



Ovens & Incubators



Welland Series



Outstanding features

The WELLAND series of ovens and incubators has been designed and engineered using the latest computer aided design systems to facilitate production of all metal components on the latest CNC controlled production equipment.

Both gravity convection and forced air circulation models are included in the Welland series. The bench mounted models are available in four sizes with a maximum operating temperature of 300°C. Incubators have a maximum temperature of 80°C.

The ovens are constructed for long term reliability. Depending on the choice of control system, they can perform simple drying processes or more complex and demanding heat treatment processes and long term stability testing of materials or components.

Stylish and robust

The outer cases are fabricated from corrosion resistant zinc coated mild steel and finished in two tone hard wearing stoved epoxy/polyester coating. The inner case is constructed from polished stainless steel. All units are provided with non-tilt bright nickel wire plated shelves with multi-position settings for convenient loading and unloading.

Adjustable air ventilation

The chamber ventilation and exhaust vent are easily adjustable from the front control panel on all models.

Digital temperature control

The control module is able to house many variations of digital instrumentation with simultaneous display of measured and set temperature.

Economy and efficiency

Insulation around the oven chamber utilises totally encased fibre material. This material has a very low thermal mass and thermal conductivity, ensuring very efficient insulation. This also ensures reduced holding power, making the units economical to operate once set temperature has been reached.

Control panel

The side mounted control panel avoids damage from accidental spillage.

Door action

A flush fitting door latch with a concealed mechanism is both simple to use and provides a handle when unlatched. The lever action ensures gentle closure. The door seal design includes a newly formulated silicone compound, providing longer life and durability at maximum temperature. The design also allows convenient replacement if necessary.

Safety standards

All units meet the relevant UK and European health and safety at work legislation and the performance criteria of BS 2648 and DIN 50-011. They are manufactured to comply with BS EN 61010: safety standard and also the low voltage and EMC European Directives.

Options

- Range of overtemperature protection systems in accordance with DIN12-880 Part 2.
- Stoving and curing option available for processes involving liberation of flammable vapours.
- Timers: Process timers - manual or automatic. Mechanical or electronic time switches
- Top access port for independent probe
- Stacking frame
- Lockable door latch
- Exhaust fan *
- Variable speed fan *
- Inert gas connection *
- Flow meter & needle valve
- Viewing window in door *
- Interior light
- Air inlet filter
- Cable entry port *
- Door switch
- Stands & trolleys
- Chart recorders
- Sealed inner chamber for use with inert gases

* These options may affect chamber uniformity

Welland Series

Ovens

This modern range of ovens provides a combination of excellent performance and reliability.

Increased power and low thermal mass encased fibre insulation ensure both fast heat up times and reduced recovery times. Reduced holding power once at set temperature, together with the insulation, makes the range economical and outer case temperatures have been significantly reduced.

Both gravity and forced air circulation models are available with a wide choice of control options allowing the most critical performance criteria to be met. Where processes involve the liberation of flammable vapours, a stoving and curing option is available. Also, where processes involve large amounts of water, a moisture extraction option is available.

Model	OVENS WITHOUT FANS				OVENS WITH FANS			
	WN30	WN60	WN120	WN200	WF30	WF60	WF120	WF200
Max Temp (°C)	300	300	300	300	300	300	300	300
Chamber Dimensions (mm)	(H) 250 (W) 330 (D) 320	(H) 350 (W) 392 (D) 420	(H) 450 (W) 492 (D) 520	(H) 700 (W) 592 (D) 520	(H) 300 (W) 292 (D) 320	(H) 400 (W) 392 (D) 420	(H) 500 (W) 492 (D) 520	(H) 750 (W) 592 (D) 520
External Dimensions (mm)	(H) 470 (W) 665 (D) 470	(H) 570 (W) 765 (D) 570	(H) 670 (W) 865 (D) 670	(H) 920 (W) 965 (D) 670	(H) 470 (W) 665 (D) 470	(H) 570 (W) 765 (D) 570	(H) 670 (W) 865 (D) 670	(H) 920 (W) 965 (D) 670
Chamber Capacity (litres)	27	58	115	215	28	66	128	230
Weight (Kg)	30	45	60	75	30	45	60	75
Shelves								
(number supplied)	2	2	2	2	2	2	2	2
(max. possible)	3	5	9	15	3	5	9	15
(max dist load/shelf kg)	10	10	10	10	10	10	10	10
(max load kg)	20	30	40	50	20	30	40	50
Performance								
Power Rating at 240 V (watts)	750	1000	1500	2250	1000	1500	2000	2700
Holding Power * at max. temp (watts)	300	480	720	1160	350	600	800	1250
Temperature Uniformity* (at max temp as a %)	± 2.3	± 2.3	± 2.7	± 3.5	± 1.0	± 1.0	± 1.0	± 1.0
Temperature Stability PID control (°C)	± 0.5	± 0.5	± 0.5	± 0.5	± 0.2	± 0.2	± 0.2	± 0.2
Heat Up Times* 100°C (mins)	12	12	12	14	4.5	4.5	4.5	5.5
200°C	26	26	26	29	12	12	12	14
240 V 300°C	52	52	52	58	25	25	25	30
Recovery Times* (mins)	2.5	2.5	2.5	3	1	1	1	1.5
100°C	5	5	5	6	2.5	2.5	2.5	3
200°C	8.5	8.5	8.5	10	4	4	4	5
Door Open 60secs 240 V								
Air Exchanges vol (l/h) @ 100°C	(a) N/A (b) N/A	(a) N/A (b) N/A	(a) N/A (b) N/A	(a) N/A (b) N/A	1400 10,000	1400 10,000	1400 10,000	1400 10,000
Air Exchanges Exchanges / Hour	(a) N/A (b) N/A	(a) N/A (b) N/A	(a) N/A (b) N/A	(a) N/A (b) N/A	50 360	21 153	11 79	6 44

Note: A uniformity of ±1% = ±1°C at 100°C.

* With vents closed

a) With standard fan

b) With optional exhaust fan



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Incubators

The incubators are of the same basic construction as the ovens and have a maximum operating temperature of 80°C. Minimum operating temperature 10°C above ambient. Both gravity convection and fan assisted versions are available.

All units have an integral sealed glass door to facilitate product inspection and are designed for long term accuracy and reliability. As with all products in the Welland range, a wide choice of control and programming options and other optional features is available.

Heat up times are excellent and temperature stability with micro-processor three term control varies from $\pm 0.2^{\circ}\text{C}$ to $\pm 0.5^{\circ}\text{C}$, depending on the model type.



	INCUBATORS WITHOUT FANS				INCUBATORS WITH FANS			
Model	WIN30	WIN60	WIN120	WIN200	WIF30	WIF60	WIF120	WIF200
Max Temp (°C)	80	80	80	80	80	80	80	80
Chamber Dimensions (mm) (H) 255, (W) 330, (D) 320	350, 392, 420	450, 492, 520	700, 592, 520	300, 292, 320	400, 392, 420	500, 492, 520	750, 592, 520	
External Dimensions (mm) (H) 470, (W) 655, (D) 470	570, 765, 570	670, 865, 670	920, 965, 670	470, 665, 470	570, 765, 570	670, 865, 670	920, 965, 670	
Chamber Capacity (litres)	27	58	115	215	28	66	128	230
Weight (Kg)	30	45	60	75	30	45	60	75
Shelves (number supplied)	2	2	2	2	2	2	2	2
(max. possible)	3	5	9	15	3	5	9	15
(max dist load/shelf kg)	10	10	10	10	10	10	10	10
(max load kg)	20	30	40	50	20	30	40	50
Performance								
Power Rating at 240 V (watts)	250	550	675	1000	250	675	675	1000
Holding Power * at max. temp (watts)	70	95	140	250	115	150	200	300
Temperature Uniformity* (at max temp as a %)	± 3.5	± 3.5	± 3.5	± 3.5	± 1.5	± 1.5	± 1.5	± 1.5
Temperature Stability PID control (°C)	± 0.5	± 0.5	± 0.5	± 0.5	± 0.2	± 0.2	± 0.2	± 0.2
Heat Up Times * 37°C (mins) 60°C 240 V 80°C	6.5, 12.5, 18	6.5, 12.5, 18	6.5, 12.5, 18	8, 16, 25	2.5, 8.5, 16.5	3, 7, 12	3, 8.5, 15.5	4, 12, 23
Recovery Times * 37°C (mins) 60°C 240 V 80°C	0.5, 1, 1.5	1, 2.5, 3	2, 3.5, 4.5	2.5, 4, 6	1, 2, 3.5	0.5, 1, 1.5	1, 1.5, 2.5	1.5, 3, 5
Air Exchanges vol (l/h)	N/A	N/A	N/A	N/A	1400	1400	1400	1400
Air Exchanges Exchanges / Hour	N/A	N/A	N/A	N/A	50	21	11	6

Note: A uniformity of $\pm 1\%$ = $\pm 1^{\circ}\text{C}$ at 100°C .
* With vents closed

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WHT Model

The laboratory high temperature range of ovens operating at temperatures up to 600°C is offered in three sizes. All models are capable of continuous operation at maximum temperature.

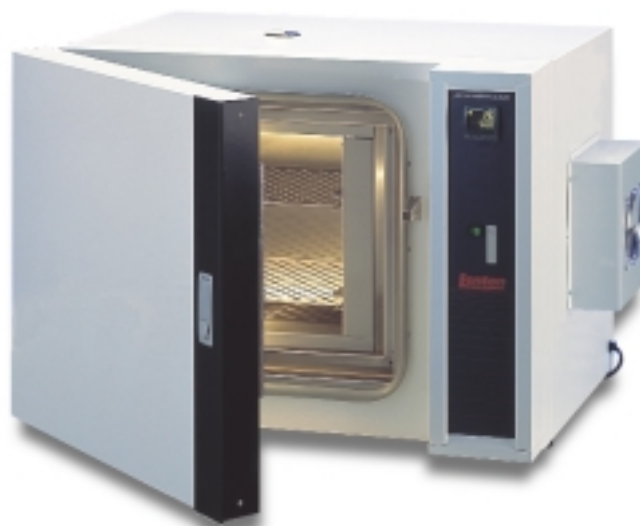
The outer cases are fabricated from corrosion resistant zinc coated mild steel and finished in two tone hard wearing stoved epoxy/polyester coating. The inner chamber is constructed from polished stainless steel which provides resistance to chemical attack and allows easy cleaning after use. All units are provided with stainless steel shelves with multi-position settings for convenient loading and unloading. Maintenance free heating elements and fan motor are fitted.

Low thermal mass insulation materials are used throughout in order to achieve rapid heating and to allow efficient energy utilisation. The heavy duty fan ensures optimum temperature uniformity throughout the work chamber. Double skin construction provides a cool safe outer case.

A variety of control options is available. Please refer to Temperature Control Systems information for further details.

A stand and trolley are available to convert bench mounted ovens into floor standing models.

Model		400°C	WHT 4/30	WHT 4/60	WHT 4/120
		500°C	WHT 5/30	WHT 5/60	WHT 5/120
		600°C	WHT 6/30	WHT 6/60	WHT 6/120
Chamber Dimensions (mm)	(H)		300	400	650
	(W)		300	400	480
	(D)		305	405	405
External Dimensions (mm)	(H)		570	670	920
	(W)		830	930	1030
	(D)		570	670	670
Usable volume (litres)			30	60	120
Heat up time (mins) 240 V	400°C		50	50	50
	500°C		75	75	75
	600°C		120	120	120
Recovery time (mins) 240 V	400°C		10	10	10
	500°C		16	16	16
	600°C		20	20	20
Temperature stability PID control			±0.5°C	±0.5°C	±0.5°C
Temperature uniformity (at 600°C)			±5°C	±5°C	±5°C
Power (watts)	400°C		1000	1500	2250
	500°C		2000	2250	3000
	600°C		2000	2250	3000
No of shelves supplied			2	2	2
Weight (kg)			73	99	179



Temperature Control Systems

A choice of control systems is available including controllers which simply heat up the oven and hold at one temperature indefinitely as well as more complex programming systems. Access to parameters is simple and easy to understand and is customised to present only those parameters which need to be viewed or adjusted.

Model TDH 02 Controller

The TDH is available as either an on/off or three term PID micro-processor controller with the facility of an adjustable single ramp to set point. This precision instrument has a large digital display.



Eurotherm 2408 CP

The Eurotherm 2408 CP contains the same features as the 2416 CG, but is housed in a 1/2 din size measuring 48 x 96mm high. The larger case allows for more options including storage of up to 20 separate programmes.



Other Options

Additional control systems can be supplied including cascade control, multi-segment programmers and process timers.

Communications Software

A choice of communications software is available. Please ask for details.

Eurotherm 2416 CG

The Eurotherm 2416 CG is an advanced setpoint programming temperature controller with eight segments, any of which can be a ramp, step or dwell. It is housed in a compact 1/16 din size measuring 48 x 48mm. It provides precise control with the advanced PID control algorithm giving stable 'straight-line' control of the process. Power feedback is used to stabilise the output power and hence the controlled temperature against supply voltage fluctuations. The controller continually corrects for drift and this gives high stability and rapid response to process changes.



Overtemperature Protection

An independent alarm instrument type 2116 and thermocouple are incorporated into the heating element circuit and, in the case of overtemperature of the oven, power to the elements is switched off with lockout action so shutting down the oven safely.



Standard Electrical Supply

When ordering, always quote the model, controller and the preferred type of electrical supply from the list. Please indicate the frequency (50 or 60 Hertz) and number of phases. For 3-phase supplies (where applicable), please state whether a neutral is available (if so, please quote both the phase-to-phase and the phase-to-neutral voltages, eg 380.220V). Typical single phase voltages are 100, 110, 200, 208, 220, 240 and 254V. 3-phase voltages without neutral are typically 220, 380, 415 and 440V. 3-phase voltages with neutral are typically 220/127, 380/220, 415/240 and 440/254.

Note

As a result of continuous product development, we reserve the right to change specifications and illustrations. In the unlikely event of one of our standard products not meeting your requirements, we have the capability to design and manufacture a unit specifically tailored to meet your needs.

Welland manufactures in compliance with the relevant safety standards to BS EN 61010-1: 1993 & 61010-2-010: 1995. All products carry the CE mark which indicates compliance with all relevant European safety directives; ie Low Voltage Directive and ElectroMagnetic Compatibility directive.

Lenton also manufactures a range of chamber & tube furnaces up to 2000°C. Please contact us for further information.



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