Natgraph
EQUIPMENT SOLUTIONS

ULTRA-VIOLET SCREENPRINTING | FORCED AIR STENCIL EXPOSURE | INFRA-RED DRYING TECHNOLOGY

Air Force Dryers

- stencil processing
- screen printing
- air force
- ultra violet
- infra red

Natgraph manufacture a range of Air Force Dryers that has been developed from many years of experience gained in the design and production of over 700 Forced Air Conveyorised Systems, that are in use world-wide.

These units have been designed, developed and manufactured for drying surface coatings applied to graphics, glass, medical products, textiles, automotive, electronics and aerospace etc, so no matter what the application, Natgraph have a solution.

With 7 standard belt widths, Touch Screen PLC Control System, 4 layouts and modular design, this range of dryers is extremely adaptable and offers the versatility and efficiency that is required in today's production environments.

Air Force Dryers
Extended Inlets/Outlets

CCTV Stack Monitoring System
Power Supply Sockets

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Air Force Dryers

The Natgraph modular range of Air Force Dryers is available in 7 belt widths from 90cm through to 215cm, therefore an Air Force Dryer can be specified for all drying requirements. These can be from small print runs on Hand Printing Tables or medium length production runs printed on semi-automatic screenprinting machines, through to continuous high speed production on fully automatic cylinder presses.

4 Heating and 2 Cooling modules

Touch Screen PLC Control Unit

The vital element in accelerated drying of solvent based inks is high velocity, high volume air delivered efficiently to the complete substrate area. Natgraph Air Force Dryers recirculate large volumes of air (over 15,0003m/hour can be recirculated in each module, for special applications). Drying therefore takes place at lower temperatures resulting in economical operation and good substrate stability. Economy is maintained by a high level of insulation and recirculating the majority of air. A proportion of the solvent laden air is always bled away through a separate outlet duct for safety reasons.

Air Force Dryer and Automatic Sheet Stacker

A typical Natgraph Air Force Dryer will consist of the following specification of modules:-

A 1 metre long inlet section (which can be extended), which has the main control box attached and contains vacuum hold-down fans. In high speed operation this is very useful, particularly with fully automatic presses. The belt is of an open mesh, P.T.F.E. coated fibre glass construction, with reinforced edges and a protection flap below the joint. All the dryer's functions are operated through a large Touch Screen Panel (HMI), these include belt start/stop, belt speed (3 – 50m/minute, 0.1m resolution, via feedback loop), inlet vacuum hold-down, forced air on/off, heated air temperature control via feedback loop (0.1°C resolution) and forced cold air on/off. A dryer fault diagnosis system is included with audible warning of fault conditions, including air pressures, over temperature sensors and belt speeds.
4 emergency stops complete a comprehensive control facility.

A 2 metre long, high pressure warm air module has motor/vee belt driven fan assemblies, connected to rigid galvanised steel internal ducting. Air is forced at high pressure through fast response heating elements up into the hood and then through a specific pattern of nozzles, in removable metal jet plates down onto the substrate. The maximum temperature of a standard Air Force Dryer is 85°C, although special high temperature versions are available. The hinged hoods are double skinned, fully insulated and fitted with large handles, access to the belt is aided by 2 support legs which raise with the hood, from inside the module's base section.

A 2 metre long, high pressure cooler similar in construction to the warm air module. Air input to this module is through a large inlet duct, which should be connected to free air for optimum efficiency.
A proportion of the cooling air is recirculated.
An optional extracted cooler is available.

A 0.5 metre exit section contains the belt drive motor, drive linkage tensioning device and drive roller. This section can also be supplied in other lengths if required.

Air Force Dryers can be specified to be anything from a minimum of 3.5m 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 Nottingham based 'Drying Solutions Centre'.

These dryers require a three phase power supply.

Air Force Dryers

Features

- Touch Screen, PLC Control System
- Motor/vee belt, fan assemblies
- Fully insulated
- Easy access hoods
- Extraction control
- Vacuum hold-down on inlet
- Modular construction
- P.T.F.E. fibre glass belt
- Castors & jacking feet
- Colour coded to industry standards

Extended Inlet

Power Supply Sockets

CCTV Stack Monitoring System

Special Paint Finish

Options

A variety of options are available for the range of Natgraph Air Force 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.

Extended inlets and outlets

The inlet and the outlet of these dryers can be extended to enable the dryer to operate with more than one printing machine, or allow extra time for 'ink flow'. These extensions are in multiples of 0.5, or 1m sections and can be fitted with vacuum hold-down systems.

Power Supply Socket Outlets

Electrical power supply socket outlets can be fitted at each end of the dryers, these are intended to provide an electrical supply for the printing machine and Stacker or Vibrating Collection Tray. This facility means that only one cable needs to be provided to supply the complete printing line, thus saving on installation costs.

CCTV Stack Monitoring System

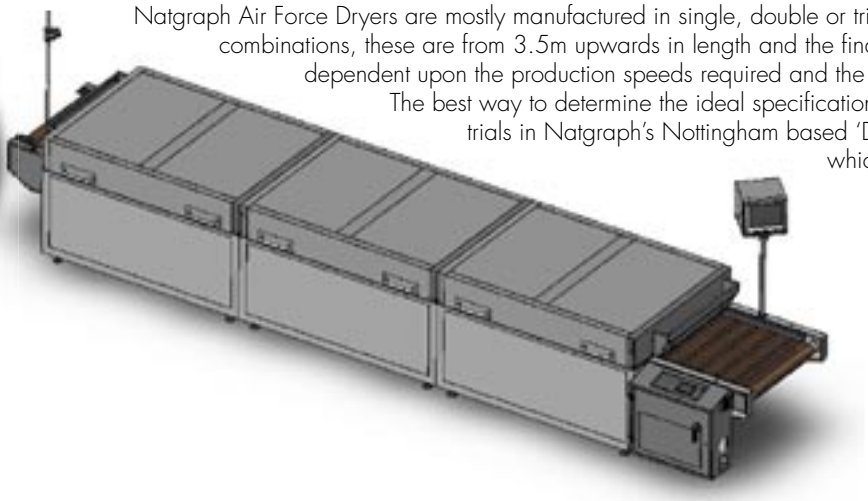
A colour CCTV system can be fitted to all Natgraph dryers, this system includes a freestanding, mast mounted camera above the stacker and a dedicated TV monitor mounted on a fully adjustable stand above the inlet of the dryer. This allows the operator to see the stacker without leaving the printing machine, which is very important when operating long, high speed, fully automatic printing lines.

Layout & Paint Finish

Air Force Dryers can be manufactured in any layout to suit the intended location or printing machine with controls and ducting on either side. This can result in significant space saving.

Natgraph also have the ability to finish these units in industry standard machine colours, so that the dryer will match existing print lines, or a customer's house colours.

Natgraph Air Force Dryers are mostly manufactured in single, double or triple module combinations, these are from 3.5m upwards in length and the final specification is dependent upon the production speeds required and the drying rate of the ink. The best way to determine the ideal specification is to carry out drying trials in Natgraph's Nottingham based 'Drying Solution Centre', which is available to all.



Specifications

Air Force Dryers

The following specifications are common to all Air Force Dryers

Belt Height	79cm – 94cm (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/curing 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 1,000m3/hour, per 2m module				
Model No.	**90**	**110**	**130**	**155**	**170**	**185**	**215**
			2m, high pressure, warm (85°C maximum), air modules				
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
			2m, high pressure, cold (ambient), air modules.				
Intake Air	4.3	5.6	6.7	7.7	8.4	8.9	10.3
			2m 2 lamp UV/cold (ambient), air modules.				
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 Forced 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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