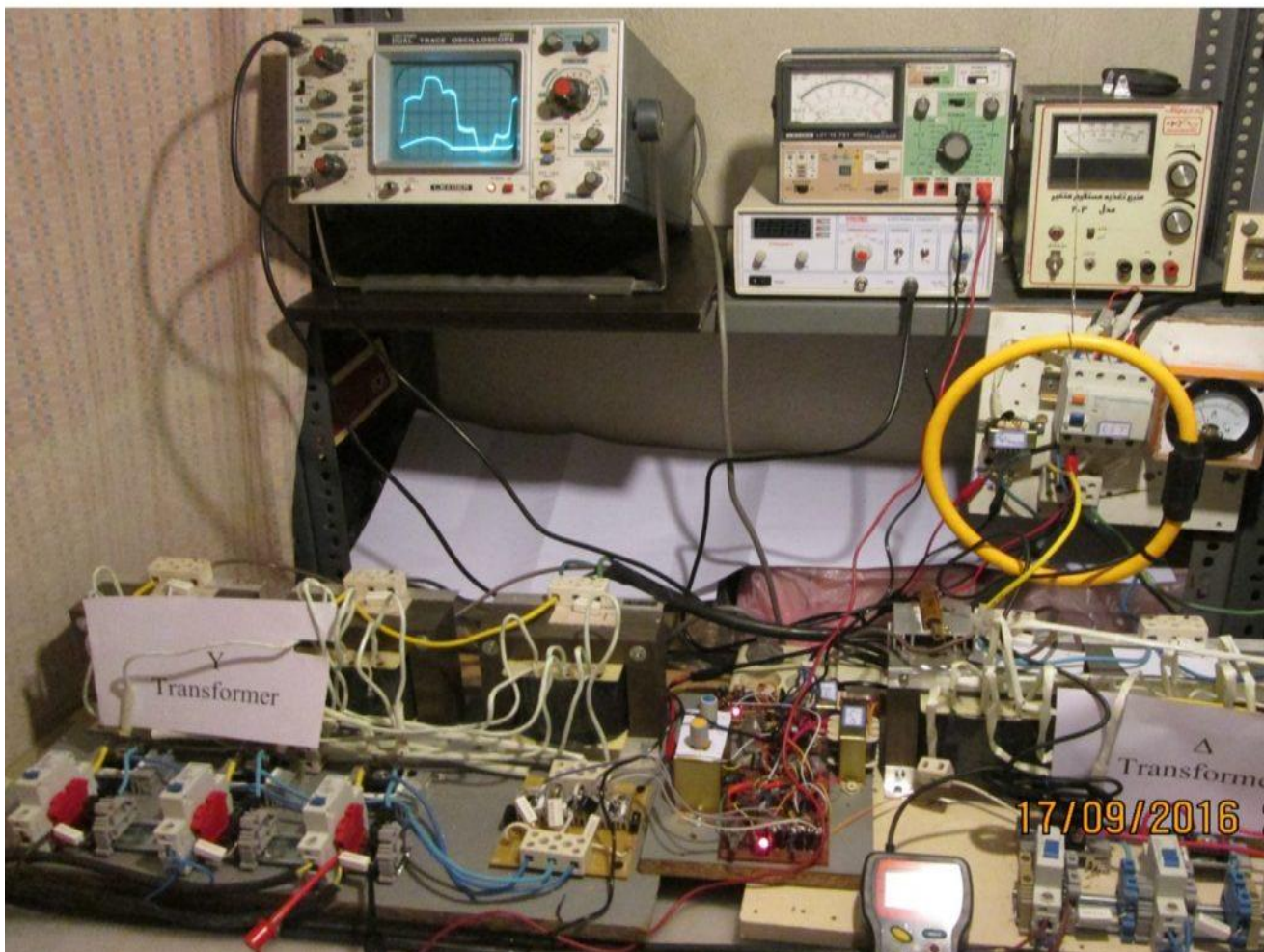


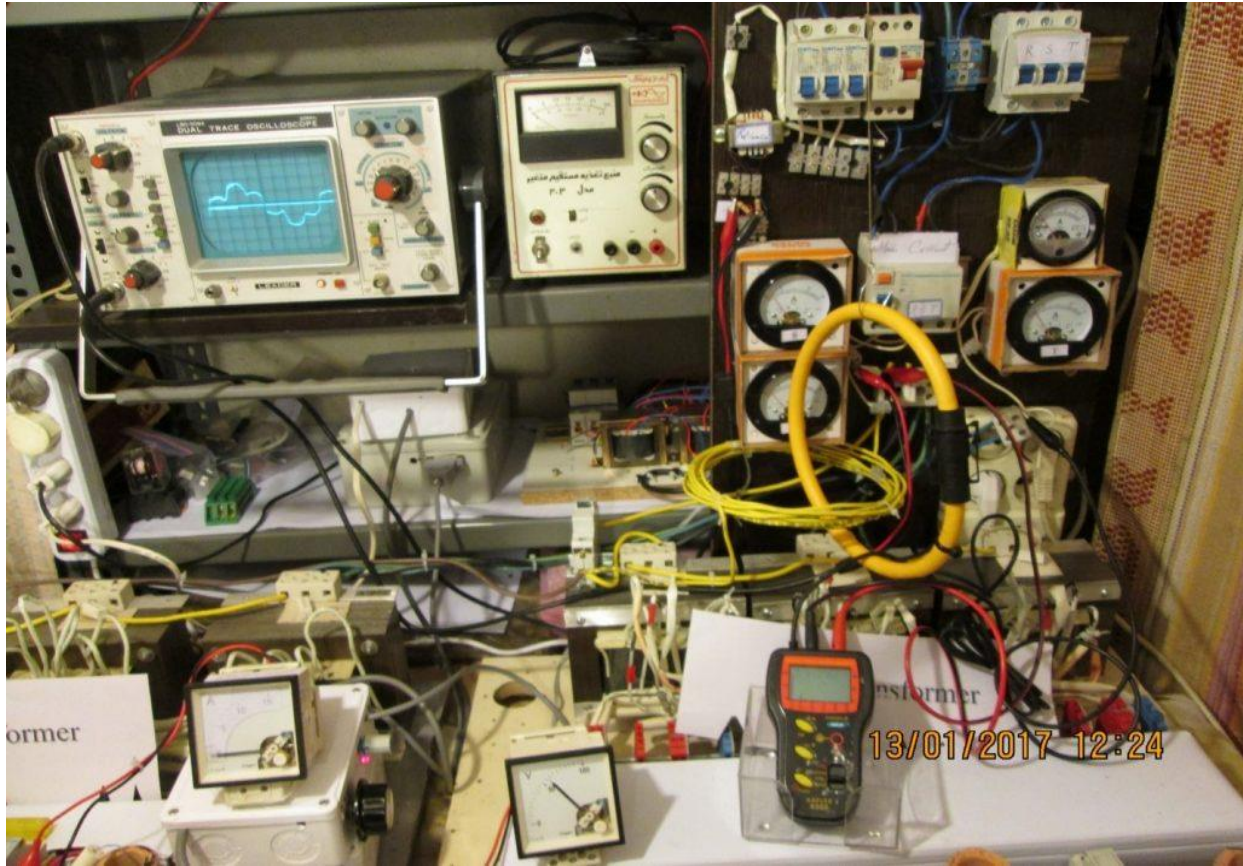
## Mini Power Electronics Lab.

### PREFACE

The result of research is confident whenever it meets the actual experimental measurement in the respective circuit on the table.

A mini *power electronics laboratory* was arranged to achieve such confidence, small and efficient. The sequential images show the improvement of devices and components over the years.



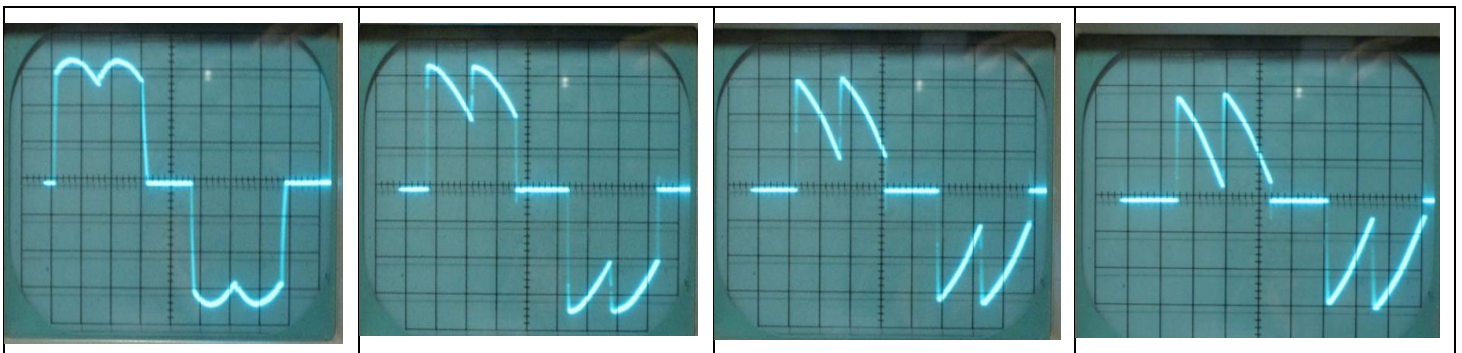
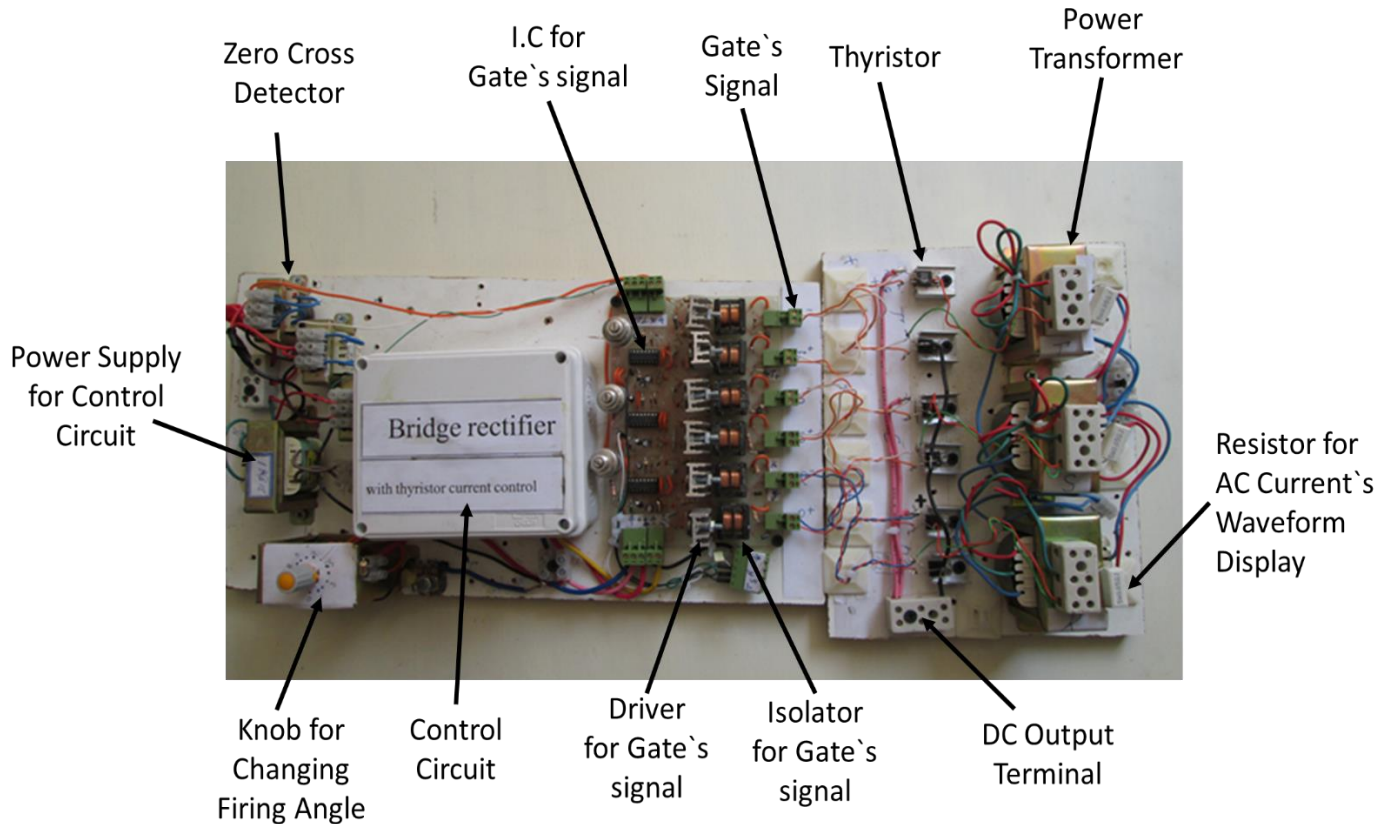


# PHOTO ALBUM

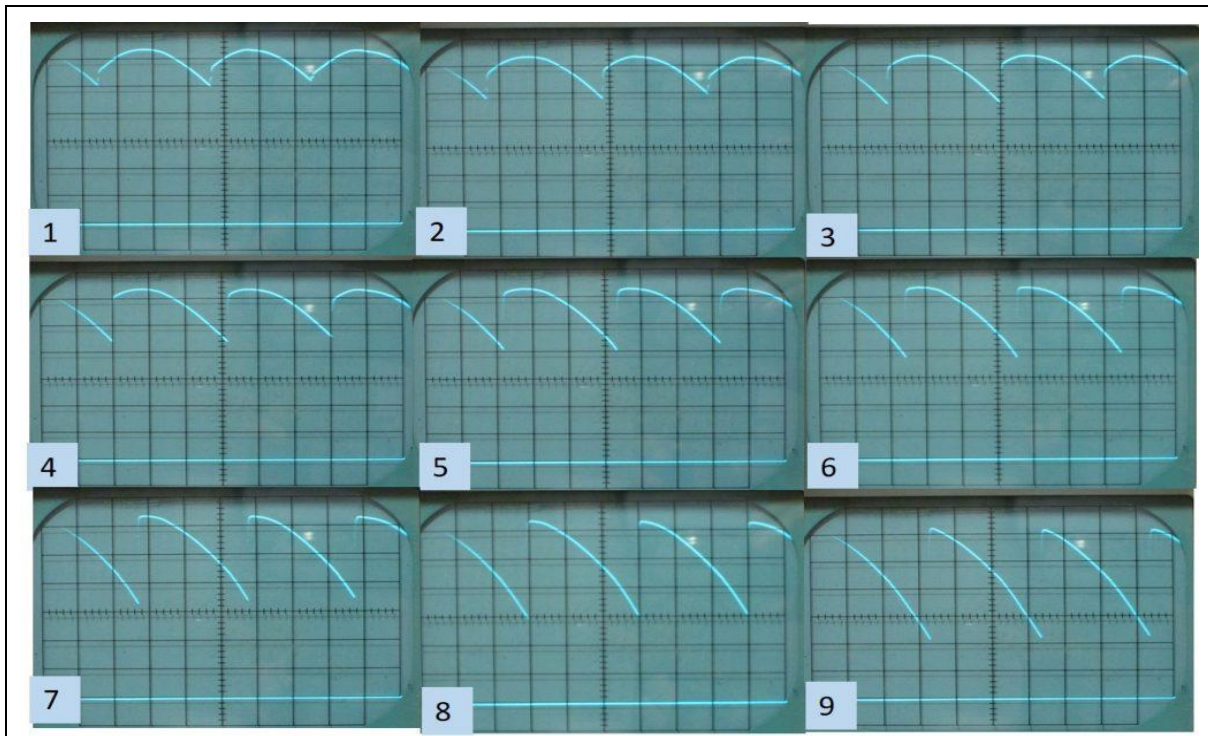
## Experimental and measurements on the table

**Applicable researches** have been executed in the power electronics sector which some of them are listed here:

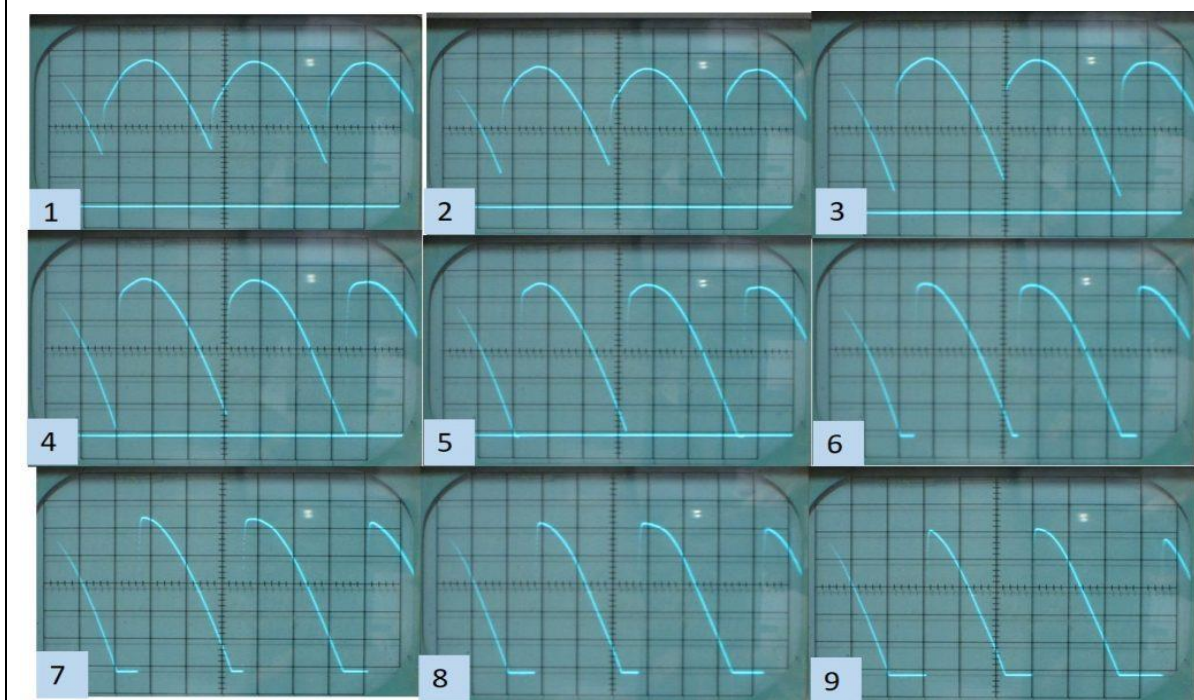
### A) A Control Panel for Three-Phase Thyristor Rectifier with Firing Angle Control.



AC Current waveforms with four different Thyristor's firing angles.

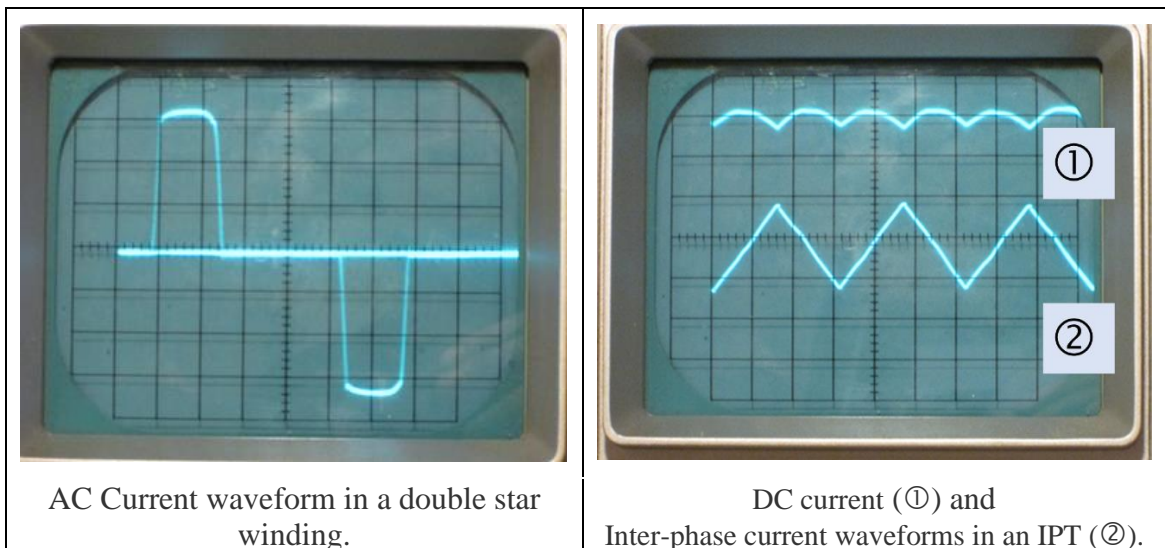
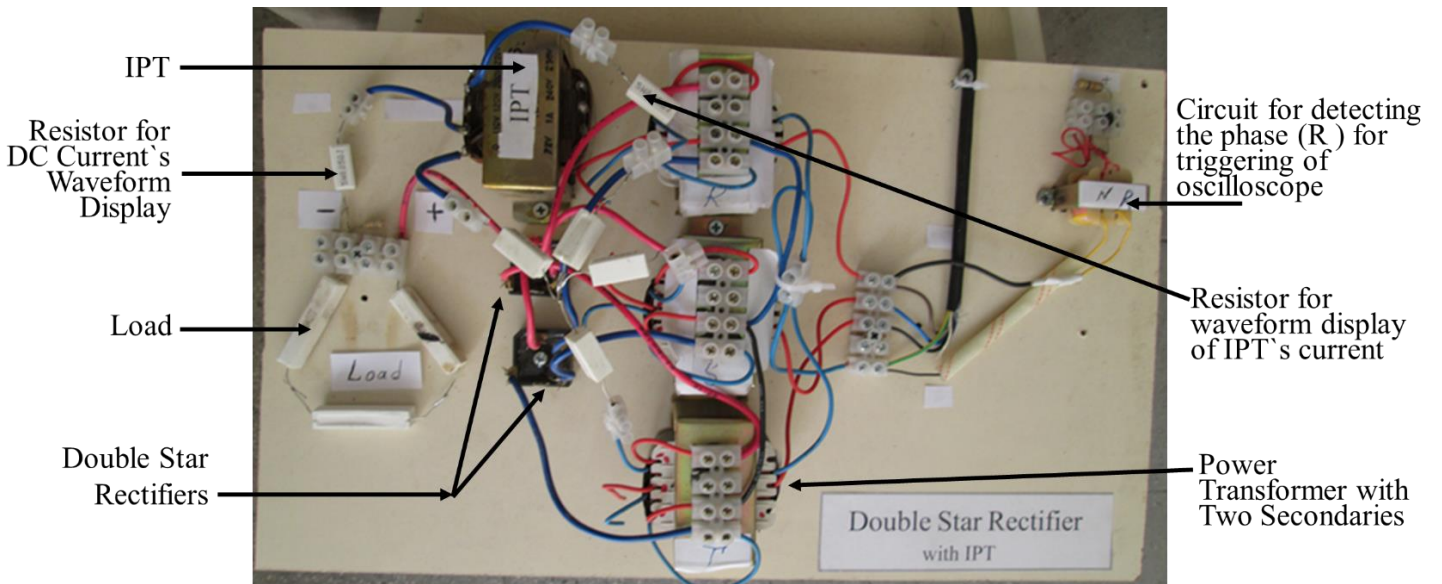
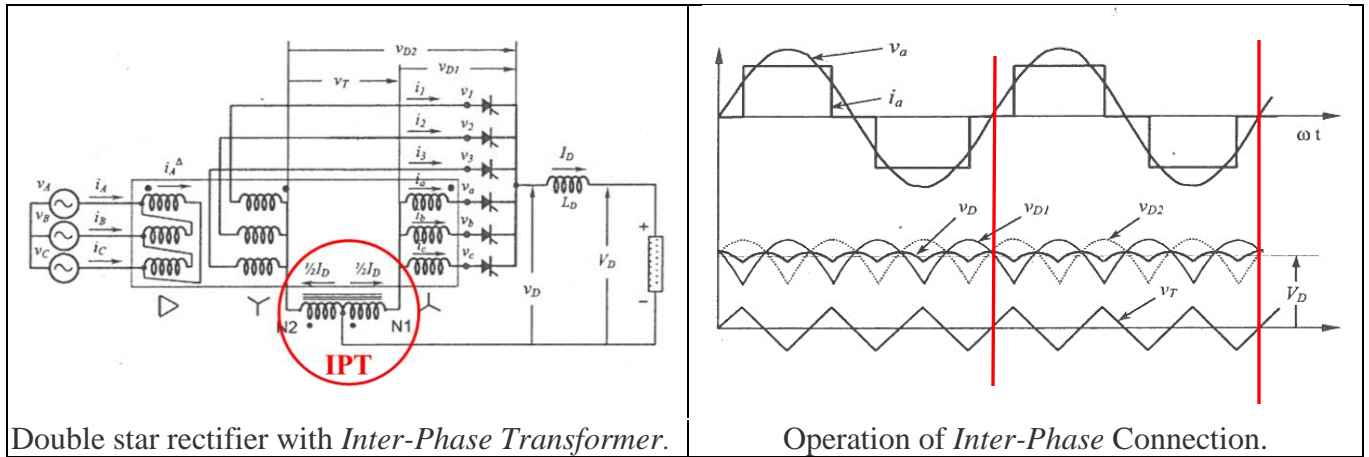


*DC Voltage waveforms with nine different Thyristor`s firing angles. The images are not six-pulse for wide display.*



*DC Current waveforms with nine different Thyristor`s firing angles. The load is ER, e.g., Chlore-Alkali electrolyzer. The images are not six-pulse for wide display.*

### B) The Inter-Phase Transformer (IPT)

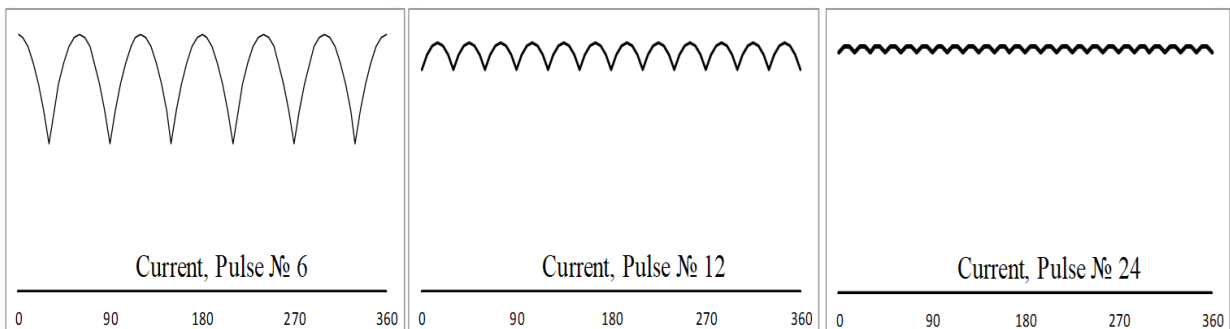
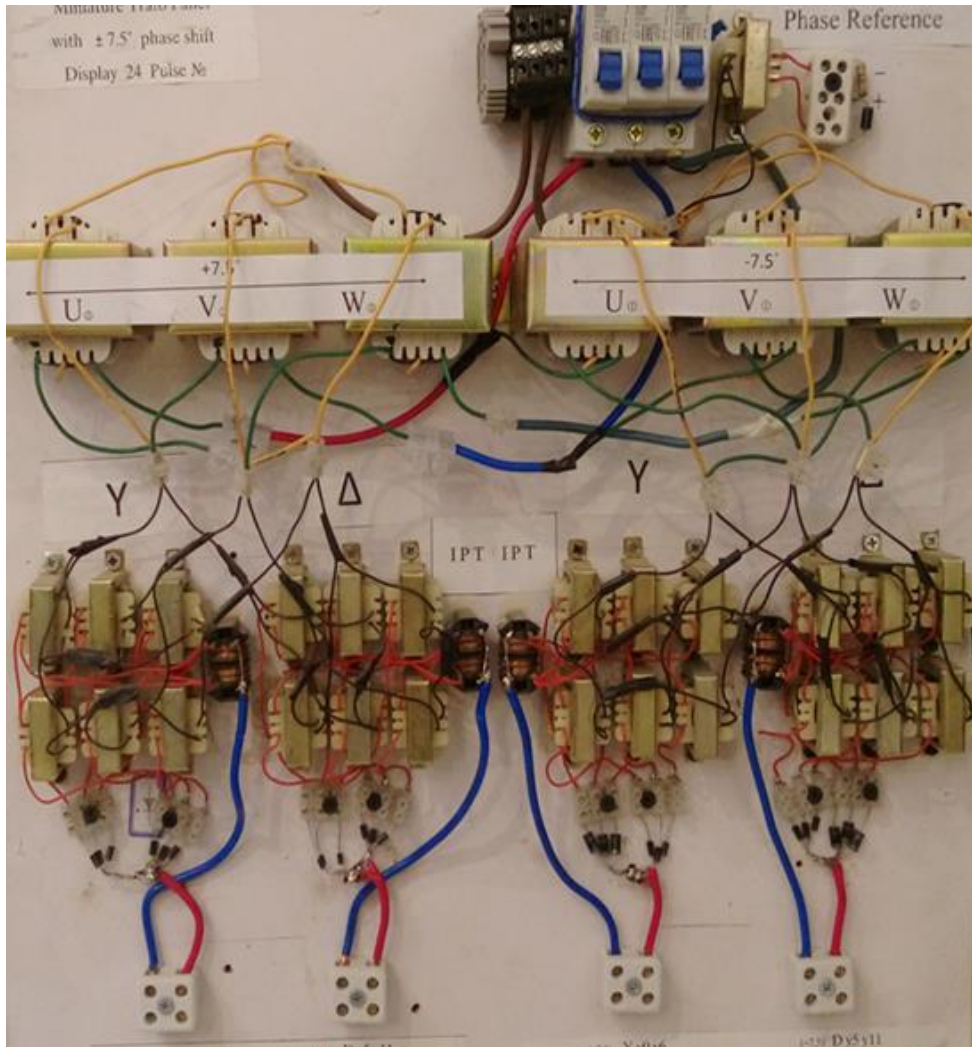


**C) Multi-Phase Transformer, Pulse N° 24.**

Implementation of two Zig-Zag transformers ( $+7.5^\circ$  and  $-7.5^\circ$ ), and each follows by two sets of transformers (Wye and Delta).

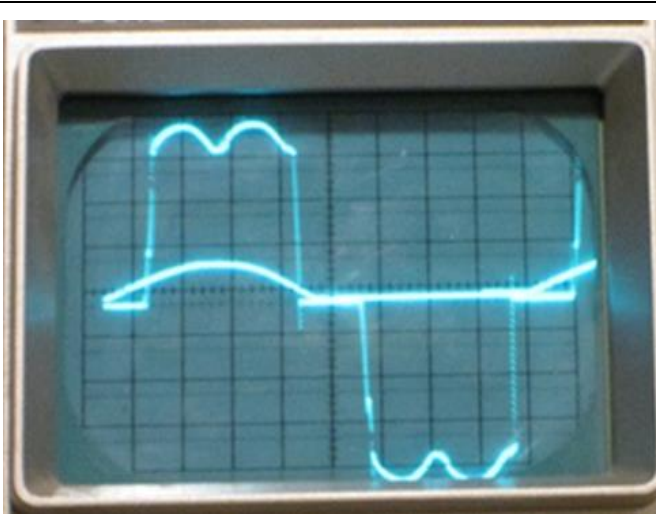
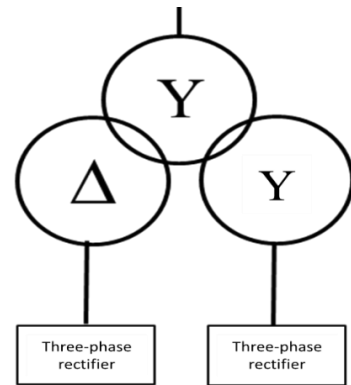
Each set consists of a double Wye transformer equipped by IPT (Inter Phase Transformer).

At output there are four DC terminals ( $+7.5^\circ Y$ ,  $+7.5^\circ \Delta$ ,  $-7.5^\circ Y$ , and  $-7.5^\circ \Delta$ ), which builds a 24 pulses waveform.

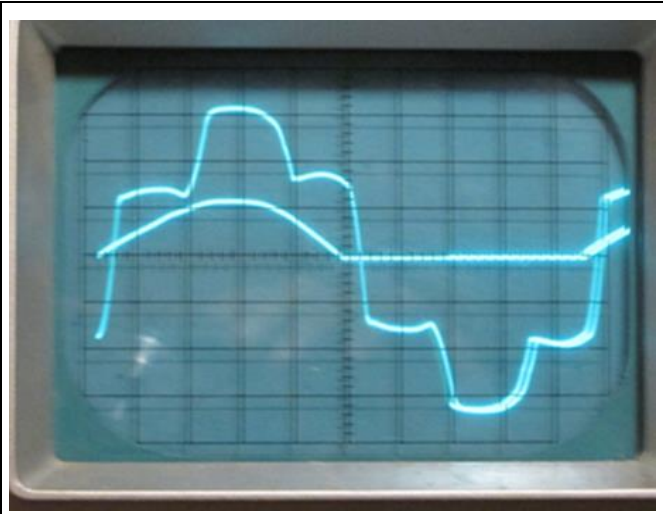


### D) The Combination of Wye and Delta

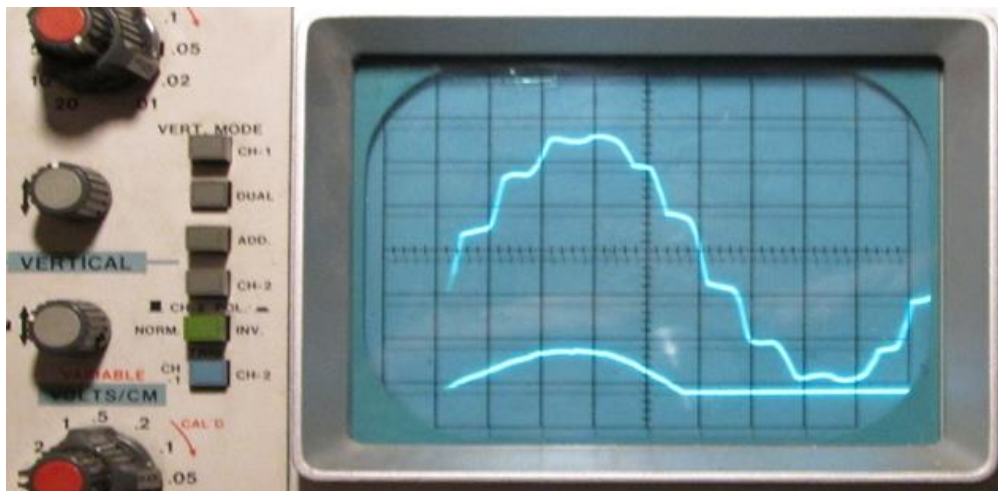
The combination of Wye and Delta windings in power transformers is implemented for elimination of some harmonic currents.



AC Current waveform in the Wye winding at the secondary.

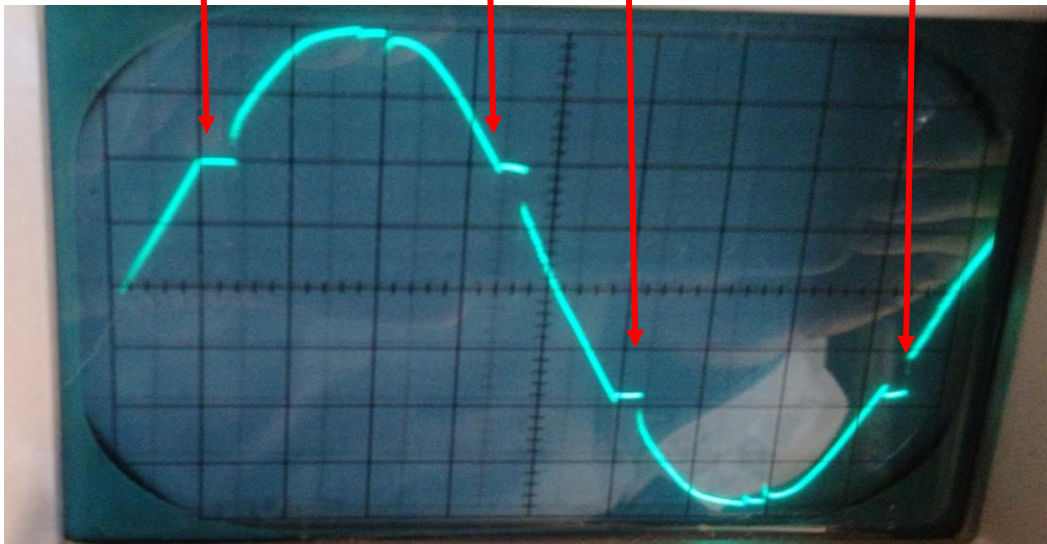
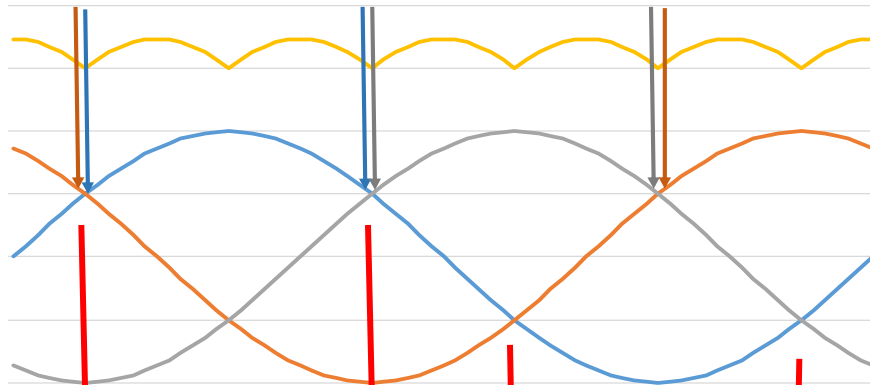
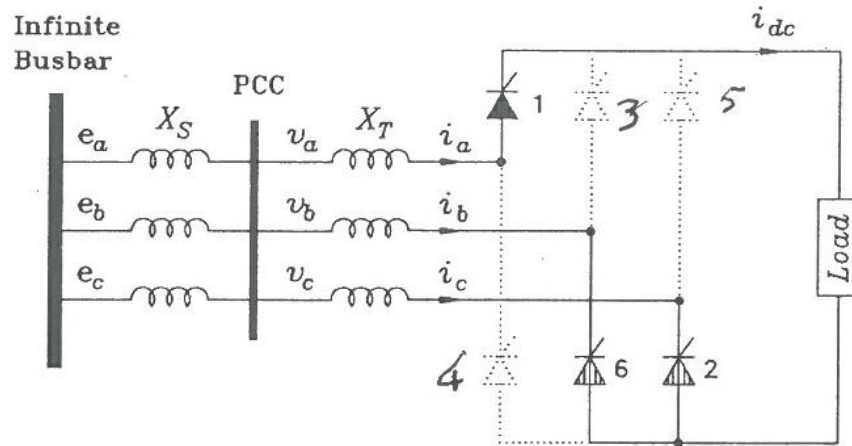


AC Current waveform in the Delta winding at the secondary.



AC Current waveform in the primary winding of power transformer  
Combination of Wye and Delta currents

### E) The Voltage Notch Arising from AC/DC Converters



The voltage notch on the phase R