

SE-HT SERIES

# SE-HT-38U

Air source high-temperature heat pump delivering sanitary hot water up to 80 °C. R134A scroll circuit, three-phase, vertical discharge.

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HEATING CAPACITY

**36.8 kW**

At T1 · A20 °C / W60 °C

PEAK COP

**4.0**

At T1 · A20 °C / W60 °C

MAX WATER TEMP

**80 °C**

Rated outlet 75 °C

HOT WATER OUTPUT

**790 LPH**

At T1 · A20 °C / W60 °C

## Performance

Rated output at each test condition

**T1** A20 °C / W60 °C

|                  |                |
|------------------|----------------|
| Heating capacity | <b>36.8 kW</b> |
| Power input      | <b>9.2 kW</b>  |
| COP              | <b>4.0</b>     |
| Hot water output | <b>790 LPH</b> |

**T2** A20 °C / W70 °C

|                  |                |
|------------------|----------------|
| Heating capacity | <b>34.8 kW</b> |
| Power input      | <b>10.7 kW</b> |
| COP              | <b>3.2</b>     |
| Hot water output | <b>600 LPH</b> |

**T3** A20 °C / W80 °C

|                  |                |
|------------------|----------------|
| Heating capacity | <b>32.8 kW</b> |
| Power input      | <b>11.5 kW</b> |
| COP              | <b>2.8</b>     |
| Hot water output | <b>470 LPH</b> |

## Technical specifications

SE-HT-38U

### ELECTRICAL SUPPLY

|                |   |                                                  |
|----------------|---|--------------------------------------------------|
| Power supply   | — | <b>380–415 V / 50 Hz / 3 Ph</b>                  |
| Rated current  | A | <b>23.6</b>                                      |
| Required MCB   | — | <b>50 A × 4 pole</b>                             |
| Required cable | — | <b>4 core × 10 sq.mm copper cable + earthing</b> |

### REFRIGERATION CIRCUIT

|                            |     |                                                    |
|----------------------------|-----|----------------------------------------------------|
| Compressor                 | —   | <b>Scroll (Copeland / Panasonic)</b>               |
| Number of compressors      | Nos | <b>2</b>                                           |
| Refrigerant                | —   | <b>R134A</b>                                       |
| Heat exchanger (condenser) | —   | <b>Tube-in-shell / Brazed plate heat exchanger</b> |
| Evaporator                 | —   | <b>Blue finned evaporator coil</b>                 |
| Throttling device          | —   | <b>Thermostatic / Electronic expansion valve</b>   |
| Fan quantity               | Nos | <b>2</b>                                           |

### WATER CIRCUIT

|                           |                    |               |
|---------------------------|--------------------|---------------|
| Rated water temperature   | °C                 | <b>75</b>     |
| Maximum water temperature | °C                 | <b>80</b>     |
| Water flow                | m <sup>3</sup> /hr | <b>6.6</b>    |
| Water pressure drop       | kPa                | <b>≤ 58</b>   |
| Water pipe size           | inch               | <b>R1-1/2</b> |

### UNIT & ACOUSTICS

|                        |       |                          |
|------------------------|-------|--------------------------|
| Dimensions (L × W × H) | mm    | <b>1450 × 890 × 1110</b> |
| Net weight             | kg    | <b>375</b>               |
| Noise at 1 metre       | dB(A) | <b>≤ 74</b>              |

### TEST CONDITIONS

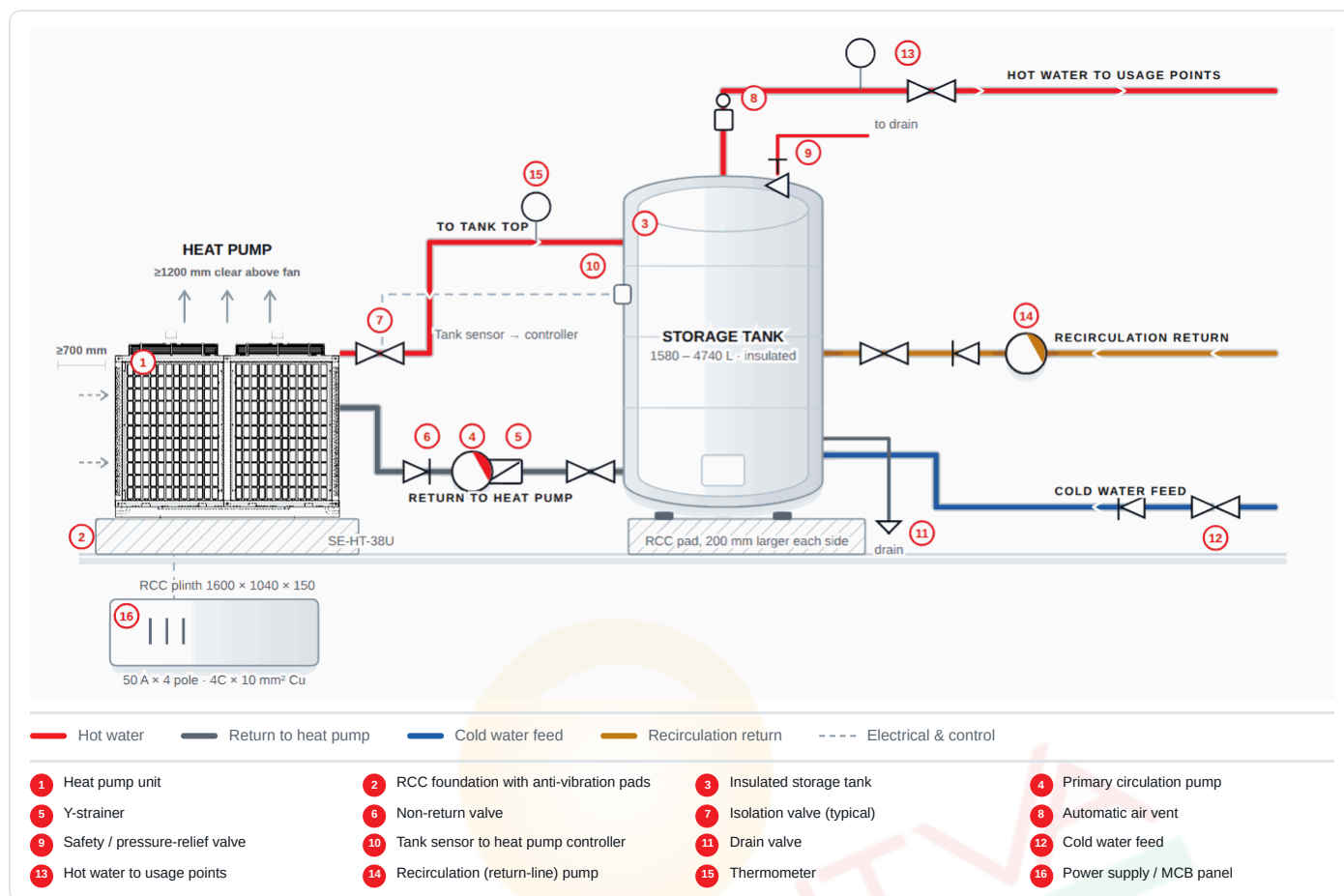
**T1** — Ambient 20/15 °C (DB/WB), E.T. 10 °C, C.T. 65 °C  
**T2** — Ambient 20/15 °C (DB/WB), E.T. 10 °C, C.T. 75 °C  
**T3** — Ambient 20/15 °C (DB/WB), E.T. 10 °C, C.T. 85 °C

### INSTALLATION REQUIREMENT

Dedicated **50 A × 4 pole** MCB required at the unit.  
 Supply cable **4 core × 10 sq.mm** copper, with separate earthing.  
 Maintain water flow of **6.6 m<sup>3</sup>/hr**; pressure drop across the unit ≤ 58 kPa.

## Site installation schematic

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



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               |                                                                                                                                                | CIVIL & ELECTRICAL          |                                                               |
|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|---------------------------------------------------------------|
| Storage tank volume         | 1580 – 4740 L                                                                                                                                  | Unit footprint & dry weight | 1450 × 890 mm · 375 kg                                        |
| Tank sizing rule            | Hot water output × 2 to 6<br>LPH measured at 20 °C ambient. Indicative range — stay inside it so the tank is neither undersized nor oversized. | Heat pump plinth            | 1600 × 1040 × 150 mm RCC, M20                                 |
| Primary circulation pump    | 7 m³/hr @ 10 – 12 m head                                                                                                                       | Plinth level                | 100 mm above finished floor, ± 3 mm/m                         |
| Recirculation (return) pump | 0.8 – 1 m³/hr @ 6 – 8 m head                                                                                                                   | Tank pad (1580 L)           | 150 mm RCC, 200 mm larger each side<br>≈ 1817 kg filled       |
| Primary pipe size           | 40 mm (R1-1/2) to 10 m run; 50 mm beyond                                                                                                       | Clearances                  | 700 mm air-on · 1200 mm above fan · 800 mm service side       |
| Line insulation             | 25 mm closed-cell, every line above 45 °C                                                                                                      | Electrical                  | 50 A × 4 pole MCB · 4 core × 10 sq.mm copper cable + earthing |

## Installation steps

Follow in order; commission before start-up

- Cast the RCC plinth 1600 × 1040 × 150 mm in M20 concrete, 100 mm above finished floor. Let it cure and check it is level within 3 mm per metre.
- 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.
- Place the tank on its own level pad, as close to the heat pump as the site allows. Short pipes lose less heat.
- Pipe tank bottom → isolation valve → Y-strainer → primary pump → heat pump inlet, in that order. Fit the non-return valve after the pump.
- 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.
- 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.
- Bring the cold water feed into the tank bottom through an isolation valve and a non-return valve.
- 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.
- Insulate every hot line with 25 mm closed-cell insulation, pump body included.
- Power the unit from a dedicated 50 A × 4 pole MCB using 4 core × 10 sq.mm copper cable + earthing.
- Fill and vent the system fully. Confirm the flow switch stops the unit when the pump is off, then start.

### SUNNIVA ENCON LLP

Manufacturer &amp; exporter of heat pumps since 2012

### OFFICE

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### FACTORY

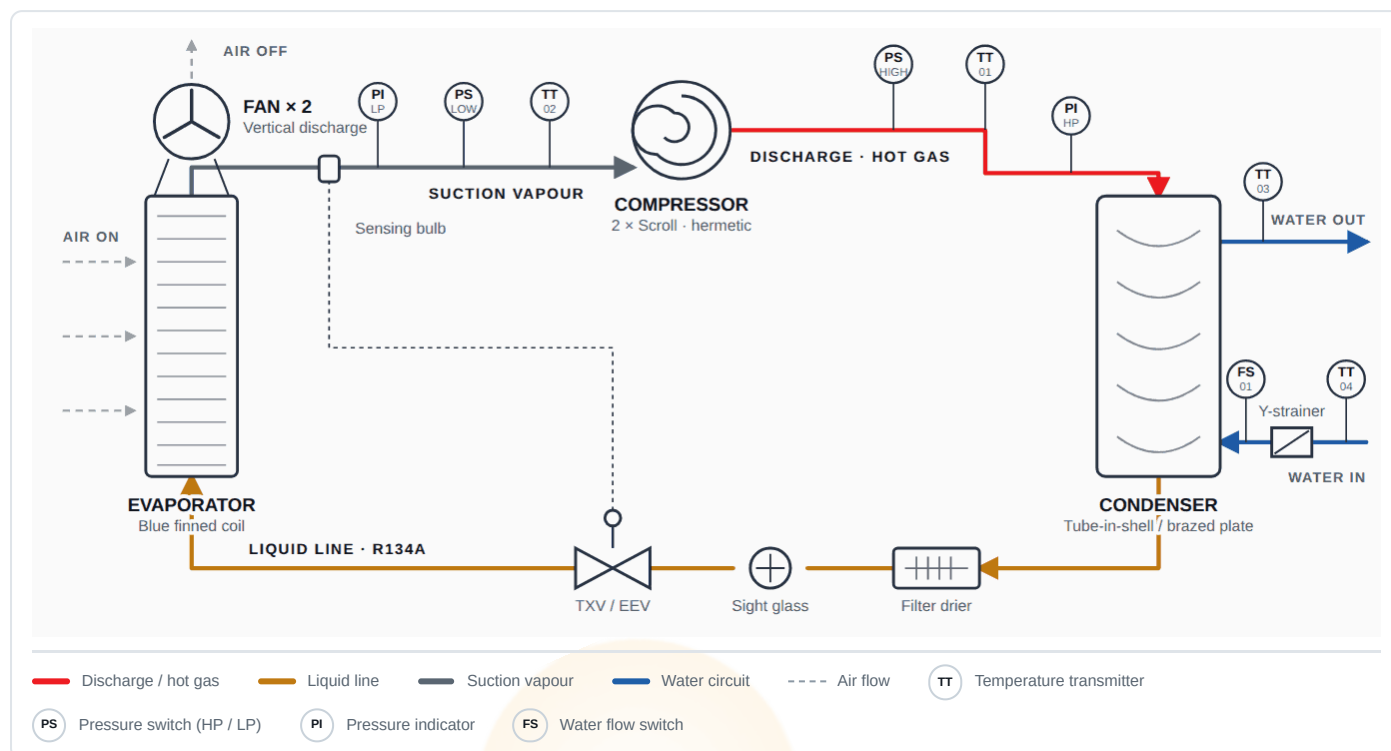
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## Process & instrumentation diagram

Refrigeration circuit, instrumentation and water connections



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

## Instrument schedule

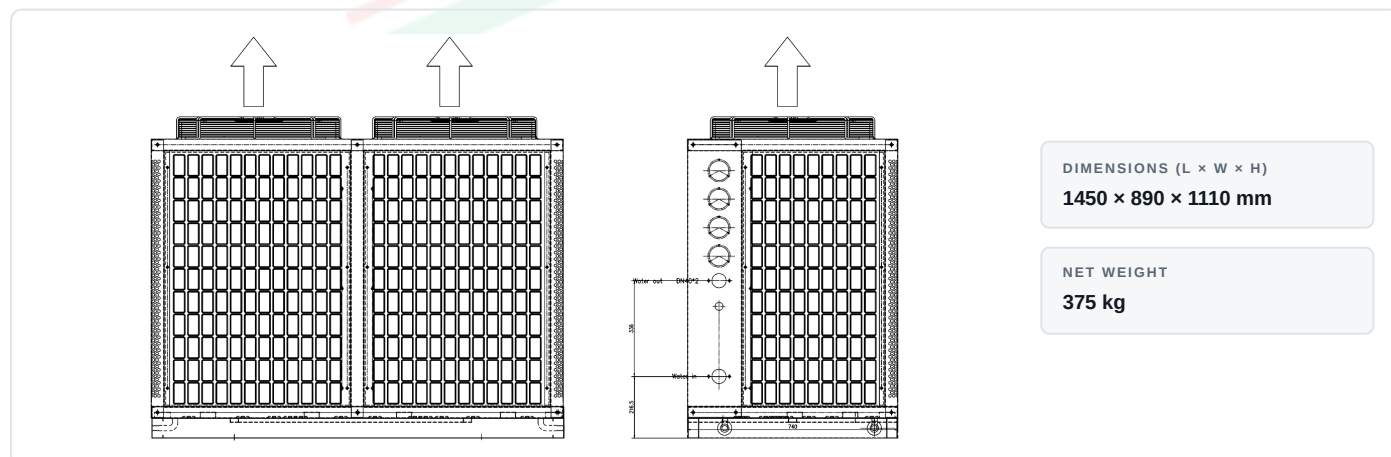
Tags as marked on the diagram above

| 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, $\Delta T$ 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

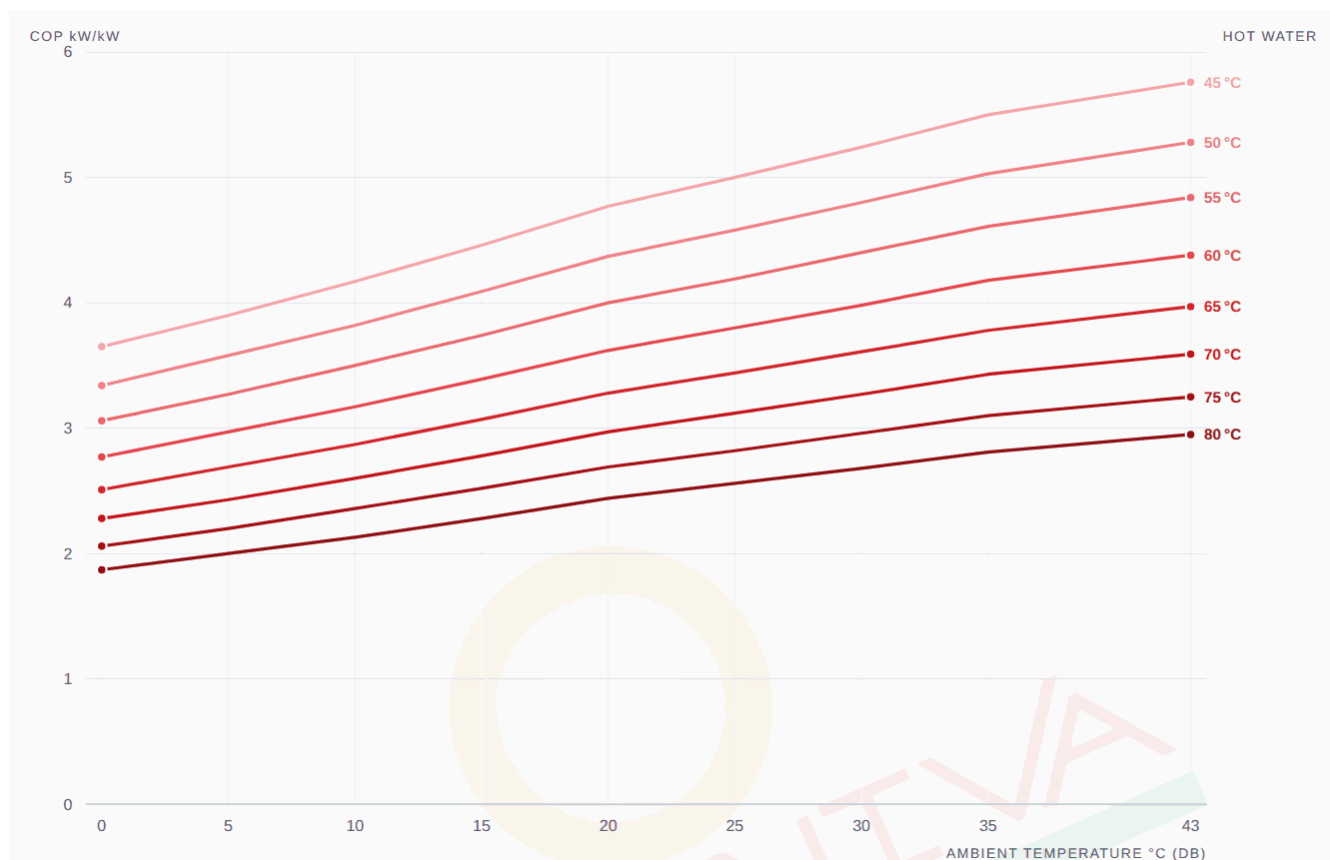


Reference arrangement only — Twin-compressor cabinet, vertical discharge. Dimensions printed on the drawing are indicative; the figures above and in the specification table are the ones that apply to this model.

**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 → | 0    | 5    | 10   | 15   | 20   | 25   | 30   | 35   | 43   |
|----------------------------------|------|------|------|------|------|------|------|------|------|
| 45 °C                            | 3.65 | 3.90 | 4.17 | 4.46 | 4.77 | 5.00 | 5.24 | 5.50 | 5.76 |
| 50 °C                            | 3.34 | 3.58 | 3.82 | 4.09 | 4.37 | 4.58 | 4.80 | 5.03 | 5.28 |
| 55 °C                            | 3.06 | 3.27 | 3.50 | 3.74 | 4.00 | 4.19 | 4.40 | 4.61 | 4.84 |
| 60 °C                            | 2.77 | 2.97 | 3.17 | 3.39 | 3.62 | 3.80 | 3.98 | 4.18 | 4.38 |
| 65 °C                            | 2.51 | 2.69 | 2.87 | 3.07 | 3.28 | 3.44 | 3.61 | 3.78 | 3.97 |
| 70 °C                            | 2.28 | 2.43 | 2.60 | 2.78 | 2.97 | 3.12 | 3.27 | 3.43 | 3.59 |
| 75 °C                            | 2.06 | 2.20 | 2.36 | 2.52 | 2.69 | 2.82 | 2.96 | 3.10 | 3.25 |
| 80 °C                            | 1.87 | 2.00 | 2.13 | 2.28 | 2.44 | 2.56 | 2.68 | 2.81 | 2.95 |

**HOW TO READ THIS**

Performance map for the R134A circuit, covering the full 45–80 °C hot-water range. Rated figures at the certified test conditions are on page 1.

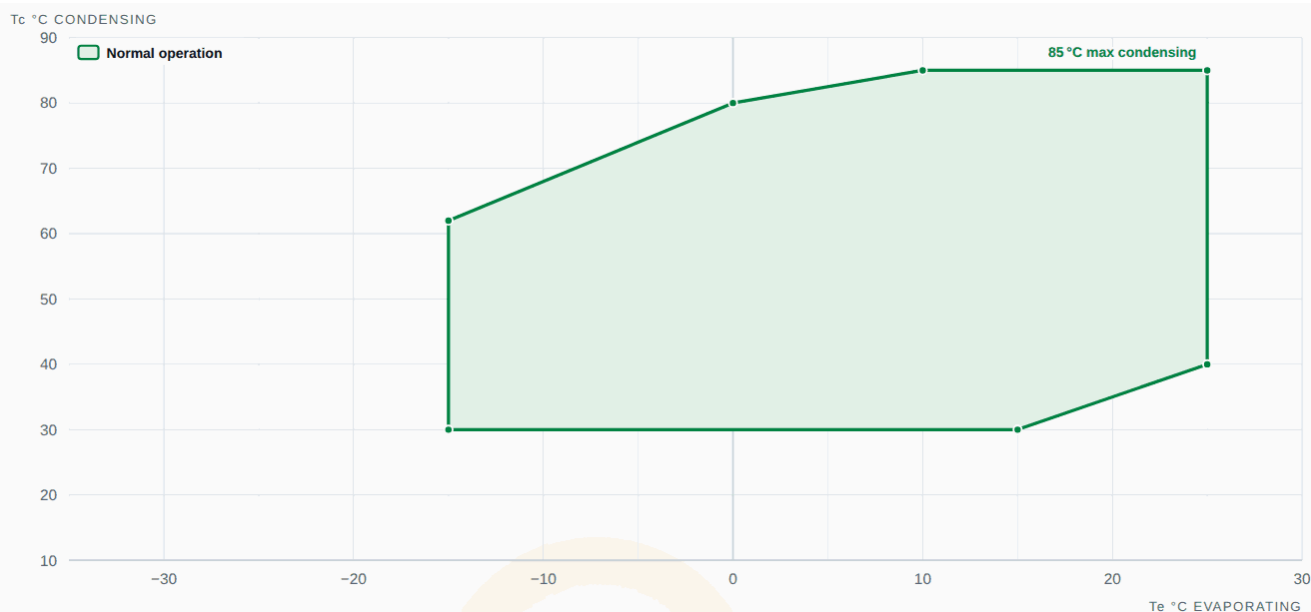
Where a figure on this map differs from the rated point on page 1, **the map governs** — it is measured across the full operating envelope, while the rated point is a single certified test condition.

## Operating envelope

The compressor's permitted window, in refrigeration terms

### Operating envelope · R134A circuit

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



#### ENVELOPE LIMITS

|                               |                                                                                |
|-------------------------------|--------------------------------------------------------------------------------|
| Evaporating temperature $T_e$ | <b>-15 °C to 25 °C</b>                                                         |
| Condensing temperature $T_c$  | <b>30 °C to 85 °C</b>                                                          |
| Peak condensing               | <b>85 °C</b><br>highest hot-water temperature the circuit can reach            |
| Transient operation           | <b>Not applicable</b><br>the envelope above is the continuous operating window |

#### READING THE ENVELOPE

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

**$T_c$**  (condensing) follows the water leaving the unit — asking for 80 °C hot water puts  $T_c$  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 R134A circuit, redrawn from Panasonic compressor data (Operating envelop.xlsx, sheet "R134a"). 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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