SPECIAL QUALITY HALF-WAVE RECTIFIER

M8091

Special quality half-wave rectifier primarily intended for operation at high altitudes in equipment where mechanical vibration and shocks are unavoidable.

This data should be read in conjunction with GENERAL NOTES—SPECIAL QUALITY VALVES which precede this section of the handbook, and the index numbers are used to indicate where reference should be made to a specific note.

HEATER

V_h[1]	6.3	V
I_h	1.15	A

MOUNTING POSITION

Any

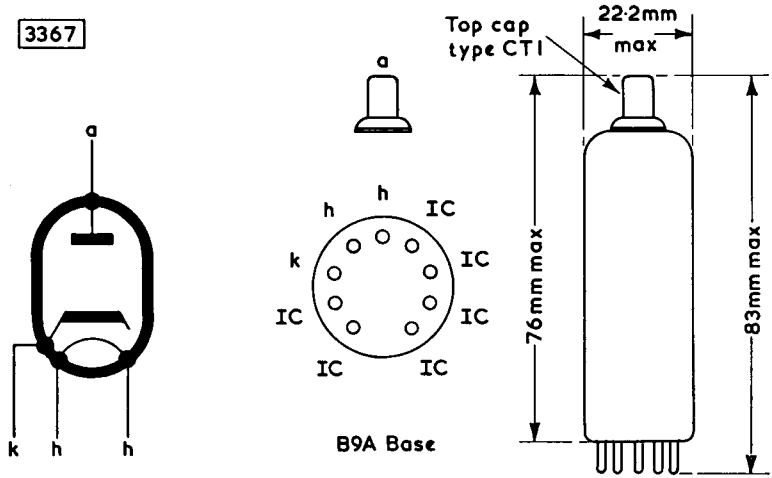
LIMITING VALUES[4] (absolute ratings)

P.I.V. max.	2.0	kV
$i_{a(pk)}$ max.	900	mA
V_{h-k} max.	650	V
Maximum altitude for full P.I.V. rating	60,000	ft
Maximum acceleration (continuous operation)	2.5	g
Maximum shock (short duration)	500	g
T_{bulb} max.	220	°C

TYPICAL OPERATION OF TWO M8091 AS FULL-WAVE RECTIFIER

Capacitor input

$V_{in(r.m.s.)}$	2 × 500	2 × 625	V
R_{lim} min. (per anode)	150	250	Ω
C max.	16	16	μF
I_{out} max.	300	250	mA



M8091

SPECIAL QUALITY
HALF-WAVE RECTIFIER

TEST CONDITIONS (unless otherwise specified)

V_h (V)	$V_{in(r.m.s.)}$ (V)	R_{load} (kΩ)	C (μF)
6.3	625	5	8

TESTS	A.Q.L.[5] (%)	Individuals[6] Bogey[9]	Min.	Max.	
GROUP A					
Voltage breakdown	0.25	—	—	—	
GROUP B					
Heater current	0.65	—	0.9	1.4	A
Heater to cathode leakage current. V_{h-k} = 330V (cathode positive)	0.65	—	—	150	μA
Anode voltage. I_a = 150mA	0.65	—	18	26	V
Output current	0.65	—	120	—	mA
Group quality level[10]	1.0	—	—	—	
GROUP C					
Output current. $V_{in(r.m.s.)}$ = 500V, R_{load} = 3kΩ	2.5	—	145	—	mA
†Hot switch	2.5	—	—	—	
†Hot switch. f = 1.5 to 2.4kc/s C reduced to suit frequency	6.5	—	—	—	

†The anode voltage is switched on and off six times and no arcing must occur within the valve.

GROUP D

Glass strain test[11A]. No applied voltages	6.5	—	—	—	
Base strain test[12]. No applied voltages	6.5	—	—	—	

GROUP E

Fatigue[14]

V_h = 7.0V, 1 minute on 3 minutes off. No other voltages applied, minimum peak acceleration = 5g, f = 170c/s for 33 hours in each of 3 mutually perpendicular planes.

Post fatigue tests

Heater to cathode leakage current. V_{h-k} = 330V (cathode positive)	2.5	—	—	200	μA
Output current	2.5	—	120	—	mA

Shock[15]

No applied voltages, 500g.

Post shock tests

Heater to cathode leakage current. V_{h-k} = 330V (cathode positive)	2.5	—	—	200	μA
Output current	2.5	—	120	—	mA
Voltage breakdown	2.5	—	—	—	
Group quality level[10]	6.5	—	—	—	

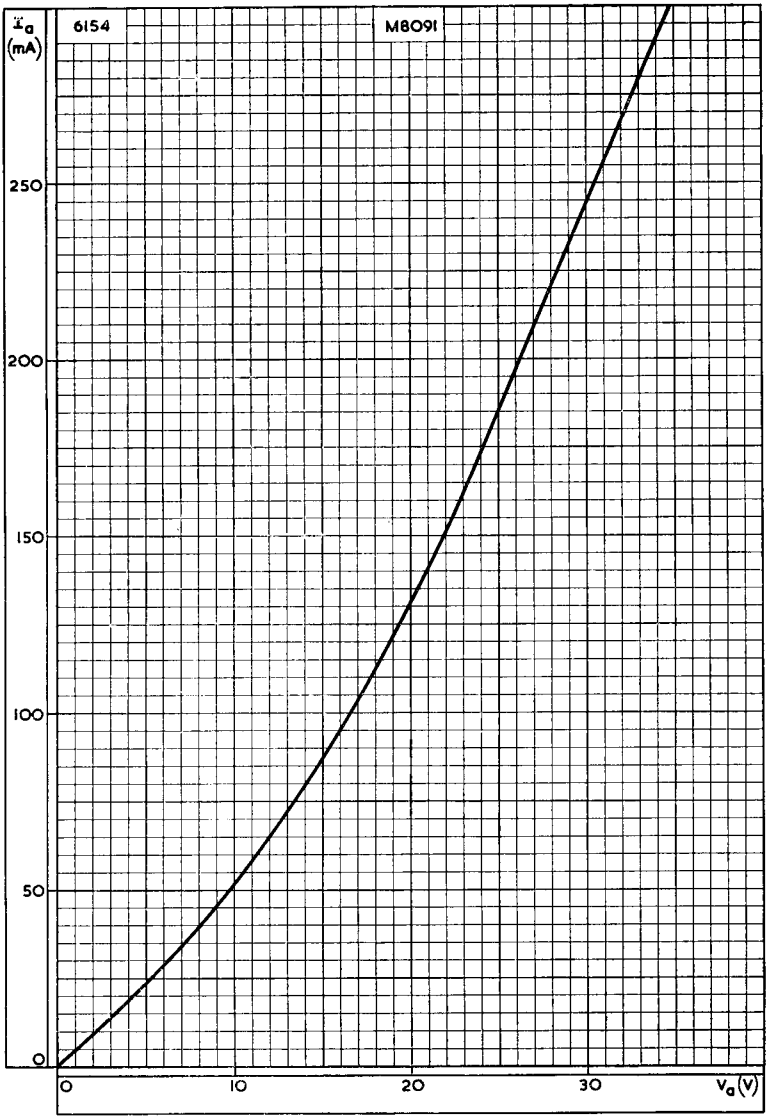
GROUP F

	A.Q.L.[5] (%)	Individuals[6] Bogey[9]	Min.	Max.	
Life[14]					
Running conditions. $V_{in(r.m.s.)}$ = 500V, R_{load} = 3kΩ V_{h-k} = V_{out} + 150V r.m.s., C = 8μF					
Stability life test end point					
Change in anode voltage after 1 hour. I_a = 150mA	1.0	—	—	10	%
Intermittent life test					
Running conditions. $V_{in(r.m.s.)}$ = 500V, R_{load} = 3kΩ V_{h-k} = V_{out} + 150V r.m.s., C = 8μF					
Intermittent life test end points		A.Q.L.[5] (%)	Min.	Max.	
Sub-group (a)					
Inoperatives[16] .. .. 500 hours		2.5	—	—	
Inoperatives[16] .. .. 1000 hours		4.0	—	—	
Heater current .. .. 500 hours		2.5	0.9	1.4	A
Heater to cathode leakage current. V_{h-k} = 300V (cathode positive) 500 hours		2.5	—	150	μA
Heater to cathode leakage current. V_{h-k} = 300V (cathode positive) 1000 hours		4.0	—	150	μA
Sub-group (b)					
Output current .. .. 500 hours		4.0	120	—	mA
Output current .. .. 1000 hours		6.5	120	—	mA
Group quality level[10] .. .. 500 hours		6.5	—	—	
Group quality level[10] .. .. 1000 hours		10	—	—	

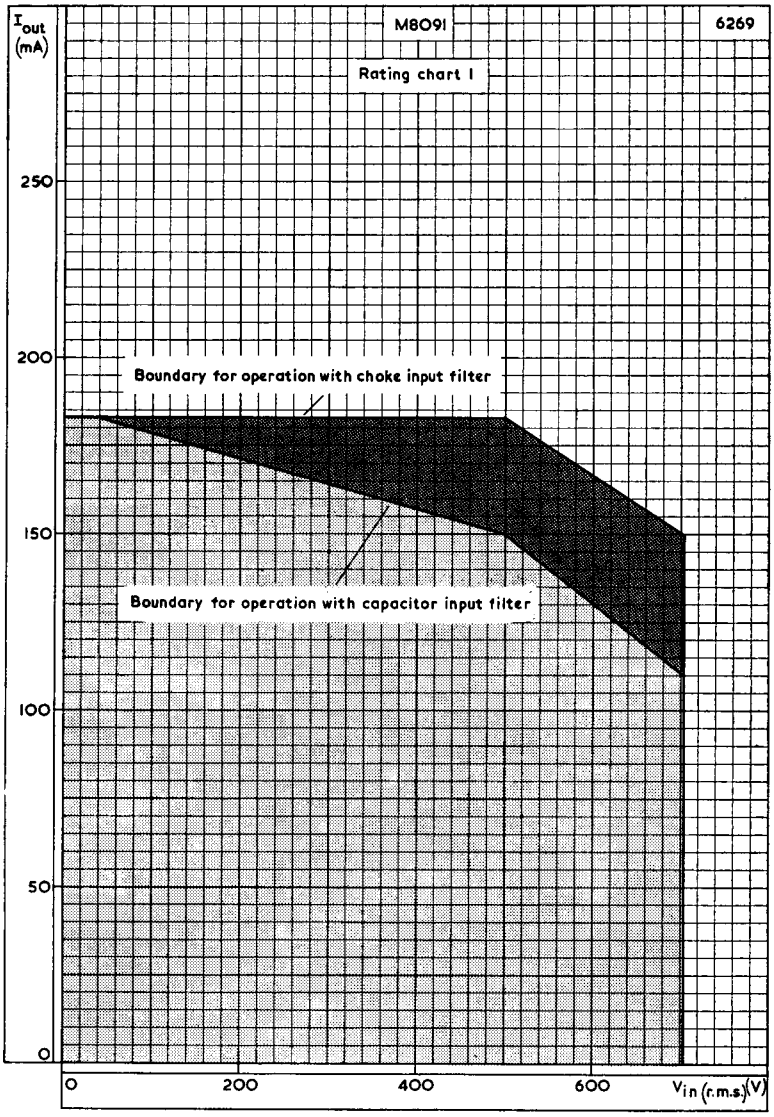
GROUP G

Valves are held for 28 days and retested for Inoperatives[16]	0.5	—	—	

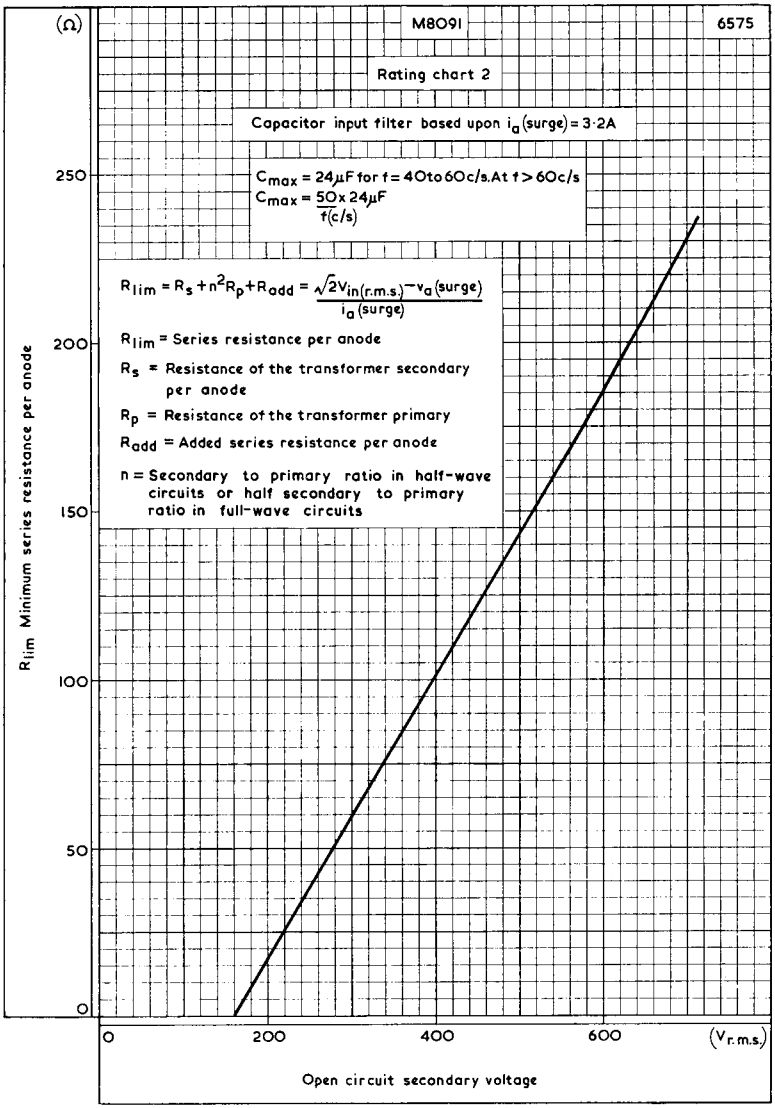
M8091



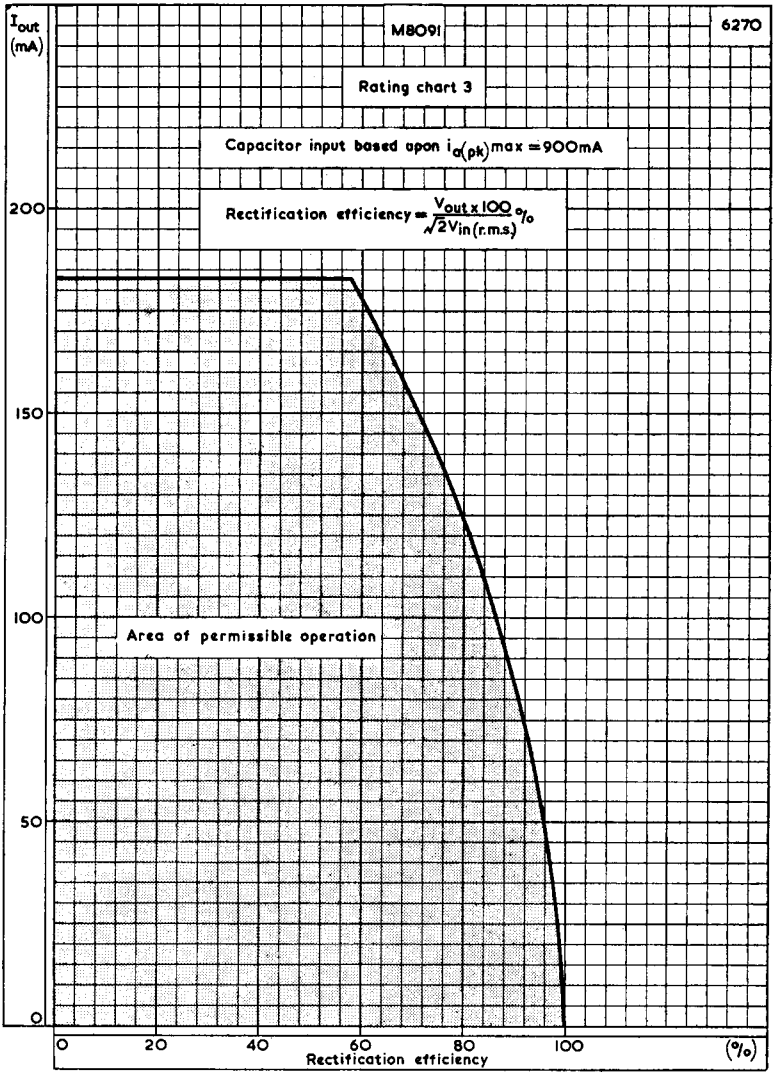
ANODE CURRENT PLOTTED AGAINST ANODE VOLTAGE



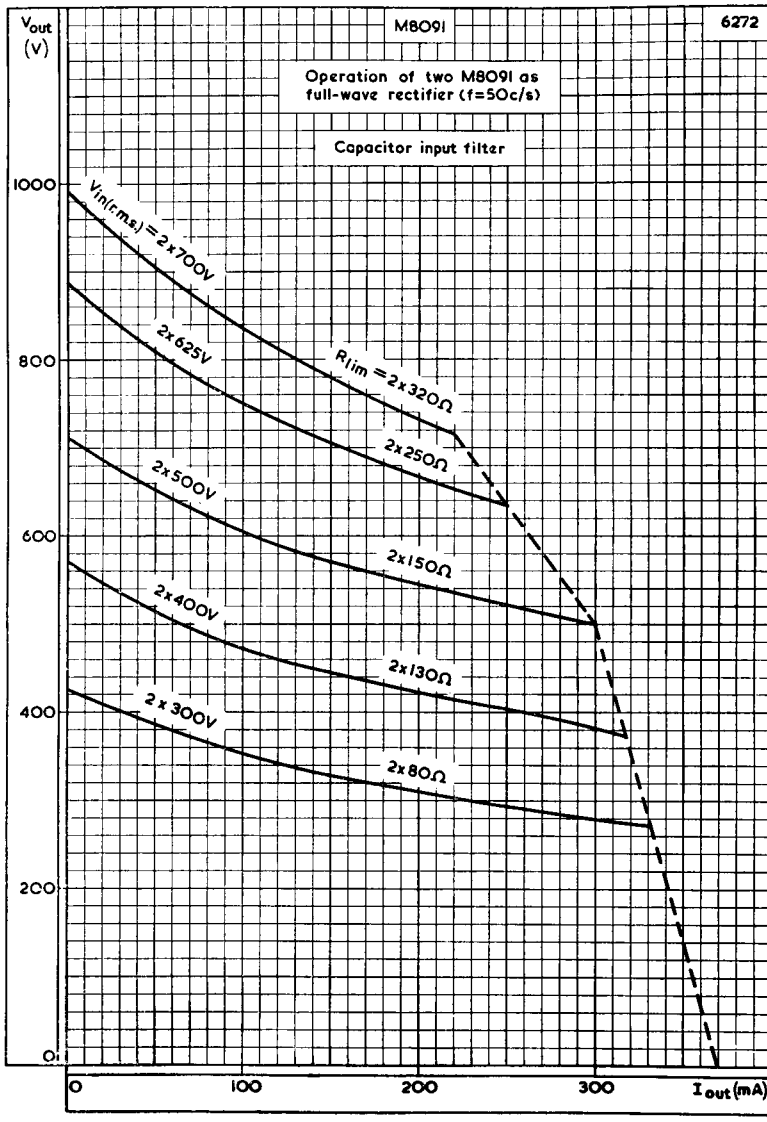
BOUNDARY OF OPERATION WITH CAPACITOR OR CHOKE INPUT FILTER



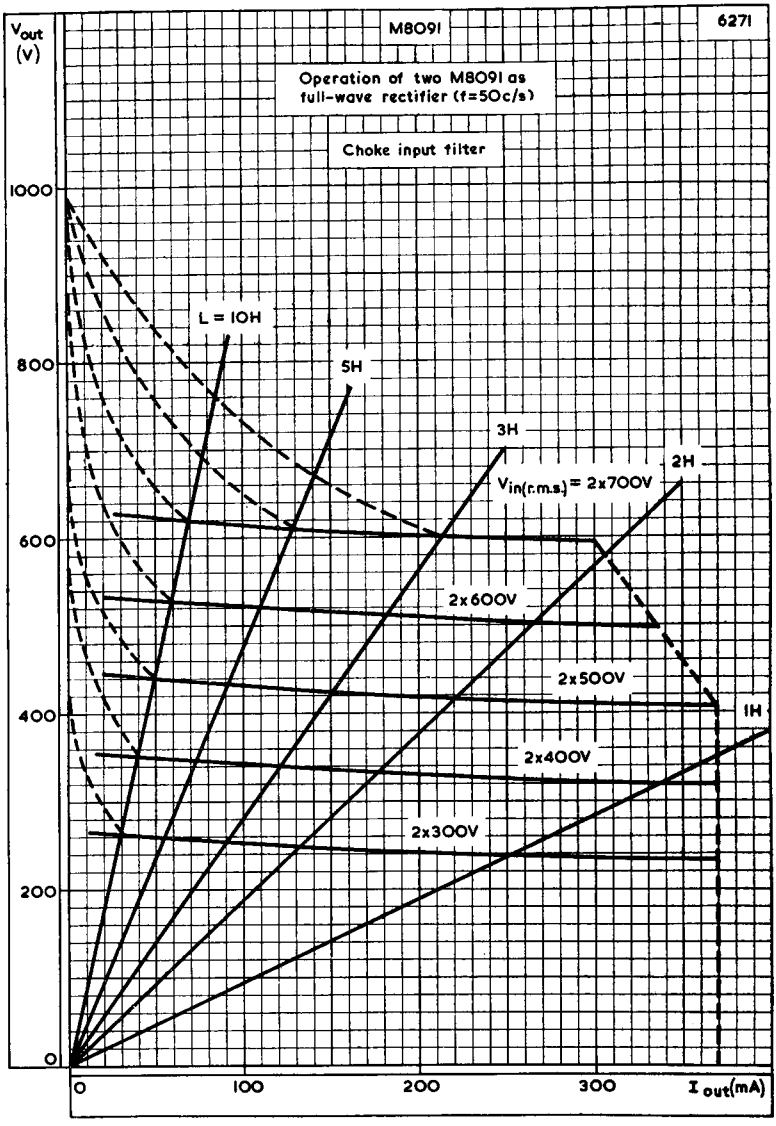
MINIMUM SERIES ANODE RESISTANCE PLOTTED AGAINST OPEN CIRCUIT SECONDARY VOLTAGE



OUTPUT CURRENT PLOTTED AGAINST RECTIFICATION EFFICIENCY



CAPACITOR INPUT FILTER REGULATION CURVES



CHOKE INPUT FILTER REGULATION CURVES