Ferranti

KLYSTRON

A water-cooled two resonator low noise rugged Klystron Power Amplifier with a gain of 10dB intended for C.W. operation. It is designed to be driven by an oscillator type SZ22, under which condition the power output will be in the range 150-200 W. The valve has rugged tuners with a ±20 Mc/s. tuning range which is intended to be used for tuning the cavities to match any SZ22.

PHYSICAL DETAILS.

Max. Overall Length	7·25″ (184·5 mm.).
Max. Overall Width	4·314″ (109·5 mm.).
For other dimensions see outline drawing on Page 3.
Output Waveguide	⎰ WG16 coupling to
Input Waveguide	⎱ I.S.S. choke flanges
Water Connections	⅛″ B.S.P. Unions.

HEATER.

Heater Power	20 to 27 Watts.
Heater Resistance at 23·5 watts. ...	2·35 to 2·65 Ohms.
Cold Heater Resistance ...	0·2 Ohms.
Max. switch-on surge current ...	9 Amps.

RATINGS.

Max. Beam Voltage	10·0 kV.
Max. Beam Current	260 mA.
Max. Focus Voltage	50 volts.

FREQUENCY.

†Operating Frequency	9500 Mc/s.
Tuning Range	±20 Mc/s.

WATER COOLING.

‡Minimum Water flow at 20°C....	1·0 Litre/min.

TYPICAL OPERATION AND CHARACTERISTICS.

Beam Voltage	8		kV.
Beam Current	150		mA.
Focus Voltage	–25		volts.
Efficiency	17		%
R.F. Gain ... High Level	10		dB.
Low level ...	14		dB.
Input Power	15	25	watts.
§Output Power	175	200	watts.

NOTES ON OPERATION.

1. It is recommended that a pressure type water flow relay should be fitted in the drain pipe, in order to break the H.T. supply in the event of cooling water supply failure, otherwise the beam will rapidly puncture the collector if such a failure occurs.

2. Care should be taken not to exceed 2:1 V.S.W.R. in the output circuit, otherwise the output window may puncture.

3. To avoid internal damage to the cathode or focus electrode in the event of flashover when the valve is first run, the focus electrode to cathode potential should be limited in the event of breakdown to less than 500 volts. This can be readily achieved by series connected neon discharge tubes across the focus electrode supply.

*Over the operating heater power range the heater resistance R series with the heater power W according to the law R∝ √W.

†Valves can be supplied tuned to any "X" band frequency by arrangement.
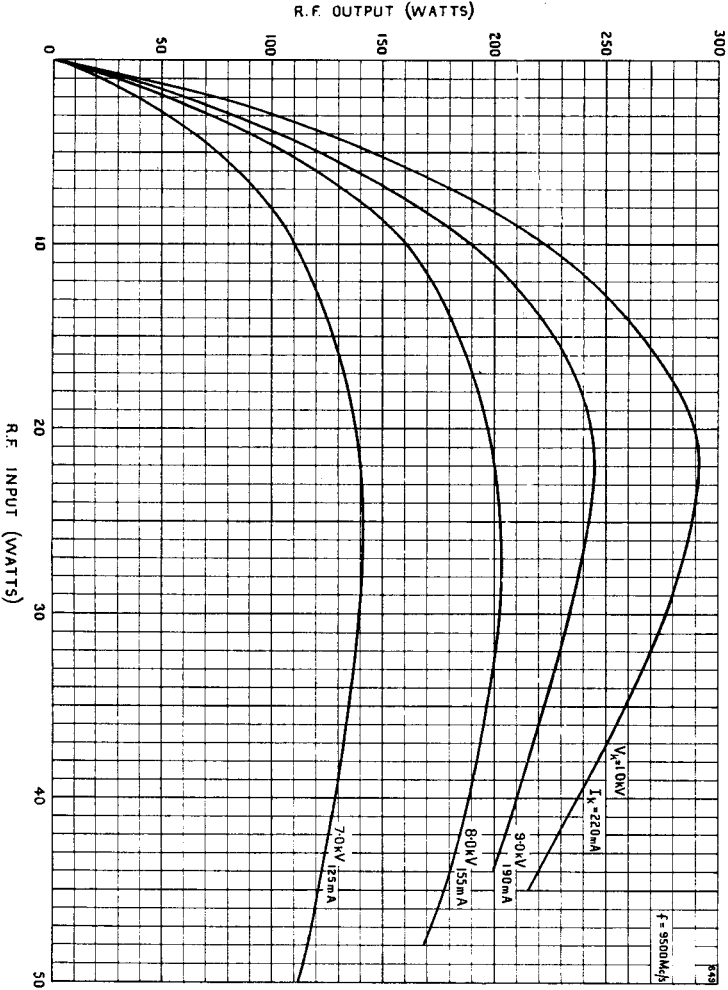
‡Water input must be to collector end union.

§At 9500 Mc/s.
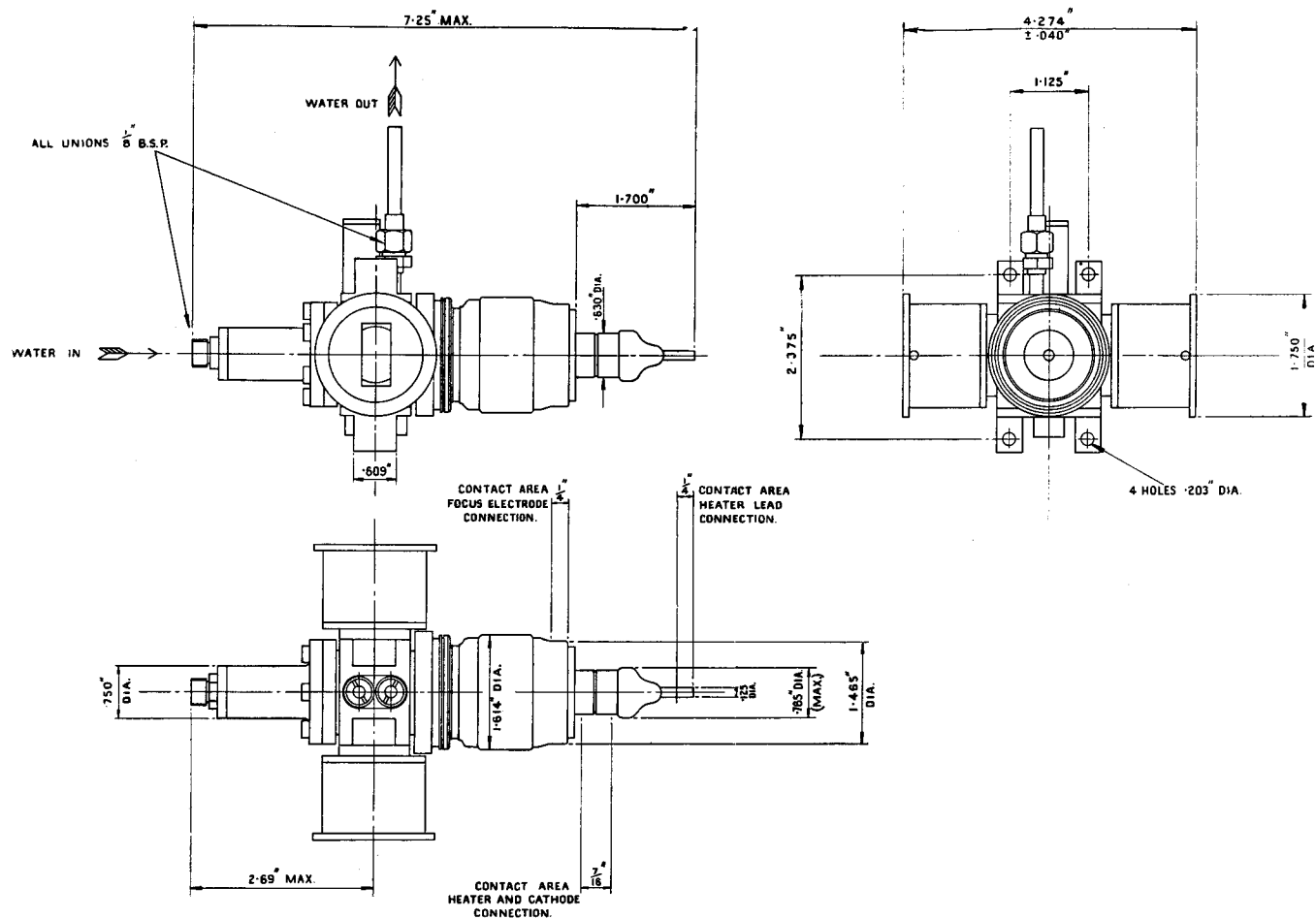　　Bandwidth: to 3 dB points—18·5 Mc/s.
　　　　　　　 to 1 dB points—10　Mc/s.
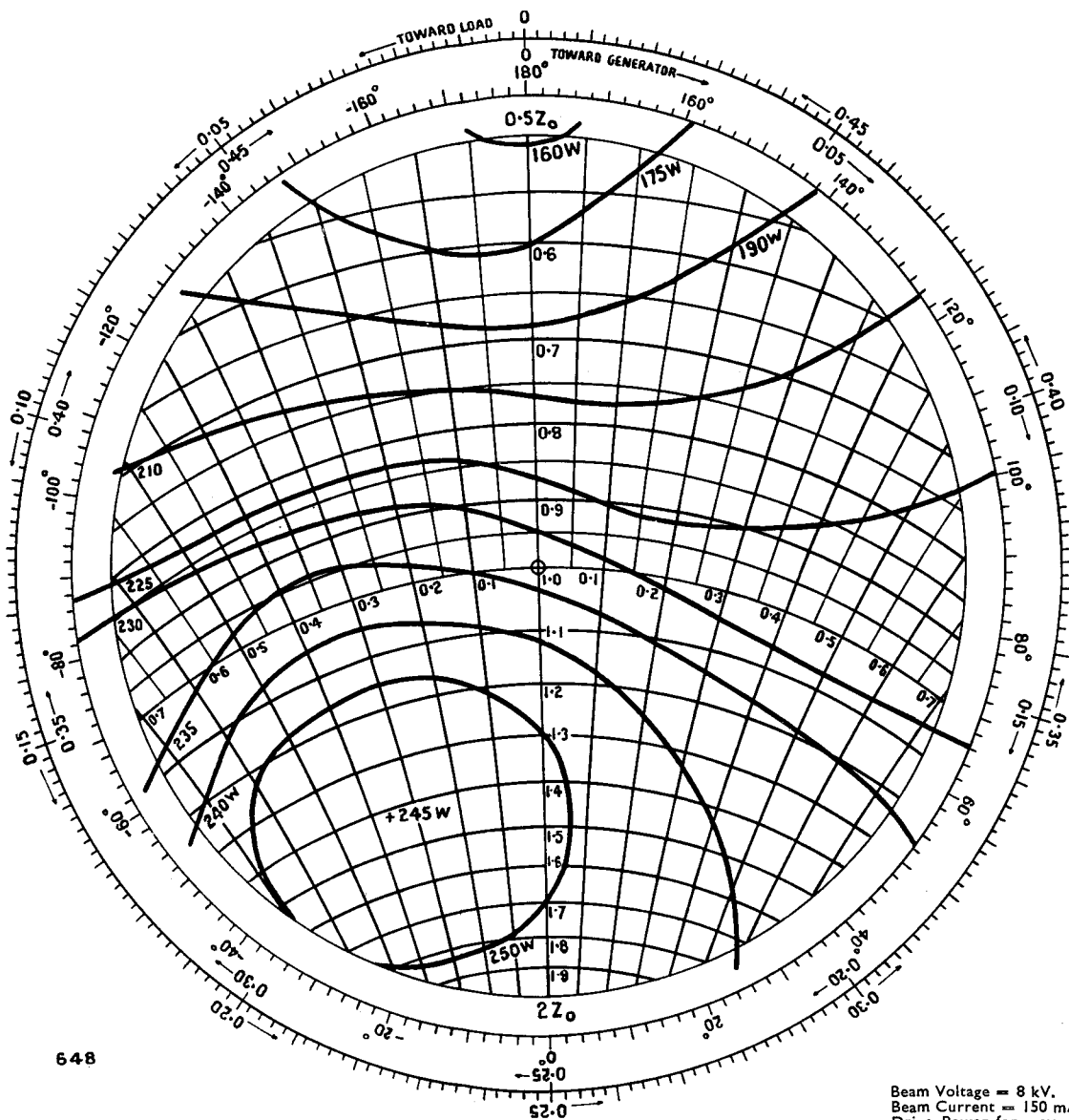
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TYPICAL RF INPUT/OUTPUT CHARACTERISTICS.

R.F. OUTPUT (WATTS)

R.F. INPUT (WATTS)

7·0kV 125mA

8·0kV 155mA

9·0kV 190mA

$V_A = 10kV$

$I_k = 220mA$

f = 9500Mc/s

7·25" MAX.

WATER OUT

ALL UNIONS $\frac{1}{8}$" B.S.P.

1·700"

·630" DIA.

WATER IN

·609"

4·274" ±·040"

1·125"

2·375"

1·750" DIA

4 HOLES ·203" DIA.

CONTACT AREA
FOCUS ELECTRODE
CONNECTION.

CONTACT AREA
HEATER LEAD
CONNECTION.

·750" DIA.

1·614" DIA.

·125 DIA.

·765" DIA.
(MAX.)

1·465" DIA.

2·69" MAX.

CONTACT AREA
HEATER AND CATHODE
CONNECTION.

$\frac{1}{4}$"

$\frac{1}{4}$"

$\frac{7}{16}$"

All dimensions
shown are in
inches

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RIEKE DIAGRAM

TOWARD LOAD
0
0 TOWARD GENERATOR
180°

0.5Z₀ → $0.5Z_0$

160W
175W
190W
210
225
230
235
240W
+245W
250W

0·6
0·7
0·8
0·9
1·0
1·1
1·2
1·3
1·4
1·5
1·6
1·7
1·8
1·9

0·1 0·2 0·3 0·4 0·5 0·6 0·7 0·8

2Z₀ → $2Z_0$

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Beam Voltage = 8 kV.
Beam Current = 150 mA.
Drive Power for max. power output in
    matched conditions.
180° corresponds to the plane of the out-
    put flange.