TECHNICAL COMMERCIAL PROPOSAL

Customer	**: Charles Scott & Ptnr**
Attention	**: K MacLennan**
From	**: Hidros UK Ltd D. Neville**
Phone	**: 0141 286 0325**
Project	**: UKI 1781 Rev 2 Simply Care Homes - 4 x Everest 290**
Date	**: 09/06/2023**
Offer validity	**: 30 days**
Internal reference:	
230609_9468_000	

MODULAR AIR COOLED HEAT PUMPS FOR OUTDOOR INSTALLATION WITH SCROLL COMPRESSORS AND AXIAL FANS

REFRIGERANT R290

EVEREST290 - PAE Kp MODULAR MULTISCROLL

EVEREST290 - PAE Kp EMICON series air/water heat pump is a modular monoblock unit for outdoor installation. It is particularly suitable for residential, commercial, and industrial applications that require the production of hot water at high temperatures, at the highest efficiency levels possible.
This unit is specifically designed to reach optimal efficiency levels in heating mode, being able to operate down to outdoor air temperatures of -20°C and ensuring hot water production up to 70°C.

EMICON's Innovative "Master in Rotation" logic guarantees high reliability of the entire system. It is possible to disconnect one or more component units of the module without any limitation. This allows routine and extraordinary maintenance operations, or interventions for any other customer need, without interrupting all the other modules.
This independent logic allows the whole system to be expanded at any time, simply and effectively, with the progressive addition of modules, up to 10 units on a single system.

The structure is designed to minimize overall weight and dimensions. The multiple modules configuration ensures perfect adherence between the individual units while preserving high cooling performance. This is achieved thanks to high-quality and innovative components.

The Scroll compressors, optimized to work at high compression ratios, are installed in tandem configuration. In combination with the electronic control of source-side airflow rate, they ensure the achievement of high values of the Seasonal Energy Efficiency Ratio.

The refrigerant used is Propane, a non-toxic hydrocarbon, even in high concentrations. It has zero ODP (Ozone Depletion Potential), an almost imperceptible GWP (Global Warming Potential), and excellent thermodynamic characteristics that allow the achievement of high-efficiency values.

The unique design of the refrigeration circuit allows a reduced refrigerant charge. This is possible mainly through the use of mini-channel type heat exchange coils and brazed plate heat exchangers.

All units are assembled and fully tested at the factory, according to specific quality procedures. Moreover, they are already provided with all the necessary refrigeration, plumbing, and electrical connections for rapid installation on-site.
Before testing, the refrigeration circuits of each unit are pressure tested and then charged with R290 refrigerant and anti-freeze oil.

The units are designed for outdoor installation in non-accessible sites for unauthorized persons. They also satisfy the European standards EN 378-1, 2, 3, 4 : 2016 and their subsequent updates.
The units are CE-certified and comply with European Regulation 813/2013 (low-temperature heat pumps/medium climate conditions).

Operation limits at cooling mode (standard unit):

SUMMER OPERATION: air from -20 to 48°C - water (out from evaporator) from 6 to 20°C.

WINTER OPERATION: air from -20 to 35°C - water (out from condenser) max 70°C.

MAIN COMPONENTS STANDARD UNIT

STRUCTURE

The structure, strong and compact, is made of a base and frame in high-thickness galvanized steel elements assembled with stainless steel rivets. All galvanized steel parts placed externally are protected on the surface level with an oven powder coating system in RAL 7035 colour. The basement is designed in order to allow the unit to be forked and handled by standard lifting devices. The refrigerant circuit (except for the source side exchanger) is sealed from the rest of the unit. Internally, it also contains a refrigerant leakage sensor. In case of severe sensor alarm, the power supplied to all equipment is interrupted, except for the ATEX extraction fans, which activate in order to remove the potentially explosive atmosphere from the cabinet.

COMPRESSORS

The compressors, specially designed to operate with R290, are Scroll type with orbiting spirals, optimized for heat pump operating mode and high compression ratios. They are installed in tandem configuration, mounted on rubber dampers, and equipped with direct-start engines cooled by the suctioned refrigerant gas. They are also fitted with built-in thermistor protection with manual reset, which safeguards them from overloads. The crankcase oil sump, PAG type, is equipped with a heating resistor. The compressors terminal block has an IP54 protection rating. Activation and deactivation of the compressors are controlled by the on-board microprocessor, which regulates the thermo-cooling power delivered.

USER HEAT EXCHANGER

The heat exchanger is stainless steel "single-circuit" plate type, thermally insulated by a flexible closed-cell insulating mat of high thickness and UV-resistant. The evaporator is also equipped with a safety flow switch on the water flow side that does not allow the unit to operate if there is a lack of water in the heat exchanger.

HEAT - EXCHANGE EXTERNAL COILS

The coils are made with micro-finned copper pipes arranged in staggered rows and mechanically expanded inside an aluminium-finned pack with hydrophilic treatment. The fin shape ensures maximum heat exchange efficiency. The innovative mini-channel technology, besides guaranteeing maximum performance in terms of heat exchange, allows the refrigerant charge to be at the minimum necessary values for the correct operation of the unit. The maximum operating pressure on the refrigerant side of the heat exchange coils corresponds to 31 bar (relative).

AXIAL FANS

With external rotor directly coupled to a three-phase electronically commutated motor (EC) they have the possibility of a continuous regulation of the speed by means of a 0-10V signal completely managed by the microprocessor. Aluminum blades with wings profile are suitably designed to avoid any turbulence in the air detachment zone, granting in this way the max efficiency with the minimum noise level. The fan is equipped with galvanized steel protection grid painted after the construction. The fan motors are of totally closed type and have got a protection factor IP54 and protection winding-flooded thermostat.

Thanks to a more accurate adjustment of air flow, they allow operation of the unit with external temperature down to -20 °C.

COOLING CIRCUIT

The cooling circuit includes a 4-way cycle reversing valve, liquid receiver, liquid/gas separator, and electronic thermostatic expansion valves operating in parallel (to allow the unit to work constantly along the entire working range). It also includes a liquid passage and humidity indicator, filter drier, safety valve, high-pressure switches with manual and automatic reset, service valve for the addition of the refrigerant and anti-freeze probe.

WATER CIRCUIT

On both user-side exchangers, the hydraulic circuit consists of a 2-pole centrifugal electric pump that allows water to circulate through the corresponding exchanger. On both hydraulic circuits, a check valve prevents recirculation of the processed fluid when the pump is off and the unit is combined with others running on the same water circuit. The hydraulic circuit pipes inside the unit and the Victaulic joints are factory-insulated with thermal insulation material of high thickness.

ELECTRICAL BOARD

The electrical board is designed in accordance with EN 61439-1 and EN 60204-1 standards. It contains all the control system components, those required for starting the units, and the magneto thermal protection of the electric motors, which are connected and tested at the factory. The electrical board has a watertight structure, equipped with IP65/66 cable glands.

Inside the electrical board, there are also installed all the power and control components. It includes the microprocessor electronic card with keyboard and display for the visualization of the various functions, main disconnecting switch with the door lock, insulation transformer for auxiliary circuit supply, magneto thermic protection for compressors and fans, fuses for auxiliary circuit devices, terminals for cumulative alarms and remote ON/OFF. It also comprises a terminal block for spring-type control circuits and the possibility of enabling communication with the BMS management systems. Additionally, there is also a phase monitor that controls the correct sequence and/or any failure of one of the three power phases, interrupting the unit's operation if necessary.

Selected accessories:

R290 - Refrigerant
Refrigerant

PA - Anti-vibration bell mounts (1 per unit)
Bell-type anti-vibration mounts for unit isolation from the supporting base. They are made of galvanized iron base and bell and rubber compound. (Supplied in kit).

CI - Soundproofing jacket on compressors
made of soundproofing material, wrapped all around compressors so to further reduce the overall sound level of the unit.

MF - Phase monitor
Electronic device that checks the correct sequence and/or the lack of one of the 3 phases, switching off the unit if necessary.

RL - Compressor overload relays
Electromechanical protection devices against compressors overload.

KCA - Water collector kit without insulation (1 per unit)
Kit consisting of water collectors (6" diameter), ball valves, support brackets, and all the necessary for the hydraulic connection between the unit and the collectors. (Supplied in kit).

KGH5 - Gateway framework kit up to 5 units provided with HIWEB (1 in case of multiple units)
Data communication framework and serial interface for unit groups (up to 5). It allows the monitoring and supervision of the main working parameters of the system by accessing the Hi-Web platform from the local Wi-Fi network. (Supplied in kit).

KIT - HYDRONIC KIT (ENABLE P1 HYDRONIC KIT)
MANDATORY HYDRONIC KIT P1

KTT - Victaulic cap + Socket kit / Weld (1 in case of multiple units)
Kit consisting of Victaulic caps, Victaulic sockets, and Victaulic couplings (including insulation) necessary for sealing one end of the water collector and for connecting the other end to the user circuit. (Supplied in kit).

MG - Handling with lifting hooks
Side brackets firmly fixed to the basement allow the unit to be lifted with hooks and cables.

MM - Handling brackets for forklift
Handling brackets for forklift.

RA - Anti-freeze resistance on evaporator
Electric heater on the evaporator with anti-freeze function and equipped with an independent thermostat.

P1 - Pump group
Chilled water pump group made of a single pump, expansion vessel, safety valve water gauge, water charge and discharge valves, air purging valves, electric control of the pump. The pump is of enbloc 2-pole type.

IWG - SNMP or TCP/IP or BACNET IP or MODBUS IP Protocol serial interface
Electronic card to be connected to the microprocessor to allow connection of the units to supervision systems with SNMP or TCP/IP protocol, for a remote control and monitoring of the unit. (Alternative to IH or IH LON)

I1 - Victaulic insulation on pump side
Insulation of the joints by close-cell polyurethane material, to prevent condensation, pump side.

DELV - DELIVERY

Model: PAE 881 Kp
Option: R290-PA-CI-MF-RL-KCA-KGH5-KIT-KTT-MG-MM-RA-P1-IWG-I1-DELV

HEATING

Performance data		
Heating capacity	kW	59.1
Total input power	kW	31.6
Compressor input power	kW	28.1
Input current	A	58.2
COP	W/W	1.87
SCOP $LT^{(B2)}/MT^{(B3)}$	W/W	3.87/-
$\eta_{s,h}$ $LT^{(B2)}/MT^{(B3)}$	%	152/-
Source		
Altitude	m	0.0
Dry bulb outdoor air	°C	-4.0
Outdoor air Relative humidity	%	99.9
Air flow rate	m³/h	42705
Fan input power	kW	3.57
Fan input current	A	6.08
Fans available static pressure	Pa	0

User		
Fluid type		Water
Fouling fact.	m²K/kW	0.000
In/out fluid temperature	°C	58.0/64.9
Fluid flow rate	m³/h	7.516
Circuit pressure drops	kPa	10.8
Pump available static pressure	kPa	109.7
Max pump available static pressure	kPa	109.7
Sound data		
Calculated sound power	dB(A)	87
Sound pressure(C0) [10.0 m]	dB(A)	55

DESIGN AND SIZING DATA

GENERAL DATA		
Compressor type		Scroll
Number of compressors		2
Number of circuits		1
Capacity steps		2
Minimum capacity step	%	50.0
Refrigerant type		R290
GWP		3.3
Total refrigerant charge	kg	-
CO2 equivalent charge	kg	-

ELECTRICAL DATA		
Nominal voltage supply	Ph/V/Hz	3/400/50.0
Maximum voltage supply	V	440
Minimum voltage supply	V	360
Maximum input power	kW	44.1
Maximum input current	A	79.3
Maximum peak current	A	231
Input power in stand-by mode	kW	0.100

Sound data		
Calculated sound power	dB(A)	87
Sound pressure(C0) [10.0 m]	dB(A)	55

DIMENSIONS		
Length	mm	2560
Width	mm	1100
Height	mm	2450
Shipping weight	kg	835
Operating weight	kg	840

FANS		
Fan type		Axial
Fan motor		EC
Number of fans		2
Maximum input power	kW	5.70
Maximum input current	A	9.40

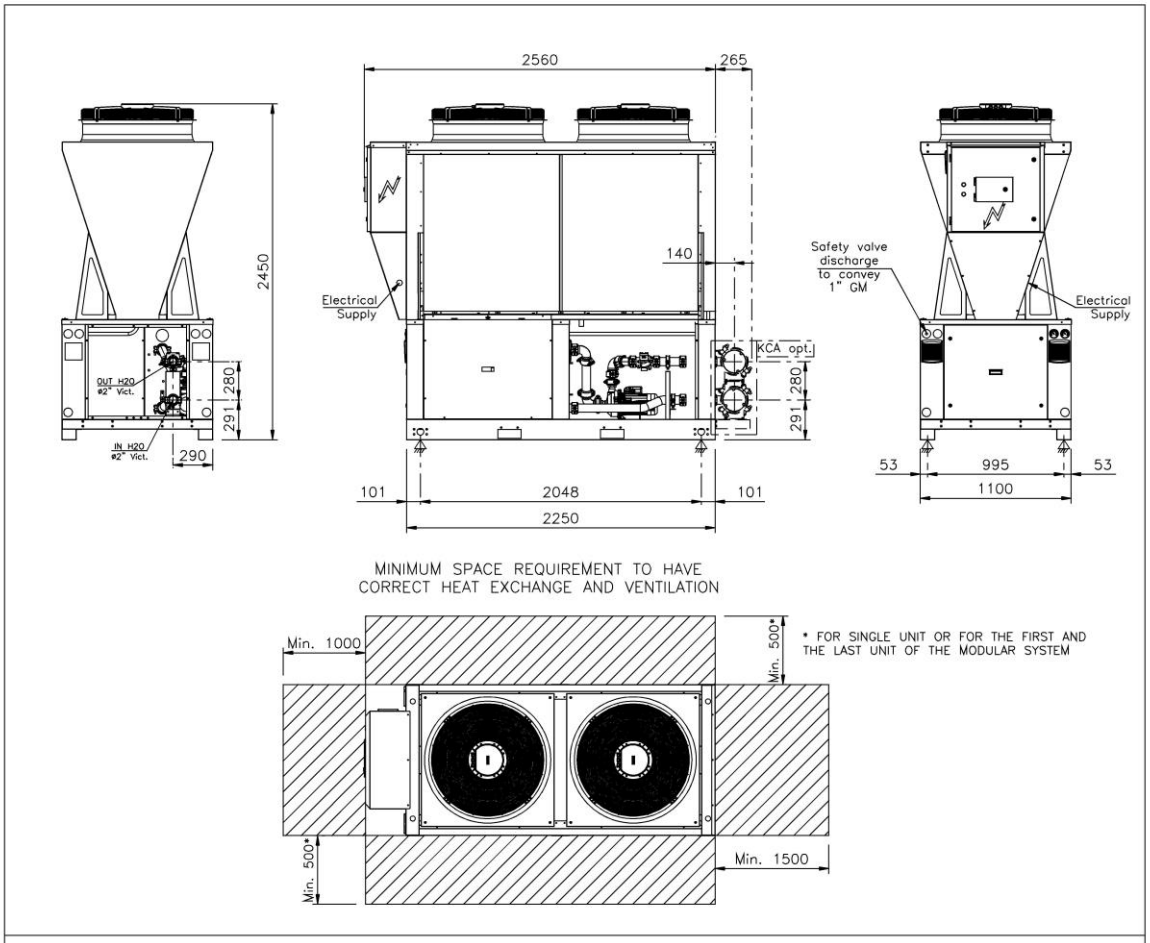
HYDRAULIC CIRCUITS

USER HYDRAULIC CIRCUIT		
Maximum input power	kW	0.91
Maximum input current	A	1.77

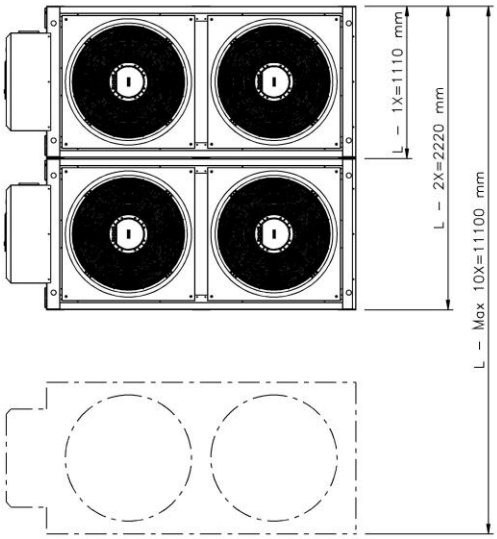
(A0) Technical data shown are not binding. The Company shall have the right to introduce at any time whatever modifications necessary to the improvement of the product.
(A2) According to standard: EN 14511-2018
(B2) Calculated according to Commision Regulation (EU) 2013/813: Average/Outdoor air/Low temperature/Variable outlet/Constant user flow rate/-
(C0) Noise pressure is calculated according to the following sound propagation method: Hemispherical ISO EN 3744 source

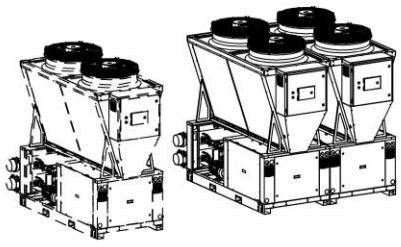
Please be informed that the sound level is referred to the basic unit without those options which could increase the sound level value.

DIMENSIONAL DRAWING



Number of units	L
1	1110
2	2220
3	3330
4	4440
5	5550
6	6660
7	7770
8	8880
9	9990
10	11100





Model: PAE 881 Kp

Option: R290-PA-CI-MF-RL-KCA-KGH5-KIT-KTT-MG-MM-RA-P1-IWG-I1-DELV

Quantity: 4

Price (excl commissioning): £125,590.00

Carriage: EXW Ex Works

Carriage cost: On standard 40' curtain sided transport during normal working hours Monday to Friday. Off-Loading, craneage, HiAb, Tail Lift, timed delivery or any other special request, extra.

Availability: Currently approx 20 working weeks from receipt of purchase order

Warranty: Two years parts and labour PROVIDED THAT the unit is commissioned and maintained under a service contract by a Hidros approved engineer otherwise one year parts only.

Commissioning: Not included in quote below, budget £950/unit

Payment: Standard terms are 30 days from invoice subject to satisfactory credit checks

(All Prices are VAT excluded)

Code	Description	Qty	Price Each (£)	Total Price (£)
PAE 881 Kp	MODULAR AIR COOLED HEAT PUMPS FOR OUTDOOR INSTALLATION WITH SCROLL COMPRESSORS AND AXIAL FANS REFRIGERANT R290 EVEREST290 - PAE Kp MODULAR MULTISCROLL	4	27,846.50	111,386.00
R290	Refrigerant	4	71.50	286.00
PA	Anti-vibration bell mounts (1 per unit)	4	132.00	528.00
CI	Soundproofing jacket on compressors	4	368.50	1,474.00
MF	Phase monitor	4	STD	STD
RL	Compressor overload relays	4	STD	STD
KCA	Water collector kit without insulation (1 per unit)	4	797.50	3,190.00
KGH5	Gateway framework kit up to 5 units provided with HIWEB (1 in case of multiple units)	1	1,870.00	1,870.00
KIT	HYDRONIC KIT (ENABLE P1 HYDRONIC KIT)	4	STD	STD
KTT	Victaulic cap + Socket kit / Weld (1 in case of multiple units)	1	264.00	264.00
MG	Handling with lifting hooks	4	137.50	550.00
MM	Handling brackets for forklift	4	STD	STD
RA	Anti-freeze resistance on evaporator	4	88.00	352.00
P1	Pump group	4	STD	STD
IWG	SNMP or TCP/IP or BACNET IP or MODBUS IP Protocol serial interface	4	522.50	2,090.00
I1	Victaulic insulation on pump side	4	STD	STD
DELV	DELIVERY	4	900.00	3,600.00

Total price (excl commissioning) £125,590.00

Selected accessories:

- R290: Refrigerant
- PA: Anti-vibration bell mounts (1 per unit)
- CI: Soundproofing jacket on compressors
- MF: Phase monitor
- RL: Compressor overload relays
- KCA: Water collector kit without insulation (1 per unit)
- KGH5: Gateway framework kit up to 5 units provided with HIWEB (1 in case of multiple units)
- KIT: HYDRONIC KIT (ENABLE P1 HYDRONIC KIT)
- KTT: Victaulic cap + Socket kit / Weld (1 in case of multiple units)
- MG: Handling with lifting hooks
- MM: Handling brackets for forklift
- RA: Anti-freeze resistance on evaporator
- P1: Pump group
- IWG: SNMP or TCP/IP or BACNET IP or MODBUS IP Protocol serial interface
- I1: Victaulic insulation on pump side
- DELV: DELIVERY