

CH1-75A(option 01) Active Hydrogen Maser

◆ *The highest accuracy and short- and long-term stability*

◆ *Autonomous automatic cavity tuning (without the 2nd H-Maser)*

◆ *Frequency stability 7×10^{-16} /day, $2 \cdot 10^{-13}$ /s*



IEC 625 Bus

DESCRIPTION

The CH1-75A (option 01) Active Hydrogen Maser is designed to operate as a high stability, precision spectral pure 5 and 100 MHz signal source and provides time scale signals of 1 s period.

The CH1-75A (option 01) Active Hydrogen Maser provides the highest frequency stability among all industrial frequency standard known today.

The Maser has an autonomous automatic cavity tuning system, which does not require the 2nd analogous Maser.

APPLICATIONS

National time and frequency services, ground control and surveillance points of satellite navigation systems, radiointerferometry with a very long base.

SPECIFICATIONS

Outputs:

5, 100 MHz (sine), 1 ± 0.2 V rms into 50 Ohm

1 Hz (pulse):

Amplitude: > 2.5 V into 50 Ohm

Width: 10-20 μ s

Rise time: < 10 ns

Jitter: < 0.1 ns

Frequency instability, $\sigma_y(2, \tau)$:

1 s $\leq 2 \cdot 10^{-13}$ (in 2 Hz measuring system band)

10 s $\leq 3 \cdot 10^{-14}$

10^2 s $\leq 7 \cdot 10^{-15}$

10^3 s $\leq 2.5 \cdot 10^{-15}$

1 h $\leq 1 \cdot 10^{-15}$

1 day $\leq 7 \cdot 10^{-16}$

Temperature sensitivity: $1.5 \cdot 10^{-15} / ^\circ\text{C}$

Magnetic field sensitivity: $< 1 \cdot 10^{-14} / \text{Gauss}$

Frequency trim range: $1 \cdot 10^{-10}$

Setting resolution: $1 \cdot 10^{-15}$

Phase noise:

Offset from carrier	SSB Phase Noise, dBc/Hz
1 Hz	-110
10 Hz	-130
100 Hz	-140
1 kHz	-150
10 kHz	-150

Harmonic distortion: < 30 dB (for 5 MHz output)

Non-harmonic distortion: < -100 dB in the range from 10 Hz to 10 kHz

GENERAL

Power: ac: 100, 120, 220 V $\pm 10\%$, 240 V $+5-10\%$, 47-63 Hz
 dc: 22 to 30 V

In case of line failure the Instrument automatically switches to an external 22-30 V dc power supply

Power consumption: < 150 VA ac, < 100 W dc

Operating temperature range: 10...35 $^\circ\text{C}$

Storage temperature range: -50 tu +50 $^\circ\text{C}$

Humidity: up to 80% at 25 $^\circ\text{C}$

Dimensions: 480x708x595 mm

Weight: 90 kg

Lifetime: 15 years

CH1-76A Passive Hydrogen Maser

◆ **Small size and weight**

◆ **High long-term and short-term frequency stability**



DESCRIPTION

The CH1-76A Passive Hydrogen Maser is designed to operate as a high-stability frequency source with precise, spectrally pure 5 MHz output.

APPLICATIONS

The CH1-76A H-Maser may be used in metrology for crystal, rubidium and other frequency standards calibration, in radionavigation and for time keeping.

Thanks to small dimensions the CH1-76A Passive H-Maser may be used in different transportable systems, (transportable clocks for example).

SPECIFICATIONS

Outputs:

5 MHz (sine), 1 ± 0.2 V RMS into 50 Ohm

1 Hz (pulse):

Amplitude: ≥ 2.5 V into 50 Ohm

Width: 10-20 μ s

Rise time: <30 ns

Jitter: <0.1 ns

Frequency stability, $\sigma_y(2, \tau)$:

1 s $\leq 8 \cdot 10^{-13}$ (in 2 Hz measuring system band)

10 s $\leq 2 \cdot 10^{-13}$

10^2 s $\leq 7 \cdot 10^{-14}$

10^3 s* $\leq 3 \cdot 10^{-14}$

1 h* $\leq 2 \cdot 10^{-14}$

1 day* $\leq 5 \cdot 10^{-15}$

* Specified only under laboratory conditions: at ± 1 °C ambient temperature change in 5-40 °C operating temperature range

Aging: $< 1 \cdot 10^{-15}$ /day

Accuracy: $\pm 1.5 \cdot 10^{-12}$ /year

Temperature coefficient of frequency: $\leq 2 \cdot 10^{-14}$ /°C

Magnetic field sensitivity: $\pm 2 \cdot 10^{-14}$ /Gauss

Frequency trim range: $1 \cdot 10^{-10}$

Setting resolution: $\pm 1 \cdot 10^{-14}$

Phase noise:

Offset from carrier	SSB Phase Noise, dBc/Hz
1 Hz	-100
10 Hz	-120
100 Hz	-140
1 kHz	-150
10 kHz	-150

Harmonic distortion: < 30 dB

Non-harmonic distortion: < 100 dB

GENERAL

Power: 220 V $\pm 10\%$, 47-63 Hz, or 22-30 V dc

At power line failure the Instrument automatically switches to an external 22-30 V dc power supply

Power consumption: 140 VA ac, 90 W dc

Operating temperature range: 5...40 °C

Storage temperature range: -50...50 °C

Humidity: up to 80% at 25 °C

Dimensions: 480x280x555 mm

Weight: 55 kg

Lifetime: 15 years



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