Health problem addressed

Blood grouping systems perform basic blood processing tests that include ABO grouping and subgrouping, Rh and other red cell phenotyping, and antibody detection. These tests determine factors that can cause transfusion reactions such as red cell hemolysis, anaphylaxis, and other immunologic and nonimmunologic effects.

Product description

Floor-standing or benchtop device includes a rack or tray onto which patient blood sample tubes are loaded; the samples are mixed with reagents to determine blood type and the results are displayed on a monitor; cabinets or compartments store reagent vessels; a monitor, keyboard, mouse, and printer (or entire computer) may be connected for programming, data entry, and to view and print testing results.

Principles of operation

Blood tube containing ethylenediamine-tetraacetic acid (EDTA) anticoagulant is loaded onto the analyzer, and the operator usually centrifuges them to separate the RBCs from the plasma. Automated analyzers typically resuspend the RBCs in saline and load the diluted samples onto microplates to which reagents (known antisera) have been added. Blood group identity occurs when the known antiserum, containing antibodies, clumps (agglutinates) RBCs that have a corresponding antigen. Barcode labels provides a means of sample tracking.

Operating steps

Technicians load tubes into the sample tray and keep reagents filled; tests are programmed either via a touchscreen panel on the instrument, a computer, or the required test information is on the tube’s printed bar code.

Reported problems

Operators should be aware of the risk of exposure to potentially infectious bloodborne pathogens during testing procedures and should use universal precautions, including wearing gloves, face shields or masks, and gowns.

Use and maintenance

User(s): Laboratory technician
Maintenance: Biomedical or clinical engineer
Training: Initial training by manufacturer and manuals

Environment of use

Settings of use: Hospital, blood bank, clinical laboratory
Requirements: Line power, water supply, benchtop or floor space, biohazard disposal

Product specifications

Approx. dimensions (mm): 1,000 x 1,750 x 900
Approx. weight (kg): 50-500
Consumables: Reagents, blood tubes
Price range (USD): 115,000 - 225,000
Typical product life time (years): 5-7
Shelf life (consumables): EDTA: 1 year

Types and variations

Benchtop or floor-standing