PHILIPS POWER AMPLIFIER VALVES

Type Number	Valve type	Maximum Dimensions[1] mm	Base (Connection reference in brackets)[7]	Filament data: Heating	Filament data: Voltage Volts	Filament data: Current Amps	Application	Anode Voltage Va Volts	Screen-grid voltage Vg_2 Volts	Quiescent anode current Ia_0 mA	Anode current at full modulat. Ia_{max} mA	Quiescent Screen-grid current Ig_{2o} mA	Screen-grid current at full modulat. Ig_{2max} mA	Neg. grid bias for fixed bias Vg_1 Volts	Common cathode resist. with autom. bias Rk Ohms	Mutual conduct. at working point S mA/V	Internal resist. at working point Ri Ohms	Optim. matching imped. (between the two anodes) Ra Ohms	Max. output Wo_{max} Watts	Distortion at max. output dtot %	Grid A.C. voltage at full modulat. Vi_{max} $V_{R.M.S.}$	Max. anode load Wa_{max} Watts	Type Number
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	—	2×25	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	—	2×32	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[6]	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[2]	—	2,4	2400	6.400[4]	1,25	5	—	10	E451
							Class B, 2 valves	300	—	2×6	2×48	—	—	0[3]	—	—	—	6.000	16	8,4[5]	—	—	
							Class B, 2 valves	400	—	2×8,5	2×56	—	—	0[3]	—	—	—	6.000	22,4	5,4[5]	—	—	
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]	2×20	2×45	2×3	2×5,5	—32	—	—	—	9.000	19	1,5	21,5	9	4682
								375	250[6]	2×24	2×29	2×3,5	2×4	—	540	—	—	15.000	14	5,2	16,5	9	
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
								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 (Va = 250 V, Vg = — 33 V) and an intervalve transformer with a ratio 2·5 : (1 + 1) (primary to secundary 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.

Sc p 4 AL5