

V.H.F. POWER TRIODE

TY8-6000A
TY8-6000W
TY8-6000H

TENTATIVE DATA

QUICK REFERENCE DATA

External anode triode, intended for use as industrial Class 'C' oscillator

The TY8-6000A is forced-air cooled.

The TY8-6000W is water cooled by means of a water jacket.

The TY8-6000H is water cooled by means of an integral helical water cooler.

f	50	Mc/s
P _{out} (less P _{drive})	7.2	kW
f max.	50	Mc/s
V _a max.	8.0	kV
p _a max.	6.0	kW

Unless otherwise shown data is applicable to all types

To be read in conjunction with GENERAL OPERATIONAL RECOMMENDATIONS - TRANSMITTING VALVES

INDUSTRIAL OPERATION AS CLASS 'C' OSCILLATOR

Anode supply from three-phase halfwave rectifier

Typical operating conditions

f	50	50	Mc/s
P _{out}	7.5	6.2	kW
P _{out} (less P _{drive})	7.2	5.9	kW
P _{load}	6.1	5.0	kW
η _a	70	71	%
V _{tr} (r.m.s.) per phase	6.15	5.3	kV
V _a	7.2	6.2	kV
I _a (loaded)	1.5	1.4	A
I _a (unloaded)	370	400	mA
I _g (loaded)	360	370	mA
I _g (unloaded)	470	470	mA
Feedback ratio $\frac{v_{in(pk)}}{v_{out(pk)}}$	0.17	0.17	
p _a	3.3	2.5	kW
R _{g-f}	1.85	1.5	kΩ
R _a	2.3	2.1	kΩ



Absolute maximum ratings

f max.	50	Mc/s
V_a max.	8.0	kV
$-V_g$ max.	1.25	kV
I_a max.	1.8	A
p_a max.	6.0	kW
I_g (loaded) max.	400	mA
I_g (unloaded) max.	500	mA
R_{g-f} max.	10	k Ω

CATHODE

Directly heated, thoriated tungsten

$*V_f$	12.6	V
I_f	33	A

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

CAPACITANCES

c_{a-g}	7.9	pF
c_{out}	1.0	pF
c_{in}	14.2	pF

CHARACTERISTICS (measured at $V_a = 6.0$ kV, $I_a = 1.0$ A)

g_m	12	mA/V
μ	24	

MOUNTING POSITION

Vertical, with anode down.



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COOLING

TY8-6000A
Forced-air cooled
Maximum temperatures
Seals

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220 °C

The amount of forced-air cooling required for this valve depends on the height above sea level and the anode dissipation.

Typical values for continuous operation of inlet temperature, rate of flow of air and pressure difference between the inlet and the outlet of the housing are given in the following table.

For intermittent operation see the curve on page C4.

Anode dissipation P_a (kW)	Height above sea level h		Inlet temperature T_{in} °C	Minimum rate of flow of air per minute		Pressure difference between inlet and outlet	
	(km)	(ft)		(m ³)	(ft ³)	(mm of H ₂ O)	(in of H ₂ O)
2.0	0	0	35	4.8	170	20	0.8
2.0	0	0	45	5.7	200	25	1.0
2.0	1.5	4920	35	5.7	200	23	0.9
2.0	3.0	9840	25	6.1	215	23	0.9
4.0	0	0	35	6.8	240	38	1.5
4.0	0	0	45	7.9	280	49	1.9
4.0	1.5	4920	35	7.8	275	42	1.7
4.0	3.0	9840	25	8.4	300	42	1.7
6.0	0	0	35	9.2	325	68	2.7
6.0	0	0	45	10.7	380	90	3.5
6.0	1.5	4920	35	11.2	395	81	3.2
6.0	3.0	9840	25	11.7	415	81	3.2

TY8-6000W

Water cooled anode, low velocity air flow on seals.

Maximum temperatures

Seals	220	°C
Water inlet	50	°C

The amount of forced-air cooling required for this valve depends on the temperature of the water. Typical values of rate of flow of water and pressure lost in the jacket are given in the following table : -

Anode dissipation P_a (kW)	Inlet temperature T_{in} (°C)	Minimum rate of water flow per minute		Pressure loss in jacket
		(litres)	(gal)	(atm)
2.0	20	2.5	0.55	0.06
	50	5.0	1.1	0.2
4.0	20	4.0	0.88	0.14
	50	9.0	1.98	0.7
6.0	20	6.0	1.32	0.3
	50	14.0	3.08	1.9

At inlet temperatures between 20 and 50°C the required quantity of water can be found by linear interpolation.

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Water cooled anode, low velocity air flow on seals.

Maximum temperatures

Seals	220	°C
Water inlet	50	°C

The amount of water cooling required for this valve depends on the anode dissipation and temperature of the water.

Typical values of rate of flow of water through helix and pressure loss in the helix are given in the curve on page C2. The minimum rate of flow of water through helix required can be found from the curves on page C3. To avoid excessive temperatures at frequencies above 4Mc/s both grid terminals should be connected in parallel and care should be taken to distribute the R. F. current evenly between them and a low velocity air flow should be directed on the seals.

PHYSICAL DATA

	TY8-6000A	TY8-6000W	TY8-6000H	
Weight of valve	9.7	1.8	2.2	lb
	4.4	0.8	1.0	kg
Weight of valve plus carton	22	3.6	4.2	lb
	10	1.6	1.9	kg
Weight of insulating pedestal	4.6	-	-	lb
	2.1	-	-	kg
Weight of insulating pedestal plus carton	6.8	-	-	lb
	3.1	-	-	kg
Weight of water jacket	-	1.7	-	lb
	-	0.76	-	kg
Weight of water jacket plus carton	-	2.0	-	lb
	-	0.9	-	kg

ACCESSORIES

TY8-6000A

Grid and filament connectors x 4	40634
Insulating pedestal x 1	40630

TY8-6000W

Grid and filament connectors x 4	40634
Water jacket x 1	K721

TY8-6000H

Grid and filament connectors x 4	40634
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Dimensions of TY8-6000A

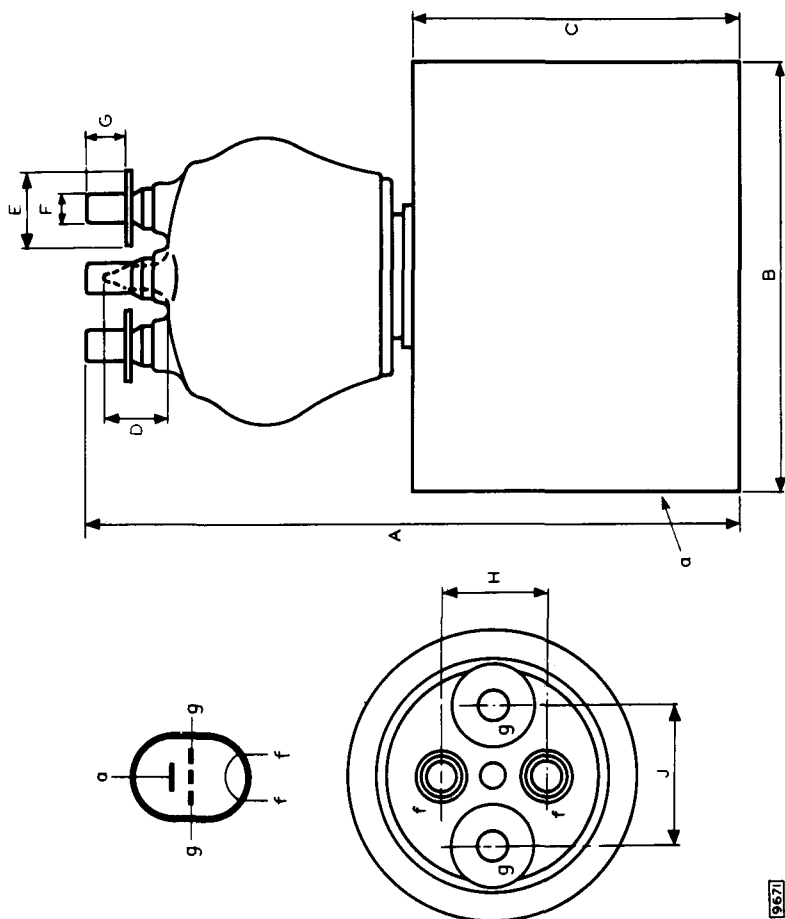
	Inches	Millimetres	
A	0.732	186	max
B	4.815 ± 0.012	122.3 ± 0.3	dia
C	3.70	94	
D	0.71	18	max
E	0.87	22	dia
F	0.358	9.1	dia
G	0.43	11	min
H	1.18	30	
J	1.57	40	

Inch dimensions derived from original millimetre dimensions.

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OUTLINE DRAWING OF TY8-6000A



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Dimensions of TY8-6000W

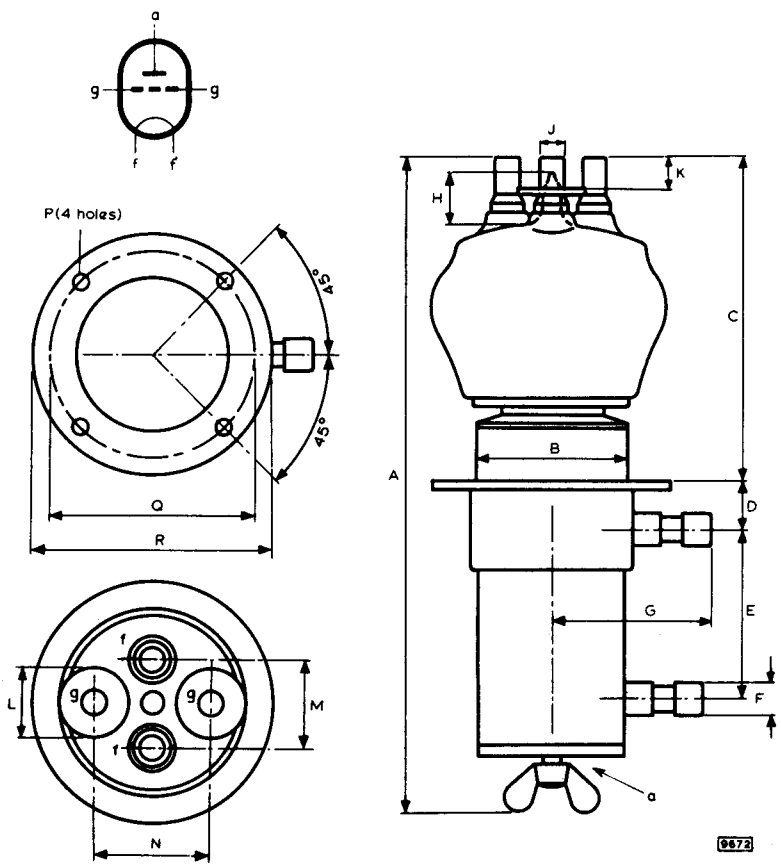
	Inches	Millimetres	
A	8.62	224	max
B	2.05	52	dia
C	4.37	111	
D	0.650	16.5	
E	2.24	57	
F	0.453	11.5	dia
G	2.146	54.5	
H	0.71	18	max
J	0.358	9.1	dia
K	0.43	11	min
L	0.87	22	
M	1.18	30	
N	1.57	40	
P	0.24	6.0	dia
Q	2.76	70	
R	3.228 ± 0.008	82 ± 0.2	

Inch dimensions derived from original millimetre dimensions.

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TY8-6000H

OUTLINE DRAWING OF TY8-6000W



Dimensions of TY8-6000H

	Inches	millimetres	
A	8.287	210.5	
B	4.882	124	
C	0.394	10	
D	0.079	2	
E	0.433	11	min
F	0.358	9.1	dia
G	3.386	86	dia. max.
H	1.811	46	
J	0.394	10	dia
K	0.315	8	dia
L	0.709	18	max
M	2.559	65	
N	5.118	130	
P	4.331	110	
Q	0.276	7	dia
R	1.339	34	
S	0.906	23	
T	1.575	40	
U	1.181	30	

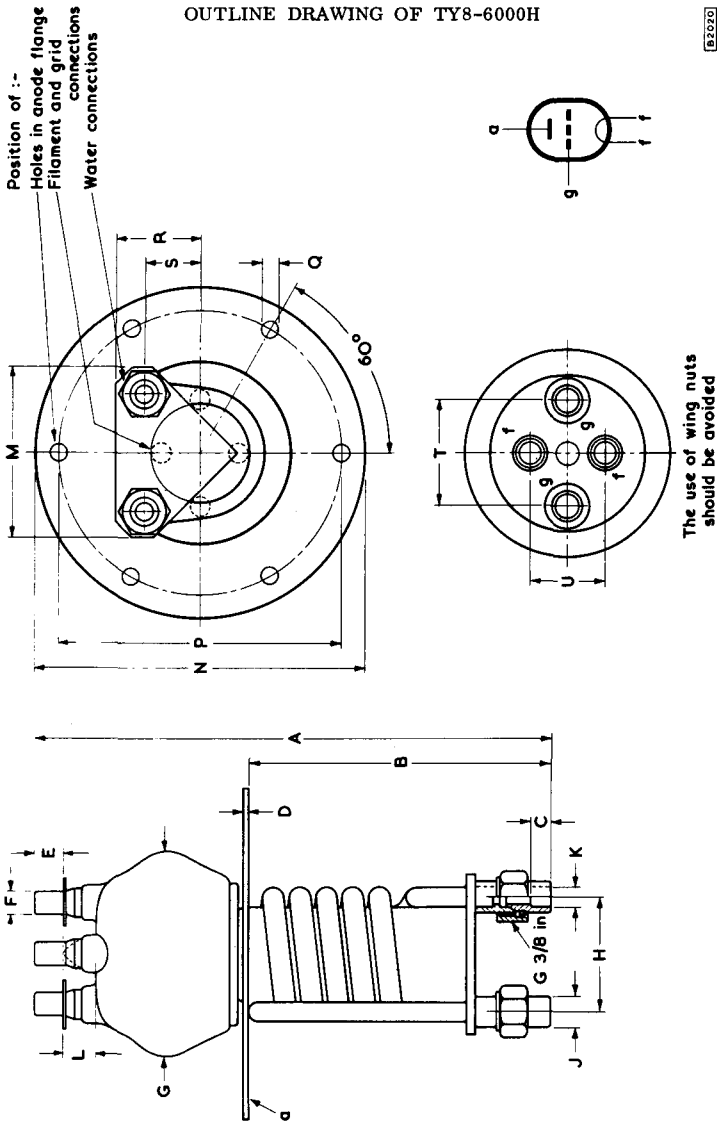
Inch dimensions derived from original millimetre dimensions.

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TY8-6000A
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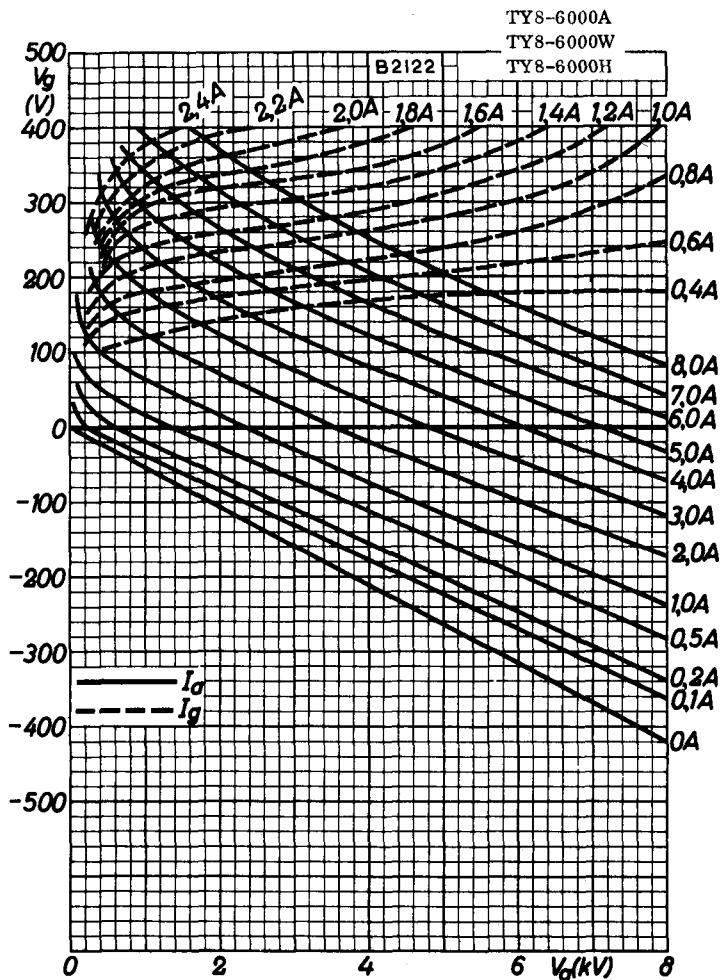
OUTLINE DRAWING OF TY8-6000H

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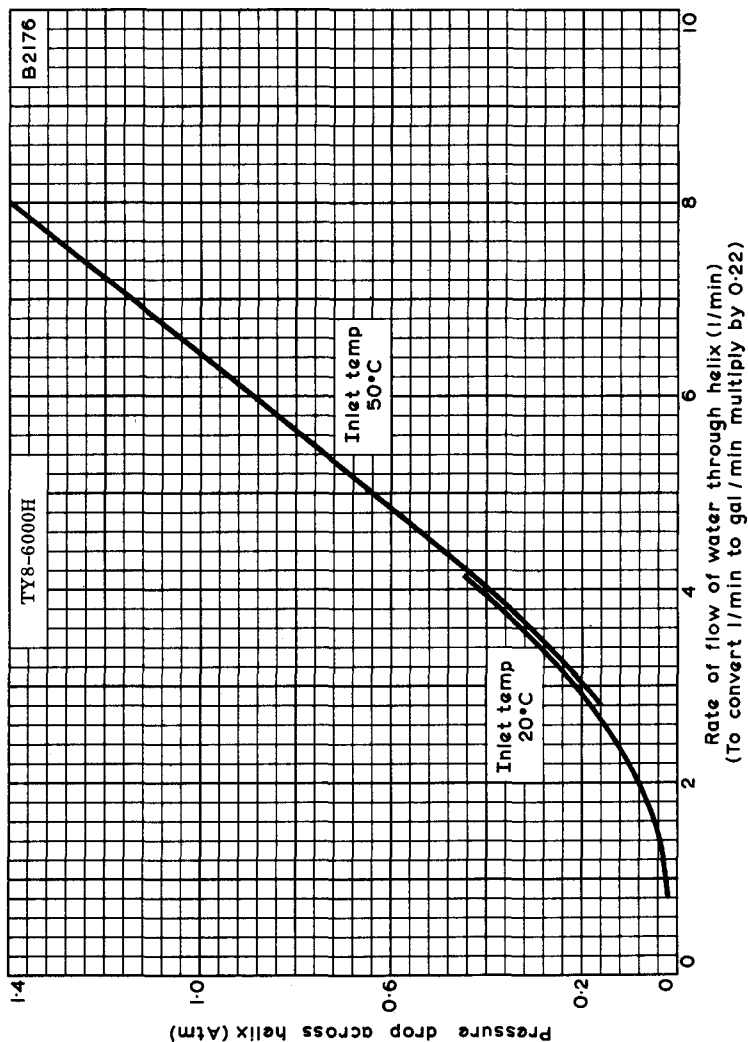


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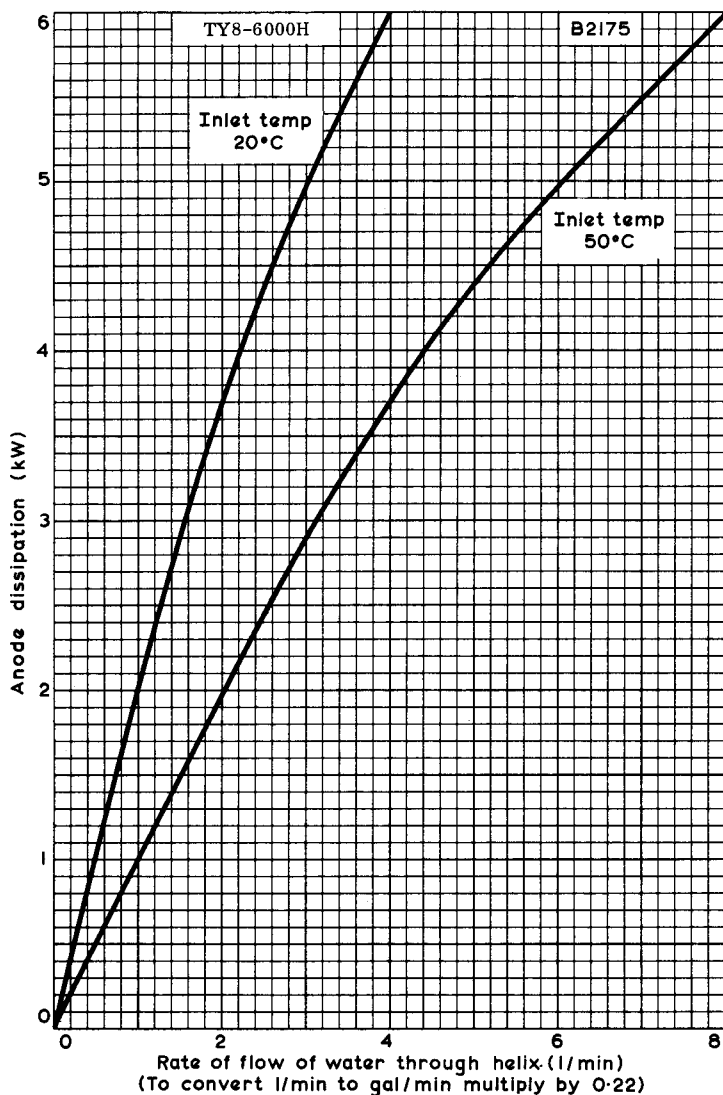
TY8-6000A
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CONSTANT CURRENT CHARACTERISTICS



PRESSURE DROP ACROSS HELIX PLOTTED AGAINST RATE OF FLOW OF WATER THROUGH HELIX FOR INLET TEMPERATURES OF 20 AND 50°C.



ANODE DISSIPATION PLOTTED AGAINST MINIMUM RATE OF FLOW OF WATER THROUGH HELIX FOR INLET TEMPERATURES OF 20 AND 50°C.

