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Contents

General

Dear customer

We congratulate you on your purchase of your new, high quality water heat exchanger "Made in Germany".
Your specialist dealer will be pleased to provide any assistance you require.

Please read the installation instructions carefully.

Keep the installation instructions on hand for future reference.

1 Safety

1.1 Dangers in working with this heat exchanger

The heat exchanger is manufactured in accordance with the latest technological advances and recognised safety regulations. However, it may be dangerous when in use, as follows

- injury to the operator or
- third parties, or
- faults on the heat exchanger or
- damage to other objects.

All persons involved with installation, commissioning, operation, maintenance and repair of the heat exchanger must meet the following requirements

- mentally and physically qualified.
- appropriately qualified.
- carefully observe the installation instructions.

The heat exchanger must used under the following conditions only

- for the intended use.
- in perfect technically safe condition.

Faults that could affect safety must be repaired by a qualified plumber.

Your safety is at stake.

1.2 Safety instructions and tips

The following icons are used in the operating instructions:

DANGER!
This icon indicates an **immediate danger** to the health of persons.

WARNING!
This icon indicates a **potential danger** to the health of persons.
If it is not observed, serious injury may result.

CAUTION!
This icon indicates a **potentially dangerous situation** for the health of persons.
If it is not observed, injury or property damage may result.

IMPORTANT!
This icon indicates important instructions for correct working with the system.
If the instructions are not observed, faults in the system or the surroundings may result.

1.3 Proper use

The QWT series heat exchanger is designed exclusively for heating pool water via hot water heating.

The SWT series heat exchanger is designed exclusively for heating pool water via heat pump, solar system or a low temperature heating system.

The WTI series heat exchanger is designed exclusively for heating pool water via hot water heating; suitable for water with a raised chloride content (e.g. brine pools, therapy pools, seawater pools).

The SWT-T series heat exchanger is designed exclusively for heating pool water via heat pump, solar system or a low temperature heating system; suitable for water with a raised chloride content (e.g. brine pools, therapy pools, seawater pools).

Any other use or use beyond this is **not** considered proper use. The manufacturer, **BEHNCKE ® GmbH**, will not be liable for any damage resulting from improper use.

Any other use requires consultation with and approval by the manufacturer.

IMPORTANT!
Proper use also includes
- following all directions in the installation instructions and
- compliance with inspection and maintenance schedules.

The maximum approved operating pressure must not be exceeded.
Heating coil (primary side) max. 1000 kPa (10 bar)
Pool water (secondary side) max. 300 kPa (3 bar)

Only water with the following values may be used:

	QWT, SWT	**WTI, SWT-T**
Chloride content	max. 500 mg/	l max. 3000 mg/l
Free chlorine	max. 1.3 mg/l	unlimited
pH	6.5 - 8.2	6.5 - 8.2
Salt content	–	max. 3.5%

Conversions and modifications of the heat exchanger are prohibited for safety reasons.

1.4 Sources of danger

CAUTION!
The heat exchanger may be damaged.
If the max. operating pressure of 300 kPa (3 bar) is exceeded on the pool water side or 1000 kPa (10 bar) on the heating water side, the heat exchanger may sustain leaks.

WARNING!
There is a risk of combustion.
The connections on the heating water side of the heat exchanger can attain temperatures up to 100 °C.

CAUTION!
The heat exchanger can heat up to the feed temperature of the heating water if the pool water does not flow through it.
Connected plastic pipes may be thermally loaded to a non-permitted level and thus become damaged.

CAUTION!
If the heating circuit is not locked with the circulating/filter pump, the heat exchanger may heat up to the feed temperature of the heating water.
The heat exchanger may be damaged.
Due to water drips onto the exterior skin or metal parts being swept into the heat exchanger may be subject to contact corrosion due to immersion in water.

CAUTION!
Pool water can become contaminated.
Metal parts being swept away into the heating coil of the heat exchanger can cause leaks in the coil due to contact corrosion. Heating water can enter into the pool water.

1.5 Safety precautions at the installation site

The heat exchanger must be fitted in a frost-free area using the bracket supplied.
Make sure that the maximum positive operating pressure of 300 kPa (3 bar) on the secondary side and 1000 kPa (10 bar) on the primary side is not exceeded.

CAUTION!
The heat exchanger or surroundings may be damaged.
Inspect the heat exchanger and its connections for leakage and external damage at least once a week during pool operation.

2 Technical specifications

2.1 QWT 100*

		Minimum pumping output					
	Output: kW for	Heating		Pool water		Connection	
Article	70 °C	m³/h	kPa	m³/h	kPa	Inches	Article no.
QWT 100-20	16	2	4.3	10	4.3	1 ½ ¾	305.018.00
QWT 100-30	20	2	6.4	10	4.9	1 ½ ¾	305.026.00
QWT 100-40	30	2	9.7	10	5.3	1 ½ ¾	305.033.00
QWT 100-70	50	3	3.5	12	6.6	1 ½ 1	305.017.00
QWT 100-104	90	5	14	15	11.25	2 1	305.027.00
QWT 100-140	115	2 x 3	2 x 3.5	20	12.9	2 1	305.037.00
QWT 100-209	200	2 x 5	2 x 14	25	25.3	2 1	305.047.00

2.2 SWT 100*

		Minimum pumping output					
	Output: kW for	Heating		Pool water		Connection	
Item	70°C 50°C	m³/h	kPa	m³/h	kPa	Inches	Article no.
SWT 100-20	40 / 24	1.2	8	10	6	1 ½ ¾	330.004.00
SWT 100-25	65 / 35	1.8	27	10	7	1 ½ ¾	330.006.00
SWT 100-40	68 / 40	2.2	4	10	6	1 ½ 1	330.008.00
SWT 100-52	112 / 65	3.5	15	12	7	1 ½ 1	330.010.00

2.3 SWT 100 Titanium*

		Minimum pumping output					
	Output: kW for	Heating		Pool water		Connection	
Item	70°C 50°C	m³/h	kPa	m³/h	kPa	Inches	Article no.
SWT 100-20	40 / 24	1.2	8	10	6	1 ½ ¾	331.004.00
SWT 100-40	68 / 40	2.2	4	10	6	1 ½ ¾	331.008.00

2.4 WTI 100*

		Minimum pumping output					
	Output: kW for	Heating		Pool water		Connection	
Item	70 °C	m3/h	kPa	m3/h	kPa	Inches	Article no.
WTI 100-20	16	2	4.3	10	4.3	PVC 40 ¾	305.080.55
WTI 100-30	20	2	6.4	10	4.9	PVC 40 ¾	305.081.55
WTI 100-40	30	2	9.7	10	5.3	PVC 40 ¾	305.082.55
WTI 100-70	50	3	3.5	6.6	6.6	PVC 40 1	305.083.55
WTI 100-104	90	5	14	11.25	11.25	PVC 50 1	305.084.55
WTI 100-140	115	2 x 3	2 x 3.5	12.9	12.9	PVC 50 1	305.085.55
WTI 100-209	200	2 x 5	2 x 14	25.3	25.3	PVC 50 1	305.086.55

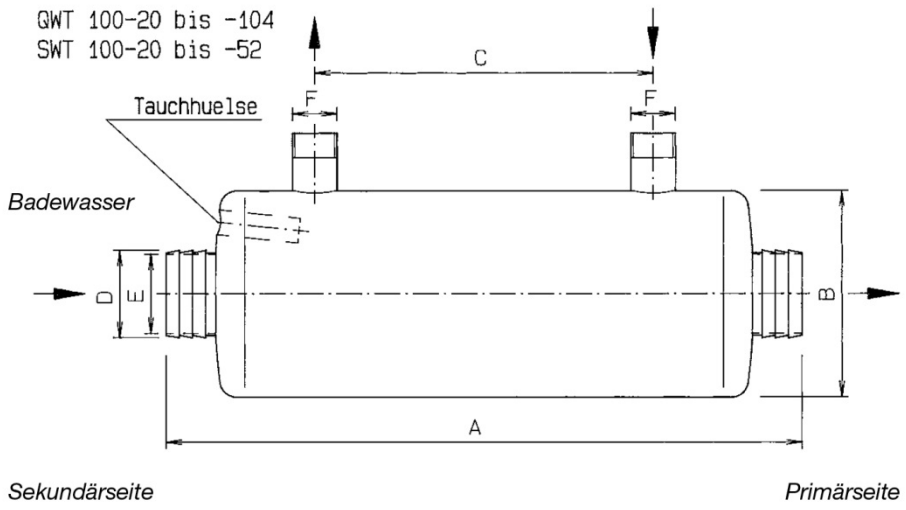
* Subject to modifications or custom versions.

3 Setup / installation

3.1 Transport / storage

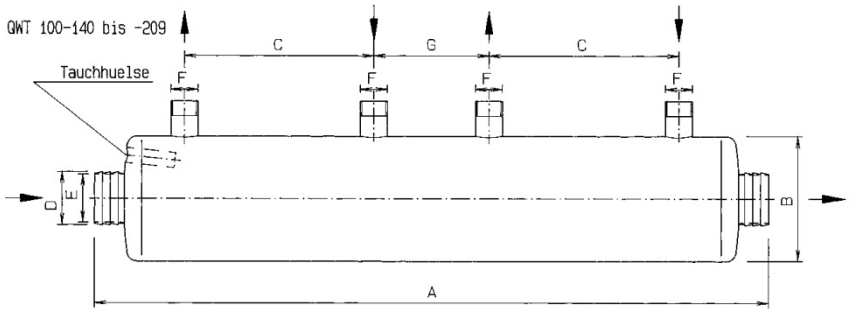
Transport the water heat exchanger only when empty.
Always store the washed and drained water heat exchanger indoors in a non-aggressive atmosphere.

3.2 Setup and connection dimensions

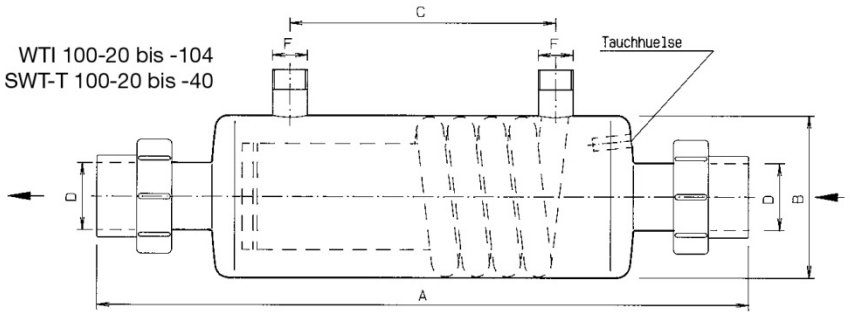


Item	A mm	B mm ø	C mm	D DN	E Inches	F Inches
QWT 100-20	275	125	90	50	1 1/2	3/4
QWT 100-30	315	125	135	50	1 1/2	3/4
QWT 100-40	385	125	205	50	1 1/2	3/4
QWT 100-70	520	190	290	50	1 1/2	1
QWT 100-104	660	190	430	60	2	1
SWT 100-20	530	153	335	50	1 1/2	3/4
SWT 100-25	710	153	520	50	1 1/2	3/4
SWT 100-40	800	190	570	50	1 1/2	1
SWT 100-52	1090	190	870	50	1 1/2	1

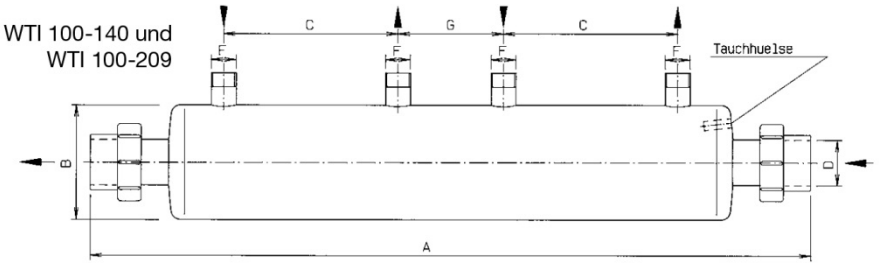
Setup / installation



Item	A mm	B mm ø	C mm	G mm	D DN	E Inches	F Inches
QWT 100-140	920	190	295	100	60	2	1
QWT 100-209	1190	190	430	100	60	2	1



Item	A mm	B mm ø	C mm	D DN	F Inches
WTI 100-20	395	125	90	PVC DN40	3/4
WTI 100-30	440	125	135	PVC DN40	3/4
WTI 100-40	505	125	205	PVC DN40	3/4
WTI 100-70	640	190	290	PVC DN40	1"
WTI 100-104	820	190	425	PVC DN40	1"
SWT-T 100-20	545	153	335	PVC DN40	3/4
SWT-T 100-40	815	130	570	PVC DN40	1"



Item	A mm	B mm ø	C mm	G mm	D DN	F Inches
QWT 100-140	1080	190	295	100	PVC DN50	1
QWT 100-209	1350	190	430	100	PVC DN50	1

3.3 Setup

Set up the heat exchanger indoors in frost-proof, dry rooms with a non-aggressive atmosphere only. Dripping water may damage the heat exchanger.

Make sure access for assembly and disassembly is guaranteed.

The heat exchanger can be installed above or below the water level.

CAUTION!
The following water values must be observed for the heat exchanger.

	QWT, SWT	WTI. SWT-T
Chloride content	max. 500 mg/l	max. 3000 mg/l
Free chlorine	max. 1.3 mg/l	unlimited
pH value	6.5 to 8.2	6.5 to 8.2
Salt content	-	max. 3.5 %
Max. water pressure, primary		1000 kPa (10 bar)
Max. water pressure, secondary		300 kPa (3 bar)

IMPORTANT!
When operating the heating circuit, the running empty of the heat exchanger on the pool water side must be prevented.

3.4 Installation

Before installation, check that the heat exchanger has no visible damage.

The heat exchanger can be installed horizontally or vertically above or below the water level.

3.4.1 Installation layout above the water level

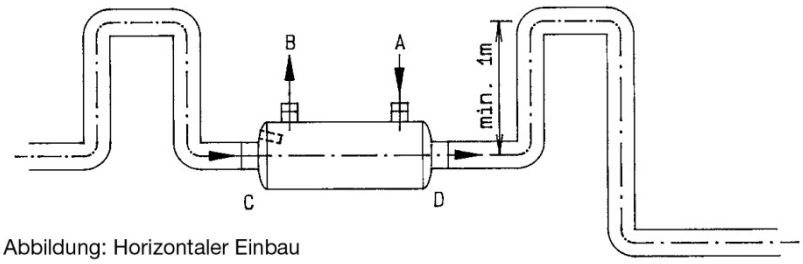


Abbildung: Horizontaler Einbau

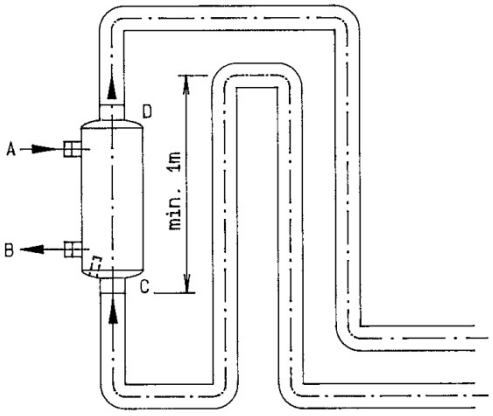


Abbildung: Vertikaler Einbau

3.4.2 Installation layout below the water level

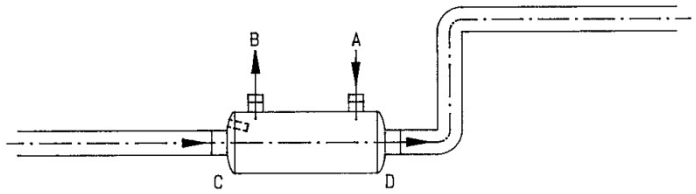


Abbildung: Horizontaler Einbau

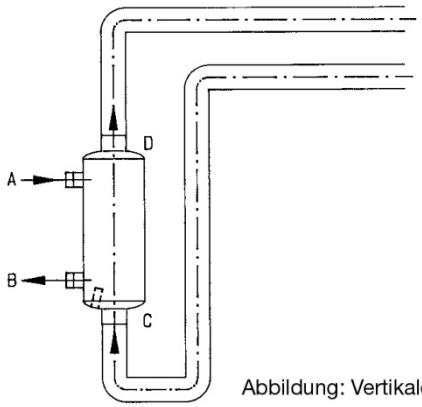


Abbildung: Vertikaler Einbau

3.4.3 Connecting the heat exchanger

CAUTION!
Install the stop and drainage valves in the feed and return lines of the heating circuit inside the frost-proof area of the building.
The heat exchanger may be damaged.
Ensure that the water quality and maximum pressure levels are observed.

CAUTION!
The heat exchanger may be damaged.
When installing a third-party circuit, make sure that metal parts cannot enter the heat exchanger.
The heat exchanger and steel pipes are electrically isolated by brass connections.
The heat exchanger can be damaged by chemicals.

CAUTION!
Purification equipment should always be installed after the heat exchanger. When using chemicals (e.g. chlorine gas), it is not permitted for any gases to penetrate the heat exchanger during filter standstill times.

3.4.3.1 QWT / SWT / WTI / SWT-T connection to a circulating pump / filter system

- Connect the hot water circuit to the primary side of the heat exchanger.
- Connect the secondary side of the heat exchanger to the pool water pipe via pipe connections using pipe clips or via the internal thread with plastic/brass screw connectors.
- Connect the WTI and SWT-T on the secondary side to the pool water pipework using PVC adhesive pipe bonds.

3.4.3.2 QWT 100-140 / 100-209 and WTI 100-140 / 100-209 connection to a filter system

- Connect both heating coils of the heat exchanger to the heating water circuit.
- Connect the secondary side of the heat exchanger to the pool water pipe via pipe connections using pipe clips or via the internal thread with plastic/brass screw connectors.
- Connect the WTI on the secondary side to the pool water pipework using PVC adhesive pipe bonds.

4 Function

In the QWT counterflow heat exchanger, the heat from the heating water circuit is transferred to the pool water circuit.

In the WTI counterflow heat exchanger, the heat from the heating water circuit is transferred to the pool water circuit. The WTI is manufactured from titanium and is suitable for use with water with raised free chlorine values (e.g. brine pools, therapy pools, seawater pools).

In the SWT counterflow heat exchanger, the heat from the low temperature heating water circuit or the solar system is transferred to the pool water circuit. The SWT-T is manufactured from titanium and is suitable for use with water with raised free chlorine values (e.g. brine pools, therapy pools, seawater pools).

A temperature sensor can be inserted into the integrated clamp in the immersion sleeve. In combination with a control, the temperature of the pool water can be controlled via the temperature controller.

5 Commissioning

WARNING!
Have you read and understood these operating instructions – particularly chapter 1 Safety? Do not operate the heat exchanger if you have not read and understood the instructions!
The heat exchanger may be damaged.
Do not climb on the heat exchanger.
Always close all stop valves in both water circuits before performing any maintenance and cleaning work.

- Drain both water circuits.

6 Maintenance / repair

Inspect the heat exchanger and connections for leaks once a week.

6.1 Winter storage of the WHE in frost-free areas

CAUTION!
Changes to technical systems by unqualified persons may result in injuries and property damage.
If decommissioned in frost-free areas, the heat exchanger must be completely filled with water.

6.2 Winter storage of the WHE in areas exposed to freezing

The heat exchanger can be stored under freezing conditions after the following preparations.

- Close stop valves in both water circuits.
- Drain the heat exchanger and connecting pipes to the stop valves.

6.2.1 Heat exchanger in vertical layout

- Completely drain the heat exchanger via the drain fittings.

6.2.2 Heat exchanger in horizontal layout

- Remove the heat exchanger in horizontal layout.
- Rinse the heat exchanger to remove contamination, and store dry.

7 Maintenance of the stainless steel

Instructions for long-life stainless steel

1. Keep the water in optimum clean condition at all times. Always follow the manufacturer's instructions when adding chemicals (pH, chlorine concentration, salts, etc.).
2. Never use disinfectants in the vicinity of stainless steel parts as these products are bleaching agents and could cause stains on stainless steel.
3. Stainless steel will rust in contact with dust, salts, concrete, dirt and other materials (particularly in contact with iron). Try to avoid such contacts.
4. When cleaning the pool (including the first time before filling the pool with water), it is always recommended to remove the stainless steel items. This means that no cleaning agent residues remain on the stainless steel parts. If it is not possible to remove the stainless steel parts, these should be cleaned thoroughly afterwards with water.
5. In indoor swimming pools there is a higher concentration of corrosive chemical vapours. For this reason, it is very important to carry out cleaning several times.
6. Where required, it is important to fit an earthing connection to the swimming pool to achieve correct insulation and thus a longer service life of the stainless steel items.
7. In systems with hard water or heavy contamination, the stainless steel quality is especially important.

Storage of stainless steel items

1. During the winter months it is advisable to follow the instructions below. Remove the stainless steel articles and rinse thoroughly with water. Dry the parts and do not keep with chemicals and dosing units.
2. If limescale or other stains appear on the stainless steel items, clean these using stainless steel cleaner and polishing agent - Never scrub with abrasive materials. - Then rinse thoroughly with soft water and allow to dry.

8 Faults and remedies

Effect	Check the possible cause
No power	Are the stop valves open? Is the heat exchanger completely filled with water in both circuits? Has the heat exchanger been vented? Is the flow sufficient in the heating circuit (see Technical specifications)?

9 EC Declaration of Conformity in the context of the EC Directives

Product:	**Coiled tube heat exchanger**
Manufacturer:	**BEHNCKE® GmbH**
Type:	**QWT, WTI, SWT, SWT-T**
Type plate no.	
Year of manufacture:	
Operating medium:	Fluid
Max. operating pressure of cylindrical wall (bar)	3
Test pressure of cylindrical wall (bar):	4.29
Max. operating pressure of pipe (bar):	10
Test pressure of pipe (bar):	14.3

The Declaration of Conformity is in accordance with the listed EC directives and has been developed, designed and manufactured by:

BEHNCKE® GmbH
Michael-Haslbeck-Str. 13
D-85640 Putzbrunn/Munich

- **Pressure Equipment Directive 97/23/EC**
- DIN EN ISO 13732-1 – Surface temperature requirements
- Original operating instructions in German

Putzbrunn	27.02.2013	Christian Ebert Operations Manager	
City	Date	Name/signer and details of signer	Signature