The Bike: Locked Specification

Status: LOCKED, 9 October 2026. One revision before the master frame was fixed, same day: the front light slot wraps onto the flanks of the head-tube node (section 6), a side-visibility refinement; nothing else moved.

Canonical master frame: `Extras/hero-side-profile.png`. Every later frame of the bike is made with that file as its reference. One true form. Every render, every number in the identity work and the launch book descends from this sheet. A frame whose pixels contradict this sheet is a defect and is re-made, never explained away.

Register: technical and precise. Leica, Porsche Design, Unno. Nothing decorative; every line carries load, current or light.

Concept status: this is a concept product. Figures marked *design target* are honest engineering intent for a prototype, not tested results. Figures marked *supplier* are the drive-unit maker's published numbers, read on its own page (source at the foot).

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1. The idea in one paragraph

A city bike built around a sealed gearbox. A motor and a 12-speed transmission share one housing at the bottom bracket, so the rear of the bike carries nothing but a single belt sprocket: no derailleur, no cassette, no chain, no oil on a trouser leg. The frame is a straight-tube triangle of 6061 aluminium joined by CNC-machined 6061-T6 nodes, hard-anodised matte black, with the machined edges of each node diamond-cut back to bright metal. The battery is concealed inside an oversized down tube, honestly: you see the tube and its machined end cap, never a bolted-on box. Lights live inside the structure. The drivetrain is the jewellery.

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2. Frame architecture

Item	Locked decision
Architecture	Classic closed diamond: straight horizontal top tube, straight seat tube, large straight down tube, straight seat stays and chain stays. No step-through, no curved tubes, no suspension.

Item	Locked decision
Tubes	6061-T6 aluminium. Top tube and stays round-section; down tube a large rounded-rectangle section (approx. 70 × 58 mm) that houses the battery.
Nodes	Four CNC-machined 6061-T6 nodes, welded to the tubes: (1) head-tube node, (2) seat-cluster node, (3) drive-unit cradle at the bottom bracket, (4) rear dropouts. Each node shows its milled facets and a diamond-cut chamfer of bright raw aluminium along its edges.
Belt split	Drive-side seat stay carries a machined, bolted split link just above the dropout (two exposed hex-socket bolts) so the one-piece belt can be fitted. Shown, not hidden.
Rear dropouts	Machined sliding dropouts with an exposed tension bolt, for belt tension. 12 × 142 mm thru-axle.
Fork	Rigid aluminium, two straight tapered blades, machined crown, 12 × 100 mm thru-axle, flat-mount disc. Same black finish.
Joining	TIG-welded, welds dressed smooth at the nodes. Nodes and tubes share one alloy (6061-T6), so the welds are sound and heat-treat uniformly after fixturing.
Fasteners	Exposed stainless hex-socket (Allen) bolts, black-oxide finish, where they do work: the drive-unit cradle (six bolts), the belt split (two), the stem clamp, the dropout tensioners. Never decorative bolts.
Mounts	Hidden threaded bosses for fenders, rack and stand exist; NONE are fitted in the canonical configuration.

3. Drive

Item	Locked decision
Drive type	**Mid-mounted motor-gearbox unit.** The motor and a 12-speed gearbox in one sealed housing at the bottom bracket.
Drive unit	Pinion MGU E1.12 (supplier). Held in a two-piece machined aluminium cradle; the outer face of the cradle is what the eye sees, a round-cornered matte-black housing with six exposed bolts.
Gears	12, electronic shifting, 600 % range, ~17.7 % steps (supplier).
Torque	85 Nm competitive torque (supplier); up to 160 Nm at the rear wheel in the lowest gears (supplier).

Item	Locked decision
Peak power	600 W (supplier, pedelec setting). Assist limited to 25 km/h in the EU pedelec build.
Drive unit mass	~4,100 g (supplier).
Q-factor	174 mm (supplier).
Service	Oil change after 10,000 km (supplier). Belt: no lubrication.
Final drive	**Belt.** Gates Carbon Drive CDX CenterTrack, 12 mm wide, 11 mm pitch, black. Front sprocket on the drive unit, single rear sprocket on a plain hub. Sprocket pair: design target 24T front / 28T rear, final ratio to be set against the supplier's ratio guidance.
What is NOT there	No chain. No derailleur. No cassette. No chain guard. No front chainring of a chain drive.
Cranks	Forged aluminium, matte black, 170 mm. Flat aluminium pedals, black.

4. Battery

Item	Locked decision
Decision	**Concealed, honestly.** The cells live inside the down tube; nothing is bolted to the outside of the frame.
Cells	13s3p, 21700 lithium-ion cells, 48 V-class nominal (13s ≈ 46.8 V). Voltage match to be confirmed against the drive-unit supplier's documentation.
Capacity	~670 Wh nominal (*design target*).
Removal	Drops out of the underside of the down tube, ahead of the drive unit, after unlocking. The visible trace is a fine machined split line along the underside of the down tube and a milled end cap with a keyed lock.
Charge port	Sealed port with a machined aluminium cover on the non-drive side of the down tube, just above the drive-unit cradle.
Charge time	~4.5 h, 0–100 % on a 4 A charger (*design target*).

5. Cockpit and controls

Item	Locked decision
Bar and stem	One-piece machined aluminium bar-stem, matte black. Flat bar, 640 mm wide, 8° backsweep.
Display	A small circular display, 32 mm, set flush into the top face of the stem, glass flush with metal. Monochrome white on black: speed, assist level, gear, charge. Off, it is a black disc.
Controls	Two machined aluminium thumb remotes, one per side, each a small block with two backlit buttons. Left: assist up/down. Right: shift up/down (electronic). No twist shifter, no shift cables.
Brakes	Hydraulic disc, two-piston, black levers. Rotors 180 mm front, 160 mm rear.
Cables	All lines enter the frame at the head-tube node and run internally.
Grips	Black rubber, plain, with a machined aluminium outer collar.
Bell	Integrated as a tone from the display unit; no separate bell in the canonical configuration.

6. Lighting

Item	Locked decision
Front	A slim white LED slot milled into the head-tube node: a horizontal bar across the front face (~60 mm) that wraps round onto both flanks of the node as a short vertical slot, so the bike is seen from the side at a junction as well as head-on. Flush; no lamp housing, no bracket.
Rear	A horizontal LED slot, ~40 mm wide, milled into the rear face of the seat-cluster node, below the saddle. Red. Flush.
Power	From the main battery, always on with the system.

7. Wheels and contact points

Item	Locked decision
Wheel size	**700c (ISO 622)**, both wheels.

Item	Locked decision
Rims	Aluminium, 25 mm internal, matte black, 28 spokes, black spokes.
Tyres	700 × 50 mm (ISO 50-622), smooth city tread, all-black sidewall.
Hubs	Front: plain 12 × 100. Rear: plain single-sprocket 12 × 142 (all gearing is in the drive unit).
Saddle	Slim black saddle, flat profile.
Seatpost	30.9 mm aluminium, matte black, clamped in the seat-cluster node.

8. Finish and colourways

	A. Graphite (canonical)	B. Raw
Frame + fork	Hard-anodised matte black, fine bead-blasted surface	Clear-anodised natural aluminium, bead-blasted satin grey
Node chamfers	Diamond-cut to bright raw aluminium	Diamond-cut to bright aluminium (higher polish against satin)
Drive cradle, bar-stem, cranks, rims, tyres, belt	Matte black	Matte black (same parts)
Fasteners	Black oxide	Black oxide

No graphic, no stripe, no decal on either colourway. The only mark the frame will ever carry is added later as an identity layer; every render leaves the surfaces blank.

9. Geometry (size M, rider 172–184 cm)

Measure	Value
Seat tube (centre to top)	520 mm
Effective top tube	585 mm
Reach	400 mm
Stack	620 mm
Head-tube angle	70.0°
Seat-tube angle	73.5°

Measure	Value
Head tube length	160 mm
Chainstay	455 mm
BB drop	70 mm
Fork offset	50 mm
Wheelbase	~1,130 mm
Standover	~810 mm

Sizes S, M and L; the canonical renders are size M.

10. Headline figures (the numbers every surface must agree with)

Figure	Value	Basis
Weight, complete bike, size M	**21.5 kg**	*design target*
Battery	**~670 Wh**	*design target*
Range	**60–120 km** (mode and terrain dependent)	*design target* (≈ 5.5–11 Wh/km)
Torque	**85 Nm**	supplier
Gears	**12**, 600 % range	supplier
Assist speed	**25 km/h** (EU pedelec)	regulatory
Final drive	**Belt**, Gates CDX	supplier
Wheels	**700c × 50 mm**	locked
Service interval	**10,000 km** drive-unit oil change; belt needs no lubrication	supplier

11. The render checklist (every frame is held against this)

1. Belt, never chain. One thin black toothed belt, straight between two sprockets. No derailleur, no cassette.
2. Compact black drive unit at the bottom bracket in a machined cradle with exposed bolts.

3. Large straight down tube; NO external battery pack anywhere.
4. Straight horizontal top tube; closed diamond triangle; rigid straight-blade fork.
5. Two 700c wheels, black rims, black 50 mm smooth tyres, disc rotors front and rear.
6. Flat bar, one-piece bar-stem; no headlamp housing, no bracket; light is a flush slot in the head-tube node, visible on its flank in side view.
7. NO rack, NO fenders, NO kickstand, NO basket, NO bottle cage, NO bell, NO reflectors.
8. NO text, NO logo, NO decal, NO badge anywhere on the bike.
9. Bright diamond-cut chamfers on the machined nodes; everything else matte.

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12. The canonical frames (the one true form)

Every later frame of this bike is made with these as references. Name `hero-side-profile.png` first in every reference call; add the detail that matches the shot.

Frame	Path
Side profile, Graphite (MASTER)	`Extras/hero-side-profile.png`
Front three-quarter, Graphite	`Extras/hero-three-quarter-2.png`
Side profile, Raw colourway	`Extras/colorway-raw-side-profile.png`
Drive unit and belt, macro	`Extras/detail-drivetrain.png`
Cockpit, rider's view	`Extras/detail-cockpit-3.png`
Seat-cluster node, finish and rear light	`Extras/detail-finish-node-2.png`
The set on one sheet	`product/hero-set-overview.png`

Known liberties in the master at macro scale (invisible at plate size, named so nobody copies them into a drawing): the belt's lower run shows its teeth on the outer face, and a rear disc rotor reads through on the drive side. The drivetrain macro is the correct reference for belt and sprocket detail.

Sources for supplier figures

- Pinion GmbH, Motor.Gearbox.Unit page, "Hard Facts" table and feature text, read 9 Oct 2026: pinion.eu/en/e-drive (12 gears, 600 %, ~17.7 % steps, ~4,100 g, Q-factor 174 mm, 600 W peak, 85 Nm competitive torque, up to 160 Nm at the rear wheel, oil change after 10,000 km).

- Gates Carbon Drive CDX CenterTrack belt (12 mm width, 11 mm pitch): Gates Carbon Drive technical manual as surfaced in search, not read on Gates' own page in this sitting; re-check before print.