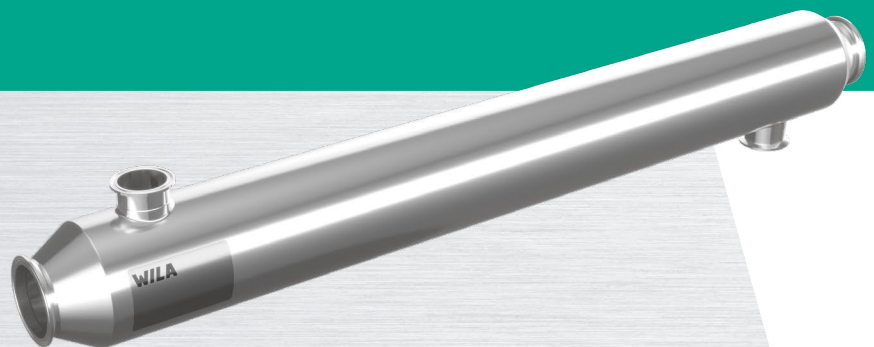


TUBULAR HEAT EXCHANGER

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



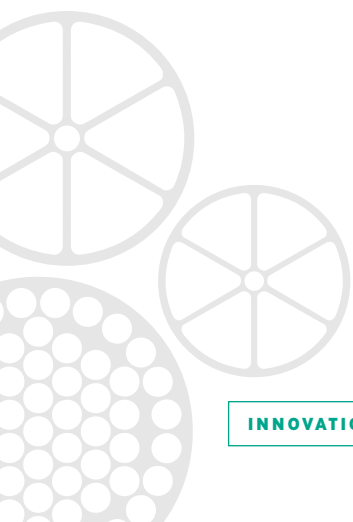
Dimensions overview for type Ø133 - 60 bar[g]

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
THEA-.5-133-60	6
THEA-01-133-60	7
THEA-02-133-60.....	8
THEA-03-133-60.....	9



Introduction

This overview is for Tubular Heat Exchangers manufactured by Wila A/S under the category "THEA" 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 entire inside surface roughness is $\leq 0.8 \mu\text{m}$ and the outside surface roughness is $\leq 1.6 \mu\text{m}$. **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 $\varnothing 133 \times 4$ 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).
- 3-A Sanitary Standards 00-01 / 12-08

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.

THEA-xx-133-60

THEA **T**ubular **H**eat **E**xchanger with **3A** certificate.
 xx .5, 01, 02, 03 Indicates the heat transfer surface area in m².
 133 Ø133 Indicates the heat exchanger shell diameter in mm.
 60 The heat exchanger is designed for pressures up to 60 bar

THEA-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	
Ø133	DN100-DN80-DN65	in accordance with DIN 32676-A
Ø133	4" (Ø101.6) – 3" (Ø76.1) – 2.5" (Ø63.5)	In accordance with ISO 2852-2

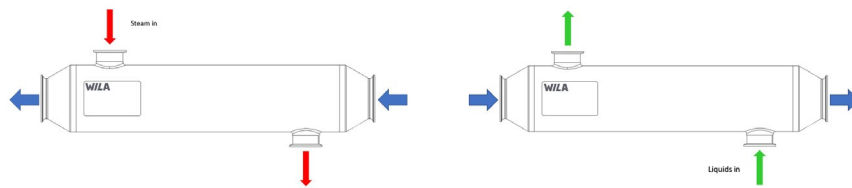
Shell side (S1 and S2) connections, both Ø129 and Ø209 are:

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

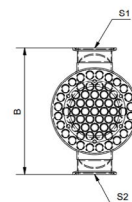
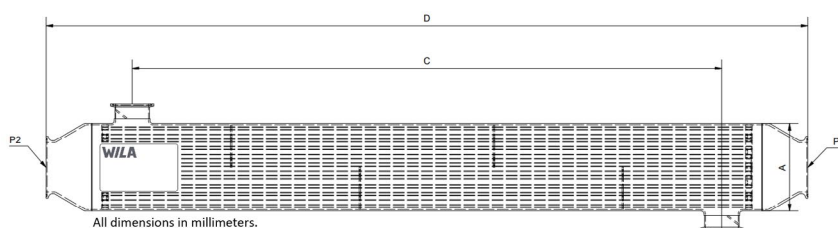
The heat exchanger's shell side maximum pressure and temperature limits are based on the maximum allowed steam pressure, which varies with the size of the heat exchanger:

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

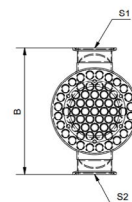
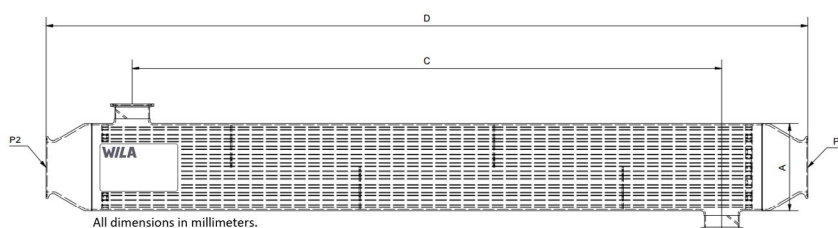
For pressure and temperature limits for other fluids than steam, see "Heat exchangers – pressure and temperature relations" document.

Note:

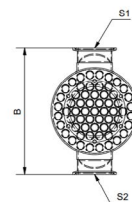
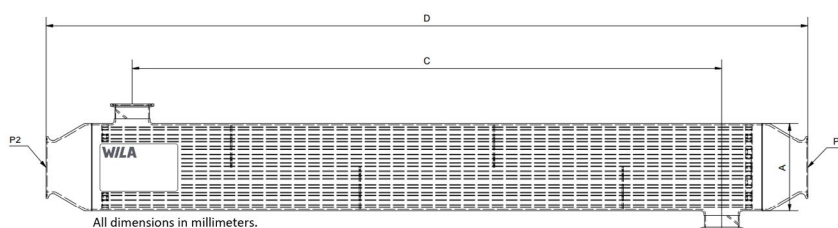
In the following group tables 'Tube bank' is data on the product tubes running paralell inside the shell.



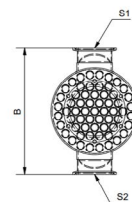
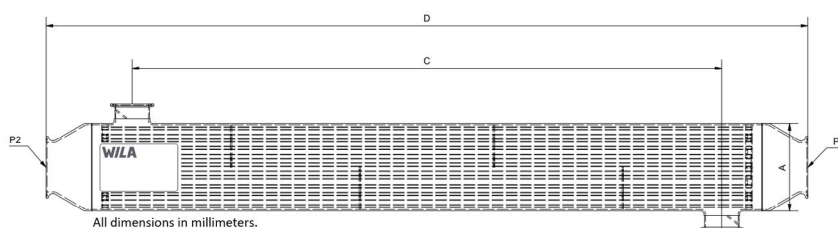
THEA-.5-133-60		60 barg / 85°C		10 bar[g] / 185°C		Maximum pressure / Maximum temperature		
		Volume 3 liters		Volume 1 liters		316L Concentric	Dry weight 10 kg	
Stock number	Drawing number	P1/P2	A	S1/S2	B	C	D	Tube bank
THEA-.5-133-100-51	W-035392	DN100	Ø133	Ø51	190	130	374	61 pc Ø12x1mm
THEA-.5-133-101-51	W-035393	Ø101.6	Ø133	Ø51	190	130	390	61 pc Ø12x1mm
THEA-.5-133-080-51	W-035394	DN80	Ø133	Ø51	190	130	400	61 pc Ø12x1mm
THEA-.5-133-076-51	W-035395	Ø76.1	Ø133	Ø51	190	130	437	61 pc Ø12x1mm
THEA-.5-133-065-51	W-035396	DN65	Ø133	Ø51	190	130	420	61 pc Ø12x1mm
THEA-.5-133-063-51	W-035397	Ø63.5	Ø133	Ø51	190	130	440	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1/S2	B	C	D	Tube bank
THEA-.5-133-100-38	W-035398	DN100	Ø133	Ø38	190	130	374	61 pc Ø12x1mm
THEA-.5-133-101-38	W-035399	Ø101.6	Ø133	Ø38	190	130	390	61 pc Ø12x1mm
THEA-.5-133-080-38	W-035400	DN80	Ø133	Ø38	190	130	400	61 pc Ø12x1mm
THEA-.5-133-076-38	W-035401	Ø76.1	Ø133	Ø38	190	130	437	61 pc Ø12x1mm
THEA-.5-133-065-38	W-035402	DN65	Ø133	Ø38	190	130	420	61 pc Ø12x1mm
THEA-.5-133-063-38	W-035403	Ø63.5	Ø133	Ø38	190	130	440	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1/S2	B	C	D	Tube bank
THEA-.5-133-100-50	W-035404	DN100	Ø133	DN50	190	130	374	61 pc Ø12x1mm
THEA-.5-133-101-50	W-035405	Ø101.6	Ø133	DN50	190	130	390	61 pc Ø12x1mm
THEA-.5-133-080-50	W-035406	DN80	Ø133	DN50	190	130	400	61 pc Ø12x1mm
THEA-.5-133-076-50	W-035407	Ø76.1	Ø133	DN50	190	130	437	61 pc Ø12x1mm
THEA-.5-133-065-50	W-035408	DN65	Ø133	DN50	190	130	420	61 pc Ø12x1mm
THEA-.5-133-063-50	W-035409	Ø63.5	Ø133	DN50	190	130	440	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1/S2	B	C	D	Tube bank
THEA-.5-133-100-40	W-035410	DN100	Ø133	DN40	190	130	374	61 pc Ø12x1mm
THEA-.5-133-101-40	W-035411	Ø101.6	Ø133	DN40	190	130	390	61 pc Ø12x1mm
THEA-.5-133-080-40	W-035412	DN80	Ø133	DN40	190	130	400	61 pc Ø12x1mm
THEA-.5-133-076-40	W-035413	Ø76.1	Ø133	DN40	190	130	437	61 pc Ø12x1mm
THEA-.5-133-065-40	W-035414	DN65	Ø133	DN40	190	130	420	61 pc Ø12x1mm
THEA-.5-133-063-40	W-035415	Ø63.5	Ø133	DN40	190	130	440	61 pc Ø12x1mm



THEA-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
THEA-01-133-100-51	W-035422	DN100	Ø133	Ø51	190	380	624	61 pc Ø12x1mm
THEA-01-133-101-51	W-035423	Ø101.6	Ø133	Ø51	190	380	640	61 pc Ø12x1mm
THEA-01-133-080-51	W-035424	DN80	Ø133	Ø51	190	380	650	61 pc Ø12x1mm
THEA-01-133-076-51	W-035425	Ø76.1	Ø133	Ø51	190	380	687	61 pc Ø12x1mm
THEA-01-133-065-51	W-035426	DN65	Ø133	Ø51	190	380	670	61 pc Ø12x1mm
THEA-01-133-063-51	W-035427	Ø63,5	Ø133	Ø51	190	380	690	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1/S2	B	C	D	Tube bank
THEA-01-133-100-38	W-035428	DN100	Ø133	Ø38	190	380	624	61 pc Ø12x1mm
THEA-01-133-101-38	W-035429	Ø101.6	Ø133	Ø38	190	380	640	61 pc Ø12x1mm
THEA-01-133-080-38	W-035430	DN80	Ø133	Ø38	190	380	650	61 pc Ø12x1mm
THEA-01-133-076-38	W-035431	Ø76.1	Ø133	Ø38	190	380	687	61 pc Ø12x1mm
THEA-01-133-065-38	W-035432	DN65	Ø133	Ø38	190	380	670	61 pc Ø12x1mm
THEA-01-133-063-38	W-035433	Ø63,5	Ø133	Ø38	190	380	690	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1/S2	B	C	D	Tube bank
THEA-01-133-100-50	W-035434	DN100	Ø133	DN50	190	380	624	61 pc Ø12x1mm
THEA-01-133-101-50	W-035435	Ø101.6	Ø133	DN50	190	380	640	61 pc Ø12x1mm
THEA-01-133-080-50	W-035436	DN80	Ø133	DN50	190	380	650	61 pc Ø12x1mm
THEA-01-133-076-50	W-035437	Ø76.1	Ø133	DN50	190	380	687	61 pc Ø12x1mm
THEA-01-133-065-50	W-035438	DN65	Ø133	DN50	190	380	670	61 pc Ø12x1mm
THEA-01-133-063-50	W-035439	Ø63,5	Ø133	DN50	190	380	690	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1/S2	B	C	D	Tube bank
THEA-01-133-100-40	W-035440	DN100	Ø133	DN40	190	380	624	61 pc Ø12x1mm
THEA-01-133-101-40	W-035441	Ø101.6	Ø133	DN40	190	380	640	61 pc Ø12x1mm
THEA-01-133-080-40	W-035442	DN80	Ø133	DN40	190	380	650	61 pc Ø12x1mm
THEA-01-133-076-40	W-035443	Ø76.1	Ø133	DN40	190	380	687	61 pc Ø12x1mm
THEA-01-133-065-40	W-035444	DN65	Ø133	DN40	190	380	670	61 pc Ø12x1mm
THEA-01-133-063-40	W-035445	Ø63,5	Ø133	DN40	190	380	690	61 pc Ø12x1mm



THEA-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
THEA-02-133-100-51	W-035452	DN100	Ø133	Ø51	190	870	1114	61 pc Ø12x1mm
THEA-02-133-101-51	W-035453	Ø101.6	Ø133	Ø51	190	870	1130	61 pc Ø12x1mm
THEA-02-133-080-51	W-035454	DN80	Ø133	Ø51	190	870	1140	61 pc Ø12x1mm
THEA-02-133-076-51	W-035455	Ø76.1	Ø133	Ø51	190	870	1177	61 pc Ø12x1mm
THEA-02-133-065-51	W-035456	DN65	Ø133	Ø51	190	870	1160	61 pc Ø12x1mm
THEA-02-133-063-51	W-035457	Ø63,5	Ø133	Ø51	190	870	1180	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1/S2	B	C	D	Tube bank
THEA-02-133-100-38	W-035458	DN100	Ø133	Ø38	190	870	1114	61 pc Ø12x1mm
THEA-02-133-101-38	W-035459	Ø101.6	Ø133	Ø38	190	870	1130	61 pc Ø12x1mm
THEA-02-133-080-38	W-035460	DN80	Ø133	Ø38	190	870	1140	61 pc Ø12x1mm
THEA-02-133-076-38	W-035461	Ø76.1	Ø133	Ø38	190	870	1177	61 pc Ø12x1mm
THEA-02-133-065-38	W-035462	DN65	Ø133	Ø38	190	870	1160	61 pc Ø12x1mm
THEA-02-133-063-38	W-035463	Ø63,5	Ø133	Ø38	190	870	1180	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1/S2	B	C	D	Tube bank
THEA-02-133-100-50	W-035464	DN100	Ø133	DN50	190	870	1114	61 pc Ø12x1mm
THEA-02-133-101-50	W-035465	Ø101.6	Ø133	DN50	190	870	1130	61 pc Ø12x1mm
THEA-02-133-080-50	W-035466	DN80	Ø133	DN50	190	870	1140	61 pc Ø12x1mm
THEA-02-133-076-50	W-035467	Ø76.1	Ø133	DN50	190	870	1177	61 pc Ø12x1mm
THEA-02-133-065-50	W-035468	DN65	Ø133	DN50	190	870	1160	61 pc Ø12x1mm
THEA-02-133-063-50	W-035469	Ø63,5	Ø133	DN50	190	870	1180	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1/S2	B	C	D	Tube bank
THEA-02-133-100-40	W-035470	DN100	Ø133	DN40	190	870	1114	61 pc Ø12x1mm
THEA-02-133-101-40	W-035471	Ø101.6	Ø133	DN40	190	870	1130	61 pc Ø12x1mm
THEA-02-133-080-40	W-035472	DN80	Ø133	DN40	190	870	1140	61 pc Ø12x1mm
THEA-02-133-076-40	W-035473	Ø76.1	Ø133	DN40	190	870	1177	61 pc Ø12x1mm
THEA-02-133-065-40	W-035474	DN65	Ø133	DN40	190	870	1160	61 pc Ø12x1mm
THEA-02-133-063-40	W-035475	Ø63,5	Ø133	DN40	190	870	1180	61 pc Ø12x1mm



THEA-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
THEA-03-133-100-51	W-035482	DN100	Ø133	Ø51	190	1360	1604	61 pc Ø12x1mm
THEA-03-133-101-51	W-035483	Ø101.6	Ø133	Ø51	190	1360	1620	61 pc Ø12x1mm
THEA-03-133-080-51	W-035484	DN80	Ø133	Ø51	190	1360	1630	61 pc Ø12x1mm
THEA-03-133-076-51	W-035485	Ø76.1	Ø133	Ø51	190	1360	1667	61 pc Ø12x1mm
THEA-03-133-065-51	W-035486	DN65	Ø133	Ø51	190	1360	1650	61 pc Ø12x1mm
THEA-03-133-063-51	W-035487	Ø63,5	Ø133	Ø51	190	1360	1670	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1/S2	B	C	D	Tube bank
THEA-03-133-100-38	W-035488	DN100	Ø133	Ø38	190	1360	1604	61 pc Ø12x1mm
THEA-03-133-101-38	W-035489	Ø101.6	Ø133	Ø38	190	1360	1620	61 pc Ø12x1mm
THEA-03-133-080-38	W-035490	DN80	Ø133	Ø38	190	1360	1630	61 pc Ø12x1mm
THEA-03-133-076-38	W-035491	Ø76.1	Ø133	Ø38	190	1360	1667	61 pc Ø12x1mm
THEA-03-133-065-38	W-035492	DN65	Ø133	Ø38	190	1360	1650	61 pc Ø12x1mm
THEA-03-133-063-38	W-035493	Ø63,5	Ø133	Ø38	190	1360	1670	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1/S2	B	C	D	Tube bank
THEA-03-133-100-50	W-035494	DN100	Ø133	DN50	190	1360	1604	61 pc Ø12x1mm
THEA-03-133-101-50	W-035495	Ø101.6	Ø133	DN50	190	1360	1620	61 pc Ø12x1mm
THEA-03-133-080-50	W-035496	DN80	Ø133	DN50	190	1360	1630	61 pc Ø12x1mm
THEA-03-133-076-50	W-035497	Ø76.1	Ø133	DN50	190	1360	1667	61 pc Ø12x1mm
THEA-03-133-065-50	W-035498	DN65	Ø133	DN50	190	1360	1650	61 pc Ø12x1mm
THEA-03-133-063-50	W-035499	Ø63,5	Ø133	DN50	190	1360	1670	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1/S2	B	C	D	Tube bank
THEA-03-133-100-40	W-035500	DN100	Ø133	DN40	190	1360	1604	61 pc Ø12x1mm
THEA-03-133-101-40	W-035501	Ø101.6	Ø133	DN40	190	1360	1620	61 pc Ø12x1mm
THEA-03-133-080-40	W-035502	DN80	Ø133	DN40	190	1360	1630	61 pc Ø12x1mm
THEA-03-133-076-40	W-035503	Ø76.1	Ø133	DN40	190	1360	1667	61 pc Ø12x1mm
THEA-03-133-065-40	W-035504	DN65	Ø133	DN40	190	1360	1650	61 pc Ø12x1mm
THEA-03-133-063-40	W-035505	Ø63,5	Ø133	DN40	190	1360	1670	61 pc Ø12x1mm