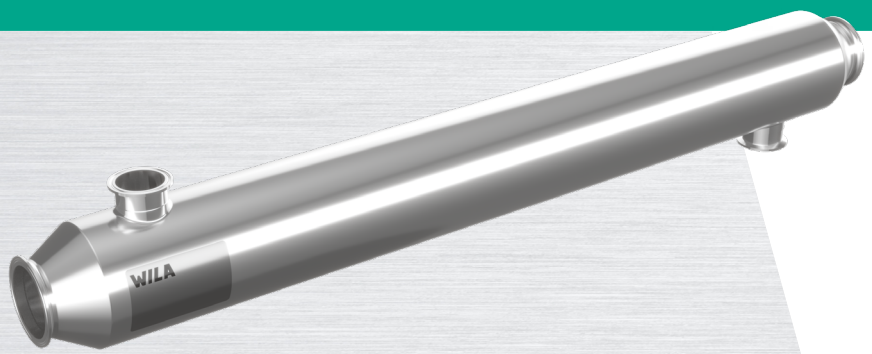
Version 1.1

TUBULAR LIQUID COOLER

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



Dimensions overview for type Ø133 - 60 bar[g]

Tubular Liquid coolers 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.

12-08

INNOVATION – DRIVEN BY PEOPLE

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Introduction

This overview is for Tubular Liquid Coolers manufactured by Wila A/S under the category "TLCA" 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 ≤ 0.8 µm and the outside surface roughness is ≤ 1.6 µm. **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 Ø133x4mm 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.

TLCA-xx-133-60

TLCXA	**T**ubular **L**iquid **C**ooler with 3**A** 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	

* Other versions are available

TLCA-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	in accordance with DIN 32676-A
Ø133mm	4″ (Ø101.6) – 3″ (Ø76.1)	In accordance with ISO 2852-2

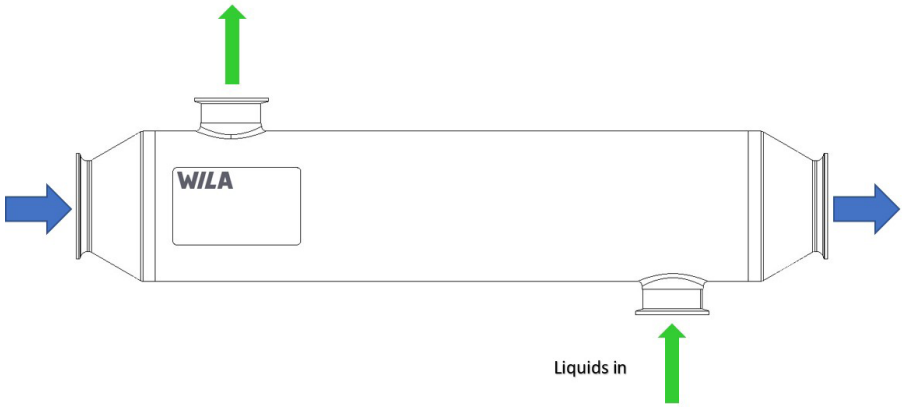
Shell side (S1 and S2) connections:

DN20 - DN25 - DN40 - DN50 - DN65	in accordance with DIN 32676-A
3/4″ (Ø20) - 1″ (Ø25) - 1.5″ (Ø38) - 2″ (Ø51) - 2.5″ (Ø63.5)	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 liquids, the outlet should be at the highest point to ensure complete removal of air in the chamber.

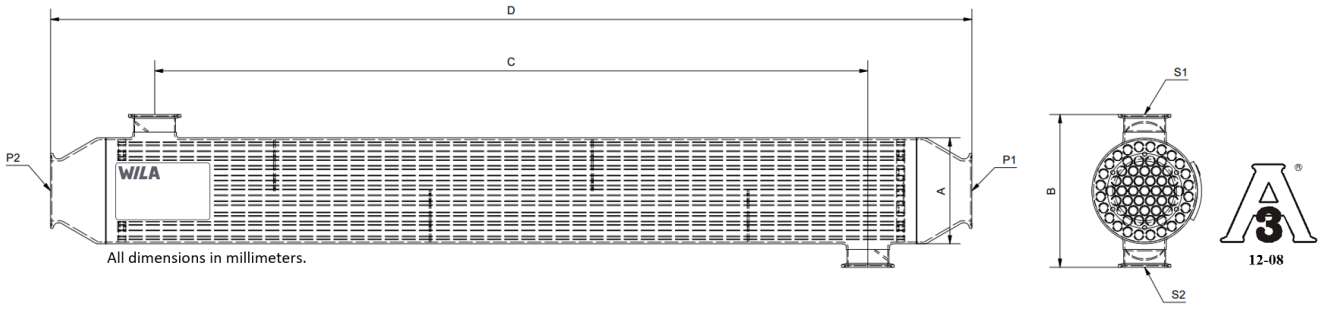


Shell side workflow

The liquid cooler shell side recommended workflow limits are based on the most optimal placement of our baffle plates in the tube bundle, which varies with the size of the liquid cooler:

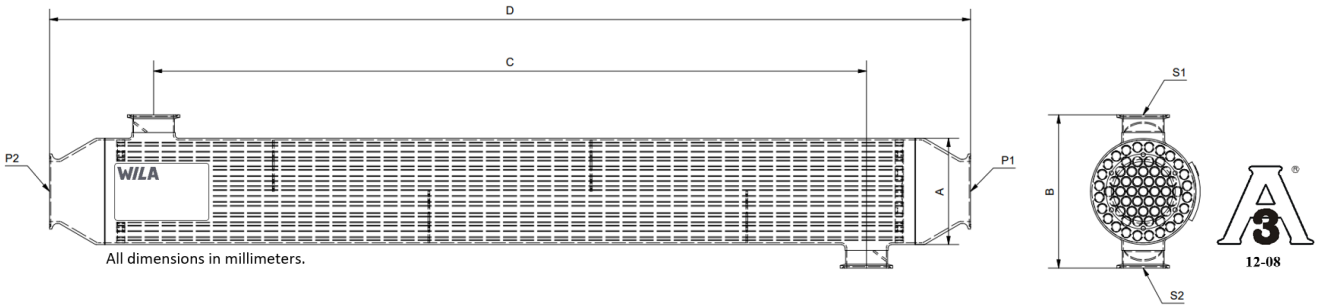
- For liquid cooler size 0.5m² the recommended maximum shell side workflow is 3 m³/h
- For liquid cooler size 1 m² the recommended maximum shell side workflow is 3 m³/h
- For liquid cooler size 2 m² the recommended maximum shell side workflow is 7 m³/h
- For liquid cooler size 3 m² the recommended maximum shell side workflow is 12 m³/h

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



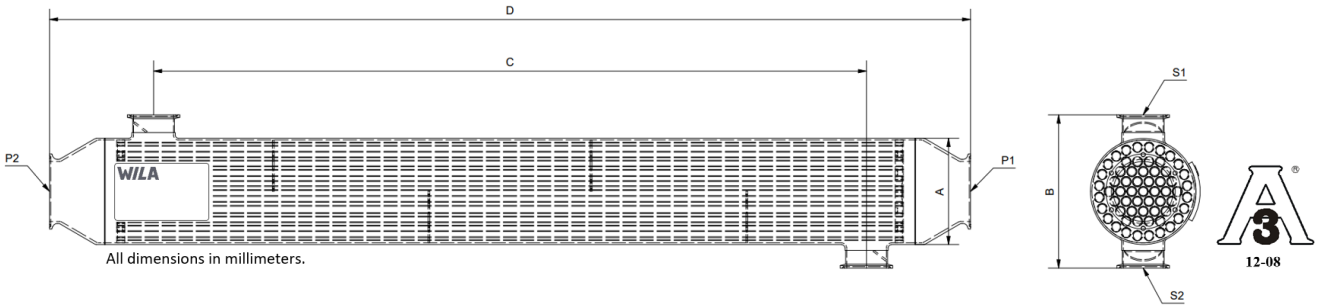
All dimensions in millimeters.

TLCA-.5-133-60		60 barg / 85°C		16 bar[g] / 95°C		Maximum pressure / temperature		
		Volume 3 liters		Volume 1 liters		316L Eccentric		Dry weight 10 kg
Stock number	**Drawing number**	**P1/P2**	**A**	**S1/S2**	**B**	**C**	**D**	**Tube bank**
TLCA-.5-133-100-25	W-038421	DN100	Ø133	Ø25	186	160	374	61 pc Ø12x1mm
TLCA-.5-133-101-25	W-038422	Ø101.6	Ø133	Ø25	186	160	370	61 pc Ø12x1mm
TLCA-.5-133-080-25	W-038423	DN80	Ø133	Ø25	186	160	392	61 pc Ø12x1mm
TLCA-.5-133-076-25	W-038424	Ø76.1	Ø133	Ø25	186	160	416	61 pc Ø12x1mm
TLCA-.5-133-065-25	W-038425	DN65	Ø133	Ø25	186	160	420	61 pc Ø12x1mm
TLCA-.5-133-063-25	W-038426	Ø63.5	Ø133	Ø25	186	160	438	61 pc Ø12x1mm
Stock number	**Drawing number**	**P1/P2**	**A**	**S1/S2**	**B**	**C**	**D**	**Tube bank**
TLCA-.5-133-100-21	W-038427	DNI00	Ø133	Ø21.3	179	160	374	61 pc Ø12x1mm
TLCA-.5-133-101-21	W-038428	Ø101.6	Ø133	Ø21.3	179	160	370	61 pc Ø12x1mm
TLCA-.5-133-080-21	W-038429	DN80	Ø133	Ø21.3	179	160	392	61 pc Ø12x1mm
TLCA-.5-133-076-21	W-038430	Ø76.1	Ø133	Ø21.3	179	160	416	61 pc Ø12x1mm
TLCA-.5-133-065-21	W-038431	DN65	Ø133	Ø21.3	179	160	420	61 pc Ø12x1mm
TLCA-.5-133-063-21	W-038432	Ø63.5	Ø133	Ø21.3	179	160	438	61 pc Ø12x1mm
Stock number	**Drawing number**	**P1/P2**	**A**	**S1/S2**	**B**	**C**	**D**	**Tube bank**
TLCA-.5-133-100-26	W-038433	DN100	Ø133	DN25	186	160	374	61 pc Ø12x1mm
TLCA-.5-133-101-26	W-038434	Ø101.6	Ø133	DN25	186	160	370	61 pc Ø12x1mm
TLCA-.5-133-080-26	W-038435	DN80	Ø133	DN25	186	160	392	61 pc Ø12x1mm
TLCA-.5-133-076-26	W-038436	Ø76.1	Ø133	DN25	186	160	416	61 pc Ø12x1mm
TLCA-.5-133-065-26	W-038437	DN65	Ø133	DN25	186	160	420	61 pc Ø12x1mm
TLCA-.5-133-063-26	W-038438	Ø63.5	Ø133	DN25	186	160	438	61 pc Ø12x1mm
Stock number	**Drawing number**	**P1/P2**	**A**	**S1/S2**	**B**	**C**	**D**	**Tube bank**
TLCA-.5-133-100-20	W-038439	DN100	Ø133	DN20	179	160	374	61 pc Ø12x1mm
TLCA-.5-133-101-20	W-038440	Ø101.6	Ø133	DN20	179	160	370	61 pc Ø12x1mm
TLCA-.5-133-080-20	W-038441	DN80	Ø133	DN20	179	160	392	61 pc Ø12x1mm
TLCA-.5-133-076-20	W-038442	Ø76.1	Ø133	DN20	179	160	416	61 pc Ø12x1mm
TLCA-.5-133-065-20	W-038443	DN65	Ø133	DN20	179	160	420	61 pc Ø12x1mm
TLCA-.5-133-063-20	W-038444	Ø63.5	Ø133	DN20	179	160	438	61 pc Ø12x1mm



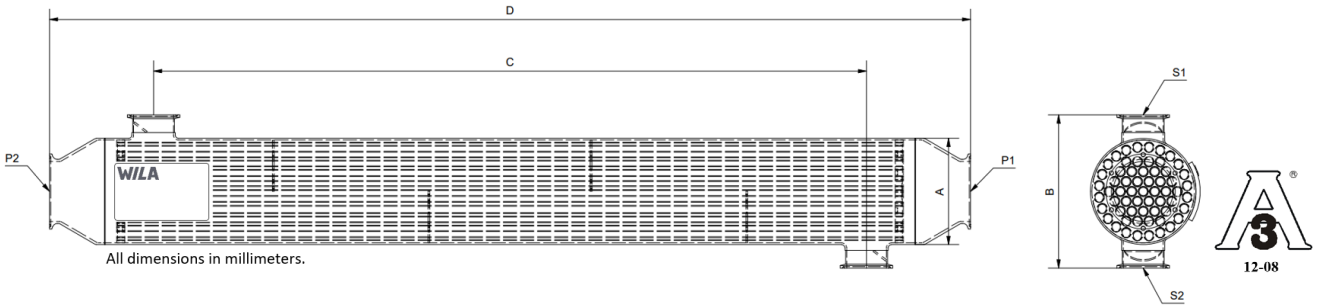
All dimensions in millimeters.

TLCA-01-133-60		60 barg / 85°C		16 bar[g] / 95°C		Maximum pressure / temperature		
		Volume 4.5 liters		Volume 2.5 liters		316L Eccentric		Dry weight 18 kg
Stock number	**Drawing number**	**P1/P2**	**A**	**S1/S2**	**B**	**C**	**D**	**Tube bank**
TLCA-01-133-100-25	W-038448	DN100	Ø133	Ø25	186	408	624	61 pc Ø12x1mm
TLCA-01-133-101-25	W-038449	Ø101.6	Ø133	Ø25	186	408	620	61 pc Ø12x1mm
TLCA-01-133-080-25	W-038450	DN80	Ø133	Ø25	186	408	642	61 pc Ø12x1mm
TLCA-01-133-076-25	W-038451	Ø76.1	Ø133	Ø25	186	408	666	61 pc Ø12x1mm
TLCA-01-133-065-25	W-038452	DN65	Ø133	Ø25	I86	408	670	61 pc Ø12x1mm
TLCA-01-133-063-25	W-038453	Ø63.5	Ø133	Ø25	I86	408	688	61 pc Ø12x1mm
Stock number	**Drawing number**	**P1/P2**	**A**	**S1/S2**	**B**	**C**	**D**	**Tube bank**
TLCA-01-133-100-21	W-038454	DN100	Ø133	Ø21.3	179	408	624	61 pc Ø12x1mm
TLCA-01-133-101-21	W-038455	Ø101.6	Ø133	Ø21.3	179	408	620	61 pc Ø12x1mm
TLCA-01-133-080-21	W-038456	DN80	Ø133	Ø21.3	179	408	642	61 pc Ø12x1mm
TLCA-01-133-076-21	W-038457	Ø76.1	Ø133	Ø21.3	179	408	666	61 pc Ø12x1mm
TLCA-01-133-065-21	W-038458	DN65	Ø133	Ø21.3	179	408	670	61 pc Ø12x1mm
TLCA-01-133-063-21	W-038459	Ø63.5	Ø133	Ø21.3	179	408	688	61 pc Ø12x1mm
Stock number	**Drawing number**	**P1/P2**	**A**	**S1/S2**	**B**	**C**	**D**	**Tube bank**
TLCA-01-133-100-26	W-038460	DN100	Ø133	DN25	186	408	624	61 pc Ø12x1mm
TLCA-01-133-101-26	W-038461	Ø101.6	Ø133	DN25	186	408	620	61 pc Ø12x1mm
TLCA-01-133-080-26	W-038462	DN80	Ø133	DN25	186	408	642	61 pc Ø12x1mm
TLCA-01-133-076-26	W-038463	Ø76.1	Ø133	DN25	186	408	666	61 pc Ø12x1mm
TLCA-01-133-065-26	W-038464	DN65	Ø133	DN25	186	408	670	61 pc Ø12x1mm
TLCA-01-133-063-26	W-038465	Ø63.5	Ø133	DN25	186	408	688	61 pc Ø12x1mm
Stock number	**Drawing number**	**P1/P2**	**A**	**S1/S2**	**B**	**C**	**D**	**Tube bank**
TLCA-01-133-100-20	W-038466	DN100	Ø133	DN20	179	408	624	61 pc Ø12x1mm
TLCA-01-133-101-20	W-038467	Ø101.6	Ø133	DN20	179	408	620	61 pc Ø12x1mm
TLCA-01-133-080-20	W-038468	DN80	Ø133	DN20	179	408	642	61 pc Ø12x1mm
TLCA-01-133-076-20	W-038469	Ø76.1	Ø133	DN20	179	408	666	61 pc Ø12x1mm
TLCA-01-133-065-20	W-038470	DN65	Ø133	DN20	179	408	670	61 pc Ø12x1mm
TLCA-01-133-063-20	W-038471	Ø63.5	Ø133	DN20	179	408	688	61 pc Ø12x1mm



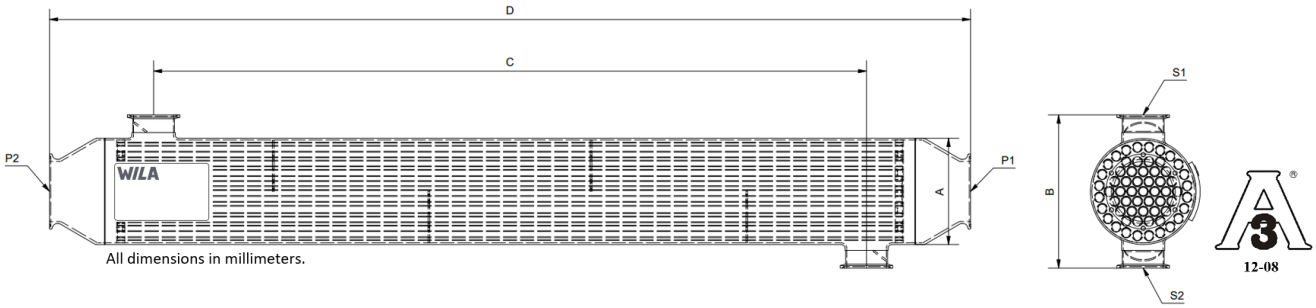
All dimensions in millimeters.

TLCA-02-133-60		60 barg / 85°C		16 bar[g] / 95°C		Maximum pressure / temperature		
		Volume 6.5 liters		Volume 5 liters		316L Eccentric		Dry weight 33 kg
Stock number	**Drawing number**	**P1/P2**	**A**	**S1/S2**	**B**	**C**	**D**	**Tube bank**
TLCA-02-133-100-51	W-038475	DN100	Ø133	Ø51	186	886	1114	61 pc Ø12x1mm
TLCA-02-133-101-51	W-038476	Ø101.6	Ø133	Ø51	186	886	1110	61 pc Ø12x1mm
TLCA-02-133-080-51	W-038477	DN80	Ø133	Ø51	186	886	1132	61 pc Ø12x1mm
TLCA-02-133-076-51	W-038478	Ø76.1	Ø133	Ø51	186	886	1156	61 pc Ø12x1mm
TLCA-02-133-065-51	W-038479	DN65	Ø133	Ø51	186	886	1160	61 pc Ø12x1mm
TLCA-02-133-063-51	W-038480	Ø63.5	Ø133	Ø51	186	886	1178	61 pc Ø12x1mm
Stock number	**Drawing number**	**P1/P2**	**A**	**S1/S2**	**B**	**C**	**D**	**Tube bank**
TLCA-02-133-100-38	W-038481	DN100	Ø133	Ø38	186	886	1114	61 pc Ø12x1mm
TLCA-02-133-101-38	W-038482	Ø101.6	Ø133	Ø38	186	886	1110	61 pc Ø12x1mm
TLCA-02-133-080-38	W-038483	DN80	Ø133	Ø38	186	886	1132	61 pc Ø12x1mm
TLCA-02-133-076-38	W-038484	Ø76.1	Ø133	Ø38	186	886	1156	61 pc Ø12x1mm
TLCA-02-133-065-38	W-038485	DN65	Ø133	Ø38	186	886	1160	61 pc Ø12x1mm
TLCA-02-133-063-38	W-038486	Ø63.5	Ø133	Ø38	186	886	1178	61 pc Ø12x1mm
Stock number	**Drawing number**	**P1/P2**	**A**	**S1/S2**	**B**	**C**	**D**	**Tube bank**
TLCA-02-133-100-50	W-038487	DN100	Ø133	DN50	186	886	1114	61 pc Ø12x1mm
TLCA-02-133-101-50	W-038488	Ø101.6	Ø133	DN50	186	886	1110	61 pc Ø12x1mm
TLCA-02-133-080-50	W-038489	DN80	Ø133	DN50	186	886	1132	61 pc Ø12x1mm
TLCA-02-133-076-50	W-038490	Ø76.1	Ø133	DN50	186	886	1156	61 pc Ø12x1mm
TLCA-02-133-065-50	W-038491	DN65	Ø133	DN50	186	886	1160	61 pc Ø12x1mm
TLCA-02-133-063-50	W-038492	Ø63.5	Ø133	DN50	186	886	1178	61 pc Ø12x1mm
Stock number	**Drawing number**	**P1/P2**	**A**	**S1/S2**	**B**	**C**	**D**	**Tube bank**
TLCA-02-133-100-40	W-038493	DN100	Ø133	DN40	186	886	1114	61 pc Ø12x1mm
TLCA-02-133-101-40	W-038494	Ø101.6	Ø133	DN40	186	886	1110	61 pc Ø12x1mm
TLCA-02-133-080-40	W-038495	DN80	Ø133	DN40	186	886	1132	61 pc Ø12x1mm
TLCA-02-133-076-40	W-038496	Ø76.1	Ø133	DN40	186	886	1156	61 pc Ø12x1mm
TLCA-02-133-065-40	W-038497	DN65	Ø133	DN40	186	886	1160	61 pc Ø12x1mm
TLCA-02-133-063-40	W-038498	Ø63.5	Ø133	DN40	186	886	1178	61 pc Ø12x1mm



All dimensions in millimeters.

TLCA-03-133-60 (Section 1 of 2)		60 barg / 85°C		16 bar[g] / 95°C		Maximum pressure / temperature		
		Volume 9 liters		Volume 7.5 liters		316L Eccentric		Dry weight 48 kg
Stock number	**Drawing number**	**P1/P2**	**A**	**S1/S2**	**B**	**C**	**D**	**Tube bank**
TLCA-03-133-100-63	W-038505	DN100	Ø133	Ø63.5	186	1360	1604	61 pc Ø12x1mm
TLCA-03-133-101-63	W-038506	Ø101.6	Ø133	Ø63.5	186	1360	1600	61 pc Ø12x1mm
TLCA-03-133-080-63	W-038507	DN80	Ø133	Ø63.5	186	1360	1622	61 pc Ø12x1mm
TLCA-03-133-076-63	W-038508	Ø76.1	Ø133	Ø63.5	186	1360	1646	61 pc Ø12x1mm
TLCA-03-133-065-63	W-038509	DN65	Ø133	Ø63.5	186	1360	1650	61 pc Ø12x1mm
TLCA-03-133-063-63	W-038510	Ø63.5	Ø133	Ø63.5	186	1360	1668	61 pc Ø12x1mm
Stock number	**Drawing number**	**P1/P2**	**A**	**S1/S2**	**B**	**C**	**D**	**Tube bank**
TLCA-03-133-100-51	W-038511	DN100	Ø133	Ø51	186	1360	1604	61 pc Ø12x1mm
TLCA-03-133-101-51	W-038512	Ø101.6	Ø133	Ø51	186	1360	1600	61 pc Ø12x1mm
TLCA-03-133-080-51	W-038513	DN80	Ø133	Ø51	186	1360	1622	61 pc Ø12x1mm
TLCA-03-133-076-51	W-038514	Ø76.1	Ø133	Ø51	186	1360	1646	61 pc Ø12x1mm
TLCA-03-133-065-51	W-038515	DN65	Ø133	Ø51	186	1360	1650	61 pc Ø12x1mm
TLCA-03-133-063-51	W-038516	Ø63.5	Ø133	Ø51	186	1360	1668	61 pc Ø12x1mm
Stock number	**Drawing number**	**P1/P2**	**A**	**S1/S2**	**B**	**C**	**D**	**Tube bank**
TLCA-03-133-100-38	W-038517	DN100	Ø133	Ø38	186	1360	1604	61 pc Ø12x1mm
TLCA-03-133-101-38	W-038518	Ø101.6	Ø133	Ø38	186	1360	1600	61 pc Ø12x1mm
TLCA-03-133-080-38	W-038519	DN80	Ø133	Ø38	186	1360	1622	61 pc Ø12x1mm
TLCA-03-133-076-38	W-038520	Ø76.1	Ø133	Ø38	186	1360	1646	61 pc Ø12x1mm
TLCA-03-133-065-38	W-038521	DN65	Ø133	Ø38	186	1360	1650	61 pc Ø12x1mm
TLCA-03-133-063-38	W-038522	Ø63.5	Ø133	Ø38	186	1360	1668	61 pc Ø12x1mm
Stock number	**Drawing number**	**P1/P2**	**A**	**S1/S2**	**B**	**C**	**D**	**Tube bank**
TLCA-03-133-100-65	W-038523	DN100	Ø133	DN65	199	1360	1604	61 pc Ø12x1mm
TLCA-03-133-101-65	W-038524	Ø101.6	Ø133	DN65	199	1360	1600	61 pc Ø12x1mm
TLCA-03-133-080-65	W-038525	DN80	Ø133	DN65	199	1360	1622	61 pc Ø12x1mm
TLCA-03-133-076-65	W-038526	Ø76.1	Ø133	DN65	199	1360	1646	61 pc Ø12x1mm
TLCA-03-133-065-65	W-038527	DN65	Ø133	DN65	199	1360	1650	61 pc Ø12x1mm
TLCA-03-133-063-65	W-038528	Ø63.5	Ø133	DN65	199	1360	1668	61 pc Ø12x1mm



All dimensions in millimeters.

TLCA-03-133-60 (Section 2 of 2)		60 barg / 85°C		16 bar[g] / 95°C		Maximum pressure / temperature		
		Volume 9 liters		Volume 7.5 liters		316L Eccentric		Dry weight 48 kg
Stock number	**Drawing number**	**P1/P2**	**A**	**S1/S2**	**B**	**C**	**D**	**Tube bank**
TLCA-03-133-100-50	W-038529	DN100	Ø133	DN50	186	1360	1604	61 pc Ø12x1mm
TLCA-03-133-101-50	W-038530	Ø101.6	Ø133	DN50	186	1360	1600	61 pc Ø12x1mm
TLCA-03-133-080-50	W-038531	DN80	Ø133	DN50	186	1360	1622	61 pc Ø12x1mm
TLCA-03-133-076-50	W-038532	Ø76.1	Ø133	DN50	186	1360	1646	61 pc Ø12x1mm
TLCA-03-133-065-50	W-038533	DN65	Ø133	DN50	186	1360	1650	61 pc Ø12x1mm
TLCA-03-133-063-50	W-038534	Ø63.5	Ø133	DN50	186	1360	1668	61 pc Ø12x1mm
Stock number	**Drawing number**	**P1/P2**	**A**	**S1/S2**	**B**	**C**	**D**	**Tube bank**
TLCA-03-I33-I00-40	W-038535	DN100	Ø133	DN40	186	1360	1604	61 pc Ø12x1mm
TLCA-03-I33-I0I-40	W-038536	Ø101.6	Ø133	DN40	186	1360	1600	61 pc Ø12x1mm
TLCA-03-I33-080-40	W-038537	DN80	Ø133	DN40	186	1360	1622	61 pc Ø12x1mm
TLCA-03-I33-076-40	W-038538	Ø76.1	Ø133	DN40	186	1360	1646	61 pc Ø12x1mm
TLCA-03-I33-065-40	W-038539	DN65	Ø133	DN40	186	1360	1650	61 pc Ø12x1mm
TLCA-03-I33-063-40	W-038540	Ø63.5	Ø133	DN40	186	1360	1668	61 pc Ø12x1mm