



# Yamato Ovens

## Contents

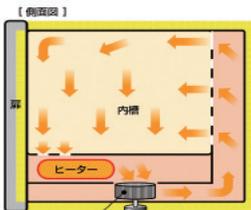
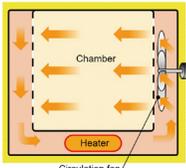
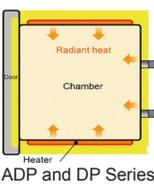
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<b>Oven Overview</b> .....	Page 3
<b>Natural Convection Oven</b>	
DX Series .....	Page 5
DVS Series .....	Page 7
DR Series .....	Page 11
DG Series .....	Page 13
<b>Forced Convection Oven</b>	
DKL Series .....	Page 15
DKN Series .....	Page 17
DKV Series .....	Page 1919
DNE Series .....	Page 21
DNF Series .....	Page 23
<b>Fine Oven</b>	
DF/DH Series .....	Page 25
<b>Vacuum Oven</b>	
ADP Series .....	Page 29
SDP Series .....	Page 31
DP Series .....	Page 33
NEODRY Dry Vacuum Pump .....	Page 37
GLD Oil Vacuum Pump .....	Page 39
<b>Inert Oven</b>	
DN Series .....	Page 41
<b>Clean Oven</b>	
DE/DT Series .....	Page 43
DES/DTS Series .....	Page 45
<b>Oven Accessories</b> .....	Page 47



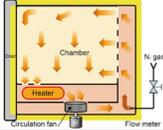
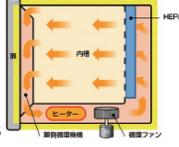
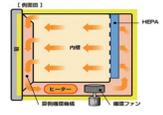


# OVEN OVERVIEW

	Series	Model No.	Operating Temperature Range							Internal Capacity (L)	Program	Characteristics	
			0	100	200	300	400	500	600				700
Natural Convection	DX	302C/312C	RT+5~300°C							28	--	<ul style="list-style-type: none"> <li>Economical</li> <li>High temperature</li> <li>Do not use fans. Heat rises by natural air convection for a slower heat flow</li> </ul> 	
		402C/412C								74	--		
		602C/612C	RT+5~280°C							153	--		
	DVS	403C/413C	RT+10~260°C							99	Yes		
		603C/613C								162	Yes		
	DR	201	300~700°C							13.75	Yes		
	DG	400C/410C	RT+5~70°C							92	--		*DG840C/850C: Natural+Forced convection
		440C/450C								92	--		
		800C/810C								445	--		
		840C/850C*								445	--		
Forced Convection	DKL	301C/311C	RT+10~260°C							27	--	<ul style="list-style-type: none"> <li>High level of air circulation, accuracy and uniformity</li> <li>Use fan motors for vertical air circulation providing a more uniform heat flow</li> <li>Built-in exhaust port</li> <li>Calibration offset function</li> </ul> 	
		401C/411C								90	--		
		601C/611C								150	--		
	DKN	303	RT+10~260°C							27	Yes		
	DKV	400/410	RT+10~270°C							90	Yes		* DNF301/401/411/601/611 Two types of circulation: forced and natural convection
		600/610								150	Yes		
		810								300	Yes		
		910	RT+10~220°C							545	Yes		
	DNE	401/411	RT+20~210°C							90	Yes		
		601/611								150	Yes		
		811	RT+15~210°C							300	Yes		
		911								540	Yes		
	DNF	301	RT+15~260°C (Wind velocity: 1~10)							27	Yes		
		401/411								90	Yes		
		601/611								150	Yes		
811									300	Yes			
911									540	Yes			
Fine	DF	412	RT+15~260°C							91	Yes	<ul style="list-style-type: none"> <li>Rapid &amp; high volume of airflow</li> <li>Use forced convection for a horizontal air flow as opposed to vertical</li> <li>Very high uniformity, accuracy and performance</li> <li>Quick exhaust and cooling</li> </ul> 	
		612								216	Yes		
		832	RT+15~200°C							512	Yes		
		1032								1000	Yes		
	DH	412	RT+15~360°C							91	Yes		
		612								216	Yes		
		650Z	RT+10~500°C							216	Yes		
		832	RT+15~300°C							512	Yes		
		1032								1000	Yes		
Vacuum	ADP	200C/210C	40~240°C							10	Yes	<ul style="list-style-type: none"> <li>Handle sensitive samples at lower temperature</li> <li>Heat is evenly distributed from arrangement of the heaters against outer chamber walls</li> <li>Reduced oxidation</li> </ul> 	
		300C/310C								27	Yes		
	SDP	300/310	RT+10~220°C							47.2	Yes		
		400/410								127.4	Yes		
		610	RT+15~220°C							264	Yes		
	DP	43C	40~200°C							91	Yes		
		63C								216	Yes		
		83C								512	Yes		
		104C								1000	Yes		



# OVEN OVERVIEW

	Series	Model No.	Operating Temperature Range	Operating Temperature Range							Internal Capacity (L)	Program	Characteristics
				0	100	200	300	400	500	600			
Inert	DN	411IE	RT+15~260°C	[Bar chart showing range from 0 to 300]							95	Yes	<ul style="list-style-type: none"> <li>Creates non-oxidative environment</li> <li>Controllable nitrogen flow</li> </ul> 
		611IE		[Bar chart showing range from 0 to 300]							223	Yes	
Clean	DE	411	RT+30~260°C	[Bar chart showing range from 0 to 200]							91	Yes	<ul style="list-style-type: none"> <li>Class 100</li> <li>Adopts anti-fouling casters preventing wheel contamination during transportation</li> <li>Improved optional accessories and more customization options</li> </ul> 
	DE	611	RT+30~260°C	[Bar chart showing range from 0 to 200]							216	Yes	
	DT	411	RT+30~360°C	[Bar chart showing range from 0 to 300]							91	Yes	
	DT	611	RT+30~360°C	[Bar chart showing range from 0 to 300]							216	Yes	
	DES	830	RT+30~260°C	[Bar chart showing range from 0 to 200]							327	Yes	<ul style="list-style-type: none"> <li>Class 100</li> <li>Stable cleanliness through forced circulation with rear exhaust</li> </ul> 
	DTS	830	RT+30~360°C	[Bar chart showing range from 0 to 300]							327	Yes	

# Natural Convection Oven

Economical, Constant Temperature Ovens



**DX302C/312C/402C/412C/602C/612C**

Operating temp. range	Room temp. +5~300°C (DX302C/402C)	Room temp. +5~280°C (DX602C)	Temp. distribution accuracy	±10°C	Operation	Economical, affordable
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Highly practical standard ovens with maximum temperature up to 300°C



(Stand optional)

Standard natural convection constant temperature drying ovens, with extensive features and simple operation.

### Performance and functions

- Economical and cost saving
- Easy to use and maintain
- Excellent temperature accuracy
- Digital PID controller
- Easy operation functions: Fixed setting, Quick Auto Stop, Auto Start, Auto Stop
- Increased safety and self-diagnostic function
- Calibration off-set function

### Safety features

- Temp sensor error, Temp input circuit error, Auto overheat prevention, Measured temp error, Circuit breaker with over current protection

### Specifications

Model	DX302C	DX312C	DX402C	DX412C	DX602C	DX612C
Circulation method	Natural gravity convection					
Operating temp. range	Room temp. +5°C~300°C				Room temp. +5°C~280°C	
Temp. control accuracy	±1°C (at 300°C)					
Temp. distribution accuracy	±10°C (at 300°C)				±10°C (at 280°C)	
Max. temp. reaching time	~45 min (Room temp.~300°C)		~60 min (Room temp.~300°C)		~80 min (Room temp.~280°C)	
Interior material	Stainless steel					
Exterior material	Electro-galvanized steel sheet with melamine resin baking finish					
Heat insulating material	Glass wool					
Heater	Iron-chrome wire heater, 0.9 kW		Iron-chrome wire heater, 1.36 kW			
Exhaust port	33 mm I.D. x 2 pcs. (on top)					
Temp. controller	PID control by microprocessor					
Temp. setting method	Digital setting by UP/DOWN key					
Temp. display method	Measurement temp. : Digital display by green LED Setting temp. : Digital display by red LED					
Timer	1 min. to 99 Hrs. 59 min. and 100 Hrs. to 999 Hrs. 50 min.					
Operation function	Fixed temperature operation, Quick auto stop, Auto stop, Auto start					
Additional function	Calibration off-set, Power failure compensation function, Key lock function					
Heater circuit control	SSR control					
Sensor	K-thermocouple					
Safety device	Self diagnosis functions(Temp. Sensor abnormal, Abnormal memory, Input temp. abnormal, Measured temp. abnormal, Automatic overheat prevention), Key lock function, Hydraulic independent overheat prevention device, Electric leakage breaker with over current protection.					
Internal dimensions (W×D×H)	300*310*300mm		450*410*400mm		600*510*500mm	
External dimensions(W×D×H)	400*440*630mm		550*540*730mm		700*640*830mm	
Internal capacity	28L		74L		153L	
Shelf plate with standard load	15kg/piece					
Shelf rest step number / pitch	6 steps / 35mm		9steps / 35mm		12steps / 35mm	
Power source 50/60Hz	AC115V 9.5A with plug	AC220V 4.3A no plug, round terminal	AC115V 14A with plug	AC220V 6.4A no plug, round terminal	AC115V 14A with plug	AC220V 6.4A no plug, round terminal
Weight	~23kg		~38kg		~56kg	

## Interior



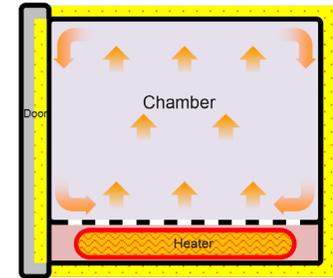
DX402C

## Control Panel



## Method

[Side view]

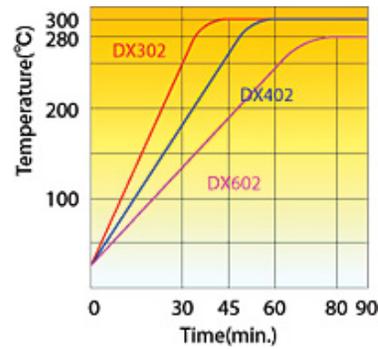


## Optional items

Description	Product code
Stand	
ONS30 for DX302C/312C	212801
ONS60 for DX402C/412C/602C/612C	212802
Stacking support	
ODK80 For DX302C/312C	212803
ODK82 For DX402C/412C	212804
ODK84 For DX602C/612C	212805
Shelf	
For DX302C/312C	212068
For DX402C/412C	212095
For DX602C/612C	212266
*Cable port	
25mm Ø	281009
50mm Ø	281010
Seismic mat	296902

\* Please specify when ordering main unit.

## Temperature Rising Curve



## Optional Items



Stand

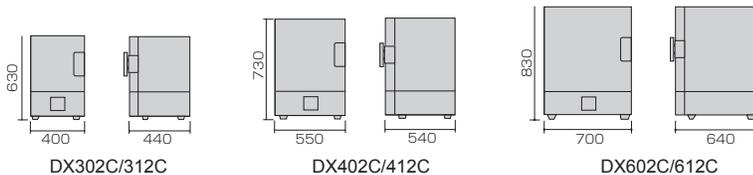


Shelf with 2 brackets



Seismic mat

## Dimensional Drawing (mm)



## ⚠ Attention

- Never use in flammable or explosive gas atmosphere.
- Never use explosive or flammable material.
- Caution: High temperature components.

# Programmable Natural Convection Oven

Constant Temperature Ovens



## DVS402C/412C/602C/612C

Operating temp. range	Room temp. +5~260°C	Temp. distribution accuracy	±5°C (at 260°C)	Internal capacity	99L (402C/412C) 162L (602C/612C)
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### Programmable standard ovens with easy to perform program settings



(Stand optional)

#### Operation and functions

- Excellent temperature accuracy
- Easy to use and maintain
- Equipped with a 6 pattern PID program controller with easy program settings (30 steps x 1, 15 steps x 2, 10 steps x 3)
- Simultaneous display of set constant and measured temperature
- Quick Auto stop, Auto Start / Stop operation
- Increased safety and self-diagnostic function
- With calibration offset function

#### Safety features

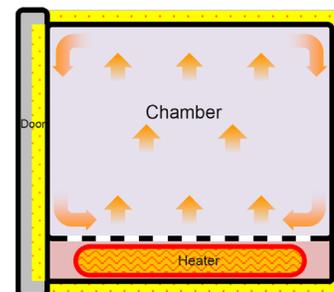
- Self diagnosis functions (Temp. sensor abnormal, Heater disconnection, Internal communication error, temperature input circuit abnormality, Automatic overheat prevention function, SSR-short), Overheat prevention, Electric leakage breaker with over current protection

#### Specifications

Model	DVS402C	DVS412C	DVS602C	DVS612C
Circulation method	Natural convection			
Operating temp. range	Room temp. +5 to 260°C			
Temp. control accuracy	±1.0°C (at 260°C)			
Temp. distribution accuracy	±5.0°C (at 260°C)			
Max. temp. reaching time	~90 min. (Room temp. +5°C~260°C)			
Interior material	Stainless steel			
Exterior material	Cold rolled steel plate with melamine resin baking finish			
Heat insulating material	Glass wool			
Heater	Stainless pipe heater			
	1.2kW		1.36kW	
Observation window	250×280 mm Chemically strengthened glass x 3			
Cable hole	30 mm I.D.×1 pcs.(right side)			
Exhaust port	30 mm I.D.×2 pcs.(on top)			
Temp. controller	3 patterns program controller, PID control by microprocessor			
Temp. setting method	Operation menu key and Digital setting by ▲/▼ key			
Temp display method	Measurement temp. : Digital display by green LED			
	Setting temp. : Digital display by red LED			
Timer	1 min. to 99 Hrs. 59 min. and 100 Hrs. to 999 Hrs. 50 min.			
Operation function	Fixed temperature, Program, Auto start, Auto stop, Quick Auto-stop,			
Program mode	Program operation: 6 pattern, 30 steps (30 steps×1, 15 steps×2, 10 steps×3)			
Additional functions	Calibration off-set function, Key lock, Uninterruptible power for memory, Pattern repeat function			
Heater circuit control	SSR control			
Sensor	K-thermocouple			
Safety device	Self diagnosis functions (temp. sensor abnormal, Heater disconnection, SSR- short, Memory abnormal, Automatic overheating prevention), Overheat prevention, Electric leakage breaker with over current protection			
Internal dimensions (W×D×H)	450×490×450 mm		600×540×500 mm	
External dimensions (W×D×H)	560×601×820 mm		710×651×870 mm	
Internal capacity	99L		162L	
Shelf plate load	~15kg / pcs.			
Shelf rest step number / pitch	9 steps / 30mm		13 steps /30mm	
Power source 50/60Hz	AC115V 12A with plug	AC220V 6.5A no plug, round terminal	AC115V 13.5A with plug	AC220V 7.5A no plug, round terminal
Weight	~48kg		~63kg	
Included accessories	Stainless steel, 2 pcs. shelf plate / 4 pcs. brackets			

#### Method

[Side view]

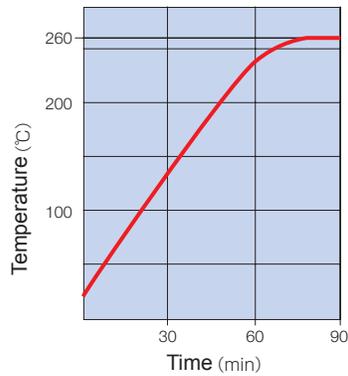


## Interior (DVS402C)



- Enhanced sealing function with heat resistant silicon rubber packing, ensuring stable performance.
- Stainless steel interior material, high corrosion resistance for easy cleaning.

## Temp. Rising Curve



## Control Panel



## Cable Port (Standard)



## Exhaust Port (Standard)



## Shelf Plate / Shelf Bracket

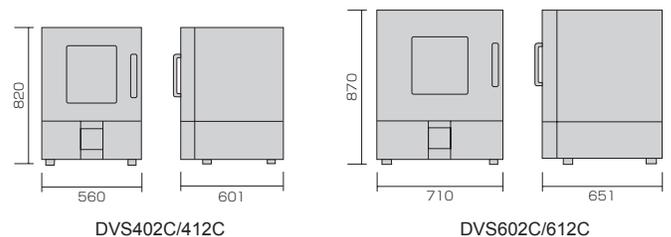


## Optional Items

Description	Product code
Stand OA194	281596
Stacking support	
OD40 for DVS402C/412C	212822
OD60 for DVS602C/612C	212823
Shelf (with support 2 pcs)	
For DVS402C/412C	212246
For DVS602C/612C	212266
*Cable Port	
25mm Ø	281131
50mm Ø	281132
*Temperature output terminal (4-20 mA)	281133
*External alarm terminal/ time-up output terminal (choose either)	281134
Seismic mat	296902

\* Please specify when ordering main unit.

## Dimensions (Unit:mm)



**Attention** ● Never use in flammable or explosive gas atmosphere.  
● Never use explosive or flammable material.

● Caution: High temperature components.

# New! Programmable Natural Convection Oven MADE IN CH



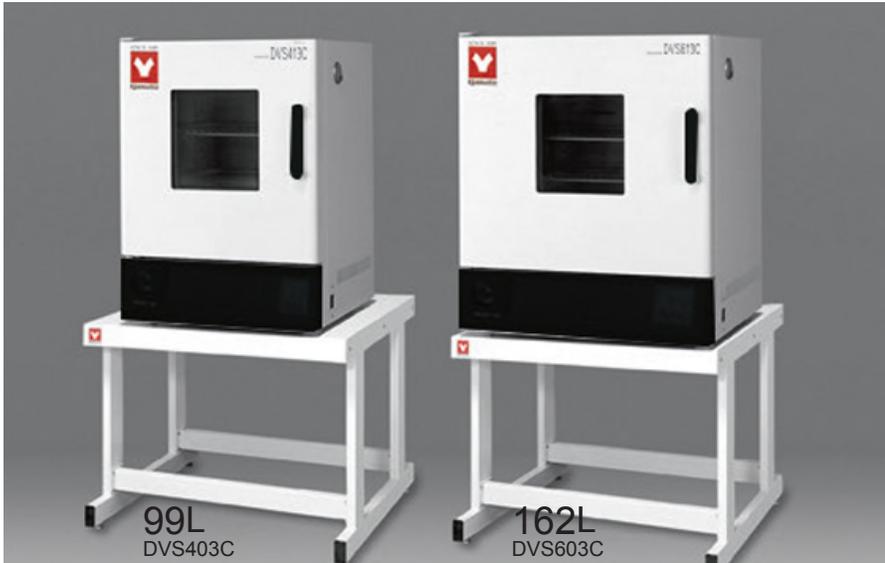
Constant Temperature Ovens

**DVS403C/413C/603C/613C\***

\* replacement models of DVS402C/412C/602C/612C

Operating temp. range	Room temp. +10~260°C	Temp. distribution accuracy	±5°C (at 260°C)	Internal capacity	99L (403C/413C) 162L (603C/613C)
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## Programmable standard ovens with easy to perform program settings



99L  
DVS403C

162L  
DVS603C

(Stand optional)

### Operation and functions

- Excellent temperature accuracy
- Easy to use and maintain
- Equipped with a 6 pattern PID program controller with easy program settings (30 steps x 1, 15 steps x 2, 10 steps x 3)
- Simultaneous display of set constant and measured temperature
- Quick Auto stop, Auto Start / Stop operation
- Increased safety and self-diagnostic function
- With calibration offset function

### Safety features

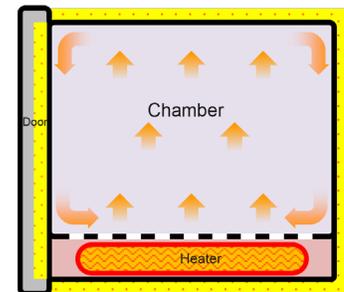
- Self diagnosis functions (Temp. sensor abnormal, Heater disconnection, Internal communication error, temperature input circuit abnormality, Automatic overheat prevention function, SSR-short), Overheat prevention, Electric leakage breaker with over current protection

### Specifications

Model	DVS403C	DVS413C	DVS603C	DVS613C
Circulation method	Natural convection			
Operating temp. range	Room temp.+10 to 260°C			
Temp. fluctuation	±1.0°C (at 260°C)			
Temp. uniformity	±3% (at 260°C)			
Temp. adjustment accuracy	±1.0°C (at 260°C)			
Temp. distribution accuracy	±5.0°C (at 260°C)			
Max. temp. reaching time	~75 min. (Room temp. +5°C~260°C)			
Interior material	Stainless steel			
Exterior material	Cold rolled steel plate with chemical resistant coating			
Heat insulating material	Glass fiber + rock wool			
Heater	Stainless pipe heater 1.2kW		1.36kW	
Observation window	250×280 mm Chemically strengthened glass x 3			
Cable hole	33 mm I.D.×1 pcs.(right side)			
Exhaust port	33 mm I.D.×2 pcs.(on top)			
Temp. controller	3 patterns program controller, PID control by microprocessor			
Temp. setting method	Operation menu key and Digital setting by ▲/▼ key			
Temp display method	Measurement temp. : Digital display by green LED Setting temp. : Digital display by red LED			
Timer	1 min. to 99 Hrs. 59 min. and 100 Hrs. to 999 Hrs. 50 min.			
Operation function	Fixed temperature, Program, Auto start, Auto stop, Quick Auto-stop,			
Program mode	Program operation: 6 pattern, 30 steps (30 steps×1, 15 steps×2, 10 steps×3)			
Additional functions	Calibration off-set function, Key lock, Uninterruptible power for memory, Pattern repeat function			
Heater circuit control	SSR control			
Sensor	K-thermocouple			
Safety device	Self diagnosis functions (temp. sensor abnormal, Heater disconnection, SSR- short, Memory abnormal, Automatic overheating prevention), Overheat prevention, Electric leakage breaker with over current protection			
Internal dimensions (W×D×H)	450×490×450 mm		600×540×500 mm	
External dimensions (W×D×H)	560×601×827 mm		710×651×877 mm	
Internal capacity	99L		162L	
Shelf plate load	~15kg / pcs.			
Shelf rest step number / pitch	11 steps / 30mm		13 steps / 30mm	
Power source 50/60Hz	AC115V 11A with plug	AC220V 5.5A no plug, round terminal	AC115V 12.5A with plug	AC220V 6.5A no plug, round terminal
Weight	~48kg		~63kg	
Included accessories	Stainless steel, 1 pc. shelf plate / 2 pcs. brackets			

### Method

[Side view]

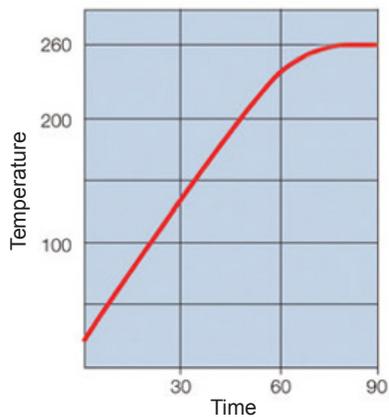


## Interior (DVS403C/413C)



- Enhanced sealing function with heat resistant silicon rubber packing, ensuring stable performance.
- Stainless steel interior material, high corrosion resistance for easy cleaning.

## Temp. Rising Curve



## Control Panel



## Cable Port (Standard)



## Exhaust Port (Standard)



## Shelf Plate / Shelf Bracket

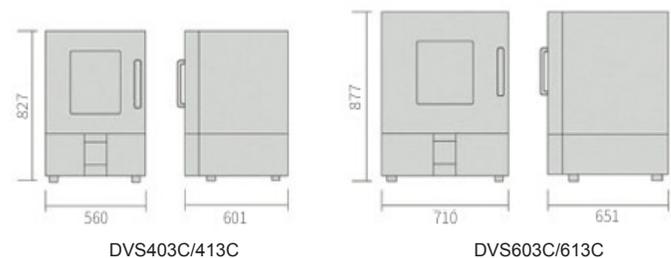


## Optional Items

Description	Product code
Stand OA194	281596
Stacking support	
OD40 for DVS403C/413C	212822
OD60 for DVS603C/613C	212823
Shelf (with support 2 pcs)	
For DVS403C/413C	212246
For DVS603C/613C	212266
*Cable Port	
25mm Ø	281131
50mm Ø	281132
*Temperature output terminal (4-20 mA)	281133
*External alarm terminal/ time-up output terminal (choose either)	281134
Seismic mat	296902

\*Please specify when ordering main unit.

## Dimensions (Unit:mm)



**⚠ Attention** ● Never use in flammable or explosive gas atmosphere.  
● Never use explosive or flammable material.

● Caution: High temperature components.

# High Temperature Natural Convection Oven

MADE  
IN  
JP

## DR201-115V / DR201-220V

Operating temp. range 300~700°C

Temp. distribution accuracy ±25°C (at 700°C)

Internal capacity 13.75L

### Maximum operation temperature up to 700°C

#### Operation and functions

- Programmable natural convection oven with high accuracy control at high temperature range
- Can be used as an electric furnace for ashing and sintering, but also as an incubator and drying oven
- Temperature, measured temperature and overheat prevention temperature can be digitally set by operation menu and ▲/▼ keys
- Easy programmable operation, fixed temperature, quick auto stop, auto stop, program auto start, auto start
- Equipped with sub-functions such as overheating prevention temperature prevention temperature setting, key lock function, program repeat function, calibration offset

#### Safety features

- Self-diagnostic functions (automatic overheat prevention, temperature sensor failure, heater disconnection, SSR short circuit, main relay failure, memory error, internal communication error, abnormal temperature reading), Overcurrent ELB, Overheat prevention device

#### Specifications

Model	DR201-115V	DR201-220V
System	Natural convection	
Temp. control range	300~700°C	
Temp. control accuracy	±5°C (at 700°C)	
Temp. fluctuation	10°C (at 700°C)	
Temp. distribution accuracy	±25°C (at 700°C)	
Temp. gradient	30°C (at 700°C)	
Temp. rise time	~70min. (Room temp. +5°C~700°C)	
Temp. fall time	~150min. (700°C to 300°C)	
Interior material	Stainless steel sheet metal	
Exterior material	Chromium-free electrogalvanized steel sheet, baked-on finish	
Heat insulating material	Ceramic fiber rock wool	
Heater type / capacity	Iron-chrome wire heater / 1.3kW	
Temp. controller	PID control by microcomputer	
Temp. setting method	Digital setting with menu keys and ▲/▼ keys	
Temp. display	Temp. reading display: Green 4 digit LED digital Temp. setting display: Red 4 digit LED digital	
Timer function	0 to 99 hrs 59 mins. and 100 hrs. to 999 hrs 50min.	
Timer resolution	1 minute increments under 99 hours and 59 minutes, 10 minutes after 100 hours.	
Wait function	Timer wait function (ON/OFF setting)	
Operation modes	Fixed temperature, program, program auto start, auto start, quick auto stop, auto stop	
Program modes	6 patterns (PrG1: 30 steps, PrG2-3: 15 steps, PrG4-6: 10 steps) step weight function, repeat function, step hold function, step skip function	
Additional functions	Calibration offset, keypad lock, auto resume mode select	
Sensor	K thermocouple (W sensor)	
Safety devices	Self-diagnostic functions (automatic overheat prevention, temp. sensor failure, heater disconnection, SSR short circuit, main relay failure, memory error, internal comm. error, abnormal temp. reading), overcurrent ELB, overheat prevention device	
Internal dimension (WxDxH)	250 x 250 x 220 mm	
External dimension (WxDxH)	520 x 443 x 612 mm (protrusions excluded)	
Internal capacity	13.75L	
Shelf load capacity	15 kg / pc. Total load capacity 30 kg	
Shelf rest step number	3 steps	
Shelf rest pitch	33 mm	
Power source (50/60Hz)	AC115V 11.5A (with plug)	AC220V 6.0A (with plug)
Weight	~36 kg	
Shelf plate	Perforated stainless steel plate	
Included accessory	2 pcs. shelf plate	



13.75L

#### Optional items

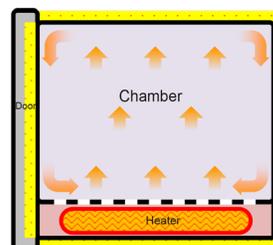
No.	Description	Product code
1	Stand ONS60	212802
2	Shelf plate 1pc.	212808
3	Seismic mat (set of 4 pcs.)	296902
4	External alarm output terminal*	281283
5	Time-up output terminal*	281284
6	Temperature output terminal (4-20mA)	281285

Some options are required to be installed at the factory. Contact YSA for options 4-6.

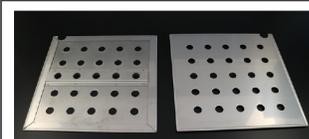
\* External alarm terminal and time-up output terminal cannot be installed at the same time

#### Method

[Side view]



#### Accessories

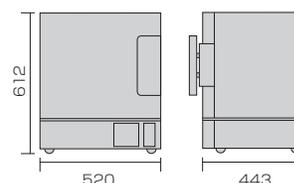


Shelf plate



ONS stand

#### Dimensions (mm)



#### Attention

- Never use in flammable or explosive gas atmosphere
- Never use explosive or flammable material
- Caution: High temperature components



# Glassware Drying Oven

Natural / Forced Convection Ovens for Glassware Drying



## DG400C/410C/440C/450C/800C/810C/840C/850C

Operating temp. range Room temp. +5~70°C

Internal capacity 92L DG400C/410C/440C/450C 445L DG800C/810C/840C/850C

### Operation and functions

- Large window for easy observation
- Can be used to store instruments after drying
- Highly efficient heat insulation material for both internal and external structure
- Adjustable foot for stability on uneven floors
- Mobile on casters (DG800C/810C/840C/850C)
- Equipped with stainless steel pipe heater and water receiving plate at the bottom
- Stainless steel interior, easy to clean and highly resistant to corrosion
- DG440C/450C/840C/850C installed with filter at air in-take port, exhaust fan and germicidal lamp for fast drying
- Dial setting and digital display of temperature control and timer

### Safety features

- Self-diagnostic functions, calibration offset, independent overheat prevention, over current leakage breaker, key lock and auto recovery after power failure

Note: Accurate temperature control may not be possible with heat generating samples in the chamber



(Stand optional)

### Specifications

Model	DG400C/410C	DG440C/450C	DG800C/810C	DG840C/850C
System	Natural convection			Natural / Forced convection
Operating temp. range	RT+5~70°C			
Interior material	Stainless steel			
Exterior material	Cold rolled steel plate with chemical proofing coating			
Heater	SUS pipe heater 1.0kW		SUS pipe heater 1.34kW	
Temp. controller	PID control with microprocessor			
Temp. setting	Digital setting by ▲/▼ keys			
Temp. display	Measured temp. display: Green 4-digit LED digital display Setting temp. display: Red 4-digit LED digital display			
Timer	1min-99 hr 59 min and 100 hr-999 hr 50 min (with time wait function)			
Operation functions	Fixed temperature, auto stop, auto start, quick auto stop			
Additional functions	Deviation correction, Key lock, Power outage compensation			
Heater circuit control	SSR driving			
Sensor	Temp. controller: K thermocouple, Overheat protection: Liquid-expansion temp. controller			
Exhaust port	I.D. 34mm×2	Axial flow fan forced exhaust	I.D. 34mm×2	Axial flow fan forced exhaust
Suction port	I.D. 30mm×2	Set air suction filter	I.D. 30mm×2	Set air suction filter
Germicidal lamp	—	8W×1	—	15W×1
Safety device	Self-diagnostic (Abnormal temp. sensing, Auto overheat prevention, SSR short circuit), Key lock, Independent overheat protector, Overcurrent ELB			
Internal dimensions (W×D×Hmm)	450×450×450		620×600×1195	
External dimensions (W×D×Hmm)	504×562×788		674×711×1586	
Internal capacity	92L		445L	
Weight	~45kg		~83kg	
Door	Single door, silicon rubber packing			
Observation window	Standard glass 3mm W250 x H300mm		Standard glass 3mm W250 x H700mm	
Shelf plate / bracket (stainless steel)	2pcs. / 4pcs.		4pcs. / 8pcs.	
Shelf plate load	15kg/pc.			
Shelf rest / pitch	10 steps / 30mm		29 steps / 30mm	
Water receiving plate	1 pc			
Power supply (50/60Hz) rated current	AC115V with plug AC220V no plug, round terminal	AC115V with plug AC220V no plug, round terminal	AC115V with plug AC220V no plug, round terminal	AC115V with plug AC220V no plug, round terminal



### Interior (DG840C/850C)



Equipped with exhaust axial flow fan

### Control Panel



DG400C/410C/440C/450C



DG800C/810C/840C/850C

### Germicidal lamp (DG440C/450C/840C/850C)



### Air in-take filter (DG440C/450C/840C/850C)



### Water Receiving Plate (sliding type)



### Optional Items

Product code	Description	Suitable models
212246	Shelf & bracket set	DG400C/410C/440C/450C
211854	Shelf & bracket set	DG800C/810C/840C/850C
296902	Seismic mat	DG400C/410C/440C/450C
281596	Stand	DG400C/410C/440C/450C



Shelf plate and brackets

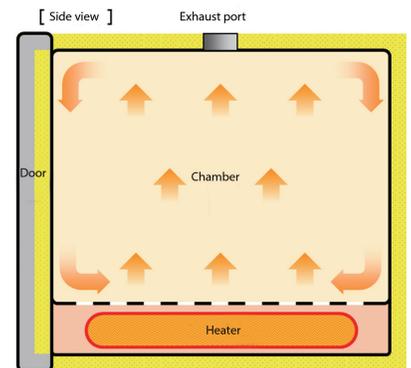


Seismic mat



Stand

### Method



### ⚠ Attention

- Never use in flammable or explosive gas atmosphere
- Caution: High temperature components
- Never use explosive or flammable material

# Economical Forced Convection Oven

Basic Non-programmable Forced Convection Ovens

DKL301C/311C/401C/411C/601C/611C



Operating temp. range Room temp. +10°C to 260°C

Temp. distribution accuracy ±2.5°C (at 260°C)

Internal capacity 27L DKL301C/311C

90L DKL401C/411C

150L DKL601C/611C

## Fixed temperature operation

### Performance and functions

- Fixed temperature, Quick auto stop, Auto stop, and Auto start operation modes with easy control capabilities
- Settings can be made digitally using the dedicated operation menu keys or the up and down keys
- Calibration offset function as an auxiliary function

### Safety features

- Self-diagnostic functions, MCB with over current protector, hydraulic standalone overheat prevention device



27L  
DKL301C/311C

90L  
DKL401C/411C

### Specifications

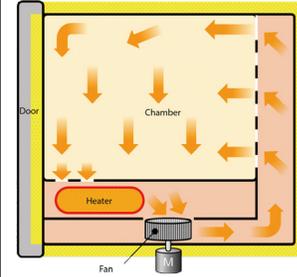
Model	DKL301C/311C	DKL401C/411C	DKL601C/611C
Circulation method	Forced air circulation		
Operating temperature range	Room temp. +10~260°C		
Temp. control accuracy	±1°C (at 260°C)		
Temp. distribution accuracy	±2.5°C (at 260°C)		
Temperature rise time	~90 min (at room temp. ~260°C)		
Interior material	Stainless steel (SUS430)		
Exterior material	Steel plate SPCC (powder coating)		
Heat insulating material	Glass wool		
Heater	SUS304 pipe heater		
	0.8kW	1.2kW	1.5kW
Fan motor	Sirocco fan 10W		
Cable port	30 mm I.D.×1 pc. (right side)		
Exhaust port	30 mm I.D.×2 pcs. (top)		
Temp. controller	PID control by microprocessor		
Temp. setting method	Digital setting by ▲/▼ keys		
Operation functions	Fixed temperature, Quick auto-stop, Auto stop, Auto start		
Additional functions	Calibration offset function		
Heater circuit control	SSR control		
Sensor	K-thermocouple		
Safety device	Self diagnostic functions (temperature sensor error, memory error, auto overheat prevention, measured temperature error), MCB with an over current protector, hydraulic standalone overheat prevention device		
Internal dimensions (W×D×H)	310×310×310 mm	450×450×450 mm	610×500×500 mm
External dimensions (W×D×H)	410×450×680 mm	560×600×820 mm	710×650×880 mm
Internal capacity	27L	90L	150L
Shelf plate with standard load	15kg/piece		
Shelf rest step number	6 steps	9 steps	12 steps
Shelf rest pitch	35mm		
Power source 50/60Hz	AC115V 7.5A with plug AC220V 4A no plug, round terminal	AC115V 11A with plug AC220V 6A no plug, round terminal	AC115V 13.5A with plug AC220V 7.5A no plug, round terminal
Weight	~35kg	~50kg	~65kg
Shelf plate	Stainless steel		
	2 pcs.		
Shelf bracket	4 pcs.		

Performance under the power supply condition of AC 115V and 220V are shown here.  
Operating environmental temperature range for this device is 5~35°C



## Method

[Side view]



## Control Panel



## Exhaust Ports (Standard)



## Cable Port (Standard)



## Optional Items

Description	Product Code
Stand	
For DKL301C/311C ON30C	Q020101001
For DKL401C/411C/601C/611C ON61C	Q020101002
Stacking kit	
For DKL301C/411C OD40C	Q010101001
For DKL601C/611C OD60C	Q010101002
Shelf (1 pc. shelf and 2 pcs. brackets)	
For DKL301C/311C	Q110101001
For DKL401C/411C	Q110101002
For DKL601C/611C	Q110101003
*Cable port	
Ø 25mm	Q110101007
Ø 50mm	Q110101008
Seismic mat	296902

\* Please specify when ordering main unit.

## ⚠ Attention

- Never use in flammable or explosive gas atmosphere.
- Never use explosive or flammable material.
- Caution: High temperature components.

## Optional Items



Stand

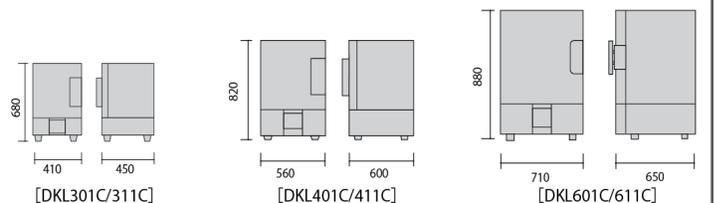


Seismic mat



Shelf (with 2 brackets)

## Dimensions (Unit:mm)



# New! Forced Convection Oven

Programmable Forced Convection Ovens

**DKN-303-115V / DKN-303-220V**

MADE

IN

JP

Operating temp range RT+10°C~260°C

Temperature fluctuation ±0.4°C (at 260°C)

Internal capacity 27L

## Operation and functions

- Excellent temperature performance
- Temperature fluctuation is ±0.4°C
- Temperature gradient is highly accurate at 9°C (at max. temp.)
- Monochromatic design for intuitive operation - design features a unified black color for all parts touched during operation, resulting in an intuitive user experience
- Improved visibility and operability with the redesigned control panel, now angled to provide a more easily visible and user-friendly position
- Simple-to-operate forced convection constant temperature oven
- Easy operation allows for constant temperature operation, quick auto-stop operation, auto-stop operation, and auto-start operation.

## Safety features

- Full range of safety functions, including automatic over-temperature protection, abnormal temperature measurement detection, and an overcurrent leakage circuit breaker.
- Independent overheat protector is now fitted as standard on the bottom front.
- Settings can be checked any time.

## Specifications

Model	DKN-303-115V / DKN-303-220V
Circulation method	Forced convection
Operating temp. range <sup>1</sup>	Room temp. +10°C to 260°C
Temp. fluctuation <sup>1</sup>	±0.4°C (at 260°C)
Temp. gradient <sup>1</sup>	9°C (at 260°C)
Temperature rise rate <sup>1</sup>	3.9°C / min.
Temp. rise time <sup>2</sup>	~60 min.
Exterior material	Chromium-free electrogalvanized steel sheet, baked coating
Chamber	Stainless steel sheet metal
Heat insulating material	Glass wool
Heater	Stainless steel tube heater 0.8kW
Fan Type / Fan Motor	Scirocco fan / Capacitor motor
Cable port	33 mm I.D. x 1 (right side)
Exhaust port	33 mm I.D. x 2 (on top)
Observation window	180×180mm Chemically strengthened glass x 3 pcs.
Temp. controller	PID control by microprocessor
Setting system	Digital setting using dedicated menu keys and ▲▼ keys
Display system	Temperature reading display: Green 4-digit LED digital Temperature setting display: Red 4-digit LED digital
Timer	0 minutes to 99 hours 59 minutes and 100 to 999 hours 50 minutes (with timer wait function, ON/OFF possible)
Timer resolution	1 minute increments under 999 hours and 59 minutes, 10 minutes after 100 hours
Wait function	Timer wait function (ON/OFF setting)
Operation function	Fixed temperature/Program operation/Quick auto stop operations/Auto stop operation/Auto start operation/Program auto start
Additional functions	Calibration offset / Keypad lock / Auto-resume mode select
Sensor	Temperature regulator: K thermocouple For independent oversurge prevention: Hydraulic oversurge prevention
Safety device	Self-diagnostic functions (Automatic over-temperature protection, Temperature sensor failure, Heater disconnection, SSR short circuit, Main relay failure, Memory error, Internal communication error, Abnormal temperature reading) / Independent over-temperature protection / Set value lock function / Overcurrent leakage breaker
Internal dimensions (W×D×H)	300×300×300 mm
External dimensions (W×D×H)	410×450×670 mm
Internal capacity	27L
Shelf plate with standard load	~15kg/piece. Total load capacity 30 kg.
Shelf rest step number / Shelf rest pitch	6 steps / 30mm
Power source 50/60Hz	115V 7.5A with plug / 220V 4A no plug, round terminal
Weight	~35kg
Included shelf plate / brackets	1 piece / 2 pcs

<sup>1</sup> Performance (excluding temp. rise time) is based on a power supply of 115V or 220V, room temp. of 23°C±5°C, humidity of 65%RH±20%, and no load. Note that the max. temp. in the temp. control range (260°C) may not be reached if the power supply voltage is below 115V or 220V or if the outside temp. is low.

<sup>2</sup> Temp. rise time is reference data at 115V or 220V, room temp. 23°C, humidity 65%, and no load. Note that if the power supply voltage is below 115V or 220V or if the outside temperature is low, the temperature rise time may be extended.



27L  
(Stand optional)

## Interior



## Control Panel



## Cable Port / Exhaust Ports



## Optional Items

Description	Product code
Stand	281353
Shelf (with support 2 pcs)	212068
*Cable port	
25mm Ø	281121
50mm Ø	281122
*Temperature output terminal (4-20 mA)	281375
Choose either:	
* External alarm terminal	281376
* Time-up output terminal	281377
Seismic mat	296902
Sheath sensor	ODT48
Silicon plug (with hole)	212947

\* Please specify when ordering main unit.



# New! Forced Convection Oven

MADE  
IN  
JP

Programmable Forced Convection Ovens

DKV400/410/600/610/810/910

Operating temp. range

RT+10°C~270°C  
DKV400/410/600/610

RT+10°C~220°C  
DKV910

Temp. fluctuation

±.5°C - ±.6°C

Internal capacity

90L  
(DKV400/410)

150L  
(DKV600/610)

300L  
(DKV810)

535L  
(DKV910)

## Operation and functions

- Superior temperature accuracy
- Highly visible 3.5 inch color LCD controller (VSD-1 type)
- Door hinges with click function at 30°click and 120°click
- Fixed temperature operation, Quick Auto-Stop Operation / Auto-Stop Operation / Auto-Start Operation / Programmed Auto-Start Operation (Time and Clock Settings), Programmed Operation (Time Settings)
- Increased safety and self-diagnostic function
- Easy to use and maintain
- Built in exhaust ports

**Q:** Is it possible to install an observation window on the door?

**A:** Custom orders can be accommodated; however, insulation and specified performance may vary depending on operating temperature. Standard window size is W250×280 mm. For alternative sizes, please contact Customer Service.



90L

DKV400 + 281355 stand

150L

DKV600 + 281596 stand

(Stands purchased separately)

## Specifications

Model	DKV400	DKV410	DKV600	DKV610	DKV810	DKV910
Circulation method	Forced convection					
Operating temp. range	Room temp. +10°C to 260°C					RT +10°C to 220°C
Temp. fluctuation*2	±.6°C (at 270°C)		±.5°C (at 270°C)		±.6°C (at 270°C)	±.6°C (at 220°C)
Temp. gradient*2	9°C (at 270°C)				11°C (at 270°C)	11°C (at 220°C)
Temp. rise rate*2	3.3°C / min		2.1°C / min		3.4°C / min	2.5°C / min
Temp. rise time*2	~75 min.		~115 min.		~75 min.	~80 min.
Exterior material	Chromium-free electrogalvanized steel sheet, baked-on finish					
Chamber	Stainless steel					
SUS tube heater	1.5kW		2.5kW		3.0kW	
Cable port	Inner diameter 33mm (1 piece on right side)					
Exhaust port	33mm I.D. x 2 (top)				33mm I.D. x 2 (back)	
Safety devices	Self-diagnostic functions (automatic overtemperature protection, temperature sensor error, SSR short circuit, heater disconnection, fan error, clock element error, main relay error, memory error, internal communication error) / independent overheat prevention device / door switch (door alarm) / overcurrent leakage breaker / fall prevention fitting (Model 810/910)					
Controller type	VSD-1 Controller					
Temp. control system	PID control by microcomputer					
Temp. display	3.5-inch color LCD panel digital display					
Timer / clock timer	1 minute to 99 hours 59 minutes / Date: hour: minute (up to 31 days later)					
Operation modes	Fixed temperature / Timer: Hourly quick auto stop operation / Timer: Hourly auto stop operation / Timer: Hourly auto start operation / Program operation / Timer: Hourly program auto start operation					
Additional functions	Calibration offset / Power failure return mode selection function / Timer Wait function / Security management function / Temperature upper/lower limit alarm function / Fan OFF delay function / Power failure alarm / External communication terminal (RS-485) / Temperature output terminal (4-20mA) / Time-up output terminal / Error output terminal / Recorder terminal / Program preview function / Operation trend function					
Sensor	Temperature controller / independent overheat prevention device: K thermocouple					
Safety devices*3	Self diagnosis functions (temp. sensor abnormal, Heater disconnection, SSR- short, Automatic overheating prevention), Key lock function, Overheat prevention, Electric leakage breaker with over current protection					
Internal dimensions (W×D×H)	450×450×450 mm		600×500×500 mm		600×500×1000 mm	1090×500×1000 mm
External dimensions (W×D×H)*4	580×635×830 mm		730×685×880 mm		730×685×1610 mm	1220×685×1610 mm
Internal capacity	90L		150L		300L	545L
Chamber shelf load	~15kg/shelf					
Chamber load capacity	~30kg		~60kg		~120kg	
Number of shelves / pitch	11 steps / 30mm		13 steps / 30mm		29 steps / 30mm	29 / 30mm×2 columns
Power supply 50/60Hz Rated current	115V, 13.5A with plug	220V, 7.5A no plug, round terminal	115V, 13.5A with plug	220V, 7.5A no plug, round terminal	Single phase 220V, 12A with plug	Single phase 220V, 14.5A no plug, round terminal
Weight	~60kg		~75kg		~120kg	~195kg
Included shelf plate / brackets	1 pc. / 2 pcs.				3 pc. / 6 pcs.	6 pc. / 12 pcs.
Fall prevention fittings	-				4 pcs (fixing hole diameter Φ14 M12 recommended)	

\*1 Performance (excluding temperature rise time) is measured at rated voltage, 50Hz or 60Hz frequency, room temperature 23° C ±5° C, humidity 65%RH ±20%, and no load. Note that the maximum temperature in the temperature control range may not be reached if the power supply voltage is below the rating or if the outside temperature is low. \*2 Temperature rise time is reference data for rated voltage, 50 Hz or 60 Hz, room temperature 23° C, humidity 65%, and no load. Note that the temperature rise time may be longer when the power supply voltage is below the rating or when the outside temperature is low. \*3 If the product is used beyond the operating voltage range (±10% of rating), there is a possibility that the safety function will malfunction. Pay attention to the power supply voltage when using the product. \*4 Protrusions are not included.

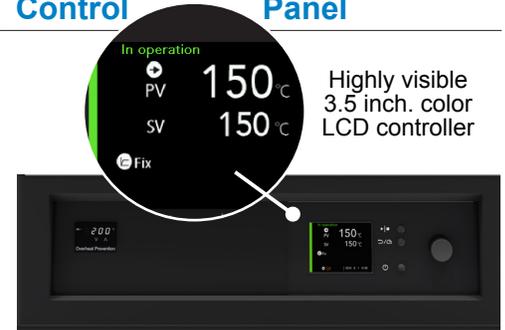


**300L**  
DKV810



**535L**  
DKV910

## Control Panel



## Interior



DKV400/410



DKV600/610



DKV810



DKV910

Standard DKV910 model includes a center column, as shown in the photo. However, we can accommodate special orders for versions without the center column.

\*Please note that the maximum temperature will be limited.

## Door Hinges with click function



Door hinges have a click function that can hold the door at two angles: 30° and 120° (operating range is 180°). Samples can be inserted and removed safely, without concern for burns or accidental contact.

## Optional Items

Description	Factory Code	YSA Part Number	Compatible Models
Stand (no casters)	OA194	281596	DKV400/410/600/610
	OA117	281355	DKV400/410
	OA118	281356	DKV600/610
Stacking kit	OA196	281598	DKV400/410
	OA197	281599	DKV600/610
	-	212246	DKV400/410
Shelf and bracket set <i>Stainless steel perforated metal shelf. Same shelf as standard accessories.</i>	-	212246	DKV400/410
	-	212266	DKV600/610/810
	-	212490	DKV910
Seismic isolation mat <i>Secures devices in place by fastening them to the base, preventing tipping</i>		296902	DKV400/410/600/610
Sheath sensor <i>(K thermocouple)</i>	ODT48	212946	DKV400/410/600/610/810/910
Silicone stopper <i>Silicone rubber plug for cable hole, φ2mm hole for sensor</i>	ODT52	212947	DKV400/410/600/610/810/910
*Rubber feet <i>Rubber feet attachable to the main unit legs</i>	OA198	281634	DKV400/410/600/610
*Cable port <i>Contact Customer Service for installation position and quantity. Not available for installation after delivery.</i>			
*Cable port 25mm inner Ø	ODM36	281454	DKV400/410/600/610/810/910
*Cable port 50mm inner Ø	ODM38	281455	DKV400/410/600/610/810/910

\* Please specify when ordering main unit.



● Never use in flammable or explosive gas atmosphere.  
● Never use explosive or flammable material.

● Caution: High temperature components.

# Forced Convection Oven

Energy Saving Programmable Forced Convection Ovens



## DNE401/411/601/611/811/911

Operating temp. range RT +20°C~210°C (DNE401/411/601/611)  
RT +15°C~210°C (DNE811/911)

Temp. distribution accuracy ±2.0°C (at 210°C)

Operation Energy saving  
Environment friendly

### High performance environment friendly eco-oven that reduces power consumption significantly

#### Operation and functions

- High precision controller allows high performance temperature control and display of CO<sub>2</sub> and power discharge
- Heat tightness and insulation design of the chamber achieves an energy saving rate of about 40% at constant temperature compared to previous models
- Maximum temperature reaching time reduced by 15 minutes (no-load) compared to previous models.
- Program operation with a maximum of 99 steps, 99 patterns repeatable
- Standard equipped with various support functions such as calibration offset, power failure recovery mode, save and access of user setting information, as well as other operation modes
- Data acquisition from internal test device possible because of cable holes
- Easy system upgrade with various option settings

#### Safety features

- Standard equipped with various self-diagnostic functions, independent overheat prevention device, overcurrent circuit breaker, and key lock function

#### Specifications

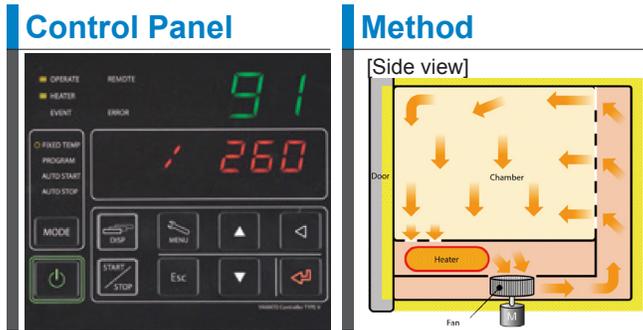


Model	DNE401	DNE411	DNE601	DNE611	DNE811	DNE911
Circulation method	Forced air circulation					
External temp. range	5~35°C					
Temperature control range	Room temperature +20~210°C			Room temperature +15~210°C		
Temp. control accuracy *1	±0.5°C (at 210°C)					
Temp. fluctuation *1	±0.6°C (at 210°C)					
Temp. distribution accuracy *1	±2.0°C (at 210°C)					
Temp. gradient*1	6°C (at 210°C)		8°C (at 210°C)		8°C (at 210°C)	10°C (at 210°C)
Temp. rise time *1	~60 min.		~70 min.		~45 min.	~60 min.
Chamber / Exterior / Insulation	Stainless steel / Chrome-free electro-galvanized steel plate, chemical-proof baked-on finish / Glass wool					
Door	Single swing (left side)					Double doors (from center)
Insulating material	Glass wool					
Heater (Stainless steel pipe)	1.1kW		1.2kW		1.2kW x 2	1.5kW x 2
Fan Type	Fan	Scirocco fan, capacitor motor				Motor
	Motor	10W				30W
						30W x 2
Cable hole (lower right side)	33mm I.D. 1pc.					
Exhaust port	33mm I.D. 2pcs (top)				33mm I.D. 2pcs (rear)	
Caster wheels	--				Free swivel caster wheels (w/o stopper)	
Adjuster	--				Level adjusters (2 at the front)	
Controller	Model V type					
Temp. control / setting system	PID Z control / Digital setting with ▲/▼ keys					
Temp. display	Top screen (Chamber): Green 4 digit LED digital display (1°C resolution) / Bottom screen: Orange 5 digit LED digital display (1°C resolution)					
Other indications	LED indicates temperature patterns for heating/stable/cooling					
Timer	1 min. and 99 Hrs. 59 mins: duration operation, 24 hour setting: time operation					
Operation functions	Fixed temperature, Program operation (max.99 steps, up to 99 patterns repeat operation function), Duration/time select timer operation function (fixed temperature operation, auto-start, auto-stop, quick auto stop, program operation auto start)					
Additional functions	Power on and Integration time function (up to 65,535 hours), Calibration offset, Time display, Display of power consumption, CO <sub>2</sub> discharge and heater operation, Power failure return mode, User configuration information					
Temperature sensor	K type Thermocouple double sensor (for temperature control and independent overheat prevention device)					
Heater control	Triac with Zero-cross Control					
Control board	Self diagnostic functions (temp. sensor failure detection, TRIAC short circuit, heater line disconnection, fan failure detection, main relay abnormal, automatic overheating prevention, key lock function)					
Earth leakage breaker	Leak Current/Short Circuit/Overcurrent Protection, Rated Current Sensitivity 30mA					
Independent overheat prevention	Set temperature range: 0~250°C					
Internal dimensions (W×D×H)*2	450×450×450 mm		600×500×500 mm		600×500×1000 mm	1090×500×1000 mm
External dimensions (W×D×H)*2	580×645×860 mm		730×695×910 mm		730×695×1660 mm	1220 ×695×1660 mm
Capacity	90L		150L		300L	540L
Weight	~63kg		~77kg		~92kg	~185kg
Included accessories: shelf plate/bracket	2 pcs. / 4 pcs.				4 pcs. / 8 pcs.	8 pcs. / 16 pcs.
Shelf rest step number / Shelf rest pitch	11 steps / 30mm		13 steps / 30mm		29 steps / 30mm	29 steps / 30mm x 2
Withstand load of shelf	~15kg / shelf					
Power supply V±10% 50/60Hz single phase	AC115V 10A with plug	AC220V 5.5A no plug, round terminal	AC115V 11A with plug	AC220V 6A no plug, round terminal	AC220V 11.5A no plug, round terminal	AC220V 14A no plug, round terminal

\*1 Temperature Accuracy / Rise time Standard: Testing Machinery Association of Japan. Temperature Fluctuation/Gradient Standard: Japanese Industrial Standard

Performance data above based on 115V or 220V AC supplied power, 23°C±5°C (room temperature), 65%RH ±20% humidity, maximum air speed (FAN setting 10), damper closed, and no process load.

\*2 Protrusions excluded



### Interior



DNE401



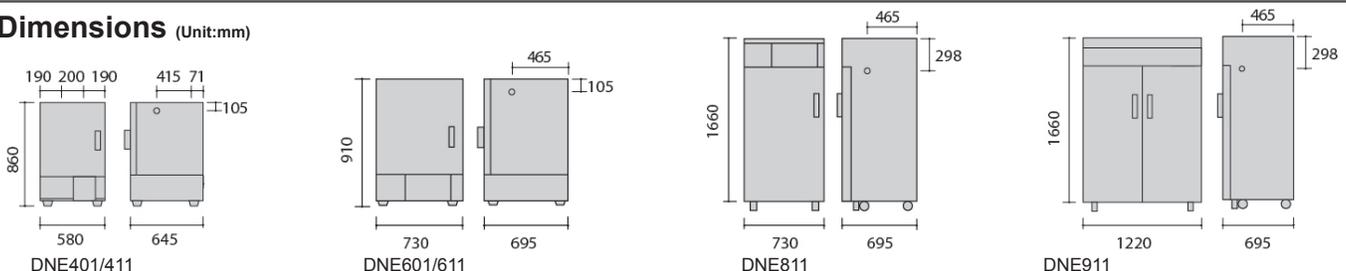
DNE911

### Optional Items

Description	Product code	Model	Applicable units
Stand	281596	OA194	DNE401/411/601/611
	212348	OT42	DNE401/411
	212349	OT62	DNE601/611
Stacking support	212806	ODN26	DNE401/411
	212807	ODN28	DNE601/611
	212246	ODN20	DNE401/411
Shelf and bracket set	212266	ODN22	DNE601/611/811
	212490	--	DNE911
	212946	ODT48	All models
Seath sensor (K type Thermocouple)	212947	ODT52	All models
Silicon plug (with one hole)	281454	ODM36	All models
*Cable port, 25mm diameter	281455	ODM38	All models
*Cable port, 50mm diameter	281456	ODM40	DNE401/411
*Observation window for DNE401/411	281457	ODM42	DNE601/611
*Observation window for DNE601/611	211880	OIN90	All models
*External communication adapter set	281446	ODM20	DNE401/411/601/611/811
*External alarm output terminal	281447	ODM22	DNE911
*Time-up output terminal / Operation signal output terminal	281448	ODM24	DNE401/411/601/611/811
	281449	ODM26	DNE911
*Event output terminal / Time-up output terminal	281450	ODM28	DNE401/411/601/611/811
	281451	ODM30	DNE911
*Operation signal output terminal	281452	ODM32	DNE401/411/601/611/811
	281453	ODM34	DNE911

\* Please specify when ordering main unit.

### Dimensions (Unit:mm)



- Attention**
- Never use in flammable or explosive gas atmosphere
  - Never use explosive or flammable material
  - Caution: High temperature components

# Forced Convection Oven



**Energy Saving** Programmable Forced Convection Ovens with Variable Flow Rate

**DNF301-115V/301-220V/401/411/601/611/811/911**

Operating temp. range	Room temp. +15°C~260°C	Method	DNF301/401/411/601/611 Forced convection+Natural convection	DNF811/911 Forced convection	Capacity	27L DNF301	90L DNF401/411	150L DNF601/611	300L DNF811	540L DNF911
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## The first 2 in 1 system in the industry

- Two types of circulation, forced and natural convection, in one unit (compatible with model 300/400/600)
- Eco-oven with improved air velocity control system and adjustable damper
- Program featured to reduce power consumption significantly
- Superior heat tightness and insulation of chamber
- Excellent dust tightness, dust can hardly enter the chamber
- Air velocity changeable in 10 stages using digital setting of controller
- Standard with 99 step program operation with repeat operation, auto start, auto stop and quick auto stop functions
- Adjustable damper position at chamber front to optimize operation
- Fluorescent display, interactive input method, calibration off-set function



## Specifications

Model	DNF301-115V / DNF301-220V	DNF401/411	DNF601/611	DNF811	DNF911
Circulation method	Forced convection + Natural convection			Forced convection	
External temp. range	5~35°C				
Temperature set range	0~130°C (Wind velocity: 0), 0~270°C (Wind velocity: 1~10)			0~270°C (Wind velocity: 1~10)	
Temperature control range	RT +25~120°C (Wind velocity: 0), RT +15~260°C (Wind velocity: 1~10)			RT +15~260°C (Wind velocity: 1~10)	
Temp. control accuracy *1	Forced convection Natural convection	±0.3°C (at 260°C) ±0.5°C (at 120°C)		±0.3°C (at 120°C) Not applicable	
Temp. fluctuation *1	Forced convection Natural convection	±0.5°C (at 260°C) ±1.0°C (at 120°C)		±0.6°C (at 120°C) Not applicable	
Temp. distribution precision *1	Forced convection Natural convection	±2.5°C (at 260°C) ±5°C (at 120°C)		±3°C (at 120°C) Not applicable	
Temp. gradient *1	Forced convection Natural convection	5°C (at 260°C) 15°C (at 120°C)		7°C (at 260°C) 13°C (at 120°C)	
Temp. rise time *1	Forced convection Natural convection	~70min. ~20min.		~105min. ~25min.	
Chamber / Exterior / Insulation	Stainless steel / Cold rolled steel paneling, chemical-proof baked-on finish / Glass wool				
Door	Single swing (left side)				Double doors (opening from center)
Heater (stainless steel tube)	0.8kW	0.6kWx2	0.83kWx2	1.35kWx2	1.65kWx2
Wind velocity adjusting system	10 steps (600~1500rpm) + Wind velocity (0)			10 steps (600~1500rpm)	
Damper	Circulation-Ventilation Manual switching: Interlocked intake and exhaust system (Complete exhaust applicable / Unable to reach 260°C with damper fully open)				
Cable port	Inner diameter: 33mm×1 (right side)				
Exhaust port	Outer diameter: 50mm×1 (back side)				Outer dia.: 50mm×2 (back)
Inlet port	Inner diameter: 33mm×1 (right side)				Inner dia.: 33mm×2 (both)
Controller	Model V type				
Temperature control / setting system	PID Z control / Digital setting with ▲/▼ keys				
Temperature display system	Temperature reading display: green 4-digit digital LED / Temperature setting display: orange 5-digit digital LED				
Other indications	LED indicates temperature patterns for heating/stabilizing/cooling				
Timer	1 minute and 99 hours 59 minutes: duration operation, 24 hour setting: time operation				
Operation functions	Fixed temperature operation, Program operation (maximum 99 steps or 99 patterns, with repeat operation function), Timer or clock operation function (Fixed temperature operation w/ auto start/auto stop/quick auto stop, program operation auto start)				
Additional functions	Variable Air Flow Function, Power-on Time and Operation Time Accumulation Monitor (up to 65,535 hours); Calibration Offset; Monitoring Display for Accumulated Power Consumption, Total CO <sub>2</sub> Emissions, and Heater Operation Output; Power Recovery Mode; Setting Data Backup and Recovery				
Temperature sensor	K type Thermocouple double sensor (for temperature control and independent overheat prevention device)				
Heater control	Triac with Zero-cross Control				
Control board	Self-diagnostic Functions (Detection for Temp. Sensor Failure, TRIAC Short Circuit, Automatic overheating prevention, Heater Line Disconnect, Main Relay Contact Damage ), Earth leakage breaker, Fan Motor Failure, Key Lock Function, Independent overheating prevention device				
Earth leakage breaker	Leak Current/Short Circuit/Over-current Protection, Rated Current Sensitivity 30mA				
Door switch	Door open: fan motor and heater circuit OFF, Door close: fan motor and heater circuit ON				
Internal dimensions (W×D×H mm)*2	300×300×300	450×450×450	600×500×500	600×500×1000	1090×500×1000
External dimensions (W×D×H mm)*2	430×495×740	580×645×890	730×695×940	730×695×1685	1220×695×1685
Capacity	27L	90L	150L	300L	540L
Weight	~50kg	~75kg	~90kg	~135kg	~210kg
Number of shelf bracket step / pitch	6 steps/30mm	11 steps/30mm	13 steps/30mm	29 steps/30mm	
Included accessories: shelf plate/bracket	2 pcs. / 4 pcs.			4 pcs. / 8 pcs.	8 pcs. / 16 pcs.
Withstand load of shelf	15kg/shelf				
Power supply V±10% 50/60Hz Single phase	115V 7.5A (with plug) / 220V (no plug) with external transformer	115V 11A (with plug) 220V 6A (no plug, round terminal)	115V 15A / 220V 8A (no plug, round terminal)	220V 15.5A (no plug, round terminal)	220V 18.5A (no plug, round terminal)

\*1. Temperature Accuracy / Rise time Standard: Testing Machinery Association of Japan. Temperature Fluctuation/Gradient Standard: Japanese Industrial Standard  
Performance data above based on 115V or 220V AC supplied power, 23°C±5°C (room temperature), 65%RH ±20% humidity, maximum air speed (FAN setting 10), damper closed, and no process load.  
\*2. Protrusions excluded.



## Control Panel & Fan Setting



## Method

[Side view]

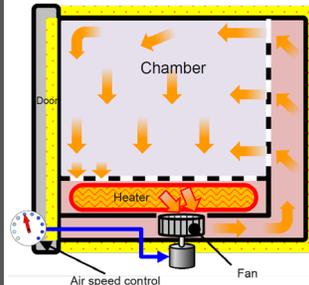


Diagram A: Forced convection

[Side view]

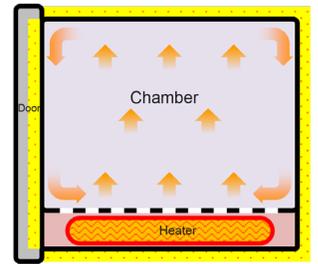
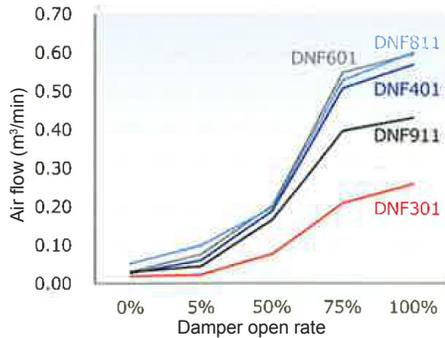


Diagram B: Natural convection

Model	Method
DNF301/401/411/601/611	Diagram A + B
DNF811/911	Diagram A

## Damper Switch



## Optional Items

Product name	Product code
ON30 Stand for DNF301	211180
OA194 Stand for DNF401/411/601/611	281596
OT42 Stand for DNF401/411	212348
OT62 Stand for DNF601/611	212349
Stacking support for DNF301 ODM44	281458
for DNF401/411 ODN26	212806
for DNF601/611 ODN28	212807
Shelf (with brackets 2 pcs.) for DNF301	212068
for DNF401/411	212246
for DNF601/611/811	212266
for DNF911	212490
*Cable port 25mm Ø	281454
50mm Ø	281455
*External alarm terminal for DNF401/411/811	281466
for DNF301/601/611/911	281467
*Time-up output terminal for DNF401/411/811	281468
for DNF301/601/611/911	281469
*Operation information output terminal for DNF401/411/811	281470
for DNF301/601/611/911	281471
*Event output terminal for DNF401/411/811	281472
for DNF301/601/611/911	281473
*Heat sensor for sample monitoring (K-thermocouple)	212946
*Exhaust duct (50mm Ø with exhaust flange)	
for DNF301	281459
for DNF401/411	281460
for DNF601/611	281461
for DNF811	281462
for DNF911 (50mm Ø with exhaust flange x 2 points)	281463
Seismic mat for DNF401/411/601/611	296902

\* Please specify when ordering main unit.

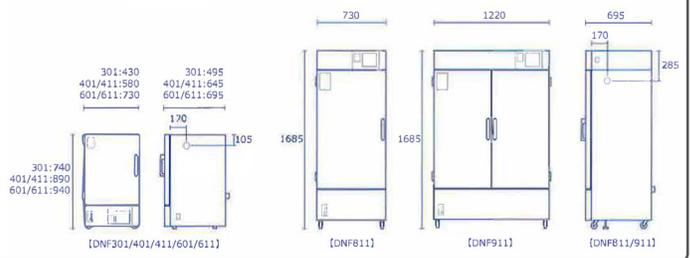
## Exhaust Duct (optional)



## Interior



## Dimensions (Unit:mm)



## Attention

- Never use in flammable or explosive gas atmosphere.
- Never use explosive or flammable material.
- Caution: High temperature components.

# Fine Oven

High accuracy temperature control

DF412/612 DH412/612



Operating temp. range

Room temp. +15~260°C(DF)  
Room temp. +15~360°C(DH)

Temp. distribution accuracy

±1.5°C(at 260°C) (DF) / ±2.5°C (at 360°C) (DH)

Internal capacity

91L (412 model)  
216L (612 model)

## Circulates uniformed heated air in a horizontal air flow pattern



Highly reliable and accurate oven with improved visibility and operability of control panel

### Operation and functions

- Precise temperature stability & uniformity
- Standard equipped with adjustable air speed function and displays of power consumption, CO<sub>2</sub> emission and heat timer
- Enhanced program operation function (maximum 99 steps, 99 patterns, repetitive operation function)
- Improved safety with fan motor error detection
- Exhaust damper allows quick exhaust and cooling of inside chamber
- Equipped with exhaust and cable ports

### Safety features

- Self-diagnosis circuit (abnormal temp. sensing, heater disconnection, auto overheat prevention, SSR short circuit), overheat protector, earth leakage breaker, key lock, etc.

### Specifications

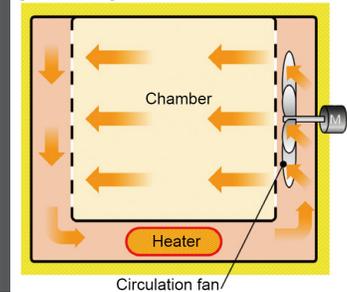
Model	DF412	DF612	DH412	DH612
Circulation method	Forced air circulation and ventilation			
Operating temp. range *1	Room temp. +15°C~260°C		Room temp. +15°C~360°C	
Temp. adjustment accuracy *1	±0.1°C (at 260°C)		±0.2°C (at 360°C)	
Temp. distribution accuracy *1	±1.5°C (at 260°C)		±2.5°C (at 360°C)	
Max temp. reaching time *1	~40 min. (reaches 260°C when setting at 270°C)		~50 min. (reaches 360°C when setting at 370°C)	
Temp. control / setting	PID Z control / Digital setting with ▲/▼ keys			
Temp. display system	Temperature reading display: green 4-digit digital LED / Temperature setting display: orange 5-digit digital LED			
Other indications	LED indicates temperature patterns for heating/stabilizing/cooling			
Timer display range	Fixed value operation for 1 min. to 99 hrs. 59 mins. 24 hr time system: clock operation			
Operation functions	Fixed temperature, auto start, auto stop, program (max. 99 steps or 99 patterns with repeat operation)			
Additional functions	Variable air flow function, power on time and timer accumulation monitor (up to 65535 hrs), calibration offset, power consumption display, total CO <sub>2</sub> emissions and heat operation output, power failure recovery mode, setting data backup and recovery			
Sensor	Double K-thermocouple			
Heater / heater control	Stainless pipe heater with fan / Triac with zero-cross control			
Heater capacity	2.1kW	3.0kW	2.7kW	3.75 kW
Blower fan (motor)	Axial flow fan (capacitor motor: 20W)			
Cable port	I.D. 33 mm X 1 pc. (rear)			
Interior / Exterior / Insulation	Stainless steel / Chrome-free electro-galvanized steel sheet metal, chemical-proof baked-on finish / Glass wool			
Door	Single swing (left side)			
Exhaust port	Automatic exhaust damper I.D. 80 mm (rear panel)			
Safety device	Self-diagnostic functions (temp. sensor error, TRIAC short circuit, heater disconnection, SSR short-circuit, fan motor failure, main relay contact damage and overheating), key lock function, door switch (door open, fan motor and heater circuit OFF / door close: fan motor and heater circuit ON), independent overheat prevention (temp. setting range: 0~300°C for DF and 0~400°C for DH)			
Earth leakage breaker	15A	20A	20A	30A
	Leak current/short circuit / Over-current protection, rated current sensitivity 30mA			
Internal dimensions (mm)(WxDxH) *2	450×450×450	600×600×600	450×450×450	600×600×600
External dimensions (mm)(WxDxH) *2	1050×630×850	1,200×780×1000	1050×630×850	1200×780×1000
Internal capacity	91L	216L	91L	216L
Shelf max. load	~30kg / pc			
Shelf support qty. / pitch	9 steps / 45mm	9 steps / 60mm	9 steps / 45mm	9 steps / 60mm
Power source (single phase)	AC 220V 12.5A no plug, round terminal	AC 220V 17.5A no plug, round terminal	AC 220V 15.5A no plug, round terminal	AC220V 17.5A no plug, round terminal
Weight	~112kg	~156kg	~112kg	~156kg
Shelf / bracket	2 pcs. / 4 pcs.	3 pcs. / 6 pcs.	2 pcs. / 4 pcs.	3 pcs / 6 pcs

\*1. Performance data above based on rated source voltage, single phase 220V AC ±5%, supplied power, 23°C±5°C (room temperature), 65%RH ±20% humidity, 86kPa atmospheric pressure, exhaust damper closed, and no sample load.

\*2. Protrusions excluded.

### Method

[Front view]



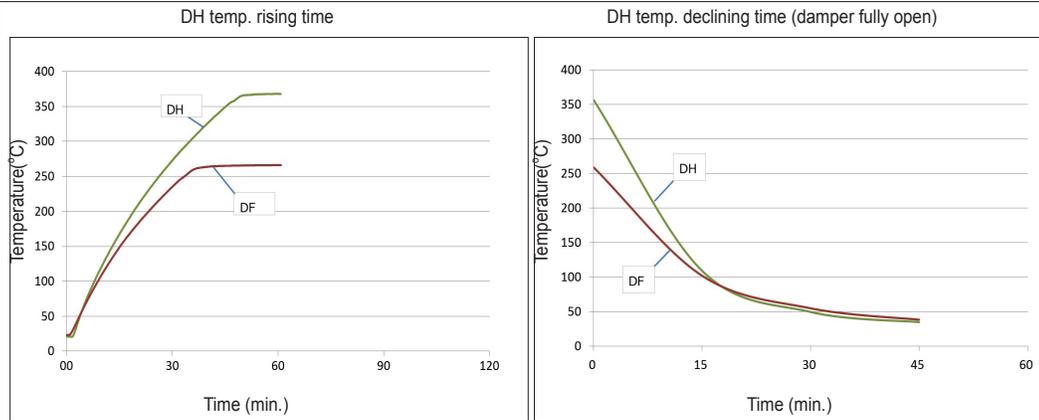
### Control Panel



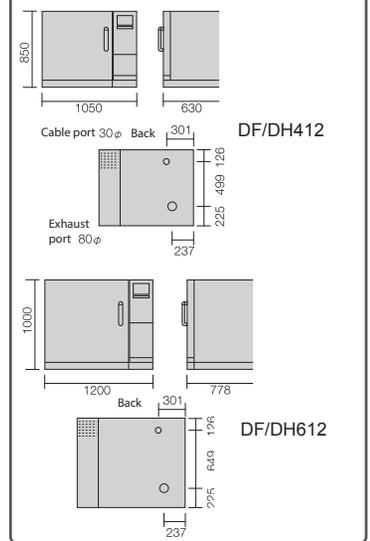
### Interior



## Performance



## Dimensions (Unit:mm)



## Optional Items



- (1) Exhaust duct (213704)
- (2) Emergency stop switch (213709)
- (3) Paperless recorder (Built-in) (213707)
- (4) Stand (with casters) (415467)

Description	Product code	Model	Applicable units
Stand			
without caster	415464	OP43	DF/DH412
	415465	OP63	DF/DH612
with caster wheels and caster stopper in front	415466	OP46	DF/DH412
	415467	OP66	DF/DH612
Stacking support	213700	ODF48	All models
Shelf with brackets - Stainless steel wire (loading up to 30kg/shelf)	211063	ODQ10	DF/DH412
	211064	ODQ20	DF/DH612
Shelf with brackets - Stainless steel punching (loading up to 15 kg/shelf)	211098	ODQ30	DF/DH412
	211099	ODQ40	DF/DH612
Shelf with brackets - Stainless steel mesh (loading up to 15 kg/shelf, 30 mm deep / designed to be stacked on std stainless steel wire shelves)	212924	ODT12	DF/DH412
	212925	ODT14	DF/DH612
Sheath sensor (K thermocouple)	212946	ODT48	All models
Silicon stopper (for 1 opening)	212947	ODT52	DF models only
*External communication adapter	211880	OIN90	All models
*External communication terminal (RS485)	213712	ODF72	All models
*Temp. output terminal (4-20mA)	213713	ODF74	All models
*External alarm output terminal	213714	ODF76	All models
*Time-up output terminal	213715	ODF78	All models
*Operation signal output terminal	213716	ODF80	All models
*Event output terminal	213717	ODF82	All models
*Emergency stop switch	213708	ODF64	DF/DH412
*Emergency stop switch	213709	ODF66	DF/DH612
*Auto damper	213706	ODF60	All models
*Paperless recorder (built-in)	213707	ODF62	All models
*Exhaust duct (80mm Ø)	213703	ODF54	DF/DH412
*Exhaust duct (80mm Ø)	213704	ODF56	DF/DH612
*Exhaust port flange	281069	ODF46	All models
*Observation window	213701	ODF50	DF412
*Observation window	213702	ODF52	DF612
*Power cord ~8m.	213710	ODF68	DF/DH412
*Power cord ~8m.	213711	ODF70	DF/DH612
*Cable port			
25mm Ø (for top)	213718	ODF84	All models
50mm Ø (for top)	213719	ODF86	All models
25mm Ø (for rear)	213720	ODF88	All models
50mm Ø (for rear)	213721	ODF90	All models

\* Customized from factory. Please specify when ordering main unit.

## Shelf / Bracket



Stainless steel punching shelf



Stainless steel wire shelf



Stainless steel mesh shelf  
(Placed on top of standard shelves)

## Attention

- Never use in flammable or explosive gas atmosphere.
- Never use explosive or flammable material.
- Caution: High temperature components.

# New! Fine Oven

High temperature 500°C, with exhaust damper

## DH650Z



Operating temp. range

Room temp. +10°C~500°C

Temp. adjustment accuracy

±0.5°C (at 500°C)

Internal capacity

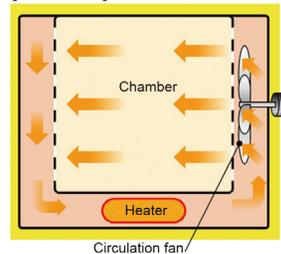
216L



216L  
DH650Z

- Maximum working temperature at 500°C
- Allows quick exhaust and cooling with the exhaust damper inside the chamber
- Equipped with a variety of operation functions such as an easy-to-use program operation function, power consumption, power charge display and history storage
- Operation function includes fixed temp., program, quick auto stop, auto stop and auto start operations
- Equipped with a four-fold overheating prevention device (automatic overheating, heater chamber overheating, tank overheating, and temp. fuse) to ensure complete safety

[Front view]



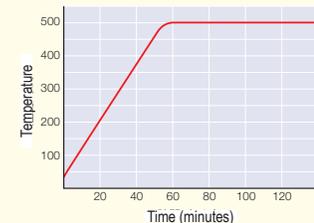
### Forced Horizontal Air Circulation

It circulates air evenly throughout the chamber, making it ideal for constant temperature tests that require excellent temperature performance.

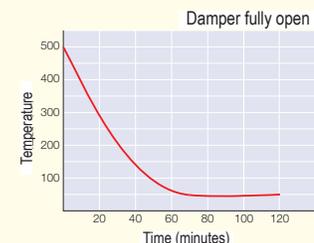
### Specifications

Model	DH650Z
System	Forced convection circulation (with exhaust damper)
Operating temp. range	Room temp. +10°C~500°C
Temp. adjustment accuracy*1	±0.5°C (at 500°C)
Temp. distribution accuracy*1	±5.0°C (at 500°C)
Max. temp. reaching time*1	~60 min.
Temperature controller	PID Z control
Temperature setting	Digital setting with ▲/▼ keys / digital display
Temperature display	Internal temp. display: Green 4-digit LED digital display (Resolution:1°C) Set temp. display: Orange 5-digit LED display (Resolution:1°C)
Damper control	Manual operation for circulation / ventilation
Sensor	K-thermocouple
Heater control	SSR-controlled
Safety functions	Self-diagnosis function (temperature sensor abnormality, heater disconnection, SSR short circuit, Automatic overheating prevention (controller built-in), fan abnormality), temperature fuse, door switch
Additional functions	Accumulation function for power-on/operation time (up to 65535 hours), Calibration offset function, Monitor display of power consumption, CO2 emissions, heater output operation amount, Power failure recovery mode selection, user setting information storage and retrieval
Heat insulator	Ceramic fiber, rock wool, heat insulation block
Heater	Wire heater: 1.3 kW × 6
Fan motor	20W (capacitor)
Exhaust port	ø80mm (rear)
Number of shelf stages	9 stages
Shelf pitch	60 mm
Withhold load of shelf	30 kg/shelf
Power supply (50/60 Hz)	3 phase AC220V 26A no plug, round terminal
Internal dimensions (W x D x H)	600 x 600 x 600 mm
External dimensions (W x D x H) *2	1350 x 950 x 1300 mm
Internal capacity	216L
Weight	~250kg
Shelf / bracket	3 pcs. / 6 pcs.

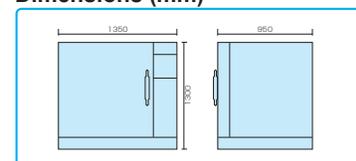
### Temperature Rise Curve



### Temperature Fall Curve



### Dimensions (mm)



211064  
Shelf & bracket set

\*1 Values at rated voltage 3 phase AC220V, room temperature 23°C no load, exhaust damper and cable hole fully closed.  
\*2 Protrusions excluded.

### Optional Items

Description	Product code
Shelf and bracket set	211064
Cable port	
25 mm Ø	281508
50 mm Ø	281509

### ⚠ Attention

- Never use in flammable or explosive gas atmosphere.
- Never use explosive or flammable material.
- Caution: High temperature components.

# Fine Oven

With high accuracy temperature control and exhaust damper



**DF832/1032 DH832/1032**

Operating temp. range	Room temp. +15°C~200°C(DF) Room temp. +15°C~300°C(DH)	Temperature slope	15°C(at 200°C) (DF) / 20°C(at 300°C)( DH)	Internal capacity	512L (Model832) / 1000L (Model1032)
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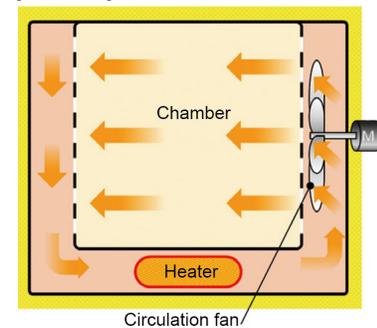
## Large fine oven designed to support high throughput



- Allows precision maintenance of large parts at a constant temperature
- Quick exhaust and cooling in the unit with the exhaust damper
- Interactive key entry on the control panel with a green LED digital display for easy settings
- Features power consumption/ CO<sub>2</sub> emissions monitoring
- Increased safety and self diagnostic functions



[Front view]



### Specifications

Model	DF832	DF1032	DH832	DH1032
System	Forced air circulation and ventilation			
Operating temp. range	Room temp. +15°C~200°C		Room temp. +15°C~300°C	
Temperature fluctuation	±0.5°C (at 200°C)		±1.0°C (at 300°C)	
Temperature slope	15°C (at 200°C)		20°C (at 300°C)	
Temperature controller	PID Z control			
Temp setting method	Digital setting with ▲/▼ keys			
Timer	0 min~99 hrs 59 min (Resolution: 1 minute or 1 hour)			
Operation function	Fixed temperature operation, Program operation (Maximum 99 steps, up to 99 patterns, repeat operation function) Duration/time select timer operation function (Fixed temperature operation, auto start/auto stop/quick auto stop, program operation auto start)			
Additional functions	Accumulated Power on and Operation Time (up to 65,535 hours); Calendar Time (24 hours); Calibration Offset; Monitor Display of Accumulated Power Consumption, Total CO <sub>2</sub> Emission, and Heater operating Output; Power Recovery Mode; User Settings Save and Restore Function; Fan Speed Setting Function			
Sensor	K-thermocouple (double sensor)			
Heater	Stainless steel pipe heater with a fan			
	4.5kW	6.0kW	6.9kW	9.0kW
Fan motor	Stainless steel axial flow fan (capacitor motor: 20W), Two motors used for model1032			
Cable port	I.D. ø30mm (rear)			
Heat insulator	Glass wool		Glass wool + ceramic fiber	
Other additional structure	Exhaust damper (manual operation)			
Safety device	Self-diagnostic functions (temp. sensor error, heater disconnection, SSR short-circuit, automatic overheat prevention), Door switch, Fan Failure Detection, key lock, independent overheat protection, electric leakage breaker with over current protection			
Power supply (50/60 Hz)	3 phase AC220V 13.5A <i>no plug, round terminal</i>	3 phase AC220V 17A <i>no plug, round terminal</i>	3 phase AC220V 20A <i>no plug, round terminal</i>	3 phase AC220V 28A <i>no plug, round terminal</i>
Internal dimensions (W x D x H)	800 x 800 x 800 mm	1000 x 1000 x 1000 mm	800 x 800 x 800 mm	1000 x 1000 x 1000 mm
External dimensions (W x D x H)	1500 x 1015 x 1330 mm	1700 x 1215 x 1530 mm	1500 x 1015 x 1330 mm	1700 x 1215 x 1530 mm
Shelf support qty. / pitch	10 steps / 76mm	10 steps / 98mm	10 steps / 76mm	10 steps / 98mm
Internal capacity	512L	1,000L	512L	1,000L
Weight	~350kg	~450kg	~350kg	~450kg
Included shelf / bracket	3 pcs. / 6 pcs.			

### ⚠ Attention

- Never use in flammable or explosive gas atmosphere.
- Never use explosive or flammable material.
- Caution: High temperature components.

# Vacuum Drying Oven

Standard Small Size Benchtop Vacuum Drying Oven



## ADP200C/210C/300C/310C

Operating temp. range 40~240°C

Operating pressure range 101~0.1kPa

Internal capacity 10L(ADP200C/210C) 27L(ADP300C/310C)

### Standard vacuum drying oven with enhanced safety features

#### Operation and functions

- Easy input of parameters and settings
- Digital PID controller supports fixed temperature, quick auto-stop, auto stop, auto start and program operations
- Self-diagnostic and overheating prevention functions
- Silicon rubber door seal prevents air from leaking
- Independent over heating prevention device for each circuit
- Customizable with N<sub>2</sub> gas inlet and communication ports
- Calibration off-set function
- Easy maintenance

#### Safety features

- Sensor trouble detection, SSR, short circuit detection, heater disconnecting detection, memory error, over heating and measurement temperature error



10L  
ADP200C



27L  
ADP300C

#### Specifications

Model	ADP200C/210C	ADP300C/310C
System	Vacuum drying by decompressed chamber direct heating	
Operating temperature range	40~240°C	
Operating pressure range	101~0.1kPa (760~1 Torr)	
Temp. control accuracy	±1.5°C (at 240°C)	
Max. temp. reaching time	~70min.	~100min.
Interior Material	Stainless steel	
Temp. control method	PID control by microprocessor	
Sensor	K-thermocouple	
Temp. setting method	Digital setting by ▲/▼ keys	
Temp. display method	Measurement temp.: Digital display by green LED Setting temp.: Digital display by red LED	
Timer	1 min. to 99 Hrs. 59 min. and 100 Hrs. to 999 Hrs. and 50 min., Digital display	
Heater	Mica heater 0.68kW	1.05kW
Heat insulating material	Rock wool	
Observation window	Tempered glass (12 mm thickness) and polycarbonate resin plate	
Vacuum gauge	Bourdon tube type, 0~0.1 MPa (Gauge pressure)	
Safety device	Self diagnostic functions (Heater, Sensor, SSR short circuit, automatic overheat prevention function), over current electric leakage breaker, overheating prevention device	
Internal dimensions	W200 x D250 x H200mm	W300 x D300 x H300mm
External dimensions	W400 x D412 x H603mm	W500 x D465 x H705mm
Internal capacity	10L	27L
Shelf loading	~15kg / pcs	
Shelf rest step number	2 steps	3 steps
Shelf rest pitch	65mm	75mm
Vacuum port	O.D.18mm	
Power source	AC115V 6A with plug AC220V 3.5A no plug, round terminal	AC115V 9.5A with plug AC220V 5A no plug, round terminal
Weight	~30kg	~55kg
Included accessories	Shelf plate (aluminum perforated metal) 2 pcs.	Shelf plate (aluminum perforated metal) 3 pcs.

#### Optional Items

Description	Product code
Shelf	
ADP200C/210C	297071
ADP300C/310C	297072
*N <sub>2</sub> gas introduction device 30L/min. (factory installed)	Contact Customer Service

\* Please specify when ordering main unit.

#### Recommended Pumps

Description	Product code
Oil pump	
GLD137CC 115V 162L/min, 5.7CFM with Rubber Hose Kit	GLD137CC115DPRKIT
GLD137CC 220V 162L/min, 5.7CFM with Rubber Hose Kit	GLD137CC220DPRKIT
Dry vacuum pump	
ADP NEODRY15G1 100-240V DRY VACUUM PUMP KIT	NEOADPCKITA

## Internal view of ADP

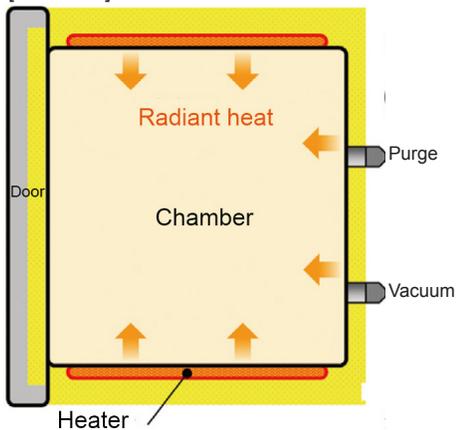


## Control Panel



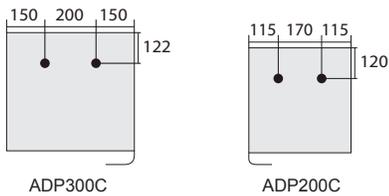
## Method

[Side view]



## Dimensions (Unit:mm)

Upper part

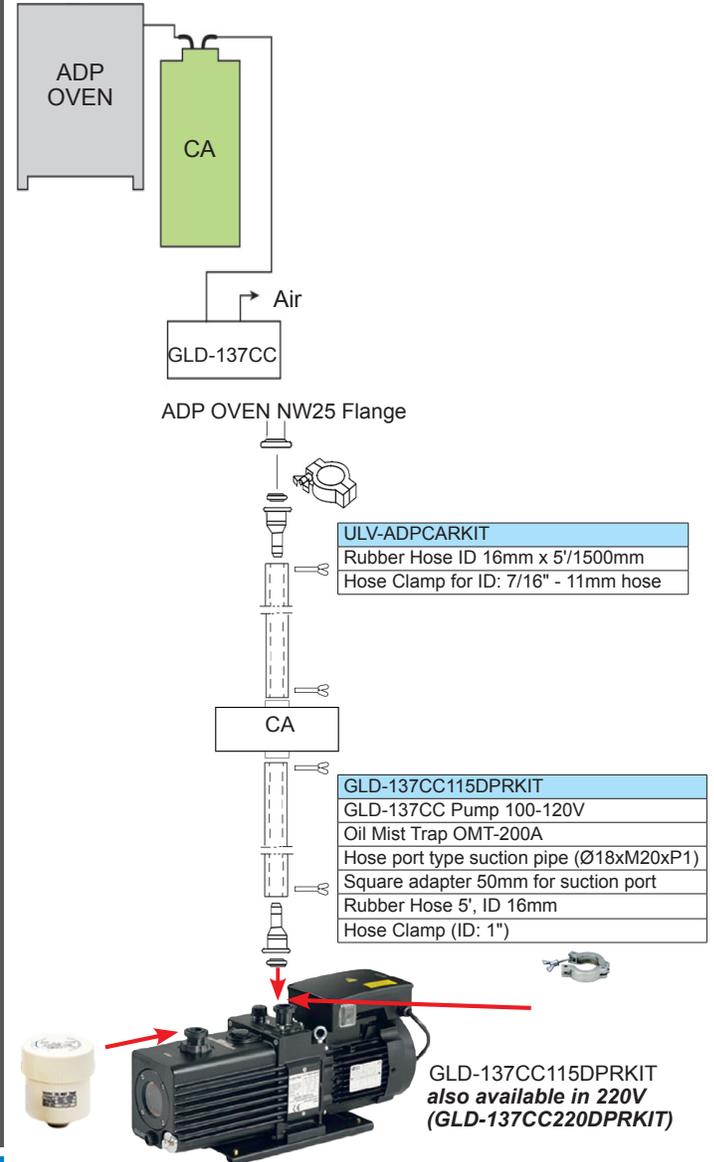


### ⚠ Attention

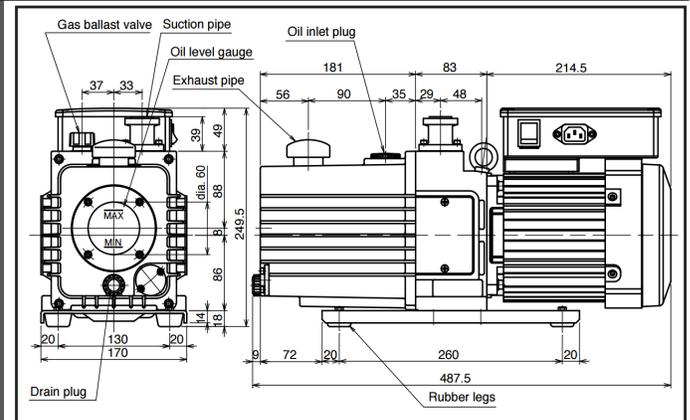
- Never use in flammable or explosive gas atmosphere
- Never use explosive or flammable material
- Caution: High temperature components

## Sample Installation with Cold Trap

Use with CA Series



## GLD-137CC for ADP Series



# Vacuum Drying Oven

Benchtop to Floor Type Vacuum Drying Oven

**SDP300/310/400/410/610**



Operating temp. range RT +10~220°C (SDP300/310/400/410) RT +15~220°C (SDP610)

Operating vacuum range -10 ~ 101 kPa

Capacity 47.2L (SDP300/310) 127.4L (SDP400/410) 264L (SDP610)

**Provides exceptional capabilities for fast and gentle drying of heat-sensitive materials**

## Features

- Digital vacuum gauge shows chamber vacuum level
- Watlow controller that can be programmed to perform multiple ramp and soak profiles
- Doors with positive latch handles with spring-loaded glass to facilitate good vacuum seal
- Tempered glass viewing window allows for safe, continuous monitoring of samples
- Generous usable shelf area
- Achieve impressive vacuum levels
- Built-in overtemperature protection
- Meets TUV safety requirements



47L  
SDP300/310



127L  
SDP400/410

## Specifications

Model	SDP300 SDP310	SDP400 SDP410	SDP610
Operating temperature range	Room temperature +10°C ~220°C		Room temperature +15°C ~220°C
Operating vacuum range	-3.0 ~ -29.9 inHg (-10 ~ 101 kPa)		
Vacuum display range	0.0 ~ -29.9 inHg (5 to -101 kPa)		760 Torr down to 0 mTorr
Controls	EZ-ZONE Watlow		
Access port	KF25		
Temperature uniformity - midrange	± 6.0% of setpoint		
Temperature stability	@ 80°C	± 0.1°C	± 0.2°C
	@ 150°C	± 0.20°C	± 0.2°C
	@ 220°C	± 0.3°C	± 0.3°C
Heat up times (from RT of 20°C for SDP300/400) (from RT of 25°C for SDP610)	@ 80°C	70 mins.	80 mins.
	@ 150°C	120 mins.	130 mins.
	@ 220°C	200 mins.	180 mins.
Cool down times (time to cool down to 50°C)	From 80°C	110 mins.	---
	From 150°C	188 mins.	---
	From 220°C	233 mins.	---
Controller	Digital		
Display resolution	0.1 °C		
Interior material	300 SST		
Exterior material	Painted cold roll steel		
Standard chamber gasket	Silicone		Viton
Internal dimensions	W304 x D508 x H304 mm 12 x 20 x 12 in.	W457 x D610 x H457 mm 18 x 24 x 18 in	W710 x D609 x H609 mm 28 x 24 x 24 in
External dimensions	W528 x D795 x H681 mm 20.8 x 31.3 x 26.8 in	W686 x D895 x H833 mm 27.0 x 35.2 x 32.8 in	W965 x D1189 x H1624 mm 38.1 x 46.8 x 63.9 in
Internal capacity	47.2L	127.4L	264L
Shelf dimensions (WxD)	287 x 483 mm (11.3" x 19")		
Shelf capacity by weight per shelf *1	15.8 kg		34 kg
Maximum total load *2	47.6 kg.		102 kg
Shelf rest step number	3 steps	6 steps	3 steps
Power source 50/60 Hz	AC110 - 120V 10A with plug AC220 - 240 5.5A with plug, Type F	AC110 - 120V 13A with plug AC220 - 240V 7A with plug, Type F	AC230V 20A no plug, round terminal
Weight	~83kg	~144kg	~223kg
Included accessories	3 shelves (2 tall, 1 short bottom), 1 power cord, 4 leveling feet	3 shelves, 12 shelf clips, 1 power cord, 4 leveling feet	3 shelves, 12 shelf clips, 4 leveling feet, oil drain tray

\*1 With weight evenly distributed across the shelf

\*2 Exceeding this limit risks damaging chamber liner

## SDP300/310 (47L)



Front view with open door



Back view with open door

## SDP400/410 (127L)



Front view



Back view

## SDP610 (264L)



Front view



Front view with open door

Features a fully programmable Watlow controller and a cool touch surface. A digital vacuum gauge shows chamber vacuum level in measurements of Torr and m/Torr. The display range is 760 Torr down to 0 mTorr (Maximum permitted end vacuum is 10 mTorr. Leak rate is 30 mTorr in 30 min).

A secondary independent high limit controller provides overtemperature safety protection.

Equipped with a **VITON** gasket which provides an excellent combination of high temperature performance and chemical resistance.

### Optional Items

Description	Applicable Models	Product code
<b>Shelf</b>		
Tall shelf	SDP300/310	SHE-5680588
Short shelf	SDP300/310	SHE-9751342
Shelf	SDP400/410	SHE-5680563
Shelf	SDP610	SHE-5680562
Shelf clip	SDP400/410/610	SHE-1250510
Adjustable leveling feet	All SDP models	SHE-2700506
<b>Door gasket</b>		
Silicone	SDP300/310	SHE-3450707
	SDP400/410	SHE-2450719
Buna-N	SDP300/310	SHE-3450708
	SDP400/410	SHE-3450724
Fluorosilicone	SDP300/310	SHE-3450611
	SDP400/410	SHE-3450612
	SDP300/310	SHE-3450670
Viton	SDP400/410	SHE-3450671
	SDP610	SHE-3450755
<b>Window gasket</b>		
Viton	SDP610	SHE-3450754
<b>Vacuum pump</b>		
GLD137 Oil Vacuum Pump with Rubber Hose Kit 115V	SDP300	GLD137CC115DPRKIT
GLD137 Oil Vacuum Pump with Rubber Hose Kit 220V	SDP310	GLD137CC220DPRKIT
GLD202 Oil Vacuum Pump with Rubber Hose Kit 115V	SDP400	GLD202BB115DPRKIT
GLD202 Oil Vacuum Pump with SUS Hose Kit 115V		GLD202BB115DPSKIT
GLD202 Oil Vacuum Pump with Rubber Hose Kit 220V	SDP410	GLD202BB220DPRKIT
GLD202 Oil Vacuum Pump with SUS Hose Kit 220V	SDP610	GLD202BB220DPSKIT
SDP NEODRY15G2 100-240V Dry Vacuum Pump Kit	All models	NEOSDPKITC

### ⚠ Attention

- Never use in flammable or explosive gas atmosphere
- Never use explosive or flammable material
- Caution: High temperature components

# Floor Type Vacuum Drying Oven

Large Capacity Vacuum Drying Oven

DP43C/63C



Operating temp. range 40~200°C

Operating pressure range 101~0.1kPa

Internal capacity 91L (DP43C) 216L (DP63C)

## Large capacity multi-purpose vacuum oven



91L  
DP43C



216L  
DP63C

### Operation and functions

- Interactive key input of the control panel for easy operation
- Equipped with high precision functions such as fixed temperature, quick auto stop, auto stop, auto start and program operations for enhanced performance
- Vacuum reaching time significantly reduced by improvement of the exhaust system, resulting in more efficient operation
- Vacuum pump can be stored in the bottom cabinet, which is suitable for space limited laboratories
- Easy removal of piping and maintenance of vacuum pump
- Calibration off-set function

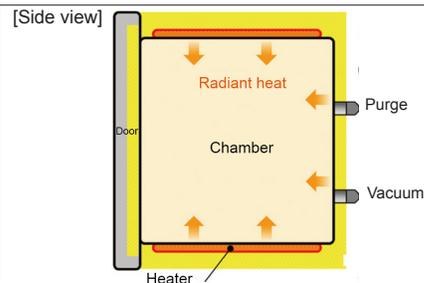
### Safety features

- Enhanced safety features: sensor trouble detection, SSR short circuit detection, heater disconnection detector(sensor), memory error, internal communication error, overheating and measurement temperature error
- Large observation window with protective cover for increased safety

### Specifications

Model	DP43C	DP63C
System	Vacuum drying by decompressed chamber direct heating	
Operating temp. range	40°C to 200°C	
Operating pressure range	101 to 0.1 kPa (760 to 1 Torr)	
Temp. control accuracy	±1.0°C (at 200°C)	
Max. temp. reaching time	~80 min.	~120 min.
Interior material	Stainless steel	
Exterior material	Cold rolled steel plate with baked-on melamine resin finish	
Door	Single swing door	
Heat insulating material	Glass wool	
Heater	Mica heater, 2.25 kW	Mica heater, 3.15 kW
Vacuum gauge	Bourdon tube type, 0 ~ -0.1 MPa (Gauge pressure)	
Observation window	Tempered glass and polycarbonate resin plate	
Temp. control method	PID control by microprocessor	
Temp. setting method	Digital setting with ▲/▼ keys	
Temp. display method	Green LED digital display	
Timer	1 min. to 99 Hrs. 59 min. and 100 Hrs. to 999 Hrs. and 50 min.	
Min. division	1 min. or 10 mins.	
Operation function	Fixed temperature operation, Quick auto stop, Auto-start operation, Auto-stop operation, Program operation (16 segments)	
Additional functions	Calendar timer (max. 24 Hrs.), Integration time (max. 49999 Hrs.), Time display	
Heater circuit control	Triac zero-cross control	
Temp. sensor	K-thermocouple (double sensor)	
Safety device	Self diagnostic functions (Sensor, Heater, Triac, Automatic overheating prevention), Independent overheating prevention, Key lock function, Electric leakage breaker	
Internal dimensions (WxDxH)	450×450×450 mm	600×600×600 mm
External dimensions (WxDxH)	670×669×1500 mm	820×819×1650 mm
Internal capacity	91L	216L
Shelf Support Qty. / Pitch	4 steps / 105mm	4 steps / 140mm
Exhaust port / Purge port	NW25 flange / Rc 1/4 (18mm O.D.)	
Power source	220V, single phase, 11A no plug, round terminal	220V, single phase, 15A no plug, round terminal
Weight	~190kg	~290kg
Shelf	2 perforated stainless steel shelves	

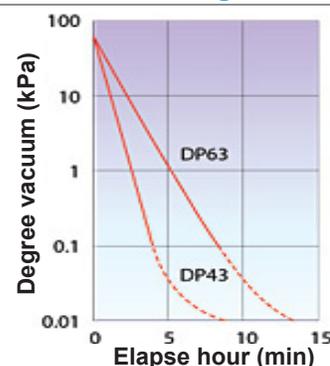
### Method



### Control Panel



### Pressure Falling Curve



## Optional Items

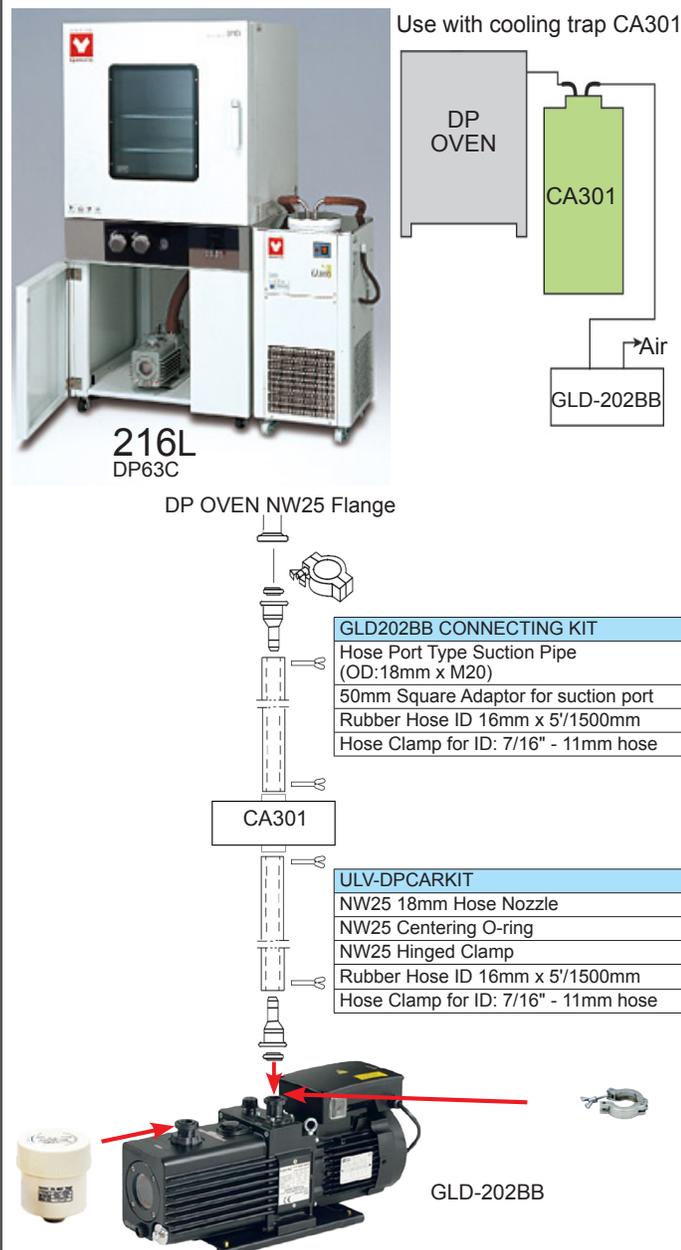
Description	Product Code
DP43C shelf	212192
DP63C shelf	212193
Temperature output terminal	281609
*N <sub>2</sub> Gas Introduction Device 30L/min. (Factory Installed)	281151
*Vacuum Pump Switch (For DP43C/63C) (Factory Installed)	281152
GLD202BB Oil vacuum pump w/ rubber hose kit 115V	GLD202BB115DPRKIT
GLD202BB Oil vacuum pump with SUS hose kit 115V	GLD202BB115DPSKIT
GLD202BB Oil vacuum pump with rubber hose kit 220V	GLD202BB220DPRKIT
GLD202BB Oil vacuum pump with SUS hose kit 220V	GLD202BB220DPSKIT
NEODRY15G2 100-240V Dry Vacuum Pump Kit	NEODP4363CKITB

\* Please specify when ordering main unit.

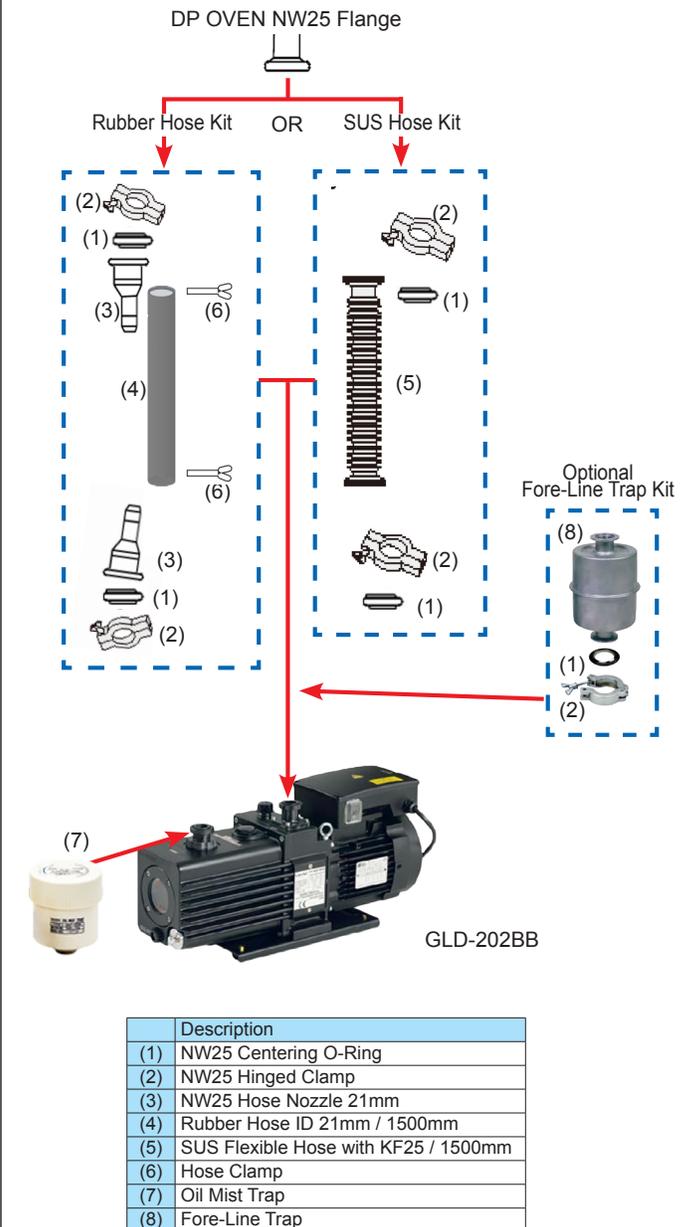
## Dimensions (Unit:mm)



## Sample Installation with CA301



## Rubber Hose or Stainless Steel Hose Connection for Vacuum Pump



### ⚠ Attention

- Never use in flammable or explosive gas atmosphere
- Never use explosive or flammable material
- Caution: High temperature components

# Floor Type Vacuum Drying Oven

Large capacity Vacuum Drying Oven



## DP83C/104C

Operating temp. range 40~200°C

Operating pressure range 101~0.1kPa

Internal capacity 512L (DP83C) 1000L (DP104C)

Large scale vacuum drying oven designed for treatment of large-sized parts



### Operation and function

- Vacuum pump can be installed inside the oven
- Quick connect / disconnect of vacuum pipes for easy vacuum pump maintenance
- Improved working efficiency as exhaust system is improved to significantly shorten the time to reach vacuum
- Use specialized function menu key and up/down key to set. With program operation function, use submenu key to operate overheat protector, deviation correction, etc.

### Safety features

- Self-diagnosis circuit (abnormal temperature sensing, heater disconnection, auto overheat prevention, SSR short circuit), overheat protector, ELB to prevent overcurrent, key lock, etc.
- For safety, resin protection panel is installed at the observation window

### Specifications

Model	DP83C	DP104C
Method	Decompressed chamber direct heating	
Operating temp. range	40~200°C	
Operating vacuum range	101~0.1kPa (760~1Torr)	
Temp. adjustment accuracy	±1.0°C (at 200°C)	
Interior material	Stainless steel plate	
Exterior material	Cold rolled steel plate with chemical proofing coating	
Insulating material	Glass fiber	
Heater power	6.5kW	14.4kW
Observation window	Toughened glass + resin protection panel	
Vacuum gauge	Pointer type, -100~0kPa	
Vacuum pump installation room	Yes	
Temp. control	3 segments PID	
Temp. setting	Use specialized function menu key and ▲/▼ key to set	
Temp. display	Measured temp. display: green 4-digit LED digital display Setting temp. display: red 4-digit LED digital display	
Timer	1min-99 hr 59 min and 100 hr - 999 hr 50 min (with time wait function)	
Operation function	Fixed temp. auto start, auto stop, program operation	
Program mode	Program operation 3 segments 30 steps (30 steps×1, 15 steps×2, 10 steps×3)	
Additional function	Deviation correction, key lock, power outage compensation	
Heater circuit control	SSR driving	
Sensor	K thermocouple (temp. controller and overheat protector)	
Safety device	Self-diagnostic circuit (abnormal temp. sensing, heater disconnection, auto overheat prevention, SSR short circuit), overheat protector, EBL to prevent overcurrent, key lock, etc.	
Internal dimensions (W×D×H)	800×800×800 mm	1000×1000×1000 mm
External dimensions (W×D×H)	1020×1020×1850 mm	1300×1280×2110 mm
Internal capacity	512L	1000L
Air exhaust port	NW40 flange	
Air suction port	Rc 3/8	
Power source (50/60Hz) rated current	AC220V 31.5A (no plug, round terminal)	3 phase AC480V 18A (no plug, round terminal)
Weight	~450kg	~1000kg
Included accessories	Stainless steel punching plates, 2 pcs.	Stainless steel punching plates, 4 pcs.
Optional accessories	Shelf plate, vacuum pump, N <sub>2</sub> introduction device, recorder, alarm indicator lamp (stand-by/running/malfunction), temp. output terminal (4~20mA), Output terminal for external alarm, time up output terminal	

### Optional Items

Product Code	Description
Q110204006	DP83C shelf
Q110204007	DP103C shelf

### Recommended pump:

Product Code	Description
NEODP83104KITD	NEODRY60E2 Dry vacuum pump kit 200-240V





# Air-cooled Dry Vacuum Pump



## NeoDry Series



### NeoDry 15G

- **Features**
- **Wide voltage range**  
*Switchable between 1 phase 100V to 200V automatically*
- **Quieter operation**  
*Typically 45dB (51dB for 36G) at ultimate pressure*
- **Temperature optimization**  
*Optimized temperature with fan control*
- **Upgraded water vapor evacuation performance**  
*Gas ballast enables vacuum of condensable gases and brings a 10% water vapor evacuation performance boost*
- **IEC power connector**  
*IEC connector adopted for convenience*
- **Maintenance Cycle**  
*Approximately once in 6 years when Air / N2 is used, based on track record of sales*

### Vacuum pumps come with gas ballast



The gas ballast mechanism prevents condensable gases (such as water vapor and solvent-laden gases) from condensing inside the pump, thereby extending the pump's lifespan.

### Specifications

Model	NeoDry 15G for ADP, SDP and DP43C/63C
Maximum pumping speed	250 L/min 8.83 CFM
Ultimate pressure (without gas ballast)	1.0 Pa 0.00750062 Torr
Supply voltage (50/60 Hz)	Single Phase, AC100-240V
Gas ballast mechanism	Yes
Max allowable moisture (with gas ballast)	275 g/h
Noise value (inlet closed)	45 dBa
Vibration (inlet closed)	≤ 8 μmp-p
Weight	22 kg 48.5 lbs
Inlet size	NW25
Outlet size	NW25
Power consumption at ultimate pressure	0.34 kW
Overall dimensions L x W x H	385 × 210 × 219 mm

### Gas ballast mechanism



The gas ballast mechanism is not installed in the pump upon delivery. Installation instructions can be found in the operational manual provided with the unit.

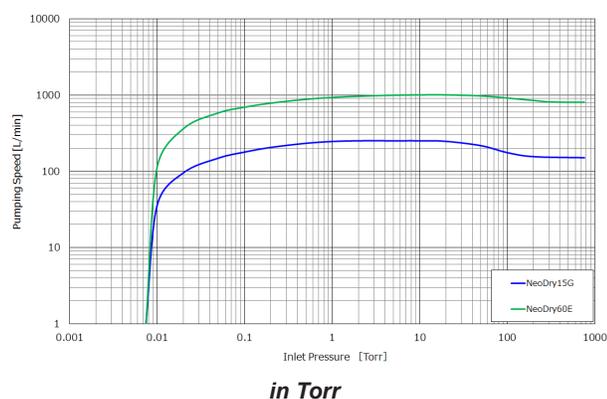
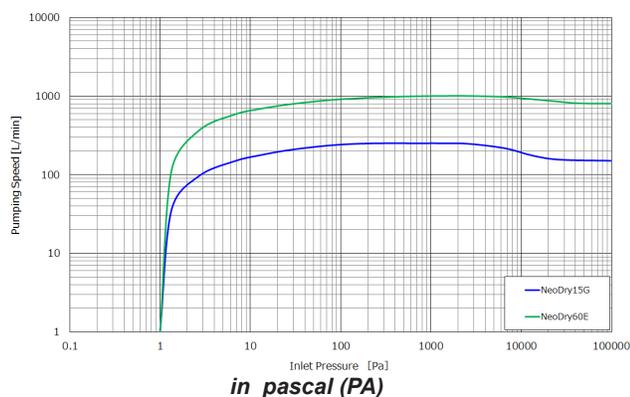


## NeoDry 60E2

### ■ Features

- No tip-seal replacement. No performance deterioration. No particle.
- No oil smoke. No chamber contamination.
- Hassle free to replace rotary / scroll pumps
- Frequency of use does not affect performance by virtue of the inverter.
- Low noise, low vibration
- Maintenance Cycle  
*Approximately once in 6 years when Air / N<sub>2</sub> is used, based on track record of sales*

## Pumping Speed Curves



### ■ Specifications

Model	NeoDry 60E2 for DP83C/104C
Maximum pumping speed	1000 L/min 35.3 CFM
Ultimate pressure (without gas ballast)	≤ 1.0 Pa 7.5 Torr
Supply voltage	Single phase, AC200-240V
Gas ballast mechanism	Yes
Max allowable moisture (with gas ballast)	600 g/h
Noise (inlet closed)	≤ 60 dBA
Vibration (inlet closed)	≤ 8 μmp-p
Weight	56 kg 124 lbs
Inlet size	NW40
Outlet size	NW25
Overall dimensions L x W x H	530 × 315 × 275 mm

### ■ Recommended dry pump kits for all Yamato vacuum oven models

Assembly No.	Components	Applicable products
<b>NEOADPCKITA</b>	Vacuum pump, silencer, connecting kit (1500 SUS hose, KF25 joint plug, KF25 center ring, KF25 clamp)	<b>ADP200C/210C/300C/310C</b>
<b>NEODP4363CKITB</b>	Vacuum pump, silencer, connecting kit (1500 SUS hose, KF25 center ring, KF25 clamp)	<b>DP43C/63C</b>
<b>NEOSDPKITC</b>	Vacuum pump, silencer, connecting kit (1500 SUS hose, KF25 center ring, KF25 clamp, KF25 open and close handle)	<b>SDP300/310/400/410/610</b>
<b>NEODP83104KITD</b>	Vacuum pump, silencer, connecting kit (KF40 1500 SUS hose, KF40 center ring, KF40 clamp)	<b>DP83C/104C</b>

# Oil-Sealed Rotary Vacuum Pump



GLD-137CC/202BB



## GLD Series, Direct Drive Oil-Sealed

### ■ Features

- GLD series features high performance, low vibration and noise and several functions such as gas ballast valve, oil-back-flow prevention mechanism, and large sized oil level gauge. This series equips multi-voltage motor and correspondent to international standard

### ■ Applications

- Chemical, science experiment, analyzer and laser system
- Backing pumps for electronic microscope
- Semiconductor equipment, sputtering equipment, vacuum evaporation equipment
- Vacuum dryer, freeze dryer
- Db noise level 57 db(A) or less

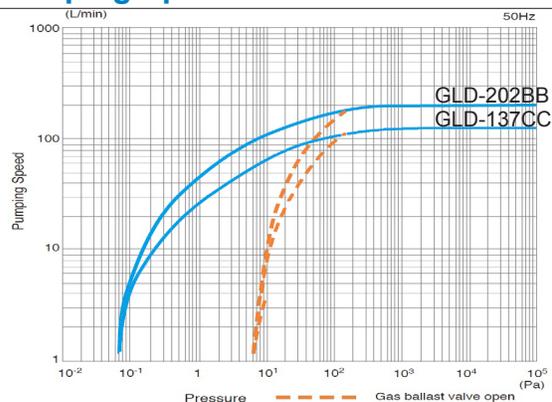
### ■ Specifications

Model		GLD-137CC for ADP and SDP300/310 Series		GLD-202BB for DP and SDP400/410/610 Series	
		50Hz	60Hz	50Hz	60Hz
Actual pumping speed	Unit	50Hz	60Hz	50Hz	60Hz
	L/min	135	162	200	240
	m <sup>3</sup> /h	8.1	9.72	12.00	14.40
	CFM	4.77	5.72	7.06	8.47
Ultimate pressure	Pa	G.V. Closed : 0.67 G.V. Open : 6.7		G.V. Closed : 0.67 G.V. Open : 6.7	
	Torr	G.V. Closed : $5.0 \times 10^{-3}$ G.V. Open : 0.05		G.V. Closed : $5.0 \times 10^{-3}$ G.V. Open : 0.05	
	mbar	G.V. Closed : $6.7 \times 10^{-3}$ G.V. Open : 0.07		G.V. Closed : $6.7 \times 10^{-3}$ G.V. Open : 0.07	
Motor		Single phase, 400W, 4P, Multiple-range motor Capacitor start & run, 100–120V/200–240V		Single phase, 550W, 4P, Multiple-range motor Capacitor start & run, 100–120V/200–240V	
Full load current	A	6.8 (100-120V) 3.5 (200-240V)	5.8 (100-120V) 2.9 (200-240V)	8.2 (100-120V) 4.1 (200-240V)	7.9 (100-120V) 3.9 (200-240V)
Oil capacity	mL	1000		1100	
Recommended oil		SMR-100		SMR-100	
Weight	kg	27.0		29.0	
Inlet port diameter	mm	KF-25		KF-25	
Ambient temperature	°C	7-40		7-40	
	°F	44.6 – 104		44.6 – 104	
Overall dimensions	mm	170(W) × 488(L) × 250(H)		170(W) × 516(L) × 250(H)	

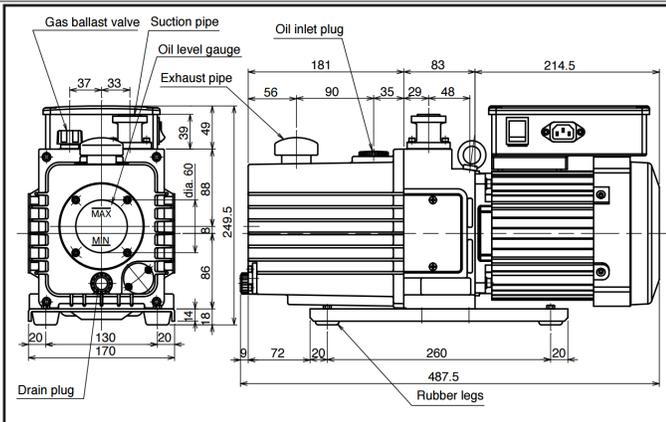
### ■ Corresponding Voltage and Certificate

Model	Voltage	Applicable Volt	CE Marked	TUV Marked	cTUVus Marked
GLD-137CC	Single phase, 100-120V	Standard	●	●	●
	Single phase, 200-240V	Standard	●	●	●
GLD-202BB	Single phase, 100-120V	Standard	●	●	●
	Single phase, 200-240V	Standard	●	●	●

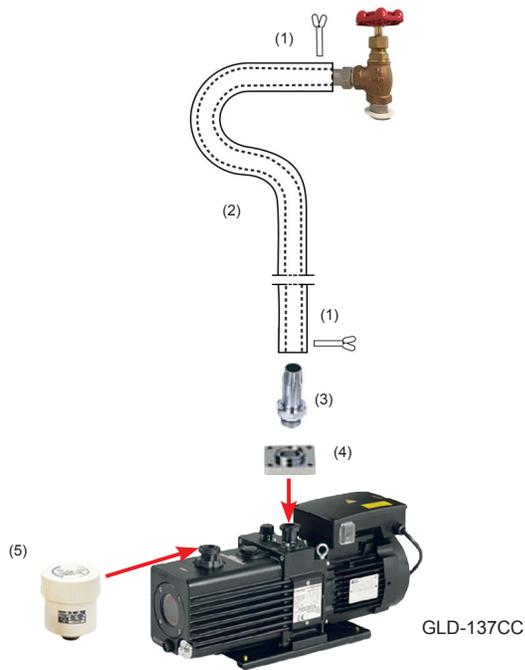
### Pumping Speed Curves



## GLD-137CC for ADP & SDP Series

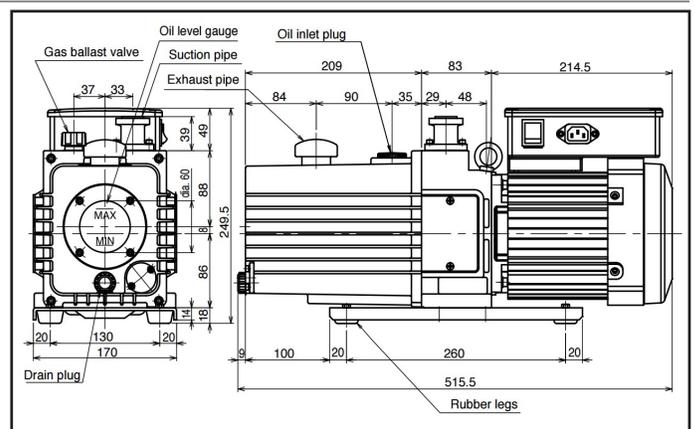


ADP & SDP Series Oven  
(Hose Connection)

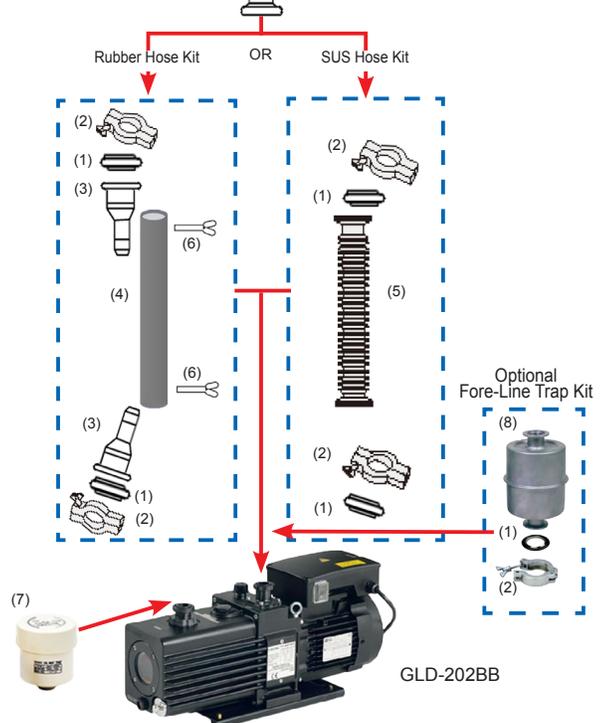


	Description
(1)	Hose Clamp
(2)	Rubber Hose ID: 16mm/1500mm
(3)	Hose Port Type Suction Pipe OD: 18mm x M20
(4)	50mm Square Adapter for Suction Port
(5)	Oil Mist Trap

## GLD-202BB for DP & SDP Series



DP & SDP Series Oven (NW25 Flange Connection)



	Description
(1)	NW25 Centering O-Ring
(2)	NW25 Hinged Clamp
(3)	NW25 Hose Nozzle 21mm
(4)	Rubber Hose ID 21mm / 1500mm
(5)	SUS Flexible Hose KF25 x 1500mm
(6)	Hose Clamp
(7)	Oil Mist Trap
(8)	Fore-Line Trap

Description	Product Code	Applicable products	Components
Rotary Vacuum Pump			
GLD137CC with Rubber Hose Kit 115V	GLD137CC115DPRKIT	ADP200C/210C/300C/310C	Vacuum pump, Oil mist trap, Hose clamp, Rubber hose, Suction pipe, Square adapter
GLD137CC with Rubber Hose Kit 220V	GLD137CC220DPRKIT	SDP300/310	Vacuum pump, Oil mist trap, Hose clamp, Rubber hose, Suction pipe, Square adapter
GLD202BB with Rubber Hose Kit 115V*	GLD202BB115DPRKIT	DP43C/63C SDP400/410/610	Vacuum pump, Oil mist trap, Centering o-ring, Hinged clamp, Hose nozzle, Rubber hose, Hose clamp
GLD202BB with SUS Hose Kit 115V*	GLD202BB115DPSKIT		Vacuum pump, Oil mist trap, Centering o-ring, Hinged clamp, Hose nozzle, SUS flexible hose, Hose clamp
GLD202BB with Rubber Hose Kit 220V*	GLD202BB220DPRKIT		Vacuum pump, Oil mist trap, Centering o-ring, Hinged clamp, Hose nozzle, Rubber hose, Hose clamp
GLD202BB with SUS Hose Kit 220V*	GLD202BB220DPSKIT		Vacuum pump, Oil mist trap, Centering o-ring, Hinged clamp, Hose nozzle, SUS flexible hose, Hose clamp

\* Optional Fore-Line Trap Kit not included in the kit above.

# Inert Oven

Suitable for No Oxidation Environment



## DN411IE/611IE

Operating temp. range Room temp. +15°C~360°C

Temp. gradient 12°C (at 360°C) (411IE) / 20°C (at 360°C) (611IE)

Internal capacity 95L (DN411IE) 223L (DN611IE)

### Suitable for Curing Process in No Oxidation Environment



95L  
DN411IE

223L  
DN611IE

#### Specifications

Model	DN411IE	DN611IE
System	Forced Convection	
Operating temp. range	Room Temp. +15 to 360°C	
Temp. adjustment accuracy	±0.2°C (at 360°C)	
Temp. fluctuation	±0.6°C (at 360°C)	
Temp. uniformity	±3°C (at 360°C)	
Temp. gradient	12°C (at 360°C)	20°C (at 360°C)
Max. temp. reaching time	~60 min.	
Nitrogen substitution time required	~30 min. (ordinary temp with oxygen concentration of 2%)	~70 min. (ordinary temp with oxygen concentration of 2%)
Interior	Stainless steel plate	
Exterior	Cold rolled steel plate with baked melamine resin coating	
Heat insulator	Glass wool + Ceramic fiber	
Heater	SUS Pipe Heater 3.0kW	SUS Pipe Heater 4.0kW
Sensor	K thermocouple for temperature control and independent overload prevention device	
Fan type / Motor	Sirocco Fan / Condenser Type	
Flow meter, Gas carrier	Max. Flow 30L/min, O.D. 9mm Hose Nipple	
Temp. controller	PID Control by Microcomputer	
Temp. display type	Temp. display: Digital display by 4 digit green LED (resolution:1°C) Setting temp. display: Digital display by 5 digit orange LED (resolution:1°C)	
Timer / Timer resolution	1min. ~ 99hrs. 59mins. or 100hrs. ~ 999hrs. / 1min. or 1hr.	
Operation function	Fixed temp. operation, Auto-start, Auto-stop, Quick auto-stop, Program Operation	
Program mode	Repeatable operation function up to max 99 steps or 99 patterns.	
Additional functions	Power on and operation time integrating function (up to 65535 hours), calendar time (24 hours), calibration offset, Monitor display of integrated power consumption, total CO <sub>2</sub> emissions and heater operating output, power failure recovery mode, save and read out of user settings	
Heater circuit control	Triac with Zero-cross	
Safety device	Self diagnostic functions (Sensor failure, SSR short circuit, Heater line disconnection, Main Relay contact damaged, Automatic overheat prevention), Key lock function, Independent overheating prevention, Electric leakage breaker, Door switch	
Internal Dimensions	W470 x D450 x H450 mm	W620 x D600 x H600 mm
External Dimensions	W640 x D695 x H915 mm	W790 x D845 x H1065 mm
Internal Capacity	95L	223L
Shelf max. load	~30kg / shelf	
Shelf support qty. / Pitch	12pcs. / 30mm	17pcs. / 30mm
Power source	Single phase 220V 13.5A (no plug, round terminal)	Single phase 220V 19A (no plug, round terminal)
Weight	~90kg	~130kg
Included accessories	Stainless wire shelf plate / bracket: 2 pcs. / 4 pcs.	

\* N<sub>2</sub> introduction rate 20L/min.

Inert oven suitable for temperature test and heat treatment in a non-oxidizing environment, by introducing N<sub>2</sub> gas into chamber.

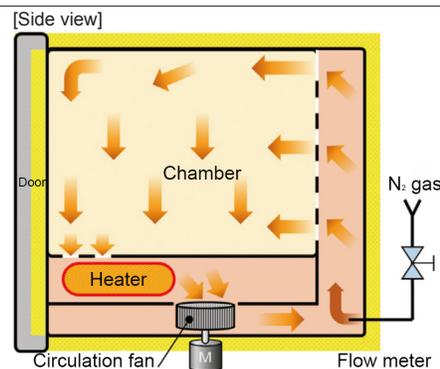
#### Operation and functions

- Heat resistance test and heat treatment of up to 360°C
- Simple operation by interactive key input
- Standard equipped with various operation modes such as program operation and calibration offset function, power failure recovery mode selection, and user configuration information saving
- Repeatable operation function up to maximum 99 steps, 99 patterns controller with repeat function
- N<sub>2</sub> gas flow amount controllable

#### Safety features

- Enhanced safety countermeasure, including self-diagnostic functions, digital setting independent overheat prevention device and electric leakage breaker
- In case of door opening during operation, fan and heater turn off by door switch

#### Method



#### Control Panel



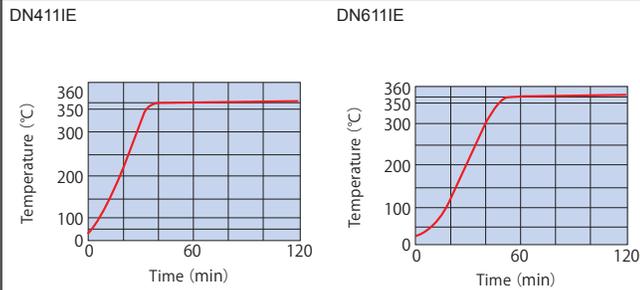
#### Overheat Prevention Device



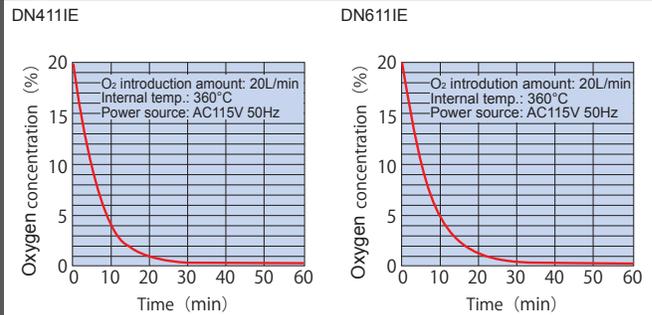
#### N<sub>2</sub> Gas Entrance Port (ø9mm)



## Temp. Rising Curve (AC220V 50Hz Room temp.23°C)



## O<sub>2</sub> Gas Substitution Performance Curve



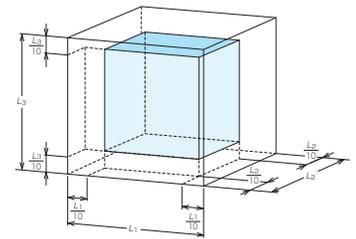
## 9 Points Distribution Reference Data

	Top right back	Top left back	Top right front	Top left front	Bottom right back	Bottom left back	Bottom right front	Bottom left front	Center
DN411IE	359	358	363	361	359	359	359	356	359
DN611IE	361	357	362	357	359	355	350	350	357

(°C)

### Conditions:

1. Measured by 9 points including 1/10 distance to the the opposite wall and center measuring point according to internal dimensions.
2. Room temperature 23°C, AC220V, 50Hz, Setting at 360°C, Average temp. during stable state.
3. No load, 2 shelf plates installed.



## Optional Items

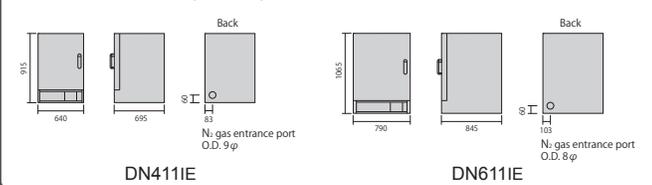
Description	Product code
Stand OH41(for DN411IE)	212477
OH61(for DN611IE)	212478
Shelf (with brackets 2 pcs.)	
Stainless wire (loading up to 30 kg/shelf)	
ODQ10 for DN411IE	211063
ODQ20 for DN611IE	211064
Stainless punching metal shelf (loading up to 15kg/shelf)	
ODQ30 for DN411IE	211098
ODQ40 for DN611IE	211099
*Temperature output terminal ODH18	212976
*External alarm output terminal ODH22	212977
*Time up output terminal ODH24	212978
*Operation signal output terminal ODH26	212979
*Event output terminal ODH28	212980

\* Customized from factory. Please specify when ordering main unit.

## Interior



## Dimensions (Unit:mm)



### ⚠ Attention

- Never use in flammable or explosive gas atmosphere
- Never use explosive or flammable materials
- Caution: High temperature components

## Stand (Optional Item)



DN611IE+ Stand (Optional Item)

# Clean Oven

Suitable for temperature test in a dust-free environment



## DE411/611 DT411/611

Operating temp. range Room temp. +30~260°C (DE)  
Room temp. +30~360°C (DT)

Temp. distribution accuracy ±2.5°C (at 260°C) (DE)  
±4.0°C (at 360°C) (DT)

Internal capacity 91L (411 model)  
216L (611 model)

### Operation and functions

- Improved visibility and operability with its V type controller
- Displays power consumption, CO<sub>2</sub> emissions and heater manipulated variables on the control panel
- Adopts anti-fouling casters which prevents wheel contamination during transportation
- Improved visibility of HEPA filter replacement timing by three color indication
- Enhanced safety with its phase-reversal relay detecting incorrect power source at installation
- Lower equipment height compared to previous models (DE/DT411 approximately ~200 mm shorter)
- Larger cable port from φ30mm to φ33mm
- Improved optional accessories and more customization options

### Safety features

- Self-diagnostic functions, calibration offset, independent overheat prevention, over current leakage breaker, key lock and auto recovery after power failure

### Specifications



Model	DE411	DE611	DT411	DT611
Circulation method	Forced convection			
Operating temperature range	Room Temp +30~260°C		Room Temp +30~360°C	
Temp. control accuracy	±0.3°C at 260°C		±0.3°C at 360°C	
Temp. fluctuation	±0.5°C at 260°C		±0.5°C at 360°C	
Temp. distribution accuracy	±2.5°C at 260°C		±4.0°C at 360°C	
Temp. gradient	±10.0°C at 260°C		±20.0°C at 360°C	
Maximum temp. reaching time	~70 min.		~80 min.	
Clean level	Class100 (when temperature is stable)			
Interior / Exterior material	Stainless steel / Cold rolled steel plate with melamine resin baking finish			
Heat insulating material	Glass wool			
Door	Single side left swing			
Heater	Stainless steel pipe heater			
Fan type	Sirocco fan, Condenser motor 400W			
Differential pressure meter	Analog type (0~300 Pa)			
Cable port / Exhaust port	Inner diameter: 33mm×1 (right side) / Outer diameter 61mm			
Filter	Heat resistant HEPA filter (dust-collection efficiency >99.97% up to 0.3µm particle filtering)			
Caster wheels / adjuster	Free swivel caster wheels without stopper / level adjuster (2 at front)			
Temperature control / setting system	PID V control / Digital setting with ▲/▼ keys			
Temperature display system	Top screen: green 4-digit digital LED (resolution 1°C), Bottom screen: orange 5-digit digital LED (resolution 1°C)			
Other indications	LED indicates temperature patterns for heating/stabilizing/cooling			
Operation functions	Constant temperature operation, Programmed operation (Maximum 99 steps, up to 99 patterns, repeat operation function), Duration/time select operation function (auto start/auto stop/quick auto stop, program operation)			
Additional functions	Variable fan speed, Accumulated on time, operation time function (up to 65,535 hours); calibration offset; accumulated power consumption monitoring, total CO <sub>2</sub> emission monitoring, heater output monitoring; power recovery; setting data save and restore			
Sensor	K type Thermocouple dual sensor (temperature control and independent overheat prevention device sensors)			
Heater control	Triac with Zero-cross control			
Safety device	Self-diagnostic functions (Detection for Temp. Sensor Failure, Triac Short Circuit, Automatic overheating prevention, Fan motor failure detection, Heater Line Disconnect, Main Relay Contact Damage), Earth leakage breaker, Key Lock Function, Independent overheating prevention device, Phase reversal relay, Door switch			
Earth leakage breaker	15A	15A	15A	20A
Door switch	Current leak /short circuit/surge protection, rated sensitivity 30mA			
Door open / Door closed	Door open: fan motor and heater circuit OFF / Door closed: fan motor and heater circuit ON			
Internal dimensions (W×D×H mm)	450×450×450	600×600×600	450×450×450	600×600×600
External dimensions (W×D×H mm)	700×1025×1570	850×1175×1720	700×1025×1570	850×1175×1720
Internal capacity	91L / 3.21 cu. ft.	216L / 7.62 cu. ft.	91L / 3.21 cu. ft.	216L / 7.62 cu. ft.
Weight	~200 kg / ~441 lbs.	~270 kg / ~596 lbs.	~200 kg / ~441 lbs.	~270 kg / ~596 lbs.
Shelf rest / pitch	12 steps / 30mm	17 steps / 30mm	12 steps / 30mm	17 steps / 30mm
Withstand load of shelf	~30 kg / shelf			
Power supply 50/60Hz (V±10%)	220V 3 phase 7A (no plug, round terminal)	220V 3 phase 10A (no plug, round terminal)	220V 3 phase 10A (no plug, round terminal)	220V 3 phase 14A (no plug, round terminal)
Included accessories: shelf plate / bracket	2 pcs. / 4 pcs.	3 pcs. / 6 pcs.	2 pcs. / 4 pcs.	3 pcs. / 6 pcs.

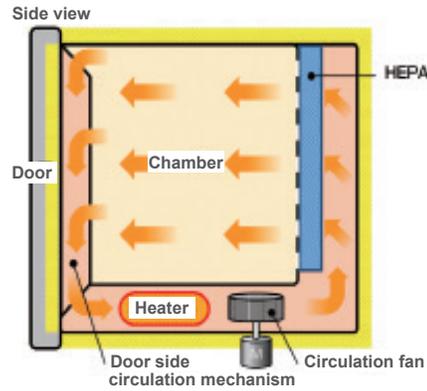
\* Conditions: temperature and humidity: 23°C+, 65% RH ±20%, atmospheric pressure 86kPa ~106kPa (no load), exhaust damper and intake closed

## Interior

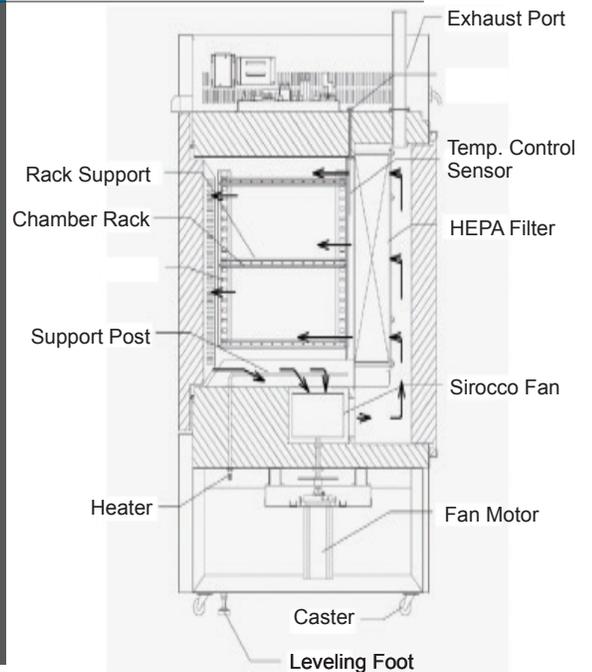


DE411

## Method



## Components

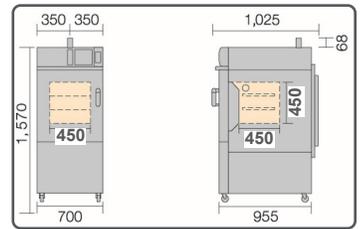


## Optional Items

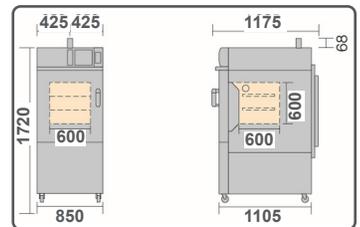
Product code	Model	Description	Suitable models
212686	---	Stainless steel wire shelf and bracket set. Withstand load up to 30 kg/shelf	DE/DT411
212687	---	Stainless steel wire shelf and bracket set. Withstand load up to 30 kg/shelf	DE/DT611
212688	---	Stainless steel punching shelf and bracket set. Withstand load up to 15 kg/shelf	DE/DT411
212689	---	Stainless steel punching shelf and bracket set. Withstand load up to 15 kg/shelf	DE/DT611
212924	ODT12	Basket-type shelf placed on top of standard shelves. Withstand load up to 15kg/shelf	DE/DT411
212925	ODT14	Basket-type shelf placed on top of standard shelves. Withstand load up to 15kg/shelf	DE/DT611
212946	ODT48	Sheath sensor (K thermocouple)	All models
212947	ODT52	Silicon plug (φ2mm opening in center)	DE models
212926 *	ODT16	Duct connection port for clean room application	DE/DT411
212927 *	ODT18	Duct connection port for clean room application	DE/DT611
212928 *	ODT22	Auto damper	DE/DT411
212929 *	ODT24	Auto damper	DE/DT611
212930 *	ODT26	N <sub>2</sub> gas introduction device (with flowmeter)	DE/DT411
212931 *	ODT28	N <sub>2</sub> gas introduction device (with flowmeter)	DE/DT611
212935 *	ODT32	Emergency stop switch	DE/DT411
212936 *	ODT34	Emergency stop switch	DE611
212937 *	ODT36	Emergency stop switch	DT611
212938 *	ODT38	Data logger	DE/DT411
212939 *	ODT42	Data logger	DE/DT611
212940	ODT44	Power cord (10m) (substitute power cable for main unit, no plug included)	All models
212954 *	ODT68	High efficiency filter (Class 100) maximum resistance temperature 200°C	DE411
212955 *	ODT70	High efficiency filter (Class 100) maximum resistance temperature 200°C	DE611
212940 *	ODT44	Power cord 10m. No plug included.	All models
212949 *	ODT56	Temperature Output Terminal (4-20mA)	All models
212950 *	ODT58	External Alarm Output Terminal	All models
212951 *	ODT62	Time-up Output Terminal	All models
212952 *	ODT64	Operation Signal Output Terminal	All models
212953 *	ODT66	Event Output Terminal	All models

\* Customized from factory. Please specify when ordering main unit.

## Dimensions (Unit:mm)



DE/DT411



DE/DT611



Stainless steel wire shelf  
212686 / 212687



Stainless steel punching shelf  
252688 / 252689



Basket type shelf  
212924 / 212925

### ⚠ Attention

- Never use in flammable or explosive gas atmosphere
- Never use explosive or flammable material
- Caution: High temperature components

# Clean Oven

Large capacity, forced convection clean oven

## DES830/DTS830



Operating temp. range	RT+30~260°C (DES830) RT+30~360°C (DTS830)	Temp. distribution accuracy	±2.0°C at 260°C DES830	±5.0°C at 360°C DTS830	Internal capacity	327L DES830 / DTS830
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### Space saving, large volume, Class 100 clean oven



- Improved visibility and operability of control panel
- Stable cleanliness through forced circulation with rear exhaust
- Displays power consumption, CO<sub>2</sub> emissions and heater manipulated variables on the control panel
- Incorporates a maximum of 99 steps, 99 patterns program controller with repeat function
- Offers several options such as recorder, manual/auto damper, N<sub>2</sub> gas introducer with flow meter and emergency switch
- DES830 convertible to high performance filter type maintaining Class 100 at stable and fluctuating temperature up to a maximum of 200°C

### Specifications

Model	DES830	DTS830
Circulation method	Forced convection	
Operating temperature range	Room temperature +30 to 260°C	Room temperature +30 to 360°C
Temp. control accuracy	±0.5°C at 260°C	±0.5°C at 360°C
Temp. fluctuation	±0.5°C at 260°C	±0.5°C at 360°C
Temp. distribution accuracy	±2.0°C at 260°C	±5.0°C at 360°C
Temp. gradient	±6.0°C at 260°C	±10.0°C at 360°C
Maximum temp. reaching time	~70 min.	~80 min.
Clean level	Class100 (when temperature is stable)	
Interior material	Stainless steel	
Exterior material	Cold rolled steel plate with melamine resin baking finish	
Heat insulating material	Glass wool	
Heater	6.0kW (stainless steel pipe heater)	9.0kW (stainless steel pipe heater)
Fan type	Scirocco fan, condenser type motor 200W x 2	
Differential pressure meter	Analog type (0 ~ 300Pa)	
Cable port	Inner diameter: 33mm×1 (right side)	
Filter	Heat resistant HEPA filter (dust-collection efficiency >99.97% with a 0.3µm particle)	
Caster wheels / adjuster	Free swivel caster wheels without stopper / level adjuster (2 at front)	
Temperature control / setting system	PID V control / Digital setting with ▲/▼ keys	
Temperature display system	Top screen: green 4-digit digital LED (resolution 1°C), Bottom screen: orange 5-digit digital LED (resolution 1°C)	
Other indications	LED indicates temperature patterns for heating/stabilizing/cooling	
Operation functions	Fixed temperature operation, Program operation (maximum 99 steps up to 99 patterns, with repeat operation function), Timer or clock operation function (Fixed temperature operation w/ auto start/auto stop/quick auto stop, program operation auto start)	
Additional functions	Power-on Time and Operation Time Accumulation Monitor (up to 65,535 hours); Calibration Offset; Monitoring Display for Accumulated Power Consumption, Total CO <sub>2</sub> Emissions, and Heater Operation Output; Power Recovery Mode; Setting Data Backup and Recovery	
Sensor	K type thermocouple double sensor (for temperature control and independent overheat prevention device)	
Heater control	Triac with zero-cross control	
Safety device	Self-diagnostic functions (Detection for Temp. Sensor Failure, Triac Short Circuit, Automatic overheating prevention, Heater Line Disconnect, Main Relay Contact Damage ), Earth leakage breaker, Fan Motor Failure, Key Lock Function, Independent overheating prevention device	
Earth leakage breaker	30A	40A
Door switch	Leak Current/Short Circuit/Over-current Protection, Rated Current Sensitivity 30mA	
Door switch	Door open: fan motor and heater circuit off, Door close: fan motor and heater circuit on	
Internal dimensions (W×D×H)*2	620×480×1100 mm	
External dimensions (W×D×H)*2	850×1080×1955 mm	
Internal capacity	327L	
Weight	~335 kg	
Number of shelf bracket step / pitch	35 steps / 30mm	
Withstand load of shelf	~30 kg / shelf	
Power supply 50/60Hz (V±10%)	AC220V, three phase, 16A (no plug, round terminal)	AC220V, three phase, 24A (no plug, round terminal)
Included accessories: shelf plate / bracket	3 pcs. / 6 pcs.	

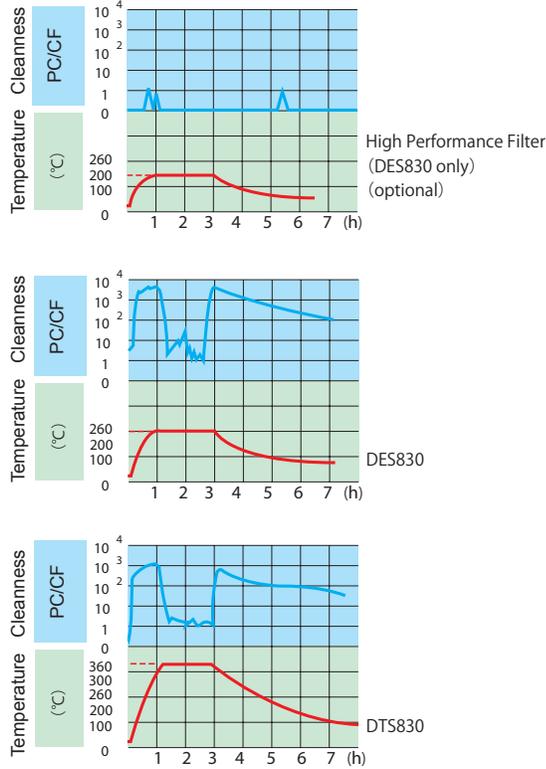
\*1 Conditions: temperature and humidity: 23°C+, 65% RH ±20%, atmospheric pressure 86kPa ~106kPa (no load)

\*2 Protrusions excluded

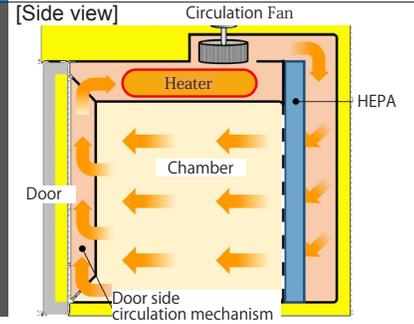
## Interior



## Performance Curve



## Method



## Cable Port (φ33mm×1 right side)



## Paperless Recorder



YHR150

## Optional Items

Product Code	Model	Description	Suitable models
212678	---	Stainless steel wire shelf and bracket set. Withstand load up to 30 kg/shelf	DES830/DTS830
212679	ODE50	Stainless steel punching shelf and bracket set. Withstand load up to 15 kg/shelf	DES830/DTS830
212919	ODE12	Basket-type shelf placed on top of standard shelves. Withstand load up to 15kg/shelf)	DES830/DTS830
212946	ODT48	Sheath sensor (K thermocouple)	DES830/DTS830
212947	ODT52	Silicon plug (One hole φ 2mm)	DES830
*212956	ODT72	Temperature output terminal (4-20 mA)	DES830/DTS830
*212957	ODT74	External alarm output terminal	DES830/DTS830
*212958	ODT76	Time-up output terminal	DES830/DTS830
*212959	ODT78	Operation signal output terminal	DES830/DTS830
*212960	ODT80	Event output terminal	DES830/DTS830
*212941	ODT82	Emergency stop switch	DES830
*212942	ODT84	Emergency stop switch	DTS830
*212943	ODT86	Recorder 6 pts. (sensors not included)	DES830/DTS830
*212945	ODT88	Power cord 10m.	DES830
*212999	ODT90	Power cord 10m.	DTS830
*212921	ODT92	Manual damper	DES830/DTS830
*212923	ODT94	Automatic damper: 5 steps: 5%-25%-50%-75%-100%	DES830/DTS830
*212932	ODT96	N <sub>2</sub> gas introduction device (with flowmeter)	DES830/DTS830
*212934	ODT98	Exhaust port for clean room O.D. φ 80mm (duct sold separately)	DES830/DTS830
*212920	ODE14	High efficiency filter (Class 100) maximum temperature 200°C	DES830

\* Customized at factory. Please specify when ordering main unit.



Stainless steel wire shelf  
212678

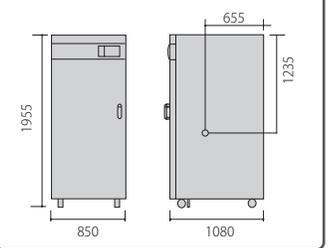


Stainless steel punching shelf  
212679



Basket-type shelf  
(Placed on top of standard shelves)  
212919

## Dimensions (Unit:mm)



## ⚠ Attention

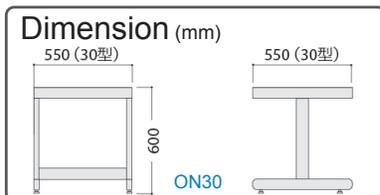
- Never use in flammable or explosive gas atmosphere.
- Never use explosive or flammable material.
- Caution: High temperature components.

## Stands

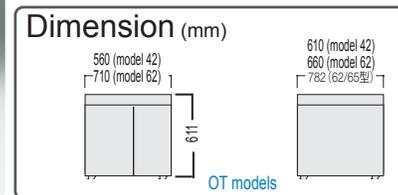
### Stands and suitable oven models

Product code	Model	Suitable oven models
211180	ON30	DKL301C/311C, DKM300C/310C, DKN302C/312C, DNF301
281353	OA115	DKN303
281355	OA117	DKV400/410
281356	OA118	DKV600/610
281596	OA194	DX/DVS/DKL/DKM/DKN/DKV/DNE/DNF 400/600 Series, DG400 Series
212348	OT42	DNE401/411, DNF401/411
212349	OT62	DNE601/611, DNF601/611
212477	OH41	DN411IE
212478	OH61	DN611IE
212801	ONS30	DX302C/312C
212802	ONS60	DX402C/412C/602C/612C, DR200/201
415464	OP43	DF411/412, DH411/412 (stand w/o caster)
415465	OP63	DF611/612, DH611/612 (stand w/o caster)
415466	OP46	DF411/412, DH411/412 (with caster & stopper in front)
415467	OP66	DF611/612, DH611/612 (with caster & stopper in front)

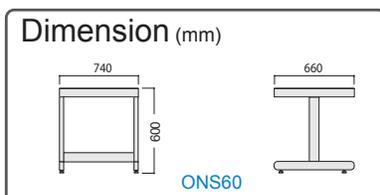
#### 211180 (ON30)



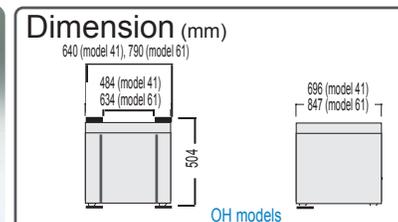
#### OT42/62



#### 212802 (ONS60)



#### OH41/61



#### 281355 (OA117)



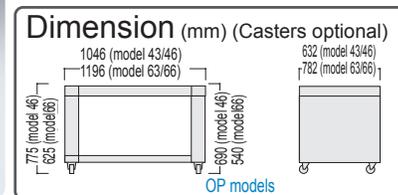
DKV400 oven + 281355 stand

#### 281596 (OA194)



DKV600 Oven + 281596 stand

#### OP43/63, OP46/66 (casters front side with two stoppers)



# Shelves

## Stainless steel shelf & bracket and suitable oven models

Product code	Description	Model	Suitable oven models
211063	Shelf and bracket set stainless wire (loading up to 30 kg/shelf)	ODQ10	DF/DH412, DN411IE
211064	Shelf and bracket set stainless wire (loading up to 30 kg/shelf)	ODQ20	DF/DH612, DN611IE, DH650Z
211090	Shelf and bracket set stainless wire		DH650
211098	Shelf and bracket set stainless punch (loading up to 15kg/shelf)	ODQ30	DF/DH412, DN411IE
211099	Shelf and bracket set stainless punch (loading up to 15 kg/shelf)	ODQ40	DF/DH612, DN611IE
211854	Shelf and bracket set		DG800 Series
212068	Shelf and bracket set stainless punch		DKN/DX300/302,DKN303,DNF301, DKM/DY300, DKL301/311
212095	Shelf and bracket set stainless punch		DKN401, DVS401, DX401/402, DN/DK/IC42/43/400/401, DY400/401
212192	Shelf		DP41/43/43C
212193	Shelf		DP61/63/63C
Q110204006	Shelf		DP83C
Q110204007	Shelf		DP103C/104C
212246	Shelf & bracket set stainless punch		400 Series DVS, DG, DKL, DKM, DKN, DKV, DNE, DNF
212266	Shelf & bracket set stainless punch		600 Series DX, DVS, DKL, DKM / 600/800 of DKN, DKV, DNE, DNF
212490	Shelf & bracket set stainless punch		900 Series of DKN, DKV, DNE, DNF
212678	Stainless steel wire shelf and bracket set. Withstand load up to 30 kg/shelf		DES830/DTS830
212679	Stainless steel punching shelf and bracket set. Withstand load up to 15 kg/shelf	ODE50	DES830/DTS830
212686	Stainless steel wire shelf and bracket set. Withstand load up to 30 kg/shelf		DE/DT411
212687	Stainless steel wire shelf and bracket set. Withstand load up to 30 kg/shelf		DE/DT611
212688	Stainless steel punching shelf and bracket set. Withstand load up to 15 kg/shelf		DE/DT411
212689	Stainless steel punching shelf and bracket set. Withstand load up to 15 kg/shelf		DE/DT611
212808	Shelf		DR200/201
212919	Basket-type shelf placed on top of std shelves. Withstand load up to 15kg/shelf	ODE12	DES830/DTS830
212924	Basket-type shelf placed on top of std shelves. Withstand load up to 15kg/shelf	ODT12	DF/DH412, DE/DT411
212925	Basket-type shelf placed on top of std shelves. Withstand load up to 15kg/shelf	ODT14	DF/DH612, DE/DT611
297071	Shelf		ADP21/200C/210C
297072	Shelf		ADP31/300C/310C
SHE-5680588	Tall shelf		SDP300/310
SHE-9751342	Short shelf		SDP300/310
SHE-5680563	Shelf		SDP400/410
SHE-5680562	Shelf		SDP610
YSA0000071	Shelf and bracket set		DF/DH832
YSA0000215	Shelf and bracket set		DF/DH1032



211063 / 211064



211090



211098 / 211099  
212688 / 212689 / 212679



212068



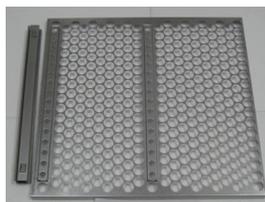
212095



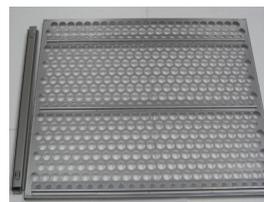
212192



212193



212246



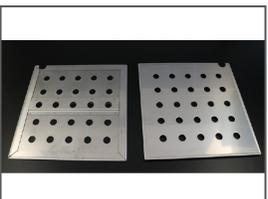
212266



212490



212678 / 212686 / 212687



212808



212919 / 212924 / 212925



297071



297072

## Stacking Kit

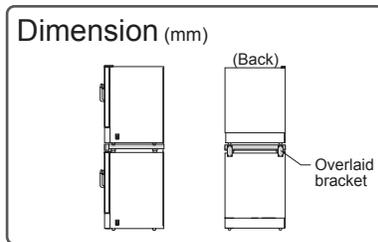
### Stacking kit and suitable models

Product code	Model	Suitable oven models
212803	ODK80	DX302C/312C
212804	ODK82	DX402C/412C
212805	ODK84	DX602C/612C
212806	ODN26	400 Series of DNE, DNF (including models suitable for OD40)
212807	ODN28	600 Series of DNE, DNF (including models suitable for OD60)
212822	OD40	400 Series of DVS, DKL, DKM, DKN
212823	OD60	600 Series of DVS, DKL, DKM, DKN
213700	ODF48	DF412/612, DH412/612
281458	ODM44	DNF301
281598	OA196	DKV400/410
281599	OA197	DKV600/610

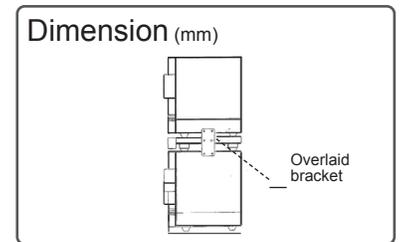
### Important Notes:

- The stacking units must belong to the same series (among 400 series or among 600 series)
- Do not stack 400 series on 600 series. If the upper 400 series is not securely fixed, it may easily topple.
- Stacking of old models is forbidden. Lower unit must be new model.

### OD/ODN



### ODK



DKV600 Oven + 281599

## Other Optional Accessories

**Note:** Listed optional accessories **ARE NOT** applicable to all oven models. Contact Customer Service for more details.

### Cable port



### Exhaust duct



Part no. R020603001  
Butterfly flange  
OD 100mm



Part no. R020603007  
Double flange to suck in more air  
OD 95mm x H 105mm



Exhaust duct for DF and DH  
Part no. 213703 for DF / DH412  
Part no. 213704 for DF / DH612

### N<sub>2</sub> gas inlet device



### External output terminal



### Seismic isolation rubber (Earthquake counter measure)



Part no. 296902  
Material: Urethane elastomer  
Max load: ~100 kg (by 4 pcs.)  
Size: W50 x D50 x H5mm  
1 set: 4pcs.

Pasted at the bottom to prevent unit from falling.  
Three layer structure made of urethane elastomer which absorbs 90% impact.

