

Air handling unit Free V90/V90EL Installation manual



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Product information

This document applies to the air handling unit FREE-V90 and V90EL made by Swegon Lidköping AB.

The unit is supplied in left hand version with a side door. The unit can be installed in left and right versions. This is determined by the electric air heater and supply air sensor placement and control system's configuration.

For the unit to function properly with safe operation, instructions must be read carefully.

The product may only be used according to local rules and regulations, all safety precautions must be followed!

Transport and storage

The unit is packed to prevent damage to both the external and internal parts, as well as protected against dust and moisture. The unit is supplied in a cardboard box on a wooden pallet and is fastened with sturdy plastic straps. The packaging is equipped with cushioned corner protectors and protective plastic.

Supplied accessories are supplied in separate carton placed on the unit.

Service and Maintenance

- One of the most common causes of poor indoor air ventilation system is that it is not managed properly.
- Poorly maintained ventilation systems may in it self be a problem for air quality, the air can be worse than it had been without ventilation.
- Alignment, then the settings made when the system is installed, is also very important for the efficiency of the system should be fine.
- Some other common problem areas are:
- Filters are dirty giving a higher pressure drop and thus higher energy consumption. Therefore, the filters should be changed once or twice a year to effectively fulfill their role. Changing the filter is easy, about as easy as changing the dust bag.
- Dirt accumulated in the ventilation system can also eventually cause the air flow to be too low. So it is very important to keep the ventilation system clean.
- To turn off the fan at night can cause contamination spread through ductwork.
- Moisture problems may be due to poor rain in outdoor air or condensation in the ducts because of poor insulation or disconnected units.
- The best thing is to never let this kind of problems arise, for as with most problems, they are difficult to correct when they get there. The easiest way to prevent these things is by managing the ventilation system as well and regularly as you do the rest of the house. If a plant is to be operated properly, all the instructions for maintenance and regularly updated.

Varnings

The following warnings appear in different sections of the document.



Taken into account

- Duct connections / duct ends should be covered during storage and installation.
- Do not connect the cooker hood or exhaust from the cooker hood to the unit.
- Do not connect the dryer to the vent system.



Hazard

- Ensure that power is disconnected before maintenance and electrical work.
- Work with electrical connections and maintenance may only be performed by a qualified person according to local rules and regulations.

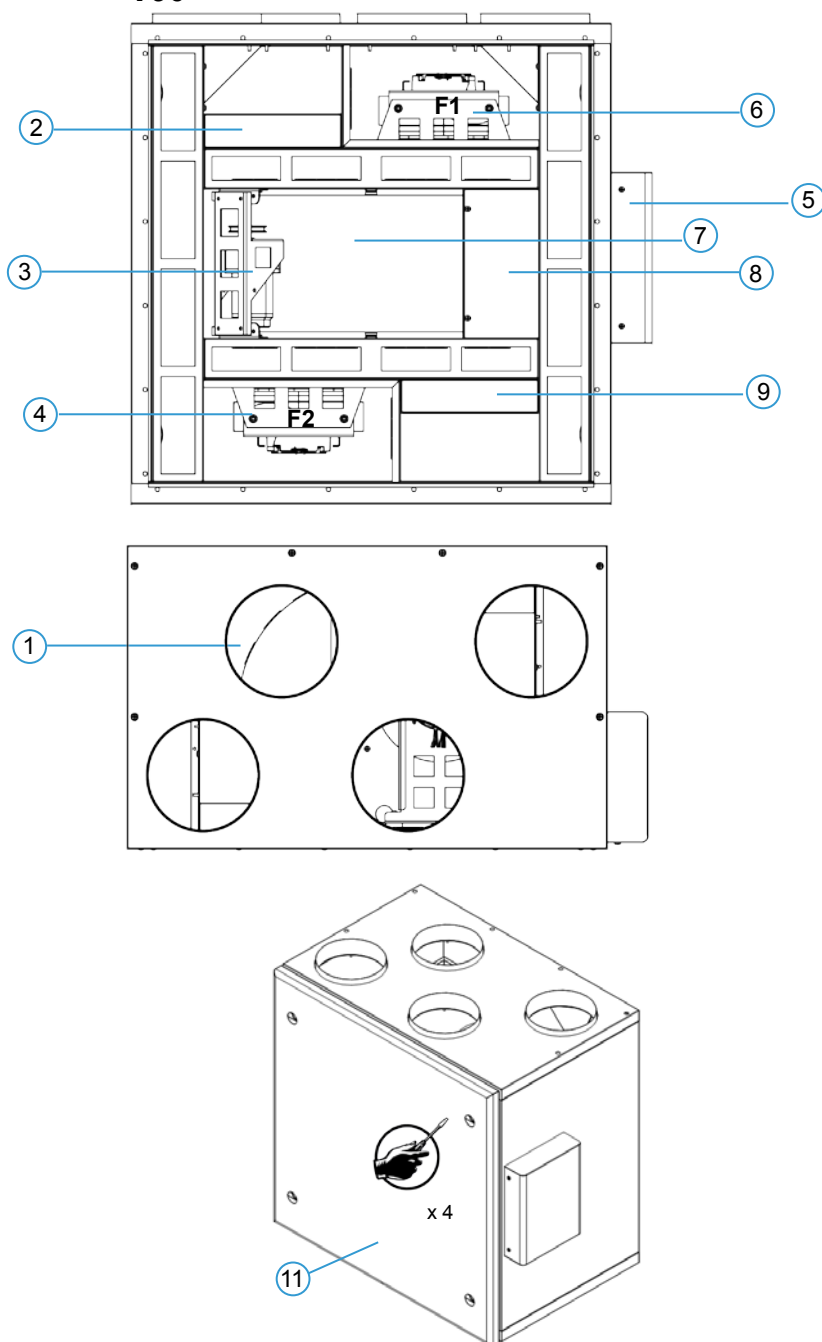


Varning

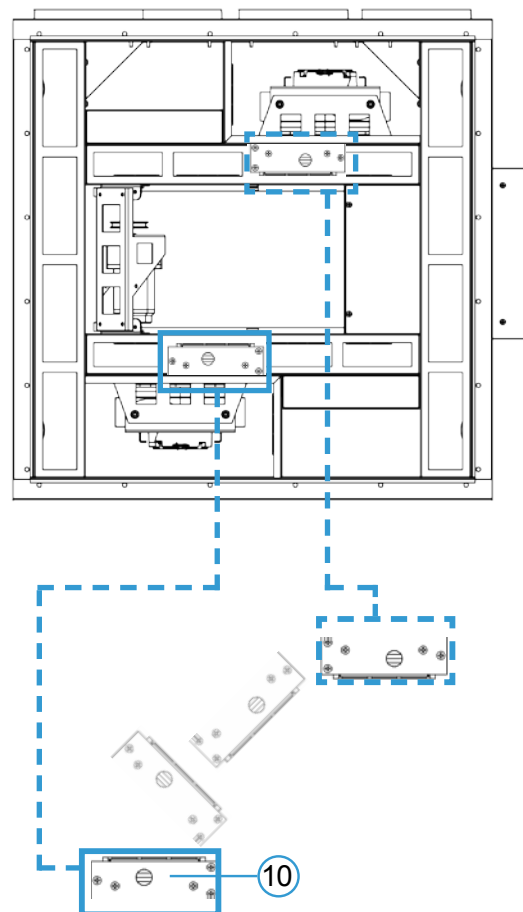
- The system should always be running and shall only be stopped for maintenance and service.
- A detached facility in an inhabited house can lead to moisture damage.
- The unit and the ventilation system must be installed by a qualified person in accordance with local rules and regulations.
- Risk of sharp edges! Wear gloves during installation and maintenance.
- The unit is heavy!
- DO NOT lift in the duct connections!
- Note that the unit stops the rotating parts a time after you disconnected the power.
- Check that the unit's parts and connections before starting.
- This product can be used by children older than 8 years, and persons with physical or mental capabilities or lack of experience and knowledge, provided it is done under the supervision or that they received instructions on how to use the product safely, and that they informed and are aware of the risks related to their use.
- Children should not play with the product.
- Children should also not carry out cleaning / maintenance without supervision.

Schematic illustration Free V90 / V90EL

V90



V90EL



1. Duct connection Ø 160 mm

2. Filter

3. Heat recovery motor

4. Fan 2 F2

5. Connection box for external functions

6. Fan 1 F1

7. Heat recovery rotor

8. Control system

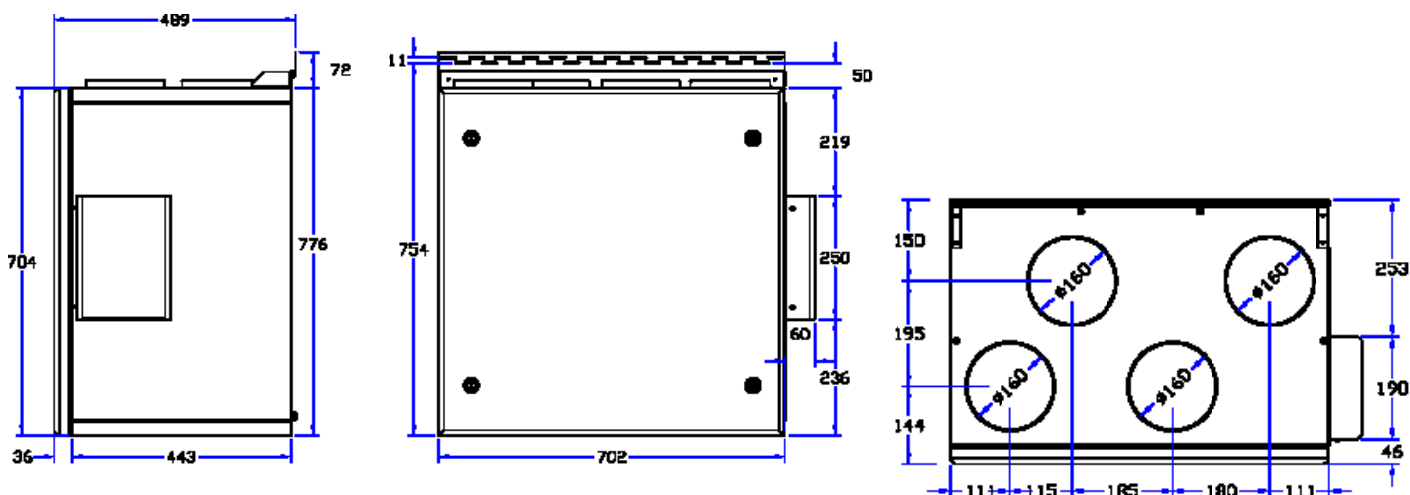
9. Filter

10. Electrical heater with over heating protection (only V90EL)

11. Inspection panel

Model	FREE V90	FREE V90EL
Rated voltage	230V, 50Hz	
Fuse A	10	
Rated Power total W	230	930
Max load A	1,8	4,0
Plug fan, type	EC-motor/B-weel	
Electrical heater	Duct mountes (TB)	Integrated 700W
Filter class supply/exhaust	F7/F7	
Filter dimensions WxHxD mm	410x195x45	
Weight kg	55	
Duct connections mm Ø, muff	4x160	
Connection cooker hood	No	
Casing outside	Steel sheet metal Aluzink powdercoated	
Color code	White RAL9010	
Corrosions class outside	C4	
Casing inside	Steel sheet metal Aluzink	
Corrosions class inside	C3	
Stone wool insulation mm / density m ³	30 / 100 kg/m ³	
Leakage class	L2	
Exhaust air limitations	+15/+40°C, Max 25% RH with -20° UL	
Out door air limitations	-20°C / 99% RH	
Supply settings	Adjustable +15/+25°C	
Surrounding to unit	+5/+45°C max 80% RH	
Surroundings Comfort panel	+10/+40°C max 80% RH	
Degree of protection	IP21	

Dimensions:



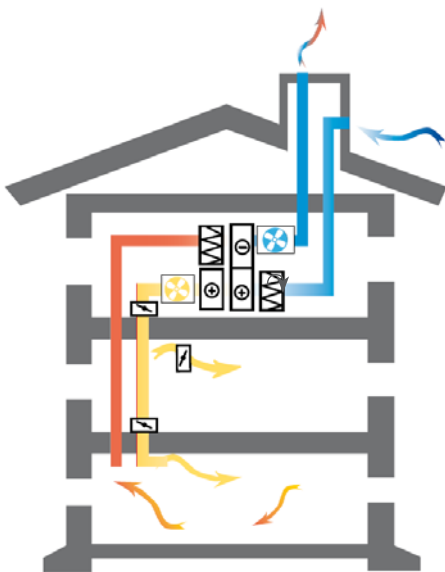


Warning

The unit and the ventilation system must be installed by a qualified person in accordance with local rules and regulations.

Installation

The unit is to replace depleted and humid air from the property to the new fresh air from outside. To recover heat from the used air and preheat outside air before it is blown into the property.



Unpacking

Check that all ordered equipment are included before installation.

If the unit is not started up directly after installation, ducts shall be covered with an airtight lid, the unit must be kept protected from dust and moisture.



Taken into account

Do not connect the dryer or cooker hood to the vent system.

Duct connections / duct ends should be covered during storage and installation.

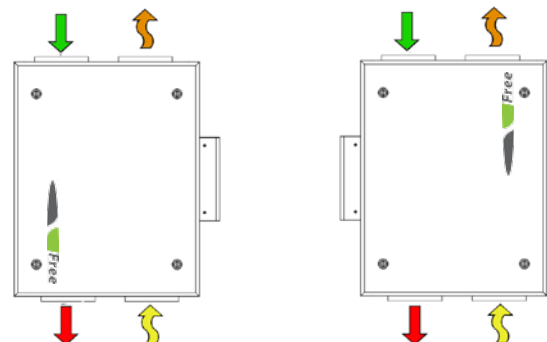
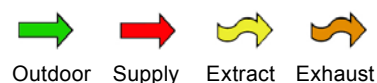
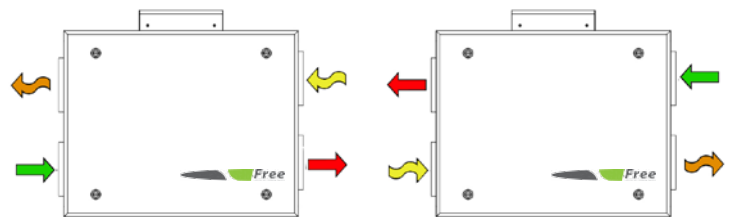


Warning

There may be hidden sharp edges, use gloves!
The unit is heavy!
DO NOT lift the duct connections!

Description of the flow direction

V90 and V90EL comes in left-hand version. Unit can be installed in the right design for easier installation and connection of the duct system. How you change the air direction is described on page 11, we advise against installing V90 / V90EL in right hand when the unit is mounted vertically, as this can lead to condensation in the heat exchanger.



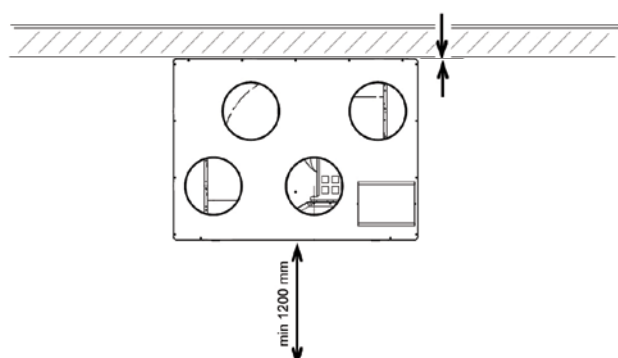
Requirements for service space

We recommend installing the unit in a separate room, storage room or laundry room on a steady surface. Leave space so that components can be removed for maintenance, such as filter replacement.

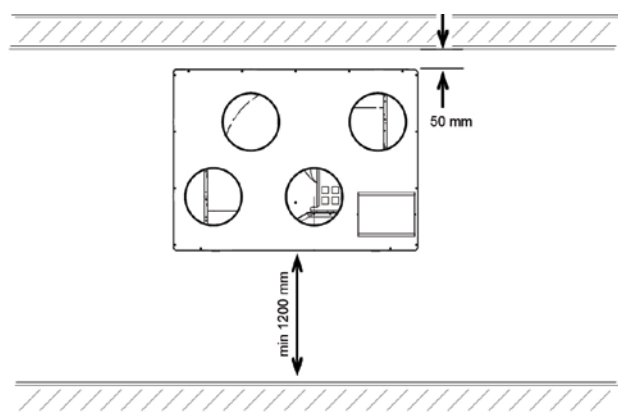
IMPORTANT!

The connection box on top of the unit should have at least 150 mm space to the ceiling or the like to be able to open when the unit is installed.

Place the unit at least 50 mm from the wall to prevent noise over carriage to the wall. Free space in front inspection cover = Unit width times two. However, minimum 1200 mm (safety distance).



Unit wall placed



Unit floor placed

Connection box

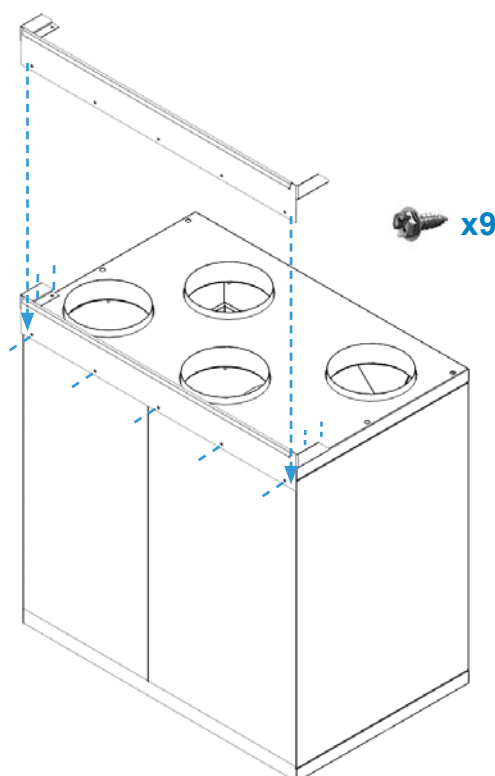
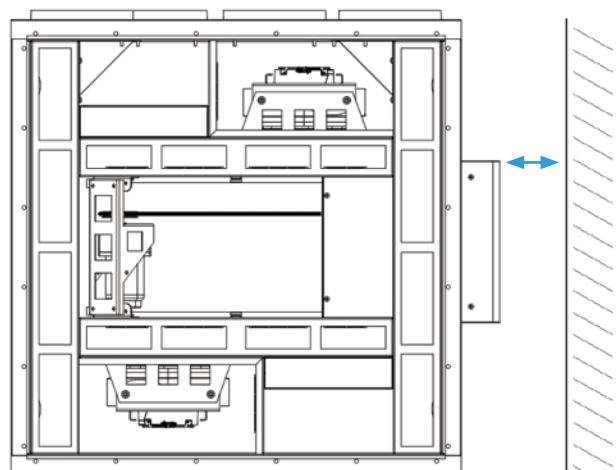
Terminal box cable entries

Terminal box top is loosened. External cables are drawn to the terminals through rubber membranes on the connection box backside, or that you provide the box with strain relief.

NOTE!

Outside the unit shall external communication cables be located at a minimum distance of 100 mm from current-carrying wires.

Min 150mm



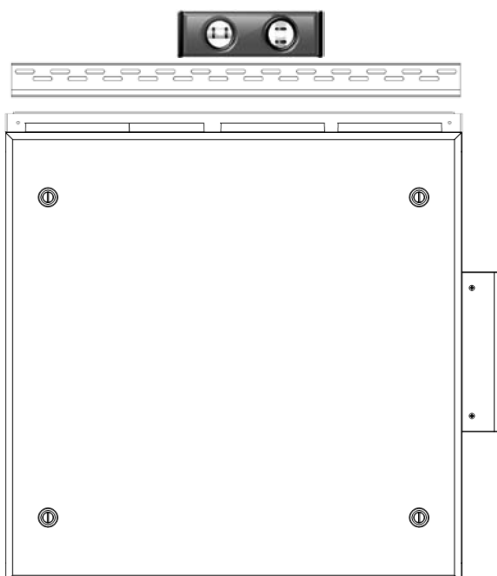
When replacing the unit

It is **VERY** important that the following points are performed and documented

- Before replacement of the unit takes place, measure and record the existing air flow / pressure in all the connecting channels, complete the protocol on page 30.
- Clean the existing canal system.
- Check the channel isolation and density. Supplement as needed.
- Replace the unit.
- Balance the airflow
- Please note the new values, protocols on page 31.

Mounting

- Prepare the surface where the unit is installed. Make sure the surface is smooth and level.
- The unit is heavy, make sure that the floor can carry the weight of the unit, otherwise reinforce the floor. A rigid and strong backing prevents any vibration.
- Lift the unit into place.
- Install in accordance with local rules and regulations.
- Check that the unit is completely level.
- Connect to the cleaned ductwork.
- Balance the airflow
- Note values, protocols on page 31.



Exchange and new installations

Duct system

The air is transported to / from the unit through ductwork. We recommend that before installing make a complete design of ductwork, silencers and diffusers. This is so that the entire system function as energy-efficient and quiet as possible.

Assembly of duct system for the exchange and Initial Installation

Install the ducts according to the selected vendor's respective instructions.

If the duct components with rubber seals are used, no additional sealing of joints.

IMPORTANT!

One should not screw or make holes in the unit casing (both internally and externally).

Units warm side

The warm connections for supply and exhaust should always be insulated if they are laid in colder or warmer areas than the ambient temperature in the duct.

Units cold side

The heater connections for air and exhaust air should always be insulated in its entirety.

Isolation of the unit both sides according to applicable industry standards.

Improper installation can result in condensation, forming and moisture with big injuries!

Connection of drainage units fitted with cooling coil

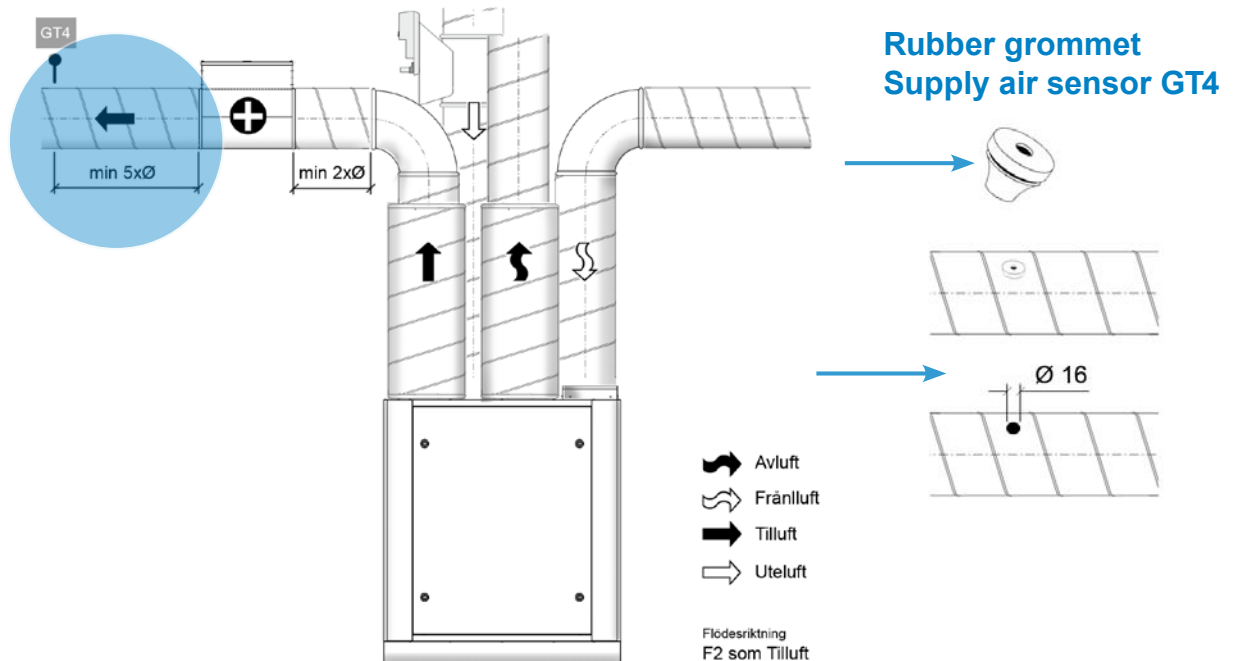
Connecting the drain with water should be done by a qualified technician. Improper wiring can result in water damage.

Electrical installation

The unit must be plugged into an easily accessible 230V grounded outlet. We recommend earth leakage circuit breaker.

Mounting

Mounting of supply air temperature sensor and accesories



The supply air sensor (GT4) should be placed in the supply air duct so it is at least 5 x Ø mm from the fan outlet or batteries.

NOTE!

Installed by licensed installer

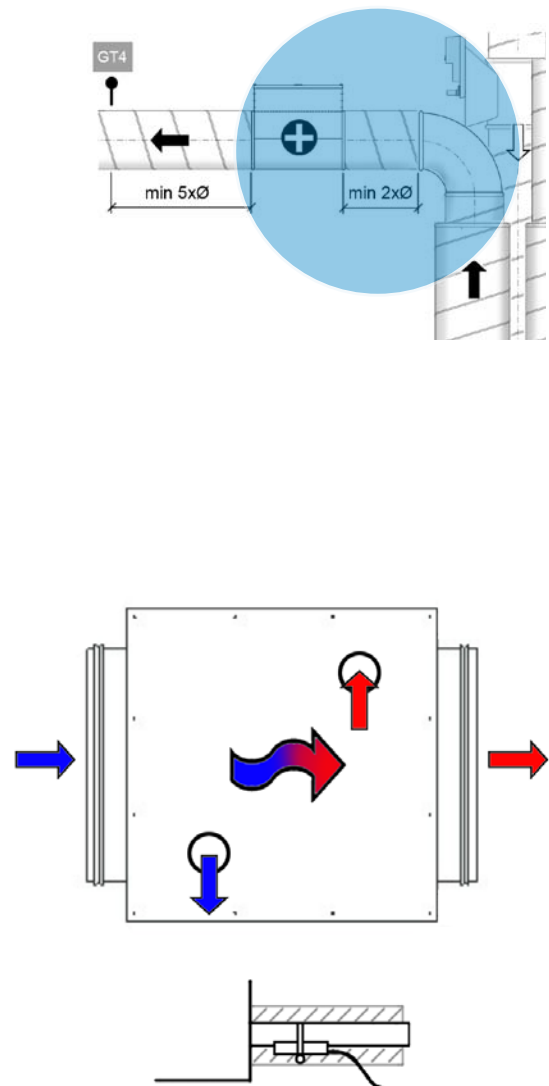
- If air heating and/or cooling coil is used, the supply air temp sensor shall be placed 5 x Ø mm from those in the direction of air flow.
- Drill a hole with a diameter of 16 mm in the supply duct. See the illustrations above and to the right.
- Push the rubber grommet into the drilled hole.
- Press the sensor so far that about 10 mm of the cable is hidden..

Direction of flow of water batteries

The illustration on the right shows the connection principle of countercurrent liquid flow. The principle is that the hot water enters the battery last in the direction of air flow, in order to get the maximum effect in the heating of the air.

Frost protection

Frost protection sensor should be mounted with the hose clamp around the water outlet pipe of the battery as close to the battery as possible. Ensure that the sensor has maximum contact with the pipe. Fluid pipes should be isolated in their entirety in order to reduce losses. **IMPORTANT!** Ensure that the frost protection sensor is isolated together with the liquid pipe. Improper installation or inadequate insulation could cause water to freeze in the coil with great damage.





Hazard

Ensure that power is disconnected before maintenance and electrical work.
Work with electrical connections and maintenance may only be performed by a qualified person according to local rules and regulations.

Change the direction of flow and change the inspection side

V90EL

The unit can be installed in left (supply) or right-hand version. If the unit are to be installed in the right-hand version the built in electric heater EB2 should be relocated, see picture on the right.

Change of flow direction is done as follows.
Remove the electric heater by loosening the three mounting screws that hold the electric heater.
Unplug the connector on the electric heater.
Pull out the electric heater, turn the device so the connector is facing down and push the electric heater between the heat exchanger and the fan on the right side.

Check that the heating coil moves freely and is not resting anywhere.

Remove the blind plug (terminal cover) on the right connecting cable and move it to the left side.

Plug the connector into the electric battery and fastened the heater with the three screws.

Make sure the cables dont get clamped or abuts the heat exchanger. Clearing if necessary.

Change the direction of airflow in the unit's control system by turning on DIP switch 4 See page 19.

Monting of comfortpanel

IMPORTANT!

Comfort panel shall be located in a conspicuous and accessible place in your home. Remember that by using the Comfort panel the user can affect their indoor climate in an easy and safe way, to change between different temperature modes and flow settings. It is also by using the Comfort panel the user gets information if any alarms occur.

The cable to the Comfort panel is 10 meters long. Extension cables are available from Swegon Lidköping AB.

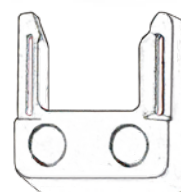
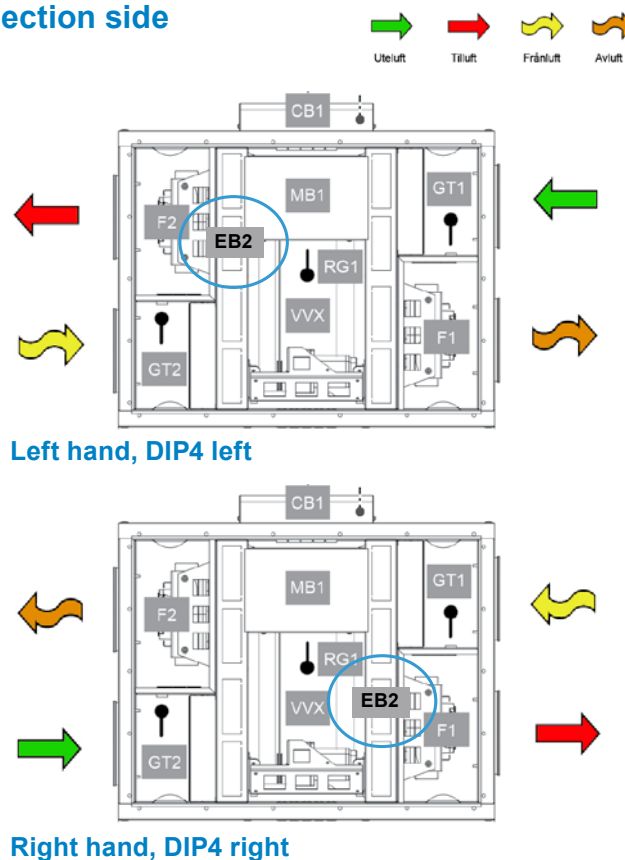
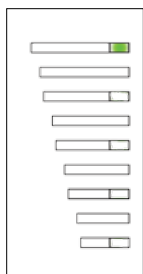


Illustration shows the wall bracket used to attach the comfort panel.

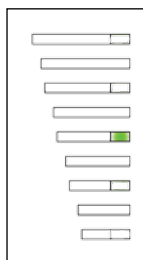
Forced ventilation



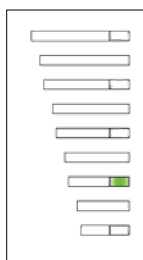
Active ventilation



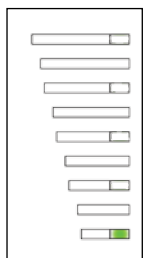
Normal ventilation



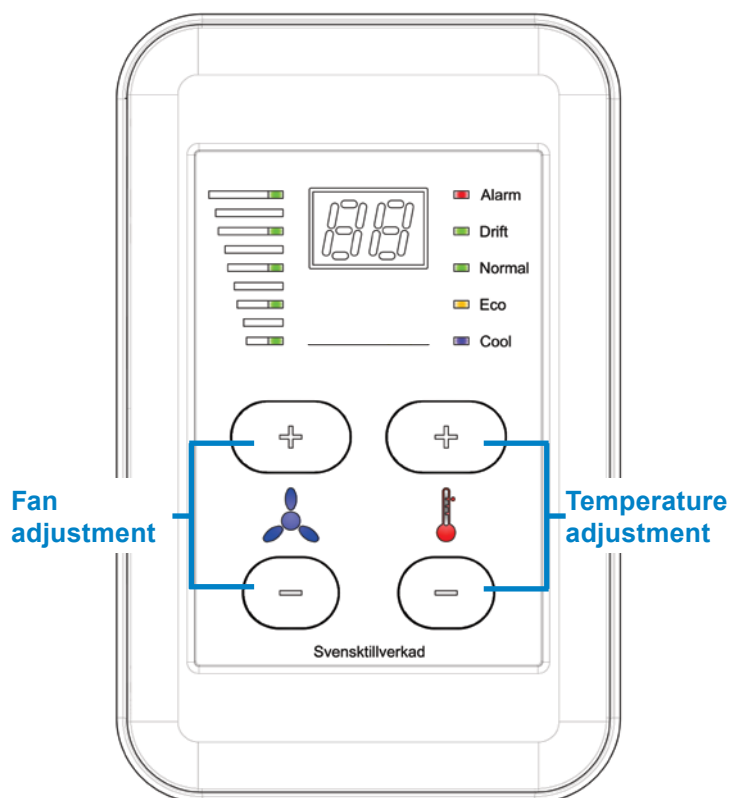
Passive ventilation



Away mode



Energy savings



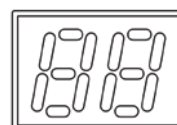
The alarm light
indicate alarm.

 Alarm

The operation lamp
indicates the operating
status with light during
normal operation.

 Drift

The display shows the
digits which alarm has
occurred.



Normal temperature

 Normal
 Eco
 Cool

Eco temperature

 Normal
 Eco
 Cool

Cool temperature

 Normal
 Eco
 Cool

Manufacturer reserves the right to alter specifications

Fan control

To change the fan setting

Pressing the + or - buttons on the blue fan symbol changes the fan speed. The change is indicated in the upper left diode scale.

Forced fan

Additional fan capacity. When you need to have maximum ventilation. For example, in the bath room or if shower is frequently used. This function can also be activated via an external switch.

Active Fan

Good with increased ventilation if you have guests at home or to cool the house during hot days. Active mode can also be good last period before changing the filter to compensate the filter pressure drop. Remember that energy consumption is increasing and changing filters is the best energy savings.

Normal Fan

Standard setting.

Passive Fan

Lowers fan speed, can be used during the day when house are empty. The passive mode stops any heating exept recovery.

Fan away

Save energy by reducing ventilation when you go away. This function can also be activated for example by house alarm or other external switch. The away mode stops any heating exept recovery.

Alarms and Operations

LEDs for Alarm and Drift (operation) flashes in different ways depending on which alarm has been triggered.

Numeric display indicates the alarm code. See alarm list on page 26. Contact your installer for more information about the action.

Filter alarm

If alarm code 12 is displayed, the filters needs to be replaced! Contact Swegon Lidköping AB and order new filters. You will receive a new filter sent home when it's time to change! Form for filter subscription is available on our website: www.luftmiljo.se. Or contact us and we will send forms to you. You can also order filters by contacting your installer.

If you do not replace the filters, the unit will stop after a certain time!

Temperature control

In order to set the temperature

Pressing the + or - buttons on the red temperature indicator changes the temperature control. The change is indicated in the lower right diode scale.

- The green light indicates that the normal temperature is selected. The unit delivers the temperature set at the installation of the unit.
- The yellow light indicates that Eco is chosen, for a more economical operation.
- The blue light at the bottom of the steps indicates that Cool is selected. The auxiliary heater is switched off and the cooling function will start if installed.

Normal



Warmest position for maximum comfort.

Eco



Heat setting by 1 degree lower temperature.

Cool



No heat is allowed. Provides cooler inlet temperature at hot days. Heat recovery is striving to maintain the set temperature. In Normal and Eco seems exchanger for maximum heat recovery. The Cool operates to cooling recovery, when the outdoor temperature falls below the setpoint in heat recovery mode to maintain the setpoint.

Functional Description

In Normal mode the unit strives to maintain the set temperature. When the outdoor temperature approaches zero it starts the heater to go in and supplement heat to maintain comfort. The heater turns off when the temperature are 2 degrees below than the set temperature.

In Eco mode, the heater works in the same way, but with a limit on the heater which is 3 degrees below than the set temperature.

When the cool mode is selected the unit strives to maintain the set temperature minus the set value (parameter 9 on page 21). The heat exchanger enters the cooling recovery if the temperature is colder than the outside temperature. In operating mode, Cool stops the heat function and activates the control signal for the cooling coil and pump control.

Before the system is started

When installation is complete, check the following:

- The unit is installed according to instructions.
- Cables are routed correctly.
- All dampers and silencers installed.
- All channels are isolated.
- No leaks in the duct system.
- That outdoor air intake is positioned with sufficient distance from the hood, etc..
- External devices are connected.
- The unit is configured properly.
- That no tools have been left inside the unit.
- No air leakage has occurred.
- All measurements are documented and saved.

For the installer

Handing over the system to the customer, or designated contact person. When the unit is installed, the parameters are checked and commissioning protocol is completed, the customer will also Quick guide filled with the corresponding parameters.

Inform the customer of comfort panel functions and aligned parameters.

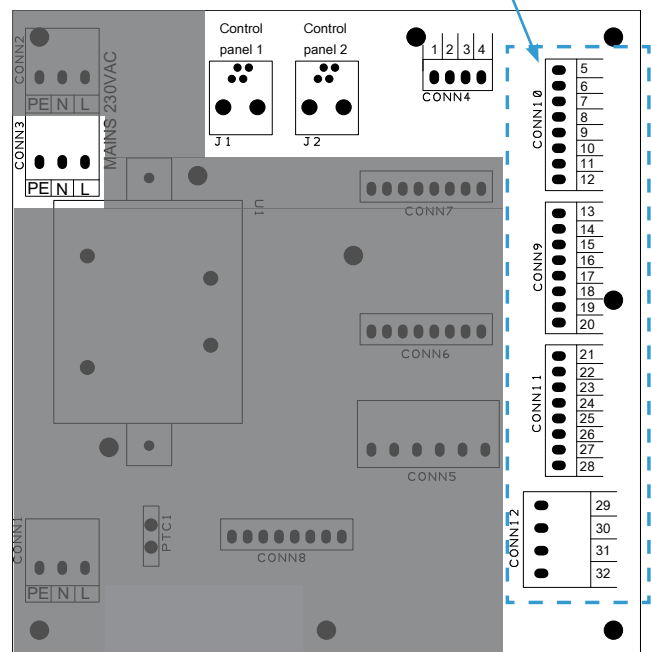
Connection board

The unit can be supplemented with external functions. These consist of accessories like sensors, thermostats and other similar features that can be connected to the unit's various inputs to obtain the desired function.

Terminals for external functions

On the connection board are prepared connection terminals. On page 15 describes the various input and output use and conditions.

Terminal board for external functions. See description on page 15





Hazard

Ensure that power is disconnected before maintenance and electrical work.
Work with electrical connections and maintenance may only be performed by a qualified person according to local rules and regulations.

CONN3	L	Brown	Connection for 230VAC to transformer 24VAC for damper and valve actuator (optional)	Only for rated insulation transformer. Here you connect 230VAC of transformer	
	N	Blue			
	P	Yellow/Green			
CONN4	1	White	Anti freeze guard for water heater coil (optional)	PT1000 sensor	
	2	Black			
	3	White	Temperature sensor supply air	PT1000 sensor	
	4	Black			
CONN10	5	G	Temperature alarm to electrical heater. Normally closed	Only potential free switch	
	6	G0			
	7	G	Emergency stop input, normally closed	Only potential free switch	
	8	G0			
	9	G	External stop, normally open	Only potential free switch	
	10	G0			
	11	G	Activation from fire place input, normally open	Only potential free switch	
	12	G0			
CONN9	13	G	Activation forced ventilation mode, normally open	Only potential free switch	
	14	G0			
	15	G	Activation away ventilation mode, normally open	Only potential free switch	
	16	G0			
	17	G	Not used, do not connect		
	18	G0			
	19	24VAC	Connection for external transformer 24VAC (optional)	Here you connect 24VAC to transformer on CONN3	
	20	24VAC			
CONN11	21	0...10V/Y1	Connection for 24VAC to cooling coil valve actuator (optional)	Max 0,3A	
	22	24VAC/G			
	23	N/G0			
	24	0...10V/Y1	Connection for 24VAC to water heater coil valve actuator (optional)	0...10V	Max 0,3A Signal electrical heater (can not be combined with water heater)
	25	24VAC/G			
	26	N/G0		N	
	27	24VAC	Connection for damper feed 24VAC (optional)	Max 0,7A	
	28	N			
CONN12	29	C	Connection for pump control of water heat circuit, normally open	Relay OUT, max 1A/50V	
	30	NO			
	31	C	Connection for pump control of water cooling circuit, normally open	Relay OUT, max 1A/50V	
	32	NO			
J1			Connection for comfort panel No 1 (modular connection)	You can connect two comfort panels	
J2			Connection for comfort panel No 2 (modular connection)	You can connect two comfort panels	

Wiring Diagram V90

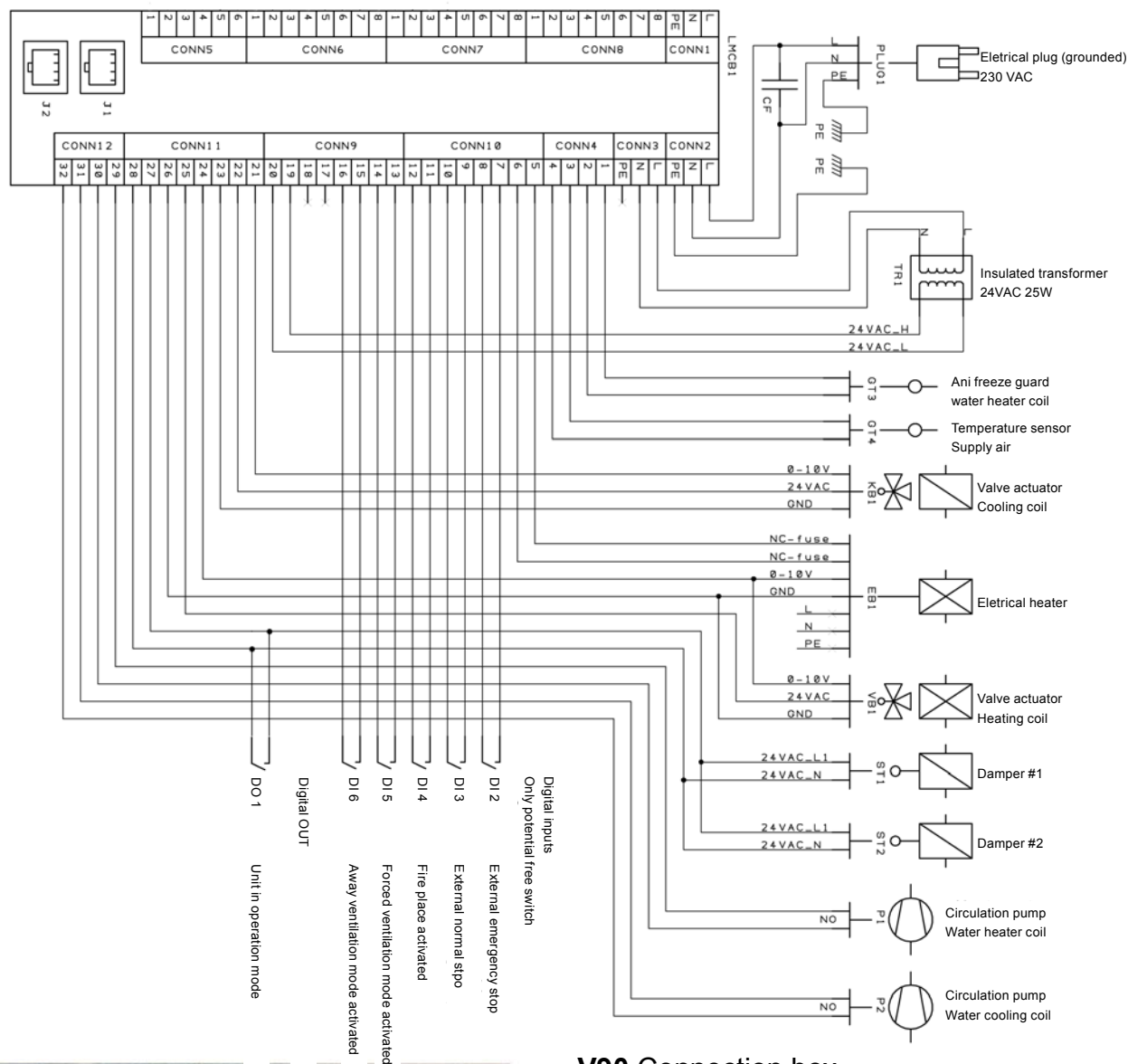


Hazard

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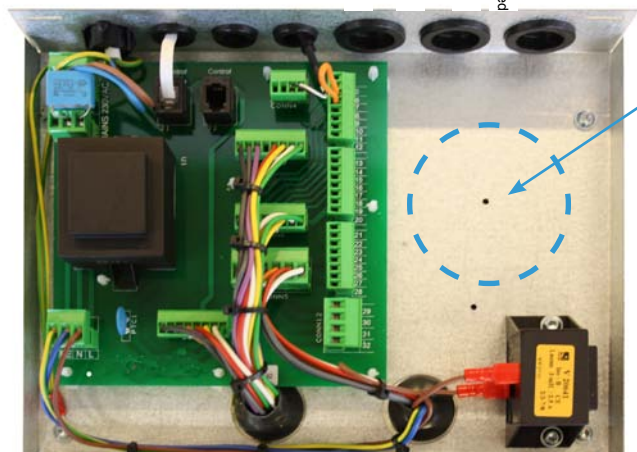
V90 wiring diagram



V90 Connection box

Designated 24VAC Transformer (included on the unit commissioned by 24 VAC optional)

When retrofitting a transformer it is connected as above wiring diagram.



Wiring Diagram V90EL

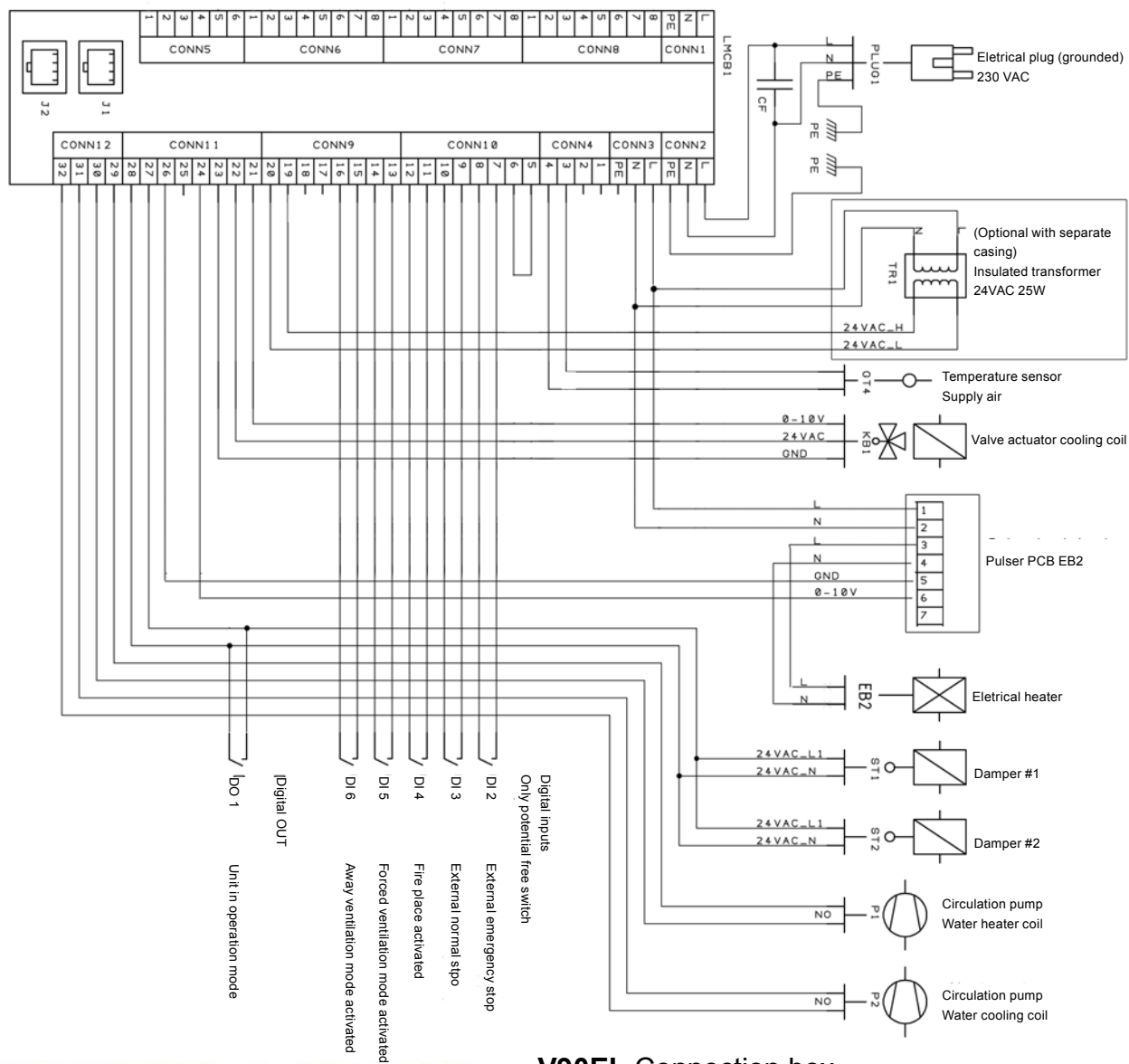


Hazard

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V90EL wiring diagram

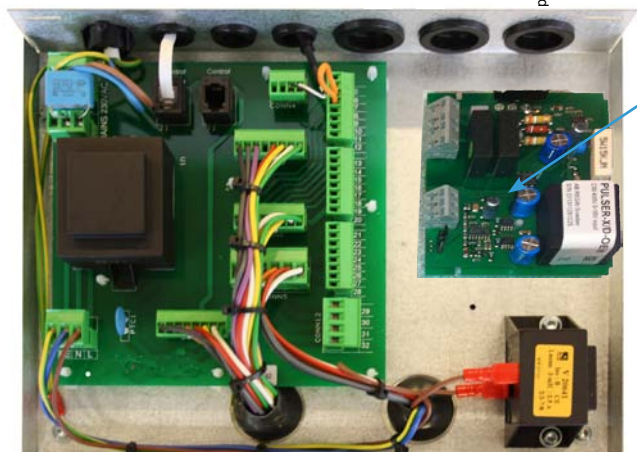


V90EL Connection box

Pulser PCB for electric heaters EB2

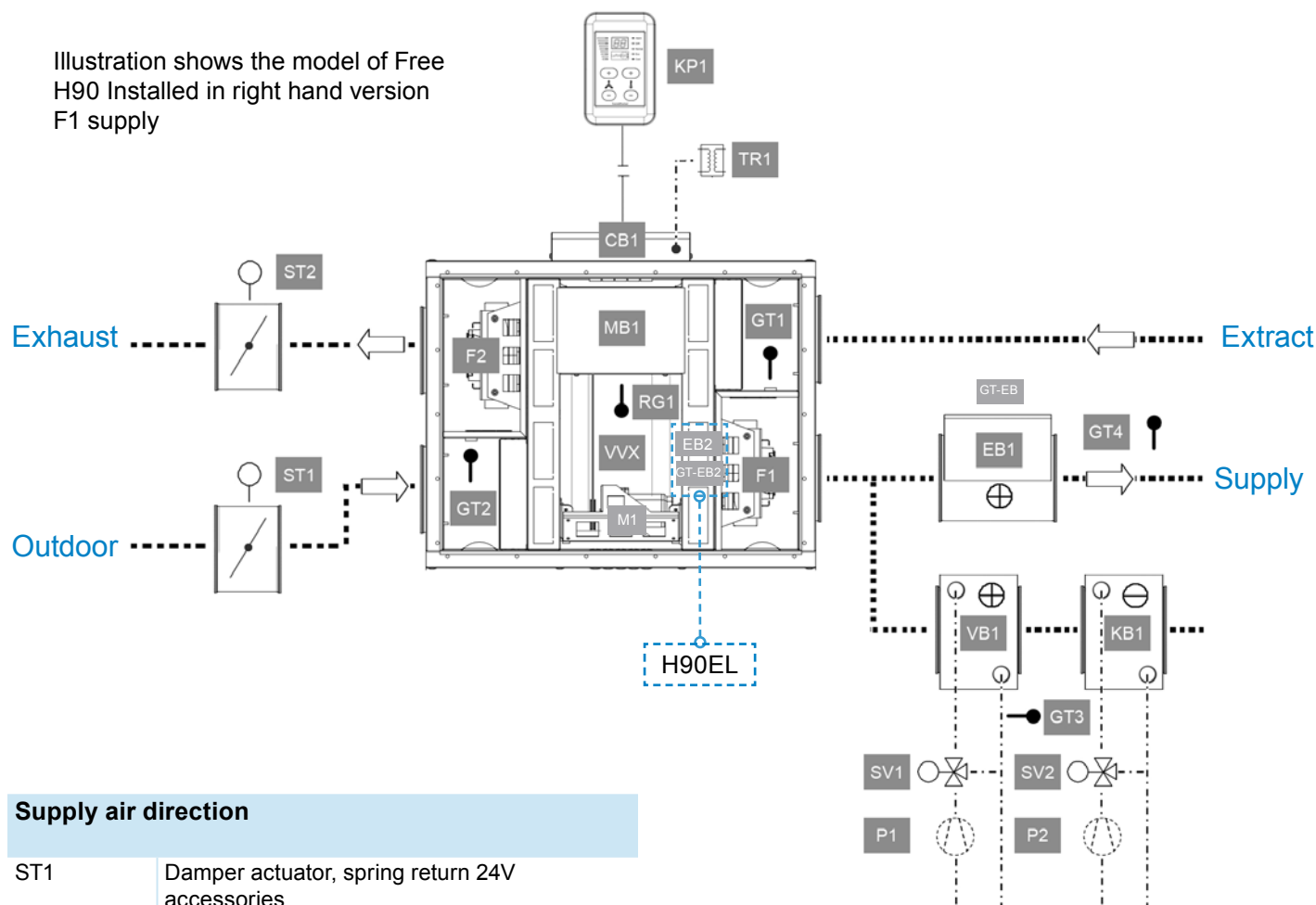
When retrofitting, connect as above wiring diagram.

When supplementing with 24VAC transformer, the transformer are placed in a separate casing.



Description unit and components

Illustration shows the model of Free H90 Installed in right hand version F1 supply



Supply air direction

ST1	Damper actuator, spring return 24V accessories
GT2	Sensor temperature, outdoor air
V VX	Heat recovery rotor
M1	Heat recovery rotor motor
RG1	Rotation guard
F1	Fan 1 (always to the right from the inspection side view)
EB1	Electrical heater accessories
GT-EB	Overheat protection electric battery Included in EB1
GT4	Sensor temperature, supply
VB1	Water heater coil accessories
SV1	Control valve with actuator 24V accessories
P1	Circulation pump heating circuit Included in the heating circuit
GT3	Sensor temperature, frost guard Included in VB1
KB1	Water cooling coil accessories
SV2	Control valve with actuator 24V accessories
P2	Circulation pump for cooling circuit Included in the cooling circuit

Exhaust air direction

GT1	Sensor temperature, exhaust
MB1	Control main board
CB1	Connection board
KP1	Comfort panel
TR1	Transformer 24V accessories
F2	Fan 2 (always to the left from the inspection side view)
ST2	Damper actuator, spring return 24V accessories

Air flow indications

TL	Supply air to room
FL	Extracted air from room
UL	Outdoor air
AL	Exhaust air



Hazard

Ensure that power is disconnected before maintenance and electrical work.
Work with electrical connections and maintenance may only be performed by a qualified person according to local rules and regulations.

Configuration of the unit

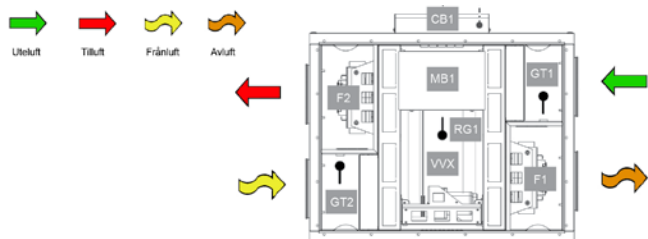
When the unit is installed in the building and all the devices connected, the DIP switches shall be configured according to how the installation is made.

Do like this:

Open the inspection door, use a large slotted screw-driver.

Remove the control box cover. Use a Torx T20 screw-driver.

Set up the unit with the features that are relevant, see table at bottom of page. DIP switch, you will see marked with a blue circle on the control board, see



Left hand, DIP4 left



Right hand, DIP4 right

The controls are left aligned in the table

	Switch number	Function	Left pos	Right pos
1	1	Eletrical heater installed	No	Yes
2	2	Water heater installed	No	Yes
3	3	Water cooler installed	No	Yes
4	4	Supply air fan	F2	F1
5	5	Service interval	5 month	11 month
6	6	Parameter settings	Normal	Factory preset
7	7	Installer level in comfort panel	Inactive	Active
8	8	Factory test		

illustration below right.

DIP switch 1 - electric heater installed yes / no.

DIP switch 2 - water heater installed yes / no.

DIP Switch 3 - cooling water coil installed yes / no.

DIP switch 4 - choice of supply fan F1 / F2

(V90EL - remember to change the position of the electric battery when you change the direction of flow).

DIP switch 5 - service intervals. Filter alarm will appear 1 month before the set alarm time. The time for service alarm is selectable (11 or 5 months).

Set DIP switch 6 Normal / factory setting.

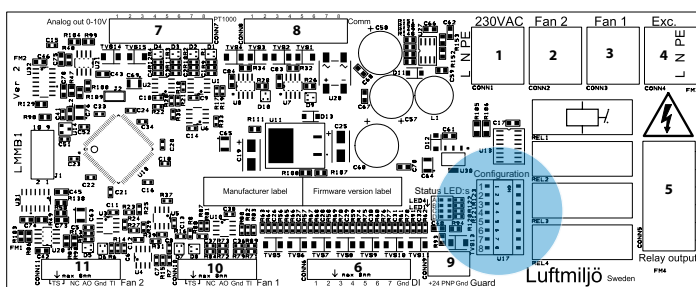
Set DIP switch 7 Air Adjustment active.

Replace the inspection cover. Guide lugs on the cover make sure it ends up in the right place. Go to the next page and proceed with the installation!

DIP switch 6 indicates Normal or Factory setting. Which means that it indicates whether the unit is to go with aligned values for fans and temperature control or factory setting. It is an advantage in troubleshooting the unit that you can go back to factory setting.

When Dip switch 7 is in an active state the comfort panel shows installation menu function, and is used for parameter setting and air adjustment.

DIP switches on the control board



Setting parameters using the Comfort Panel

continued from page 19.

Insert the plug.

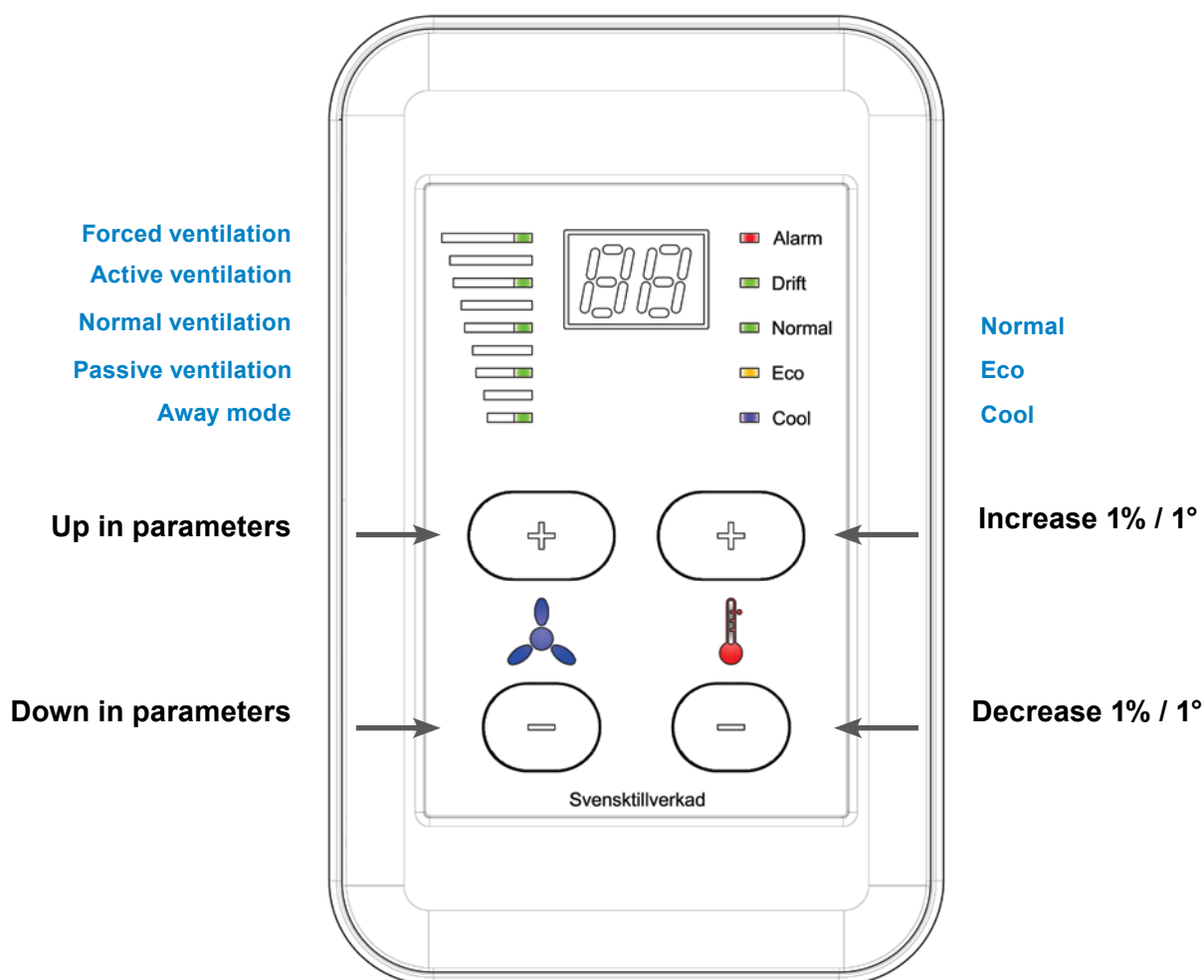
Obs!

If the comfort panel display flashing alternately "00" and "99", a forbidden combination been selected. Disconnect the power and adjust the selections made on the DIP switch.

Comfort panel display alternates between the parameter number in the right display number, to view the current parameter value

Do like this

1. Measure and adjust the value of the parameters in comfort panel, see the parameters in the table on page 22.
2. Pull the plug when all parameters are set.
3. Open the inspection panel.
4. Turn DIP switch 7 to Inactive (position left).
5. Remove any any loose objects or tools are in the unit.
6. Replace the control board cover and inspection cover.
7. Insert the plug.
8. Done!
9. Fill in the table on page 31, and the table in the Quick Guide.



The unit has five different modes, of which there, normal and forced to be adjusted:

- Away Mode (min. flow)
- Passive ventilation (unit calculates the passive flow)
- Normal ventilation (normal flow)
- Active ventilation (unit calculates the active flow)
- Forced ventilation (forced flow)

Winter adjustment function

- If the unit is not equipped with heating coil or if the battery capacity is not enough, this function can be selected.
- Exhaust fan increases speed with 0-20% (adjustable) to increase the energy efficiency of the heat exchanger and increases supply air temperature.

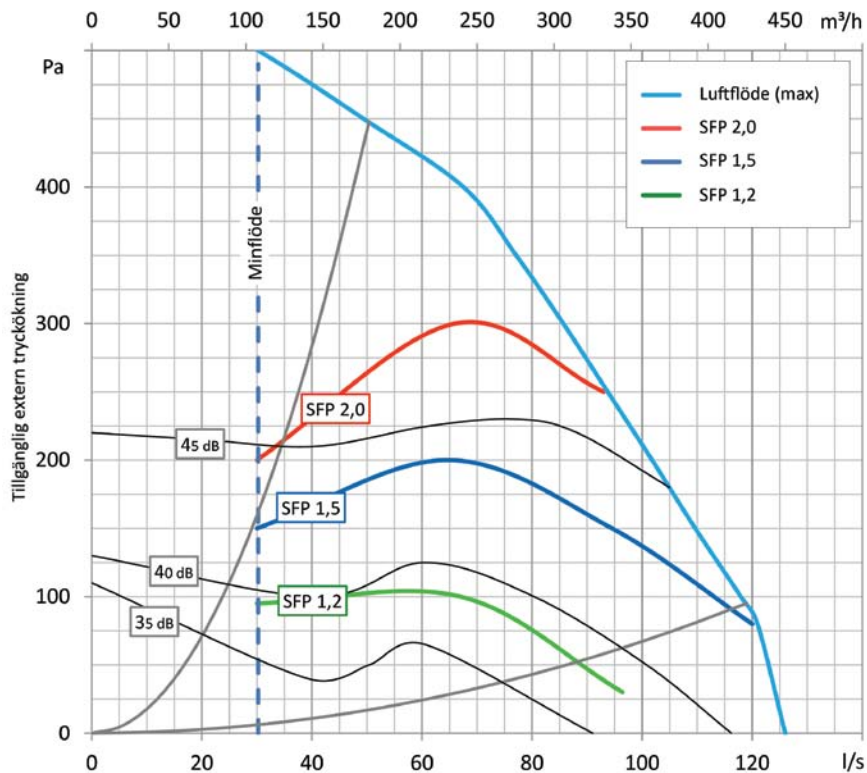
Fire place function

- Via an external switch connected to the units connecting board you can activate this feature, see DI4 page 18.
- Exhaust fan control signal then decreases with 0-20% (adjustable), as long as this input is activated.
- This produces a positive pressure in the building to assist in the start up of the fireplace.
- Recommended time of the function is 0-30 minutes.

Do not forget

Fill in the aligned values in the Protocol Operating Parameters on page 31, and the little table in the Quick Guide. Inform finally the end user of what is done!

Parameter	Parameter information	Factory setting	Adjustable value
0	Supply temperature	21°C	15-25°C
1	Supply airflow in normal mode Adjust and measure airflow.	70%	35-99%
2	Extract airflow in normal mode Adjust and measure airflow.	70%	35-99%
3	Supply airflow in away mode Adjust and measure airflow.	30%	20-99%
4	Extract airflow in away mode Adjust and measure airflow.	30%	20-99%
5	Supply airflow in forced ventilation mode Adjust and measure airflow.	85%	35-99%
6	Extract airflow in forced ventilation mode Adjust and measure airflow.	85%	35-99%
7	Winter adjustment increased airflow extract Adjust and measure airflow.	10%	0-20%
8	Fire place reduced extract airflow Adjust and measure airflow.	10%	0-20%
9	Cool function temperature decrease Negativ adjustment in cool mode.	5°C	0-10°C



In the above diagram is read as follows:

Blue solid line	Maximum air flow in relation to external pressure
Blue dashed line	Min adjustable flow in normal operating mode
Gray Line	Noise Level (dB A) to ambient (calculated)
Black line	Recommended operating max
Green, Blue, Red	SFP in relation to the flow and pressure

Airflow balance

Measure and adjust the parameters with the comfort panel, see description and parameters in the table on page 21.

Measure the total supply air and exhaust air flow in normal, max and min. The exhaust flow rate shall in all operating modes correspond to the supply air flow plus 5-10%.

Improper flow balance can result in unit stop by triggering alarm 9, low supply air temperature.

IMPORTANT!

In low external temperatures, the unit must be run in normal operating mode ventilation, this ensures that any heater is operating and that the air circulation is adequate *.

* Insufficient air circulation or improper flow balance can cause condensation to occur in the heat exchanger at low outdoor temperatures, this is a signal that the air circulation is inadequate, or that the supply airflow is larger than the exhaust air flow. This can lead to moisture and risk of major damage.

Start sequence of the unit

- The LED flashes for operation when the unit is in the startup phase, wait about 3 minutes.
- When the LED is steady, the unit is in operation mode.
- The unit then starts aligned with the parameters.

Operation with electric heating coil

- The controller keeps a constant temperature by means of the supply air sensor placed in the duct after the heater.
- Control is done in sequence, heat exchanger recovers heat from exhaust air to preheat incoming air.
- If supply air don't reach the correct temperature, the electric heater gets its start signal to help to reach the optimal supply air temp.
- At normal stop, the fans run for 3 minutes to cool the electric heater before the unit stops.

IMPORTANT

If the unit is equipped with electric heater, normal airflow should always be greater than the minimum airflow according to the graph on page 22.

Operation with water-heating coil

- The controller keeps a constant temperature by means of the supply air sensor placed in the duct after the battery.
- Control is done in sequence, heat exchanger recovers heat from exhaust air to preheat incoming air.
- If supply air do not reach the correct temperature, the circulation pump starts and water heater actuators start to open the flow of water over the heater.
- To protect the coil from freezing is a frost guard sensor adapted to the return line to the water heater. If the temperature will be below 7°C, the unit stops.
- This sensor also helps to constantly keep the battery temperature to 20°C when ventilation is turned off.
- Anti-jamming of circulation pump with 3 min / day.

Operation with water cooler

- The cooling function is activated manually using the Comfort panel, choose Cool.
- The cooling function will start the circulation pump for the cooling circuit and the cooling coil actuator opens.
- The actuator controls the flow of cooling water to the battery using the supply air sensor so that the desired temperature is reached.
- If the temperature of the air inside the property is less than the temperature of the outside air by 2°C, the heat exchanger runs cooling recover from the lower exhaust temperature.
- Anti-jamming of circulation pump with 3 min / day.

Stop sequence of unit

Stopping the unit with electric heater



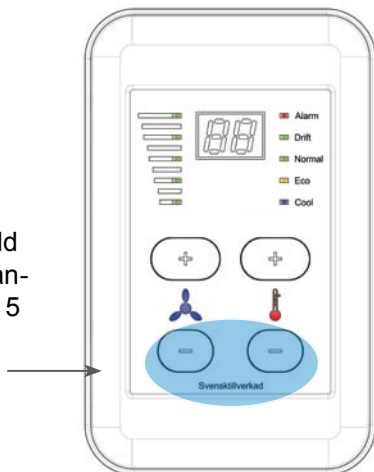
Warning

- Note that the unit stops rotating parts a while after the unit have been made powerless.

Manual stop

- Hold both comfort panel - buttons for about 5 seconds to turn off the unit. Stop function can also be connected via an external switch, see page 14. Wait 5 minutes until the unit stops.
- Pull the plug before opening the unit.

Manual stop: hold
- buttons simultane-
ously for about 5
seconds



Comfort panel will now display the alarm 13 (external stop). To start the unit again, reset the alarm by pressing and holding fan of regulation + and - buttons for 5 seconds, see picture on the right. Power failure reset the alarm automatically.

Emergency stop of unit

Comfort panel displays alarm 1 (emergency stop triggered). All functions are stopped without delay!

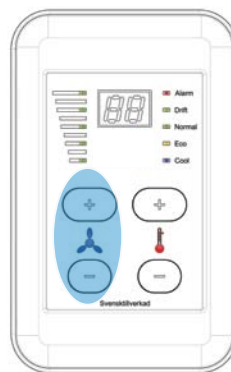
This function can be activated by external wiring of emergency stop. (Normally, this function is bridged on delivery). Check electric heater overheating protection as no cooling is done. Check reason of stop!

Alarm

The control system monitors the unit's functions. An emergency number is displayed on an action, implausible values.

Alarm 12

- When there is a month left to change the filter, alarm LED flashes. Drift diod is green.
- On reaching time for filter change lights both the alarm (red) and drift diod (green) steady.
- If the filters are not replaced by another month the unit stops. The alarm LED is lit (red) and drift diod off.



Comfort panel

If an alarm is not restored, the same alarm appears when unit is restarted. Alarm that stops the unit prevents the unit to start when power is turned on.

Alarms / Troubleshooting

Alarm is displayed with a number. For more information about alarms, see Alarm List on page 27.

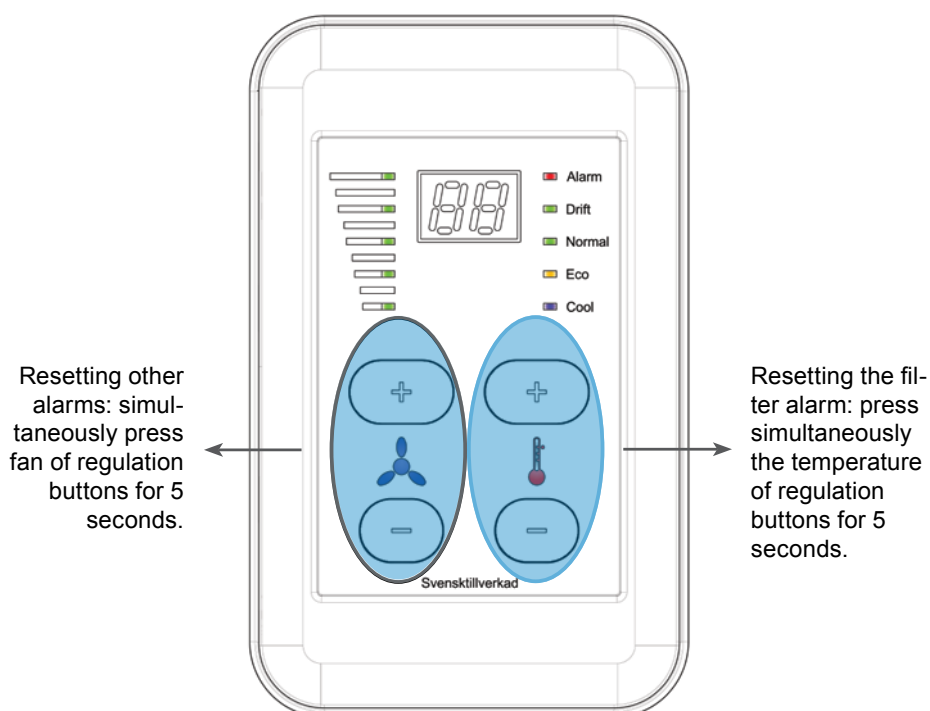
Reset alarm

Filter alarm is reset by pressing and holding the temperature of regulation + and - buttons for about 5 seconds

Other alarms are reset by pressing and holding the fan of regulation + and - buttons for about 5 seconds.

OBS!

The alarm resets when you **release** the keys!





No action may be carried out before the unit stopped, and the power is off!

Any error that is indicated to be checked and fixed!

LEDs for alarm and Operation flashes in different ways depending on which alarm has been triggered.

Numeric display indicates the alarm code.

The alarm is reset by pressing and holding the Comfort panel fan control + and - buttons for about 5 seconds.

Filter alarm is reset by pressing and holding the Comfort panel temperature control + and - buttons for about 5 seconds.

Alarm nr.	Content	Indication on led	The service technician: See the service manual how to fix the alarms.
1	Emergency stop triggered	Alarm: Shines Drift: Off	All functions are stopped without delay. Check the electric battery when no cooling is done. Check reason to stop!
2	Internal fire alarm	Alarm: Shines Drift: Off	Check the unit's internal components. The alarm stops the unit in case of fire in the property, not to spread the smoke / fire.
3	Anti freeze protection (Out < +7°C)	Alarm: Shines Drift: Off	Check water temp to the coil and/or heat recovery
3	Anti freeze protection (Out > +7°C)	Alarm: Flashes Drift: Shines	Check water temp to the coil and/or heat recovery
4	Rotation guard triggered (Out <+5°C)	Alarm: Shines Drift: Off	Check that the rotor spins easily, drive belt, rotor guard indication and cabling.
4	Rotation guard triggered (Out >+5°C)	Alarm: Flashes Drift: Shines	Check that the rotor spins easily, drive belt, rotor guard indication and cabling
5	Anti freeze protection guard defective	Alarm: Shines Drift: Off	Check connection or replace the sensor.
6	Temperature sensor defective	Alarm: Shines Drift: Off	Check connection or replace the sensor.
7	Electrical heater triggered	Alarm: Shines Drift: Off	Thermal protection is activated, investigate the reason!
8	Exhaust temperature under setpoint	Alarm: Shines Drift: Off	Check exhaust temperature, minimum +15°C and/or airflow. Check DIP-switch 4 so correct Fan (1/2) are chosen for supply
8	Exhaust temperature under setpoint	Alarm: Flashes Drift: Shines	Check exhaust temperature, minimum +15°C and/or airflow. Check DIP-switch 4 so correct Fan (1/2) are chosen for supply
9	Supply temperature under setpoint	Alarm: Shines Drift: Off	Check heater and recovery funktion
9	Supply air temperature deviates from the setpoint	Alarm: Flashes Drift: Shines	Check the recovery function and and coils.
10	Supply airflow below setpoint	Alarm: Shines Drift: Off	Check the supply fan operation. Check the supply air duct system.
11	Exhaust airflow below setpoint	Alarm: Shines Drift: Off	Check the exhaust fan function. Check the exhaust air duct system.
12	Supply/exhaust filter clogged	Alarm: Shines Drift: Off	Unit stops when filter are clogged
12	Supply/exhaust filter clogged	Alarm: Flashes Drift: Shines	Filter Alarms - the unit stops in a month if no filter is changed.
12	Supply/exhaust filter clogged	Alarm: Off Drift: Shines	Indicates that the filter should be changed.
13	External stop	Alarm: Shines Drift: Off	External stop function activated



DANGER

Ensure that power is disconnected before maintenance and electrical work.

OBS!

Hold both comfort panel minus (-) buttons for about 5 seconds to turn off the unit. Wait 5 minutes before the unit stops.

Inspection & Maintenance performed 2 times/year

In addition to general maintenance, the following points made:

Control of rotary heat exchanger is performed once a year.

Verify that the exchanger can easily rotate

Check belt condition.

Check belt tension and replace if necessary or if the belt is slipping.

Check that the heat exchanger seals abuts against the sealing surfaces.

Checking the fans should be performed once / year

Make sure the power is disconnected before work begins.

Noise and vibrations from the fan usually means fan bearings need to be replaced.

If necessary, clean the fan with a soft dry cloth or other soft materials.

Do not use water!

Be careful because the fans are finely balanced!

Check rubber mounts for fan and rotor drive for cracks etc.

Replace the fan if not the sound or vibration ceases.

Water heater coil

Check the battery heating surface.

If necessary clean with vacuum or damp cloth.

If necessary, vacuum the supply side, use compressed air from the back.

If necessary, water with corrosion of aluminum used.

Check that the frost protection sensor for recycled water is properly seated.

Electrical heater

The electric heater, make sure that air can pass freely over the battery, and not to the heating elements are dirty.

Dirty element can cause unpleasant odors and in the worst case the fire!

The air velocity across the coil shall exceed 1.5 m / s

Dampers

In operation, the damper in fully open position.

If ventilation is turned off, the damper should close completely (otherwise risk to water battery from freezing).

Check that all valves, actuators etc. are designed for the power supply and that they can work freely.

Filter alarm

Change filter and reset alarm.

We recommend replacing the filter one to two times / year.

Switch off the unit before the change occurs. Vacuum the filter portion before the new filter is inserted.

Service Schedule

Function	6-months Service period	Date Signature	12-months Service period	Date Signature
Units casing	Clean filter section		Cleaning the filter section. Check the inspection panel sealing.	
Filter	Inspection and possible replacement of filters.		Replacement of filters	
Dampers	Functional checks and seals, replacement if necessary.		Functional checks and seals, replacement if necessary.	
Exchanger rotor	General review, performance testing, checking seals, control pollution. Clean if necessary.		General review, performance testing, checking seals, control pollution. Clean if necessary.	
Coils	General review, performance testing, checking seals, control pollution. Clean if necessary.		General review, performance testing, checking seals, control pollution. Clean if necessary.	
Cooling unit	According local regulations.		According local regulations.	
Control system	Function control, thermal controls, dampers and fire.		Function control, thermal controls, dampers and fire.	
Handover to the customer or designated contact	A review of information from technical service.		A review of information from technical service.	
Feedback	Written feedback and compilation of material consumption. Service report is sent to the customer.		Written feedback and compilation of material consumption. Service report is sent to the customer.	

Protocol of unit performance before replacement

Before replacement of aggregates occurs, measure and record the existing air flow / pressure in all acceding ducts.

	Existing value l / s	Existing value Pa
Supply normal flow / pressure		
Extract normal flow / pressure		
Outdoor normal flow / pressure		
Exhaust normal flow / pressure		
(Supply minimum flow / pressure)		
(Exhaust minimum flow / pressure)		
(Supply maximum flow / pressure)		
(Exhaust maximum flow / pressure)		
Other notes		
Signature / Date		

Protocol parameter settings

Serial number/ unit type number:

Parameter	Parameter	Adjustable range	Set value	l/s
0	Supply temperature	15-25°C	°C	l/s
1	Supply airflow in normal mode	35-99%	%	l/s
2	Exhaust airflow in normal mode	35-99%	%	l/s
3	Supply airflow in away mode	20-99%	%	l/s
4	Exhaust airflow in away mode	20-99%	%	l/s
5	Supply airflow in forced mode	35-99%	%	l/s
6	Exhaust airflow in forced mode	35-99%	%	l/s
7	Winter adjustment function	0-20%	%	l/s
8	Fire place adjustment function	0-20%	%	l/s
9	Reduced tepmperature in cool mode	0-10°C	°C	l/s

Other notes

Signature /
Date

Service notes

To ensure that your ventilation system to work in the best way it should be handled equally well and regularly as the rest of the house. Here you can easily document the dates of service and any remarks to have a good overview.



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