Rectifier Tables

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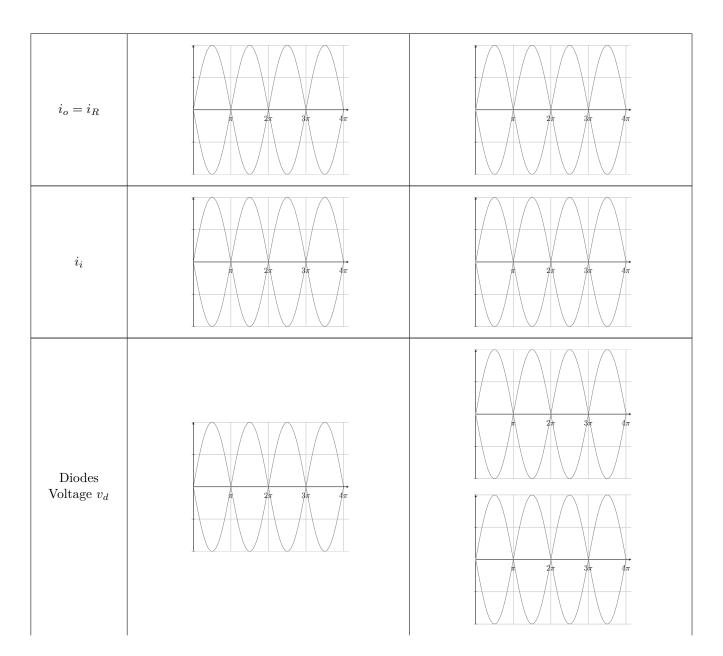
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1 Rectifier Tables

- 1. Monophasic Uncontrolled Rectifiers with R load
- 2. Monophasic Uncontrolled Full Wave Rectifier loads
- 3. Monophasic Controlled Full Wave Rectifier, R vs RL load
- 4. Triphasic Uncontrolled Rectifiers with R load
- 5. Triphasic Controlled Half Wave Rectifier, R vs RL load
- 6. Triphasic Controlled Full Wave Rectifier, R vs RL load

1 Monophasic Uncontrolled Rectifiers with R load

What	Half Wave Rectifier	Full Wave Rectifier
Circuit Diagram	$v_{i} \bigotimes^{D} V_{v_{i}} \bigotimes^{R} R$	
$v_i > 0$ equivalent	$v_i \bigotimes v_o \gtrless R$	
$v_i < 0$ equivalent	$v_i \bigotimes v_o \gtrless R$	
Diode table		
v_o	2π 3π 4π	2\pi 3\pi 4\pi
$ar{v_o}$		



1 Monophasic Uncontrolled Full Wave Rectifier loads

What	R load	RC load	RLC load
Circuit Diagram			
v_o	24 34 4m	2h 3h 4π	24 34
v_R	27 3A 4π	24 34 4π	
$ar{v_R}$			
i_R	37 37 4π	2π 3π 4π	2π 3π 4π
i_o		2x 3x 4x	24 34 47

i_i	27 37 4π	37 37 4π	2π 3π 4π
i_{D1}	27 37 47	24 34 4T	24 34 4T
i_{D3}	27 34 47	24 34 4m	Δ 3 4π
i_C	27 37 47	37 37 4π	37 37 47

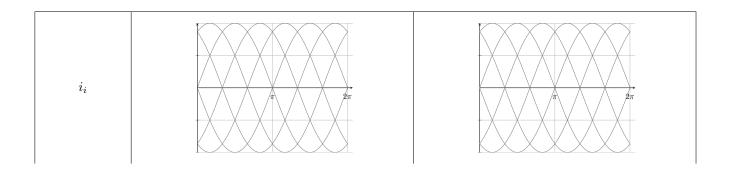
1 Monophasic Controlled Full Wave Rectifier, R vs RL load

What	Controlled FWR R load	Controlled FWR RL load
Circuit Diagram	D1 X D2 X i,	$D1 \times D2 \times $ $v_i \otimes D3 \times D4 \times$
v_o	2A 3A 4π	
v_R	27 32 47	
$ar{v_o}(lpha)$	$\bar{v_o} = \frac{V_i}{\pi} (\cos{(\alpha)} + 1)$	$\bar{v_o} = \frac{2V_i}{\pi} \cos\left(\alpha\right)$
Thyristor table		
$i_o(t)$	2A 3A 4π	
$ar{i_o}$		

$i_i(t)$	2\pi 3\pi 4\pi	3\pi 3\pi 4\pi
$v_{T1}(t)$		
Power Factor		

1 Triphasic Uncontrolled Rectifiers with R load

What	3Φ Half Wave Rectifier	3Φ Full Wave Rectifier
Circuit Diagram		
v_o	27	2π
Peaks/period	3 peaks/period	3 peaks/period
Period	$\frac{2\pi}{3}$	$\frac{2\pi}{6} = \frac{\pi}{3}$
Integration limits	$\frac{\pi}{6}, \frac{5\pi}{6}$	
Load Voltage	Phase Voltage	Line Voltage
$ar{v_o}$		
Diode table		
i_o	- 2π	- 2π



1 Triphasic Controlled Half Wave Rectifier, R vs RL load

What	3Φ Controlled HWR R load	3Φ Controlled HWR R load
Circuit Diagram		
v_o	- 2π	φ 2π
v_R	27	2π
Peaks/period	3 peaks/period	3 peaks/period
Period		
Integration limits		
Load Voltage		
$ar{v_o}(lpha)$		
Thyristor table		

i_o	- 2π	27
i_i	φπ Φπ	φ

1 Triphasic Controlled Full Wave Rectifier, R vs RL load

What	3Φ Controlled FWR R load	3Φ Controlled FWR R load
Circuit Diagram		
v_o	- 2π	7 27
v_R	27	27
Peaks/period	6 peaks/period	6 peaks/period
Period		
Integration limits		
Load Voltage		
$ar{v_o}(lpha)$		
Thyristor table		

i_o	- 2π	27
i_i	φπ Φπ	φ