

12 V DC VEHICLE INPUT · 48 / 60 V AC TO PDLC PANEL

CZ

Vehicle / Marine Power Adapter

Three sub-variants for cars, motorhomes, boats and special-purpose mobility



CZPJ20A

Single channel · fixed 48/60 V AC out · basic
car / boat use



CZ4L20A

4-channel · drives up to 4 panels independently
· executive cabin / partition glazing



CZD20A

Dimming · variable transparency · luxury
automotive sunroof / privacy

DOCUMENT

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PRIVASEE® Group · UK

UAE/GCC: S O R S Reflective LLC

info@privasee.uk

01 What it is

★ IN ONE SENTENCE

The **CZ family** is the PRIVASEE® power adapter range built for **vehicles and marine applications** — it runs from a 12 V DC supply (the vehicle's battery / leisure system) and delivers the 48 V or 60 V AC needed to switch a PDLC smart-film panel. Three sub-variants cover different use cases.

WHERE IT IS TYPICALLY USED

- Automotive sunroofs and rear quarter-light windows that need switchable privacy
- Limousine and executive-vehicle internal partitions
- Motorhome / RV cabin glazing for privacy / shade on demand
- Marine yacht cabin and saloon glazing
- Special-purpose mobility (ambulances · diplomatic vehicles · airport ground vehicles)
- Aircraft cabin partitions where 12 V DC is the available bus voltage

THE THREE SUB-VARIANTS

SUB-VARIANT	CHANNELS	OUTPUT TYPE	BEST FOR
CZPJ20A	Single channel	Fixed AC 48 / 60 V (on/off)	One privacy panel · basic car install · simplest wiring
CZ4L20A	4 channels	Fixed AC 48 / 60 V (on/off, per channel)	Multi-window vehicle · 4 panels switched independently or together · limousines
CZD20A	Single channel	Variable AC 0 – 48 / 60 V (smooth dimming)	Premium automotive · adjustable transparency · sunroof feature

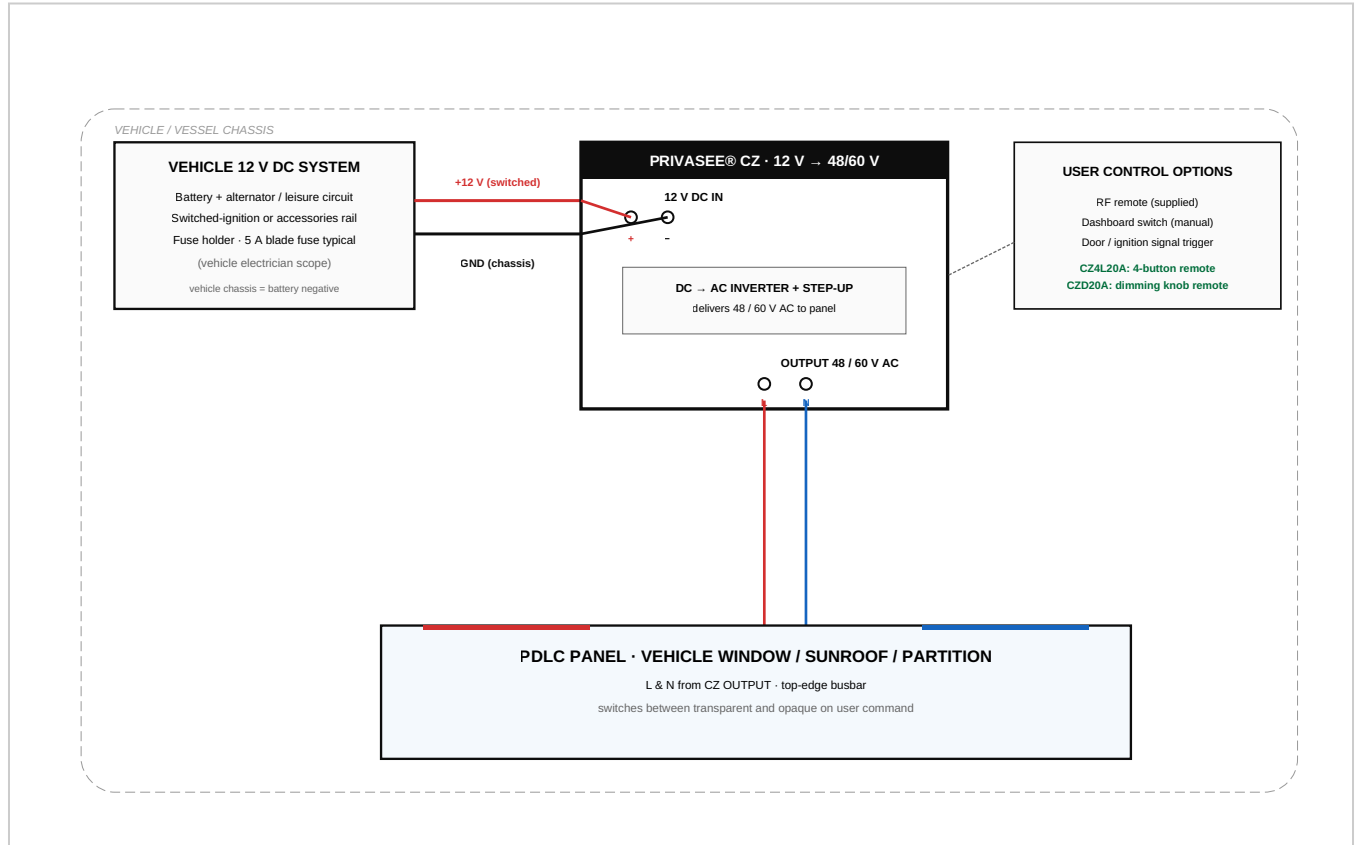
All three sub-variants share the same chassis size and the same 12 V DC input. Output rating is 20 W (sufficient for typical vehicle-cabin panel sizes). For larger architectural installations above 20 W use the standard mains-powered families instead.

WHAT STAYS THE SAME AS THE BUILDING-MOUNT RANGE

- The PDLC panel itself is identical — same film, same busbar, same TOSSEAL silicone
- The output is 48 V or 60 V AC (the same voltage every PRIVASEE PDLC panel needs)
- The user controls (RF remote · manual switch) work the same way

02 How it connects in a vehicle

The CZ adapter sits between the vehicle's 12 V DC electrical system and the PDLC panel. It draws its supply from a switched 12 V circuit (typical "ignition" or "accessories" feed) and outputs the AC needed by the panel.



★ READING THE DRAWING

The CZ adapter takes 12 V DC from the vehicle's switched-ignition rail (or leisure circuit on a motorhome / yacht), inverts and steps it up to 48 V or 60 V AC, and sends it to the PDLC panel via the same L & N output the building-mounted PRIVASEE® drives use. The user controls the panel using the supplied RF remote, a dashboard / cabin switch, or an ignition / door signal depending on the install.

03 Specifications & bill of materials

COMMON SPECIFICATIONS ACROSS ALL THREE SUB-VARIANTS

PARAMETER	VALUE
Input voltage	12 V DC nominal · 11 – 16 V DC operating range
Output voltage	48 V or 60 V AC (specified at order; matches the chosen PDLC panel)
Output power	20 W
Recommended panel area	Up to ~2 m ² @ 80 % rule (PDLC current density ~10 W / m ²)
Operating temperature	-20 °C to +70 °C (vehicle-grade · wider than building drives)
Storage temperature	-30 °C to +80 °C
Operating humidity	10 – 95 % RH non-condensing
Protection	Short-circuit · reverse-polarity (typical PTC thermistor)
Mounting	4 fixing holes on flange · vibration-resistant bracket recommended for road use

SUB-VARIANT DIFFERENCES

ITEM	CZPJ20A	CZ4L20A	CZD20A
Channels	1	4 independent	1 (with dimming)
Output behaviour	On / off	On / off per channel	Smoothly variable 0 – 100 %
Supplied remote	Single-button RF	4-button RF (one per channel)	Knob remote (rotary dimming)
Best fit application	Single window panel	Limousine partitions · 4-window vehicle	Sunroof · luxury automotive privacy
Wattage budget	20 W to one panel	20 W shared across 4 channels (~5 W each)	20 W to one panel · variable level

BILL OF MATERIALS · PER PANEL INSTALLATION

REF	ITEM	QTY
U1	PRIVASEE® CZ adapter (CZPJ20A · CZ4L20A · CZD20A — pick per use)	1
—	Vehicle 12 V DC fused tap (5 A blade fuse, switched-ignition or leisure feed)	1
—	RF remote handset (supplied with the adapter, paired ex-works)	1
W0	12 V DC supply cable from fused tap to CZ adapter input · 2-core 1.5 mm ² automotive cable	per run
W1	Output cable from CZ adapter to PDLC panel busbar · 2-core 1.0 – 1.5 mm ² LV cable	per run
—	Vibration-rated mounting bracket / cable ties for the adapter	1

E1	PRIVASEE® PDLC smart film panel (sized for the window / sunroof opening)	1+
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04 Vehicle / marine installation rules

WHERE TO MOUNT THE ADAPTER

- Inside the vehicle / vessel cabin or in a sealed dry compartment — the CZ adapter is not waterproof
- Away from direct heat sources (engine bay, exhaust manifolds, heater outputs)
- On a vibration-damped bracket if the install is in a wheel-well or on the chassis — not directly on bare metal
- Reachable for service (RF remote re-pairing, sensitivity tuning on CZD20A) — do not bury behind permanent trim

POWER FEED RULES

- Take the +12 V from a fused, switched-ignition or leisure circuit — **do not connect direct to the battery without a fuse**
- Recommended fuse: 5 A blade fuse on the +12 V leg, as close to the source as practical
- Negative (GND) lands on the vehicle's chassis bond point or the leisure-system common return — **do not bond to the body skin or to any fuel-line earth**
- Use proper automotive-grade crimp lugs and heat-shrink — not domestic terminal blocks
- Keep the 12 V supply cable separate from any LV antenna / signal cable to avoid radiated noise

OUTPUT CABLE RULES

- Run the 48 / 60 V AC output cable in a marked sleeve or conduit to distinguish it from 12 V DC and from low-voltage signal cables
- Use 2-core LV cable rated for the AC voltage and for cabin temperature range
- Keep the run as short as practical (under 5 m typical) to limit voltage drop on the AC side

EARTHING & SAFETY

■ DANGER · ISOLATE BEFORE WORKING ON THE PANEL

The CZ adapter outputs 48 V or 60 V AC. This is hazardous touch voltage in a damp / sweaty cabin. Always switch off the vehicle ignition (or the leisure-system master) and verify dead with a multimeter at the panel busbar before any work on terminals.

▲ WARNING · CZ OUTPUT IS NOT CHASSIS-BONDED

The 48 / 60 V AC output is galvanically isolated from the vehicle's 12 V DC system. Do not bond either output leg to the vehicle chassis. Keep the panel side strictly insulated from the body metalwork.

▲ WARNING · MARINE WET ZONES

For yacht / motorhome installations near galleys, heads or wet lockers, mount the CZ adapter in a dry locker and run the output cable through a sealed gland into the wet zone. The PDLC panel itself is sealed, but the adapter must remain dry.

RF REMOTE / CONTROL COMMISSIONING

- The supplied RF remote is paired ex-works — just install the battery and operate

- If pairing is lost (e.g. battery removed for a long period), follow the PAIR-button procedure printed on the adapter housing
- For dashboard-switch installs: the manual switch is wired across the adapter's SWITCH terminal pair (same dry-contact rule as the building drives)
- For ignition-trigger installs: route the switched-ignition signal (already 12 V) through a relay whose NO contact bridges the SWITCH terminal pair — the adapter sees a momentary closure each time the ignition state changes

05 Contact & document close

PRIVASEE® GROUP

UK OFFICE	PRIVASEE® Group · Sandbach, England · United Kingdom
EMAIL	info@privasee.uk
TELEPHONE	+44 7729 534416
UAE / GCC	S O R S Reflective LLC · United Arab Emirates
ENGINEERING	SORS GT UK LTD · Sandbach, England

COMPANION DOCUMENTS

DOC NUMBER	TITLE
PVS-SGS-DAT-CZ	CZ Vehicle / Marine Adapter — Product Datasheet (compact spec sheet)
PVS-SGS-TEC-01a/b	FM Smart Film Datasheet series (panel side)
PVS-SGS-QUA-01b	PRIVASEE® Smart Glass Warranty (GCC edition) — applies to the panel

REVISION HISTORY

REV	DATE	DESCRIPTION
1.0	2026-05-05	Initial release · CZ family (CZPJ20A · CZ4L20A · CZD20A) integration annex for vehicle / marine applications

DOCUMENT APPROVAL

ROLE	NAME	DATE
PRIVASEE® preparer	PRIVASEE® Smart Glass Engineering	2026-05-05 · DRAFT
PRIVASEE® approver	[awaiting founder approval]	—
Vehicle / marine electrician (qualified)	[name · qualification · date]	—

This annex covers the vehicle / marine application of the CZ family. It is a standalone document and does not reference building-mounted power drives. Comments to info@privasee.uk referencing *PVS-SGS-MAN-CZ-INT-01 Rev 1.0*.