

# CONTHERM *Scientific Limited*

TECHNICAL MEMORANDUM  
0074

PRODUCT :ZP13A TO ZP17B

No :

=====

FROM : Contherm Scientific Ltd

DATE : 06/12/2000

TO : ALL AGENTS

---

**SUBJECT:** ZP13A TO ZP17B INC/OVEN UPGRADE KIT FOR STANDARD OVENS & INCUBATORS

The original ZP13A PCB was introduced in 1982 and is no longer manufactured. If a ZP13A PCB requires replacement in a CAT 100,105,110,120,130,140,150,160 incubator or CAT 200,205,210,220,230 oven a ZP17B PCB can replace it.

**NOTE:** An additional solid state relay is required to operate ovens with larger elements than 1200W I.E. CAT 250, 260.

The basic layout of the ZP17B is very similar to the ZP13A, the terminal header has been replaced with a plug-in type and a mains transformer is fitted. The mounting holes are the same and the position of the LED indicators is retained.

The main differences are:

- Thermocouple sensing probe instead of a transistor probe.
- Nominal Incubator temperature range is 0°C to 100°C instead of 10°C to 80°C.
- Nominal Oven temperature range is 0°C to 200°C instead of 70°C to 200°C.

When replacing the PCB ensure ALL POWER to the unit is OFF, the replacement must ONLY be carried out by a qualified electrical service engineer.

After removing the ZP13A PCB, stick the small lexan overlay to the escutcheon directly beneath where the mains power terminals of the ZP17B PCB would sit, this provides additional electrical isolation.

Fit spacer 12 between the ZP17B PCB and the escutcheon by locating it over the mounting screw closest to where the thermocouple sensor is connected to the PCB (At the heatsink end of the board). The special rectangular aluminium spacer screwed to the ZP17B next to the mains phase connection sits directly onto the escutcheon when the PCB is fitted to ensure any excess heat is conducted away from the triac heater driver. The opposite end of the PCB must have INSULATING spacers to ensure that it does NOT contact the aluminium escutcheon therefore fit 2x nylon spacers over each mounting screw between the ZP17B PCB and the escutcheon.

Firmly secure the ZP17B PCB in place with one washer 04 and nut on black heatsink and 1x nylon spacer and nut on the opposite end of the board.

Ensure the new socket is correctly wired, it is best to carry out the wiring with the header & socket mated so that the connections can be read from the PCB markings. Connect the MOTOR earth DIRECT to the cabinet metal chassis rather than to the PCB earth. Ensure that the High/Low temperature range setting on the PCB is set to Low for incubators and High for ovens. The new thermocouple probe MUST be used in place of the original probe, ensure that the polarity is correct to the PCB (red sleeve is +ve).

**NOTE:** For Cat: 250 and 260 ovens with elements larger than 1200 Watts a solid state relay is fitted to the ZP17B Element Connections.  
Mount the solid state relay and terminal strip (already pre-wired to the relay) securely to the top of the oven inside the top cover using the screws provided. Connect the two wires coming from the cabinets element to the terminals marked 'EL' on the extended terminal strip.

It is best to set the unit for the temperature desired and either MARK the old silkscreen overlay to indicate the operating temperature OR calibrate the ZP17B to one of the original temperature markings, (the small trimmer potentiometer on the PCB will adjust the calibration). Note that the scale LINEARITY will be incorrect when using the original silkscreen overlay.

**BEFORE** applying any power to the unit check the **EARTHING** of the cabinet and controller housing and check the **INSULATION** with a **500V** tester.

#### **PARTS REQUIRED:**

- ZP17B PCB (This board has a High/Low jumper – comes set to Low as default).
- ZP17 Thermocouple (Type 'K') sensor probe (red sleeve is +ve).  
Part No: GP067.
- ZP17B plug in terminal socket. (normally comes with the new PCB).
- Spacers:  
1xSpacer 12 (Metal – fitted to heatsink end of PCB on thermocouple side of board), 2x Washer 04 (4mm), 6x Nylon spacers. NB: The PCB should come with a special spacer already attached to the heatsink end nearest the mains input terminals)
- 4x Nut 06 (4mm)
- Lexan overlay insulator. (Stick to aluminum escutcheon below mains terminals).

#### **Additional Parts Required when fitting Solid State Relay**

- 1 x Solid State Relay
- 1 x Plastic Cover (to cover relay terminals)
- 1 x 3 way Terminal Strip
- 2 x PK 13 (6 x 3/8 Stainless Steel PK Pozi) for screwing terminal strip to cabinet
- 2 x PK 03 (8 x 3/8 Stainless Steel PK Pozi) for screwing solid state relay to cabinet
- 0.2m length Red 1mm<sup>2</sup> ∅ Silicone Insulated Wire
- 0.18m length Red 1mm<sup>2</sup> ∅ Silicone Insulated Wire
- 1.0m length Red 1mm<sup>2</sup> ∅ Silicone Insulated Wire
- 2.0m length Black 1mm<sup>2</sup> ∅ Silicone Insulated Wire
- 6 x Cabltie YJ

Test and Calibrate the new controller to customers requirements.