



**LIBERTY AIR HANDLING UNITS | SWIMMING POOLS**

**SUSTAINABLE, ENERGY EFFICIENT AND CORROSION RESISTANT**



## THE POWER OF SUSTAINABLE COMPOSITE

An air handling unit within a swimming pool environment is exposed to many challenges. The high humidity, presence of chlorides in the air, varying temperature differences and high vapor pressure require specific solutions.

In addition to corrosion resistance, such an air handling unit must also be sustainable and energy efficient, which contributes favorably to the operating costs. Our Liberty air handling units for swimming pools are the answer to all these issues.

### ABOUT CORROSION IMMUNITY

Both the inside and outside of these unique air handling units are made of high-quality composite. Within the design, it was also decided to make the base frame of the same material. This means that corrosion has no chance in the Liberty air handling units.

The specific cabinet wall construction has a “high” lifespan according to ISO 12944-2 in the highest corrosion load category: CX extreme.

### COMPOSITE AHU's: DESIGNED AND BUILT TO LAST

In order to enable a sustainable operation of a swimming pool, it is important that installations are not only energy efficient, but also sustainable and future-proof. Themes that were central to the design of our Liberty air handling units. By using specific raw materials and developing the design in such a way, our cabinets have mechanical performances that are unique within the industry. This results in air handling units with an ultra-low CO2 footprint; we even provide a 12-year warranty on the casing!

Competition pool, target group pool or recreational pool. For each type of swimming pool, we are able to supply a Liberty air handling unit that is both sustainable and energy efficient!



FULLY VAPOUR TIGHT PANEL

INTEGRATED COLD BRIDGE FREE LOCKS  
(WITH OVERPRESSURE PROTECTION &  
LOCABLE ACCORDING TO VDI 3803)

HYGIENIC, PET INNER WALL (ACCORDING TO  
VDI 6022 & 3803); CORROSION RESISTANT  
(CX ACCORDING TO ISO 12944-2)



THERMAL TRANSMISSION

**T1**



THERMAL COLD BRIDGE

**TB1**



MECHANICAL STRENGTH

**D1**



AIR TIGHTNESS

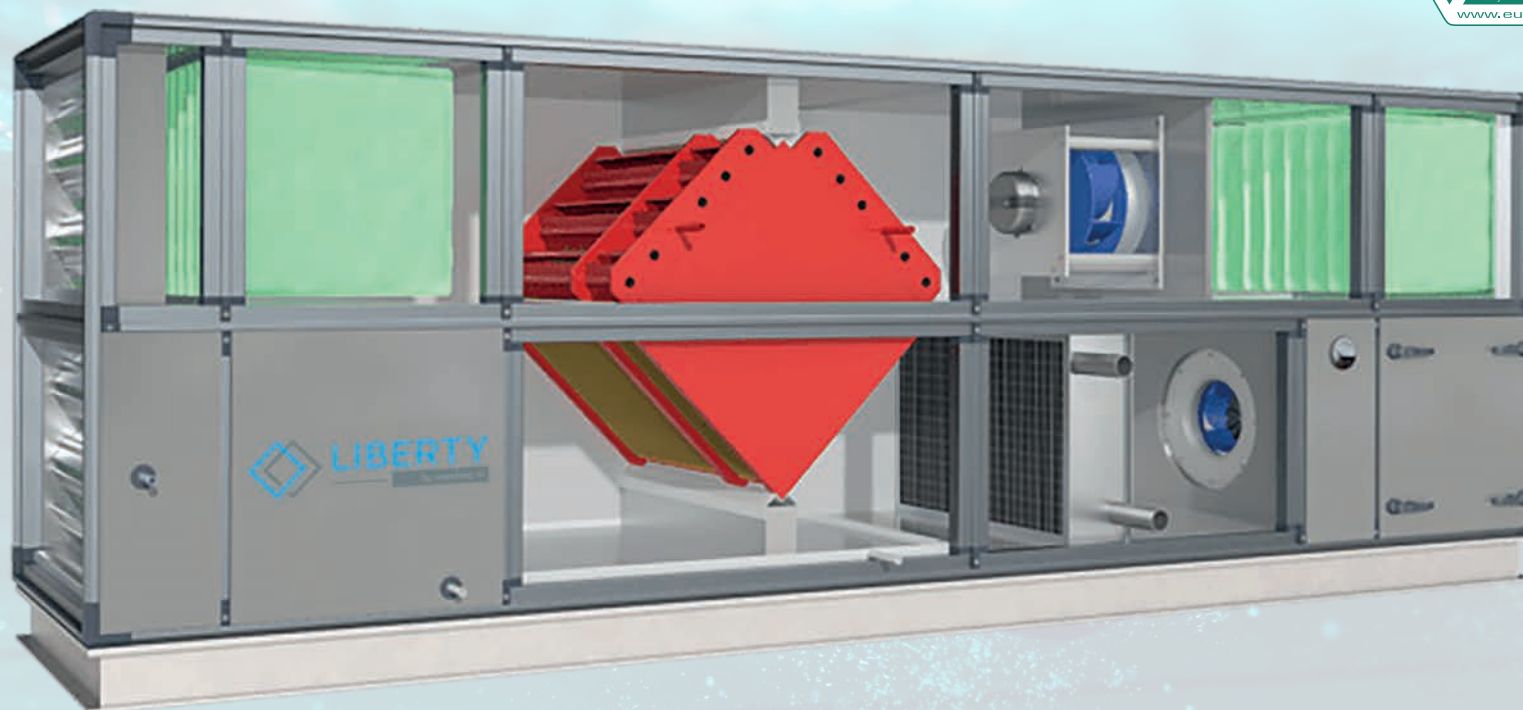
**L1**



FILTER BYPASS LEAKAGE


**F9**


**FIRST CLASS PERFORMANCES**





 **COLD BRIDGE FREE**  
EN 1886 T1/TB1

 **CORROSION IMMUNITY**  
CX EXTREME (ABOVE C5I / C5M)

 **LIGHTWEIGHT**  
40% LESS WEIGHT

**ROBUST**  
WALL THICKNESS 70 MM 

**SUSTAINABLE**  
ULTRA LOW CARBON FOOTPRINT 

**HYGIENIC**  
EASY CHEMICAL CLEANING 

## THE ROSENBERG KNOWLEDGE CENTER

Over 100 years of industry experience is represented within our own knowledge center. Besides technical knowledge, they also know how to implement EU legislation. Our consultants share their knowledge with clients in the field of installation technology, air treatment and control technology. Our solutions are among other successfully applied in the food and chemical industry, offices, multi-storey residential buildings, hospitals and swimming pools.

Knowledge that is also available to you: we are happy to translate your climate wishes into the best technical requirements!

LIFE CYCLE COST BEREKENING ZWEMBADEN Recreatiebad, Den Dolder		Klant	Klarnaam
		Projectnummer	220614 OFP-08
		Postcode/nummer	
		Datumbijl. door	Gegeven
		Datum	26-1-2023
		Ontwerp luchtdebit	26.000 m³/h
		Consoliderend luchtdebit buiten opengingen	8.200 m³/h
		Of val zelf geconsoliderd luchtdebit buiten opengingen in	>
<b>1. Energieprestaties voor dit project</b>			
Stroomprijs excl. BTW maar incl. levering, transport en energielevering	€ 0,25 per kWh		
Gegrip. excl. BTW maar incl. levering, transport en energielevering	€ 0,75 per m³		
Warmteprijs op basis van jaartotaalverm. gasgestookte CV installatie	€ 0,08791 per kWh		
<b>2. Opengingen voor dit project</b>			
Opengingen tussen 06:00 uur en 18:00 uur	10 eenen		
Opengingen tussen 18:00 uur en 06:00 uur	4 eenen		
Dagen per week open	7 dagen		
Weken per jaar open	52 weken		
Bedruken ontwerp luchtdebit per jaar	4.900 eenen		
Bedruken gereueend luchtdebit per jaar	3.836 eenen		
<b>3. CO2 emissiefactor voor dit project</b>			
Elektrisch projectcoëfficiënt	0,648 kg CO2 / kWh		
Aardgas voor verwarming projectcoëfficiënt	0,243 kg CO2 / kWh		
<b>4. Investeringskosten per LBK concept</b>			
Type ventilatiegarnijng	Conventioneel	IEC ontwerp	LBK 3
Investeringskosten van minder naar meer	Kruisstroem € 79.808	Kruisstroem € 79.808	Kruisstroem € 0
<b>5. Stroomkosten ventilatoren</b>			
Opengingen elektrisch vermogen boventilator incl. verliesen F.O. bij ontverp. defect	9,58 kW	6,12 kW	0 kW
Opengingen elektrisch vermogen afkantventilator incl. verliesen F.O. bij ontverp. defect	8,80 kW	4,89 kW	0 kW
Opengingen vermogen ventilatoren totaal	18,38 kW	11,01 kW	0 kW
Stroomkosten ventilatoren gemiddeld totaal per jaar	€ 21.432	€ 12.802	€ 0
<b>6. Warmtekosten</b>			
Temperatuurafhankelijk verwarmingsvermogen (erog. uitoefbaar (20max))	75 %	75,4 %	100 %
Temperatuurafhankelijk verwarmingsvermogen met ventilator in uitverp. defect	87 %	90,0 %	100 %
Ruimtetemperatuur zomerzwaar (meestal 24 boven badwater conform VDI 2086)	33 °C	33 °C	33 °C
Absolute vochtgehalte in de zomerzwaar condense onderp.	14,2 g/kg	14,2 g/kg	14,2 g/kg
Warmtekosten per jaar exclusief transmissieverliezen	€ 12.850	€ 11.135	€ 0
Totaal warmtekosten ventilatoren en warmtekosten	€ 44.282	€ 23.937	€ 0
<b>7. Totaal kosten met Warmtepomp opgra</b>			
Luchtdehumidificatiegevoel opvoeren van extreme warmtevoop 7	<input checked="" type="checkbox"/> JA	<input type="checkbox"/> NEE	<input type="checkbox"/> NEE
Warmtepomp totale verarmingscapaciteit condensator	75,3 kW		
Opengingen elektrisch vermogen warmtepomp	19,4 kW		
Volledigen warmtepomp	3.502 eenen		
Netto opbrengst warmtepomp (thermisch - elektrisch)	€ 9.233		
Stroomkosten ventilatoren gemiddeld totaal per jaar	€ 21.432		
Warmtekosten per jaar exclusief transmissieverliezen	€ 12.850		
Totaal onderhoudskosten + afchtelting warmtepomp	€ 7.847		
Totaal van Stroom, Warmte en Onderhoudskosten	€ 27.860		
<b>8. CO2 uitstoot</b>			
CO2 uitstoot per jaar door stroomafh. ventilatoren	60.475 kg	36.125 kg	0 kg
CO2 uitstoot per jaar door stroomafh. warmtepomp	24.981 kg	0 kg	0 kg
CO2 uitstoot per jaar door warmtepomp gas	30.752 kg		
Totale hoeveelheid CO2 per jaar	116.208 kg	36.125 kg	0 kg
<b>9. Terugverdientijd</b>			
Terugverdientijd LBK ten opzichte van LBK1	6,50 jaar		
Terugverdientijd LBK ten opzichte van LBK2	geen		
Terugverdientijd LBK ten opzichte van LBK3	geen		
<small>Opmerking: De terugverdientijd aan berekend met de "DGT" methode conform ISO 15687:2016 11. Warmtepomp energiecapaciteit verschillen van andere gegevens. Voor de berekening zijn er twee opties om de uitstoot van CO2 te berekenen: met of zonder warmtepomp. Hier zijn de resultaten van de berekening. Het is belangrijk om te weten dat de uitstoot van CO2 niet wordt berekend op basis van de werkelijke CO2 uitstoot van de warmtepomp, maar op basis van de theoretische CO2 uitstoot van de warmtepomp. Het is belangrijk om te weten dat de uitstoot van CO2 niet wordt berekend op basis van de werkelijke CO2 uitstoot van de warmtepomp, maar op basis van de theoretische CO2 uitstoot van de warmtepomp.</small>			



## SWIMMING POOL LIFE CYCLE COST CALCULATION

Implementing a composite air handling unit with a Eurovent energy label A is an excellent starting point for an energy-efficient and sustainable swimming pool.

To be sure which is the most suitable version for your project, our swimming pool Life Cycle Cost Calculation provides a lot of certainty. This calculation gives you easy insights on both energy, maintenance and investment costs (with and without a heat pump). Up to three different air handling units can be compared in these areas per calculation.

The consultants of our knowledge center will be happy to tell you all about our Life Cycle Cost Calculation!



RETURN ON INVESTMENT | 2 YEARS



## IS YOUR SWIMMING POOL READY FOR A HEALTHY INDOOR CLIMATE?

The new Dutch decree (topic: Hygiene & Safety of Bathing Establishments & Swimming Facilities) sets strict requirements for air quality for the first time. The value for trichloramine in the air may not exceed  $0.5 \text{ mg/m}^3$ . With this new legislation, the quality of the air in a swimming pool becomes part of the verifiable regulations for the first time.

### AMOUNT OF WATER VAPOR

The amount of moisture that evaporates from the swimming pool depends on the use, the water temperature and the air conditions. This quantity can be calculated according to the VDI 2089 guideline.

However, it is a known fact that the outcome is always reasonably safe, which means that this draft guideline often leads to larger climate installations than strictly necessary. In practice, there is often less evaporation from the bath.

By using the Rosenberg/ASHRAE calculation method when designing your air treatment installation, you will gain a good insight into the actual values.

### AIR QUALITY

The lower evaporation from the bath results in lower air quality throughout the heating season than may be expected according to the VDI design. After all, the lower the outside temperature, the lower the outside air proportion and the lower the air quality.

To comply with the new Dutch decree, our swimming pool solutions are equipped with additional integrated control technology, which makes adjustments to the air quality during the winter season possible, without disrupting the control circuits.

### TRICHLORAMINE CHECKLIST

We have drawn up an easy checklist that provides clear steps on how to implement and execute the new regulations. Looking for additional information? Please contact our Knowledge Center!



## 40 YEARS OF EXPERIENCE

In 2023, Rosenberg NL celebrated its 40th anniversary!

Since our start in 1983, we have supplied a wide range of fans. After the successful introduction of composite roof fans, we started developing and producing the Liberty product line: our unique series of fully composite air handling units.

The Liberty air handling units are successfully used in our Dutch home market and abroad in both new construction and renovation projects. In addition to the chemical and food industry, we are also strongly represented in non-residential construction, swimming pools and healthcare and educational institutions.

Our company pays a lot of attention to quality and innovation. We have relevant certifications for this purpose, including ISO 9001 and Eurovent. With the use of our own assembly and production lines, custom-built is possible. By continuously developing the products, continuing to invest in the knowledge level of our employees and taking customer feedback to heart, we are able to supply the market with energy-saving solutions that are designed and built to last.

Since 2023, we have become a subsidiary of the HC Groep, market leader in the field of indoor climate technology in the Netherlands.

## HEALTHCARE



## NUTRITION



## LABORATORIES



## VERTICAL FARMING



## SPECIFIC SOLUTIONS IN EVERY BRANCHE!

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**LIBERTY**  
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PLEASE TRY OUR  
NEW SELECTION TOOL!

