

HALF-WAVE RECTIFIER

RR3-250

Inert gas-filled half-wave rectifier for use in high voltage rectifier circuits.

LIMITING VALUES (Absolute ratings)

It is important that these limits are never exceeded and such variations as mains fluctuations, component tolerances and switching surges must be taken into consideration in arriving at actual valve operating conditions.

Max. peak inverse anode voltage	5.0	10	kV
Max. cathode current			
Peak	2.0	1.0	A
Average (max. averaging time 15s)	500	250	mA
Surge (fault protection max. duration 0.1s)	20	20	A
Min. valve heating time	10	10	s
Max. supply frequency	500	150	c/s
Ambient temperature limits	-55 to +75	-55 to +75	°C

CHARACTERISTICS

Electrical

Filament voltage	2.5	V
Average filament current at 2.5V	5.0	A
Anode voltage drop ($I_a = 500\text{mA}$)	12	V

Mechanical

Type of cooling	Convection				
Mounting position	Any				
Max. net weight	<table border="1"> <tr> <td>3.5</td> <td>oz</td> </tr> <tr> <td>100</td> <td>g</td> </tr> </table>	3.5	oz	100	g
3.5	oz				
100	g				

FULL LOAD OPERATING CONDITIONS

Circuit	No. of valves	P.I.V. (kV)	Full load d.c. output		Applied a.c. volts ($kV_{r.m.s.}$)	Initial filter elements					
			(kV)	(A)		L min. (H)	C max. (μF)				
Single phase full-wave	2	<table border="1"> <tr> <td>10</td> <td>3.1</td> <td>0.5</td> </tr> <tr> <td>5.0</td> <td>1.5</td> <td>1.0</td> </tr> </table>	10	3.1	0.5	5.0	1.5	1.0	3.5	10	2.0
			10	3.1	0.5						
5.0	1.5	1.0									
			(per valve)	1.7	2.5	8.0					
			(per valve)								
Single phase bridge	4	<table border="1"> <tr> <td>10</td> <td>6.3</td> <td>0.5</td> </tr> <tr> <td>5.0</td> <td>3.1</td> <td>1.0</td> </tr> </table>	10	6.3	0.5	5.0	3.1	1.0	7.0	20	1.0
			10	6.3	0.5						
5.0	3.1	1.0									
			(total)	3.5	5.0	4.0					
			(total)								



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FULL LOAD OPERATING CONDITIONS (cont.)

Circuit	No. of valves	P.I.V. (kV)	Full load d.c. output		Applied a.c. volts ($kV_{r.m.s.}$)	Initial filter elements					
			(kV)	(A)		L min. (H)	C max. (μF)				
Three phase half-wave	3	<table border="1"> <tr> <td>10</td> <td>4.1*</td> <td>0.75</td> </tr> <tr> <td>5.0</td> <td>2.0*</td> <td>1.5</td> </tr> </table>	10	4.1*	0.75	5.0	2.0*	1.5	3.5*	6.0	1.0
			10	4.1*	0.75						
5.0	2.0*	1.5									
			(4.7)	(per phase)	1.7*	1.5	4.0				
			(2.3)	(per phase)	(2.0)						
				(per phase)							
Three phase full-wave	6	<table border="1"> <tr> <td>10</td> <td>9.5</td> <td>0.75</td> </tr> <tr> <td>5.0</td> <td>4.7</td> <td>1.5</td> </tr> </table>	10	9.5	0.75	5.0	4.7	1.5	4.1	10	0.5
			10	9.5	0.75						
5.0	4.7	1.5									
			(per phase)	2.0	2.5	2.0					
			(per phase)								

*These figures take into account the increase in peak inverse voltage which occurs if the power supply is lightly loaded. For operation with a constant load the voltages may be increased to the value shown in brackets.

CIRCUIT NOTES

When quadrature operation is used the filament voltage (pin 4 with respect to pin 1) should be crossing zero from positive to negative when the anode voltage is at the peak of the positive half cycle.

When quadrature operation is not practicable filament pin 4 should be positive when the anode is positive.

