

CRFF SERIES

Fan Filter Unit



INTRODUCTION

Krueger's CRFF, CRFF-E, CRFF-B series of critical room fan filter units are intended for environments that demand the highest levels of cleanliness such as laboratories, clean rooms and microprocessor assembly areas. Each unit contains an integral HEPA filter for improving contaminant and particulate removal from supply air. These devices combine quiet operation, low power consumption and a space saving low profile design to meet a variety of applications. Additionally, these devices are modular and can be used in nominally sized 24" x 24" and 24" x 48" grid systems.

MODELS

- CRFF - Critical Room Fan Filter with HEPA Filter
- CRFF-ARS - Critical Room Fan Filter with HEPA Filter and Room Side Access
- CRFF-ARSM - Critical Room Fan Filter with HEPA Filter and Room Side Access to ECM Motor and Filter
- CRFF-E - Critical Room Fan Filter with HEPA Filter, ECM Motor, and Forward Inclined Fan
- CRFF-E-ARS - Critical Room Fan Filter with HEPA Filter, ECM Motor, Forward Inclined Fan, and Room Side Access
- CRFF-E-ARSM - Critical Room Fan Filter with HEPA Filter and Room Side Access to ECM Motor, Forward Inclined Fan, and Filter
- CRFF-B - Critical Room Fan Filter with HEPA Filter, ECM Motor, and Backward Inclined Fan
- CRFF-B-ARS - Critical Room Fan Filter with HEPA Filter, ECM Motor, Backward Inclined Fan, and Room Side Access
- CRFF-B-ARSM - Critical Room Fan Filter with HEPA Filter and Room Side Access to ECM Motor, Backward Inclined Fan, and Filter

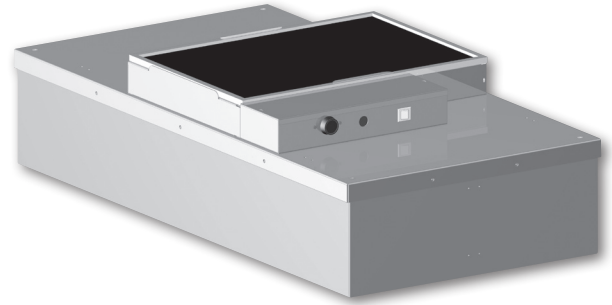
APPLICATION

Constant Volume Airflow

The CRFF-E and CRFF-B series of critical room fan filter units contain an electronically commutative (ECM) brushless DC motor which delivers constant airflow by adjusting the motor rpm or torque. The adjustment compensates for changes in static pressure, filter loading or other local conditions, which reduces the need for post installation adjustments.

Filter Options and Accessibility

With the ARS option, the perforated face can be removed for periodic cleaning, HEPA filters are easily accessible and replaceable from the room side. Utilizing industry proven gel seal filter technology these units possess an integral continuous knife edge that penetrates the filter's gel filled pocket, delivering a leak proof sealed unit. The HEPA filter is protected by an expanded metal face that minimizes unnecessary or accidental contact with the filter media. To increase particulate removal, a ULPA filter is available.



FEATURES

- Space saving low profile design, less than 13" in height (CRFF only).
- PSC motor with solid state speed control or 3-speed switch.
- Forward or backward inclined centrifugal-type fan.
- High Efficiency Particulate Air (HEPA) Filter: 99.99% @ 0.3 micron, Type J.
- Low power consumption.
- Snap-in prefilter.
- Walkable plenum (excluding prefilter).
- Available in 24" x 24" or 24" x 48".
- ECM Brushless DC Motor: Constant airflow over a wide range of external static pressures. *
- Challenge and pressure ports. **
- 1/2 - 20 threaded bushings (located on casing).
- ECM motor with universal control card: VCU,0-10V or RTU Modbus control functionality. *
- Meets IEST-RP CC001.5 and IEST-RP-CC0034.3 leak testing.
- UL listed with Standard UL 900.
- Combinations of Mill and White are available. See Engineering Specifications for options.

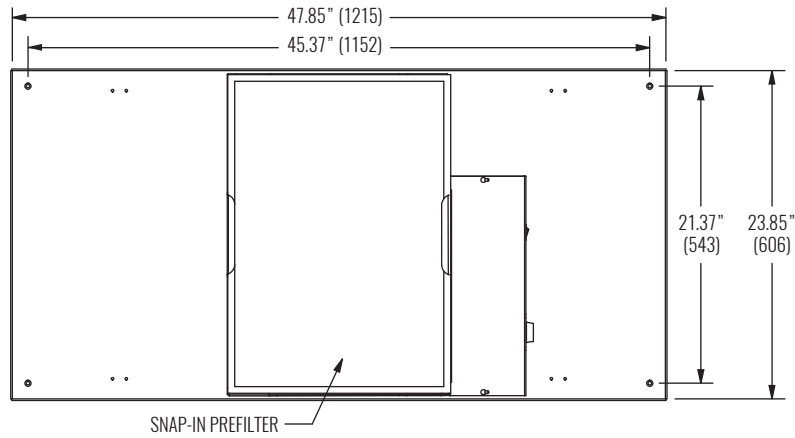
* Feature applies to CRFF-E, CRFF-E-ARS, CRFF-E-ARSM, CRFF-B, CRFF-B-ARS, and CRFF-B-ARSM Series only.

** Feature applies to CRFF-ARS, CRFF-ARSM, CRFF-E-ARS, CRFF-E-ARSM, CRFF-B-ARS, and CRFF-B-ARSM Series only.

OPTIONS

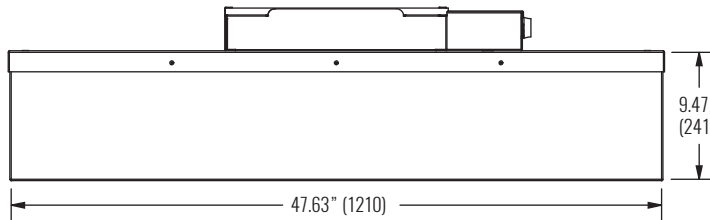
- Ultra-Low Penetration Air (ULPA) Filter: 99.9995% @ 0.12 micron, Type F
- Loose shipped filters
- Continuous filter monitoring
- Filter Indicator Light
- Run Indicator Light
- Insulation
- A/C Collar: Allows direct connection to air conditioning supply
- Extruded aluminum plaster frame for hard ceilings (Model 5HCF23, ordered separately)
- 304 stainless steel construction
- Power Cord: Provides convenient plug-in (Voids UL listing.)
- Infrared Speed Control: Room-side airflow adjustment with hand-held remote control (ECM motors only)
- Challenge and pressure ports on non-ARS units
- Wall mounted control enclosure (ECM motors only)

DIMENSIONAL DATA | CRFF SERIES

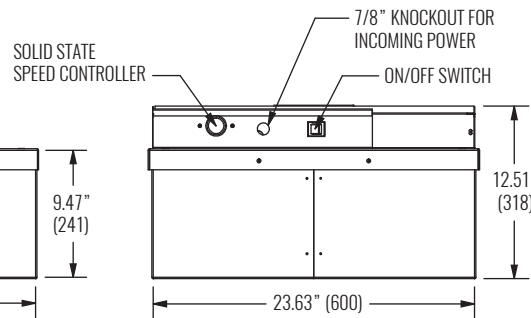


**FACE VIEW - 24"x48" PANEL
CRFF, CRFF-ARS, CRFF-ARSM**

CRFF	
PANEL SIZE	OA FACE DIMENSION
24" x 24"	23.63" x 23.63" (600 x 600 mm)
24" x 48"	23.63" x 47.63" (600 x 1200 mm)

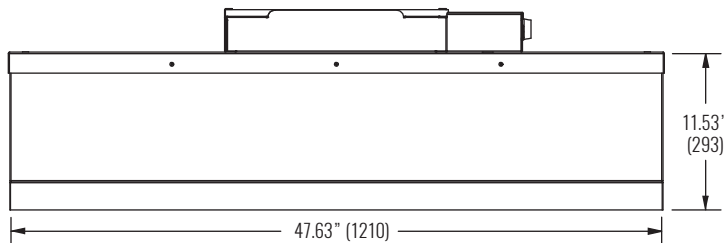


**SIDE VIEW 1 - 24"x48" PANEL
CRFF**

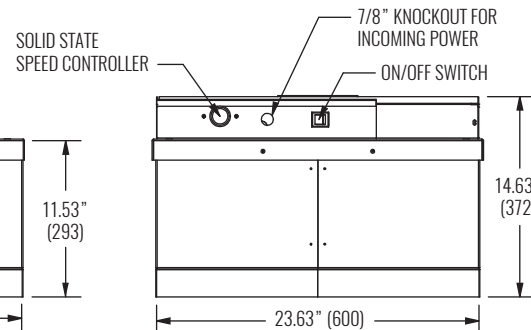


**SIDE VIEW 2 - 24"x48" PANEL
CRFF**

CRFF-ARS, CRFF-ARSM	
PANEL SIZE	OA FACE DIMENSION
24" x 24"	23.63" x 23.63" (600 x 600 mm)
24" x 48"	23.63" x 47.63" (600 x 1200 mm)



**SIDE VIEW 1 - 24"x48" PANEL
CRFF-ARS, CRFF-ARSM**



**SIDE VIEW 2 - 24"x48" PANEL
CRFF-ARS, CRFF-ARSM**

NOTE: Dimensions in parentheses are millimeters.

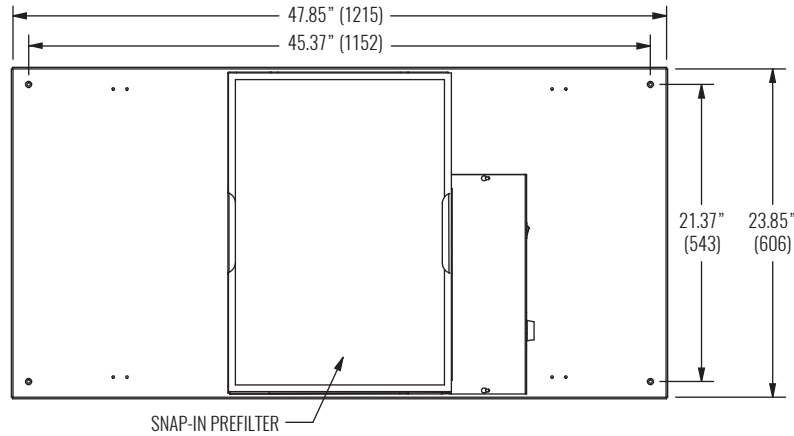
CRFF SERIES

Fan Filter Unit



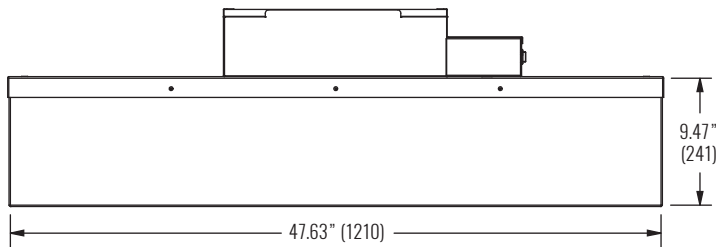
SPECIALTY PRODUCTS | CRITICAL ENVIRONMENT

DIMENSIONAL DATA | CRFF-E SERIES, CRFF-B SERIES

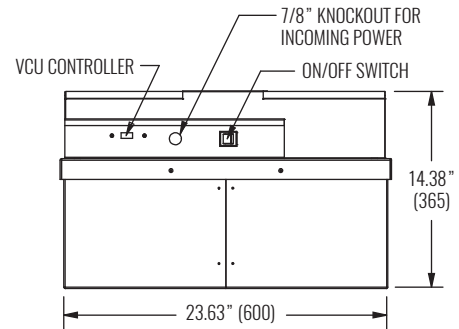


FACE VIEW - 24"x48" PANEL
 CRFF-E, CRFF-E-ARS, CRFF-E-ARSM, CRFF-B, CRFF-B-ARS, CRFF-B-ARSM

CRFF-E, CRFF-B	
PANEL SIZE	OA FACE DIMENSION
24" x 24"	23.63" x 23.63" (600 x 600 mm)
24" x 48"	23.63" x 47.63" (600 x 1200 mm)

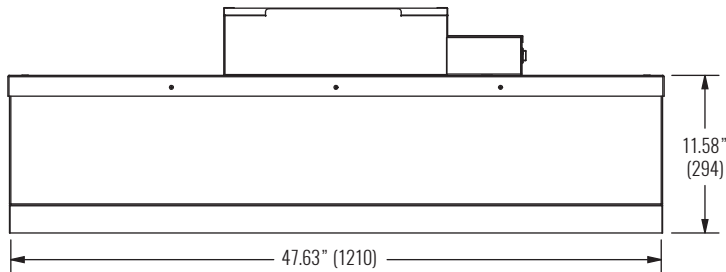


SIDE VIEW 1 - 24"x48" PANEL
 CRFF-E, CRFF-B

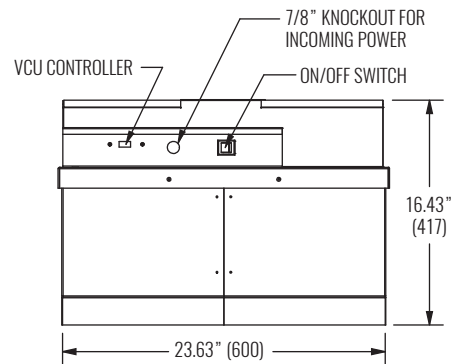


SIDE VIEW 2 - 24"x48" PANEL
 CRFF-E, CRFF-B

CRFF-E-ARS, CRFF-E-ARSM, CRFF-B-ARS, CRFF-B-ARSM	
PANEL SIZE	OA FACE DIMENSION
24" x 24"	23.63" x 23.63" (600 x 600 mm)
24" x 48"	23.63" x 47.63" (600 x 1200 mm)



SIDE VIEW 1 - 24"x48" PANEL
 CRFF-E-ARS, CRFF-E-ARSM, CRFF-B-ARS, CRFF-B-ARSM



SIDE VIEW 2 - 24"x48" PANEL
 CRFF-E-ARS, CRFF-E-ARSM, CRFF-B-ARS, CRFF-B-ARSM

NOTE: Dimensions in parentheses are millimeters.

PERFORMANCE DATA

CRFF, CRFF-ARS, CRFF-ARSM SERIES															
UNIT TYPE	NOMINAL UNIT SIZES	MOTOR Hp	MAX CFM	CFM @ 90 fpm	Watts @ Max CFM	Watts @ 90 fpm	TOTAL UNIT WEIGHT lb (kg)	SOUND LEVEL dB	OCTAVE BAND SOUND @ 90 fpm						
									2	3	4	5	6	7	
CRFF	24"x24"	1/5	410	315	200	165	41 (19)	48.0	45	51	49	36	32	25	
	24"x48"		660	650	315	310	66(30)	50.3	57	52	49	44	36	30	
CRFF-ARS	24"x24"	1/5	350	210	170	140	44 (20)	48.0	45	51	49	36	32	25	
	24"x48"		610	470	300	245	71 (32)	50.3	57	52	49	44	36	30	
CRFF-ARSM	24"x24"	1/5	350	210	170	140	44 (20)	48.0	45	51	49	36	32	25	
	24"x48"		610	470	300	245	71 (32)	50.3	57	52	49	44	36	30	

CRFF-E, CRFF-E-ARS SERIES															
UNIT TYPE	NOMINAL UNIT SIZES	MOTOR Hp	MAX CFM	CFM @ 90 fpm	Watts @ Max CFM	Watts @ 90 fpm	TOTAL UNIT WEIGHT lb (kg)	SOUND LEVEL dB	OCTAVE BAND SOUND @ 90 fpm						
									2	3	4	5	6	7	
CRFF-E	24"x24"	1/3	410	315	145	80	41 (19)	46.5	48	48	49	44	38	30	
	24"x48"		660	650	260	235	66(30)	48.0	53	50	47	40	38	35	
CRFF-E-ARS	24"x24"	1/3	350	210	130	50	44 (20)	46.5	48	48	49	44	38	30	
	24"x48"		610	470	225	110	71 (32)	48.0	53	50	47	40	38	35	
CRFF-E-ARSM	24"x24"	1/3	350	210	130	140	44 (20)	46.5	48	48	49	44	38	30	
	24"x48"		610	470	225	245	71 (32)	48.0	53	50	47	40	38	35	

CRFF-B, CRFF-B-ARS SERIES															
UNIT TYPE	NOMINAL UNIT SIZES	MOTOR Hp	MAX CFM	CFM @ 90 fpm	Watts @ Max CFM	Watts @ 90 fpm	TOTAL UNIT WEIGHT lb (kg)	SOUND LEVEL dB	OCTAVE BAND SOUND @ 90 fpm						
									2	3	4	5	6	7	
CRFF-B	24"x24"	1/3	410	315	145	85	41	46	39	41	40	35	32	19	
	24"x48"		950	650	250	90	66	52	58	58	50	43	33	25	
CRFF-B-ARS	24"x24"	1/3	350	210	130	50	44	46	42	42	40	33	28	17	
	24"x48"		850	477	240	65	71	47	53	53	45	35	23	20	
CRFF-B-ARSM	24"x24"	1/3	350	210	130	50	44	46	42	42	40	33	28	17	
	24"x48"		850	477	240	65	71	47	53	53	45	35	23	20	

NOTES: Test data taken with an electronic micromanometer with Velgrid attachment; eight readings in unloaded conditions. Custom-sized units are also available.

FULL LOAD AMPS		
PSC	115V	3.00
	208V	1.50
	277V	1.20
ECM	115V	5.00
	208V	3.00
	277V	2.50

CRFF SERIES

Fan Filter Unit



SPECIALTY PRODUCTS | CRITICAL ENVIRONMENT

SUGGESTED SPECIFICATION & CONFIGURATION | CRFF

The critical room fan filter unit shall be Krueger model CRFF of the sizes shown on the plans or outlet schedule. The unit shall be configured to deliver uniform filtered laminar flow over the face of the unit. A patented air baffle system will be furnished as an integral part of the fan plenum housing. The fan filter unit shall be UL 507 listed, possessing a UL 900 filter. The lid shall be constructed of .080" (2.0 mm) aluminum with ¼"-20 (M6x1) threaded inserts in four corners for suspension. The filter housing will be constructed of 0.063" (1.6 mm) thick aluminum. The unit will be furnished with a 30% (20 PPI) polyurethane foam, washable pre-filter (to be removed with A/C collar option). The unit will contain an integral factory tested type J HEPA filter, which will be rated 99.99% efficient in removal of particles 0.3 micron and larger; leak free in accordance with the latest I.E.S.T. recommended practices. The HEPA filter shall be auto scanned for efficiency and leakage prior to assembly of the fan filter unit. HEPA filter media shall be micro-glass fiber with no more than 8 pleats per inch, sealed to the aluminum housing. The fan will be direct drive; forward curve centrifugal type with permanently lubricated sealed ball bearings. Bearings are rated for L-10 life of 80,000 hours. The motor shall be a permanent split capacitor type, rated for continuous duty, furnished with thermal overload protection and Solid State Speed Control.

ULPA Filters (Rated 99.9995% at 0.12 Micron), UL 900 type F, PTFE (45mm and 68mm packs) are Boron-free ULPA.

Total weight of the standard (24" x 48") unit, excluding optional accessories shall be less than 66 lbs. (30 kg).

PERFORMANCE

The unit shall meet or exceed the requirements/specifications of the following industry standards: ISO Class 5 (Class "100" (M 3.5)) air per the latest IEST 14644-1 (Airborne Particulate Cleanliness Classes). I.E.S.T. Recommended Practices (Laminar Flow Clean Air Devices). Average measured air velocity will be 90 (±10) ft/min (.45 m/s), when measured using a Velgrid (eight readings) 6 in. (152mm) below the filter face. All measured values shall fall within ± 20% of the measured average. The sound level shall be approximately 51 dBA (below NC 45) on low speed or with the optional speed control, measured at 30 in. (762 mm) from the filter face, with the fan delivering an average air flow velocity of 90 ft/min (.45 m/s). Ambient sound level less than 35 dBA. Noise measurements are taken with a clean filter with no external static pressure. Vibration level will not exceed .09 MILS RMS at 90 ft/min (0.45 m/s).

FINISH

The filter face guard will be epoxy powder coated expanded steel. Both the fan plenum and filter housing shall have a mill finish (white aluminum casing or stainless steel construction optional), sealed airtight.

1. SERIES: (XXXX)
CRFF

2. MOTOR: (X)
1 - PSC 120V 1-Phase
2 - PSC 208/240V 1-Phase
3 - PSC 277V 1-Phase

3. CONTROL: (X)
PSC - Solid State Speed Controller

4. FRAME: (XXX)
F23 - Lay-in T-Bar

5. PANEL: (XX)x(XX)
24"x24"
24"x48"

6. FILTER: (XXXX)
HEPA - 99.99% @ 0.3 Micron
ULPA - 99.9995% @ 0.12 Micron

7. ACCESSORY 1: (XXX) (XXX) (XXX)
0 - None
RFI - Run & Filter Load Indicator Light
AIL - Green Run Indicator Light
FLI - Filter Load Indicator Light
CFM - Continuous Filter Monitor (Field Wired)

8. ACCESSORY 2: (XXX)
0 - None
INS - Insulation Top & Sides

9. ACCESSORY 3: (XXX)
0 - None
CHP - Challenge Ports

10. ACCESSORY 4: (XXXXX)
0 - None
SMASS - 304 SS Surface Mount Frame
SMAW - White Surface Mount Frame

11. FINISH: (XX)
01 - Mill Aluminum Casing with White Diffuser Screen
44 - White Aluminum Casing with White Diffuser Screen
90 - 304 SS Casing with 304 SS Diffuser Screen
91 - Mill Aluminum Casing with 304 SS Diffuser Screen

SAMPLE CONFIGURATION: CRFF - 1 - PSC - F23 - 24x48 - HEPA - 0 - 0 - 0 - 0 - 44

B3-66

SUGGESTED SPECIFICATION & CONFIGURATION | CRFF-ARS

The critical room fan filter unit shall be Krueger model CRFF-ARS of the sizes shown on the plans or outlet schedule. The unit shall be configured to deliver uniform filtered laminar flow over the face of the unit. A patented air baffle system will be furnished as an integral part of the fan plenum housing. The fan filter unit shall be UL 507 listed, possessing a UL 900 filter which is removable from the room side. The lid shall be constructed of .080" (2.0 mm) aluminum with ¼"-20 (M6x1) threaded inserts in four corners for suspension. The filter housing will be constructed of 0.063" (1.6 mm) thick aluminum with integral knife edge. The unit will be furnished with a 30% (20 PPI) polyurethane foam, washable pre-filter (to be removed with A/C collar option). The unit will contain an integral factory tested type J HEPA filter, which will be rated 99.99% efficient in removal of particles 0.3 micron and larger; leak free in accordance with the latest I.E.S.T. recommended practices. The HEPA filter shall be auto scanned for efficiency and leakage prior to assembly of the fan filter unit. HEPA filter media shall be micro-glass fiber with no more than 8 pleats per inch and contain a continuous gel seal pocket. The fan will be direct drive; forward curve centrifugal type with permanently lubricated sealed ball bearings. Bearings are rated for L-10 life of 80,000 hours. The motor shall be a permanent split capacitor type, rated for continuous duty, furnished with thermal overload protection and Solid State Speed Control.

ULPA Filters (Rated 99.9995% at 0.12 Micron), UL 900 type F, PTFE (45mm and 68mm packs) are Boron-free ULPA.

Total weight of the standard (24" x 48") unit, excluding optional accessories shall be less than 71 lbs. (32 kg).

PERFORMANCE

The unit shall meet or exceed the requirements/specifications of the following industry standards: ISO Class 5 (Class "100" (M 3.5)) air per the latest IEST 14644-1 (Airborne Particulate Cleanliness Classes). I.E.S.T. Recommended Practices (Laminar Flow Clean Air Devices). Average measured air velocity will be 90 (±10) ft/min (.45 m/s), when measured using a Velgrid (eight readings) 6 in. (152mm) below the filter face. All measured values shall fall within ± 20% of the measured average. The sound level shall be approximately 51 dBA (below NC 45) on low speed or with the optional speed control, measured at 30 in. (762 mm) from the filter face, with the fan delivering an average air flow velocity of 90 ft/min (.45 m/s). Ambient sound level less than 35 dBA. Noise measurements are taken with a clean filter with no external static pressure. Vibration level will not exceed .09 MILS RMS at 90 ft/min (0.45 m/s).

FINISH

The filter face guard will be anodized or epoxy powder coated perforated aluminum. Both the fan plenum and filter housing shall have a mill finish (white aluminum casing or stainless steel construction optional), sealed airtight.

- 1. SERIES: (XXXX-XXXX)**
CRFF-ARS
- 2. MOTOR: (X)**
 - 1 - PSC 120V 1-Phase
 - 2 - PSC 208/240V 1-Phase
 - 3 - PSC 277V 1-Phase
- 3. CONTROL: (X)**
PSC - Solid State Speed Controller
- 4. FRAME: (XXX)**
F23 - Lay-in T-Bar
- 5. PANEL: (XX)x(XX)**
 - 24"x24"
 - 24"x48"
- 6. FILTER: (XXXX)**
 - HEPA - 99.99% @ 0.3 Micron
 - ULPA - 99.9995% @ 0.12 Micron
- 7. ACCESSORY 1: (XXX) (XXX) (XXX)**
 - 0 - None
 - RFI - Run & Filter Load Indicator Light
 - AIL - Green Run Indicator Light
 - FLI - Filter Load Indicator Light
 - CFM - Continuous Filter Monitor (Field Wired)
- 8. ACCESSORY 2: (XXX)**
 - 0 - None
 - INS - Insulation Top & Sides
- 9. ACCESSORY 3: (XXX)**
 - 0 - None
 - FSL - Filter Ships Loose
- 10. ACCESSORY 4: (XXXXXX)**
 - 0 - None
 - SMASS - 304 SS Surface Mount Frame
 - SMAW - White Surface Mount Frame
- 11. FINISH: (XX)**
 - 01 - Mill Aluminum Casing with White Diffuser Screen
 - 44 - White Aluminum Casing with White Diffuser Screen
 - 90 - 304 SS Casing with 304 SS Diffuser Screen
 - 91 - Mill Aluminum Casing with 304 SS Diffuser Screen

SAMPLE CONFIGURATION: CRFF-ARS - 2 - PSC - F23 - 24x48 - HEPA - RFI - 0 - 0 - 0 - 01

CRFF SERIES

Fan Filter Unit



SPECIALTY PRODUCTS | CRITICAL ENVIRONMENT

SUGGESTED SPECIFICATION & CONFIGURATION | CRFF-ARSM

The critical room fan filter unit shall be Krueger model CRFF-ARSM of the sizes shown on the plans or outlet schedule. The unit shall be configured to deliver uniform filtered laminar flow over the face of the unit. A patented air baffle system will be furnished as an integral part of the fan plenum housing. The fan filter unit shall be UL 507 listed, possessing a UL 900 filter which is removable from the room side. The lid shall be constructed of .080" (2.0 mm) aluminum with 1/4"-20 (M6x1) threaded inserts in four corners for suspension. The filter housing will be constructed of 0.063" (1.6 mm) thick aluminum with integral knife edge. The unit will be furnished with a 30% (20 PPI) polyurethane foam, washable pre-filter (to be removed with A/C collar option). The unit will contain an integral factory tested type J HEPA filter, which will be rated 99.99% efficient in removal of particles 0.3 micron and larger; leak free in accordance with the latest I.E.S.T. recommended practices. The HEPA filter shall be auto scanned for efficiency and leakage prior to assembly of the fan filter unit. HEPA filter media shall be micro-glass fiber with no more than 8 pleats per inch and contain a continuous gel seal pocket. The fan will be direct drive; forward curve centrifugal type with permanently lubricated sealed ball bearings. Bearings are rated for L-10 life of 80,000 hours. The motor shall be a permanent split capacitor type, rated for continuous duty. The motor must be roomside removable, furnished with thermal overload protection and Solid State Speed Control.

ULPA Filters (Rated 99.9995% at 0.12 Micron), UL 900 type F, PTFE (45mm and 68mm packs) are Boron-free ULPA.

Total weight of the standard (24" x 48") unit, excluding optional accessories shall be less than 71 lbs. (32 kg).

PERFORMANCE

The unit shall meet or exceed the requirements/specifications of the following industry standards: ISO Class 5 (Class "100" (M 3.5)) air per the latest IEST 14644-1 (Airborne Particulate Cleanliness Classes). I.E.S.T. Recommended Practices (Laminar Flow Clean Air Devices). Average measured air velocity will be 90 (±10) ft/min (.45 m/s), when measured using a Velgrid (eight readings) 6 in. (152mm) below the filter face. All measured values shall fall within ± 20% of the measured average. The sound level shall be approximately 51 dBA (below NC 45) on low speed or with the optional speed control, measured at 30 in. (762 mm) from the filter face, with the fan delivering an average air flow velocity of 90 ft/min (.45 m/s). Ambient sound level less than 35 dBA. Noise measurements are taken with a clean filter with no external static pressure. Vibration level will not exceed .09 MILS RMS at 90 ft/min (0.45 m/s).

FINISH

The filter face guard will be anodized or epoxy powder coated perforated aluminum. Both the fan plenum and filter housing shall have a mill finish (white aluminum casing or stainless steel construction optional), sealed airtight.

- 1. SERIES: (XXXX-XXX)**
CRFF-ARSM
- 2. MOTOR: (X)**
1 - PSC 120V 1-Phase
2 - PSC 208/240V 1-Phase
3 - PSC 277V 1-Phase
- 3. CONTROL: (X)**
PSC - Solid State Speed Controller
- 4. FRAME: (XXX)**
F23 - Lay-in T-Bar
- 5. PANEL: (XX)x(XX)**
24"x24"
24"x48"
- 6. FILTER: (XXXX)**
HEPA - 99.99% @ 0.3 Micron
ULPA - 99.9995% @ 0.12 Micron
- 7. ACCESSORY 1: (XXX) (XXX) (XXX)**
0 - None
RFI - Run & Filter Load Indicator Light
AIL - Green Run Indicator Light
FLI - Filter Load Indicator Light
CFM - Continuous Filter Monitor (Field Wired)
- 8. ACCESSORY 2: (XXX)**
0 - None
INS - Insulation Top & Sides
- 9. ACCESSORY 3: (XXX)**
0 - None
FSL - Filter Ships Loose
- 10. ACCESSORY 4: (XXXXX)**
0 - None
SMASS - 304 SS Surface Mount Frame
SMAW - White Surface Mount Frame
- 11. FINISH: (XX)**
01 - Mill Aluminum Casing with White Diffuser Screen
44 - White Aluminum Casing with White Diffuser Screen
90 - 304 SS Casing with 304 SS Diffuser Screen
91 - Mill Aluminum Casing with 304 SS Diffuser Screen

SAMPLE CONFIGURATION: CRFF-ARS - 1 - PSC - F23 - 24x48 - ULPA - AIL - INS - 0 - SMASS - 01

B3-68

SUGGESTED SPECIFICATION & CONFIGURATION | CRFF-E

The critical room fan filter unit shall be Krueger model CRFF-E of the sizes shown on the plans or outlet schedule. The unit shall be configured to deliver uniform filtered laminar flow over the face of the unit. A patented air baffle system will be furnished as an integral part of the fan plenum housing. The fan filter unit shall be UL 507 listed, possessing a UL 900 filter. The lid shall be constructed of .080" (2.0 mm) aluminum with ¼"-20 (M6x1) threaded inserts in four corners for suspension. The filter housing will be constructed of 0.063" (1.6 mm) thick aluminum. The unit will be furnished with a 30% (20 PPI) polyurethane foam, washable pre-filter (to be removed with A/C collar option). The unit will contain an integral factory tested type J HEPA filter, which will be rated 99.99% efficient in removal of particles 0.3 micron and larger; leak free in accordance with the latest I.E.S.T. recommended practices. The HEPA filter shall be auto scanned for efficiency and leakage prior to assembly of the fan filter unit. HEPA filter media shall be micro-glass with no more than 8 pleats per inch, sealed to the aluminum housing. The fan will be direct drive; forward curve centrifugal type with permanently lubricated sealed ball bearings. Bearings are rated for L-10 life of 80,000 hours. The motor shall be an electronically commutative (ECM) brushless DC motor delivering constant airflow by adjusting motor rpm or torque. The motor must be furnished with thermal overload protection and a universal control card. The universal control card must allow for user selected control via VCU, 0-10V input, or ModBus RTU. Dip switches will select the required mode of operation.

ULPA Filters (Rated 99.9995% at 0.12 Micron), UL 900 type F, PTFE (45mm and 68mm packs) are Boron-free ULPA.

Total weight of the standard (24" x 48") unit, excluding optional accessories shall be less than 66 lbs. (30 kg).

PERFORMANCE

The unit shall meet or exceed the requirements/specifications of the following industry standards: ISO Class 5 (Class "100" (M 3.5)) air per the latest IEST 14644-1 (Airborne Particulate Cleanliness Classes). I.E.S.T. Recommended Practices (Laminar Flow Clean Air Devices). Average measured air velocity will be 90 (±10) ft/min (.45 m/s), when measured using a Velgrid (eight readings) 6 in. (152mm) below the filter face. All measured values shall fall within ± 20% of the measured average. The sound level shall be approximately 51 dBA (below NC 45) on low speed or with the optional speed control, measured at 30 in. (762 mm) from the filter face, with the fan delivering an average air flow velocity of 90 ft/min (.45 m/s). Ambient sound level less than 35 dBA. Noise measurements are taken with a clean filter with no external static pressure. Vibration level will not exceed .09 MILS RMS at 90 ft/min (0.45 m/s).

FINISH

The filter face guard will be anodized epoxy powder coated expanded aluminum. Both the fan plenum and filter housing shall have a mill finish (white aluminum casing or stainless steel construction optional), sealed airtight.

1. SERIES: (XXXX-X)
CRFF-E

2. MOTOR: (X)
4 - ECM 120V 1-Phase
5 - ECM 208/240V 1-Phase
6 - ECM 277V 1-Phase

3. CONTROL: (X)
UCC - Universal Control Card - CFM
TRQ - Universal Control Card - TRQ
RPM - Universal Control Card - RPM
ISC - IR Control Card
RM - Remote Mounted

4. FRAME: (XXX)
F23 - Lay-in T-Bar

5. PANEL: (XX)x(XX)
24"x24", 24"x48"

6. FILTER: (XXXX)
HEPA - 99.99% @ 0.3 Micron
ULPA - 99.9995% @ 0.12 Micron

7. ACCESSORY 1: (XXX) (XXX) (XXX)
0 - None
RFI - Run & Filter Load Indicator Light
AIL - Green Run Indicator Light
FLI - Filter Load Indicator Light
CFM - Continuous Filter Monitor (Field Wired)
CFW - Filter Monitor (Factory Wired, UCC Req.)

8. ACCESSORY 2: (XXX)
0 - None
INS - Insulation Top & Sides

9. ACCESSORY 3: (XXX)
0 - None
CHP - Challenge Ports

10. ACCESSORY 4: (XXXXX)
0 - None
SMASS - 304 SS Surface Mount Frame
SMAW - White Surface Mount Frame

11. FINISH: (XX)
01 - Mill Aluminum Casing with White Diffuser Screen
44 - White Aluminum Casing with White Diffuser Screen
90 - 304 SS Casing with 304 SS Diffuser Screen
91 - Mill Aluminum Casing with 304 SS Diffuser Screen

SAMPLE CONFIGURATION: CRFF-E - 4 - UCC - F23 - 24x48 - HEPA - RFI - INS - CHP - 0 - 44

CRFF SERIES

Fan Filter Unit



SPECIALTY PRODUCTS | CRITICAL ENVIRONMENT

SUGGESTED SPECIFICATION & CONFIGURATION | CRFF-E-ARS

The critical room fan filter unit shall be Krueger model CRFF-E-ARS of the sizes shown on the plans or outlet schedule. The unit shall be configured to deliver uniform filtered laminar flow over the face of the unit. A patented air baffle system will be furnished as an integral part of the fan plenum housing. The fan filter unit shall be UL 507 listed, possessing a UL 900 filter which is removable from the room side. The lid shall be constructed of .080" (2.0 mm) aluminum with 1/4"-20 (M6x1) threaded inserts in four corners for suspension. The filter housing will be constructed of 0.063" (1.6 mm) thick aluminum with integral knife edge. The unit will be furnished with a 30% (20 PPI) polyurethane foam, washable pre-filter (to be removed with A/C collar option). The unit will contain an integral factory tested type J HEPA filter, which will be rated 99.99% efficient in removal of particles 0.3 micron and larger; leak free in accordance with the latest I.E.S.T. recommended practices. The HEPA filter shall be auto scanned for efficiency and leakage prior to assembly of the fan filter unit. HEPA filter media shall be micro-glass fiber with no more than 8 pleats per inch and contain a continuous gel seal pocket. The fan will be direct drive; forward curve centrifugal type with permanently lubricated sealed ball bearings. Bearings are rated for L-10 life of 80,000 hours. The motor shall be an electronically commutative (ECM) brushless DC motor delivering constant airflow by adjusting motor rpm or torque. The motor must be furnished with thermal overload protection and a universal control card. The universal control must allow for user selected control via VCU, 0-10V input, or ModBus RTU. Dip switches will select the required mode of operation.

ULPA Filters (Rated 99.9995% at 0.12 Micron), UL 900 type F, PTFE (45mm and 68mm packs) are Boron-free ULPA.

Total weight of the standard (24" x 48") unit, excluding optional accessories shall be less than 71 lbs. (32 kg).

PERFORMANCE

The unit shall meet or exceed the requirements/specifications of the following industry standards: ISO Class 5 (Class "100" (M 3.5)) air per the latest IEST 14644-1 (Airborne Particulate Cleanliness Classes). I.E.S.T. Recommended Practices (Laminar Flow Clean Air Devices). Average measured air velocity will be 90 (±10) ft/min (.45 m/s), when measured using a Velgrid (eight readings) 6 in. (152mm) below the filter face. All measured values shall fall within ± 20% of the measured average. The sound level shall be approximately 51 dBA (below NC 45) on low speed or with the optional speed control, measured at 30 in. (762 mm) from the filter face, with the fan delivering an average air flow velocity of 90 ft/min (.45 m/s). Ambient sound level less than 35 dBA. Noise measurements are taken with a clean filter with no external static pressure. Vibration level will not exceed .09 MILS RMS at 90 ft/min (0.45 m/s).

1. SERIES: (XXXX-X-XXX)
CRFF-E-ARS

2. MOTOR: (X)
4 - ECM 120V 1-Phase
5 - ECM 208/240V 1-Phase
6 - ECM 277V 1-Phase

3. CONTROL: (X)
UCC - Universal Control Card - CFM
TRQ - Universal Control Card - TRQ
RPM - Universal Control Card - RPM
ISC - IR Control Card
RM - Remote Mounted

4. FRAME: (XXX)
F23 - Lay-in T-Bar

5. PANEL: (XX)x(XX)
24"x24", 24"x48"

6. FILTER: (XXXX)
HEPA - 99.99% @ 0.3 Micron
ULPA - 99.9995% @ 0.12 Micron

7. ACCESSORY 1: (XXX) (XXX) (XXX)
0 - None
RFI - Run & Filter Load Indicator Light
AIL - Green Run Indicator Light
FLI - Filter Load Indicator Light
CFM - Continuous Filter Monitor (Field Wired)
CFW - Filter Monitor (Factory Wired, UCC Req.)

8. ACCESSORY 2: (XXX)
0 - None
INS - Insulation Top & Sides

9. ACCESSORY 3: (XXX)
0 - None
FSL - Filter Ships Loose

10. ACCESSORY 4: (XXXXX)
0 - None
SMASS - 304 SS Surface Mount Frame
SMAW - White Surface Mount Frame

11. FINISH: (XX)
01 - Mill Aluminum Casing with White Diffuser Screen
44 - White Aluminum Casing with White Diffuser Screen
90 - 304 SS Casing with 304 SS Diffuser Screen
91 - Mill Aluminum Casing with 304 SS Diffuser Screen

FINISH

The filter face guard will be anodized or epoxy powder coated perforated aluminum. Both the fan plenum and filter housing shall have a mill finish (white aluminum casing or stainless steel construction optional), sealed airtight.

SAMPLE CONFIGURATION: CRFF-E-ARS - 5 - RPM - F23 - 24x48 - HEPA - FLI - 0 - FSL - 0 - 01

B3-70

SUGGESTED SPECIFICATION & CONFIGURATION | CRFF-E-ARSM

The critical room fan filter unit shall be Krueger model CRFF-E-ARSM of the sizes shown on the plans or outlet schedule. The unit shall be configured to deliver uniform filtered laminar flow over the face of the unit. A patented air baffle system will be furnished as an integral part of the fan plenum housing. The fan filter unit shall be UL 507 listed, possessing a UL 900 filter which is removable from the room side. The lid shall be constructed of .080" (2.0 mm) aluminum with ¼"-20 (M6x1) threaded inserts in four corners for suspension. The filter housing will be constructed of 0.063" (1.6 mm) thick aluminum with integral knife edge. The unit will be furnished with a 30% (20 PPI) polyurethane foam, washable pre-filter (to be removed with A/C collar option). The unit will contain an integral factory tested HEPA filter, which will be rated 99.99% efficient in removal of particles 0.3 micron and larger; leak free in accordance with the latest I.E.S.T. recommended practices. The HEPA filter shall be auto scanned for efficiency and leakage prior to assembly of the fan filter unit. HEPA filter media shall be micro-glass fiber with no more than 8 pleats per inch and contain a continuous gel seal pocket. The fan will be direct drive; forward curve centrifugal type with permanently lubricated sealed ball bearings. Bearings are rated for L-10 life of 80,000 hours. The motor shall be an electronically commutative (ECM) brushless DC motor delivering constant airflow by adjusting motor rpm or torque. The motor must be roomside removable, furnished with thermal overload protection and a universal control card. The universal control card must allow for user selected control via VCU, 0-10V input, or ModBus RTU. Dip switches will select the required mode of operation.

ULPA Filters (Rated 99.9995% at 0.12 Micron), UL 900 type F, PTFE (45mm and 68mm packs) are Boron-free ULPA.

Total weight of the standard (24" x 48") unit, excluding optional accessories shall be less than 71 lbs. (32 kg).

PERFORMANCE

The unit shall meet or exceed the requirements/specifications of the following industry standards: ISO Class 5 (Class "100" (M 3.5)) air per the latest IEST 14644-1 (Airborne Particulate Cleanliness Classes). I.E.S.T. Recommended Practices (Laminar Flow Clean Air Devices). Average measured air velocity will be 90(±10) ft/min (.45 m/s), when measured using a Velgrid (eight readings) 6 in. (152mm) below the filter face. All measured values shall fall within ± 20% of the measured average. The sound level shall be approximately 51 dBA (below NC 45) on low speed or with the optional speed control, measured at 30 in. (762 mm) from the filter face, with the fan delivering an average air flow velocity of 90 ft/min (.45 m/s). Ambient sound level less than 35 dBA. Noise measurements are taken with a clean filter with no external static pressure. Vibration level will not exceed .09 MILS RMS at 90 ft/min (0.45 m/s).

- 1. SERIES: (XXXX-X-XXXX)**
CRFF-E-ARSM
- 2. MOTOR: (X)**
4 - ECM 120V 1-Phase
5 - ECM 208/240V 1-Phase
6 - ECM 277V 1-Phase
- 3. CONTROL: (X)**
UCC - Universal Control Card - CFM
TRQ - Universal Control Card - TRQ
RPM - Universal Control Card - RPM
ISC - IR Control Card
RM - Remote Mounted
- 4. FRAME: (XXX)**
F23 - Lay-in T-Bar
- 5. PANEL: (XX)x(XX)**
24"x24", 24"x48"
- 6. FILTER: (XXXX)**
HEPA - 99.99% @ 0.3 Micron
ULPA - 99.9995% @ 0.12 Micron
- 7. ACCESSORY 1: (XXX) (XXX) (XXX)**
0 - None
RFI - Run & Filter Load Indicator Light
AIL - Green Run Indicator Light
FLI - Filter Load Indicator Light
CFM - Continuous Filter Monitor (Field Wired)
CFW - Filter Monitor (Factory Wired, UCC Req.)
- 8. ACCESSORY 2: (XXX)**
0 - None
INS - Insulation Top & Sides
- 9. ACCESSORY 3: (XXX)**
0 - None
FSL - Filter Ships Loose
- 10. ACCESSORY 4: (XXXXX)**
0 - None
SMASS - 304 SS Surface Mount Frame
SMAW - White Surface Mount Frame
- 11. FINISH: (XX)**
01 - Mill Aluminum Casing with White Diffuser Screen
44 - White Aluminum Casing with White Diffuser Screen
90 - 304 SS Casing with 304 SS Diffuser Screen
91 - Mill Aluminum Casing with 304 SS Diffuser Screen

FINISH

The filter face guard will be epoxy powder coated perforated aluminum. Both the fan plenum and filter housing shall have a mill finish (white aluminum casing or stainless steel construction optional), sealed airtight.

SAMPLE CONFIGURATION: CRFF-E-ARSM - 4 - TRQ - F23 - 24x48 - HEPA - RFI - 0 - 0 - 0 - 01

CRFF SERIES

Fan Filter Unit



SPECIALTY PRODUCTS | CRITICAL ENVIRONMENT

SUGGESTED SPECIFICATION & CONFIGURATION | CRFF-B

The critical room fan filter unit shall be Krueger model CRFF-B of the sizes shown on the plans or outlet schedule. The unit shall be configured to deliver uniform filtered laminar flow over the face of the unit. A patented air baffle system will be furnished as an integral part of the fan plenum housing. The fan filter unit shall be UL 507 listed, possessing a UL 900 filter. The lid shall be constructed of .080" (2.0 mm) aluminum with ¼"-20 (M6x1) threaded inserts in four corners for suspension. The filter housing will be constructed of 0.063" (1.6 mm) thick aluminum. The unit will be furnished with a 30% (20 PPI) polyurethane foam, washable pre-filter (to be removed with A/C collar option). The unit will contain an integral factory tested type J HEPA filter, which will be rated 99.99% efficient in removal of particles 0.3 micron and larger; leak free in accordance with the latest I.E.S.T. recommended practices. The HEPA filter shall be auto scanned for efficiency and leakage prior to assembly of the fan filter unit. HEPA filter media shall be micro-glass with no more than 8 pleats per inch, sealed to the aluminum housing. The fan will be direct drive; forward curve centrifugal type with permanently lubricated sealed ball bearings. Bearings are rated for L-10 life of 80,000 hours. The motor shall be an electronically commutative (ECM) brushless DC motor delivering constant airflow by adjusting motor rpm or torque. The motor must be furnished with thermal overload protection and a universal control card. The universal control card must allow for user selected control via VCU, 0-10V input, or ModBus RTU. Dip switches will select the required mode of operation.

ULPA Filters (Rated 99.9995% at 0.12 Micron), UL 900 type F, PTFE (45mm and 68mm packs) are Boron-free ULPA.

Total weight of the standard (24" x 48") unit, excluding optional accessories shall be less than 66 lbs. (30 kg).

PERFORMANCE

The unit shall meet or exceed the requirements/specifications of the following industry standards: ISO Class 5 (Class "100" (M 3.5)) air per the latest IEST 14644-1 (Airborne Particulate Cleanliness Classes). I.E.S.T. Recommended Practices (Laminar Flow Clean Air Devices). Average measured air velocity will be 90 (±10) ft/min (.45 m/s), when measured using a Velgrid (eight readings) 6 in. (152mm) below the filter face. All measured values shall fall within ± 20% of the measured average. The sound level shall be approximately 51 dBA (below NC 45) on low speed or with the optional speed control, measured at 30 in. (762 mm) from the filter face, with the fan delivering an average air flow velocity of 90 ft/min (.45 m/s). Ambient sound level less than 35 dBA. Noise measurements are taken with a clean filter with no external static pressure. Vibration level will not exceed .09 MILS RMS at 90 ft/min (0.45 m/s).

FINISH

The filter face guard will be anodized epoxy powder coated expanded aluminum. Both the fan plenum and filter housing shall have a mill finish (white aluminum casing or stainless steel construction optional), sealed airtight.

1. SERIES: (XXXX-X)
CRFF-B

2. MOTOR: (X)
4 - ECM 120V 1-Phase
5 - ECM 208/240V 1-Phase
6 - ECM 277V 1-Phase

3. CONTROL TYPE: (X)
UCC - Universal Control Card - CFM
ISC - IR Control Card
RM - Remote Mounted

4. FRAME: (XXX)
F23 - Lay-in T-Bar

5. PANEL: (XX)x(XX)
24"x24"
24"x48"

6. FILTER: (XXXX)
HEPA - 99.99% @ 0.3 Micron
ULPA - 99.9995% @ 0.12 Micron

7. ACCESSORY 1: (XXX) (XXX) (XXX)
0 - None
RFI - Run & Filter Load Indicator Light
AIL - Green Run Indicator Light
FLI - Filter Load Indicator Light
CFM - Continuous Filter Monitor (Field Wired)
CFW - Filter Monitor (Factory Wired, UCC Req.)

8. ACCESSORY 2: (XXX)
0 - None
INS - Insulation Top & Sides

9. ACCESSORY 3: (XXX)
0 - None
CHP - Challenge Ports

10. ACCESSORY 4: (XXXXX)
0 - None
SMASS - 304 SS Surface Mount Frame
SMAW - White Surface Mount Frame

11. FINISH: (XX)
01 - Mill Aluminum Casing with White Diffuser Screen
44 - White Aluminum Casing with White Diffuser Screen
90 - 304 SS Casing with 304 SS Diffuser Screen
91 - Mill Aluminum Casing with 304 SS Diffuser Screen

SAMPLE CONFIGURATION: CRFF-B - 4 - UCC - F23 - 24x48 - HEPA - RFI - CFW - CHP - 0 - 0 - 90

B3-72

SUGGESTED SPECIFICATION & CONFIGURATION | CRFF-B-ARS

The critical room fan filter unit shall be Krueger model CRFF-B-ARS of the sizes shown on the plans or outlet schedule. The unit shall be configured to deliver uniform filtered laminar flow over the face of the unit. A patented air baffle system will be furnished as an integral part of the fan plenum housing. The fan filter unit shall be UL 507 listed, possessing a UL 900 filter which is removable from the room side. The lid shall be constructed of .080" (2.0 mm) aluminum with ¼"-20 (M6x1) threaded inserts in four corners for suspension. The filter housing will be constructed of 0.063" (1.6 mm) thick aluminum with integral knife edge. The unit will be furnished with a 30% (20 PPI) polyurethane foam, washable pre-filter (to be removed with A/C collar option). The unit will contain an integral factory tested type J HEPA filter, which will be rated 99.99% efficient in removal of particles 0.3 micron and larger; leak free in accordance with the latest I.E.S.T. recommended practices. The HEPA filter shall be auto scanned for efficiency and leakage prior to assembly of the fan filter unit. HEPA filter media shall be micro-glass fiber with no more than 8 pleats per inch and contain a continuous gel seal pocket. The fan will be direct drive; forward curve centrifugal type with permanently lubricated sealed ball bearings. Bearings are rated for L-10 life of 80,000 hours. The motor shall be an electronically commutative (ECM) brushless DC motor delivering constant airflow by adjusting motor rpm or torque. The motor must be furnished with thermal overload protection and a universal control card. The universal control must allow for user selected control via VCU, 0-10V input, or ModBus RTU. Dip switches will select the required mode of operation.

ULPA Filters (Rated 99.9995% at 0.12 Micron), UL 900 type F, PTFE (45mm and 68mm packs) are Boron-free ULPA.

Total weight of the standard (24" x 48") unit, excluding optional accessories shall be less than 71 lbs. (32 kg).

PERFORMANCE

The unit shall meet or exceed the requirements/specifications of the following industry standards: ISO Class 5 (Class "100" (M 3.5)) air per the latest IEST 14644-1 (Airborne Particulate Cleanliness Classes). I.E.S.T. Recommended Practices (Laminar Flow Clean Air Devices). Average measured air velocity will be 90 (±10) ft/min (.45 m/s), when measured using a Velgrid (eight readings) 6 in. (152mm) below the filter face. All measured values shall fall within ± 20% of the measured average. The sound level shall be approximately 51 dBA (below NC 45) on low speed or with the optional speed control, measured at 30 in. (762 mm) from the filter face, with the fan delivering an average air flow velocity of 90 ft/min (.45 m/s). Ambient sound level less than 35 dBA. Noise measurements are taken with a clean filter with no external static pressure. Vibration level will not exceed .09 MILS RMS at 90 ft/min (0.45 m/s).

1. SERIES: (XXXX-X-XXX)
CRFF-B-ARS

2. MOTOR: (X)
4 - ECM 120V 1-Phase
5 - ECM 208/240V 1-Phase
6 - ECM 277V 1-Phase

3. CONTROL TYPE: (X)
UCC - Universal Control Card - CFM
ISC - IR Control Card
RM - Remote Mounted

4. FRAME: (XXX)
F23 - Lay-in T-Bar

5. PANEL: (XX)x(XX)
24"x24"
24"x48"

6. FILTER: (XXXX)
HEPA - 99.99% @ 0.3 Micron
ULPA - 99.9995% @ 0.12 Micron

7. ACCESSORY 1: (XXX) (XXX) (XXX)
0 - None
RFI - Run & Filter Load Indicator Light
AIL - Green Run Indicator Light
FLI - Filter Load Indicator Light
CFM - Continuous Filter Monitor (Field Wired)
CFW - Filter Monitor (Factory Wired, UCC Req.)

8. ACCESSORY 2: (XXX)
0 - None
INS - Insulation Top & Sides

9. ACCESSORY 3: (XXX)
0 - None
FSL - Filter ships loose

10. ACCESSORY 4: (XXXXX)
0 - None
SMASS - 304 SS Surface Mount Frame
SMAW - White Surface Mount Frame

11. FINISH: (XX)
01 - Mill Aluminum Casing with White Diffuser Screen
44 - White Aluminum Casing with White Diffuser Screen
90 - 304 SS Casing with 304 SS Diffuser Screen
91 - Mill Aluminum Casing with 304 SS Diffuser Screen

FINISH

The filter face guard will be anodized or epoxy powder coated perforated aluminum. Both the fan plenum and filter housing shall have a mill finish (white aluminum casing or stainless steel construction optional), sealed airtight.

SAMPLE CONFIGURATION: CRFF-B-ARS - 4 - 2 - F23 - 24x48 - HEPA - AIL - CFM - 0 - FSL - SMASS - 90

CRFF SERIES

Fan Filter Unit



SPECIALTY PRODUCTS | CRITICAL ENVIRONMENT

SUGGESTED SPECIFICATION & CONFIGURATION | CRFF-B-ARSM

The critical room fan filter unit shall be Krueger model CRFF-B-ARSM of the sizes shown on the plans or outlet schedule. The unit shall be configured to deliver uniform filtered laminar flow over the face of the unit. A patented air baffle system will be furnished as an integral part of the fan plenum housing. The fan filter unit shall be UL 507 listed, possessing a UL 900 filter which is removable from the room side. The lid shall be constructed of .080" (2.0 mm) aluminum with 1/4"-20 (M6x1) threaded inserts in four corners for suspension. The filter housing will be constructed of 0.063" (1.6 mm) thick aluminum with integral knife edge. The unit will be furnished with a 30% (20 PPI) polyurethane foam, washable pre-filter (to be removed with A/C collar option). The unit will contain an integral factory tested HEPA filter, which will be rated 99.99% efficient in removal of particles 0.3 micron and larger; leak free in accordance with the latest I.E.S.T. recommended practices. The HEPA filter shall be auto scanned for efficiency and leakage prior to assembly of the fan filter unit. HEPA filter media shall be micro-glass fiber with no more than 8 pleats per inch and contain a continuous gel seal pocket. The fan will be direct drive; forward curve centrifugal type with permanently lubricated sealed ball bearings. Bearings are rated for L-10 life of 80,000 hours. The motor shall be an electronically commutative (ECM) brushless DC motor delivering constant airflow by adjusting motor rpm or torque. The motor must be roomside removable, furnished with thermal overload protection and a universal control card. The universal control card must allow for user selected control via VCU, 0-10V input, or ModBus RTU. Dip switches will select the required mode of operation.

ULPA Filters (Rated 99.9995% at 0.12 Micron), UL 900 type F, PTFE (45mm and 68mm packs) are Boron-free ULPA.

Total weight of the standard (24" x 48") unit, excluding optional accessories shall be less than 71 lbs. (32 kg).

PERFORMANCE

The unit shall meet or exceed the requirements/specifications of the following industry standards: ISO Class 5 (Class "100" (M 3.5)) air per the latest IEST 14644-1 (Airborne Particulate Cleanliness Classes). I.E.S.T. Recommended Practices (Laminar Flow Clean Air Devices). Average measured air velocity will be 90(±10) ft/min (.45 m/s), when measured using a Velgrid (eight readings) 6 in. (152mm) below the filter face. All measured values shall fall within ± 20% of the measured average. The sound level shall be approximately 51 dBA (below NC 45) on low speed or with the optional speed control, measured at 30 in. (762 mm) from the filter face, with the fan delivering an average air flow velocity of 90 ft/min (.45 m/s). Ambient sound level less than 35 dBA. Noise measurements are taken with a clean filter with no external static pressure. Vibration level will not exceed .09 MILS RMS at 90 ft/min (0.45 m/s).

1. SERIES: (XXXX-X-XXXX)
CRFF-B-ARSM

2. MOTOR: (X)
4 - ECM 120V 1-Phase
5 - ECM 208/240V 1-Phase
6 - ECM 277V 1-Phase

3. CONTROL TYPE: (X)
UCC - Universal Control Card - CFM
ISC - IR Control Card
RM - Remote Mounted

4. FRAME: (XXX)
F23 - Lay-in T-Bar

5. PANEL: (XX)x(XX)
24"x24"
24"x48"

6. FILTER: (XXXX)
HEPA - 99.99% @ 0.3 Micron
ULPA - 99.9995% @ 0.12 Micron

7. ACCESSORY 1: (XXX) (XXX) (XXX)
0 - None
RFI - Run & Filter Load Indicator Light
AIL - Green Run Indicator Light
FLI - Filter Load Indicator Light
CFM - Continuous Filter Monitor (Field Wired)
CFW - Filter Monitor (Factory Wired, UCC Req.)

8. ACCESSORY 2: (XXX)
0 - None
INS - Insulation Top & Sides

9. ACCESSORY 3: (XXX)
0 - None
FSL - Filter ships loose

10. ACCESSORY 4: (XXXXX)
0 - None
SMASS - 304 SS Surface Mount Frame
SMAW - White Surface Mount Frame

11. FINISH: (XX)
01 - Mill Aluminum Casing with White Diffuser Screen
44 - White Aluminum Casing with White Diffuser Screen
90 - 304 SS Casing with 304 SS Diffuser Screen
91 - Mill Aluminum Casing with 304 SS Diffuser Screen

FINISH

The filter face guard will be epoxy powder coated perforated aluminum. Both the fan plenum and filter housing shall have a mill finish (white aluminum casing or stainless steel construction optional), sealed airtight.

SAMPLE CONFIGURATION: CRFF-B-ARSM - 4 - 2 - F23 - 24x48 - HEPA - RFI - INS - FSL - SMAW - 44

B3-74