

Free Release Monitor HERCULES-FRM



Application

Free Release Monitor HERCULES-FRM main working principle can be described the following way. Any loading mechanism like forklift or a crane gently puts measuring object to the movable platform on the front roller-based conveyor. Scales which are inbuilt in the front conveyor are determining weight of the measuring object and automatically transfers information for the analytical software. Further actions are performed totally automatically or in manual mode. Measuring chamber opens front doors and movable platform slides inside of measuring chamber. Doors are closed and measurement starts. The FRM is equipped with 16 plastic scintillators surrounding the measuring object from all sides. Plastic scintillators are connected to digital multichannel analysers located in the control box. Analytical and control software packages guarantee total remote control and data acquisition from all plastic scintillators simultaneously. All analytical performance of the FRM is set up previously by inputting all information concerning measuring object, geometry, sizes, weights, filling of containers, etc. in the software package. After measurement is finished, operator is alarmed, record is stored in the database and report can be printed any time. In order to change the measuring object, the FRM opens the front doors and slides the platform out for further unload by the forklift or a crane. In case the operator needs to measure specific object, it is possible to open back doors to load the measuring object from the back. The whole measuring chamber is securely covered with stainless-steel for easy decontamination.

Features

General

- Overall dimensions of the FRM: 5000x2300x2100mm (LxWxH)
- Overall weight of the FRM: 10000kg
- Operation temperature: +10...+35°C
- Ready to accommodate object with size 1.2m x 0.8m x 1.0m (L x W x H)
- Lead walls not less than 50mm thick
- Stain-less steel protection
- External and internal automatic conveyor
- Inbuilt scales

Plastic scintillators (HPGe detectors optional)

- 16 or 24 or more plastic scintillators equipped with PMTs
- Energy range from 100 to 3000 keV
- Detection limit for Co-60 is less than 300 Bq

Software

- Total activity calculation
- Visualization of measurement and diagnostic information
- Storage of measurement data, controlled parameters and fixed constants in internal memory
- Control of all mechanically movable mechanisms
- Control and reset of the FRM in case of failure of automation
- Self-diagnostics control
- Visual and audible alarm in case of failure or exceed of previously set levels
- Alarm in case of fixed level activity exceed for separately chosen radionuclide
- 3D visualization interface for measurement object monitoring and setting geometrical parameters in order to decrease measurement uncertainties
- Visualization of inhomogeneities in activity distribution
- Automatic change of measurement parameters depending on measurement geometry (Geometry must be set up preliminary)
- All software packages run under Windows operation system

Control box Control box of the FRM includes the following components:

- Set of MCAs for reading and transforming signals from PMTs of plastic scintillators
- Set of power supplies for different modules of the FRM
- Set of controllers to manage all components of automation process
- Indicators for operator
- Control panel with colour LCD display and touchscreen
- An emergency stop button is provided on the control box and the measuring chamber

COMPLETE SET

- Measurement chamber with accessories
 - Steel frame as basis for components
 - Number of lead bricks mounted on a steel frame around measurement object
 - 16 plastic scintillators fixed on the steel frame from inside around measurement object
 - 2 doors for front loading of the measurement object
 - 2 doors for back loading of the measurement object
 - Protective stainless-steel cover from inside and outside of measurement chamber
 - 1 electrically driven roller-based conveyor located in front of measuring chamber
 - 1 electrically driven roller-based conveyor located in the back of measuring chamber
 - 1 electrically driven roller-based conveyor located inside of measuring chamber
 - Scales inbuilt in the front and back roller-based conveyor
 - A platform for measurement object to be moved around conveyor
 - Alarm/status visual indicator
 - Camera to record visual information of the measuring object
 - Barcode reader
 - External spectrometric probe as option
- Control box
 - Set of multichannel analysers for plastic scintillators
 - Number of power supply modules
 - Set of controllers to manage all automation processes of the FRM
 - LCD display with touchscreen
 - Basic controlling software package to manage all automation processes in automatic and manual modes
- Operator workplace
 - Personal computer
 - Set of software packages for automatic and manual control of the FRM, performing analytical functions, visualization of the measurement result
 - Uninterruptable power supply (UPS)
 - Barcode printer

DESCRIPTION

Free release monitor is designed for analysis of potentially irradiated wastes, its characterization and release to free disposal of wastes being not harmful for further processing.

ACCESSORIES


Free Release Monitor HERCULES-FRM can be adopted to your special applications by adjusting complete set or modifying existing components.

- Automatic, semi-automatic and manual modifications
- Amount of plastic scintillators can be adjusted from 16 to 32 or other numbers

number

- Can be equipped with high-resolution spectrometer(s) based on HPGe detector
- Combination of scintillators and HPGe detectors can be offered
- Thickness of lead, radiopurity of materials can be changed
- Detection limits can be adjusted accordingly
- Automatic or manual roller-based conveyors available
- Scales for weightening measuring object
- Video cameras inside and outside for remote control of operation
- etc.

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