acova

granPIero

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Preface

This is a Quarto book on **Repair of Acova Sèche-Serviette** (750W PCE-150-050-IFW).

https://www.radiateur-electrique.org/forum/post21937.html#p21937

1 Carte électronique

Le **Condensateur 470n K 310v~X2 339 MKP L1339** pas de 15 mm 9 x 17.5 X 15 mm est d'une capacitance de 470 nanofahrad or la mesure donne 200 nF => donc il est mort et coûte 1,90 € à remplacer.

https://www.rep-tronic.fr/produit/condensateur-mkp-x2-0-47%c2%b5f-470nf-474k-275v-15mm/#reviews

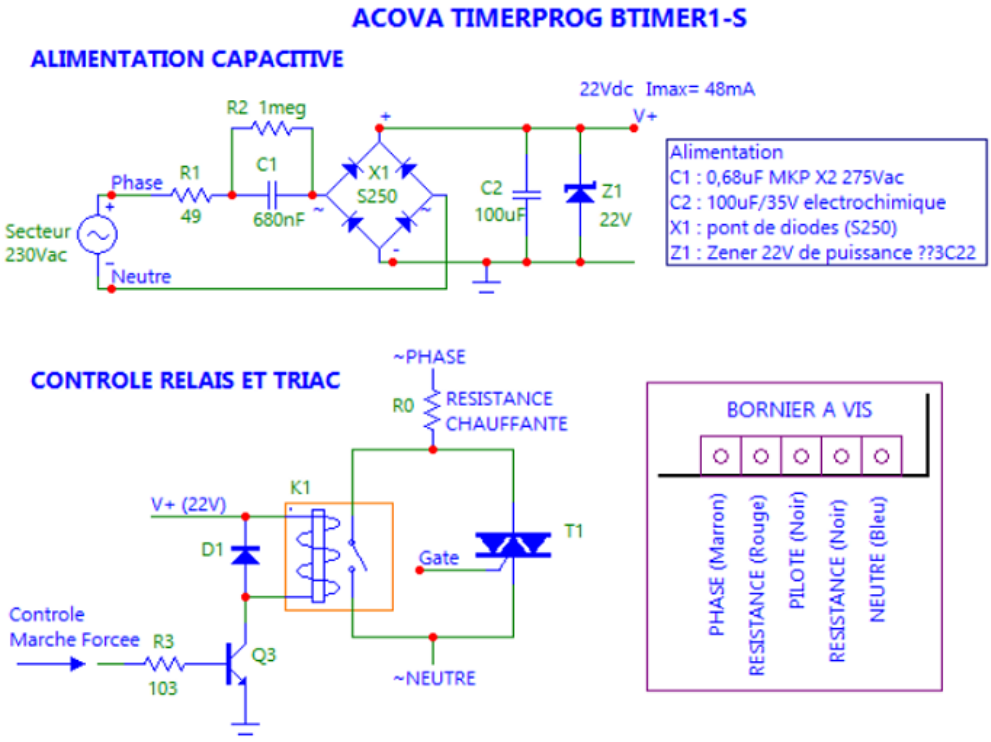

Figure 1.1: Care IFW

2 Knowledge Summary

Essential Knowledge: The forum thread explains how to troubleshoot and repair an **Acova IR IFW towel radiator electronic control board**. The key discovery is that the actual fault was a **defective zener diode**, not the relay, capacitor, or resistor initially suspected. Replacing this inexpensive component (~0.30€) restored the radiator's functionality.

2.0.1 Core Insights

- **Problem:**
  - The radiator's electronic board stopped receiving power.
  - Initial replacements included the **relay**, **power switcher**, and **capacitor**, but the issue persisted.
- **Diagnostic Process:**
  - Community members suggested checking the **0.47 µF 275V X2 capacitor (C1)** and the **22Ω resistor (R1)** in series.
  - Measurements showed the resistor was fine, and the capacitor had already been replaced.
  - Attention turned to the **diode bridge** and the **small electrolytic capacitor (C2, 25V)**.
  - Voltage testing across C2 was recommended to confirm power regulation.
- **Resolution:**
  - The **zener diode** was identified as the defective part.
  - Once replaced, the radiator worked again.
  - The user noted they had effectively rebuilt the board, but the fault was only due to this single cheap diode.
- **Follow-up Discussion:**

- Another user (*Blast*) confirmed similar symptoms and asked for the exact zener diode reference, since their component marking was illegible.
- They also sought advice on safely removing the board from the casing, which is complicated by the sensor wiring.

2.0.2 Practical Takeaways

- **Zener diodes** are critical for voltage regulation in these boards.
- A failed zener can mimic capacitor or resistor faults, leading to unnecessary part replacements.
- Proper testing (especially voltage across capacitors) helps pinpoint the issue.
- Even complex electronic failures may boil down to a **single inexpensive component**.

3 Checklist

Here's a **step-by-step diagnostic checklist** you can use when troubleshooting radiator control boards (like the Acova IR IFW case we discussed). It's designed to help you systematically identify faulty components without replacing parts blindly:

3.1 Step-by-Step Diagnostic Checklist

3.1.1 1. Visual Inspection

- Look for **burn marks, cracks, or bulging capacitors**.
- Check solder joints for **cold solder or cracks**.
- Verify connectors and wiring are firmly seated.

3.1.2 2. Power Supply Verification

- Measure AC input voltage at the board.
- Test the **series resistor (R1)** for continuity and correct resistance.
- Check the **X2 safety capacitor (often 0.47 µF, 275V)** for degradation.
- Confirm the **bridge rectifier diodes** are not shorted or open.

3.1.3 3. DC Output Check

- Measure voltage across the **main electrolytic capacitor (e.g., 25V rated)**.
- If no voltage is present, suspect the rectifier, zener diode, or switching IC.
- If voltage is unstable, check capacitors for ESR (equivalent series resistance).

3.1.4 4. Component Testing

- **Capacitors:** Replace if bulging, leaking, or showing high ESR.
- **Resistors:** Verify values with a multimeter.
- **Relays:** Test coil resistance and switching function.
- **Zener diode:** Critical for voltage regulation—test with diode mode or replace if suspect.
- **Switching ICs (power switcher):** Replace if confirmed faulty after other checks.

3.1.5 5. Functional Test

- After replacing suspect components, reconnect the board and test under load.
- Ensure the radiator powers on and responds to controls.
- Monitor for abnormal heating or repeated failure.

3.1.6 6. Final Verification

- Confirm stable operation over several cycles.
- If the board works after replacing a small component (like the zener diode), note the part reference for future repairs.
- Document the repair steps for reuse.

3.2 Practical Tips

- Always start with **low-cost, high-failure components** (capacitors, resistors, diodes).
- Use a **multimeter with diode and capacitance modes** for quick checks.
- Keep spare common parts (X2 capacitors, zener diodes, relays) on hand.
- Avoid replacing multiple parts at once—test after each change to isolate the root cause.

3.3 AC Voltage

Yes — when I said "measure before and after the fuse or X2 filter capacitor," I meant **on the alimentation (AC input) side of the board**. Here's the distinction:

3.3.1 Where to Measure

- **Alimentation side (AC input):**
  - This is where mains power (230V AC in France) enters the board.
  - You measure **AC voltage** between **L (live)** and **N (neutral)**.
  - If the fuse or X2 capacitor is in series with the input, you can check:
    - **Before the component** → should read full mains voltage.
    - **After the component** → should also read mains voltage if the part is good.
    - If voltage drops to 0 after the fuse/capacitor, that component is open/faulty.
- **Continuity check (power off):**
  - With the board disconnected from mains, use the multimeter in **ohmmeter mode**.
  - Test across the fuse or resistor in series with the X2 capacitor.
  - A good fuse shows near 0 Ω; a blown fuse shows infinite resistance.