SE-SP SERIES

SE-SP-50U

Air source swimming pool heat pump with a titanium exchanger for chlorinated water. R410A scroll circuit, three-phase, pool water to 45 °C.

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HEATING CAPACITY
50 kW
At T1 · A25 °C / W30 °C

PEAK COP
6.7
At T1 · A25 °C / W30 °C

MAX POOL WATER TEMP
45 °C
Titanium exchanger

WATER FLOW
23 m³/hr
Through the unit · Rc2

Performance

Rated output at each test condition

T1 A25 °C / W30 °C	
Heating capacity	50 kW
Power input	7.4 kW
COP	6.7
Water flow	23 m³/hr

T2 A20 °C / W30 °C	
Heating capacity	42.8 kW
Power input	6.65 kW
COP	6.5
Water flow	23 m³/hr

T3 A15 °C / W30 °C	
Heating capacity	37 kW
Power input	6.75 kW
COP	5.5
Water flow	23 m³/hr

Technical specifications

SE-SP-50U

ELECTRICAL SUPPLY		
Power supply	—	380~415 V / 50 Hz / 3 Ph
Rated current	A	16
Maximum input power	kW	11
Maximum current	A	23
Required MCB	—	40 A × 4 pole
Required cable	—	4 core × 10 sq.mm copper cable + earthing
REFRIGERATION CIRCUIT		
Compressor	—	Scroll (Copeland / Panasonic)
Number of compressors	Nos	2
Refrigerant	—	R410A
Heat exchanger (condenser)	—	PVC shell titanium condenser
Evaporator	—	Blue finned evaporator coil
Throttling device	—	Electronic expansion valve
Fan quantity	Nos	2
Fan discharge	—	Vertical

WATER CIRCUIT		
Maximum pool water temperature	°C	45
Water flow	m³/hr	23
Water pipe size	inch	Rc2
UNIT & ACOUSTICS		
Dimensions (L × W × H)	mm	1450 × 890 × 1110
Net weight	kg	320
Noise at 1 metre	dB(A)	≤ 66

TEST CONDITIONS

T1 — Ambient 25/20 °C (DB/WB), E.T. 15 °C, C.T. 35 °C
T2 — Ambient 20/15 °C (DB/WB), E.T. 10 °C, C.T. 35 °C
T3 — Ambient 15/10 °C (DB/WB), E.T. 5 °C, C.T. 35 °C
T4 — Ambient 10/7 °C (DB/WB), E.T. 0 °C, C.T. 35 °C

INSTALLATION REQUIREMENT

Dedicated **40 A × 4 pole** MCB required at the unit.

Supply cable **4 core × 10 sq.mm** copper, with separate earthing.

Maintain water flow of **23 m³/hr** through the unit.

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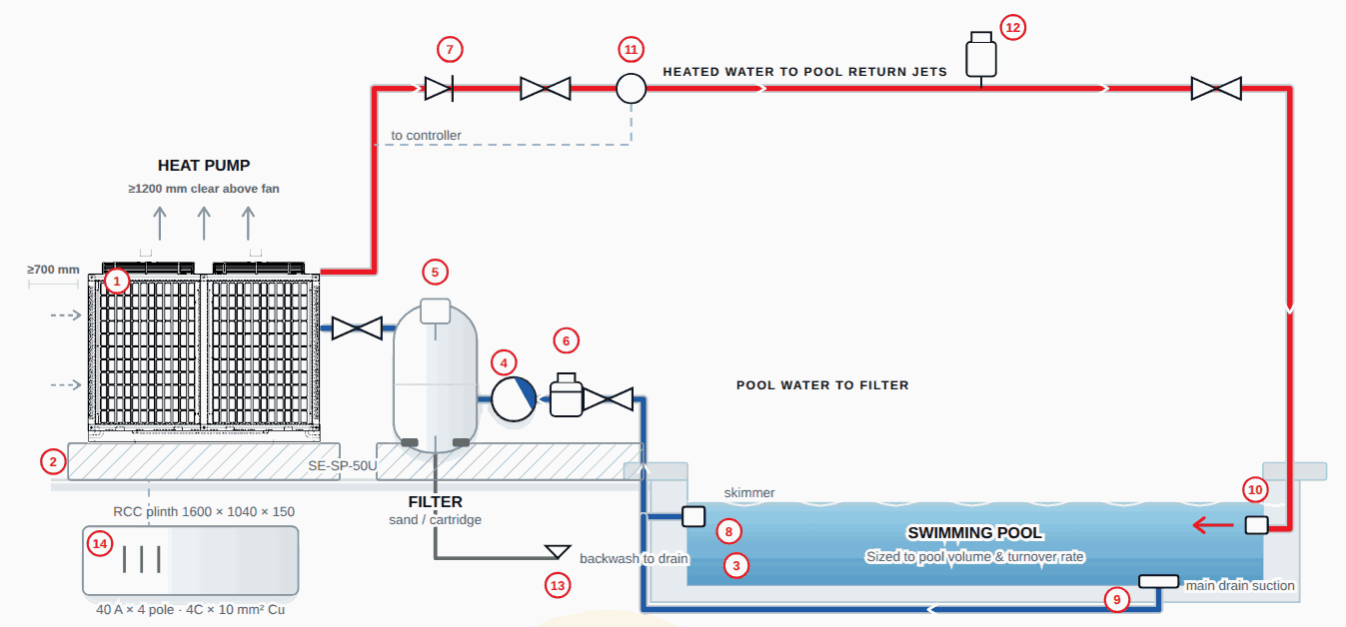
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Specifications are subject to change without prior notice.

Site installation schematic

How the unit connects to the pool, filter and pump set on site



Heated water to pool · Pool water to filter · Backwash / drain · Electrical & control

1. Heat pump unit
2. RCC foundation with anti-vibration pads
3. Swimming pool
4. Circulation pump
5. Sand / cartridge filter — always upstream of the heat pump
6. Hair-and-lint strainer
7. Non-return valve
8. Skimmer suction
9. Main drain suction
10. Return inlet jets
11. Pool water sensor to heat pump controller
12. Chemical dosing point — downstream of the exchanger only
13. Backwash / drain valve
14. Power supply / MCB panel

Indicative hookup only. Static head, draw pattern and local code may call for additional components — confirm the final scheme with Sunniva before ordering.

Selection & site preparation

Recommended sizing derived from this model's rated data

SYSTEM SIZING	
Rated heating capacity	**50 kW at T1**
Design flow through the unit	**23 m³/hr**
Pool volume served	**Sized on surface area, cover, wind exposure and required heat-up time —** confirm with Sunniva before ordering.
Filtration	**Full-flow sand or cartridge filter upstream of the heat pump; turnover 4 – 6 hours**
Hydraulic connection	**Three-valve bypass on the Rc2 (50 mm) circuit, set to the design flow**
Chemical dosing	**Downstream of the exchanger only, never between filter and unit**

CIVIL & ELECTRICAL	
Unit footprint & dry weight	**1450 × 890 mm · 320 kg**
Heat pump plinth	**1600 × 1040 × 150 mm RCC, M20**
Plinth level	**100 mm above finished floor, ± 3 mm/m**
Position	**Outdoors, clear of the pool surround splash zone, condensate drained away from the deck**
Clearances	**700 mm air-on · 1200 mm above fan · 800 mm service side**
Electrical	**40 A × 4 pole MCB · 4 core × 10 sq.mm copper cable + earthing**

Installation steps

Follow in order; commission before start-up

1. Cast the RCC plinth **1600 × 1040 × 150 mm** in M20 concrete, 100 mm above finished floor and clear of the pool surround. Check it is level within 3 mm per metre.
2. Set the unit down on anti-vibration pads. Keep **700 mm clear** at the finned coil faces and **1200 mm above the fan**. The unit sheds cold air and condensate — drain both away from the deck.
3. Take pool water from the **skimmer and main drain** through the hair-and-lint strainer to the circulation pump.
4. Pipe **pump → filter → heat pump**. The filter must always sit upstream: debris through the titanium exchanger will foul it.
5. Fit a **three-valve bypass** around the unit on the Rc2 (50 mm) line so flow can be trimmed to **23 m³/hr** and the unit isolated for service.
6. Return heated water to the pool through the inlet jets. Fit a non-return valve on the return leg.
7. Place the **chemical dosing point downstream** of the heat pump. Dosing upstream will destroy the exchanger and voids the warranty.
8. Fit the pool water sensor in the return line and run its cable back to the controller, away from the power cable.
9. Power the unit from a dedicated **40 A × 4 pole** MCB using 4 core × 10 sq.mm copper cable + earthing.
10. Balance the water chemistry **before** first start: pH 7.2 – 7.8, free chlorine below 3 ppm, salt below 5000 ppm.
11. Run the circulation pump, confirm the flow switch stops the unit when flow is lost, then start the heat pump.

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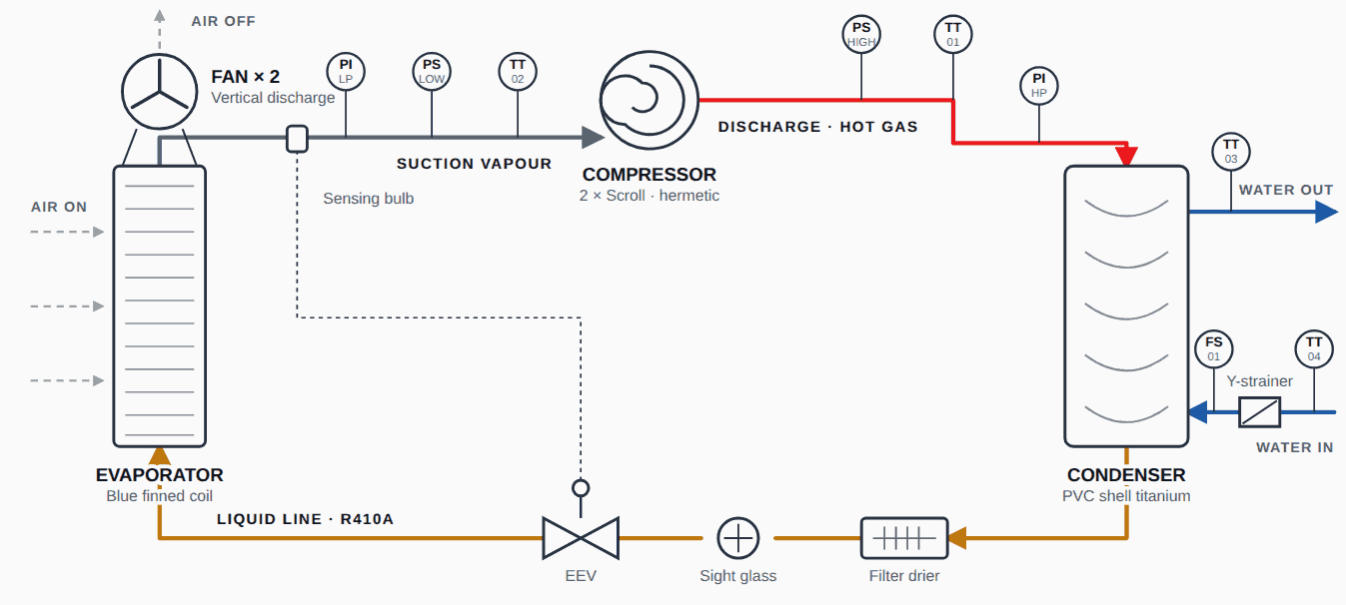
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Process & instrumentation diagram

Refrigeration circuit, instrumentation and water connections



Schematic representation of the standard circuit — not to scale. Component arrangement may vary with build option.

Instrument schedule

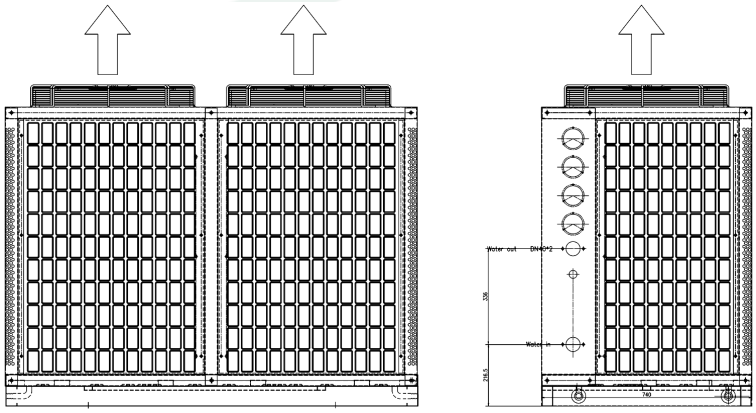
Tags as marked on the diagram above

TAG	DEVICE	FUNCTION
TT 01	**Compressor discharge temperature**	Discharge superheat & high-temperature cut-out
TT 02	**Compressor suction temperature**	Suction superheat monitoring
TT 03	**Water outlet temperature**	Set-point control
TT 04	**Water inlet temperature**	Return water sensing, ΔT calculation
PS HIGH	**High-pressure switch**	Discharge over-pressure cut-out

TAG	DEVICE	FUNCTION
PS LOW	**Low-pressure switch**	Loss-of-charge / low-suction cut-out
PI HP	**High-side pressure gauge**	Discharge pressure indication
PI LP	**Low-side pressure gauge**	Suction pressure indication
FS 01	**Water flow switch**	Interlock — no-flow lockout

Cabinet reference drawing

Typical general arrangement — this model's own dimensions alongside



DIMENSIONS (L × W × H)

1450 × 890 × 1110 mm

NET WEIGHT

320 kg

Reference arrangement only — Twin-compressor cabinet, vertical discharge. Dimensions printed on the drawing are indicative; the figures above and in the specification table are the ones that apply to this model.

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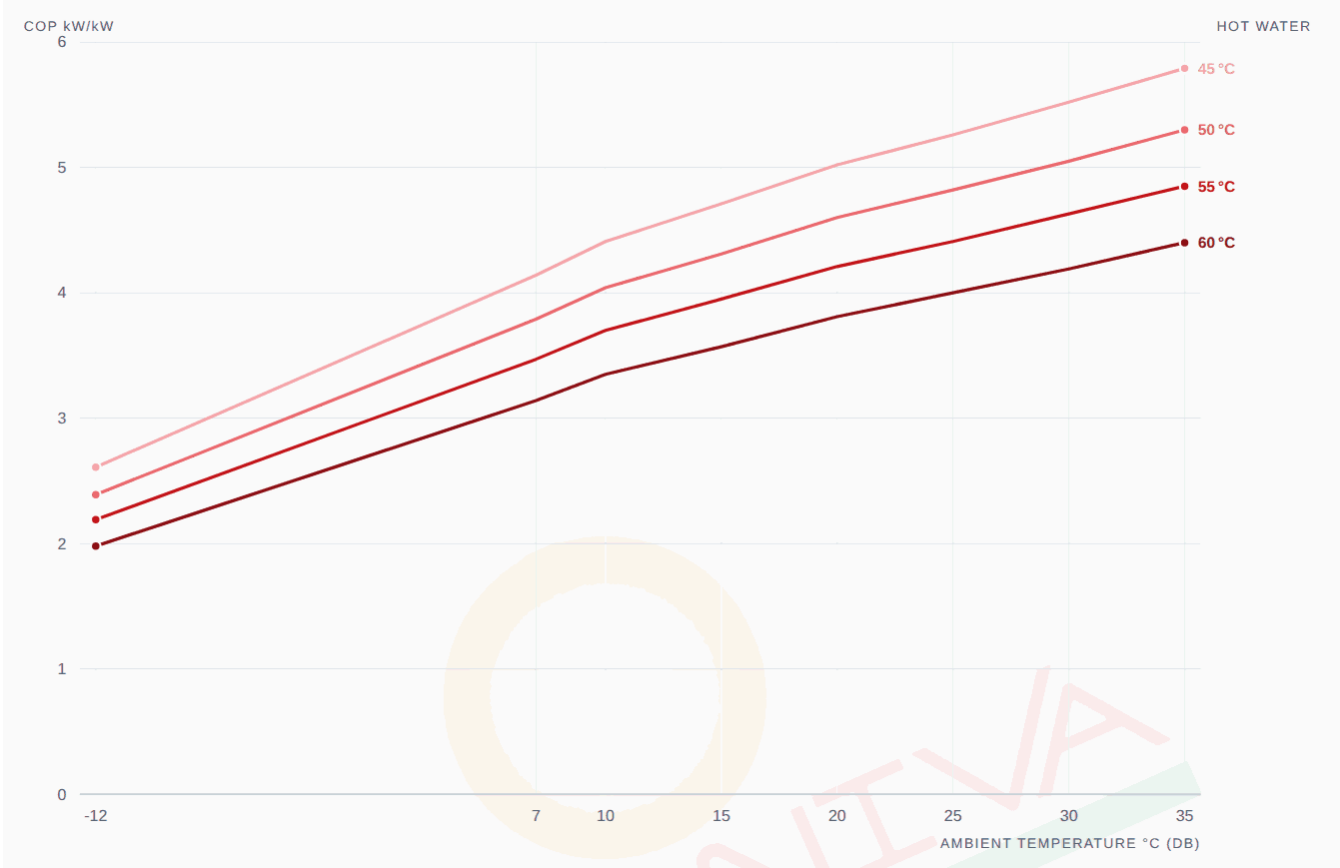
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COP characteristic

Full performance map across the operating envelope

COP · heating duty

COP against ambient temperature, one curve per hot-water outlet temperature



COP · HOT WATER ↓ / AMBIENT °C →	-12	7	10	15	20	25	30	35
45 °C	2.61	4.14	4.41	4.71	5.02	5.26	5.52	5.79
50 °C	2.39	3.79	4.04	4.31	4.60	4.82	5.05	5.30
55 °C	2.19	3.47	3.70	3.95	4.21	4.41	4.63	4.85
60 °C	1.98	3.14	3.35	3.57	3.81	4.00	4.19	4.40

HOW TO READ THIS

Performance map for the R410A circuit. Rated figures at the certified test conditions are on page 1.

Where a figure on this map differs from the rated point on page 1, **the map governs** — it is measured across the full operating envelope, while the rated point is a single certified test condition.

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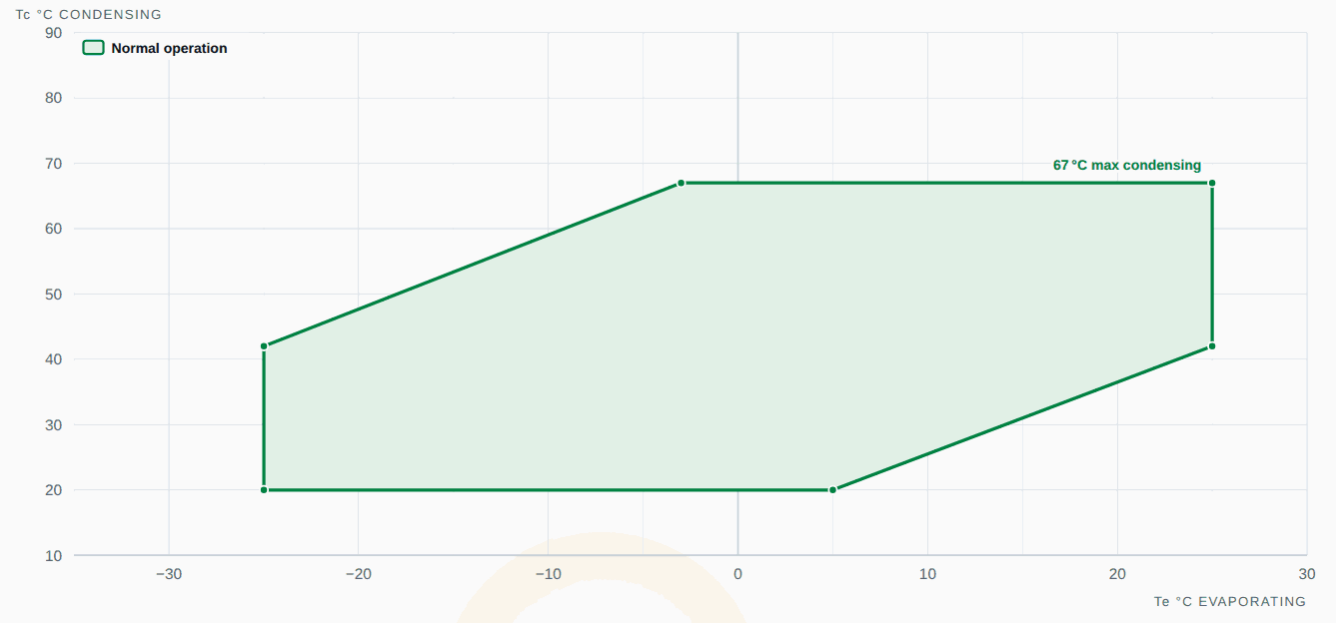
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Operating envelope

The compressor's permitted window, in refrigeration terms

Operating envelope · R410A circuit

Condensing against evaporating temperature — the compressor's permitted operating window



ENVELOPE LIMITS	
Evaporating temperature Te	**−25 °C to 25 °C**
Condensing temperature Tc	**20 °C to 67 °C**
Peak condensing	**67 °C** highest hot-water temperature the circuit can reach
Transient operation	**Not applicable** the envelope above is the continuous operating window

READING THE ENVELOPE

Te (evaporating) follows the source the unit draws heat from — the colder the air or source water, the lower Te sits.

Tc (condensing) follows the water leaving the unit — asking for 80 °C hot water puts Tc near the top of the envelope.

A duty is valid only **inside the shaded area**. A cold source combined with very hot water pushes the point towards the top-left, which is exactly where the envelope closes in — that corner is the real limit on winter performance.

Representative envelope for the R410A circuit, redrawn from Panasonic compressor data (**Operating envelop.xlsx**, sheet "R410a"). Envelope limits are broadly similar across compressor makes, so treat this as a representation of the circuit's operating window. Where a duty sits close to a boundary, confirm against the compressor fitted to the unit before finalising the design.

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