

Think GAIA
For Life and the Earth

SANYO

**MOV Series
Electric Ovens
Dry Heat Sterilizers**

**MOV-112F/212F
MOV-112/212
MOV-112S/212S**



MOV-112F

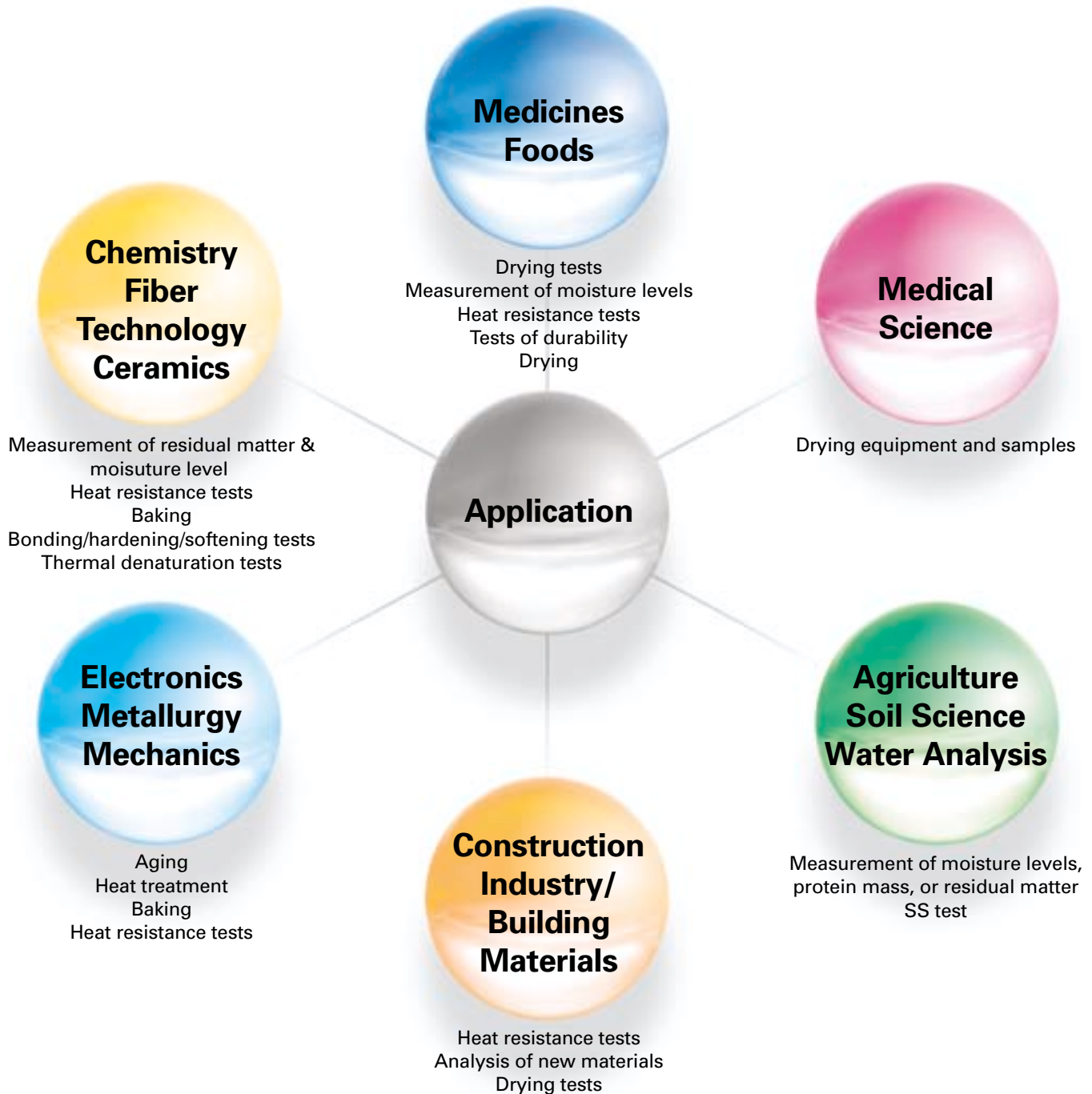
MOV-212

SANYO MOV Series

Electric Ovens
and Dry Heat Sterilizers

Accurate, High-Temperature Equipment for the New Generation of Scientific Research.

SANYO has always aimed to provide research support equipment that offers complete satisfaction to its users. Inspired by the search for even higher precision and greater flexibility of control, SANYO presents the new MOV Series.



Search to the future

Microprocessor PID temperature control system guarantees accurate temperature environment

The microprocessor PID (Proportional, Integrated and Differential) temperature control system ensures accurate inside temperature.

With less offset or overshoot, exact control is possible. This system provides the high-temperature environment that exactly meets experimentation requirements.



Forced air circulation system ensures stable temperatures accurate to within ±4.0°C

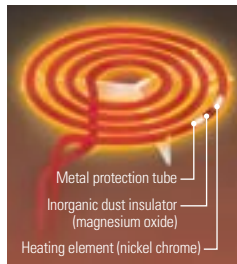
Fan circulation ensures that deviations in cabinet temperature are kept within ±4.0°C (at 200°C).

The MOV Series can be widely used for basic to applied experimentation in the areas of scientific, industrial and environmental testing.

Sheathed heater ensures durability and safety

A sheathed heater is incorporated in the heater section. The heating element is wrapped in a magnesium oxide insulating material and covered with metal protection tube.

With conventional wire heating elements (bare heaters), gases or dust can cause corrosion, resulting in loss of heating capacity and electrical leakage. With its durability and high chemical resistance, the sheathed heater ensures safer, more stable operation without the risk of electrical leakage.



Attractive design

SANYO believes that laboratory equipment should be attractive as well as functional. The MOV Series features a future-oriented design, with rounded corners, door handles that blend with the main body, and a flat control panel.

User-oriented design for easy operation

The control panel has soft-touch keys and bright, green digital LED display that allows easy confirmation of temperature and remaining operation time. Other advantages of the design include a soft-latched door handle integrated with the door, an observation window for checking conditions inside the cabinet, two exhaust vents (shared with an access vent) on the top of the unit, and a stainless-steel (SUS-304) interior to guarantee durability and superior resistance to chemicals.

Alarm and safety functions

A comprehensive range of alarm and safety devices is included as standard in the MOV Series. And the built-in alarm jack allows remote control of the unit.



Alarm and safety functions	Trigger	Alarm notification method and operation
Automatic set temperature alarm	More than 10°C deviation from set temperature.	Lamp, LED, buzzer.
Independent overheating protection circuit	Abnormal temperature increase above upper limit.	While not in operation: buzzer. While in operation: lamp, LED and buzzer. Independent circuit switches off heater and fan motor.
Overtemp. safety system for control section	Ambient temperature of main part (base) of control section exceeds 65°C.	Lamp, LED, buzzer. Heater and fan motor switched off.
Keylock switch	Keylock switch on.	Key input not possible (excl. buzzer and call key).
Memory backup function	During power failure, breaker cut or when unit is not connected to power supply.	Stores operation patterns for set temperatures/times.

Malfunction Monitor (Self diagnosis function)

Should a malfunction occur, it is diagnosed and indications are given on the digital display.

Indication	Meaning
E 01	Temperature sensor open
E 02	Triac open
E 03	Triac shortcircuit
E 04	Relay shortcircuit
E 05	Relay open, fan motor shortcircuit, heater shortcircuit, independent over-heating protection circuit activated and overtemp. safety system is ON.

Electric Ovens

MOV-112F/212F
MOV-112/212

Future-oriented Ovens That Look Good and Improve Efficiency.

Four models that feature natural convection and forced air circulation systems to create environments for a wide variety of experiments. Designed for ease of use and safety.

Microprocessor timer function

SANYO has included a microprocessor timer function, so operation times can be set up to a maximum of 99 hours and 59 minutes. The combination of auto start and auto stop provides operating patterns suited to a wide variety of applications. The auto stop operates the timer when the heater is on, or when the set temperature has been reached. A buzzer indicates the end of timer operation.

Forced air circulation system (MOV-112F/212F)

Sirocco fan circulation keeps variations in inner cabinet temperature within $\pm 4^{\circ}\text{C}$ at 200°C . Compared with natural convection, quicker drying is possible. And SANYO's unique fan motor not only circulates hot air in the cabinet but also keeps the motor cool, improving the reliability and safety of the motor.

Natural convection system (MOV-112/212)

Natural convection is best for drying very small samples and fine particles which would be scattered by a fan. This system can be used for high-temperature applications up to 250°C .

Fast heat treatment possible at an even temperature.

Ambient temperature $+5^{\circ}\text{C}$ to 200°C
(Forced air circulation system)



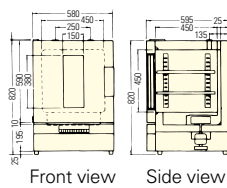
Versatile operating temperature range without damaging samples.

Ambient temperature $+5^{\circ}\text{C}$ to 250°C
(Natural convection system)



Dimensional Figures

MOV-112F

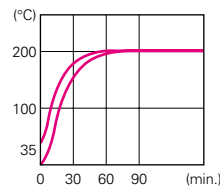


Unit: mm

Performance Data

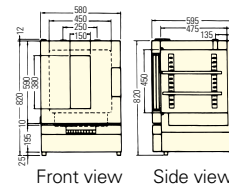
MOV-112F Pull-up characteristics

No load, exhaust vent closed.



Dimensional Figures

MOV-112

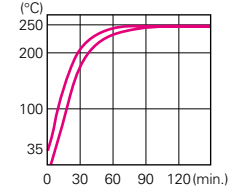


Unit: mm

Performance Data

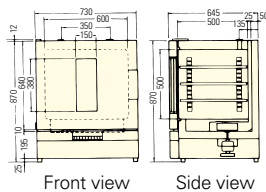
MOV-112 Pull-up characteristics

No load, exhaust vent closed.



Dimensional Figures

MOV-212F

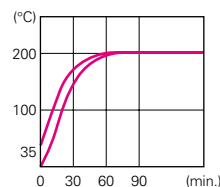


Unit: mm

Performance Data

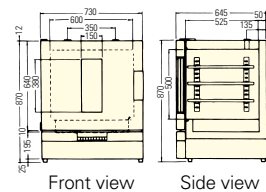
MOV-212F Pull-up characteristics

No load, exhaust vent closed.



Dimensional Figures

MOV-212

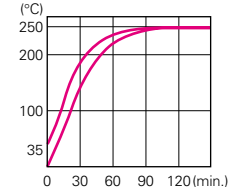


Unit: mm

Performance Data

MOV-212 Pull-up characteristics

No load, exhaust vent closed.



Dry Heat Sterilizers

MOV-112S/212S

Constant Temperature Environments for Dry Heat Sterilizing and Efficient Laboratory Work.

MOV Series models provide many advantages:

PID precision temperature control is adjustable to within $\pm 1^\circ\text{C}$; Forced air circulation keeps cabinet temperatures even to within $\pm 4^\circ\text{C}$; The new microprocessor timer helps correct sterilizing time.

The microprocessor PID control system guarantees accurate sterilizing temperatures.

The built-in sheathed heater offers superior durability and safety.

Forced air circulation with quick pull-up and precise temperature distribution

The time needed to reach the set temperature is shorter with a forced air circulation system compared with natural convection. The temperature is even throughout the cabinet—deviations are kept within $\pm 4^\circ\text{C}$ at 200°C . And the fan motor is specially designed to circulate the air in the cabinet and prevent the motor from overheating at the same time.



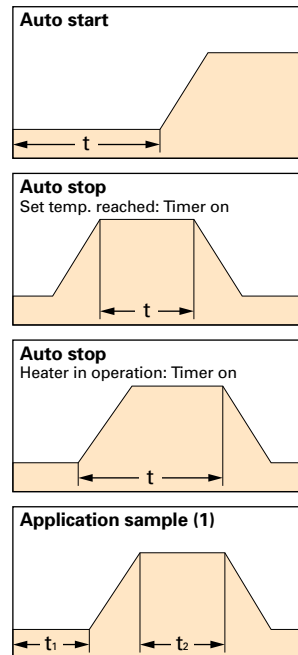
Built-in microprocessor timer guarantees accurate sterilization time

The built-in microprocessor timer (max. setting 99 hours and 59 minutes) accurately adjusts sterilization time. A consecutive display of the inner cabinet temperature is provided for quick confirmation of the time when samples should be removed. And a buzzer sounds at the end of timer operation. In combination with auto start and auto stop, operation patterns can be set for a wide range of applications.

Standard dry heat sterilizing times (as indicated by the Japanese Pharmacopoeia)

135°C – 145°C	3 – 5 hours
160°C – 170°C	2 – 4 hours
180°C – 200°C	0.5 – 1 hours

Microprocessor timer setting patterns:



Accurate temperature and time — essential for dry heat sterilization.

Ambient temperature $+5^\circ\text{C}$ to 200°C

Effective capacity

90 liters
MOV-112S



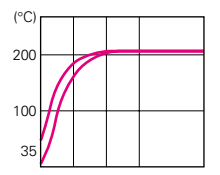
Effective capacity

150 liters
MOV-212S

Performance Data

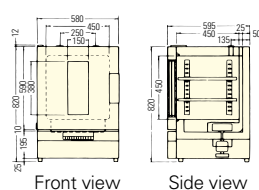
MOV-112S Pull-up characteristics

No load, exhaust vent closed.



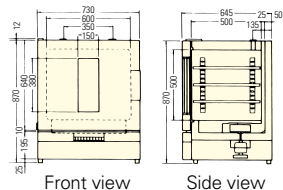
Dimensional Figures

MOV-112S



Unit: mm

MOV-212S

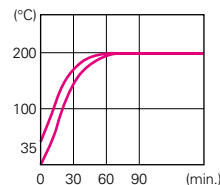


Unit: mm

MOV-212S

Pull-up characteristics

No load, exhaust vent closed.



MOV-112F/212F/112/212/112S/212S

Specifications

Type	Electric Ovens				Dry Heat Sterilizers	
Model No.	MOV-112F	MOV-212F	MOV-112	MOV-212	MOV-112S	MOV-212S
External dimensions (W x D x H)	580 x 595 x 820 mm (22.8" x 23.4" x 32.3")	730 x 645 x 870 mm (28.7" x 25.4" x 34.3")	580 x 595 x 820 mm (22.8" x 23.4" x 32.3")	730 x 645 x 870 mm (28.7" x 25.4" x 34.3")	580 x 595 x 820 mm (22.8" x 23.4" x 32.3")	730 x 645 x 870 mm (28.7" x 25.4" x 34.3")
Internal dimensions (W x D x H)	450 x 450 x 450 mm (17.7" x 17.7" x 17.7")	600 x 500 x 500 mm (23.6" x 19.7" x 19.7")	450 x 450 x 450 mm (17.7" x 17.7" x 17.7")	600 x 525 x 500 mm (23.6" x 20.7" x 19.7")	450 x 450 x 450 mm (17.7" x 17.7" x 17.7")	600 x 500 x 500 mm (23.6" x 19.7" x 19.7")
Effective capacity	90 L (3.2 cu.ft.)	150 L (5.3 cu.ft.)	97 L (3.4 cu.ft.)	157 L (5.5 cu.ft.)	90 L (3.2 cu.ft.)	150 L (5.3 cu.ft.)
Exterior finish	Painted steel					
Interior finish	Stainless steel plate					
Insulation	Glass wool					
See-through window	Reinforced triple-glass window (t = 5 mm)					
Shelves	Stainless-steel plate, stainless-steel wire (adjustable)					
	2	3	2	3	2	3
Air exhaust vent	Two on top plate (23 mm inside dia.)					
Heating system	Forced air circulation system		Natural convection system		Forced air circulation system	
Temperature control system	Microprocessor PID control					
Sensor	Thermo couple					
Temperature setting	Digital setting (adjustable range: $\pm 1^{\circ}\text{C}$)					
Timer	Auto start, Auto stop 00:00 – 99:59					
Temperature/Timer display	Digital LED display					
Heater (Sheathed heater)	1.1kW	1.2kW	1.1kW	1.3kW	1.1kW	1.2kW
Interior fan	Sirocco fan dia. 149 mm		—		Sirocco fan dia. 149 mm	
Exterior fan	Propeller fan 107 mm		—		Propeller fan 107 mm	
Power source	50/60Hz, cord approx. 2m					
Max. power consumption	Approx. 1.1kW	Approx. 1.2kW	Approx. 1.1kW	Approx. 1.3kW	Approx. 1.1kW	Approx. 1.2kW
Temperature range	Ambient temperature $+5^{\circ}\text{C}$ to 200°C		Ambient temperature $+5^{\circ}\text{C}$ to 250°C		Ambient temperature $+5^{\circ}\text{C}$ to 200°C	
Temperature controllability	± 1 deg.				—	
Temperature uniformity	$\pm 4^{\circ}\text{C}$ (at 200°C)		$\pm 10^{\circ}\text{C}$ (at 200°C)		$\pm 4^{\circ}\text{C}$ (at 200°C)	
Weight	50kg (110.2 lbs.)	66kg (145.5 lbs.)	47kg (103.6 lbs.)	63kg (138.9 lbs.)	50kg (110.2 lbs.)	66kg (145.5 lbs.)
Alarm and safety function	Overcurrent breaker, automatic set temperature alarm (set point $+10^{\circ}\text{C}$), independent overheat protection circuit, overtemperature safety system at control section (triggered at 65°C), self diagnosis.					

Appearance and specifications are subject to change without notice.

When the setting value is below 100°C , large deviations in cabinet temperature will occur.

Further details regarding our products can be accessed at <http://www.sanyo.co.jp/cm/g/biomedical>

We design and manufacture products in accordance with ISO9001 & 14001 requirements.
RoHS (European Restriction of Hazardous Substances directives) compliant

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Biomedical Division