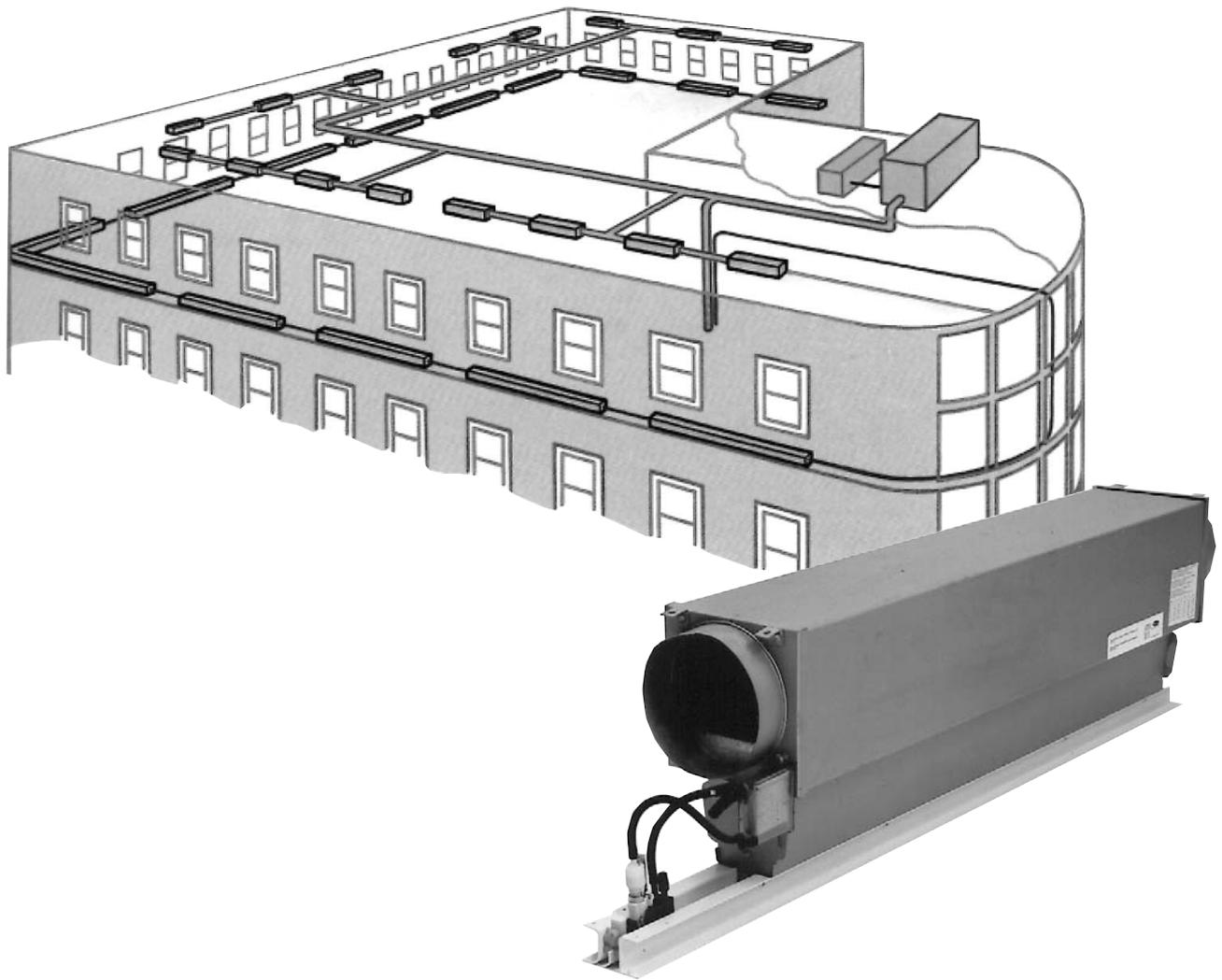




# 37A Series Moduline Air Diffusers



**Selection and Installation manual**



Quality Management System Approval

**The photo shown on the front cover is solely for information, and not contractually binding. The manufacturer reserves the right to make changes without previous notification.**

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## 1 - INTRODUCTION

### 1.1 - Main features

Carrier Moduline air conditioning terminals integrate air distribution and air volume flow control, constant volume or variable volume, in the terminal itself. The prime function of the unit is to control, automatically and accurately, the air flowing from it so that the temperature of the space which it serves stays sensibly constant at the level selected by the occupants. They are one-piece, self contained units which can be used with any type of air treatment unit: ducted central station air handlers or packaged indoor or outdoor air conditioners. Moduline air terminals distribute conditioned air through linear diffuser slots at the level of the underside of the ceiling. They take advantage of the Coanda effect by which the air stream flowing from the terminal is enlarged by a mass of room air induced into it without drafts and unnoticed by the room occupants.

The diffusers are available in sizes which match standard false ceiling modules so that neat and tidy installation are assured in the first instance and are preserved when space usages change. They ensure the ability to rearrange layouts and the air distribution with minimum effort and cost.

Any Moduline terminal can be fitted with a controller which allows it to act as a master unit controlling several other slave units. Without the controller a unit becomes a slave. The number of slaves controllable by a master varies with the Moduline model. A slave unit can have a simple control kit added to it at any time to turn it into a master in its own right. Masters and slaves are linked together by small flexible tubes. There are no electrical interconnections.

### 1.2 - Description

- a. Galvanised steel plenums are built of 6/10 or 10/10 gauge according to model.

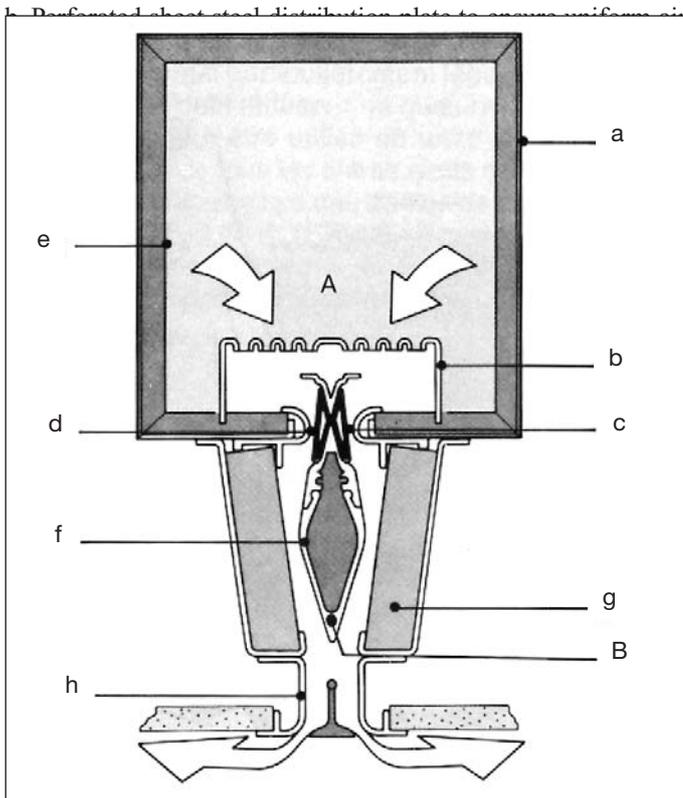


Fig. 1 - Moduline unit in cross section

distribution along the active length of the unit.

- c. Neoprene bellows which expand and contract under the influence of the control pressure to regulate the rate of the air flow from the unit.
- d. Bellows stops, felt coated to control the noise level.
- e. Thermal and acoustic insulation - a neoprene skin over 13 mm glass fibre to resist erosion.
- f. Central air guide aerodynamically profiled to prevent turbulence and maintain air velocity in the diffuser throat.
- g. Acoustic insulation - a neoprene skin over 25 mm high density glass fibre to attenuate the noise due to the air flow.
- h. Air diffuser assembly of extruded aluminium with a white baked finish (RAL 9010 30% gloss).

### 1.3 - Operating principles

Primary air from the central source is brought into the plenum (a) and passes through the perforated sheet (b) towards the outlet path formed by the bellows (c) and the bellows stops (d). The cross sectional area of the outlet path is varied by the changing control pressure from the control unit expanding and contracting the bellows. In throat B the air is at low pressure and so follows the form of the central vane with no turbulence. The form of the air stream at the diffuser outlet ensures complete mixing of the supply air from the diffuser with the induced room air within 300 mm of the outlet.

This means that temperature differences, between the room air and the supply air from the diffuser, of as much as 14°C are possible without creating the risk of cold drafts for room occupants.

### 1.4 - The Moduline range

Moduline systems can be built around four types of terminals. A wide range of capacities, weights and physical dimensions creates the diversity of unit specifications needed to satisfy a diversity of job specifications.

#### 1.4.1 - 37AG



Two models of 37AG Moduline are available with different active lengths:

- Active diffuser length: 900 mm

Nominal air flow: 200 m<sup>3</sup>/h - 56 l/s

Air flow range: 68-470 m<sup>3</sup>/h - 19-130 l/s

- Active diffuser length: 1200 mm

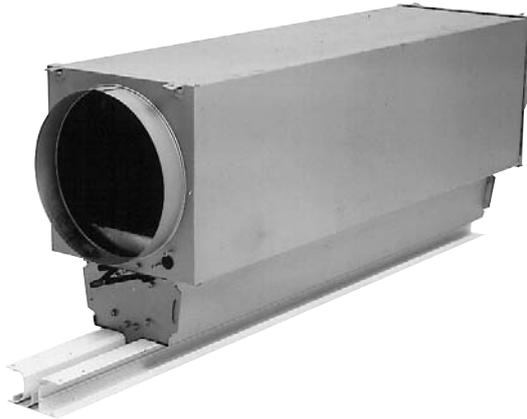
Nominal air flow: 267 m<sup>3</sup>/h - 74 l/s

Air flow range: 90-627 m<sup>3</sup>/h - 25-173 l/s

The 37AG is suitable for all types of offices, commercial premises, hospitals etc and for use in conjunction with integrated ceilings. Due to its small physical size and high capacity the 37AG unit is the basis of many VAV systems. As with the other models it can operate as a slave or, with the addition of a controller as a master unit. The controller can be added on-site provided there is access through the false ceiling. 37AG units can sit astride partitions. When the partitions are moved the terminals can usually remain undisturbed.



#### 1.4.2 - 37AH



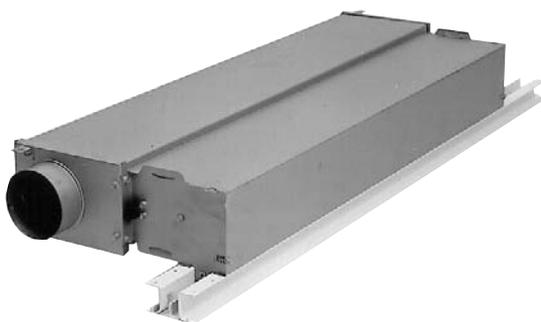
Nominal air flow: 350 m<sup>3</sup>/h - 97 l/s

Air flow range: 170-850 m<sup>3</sup>/h - 47-236 l/s

A single 37AH Moduline can deliver the duty of several 37AG units. Each unit has four neoprene bellows and one 101.6 mm wide diffuser .

Large open plan areas and areas with very high heat gains will make best use of its high air delivery capacity. Lecture halls, conference centres, open plan offices, department stores etc are all typical applications.

#### 1.4.3 - 37AS



Nominal air flow: 200 m<sup>3</sup>/h - 56 l/s

Air flow range: 69-280 m<sup>3</sup>/h - 19-78 l/s

With a height of only 170 mm this is the smallest unit in the Moduline range. It is used where the false ceiling void is very shallow. Refurbishments and older buildings are typical applications for the 37AS. Its main characteristics are the same as those of the 37AG. With one connection spigot and one stopped end, 37AS units can not be connected in series.

#### 1.4.4 - 37 AHS

Nominal air flow: 324 m<sup>3</sup>/h - 90 l/s

Air flow range: 90-432 m<sup>3</sup>/h - 25-120 l/s

The 37AHS responds to the demands from architects and consulting engineers for a square diffuser with all the features and benefits of its linear Moduline counterparts. The 37AHS diffuser measures 588 x 588 mm.

It has four neoprene bellows and an one way blow diffuser.

## 1.5 - Moduline in false ceilings

- a. All 37 Series Moduline terminals can be integrated into false ceilings with removable tiles.
- b. Moduline terminals, except the 37AHS, can be installed in continuous, uninterrupted, lines or in broken lines according to the type of false ceiling and the orientation of its T-bar members.

### 1.5.1 - Moduline in continuous systems

In these systems the Moduline supply air diffusers, the return air diffusers and dummy units are installed in a continuous line parallel with the false ceiling T-bar members. All units are installed end to end and each one has the same length which must be the same as that of the false ceiling i.e 1200 mm or 1500 mm..

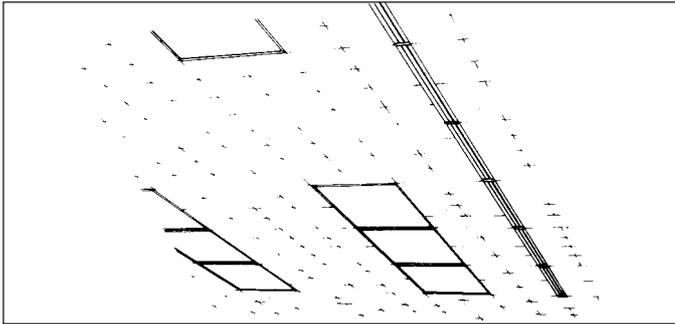


Fig. 2 - Modulines in continuous lines

### 1.5.2 - Discontinuous T-bar systems

With these systems the Moduline supply air diffusers, the return air diffusers and dummy units are installed perpendicular to the false ceiling T-bar members. The ends of the diffusers are separated by the width of the T-bar (25 mm). The length of the diffusers is thus the same as that of the ceiling less 25 mm i.e 1175 mm or 1475 mm.

The diffusers are aligned using, as reference, an accessory T-bar which rests partially within the lateral diffuser and partially upon on the upper side of the T-bar for the false ceiling itself.

### 1.5.3 - Siting air terminals in false ceilings

Moduline air terminals with their outstanding air distribution characteristics and the flexibility of their air flow controls bring incomparable adaptability.

Terminals should, ideally, be installed parallel to a wall and, for two-way discharge units in the centre of the room or, in the case of for one-way discharge, close to the wall.

Neither an adjacent light fitting nor a minor misalignment (less than 15 mm) will affect the performance of the Moduline.

In every case the ceiling module, the location of light fitting and the orientation of the T-bars will determine the layout of the Moduline system.

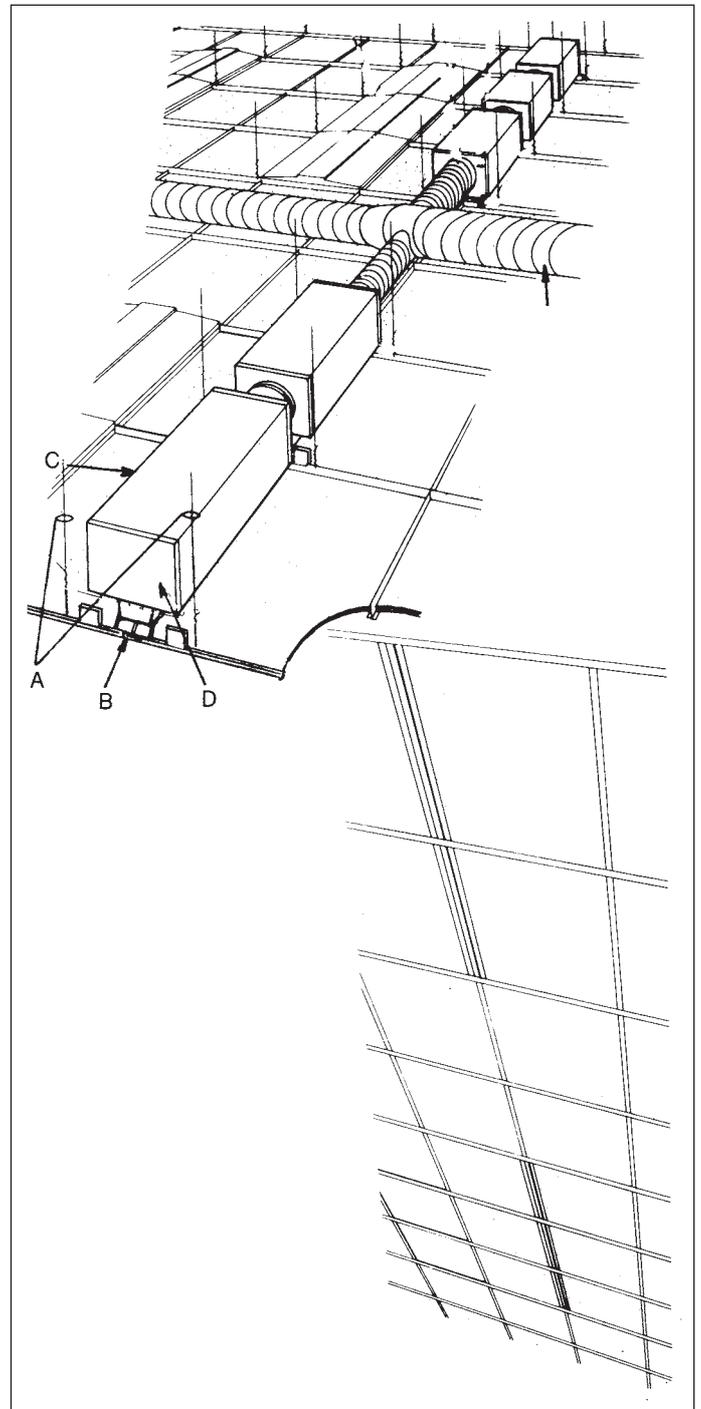


Fig. 3 - Discontinuous Moduline installation

### 1.5.4 - The 37AHS square Moduline in false ceilings

The 37AHS is especially suited to false ceilings with removable tiles. It is designed to take the place of a single 600 x 600 mm ceiling tile. Each single slot diffuser partially covers its corresponding T-bar.

Once installed the diffuser is easily removed. A ceiling tile cut to the inside dimensions of the diffuser restores continuity to the false ceiling as if no unit had been installed

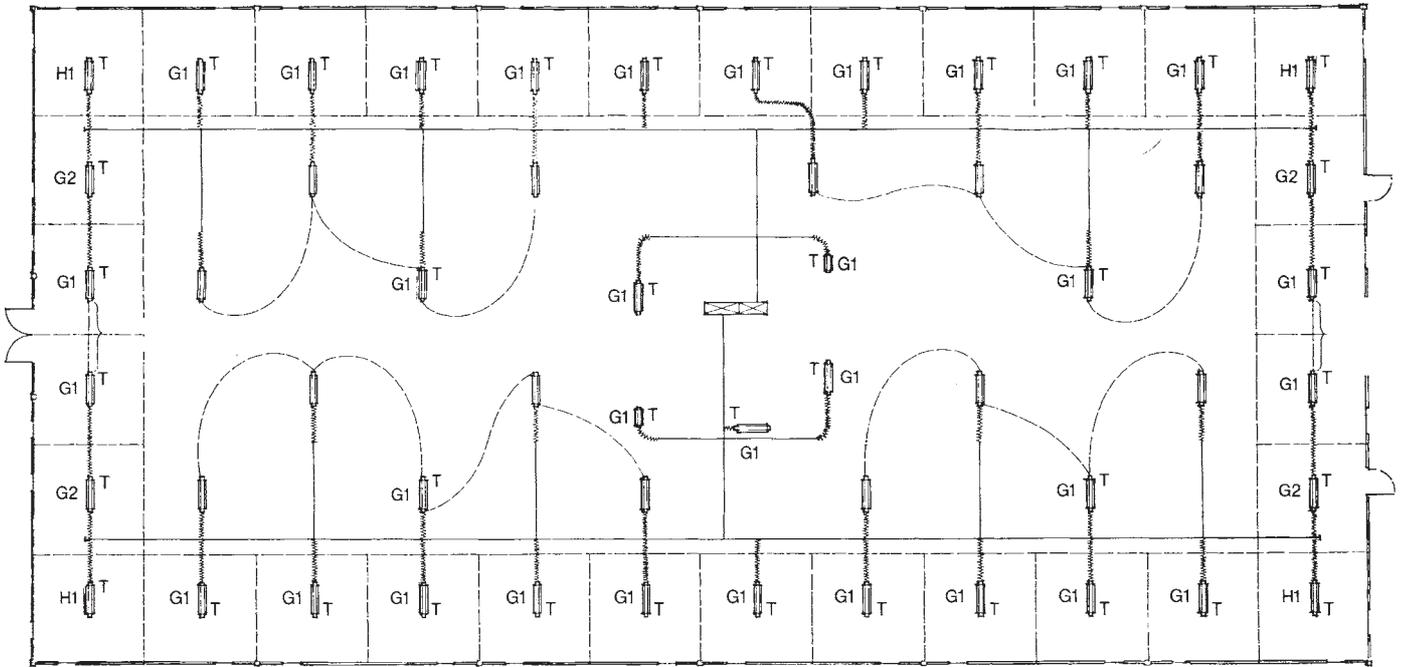


Fig. 4 - Moduline units installed parallel to T-bars in a single storey building

Location	Model	Discharge	Plenum	Adapters	Diffuser length, mm
G-1	37AG 111 203 P	2-way	178	0 x 159	1175
G-2	37AG 121 234 P	2-way	229	159 x 199	1175
H-1	37AH 111 204 P	2-way	229	0 x 199	1175

T thermostats  
 --- bellows connections

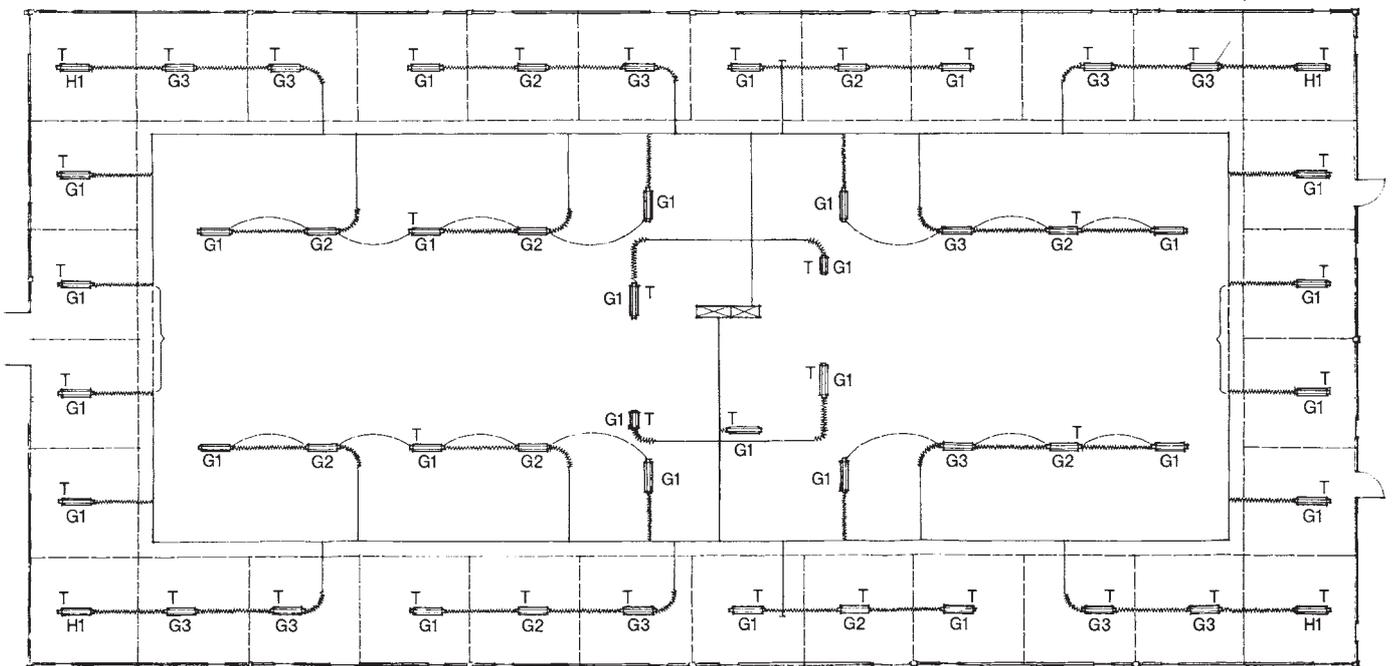


Fig 5. Moduline units installed perpendicular to T-bars in a single storey building

Location	Model	Discharge	Plenum	Adapters	Diffuser length, mm
G-1	37AG 111 203 P	2-way	178	0 x 159	1175
G-2	37AG 121 234 P	2-way	229	159 x 199	1175
G3	37AG 121 244 P	2-way	229	199 x x199	1175
H-1	37AH 111 204 P	2-way	229	0 x 199	1175

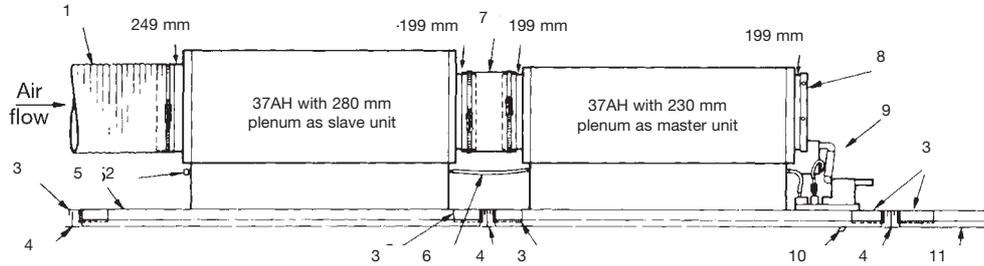
T thermostats  
 --- bellows connections

## 1.6 - Special false ceilings and Moduline

Consult Carrier SA, La Boisse before planning the use of Moduline with any special false ceiling.

## 1.7 - Installing Moduline in false ceilings

### 1.7.1 - In discontinuous T-bars

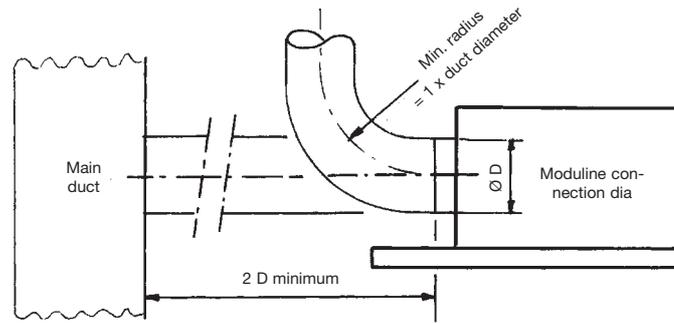


- 1 - On site connection to round duct
- 2 - Bellows connection
- 3 - T-bar hangers and corners
- 4 - T-bar

- 5 - Diffuser baffle
- 6 - Bellows connection tubes
- 7 - Elastomeric sleeve and collars
- 8 - End cap

- 9 - VAV controller assembly
- 10 - Thermostat adjustment lever
- 11 - 37AH return air diffuser

### 1.7.2 - Recommended length and bend radius for flexible air ducts



## 1.8 - Connecting Modulines in series. Sizing supply air ducts

With the exception of the 37AS model, Moduline air terminals have connection spigots at each end making it easy to connect them end to end, in series, and to simplify the air duct system. The size of both the air duct and the plenum on each Moduline is determined by the volume of air to be supplied to each unit. The table below gives examples of systems connected in

series.

The total pressure drop for each of these examples does not exceed 25 Pa and each assumes that a flexible duct 150 mm long connects adjacent units. When longer flexible ducts are used, the pressure drop must be increased proportionally. For economy, flexible ducts will not be used in lengths greater than 1200 mm.

**Note :**

**37AS units which all have one end cap can not be connected in series.**

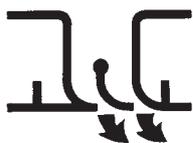
No of units supplied	Supply duct diameter mm	Maximum air flow		DUCTS AND PLENUM SIZES
		l/s	m <sup>3</sup> /h	
1	159	200	720	
2	199	310	1120	
3	199	310	1120	
4	249	485	1750	
5	249	485	1750	

37AG units in series

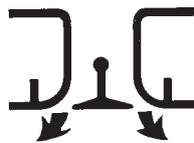
1	199	310	1120	
2	249	485	1750	
3	249	485	1750	
4	249	485	1750	

37AH units in ser

## 1.9 - Types of air discharge



One-way blow



Two-way blow

### 1.9.1 - One-way blow - OWB

Used where units are installed close to walls. The air is blown away from the wall so that irritating drafts are not created.

### 1.9.2 - Two-way blow - TWB

Two-way blow enables a single unit to serve a wider area. All units except the 37AHS are available with two-way blow.

The high induction rates with two-way blow give very good air circulation throughout the room and consistent overall air temperature.

Models AG, AH and AS are all available with for both one-way and two-way blow

One-way blow units can not be reversed to hand the air discharge on site. The 37AHS has one-way discharge on each of its four sides.

### 1.9.3 - Discharge sense

The sense of the air discharge is described from the point of view of an observer on the control end of the unit looking up at the unit installed in a false ceiling. For all units the inlet spigot is at the end of the unit opposite to the control end. The location of the controls is shown in the dimensional drawings for each unit.

### 1.9.4 - Moduline shutoff rates

When designing VAV installations the shutoff rates of all units (thermostat closed) must be taken into account. Maximum values are given for each type of unit.

The leakage rate given for each Moduline model is achieved after several hours of operation

**WARNING :**

**The shutoff rate must never be taken as the minimum permissible constant air flow for ventilation purposes. When a Moduline is shut down for a period, depending upon the type of unit, the shutoff rate will tend to decrease.**

## 1.10 - Upstream air quality

### Air filters

The standard 50 mm air filters built into central station air handlers may be of either the throwaway type or the permanent, washable type. Automatic roll filters, which are virtually maintenance free, are also frequently used in air conditioning applications.

In order to prevent any fouling of the ceiling and to keep the cost of cleaning furniture, repainting etc to a minimum, the efficiency of the filter medium must be based upon a standard (storage capacity) NBS (NBS - opacimetric) minimum of 85%. For optimum performance a dust test efficiency greater than 85% is recommended. The quality of the air outside must always be taken into account. In industrial and metropolitan areas the higher degree of airborne pollution will make higher efficiency filters, with higher storage capacity, necessary. Filters with extended surface areas and high storage capacities will be most effective and allow a normal maintenance programme to be followed. Pleated filters, bag filters and pocket filters all fulfil these criteria.

For long life, a costly, high efficiency, high dust test rated filter must be preceded in the air stream by a pre-filter to remove large particle pollutants.

Electrostatic or electronic ionisation filters, of the types which have neither oiled surfaces nor adhesive dust gathering films, may also be used provided their correct periodic maintenance can be assured. Neither of these types, nor the viscous liquid types with dampened membranes (pre-filters included) is recommended for secondary air conditioning duty. They become inefficient at low air flows and the fluids used can encourage the deposition of dust within the air terminals with possibly serious degradation of their performance.

With high efficiency pleated filters the difference in pressure drop between the initial (new) and the final conditions (generally recommended by the manufacturer) can be as much as 25.4 mm H<sub>2</sub>O. All secondary air terminal devices can tolerate this variation in static pressure and operate efficiently without showing any degradation in performance.

The pressure drop in the secondary air distribution system must be calculated using the final pressure drop through the filter.

New, or cleaned, filters have a very low initial resistance which will show as a relatively high air flow. The control systems in Variable Air Volume (VAV) terminals keep the air flow into each room at the level needed to maintain the desired conditions under all conditions.

A pressure regulator, in the secondary supply air duct, will prevent an excessive build up of static pressure in the duct enabling the speed of the fan in the central air handler to be reduced to save power.

With Moduline units in the primary air system, the same optimum operating conditions will persist for the same length of time because the controls in the terminals will keep the air flow rate constant however the pressure in the distribution ducts changes. A static pressure regulator in the primary supply air duct is again recommended to prevent an excessive build up of static pressure in the primary air terminals. This will also help to keep the noise in the terminals at acceptable levels.

Adoption of the primary air system implies acceptance that filter maintenance, or replacement, will be more frequent than with the secondary air system. This is because the primary air filters are exposed 24 hours a day to a continuous, constant incoming air flow. The secondary filters will normally handle an air flow for no more than 12 hours a day.

### 1.11 - Moduline unit storage

#### *note :*

*When receiving a shipment of any number of units, check at once that none of the packages has been damaged. To maintain the protection of the packaging as long as possible, do not open any package until just before a unit is to be installed.*

#### *warning :*

*Failure to take proper account of the above advice which result in damage to a unit will render the warranty on the product void. In case of difficulty, call Carrier.*

The Moduline units must be stored in a room where the temperature is higher than 5°C, in order to prevent deterioration of the bellows.

## 2 - AIR THROW

The air stream moves horizontally beneath the false ceiling inducing more air from the room as it does so. This creates a slowly moving upward movement of the whole mass of air and creates a sensibly consistent air temperature throughout the room.

Temperature differences up to 14°C between the supply air and the room air temperature can therefore be accepted with no adverse effect upon the comfort of the occupants.

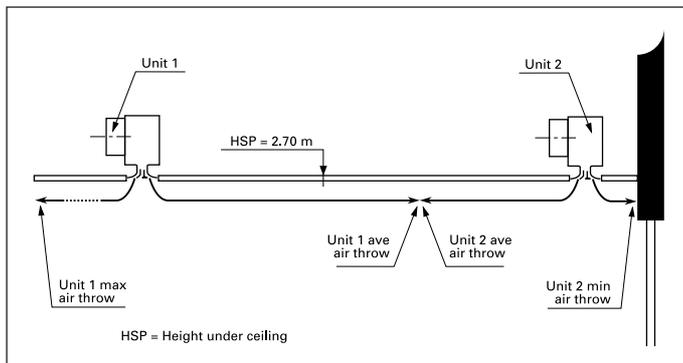
Their high efficiency diffusers enable Moduline units to be integrated into special ceilings such as those with pyramidal modules, open lattices, false beams etc and even in areas with conventional ceilings.

The air throw data given refer to a flat continuous false ceiling. The profile of the diffuser ensures that the supply air mixes instantly with air induced from the room as it leaves the diffuser slot. Air throws depend upon the air flow rate and not upon the pressure in the supply air duct. They reduce by 0.1 m for each 0.1 m increase in the height of the false ceiling and vice versa.

### 2.1 - Using the air throw curves

- Minimum air throw : minimum distance between a diffuser and a wall or partition.
- Maximum air throw : maximum length of the air stream from the Moduline.
- Average air throw : minimum length of the air stream when two Moduline units discharge towards each other.

### 2.2 - Example



*Air throw definitions*

In the following example, it is assumed that for 2 rows of 37AG units, units of row 1 each supply 220 m<sup>3</sup>/h (61 l/s) and units of row 2 each 150 m<sup>3</sup>/h (42 l/s).

According to the graphs page 15, we can determine : the minimum distance between row 2 and a wall, the distance to observe between the 2 rows of units, and the maximum air throw of the row 1.

**Unit 1 - air flow 220 m<sup>3</sup>/h - 61 l/s**  
 Min air throw 1.70 m  
 Max air throw 4.40 m  
 Ave air throw 3.05 m

**Unit 2 - air flow 150 m<sup>3</sup>/h - 42 l/s**  
 Min air throw 1.00 m  
 Max air throw 2.75 m  
 Ave air throw 1.87 m

**Distance between units 1 and 2**  
 3.05 + 1.87 = 4.92 m

**Distance between unit 2 and partition**

Min air throw 1.00 m

**Max area covered by unit 1**

Max air throw : 4.40 m

## 3 - SOUND LEVELS

Several factors contribute to the sound level within a room:

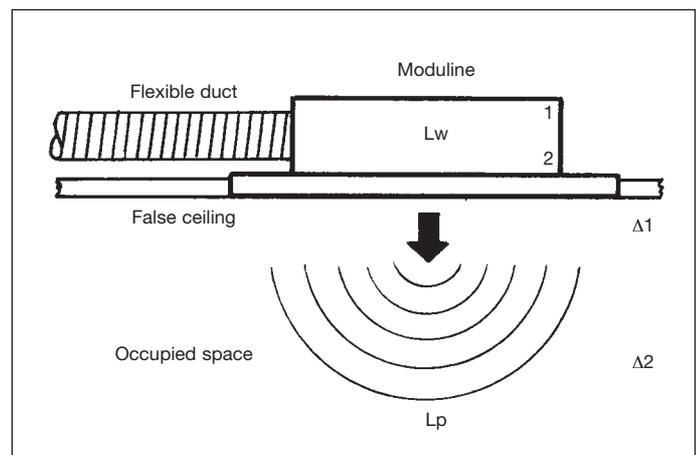
- the sound power level (L<sub>w</sub>) of the air terminal
- the acoustic attenuation of false ceiling
- the phonic absorption of the room
- distribution of the air terminals

From these parameters we can calculate the acoustic pressure within a room equipped with Moduline terminals, for which the flow rate and operating pressure are known and determined by the characteristics of the room.

### 3.1 - Radiated noise L<sub>p1</sub> = (1)-Δ1-Δ2

There are no moving parts within a Moduline air terminal and since its interior is lined throughout with 13 mm glass fibre insulation its radiated noise will be so low that it can be considered as negligible.

### 3.2 - Transmitted noise L<sub>p2</sub> = (2)-Δ2



Transmitted noise comprises :

- a) Noise produced by the expansion of the air over the bellows attenuated by the glass fibre in the diffuser throat.
- b) Noise produced by the diffuser. Refer to the table of sound power following. The values increase as the flow rate and pressure increase, and vice versa, and are added to the background sound level in the room.

## 4 - SELECTION GUIDE

### 4.1 - INTRODUCTION

#### Essential data :

- Room dimensions
- Specified or required noise level
- Room design temperature
- Heat gains and losses
- Room attenuation

#### To be determined :

- Number of terminals needed
- Types of terminals to be used
- Air flow for each terminal
- Air throw for each unit
- Minimum operating pressure required
- Supply air duct diameter
- Length of each diffuser
- Locations of the controls and of each unit

#### Constraints imposed by the false ceiling :

- Dimensions of the module
- Shape of the module
- Ceiling height
- Accessibility
- Lighting location

#### And :

- Distances between walls and terminals

### 4.2 - Selection procedure

#### 1. Use the parameters below to determine the air flow needed :

- Heat gains and losses
- Design room temperature
- Supply air temperature

#### 2. Determine the type of terminals to be used according to these criteria :

- Air flow from each unit
- Required sound level (as a function of minimum and maximum operating pressure)

#### 3. Define :

- The type of false ceiling (space available, module, shape)
- Orientation of T-bars
- Lighting location

#### 4. Confirm compatibility of max and min air throws, and distances to partitions.

When taking air throw data from the diagrams take into account also the minimum operating pressure required.

##### 4.1 - When compatibility is achieved :

- Determine the diameter of the supply air duct and its type rigid or flexible.
- Decide upon the position of controls and connections.
- Select the accessories needed for installing the units in the false ceiling
- Code the selected units

#### 4.2 - If compatibility is not found :

- Find a compromise between the air throws and the sound level by changing either :
  - the supply air temperature, or
  - the number of units or their type (AG for AH or AH for AG)
- Return to Step 2 if the type of unit is changed
- Go to Step 4.1 if there is no change of unit type
- For special applications contact your local Carrier representative.

### 4.3 - Selection example

#### 37AG

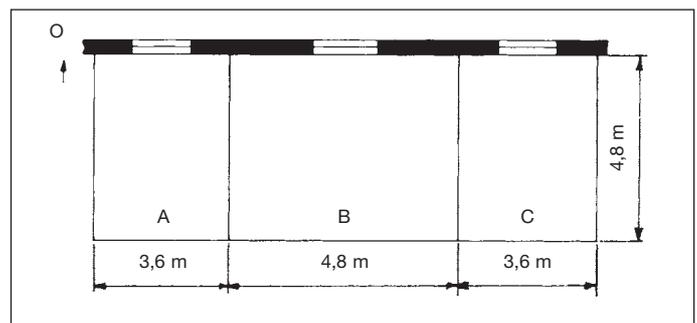
Application : 3 individual rooms A,B,C with a westerly exposure.

Sensible heat load :

Rooms A and C .....	740 W
Room B .....	1850 W
Supply air temperature Tsa .....	10°C
Design room temperature Trm .....	24 °C
Required room noise level Lp .....	NC 35
Room attenuation Lw-Lp .....	4 dB at 500 Hz

#### 1. Calculate the air flow for each room using the formula

#### 2. Determine the acceptable air flow for an office in relation to NC 35 for an office



Refer to the Sound level data for 37AG Moduline units.

$$\text{Air flow l/s} = \frac{\text{Sensible load W}}{1,214 (T_{rm} - T_{sa})}$$

$$\text{For rooms A and C} = \frac{740}{1,214 \times 14} = 44 \text{ l/s}$$

$$\text{For room B} = \frac{1850}{1,214 \times 14} = 109 \text{ l/s}$$

For NC 35 sound level and 4 dB room attenuation, the recommended air flow for each unit is 57 l/s with a maximum operating pressure of 750 Pa.

#### 3. Determine the number of units needed. Divide the required air flow by the recommended air flow for each unit

Rooms A and C 44/57 hence use 1 37AG unit in each room.

Room B 109/57 = 1.91 hence use 2 37AG units.

**4. Calculate the air flow for each unit**

$$\text{Air flow per unit l/s} = \frac{\text{Total room air supply}}{\text{Number of units}}$$

For rooms A and C : 44/1 = 44 l/s

For room B : 109/2 = 55 l/s

**5. Verify unit air throws and positions**

Terminal locations must co-ordinate with the lighting and, most important, their dimensions must also co-ordinate with the ceiling module. The units can be arranged along an axis parallel to the front wall of the three rooms. Refer to Moduline in false ceilings page 6. Refer to the 37AG Moduline air throw curves on page 17. The required air throw must fall between the minimum and maximum indexes on the curve. If it does not, there are several possible solutions :

- Increase the number of units to reduce the air flow, and hence the air throw, required of each one.
- Change the supply air temperature and hence the air supply needed to maintain the design room temperature. Reducing the air temperature reduces the air flow required and hence the air throw and noise also reduce. Confirm that the reduced air flow is environmentally acceptable.
- Select higher capacity units (AH in place of AG) and rework the selection from step 2. It is likely that fewer units will be needed.

From the air throw curve read the minimum operating pres-

sure.

**6. Select the connection spigot sizes**

Refer to the table on page 9 where the data for every possible series combination and the maximum allowable air flow for each unit are given.

**For the first unit :**

le débit d'air à l'entrée est égal à la somme des The entering air flow is the sum of the air flows of all other units in the series :  
 44 + 55 + 55 + 44 = 198 l/s

The table shows that a 159 mm connection spigot allows a maximum air flow of 200 l/s. All units, with the exception of the last, can therefore have a 159 mm connection spigot at each end. The last unit will have a 159 mm inlet spigot (the smallest available for the 37AG) and an end cap factory fitted. All plenums will be 180 x 180 mm.

**For the second unit**

The entering air flow will be: 55 + 55 + 44 = 154 l/s requiring again a 159 mm connection spigot and so on to the last unit as before.

**7. Location and connection of the VAV control**

The control should, if possible be about halfway between the master and the most distant slave. For room B, the first unit will be the master and the control will be halfway between the two units. Rooms A and C will each have their own control. Three VAV control kits Part No. 37AG 900 062 C will be needed.

Slim flexible tubing connects slave units to the master control. Order Part No. 37AE 900 592 C (30 m per roll).

**8. Accessories**

Dummy diffusers and return air diffusers may be installed to give symmetry and a neat overall appearance to an installation.

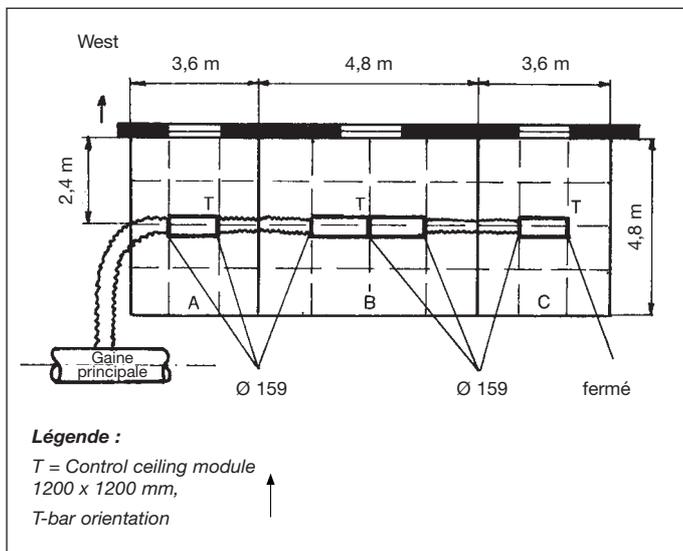
Air diffusers used in this way slightly depressurises the ceiling void which becomes the return air plenum. Return air diffusers have the same physical characteristics as their supply terminal equivalents. Depending on the type of ceiling (continuous or modular), alignment hanger angles or ceiling supports in tee-bars will be used to achieve a perfect alignment.

**9. Coding**

For a 1200 x 1200 mm false ceiling module with discontinuous diffusers (T-bars at each end of every diffuser) the units selected in the example will be coded as follows :

3 No. Moduline 37AG 11 12 33P with 1175 mm diffuser and a 159 mm connection spigot at each end.

1 No. Moduline 37AG 11 12 03P with 1175 mm diffuser one 159 mm connection spigot and one end cap.



Locations of the four 37AG terminals

## 5 - PHYSICAL AND PERFORMANCE DATA

### 5.1 - 37AG Moduline with 900 mm active length

#### 5.1.1 - General data

- Nominal air flow 200 m<sup>3</sup>/h - 56 l/s
- Maximum units per controller: 8
- Air flow at shutoff: 41 m<sup>3</sup>/h - 11 l/s ± 3 l/s
- Access to controls for maintenance: through false ceiling

Nominal plenum height	mm	180	230	280
Overall height of unit	mm	327	378	428
Supply connection spigot	Ø mm	159	199	249
Inlet maximum air flow	m <sup>3</sup> /h	720	1120	1750
Inlet maximum air flow	l/s	200	311	486
Weight*	kg	10	12	16

\* With 1200 mm diffuser unpacked



#### 5.1.2 - Physical data and dimensions

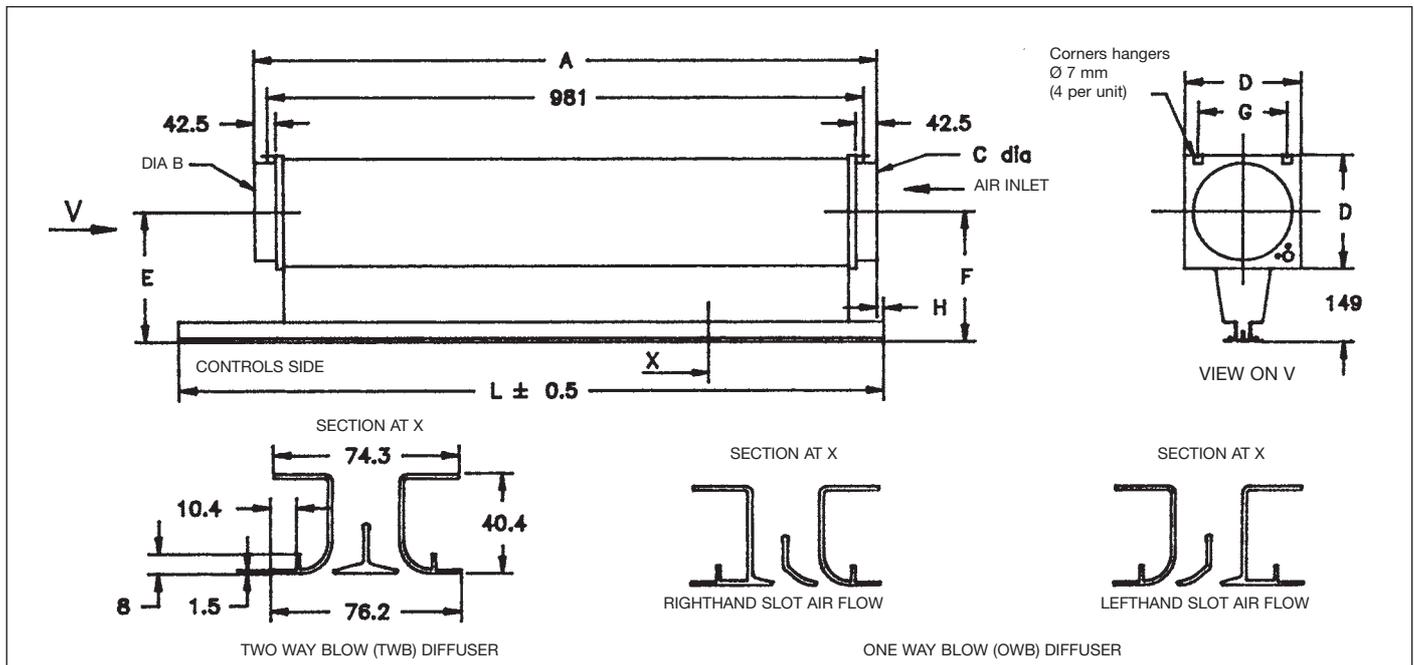
	size plenum	A	B	C	D	E	F	G	H	L
Diffuser : Nominal length = 1200 mm Plenum : Active length = 900 mm	178x178	991.5*	EC - 159	159	181.5	244.5	244.5	127	1	1175
	229x229	1034	EC - 159 - 199	199	232.5	265.5	265.5	178		
	279x279	1034	199 - 249	249	282.5	290.5	290.5	228	13.5	1200
Diffuser : Nominal length = 1500 mm Plenum : Active length = 900 mm	178x178	991.5*	EC - 159	159	181.5	244.5	244.5	127	153	1475
	229x229	1034	EC - 159 - 199	199	232.5	265.5	265.5	178		
	279x279	1034	199 - 249	249	282.5	290.5	290.5	228		1500

\* A refers to a unit with end cap

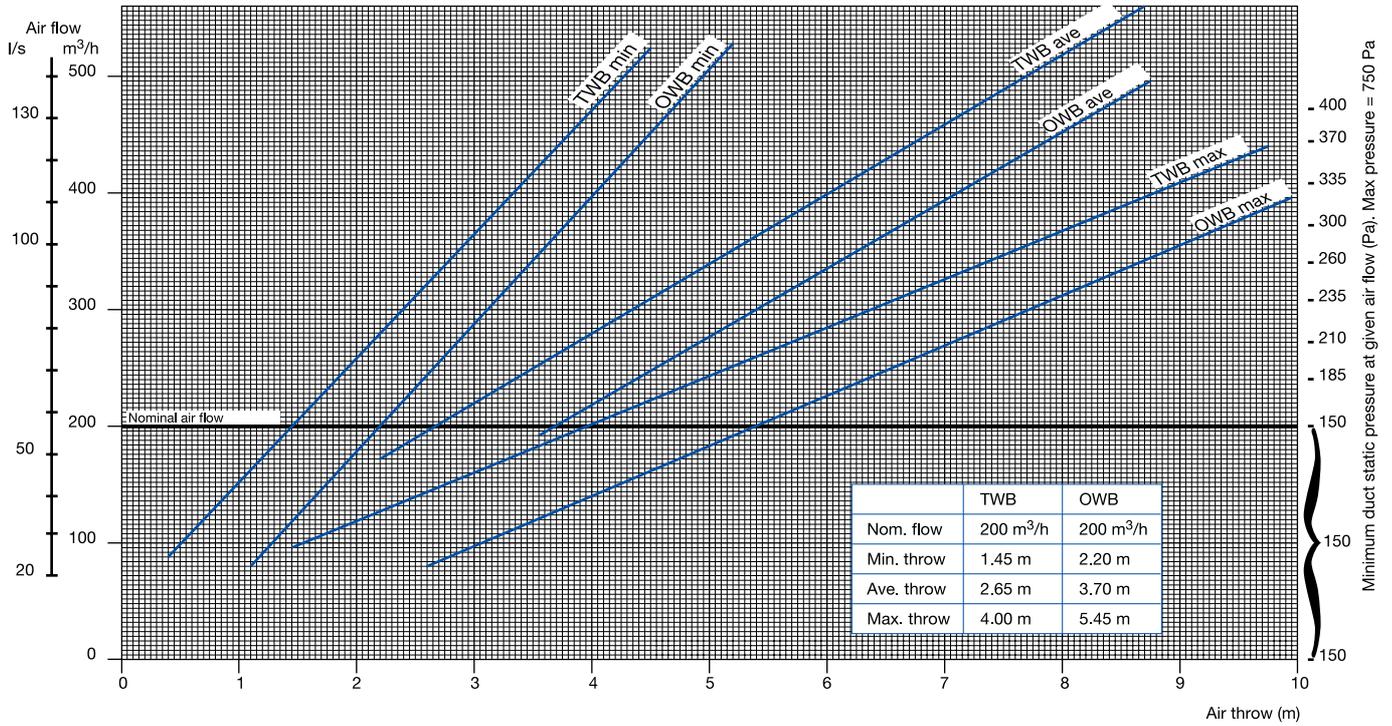
EC : End Cap

#### NOTE:

Les viroles Ø 159 mm sont également disponibles en Ø 149 mm, le débit d'air maxi d'alimentation est alors de 630 m<sup>3</sup>/h, 175 l/s.



### 5.1.3 - 37AG air throw - 900 mm active length



### 5.1.4 - Sound power level 37AG with 900 mm active length

Air flow l/s      m <sup>3</sup> /h		Operating pressure Pa      mm CE		Sound power (dB at 10 <sup>-12</sup> W) Octave band centre frequency (Hz)						NC (2)	
				125	250	500	1000	2000	4000		8000
19	70	250	25	35	28	24	20	16	14	14	16
		375	38	36	30	26	22	20	18	19	18
		500	50	36	32	28	25	24	24	21	20
		750	75	37	36	32	28	27	27	27	23
38	135	250	25	41	34	33	28	26	23	18	25
		375	38	41	36	36	30	28	26	23	28
		500	50	42	39	37	31	30	28	27	29
		750	75	43	42	38	32	32	30	32	30
57	200	250	25	44	43	41	35	33	26	21	34
		375	38	45	44	42	36	34	29	26	35
		500	50	45	45	43	37	35	31	31	35
		750	75	46	48	44	38	36	33	35	36
76	270	250	25	46	46	46	40	37	29	22	39
		375	38	47	48	47	41	38	33	26	40
		500	50	48	50	47	42	40	36	30	40
		750	75	49	53	48	43	41	37	35	41
94	340	250	25	46	49	49	44	41	34	24	41
		375	38	49	51	50	45	42	37	31	42
		500	50	50	53	51	46	43	39	36	43
		750	75	51	55	52	47	44	40	42	44
113	410	375	38	52	53	53	48	45	40	33	45
		500	50	53	55	54	49	46	42	37	46
		750	75	54	57	55	50	48	44	42	47

**Legend :**

- 1) Based upon tests according to ASHRAE 36B-63 with standard air and an ASHRAE sound reference source with no local interference.
- 2) NC with a room attenuation of 4 dB at 500 Hz.

### 5.1.5 - Atténuation acoustique du plénum (dB)

	Octave band centre frequency (Hz)						
	125	250	500	1000	2000	4000	8000
Moduline 37AG	10	11	16.5	25	32	35.5	38

## 5.2 - 37AG Moduline with 1200 mm active length

### 5.2.1 - General data

- Nominal air flow 266 m<sup>3</sup>/h - 76 l/s
- Maximum units per controller : 8
- Air flow at shutoff : 50 m<sup>3</sup>/h - 13 l/s ± 4 l/s
- Access to controls for maintenance : through false ceiling



Nominal plenum height	mm	180	230	280
Overall height of unit	mm	327	378	428
Supply connection spigot	Ø mm	159	199	249
Inlet maximum air flow	m <sup>3</sup> /h	720	1120	1750
Inlet maximum air flow	l/s	200	311	486
Weight*	kg	12	15	19

\* With 1200 mm diffuser unpacked

### 5.2.2 - Physical data and dimensions

	size plenum	A	B	C	D	E	F	G	H	L
Diffuser : Nominal length = 1500 mm	178x178	1288*	EC - 159	159	181.5	244.5	244.5	127	195.5 - 153**	1475
Plenum :	229x229	1330.5	EC - 159 - 199	199	232.5	265.5	265.5	178		
Active length = 1200 mm	279x279	1330.5	199 - 249	249	282.5	290.5	290.5	228		

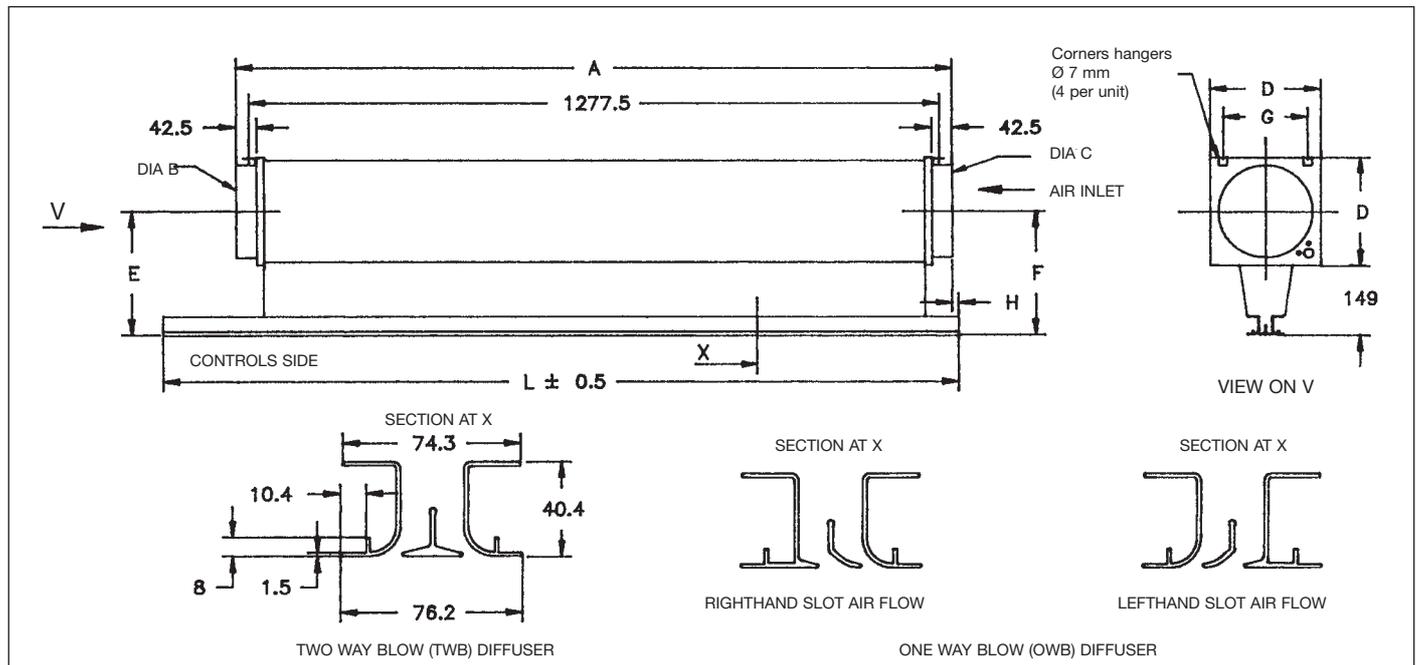
\* A refers to a unit with end cap

\*\* H refers to a unit with end cap

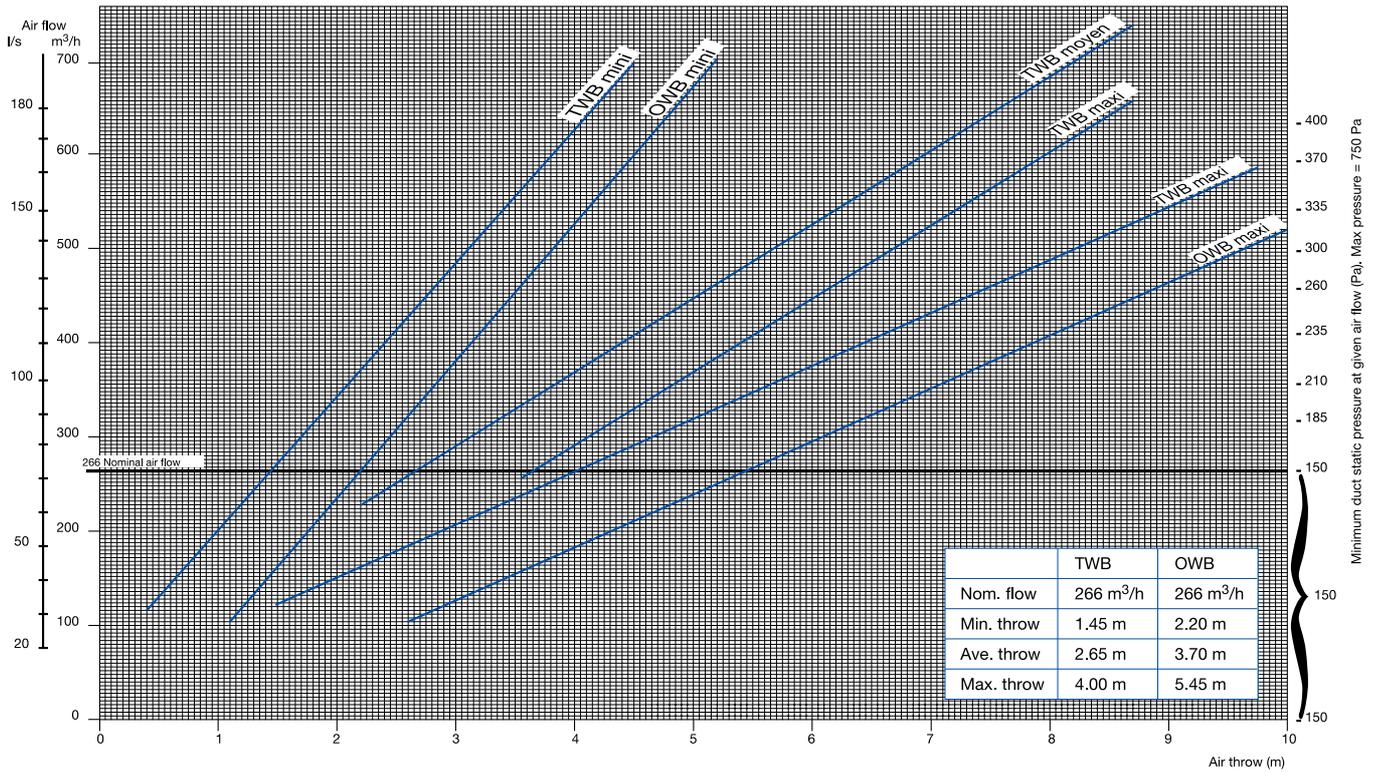
EC : End Cap

#### NOTE :

159 mm dia connection spigot are also available as 149 mm dia spigots when the maximum air flow becomes 630 m<sup>3</sup>/h - 175 l/s.



### 5.2.3 - 37AG air throw - 1200 mm active length



### 5.2.4 - Sound power level 37AG with 1200 mm active length

Air flow l/s m³/h	Operating pressure		Sound power (dB at 10 <sup>-12</sup> W) Octave band centre frequency (Hz)								NC (2)
	Pa	mm CE	125	250	500	1000	2000	4000	8000		
25 93	250	25	35	28	24	20	16	14	14	16	
	375	38	35	30	26	22	20	18	19	18	
	500	50	36	32	28	25	24	24	21	20	
	750	75	37	36	32	28	27	27	27	23	
51 180	250	25	41	34	33	28	26	23	18	25	
	375	38	41	36	36	30	28	26	23	28	
	500	50	42	39	37	31	30	28	27	29	
	750	75	43	42	38	32	32	30	32	30	
76 266	250	25	44	43	41	35	33	26	21	34	
	375	38	45	44	42	36	34	29	26	35	
	500	50	45	45	43	37	35	31	31	35	
	750	75	46	48	44	38	36	33	35	36	
101 359	250	25	46	46	46	40	37	29	22	39	
	375	38	47	48	47	41	38	33	26	40	
	500	50	48	50	47	42	40	36	30	40	
	750	75	49	53	48	43	41	37	35	41	
125 452	250	25	46	49	49	44	41	34	24	41	
	375	38	49	51	50	45	42	37	31	42	
	500	50	50	53	51	46	43	39	36	43	
	750	75	51	55	52	47	44	40	42	44	
150 545	375	38	52	53	53	48	45	40	33	45	
	500	50	53	55	54	49	46	42	37	46	
	750	75	54	57	55	50	48	44	42	47	

**Legend :**

- (1) Based upon tests according to ASHRAE 36B-63 with standard air and an ASHRAE sound reference source with no local interference.
- (2) NC with a room attenuation of 4 dB at 500 Hz.

### 5.2.5 - Plenum acoustic attenuation (dB)

	Octave band centre frequency (Hz)						
	125	250	500	1000	2000	4000	8000
Moduline 37AG	10	11	16.5	25	32	35.5	38

### 5.3 - 37AS Moduline

#### 5.3.1 - General data

- Nominal air flow 200 m<sup>3</sup>/h - 56 l/s
- Not connectible in series
- Air flow at shutoff: 41 m<sup>3</sup>/h - 11 l/s ± 3 l/s
- Access to controls for maintenance: through false ceiling

Nominal plenum height	mm	127
Overall height of unit	mm	170
Supply connection spigot	Ø mm	99
Inlet maximum air flow	m <sup>3</sup> /h	280
Inlet maximum air flow	l/s	78
Weight*	kg	11.5



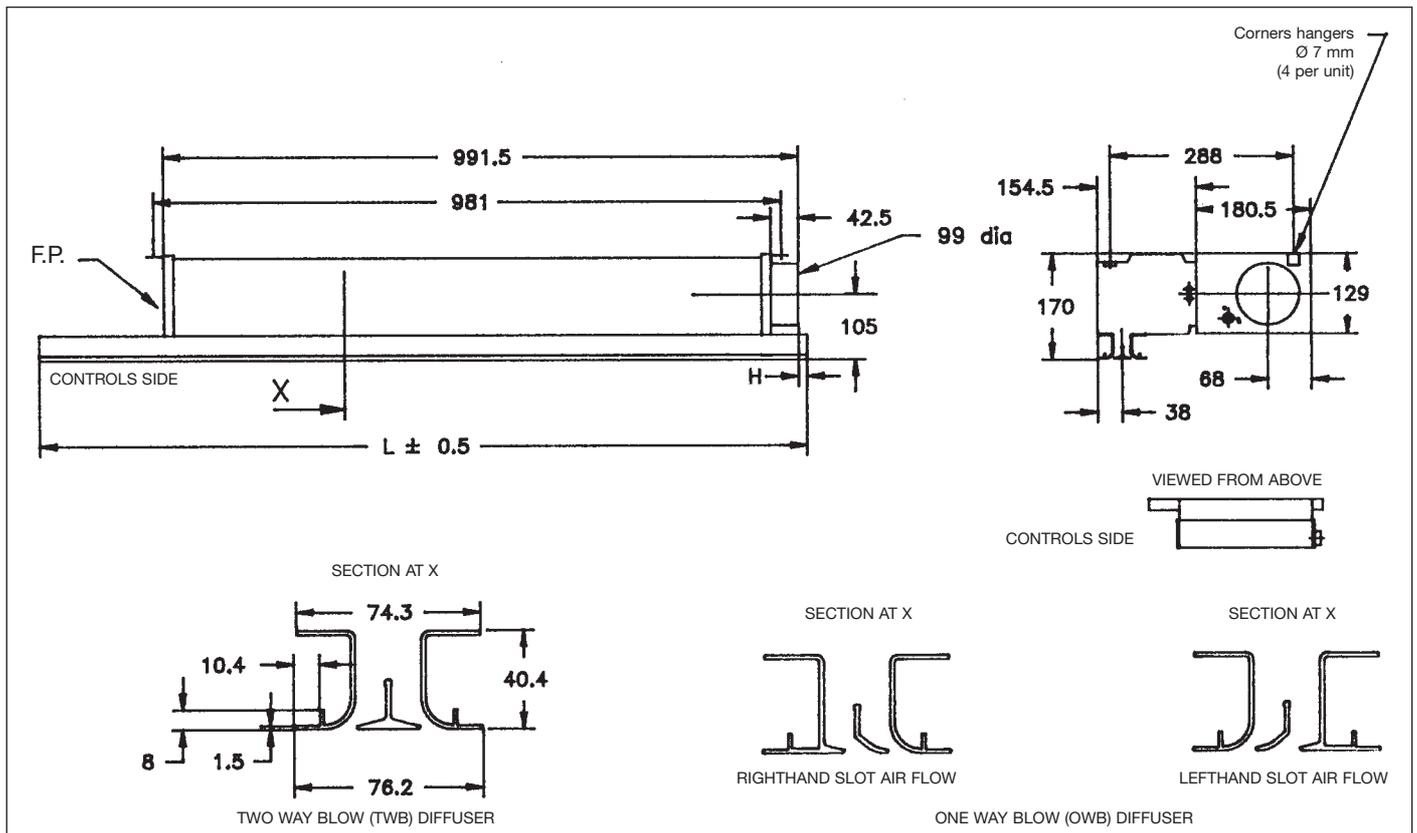
\* With 1200 mm diffuser unpacked

#### 5.3.2 - Physical data and dimensions

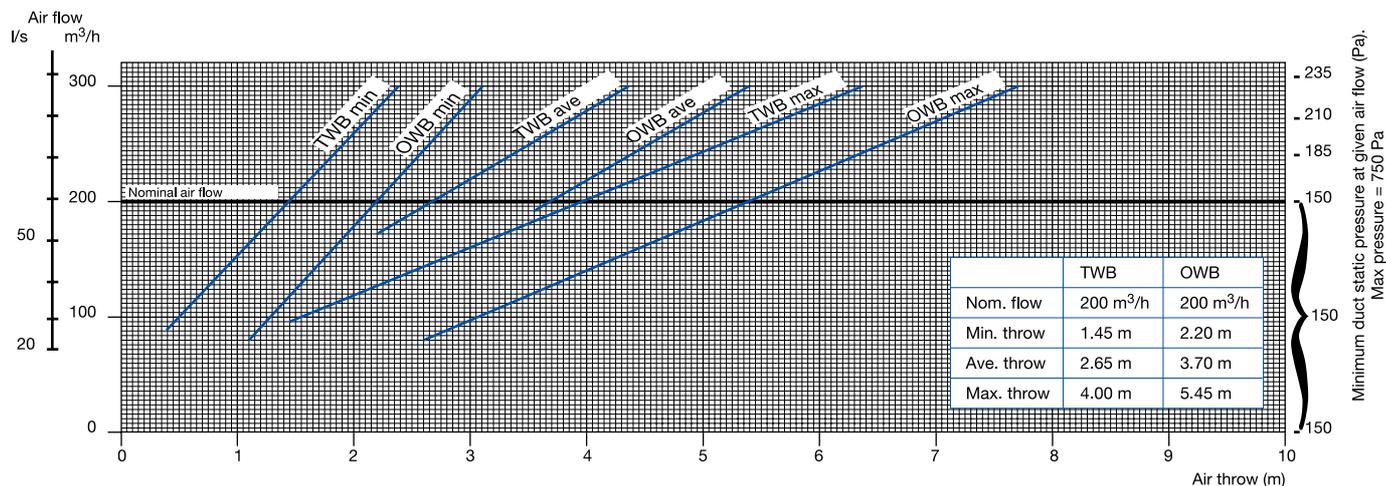
	Size plenum	H	L
Diffuser : Nominal length = 1200 mm Plenum : Active length = 900 mm	127x178	13.5	1200
Diffuser : Nominal length = 1500 mm Plenum : Active length = 900 mm	127x178	153	1500

#### NOTE :

159 mm dia connection spigot are also available as 149 mm dia spigots when the maximum air flow becomes 630 m<sup>3</sup>/h - 175 l/s.



### 5.3.3 - 37AS air throw



### 5.3.4 - Sound power level 37AG with 1200 mm active length

Air flow l/s	Air flow m <sup>3</sup> /h	Operating pressure		Sound power (dB at 10 <sup>-12</sup> W) Octave band centre frequency (Hz)							NC (2)
		Pa	mm CE	125	250	500	1000	2000	4000	8000	
19	70	250	25	35	28	24	20	16	14	14	16
		375	38	36	30	26	22	20	18	19	18
		500	50	36	32	28	25	24	24	21	20
		750	75	37	36	32	28	27	27	27	23
38	135	250	25	41	34	33	28	26	23	18	25
		375	38	41	36	36	30	28	26	23	28
		500	50	42	39	37	31	30	28	27	29
		750	75	43	42	38	32	32	30	32	30
57	200	250	25	44	43	41	35	33	26	21	34
		375	38	45	44	42	36	34	29	26	35
		500	50	45	45	43	37	35	31	31	35
		750	75	46	48	44	38	36	33	35	36
76	280	250	25	46	46	46	40	37	29	22	39
		375	38	47	48	47	41	38	33	26	40
		500	50	48	50	47	42	40	36	30	40
		750	75	49	53	48	43	41	37	35	41

**Legend :**

- (1) Based upon tests according to ASHRAE 36B-63 with standard air and an ASHRAE sound reference source with no local interference.
- (2) NC with a room attenuation of 4 dB at 500 Hz.

### 5.3.5 - Plenum acoustic attenuation (dB)

	Octave band centre frequency (Hz)						
	125	250	500	1000	2000	4000	8000
Moduline 37AS	10	11	16.5	25	32	35.5	38

## 5.4 - 37AH Moduline

### 5.4.1 - General data

- Nominal air flow 350 m<sup>3</sup>/h - 97 l/s
- Max number of units per controller: 4
- Air flow at shutoff: 68 m<sup>3</sup>/h - 19 l/s ± 5 l/s
- Access to controls for maintenance: through false ceiling



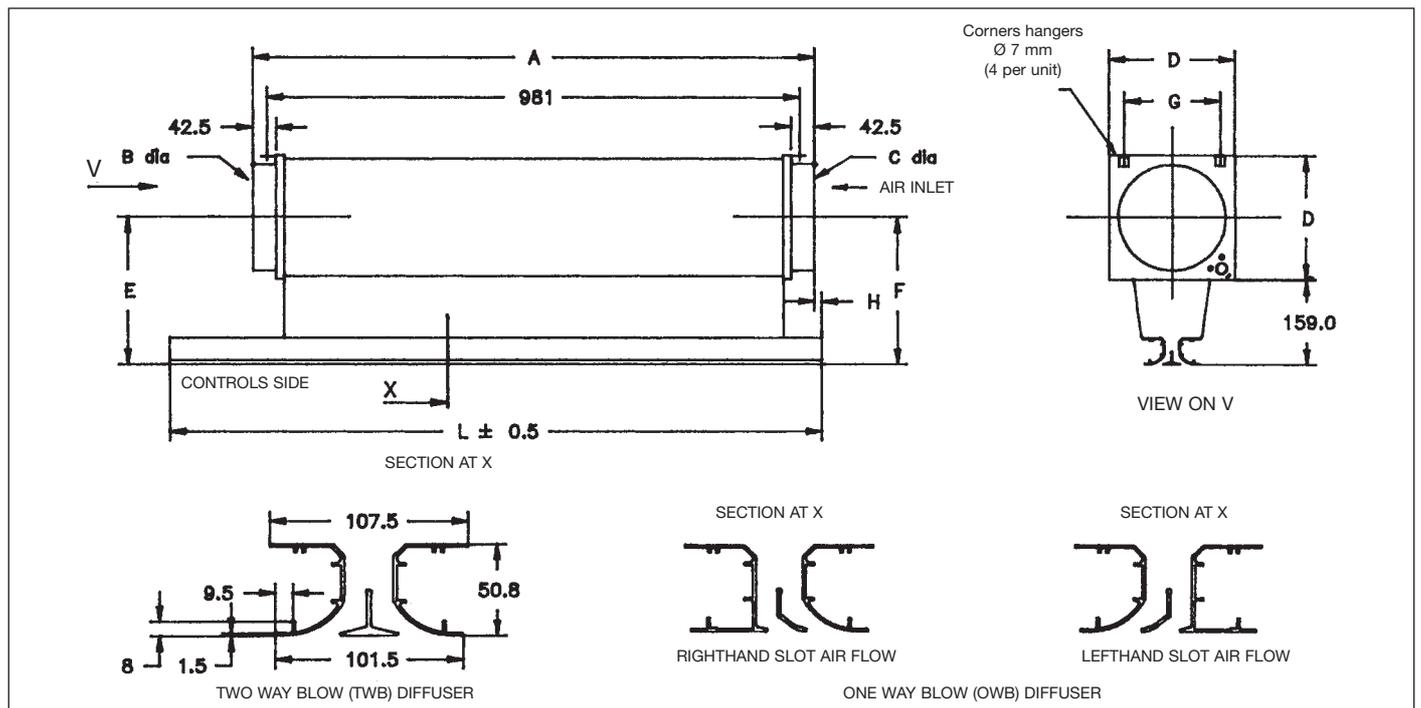
Nominal plenum height	mm	230	280
Overall height of unit	mm	388	438
Supply connection spigot	Ø mm	199	249
Inlet maximum air flow	m <sup>3</sup> /h	1120	1750
Inlet maximum air flow	l/s	311	486
Weight*	kg	15	16

\* With 1200 mm diffuser unpacked

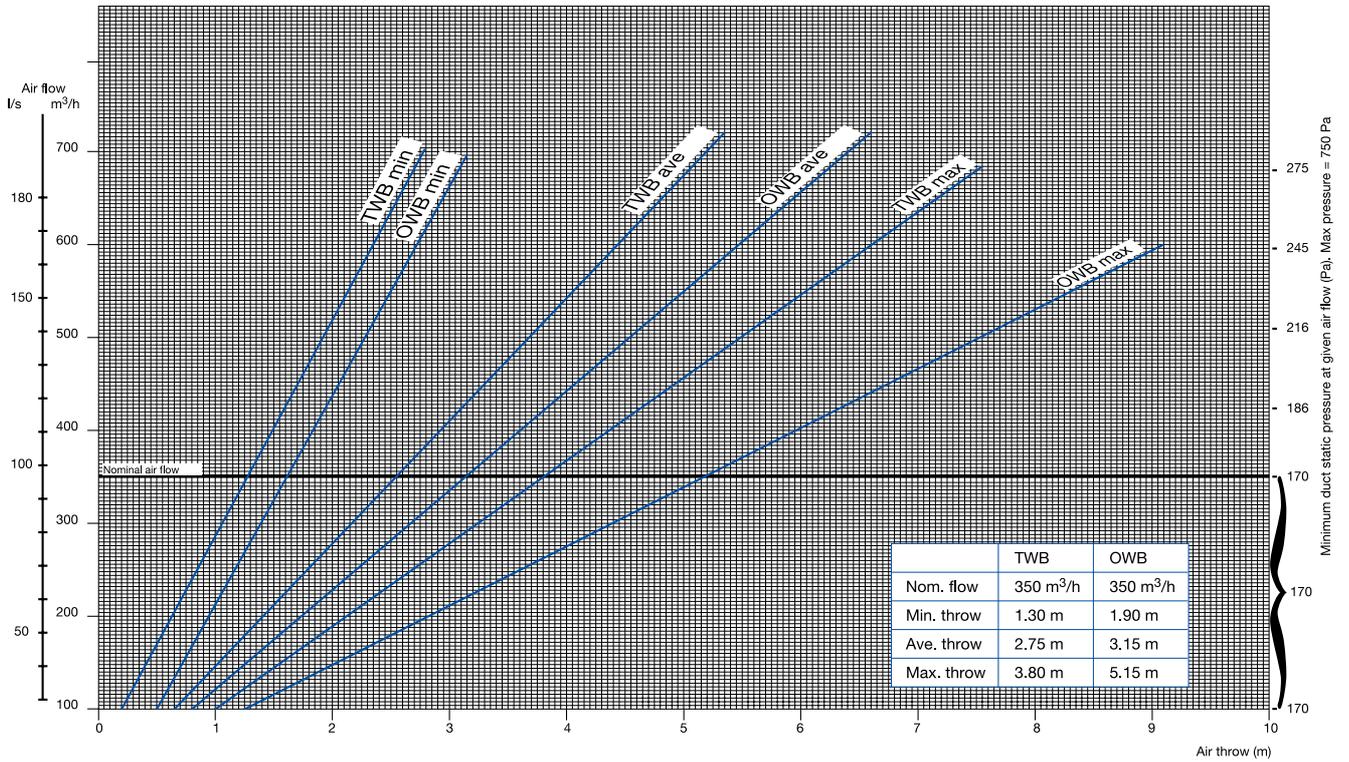
### 5.4.2 - Physical data and dimensions

	Size plenum	A	B	C	D	E	F	G	H	L
Diffuser : Nominal length = 1200 mm Plenum : Active length = 900 mm	229x229	991.5 * 1034	EC 199	199	232.5	275.5	275.5	178	1	1175
	279x279	1034	199 249	249	282.5	275.5 300.5	300.5	228	13.5	1200
Diffuser : Nominal length = 1500 mm Plenum : Active length = 900 mm	229x229	991.5 * 1034	EC 199	199	232.5	275.5	275.5	178	153	1475
	279x279	1034	199 249	249	282.5	275.5 300.5	300.5	228		1500

\* A refers to a unit with end cap  
EC : End Cap



### 5.4.3 - 37AH air throw



### 5.4.4 - 37AH Sound power level

Air flow l/s m <sup>3</sup> /h	Operating pressure		Sound power (dB at 10 <sup>-12</sup> W) Octave band centre frequency								NC (2)
	Pa	mm CE	125	250	500	1000	2000	4000	8000		
47 170	250	25	33	31	26	22	18	21	16	18	
	375	38	33	33	28	25	22	24	20	20	
	500	50	33	35	30	28	25	26	23	22	
	750	75	33	36	32	31	28	28	25	23	
70 250	250	25	37	38	34	30	26	26	20	26	
	375	38	37	40	35	31	28	29	25	27	
	500	50	38	42	36	32	30	31	30	28	
	750	75	38	44	37	33	32	34	34	29	
95 340	250	25	42	44	42	37	33	32	24	35	
	375	38	42	46	42	37	34	34	29	35	
	500	50	43	47	42	38	36	36	34	35	
	750	75	43	49	43	39	38	38	38	35	
142 510	250	25	51	51	49	44	40	36	26	41	
	375	38	52	53	50	45	41	38	32	42	
	500	50	53	54	50	45	43	41	38	42	
	750	75	53	55	50	46	44	43	43	42	
189 680	250	25	56	55	53	49	44	39	27	45	
	375	38	56	56	53	49	46	42	33	45	
	500	50	56	57	54	50	47	45	40	46	
	750	75	56	59	55	51	49	47	46	47	
236 850	375	38	59	60	59	54	51	48	36	51	
	500	50	60	60	59	55	52	50	41	51	
	750	75	60	61	59	55	53	51	47	51	

**Legend :**

- (1) Based upon tests according to ASHRAE 36B-63 with standard air and an ASHRAE sound reference source with no local interference.
- (2) NC with a room attenuation of 4 dB at 500 Hz.

### 5.4.5 - Plenum acoustic attenuation (dB)

	Octave band centre frequency (Hz)						
	125	250	500	1000	2000	4000	8000
Moduline 37AH	—	5.5	11	20.5	28.5	30	33

## 5.5 - 37AHS Moduline

### 5.5.1 - General data

- Nominal air flow 325 m<sup>3</sup>/h - 90 l/s
- Max number of units per controller : 6
- Air flow at shutoff : 72 m<sup>3</sup>/h - 20 l/s ± 5 l/s
- Access to controls for maintenance : through false ceiling



Nominal plenum height	mm	230	280
Overall height of unit	mm	388	439
Supply connection spigot	Ø mm	159	199
Inlet maximum air flow	m <sup>3</sup> /h	720	1120
Inlet maximum air flow	l/s	200	311
Weight*	kg	17	18

\* Without packaging

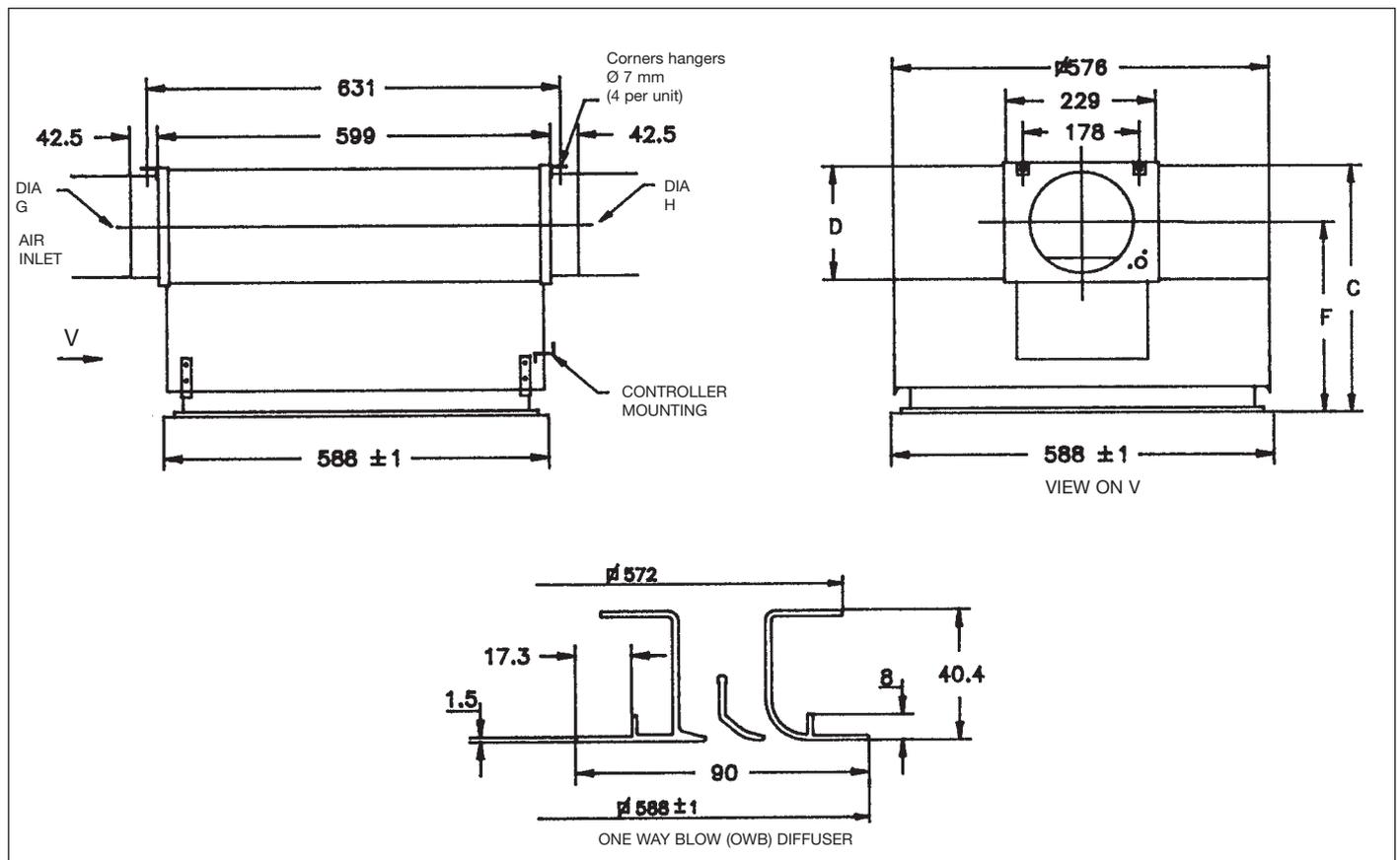
### 5.5.2 - Physical data and dimensions

	size plenum	C	D	F	G	H
Diffuser : square 588 x 588 mm	229x178	388	178	299	149/159	EC/149/159
Plenum active length = 550 mm	229x229	439	229	324.5	199	149/159

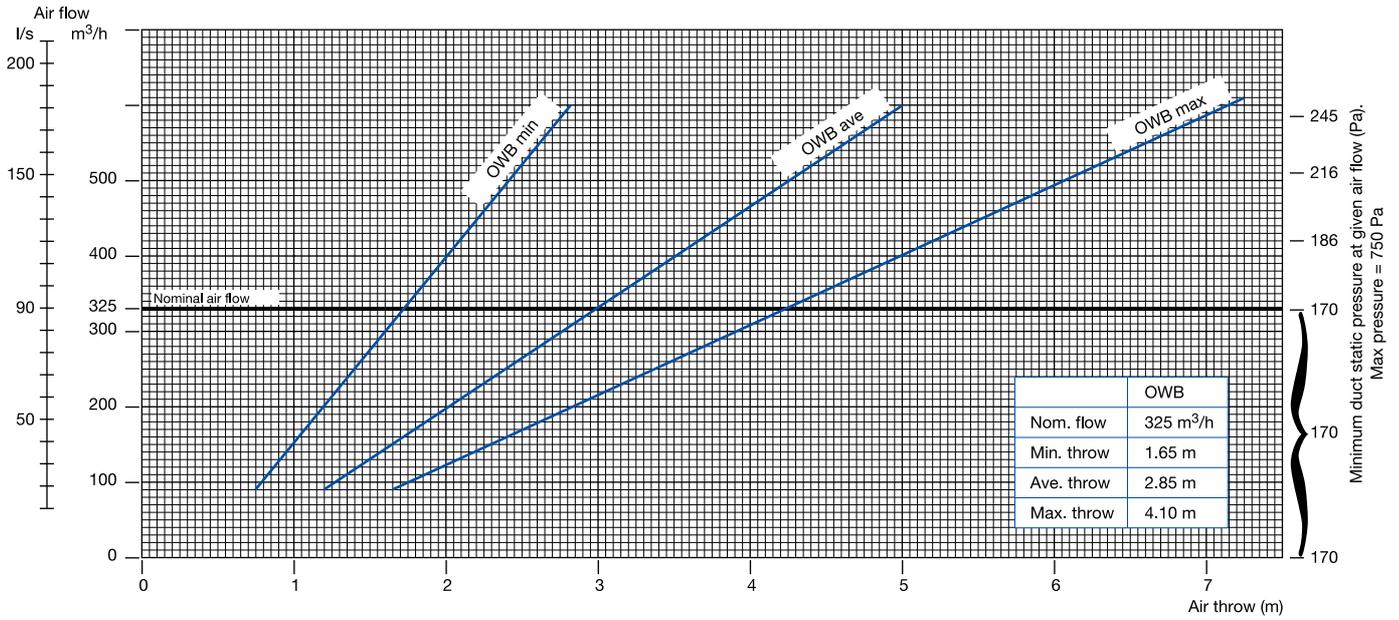
EC : End Cap

#### NOTE :

159 mm dia connection spigot are also available as 149 mm dia spigots when the maximum air flow becomes 630 m<sup>3</sup>/h - 175 l/s.



### 5.5.3 - 37AHS air throw



**Note :**  
Value determined by this curve is for one side of the diffuser only.

### 5.5.4 - 37AHS sound power level

Air flow l/s    m <sup>3</sup> /h		Operating pressure Pa    mm CE		Sound power (dB at 10 <sup>-12</sup> W) Octave band centre frequency (Hz)							NC (2)
				125	250	500	1000	2000	4000	8000	
25	90	250	25	33	35	28	24	20	7		18
		500	50	31	36	31	31	27	21	12	20
		750	75	36	37	33	35	32	27	21	24
75	270	250	25	47	48	41	38	34	32	23	30
		500	50	49	48	42	40	36	34	25	34
		750	75	49	49	43	42	39	37	30	35
125	450	250	25	55	54	46	42	36	31	26	39
		500	50	55	54	47	44	41	39	30	39
		750	75	55	55	48	46	43	41	33	40

**Legend :**  
(1) Based upon tests according to ASHRAE 36B-63 with standard air and an ASHRAE sound reference source with no local interference.  
(2) NC with a room attenuation of 4 dB at 500 Hz.

### 5.5.5 - Plenum acoustic attenuation (dB)

	Octave band centre frequency (Hz)						
	125	250	500	1000	2000	4000	8000
Moduline 37AHS	—	3.5	6.5	12.5	17.5	18.5	20

## 6 - CONTROLS

Moduline systems are essentially self regulating.

The air pressure which is the controlling force is itself derived from the primary air supply.

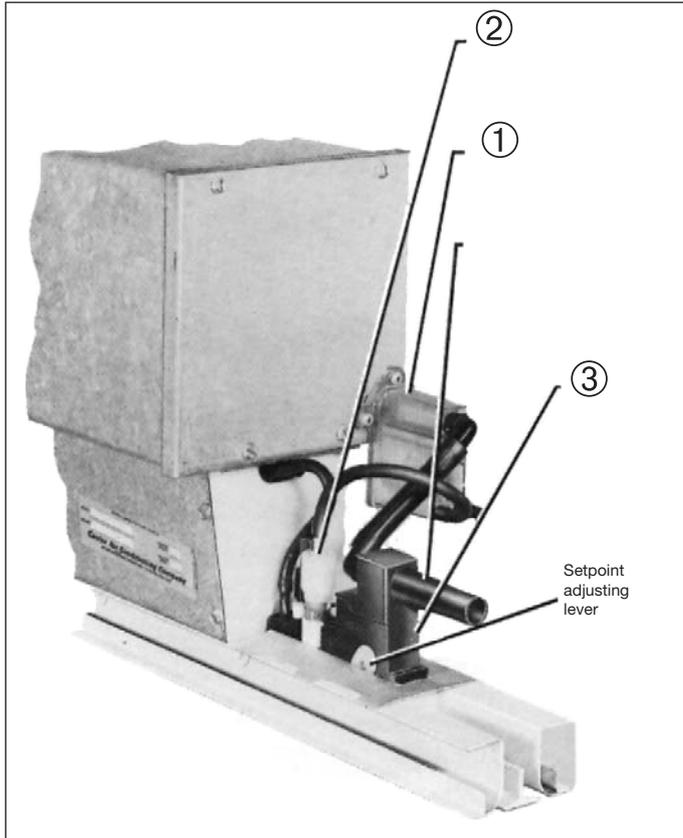


Fig. 1. Control components

### 66.1 - System powered control (Fig 1)

#### Variable air volume control

The control comprises :

- an air bleed filter ① (1) mounted on the plenum
- a flow controller ② (2) to control the supply air flow up to the maximum allowed for the unit as the primary air supply pressure varies between its minimum and 750 Pa. In Figure 2 the size of the orifice 1 changes as the pressure at the controller inlet changes. Changes in pressure within chamber A are proportional to the changes of pressure within the plenum. The size of orifice 2, set manually by rotating a serrated, calibrated sleeve determines the maximum air flow. .
- thermostat ③ (Fig 2) keeps the room temperature constant by controlling the bleed rate across the variable orifice 3. The sliding plate is moved by an internal crank linked to a bi-metal strip. The bi-metal strip is constantly exposed to the room air flow by means of a venturi which creates a depression within the thermostat. The control lever enables room the temperature to be set at any point between 18 and 28°C. The positioning of the controller on the diffuser gives much more precise control over the room temperature than is possible with wall mounted thermostats which may be unduly influenced by local sources of heat or draughts.

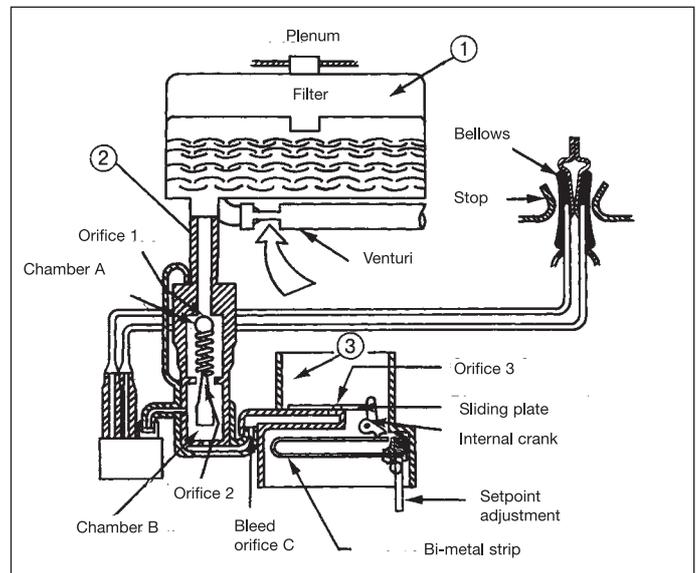


Fig. 2 - Control schematic

#### Constant air volume control

With the exception that the thermostat is replaced by a brass cap with a fixed calibrated orifice, the control components are the same as those used in the variable air volume system. The air flow is kept constant by controlling the pressure sent to the bellows by the controller.

If required, a second controller assembly can be installed enabling the two bellows to be controlled individually.

#### NOTE :

*All Moduline units can have system powered controls.*

Flexible tubes connect the controllers to their bellows. Springs inserted into the tubes prevent kinking.

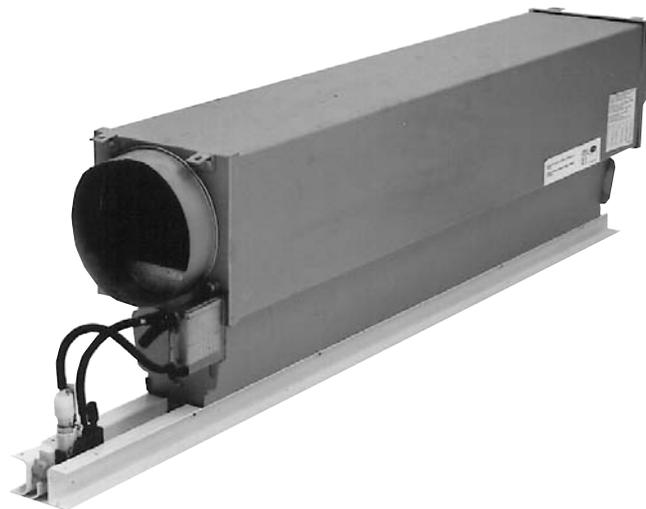
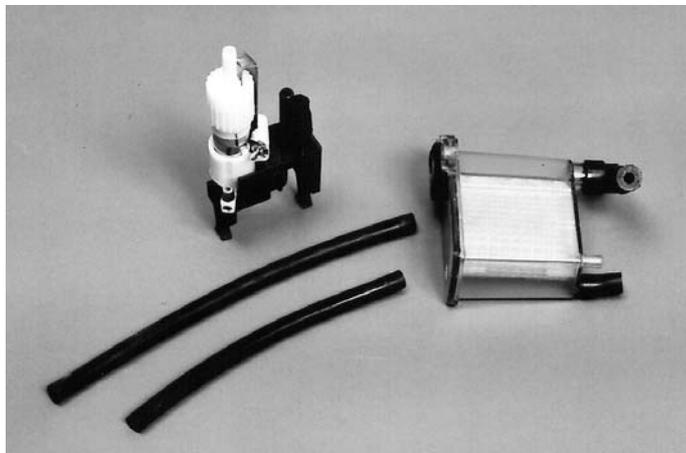
## 6.1.1 - Control accessories

### 6.1.1.1 - Constant volume control kit

The control assembly comprises:

- filter
- constant volume controller
- connection tubes

The kit is available for models 37AG, 37AH, 37AHS and 37AS.



Constant volume control kit	37AG	37AH	37AHS	37AS
	37AG 900 072 C	37AH 900 082 C	37AH 910 002 M	37AS 900 002 M

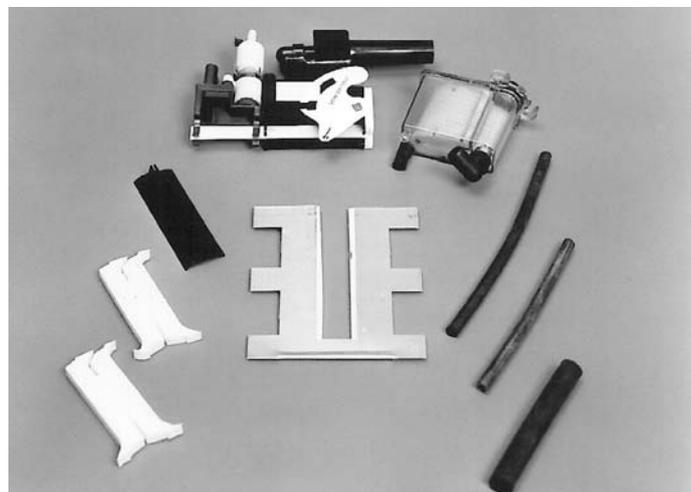
## Accessories

Part N°	Description	Application
37AE 900592 C	Control connection tube 30,5 ml rolls	Used for connections between master controllers and alavers
37AH 900 062 C	Tube bifurcator (Y) kit of 25 units	Reduces the number of control tubes needed in on installation. Located in the bellows correction it enables one control tube to link two units together.

**6.1.1.2 - Variable air volume controller with Moduline thermostat**

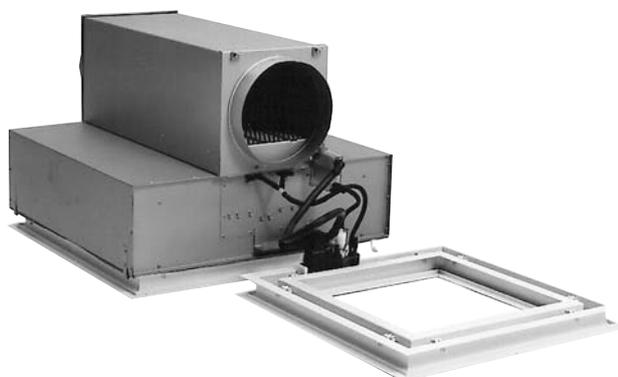
The variable air volume controller assembly comprises :

- filter
- flow controller
- thermostat with an aspirator
- connection tubes
- foam gaskets



Variable air volume control kits are available for 37AG, 37AH, 37AHS and 37AS units.

When a variable air volume controller is to be installed on a 37AHS unit, a return air diffuser with an integral thermostat must be provided at least 3 m from the 37AHS unit.



Variable volume control kit	37AG	37AH	37AHS	37AS
	37AG 900 062 C-	37AH 900 052 C-	37AH 910 012 M	37AS 900 012 M

**Accessories**

Part N°	Description	Application
37AE 900 592 C	Control connection tube 30,5 ml rolls	Used for connections between master controllers and alavers
37AH 900 062 C	Tube bifurcator (Y) kit of 25 units	Reduces the number of control tubes needed in on installation.  Located in the bellows correction it enables one control tube to link two units together.

**Minimum air flow controller  
(Accessory kit Part No. 37AG 900 172C)**

controller ensures that the requirement is always respected.

The standard Moduline controller controls the air flow from the maximum towards shutoff or sensible shutoff. Only its maximum setting can be set to an absolute value.

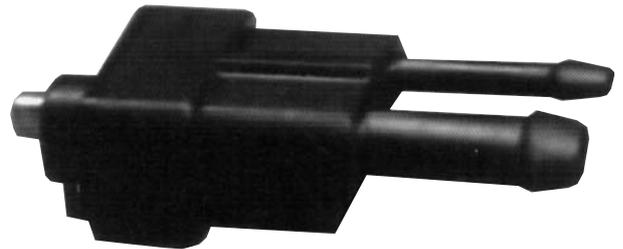
So that a minimum air flow higher than the shutoff rate of the unit can be obtained, a second controller is installed in series with the standard controller. The unit, or units, can then operate as fully variable air volume terminals with the confidence that the minimum air flow requirement will be respected. The minimum air flow controller enables the minimum air flow to be controlled at between 25 % and 50% of the setting shown on the variable air volume controller.



**NOTE :**  
*The minimum air flow controller may be used with 37AG, 37AH, 37AS and 37AHS units.*

**Warm-up switch  
(Accessory kit Part No. 37AG 901 052M)**

be reheated by installing a warm-up switch, bypassing the thermostat, in the Moduline plenum. The sensor on the switch responds to the temperature of the air from the central station air handler (setpoint 21.5°C) forcing the Moduline to behave as a constant volume unit. Without the bypass switch the Moduline would remain shut off for so long as the room temperature was below the thermostat setting (usually between 22°C and 24°C). The thermostat resumes control over the air flow when the temperature in the Moduline plenum falls below 18.5°C. This accessory can be used with all models of Moduline.



### 6.1.3 - Variable air volume control with a room thermostat

For greater accessibility, Carrier offers a high precision wall mounted thermostat with the characteristics of the standard thermostat normally fitted on the Moduline diffuser. A controller with an amplifier is used to ensure a high quality signal from the thermostat.

The control components comprises :

- filter
- air flow controller with amplifier
- control base with screws
- connection tubes



	37AG	37AH	37AHS	37AS
Variable volume control kit	37AG 900 182 C	37AH 900 142 C	37AH 900 142 C	37AG 900 182 C
Wall thermostat (°C)	37CM 910 002 M			
Wall thermostat (°F)	37CM 910 012 M			
GLC fire rated tube 76 m per roll*	35BB 900 172 C			

\* GLC fire rated tube to connect the thermostat to the controller amplifier

### Accessories

Part N°.	Description	Application
37AE 900 592 C	Control connection tube 30.5 ml rolls	Used for connections between master controllers and slaves
37AH 900 062 C	Tube bifurcator (Y) kit of 25 units	Reduces the number of control tubes needed in an installation.  Located in the bellows connection it enables one control tube to link two units together.
37AG 900 172 C	Minimum air flow controller	Used to allow a minimum air flow higher than the shutoff value for the unit.  A second controller connected in series with the standard controller. The unit operates as a variable volume unit and maintains the specified minimum air flow.
37AG 901 052 M	Warm-up switch	Bypasses the thermostat to allow rapid reheating at the start of the day before the space is occupied. Switch is installed in the plenum.

## 6.2 - Electronic control

Electronic control is recommended when a Moduline system is to operate either in conjunction with an on/off heating system or with a Building Management System. The system can be used with all Moduline models. In all cases the standard thermostat is replaced by an electric valve interface.

The interface is a proportional valve which controls the controller shutoff flow rate and the maximum flow rate.

The control at the Moduline comprises a filter, a maximum air flow controller and the interconnection accessories supplied with the standard constant volume controller kit. A minimum air flow controller can also be included.

The temperature sensor can be in either the diffuser, in a box with an aspirator tube (only in cooling mode, tolerance  $\pm 1.5$  K), or in the wall mounted control box. All control components are fixed on the diffuser by means of clips, outside the Moduline.

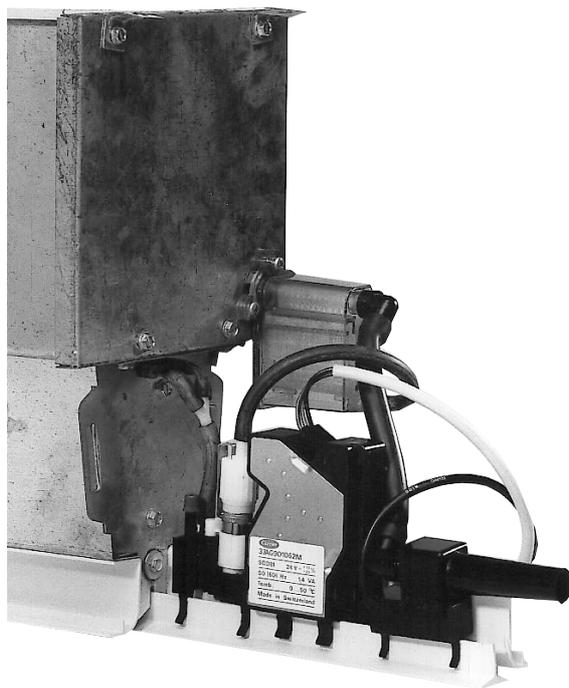
With electronic control every Moduline unit behaves in exactly the same way as its standard counterpart (operating pressure, air throw etc) and can control slave units exactly as before.

The controls (not normally supplied by Carrier) must have at least an electronic temperature controller connected to either a room temperature sensor or a return air temperature sensor.

The electrical interface is a reversible synchronous motor with a magnetic coupler. It needs no maintenance. All components of the interface are contained in a sealed, unopenable enclosure. A 1.5 m flying lead with a keyed connector at one end and stripped colour coded wire ends at the other.

Plastic fixings are used to attach the interface to the central diffuser on the Moduline. No other installation is needed.

The Carrier supply must include a constant volume control kit and an electrical interface.



	37AG	37AH	37AHS	37AS
Constant volume control kit	37AG 900 072 C	37AH 900 082 C	37AH 910 002 M	37AS 900 002 M
Electrical interface with 3 point 24 VAC control signal	37AG 901 062 M			

## 6.2.1 - Other accessories

Part N°.	Description	Type of Moduline	Application
37 AE 900 592 C	Control connection tube 30,5 ml rolls	All type	Used for connections between master controllers and slaves
37 AH 900 062 C	Tube bifurcator (Y) kit of 25 units	All type	Reduces the number of control tubes needed in an installation.  Located in the bellows connection it enables one control tube to link two units together.
37 AG 900 172 C*	Minimum air flow controller	37AG 37AH 37AHS 37AS	Used to allow a minimum air flow higher than the shutoff value for the unit.  A second controller connected in series with the standard controller. The unit operates as a variable volume unit and maintains the specified minimum air flow.
37 AG 901 052 M	Warm-up switch	All type	Bypasses the thermostat to allow rapid reheating at the start of the day before the space is occupied. Switch is installed in the plenum.

\* Not available for the 37AF

## 6.2.2 - Electrical interfaces - technical data

	37AG 901 062 M
Control signal	3 points 24 VAC
Supply voltage	24 VAC +10%, -20%
Supply frequency	50 / 60 Hz
Power input	1.4 VA
Cycle time 0 to 100 %	150 s
Temperature :	
- storage	-30 °C + 65 °C
- operating	0 °C + 50 °C
Weight	200 g
Noise level	30 dB (A)

Refer to the installation manual for wiring instructions.

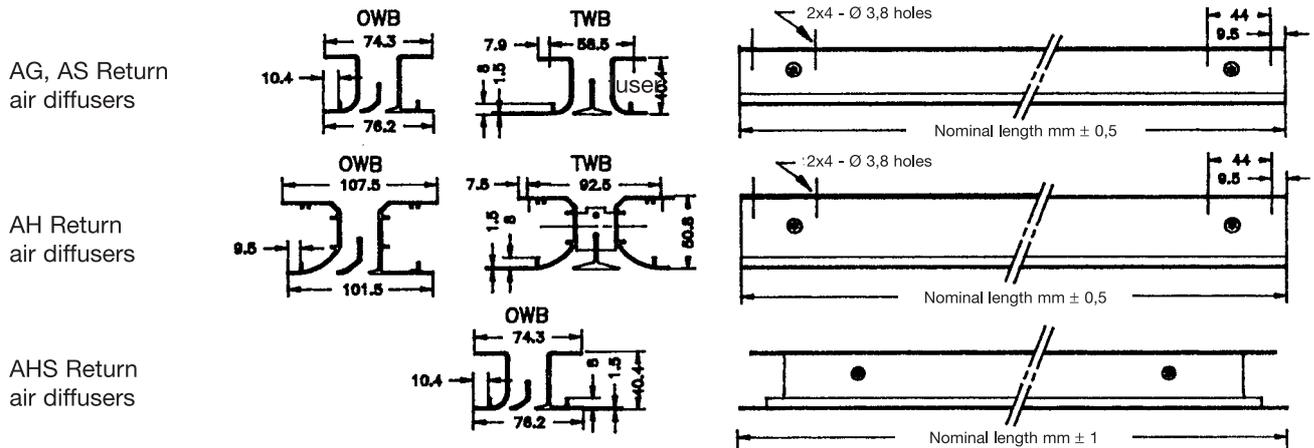
### NOTE GÉNÉRALE :

- With Moduline, the plug in controls are easily relocated or reconfigured. Partitions can be repositioned and spaces reallocated to different functions with the confidence that the controls can quickly be set up for the new arrangement without difficulty and with no loss of efficiency.

- All units on the same control loop must be controlled by the same air flow controller (with or without thermostat) installed on one of the units in the loop. Ideally it should be equidistant between the two most distant slave units in either direction. Never connect together units in different branches. Effective control will be impossible due to the difference in pressure in the primary air supply to the two ducts.

7 - ACCESSORIES

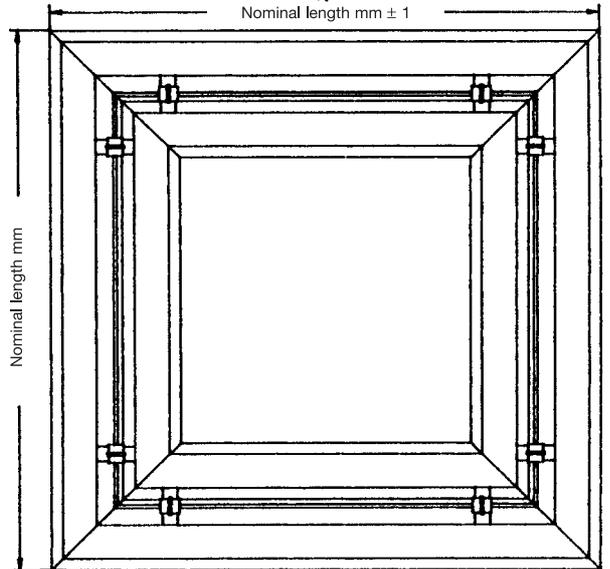
	Part N°.	Description	Nominal length mm	use with	
	37AG 900 932 P 37AG 900 802 P 37AG 900 812 P	AG 2-Way T-bar 2-way return air diffuser	575 1175 1475	AG AS	<p>Moduline return air diffuser have the same appearance as the air terminals and are designed to be integrated into the false ceiling in the same way. Packs of 6 lengths.</p> 
	37AH 900 752 P 37AH 900 502 P 37AH 900 512 P	AH 2-Way T-bar 2-way return air diffuser	575 1175 1475	AH	
	37AG 900 922 P 37AG 900 822 P 37AG 900 022 P	AG 2-Way continuous 2-way return air diffuser	600 1200 1500	AG AS	
	37AH 900 742 P 37AH 900 532 P 37AH 900 542 P	AH 2-Way continuous 2-way return air diffuser	600 1200 1500	AH	
	37AG 900 952 P 37AG 900 892 P 37AG 900 872 P	AG 1-Way T-bar 2-way return air diffuser	575 1175 1475	AG, AS	
	37AH 900 802 P 37AH 900 672 P 37AH 900 692 P	AH 1-Way T-bar 2-way return air diffuser	575 1175 1475	AH	
	37AG 900 942 P 37AG 900 902 P 37AG 900 882 P	AG 1-Way continuous 2-way return air diffuser	600 1200 1500	AG, AS	
	37AH 900 792 P 37AH 900 682 P 37AH 900 702 P	AH 1-Way continuous 2-way return air diffuser	600 1200 1500	AH	
	37AH 910 022 P	AHS 1-Way 588 mm square diffuser	588x588	AHS	



OWB : One way blow diffuser  
 TWB : Two way blow dif

Return air diffuser performance

Pressure drop in unit		Diffuser type							
		Type AG				Type AH			
		1200 mm		1500 mm		1200 mm		1500 mm	
mmCE	Pa	m³/h	l/s	m³/h	l/s	m³/h	l/s	m³/h	l/s
0,51	5	102	28	119	33	196	54	247	69
1,02	10	136	38	170	47	272	76	340	94
1,52	15	170	47	213	59	340	94	450	125
2,03	20	196	54	247	69	391	109	493	137
2,54	25	221	61	272	76	442	123	544	151
3,05	30	238	66	298	83	485	135	612	170
3,81	38	272	76	332	92	544	151	680	189
5,08	50	306	85	383	106	612	170	782	217

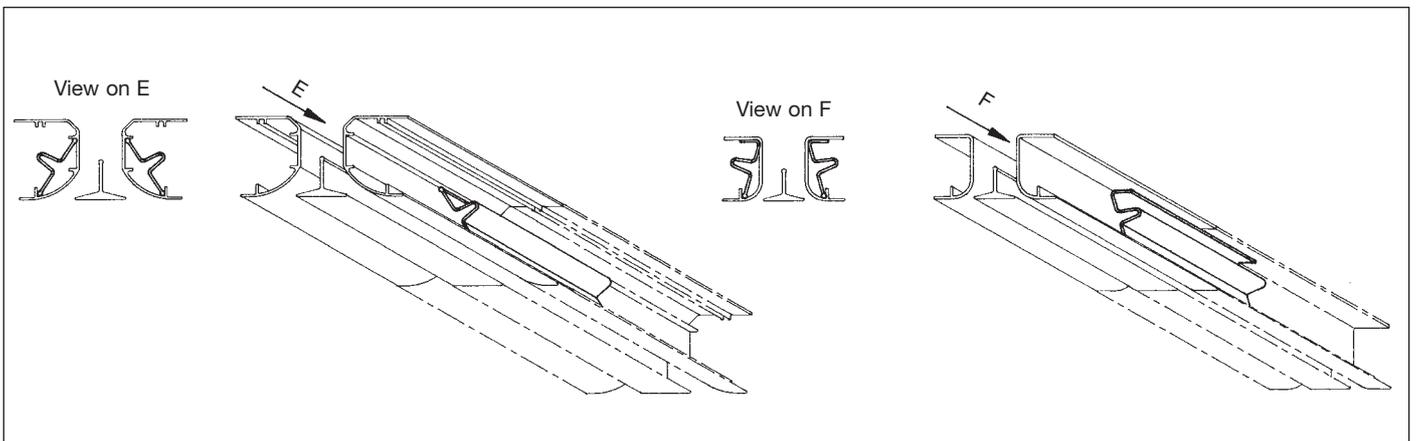


	Part N°.	Description	Nominal length mm	Use with	
	37AG 901 182 P 37AG 901 072 P 37AG 901 092 P	AG 2-Way T-bar 2-way dummy unit	575 1175 1475	AG AS	These dummy units are derived from return air diffusers to which a strip of self adhesive aluminium has been applied to close the return air path. Packs of 6 lengths.
	37AH 901 262 P 37AH 901 042 P 37AH 901 062 P	AH 2-Way T-bar 2-way dummy unit	575 1175 1475	AH	
	37AG 901 192 P 37AG 901 082 P 37AG 901 102 P	AG 2-Way continuous 2-way dummy unit	600 1200 1500	AG AS	
	37AH 901 272 P 37AH 901 052 P 37AH 901 072 P	AH 2-Way continuous 2-way dummy unit	600 1200 1500	AH	
	37AG 901 162 P 37AG 901 122 P 37AG 901 142 P	AG 1-Way T-bar 2-way dummy unit	575 1175 1475	AG, AS	
	37AH 901 242 P 37AH 901 082 P 37AH 901 102 P	AH 1-Way T-bar 2-way dummy unit	575 1175 1475	AH	
	37AG 901 172 P 37AG 901 132 P 37AG 901 152 P	AG 1-Way continuous 2-way dummy unit	600 1200 1500	AG, AS	
	37AH 901 252 P 37AH 901 092 P 37AH 901 232 P	AH 1-Way continuous 2-way dummy unit	600 1200 1500	AH	
	37 AH 910 032 P	AHS 1-Way square unit 588 x 588 mm	588x588	AHS	

**NOTE:**

Refer to the return air diffuser dimensional drawings.

	Part N°.	Description	Use with	Utilisation
	37AG 900 082 P 37AH 900 092 P	End trimming piece Pack of 50	AG, AS AH	The painted 24 mm return piece give a neat finish at the end of the diffuser when the run is not continuous. Can not be used on AHS units.
	37AE 901 012 M 37AH 901 032 M	Alignment channels 2 per diffuser Packs of 100.	All except AH AH	Used to align active units, dummies and return air units which are joined end to end. They slide onto the end of each diffuser. Can not be used on AHS units.
	37 AH 900 072 C	Plastic blanking piece (length 218.5 mm) Pack of 50 pieces	All except AHS	Used to block a section of the active length of the diffuser to close off the ceiling void from the conditioned space.



Installing alignment pieces

## 7.1 - Suspension accessories

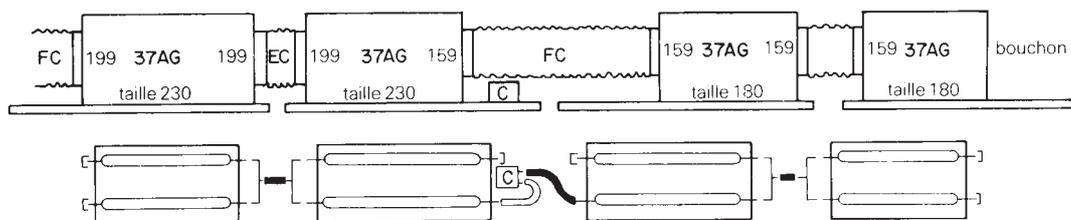
	Part N°.	Description	Use with	Utilisation
	37AE 900 642 C 37AH 900 012 C	Bracket for T-bar installations Pack of 24	All except AH AH	Used with 24 mm T-bars. Bracket slides along the end of each diffuser on active units, return air units and dummies. <b>Note : this accessory should only be used with modulines having standard length diffusers. Please contact your local Carrier office for application with non-standard or special diffuser lengths.</b>
	37AE 900 672 M	Hanger angle support Pack of 50	Return air and dummy units	Used to mount units in flat false ceilings, when dummies or return air units fall between active units. Hanger are attached active units using the alignment channels.
	37AF 900 512 M	Screw eye hangers Pack of 100	All	Used, 4 per unit, to suspend all units.

## 7.2 - Plenum accessories

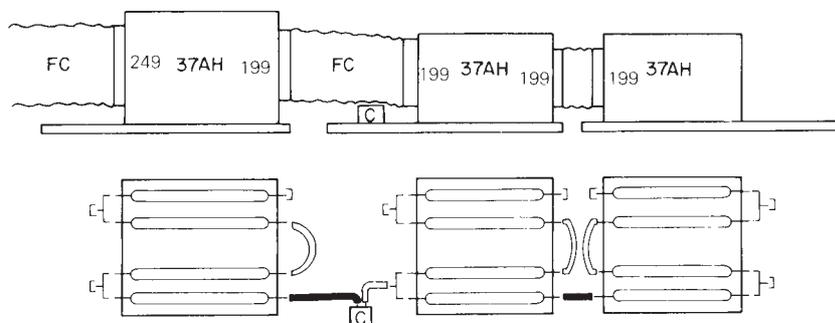
	Part N°.	Description	Ø	Use with	Utilisation
	37AF 900 022 M 37AF 909 002 M 37AF 900 032 C 37AF 900 042 C	76 mm flexible sleeve and fixing clip Pack of 25	159 149 199 249	AG, AHS AG, AHS AG,AH,AHS AG, AH	Connection sleeve. Used to connect two units together or to connect the air terminal to the air supply duct. Each connection requires two clips and one sleeve. Neoprene sleeve and 2 clamps with screws.
	37AF 909 102 M 37AH 900 102 M 37AH 900 042 M 37AH 900 642 M	End cap. Pack of 12	149 159 199 249	AG, AHS AG, AHS AG, AH, AHS AG, AH	End cap. Used to close a dead connection.

## 7.2.1 - Control interconnections and combinations

### 37AG master with 37AG slaves



### 37AH master with 37AH slaves



#### legende :

C Controller or controller with thermostat  
 EC Elastomeric collar  
 FC Flexible duct connection

Y control tube bifurcator  
 140 mm tube with internal spring  
 Control tube  
 Bellows

## 8 - UNIT ORDER CODES

Standard 37 Series units have 11 or 12 digit order codes which describe the units completely.

### 8.1 - 37AG Moduline

Character	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Example	3	7	A	G	2	2	1	2	4	4	1	P			

CHARACTERS	CODE	DESCRIPTION
1,2,3,4.....	37 AG.....	37 AG
		<u>DIFFUSER</u>
	1.....	DISCONTINUOUS (module dimension - 25 mm)
5.....	2.....	CONTINUOUS (= module dimension)
		<u>PLENUM SIZE (mm)</u>
	1.....	178 x 178 (active length 900 mm)
	2.....	229 x 229 (active length 900 mm)
6.....	3.....	279 x 279 (active length 900 mm)
	4.....	178 x 178 (active length 1200 mm)
	5.....	229 x 229 (active length 1200 mm)
	6.....	279 x 279 (active length 1200 mm)
		<u>MODULE DIMENSION (mm)</u>
	12.....	1200
7,8.....	15.....	1500 (required with 1200 mm active length)
		<u>DIAMÈTRE DE VIROLE (mm)</u>
		Control side      Opp. side      Plenum size
	03.....	closed .....159.....178 x 178
	33.....	159.....159.....178 x 178
	09.....	closed .....149.....178 x 178
	99.....	149.....149.....178 x 178
9, 10.....	34.....	159.....199.....229 x 229
	44.....	199.....199.....229 x 229
	94.....	199.....199.....229 x 229
	45.....	199.....249.....279 x 279
	55.....	249.....249.....279 x 279
		<u>TYPE OF DIFFUSER</u>
11.....	1.....	OWB to the left
	R.....	OWB to the right
	P.....	TWB (both sides)
		MADE AT CARRIER S.A. MONTLUEL, FRANCE
12.....	P.....	MADE AT CARRIER S.A. MONTLUEL, FRANCE

Example :

	<b>37 AG 2 2 12 4 4 1 P</b>	
37AG UNIT	-----	MADE AT MONTLUEL, FRANCE
CONTINUOUS DIFFUSER	-----	OWB DIFFUSER LEFT DISCHARGE
PLENUM SIZE 229 x 229 mm	-----	Ø 199 mm CONNECTION SPIGOT
MODULE DIMENSION 1200 mm	-----	ON SIDE OPPOSITE TO CONTROLS
	-----	Ø 199 mm CONNECTION SPIGOT ON CONTROL SIDE

#### NOTES:

- Diffuser length is given by module dimension (1200 mm) and diffuser type (discontinuous = module dimension - 25 mm) In this example the diffuser is 1200 mm long.
- The connection spigot diameters on both sides depend upon the size of the plenum as shown by characters 9 and 10.
- Character position shows the diffuser type, OWB or TWB. The direction of air discharge is with respect to someone viewing the unit from below on the control side, 1 means to the left, R means to the right. A P occupies position 12 when position 11 is 1 or R.

## 8.2 - 37AH Moduline

Character	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Example	3	7	A	H	1	2	1	5	4	5	P				

CHARACTERS	CODE	DESCRIPTION
		<u>TYPE – UNIT</u>
1,2,3,4.....	37 AH.....	37 AH
		<u>DIFFUSER</u>
	1.....	DISCONTINUOUS (module dimension - 25 mm)
5.....	2.....	CONTINUOUS (= module dimension)
		<u>PLENUM SIZE (MM)</u>
	1.....	229 x 229
6.....	2.....	279 x 279
		<u>MODULE DIMENSION (mm)</u>
	12.....	1200
7,8.....	15.....	1500
		<u>CONNECTION DIA (mm)</u>
		Control side      Opp side      Plenum size
	04.....	CLOSED.....199.....229 x 229
9, 10.....	44.....	199.....199.....229 x 229
	45.....	199.....249.....279 x 279
	55.....	249.....249.....279 x 279
		<u>TYPE OF DIFFUSER</u>
	1.....	OWB to the left
11.....	R.....	OWB to the right
	P.....	TWB (both sides)
		MADE AT CARRIER S.A. MONTLUEL, FRANCE
12.....	P.....	MADE AT CARRIER S.A. MONTLUEL, FRANCE

Example :

	37 AH 1 2 15	4 5 P
37AH UNIT	-----	MADE AT MONTLUEL, FRANCE
DISCONTINUOUS DIFFUSER	-----	Ø 249 mm CONNECTION SPIGOT ON SIDE
PLENUM SIZE 279 x 279 mm	-----	OPPOSITE TO CONTROLS
MODULE DIMENSION 1500 mm	-----	Ø 199 mm CONNECTION SPIGOT
		ON CONTROL SIDE

### NOTES:

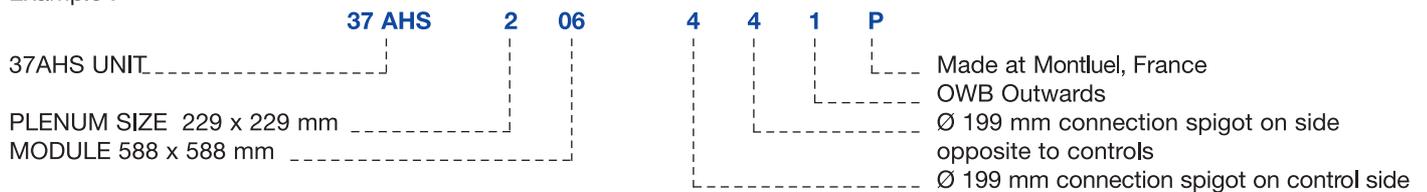
- Diffuser length is given by module dimension (1200 mm) and diffuser type (discontinuous = module dimension - 25 mm) In this example the diffuser is 1200 mm long.
- The connection spigot diameters on both sides depend upon the size of the plenum as shown by characters 9 and 10.
- Character position shows the diffuser type, OWB or TWB. The direction of air discharge is with respect to someone viewing the unit from below on the control side, 1 means to the left, R means to the right. A P occupies position 12 when position 11 is 1 or R.

### 8.3 - 37AHS Moduline

Character	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Example	3	7	A	H	S	2	0	6	4	4	P				

<u>CHARACTERS</u>	<u>CODE</u>	<u>DESCRIPTION</u>
		<u>TYPE – UNIT</u>
1,2,3,4,5.....	37 AHS.....	37 AHS
		<u>PLENUM SIZE (mm)</u>
	1 .....	178 (high) x 229 (wide)
6.....	2 .....	229 x 229
		<u>MODULE DIMENSION (mm)</u>
7,8.....	06 .....	588 x 588 square
		<u>CONNECTION DIA (mm)</u>
		Control side      Opp side      Plenum size
	03 .....	CLOSED.....159 .....178 x 229
	33 .....	159 .....159 .....178 x 229
	09 .....	CLOSED.....149 .....178 x 229
9,10.....	99 .....	149 .....149 .....178 x 229
	34 .....	159 .....199 .....229 x 229
	94 .....	149 .....199 .....229 x 229
	44 .....	199 .....199 .....229 x 229
		<u>TYPE OF DIFFUSER</u>
11.....	1 .....	OWB outwards
12.....	P.....	MADE AT CARRIER S.A. MONTLUEL, FRANCE

Example :



**NOTES:**

*The diameters of the connection spigots depend upon the size of the plenum as shown by character positions 9 and 10.*

## 8.4 - 37AS Moduline

Character	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Example	3	7	A	S	1	1	1	2	0	1	P				

<u>CHARACTERS</u>	<u>CODE</u>	<u>DESCRIPTION</u>
		<u>TYPE – UNIT</u>
1,2,3,4.....	37 AS .....	37 AS
		<u>DIFFUSER</u>
5.....	1.....	DISCONTINUOUS (module dimension - 25 mm)
	2.....	CONTINUOUS (= module dimension)
		<u>PLENUM SIZE (mm)</u>
6.....	1 .....	127 (high) x 178 (wide)
		<u>MODULE DIMENSION (mm)</u>
7,8.....	12 .....	1200
	15 .....	1500
		<u>CONNECTION DIA (mm)</u>
		Control side      Opp side
9,10.....	01 .....	CLOSED.....99
		<u>TYPE OF DIFFUSER</u>
	1.....	OWB to the left
11.....	R.....	OWB to the right
	P.....	TWB (both sides)
		MADE AT CARRIER S.A. MONTLUEL, FRANCE
12.....	P.....	MADE AT CARRIER S.A. MONTLUEL, FRANCE

Example :

	37 AS	1	1	12	0	1	P	
37AS UNIT .....								MADE AT MONTLUEL, FRANCE
DISCONTINUOUS DIFFUSER .....								Ø 99 mm CONNECTION SPIGOT ON SIDE
PLENUM SIZE 127 x 178 mm .....								OPPOSITE TO CONTROLS
MODULE DIMENSION 1200 mm .....								END CAP ON CONTROL SIDE

### NOTES:

- Diffuser length is given by module dimension (1200 mm) and diffuser type (discontinuous = module dimension - 25 mm) In this example the diffuser is 1175 mm long.
- For the 37AS, there is only one plenum size (127 x 128 mm) and one adapter size (closed and 99 mm connection spigot).
- Character position 11 shows the diffuser type, OWB or TWB. The direction of air discharge is with respect to someone viewing the unit from below on the control side, 1 means to the left, R means to the right. A P occupies position 12 when position 11 is 1 or R.

## 9 - INSTALLATION INSTRUCTIONS

### 9.1 - 37AG, AH, AS constant volume and variable volume units

#### 9.1.1 - Introduction

Controllers can be installed in the units either before (to be preferred) or after the units themselves have been installed in the false ceiling. Constant volume and variable volume kits are similar with the exceptions that the former has no thermostat and aspirator tubes, no insulating gasket and no outer foam gasket.

#### 9.1.2 - Kit part numbers

Type of control	37AG	37AH	37AS
Constant volume	37AG 900 072 C	37AH 900 082 C	37AS 900 002 M
Variable volume	37AG 900 062 C	37AH 900 052 C	37AS 900 012 M

#### NOTE :

*Do not remove the protective adhesive film covering the diffuser until the unit is installed finally in the false ceiling.*

#### 9.1.3 - Installation procedure

1- Confirm that the contents of the kit correspond with those shown in the Figure below.

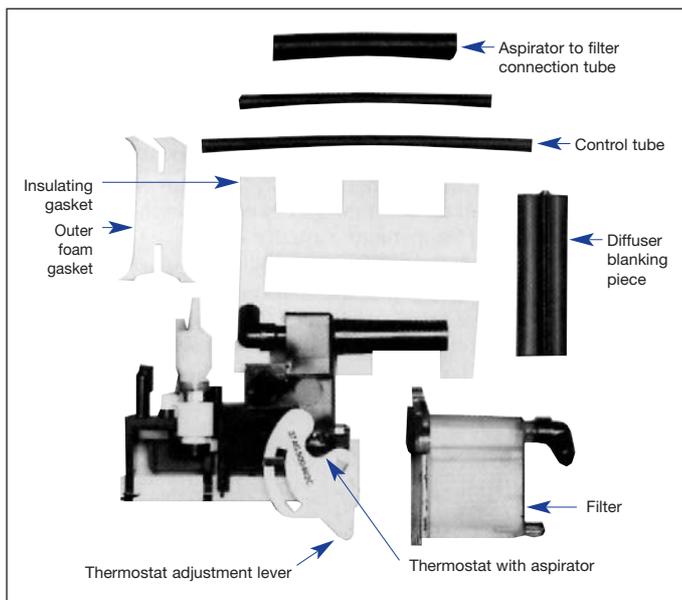


Fig. 1 - Variable control components identification

2- Remove the plug from the filter air pressure orifice and unscrew the two screws on control end of air terminal plenum. Refer to Fig 2.

3- Confirm that the pressure sensing orifice is not blocked. Remove all excess mastic.

4- Install the filter and secure it with the two screws.

5- Refer to Fig 4 which shows the variable volume control.

Before installing the air flow controller assembly and thermostat on the central diffuser first install the outer gasket against the face and confirm that the gasket horns are firmly in contact with the lateral diffusers. Next, position the controller against this insulation, on 37AG and AS units, and 13 mm away on 37AH units (aspirator outlet on the opposite side of

the plenum). Push the controller assembly fully into its clips on the central diffuser. Ensure that the thermostat adjustment lever moves freely in the slot between the central and lateral diffusers.

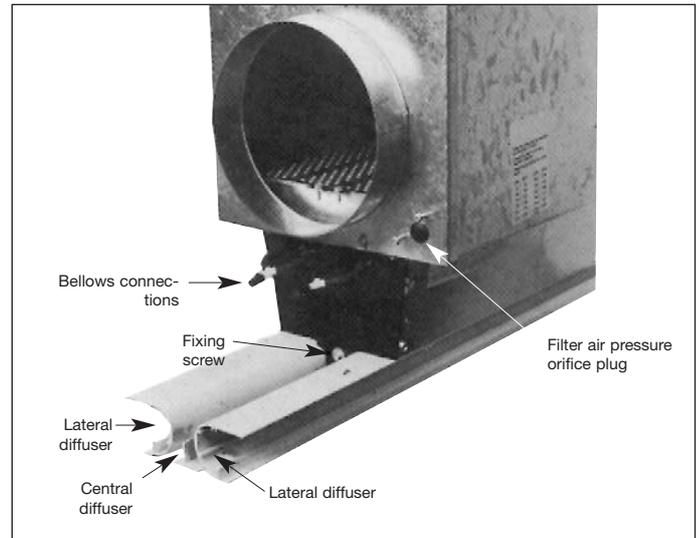


Fig. 2 - 37AH Module

#### Constant volume controller (Fig 3)

central diffuser pushing it firmly into the clips. Ensure that the controller bleed orifice is fitted with a brass cap and the filter elbow is plugged. Proceed to paragraph 8.

6 - Install the insulating gasket (insulation downwards) below the controller/thermostat assembly such that the open side (AG,AS) or the smaller tongue (AH) is in contact with the lower plenum insulation. Flatten the tongues (3 on each side) against the upper sides of the diffuser wings so that the gasket stays securely in place (Figs 5 and 6).

7 - Select the longer, aspirator tube (large diameter) and connect the filter elbow to the thermostat (Fig 6).

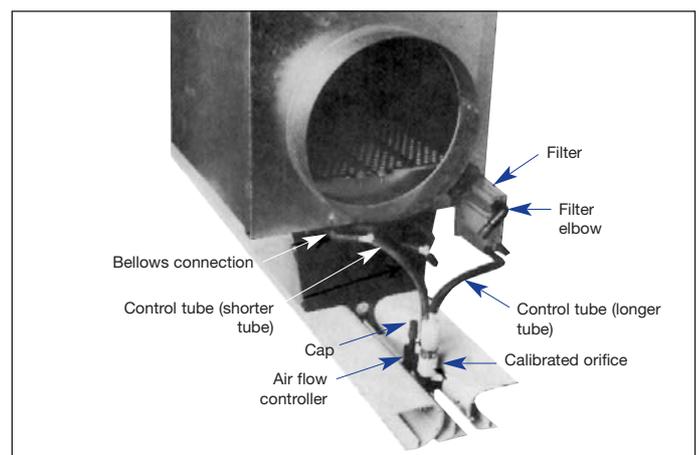


Fig 3 - Constant volume controller

#### WARNING :

*The tolerances of the controlled air flow rates at the controller are as follows*

*± 10 % for the maximum controlled air flow rate*

*± 15 % for the minimum controlled air flow rate.*

8 - Refer to Fig 3 or Fig 6 as appropriate. Remove the plug from the bellows connection, or from the Y bifurcator, according to type, and connect it to one outlet on the controller connection manifold using the shortest, small diameter tube.

9 - Connect the open outlet at the filter to the inlet on the controller using a longer, small diameter tube. Refer to Fig 3 or Fig 5.

10 - For 37AG units (Fig 5) insert the black plastic blanking piece on the central diffuser so that it abuts the thermostat.

11 - Adjust the controller to the required air flow remembering that :

- the values shown on the controller are expressed in l/s for 37AG, AS and AH units the value selected will be the total air flow for all units
- for 37AG units of 1200 mm active length, the actual air flow will be 1.3 times the air flow shown on the controller.

b) Set the thermostat to maximum cooling (room temperature higher than 18.5 °C). Wait for about 5 minutes. All units should be fully opened. If any is not the cause may be a kinked or broken control connection tube. Repair it.

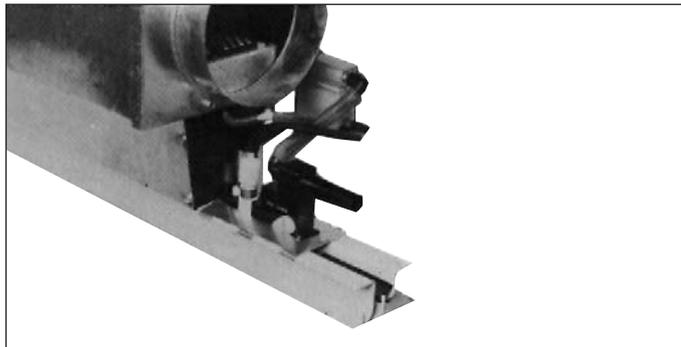


Fig 5 - 37AG unit detail

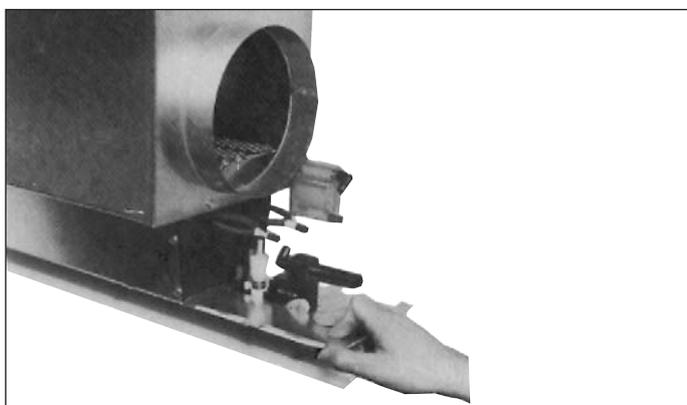


Fig 4 - Variable air flow controller

12 - Install the unit in the ceiling in accordance with the installation instructions. Set the thermostat to the desired room temperature setpoint, remembering that :

when the lever is showing the maximum amount of blue the setpoint is about 18.3 °C. when the lever is showing the maximum amount of red the setpoint is about 29.4 °C. with the lever in the centre position (perpendicular to the ceiling) the setpoint is about 23.9 °C.

#### 9.1.4 - Recommended control circuit test procedures

These procedures should be carried out after all units and their controls have been installed and connected to the air supply.

With the system under pressure :

a) Set the thermostat for maximum heat (room temperature less than 29 °C). Wait for about 2 minutes. All units should be shut off and delivering only the shutoff air flow - 9.5 l/s maximum for 37AG and AS units, 17.8 l/s maximum for 37AH units.

If any unit does not shut down to the proper shutoff rate several possible causes should be investigated :

- a plug missing either from a bellows supply or from a connection manifold
- a poorly installed thermostat
- a slave unit not connected to its master
- a controller incorrectly installed on its connection manifold
- a controller with no supply from the filter.

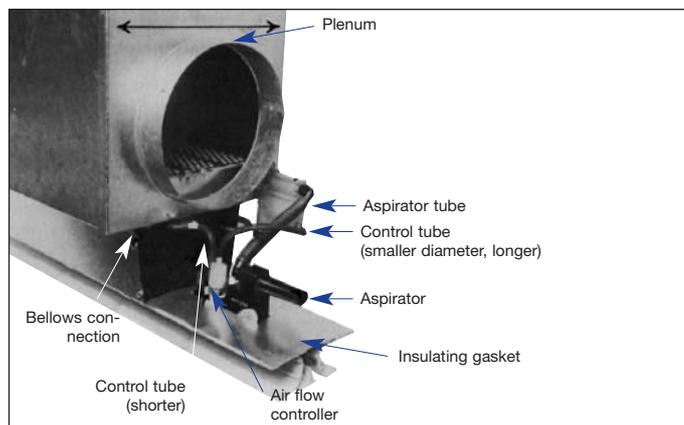


Fig 6 - Variable air volume controller

## 9.2 - 37AHS Constant volume and variable volume units

### 9.2.1 - Introduction

Controls can be installed in the units either before (to be preferred) or after the units themselves have been installed in the false ceiling. Constant volume and variable volume kits are similar with the exceptions that the former has no thermostat and aspirator, no aspirator tube or tube to link with the shutoff orifice on the controller and no insulating gasket.

Kit part numbers are :

Constant volume controller : 37AH 910 002 M

Variable volume controller : 37AH 900 012 M

### 9.2.2 - Installation procedure

- 1 - Confirm that the contents of the kit are correct and complete.
- 2 - Remove the plug from the filter air pressure orifice and unscrew the two screws on control end of air terminal plenum.
- 3 - Confirm that the pressure sensing orifice is not blocked. Remove all excess mastic.
- 4 - Install the filter and secure it with the two screws.

#### 5 - Constant volume control

Install the controller and its base on the metal angle bracket on the side of the unit.

Remove the connector plug from one arm of the Y and, using one of the smaller diameter tubes, connect it to one of the outlet ports on the controller manifold. Connect the open outlet on the filter to the controller outlet using the second small diameter tube.

#### 6 - Variable volume control

Proceed as described in paragraph 5 and install the thermostat on a return air diffuser about 3 m from the Moduline.

Push the thermostat base up to the clips on the central diffuser. Ensure that the thermostat adjustment lever moves freely in the slot between the central and lateral diffusers. Install the white gasket below the thermostat such that it is in contact with the upper wings of the diffusers. Cut a length of the large diameter aspirator tube to connect the filter elbow to the thermostat. Connect the thermostat pressure pick up to the volume controller bleed port with the tube int. diameter 11 mm. Keep the length as short as possible. Insert the black plastic blanking piece on the central diffuser so that it abuts the thermostat.

7 - Adjust the controller to the required flow rate remembering that the total air flow from the Moduline will be 0.61 times the value shown on the controller scale.

#### NOTE:

*Each side of the square diffuser delivers the same air flow.*

8 - Install the unit in the ceiling in accordance with the installation instructions. Set the thermostat to the desired room temperature setpoint, remembering that :

- when the lever is showing the maximum amount of blue the setpoint is about 18.3°C.
- when the lever is showing the maximum amount of red the setpoint is about 29.4 °C.
- with the lever in the centre position (perpendicular to the ceiling) the setpoint is about 23.9°C.

### 9.2.3 - Recommended control circuit test procedures

These procedures should be carried out after all units and their controls have been installed and connected to the air supply.

With the system under pressure :

- a) Set the thermostat for maximum heat (room temperature less than 29°C). Wait for about 2 minutes. All units should be shut off and delivering only the shutoff air flow - 16.8 l/s.

If any unit does not shut down to the proper shutoff rate several possible causes should be investigated :

- a plug missing either from a bellows supply or from a connection manifold
- a poorly installed thermostat
- a slave unit not connected to its master
- a controller incorrectly installed on its connection manifold
- a controller with no supply from the filter.

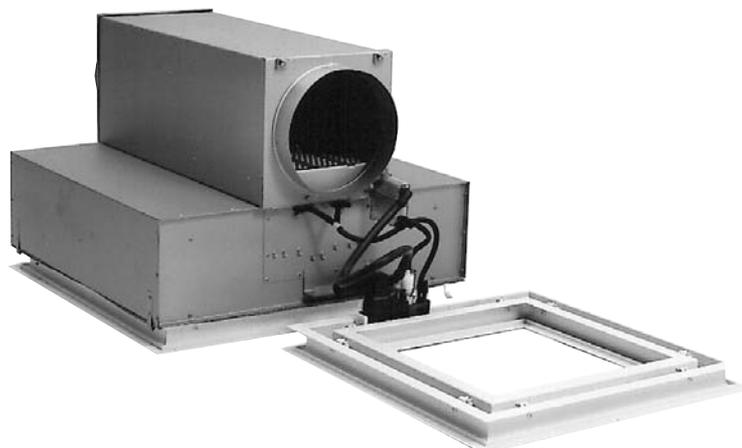
- b) Set the thermostat to maximum cooling (room temperature higher than 18.5°C). Wait for about 5 minutes. All units should be fully opened. If any is not the cause may be a kinked or broken control connection tube. Repair it.

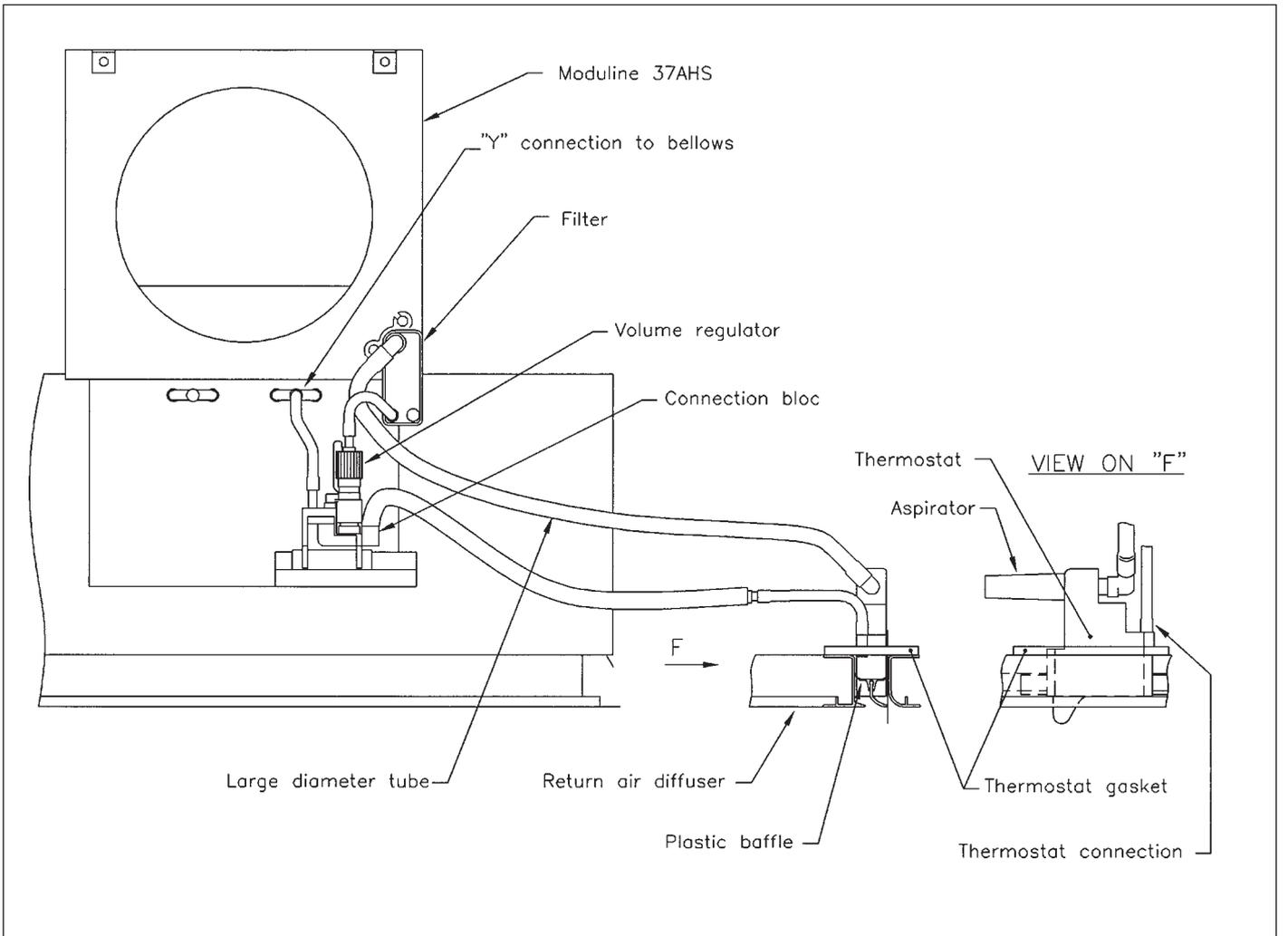
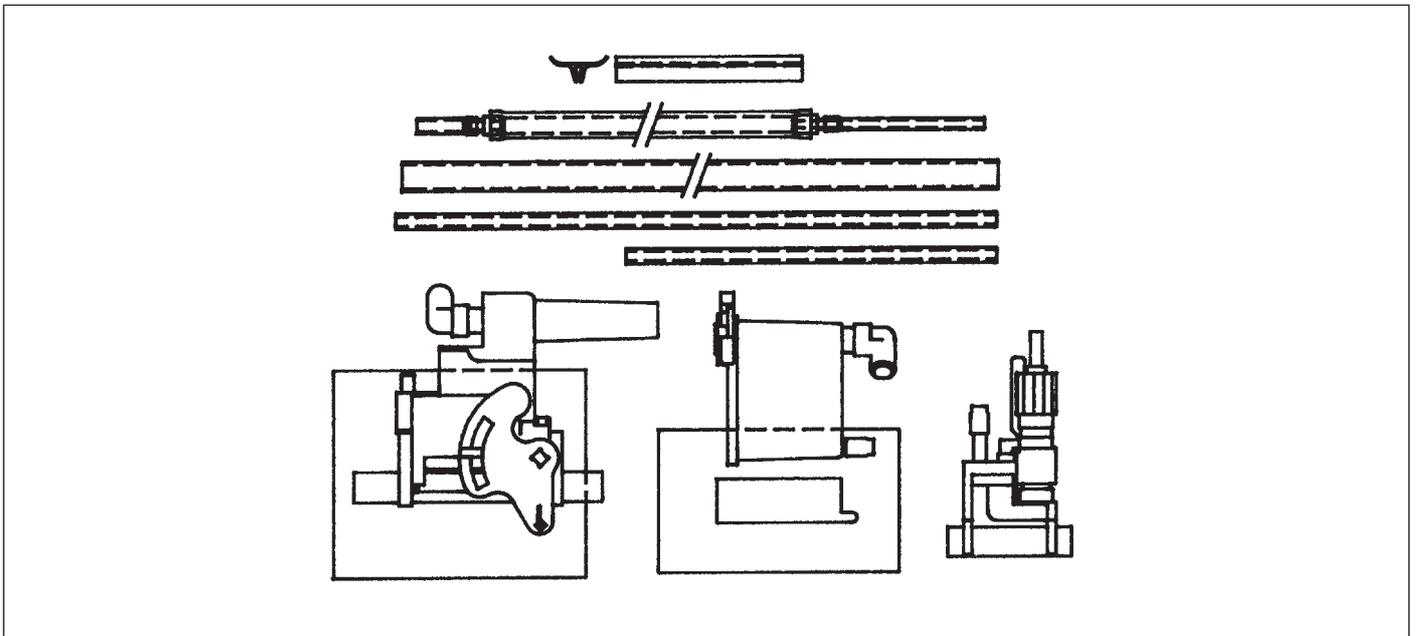
#### WARNING :

*The tolerances of the controlled air flow rates at the controller are as follows*

*± 10 % for the maximum controlled air flow rate*

*± 15 % for the minimum controlled air flow rate.*





### 9.3 - Wall thermostats with 37AG, AH, AHS and AS units

#### 9.3.1 - Description

The thermostat is a proportional device which enables the leakage rate at shutoff from a controller/amplifier to be controlled.

#### 9.3.2 - Specification

The wall thermostat is enclosed in a slim, attractive case.

Units may be calibrated in degrees Celsius or degrees Fahrenheit. Figure shows the location of the label which identifies the type of the unit.

The thermostat is installed as shown in Fig 1.

The maximum separation (maximum length of connection tube) between the wall thermostat and the flow controller is 10 m.

Fire rated tube, 1/4 in external diameter, must be used. Tube must be ordered as a separate order item. It is available in rolls of 76 m under Carrier Part No. 35BB 900 172 C.

#### 9.3.3 - Siting the thermostat

The thermostat must be in the correct position to ensure correct and stable operation. Its position must be such that it is exposed to air which gives a true measure of the room temperature. It must not however be exposed to a draft.

Ensure that the thermostat will not be exposed to direct sunlight, on an outside wall or where it may be affected by heat from a lighting, a computer or other local source of heat. It should be from 1.2 m to 1.5 m above floor level. Confirm that there are no hot water or chilled water pipes in the vicinity of the thermostat.

#### 9.3.4 - Installation

1 - The thermostat may be surface mounted (sub-base included in the kit) or recessed (use a 50 x 100 mm electrical wall box, supplied by others). Two 6-32 screws are provided in the kit. A 250 mm 5/32 in diameter tube is provided with an adapter for connection to standard 1/4 in fire rated tube.

2 - Open the box by pressing on either side of the box (Fig 2).

3 - Connect the 5/32 in inside diameter tube to the appropriate outlet as shown in Fig 1 (port T2).

4 - Connect the adapter to the 1/4 in outside diameter fire rated tube and connect the other end to the controller/amplifier (ordered separately).

#### NOTE :

**Controller/amplifier kits must be ordered separately.**

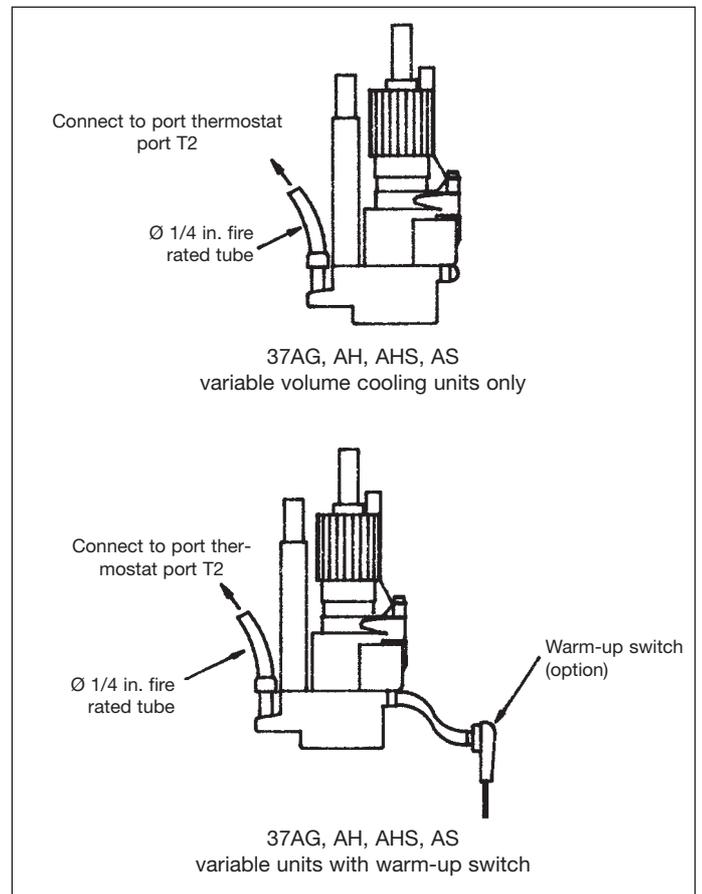


Fig. 1 - Tube connection to air flow controller



### 9.4.5 - Application

Thermostat type	Operating mode	Kit part No	Label réf.
Calibrated °C	Cooling	37CM910 002 M	CTS-1102-17
Calibrated °F	Cooling	37CM 910 012 M	CTS-1102-16

**NOTE :**

*Controller/amplifier to be ordered separately*

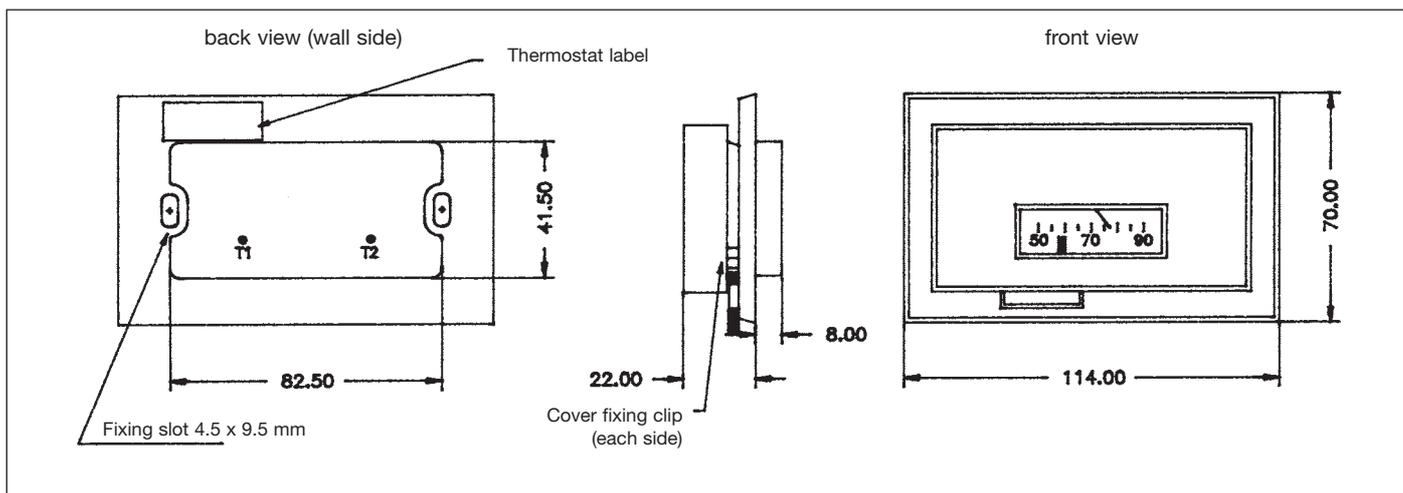


Fig. 2 - Wall thermostat dimensions

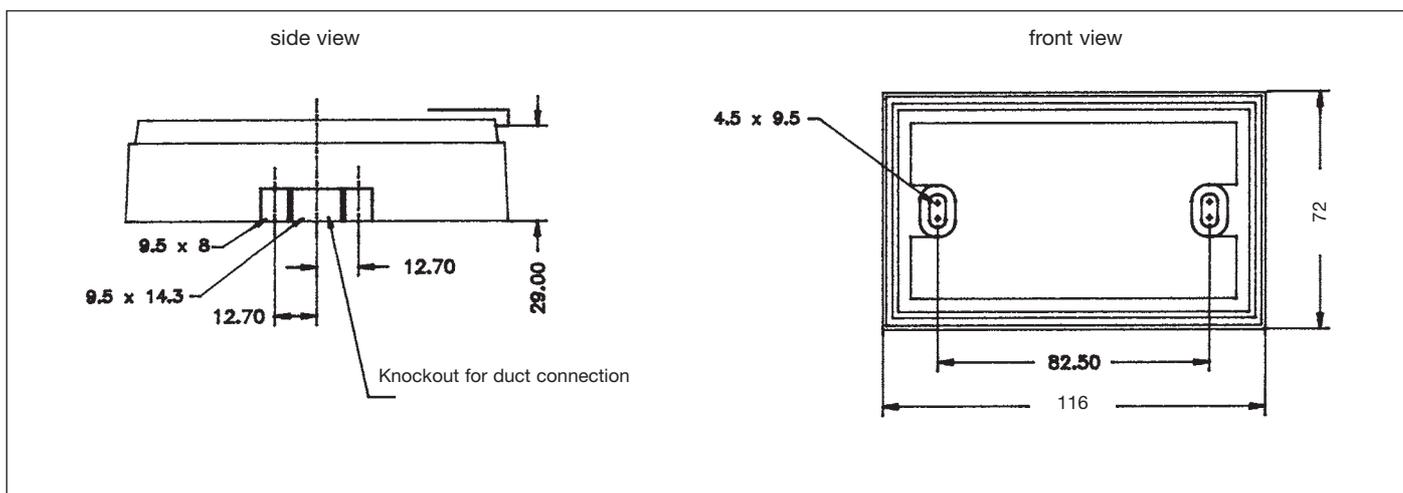


Fig. 3 - Thermostat sub-base dimensions

## 9.4 - Installing controller/amplifiers

### 9.4.1 - Introduction

Controller/amplifier assemblies may be installed before (to be preferred) or after installation of the units in the false ceiling.

### 9.4.2 - Installation procedure

**1 - Ensure that the content of the kit package is the same as that shown in Fig. 1.**

#### 2 - Install the filter :

Remove the cap from the pressure take off and unscrew the two screws. Ensure that the pressure take off is not obstructed. Locate the filter in position with the filter correctly in place. Insert and tighten the two screws.

#### 3 - Install the controller/amplifier

Fix the controller/amplifier on the mounting using the screw supplied. Screw the assembly to the plenum using one of the existing screws.

Connect the control tubes as shown in Fig 2.

Confirm that the filter elbow is plugged or capped and that the controller/amplifier is vertical.

#### 4 - Set the controller/amplifier to the required air flow remembering that :

The controller is calibrated in CFM.

- for 37AG, AS and AH units the air flow rate set on the controller is the total air flow for each unit.
- for 37AG unit with 1200 mm active length, the total air flow is 1.3 times the air flow shown on the controller.
- for 37AHS unit the total air flow is 0.61 times the air flow shown on the controller.

#### NOTE :

*The tube, sketch S, is fire rated tube, 1/4 in external diameter, and must be ordered as a separate order item. It is available in rolls of 76 m under Carrier Part No. 35BB 900 172 C.*

*The maximum separation (maximum length of tube) between the wall thermostat and the flow controller is 10 m.*

*- All connections must leak free.*

*- Access through the false ceiling is essential.*

*- The wall thermostat must be ordered as a separate item.*

*- The controller is a calibrated device with matched components. Do not interchange its components.*

#### Note :

*The controller is calibrated in CFM and not in l/s.*

$$m^3/h = CFM \times 1.7$$

$$l/s = CFM \times 1.7 / 3.6$$

### 9.4.3 - Recommended control circuit test procedures

These procedures should be carried out after all units and their controls have been installed and connected to the air supply.

With the system under pressure :

#### 1 - Set the thermostat for maximum heat (room temperature less than 30°C)

Wait for about 2 minutes. All units should be shut off and delivering only the shutoff air flow.

If any unit does not shut down to the proper shutoff rate several possible causes should be investigated :

- a plug missing either from a bellows supply
- a slave unit not connected to its master
- a controller with no supply from the filter
- leakage between the thermostat and the controller/amplifier

#### 2 - Set the thermostat to maximum cooling (10°C room temperature)

Wait for about 5 minutes. All units should be fully opened. If any is not the cause may be a kinked or broken control connection tube. Repair it.



Fig. 1.

#### WARNING :

*The tolerances of the controlled air flow rates at the controller are as follows*

*± 10 % for the maximum controlled air flow rate*

*± 15 % for the minimum controlled air flow rate*

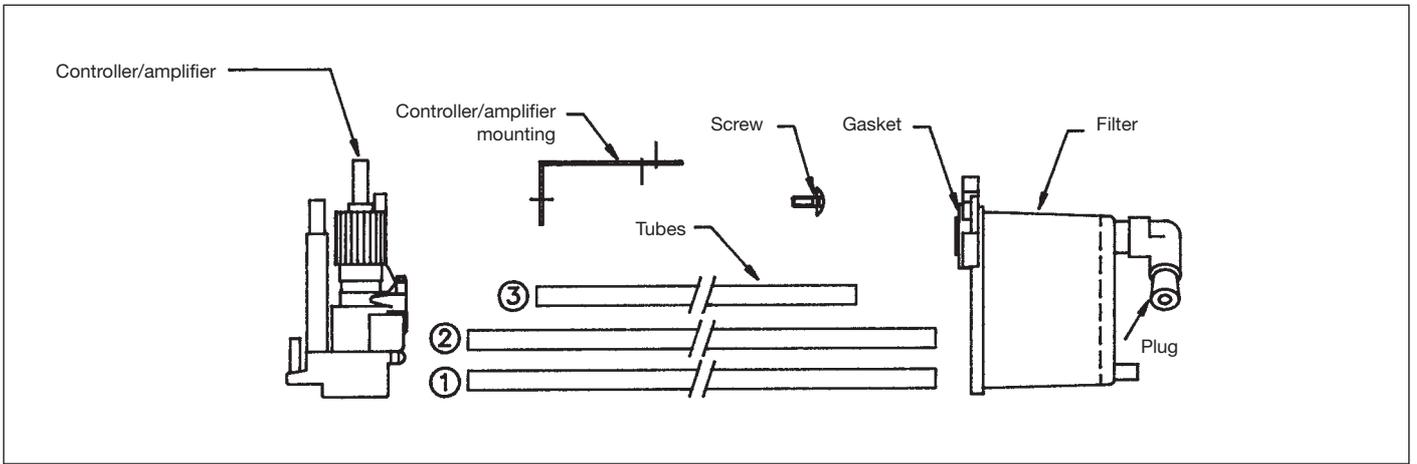


Fig. 1.

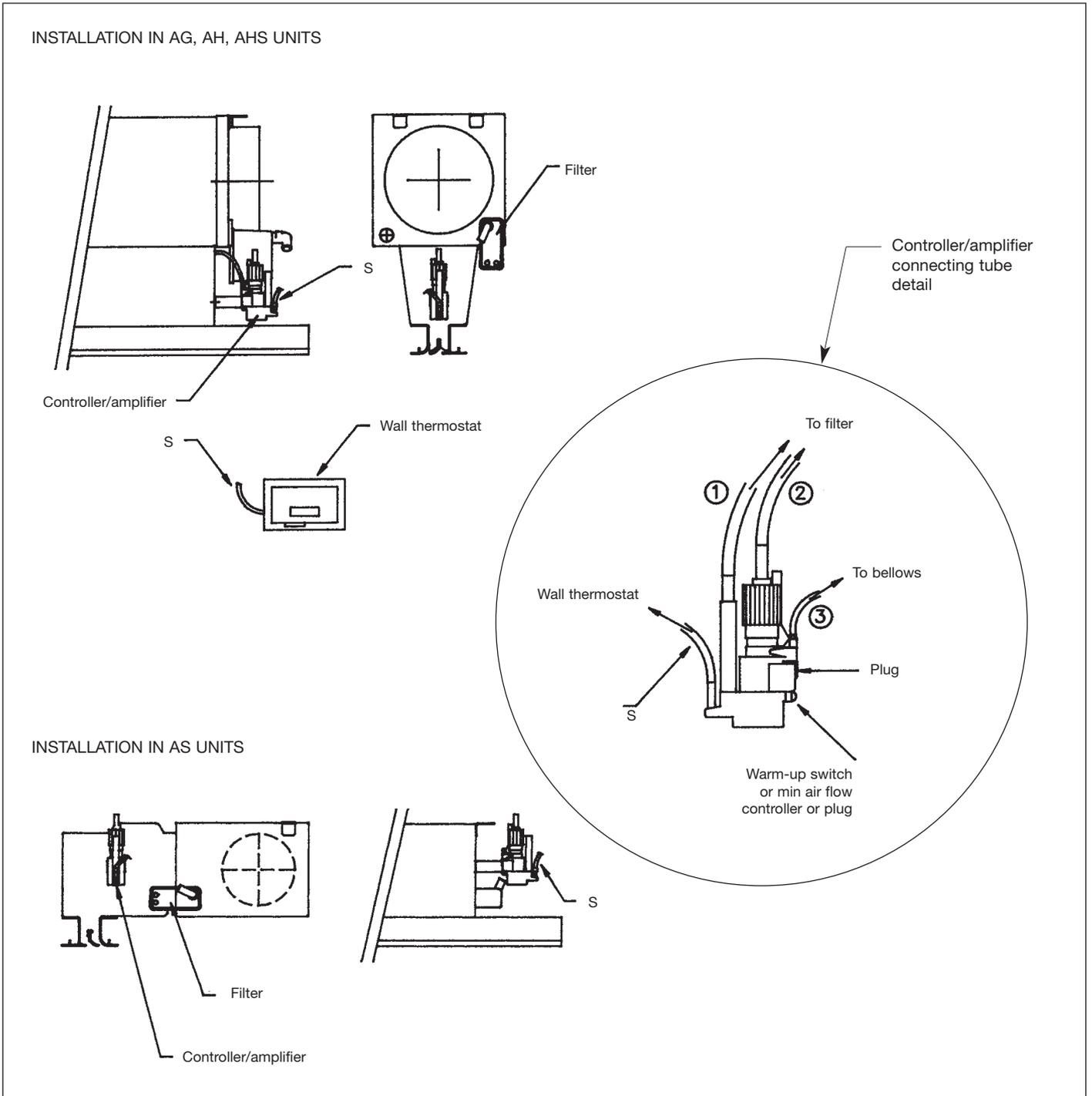


Fig. 2.

## 9.5 - Installing the minimum air flow controller

### 9.5.1 - Introduction

The minimum air flow controller and, more often, a controller on 37A units may be done before installation (to be preferred) or after the unit is installed in the false ceiling.

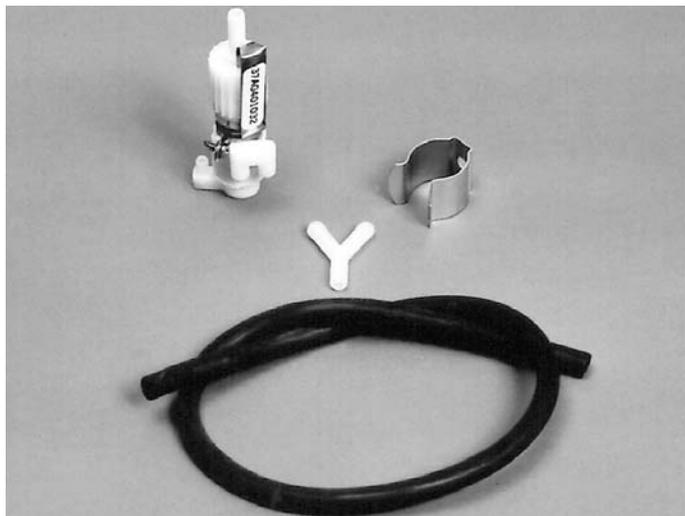
Type d'unité	Référence
37AG, AH, AHS, AS	37AG900 172 C

*Minimum air flow controller kit part number*

The tolerance of the minimum controlled air flow rate at the controller is  $\pm 15\%$ .

This figure includes any air leakage with bellows in the fully shut position. The minimum air volume turn down achievable per range is :

- Unit 37AG (900 mm active length) : 21 l/s  $\pm$  4 l/s
- Unit 37AG (1200 mm active length) : 25 l/s  $\pm$  4 l/s
- Unit 37AS : 21 l/s  $\pm$  4 l/s
- Unit 37AH : 32 l/s  $\pm$  4 l/s
- Unit 37AHS : 32 l/s  $\pm$  4 l/s



### 9.5.2 - Installation procedure

- Confirm that the kit contents are the same as those shown in Fig 1.
- Drill a 3 mm hole in the side of the plenum as shown by Fig 2. Install the controller mounting using mastic to prevent leakage and hissing.
- Install the minimum air flow controller on the mounting as described below.
- For installation with:

#### 1 - System powered variable air volume

Remove the rubber plug from the plastic base of the thermostat to enable the 3/16 in diameter tube from the minimum air flow controller to be connected. Refer to Fig 3.

#### 2 - Controller/amplifier

Remove the plug from the controller as shown in Fig 4.

### 3 - Electrical control

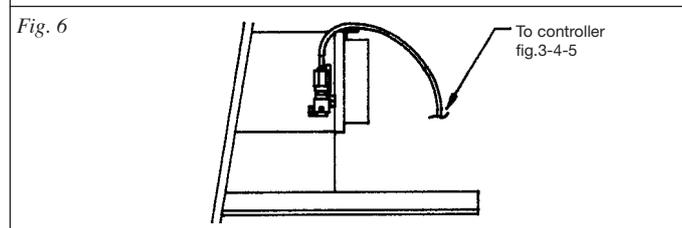
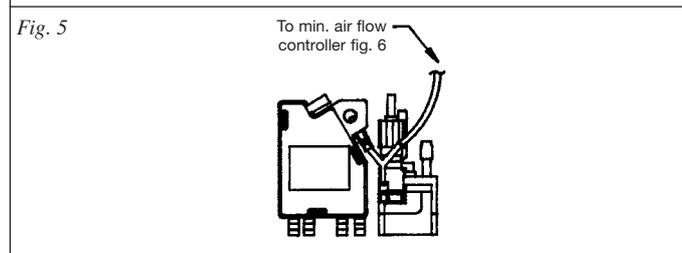
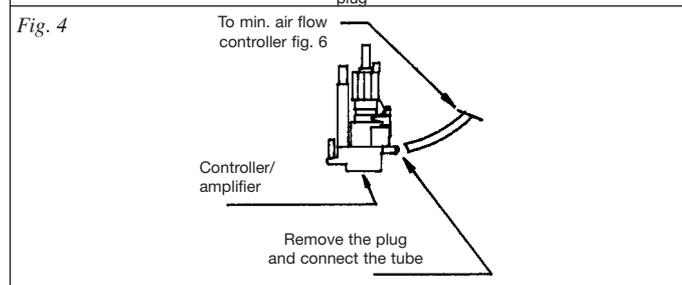
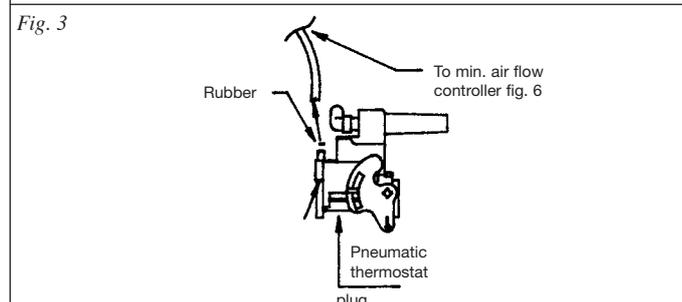
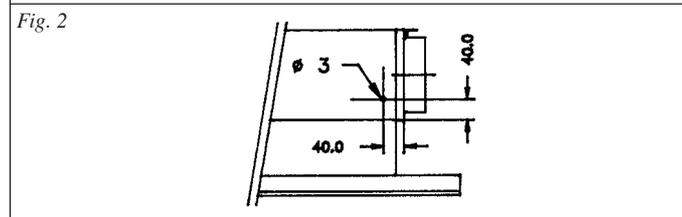
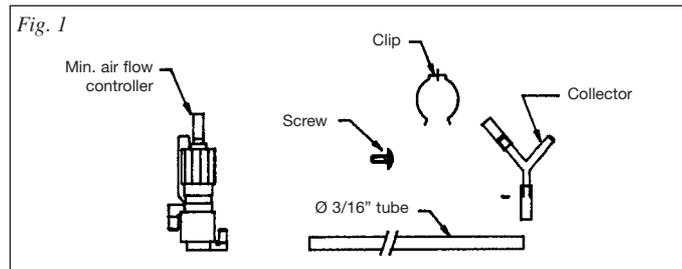
Having installed the maximum air flow controller, remove the brass calibrated orifice. Replace the interface crystal tube with the collector and reconnect the interface, the maximum air flow controller and the minimum air flow controller as shown in Fig 5. e) Use the 3/16 in internal diameter tube supplied to connect the minimum air flow controller. See Figs 3,4,5,6.

f) Set the minimum air flow controller to between 25% and 50% of the air flow setting on the maximum air flow controller.

(Always stay within the 25 - 50% range of the actual setting on the controller.)

g) All connections must be leak free.

h) Access via the false ceiling is essential.

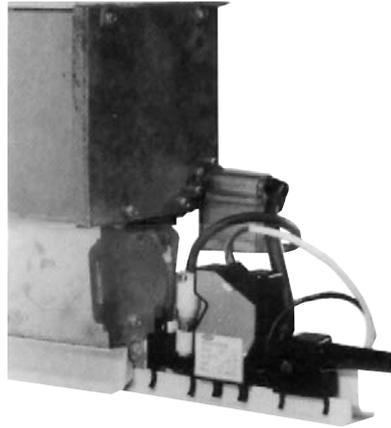


## 9.6 - Installing the warm-up switch on 37AG, AH, AHS, AS units

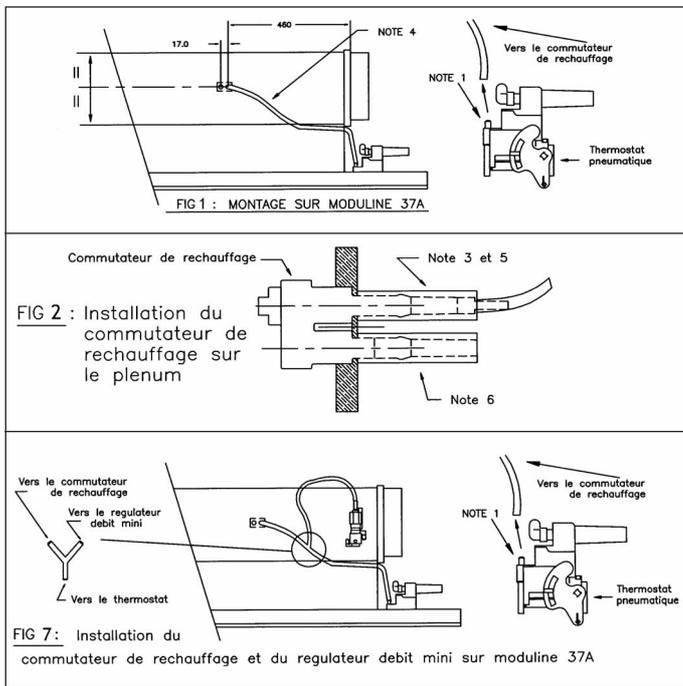


1. Remove the rubber plug from the plastic base of the thermostat to enable the 3/16 in diameter tube from the warm-up switch to be connected.
2. Drill two holes dia. 10 mm in the plenum at the position shown in Fig 1.
3. Position the warm-up switch in the unit lining up the two orifices with the two holes drilled at step 2.
4. Connect the righthand orifice (Fig 3) with the special pressure takeoff. Use the rubber tube supplied in the kit.
5. The warm-up switch is supported by the rubber tube. Push the rubber tube firmly into place and fasten the clamping ring to ensure that there are no leaks.
6. Do not block the lefthand orifice in the switch.

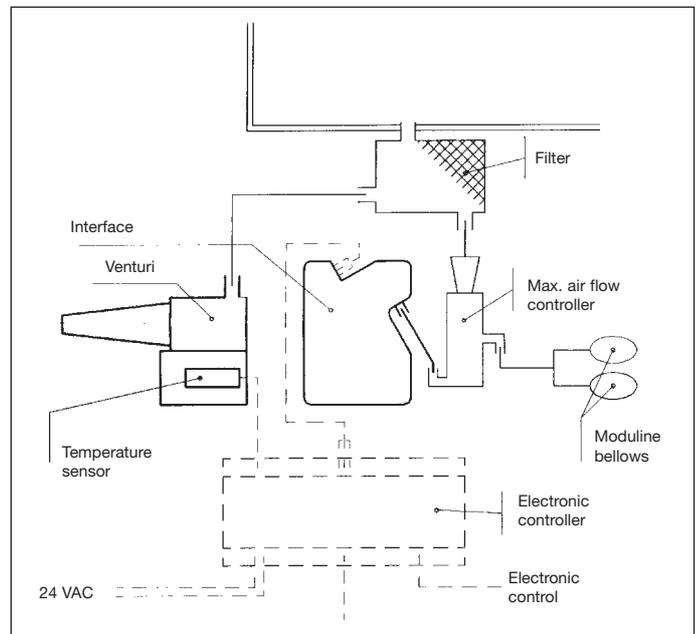
## 9.7 - Installing electronic interface with 3-wire 24 VAC output



1. Confirm that the maximum air flow controller is the correct one for the Moduline being used. Refer to the photo. Position the controller and its mounting close to the end plate and connect the tubes as described in the instructions which accompany the maximum air flow controller.



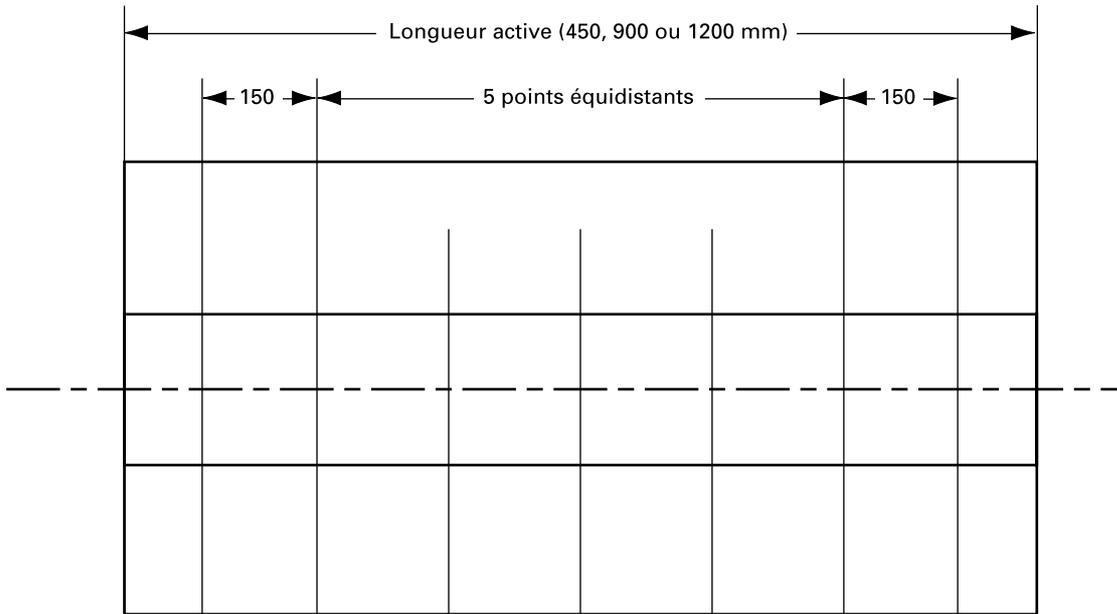
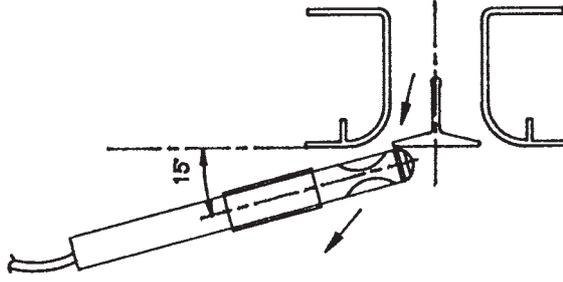
- 2 - Remove the brass cap from the controller bleed orifice.
  - 3 - Set the electronic interface on the central diffuser and connect the 4 mm internal diameter crystal tube to the bleed orifice on the controller.
  - 4 - Confirm that no plugs or caps are missing.
  - 5 - Install the interface supply cable.
  - 6 - Connect the three wires from the opposite end of the controller as shown in the controller wiring diagram :
- G = 24 VAC, Y1 = opening signal, Y2 = closing signal.



## 10 - SITE WORKS : SUPPLY AIR FLOW MEASUREMENT

### 10.1 - Velocity sensor location

Hot wire anemometer (0-10 m/s)



**NOTE :**

*Be careful, don't take velocity reading in front of spacer (inside the diffuser assembly).*

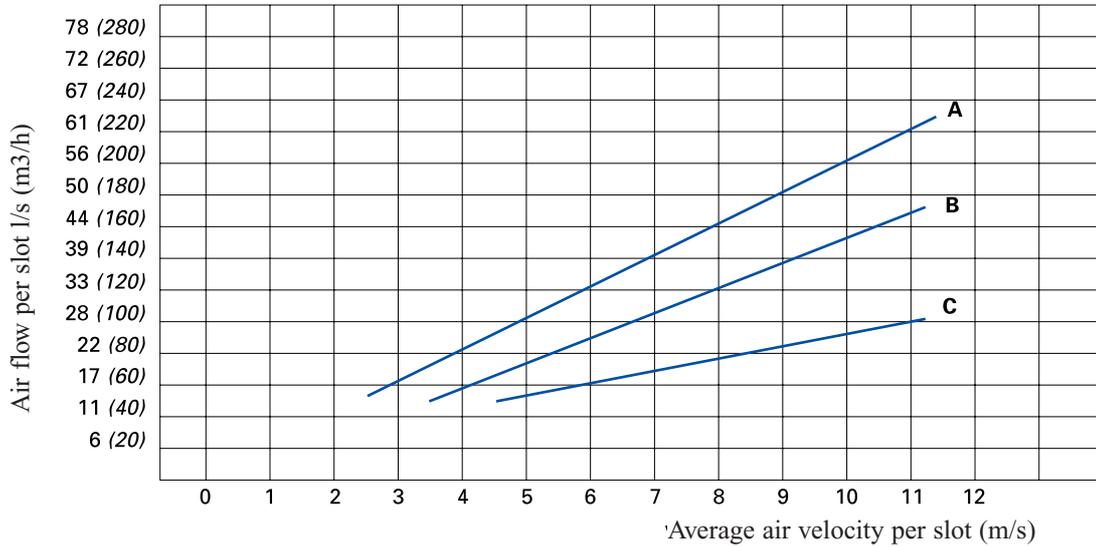
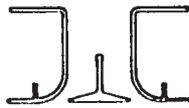
## 10.2 - Average air velocity per slot as a function of total air flow - 37AG

Diffuser active length

A 1 200 mm

B 900 mm

C 600 mm

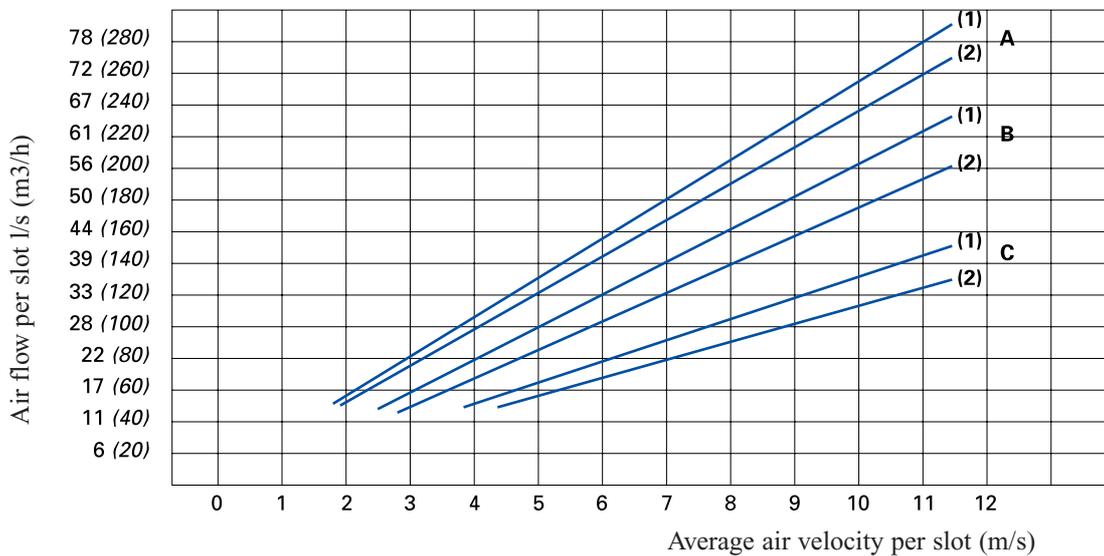
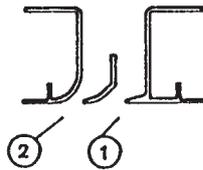


Diffuser active length

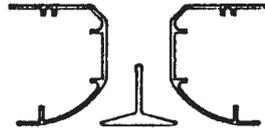
A 1 200 mm

B 900 mm

C 600 mm



### 10.3 - Average air velocity per slot as a function of total air flow - 37AH

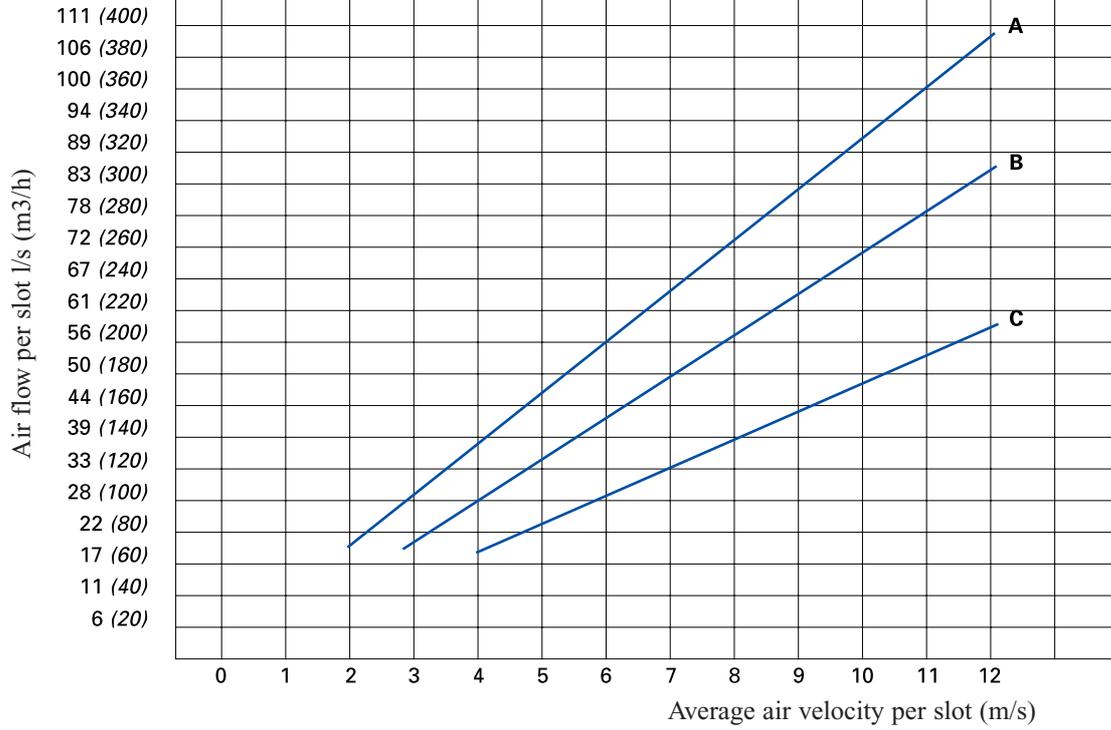


Diffuser active length

A 1 200 mm

B 900 mm

C 600 mm

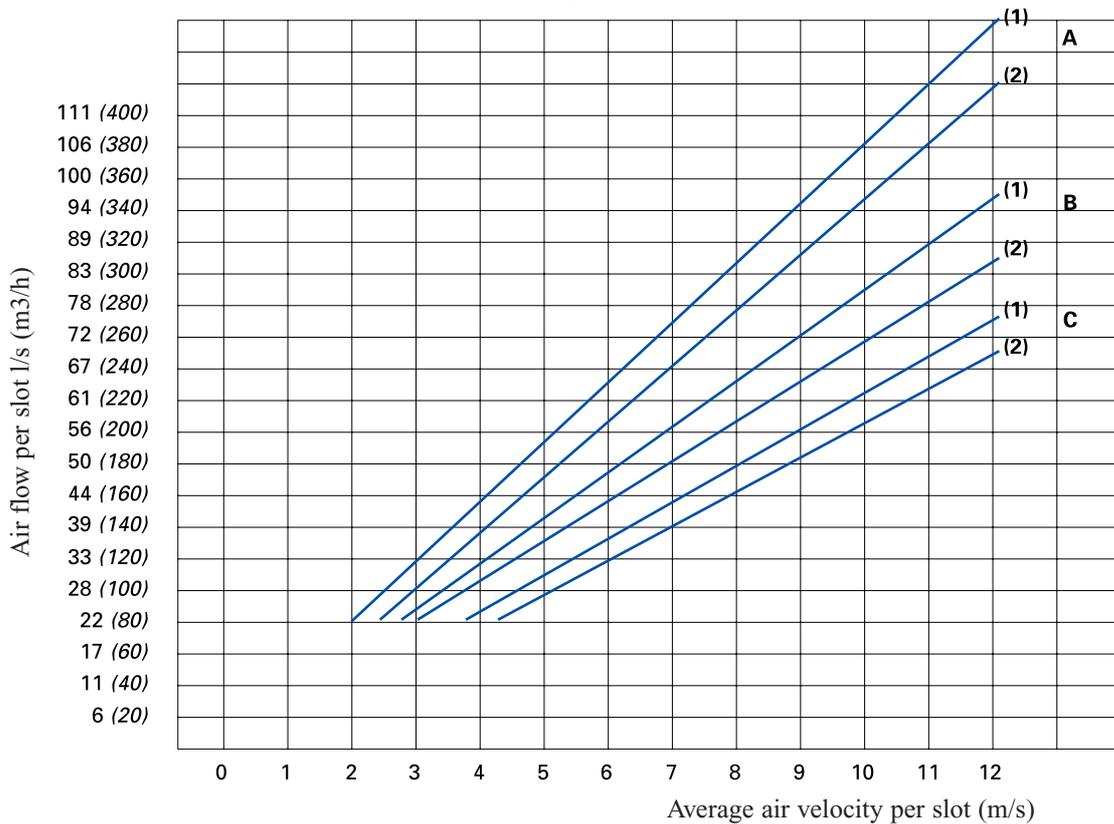
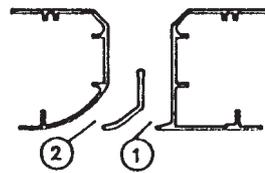


Diffuser active length

A 1 200 mm

B 900 mm

C 600 mm



## 11 - SPECIAL ORDER UNITS

### 11.1 - Diffuser length

Diffusers may be from 449.5 to 2000 mm long.

### 11.2 - Surface finish

Diffusers may be unpainted, anodised or treated with other special finishes.

### 11.3 - Diffuser shape

Diffuser outlines can be designed to match non-standard false ceiling.

### 11.4 - Moduline internally partitioned

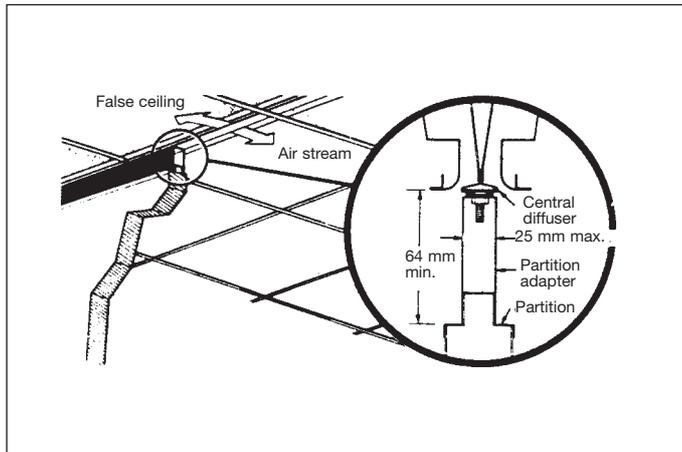
This is necessary when a diffuser is installed either close to or above a partition and the air flows from the two slots differ.

The adapter must not impair access to the controls.

A seal, which must not obstruct either slot, between the top of the partition and the centre limb of the diffuser must be used to ensure that the required air distribution is achieved.

#### **NOTE:**

*Such installations call for Moduline units which are internally partitioned to create the two air paths. Standard 37AG units are internally partitioned. 37AH units may be internally partitioned to special order.*



*Typical installation above a wall partition*

### 11.5 - Lateral primary air supply

When the normal air supply to the end of the unit plenum is not possible a connection spigot may be provided in either side of the plenum or in its top surface. In every case it should ideally be equidistant from either end of the plenum. The maximum permissible supply air velocity becomes 5 m/s.

#### **NOTE:**

*Moduline units with side supply spigots must also have an end feed spigot (either end of the plenum) to enable the unit to be calibrated*

### 11.6 - Non standard plenum aspect ratios

These are possible to cater for installations in shallow ceiling voids.

### 11.7 - Wall mounted Moduline

Moduline units are wall mounted when there is no false ceiling. Performances and air distribution are similar to those of wall grilles. Access to the controls must be available through the false ceiling in an adjacent corridor or through a service hatch in the partition itself. The diffuser neck is extended to the thickness of the partition. The air flow controller/amplifier must be installed upright close to the diffuser. A wall mounted thermostat must be used.

### 11.8 - Active length

All Moduline units have a common active length of 900 mm (except for 37AG unit with 1200 mm active length and 37AHS unit). When the maximum air flow required from a standard is not compatible with the required air throw and sound level, the active length can be increased (to 1200 mm maximum) or decreased (to 450 mm minimum). Performance is directly proportional to active length so that, with a non-standard diffuser length its performance is found by multiplying standard performance (read on the controller) by the ratio of actual active length to standard active length.

Unless the contrary is specified, all non-standard features described here give air throws, sound levels and air throw rates identical to those of the standard units. Total flexibility with respect to the standard control possibilities and master/slave combinations is maintained.

## 12 - SPECIFICATION GUIDE

Supply and install Moduline air terminal units with the controls and accessories required for the units to function as standard units in accordance with the data on the drawings provided. Dummy Moduline units, return air Moduline units and plenum stop end caps shall be supplied in addition as required to complete the installation. All installation accessories such as, but not limited to, T-bar ceiling supports, screw eye hangers, diffuser alignment pieces shall be supplied in quantities sufficient to complete the installation.

Plenums shall be made of 6/10 gauge galvanised sheet steel and shall be insulated internally, thermally and acoustically, with glass wool 13 mm thick which shall itself be protected against erosion by the air stream.

Bellows dampers, two or four per unit, shall be of neoprene and glued to the central diffuser member with two or four formed bellows stops covered with felt to attenuate noise generated by the air flow.

Diffusers shall be of extruded aluminium with baked on white paint (RAL 9010 30% gloss). All painted parts shall be protected by a peelable adhesive strip to be removed after installation.

Slave units can be easily converted into a master unit by simple addition of a control kit.

Controls shall be operated by air entering the plenum of the diffuser and passing through a filter and at a pressure no less than the minimum shown in the published performance data and no more than 750 Pa. It shall be possible for one variable volume controller or one constant volume controller to control up to 16 bellows. It shall be possible to convert any slave unit

to a master unit or any master unit to a slave unit at any time.

Variable air volume units shall be installed at the positions shown on the plans and shall be fitted on-site with control components comprising connection tubes, a flow controller and a thermostat with a venturi. The thermostat setpoint shall be variable so that it may be set at any temperature between 18 °C and 29 °C. The flow controller shall operate as described below.

Constant air volume units shall be installed at the positions shown on the plans and shall be fitted on-site with constant air volume control components comprising connection tubes and a flow controller. The flow controller shall maintain the air flow constant at any air pressure between the minimum (determined by the flow setpoint) and the permitted maximum of 750 Pa. The air flow shall be set at the controller by screwing or unscrewing a knurled nut to a position at which its base corresponds with the desired setting.

These units are not U.L fire rated. For information on this or any other fire rating, contact Carrier.



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Manufacturer reserves the right to change any product specification without notice.



Environmental Management System Approval

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