NUAIRE

DuctMaster Square Bifurcated

Mixed flow Axial Fans DSB500 & DSB630

Installation and Maintenance

NUAIRE

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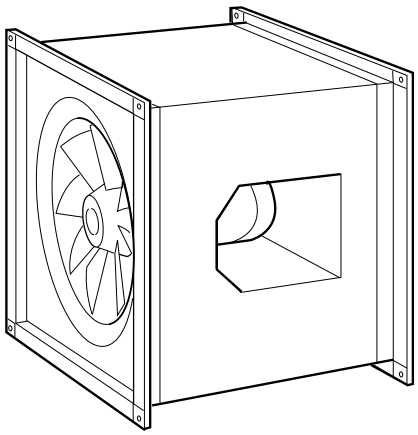


Contents

Introduction

NuAire DuctMaster Square Bifurcated Fans are produced with duty sizes up to 3.43/s. and have high performance mixed flow impellers.

The casings are manufactured in galvanised steel with proprietary flanges fitted to allow connection to ductwork.
A removable panel allows access to the case interior for cleaning and maintenance purposes whilst the unit is in duct.

A full range of matching ancillaries is available including Silencers, Fan Guards, Resilient Mounting Kits, Inverter Controls and Flexible Connectors.

All NuAire Ductmaster Square BifurcatedFans are tested to BS848 in our BSI approved laboratories. This ensures that all technical data is accurate, which means that units can be specified with confidence.

Description

Ductmaster Square BifurcatedFans are available in two sizes coded DSB500 and DSB630. Silencers, Flexible Connectors, Resilient Mountings and Guards are supplied as optional extras. A short version silencer (SIL-S) and a long version (SIL-L) are produced for each size

Handling

Equipment must be handled carefully to avoid damage or distortion. Units are provided with four lifting eyes.
If spreaders are used, they should be positioned as near the end flanges as possible and in such a way that slings or webbing do not bear on the casing. Webbing, rope or any other material must not be passed through the units for lifting purposes.

Installation

General
The design and provision of complementary ductwork, supports etc., is the responsibility of others. Adequate space however, must be provided around the unit or unit/ silencer combination to enable easy removal from the ductwork when required. It is also important that the unit is mounted so that its access panel is readily accessible to allow cleaning of the impeller when in duct.

Prior to installation, thoroughly clean the Ductmaster Square BifurcatedFan unit. Particularly the interior especially if the unit has been lying idle for several weeks on a building site or in a dust laden environment. A build up of cement dust, for example, could prove to be very damaging, even more so if the input air were to be damp.

During installation, insert a gasket strip between the joint faces.

In a rigid mounting
If the unit is to be connected into, or at the end of ductwork, lift into position and bolt the flanges together. If neccessary, the unit can be lifted with suitable ties attached to the four lifting eyes provided.

If guards have been supplied, fit to open ends.

On resilient mountings
Resilient mountings are optional extras and are supplied to match the specific unit complete with mounting feet and fixings.

Stiff structures must be available to mount the Ductmaster Square BifurcatedFans. The structures must be so designed that the unit will be seated on the resilient mountings, not hanging from them. See dimensions drawings for details.

Prior to installation prepare as follows:

a) If supplied, attach silencers directly to the unit using the corner fixings.

b) For horizontal mounting of units, attach the resilient mountings and mounting feet at the corner holes of the flanges as shown on page 3.

c) For vertical mounting of units attach the resilient mountings and mounting feet to the particular unit or unit / silencer combination flanges as shown on page 3.

d) Resilient mounting kits can be adjusted for height by turning the screw.

Lift the unit or unit / silencer combination into position and fix to the mounting structure.

Testing after Installation

Precautions
Prior to testing, make sure that no loose items have been left in the Ductmaster Square Bifurcated Fan. Whenever the fan has to be switched on with its access panel removed, ensure that all personnel are clear of the open access panel aperture.

Make sure that the external control switch or contactor, as relevant, is switched off.

Testing
Remove the access panel at the Airmover Bifurcated if in place.

Switch on the fan, just sufficiently long to ensure that it runs. Switch off. During run-down and by observation through the open panel aperture, check for correct rotation and for evidence of any malfunctioning as follows:

a) Check that the impeller is rotating freely and is secure on the shaft, with no signs of slippage.

b) Check rotation. A single phase unit is unlikely to be incorrect, as rotation is carefully checked at the factory Should a three phase unit be incorrect, reverse any two of the supply connections.

Operating the Fan

General
For general ON / OFF operations, a separate control switch or contactor is recommended.

Removing & Refitting the unit

Isolation
Before commencing work, make sure that the Ductmaster Square Bifurcated Fan is externally isolated from the electrical supply.

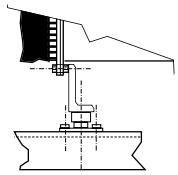
Support the Ductmaster Square Bifurcated Fan as necessary and remove all fixing devices. If silencers are fitted, the Ductmaster Square Bifurcated Fan should be removed complete with them. Move the unit and silencers, if fitted, to the working area.

Resilient Mountings

Resilient Spring Type mountings are supplied as optional items for DSB500 and DSB630.

Four resilient mountings per airmover are required, together with four purpose designed mounting feet.

Detail of horizontal resilient mounting onto steelwork



Selection of Resilient Mountings

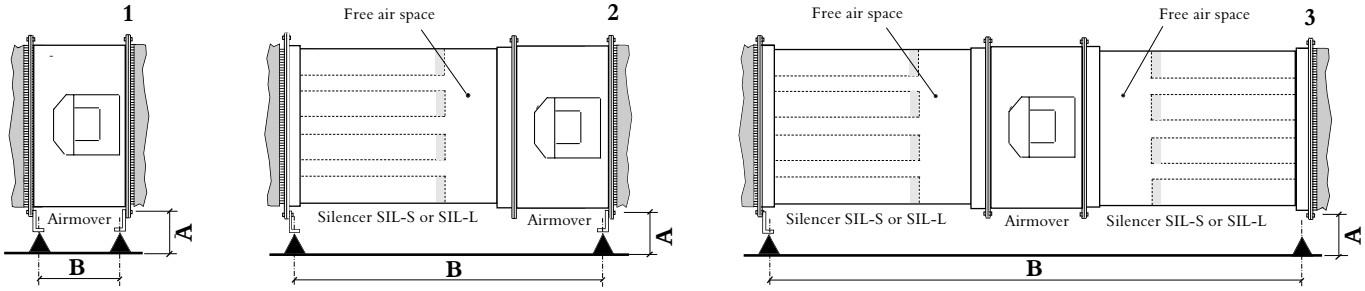
Airmover code	DSB only		SIL-S +DSB		SIL-S+DSB +SIL-S		SIL-L +DSB		SIL-L+DSB +SIL-L		SIL-L+DSB +SIL-S		Mounting surface fixing holes dia. & kit fixing centres	
	Kit	Type	Kit	Type	Kit	Type	Kit	Type	Kit	Type	Kit	Type	Dia.	Ctrs*
DSB500 1-2	MAV4	C	MAV4	C	MAV4	C	MAV4	C	MAV4	C	MAV4	C	7.5	55
DSB630 3-4	MAV6	C	MAV6	C	MAV6	C	MAV6	C	MAV6	C	MAV6	C	9.6	76

Note: Type C is a spring mounting

* centres between the two holes in bases of spring moutings.

Horizontal Mounting

It is essential that silencers are always fitted with the free air space at the airmover, as performance will otherwise be impaired.



1. Airmover Bifurcated only.

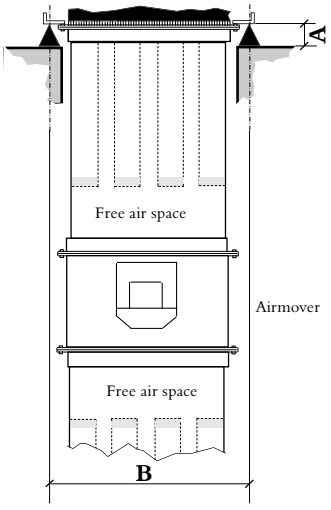
2. Airmover Bifurcated with silencer fitted one side only. Could be either side.

3. Airmover Bifurcated with silencer fitted on both sides. Could be two off SIL-S silencers, two off SIL-L or one of each.

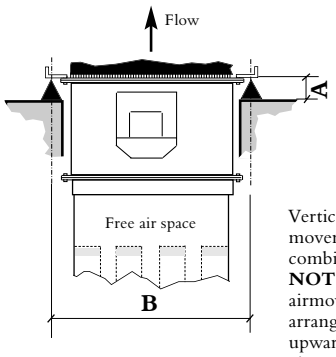
Dimensions

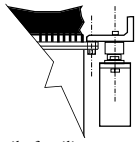
Airmover code	AM only		SIL-S +AM		SIL-S+AM +SIL-S		SIL-L +AM		SIL-L+AM +SIL-L		SIL-L+AM +SIL-S	
	A	B	A	B	A	B	A	B	A	B	A	B
DSB500 1-2	98	619	120	1316	118	2015	119	1769	116	2919	117	2466
DSB630 3-4	113	754	108	1500	103	2246	106	1950	98	3146	100	2696

Vertical Mounting

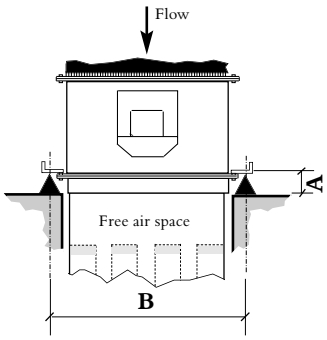


Vertical mounting of an airmover or airmover/silencer combination where a silencer is positioned above the airmover. Applies whether flow is upwards or downwards.





Detail of resilient mounting onto steelwork



Vertical mounting of an air-mover or airmover /silencer combination where a silencer is **NOT** positioned above the airmover. Left-hand view shows arrangement when flow is upwards as shown, right-hand view arrangement when flow is downwards.

Dimensions

Airmover code	DSB only		SIL-S +DSB		SIL-S+AMB +SIL-S		SIL-L +DSB		SIL-L+AMB +SIL-L		SIL-L+AMB +SIL-S	
	A	B	A	B	A	B	A	B	A	B	A	B
DSB500 1-2	36	724	58	724	56	724	57	724	54	724	55	724
DSB630 3-4	52	794	47	794	42	794	45	794	37	794	40	794

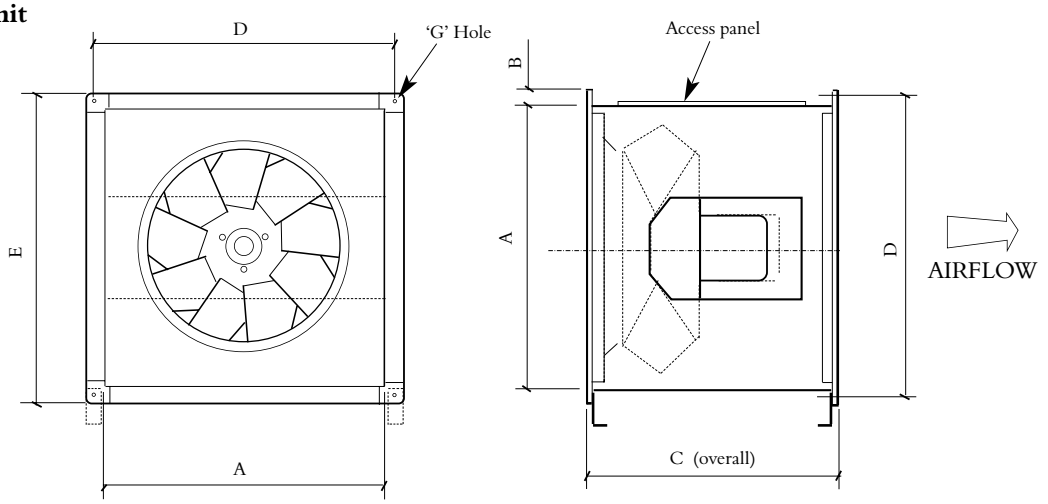
Like horizontally mounted combinations, silencers must always be fitted with free air space at the airmover.

Dimensions in mm (mountings normally compressed).

Dimensions

Fan Unit

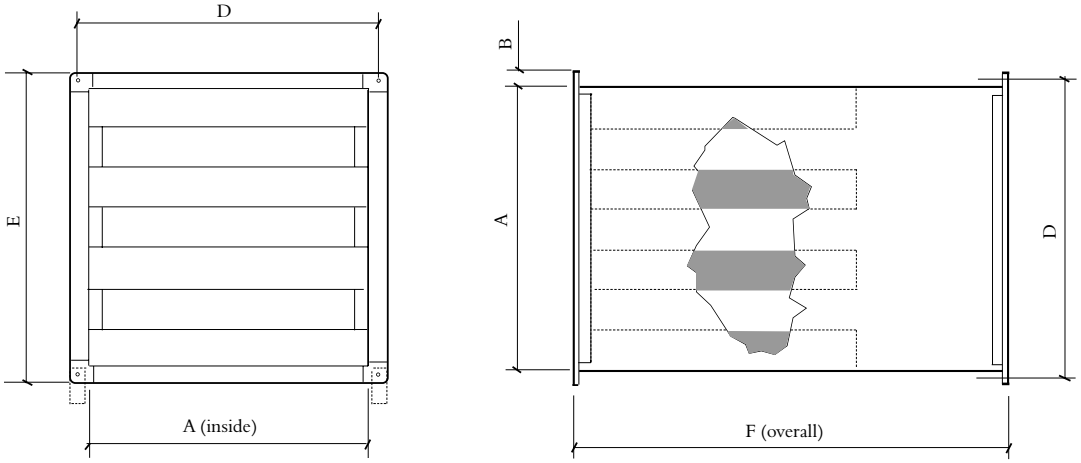
Codes
Note that the two speed models have the suffix TS e.g. DSB 500 TS



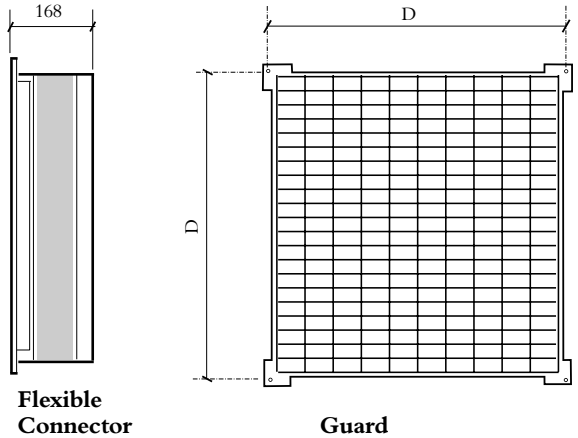
Note:
Two speed (TS) models have same dimensions etc.

Fan Code	Dimensions (mm)						Weight (kg)
	A	B	C	D	E	G dia.	
DSB 500	580	30	695	612	638	11	46
DSB 630	650	30	830	682	708	11	65

Silencer



Fan Code	Silencer Code		Dimensions (mm)								Silencer Weight kg	
	Short	Long	A	B	C	D	E	F (SIL-S)	F (SIL-L)	G dia.	(SIL-S)	(SIL-L)
DSB 500	AM 500 SIL-S	AM 500 SIL-L	580	30	700	612	638	697	1150	11	24	38
DSB630	AM 630 SIL-S	AM 630 SIL-L	650	30	825	682	708	746	1196	11	29	43



Flexible Connector

Guard

Unit Size	Guard	Flexible Connector
DSB 500	AM FG 500	AM 500 FLEX
DSB 630	AM FG 630	AM 630FLEX

Note:
Resilient Mounting Kit codes are shown on page 3

Routine Maintenance

Isolation
Before commencing work, make sure that the Ductmaster Square Bifurcatedis externally isolated from the electrical supply.

Maintenance Periods
The first maintenance should be carried out three months after commissioning and thereafter at twelve monthly intervals. These intervals may have to be shortened however if the unit is operating in adverse environmental conditions or handling heavily polluted air.

General Cleaning and Inspection
Clean the exterior of the Airmover Bifurcated, Silencers, Flexible Connectors, Resilient Mountings etc., as fitted. Inspect for security and condition. Check tightness of fixing devices.

Remove the Airmover Bifurcated's access panel. Inspect the internal components for security and condition. Check that the impeller rotates freely. Clean components as necessary (for cleaning the impeller see below).

Cleaning the Impeller
A build up of dust may be removed by carefully brushing with a stiff brush. Take care not to damage or distort the impeller blades and do not disturb the balance weights.
If the impeller is too badly fouled to allow adequate cleaning in situ, the Ductmaster Square Bifurcated/ Silencer combination should be removed from the ductwork and the impeller cleaned as follows.

a) If a silencer is fitted to the impeller side of the unit, remove it. Alternatively remove the impeller from the unit (See the following notes on removing impeller).

b) Sponge the impeller with warm soapy water and leave to soak. Do not use caustic fluids under any circumstances. When applying the water take care to prevent it getting into any electrical parts.

c) After soaking, rinse with fresh water and dry thoroughly.

d) If the impeller has been removed it should be refitted as per the following instructions.

e) If applicable, refit the silencer to the Airmover Bifurcated with a gasket inserted between the joint faces. Refit the Airmover or Ductmaster Square Bifurcated/ Silencer com bination back into the installation, again sandwiching a gasket between the joint faces.

Lubrication
Motors have sealed for life bearings and therefore need no further lubrication.

Testing
Refit the access panel and test run the Airmover Bifurcated.

Replacement of Parts

Isolation
Before commencing work, make sure that the Airmover Bifurcated is externally isolated from the electrical supply.

Parts
For the ordering of spare and replacement parts, see the section SCHEDULE OF PARTS. Before fitting, remove any protective coating from the replacement part.

Motor or Impeller
The access panel allows inspection of the impeller in the duct. The bifurcated design allows access to the motor from either side of the installation. If any components are to be removed and or serviced the bifurcated unit should be removed from the installation using a suitable hoist.

To remove the motor proceed as follows:

DISCONNECT THE AIRMOVER BIFURCATED AND REMOVE IT FROM THE DUCT BEFORE COMMENCING WORK.

a) Remove the access panel. Remove the cover from the motor terminal box. Disconnect and withdraw the flexible con duit at the motor terminal box end and move the leads and conduit clear. To speed reconnection note the position of all leads, tag them if necessary. Release the impeller from the motor shaft as described in the following section 'REMOVING A TAPERLOCKED IMPELLER FROM A MOTOR SHAFT'

b) If the motor is to be changed, first remove the impeller then remove the motor / motor plate assembly.

Fit the new motor to the original mounting plate and replace the motor/motor plate assembly in the rearward position in the unit. Assemble the impeller to the shaft. Secure the impeller by tightening the two grubscrews in the boss. See the section 'FITTING A TAPERLOCKED IMPELLER TO A MOTOR SHAFT' on page 6.

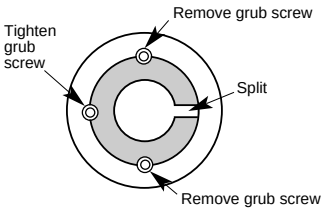
Fan replacement is the reverse of the removal procedure. Ensure the impeller can rotate freely with the overlap as specified in the diagram below. The impeller should also be concentric with the venturi. If necessary adjust the overlap and concentricity by moving the impeller along the shaft or using the slots in the motor mounting plate

Removing a taperlocked impeller from a motor shaft
Make a note or scribe a fine line to mark the position of the impeller bush on the shaft. From the locking holes of the taperlock (see diagram on page 6) remove one grubscrew. Lightly oil its thread and point and insert it into the jacking hole. Slacken the other grubscrews.
Tighten the screw until the bush is loosened in the hub and the assembly of the impeller and bush can be drawn from the shaft. Remove the screw and separate the impeller and bush

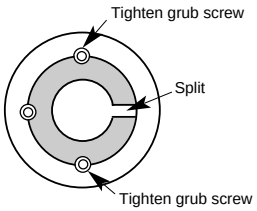
Replacement of Parts (continued)

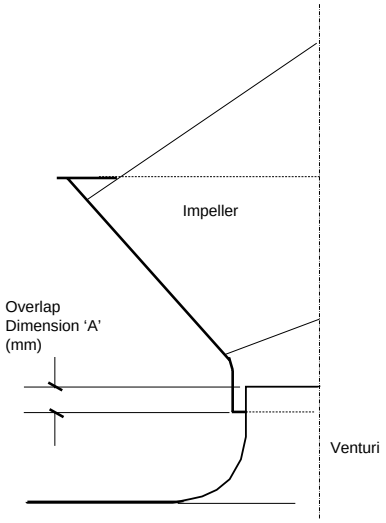
Fitting a taperlocked impeller to a motor shaft
Making sure that tapered mating surfaces are thoroughly clean, insert the taperlock bush into the impeller hub. Line up the holes. Lightly oil the threads and points of the grub screws and assemble loosely into the locking holes (see diagram below).

Releasing Taperlock



Locking Taperlock





Impeller / Venturi overlap

Unit Size	Dim.'A'	Applies to
DSB500	8	DSB500 1-2
DSB630	10	DSB630 3-4

Clean the motor shaft and fit the impeller and bush as one assembly to the shaft in the position noted during removal. If relevant, make sure that the key is fitted into the slot in the shaft. Tighten the screws gradually and alternately until pulled up tight. Note that the bush will nip the shaft first and then the hub will be slightly drawn onto the shaft.

Fill the empty holes with grease to exclude dirt.

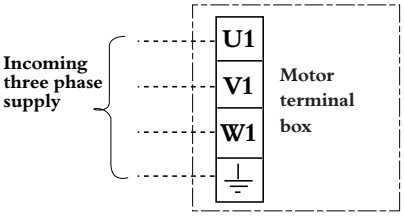
Schedule of Spare Parts

When ordering spare parts, please quote the serial number of the unit together with the part number, if listed below.
If the number is not listed, please fully describe the part.
The Fan serial number will be found on the identification plate fixed to the unit case.

Fan code	Impeller	Motor
DSB500-11	770292	530370
DSB500-13	770292	530375
DSB500-21	770290	530370
DSB500-23	770290	530375
DSB630-31	770346	530939
DSB630-33	770346	530320
DSB630-41	770293	530939
DSB630-43	770293	530320

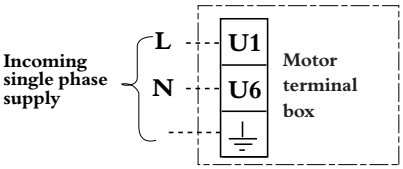
Unit Electrical Wiring

3 PHASE FOR D.O.L. STARTING



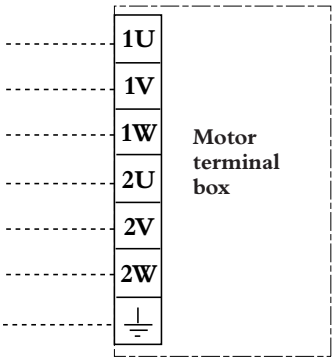
400V 3 phase 50Hz supply

1 PHASE SINGLE SPEED



230V 1 phase 50Hz supply

2 SPEED TAP WOUND MOTOR



Note:

LOW SPEED
Supply = 1U 1V 1W

HIGH SPEED
Supply = 2U 2V 2W
(& link 1U 1V 1W)

400V 3 phase 50Hz supply

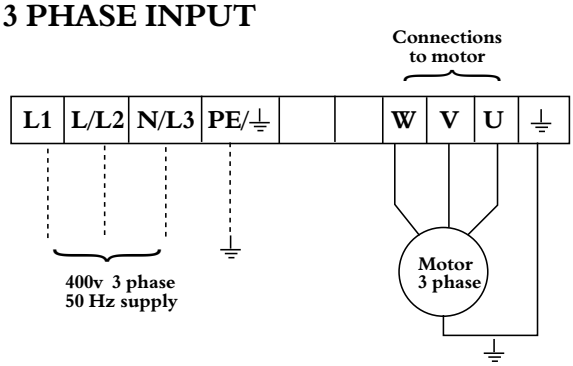
Wiring for matched NuAire Inverter Control

Note:
The total length of the motor lead should not exceed 50 metres.

If a screened motor cable is used, the maximum length should be 25 metres. Consult our Technical Dept. if you wish to use longer leads.

Inverters are configured to suit specific fans and control applications as described on customer order free of charge.

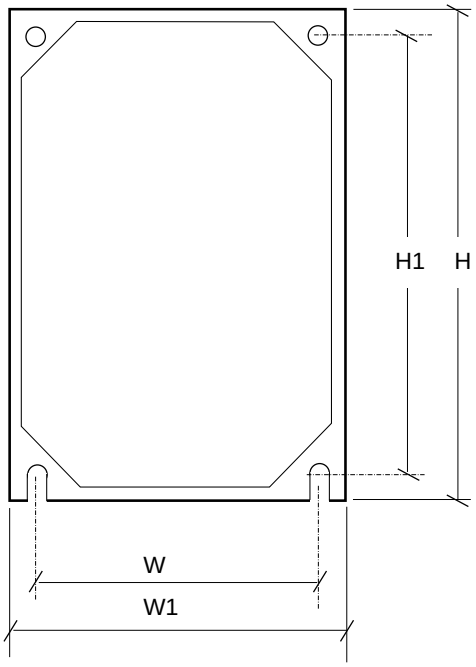
3 PHASE INPUT



DCB & DSB UNITS ARE SUITABLE FOR INVERTER SPEED CONTROL ONLY

Note: Refer to the Installation Instructions supplied with the particular Inverter Control specified.

Inverters



Coding

	Unit Code	Inverter Code	
Single Phase	DSB500-1	SC INV 75	***Three Phase Motor, Single Phase Input***
	DSB500-2	SC INV 75	
	DSB630-1	SC INV 15	
	DSB630-2	SC INV 15	
Three Phase	DSB500-1	3SC INV 15	***Three Phase Motor, Three Phase Input***
	DSB500-2	3SC INV 15	
	DSB630-1	3SC INV 15	
	DSB630-2	3SC INV 15	

Dimensions (mounting)

Inverter code	H	W	H1	W1	
SC INV 75	173	103	182	112	M4 fixings, 4.5mm dia mount holes
SC INV 15	174	138	184	149	M4 fixings, 4.8mm dia mount holes
3SC INV 15	204	174	215	185	M5 fixings, 5.6mm dia mount holes

NUAIRE

DECLARATION OF INCORPORATION & INFORMATION FOR SAFE INSTALLATION, OPERATION & MAINTENANCE

NuAire Limited,
Western Industrial Estate, Caerphilly,
Mid Glamorgan, CF8 1XH. United Kingdom.
Telephone: 029 2088 5911 Fax: 029 2088 7033
Email: info@nuaire.co.uk
www.nuaire.co.uk

SEPTEMBER 2000

We declare that the machinery named below is intended to be assembled with other components to constitute a system of machinery. The machinery shall not be put into service until the system has been declared to be in conformity with the provisions of the EC Council Machinery Directive.

Designation of machinery :-	DUCTMASTER
Machinery Types :-	DSA, DSB
Relevant EC Council Directives :-	98/37/EC (Machinery Directive)
Applied Harmonised Standards :-	EN292-1, EN292-2, EN294, EN29001
Applied National Standards :-	BS848 Parts One, Two and Five

Signature of manufacture representatives :-

Name:	Position:	Date:
1) C. Biggs	Technical Director	3. 9. 00
2) W. Glover	Manufacturing Director	3. 9. 00

NUAIRE

CE **DECLARATION OF CONFORMITY**

NuAire Limited,
Western Industrial Estate, Caerphilly,
Mid Glamorgan, CF8 1XH. United Kingdom.
Telephone: 029 2088 5911 Fax: 029 2088 7033
Email: info@nuaire.co.uk
www.nuaire.co.uk

OCTOBER 2000

We declare that the machine named below conforms to the requirements of EC Council Directives relating to Electromagnetic Compatibility and Safety of Electrical Equipment.

Designation of machinery :-	AXUS AXIAL FLOW FAN
Machinery Types :-	DSA, DSB
Relevant EC Council Directives :-	89/336/EEC, 92/31/EEC (EMC) 73/23/EEC, 93/68/EEC (Low Voltage Directive)
Applied Harmonised Standards :-	EN55014-1, EN55014-2, EN60204-1 EN60335-2-80
Basis of Self Attestation :-	Quality Assurance to BS EN ISO 9001 BSI Registered Firm Certificate No. FM 149

Signature of manufacture representatives :-

Name:	Position:	Date:
1) C. Biggs	Technical Director	3. 9. 00
2) W. Glover	Manufacturing Director	3. 9. 00

INFORMATION FOR SAFE INSTALLATION, OPERATION AND MAINTENANCE OF NUAIRE VENTILATION EQUIPMENT

To comply with EC Council Directives 98/37/EC Machinery Directive

To be read in conjunction with the relevant Product Documentation (see 2.1)

1.0 GENERAL

1.1 The equipment referred to in this **Declaration of Incorporation** is supplied by NuAire to be assembled into a ventilation system which may or may not include additional components.
The entire system must be considered for safety purposes and it is the responsibility of the installer to ensure that all of the equipment is installed in compliance with the manufacturers recommendations and with due regard to current legislation and codes of practice.

2.0 INFORMATION SUPPLIED WITH THE EQUIPMENT

2.1 Each item of equipment is supplied with a set of documentation which provides the information required for the safe installation and maintenance of the equipment. This may be in the form of a Data sheet and/or Installation and Maintenance instruction.

2.2 Each unit has a rating plate attached to its outer casing. The rating plate provides essential data relating to the equipment such as serial number, unit code and electrical data. Any further data that may be required will be found in the documentation. If any item is unclear or more information is required, please contact NuAire.

2.3 Where warning labels or notices are attached to the unit the instructions given must be adhered to.

3.0 TRANSPORTATION, HANDLING AND STORAGE

3.1 Care must be taken at all times to prevent damage to the equipment. Note in particular that shock to the unit may result in the balance of the impeller being affected.

3.2 When handling the equipment, care should be taken with corners and edges and that the weight distribution within the unit is considered. Lifting gear such as slings or ropes must be arranged so as not to bear on the casing.

3.3 Equipment stored on site prior to installation should be protected from the weather and steps taken to prevent ingress of contaminants.

4.0 OPERATIONAL LIMITS

4.1 It is important that the specified operational limits for the equipment are adhered to *e.g. operational air temperature, air borne contaminants and unit orientation.*

4.2 Where installation accessories are supplied with the specified equipment eg. wall mounting brackets. They are to be used to support the equipment only. Other system components must have separate provision for support.

4.3 Flanges and connection spigots are provided for the purpose of joining to ductwork systems. They must not be used to support the ductwork.

5.0 INSTALLATION REQUIREMENTS

In addition to the particular requirements given for the individual product, the following general requirements should be noted.

5.1 Where access to any part of equipment which **moves**, or can become **electrically live** are not prevented by the equipment panels or by fixed installation detail (eg ducting), then guarding to the appropriate standard must be fitted.

5.2 The electrical installation of the equipment must comply with the requirements of the relevant local electrical safety regulations.

6.0 COMMISSIONING REQUIREMENTS

6.1 General pre-commissioning checks relevant to safe operation consist of the following -
Ensure that no foreign bodies are present within the fan or casing
Check electrical safety. *e.g. Insulation and earthing.*
Check guarding of system.
Check operation of Isolators/Controls.
Check fastenings for security.

6.2 Other commissioning requirements are given in the relevant product documentation.

7.0 OPERATIONAL REQUIREMENTS

7.1 Equipment access panels must be in place at all times during operation of the unit, and must be secured with original fastenings.

7.2 If failure of the equipment occurs or is suspected then it should be taken out of service until a competent person can effect repair or examination. (Note that certain ranges of equipment are designed to detect and compensate for fan failure).

8.0 MAINTENANCE REQUIREMENTS

8.1 Specific maintenance requirements are given in the relevant product documentation.

8.2 It is important that the correct tools are used for the various tasks required.

8.3 If the access panels are to be removed for any reason the electrical supply to the unit must be isolated.

8.4 A minium period of two minutes should be allowed after electrical disconnection before access panels are removed. This will allow the impeller to come to rest.
NB: *Care should still be taken however since airflow generated at some other point in the system can cause the impeller to "windmill" even when power is not present.*

8.5 Care should be taken when removing and storing access panels in windy conditions.

Spares

In view of the fact that the product incorporates sealed for life bearings and utilises no consumables we would not recommend a stock holding of spares. In the unlikely event that a failure should occur contact our Regional Sales Teams and quote the fan rating label details.

Service

As a manufacturer NuAire provides you with factory trained Service Engineers.
Our Engineers are supported by a comprehensive range of spare parts 'off the shelf'.
If you are an industrial or commercial user, you may be interested in details of NuAire's regular maintenance Service Contracts. This is a worthwhile service that helps you get the most from our products.
Our Service Department will be happy to give you more information.

Telephone: **029 2085 8585**

Controls Application Service (CAS)

A team of Engineers and technicians is available to provide pre and post order support.

We are on hand to provide help and advice from the most basic use of any NuAire equipment to the more complex applications, maximising on the versatility of our SMART and NetLink control products.

Telephone: **029 2085 8585**

Facsimile: **029 2085 8586**

Technical or commercial considerations may, from time to time, make it necessary to alter the design, performance and dimensions of equipment and the right is reserved to make such changes without prior notice.

3 YEAR WARRANTY

The three year warranty starts from the date of delivery and includes parts and labour for the first year.

The labour element is subject to full, free and safe access to the equipment as recommended by the CDM regulations.

The remaining two years covers replacement parts only.

NOTE:
Installation & Maintenance of the equipment must be as directed in the instructions provided with the unit.

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NB
If you have any comments or queries on any of our products or services please write to the Product Information Manager at the main address opposite