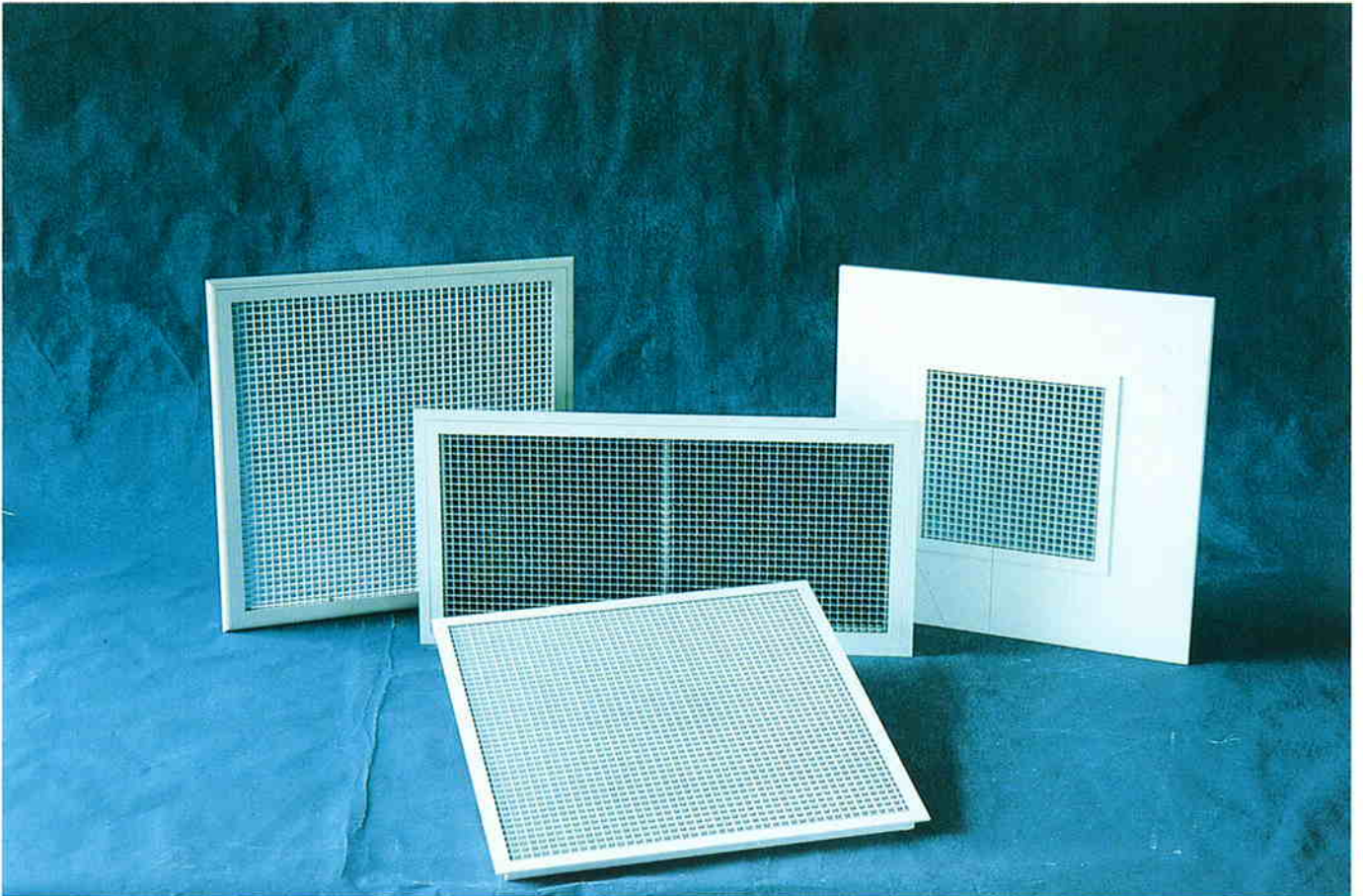


CONNOLS-AIR
RETURN AIR GRILLES



LEADER IN AIR DISTRIBUTION PRODUCTS

RETURN OR EXHAUST AIR GRILLES AND REGISTERS WITH 12.5 X 12.5 X 12.5MM GRID CORE

MODEL G12 AND PG12

CONSTRUCTION

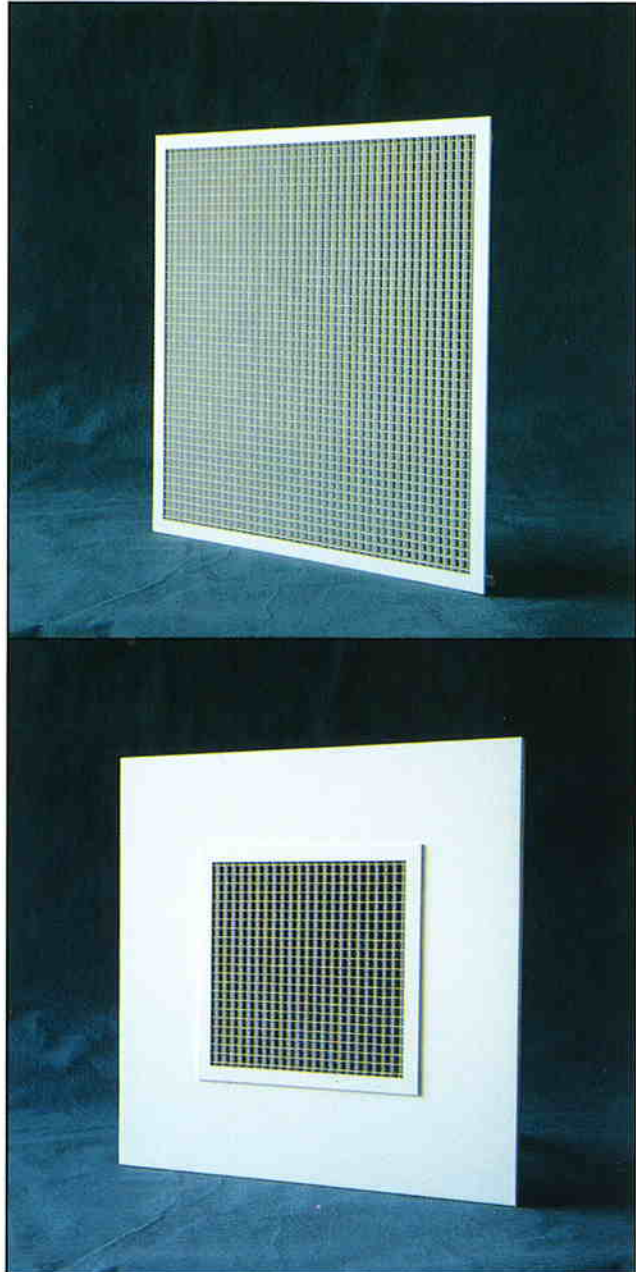
The frame is constructed of heavy gage extruded aluminium alloy 6063 tempered to T5. The 12.5 x 12.5 x 12.5mm grid core is constructed of thin aluminium strips pressure welded. Frames are assembled using corner inserts. Panel of PG models is constructed of zinc coated steel – aluminium panel is also available on request.

FEATURES

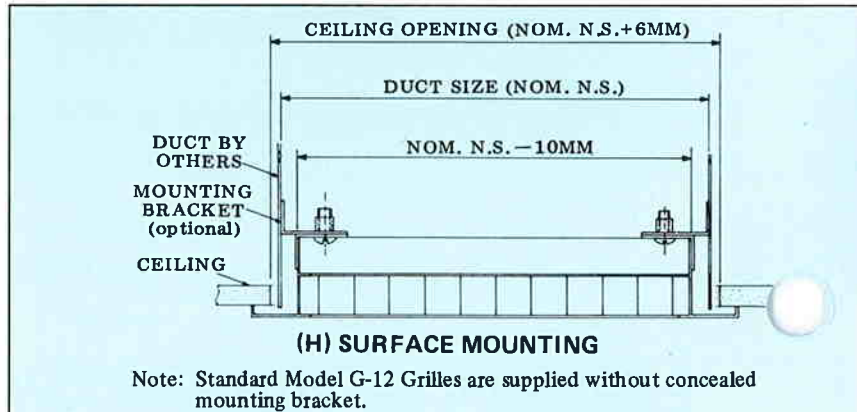
- Frame and Core are constructed of corrosion resistance aluminium.
- Corner inserts ensure hairline butting of frames
- 12.5 x 12.5 x 12.5mm grid core provide a clear unobstructed air inlet passage for maximum performance efficiency – average effective free area is 85% core area.
- Damper is easily adjustable from the face of the grille.
- **Certified Performance Data** obtained from a **NATA Independent Testing Laboratory**.

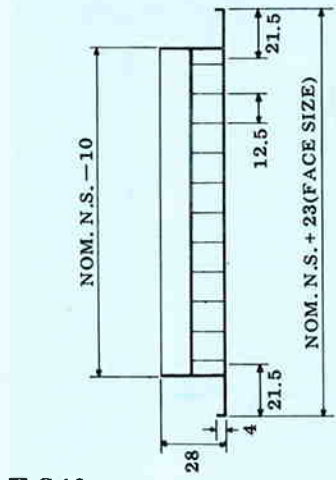
FINISH

Standard finish is baked white enamel. Other colors are also available on request. Anodised finishes are not available with model PG-12 grille.

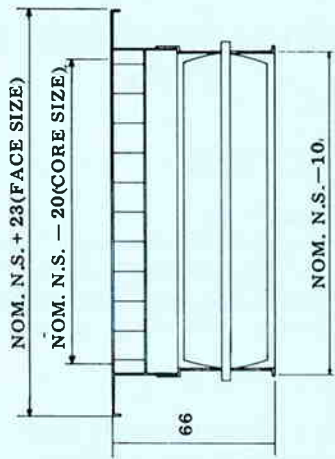
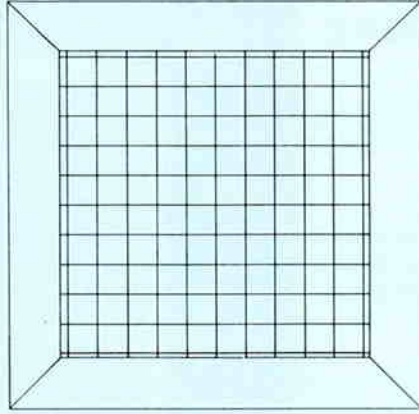


INSTALLATION DETAILS

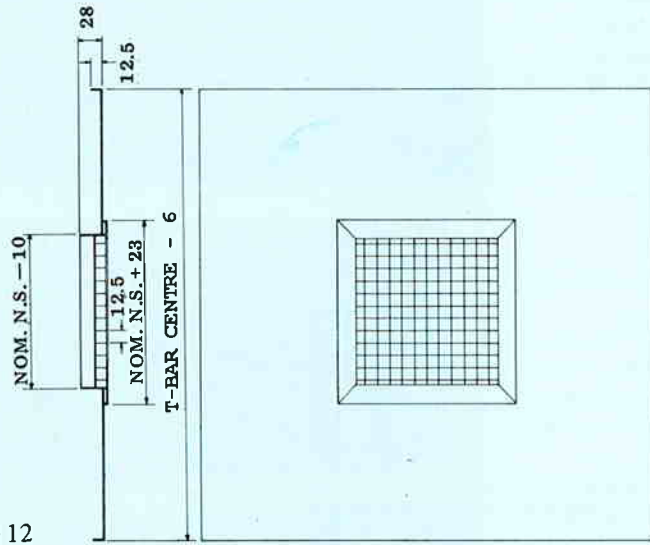




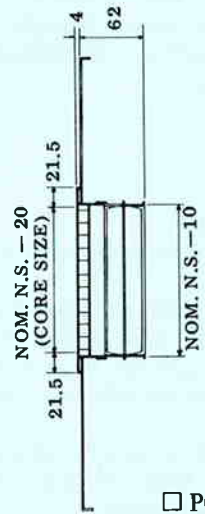
□ G12



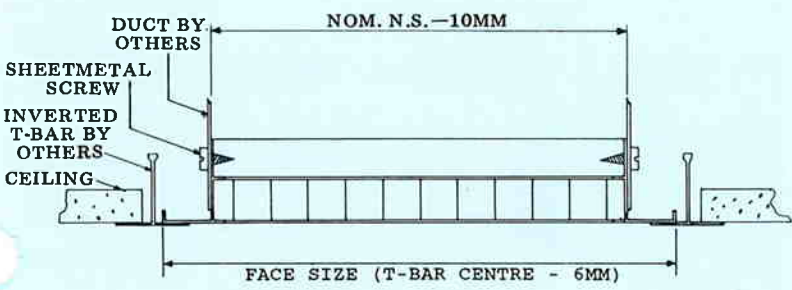
□ G12-D



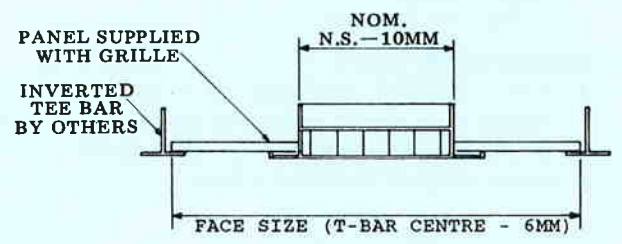
□ PG12



□ PG12-D



(T) LAY-ON TEE BAR



(T) LAY-ON TEE BAR

Note: Grille to be suspended to the structure above if return air is not ducted

HINGE FILTER AND REMOVABLE CORE RETURN OR EXHAUST AIR GRILLES WITH 12.5 x 12.5 x 12.5MM GRID CORE

MODEL FG12 : HINGE FILTER TYPE
MODEL RG12 : REMOVABLE CORE TYPE

CONSTRUCTION

MODEL RG 12 and FG 12

Both the mounting and the inner core frames are constructed of heavy gage extruded aluminium alloy 6063 tempered to T5. Grid core is constructed of thin aluminium strips pressure welded. Both frames are assembled using corner inserts.

MODEL RG 12

The 12.5 x 12.5 x 12.5mm grid core is assembled in the inner core frame which in turn is fastened to the mounting frame with concealed spring clips or sheet metal screws.

MODEL FG 12

The grid core is assembled in the inner core frame which in turn is hinged at one side to the mounting frame. Special designed concealed latches are provided for locking the core. Standard filter frame is designed for 12.5mm thick washable type filters.

FEATURES

MODEL RG 12 and FG 12

- Frames and Core are constructed of corrosion resistance aluminium.
- Corner inserts ensure hairline butting of both frames.
- 12.5 x 12.5 x 12.5mm grid core provides a clear unobstructed air inlet passage for maximum performance efficiency – average effective free area is 85% of core area.
- Damper is easily adjustable from the face of the grille.
- **Certified Performance Data** obtained from a **NATA Independent Testing Laboratory**.

MODEL RG 12

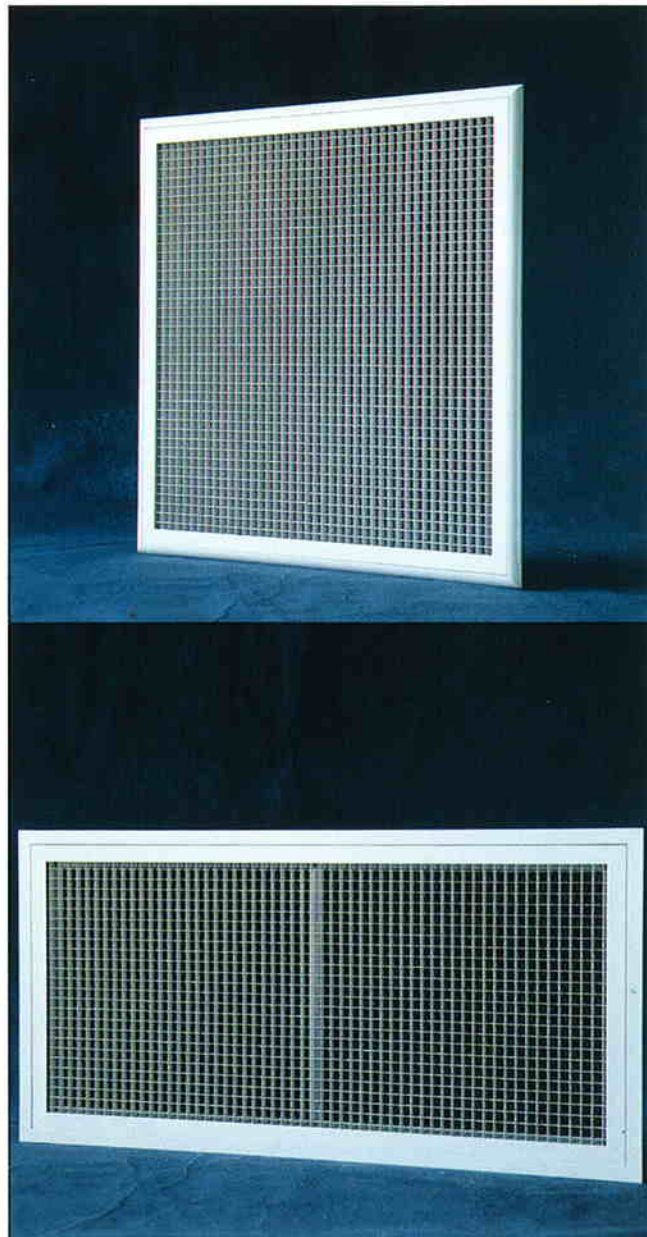
- Aluminium grid core with curve mounting frame provide an attractive appearance that will blend into all types of ceiling.
- Centre core is easily removable without special tool.

MODEL FG 12

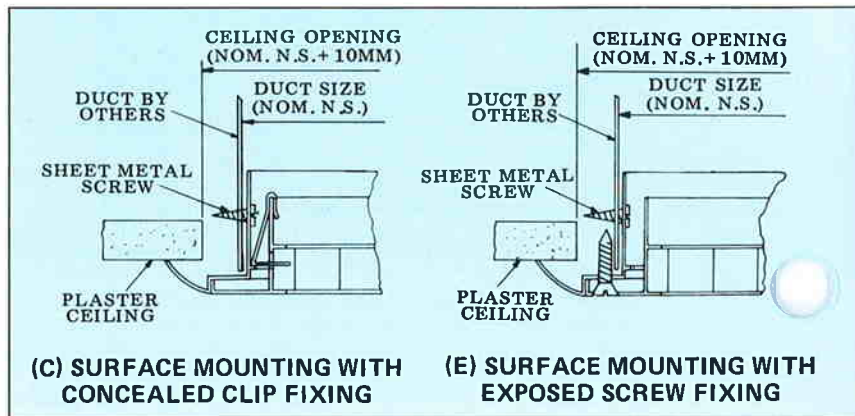
- Special designed concealed core latches and filter retainer clips permit quick and easy removal of filter for cleaning without special tool (see page 9).
- Special designed concealed hinges.

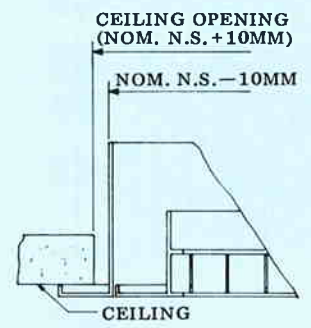
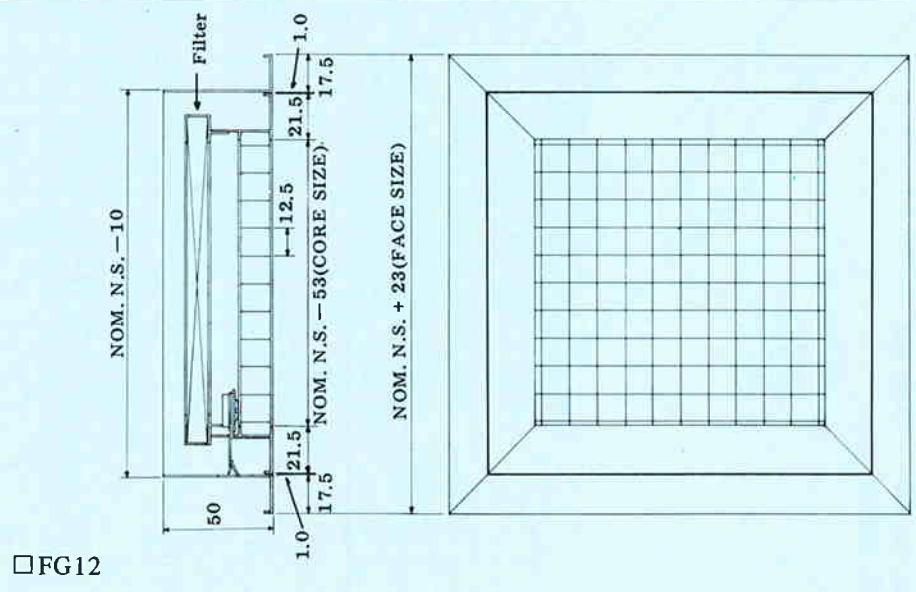
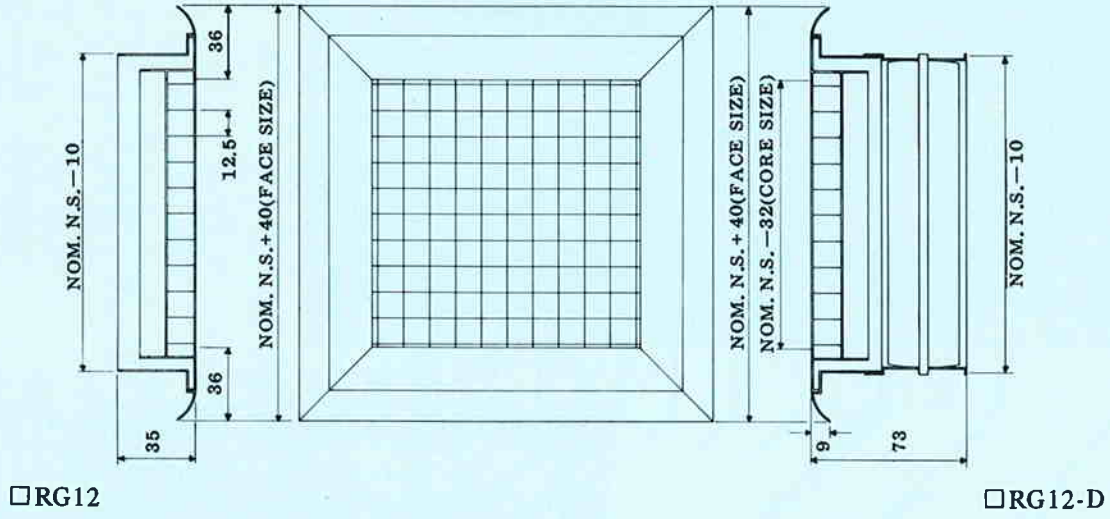
FINISH

Standard finish is baked white enamel. Other colors are available on request. Anodised finishes are also available on request.

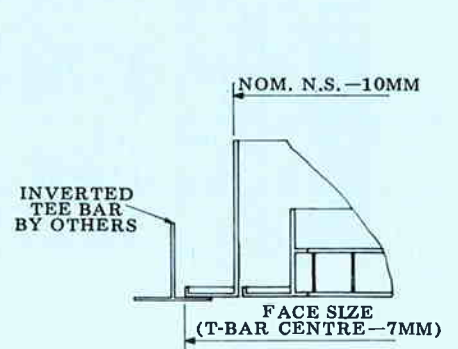


INSTALLATION DETAILS





(S) SURFACE MOUNTING



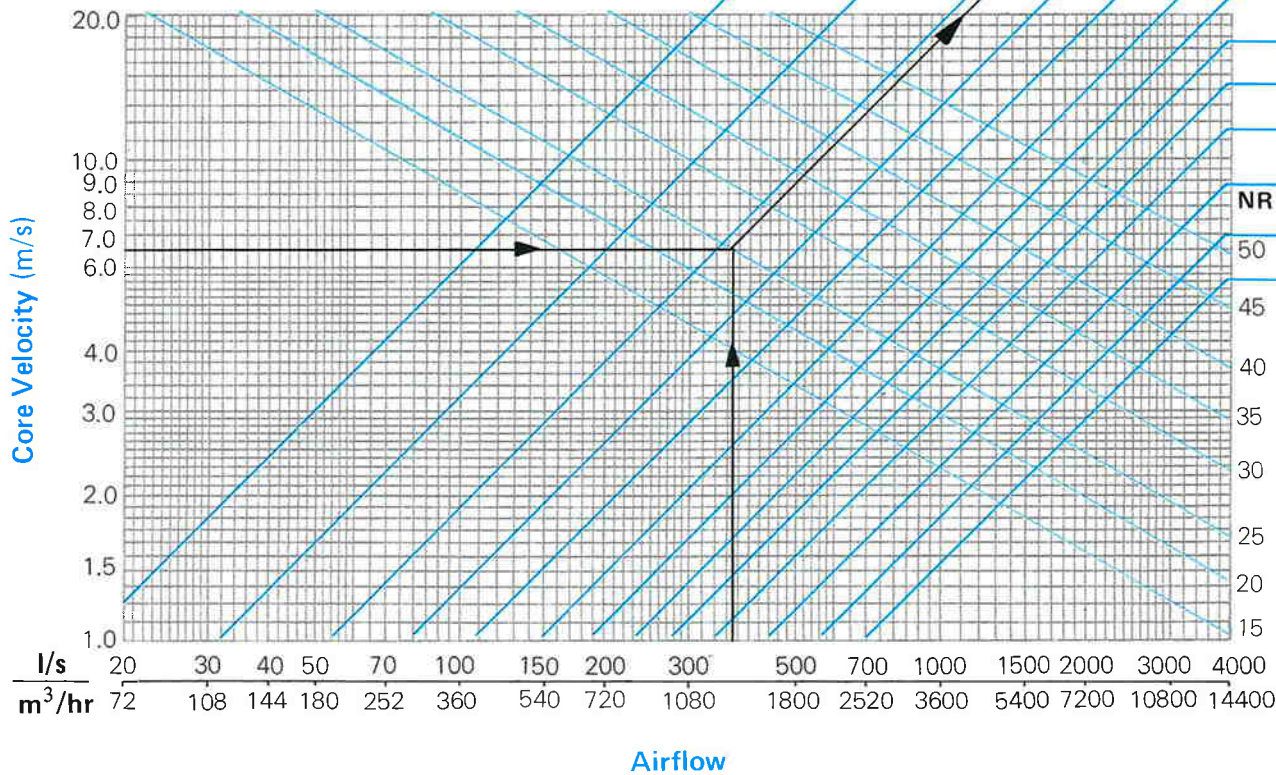
(T) LAY-ON TEE BAR

INSTALLATION

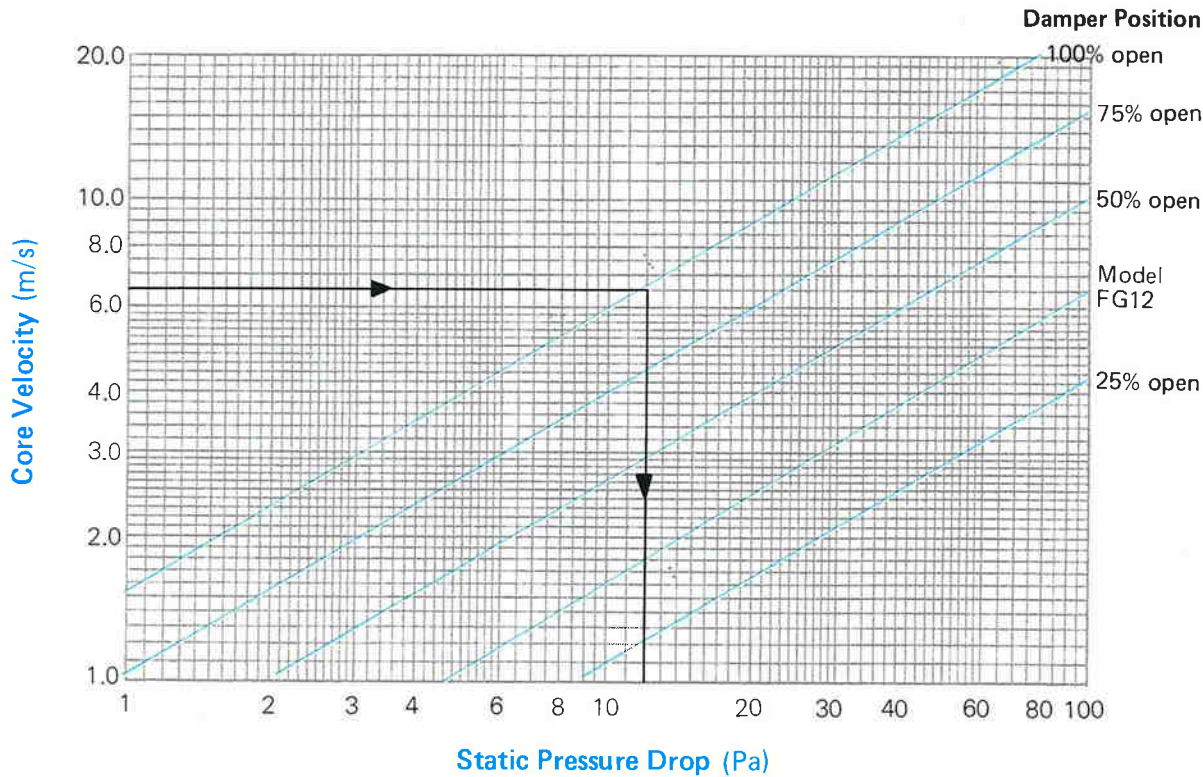
- To install :
- (1) Remove or unlatch the centre core from the mounting frame as shown in step 1 and 2 page 9,
 - (2) Fasten the mounting frame to the duct as shown in figures C and E,
 - (3) Re-install the centre core,
 - (4) Grilles to be suspended to ceiling if return air is not ducted.

RETURN AND EXHAUST GRILLES PERFORMANCE DATA

- All data are obtained in a **NATA CERTIFIED INDEPENDENT TESTING LABORATORY**
- NR values are based on a room absorption of 6dB
- Data are based on damper in the full open position. Effect of damper closure on the noise generated by a grille is shown in table 2.
- Data for Model FG12 grilles are based on 12.5mm thick, type 78/4 washable filter when the filter is clean – filter has a dust extraction efficiency of 70% according to Ashrae 52-76



CORE AREA (m ²)	NOMINAL NECK SIZE		
	RG-12	G-12/PG-12	FG-12
0.017	165 x 165	150 x 150	185 x 185
0.032	215 x 215	200 x 200 400 x 100	235 x 235
0.053	265 x 265	250 x 250 625 x 100	285 x 285
0.078	315 x 315	300 x 300 1000 x 100	335 x 335
0.109	365 x 365	350 x 350 1400 x 100	385 x 385
0.144	415 x 415	400 x 400 1150 x 150	435 x 435
0.184	465 x 465	450 x 450 1450 x 150	485 x 485
0.230	515 x 515	500 x 500 1800 x 150	535 x 535
0.280	565 x 565	550 x 550 1600 x 200	585 x 585
0.336	615 x 615 1600 x 250	600 x 600 1500 x 250	635 x 635 1800 x 250
0.452	815 x 615	800 x 600 1650 x 300	835 x 635
0.568	1015 x 615	1000 x 600 1750 x 350	1035 x 635
0.683	1215 x 615 1700 x 450	1200 x 600 1625 x 450	1235 x 635



SELECTION

Example: A small office 6(L) x 6(W) x 2.8(H)m
 Requirement: Supply air qty = 1300m³/hr(361 l/s)
 Return air qty = 1300m³/hr(361 l/s)
 Room NR = 35

From graph on page 6

Core velocity = 6.5m/s
 NR = 25

Grille Size = 250 x 250mm Nom N.S.
 1 No. Model G12

From graph on page 7

ΔP_s = 12 pa for grille with damper full open

Note : In order to meet the noise criteria specified, allowance must be made for the multiple effect of sound due to the presence of other grilles or diffusers. Hence, if a diffuser in the same office has been selected with an NR of 25 then the overall room NR will be approximately 28

Table 1. Combining Two Sound Levels

Difference Between Two Levels To be combined, dB	0-1	2-4	5-9	10 and more
Number of dB to be added to the Higher Level to Obtained Level	3	2	1	0

Table 2. Effect of Damper Closure

Effective Opening	dB to be added
100%	0
75%	8
50%	15
25%	22

TERMINOLOGY

Core Area: Total flow area of the grille including the grid core

$$\text{Core Velocity} = \frac{\text{Air flow}}{\text{Core Area}}$$

Conversion: m/s = 196.8 ft/min
 1 m³/hr = 0.588 CFM ft³/min
 1 l/s = 2.118 CFM ft³/min
 1 l/s = 3.6 CMH
 1 in wg = 249 Pa

Model G12, Model PG 12
 Core Size = Nom. NS - 20

Model RG12
 Core Size = Nom. NS - 32

Model FG12
 Core Size = Nom. NS - 53

SIZES AND CONFIGURATION

MODEL	NECK MIN SIZE	NECK MAX SIZE	REMARKS
G12	100 x 100 600 x 50	1200 x 600 1800 x 50*	—
FG12	300 x 300 600 x 150	600 x 600	For size larger check with factory
RG12	600 x 100 200 x 200	1800 x 100* 1200 x 1200	See details below
PG12	100 x 100	400 x 400	For 600 x 600 panel
	100 x 100	1000 x 400	For 1200 x 600 panel

*Model G12 and RG12 may be used as a continuous return air grilles, model RG12 being more suitable for fibrous plaster ceiling. For wall to wall or perimeter return air grille, alignment pins as shown in figure 1 will be provided.

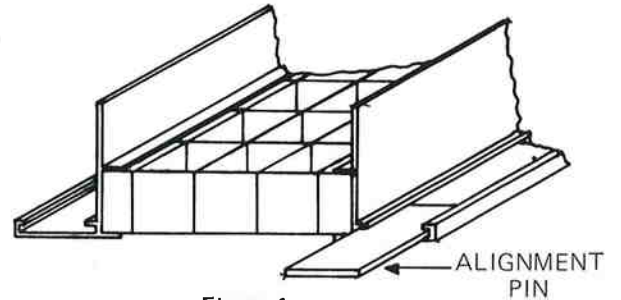
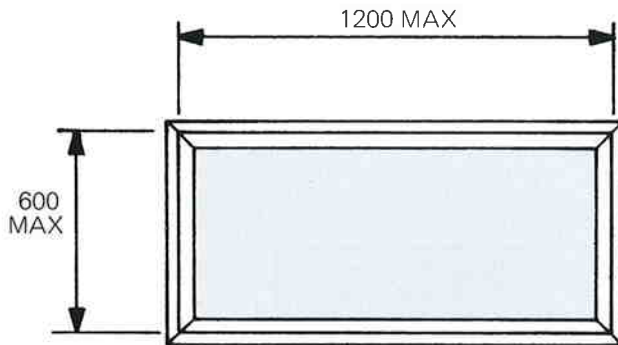


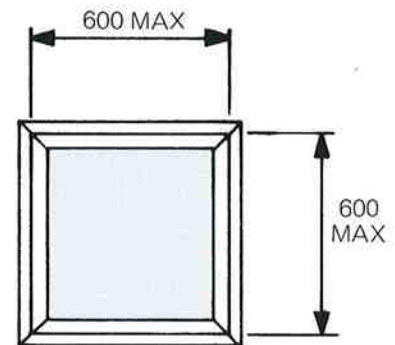
Figure 1

MODEL RG-12 CONFIGURATION

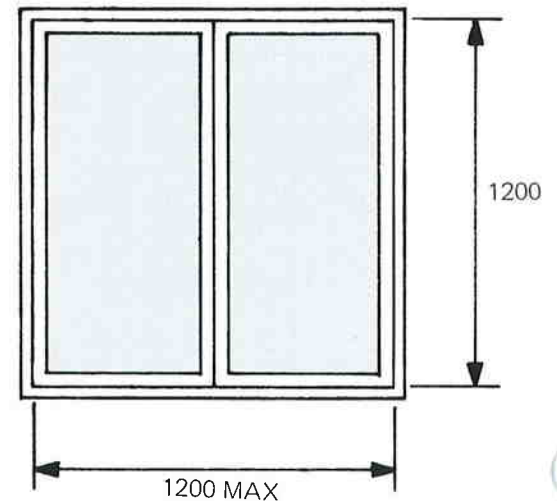
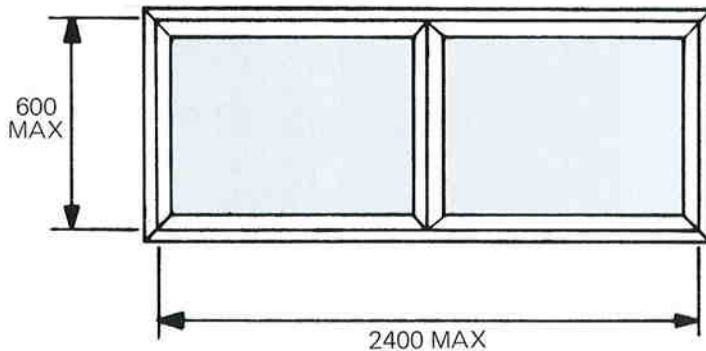
RECTANGULAR



SQUARE

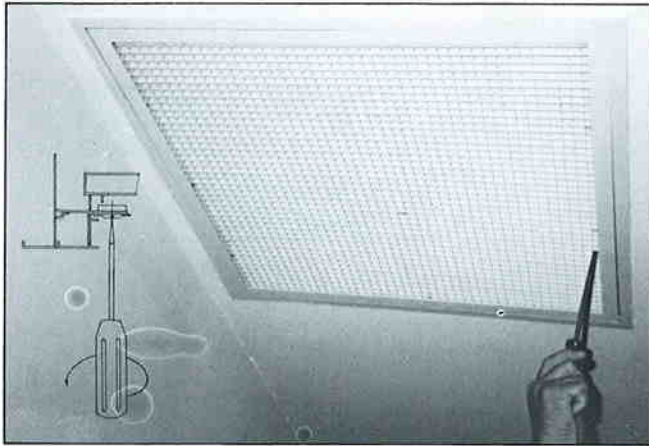


CENTRE CORE SINGLE PIECE CONSTRUCTION

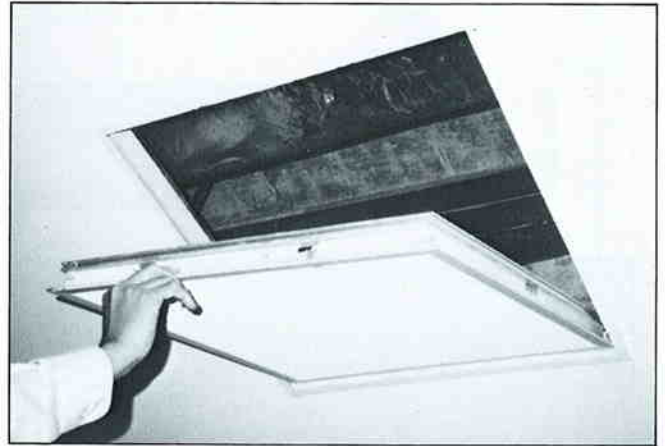


CENTRE CORE TWO PIECE CONSTRUCTION

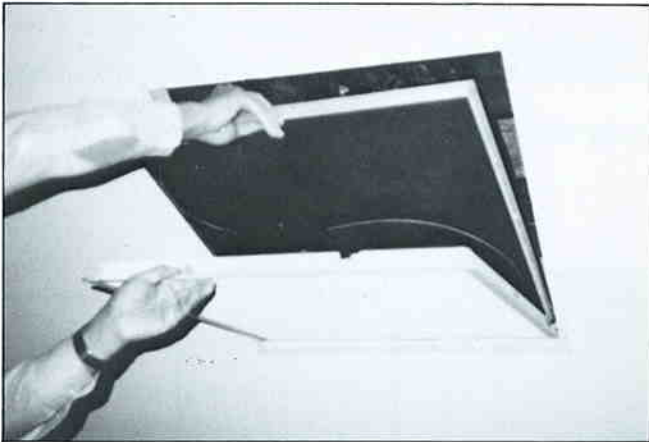
HOW TO REMOVE THE FILTER FOR CLEANING



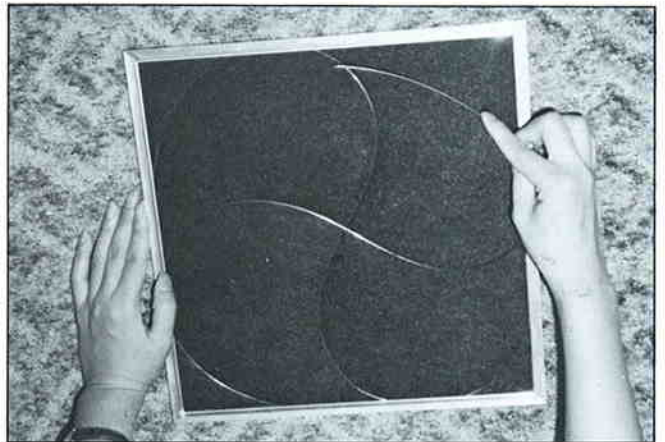
Step 1. With a Philip screw turn the latches 90 clockwise.



Step 2. Let the core down gently.



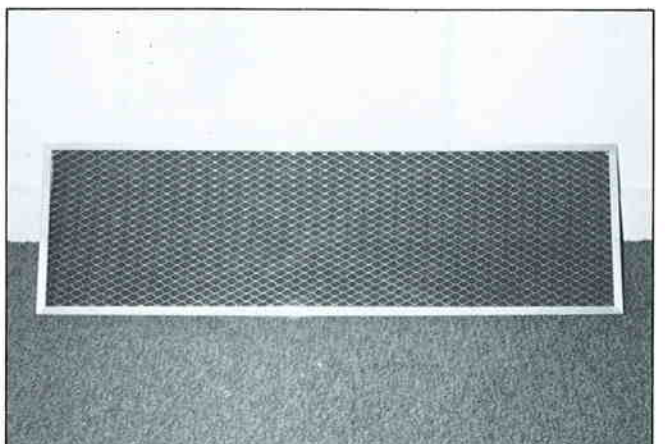
Step 3. Release the retainer clip and remove the filter from the grille.



Step 4. Remove the flexible wire from the aluminium frame of filter.



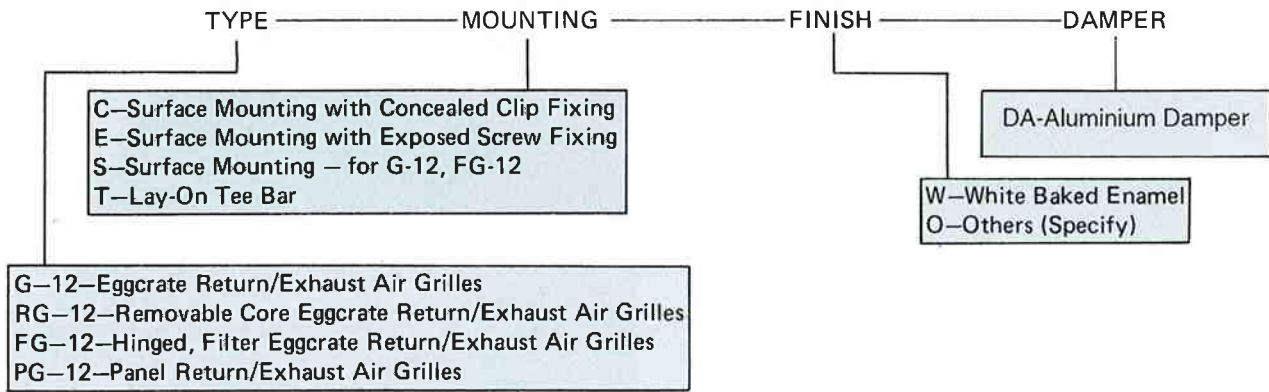
Step 5. Remove the filter media for washing.
Note: After washing replace filter in reverse order.



Filter Media: Type 78/4 washable filter media with extraction efficiency of 70% according to Ashrae 52-76.

Filter Frame: 12.5 thick extruded aluminium frame with aluminium expanded metal on one side and flexible wire on the other.

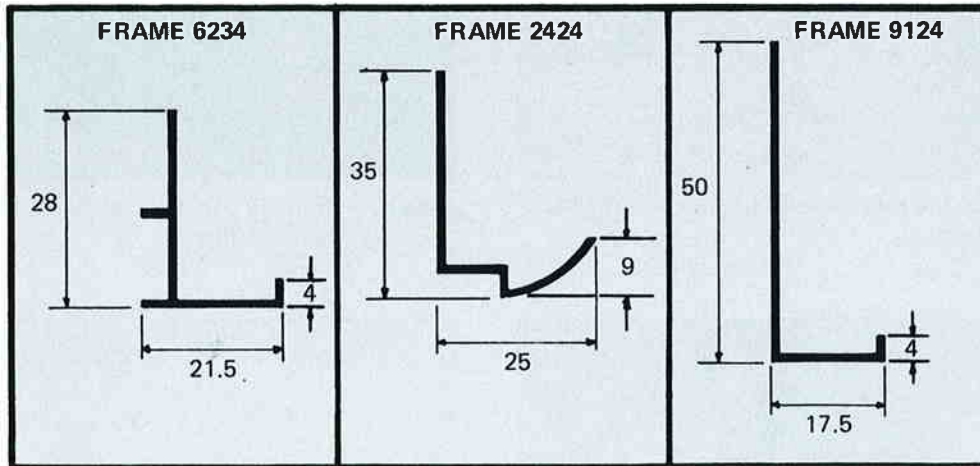
HOW TO SPECIFY



Thus, G12-S-W-DA refer to a eggcrate return/exhaust air grille in baked white enamel finish with 21.5mm frame suitable for surface mounting and complete with aluminium damper. When mounting method is not specify the grille will be supplied without mounting bracket.

- Note:
- Aluminium dampers are supplied in mill finish.
 - For type T mounting the face size equals T-Bar Centre minus 6mm.
 - When colour other then the standard baked white enamel is required please submit your order with a colour sample.
 - Where conceal mounting bracket is required for type "S" mounting please specify in your order.

FRAME DETAILS



Frame 6234: Model G12 frame and RG12 and FG12 inner core frame.

Frame 2424: Model RG12 mounting frame.

Frame 9124: Model FG12 mounting frame.

SPECIFICATION

All ceiling return air grille shall be of 12.5 x 12.5 x 12.5 mm eggcrate type. The grid core shall be constructed of 0.4mm aluminium strips pressure welded at 12.5 mm centres to give maximum free area. Frames shall be constructed of extruded aluminium specially designed for the eggcrate core. Where plaster ceiling is used the eggcrate return air grille shall be of the removable core type with spring clip concealed fixing similar to CONNOLLS-AIR Model RG12. Centre Core shall be easily removable without special tool. Return air grille used with fan coil units shall be of the conceal hinge type with 12.5 mm thick washable filter similar to CONNOLLS-AIR Model FG12 filter air grille. The filter air grille shall have concealed latches designed such that the centre core can be easily removed without special tool. The filter shall be constructed of aluminium frame and designed to clip onto the inner core frame of the grille. The filter shall have washable media with a efficiency of 70% according to Ashrae 52-76 similar to CONNOLLS-Air Model 78/4

RECOMMENDED NOISE CRITERIA FOR ROOMS

Type of Area	NC Level, Decibels	Type of Area	NC Level, Decibels
AUDITORIUMS		Bowling Alleys, Gymnasiums	35 to 45
Concert and Opera Halls, Studios for sound reproduction	20 to 25	Swimming Pools	40 to 55
Legitimate Theaters, Multi-Purpose Halls	25 to 30	TRANSPORTATION	
Movie Theaters, Lecture Halls, Planetarium, TV Audience Studios	30 to 35	Ticket Sales Offices	30 to 40
Lobbies	35 to 45	Lounges, Waiting Rooms	35 to 50
CHURCHES AND SCHOOLS		HOTELS	
Sanctuaries	20 to 30	Individual Rooms or Suites, Ball Rooms, Banquet Rooms	30 to 40
Libraries, Schools and Classrooms	30 to 40	Halls and Corridors, Lobbies	35 to 40
Laboratoires	35 to 45	Garages, Kitchens and Laundries	40 to 50
Recreation Halls, Corridors and Halls	35 to 50	MANUFACTURING AREAS	
Kitchens	40 to 50	Foreman's Office	40 to 50
HOSPITALS AND CLINICS		Assembly Lines, Light Machinery	45 to 70
Private Rooms	25 to 35	Foundries, Heavy Machinery	55 to 75
Operating Rooms, Wards	30 to 40	OFFICES	
Halls and Corridors, Laboratories, Lobbies and Waiting Rooms	35 to 45	Board Room	20 to 30
Washrooms and Toilets	40 to 50	Conference Rooms	25 to 35
RESTAURANTS & LOUNGES		Executive Office	30 to 40
Restaurants	35 to 45	Supervisor Office, Reception Room	30 to 45
Cocktail Lounges	35 to 50	General Open Offices, Drafting Rooms	35 to 50
Night Clubs	35 to 45	Halls and Corridors	35 to 55
Cafeteria	40 to 50	Tabulation and Computation	40 to 50
STORES RETAIL		PUBLIC BUILDINGS	
Clothing Stores, Department Stores (upper floors)	35 to 45	Public Libraries, Museums, Court Rooms	30 to 40
Department Stores (main floor), Small Retail Stores, Supermarkets	40 to 50	Post Offices, General Banking Areas, Lobbies	35 to 45
SPORTS ACTIVITIES INDOOR		Washrooms and Toilets	40 to 50
Coliseums	30 to 40		

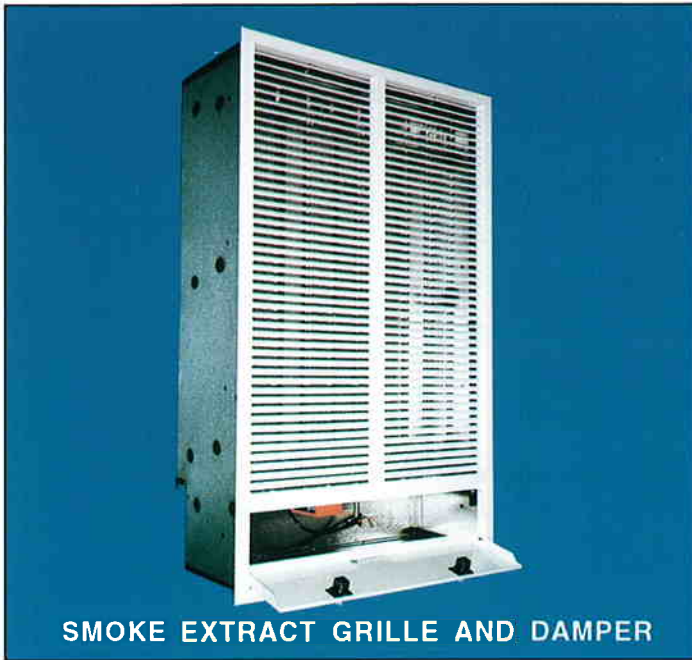
STANDARD WARRANTY

CONNOLS-AIR (S) PTE LTD (the "Company"), SINGAPORE warrants that every product manufactured and sold by them and described herein will be free from defects in material and workmanship under normal use and service for a period of one year after purchase. The Company's obligation under this warranty shall be limited to replacing any such product which proves to be defective in workmanship or material under normal use and service within such period. Any improper use, including but not limited to, operation after the discovery of defective or worn parts, operation beyond rated capacity, substitution of parts not approved by the Company, neglect, accident or any alteration or repair by others in such a manner as in the Company's opinion materially and adversely affects the products, shall void this Warranty.

The foregoing warranty is exclusive and is expressly in lieu of any other warranties elsewhere stated, express or implied, including any implied warranty or merchantability

or fitness for a particular purpose or any other purpose. In the event that such implied warranties may be disclaimed entirely for any reason, such implied warranties shall be effective only for a period of one year after purchase. No person is authorized to assume for the Company any other liability with respect to any product sold by the Company, nor is any employee or representative authorized to alter this warranty in any way or grant any other warranty, unless such change is authorized in writing by an officer of the Company at its home office. The Company shall have no liability whatsoever in any event for payment of incidental or consequential damages, including without limitation, or property. The Company makes no other representation or warranty of any kind, express or implied, in fact or in law, including without limitation, the warranty of merchantability or the warranty of fitness for a particular purpose, other than the limited warranty set forth above. Every claim under this warranty shall be deemed waived unless submitted in writing, and received by the Company within thirty (30)

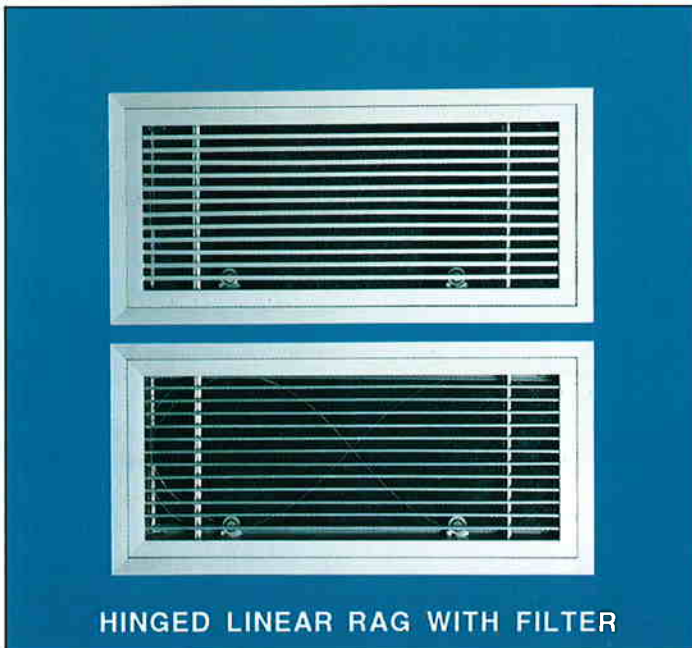
OTHER PRODUCTS



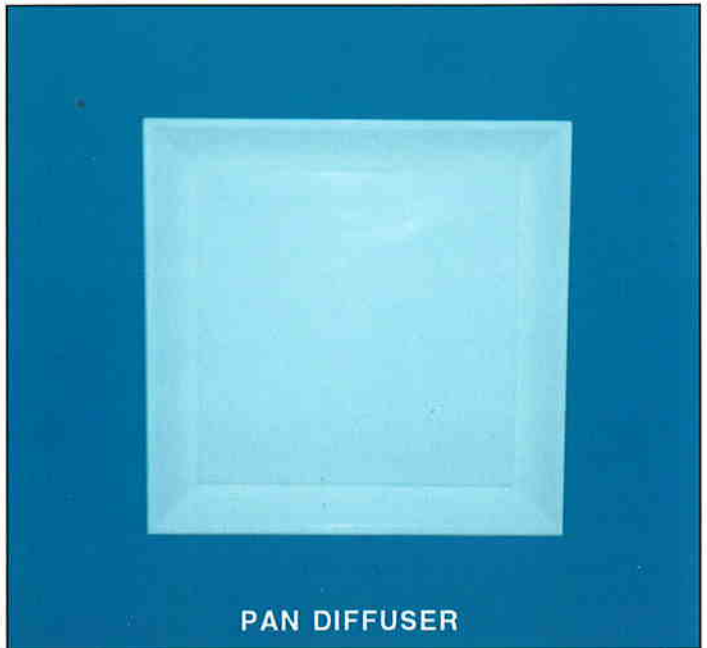
SMOKE EXTRACT GRILLE AND DAMPER



HINGED FIXED LOURVE RAG WITH FILTER



HINGED LINEAR RAG WITH FILTER



PAN DIFFUSER



LINEAR AIR GRILLES



AIR TROFFER DIFFUSER



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Website : <http://www.connols-air.com>

*In the interest of product improvement
we reserve the right to
make changes without notice.*

G12000-01-09