

TUBULAR STEAM HEATER

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



Dimensions overview for type Ø133 - 60bar[g]

Tubular steam heaters 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.



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Introduction

This overview is for Tubular Steam Heaters manufactured by Wila A/S under the category "TSHA" 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 steam to fluid heat transfer 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). For (dangerous fluids) group I restrictions may apply.
- 3-A Sanitary Standards 00-01 / I2-08

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.

TSHA-xx-133-60

TSHA	Tubular Steam Heater with 3A certificate	
xx	01, 02, 03*	Indicates the heat transfer surface area in m ² .
133	Either 133*	Indicates the heat exchanger shell diameter in mm.
60	The heat exchanger is designed for pressure up to 60 bar.	

* Other versions are available.

TSHA-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	Ø101.6 – Ø76.1 – Ø63.5	In accordance with ISO 2852-2

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

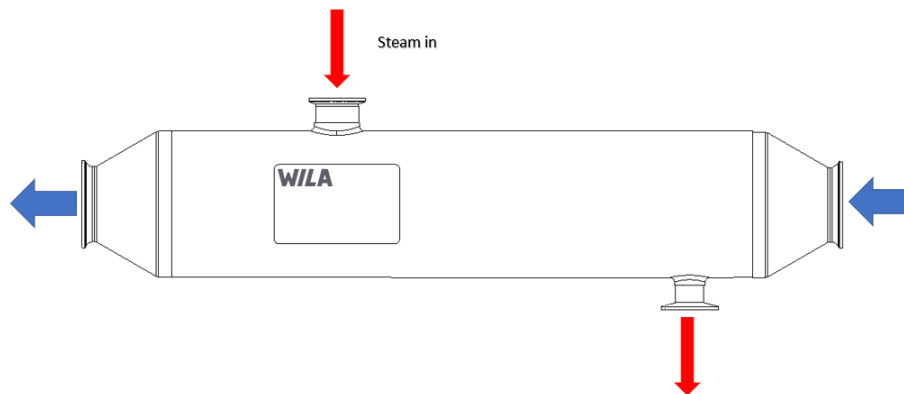
DN80 – DN65 – DN50 – DN40 – DN25	in accordance with DIN 32676-A
Ø76.1 – Ø63.5 – Ø51 – Ø38 – Ø25	in accordance with ISO 2852-2
DN80 (82) – DN65 (70) – DN50 (54) – DN40 (43) – DN25 (28) *	in accordance with DIN 2633 / EN 1092 Type 11

* Numbers in parentheses are numbers used in the unit codes on following pages.

For both tube and shell sides other connections 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.



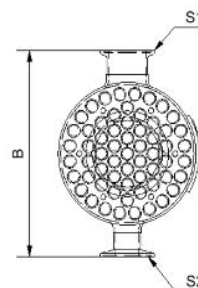
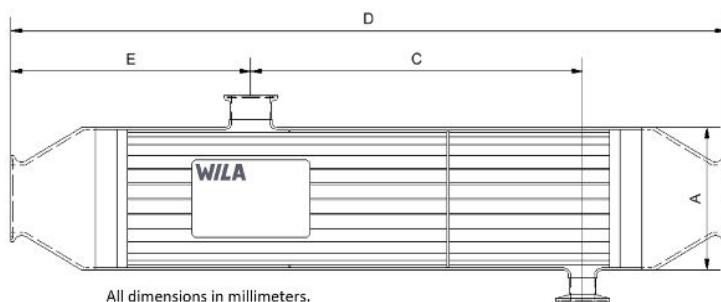
Service side limits

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:

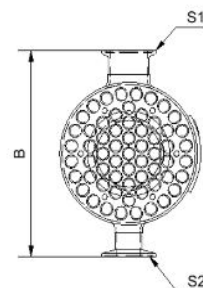
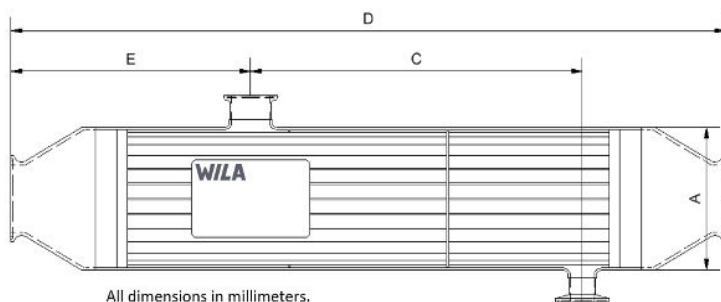
1. For heat exchanger size 1 m² these limits are respectively 10 bar[g] and 185°C
2. For heat exchanger size 2 m² these limits are respectively 8 bar[g] and 176°C
3. For heat exchanger size 3 m² these limits are respectively 6 bar[g] and 165°C

Note:

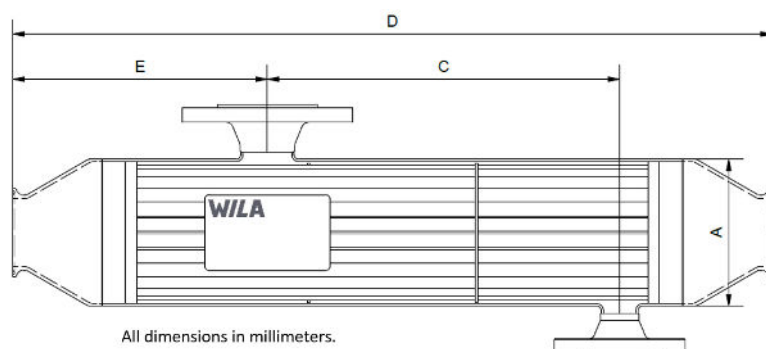
In the following group tables 'Tube bank' is data on the product tubes running paralell inside the shell.



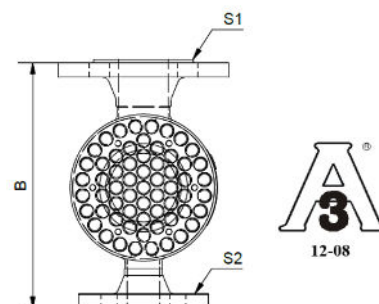
TSHA-01-133-60 (section 1 of 2)		60 barg / 85°C		10 bar[g] / 185°C			Maximum pressure / temperature			
		Volume 4.5 liters		Volume 2.5 liters			316L Concentric		Dry weight 18 kg	
Stock number	Drawing number	P1/P2	A	S1	S2	B	C	D	E	Tube bank
TSHA-01-133-100-80	W-041293	DN100	Ø133	DN80	DN40	195	310	624	202	61 pc Ø12x1mm
TSHA-01-133-101-80	W-041294	Ø101.6	Ø133	DN80	DN40	195	310	640	210	61 pc Ø12x1mm
TSHA-01-133-080-80	W-041295	DN80	Ø133	DN80	DN40	195	310	650	215	61 pc Ø12x1mm
TSHA-01-133-076-80	W-041296	Ø76.1	Ø133	DN80	DN40	195	310	686	233	61 pc Ø12x1mm
TSHA-01-133-065-80	W-041297	DN65	Ø133	DN80	DN40	195	310	670	225	61 pc Ø12x1mm
TSHA-01-133-063-80	W-041298	Ø63.5	Ø133	DN80	DN40	195	310	678	234	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1	S2	B	C	D	E	Tube bank
TSHA-01-133-100-76	W-041299	DN100	Ø133	Ø76.1	Ø38	186	310	624	202	61 pc Ø12x1mm
TSHA-01-133-101-76	W-041300	Ø101.6	Ø133	Ø76.1	Ø38	186	310	640	210	61 pc Ø12x1mm
TSHA-01-133-080-76	W-041301	DN80	Ø133	Ø76.1	Ø38	186	310	650	215	61 pc Ø12x1mm
TSHA-01-133-076-76	W-041302	Ø76.1	Ø133	Ø76.1	Ø38	186	310	686	233	61 pc Ø12x1mm
TSHA-01-133-065-76	W-041303	DN65	Ø133	Ø76.1	Ø38	186	310	670	225	61 pc Ø12x1mm
TSHA-01-133-063-76	W-041304	Ø63.5	Ø133	Ø76.1	Ø38	186	310	678	234	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1	S2	B	C	D	E	Tube bank
TSHA-01-133-100-65	W-041305	DN100	Ø133	DN65	DN40	195	310	624	202	61 pc Ø12x1mm
TSHA-01-133-101-65	W-041306	Ø101.6	Ø133	DN65	DN40	195	310	640	210	61 pc Ø12x1mm
TSHA-01-133-080-65	W-041307	DN80	Ø133	DN65	DN40	195	310	650	215	61 pc Ø12x1mm
TSHA-01-133-076-65	W-041308	Ø76.1	Ø133	DN65	DN40	195	310	686	233	61 pc Ø12x1mm
TSHA-01-133-065-65	W-041309	DN65	Ø133	DN65	DN40	195	310	670	225	61 pc Ø12x1mm
TSHA-01-133-063-65	W-041310	Ø63.5	Ø133	DN65	DN40	195	310	678	234	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1	S2	B	C	D	E	Tube bank
TSHA-01-133-100-63	W-041311	DN100	Ø133	Ø63.5	Ø38	186	310	624	202	61 pc Ø12x1mm
TSHA-01-133-101-63	W-041312	Ø101.6	Ø133	Ø63.5	Ø38	186	310	640	210	61 pc Ø12x1mm
TSHA-01-133-080-63	W-041313	DN80	Ø133	Ø63.5	Ø38	186	310	650	215	61 pc Ø12x1mm
TSHA-01-133-076-63	W-041314	Ø76.1	Ø133	Ø63.5	Ø38	186	310	686	233	61 pc Ø12x1mm
TSHA-01-133-065-63	W-041315	DN65	Ø133	Ø63.5	Ø38	186	310	670	225	61 pc Ø12x1mm
TSHA-01-133-063-63	W-041316	Ø63.5	Ø133	Ø63.5	Ø38	186	310	678	234	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1	S2	B	C	D	E	Tube bank
TSHA-01-133-100-50	W-041317	DN100	Ø133	DN50	DN25	186	310	624	202	61 pc Ø12x1mm
TSHA-01-133-101-50	W-041318	Ø101.6	Ø133	DN50	DN25	186	310	640	210	61 pc Ø12x1mm
TSHA-01-133-080-50	W-041319	DN80	Ø133	DN50	DN25	186	310	650	215	61 pc Ø12x1mm
TSHA-01-133-076-50	W-041320	Ø76.1	Ø133	DN50	DN25	186	310	686	233	61 pc Ø12x1mm
TSHA-01-133-065-50	W-041321	DN65	Ø133	DN50	DN25	186	310	670	225	61 pc Ø12x1mm
TSHA-01-133-063-50	W-041322	Ø63.5	Ø133	DN50	DN25	186	310	678	234	61 pc Ø12x1mm



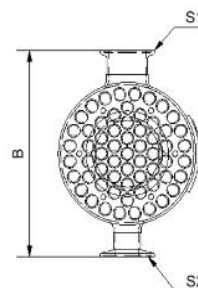
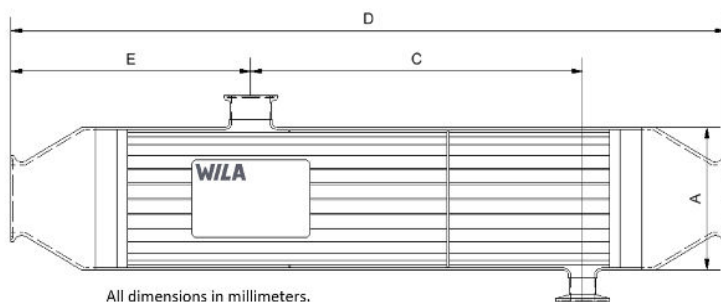
TSHA-01-133-60 (section 2 of 2)		60 barg / 85°C		10 bar[g] / 185°C			Maximum pressure / temperature			
		Volume 4.5 liters		Volume 2.5 liters			316L Concentric		Dry weight 18 kg	
Stock number	Drawing number	P1/P2	A	S1	S2	B	C	D	E	Tube bank
TSHA-01-133-100-51	W-041323	DN100	Ø133	Ø51	Ø25	186	310	624	202	61 pc Ø12x1mm
TSHA-01-133-101-51	W-041324	Ø101.6	Ø133	Ø51	Ø25	186	310	640	210	61 pc Ø12x1mm
TSHA-01-133-080-51	W-041325	DN80	Ø133	Ø51	Ø25	186	310	650	215	61 pc Ø12x1mm
TSHA-01-133-076-51	W-041326	Ø76.1	Ø133	Ø51	Ø25	186	310	686	233	61 pc Ø12x1mm
TSHA-01-133-065-51	W-041327	DN65	Ø133	Ø51	Ø25	186	310	670	225	61 pc Ø12x1mm
TSHA-01-133-063-51	W-041328	Ø63,5	Ø133	Ø51	Ø25	186	310	678	234	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1	S2	B	C	D	E	Tube bank
TSHA-01-133-100-40	W-041329	DN100	Ø133	DN40	DN25	186	310	624	202	61 pc Ø12x1mm
TSHA-01-133-101-40	W-041330	Ø101.6	Ø133	DN40	DN25	186	310	640	210	61 pc Ø12x1mm
TSHA-01-133-080-40	W-041331	DN80	Ø133	DN40	DN25	186	310	650	215	61 pc Ø12x1mm
TSHA-01-133-076-40	W-041332	Ø76.1	Ø133	DN40	DN25	186	310	686	233	61 pc Ø12x1mm
TSHA-01-133-065-40	W-041333	DN65	Ø133	DN40	DN25	186	310	670	225	61 pc Ø12x1mm
TSHA-01-133-063-40	W-041334	Ø63,5	Ø133	DN40	DN25	186	310	678	234	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1	S2	B	C	D	E	Tube bank
TSHA-01-133-100-38	W-041335	DN100	Ø133	Ø38	Ø25	186	310	624	202	61 pc Ø12x1mm
TSHA-01-133-101-38	W-041336	Ø101.6	Ø133	Ø38	Ø25	186	310	640	210	61 pc Ø12x1mm
TSHA-01-133-080-38	W-041337	DN80	Ø133	Ø38	Ø25	186	310	650	215	61 pc Ø12x1mm
TSHA-01-133-076-38	W-041338	Ø76.1	Ø133	Ø38	Ø25	186	310	686	233	61 pc Ø12x1mm
TSHA-01-133-065-38	W-041339	DN65	Ø133	Ø38	Ø25	186	310	670	225	61 pc Ø12x1mm
TSHA-01-133-063-38	W-041340	Ø63,5	Ø133	Ø38	Ø25	186	310	678	234	61 pc Ø12x1mm



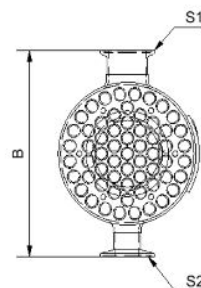
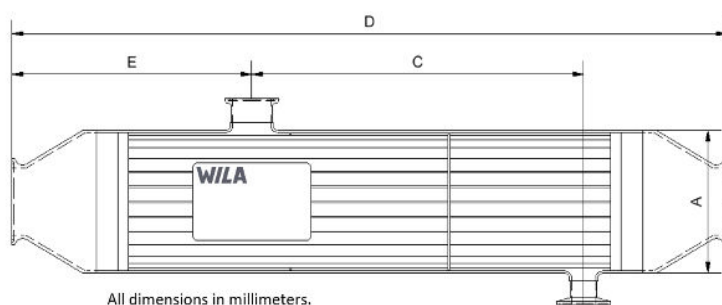
All dimensions in millimeters.



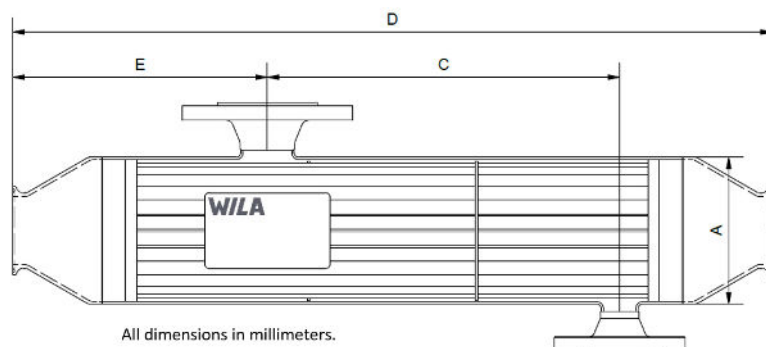
TSHA-01-133-60-F		60 barg / 85°C		10 bar[g] / 185°C		Maximum pressure / temperature				
		Volume 4.5 liters		Volume 2.5 liters		316L Concentric		Dry weight 18 kg		
Stock number	Drawing number	P1/P2	A	S1	S2	B	C	D	E	Tube bank
TSHA-01-133-100-82F	W-041473	DN100	Ø133	DN80	DN40	232	310	624	202	61 pc Ø12x1mm
TSHA-01-133-101-82F	W-041474	Ø101.6	Ø133	DN80	DN40	232	310	640	210	61 pc Ø12x1mm
TSHA-01-133-080-82F	W-041475	DN80	Ø133	DN80	DN40	232	310	650	215	61 pc Ø12x1mm
TSHA-01-133-076-82F	W-041476	Ø76.1	Ø133	DN80	DN40	232	310	686	233	61 pc Ø12x1mm
TSHA-01-133-065-82F	W-041477	DN65	Ø133	DN80	DN40	232	310	670	225	61 pc Ø12x1mm
TSHA-01-133-063-82F	W-041478	Ø63.5	Ø133	DN80	DN40	232	310	678	234	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1	S2	B	C	D	E	Tube bank
TSHA-01-133-100-70F	W-041479	DN100	Ø133	DN65	DN40	227	310	624	202	61 pc Ø12x1mm
TSHA-01-133-101-70F	W-041480	Ø101.6	Ø133	DN65	DN40	227	310	640	210	61 pc Ø12x1mm
TSHA-01-133-080-70F	W-041481	DN80	Ø133	DN65	DN40	227	310	650	215	61 pc Ø12x1mm
TSHA-01-133-076-70F	W-041482	Ø76.1	Ø133	DN65	DN40	227	310	686	233	61 pc Ø12x1mm
TSHA-01-133-065-70F	W-041483	DN65	Ø133	DN65	DN40	227	310	670	225	61 pc Ø12x1mm
TSHA-01-133-063-70F	W-041484	Ø63.5	Ø133	DN65	DN40	227	310	678	234	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1	S2	B	C	D	E	Tube bank
TSHA-01-133-100-54F	W-041485	DN100	Ø133	DN50	DN25	224	310	624	202	61 pc Ø12x1mm
TSHA-01-133-101-54F	W-041486	Ø101.6	Ø133	DN50	DN25	224	310	640	210	61 pc Ø12x1mm
TSHA-01-133-080-54F	W-041487	DN80	Ø133	DN50	DN25	224	310	650	215	61 pc Ø12x1mm
TSHA-01-133-076-54F	W-041488	Ø76.1	Ø133	DN50	DN25	224	310	686	233	61 pc Ø12x1mm
TSHA-01-133-065-54F	W-041489	DN65	Ø133	DN50	DN25	224	310	670	225	61 pc Ø12x1mm
TSHA-01-133-063-54F	W-041490	Ø63.5	Ø133	DN50	DN25	224	310	678	234	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1	S2	B	C	D	E	Tube bank
TSHA-01-133-100-43F	W-041491	DN100	Ø133	DN40	DN25	221	310	624	202	61 pc Ø12x1mm
TSHA-01-133-101-43F	W-041492	Ø101.6	Ø133	DN40	DN25	221	310	640	210	61 pc Ø12x1mm
TSHA-01-133-080-43F	W-041493	DN80	Ø133	DN40	DN25	221	310	650	215	61 pc Ø12x1mm
TSHA-01-133-076-43F	W-041494	Ø76.1	Ø133	DN40	DN25	221	310	686	233	61 pc Ø12x1mm
TSHA-01-133-065-43F	W-041495	DN65	Ø133	DN40	DN25	221	310	670	225	61 pc Ø12x1mm
TSHA-01-133-063-43F	W-041496	Ø63.5	Ø133	DN40	DN25	221	310	678	234	61 pc Ø12x1mm



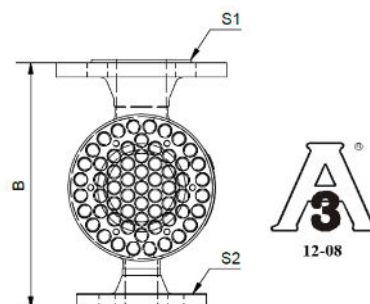
TSHA-02-133-60 (section 1 of 2)		60 barg / 85°C		8 bar[g] / 176°C			Maximum pressure / temperature			
		Volume 6.5 liters		Volume 5 liters			316L Concentric		Dry weight 33 kg	
Stock number	Drawing number	P1/P2	A	S1	S2	B	C	D	E	Tube bank
TSHA-02-133-100-80	W-041353	DN100	Ø133	DN80	DN40	195	655	1114	342	61 pc Ø12x1mm
TSHA-02-133-101-80	W-041354	Ø101.6	Ø133	DN80	DN40	195	655	1130	350	61 pc Ø12x1mm
TSHA-02-133-080-80	W-041355	DN80	Ø133	DN80	DN40	195	655	1140	355	61 pc Ø12x1mm
TSHA-02-133-076-80	W-041356	Ø76.1	Ø133	DN80	DN40	195	655	1176	373	61 pc Ø12x1mm
TSHA-02-133-065-80	W-041357	DN65	Ø133	DN80	DN40	195	655	1160	365	61 pc Ø12x1mm
TSHA-02-133-063-80	W-041358	Ø63.5	Ø133	DN80	DN40	195	655	1178	374	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1	S2	B	C	D	E	Tube bank
TSHA-02-133-100-76	W-041359	DN100	Ø133	Ø76.1	Ø38	186	655	1114	342	61 pc Ø12x1mm
TSHA-02-133-101-76	W-041360	Ø101.6	Ø133	Ø76.1	Ø38	186	655	1130	350	61 pc Ø12x1mm
TSHA-02-133-080-76	W-041361	DN80	Ø133	Ø76.1	Ø38	186	655	1140	355	61 pc Ø12x1mm
TSHA-02-133-076-76	W-041362	Ø76.1	Ø133	Ø76.1	Ø38	186	655	1176	373	61 pc Ø12x1mm
TSHA-02-133-065-76	W-041363	DN65	Ø133	Ø76.1	Ø38	186	655	1160	365	61 pc Ø12x1mm
TSHA-02-133-063-76	W-041364	Ø63.5	Ø133	Ø76.1	Ø38	186	655	1178	374	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1	S2	B	C	D	E	Tube bank
TSHA-02-133-100-65	W-041365	DN100	Ø133	DN65	DN40	195	655	1114	342	61 pc Ø12x1mm
TSHA-02-133-101-65	W-041366	Ø101.6	Ø133	DN65	DN40	195	655	1130	350	61 pc Ø12x1mm
TSHA-02-133-080-65	W-041367	DN80	Ø133	DN65	DN40	195	655	1140	355	61 pc Ø12x1mm
TSHA-02-133-076-65	W-041368	Ø76.1	Ø133	DN65	DN40	195	655	1176	373	61 pc Ø12x1mm
TSHA-02-133-065-65	W-041369	DN65	Ø133	DN65	DN40	195	655	1160	365	61 pc Ø12x1mm
TSHA-02-133-063-65	W-041370	Ø63.5	Ø133	DN65	DN40	195	655	1178	374	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1	S2	B	C	D	E	Tube bank
TSHA-02-133-100-63	W-041371	DN100	Ø133	Ø63.5	Ø38	186	655	1114	342	61 pc Ø12x1mm
TSHA-02-133-101-63	W-041372	Ø101.6	Ø133	Ø63.5	Ø38	186	655	1130	350	61 pc Ø12x1mm
TSHA-02-133-080-63	W-041373	DN80	Ø133	Ø63.5	Ø38	186	655	1140	355	61 pc Ø12x1mm
TSHA-02-133-076-63	W-041374	Ø76.1	Ø133	Ø63.5	Ø38	186	655	1176	373	61 pc Ø12x1mm
TSHA-02-133-065-63	W-041375	DN65	Ø133	Ø63.5	Ø38	186	655	1160	365	61 pc Ø12x1mm
TSHA-02-133-063-63	W-041376	Ø63.5	Ø133	Ø63.5	Ø38	186	655	1178	374	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1	S2	B	C	D	E	Tube bank
TSHA-02-133-100-50	W-041377	DN100	Ø133	DN50	DN25	186	655	1114	342	61 pc Ø12x1mm
TSHA-02-133-101-50	W-041378	Ø101.6	Ø133	DN50	DN25	186	655	1130	350	61 pc Ø12x1mm
TSHA-02-133-080-50	W-041379	DN80	Ø133	DN50	DN25	186	655	1140	355	61 pc Ø12x1mm
TSHA-02-133-076-50	W-041380	Ø76.1	Ø133	DN50	DN25	186	655	1176	373	61 pc Ø12x1mm
TSHA-02-133-065-50	W-041381	DN65	Ø133	DN50	DN25	186	655	1160	365	61 pc Ø12x1mm
TSHA-02-133-063-50	W-041382	Ø63.5	Ø133	DN50	DN25	186	655	1178	374	61 pc Ø12x1mm



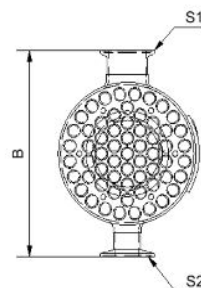
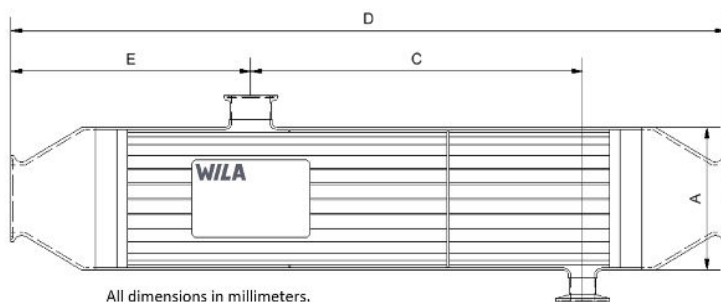
TSHA-02-133-60 (section 2 of 2)		60 barg / 85°C		8 bar[g] / 176°C			Maximum pressure / temperature			
		Volume 6.5 liters		Volume 5 liters			316L Concentric		Dry weight 33 kg	
Stock number	Drawing number	P1/P2	A	S1	S2	B	C	D	E	Tube bank
TSHA-02-133-100-51	W-041383	DN100	Ø133	Ø51	Ø25	186	655	1114	342	61 pc Ø12x1mm
TSHA-02-133-101-51	W-041384	Ø101.6	Ø133	Ø51	Ø25	186	655	1130	350	61 pc Ø12x1mm
TSHA-02-133-080-51	W-041385	DN80	Ø133	Ø51	Ø25	186	655	1140	355	61 pc Ø12x1mm
TSHA-02-133-076-51	W-041386	Ø76.1	Ø133	Ø51	Ø25	186	655	1176	373	61 pc Ø12x1mm
TSHA-02-133-065-51	W-041387	DN65	Ø133	Ø51	Ø25	186	655	1160	365	61 pc Ø12x1mm
TSHA-02-133-063-51	W-041388	Ø63.5	Ø133	Ø51	Ø25	186	655	1178	374	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1	S2	B	C	D	E	Tube bank
TSHA-02-133-100-40	W-041389	DN100	Ø133	DN40	DN25	186	655	1114	342	61 pc Ø12x1mm
TSHA-02-133-101-40	W-041390	Ø101.6	Ø133	DN40	DN25	186	655	1130	350	61 pc Ø12x1mm
TSHA-02-133-080-40	W-041391	DN80	Ø133	DN40	DN25	186	655	1140	355	61 pc Ø12x1mm
TSHA-02-133-076-40	W-041392	Ø76.1	Ø133	DN40	DN25	186	655	1176	373	61 pc Ø12x1mm
TSHA-02-133-065-40	W-041393	DN65	Ø133	DN40	DN25	186	655	1160	365	61 pc Ø12x1mm
TSHA-02-133-063-40	W-041394	Ø63.5	Ø133	DN40	DN25	186	655	1178	374	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1	S2	B	C	D	E	Tube bank
TSHA-02-133-100-38	W-041395	DN100	Ø133	Ø38	Ø25	186	655	1114	342	61 pc Ø12x1mm
TSHA-02-133-101-38	W-041396	Ø101.6	Ø133	Ø38	Ø25	186	655	1130	350	61 pc Ø12x1mm
TSHA-02-133-080-38	W-041397	DN80	Ø133	Ø38	Ø25	186	655	1140	355	61 pc Ø12x1mm
TSHA-02-133-076-38	W-041398	Ø76.1	Ø133	Ø38	Ø25	186	655	1176	373	61 pc Ø12x1mm
TSHA-02-133-065-38	W-041399	DN65	Ø133	Ø38	Ø25	186	655	1160	365	61 pc Ø12x1mm
TSHA-02-133-063-38	W-041400	Ø63.5	Ø133	Ø38	Ø25	186	655	1178	374	61 pc Ø12x1mm



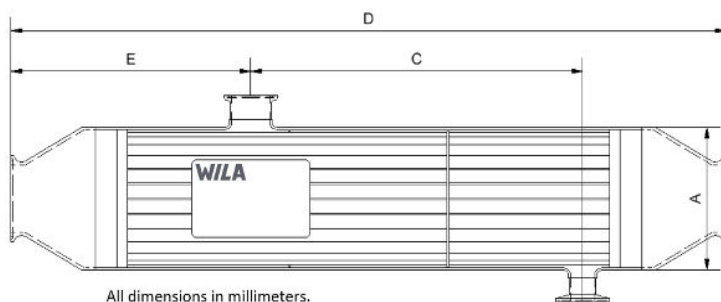
All dimensions in millimeters.



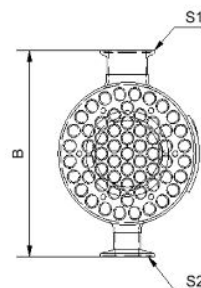
TSHA-02-133-60-F		60 barg / 85°C		8 bar[g] / 176°C			Maximum pressure / temperature			
		Volume 6.5 liters		Volume 5 liters			316L Concentric		Dry weight 33 kg	
Stock number	Drawing number	P1/P2	A	S1	S2	B	C	D	E	Tube bank
TSHA-02-133-100-82F	W-041497	DN100	Ø133	DN80	DN40	232	655	1114	342	61 pc Ø12x1mm
TSHA-02-133-101-82F	W-041498	Ø101.6	Ø133	DN80	DN40	232	655	1130	350	61 pc Ø12x1mm
TSHA-02-133-080-82F	W-041499	DN80	Ø133	DN80	DN40	232	655	1140	355	61 pc Ø12x1mm
TSHA-02-133-076-82F	W-041500	Ø76.1	Ø133	DN80	DN40	232	655	1176	373	61 pc Ø12x1mm
TSHA-02-133-065-82F	W-041501	DN65	Ø133	DN80	DN40	232	655	1160	365	61 pc Ø12x1mm
TSHA-02-133-063-82F	W-041502	Ø63.5	Ø133	DN80	DN40	232	655	1178	374	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1	S2	B	C	D	E	Tube bank
TSHA-02-133-100-70F	W-041503	DN100	Ø133	DN65	DN40	227	655	1114	342	61 pc Ø12x1mm
TSHA-02-133-101-70F	W-041504	Ø101.6	Ø133	DN65	DN40	227	655	1130	350	61 pc Ø12x1mm
TSHA-02-133-080-70F	W-041505	DN80	Ø133	DN65	DN40	227	655	1140	355	61 pc Ø12x1mm
TSHA-02-133-076-70F	W-041506	Ø76.1	Ø133	DN65	DN40	227	655	1176	373	61 pc Ø12x1mm
TSHA-02-133-065-70F	W-041507	DN65	Ø133	DN65	DN40	227	655	1160	365	61 pc Ø12x1mm
TSHA-02-133-063-70F	W-041508	Ø63.5	Ø133	DN65	DN40	227	655	1178	374	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1	S2	B	C	D	E	Tube bank
TSHA-02-133-100-54F	W-041509	DN100	Ø133	DN50	DN25	224	655	1114	342	61 pc Ø12x1mm
TSHA-02-133-101-54F	W-041510	Ø101.6	Ø133	DN50	DN25	224	655	1130	350	61 pc Ø12x1mm
TSHA-02-133-080-54F	W-041511	DN80	Ø133	DN50	DN25	224	655	1140	355	61 pc Ø12x1mm
TSHA-02-133-076-54F	W-041512	Ø76.1	Ø133	DN50	DN25	224	655	1176	373	61 pc Ø12x1mm
TSHA-02-133-065-54F	W-041513	DN65	Ø133	DN50	DN25	224	655	1160	365	61 pc Ø12x1mm
TSHA-02-133-063-54F	W-041514	Ø63.5	Ø133	DN50	DN25	224	655	1178	374	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1	S2	B	C	D	E	Tube bank
TSHA-02-133-100-43F	W-041515	DN100	Ø133	DN40	DN25	221	655	1114	342	61 pc Ø12x1mm
TSHA-02-133-101-43F	W-041516	Ø101.6	Ø133	DN40	DN25	221	655	1130	350	61 pc Ø12x1mm
TSHA-02-133-080-43F	W-041517	DN80	Ø133	DN40	DN25	221	655	1140	355	61 pc Ø12x1mm
TSHA-02-133-076-43F	W-041518	Ø76.1	Ø133	DN40	DN25	221	655	1176	373	61 pc Ø12x1mm
TSHA-02-133-065-43F	W-041519	DN65	Ø133	DN40	DN25	221	655	1160	365	61 pc Ø12x1mm
TSHA-02-133-063-43F	W-041520	Ø63.5	Ø133	DN40	DN25	221	655	1178	374	61 pc Ø12x1mm



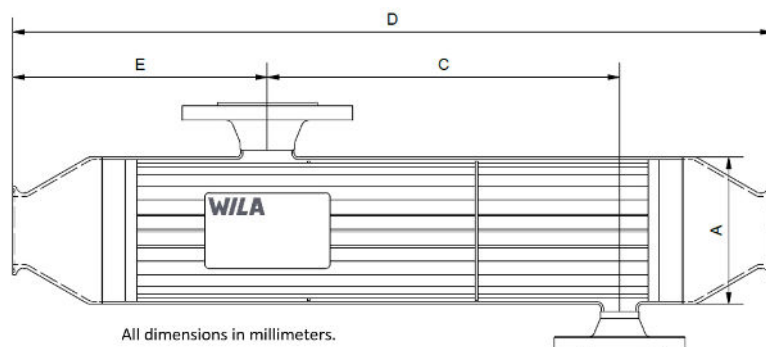
TSHA-03-133-60 (section 1 of 2)		60 barg / 85°C		6 bar[g] / 165°C			Maximum pressure / temperature			
		Volume 9 liters		Volume 7.5 liters			316L Concentric		Dry weight 48 kg	
Stock number	Drawing number	P1/P2	A	S1	S2	B	C	D	E	Tube bank
TSHA-03-133-100-80	W-041413	DN100	Ø133	DN80	DN40	195	1020	1604	467	61 pc Ø12x1mm
TSHA-03-133-101-80	W-041414	Ø101.6	Ø133	DN80	DN40	195	1020	1620	476	61 pc Ø12x1mm
TSHA-03-133-080-80	W-041415	DN80	Ø133	DN80	DN40	195	1020	1630	480	61 pc Ø12x1mm
TSHA-03-133-076-80	W-041416	Ø76.1	Ø133	DN80	DN40	195	1020	1666	498	61 pc Ø12x1mm
TSHA-03-133-065-80	W-041417	DN65	Ø133	DN80	DN40	195	1020	1650	490	61 pc Ø12x1mm
TSHA-03-133-063-80	W-041418	Ø63.5	Ø133	DN80	DN40	195	1020	1668	499	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1	S2	B	C	D	E	Tube bank
TSHA-03-133-100-76	W-041419	DN100	Ø133	Ø76.1	Ø38	186	1020	1604	467	61 pc Ø12x1mm
TSHA-03-133-101-76	W-041420	Ø101.6	Ø133	Ø76.1	Ø38	186	1020	1620	476	61 pc Ø12x1mm
TSHA-03-133-080-76	W-041421	DN80	Ø133	Ø76.1	Ø38	186	1020	1630	480	61 pc Ø12x1mm
TSHA-03-133-076-76	W-041422	Ø76.1	Ø133	Ø76.1	Ø38	186	1020	1666	498	61 pc Ø12x1mm
TSHA-03-133-065-76	W-041423	DN65	Ø133	Ø76.1	Ø38	186	1020	1650	490	61 pc Ø12x1mm
TSHA-03-133-063-76	W-041424	Ø63.5	Ø133	Ø76.1	Ø38	186	1020	1668	499	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1	S2	B	C	D	E	Tube bank
TSHA-03-133-100-65	W-041425	DN100	Ø133	DN65	DN40	195	1020	1604	467	61 pc Ø12x1mm
TSHA-03-133-101-65	W-041426	Ø101.6	Ø133	DN65	DN40	195	1020	1620	476	61 pc Ø12x1mm
TSHA-03-133-080-65	W-041427	DN80	Ø133	DN65	DN40	195	1020	1630	480	61 pc Ø12x1mm
TSHA-03-133-076-65	W-041428	Ø76.1	Ø133	DN65	DN40	195	1020	1666	498	61 pc Ø12x1mm
TSHA-03-133-065-65	W-041429	DN65	Ø133	DN65	DN40	195	1020	1650	490	61 pc Ø12x1mm
TSHA-03-133-063-65	W-041430	Ø63.5	Ø133	DN65	DN40	195	1020	1668	499	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1	S2	B	C	D	E	Tube bank
TSHA-03-133-100-63	W-041431	DN100	Ø133	Ø63.5	Ø38	186	1020	1604	467	61 pc Ø12x1mm
TSHA-03-133-101-63	W-041432	Ø101.6	Ø133	Ø63.5	Ø38	186	1020	1620	476	61 pc Ø12x1mm
TSHA-03-133-080-63	W-041433	DN80	Ø133	Ø63.5	Ø38	186	1020	1630	480	61 pc Ø12x1mm
TSHA-03-133-076-63	W-041434	Ø76.1	Ø133	Ø63.5	Ø38	186	1020	1666	498	61 pc Ø12x1mm
TSHA-03-133-065-63	W-041435	DN65	Ø133	Ø63.5	Ø38	186	1020	1650	490	61 pc Ø12x1mm
TSHA-03-133-063-63	W-041436	Ø63.5	Ø133	Ø63.5	Ø38	186	1020	1668	499	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1	S2	B	C	D	E	Tube bank
TSHA-03-133-100-50	W-041437	DN100	Ø133	DN50	DN25	186	1020	1604	467	61 pc Ø12x1mm
TSHA-03-133-101-50	W-041438	Ø101.6	Ø133	DN50	DN25	186	1020	1620	476	61 pc Ø12x1mm
TSHA-03-133-080-50	W-041439	DN80	Ø133	DN50	DN25	186	1020	1630	480	61 pc Ø12x1mm
TSHA-03-133-076-50	W-041440	Ø76.1	Ø133	DN50	DN25	186	1020	1666	498	61 pc Ø12x1mm
TSHA-03-133-065-50	W-041441	DN65	Ø133	DN50	DN25	186	1020	1650	490	61 pc Ø12x1mm
TSHA-03-133-063-50	W-041442	Ø63.5	Ø133	DN50	DN25	186	1020	1668	499	61 pc Ø12x1mm



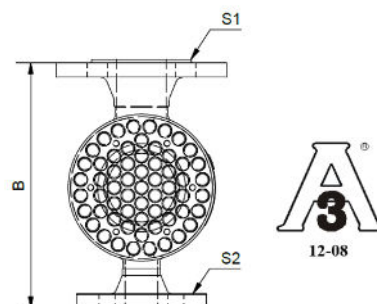
All dimensions in millimeters.



TSHA-03-133-60 (section 2 of 2)		80 barg / 85°C		6 bar[g] / 165°C			Maximum pressure / 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	E	Tube bank
TSHA-03-133-100-51	W-041443	DN100	Ø133	Ø51	Ø25	186	1020	1604	467	61 pc Ø12x1mm
TSHA-03-133-101-51	W-041444	Ø101.6	Ø133	Ø51	Ø25	186	1020	1620	476	61 pc Ø12x1mm
TSHA-03-133-080-51	W-041445	DN80	Ø133	Ø51	Ø25	186	1020	1630	480	61 pc Ø12x1mm
TSHA-03-133-076-51	W-041446	Ø76.1	Ø133	Ø51	Ø25	186	1020	1666	498	61 pc Ø12x1mm
TSHA-03-133-065-51	W-041447	DN65	Ø133	Ø51	Ø25	186	1020	1650	490	61 pc Ø12x1mm
TSHA-03-133-063-51	W-041448	Ø63.5	Ø133	Ø51	Ø25	186	1020	1668	499	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1	S2	B	C	D	E	Tube bank
TSHA-03-133-100-40	W-041449	DN100	Ø133	DN40	DN25	186	1020	1604	467	61 pc Ø12x1mm
TSHA-03-133-101-40	W-041450	Ø101.6	Ø133	DN40	DN25	186	1020	1620	476	61 pc Ø12x1mm
TSHA-03-133-080-40	W-041451	DN80	Ø133	DN40	DN25	186	1020	1630	480	61 pc Ø12x1mm
TSHA-03-133-076-40	W-041452	Ø76.1	Ø133	DN40	DN25	186	1020	1666	498	61 pc Ø12x1mm
TSHA-03-133-065-40	W-041453	DN65	Ø133	DN40	DN25	186	1020	1650	490	61 pc Ø12x1mm
TSHA-03-133-063-40	W-041454	Ø63.5	Ø133	DN40	DN25	186	1020	1668	499	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1	S2	B	C	D	E	Tube bank
TSHA-03-133-100-38	W-041455	DN100	Ø133	Ø38	Ø25	186	1020	1604	467	61 pc Ø12x1mm
TSHA-03-133-101-38	W-041456	Ø101.6	Ø133	Ø38	Ø25	186	1020	1620	476	61 pc Ø12x1mm
TSHA-03-133-080-38	W-041457	DN80	Ø133	Ø38	Ø25	186	1020	1630	480	61 pc Ø12x1mm
TSHA-03-133-076-38	W-041458	Ø76.1	Ø133	Ø38	Ø25	186	1020	1666	498	61 pc Ø12x1mm
TSHA-03-133-065-38	W-041459	DN65	Ø133	Ø38	Ø25	186	1020	1650	490	61 pc Ø12x1mm
TSHA-03-133-063-38	W-041460	Ø63.5	Ø133	Ø38	Ø25	186	1020	1668	499	61 pc Ø12x1mm



All dimensions in millimeters.



TSHA-03-139-60-F		60 barg / 85°C		6 bar[g] / 165°C		Maximum pressure / 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	E	Tube bank
TSHA-03-133-100-82F	W-041521	DN100	Ø133	DN80	DN40	232	1020	1604	467	61 pc Ø12x1mm
TSHA-03-133-101-82F	W-041522	Ø101.6	Ø133	DN80	DN40	232	1020	1620	476	61 pc Ø12x1mm
TSHA-03-133-080-82F	W-041523	DN80	Ø133	DN80	DN40	232	1020	1630	480	61 pc Ø12x1mm
TSHA-03-133-076-82F	W-041524	Ø76.1	Ø133	DN80	DN40	232	1020	1666	498	61 pc Ø12x1mm
TSHA-03-133-065-82F	W-041525	DN65	Ø133	DN80	DN40	232	1020	1650	490	61 pc Ø12x1mm
TSHA-03-133-063-82F	W-041526	Ø63.5	Ø133	DN80	DN40	232	1020	1668	499	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1	S2	B	C	D	E	Tube bank
TSHA-03-133-100-70F	W-041527	DN100	Ø133	DN65	DN40	227	1020	1604	467	61 pc Ø12x1mm
TSHA-03-133-101-70F	W-041528	Ø101.6	Ø133	DN65	DN40	227	1020	1620	476	61 pc Ø12x1mm
TSHA-03-133-080-70F	W-041529	DN80	Ø133	DN65	DN40	227	1020	1630	480	61 pc Ø12x1mm
TSHA-03-133-076-70F	W-041530	Ø76.1	Ø133	DN65	DN40	227	1020	1666	498	61 pc Ø12x1mm
TSHA-03-133-065-70F	W-041531	DN65	Ø133	DN65	DN40	227	1020	1650	490	61 pc Ø12x1mm
TSHA-03-133-063-70F	W-041532	Ø63.5	Ø133	DN65	DN40	227	1020	1668	499	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1	S2	B	C	D	E	Tube bank
TSHA-03-133-100-54F	W-041533	DN100	Ø133	DN50	DN25	224	1020	1604	467	61 pc Ø12x1mm
TSHA-03-133-101-54F	W-041534	Ø101.6	Ø133	DN50	DN25	224	1020	1620	476	61 pc Ø12x1mm
TSHA-03-133-080-54F	W-041535	DN80	Ø133	DN50	DN25	224	1020	1630	480	61 pc Ø12x1mm
TSHA-03-133-076-54F	W-041536	Ø76.1	Ø133	DN50	DN25	224	1020	1666	498	61 pc Ø12x1mm
TSHA-03-133-065-54F	W-041537	DN65	Ø133	DN50	DN25	224	1020	1650	490	61 pc Ø12x1mm
TSHA-03-133-063-54F	W-041538	Ø63.5	Ø133	DN50	DN25	224	1020	1668	499	61 pc Ø12x1mm
Stock number	Drawing number	P1/P2	A	S1	S2	B	C	D	E	Tube bank
TSHA-03-133-100-43F	W-041539	DN100	Ø133	DN40	DN25	221	1020	1604	467	61 pc Ø12x1mm
TSHA-03-133-101-43F	W-041540	Ø101.6	Ø133	DN40	DN25	221	1020	1620	476	61 pc Ø12x1mm
TSHA-03-133-080-43F	W-041541	DN80	Ø133	DN40	DN25	221	1020	1630	480	61 pc Ø12x1mm
TSHA-03-133-076-43F	W-041542	Ø76.1	Ø133	DN40	DN25	221	1020	1666	498	61 pc Ø12x1mm
TSHA-03-133-065-43F	W-041543	DN65	Ø133	DN40	DN25	221	1020	1650	490	61 pc Ø12x1mm
TSHA-03-133-063-43F	W-041544	Ø63.5	Ø133	DN40	DN25	221	1020	1668	499	61 pc Ø12x1mm