



Rinnai - R290 Commercial and Industrial Heat Pumps

Rinnai

COMMERCIAL AND INDUSTRIAL HEAT PUMPS R290

WATER CHILLERS &
REVERSIBLE HEAT PUMPS
AIR/WATER FROM 40 TO 410 KW

- Refrigerant R290 (Propane): GWP = 0.02 / ODP = 0 exempt from the F-Gas regulation (2024/573)
- Hot water up to 75°C & -5°C ambient 1
- High Performance operate @ -20°C
- Market Leading SCOP
- Modular installation capability for all the range
- Small footprint for ease of installation
- High efficiencies at partial loads
- Reduced quantities of refrigerant
- Maximum accessibility to the refrigeration circuit compartment



High-Efficiency Rinnai Large Commercial and Industrial Heat Pumps – Built for Performance, Designed for the Future.

Rinnai is proud to introduce the latest in smart heat pump technology with the Rinnai commercial and industrial series of R290 heat pumps. These high-efficiency chillers and heat pumps are purpose built for commercial and industrial heating and cooling.

Why Rinnai R290 commercial and industrial heat pumps?

- **Lower Total Life Costs:** These units are engineered to keep your long-term costs down without compromising performance.
- **Eco-Friendly by Design:** By tapping into renewable energy sources and using natural refrigerant propane (R290), they help you hit top-tier energy ratings like LEED® and BREEAM®—and stay ahead of F-Gas and PFAS regulations.
- **Top-Tier Efficiency:** Fully compliant with ECODESIGN (EU) 2016/2281, they meet or exceed all the key energy performance standards—SEER, SEPR, and SCOP.
- **Tailored for Every Job:** With three optimised versions, there's a perfect fit for every application—whether you're focused on cooling, heating, or both.
- **Quiet Operation:** Smart design keeps compressor noise locked down, so you get powerful performance without the racket.

Whether you're upgrading an existing system or planning a new build, these units are ready to deliver comfort, compliance, and cost savings.

VERSIONS

Scan QR Code for more details



ACCESSORIES

Scan QR Code for a Rinnai expert to explain more



APPLICATIONS

- Water cooler only
- Reversible water chiller
- Reversible heat pump
- Reversible heat pump with augmented temperature difference at user exchanger in heating mode
- Silenced up to -6.8 dB(A) vs standard
- Super silent up to -9.2 dB(A) vs standard
- Partial recovery
- Marine type Onshore/Offshore
- 1/2 low head pump (10-15m)
- 1/2 high head pump (20-25m)
- 1/2 low head pump (10-15m) + Buffer tank
- 1/2 high head pump (20-25m) + Buffer tank
- Inverter pumps with constant pressure operation

Rinnai is simplifying Heat Pump design with (SPF) Seasonal Performance Factors. SPF helps establish the true system performance including Pumps, Cylinders and Ancillaries. For more information about SPF modeling scan the QR Code.

TELL ME MORE ABOUT SPF



Industrial



Sports facilities



Airports / Railway stations



Data Centres



Cinema / Theatres



Hospitals / Nursing homes



Catering



Supermarkets



Shops



Care Homes



Schools and Institutes



Multi-family dwellings



Hotels



Offices



Marine and Offshore Power Plant

Rinnai R290, Commercial and Industrial Heat Pumps

Why R290 (Propane) is the Smart, Sustainable Choice

R290, also known as propane is a natural hydrocarbon refrigerant that is set to have a impact within heat pump selection for many years to come. **Why?** Because it's clean, efficient, can provide high temperature hot water and it is future proof.

R290 and its Ultra-Low Environmental Impact

With a Global Warming Potential (GWP) of just 0.02 and zero Ozone Depletion Potential (ODP), R290 is one of the greenest refrigerants available.

Unrivalled Performance

Thanks to R290's thermodynamic properties, it delivers high efficiency and performance even with lower refrigerant charges. That means better results such as higher hot water temperatures with less environmental impact.

Future-Proof & Regulation-Ready

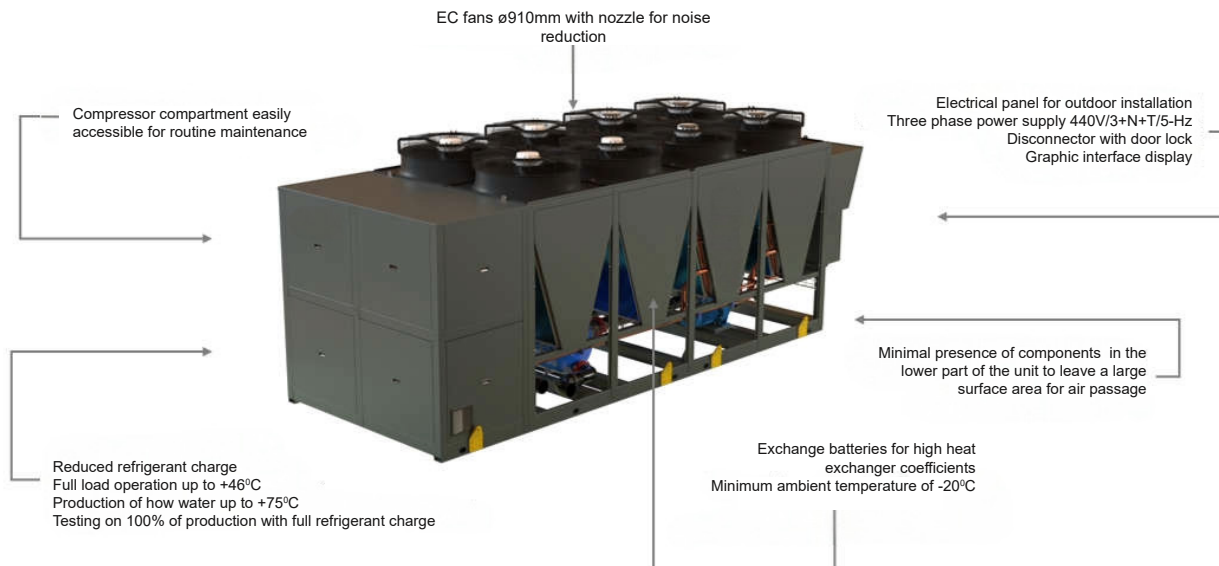
R290 is not affected by the F-Gas Regulation (EU 2024/573), which means no phase-downs and no bans. It's a long-term solution that won't get caught up in changing legislation.

Safe by Design

Rinnai R290 systems are engineered with safety in mind. Every critical aspect has been addressed to ensure safe operation within defined limits and multiple leak detection devices and watchdogs for piece of mind.

In short, R290 is a sustainable, regulation-proof refrigerant that's ready for green future.

Robust Components for Heat Pump Longevity



Structure

Small footprint with accessible compressor compartment
Strong monobloc (RAL7012 galvanized steel)
Suitable for outdoor installation
Corrosion resistance
Prepared for the insertion of vibration dampers
Prepared with lifting eyebolts
Unparalleled material & market leading design

Refrigeration circuit

SCROLL compressors in tandem and/or trio (Size dependant)
Natural refrigerant gas R290 (propane)
Microchannel air exchanger for chiller version and fin&tubes for reversible versions
Single circuit plate evaporators for greater reliability
Electronic expansion valve
Liquid separator as standard
Gas leak sensor present as standard
Compressor compartment air extraction fan as standard
Partial heat recovery (optional)

Aeraulic circuit

Fans Ø 910 mm EC
Batteries with multi-V geometry from nr.4 fans frame
Speed control as standard
Noise control for night hours

Hydraulic circuit

Standard setup with evaporator only and antifreeze flow switch
Suitable for operation with glycol up to 40%
UV-resistant pipe insulation
Prepared for monobloc parallel free-cooling version

Plumbing accessories

1 or 2 low or high head pumps Inverter pumps with constant pressure operation
Inertial tank
Water pressure gauges upstream and downstream of the pump(s).
Air vent valve

Electrical accessories

Antifreeze resistance
Relay for managing 1 or 2 external pumps
Double set point from digital input
Variable set point from analogue input
Soft Starter compressors
Compressor power factor correction device
Remote user terminal
BMS network cards

Mechanical accessories

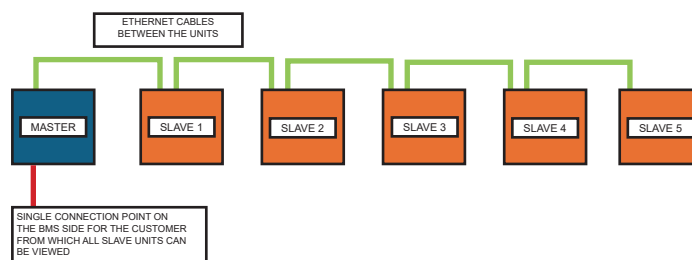
Water condensed trays
Rubber vibration dampers
Spring vibration dampers for superior isolation
Battery protection filters

Flexibility of the R290 Commercial and Industrial Range

The Rinnai R290 range of chillers and heat pumps will be equipped with smart control logic, capable of managing up to 1 master plus 5 slaves for a total of 6 units. To optimise system performance and minimise wastage.



Figure 1 - example with 528kW of capacity



Flexible Power, Smart Design - The Rinnai Commercial and Industrial Heat Pump Series

The Rinnai R290 commercial and industrial heat pump range is one of the most versatile R290-based systems on the market. Whether you're working on a large-scale install or need a modular setup, this range is both flexible and powerful enough to cover even the heaviest demand.

Why Modular Makes Sense:

Built-in Redundancy: Spread the load across multiple units. If one is down for service, the others keep running meaning no single point failure.

Lower Risk, Smarter Safety: Smaller refrigerant charges per unit make it easier to meet safety standards.

Space-Saving Flexibility: Limited space for large units consider the distribution of smaller units across available space.

Better Seasonal Efficiency: More units = more compressors = more partial load steps. That means better performance all year round.

Innovative HTW Versions Available

Need to replace a gas boiler without reworking the whole heating system? The HTW version is made for that.

High Delta T Ready: Designed to work with the flow rates and temperature differences typical of gas boiler systems.

High Output, Low Temps: Thanks to R290 and a specially designed heat exchanger, it delivers high temperatures even in cold weather.

Minimal Disruption: Modernise and boost efficiency without tearing up the existing setup.

In short, the HTW version is your go-to for upgrading legacy heating systems. Contact our design team today to discuss more design@rinnaiuk.com OR SCAN QR CODE.

HELP ME
CHOOSE



Technical data – R290 – Water chiller

MODEL			45.1	55.1	65.1	90.1	110.1	130.1	140.1	170.2	220.2	260.2	290.2	330.2	360.2	410.2
Refrigeration yield	(1)	kW	42.3	50.3	60.6	82.4	102	118	131	164	204	235	275	312	346	386
Total electrical power absorbed	(1)	kW	12.2	15.2	18.9	23.2	30.8	37	37.5	46.3	62.1	74.7	80.4	95	98.1	114
EER (UNI EN 14511-22)	(1)		3.47	3.31	3.21	3.55	3.31	3.19	3.49	3.54	3.29	3.15	3.42	3.28	3.53	3.39
SEER	(2)		4.43	4.38	4.36	4.53	4.57	4.59	4.54	4.58	4.36	4.38	4.54	4.64	4.93	4.83
ηs		%	174	172	172	178	180	181	179	180	171	172	179	183	194	190
SEPR HT	(3)		5.77	5.45	5.62	6.23	5.55	5.54	5.92	6.12	5.72	5.52	5.92	5.87	5.99	5.75
Compressors																
Number of circuits		no	1	1	1	1	1	1	1	2	2	2	2	2	2	2
Number of compressors		no	2	2	2	2	2	2	2	2	4	4	5	5	6	6
Minimum partialization step		%	40%	37%	34%	50%	50%	47%	50%	25%	25%	23%	21%	20%	17%	17%
Refrigerant charge (estimated)		kg	3	4	4	6	7	8	9	12	15	17	20	22	25	28
Hydronics																
Nominal water flow rate		m ³ /h	7.3	8.7	10.4	14.2	17.5	20.3	22.5	28.2	35.1	40.4	47.3	53.7	59.5	66.4
Water pressure drops		kPa	31	32	34	32	34	31	32	34	31	32	33	34	32	33
H Low head pump		m	19	19	18	17	17	16	17	15	15	14	18	17	17	16
H High head pump		m	22	21	21	22	21	20	21	27	25	24	23	28	26	25
Tank capacity		dm ³	150	150	150	200	200	200	250	300	300	300	300	300	300	300
Hydraulic diameters		'	1"1/2	1"1/2	1"1/2	2" 1/2	2" 1/2	2" 1/2	2" 1/2	3"	3"	3"	4"	4"	4"	4"
Hydraulic diameters		DN	DN40	DN40	DN40	DN65	DN66	DN65	DN65	DN80	DN80	DN80	DN100	DN100	DN100	DN100
Air conditioning																
Type of fans			Axial EC													
Fan diameter		mm	910													
Number of fans		no	1	1	1	2	2	2	3	4	4	4	6	6	8	8
Fans air flow		m ³ /h	23000	23000	23000	46000	46000	46000	69000	92000	92000	92000	138000	138000	184000	184000
Acoustics																
Sound Power Level	(5)	dBA	86	86	86	88	88	88	90	91	91	91	93	93	95	95
Dimensions																
Height		mm	1973	1973	1973	2444	2444	2444	2444	2444	2444	2444	2444	2444	2444	2444
Width		mm	1099	1099	1099	1100	1100	1100	1100	1100	2240	2240	2240	2240	2240	2240
Length		mm	2592	2592	2592	3330	3330	3330	4400	4113	3942	3942	5076	5076	6210	6210
Power supply			400 / 3 / 50													
Max absorbed power (FLI)		kW	33	40	50	69	83	98	105	138	166	191	225	255	284	314
Max absorbed current (FLA)		TO	39.5	46.9	58.5	81.0	104.6	126.8	137.7	162.0	209.2	246.6	288.2	331.4	367.2	409.2
Max starting current (MIC)		TO	141.8	158.2	231.9	254.4	330.2	337.8	348.7	335.4	434.8	464.6	506.2	542.4	585.2	620.2

1 - In accordance with standard EN14511-2022: inlet/outlet chilled water: 12/7°C, air temperature 35°C DB.

2 - User side exchanger inlet/outlet water temperature 12/7°C (low temperature application), with reference to regulation 2016/2281 and standard EN 14825.

3 - Exchanger inlet/outlet water temperature on user side 12/7°C, with reference to regulation 2016/2281 and standard EN 14825

5 - Unit operating at nominal power, without accessories of any kind - external air temperature 35°C and exchanger and user water inlet/outlet temperature equal to 12/7°C. Values according to ISO 3744

Preliminary data subject to change

Technical data R290 – Reversible water chiller

MODEL			45.1	55.1	65.1	90.1	110.1	130.1	140.1	170.2	220.2	260.2	290.2	330.2	360.2	410.2
Refrigeration yield	(1)	kW	40.7	48.1	57.6	79	97.1	112	125	158	194	224	264	298	332	369
Electrical power absorbed	(1)	kW	12.5	15.6	19.5	23.7	31.9	38.6	38.3	47.4	63.7	77	82.6	97.6	101	118
EEA (UNI EN 14511-22)	(1)		3.26	3.08	2.95	3.33	3.04	2.9	3.3	3.33	3.05	2.91	3.2	3.04	3.29	3.13
Thermic yield	(2)	kW	44.3	52.6	62.6	86.8	109	124	134	174	217	248	292	331	365	410
Electrical power absorbed	(2)	kW	12.5	15.5	18.8	25.6	34.2	39.4	41.2	51.1	68.3	78.6	88.4	103	107	125
COP (UNI EN 14511-22)	(2)		3.54	3.39	3.33	3.39	3.19	3.15	3.3	3.41	3.18	3.16	3.3	3.21	3.41	3.28
SCOP	(4)		3.92	3.96	4.00	3.82	3.72	3.81	3.8	3.86	3.78	3.88	3.88	3.96	4.04	4.01
ηs		%	154	156	157	150	146	149	151	152	148	152	152	155	159	158
Compressors																
Number of circuits		no	1	1	1	1	1	1	1	2	2	2	2	2	2	2
Number of compressors		no	2	2	2	2	2	2	2	2	4	4	5	5	6	6
Minimum bias		%	40%	37%	34%	50%	50%	47%	50%	25%	25%	23%	21%	20%	17%	17%
Refrigerant charge (estimated)		kg	4	5	6	8	10	11	12	16	20	23	27	30	33	37
Hydronics																
Nominal water flow rate		m ³ /h	7.6	9.0	10.8	14.9	18.7	21.3	22.7	29.9	37.3	42.7	50.2	56.9	62.8	70.5
Water pressure drops		kPa	34	35	36	36	39	34	32	38	35	36	37	38	36	37
H Low head pump		m	19	19	18	17	17	16	17	15	15	14	18	17	17	16
H High head pump		m	22	21	21	22	21	20	21	27	25	24	23	28	26	25
Tank capacity		dm ³	150	150	150	200	200	200	250	300	300	300	300	300	300	300
Hydraulic diameters		'	1"1/2	1"1/2	1"1/2	2" 1/2	2" 1/2	2" 1/2	2" 1/2	3"	3"	3"	4"	4"	4"	4"
Hydraulic diameters		DN	DN40	DN40	DN40	DN65	DN66	DN65	DN65	DN80	DN80	DN80	DN100	DN100	DN100	DN100
Air conditioning																
Type of fans			Axial EC													
Fan diameter		mm	910													
Number of fans		no	1	1	1	2	2	2	3	4	4	4	6	6	8	8
Fans air flow		m ³ /h	23000	23000	23000	46000	46000	46000	69000	92000	92000	92000	138000	138000	184000	184000
Acoustics																
Sound Power Level	(5)	dBA	86	86	86	88	88	88	90	91	91	91	93	93	95	95
Dimensions																
Height		mm	1973	1973	1973	2444	2444	2444	2444	2444	2444	2444	2444	2444	2444	2444
Width		mm	1099	1099	1099	1100	1100	1100	1100	1100	2240	2240	2240	2240	2240	2240
Length		mm	2592	2592	2592	3330	3330	3330	4400	4113	3942	3942	5076	5076	6210	6210
Power supply			400 / 3 / 50													
Max absorbed power (FLI)		kW	33	40	50	69	83	98	105	138	166	191	225	255	284	314
Max absorbed current (FLA)		TO	39.5	46.9	58.5	81.0	104.6	126.8	137.7	162.0	209.2	246.6	288.2	331.4	367.2	409.2
Max starting current (MIC)		TO	141.8	158.2	231.9	254.4	330.2	337.8	348.7	335.4	434.8	464.6	506.2	542.4	585.2	620.2

1 - In accordance with standard EN14511-2022: inlet/outlet chilled water: 12/7°C, air temperature 35°C DB.

2 - In accordance with standard EN14511-2022: inlet/outlet hot water: 40/45°C, air temperature 7°C DB/6°C WB.

4 - User side exchanger inlet/outlet water temperature 30/35°C, Average climate profile, with reference to regulation 2013/813 and standard EN14825

5 - Unit operating at nominal power, without accessories of any kind - external air temperature 35°C and exchanger and user water inlet/outlet temperature equal to 12/7°C. Values according to ISO 3744

Preliminary data subject to change

Technical data R290 – Reversible heat pump

MODEL			45.1	55.1	65.1	90.1	110.1	130.1	140.1	170.2	220.2	260.2	290.2	330.2	360.2	410.2
Refrigeration yield	(1)	kW	35.9	42.4	50.5	69.4	85.3	98.7	111	139	171	197	231	262	291	323
Electrical power absorbed	(1)	kW	12.0	15.2	19.1	23.2	31.2	37.6	37.3	46.5	62.4	75.2	80.2	94.8	98.5	115
EEA (UNI EN 14511-22)	(1)		2.99	2.79	2.64	2.99	2.73	2.62	3.0	2.99	2.74	2.62	2.88	2.76	2.95	2.81
Thermal output	(2)	kW	45	53.4	63.4	88.3	110	126	136	176	221	252	296	335	370	415
Electrical power absorbed	(2)	kW	11.6	14.3	17.4	23.3	30.9	35.6	37.3	46.4	61.6	71.1	79.4	92.1	97.9	114
COP (UNI EN 14511-22)	(2)		3.88	3.73	3.64	3.79	3.56	3.54	3.7	3.79	3.59	3.54	3.73	3.64	3.78	3.64
SCOP	(4)		4.21	4.25	4.18	4.08	3.99	4.06	4.1	4.10	4.04	4.12	4.24	4.30	4.26	4.25
ηs		%	166	167	164	160	156	159	162	161	158	162	167	169	168	167
Compressors																
Number of circuits		no	1	1	1	1	1	1	1	2	2	2	2	2	2	2
Number of compressors		no	2	2	2	2	2	2	2	2	4	4	5	5	6	6
Minimum bias		%	40%	37%	34%	50%	50%	47%	50%	25%	25%	23%	21%	20%	17%	17%
Refrigerant charge (estimated)		kg	4	5	6	8	10	11	12	16	20	23	27	30	34	38
Hydronics																
Nominal water flow rate		m ³ /h	7.7	9.2	10.9	15.2	18.9	21.7	23.0	30.3	38.0	43.3	50.9	57.6	63.6	71.4
Water pressure drops		kPa	35	36	37	37	40	35	33	39	36	37	38	39	37	38
H Low head pump		m	19	19	18	17	17	16	17	15	15	14	18	17	17	16
H High head pump		m	22	21	21	22	21	20	21	27	25	24	23	28	26	25
Tank capacity		dm ³	150	150	150	200	200	200	250	300	300	300	300	300	300	300
Hydraulic diameters		'	1"1/2	1"1/2	1"1/2	2" 1/2	2" 1/2	2" 1/2	2" 1/2	3"	3"	3"	4"	4"	4"	4"
Hydraulic diameters		DN	DN40	DN40	DN40	DN65	DN66	DN65	DN65	DN80	DN80	DN80	DN100	DN100	DN100	DN100
Air conditioning																
Type of fans			Axial EC													
Fan diameter		OR	910													
Number of fans		no	1	1	1	2	2	2	3	4	4	4	6	6	8	8
Air flow Fans		m ³ /h	23000	23000	23000	46000	46000	46000	69000	92000	92000	92000	138000	138000	184000	184000
Acoustics																
Sound Power Level	(5)	dBA	86	86	86	88	88	88	90	91	91	91	93	93	95	95
Dimensions																
Height		mm	1973	1973	1973	2444	2444	2444	2444	2444	2444	2444	2444	2444	2444	2444
Width		mm	1099	1099	1099	1100	1100	1100	1100	1100	2240	2240	2240	2240	2240	2240
Length		mm	2592	2592	2592	3330	3330	3330	4400	4113	3942	3942	5076	5076	6210	6210
Power supply			400 / 3 / 50													
Max absorbed power (FLI)		kW	33	40	50	69	83	98	105	138	166	191	225	255	284	314
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1 - In accordance with standard EN14511-2022: inlet/outlet chilled water: 12/7°C, air temperature 35°C DB.

2 - In accordance with standard EN14511-2022: inlet/outlet hot water: 40/45°C, air temperature 7°C DB/6°C WB.

4 - User side exchanger inlet/outlet water temperature 30/35°C, Average climate profile, with reference to regulation 2013/813 and standard EN14825.

5 - Unit operating at nominal power, without accessories of any kind - external air temperature 35°C and exchanger and user water inlet/outlet temperature equal to 12/7°C. Values according to ISO 3744

Preliminary data subject to change

Technical data – Heat recovery – R290

PARTIAL RECOVERY															
MODEL		45.1	55.1	65.1	90.1	110.1	130.1	140.1	170.2	220.2	260.2	290.2	330.2	360.2	410.2
Thermal power	kW	9.3	11.1	13.5	18.0	22.6	26.4	28.6	35.8	45.2	52.6	60.4	69.2	75.5	85.0
Water flow rate W40/45	m³/h	1.6	1.9	2.3	3.1	3.9	4.5	4.9	6.1	7.8	9.1	10.4	11.9	13.0	14.6
Water pressure drops	kPa	20	22	21	25	24	26	23	24	25	27	24	23	26	28

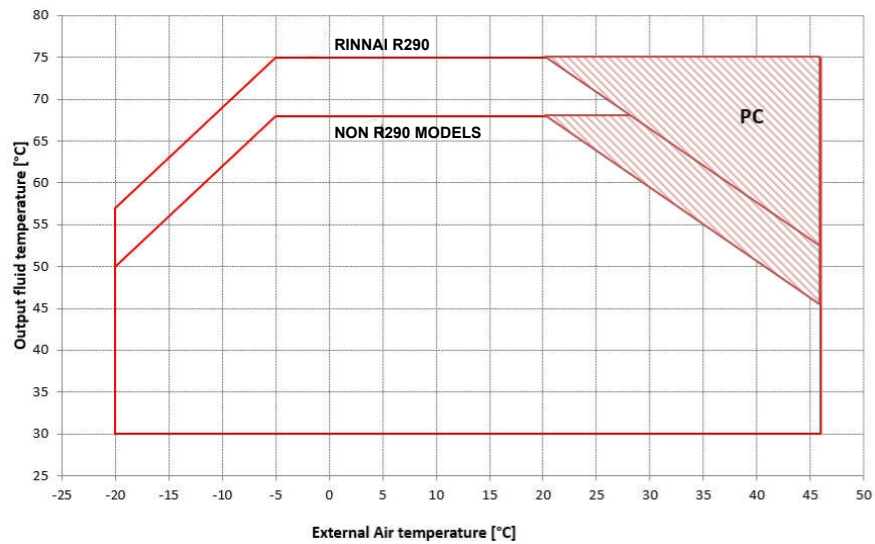
Scan QR code to book on our heat pump specification, design and SPF, CPDs and training courses today.

The courses are **FREE** and are certified by **CIBSE** and **CPD UK**.



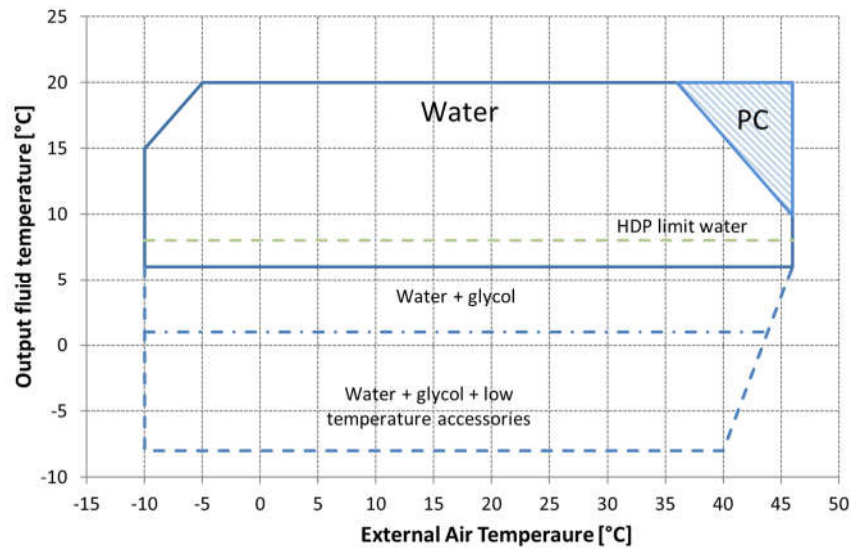
Operational limits – R290

HEATING



The temperature difference at the user side exchanger must be between 3K and 6K (between 12K and 20K in case of HTW version)
 Operating outside the operating limits may cause the intervention of the safety devices or serious malfunctions
 Within the operating limits, the ventilation section can be subject to modulation
 Operating limits are subject to change based on humidity in the air
 The inlet and outlet temperatures of the user exchanger must be indicated at the time of order to allow the correct setting of the alarm parameters and verification of the sizing of the expansion valve
 PC = In the indicated area the control could implement a forced partialization of the compressors to avoid the intervention of the safety devices
 Preliminary data subject to change

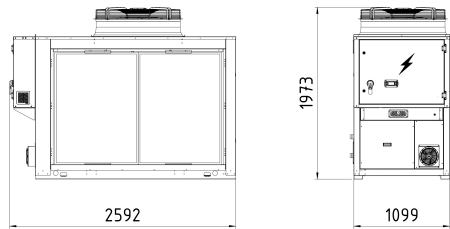
COOLING



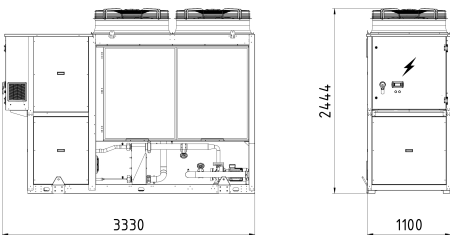
The temperature difference at the user side exchanger must be between 3K and 6K (in case of HTW version it is not possible to work on chilling mode)
 Operating outside the operating limits may cause the intervention of the safety devices or serious malfunctions
 The water inlet temperature at the user side exchanger cannot be higher than 25°C (30°C in case of HTW version)
 Within the operating limits, the ventilation section can be subject to modulation
 Within the operating limits, to limit the delivery temperature, the unit may be subject to partialization of the compressors
 Operating limits are subject to change based on humidity in the air
 The inlet and outlet temperatures of the user exchanger must be indicated at the time of order to allow the correct setting of the alarm parameters and verification of the sizing of the expansion valve
 PC: In the indicated area the control could implement a forced partialization of the compressors to avoid the intervention of the safety devices
 Preliminary data subject to change

Dimensional – R290

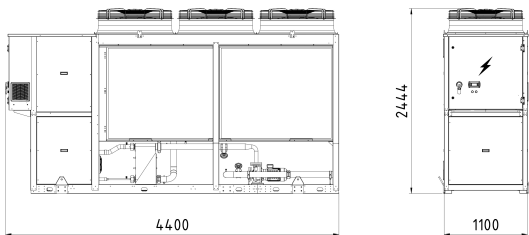
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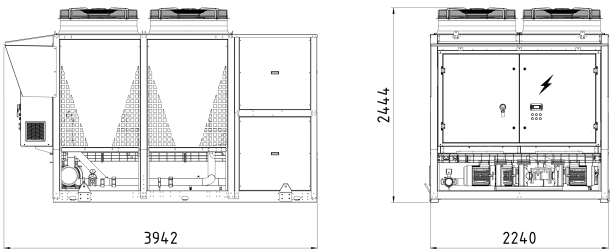
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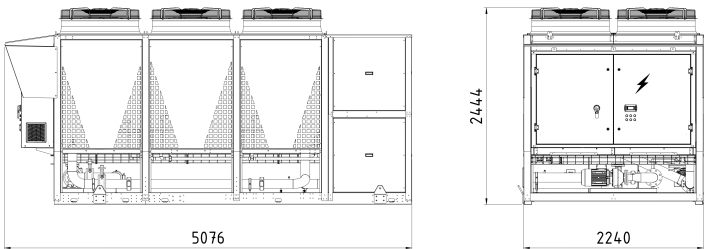
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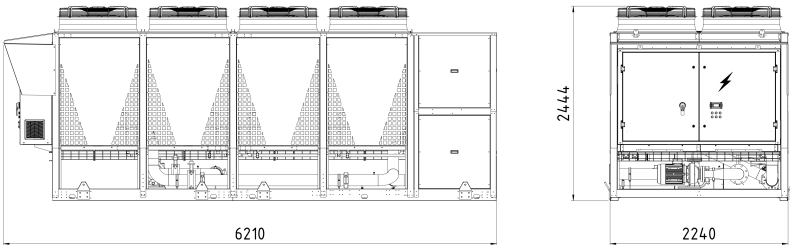
SIZE 170.2 - 220.2 – 260.2



SIZE 290.2 – 330.2



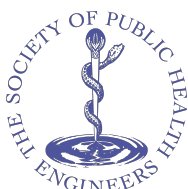
SIZE 360.2 – 410.2



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