

LABAIRE



Slim Line Low Pressure Differential

Slimline Laminar Flow Theatre

Operation

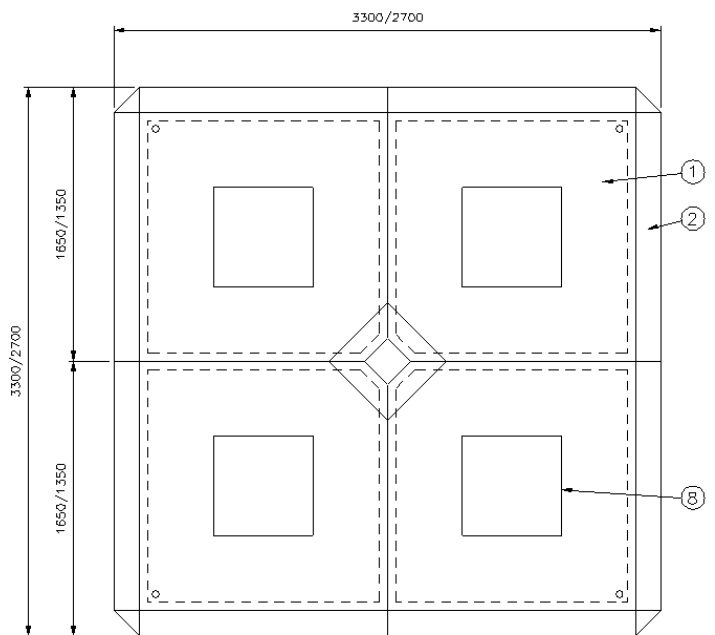
The Labaire Slim-Line Laminar Flow Operating Theatre [1] is a versatile system, which provides maximum protection to the patient on the operating table. The unit provides laminar air flow over the active area and staged peripheral lighting for the entire theatre. The laminar flow air is supplied at 0,35m/s with a maximum variance of 10%. The fluorescent lights provide illumination over the theatre operating table and the background. The extremely low pressure drop across the system ensures no noise is generated. The high volume HEPA filters [10&11] are 99,997 % efficient and situated above the unit outside the theatre. The Ruaire Slim-Line system has been evaluated in accordance with international standards and the results recorded.

Applications

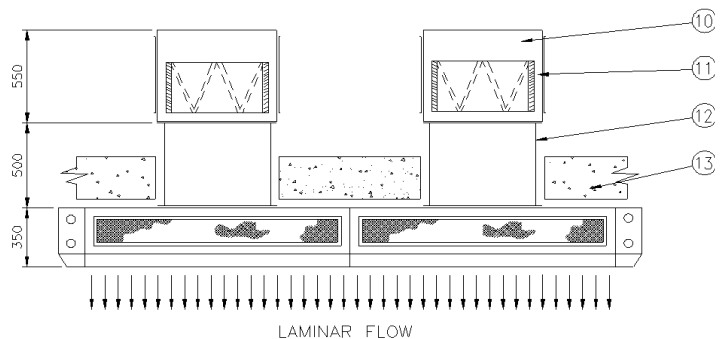
Laminar Flow protection is primarily required for orthopedic surgery however recent developments often require such protection for the patient and operating theatre staff during other operations.

Design Features

The fully welded construction is finished in white baked epoxy paint. The two stages of fluorescent lighting are housed and bolted to the laminar flow distribution plenum and are sealed [6] from the sterile air stream. The four quadrants are then bolted together around the theatre light base and stem ensuring maximum laminar flow area. The screens are light and easily secured and removed for cleaning. The HEPA filter housings are joined to the plenum from outside the theatre with a stainless steel duct [12] of minimum size 350x350mm and 400x400mm for the 2400 and 3000 standard theatres are required. This duct protrudes through the concrete slab [13], is as short as possible (usually 500mm) and fully welded with no cervices to facilitate cleaning, which is periodically required.



TOP VIEW



LAMINAR FLOW



Slim Line Laminar Flow Theatre

Technical Data

MODEL CODE	Overall Dimensions [mm]			Active Area [mm]		Volume [m3/s]	Pressure Drop [Pa]
	L	B	D	L	B		
L33LFT	3300	3300	350	3000	3000	3.15	25
L27LFT	2700	2700	350	2400	2400	2	25

Operation

The laminar flow screens comprise a double layer of a monofilament, polyester material, each evenly tensioned onto a frame. This provides a flat surface, which distributes the sterile supply air into millions of jets all at the same velocity. These jets, which move uniformly downwards, are known as laminar air flow and ensure any disruption to the flow of air is contained and removed out of the critical area. The dynamic pressure exerted by the surrounding jets of air achieves this. The screens are mounted into the four quadrants and require very little pressure to secure them and ensure no air bypass.

Applications

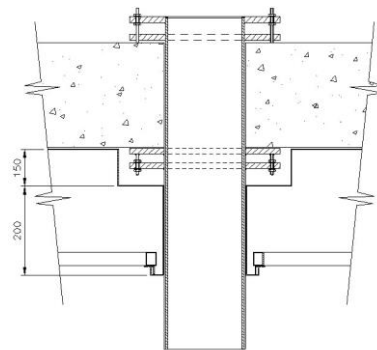
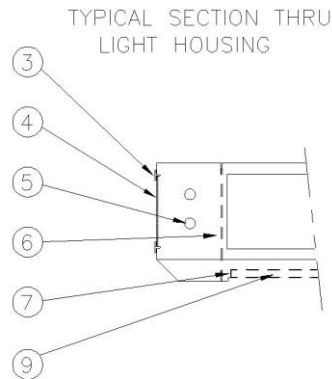
The screens are positioned with the sole intention of distributing the air into a laminar flow pattern. They do double up as an efficient light diffuser. They do not perform as a filter as the air is already filtered down to 0,3 microns.

Design Features

The evenly tensioned materials are applied to two surfaces of a frame with the tension of the upper surface less than that of the lower. The screens are easily removed for cleaning and will not degenerate with time. Stains can be removed by simply washing with detergent. They weigh very little and are extremely strong however they are susceptible to sharp objects. Caution is advised when cleaning.

Technical data

Level [mm]	Velocity [m/s]	Variance
Zero	0,4	5%
100	0,38	10%
1000	0,35	10%



THEATRE LIGHT OPTIONAL FIXING ARRANGEMENT

Laminar Flow Screens



Slim Line Laminar Flow Theatre

When ordering a Laminar Flow Theatre the following must be stated:

1. The active size of laminar flow.
 - 1.1. Two standards are 2400x2400 or 3300x3300.
 - 1.2. Other sizes upon request.
2. Size of inlet ducts (opening in the slab).
3. A minimum inlet duct size of 350x350mm for 2400x2400 and 400x400mm for the 3000x3000 theatres.
 - 3.1. Slab openings must accommodate this plus a 25mm flange thus 400x400 and 450x450 slab openings are required respectively.
4. The pendant has to be specified with specific reference to the stem diameter and the base size.
 - 4.1. The maximum diameter of 200mm for the pendant.
 - 4.2. A maximum size of 500x500mm for the base and 150mm deep.
 - 4.3. Again provision in the slab must be made for fastening and electrical supply.

Maintenance Procedures

The theatre should be thoroughly checked and serviced every 6 months to determine if it is functioning effectively. This service consists of:

1. Velocity test to determine that the correct volume of air is being supplied and the variance is in accordance with the specification.
2. The pressure drop across the filters is determined once the correct velocity is set [supply air volume] and the life span of the filter monitored.
3. Integral photometer scan of the Hepa filters to determine whether the filters are performing correctly.
4. A particle count inside the theatre to determine the sterility and the cleanliness of the theatre.
5. A smoke test to ensure correct and thorough purging of the theatre and no migration of contaminated air into the laminar flow area.
6. The supply air ducts are cleaned and sterilized.

The daily maintenance of the unit should be carried out with nothing more than a soft cloth to clean the unit and screen if required. This should be kept to a minimum as the screen membrane is delicate. Any commercial detergent may be used for this purpose. The unit maybe sterilized with alcohol. Light fittings are mounted around the perimeter of the housing and are accessible from the light diffusers on the sides.

NOTE: *Under no circumstances must the screens be handled with a sharp object.*

The distribution screens are a standard size and are kept in stock by **LABAIRE**. If damage does occur, the screens may be replaced within 24 hours. Please see our service contract for more details.

Labaire

57B Mount Street, Bryanston,
Gauteng, RSA.

Email: sales@labaire.co.za