SE-AH SERIES

SE-AH-19U-CORE

Air source commercial heat pump for centralised hot water — hotels, hospitals, resorts, boarding schools and apartment complexes. GMCC scroll, R410A, three-phase.

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HEATING CAPACITY	PEAK COP
19 kW	**4.2**
At T1 · A20 °C / W50 °C	At T1 · A20 °C / W50 °C
MAX WATER TEMP	**HOT WATER OUTPUT**
60 °C	**540** LPH
Rated outlet 55 °C	At T1 · A20 °C / W50 °C

Performance

Rated output at each test condition

T1 A20 °C / W50 °C		T2 A15 °C / W50 °C		T3 A10 °C / W50 °C		T4 A5 °C / W50 °C	
Heating capacity	19 kW	Heating capacity	16.7 kW	Heating capacity	14.6 kW	Heating capacity	12.7 kW
Power input	4.5 kW	Power input	4.5 kW	Power input	4.4 kW	Power input	4.36 kW
COP	4.2	COP	3.7	COP	3.3	COP	2.9
Hot water output	540 LPH	Hot water output	410 LPH	Hot water output	315 LPH	Hot water output	250 LPH

Technical specifications

SE-AH-19U-CORE

ELECTRICAL SUPPLY

Power supply	—	**380~415 V / 50 Hz / 3 Ph**
Rated input power	kW	**4.5**
Rated current	A	**8.7**
Required MCB	—	**32 A × 4 pole**
Required cable	—	**4 core × 4 sq.mm copper cable + earthing**

REFRIGERATION CIRCUIT

Compressor	—	**Scroll (GMCC)**
Number of compressors	Nos	**1**
Refrigerant	—	**R410A**
Heat exchanger (condenser)	—	**Tube-in-shell heat exchanger**
Evaporator	—	**Blue finned evaporator coil**
Throttling device	—	**Electronic expansion valve**
Fan quantity	Nos	**1**

WATER CIRCUIT

Rated water temperature	°C	**55**
Maximum water temperature	°C	**60**
Water flow	m³/hr	**3.5**
Water pipe size	inch	**R1**

UNIT & ACOUSTICS

Dimensions (L × W × H)	mm	**750 × 750 × 1100**
Net weight	kg	**115**
Noise at 1 metre	dB (A)	**≤ 55**

TEST CONDITIONS

T1 — Ambient 20°C/15°C, E.T. 10°C , C.T. 55°C
T2 — Ambient 15°C/10°C, E.T. 5°C , C.T. 55°C
T3 — Ambient 10°C/7°C, E.T. 0°C , C.T. 55°C
T4 — Ambient 5°C/3°C, E.T. −5°C , C.T. 55°C

INSTALLATION REQUIREMENT

Dedicated **32 A × 4 pole** MCB required at the unit.
Supply cable **4 core × 4 sq.mm copper cable + earthing**.
Maintain water flow of **3.5 m³/hr** through the unit.

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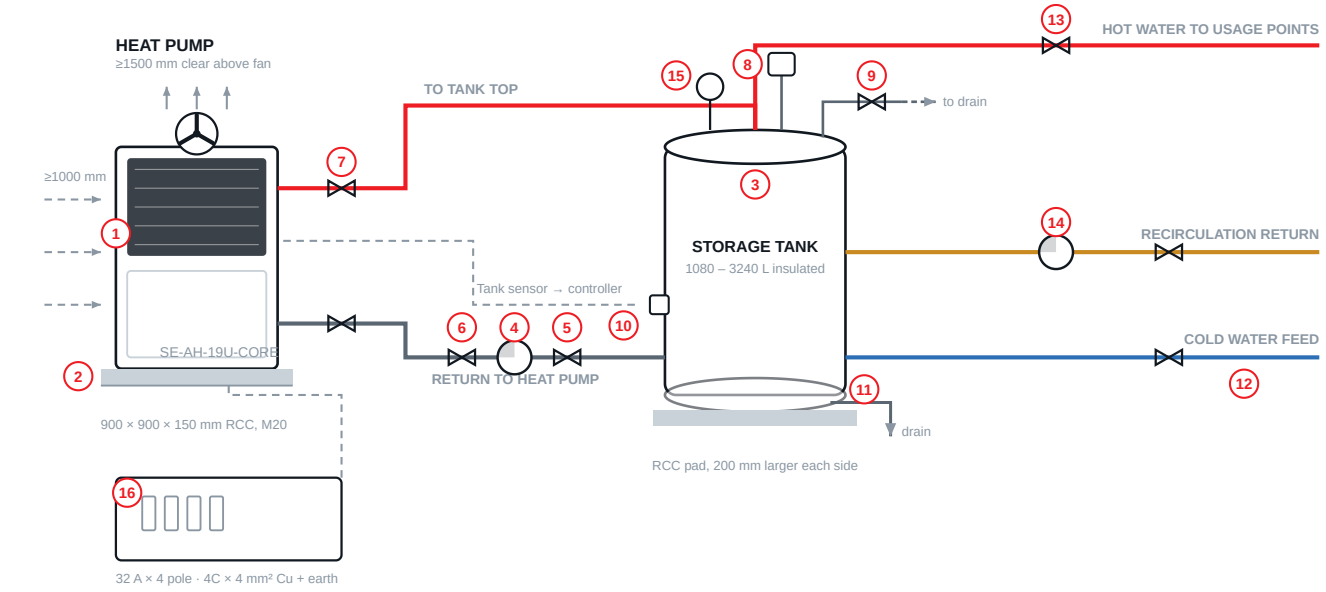
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Site installation schematic

How the unit connects to the tank, pumps and piping on site



Hot water · Return to heat pump · Cold water feed · Recirculation return · Electrical & control

1. Heat pump unit
2. RCC foundation with anti-vibration pads
3. Insulated storage tank
4. Primary circulation pump
5. Y-strainer
6. Non-return valve
7. Isolation valve (typical)
8. Automatic air vent
9. Safety / pressure-relief valve
10. Tank sensor to heat pump controller
11. Drain valve
12. Cold water feed
13. Hot water to usage points
14. Recirculation (return-line) pump
15. Thermometer
16. 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

Storage tank volume	**1080 – 3240 L**
Tank sizing rule	**Hot water output × 2 to 6** LPH measured at 20 °C ambient. Indicative range — stay inside it so the tank is neither undersized nor oversized.
Primary circulation pump	**3.7 m³/hr @ 10 – 12 m head**
Recirculation (return) pump	**0.4 – 0.5 m³/hr @ 6 – 8 m head**
Primary pipe size	**25 mm (R1) to 10 m run; 32 mm beyond**
Line insulation	**25 mm closed-cell on every line above 45 °C**

CIVIL & ELECTRICAL

Unit footprint & dry weight	**750 × 750 mm · 115 kg**
Heat pump plinth	**900 × 900 × 150 mm RCC, M20**
Plinth level	**100 mm above finished floor, ± 3 mm/m**
Tank pad (1080 L)	**150 mm RCC, 200 mm larger each side** ≈ 1242 kg filled
Clearances	**1000 mm air-on · 1500 mm above fan · 1000 mm service side**
Electrical	**32 A × 4 pole · 4 core × 4 sq.mm copper cable + earthing**

Installation steps

Follow in order; commission before start-up

1. Cast the RCC plinth **900 × 900 × 150 mm RCC, M20**, 100 mm above finished floor. Let it cure and check it is level within 3 mm per metre.
2. Set the unit down on anti-vibration pads. Keep **1000 mm** clear at the finned coil faces and **1500 mm** above the fan — the unit must breathe or capacity drops.
3. Place the tank on its own level pad, as close to the heat pump as the site allows. Short pipes lose less heat.
4. Pipe tank bottom → isolation valve → Y-strainer → primary pump → heat pump inlet, in that order. Fit the non-return valve after the pump.
5. Pipe the heat pump outlet → tank top inlet. Fit an isolation valve at each end so the unit can be serviced without draining the tank.
6. Fit the automatic air vent and the safety valve on the tank top. Pipe the safety valve discharge to an open drain — never cap it.
7. Bring the cold water feed into the tank bottom through an isolation valve and a non-return valve.
8. Fit the tank sensor into the tank pocket and run its cable back to the heat pump controller. Do not run it alongside the power cable.
9. Insulate every line above 45 °C with **25 mm closed-cell**, pump body included.
10. Power the unit from a dedicated **32 A × 4 pole** MCB using **4 core × 4 sq.mm copper cable + earthing**.
11. Fill and vent the system fully. Confirm the flow switch stops the unit when the pump is off, then start.

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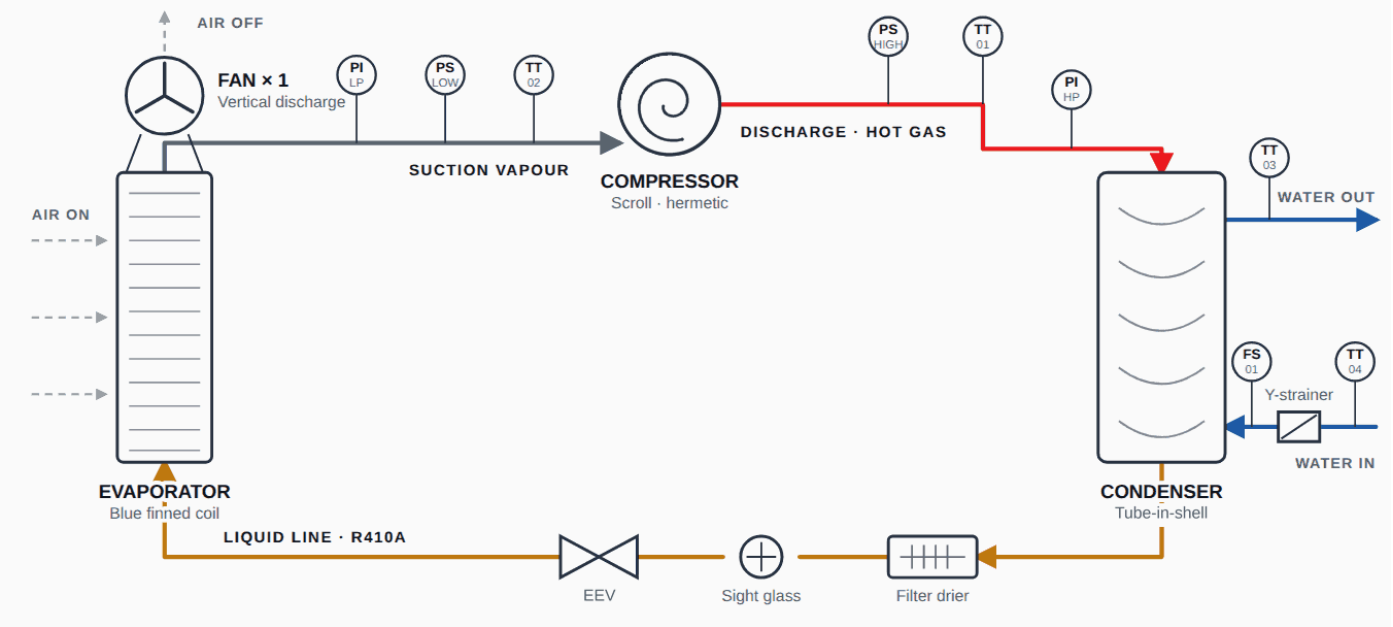
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Process & instrumentation diagram

Refrigeration circuit, instrumentation and water connections



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

Instrument schedule

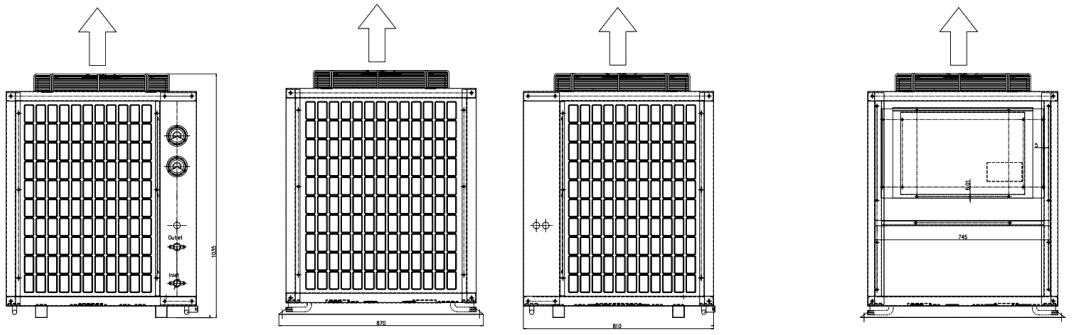
Tags as marked on the diagram above

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)	**750 × 750 × 1100 mm**
Net weight	**115 kg**

Reference arrangement only — Single-coil 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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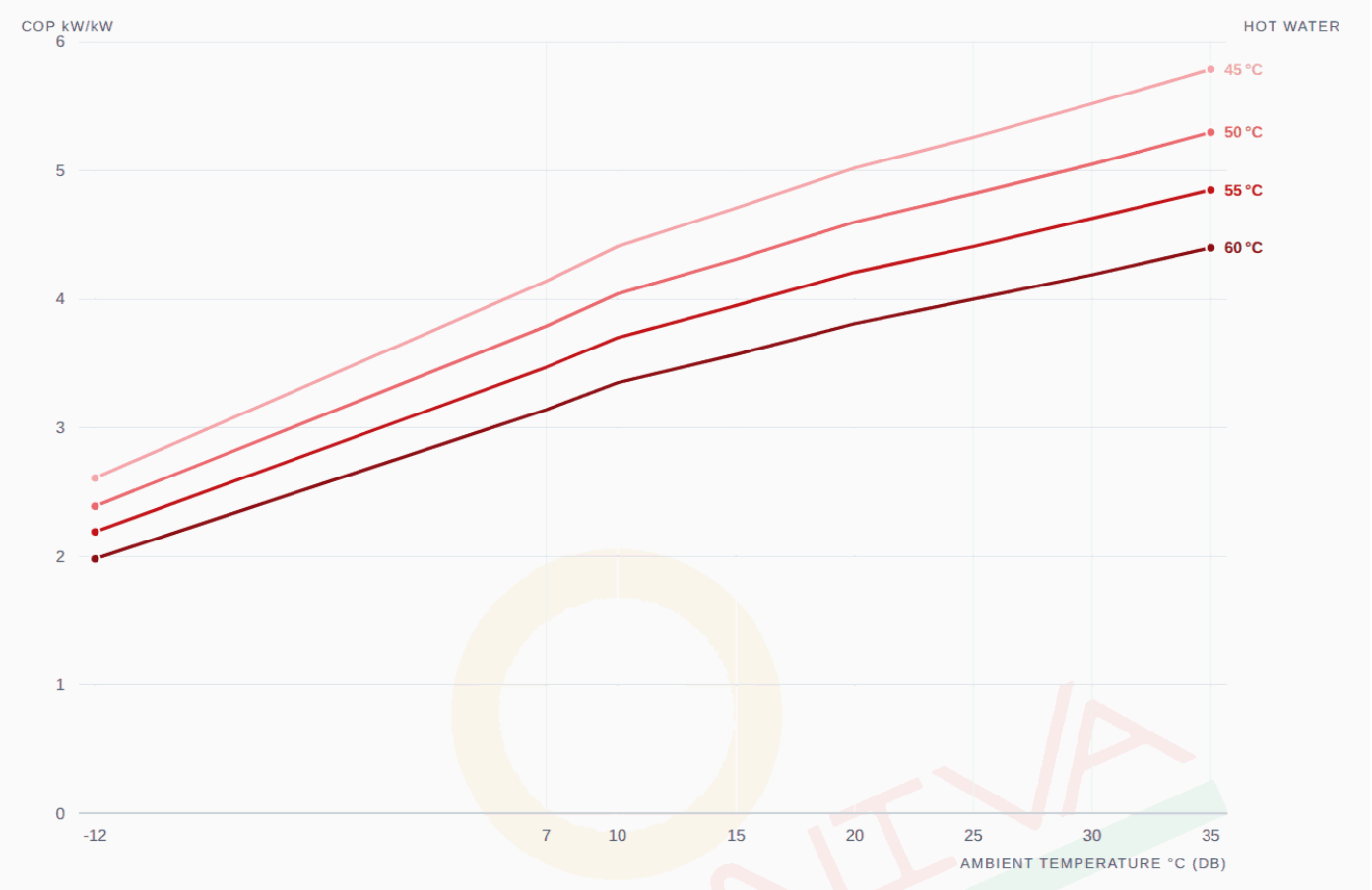
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COP characteristic

Full performance map across the operating envelope



COP · 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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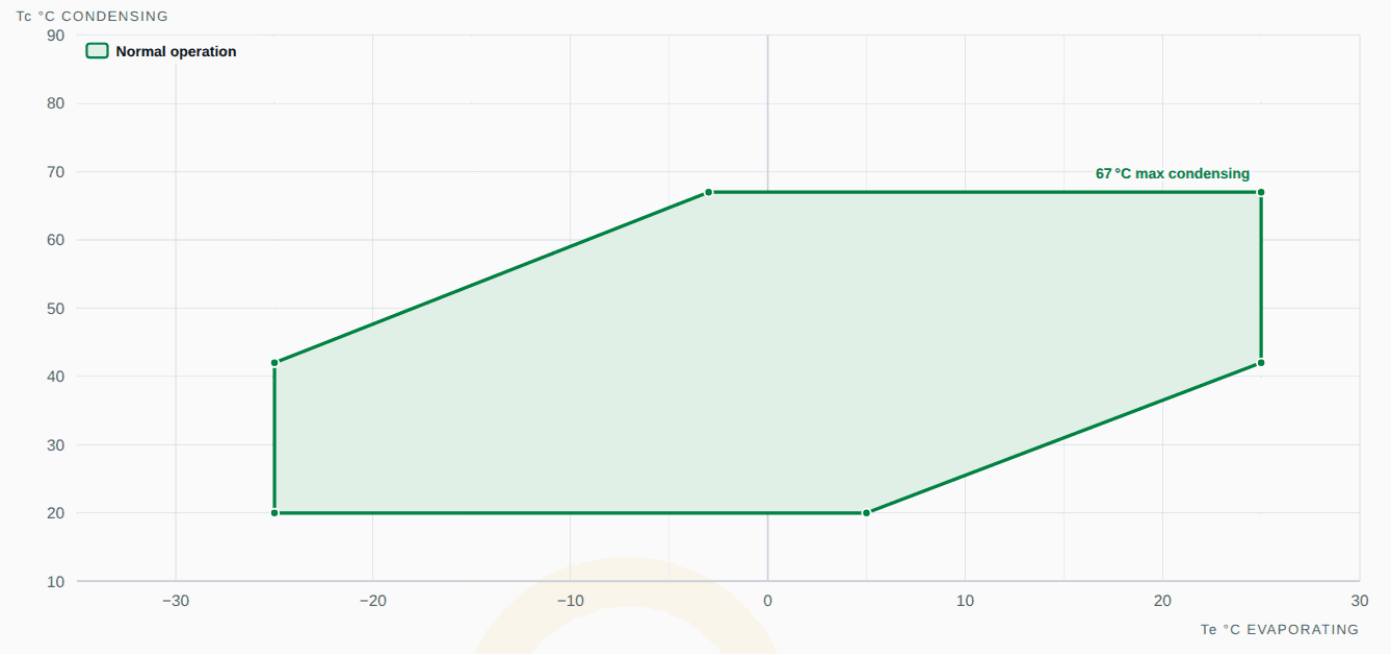
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Operating envelope

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** the compressor circuit's figure — this model's published water limit is 60 °C
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 scroll 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 GMCC compressor fitted to this unit before finalising the design.

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