

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, CO₂ 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

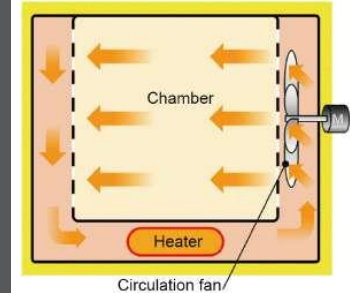
- Self-diagnosis circuit (abnormal temp. sensing, heater disconnection, auto overheat prevention, SSR short circuit), overheat protector, earth leakage breaker, key lock, etc.

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 ₂ 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	AC 220V 17.5A	AC 220V 15.5A	AC220V 17.5A
Weight	~112kg	~156kg	~112kg	~156kg
Shelf / bracket	2 pcs. / 4 pcs.	3 pcs. / 6 pcs.	2 pcs. / 4 pcs.	3 pcs / 6 pcs

Method

[Front view]



Control Panel



Interior



*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.

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, CO₂ 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 ₂ 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 / 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.

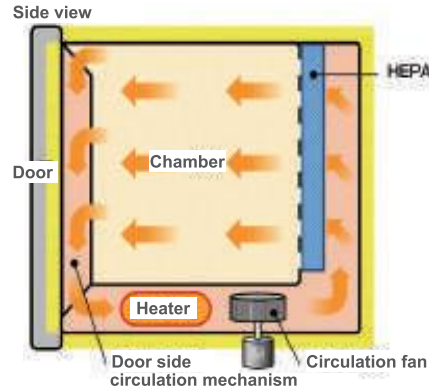
* Conditions: temperature and humidity: 23°C+, 65% RH ±20%, atmospheric pressure 86kPa ~106kPa (no load), exhaust damper and intake closed

Interior

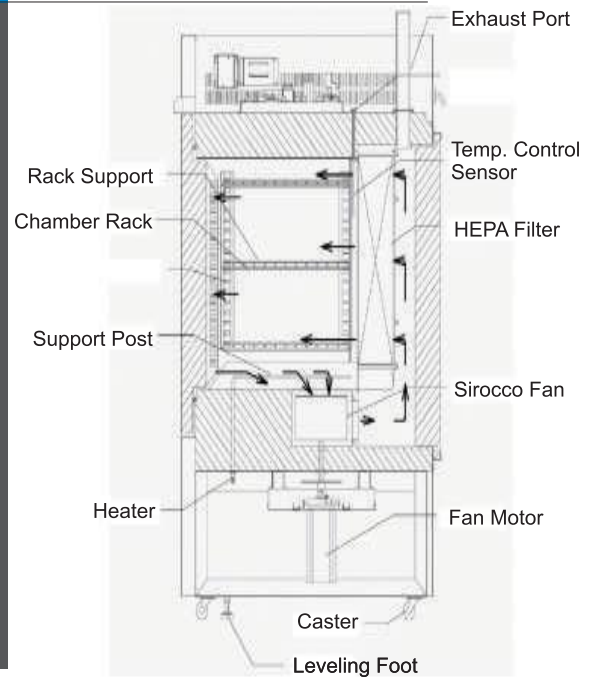


DE411

Method



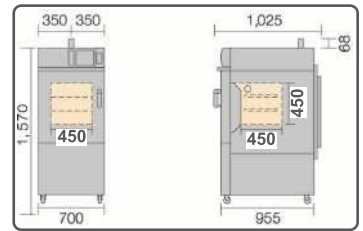
Components



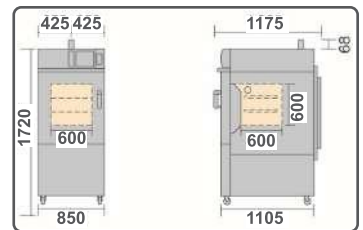
Optional Items

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 ₂ gas introduction device (with flowmeter)	DE/DT411
212931	ODT28	N ₂ 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
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

Dimensions (Unit:mm)



DE/DT411



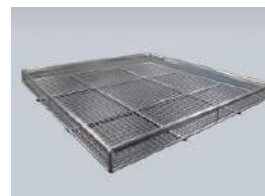
DE/DT611



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, CO₂ 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, N₂ 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	
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 ₂ 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.	

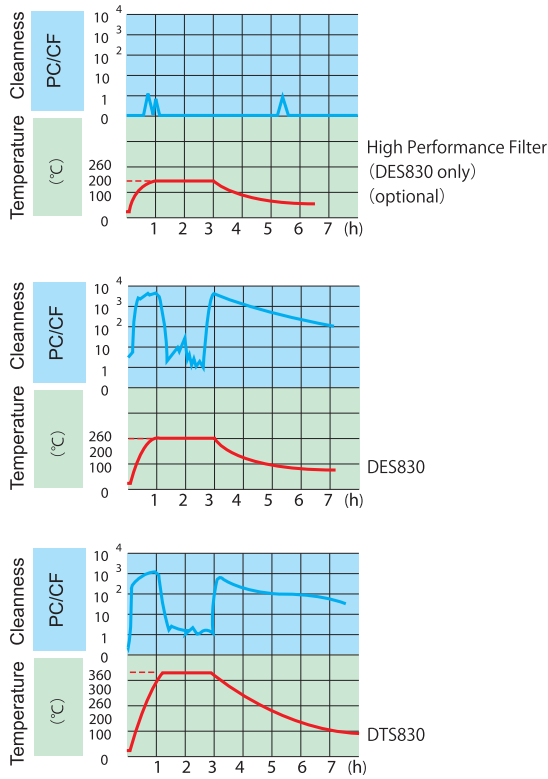
*1 Conditions: temperature and humidity: 23°C+, 65% RH ±20%, atmospheric pressure 86kPa ~106kPa (no load)

*2 Protrusions excluded

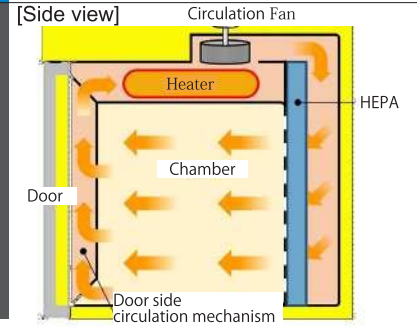
Interior



Performance Curve



Method



Cable Port (φ33mm×1 right side)



Paperless Recorder



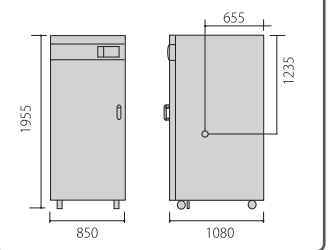
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Optional Items

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 ₂ 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.

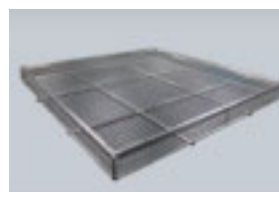
Dimensions (Unit:mm)



Stainless steel wire shelf
212678



Stainless steel punching shelf
212679



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

⚠ Attention

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