

May 15, 1960

HIGH PRESSURE ION GAUGE TYPE 7676

The 7676 is a three electrode ionization type vacuum gauge designed to measure gas pressures in the range of 1×10^{-5} to 5×10^{-1} mm Hg. The operating filament is a thorium coated iridium wire. Filament burnout will not occur if the tube is accidentally let down to air during operation. The ion collector is a flat plate parallel to the operating filament. The other electrode, which is used as an electron emitter during outgassing and as an electron collector during operation, is a tungsten ribbon parallel to the ion collector on the opposite side of the operating filament.

ELECTRICAL:

Outgassing:

Cathode	Tungsten Ribbon Filament
Filament:	
Voltage (ac or dc) approx.	5 Volts
Current	13 Amperes

Operating:

Cathode	Thorium Coated Iridium Filament
Filament:	
Voltage	2.0 Volts
Current at 1×10^{-5} mm Hg.	2.25 Amperes

MECHANICAL:

Type of Cooling.	Air
Tubulation:	
Glass	Nonex, Code 7720
Size	$\frac{1}{2}$ " Diameter
Mounting Position	Any

MAXIMUM RATINGS:

Absolute Maximum Values

Outgassing: (DC voltages are with respect to Outgas-Filament-Electron-Collector Electrode)

Ion collector Voltage	500 max.	Volts
Ion Collector DC Power Input.	15 max.	Watts
Filament Voltage (ac or dc)	5.5 max.	Volts
Ambient Temperature	100 max.	°C

Operating: (DC voltages are with respect to Operate Filament)

Ion Collector Voltage	+65 max.	Volts
Outgas-Filament-Electron-Collector		
Electrode Voltage	-65 max.	Volts
Filament Voltage (ac or dc)	2.0 max.	Volts
Ambient Temperature	100 max.	°C
Gas Pressure	1 max.	mm Hg

OUTGASSING CONDITIONS

Ion Collector Voltage with

respect to Outgas-Filament-Electron-

Collector Electrode +300 Volts

Operate-Filament* Connected to Outgas-Filament-Electron-Collector-Electrode

Outgas-Filament:

Voltage (ac or dc)	5.0	Volts
Current	13	Amperes

OPERATING CONDITIONS

Ion Collector Voltage with respect

to Operate-Filament -60 Volts

Outgas-Filament-Electron-Collector Electrode

Voltage with respect to Operate Filament . . . +60 Volts

Operate-Filament Conditions for

50 Microamperes Electron Current:

Voltage (ac or dc)		
At 1×10^{-4} mm Hg.	1.1	Volts
At 5×10^{-1} mm Hg.	1.8	Volts

Electron Current:

From 1×10^{-4} to 1×10^{-2} mm Hg.	1	Ma.
From 1×10^{-3} to 1×10^{-1} mm Hg.	50	μ A.
From 1×10^{-2} to Saturation.	10	μ A.

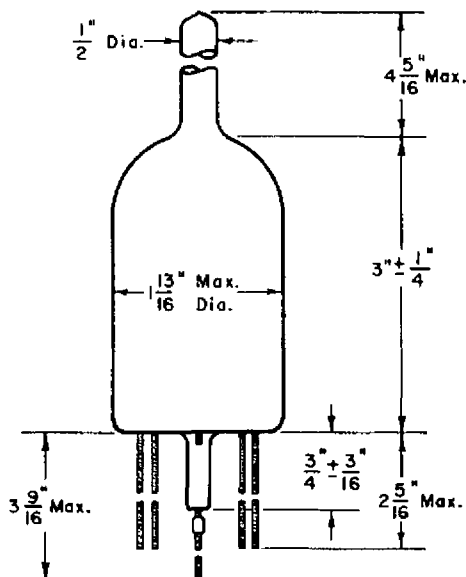
Sensitivity with Nitrogen

$S = (i^+ / i^-) \times (1/P)$ 0.4 (mm Hg) $^{-1}$

Pressure Measuring Range with Nitrogen

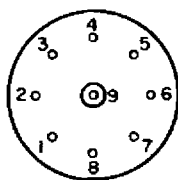
(See Figure 1). 1×10^{-4} to 6×10^{-1} mm Hg

* Voltage must not be applied across operate filament during outgassing.



OUTGASSING (See Note)

Electrode	Lead
Outgas Filament (+)	1 & 3
Outgas Filament (-)	5 & 7
Collector	9
Tie Lead 2 or 6 to one side of outgas Filament.	



OPERATING

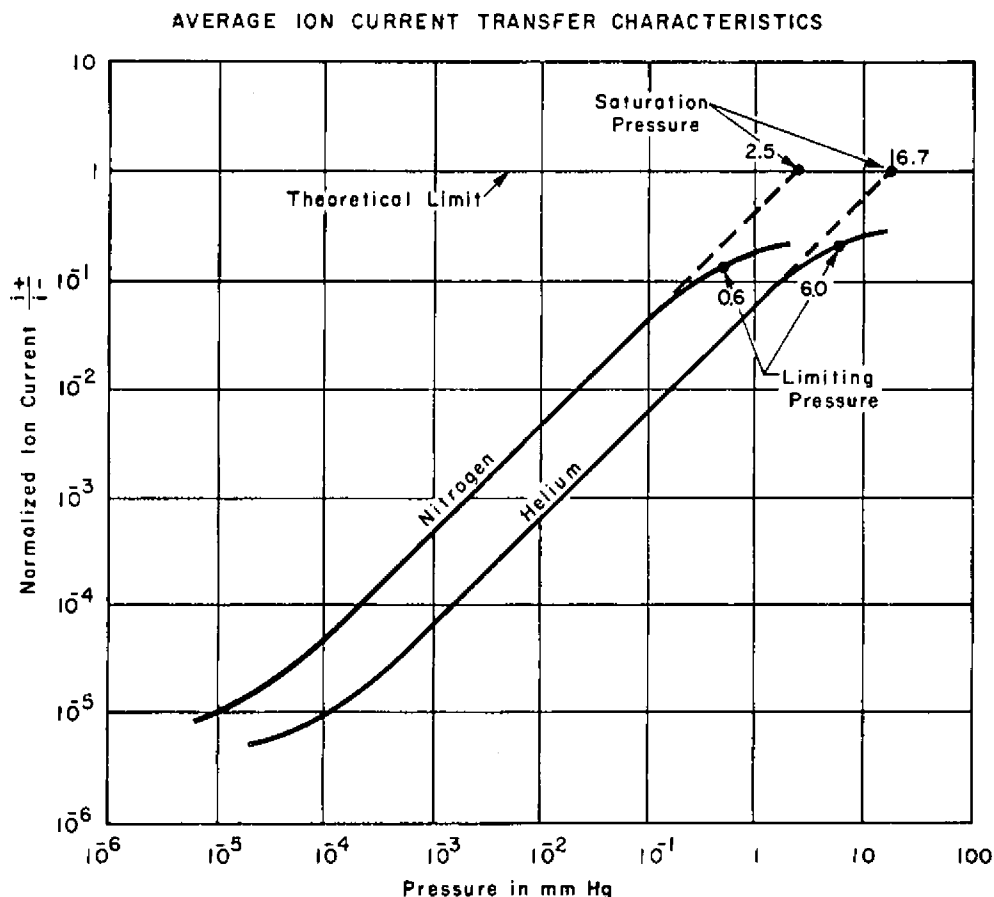
Electrode	Lead
Operate Filament (+)	2
Operate Filament (-)	6
Ion Collector	9
Electron Collector 1, 3, 5 or 7	

(Pins 4 & 8 are short leads.)

Note: Both leads of each terminal of outgas filament must be used during outgassing to prevent damage to the tube.

Special Devices Section

WESTINGHOUSE ELECTRIC CORPORATION, ELECTRONIC TUBE DIVISION, ELMIRA, NEW YORK



CE-A1572

GAUGE CHARACTERISTICS FOR DIFFERENT GASSES

	N ₂	CO	He	H ₂
Sensitivity in (mmHg) ⁻¹	0.4	0.42	0.06	0.21
Saturation Pressure in mmHg.	2.5	2.6	16.7	4.8
Limiting Pressure in mmHg.	0.6	0.6	6.0	0.6

APPLICATION DATA

The circuitry for operation of the tube consists of suitable 60 V DC. power supplies for each collecting electrode and a variable voltage filament supply. A meter with ranges from 10^{-5} to 10^{-3} ampere is required for measuring electron current and a sensitive microammeter with ranges from 10^{-8} to 10^{-5} amperes is required in the ion collector circuit. The filament power required is 2 volts at 2.5 amperes for operation and 5.5 volts at 13 amperes for outgassing. A circuit incorporating these features is shown in Figure 2. In this circuit, a 300 volt, 100 milliamperes stabilized power supply is used.

For outgassing the full 300 V is used, the outgassing current being set by the outgassing filament temperature. The outgas filament voltage is adjusted by a variable auto-transformer.

During operation, the operating filament is connected to the center of a resistance chain across the power supply. The electron collector and ion collector are connected to potentiometers in the resistance chain, so that the ion collector is approximately 60 volts negative, and the electron collector approximately 60 volts positive with respect to the operate filament. The operate filament supply is controlled by a variable auto-transformer, with a series variable resistance which acts as a fine control.

7676 GAUGE POWER SUPPLY

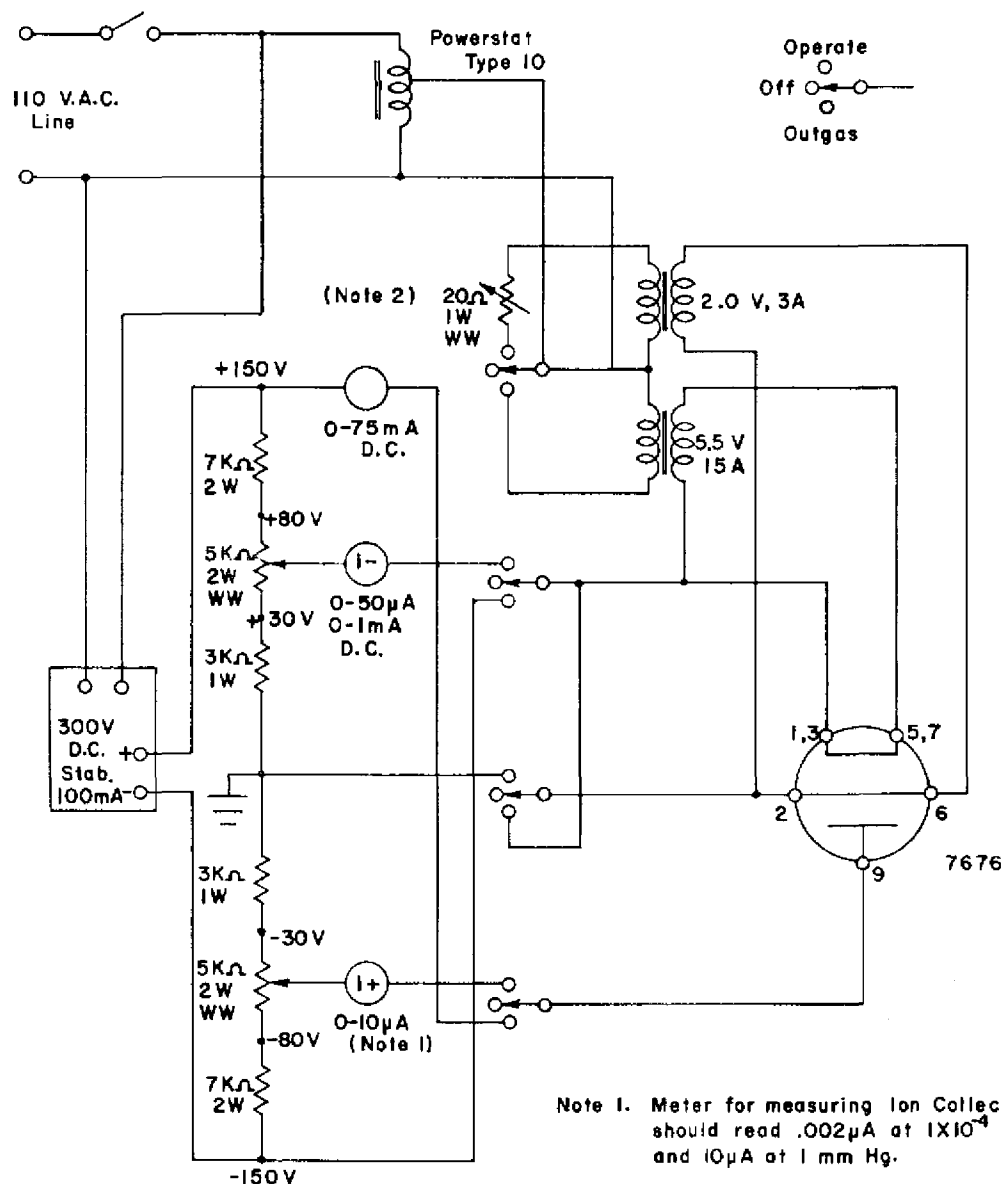
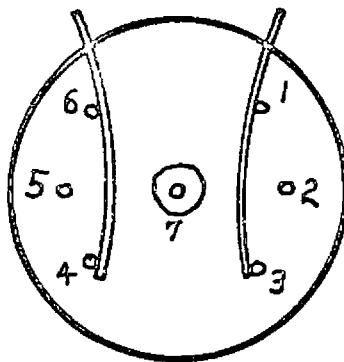


FIGURE 2

CE - B1577

December 7, 1964

NEW TYPE 7676 CONNECTIONS



CONNECTIONS

OUTGASSING	Pin
Outgas Filament + (Note 1)	1&3 (Tied Together)
Outgas Filament - (Note 1)	4&6 (Tied Together)
Collector	7
Operate Filament	Tie Pin 2 or 5 to Pin 1&3 or 4&6

OPERATING	
Operate Filament + ...	2
Operate Filament -	5
Ion Collector	7
Electron Collector	1&3 or 4&6

NOTE

1. Filament tie straps have a 1/8" hole drilled at one end to receive connector screws.