

Air Force UV Combination Dryers



stencil processing



screen printing



air force



ultra violet



infra red



Natgraph manufacture a range of Air Force UV Combination Dryers that has been developed from many years of experience gained in the design and production of over 400 Combined Forced Air and Ultra Violet Conveyorised Systems, in daily use world-wide. These versatile dryers have the ability to dry both solvent based inks and Ultra Violet curing inks in the same unit

These dryers have been designed, developed and manufactured for drying

surface coatings applied to graphics, glass, telecommunications, automotive and electronics etc, if there is a UV ink available for the application, Natgraph will have a solution.

With 7 standard belt widths, Touch Screen PLC Control System, 4 layouts, UV lamp systems with 1 or 2 lamps and modular design, this range of dryers is extremely adaptable, versatile and efficient.

Air Force UV Combination Dryers
UV Modules

Intelligent UV Control System



Air Force UV Combination Dryers

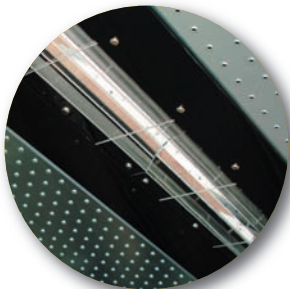
Air Force UV Combination Dryers

Features

- High efficiency fully focused reflectors
- Quartz infra red heat filter
- Touch Screen, PLC Control System with hour meters
- Gas filled hood lifting arms
- Vacuum hold-down system
- Modular construction
- P.T.F.E. fibre glass belt
- Castors & jacking feet
- Colour coded to industry standards
- Optional ozone filter



Air Force Combination Dryers in full production



Quartz Infra Red heat filters



Air Force UV Combination Dryer with high pile Automatic Sheet Stacker

The Natgraph modular range of Air Force Dryers is available in 7 belt widths from 90cm through to 215cm and is also available with a combination of forced air for solvent based inks and Ultra Violet lamps for curing UV inks. These versions of Natgraph's world famous Air Force Dryers have all the same features and build quality as a standard unit, but with the added versatility of forced air and UV curing within the same dryer.

The inclusion of a UV curing capability does not extend the length of an Air Force Dryer, as the UV lamp system is incorporated within the 2m cooler module, making it into a UV cooler module. This module is completely self contained, with all transformers, cooling/extraction fans, control circuitry, etc. inside. 1 or 2 lamps can be installed in this module, which has internal gas filled lifting arms to give rapid access to the belt if required. Aluminium lamphouses have fully focused, sectional anodised aluminium reflectors, and a flat quartz infra red filter window located below each lamp.

The quartz window has 2 distinct benefits, firstly it filters out a high proportion of the infra red heat that is being focussed onto the substrate with the UV radiation, therefore lowering the impact temperature that the substrate is subjected to. Secondly, it forms a natural barrier to separate the substrate from the air that is being used to keep the reflectors and lamps at their optimum temperature, thereby also lowering the substrate temperature when compared to other conventional systems.

In addition, an adjustable vacuum system holds the substrate in position from beneath and also cools the belt itself. The lamps run at 120 watts/cm (300 watts/inch) at high power and 100 watts/cm (250 watts/inch) at low power. As the lamp cooling system is sealed by the quartz window and under negative pressure from the efficient extraction fan, no ozone can escape into the printroom.

Natgraph's UV technology is acknowledged as the coolest and most efficient available. This is achieved by extensive knowledge of the discharge lamp requirements for optimum performance and the Natgraph, in-house manufactured transformer systems.

The lamphouses are arranged within the hood to give the most efficient UV curing at the lowest possible substrate temperature, a cold air jet plate is located between the lamphouses, which lowers the impact temperature beneath the second lamp. A 1m wide cooling area follows the second lamp to cool the substrate even further.

The unique design of Natgraph's transformers allows Natgraph to force much more cooling air onto the lamp and reflector than is possible with other technology. The end result is a cooler substrate, better curing, greater adhesion and therefore the lamps can be run at lower power settings. This lower temperature means that the belt speeds can be decreased, allowing more UV energy to reach the inks (without overheating the substrate), therefore lower lamp power settings can be used, with much reduced operating costs.

A comprehensive safety system is installed in all Natgraph UV systems, this includes a lamp current monitoring system, positive disconnect safety switches, air pressure switches, earth leakage sensor, thermal switches within the transformers and a minimum speed cut-out device for the belt. These are all linked to a warning siren to alert the operator in the unlikely event of any technical problems. A large, hinged access door allows easy access to the lamphouses for quick lamp change. An interlock is fitted as standard to prevent the UV lamps or hot air heating elements being used at the same time, as both are not normally needed and a smaller power supply can therefore be used.

Control of the UV system is via the Natgraph Touch Screen PLC Control System, this includes individual selection of each lamp, high/low power selection, virtual ammeters and lamp hour meters. A fault warning system is also built into the UV control.

Air Force UV Combination Dryers can be specified to be anything from a minimum of 5.5m long, depending upon the required production speed and the drying rate of the inks used. The final specification is best determined by carrying out drying trials in the Natgraph 'Drying Solutions Centre'. These dryers require a three phase power supply.



Air Force UV Combination Dryers

Features

- Touch Screen PLC Control System
- High efficiency fully focussed reflectors
- Quartz infra red heat filters
- Inlet vacuum hold-down
- Castors and jacking feet

- Gas filled hood lifting arms
- 7 standard model sizes
- Optional Intelligent UV Control System
- Optional Ozone Filter



1m UV Module

Options

A variety of options are available for the range of Natgraph Air Force UV Combination Dryers, these are intended to make the dryer more productive

and versatile, whilst ensuring they fit into the intended location as efficiently and economically as possible.

1m UV Module

A 1m UV Module is also available, having all of the above mentioned features with the exception of the 1m cooling zone. In this instance a twin lamphouse, containing 2 lamps with fully focussed reflectors is fitted because of the available space.

When UV is required to be fitted to an existing Air Dryer, even on other manufacturers units, the 1m UV Module can be used. These modules can also be added to existing Air Force Dryers at a later date.



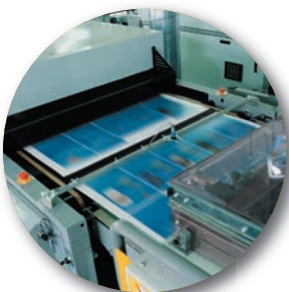
Adjustable sheet sensor

Intelligent UV Control System

Features

- Compact unit
- Vacuum hold-down
- Ammeter/hour meter
- Ozone free lamps

- Lamp height, adjustment
- High power
- Optional stand



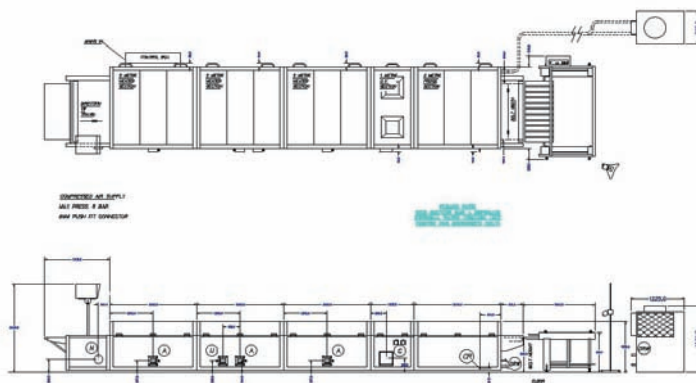
Intelligent UV Control System

The Natgraph Intelligent UV Control System lowers the cost of operating a Natgraph UV system, reduces the operating temperature and extends the lamp life of the UV curing lamps. A sheet sensor detects when no substrate is present within the dryer and automatically lowers the power level of the lamp(s) to 30%. The cooling system is also adjusted to keep the lamp(s) at the correct running temperature.

When the next sheet arrives in the dryer the power level is increased to the selected level in time for full curing to take place. It is the unique design of Natgraph's transformers and cooling systems that allow the very low stand-by power level, with testing showing that a power saving of over 35% can be made using this system, the pay back period can therefore be very short.

In tests, a typical UV dryer has been observed to be curing printed substrate for less than 50% of the period it is switched on, by reducing the power consumption of the dryer during these periods, massive savings can be achieved.

Natgraph Air Force UV Combination Dryers are mostly manufactured in, double or triple module combinations, these are from 5.5m upwards in length and the final specification is dependent upon the production speeds required and the curing requirements of the UV ink. The best way to determine the ideal specification is to carry out drying trials in Natgraph's 'Drying Solution Centre', which is available to all.





Specifications

Air Force UV Combination Dryers

The following specifications are common to all Air Force Dryers

Belt Height	79cm – 90cm (31"–37") Adjustable by the feet, higher options available.
Belt Speed	3 – 50m per minute (10' – 166') Slower speeds are available to order.
Height	114cm – 129cm (45" – 51") Adjustable by the dryer's feet.
Module Length	2m (79")
Voltage	Three Phase 400 Volts 50/60 Hz. AC

These figures apply to individual model sizes.

Model No.	90	110	130	155	170	185	215
Belt/drying/aring width	90cm (36")	110 (43")	130cm (51")	155cm (61")	170cm (67")	185cm (73")	215cm (84")
Module Width	158cm (62")	178cm (70")	198cm (78")	223cm (88")	238cm (94")	253cm (100")	283cm (112")

(Weights can be confirmed by Natgraph depending upon the size/type and number of modules used.)

Electrical

Module Type	2m, high pressure, warm (85°C maximum), air modules						
Model No.	90	110	130	155	170	185	215
Heating Elements	18kW	18kW	18kW	24kW	24kW	24kW	24kW
Current (Max. Amps)	26	26	26	34	34	34	34
Motor(s)	2.2kW	3kW	3kW	4kW	4kW	6kW	8kW
Current (Max. Amps)	5	7	7	10	10	14	17

Module Type	2m, high pressure, cold (ambient), air modules,						
Model No.	90	110	130	155	170	185	215
Motor(s)	2.2kW	3kW	3kW	4kW	4kW	6kW	8kW
Current (Max. Amps)	5	7	7	10	10	14	17

Module Type	2m, 2 lamp UV/cold (ambient), air modules, (UV lamp power 120watts/cm - 300 watts/inch)						
Model No.	90	110	130	155	170	185	215
Lamp Power	25kW	31kW	36kW	43kW	47kW	51kW	59kW
Current (run) (Amps)	50	60	70	85	95	705	120
Motor(s)	2.2kW	3kW	4kW	4kW	4kW	6kW	8kW
Current (Max. Amps)	5	7	10	10	10	14	17

Air	Figures are in 1,000m ³ /hour, per 2m module						
Model No.	90	110	130	155	170	185	215
Recirculated Air	6.8	8.2	9.5	11.5	12.6	13.1	15.8
Exhaust Air (Adjustable)	1.9	2.1	2.3	2.6	2.5	2.6	2.9
Intake Air	4.3	5.6	6.7	7.7	8.4	8.9	10.3
Intake Air	2.8	3.2	3.8	4	4.3	4.8	5.6
Exhaust Air	2.9	3.4	4	4.2	4.6	5	5.8

NOTE: When calculating power supply sizes for Air Force Dryers, add all the motor and heating element currents of the modules involved together to give the final figure. For Air Forced/UV Combinations, add all the motor currents of the modules involved to the lamp current, but do not include the heating elements. This is because a safety interlock ensures that the air heating elements and UV lamps cannot be used at the same time. The UV lamp currents are calculated with 2 lamps at full power.

Example: Model 110 Air Force Dryer, 2m warm, 2m cold = 26 + 7 + 7 = 40 Amps, Model 110 Air Force UV/Combination Dryer, 2m warm, 2m 2 lamp UV cold = 7 + 60 + 7 = 74 Amps.

Typical power consumption of a Model 110 Air Force Dryer, 2m warm, 2m cold, running at 50°C with an ambient temperature of 20°C is 10kW per hour (including all motors), at average U.K. power costings, this represents a running cost of below 70p per hour.

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