TINPENG

FLUID MECHANICS LAB EQUIPMENT

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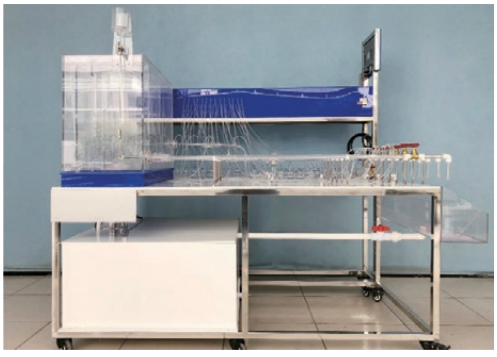
DYT001 MULTIFUNCTIONAL FLUID MECHANICS EXPERIMENT DEMONSTRATION

APPLICATION

Through this equipment, learn the operation process of fluid mechanics experiment.
This equipment can carry out the following experiments:

- ◎ Frictional Resistance Coefficient Determination Experiment
- ◎ Local Resistance Coefficient Determination Experiment (sudden expansion, sudden contraction experiment)
- ◎ Reynolds Experiment (fluid flow change in plexiglass tube)
- ◎ Bernoulli’ s Theorem Demonstration
- ◎ Flow Coefficient Measurement with Venturi Flowmeter
- ◎ Flow Coefficient Measurement with Orifice Flowmeter
  Flow Coefficient Measurement with Pitot-tube Flowmeter



DYT001 II DIGITAL FLUID MECHANICS EXPERIMENT DEMONSTRATION

TECHNICAL PARAMETERS

- ◎ Equipment working environment: normal temperature and normal pressure.
- ◎ Working power supply: AC220V, 50HZ, single-phase three-wire system.
- ◎ Safety protection: with grounding protection, leakage protection, overcurrent protection.
- ◎ Dimensions: 1960×900×1680mm.

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DYT005 II FLOW METER CALIBRATION DEMONSTRATION

APPLICATION

Calibrate homemade venturi and orifice flowmeters with standard electromagnetic flowmeters, vortex flowmeters and turbine flowmeters.

DYT016 REYNOLDS EXPERIMENT DEMONSTRATION

APPLICATION

- Used to determine the critical Reynolds number. Qualitative analysis experiments can be carried out - to observe the flow state change process of laminar flow and turbulent flow, and to reproduce the whole process of the Reynolds number experiment.
- Quantitative relationship between frictional loss and flow for laminar and turbulent flow in circular tubes.
- Quantitative analysis experiment - Determination of upper critical and lower critical Reynolds numbers, the results are consistent: Re lower critical = 2000-2300.
- Combined with the dimensional analysis method for experimental research. Determination of critical generalized Reynolds number under open channel by pipeline experiment.

DYT016 II DIGITAL REYNOLDS EXPERIMENT DEMONSTRATION

APPLICATION

- Used to determine the critical Reynolds number. Qualitative analysis experiment - to observe the flow state change process of laminar flow and turbulent flow, and to reproduce the whole process of the Reynolds number experiment.
- Quantitative relationship between frictional loss and flow for laminar and turbulent flow in circular tubes.
- Quantitative analysis experiment - Determination of upper critical and lower critical Reynolds numbers, the results are consistent: Re lower critical = 2000-2300.
- Combined with the dimensional analysis method for experimental research. Determination of critical generalized Reynolds number under open channel by pipeline experiment.

DYT017 CENTRIFUGAL PUMP DEMONSTRATION

APPLICATION

Test the pump characteristic curve of centrifugal pump, water pump cavitation and series and parallel characteristic test of water pump.

DYT017 II DIGITAL CENTRIFUGAL PUMP DEMONSTRATION

APPLICATION

Test the pump characteristic curve of centrifugal pump, water pump cavitation and series and parallel characteristic test of water pump.

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DYT018 SELF-CIRCULATING ORIFICE AND NOZZLE DEMONSTRATION

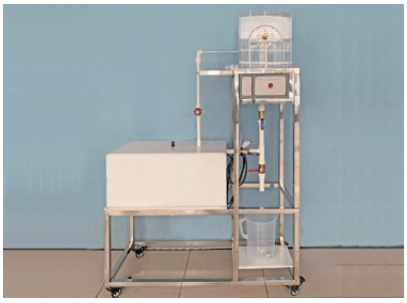
APPLICATION

- Measure the flow velocity coefficient, flow coefficient, side contraction coefficient, local resistance coefficient, and local vacuum of the right-angle nozzle outflow from the orifice and the nozzle.
- Stream pattern and resistance, large and small orifices and side contractions.
- An innovative research experiment on the correction factor of the flow out of the nozzle and the measurement of the thickness of the boundary layer.

DYT018 II DIGITAL SELF-CIRCULATING ORIFICE AND NOZZLE DEMONSTRATION

APPLICATION

- Measure the flow velocity coefficient, flow coefficient, side contraction coefficient, local resistance coefficient, and local vacuum of the right-angle nozzle outflow from the orifice and the nozzle.
- Stream pattern and resistance, large and small orifices and side contractions.
- An innovative research experiment on the correction factor of the flow out of the nozzle and the measurement of the thickness of the boundary layer.



DYT019 SELF-CIRCULATING MOMENTUM EQUATION DEMONSTRATION

APPLICATION

- Learn the structure, principles and experimental methods of equipment.
- Measure the force of the jet on a flat or curved plate and verify the constant flow equation.

DYT019 II DIGITAL SELF-CIRCULATING MOMENTUM EQUATION DEMONSTRATION

TECHNICAL PARAMETERS

- Working environment: normal temperature and normal pressure.
- Power supply: AC220V, 200W. Safety protection: with grounding protection.
- Installation of power supply lines and control lines: use environmental protection and flame retardant electrical wiring ducts, standardized and arranged in line with national standards, and have the characteristics of insulation, arc resistance, flame retardant and self-extinguishing. The wiring needs to be neat and reliable, and easy to find, repair and replace the wiring.
- Dimensions: 1100×450×1700mm.

DYT021 CHARACTERISTIC CURVE OF CENTRIFUGAL PUMP MEASURING DEMONSTRATION

APPLICATION

- Centrifugal pump characteristic curve test.

TECHNICAL PARAMETERS

- Working environment: normal temperature and normal pressure. Relative humidity: ≤ 90%RH.
- Power supply: AC220V/50Hz, 600W. Safety protection: with grounding protection, leakage protection, overcurrent protection.
- Installation of power supply lines and control lines: use environmental protection and flame retardant electrical wiring ducts, standardized and arranged in line with national standards, and have the characteristics of insulation, arc resistance, flame retardant and self-extinguishing. The wiring needs to be neat and reliable, and easy to find, repair and replace the wiring.
- Dimensions: 1500×470×1640mm.

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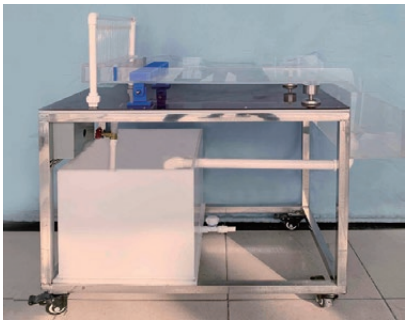
DYT021 II DIGITAL CHARACTERISTIC CURVE OF CENTRIFUGAL PUMP MEASURING DEMONSTRATION

APPLICATION

- Centrifugal pump characteristic curve test.



DYT023 LIQUID STREAMLINE DEMONSTRATION

DIMENSIONS: 1000×400×1000mm. Power: 200V, 80W

APPLICATION: Use the streamline formed when the foamed transformer oil flows through the guide vanes to observe the changes of the streamline when they pass through the surfaces of different specimens.

MAIN CONFIGURATION AND PARAMETERS: circulating oil tank, oil pump, oil tank, streamline generator, mobile test bench, cylindrical, wing-shaped workpiece.

DYT025 SELF-CIRCULATING CAVITATION MECHANISM DEMONSTRATION

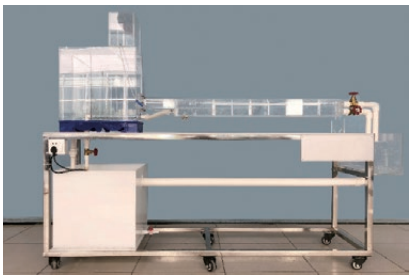
APPLICATION

- It can show various cavitation forms such as vortex type, separation type and wandering type, and can quantitatively measure its vaporization pressure.
- Demonstrate the process, phenomenon and mechanism of cavitation.
- Demonstrate the effect of runner body shape on cavitation.
- Demonstrate the principle of the cavitation pipe throttling device.
- Demonstrate the phenomenon of low pressure boiling of normal temperature water.

DYT026 TOTAL HYDROSTATIC FORCE ON PLANE SURFACE DEMONSTRATION

APPLICATION

- Verify the correctness of the hydrostatic force on plane surface theory.
- Determine the total hydrostatic force on a rectangular plane surface.



DYT030 SELF-CIRCULATION TURBULENCE MECHANISM DEMONSTRATION

APPLICATION

- It is used for experimental teaching of the mechanism of turbulence.
- Self-circulation, turbulent vortex dyeing can automatically decolor after display, demonstrating the whole process of laminar flow, wave formation and development, and wave transformation into vortex turbulence.

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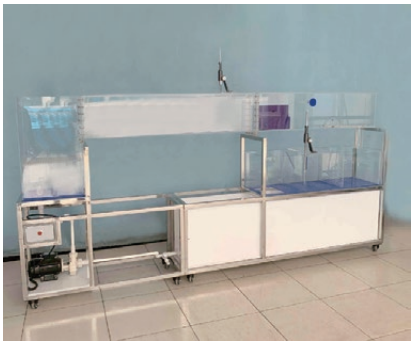


DYT041 SELF-CIRCULATING OPEN CHANNEL HYDRAULICS DEMONSTRATION

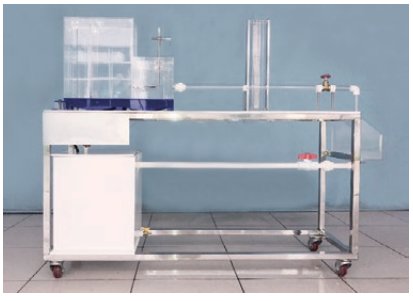
APPLICATION

- It can carry out a number of quantitative experiments such as weir flow, hydraulic jump experiment, stilling pool energy dissipation experiment, stilling sill energy dissipation experiment, and ski-jump energy dissipation experiment.
- It can demonstrate water flow phenomena such as thin-wall weir, bucket flow, WES weir, right-angle inlet wide-top weir, rounded inlet wide-top weir, and outflow under the gate.
- It can measure various hydraulic parameters such as the discharge coefficient of the weir flow, the submerged coefficient, and the conjugate water depth of the hydraulic jump.
- The parameters related to the underflow energy dissipation of underflow and ski-jump energy dissipation can be measured to verify the correctness of the design.
- Through experiments to deepen the understanding of the factors affecting roughness, draw the relationship curve between the uniform flow depth and roughness.

DYT043 HYDROSTATICS DEMONSTRATION

APPLICATION

- Verify the basic equations of incompressible hydrostatics, which can be used to analyze constant flow experiments under variable liquid level in the Mariotte vessel.
- Determine the pressure measuring tube and the connecting tube, observe the water head line of the pressure measuring tube, judge the isobaric surface, and observe the vacuum phenomenon.
- Oil depot liquid level height detection, household drinking water mechanism design, variable liquid level constant pressure system water supply design, etc.
- Various methods are used to determine the specific gravity and bulk density of an oil.
- Constant flow experiments and more than ten other qualitative and quantitative experiments.



DYT049 SELF-CIRCULATING PITOT TUBE DEMONSTRATION

APPLICATION

- Can carry out experiments on the flow velocity of the measuring point of the Prandtl Pitot tube, and can calibrate or correct the correction factor of the Pitot tube.
- The flow velocity distribution of the nozzle submerged jet through the flow section.

DYT049 II DIGITAL SELF-CIRCULATING PITOT TUBE DEMONSTRATION

APPLICATION

- Can carry out experiments on the flow velocity of the measuring point of the Prandtl Pitot tube, and can calibrate or correct the correction factor of the Pitot tube.
- The flow velocity distribution of the nozzle submerged jet through the flow section.

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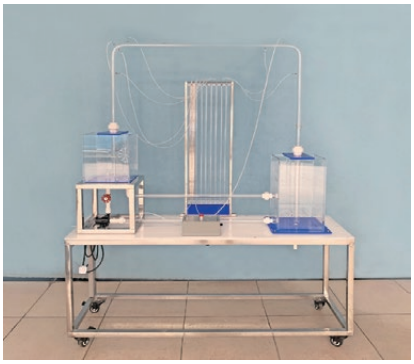


DYT053 SELF-CIRCULATING SIPHON DEMONSTRATION

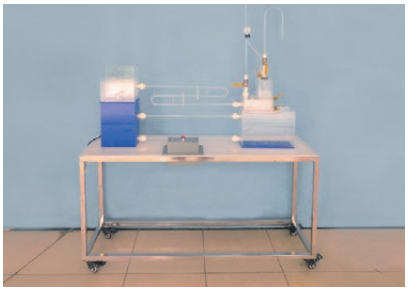
APPLICATION

- ◎ Experimental teaching for the working principle of siphon and its application;
- ◎ The working principle of elbow flowmeter;
- ◎ The pressure changes along the siphon;
- ◎ The working principle of the siphon valve;
- ◎ It can be used to measure the vacuum degree of the siphon and determine the maximum vacuum area;
- ◎ For qualitative analysis of energy conversion characteristics of siphon flow, siphon valve;
- ◎ It can demonstrate the principles of elbow flowmeter, frictional loss, local loss and so on.

DYT056 SELF-CIRCULATING LOCAL RESISTANCE DEMONSTRATION

APPLICATION

- ◎ It is used to train the skills of three-point method and four-point method to measure local head loss and local resistance coefficient.
- ◎ Verify the J.C.Bordas formula for the local resistance coefficient of sudden expansion and the empirical formula for the local resistance coefficient of sudden contraction.
- ◎ The change rule of the piezometric head line before and after the sudden change section deepens the understanding of the mechanism of local resistance loss.



DYT059 SELF-CIRCULATING WATER HAMMER DEMONSTRATION

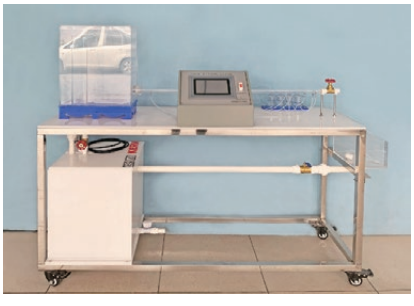
APPLICATION

- ◎ Generation of water hammer - the generation and spread of water hammer;
- ◎ Water hammer hazard - quantitative observation of water hammer pressure;
- ◎ The use of water hammer - the principle of water hammer pumping, the working principle of natural energy water pump;
- ◎ Elimination of water hammer hazards - the working principle of surge wells (bore).

DYT061 SELF-CIRCULATING FRICTIONAL RESISTANCE DEMONSTRATION

APPLICATION

- ◎ Quantitative relationship between the frictional loss and the mean velocity of laminar and turbulent flow in a circular tube.
- ◎ It can be used to measure the equivalent roughness of stainless steel pipes and other qualitative and quantitative experiments.
- ◎ It can measure the friction coefficient λ along the pipeline, and can be used to draw the $\lambda \sim Re$ curve.
- ◎ Through experiments, deepen the understanding of the law of the change of the frictional loss of the laminar flow and the turbulent flow with mean velocity.



DYT061 II DIGITAL SELF-CIRCULATING FRICTIONAL RESISTANCE DEMONSTRATION

TECHNICAL PARAMETERS

- ◎ Working environment: normal temperature and normal pressure. Relative humidity: ≤ 90%RH.
- ◎ Power supply: AC220V/50Hz
- ◎ Dimensions: 1500×450×1280mm

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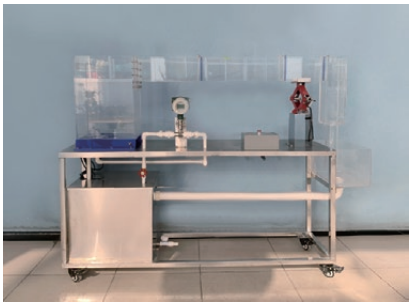

DYT065 SELF-CIRCULATING TILTING FLUME DEMONSTRATION

APPLICATION

- The real-time display of flow measurement and the manual measurement function coexist.
- Qualitative analysis experiments - demonstration of open channel flow regimes such as critical flow, rapid flow, slow flow, hydraulic jump, and hydraulic drop.
- Quasi-quantitative measurement experiment - 12 types of water surface curves for five types of slopes.
- It can conduct innovative, exploration, SRTP, graduation design, and postgraduate experiments related to variable-slope flumes, and demonstrate water flow phenomena such as thin-wall weirs and wide-top weirs (right-angle inlet, fillet-angle inlet and ridge-free).

DYT071 ORIFICE FLOWMETER DEMONSTRATION

APPLICATION

- Measure the flow coefficient μ of the orifice flowmeter, and learn the changing law of the flow coefficient;
- Familiar with the structure and application of throttling flowmeter;
- Learn the flow correction method of the flowmeter.

DYT076 PIPELINE SERIES AND PARALLEL DEMONSTRATION

TECHNICAL PARAMETERSZ

- Working environment: normal temperature and normal pressure. Relative humidity: ≤ 90%RH.
- Power supply: AC220V/50Hz
- Dimensions: 1500×450×1500mm

DYT081 SELF-CIRCULATING BERNOULLI EQUATION DEMONSTRATION

APPLICATION

- It is used for experimental analysis to study the on-way change law of the total head of the pipe flow and the head of the piezometric pipe and the conversion relationship between potential energy, pressure energy, kinetic energy and loss energy.
- Quantitative measurement experiments - verification of Bernoulli's equation, and analysis of the applicability of the energy equation.
- Qualitative analysis experiment - Demonstrate the total water head line and piezometric tube water head line directly displayed by the pressure gauge, the dynamic pressure distribution on the uniform flow and the non-uniform flow section, and the on-way energy conversion law.
- The influence of variable water level on the vacuum degree of the throat.
- Verify the Darcy-Weisbach formula for the equal Re number, and verify the local head loss formula experiment.
- Shows the relationship between the mean velocity of the section and the point velocity.
- Application mechanism and practice of Venturi flowmeter.

DYT081 II DIGITAL SELF-CIRCULATING BERNOULLI EQUATION DEMONSTRATION

TECHNICAL PARAMETERS

- Working environment: normal temperature and normal pressure. Relative humidity: ≤ 90%RH.
- Power supply: AC220V/50Hz
- Dimensions: 1650×450×1280mm

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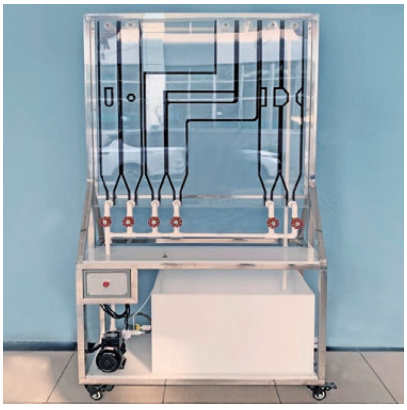
DYT096 HYDROSTATIC TRANSMISSION DEMONSTRATION

APPLICATION

- Demonstrate the hydraulic phenomenon of automatic pumping under the action of hydrostatic transmission.
- It can be used for experimental analysis of hydrostatic transmission characteristics, hydraulic principle and its occurrence conditions, and siphon principle.

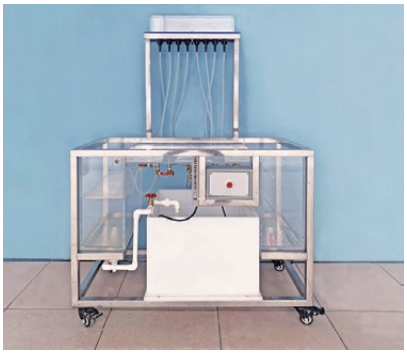


DYT116 VORTEX DEMONSTRATION

DIMENSIONS: 1000×420×2000mm; Power: 200V, 370W

APPLICATION: Demonstrate the change of the vortex area when fluid flows through bridge piers, cylinders, right-angled bends, fillet-angle bends, and sudden contractions, sudden expansions and converging diverging pipes, and can observe typical Von Karman vortices.

MAIN CONFIGURATION AND PARAMETERS: Circulating water tank, water pump, overflow tank, flat trough and workpiece, steel angle iron bracket, copper valve adjustment group.



DYT121 POTENTIAL FLOW SUPERPOSITION DEMONSTRATION

APPLICATION

- Understand the basic composition and process of the potential flow superposition demonstrator.
- Observe the superposition of potential flows when the fluid flows through the specimen.
- Observation and analysis of the phenomena appearing in the experiment will deepen the understanding of the superposition of potential flows.

DYT166 SELF-CIRCULATING VENTURI FLOWMETER DEMONSTRATION

APPLICATION

- Calibrate the flow coefficient of the flowmeter, and qualitatively analyze the correlation with the Reynolds number R.
- Learn the Venturi flowmeter structure and arrangement. Porous pressure equalizing ring structure.
- Theoretical analysis and experiment of the maximum allowable overflow of Venturi flowmeter.
- It can be used for experimental analysis of the partial vacuum of the Venturi flowmeter, to analyze the hydraulic conditions and structural conditions generated by the Venturi cavitation tube, and a number of other qualitative and quantitative experiments.

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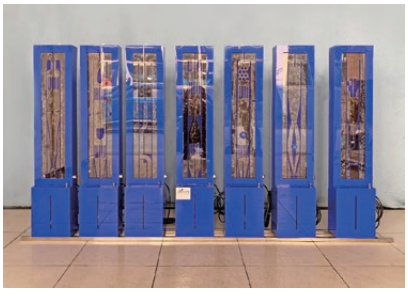
DYT166 II DIGITAL SELF-CIRCULATING VENTURI FLOWMETER DEMONSTRATION

- Working environment: normal temperature and normal pressure. Relative humidity: ≤ 90%RH.
- Power supply: AC220V/50Hz
- Dimensions: 1650×450×1280mm

DYT181 SELF-CIRCULATING REYNOLDS AND BERNOULLI EQUATIONS DEMONSTRATION

APPLICATION

- It is used to determine the critical Reynolds number, and can do qualitative analysis experiment - observe the flow regime change process of laminar flow and turbulent flow, and reproduce the whole process of the Reynolds number experiment.
- Quantitative relationship between frictional loss and flow rates for laminar and turbulent flow in circular tubes.
- Determine the upper critical and lower critical Reynolds numbers, the results should be consistent with: Re lower critical = 2000-2300.
- It is used for experimental analysis to study the on-way change law of the total head of the pipe flow and the head of the piezometric pipe and the conversion relationship between potential energy, pressure energy, kinetic energy and loss energy.
- Verification of the Bernoulli equation, and analysis of the applicability of the energy equation.
- Demonstrate the total water head line and piezometric tube water head line directly displayed by the pressure gauge, the dynamic pressure distribution on the uniform flow and the non-uniform flow section, and the on-way energy conversion law.



DYT190 SELF-CIRCULATING FLOW DEMONSTRATION

APPLICATION

The display screen is composed of self-circulating multi-flow channels, bubbles are used as the tracer medium, and light refraction technology is used to demonstrate more than 30 flow spectrum patterns and related principles. For example, to demonstrate the vortex formation in the internal flow field, boundary layer separation, medium transport, water plug and other flow channel flow pattern. Demonstrate the flow field flow pattern of outflow wake formation, Karman vortex street, mass and heat transfer. Demonstrate flow patterns such as jet elements, Coanda effect and jet control principles.

DYT191 SELF-CIRCULATING FLOW PATTERN AND STREAMLINE DEMONSTRATION

APPLICATION

- The display screen is composed of self-circulating multi-flow channels, and chemical solution is used as the working fluid. The streamline and pathlines are displayed by electronically controlled dyeing. After passing through the display screen, they can be automatically decolorized and can be self-circulating for a long time.
- It can demonstrate the streamline and pathlines of the flow around the wing and the direction of lift, and demonstrate more than ten potential flow patterns and related principles.
- Demonstrate flow patterns of Venturi and orifice tube flow, gradual diffusion, gradual contraction, sudden expansion, sudden contraction, streamline, pathlines, and other potential flow patterns of open channel rams and planar confluence.

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DYT192 SELF-CIRCULATING DARCY FLOW DEMONSTRATION

APPLICATION

- Determine the permeability coefficient K of three kinds of sand gravel samples.
- It can verify Darcy formula and is suitable for steady flow conditions.
- Deepen the understanding of the relationship between seepage velocity, hydraulic gradient and permeability coefficient, and be familiar with the method of measuring permeability coefficient in the laboratory.
- It can verify Darcy formula, which is applicable to both steady flow conditions and unstable flow conditions.

DYT386 RIVER DYNAMICS DEMONSTRATION (CUSTOMIZABLE)

APPLICATION

- Experiment on the starting velocity of uniform sand: to understand the experimental method of the starting velocity of sediment. Experiment on the starting velocity of uniform sand: an experimental method to understand the starting velocity of sediment. Observe the starting process of the uniform sand. The measured average velocity of the vertical line or the average velocity of the section. Observe the water level and grasp the water surface slope.
- Sand wave movement and bed load transport experiment: understand the experimental methods of sand wave movement and bedding sediment transport, and observe the formation, shape and movement characteristics of sand waves. Recognize collective forms of bed load sediment movement on sand wave motion beds. Analyze the influence of sand wave motion on water flow resistance, understand bed load motion, and calculate bed load transport rate.
- Experiment on concentration distribution of suspended sediment along depth: Learn the general method of carrying out the experiment of the suspended sediment content along depth in the laboratory water tank, and deepen the understanding of the general law of the suspended sediment content along depth.
- Water flow characteristics test on curve experiment: Understand the experimental method of curved channels, observe the slope of water surface in the bend, the flow direction of the surface water flow and the bottom water flow, the movement direction of the bottom sand, and observe the on-way change of the flow hydrodynamic axis.

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Type II is a data acquisition type, and the device provides two monitoring methods:

- The upper computer touch screen is combined with PLC modules, sensors, etc. to form an industrial control system. The industrial 7-inch LCD touch screen combined with the mainstream PLC module provides on-site monitoring of the acquisition system, which can monitor and save the data of all current acquisition points and provide switch control. The system has a communication expansion function.
- The digital display meter is combined with sensors and control buttons to form a display control system. Mainstream digital display meters collect and display data, and buttons control the start and stop of the equipment. The system has a communication expansion function.

Type III is computer control type, adopts Siemens controller and analog acquisition module, with high control sensitivity, safe and stable system, timely and accurate data acquisition. Combined with the touch screen or the host computer, the collected data can be displayed, analyzed and processed in real time through the CPU, automatically generating tables, data curves, historical data records, and equipped with the dynamic display function of the system operation. The effect is intuitive and realistic. The equipment has the functions of near control and remote control, which can realize manual control, automatic control and remote centralized control. Equipped with an Ethernet module, the computer can be connected to the device for remote control. The system has the simulation function of the host computer. Without the need for hardware operation, it can be used as a simulation software to simulate the experimental process, select and set process parameters, environmental parameters and equipment parameters, and obtain the operation results. It can automatically calculate the experimental results and generate the experimental report.

Model	Name	Application
DYT001	Fluid Mechanics Experiment Demonstration	▸ Frictional Resistance Coefficient Determination Experiment ▸ Local Resistance Coefficient Determination Experiment (sudden expansion, sudden contraction experiment) ▸ Reynolds Experiment (fluid flow change in plexiglass tube) ▸ Bernoulli's Theorem Demonstration ▸ Flow Coefficient Measurement with Venturi Flowmeter ▸ Flow Coefficient Measurement with Orifice Flowmeter ▸ Flow Coefficient Measurement with Pitot-tube Flowmeter
DYT001 II	Digital Fluid Mechanics Experiment Demonstration	
DYT001 III	Microcomputer Fluid Mechanics Experiment Demonstration	
DYT005 II	Flow Meter Calibration Demonstration	▸ Calibrate homemade venturi and orifice flowmeters with standard electromagnetic flowmeters, vortex flowmeters and turbine flowmeters.
DYT011	Flow Detection and Control System Demonstration	▸ It has the measurement technical skills training function of electromagnetic flowmeter, vortex flowmeter, differential pressure flowmeter and pressure sensor; ▸ Meet the teaching requirements of understanding the structure, composition and functions of computer data acquisition and control systems; ▸ The experimental teaching software for flow detection and automatic control has teaching functions such as data acquisition, calibration, automatic control of flow and water level, result display, printing, automatic switch control of pumps, water level inspection, and flow adjustment.

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Model	Name	Application
DYT016	Reynolds Experiment Demonstration	▸ Used to determine the critical Reynolds number. Qualitative analysis experiments can be carried out - to observe the flow state change process of laminar flow and turbulent flow, and to reproduce the whole process of the Reynolds number experiment. ▸ Quantitative relationship between frictional loss and flow for laminar and turbulent flow in circular tubes. ▸ Quantitative analysis experiment - Determination of upper critical and lower critical Reynolds numbers, the results are consistent: Re lower critical = 2000-2300. ▸ Combined with the dimensional analysis method for experimental research. Determination of critical generalized Reynolds number under open channel by pipeline experiment.
DYT016 II	Digital Reynolds Experiment Demonstration	
DYT016 III	Microcomputer Reynolds Experiment Demonstration	
DYT017	Centrifugal Pump Demonstration	▸ Test the pump characteristic curve of centrifugal pump, water pump cavitation and series and parallel characteristic test of water pump.
DYT017 II	Digital Centrifugal Pump Demonstration	
DYT017 III	Microcomputer Centrifugal Pump Demonstration	
DYT018	Self-Circulating Orifice and Nozzle Demonstration	▸ Measure the flow velocity coefficient, flow coefficient, side contraction coefficient, local resistance coefficient, and local vacuum of the right-angle nozzle outflow from the orifice and the nozzle. ▸ Stream pattern and resistance, large and small orifices and side contractions. ▸ An innovative research experiment on the correction factor of the flow out of the nozzle and the measurement of the thickness of the boundary layer.
DYT018 II	Digital Self-Circulating Orifice and Nozzle Demonstration	
DYT018 III	Microcomputer Self-Circulating Orifice and Nozzle Demonstration	
DYT019	Self-Circulating Momentum Equation Demonstration	▸ Learn the structure, principles and experimental methods of equipment. ▸ Measure the force of the jet on a flat or curved plate and verify the constant flow equation.
DYT019 II	Digital Self-Circulating Momentum Equation Demonstration	
DYT021	Characteristic Curve of Centrifugal Pump Measuring Demonstration	▸ Centrifugal pump characteristic curve test.
DYT021 II	Digital Characteristic Curve of Centrifugal Pump Measuring Demonstration	

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Model	Name	Application
DYT022 II	Centrifugal Pump Cavitation Erosion Demonstration	▸ Used for centrifugal pump cavitation erosion experiment.
DYT023	Liquid Streamline Demonstration Oil Tank Streamline Demonstration	▸ Use the streamlines formed when the foamed transformer oil flows through the guide vanes to observe the changes of the streamlines when they pass through the surfaces of different specimens.
DYT025	Self-circulating Cavitation Mechanism Demonstration	▸ It can show various cavitation forms such as vortex type, separation type and wandering type, and can quantitatively measure its vaporization pressure. ▸ Demonstrate the process, phenomenon and mechanism of cavitation. ▸ Demonstrate the effect of runner body shape on cavitation. ▸ Demonstrate the principle of the cavitation pipe throttling device. ▸ Demonstrate the phenomenon of low pressure boiling of normal temperature water.
DYT026	Total Hydrostatic Force on Plane Surface Demonstration	▸ Verify the correctness of the hydrostatic force on plane surface theory. ▸ Determine the total hydrostatic force on a rectangular plane surface.
DYT030	Self-circulation Turbulence Mechanism Demonstration	▸ It is used for experimental teaching of the mechanism of turbulence. ▸ Self-circulation, turbulent vortex dyeing can automatically decolor after display, demonstrating the whole process of laminar flow, wave formation and development, and wave transformation into vortex turbulence.
DYT041	Self-Circulating Open Channel Hydraulics Demonstration	▸ It can carry out a number of quantitative experiments such as weir flow, hydraulic jump experiment, stilling pool energy dissipation experiment, stilling sill energy dissipation experiment, and ski-jump energy dissipation experiment. ▸ It can demonstrate water flow phenomena such as thin-wall weir, bucket flow, WES weir, right-angle inlet wide-top weir, rounded inlet wide-top weir, and outflow under the gate. ▸ It can measure various hydraulic parameters such as the discharge coefficient of the weir flow, the submerged coefficient, and the conjugate water depth of the hydraulic jump. ▸ The parameters related to the underflow energy dissipation of underflow and ski-jump energy dissipation can be measured to verify the correctness of the design. ▸ Through experiments to deepen the understanding of the factors affecting roughness, draw the relationship curve between the uniform flow depth and roughness.

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Model	Name	Application
DYT043	Hydrostatics Demonstration	▸ Verify the basic equations of incompressible hydrostatics, which can be used to analyze constant flow experiments under variable liquid level in the Mariotte vessel. ▸ Determine the pressure measuring tube and the connecting tube, observe the water head line of the pressure measuring tube, judge the isobaric surface, and observe the vacuum phenomenon. ▸ Oil depot liquid level height detection, household drinking water mechanism design, variable liquid level constant pressure system water szupply design, etc. ▸ Various methods are used to determine the specific gravity and bulk density of an oil. ▸ Constant flow experiments and more than ten other qualitative and quantitative experiments.
DYT045	Self-Circulating Energy Equation Demonstration	▸ Verify the energy equation of the constant total flow of fluid; ▸ Through the experimental analysis and research of many hydraulic phenomena in hydrodynamics, master the energy conversion characteristics of hydrodynamics in pressure pipe flow; ▸ The conversion between kinetic energy and potential energy can be visually demonstrated, and the flow velocity and head can be measured; ▸ The pressure measuring plate directly displays the total water head line and the piezometer tube water head line.
DYT049	Self-Circulating Pitot Tube Demonstration	▸ Can carry out experiments on the flow velocity of the measuring point of the Prandtl Pitot tube, and can calibrate or correct the correction factor of the Pitot tube. ▸ The flow velocity distribution of the nozzle submerged jet through the flow section.
DYT049 II	Digital Self-Circulating Pitot Tube Demonstration	
DYT049 III	Microcomputer Self-Circulating Pitot Tube Demonstration	
DYT053	Self-Circulating Siphon Demonstration	▸ Experimental teaching for the working principle of siphon and its application; ▸ The working principle of elbow flowmeter; ▸ The pressure changes along the siphon; ▸ The working principle of the siphon valve; ▸ It can be used to measure the vacuum degree of the siphon and determine the maximum vacuum area; ▸ For qualitative analysis of energy conversion characteristics of siphon flow, siphon valve; ▸ It can demonstrate the principles of elbow flowmeter, frictional loss, local loss and so on.
DYT053II	Self-Circulating Siphon Demonstration	

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Model	Name	Application
DYT056	Self-Circulating Local Resistance Demonstration	▸ It is used to train the skills of three-point method and four-point method to measure local head loss and local resistance coefficient. ▸ Verify the J.C.Bordas formula for the local resistance coefficient of sudden expansion and the empirical formula for the local resistance coefficient of sudden contraction. ▸ The change rule of the piezometric head line before and after the sudden change section deepens the understanding of the mechanism of local resistance loss.
DYT056 II	Digital Self-Circulating Local Resistance Demonstration	
DYT056 III	Microcomputer Self-Circulating Local Resistance Demonstration	
DYT059	Self-Circulating Water Hammer Demonstration	▸ Generation of water hammer - the generation and spread of water hammer; ▸ Water hammer hazard - quantitative observation of water hammer pressure; ▸ The use of water hammer - the principle of water hammer pumping, the working principle of natural energy water pump; ▸ Elimination of water hammer hazards - the working principle of surge wells (bore).
DYT061	Self-Circulating Frictional Resistance Demonstration	▸ Quantitative relationship between the frictional loss and the mean velocity of laminar and turbulent flow in a circular tube. ▸ It can be used to measure the equivalent roughness of stainless steel pipes and other qualitative and quantitative experiments. ▸ It can measure the friction coefficient λ along the pipeline, and can be used to draw the λ～Re curve. ▸ Through experiments, deepen the understanding of the law of the change of the frictional loss of the laminar flow and the turbulent flow with mean velocity.
DYT061 II	Digital Self-Circulating Frictional Resistance Demonstration	
DYT061 III	Microcomputer Self-Circulating Frictional Resistance Demonstration	
DYT065	Self-Circulating Tilting Flume Demonstration	▸ The real-time display of flow measurement and the manual measurement function coexist. ▸ Qualitative analysis experiments - demonstration of open channel flow regimes such as critical flow, rapid flow, slow flow, hydraulic jump, and hydraulic drop. ▸ Quasi-quantitative measurement experiment - 12 types of water surface curves for five types of slopes. ▸ It can conduct innovative, exploration, SRTP, graduation design, and postgraduate experiments related to variable-slope flumes, and demonstrate water flow phenomena such as thin-wall weirs and wide-top weirs (right-angle inlet, fillet-angle inlet and ridge-free).
	Variable Bottom Slope Tilting Flume Demonstration	
	Variable Slope Water Surface Curve Demonstration	

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Model	Name	Application
DYT071	Orifice Flowmeter Demonstration	▸ Measure the flow coefficient μ of the orifice flowmeter, and learn the changing law of the flow coefficient; ▸ Familiar with the structure and application of throttling flowmeter; ▸ Learn the flow correction method of the flowmeter.
DYT071 II	Orifice Flowmeter Demonstration	
DYT076	Pipeline Series and Parallel Demonstration	Technical parameters ▸ Water supply tank: volume about 25L, high quality PVC material; ▸ Water supply pump: It adopts low-noise, rust-free and environmentally friendly booster pump with a maximum lift of 10m, a rated flow of 12L/min, and a power of 90W; ▸ Experimental pipeline: plexiglass material, 3 pieces, ф 20mm, 1000mm long; ▸ Metering water tank: made of transparent plexiglass; ▸ Pressure measuring plate: differential pressure gauge φ 8X550mm, indicator liquid is water, transparent plexiglass material.
DYT081	Self-Circulating Bernoulli Equation Demonstration	▸ It is used for experimental analysis to study the on-way change law of the total head of the pipe flow and the head of the piezometric pipe and the conversion relationship between potential energy, pressure energy, kinetic energy and loss energy. ▸ Quantitative measurement experiments - verification of Bernoulli's equation, and analysis of the applicability of the energy equation. ▸ Qualitative analysis experiment - Demonstrate the total water head line and piezometric tube water head line directly displayed by the pressure gauge, the dynamic pressure distribution on the uniform flow and the non-uniform flow section, and the on-way energy conversion law. ▸ The influence of variable water level on the vacuum degree of the throat. ▸ Verify the Darcy-Weisbach formula for the equal Re number, and verify the local head loss formula experiment. ▸ Shows the relationship between the mean velocity of the section and the point velocity. ▸ Application mechanism and practice of Venturi flowmeter.
DYT081 II	Digital Self-Circulating Bernoulli Equation Demonstration	
DYT081 III	Microcomputer Self-Circulating Bernoulli Equation Demonstration	
DYT096	Hydrostatic Transmission Demonstration	▸ Demonstrate the hydraulic phenomenon of automatic pumping under the action of hydrostatic transmission. ▸ It can be used for experimental analysis of hydrostatic transmission characteristics, hydraulic principle and its occurrence conditions, and siphon principle.

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Model	Name	Application
DYT116	Vortex Demonstration	▸ Demonstrate the change of the vortex area when fluid flows through bridge piers, cylinders, right-angled bends, fillet-angle bends, and sudden contractions, sudden expansions and converging diverging pipes, and can observe typical Von Karman vortices.
DYT121	Potential Flow Superposition Demonstration	▸ Understand the basic composition and process of the potential flow superposition demonstrator. ▸ Observe the superposition of potential flows when the fluid flows through the specimen. ▸ Observation and analysis of the phenomena appearing in the experiment will deepen the understanding of the superposition of potential flows.
DYT131	Fluid Flow Resistance Measurement Demonstration	▸ Learn how to measure the frictional resistance △ Pf of the straight pipe and the friction coefficient λ of the straight pipe; ▸ Master the relationship between the friction coefficient λ and the Reynolds number Re and its variation rule under different flow rates. Verify the relationship between λ and Re in laminar, transitional, and turbulent regions; ▸ Determine the local resistance coefficient of fluid flowing through the valve under turbulent flow conditions; ▸ Learn how to measure differential pressure with differential pressure sensor and flow meter to measure flow; ▸ Learn how to use the logarithmic coordinate system.
DYT151 II	Water Hammer Demonstration	▸ Carry out water hammer test.
DYT166	Self-Circulating Venturi Flowmeter Demonstration	▸ Calibrate the flow coefficient of the flowmeter, and qualitatively analyze the correlation with the Reynolds number R. ▸ Learn the Venturi flowmeter structure and arrangement. Porous pressure equalizing ring structure. ▸ Theoretical analysis and experiment of the maximum allowable overflow of Venturi flowmeter. ▸ It can be used for experimental analysis of the partial vacuum of the Venturi flowmeter, to analyze the hydraulic conditions and structural conditions generated by the Venturi cavitation tube, and a number of other qualitative and quantitative experiments.
DYT166 II	Digital Self-Circulating Venturi Flowmeter Demonstration	
DYT166 III	Microcomputer Self-Circulating Venturi Flowmeter Demonstration	

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Model	Name	Application
DYT181	Self-Circulating Reynolds and Bernoulli equations Demonstration	▸ It is used to determine the critical Reynolds number, and can do qualitative analysis experiment - observe the flow regime change process of laminar flow and turbulent flow, and reproduce the whole process of the Reynolds number experiment. ▸ Quantitative relationship between frictional loss and flow rates for laminar and turbulent flow in circular tubes. ▸ Determine the upper critical and lower critical Reynolds numbers, the results should be consistent with: Re lower critical = 2000-2300. ▸ It is used for experimental analysis to study the on-way change law of the total head of the pipe flow and the head of the piezometric pipe and the conversion relationship between potential energy, pressure energy, kinetic energy and loss energy. ▸ Verification of the Bernoulli equation, and analysis of the applicability of the energy equation. ▸ Demonstrate the total water head line and piezometric tube water head line directly displayed by the pressure gauge, the dynamic pressure distribution on the uniform flow and the non-uniform flow section, and the on-way energy conversion law.
DYT181 III	Microcomputer Self-Circulating Reynolds and Bernoulli equations Demonstration	
DYT182	Self-circulating Reynolds and Venturi Demonstration	▸ Demonstrate laminar flow, transition flow, turbulent flow and their transitions, and measure the critical Reynolds coefficient; ▸ The pressure plate directly displays the main head line and the piezometric head line. It can be used to demonstrate the conversion of kinetic energy and potential energy, and to measure the flow head.
DYT182 II	Digital Self-circulating Reynolds and Venturi Demonstration	
DYT182 III	Microcomputer Self-circulating Reynolds and Venturi Demonstration	
DYT190	Self-Circulating Flow Demonstration Multi-Boundary Condition Flow Demonstration	The display screen is composed of self-circulating multi-flow channels, bubbles are used as the tracer medium, and light refraction technology is used to demonstrate more than 30 flow spectrum patterns and related principles. For example, to demonstrate the vortex formation in the internal flow field, boundary layer separation, medium transport, water plug and other flow channel flow pattern. Demonstrate the flow field flow pattern of outflow wake formation, Karman vortex street, mass and heat transfer. Demonstrate flow patterns such as jet elements, Coanda effect and jet control principles.

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Model	Name	Application
DYT191	Self-Circulating Flow Pattern and Streamline Demonstration	▸ The display screen is composed of self-circulating multi-flow channels, and chemical solution is used as the working fluid. The streamlines and pathlines are displayed by electronically controlled dyeing. After passing through the display screen, they can be automatically decolorized and can be self-circulating for a long time. ▸ It can demonstrate the streamlines and pathlines of the flow around the wing and the direction of lift, and demonstrate more than ten potential flow patterns and related principles. ▸ Demonstrate flow patterns of Venturi and orifice tube flow, gradual diffusion, gradual contraction, sudden expansion, sudden contraction, streamlines, pathlines, and other potential flow patterns of open channel rams and planar confluence.
DYT192	Self-Circulating Darcy Flow Demonstration	▸ Determine the permeability coefficient K of three kinds of sand gravel samples. ▸ It can verify Darcy formula and is suitable for steady flow conditions. ▸ Deepen the understanding of the relationship between seepage velocity, hydraulic gradient and permeability coefficient, and be familiar with the method of measuring permeability coefficient in the laboratory. ▸ It can verify Darcy formula, which is applicable to both steady flow conditions and unstable flow conditions.
DYT211	Double Tilting Flume	▸ It can demonstrate various water surface curves and calculate flow. ▸ It can quantitatively measure the critical bottom slope, critical flow, and critical water surface curve. It can demonstrate and analyze the flow connection phenomenon of flat slope, inverted slope, critical slope, steep slope and gentle slope. Twelve water surface curvatures in prismatic channels can be demonstrated and analyzed.
DYT371	Flow velocity measurement device in pipeline	▸ Measure the flow by the differential pressure flow measuring device and the throttling flow measuring device installed in the pipeline, and calibrate the respective flow coefficients or correction coefficients.
DYT381	Liquid Relative Equilibrium Demonstration Liquid Forced Vortex Demonstration	▸ Demonstrate the equilibrium state of the liquid in the constant angular velocity rotating container and the separation of impurities greater than or less than the bulk density of the liquid; ▸ The theoretical relationship between the two can be verified by measuring the rotational speed and the superelevation of the liquid level; ▸ The theoretical free surface equation can be verified by measuring the liquid level curve.

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Model	Name	Application
DYT391	Self-Circulating River Channel and Water Supply Pipeline Demonstration	▸ Experiment on the starting velocity of uniform sand: to understand the experimental method of the starting velocity of sediment. Experiment on the starting velocity of uniform sand: an experimental method to understand the starting velocity of sediment. Observe the starting process of the uniform sand. The measured average velocity of the vertical line or the average velocity of the section. Observe the water level and grasp the water surface slope. ▸ Sand wave movement and bed load transport experiment: understand the experimental methods of sand wave movement and bedding sediment transport, and observe the formation, shape and movement characteristics of sand waves. Recognize collective forms of bed load sediment movement on sand wave motion beds. Analyze the influence of sand wave motion on water flow resistance, understand bed load motion, and calculate bed load transport rate. ▸ Experiment on concentration distribution of suspended sediment along depth: Learn the general method of carrying out the experiment of the suspended sediment content along depth in the laboratory water tank, and deepen the understanding of the general law of the suspended sediment content along depth. ▸ Water flow characteristics test on curve experiment: Understand the experimental method of curved channels, observe the slope of water surface in the bend, the flow direction of the surface water flow and the bottom water flow, the movement direction of the bottom sand, and observe the on-way change of the flow hydrodynamic axis.
DYT396	Circulating Water Tank Demonstration	The entire system is powered by the impeller in the power section, which enables the water in the tank to circulate. The water flows into the rectification section from the return pipe, and then flows into the contraction section after being rectified by the orifice plate, the deflector, the honeycomb and the damping net. The water accelerated by the contraction section flows into the working section, and flows into the power section through the diffusion section. The impeller in the middle of the power section accelerates the water, so that the water flows into the return pipe to form a circulating flow of water.
DYT501	Multi-Channel Signal Acquisition and Monitoring System	This system is mainly developed to satisfy design and independent innovation experiments. Realize the data acquisition and analysis functions of any physical quantity (such as flow velocity, flow rate, water level, pressure, strain, vibration and other analog voltages), including general spectrum analysis functions, simultaneous acquisition of multi-channel signals, and multi-channel trigger control functions. Multi-channel arbitrary physical quantity data acquisition: the user is required to provide the voltage range of the input signal -5V~+5V; 4-20mA; RS485 or RS232 communication, etc.; The AIoT-based remote monitoring system adopts a new generation of Internet of Things technology, embedded WEB server, and convenient access to communication software, which can be accessed through various terminals such as computers, mobile phones and tablets.

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