

DESCRIPTION

The Sylvania Omegatron Type SY1301 is a mass spectrometer analyzer tube capable of resolving peaks of interest of simple hydrocarbons and fixed gases in the 2 to 50 mass to charge ratio range. By increasing magnetic field strength resolution is extended through mass 80. Useable in a pressure range from 10^{-5} to 10^{-10} torr, it can be incorporated into nearly any high vacuum system where a glass to glass or metal to glass seal can be made. The bulb is Nonex glass and is supplied with graded seals according to customer specifications. It operates at an ionizing current of only one microamp which minimizes gauge pumping and gas reactions. (See Note 5 for additional technical references.)
Type SY1301A is a calibrated unit, being otherwise identical with its counterpart Type SY1301.

QUICK REFERENCE DATA

**Omegatron
Mass Spectrometer
Small Size
High Sensitivity
Nonex Glass
Gold Plated Pins
Complete Systems
Available**

MECHANICAL DATA

Physical Dimensions	See Outline
Filament Emitter	Tungsten
Envelope	7720 Nonex Glass
Maximum Envelope Bake-Out Temperature	450°C
Base	8-Pin, T-9 with Center Lead ³
Basing	
Pin No. 1—Electron Beam Focusing Electrode	
Pin No. 2—Filament Emitter	
Pin No. 3—Trapping Voltage Cage	
Pin No. 4—RF Electrode	
Pin No. 5—Electron Collector Electrode	
Pin No. 6—Ion Collector Shield (RF Ground)	
Pin No. 7—Trapping Voltage Cage	
Pin No. 8—Filament Emitter	
Center Pin—Ion Collector Electrode	

ELECTRICAL DATA

TYPICAL OPERATION² (M/e 44-2; Pressure Range 10^{-5} to 10^{-10} Torr)

Frequency of Applied RF	169 to 3720 Kc
Amplitude	1.7 to 3.0 v
Focus Electrode Voltage	-70 Vdc
Trapping Voltage ¹	-0.5 to -2.0 Vdc
Electron Collector Voltage	22.5 Vdc
Magnetic Flux Density	5000 Gauss
Electron Beam Current	1.0 μ A
Emitter Voltage Range (Approx.) ⁴	1.05 to 1.25 Vac
Ion Collector Current	10^{-10} to 10^{-15} A

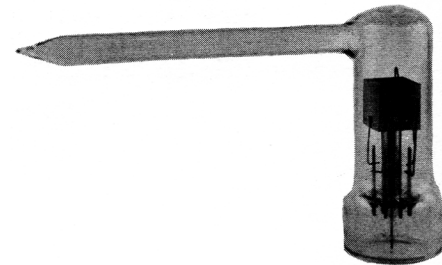
NOTES:

1. With the Omegatron in a properly aligned magnetic field, the trapping voltage is normally -1.0 volt but may be varied in increments of 0.1 volt within the range to obtain maximum sensitivity. For mass 2 trapping voltage is set at 1.9 volts.
2. Resolution can be extended through mass 80 by increasing magnetic field strength. The approximate relationship is

$$\frac{M}{\Delta M} = \frac{edH^2}{2EM}$$

where:

- e = charge of the ion in esu.
- d = distance from ion collector to electron beam in cm.
- H = magnetic flux density in gauss.
- E = high frequency field strength (distance between high frequency electrodes in cm).
- M = mass of the ion in grams.



**SYLVANIA ELECTRIC
PRODUCTS INC.**

**Electronic Components Group
ELECTRONIC TUBE DIVISION
EMPORIUM, PA.**

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File Under

**SPECIAL PURPOSE
ELECTRONIC TUBES**

NOTES: (Continued)

3. Base pins are coated with gold to assure low resistance connection with pin clips.
4. Following alignment of the Omegatron in the magnetic field, the emitter voltage is adjusted within the specified range to produce a beam current of 1.0 μ A.
5. The following technical reference booklets are available from Sylvania upon request: (1) Omegatron Mass Spectrometer and (2) Operational Data—Sylvania Omegatron Type SY1301.

OUTLINE

