
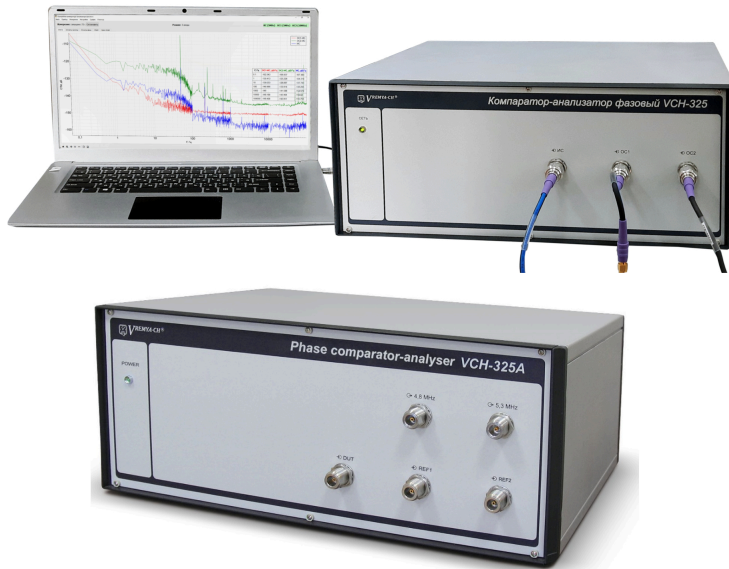


# Phase Comparator-Analyzer VCH-325

 [vremya-ch.com/index.php/en/products-en/freq-comparators-en/vch-325-en/index.html](http://vremya-ch.com/index.php/en/products-en/freq-comparators-en/vch-325-en/index.html)



Phase comparator-analyzer VCH-325 is intended for precise frequency instability and phase noise measurements (Allan deviation,  $L(f)$ ).

## Key applications:

- Metrological characteristics monitoring of the of precise signal sources, including crystal oscillators and quantum frequency standards;
- Scientific research measurements.

## Manual for VCH-325, VCH-325A

– Operational Manual download

## Specification

The comparator has two identical measuring channels (three inputs) and uses correlation processing providing extremely low measurement error and the frequency instability calculation of each input signals.

**Input signals:** sinusoidal in frequency range from 1 up to 100 MHz (different frequencies at all inputs are allowed), level (0.6–1.2)  $V_{rms}$ , 50 Ohm load.

**Noise bandwidth:** 0.5, 1.5, 5, 50, 500 Hz.

**Averaging time range:** 0.001 s to  $10^5$  s.

**Phase noise spectrum measurement range:** 0.1 Hz to 100 kHz.

**Allan deviation noise floor, not more:**

### Allan deviation

| Averaging time | Passband | For the input signal pairs (YX, ZX) |         | “Two inputs” mode for the input signal pair YX.<br>“Three inputs” mode for the input signal X |         |
|----------------|----------|-------------------------------------|---------|---|---------|
|                |          | Specification                       | Typical | Specification   | Typical |
|                |          |                                     |         |   |         |

|        |            |                      |                      |                      |                      |
|--------|------------|----------------------|----------------------|----------------------|----------------------|
| 0.01 s | 50         | $5.0 \cdot 10^{-12}$ | $2.5 \cdot 10^{-12}$ | $3.0 \cdot 10^{-13}$ | $3.0 \cdot 10^{-14}$ |
| 0.1 s  | 5          | $6.0 \cdot 10^{-13}$ | $2.5 \cdot 10^{-13}$ | $1.0 \cdot 10^{-13}$ | $9.0 \cdot 10^{-15}$ |
| 1 s    | 0.5<br>1.5 | $3.0 \cdot 10^{-14}$ | $9.0 \cdot 10^{-15}$ | $5.0 \cdot 10^{-15}$ | $1.0 \cdot 10^{-15}$ |
| 10 s   |            | $5.0 \cdot 10^{-15}$ | $1.5 \cdot 10^{-15}$ | $1.0 \cdot 10^{-15}$ | $1.5 \cdot 10^{-16}$ |
| 100 s  |            | $1.0 \cdot 10^{-15}$ | $5.5 \cdot 10^{-16}$ | $2.0 \cdot 10^{-16}$ | $8.0 \cdot 10^{-17}$ |
| 1 hour |            | $2.0 \cdot 10^{-16}$ | $8.0 \cdot 10^{-17}$ | $1.0 \cdot 10^{-16}$ | $9.0 \cdot 10^{-17}$ |
| 1 day  |            | $5.0 \cdot 10^{-17}$ | $5.0 \cdot 10^{-17}$ | $5.0 \cdot 10^{-17}$ | $7.0 \cdot 10^{-18}$ |

### Phase Noise floor, not more

#### Phase Noise L(f), dBc/Hz

“Three inputs” mode for the input signal pairs (YX, ZX)

| Frequency offset | Specification              |        |         | Typical                    |        |        |
|------------------|----------------------------|--------|---------|----------------------------|--------|--------|
|                  | Frequency of input signals |        |         | Frequency of input signals |        |        |
|                  | 5 MHz                      | 10 MHz | 100 MHz | 5 MHz                      | 10 MHz | 100MHz |
| 1 Hz             | -130                       | -127   | -107    | -141                       | -138   | -119   |
| 10 Hz            | -143                       | -135   | -115    | -145                       | -146   | -128   |
| 100 Hz           | -145                       | -143   | -127    | -147                       | -147   | -133   |
| 1 kHz            | -146                       | -145   | -133    | -148                       | -148   | -134   |
| 10 kHz           | -147                       | -145   | -135    | -148                       | -149   | -138   |
| 100 kHz          | -148                       | -146   | -140    | -148                       | -150   | -143   |

**Phase Noise L(f), dBc/Hz**

“Two inputs” mode the input signal pair YX.

“Three inputs” mode for the input signal (X)

| Frequency offset | Specification              |        |         | Typical                    |        |        |
|------------------|----------------------------|--------|---------|----------------------------|--------|--------|
|                  | Frequency of input signals |        |         | Frequency of input signals |        |        |
|                  | 5 MHz                      | 10 MHz | 100 MHz | 5 MHz                      | 10 MHz | 100MHz |
| 1 Hz             | -135                       | -130   | -110    | -148                       | -144   | -128   |
| 10 Hz            | -150                       | -145   | -127    | -160                       | -156   | -142   |
| 100 Hz           | -155                       | -153   | -140    | -168                       | -165   | -152   |
| 1 kHz            | -160                       | -158   | -143    | -172                       | -170   | -157   |
| 10 kHz           | -163                       | -160   | -150    | -175                       | -172   | -164   |
| 100 kHz          | -163                       | -160   | -155    | -176                       | -173   | -168   |

**Interfaces:** USB.

**Software:** calculates relative frequency difference, Allan deviation, phase noise spectrum.

**Temperature in use:** +5°C to +40°C.

**Power supply:** AC(198÷242)V.

**Power consumption:** not more 60 V·A.

**Size (H×W×D):** 184×449×337 mm.

**Weight:** not more 12 kg.