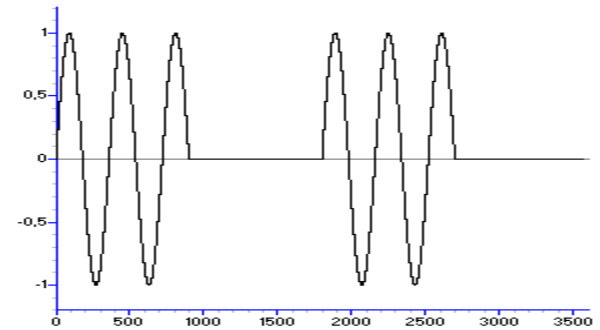
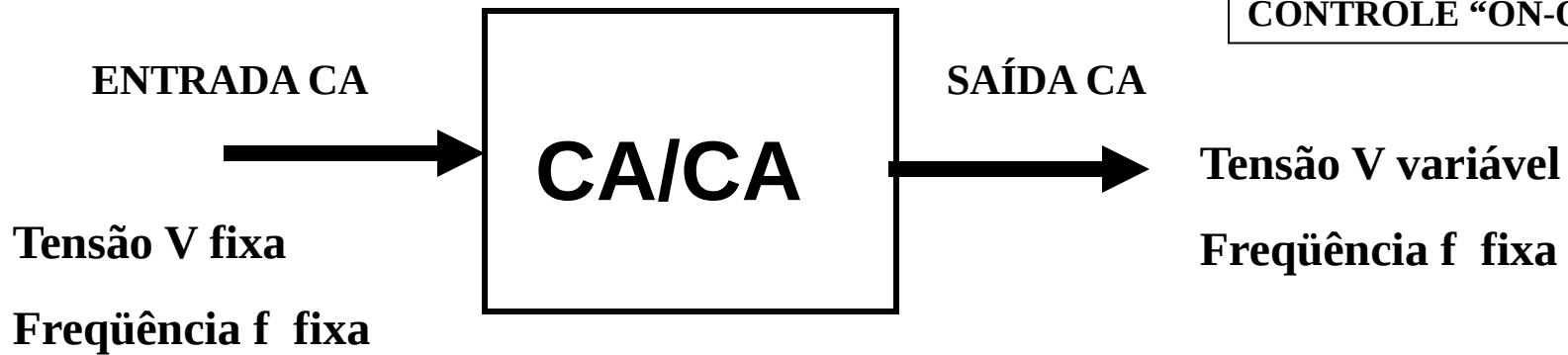


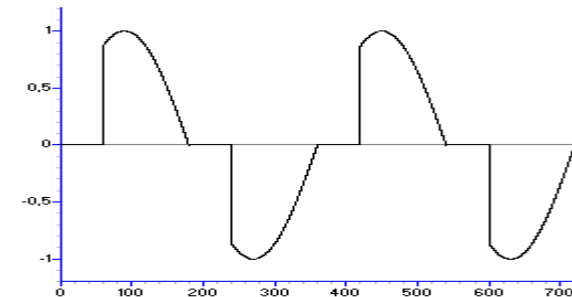
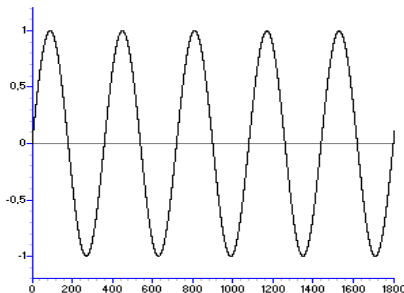
# **CONTROLADORES DE TENSÃO CA MONOFÁSICOS**

**Prof. Azauri A. de Oliveira Jr.**

# CONTROLADOR CA – CONVERSOR TIPO CA/CA

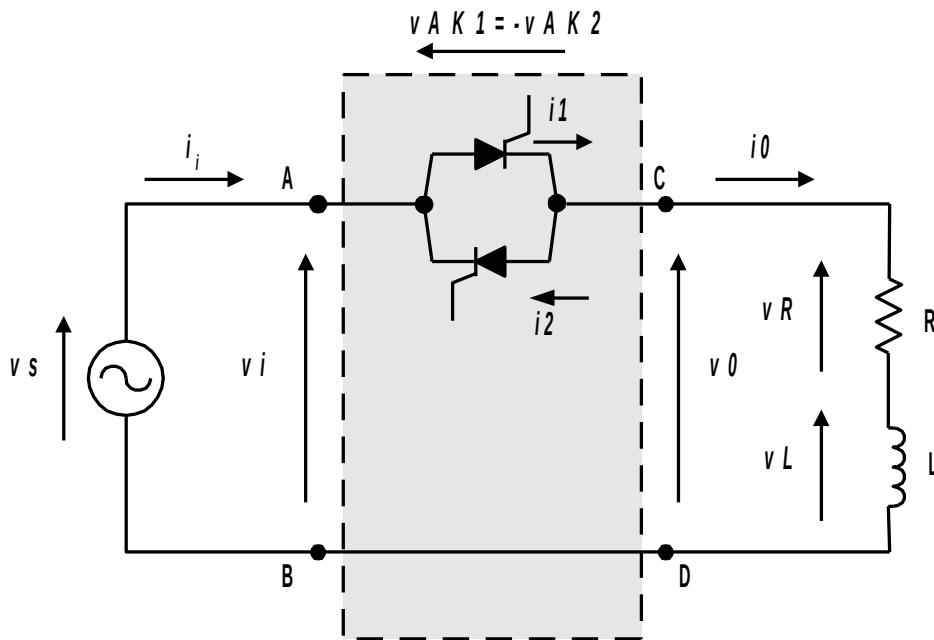


CONTROLE “ON-OFF”



CONTROLE DE FASE

# CONTROLADOR DE TENSÃO CA MONOFÁSICO



$$v_{AK1} = -v_{AK2}$$

$$v_i = v_o + v_{AK1} = v_o - v_{AK2}$$

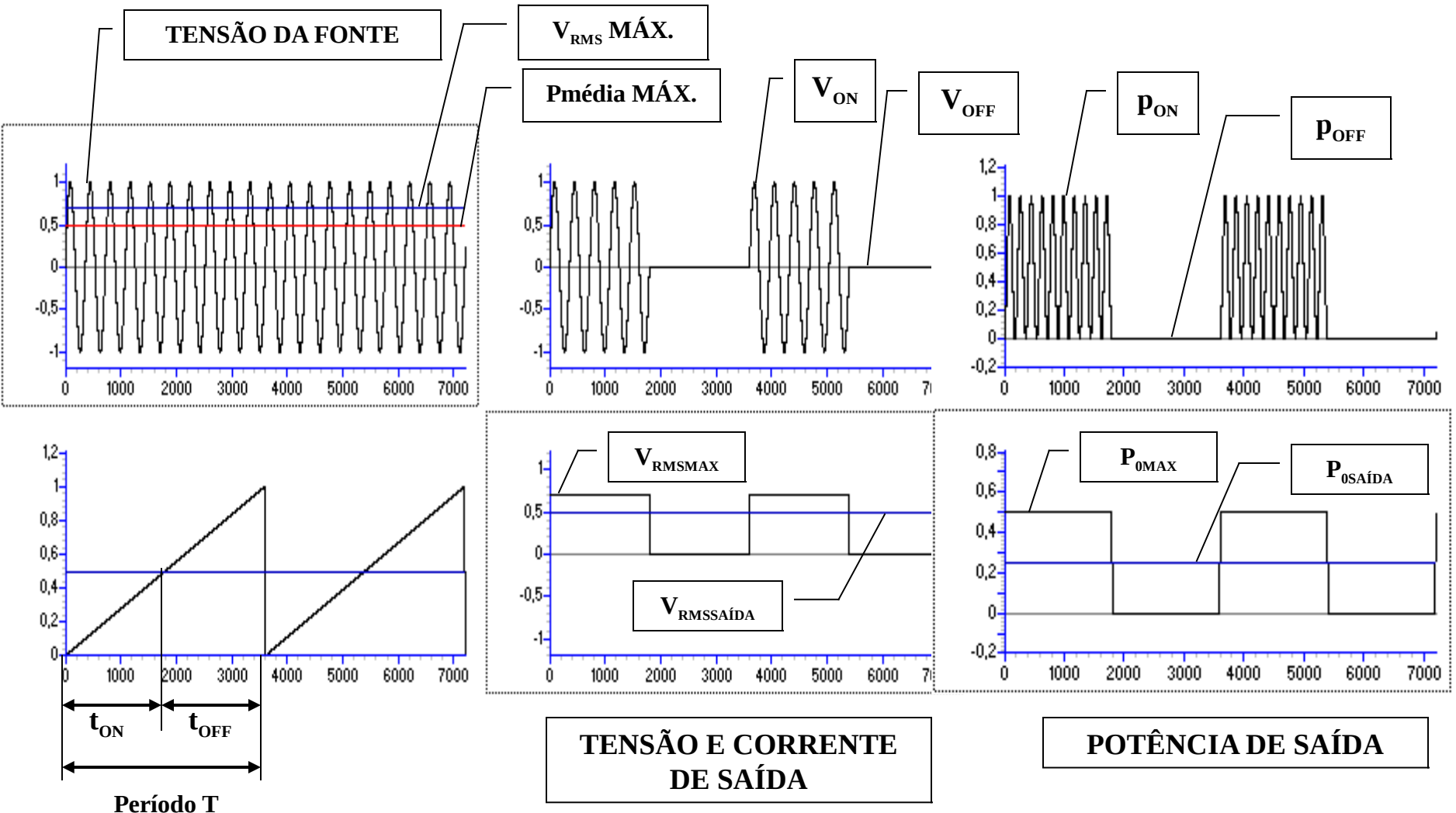
$$v_o = v_{\text{carga}}$$

$$v_s = v_i$$

$$i_o = i_i = i_1 - i_2$$

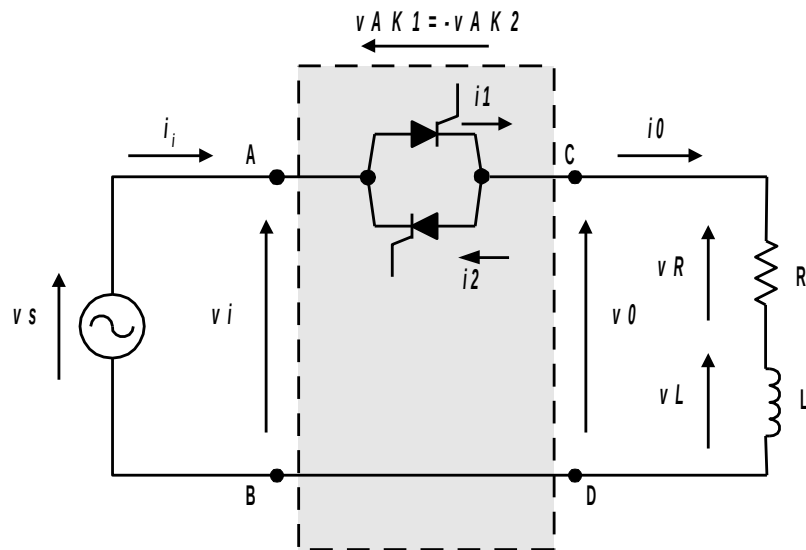
# CONTROLADOR DE TENSÃO CA MONOFÁSICO

## CONTROLE LIGA/DESLIGA (“ON/OFF”) - CARGA R

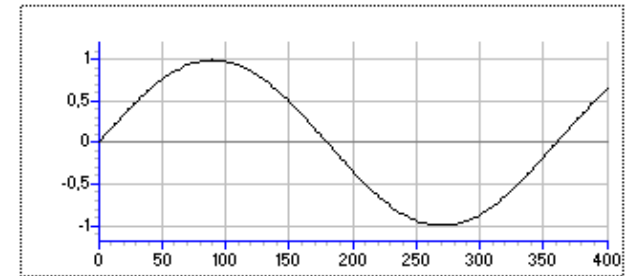


# CONTROLADOR DE TENSÃO CA MONOFÁSICO

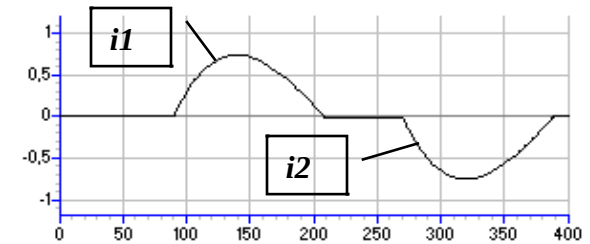
## CONTROLE DE FASE



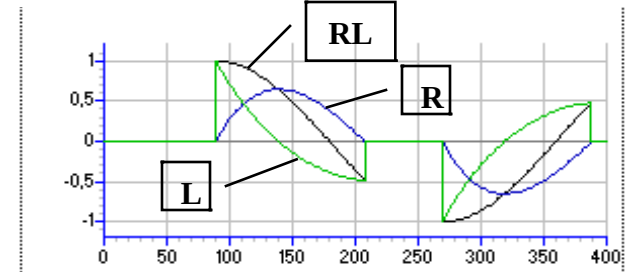
Tensão da Fonte



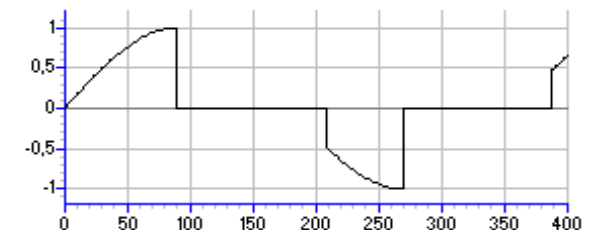
Corrente na Carga



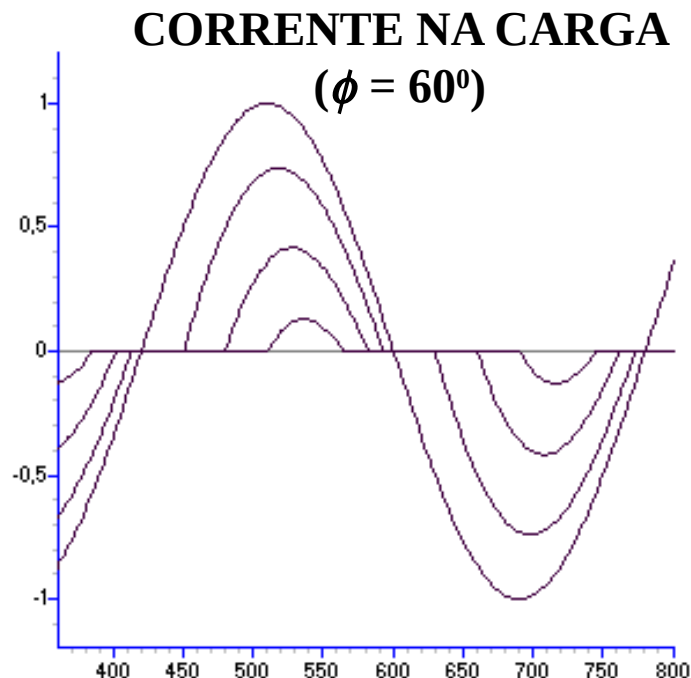
Tensão na Carga



Tensão nos SCR's

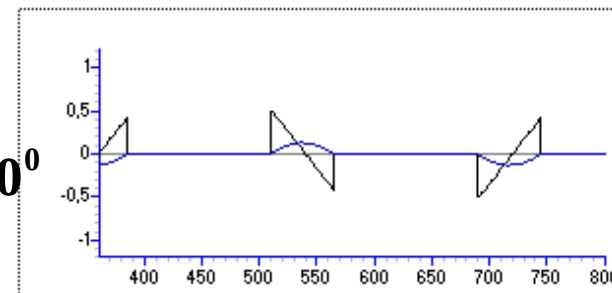


# FAIXA DE CONTROLE DO ÂNGULO DE DISPARO

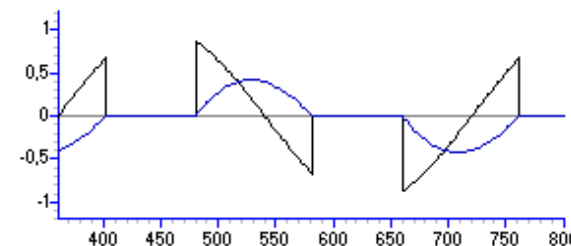


$$\phi \leq \alpha \leq 180^\circ$$

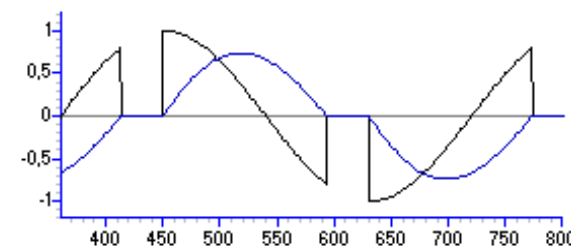
$$\alpha = 150^\circ$$



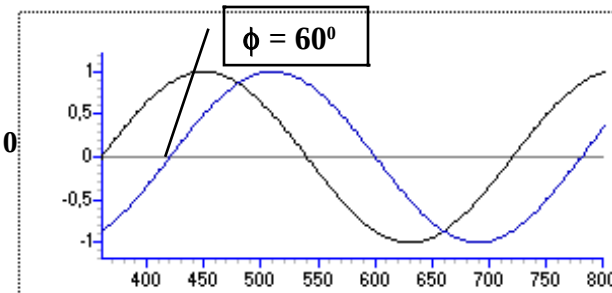
$$\alpha = 120^\circ$$



$$\alpha = 90^\circ$$

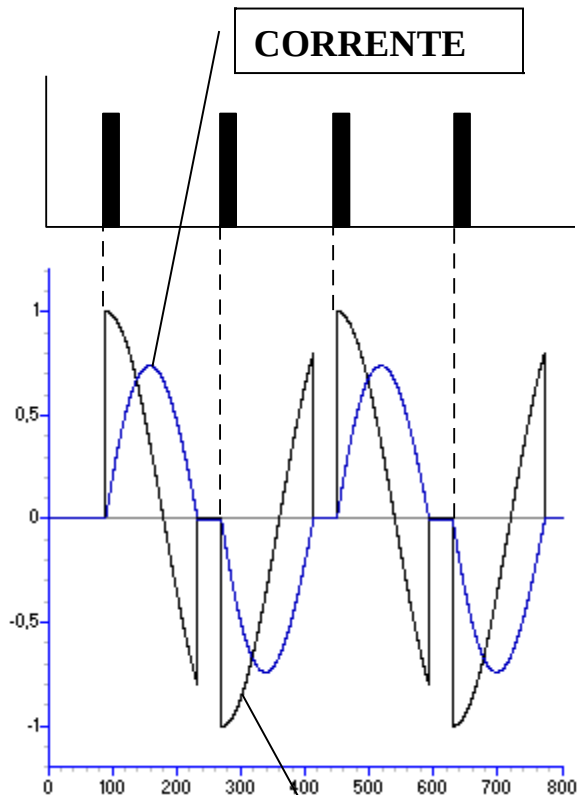


$$\alpha = 60^\circ$$



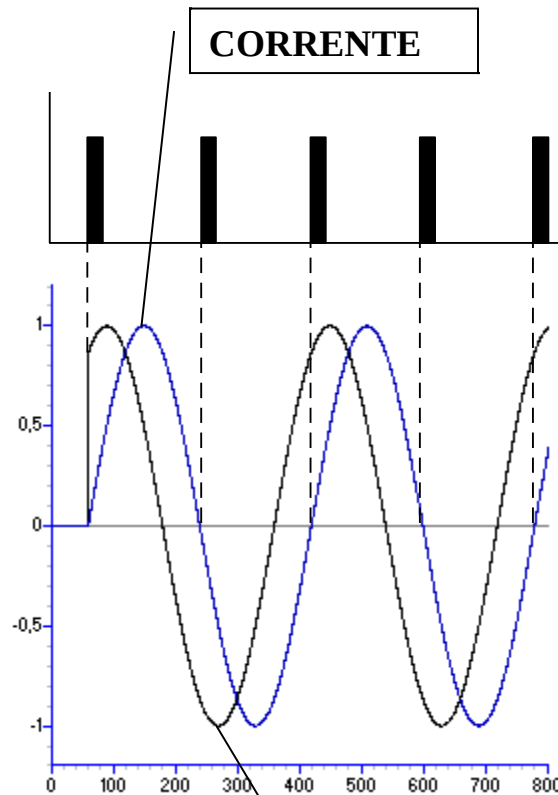
**CORRENTES E TENSÕES NA CARGA**  
( $\phi = 60^\circ$ )

# TÉCNICA DE DISPARO COM PULSO ESTREITO (EFEITO PARA $\alpha < \phi$ )



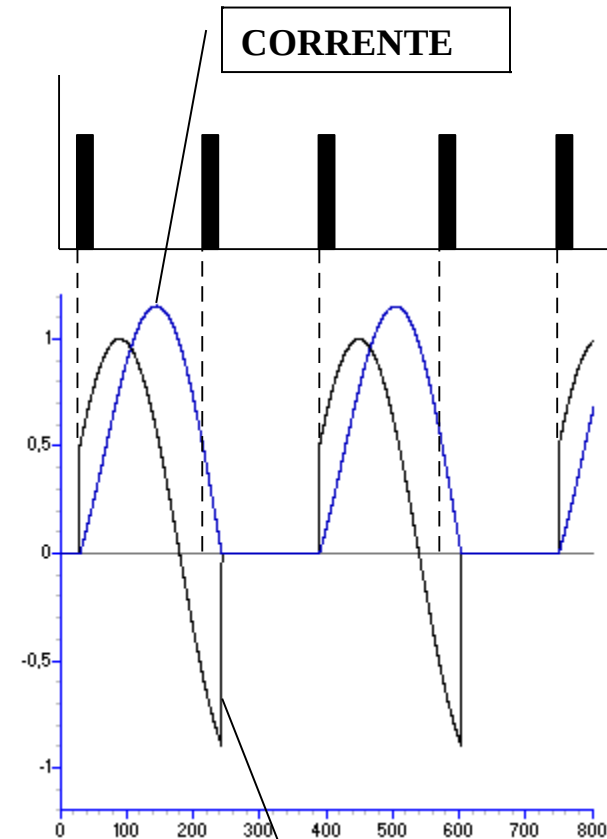
$$\phi = 60^\circ$$
$$\alpha = 90^\circ$$

TENSÃO



$$\phi = 60^\circ$$
$$\alpha = 60^\circ$$

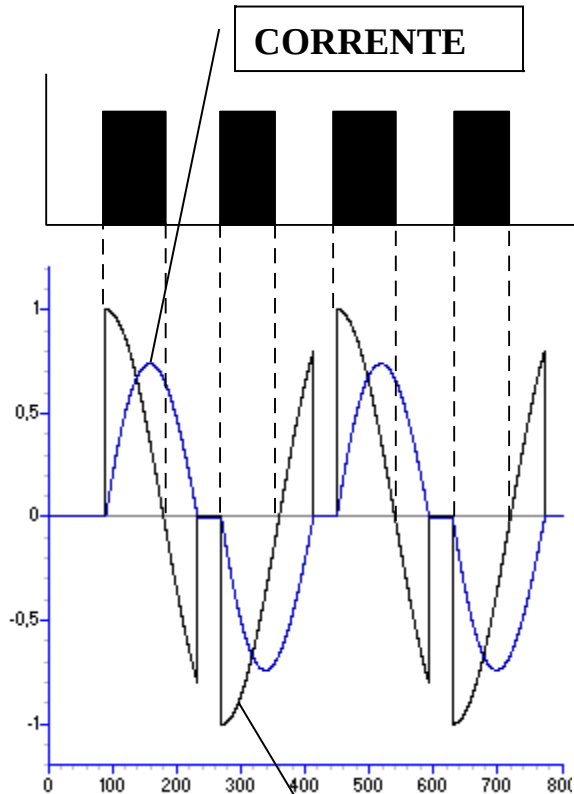
TENSÃO



$$\phi = 60^\circ$$
$$\alpha = 30^\circ$$

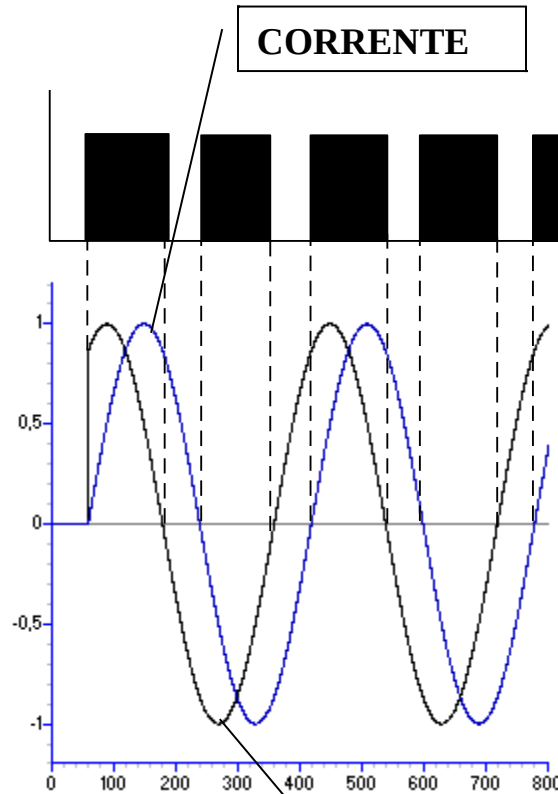
TENSÃO

# TÉCNICA DE DISPARO COM PULSO LARGO (EFEITO PARA $\alpha < \phi$ )



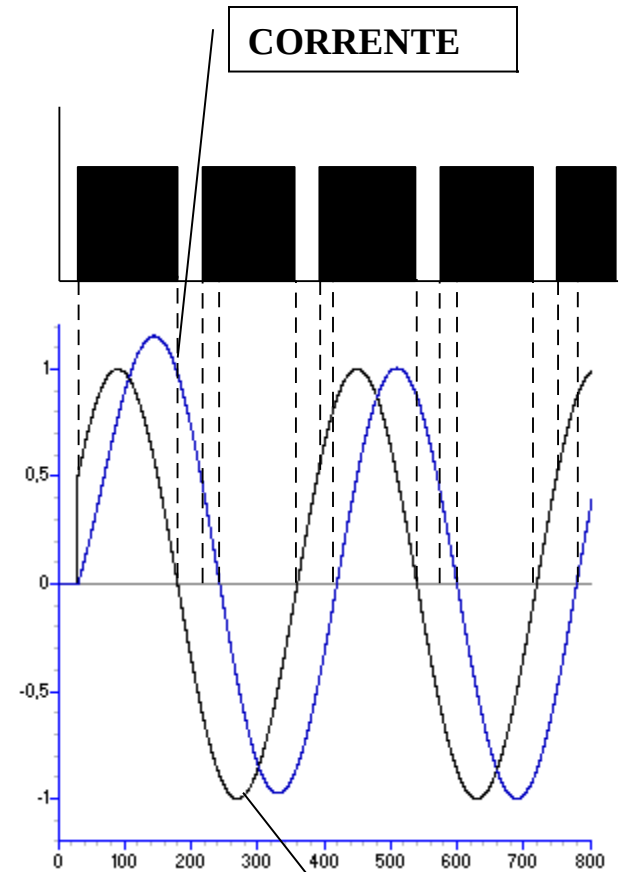
$$\phi = 60^\circ$$
$$\alpha = 90^\circ$$

TENSÃO



$$\phi = 60^\circ$$
$$\alpha = 60^\circ$$

TENSÃO



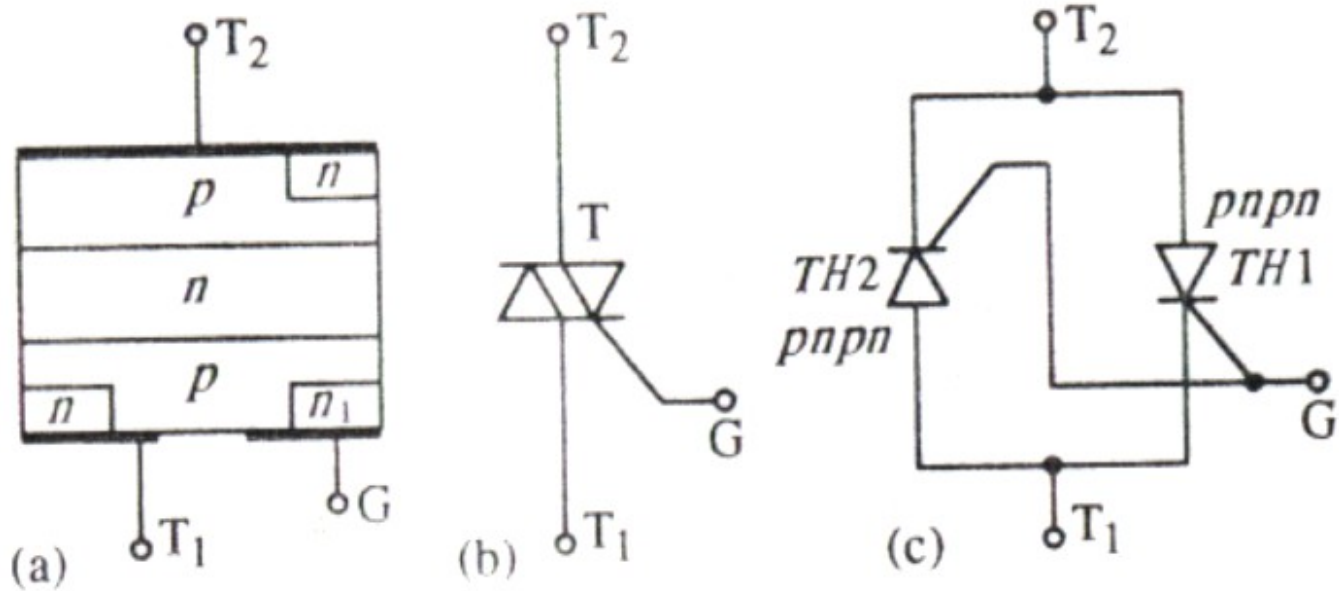
$$\phi = 60^\circ$$
$$\alpha = 30^\circ$$

TENSÃO



# TRIAC – TRANSISTOR AC (TIRISTOR AC)

## ESTRUTURA FÍSICA



# TRIAC – TRANSISTOR AC (TIRISTOR AC)

## CARACTERÍSTICAS ESTÁTICAS

