OUTPUT PENTODE

DL96

Output pentode with centre-tapped filament for use in battery operated equipment.

FILAMENT

This valve is suitable for d.c. operation only.

Series

 V_f applied across the two filament sections in series, between pins 1 and 7. V_{g1} referred to pin 1.

Parallel

 V_t applied across the two filament sections in parallel, between pin 5 and pins 1 and 7 connected together. V_{g1} referred to pin 5.

Single Section

 V_{f} applied across one section of the filament only, between pin 5 and either pin 1 or 7.

From a parallel supply

	Series	Parallel
V _f I _f	2.8 25	1.4 V 50 mA
From a series supply		
$V_{\mathbf{f}}$	2.6	1.3 V
l _f	24	48 mA

The filament must be shunted to ensure the correct filament voltage across each section. If separate l.t. and h.t. batteries are employed it is recommended that each filament section is shunted separately to h.t.

If a pair of valves are used in push-pull in a 50mA series chain, then the corresponding filament sections of each valve must be connected in parallel and the pairs of sections in series. A resistor must shunt the more negative pair of sections. $V_{\rm g1}$ referred to pin 1.

CAPACITANCES

$C_{\mathbf{a}-\mathbf{g}1}$	< 0.4 4.8 4.4	рF
Cin	4.8	pF←
Cout	4.4	pF∢—

CHARACTERISTICS (parallel filament connection)

$V_{\rm b}$	67.5	90	٧
Va	64	85	V
V_{g2}	64	85	V
V_{g1}	-3.3	-5.2	٧
l _a	3.5	5.0	mΑ
I_{g2}	650	900	Au
g _m	1.3	1.4	mÀ/V
μ _{g1-g2}	7.0	7.0	,
ra	170	150	kΩ
V_{g1} max. $(I_{g1} = +0.3 \mu A)$. 0	٧

OPERATING CONDITIONS AS SINGLE VALVE CLASS "A" AMPLIFIER Series filament connection $V_{\mathbf{b}}$ 90 85 ٧a 85 V_{g2} V_{g1}^{s-} -5.2 mΑ la 4.3 700 μΑ 122 15 Řa kΩ 3.0 $V_{in(r.m.s.)}$ ٧ Pout 160 mW $D_{\rm tot}$ 10 % Parallel filament connection 67.5 90 85 V_a 64 V_{g2} 64 85 V_{g1}^{o} -3.3-5.23.5 5.0 mΑ la` 650 900 μA l_{g2} Řa 15 13 kΩ 3.5 2.6 $V_{in(r.m.s.)}$ 100 200 mW Pout 10 10 Dtot % Single section of filament 67.5 90 ٧b $V_{\rm a}$ 64 85 64 85 V_{g2} -3.3 -5.2 V_{g1} 1.75 2.5 mΑ

OPERATING CONDITIONS FOR TWO VALVES IN CLASS "AB" PUSH-PULL

All filament sections in parallel

 ${f R_a}$

Pout

 D_{tot}

 $V_{in(r.m.s.)}$

V _b	67.5	90	٧
*R _k	470	560	Ω
I _{a(0)}	2×2.3	2×3.25	mΑ
la (max. sig.)	2×3.4	2×4.75	mΑ
I _{g2(0)}	2×430	2×600	μA
lg2 (max. sig.)	2×0.95	2×1.5	mΑ
R _{a-a}	20	20	$k\Omega$
$V_{in(g1-g1)r.m.s.}$	11.4	15.8	٧
P_{out}	220	420	mW
D_{tot}	3.0	4 .0	%

330

30

50

10

2.6

450

25

100

10

3.6

kΩ

mW

٧

^{*}An additional 3.5mA is fed through $R_{\mathbf{k}}$ to simulate the current from previous stages.

OUTPUT PENTODE

DL96

Output pentode with centre-tapped filament for use in battery operated equipment.

FILAMENT

This valve is suitable for d.c. operation only.

Series

 V_{f} applied across the two filament sections in series, between pins 1 and 7. V_{g1} referred to pin 1.

Parallel

 V_r applied across the two filament sections in parallel, between pin 5 and pins 1 and 7 connected together. V_{g1} referred to pin 5.

Single Section

 V_{t} applied across one section of the filament only, between pin 5 and either pin 1 or 7.

From a parallel supply

	Series	Parallel
V_t	2.8	1.4 V
1 _f	25	50 mA
From a series supply		
$V_{\mathbf{f}}$	2.6	1.3 V
le	24	48 mA

The filament must be shunted to ensure the correct filament voltage across each section. If separate l.t. and h.t. batteries are employed it is recommended that each filament section is shunted separately to h.t.

If a pair of valves are used in push-pull in a 50mA series chain, then the corresponding filament sections of each valve must be connected in parallel and the pairs of sections in series. A resistor must shunt the more negative pair of sections. $V_{\rm g\,I}$ referred to pin 1.

CAPACITANCES

$c_{\mathbf{a}-\mathbf{g}1}$	< 0.4	рF
c _{in}	4.8	pF∻
Cout	4.4	pF∻

CHARACTERISTICS (parallel filament connection)

V_{b}	67.5	90	٧
Va	64	85	V
V_{g2}	64	85	V
V_{g1}^{o-}	-3.3	-5.2	V
l _a	3.5	5.0	mΑ
I_{g2}	650	900	μΑ
g _m	1.3	1.4	mÀ/V
$\mu_{\mathbf{g}1-\mathbf{g}2}$	7.0	7.0	,
r _a	170	150	kΩ
V_{g1} max. $(I_{g1} = +0.3 \mu A)$. 0	٧

DL96

OPERATING CONDITIONS A AMPLIFIER	AS SINGLE VALVE C	LASS "A"	<
Series filament connection			
V_{b}		90	٧
Va		85	٧
V_{g2}		85	٧
V_{g1}°		-5.2	V
l _a		4.3	mĄ
$I_{\mathbf{g}2}$		700	μΑ
R_a		15 3.0	kΩ V
$V_{in(r.m.s.)}$		160	m₩
P_{out}		100	%
D_{tot}		10	/0
Parallel filament connectio	n		
V_{b}	67.5	90	٧
V _a	64	85	٧
V_{g2}	64	85	V
V_{g1}	-3.3	-5.2	V
la	_3.5	5.0	mĄ
l_{g2}	650	900	μ A
Ra	15	13 3.5	kΩ
$\bigvee_{in(r,m.s.)}$	2.6 100	3.5 200	mW
Pout	100	10	™ ∨∨ %
D_{tot}	10	10	/0
Single section of filament			
V_{b}	67.5	90	٧
Va	64	85	Ý
V_{g2}	64	85	V
V_{g1}^{s2}	–3.3	-5.2	V
l _a *^	1.75	2.5	mΑ
I_{g2}	330	450	$\mu \mathbf{A}$
Ra	30	25	kΩ
Vin(r.m.s.)	2.6	3.6 100	mW/

OPERATING CONDITIONS FOR TWO VALVES IN CLASS "AB" PUSH-PULL

All filament sections in parallel

 P_{out}

 D_{tot}

V_{b}	67.5	90	٧
*R _k	470	560	Ω
I _{a(o)}	2×2.3	2 × 3.25	mΑ
la (max. sig.)	2×3.4	2 × 4.75	mΑ
I _{g2(0)}	2×430	2×600	μA
l _{g2} (max. sig.)	2×0.95	2×1.5	mΑ
Ř _{a-a}	20	20	$\mathbf{k}\Omega$
$V_{in(g1-g1)r.m.s.}$	11.4	15.8	V
Pout	220	420	mW
D _{tot}	3.0	4.0	%

50

10

100

10

^{*}An additional 3.5mA is fed through $R_{\mathbf{k}}$ to simulate the current from previous stages.

OPERATING CONDITIONS FOR TWO VALVES IN CLASS "B" PUSH-PULL

All filament sections in parallel

$V_{\mathbf{b}}$	67.5	90	٧
V _a	61.5	81.5	٧
$V_{g2}^{"}$	61.5	81.5	٧
V _{g1}	-5.8	8.5	٧
la(o)	2×0.75	2×1.0	mΑ
la (max. sig.)	2×3.4	2×5.0	mΑ
$I_{g2(0)}$	2×140	2×180	μΑ
l _{g2} (max. sig.)	2×0.95	2×1.3	mΑ
R _{a-a}	20	16	$\mathbf{k}\Omega$
V _{in(g1-g1)r.m.s.}	11.4	15.8	٧
Pout	220	440	mW
D _{tot}	3.0	2.6	%

LIMITING VALUES

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V _b max. (absolute)	110	٧
V _b max.	90	٧
Va max.	90	٧
p _a max.	600	mW
V _{g2} max.	90	٧
p _{g2} max.	200	mW
h max. (parallel filament connection)	6.0	mΑ
R _{g1-f} max.	2.0	$M\Omega$
**		

^{*}Ik max. for each 1.4V section of the filament is 3mA.

