



瑞合
RUIHE

北京瑞合航天电子设备有限公司
Beijing Reful Co., Ltd.

非接触光纤尺规格书

Specification for non-contact optical fiber scale



北京瑞合航天电子设备有限公司

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一、产品优点

非接触光纤尺采用了非接触测量的方式，在使用中它对被测物体表面不会产生任何影响。

非接触光纤尺超细的光纤束探针部分，可以使探头深入更狭小的空间进行测量，完成其它传感器无法完成的部件位移测量工作，测量精度高达 $\pm 1\mu\text{m}$ 。探针采用不锈钢或陶瓷套管保护，具有耐酸碱，抗磕碰，防水，耐高温的特点，即便是恶劣环境下使用，也不会影响其测量精度；

非接触光纤尺柔软光纤束尾纤部分，用外覆 PVC 的不锈钢管保护，弯曲半径小，抗冲击。万一用户在操作过程中发生勾挂或踩踏，也不易出现断纤的风险。用户完全可以采用电线施工的方式进行装配，施工简单、方便而安全。

非接触光纤尺可以在各类需要非接触测量的领域，例如：各类材料平整度测量、配合间隙测量；位移震动测量等，发挥其优越的测量性能。它能在线输出数据，与计算机、PLC 或上位机系统联机，实时分析数据，满足用户的各类测量应用。

The non-contact fiber optic displacement sensor (NFODS) employs non-contact measurement techniques and does not affect the surface of the object being measured. The NFODS ultra-fine fiber optic probe allows the probe to penetrate narrow spaces for measuring, completing displacement measurement tasks that other sensors cannot achieve, with a measurement accuracy of up to $\pm 1\mu\text{m}$. The probe is protected by a stainless steel or ceramic sleeve, which has features such as acid and alkali resistance, anti-collision, waterproofing, and high temperature resistance. Even when used in harsh environments, the measurement accuracy is not affected.

The flexible fiber optic cable of the NFODS is protected by a stainless steel tube covered with PVC, with a small bending radius and high impact resistance. In the event of accidental hanging or stepping during operation, the risk of fiber breakage is low. Users can easily install the NFODS using standard electrical wiring methods, making installation simple, convenient, and safe.

The NFODS can be applied in various non-contact measurement fields, such as measuring material flatness, clearance, and displacement vibration, to demonstrate its superior measurement performance. It can output data online, connect with computers, programmable logic controllers (PLCs), or upper-level computer systems to analyze data in real-time, satisfying users' diverse measurement needs.




二、注意事项 Matters needing attention:

1、本产品包含光纤，请勿拉伸或弯折光纤。请小心操作光纤探头。如果损毁，不保证退换。


This product contains optical fiber. Do not stretch or bend the optical fiber. Please handle the optical fiber probe carefully. In case of damage, return and replacement are not guaranteed.

2、请确保光纤探头、工件反射面和光路的清洁、清晰。精密测量依赖于光线从探头到工件表面的反射。工件表面的绒毛、灰尘、残渣以及反射面粗糙将导致不规则的反射光方向，产生测量误差。光纤探头可以用软布蘸酒精擦拭清洁。

Please ensure that the optical fiber probe, workpiece reflection surface and optical path are clean and clear. Precision measurement depends on the reflection of light from the probe to the workpiece surface. The fuzz, dust, residue on the surface of the workpiece and the roughness of the reflecting surface will lead to irregular reflected light direction, resulting in measurement error. The optical fiber probe can be cleaned with a soft cloth dipped in alcohol.

 光纤不能使劲弯折

The optical fiber cannot bend hard

 光纤不能使劲拉伸

Optical fiber cannot be stretched hard

 光纤探头表面不能有脏物或损伤

The surface of optical fiber probe shall be free of dirt or damage



三、输入/输出连接 Input/output connection

1、输入电源为工频交流电 AC220V，50Hz。

The input power supply is power frequency AC 220V, 50Hz.

2、测量结果在 OLED 显示屏上显示，并有 RS232 接口。

The measurement results are displayed on the OLED display screen with RS232 interface.

备注 Remarks:

1、输出信号通过 RS232 接口连接计算机，可用于闭环控制。

The output signal is connected to the computer through RS232 interface and can be used for closed-loop control.

2、显示数据以不锈钢表面进行刻度。反射表面材料不同，结果有系统误差，使用者需要进行刻度，并根据拟合曲线校正。

The displayed data is scaled on a stainless steel surface. Due to the different materials of the reflecting surface, the results have systematic errors. The user needs to calibrate and correct according to the fitting curve.

二、测量流程 Measurement process

1、查验待测工件表面，确保表面平整、光亮、无污垢。

Check the surface of the workpiece to be tested to ensure that the surface is flat, bright and free of dirt.

2、将光纤探头固定到工作位置，保证光纤探头表面与待测工件表面平行，且两平面距离在约 1mm。

Fix the optical fiber probe to the working position to ensure that the surface of the optical fiber probe is parallel to the surface of the workpiece to be measured, and the distance between the two planes is about 1mm.

3、轻触开关通电，OLED 显示屏上输出实测距离。如下图所示。

Touch the switch to power on, and the measured distance will be output on the OLED display. As shown in the figure below.





三、技术规格 Technical specifications

- 1、测量范围 Measuring range: 0.2~3mm
- 2、显示精度 Display accuracy: 0.001mm
- 3、采样速率 Sampling rate: >2 times/s
- 4、输出方式 Output mode: OLED/RS232
- 5、电源 Power supply: AC220V, 50Hz
- 6、电源功率 Power supply: <5W
- 7、仪器尺寸 Instrument size: 320mmX375mmX90mm
- 8、探头尺寸 Probe size: φ 12mm* 1m
- 9、环境温度 Ambient temperature: 0~40℃
- 10、空气湿度 Air humidity: <80%

四、RS232 接口 RS232 interface

用小助手查看 RS232 接口的输出数据，结果如下图。

Use a small assistant to view the output data of the RS232 interface, and the results are as follows.

```

本次采集 输入1:0.859392    输入2:0.096225    比值:4.465322    滤波后 输入1:0.859458
      输入2:0.096237    比值:4.465334
本次采集 输入1:0.859447    输入2:0.096251    比值:4.465334    滤波后 输入1:0.859458
      输入2:0.096239    比值:4.465213
本次采集 输入1:0.859574    输入2:0.096240    比值:4.465213    滤波后 输入1:0.859464
      输入2:0.096240    比值:4.465224
本次采集 输入1:0.859579    输入2:0.096264    比值:4.465224    滤波后 输入1:0.859471
      输入2:0.096242    比值:4.465153
本次采集 输入1:0.859514    输入2:0.096256    比值:4.465153    滤波后 输入1:0.859474
      输入2:0.096243    比值:4.465137
本次采集 输入1:0.859358    输入2:0.096255    比值:4.465137    滤波后 输入1:0.859462
      输入2:0.096244    比值:4.465017

```

用户可以根据这个数据格式，编写自己的反馈控制程序。

Users can write their own feedback control program according to this data format.

五、设备清单 Equipment list

- 1、主机 Host: 1Pcs
- 2、光纤探头 Fiber probe : 1Pcs
- 3、电源线 power cord : 1Pcs
- 4、说明书 Instructions: 1Copy

六、售后服务 After-sale service

- 1、凡购买本公司产品，一年内免费保修。

All products purchased from our company will be guaranteed free of charge within one year.

- 2、在保修期内，以下情况将不执行保修：

During the warranty period, the warranty will not be implemented under the following circumstances:

- 1) 因操作不当造成的损坏，尤其是光纤弯折或拉伸导致的光纤探头损坏；



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Damage caused by improper operation, especially damage of optical fiber probe caused by bending or stretching of optical fiber;

2) 因对产品拆解、改造、组装而发生的损坏;

Damage caused by product disassembly, transformation and assembly;

3) 因不可抗力而发生的损坏。

Damage caused by force majeure.

3、售后电话 After-sales telephone: 13311581686 任经理 (Manager)

18210157181 张经理 (Manager)

七、定制服务：我公司接受定制服务

Customized service: our company accepts customized service