

TENTATIVE DATA

QUICK REFERENCE DATA

External anode triode, of ceramic to metal construction, intended for use as an industrial oscillator at frequencies up to 120 MHz. The YD1170 is forced-air cooled. The YD1171 is water cooled by means of a separate water jacket. The YD1172 has an integral helical water cooler.

f	120	MHz
P_{out} (less P_{drive})	15.4	kW
f max.	120	MHz
V_a max.	7.2	kV
p_a max.	10	kW

Unless otherwise stated, data is applicable to all types

To be read in conjunction with

GENERAL OPERATIONAL RECOMMENDATIONS - TRANSMITTING VALVES

INDUSTRIAL OSCILLATOR, CLASS 'C'

OPERATING CONDITIONS

f	120	MHz
P_{out}	16.2	kW
P_{out} (less P_{drive})	15.4	kW
P_{load}	13.5*	kW
Duty factor	1.0	
η_a	79.4	%
V_a	6.0	kV
I_a	3.4	A
$-V_g$	460	V
$I_{g \text{ on load}}$	920	mA
$I_{g \text{ off load}}$	1.35	A
R_{g-f}	500	Ω
Feedback ratio $v_{in(pk)} / v_{a(pk)}$	0.13	
p_a	4.2	kW
p_g	275	W

*Cavity circuit, 90% transfer.

RATINGS (ABSOLUTE MAXIMUM SYSTEM)

f_{max}	120	MHz
$P_{in} max.$	24	kW
$V_a max.$	7.2	kV
$-V_g max.$	1.5	kV
$I_a max.$	4.0	A
$I_g max. on load$	1.0	A
$I_g max. off load$	1.5	A
$I_k max.$	4.8	A
$i_{k(pk)} max.$	25	A
$p_a max.$	10	kW
$R_{g-f} max.$	10	k Ω

CATHODE

Directly heated, thoriated tungsten

$V_f < 100MHz$	5.8	V
$V_f 100-120MHz$	5.5	V
I_f	130	A
$i_{f(pk)} max. (starting)$	800	A
$r_f (cold)$	0.0056	Ω

The filament has been designed to accept temporary fluctuations of supply voltage of +5 to -10%.

CAPACITANCES

c_{a-g}	24	pF
c_{g-f}	47	pF
c_{a-f}	0.6	pF

CHARACTERISTICS (at $V_a = 6.0kV$, $I_a = 2.0A$)

g_m	33	mA/V
μ	29	

MOUNTING POSITION - YD1170, YD1172
YD1171

Vertical, anode up or down
Vertical, anode down

COOLING

YD1170

Anode - Forced-air cooled

Seals - At the higher values of anode dissipation and at the highest operating frequencies additional cooling is required.

Temperatures

All seals max.	200	°C
Envelope max.	200	°C
Air inlet max.	45	°C

Anode dissipation	Height above sea level	Inlet temperature	Outlet temperature	Rate of air flow per minute		Pressure difference between inlet and outlet
(kW)	(km)	(°C)	(°C)	(m ³)	(ft ³)	(mm H ₂ O)
10	0	35	94	9.5	335	55
8.0	0	35	105	6.5	229	28
6.0	0	35	113	4.5	159	15
4.0	0	35	117	3.0	106	8.0
10	0	45	98	11.0	388	69
8.0	0	45	108	7.6	265	35
6.0	0	45	115	5.2	184	19
4.0	0	45	119	3.5	123	10
10	1.5	35	94	11.4	405	63
8.0	1.5	35	105	7.8	273	32
6.0	1.5	35	113	5.4	194	17
4.0	1.5	35	117	3.6	131	9.0
10	3.0	25	90	12	424	62
8.0	3.0	25	102	8.2	291	32
6.0	3.0	25	111	5.7	203	17
4.0	3.0	25	116	3.8	138	9.0

YD1171

Anode - Water cooled (separate water jacket)

Seals - For frequencies >4 MHz air cooling is required.

Temperatures

All seals max.	200	°C
Envelope max.	200	°C
Water inlet max.	50	°C

Anode dissipation	Inlet temperature	Outlet temperature	Rate of water flow per minute		Pressure difference between inlet and outlet
(kW)	(°C)	(°C)	(litres)	(gal)	(atm)
10	20	36	10	2.2	0.6
8.0	20	37	7.8	1.72	0.38
6.0	20	38	5.7	1.25	0.22
10	50	61	15	3.3	1.25
8.0	50	62	11.3	2.49	0.75
6.0	50	62	8.2	1.80	0.42

For inlet temperatures between 20 and 50°C the required water flow can be found by linear interpolation.

YD1172

Anode - Water cooled (integral cooler)

Seals - For frequencies >4 MHz air cooling is required.

Temperatures

All seals max.	200	°C
Envelope max.	200	°C
Water inlet max.	50	°C

Anode dissipation	Inlet temperature	Outlet temperature	Rate of water flow per minute		Pressure difference between inlet and outlet
(kW)	(°C)	(°C)	(litres)	(gal)	(atm)
10	20	46	6.0	1.32	0.25
8.0	20	49	4.5	0.99	0.15
6.0	20	53	3.0	0.66	0.07
10	50	67	9.0	1.98	0.52
8.0	50	69	6.7	1.47	0.31
6.0	50	72	4.5	0.99	0.15

For inlet temperatures between 20 and 50°C the required water flow can be found by linear interpolation.



V.H.F. INDUSTRIAL TRIODES

YD1170
YD1171
YD1172

PHYSICAL DATA

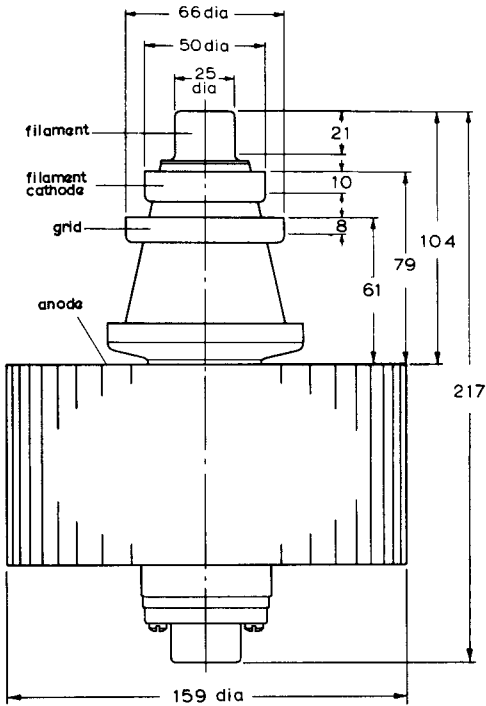
	YD1170	YD1171	YD1172	
Weight of valve	7.5	1.5	2.0	kg
	16.5	3.3	4.4	lb
Weight of insulating pedestal	4.25	-	-	kg
	9.4	-	-	lb
Weight of water jacket	-	2.0	-	kg
	-	4.4	-	lb

ACCESSORIES

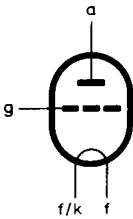
Filament connector	40692
Filament/cathode connector	40693
Grid connector ($f \leq 4.0$ MHz)	40690
Grid connector ($f > 4.0$ MHz)	40691
Filament cables $\times 2$	40715
Insulating pedestal (YD1170)	40654
Water jacket (YD1171)	K727



OUTLINE DRAWING OF YD1170

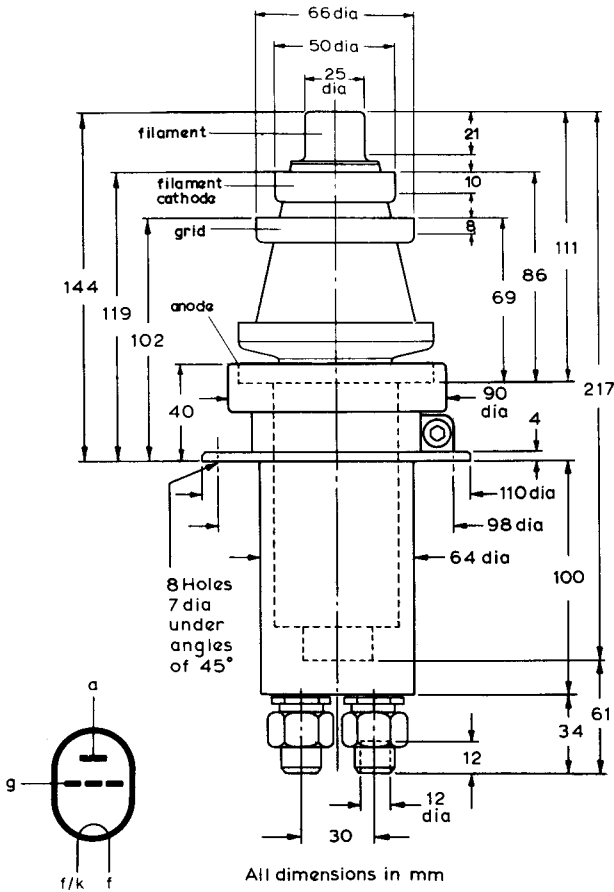


All dimensions in mm



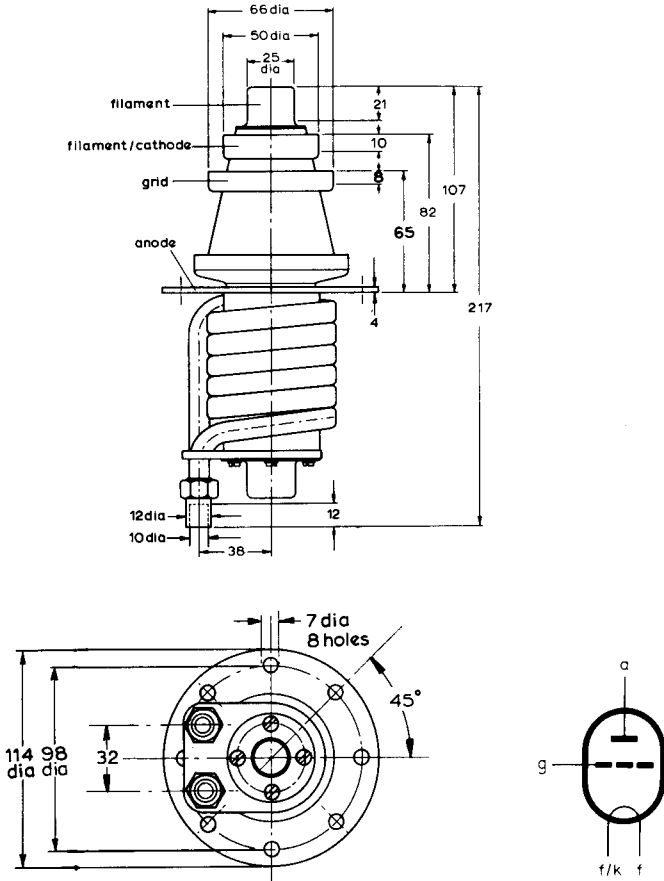
B5767

OUTLINE DRAWING OF YD1171 MOUNTED IN WATER JACKET K727



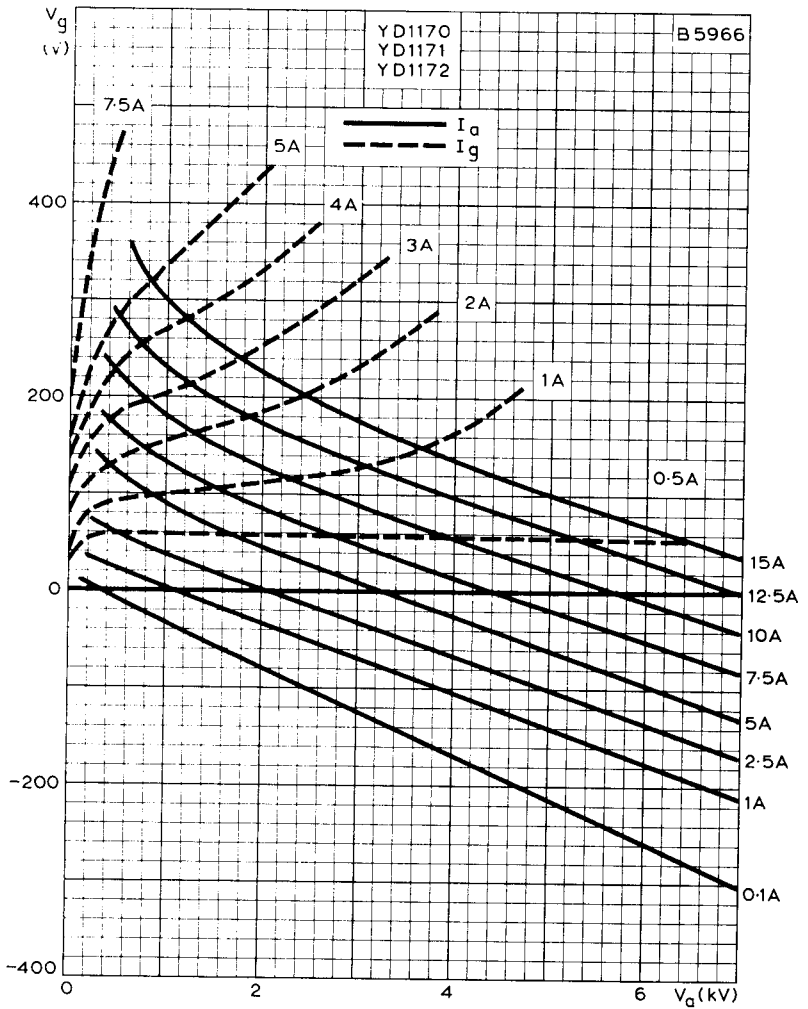
BS751

OUTLINE DRAWING OF YD1172



All dimensions in mm

B6734



CONSTANT CURRENT CHARACTERISTICS