

4-VOLT A.C. VALVES WITH PIN BASES (POWER STAGES)

Type Number	Valve type	Maximum dimensions ¹⁾ mm	Base (Connection reference in brackets)	Application (see p. 2)	Filament data			Anode voltage V_a Volts	Anode current I_a mA	Neg. grid bias V_{g1} Volts	Screen-grid voltage V_{g2} Volts	Screen-grid current I_{g2} mA	Voltage on grids 3 (and 5) $V_{g3(s)}$ Volts	Voltage on grid 4 V_{g4} Volts	Mutual conduct. S mA/V	Amplification factor μ	Internal resistance R_i Ohms	External anode resist. or optimum matching imped. R_a Ohm	Output at 10% distortion W_o Watts	Grid A.C. voltage at the indicated output V_i V.R.M.S.	Max. anode dissipation $W_{a\max}$ Watts	Grid anode capacity C_{ag1} μF	Type Number
					Heating	Voltage Volts	Current Amps.																
E453	Pentode	105 × 51	B35 (8)	12	indir.	4,0	1,1	250	24	—15	250	—	—	—	2,5	175	70.000	15.000	2,8	8	6	—	E453
E463	Pentode	119 × 55	B35 (8)	12	indir.	4,0	1,35	250	36	—22	250	—	—	—	2,7	100	37.000	8.000	4,1	12,3	9	—	E463
B409	Triode	91 × 46	A32 (1)	12	dir.	4,0	0,15	250	12	—18	—	—	—	—	1,8	9	5.000	12.000	0,65 ²⁾	12	3	—	B409
B443	Pentode	92 × 51	O35 (19)	12	dir.	4,0	0,15	250	12	—19	150	—	—	—	1,3	60	45.000	20.000	1,35	12,1	3	—	B443
B443S	Pentode	92 × 51	O35 (19)	12	dir.	4,0	0,15	250	12	—12	80	—	—	—	1,6	100	60.000	22.000	1,12	6,8	3	—	B443S
C443	Pentode	92 × 51	O35 (19)	12	dir.	4,0	0,25	300	20	—25	200	—	—	—	1,7	60	35.000	15.000	2,8	16	6	—	C443
C443N	Pentode	89 × 51	O35 (19)	12	dir.	4,0	0,25	300	20	—42	200	—	—	—	1,5	37	25.000	15.000	3,0	20	6	—	C443N
E443H	Pentode	123 × 55	O35 (19)	12	dir.	4,0	1,1	250	36	—15	250	—	—	—	2,8	120	13.000	7.000	3,1	9,7	9	—	E443H

¹⁾ Without pins.²⁾ At 5% distortion.

180-MA D.C. VALVES

Type Number	Valve type	Maximum dimensions ¹⁾ mm	Base (Connection reference in brackets)	Application (see p. 2)	Filament data			Anode voltage V_a Volts	Anode current I_a mA	Neg. grid bias V_{g1} Volts	Screen-grid voltage V_{g2} Volts	Screen-grid current I_{g2} mA	Voltage on grids 3 (and 5) $V_{g3(s)}$ Volts	Voltage on grid 4 V_{g4} Volts	Mutual conduct. S mA/V	Amplification factor μ	Internal resistance R_i Ohms	External anode resist. or optimum matching imped. R_a Ohm	Output at 10% distortion W_o Watts	Grid A.C. voltage at the indicated output V_i V.R.M.S.	Max. anode dissipation $W_{a\max}$ Watts	Grid anode capacity C_{ag1} μF	Type Number
					Heating	Voltage Volts	Current Amps.																
B2046	H.F. Pentode	138 × 51	O35 (23)	1, 2, 5, 7, 8, 11	indir.	20	0,180	200	3,0	—2,0	100	1,1	—	—	3,5	2,2	5000	2,2.10 ⁴	—	—	—	< 0,006	B2046
B2047	Variable-Mu Pentode	138 × 51	O35 (23)	1, 2, 5	indir.	20	0,180	200	4,0	—2,0 —50	100	1,8	—	—	3,0	2,0 < 0,002	2200	1,1.10 ⁴ > 10 ⁷	—	—	—	< 0,006	B2047
B2048	Hexode (oscillator modulator)	130 × 50	C35 (11)	4	indir.	20	0,180	200	3,0	—1,5	120	8,5 ³⁾	200	—4 ³⁾	—	0,58 ⁴⁾	—	> 0,15.10 ⁴	—	—	—	—	B2048
B2049	Variable-Mu Hexode	130 × 50	C35 (11)	1, 2	indir.	20	0,180	200	3	—1,5 —8	80	—	—1,5 —8	80	3	1,8 < 0,002	—	0,45.10 ⁴ > 50.10 ⁴	—	—	—	< 0,002	B2049
B2052T	Tetrode	127 × 51	O35 (22)	1, 2, 5, 7, 8, 11	indir.	20	0,180	200	3,0	—2,0	100	0,2	—	—	3,0	2,0	900	0,45.10 ⁴	—	—	—	0,003	B2052T
B2045	Variable-Mu Tetrode	120 × 51	O35 (22)	1, 2, 5	indir.	20	0,180	200	4,0 0,01	—2,0 —40	60	0,9	—	—	1,2	1,0 0,005	400	0,4.10 ⁴ > 10 ⁷	—	—	—	0,004	B2045
B2044	Binode (Diode-Tetrode)	130 × 51	B35 (7)	9	indir.	20	0,180	200	0,29 0,76	—3,2 —4,0	40 60	—	—	—	2,8	—	700 600	2,4.10 ⁴ 1,2.10 ⁴	0,32.10 ⁴ 0,1.10 ⁴	—	—	0,003	B2044
B2044S	Binode (Diode-Triode)	108 × 46	O35 (20)	9	indir.	20	0,180	200	6,0	—3,0	—	—	—	—	2,0	1,8	30	16.000	—	—	—	—	B2044S
B2038	Triode	105 × 51	O35 (17)	3, 6, 7, 10, 11	indir.	20	0,180	200	6,0	—3,0	—	—	—	—	3,5	2,3	33	14.000	—	—	—	—	B2038
B2099	High-Mu Triode	101 × 46	O35 (17)	11	indir.	20	0,180	200	0,08 0,2	—1,6 —1,6	—	—	—	—	3,0	—	99	330.000 100.000	0,32.10 ⁴ 1.10 ⁴	—	—	1,5	B2099
B2006	Power Triode	105 × 51	O35 (16)	12	indir.	20	0,180	200	15	—18	—	—	—	—	2,5	1,6	6	4.000	16.000	0,21 ⁵⁾	5	—	B2006
B2043	Power Pentode	105 × 51	B35 (8)	12	indir.	20	0,180	200	20	—18	200	8	—	—	2,5	1,7	70	40.000	10.000	1,7	5	—	B2043

¹⁾ Without pins.²⁾ Current of the third grid.³⁾ $V_{osc} = 6,3 V_{R.M.S.}$ ⁴⁾ Conversion conductance at $V_{osc} = 6,3 V_{R.M.S.}$ ⁵⁾ At 5% distortion.

BATTERY VALVES WITH PIN BASES

Type Number	Valve type	Maximum dimensions mm	Base (Connection reference in brackets)	Application (see p. 2)	Filament data			Anode voltage V_a Volts	Anode current I_a mA	Neg. grid bias V_{g1} Volts	Screen-grid voltage V_{g2} Volts	Screen-grid current I_{g2} mA	Voltage on grid 3 (and 5) $V_{g3(5)}$ Volts	Voltage on grid 4 V_{g4} Volts	Mutual conduct. S mA/V	Amplification factor μ	Internal resistance R_i Ohms	External anode resist. or most fav. matching imped. R_a Ohms	Output at 10% distortion W_o Watts	Grid A.C. voltage at the indicated output V_i V.R.M.S.	Max. anode dissipation W_{amax} Watts	Grid anode capacity C_{ag1} μF	Type Number
					Heating	Voltage Volts	Current Amps.																
KF2	Variable-Mu Pentode	118 × 47	C35 (10)	1, 2	dir.	2,0	0,2	135	3,0 appr 0,01	0 —16	135	1,0	0	—	1,3	1,3 <0,002	1400	1,1·10 ⁴ >10 ⁷	—	—	—	<0,01	KF2
								90	1,4 appr 0,01	0 —11	90	—	0	—	—	0,8 <0,002	1500	1,9·10 ⁴ >10 ⁷					
KF1	H.F. Pentode	118 × 47	C35 (10)	1, 2, 7, 8, 11	dir.	2,0	0,2	135	3,0	0	135	1,0	0	—	1,8	1,8	1600	0,9·10 ⁴	—	—	—	<0,01	KF1
								90	1,1	0	90	—	0	—	—	1,0	1500	1,5·10 ⁴					
B228	Triode	81 × 41	A32 (1)	7, 11	dir.	2,0	0,1	150	2,0	—2,0	—	—	—	—	1,3	1,2	28	23.000	—	—	—	5,5	B228
B217	Triode	81 × 41	A32 (1)	3, 6, 10	dir.	2,0	0,1	150	4,5	—3,0	—	—	—	—	1,4	1,3	17	13.000	—	—	—	5,5	B217
C243N	Power Pentode	89 × 51	O35 (19)	12	dir.	2,0	0,2	150	9,5	—4,5	150	—	—	—	—	2,4	—	75.000	15.000	0,58	1,5	—	C243N
B240	Double Triode	96 × 47	C35 (9)	16	dir.	2,0	0,2	150	2 × 1,5 ¹⁾	0	—	—	—	—	—	—	—	—	14.000 ²⁾	1,0 ³⁾	—	—	B240
B442	Tetrode	108 × 46	A35 (3)	1, 2	dir.	4,0	0,100	200	4,5	—1,0	100	—	—	—	0,9	0,9	350	0,4·10 ⁴	—	—	—	0,005	B442
A442	Tetrode	105 × 46	A35 (3)	1, 2, 5, 7, 8, 11	dir.	4,0	0,06	200	4,0	—1,0	100	—	—	—	0,8	0,7	280	0,4·10 ⁴	—	—	—	0,01	A442
B424	Triode	92 × 46	A35 (1)	3, 6, 10	dir.	4,0	0,100	200	6,0	—0,3	—	—	—	—	3,0	2,5	24	9.000	—	—	—	4	B424
B438	Triode	78 × 38	A35 (1)	7, 8, 11	dir.	4,0	0,100	200	0,2 0,05	—2,5 —2,5	—	—	—	—	2,0	—	38	170.000 400.000	0,32·10 ⁴ 1,0·10 ⁴	—	—	4	B438
A415	Triode	83 × 42	A32 (1)	3, 6, 10	dir.	4,0	0,085	150	4,0	—4,0	—	—	—	—	2,0	1,5	15	10.000	—	—	—	4,5	A415
A425	Triode	83 × 42	A32 (1)	7, 8, 11	dir.	4,0	0,065	200	0,25 0,1	—2,5 —2,5	—	—	—	—	1,2	—	25	80.000 250.000	0,32·10 ⁴ 1,0·10 ⁴	—	—	3	A425
A409	Triode	83 × 42	A32 (1)	3, 6, 10	dir.	4,0	0,065	150	3,5	—9,0	—	—	—	—	1,2	0,9	9	10.000	—	—	—	4	A409
A441N	Double-grid valve	92 × 46	A35b (4)	4	dir.	4,0	0,08	100	4,0	0 ⁴⁾	4,0 ⁴⁾	—	—	—	—	0,3 ⁵⁾ 1,0 ⁷⁾	—	—	—	—	—	—	A441N
B405	Triode	91 × 46	A32 (1)	12	dir.	4,0	0,15	150	11	—18	—	—	—	—	2,0	1,6	5	3.000	—	—	—	—	B405
B406	Triode	91 × 46	A32 (1)	12	dir.	4,0	0,1	150	8	—15	—	—	—	—	1,4	1,3	6	4.500	—	—	—	—	B406
B409	Triode	91 × 46	A32 (1)	12	dir.	4,0	0,15	250	12	—16	—	—	—	—	2,0	1,8	9	5.000	12.000	0,65 ⁶⁾	3	—	B409
B443	Power Pentode	92 × 51	O35 (19)	12	dir.	4,0	0,150	250	12	—17	150	—	—	—	—	1,3	—	45.000	20.000	1,35	3	—	B443

1) Quiescent anode current for both anodes.

2) At $V_a = 120$ volts.

3) Voltage of the space charge grid.

7) Conductance of space charge grid.

8) At 5% distortion.

2) From anode to anode.

4) Voltage of the control grid.

4) Conductance of control grid.

8) Without pins.

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