Quartzlock CH1-75A

Active Hydrogen Maser

- The highest accuracy and short- and long-term frequency stability
- Autonomous automatic cavity tuning (without a second H-Maser)
- Frequency accuracy $\pm 5 \times 10^{-13}$
- Frequency instability 7×10^{-16}/day, 1.5×10^{-13}/s

DESCRIPTION

The CH1-75A Active Hydrogen Maser is designed to operate as a high stability, precision spectrally pure 5 and 100MHz signal source and provides time scale signals of 1s period.
The CH1-75A Active Hydrogen Maser provides the highest frequency stability among all industrial frequency standard known today.
The Maser has an autonomous cavity automatic tuning (CAT) system, which does not require the second analogous Maser.

APPLICATIONS

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

GENERAL

Power: 100, 120, 220V±10 %, 240V+5–10 %, 47–63Hz or 22–30V dc
At power line failure the Instrument automatically switches to an external 22–30V DC Power Supply
Power consumption: 150 VA ac, 100 W dc
Operating temperature range: 10–35°C
Storage temperature range: –50–+50°C
Humidity: up to 80% at 25°C
Dimensions: 480 x 708 x 595 mm
Weight: 90kg
Lifetime: 15 years

Active Hydrogen Maser Specifications	
Output signals:	5, 100MHz (sine), 1±0.2V rms into 50 Ohm, 1Hz (pulse)
Amplitude	>2.5V into 50 Ohm
Width	10–20ms
Rise time	<15ns
Jitter	<0.1ns
Frequency instability, σ_y (2, t): 1s 10s 10^2s 10^3s 1h 1 day	 $\leq 5 \times 10^{-13}$ (in 2 Hz measurement BW) $\leq 3 \times 10^{-14}$ $\leq 6 \times 10^{-15}$ $\leq 2 \times 10^{-15}$ $\leq 1.5 \times 10^{-15}$ $\leq 7 \times 10^{-16}$
Temperature coefficient of frequency	1.5×10^{-15}/ °C
Magnetic field sensitivity	$<1 \times 10^{-14}$/Gauss
Frequency trim range	1×10^{-10}
Setting resolution	1×10^{-15}
Phase noise Offset from carrier 1Hz 10Hz 100Hz 1kHz 10kHz	 SSB phase noise, dBc/Hz –117 –133 –148 –155 –155
Harmonic distortion	< 30dB (for 5 MHz output)
Non-harmonic distortion	< –100dB in the range from 10Hz to 10kHz

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See Quartzlock Hydrogen Maser compatible instrumentation
A5 Distribution Amplifier
A6 Frequency Converter
A7 Signal Stability Analyzer