SE-UHT SERIES

SE-UHT-45V

Cascade heat pump delivering hot water to 125 °C from ambient air alone. An R410A low stage lifts the air-side heat, an R245fa high stage takes it the rest of the way, and the two meet at a cascade heat exchanger.

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HEATING CAPACITY
45 kW
At T1 · A20 °C, / WB15 °C / W120 °C

PEAK COP
2.2
At T1 · A20 °C, / WB15 °C / W120 °C

MAX WATER TEMP
125 °C
Rated outlet 120 °C

HOT WATER OUTPUT
390 LPH
At T1 · A20 °C, / WB15 °C / W120 °C

Performance

Rated output at each test condition

T1 A20 °C, / WB15 °C / W120 °C	
Heating capacity	45 kW
Power input	20.5 kW
COP	2.2
Hot water output	390 LPH

T3 A−7 °C / WB-8 °C / W120 °C	
Heating capacity	35 kW
Power input	20.6 kW
COP	1.7
Hot water output	240 LPH

T5 A−20 °C / W120 °C	
Heating capacity	28 kW
Power input	19.8 kW
COP	1.4
Hot water output	175 LPH

Technical specifications

SE-UHT-45V

ELECTRICAL SUPPLY		
Power supply	—	**380~415 V / 50 Hz / 3 Ph**
Maximum current	A	**100**
REFRIGERATION CIRCUIT		
Compressor	—	**Scroll (Copeland / Panasonic)**
Number of compressors	Nos	**2**
Refrigerant	—	**R410A + R245fa *(cascade)***
Heat exchanger (condenser)	—	**Tube-in-shell / Brazed plate heat exchanger**
Evaporator	—	**Blue finned evaporator coil**
Throttling device	—	**Thermostatic / Electronic expansion valve**

WATER CIRCUIT		
Rated water temperature	°C	**120**
Maximum water temperature	°C	**125**
Water flow	m³/hr	**7.8**
Water pipe size	inch	**R1-1/2**
UNIT & ACOUSTICS		
Dimensions (L × W × H)	mm	**1550 × 780 × 1780**
Net weight	kg	**435**
Noise at 1 metre	dB(A)	**≤ 60**

TEST CONDITIONS

T1 — Ambient 20 °C, water outlet 120 °C
T2 — Ambient 7 °C, water outlet 120 °C
T3 — Ambient -7 °C, water outlet 120 °C
T4 — Ambient -12 °C, water outlet 120 °C
T5 — Ambient -20 °C, water outlet 120 °C

INSTALLATION REQUIREMENT

Protection device and cable size are not published for this model. Confirm both with Sunniva before wiring — the rated current above is not sufficient to size them.

Maintain water flow of **7.8 m³/hr** through the unit.

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Manufacturer & exporter of heat pumps since 2012

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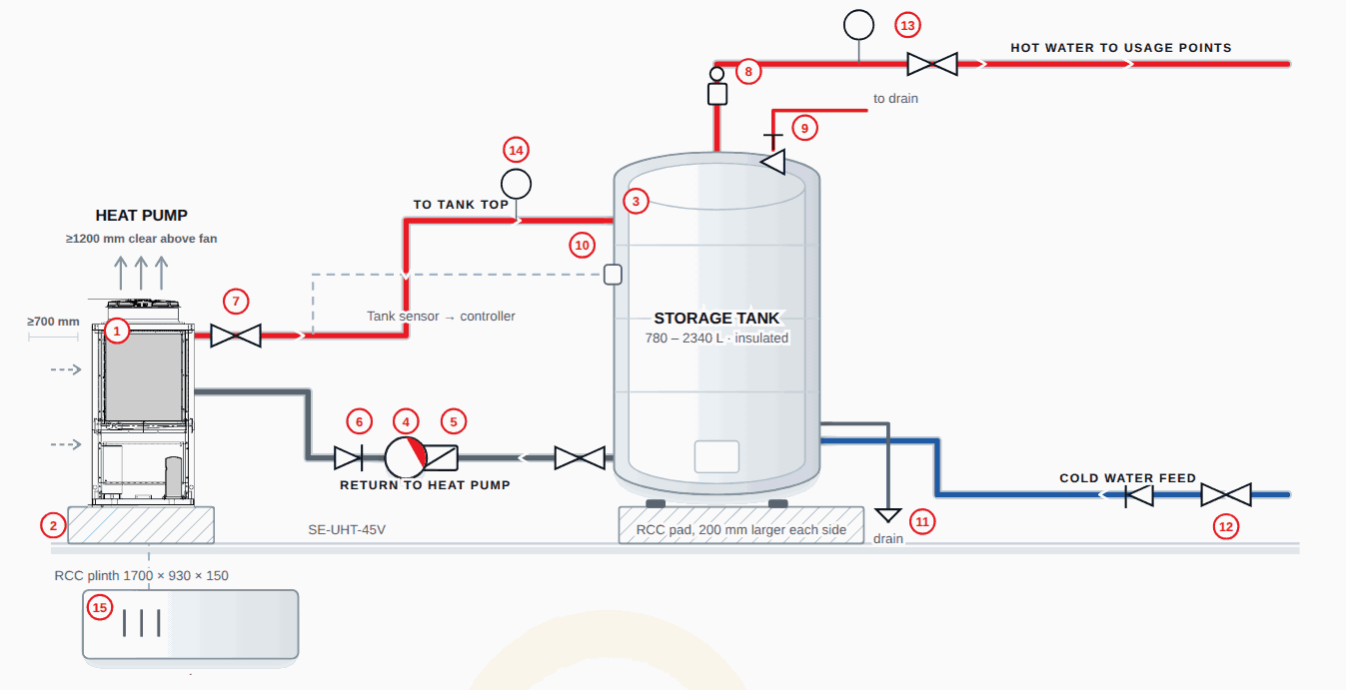
Site installation schematic

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



Hot water · Return to heat pump · Cold water feed · 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. Thermometer
15. 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	**780 – 2340 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	**8.5 m³/hr @ 10 – 12 m head**
Primary pipe size	**40 mm (R1-1/2) to 10 m run; 50 mm beyond**
Line insulation	**25 mm closed-cell, every line above 45 °C**

CIVIL & ELECTRICAL	
Unit footprint & dry weight	**1550 × 780 mm · 435 kg**
Heat pump plinth	**1700 × 930 × 150 mm RCC, M20**
Plinth level	**100 mm above finished floor, ± 3 mm/m**
Tank pad (1000 L)	**150 mm RCC, 200 mm larger each side** ≈ 1150 kg filled
Clearances	**700 mm air-on · 1200 mm above fan · 800 mm service side**
Electrical	**MCB ·**

Installation steps

Follow in order; commission before start-up

1. Cast the RCC plinth **1700 × 930 × 150 mm** in M20 concrete, 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 **700 mm clear** at the finned coil faces and **1200 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 hot line with **25 mm closed-cell** insulation, pump body included.
10. Power the unit from a dedicated MCB using .
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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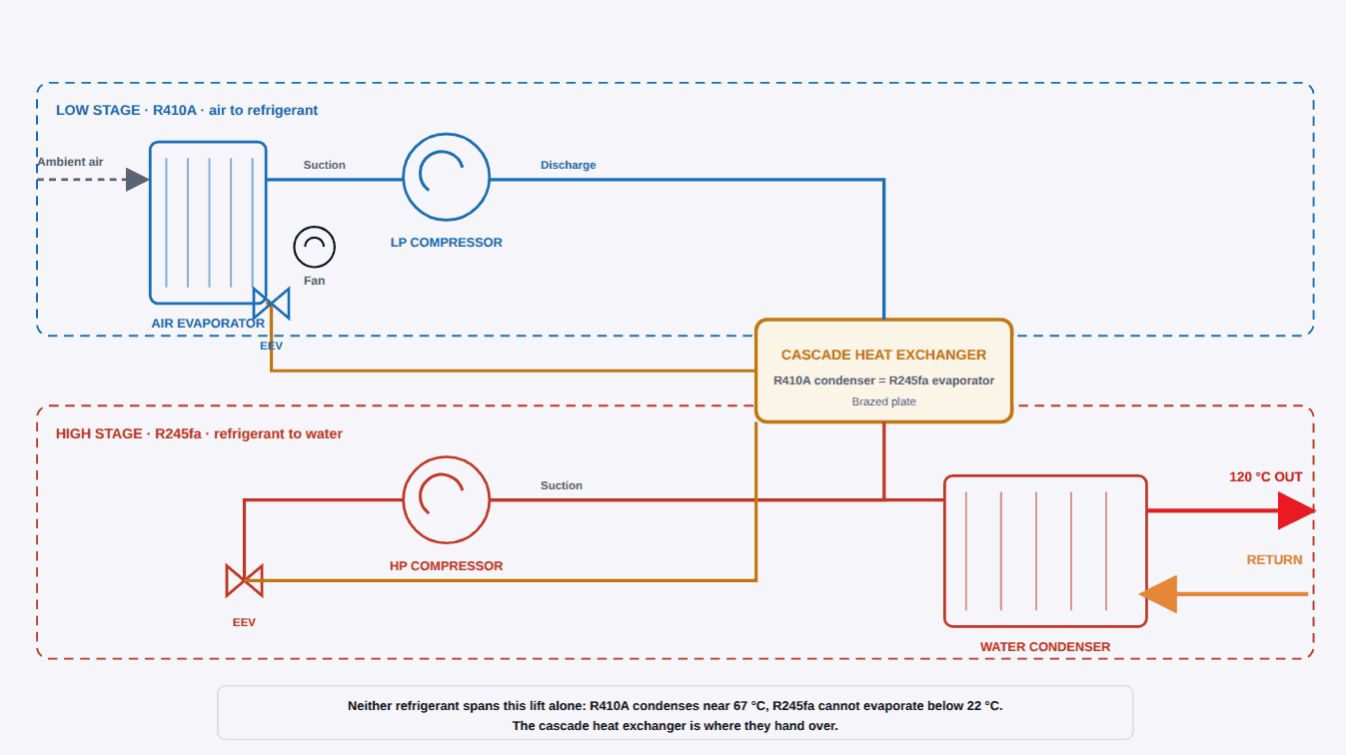
Process & instrumentation diagram

Refrigeration circuit, instrumentation and water connections



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

Instrument schedule

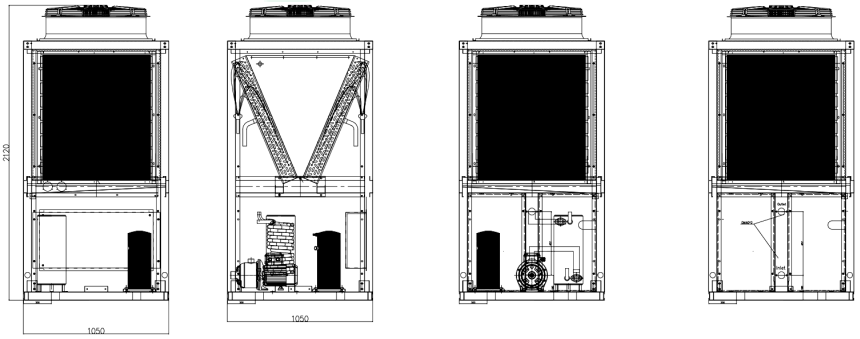
Tags as marked on the diagram above

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)
1550 × 780 × 1780 mm

NET WEIGHT
435 kg

Reference arrangement only — V-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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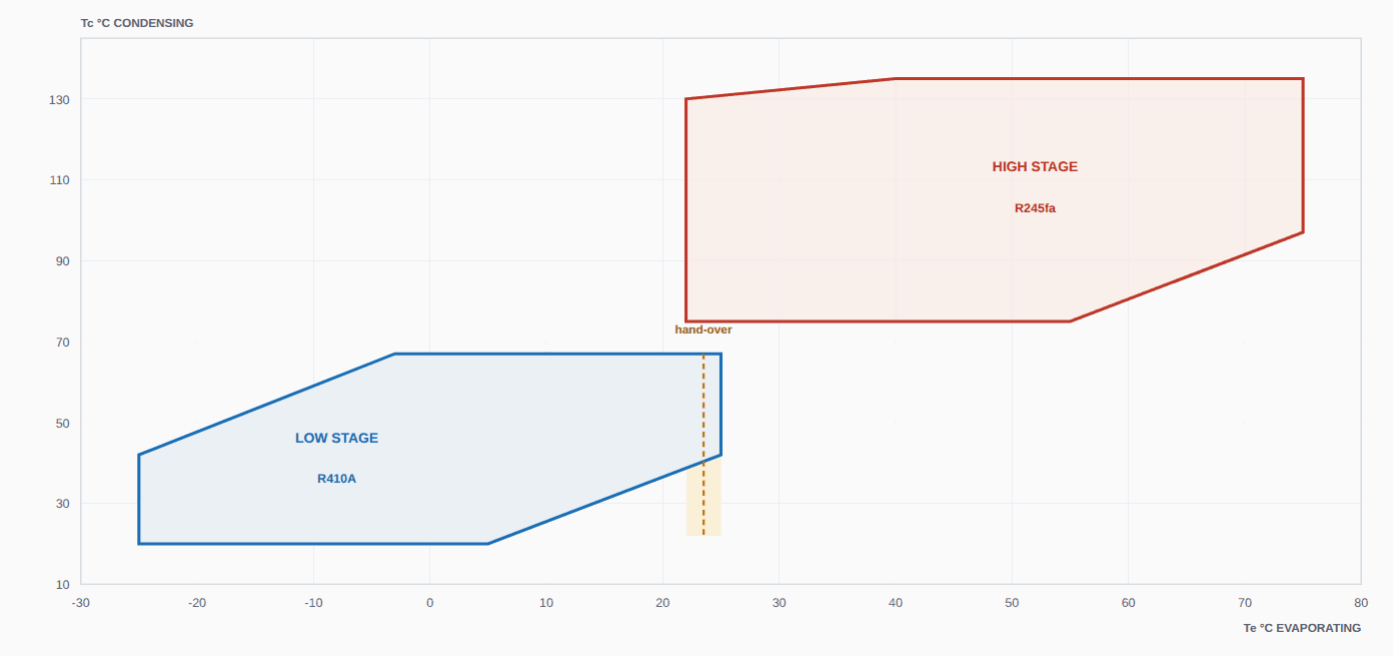
Operating envelope

The compressor's permitted window, in refrigeration terms



ENVELOPE LIMITS	
Low stage — R410A	**Te −25 to 25 °C · Tc 20 to 67 °C**
High stage — R245fa	**Te 22 to 75 °C · Tc 75 to 135 °C**
Hand-over	**22 to 25 °C** where the low stage's condensing overlaps the high stage's evaporating — the cascade heat exchanger sits in this band
Peak condensing	**135 °C** high stage; the machine's published water limit is 125 °C
Transient operation	**Not applicable**

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.

Two circuits, drawn on one frame. The low stage cannot condense much above 67 °C and the high stage cannot evaporate below 22 °C, so neither spans the lift alone — the shaded band between them is where the cascade heat exchanger hands the heat over. Envelopes redrawn from the **Xecom / Embraco Nidec** scroll compressor selection guide, "Operating Envelop". Where a duty sits close to a boundary, confirm against the compressors fitted to the unit before finalising the design.

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