



MIR-153  
MIR-253  
MIR-553  
MIR-162/262

SANYO's MIR cooled series incubators have been recognized as exceptional units suitable for a wide range of applications by providing a temperature range of  $-10^{\circ}\text{C}$  to  $50^{\circ}\text{C}$ . In pursuit of temperature precision and enhanced operability, the MIR-153/253/553 series makes its debut. Incorporating an 8-bit microcomputer, these incubators control the heater and compressor within a precise  $\pm 0.2^{\circ}\text{C}$  and  $\pm 1^{\circ}\text{C}$  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 micro organism cultures and plant germination tests to various constant temperature experiments.

**Programmable 3-step operation 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

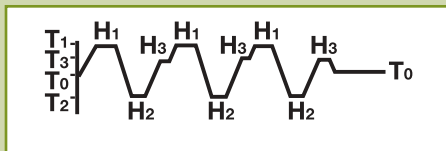
maximum of 99 times. Program input is simple and the steps during each operation are indicated by a lamp. This incubator accommodates a range of diversified experimentation requirements, and is ideal for experimentation during night time or holidays, experimentation that requires settings to be changed, and micro organism culture and preservation. Constant operation mode without step operation is also available.

# Sanyo Cooled-/Standard-Incubators

## 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 temperatures and times are combined.



Cooled incubators MIR-153/253/553

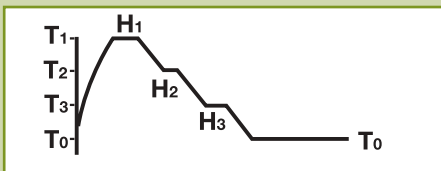
## High-precision Temperature Environment

### Microprocessor Control with Feed forward 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 feed forward function that monitors the operating conditions of the compressor, ensuring accurate temperature control of the chamber. In a wide temperature range of -10°C to 50°C, the heater PID exhibits temperature fluctuation of only  $\pm 0.2^\circ\text{C}$ , and the Compressor ON-OFF controls only  $\pm 1^\circ\text{C}$ . In addition, temperature uniformity in the chamber is within  $\pm 1^\circ\text{C}$ , allowing a full range of precise experimentation from micro

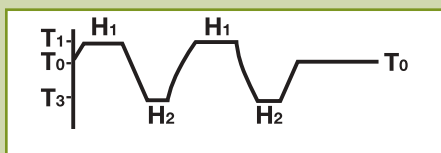
## 3-Step to constant Operation

With a temperature of T1, T2, and T3, operation is conducted using time H1, H2, H3 respectively. Then, constant operation temperature T0 is retained. Application: Optimum for experiments that require consistent 4-step temperature increases and decreases.



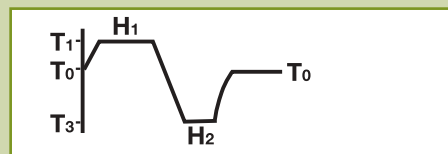
## 2-Step Repeat Operation

Using a temperature of 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.



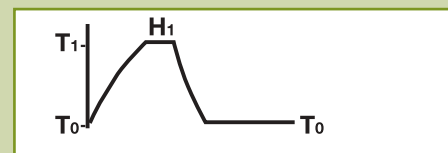
## 2-Step to constant Operation

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 labour savings while performing bacteria inspection from culture to preservation, and from preservation to culture.



organism 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 high-energy savings.

### CFC-free Foamed-in-place Rigid Polyurethane Insulation

CFC-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 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.

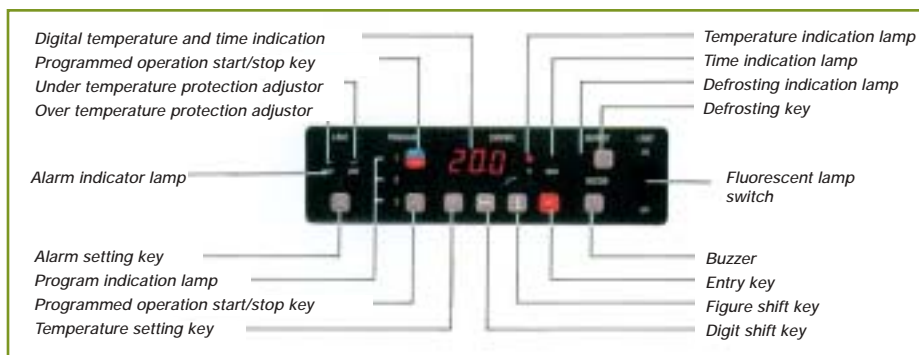
### Alarm and Security System to Protect Sample Safety

#### Automatic Setting Temperature Alarm

When the chamber temperature deviates more than  $\pm 2.5^\circ\text{C}$ , all the digits on the digital indicator flash and after 10 minutes a buzzer sounds to notify you. This system also automatically allows for 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). A 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.

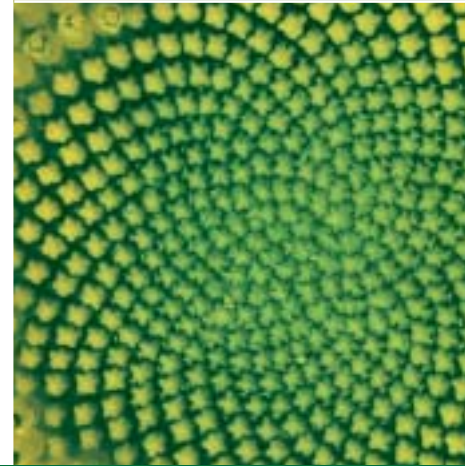
**Auto Return Mechanism**

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.

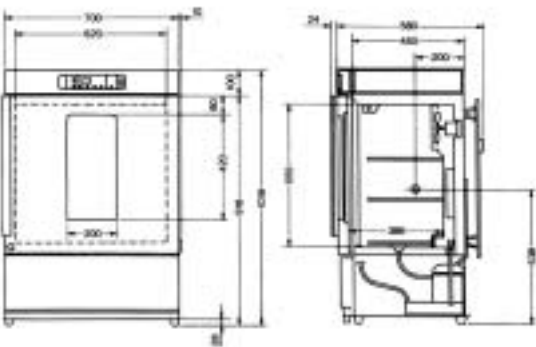
**Trouble Monitor (Self Diagnostic Function)**

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

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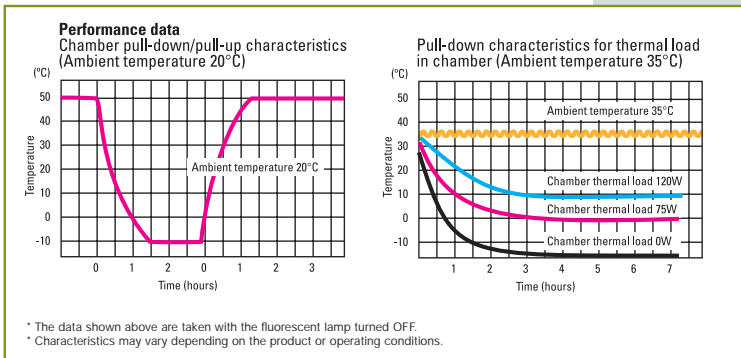


Cooled incubators



126 Liter

MIR-153



**Performance**  
Temperature pull-down speed: 50°C to 0°C Approx. 60 minutes. (ambient temperature 20°C, no load)  
Temperature pull-up speed: 0°C to 50°C Approx. 70 minutes. (ambient temperature 20°C, no load)



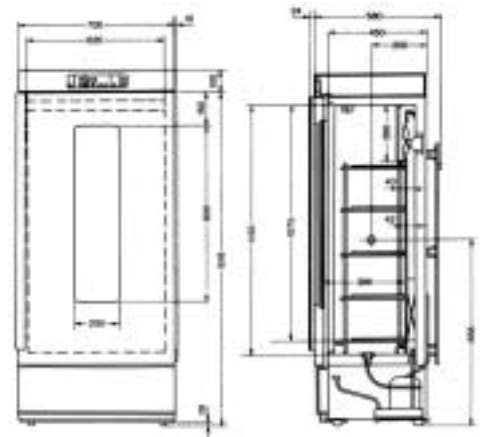
# Sanyo Cooled-/Standard-Incubators

## MIR-253

## 254 Liter

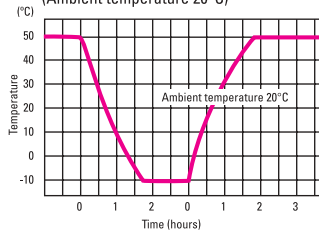


**Performance**  
 Temperature pull-down speed: 50°C to 0°C Approx. 86 minutes.  
 (ambient temperature 20°C, no load)  
 Temperature pull-up speed: 0°C to 50°C Approx. 105 minutes.  
 (ambient temperature 20°C, no load)

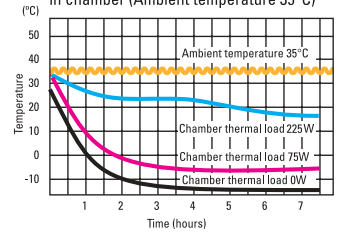


Cooled incubators

**Performance data**  
 Chamber pull-down/pull-up characteristics  
 (Ambient temperature 20°C)



**Pull-down characteristics for thermal load in chamber (Ambient temperature 35°C)**



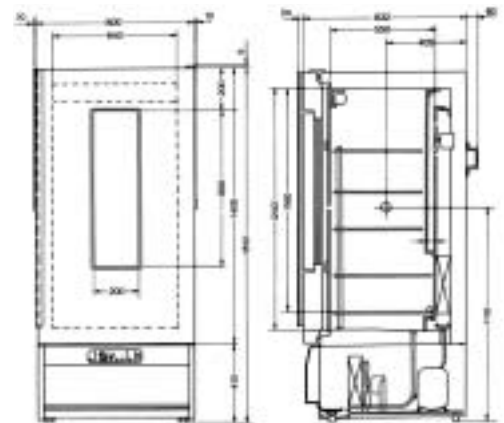
\* The data shown above are taken with the fluorescent lamp turned OFF.  
 \* Characteristics may vary depending on the product or operating conditions.

## MIR-553

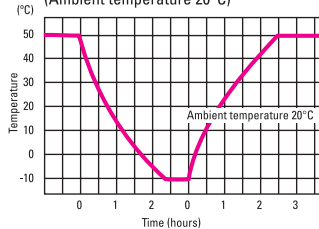
## 406 Liter



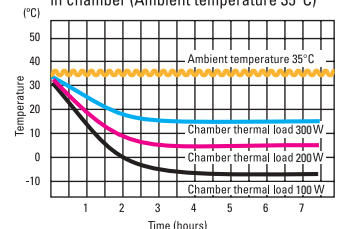
**Performance**  
 Temperature pull-down speed: 50°C to 0°C  
 Approx. 100 minutes.  
 (ambient temperature 20°C, no load)  
 Temperature pull-up speed: 0°C to 50°C  
 Approx. 140 minutes.  
 (ambient temperature 20°C, no load)



**Performance data**  
 Chamber pull-down/pull-up characteristics  
 (Ambient temperature 20°C)



**Pull-down characteristics for thermal load in chamber (Ambient temperature 35°C)**



\* The data shown above are taken with the fluorescent lamp turned OFF.  
 \* Characteristics may vary depending on the product or operating conditions.

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MIR-162/262

**Heated incubator 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  $\pm 0,2^{\circ}\text{C}$  (at  $37^{\circ}\text{C}$ ) and temperature uniformity is within  $\pm 1^{\circ}\text{C}$  (at  $37^{\circ}\text{C}$ ).

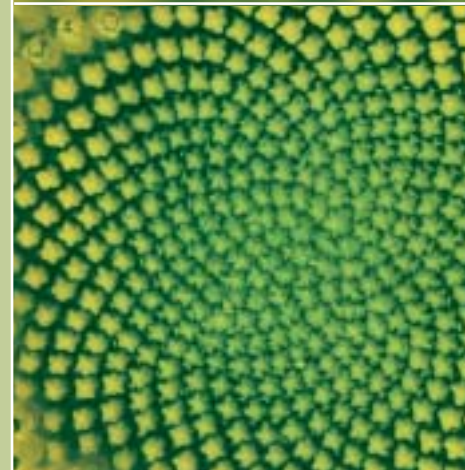
**Microcomputer Timer Function**

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). The program 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  $+5^{\circ}\text{C}$ ~ $80^{\circ}\text{C}$  (at  $20^{\circ}\text{C}$ )**  
SANYO heated incubators allow incubation at normal temperature to high temperature.

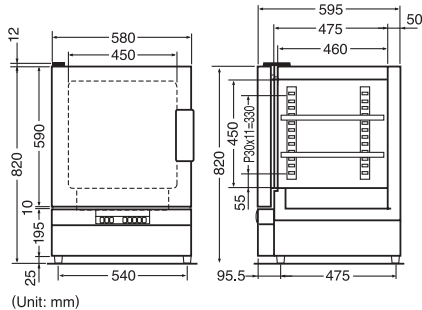
**Advanced Design**

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.

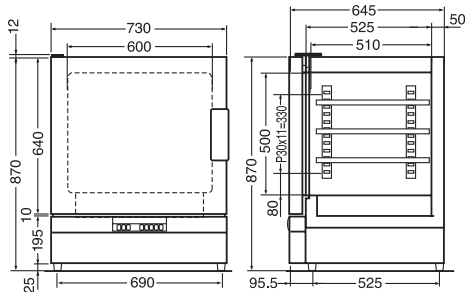


**Heated incubator MIR-162/262**

MIR-162



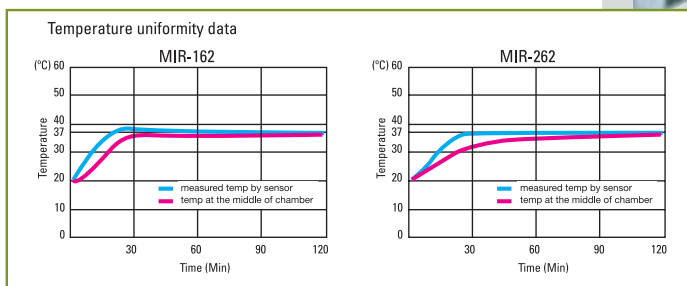
MIR-262



**93 Liter / 153 liter**

**MIR-162 / 262**

Temperature pull-up speed;  $20^{\circ}\text{C}$  to  $60^{\circ}\text{C}$   
Approx. 70 minutes (MIR-162)  
Approx. 60 minutes (MIR-262)  
(Ambient temperature  $20^{\circ}\text{C}$ , no load).



# Sanyo Cooled-/Standard-Incubators



## Exclusive stand

MKD-300T  
(for MIR-153)  
External dimensions  
820(W)x750(D)x750(H)mm



Specifications	Cooled incubators			Heated incubators	
Model	MIR-153	MIR-253	MIR-553	MIR-162	MIR-262
Exterior dimensions: (WxDxH)	700 x 580 x 1018	700 x 580 x 1618	800 x 832 x 1800	580 x 595 x 820	730 x 645 x 870
Interior dimensions: (WxDxH)	620 x 386 x 555	620 x 386 x 1075	640 x 550 x 1160	450 x 460 x 450	600 x 510 x 500
Effective capacity:	126 Liter	254 Liter	406 Liter	93 Liter	153 Liter
Exterior finish:	Baked acrylic finish on galvanized steel				
Interior finish:	Stainless steel				
Door:	Baked acrylic finish on galvanized steel, triple pane glass with key		triple pane glass with observation window and key	Baked acrylic finish on galvanized steel	
Shelves:	PE coated steel wire, adjustable			Stainless steel, stainless wire	
	3	5	5	2	3
Insulation:	Foamed-in-place rigid polyurethane			Glass wool	
Circulation system:	Forced air circulation			Natural convection	
Compressor:	Hermetic type			-	
	Single phase, output 180W	Single phase, output 300W	Single phase, output 300W	-	
Evaporator:	Fin and tube type, forced circulation			-	
Condenser:	Wire and tube type natural air cooling system			-	
Defrosting system:	Manual start, automatic finish, natural vaporisation of drain water			-	
Heater:	Cord heater	Cord heater	Cord heater	Sheathed heater	Sheathed heater
	141 W	218 W	332 W	200 W	300 W
Temp. setting indication	Digital setting with key lock digital display				
Temperature control	Microprocessor PID system (when compressor operates, ON/OFF control)			Microprocessor PID system	
Temperature sensor	Thermistor				
Autom. setting temp. alarm	When temperature deviates approx. $\pm 2,5^{\circ}\text{C}$ , visual and audible alarm				
Over temp. protection device	Visual and audible alarm				
Programmed operation	3-step repeat from 1-99 times. Continuous repeat 1 step 0,5-99,5Hr (program memory back up function approx. 5 hours)			-	
Temperature range	-10°C ~ +50°C			+ 5°C ~ +80°C (UT 20°C)	
Timer	-			Automatic timer with delay function 00:00 - 99:59	
Temperature controllability	$\pm 0,2^{\circ}\text{C}$ at heater PID control (Temp. setting 50°C, ambient temp. 20°C, no load) $\pm 1^{\circ}\text{C}$ at compressor ON/OFF control (Temp. setting 5°C, ambient temp. 20°C, no load)			$\pm 0,2^{\circ}\text{C}$ (-60°C) $\pm 0,5^{\circ}\text{C}$ (60-80°C) at 37°C	
Temperature uniformity	$\pm 0,5^{\circ}\text{C}$ (Temp. setting 37°C, ambient temp. 20°C, no load)			$\pm 1^{\circ}\text{C}$	
Power source: Voltage	230/240 V / 50 Hz	230/240 V / 50Hz	230/240 V / 50 Hz	230/240 V / 50 Hz	230/240 V / 50 Hz
Amps	1,4 A	1,2 A	2,1 A	0,9 A	1,4 A
Breaker	15 A	15 A	15 A	15 A	15 A
Power consumption	224/232 W	292/290 W	384/415 W	200 W	300 W
Interior lamp	15 W x 1, fluorescent lamp			-	
Net weight	69 Kg	104 Kg	205 Kg	44 Kg	61 Kg
Accessories	Key 1set Light shielding plate 1	Key 1set Light shielding plate 1	Key 1set	-	-

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