



# LADY WIGRAM RETIREMENT VILLAGE - MAGNUS



**Wigram, Christchurch,  
New Zealand**

Working with Hartnell Coolheat to assist in the design and installation of a custom MAGNUS system providing Lady Wigram Village with space heating & cooling, pool heating and spa heating. The \$120 million dollar facility began construction after the Christchurch Earthquakes and offers a mix of apartments and villas equipped with the latest amenities including a pool, spa, library, theatre, bar and restaurant.

## Solution & Application



Rest Home



Hot Water Heat Pump



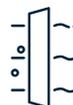
Thermoshell



Innovative System



Energy Savings



Filters



Louvered Guards

## Key outcomes

- ✓ Space heating using MAGNUS/Fan Coil integrated system application
- ✓ Pool & Spa heating using MAGNUS's highly efficient multi-pass system to 29°C and 38°C respectively
- ✓ Pool & spa split heating capabilities by combining two separate systems into one MAGNUS unit – this is done by separating and isolating the two pool-heat exchangers so the water from each pool does not mix but sharing a common refrigeration side
- ✓ 3 individually controlled zones using custom designed software
- ✓ Titanium ThermoShell non-fouling water heat exchanger
- ✓ This hot water heat pump system achieves typical running efficiency of >500%

## Key stakeholder requirements

- **Pool & Spa Heating** – Amenities in the village include an indoor pool and spa that are in close proximity of each other. Temperzone proposed a custom system design to achieve heating of the pool and spa from one unit using MAGNUS technology.
- **Space Heating in Entry Building & Pool Room** – Requiring a reliable source of space heating across the widest possible range of ambient conditions, Temperzone proposed using MAGNUS technology which is an innovative boiler/electric heater replacement systems that efficiently maintain a constant supply water temperature.
- **Efficient system design to minimise power usage.**

## Our solution

Is an integrated custom system designed to provide Space heating, Pool & Spa heating and replace outdated, inefficient equipment.

- **MAGNUS MWH900** – An tempering hot water heat pump including a programmable control system designed to provide space heating to the building entrance and pool/spa room. A 73kW (range: 6.2kW ~ 91kW) inverter compressor, the MWH900 was commissioned and applied to the system design for its reliability to maintain a supply water temperature of 40°C ~55°C. Connected to the MWH900 unit are 4 Temperzone fan coil units - 2 x IMD135Y's, 1 x IMD280Y & 1 x IMD420Y.

Model	Qty	Cooling Rows	dB(A)	Heating	Cooling
IMD135Y-4/1	2	1	58	13.9kW	13.4kW
IMD280Y	1	1	61	25.6kW	26.0kW
IMD420Y	1	1	63	39.8kW	36.8kW
MAGNUS MWH900	1	-	40	6.2 ~ 91kW	-

- **MAGNUS MWP400** – A 39.9kW twin fan pool heating system with a Titanium heat exchanger and anti-fouling ThermoShell technology were applied to this pool/spa heating system. Achieved by separating the heating coils to allow the spa 2 hours of heating and the pool 10 hours of heating meaning it runs two complete heating cycles every 12 hours.

This system design requires two flow and return lines from the filters to each pool. Pioneer pools supplied the pipes from the pool to the plant room through the pump, filters and back to each pool. Two pairs of pipes run from the filters to the two respective heat exchangers in the HPWH and back to the return pipe back to the pool.

### In summary the system works as follows:

- The spa has priority heating, to the set-point on the TZT100. The TZT100 uses relay outputs to the UC8 relay inputs.
- When the spa is heating, the main pool pump is disabled, through the signal from the HPWH UC8 board to the contractor on the main pool pump.
- When the spa heating is satisfied, the HPWH is available to heat the pool to the required set point.
- When both pools are satisfied, the pool pump is free to operate.
- There are no further valves or pumps etc required for this system to operate other than the normal pumps used for pool filtration.

Model	Qty	dB(A)	Heating	Cooling
MAGNUS MWP400	1	56	39.9kW	-

## GENERAL INFORMATION

### Customer

Hartnells Coolheat

### Location

Wigram, Christchurch, New Zealand

### Project

Integrated MAGNUS systems

### Date of installation

2018 - 2019

## SYSTEM DESCRIPTION

### Outdoor Units

#### MAGNUS MWH900 - 73kW Space Heating

- R32 Low GWP Refrigerant
- Low capital investment
- No need for buffer tanks
- Reduction required in pump power
- Reduction in piping required
- Most efficient energy design
- Reliable long life system
- Low service/maintenance requirements
- Compact design



#### MAGNUS MWP400 - 39.9kW Pool Heating

- Highly corrosion resistant
- Titanium ThermoShell heat exchanger for chlorinated or salt-water
- Non-fouling ThermoShell heat exchanger for minimal maintenance
- No need for buffer tanks
- Highly efficient design achieving very high COP's
- Leak free access door construction
- Durable temperzone design
- Compact design



### Indoor Units

#### IMD Premium Compact Range

- Air flow ranges (l/s) - 450, 600, 750, 900, 1250, 1800, 2350
- EC motors
- Epoxy coated coils

#### 4 Units Provided for the project

- 2 x IMD135Y
- 1 x IMD80Y
- 1 x IMD420Y



### Controllers

#### TZT100

Temperzone's TZT-100 thermostat is an advanced controller suited any surrounding that can control almost any type of air conditioning system. When central control is necessary then the TZT-100 has integrated Modbus communication. Every function and setting can be viewed, locked, changed or edited from a centralised location as desired or automatically from a suitable building management system.

