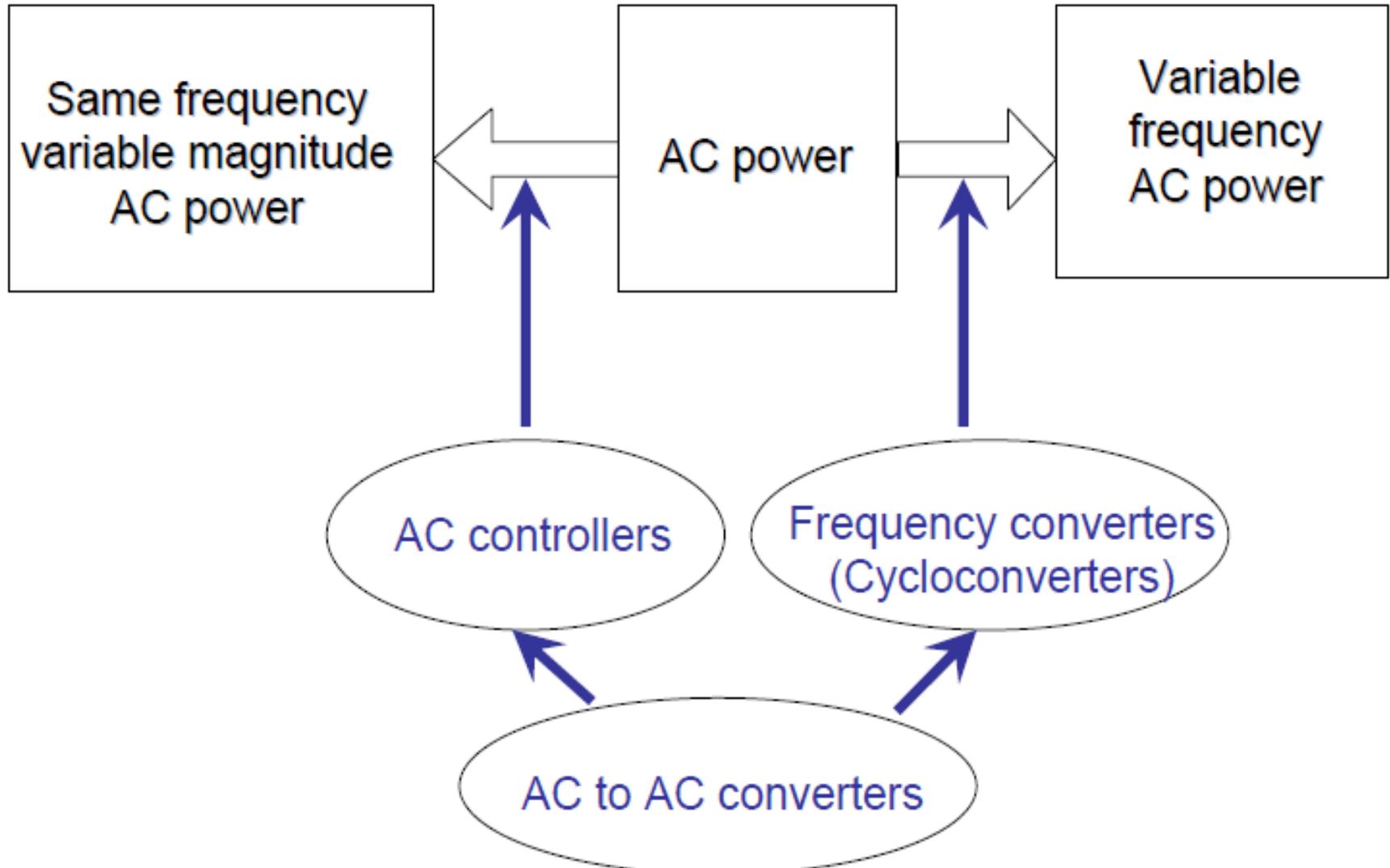
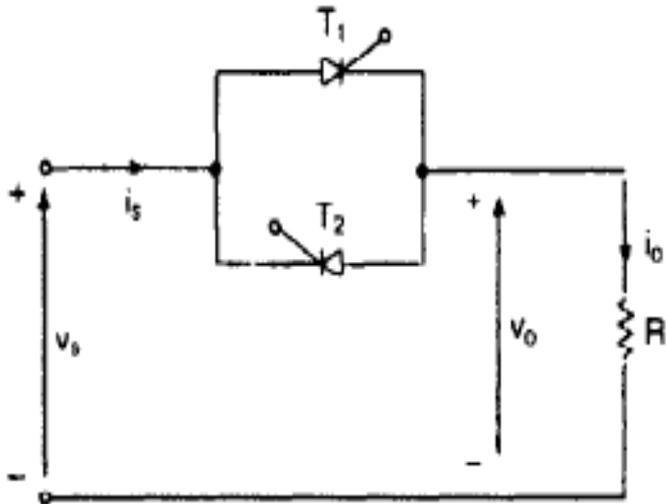


Conversión AC-AC

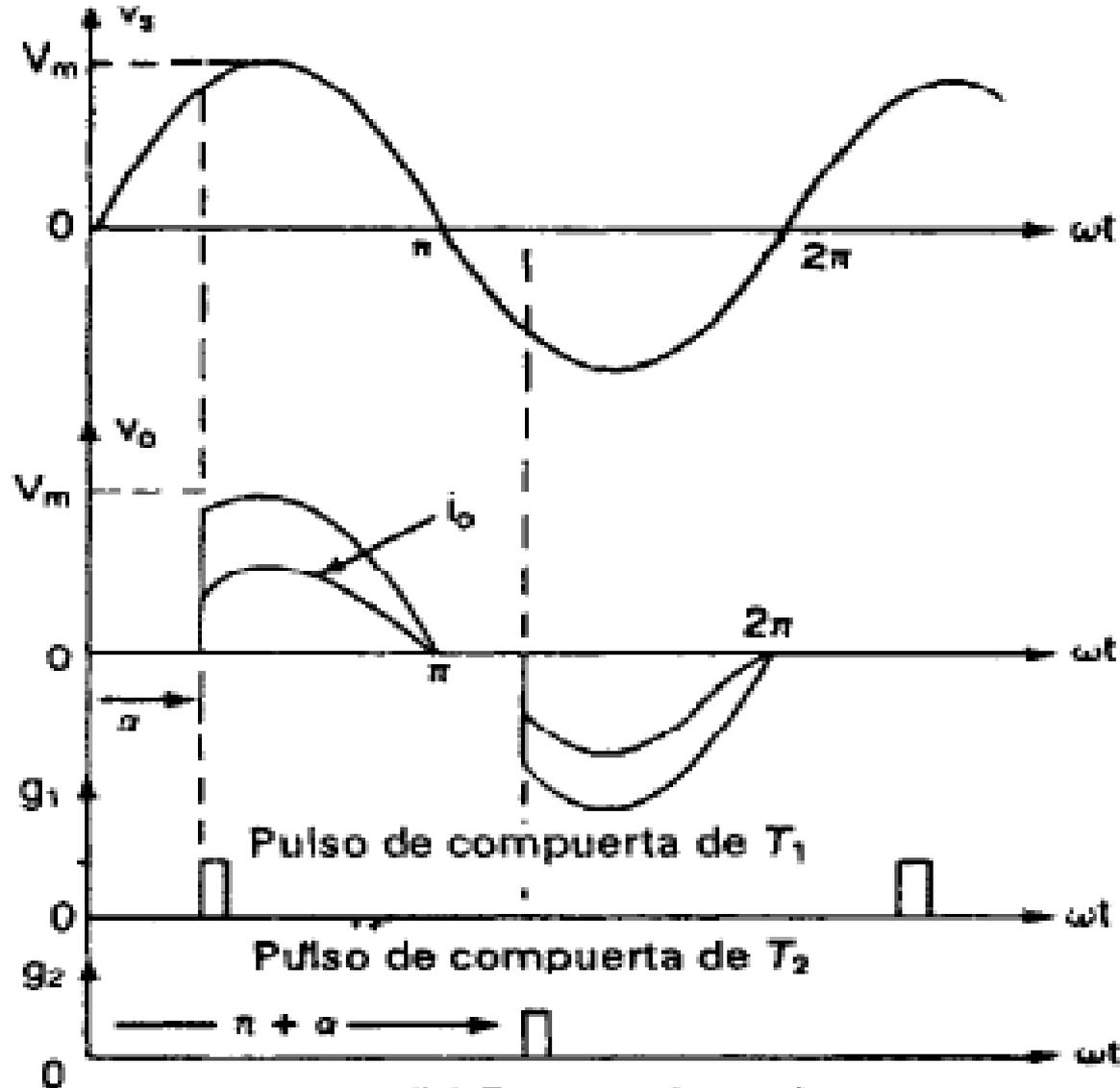
Conversión AC-AC



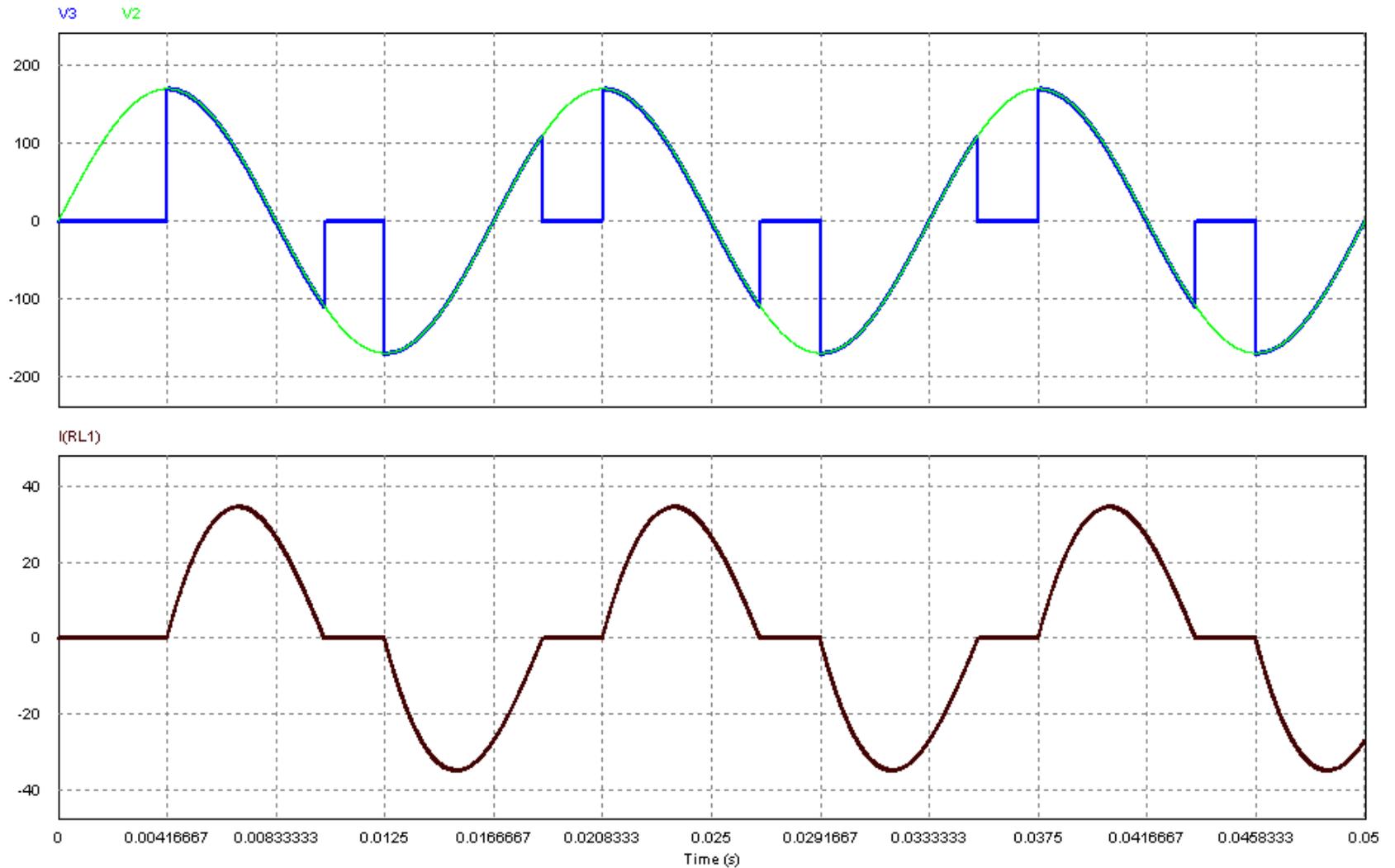
Conversión Monofásica



$$\begin{aligned}
 V_o &= \left\{ \frac{2}{2\pi} \int_{\alpha}^{\pi} 2V_s^2 \sin^2 \omega t \, d(\omega t) \right\}^{1/2} \\
 &= \left\{ \frac{4V_s^2}{4\pi} \int_{\alpha}^{\pi} (1 - \cos 2\omega t) \, d(\omega t) \right\}^{1/2} \\
 &= V_s \left[\frac{1}{\pi} \left(\pi - \alpha + \frac{\sin 2\alpha}{2} \right) \right]^{1/2}
 \end{aligned}$$

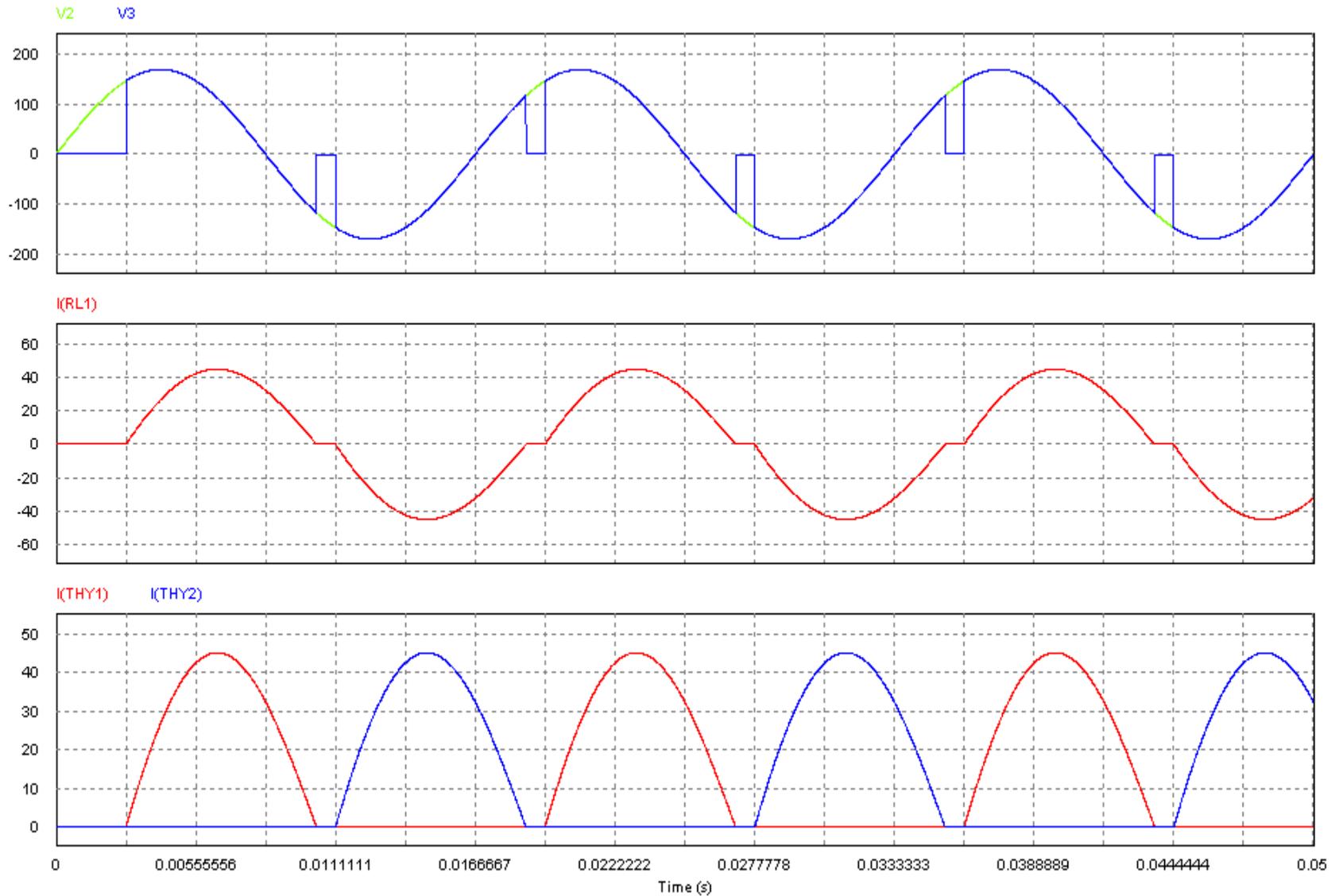


Simulación



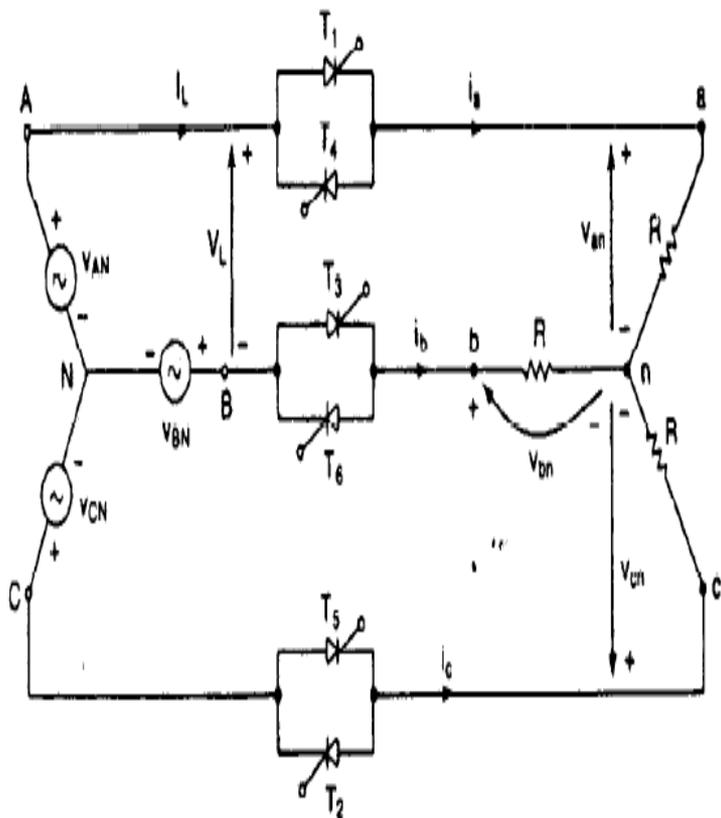
$$\alpha = 90^\circ$$

Simulación



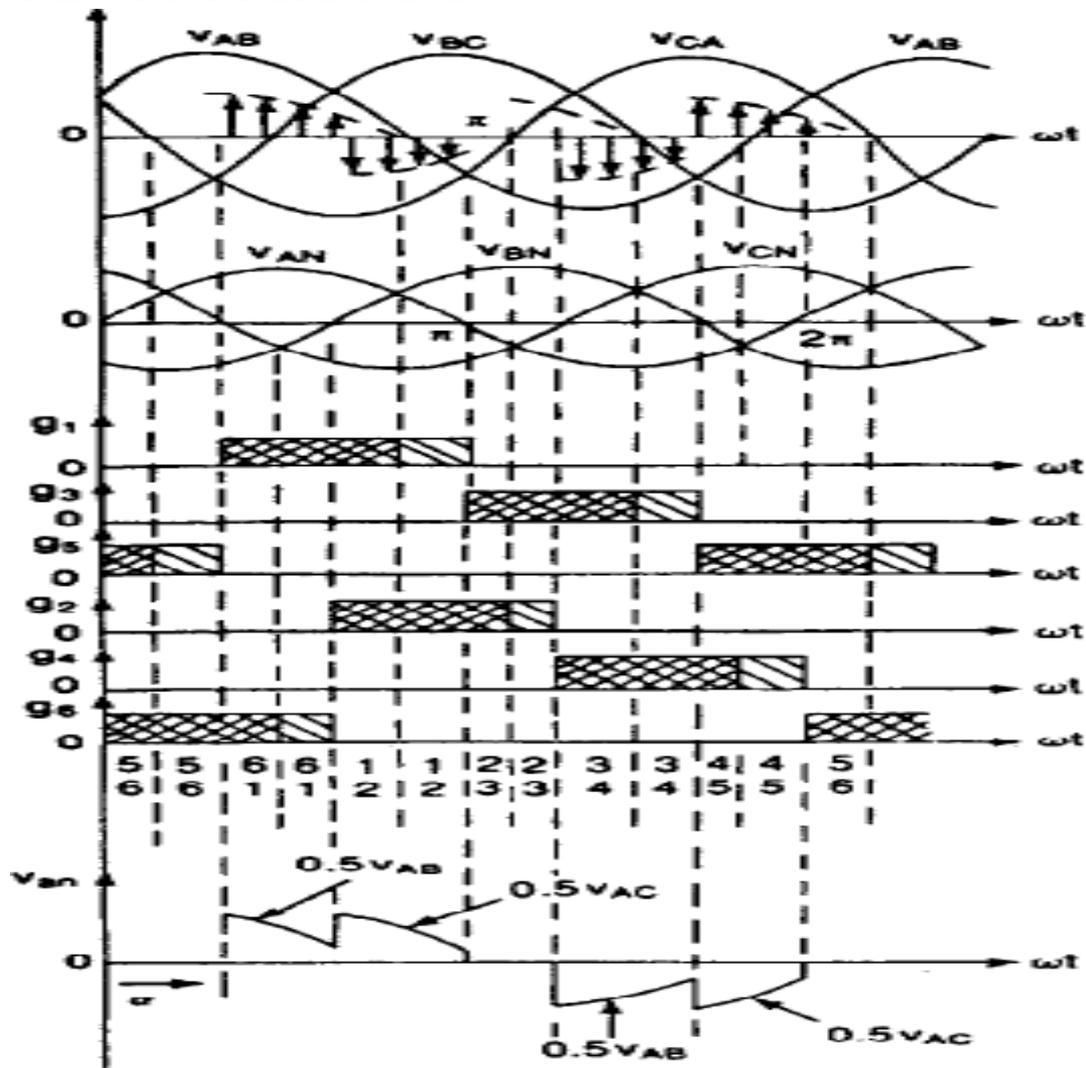
$$\alpha = 60^\circ$$

AC-AC Trifásico



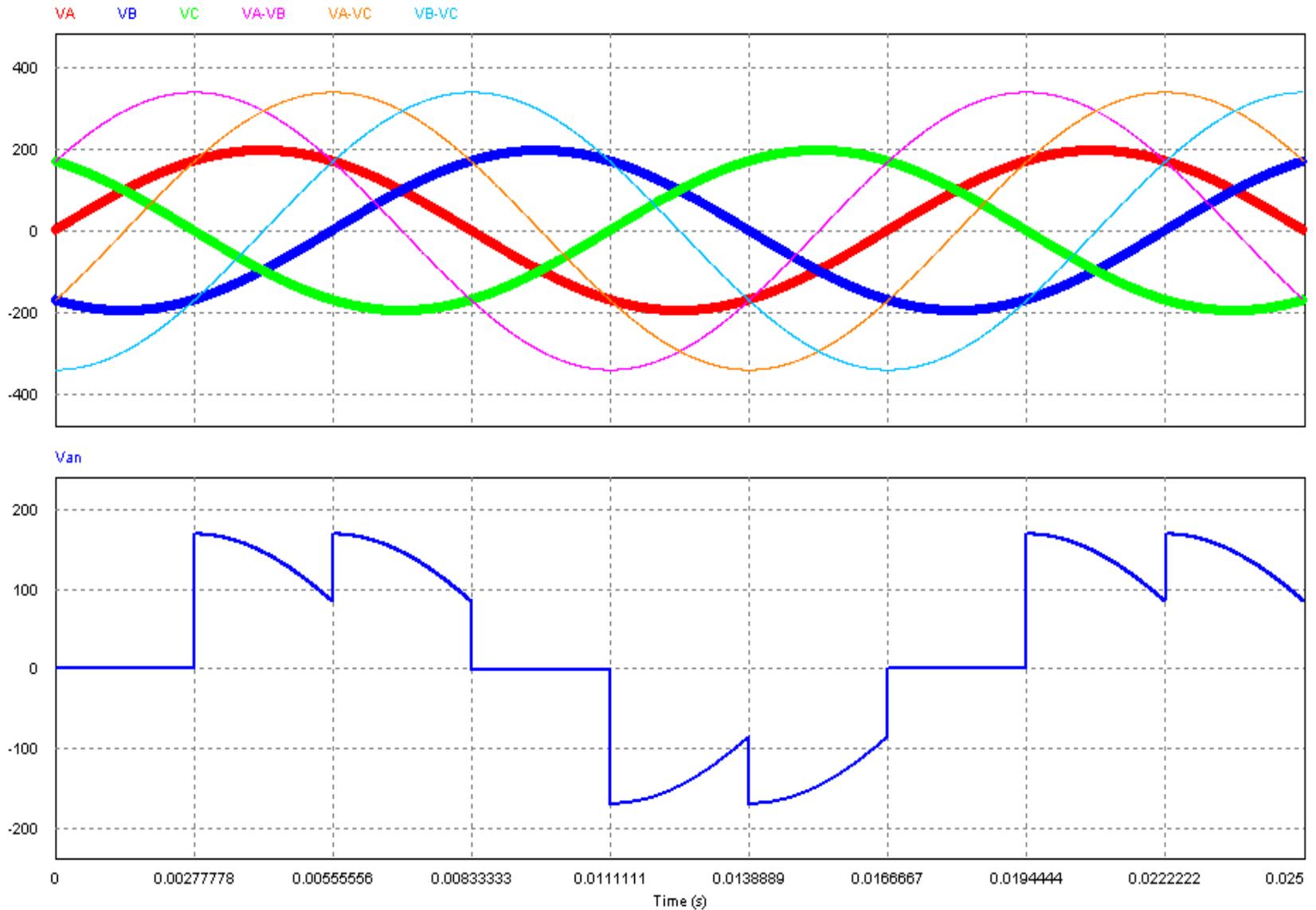
Para $60^\circ \leq \alpha < 90^\circ$:

$$V_o = \sqrt{6} V_s \left[\frac{1}{\pi} \left(\frac{\pi}{12} + \frac{3 \operatorname{sen} 2\alpha}{16} + \frac{\sqrt{3} \cos 2\alpha}{16} \right) \right]^{1/2}$$



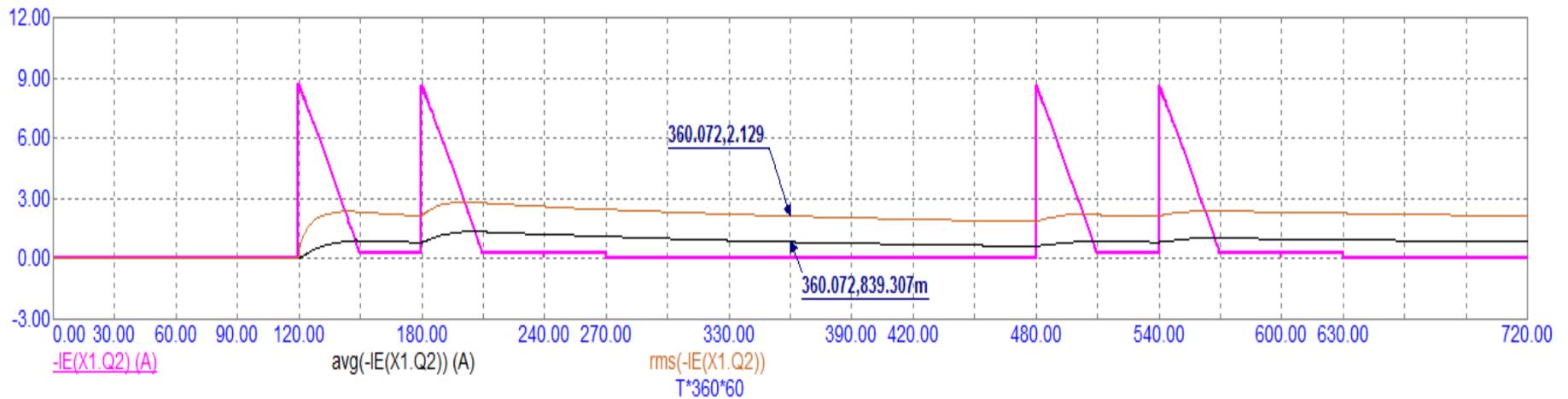
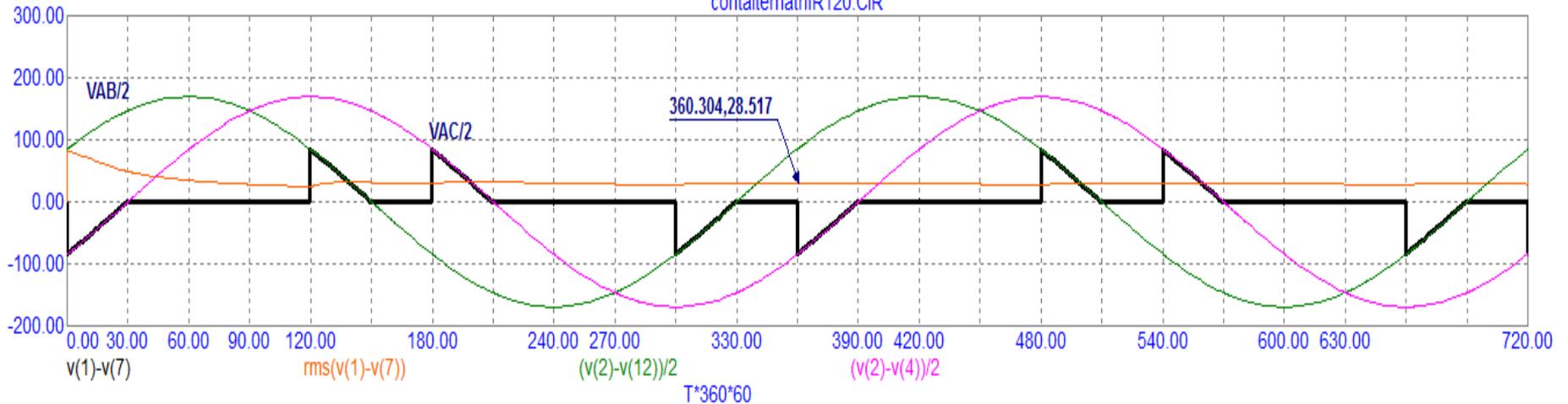
(a) Para $\alpha = 60^\circ$

Simulación $\alpha=60^\circ$



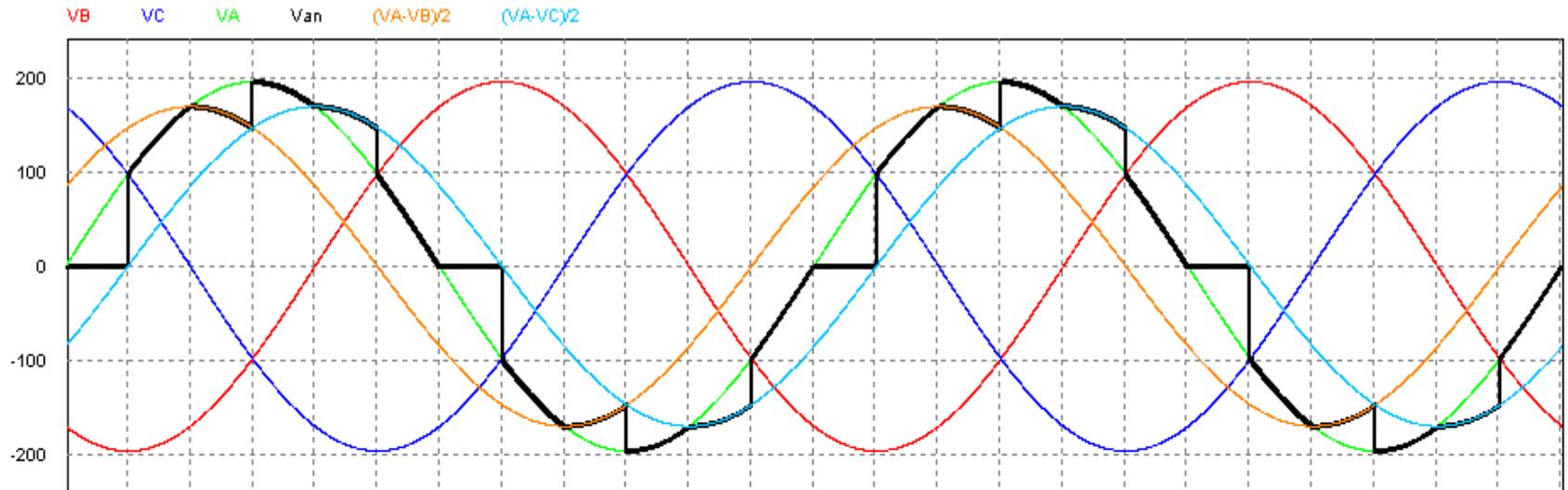
Simulación $\alpha=120^\circ$

Micro-Cap 11 Evaluation Version
contaltematrifR120.CIR

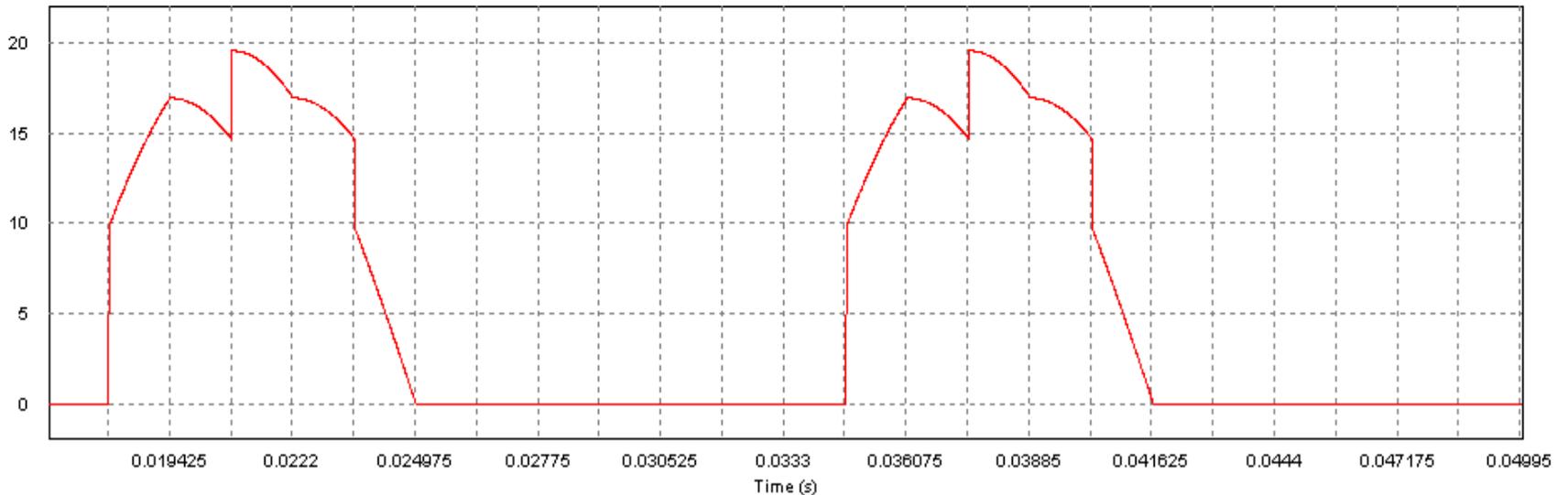


Para $90^\circ \leq \alpha < 150^\circ$:

Simulación $\alpha=30^\circ$

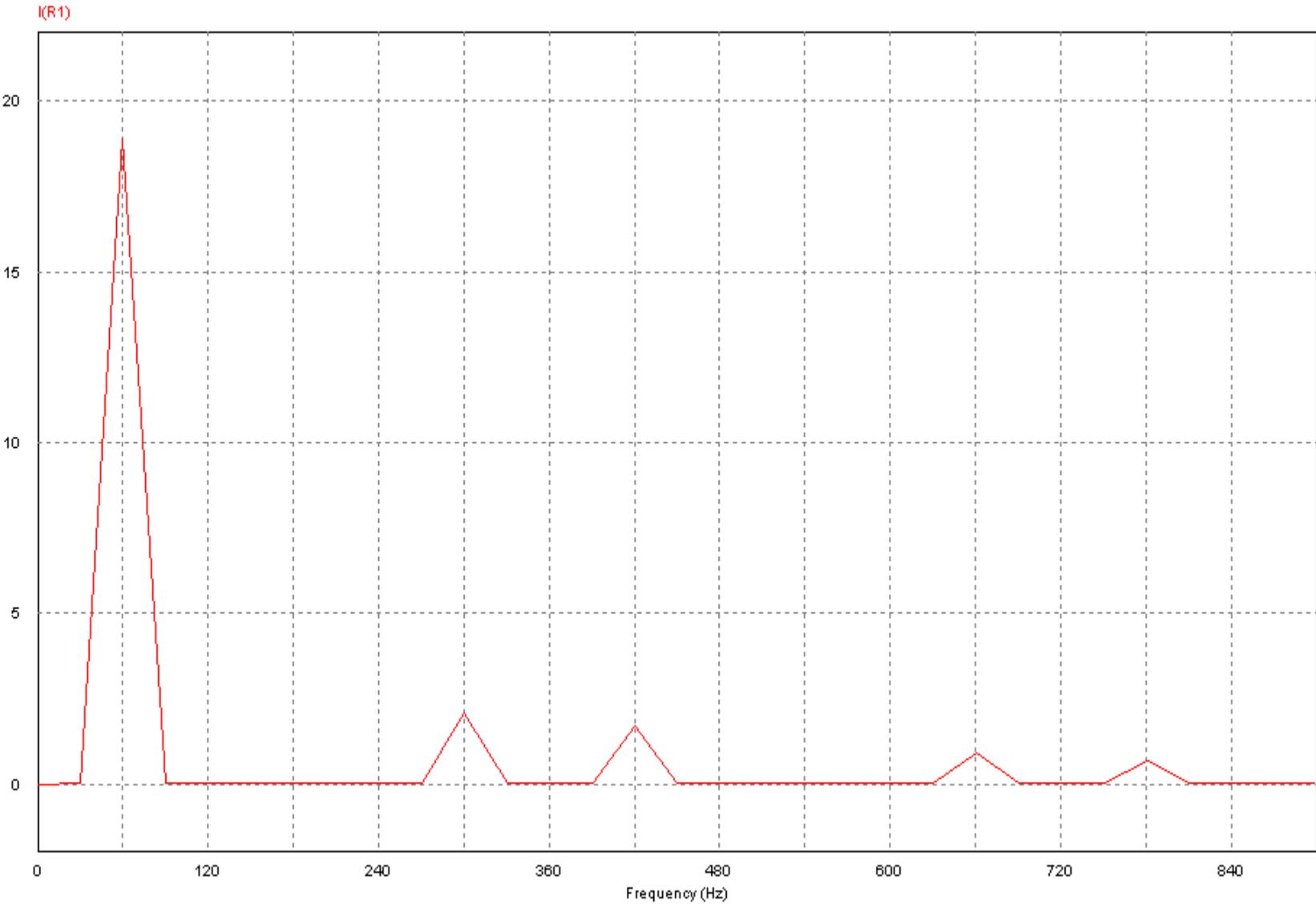


I(THY1)



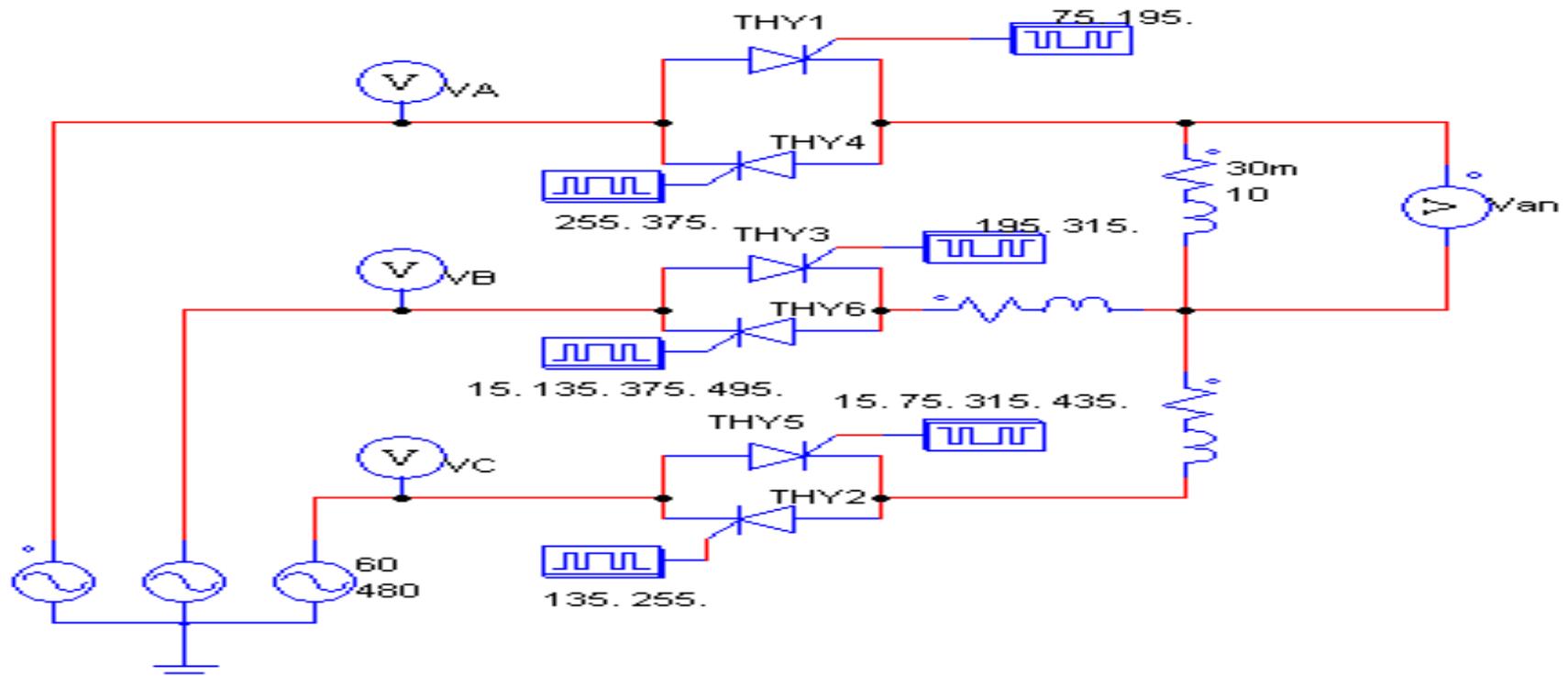
Para $0 \leq \alpha < 60^\circ$:

Armónicos



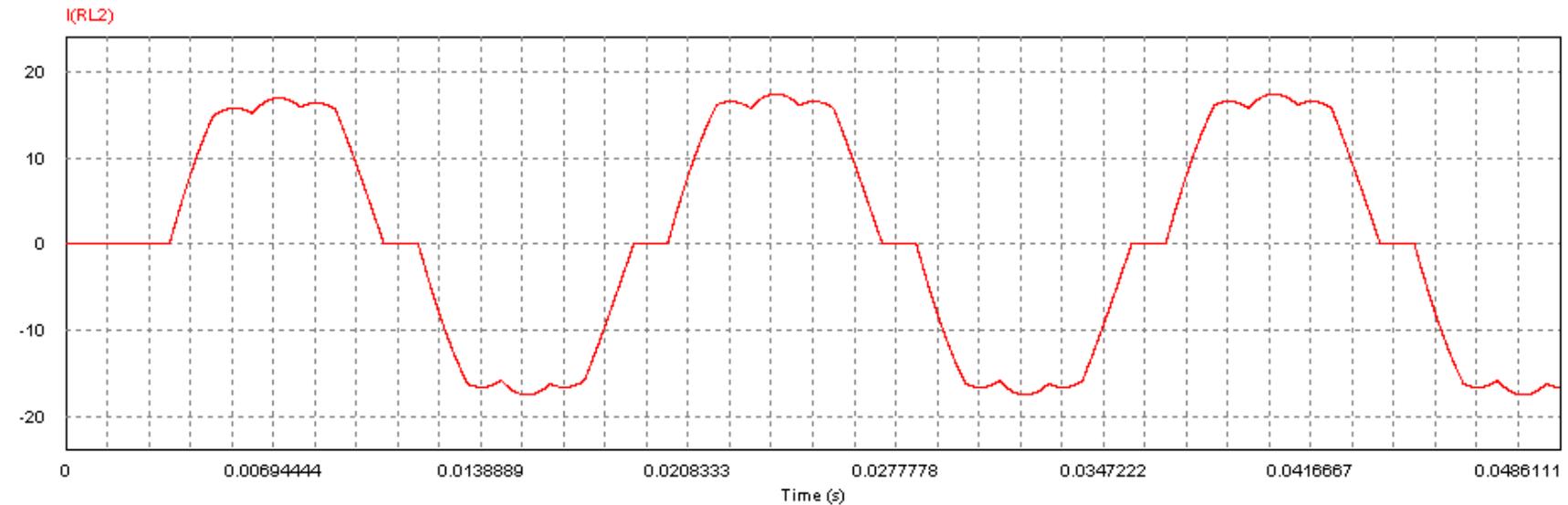
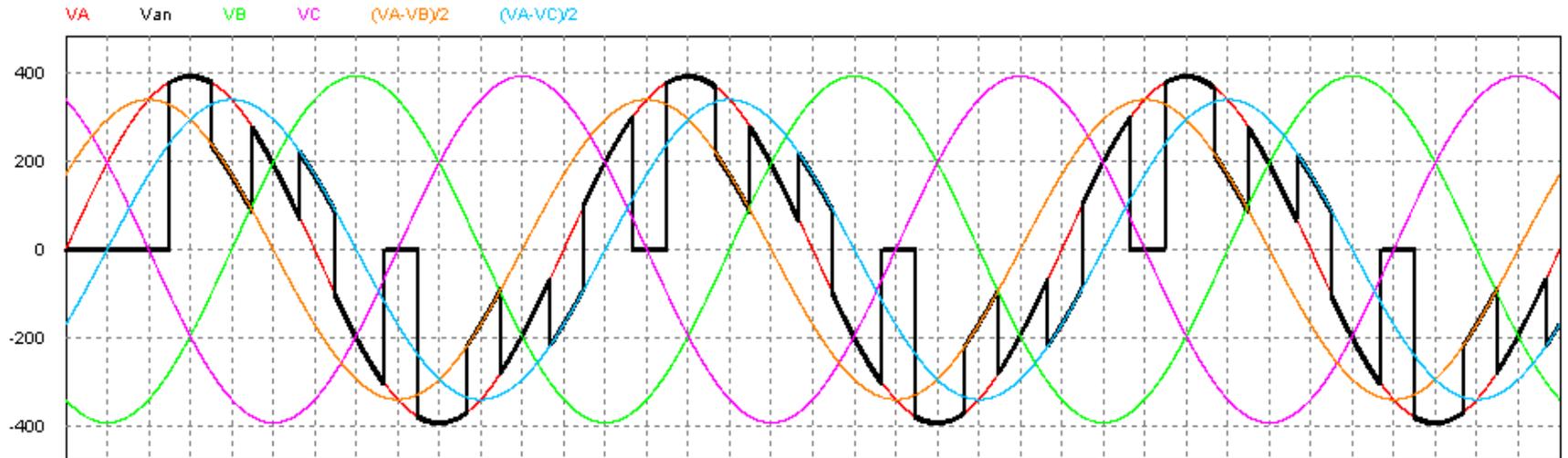
Ejemplo Carga R-L en estrella

Utilice PSpice para calcular la potencia entregada a una carga trifásica conectada en estrella. Cada fase de la carga es una combinación serie R-L, con $R = 10 \Omega$ y $L = 30 \text{ mH}$. El generador trifásico es un generador de 480 V eficaces línea a línea a 60 Hz y el ángulo de disparo α es igual a 75° . Determine la DAT de la corriente del generador.



Magnitud	Expresión	Resultado
Corriente eficaz de línea	$\text{RMS}(I(\text{RA}))$	12,86 A
Potencia de carga	$3 * \text{AVG}(V(4,7) * I(\text{RA}))$	4.960 W
Potencia absorbida por los SCR	$6 * \text{AVG}(V(1,4) * I(\text{S1}))$	35,1 W
DAT de la corriente del generador	(a partir del archivo de salida)	13,1 %

Simulación



Vanrms= 2.2381825e+002 **$I(RL2)$ rms=1.2636887e+001**

Thd(Van)=6.2607947e-001

Thd($I(RL2)$)= 1.3137221e-001

Cicloconvertidores

Cicloconvertidor Monofasico

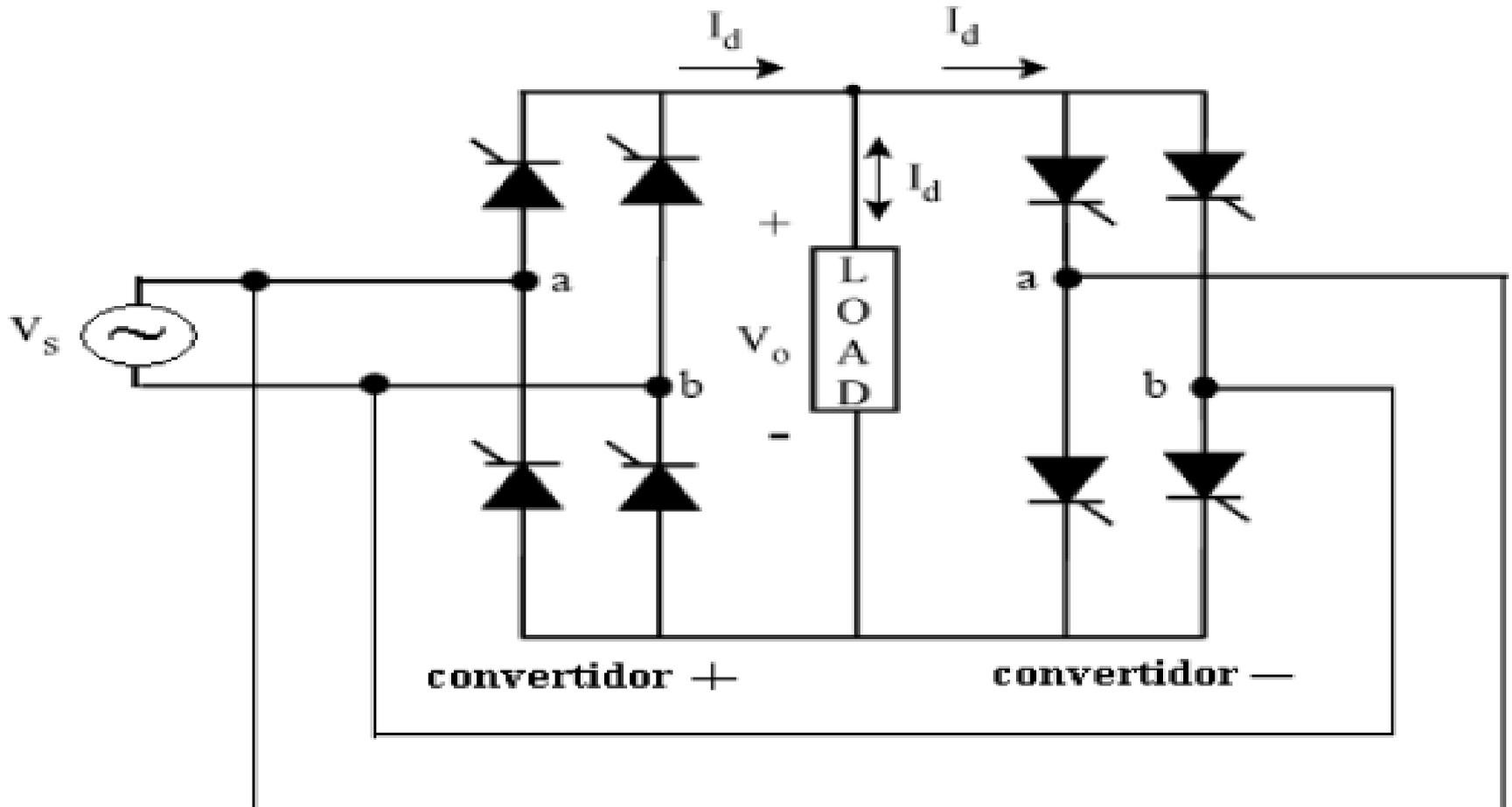


Fig. 2 cicloconvertidor monofásico

Formas de Onda con Angulo fijo

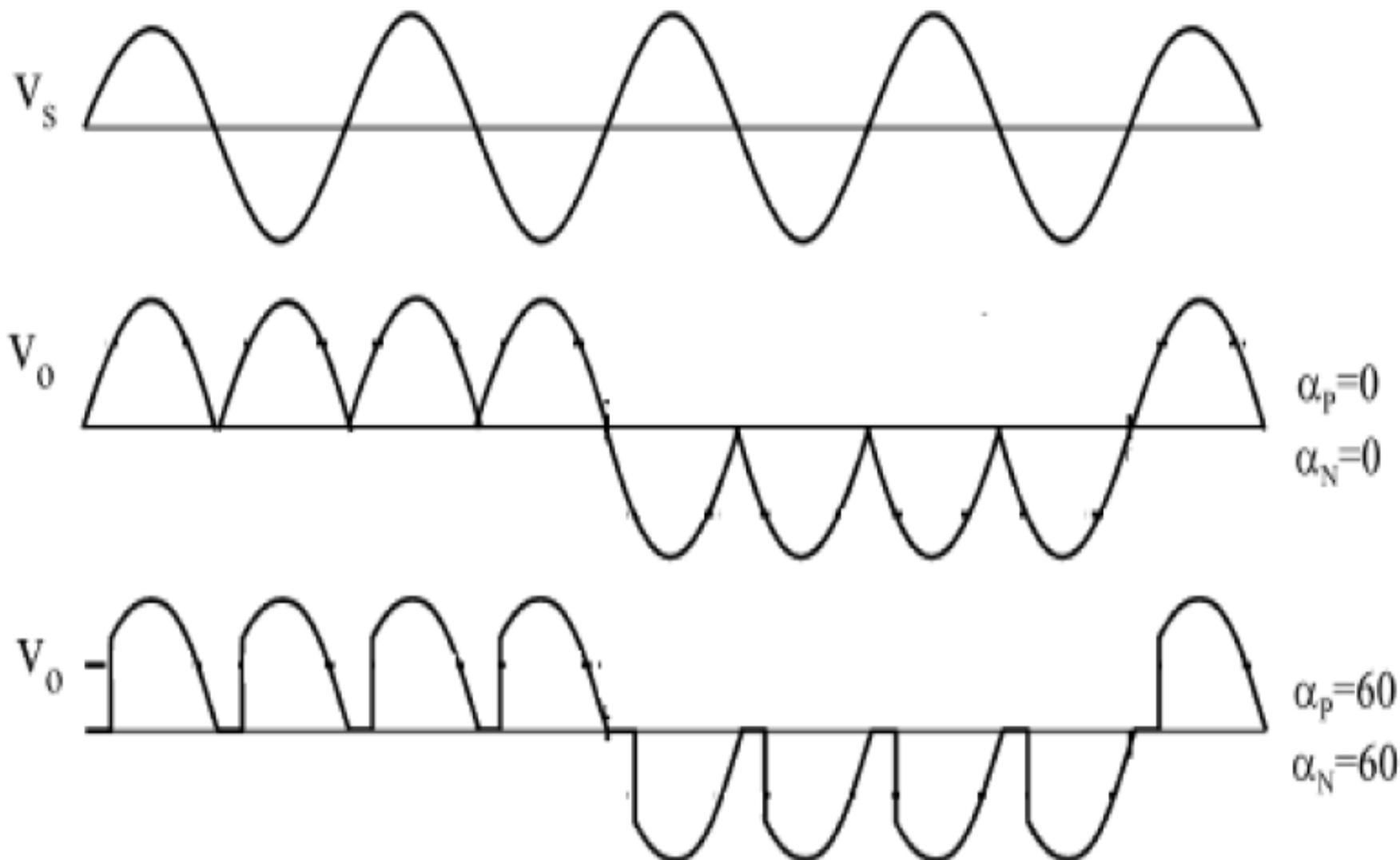
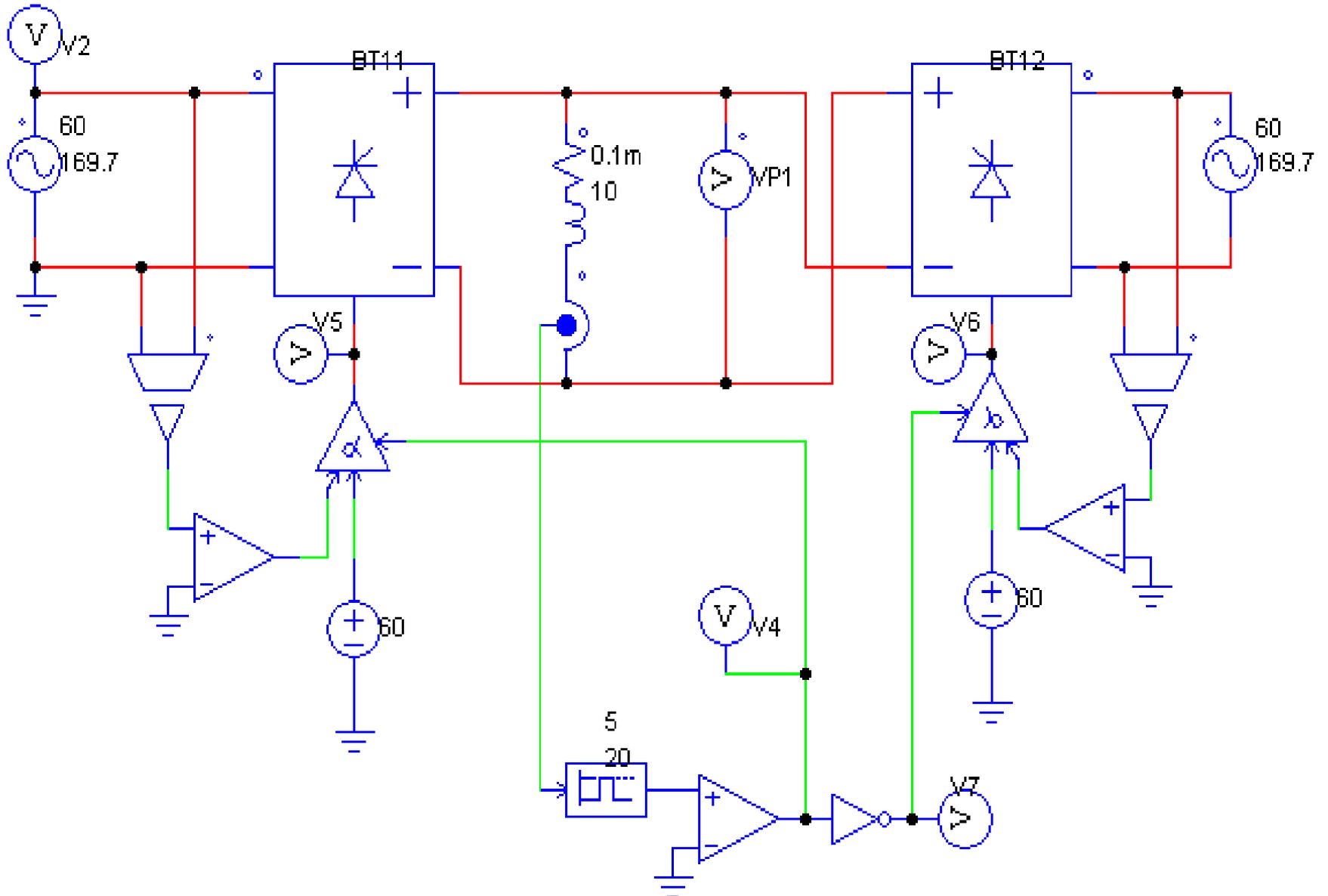


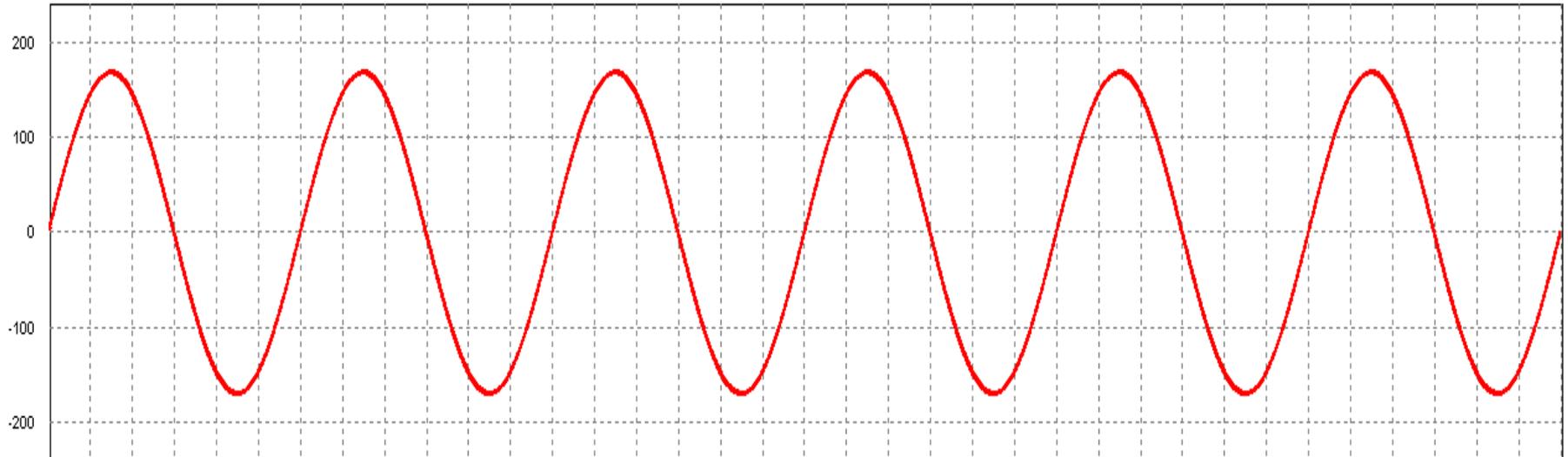
Fig. 3 formas de onda para $\alpha=0^\circ$ y $\alpha=60^\circ$

Simulación

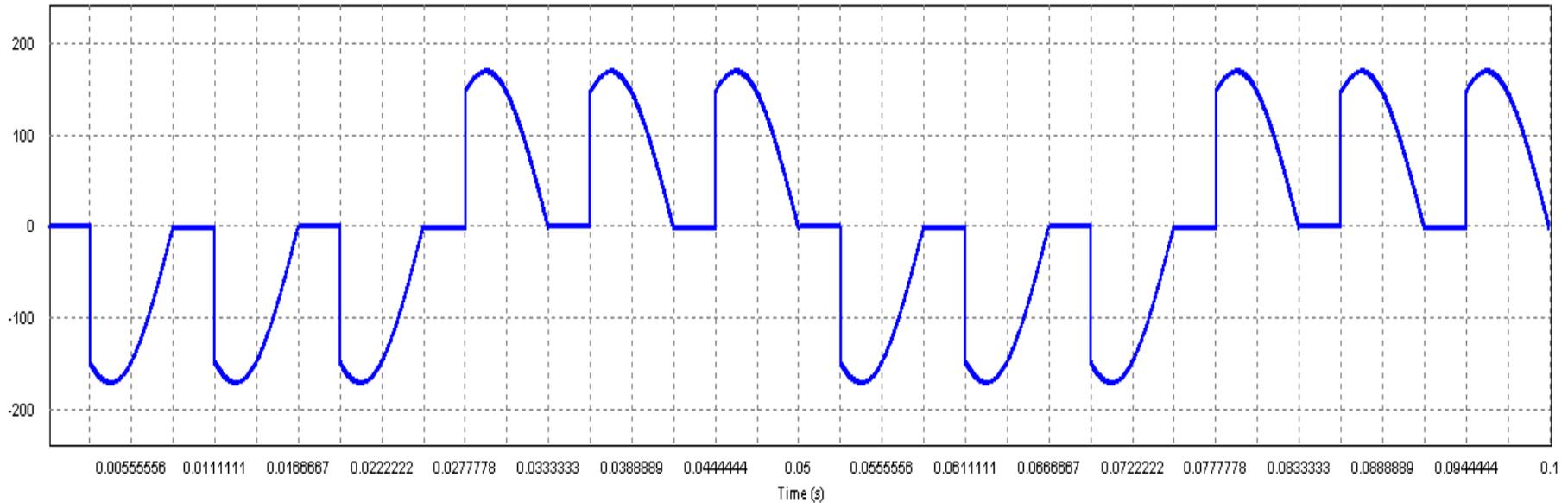


Simulación Formas de onda

V2

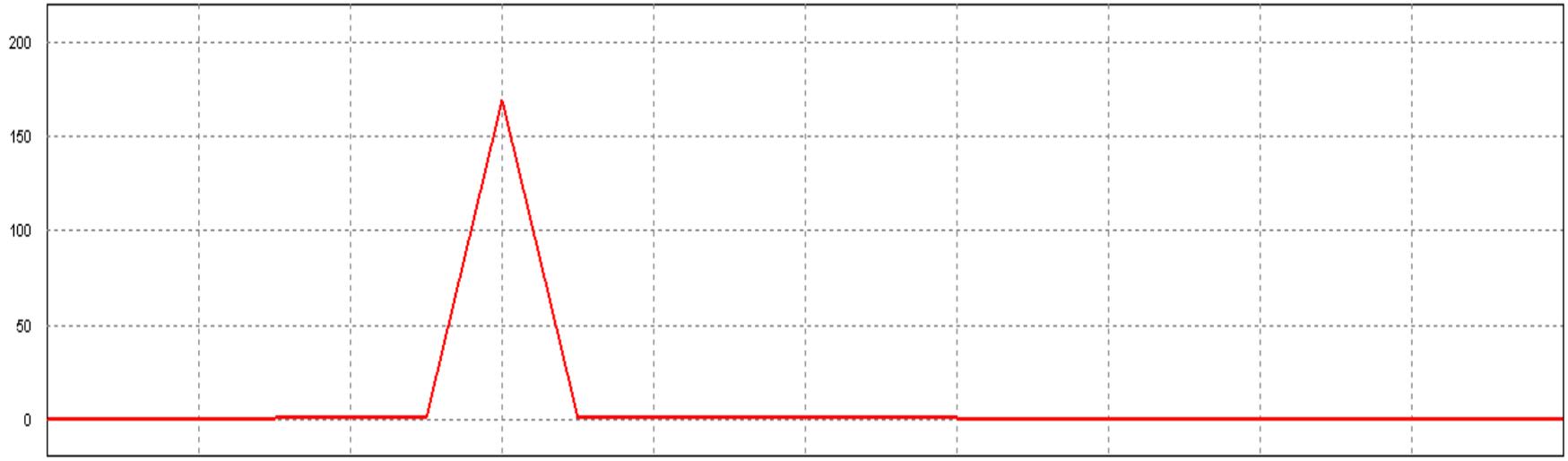


VP1

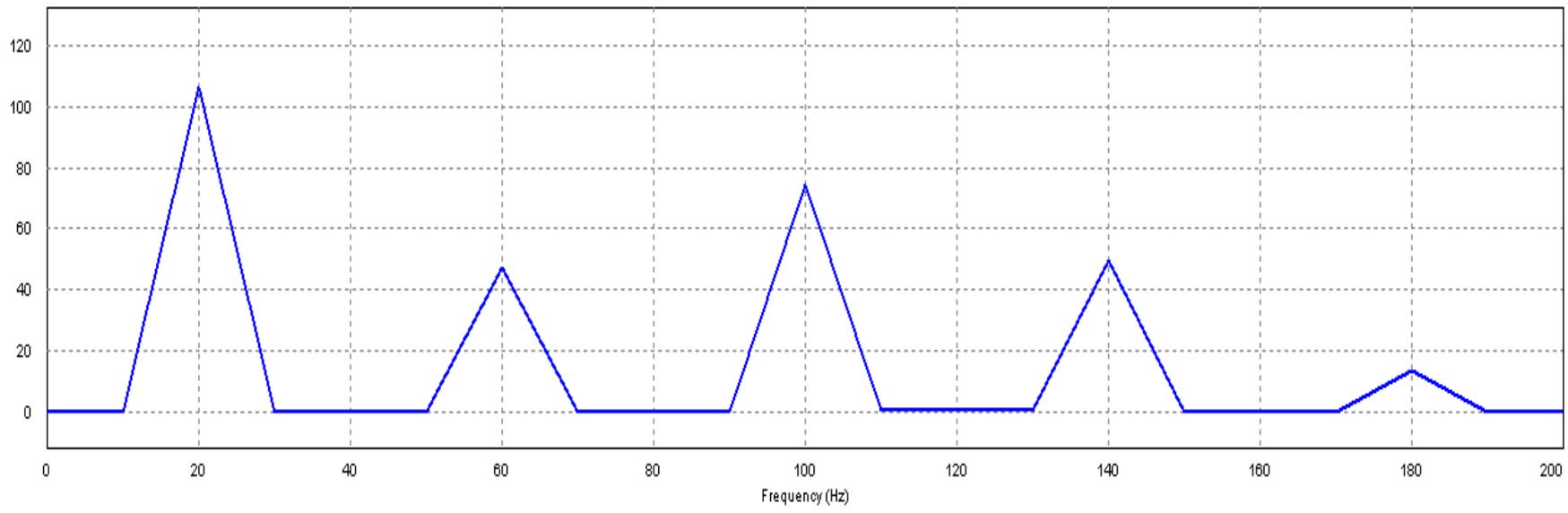


Armónicos

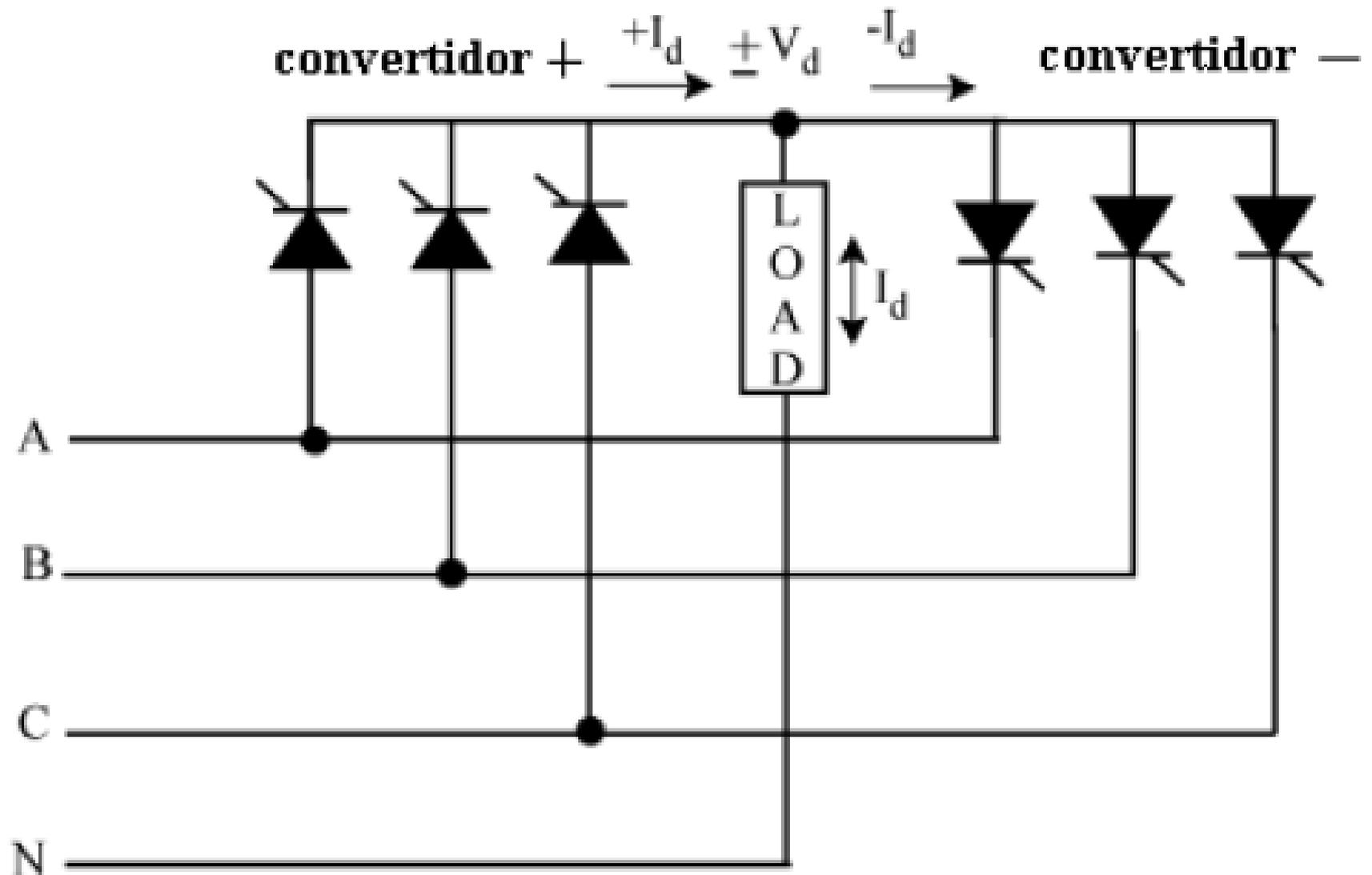
V2



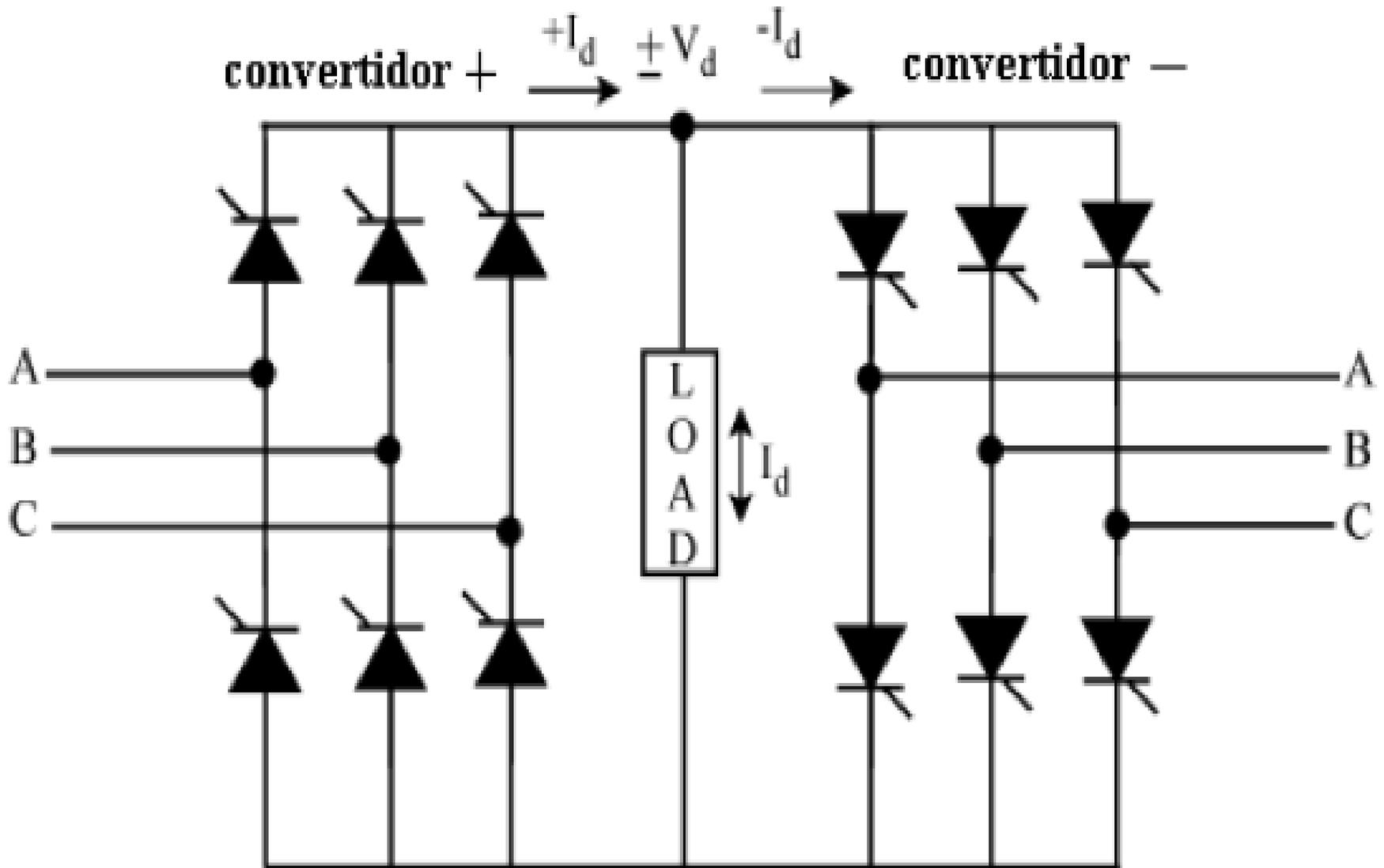
VP1



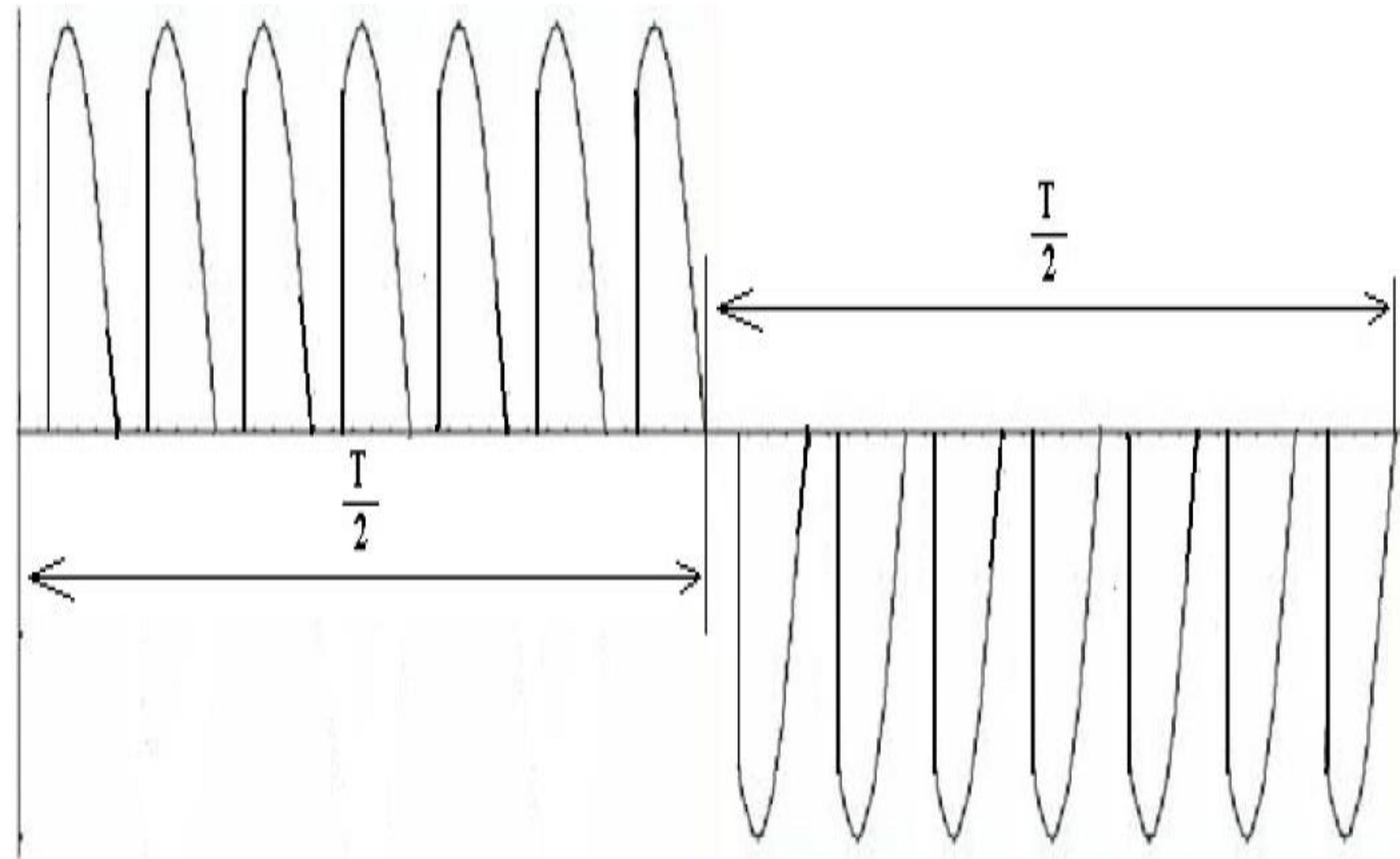
Cicloconvertidor Trif-Mono de media onda



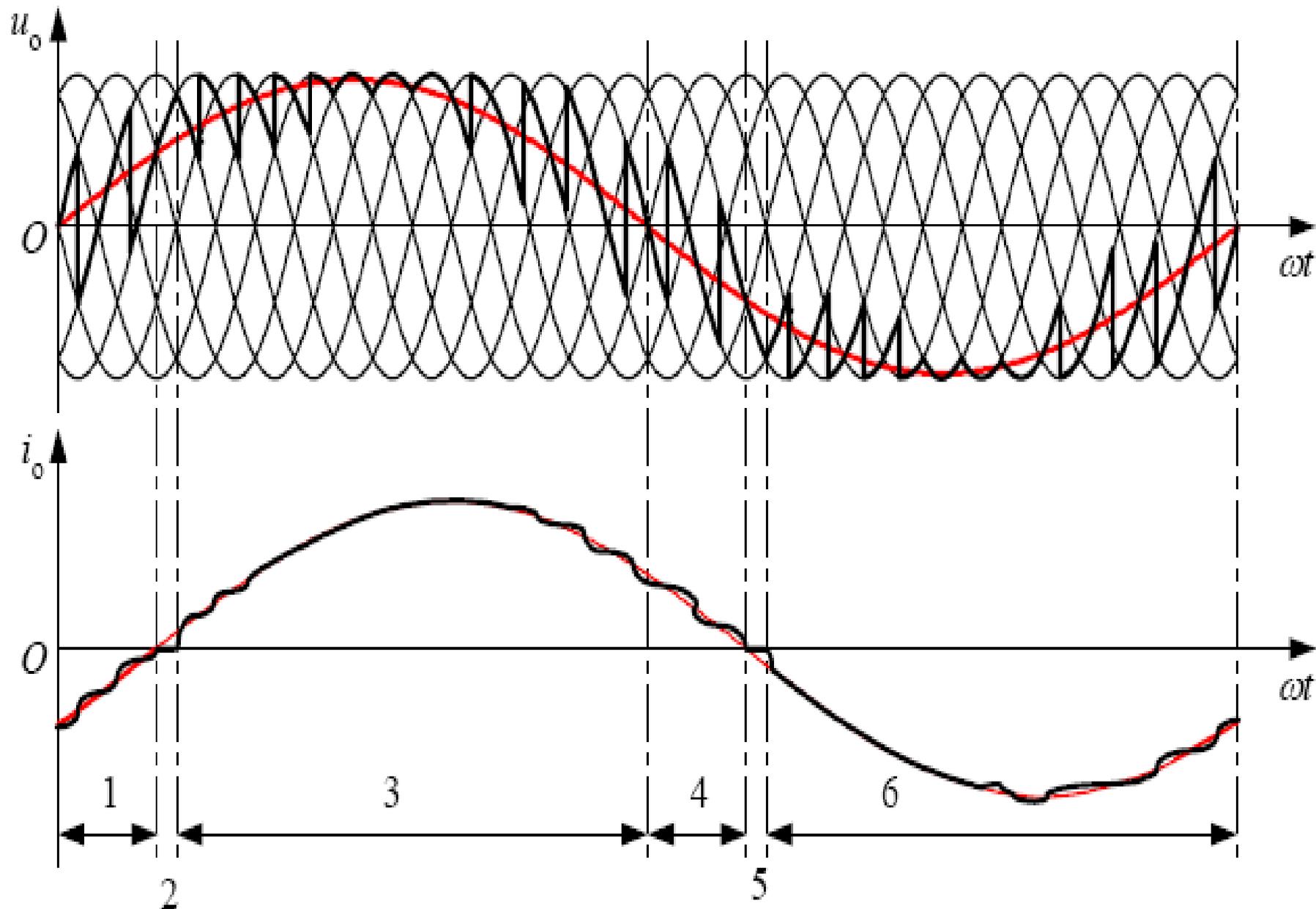
Cicloconvertidor Trifásico Onda completa



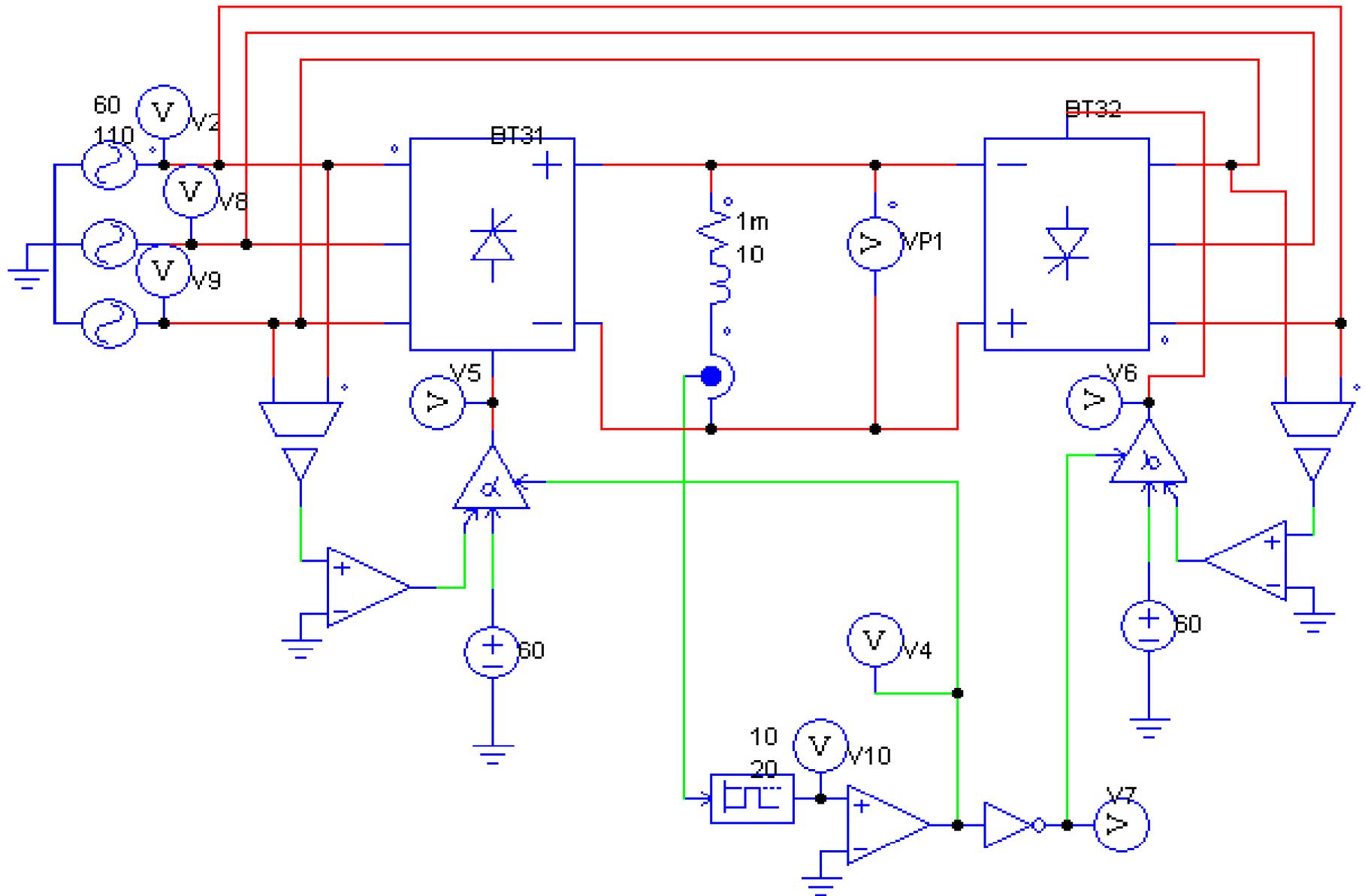
Forma de onda con ángulo fijo



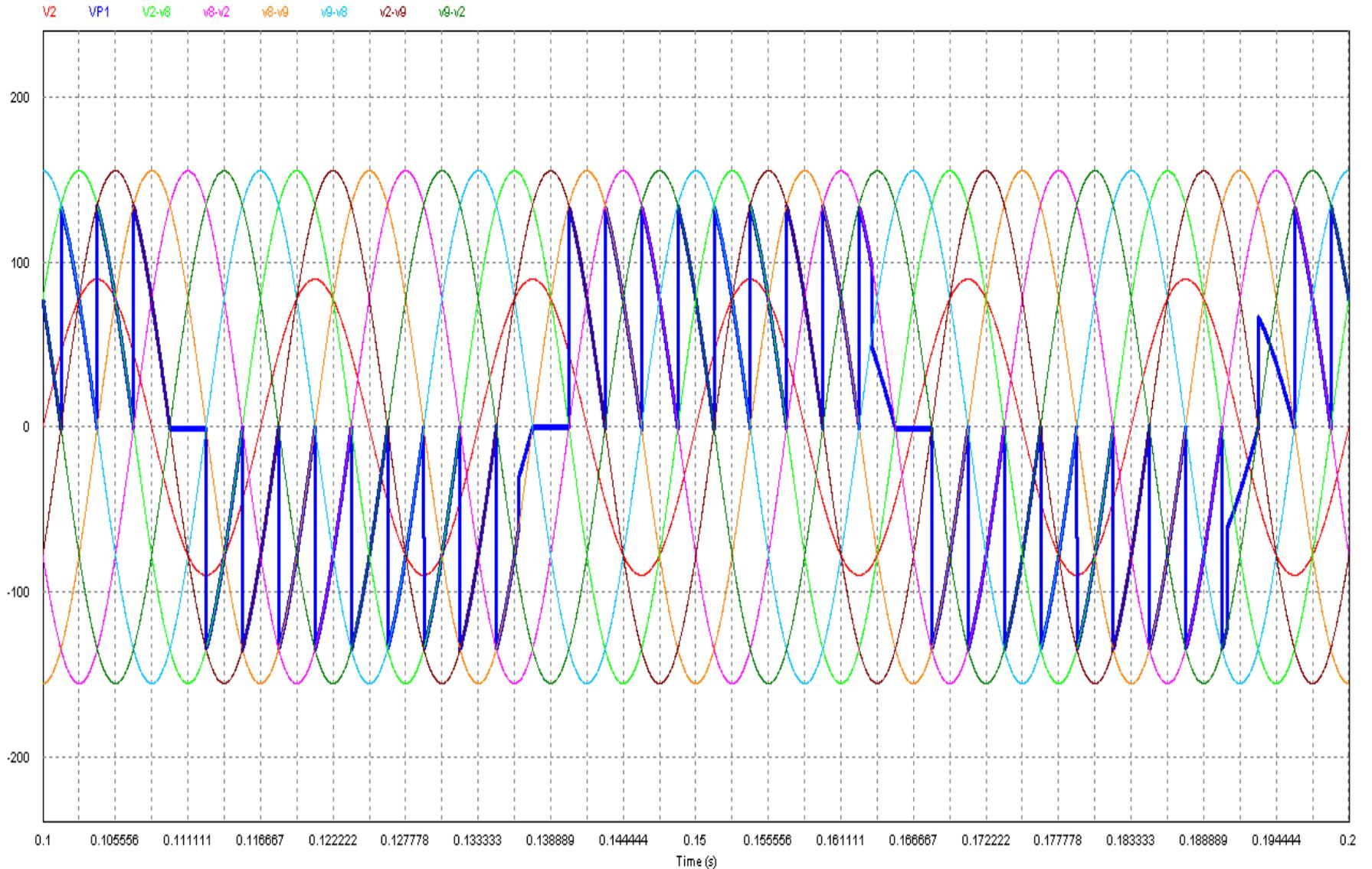
Con ángulo variable



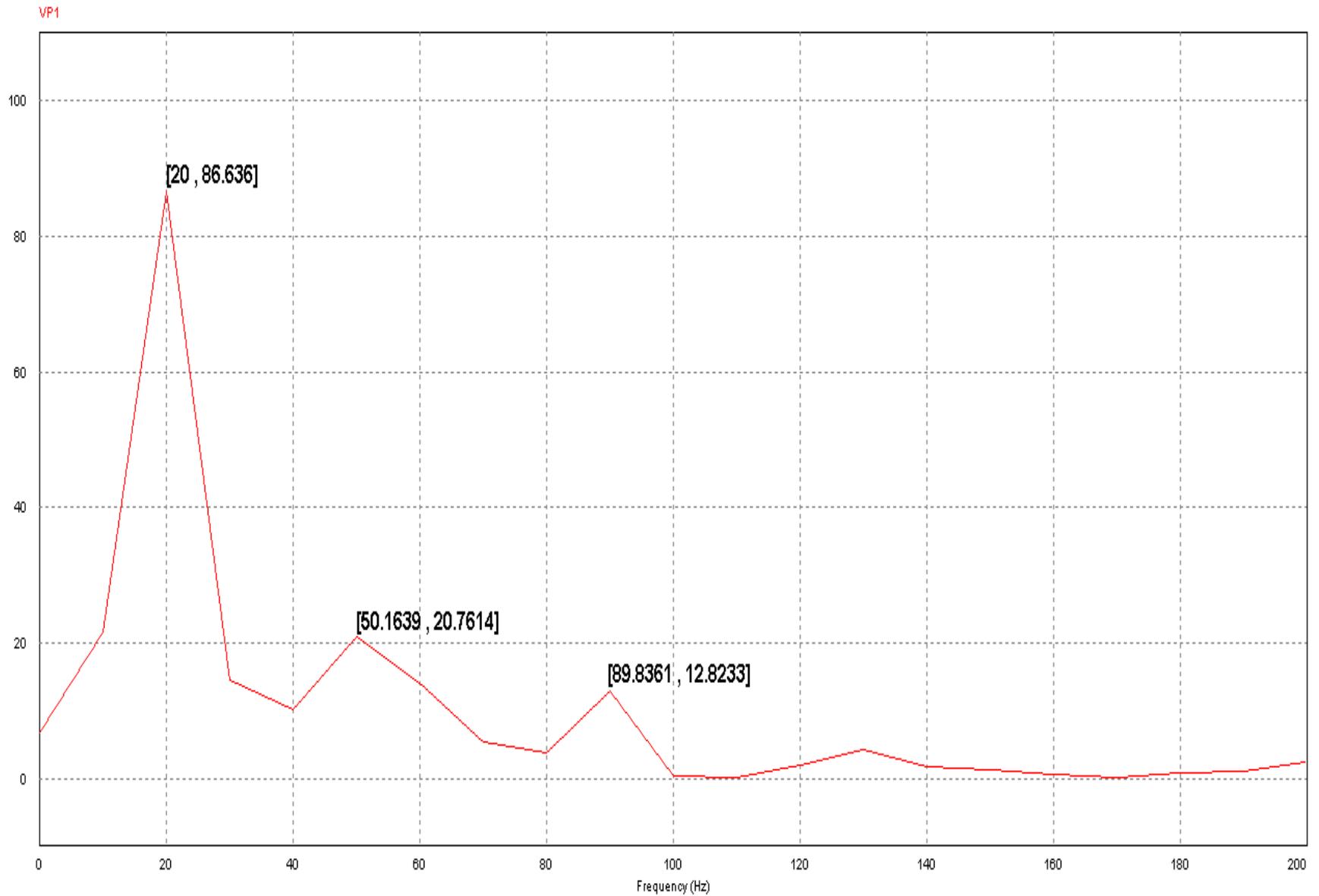
Simulación



Formas de onda

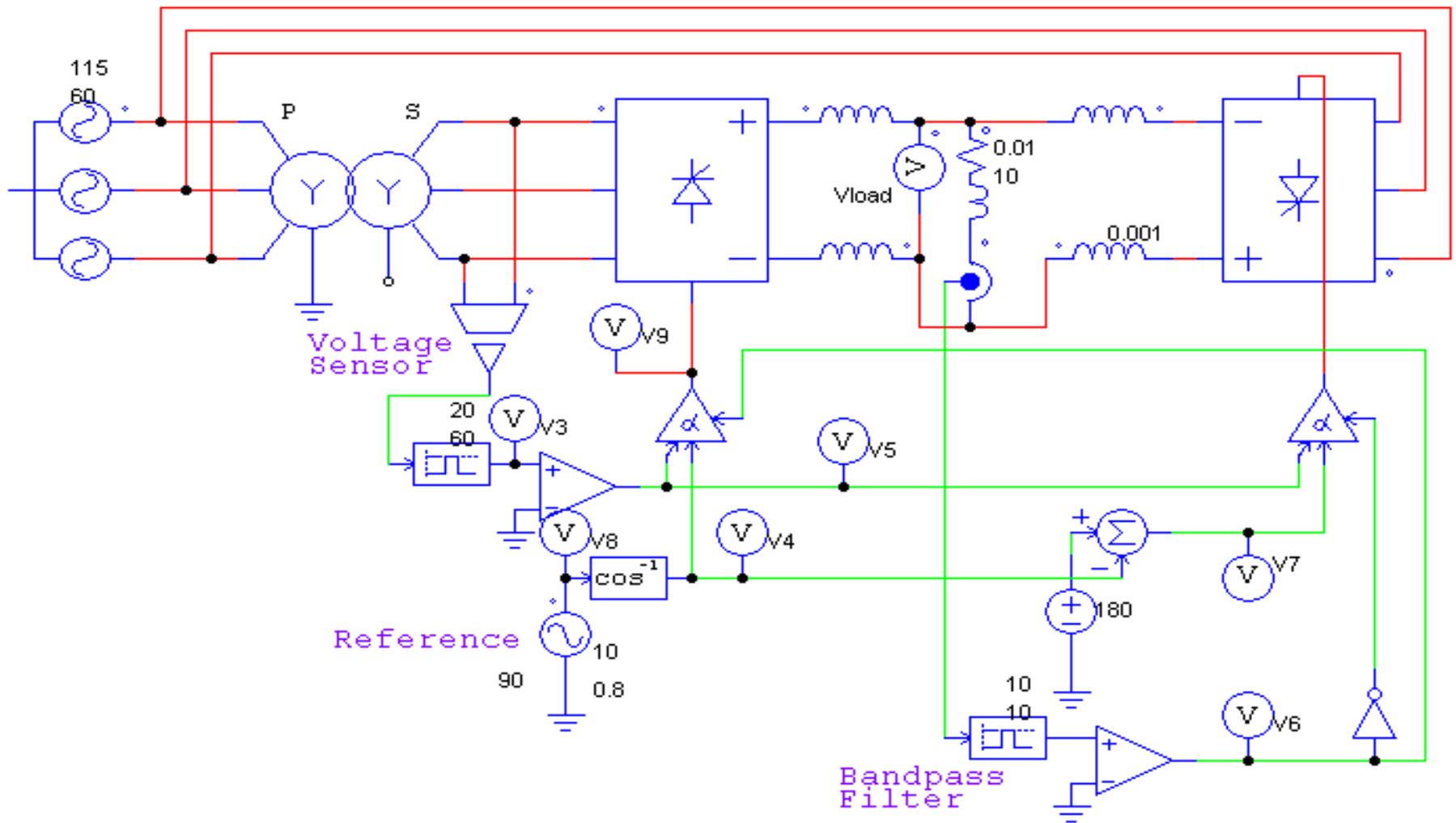


Armónicos



Simulación- ángulo variable

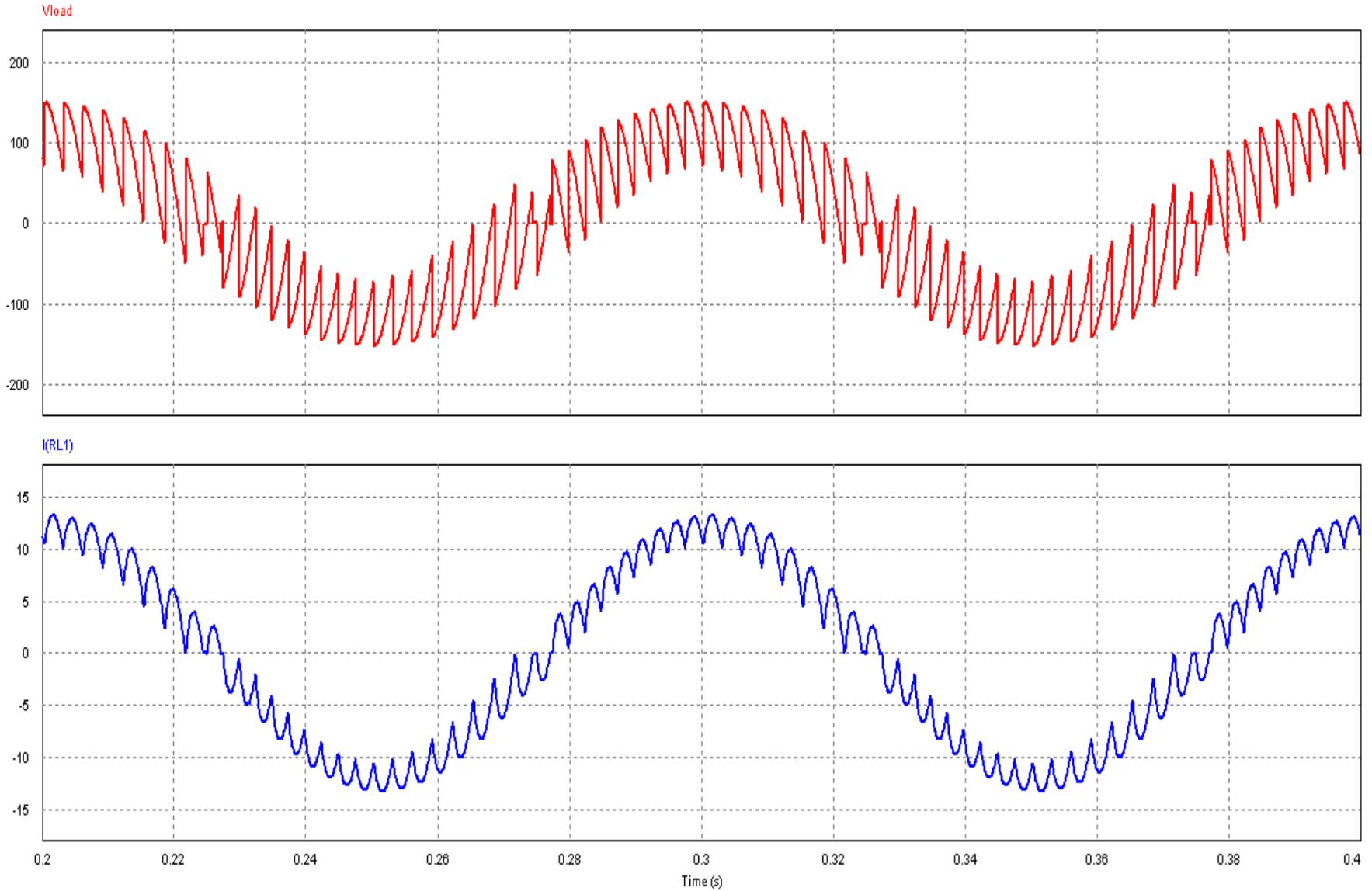
AC/AC Cycloconverter Circuit



Input Frequency: 60 Hz

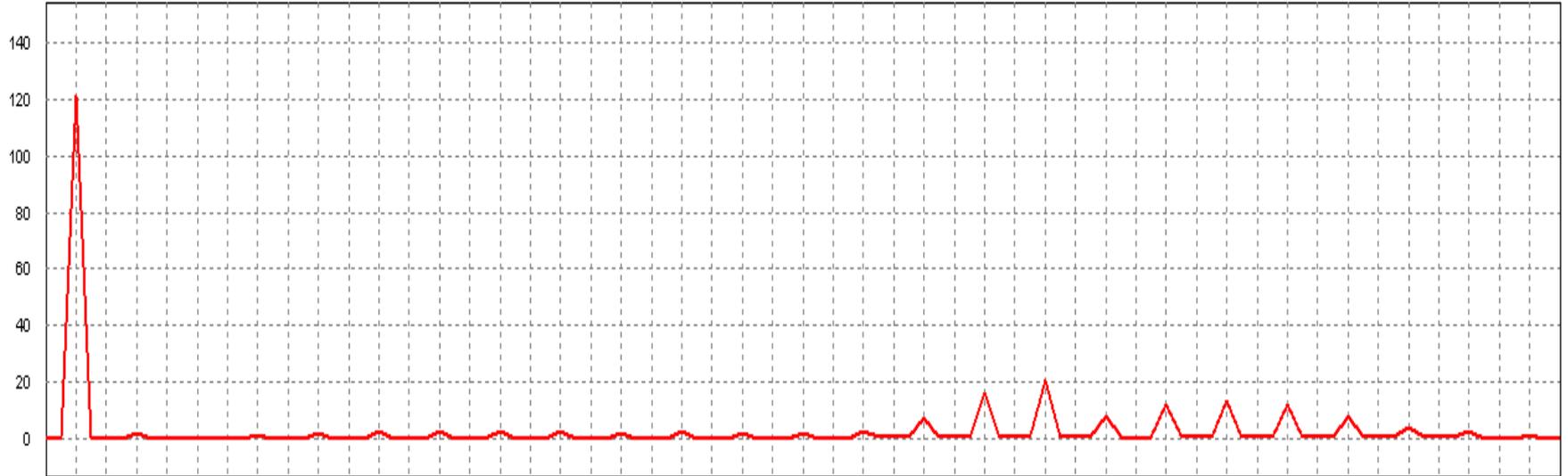
Output Frequency: 10 Hz

Formas de Onda

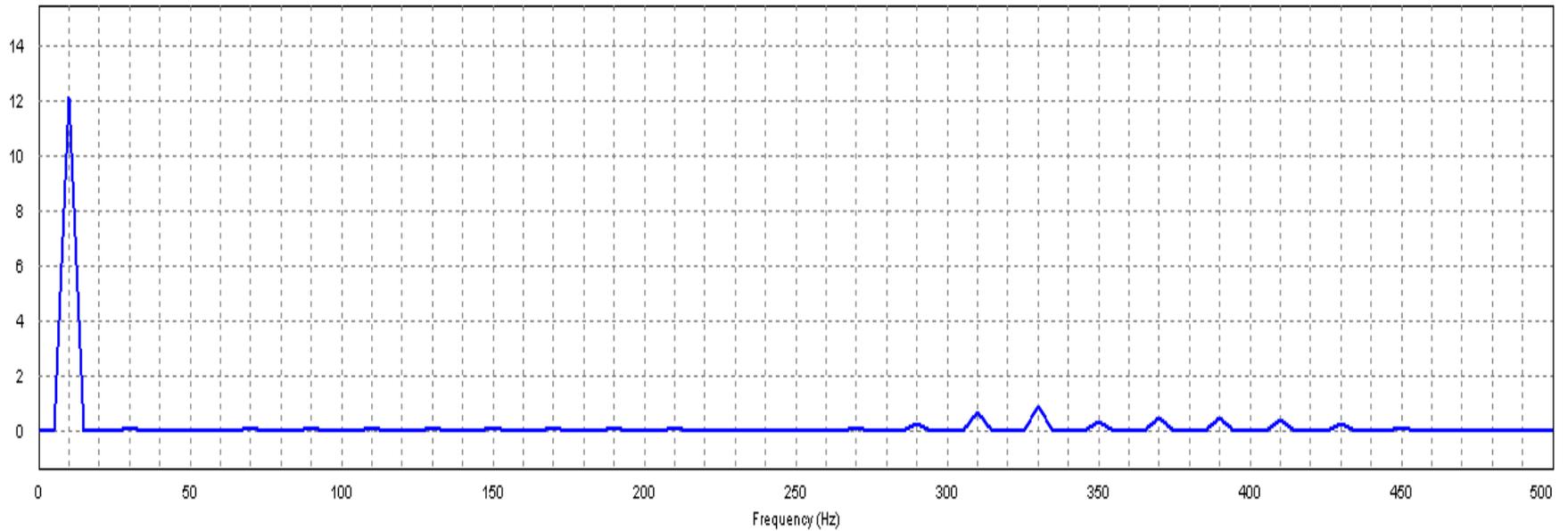


Armónicos

Vload



(RL1)



Cicloconvertidor Trifásico-Trif. Onda completa

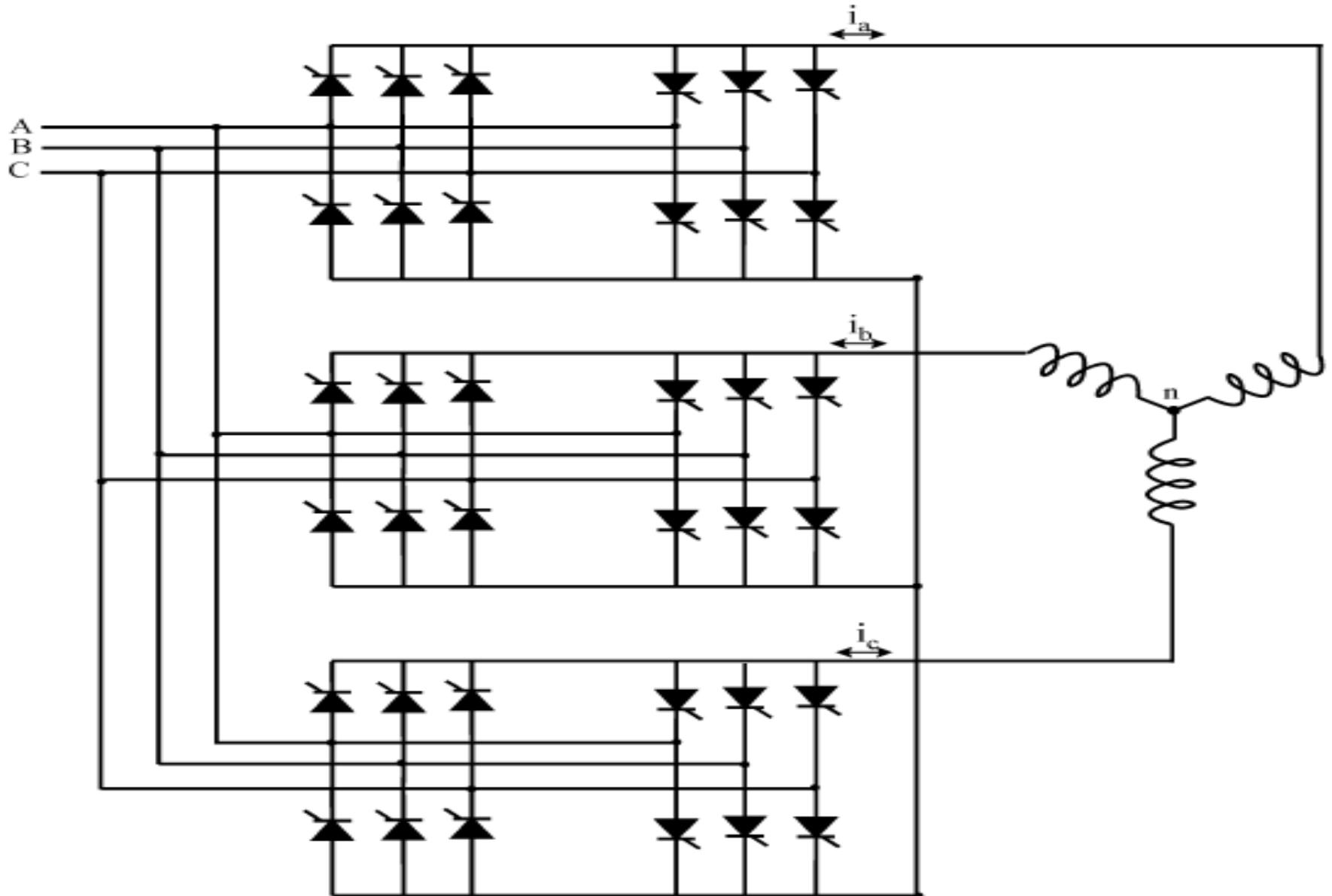


Fig. 7 cicloconvertidor trifásico de onda completa