



# P92.X20 Fast Tool Positioning Stage

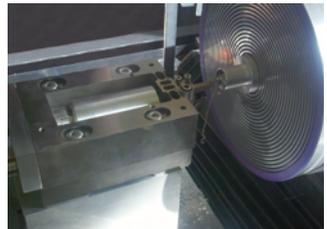
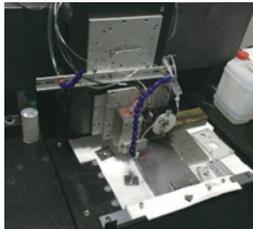
## User Manual

Version: V1.0



This document describes the following products:

- P92.X20S
- P92.X20K



# DECLARATION

This user manual is applicable to P92.X20 Fast Tool Positioning Stage, for your smooth and correct use of this product, please read this manual carefully before using it. Please follow the instructions in the installation and use process. Improper operation may cause injury to the operator and/or damage to the product, so it is required that the entire installation and operation process should be completed by professionals with a certain foundation and a certain understanding of product principles, or under the guidance of a professional.

If you disassemble or transform the product without permission, our company will not be responsible for any consequences arising therefrom.

To change the product model and other false sales of our company's products are illegal, users should be vigilant. Once found, you should actively report or contact our company, jointly crack down on illegal acts, and prevent fraud and economic losses. CoreMorrow will investigate for the legal responsibility of the illegal subject and related party.

With the continuous development and innovation of technology, CoreMorrow will timely add the latest information to the manual as required. If you need, please contact us, or to our website [www.coremorrow.com](http://www.coremorrow.com) for download, we apologize for any inconvenience caused to you.

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## 1. Introduction

### 1.1 Purpose and content

- ▶ The manual is mainly for your smooth and correct use of piezo stage.
- ▶ The manual contains all necessary information for P92.X20 piezo stage.
- ▶ The manual describes the precautions during installation and use.

### 1.2 Symbol and meaning



**DANGER:** Improper handling may could cause injury to the operator.



**Attention:** Improper handling can cause damage to the equipment.

- ▶ No order between items.

1. Please operating in order.
- 2.

### 1.3 Expected reader

The manual default user has knowledge of piezo stages and controllers, and has a basis for its installation and use.

### 1.4 Manual lost replacement

If the manual is accidentally lost, please contact our customer service department, we will send you the latest version of user manual.

## 2. Safety Guide

P92.X20 fast tool positioning stage is designed with the most advanced technology and safety standards for your own safety and the correct use of the product, please observe the following points when in use.



A change in temperature and pressure will charge the piezoelectric actuator, and the actuator will remain energized for a period of time when it is disconnected from the controller, So the operator should pay attention to when in use:

- ▶ Do not disassemble P92.X20 fast tool positioning stage.
- ▶ Discharge P92.X20 before installation, which can be done by connecting to the controller.
- ▶ Do not unplug the wire connecting with controller during operation.
- ▶ Before use, check whether the connection wire of the product is in good condition and whether the product and the controller are effectively grounded. During operation, strictly standardize the operation. Do not touch the product (up to 1000V voltage) with your hand when power on, in case of danger.



In order to prevent damage to the product caused by improper operation, the following points should be paid attention to when in use.

- ▶ P92.X20 fast tool positioning stage is used in a dust-free, oil-free and lubricant-free environment.
- ▶ As the product is designed with flexible structure, it is recommended that the load should not exceed load capacity of product. When loading, DO NOT apply torque force and DO NOT pry or twist the load surface, so as not to damage the structure.
- ▶ Recommended voltage range is 0~120V for long-term use and lifetime.
- ▶ Do not disassemble the product to avoid damage.
- ▶ Avoid stretching and bending the cable interface to prevent damage to the cable.
- ▶ Use the dedicated cable provided by CoreMorrow to connect P92.X20 fast tool positioning stage to controller.
- ▶ Do not connect via an extension cable casually, if you need a longer cable, please contact CoreMorrow.

## 3. Product Overview

### 3.1 Product Introduction

P92.X20 fast tool positioning stage has the following advantages:

▶ High performance piezo stack:

P92.X20 Fast Tool Positioning Stage is driven by a highly reliable ceramic actuator with a fully insulated structure, so its performance and service life are far better than the traditional actuator. The insulating layer can effectively prevent the piezoelectric ceramic from being damaged when exposed to moisture. Therefore, the stability of piezoelectric ceramics can be guaranteed under extreme circumstances. Compared with traditional driving mechanism, there are no transmission parts and friction. Therefore, ceramic actuator has the characteristics of no rebound, no maintenance, and no wear, etc.

▶ Flexible hinge structure:

P92.X20 Fast Tool Positioning Stage adopts flexible hinge mechanism has advantages of no friction, high positioning accuracy. Flexible hinge is an element not affected by static and dynamic friction, based on the elastic deformation of metal material (e.g., steel) , there is no rolling and sliding parts. Flexible unit has very high load capacity and stiffness. Hinge guide needs no maintenance and no wear and tear. Suitable for a wide range of temperatures, no lubricating oil is required.

▶ SGS sensor:

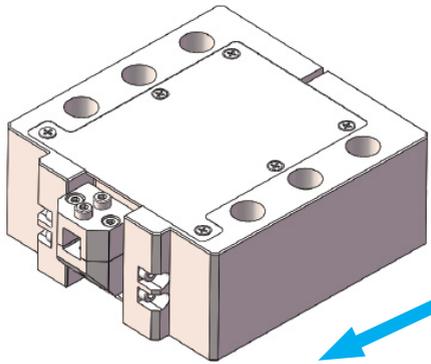
Strain sensor detects the position information by its own expansion. They are fixed in the proper position of the transmission part and measure the displacement of the moving part. This type of position measurement is made by contact and indirect measurement. So the displacement of the moving platform is measured by measuring lever, guide hinge, or piezoelectric ceramic stack.

The sensor is connected by a full bridge, no drift, and can be precisely positioned in the nanometer range. P92.X20 Fast Tool Positioning Stage has a travel range up to 18 $\mu$ m and features fast response speed, high repeatable positioning accuracy, high flexibility, easy to operate.

### 3.2 Product Features

- ▷ Max stroke to 18 $\mu$ m
- ▷ Operating frequency to 95Hz
- ▷ Load capacity to 300g

### 3.3 Motion Direction



## 4. Operating environment

- ▷ Operating temperature: -20~80°C
- ▷ Environment free of dust, clean, and non-corrosive substances
- ▷ Relative humidity: <60%
- ▷ Recommended voltage between 0~120V for long-term and high-reliability operation

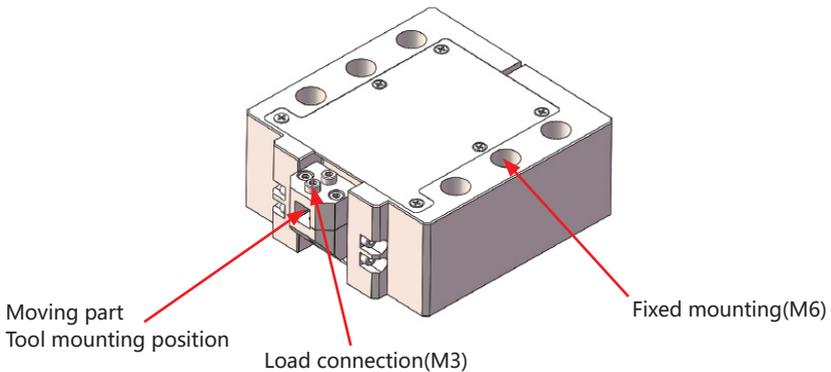
## 5. Installation and operation

Before installation, first check the safety, such as whether the cable is damaged or broken, and whether the power supply has grounding protection.

### 5.1 Installation and connection

1. Ensure that the installation plane is flat.
  2. Secure the piezo stage with M6 screws and tighten.
  3. Install the load and tighten properly to ensure positioning accuracy.
  4. Connect the cable to the corresponding interface of the controller according to the connector head.
- connector head.

P92.X20 installation diagram is as follows:

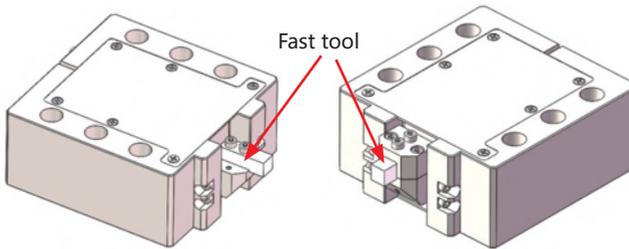


### 5.2 Load

When mounting the load, ensure that the load weight is less than the maximum load capacity of P92.X20, and try to mount the load in the center of the moving surface. The

two screws should be tightened, so as not to affect the dynamic characteristics of the fast tool.

The correct position to mount the load is shown below.



**Notice:**

- ▶ When mounting the load, tighten the load slowly. The torque should not be too large to prevent damage to the mechanism.
- ▶ Avoid stretching and bending cables.
- ▶ Use the dedicated cable provided by CoreMorrow to connect P92.X20 and the controller.
- ▶ Do not connect via an extension cable casually, if you need a longer cable, please contact CoreMorrow.

### 5.3 Operating

Please reconfirm the following information before turning on the power:

- ▶ Operating environment meets the operating environment requirements of P92.X20.
- ▶ Fixed screws must be tightened.

After the above information is confirmed, relevant controller operations can be carried out:

1. Please read the user manual of the controller carefully before operation, and then start the controller.
2. Set the controller' output voltage to zero first.
3. Check no abnormal phenomenon, then input voltage value (via keyboard or analog control) according to specified input voltage range.
4. Operating normally within the rated voltage range of piezoelectric ceramics (0~120V, maximum 150V).
5. After use, please carry out voltage reset operation.

Please take light steps when P92.X20 in operation, do not knock the product, so as not to affect the use of the product or even damage the product.

In order to achieve better motion precision of P92.X20, it is recommended to use our company's supporting controller. Please refer to the user manual of the controller for the specific operation to ensure correct operation before relevant operation.

**Notice:**

- ▶ The driving voltage shall not exceed the voltage(150V) range of P92.X20.
- ▶ If any abnormal noise or oscillation occurs during use, turn off the power immediately and check the parameter setting.

## 6. Transportation and inspection

### 6.1 Transportation

Piezo stage is packed in carton. The transportation is carried out under the condition of packaging. This product can be transported by various means of transportation under normal conditions. During transportation, it should avoid direct rain and snow, avoid contact with corrosive substances, and avoid strong collision, try to avoid improper behavior such as squeezing, irregular placement.

## 6.2 Unpacking inspection

Please check below information:

- ▶ Before opening the package, please carefully check the packaging for damage, bruising, wetting, moisture, deformation, etc.;
- ▶ Please check the parts on a case-by-case basis based on the supply contract and the packing list;
  - ▶ Whether there is obvious damage on the surface of the product;
  - ▶ Whether the product identification is clear and complete;
  - ▶ Whether the connector is loose, the connection line is broken or not, etc.;

If any of the above occurs, please make a detailed record and take a photo, and please contact us immediately.

### Precautions:

- ▶ Please handle gently when unpacking to avoid permanent damage to the stage caused by bumps;
- ▶ Please do not use heavy tools or use rough methods to open them;
- ▶ Please do not discard all packaging materials for return shipments.

# 7. Maintenance and processing

## 7.1 Problem Processing

Common problems are shown in the following table:

Problem Description	Possible reasons	Solutions
No displacement or displacement becomes smaller	The cable is not connected correctly or is in faulty contact.	Check the cable connection
	Excessive load	Loaded by product max load
	Sensor zero drift	Calibrate the sensor

Reduced accuracy	The installation base is uneven	Mount the stage on flat surface
	Loose connection	Fastening connection
	Wiring is wrong	Check the wiring is correct
Vibration or inaccurate positioning at start-up	The parameters are incorrect.	Stop immediately, check the parameter settings
	Resonance	operating frequency less than the resonant frequency

If the user has problems that could not be solved. Please record the fault situation and contact with us. The professional technical engineer would help solve the problem.

Problems caused by improper operation are not covered by the warranty;

CoreMorrow is not responsible for any problems caused by dismantling the piezo stage without permission.

## 7.2 Daily maintenance

If the piezo stage is not used for a long time, please store it in an room environment with no dust, good ventilation, clean and non-corrosive substances.

Please do not loosen the screws on the stage structure, avoiding to affect the accuracy of the stage.

### **Daily cleaning:**

Please disconnect the piezo stage to controller, then clean the surface of it.

When cleaning, first wipe a small amount of detergent with a towel and gently wipe the surface of the piezo stage, then wash it with alcohol. Please do not use ultrasonic waves for cleaning.

When cleaning the surface, try not to pick up the product. If it is necessary to pick up, please place a sponge under the piezo stage for protection, the piezo stage should not be too high from the sponge to prevent the piezo stage from falling off.

## 8. Customer Service

If you have questions about the products you are currently using, please let us know the following information:

- ▷ Product model and relevant number
- ▷ The controller model
- ▷ Software driver version
- ▷ Computer operating system that installs supporting software

## 9. Contact us

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