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[54] MULTI-DIRECTIONAL ABSOLUTE DISPLACEMENT MEASUREMENT APPARATUS BASED ON ZERO RIGIDITY VIBRATION ISOLATING STRUCTURE 基於零剛度隔振結構的多方向絕對位移測量裝置

[57] Multi-directional absolute displacement measurement apparatus based on zero rigidity vibration isolating structure provides a multi-directional absolute displacement measurement apparatus based on a zero rigidity vibration isolating structure, the multi-directional absolute displacement measurement apparatus comprises a framework, a balancing weight, a connecting structure connected between the balancing weight and the framework, a first range sensor and a second range sensor fixed on the balancing weight and configured for measuring distances in vertical and horizontal directions between the balancing weight and a measured vibrating structure, and an upper computer electrically connected to the first range sensor and the second range sensor. The connecting structure comprises first connecting mechanisms elastically connected between each of two first sides of the balancing weight and a corresponding inner side of the framework respectively, and second connecting mechanisms elastically connected between each of two second sides of the balancing weight and a corresponding inner side of the framework respectively, the two first connecting mechanisms are orthogonal to the two second connecting mechanisms, each of the first connecting mechanisms comprises a X-shaped structure and an extension spring stretched and connected between hinge joints of a pair of connecting endpoints thereof. Absolute displacements in a plurality of directions of a vibrating object can be directly measured under the condition of lower cost.

基於零剛度隔振結構的多方向絕對位移測量裝置的實用新型提供了一種基於零剛度隔振結構的多方向絕對位移測量裝置，其包括框架、配重塊、連接於配重塊與框架之間的連接結構、固定於配重塊上以測量該配重塊在豎直、水平方向上與被測振動結構之間的距離的第一、第二距離傳感器及電性連接於第一、第二距離傳感器上的上位機 。連接結構包括分別彈性連接於配重塊的兩個第一側面與框架的對應的內側面之間的第一連接機構及分別彈性連接於配重塊的兩個第二側面與框架的對應的內側面之間的第二連接機構，兩個第一連接機構與兩個第二連接機構正交，每一個第一連接機構包括 X 型結構及拉伸連接於其中一對連接末端的鉸接處之間的拉伸彈簧 。在較低成本的情況下，直接測量振動物體多個方向的絕對位移 。