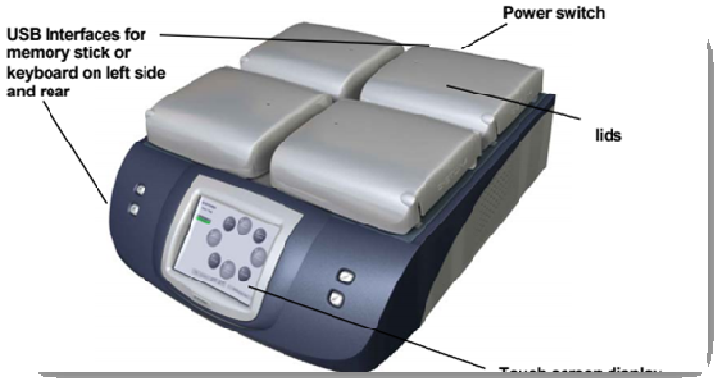
PCR Thermal Cycler

Make: G-Storm
Model: GS0004M
Specification: Simple way of copying specific DNA fragments from minute quantities of source DNA material



Thermal Blocks

Temperature Control	4°C - 99°C with simulated volume dependent control algorithm
Sample Volume Range	5-150µl
Sample Homogeneity	+/- 0.4°C
Heating	Up to 3°C per second
Cooling	Up to 3°C per second
Sample Overshoot	< 1°C
Gradient Temperature Range	30°C - 80°C
Maximum/minimum Gradient Span	30°C / 1°C
Sample Accuracy	+/- 0.4°C (20-99°C), +/- 1°C (4-20°C)

Special feature:

Touchdown: It is an advanced technique used to reduce non-specific binding. With the G-Storm thermal cycler, Touchdown is provided as a one-step command for easy implementation in the programming sequence.

Working Principle: As the name implies, it is a chain reaction, a small fragment of the DNA section of interest needs to be identified which serves as the template for producing the primers that initiate the reaction. One DNA molecule is used to produce two copies, then four, then eight and so forth. This continuous doubling is accomplished by specific proteins known as polymerases, enzymes that are able to string together individual DNA building blocks to form long molecular strands. To do their job polymerases require a supply of DNA building blocks, i.e., the nucleotides consisting of the four bases adenine (A), thymine (T), cytosine (C) and guanine (G). They also need a small fragment of DNA, known as the primer, to which they attach the building blocks as well as a longer DNA molecule to serve as a template for constructing the new strand. If these three ingredients are supplied, the enzymes will construct exact copies of the templates.

User Instruction:

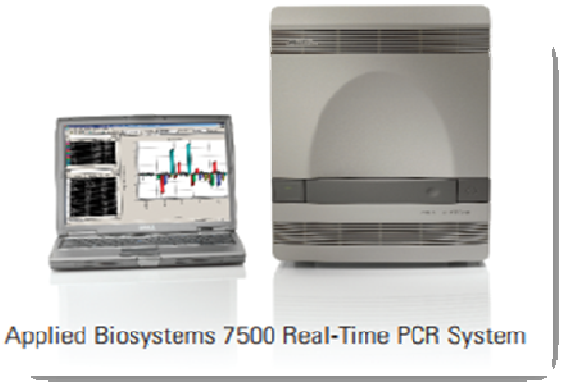
- 96 sample can be used in a single gradient blocks.
- The thermal blocks, inner side of heated lids and reaction vessels quickly attain temperatures of greater than 50°C. Do not touch –Risk of Burns!
- Do not use any materials (plates, sealings, foils, mats), which are not sufficiently temperature-stable (up to 120 °C).
- 96 well gradient block: For 96 well plates or 96x 0.2 ml tubes
- Reaction vessels should be filled outside the cycler so that no fluids penetrate the instrument.

Application:

- Selective DNA isolation
- Forensic applications
- Medical applications
- Amplification and quantification of DNA
- Infectious disease applications
- Research applications

7500 Real-Time PCR System

Make: AB Bioscience
Part No: 4346241
Specification: detection and quantification of nucleic acid sequences, gene expression analysis, pathogen detection using standard curves.



Instrument Specifications

Instrument	7500 System
Thermal cycling system	Peltier-based, 96-well block
Optical system	Five-excitation, Five-emission filters and CCD camera
Quantitative PCR run time	< 2 hours
Supported Consumables	➢ Standard Optical 96-well plates ➢ 8-strip 0.2mL tubes ➢ 0.2mL tubes ➢ Optical Adhesive Covers ➢ Optical Flat Caps

Working Principle:
All sample wells are illuminated with a tungsten halogen lamp. Light from this lamp passes through five excitation filters before reaching sample wells. The inclusion of excitation filters improves the ability of the instrument to excite dyes at longer (red) wavelengths, resulting in greater sensitivity and precision for these dyes. Fluorescence emission is then detected through five emission filters to a charge-coupled device (CCD) camera. Emission filters are optimized for use with FAM™/ SYBR® Green I, VIC®/JOE™, NED™/TAMRA™/Cy3™, ROX™/Texas Red®, and Cy5™ fluorescent dyes.

User Instruction:
- Supported volume is 20-100 µL
- Sample must be pure and all contamination must be removed

Application:
- Gene expression analysis using relative quantitation (RQ) assays
- Pathogen detection using standard curves.
- Qualitative post-PCR detection of nucleic acids for allelic discrimination (SNP genotyping assays) etc.

Molecular Imager Systems

Make: Bio-Rad
Model: Pharox FX Plus system
Specification: used for the sensitive detection and analysis of DNA, RNA, or protein samples in gels, blots, or microplates. Detect a wide range of fluorophores with optional 488 nm and 635 nm external lasers

Instrument Specifications

Dynamic range	5 orders of magnitude (Accurately quantitates ^{32}P, ^{33}P, ^{35}S, ^{14}C, and ^{3}H)
Linearity	$r^2 > 0.99$
Uniformity	±5% over entire scan area
Scan resolution	800, 200, 100, and 50 µm(user selectable)
Scan time	20 x 25 cm area: 8.5 min at 100 µm, 15 min at 50 µm 35 x 43 cm area: 8.5 min at 200 µm, 17 min at 100 µm
Digital resolution	16-bit (65,536 gray scale)
Excitation source	25 mW 532 nm (green) diode-pumped solid-state laser 10 mW 635 nm diode laser

Working Principle:
In this machine, optimized excitation/emission filter combinations deliver optimal signal-to-noise and thus exceptional sensitivity. Flexibility in the choice of filters, together with software control, allows extensive user customization. The Pharos FX Plus imagers detect photons with a variable-gain photomultiplier tube (PMT) assembly. The variable PMT gain is software controlled, and can be used to boost imaging sensitivity for enhanced detection of low-abundance proteins or small quantities of fluorescently labeled nucleotides.

User Instruction:
- No gels thicker than 8 mm
- Gels blot or membrane should be wet
- Use sample holders to keep sample from moving during scan

Application:
- Proteomic Applications
- Genomic Applications etc.

MiniOpticon Real-Time PCR System

Make: Bio-Rad
Model: CFB-3120

Specification: Real-time PCR detection is a powerful tool that simplifies DNA quantitation, genotyping, expression analysis, and many other applications

Instrument Specifications:

Number of targets detectable per well	2
Excitation range	470–500 nm
Detection range	523–700 nm
Thermal gradient differential range	1–16°C
Number of wells	48
Serial connectivity options	Up to 4 units from 1 PC

Working Principle:
It offers thermal gradient technology so you can optimize reactions for maximum efficiency and accurate quantitation. It is a compact two-color real-time PCR detection platform.
In this samples are sequentially illuminated by a fixed array of 48 light-emitting diodes (LEDs), and emitted fluorescence is detected by one of two filtered photodiodes. This no- moving-parts design allows sensitive detection in a small yet robust package.

User Instruction:
- Sample must be pure and all contamination must be removed
- Choose the reaction vessels that best suit your application 0.2 or 0.5 ml tubes, strip tubes, or 48-well PCR plates

Application:
- Proteomic Applications
- Genomic Applications etc.

GAS CHROMATOGRAPHY

INSTRUMENT DETAILS:

Make : Agilent Technologies, Singapore

Model : 7890A Gas Chromatography

Detectors : FID and TCD

APPLICATIONS:

Detection and quantification of Ethylene,

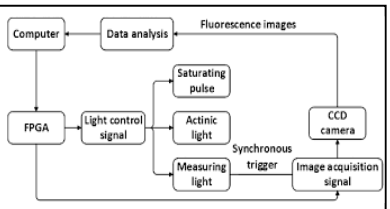
Detection and quantification of Acetylene,

Detection and quantification of nitrogenase activity

Chlorophyll Fluorescence Imaging System

Chlorophyll Fluorescence and PAM Fluorometry (Maxi-Version, Walz, Germany)

Chlorophyll fluorescence is a very sensitive indicator of photosynthesis. Quantitative information on the quantum yield of photosynthetic energy conversion is obtained by PAM fluorometry and the saturation pulse method. A wide range of photosynthetic parameters can be derived from fluorescence measurements, giving insight into the physiological state of all photosynthetically active organisms, including higher plants, mosses and ferns as well as various types of algae, phytoplankton and biofilms



By using a fiber-optic microprobe in combination with a modified PAM Fluorometer, chlorophyll fluorescence yield was measured within leaves with spatial resolution of approximately 20 µm. The new system employs a miniature photomultiplier for detection of the pulse-modulated fluorescence signal received by the 20 #m fiber tip. The obtained signal/noise ratio qualifies for recordings of fluorescence induction kinetics (Kautsky effect), fluorescence quenching by the saturation pulse method and determination of quantum yield of energy conversion at Photosystem II at different sites within a leaf... Photoinhibition is shown to affect primarily the quantum yield of the palisade chloroplasts when excessive illumination is applied from the adaxial leaf side. The new system is envisaged to be used in combination with light measurements within leaves for an assessment of the specific contributions of different leaf regions to overall photosynthetic activity and for an integrative modelling of leaf photosynthesis.

Applications

Photosynthetic light reactions of

- Higher plants
- Mosses and ferns
- Algae
- Phytoplankton and biofilms

User information
Samples should be live
Experimental conditions should be on site of testing

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