

8.REALIZATION OF SINGLE-PHASE RECTIFIER CIRCUIT (HALF-WAVE, FULL-WAVE AND FULL-WAVE BRIDGE) WITH FILTER

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STEP 01: Table 1: Rectifier without filter

HWR	V_m	$V_{rms} = V_m/2$	$V_{dc} = V_m/\sqrt{2}$	$r = \sqrt{(V_{rms}/V_{dc})^2 - 1}$	Efficiency = $(V_{dc} / V_{rms}) \times 100$
	8	4	2.54	1.209	40.3
FWR	V_m	$V_{rms} = V_m/2$	$V_{dc} = V_m/\sqrt{2}$	$r = \sqrt{(V_{rms}/V_{dc})^2 - 1}$	Efficiency = $(V_{dc} / V_{rms}) \times 100$
	7	4.95	4.46	0.224	81.6
BR	V_m	$V_{rms} = V_m/2$	$V_{dc} = V_m/\sqrt{2}$	$r = \sqrt{(V_{rms}/V_{dc})^2 - 1}$	Efficiency = $(V_{dc} / V_{rms}) \times 100$
	6	4.24	3.82	0.231	81.1

STEP 02: Table 2: Rectifier with capacitor filter

HWR	V_m	V_{rpp}	$V_{r,rms} = V_{rpp}/2\sqrt{2}$	$V_{dc} = V_m - V_{rpp}/2$	$r = V_{r,rms}/V_{dc}$
	8	1.6	0.4618	7.2	0.0641
HWR	V_m	V_{rpp}	$V_{r,rms} = V_{rpp}/2\sqrt{2}$	$V_{dc} = V_m - V_{rpp}/2$	$r = V_{r,rms}/V_{dc}$
	7	1.2	0.3464	6.4	0.054
HWR	V_m	V_{rpp}	$V_{r,rms} = V_{rpp}/2\sqrt{2}$	$V_{dc} = V_m - V_{rpp}/2$	$r = V_{r,rms}/V_{dc}$
	6	1	0.2886	5.5	0.0524

Step 3 : Conclusion

Rectifiers of different types are realized and their performance is compared with and without the filter.