

STC

VALVES

Water-Cooled Industrial Triode with Integral Water Jacket

Code: 3R/280E

The 3R/280E is designed primarily for induction heating applications. Design features give a high mutual conductance resulting in high efficiency with the low grid dissipation and large safety factor which are desirable when the valve is operated under variable-load conditions.

CATHODE

Thoriated tungsten filament

Filament voltage 8 ($\pm 5\%$) V

Filament current, nominal (Note 1) 300 A

Maximum usable emission 60 A

NOTE 1.—It is recommended that some resistance or reactance be introduced into the filament supply to limit the surge peak current to about two and a half times the normal r.m.s. working value. This impedance may be short-circuited as soon as the surge has decayed.

CHARACTERISTICS

Amplification factor 24

Mutual conductance 75 mA/V

DIRECT INTERELECTRODE CAPACITANCES

Grid to anode 50 pF

Grid to filament 110 pF

Anode to filament 2 pF

MECHANICAL DATA

Dimensions } As shown in Figure 2

Connection detail }

Mounting position Vertical, anode downwards

Filament and grid connector rings are available separately under the following codes:

CN-2A Filament connector, smaller

CN-2B Filament connector, larger

CN-2C Grid connector

May 1967

3R/280E—1

Standard Telephones and Cables Limited

Valve Division, Brixham Road, Paignton, Devon

Telephone: Paignton 50762 Telex: 4230

London Sales Office, Telephone: Footscray 3333 Telex: 21836

C O M P O N E N T S G R O U P

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COOLING REQUIREMENTS

The anode must be cooled by an adequate water flow through the integral water jacket. It is important to ensure that the water inlet and outlet connections to the water jacket are correct.

Forced-air-cooling of the grid and filament seals is required to limit their temperature to below the maximum permissible value of 180°C: an air flow of 50 ft³/min (1.42 m³/min) directed vertically downwards on to the seals from a 4-inch (10cm) diameter orifice is sufficient for normal operation.

MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS**CLASS C. INDUSTRIAL HEATING OSCILLATOR****Maximum Ratings**

Maximum direct anode voltage (peak value of direct voltage plus ripple)	13	kV
Maximum direct anode current	10	A
Maximum direct anode dissipation (continuous)	30	kW
Maximum direct grid dissipation (continuous)	1	kW
Maximum negative grid bias	1.5	kV
Maximum frequency for above ratings	10	MHz

Typical Operating Conditions

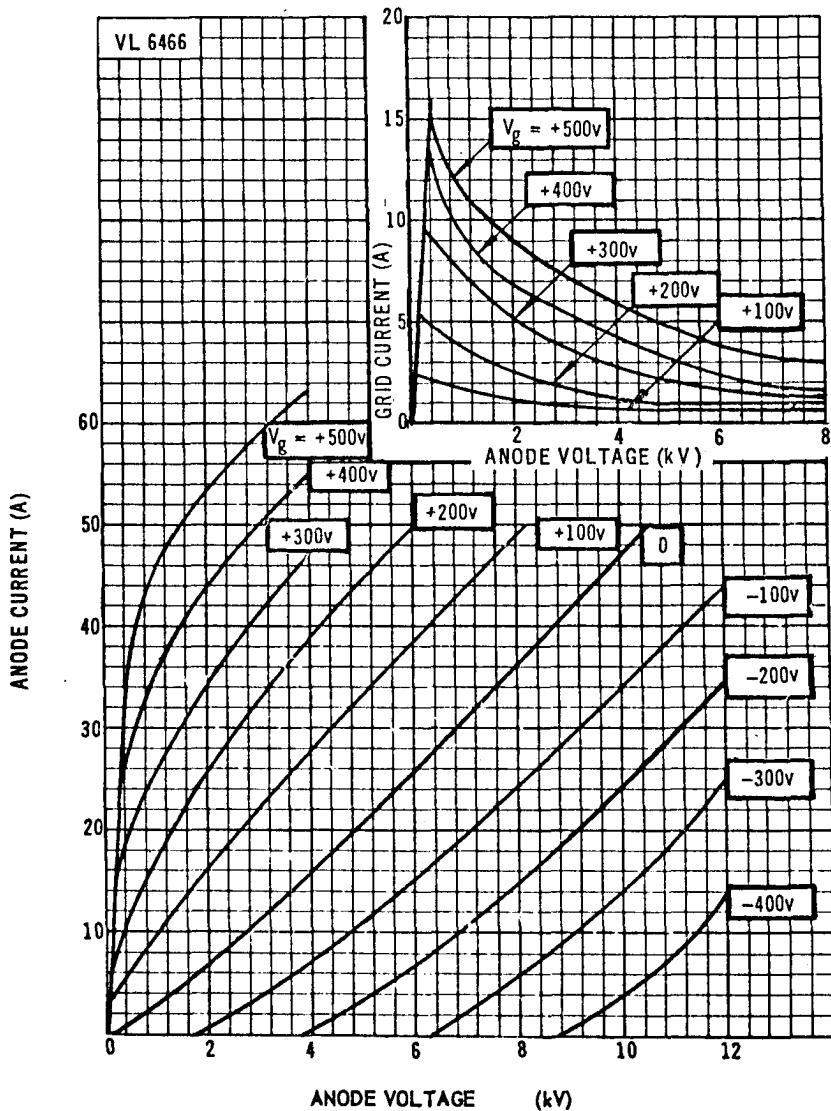
Direct anode voltage	8.5	10	12	kV
Direct grid voltage	-610	-670	-760	V
Direct anode current	10	10	10	A
Peak r.f. grid voltage	1 060	1 120	1 210	V
Direct grid current (Note 2)	1.4	1.37	1.31	A
Grid resistor	435	490	575	Ω
Grid dissipation (Note 2)	600	600	600	W
Anode dissipation	24	26	29	kW
Power input	85	100	120	kW
Power output (oscillator)	61	74	91	kW
Power into load at 85% transfer efficiency	52	63	77.5	kW

NOTE 2.—Subject to wide variation dependent upon the impedance of the load circuit.

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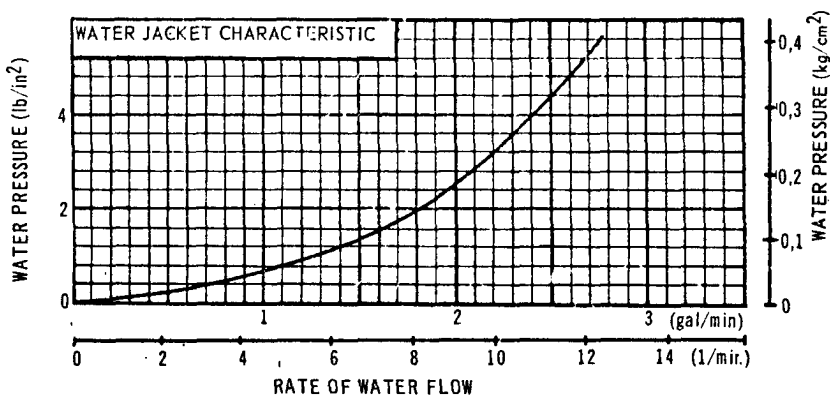
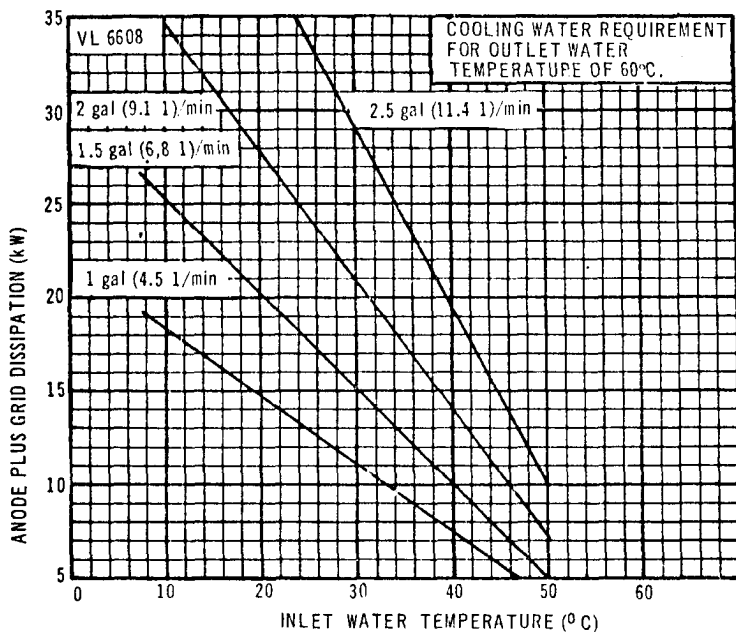
Fig. 1.—Anode Current and Grid Current versus Anode Voltage.



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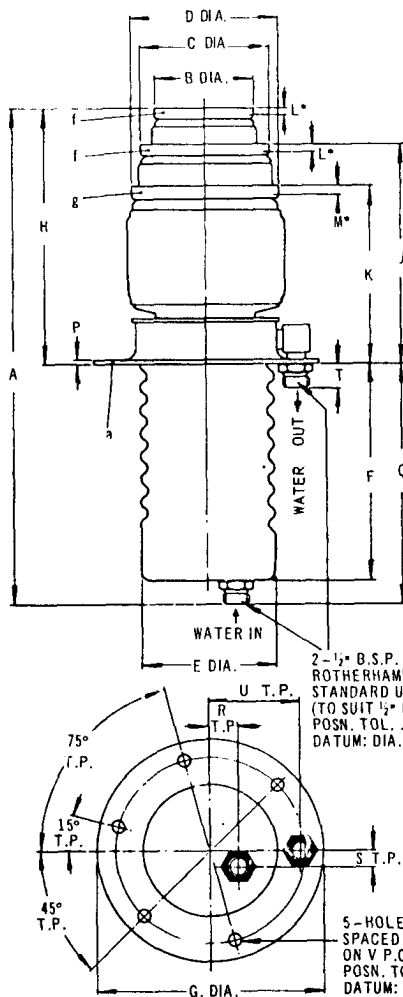
Fig. 2.—Cooling Characteristics



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Fig. 3.—3R/280E Outline



DIM.	MILLIMETRES	INCHES
A	410 MAX.	16.125 MAX.
B	77.85 ± 0.25	3.065 ± 0.010
C	100.08 ± 0.25	3.940 ± 0.010
D	114.83 ± 0.25	4.521 ± 0.010
E	107 MAX.	4.200 MAX.
F	171.5 ± 1.6	6.750 ± 0.062
G	177.80 ± 0.8	7.000 ± 0.030
H	206.4 ± 10.2	8.125 ± 0.400
J	178.6 ± 5.6	7.031 ± 0.220
K	145.3 ± 3.2	5.720 ± 0.125
L	4.8 MIN.	0.187 MIN.
M	7.9 MAX.	0.313 MAX.
N	6.4 MIN.	0.250 MIN.
P	9.5 MAX.	0.375 MAX.
Q	9.53 ± 0.18	0.375 ± 0.007
R	3.18 ± 0.25	0.125 ± 0.010
S	190.50 ± 2.4	7.500 ± 0.094
T	22.23 T.P.	0.875 T.P.
U	12.70 T.P.	0.500 T.P.
V	19.05 ± 0.3	0.750 ± 0.030
	72.12 T.P.	2.840 T.P.
	146.05 ± T.P.	5.750 T.P.

TOLERANCES TO DS 308. 1964

BASIC DIMENSIONS ARE INCHES

* DENOTES: CONTACT LENGTH