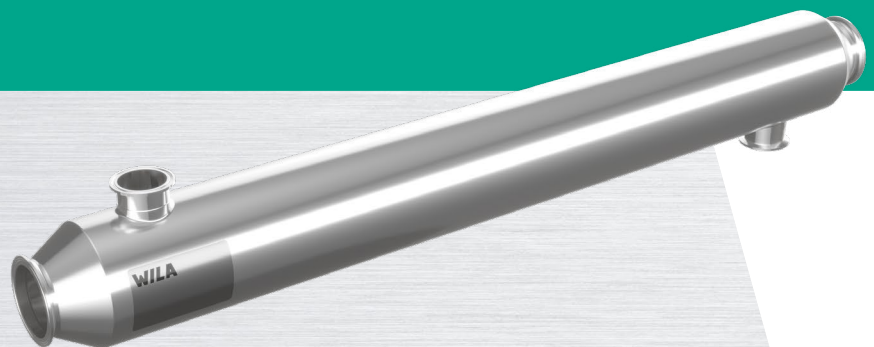


TUBULAR HEAT EXCHANGER

DETAILED OVERVIEW FOR TYPE 'THE'
HIGH PRESSURE - 60 BAR

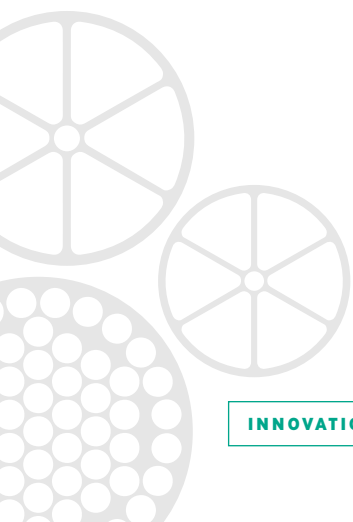


Dimensions overview for type Ø133 - 60bar[g]

Tubular heat exchangers are highly used in the food and beverage industry and in connection with many applications such as CIP units. In the food and beverage industry tubular heat exchangers are often used in systems to reduce or eliminate microbials to make products safe for consumption and to extend their shelf life. A tubular heat exchanger may also be used to heat or cool products prior to filling, drying, concentration or other processes.

Content

Introduction	3
Regulations and Directives	3
Documentation	3
Group specifications.....	4
Connections	5
Steam pressure limits	5
THE-.5-133-60.....	6
THE-01-133-60	7
THE-02-133-60	8
THE-03-133-60	9



Introduction

This overview is for Tubular Heat Exchangers manufactured by Wila A/S under the category "THE" hereinafter referred to as "Heat Exchanger". A Tubular Heat Exchanger is by design, two Pressure chambers in a combined housing.

The inner chamber consists of both ends and the insides of all tubes in the tube bundle, hereinafter referred to as "Tube side" or "Product side".

The outer pressure chamber consists of the outside of the tube bundle, and the inside of the exchangers outer shell, hereinafter referred to as "Shell side" or "Service side".

The Heat Exchanger is intended for a fluid to fluid heat transfer, **either** cooling or heating and is made from EN.1.4404 (AISI 316L) stainless steel with a sanitary surface finish. The tube side is suitable for food stuff fluids, such as dairy products and juices. The outside surface roughness is $\leq 1,6\mu\text{m}$ and the internal tube side surface roughness is $\leq 0,8\mu\text{m}$. **All fluid media in use with the Heat exchanger, must be compatible with EN.1.4404 (AISI 316L) Stainless Steel.**

The 60 BAR (870 PSI), maximum product side pressure, heat exchanger design is based on a Ø133x4 shell. Other sizes and pressure ratings are also available.

Regulations and Directives

The heat exchanger is designed and manufactured in accordance with

- the European Commission regulation No. 2023/2006 (Good Manufacturing Practices)
- the European Parliament directive No. EN 1935/2004 (Food Contact Materials).
- the European Parliament directive No. EN 1907/2006 (Chemical Restrictions (REACH)).
- PED - Article 4.3 (SEP) in the European Parliament directive No. 2014/68/EU (Pressure Equipment Directive). The Heat Exchanger is only designed for fluid group 2 (non-dangerous fluids).

Documentation

1. Customer drawing with description and design data table
2. Declaration of conformity
3. Pressure test certificate
4. User Manual

As Supplement the following can be provided:

5. 3.1 material certificates according to EN 10204
6. Weld-logs with associated welding certificates according to DS/EN ISO 9601-1.

Group specifications

Group ordering codes and specifications are as listed below. A more detailed group tables with unit codes and main dimensions can be found on the following pages.

THE-xx-133-60

THE	Tubular Heat Exchanger	
xx	.5, 01, 02, 03	Indicates the heat transfer surface area in m ² .
133	Ø133	Indicates the heat exchanger shell diameter in mm.
60	The heat exchanger is designed for pressure up to 60 bar	

THE-xx-xxx-yyy-zz

xx	See above	
xxx	See above	
yyy	See below	Indicates tube side clamp ferrule connection.
zz	See below	Indicates shell side clamp ferrule connection.

Tube side (P1 and P2) connections are:

Shell size's	Tube side connection size's	
Ø133mm	DN100 – DN80 – DN65	in accordance with DIN 32676-A
Ø133mm	4" (Ø101.6) – 3" (Ø76.1) – 2.5" (Ø63.5)	In accordance with ISO 2852-2

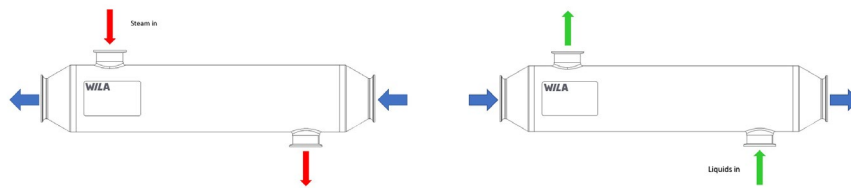
Shell side (S1 and S2) connections:

DN50 – DN40	in accordance with DIN 32676-A
2" (Ø51) – 1.5" (Ø38)	in accordance with ISO 2852-2

For both tube and shell sides other connection types and sizes are available.

Connections

Always follow your fitting supplier guidelines and local legislations. SSH clamping rings (or similar) are recommended. For steam connections the outlet should always be at the lowest point. For liquids, the outlet should be at the highest point to ensure complete removal of air in the chamber.



Service side limits

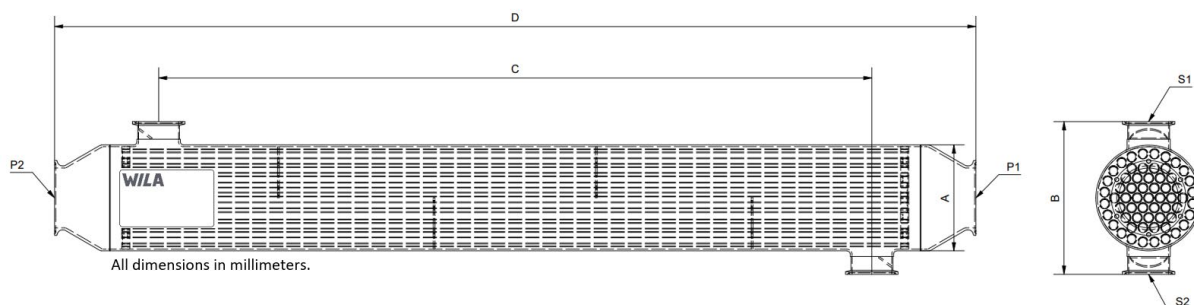
The heat exchanger's shell side maximum pressure and temperature limits are based on the maximum allowed steam pressure, which varies with the size of the heat exchanger:

1. For heat exchanger sizes 0.5m² and 1 m² these limits are respectively 10 bar[g] and 185°C
2. For heat exchanger size 2 m² these limits are respectively 8 bar[g] and 176°C
3. For heat exchanger size 3 m² these limits are respectively 6 bar[g] and 165°C

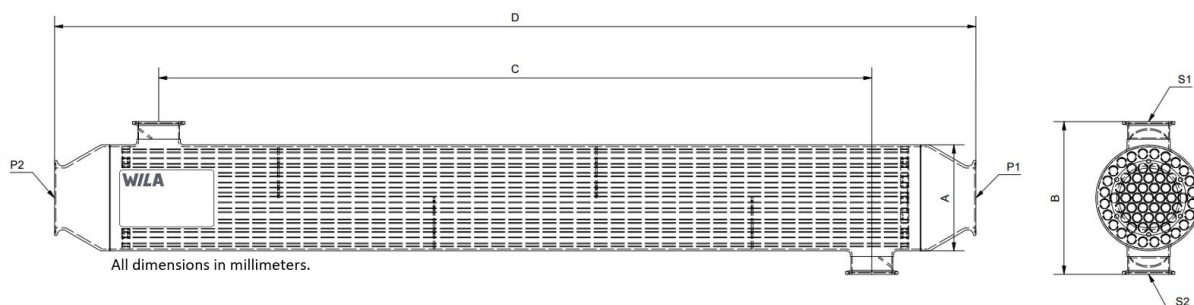
For pressure and temperature limits for other fluids than steam, see "Heat exchangers – pressure and temperature relations" document.

Note:

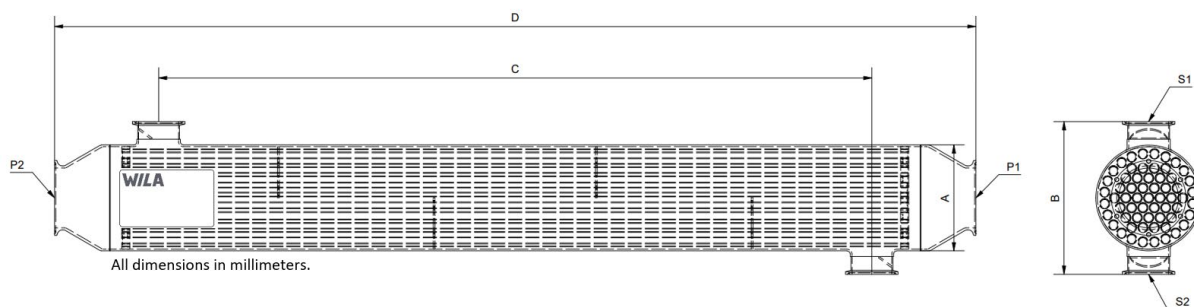
In the following group tables 'Tube bank' is data on the product tubes running paralell inside the shell.



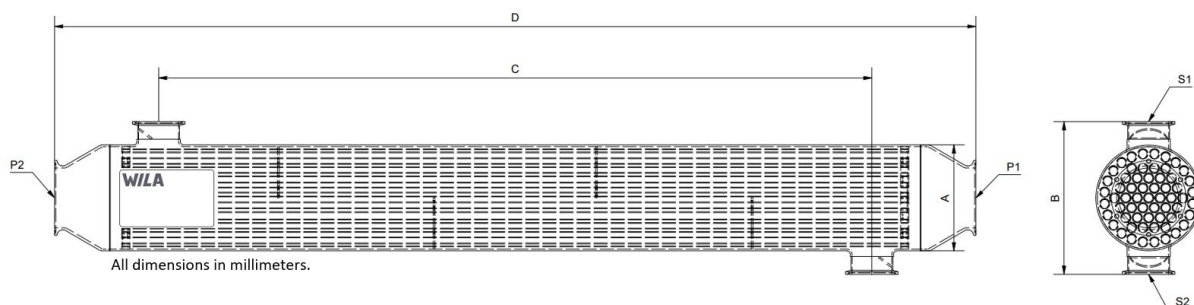
THE-.5-133-60		60 barg / 85°C		10 bar[g] / 185°C		Maximum pressure / Maximum temperature		
		Volume 3 liters		Volume 1 liters		316L Concentric	Dry weight 10 kg	
Stock number	Drawing number	P1/P2	A	S1/S2	B	C	D	Tube bank
THE-.5-133-100-51	W-035195	DN100	Ø133	Ø51	190	130	374	61 pc Ø12x1mm
THE-.5-133-101-51	W-035196	Ø101.6	Ø133	Ø51	190	130	390	61 pc Ø12x1mm
THE-.5-133-080-51	W-035197	DN80	Ø133	Ø51	190	130	400	61 pc Ø12x1mm
THE-.5-133-076-51	W-015518	Ø76.1	Ø133	Ø51	190	130	437	61 pc Ø12x1mm
THE-.5-133-065-51	W-035199	DN65	Ø133	Ø51	190	130	420	61 pc Ø12x1mm
THE-.5-133-063-51	W-035200	Ø63.5	Ø133	Ø51	190	130	440	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1/S2	B	C	D	Tube bank
THE-.5-133-100-38	W-035201	DN100	Ø133	Ø38	190	130	374	61 pc Ø12x1mm
THE-.5-133-101-38	W-035202	Ø101.6	Ø133	Ø38	190	130	390	61 pc Ø12x1mm
THE-.5-133-080-38	W-035203	DN80	Ø133	Ø38	190	130	400	61 pc Ø12x1mm
THE-.5-133-076-38	W-035204	Ø76.1	Ø133	Ø38	190	130	437	61 pc Ø12x1mm
THE-.5-133-065-38	W-035205	DN65	Ø133	Ø38	190	130	420	61 pc Ø12x1mm
THE-.5-133-063-38	W-035206	Ø63.5	Ø133	Ø38	190	130	440	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1/S2	B	C	D	Tube bank
THE-.5-133-100-50	W-020363	DN100	Ø133	DN50	190	130	374	61 pc Ø12x1mm
THE-.5-133-101-50	W-035208	Ø101.6	Ø133	DN50	190	130	390	61 pc Ø12x1mm
THE-.5-133-080-50	W-035209	DN80	Ø133	DN50	190	130	400	61 pc Ø12x1mm
THE-.5-133-076-50	W-035210	Ø76.1	Ø133	DN50	190	130	437	61 pc Ø12x1mm
THE-.5-133-065-50	W-035211	DN65	Ø133	DN50	190	130	420	61 pc Ø12x1mm
THE-.5-133-063-50	W-035212	Ø63.5	Ø133	DN50	190	130	440	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1/S2	B	C	D	Tube bank
THE-.5-133-100-40	W-035213	DN100	Ø133	DN40	190	130	374	61 pc Ø12x1mm
THE-.5-133-101-40	W-035214	Ø101.6	Ø133	DN40	190	130	390	61 pc Ø12x1mm
THE-.5-133-080-40	W-035215	DN80	Ø133	DN40	190	130	400	61 pc Ø12x1mm
THE-.5-133-076-40	W-035216	Ø76.1	Ø133	DN40	190	130	437	61 pc Ø12x1mm
THE-.5-133-065-40	W-035217	DN65	Ø133	DN40	190	130	420	61 pc Ø12x1mm
THE-.5-133-063-40	W-035218	Ø63.5	Ø133	DN40	190	130	440	61 pc Ø12x1mm



THE-01-133-60		60 barg / 85°C		10 bar[g] / 185°C		Maximum pressure / Maximum temperature		
		Volume 4.5 liters		Volume 2.5 liters		316L Concentric	Dry weight 18 kg	
Stock number	Drawing number	P1/P2	A	S1/S2	B	C	D	Tube bank
THE-01-133-100-51	W-035219	DN100	Ø133	Ø51	190	380	624	61 pc Ø12x1mm
THE-01-133-101-51	W-015524	Ø101.6	Ø133	Ø51	190	380	640	61 pc Ø12x1mm
THE-01-133-080-51	W-035221	DN80	Ø133	Ø51	190	380	650	61 pc Ø12x1mm
THE-01-133-076-51	W-035222	Ø76.1	Ø133	Ø51	190	380	687	61 pc Ø12x1mm
THE-01-133-065-51	W-035223	DN65	Ø133	Ø51	190	380	670	61 pc Ø12x1mm
THE-01-133-063-51	W-035224	Ø63,5	Ø133	Ø51	190	380	690	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1/S2	B	C	D	Tube bank
THE-01-133-100-38	W-035225	DN100	Ø133	Ø38	190	380	624	61 pc Ø12x1mm
THE-01-133-101-38	W-035226	Ø101.6	Ø133	Ø38	190	380	640	61 pc Ø12x1mm
THE-01-133-080-38	W-035227	DN80	Ø133	Ø38	190	380	650	61 pc Ø12x1mm
THE-01-133-076-38	W-035228	Ø76.1	Ø133	Ø38	190	380	687	61 pc Ø12x1mm
THE-01-133-065-38	W-035229	DN65	Ø133	Ø38	190	380	670	61 pc Ø12x1mm
THE-01-133-063-38	W-035230	Ø63,5	Ø133	Ø38	190	380	690	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1/S2	B	C	D	Tube bank
THE-01-133-100-50	W-035231	DN100	Ø133	DN50	190	380	624	61 pc Ø12x1mm
THE-01-133-101-50	W-035232	Ø101.6	Ø133	DN50	190	380	640	61 pc Ø12x1mm
THE-01-133-080-50	W-035233	DN80	Ø133	DN50	190	380	650	61 pc Ø12x1mm
THE-01-133-076-50	W-035234	Ø76.1	Ø133	DN50	190	380	687	61 pc Ø12x1mm
THE-01-133-065-50	W-035235	DN65	Ø133	DN50	190	380	670	61 pc Ø12x1mm
THE-01-133-063-50	W-035236	Ø63,5	Ø133	DN50	190	380	690	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1/S2	B	C	D	Tube bank
THE-01-133-100-40	W-035237	DN100	Ø133	DN40	190	380	624	61 pc Ø12x1mm
THE-01-133-101-40	W-035238	Ø101.6	Ø133	DN40	190	380	640	61 pc Ø12x1mm
THE-01-133-080-40	W-035239	DN80	Ø133	DN40	190	380	650	61 pc Ø12x1mm
THE-01-133-076-40	W-035240	Ø76.1	Ø133	DN40	190	380	687	61 pc Ø12x1mm
THE-01-133-065-40	W-035241	DN65	Ø133	DN40	190	380	670	61 pc Ø12x1mm
THE-01-133-063-40	W-035242	Ø63,5	Ø133	DN40	190	380	690	61 pc Ø12x1mm



THE-02-133-60		60 barg / 85°C		8 bar[g] / 176°C		Maximum pressure / Maximum temperature		
		Volume 6.5 liters		Volume 5 liters		316L Concentric	Dry weight 33 kg	
Stock number	Drawing number	P1/P2	A	S1/S2	B	C	D	Tube bank
THE-02-133-100-51	W-035243	DN100	Ø133	Ø51	190	870	1114	61 pc Ø12x1mm
THE-02-133-101-51	W-035244	Ø101.6	Ø133	Ø51	190	870	1130	61 pc Ø12x1mm
THE-02-133-080-51	W-015527	DN80	Ø133	Ø51	190	870	1140	61 pc Ø12x1mm
THE-02-133-076-51	W-015526	Ø76.1	Ø133	Ø51	190	870	1177	61 pc Ø12x1mm
THE-02-133-065-51	W-035247	DN65	Ø133	Ø51	190	870	1160	61 pc Ø12x1mm
THE-02-133-063-51	W-035248	Ø63,5	Ø133	Ø51	190	870	1180	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1/S2	B	C	D	Tube bank
THE-02-133-100-38	W-035249	DN100	Ø133	Ø38	190	870	1114	61 pc Ø12x1mm
THE-02-133-101-38	W-035250	Ø101.6	Ø133	Ø38	190	870	1130	61 pc Ø12x1mm
THE-02-133-080-38	W-035251	DN80	Ø133	Ø38	190	870	1140	61 pc Ø12x1mm
THE-02-133-076-38	W-035252	Ø76.1	Ø133	Ø38	190	870	1177	61 pc Ø12x1mm
THE-02-133-065-38	W-035253	DN65	Ø133	Ø38	190	870	1160	61 pc Ø12x1mm
THE-02-133-063-38	W-035254	Ø63,5	Ø133	Ø38	190	870	1180	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1/S2	B	C	D	Tube bank
THE-02-133-100-50	W-035255	DN100	Ø133	DN50	190	870	1114	61 pc Ø12x1mm
THE-02-133-101-50	W-035256	Ø101.6	Ø133	DN50	190	870	1130	61 pc Ø12x1mm
THE-02-133-080-50	W-035257	DN80	Ø133	DN50	190	870	1140	61 pc Ø12x1mm
THE-02-133-076-50	W-020339	Ø76.1	Ø133	DN50	190	870	1177	61 pc Ø12x1mm
THE-02-133-065-50	W-035259	DN65	Ø133	DN50	190	870	1160	61 pc Ø12x1mm
THE-02-133-063-50	W-035260	Ø63,5	Ø133	DN50	190	870	1180	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1/S2	B	C	D	Tube bank
THE-02-133-100-40	W-035261	DN100	Ø133	DN40	190	870	1114	61 pc Ø12x1mm
THE-02-133-101-40	W-035262	Ø101.6	Ø133	DN40	190	870	1130	61 pc Ø12x1mm
THE-02-133-080-40	W-035263	DN80	Ø133	DN40	190	870	1140	61 pc Ø12x1mm
THE-02-133-076-40	W-035264	Ø76.1	Ø133	DN40	190	870	1177	61 pc Ø12x1mm
THE-02-133-065-40	W-035265	DN65	Ø133	DN40	190	870	1160	61 pc Ø12x1mm
THE-02-133-063-40	W-035266	Ø63,5	Ø133	DN40	190	870	1180	61 pc Ø12x1mm



THE-03-133-60		60 barg / 85°C		6 bar[g] / 165°C		Maximum pressure / Maximum temperature		
		Volume 9 liters		Volume 7.5 liters		316L Concentric	Dry weight 48 kg	
Stock number	Drawing number	P1/P2	A	S1/S2	B	C	D	Tube bank
THE-03-133-100-51	W-015533	DN100	Ø133	Ø51	190	1360	1604	61 pc Ø12x1mm
THE-03-133-101-51	W-035268	Ø101.6	Ø133	Ø51	190	1360	1620	61 pc Ø12x1mm
THE-03-133-080-51	W-015531	DN80	Ø133	Ø51	190	1360	1630	61 pc Ø12x1mm
THE-03-133-076-51	W-015530	Ø76.1	Ø133	Ø51	190	1360	1667	61 pc Ø12x1mm
THE-03-133-065-51	W-035271	DN65	Ø133	Ø51	190	1360	1650	61 pc Ø12x1mm
THE-03-133-063-51	W-035272	Ø63,5	Ø133	Ø51	190	1360	1670	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1/S2	B	C	D	Tube bank
THE-03-133-100-38	W-035273	DN100	Ø133	Ø38	190	1360	1604	61 pc Ø12x1mm
THE-03-133-101-38	W-035274	Ø101.6	Ø133	Ø38	190	1360	1620	61 pc Ø12x1mm
THE-03-133-080-38	W-035275	DN80	Ø133	Ø38	190	1360	1630	61 pc Ø12x1mm
THE-03-133-076-38	W-035276	Ø76.1	Ø133	Ø38	190	1360	1667	61 pc Ø12x1mm
THE-03-133-065-38	W-035277	DN65	Ø133	Ø38	190	1360	1650	61 pc Ø12x1mm
THE-03-133-063-38	W-035278	Ø63,5	Ø133	Ø38	190	1360	1670	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1/S2	B	C	D	Tube bank
THE-03-133-100-50	W-035279	DN100	Ø133	DN50	190	1360	1604	61 pc Ø12x1mm
THE-03-133-101-50	W-035280	Ø101.6	Ø133	DN50	190	1360	1620	61 pc Ø12x1mm
THE-03-133-080-50	W-035281	DN80	Ø133	DN50	190	1360	1630	61 pc Ø12x1mm
THE-03-133-076-50	W-035282	Ø76.1	Ø133	DN50	190	1360	1667	61 pc Ø12x1mm
THE-03-133-065-50	W-035283	DN65	Ø133	DN50	190	1360	1650	61 pc Ø12x1mm
THE-03-133-063-50	W-035284	Ø63,5	Ø133	DN50	190	1360	1670	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1/S2	B	C	D	Tube bank
THE-03-133-100-40	W-035285	DN100	Ø133	DN40	190	1360	1604	61 pc Ø12x1mm
THE-03-133-101-40	W-035286	Ø101.6	Ø133	DN40	190	1360	1620	61 pc Ø12x1mm
THE-03-133-080-40	W-035287	DN80	Ø133	DN40	190	1360	1630	61 pc Ø12x1mm
THE-03-133-076-40	W-035288	Ø76.1	Ø133	DN40	190	1360	1667	61 pc Ø12x1mm
THE-03-133-065-40	W-035289	DN65	Ø133	DN40	190	1360	1650	61 pc Ø12x1mm
THE-03-133-063-40	W-035290	Ø63,5	Ø133	DN40	190	1360	1670	61 pc Ø12x1mm