Forced Convection Oven

Energy Saving Programmable Forced Convection Ovens with Variable Flow Rate

Ecological Economical

DNF301/401/411/601/611/811/911

Operating temp. range	Room temp. +15°C~260°C

Method	DNF301/401/411/601/611	DNF811/911
	Forced convection+Natural convection	Forced convection

Capacity	27L	90L	150L	300L	540L
	DNF301	DNF401/411	DNF601/611	DNF811	DNF911

The first 2 in 1 system in the industry

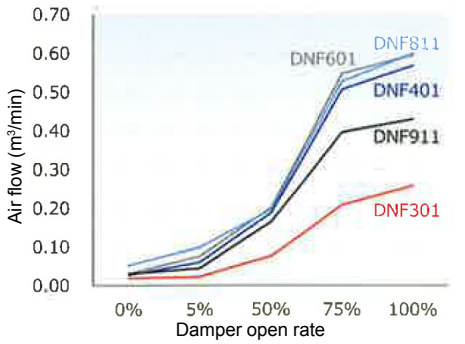
- Two types of circulation, forced and natural convection, in one unit (compatible with model 300/400/600)
- Eco-oven with improved air velocity control system and adjustable damper
- Program featured to reduce power consumption significantly
- Superior heat tightness and insulation of chamber
- Excellent 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	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	±0.3°C (at 260°C)				
	Natural convection	±0.5°C (at 120°C)	±0.3°C (at 120°C)		Not applicable	
Temp. fluctuation *1	Forced convection	±0.5°C (at 260°C)				
	Natural convection	±1.0°C (at 120°C)	±0.8°C (at 120°C)	±0.6°C (at 120°C)	Not applicable	
Temp. distribution precision *1	Forced convection	±2.5°C (at 260°C)				
	Natural convection	±5°C (at 120°C)	±3°C (at 120°C)		Not applicable	
Temp. gradient *1	Forced convection	5°C (at 260°C)	7°C (at 260°C)	8°C (at 260°C)	12°C (at 260°C)	6°C (at 260°C)
	Natural convection	15°C (at 120°C)	13°C (at 120°C)		Not applicable	
Temp. rise time *1	Forced convection	~70min.	~105min.	~100min.	~60min.	~100min.
	Natural convection	~20min.	~25min.		Not applicable	
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_2 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	
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		AC115V, 7.5A	AC115/220V 11A/6A	AC115/220V 15A/8A	AC220V 15.5A	AC220V 18.5A

*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.

Damper Switch



Optional Items

Description	Product code
ON30 Stand for DNF301	211180
ON61 Stand for DNF401/411/601/611	211856
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 diameter	281454
50mm diameter	281455
*External communication terminal for DNF401/411/811 (RS485)	281464
*External communication terminal for DNF301/601/611/911 (RS485)	281465
*External communication adapter, connect RS485 to external device (eg: PC) USB port	211880
*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 dia with exhaust flange)	
for DNF301	281459
for DNF401/411	281460
for DNF601/611	281461
for DNF811	281462
for DNF910 (50mm dia with exhaust flange x 2 points)	281463
Seismic mat	296902

* Please specify when ordering main unit.

Control Panel & Fan Setting

Method

[Side view]

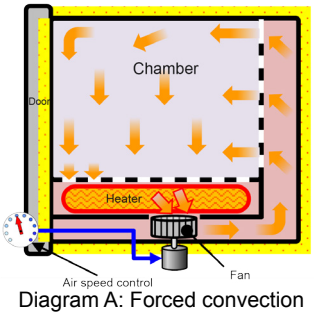


Diagram A: Forced convection

[Side view]

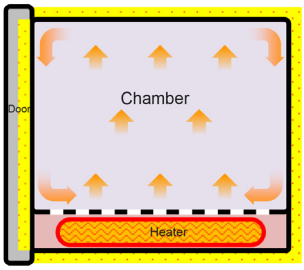


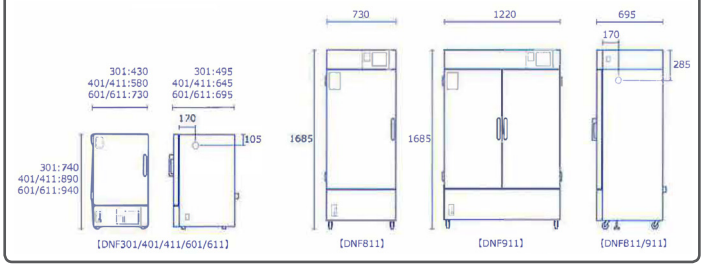
Diagram B: Natural convection

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

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.