

Cooled Incubators MIR-153/253/553

High-precision Temperature Environment

Microprocessor Control with Feedforward Function

SANYO Cooled Incubators incorporate a high precision microprocessor temperature control combined with a heater PID and compressor ON-OFF system. This system has a feedforward function that inputs the operating conditions of the compressor beforehand, ensuring accurate temperature control of the chamber. In a wide temperature range of from -10°C to 50°C, the heater PID exhibits temperature fluctuation of only ±0.2 degrees, and the Compressor ON-OFF controls only ±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.

Energy Savings

Because 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 a high-energy savings.

HCFC-free Foamed-in-place Rigid Polyurethane Insulator

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

Triple-pane Glass Observation Window plus 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-153/253) can be easily attached.

Control panel



Alarm and Security System to Protect Sample Safety

Automatic Setting Temperature Alarm

When the chamber temperature deviates more than ±2.5 degrees, all the digits of digital indicator flash and after 10 minutes a buzzer sounds to notify you. 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 micro-processor malfunction, activating an exclusive lamp and buzzer for notification. This system turns off the heater and chamber fan motor when over high temperature is detected (setting temperature range 15°C–55°C), and turns off the compressor when over low temperature is detected (setting temperature range -15 to 20°C). Remote alarm contact is provided for monitoring alarm from a remote location.

Programmed Memory Backup 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 abnormality 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 Switch

A key lock switch is provided so that settings may not be changed unintentionally. This prevents the control key from operating unless the lock switch in the switch box is turned to the "OFF" position.

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.

Heated Incubators MIR-162/262

Microcomputer PID Control+ Air Jacketed System

Microcomputer PID control and air jacketed system gives precise temperature control within the chamber. Temperature accuracy is within ±0.2 deg. and temperature uniformity is within ±1 deg. (setting temperature +5°C–60°C).

Microcomputer Timer Function

An accurate microcomputer timer is fitted to allow experiments up to 99 hours and 59 minutes. Desired start time is set by an automatic start delay function. An information function activates a buzzer when a set time is over and keeps a set temperature after an operation finishes. Various operation patterns can be set by utilizing these functions.

Temperature Control Range— Ambient Temperature +5°C–80°C (at 20°C)

SANYO heated incubators allow incubation at normal temperature to high temperature.

Advanced Design

Control panel uses a touch keyboard and an easy-to-read green LED display. Temperature and time are shown respectively by digital displays. Durable stainless steel (SUS-304) for interior cabinet.



MIR-153/253/553/162/262

Specifications

Model	Cooled Incubators					Heated Incubators				
	MIR-153	MIR-253	MIR-553	MIR-162	MIR-262	MIR-162	MIR-262	MIR-553	MIR-162	MIR-262
Exterior dimensions (W x D x H)	600 x 686 x 1010mm 23.6 x 26.9 x 40.1	1000 x 690 x 1610mm 37.8 x 27.2 x 63.3	900 x 832 x 1810mm 35.4 x 32.8 x 71.3	600 x 686 x 800mm 23.6 x 26.9 x 31.3	730 x 646 x 870mm 28.7 x 25.4 x 34.3	600 x 686 x 800mm 23.6 x 26.9 x 31.3	730 x 646 x 870mm 28.7 x 25.4 x 34.3	900 x 832 x 1810mm 35.4 x 32.8 x 71.3	600 x 686 x 800mm 23.6 x 26.9 x 31.3	730 x 646 x 870mm 28.7 x 25.4 x 34.3
Interior dimensions (W x D x H)	520 x 546 x 930mm 20.4 x 21.5 x 36.6	920 x 546 x 1510mm 36.2 x 21.5 x 61.3	840 x 690 x 1710mm 33.1 x 27.1 x 67.7	490 x 590 x 690mm 19.2 x 23.1 x 27.1	600 x 510 x 500mm 23.6 x 20.1 x 19.7	490 x 590 x 690mm 19.2 x 23.1 x 27.1	600 x 510 x 500mm 23.6 x 20.1 x 19.7	840 x 690 x 1710mm 33.1 x 27.1 x 67.7	490 x 590 x 690mm 19.2 x 23.1 x 27.1	600 x 510 x 500mm 23.6 x 20.1 x 19.7
Effective capacity	120L (4.2 cu.ft.)	250L (8.8 cu.ft.)	400L (14.1 cu.ft.)	80L (2.8 cu.ft.)	150L (5.3 cu.ft.)	80L (2.8 cu.ft.)	150L (5.3 cu.ft.)	400L (14.1 cu.ft.)	80L (2.8 cu.ft.)	150L (5.3 cu.ft.)
Exterior finish	Painted steel					Painted steel				
Interior finish	Stainless steel					Stainless steel				
Door	Painted steel, triple-pane glass					Painted steel, triple-pane glass with observation door				
Shelves	P.E. coated steel wire, adjustable					Stainless steel, removable wire				
Insulation	Foamed-in-place rigid polyurethane					Glass wool				
Circulation system	Forced air circulation					Natural convection				
Compressor	Hermetic type					—				
Evaporator	Single phase, Output 100W					Single phase, Output 300W				
Condenser	Fin and tube type, natural air cooling system					Fin and tube type, forced air cooling system				
Defrosting system	Manual start, automatic defrost, natural vaporization of clean water					—				
Heater	Cord heater 141W					Cord heater 210W				
Temperature setting indication	Digital setting with keylock, digital display					Digital setting with keylock, digital display				
Temperature control	Microprocessor PID system (when compressor operates, PID-ON control)					Microprocessor PID system				
Temperature sensor	Thermistor					Thermistor				
Automatic setting temperature alarm	When temperature deviates approx. ±2.5 deg., visual and audible alarm					When temperature deviates approx. ±2.5 deg., visual and audible alarm				
Over temperature protection device	Visual and audible alarm					Visual and audible alarm				
Programmed operation	2-step repeat from 1-99 times. Continuous repeat 1 step 0.5-99.99 hrs. (Backup memory backup function—approx. 5 hours)					—				
Temperature range	-10°C–+50°C					Ambient temperature +5°C–80°C (without temperature 37°C)				
Timer	—					Automatic timer with delay function 30' 00' – 99' 59'				
Temperature controllability	±0.2 deg. at heater PID control. Temperature setting 16°C. Ambient temperature 37°C. No load / 1 deg. at Compressor On-Off control. Temperature setting 55°C. Ambient temperature 37°C. No load					±0.2 deg. at 37°C. ±0.5 deg. at 60°C				
Temperature uniformity	±0.5 deg. Setting temperature 37°C. Ambient temperature 37°C. No load					±1.0 deg. Setting temp. 37°C. At 37°C. No load				
Power source	Voltage: A, B, C, D, E, A, B, C, D, E, A, B, C, D, E, A, C, D, E, A, C, D, E Amps: 2.2, —, 1.6, 1.1, 1.6, 2.2, —, 1.7, 1.2, 1.2, 3.6, —, 2.2, 1.6, 2.2 Breaker: 15, —, 10, 15, 15, 15, —, 15, 15, 15, 15, —, 15, 15, 15, 15, 15, 15, 15, 15					Voltage: A, B, C, D, E, A, B, C, D, E, A, B, C, D, E, A, C, D, E, A, C, D, E Amps: 2.2, —, 1.6, 1.1, 1.6, 2.2, —, 1.7, 1.2, 1.2, 3.6, —, 2.2, 1.6, 2.2 Breaker: 15, —, 10, 15, 15, 15, —, 15, 15, 15, 15, —, 15, 15, 15, 15, 15, 15, 15, 15				
Power consumption	220/230W					220/230W				
Interior lamp	15W V.A. Fluorescent lamp					—				
Net weight	88 kg (194.3 lb.)					44 kg (97.0 lb.)				
Accessories	Key 1 set, Light shielding glass 1					Key 1 set, Light shielding glass 1				

*Specifications subject to change without notice.
*MIR-153, MIR-253 minimum depth 370mm

Option

Exclusive stand:
MKD 300T
(for MIR-153)
External dimensions:
820(W) x 200(D) x
760(H)mm
(32.3" x 29.5" x 29.9")



We design and manufacture products in accordance with ISO9001 & 14001 requirements.

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SANYO

SANYO Electric Co., Ltd.
SANYO Sales & Marketing Corporation
3-15, Kiyohashi 2-chome, Matsuyama City, Ehime, 794-8604, Japan
Telephone: +81-6-6992-0021 Fax: +81-6-6992-4021
URL: <http://www.sanyo.co.jp/eng/biomedical>
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SANYO
EVOLUTION

SANYO Incubators

MIR-153/253/553/162/262

SANYO's MIR series incubators have been recognized as exceptional units suitable for a wide range of applications by accommodating a temperature range of from -10°C to 50°C . In pursuit of temperature precision and enhanced operability, the new MIR-153/253/553 series makes its debut. Incorporating an 8-bit microcomputer, these incubators control the heater and compressor within a precise $\pm 0.2^{\circ}\text{deg}$.

Improved Experimentation of Repetitive Operation and Operability

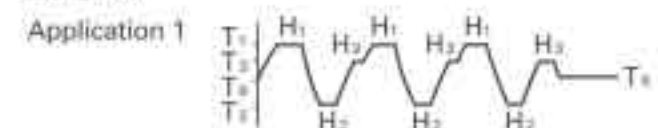
Programmable 3-step operational function with microcomputer control

Combining flexible Temperature (T) and Time (H) control, a maximum 3-step plus constant operation or max. 3-step repeating operation can be programmed according to the experimentation requirements. The one-step setting time ranges from 0.0 to 99.5 hours in increments of a half hour. A program can be set to repeat for a minimum of once up to a maximum of 99 times. 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 (T_1 , T_2 , T_3) and Time (H_1 , H_2 , H_3) 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 T_0 is retained.

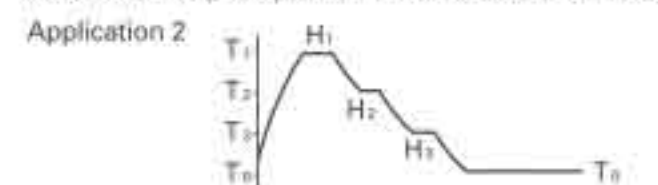
Application: Optimum for repeated experiments in which 3 different elemental temperatures and times are combined.



3 Step to Constant Operation

With a temperature of T_1 , T_2 , and T_3 , operation is conducted using time H_1 , H_2 , H_3 , respectively. Then, constant operation temperature T_0 is retained.

Application: Optimum for experiments that require consistent 4-step temperature increases and decreases.

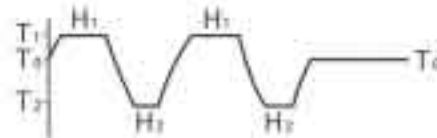


and $\pm 1^{\circ}\text{deg}$ range, respectively. In addition, they can be applied to a wide variety of experimentation patterns with the aid of a 3-step microcomputer program. These cooled incubators are designed to meet a variety of advanced experimental needs ranging from microorganism cultures and plant germination tests to various constant temperature experiments.

2 Step Repeating Operation

Using a temperature of T_1 and T_2 , operation is repeatedly conducted using time H_1 and H_2 . Application: Optimum for day and night cycle operations of plant material or quality testing for chemicals, foods and samples.

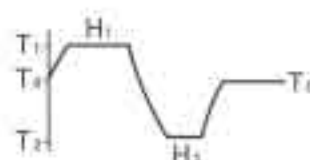
Application 3



2 Step to Constant Operation

With a temperature of T_1 and T_2 , operation is conducted using time H_1 and H_2 . Then, constant operating temperature T_0 is retained.

Application 4



1 Step to Constant Operation

With a temperature of T_1 , operation is conducted using time H_1 . Then, constant operating temperature T_0 is retained.

Application: Optimum for automation and labor savings while performing bacteria inspection from culture to preservation, and from preservation to culture.

Application 5

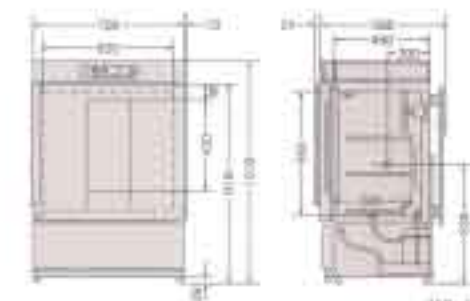


Cooled Incubators



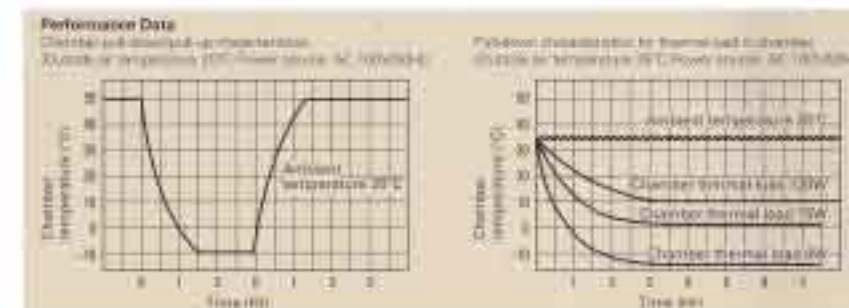
Effective capacity:

126
liters



MIR-153

Performance
Temperature pull-down speed: 50°C to 0°C
Approx. 50 minutes
Ambient temperature 20°C , No load
Temperature pull-up speed: 0°C to 50°C
Approx. 30 minutes
Ambient temperature 20°C , No load
Power source: 100V/50Hz

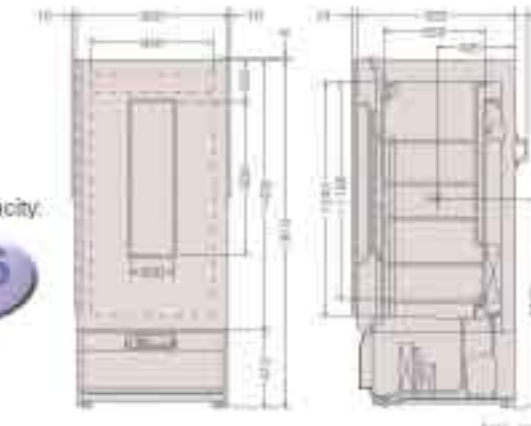


*The data shown above are taken with the 5-step repeat turned off.
*Characteristics may vary depending on the product or operating conditions.



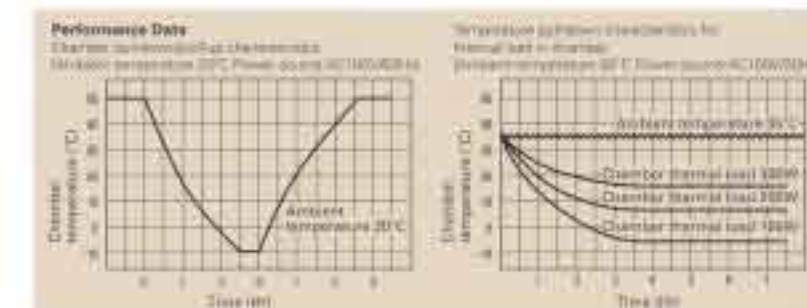
Effective capacity:

406
liters



MIR-553

Performance
Temperature pull-down speed: 50°C to 0°C
Approx. 100 minutes
Ambient temperature 20°C , No load
Temperature pull-up speed: 0°C to 50°C
Approx. 140 minutes
Ambient temperature 20°C , No load
Power source: 100V/50Hz



*The data shown above are taken with the 5-step repeat turned off.
*Characteristics may vary depending on the product or operating conditions.

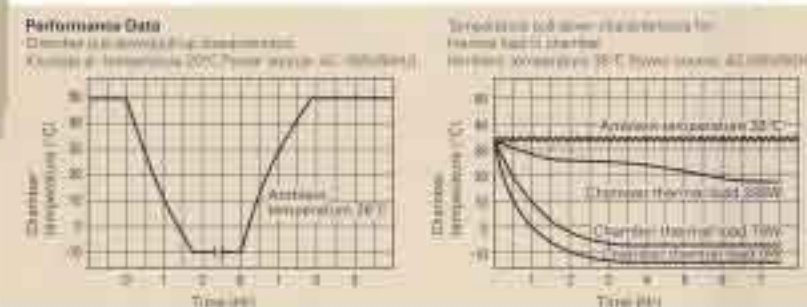
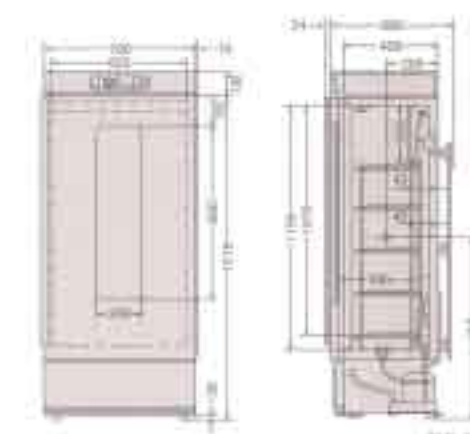


MIR-253

Performance
Temperature pull-down speed: 50°C to 0°C
Approx. 55 minutes
Ambient temperature 20°C , No load
Temperature pull-up speed: 0°C to 50°C
Approx. 115 minutes
Ambient temperature 20°C , No load
Power source: 100V/50Hz

Effective capacity:

254
liters



*The data shown above are taken with the 5-step repeat turned off.
*Characteristics may vary depending on the product or operating conditions.

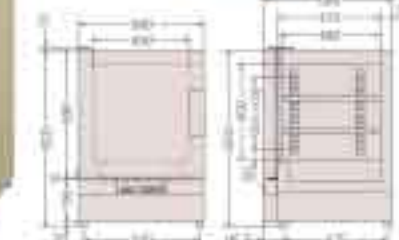
Heated Incubators



Effective capacity:

93
liters

MIR-162



Effective capacity:

153
liters

MIR-262



MIR-162/262

Performance
Temperature pull-up speed: 0°C to 20°C
Approx. 70 minutes (MIR-162)
Approx. 90 minutes (MIR-262)
Ambient temperature 20°C , No load

