

Chronoscope M1



Measurement of the rate accuracy, the amplitude and the beat error of mechanical watches

The Chronoscope M1 with the motorised microphone for 11 measuring positions is the ideal combination for rate adjustment, final test and for laboratory test. Possible is also the graphic presentation of the rate and amplitude values in function of the time. Programming and saving of 99 parameter sets for mechanical watches and 5 for quartz watches.

Easy and comfortable handling of the equipment with its large LCD.

The built-in signal sensor allows the measurement of the rate deviation of quartz watches.

Storage of the last 4 screen contents, which are later callable.

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Technical Data

Measurement Possibilities

Rate deviation, amplitude and beat error of mechanical watches. Diagram of the beat noises.

Beat Error

Automatic selection of all common beat numbers. Manual selection of less common beat numbers. Manual selection of any beat number between 1'800 to 43'200 b/h. Determination of an unknown beat number.

Measuring Modes

- **Stnd** Standard mode for watches with the Swiss escapement.
- **Spe1** Mode for watches with coaxial escapement.
- **Spe2** Mode for watches with AP escapement.
- **Spe4** Mode with specific amplitude filter.
- **Rate** Only the rate measurement occurs.

Gain Control

Automatic. Manual control facility for watches with stray or unusual beat noises.

Display

- **Cont** Continuous diagram recording of the beat noises and display of the numeric values for the rate accuracy, amplitude and beat error.
- **Seq.** Automatic test sequences in up to 11 measurement positions with statistical evaluation of the results.
- **Trace** Simultaneous record of the rate and amplitude in function of the time.
- **Scope** Visualisation of the beat noises for escapement analysis. 3 different time deviation for the full screen length: 20 ms, 200 ms and 400 ms.
- **Quartz** Measurement of the rate accuracy of quartz watches.

Rate accuracy: numerical display in s/d. Resolution: 1 s/d with a measuring range of ± 999 s/d or 0.1 s/d with a measuring range of ± 99.9 s/d.

Amplitude: numerical display in degrees. Resolution 1°. Measuring range from 70° to 360°. Lift angle adjustable from 10° to 90°.

Beat error: numerical display in milliseconds. Resolution 0.1 ms. Measuring range 9.9 ms.

Diagram recording on an illuminated 1/2 VGA LCD graphic display with 640x200 dots. Time scale adjustable from 1 up to 10 mm/ms (zoom). Recording speed depends on the beat number, adjustable from 0.3 mm up to 0.04 mm per watch beat.

Visible diagram length: 210 mm.

Functions

Measuring time for mechanical watches: automatic for the instant display or selectable from 2 s to 240 s. Continuous renewal of the average values every 2 s over the measurement period. Display on the screen of the evaluated part of the rate measurement diagram.

Measuring time for quartz watches: selectable from 2 s to 480 s or automatic selection (60 s for watches with inhibition adjustment).

Selectable resolution: 0.01 s/d or 1 s/month.

Measuring range: ± 9.9 s/d respective ± 300 s/month.

Start/stop: enables to stop the current screen display and to re-start the measurement.

Built in loudspeaker to hear the beat noises.

Three RS232-interfaces for the connection of the Witschi thermo- printer, of a PC or the Witschi GPS receiver. Print out of the numeric results or graphic print out of the displayed diagram.

Details

Time base: high frequency quartz time base, OXCO.

Stability: ± 0.0045 s/d between 20° and 40° C.

Aging for the first year: ± 0.03 s/d.

Plastic housings, titanium.

Dimensions

Chronoscope M1: 275x250x115 mm (w x h x d).

Microphone AM1: 135x135x205 mm (w x h x d).

Weight: 3,4 kg, microphone included.

Mains connection: mains adapter for 230 V~ or 120 V~.

Output: 12 VDC, 1 A.

Accessories

Clamping microphone for wall clocks. Item 13.1820

Optoelectronic sensor for pendulum clocks. Item 13.1620

Tripod for optoelectronic sensor. Item 13.16.201

Thermo printer Witschi with graphic mode, universal mains adapter 90 V~ - 260 V~, cable and 1 paper roll. Item JB01-MCP7810

Thermo paper, roll. Item JB01-MM58-DPU20-N

Autoprint: PC software for result and graphic file transmission to a PC. Item 64.55.901PK1

SyncM1 Pro: PC software for the bi-directional data synchronization and amplitude and rate recording. Item 11.20921PK1

Witschi GPS receiver. Item 19.91PK1 (230 V~) 19.91PK1 (120 V~)