

## R&S NG-Z Overvoltage Protection Unit

Matthias, DD1US, November 4<sup>th</sup> 2019

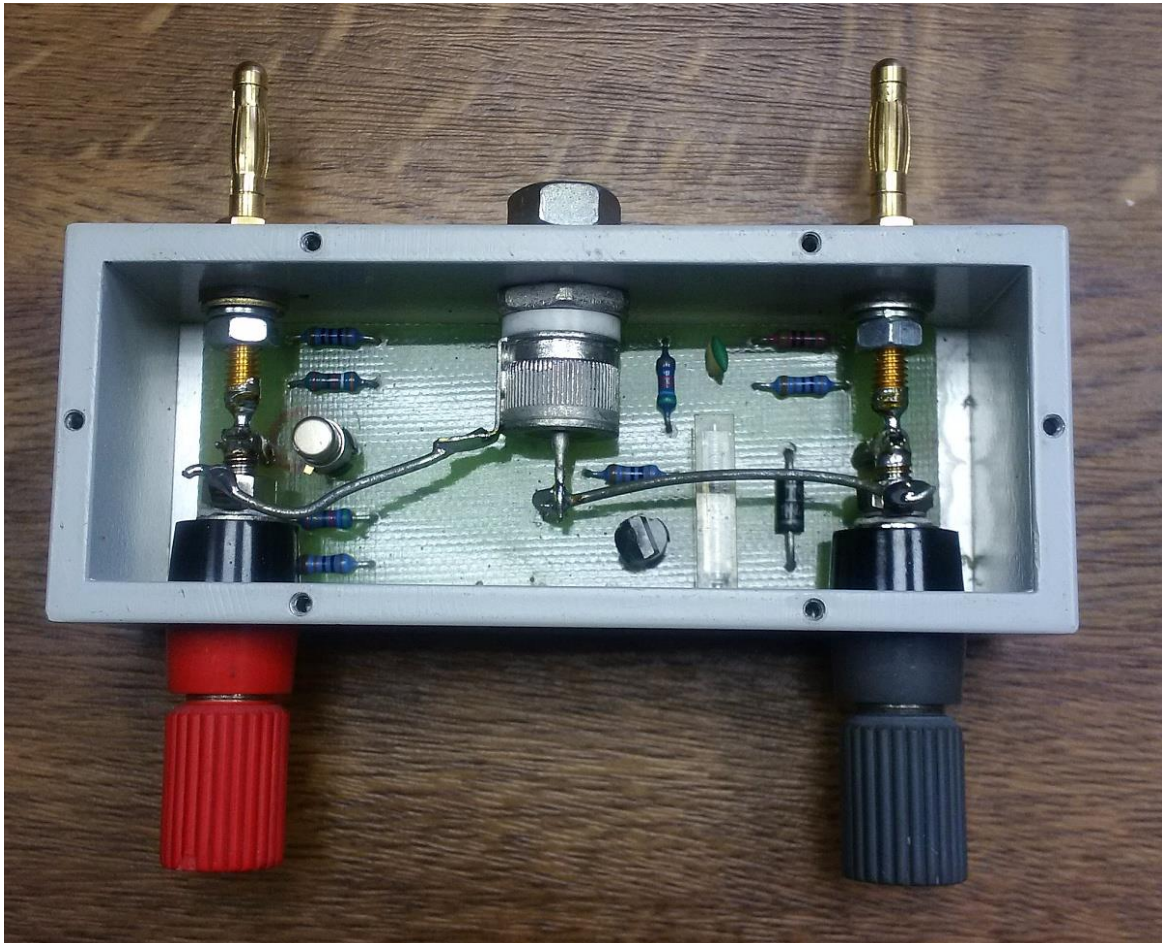
Some time ago, I acquired second hand an Over-Voltage Projection unit from R&S. The NG-Z “Überspannungsschutz” unit detects the output voltage of a power supply and compares the voltage with an adjustable voltage level. Once the output voltage exceeds the adjustable threshold (5 ... 100V) a thyristor is activated which short cuts the output voltage of the power supply. The maximum current the thyristor can withstand is 10A continuously and 20A peak.

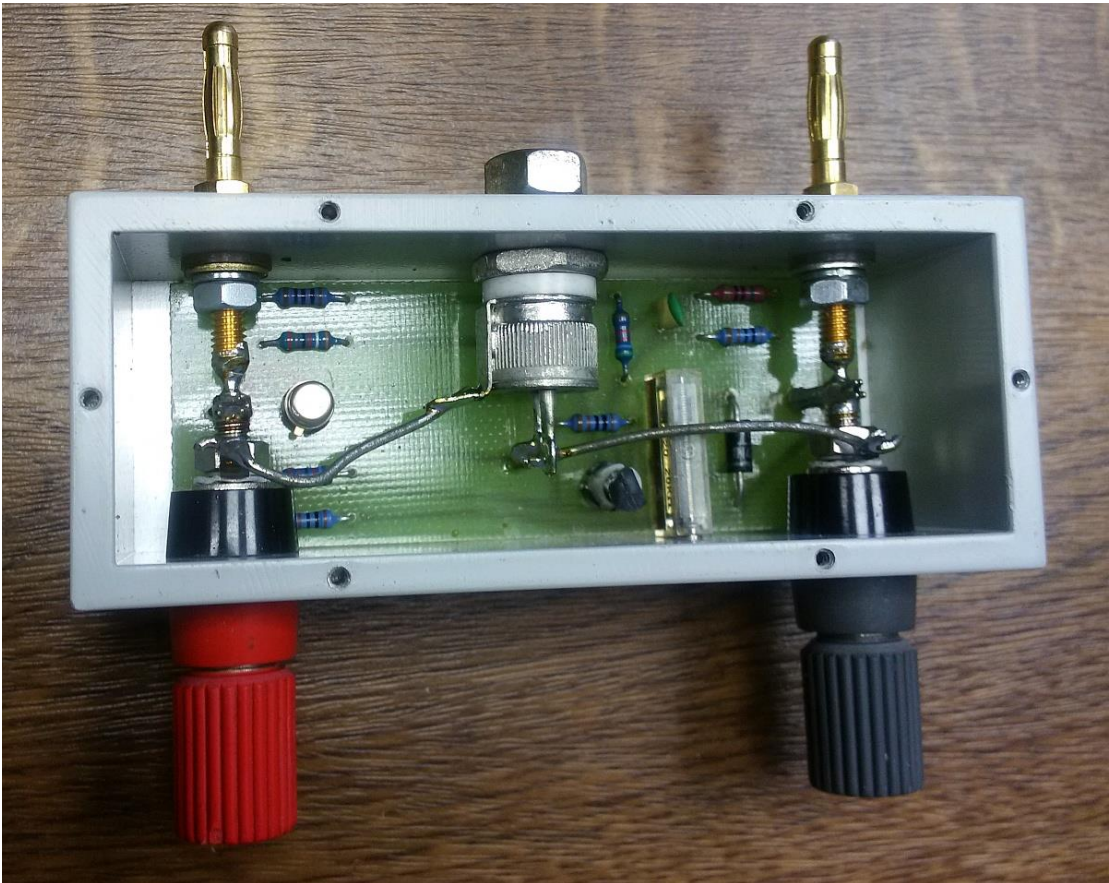
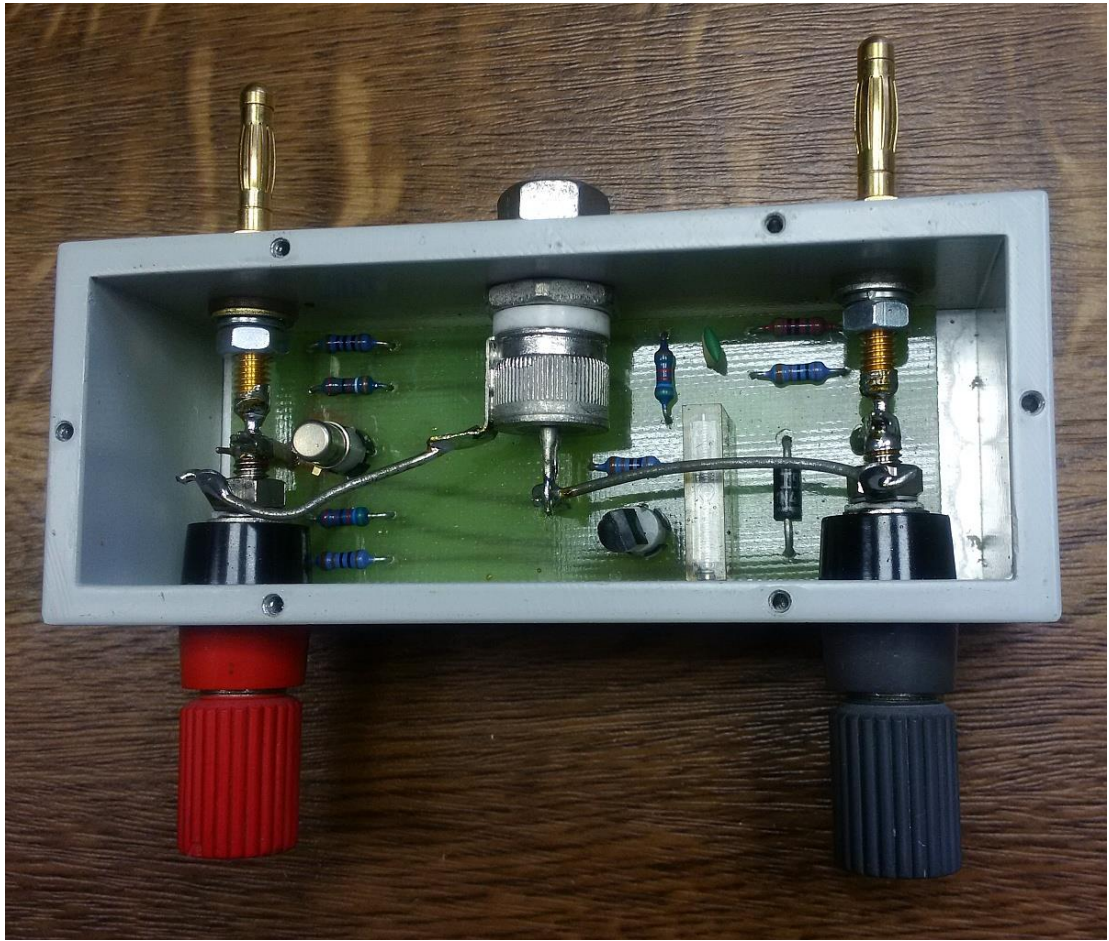
Here are some pictures of the unit:



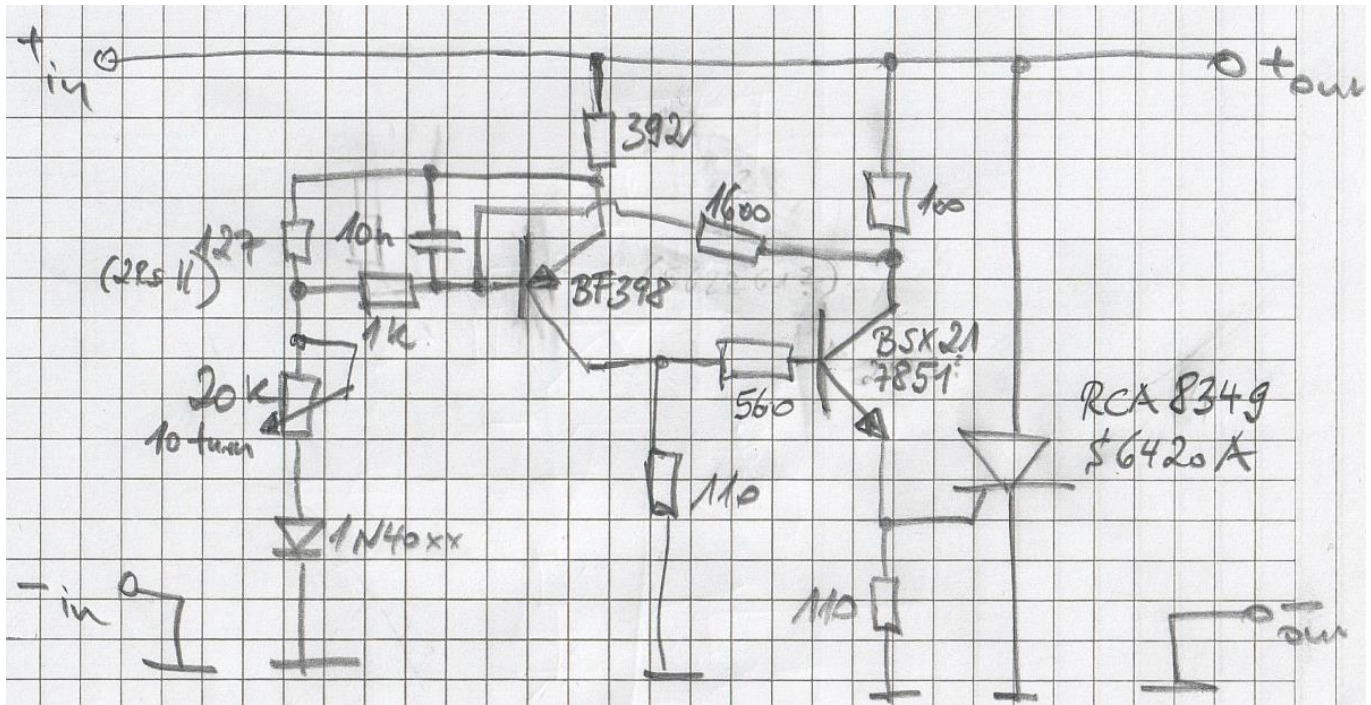


Of course, I was curious to see how the unit is build and opened it. Here are some pictures of its inside:





Finally, here is a sketch of the schematic of the over voltage protection unit:



The unit has the part number NG-Z 100.5103.02. The PCB is marked with 202.131.01

In the unit are 3 active devices, a BF398 PNP transistor which acts as the comparator, a BSX21 NPN transistor as a driver to trigger the thyristor S6420A.

Here are some key data of the devices:

**BF398:**  
SI PNP transistor,  $U_{cmax}=150V$ ,  $I_{cmax}=100mA$ ,  $\beta > 30$

**BSX21:**  
SI MESA NPN transistor,  $U_{cmax}=80V$ ,  $I_{cmax}=50mA$ ,  $\beta > 20$ ,  $f_T=60\text{ MHz}$

**S6420A (RCA):**  
Thyristor with isolated stud,  $U_{dsmax}=100V$ ,  $I_{dsmax}=35A$ ,  $V_{gs}$  ca. 1.1V,  $I_{gs}$  ca. 25mA,  $t_{on}$  ca. 1.25us,  $t_{off}$  ca. 20us

If you have any additional information about this unit then please send them to me. Comments and questions are always welcome. Please send them to the Email address given below.

Best regards

Matthias DD1US

Email: [DD1US@AMSAT.ORG](mailto:DD1US@AMSAT.ORG)

Homepage: <http://www.dd1us.de>