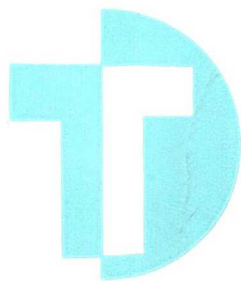


TUNGSRAM



**Miniature 9-Pin (Noval)
Series, 6.3 V Heater Type**

		Heater		Plate		Screen		Grid Voltage	Power Output	Mutual Conductance (Conversion Trans-conductance)	Plate Resistance	Amplification Factor	Base Connections
		Voltage	Current	Voltage	Current	Voltage	Current						
		V	A	V	mA	V	mA						
EABC 80	Diode Twin Diode Triode	6.3 i	0.48	350* 350* 200	6* 75* 1	— — —	— — —	— — -2.3	— — —	— — 1.4	— — 50	— — 70	1
EBC 81	Twin Diode Triode	6.3 i	0.23	350* 250	5* 1	— —	— —	— -3	— —	— 1.2	— 58	— 70	2
EBF 80	Twin Diode Pentode	6.3 i	0.3	200* 250	5* 5	— 85	— 1.75	— -2	— —	— 2.2	— 1400	— 18	3
EBF 83	Twin Diode Pentode	6.3 i	0.3	— 6.3 12.6	5* 0.12 0.45	— 6.3 12.6	— 0.04 0.14	— R _g = 2.2 MΩ	— — —	— 0.45 1	— 650 1000	— — —	3
EBF 89	Twin Diode Pentode	6.3 i	0.3	200* 250	5* 9	— 100	— 2.7	— -2	— —	— 3.8	— 1000	— 20	3
ECC 82	Twin Triode	6.3 i 12.6 i	0.3 0.15	250	10.5	—	—	-8.5	—	2.2	7.7	17	4
ECC 83	Twin Triode	6.3 i 12.6 i	0.3 0.15	250	1.2	—	—	-2	—	1.6	—	100	4
ECC 85	Twin Triode	6.3 i	0.435	250	10	—	—	-2.2	—	6	—	57	5
ECF 80	Triode Pentode	6.3 i	0.43	100 170	14 10	— 170	— 2.8	-2 -2	— —	5 6.2	— 400	20 47	6
ECH 81	Triode Heptode	6.3 i	0.3	100 250	13.5 6.5	— 100	— 3.8	0 -2	— —	3.7 2.4	— 700	22 20	7
ECH 83	Triode Heptode	6.3 i	0.3	6.3 6.3	0.3 0.05	— 6.3	— 0.08	0 0	— —	0.8 (0.09)	— 1300	14.6 —	7
ECH 84	Triode Heptode	6.3 i	0.3	50 135	3 1.7	— 14	— 0.9	0 0	— —	3.7 2.2	— —	50 —	8
ECL 82	Triode Pentode	6.3 i	0.78	100 170	3.5 41	— 170	— 8	0 -11.5	— —	2.5 7.5	— 16	70 9.5	9
ECL 85	Triode Pentode	6.3 i	0.9	100 50	10 200*	— 170	— 35*	0 -1	— —	5.5 —	9 —	50 —	10
ECL 86	Triode Pentode	6.3 i	0.7	250 250	1.2 36	— 250	— 6	-1.9 -7	— —	1.6 10	— 48	100 21	11
EF 80	Pentode	6.3 i	0.3	250	10	250	2.8	-3.5	—	6.8	650	50	12
EF 85	Pentode	6.3 i	0.3	250	10	100	2.5	-2	—	6	600	26	12
EF 86	Pentode	6.3 i	0.2	250	3	140	0.55	-2	—	2	2000	38	13
EF 89	Pentode	6.3 i	0.2	250	9	100	3	-1.95	—	3.5	900	—	14
EF 183	Pentode	6.3 i	0.3	200	12	90	4.5	-2	—	12.5	500	—	12
EF 184	Pentode	6.3 i	0.3	200	10	200	4.1	-2.5	—	15	380	60	12
EH 81	Dual Control Heptode	6.3 i	0.3	250	6	100	6.3	-2	—	1.9	60	18	15
EL 36	Pentode	6.3 i	1.225	100	100	100	8	-8.2	—	14	5	5.6	16
EL 84	Pentode	6.3 i	0.76	250	48	250	5.5	-7.3	6	11.3	38	19	17
EM 80	Tuning Indicator	6.3 i	0.3	250	0.45	U _i =250	I _i =2	0/-20	—	—	—	—	18
EM 84	Tuning Indicator	6.3 i	0.24	250	0.45/0.08	U _i =250	I _i =1.4/2	0/-22	—	—	—	—	19
EY 86**	Diode	6.3 i	0.09	18 000	0.15	—	—	—	U _a max = 22 kV; I _a max = 0.8 mA; I _a = 40 mA*				20
EZ 80	Twin Diode	6.3 i	0.6	2×250	90	—	—	—	R = 2×125 Ω U _a max = 2×350 V; R = 2×300 Ω				21
EZ 81	Twin Diode	6.3 i	1	2×250	150	—	—	—	R = 2×150 Ω U _a max = 2×350 V; R = 2×240 Ω				21

* peak value ** with a water-repellent layer: EY 87

Miniature 9-Pin (Noval) Series for TV, 0.3 A Heater Types

DY 86**	Diode	1.4 i	0.55	18 000	0.15	—	—	—	U _a max = 22 kV; I _a max = 0.8 mA; I _a = 40 mA*				20
PABC 80	Diode	9.5 i	0.3	350*	6*	—	—	—	—	—	—	—	1
	Twin Diode			350*	75*	—	—	—	—	—	—		
	Triode			200	1	—	—	-2.3	—	1.4	50	70	
PC 86	Triode	3.8 i	0.3	175	12	—	—	-1.5	—	14	—	68	22
PC 88	Triode	4 i	0.3	160	12.5	—	—	R _k = 100 Ω	—	13.5	—	65	23
PCC 84	Twin Triode	7.2 i	0.3	90	12	—	—	-1.5	—	6	—	24	24
PCC 85	Twin Triode	9 i	0.3	200	10	—	—	-2.1	—	5.8	—	48	5
PCC 88	Twin Triode	7 i	0.3	90	15	—	—	-1.3	—	12.5	—	33	5
PCC 189	Twin Triode	7.2 i	0.3	90	15	—	—	-1.2	—	12.5	2.5	34	5
PCF 80	Triode	9 i	0.3	100	14	—	—	-2	—	5	—	20	6
	Pentode			170	10	170	2.8	-2	—	6.2	400	47	
PCF 82	Triode	9 i	0.3	150	11	—	—	-2	—	5.8	—	35	6
	Pentode			170	10	110	3.3	-0.9	—	5.5	400	32	
PCF 86	Triode	8 i	0.3	100	14	—	—	-3	—	5.5	—	17	25
	Pentode			170	10	150	3.3	-1.2	—	12	≥ 350	70	
PCL 82	Triode	16 i	0.3	100	3.5	—	—	0	—	2.5	—	70	9
	Pentode			170	41	170	8	-11.5	—	7.5	16	9.5	
PCL 84	Triode	15 i	0.3	200	3	—	—	-1.7	—	4	—	65	26
	Pentode			220	18	220	3.1	-3.4	—	10	≥ 150	36	
PCL 85	Triode	18 i	0.3	100	10	—	—	0	—	5.5	9	50	10
	Pentode			50	200*	170	35*	-1	—	7.5	25	7	
PCL 86	Triode	14.5 i	0.3	230	1.2	—	—	-1.7	—	1.6	—	100	11
	Pentode			230	39	230	6.5	-5.7	—	10.5	45	21	
PL 36	Pentode	25 i	0.3	100	100	100	8	-8.5	—	14	5	5.6	16
PL 82	Pentode	16.5 i	0.3	170	53	170	10	-10.4	4	9	20	10	17
PL 83	Pentode	15 i	0.3	200	36	200	5	-3.5	—	10.5	100	25	27
PL 84	Pentode	15 i	0.3	170	70	170	5	-12.5	5.6	10	23	8	17
PL 500	Pentode	27 i	0.3	75	440*	200	30*	-10	—	—	—	—	28
PM 84	Tuning Indicator	4.5 i	0.3	220	0.4/0.085	U _I =220	I _I = 0.85/1.5	0/-19.5	—	—	—	—	19
PY 80	Diode	19 i	0.3	4 000*	400*	C _{boost} = 4 μF			—	—	—	—	29
PY 81	Diode	17 i	0.3	5 000*	450*	C _{boost} = 4 μF			—	—	—	—	30
PY 82	Diode	19 i	0.3	127	180	—	—	—	—	—	—	—	29
PY 83	Diode	20 i	0.3	5 600*	175	—	—	—	—	—	—	—	30
PY 88	Diode	30 i	0.3	6 000*	550*	—	—	—	—	—	—	—	30

* peak value ** with a water-repellent layer: DY 87

Miniature 9-Pin (Noval) Series, 0.1 A Heater Types

UABC 80	Diode Twin Diode Triode	28.5 i	0.1	350* 350* 200	6* 75* 1	— — —	— — —	— — -2.3	— — —	— — 1.4	— — 50	— — 70	1
UBC 81	Twin Diode Triode	14 i	0.1	350* 250	5* 1	— —	— —	— -3	— —	— 1.2	— 58	— 70	2
UBF 89	Twin Diode Pentode	19 i	0.1	200* 200	5* 11	— 100	— 3.3	— -1.5	— —	— 4.5	— 600	— 20	3
UCC 85	Twin Triode	26 i	0.1	200	10	—	—	-2.1	—	5.8	—	48	5
UCH 81	Triode	19 i	0.1	100	13.5	—	—	0	—	3.7	—	22	7
	Heptode			200	3.7	119	8.1	-2.6	—	(0.775)	1000	—	
UCL 82	Triode	50 i	0.1	100	3.5	—	—	0	—	2.5	—	70	9
	Pentode			170	41	170	8	-11.5	3.3	7.5	16	9.5	
UF 80	Pentode	19 i	0.1	170	10	170	2.5	-2	—	7.4	400	50	12
UF 85	Pentode	19 i	0.1	200	11.4	116	3.1	-2.3	—	6.1	350	—	12
UF 89	Pentode	12.6 i	0.1	200	11.1	R _{g2} = 24 kΩ	3.8	-1.95	—	3.85	550	—	14
UL 84	Pentode	45 i	0.1	170	70	170	5	-12.5	—	10	23	8	17
UM 80	Tuning Indicator	18 i	0.1	200	—	U _I =200	I _I =5.7/7	1/-14	—	—	—	—	18
UM 84	Tuning Indicator	17 i	0.1	170	—	U _I = 170	I _I = 0.8/1.25	0/-15	—	—	—	—	19
UY 85	Diode	38 i	0.1	250	110	—	—	—	—	—	—	—	29

* peak value

Miniature 8-Pin (Rimlock) Series, 6.3 V Heater Types

AZ 41	Diode	4 d	0.75	2×300	70	—	$U_{a\max} = 2 \times 500 \text{ V}; R \geq 2 \times 200 \Omega$						31	
EAF 42	Diode Pentode	6.3 i	0.2	350* 250	5* 5	85	1.5	—	—	—	2	1400	16	32
EBC 41	Twin Diode Triode	6.3 i	0.23	350* 250	5* 1	—	—	—	—	—	—	—	—	33
ECC 40	Twin Triode	6.3 i	0.6	250	6	—	—	—5.6	0.28	2.9	11	32	34	
ECH 42	Triode	6.3 i	0.23	100	10	—	—	0	—	2.8	—	22	35	
	Hexode			250	3	85	3	$R_{g1} = 3 \text{ M}\Omega$	—	0.75	≥ 1000	—		
EF 40	Pentode	6.3 i	0.2	250	3	140	0.55	—2	—	1.85	2500	38	36	
EF 41	Pentode	6.3 i	0.2	250	6	$R_{g2} = 90 \text{ k}\Omega$	1.7	—2.5	—	2.2	1100	18	37	
EF 42	Pentode	6.3 i	0.33	250	10	250	2.4	—2	—	9	500	83	38	
EL 41	Pentode	6.3 i	0.71	250	36	250	5.2	—7	3.9	10	40	22	39	
EZ 40	Twin Diode	6.3 i	0.6	2×250	90	—	$U_{a\max} = 2 \times 350 \text{ V}; R = 2 \times 300 \Omega$						40	

* peak value

Miniature 8-Pin (Rimlock) Series, 0.1 A Heater Types

UAF 42	Diode Pentode	12.6 i	0.1	350* 200	5* 5	85	1.5	—2	—	—	2	1000	18	32
UBC 41	Twin Diode Triode	14 i	0.1	350* 170	5* 1.5	—	—	—1.55	—	1.65	42	70	33	
UCH 42	Triode	14 i	0.1	100	10	—	—	0	—	2.8	—	16	35	
	Hexode			200	3	85	3	—2	—	(0.75)	≥ 1000	—		
UF 41	Pentode	12.6 i	0.1	200	7.2	$R_{g2} = 40 \text{ k}\Omega$	2.1	—3	—	2.3	1000	18	37	
UY 41	Diode	31 i	0.1	220	100	—	$R = 160 \Omega$						41	

* peak value

Battery Miniature 7-Pin Series, 1.4 V (2.8 V) Heater Types

DLL 101	Twin Pentode	1.4 d	0.1	90	4.73	67.5	2.53	—12	0.4	—	—	—	42
1L4	Pentode	1.4 d	0.05	90	4.5	90	1.2	0	—	1.2	400	—	43
1R5	Pentagrid	1.4 d	0.05	90	1.6	67.5	3.2	$R_{g1} = 0.5 \text{ M}\Omega$	—	(0.3)	600	—	44
1R5T	Pentagrid	1.4 d	0.025	90	1.35	67.5	3.2	$R_{g1} = 0.5 \text{ M}\Omega$	—	(0.25)	500	—	44
1S4	Pentode	1.4 d	0.1	90	7.4	67.5	1.4	—7	0.27	1.57	100	—	45
1S4T	Pentode	1.4 d	0.05	90	7.4	67.5	1.4	—7	0.21	1.4	100	—	45
1S5	Diode	1.4 d	0.05	100*	1.2*	—	—	—	—	—	—	—	46
	Pentode			90	1.6	67.5	0.4	0	—	0.625	600	15.5	
1S5T	Diode	1.4 d	0.025	100*	1.2*	—	—	—	—	—	—	—	46
	Pentode			90	1.6	67.5	0.4	0	—	0.625	600	15.5	
1T4	Pentode	1.4 d	0.05	90	3.5	67.5	1.4	0	—	0.9	500	—	43
1T4T	Pentode	1.4 d	0.025	90	3.5	67.5	1.4	0	—	0.75	500	—	43
1U4	Pentode	1.4 d	0.05	90	1.6	90	0.45	0	—	0.9	1000	22	43
3A4	Pentode	1.4 d	0.2	150	13.3	90	2.1	—8.4	0.7	1.9	100	—	47
3S4	Pentode	1.4 d	0.1	90	7.4	67.5	1.4	—7	0.27	1.57	100	5	47
3S4T	Pentode	1.4 d	0.05	90	7.4	67.5	1.4	—7	0.27	1.57	100	5	47
3V4	Pentode	1.4 d	0.1	90	9.5	90	2.1	—4.5	0.27	2.1	100	9	48

* peak value

Miniature 7-Pin Series, 6.3 V Heater Types

		Heater		Plate		Screen		Grid Voltage	Power Output	Mutual Conductance (Conversion Transconductance)	Plate Resistance	Amplification Factor	Base Connections
		Voltage	Current	Voltage	Current	Voltage	Current						
		V	A	V	mA	V	mA						
EC 92	Triode	6.3 i	0.15	250	10	—	—	-2	—	5.5	—	60	49
PC 92	Triode	3.1 i	0.3	230	10.5	—	—	-1.6	—	6	—	62	49
6AQ5	Beam Power Tetrode	6.3 i	0.45	250	45	250	4.5	-12.5	4.5	4.1	52	—	50
6AT6	Twin Diode Triode	6.3 i	0.3	200* 250	1* 1	—	—	— -3	—	— 1.2	— 58	— 70	51
6AU6	Pentode	6.3 i	0.3	250	10.8	150	4.3	-1	—	5.2	1000	—	52
6AV6	Twin Diode Triode	6.3 i	0.3	200* 250	6* 1.2	—	—	— -2	—	— 1.6	— 62.5	— 100	51
6BA6	Pentode	6.3 i	0.3	250	9	100	3.8	-1.5	—	4.4	1500	—	52
6BE6	Pentagrid	6.3 i	0.3	250	3	100	7.1	$R_{g1} = 0.02 M\Omega$	—	(0.475)	1000	—	53
6X4	Twin Diode	6.3 i	0.6	2 × 325	70	$U_{a max} = 2 \times 650 V$				—	—	—	54

* peak value

Miniature 7-Pin Series, 0.15 A Heater Types

12AT6	Twin Diode Triode	12.6 i	0.15	200* 250	1* 1	—	—	— -3	—	— 1.2	— 58	— 70	51
12BA6	Pentode	12.6 i	0.15	250	11	100	4.2	—	—	4.4	1500	—	52
12BE6	Pentagrid	12.6 i	0.15	250	3	100	7.1	$R_{g1} = 0.02 M\Omega$	—	(0.475)	1000	—	53
35W4	Diode	35 i	0.15	117	90	$U_{a max} = 330 V$				—	—	—	55
50B5	Beam Power Tetrode	50 i	0.15	110	49	110	4	-7.5	1.9	7.5	14	—	56

* peak value

Loctal Series, 6.3 V Heater Types

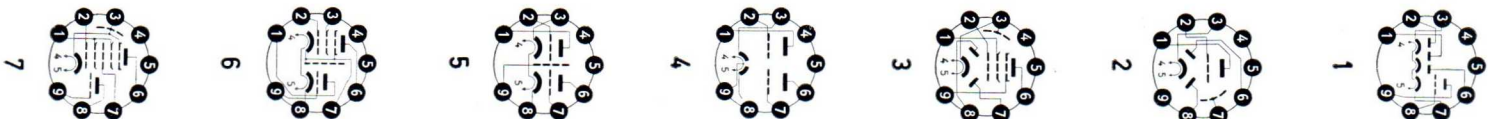
AZ 21	Twin Diode	4 d	1.0	2 × 300	120	—	—	—	—	—	—	—	57
EBL 21	Twin Diode Pentode	6.3 i	0.9	350* 250	5* 36	— 250	— 4.5	— -6	— 4.5	— 9	— 50	— 23	58
ECH 21	Triode Heptode	6.3 i	0.34	100 250	12 5.3	— 90	— 3.5	0 -2	—	3.2 2.2	— 900	22 18	59
EF 22	Pentode	6.3 i	0.2	250	6	100	1.7	-2.5	—	2.2	1200	17	60

* peak value

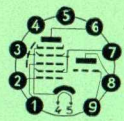
Loctal Series, 0.1 A Heater Types

UBL 21	Twin Diode Pentode	55 i	0.1	200* 200	5* 55	— 200	— 9.5	— -13	— 4.8	— 8	— 25	— 9	58
UCH 21	Triode Heptode	20 i	0.1	100 200	12 3.5	— 100	— 6.5	0 -2	—	3.2 (0.75)	— 1000	19 —	59
UF 21	Pentode	12.6 i	0.1	200	6	100	1.7	-2.5	—	2.2	1000	17	60
UY 21	Diode	50 i	0.1	250	120	—	$R = 1600 \Omega$		—	—	—	—	61

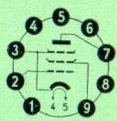
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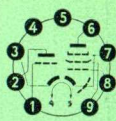
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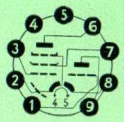
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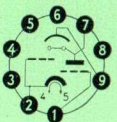
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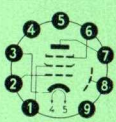
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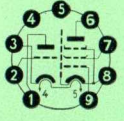
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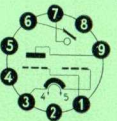
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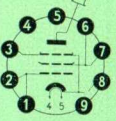
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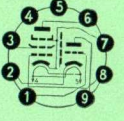
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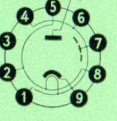
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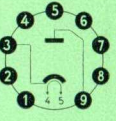
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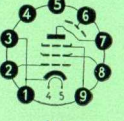
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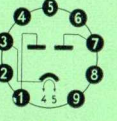
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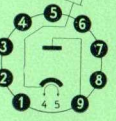
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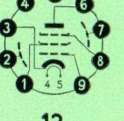
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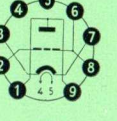
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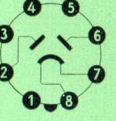
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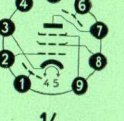
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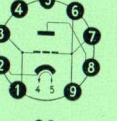
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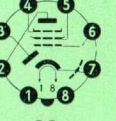
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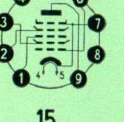
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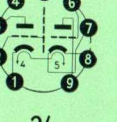
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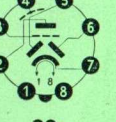
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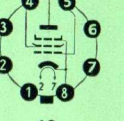
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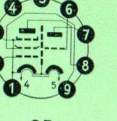
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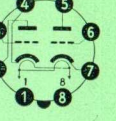
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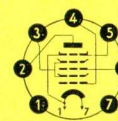
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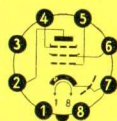
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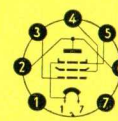
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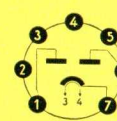
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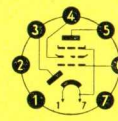
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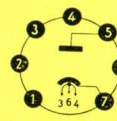
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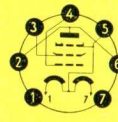
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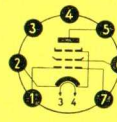
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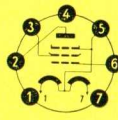
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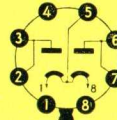
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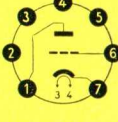
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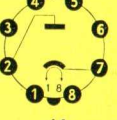
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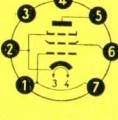
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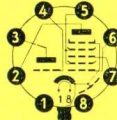
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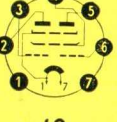
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50



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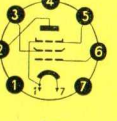
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61