



Series 3 Basic, Standard & Quietscroll Cabinet Twinfan

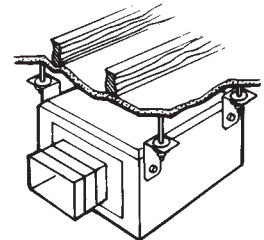
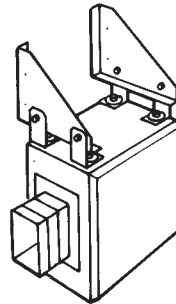
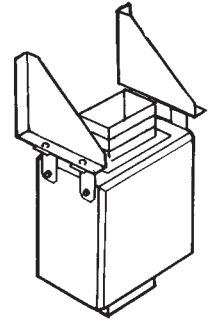
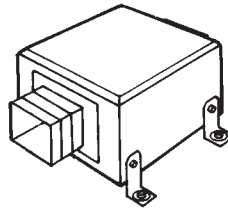
NUAIRE

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Contents

Installation	3
Electrical details	4
Routine maintenance	4
Replacement of parts	7
Schedule of parts	7
Wiring Diagrams	8



Introduction

Series 3 Cabinet Twinfans and Quietscroll Cabinet Twinfans are each produced in six sizes, coded respectively 3CT and 3QSCT followed by the unit size. Apart from the extent of acoustic treatment, they are basically identical and are treated as such in this publication. A Basic model coded BT supplied with stand-by failure facility only, and which does not require a control unit is also available. Each twinfan unit incorporates two direct-driven high efficiency double inlet forward curved centrifugal impellers running in metal scrolls. The impellers feed into a common plenum chamber through a shutter system. Normally, one impeller would be on duty with the other on standby. Resilient mounting kits (optional) are available with all units in the Twinfan range including the Basic version. Silencers, mounting brackets, and a selection of auto-changeover controls are available as optional extras.

All units incorporate a manual duty-trimming device which enables adjustment of unit performance during installation.

Silencers bolt on the end of the twinfan units in place of the removable spigot plates with which the units are normally terminated. The plates are then fixed to the outer ends of the silencers. Fans and silencers thus become

integrated assemblies for direct fitting into ductwork.

Resilient mounting kits contain the appropriate number of mounting feet complete with resilient mounts.

NuAire Controls provide a variety of options, including automatic change-over should the duty fan fail, automatic or manual change-over for duty sharing, run-on after switch off, etc. The run-on period is adjustable between 5 and 30 minutes nominal.

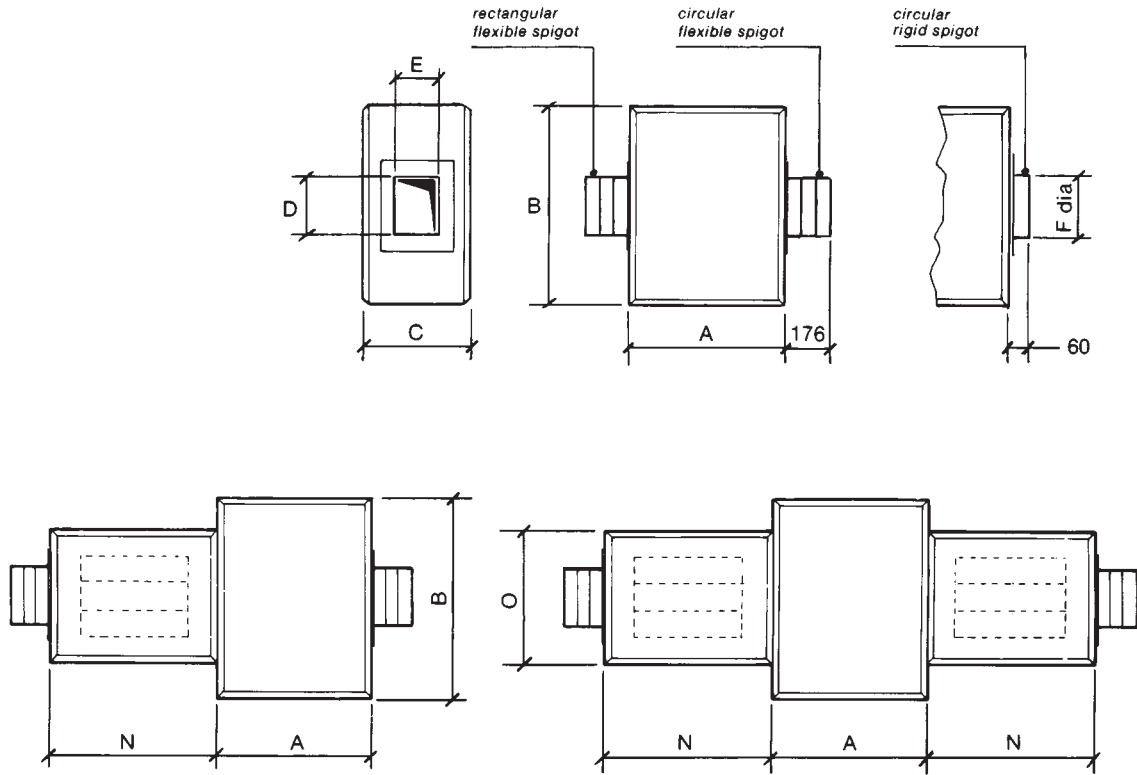
These facilities are not available on Basic version.

Units are complete with a two meter length of cabling protected by flexible conduit. Flexible conduit omitted from basic model. Cabling and conduit terminate at their outer ends in a box containing a terminal strip for input connections. The box can be sited in any convenient position adjacent to the unit.

Basic model is supplied with a two metre length of mains cable terminating in a moulded, fused, three pin plug.

Units are supplied for single phase operation only.

Dimensions and weights



Unit Code	Case overall			Spigot			Silencer		Weight (kg) Fan Unit		Silencer
	A	B	C	D	E	F dia	N	O	3CT	3QSCT	
3BT100, 3CT100, 3QSCT100	450	495	238	150	100	125	600	452	13.5	15.5	12
3BT150, 3CT150, 3QSCT150	465	710	303	200	150	200	600	452	23.0	26.0	14
3BT190, 3CT190, 3QSCT190	560	710	370	200	150	200	600	452	32.0	36.0	16
3BT220, 3CT220, 3QSCT220	700	970	476	400	150	250	600	632	41.0	46.0	23
3BT240, 3CT240, 3QSCT240	700	970	476	500	300	400	600	632	46.0	51.0	23
3BT270, 3CT270, 3QSCT270	700	970	476	500	300	400	600	632	52.0	57.0	23

Dimensions in mm.

Ancillary codes

Unit code	Silencer	Mounting Bracket	Resilient Mounting Kit		
			Unit only	Unit + 1 silencer	Unit + 2 silencers
3BT100, 3CT100, 3QSCT100	3QSIL100	3BRKT100	3QAV1	3QAV1	3QAV2
3BT150, 3CT150, 3QSCT150	3QSIL150	3BRKT190	3QAV1	3QAV2	3QAV3
3BT190, 3CT190, 3QSCT190	3QSIL190	3BRKT190	3QAV1	3QAV2	3QAV3
3BT220, 3CT220, 3QSCT220	3QSIL270	3BRKT270	3QAV2	3QAV3	3QAV4
3BT240, 3CT240, 3QSCT240	3QSIL270	3BRKT270	3QAV2	3QAV3	3QAV4
3BT270, 3CT270, 3QSCT270	3QSIL270	3BRKT270	3QAV2	3QAV3	3QAV4

Spigot options

	Circular rigid spigot	Rectangular flexible spigot	Circular flexible spigot	Blank plate
3BT units	Optional	Optional	Optional	Optional
3CT units	Optional	Optional	Optional	Optional
3QSCT units	Optional	Optional	Optional	Optional

Fig. 1 — Unit/Silencer dimensions and weights, ancillary codes, spigot options

INSTALLATION

General

Twinfan units can be mounted in any attitude (see fig. 3. and 4), except with the outlet down. In this configuration, airflow sensing switches may not function satisfactorily. Units should always be positioned with enough space to allow easy removal of the cover, followed by withdrawal of the fan and motor assemblies if required.

Note:

For horizontal floor or ceiling mounting, correct unit orientation must be observed (this is indicated by label on unit).

Silencers are delivered separated from the twinfan unit. Before installation, assemble together by removing the spigot plates (one or both depending upon number of silencers) from the unit, bolting silencers in their place and then fitting the plates to the ends of the silencers.

Handling

Handle equipment carefully to avoid damage and distortion. When lifting mechanically, use spreaders to make sure that slings, webbing, etc., do not bear on the casing.

Isolation

Note that the unit must be provided with a means of isolation (by others) for maintenance purposes etc.

A suitable isolator can be provided by NuAire on request as a separate item.

Rigid mounting (applicable only to Cabinet Twinfans not supplied with resilient mounting kits)

The method adopted is the responsibility of others. Note, however, that twinfan unit and silencer cases have captive M8 nuts which can be used, after removing the M8 screws plugging them. Optional mounting brackets can be employed, the fixing holes being on the same centres as the nuts.

On resilient mountings (see fig. 2 and 3)

Preparations

Suspension rods/fixing screws are not supplied. Recommended thread sizes are:-

Resilient Mounting Kit	Thread Size
3QAV1 to 3QAV4	M8

When required, drill suitable holes in support structure to receive the particular sizes.

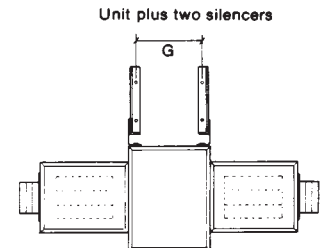
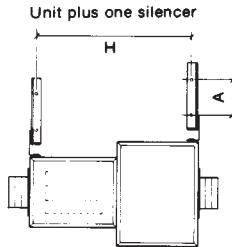
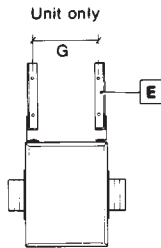
Note that the large round washers included in the resilient mounting kit are for fitting above or below resilient mountings, as required by the particular method of mounting, to safeguard the installation against break-up of, or damage to, a mounting. The washers will adequately support the unit under such circumstances.

Fit the mounting feet from the mounting kit to the unit/silencer cases as shown in the various sketches in fig. 3 and 4 does not apply when the unit is to be suspended horizontally from the wall, when the feet are to be assembled to the mounting brackets instead. Make sure that the feet are positioned and orientated as necessary for the form of installation decided upon.

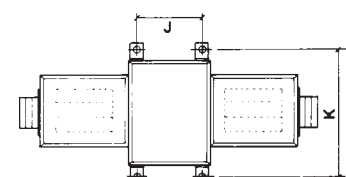
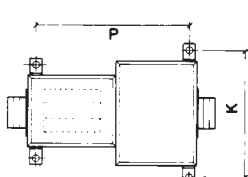
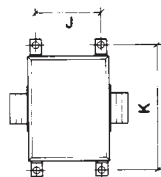
Floor mounting

Position unit or unit/silencer combination where required. Fix through the resilient mounts. For centres see fig. 2 Connect ductwork.

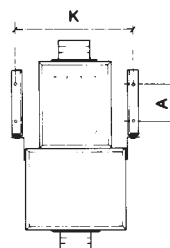
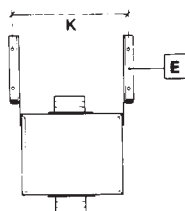
Side view showing fixing centres of mounting brackets 'E' for unit and unit silencer combinations. Supported horizontally off wall.



Plan view showing fixing centres for unit and unit/silencer combinations. Supported horizontally off floor or suspended from ceiling.



Side view showing fixing centres of mounting brackets 'E' for unit and unit/silencer combinations. Supported vertically off wall.



Vertically mounted units MUST blow upwards

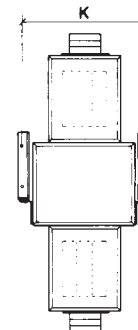


Fig. 2 — Centres for fixing unit

Unit Code	Dimensions in millimetres					Mounting Bracket Holes A
	G	H	J	K	P	
3BT100, 3CT100, 3QSCT100	348	1024	374	591	974	110
3BT150, 3CT150, 3QSCT150	363	1039	389	806	989	175
3BT190, 3CT190, 3QSCT190	458	1134	484	806	1084	242
3BT220, 3CT220, 3QSCT220	598	1274	624	1066	1224	462
3BT240, 3CT240, 3QSCT240	598	1274	624	1066	1224	462
3BT270, 3CT270, 3QSCT270	598	1274	624	1066	1224	462

Dimensions in mm

INSTALLATION (contd).

On resilient mountings

Suspended from ceiling

Prepare suitable supports in the ceilings. For centres see fig. 3. Lift the unit or unit/silencer combination into position. Fix with suspension rods, fitting the large round washers in the mounting kit **below the resilient mounts**. Connect ductwork.

Supported horizontally from wall

Fit mounting brackets to the wall, using fixing holes which are of 9.1mm diameter. For centres see fig. 2. To the outside of the brackets fit the mounting feet in the kit as shown in the sketches. Lift the unit or unit/silencer combination into position. Fix with suspension rods, fitting the large round washers in the mounting kit **above the resilient mounts**. Connect ductwork.

Supported vertically from wall

Fit mounting brackets to the wall, using fixing holes which are of 9.1mm diameter. For centres see fig. 2. Fix the unit or unit/silencer combination to the brackets. Connect ductwork.

Adjusting the integral trimming device.

Unit performance may be trimmed during installation to meet individual requirements. The air-flow rate may be regulated by means of a control arm situated at the side of the unit and which may be positioned in one of a number of locating holes. Adjustment is effected by pulling the arm away from the case, moving it to the required position and re-engaging the arm in the appropriate hole. When the control arm is at right angles to the airflow the device is inoperative and the normal fan performance will be delivered.

Installing NuAire twinfan controls and remote indicators

A control or a remote indicator can be mounted on any firm surface in any attitude, through fixing holes in its base. These become accessible when the cover is removed. Drill and plug the mounting surface as necessary, positioning the control or indicator so that the cover retaining screws remain available. This is particularly important if a battery of controls is being fitted. Fix with No. 8 woodscrews (not supplied) or equivalent.

For wiring purposes, the control or indicator cover has knock-out slots for up to 20 mm conduit for cable entry. Alternatively, cable entry can be effected through the base which is punched to accept a 20 mm series conduit box.

Electrical (refer to fig. 5)

If a NuAire Control has been supplied, wire to the twinfan unit and to the mains supply, through a suitable control switch unless the Control is fitted with an on/off switch (control code TMXCON1). See wiring diagrams, page 8. When wiring to the twinfan unit, use the terminal strip in its isolator box.

If a NuAire control is not being used, the design of suitable circuitry is the responsibility of others. The terminal strip in the twinfan unit isolator box is fitted

with a number of links to suit the NuAire Control system. These links may be removed or rearranged as necessary.

Testing after installation

Ensure that the twinfan unit and control/remote indicator covers, as relevant, are fitted.

Switch on and check that the twinfan unit runs satisfactorily. If a NuAire Control has been installed, switch over to the standby fan by means of the Control's fan selection switch. Check that changeover occurs. Shutters should be heard to operate and the failure indicator on the face of the Control should light momentarily. Switch off. If the Control is fitted with run-on facilities (Control code TMSCON1), check that the fan continues to run. Time the run-on period, which is adjustable between 5 and 30 minutes nominal. Controls are set at Works to the shortest period. To alter, adjust as described on page 7.

ELECTRICAL DETAILS

Because run and start currents depend upon the duty of an individual unit and associated system, values quoted in the table below are nominal. The values stated on the Test Certificate issued with each unit are those obtained during factory testing. Start currents quoted are instantaneous values and are for both motors starting together as when the unit is used with the NuAire Twinfan Control system.

Run currents will be exceeded if the twinfan unit is operated with its cover removed. It is therefore recommended that the unit is not run for prolonged periods under these conditions.

ROUTINE MAINTENANCE

Isolation

Before commencing, make sure that the twinfan unit, and NuAire Control if fitted, are electrically isolated from the mains 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 and inspect the exterior of the twinfan unit, silencers, resilient mountings, NuAire controls, indicators, as fitted. Check tightness of fixing devices.

Remove twinfan unit cover. As it is normally more convenient to clean and inspect fan and motor assemblies out of the unit, it is recommended that they be removed (see REPLACEMENT OF PARTS). Clean out the case remaining. Inspect interior. Check that the shutter assembly moves smoothly and that it effectively seals the appropriate fan outlet in each of the alternative positions.

Clean and inspect each fan and motor assembly as follows, taking care not to damage, distort or disturb balance of the impeller:-

- (a) Lightly brush away dirt and dust, paying particular attention to any build-up at motor ventilating slots and at the slot through which the flow switch flag arms act. If necessary, very carefully remove with a suitable blade or scraper.
- (b) Stubborn dirt at the impeller may be carefully removed with a stiff nylon brush.

Table of Fan Speeds, Motor Details and Temperature

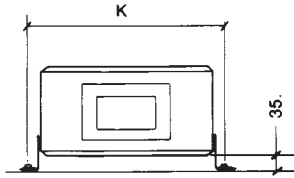
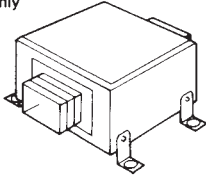
Unit Code	Nominal fan speed		Motor details		Maximum Permissible Temperature of Air passing over motor	
	r.p.s.	r.p.m.	Input power watts	Nominal run and start f.l.c. s.c.		
3BT100, 3CT100, (3QSCT100)	34(34.0)	2040(2040)	82(80)	0.60(0.58)	1.4(1.3)	60(60)
3BT150, 3CT150, (3QSCT150)	21(22.0)	1260(1320)	96(95)	0.55(0.55)	1.5(1.5)	60(60)
3BT190, 3CT190, (3QSCT190)	21(22.0)	1260(1320)	238(233)	1.54(1.53)	4.5(4.5)	60(60)
3BT220, 3CT220, (3QSCT220)	20(19.0)	1200(1140)	365(358)	1.53(1.50)	4.5(4.7)	60(60)
3BT240, 3CT240, (3QSCT240)	18(18.4)	1080(1104)	636(657)	2.70(2.78)	8.7(8.4)	60(60)
3BT270, 3CT270, (3QSCT270)	20(19.5)	1200(1170)	1200(1119)	5.00(4.98)	18.0(18.0)	60(60)

Starting current (sc) is for both motors starting together as when the unit is used with the NuAire Twinfan Control System

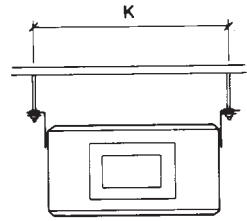
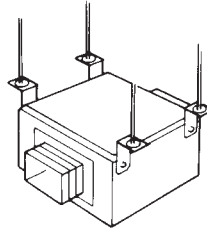
Unit, unit/silencer(s) supported horizontally off floor.

Unit, unit silencer(s) suspended from ceiling.

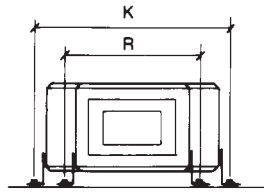
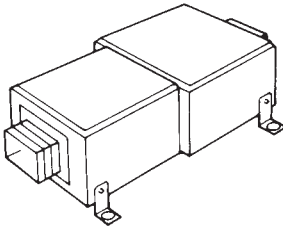
Unit only



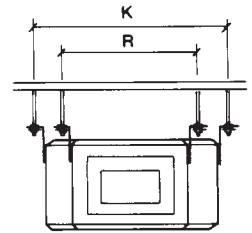
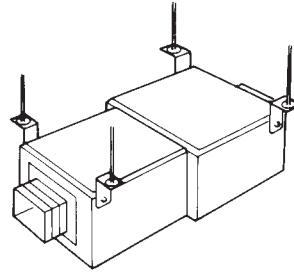
Unit only



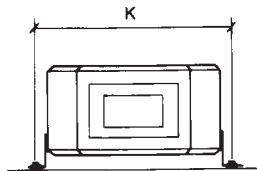
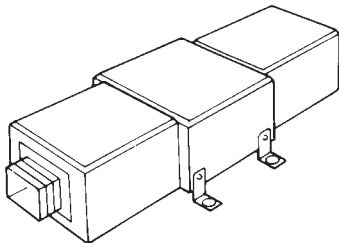
Unit plus one silencer



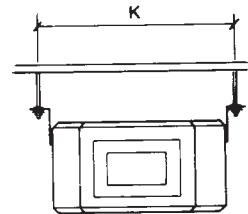
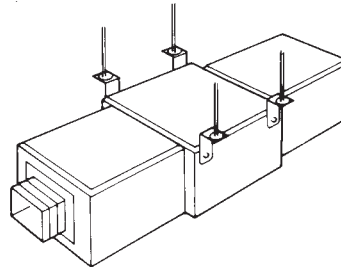
Unit plus one silencer



Unit plus two silencers



Unit plus two silencers

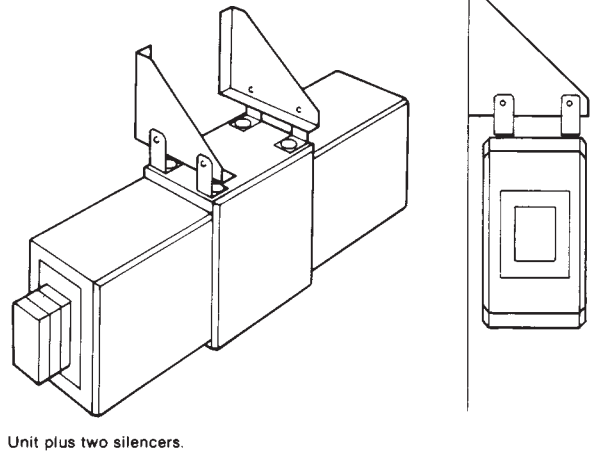
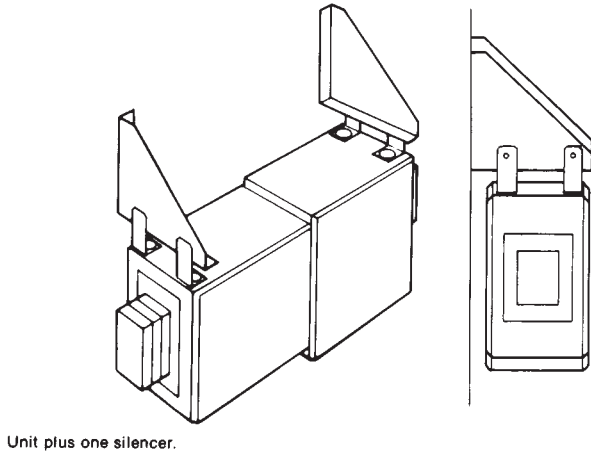
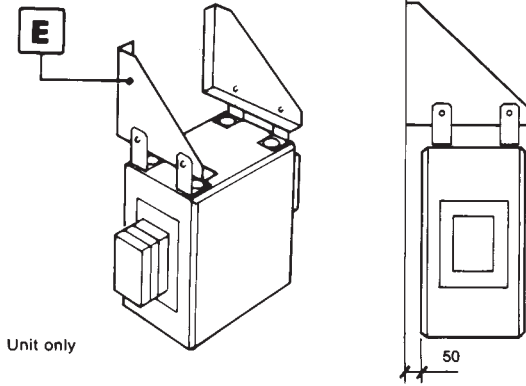


Dimensions in mm

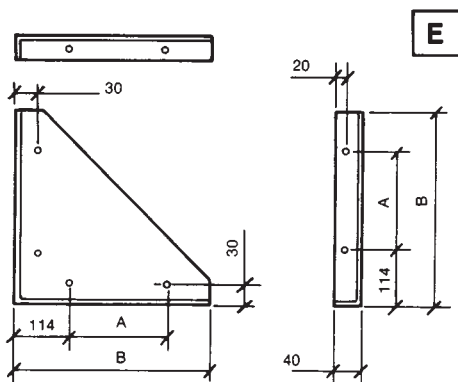
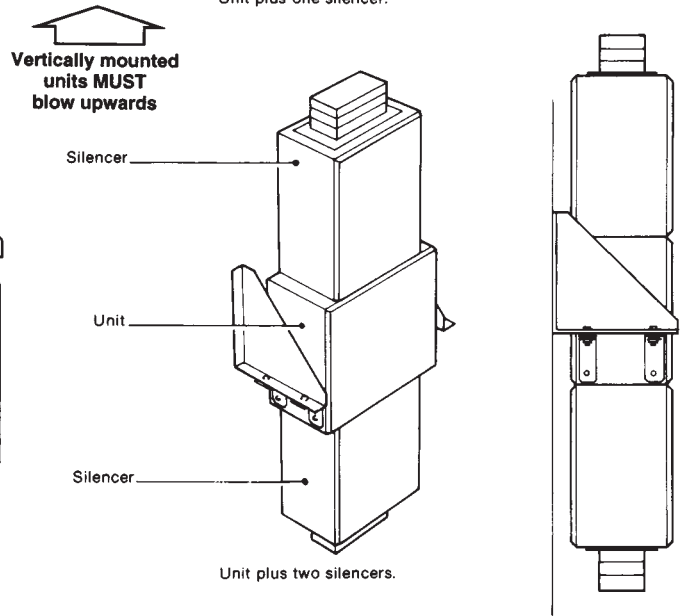
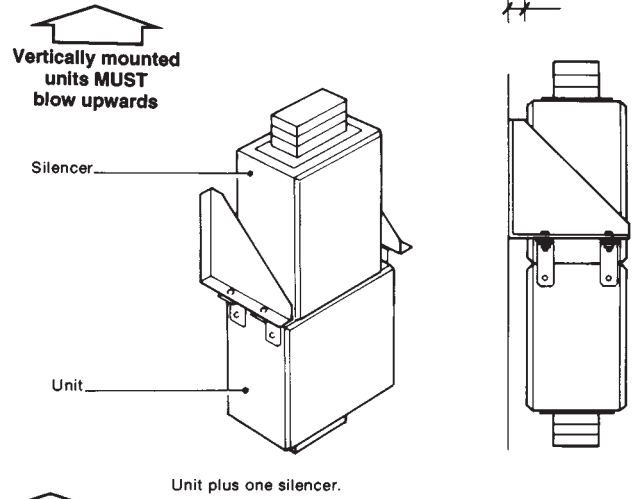
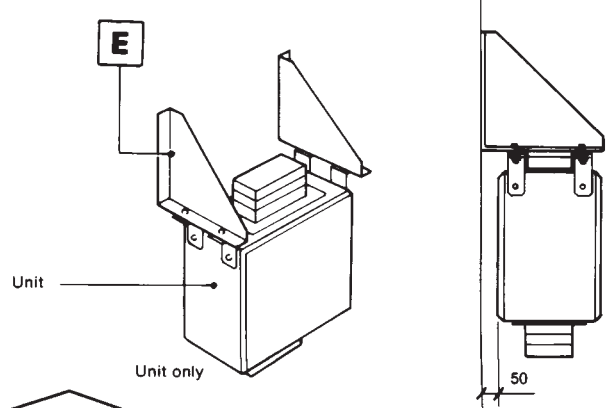
Unit Code	K	R
3BT100, 3CT100, 3QSCT100	591	540
3BT150, 3CT150, 3QSCT150	806	548
3BT190, 3CT190, 3QSCT190	806	548
3BT220, 3CT220, 3QSCT220	1066	728
3BT240, 3CT240, 3QSCT240	1066	728
3BT270, 3CT270, 3QSCT270	1066	728

Fig. 3 — Installation of unit/silencer combinations off floor and from ceiling on resilient mountings

Unit, unit/silencer(s) suspended horizontally from wall.



Unit, unit/silencer(s) suspended vertically from wall.



Dimensions in mm

Code	Unit	Unit	
		A	B
3BRKT100	100	113	262
3BRKT190	150	178	394
3BRKT190	190	245	394
3BRKT270	220	351	500
3BRKT270	240	351	500
3BRKT270	270	351	500

Fig. 4 — Installation of unit/silencer combinations from wall on resilient mountings

ROUTINE MAINTENANCE (contd).

General cleaning and inspection

- (c) Check all parts for security and conditions. Check that the impeller rotates freely. Check that the flow switch operates freely and that the flag is secure on the arm, **but take great care not to alter the angle of the flag arm or the flag.**

Re-fit the assemblies back to the unit (as detailed in REPLACEMENT OF PARTS), then replace the unit cover.

If NuAire Controls and/or remote indicators are fitted, remove covers. Carefully clean out interiors as necessary. Check for any evidence of damage. Check for security of components. Re-fit covers.

Lubrication

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

Testing

Test run the twinfan unit. If a NuAire Control has been installed, switch over to the standby fan by means of the Control's fan selection switch. Check that change-

over occurs. Shutters should be heard to operate and the failure indicator on the face of the Control should light momentarily. Switch off. If the Control is fitted with run-on facilities (Control code TMSCON1, check that the fan continues to run. Time the run-on period, which is adjustable between 5 and 30 minutes nominal. If resetting is required, proceed as follows:

Adjusting run-on period (NuAire Controls)

Isolate the Control from the mains supply. Remove its cover. The timer is fitted to the inside of one of the base uprights. The adjustment is made at a screwdriver-slotted potentiometer mounted on the timer board. Rotate clockwise to lengthen run-on period, anti-clockwise to shorten it.

Re-fit the cover. Time new run-on period. Repeat procedure as necessary.

REPLACEMENT OF PARTS

The only parts of the twinfan unit likely to require replacement is a defective flow switch or a complete fan and motor assembly, due possibly to a failed motor

or damaged impeller. In each case the assembly has to be removed from the unit case.

Before commencing, electrically isolate the twinfan unit and/or the associated NuAire Control, if fitted, from the mains supply.

Remove the twinfan unit cover. Disconnect the internal electrical socket from the plug fixed to the particular fan and motor assembly to be removed. Remove the screws and washers at the mounting holes, supporting the assembly as necessary whilst doing so. Lift the assembly out of the twinfan casing.

To replace a defective flow switch at the removed assembly, proceed as follows:

- (a) Slide the lid off the box housing the switch. Disconnect the switch (push tab connections), noting connections. Lift the switch out of the box, turning it to allow the flag to come out through the slot in the scroll.
- (b) Fit the replacement switch in the reverse order, taking great care when feeding the flag through the slot in the scroll not to distort or alter the angle of the flag arm and flag. Connect (normally-closed contacts). Re-fit box lid.

Return the assembly (complete replacement or the old with a new flow switch) to the twinfan unit.

Re-connect the internal plug and socket. Re-fit unit cover.

SCHEDULE OF PARTS

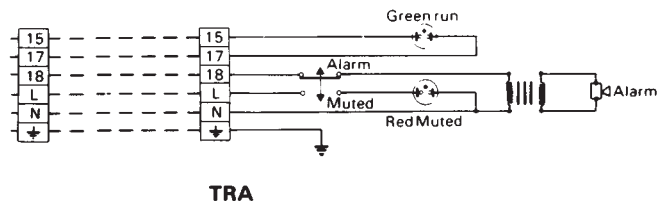
When ordering spare parts please quote the serial number of the unit, together with the part number, if quoted below. If not quoted, please fully describe the part. Serial number will be found on the identification plate fixed to the unit.

Unit code	Fan/motor assembly	Flag switch (flow)
3BT100, 3CT100	3QSCT100	770867
3BT150, 3CT150	3QSCT150	770894
3BT190, 3CT190	3QSCT190	770969
3BT220, 3CT220	3QSCT220	770910
3BT240, 3CT240	3QSCT240	770911
3BT270, 3CT270	3QSCT270	770912
		270093
		270096
		270093
		270093
		270095
		270161

Remote Indicators

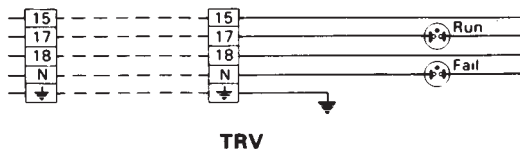
TRA

Designed as a remote indicating extension of TM and TA control units, the TRA unit provides audible warning of a fault condition. The audible warning can be silenced by a manually operated muting switch, but this lights a visual indicator which remains as an indication that the switch has been changed-over to the muted position.



TRV

Also designed as a remote indicating extension of TM and TA control units, the TRV unit provides positive indication at a remote location of the fan condition by means of 'run' and 'fail' indicator lamps.



CONTROLS

TMC1

This control unit provides manual selection of either fan for duty-sharing or test purposes through a fan selector switch, as well as automatic change-over on fan failure. Loss of airflow is detected by the selected fan sensing switch (a normally-closed switch, open when airflow is correct). The switch closes to bring into operation the standby fan to maintain full extraction. At the same time a local failure warning lamp lights and a remote warning indicator, if installed, is energised. Integral fuses protect control and associated wiring.

TMXC1

Similar to the TMC1 control unit, the TMXC1 has in addition a two-pole on-off switch to isolate incoming line and neutral.

TMSC1

Again similar to the TMC1 control unit, the TMSC1 unit has in addition an electronic timer. This maintains the selected fan running for a period adjustable between 5 and 30 minutes approximately after the initiating source (coupled light switch or similar) has been switched off.

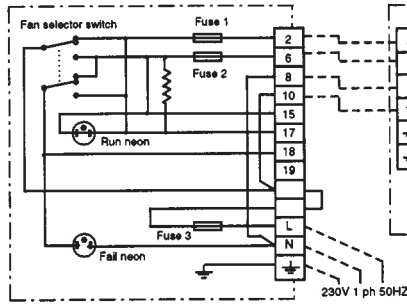
TAC1

This control unit provides automatic duty-sharing facilities, as well as the automatic change-over on fan failure described for the TMC1 unit. An incorporated timing mechanism brings alternate fans into operation at 12-hourly intervals, ensuring optimum duty-sharing and thus maximum bearing life. An override switch is fitted to allow manual selection for test purposes.

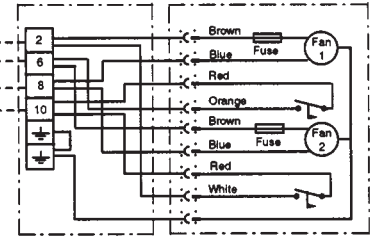
TVCON1

Provides automatic duty sharing as well as automatic change-over on fan failure. For use with Nuair's Varitrol system, it allows uninterrupted air extraction yet automatically reduces the volume of extracted air during periods of low demand.

Control

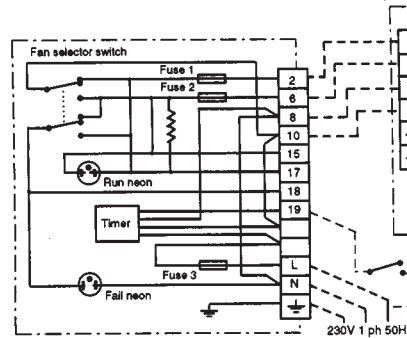


Terminal Box

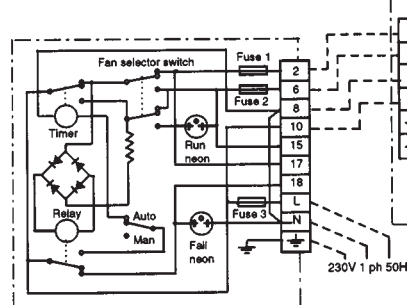


Twinfan

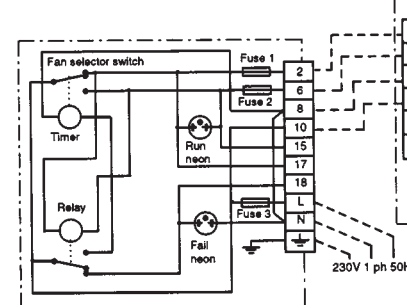
TMC1



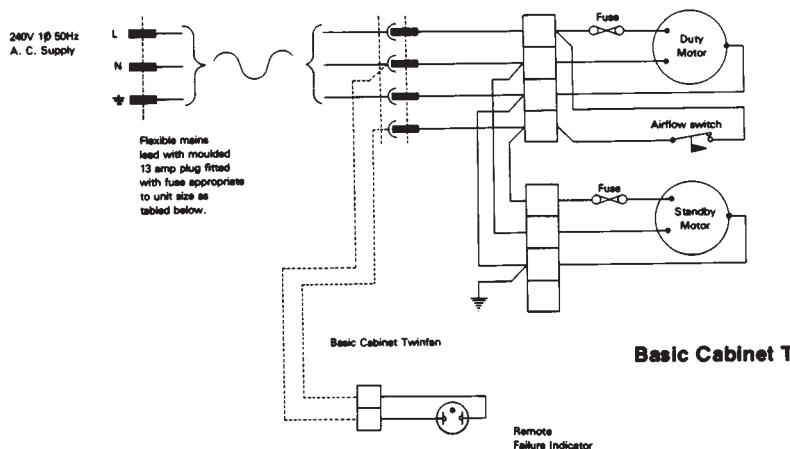
TMSC1



TAC1



TVCON1

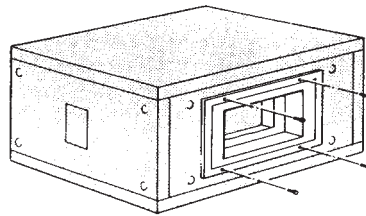


Basic Cabinet Twinfan Wiring Diagram

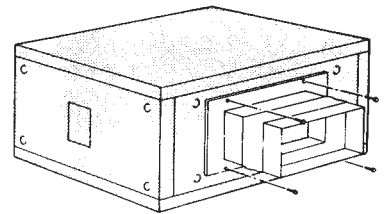
SERIES III Cabinet Fans and Twinfans IMPORTANT!

1) FLEXIBLE CONNECTORS

WHEN FLEXIBLE CONNECTOR SPIGOTS ARE SUPPLIED THEY ARE DESPATCHED FITTED IN THE INVERTED POSITION TO PREVENT SITE DAMAGE.
PLEASE REVERSE THE SPIGOTS PRIOR TO INSTALLATION.



AS SUPPLIED



READY FOR INSTALLATION

2) ANTI VIBRATION MOUNTING KITS

NOTE THAT WHEN SUPPLIED, ANTI VIBRATION MOUNTING KITS ARE PACKED INSIDE THE UNIT CASE