

## QUICK REFERENCE DATA

External anode triodes of ceramic-metal construction, intended for use as industrial oscillators.

The YD1150 is forced-air cooled.

The YD1151 is water-cooled by means of a separate jacket.

The YD1152 has an integral helical water cooler.

|                                             |      |       |     |
|---------------------------------------------|------|-------|-----|
| f                                           | 160  | 27.12 | MHz |
| P <sub>out</sub> (less P <sub>drive</sub> ) | 3.55 | 4.57  | kW  |
| f max.                                      | 160  |       | MHz |
| V <sub>a</sub> max.                         | 7.2  |       | kV  |
| p <sub>a</sub> max.                         | 2.5  |       | kW  |

Unless otherwise shown, data is applicable to all types

To be read in conjunction with

## GENERAL OPERATIONAL RECOMMENDATIONS - TRANSMITTING VALVES

### INDUSTRIAL OSCILLATOR, CLASS 'C'

#### OPERATING CONDITIONS

|                                             |      |       |       |            |
|---------------------------------------------|------|-------|-------|------------|
| f                                           | 160  | 27.12 | 27.12 | MHz        |
| P <sub>out</sub>                            | 3.9  | 4.9   | 4.0   | kW         |
| P <sub>out</sub> (less P <sub>drive</sub> ) | 3.55 | 4.57  | 3.75  | kW         |
| P <sub>load</sub>                           | 3.1  | 3.7   | 3.3   | kW         |
| Duty factor                                 | 1.0  | 1.0   | 1.0   |            |
| $\eta_a$                                    | 78   | 82    | 80    | %          |
| V <sub>a</sub>                              | 5.0  | 6.0   | 5.0   | kV         |
| I <sub>a</sub>                              | 1.0  | 1.0   | 1.0   | A          |
| -V <sub>g</sub>                             | 520  | 625   | 520   | V          |
| I <sub>g</sub>                              | 260  | 250   | 260   | mA         |
| R <sub>g-f</sub>                            | 2.0  | 2.5   | 2.0   | k $\Omega$ |
| Feedback ratio $v_{in(pk)}/v_{a(pk)}$       | 0.17 | 0.17  | 0.17  |            |
| P <sub>drive</sub>                          | 350  | 330   | 250   | W          |
| p <sub>a</sub>                              | 1.1  | 1.1   | 1.0   | kW         |
| p <sub>g</sub>                              | 120  | 110   | 100   | W          |
| V <sub>f</sub>                              | 6.0  | 6.3   | 6.3   | V          |

# **RATINGS (ABSOLUTE MAXIMUM SYSTEM)**

|                    |     |     |            |
|--------------------|-----|-----|------------|
| $f$ max.           | 85  | 160 | MHz        |
| $V_a$ max.         | 7.2 | 6.0 | kV         |
| $-V_g$ max.        | 1.0 | 1.0 | kV         |
| $I_g$ max. on load | 280 | 280 | mA         |
| off load           | 400 | 400 | mA         |
| $I_k$ max.         | 1.4 | 1.4 | A          |
| $i_{k(pk)}$ max.   | 7.5 | 7.5 | A          |
| $P_{in}$ max.      | 6.5 | 6.0 | kW         |
| $p_a$ max.         | 2.5 | 2.5 | kW         |
| $p_g$ max.         | 150 | 150 | W          |
| $R_{g-f}$ max.     | 20  | 20  | k $\Omega$ |

## **CATHODE**

Directly heated, thoriated tungsten

|                          |     |   |
|--------------------------|-----|---|
| $V_f$ ( $\leq 120$ MHz)  | 6.3 | V |
| ( $> 120$ MHz)           | 6.0 | V |
| $I_f$ (measured at 6.3V) | 33  | A |

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

## **CAPACITANCES**

|           |     |     |
|-----------|-----|-----|
| $c_{a-g}$ | 14  | pF  |
| $c_{a-f}$ | 400 | mpF |
| $c_{g-f}$ | 17  | pF  |

## **CHARACTERISTICS (measured at $V_a = 2.0$ kV, $I_a = 0.5$ A)**

|       |    |      |
|-------|----|------|
| $g_m$ | 10 | mA/V |
| $\mu$ | 20 |      |

**MOUNTING POSITION** - YD1150, YD1152  
                              - YD1151

Vertical, anode up or down  
Vertical, anode down

## **COOLING**

Maximum temperature of ceramic-metal seals 220 °C

YD1150 - Forced-air cooled. See curves on page C4

YD1151 - Anode water cooled using jacket type K713

Seals - low velocity air flow may be required

See curves on page C5

YD1152 - Anode water cooled with integral helical cooler

Seals - low velocity air flow may be required

See curves on page C6

# V.H.F. INDUSTRIAL TRIODES

YD1150  
YD1151  
YD1152

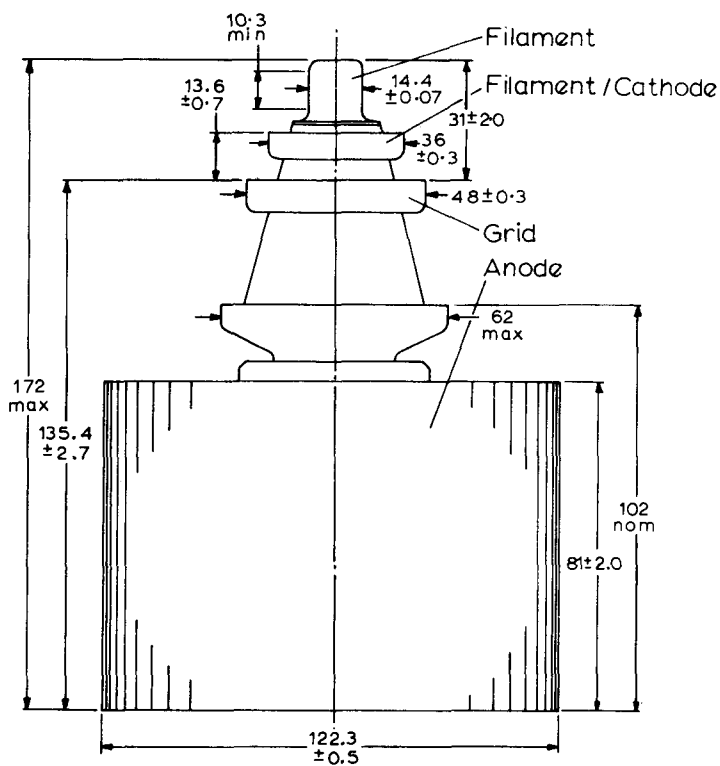
## PHYSICAL DATA

|                 | YD1150 | YD1151 | YD1152 |    |
|-----------------|--------|--------|--------|----|
| Weight of valve | 6.6    | 1.4    | 1.9    | lb |
|                 | 3.0    | 0.65   | 0.85   | kg |

## ACCESSORIES

|                              |       |
|------------------------------|-------|
| Filament clip                | 40688 |
| Filament/cathode clip        | 40689 |
| Grid connector (f < 30MHz)   | 40686 |
| Insulating pedestal (YD1150) | 40630 |
| Water jacket (YD1151)        | K713  |



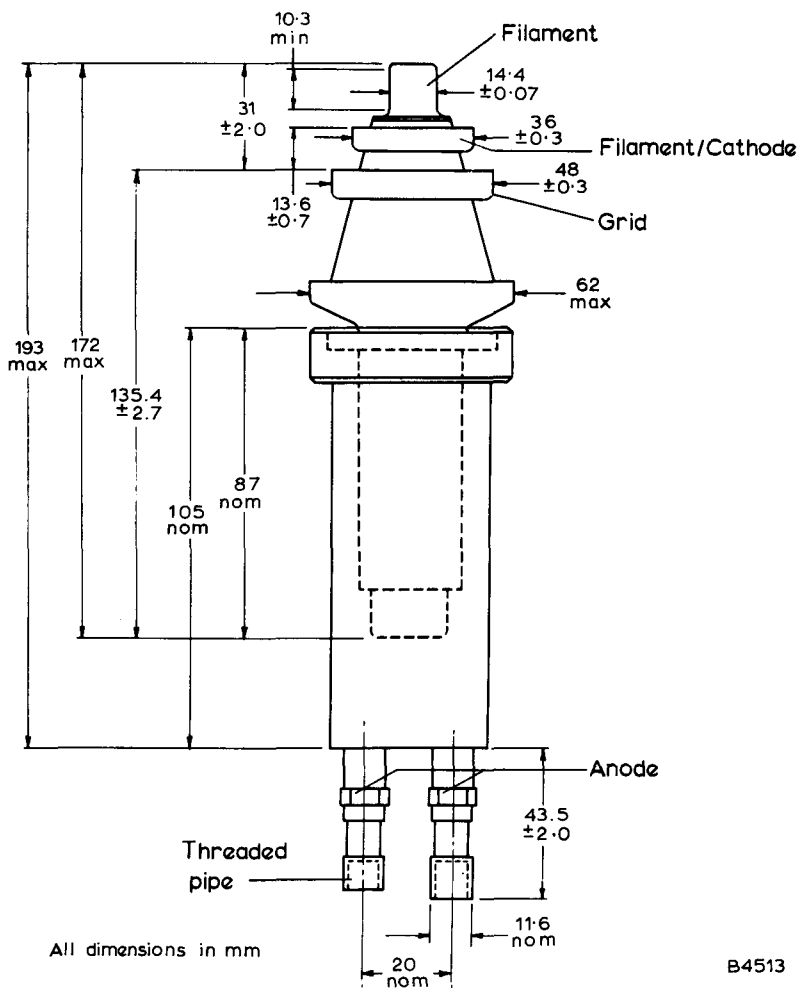


All dimensions in mm

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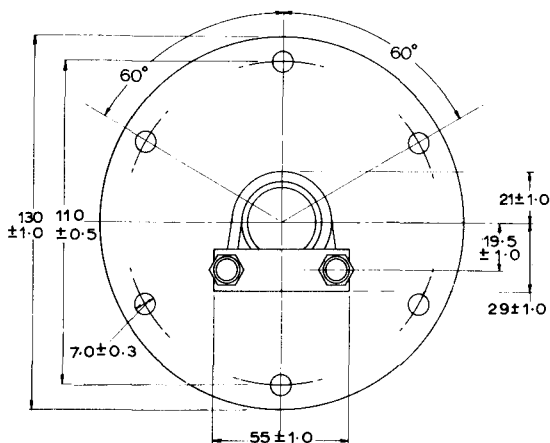
OUTLINE DRAWING OF YD1150

OUTLINE DRAWING OF YD1151 MOUNTED IN WATER JACKET K713

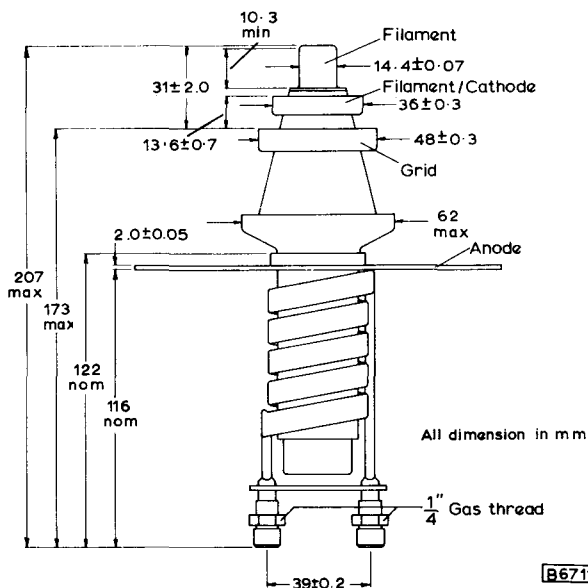


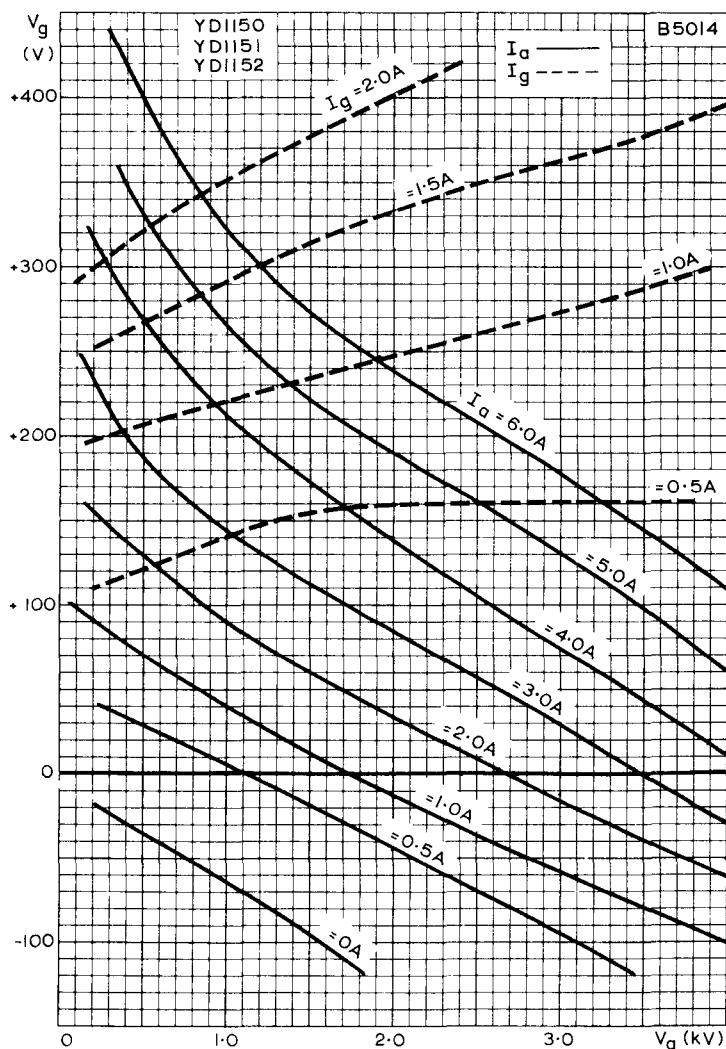
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# OUTLINE DRAWING OF YD1152

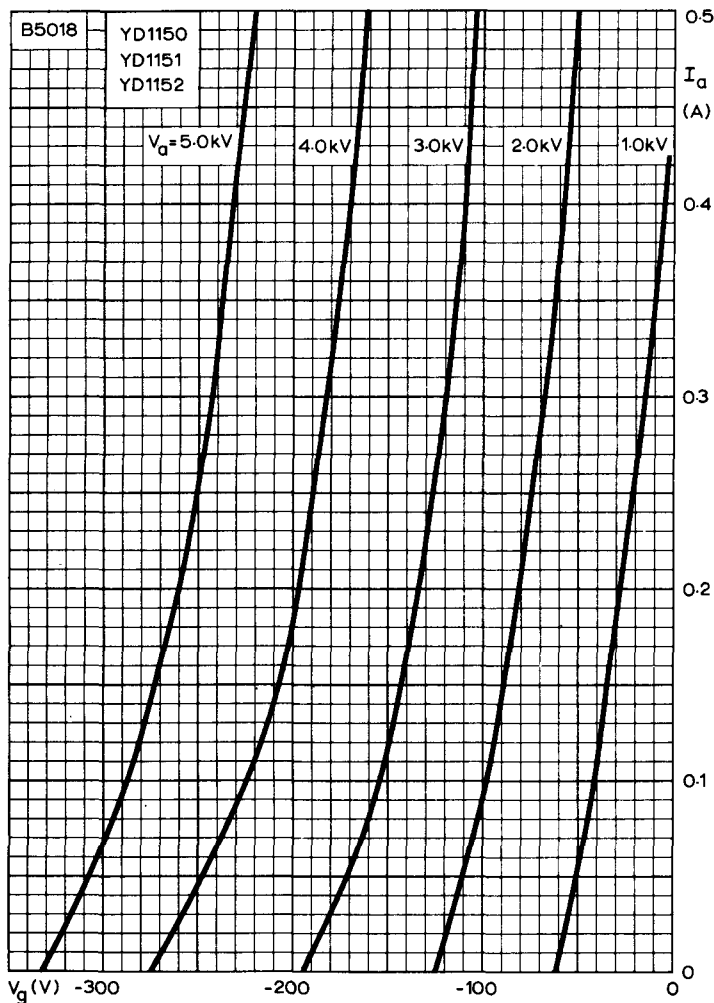


The use of wing nuts should be avoided

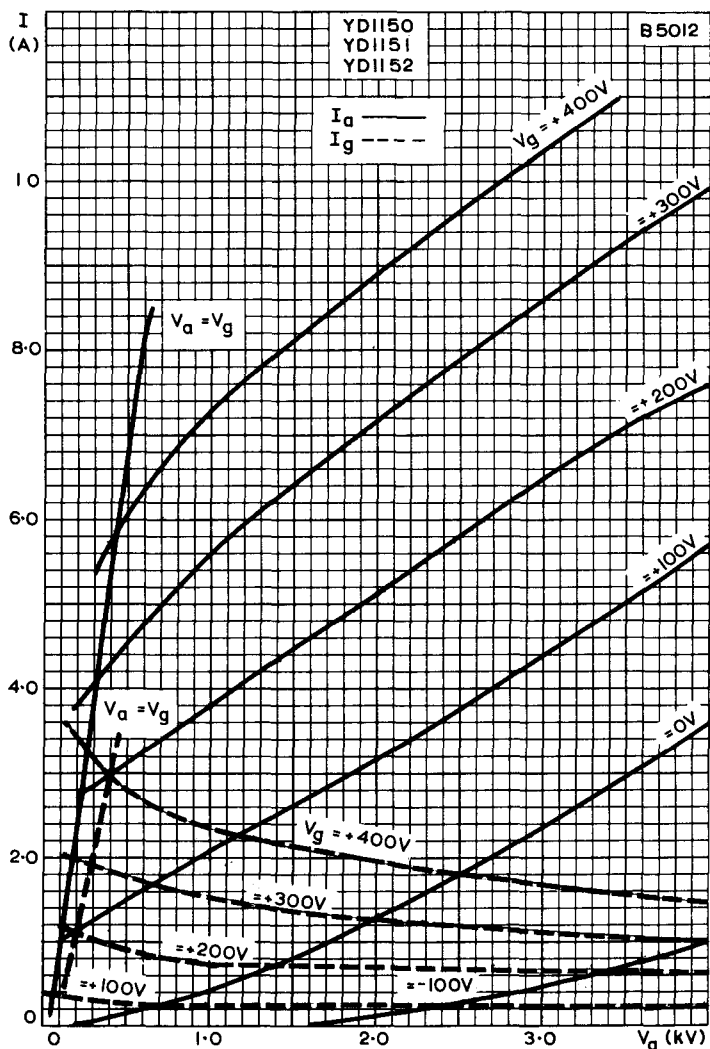




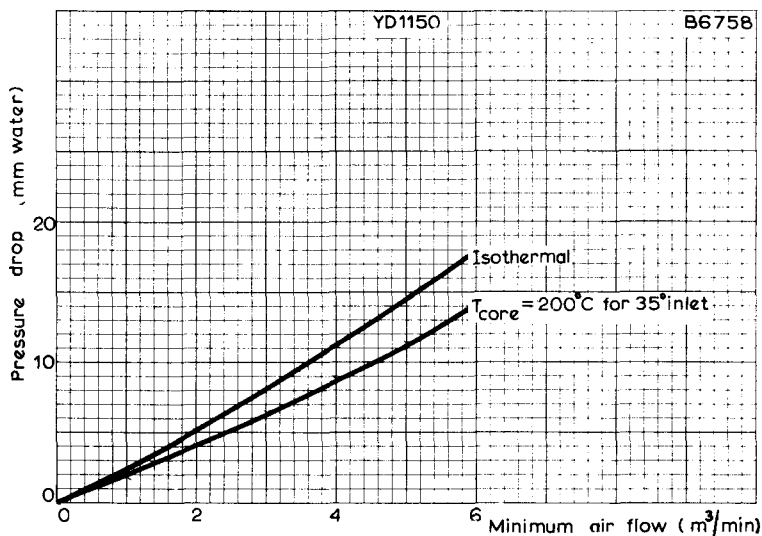
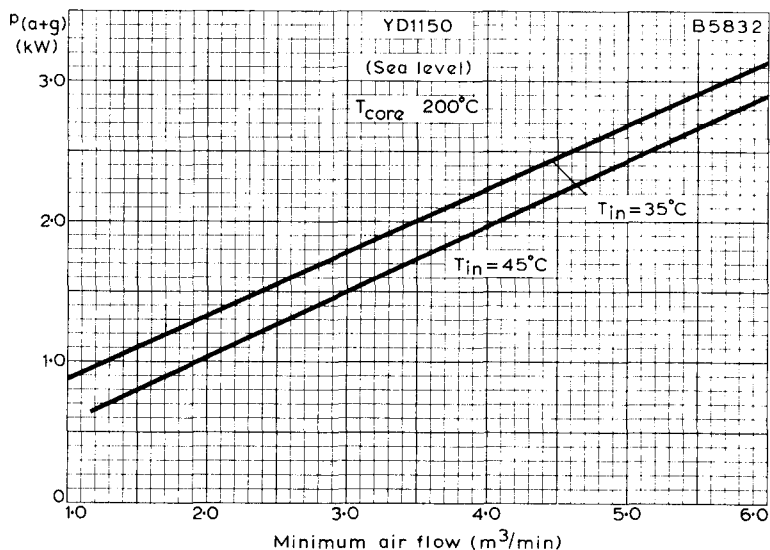
CONSTANT CURRENT CHARACTERISTICS



ANODE CURRENT PLOTTED AGAINST GRID VOLTAGE WITH ANODE VOLTAGE AS PARAMETER

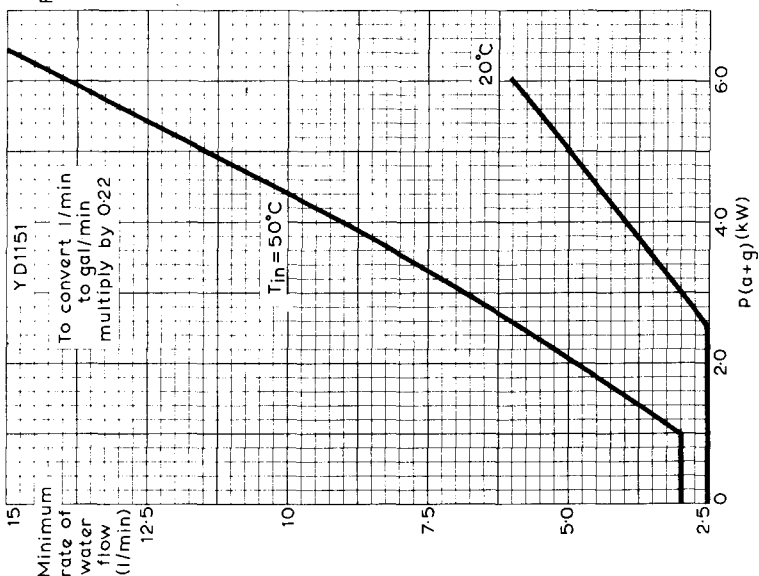
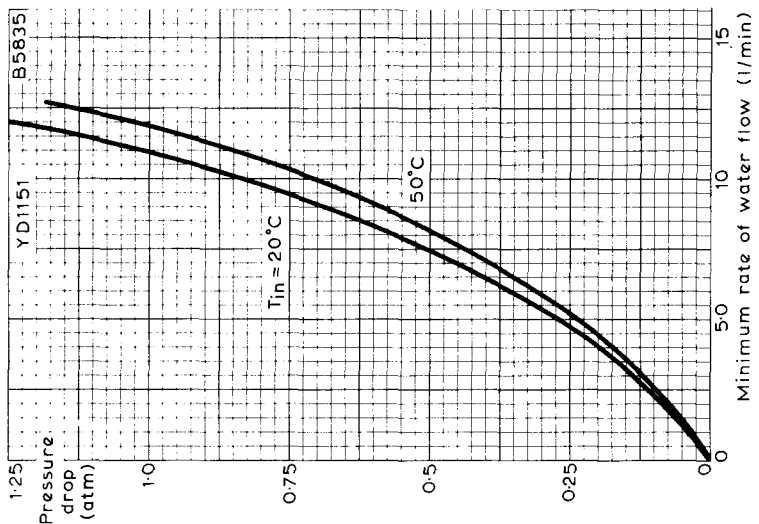


ANODE AND GRID CURRENTS PLOTTED AGAINST ANODE VOLTAGE WITH  
GRID VOLTAGE AS PARAMETER



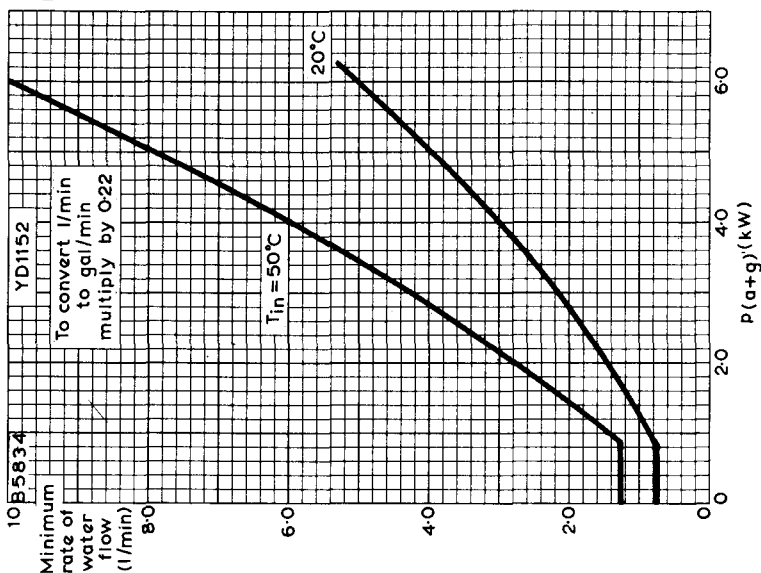
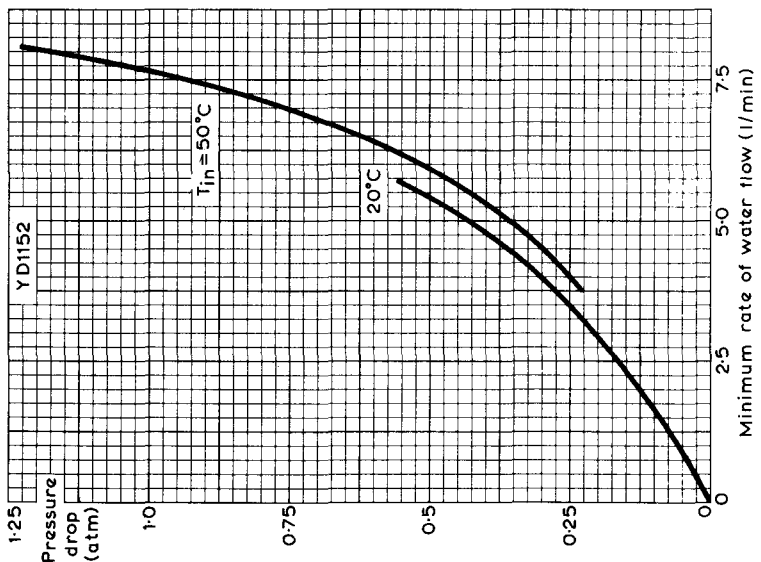
MINIMUM COOLING REQUIREMENTS AT SEA LEVEL WITH AIR INLET TEMPERATURES OF 35 AND 45°C AND A CORE TEMPERATURE OF 200°C

PRESSURE DROP PLOTTED AGAINST MINIMUM AIR FLOW FOR AN ISOTHERMAL CONDITION AND FOR A RISE IN CORE TEMPERATURE OVER INCOMING AIR OF 165°C



MINIMUM RATE OF WATER FLOW PLOTTED AGAINST ANODE AND GRID  
DISSIPATION FOR  $T_{in} = 20$  AND  $50^{\circ}\text{C}$

PRESSURE DROP PLOTTED AGAINST MINIMUM RATE OF WATER FLOW  
FOR  $T_{in} = 20$  AND  $50^{\circ}\text{C}$



MINIMUM RATE OF WATER FLOW PLOTTED AGAINST ANODE AND GRID DISSIPATION FOR  $T_{in} = 20$  AND  $50^{\circ}\text{C}$   
 PRESSURE DROP PLOTTED AGAINST MINIMUM RATE OF WATER FLOW FOR  $T_{in} = 20$  AND  $50^{\circ}\text{C}$