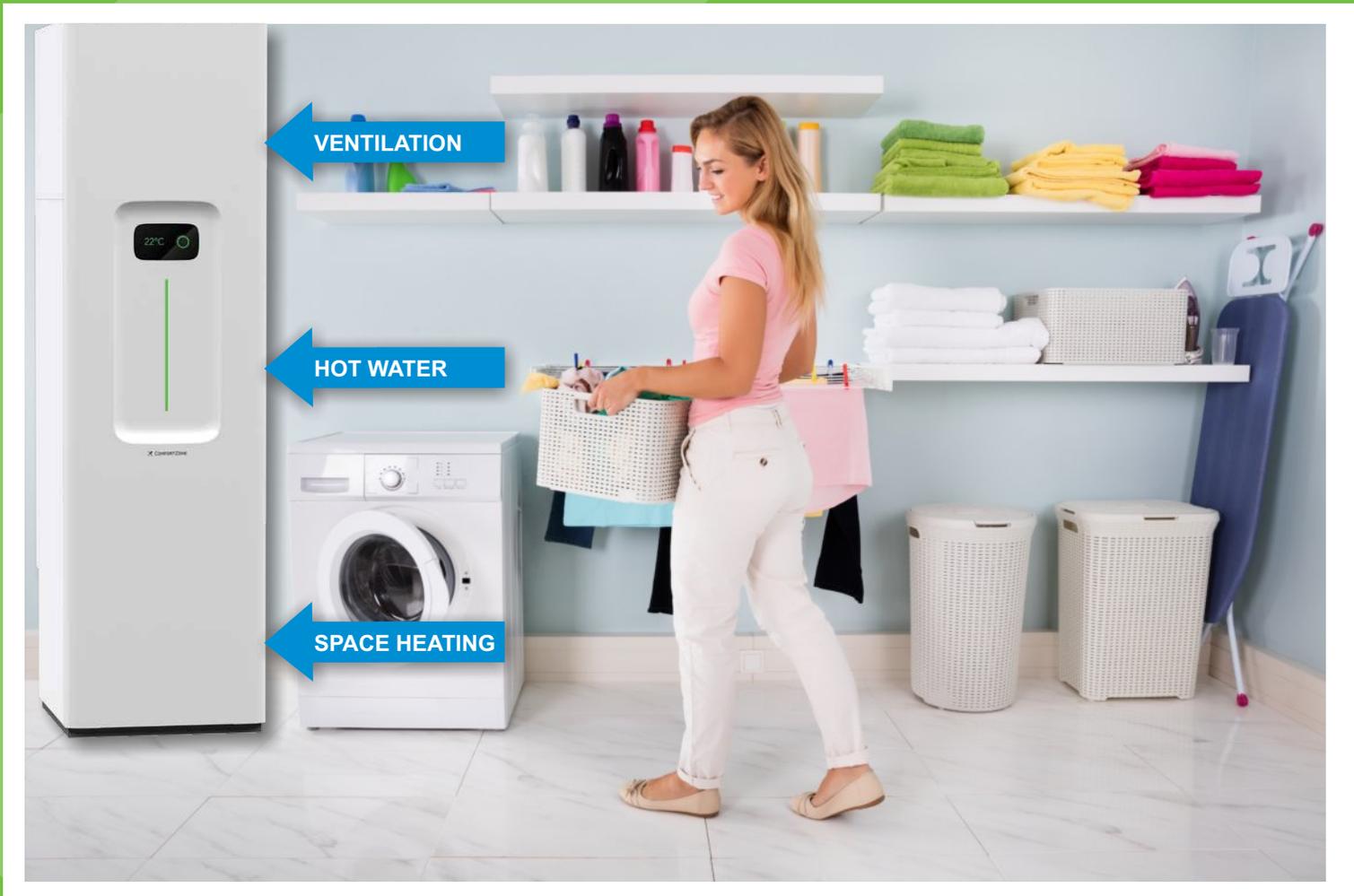




# COMFORTZONE

Exhaust Air Heat Pumps



THE ALL IN ONE SOLUTION



**Mike Teahan**  
Technical Sales Director



## INTRODUCTION:

Following months of research and factory visits, I am delighted to add the The ComfortZone EX Range of Exhaust Air Energy Recycling products for Heating, Hot Water and Ventilation to the RBSi port folio of products. Gunnar Hedlund (CEO) is a true professional and expert in exhaust air heat pump technology, and shares the same vision as I in terms of product specification, supply and support. Quality underpins all activity at ComfortZone, and a welcome addition to RBSi products.

ComfortZone manufacturing facility is in Sweden and has been a pioneer of Exhaust Air heat pump technology for the past 16 years. Apart from delivering the perfect indoor environment, Exhaust Air Heat Pumps (EAHP) contribute the necessary renewable energy for Part L compliance making them ideal for modern apartment blocks or residential homes.

The EX Product range provides an All In One solution delivering Heating, Hot Water and Controlled Mechanical Ventilation in a beautifully designed Appliance like product making it a seamless integration into a kitchen or utility room.

The ComfortZone EX Product range negates the significant expense of centralised or district heating, and also gives much higher efficiencies and lower running costs as there are no heat losses. Another problem solved is there is no requirement for separate billing and collection of fees for the heating meter.

Additional car parking or even living space is also released where the central heating plant room would have been placed.

### **OBVIOUS ADVANTAGES TO THE DEVELOPER ARE:**

- PART L COMPLIANCE MADE EASY
- PLUG & PLAY HEATING AND VENTILATION SYSTEM
- NO CIVIL WORKS
- NO PIPE DISTRIBUTION FROM GROUND LEVEL
- NO GAS / NO CHP
- NO ENERGY LOSSES = LOW RUNNING COST
- NO GEOTHERMAL HEAT PUMPS
- NO BUFFER TANKS
- NO BORE HOLES
- NO PLANT ROOM MAINTENANCE
- NO METERING
- NO BILLING
- NO CONSTRUCTION DELAYS
- INCREASED SITE SAFETY
- PLANT ROOM SPACE NOW USABLE FOR CAR PARKING OR LIVING
- REDUCED DEVELOPMENT COSTS = HUGE SAVINGS

## **WHY THROW OUT OLD ENERGY WHEN YOU CAN RECYCLE IT INSTEAD?**

An Exhaust Air Heat Pump is basically an energy recycling system. It collects energy from the warm inside air as it leaves your home via the ventilation system, and re-uses it to heat your radiators / UFH and Tap Water

## THE IDEA THAT BECAME A COMPANY

A bad heat pump and an innovative engineer prompted the formation of ComfortZone in 2001 and whose heat pumps today, supply many houses with warmth, hot water and Ventilation providing comfortable, fresh indoor environments.

Living with a poor performing heat pump inspired Gunnar Hedlund (CEO) who together with Kent Andersson, started ComfortZone. The combined expertise of an innovative mechanical engineer, a mechanical contractor, both visionaries and perfectionists with an entrepreneurial flair, was the recipe for success.

Many months were spent on research and development to overcome the limitation on the heat pump installed at Gunnar's home, and utilising 21st century technology, design solutions were tested to increase efficiency, and following successful test results, the manufacture and distribution of ComfortZone Exhaust Air Heat Pumps was borne in 2003 by sub contract.

Due to the success of the designs, and the continued growth of the company, in 2008, ComfortZone began with its own production from the factory in Motala, Sweden, and is now supplying heat pumps to Sweden and selected partners in Germany, Finland, Norway, etc.

“Our vision is to continue to be innovators in design and quality, and provide unsurpassed service and support to our partners and customers”



*Gunnar Hedlund*  
CEO

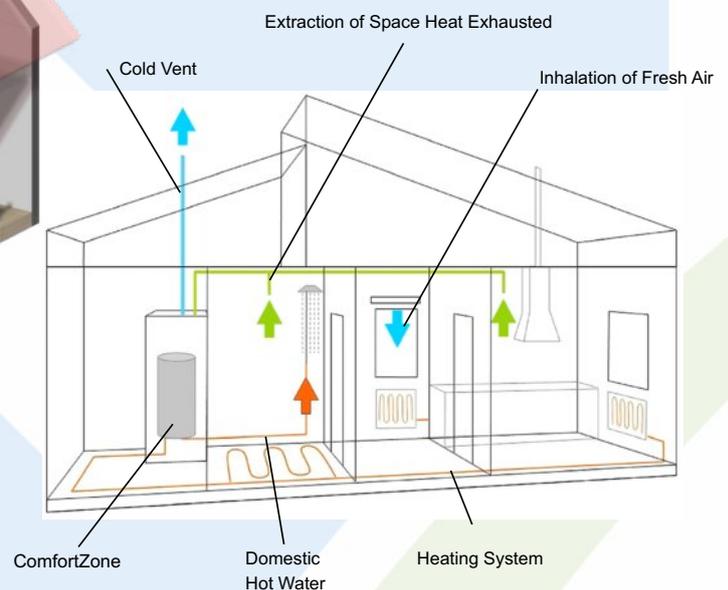
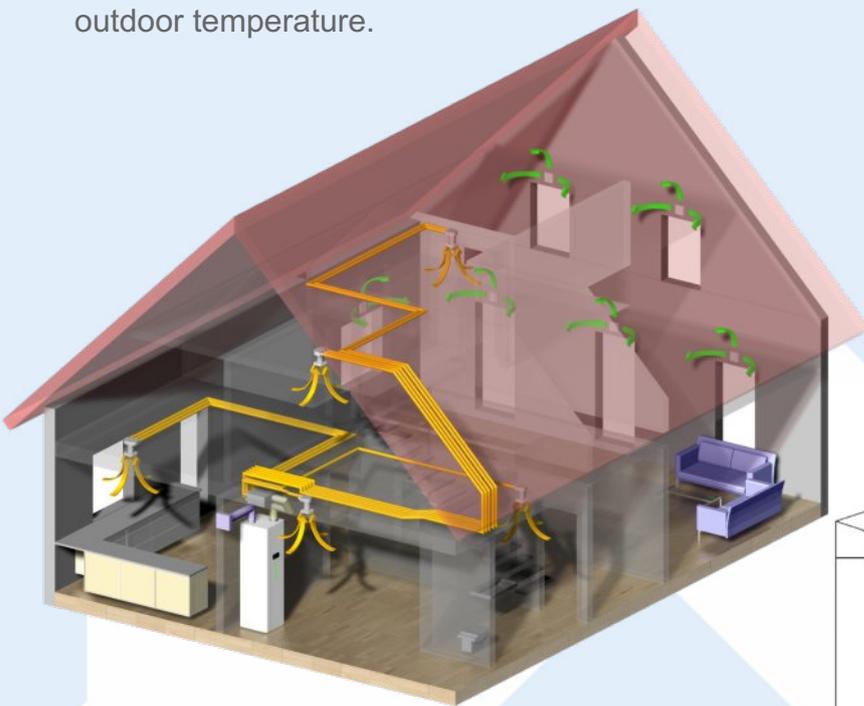


## HOW AN EXHAUST AIR HEAT PUMP WORKS

The basic principle of an exhaust air heat pump is that the energy in the warm indoor air is recycled and sent back to the house via underfloor or radiator heat. ComfortZone fan extracts heat from the air from all the wet rooms in the house.

The air then passes through the heat pump, where the heat is recycled, is exchanged in temperature and sent back to the house as water-based heat. A by product of the process is cooled ventilation of -15 degrees which can be expelled through a cold vent to outside, and fresh indoor air taken into the house via wall or window vents.

The user simply sets the desired temperature and the heat pump will handle the rest, regardless of outdoor temperature.



### TECHNICAL SUMMARY:

Heating, hot water and ventilation are combined in one unit. Due to the modulating operation of the compressor (inverter), a very high efficiency can be achieved. Due to the microprocessor in the weather-compensated control, the correct output quantity is always delivered to the heating system. The integrated controlled ventilation system creates a pleasant indoor climate without having to open the windows for ventilation.

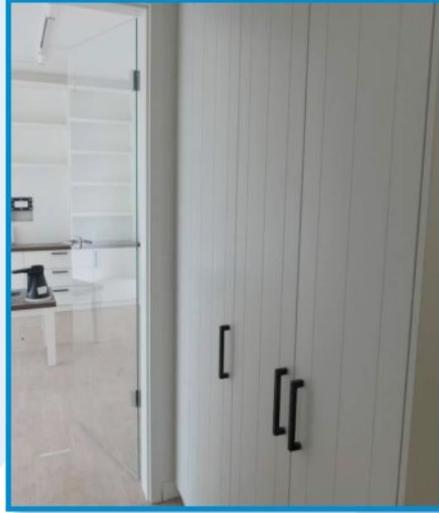
The exhaust air is extracted by the fan of the heat pump from the "wet rooms" such as kitchen, bathroom, guest toilet or utility room. This moist warm air is extracted of heat in the heat pump and then discharged outside at -15 ° C. The extracted heat is then used for heating and service water.

## SAMPLE INSTALLATIONS:



# COMFORTZONE

Exhaust Air Heat Pumps



The  
All In One  
Solution

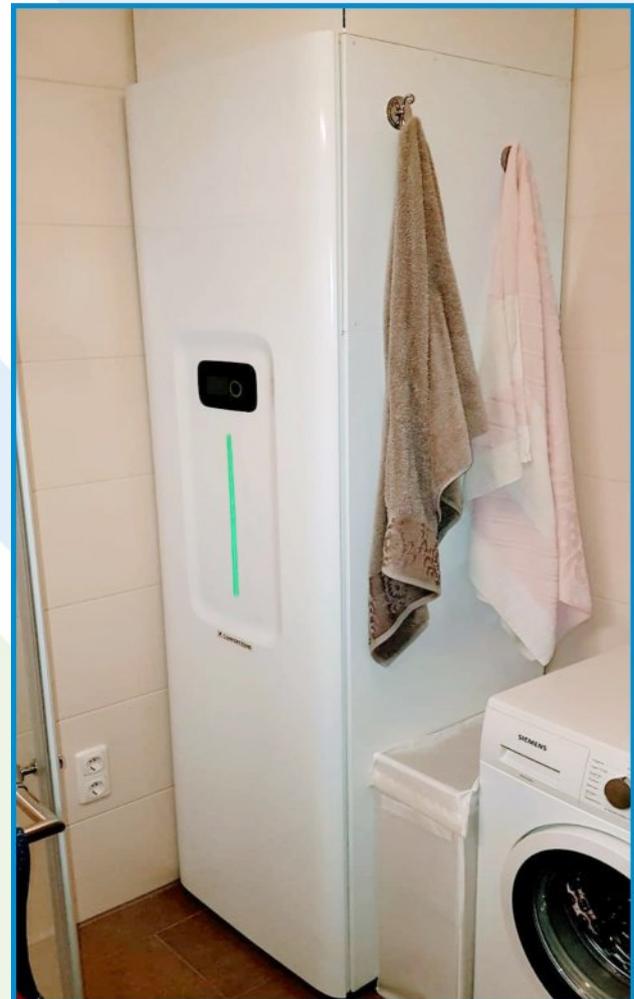




## SAMPLE INSTALLATIONS:

The  
All In One  
Solution

## SEAMLESS INTEGRATION:





## COMFORTZONE ALWAYS AT THE FOREFRONT

We at ComfortZone always want to be first with new innovations. If we continue to look in the rear view mirror and see our competitors, we are satisfied, but never content.

For example, we were the first Swedish manufacturer of heat pumps with an inverter controlled compressor, never working more than is needed, making it more efficient than older types of compressors.

ComfortZone was also the first in Sweden with a supply air heater adapted to Swedish building regulations. An electronic expansion valve is another example where we lead R&D in exhaust technology.

At ComfortZone, we continue to strive to be market innovators. We have already proven that the biggest need not be best. We are an effective company with a high degree of flexibility, highly skilled and constantly motivated.



# COMFORTZONE EXCELLENCE - TOMORROWS EXHAUST AIR HEAT PUMPS

We at ComfortZone want to manufacture products that have one long life and that meet the demands of the future. The new The exhaust air heat pump, ComfortZone Excellence, is designed to handle more than today's building regulations, but have In addition, several other benefits. In particular, ComfortZone Excellence is revamped by new computer technology.

Qualified flow calculations of both hot water flow provided by airflow, along with a more powerful compressor, has resulted in a product of higher efficiency. We are the first with an electronic expansion valve for exhaust air heat pumps, which controls the cooling circuit more accurately.

## COMFORTZONE EXCELLENCE IS AVAILABLE IN THREE MODELS:

**EX35** for houses / apartments  
up to 120m<sup>2</sup>.

**EX50** for houses / apartments  
up to 180m<sup>2</sup>

**EX65** for houses / apartments  
up to 260m<sup>2</sup>

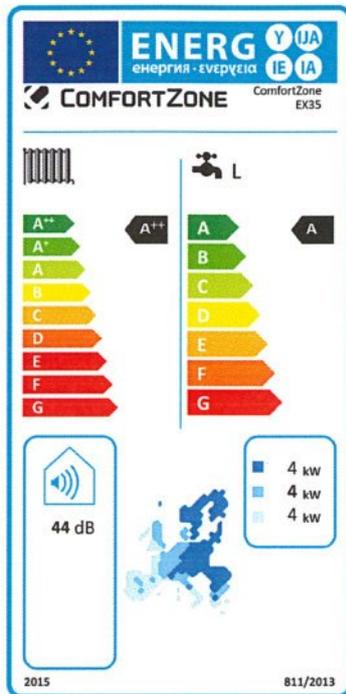
NOTE: In addition, there are  
low-rise (160 cm) models  
EX50L and EX65L.  
These require separate stand-  
alone hot water tanks, and  
generally used where there are  
low ceilings



# FICHE DATA EX35

Energy declaration corresponding to EU commission regulations nr 811/2013 and 518/2014.

## Comfortzone EX35



### Energy consumption (per year)

Hot water*	1880 GJ**	1880 GJ**	1880 GJ**
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### Average efficiency (per year)

Heating (+55C)

- Climate zone colder
- Climate zone medium
- Climate zone warmer

### Energieffektivitet vid Varmvattenuppvärmning\*

Climate zone colder	118 %	118 %	118 %
Climate zone medium	118 %	118 %	118 %
Climate zone warmer	118 %	118 %	118 %

\* Load profile L (Large) for hot water consumption.

\*\* The unit GJ means primary energy.

1 GJ primary energy corresponds to 0,46 kWh electricity.



<b>Model(s):</b>	Comfortzone EX35
<b>Type of heat source/sink</b>	Exhaust air-to-water
<b>Low temperature heat pump</b>	No
<b>Equipped with supplementary heater</b>	Yes
<b>Heat pump combination heater</b>	Yes
<b>Climate condition</b>	Warm
<b>Temperature application</b>	35°

Applied standards: EN14825 and EN16147

<b>Rated heat output</b>	Prated	3,5	kW
<i>Declared capacity at part load at outdoor temperature Tj</i>			
Tj = -7°C	Pdh	3,5	kW
Tj = +2°C	Pdh	2,3	kW
Tj = +7°C	Pdh	1,55	kW
Tj = +12°C	Pdh	1,3	kW
Tj = biv	Pdh	3,1	kW
Tj = TOL	Pdh	3,1	kW
Tj = -15°C (if TOL < -20°)			
<b>Bivalent temperature</b>	T <sub>biv</sub>	-10°C	
<b>Cycling interval capacity for</b>	P <sub>cyh</sub>		
<b>Degradation co-efficient</b>	Cdh	0,97	

*Power consumption in modes other than active mode*

<b>Off mode</b>	P <sub>OFF</sub>	0,00	kW
<b>Thermostat-off mode</b>	P <sub>TO</sub>	0,01	kW
<b>Standby mode</b>	P <sub>SB</sub>	0,01	kW
<b>Crankcase heater mode</b>	P <sub>CK</sub>	0,00	kW

*Other items*

<b>Capacity control</b>	Variable		
<b>Sound power level, indoors/outdoors</b>	L <sub>WA</sub>	44/-	dB
<b>Annual energy consumption</b>	Q <sub>HE</sub>		kWh

*For heat pump combination heater:*

<b>Declared load profile</b>	L		
<b>Daily electrical consumption</b>	Q <sub>elec</sub>	5,51	kWh
<b>Annual electricity consumption</b>	AEC	864	kWh

<b>Seasonal space heating efficiency</b>	η <sub>s</sub>		%
Tj = -7°C	COPd	3,2	-
Tj = +2°C	COPd	4,55	-
Tj = +7°C	COPd	5,6	-
Tj = +12°C	COPd	5,7	-
Tj = biv	COPd	3,1	-
Tj = TOL	COPd	3,1	-
Tj = -15°C (if TOL < -20°)			
<b>Operation limit temperature</b>	TOL	-10	°C
<b>Cycling interval efficiency</b>	COP <sub>cyh</sub>		-
<b>Heating water operating limit temperature</b>	WTOL	60	°C

*Supplementary heater*

<b>Rated heat output</b>	P <sub>sup</sub>	6	kW
<b>Type of energy input</b>	Electric		

<b>Rated air flow rate</b>		180	m <sup>3</sup> /h
<b>Rated brine or water flow rate, outdoor heat exchanger</b>		-	m <sup>3</sup> /h

<b>Water heating energy efficiency</b>	η <sub>wh</sub>	118	%
<b>Reference temperature</b>	θ' <sub>WH</sub>	53,6	°C
<b>Standby power input</b>	P <sub>stby</sub>	48	W
<b>Daily fuel consumption</b>	Q <sub>fuel</sub>	-	kWh
<b>Annual fuel consumption</b>	AFC	-	GJ

<b>Model(s):</b>				<b>Comfortzone EX35</b>			
<b>Type of heat source/sink</b>				<b>Exhaust air-to-water</b>			
<b>Low temperature heat pump</b>				<b>No</b>			
<b>Equipped with supplementary heater</b>				<b>Yes</b>			
<b>Heat pump combination heater</b>				<b>Yes</b>			
<b>Climate condition</b>				<b>Warm</b>			
<b>Temperature application</b>				<b>55°</b>			
Applied standards: EN14825 and EN16147							
<b>Rated heat output</b>		Prated	3,5	kW			
<i>Declared capacity at part load at outdoor temperature Tj</i>							
Tj = -7°C	Pdh	3,6					
Tj = +2°C	Pdh	2,5					
Tj = +7°C	Pdh	1,65					
Tj = +12°C	Pdh	1,5					
Tj = biv	Pdh	3,2					
Tj = TOL	Pdh	3,2					
Tj = -15°C (if TOL < -20°)							
<b>Bivalent temperature</b>		T <sub>biv</sub>	-10°C				
<b>Cycling interval capacity for</b>		P <sub>cyh</sub>					
<b>Degradation co-efficient</b>		Cdh	0,97				
<i>Power consumption in modes other than active mode</i>							
Off mode	P <sub>OFF</sub>	0,00	kW				
Thermostat-off mode	P <sub>TO</sub>	0,01	kW				
Standby mode	P <sub>SB</sub>	0,01	kW				
Crankcase heater mode	P <sub>CK</sub>	0,00	kW				
<i>Other items</i>							
<b>Capacity control</b>	Variable						
<b>Sound power level, indoors/outdoors</b>	L <sub>WA</sub>	44/-	dB				
<b>Annual energy consumption</b>	Q <sub>HE</sub>		kWh				
<i>For heat pump combination heater:</i>							
<b>Declared load profile</b>	L						
<b>Daily electrical consumption</b>	Q <sub>elec</sub>	5,51	kWh				
<b>Annual electricity consumption</b>	AEC	864	kWh				
<b>Seasonal space heating efficiency</b>		η <sub>s</sub>				%	
Tj = -7°C	COPd	2,4					
Tj = +2°C	COPd	3,2					
Tj = +7°C	COPd	4,1					
Tj = +12°C	COPd	4,4					
Tj = biv	COPd	2,3					
Tj = TOL	COPd	2,3					
Tj = -15°C (if TOL < -20°)							
<b>Operation limit temperature</b>		TOL	-10	°C			
<b>Cycling interval efficiency</b>		COP <sub>cyh</sub>					
<b>Heating water operating limit temperature</b>		WTOL					
<i>Supplementary heater</i>							
<b>Rated heat output</b>		P <sub>sup</sub>	6	kW			
<b>Type of energy input</b>		Electric					
<b>Rated air flow rate</b>			180	m <sup>3</sup> /h			
<b>Rated brine or water flow rate, outdoor heat exchanger</b>			-	m <sup>3</sup> /h			
<b>Water heating energy efficiency</b>		η <sub>wh</sub>	118	%			
<b>Reference temperature</b>		Θ' <sub>WH</sub>	53,6	°C			
<b>Standby power input</b>		P <sub>stby</sub>	48	W			
<b>Daily fuel consumption</b>		Q <sub>fuel</sub>	-	kWh			
<b>Annual fuel consumption</b>		AFC	-	GJ			

Approved by:

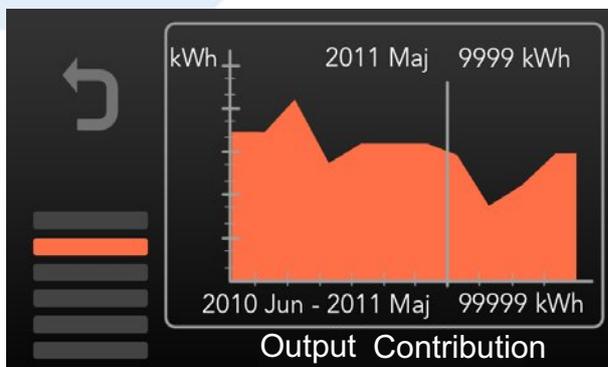


Gunnar Hedlund  
CEO  
Comfortzone AB

## BRAND NEW GRAPHICAL INTERFACE

ComfortZone has also invested heavily in making the interface more user friendly. Clear symbols, a graphical presentation of savings and opportunities to fine-tune the heat curve with ease, are some examples of what can be achieved through the icon-based full color display.

To make ComfortZone Excellence aesthetically more pleasing, we have employed professional designers to put their magic touch to the product. Last but not least, we have added an innovative sound attenuation which has lowered the already impressive sound levels even further. We can proudly tell you that ComfortZone Excellence is extremely quiet... EX50 / EX50L



	EX35	EX50/EX50L	EX65/EX65L
Living Area	80–120 m <sup>2</sup>	120–180 m <sup>2</sup>	180–260 m <sup>2</sup>
Heat Pump Power Out/In @ 50 °C	3,5/1,1 kW	4,8/1,6 kW	6,5/2,1 kW
Heat Pump Power Out/In @ 35 °C	3,4/0,8 kW	4,8/1,2 kW	6,3/1,6 kW
Max Heat Output	9,5 kW	11,0 alt. 14,0 kW	12,5 alt. 15,5 kW
Airflow	100–150 m <sup>3</sup> /h	150–230 m <sup>3</sup> /h	220–260 m <sup>3</sup> /h
Hot Water Capacity with 210 l tank	260 l/h	300 alt. 360 l/h	320 alt. 380 l/h
Sound Power Level	47 dB (A)	50 dB (A)	52 dB (A)
Stos	125 mm	125/160 mm	160 mm

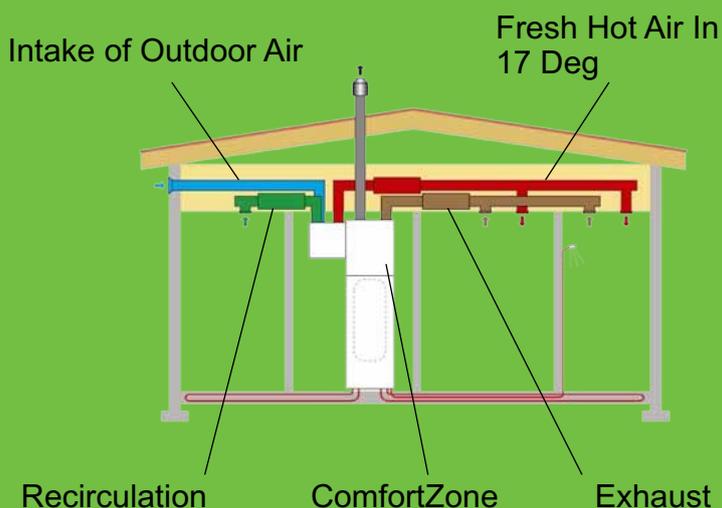
(Data is Preliminary)



## HIGHER COMFORT WITH COMFORTZONE T12

ComfortZone T12 is a new air conditioning unit with new technology, adapted for Swedish building regulations. The product is a further development of a previous model, with the difference that the electrical cartridge has been removed and a larger water battery and frost damper have been added. Design upgrade means the ComfortZone T12 can work exclusively on recycled energy, which means lower operating costs for the user.

The ComfortZone T12 also has a pollen filter that filters the air before entering the house.



## HOW AN AIR HEATER WORKS

In order to prevent cold fresh air through wall valves you can use the T12 supply air unit. The cold and fresh air is extracted centrally via a single channel. The unit then filters the air from soot, dust pollen, etc. A heating coil in the unit is fed from the heat pump with hot water.

A heat battery in the assembly is fed from the heat pump hot water. As the air passes this battery it is heated to a comfortable 17 degrees. Via a fan and a duct system the preheated fresh supply air is then blown into the house. In this way, you can preheat the incoming air using recycled ventilation air from a Comfort Zone Excellence exhaust air heat pumps



## CONTACT DETAILS

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  - Dublin Training Academy
    - Part L Compliance
    - Fabric Optimisation
    - Ventilation Solutions  
*Demand Controlled Ventilation (DCV)*
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    - Value Added Services



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