Think GAIA
For Life and the Earth

SANYO

Refrigerated Incubators / Environmental Testing Chambers

MIR-154
MIR-254
MIR-553
MLR-351H

Models: MLR-351H & MIR-254

SANYO's MIR and MLR series incubators have been recognized as exceptional units suitable for a wide range of applications. The wide variety of temperatures, humidity and lighting patterns that are essential in research, environmental studies and testing can now be accurately reproduced and controlled.

New MIR-154 and MIR-254 Incubators

Wide Range of Applications

The MIR 154 and 254 refrigerated incubators are ideal in testing applications such as

- Industrial testing in the electrical, machinery, textiles industries
- Chemical testing e.g., storage, stability, acid/alkali, durability
- Food industry for packaging, quality control and stability
- Testing for waste water, BOD, soil testing
- Microorganism culturing
- Germination experiments

Flexibility

The SAYNO MIR series offers accurate temperature control and uniformity in a wide range of temperatures, making them suitable for various applications.

- The MIR 154 and 254 are programmable with 12 step, 10 program capability.
- Wide temperature range that goes up to +60c
- Excellent temperature uniformity
- ON-OFF control of chamber lighting – controlled by programming

New LCD Controller

The new LCD Controller improves user interface for better programming and control

- Display – pop up menu that can display:
  - Current conditions (temperature, date, time (12 hour or 24 hour selectable)
  - Alarm condition
  - Status of door and light
  - Light status
  - Various settings of each program (12 step, 10 program, clock function and join mode)
  - 2 weeks of data (recorded data can be forwarded to PC with optional MTR-480)

Programming

- Numeric input with keypad
- Booking of operation start date and hour with delay start timer
- Both clock mode and count down mode can be used for program setting

Improved Usability

- Modern design and reversible door capable
- Improved gentle air circulation that reduces media drying
- Adjustable low vibration for sensitive materials testing
- Full alarm package

Options

- Double stacking option with spacer (only for MIR-154) Model # MIR-S154SB
- Key Mounting Plate: MIR-LP
- Lighting addition kit: MIR-LP15
- Light shading plate for glass: MIR-154BP/MIR-254BP
- Chart Recorder: MTR-C958

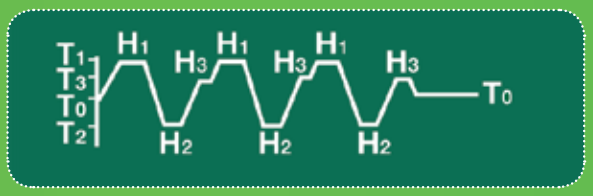
Operational Functions - Cooled Incubators

Programmable 3-step operational functions with microcomputer control

Program input is simple and the steps during each operation are indicated by a lamp. This incubator accommodates a range of diversified experimentation requirements, and is ideal for experimentation during night time or holidays, experimentation that requires settings to be changed, and microorganism culture and preservation. Constant operation mode without step operation is also available.

3 Step Repeat Operation

Temperature (T1, T2, T3) and Time (H1, H2, H3) are set. Then, limited repeating operations (from 1 to 99 times) or continuously repeated operations are conducted. After a limited repeating operation has been completed, constant operating temperature T0 is retained.
Application: Optimum for repeated experiments in which 3 different elemental temperatures and times are combined.



The MIR Series accommodates a wide range of temperatures

High-precision Temperature Environment

SANYO Refrigerated Incubators incorporate a high precision microprocessor temperature control combined with a heater P.I.D. and compressor ON-OFF system. This system has a feed forward function that inputs the operating conditions of the compressor beforehand, ensuring accurate temperature control for the chamber. In a wide temperature range from -10°C to 60°C, the heater P.I.D. exhibits temperature fluctuation up to 0.2 degrees, and the Compressor ON-OFF controls precisely ±1 degree. In addition, the fluctuation of temperature uniformity in the chamber is within ±0.5 degrees, allowing a full range of precise experimentation from microorganism cultures to various types of incubation and testing.

Energy Savings

Because a heater output and compressor on/off are microprocessor controlled, optimum automatic operation according to ambient temperature and fluctuation of chamber load is possible, resulting in energy savings.

Foamed-in-place Rigid Polyurethane Insulation

HCFC-free foamed-in-place polyurethane is used for the chamber because of its high thermal retention and energy saving properties.

Triple-pane Glass Operation Window plus Programmable 15W Fluorescent Lamp

An easy-to-observe triple-pane glass observation window and 15W fluorescent lamp are provided for sample observation during experimentation. When observation is not required, a light shielding plate (MIR-154/254) can be easily attached.

Alarm and Security System to Protect Sample Safety

Automatic Setting Temperature Alarm

When the chamber temperature deviates more than ±2.5 degrees, all digits of the digital indicator flash. Ten minutes later a buzzer will sound. This system also automatically allows programmed operation or setting value changes.

Independent Over-temperature Protection Device

This incubator incorporates an excessive temperature prevention circuit that protects experimentation materials in the rare event that a temperature abnormality does occur. Isolated from the main circuit, this exclusive circuit and sensor operate even if the temperature sensor or microprocessor malfunction, activating an exclusive lamp and buzzer notification. This system turns off the heater and chamber fan motor when over temperature is detected (setting temperature range: 15°C~65°C), and turns off the compressor when under temperature is detected (setting temperature range -15°C to 20°C). Remote alarm contacts are provided for monitoring alarm from a remote location.

Programmed Memory Back-up Mechanism

Should the power source be interrupted due to power failure or other event, programmed data remains stored in memory for approx. 5 hours. When the power source is restored, operation can be continued according to the predetermined program.

Automatic Return Buzzer Switch

After an power failure occurs, the alarm buzzer automatically switches to the ON mode, even if the operator forgets to return the alarm buzzer to the ON mode, thus ensuring safe and secure operation.

Key Lock

A key lock switch is provided so that settings may not be changed unintentionally.

Auto Return Mechanism

This mechanism automatically returns the chamber temperature indicator to its normal indication when the control key is not operated for approx. 90 seconds at each setting mode. Thus, normal operation is ensured even if the operator forgets an operational procedure during setting.

Trouble Monitor (Self Diagnostic Function)

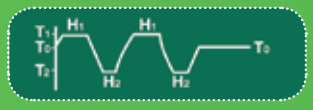
Should a malfunction occur, the location of the malfunction can be digitally indicated, allowing quick operator response.

3 Step to Constant Operation

Temperature of T1, T2, and T3, correspond to times H1, H2, and H3, respectively. Then, constant operation temperature T0 is retained. Application: Optimum for experiments that require consistent 4-step temperature increases and decreases.

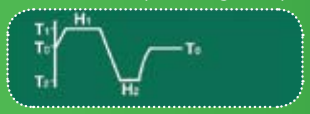
2 Step to Repeating Operation

Using a temperature T1 and T2, operation is repeatedly conducted using time H1 and H2. Application: Optimum for day and night cycle operations of plant material or quality testing for chemicals, foods and samples.



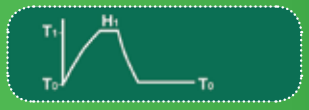
2 Step to Constant Operation

With a temperature of T1 and T2, operation is conducted using time H1 and H2. Then, constant operating temperature T0 is retained.



1 Step to Constant Operation

With a temperature of T1, operation is conducted using time H1. Then, constant operating temperature T0 is retained. Application: Optimum for automation and labor savings while performing bacteria inspection from culture to preservation, and from preservation to culture.



Incubation & Testing

MIR Series Refrigerated Incubators

MIR-154

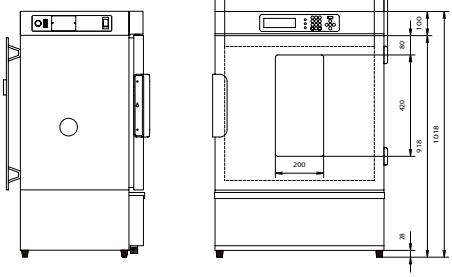
Effective Capacity:
4.3 cu.ft.
(123 liters)

MIR-254

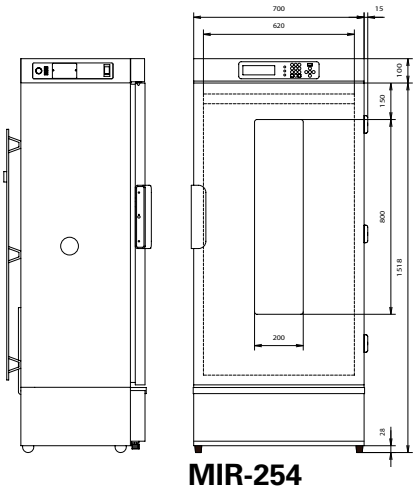
Effective Capacity:
8.4 cu.ft.
(238 liters)

MIR-553

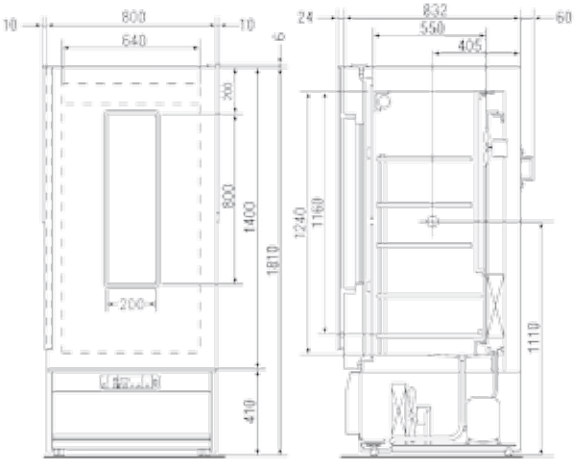
Effective Capacity:
14.3 cu.ft.
(406 liters)



MIR-154



MIR-254



MIR-553

(Unit : mm)

MLR-351H Environmental Test Chambers with Humidity Control

Versatile Environmental Test Chamber

- Graphic LCD provides easier operation
- Programmable temperature, lighting and humidity function
- Microprocessor P.I.D. temperature control
- Data logging function
- Easy calibration through controller
- Small lightweight, high molecular membrane-type humidity sensor

Feature and Benefits

Microprocessor P.I.D. controls temperature and humidity to create the optimum environments for various applications.

Programmable Temperature Function can operate 12 step programs x 10 patterns which can be stored, select a clock or timer mode, multiple programs can be 'connected' (join mode), and a starting day and time of operation can be programmed.

Automatic Data Logging of Operational Data of approximately two weeks (6 minute intervals) can be automatically recorded. The data can be viewed on the control panel. The data can also be transmitted to a PC via RS-232C, interface board (MTR-480 required)

Technology and Applications

The wide variety of temperatures, humidity and lighting patterns that are essential in research and environmental studies can now be accurately reproduced and controlled.

Applications:

- Plant Growth
- Culture of plant cells, tissue and organs
- Incubation and growing insects (drosphila)
- Electronic testing
- Food testing
- Packaging testing

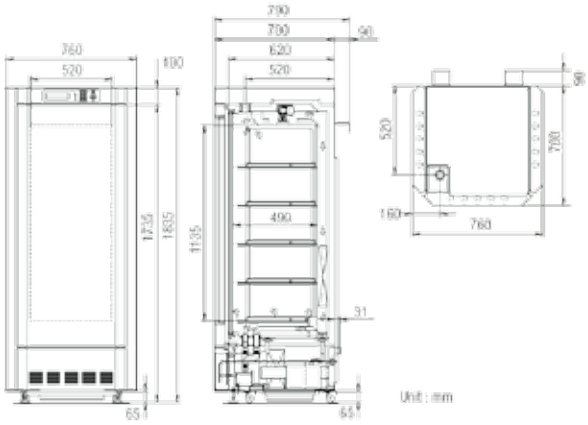
The microprocessor P.I.D. and refrigeration capacity control minimizes temperature flunctuations and thereby improves temperature control. This allows precise experiments plus energy and electricity savings.

Programming of temperature, light, and humidity can be used for small plants, environmental tests, algae, drosophila, etc.

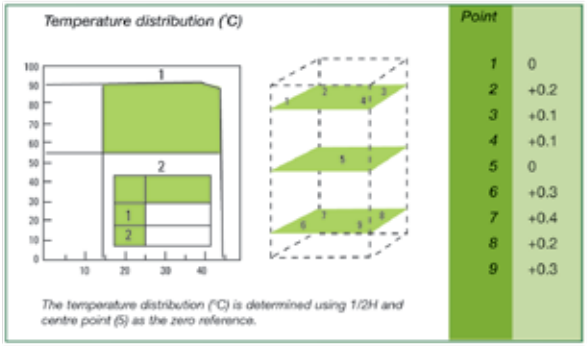
Easy calibration of temperature and humidity can be calibrated easily through the control panel. Small lightweight, high molecular membrane-type humidity sensor also boasts a high degree of accuracy and reproducibility.

Graphic LCD panel with pop-up menu function on control panel provides visual display of operation and allows intuitive operation.

Dimensions



Temperature Distribution



Specifications

Model No.	MIR-154	MIR-254	MIR-553
Effective capacity	4.3 cu.ft. (123 liters)	8.4 cu.ft (238 liters)	14.3 cu.ft (406 liters)
Exterior Dimensions (W x D x H)	27.6" x 22.8" x 40.1" (700 x 580 x 1018mm)	27.6" x 22.8" x 63.7" (700 x 580 x 1618mm)	31.5" x 32.75" x 70.87". (800 x 832 x 1800mm)
Interior Dimensions (W x D x H)	24.4" x 15.2" x 21.9" (620 x 386 x 555mm)	24.4" x 15.2" x 42.8" (620 x 386 x 1088mm)	25.17" x 21.65" x 45.68" (640 x 550 x 1160mm)
Exterior Finish	Galvanized Steel with baked on finish		
Interior Finish	Stainless Steel		
Door	Painted Steel & Triple pane glass with observation window and key		
Shelves	PE coated Steel wire, adjustable		
	3	5	5
Insulation	Foam-in-place rigid polyurethane		
Circulation System	Forced air circulation		
Compressor	Hermetic type		
	150W	256W	300W
Evaporator	Fin and tube type, forced circulation		
Condensor	Wire and tube type natural air cooling system		
Defrosting System	Selectable manual start or timer defrost, natural vaporisation of drainwater		Manual start, automatic finish, natural vaporisation of drain water
Heater	Cord Heater		
	141 W	218 W	332 W
Temp. Setting Indication	Digital setting with digital display		
Temperature Control	Microprocessor PID system, (when compressor operates, ON/OFF control)		
Temperature Sensor	Thermistor		
Autom. Setting temp. alarm	When temp. deviates approx. ±2.5ºC, visual and audible alarm		
Over temp. protection device	Visual audible alarm		
Programmed Operation	3-step repeat from 1-99 times or Continuous repeat		
Temperature Range	-10ºC to +60ºC		
Temperature Controllability	±0.2ºC at heater PID control (Temp. setting 50ºC, ambient temp. 20ºC, no load) ±1ºC at compressor ON/OFF control (Temp. setting 5ºC, ambient temp. 20ºC, no load)		
Temperature Uniformity	±0.5ºC (Temp. setting 37ºC, ambient temp. 20ºC, no load)		
Power Source: Voltage	115V / 60Hz/ 1 phase	115V / 60Hz/ 1 phase	115V / 60Hz/ 1 phase
Power Consumption	195 W	295 W	415 W
Interior Lamp	15 W x 1, fluorescent lamp (setting temp. +5ºC to 50ºC)		
Net weight	172 lbs (78 kg)	238 lbs (108 kg)	452.5 lbs (205 kg)
Accessories	Key 1set, Light shielding plate1	Key1 set, Light shielding plate1	Key 1set

Model No.	MLR-351H
Effective Capacity	10.4 cu.ft. (294L)
Exterior Dimensions	29.9" x 27.6" x 72.2"
(WxDxH)	760 x 700 x 1.835mm
Interior Dimensions	20.5" x 19.3" x 44.7"
(WxDxH)	520 x 490 x 1.135mm
Exterior	Painted Steel Left/right wall: paired glass window (14.6 x 43.7inch / 370 x 1.110mm)
Interior	Stainless steel (SUS-304)
Door	Baked-on acrylic finish on galvanized steel with fluorescent lamps
Inner Door	Paired glass door
Shelves	5pcs. PE coated steel wire (bottom shelf with stainless steel cover), adjustable
Access Hole	1.574in dia. 1x (chamber top position)
Casters	4pcs.
Air Circulation	Forced air circulation
Compressor	Fully hermetic, 325W output
Evaporator	Fin and tube type, forced circulation
Refrigerant	R404A
Heater	340W
Defrosting System	Automatic defrost (3 patterns), manual defrost
Temperature	
Temperature Range	5°C~50°C (lamp OFF) 10~50°C (lamp ON)
Temperature Distribution	±1.0°C (lamp OFF) ±2.5°C (lamp ON)
Temperature Accuracy	±0.3C
Temperature Control	PID microprocessor contol + refrigeration capacity control
Temp. Programmable Operations	12 steps (10 patterns), 98 cycle or limitless; Clock mode: 00:00~23:59, Timer mode: 00:01~99:59
Lighting	
Lighting Range	0-20.000lux Max. 6 increments adjustable fluorescent lamp 40W x 15pcs.
Lighting Programmable Operations	Lighting levels: 6 (0,1,2,3,4,5) max. 12 steps (10 pattern) 1-98 cycles repeat or unlimited
Humidity	
Control System	Ultrasonic PID control
Control Range	55-86% & 60-90% RH
Alarm & Security	
Alarms	Temp. alarm, High & low temp. unit, Humidity alarm

Product conforms to RoHS (European Restriction of Hazardous Substance directives)

SANYO Electric Co.,Ltd., Biomedical Division, Gumma is certified for Quality management system:ISO9001/ Medical devices Quality management system:ISO13485/Environmental management system:ISO14001

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SANYO

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