



Active Hydrogen Maser

VCH-1003M



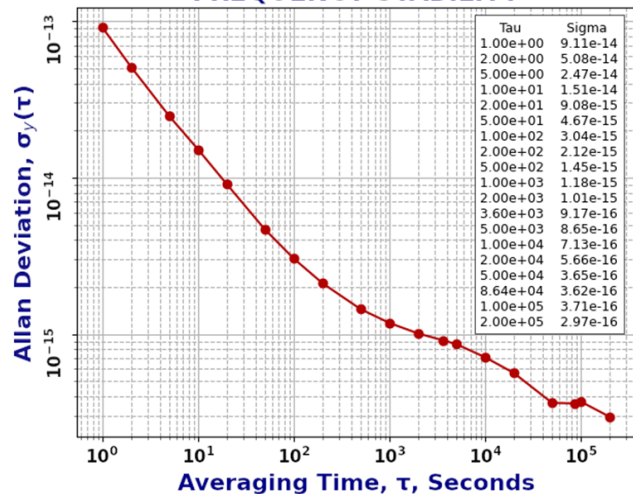
Active Hydrogen Maser is a source of high stable low noise sine signals as standard frequencies and one pulse per second (1 PPS) timing signals. It can operate both as standalone instrument and as a reference of time and frequency measurement systems. Full data monitoring and functions control (local or remotely through any network) are performed by personal computer (not included in delivery set). Application software running under Microsoft Windows (7) is supplied.

The main maser's applications:

- ◆ Radio astronomy;
- ◆ Radio navigation;
- ◆ Time keeping;
- ◆ Scientific research.



FREQUENCY STABILITY



VCH-1003M Specifications

Outputs :-

Waveform	Qty	Amplitude	Width	Rise time	Termination
5MHz (sine)	2	1 ±0.2 V _{RMS}	-	-	50 Ω
10 MHz (sine)	2	1 ±0.2 V _{RMS}	-	-	50 Ω
100 MHz (sine)	2	1 ±0.2 V _{RMS}	-	-	50 Ω
1 Hz (pulse) PPS	2	>2.5 V	15±5 μs	<3 ns	50 Ω

Frequency stability, $\sigma_y(1, \tau)$:

	τ	Std.	Remarks
Allan deviation at (23±0.5)°C, env. effects are excluded	1s	$\leq 1.5 \times 10^{-13}$	1) measuring bandwidth 1 Hz 2) Long term: <3.0E-16 per day* (Achieved after extended period of unperturbed, continuous operation) 3) Auto tuning: no external reference required
	10s	$\leq 2.5 \times 10^{-14}$	
	100s	$\leq 6.0 \times 10^{-15}$	
	1000s	$\leq 2.0 \times 10^{-15}$	
	1 Hour	$\leq 1.5 \times 10^{-15}$	
	1 Day*	$\leq 6.0 \times 10^{-16}$	

	Offset	Std.		
		5MHz	10MHz	100MHz
Phase noise spectral density (dBc/Hz)	1 Hz	≤ -118	≤ -112	≤ -92
	10 Hz	≤ -135	≤ -129	≤ -109
	100 Hz	≤ -149	≤ -143	≤ -122
	1 kHz	≤ -156	≤ -149	≤ -122
	10 kHz	≤ -158	≤ -150	≤ -152
	100 kHz	≤ -158	≤ -150	≤ -152

Temperature sensitivity (+10 ÷ +35) °C	$< 1.5 \times 10^{-15} / ^\circ\text{C}$
Magnetic sensitivity / Gauss	$< 5.0 \times 10^{-15}$
Relative Frequency accuracy	$\leq \pm 1 \times 10^{-13}$
Frequency trim range / Resolution	$1.0 \times 10^{-10} / 1.0 \times 10^{-16}$
Manual synchronization to external 1PPS signal	$\leq 25 \text{ ns}$
Harmonic distortion @5 MHz	$< -30 \text{ dB}$
Non-harmonic distortion (10Hz to 100KHz)	$< -100 \text{ dB}$
Power Supplies	220±10% VAC 22-30VDC x 2
Power consumptions	150 VA /100W
Operating temperature Range	(10...35)°C (Rec.+22°C)
Humidity	$< 80\% @ 25$
Dimension(WxHxD) mm	550x1010x550
Weight	~105 kg

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