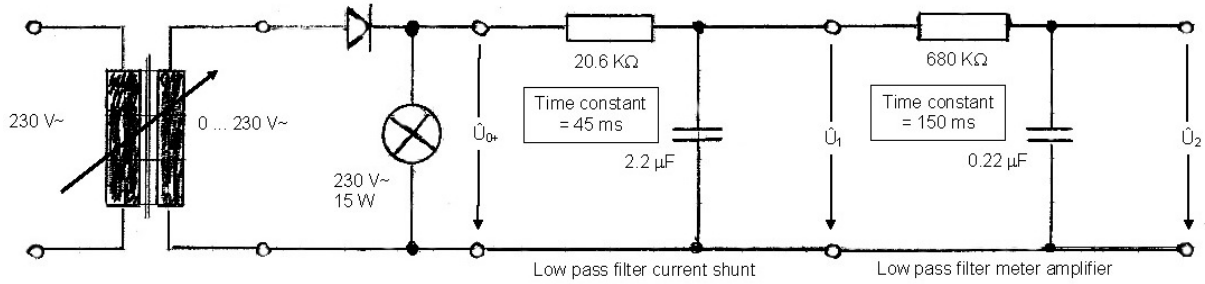


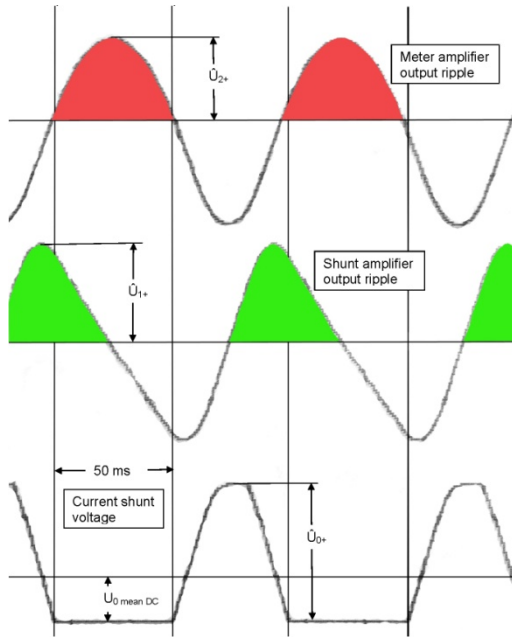
## Shunt Amplifier and Meter Amplifier Output Ripple

Output ripple of the shunt and meter amplifiers were measured with the test setup in Fig. 1.



**Fig. 1 Test setup**

The input voltage curve  $U_0$  is generated across a low power light bulb which creates a negligibly low source resistance for the first filter. Time constants are as in the original circuits. To minimize load of the first filter the second filter is reproduced by a high impedance RC combination with the same time constant.



**Fig. 2 Output ripple**

The designated voltages were oscillographed and measured. Fig. 2 shows the traces.

The green peaks are the ripple amplitudes of the shunt amplifier output. During anode current measurement these peaks are fed to the meter amplifier where they appear at the output as the red peaks.

Neither green nor red ripple peaks must be clipped by insufficient amplifier output swing, otherwise the meter reading will be too low.

The following ripple amplitude ratios have been measured ( $RC$  = filter time constant,  $f = 50$  Hz):

$$\hat{U}_{1+}/\hat{U}_{0+} = 0.5/(2\pi fRC)$$

$$\hat{U}_{2+}/\hat{U}_{1+} = 0.8/(2\pi fRC)$$