GB

CW/CCW cooling coil

for VEX100-200-340-350-360-370 with EXact2

Original instructions

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EXHAUSTO

1. Product information

2. Mechanical assembly

3. Electrical installation

4. Commissioning and operation

5. Maintenance

6. Troubleshooting

7. Technical specifications

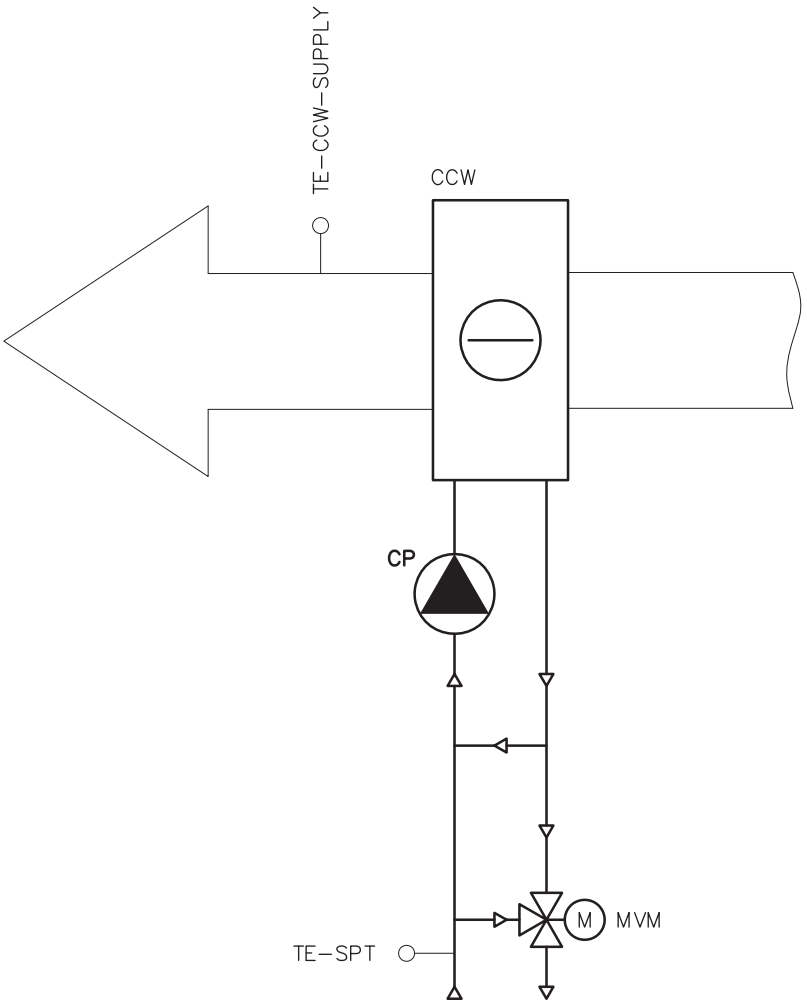
1. Product information

1.1 Application

1.1.1 Application

EXHAUSTO's cooling coil CW/CCW is a cooling coil used to lower the temperature of the supply air. The cooling coil can be used for both left and right units. Depending on VEX type, the cooling coil has connections for round or square ducts.

Designations used in these instructions



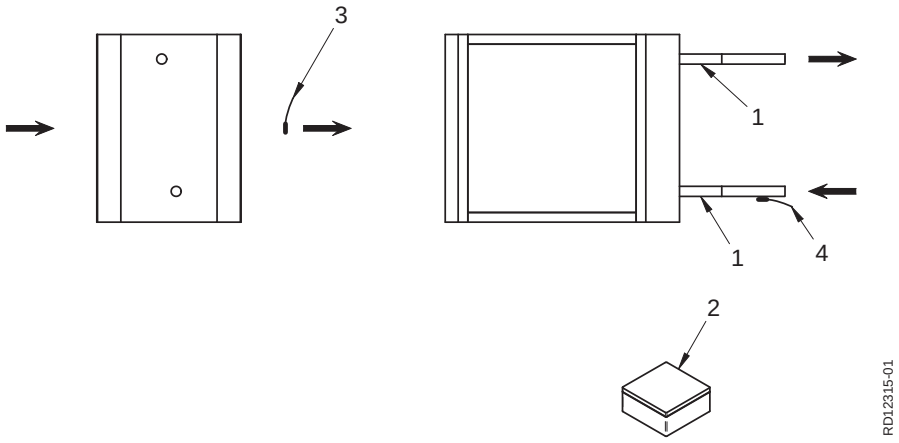
Designation	Function	Standard/accessory
TE-CCW-SUPPLY	Temperature sensor, supply air	Standard
TE-SPT	Temperature sensor on supply pipe to the cooling coil	Standard
CP	Circulation pump	Not supplied by EXHAUSTO

1.2 Description

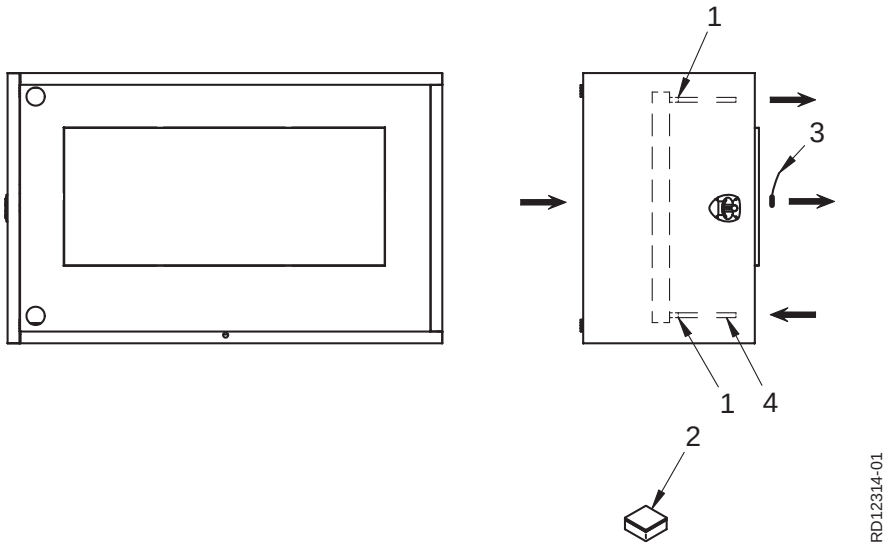
Design

The two drawings below illustrate the cooling coil layout (models for connecting to square ducts):

Uninsulated CW/CCW cooling coil



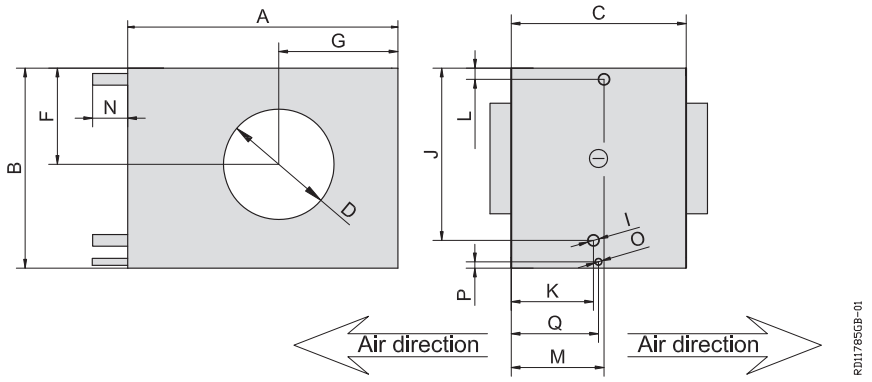
Insulated CW/CCW cooling coil



Pos. no.	Part	Function
1	Spigots for connecting water to the system	Water connection to cooling coil. Feed and return pipes are shown by labels.
2	MCCW-MODULE	MCCW control.
3	TE-CCW-SUPPLY	Measures the temperature in the supply air duct
4	TE-SPT	Measures the temperature of the supply water

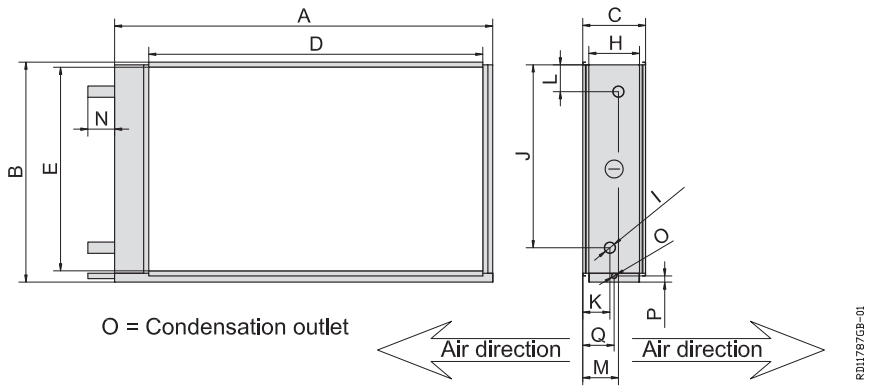
1.3 Principal dimensions

Uninsulated circular coils



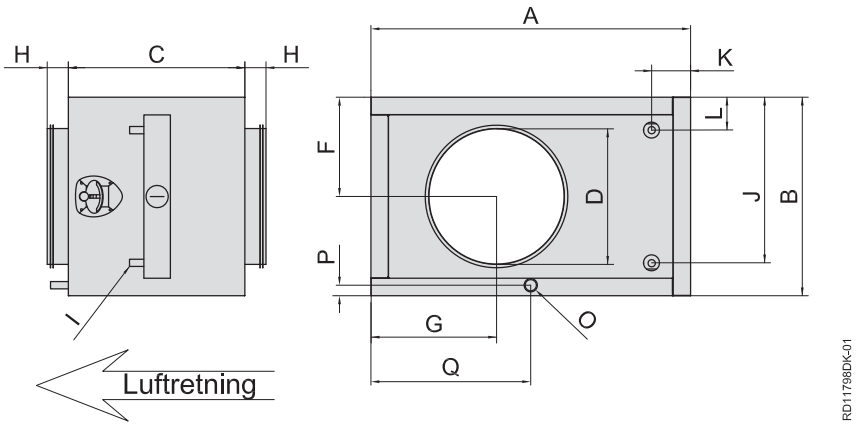
Type	A	B	C	D	F	G	I	J	K	L	M	N	O	P	Q
CW315	757	575	520	Ø315	275	475	DN25 (1")	497	227,5	33	292,5	105	¾"	27	260
CCW240	757	575	520	Ø315	290	330	DN25 (1")	497	227,5	33	292,5	105	¾"	27	260
CCW340	757	575	520	Ø400	290	330	DN25 (1")	497	227,5	33	292,5	105	¾"	27	260
CW400	907	600	520	Ø400	282,5	518	DN32 (1¼")	517	216,5	38	303,5	105	¾"	27	260
CCW250	907	600	520	Ø400	300	370	DN32 (1¼")	517	216,5	38	303,5	105	¾"	27	260

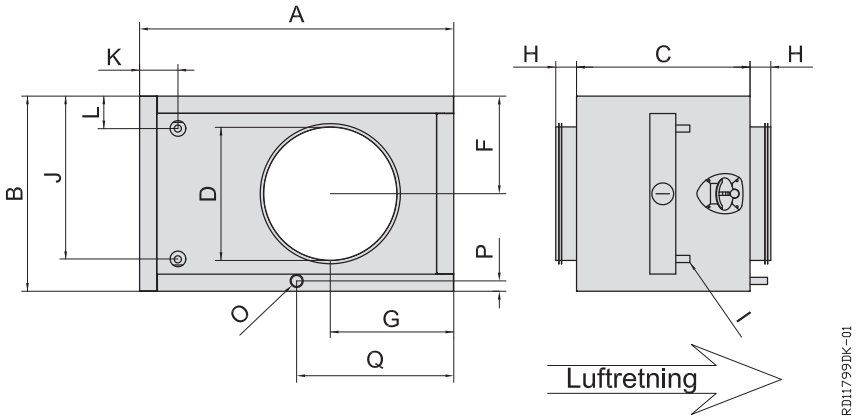
Uninsulated square coils



Type	A	B	C	D	E	H	I	J	K	L	M	N	O	P	Q
CW065x100	1164	711	235	1000	650	155	DN32 (1¼")	619	85	50	150	97,5	¾"	21	117,5
CW076x125	1397	831	333	1250	762	253	DN40(1½")	774	123	50	210	100	¾"	21	166,5
CW080x120	1485	900	333	1200	800	253	DN32 (1¼")	795	134	53	199	100	¾"	21	166,5
CW100x160	1785	1069	333	1600	1000	253	DN50 (2")	957	134	56	199	100	¾"	21	166,5

Insulated circular coils

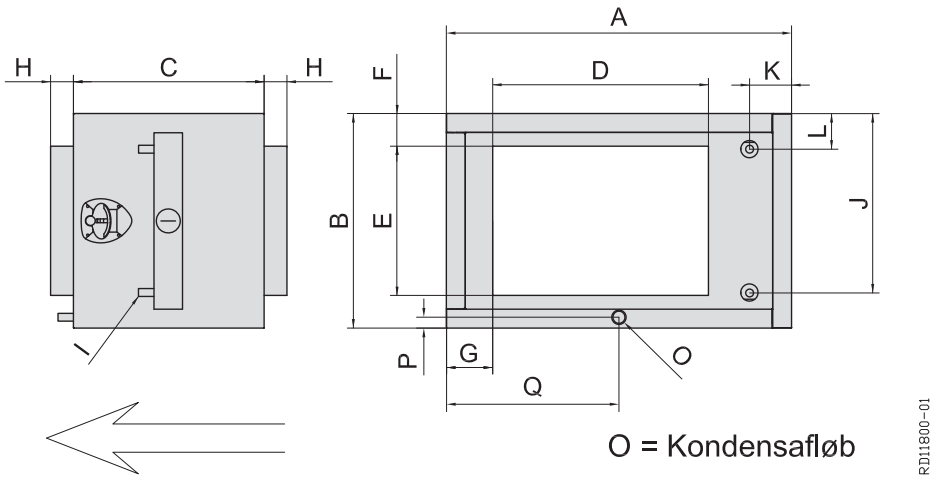


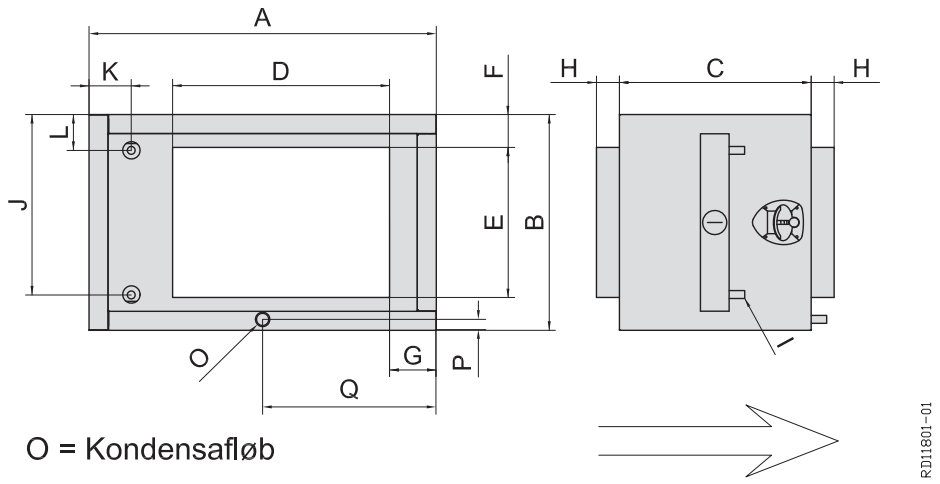


Type	A	B	C	D	F	G	H	I	J	K	L	O	P	Q
CW315	860	676	750	Ø315	262.5	430/ 475	62	DN25(1")	547	100	97	½"	36.25	430/ 475
CW400	1015	701	750	Ø400	290	518/ 507.5	62	DN32(1¼")	547	80	97	½"	36.25	518/ 507.5
CW500	1265	826	750	Ø500	340	553	62	DN40(1½")	697	80	97	½"	36.25	632.5
CCW240L V1 CCW240R V2	860	676	750	Ø315	381.5	330	62	DN25(1")	547	100	97	½"	36.25	430
CCW240L V2 CCW240R V1	860	676	750	Ø315	288	330	62	DN25(1")	547	100	97	½"	36.25	430
CCW250L V1 CCW250R V2	1015	701	750	Ø400	408	370	62	DN32(1¼")	572	80	97	½"	36.25	507.5
CCW250L V2 CCW250R V1	1015	701	750	Ø400	289	370	62	DN32(1¼")	572	80	97	½"	36.25	507.5

V1 = Fan location 1, 2 = Fan location 2

Insulated square coils





Type	A	B	C	D	E	F	G	H	I	J	K	L	O	P	Q
CW050x060	1525	778	750	600	500	190	319	62	DN40(1½")	778	90	97	½"	36.25	762.5
CCW260L V1 CCW260R V2	1265	826	750	800	400	245	233	62	DN40(1½")	697	80	97	½"	36.25	632.5
CCW260L V2 CCW260R V1	1265	826	750	800	400	174	233	62	DN40(1½")	697	80	97	½"	36.25	632.5
CCW270L V1 CCW270R V2	1525	946	750	1000	500	251	263	62	DN40(1½")	778	90	97	½"	36.25	762.5
CCW270L V2 CCW270R V1	1525	946	750	1000	500	187	263	62	DN40(1½")	778	90	97	½"	36.25	762.5
CCW280L V1 CCW280R V2	1900	1181	750	1400	600	344	250	20	DN 50(2")	1016	90	97	½"	36.25	950
CCW280L V2 CCW280R V1	1900	1181	750	1400	600	240	250	20	DN 50(2")	1016	90	97	½"	36.25	950

CCW 350/360	1265	826	750	800	500			62	DN 32(1¼")	697	80	97	½"	36.25	632.5
CCW 370R	1580	830	850	1200	600	116	82	63	DN(1¼")	663	74	160	1"	23	778
CCW 370L	1580	830	850	1200	600	116	82	63	DN(1¼")	670	74	160	1"	23	778

V1 = Fan location 1, 2 = Fan location 2

2. Mechanical assembly

2.1 Unpacking

2.1.1 Before unpacking

Unpacking

In general, the product should be protected from dust before it is started – this is due to dust and hygiene considerations.

Supplied components

The following components are supplied:	Standard	Accessories
CW/CCW	X	
MCCW module		X
MVM valve		X
Temperature sensor, supply air duct (TE-CCW-SUPPLY)		X
Temperature, supply (TE-SPT).		X

Delivery, CW-X/ CCW-X

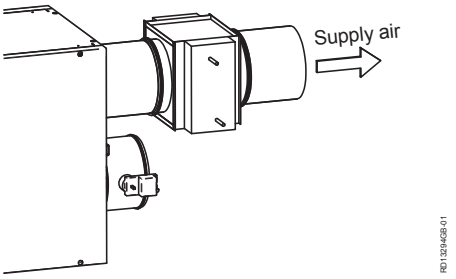
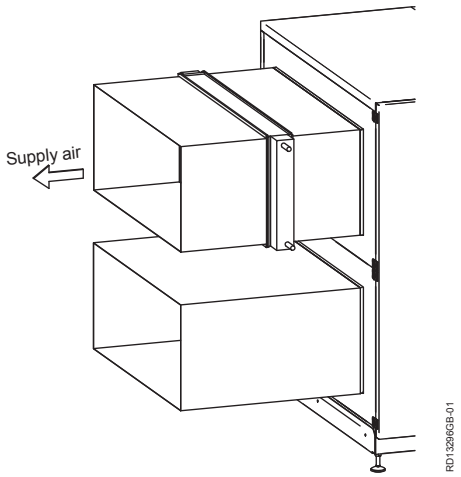
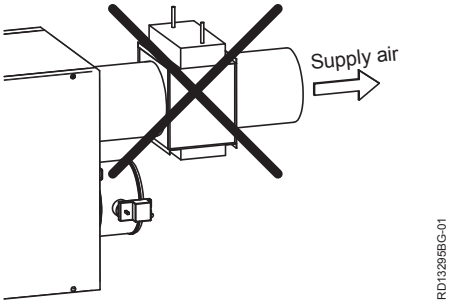
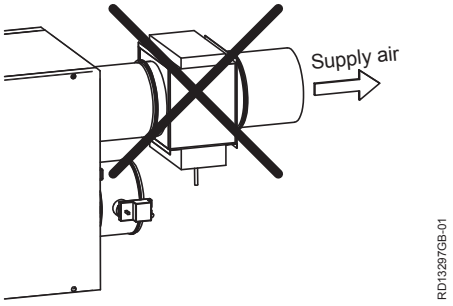
If the coil is for use with a third-party control system, the following components are supplied:

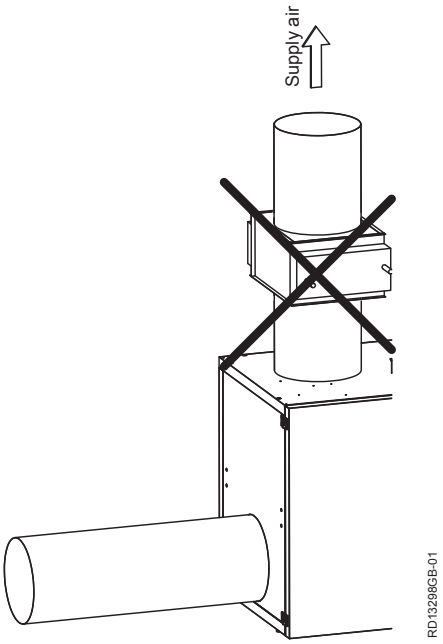
The following components are supplied:	Standard
CW/CCW cooling battery	X

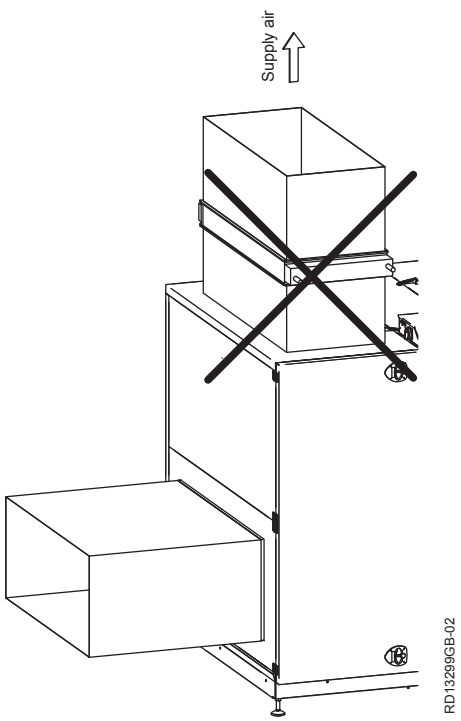
2.2 Position in relation to VEX

2.2.1 Correct positioning of cooling coil

Position the cooling coil on the supply air duct or directly on the VEX unit supply air spigot.

✓		
✗		





The cooling coil must always be supported - during fitting as well The fixture for this is not part of the EXHAUS-TO delivery.

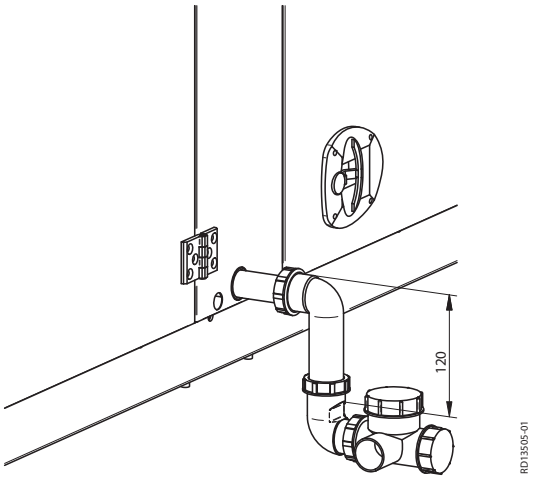
The cooling coil must always be positioned so that the air flows through it horizontally.

The cooling coil pipe must be horizontal and the connecting manifold vertical, so that the system can be bled and water in the system can be topped up/emptied.

2.2.2 Condensation outlet

Water trap

Establish a water trap from the condensation outlet, as shown on the drawing. Lead the condensation outlet into a floor gully or similar.



Connection

The condensation outlet must have a water trap as shown on the diagram.

Risk of frost

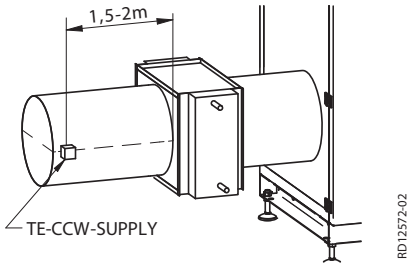
Where there is a risk of frost: Insulate the condensation outlet and protect it against frost - if necessary, using a heating cable.

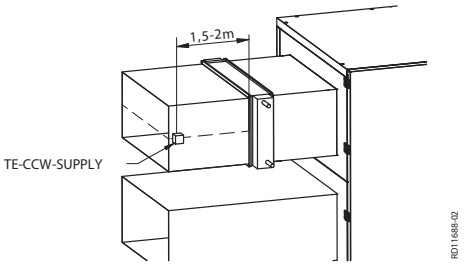
Correct dimensions

Pressure P (Pa)	H
200	115 mm
500	190 mm
750	230 mm

2.2.3 Positioning the temperature sensor (TE-CCE-SUPPLY) in duct

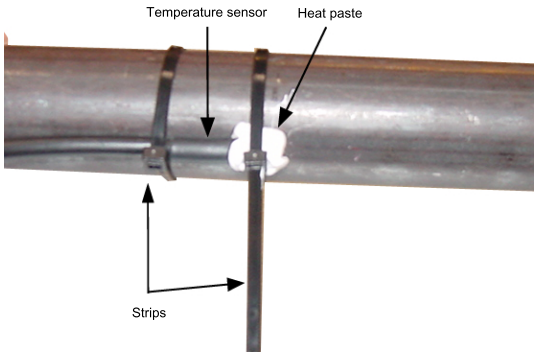
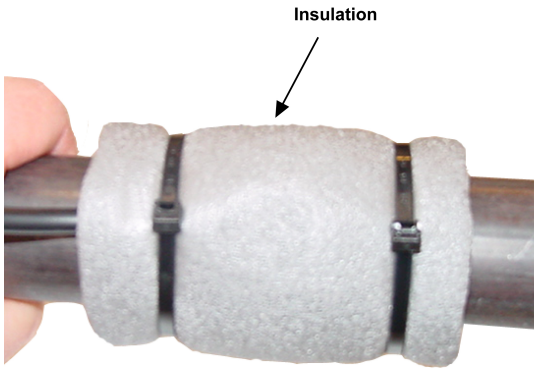
The temperature sensor is positioned here





2.2.4 Correct fitting of TE-SPT

Correctly fitting the temperature sensor (TE-SPT) on the supply pipe of the cooling coil:

Step	Action	
1.	Use heat paste to ensure good contact between the pipe and the sensor. Use strips to secure the sensor in position	
2.	Ensure there is sufficient insulation around the sensor	

2.3 Cooling coil

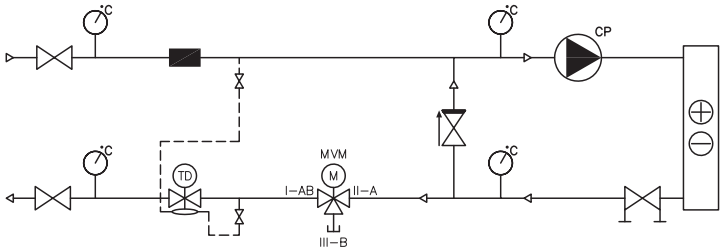
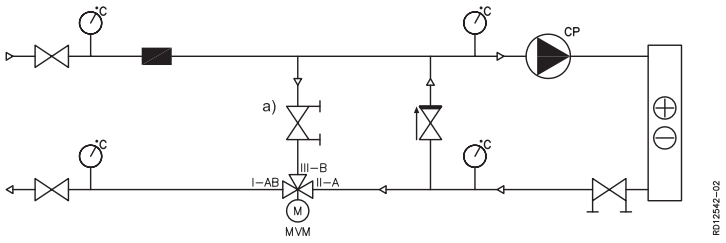
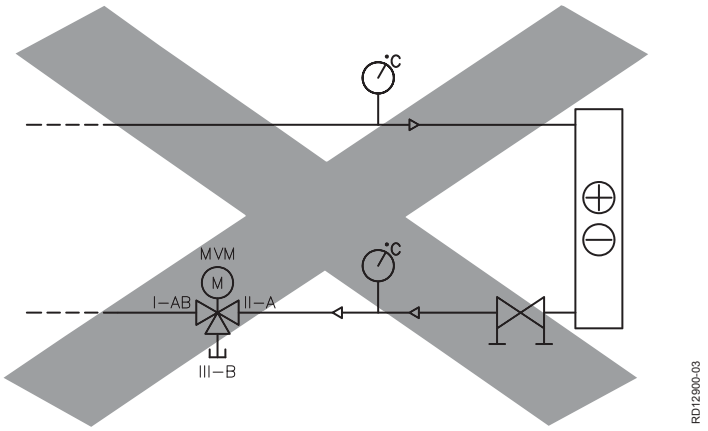
2.3.1 Connecting an insulated CW/CCW

With an insulated CW/CCW, the connection must be made with stopcocks and unions, in order to allow easy release, extraction and cleaning of the coil.

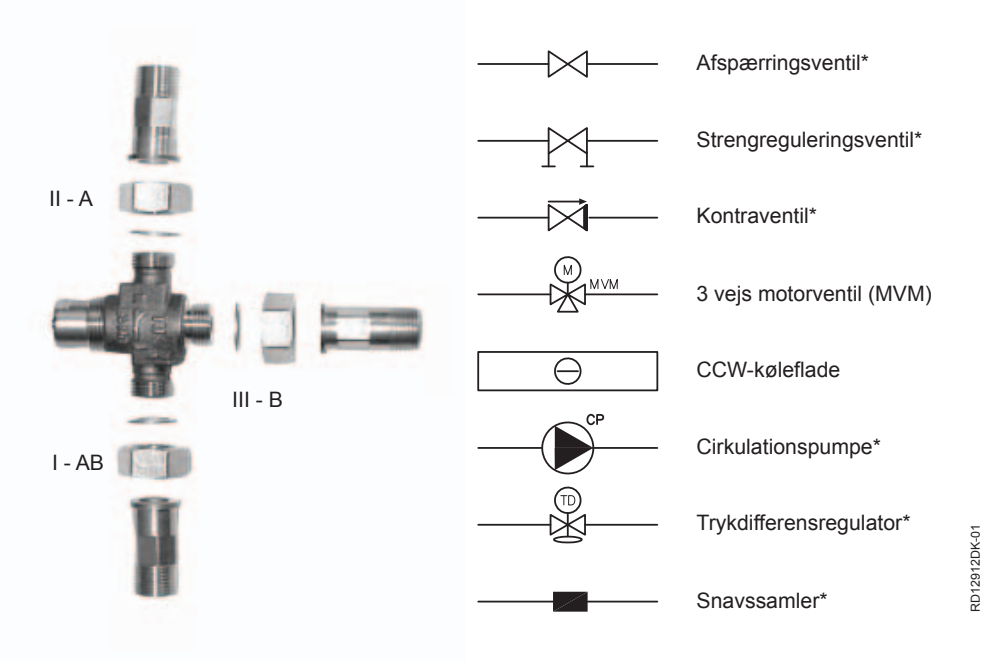
2.3.2 Principles for connecting the water heating coil

Mixing loop

The diagrams below are simplified. The dimensioning of valves, pipes, etc. and cooling coil connection must always be carried out by authorised fitters in accordance with applicable regulations and legislation.

Type	Method	Simplified diagram
Mixing loop 1	Variable flow in the primary circuit (supply) and constant flow in secondary circuit (VEX unit)	
Mixing loop 2	Constant flow in the primary circuit (supply) and the secondary circuit (VEX unit) a) When there is no cooling requirement, valve adjustment must be based on the required primary circuit water flow	
⚠	Do not connect the heating coil like this! Connection without circulation pump risks frost damage!	

Explanation of simplified diagram



*) not EXHAUSTO delivery (refer to the technical specifications in section 7).

2.3.3 Air bleeding of coils

Bleeding

It is the responsibility of the contractor/customer to ensure that the bleeding option is correctly installed and that the building owner is informed of the risk of insufficient bleeding, regardless of whether the coil(s) in question are built into a ventilation system or mounted separately in the duct system.
The following must be observed when bleeding liquid-coupled coils/heating and cooling batteries:

- The heating/cooling system must be arranged in accordance with DS469 so that they can be bled.
- Ventilation systems installed above suspended ceilings or outside on roofs are often the top point of the pipe system and therefore air is often collected in the system here.
- Bleeding points must be easily accessible.
- Bleeding points must be selected so that all air in the system can be bled.
- Air pots and automatic air vents should be considered so that air is collected before it enters the coils, despite the fact that many coils are equipped with a bleeding option.
- A lack of bleeding can lead to a lack of water flow and, ultimately, frost damage to the coils and subsequent water damage to the building.

Following connection of water supply to the unit:

- Bleed the system thoroughly using the upper bleed screw on the water coils.

Air screw	

2.3.4 Installation requirements

Insufficient bleeding

Following connection of water supply to the cooling coil, the system must be bled thoroughly.

Fitting motor valve

The valve must not be fitted with the motor facing down

Insulate the feed pipe

The pipes must be insulated according to applicable regulations

Frost protection

The cooling coil can be protected against frost by mixing in 25% ethylene glycol. This provides frost protection down to -13°C.

2.3.5 MVM valve

Definition

MVM is used as a general term for an engine valve.

Screening

Screen the valve motor from direct sunlight. Due to heat emissions, the valve motor must not be encapsulated (max. ambient temperature: 50°C).

Insulating the valve

To ensure normal operation at ambient temperatures below 0°C, it is very important that the valve section is insulated according to current standards/procedures.

MVM-OD, valve for outdoor fitting

If MVM_OD (MVM designed for outdoor fitting) is used, the screening is part of the delivery. MVM-OD is only possible for valve sizes below 6.3 K_{VS}.

Regulating properties

Optimal regulation is achieved when the differential pressure is between 5-20 kPa. See section "Technical specifications" to calculate K_{VS}.

Cold water supply

The cold water supply **must** be constant.

Exercise cycle of circulation pump

The circulation pump is exercised with the EXact2 control, as described here:

1. With no cooling requirement, the MVM valve runs at 0%.
2. The circulation pump will then run for a further 5 min and stop.
3. EXact control will start a 24 hour timer.
4. When the 24 hours are over, the circulation pump will exercise for 5 min.
5. The exercise cycle will repeat once a day until the next time a cooling requirement arises.

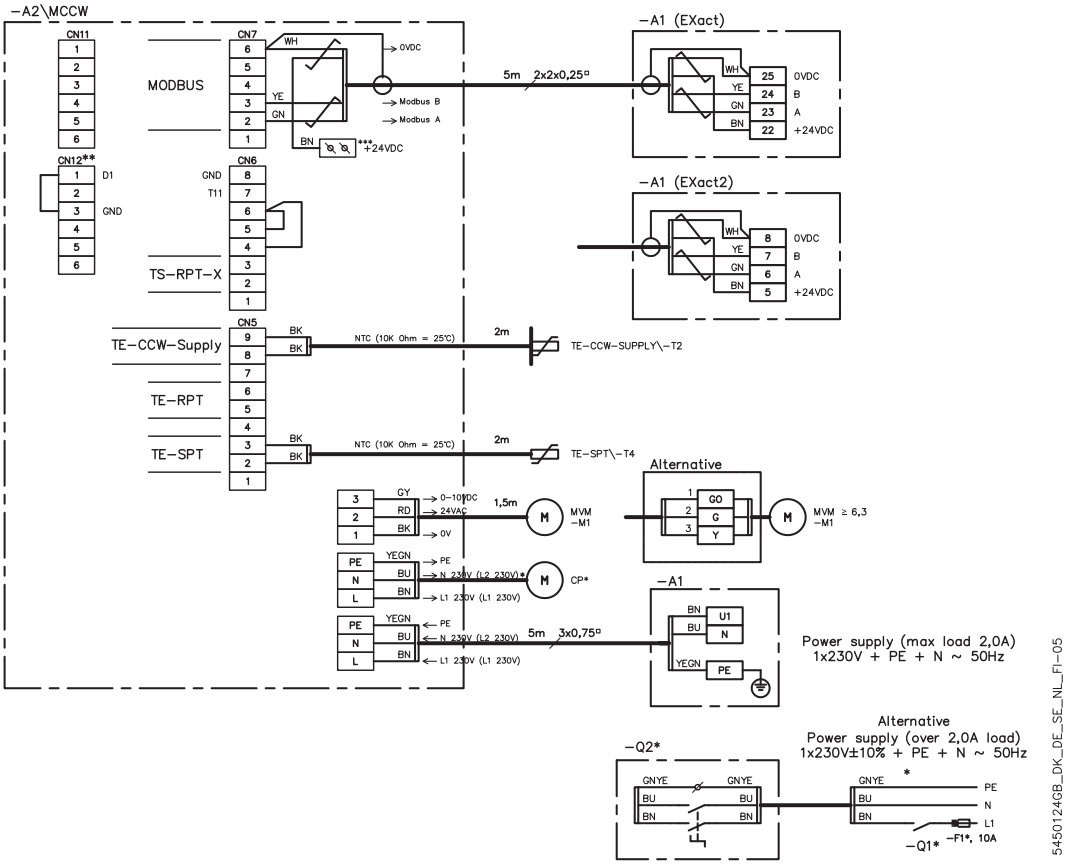
3. Electrical installation

3.1 Connection diagram

3.1.1 Wiring diagram for supply voltage and control box

1 x 230 V

The following diagram shows the connection of supply voltage (1 x 230 V) and the cooling coil control box (MCCW).



* Not supplied by EXHAUSTO

** CN12: It is possible to invert the control signal to the MVM, i.e. 0V→10V becomes 10V→0V. This is done by fitting a jumper across terminals 1 and 3 of CN12. The change will be registered the next time the unit is powered up.

***24VDC: Terminal block for continuation of 24 VDC

Power supply

Overall maximum load of terminal in VEX (U1, N) is 2.0 A

If the maximum power consumption of the connected unit	Then
exceeds the maximum load of 2.0 A	a separate electrical supply with isolation switch and fuses must be established
does not exceed the maximum load of 2.0 A	the MCCW module can be connected to the VEX unit connection box (-A1)

Key to diagram

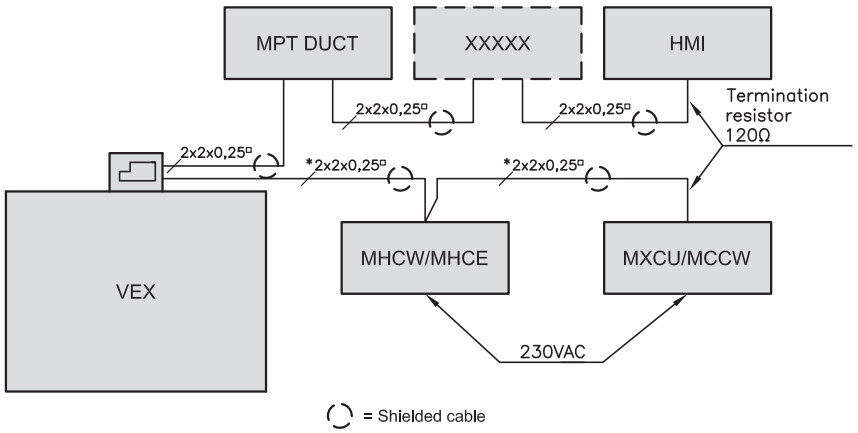
Designation	Component	Supplied by
-A1	Voltage supply/modbus terminal in VEX	EXHAUSTO
-A2	MCCW module	EXHAUSTO
-F1	Distribution board fuse	Customer
-Q1	Distribution board group switch	Customer
-Q2	Isolation switch (disconnects all poles)	Customer
-M1	MVM valve	EXHAUSTO
-T2	TE-CCW-SUPPLY (temperature sensor, supply air)	EXHAUSTO
-T4	TE-SPT (Temperature sensor supply water)	EXHAUSTO
CP	Circulation pump	Customer

3.2 Connection of Modbus devices

3.2.1 Connection of Modbus devices

Diagram

Connection must be carried out according to the following diagram (see also instructions "Electrical Installation Guide for VEX with EXact control" for the VEX unit in question. This shows the method for connecting standard components on the connection box connection diagram.



** Not supplied by EXHAUSTO*

MHCW/MHCE	Heat control (water or electric)
MXCU/MCCW	Cooling control
MPTDUCT	Pressure measurement in duct
XXXXX	Can be different modules, e.g. MIO module or additional MPTDUCT
HMI	Control panel

3.2.2 Cable (type, max. length and termination)

Cable

EXHAUSTO recommends the use of 4-core, twisted pair, shielded cable. To limit voltage drop across the cable, 0.25□ conductors are recommended. For correct connection of shielded cable to Modbus units, refer to the "Electrical Installation Guide" for the relevant VEX.

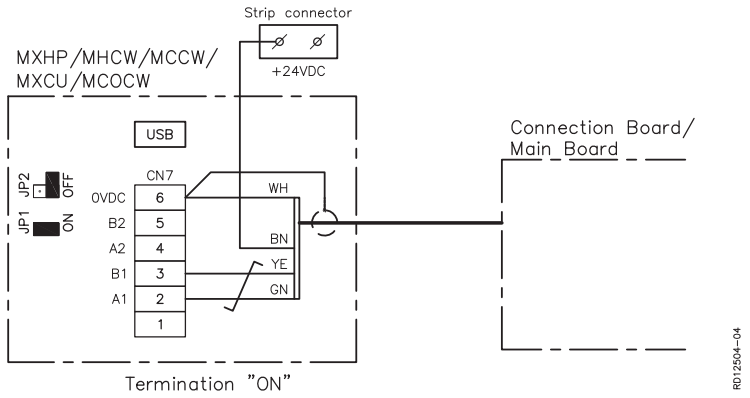
Max. cable length

The overall cable length of a complete installation may not exceed 200 m.

Modbus, termination or daisy chaining

The first and last devices on the bus must be terminated. The PCB contains a jumper JP1, which can be used for termination.

If	Then	See diagram no.
MCCW is the first and last device on the bus	it must be terminated by use of jumper JP1 (jumper nearest terminal 1 on CN7).	1
MCCW is **neither** the first nor last device on the bus	it must be daisy-chained to the next device 0 default setting	2



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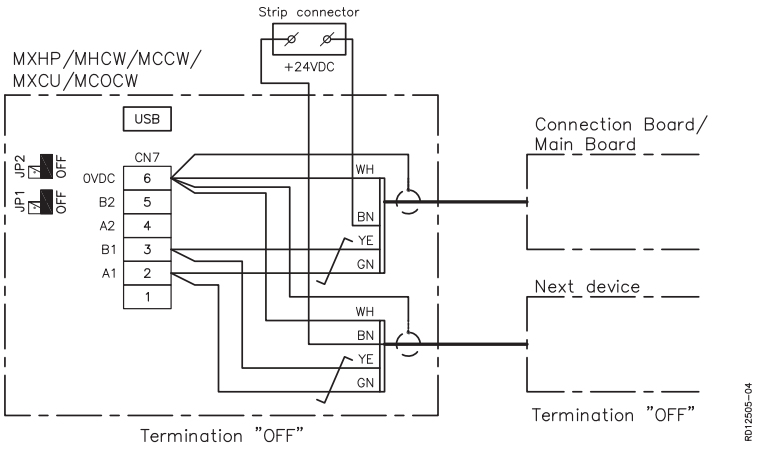

2.

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4. Commissioning and operation

During commissioning...

ensure the supply and return pipes are sufficiently insulated, to avoid risk of frost-induced leaks during "winter operation", when there is no circulation in the cooling coil.

check that pressure ratios and flow rates are in accordance with the data arrived at by K_{VS} calculations.

NB

For settings and safety functions, see "Basic Instructions - EXact2 control system".

5. Maintenance

5.1 Cleaning the cooling coil

5.1.1 Cleaning

The cooling coil must be kept clean from dust and foreign bodies in order to ensure high performance and good hygiene.

How to clean the cooling coil

Step	Action	
	Insulated CW/CCW	**Uninsulated CW/CCW**
1	Switch off the power supply to the unit at the isolation switch	
2	● close the stop cocks ● release the unions ● extract the cold water coil	
3	Vacuum the cooling coil from the side facing the VEX. ⚠ **Take care not to bend the aluminium fins**	
4	Check: ● that the fins are not out of shape ● that the drip trays are clean ● that the water traps are in working order	
5	● Push the cold water coil back into position ● tighten the unions ● open the stop cocks ● bleed the system	

6. Troubleshooting

6.1 Troubleshooting

Troubleshooting See "Alarms" section in the “EXact Control System, Basic Instructions”.

7. Technical specifications

7.1 Data, cooling coils

7.1.1 Uninsulated CW coils

Type	Weight without fluid [kg]	Water content [l]	Test pressure [kPa]	Max. operating pressure [kPa]
CW31504U0UC	39	3,9	3000	1600
CW40005U0UC	49	6,3	3000	1600
CW065x10004U0UL	54	8,3	3000	1600
CW076x12504U0UL	72	15	3000	1600
CW080x120	40	12,9	3000	1600
CW280	65	22	3000	1600

Type	Number of pipe rows	Number of circuits	Face area (h x b) [mm]	Pipe connection	Distance between fins [mm]
CW31504U0UC	4	8	500 x 610	DN25 (1")	2,5
CW40005U0UC	5	10	525 x 760	DN32 (1¼")	3,2
CW065x10004U0UL	4	17	650 x 1000	DN32 (1¼")	2,5
CW076x12504U0UL	5	25	750 x 1250	DN32 (1¼")	3,2
CW080x120	4	21	800 x 1300	DN32 (1¼")	3,2
CW280	4	40	1000 x 1600	DN50 (2")	2,5

7.1.2 Insulated CW coils

Type	Weight without fluid [kg]	Water content [l]	Test pressure [kPa]	Max. operating pressure [kPa]
CW315/CCW240	72	3,9	3000	1600
CW400/CCW250	87	6,3	3000	1600
CW500/CCW260	135	8,3	3000	1600
CW050x080	135	8,3	3000	1600
CW050x060/CCW270	165	15	3000	1600
CW060x120	67	11,7	3000	1600
CCW280	202	22	3000	1600

Type	Number of pipe rows	Number of circuits	Face area (h x b) [mm]	Pipe connection	Distance between fins [mm]
CW315/CCW240	4	8	500 x 610	DN25 (1")	2,5
CW400/CCW250	5	10	525 x 760	DN32 (1¼")	3,2
CW500/CCW260	4	17	650 x 1000	DN32 (1¼")	2,5
CW050X080	4	17	650 x 1000	DN32 (1¼")	2,5
CW050x060/CCW270	5	25	750 x 1250	DN32 (1¼")	3,2
CW060x120	4	16	840x1140	DN32 (1¼")	2,5

Type	Number of pipe rows	Number of circuits	Face area (h x b) [mm]	Pipe connection	Distance between fins [mm]
CCW280	4	40	1000 x 1600	DN50 (2")	2,5

Circulation pump

Max. load may be	5 A at cos φ 0.97 (inductive load)

Max. load

Overall maximum load of terminal in VEX (U1, N) is 2 A
If the connected devices' maximum current consumption exceeds the maximum load, a separate electrical supply with isolation switch and fuses must be established. See section "Electrical installation".

Recommendation

You are recommended to make a calculation of the cooling coil with the EXselectPro calculation program, available on the EXHAUSTO website.

7.1.3 MVM motor valve

Valve			
Test pressure [kPa]	**Max. differential pressure [kPa]**	**Permitted temperature of medium [°C]**	**The valve will remain open if the differential pressure [kPa]**
1600	200	5 - 110	> 200

Motor				
Permitted ambient temperature [°C]	**Protection class IEC529**	**Time taken to open/ close [s]**	**Power supply [AC/DC, 50/60Hz]**	**Regulation [VDC]**
(-30) - (+50)	IP40	30	24VAC ±20% 24VDC ±20%	0 - 10

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