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## GDS-50 秒表检定仪

### 主要功能特性

- 根据国家颁发的机械式秒表和数字式石英秒表检定规程设计制造
- 是一种多功能，综合性的时间检定自动测试装置
- 采用高稳定度石英晶体振荡器作为时间基准
- 采用先进的 FPGA 技术和单片机整合控制，响应速度快，输出精度高
- LCD 显示界面清晰，操作便捷
- 供各级计量部门，工厂，院校及科研单位对机械秒表、电子秒表等计时仪器进行检定
- 外形尺寸：255×300×400(mm);
- 重量：6kg

### 主要技术指标

产品型号	主要技术指标	外形尺寸(mm3)	价格(元)
GDS-50	检定机械秒表和电子秒表 输入范围 T0 : 1s~99999s 准确度：优于 $\pm(2 \times 10^{-7} \times T0 + 3ms)$ 晶振指标 标称频率：10MHz 高稳晶振日老化率： $\leq 5 \times 10^{-9}/\text{日}$ 秒稳定度： $\leq 1 \times 10^{-10}/s$ 准确度： $\leq 1 \times 10^{-7}$ 预热时间：>24 小时 标准 10MHz 输出； 本检定仪完全适合国家计量总局颁发的机械式秒表和数字式石英秒表检定规程	254×300×400	19800
秒表夹具	可选单通道,双通道,四通道	380×240×240	3000/通道

### 一、概述

GDS-50 型秒表检定仪是一种多功能，综合性的时间检定自动测试装置，它能对机械秒表、电子秒表进行进行检定。本仪器采用高稳定度石英晶体振荡器作为时间基准，用 AVR 单片机和 TTL 集成电路为主要元件，大屏 LCD 显示，旋转编码开关操作，满足 JJG237-2010《秒表检定规程》的要求，是一种较理想和实用的秒表检定仪。

### 二、技术指标

#### 1. 测量范围

1ms-----99999.9s

#### 2. 测量误差

秒表： $\pm 3ms$

#### 3. 晶体振荡器

准确度:  $\pm 5 \times 10^{-7}$ /日

### 三、工作条件

环境温度: 0~40℃ 相对湿度: <80%

## FEATURES

Comply with national regulation of calibrating.

Auto time measuring device of multi-function and high synthesis

with time base of crystal oscillator of high stability

With advanced FPGA technique and MCU integration control, quick response.

LED display with clarity interface, easy operation

suitable for metrological service, factory, academy and scientific research institution to calibrate all kinds of timer instruments

Dimension: 255mm×100mm×380mm

Weight: 4.9kg

## SPECIFICATIONS

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For mechanical stopwatch and electronic stopwatch calibrating

Input Range T0	1s-99999s	Accuracy	$< \pm (1 \times 10^{-7} \times T0 + 3\text{ms})$
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For pointer stopwatch calibrating

Input Range T0	Continuous: 0.1s-99999s Trigger: 1s-99999s Pause: 0.1s-99999s
Accuracy	$< \pm (\text{Mains frequency accuracy} \times T0 + 0.6\text{ms})$

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For millisecond stopwatch and digital stopwatch calibrating

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Input Range T0	$1 \times 10^2 \mu s \sim 1 \times 10^9 \mu s$	Accuracy	$< \pm (1 \times 10^{-7} \times T0 + 3 \mu s)$
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#### Crystal Oscillator

Nominal Frequency	10MHz	Daily Aging Rate	$\leq 5 \times 10^{-9}/\text{day}$
Second Stability	$\leq 1 \times 10^{-10}/s$	Accuracy	$\leq 1 \times 10^{-7}$
Warm Up Time	12 hours		

#### Connection of the calibrator

**GDS-50 秒表检定仪**是一最新用的时间检定仪，供各级计量部门，工厂，院校及科研单位检定各种秒表、毫秒仪，机械秒表等，性能符合检定规程的要求。

技术指标：

1、 检定电子秒表和机械秒表：

在 1—99999 秒内可任意置数

准确度 $\pm (2 \times 10^{-7} \times \text{输出时段})$  秒 $\pm 0.003$  秒

2、 检定电子毫秒仪（正负两组输出）

在 1—99999 秒内可任意置数，最小输出 100 微秒

准确度 $\pm (2 \times 10^{-7} \times \text{输出时段})$  秒 $\pm 0.003$  秒

### 3、 检定电秒表（适合新规程 JJG237-95）

在 1—99999 秒内可 任意置数

指针式准确度：电同步  $< \pm 0.6$  毫秒

数字式准确度：  $\pm (2 \times 10^{-7} \times \text{输出时段})$  秒  $\pm 0.006$  秒

## Introduction

The calibrator is a precision instrument calibrating mechanical stopwatch, electronic stopwatch, and 405/407/408/415/417 type pointer electric stopwatch. The SF2001 stopwatch calibrator is compliant with the stopwatch calibration procedure JJG 237-2010 issued by the National Metrological Bureau. It could be used at metrological department at all levels, factory, institutions and all research institutes to calibrate electric stopwatch (405,407,408,415/417), mechanical stopwatch and digital quartz electronic stopwatch. The instrument is fully digitally controlled, high reliability, high accuracy, complete functions, convenient operation, and strong anti-interfere ability.

#### **GDS-50 stopwatch calibrator and its accessories:**

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|--------------------------------|----------|
| 1) GDS-50 stopwatch calibrator | 1 piece  |
| 2) Three-core power cord       | 1 piece  |
| 3) Dual banana plug test lead  | 2 pieces |
| 4) BNC-banana test lead        | 1 piece  |
| 5) Soft copy of User's Guide   | 1 piece  |

## Main Parameter

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### **1.1 Crystal Oscillator**

Nominal frequency: 10MHz

Daily aging rate:  $\leq 5 \times 10^{-9}$  /day

Second stability:  $\leq 5 \times 10^{-10}$  /s

Accuracy:  $\leq 1 \times 10^{-7}$

Warming-up time: over 2 hours

**1.2 Calibrate mechanical stopwatch and electronic stopwatch** (T0 is inputted calibration period of time)

Input range: T 0 :1s-99999s

Accuracy: better than  $\pm (1 \times 10^{-7} \times T 0 + 3\text{ms})$

**1.3 Calibrate electric stopwatch**

Pointer:

Input range:

Continuous: T 0 :0.1s-99999s

Trigger state: T 0 :1s-99999s

Pause state: T 0 :0.1s-99999s

Accuracy: better than  $\pm(\text{commercial power frequency accuracy} \times T 0 + 0.6\text{ms})$

#### **1.4 Calibrate millisecond counter and digital electric stopwatch**

Input range: T 0 :1×10<sup>2</sup> μs-1×10<sup>9</sup> μs

Accuracy: better than  $\pm(1 \times 10^{-7} \times T 0 + 3 \mu\text{s})$

The SF2001 calibrator is fully compliant with the mechanical stopwatch and digital quartz stopwatch calibration procedure, electric stopwatch calibration procedure, and electronic millisecond counter calibration procedure, issued by the National Metrological Bureau.

#### **2.1 Working conditions**

Voltage: 220(1±10%)V;

Frequency: 50(1±5%)Hz;

Power consumption: <60VA;

Temperature : 0~40℃;

Humidity: <80%

#### **2.2 Mechanical characteristics**

Dimension: 329mm×283mm×155mm Weight: 3.7kg

**2.3 Operation characteristics:** Input with keys, menu display

**2.4 Display mode:** LCD display, English menu

**2.5 Technique:** With SMT technique and large-scale IC, the calibrator is of high reliability, small volume and long service life.