GB

HCW water heating coil

for VEX w/wo EXact2 control

Original instructions

EXHAUSTO A/S
Odensevej 76
5550 Langeskov, Denmark

Tel.: +45 65 66 12 34
Fax: +45 65 66 11 10
exhausto@exhausto.dk
www.exhausto.dk

1. Product information

2. Mekanisk montage

3. Electrical installation

4. Commissioning and operation

5. Maintenance

6. Troubleshooting

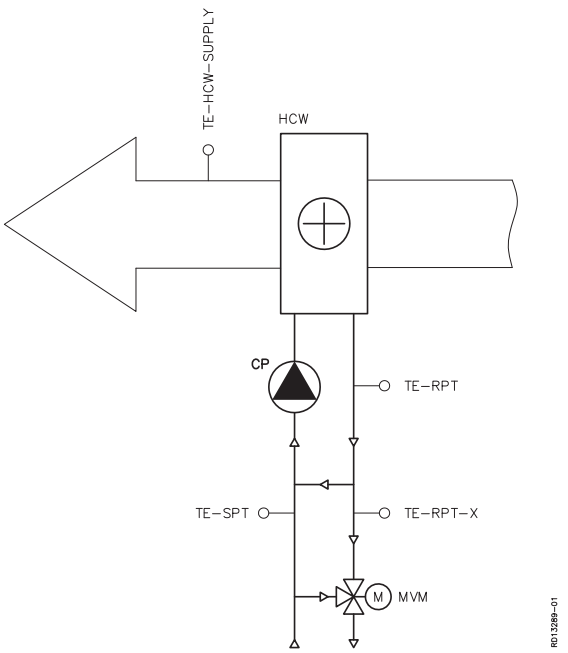
7. Technical specifications

1. Product information

1.1 Application

EXHAUSTO's HCW heating coil is a water heating coil used to increase the temperature of the supply air. The water heating coil can be used for both left and right units.

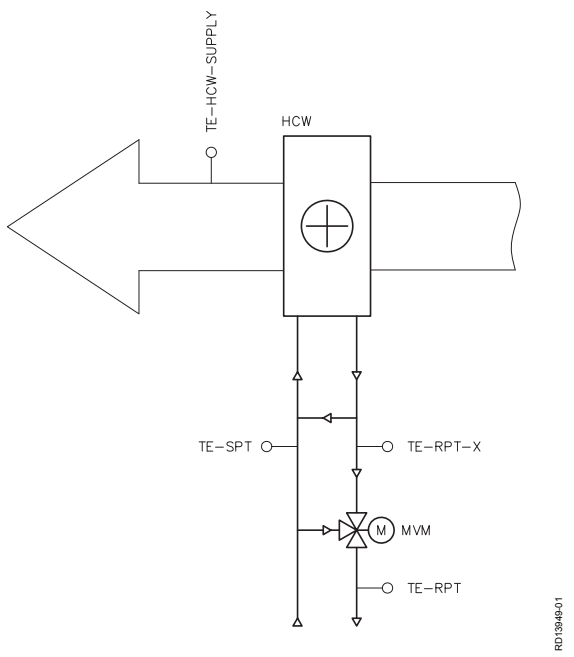
1.1.1 Designations used in these instructions



Designation	Function	Standard/accessory
CP	Circulation pump	Not supplied by EX-HAUSTO
MVM	Motor valve	Standard
TE-HCW-SUPPLY	Temperature sensor, supply air	Standard
TE-RPT	Temperature sensor on return pipe from water heating coil	Standard
TE-SPT	Temperature sensor on supply pipe to water heating coil	Standard
TS-RPT-X	Temperature sensor on external pipeline from water heating coil	Accessories

If the water heating coil is positioned	Then
less than 10 m from the VEX	it can be connected directly to the main board (IHCW) in the VEX
more than 10 m from the VEX	it must be connected to an MHCW module

1.1.2 Designations used in these instructions



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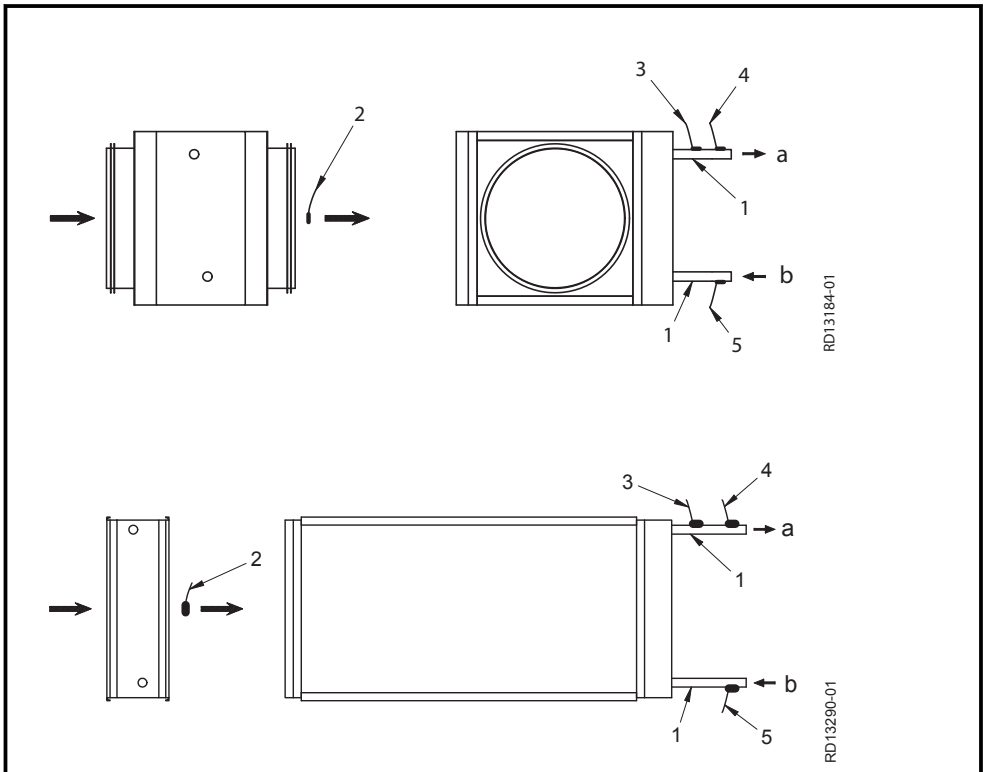
1.2 Description

1.2.1 Design

General drawing The drawings below show the design of the heating coil:

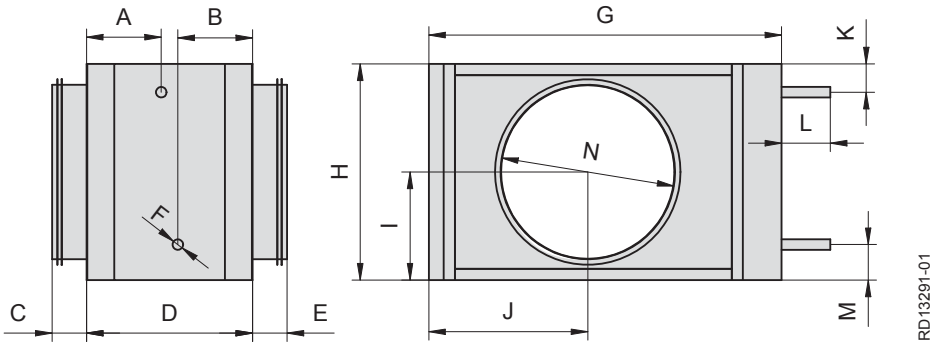


Pos. no.	Part	Function
1	Spigots for connecting water to the system	To connect water to the water heating coil: a. Return b. Supply
2	Temperature sensor	Measures the temperature in the supply air duct
3	TE-RPT; return water temperature sensor	Measures the temperature of the return water from the water heating coil
4	TS-RPT-X; return water temperature sensor	Measures the return water temperature at the coldest point in the piping
5	TE-SPT; supply water temperature sensor	Measures the temperature of the supply water

1.3 Principal dimensions

Coils with circular connector

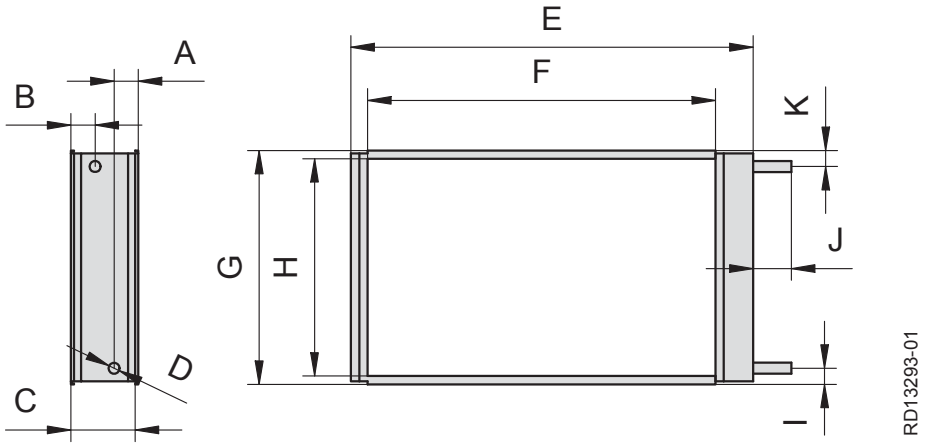
The coils have the following dimensions:



Type	A	B	C	D	E	F	G	H	I	J	K	L	M	N
HW315SU0UC	150	150	48	300	48	DN15(½")	488.5	390	195	222	26	85	39	Ø315
HW315MU0UC	139	139	48	300	48	DN15(½")	488.5	390	195	222	26	85	26	Ø315
HW315LU0UC	128	128	48	300	48	DN15(½")	637	390	195	287	30	85	30	Ø315
HW40003U0UC	128	128	48	300	48	DN15(½")	663.5	540	270	309.5	32	85	49	Ø400

Rectangular uninsulated coils without transition pieces

The coils have the following dimensions:



Type	A	B	C	D	E	F	G	H	I	J	K
HW040X080U	58	58	148	DN15(½")	919	800	438	400	43	100	30
HW050X080U	52	52	148	DN15(½")	918	800	538	500	32	100	32
HW070X080U	63	63	170	DN25(1")	945	800	738	700	48	90	65
HW050X100U	45	45	148	DN25(1")	1137	1000	538	500	37	100	37
HW060X140U	40	40	148	DN25(1")	1545	1400	638	600	38	90	38
HW060X140U D	115	115	298	DN25(1")	1545	1400	638	600	38	90	38
HW060X12003U0UL	52.4	52.4	148	DN32(1¼")	1357	1200	638	600	34	88	34
HW060X12003U0UD	127.5	127.5	298	DN32(1¼")	1357	1200	638	600	34	88	34

2. Mekanisk montage

2.1 Unpacking

Supplied components

The following components are supplied:	Standard	Accessories
HCW water heating coil	X	
MVM valve		X
MHCW module		X
Temperature sensor, supply air duct (TE-HCW-SUPPLY)	X	
Temperature sensor, return water (TE-RPT).	X	
Temperature sensor, supply water (TE-SPT).	X	
Temperature sensor, frost protection for external piping (TS-RPT-X)		X

Supplied components, HCW-X

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

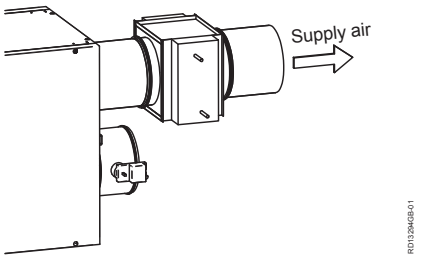
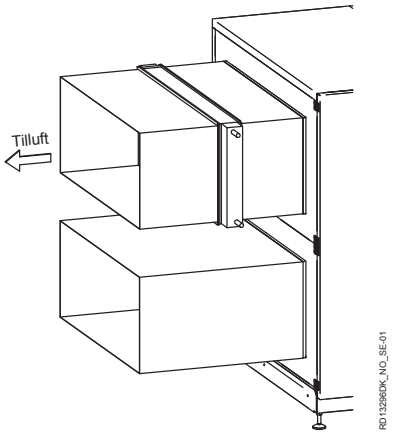
The following components are supplied:	Standard	Accessories
HW heating coil	X	
MVM valve		X

2.2 Position in relation to VEX

2.2.1 Correct positioning of water heating coil

Positioning on supply air spigot

Position the water heating coil on the supply air duct or directly on the ventilation unit supply air spigot:

✓		

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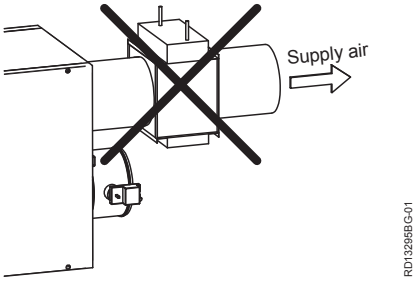
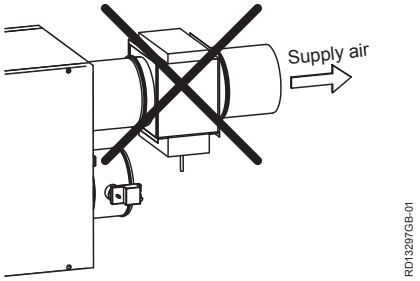
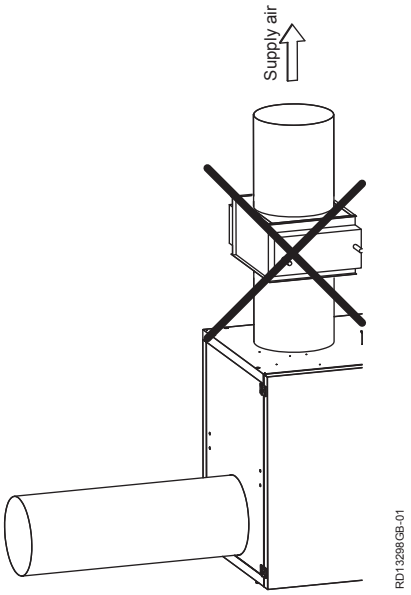
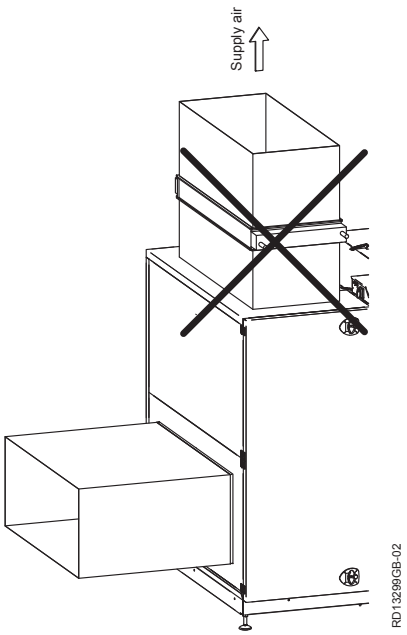
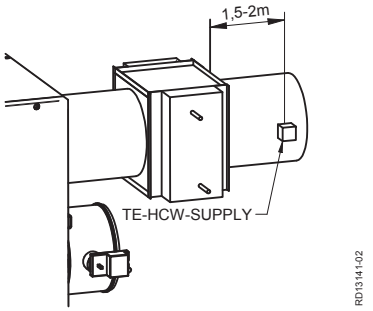
✗		
✗		

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

⚠ **The heating coil must always be positioned so that the air flows through it horizontally.**

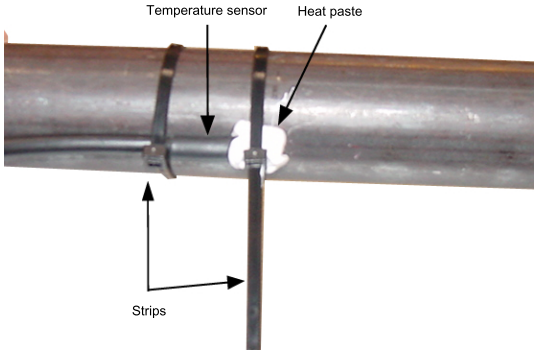
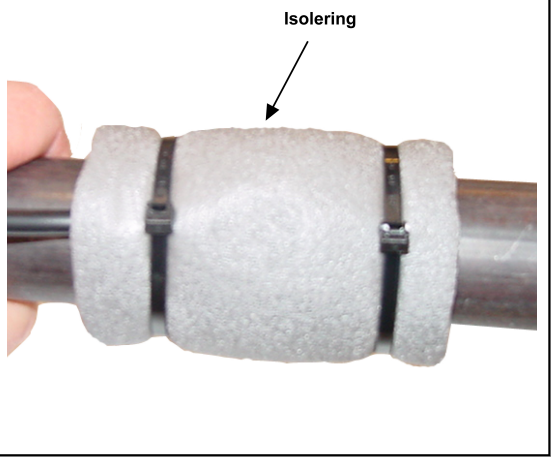
2.2.2 Positioning the temperature sensor (TE-HCE-SUPPLY) in duct

This is the position for temperature sensor TE-HCE-SUPPLY



2.2.3 Correct fitting of supply and return water temperature sensor

How to mount the temperature sensor correctly on the supply/return to/from the heating coil:

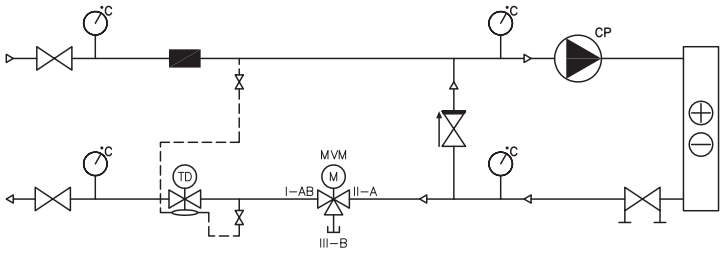
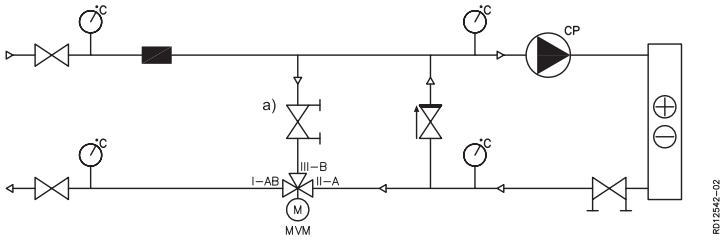
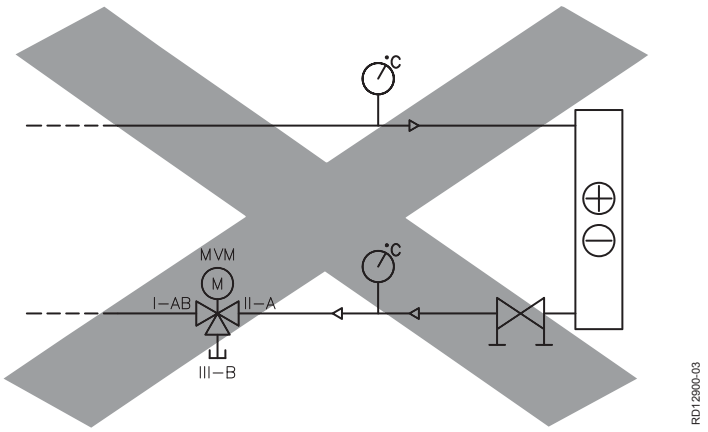
1.	Use heat paste to ensure good contact between the pipe and the sensor. Use strips to secure the sensor in position.	
2.	Ensure there is sufficient insulation around the sensor	

2.3 Water heating coil

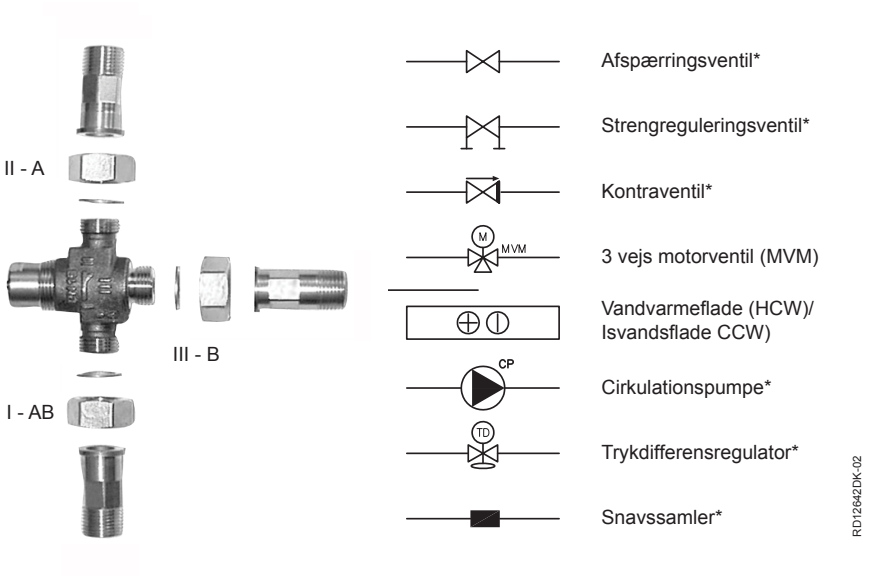
2.3.1 Principles for connecting the water heating coil

Mixing loop

The diagrams below are simplified. The dimensioning of valves, pipes, etc. and heating 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 heating 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).

2.3.2 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 coil.

Air screw	

Insufficient bleeding

Insufficient bleeding can result in still water forming in the system, which may result in frost-induced leaks during the winter.

Fitting motor valve

⚠ **The valve must not be fitted with the motor facing down**

Insulate the supply pipe and heating coil

⚠ **The pipes and heating coil must be insulated according to applicable regulations**

2.3.3 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 intended for outdoor fitting) is used, the screening and insulation are 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}.

Heat supply

The heat supply **must** be constant.

3. Electrical installation

3.1 Connection diagrams

3.1.1 Connection diagrams (VEX with EXact2 control)

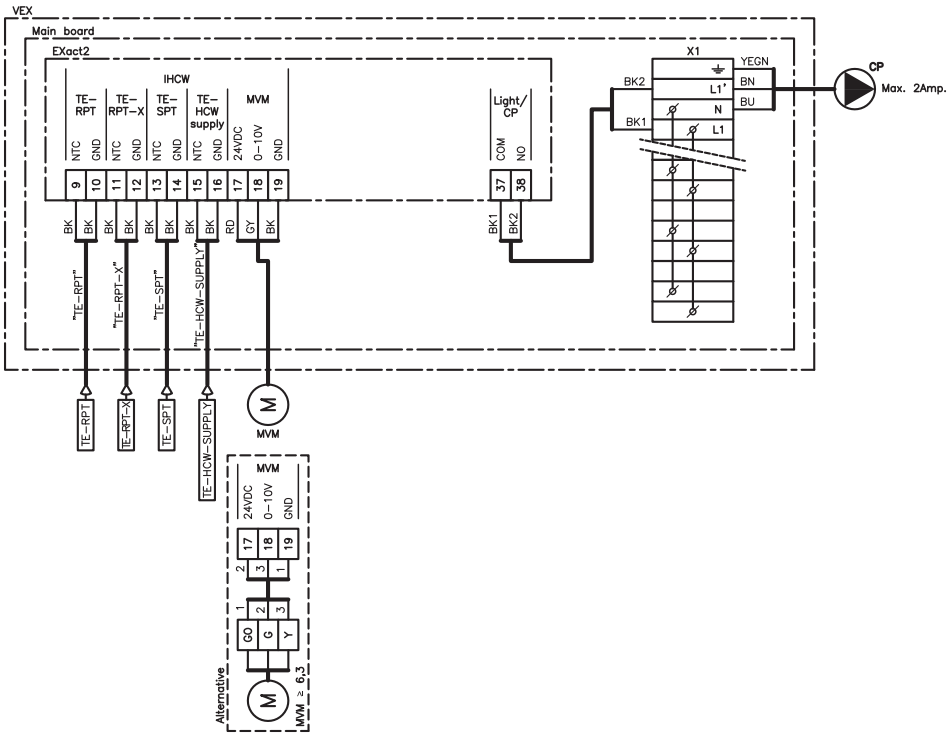
The position of the heating coil in relation to the VEX will determine the connection method:

If the heating coil is positioned	Then	See diagram
less than 10 m from the VEX	the heating coil can be connected directly to the main board (IHCW)	1
more than 10 m from the VEX	the heating coil must be connected to an MHCW module	2

Diagram 1

The diagram below shows how to connect the heating coil to the automatic control directly on the EXact2 main board:

- The TE... sensors are factory-fitted in the EXact2 main board
- Each sensor is provided with a 4-m cable
- The MVM valve is connected to terminals 17–19 (4.5-m cable is connected at the factory)
- CP is connected to terminal block X1



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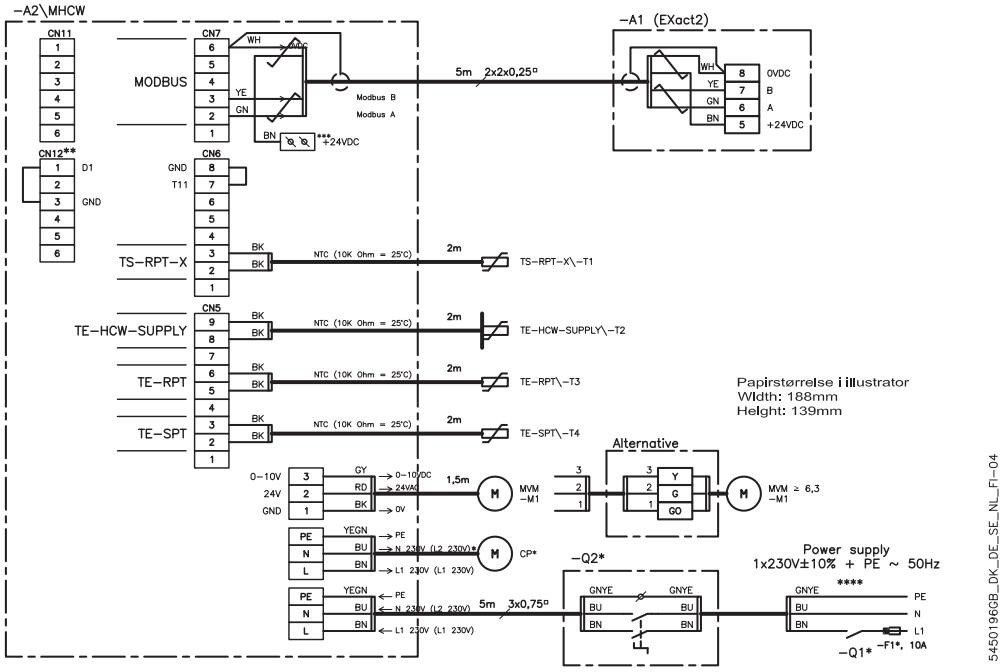
Components, wiring diagram

See table of component designations in Section 1.1.1

Diagram 2

A separate power supply must be established with isolation switch and fuse. The diagram below shows how to connect the heating coil via an MHCW module.



* 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 takes effect after the voltage has been disconnected and reconnected.

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

****Power supply: The water heating coil must be connected to a separate power supply with isolation switch and fuses

Key to diagram

Designation	Component	Supplied by
-A1	EXact2 main board	EXHAUSTO
-A2	MHCW module	EXHAUSTO
-F1	Distribution board fuse	Customer
-Q1	Distribution board group switch	Customer
-Q2	Isolation switch (disconnects all poles)	Customer
-M1	MVM valve	EXHAUSTO
-T1[1])	TS-RPT-X (Temperature sensor on external pipeline from water heating coil)	EXHAUSTO (accessory)
-T2	TE-HCW-SUPPLY (temperature sensor, supply air)	EXHAUSTO
-T3	TE-RPT (Temperature sensor on return pipe from water heating coil)	EXHAUSTO
-T4	TE-SPT (Temperature sensor supply water)	EXHAUSTO

Designation	Component	Supplied by
CP	Circulation pump Relay contact for CP: 250V, max 5 A cosφ 0.97 See section Technical data.	Customer

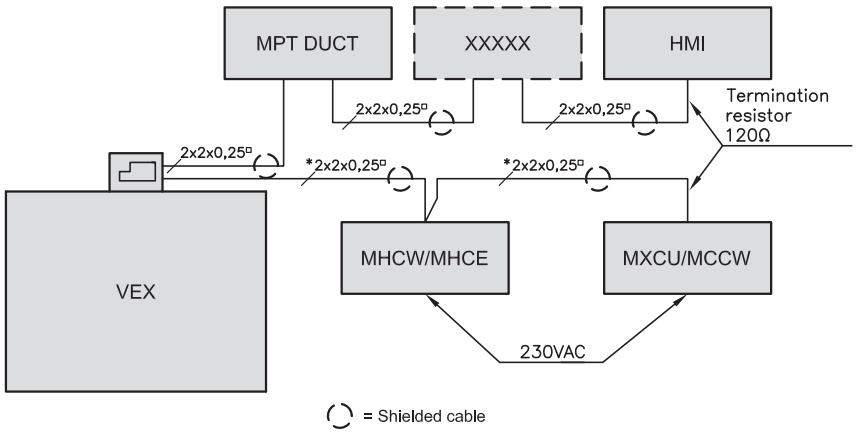
[1])TS-RPT-X (-T1) TS-RPT-X must be configured in the HMI - see instructions "EXact control, basic instructions".

3.2 Connection of Modbus devices

3.2.1 Connection of modbus units (when MHCW module is used)

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.

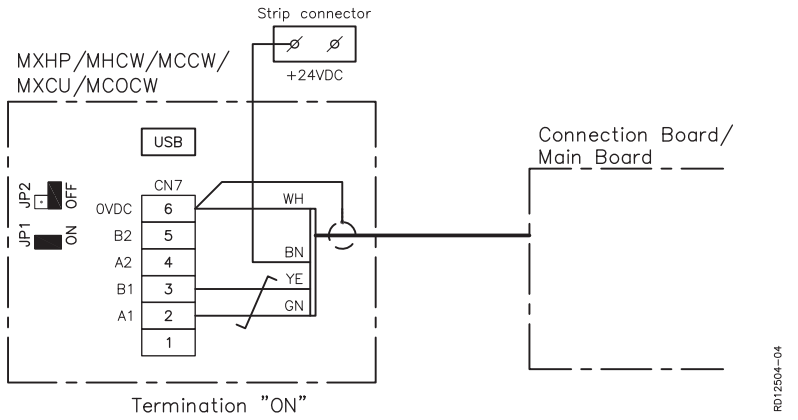
Max. cable length

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

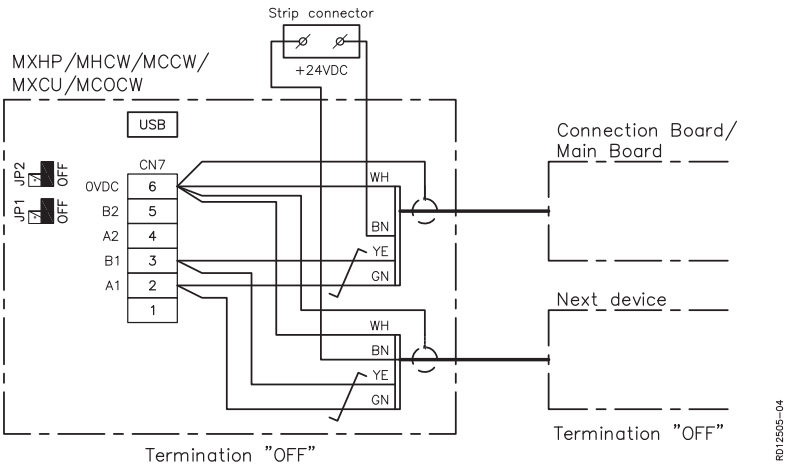
Modbus, termination or daisy chaining

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.
MHCW is the first or last device on the bus	it must be terminated by use of jumper JP1 (jumper nearest terminal 1 on CN7).	1
MHCE is **neither** the first nor last device on the bus	it must be daisy-chained to the next device = default setting	2



1.



2.

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4. Commissioning and operation

Warnings

Do not touch the heating coil - risk of burns.

Frost protection is only active when the electrical power and heating supplies are connected.

During commissioning, ensure that there is no risk of frost-induced leaks in the water heating coil.

Before commissioning begins

Check that the MVM valve opens:

- On the HMI panel: go to menu 7.2 and set constant heating temperature to maximum
- After checking: set constant heating temperature to the required value

4.1 Safety features

Frost protection

Settings and safety functions: see "Exact Control System, Basic Instructions" for the VEX type in question, chapter 3 and HMI panel, menu 7.2.

5. Maintenance

5.1 Maintenance

See section "Maintenance" in the product instructions for the VEX unit.

6. Troubleshooting

6.1 Troubleshooting

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

7. Technical specifications

7.1 Water heating system

Type	Weight without fluid [kg]	Water content [l]	Test pressure [kPa]	Max. operating pressure [kPa]
HW315SU(X/E/M)	11	0.5	3000	1600
HW315MU(X/E/M)	12	0.9	3000	1600
HW315LU(X/E/M)	16	1.7	3000	1600
HW400U(X/E/M)	15.5	2.7	3000	1600
HW04X08U(X/E/M)	9.2	2.0	3000	1600
HW05X08U(X/E/M)	12.2	4.0	3000	1600
HW05X10U(X/E/M)	15	3.2	3000	1600
HW06X14U(X/E/M)	23	5.4	3000	1600
HW07X08U(X/E/M)	26	6.0	3000	1600
HW06X12U(X/E/M)	27	6.8	3000	1600

X = For third-party control system, E = EXact2, M = Modbus - MHCW

Type	Number of pipe rows	Number of circuits	Face area (h x b) [mm]	Connection dimension	Distance between fins [mm]
HW315SU(X/E/M)	1	1	350 x 350	DN15 (1/2")	1.6
HW315MU(X/E/M)	2	1	350 x 350	DN15 (1/2")	3.2
HW315LU(X/E/M)	3	3	350 x 500	DN20 (3/4")	3.2
HW400U(X/E/M)	3	6	500 x 525	DN15 (1/2")	3.2
HW04X08U(X/E/M)	2	4	400 x 800	DN15 (1/2")	3.0
HW05X08U(X/E/M)	3	10	500 x 800	DN15 (1/2")	2.8
HW05X10U(X/E/M)	2	5	500 x 1000	DN25 (1")	3.0
HW06X14U(X/E/M)	2	12	600 x 1400	DN25 (1")	3.0
HW07X08U(X/E/M)	3	14	700 x 800	DN25 (1")	2.1
HW06X12U(X/E/M)	3	12	600 x 1200	DN32 (1 1/4")	3.2

X = For third-party control system, E = EXact2, M = Modbus - MHCW

Circulation pump

Max. load may be	
IHCW	2 A at cos φ 0.97 (inductive load)
MHCW (separate supply)	5 A at cos φ 0.97 (inductive load)

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]**
Kvs 0.25 - 4.0	1600	200	5 - 110	> 100
Kvs 6.3	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]**
Kvs 0.25 - 4.0	(-30) - (+50)	IP40	34	24VAC ±20% 24VDC ±20%	0 - 10
Kvs 6.3	(-30) - (+50)	IP40	30	24VAC ±20% 24VDC ±20%	0 - 10

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