Q2 side/ Q3 Q4side	Heat transfer area (m^2)
n	7+2.3n	0.7+0.06n	0.02×n/2/0.02×(n-2)/2	（n-2）0.014

Technical Data	
Design pressure	30 bar（A type）
	45 bar（B type）
Testing pressure	45 bar（A type）
	67.5 bar（B type）
Design temperature	-196 ~ +200℃
Plate type	H、L、M
Heat load	~15KW
Number of max plates	60

Male thread	Female thread
	
The max size of male thread connection 3/4″	The max size of female thread connection 1/2″

Danfoss provides customers with various thread connections. See connection table page 18.

● Brazed Plate Heat Exchanger **PHE B3-018**



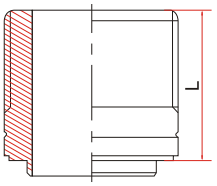
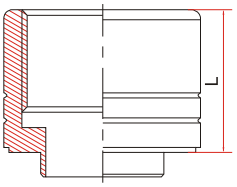
The standard plate material is stainless steel AISI 316L, For other plate material (AISI 304, SMO 254) please contact local sales organization.

PHE B3-018 Dimensional Data

Number of plates	A（mm）	Weight (kg)	Channel volume (L) Q1 Q2 side/ Q3 Q4side	Heat transfer area (m^2)
n	10+2.3n	1.1+0.055n	0.036×n/2 / 0.036×(n-2)/2	（n-2）0.014

Technical Data

Design pressure	30bar（A type）
	45bar（B type）
Testing pressure	45bar（A type）
	67.5 bar（B type）
Design temperature	-196 ~ +200℃
Plate type	H、L、M
Heat load	~20KW
Number of max plates	60

Male thread	Female thread
	
The max size of male thread connection 3/4″	The max size of female thread connection 1/2″

Danfoss provides customers with various thread connections. See connection table page 18.

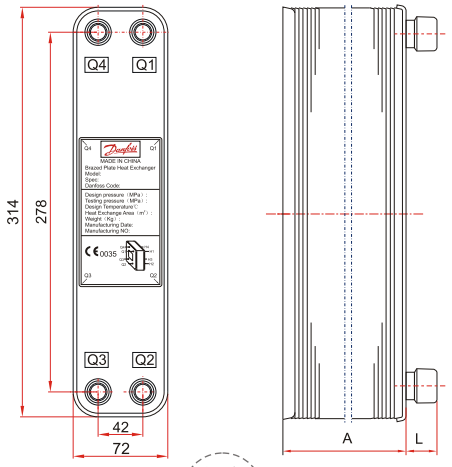
● Brazed Plate Heat Exchanger PHE B3-020

PHE B3-020 Dimensional Data				
Number of plates	A（mm）	Weight (kg)	Channel volume (L) Q1 Q2 side/ Q3 Q4 side	Heat transfer area (m^2)
n	7+2.3n	0.44+0.076n	0.04×n/2 0.04×(n-2)/2	（n-2）0.022

Technical Data	
Design pressure	30 bar（A type）
	40 bar（B type）
Testing pressure	45 bar（A type）
	60 bar（B type）
Design temperature	-196 ~ +200℃
Plate type	H、L、M
Heat load	2-30KW
Number of max plates	60

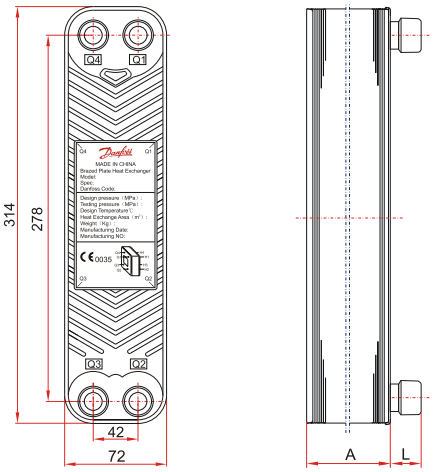
The standard plate material is stainless steel AISI 304. For other plate material (AISI 316L, SMO 254) please contact local sales organization.

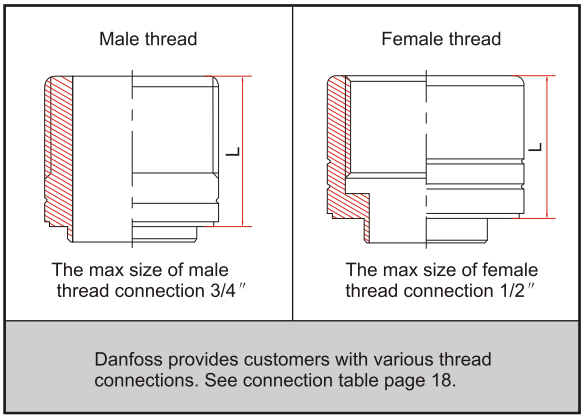
Flat front / back cover plate



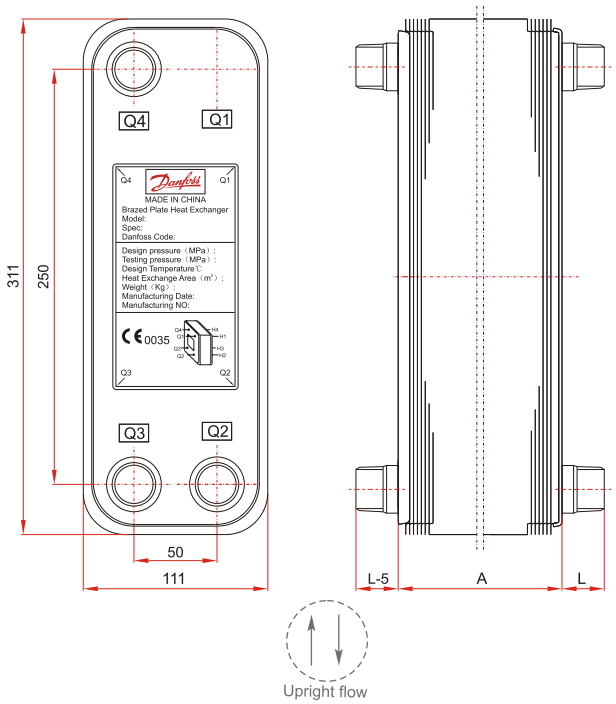
Upright flow

Corrugated front / back cover plate





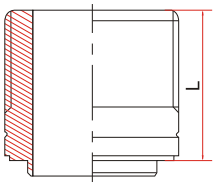
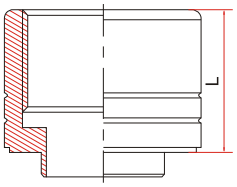
● Brazed Plate Heat Exchanger **PHE B3-027**



The standard plate material is stainless steel AISI 316L. For other plate material (AISI 304L 、SMO 254) please contact local sales organization.

PHE B3-027 Dimensional Data				
Number of plates	A（mm）	Weight (kg)	Channel volume (L) Q1 Q2 side/ Q3 Q4side	Heat transfer area (m^2)
n	9+2.4n	1.2+0.13n	0.05×n/2/0.05×(n-2)/2	(n-2) 0.026

Technical Data	
Design pressure	30 bar（A type）
	45 bar（B type）
Testing pressure	45 bar（A type）
	67.5 bar（B type）
Design temperature	-196 ~ +200℃
Plate type	H、L、M
Heat load	5~45KW
Number of max plates	150

Male thread	Female thread
	
The max size of male thread connection 1 1/4″	The max size of female thread connection 1″

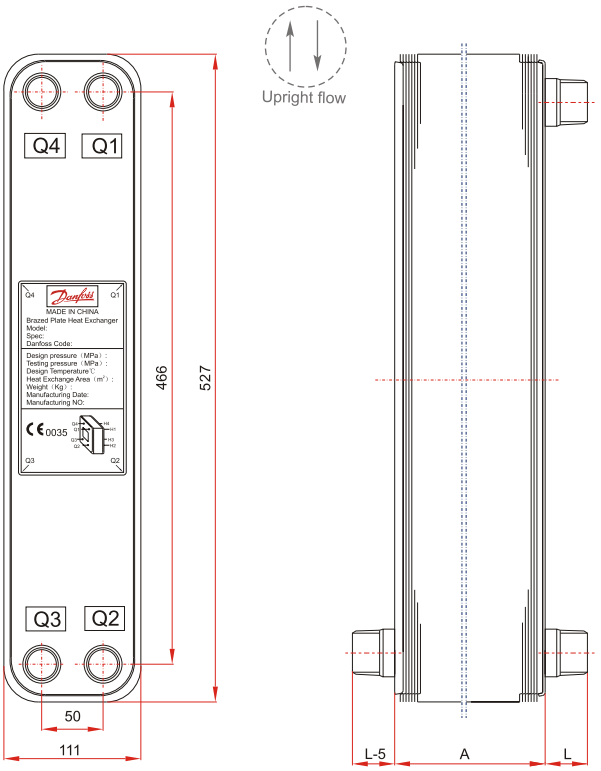
Danfoss provides customers with various thread connections. See connection table page 18.

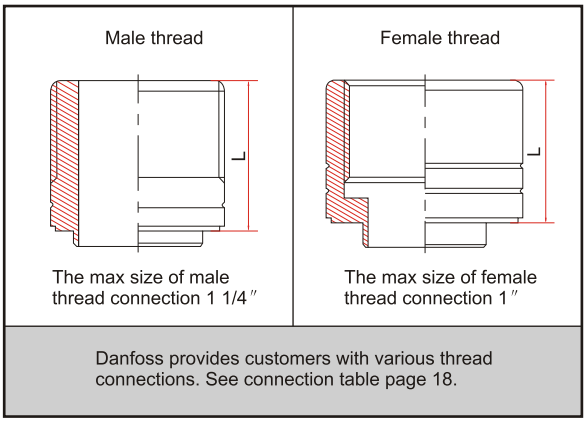
● Brazed Plate Heat Exchanger **PHE B3-052**

The standard plate material is stainless steel AISI 316L. For other plate material (AISI 304L 、SMO 254) please contact local sales organization.

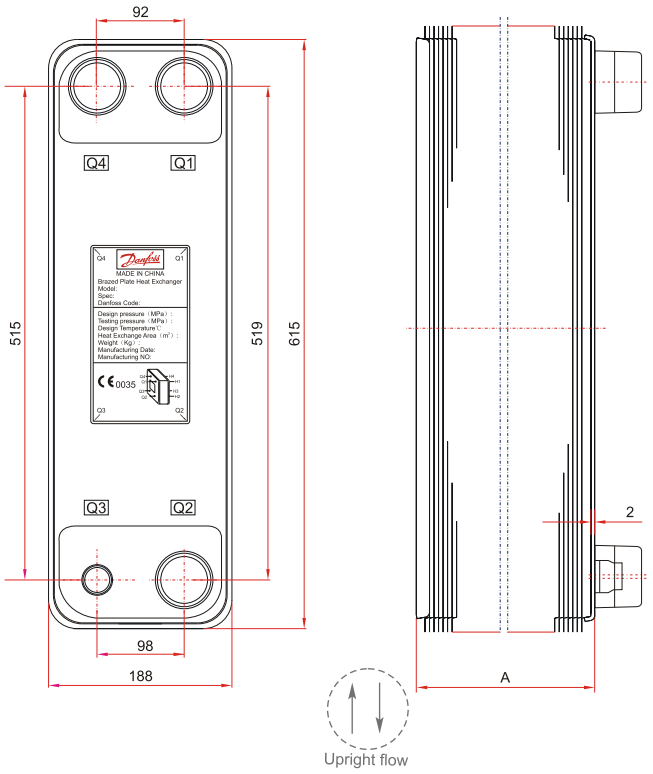
PHE B3-052 Dimensional Data				
Number of plates	A（mm）	Weight (kg)	Channel volume (L) Q1 Q2 side/ Q3 Q4 side	Heat transfer area (m^2)
n	9+2.4n	1.8+0.23n	0.094×n/2 0.094×（n-2）/2	（n-2）0.050

Technical Data	
Design pressure	30 bar（A type）
	45 bar（B type）
Testing pressure	45 bar（A type）
	67.5 bar（B type）
Design temperature	-196 ~ +200℃
Plate type	H、L、M
Heat load	10-200KW
Number of max plates	150





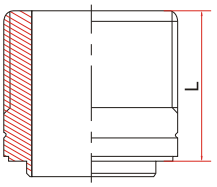
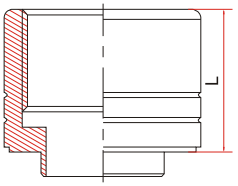
● Brazed Plate Heat Exchanger **PHE B3-095**



The standard plate material is stainless steel AISI 316L. For other plate material (AISI 304L、SMO 254) please contact local sales organization.

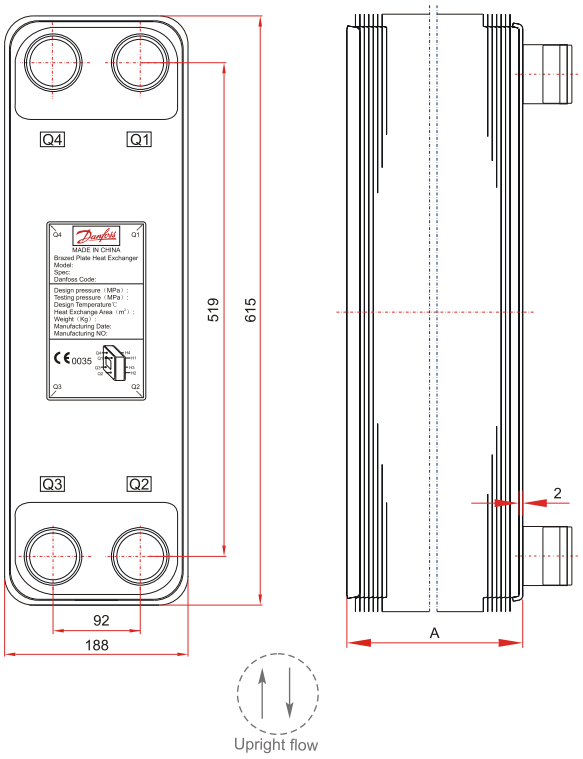
PHE B3-095 Dimensional Data				
Number of plates	A（mm）	Weight (kg)	Channel volume (L) Q1 Q2 side/ Q3 Q4 side	Heat transfer area (m^2)
n	12+2.4n	5.64+0.41n	0.201×n/2 0.201×(n-2)/2	（n-2）0.095

Technical Data	
Design pressure	30 bar（A type）
	45 bar（B type）
Testing pressure	45 bar（A type）
	67.5 bar（B type）
Design temperature	-196 ~ +200℃
Plate type	H、L、M
Heat load	30-600KW
Number of max plates	250

Male thread	Female thread
	
The max size of male thread connection 2″	The max size of female thread connection 1 1/2″

Danfoss provides customers with various thread connections. See connection table page 18.

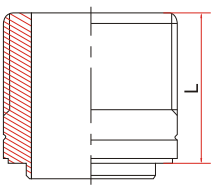
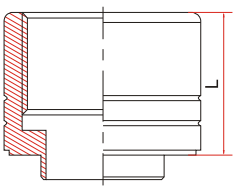
● Brazed Plate Heat Exchanger **PHE B3-095B**



The standard plate material is stainless steel AISI 316L. For other plate material (AISI 304L、SMO 254) please contact local sales organization.

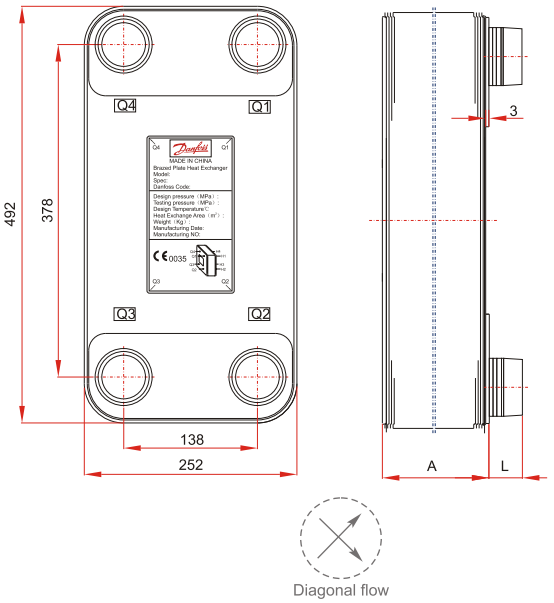
PHE B3-095B Dimensional Data				
Number of plates	A（mm）	Weight (kg)	Channel volume (L) Q1 Q2 side/ Q3 Q4 side	Heat transfer area (m^2)
n	12+2.8n	5.64+0.41n	0.25×n/2 0.25×（n-2）/2	（n-2）0.095

Technical Data	
Design pressure	30 bar（A type）
	45 bar（B type）
Testing pressure	45 bar（A type）
	67.5 bar（B type）
Design temperature	-196 ~ +200℃
Plate type	H、L、M
Heat load	30-600KW
Number of max plates	250

Male thread	Female thread
	
The max size of male thread connection 2″	The max size of female thread connection 1 1/2″

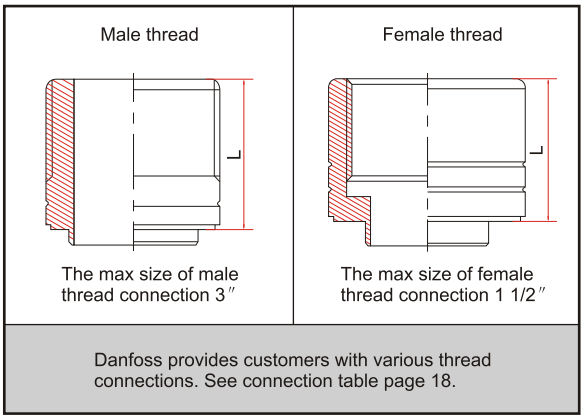
Danfoss provides customers with various thread connections. See connection table page 18.

● Brazed Plate Heat Exchanger **PHE B3-136**



The standard plate material is stainless steel AISI 316L. For other plate material (SMO 254) please contact local sales organization.

Technical Data	
Design pressure	30 bar（A type）
	40 bar（B type）
Testing pressure	45 bar（A type）
	60 bar（B type）
Design temperature	-196 ~ +200℃
Plate type	H
Heat load	60-600KW
Number of max plates	200

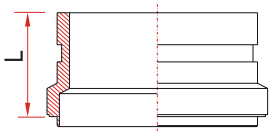
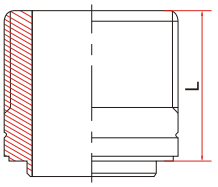


Danfoss provides customers with various thread connections. See connection table page 18.

PHE B3-136 Dimensional Data				
Number of plates	A（mm）	Weight (kg)	Channel volume (L)	Heat transfer area (m^2)
n	10+2.8n	6.5+0.38n	Q1 Q3 side :0.194×n/2	（n-2）0.136
			Q2 Q4 side: 0.194×（n-2）/2	

● Brazed Plate Heat Exchanger **PHE B3-260B** A

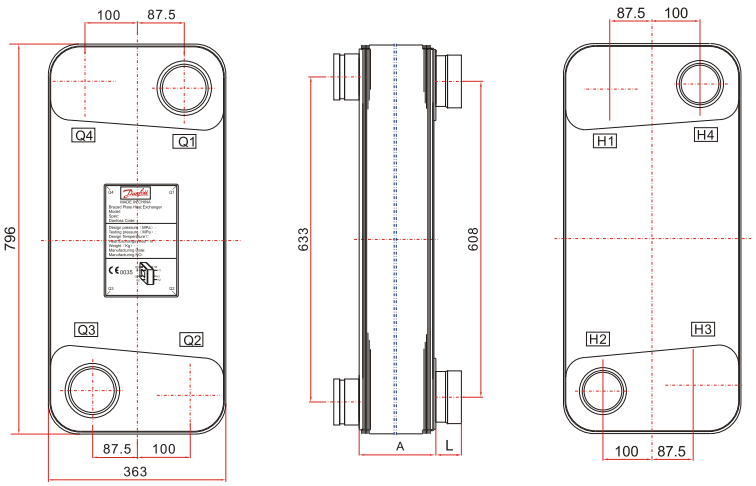
Technical Data	
Design pressure	25 bar
Testing pressure	37.5 bar
Design temperature	-196 ~ +200℃
Plate type	H
Heat load	150-1500KW
Number of max plates	300

Clamp connection	Thread connection
	
The max size of clamp connection 5"	The max size of thread connection 3″

Danfoss provides customers with various thread connections. See connection table page 18. Flange version also available, please contact local sales organization.

PHE B3-260B Dimensional Data				
Number of plates	A（mm）	Weight (kg)	Channel volume (L)	Heat transfer area (m^2)
n	13+2.8n	13.5+0.97n	Q1 Q3 side:0.6×n/2 Q2 Q4 side:0.6×(n-2)/2	（n-2）0.260

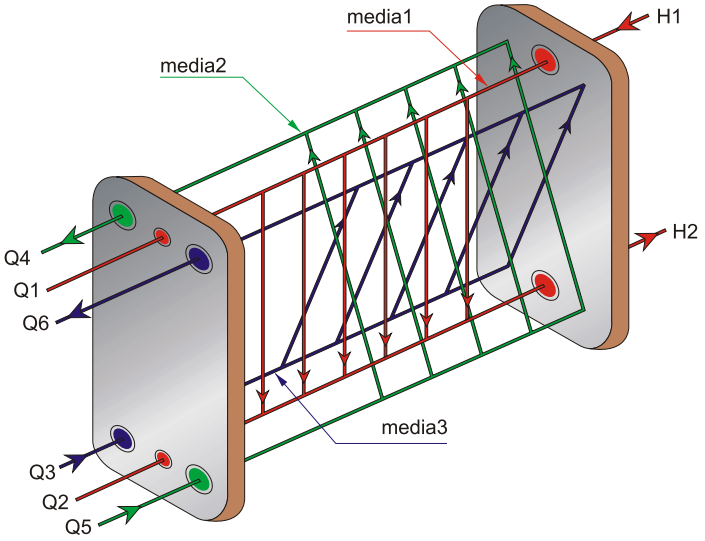
The standard plate material is stainless steel AISI 316L. For other plate material(SMO 254) please contact local sales organization.



Diagonal flow

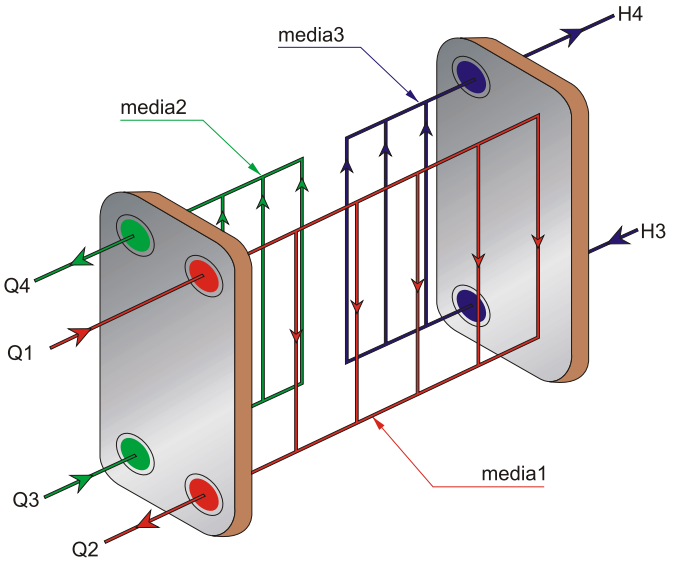
- **Danfoss provides customers with some special types, which can run with 3 different media.**

Dual Circuit system



Danfoss type B3-048, B3-113 and B3-210 are Dual Circuit system.

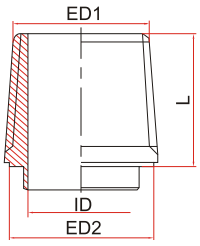
Back to Back system



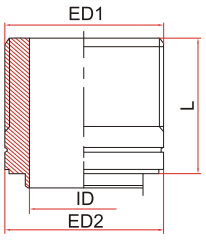
The back to back system can be utilized in most of our products, find "BB" symbol in the product introduction.

Thread connection

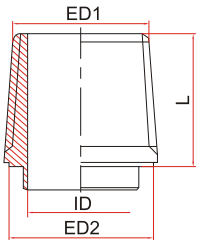
Male thread



NPT



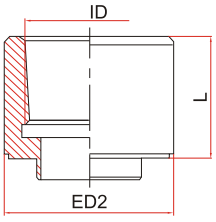
BSP



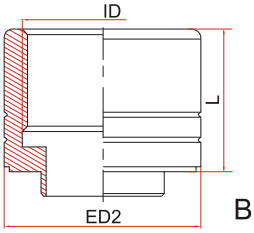
DIN

Connection Type	Connection Size(inch)	External Diameter (ED1) (inch)	External Diameter (ED2) (mm)	Internal Diameter (ID) (mm)	Length (L) (mm)	B3-012 B3-014 B3-018 B3-020	B3-027 B3-052	B3-048	B3-095 B3-095B	B3-113	B3-136	B3-210	B3-260B
NPT	1/2	NPT 1/2	23	13	20	×							
	3/4	NPT 3/4	26.5	16	29		×	×	×	×	×	×	×
	3/4	NPT 3/4	27	16	20	×							
	1	NPT 1	33.5	23	29		×	×	×	×	×	×	×
	1 1/4	NPT 1 1/4	42	30	29		×	×	×	×	×	×	×
	1 1/2	NPT 1 1/2	48	36	29			×	×	×	×	×	×
	2	NPT 2	60.3	49	48				×	×	×	×	×
	2 1/2	NPT 2 1/2	75.2	62	52					×	×	×	×
	3	NPT3	89	78	52						×	×	×
BSP	G 1/2	G 1/2	24	12	29		×	×	×	×	×	×	×
	G 1/2	G 1/2	21	15.5	15	×							
	G 3/4	G 3/4	26.5	16	29		×	×	×	×	×	×	×
	G 3/4	G 3/4	22	16	25	×							
	G 3/4	G 3/4	26.5	20	15	×							
	G 1	G 1	33.5	23	29		×	×	×	×	×	×	×
	G 1 1/4	G 1 1/4	42	30	29		×	×	×	×	×	×	×
	G 1 1/2	G 1 1/2	48.3	36	29			×	×	×	×	×	×
	G 2	G 2	60.3	49	48				×	×	×	×	×
	G 2 1/2	G 2 1/2	75.2	75.2	52					×	×	×	×
	G 3	G 3	89	78	52						×	×	×
DIN	R 1/2	R 1/2	21	15.5	15	×							
	R 3/4	R 3/4	26.5	16	29		×	×	×	×	×	×	×
	R 3/4	R 3/4	26.5	20	15	×		×	×	×	×	×	×
	R 3/4	R 3/4	22	19.2	25	×							
	R 1	R 1	33.5	23	29		×	×	×	×	×	×	×
	R 1 1/4	R 1 1/4	42	30	29		×	×	×	×	×	×	×
	R 1 1/2	R 1 1/2	46	36	29			×	×	×	×	×	×
	R 2	R 2	60.3	49	48				×	×	×	×	×
	R 2 1/2	R 2 1/2	75.2	62	52					×	×	×	×
	R 3	R 3	89	78	52						×	×	×

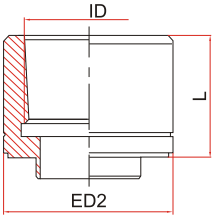
Female thread



NPT



BSP

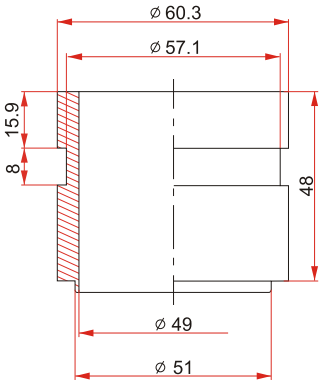


DIN

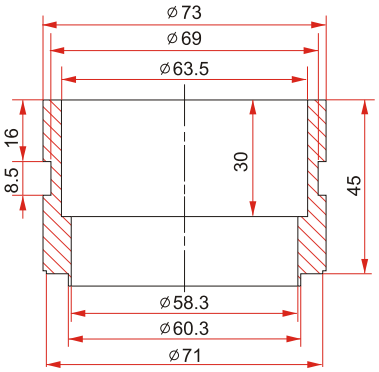
Connection Type	Connection Size(inch)	External Diameter (ED1) (mm)	External Diameter (ED2) (mm)	Internal Diameter (ID) (inch)	Length (L) (mm)	B3-012 B3-014 B3-018 B3-020	B3-027 B3-052	B3-048	B3-095 B3-095B	B3-113	B3-136	B3-210	B3-260B
NPT	1/4	20	20	NPT 1/4	29		×	×	×	×	×	×	×
	1/2	27	27	NPT 1/2	25	×	×	×	×	×	×	×	×
	3/4	30	30	NPT 3/4	29		×	×	×	×	×	×	×
	1	40	40	NPT 1	29		×	×	×	×	×	×	×
BSP	G 1/2	27	27	G 1/2	29		×	×	×	×	×	×	×
	G 3/4	33	33	G 3/4	29		×	×	×	×	×	×	×
	G 1	40	40	G 1	29		×	×	×	×	×	×	×
	G 1 1/4	52	52	G 1 1/4	49			×	×	×	×	×	×
DIN	R 1/2	27	27	R 1/2	29		×	×	×	×	×	×	×
	R 3/4	30	30	R 3/4	29		×	×	×	×	×	×	×
	R 3/4	33	33	R 3/4	29		×	×	×	×	×	×	×
	R 1	40	40	R 1	29		×	×	×	×	×	×	×
	R 1/2	61	61	R 1 1/2	49			×	×	×	×	×	×

Clamp connection

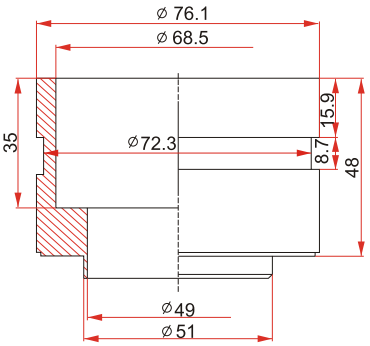
T60.3 (123)



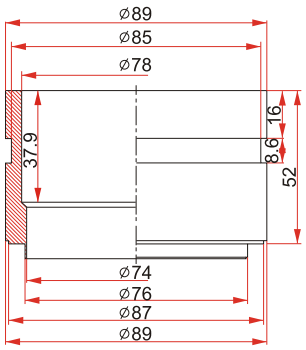
K2.5″ (251)



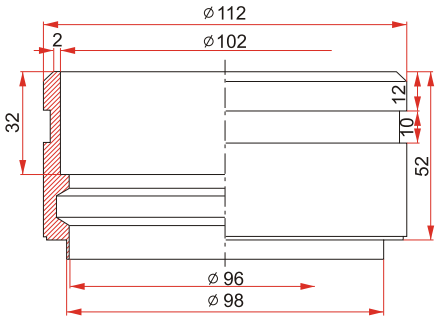
T76.1 (174)



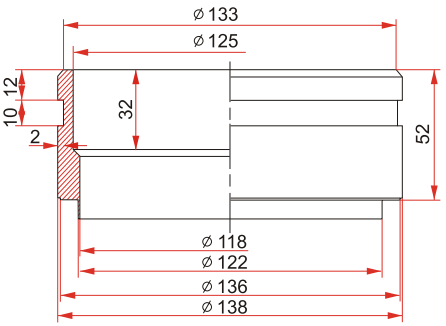
H3 1/8″ D (189)



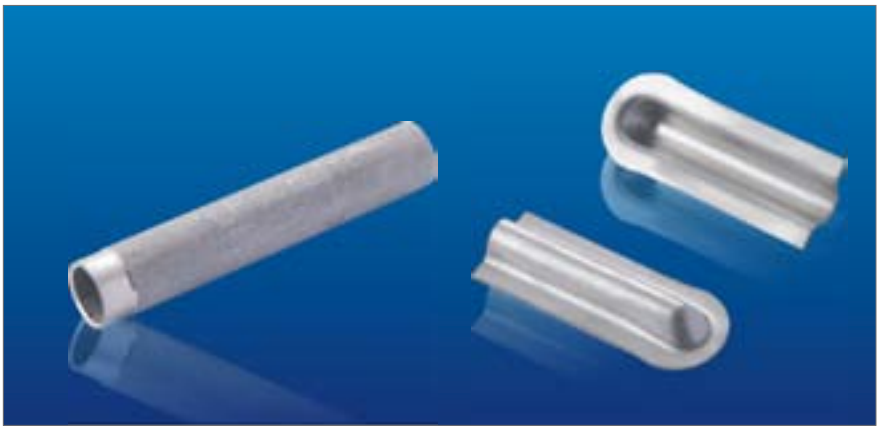
H4″ (134)



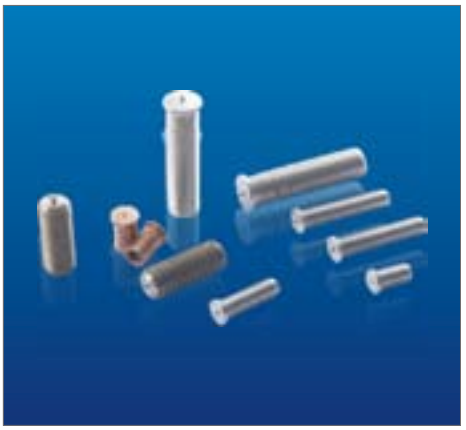
H5″ (215)



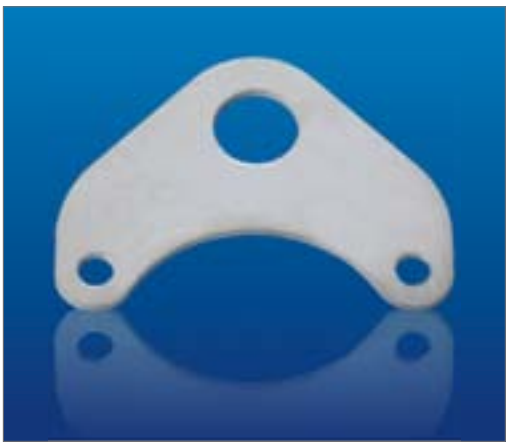
Adapter



Stud Bolt



Lift Ring



Insulation

Bracket

Other accessories can be made according to customer's request, please contact local sales organization.

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