SC-17 CAREWING

Reference aircraft configuration for the Simplycity Amsterdam care corridor

Revision 0.1 · 21 September 2026 · Concept / pre-feasibility

> SC-17 is a reference aircraft, not a claimed Simplycity product or an airworthy design. It gives the care-corridor pilot a concrete vehicle envelope for routing, hubs, noise, safety and service design. Every value is a preliminary sizing estimate and must be validated by the selected design organisation, operator and competent authority before procurement, manufacture or flight.

The pitch

SC-17 CAREWING turns a 17-minute hospital sample corridor into a quiet, traceable electric service: vertical at the roof, wing-borne between care sites, and visible to every stakeholder through Simplycity.
Simplycity remains the coordination layer, not a drone manufacturer. This is the reference configuration that makes the first service tangible and lets the city design a disciplined operating envelope.

Architecture

SC-17 CAREWING reference configuration (concept render)

SC-17 is a battery-electric quadplane: four dedicated vertical-lift rotors handle approved rooftop departures and arrivals; a fixed wing and rear pusher propeller complete the cross-city leg. The combination avoids a hover-only multicopter’s cruise-energy penalty while keeping a compact pad footprint.

Choice	Rationale
Four independent lift rotors	Controlled vertical launch/landing; failure tolerance requires later demonstration.
High wing + rear pusher	Efficient wing-borne cruise; clean cargo access and propeller separation.
Removable 7 L cassette	2.5 kg samples, custody scan, temperature logging and fast turnaround.
0.42 kWh swappable battery	Reference mission plus reserve; supports short hub dwell.
Fixed care corridor	Turns route, noise, weather minima and contingency sites into measurable evidence.

Reference specification

Item	Preliminary value

Configuration	Electric quadplane; fixed wing; rear pusher; V-tail
Payload	2.5 kg maximum; 7 L insulated cassette target
MTOM	13.6 kg target envelope
Span / length / height	1.75 m / 1.18 m / 0.42 m
Wing area / aspect ratio	0.42 m² / 7.3
Lift system	4 x 457 mm (18 in) rotors
Battery	0.42 kWh nominal, 80% usable planning assumption
Cruise	95 km/h (26.4 m/s) nominal
Stall estimate	61 km/h (17.0 m/s), clean; test required
Nominal range	35 km, still-air planning envelope

17-minute corridor model

Illustrative Amsterdam care-corridor operation

Scenario: 18 km direct route between hospital rooftop micro-hubs.

Segment	Time	Aircraft energy
Authenticate, load, pre-flight release	1.5 min	Hub power
Vertical departure + transition	0.67 min	2.5 kW model
Wing-borne cruise, 18 km at 26.4 m/s	11.36 min	0.47 kW model
Transition + vertical landing	0.67 min	2.5 kW model
Receive, scan and handover	2.8 min	Hub power
Door-to-door target	17.0 min	0.170 kWh nominal aircraft mission

Flow checks aircraft health, weather, route and airspace before release. The aircraft climbs from a controlled pad, transitions to wing-borne cruise within an approved route volume, then lands at the receiving hub. Trust provides the authorised shared operating picture and audit trail; Impact records service, energy and measured noise. Out-of-envelope missions do not launch or divert according to an approved policy.

First-order sizing calculations

Mass and wing loading

Assumed worst-case weight: W = 13.6 kg x 9.81 = 133.4 N.
W/S = 133.4 N / 0.42 m² = 318 N/m² (32.4 kg/m²).
Preliminary budget: structure/fuselage 3.0 kg; wing/tail 0.9 kg; lift units 1.9 kg; cruise propulsion 0.5 kg; battery 2.0 kg; avionics/cargo interface 0.6 kg; payload 2.5 kg; allowance 2.2 kg = 13.6 kg MTOM. This is a target, not a substantiated mass statement.

Stall check

For sea-level rho = 1.225 kg/m³, wing S = 0.42 m² and provisional CLmax = 1.8:
Vs = sqrt[2W / (rho S CLmax)] = sqrt[2 x 133.4 / (1.225 x 0.42 x 1.8)] = 16.97 m/s = 61.1 km/h.
The 95 km/h cruise point is 1.55 x Vs. Actual airfoil, gust margin and CLmax require wind-tunnel and flight validation.

Cruise drag and power

At V = 26.4 m/s, use preliminary polar CD = CD0 + k CL²; CD0 = 0.040; AR = 7.3; e = 0.75; k = 1/(piAR e) = 0.058.
CL = W / (0.5 rho V² S) = 0.744.
CD = 0.040 + 0.058 x 0.744² = 0.072.
D = 0.5 rho V² S CD = 12.9 N.
At 70% propulsive efficiency, P = D V / 0.70 = 486 W; planning cruise electrical draw is 0.47–0.55 kW. Bench-tested motor, ESC, propeller and installation losses will replace this estimate.

Vertical-lift power

Four 457 mm rotors yield A = 4pi(0.457/2)² = 0.656 m².
Pi = sqrt[W³/(2rhoA)] = 1.21 kW ideal induced power.
At provisional 0.65 figure of merit: 1.21/0.65 = 1.86 kW; allowing profile, drivetrain and control margin gives 2.5 kW planning hover draw. Installed peak power, thermal performance and one-motor-out behaviour are unproven until testing.

Energy and reserve

Cruise: 0.47 kW x (18,000/26.4) s / 3600 = 0.089 kWh.
Vertical/transition: 2.5 kW x 80 s / 3600 = 0.056 kWh.
Avionics/payload thermal allowance: 0.025 kWh. Nominal total: 0.170 kWh. A 30% contingency reserve adds 0.051 kWh, so planning requirement is 0.221 kWh.
A 0.42 kWh pack at 80% usable capacity provides 0.336 kWh usable, or 0.115 kWh additional margin. At 0.50 kW planning cruise, a 30% operational derate produces the 35 km nominal range envelope. This is not a guaranteed range: dispatch must account for wind, diversion, ageing and weather.

Safety concept and verification

1. Before launch: independent positioning, geofence, weather/UTM checks, health check, cassette identity and temperature check.
2. In flight: autopilot plus independent health monitor, primary communications and contingency link, loss-link behaviour, energy/wind monitoring and route-volume containment.
3. Degraded policy: reject launch, return, continue only where energy policy allows, or divert to a surveyed contingency site.
4. Ground safety: locked pad during rotor operation, personnel exclusion zone, positive cassette retention and battery thermal monitoring.

Gate	Evidence needed
G0 — route	Care workflow, survey, stakeholder agreement, contingency inventory.
G1 — model	Mass properties, propulsion map, aero/rotor/noise model and initial risk assessment.
G2 — ground	Structural, battery thermal, EMC, cargo and containment evidence.
G3 — flight development	Hover/transition, failure behaviours and measured acoustics.

G4 — supervised corridor	Approved demonstrations, operational weather/energy data and custody evidence.
G5 — limited service	Accepted safety case, maintenance, training and public-value review.

Package index

- SC17-Carewing-Blueprint.pdf — portable continuity briefing
- sc17-design-book.html — image-rich printable book
- sc17-blueprint.svg — editable three-view concept
- sc17-studio-render.png — original studio render
- sc17-route-render.png — original operational render

Important: This package is an engineering concept only; it is not a manufacturing drawing, flight manual, safety case or approval to operate.