

## ***Measuring the current ripple on rectifier power supplies for film projection.***

### ***General purposes***

The rectifier output current is never perfectly direct: it has a residual pulsation value called "ripple". The manufacturers of discharge lamps define the lamp ripple by the following formula:

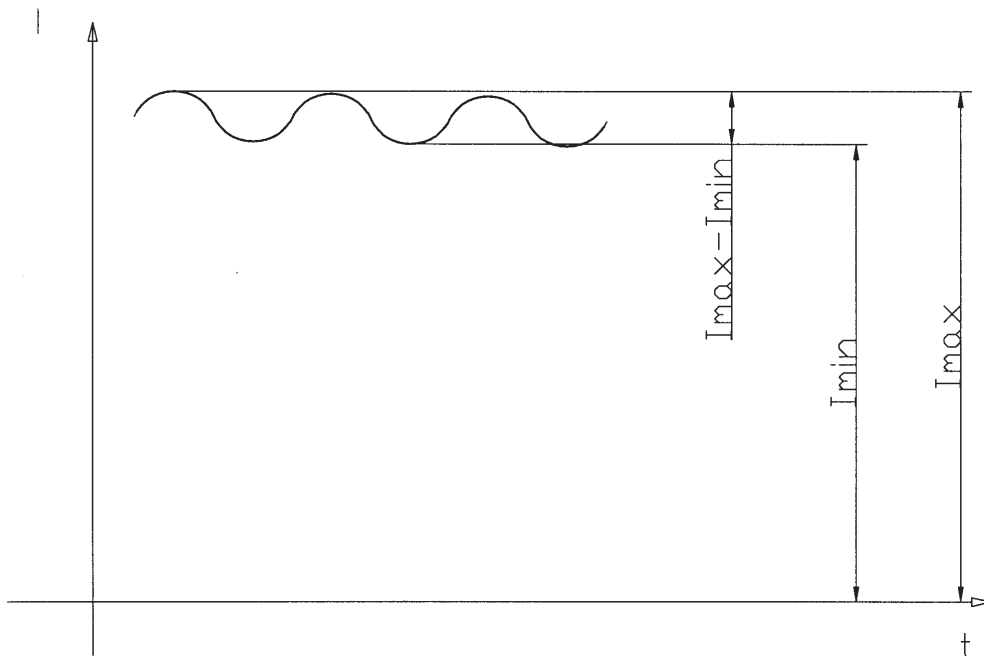
$$rI = \frac{I_{\max} - I_{\min}}{I_{\max}} \cdot 100$$

where:

$I_{\max}$  = max. lamp current

$I_{\min}$  = min. lamp current

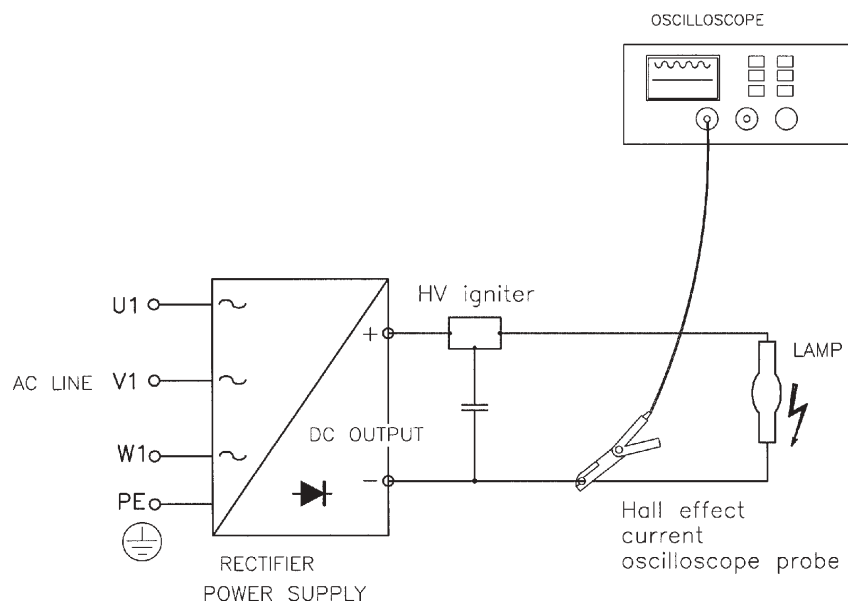
Picture no. 1 : Reference waveform for ripple calculation



### Performing the measurement

To perform the measurement you simply need a scope and a Hall current probe (this probe is useful to measure AC/DC current of the lamp). The schematic diagram is shown on picture no. 2.

Picture no. 2: measuring the ripple by means of a Hall current probe.



### First of all strike the lamp to avoid damaging the instruments

Perform the measurement as per following steps:

1. Connect the Hall current probe to the scope
2. Insert the current probe clamp to the negative pole of the lead connecting the rectifier power supply to the lamp.
3. Set the range scope to A/div. to display the total current waveform at DC coupling and then measure the max. value of the current ( $I_{max}$ ).
4. Set the scope to AC coupling (the scope will display only the AC lamp current) and then measure the AC peak-to-peak current values ( $I_{max} - I_{min}$ ).
5. Now all the data are available to calculate the ripple as per the following formula:

$$rI = \frac{I_{max} - I_{min}}{I_{max}} \cdot 100$$