INSTALLATION INSTRUCTION

CW-500x250-3 A
CW-500x300-3 A
CW-600x350-3 A
CW-700x400-3 A
CW-900x500-3 A
CW-1000x500-3 A
HW-500x250-2 A
HW-500x250-4 A
HW-500x300-2 A
HW-500x300-4 A
HW-600x350-2 A
HW-600x350-4 A
HW-700x400-2 A
HW-700x400-3 A
HW-900x500-2 A
HW-900x500-3 A
HW-1000x500-2 A
HW-1000x500-3 A
HW-250-2 A
HW-250-4 A
HW-315-2 A
HW-315-4 A

Liquid heat exchanger in an uninsulated casing

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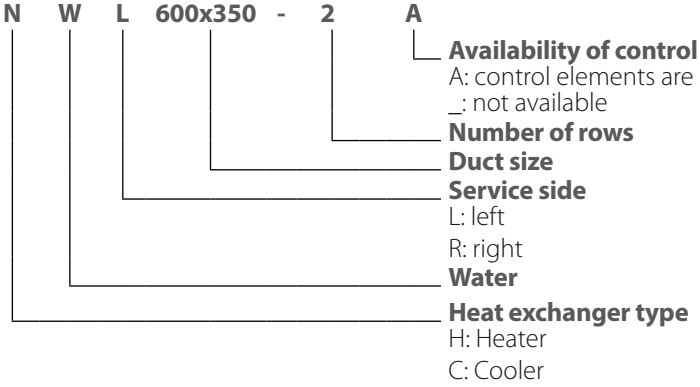
HW/CW is a component part and is not designed for independent operation.
The unit design is constantly being improved, thus some models may be slightly different from those described in this manual.

DESIGNATION KEY



COMPATIBILITY OF HEAT EXCHANGERS AND UNITS

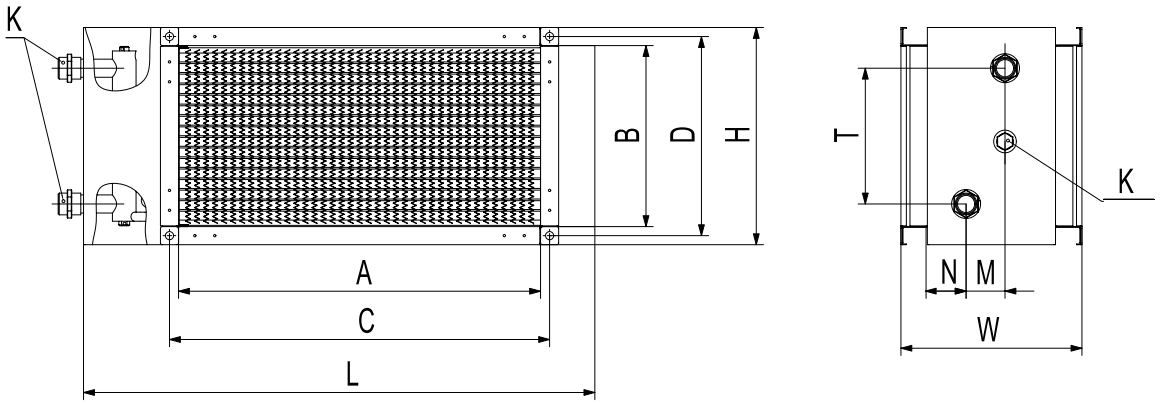
Water heat exchangers for heating

AV/AVC	01 CFP 700, 01 RV 1200, 01 RV 800	HW-250-2 A
AV/AVC	01 CFP 700, 01 RV 1200, 01 RV 800	HW-250-4 A
AV/AVC	01 CFV 1200, 01 CFV 800	HW-315-2 A
AV/AVC	01 CFV 1200, 01 CFV 800	HW-315-4 A
AV/AVC	01 CFV 1200, 01 CFV 800, 01 CFP 700	HW-500x250-2 A
AV/AVC	01 CFV 1200, 01 CFV 800, 01 CFP 700	HW-500x250-4 A
AV/AVC	01 CFP 1200, 02 RP 1500, 02 RP 2500	HW-500x300-2 A
AV/AVC	01 CFP 1200, 02 RP 1500, 02 RP 2500	HW-500x300-4 A
AV/AVC	02 CFV 1500, 02 CFV 2500, 02 RV 1500, 02 RV 2500, 03 CFV 3500, 03 RV 3500, 02 CFP 1500, 02 CFP 2500	HW-600x350-2 A
AV/AVC	02 CFV 1500, 02 CFV 2500, 02 RV 1500, 02 RV 2500, 03 CFV 3500, 03 RV 3500, 02 CFP 1500, 02 CFP 2500	HW-600x350-4 A
AV/AVC	03 CFV 3500, 03 RV 3500, 04 CFP 3500	HW-700x400-2 A
AV/AVC	03 CFV 3500, 03 RV 3500, 04 CFP 3500	HW-700x400-3 A
AV/AVC	06 CFP 5000	HW-900x500-2 A
AV/AVC	06 CFP 5000	HW-900x500-3 A
AV/AVC	07 CFV 6000, 07 RV 6000	HW-1000x500-2 A
AV/AVC	07 CFV 6000, 07 RV 6000	HW-1000x500-3 A

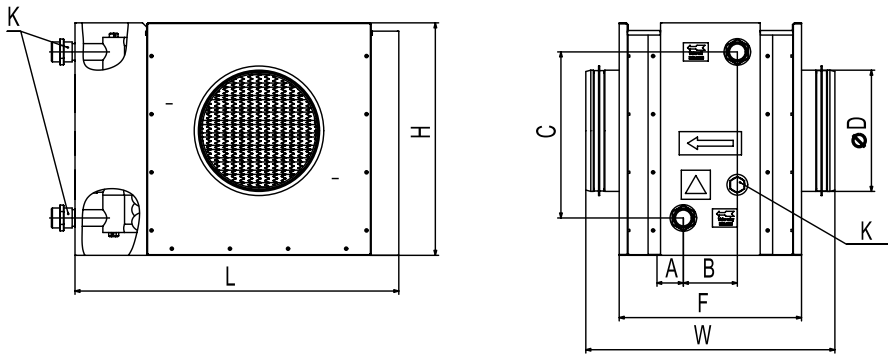
Water heat exchangers for cooling

AV/AVC	01 CFP 700, 01 CFV 1200, 01 CFV 800, 01 RV 1200, 01 RV 800	CW-500x250-3 A
AV/AVC	01 CFP 1200, 02 RP 1500, 02 RP 2500	CW-500x300-3 A
AV/AVC	02 CFV 1500, 02 CFV 2500, 02 RV 1500, 02 RV 2500, 02 CFP 1500, 02 CFP 2500	CW-600x350-3 A
AV/AVC	03 CFV 3500, 03 RV 3500, 04 CFP 3500	CW-700x400-3 A
AV/AVC	06 CFP 5000	CW-900x500-3 A
AV/AVC	07 CFV 6000, 07 RV 6000	CW-1000x500-3 A

WATER HEAT EXCHANGERS FOR HEATING

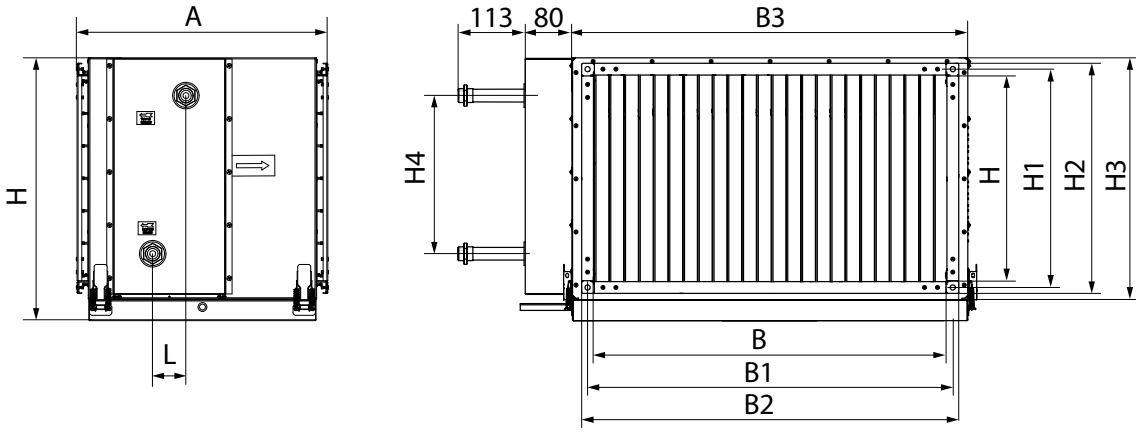


Type	Dimensions [mm]											Number of rows	Heat transfer medium volume [L]	Weight [kg]
	A	B	C	D	L	H	W	N	M	T	K			
HW 500*250-2	500	250	520	270	665	290	200	43	43	200	G 3/4"	2	1.2	6.6
HW 500*250-4	500	250	520	270	665	290	200	38	65	200	G 3/4"	4	2.4	10.2
HW 500*300-2	500	300	520	320	665	340	200	43	43	250	G 1"	2	1.5	7.1
HW 500*300-4	500	300	520	320	665	340	200	38	65	250	G 1"	4	2.8	11.4
HW 600*350-2	600	350	620	370	765	390	200	43	43	300	G 1"	2	1.9	8.8
HW 600*350-4	600	350	620	370	765	390	200	38	65	300	G 1"	4	3.6	14
HW 700*400-2	700	400	720	420	865	440	200	36	47	350	G 1"	2	2.3	10.6
HW 700*400-3	700	400	720	420	865	440	200	42	58	350	G 1"	3	3.0	14.6
HW 900*500-2	900	500	920	520	1065	540	200	36	47	450	G 1"	2	3.4	16.4
HW 900*500-3	900	500	920	520	1065	540	200	42	58	450	G 1"	3	4.5	17.6
HW 1000*500-2	1000	500	1020	520	1165	540	200	36	47	450	G 1"	2	3.6	18.5
HW 1000*500-3	1000	500	1020	520	1165	540	200	42	58	450	G 1"	3	5.1	19.8



Type	Dimensions [mm]									Number of rows	Heat transfer medium volume [L]	Weight [kg]
	D	L	H	W	F	A	B	C	K			
HW 250-2	248	470	350	350	270	32	43	270	G 1"	2	0.62	6
HW 250-4	248	470	350	350	270	28	65	270	G 1"	4	1.08	6.3
HW 315-2	313	550	430	450	370	57	43	350	G 1"	2	0.95	6.7
HW 315-4	313	550	430	450	370	53	65	350	G 1"	4	1.66	7.1

WATER HEAT EXCHANGERS FOR COOLING

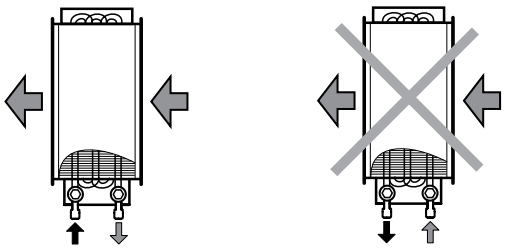


Type	Dimensions [mm]											Heat transfer medium volume [L]	Weight [kg]
	B	B1	B2	B3	H	H1	H2	H3	H4	L	K		
CW 500x250-3	500	520	540	570	250	270	290	345	188	45	G 3/4"	1.4	21.0
CW 500x300-3	500	520	540	570	300	320	340	395	252	56	G 3/4"	1.8	23.5
CW 600x350-3	600	620	640	670	350	370	390	445	268	56	G 3/4"	2.3	29.0
CW 700x400-3	700	720	740	770	400	420	440	495	314	56	G 3/4"	3.0	35.9
CW 900x500-3	900	920	940	970	500	520	540	595	442	56	G 3/4"	4.8	51.7
CW 1000x500-3	1000	1020	1040	1070	500	520	540	595	442	56	G 1"	5.3	52.5

TECHNICAL DATA

Maximum operating pressure of the heat transfer medium:	
Water heating heat exchanger (HW)	1.6 MPa
Water cooling heat exchanger (CW)	1.5 MPa
Maximum temperature of the heat transfer medium: 100 °C (inlet)	
Minimum temperature of the coolant: +5 °C (no antifreeze)	
Materials:	
tubes	copper
fins	aluminum
casing	galvanized steel
threaded fittings	brass
Connection thread	G 3/4 or G 1 (according to the size chart).
Heat / coolant transfer medium	water or water-glycol mixture.

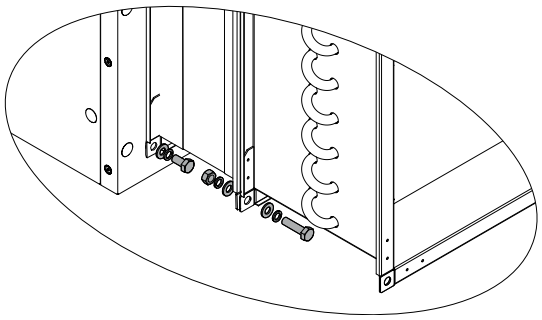
MOUNTING OF THE HEAT EXCHANGER



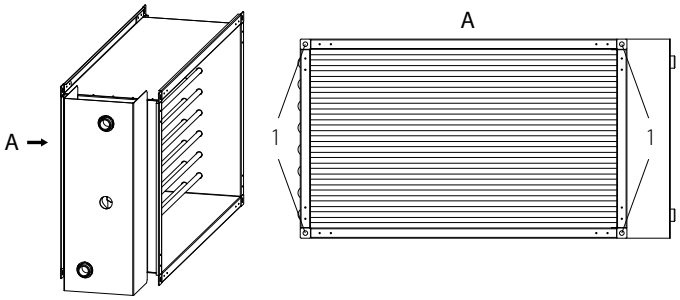
The flow and return connections to the heat exchanger must be made in such a way that the heat exchanger operates in counter-flow mode.

Direct-flow connection reduces the temperature difference and reduces the heat output of the heat exchanger.

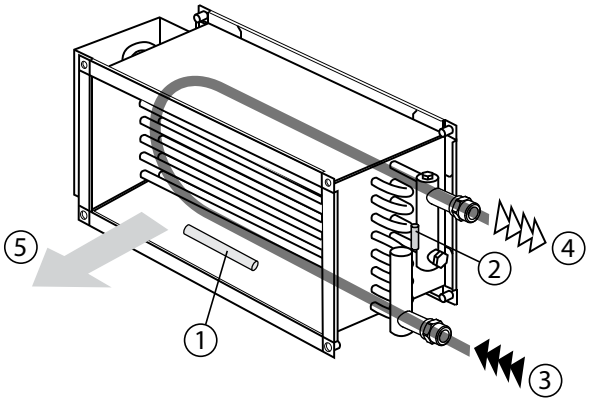
The supply piping system for the heat transfer medium must be designed so that it does not interfere with other sections.
Heat exchangers must be connected to the supply system in a way that allows for easy disassembly of the piping and enables the heat exchanger to be removed from the installation space during maintenance operations.



Use the fasteners as shown in the figure to connect the heating/ cooling heat exchangers to the unit.



Secure the heat exchanger casing to the unit with screws.
1 - mounting screw points.



Sensor placement

The return water temperature sensor **TE3** (2) is used to protect the water heating heat exchanger from freezing; it is mounted in such a way as to ensure adequate contact with the surface of the piping. **The thermostat** (1) is used to protect the water heating heat exchanger from freezing; it is installed directly on the surface of the water heating heat exchanger on the side of the heated air outlet (5) and measures the air temperature upstream of the heating heat exchanger.

1 — thermostat;
2 — return water temperature sensor TE3;
3 — heat transfer medium inlet;
4 — heat transfer medium outlet;
5 — air flow direction.

The supply air temperature control sensor **TE5** must always be located downstream of the heating or cooling heat exchanger (in the direction of air flow) and installed in the air duct downstream of the heat exchanger at a distance of 3 m from it.

Hydraulic connection

Before connecting the heat exchanger to the piping system, verify that the system's operating pressure does not exceed the unit's maximum acceptable pressure.
The recommended operating fluid velocity in the tubes is 0.2–1.0 m/s.
Exceeding the velocity beyond 1.5 m/s may lead to increased hydraulic noise and tube erosion.
The hydraulic resistance of the operating fluid when selecting a circulation pump is calculated according to the technical specifications for the unit.

Condensate drainage

The components of the unit that have a condensate drain must be equipped with a trap to ensure that the casing is watertight and that water can be drained out uninterrupted through the drainage spigot on both the suction and discharge sides.

Recommendations for organizing condensate drainage are given below.
All components of the system are not included in the delivery set of the unit and must be purchased separately.
The manufacturer of the ventilation system is not liable for the operability of the condensate drainage system installed at a particular facility.

When installing the heat exchanger on the floor, ensure sufficient distance from the floor to the bottom of the heat exchanger to fit the entire condensate drainage system.

A trap must be provided at each drainage spigot, separating it from the drainage pipe. Multiple outlets must not be connected to a common trap.

The drainage pipes must have a downward slope of at least 3°, without any tapering or loops, so as not to obstruct the water flow.

Due to the positive or negative air pressure inside the air handling unit, water cannot drain out of the condensate drip tray by itself. Therefore, it is necessary to connect a trap of a suitable height or a trap with a one-way valve to the drainage pipe. The trap must have a water level that is high enough to counteract the pressure drop between the internal and external space.

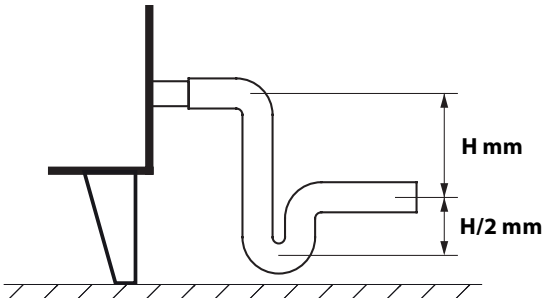
The height of the trap is selected based on the static pressure inside the air handling unit (the static pressure is specified in the technical data sheet for the unit).

- only use the positive value for calculations;
- take into account the final pressure drop (filter, etc.).

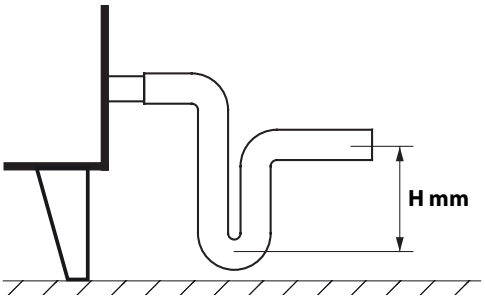
For a trap wit no one-way valve, the height **H** is determined by the static pressure **p** using the formula:
H [mm] = 25 + **p,** if the pressure is expressed in mm of the water level.
H [mm] = 25 + 0.1**p** if the pressure is expressed in Pa.

The figures below illustrate the geometric features of the traps.

The suction side. Negative pressure (**$p < p_{atmospheric}$**)

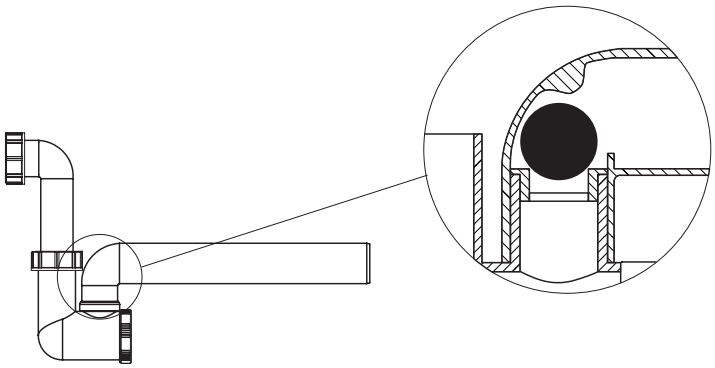


The discharge side. Positive pressure (**$p > p_{atmospheric}$**)



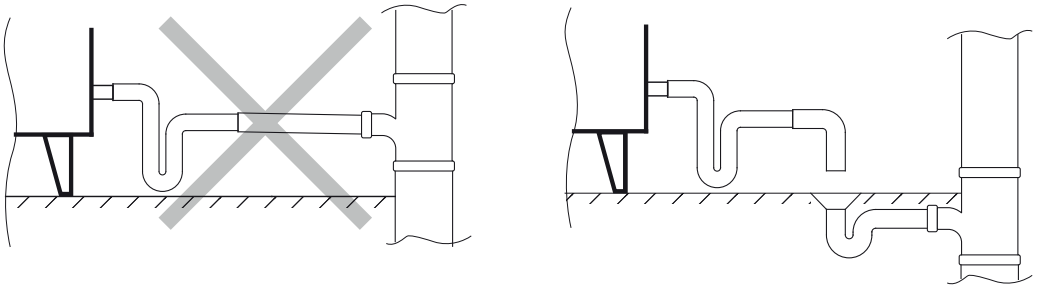
If the trap is equipped with a one-way valve, the height can be reduced, but this depends on the technical data of the trap. It is recommended to choose the height similarly to the trap without a one-way valve.

The figure below illustrates a schematic example of a trap with a one-way valve.



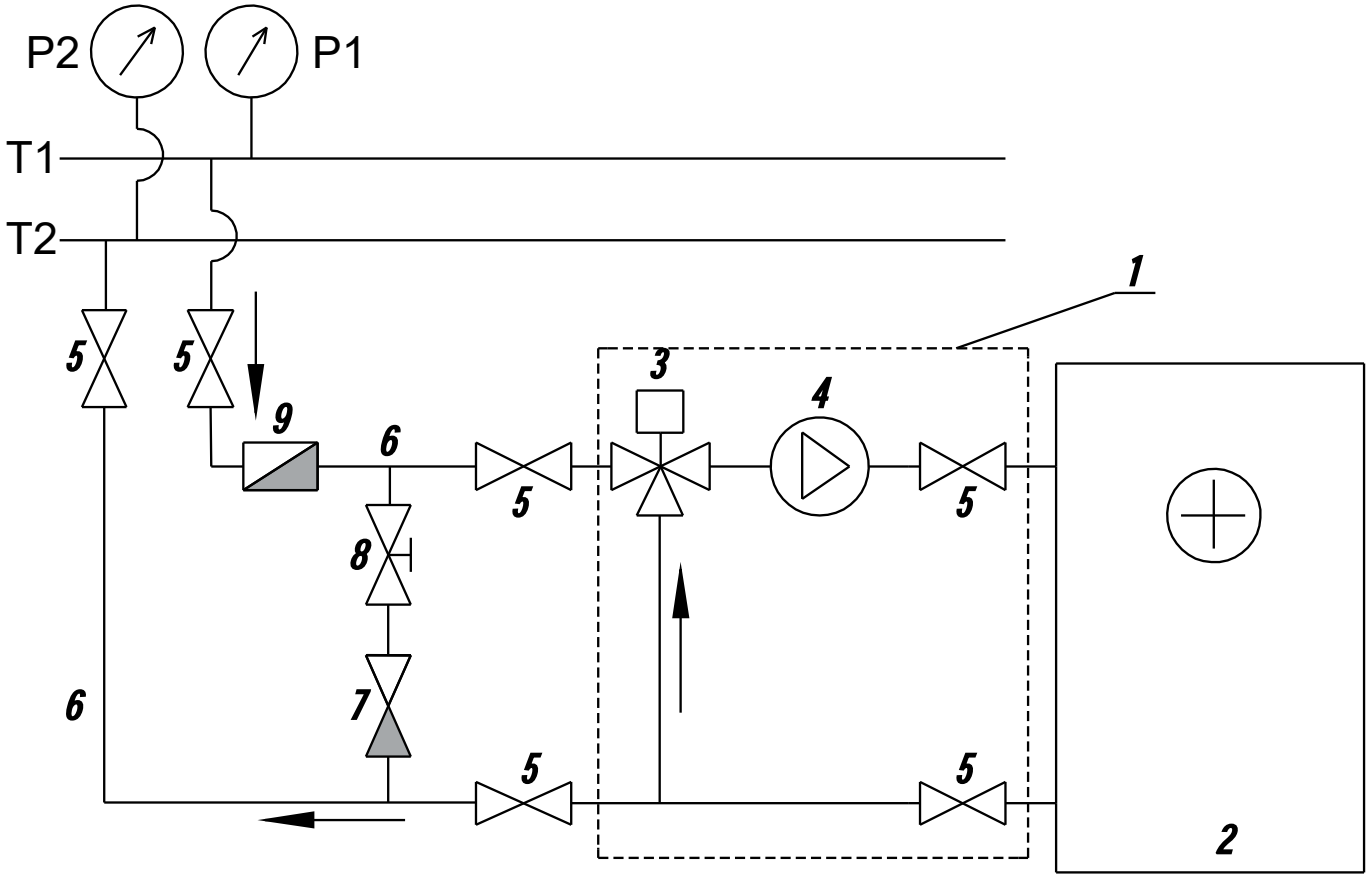
Fill up the U-traps with water before using the system.
The trap must be filled with water at all times as long as the system is operating.

The condensate drainage system should not be directly connected to the common sewage system to avoid polluting the air with bacteria and odors.



To prevent the water from freezing over in winter, the pipeline laid outdoors or in unheated rooms must be equipped with heat insulation and pre-heating.

Connection diagram to municipal water mains



T1 and T2 - supply and return pipelines of heating/cooling system
P1 and P2 - liquid pressure gages in the heat distribution system
1 - USWK mixing unit
2 - water heater
3 - three-way valve with actuator
4 - circulation pump
5 - shut-off valve
6 - supply and return pipeline connection between heating system and water heater
7 - non-return valve
8 - balancing valve
9 - coarse filter

TECHNICAL MAINTENANCE

Water heat exchangers must be fitted with frost protection systems. A non-freezing liquid (e.g. a water-glycol mixture) can be optionally used in winter. If the heating system is switched off or the unit is switched off, or the air temperature may drop below +5 °C, the water must be drained from the heat exchanger.

Regularly check the level of soiling of the heat exchanger. The deposition of dust on the surface of the heat exchanger leads to a deterioration in its heat output and an increase in air resistance. Even if the unit is equipped with filters, the dust contained in the supply air settles on the heat exchanger plates. If the heat exchanger plates are dirty, they must be cleaned in one of the following ways:

Using a vacuum cleaner with a soft suction nozzle.

Blowing with a jet of compressed air directed parallel to the heat exchanger lamellas.

Rinsing with warm water and a cleaning agent that will not corrode the aluminium or copper elements.

When the unit is switched off, the temperature of the circulating heat medium must be kept to a minimum so that the temperature inside the unit does not exceed +60 °C. Exceeding this value can cause damage to certain components or units installed in neighbouring sections.

STORAGE AND TRANSPORTATION REGULATIONS

- Store the unit in the manufacturer's original packaging box in a dry closed ventilated premise with temperature range from +5 °C to + 40 °C and relative humidity up to 70 %.
- Storage environment must not contain aggressive vapors and chemical mixtures provoking corrosion, insulation, and sealing deformation.
- Use suitable hoist machinery for handling and storage operations to prevent possible damage to the unit.
- Follow the handling requirements applicable for the particular type of cargo.
- The unit can be carried in the original packaging by any mode of transport provided proper protection against precipitation and mechanical damage. The unit must be transported only in the working position.
- Avoid sharp blows, scratches, or rough handling during loading and unloading.
- Prior to the initial power-up after transportation at low temperatures, allow the unit to warm up at operating temperature for at least 3-4 hours.

MANUFACTURER'S WARRANTY

The product is in compliance with EU norms and standards on low voltage guidelines and electromagnetic compatibility. We hereby declare that the product complies with the provisions of Electromagnetic Compatibility (EMC) Directive 2014/30/EU of the European Parliament and of the Council, Low Voltage Directive (LVD) 2014/35/EU of the European Parliament and of the Council and CE-marking Council Directive 93/68/EEC. This certificate is issued following test carried out on samples of the product referred to above.
The manufacturer hereby warrants normal operation of the unit for 24 months after the retail sale date provided the user's observance of the transportation, storage, installation, and operation regulations. Should any malfunctions occur in the course of the unit operation through the Manufacturer's fault during the guaranteed period of operation, the user is entitled to get all the faults eliminated by the manufacturer by means of warranty repair at the factory free of charge. The warranty repair includes work specific to elimination of faults in the unit operation to ensure its intended use by the user within the guaranteed period of operation. The faults are eliminated by means of replacement or repair of the unit components or a specific part of such unit component.

The warranty repair does not include:
- routine technical maintenance
- unit installation/dismantling
- unit setup

To benefit from warranty repair, the user must provide the unit, the user's manual with the purchase date stamp, and the payment paperwork certifying the purchase. The unit model must comply with the one stated in the user's manual. Contact the Seller for warranty service.

The manufacturer's warranty does not apply to the following cases:
- User's failure to submit the unit with the entire delivery package as stated in the user's manual including submission with missing component parts previously dismounted by the user.
- Mismatch of the unit model and the brand name with the information stated on the unit packaging and in the user's manual.
- User's failure to ensure timely technical maintenance of the unit.
- Damage to the unit casing and internal components caused by the user.
- Redesign or engineering changes to the unit.
- Replacement and use of any assemblies, parts and components not approved by the manufacturer.
- Unit misuse.
- Violation of the unit installation regulations by the user.
- Violation of the unit control regulations by the user.
- Unit connection to power mains with a voltage different from the one stated in the user's manual.
- Unit breakdown due to voltage surges in power mains.
- Discretionary repair of the unit by the user.
- Unit repair by any persons without the manufacturer's authorization.
- Expiration of the unit warranty period.
- Violation of the unit transportation regulations by the user.
- Violation of the unit storage regulations by the user.
- Wrongful actions against the unit committed by third parties.
- Unit breakdown due to circumstances of insuperable force (fire, flood, earthquake, war, hostilities of any kind, blockades).
- Missing seals if provided by the user's manual.
- Failure to submit the user's manual with the unit purchase date stamp.
- Missing payment paperwork certifying the unit purchase.

FOLLOWING THE REGULATIONS STIPULATED HEREIN WILL ENSURE A LONG AND TROUBLE-FREE OPERATION OF THE UNIT

USER'S WARRANTY CLAIMS SHALL BE SUBJECT TO REVIEW ONLY UPON PRESENTATION OF THE UNIT, THE PAYMENT DOCUMENT AND THE USER'S MANUAL WITH THE PURCHASE DATE STAMP

CERTIFICATE OF ACCEPTANCE

Unit Type	Liquid heat exchanger in an uninsulated casing
Model	
Serial Number	
Manufacture Date	
Quality Inspector's Stamp	

SELLER INFORMATION

Seller	
Address	
Phone Number	
E-mail	
Purchase Date	
This is to certify acceptance of the complete unit delivery with the user's manual. The warranty terms are acknowledged and accepted.	
Customer's Signature	

Seller's Stamp

INSTALLATION CERTIFICATE

The _____ unit is installed pursuant to the requirements stated in the present user's manual.		
Company name		
Address		
Phone Number		
Installation Technician's Full Name		
Installation Date:	**Signature:**	
The unit has been installed in accordance with the provisions of all the applicable local and national construction, electrical and technical codes and standards. The unit operates normally as intended by the manufacturer.		
Signature:		

Installation Stamp

WARRANTY CARD

Unit Type	Liquid heat exchanger in an uninsulated casing
Model	
Serial Number	
Manufacture Date	
Purchase Date	
Warranty Period	
Seller	

Seller's Stamp

Manufacturer: Ventilation Systems LLC,
Ukraine, Kyiv, 1 M. Kotsyubynskoho Street
Address of production facilities:
Ukraine, Kyiv Region, Fastiv District, Boyarka, 36 Sobornosti Street

V234-2EN-01