

# Analyzer Q1



## For testing Quartz Watches

The Analyzer Q1 is the ideal instrument for the efficient and fast operating in the repair service, in watch laboratories as well as for income and final control. Extensive test and measuring futures guarantee skilled trouble shooting on quartz watches. The measurement process is largely automated.

The multifunctional rotating/push knob allows easy and quick parameter settings. High operating comfort is performed by the perfect and functional placement of the control panel as well as by the large LCD display. The chopping rate of the motor pulses on watches with asservisement is detected and displayed.

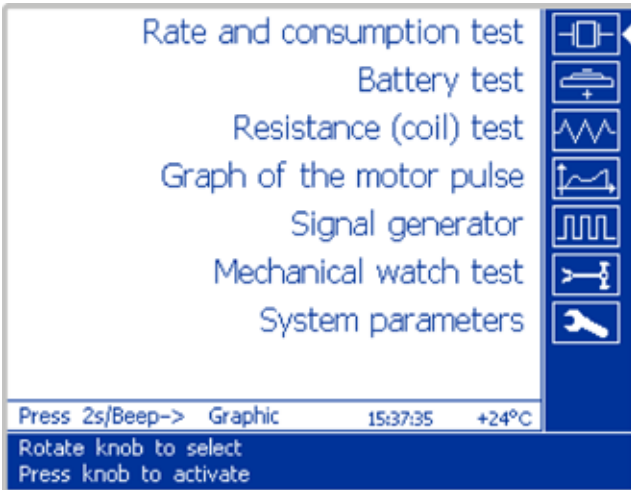
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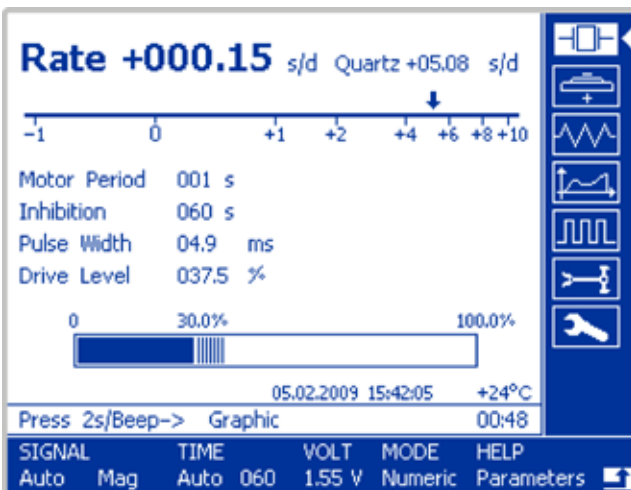
## General

The Analyzer Q1 sets new technical standards in the analysis and repair of quartz watches. With its new VARIO display mode for rate measurement of mechanical watches, the instrument, designed for universal use, is indeed a very versatile instrument.



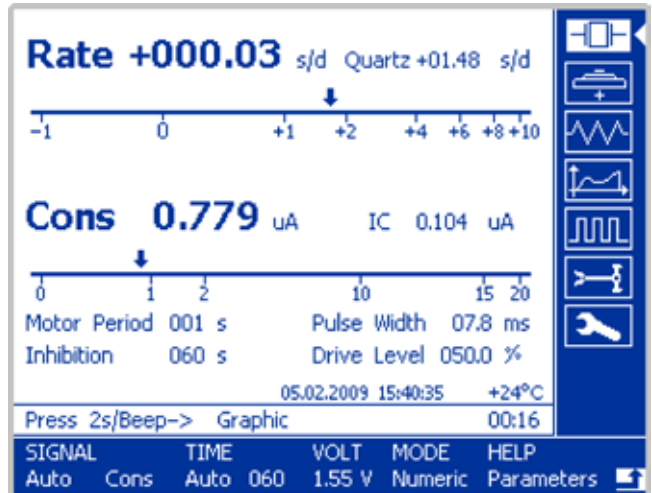
The operation is simple and easy to understand. Ordinary standard measurements can be largely automated. The instrument determines the associated parameters. For more advanced users, measuring parameters can also be manually selected according to requirements. The results, menus and parameters appear on the ¼ VGA LCD graphic display.

## Rate Measurement and Pulse Parameter



Along with the display of the rate accuracy, the analysis of the magnetic signal can provide the period and the pulse width as well as the inhibition period and the chopping level. With this information, it is possible to determine the efficiency of a watch drive with asservissement.

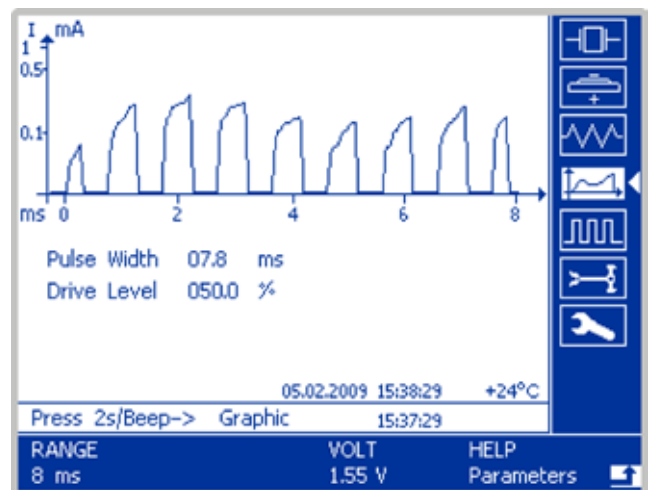
## Rate and Current Measurement



The watch to be tested is supplied with a variable voltage. Moveable probes are used as contact elements. The hands of the watch can be observed during measurement by means of the built-in mirror.

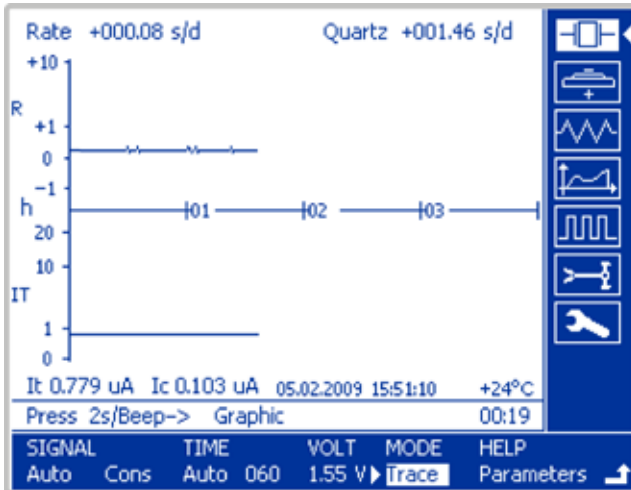
The display of the instantaneous values of the rate accuracy and the total current occurs in a logarithmic scale. The IC current, motor period, pulse width, inhibition period and the chopping level are displayed numerically.

## Pulse Analysis Motor Current



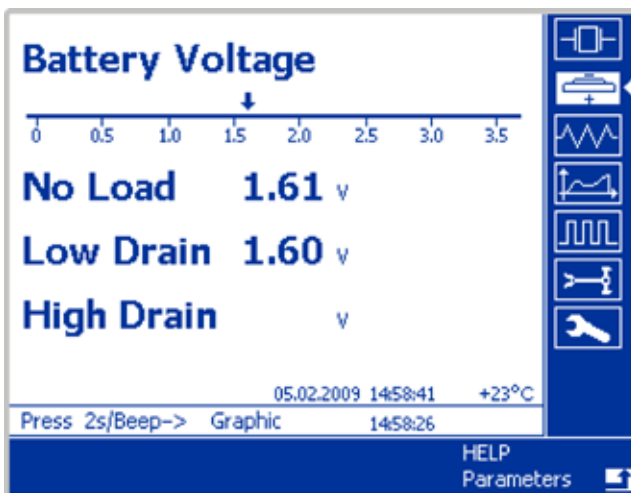
The shape of the motor pulse current is shown as a curve. The pulse shape is an important criterion about the good operation of the watch. Errors in the mechanical part of the watch can be determined by comparative measurements with a good watch of the same type. The pulse width and the chopping level are displayed numerically.

## Long-Range Recording



The Trace mode allows a long range diagram recording of the rate deviation and the chopping level. Thereby are determined changes in the rate deviation (e.g. caused by temperature variations) as well as changes in the chopping level of watches with adaptive motor pulses (e.g. caused by a change of date) for a duration reaching 60 h.

## Battery Test

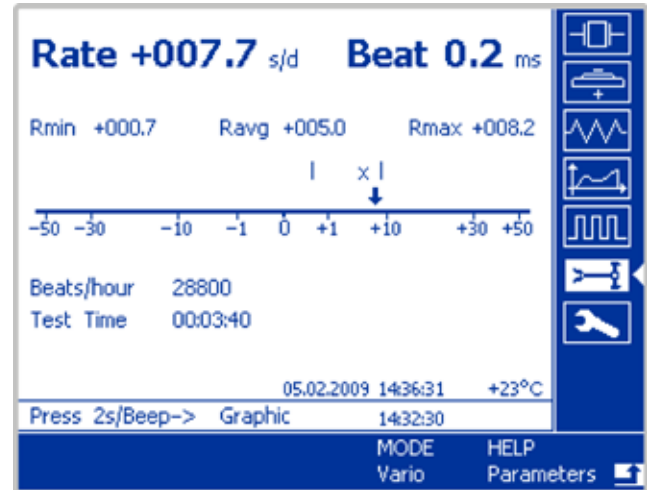


Low drain batteries are automatically tested with a load resistance matching the battery and high drain batteries are manually tested by pressing a button.

## Resistance Measurement

Measurement of the coil resistance and insulation and detection of short-circuits and breaks.

## Measurement of Mechanical Watches



The VARIO display mode provides a clear-cut and efficient measurement of the rate and the evaluation of the rate stability. The results are displayed in graphical form on a logarithmic scale..

The minimum, average and maximum values of the individual measurements since the beginning of the measurement process are displayed under the current results. The beat number as well as the measuring time since the beginning of the measurement process are also displayed.

## Additional Functions

- Log printout of the numerical measurement results or of the display contents on the Witschi thermo printer, available as accessory.
- Export of the numerical results and graphics (screen contents) to a PC by means of the software AutoPrint (accessory).
- Real time clock. Date and time are displayed and printed in the log.
- The Witschi GPS receiver (accessory) allows the time base of the Chronoscope S1 to be tested and adjusted if necessary. For an unmatched accuracy the time base can also be continuously synchronised.

## Technical Data

### Measurement Possibilities

Rate deviation, current measurement, resistance measurement, battery voltage, chopping level of motor pulse and rate measurement of mechanical watches.

### Rate Measurement

- Measurement over the quartz frequency, signal sensing acoustical, capacitive or over the supply current.
- Measurement over the motor pulses, signal sensing magnetically or over the supply voltage.
- Measurement over the LCD-operating frequency.

Signal sources: Motor, quartz 32 kHz, LCD. Automatic change-over between magnetic motor pulses and current pulses. Automatic change-over between acoustical/capacitive quartz frequency and quartz frequency over the current.

Measuring time: automatic definition over one motor period i.e. inhibition period, min. 2 s, max. 120 s. Also manual setting: 2, 4, 10, 12, 20, 60, 120, 480 and 960 s.

Result display: measuring range  $\pm 30$  s/d, resolution 0.01 s/d.

Graphic display: measuring range -1 s to +10 s, logarithmic scale.

Display of the momentary value, independent of the selected measuring time. Simultaneous display of the quartz accuracy for watches with inhibition adjustment.

Status display: count down of the remaining measuring time. No Signal in case of missing signal. Unstable and beep in case of an unstable signal. Out of Range and beep if out of measuring range.

### Module Supply

Mobile probes for direct contacting or by means of test leads with probe tips.

Supply voltage: adjustable, 0 - 3.5 V, resolution 0.05 V.

### Current Measurement

- Instantaneous measurement of the IC current.
- Integrated measurement of the total current over a measuring period.

Measuring time: Automatic over a pulse period, min. 2 s, max. 60 s.

Also manual setting.

Display total current: measuring range 20 mA, resolution 1 nA.

Display IC current: measuring range 10  $\mu$ A, resolution 1 nA.

Graphic display: momentary value of the total current, independent of the selected measuring time. Display range 20  $\mu$ A, logarithmic scale.

Error display: warning beep and over range display for current  $>20$  mA.

### Trace

Long time tracing of the rate and current measurement diagrams. Time scale: automatic in accordance with the selected measuring time; one pixel per measurement. Tracing length 6 min. to 50 h.

### Resistance

Measurement of the coil resistance and detection of short circuits and interruptions. Measuring range: 1  $\Omega$  - 10 M $\Omega$ , 3 digit display with automatic range selector. Accuracy 1% of the measured value. Error display: short and warning beep for  $R < 1 \Omega$ .

### Battery

Measurement of the battery voltage with loads of 2 M $\Omega$  (no Load) and 2 k $\Omega$  (low Drain). Additional measurement with 100  $\Omega$ .

### Pulse Generator

- Test of stepping motor with programmable pulses.
- Test of acoustic signal transmitters (buzzer).

Pulse width: programmable 2.94 - 31.25 ms in steps of 0.49 i.e. 0.98 ms.

Repetition frequency: programmable 1, 2, 8, 16 and 32 Hz.

Chopping level: programmable 37.5 - 100% in steps of 6.25%.

Voltage: programmable 0 to 3.5 V.

Buzzer test: bipolar square wave signal. Frequency 2kHz. Programmable voltage from 0 up to 3.5V peak.

### Pulse Analysis

Stepping motor: the positive and negative pulses are alternately displayed in the time scale of 8 or 16 ms.

Current scale: range 1 mA, logarithmic.

Numeric display: pulse width and chopping level.

### Testing Mechanical Watches

Automatic selection of the beat number: 12'000, 14'400, 18'000, 19'800, 21'600, 25'200, 28'800, 32'400 and 36'000.

Measuring time: 8 s.

Range of the rate measurement:  $\pm 300$  s/d, resolution 0.1 s/d.

Graphic display of the rate:  $\pm 50$  s/d, logarithmic scale.

### Functions

Selectable languages: English, German and French.

Interfaces:

3 x RS232 for the connection of the Witschi thermo printer, of a PC and of the Witschi GPS receiver.

DIN 8-pin for the connection of an external signal sensor.

### Details

Time base: pre-aged, thermo-stabilised high frequency quartz, OCXO.

Stability:  $\pm 0.004$  s/d between 10° and 50° C.

Aging for the first year: max.  $\pm 0.03$  s/d.

Casing: aluminium, glass and plastic.

Display: graphic display, ¼ VGA (320 x 240 dots), illuminated.

Dimensions: 290 x 180 x 170 mm (w x h x d).

Weight: 2.9 kg mains adapter included.

Mains connection: mains adapter for 230 V~ or 120 V~, 1.2 A.

### Accessories

Witschi thermo printer with universal-mains adapter, 90 V~ - 260 V~. Item JB01-MCP7810

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

Witschi GPS receiver for time base calibration or for the time base and real time clock synchronisation. Item 19.91PK1

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