



## Biomedical and Medical Equipment



Quality without Compromise

\* The information contained in this brochure is as of April 2004.  
\* Appearance and specifications are subject to change without notice  
\* For more details, refer to individual product brochures.

Distributed by:



**SANYO Electric Biomedical Co., Ltd.**  
**SANYO Sales & Marketing Corporation**  
5-15, Hiyoshi-cho 2-chome, Moriguchi City, Osaka, 570-8634, Japan  
Telephone: +81-6-6992-4015 Fax: +81-6-6992-9291/9295  
URL <http://www.sanyo-biomedical.co.jp/>  
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SANYO is well known throughout the world for high-quality biomedical equipment. In October 2001, SANYO Electric Biomedical Co., Ltd. was formed by the merger of SANYO Electric Refrigeration Products Division and SANYO Electric Medica Systems Co., Ltd. This marked the establishment of a new operation system that integrates engineering and manufacturing capabilities with sales and marketing functions. The end result is quick and flexible response to customer requirements.

Drawing on SANYO’s leading refrigeration technology, the first ever -152°C ultra-low temperature freezer has been successfully introduced. Along with the rapid development of biotechnology, our CO<sub>2</sub> incubators and bio safety cabinets have been accepted and highly acclaimed by researchers around the world. SANYO also leads the world with its complete range of CFC-free medical equipment. These are just a few examples of the many advanced products on which our customers depend.

Keeping in line with our corporate philosophy of “Learning from our customers,” we at SANYO Electric Biomedical will continue to strengthen our business operations and increase customer satisfaction on a global level.



SANYO Electric Biomedical Co., Ltd.

Corporate Data

- Company Name: SANYO Electric Biomedical Co., Ltd.
- Tokyo Head Office: 10-15, Hongo 3-Chome, Bunkyo-Ku, Tokyo 113-8434, Japan
- Osaka Branch: 5-5, Keihan-Hondori 2-Chome, Moriguchi City, Osaka 570-8677, Japan
- Gunma Factory: 1-1-1, Sakata, Oizumi-Machi, Ora-Gun, Gunma 370-0596, Japan

History of SANYO Biomedical Equipment Development (Main products, launch year)

- 1966 Pharmaceutical fridge
- 1969 Incubator
- 1973 Medical autoclave
- 1974 -40°C freezer
- 1975 Automatic tablet dispensing machine
- 1977 -86°C chest freezer
- 1979 Prefabricated unit
- 1980 -86°C upright freezer
- 1982 PI-controlled oven
- 1984 CO<sub>2</sub> incubator  
Dry heat sterilizer
- 1985 Lab autoclave
- 1986 -135°C freezer  
Lab equipment washer
- 1987 Bio clean bench
- 1991 World’s first -152°C freezer
- 1993 Bio safety cabinet
- 1998 -86°C V.I.P.™ freezer
- 1999 inCu saFe® CO<sub>2</sub> incubators
- 2001 SafeCell™ UV CO<sub>2</sub> incubator

Life science—a rapidly transforming field.



We are always up to speed with fast moving trends in the field of life science. This is essential if we aim to fulfill the needs of customers around the world with our advanced technology. Preservation and culturing are the company’s core technologies which have been built up over many years. We are constantly reinforcing these as well as developing new key technologies. In this way we can offer customers reliable solutions by supplying them with a full range of integrated systems that combine hardware and software. In the near future, it is quite clear that biotechnology will merge with information technology and mechatronics to create an entirely new field. The SANYO Electric Group will integrate total efforts to satisfy increasingly diversified requirements in the field of leading-edge medicine by developing and offering a wide array of advanced products. These range from products that assist research in the cutting-edge field of cell therapy such as regenerative medicine and gene therapy, and automated equipment for medication and pharmacy-related fields to nursing care equipment which is an essential element for the aging society. While learning from customers, SANYO will continue to evolve itself in the years to come.

C O N T E N T S

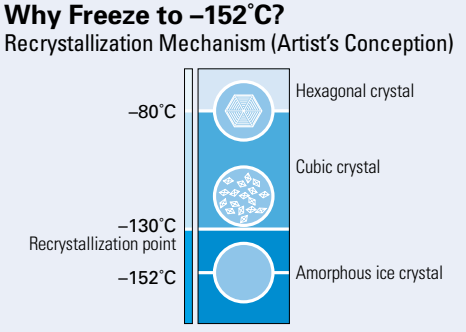
<b>Preservation Systems</b>	
CFC-Free Ultra-Low Temperature Freezers	3–5
Biomedical Freezers (Direct Cooling Type)	6
Biomedical Freezers (Fan Type)	7
Blast Freezer/Specifications	7
Blood Bank Refrigerators	8
Pharmaceutical Refrigerators	9–10
Specifications	10
Optional Accessories	11
<b>Culturing Systems</b>	
CO <sub>2</sub> Incubators	12–13
Multi-Gas Incubator	13
Heated Incubators	14
Cooled Incubators	14
Plant Growth Chambers	14
Specifications/Optional Accessories	15
<b>Autoclaves</b>	
Laboratory Autoclaves	16
Medical Autoclaves	16
Specifications	16
<b>Drying &amp; Sterilizing Systems</b>	
Electric Ovens	17
Dry Heat Sterilizers	17
High-Temperature Programmable Ovens	17
Specifications/Optional Accessories	18
<b>Flake Ice Maker</b>	
Undercounter Flake Ice Maker	17
Specifications	18
<b>Experiment Systems</b>	
Biological Safety Cabinet	19
Bio-Clean Benches (Forced air circulation exhaust system)	19
Clean Benches (Standard type)	19
Specifications	20
<b>Dispensing Systems</b>	
ATC (Automatic Tablet Counting Machine)	21
Compact ATC	21
Tablet Dispenser	21
Multi-Drive Vial Filler	21
Compact Vial Filler	21
Specifications	22
<b>Nursing Care Equipment</b>	22

Ideal for preservation of reagents, research materials and medicines, SANYO preservation systems employ microprocessor control to maintain high-precision temperature environment, not being affected by ambient temperature, minimizing uneven temperature distribution within the chamber, and a temperature rise during defrosting.

3

Preservation Systems

CFC-Free Ultra-Low Temperature Freezers



World's lowest  $-152^{\circ}\text{C}$  freezer ensures stable cell and tissue preservation.

An important factor to consider when preserving cells or tissue at ultra-low temperatures is to prevent amorphous ice crystals from recrystallizing within and outside the cells. Samples that are maintained in an ultra-low temperature freezer at  $-152^{\circ}\text{C}$  which is far lower than the recrystallization point ( $-130^{\circ}\text{C}$  for pure water) can be preserved semi-permanently. Preservation at ultra-low temperatures maintains vitrification without crystallization occurring inside and outside cells. In contrast to conventional liquid nitrogen preservation containers, freezer preservation has numerous advantages: no sample contamination, no sudden liquid eruptions as well as low operational costs. SANYO freezers make long-term storage below the recrystallization point easier and more stable than ever before.

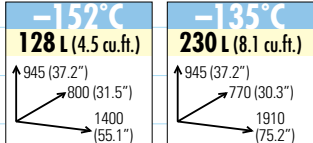


MDF-192

- Super freezing capacity below  $-86^{\circ}\text{C}$  ( $-123^{\circ}\text{F}$ )
- Low-profile design for easier loading and unloading
- Ultra-freezing in minimal space



MDF-1155



MDF-1155ATN

MDF-1155

MDF-2136ATN

MDF-2136

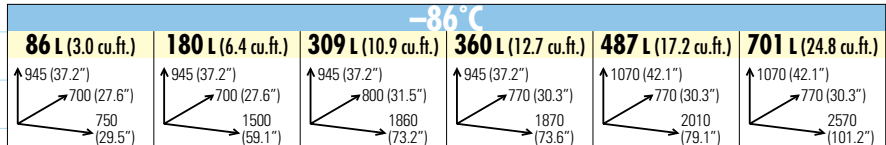
ATN: LN<sub>2</sub> back-up, Temp. recorder, Alarm function

- CFC-free special mixed refrigerant
- Alarm and safety devices
- Microprocessor temperature control



MDF-592AT

- Microprocessor temperature control
- Improved design
- Alarm and safety devices
- Digital display



MDF-192AT

MDF-192

MDF-293AT

MDF-293

MDF-392AT

MDF-392

MDF-492AT

MDF-492

MDF-592AT

MDF-592

MDF-792AT

MDF-792

AT: LCO<sub>2</sub> back-up, Temp. recorder, Alarm function

- Maximised storage capacity with V.I.P.<sup>™</sup> technology
- Safe operation with continuous condition monitor status alerats\*
- Enhanced security
- Improved accessibility

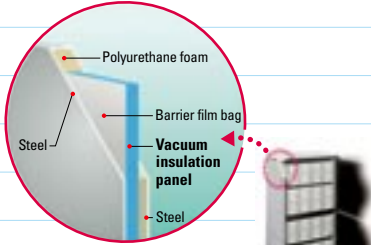
\*Excluding MDF-U51VA



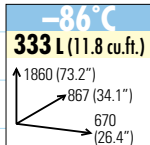
Patented V.I.P.<sup>™</sup>  
(Vacuum Insulation Panel)

VIP panel is the innovative insulation component developed and manufactured by SANYO. VIP panels contain densely packed, open cell foam insulation under vacuum.

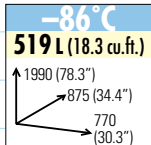
This configuration dramatically enhances the insulation capability of the freezer while reducing the wall thickness. This in turn leads to greater interior volume and structural stability.



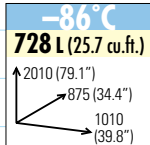
MDF-U50V



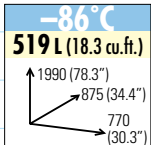
MDF-U32V



MDF-U52V



MDF-U72V



MDF-U51VA [115V]

(North America only)

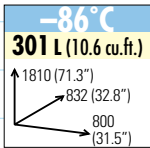


Preservation Systems

CFC-Free Ultra-Low Temperature Freezers

Robust cooling performance

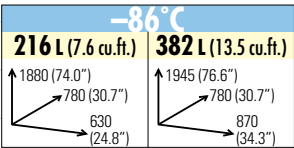
- Space-saving design
- More effective capacity with latest CFC-free insulation technology



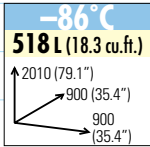
MDF-U3086S  
MDF-382E (China only)



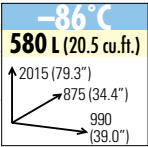
MDF-U4086S



MDF-U2086S    MDF-U4086S



MDF-U5186S



MDF-U6086S

Biomedical Freezers (Direct Cooling Type)

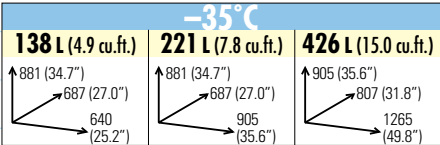
Chest type

Power to cope with frequent door openings



MDF-436

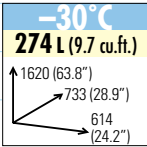
- Balance hinge
- Temperature alarm
- Power failure alarm



MDF-136    MDF-236    MDF-436

Upright type

Maximum capacity in minimum installation space

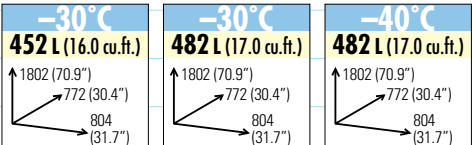


MDF-U333



MDF-U537D

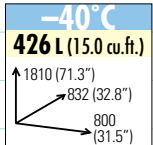
- Door latch with padlock hole
- Temperature alarm
- Power failure alarm



MDF-U537D    MDF-U537    MDF-U5411

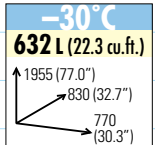
Note:  
MDF-U537D: Separate upper/lower compartments  
MDF-U537: Single compartment  
MDF-U5411: -40℃ version of MDF-U537 with interior dimensions and effective capacity same as MDF-U537

Biomedical Freezers (Fan Type)



MDF-U442

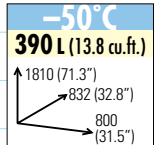
- High freezing power
- Forced air circulation and auto defrost
- High freezing power improves temperature uniformity



MDF-U730

- Fan-forced air circulation system and auto defrost
- Large capacity
- Adjustable wire shelves
- Alarm and safety functions

Blast Freezer



MDF-U460BR

- High-speed freezing with cascade cooling system and double fans in chamber
- Microcomputer control
- Defrosting is either by automatic or manual operation

Specifications

Description	CFC-Free Ultra-Low Temperature Freezers			
Model No.	MDF-1155/ATN	MDF-2136/ATN	MDF-192/AT	MDF-293/AT
Temperature Range	−100°C to −152°C	−85°C to −135°C	−20°C to −86°C	
Exterior Dimensions (W x D x H)	1400 x 800 x 945mm	1910 x 770 x 945mm	750 x 700 x 945mm	1500 x 700 x 945mm
Interior Dimensions (W x D x H)	500 x 450 x 572mm	1030 x 390 x 572mm	480 x 430 x 420mm	760 x 420 x 565mm
Net Weight (Approx.)	278 kg (613 lbs.)/285 kg (628 lbs.)	323 kg (712 lbs.)/330 kg (728 lbs.)	121 kg (267 lbs.)/127 kg (280 lbs.)	198 kg (437 lbs.)/205 kg (452 lbs.)

Description	CFC-Free Ultra-Low Temperature Freezers			
Model No.	MDF-392/AT	MDF-492/AT	MDF-592/AT	MDF-792/AT
Temperature Range	−20°C to −86°C			
Exterior Dimensions (W x D x H)	1860 x 800 x 945mm	1870 x 770 x 945mm	2010 x 770 x 1070mm	2570 x 770 x 1070mm
Interior Dimensions (W x D x H)	1120 x 520 x 530mm	1140 x 500 x 632mm	1280 x 500 x 762mm	1840 x 500 x 762mm
Net Weight (Approx.)	2248 kg (547 lbs.)/55 kg (562 lbs.)	278 kg (613 lbs.)/285 kg (628 lbs.)	310 kg (683 lbs.)/320 kg (705 lbs.)	370 kg (816 lbs.)/380 kg (838 lbs.)

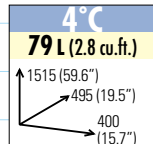
Description	CFC-Free Ultra-Low Temperature Freezers							
Model No.	MDF-U32V	MDF-U51VA	MDF-U52V	MDF-U72V	MDF-U3086S	MDF-382E	MDF-U2086S	MDF-U4086S
Temperature Range	-50°C to -86°C				-20°C to -86°C			
Exterior Dimensions (W x D x H)	670 x 867 x 1860mm	770 x 875 x 1990mm	1010 x 875 x 2010mm		800 x 832 x 1810mm	630 x 780 x 1880mm		870 x 780 x 1945mm
Interior Dimensions (W x D x H)	490 x 600 x 1140mm	630 x 600 x 1380mm		870 x 600 x 1400mm	520 x 517 x 1120mm	370 x 490 x 1200mm		620 x 520 x 1200mm
Net Weight (Approx.)	258 kg (569 lbs.)	314 kg (692 lbs.)/304 kg (670 lbs.)		345 kg (761 lbs.)	273 kg (602 lbs.)		195 kg (430 lbs.)	286 kg (631 lbs.)

Description	CFC-Free Ultra-Low Temperature Freezers		Biomedical Freezers (Direct Cooling Type)			
Model No.	MDF-U5186S	MDF-U6086S	MDF-136	MDF-236	MDF-436	MDF-U333
Temperature Range	−20°C to −86°C		−20°C to −35°C			
Exterior Dimensions (W x D x H)	900 x 900 x 2010mm	990 x 875 x 2015mm	640 x 687 x 881mm	905 x 687 x 881mm	1265 x 807 x 905mm	614 x 733 x 1620mm
Interior Dimensions (W x D x H)	640 x 625 x 1300mm	740 x 600 x 1310mm	525 x 440 x 715mm	790 x 440 x 715mm	1140 x 550 x 735mm	490 x 485 x 1290mm
Net Weight (Approx.)	287 kg (633 lbs.)	310 kg (683 lbs.)	45 kg (99 lbs.)	54 kg (119 lbs.)	71 kg (157 lbs.)	81 kg (179 lbs.)

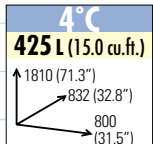
Description	Biomedical Freezers (Direct Cooling Type)			Biomedical Freezers (Fan Type)		Blast Freezer
Model No.	MDF-U537D	MDF-U537	MDF-U5411	MDF-U442	MDF-U730	MDF-U460BR
Temperature Range	−20°C to −30°C			−15°C to −40°C	−15°C to −30°C	−15°C to −50°C
Exterior Dimensions (W x D x H)	804 x 772 x 1802mm		804 x 772 x 1802mm	800 x 832 x 1810mm	770 x 830 x 1955mm	800 x 832 x 1810mm
Interior Dimensions (W x D x H)	Top: 658 x 607 x 589mm Bottom: 658 x 607 x 603mm		658 x 607 x 1272mm	640 x 615 x 1090mm	650 x 710 x 1520mm	640 x 560 x 1090mm
Net Weight (Approx.)	136 kg (300 lbs.)		131 kg (289 lbs.)	210 kg (463 lbs.)	170 kg (375 lbs.)	225 kg (496 lbs.)

Blood Bank Refrigerators

- Designed to meet AABB criteria
- Precise temperature control
- Alarm and safety functions



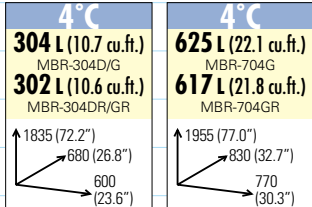
MBR-107D(H)



MBR-506D(H)



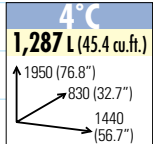
MBR-704GR



MBR-304D/DR MBR-304G/GR MBR-704G/GR



MBR-1404G



MBR1404G/GR

D: 30-day strip chart recorder  
G: 7-day circular chart recorder  
R: Drawer type

Pharmaceutical Refrigerators

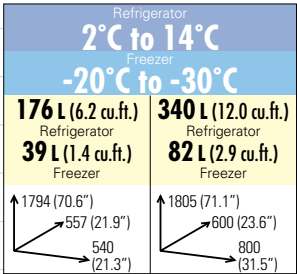


MPR-214F



MPR-414F

- One unit dual temperature zone (Refrigerator with freezer)
- Superior cooling performance
- Quiet operation
- Various alarm and safety functions



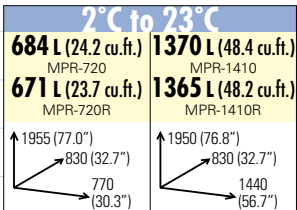
**MPR-214F**  
**MPR-414F**  
**MPR-414FS**  
F: Glass door type  
FS: Steel door type



MPR-720R



MPR-1410



**MPR-720**  
**MPR-720R**  
**MPR-1410**  
**MPR-1410R**  
R: Drawer type



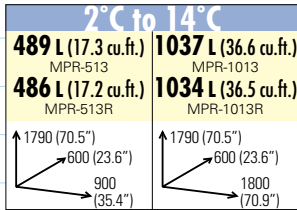
**MPR-161D(H)**



**MPR-311D(H)**  
D: Digital temp. display  
Stainless steel interior cabinet  
Card holder



MPR-1013R



**MPR-513**  
**MPR-513R**  
**MPR-1013**  
**MPR-1013R**  
R: Drawer type

Specifications

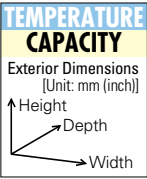
Description	Blood Bank Refrigerators					
Model No.	MBR-107D(H)	MBR-506D(H)	MBR-304D/DR	MBR-304G/GR	MBR-704G/GR	MBR-1404G/GR
Temperature	4°C					
Exterior Dimensions (W x D x H)	400 x 495 x 1515mm	800 x 832 x 1810mm	600 x 680 x 1835mm	520 x 490 x 1150mm	770 x 830 x 1955mm	1440 x 830 x 1950mm
Interior Dimensions (W x D x H)	320 x 350 x 710mm	640 x 550 x 1240mm	640 x 550 x 1240mm	520 x 490 x 1150mm	650 x 697 x 1500mm	1320 x 697 x 1500mm
Net Weight (Approx.)	70 kg (154 lbs.)	185 kg (408 lbs.)	125 kg (276 lbs.)/140 kg (309 lbs.)	195 kg (430 lbs.)/210 kg (463 lbs.)	245 kg (540 lbs.)/290 kg (639 lbs.)	

Description	Pharmaceutical Refrigerators		
Model No.	MPR-214F	MPR-414F	MPR-414FS
Temperature Range	Refrigerator: 2°C to 14°C Freezer: -20°C to -30°C		
Exterior Dimensions (W x D x H)	540 x 557 x 1794mm	800 x 600 x 1805mm	
Interior Dimensions (W x D x H)	Refrigerator: 455 x 466 x 917mm Freezer: 420 x 342 x 267mm	Refrigerator: 720 x 495 x 1425mm Freezer: 317 x 440 x 576mm	
Net Weight (Approx.)	81 kg (179 lbs.)	126 kg (278 lbs.)	119 kg (262 lbs.)

Description	Pharmaceutical Refrigerators			
Model No.	MPR-720/R	MPR-1410/R	MPR-161D(H)	MPR-311D(H)
Temperature Range	2°C to 23°C		2°C to 14°C	
Exterior Dimensions (W x D x H)	770 x 830 x 1955mm	1440 x 830 x 1950mm	800 x 450 x 1090mm	800 x 450 x 1800mm
Interior Dimensions (W x D x H)	650 x 710 x 1500mm	1320 x 710 x 1500mm	720 x 300 x 725mm	720 x 300 x 1435mm
Net Weight (Approx.)	167 kg (368 lbs.)/186 kg (410 lbs.)	231 kg (509 lbs.)/267 kg (589 lbs.)	59 kg (130 lbs.)	90 kg (198 lbs.)

Description	Pharmaceutical Refrigerators	
Model No.	MPR-513/R	MPR-1013/R
Temperature Range	2°C to 14°C	
Exterior Dimensions (W x D x H)	900 x 600 x 1790mm	1800 x 600 x 1790mm
Interior Dimensions (W x D x H)	800 x 465 x 1300mm	1700 x 465 x 1300mm
Net Weight (Approx.)	136 kg (300 lbs.)/142 kg (313 lbs.)	240 kg (529 lbs.)/252 kg (556 lbs.)

Ambient temp. : 30°C





Optional Accessories  
Temperature Recorder / Mounting Brackets

Recorder Type		32-day Slip Chart Recorder						7-day Circular Chart Recorder		
Model		MTR-4014LH	MTR-0620LH	MTR-85H	MTR-135H	MTR-155H	MTR-D60	MTR-G04	MTR-G85	MTR-G3504
Recording Range (°C)		-40 to +14	-6 to +20	-100 to +50	-150 to 0	-170 to +30	-10 to +50	-10 to +40	-100 to +40	-10 to +40/-60 to +40
No Mounting Brackets Required		MDF-U333 MDF-U537D (upper room)	MPR-161D(H) MPR-311D(H) MPR-414F/FS MPR-214F  [ MBR-107D(H) ] * [ MBR-506D(H) ] [ MBR-304D/DR ]	MDF-192/293/392 MDF-492/592/792 MDF-382E MDF-U2086S/U3086S MDF-U4086S/U5186S MDF-U6086S MDF-U442 MDF-U460BR	MDF-2136	MDF-1155	MLR-350 MLR-350H	[ MBR-1404G/GR ] * [ MBR-304G/GR ] [ MBR-704G/GR ]	MDF-U51VA MDF-U32V MDF-U52V MDF-U72V	
Recorder Mounting Brackets	MPR-31RO(H)		MPR-161(H) MPR-311(H)							
	MPR-S30	MDF-U537/U5411 MDF-U537D (lower room) MPR-214F MPR-414F/FS	MPR-513/513R MPR-1013/1013R MPR-1410/1410R MPR-720/720R							
	MDF-S3040	MDF-136/236/436								
	MDF-S3085			MDF-U51VA MDF-U32V MDF-U52V/U72V						
	MPR-S7							MPR-513/513R MPR-1013/1013R MPR-1410/1410R MPR-720/720R	MDF-U537 MDF-U537D (lower room) MDF-U5411 MDF-U730	MPR-214F MPR414F/FS
	MDF-S740								MDF-136/236/436	
Chart Paper		RP-40	RP-06	RP-85	RP-135	RP-155	RP-D60	RP-G04	RP-G85	RP-G3504
Recording Pen		—	—	DF-38FP	DF-38FP	DF-38FP	—	PG-R	PG-R	PG-RB

\* MBR has recorder as a standard accessory.

Storage Racks

Model No.	MDF-19SC	MDF-29SC	MDF-39SC	MDF-49SC	MDF-59SC	MDF-38SC	MDF-48SC
Case Dimensions (W x D x H)	207 x 144 x 413mm 8.1" x 5.7" x 16.3"	185 x 175 x 539mm 7.3" x 6.9" x 21.2"	155 x 155 x 515mm 6.1" x 6.1" x 20.3"	207 x 144 x 539mm 8.1" x 5.7" x 21.2"	207 x 144 x 665mm 8.1" x 5.7" x 26.2"	228 x 475 x 146mm 9.0" x 18.7" x 5.7"	280 x 440 x 255mm 11.0" x 17.3" x 10.0"
Number of Drawers	3	4	4	4	5	2	3
Applicable Model (Rack capacity)	MDF-192/192AT (6)	MDF-2136/ 2136ATN (6) MDF-293AT (8)	MDF-293/293AT (8) MDF-392/392AT (20) MDF-2136/2136ATN (12)	MDF-293/293AT (9) MDF-492/492AT (15) MDF-1155/1155ATN (6)	MDF-592/592AT (18) MDF-792/792AT (24)	MDF-382/382E (12) MDF-U3086S (12)	MDF-U2086S (4) MDF-U4086S (8)

Storage Racks

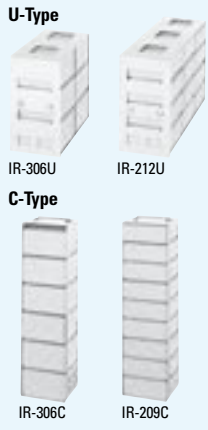


Inventory Racks


	Model No.	Box Type (Capacity)	External Dimensions (mm)			Freezer Model (Rack capacity)
			Width	Depth	Height	
For Upright Freezers	IR-215U	2" (15)	142	425	305	MDF-U3086S/382/382E (9)
	IR-212U	2" (12)	142	425	245	MDF-U2086S (8), U4086S (16)
	IR-220U	2" (20)	140	561	277	MDF-U5186S (16), U6086S (10), MDF-U32V (6)
	IR-224U	2" (24)	140	561	331	MDF-U6086S (10)
	IR-A216U	2" (16)	139	559	225	MDF-U32V (6)
	IR-309U	3" (9)	142	425	245	MDF-U2086S (8), U4086S (16)
	IR-312U	3" (12)	140	561	277	MDF-U5186S (16), U6086S (10)
	IR-316U	3" (16)	140	561	331	MDF-U6086S (10)
For Chest Freezers	IR-207C	2" (7)	144	142	405	MDF-192 (6)
	IR-209C	2" (9)	144	142	518	MDF-293 (10), 392 (21), 2136 (14), 1155 (9)
	IR-210C	2" (10)	144	142	592	MDF-492 (21)
	IR-213C	2" (13)	144	142	592	MDF-592 (24), 792 (36)
	IR-305C	3" (5)	144	142	405	MDF-192 (6)
	IR-306C	3" (6)	144	142	518	MDF-293 (10), 392 (21), 2136 (14), 1155 (9)
	IR-307C	3" (7)	144	142	592	MDF-492 (21)
	IR-309C	3" (9)	144	142	747	MDF-592 (24), 792 (36)

\* e.g., IR-220U(6pcs.) plus IR-A216U(6pcs.) are necessary for full storage into MDF-U32V.

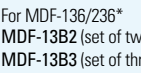
Inventory Racks



Storage Baskets




For MDF-436\*  
**MDF-43B2** (set of two)  
**MDF-43B3** (set of three)  
For MBR-107D(H)  
**MDF-16B**  
For MDF-506D(H)  
**MDF-56B**  
\*Extra Optional Accessory



For MDF-136/236\*  
**MDF-13B2** (set of two)  
**MDF-13B3** (set of three)

ULT-Freezer Back-up Kits



**CVK-UB2(I) :**  
LCO: Back-up Kit for all -86°C ULT freezers  
**CVK-UBN2(I) :**  
LN<sub>2</sub>: Back-up Kit for all -86°C ULT freezers  
**CVK-AT2 :**  
LCO: Back-up Kit for all -135°C / -152°C ULT freezers  
**CVK-ATN2 :**  
LN<sub>2</sub>: Back-up Kit for all -135°C / -152°C ULT freezers

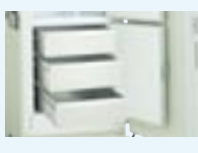
Drawers for Bottom Compartments

Model No.	MDF-30R	MDF-50R
Interior Dimensions (W x D x H)	410 x 482 x 150mm 16.1" x 19.0" x 5.9"	540 x 483 x 150mm 21.3" x 19.0" x 5.9"
Material	Stainless steel	Stainless steel
Applicable Model ( ) indicates maximum number of sets	MDF-U32V (1)	MDF-U51VA MDF-U52V (1)

MPR-41R (6 drawers/set)  
for the lower left side of MPR-414F/414FS

MPR-31RR (3 drawers/set)  
for the lower right side of MPR-311D (H)

Drawers (3 drawers/set)



SANYO DAQ Systems  
Monitoring Features

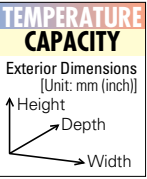
Integrated remote monitoring system for SANYO biomedical products (optional)  
**SANYO Data Acquisition Software MTR-2000**  
This software is fully compatible with MDF-U32V, MDF-U52V, MDF-U72V, MDF-136, MDF-236, MDF-436, MDF-U333, MDF-U537D, MDF-U537, MPR-214F and MPR-414F/FS. It allows data transfer between these models and a PC.  
**Interface board MTR-480**  
Exclusive option for SANYO biomedical products RS232C & RS485, for easy installation

CVK-NBST2 Voltage Booster

- Stand-alone voltage booster
- Power and Boost indicators
- Exterior dimensions (W x D x H): 180 x 250 x 150 mm (7.1" x 9.8" x 5.9")
- Electrical: 208/230V, 1PH, 50/60Hz
- Volts Boost: 18V, Cut in 210V, Cut out 220V
- Maximum Load: 13A
- Plug and Receptacle: 15A (6-15R, 6-15P)
- Applicable Models: MDF-U2086S, U3086S, U4086S, U5186S, U6086S, U52V, U72V, 492, 592, 792, 2136, 1155



SANYO culturing systems provide an ideally controlled environment for various forms of cell culture. With precise in vitro control, these units offer a stable environment to match the needs of modern laboratory professionals.



Culturing Systems

CO<sub>2</sub> Incubators



inCu saFe®

inCu saFe® copper enriched stainless steel is SANYO's new solution

against contamination that combines the bacteria-killing property of copper with the corrosion resistance of stainless steel.



IR Sensor

SANYO's infrared CO<sub>2</sub> sensor utilizes a ceramic heater and eliminates

conventional filament bulbs and electromechanical devices to deliver accurate CO<sub>2</sub> control with fast recovery following door openings.



SafeCell™ UV

SafeCell™ UV system with programmable ultraviolet lamp, isolated from cell cultures, sterilizes chamber air and water in the humidifying pan to maintain contamination-free air conditions within the chamber.



FDA 510(k)

Clearance

SANYO has received

FDA 510(k) clearance to market its MCO-Series incubators as "assisted reproduction accessories" required to maintain optimum temperature, CO<sub>2</sub> and/or O<sub>2</sub> and relative humidity essential for in vitro applications.



- New air duct and ultraviolet lamp sterilization
- Copper enriched stainless steel for contamination control
- Precision temperature control
- Double stackable



- Continuous contamination control with inCu saFe® interior and SafeCell™ UV (option) technologies
- Faster CO<sub>2</sub> level recovery offers greater CO<sub>2</sub> environment stability for frequent door openings
- Double stackable

**AT +5°C to 50°C**

**215 L (7.6 cu.ft.)**





MCO-20AIC

**AT +5°C to 50°C**

**170 L (6.0 cu.ft.)**







MCO-18AIC




- Patient specific,space saving
- Triple stackable
- Compact design

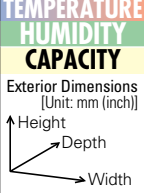
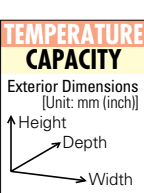
**AT +5°C to 50°C**

**49 L (1.7 cu.ft.)**





MCO-5AC



CO<sub>2</sub> Incubators

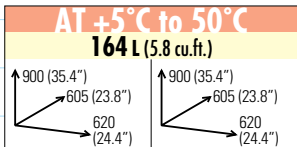


- Easy maintenance, easy installation and quick warm-up
- Direct Heat & Air (DHA) jacket system
- Double stackable



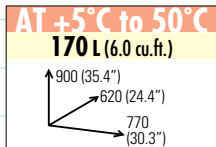
Water jacket incubator

MCO-15AC



MCO-15AC

MCO-17AC



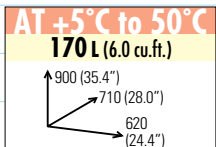
MCO-175



Multi-Gas Incubator



- Continuous contamination control with inCu saFe® interior and SafeCell™ UV (option) technologies.
- P.I.D. controls for fast recovery of temperature, CO<sub>2</sub> and O<sub>2</sub> levels
- Speedy humidity level recovery with N<sub>2</sub> gas bubbler
- Double stackable



MCO-18M



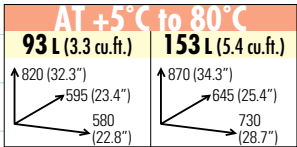
Heated Incubators



MIR-162



MIR-262



MIR-162

MIR-262

- Air jacket chamber
- Microcomputer PID control system

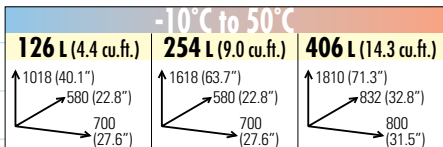
Cooled Incubators



MIR-153



MIR-553



MIR-153

MIR-253

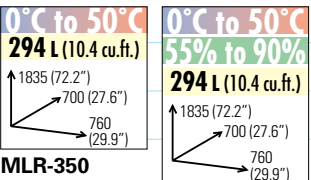
MIR-553



MLR-350



MLR-350HT



MLR-350H  
MLR-350HT

H: Humidifier type  
HT: Humidifier type, Recorder  
T: Recorder

Microprocessor PID control of temperature, lighting and humidity creates optimum environment for meticulous plant culturing and growing.



Specifications

Description	CO2 Incubators						Multi-Gas Incubator
Model No.	MCO-18AIC	MCO-20AIC	MCO-15AC	MCO-17AC	MCO-5AC	MCO-175	MCO-18M
Temperature Range	AT +5°C to 50°C				AT +5°C to 50°C	AT +5°C to 50°C	AT +5°C to 35°C
CO2 Range	0 to 20%	0 to 20%, ±0.1%	0 to 20%				0 to 20%
O2 Range	—						1 to 18%, 22 to 80%
Humidity	95 ±5% RH						95 ±5% RH
Interior Volume	170L (6.0 cu.ft.)	215L (7.6 cu.ft.)	164L (5.8 cu.ft.)		49L (1.7 cu.ft.)	170L (6.0 cu.ft.)	170L (6.0 cu.ft.)
Exterior Dimensions (W x D x H)	620 x 710 x 900mm	770 x 708 x 900mm	620 x 605 x 900mm		480 x 548 x 568mm	770 x 620 x 900mm	620 x 710 x 900mm
Interior Dimensions (W x D x H)	490 x 523 x 665mm	620 x 523 x 665mm	490 x 505 x 665mm		350 x 378 x 375mm	490 x 505 x 690mm	490 x 523 x 665mm
Net Weight (Approx.)	93 kg (205 lbs.)	106 kg (234 lbs.)	78 kg (172 lbs.)	91 kg (201 lbs.)	50 kg (110 lbs.)	108 kg (238 lbs.)	97 kg (214 lbs.)

Description	Heated Incubators		Cooled Incubators		
Model No.	MIR-162	MIR-262	MIR-153	MIR-253	MIR-553
Temperature Range	AT +5°C to 80°C		−10°C to 50°C		
Interior Volume	93L (3.3 cu.ft.)	153L (5.4 cu.ft.)	126L (4.4 cu.ft.)	254L (9.0 cu.ft.)	406L (14.3 cu.ft.)
Exterior Dimensions (W x D x H)	580 x 595 x 820mm	730 x 645 x 870mm	700 x 580 x 1018mm	700 x 580 x 1618mm	800 x 832 x 1810mm
Interior Dimensions (W x D x H)	450 x 460 x 450mm	600 x 510 x 500mm	620 x 368 x 555mm	620 x 368 x 1075mm	640 x 550 x 1160mm
Net Weight (Approx.)	44 kg (97 lbs.)	61 kg (134 lbs.)	69 kg (152 lbs.)	104 kg (229 lbs.)	205 kg (452 lbs.)

Description	Plant Growth Chambers		
Model No.	MLR-350	MLR-350H	MLR-350HT
Temperature Range	0°C to 50°C (Lamp OFF) ; 10 to 50°C (Lamp ON)		
Interior Volume	294L (10.4 cu.ft.)		
Exterior Dimensions (W x D x H)	760 x 700 x 1835mm		
Interior Dimensions (W x D x H)	520 x 490 x 1135mm		
Net Weight (Approx.)	220 kg (485 lbs.)		230 kg (507 lbs.)

Optional Accessories (for MCO series)

Stacking Kits

Upper unit \ Lower unit	MCO-175	MCO-17AC MCO-15AC	MCO-18AIC MCO-18M	MCO-20AIC	MCO-5AC
MCO-175	MCO-175SB	MCO-18SB		MCO-175SB	—
MCO-17AC/15AC	—	MCO-18PS		—	—
MCO-18AIC/18M	—	MCO-18PS	(Standard)*1	—	—
MCO-20AIC	—	MCO-21SB		(Standard)*2	—
MCO-5AC	—	—	—	—	(Standard)

\*1: 0.5 kit is included and fixed under rear cover of MCO-18AIC/18M.  
\*2: 0.5 kit of is included and fixed under rear cover of MCO-20AIC.

Other Options

	MCO-175	MCO-17AC MCO-15AC	MCO-18AIC MCO-18M	MCO-20AIC	MCO-5AC
Roller base	—	MCO-18RB		MCO-20RB	MCO-5RB
Individual small door	(Standard)	—	MCO-18ID (Standard or 18M)	MCO-20ID	—
Extra tray	MCO-46ST			MCO-58ST	MCO-30ST
Half tray	MCO-25ST			MCO-35ST	—
CO <sub>2</sub> /N <sub>2</sub> pressure regulator	MCO-100L				
Water preservative agent	MCO-100C	—	—	—	—
Recorder (CO <sub>2</sub> & Temp.)	MCO-101TR*	—	—	—	—
SANYO DAQ system	—	—	MTR-480/2000		
CO <sub>2</sub> tank switcher	—	—	MCO-21GC		MCO-5GC
UV system kit	—	—	MCO-18UVS2	—	MCO-18UVS2
UV replacement kit	—	—	MCO-20UV		

\*Chart paper: RP-CO, Pen: Cartridge

SANYO DAQ Systems

Monitoring Features

Integrated remote monitoring system for SANYO biomedical products (optional)

SANYO Data Acquisition Software MTR-2000

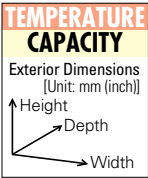
This software is fully compatible with MCO-20AIC, MCO-18AIC, MCO-18M and MCO-5AC. It allows data transfer between these models and a PC.

Interface board MTR-480

Exclusive option for SANYO biomedical products RS232C & RS485, for easy installation



The importance of high-performance sterilization is growing in medical facilities and laboratories. High pressure steam (autoclaves) is the most widely used due to its efficiency, speed and reliability. Incorporating microprocessor control and other advanced features, SANYO autoclaves are easy to use and provide safe, dependable sterilizing.



Autoclaves

Laboratory Autoclaves



MLS-2420



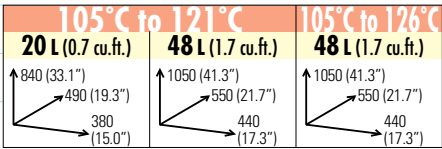
MLS-3020/3020U



MLS-3750



MLS-3780

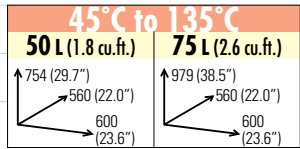


MLS-2420

MLS-3020

MLS-3020U  
U: CE marked

- Microprocessor control system
- Easy to operate, ergonomic design
- Alarm & safety devices
- Compact design

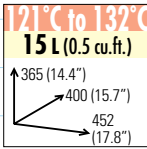


MLS-3750

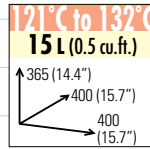
MLS-3780

- Compact design, swing-up door for easy access
- Surprisingly large chamber
- Alarm & safety devices
- User-friendly design
- Microprocessor temperature control

Medical Autoclaves

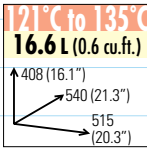


MAC-235EX



MAC-1200

- Microprocessor control system
- Built-in safety systems
- Compact design



MAC-1600PV

Tabletop unit for any professional application with pre-vacuum program system

Specifications

Description	Laboratory Autoclaves					Medical Autoclaves			
Model No.	MLS-2420	MLS-3020	MLS-3020U	MLS-3750	MLS-3780	MAC-235EX	MAC-1200	MAC-1600PV	
Temperature Range	105°C to 121°C		105°C to 126°C	45°C to 135°C		121°C to 132°C		121°C to 135°C	
Exterior Dimensions (W x D x H)	380 x 490 x 84mm		440 x 550 x 1050mm		600 x 560 x 754mm	600 x 560 x 979mm	452 x 400 x 365mm	400 x 400 x 365mm	515 x 540 x 408mm
Interior Dimensions (Ø x H)	ø240 x 450mm		ø300 x 670mm		ø370 x 410mm	ø370 x 635mm	ø228 x 370mm		ø230 x 400mm
Net Weight (Approx.)	47 kg (104 lbs.)		67 kg (148 lbs.)		63 kg (139 lbs.)	74 kg (163 lbs.)	20 kg (44 lbs.)	16 kg (35 lbs.)	39 kg (86 lbs.)

Drying & Sterilizing Systems

Electric Ovens

Dry Heat Sterilizers



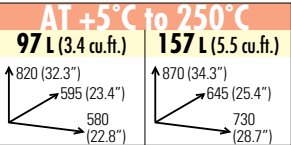
MOV-112/112F



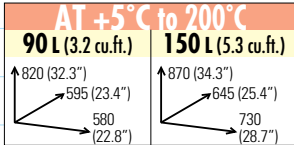
MOV-212/212F



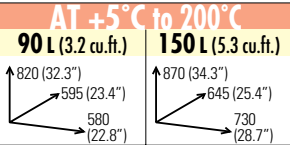
MOV-112S



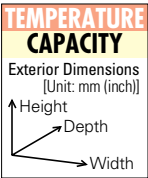
MOV-112 MOV-212  
Natural convection system



MOV-112F MOV-212F  
F: Fan circulation system



MOV-112S MOV-212S



SANYO sterilizers provide constant high-temperature conditions for dry heat sterilization. SANYO electric ovens combine an easy-to-use design and strict safety features to facilitate a host of applications.

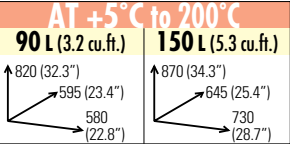
High-Temperature Programmable Ovens

Flake Ice Maker

Undercounter Flake Ice Maker



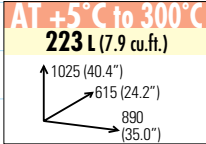
MOV-212P



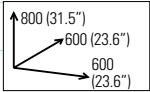
MOV-112P MOV-212P



MOV-313P



SIM-F124



Specifications

Description	Electric Ovens				Dry Heat Sterilizers	
Model No.	MOV-112	MOV-112F	MOV-212	MOV-212F	MOV-112S	MOV-212S
Temperature Range	40°C to 250°C	40°C to 200°C	40°C to 250°C	40°C to 200°C	40°C to 200°C	
Exterior Dimensions (W x D x H)	580 x 595 x 820mm			730 x 645 x 870mm		580 x 595 x 820mm
Interior Dimensions (W x D x H)	450 x 475 x 450mm	450 x 450 x 450mm	600 x 525 x 500mm	600 x 500 x 500mm	450 x 450 x 450mm	600 x 500 x 500mm
Net Weight (Approx.)	47 kg (104 lbs.)	50 kg (110 lbs.)	63 kg (139 lbs.)	66 kg (146 lbs.)	50 kg (110 lbs.)	66 kg (146 lbs.)

Description	High-Temperature Programmable Ovens			Undercounter Flake Ice Maker
Model No.	MOV-112P	MOV-212P	MOV-313P	SIM-F124
Temperature Range	40°C to 200°C		40°C to 300°C	—
Exterior Dimensions (W x D x H)	580 x 595 x 820mm	730 x 645 x 870mm	890 x 615 x 1025mm	600 x 600 x 800mm
Interior Dimensions (W x D x H)	450 x 450 x 450mm	600 x 500 x 500mm	570 x 465 x 840mm	—
Net Weight (Approx.)	50 kg (110 lbs.)	66 kg (146 lbs.)	97 kg (214 lbs.)	67 kg (148 lbs.)

Optional Accessories (for MLS or MAC Models)

MLS-RBA  
Special Round Basket



For MLS-2420

MLS-RBB  
Special Round Basket



For MLS-3020/U

MLS-RBC  
Special Round Basket



For MLS-3750/3780

MLS-RBH  
Special Round Basket, Half



For MLS-3020/U

MLS-SA  
Object Temperature Sensor



For MLS-3750/3780

MLS-SVT  
Ambient Sensors



For MLS-3750/3780

MLS-F23  
Cooling Fan



For MLS-3750/3780

MAC-TR  
Special Tray

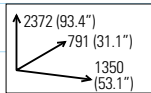


For MAC series autoclaves

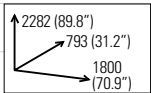


Biological Safety Cabinet

Bio-Clean Benches (Forced air circulation exhaust system)



MHE-130AB3



MHE-181AB3

**Class II**  
**Type AB3**

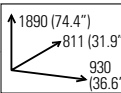
**Note:**  
Export models are not equipped with gas fittings.  
If plans call for the use of gas burners on clean benches,  
please ask your local SANYO dealer for more information.



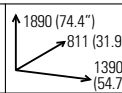
MCV-B91F



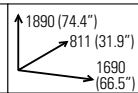
MCV-B131F



MCV-B91F  
MCV-B91S



MCV-B131F  
MCV-B131S



MCV-B161F  
MCV-B161S

Clean Benches (Standard type)



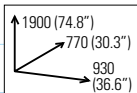
MCV-91BNF



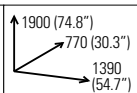
MCV-131BNF



MCV-710ATS

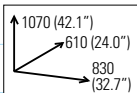


MCV-91BNF  
MCV-91BNS  
MCV-91BNN

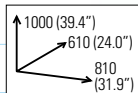


MCV-131BNF  
MCV-131BNS  
MCV-131BNN

**Note:**  
Export models are not equipped with gas fittings.  
If plans call for the use of gas burners on clean benches,  
please ask your local SANYO dealer for more information.



MCV-710ATS  
Standard type



MCV-711ATS  
Mericlones

Specifications

Description	Biological Safety Cabinet	
Model No.	MHE-130AB3	MHE-181AB3
Particle Collection Efficiency	99.99% (0.3μm DOP)	
Exhaust Volume	8.1m³/min.	10.9m³/min.
Exterior Dimensions (W x D x H)	1350 x 791 x 2372mm	1800 x 793 x 2282mm
Interior Dimensions (W x D x H)	1200 x 601 x 680mm	1650 x 601 x 640mm
Net Weight (Approx.)	335 kg (739 lbs.)	403 kg (888 lbs.)

Description	Bio-Clean Benches (Forced air circulation exhaust system)					
Model No.	MCV-B91F	MCV-B91S	MCV-B131F	MCV-B131S	MCV-B161F	MCV-B161S
Particle Collection Efficiency	99.99% (0.3μm DOP)					
Air Flow	10/11m³/min.		14/14m³/min.		19/21m³/min.	
Exterior Dimensions (W x D x H)	930 x 811 x 1890mm		1390 x 811 x 1890mm		1690 x 811 x 1890mm	
Interior Dimensions (W x D x H)	900 x 605 x 680mm		1360 x 605 x 680mm		1660 x 605 x 680mm	
Net Weight (Approx.)	209 kg (461 lbs.)		263 kg (580 lbs.)		306 kg (675 lbs.)	

Description	Clean Benches (Standard type)							
Model No.	MCV-91BNF	MCV-91BNS	MCV-91BNN	MCV-131BNF	MCV-131BNS	MCV-131BNN	MCV-710ATS	MCV-711ATS
Particle Collection Efficiency	99.99% (0.3μm DOP)							
Air Flow	18m³/min.			23m³/min.			8m³/min.	4m³/min.
Exterior Dimensions (W x D x H)	930 x 770 x 1900mm			1390 x 770 x 1900mm			830 x 610 x 1070mm	810 x 610 x 1000mm
Interior Dimensions (W x D x H)	900 x 610 x 680mm			1360 x 610 x 680mm			710 x 477 x 620mm	730 x 484 x 640mm
Net Weight (Approx.)	211 kg (465 lbs.)		210 kg (463 lbs.)	262 kg (578 lbs.)		260 kg (573 lbs.)	74 kg (163 lbs.)	59 kg (130 lbs.)

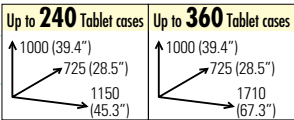
Dispensing Systems

ATC (Automatic Tablet Counting Machine)

Compact ATC

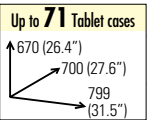


ATC-240F



ATC-240F  
ATC-240FL    ATC-360F  
ATC-360FL

Model numbers that end with L designate units having a left-side (when facing the machine) dispensing port.

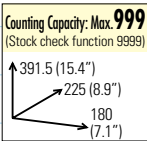


ATC-M7G

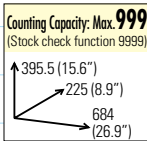
Tablet Dispenser

Multi-Drive Vial Filler

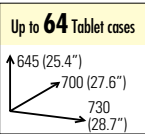
Compact Vial Filler



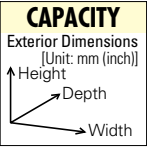
MVF-C1



MVF-C6



MVF-64



Specifications

Description	ATC (Automatic Tablet Counting Machine)				Compact ATC
Model No.	ATC-240F	ATC-240FL	ATC-360F	ATC-360FL	ATC-M7G
Tablet Cases	240		360		71
Exterior Dimensions (W x D x H)	1150 x 725 x 1000mm		1710 x 725 x 1000mm		799 x 700 x 670mm
Net Weight (Approx.)	186 kg (410 lbs.)		245 kg (540 lbs.)		150 kg (331 lbs.)

Description	Tablet Dispenser	Multi-Drive Vial Filler	Compact Vial Filler
Model No.	MVF-C1	MVF-C6	MVF-64
Cabinet Dimensions (W x D x H)	180 x 225 x 391.5mm	684 x 225 x 395.5mm	730 x 700 x 645mm
Tablet Cases	1	6	64
Processing Speed	2 vials per minute (50 tablet per vial)	Maximum 5 vials per minute (50 tablet per vial)	5 vials per minute (50 tablet per vial)
Counting Capacity	Maximum 999 (Stock check function 9999)		
Exit Chute and Capacity	250cc chute with gate and magnetic sensor	300cc chute with gate and magnetic sensor	250cc chute with gate and magnetic sensor
Net Weight (Approx.)	5 kg (11 lbs.)	14 kg (31 lbs.)	131 kg (289 lbs.)

Nursing Care Equipment

SANYO introduces two assisted-care products in Japan.

Assisted-care, Storable Bathtub

SANYO's innovative assisted-care bath now makes bathing a simpler and more enjoyable procedure for the bather and helper as well. It offers simplified but precise control of hot water temperature and water level for bathing.



Posture-changeable Assisted-care Bed

A good night's sleep is as essential for the healthy as it is for the infirm and hospital patients. This high-function, posture-changeable bed provides exactly that. Multi-functional because the bed adjusts back and knee angles, rolling angles and rollover intervals.