

AIR FILTRATION UNITS (AFUs) – See Attached Data Sheet

It is proposed to provide Clean Filtered Air using our fully developed and in-service AC-110A4 Portable CBRN Filtration Units each capable of providing 300m³/h of Clean Filtered Air.

To support 50 persons within the COLPRO liner we would recommend a minimum of 17m³/h of fresh air per person. As such a minimum of 850m³/h is required to support the 50 persons

Based on recommendation of 5 air changes in no more than 3 minutes through the airlock chamber, and basing the airlock on being a 46m² tent, split into the 2 airlock sections with each section being 14m³ in volume, we need 1400m³ per hour of air through the airlock to give 5 changes in 3 minutes.

Considering leakages from the shelter before air reaches the airlock, we have assumed a 25% leak of air from each AFU in each section; - with 12 sections this gives a leakage of 900m³/h, and thus additional systems to cover this leakage. Last considerations are made to be able to change filters and have 100% redundancy in the event of failure of a single AFU.

We would like to point out that each section has the ability for Air filtration units to be connected to ensure the complex can be made in other configurations and is universal.

Please note that the given number of filters will allow:

- AFU Filters to be changed without undue loss of over pressure within the TFA. • 100% redundancy in the event of failure of a single AFU.
- Provide sufficient air flow for recommended 5 air changes within entry airlock, over a period not exceeding 3 minutes. (A single AFU will not achieve this recommended time)
- Greater allowance for damage and wear to liner before system is unable to maintain overpressure.

Air is supplied from the AFU through a 100mm diameter hose, 5 m in length.

AIR CONDITIONING UNIT (ACU) – See Attached Data Sheet

In order to provide either heating or cooling of the air entering the liner we propose to use a single AC- M18 CBRN per 2 tents for the COLPRO area.

AC-M18 CBRN is a split type air conditioner; when deployed without need for CBRN protection, the AC is set up outside the tent, while during deployment with COLPRO installed, the AC is split with the condenser placed outside the tent and the evaporator inside, close to the air inlet from the AFU, as illustrated in the Fig 4.

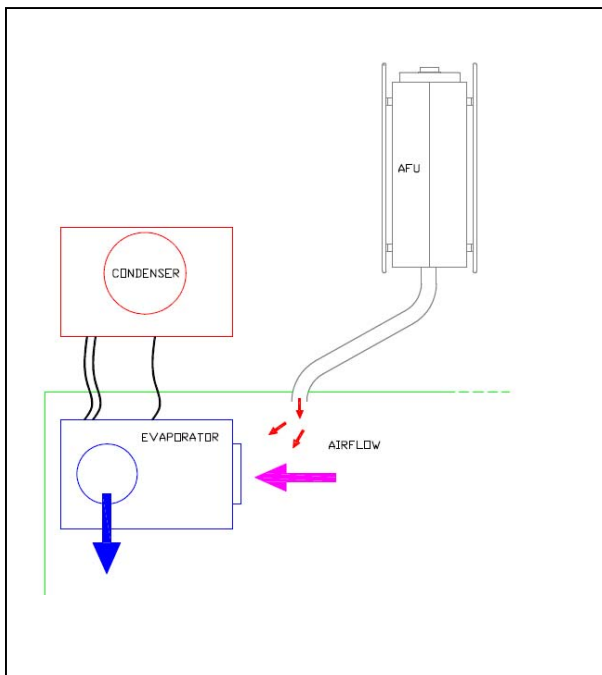


Fig 4: System drawing ACU/AFU

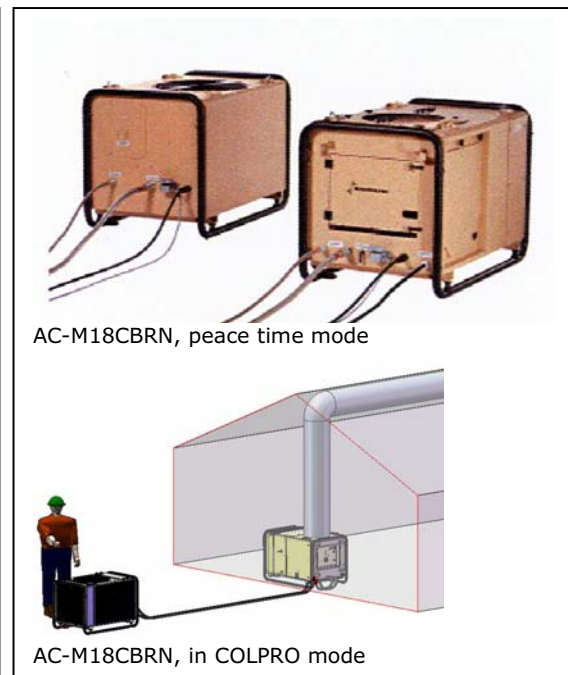


Fig 5: AC-M18 CBRN

Performance of the ACU is described in enclosed brochure

CBRN LINER - See Figures 6 A+B

The CBRN protective liner is made from a split film semi permeable polyethylene material, supported by end frames and ribs and separated into areas.

2 Airlocks, each 7m² Floor Space

Toxic Free Area, 46m² Floor Space/ tent- connected by means of zips.

The liner provides CBRN protection from airborne contaminants by being maintained at an overpressure by the AFUs and therefore preventing any ingress of any airborne contaminants.

The Liner is not chemically hardened to protect against any liquid threats.

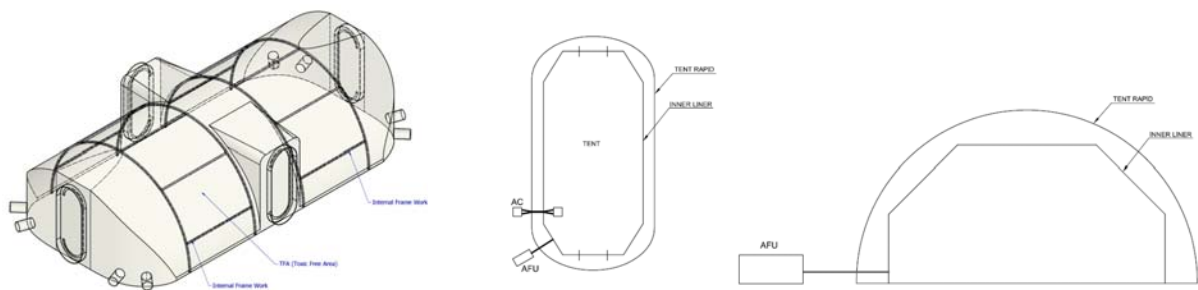


Figure 6A+B, CBRN Liner Overview, please see enclosed drawings showing liner for 4-door tent

The entry and exit airlocks are located at one end of the configuration. Air from the AFU enters the Liners at one end, where it is mixed with the air returning to the ACU evaporator. The position of the airlock at one end of the hospital complex promotes good airflow throughout the Liners.

Operation

The liner is intended to be maintained at an overpressure of 125Pa. This enables sufficient cascading pressures through the inner and outer airlocks. With the TFA at 125Pa Over Pressure, the Inner Airlock should be maintained at 50-80 Pa and the Outer Airlock at 5 Pa.

If personnel decontamination* is required, an additional Air-lock system with decontamination equipment must be installed. The set-up is based on the Air-lock being used for evacuation only.

*In such decon- system the following design would be required:

Liquid Hazard Area (LHA)

- The LHA is outside the Liner but inside the Outer Tent. Personnel decontamination and removal of their external equipment.

Vapour Hazard Area (VHA/Outer Airlock)

- This is the area for personnel to remove/ replace their CBRN protective suit (having already been decontaminated in the LHA).

Inner Airlock

The inner airlock presents a vapour barrier. Personnel must wait a sufficient time in the airlock to ensure 5 full air changes have completed, thus ensuring any vapour hazard has been purged from the airlock.

It is recommended that the 5 air changes should occur through the airlock in no more than 3 minutes. The proposed airlocks, at 3,5m long x 2m wide x 2m tall gives a volume of 14 m³.

With 2 airlocks and a total of 10 AFU's assumed to be providing a de-rated 300m³/h of air each, each air lock will receive 5 air changes in 3 minutes giving faster entry and exit times and allows for a greater degradation in AFU performance before filters require changing.

It should be noted that both airlocks should not be opened simultaneously as this will cause a large drop in the overpressure and therefore protection of the liner.

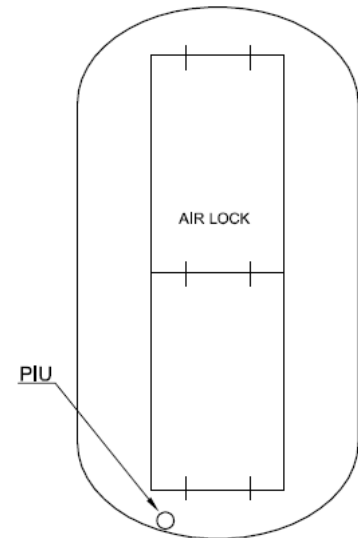


Fig 7 – 2 step Air Lock and PIU

Toxic Free Area (TFA)

The TFA enables personnel to be without full Individual Protective Equipment (IPE).

A Pressure Indicating Unit is positioned at the entry/exit airlock of the hospital complex, to enable monitoring of the pressure within the TFA and inner airlock, allowing the marshal to regulate entry/exit from the TFA.

PRESSURE INDICATING UNIT (PIU) – See Figure 8

With Entry/exit air locks located at the entrance of the COLPRO configuration, a PIU is needed to enable marshals to monitor the pressures within the TFA and inner airlocks and regulate the entry/exit of personnel to and from the TFA.

Each PIU consists of a two Pressure Gauges. The PIU is mounted to the support frame at the ends of the liner.

Small nylon tubes fitted through the liner provide static pressure readings to the PIU.

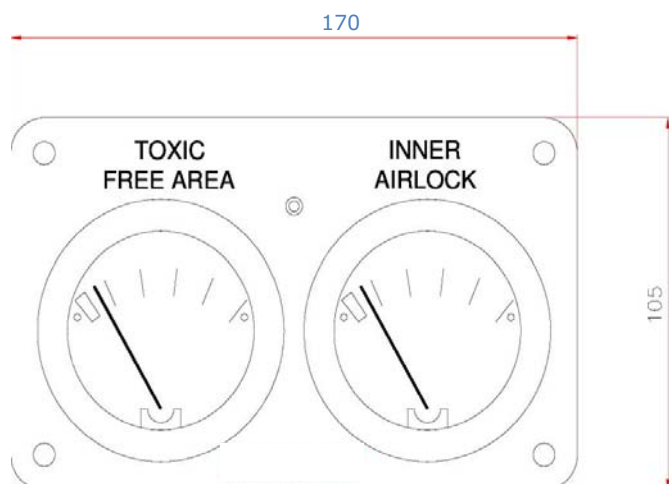


Fig 8 – Pressure Indication Unit



Normeca^A

SUPPLIER OF MOBILE HOSPITALS

Mailandvn 12, P.O. Box 404, 1470 Lorenskog _ Norway

Tlf.: +47 67 92 76 00 - Fax: +47 67 92 76 92

Mail: post@normeca.no - Web: www.normeca.no