Tent Swamp Cooler v3

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A quieter, simpler build of the classic Yurt Cooler

v1: yurtcooler.com | v2.1: Oskar Arvidsson | v2.2: Joanna Ma | v3: this guide (2026)

The complete v3 system: cooler tote, CLOUDLINE H4 fan, Anker SOLIX C300, dust collection hose, cone intake filter.

What this is

A DIY evaporative (swamp) cooler for a camping tent at Burning Man. Outside air is pulled through a washable cone filter, pushed by a quiet inline duct fan into a plastic tote where it passes through water-soaked humidifier wicks, and discharges into the tent as cool, humid, filtered air. The tent runs at slight positive pressure, which also helps keep dust out.

It follows the original yurtcooler.com design (v1) and Oskar Arvidsson (v2.1) + Joanna Ma (v2.2). The core change in v3 is replacing the 12V bilge blower + hand-wired electronics with a single EC inline duct fan on a power station's AC outlet. That one swap removes all of the soldering/electronics assembly steps, and replaces a blower that jumps between noise plateaus with a fan that adjusts smoothly across its whole range. Upgrading an existing v2 swamp cooler to v3 takes minimal time and effort.

Other designs. There's a second lineage worth knowing about: the Figjam bucket cooler, best documented by PlayaLabs. It's architecturally different -- a 5-gallon bucket with cooler pad lining the wall, kept wet by a submersible 12V pump feeding a drip ring. The pump keeps the media evenly saturated at any water level; the cost is another 12V load and a component you must never run dry. The yurt cooler design has no moving parts besides the fan. I haven't built one, so treat this as orientation rather than a comparison. Worth noting the v3 change is portable: swapping a bilge blower and hand-wired PWM for an EC inline fan *could* work on a bucket build too.

How v3 improves on v1/v2

Dimension	v1/v2 (Attwood Turbo 4000 bilge blower)	v3 (CLOUDLINE H4)
Power draw	~42W max; PWM potentiometer is continuously variable in power, but noise jumps between plateaus rather than rising smoothly	3W / 9W / 28W at 10/50/100% (measured at the plug)
Runtime on a 288Wh Anker C300	~9h at the loud plateau, ~20h at the quiet plateau (measured)	~13h at 50%; ~7h at 100% (measured)
Airflow	230 CFM free air (220 at 12V), but noise caps practical use well below that. Measured: moves ~45% less air than the H4 at the same 48 dB	212 CFM free air, usable across the whole range. Measured: ~80% more air than the blower at 48 dB
Noise	Steps between plateaus rather than rising smoothly; swept at eight knob positions from 40 to 62 dB, and several of them buy more noise without more air (wet, @6ft)	39 dB at speed 1 rising smoothly to 57 dB at speed 10, roughly 2 dB per step (measured wet @6ft)
Speed control	Separate PWM module, hand-wired	Built-in 10-speed corded controller
Scheduling	12V JVR timer with autolock workarounds or morning switch flip	Plug-in outlet timer or morning button-press
Build skill	Hole saw, wire stripping, spade/ring terminals, 12V fusing, soldering	Hole saw and hose clamps. No electrical work
Build time	A full day: cutting plus electronics fiddling	A few hours: cutting, then fitting pieces together
Dust survivability	Brushed motor	IP65-rated sealed motor (dust-tight)
Sealing and fit	Connections are aluminum and plastic, creating imperfect and rigid seals which rattle. Tape partially closes airflow gaps.	Flexible adapters fit easily and smoothly without leaks, with clamps to keep them tight.

Downsides of v3: the fan is bigger and heavier, and it needs 120V AC, so your power station must have an inverter (e.g. the AC version of the Anker C300). The inverter costs about 10W of standing overhead, which at low fan speeds is more than the fan itself draws. The fan is still substantially more efficient than a brushed blower, but the inverter eats much of that advantage. If you want to keep your power source 12V-only (car battery, or bare LiFePO4 like the Anker C300 DC, about $100 less), stay on the v1/v2 blower.

The cost is roughly a wash. The H4 costs ~$60 more than a bilge blower, but v1/v2 also needs a PWM controller, toggle switch, inline fuse, wire, terminals, and a project box: $40-60 and several hours. v3 spends that money on the fan and skips the labor.

Full measurements — airflow, noise, cooling power, and the methods behind them — are in the Measurements tab.

🛠️ Build it

Shopping list

Prices are August 2026 US street prices not including tax; verify at checkout. Items marked (have?) are reusable components you might already own outside of this build.

Necessary

Item	~Price	Notes
AC Infinity CLOUDLINE H4 (IP65 version)	$99	Buy the humidity-proof H4, not the PRO S4: same platform, IP65-sealed motor, slightly quieter. AC Infinity's official eBay store ships free/fast with 60-day returns.
AC Infinity Noise Reduction Clamp, 4″	$14	Nitrile rubber coupler; joins fan to tote wall, seals it, and kills vibration. Includes 2 worm clamps.
4″ cone air filter (102mm neck)	$21	Washable automotive intake filter.
4″ x 10 ft PVC dust collection hose	$27	Wire-reinforced clear hose; the soft cuff ends grip 4″ collars tightly. Includes 4 worm clamps.
4″ hose connector	$10	Rigid sleeve that adapts the hose end to the cone filter's neck. The hose cuff may need a slight interior trim to seat over it.
Worm-drive clamps (3 used)	$0	No separate purchase: 2 come with the Noise Reduction Clamp, 4 with the hose. The hand-tightened hose clamps are annoying to use though.
IRIS USA 19 Qt WeatherPro tote (model 500199)	$15	The cooler body holds ~5L. Use this exact tote if possible: its geometry wedges the cone filter and wick filters just right. Substitutes can work, but verify the filter fit before cutting.
Humidifier wick filters (HWF75 / "Filter D")	$27	The evaporative media; one set lasts the week. Any HWF75-compatible wick works. Sold as a 2-pack of closed loops; cut each in half for 4 flat sheets — the build uses 3, keep the 4th as a spare.
Stainless steel wire, 20 ga (0.032″ / 0.8 mm)	$10	Forms the rack that holds the wicks upright. Roughly 18-20 ga is the useful range: stiff enough to hold the D shape, soft enough to bend by hand and thread through the 5/64″ holes. ~38″ needed.
Anker SOLIX C300 power station (288Wh, 300W AC) (have?)	$260	Any AC inverter power station of similar size works. See Power section for runtimes.

Nice to have

Item	~Price	Notes
Outlet digital timer	$16	Digital, not mechanical (no ticking). A corded plug keeps the C300's other outlets clear; its two outlets switch together, so fan only.
Flexible 4″ caps, 2-pack	$14	Transport/storm caps for the fan openings.
Waterproof travel bag for SOLIX C300	$33	Not super durable, but it helps carry and protect the battery in transit and around camp. Front and sides must be unzipped while running.
Fine-dust filter media	$13	PC filter foam taped over the C300's vents to keep dust out of the internals.

Item	~Price	Notes
[100W+ solar panel, 11-28V, XT60 (optional, have?)]	$65	A 100W+ panel recovers most of a day's use on a clean day (estimated, not yet field-validated). Produce your own power, or shuttle the battery to the camp charging station every day.
[1+ gallon water jug]	$16	Keep by the cooler to refill the tank in the morning if it runs dry.

Total: ~$140 to upgrade from v2; ~$225 for a full build minus the battery; ~$485 with the power station; ~$640 with every extra. Comparable all-in to v1/v2 once its electronics-box parts are counted.

Tools

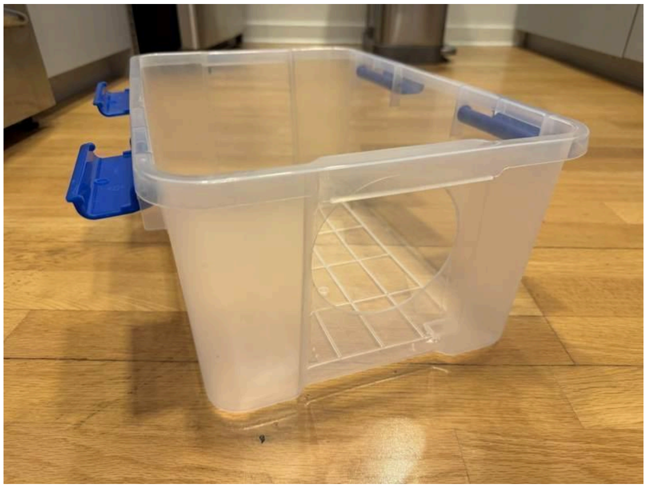
- Drill with a 4″ hole saw (fan opening) and a 3.5″ hole saw (vent openings)
- Small drill bit (~5/64″) for the wire-rack holes; also useful to pre-drill a pilot hole for each hole-saw cut
- Coarse sandpaper (~80-120 grit) to smooth the cut edges; optional second pass with finer grit. Seems to work at least as well as a rotary/Dremel tool for this material.
- Box cutter / utility knife: trim larger saw artifacts off the lid, cut the hose PVC to length
- Wire cutters: to cut the hose's steel helix and the stainless wire
- Flathead screwdriver or 5/16″ nut driver for the worm clamps. NB: Needed on playa unless you borrow one or use the hand-tightened ones.
- Permanent marker
- Eye protection and an N95 mask or better while cutting to protect against airborne microplastics.
- Supplies to prevent or clean up a mess of microplastic moop around the cutting area.

Build (at home, ~2-3 hours)

1. The tote

1. Cut one 4″ hole in an end wall of the tote for the fan; the rubber coupler seats through it. Cut it as high as practical while still clearing the lid to maximize water capacity below it. Confirm the size against your actual coupler and optionally measure and mark the center before cutting.

NB: Be careful when reaching the end of the cut and go slowly. The cut piece can get stuck in the saw and jerk your hand.



4″ fan hole in the end wall, as high as the lid allows.

2. Cut two 3.5″ vent holes in the lid at the far end, for cooled air out into the tent. Be careful here too.

Two 3.5″ vent holes in the lid, at the end opposite the fan.

3. Sand every cut edge smooth; optionally trim large saw artifacts with a box cutter first. Smooth edges help the coupler seat. Light pressure goes a long way.
4. Wire rack: on each long wall, drill two ~5/64″ holes roughly 3.75″ and 8″ from the vent end. Thread ~38″ of stainless wire through to form a D shape (straight along the walls) and curving around the vent end. Twist the ends on the intake side (the left side of the D) to hold the shape together.

Drill two wire holes on each side roughly halfway up the wall, then thread the wire into a D shape.

5. The wicks come as closed loops: cut each in half into flat sheets. Stand 3 inside the wire, following the D so they press against the walls and air cannot bypass them. Keep the vent end clear so the last wick does not block the lid openings. The wicks should be pressed tight against the lid ceiling.

Cut each wick loop in half, stand the halves inside the wire, and check that the lid vents stay clear of the last wick.

2. The fan

1. Seat the Noise Reduction Clamp (rubber coupler) into the wall hole and clamp the H4’s discharge collar into it. The rubber sleeve is the gasket, the vibration isolator, and the mount all at once.

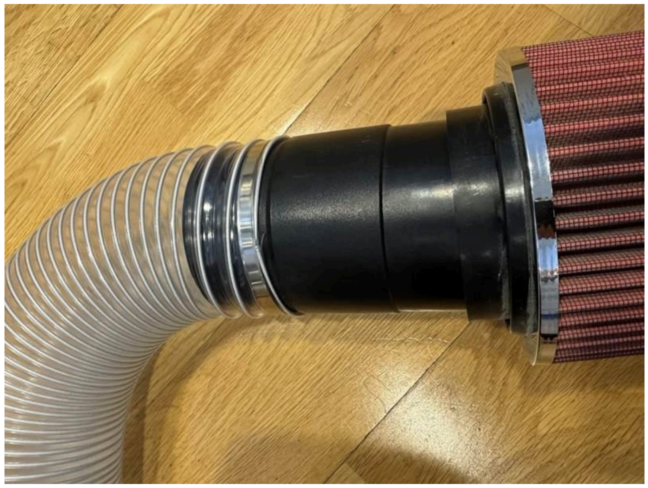
The rubber coupler seated through the tote wall.

2. Check the airflow arrow on the fan housing: it points INTO the tote.

The rubber coupler joining the H4 discharge to the tote wall, worm clamp snugged.

3. Intake hose and filter

1. Cutting the hose is optional: I cut mine to ~5 ft for a Coleman 6P setup, but longer keeps flexibility. Keep a factory cuff on the fan end, and run it stretched rather than accordioned; compression adds friction, though at this length the penalty is small. Don't leave the hose twisted or kinked.
2. Cuff the hose over the H4 intake collar, and add a stainless clamp over the cuff. The cuff's interference fit + clamp is dust-tight; no tape needed.
3. Join the hose to the cone filter with the 4″ connector. Seat into the cone's neck, cuff the hose over it, and clamp both.



Hose-to-connector-to-cone-filter joint. Wire-reinforced PVC hose holds round under suction and takes a clamp properly.

4. Optional: prep a milk crate or stake to hold the filter outside the tent, off the ground where ground dust won't be sucked into the intake. I leave it on top of an unused cargo tote sitting outside my tent.

4. Through the tent

The hose passes through the tent door zipper (v2 style: zip the door around the hose) or, if you want to be extra, a zipper-mounted vent plate that seals the gap (see the Improve3D zipper vent, or a stove-jack port for a permanent solution). The tote and fan sit INSIDE the tent; only the hose and cone filter live outside. For tent exhaust aim for one partially-open ceiling vent flap, sized modestly so the tent holds slight positive pressure, and ideally on the opposite end of the swamp cooler. You can consider putting a MERV 13 furnace filter in front of it for better dust isolation when open. If you have a second back tent door or zippable window, routing this through that opening and keeping it closed is less annoying than zipping your front door around it every time you go in and out.

Finishing touches

- At the first water fill, mark the fill line on the tote wall with a permanent marker: water just below the fan opening (~5L in this tote). Keep the C300, timer and plugs out of the tote's spill path, and unplug the fan before filling or moving the tote.
- Tape fine-dust filter media over the C300's vents to keep dust out of the internals (e.g. DustEND G3 PC foam sheet). At this build's tiny output loads the restriction is harmless; while solar-charging at the full 100W in heat, check that the unit stays cool.
- If bringing a solar panel, test the connection and the charging at home before packing.
- Critical: download the Anker app and turn OFF power-saving / AC auto-off in settings before leaving home (see the Power tab).

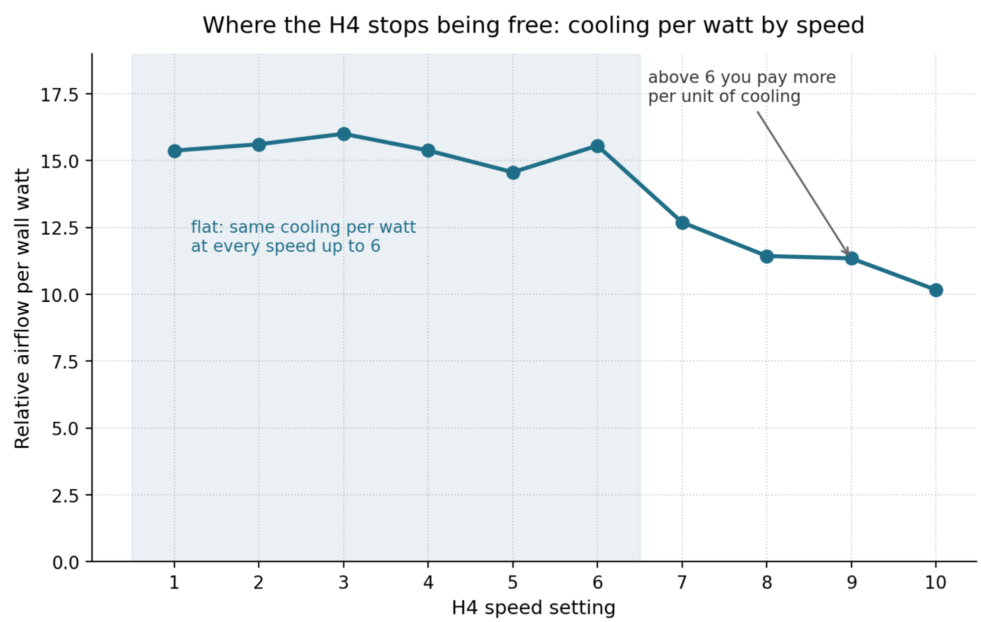
🔋 Power & water

Power: what to expect from a SOLIX C300 (288Wh)

All figures from Kill A Watt measurements and battery runtime experiments on this exact build. Wall draws are long-run averages; the instrumented session's spot readings ran slightly higher (3.5 / 10.1 / 30W). Wall draw is the fan alone; battery drain includes the C300's inverter overhead (~10W in practice, rising slightly with load), which is why low fan speeds cost proportionally more from the battery than their wall watts suggest. Runtime figures come from speeds 1, 5 and 10. I expected a cooling sweet spot at some middle speed -- the idea being that faster air spends less time against the wet media and comes out less cold -- but measurement did not support it: saturation efficiency was flat across all ten speeds. Cooling therefore scales with airflow, and choosing a speed is purely a noise and power decision, not a cooling-quality one. Measured power drains:

Fan setting	Wall draw	Approx. battery drain	Full-pack runtime	Noise
Speed 1 (10%)	3W	4.0%/hr	~25h	39 dB @6ft (room noise floor)
Speed 5 (50%)	9W	7.7%/hr	~13h	47 dB @6ft
Speed 10 (100%)	28W	14.8%/hr	~7h	57 dB @6ft

Airflow per wall watt turns out to be flat from speed 1 through 6 and then falls off — climbing to roughly 50% more per unit of cooling by speed 10. (That is fan wall watts; battery-side, the inverter's fixed overhead shifts the picture — see above.) So speeds 1-6 are effectively free to choose between, and 7-10 are a deliberate expenditure.



- **Typical day:** run the fan at 50% from a plug timer starting ~6:30-7am; that is the run that lets you sleep in. Expect ~4h ≈ 30% of the pack.
- **Bursts:** 100% is for rapid manual cooling when you're in the tent; it is louder and drinks roughly double the power and water.
- **Unattended:** optionally dial down to speed 1 when leaving for the day. It holds a filtered dust-positive trickle for ~4%/hr — about half what speed 5 costs, so roughly 30% of the pack saved across a full day away. Dial back to 5 at bedtime so the morning timer wakes it at the right speed. I run an air purifier overnight to cover the gap.

- **Critical setting:** turn OFF the C300's power-saving / AC auto-off in the Anker app before you leave home, or the inverter will kill the fan under light load every 10-20 minutes and no timer will revive it. Downloading the app on playa is non-trivial. The cost of leaving it off: the inverter keeps idling at roughly 10W whenever nothing is drawing. You get most of that back by switching the C300's AC output off by hand for the hours you are out and nothing needs to run — worth about 23% of the pack a day — then switching it on again before you sleep so the morning timer fires. Check that your timer resumes its program after the power comes back; mine does, but test yours.

Recharging: budget on refilling the pack every day. The cooler on its own roughly breaks even against a clean day of sun; add the optional overnight air purifier and the budget goes negative, so plan a shore-power top-up every day or two. A fixed-lean 100W+ panel recovers most of a day on a clean day (estimated, not yet field-validated, and the workbook's figure assumes an over-provisioned 130W panel; the C300 clips input at 100W); camp shore power refills it in ~1-2 hours, so solar is optional. Keep the battery shaded; the C300 stops charging above 104°F / 40°C (Anker's spec). Consider how to place it ahead of time, e.g. on stands or zip-tied to the aluminet, as well as placement relative to the direction the sun comes from. If you want to maximize charging, you can overprovision with higher-wattage panels for more effective charging in sub-optimal conditions. The battery's MPPT controller will just clip it if incoming wattage exceeds 100W — but panel voltage must stay inside the 11-28V window, including open-circuit on cold mornings.

Water

- Rule of thumb from yurtcooler.com: about 2 hours of cold air per gallon. At the H4's 50% airflow, expect roughly 2-4 hours per gallon; less in peak heat or at higher speeds. The airflow measurements independently predict about 4 hours per gallon at speed 5 and about 2 at speed 10, which brackets the v1 rule neatly.
- The tote holds ~1.3 gal below the fan opening; saturating the wicks absorbs a little extra on first fill.
- A full tank may cover the 4-hour morning run (~1 gal), but it is borderline: by the v1 rule a hard-running morning would outpace it. Keep a full jug by the tent for a late-morning top-up when needed.
- Budget 1-2 gal/day at this usage pattern.

⛺ On playa

Suggested daily routine

Plug timer: one program, ON 6:30am / OFF 8:00pm, all days, left in AUTO (hold MANUAL ~4s to set the mode; a short press is a temporary override). Fan dial lives at speed 5 or your preferred sweet spot.

1. 6:30am: timer powers the fan; it wakes at its last-set speed and cools the tent while you sleep in.
2. Leaving for the day: dial down to speed 1. The tote runs dry through the afternoon as a filtered-air trickle at about half the battery cost.
3. 8:00pm: timer kills the fan on its own. Switch the C300's AC output OFF once the fan stops if you are heading out for the evening: the inverter idles at roughly 10W doing nothing, which is about 23% of the pack across a six-hour evening. Switch it back on when you get home, and confirm the timer has picked its schedule back up. If you run an air purifier, run it while you are actually in the tent asleep rather than during the evening you are out — running it to an empty tent spends the pack twice, once on the purifier and once on the inverter it forces to stay awake. If you don't want to bother with the positive pressure, schedule it to turn off at the latest time you might get out of bed.
4. When you get home: fill water to the marked line, dial back to 5 for the morning timer, and sleep.
5. Storm day (weak solar): shorten the purifier window and skip discretionary loads as needed. The daily budget is thin — on the workbook's estimates the full routine outruns even a clean day of solar — so plan on a shore-power top-up, an over-provisioned panel, or a shorter purifier window.

Dust, transport, teardown

- Optional: cap the fan openings with the rubber caps when the hose comes off, especially if teardown coincides with a storm.
- Optional: shake out the cone filter after big storms or if airflow noticeably drops. A week of typical playa use does not meaningfully clog it.
- Keep the C300 clean, ideally in a ventilated tub, in shade, and off the ground. The travel bag (see Nice to have) protects it in transit and around camp; unzip the front and sides while it runs.
- Everything packs into the cooler tote plus a second tote the same size: fan, wicks, cords and timer in one; hose and cone filter in the other, coiled loosely and never creased.

Everything packs into the cooler tote and a second tote the same size: fan, wicks, cords and timer in one (plus extra stuff for padding); hose and cone filter in the other. Coil the hose loosely rather than kinking it.

🔧 Troubleshooting

Fan didn't come on in the morning. Check the C300's power-saving / AC auto-off, which kills the inverter under light load. Turn it off in the Anker app before you leave home. Otherwise: timer not left in AUTO, timer's backup battery dead, or the pack simply ran empty overnight.

Air isn't cold. Check the tank first -- dry wicks cool nothing. On the first fill, give the wicks a few minutes to saturate before judging. If water is present and it is still weak, look for air bypassing the wicks rather than passing through them: they should press against both walls and the lid ceiling with no gap at the edges. Turning the speed down will not help -- measured efficiency showed no speed trend, so lower speed just means less cooling.

Tent feels humid rather than cool. Not enough air leaving. Open the ceiling vent further, or open one more. Cooled air has to have somewhere to go or you are just adding moisture to a closed box.

Water disappearing faster than expected. Normal at high speed and in peak heat. If it seems extreme, check that the fan hole is above the fill line and that nothing is wicking water out over the tote edge.

Dust getting in anyway. Positive pressure only works while the fan is moving real air. With the fan off or at speed 1 in a hard blow, the tent is just a tent. Check the cone filter is fully seated on its connector and both hose clamps are tight -- an unsealed intake joint pulls dusty air in downstream of the filter.

New rattle or buzz. Usually the hose touching the tote wall, the lid not fully latched, or the fan not seated all the way into the rubber coupler. A mat or towel under the tote kills resonance against a hard floor.

Airflow dropped over the week. Shake out the cone filter. If that does not fix it, the wicks may be loading with dust or mineral scale; they are cheap enough to bring a spare set.

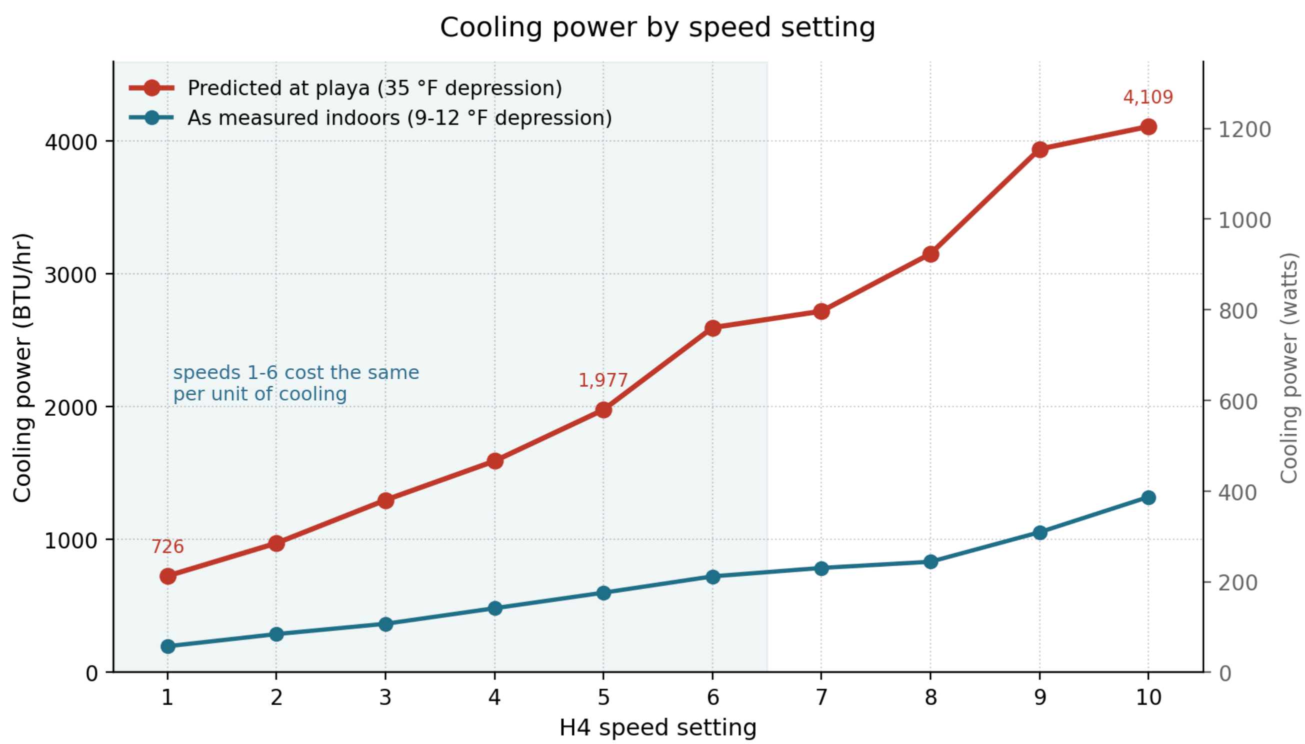
Solar not charging. The C300 stops accepting charge above 104°F / 40°C (Anker's spec), and a dark power station in direct sun hits that by late morning. Shade the unit even if the panel is in full sun. Also confirm the XT60 is fully seated and the panel's voltage is inside the 11-28V window.

📊 Measurements

Everything here comes from one instrumented session in August 2026: both fans on the same cooler, same wet wicks, minutes apart. Every reading, plus the method and its known weaknesses, is in the experiment spreadsheet linked below. Skip this tab if you just want to build the thing.

On cooling performance: the evaporative side of this build is unchanged from v1 -- same wick media, same water, same geometry. I measured saturation efficiency across all ten fan speeds and got roughly 80% (±15), essentially flat from speed 1 to speed 10. Saturation efficiency is the fraction of the available wet-bulb depression you actually capture, and it is the number that transfers between climates. At Black Rock, where a 100°F day at 10% RH gives a depression around 35°F, 80% predicts roughly 25-30°F below ambient at the discharge. For reference, v1 measured 13°F below outside shade temperature at high noon in a hexayurt. All of this was measured indoors in San Francisco, where the depression was only 9-12°F, so the efficiency figure carries real uncertainty and the playa number is a prediction rather than a measurement.

Because efficiency is flat, cooling output scales directly with airflow, so the speed dial is a noise and power control rather than a cooling-quality one. Turning it up gets you more cooling; it does not get you colder air. Converting the measured airflow into cooling power puts speed 5 at roughly 2,000 BTU/hr and speed 10 at roughly 4,100 BTU/hr under playa conditions -- about 580 and 1,200 watts of cooling respectively, from a fan drawing 10 to 30 watts. The energy comes from the water and the dry air, not from the fan.



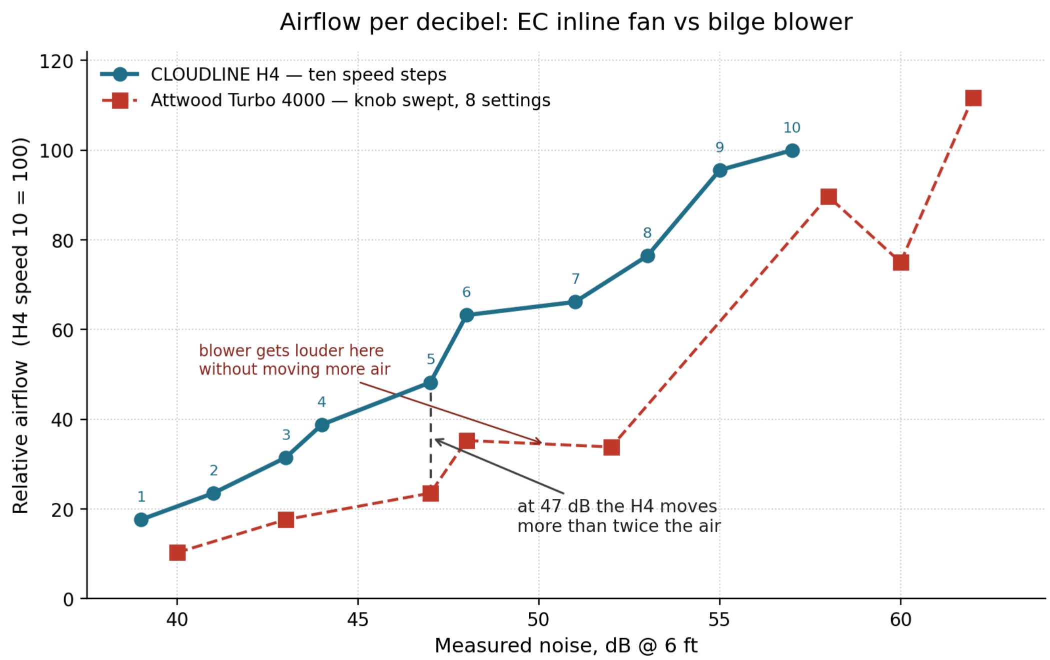
Cooling power by speed setting. Blue is as measured indoors; red scales it to a 35°F playa depression. Airflow anchored to the fan’s free-air rating — ballpark, not a calibrated measurement.

Those absolute figures deserve a caveat. My anemometer read low against the fan’s own free-air rating, so I scaled the airflow readings by anchoring the bare-fan measurement to the manufacturer’s 212 CFM spec -- a factor of about 5. That puts speed 5 at roughly 65 CFM in the wet system, which is close to what v1 reported, and implies water use of roughly 2 gallons a day at my usage pattern, in line with the 1-2 gal/day this design is known to consume. Those checks agreeing — with the Water tab’s hours-per-gallon bracket as a third — is why I am willing to print the numbers, but treat them as ballpark (±30%) rather than measured. They also assume sea-level air density; Black Rock’s ~3,900 ft elevation thins the air roughly 12%, well inside that ballpark.

What that translates to in a tent depends on your heat load, which I have not measured, but a few reference points help. A Coleman 6-person Instant Cabin holds roughly 540 cubic feet, so at speed 5 the cooler turns the air over about every 8 minutes -- every 4 minutes at speed 10, every 22 at speed 1. The community rule of thumb for tent cooling is an air change every couple of minutes, so at normal settings this is a zone cooler: it makes the air around you cold rather than conditioning the whole tent evenly. Park the cooler with its vent end next to where you sleep. For a more visceral sense of scale, speed 5 removes heat at roughly the rate of 14 pounds of ice melting per hour, and speed 10 about 28 pounds.

Steady-state tent temperature is a balance between the cooling going in and the heat coming in, and heat gain is the term that varies wildly with shade, tent colour and how often the door opens. The sensitivity is easy to state, though: at speed 5, every 700 BTU/hr of heat entering the tent eats about 10°F of the drop available at the discharge. That is why v1 measured 13°F below shade temperature rather than the 25-30°F coming out of the vents -- their result implies roughly 1,000 BTU/hr of gain in a shaded hexayurt. Shade is worth more than fan speed. An unshaded tent in full playa sun will swamp anything this cooler can deliver.

Time to cool is bounded by the same air-change figure. With no heat load at all, tent air would get most of the way to discharge temperature within two or three air changes, so 15 to 25 minutes at speed 5. In the sun it never fully gets there; it settles wherever cooling and heat gain balance out. Practically, that means starting the cooler before the tent is hot is worth more than running it harder once the tent is already hot.



Both fans on the same cooler, same wet wicks, measured minutes apart. Airflow is relative only — absolute CFM unresolved.

In practice, noise is the limiting factor on v1/v2, and the blower does not adjust smoothly. Sweeping the potentiometer produces plateaus with steep jumps between them, so you end up parked just below whichever cliff you can tolerate. It is somewhat more continuous with wet media than dry, but plenty of intermediate positions still are not worth using. I swept it at eight settings from 40 to 62 dB, all wet at 6 ft; the ones worth parking on cluster at 48, 58 and 62. The H4 moves smoothly across its ten steps -- roughly 2 dB per step from 39 dB at speed 1 to 57 dB at speed 10 -- so you can trade noise for airflow in small increments rather than choosing between plateaus. Speed 1 sits at my room’s noise floor: whisper quiet.

I ran both fans on the same cooler, same wet wicks, minutes apart, with a hot-wire anemometer in the intake duct. Across the quiet-to-middle range where you would actually sleep -- 43 to 53 dB -- the H4 moves roughly 80 to 105% more air at the same measured noise. At 47 dB, an exact match, it moves more than double. The gap narrows at the top: at 57 versus 58 dB the two are within about 10% of each other. So the H4’s advantage lives in the quiet range, which is where you actually want to run, and since saturation efficiency is flat across speeds, more air is directly more cooling. The blower does reach 40 dB, quieter than I expected, but it moves very little air there -- about 40% less than the H4 at a comparable 39 dB.

One caveat on the airflow numbers: the anemometer read consistently low against the fan's free-air rating, so I am reporting airflow as relative rather than absolute. Every comparison here is a ratio between two readings taken the same way, which survives a constant scale error; the absolute CFM does not, and remains unresolved.

Every reading behind these numbers, plus the method and its known weaknesses, is in the experiment spreadsheet.

How much does the cooler restrict the fan? Measuring the same fan bare, then with the box and hose attached, then with media in it, all on the same instrument (the bare-fan reference probed at the fan outlet, the rest in the intake duct): the box, hose and lid holes cost about 13% of free-delivery airflow, and wet media costs a further 26 points, so the complete wet system passes roughly 60% of what the fan moves with nothing attached. That is an ordinary figure for a ducted cooler, and it held at speeds 2, 5 and 10. Electrically the media is free: wet and empty drew the same 10.1W at speed 5, and at speed 10 the fan actually pulled slightly less with media in than without, which is what a fan does when it works against more resistance. So the media is the bigger restriction to airflow while costing nothing in watts.

One result I cannot explain: dry media restricted more than wet, not less. Wet wicks passed roughly a third more air than dry ones at every speed (23% at speed 2, 36% at speeds 5 and 10), and the blower showed the same thing even more strongly. Two fans, three speeds, same direction. It may be that my dry spares are a fresh, denser set while the wet ones have been through a few cycles, or that wet cellulose relaxes and opens up in the rack. Flagging it rather than concluding anything.

Worth noting that noise is a property of the fan, not the load: the H4 read 46-47 dB at speed 5 whether the box was wet, dry, or empty, and 56-58 dB at speed 10 across all four configurations. So the shape of the noise curve — and its indifference to load — should hold in anyone else's build; absolute dB will vary with room and meter.

The blower also does not hold a setting cleanly: it surges in speed and noise unpredictably, noticeably worse with wet media than dry, and its noise is higher-pitched and whinier than the H4's at the same measured level. Tonal noise is harder to sleep through than broadband at equal decibels, so the dB figures understate the difference. That instability shows up in the measurements too: sweeping the knob, the blower is not monotonic. Going from 48 to 52 dB, and again from 58 to 60 dB, buys more noise and no more air.

📜 Credits

v1: the original Yurt Cooler design and wick-filter concept, yurtcooler.com (Luke Allen and Chris Gervang).

v2.1: mods by Oskar Arvidsson (oskar@arvidsson.co): moved the cooler inside the tent with the cone inlet filter outside, packed the whole build down into its own box for transport, and swapped the 12V deep-cycle battery for a solar panel and USB-PD power bank.

v2.2: Joanna Ma's no-cut ducted intake (joanna.m.ma@gmail.com): flexible duct, connector and clamps so the intake reaches outside through an existing opening, for tents you cannot cut a hole in. Also the programmable 12V timer with its autolock workaround, and the on-playa assembly and operating instructions.

v3 (this doc): Alex Degtiar (alexdegtiar@gmail.com). CLOUDLINE H4 EC fan replacing the bilge blower and hand-wired PWM, AC power architecture, PVC dust hose and rubber couplers, outlet-timer scheduling, and the measurements: battery runtimes at each setting, both fans compared on the same cooler for airflow against noise, saturation efficiency across the speed range, and the restriction the box and media impose on the fan.

Build log
2026:

- First v3 build, replacing the bilge blower with a CLOUDLINE H4 on a SOLIX C300.
- Replaced rigid plastic/aluminum connections with vibration rubber.
- Ran experiments: battery runtimes at each setting, Kill A Watt power draws, and an overnight instrumented session (thermohygrometer + hot-wire anemometer) comparing both fans wet, dry and bare on the same cooler. Data linked above.
- Hose cut to ~5 ft for a Coleman 6-person Instant Cabin.