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ENGINEERING LAB INDIA	

Product Name :	**Product Code :**
CNC Milling Machine Comprehensive Training Workbench	POL-CNC0001

Description :

CNC Milling Machine Comprehensive Training Workbench

Technical Specification :

This test bench deeply analyzes the numerical control system to meet the electrical design of CNC machine tools, the fault design of CNC machine tools, the electrical assembly of CNC machine tools, and the numerical control of machine tools.

The test bench adopts a semi-physical milling machine to realize mechanical adjustment and installation of the machine tool (including spindle, feed axis, lead screw, bearing, nut pair, etc.), and meet the electromechanical joint adjustment of CNC machine tools. The milling machine uses a drill chuck clamping tool to directly machine the workpiece.

The test bench can set 28 common fault points and composite fault points.

The built-in PLC editor of the CNC system can download the ladder diagram on the PC.

The test bench is equipped with a semi-physical milling machine to process engineering plastics and plexiglass.

Product components

The CNC milling machine comprehensive experimental platform is composed of a wide-numbered control system, machine tool electrical control interface board, spindle frequency conversion speed regulation experiment board, AC servo drive and servo motor, input and output module, low-voltage electrical components and semi-physical milling machine.

The principle of numerical control

The numerical control console provides a complete control system. The control system has a complete system of GSK990 M numerical control technology. The console comprehensively analyzes the control principle and structure of the system, and electrically connects according to the requirements of real CNC equipment. The

CNC machine can be used to carry out CNC machining. At the same time, the CNC console provides circuit fault system for setting, repairing and evaluating common faults of CNC machine tools inside the control system. The fault system provides a fully open terminal interface, which can set circuit faults. The main device failure and the internal fault of the operating system are for the students to measure and judge. The teacher can set the fault, the student can realize the online measurement and troubleshooting, and can also realize the power-off measurement for troubleshooting, and improve the students' ability to solve the problem.

Training platform configuration

It consists of a control panel, a training table and a semi-physical milling machine. The console is made of iron double-layer matt dense spray structure, aluminum panel; the training table is iron double-layer matt dense spray structure, and the table top is fireproof, waterproof and wear-resistant high-density board. The semi-physical milling machine can directly demonstrate machine zero return, machine tool overtravel limit and so on.

Three-phase four-wire 380V AC power supply, the leakage protector controls the total power supply, and the power supply of the control panel is controlled by the key switch and the start-stop switch. The voltmeter monitors the grid voltage, and the ammeter monitors the total operating current of the equipment and is provided with indicator lights and fuse protection.

CNC system unit: It adopts system to control 3 digital control feed axes and 1 analog spindle.

Drive module: The feed axis adopts AC servo motor and servo drive to form a semi-open loop system.

Spindle module: The spindle motor is controlled by frequency converter to realize stepless frequency conversion speed regulation.

Outstanding features of the product:

The company has many years of experience in the production of CNC, so the CNC system is fully analyzed and displayed on the panel, and the functions of the CNC milling machine are all controlled by connectors. The control methods for all control units are as follows:

The test bench displays the global map of the control circuit of the universal milling machine. The trainee can use this diagram as a demonstration diagram of the design circuit to better understand the control method of the CNC milling machine. .

open structure, modular design: the experimental bench decomposes the numerical control system, expands the control interface to the panel of the experimental bench, and then uses the terminal block to be connected to each module board for control.

Three-phase inverter control unit: Connect to the numerical control system through the patch cord to carry out frequency conversion control, increase the hands-on ability of the trainees, and increase the understanding and analysis of the faults in the control process.

Servo drive control unit: Connect to the CNC system through the patch cord for servo drive control, increase the hands-on ability of the trainees, and let the trainees have a comprehensive understanding and analysis ability for the servo controller.

the MP unit: connected to the CNC system through the patch cord for manual control of the machine coordinate motion

CNC milling machine comprehensive experimental platform training program

The following experimental internship projects can be completed through the training platform.

CNC milling machine system operation and programming experiment (with semi-physical milling machine)

Commissioning operation and fault diagnosis experiment of spindle frequency conversion unit

AC servo motor operation and fault diagnosis experiment

Numerical Control Milling Machine Electrical Control Design and Analysis Experiment

CNC milling machine tool zero return experiment

CNC machine tool overrun limit experiment

Parameter setting experiment of numerical control system

Use of input and output signals

Cooling and illumination and fault diagnosis experiment of CNC milling machine

Screw pitch error compensation experiment

CNC milling machine electronic handwheel experiment

Machine tool RS232 serial communication experiment

Milling machine DNC processing experiment

CNC milling machine fault design exclusion test 28 items

2, manual programming and simulation processing training

CNC milling machine programming and simulation processing

Mastering the structure, format and command system of the NC program;

understanding of the basic operations of each system;

Understanding of the basic processing technology of CNC milling machines.

CNC milling machine programming and operation training

Master of CNC milling program editing

Mastering the basic operation of CNC milling machine

Skills application of CNC milling machine system function

Assembly and processing of parts in CNC milling

3, understand the common CNC machine tool fault detection and maintenance training

Basic requirements and troubleshooting methods for CNC machine maintenance

Common fault self-diagnosis technology

Common troubleshooting methods

Common faults and handling of CNC machine tools

4, semi-physical milling machine parameters:

Semi-physical milling machine can directly process workpieces, demonstrate machine tool zero return, machine tool overtravel limit, etc.

Cross table width (length × width): 450mm × 170mm

Cross table T-slot number and width: 3 × 12 mm

Spindle speed range: 20 ? 1500 rpm.

Spindle chuck clamping range: ?1 ~ ?13 mm

Workbench X-axis travel: 450mm

Workbench Y-axis travel: 250mm

Workbench Z-axis travel: 250mm

X, Y, Z axis fast moving speed (Max) ? 4.0 / 4.0 / 3m / min

Positioning accuracy: 0.02mm

Main motor power: 750W

Control system: (AC servo system)

Machine dimensions: 850 × 800 × 1600 mm

CNC milling machine comprehensive experimental bench outline drawing

Experimental platform technical parameters:

Input power: AC380V (three-phase), 50HZ

28 fault assessments

working environment: temperature -200C ± 400 C

the whole machine capacity: ? 3kVA;

Bench size: length × width × height (mm) = 1370 mm × 600 mm × 1890 mm;

Semi-physical milling machine size: length × width × height (mm) = 1200 mm × 800 mm × 2300 mm;

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