

PHILIPS POWER AMPLIFIER VALVES

Type Number	Valve type	Maximum Dimensions ¹⁾ mm	Base (Connection reference in brackets) ²⁾	Filament data			Application	Anode Voltage V_a Volts	Screen-grid voltage V_{g2} Volts	Quiescent anode current I_{a0} mA	Anode current at full modulat. $I_{a\max}$ mA	Quiescent screen-grid current I_{g20} mA	Screen-grid current at full modulat. $I_{g2\max}$ mA	Neg. grid bias for fixed bias V_{g1} Volts	Common cathode resist. with autom. bias R_k Ohms	Mutual conduct. at working point S mA/V	Internal resist. at working point R_i Ohms	Optim. matching imped. (between the two anodes) R_a Ohms	Max. output $W_{0\max}$ Watts	Distortion at max. output $\dot{d}_{tot}$ %	Grid A.C. voltage at full modulat. $V_{R.M.S.}$ V	Max. anode load $W_{a\max}$ Watts	Type Number
				Heating	Voltage Volts	Current Amps																	
E406N	Triode	130 × 51	A35 (1)	dir.	4,0	1,0	Class A, 1 valve	500	—	24	—	—	—	—68	—	3,0	2000	11.500	5,3	5	45	12	E406N
							Class AB, 2 valves	500	—	2 × 24	2 × 38	—	—	—70	—	—	—	12.000	15	1,4	43	12	
							Class AB, 2 valves	500	—	2 × 24	2 × 27	—	—	—	1400	—	—	16.000	13	3,3	52	12	
E408N	Triode	121 × 51	A40 (1)	dir.	4,0	1,0	Class A, 1 valve	400	—	30	—	—	—	—36	—	2,7	3000	6.000	2,6	5	—	12	E408N
							Class AB, 2 valves	400	—	2 × 20	2 × 28	—	—	—40	—	—	—	12.000	7	0,56	28	12	
							Class AB, 2 valves	400	—	2 × 30	2 × 32	—	—	—	600	—	—	10.000	7	0,62	26,5	12	
E443N	Pentode	110 × 57	O40 (19)	dir.	4,0	1,0	Class A, 1 valve	400	200	30	—	—	—	—40	—	1,9	40.000	14.000	5,4	10	20,2	12	E443N
							Class AB, 2 valves	400	200 ⁴⁾	2 × 25	2 × 28	2 × 4,7	2 × 10	—	720	—	—	16.000	14	4,1	—	12	
E451	Double-grid power valve	123 × 55	O35 (18)	dir.	4,0	1,1	Class A, 1 valve	250	—	22	—	—	—	—33 ⁵⁾	—	2,4	2400	6.400 ⁶⁾	1,25	5	—	10	E451
							Class B, 2 valves	300	—	2 × 6	2 × 48	—	—	0 ⁸⁾	—	—	—	6.000	16	8,4 ⁸⁾	—	—	
							Class B, 2 valves	400	—	2 × 8,5	2 × 56	—	—	0 ⁸⁾	—	—	—	6.000	22,4	5,4 ⁸⁾	—	—	
E707	Triode	200 × 51	W42 (56)	dir.	7,2	1,1	Class A, 1 valve	800	—	40	—	—	—	—80	—	2,0	3500	11.000	10	5	58	32	E707
							Class AB, 2 valves	800	—	2 × 30	2 × 52	—	—	—87	—	—	—	10.000	23	1,3	55	32	
							Class AB, 2 valves	800	—	2 × 40	2 × 45	—	—	—	1000	—	—	12.000	24	1,3	61	32	
F410	Triode	145 × 60	A40 (1)	dir.	4,0	2,0	Class A, 1 valve	550	—	45	—	—	—	—36	—	4,0	2500	7.000	5,9	5	24,5	25	F410
							Class AB, 2 valves	550	—	2 × 20	2 × 40	—	—	—43	—	—	—	10.000	14,6	1,08	28	25	
							Class AB, 2 valves	550	—	2 × 45	2 × 48	—	—	—	400	—	—	10.000	14,4	0,86	25	25	
F443N	Pentode	160 × 67	O40 (19)	dir.	4,0	2,0	Class A, 1 valve	550	200	45	—	1,4	—	—30	647	3,2	30.000	12.000	12	10	12,5	25	F443N
							Class A, 1 valve	300	300	83	—	4,6	—	—40	457	3,9	20.000	3.500	10,3	10	20	25	
							Class AB, 2 valves	550	250 ⁶⁾	2 × 45	2 × 53	2 × 0,8	2 × 7,4	—	455	—	—	12.000	41	4,3	37	25	
							Class AB, 2 valves	300	300 ⁶⁾	2 × 15	2 × 72,5	2 × 0,54	2 × 14,3	—63	—	—	—	4.500	26,5	3,4	46	25	
							Class AB, 2 valves	300	300 ⁶⁾	2 × 64	2 × 72,5	2 × 2,0	2 × 11,9	—	340	—	—	4.000	24	2,9	39	25	
4641	Triode	165 × 66	W42 (56)	dir.	4,0	2,0	Class A, 1 valve	1000	—	25	—	—	—	—80	—	3,2	3200	25.000	11,5	5	58	25	4641
							Class AB, 2 valves	1000	—	2 × 25	2 × 39	—	—	—80	—	—	—	35.000	30	0,67	56	25	
							Class AB, 2 valves	1000	—	2 × 25	2 × 28	—	—	—	1600	—	—	35.000	29	4,5	55	25	
							Class B, 2 valves	1000	—	2 × 5	2 × 45	—	—	—90	—	—	—	18.000	41	4,0	60	25	
4682	Pentode	115 × 46	P35 (32)	indir.	4,0	1,0	Class AB, 2 valves	375	250 ⁶⁾	2 × 26	2 × 45	2 × 3	2 × 5,5	—32	—	—	—	9.000	19	1,5	21,5	9	4682
4683	Triode	135 × 59	P35 (24)	dir.	4,0	0,95	Class AB, 2 valves	350	—	2 × 35	2 × 69,5	—	—	—75	—	—	—	5.000	20	2,1	49	15	4683
							Class AB, 2 valves	350	—	2 × 43	2 × 46,5	—	—	—	850	—	—	8.000	15,6	2,3	51	15	
4684	Pentode	115 × 50	P35 (31)	indir.	4,0	1,75	Class AB, 2 valves	375	250 ⁶⁾	2 × 24	2 × 30	2 × 3,2	2 × 5,3	—	142	—	—	13.000	12	2,3	6,9	9	4684
4688	Pentode	117 × 51	P35 (31)	indir.	4,0	2,0	Class AB, 2 valves	375	275 ⁶⁾	2 × 48	2 × 62	2 × 5	2 × 9	—	165	—	—	6.500	28,5	2,25	16	18	4688
4689	Pentode	117 × 51	P35 (31)	indir.	6,3	1,35	Class AB, 2 valves	375	275 ⁶⁾	2 × 48	2 × 62	2 × 5	2 × 9	—	165	—	—	6.500	28,5	2,25	16	18	4689
4694	Pentode	120 × 37	P35 (31)	indir.	6,3	1,2	Class AB, 2 valves	375	250 ⁶⁾	2 × 24	2 × 30	2 × 3,2	2 × 5,3	—	142	—	—	13.000	12	2,3	6,9	9	4694

1) Without pins.

2) Anode and grid 2 interconnected, class A as driver valve.

3) Grids 1 and 2 interconnected, class B driven into grid current.

4) Optimum external resistance for maximum power output. About double the value is recommended as load when using this valve as driver valve of class B power stages driven into grid current.

5) Measured with a valve E 451 as driver ($V_a = 250$ V, $V_{g2} = -33$ V) and an intervalve transformer with a ratio 2:5: (1 + 1) (primary to secondary turns).

6) The screen-grid voltage must be maintained as constant as possible in push-pull stages by a chain of neon stabiliser tubes. The tubes type 4687 are very suitable for the purpose.

7) See page 15. The numeral after the letter gives the maximum base diameter in mm.