

产品类成果

波高、掺气、电导率仪及多功能监测系统



【创新性】

波高、掺气、电导率仪及多功能监测系统，属我院在国内水力学专业领域首创的动态测试仪器。电容式波高仪结构简单无扰流、清水浑水介质兼容、温度自动校准。比国外同类钽丝电容或电阻式波高仪抗干扰能力强、精度高、响应快、稳定性好、经久耐用、性价比高。电阻式掺气仪具有结构稳固、来流平顺、操作简便等特征，适于点域掺气浓度动态特征描述，既适于模型试验又适于原型水流掺气浓度检测。动态电导率仪，采用有效隔离技术克服共水域交互干扰难题，可快速、多点在线跟踪与同步测量浓度场大范围的时空变化。多功能监测系统，集水力学相关的多种物理量参数及传感器接口，包括压强、水位、波浪、流速、风速、电导率、温盐度、拉压力、振动加速度及位移等参数；传感器接口兼容电压、电流、数字脉冲等多种信号形式；专用数据处理软件，适于水力学原、模型试验中多物理量参数转换、动态信息采集、监测与分析。

【影响力】

水力学是一门以试验为主的科学，学科的进步和发展依赖于测量仪器的进步。水力学模型试验是运动水流的动态模拟系统，涉及多物理量、多界域和复杂边界条件，均与水流内部力学特性相互关联、相互影响。波高、掺气、电导率仪及多功能监测系统是水力学模型试验、原型观测的重要测试设备，已被国内高校、科研、生产等百余家单位广泛使用。

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WAVE HEIGHT, AERATION, CONDUCTIVITY METER AND MULTI-FUNCTIONAL MONITORING SYSTEM

【Innovation】

The wave height, aeration, conductivity meters and the multi-functional monitoring system are the first dynamic testing instruments our Academy has developed in China's professional hydraulics sector. The capacitive wave height meter boasts simple structure without turbulent flows, compatibility with clear and muddy water media and automatic temperature calibration. It features higher anti-interference capability, higher precision, faster response, better stability, more durability and higher performance-to-price ratio than tantalum-wire-type capacitive or resistive wave height meters of the same kind in foreign countries; the resistive aeration meter comes with stable structure, appropriate and smooth incoming flow and easy operation, suitable for the description of dynamic features of aerated concentration in point domains as well as suitable for model experiments and the test of water flow aeration concentration of prototypes; the dynamic conductivity meter adopts effective separation techniques to overcome the difficulty of interactive interference during a water bath and to conduct fast and multipoint online tracking as well as the synchronous measurement of a wide range of spatial and temporal changes in concentration fields. The multi-functional monitoring system integrates various hydraulics-related physical parameters and sensor interfaces, including parameters such as pressure, water level, wave, flow rate, wind speed, electrical conductivity, temperature & salinity, pull pressure, vibration acceleration and displacement; the sensor interfaces are compatible with various signal types, such as voltage, current, digital pulse, etc.; the dedicated data processing software is suitable for the conversion of many physical parameters during hydraulics prototype and model experiments, dynamic information acquisition, monitoring and analysis.

【Influence】

Hydraulics is a science that focuses on experiments, and the progress and development of the discipline relies on the progress of measuring instruments. The hydraulics model experiment is a dynamic simulation system for water flow in motion, which involves multiple physical, realm and complicated boundary conditions that are interrelated and interactive with the properties of internal water flow mechanics. The wave height, aeration, conductivity meters and the multi-functional monitoring system are indispensable testing devices for hydraulics model experiments and prototype observation, and widely serve key large and medium sized water conservancy projects in China. The aeration meter is the only standard device in the hydraulics research field so far that is used to detect the concentration of water flow aeration; the dynamic conductivity meter is an essential device for water simulation experiments in the metallurgy industry. These devices are still widely used by nearly 100 units, including universities, scientific research institutions and manufactures.

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