Ritter (Strix) Kettle 'Fontana' Microcontroller Replacement

Water entered the base of this kettle and killed the microcontroller. A would-be repair if the microcontroller was available.

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INTRODUCTION

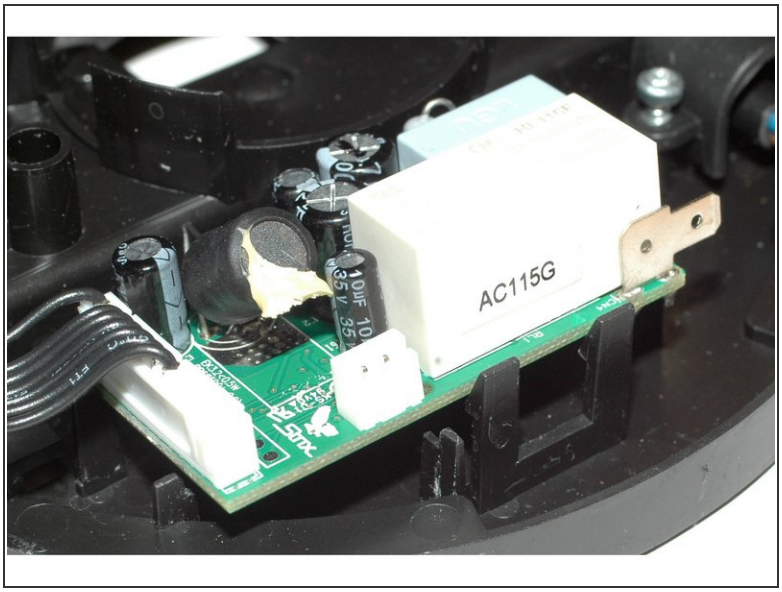
Many water heaters / kettles use systems from Strix. The one I got is sold by German company Ritter.

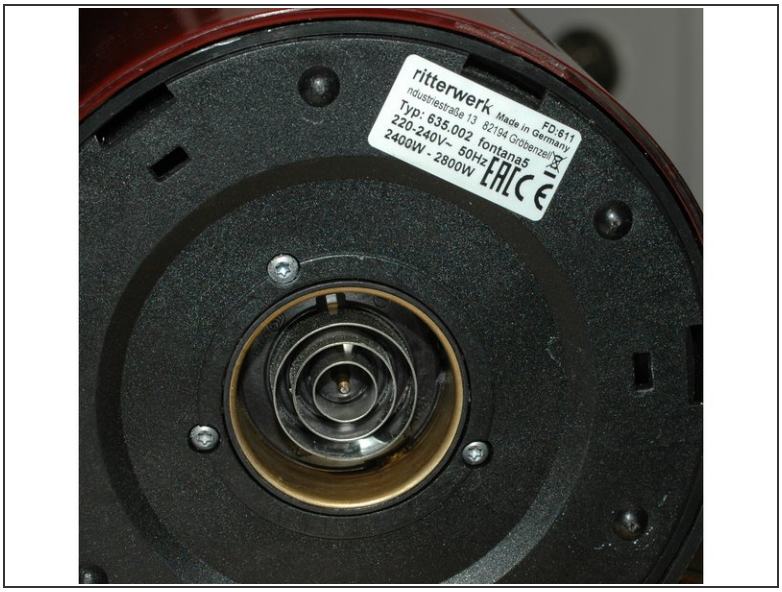
Be extremely careful when operating the PCB out of the box as it may contain voltages of up to 320VDC!

TOOLS:

- Torx Screwdriver (1)
- Hot Air Rework Soldering Station (1)

Step 1 — Open kettle base

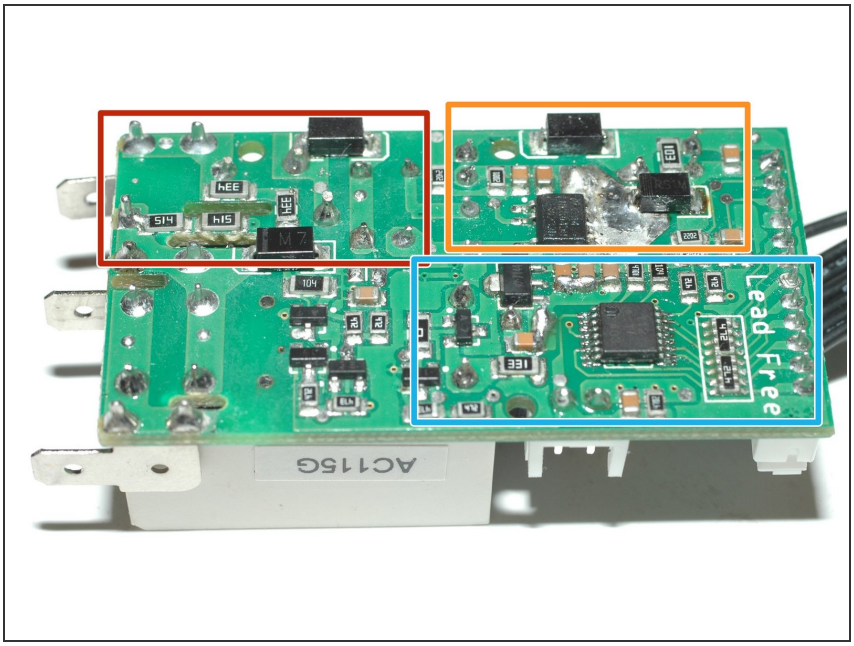




Before you begin, be sure to unplug the kettle base.

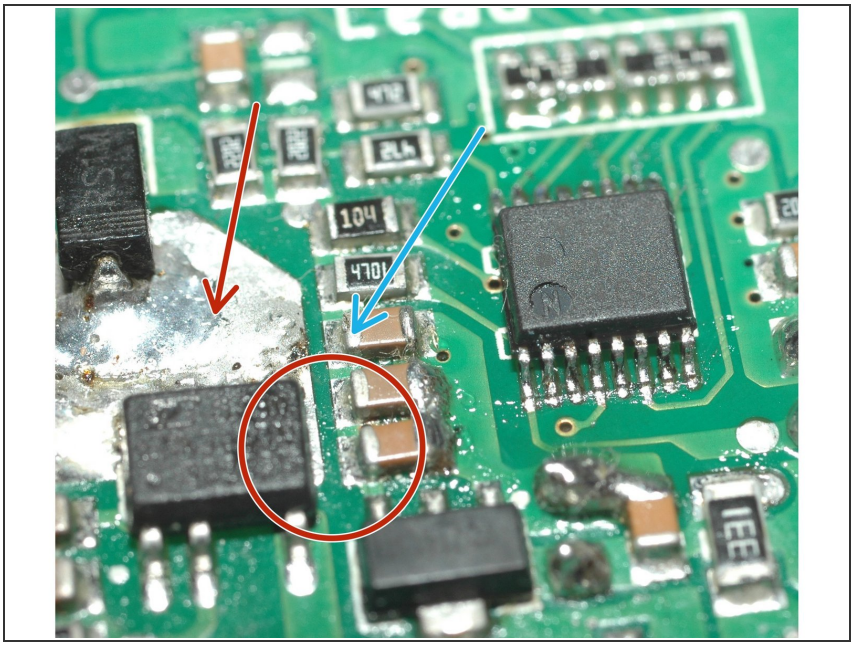
- Using Torx screwdriver, open kettle base and remove PCB
- One can see the five contact rings. From inside they are: Live, Sensor +, Sensor -, Neutral, Ground

Step 2 — High voltage gap potential problem



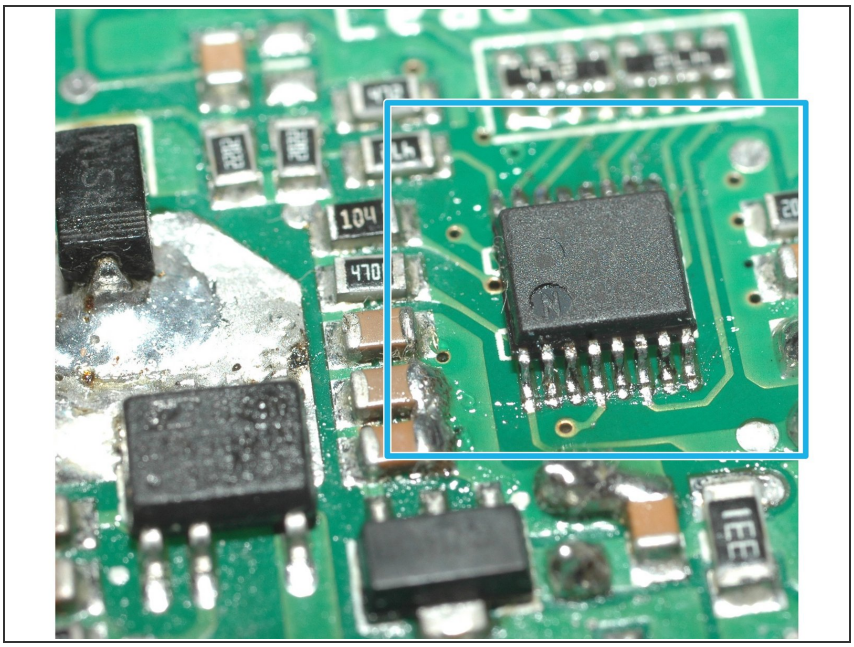
- The PCB is not conformally coated, so water splashing around the base can potentially enter and cause damage.
- The design of the PCB is a bit unfortunate as the high voltage switching regulator is very close to the LDO and microcontroller.
- Line input
- Switching regulator
- LDO and MCU

Step 3 — High voltage gap problem (2)



- Red circle: Isolation gap between 320VDC and 4.4VDC is about less than 1mm
- Red arrow: Pulsed 320V (220VAC) switching regulator
- Blue arrow: 4.4V LDO supply voltage for MCU

Step 4 — Microcontroller replacement



- Using hot air, desolder the TSSOP16 microcontroller labeled "Y12"
- Unfortunately I was not able to source the microcontroller allone yet. But I could order the entire board for 25€ which is better than nothing. Thank you Ritter

To reassemble your device, follow these instructions in reverse order.