



**ORYX**  
HEAT PUMP

LEADING HEAT PUMP TECHNOLOGY

# ORYX HEATING TECHNOLOGY

ORYX heating technologies are considered as a leading supplier of heat pumps systems and solutions for different and various types of commercial and residential projects. ORYX is the heat pump brand being manufactured under the umbrella of the leading heat energy technologies group **APAYDIN ISITMA VE ENERJİ SİSTEMLERİ SAN. TİC.LTD.ŞTİ.** Turkey. The group and its subsidiaries has gained the trust of its clients for more than 35 years in which all the products are strictly manufactured and supplied following the most recent European standards.

Demand for heat energy especially domestic water heating/ cooling is increasing significantly, which makes it very difficult for classic heating systems to cover the sector needs efficiently as they propose major issues and concerns about energy sustainability, cost-effectiveness and environment pollution.

THANKS to ORYX Heating Technology which omit all those concerns by introducing the most recent heat pump systems that are considered environment friendly, operational cost effective with higher efficiency!



## SAVING ENVIRONMENT IS SAVING THE WORLD!



The massive increase of environment pollution and Global Warming phenomenon has put a huge responsibility on heat energy developers. At **ORYX**, we take this into account by producing a very low that can reach up to zero. CO<sub>2</sub> emissions heat pumps. In addition, **ORYX** heat pump hybrid systems can be accompanied with other energy sources such as solar collectors to better enhance the system.

## SUSTAINABILITY, A MAJOR CONCERN!



The world is moving towards sustainable energy sources and equipment that lower the dependence on fossil fuels and achieve highly energy-efficient systems. At **ORYX** heating technologies, we supply you with renewable energy resources that help you to cover your heating/ cooling requirements using free sources of energy and save your money!

## STAY EFFICIENT



**ORYX** heat pumps provide you with 100% efficient heat recovery with up to 80% free of charge. This is because we use natural resources such as air and water to drag your heat needs. Thanks to our nice nature that keeps heat for us. **ORYX** heat pumps can heat up to more than five times efficiently as traditional heating system can heat. Alongside their classic application as heat generators on cold days, they can also create a pleasant interior in summer by bringing refreshing cool air into the house.

## ECONOMICAL BEST SOLUTION



**ORYX** heat pumps require a low installation cost with less system complexities and accessories. In addition, **ORYX** heat pumps require minimal maintenance cost as well with compared to other heating methodologies such as electric heaters. The EVI compressor technology adapted by **ORYX** heat pumps and the implementation of new inverter technology will optimize your energy consumption and lower your utility running cost. As a result, your ROI will be sooner than you ever expect!



# ORYX METAMORPHIC SYSTEMS

ORYX takes care of each small detail that might form a concern for the client. On a system level, ORYX supplies complete system solutions for domestic hot water cooling and heating. This is done with the collaboration of our leading partners.

ORYX heat pumps can be implemented in new buildings and modernization projects. In addition, ORYX systems can be applied to existing projects to form a hybrid system to improve different system characteristics to lower the operational cost such as ORYX heat pump / solar thermal system and even combined with an existing oil or gas heating system to form a multi mode system. This allows every building and property owner to put their plans into action in the most efficient way possible.

Higher energy efficient

### PRIMARY ENERGY



**-39%**



lower CO<sub>2</sub> foot- print

### CO<sub>2</sub> EMISSION



**-55%**



More money savings for the end user

### RUNNING COST



**-55 TO -75%**



# WIDE RANGE APPLICATION

**ORYX** offers reliable solutions for hotel applications. The system generates efficiently hot water in both heating and cooling modes.

## HOTELS

20° to 60°C

- Sanitary
- Kitchen
- Laundry



## HOSPITALS

60°C

- Steam bath
- Laundry



Highly efficient production of large hot water volume in which it makes the system a perfect solution for Hospitals. The system follows British Health Standards equipped with anti-Legionella solutions.

Highly efficient production of domestic hot water volume which makes the system a perfect solution for Restaurants as **ORYX** Heat pumps are compatible with sanitary water use.

## RESTAURANTS

20° to 60°C

- Utensils
- Washing



## GYM/ HEALTH CLUB

30° to 60°C

- Swimming Pool
- Steam Bath
- Shower



**ORYX** easily provides heating and cooling to large number of rooms of different sizes. Cover high load requirements effectively.

**ORYX** offers reliable solutions for schools and dormitories applications. It can handle load fluctuation easily.

## SCHOOLS/ DORMITORY

55° to 60°C

- Sanitary



# HEAT PUMP PRINCIPLE

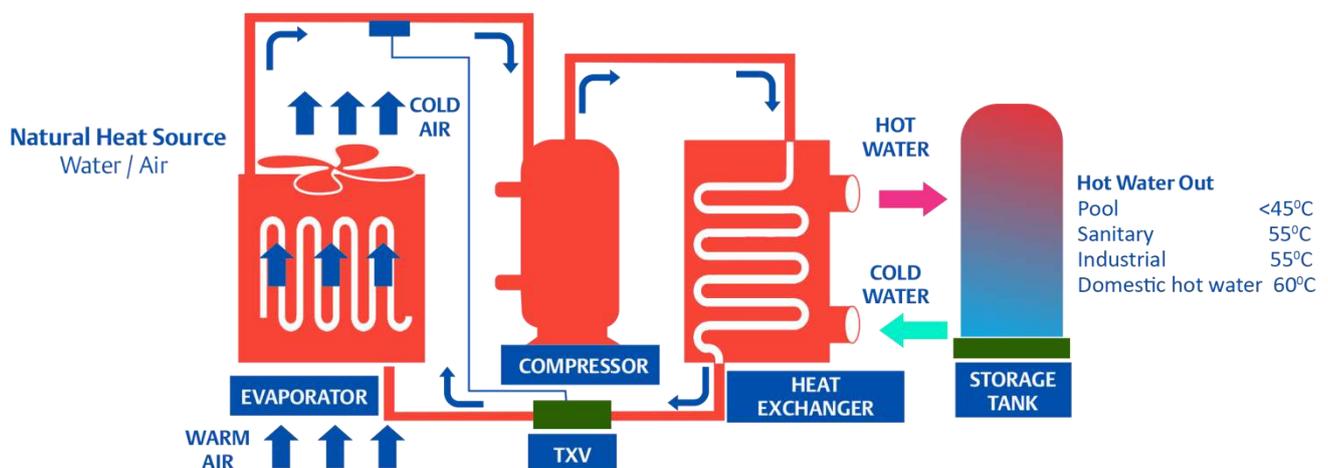
A heat pump is a device that transfers heat from a lower temperature medium to a higher temperature medium with the assistance of a power source. Basically, a heat pump operates in a similar manner as the air conditioner does, but in reverse

## Heat pump thermal Cycle

A Heat pump comprises a refrigerant circuit, filled with a special fluid (refrigerant). Depending on the temperature and pressure operating conditions in which it is working, will be in either a gaseous or liquid state. The refrigerant circuit consists mainly:

No.	Equipment	Task	Energy	Pressure	Temp.	Physical Phase
1	Compressor	Compress Refrigerant/ Heat Exchanger	Thermal Energy	High	High	Super Heated
2	Condenser	Phase Transfer/ Heat Exchanger	Thermal Energy	High	Med.	Saturated Liquid
3	Expansion Valve	Lower Pressure	-	Low	Low	Mixed Vapor
4	Evaporator	Phase transfer / Heat Exchanger	Thermal Energy	Low	Med.	Saturated Vapor

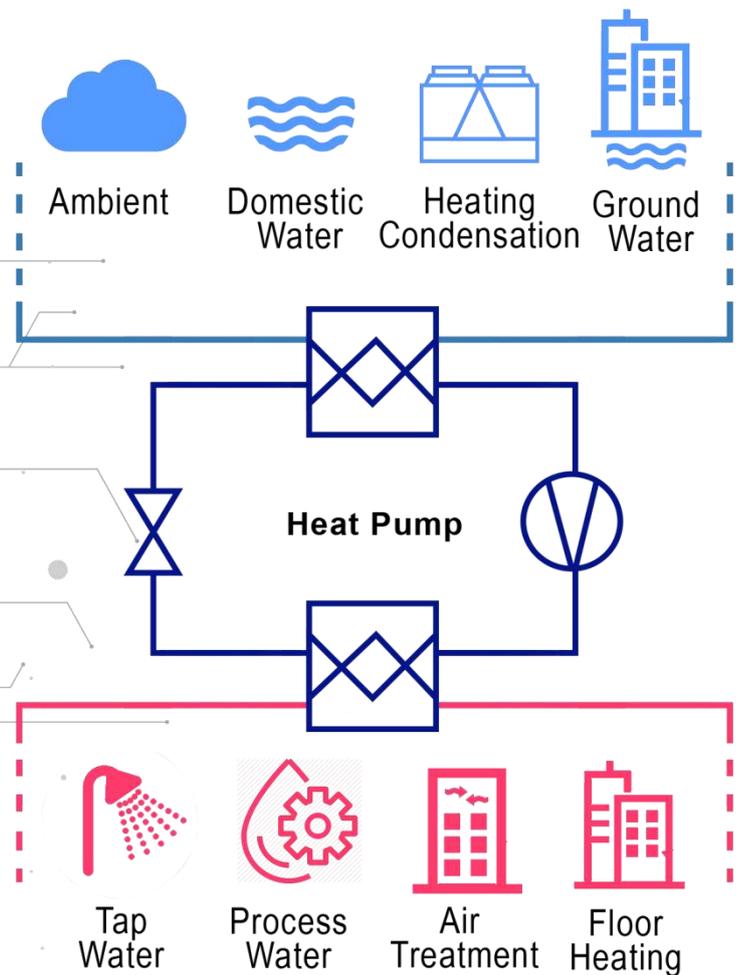
The heat pump thermal cycle is best described through the flow of the refrigerant through the prescribed heat pump components. Starting at the discharge side of the compressor, the refrigerant is in a gaseous state, has been compressed and is therefore hot and at high pressure. It passes into the condenser (a Heat exchanger) where it releases most of its heat. As it cools it changes state (condenses) to a liquid which is warm and at high pressure. This warm liquid refrigerant passes through a pressure reducing device (the expansion valve) as temperature and pressure are directly linked; pressure drop causes the sudden temperature of the refrigerant to plummet. In addition, some of the refrigerant evaporates and the result is a low temperature mix of liquid and gaseous refrigerant that is known as "Flash Gas". This mixture then passes to another heat exchanger, the evaporator, where the refrigerant, in this gaseous state, passes to the compressor where it is pressurized, heated and circulated back around the system.



# THE SOURCE, THE SINK

**The SOURCE:** the external medium from which the energy is absorbed is called the source. It is generally a low temperature source. The refrigerant absorbs heat from the source in the evaporator. The air to water heat pumps uses the ambient air as their source, and they are therefore identified as air-to-water heat pumps. The water to water Heat pumps use water to water as the source and they are therefore identified as Water-to-Water Heat pumps.

**The USER "SINK":** for all **ORYX** heat pumps, water is the Medium that is to be heated and this is called the user. The user (sink) is the condenser in which the refrigerant transfers (releases) the thermal energy that was absorbed from the source plus that which was input to the compressors. The warm water transfers the heat to the building with a heating system.



# NEXT REVOLUTIONARY HEAT PUMP

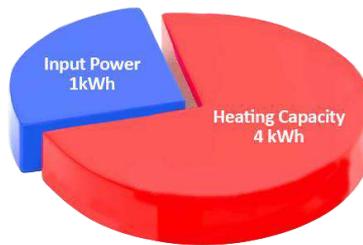
- **Ecological** : Environmentally friendly refrigerant R410a, CFC free, low Co<sub>2</sub> emission .
- **High Quality**: Partnership with leaders in heating industry.
- **Wide product range**: more than 50 product & system for different fields either residential, commercial or industrial.
- **High Performance**: products are compatible with most recent high standards of European regulations
- **Quality**: starts with **ORYX** optimized design.
- **Flexible**: applicable to different application when ever heating, cooling of domestic hot water generate.
- **Safe & Reliable**: **ORYX** heat pump is provided with electrical protections safe failures, water proof enclosure & smart control system comfort and reliability.
- **Different cases different solutions**: **ORYX** presents customized solutions to satisfy our client's requirements.
- **Expert**: Production over 35 years of heat technology experience.
- **Economical**: **ORYX** heat pump best coast saving energy solutions with savings that can reach up to 80% compared to other heating systems



# HOW EFFICIENT A HEAT PUMP IS?

Coefficient of performance (COP), is an expression of the efficiency of heat pump. When calculating the COP for a heat pump, the heat rate output from the condenser  $Q_h$  is compared to the power supplied to the compressor (W).

$$COP = \frac{IQI}{W}$$



The main advantage of the heat pump is the capacity to supply more Energy (thermal) than that required for its operation (electrical). Hence HP classified as renewable energy.

The COP is variable depending on the type of the heat pump and the working conditions but is generally in the region of 3 to 5.5 this means that for 1 kWh of electrical input energy, the unit will supply between 3 and 5.5 kWh of thermal energy to the user.

# NEW ENERGY EFFICIENCY METRIC

Calculations of the energy efficiency of buildings require accurate indicators of the efficiency of their equipment. These indicators must be representative of actual operational conditions throughout the year, measuring the performance of equipment on a seasonal basis.



**SEPR** is the new metric for **chillers in industrial process cooling applications**

**SEER** is the new metric for **chillers in comfort cooling application**



**SCOP** is the new metric for **space heating applications.**



# HEATING EFFICIENCY $\eta_s(\eta_s)$

In order to compare the energy efficiency of products using different sources of energy, the Eco design regulation introduces a new measurement expressed in primary energy:  $\eta_s$  cool is the equivalent of SEER for cooling applications and  $\eta_s$  heat is the equivalent of SCOP for space heating.

**EER and COP** belong to the past. Now, and in the future, the focus is on seasonal efficiency. With a broad new products range, **ORYX** is fully engaged to take up the challenge of energy efficiency

Compliance with the new Eco design regulations therefore involves the use of new, more meaningful seasonal efficiency metrics. The Seasonal Energy Efficiency Ratio (**SEER**), Seasonal Energy Performance Ratio (**SEPR**) and Seasonal Coefficient of Performance (**SCOP**) all ensure precise evaluation of the energy actually consumed by chillers and heat pumps, being calculated according to technical standard EN 14825.

SCOP – Seasonal Coefficient of Performance Ratio between the annual heating demand and the annual electrical input energy over the entire heating season. SCOP is calculated using standard

EN14825, which takes the following into account:

- Seasonal efficiency while the compressor is running (SCOPon)
- Electrical consumption when the compressor is not running: crankcase heater, standby or OFF mode
- Backup heater required to achieve the defined heating design load

$$\eta_{s,h} = 1/CC \times SCOP - \sum F_i$$

## CC – Conversion Coefficient

European average coefficient that represents the amount of primary energy required to obtain electricity.

CC is defined by the regulation with a constant value of 2,5.

$\sum F_i$  – Correction Factors

Air source heat pumps

$$\eta_{s,h}$$

Water source heat pumps

$$\eta_{s,c}$$



# ORYX LABELS ARE COMING



In addition, European Energy Labeling regulation 811/2013 classifies heat pumps up to 70 kW from G to A++, according to their energy efficiency. This enhanced consumer information that drives the market towards more energy-efficient products. From September 2019, the E, F and G classes will no longer exist. A new A+++ class will identify the most energy efficient products. **ORYX** heat pump Classification is A- A+++ !

Energy Efficiency Class	Boilers and mid-temperature heat pumps 47/55°	Low temperature heat pumps 30/35°
A+++	$\eta_s \geq 150$	$\eta_s \geq 175$
A++	$125 \leq \eta_s < 150$	$150 \leq \eta_s < 175$
A*	$98 \leq \eta_s < 125$ <span style="background-color: #0056b3; color: white; padding: 2px;">100</span> <span style="background-color: #0056b3; color: white; padding: 2px;">110</span>	$123 \leq \eta_s < 150$ <span style="background-color: #0056b3; color: white; padding: 2px;">125</span>
A	$90 \leq \eta_s < 98$	$115 \leq \eta_s < 123$ <span style="background-color: #0056b3; color: white; padding: 2px;">115</span>
B	$82 \leq \eta_s < 90$	$107 \leq \eta_s < 115$
C	$75 \leq \eta_s < 82$	$100 \leq \eta_s < 107$
D	$36 \leq \eta_s < 75$	$61 \leq \eta_s < 100$
E	$34 \leq \eta_s < 36$	$59 \leq \eta_s < 61$
F	$30 \leq \eta_s < 34$	$55 \leq \eta_s < 59$
G	$\eta_s < 30$	$\eta_s < 55$

\*A+++ energy class will be implemented from September 2019.

100 110 125 115  
100 110 125 115



# ORYX HEAT PUMP COMPARISON WITH COMPETING TECHNOLOGIES

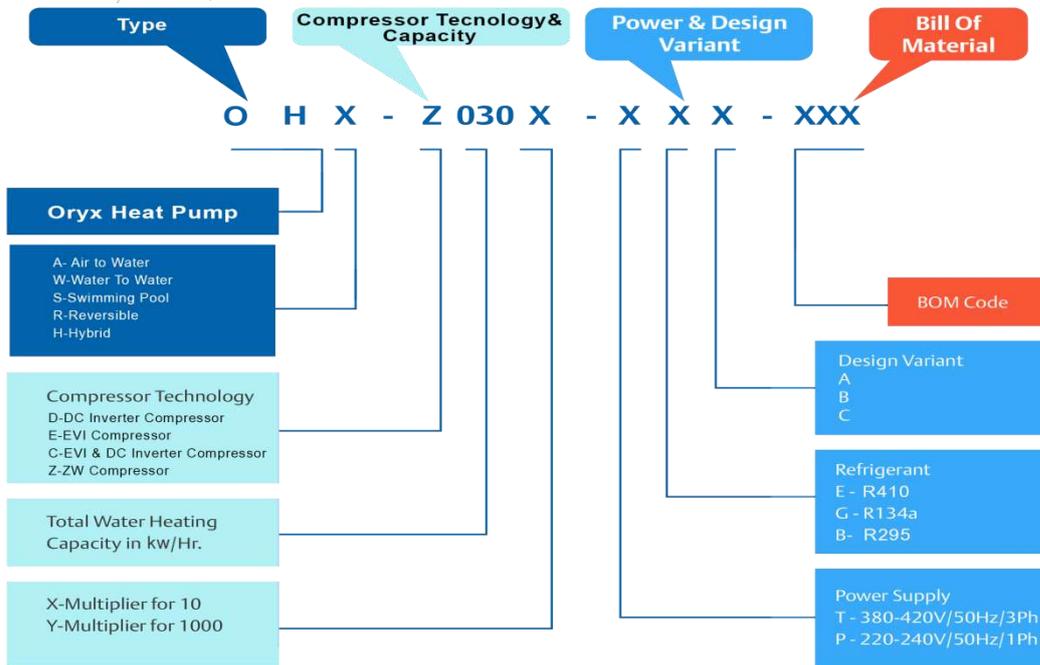
## Heat Pump technology scores across all parameters

parameters	Heat pump	Solar water Heater	Diesel Fired	LPG fired	Electric Geyser
Energy Savings w.r.t Conventional	Up to 78%	60-75%	N.A	N.A	N.A
Efficiency	Up to 45%	Up to 93%	Up to 82%	Up to 82%	Up to 93%
Safety	YES	YES	Moderate	NO	Moderate
Space Requirement	5% of solar	N.A	5% of Solar	5% of Solar	5% of Solar
Climate independent	YES	NO	N.A	N.A	N.A
Environment friendly	YES	YES	NO	NO	YES
Maintenance	Minimal	Panel cleaning	High	Moderate	High
Depreciation	80% in 1 yr	80% in 1yr	NO	NO	NO

## Significant Energy Saving Compared to Traditional Heating System: Delivers ROI within a Year

Hot Water Qty/ Dat	Liters	2800				Number of Showers (No/ Day) Typical	
Water In Temp	°C	30				75	
Water Out Temp	°C	60					
Total Heat Energy	Kw	97.70					
				Solar Systems			
	UNIT	Commercial Heat pump Heating	Commercial Electric Heating	Solar With 50% Elec. Back up	Solar With 100% Elec. Back up	LPG	Diesel
Fuel unit	Varies	kWh	kWh	kWh	kWh	kg	Liters
Energy / Fuel unit	kW	860	860	860	860	11100	10994
Average COP of System	Ratio	3.50	0.95	0.95	0.95	0.80	0.80
Energy/ Fuel unit system	kW	3010	817	817	817	8880	8795
Reqd Fuel unit	Varies	28	103	51	103	9	10
Fuel Cost /Unit	AED	.40	.40	0.40	0.40	2.30	2.38
Energy Cost / day	AED/day	10.56	42.02	21.01	42.02	22.32	23.32
Energy Cost comparison	%	Base	297.85	148.66		111.32	120.78
AED Difference / Day		Base	31.46	15.70		11.76	12.76
Annual Energy Saving In AED		Base	11482.27	5730.77		4291.63	4656.28
Annual Energy Saving In %		Base	74.86%	59.78%		52.68%	54.71%
ROI @ 1 year		Base	0.45	0.98		0.83	0.90

# ORYX NOMENCLATURE



## Nomenclature example

OHA- CO35X-TEA-100 ( ORYX heat pump air to water, 350kW/hr with R410A, 3phase)

# SIMPLE TO USE DIAGNOSTICS FEATURES

**ORYX** are design for simple & easy operation in the field for end users like hotels, Hostels & Restaurants etc. these units comes with “Simple User Interface” which allows service teams to get advance warnings about field failures, simple error codes for easy diagnosis & troubleshooting. This reduces the downtime and increases the life of the system



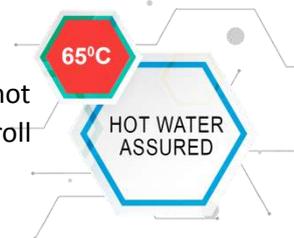
# ORYX EVI DC INVENTOR SCROLL COMPRESSORS TECHNOLOGY

Compressors are the main power consumers among other heat pump components. As a results, any improvement in the compressor performance will diffidently results in a better heat pump performance. This is why **ORYX** has implemented two new technologies the improve the compressor efficiency up to 27% more than a normal compressor can do.



**HIGHER COP:** Since both the total heating capacity is increase and the refrigerant enthalpy is increase as well this will lead to higher COP with the same input

Hot water Temperature: Normal Heat Pumps can produce hot water up to 55°C. with the implementation of **ORYX EVI** Scroll compressors, the hot water temperature can reach up to 65°C



**High Efficiency:** the High efficient Brushless DC Motor that is accompanied with a special design axial compliance has made our scroll compressors highly efficient and suitable for different kinds of heat pumps.

Hot water Reliability: Hot Water production requires long operational hours at high capacities and high compression ratios. **ORYX** compressors are designed and tested in such a way to comply with such hard task especially at low ambient temperatures.



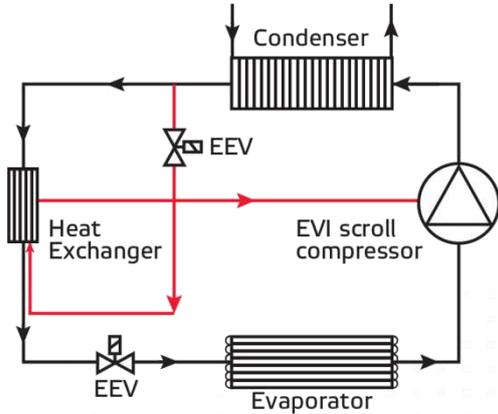
**Low Life Cycle cost:** the simplicity of the **ORYX** heat pump design makes it an easy mission to maintain the system and operate it for longer life cycle than other conventional heat pumps. **ORYX** compressors simple design has lowered the moving parts contained in our compressors to less than 70% than other conventional compressors which lower the maintenance and operational cost.

Quiet Mode: The Implementation of shock absorbers and special bearing mounting make **ORYX** compressors not only to operate on Low vibrations but on silent mode



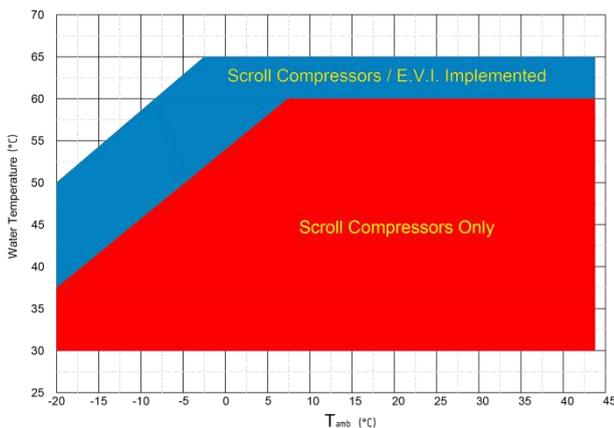
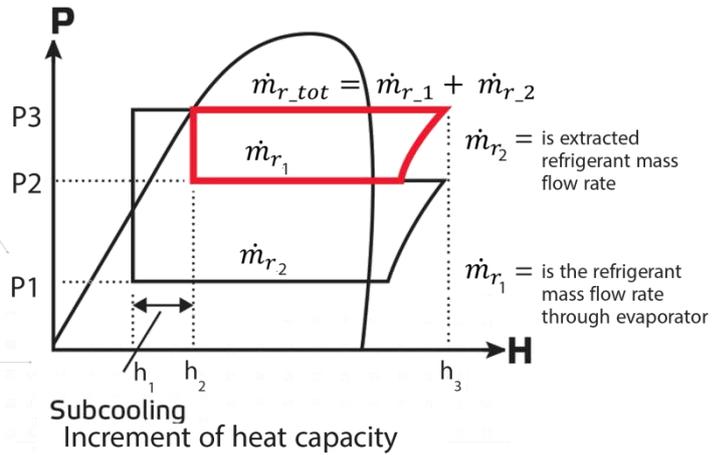


# ORYX EVI SCROLL COMPRESSOR TECHNOLOGY



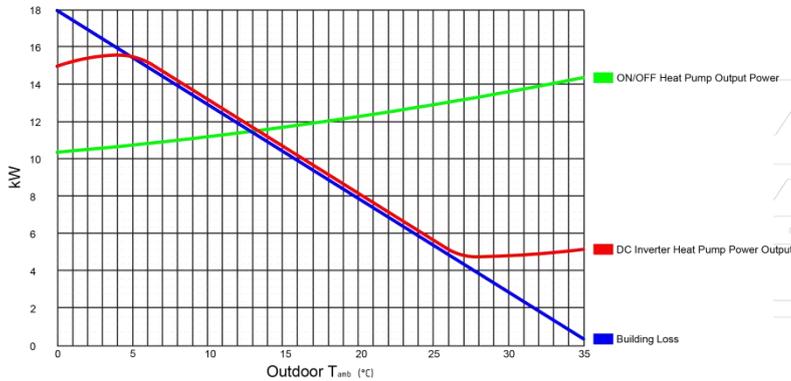
The **EVI** Compressor cycle represents a multi-stage compression that is done with a single compressor leading to less system complexity, better life cycle, low maintenance cost and higher efficiency!

This is done extracting portion of the refrigerant directly after leaving the condenser, expanding it through electronic expansion valve, sub heating it through a brazed-plate heat exchanger and then injecting it back into the compressor.



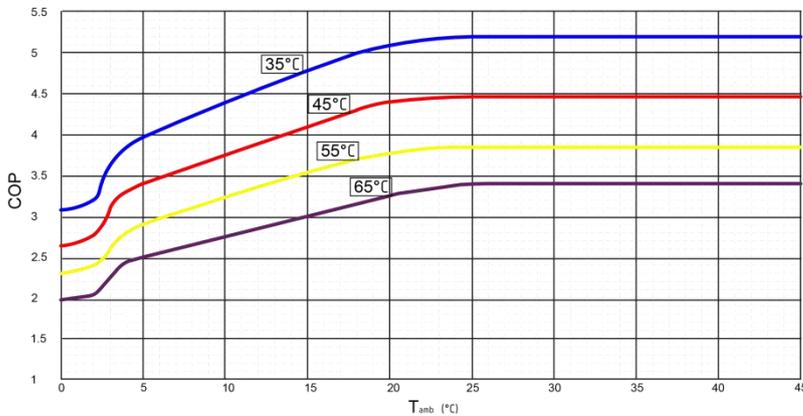
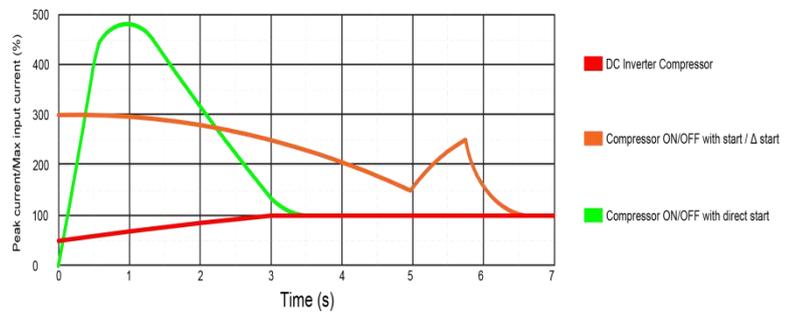
Improvement of scroll compressors performance characteristics with the implementation of **ORYX EVI** Technology especially for hot water production.

# ORYX DC INVERTER TECHNOLOGY



A major concern that affect the compressor durability is the load variation that leads to thermal shocks, pressure blows and noise increase inside the compressor. As the ON / OFF times increases, the compressor durability and performance decrease significantly.

ORYX has implemented the innovate inverters that modulate the compressors power smoothly to avoid and thermal shocks and pressure blows inside the compressors. As a results, the compressors power is optimized, the efficiency is increased, the durability is increased and the required hot water is delivered on time.



The COP as a Function of the Ambient temperature. As can be discovered that the achievement of 65°C is very easy with a remarkable COP value equals to 3.8 with the implementation of EVI Dc inverter technology.

## ORYX DC INVERTER SCROLL COMPRESSORS TECHNOLOGY

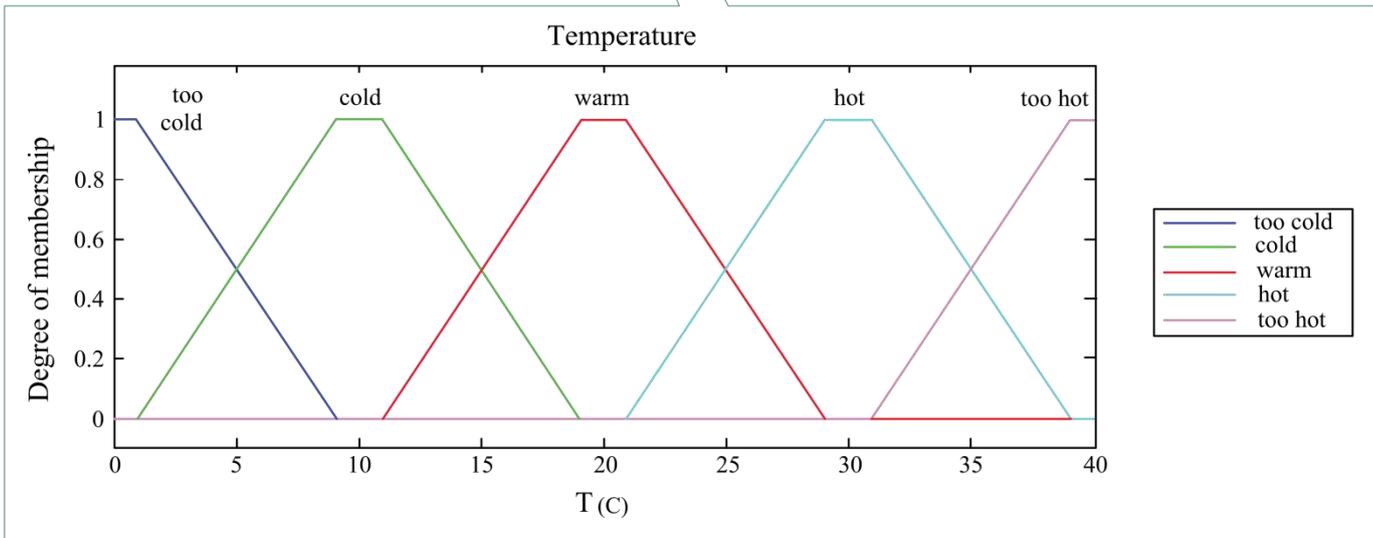
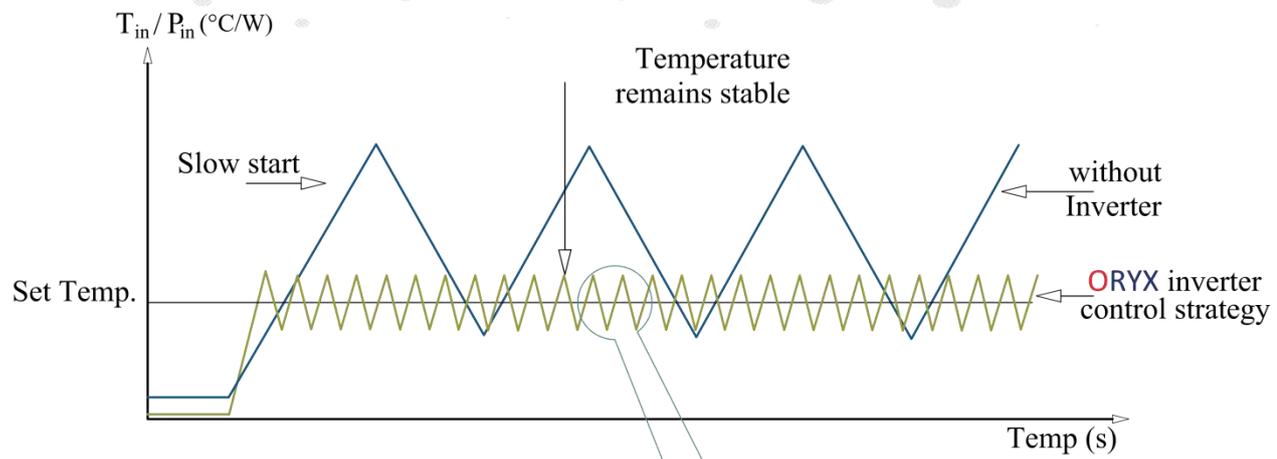
Innovation Criteria	Traditional AC Scroll	ORYX Compressor Scroll Design Innovation
Heating Capacity	Conventional	Up to 27% more than Standard
COP	Conventional	20% more than Standard
Highest Water Temperature	55°C	65°C BLDC (Optimized Compression ratio)
Hot Water Reliability	Conventional	BLDC High Power Motor to operate at Higher Condensing Temperature vs AC compressors



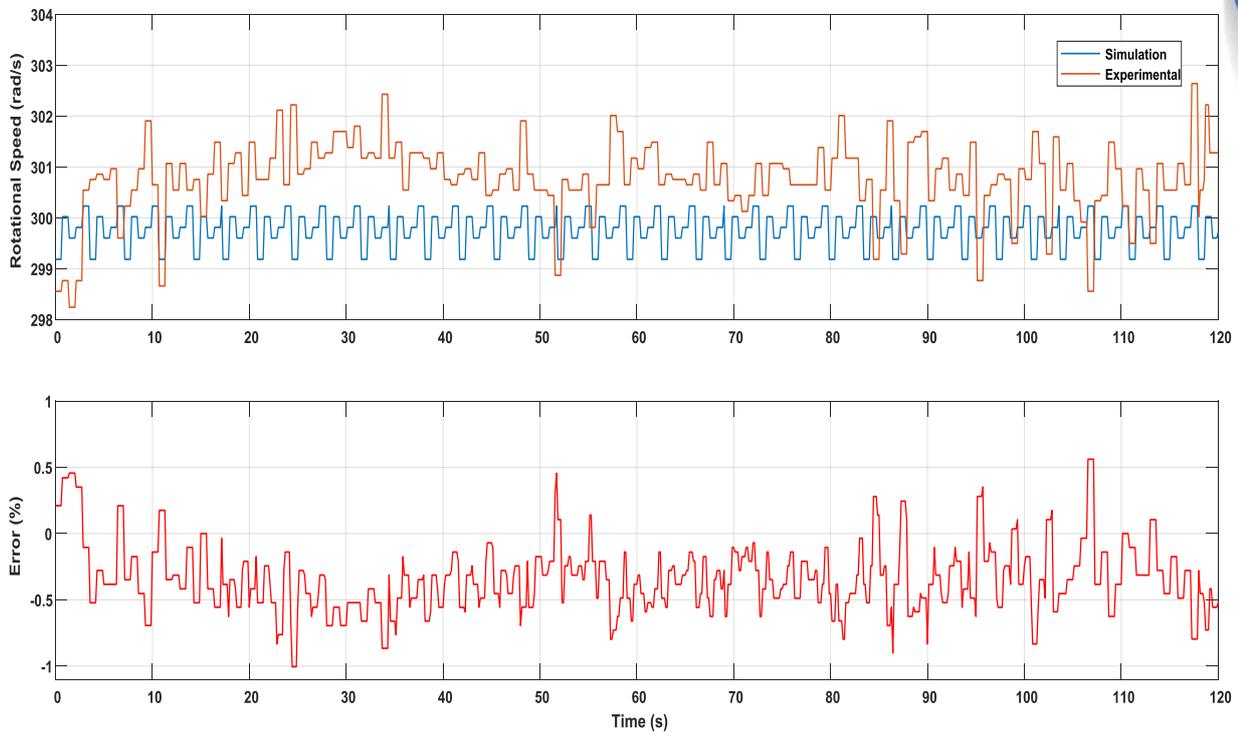
## WHEN IT COMES TO CONTROL, ITS OUR ELEMENT!

A very significant element that affects the heat pump performance is the way it is being managed! You might install two identical heat pumps under the same conditions in which one of them will satisfy your needs with lower running cost and other one will not. Well this is because of the inverter control technology being used by each of them.

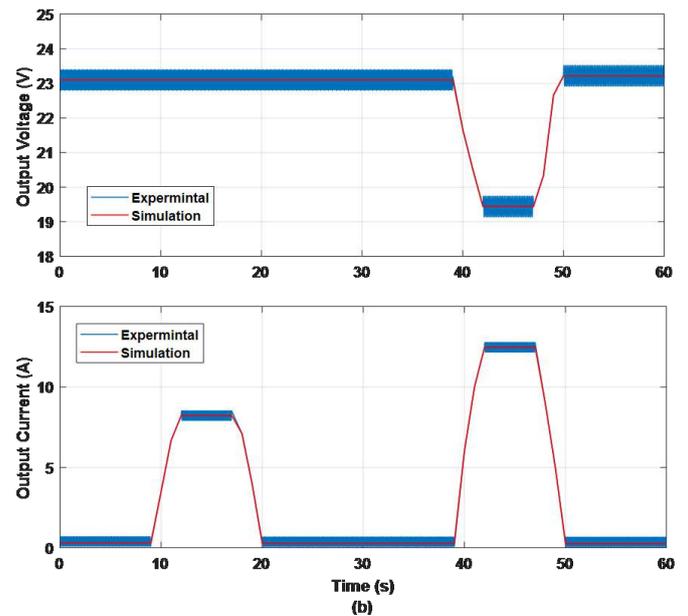
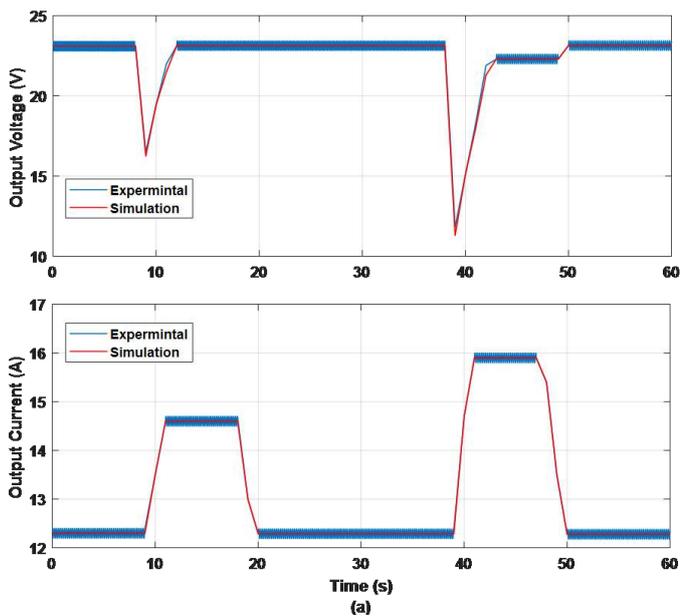
At **ORYX**, our inverter control system is derived based on the Neuro-Fuzzy logic strategy that optimizes power input without sacrificing our clients requirements. This energy management system(EMS) is considered as one of the most recent high efficient control technologies because it merges Artificial Neural Network EMS and Fuzzy Logic Strategy EMS. The control system is trained considering the data of more than 108,000 heat pumps located at different areas of our universe to get the optimum performance results based on the client requirements without the effect of the other conditons such as the out side tempreature and humidity.



To implement this strategy, the Pulse With Modulation (PWM) signal technology is used as the connection between the inverter board and programmed optimization routine to futher increase the system reponse and efficiency.



PMW inverter-driver controls the compressors rotational speed by adjusting the frequency accurately and effectively.





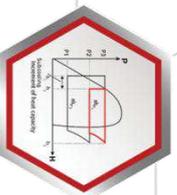
**Evaporator**  
Copper-Aluminum finned Heat Exchanger with 30% Bigger heat exchanging Surface Area



**Condenser**  
Dedicated Coaxial Heat Exchanger for double wall high efficient



**EEV**  
Electronic Controlled EEV to Optimize Refrigerant Flow



**EVI Technology**  
Enhanced EVI Technology to Increase COP and Life Cycle



**BLDC Motor**  
High Efficiency Brushless DC Motor to enhance compressor performance of electric consumption



**Compressor**  
Super Low Noise DC Inverter Scroll Compressor



**Fan Blade**  
Low Noise With High Aerodynamic Performance fan blades to decrease Turbulent Flow



# AIR TO WATER





HIGH EFFICIENCY

25% higher efficiency, evaporator special coating for sea side application.

Advance Evaporator wind field design, the unit is of ultra-quiet operation.



WIDE APPLICATIONS

Supper widely operation condition for all weather conditions to produce hot water all over the year



65°C HOT WATER OUTLET

Suitable in high temprature for hot water supply. **ORYX** can be applied for any industrial application.

**ORYX** operatig cost is very low compared with conventional heat source ,such as electrcity, gas and diesel.



ENVIRONMENTAL FRIENDLY

dopting R410A refrigerant CFC free, Zero air pollution emissioon wich is very environmental friendly.

Durable and reliable of itself, the unit can run in good condition with out the effect of the ambiant temprature.



SPECIAL DESIGNED COAXIAL HEAT EXCHANGER

The double wall technology assures that no contaminants will pass through walls which make it an excellent solution for hospitals and restaurants.

Overload protection, high & low voltage protection,water storage protection, anit- freezing protection for long sevice life and stable operation for both short & long term.



WIDE APPLICATIONS

With advance 4 way valve applied in various unit sizes that can be used in -7°C environment and can be applied in all types of building.

Low cost water heating flexible installation and combonation solution equals to HIGH ROI in the long run.



ULTRA-QUIET OPERATION



LOW OPERATION COAST



MORE RELIABLE



MULTIPLE PROTECTIONS



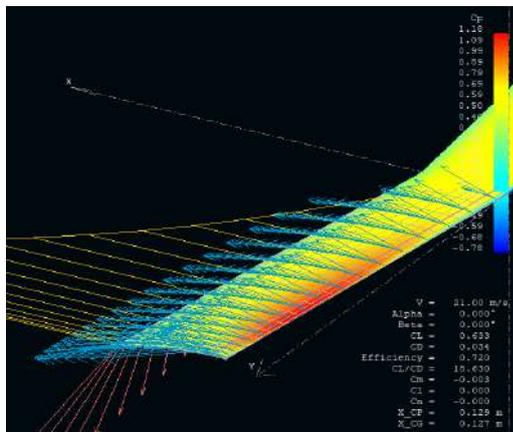
HIGHER ROI



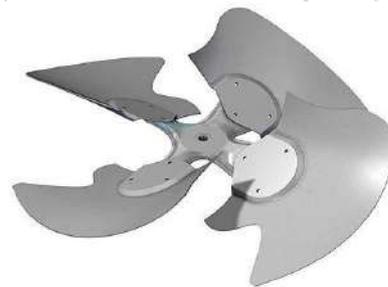
ULTRA-QUIET OPERATION

Top case insulation material, Sound absoption & insulation solution.

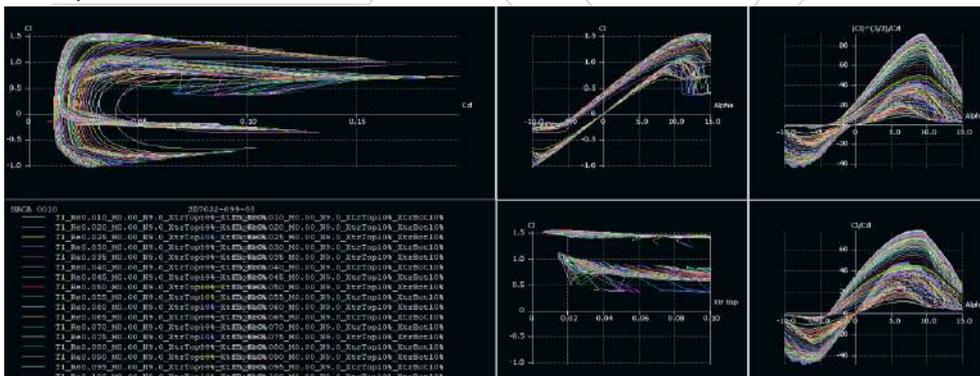
# FAN BLADES



Fan blades are designed in such a way to give high aerodynamic stability with low drag that will lower the fan noise to the minimum. All blades are analyzed using CFD analysis technology before installation.



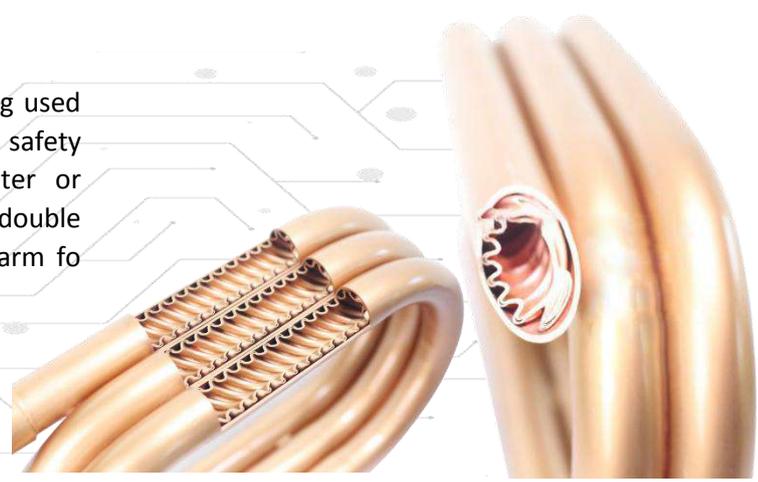
Pressure drop measurements are given a special care in our design, analysis and installation. Variable speed blade are implemented to amend to different load requirements, conditions and wind speeds.



# COAXIAL HEAT EXCHANGER

Double wall hot water heat exchanger is being used in application with particularly stringent safety requirements, in the event of a leak, water or refrigerant seeps out between the vented double walls to the atmosphere, thus gives visual alarm for attention.

- Excellent corrosion resistance
- Outstanding anti-freezing capability
- Clean
- High efficiency



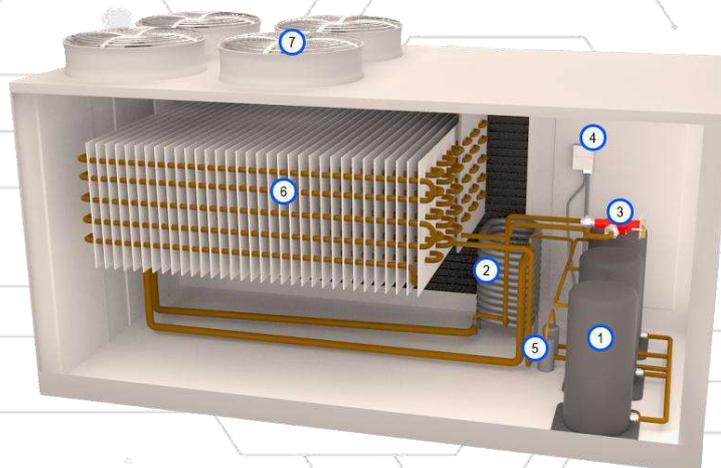
# AIR TO WATER HEAT PUMP TECHNICAL DATA

Model		OHA-002X-TEA-100	OHA-065X-TEA-100	OHA-012Y-TEA-100	OHA-017Y-TEA-100	OHA-024Y-TEA-100	OHA-30Y-TEA-100
Heating Capacity	kW	25.4	65.1	123.7	177.1	246.0	306.8
Input Power	kW	5.8	14.5	28.1	41.2	57.2	74.8
COP	W/W	4.40	4.50	4.40	4.30	4.10	4.10
Power supply	V/Ph/Hz	400/3+N/50		400/3/50			
Max input current standard unit	A	18.5	47.8	87.6	125.3	175.2	216.8
Current standard unit	A	53.2	143.8	272.6	359.3	360.2	440.3
Max air flow (heating mode)	m <sup>3</sup> /h	9600	2100	42000	62000	81500	110000
Fans	n°	2	1	2	3	4	6
Compressor (Type)	Scroll						
Compressors / Circuits	n°/n°	2/1	2/1	2/1	2/1	4/2	4/2
Noise (Power level)	dB(A)	75	78	81	84	85	86
Noise (Pressure level)	dB(A)	47	50	53	56	57	58
Frame	ECO Friendly Galvanized Metal						
Dimensions	(L) mm	1900	2200	2900	3900	2200	2900
	(W) mm	880	1150	1150	1150	1150	1150
	(H) mm	1470	1820	1820	1820	1820	1820

Performances are referred to the following conditions:

- Heating: Ambient temperature 7°C DB, 6° WB, water temperature 30/35°C
- Sound power level in accordance with ISO 9614.
- Sound pressure level at 10mt from the field conditions, calculated in accordance with ISO 9614

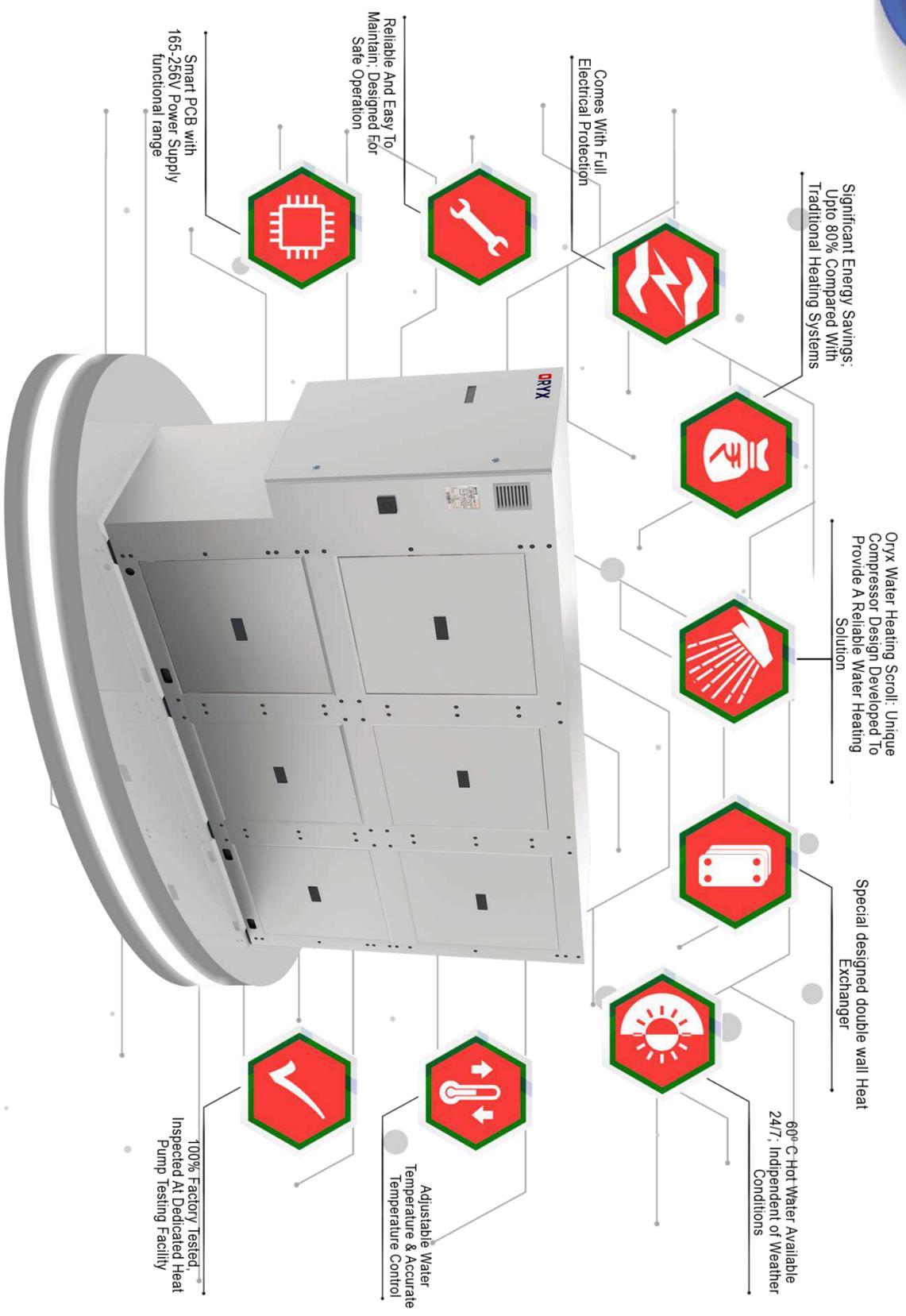
*Drawings not a scale.*



- 1-Compressor
- 2-Coaxial Heat Exchanger
- 3-Expansion Valve
- 4-Control Panel
- 5-Refrigerent filtration & Storage
- 6-Radiator
- 7-Fan

ORYX reserves the right to change the specifications of the product and/or their accessories without prior notice.

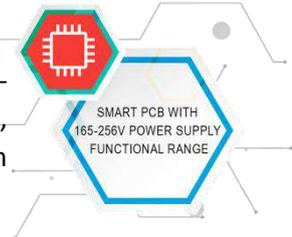
# WATER TO WATER



# SAFETY IS OUR CONCERN! HEALTHY EQUIPMENT, BEST RELIABILITY

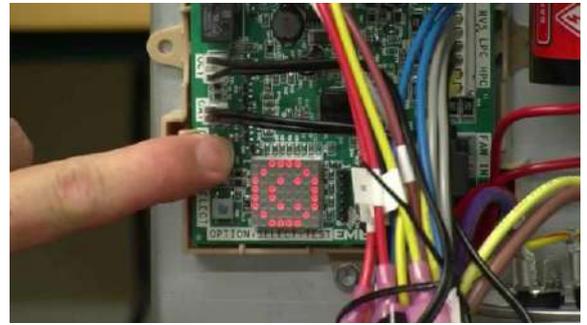
Safety is a top priority at ORYX. From early design stage till final operation and maintenance stages, ORYX takes care of any small detail to assure that both the equipment and user are safe!

Controls the water temperature, anti-freeze protection, compressor timing, automatic starting sequence alarm reset.



## SYSTEM PROTECTION

- Controller communication error
- Fuse failure display
- Daily usage programming capability
- Water tank temperature sensor
- Low pressure cut off
- No incoming water flow
- High discharge pressure cut off
- Memory for the last 30 errors occurred



## Compressor

- Under / over voltage & current
- Single phase, Phase missing / reversal
- High discharge temperature

## Fan Motors

- Healthy Status
- High current

## Heat Exchangers

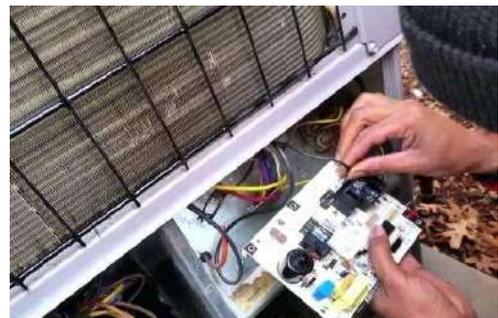
- Leakage detection
- Premium Protection
- Design with drain zone

## COMPONENT PROTECTION



## ELECTRICAL PROTECTION

- Under/ Low voltage Protection
- MBC/Fuse as standard
- Compressor overload protector
- Single Phasing / Phase missing & reversal protection



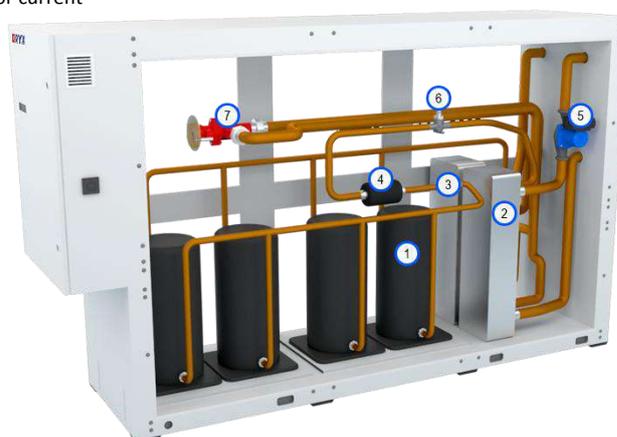


# WATER TO WATER TECHNICAL DATA

Model		OHW-025X-TEA-110	OHW-030X-TEA-110	OHW-040X-TEA-110	OHW-050X-TEA-110	OHW-065X-TEA-110	OHW-080X-TEA-110
Cooling Capacity	kW	27.7	33.2	41.3	53.8	64.4	80.1
Cooling Power Input	kW	6.39	7.55	10.04	12.52	14.79	19.67
EER	-	4.34	4.40	4.11	4.30	4.35	4.07
Heating Capacity	kW	37.3	44.0	55.9	72.4	85.4	108.4
Heating Power Input	kW	8.10	9.60	12.37	15.87	18.81	24.24
COP	-	4.60	4.58	4.52	4.56	4.54	4.47
Load Water Flow	m <sup>3</sup> /h	4.7	5.4	7.2	9.2	11.1	13.8
Load Water Pressure Drop	kPa	39.3	30.4	33.3	39.5	39.2	39.6
Source Water Flow	m <sup>3</sup> /h	5.5	6.4	8	10.7	12.4	15.5
Source Water Pressure drop	kPa	48.8	27.6	28.1	57.7	60.1	71.2
Power Supply	V/Ph/Hz	380/3/50					
Refrigerant	-	R410A					
Refrigerant charge	Kg	3.6	6.0	5.9	70	95	13.0
Compressor Type	-	Scroll Compressor					
Compressor (Qty.)	Unit	1	1	1	2	2	2
Compressor RLA	-	20	20.7	29.3	40	41.4	58.6
Compressor LRA	-	110	110	174	220	220	348
Load Water Pipe	Ømm	DN32	DN40	DN40	DN50	DN50	DN50
Source Water Pipe	Ømm	DN32	DN40	DN40	DN50	DN50	DN50
Noise Level	dB(A)	53	54	54	55	56	61
Net Weight	kg	252	285	315	484	560	620
Dimensions	(L) mm	711	711	711	711	711	711
	(W) mm	1168	1168	1168	1168	1168	1168
	(H) mm	953	953	953	1778	1778	1778

**NOTE:**

- **Cooling:** load water inlet/outlet 12°C/7°C: Source water inlet/outlet: 30°/35°C (water loop). 18°C/29°C (ground water)
- **Heating:** load water inlet/outlet:40°C/45°C: Source water inlet: 20°C/(water loop). 15°C (ground water), 10°C groundloop same source water flow as in cooling mode
- **RLA:** Rated load current, **LRA:** Lock Rotor current

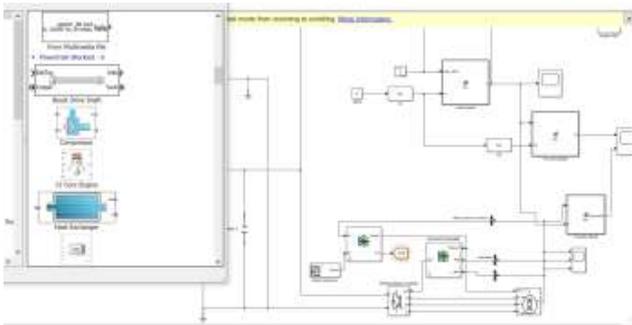


- 1-Compressor
- 2- Evaporator
- 3-Condenser
- 4-Filter
- 5-Circulation Pump
- 6-Shut Off Valve
- 7-Expansion Valve

*Drawings not a scale.*

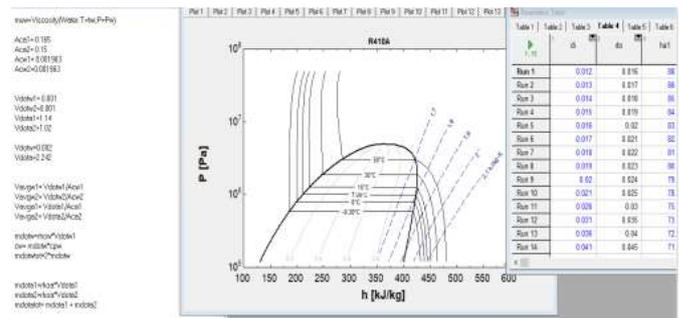
ORYX reserves the right to change the specifications of the product and/or their accessories without prior notice.

The involvement of big number of design parameters and operating conditions for heat pump systems require the use of optimization techniques in order to get the optimum solution depending on the area of application. **ORYX** has developed its special optimization schemes using the most recent optimization techniques such as Genetic Algorithm and Artificial Neural Network to find the optimum operating conditions that satisfy the different needs of our clients.



The designer has to input all design requirements in term of heating and cooling loads, location, building type and application. The software will select the best choice of heat pump system components including heat pump, storage tank, heat exchanger, solar connections....etc.

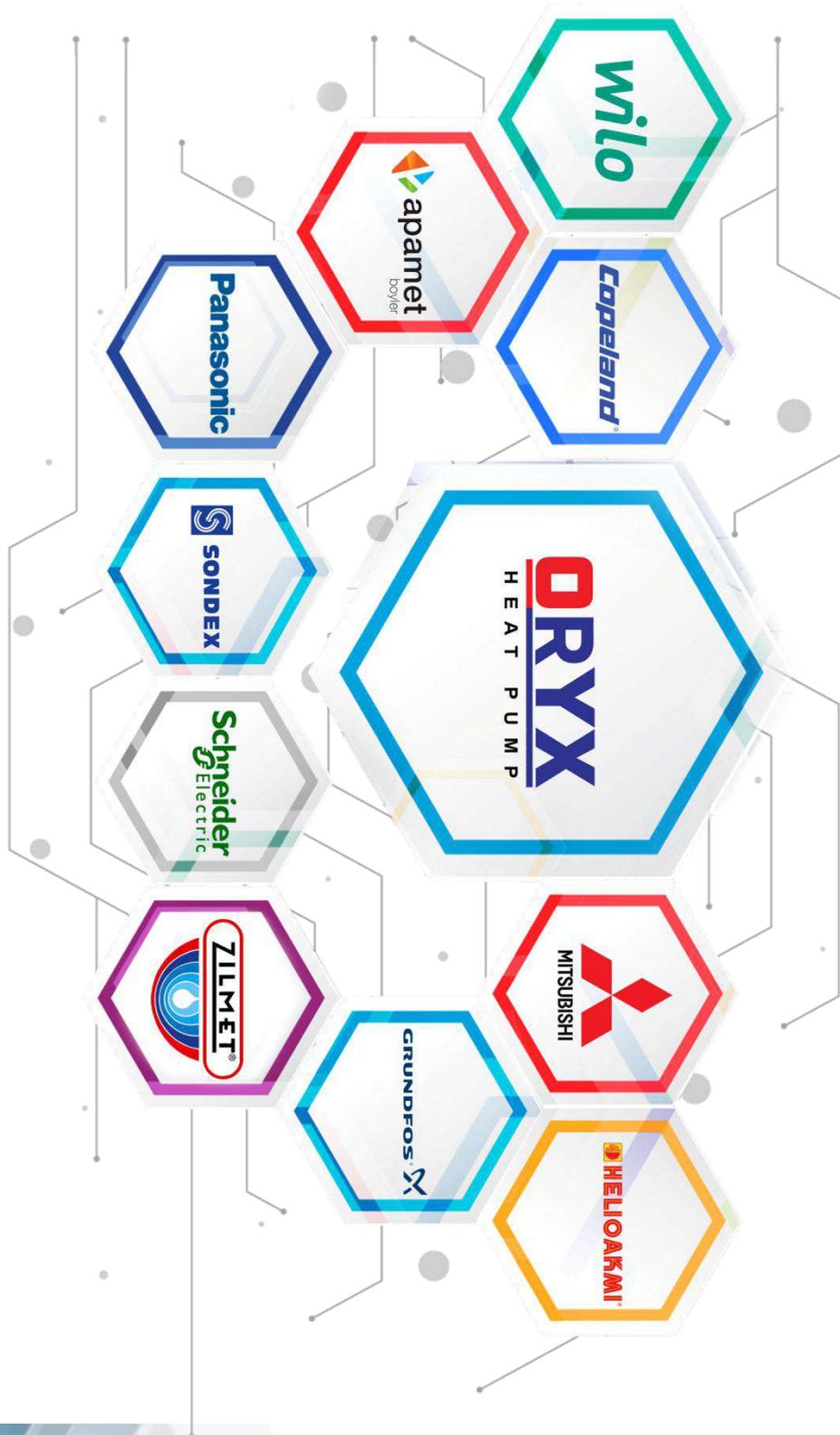
A new feature has implemented in which the software will simulate the system operation under different conditions and partial loads. Results will include all temperatures, efficiencies and cost analysis and much more other features





# PARTNERS

At **ORYX** we are proud of our cooperative Partner that are considered leaders in their different fields. Our high efficient systems solutions & technologies are a result of such a perfect collaboration.



**ORYX**  
HEAT PUMP

Mehmet Akif Ersoy Mahallesi, 2. Bulv.  
D:6, 05300 Merzifon/Amasya  
Email:- [info@apaydinmetal.com.tr](mailto:info@apaydinmetal.com.tr)  
Tel:- +90 (358) 514 1817

