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# REVERSE FLOW FAN FILTER UNITS

[ MODEL RFCRFF-E-ARSM ]

Air Distribution Solutions for  
Patient Isolation Rooms



 **KRUEGER**<sup>®</sup>

## INTRODUCTION

**A reverse-flow fan filter unit is a common air distribution solution for applications that require patient isolation of contagious diseases.** It works by pulling in room air, extracting contaminants and other particles from the air (trapping them in a HEPA filter), and exhausting clean air.



### STANDARD FEATURES

- Ceiling and mobile units available
- Stainless steel (304) construction
- 51% free area, perforated face
- Quiet performance
- Pre-filter
- HEPA filter (99.99% @ 0.3 micron)
- Energy efficient, high output EC motors (up to 1200 CFM)
- Round duct connections
- Satin polish finish

### OPTIONS

- ULPA filter (99.9995% @ 0.12 micron)
- Constant filter monitoring
- Filter pressure light
- Challenge/pressure ports
- Antimicrobial white finish

### HOSPITAL APPLICATIONS

- Negative Pressure Rooms
- Emergency Rooms
- Waiting Rooms
- Intensive Care Units

### OTHER APPLICATIONS

- Clinics
- Urgent Care Centers
- Physician Offices
- Homeless Shelters
- Correctional Facilities
- Temporary Isolation Rooms

## CEILING APPLICATION

Ceiling units are an optimal choice for new building applications. Not only do they provide medical staff unobstructed access to the patient, but they can also take advantage of the natural buoyancy of warm air to carry particulates upward in the room.

While not as common, overhead units can also be a solution for retrofit applications. There are however many considerations that need to be made, including plenum heights/limitations, exhaust ducting, and network/control requirements, just to name a few.

### CEILING UNIT FEATURES

- Sizes: 24"x24" or 24"x48"
- Motor: 120V, 208/240V, or 277V EC motor
- External 1.5" foil backed insulation (optional)

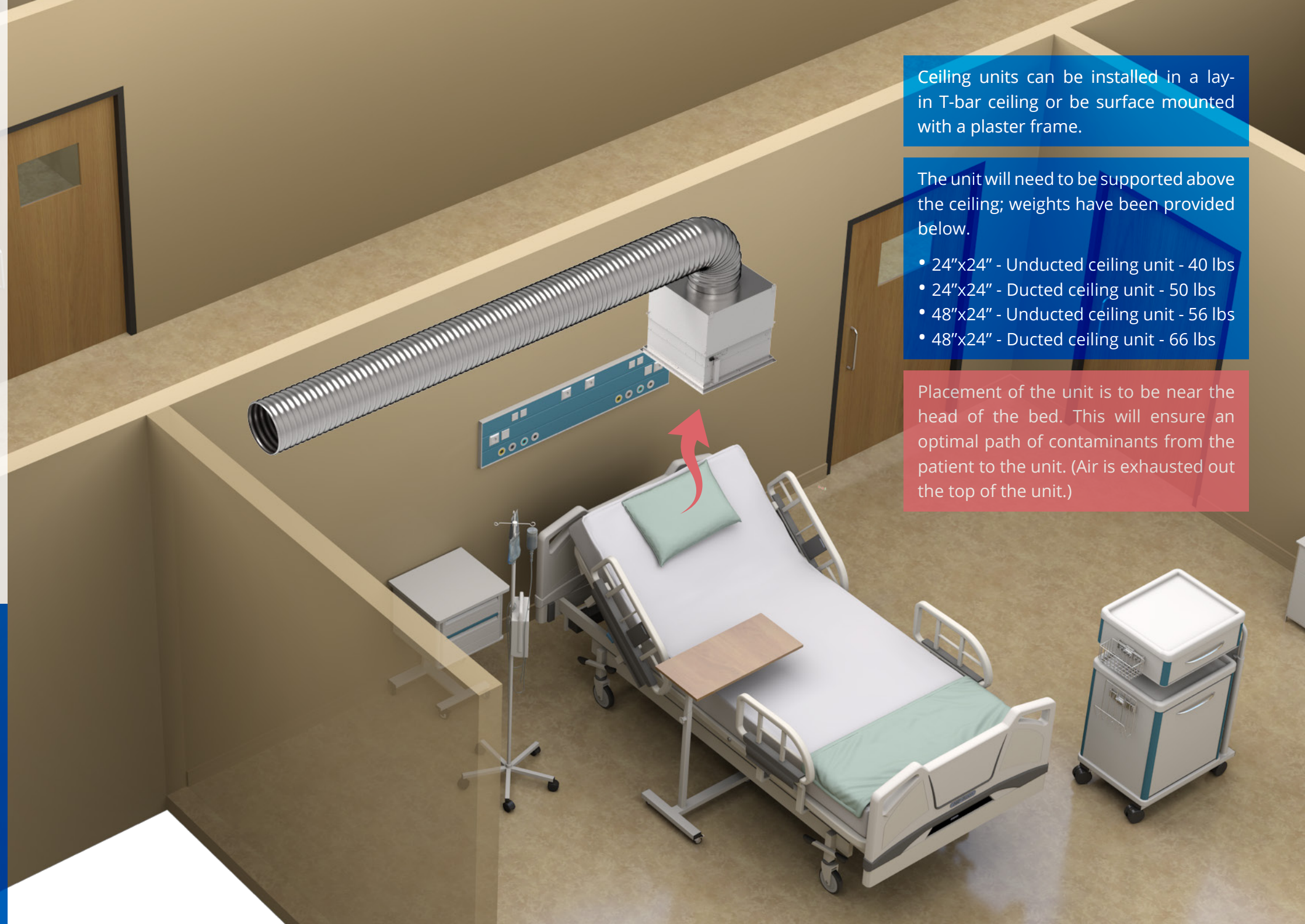


Ceiling units can be installed in a lay-in T-bar ceiling or be surface mounted with a plaster frame.

The unit will need to be supported above the ceiling; weights have been provided below.

- 24"x24" - Unducted ceiling unit - 40 lbs
- 24"x24" - Ducted ceiling unit - 50 lbs
- 48"x24" - Unducted ceiling unit - 56 lbs
- 48"x24" - Ducted ceiling unit - 66 lbs

Placement of the unit is to be near the head of the bed. This will ensure an optimal path of contaminants from the patient to the unit. (Air is exhausted out the top of the unit.)



### ASHRAE STANDARD 170 EXCERPT

Exception to 8.2.1(b): AII (Airborne Infection Isolation) rooms that are retrofitted from standard patient rooms from which it is impractical to exhaust directly outdoors may be provided with recirculated air from the room's exhaust on the condition that the air first passes through a HEPA filter.

c. All exhaust air from the AII rooms, associated anterooms, and associated toilet rooms shall be discharged directly to the outdoors without mixing with exhaust air from any other non-AII room or exhaust system.

## MOBILE APPLICATION

Whether for a dedicated AII (Airborne Infection Isolation) room or a temporary space, such as a tented area within a convention center (with or without ceiling), the mobile unit can provide a speedy solution. It needs only to be rolled into place and calibrated before being put into use.

While it is a floor-based model and not located directly over the patient, it is strong enough to overcome body plume buoyancy to effectively remove contaminants from the space.

### MOBILE UNIT FEATURES

- Size: 48"x24"
- Motor: 120V EC motor
- 4 casters (2 with brakes)
- 10ft hospital grade power cord with plug



FRONT/FACE VIEW

BACK VIEW

SIDE VIEW



Mobile units are to be placed on the floor, next to the patient, near the head of the bed. This will ensure an optimal path of contaminants from the patient to the unit. (Air is exhausted out the back of the unit.)

Special consideration should be given to ensure medical staff are not obstructed from the patient.

**ASHRAE STANDARD 170 EXCERPT**  
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# PERFORMANCE DATA

24" x 24" UNIT - HEPA FILTER* - 120VAC			
SETPOINT	CFM	WATTS	RPM
100%	505	192	2090
90%	428	148	1881
80%	355	101	1672
70%	278	69	1463
60%	205	50	1254
50%	138	33	1045
40%	85	22	836
30%	40	15	627
20%	15	11	418

48" x 24" UNIT - HEPA FILTER* - 120VAC			
SETPOINT	CFM	WATTS	RPM
100%	930	237	2090
90%	806	174	1881
80%	672	120	1672
70%	545	81	1463
60%	415	50	1254
50%	292	32	1045
40%	183	17	836
30%	104	12	627
20%	34	8	418

48" x 24" UNIT - HEPA FILTER* - 208-277VAC			
SETPOINT	CFM	WATTS	RPM
100%	1125	365	2450
90%	1004	274	2205
80%	848	195	1960
70%	708	127	1715
60%	545	81	1470
50%	395	48	1225
40%	260	26	980
30%	141	14	735
20%	56	8	490

NOTES: Data was derived from tests conducted in accordance with ANSI/ASHRAE Standard 70-1991. Rows in **BLUE** indicate recommended design setpoints. \* Data is for diffusers with clean filters. Filters may be operated up to a final resistance of 2" w.g. (500 Pa).

# IMPLEMENTATION

## AIR CHANGES PER HOUR (ACH)

Per ASHRAE Standard 170, 12 air changes per hour is recommended. The suggested design setpoint is between 40% and 50%.

## DUCTING

Per ASHRAE Standard 170, air should be exhausted to the roof. This may not always be achievable, so alternatively, air can be exhausted to an adjacent room or hallway, or back into the room itself as long as a HEPA filter is used.

Special consideration should be given if there are several rooms that exhaust to the same space, as there will need to be a plan for those secondary areas to be properly exhausted.

## FACE CONTROLS

The face display provides the following controls: start/stop, setpoint adjustment (motor RPM), and calibration adjustment. There is also a digital display for RPM. If the unit includes an optional airflow sensor, then the numeric display will provide CFM.

## MAINTENANCE

Both the pre-filter and HEPA filter are easily accessible to be replaced as needed.

## NEGATIVE PRESSURE

A negative pressure space requires the air to be exhausted to an external/exterior space. To maintain a negative pressure differential, the room must be a minimum of .01" w.c. between the occupied room and the adjacent space.

## NETWORKING

Much like the overhead units, the mobile units can operate individually or be daisy-chained with CAT5 or CAT6 cable and be controlled through a wall panel (sold separately). They can also be integrated into a Building Management System (BMS).

## CONTINUOUS FILTER MONITORING OPTION

For the continuous filter monitoring option, it will add to the unit a pressure transducer that can either be fed back through the MODBUS control board or send a 0-5V signal to a DDS. If equipped with an airflow sensor, the motor RPM can be monitored from the BMS and used as a filter load indicator.

## SPECIAL REQUESTS

If there is a special feature that you are looking for, like LED lights or side duct connections, contact us to discuss. Often times, we're able to accommodate, although it may require engineering time and lengthen lead times.

## SUPPLY AIR

With the need to control airflow, supply air should be provided by a non-aspirating diffuser, which, defined by ASHRAE, provides unidirectional downward airflow from the ceiling with minimum entrainment of room air. The placement of that diffuser should be near the foot of the bed. This will allow the reverse flow fan filter unit to continue at optimal operation.

## MORE INFORMATION

Find additional information, such as catalog, submittals, and FAQs by visiting us on the web.

CONNECT WITH US!



## PROUD TO BE YOUR RESOURCE FOR AIR DISTRIBUTION AND EQUIPMENT SOLUTIONS

Let us know how we can assist you in your next building application. For more information, contact your local Krueger representative or visit us on the web at [www.krueger-hvac.com](http://www.krueger-hvac.com).

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Louvered  
Perforated  
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Plenum Slot  
Round  
Air Nozzles

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Return  
Linear Bar  
Security  
Industrial  
Duct Mounted  
Transfer  
Stainless Steel



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