

HEAT PUMPS

CLIMEXEL - M.P.I. MITSUBISHI POWER INVERTER

Climixel
by PROCOPI



**LISTEN TO THE SILENCE...
APPRECIATE THE PERFORMANCE...**

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PROCOPI
Pool & Spa Equipment



SILENCE AT 35°C

CLIMEXEL M.P.I.

MITSUBISHI POWER INVERTER

Procopi's industrial strength

MITSUBISHI ELECTRIC, a world leader in the field of heat pumps for climate control and heating, have produced several million machines that use Ecodan Power Inverter and Zubadan Power Inverter technologies. These machines are renowned for their reliability and excellent performance levels..



Mitsubishi and Procopi decided to pool their core expertise to create two ranges of swimming pool heat pumps, the M.P.I. (Ecodan) range and the M.Z.I. (Zubadan) range, that exploit these technologies to achieve exceptional performance levels, both in terms of noise level and improved coefficient of performance.

Comprehensive range

The Climaxel Power Inverter range offers a selection of models to suit pools of all types and sizes.

Power Inverter system

On the contrary to a conventional On/Off heat pump that run at a constant speed (50 Hz), the Inverter heat pump compressor can run at between 11 and 100 Hz to adapt to the machine's operating conditions.

In fact, while the outside temperature is low, or while the heating demand is high, the compressor will run at high speed (between 50Hz and 100Hz). Inversely, while the heating demand is low, notably around the set point, the Inverter compressor will run at low speeds (between 25Hz and 50Hz).

Climaxel Power Inverter heat pumps automatically adjust their compressor speed to adapt to the operating mode and outdoor temperature. There is no need for any intervention by the user.

Running at low speeds, inverter compressors are almost noiseless, provide optimal yield and enjoy a longer service life.

Reversible heat pumps

All Climaxel Inverter Plus heat pump are reversible as standard.

Climaxel Power Inverter heat pumps can be used to heat or cool pool water, they are also compatible with systems running on 60 Hz.

Their ability to run in heat or cool mode is particularly appreciated in very hot regions where it can be used to hold swimming pool water at a comfortable temperature or even to lower or maintain the water temperature in aquaculture tanks used to rear and store fish.

Silence

Conventional On/Off heat pumps generate a constant sound power, even when water temperature is around the set point.

On the other hand, Climaxel Power Inverter heat pump compressors slow significantly around the set point so that they run much more quietly than a conventional On/Off machine.

This is particularly important when the heat pump must be installed close to neighbouring properties.

Installers should consider local regulations concerning neighbourhood noise abatement.

Start-up over-currents

Climaxel Power Inverter heat pumps feature acceleration ramps that exploit frequency variation technology to avoid over-currents on start-up along with their inherent negative impact on electrical and electronic devices in the home.

Total automation

Climaxel Power Inverter heat pumps are designed to be easy to install and simple to maintain.

Systematic quality control

To guarantee complete reliability, all Climaxel Power Inverter heat pumps are tested before being shipped.





Silence - Acoustic comfort

The acoustic power of an On/Off heat pump remains constant, even while the machine is running at water temperatures around the set point. On the contrary, a Climixel heat pump adapts the operating regimes of its compressor and its fan(s) to match the actual heating demand of the pool, notably as the water temperature approaches the set point.

On the contrary, a Climixel heat pump adapts the operating regimes of its compressor and its fan(s) to match the actual heating demand of the pool, notably as the water temperature approaches the set point. To hear a Climixel heat pump, you really have to listen carefully.

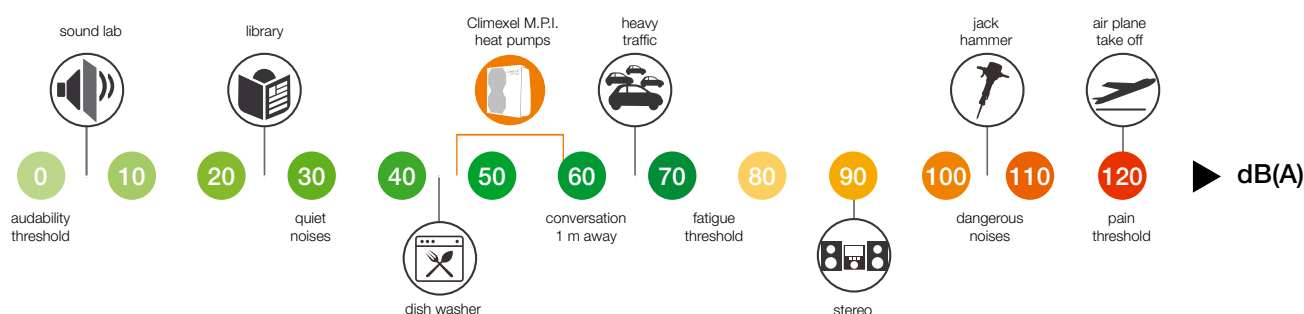
To hear a Climixel M.P.I. heat pump, you have to listen very carefully. This feature is particularly appreciated in situations

where the heat pump must be installed near your residence or that of your neighbours.

Climixel Power Inverter heat pumps slow considerably when running at water temperatures around the set point, so it generates very low noise levels compared to conventional On/Off heat pumps.

In order to appreciate the acoustic performance of Climixel M.P.I. heat pumps, a scale is provided below that allows you to compare the tolerance limits of various devices and everyday events.

It may be seen that, even running at 100% capacity, Climixel M.P.I. heat pumps fall well within common, acceptable tolerance limits.



Performance - Inverter principle

Climixel M.P.I. heat pumps are fitted with a frequency variator capable of adjusting the compressor and fan speeds.

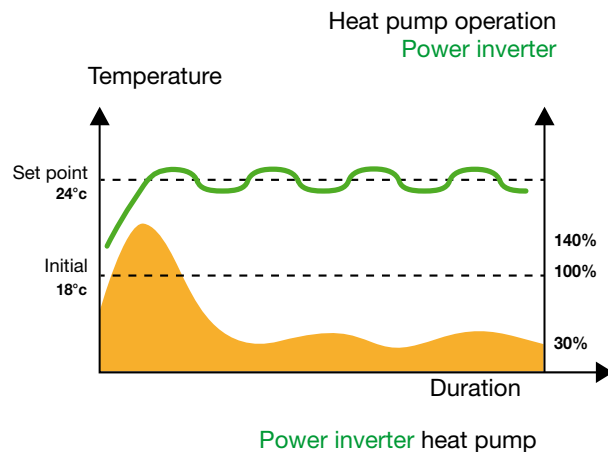
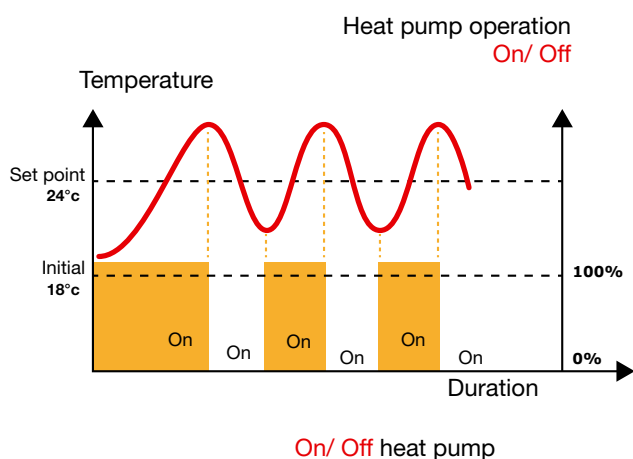
On the contrary to the compressor and fan(s) in conventional On/Off heat pumps that run at a fixed speed (50 Hz), those in the Climixel heat pumps run at variable speeds (11 to 100 Hz), thus allowing the machine to automatically adapt to the heating demand and climatic conditions.

While the outdoor temperature is low, or while the heating demand is high, the Power Inverter® compressor and fan(s) run at high speed, between 50 Hz and 100 Hz).

Inversely, while the heating demand is low, or while the heat pump is running at temperatures around the set point, the Inverter® compressor and fan(s) will run at low speeds (between 11 Hz and 50 Hz).

At low speeds, a Climixel Power Inverter heat pump's COP is improved by 30 to 40 %.

Running at low speeds, the Power Inverter® compressor and fan(s) are almost noiseless and provide optimal yields. In addition, the service life of the Climixel heat pump compressor, and other components, is extended.



Technical data

| | M.P.I.-100M | M.P.I.-160M | M.P.I.-190M | M.P.I.-190T | M.P.I.-240M | M.P.I.-240T | M.P.I.-320T | M.P.I.-380T |
|---|------------------|------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Certified heating capacity, Air temp 26° C, Water temp 26° C | 16.2 kW | 26 kW | 31.4 kW | 31.4 kW | 39 kW | 39 kW | 50 kW | 59 kW |
| Certified heating capacity, Air temp 15° C, Water temp 26° C* | 10.6 kW | 17 kW | 20.2 kW | 20.2 kW | 25.5 kW | 25.5 kW | 33 kW | 39 kW |
| Cooling power, Air temp 35° C, Water temp 28°C | 5.7 kW | 13 kW | 19.5 kW | 19.5 kW | 20.25 kW | 20.25 kW | 35.2 kW | 36.5 kW |
| Recommended pool water volume** | ≤ 65 m³ | ≤ 104 m³ | ≤ 123 m³ | ≤ 123 m³ | ≤ 156 m³ | ≤ 156 m³ | ≤ 208 m³ | ≤ 247 m³ |
| Type of refrigerant | R 410A | R 410A | R 410A | R 410A | R 410A | R 410A | R 410A | R 410A |
| Recommended water flow rate | 4 to 5 m³/h | 4 to 6 m³/h | 5 to 7 m³/h | 5 to 7 m³/h | 8 to 10 m³/h | 8 to 10 m³/h | 10 to 12 m³/h | 12 to 14 m³/h |
| Max current consumed | 13 A | 19 A | 29.5 A | 13 A | 29.5 A | 13 A | 19 A | 21 A |
| Power supply | 230 V 1ph | 230 V 1ph | 230 V 1ph | 400 V 3ph | 230 V 1ph | 400 V 3ph | 400 V 3ph | 400 V 3ph |
| Power cable cross section | 3 x 2.5 mm² | 3 x 4 mm² | 3 x 6 mm² | 5 x 2.5 mm² | 3 x 6 mm² | 5 x 2.5 mm² | 5 x 6 mm² | 5 x 6 mm² |
| Electrical protection | 16 A | 25 A | 32 A | 16 A | 32 A | 16 A | 32 A | 32 A |
| Exchanger model | Spiral plates | Spiral plates | Spiral plates | Spiral plates | Spiral plates | Spiral plates | Spiral plates | Spiral plates |
| Compressor | Rotatif | Rotatif | Scroll | Scroll | Scroll | Scroll | Scroll | Scroll |
| Quantity of gas | 2.10 Kg | 3.20 Kg | 4.60 Kg | 4.60 Kg | 4.60 Kg | 4.60 Kg | 7.10 Kg | 7.70 Kg |
| Number of fans | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 |
| Dimensions L x D x H (mm) | 995x495 x600 | 1150x360 x950 | 1250x360 x1350 | 1250x360 x1350 | 1250x360 x1350 | 1250x360 x1350 | 1250x360 x1340 | 1250x360 x1340 |
| Weight | 49 Kg | 82 Kg | 125 Kg | 137 Kg | 125 Kg | 137 Kg | 142 Kg | 148 Kg |

* Technical data was certified by CETIAT and were measured according to the test protocol EN-14511 (Test report available at Procopi.com).

** The values shown are valid under the following conditions: ambient air temperature 15° C. Water temperature 26° C, pool covered with an isothermal cover at night, filtration running 15 hours per day during the heating season



The AFNOR ACP 90-327 agreement and the test standard CERTITA, in the context of NF Heat pump-Pool certification, recommend communication of the heating capacity at an outdoor air temperature of 15°C.

Performance data

| | | | M.P.I. 100M | M.P.I. 160M | M.P.I. 190M | M.P.I. 190T | M.P.I. 240M | M.P.I. 240T | M.P.I. 320T | M.P.I. 380T |
|-------------------|-------------------|--|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| LOW SPEED | STEP 1: 20 Hz | COP* | 8.51 | 8.14 | 7.69 | 7.69 | 7.20 | 7.20 | 6.95 | 6.84 |
| | | Acoustic pressure level at 10 m, in dB (Lp) | 24 | 29 | 27 | 27 | 30 | 30 | 34 | 34 |
| | | Acoustic power, in dB (Lw) | 52.8 | 57.9 | 55.8 | 55.8 | 58.7 | 58.7 | 62.9 | 62.9 |
| CRUISING SPEED | STEP 4: 50 Hz | COP* | 7.06 | 6.95 | 6.54 | 6.54 | 6.12 | 6.12 | 5.84 | 5.75 |
| | | Acoustic pressure level at 10 m, in dB (Lp) | 28 | 33 | 29 | 29 | 34 | 34 | 39 | 39 |
| | | Acoustic power, in dB (Lw) | 56.5 | 61.9 | 57.8 | 57.8 | 62.8 | 62.8 | 67.3 | 67.3 |
| HIGH SPEED | STEP 7: 100 Hz | COP* | 5.72 | 5.44 | 5.15 | 5.15 | 4.84 | 4.84 | 4.68 | 4.60 |
| | | Acoustic pressure level at 10 m, in dB (Lp) | 35 | 40 | 40 | 40 | 43 | 43 | 47 | 47 |
| | | Acoustic power, in dB (Lw) | 63 | 69 | 68.6 | 68.6 | 72 | 72 | 76 | 76 |

* COP values are quoted for an air temperature of 15°C and a water temperature of 26°C.

The table above summarises the main characteristics of the Climixel M.P.I. heat pumps in their various operating modes.

The Climixel M.P.I. heat pumps automatically select the operating mode best suited to the current weather and operating conditions:

- **LOW SPEED:** Climixel M.P.I. heat pumps can operate at three speeds below 50 Hz (Step 1, 2 and 3). The heat pump operates in this mode when it is close to the set point (within approximately 1°C). At these speeds, Climixel M.P.I. heat pumps offer a COP and sound levels that cannot be achieved by conventional On/ Off heat pumps.
- **CRUISING SPEED:** This is the operating speed of a standard On/ Off heat pump, it corresponds to a compressor speed of 50 Hz, or Step 4.
- **FULL SPEED:** Climixel M.P.I. heat pumps operate at one of three speeds greater than 50 Hz (Steps 5, 6 and 7) during the initial heating ramp or when weather conditions are harsh.

Climixel - M.P.I. heat pump guarantee conditions

Duration of the guarantee:

- Climixel M.P.I heat pumps are covered by a 5 year guarantee commencing on the date of manufacture; heat pump guarantee terms and conditions can be found on our Internet site,
- the guarantee period is extended to 10 years for titanium exchangers.

Commissioning:

- Heat pump specifications and commissioning documentation is available for download from our internet site.



Trophée d'Or 2013
Category - Innovation

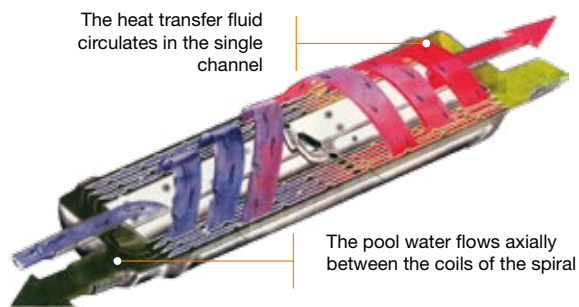
Climixel exchanger

What is a heat exchanger?

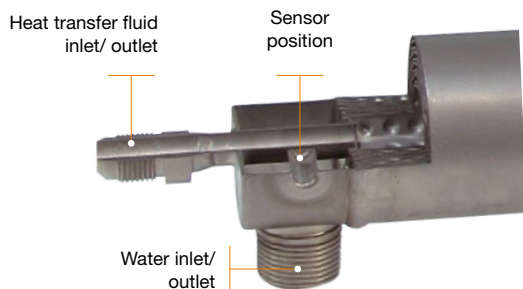
A heat exchanger is a device that transfers heat from a hot body to a cold body or vice versa. The larger the surface area, the better the yield. For this reason, Procopi fits all Climixel heat pumps with spiral plate exchangers that offer a much larger heat exchange surface area than tube exchangers.

Pure titanium, single channel, spiral plate heat exchanger:

The titanium, spiral plate exchanger is a Procopi exclusive.



Its large surface area guarantees excellent performance data. Made of titanium, it is compatible with all water treatment methods available, notably salt water electrolysis.



Advantages:

- Extremely robust
- Completely leaktight
- Extended service life (+ 20 years)



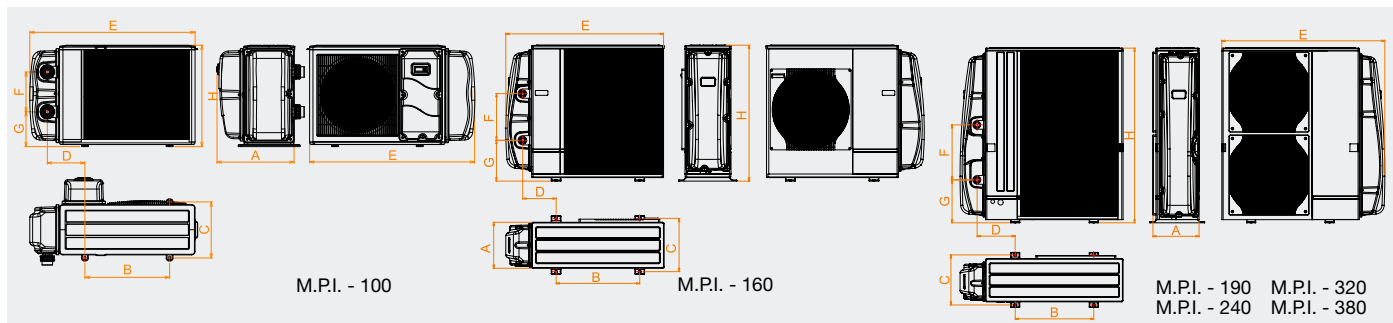
GUARANTEE
10
YEARS
TITANIUM
EXCHANGER

SPECIFICATIONS

- Improved heating power and COP (coefficient of performance),
- Reversible machine, can be used to heat or cool the pool water, compatible with systems running under 60hz,
- The pool water temperature, set point and operating mode (heat/cool) are displayed on the thermostat,
- Automatic defrosting by cycle inversion, allows the machine to work at temperatures down to -15°C,
- Complies with EC standards,
- Low acoustic power in low speed mode, thanks to the Mitsubishi Scroll Inverter,
- Titanium, helical plate heat exchangers (Procopi exclusive),
- compatible with salt electrolysis,
- Low water level safety device (flow switch),
- Wired in via a watertight deck box,
- Anti-UV treated ABS casing allowing integration of a regulator, deck box, heat exchanger, flow controller, sensors, communication and control circuit boards,
- Hydraulic connections solvent unions, Ø 50 mm,
- ICHILL Thermostat, comfort mode and Eco mode,
- Condensate drainage and recovery kit.



ICHILL thermostat

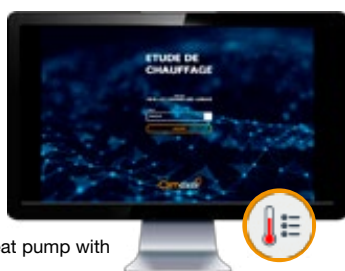


| Models/ Dimensions (in mm) | A | B | C | D | E | F | G | H |
|----------------------------|-----|-----|-----|-----|------|-----|-----|------|
| 1 fan | | | | | | | | |
| M.P.I. - 100M | 455 | 500 | 330 | 222 | 975 | 235 | 205 | 600 |
| M.P.I. - 160M | 330 | 600 | 370 | 240 | 1145 | 335 | 266 | 943 |
| 2 fans | | | | | | | | |
| M.P.I. - 190M | 330 | 600 | 370 | 240 | 1245 | 335 | 412 | 1350 |
| M.P.I. - 190T | 330 | 600 | 370 | 240 | 1245 | 335 | 412 | 1350 |
| M.P.I. - 240M | 330 | 600 | 370 | 240 | 1245 | 420 | 327 | 1350 |
| M.P.I. - 240T | 330 | 600 | 370 | 240 | 1245 | 420 | 327 | 1350 |
| M.P.I. - 320T | 330 | 600 | 370 | 240 | 1245 | 420 | 327 | 1335 |
| M.P.I. - 380T | 330 | 600 | 370 | 240 | 1245 | 420 | 327 | 1335 |



JUST THINK!

With our free software application the Procopi **HEATING STUDY** you can size your heat pump with absolute precision.
The application is available on procopi.com from your personal space in the **Procopi tools** section.



Dealer's stamp:



Avenida da Conduta, 836
4420-619 GONDOMAR
PORTUGAL
Tel: (+351) 22 372 03 92 Fax: (+351) 22 379 09 08
info@climaconforto.pt www.climaconforto.pt